University of Mumbai

PRACTICAL JOURNAL – ELECTIVE II

PSIT3P3c

Data Centre Technology

SUBMITTED

BY

SACHIN DADHIBAL JAISWAR

SEAT NO 30440

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTSFOR
QUALIFYING M.Sc. (I.T.) PART-II (SEMESTER – III) EXAMINATION

2023-2024

DEPARTMENT OF INFORMATION TECHNOLOGY 3RD FLOOR, DR. SHANKAR DAYAL SHARMA BHAVAN, VIDYANAGRI,SANTACRUZ (E), MUMBAI – 400098.

University of Mumbai

Department of Information Technology

Certificate

This is to certify that **Mr Sachin Dadhibal jaiswar Seat No. 30440** studying in **Master of Science** in **Information Technology Part II Semester III** has satisfactorily completed the Practical of **PSIT3P3c Data centre Technology** as prescribed by University of Mumbai,during the academic year **2023-24**.

_____ _____

Signature Signature
Subject-In-Charge Head of the Department

_____

Signature
External Examiner

College Seal:_____ **Date: _____**

INDEX

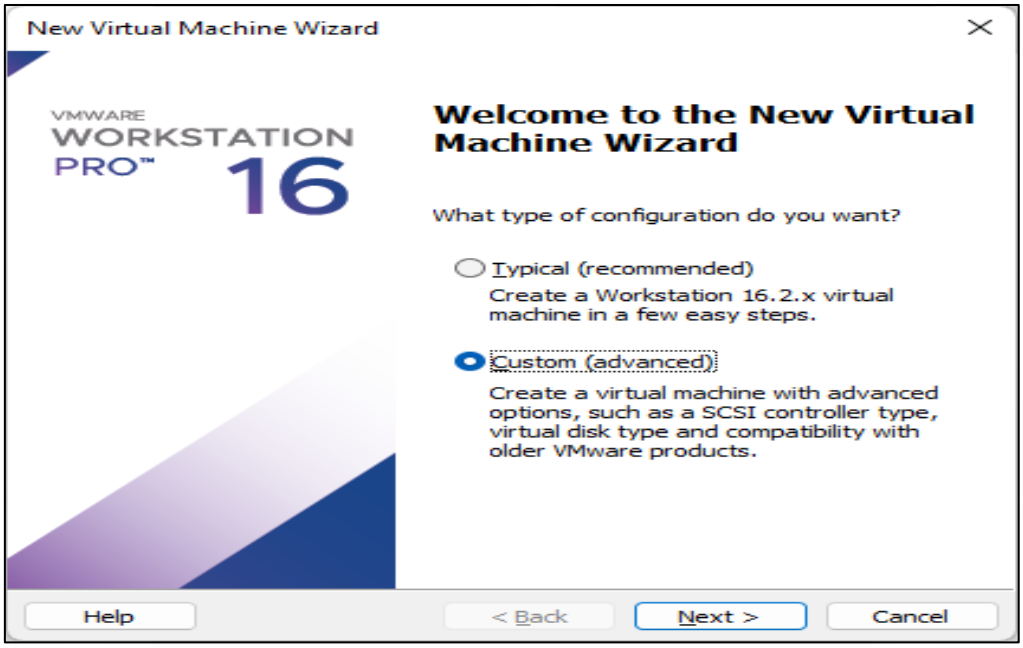
Practical no: 01

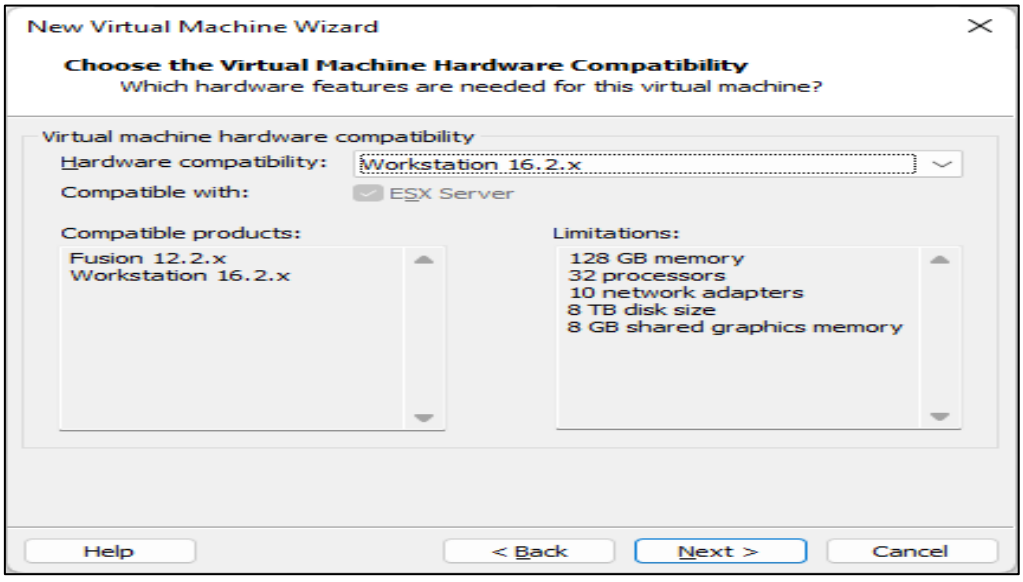
Configuring ESXi Host

Aim: Installation of ESXi.

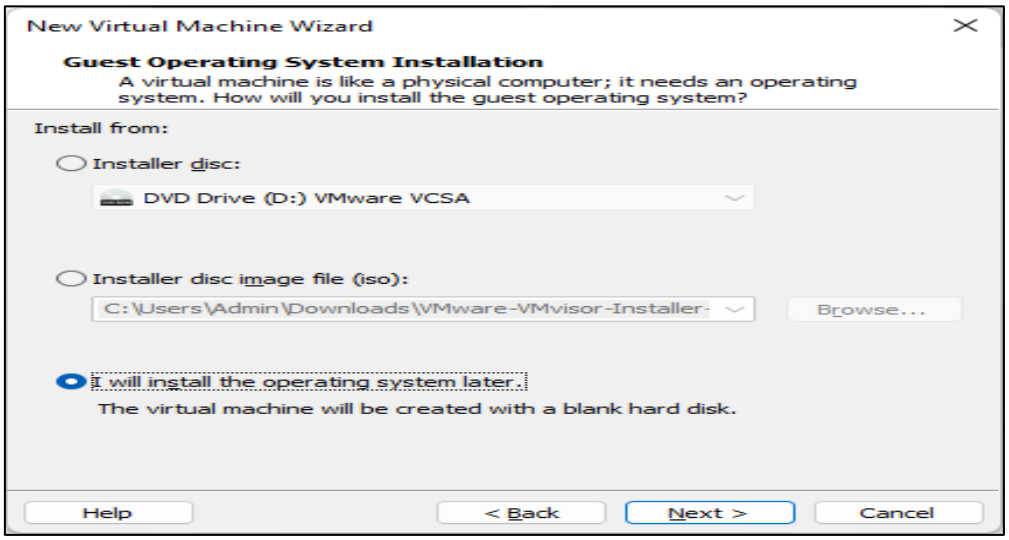
IMPLEMENTATION:

STEP 1: Open the VMware Workstation Pro 16. Go to the File menu. Click on New Virtual Machine option.

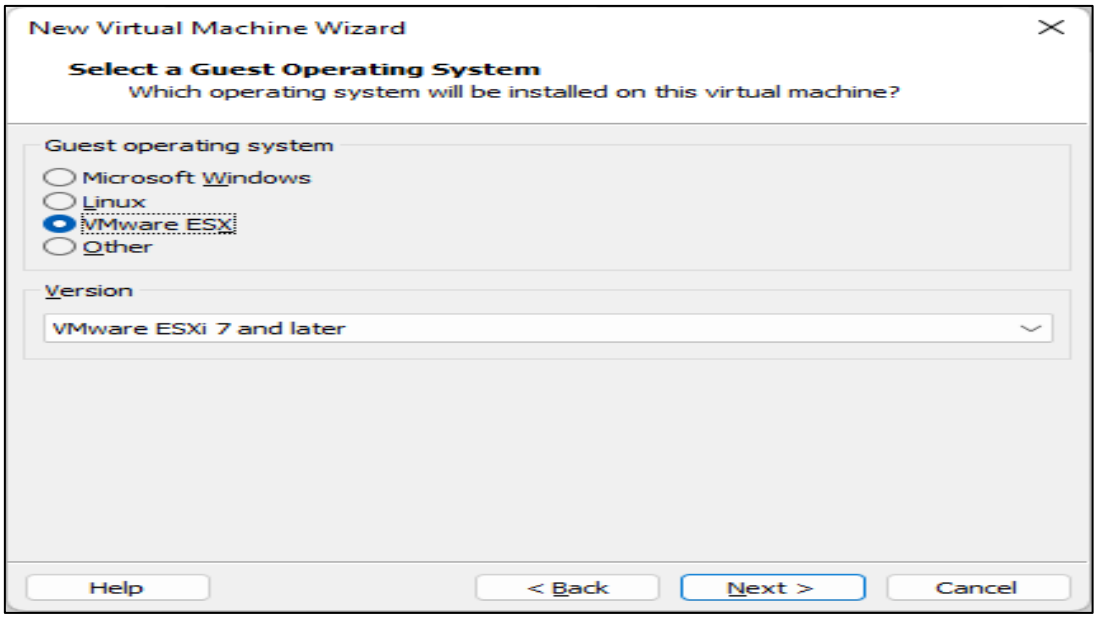




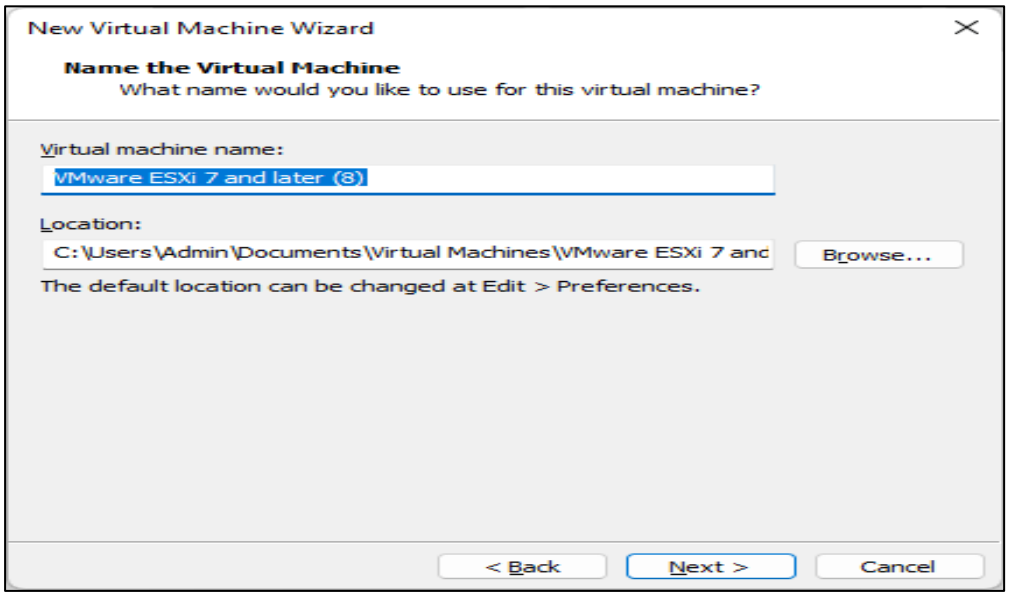
STEP 2: Select the option button "I will install the operating system later" & click on Next.



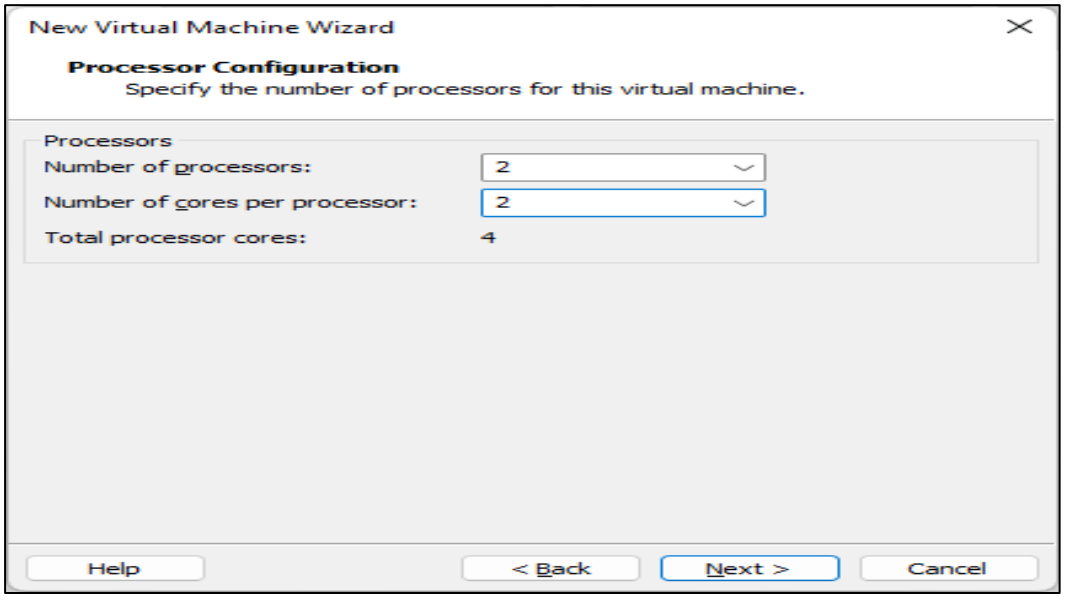
STEP 3: Select the Guest operating system as VMware ESXi & confirm the version should be VMware ESXi 7.



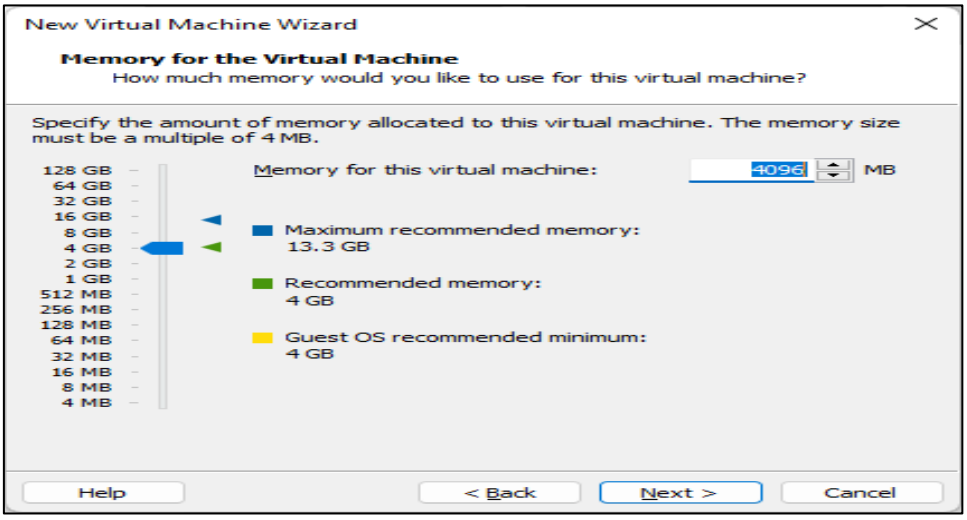
STEP 4: Give the Virtual machine name as VMware ESXi 7 & click on Next.

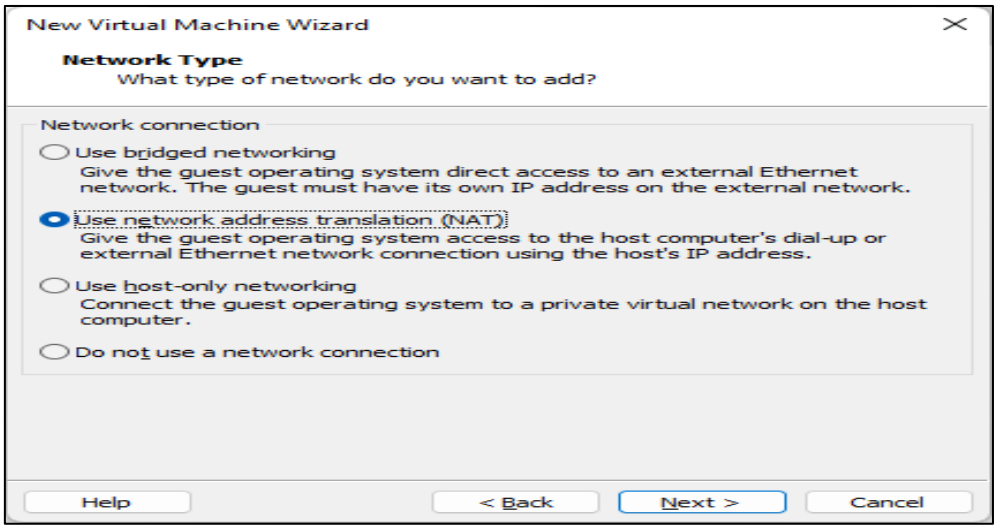


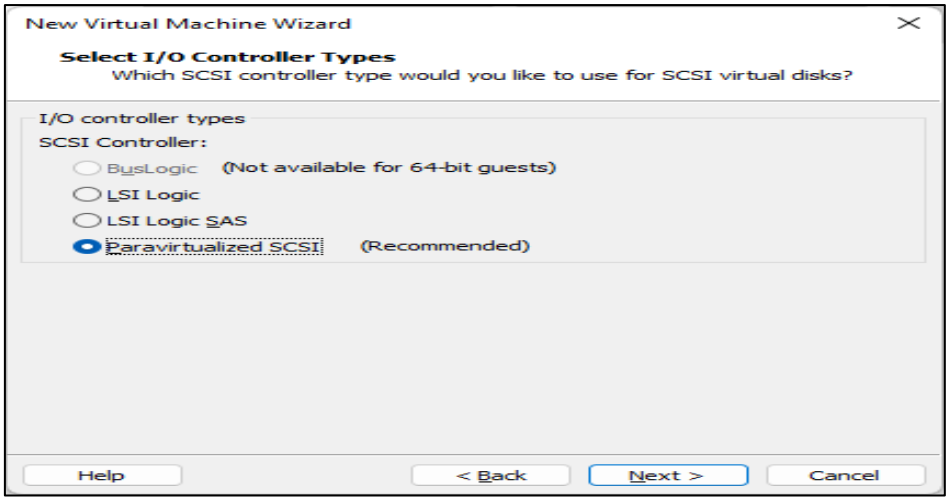
STEP 5: The number of core processors is 1, make it number of core processors as 2.

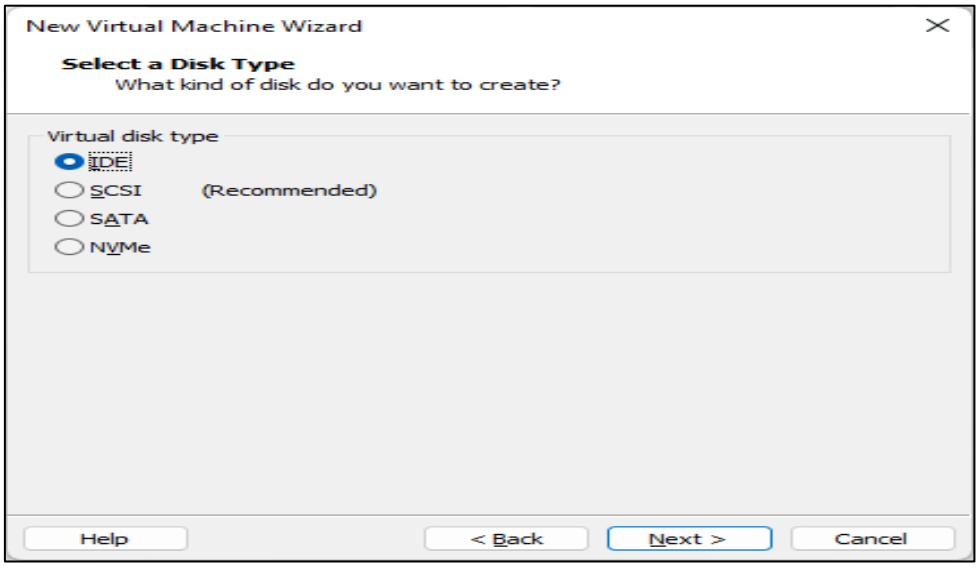


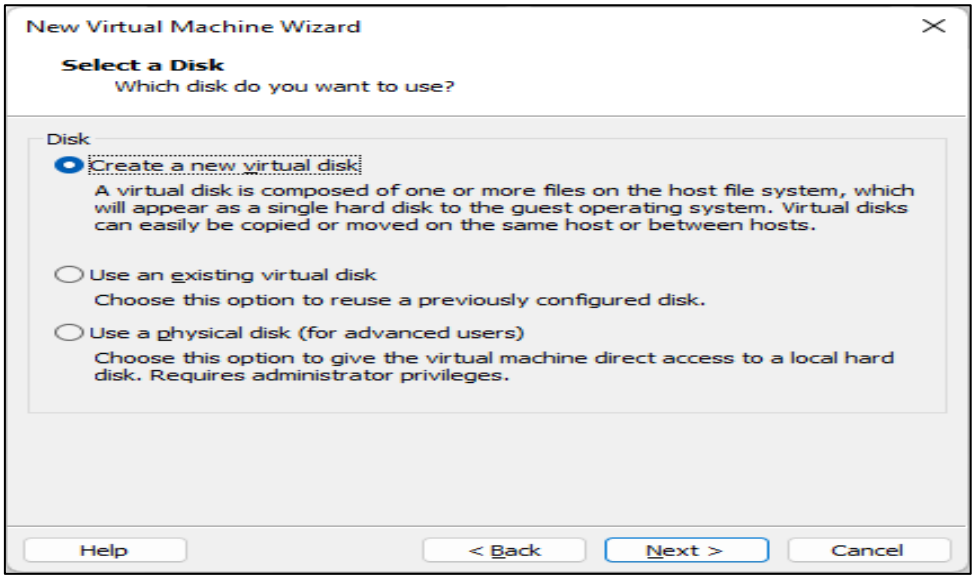
STEP 6: The virtual machine settings will display, by default, memory 4 GB. Click On Next.

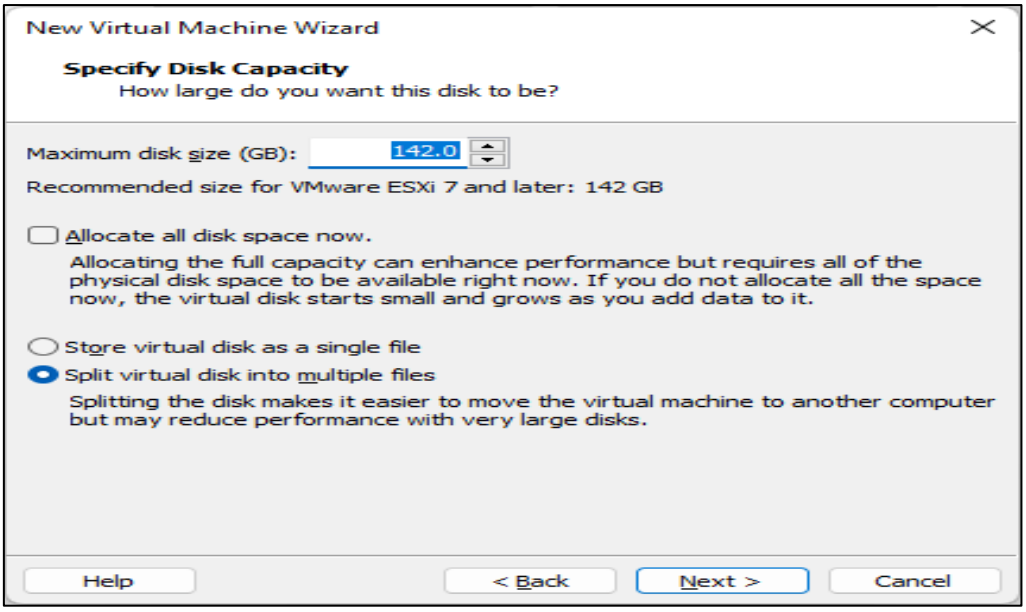


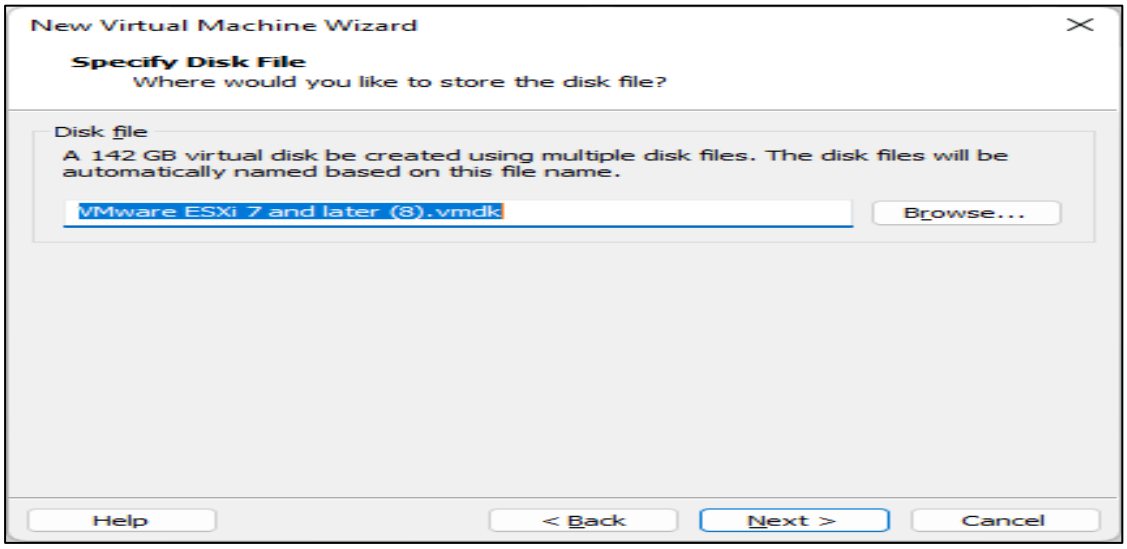



New Virtual Machine Wizard
Select I/O Controller Types
Which SCSI controller type would you like to use for SCSI virtual disks?
I/O controller types
SCSI Controller:
BusLogic (Not available for 64-bit guests)
LSI Logic
LSI Logic SAS
Paravirtualized SCSI (Recommended)
Help
< Back
Next >
Cancel

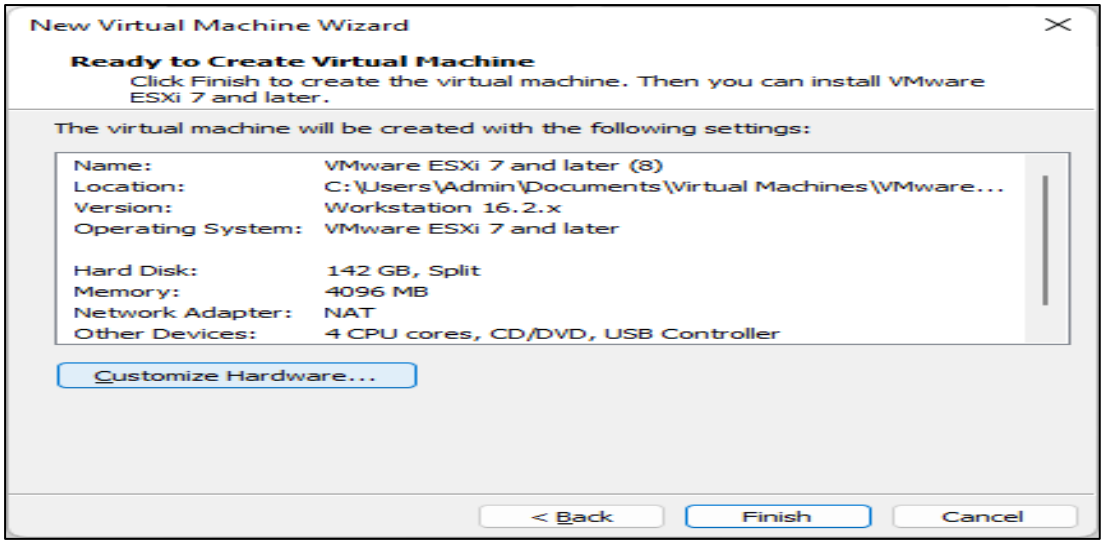

New Virtual Machine Wizard
Select a Disk Type
What kind of disk do you want to create?
Virtual disk type
IDE
SCSI (Recommended)
SATA
NVMe
Help
< Back
Next >
Cancel

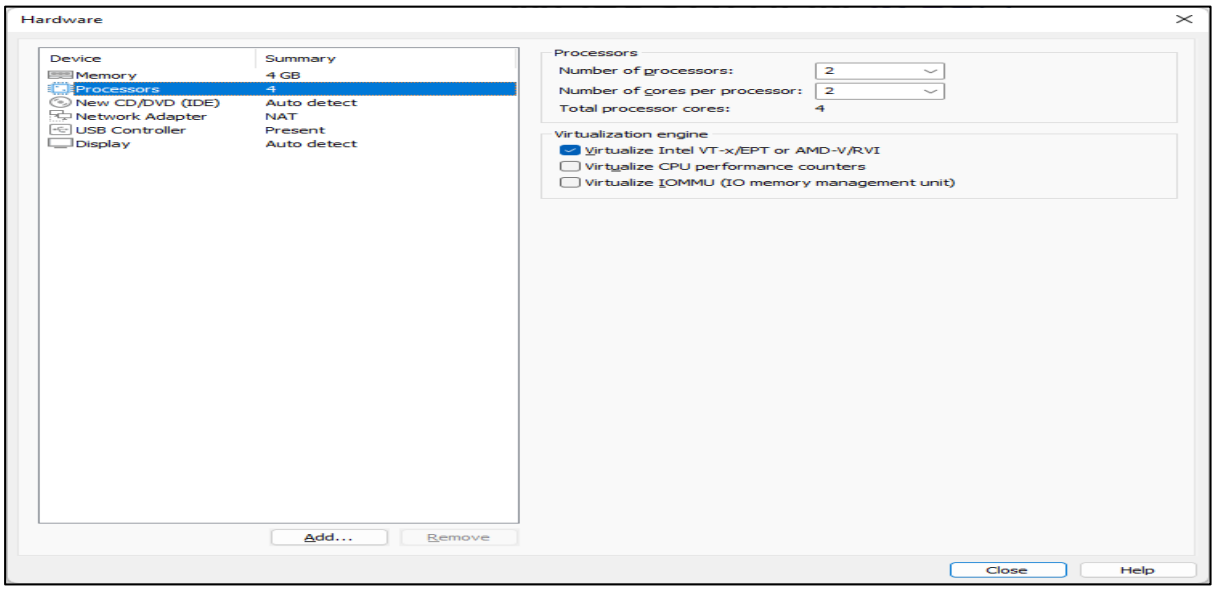

New Virtual Machine Wizard
Select a Disk
Which disk do you want to use?
Disk
Create a new virtual disk
A virtual disk is composed of one or more files on the host file system, which will appear as a single hard disk to the guest operating system. Virtual disks can easily be copied or moved on the same host or between hosts.
Use an existing virtual disk
Choose this option to reuse a previously configured disk.
Use a physical disk (for advanced users)
Choose this option to give the virtual machine direct access to a local hard disk. Requires administrator privileges.
Help
< Back
Next >
Cancel



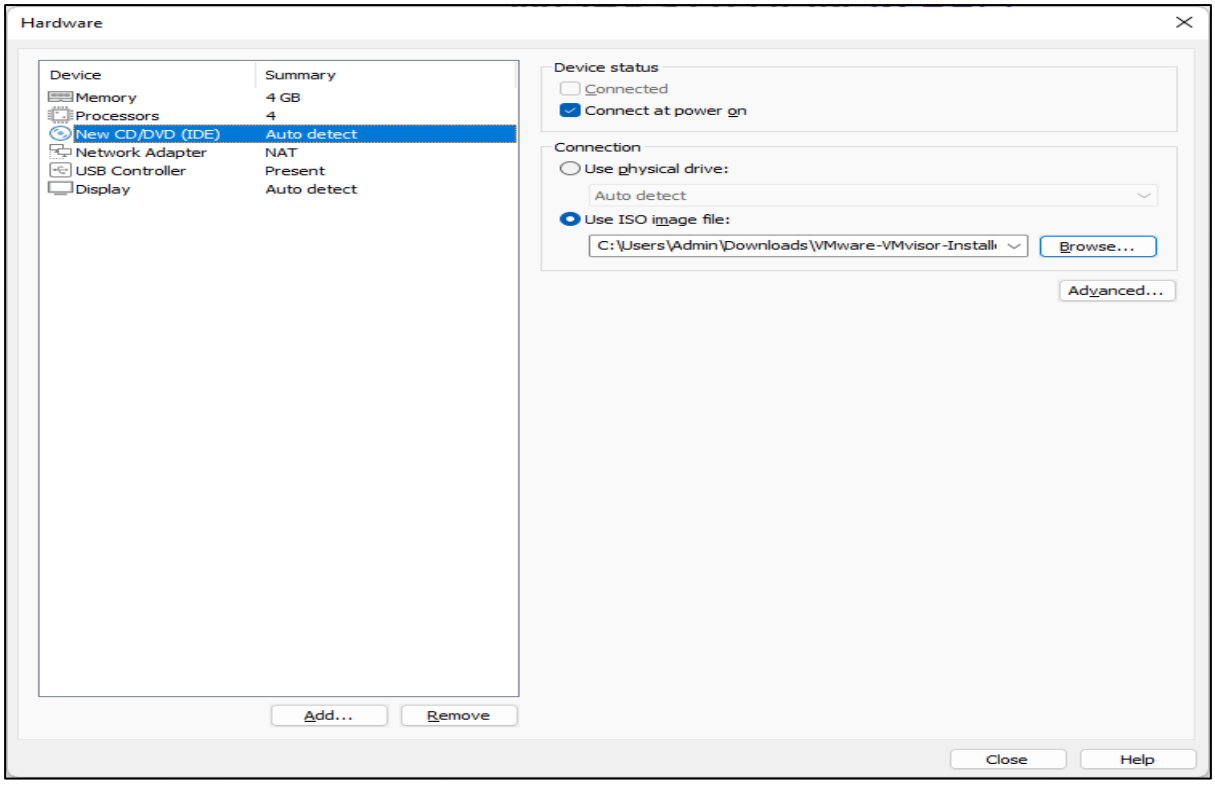


STEP 7: Then it will display the whole hardware information for VMware ESXi 5. Just click on Customize Hardware.

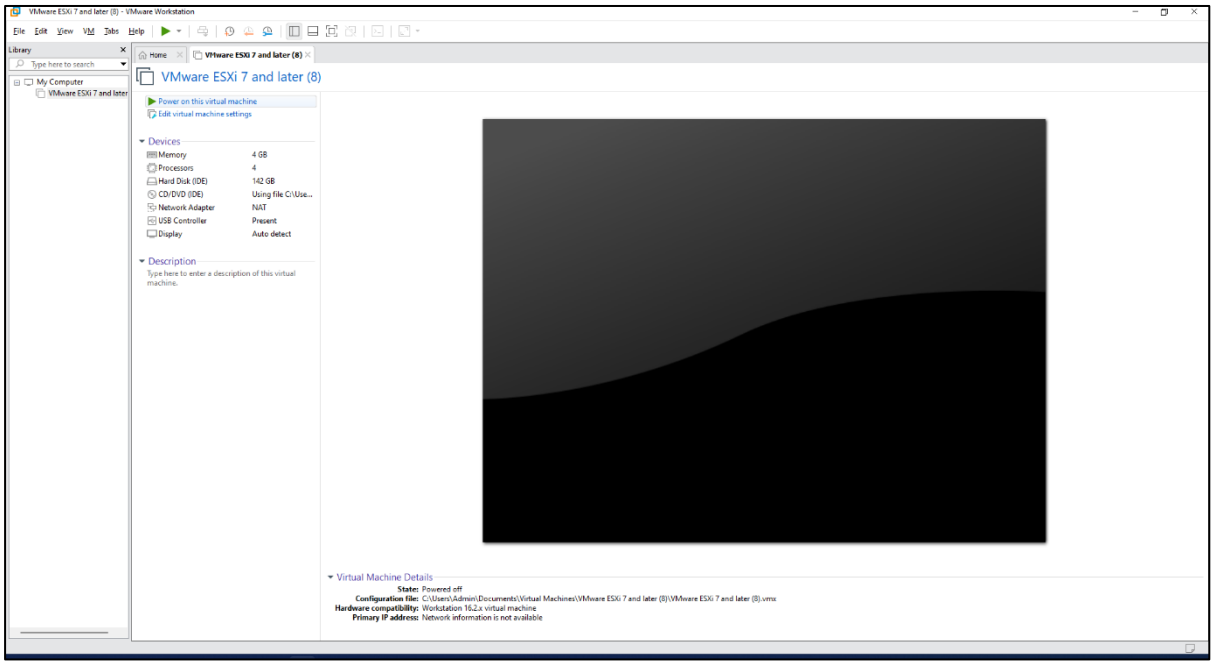




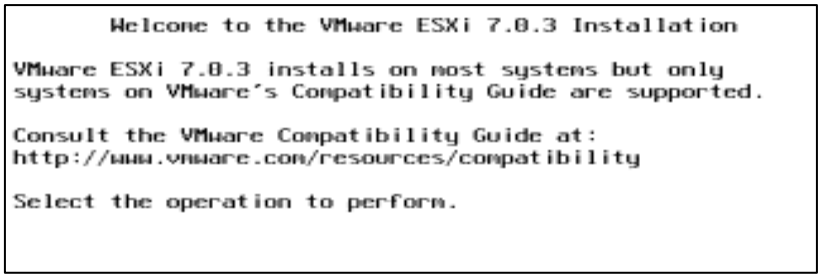
STEP 8: Click on CD/DVD SATA option & click on the option button "Use ISO image file" & then click on browse button & just select the ISO image of ESXi server "VMware-VMvisor-Installer-5.1.0-799733.x86_64.iso". Then click on OK.



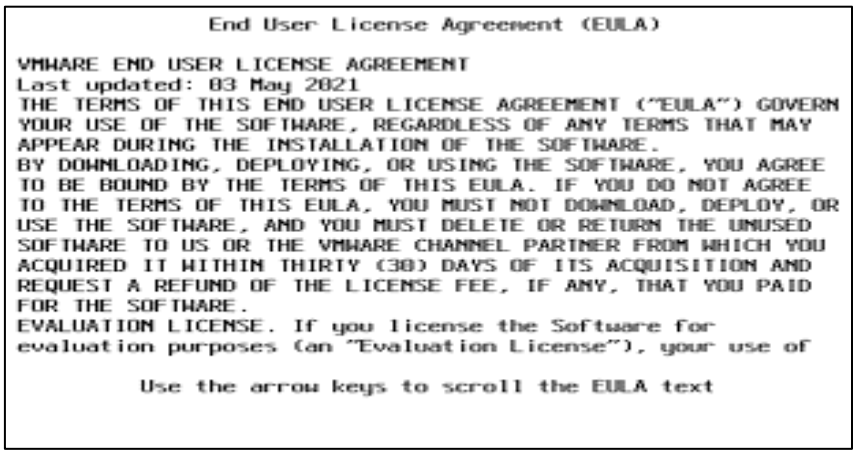
STEP 9 : Click On Close, Click Finish and click Power on Virtual Machine



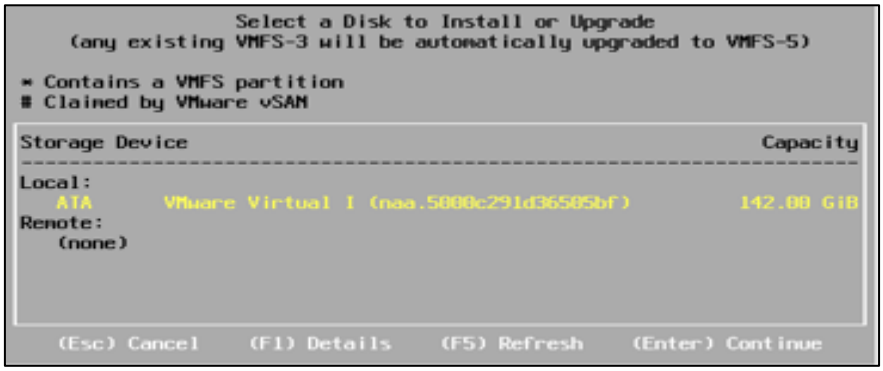
STEP 10: After loading this, it will display the Welcome screen for ESXi installation. Press (Enter) to continue.

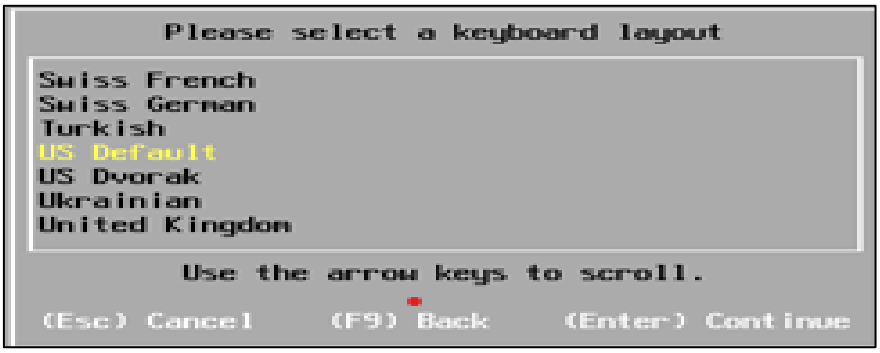


STEP 11: It will display End User License Agreement screen. Press(F11) key to accept the license & continue.



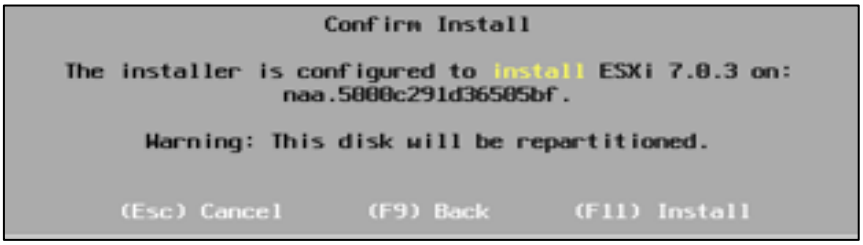
STEP 12: It will display the screen for selecting the disk to install. Press (Enter) to continue.



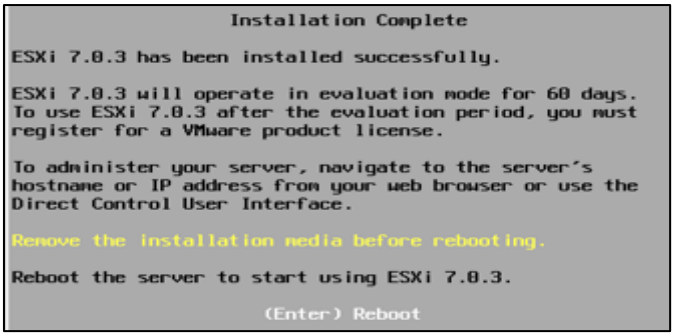


STEP 13: It will display the screen for entering the password for root user. Just enter the password & remember the password for future use.

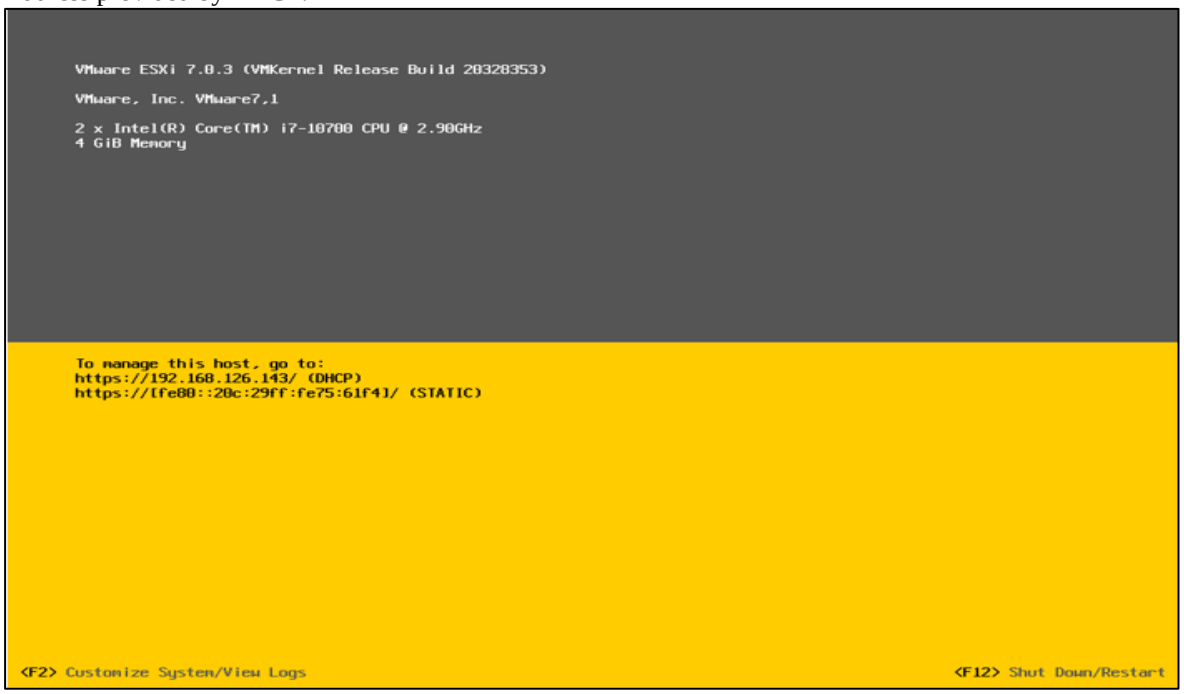
STEP 14 : It will provide the window for Confirm install. Press (F11) to install. It will install the ESXi server.



STEP 15: Then it will ask for rebooting.



STEP 16: After rebooting the server, it will provide an ip-address through DHCP. Note down IP Address provided by DHCP.



Practical No : 02

Configuring ESXi Hosts

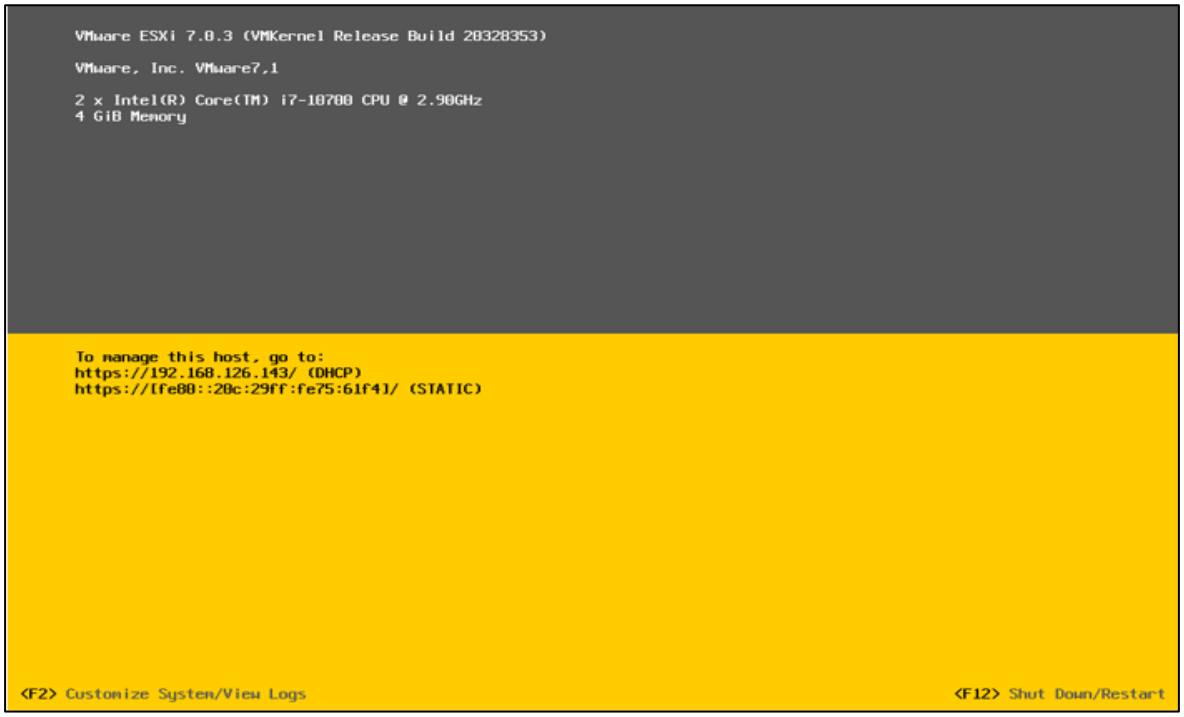
Description :

a. **Examine the options in DCUI**
b. **Configure the Management Network**
c. **Enable SSH**

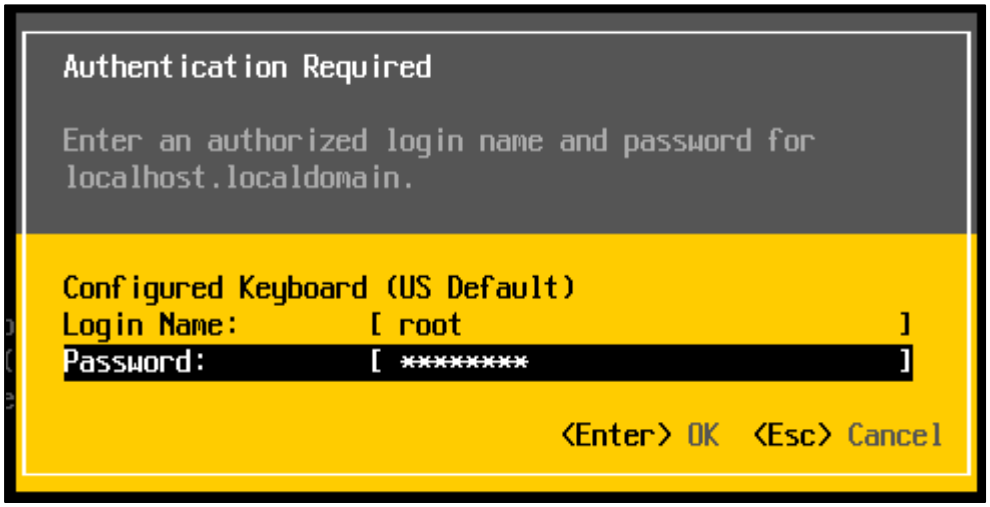
IMPLEMENTATION :

a. **Examine the options in DCUI**

STEP 1: Press F2 to log in to the Direct Console User Interface.

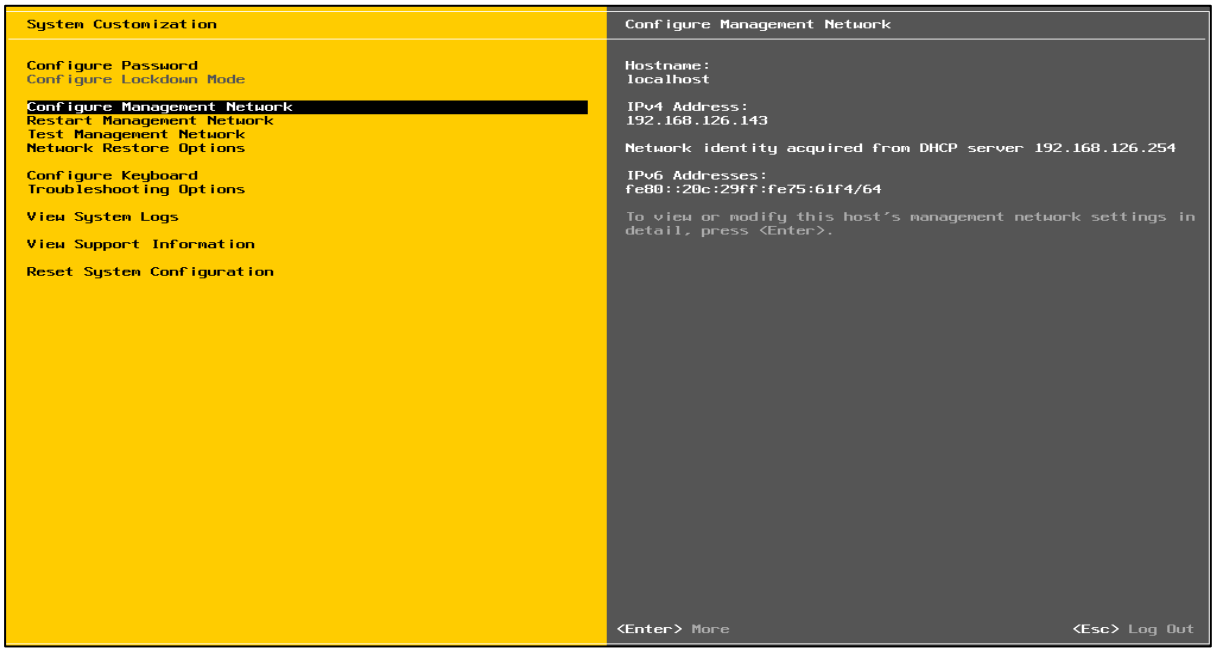


STEP 18 : Enter the credentials that you created during the ESXi setup, and then press Enter.

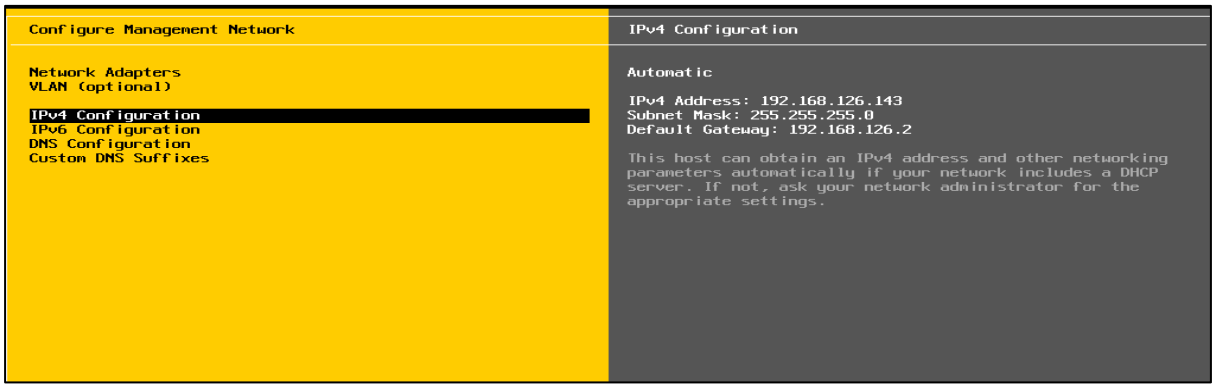


b. Configure the Management Network

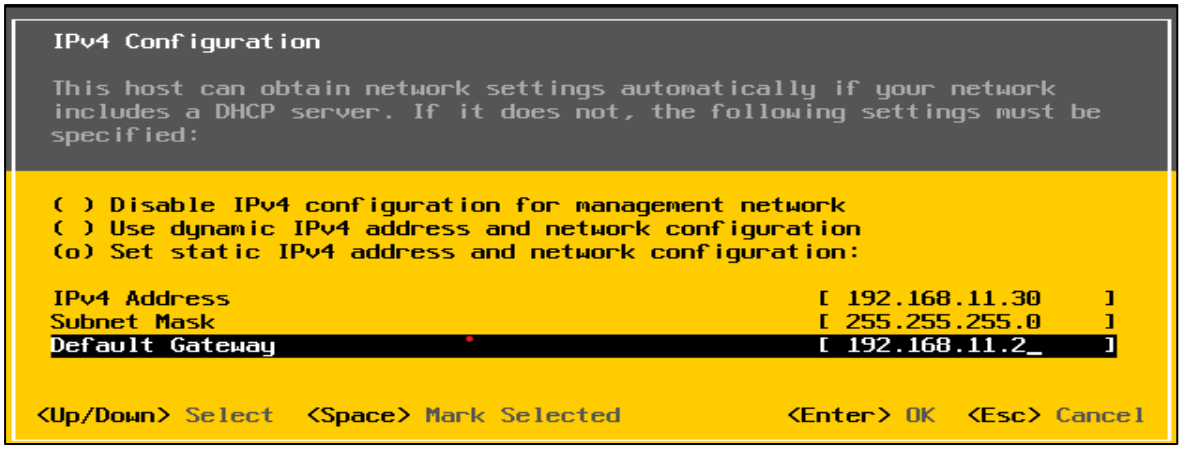
STEP 19 : From the **System Customization** menu, select **Configure Management Network**



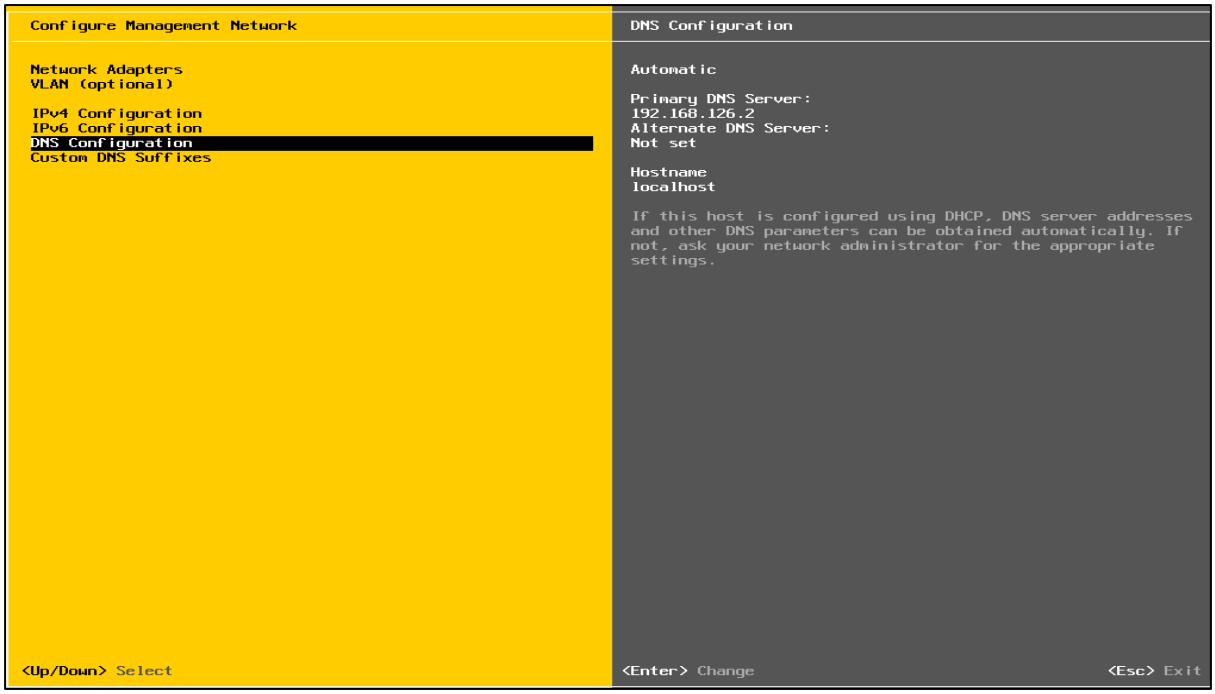
STEP 20 : Select **IPv4 Configuration** and press Enter.



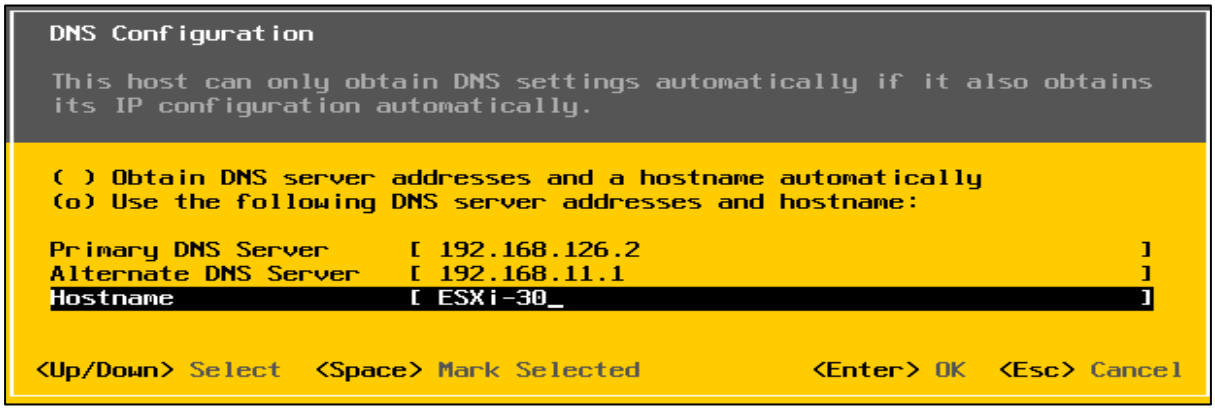
STEP 21 : Using the cursor keys, select **Set static IPv4 address**, and then press the space bar.
On the **IPv4 Configuration** page, enter the IPv4 address, subnet mask, and default gateway for the management host.



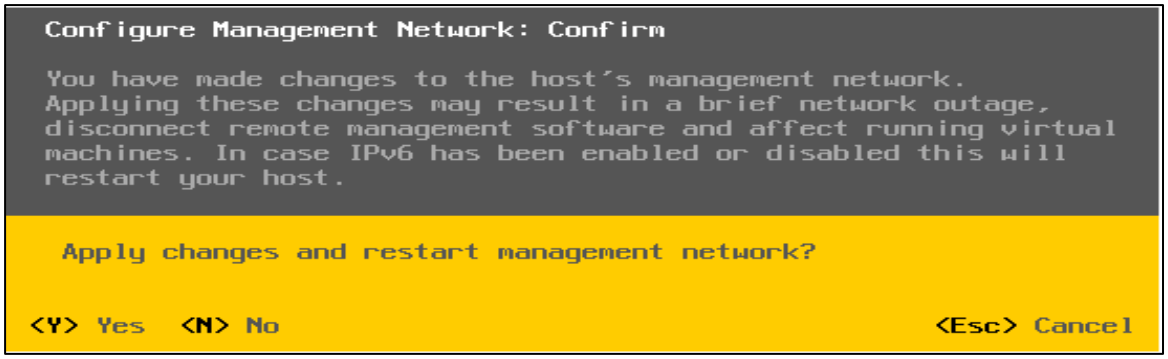
STEP 22 : Select **DNS Configuration** and press Enter.



STEP 23 : Type the IP address of the DNS servers and the FQDN of the host.



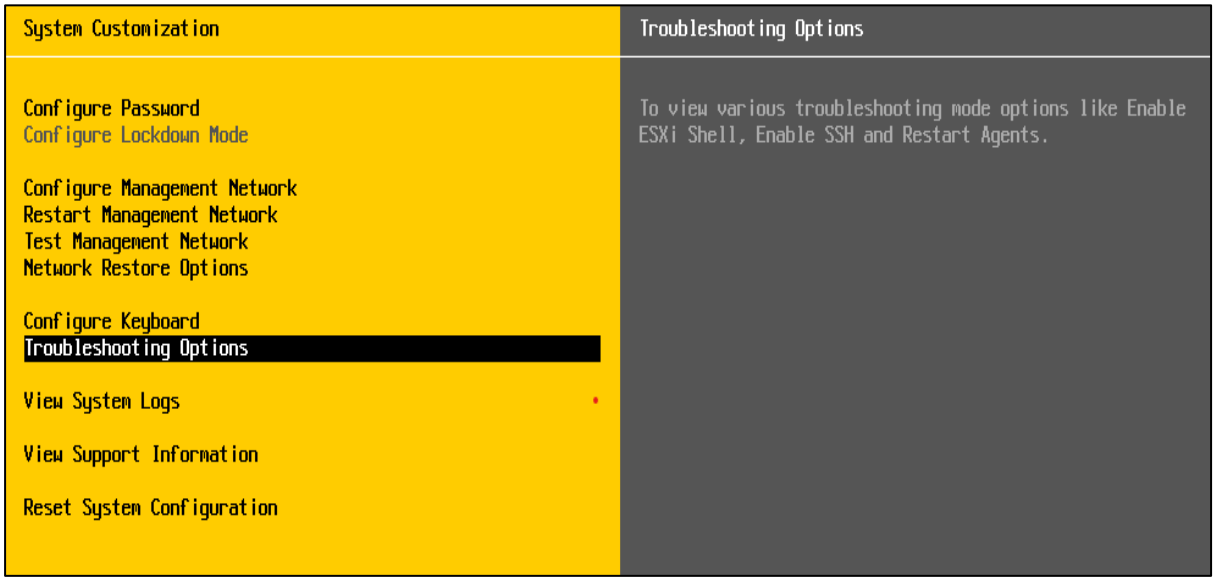
STEP 24 : Press Esc to exit Configure Management Network menu. Reboot is required, press Y to reboot ESXi host



c. Enabling SSH.

STEP 25 : From the Direct Console User Interface, press F2 to access the System Customization menu.

STEP 26 : Select **Troubleshooting Options** and press Enter.



STEP 27 : From the Troubleshooting Mode Options menu, select a service to enable.

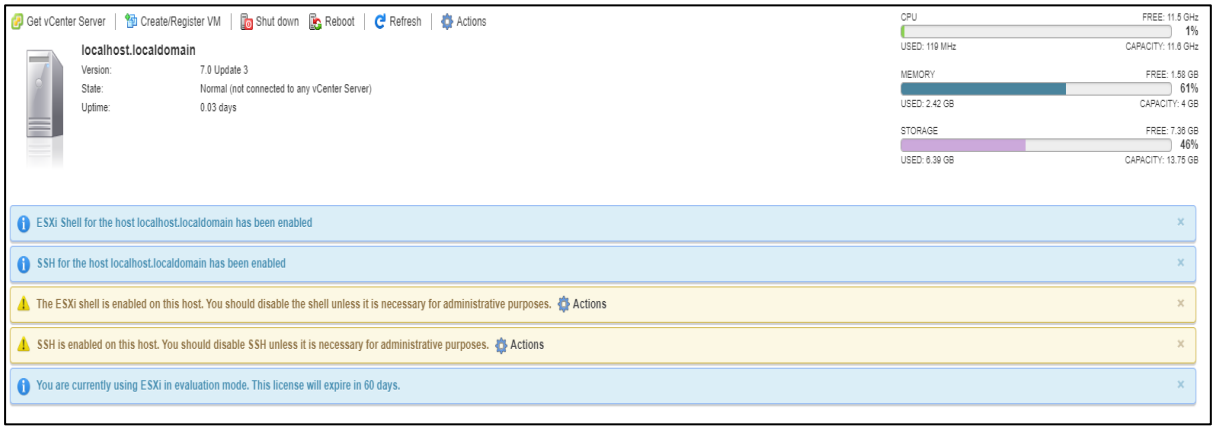
a. Enable ESXi Shell

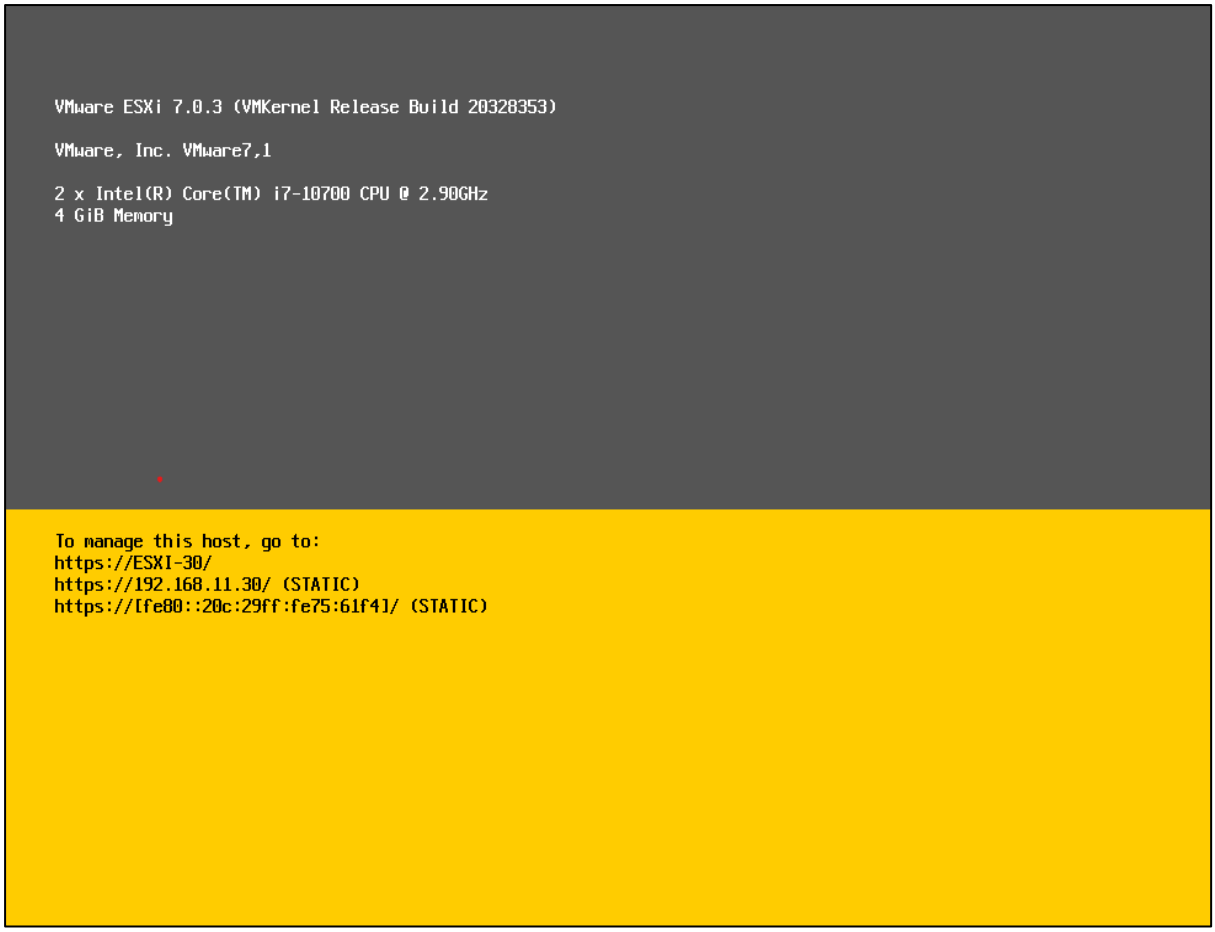
b. Enable SSH

Press Enter to enable the service


Troubleshooting Mode Options
ESXi Shell
Disable ESXi Shell
Disable SSH
Modify ESXi Shell and SSH timeouts
Modify DCUI idle timeout
Restart Management Agents
ESXi Shell is Enabled
Change current state of the ESXi Shell

OUTPUT:


Get vCenter Server
Create/Register VM
Shut down
Reboot
Refresh
Actions
localhost.localdomain
Version: 7.0 Update 3
State: Normal (not connected to any vCenter Server)
Uptime: 0.03 days
CPU FREE: 11.5 GHz 1% USED: 119 MHz CAPACITY: 11.6 GHz
MEMORY FREE: 1.59 GB 61% USED: 2.42 GB CAPACITY: 4 GB
STORAGE FREE: 7.36 GB 46% USED: 6.39 GB CAPACITY: 13.75 GB
ESXi Shell for the host localhost.localdomain has been enabled
SSH for the host localhost.localdomain has been enabled
The ESXi shell is enabled on this host. You should disable the shell unless it is necessary for administrative purposes. Actions
SSH is enabled on this host. You should disable SSH unless it is necessary for administrative purposes. Actions
You are currently using ESXi in evaluation mode. This license will expire in 60 days.



Practical No: 03

Deploying and Configuring A Virtual Machine.

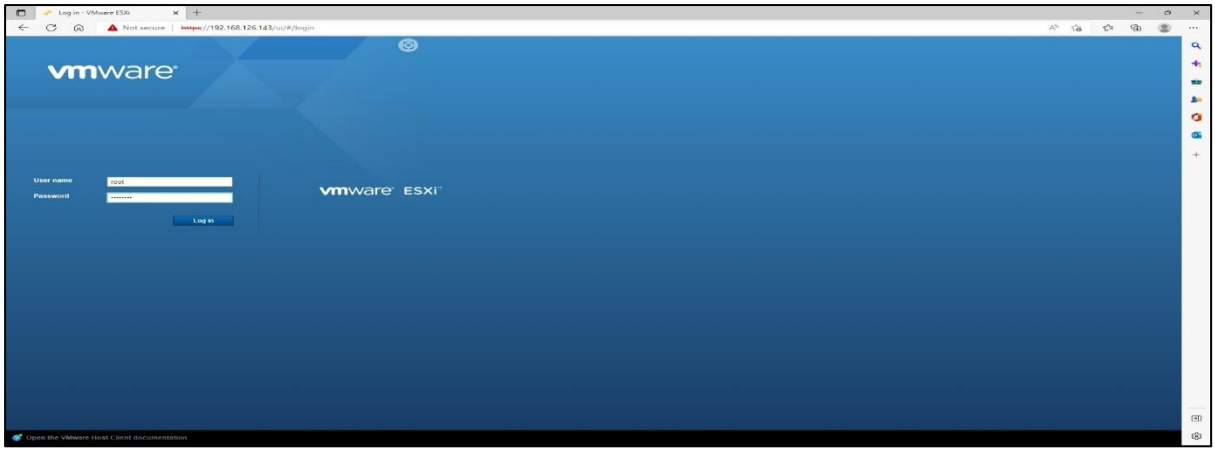
Description :

a. **Create a Virtual Machine.**
b. **Install A Guest Operating System and Disable Windows Updates.**
c. **Install VMware Tools/Install Files.**

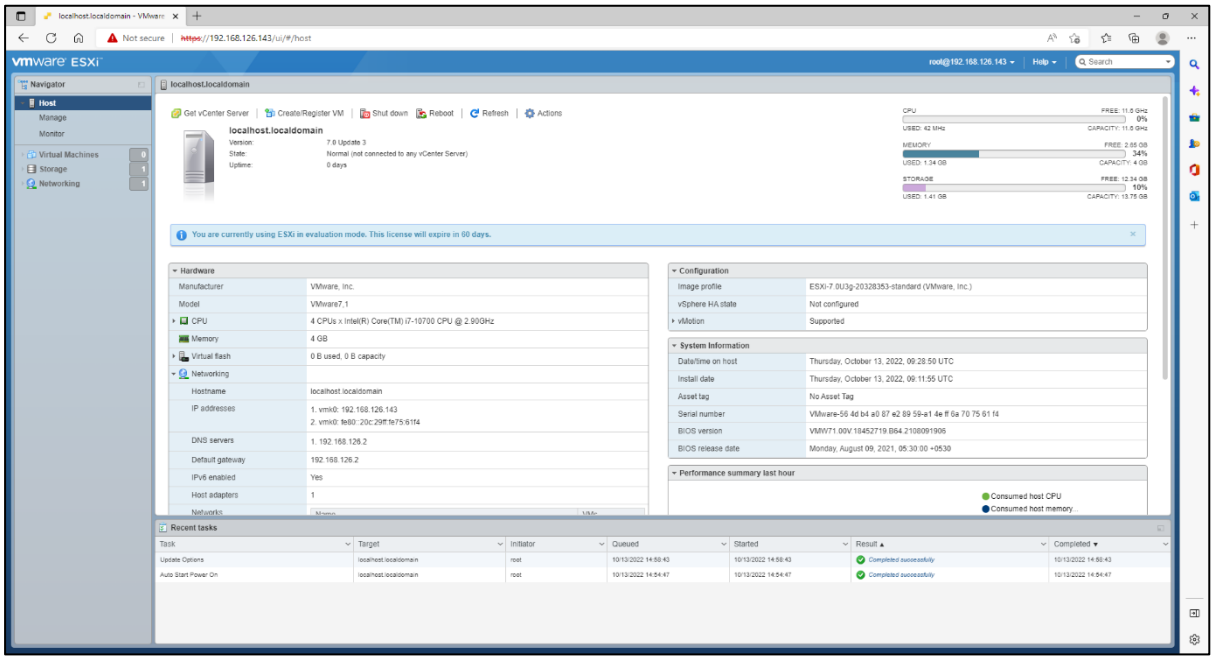
IMPLEMENTATION :

a. **Create a Virtual Machine.**

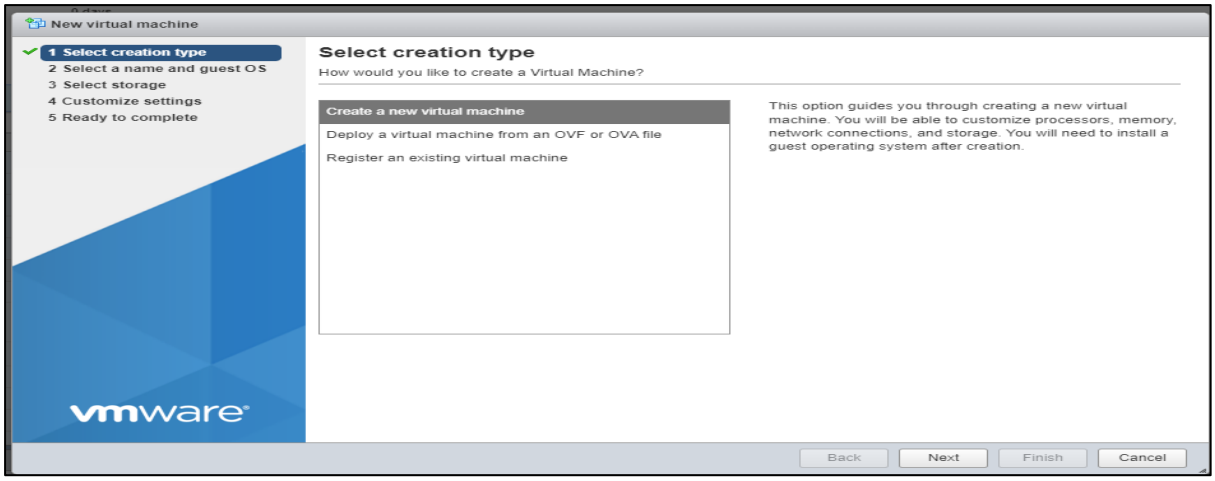
STEP 1 : Open Browser and enter the first IP address from the DCUI console & login with the credentials.



STEP 2 : After Login, Click on Create/Register VM

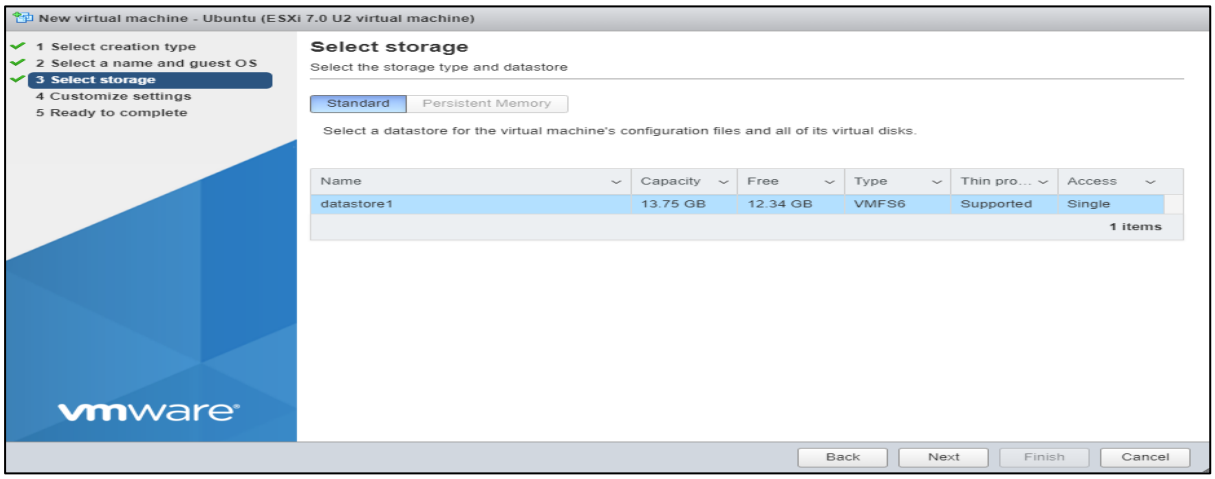


STEP 3 : A wizard opens up, Click Next.

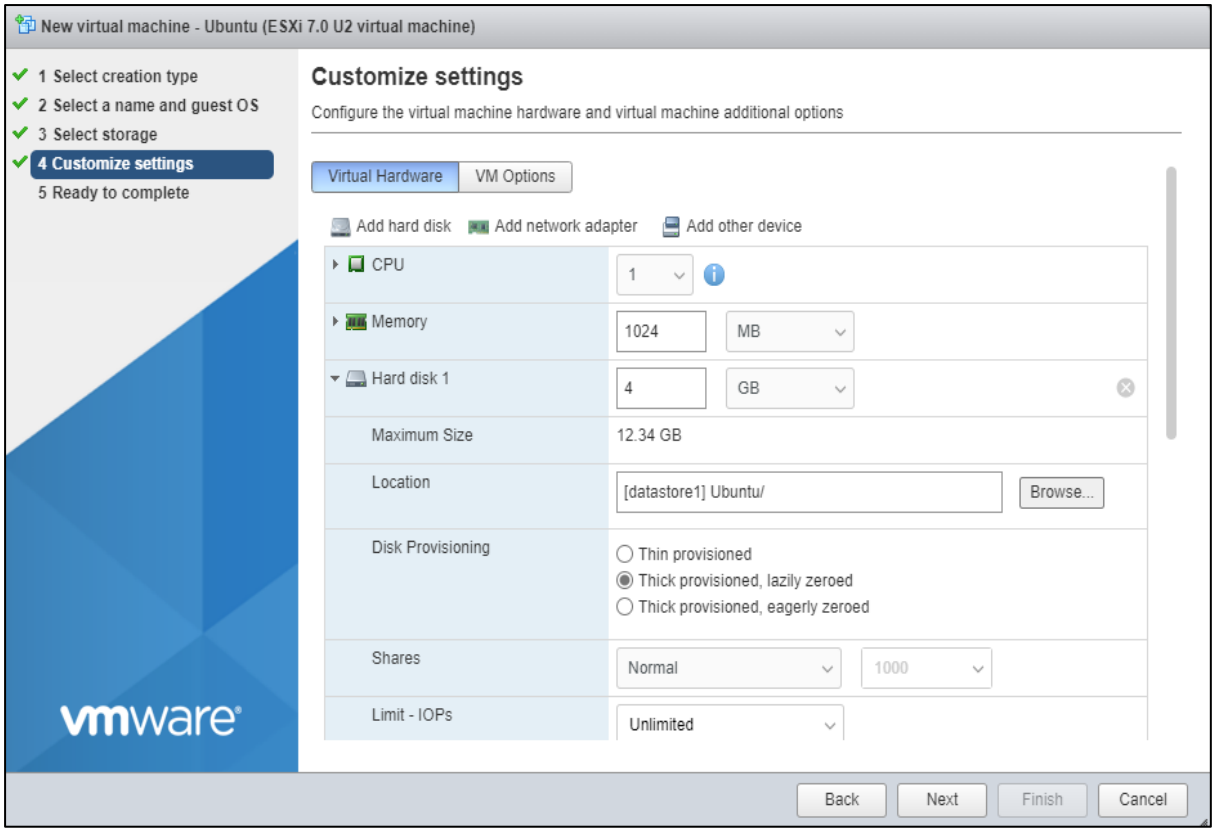


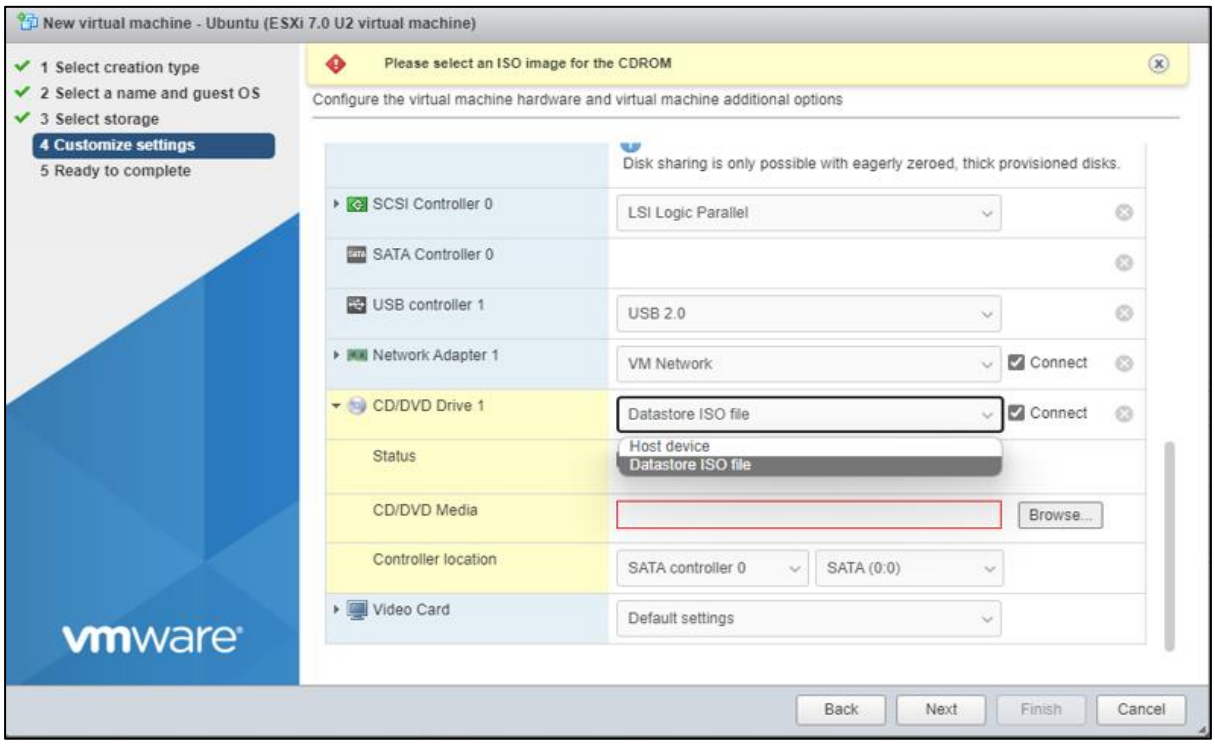
STEP 4 : Give a name to the Virtual Machine & Click Next

STEP 5 : Select a storage for the VM.

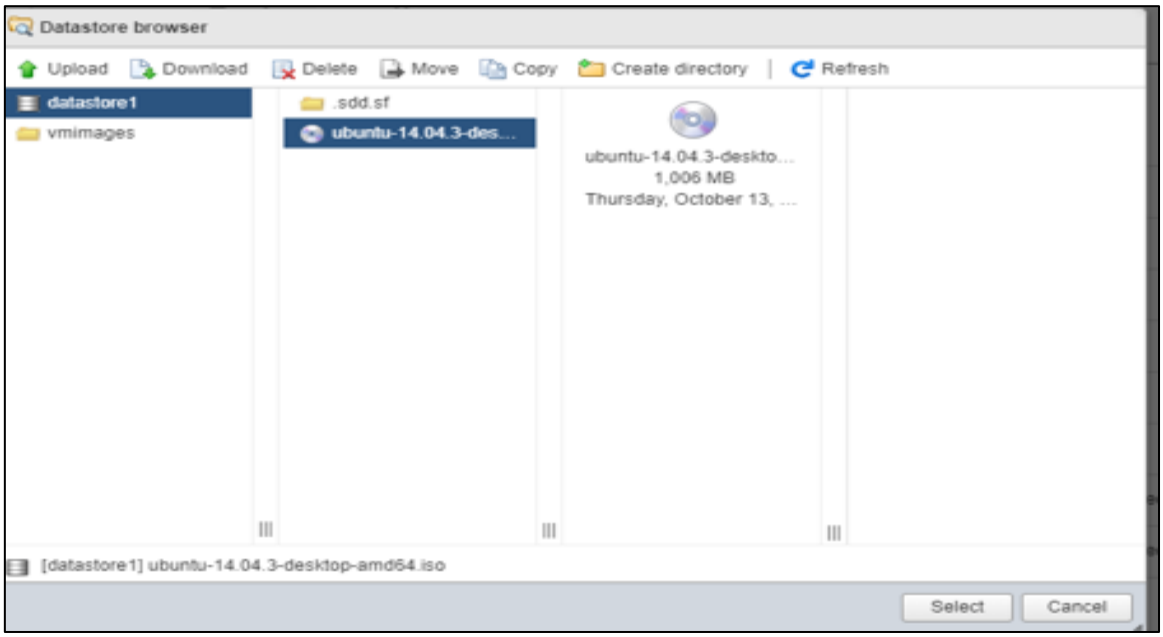


STEP 6 : Customize the Settings as given below

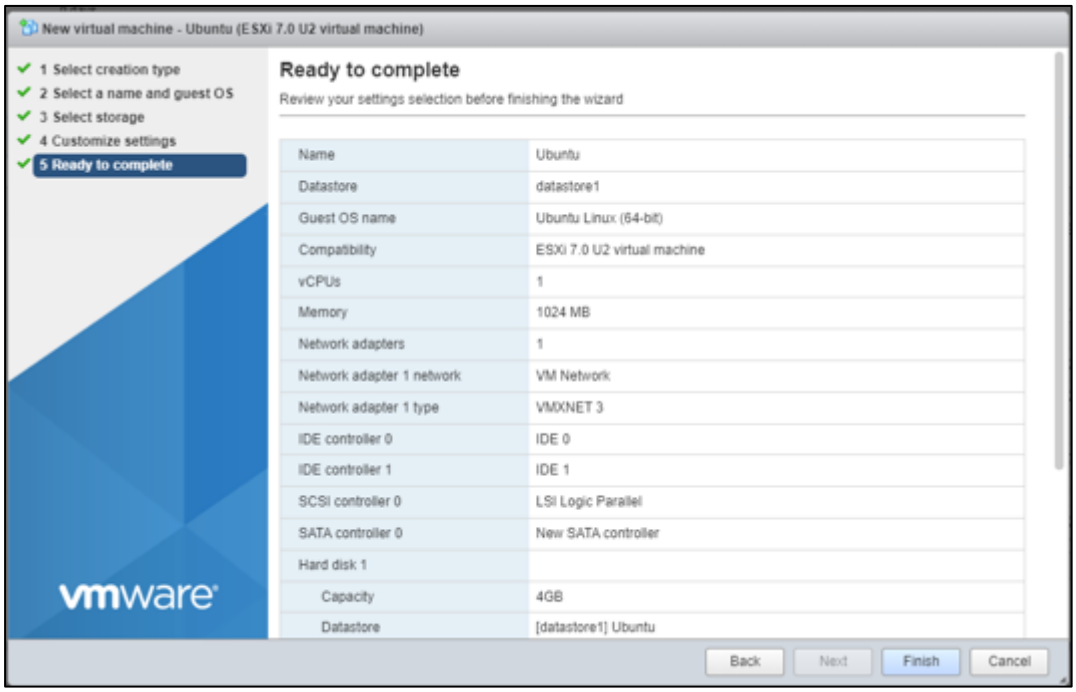

New virtual machine - Ubuntu (ESXi 7.0 U2 virtual machine)
1 Select creation type
2 Select a name and guest OS
3 Select storage
4 Customize settings
5 Ready to complete
Customize settings
Configure the virtual machine hardware and virtual machine additional options
Virtual Hardware
VM Options
Add hard disk
Add network adapter
Add other device
CPU
1
Memory
1024
MB
Hard disk 1
4
GB
Maximum Size
12.34 GB
Location
[datastore1] Ubuntu/
Browse...
Disk Provisioning
Thin provisioned
Thick provisioned, lazily zeroed
Thick provisioned, eagerly zeroed
Shares
Normal
1000
Limit - IOPs
Unlimited
vmware
Back
Next
Finish
Cancel


New virtual machine - Ubuntu (ESXi 7.0 U2 virtual machine)
1 Select creation type
2 Select a name and guest OS
3 Select storage
4 Customize settings
5 Ready to complete
Please select an ISO image for the CDROM
Configure the virtual machine hardware and virtual machine additional options
Disk sharing is only possible with eagerly zeroed, thick provisioned disks.
SCSI Controller 0
LSI Logic Parallel
SATA Controller 0
USB controller 1
USB 2.0
Network Adapter 1
VM Network
Connect
CD/DVD Drive 1
Datastore ISO file
Connect
Status
Host device
Datastore ISO file
CD/DVD Media
Browse...
Controller location
SATA controller 0
SATA (0:0)
Video Card
Default settings
vmware
Back
Next
Finish
Cancel

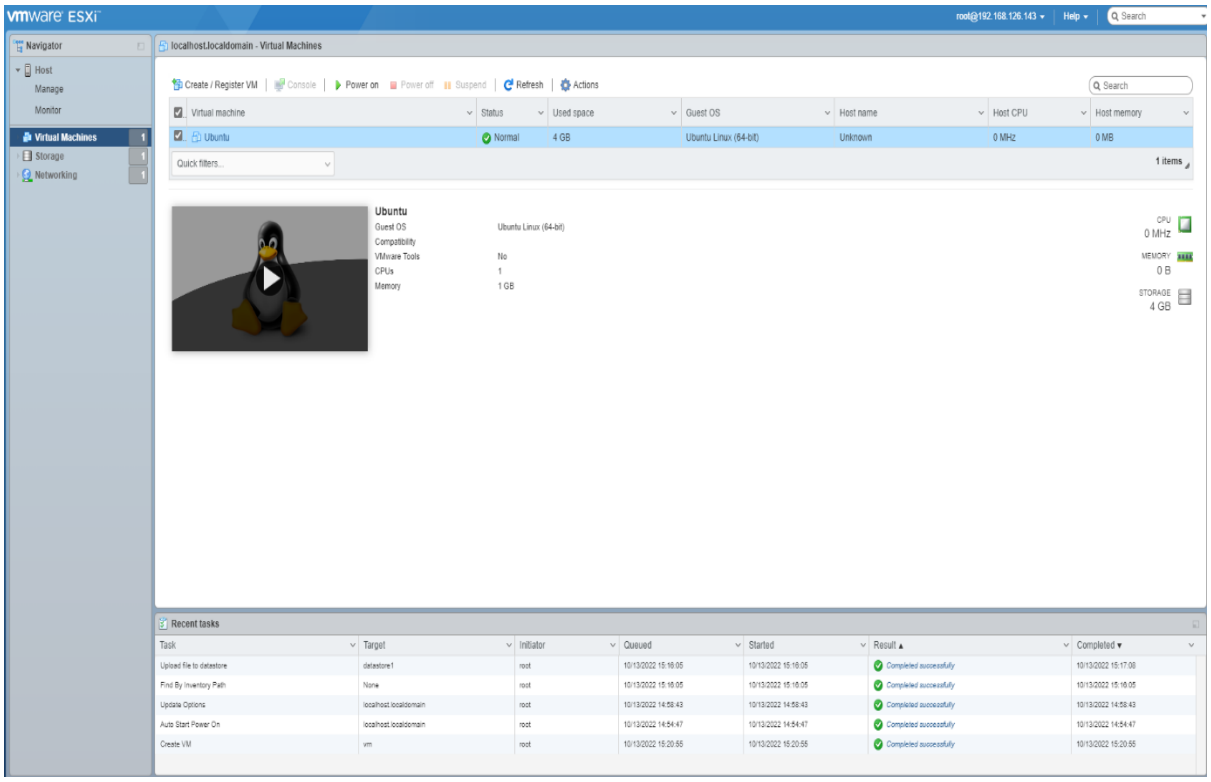
STEP 7 : Click Upload and select Ubuntu iso file

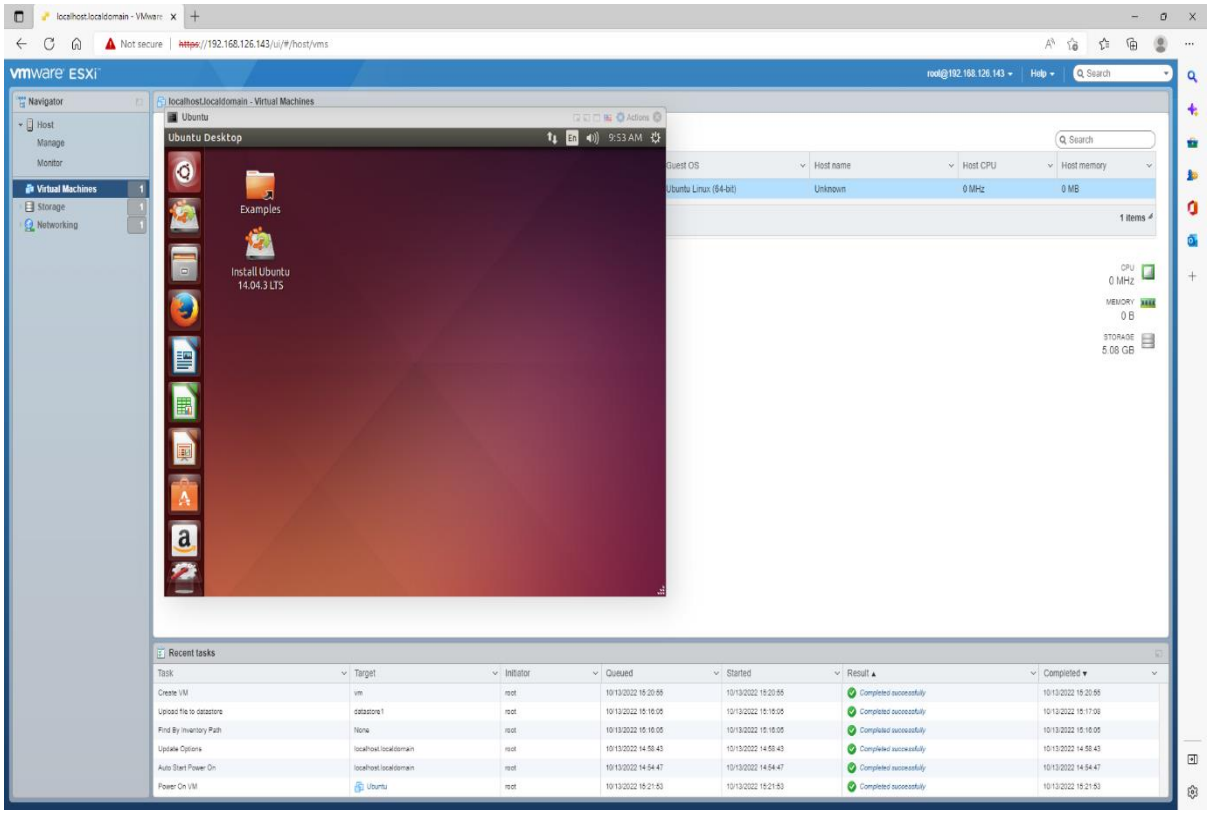


STEP 8: Click Finish



STEP 9 : The Virtual Machine with UBUNTU Guest Operating system is created. Click to power on it.





Practical No: 04

Working with vCenter Server

Objective: Install and use vCenter Server Appliance

1. Deploy vCenter Server Appliance

2. Access and Configure vCenter Server Appliance

3. Add Your ESXi Hosts to the vCenter Server Inventory

4. Configure the ESXi Hosts as NTP Clients

5. Back Up vCenter Server Appliance

6. Complete the vCenter Server Appliance Deployment

IMPLEMENTATION :

Deploy a VMware vCenter® Server Appliance™ on a your first ESXi host:

1. On your student desktop, navigate to the Class Materials and Licenses folder and double-click to open it.

2. Double-click the Class Files subfolder.

3. Double-click the VMware-VCSA-all-6.5.0.iso file.

4. Double-click the vcsa-ui-installer folder.

5. Double-click the win32 folder.

6. Locate and double-click the installer.exe application.

7. On the vCenter Server Appliance 6.5 Installer page, click Install

8. On the Install-Stage 1: Deploy appliance page, select the I accept the terms of the license agreement check box and click Next.

9. On the Select deployment type page, ensure that vCenter Server with an Embedded Platform Services Controller is selected and click Next.

10. On the Appliance deployment target page, enter your first ESXi host name sa-esxi01.vclass.local in the ESXi host or vCenter Server name text box.

11. In the HTTPS port text box, enter 443.

12. In the User name text box, enter root.

13. In the Password text box, enter the standard lab password and click Next.

14. On the Certificate Warning page, click Yes.

15. On the Set up appliance VM page, enter 172.20.10.194 in the VM name text box.

16. Enter the standard lab password in the Root password and Confirm root password text boxes and click Next.

17. On the Select deployment size page, accept the default Tiny and click Next.

18. On the Select datastore page, select Local01-2 as the deployment datastore.

19. Select the Enable Thin Disk Mode check box and click Next.

20. On the Configure network settings page, select VM Network from the Network drop-down menu.

21. From the IP version drop-down menu, select IPv4.

22. From the IP assignment drop-down menu, select static.

23. In the System name text box, enter 172.20.10.194.

24. In the IP address text box, enter 172.20.10.194.

25. In the Subnet mask or prefix length text box, enter 255.255.255.0.

26. In the Default gateway text box, enter 172.20.10.10.

27. In the DNS servers text box, enter 172.20.10.10 and click Next.

28. Click Finish.

Task 2: Access and Configure vCenter Server Appliance

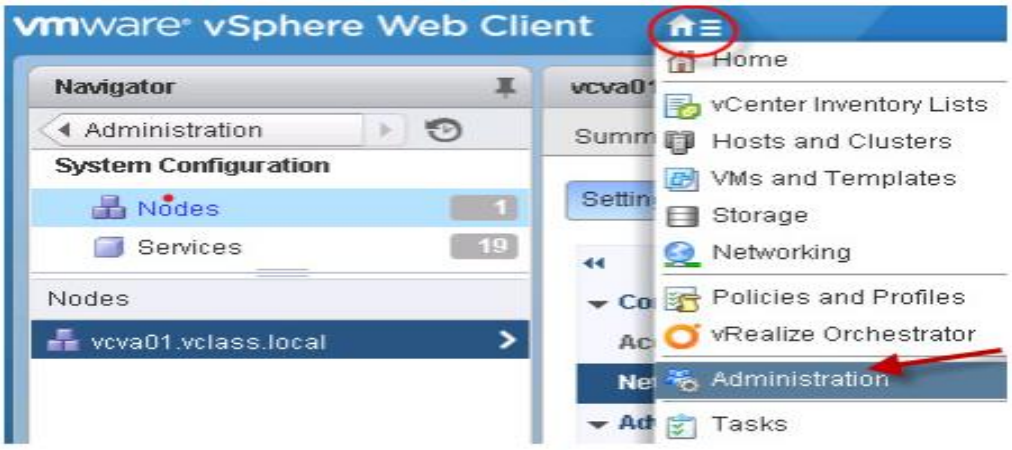
You license both vCenter Server and ESXi hosts, edit the SSO configuration, create a data center object, and add your ESXi hosts to the inventory.

1. In your Internet Explorer Web browser, click vSphere Web Client on the favorite bar and select vSphere Web Client - sa-vcsa-01.vclass.local.

2. When the Website Security page opens, click Continue to this website (not recommended).

3. Log in to vCenter Server using administrator@vsphere.local as the user name and the standard lab password.

4. In vSphere Web Client, click the Home icon and select Administration.



5. In the Navigator pane, select Licenses.

6. In the Content pane, click the Licenses tab.

7. Click the Create New Licenses icon (the green plus sign).

8. On the Enter license keys page, in the License keys text box, enter the vCenter Server and vSphere Enterprise Plus license keys (on separate lines) provided by your instructor.

9. Verify that both licenses are listed correctly in the text box and click Next.

10. On the Edit license names page, enter VMware vCenter Server and VMware ESXi in the appropriate License name fields.

11. Click Next.

12. On the Ready to complete page, click Finish.

13. In the content pane, click the Assets tab

14. Right-click sa-vcsa-01.vclass.local and select Assign License.

At the bottom of the Assign License screen, you will a message stating Some features will become unavailable.

15. Select the vCenter Server license and click OK.

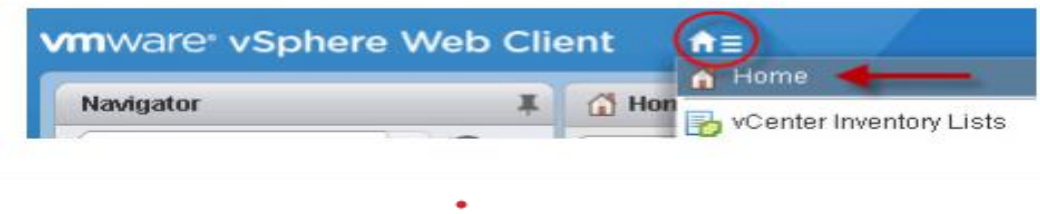
16. Point to Home and select Administration > Single Sign-On > Configuration.

17. On the Policies tab, ensure that Password Policy is select and click Edit.

18. In the Maximum lifetime text box, enter 0 for password never expires.

19. Click OK to save

20. Point to Home and select Home



21. In the center pane, click Hosts and Clusters.

22. In the Navigator pane, right-click sa-vcsa-01.vclass.local and select New Datacenter.

23. In the Datacenter name text box, accept the default name Datacenter and click OK.

In the Navigator pane, you should see that the new data center object is listed under vCenter Server Appliance.

Task 3: Add Your ESXi Hosts to the vCenter Server Inventory

You add ESXi hosts to the vCenter Server inventory.

1. In the Navigator pane, right-click Datacenter and select Add Host. The Add Host wizard appears.

2. On the Name and location page, enter sa-esxi-01.vclass.local and click Next. When repeating the task for your second host, enter sa-esxi-02.vclass.local.

3. On the Connection settings page, enter root as the user name and the standard lab password and click Next.

4. If you see a security alert stating that the certificate store of vCenter Server cannot verify the certificate, click Yes to proceed.

5. On the Host summary page, review the information and click Next.

6. On the Assign license page, click the VMware ESXi license key and click Next.

7. On the Lockdown mode page, accept the default Disabled and click Next.

8. On the VM location page, leave the default and click Next.

9. On the Ready to complete page, review the information and click Finish.

10. In the Recent Tasks pane, monitor the progress of the task.

11. Repeat steps 1 through 10 to add sa-esxi-02.vclass.local to the inventory.

12. In the Navigator pane, select your first ESXi host and click the Summary tab. This tab displays information for the ESXi host, such as CPU, memory, storage, NICs, and virtual machines.

13. Click the arrow next to the Hardware pane to view the hardware details of the ESXi host.

Task 4: Configure the ESXi Hosts as NTP Clients

You configure the ESXi hosts to use Network Time Protocol (NTP) to maintain accurate time and date.

1. Select sa-esxi-01.vclass.local in the inventory and click the Configure tab. When repeating steps for your second host, select sa-esxi-02.vclass.local.

2. Under System in the middle pane, select Time Configuration and view the current settings.

3. Click Edit.

4. Click Use Network Time Protocol (Enable NTP client).

5. From the NTP Service Startup Policy drop-down menu, select Start and stop with host.

6. In the NTP Servers text box, ensure that 172.20.10.10 is entered.

7. Under NTP Service Status, click Start.

8. Click OK.

9. In the Time Configuration pane, verify that the NTP client appears as Enabled and that the NTP service status appears as Running.

10. Repeat steps 1 though 9 to configure your second ESXi host.

Task 5: Back Up vCenter Server Appliance

You back up your vCenter Server appliance by connecting to the vCenter Server Appliance with a Web browser using Management port 5480.

1. Open a new Internet Explorer tab and enter https://sa-vcsa-01.vclass.Local:5480 in the address bar to access your vCenter Server Management port.

2. When the Security Warning appears, click Continue to this website (not recommended).

3. Log in with root as the user name and the standard lab password and click Login.

4. On the Summary page, click Backup on the upper-right corner of the screen.

5. On the Enter backup details page, select FTP from the Protocol drop-down menu.

6. In the Location text box, enter 172.20.10.10/VC-Backup.

7. In the User name text box, enter ftp-admin.

8. In the Password text box, enter the standard lab password and click Next.

9. On the Select parts to backup page, click Next.

10. On the Ready to complete page, click Finish.

11. When the vCenter Server backup progress bar appears, close the vCenter Server Appliance Management UI browser tab.

Task 6: Complete the vCenter Server Appliance Deployment

You return to the vCenter Server Appliance deployment to complete the final steps and clean up for the next lab.

1. Return to the vCenter Server Appliance deployment screen and click Continue.

2. On the Introduction page of stage 2, click Next.

3. On the Appliance configuration page, enter 172.20.10.10 in the NTP servers text box and click Next.

4. On the SSO configuration page, enter vsphere.local in the SSO domain name text box.

5. In the SSO password and Confirm password text boxes, enter the standard lab password.

6. In the Site name text box, enter site-a and click Next.

7. On the Configure CEIP page, deselect the Join the VMware Customer Experience Improvement Program check box and click Next.

8. On the Ready to complete page, click Finish.

9. When you are prompted with the warning message You will not be able to pause or stop the install from completing once it's started. Click OK to continue or Cancel to stop, click OK. The installation might take about 20 minutes to complete.

10. When the progress bar shows that the installation is complete, click Close. If your browser is open, it will automatically open a new browser tab.

11. When a certificate warning appears, click Continue to this website (Not recommended).

12. Close the Getting Started tab.

13. Log in to sa-esxi-01.vclass.local with root as user name and the standard lab password.

14. In the navigator pane, select Virtual Machines.

15. In the right pane, right-click your newly deployed vCenter Server Appliance and select Power > Power off.

16. When prompted with the warning messaging about powering off the virtual machine, click Yes to continue.

17. When vCenter Server Appliance is powered off, right-click it in the Navigator pane and select Delete.

18. When prompted with the Are you sure message, click Delete.

Practical No: 05

Navigating the vSphere Clients

Objective: Become familiar with vSphere Client and vSphere Web Client

1. Navigate vSphere Client
2. Navigate vSphere Web Client

1: Navigate vSphere Client

In VMware vSphere® Client™, you navigate through the objects in the navigation tree and view the configuration settings to become familiar with the UI layout.

1. In your Internet Explorer Web browser, click vSphere Client on the favorite bar and select vSphere Client - sa-vcsa-01.vclass.local.
2. When the Security Warning appears, click Continue to this website (not recommended).
3. On the VMware vCenter Single Sign-on page, enter administrator@vsphere.local as the user name and the standard lab password and click Login.
4. In the navigation pane on the left, click the Hosts and Clusters icon.
5. In the navigation pane, click the arrow next to each object to expand the view completely.
6. In the navigation pane, select sa-esxi-01.vclass.local
7. In the right pane, click the Summary tab and record the information.
    - Hypervisor
    - Logical Processors
    - NICs
8. In the right pane, expand the Hardware and Configuration panes to review the information.
9. In the navigation pane, select the vCenter Server Appliance name to return to the top of the navigation tree.
10. In the Search text box on the top, enter datastore.
11. When the datastores appear under the search box, click datastore 1.
12. In the Summary tab, review the datastore details in the Details pane.
13. Close the vSphere Client tab.

2: Navigate vSphere Web Client

You navigate through vSphere Web Client to become familiar with the UI layout.

1. In the favorites menu of your Internet Explorer Web browser, select vSphere Web Client > vSphere Web Client - sa-vcsa-01.vclass.local.
2. When the There is a problem with this website's security certificate warning message appears, click Continue to this website (not recommended).
3. On the VMware vCenter Single Sign-on page, enter administrator@vsphere.local as the user name and the standard lab password and click Login.
4. On the vSphere Web Client Home page, click Hosts and Clusters.
5. Click sa-esxi-01.vclass.local in the navigation pane.

6. In the center pane, under the Summary tab, expand the Hardware and Configuration panes to review the information.
7. In the navigation pane, select sa-vcsa-01.vclass.local to return to the top of the navigation tree.
8. In the Search text box, enter datastore.
9. When the datastores appear under the search box, select datastore 1.
10. In the Summary tab, review the datastore details in the Details pane.
11. Click the vSphere Web Client Home icon and select Home. The vSphere Web Client displays two panes to the right of the window: Work In Progress and Alarms. You can adjust these panes to provide more space for the content area.
12. In the Alarms pane, click the pin icon. The Alarms pane shrinks to a side tab to the right.
13. In the Work In Progress pane, click the pin icon to shrink it to a side tab.
14. To restore the default layout of the user interface, click your logged in user name and select Layout Settings.
15. In the Layout Settings window and click Reset to default layout.
16. On the vSphere Web Client Home page, click Hosts and Clusters and select sa-vcsa01.vclass.local in the navigation pane.
17. In the content pane, review the information shown under the Getting Started tab, which provides general information about the object that you selected in the navigation pane.
18. If you are familiar with vCenter Server fundamentals and know how to navigate among the objects, click Help above the content pane and select Hide All Getting Started Pages. The Getting Started tab no longer appears.
19. In vSphere Web Client, click the Home icon and select Home from the drop-down menu.
20. Leave vSphere Web Client open for the next lab.

Practical No: 06

Creating Folders in vCenter Server Appliance

Objective: Create folders in vCenter Server Appliance

1. Create a Host and Cluster Folder

2. Create Virtual Machine and Template Folders

1: Create a Host and Cluster Folder

You create a folder to group hosts and clusters of the same type together.

1. If your Internet Explorer browser is not open from the previous lab, click it in your taskbar on the student desktop to open it.
2. In your Internet Explorer Web browser, click vSphere Web Client on the favorite bar and select vSphere Web Client - sa-vcsa-01.vclass.local.
3. When the There is a problem with this website's security certificate warning message appears, click Continue to this website (not recommended).
4. Log in using administrator@vsphere.local as the user name and the standard lab password.
5. On the vSphere Web Client Home page, click Hosts and Clusters.
6. In the left pane, click the arrow to expand the vCenter Server inventory.
7. Right-click Datacenter and select New Folder > New Host and Cluster Folder.
8. In the Enter a name for the folder text box, enter Lab Servers and click OK.
9. Drag both ESXi hosts to the Lab Servers folder.
10. In the Recent Tasks pane, monitor the Move Entities tasks until they are completed.
11. Click the Home icon and select Home.

2: Create Virtual Machine and Template Folders

1. On the vSphere Web Client Home page, click VMs and Templates.
2. Right-click the data center and select New Folder > New VM and Template Folder.
3. In the Enter a name for the folder text box, enter LabVMs and click OK.
4. In the left pane, expand the Datacenter inventory object.
5. Drag both virtual machines to the LabVMs folder.
6. Expand the LabVMs folder to verify that both virtual machines are in the folder.
7. Right-click Datacenter and select New Folder > New VM and Template Folder to create a second virtual machine folder.
8. In the Enter a name for the folder text box, enter Templates and click OK.
9. Click the Host and Clusters icon.
10. Select the Datacenter inventory object. The Lab Servers folder that you created in this lab appears in the left pane.

11. Right-click the folder and notice the menu commands in the drop-down menu.
12. Click the VMs and Templates icon.
13. Select the Datacenter inventory object. The LabVMs folder that you created in this lab appears in the left pane.
14. Right-click the folder and notice the menu commands in the drop-down menu.
15. Leave vSphere Web Client open for the next lab.

Practical No: 07

Using Standard Switches

Objective: Create a standard switch and a port group
1. View the Standard Switch Configuration
2. Create a Standard Switch with a Virtual Machine Port Group
3. Attach Your Virtual Machines to the New Virtual Machine Port Group

1: View the Standard Switch Configuration
You view the VMware vSphere® standard switch settings to ensure proper configuration of the default switch.
1. If vSphere Web Client is not active, open your Internet Explorer Web browser, click vSphere Web Client on the favorite bar, and select vSphere Web Client - sa-vcsa-01.vclass.local.
2. When the There is a problem with this website's security certificate warning message appears, click Continue to this website (not recommended).
3. Log in with administrator@vsphere.local as the user name and the standard lab password.
4. On the Home page, click Hosts and Clusters.
5. In the navigation pane, click the arrows to expand the inventory view.
6. Select sa-esxi-01.vclass.local, click the Configure tab, and select Virtual switches in the middle pane.
7. In the Virtual switches pane, select the displayed virtual switch,

Q1. What is the name of the default standard switch?
The default virtual switch is named vSwitch0.
Q2. Which physical adapter is the default standard switch connected to?
The default switch is connected to the physical adapter vmnic0.
Q3. Which network is your virtual machine connected to?
vSwitch0 contains a virtual machine port group named VM Network. Your virtual machine is connected to the VM Network port group.
Q4. Which networks are connected to the default standard switch?

2: Create a Standard Switch with a Virtual Machine Port Group
You create a virtual machine port group on a standard switch, which handles network traffic at the host level in your vSphere environment.
1. In the Hosts and Clusters navigator pane, select sa-esxi-01.vclass.local and click the Configure tab. When repeating this task for your second ESXi host, select sa-esxi02.vclass.local.
2. Select Networking > Virtual Switches in the center pane and click Add host networking. The Add Networking wizard appears

3. On the Select connection type page, click Virtual Machine Port Group for a Standard Switch and click Next.
4. On the Select target device page, click New standard switch and click Next.
5. On the Create a Standard Switch page, click the Add adapters icon (the green plus sign).
6. Select vmnic3 for the virtual switch of the Production network and click OK.
7. Review the information for the new active adapter and click Next.
8. On the Connection settings page, enter Production in the Network label text box and click Next.
9. On the Ready to complete page, verify that the information is accurate and click Finish.
10. In the Virtual switches pane, select vSwitch1. You may need to click and pull downwards the 3 bar display adjustment below the list to display the newly created switch. The Production port group appears.
11. Repeat task 2 for your second ESXi host sa-esxi-02.vclass.local.

3: Attach Your Virtual Machines to the New Virtual Machine Port Group

You attach the virtual machine to the virtual switch port group so that the virtual machine can communicate with other networked devices.

1. In vSphere Web Client, click the Home icon and select VMs and Templates.
2. In the left pane, click the arrows to expand the view of your data center and folders.
3. In the LabVMs folder, right-click VM1-1 and select Edit Settings. When repeating this task for your first virtual machine on your second host, right-click VM2-1.
4. Click the arrow next to Network adapter 1 to expand the view.
5. From the drop-down menu, select Production.
6. Verify that the Connected and Connect At Power On check boxes are selected.
7. Click OK to close the Edit Settings window.
8. Renew the virtual machine's IP address.
    a. In the navigation pane, right-click your virtual machine and select Open Console.
    b. When prompted with the Open Console window, accept the default Web Console and click Continue.
    c. When the website security certificate page opens, click Continue to this website (not recommended).
    d. Log in to the virtual machine using the standard lab password.
    e. Click Start.
    f. In the Search programs and files text box, enter cmd to open a Command Prompt window and press Enter.
    g. At the command prompt, run the ipconfig /release command.
    h. Run the ipconfig /renew command.
    i. Record the virtual machine's IP address and the default gateway.

9. At the virtual machine's command prompt, ping the ControlCenter 172.20.10.10 to verify the virtual machine is connected to the network. Your ping should be successful. If it is not successful, ask your instructor for help.
10. Repeat Task 3 for your VM2-1 virtual machine.
11. Leave vSphere Web Client and the virtual machine console tab open for the next lab.

Practical No: 08

Accessing iSCSI Storage
a] Managing VMFS Datastores
b] Accessing NFS Storage

Accessing iSCSI Storage:

Objective: Configure access to an iSCSI datastore

1. Add a VMkernel Port Group to a Standard Switch
2. Configure the iSCSI Software Adapter and Connect It to the Storage

1: Add a VMkernel Port Group to a Standard Switch

You use VMkernel interfaces to provide network connectivity for your hosts and to handle other types of traffic, such as VMware vSphere® vMotion® traffic, storage traffic, and VMware vSphere® Fault Tolerance traffic.

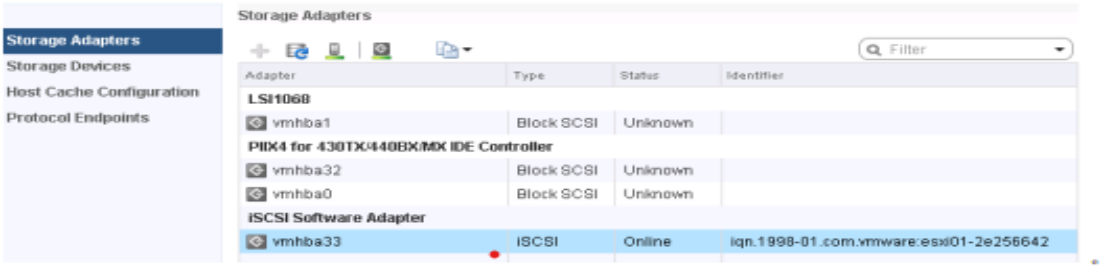
1. If vSphere Web Client is not active, open your Internet Explorer Web browser, click vSphere Web Client on the favorite bar, and select vSphere Web Client - sa-vcsa-01.vclass.local.
2. When the There is a problem with this website's security certificate warning message appears, click Continue to this website (not recommended).
3. Log in using administrator@vsphere.local as the user name and the standard lab password.
4. On the vSphere Web Client Home page, click Hosts and Clusters.
5. In the left pane, click the arrows to expand the data center and folders.
6. Select sa-esxi-01.vclass.local. When repeating this task for your second host select sa-esxi02.vclass.local.
7. Click the Configure tab and select Networking > VMkernel adapters.
8. Click the Add host networking icon. The Add Networking wizard starts.
9. On the Select connection type page, click VMkernel Network Adapter and click Next.
10. On the Select target device page, click Select an existing standard switch.
11. Click Browse and select vSwitch0.
12. Click OK.
13. Click Next.
14. On the Port properties page, enter IP Storage in the Network label text box and click Next.
15. On the IPv4 settings page, click Use static IPv4 settings.

16. In the VMkernel port IPv4 address text box, enter 172.20.10.61 for the first host and 172.20.10.62 for the second host.
17. Enter 255.255.255.0 in the Subnet mask text box for both hosts.
18. Verify that the VMkernel default gateway is set to 172.20.10.10.
19. Click Next.
20. On the Ready to complete page, click Finish.
21. Repeat steps 6 through 20 for your second ESXi host sa-esxi-02.vclass.local

2: Configure the iSCSI Software Adapter and Connect It to the Storage

You use the built-in software iSCSI adapter on the ESXi host to directly connect to a remote iSCSI target on the IP network.
1. In the inventory, select your first ESXi host sa-esxi-01.vclass.local and click the Configure tab. When repeating the task for your second host select sa-esxi-02.vclass.local.
2. Select Storage > Storage Adapters.
3. Click the Add new storage adapter icon (the green plus sign).
4. Select Software iSCSI adapter.
5. When the Add Software iSCSI Adapter message appears, click OK

6. In the Storage Adapters list, scroll down and select the newly created iSCSI software adapter.



7. In the Adapter Details pane, click the Properties tab.
8. Verify that the adapter status is Enabled.
9. Click Edit next to General.
10. Ensure that the name shown in the iSCSI Name text box matches iqn.1998- 01.com.vmware:sa-esxi-01-######## for your first ESXi host and iqn.1998- 02.com.vmware:sa-esxi-02-######## for the second ESXi host. The numbers at the end of the iSCSI name have #s to represent characters that might change.
11. Click OK.
12. In the Adapter Details pane, click the Network Port Binding tab.
13. Click the Add icon (the green plus sign).
14. Select the IP Storage check box and click OK.
15. In the Adapter Details pane, click the Targets tab.
16. Click Dynamic Discovery and click Add.
17. On the Add Send Target Server page, enter 172.20.10.10 for the iSCSI server name in the iSCSI Server text box and click OK.
18. Monitor the Recent Tasks pane and wait for the task to complete.
19. Click the Rescan all storage adapters icon.

20. When the rescan storage message appears, click OK and wait for the task to complete.

21. Repeat steps 1 through 20 for your second ESXi host sa-esxi-02.vclass.local.
22. In the Adapter Details pane, click the Devices tab.
23. Verify that one or more LUNs appear and record the values.
• LUN number
• Capacity
• Operational state
• Hardware Acceleration
The LUNs are hosted by an iSCSI provider and are used to create datastores in later labs.
24. Compare the results for both hosts.
25. Leave vSphere Web Client open for the next lab.

Managing VMFS Datastores

Objective: Create and manage VMFS datastores

1. Rename a VMFS Datastore
2. Create VMFS Datastores for the ESXi Host
3. Expand a VMFS Datastore to Consume Unused Space on a LUN
4. Remove a VMFS Datastore
5. Extend a VMFS Datastore
6. Create a second Shared VMFS Datastore Using iSCSI

1: Rename a VMFS Datastore

1. If vSphere Web Client is not active, open your Internet Explorer Web browser, click vSphere Web Client on the favorite bar, and select vSphere Web Client - sa-vcsa-01.vclass.local.
2. When the There is a problem with this website's security certificate warning message appears, click Continue to this website (not recommended).
3. Log in using administrator@vsphere.local for the user name and the standard lab password.
4. In the left pane of the vSphere Web Client Home page, click Storage.
5. In the left pane, expand the vCenter Server instance and the Datacenter inventory object.
6. In the left pane, right-click your local datastore for your first ESXi host named datastore 1 and select Rename
7. Enter Local01-1 and click OK
8. In the left pane, right-click your local datastore for your second ESXi host named datastore 1(1) and select Rename.
9. Enter Local02-1 and click OK.
10. In the Navigator pane, verify that the new datastore names appear in the storage inventory.

2: Create VMFS Datastores for the ESXi Host

You set up VMFS datastores on iSCSI-based storage devices to be used as repositories by virtual machines.
1. On the vSphere Web Client Home page, click Hosts and Clusters.
2. In the left pane, click the arrows to expand the data center and folders.
3. Right-click Datacenter and select Storage > New Datastore to start the New Datastore wizard.
4. On the Location page, click Next.
5. On the Type page, ensure that VMFS is selected and click Next.
6. On the Name and device selection page, enter VMFS-2 in the Datastore name text box.
7. In the Select a host to view its accessible disks/LUNs drop-down menu, select your first host name sa-esxi-01.vclass.local. A LUN list appears.
8. In the LUN list, select LUN 2 and click Next.
9. On the VMFS version page, select VMFS 6 and click Next.
10. On the Partition configuration page, move the Datastore Size slider to reduce the LUN size by 3 GB, or enter the desired number on the line next to the slider and click Next. For example, if the

current disk size is 10 GB, change the size to 7 GB. This setting is in preparation for task 3 in which you expand the VMFS datastore to its full size.
11. On the Ready to complete page, review the information and click Finish.
12. Right-click Datacenter in the inventory and select Storage > New Datastore.
13. On the Location page, click Next.
14. On the Type page, ensure that VMFS is selected and click Next.
15. On the Name and device selection page, enter VMFS-3 in the Datastore name text box.
16. In the Select a host to view its accessible disks/LUNs drop-down menu, select your second host name. A LUN list appears.
17. In the LUN list, select LUN 3 and click Next.
18. On the VMFS version page, select VMFS 6 and click Next.
19. On the Partition configuration page, accept the default (full capacity) and click Next.
20. On the Ready to complete page, review the information and click Finish.
21. Monitor the progress in the Recent Tasks pane until the task is completed.
22. In the Navigator pane, click the Storage icon

23. Verify that your two VMFS-2 and VMFS-3 datastores are listed in the datastore inventory.
24. In the datastore inventory, click VMFS-2 datastore.
25. Click the Summary tab and record the value for storage capacity.

3: Expand a VMFS Datastore to Consume Unused Space on a LUN

You dynamically increase the capacity of a VMFS datastore when more space is required by virtual machines.
1. In the left pane, click the Storage icon and click the arrows to expand the Datacenter inventory object.
2. Right-click VMFS-2 datastore and select Increase Datastore Capacity. The Increase Datastore Capacity wizard starts.
3. On the Select Device page, select LUN 2.
Yes should appear in the Expandable column of LUN 2.
You should see an entry similar to the screenshot.

4. Click Next.
5. On the Specify Configuration page, select Use “Free Space 3.00 GB” to expand the datastore from the Partition configuration drop-down menu and click Next. The free space listed in the drop-down menu might be different in your lab environment.
6. On the Ready to Complete page, review the information and click Finish.
7. When the task is completed, select the VMFS-2 datastore in the left pane.
8. Click the Summary tab.
9. Verify that the datastore size is increased to the maximum capacity, minus the space required for system overhead.
The new capacity should be 9.75 GB.

4: Remove a VMFS Datastore

You can delete any type of VMFS datastore, including the copies that you mounted without resignaturing. When you delete a datastore, it is destroyed and removed from all hosts.
1. In the Navigator pane, ensure that the Datastore tab is clicked and expand the vCenter Server instance and the Datacenter inventory object.
2. Right-click the VMFS-3 datastore and select Delete Datastore.

3. When the Confirm Delete Datastore message appears, click Yes and wait for the task to be completed.
4. Click the Refresh icon in the vSphere Web Client and verify that the datastore is removed from the inventory.

5: Extend a VMFS Datastore

You extend the capacity of a VMFS datastore when extra storage space is needed. This task uses a second LUN to extend the size of a datastore based on the first LUN.
1. In vSphere Web Client, click the Home icon and select Storage.
2. In the left Navigator pane, select the first VMFS-2 datastore.
3. Click the Configure tab.
4. Ensure that General is selected and click Increase. The Increase Datastore Capacity wizard starts.
5. On the Select Device page, select LUN 3 and click Next.
6. On the Specify Configuration page, select Use all available partitions from the Partition Configuration drop-down menu and click Next.
7. On the Ready to Complete page, review the information and click Finish.
8. When the task completes, refresh the page and select Device Backing in the middle pane and verify that two extents appear in the Extent Name pane. The Extent Name pane should show both of your assigned LUN IDs. You might need to adjust the size of the Extent Name pane to view all the extent names.

9. Click the Summary tab.
10. Record the new value for Total Capacity in the Summary tab.
    The value should differ from the value recorded in task 3, step 9.
11. In the navigator pane, click the Storage tab, click the Hosts tab in middle pane, and notice that two hosts are connected, indicating that this new datastore is shared between your two ESXi hosts.
12. Right-click your VMFS-2 datastore in the inventory and select Rename.
13. In the Enter the new name text box, enter Shared-VMFS.
14. Click OK.

6: Create a second Shared VMFS Datastore Using iSCSI

You use an iSCSI shared LUN to create a VMFS 6 file system.
1. On the vSphere Web Client Home page, click the Home icon and select Hosts and Clusters.
2. In the left pane, click the arrows to expand the data center and folders.
3. Right-click Datacenter and select Storage > New Datastore. The New Datastore wizard starts.
4. On the Location page, click Next.
5. On the Type page, ensure that VMFS is selected and click Next.
6. On the Name and device selection page, enter Shared-iSCSI-Datastore in the Datastore name text box.
7. In the “Select a host to view its accessible disks/LUNs” drop-down menu, select your first ESXi host name. A LUN list appears.
8. In the newly displayed LUN list, select MSFT iSCSI Disk (Capacity 63 GB) and click Next.
9. On the VMFS version page, select VMFS 6 and click Next.
10. On the Partition configuration page, select Use all available partition from the Partition Configuration drop-down menu and click Next.
11. On the Ready to complete page, review the information and click Finish.
12. Leave vSphere Web Client open for the next lab.

Accessing NFS Storage

Objective: Configure access to an NFS datastore
1. Configure Access to NFS Datastores
2. View NFS Storage Information

Next1: Configure Access to NFS Datastores
You mount an NFS share to your ESXi hosts and use it as a datastore.
1. If vSphere Web Client is not active, open your Internet Explorer Web browser, click vSphere Web Client on the favorite bar, and select vSphere Web Client - sa-vcsa-01.vclass.local.
2. When the There is a problem with this website's security certificate warning message appears, click Continue to this website (not recommended).
3. Log in using administrator@vsphere.local as the user name and standard lab password.
4. On the vSphere Web Client Home page, click the Storage icon in the Navigator pane.
5. Right-click the datacenter and select Storage > New Datastore. The New Datastore wizard starts.
6. On the Location page, click Next.
7. On the Type page, select NFS and click Next.
8. On the Select NFS version page, select NFS 3 and click Next.
9. On the Name and configuration page, enter NFS-Data in the Datastore name text box.
10. In the Folder text box, enter /NFS-Data as the folder name.
11. In the Server text box, enter 172.20.10.10 as the NFS server name and click.
12. On the Host accessibility page, select both ESXi hosts and click Next.
13. On the Ready to complete page, review the information and click Finish.
14. Verify that your NFS datastore is listed in the inventory.

2: View NFS Storage Information

You view the information about your NFS storage and the contents in the NFS datastore.
1. In the left pane, select your NFS-Data datastore.
2. In the center pane, click the Summary tab.
3. In the content pane, record the following information.
    - The datastore type
    - The capacity of the datastore
    - The free space of the datastore
    - The used space of the datastore
4. Leave vSphere Web Client open for the next lab.

Practical No: 09

Using Templates and Clones

Objective: Deploy a new virtual machine from a template In this lab, you perform the following tasks: and clone a virtual machine

1. Create a Virtual Machine Template
2. Create Customization Specifications
3. Deploy a Virtual Machine from a Template
4. Create a Content Library
5. Clone a VM Template to a Template in a Content Library
6. Deploy a Virtual Machine from a VM Template in the Content Library
7. Clone a Powered-On Virtual Machine

1: Create a Virtual Machine Template

You create a template to securely preserve a virtual machine configuration and easily deploy new virtual machines from the template.

1. If vSphere Web Client is not active, open your Internet Explorer Web browser, click vSphere Web Client on the favorites bar, and select vSphere Web Client - sa-vcsa-01.vclass.local.
2. When the There is a problem with this website's security certificate warning message appears, click Continue to this website (not recommended).
3. Log in using administrator@vsphere.local as the user name and the standard lab password.
4. On the vSphere Web Client Home page, click VMs and Templates.
5. In the inventory, expand Datacenter and LabVMs folder.
6. If the VM1-1 virtual machine is powered on, right-click the virtual machine and select Power > Shut Down Guest OS.
7. Click Yes to confirm and wait for the virtual machine to power off completely.
8. Right-click the VM1-1 virtual machine and select Template > Convert to Template.
9. Click Yes to confirm the conversion.
10. Right-click the VM1-1 virtual machine template and select Move To. 1
1. Select VM Folders > Templates folder and click OK.

12. Expand the Templates folder, right-click the VM1-1 virtual machine template, and select Rename.
13. Enter VM-Template and click OK.

2: Create Customization Specifications

1. Go to the vSphere Web Client Home page.
2. In the Navigator pane, select Policies and Profiles.
3. Under Policies and Profiles, click Customization Specification Manager and click the Create a new specification icon. The New VM Guest Customization Spec wizard appears.
4. On the Specify Properties page, verify that Windows is selected from the Target VM Operating System drop-down menu.
5. In the Customization Spec Name text box, enter VM-CustomSpec and click Next.
6. On the Set Registration Information page, enter VMware Student in the Name text box and enter VMware in the Organization text box.
7. Click Next.
8. On the Set Computer Name page, click Use the virtual machine name and click Next.
9. On the Enter Windows License page, leave the product key text box blank, leave other settings at their defaults, and click Next.
10. On the Set Administrator Password page, enter the standard lab password and confirm it.
11. On the Time Zone page, select the (GMT-08:00) Pacific Time (US & Canada) time zone from the Time Zone drop-down menu and click Next.
12. On the Run Once page, click Next.
13. On the Configure Network page, verify that Use standard network settings for the guest operating system, including enabling DHCP on all network interfaces is clicked and click Next.
14. On the Set Workgroup or Domain page, verify that Workgroup is clicked and that the text box shows WORKGROUP.
15. Click Next.
16. On the Set Operating System Options page, verify that the Generate New Security ID (SID) check box is selected and click Next.
17. On the Ready to complete page, review the information and click Finish.
18. In the Customization Specification Manager pane, verify that VM-CustomSpec is listed.

3: Deploy a Virtual Machine from a Template

Using templates, you rapidly deploy and provision new virtual machines and easily customize the guest operating systems.

1. On the vSphere Web Client Home page, click VMs and Templates and expand the view of the inventory.
2. In the left pane, expand the data center and folders until all the virtual machines are visible.
3. Right-click VM-Template and select New VM from this Template. The Deploy From Template wizard starts.
4. On the Select a name and folder page, enter VM1-2.
5. In the Select a location for the virtual machine pane, expand the inventory tree, select the LabVMs folder, and click Next.
6. On the Select a compute resource page, expand the Lab Servers folder and select sa-esxi01.vclass.local. The Compatibility pane displays the Compatibility checks succeeded message.
7. Click Next.
8. On the Select storage page, select Shared-iSCSI-Datastore from the list. The Compatibility pane displays the Compatibility checks succeeded message.
9. Click Next.
10. On the Select clone options page, select the Customize the operating system and the Power on virtual machine after creation check boxes and click Next.
11. On the Customize guest OS page, select VM-CustomSpec and click Next.
12. On the Ready to complete page, review the information and click Finish.

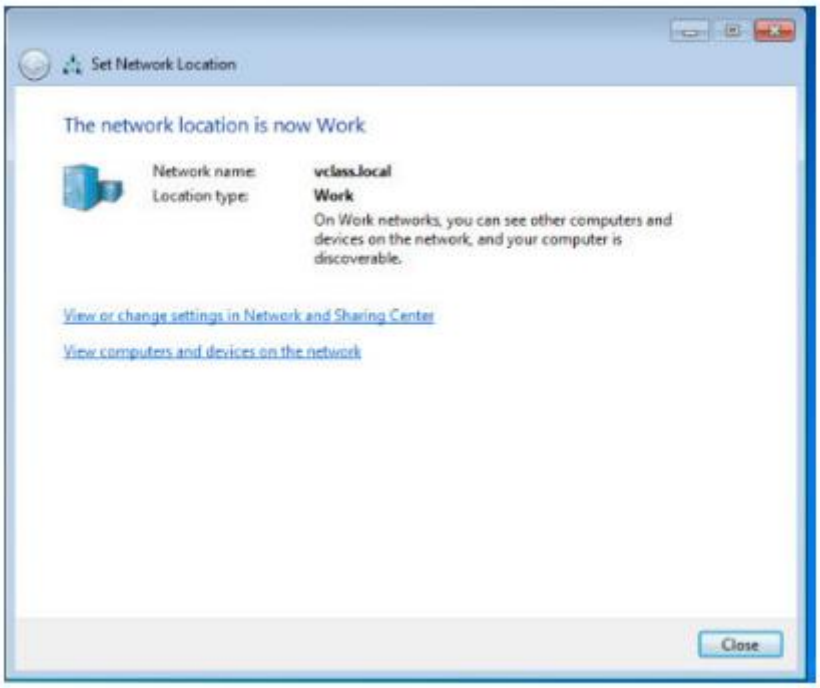
13. Repeat steps 3 through 12 to create another virtual machine on your second host named sa-esxi-02.vclass.local and name it VM2-2.
14. In the Recent Tasks pane, monitor the progress of the two template deployment tasks and wait for their completion.
15. Open a console for each of the newly created virtual machines.

a. In the left pane of vSphere Web Client, right-click the virtual machine and select Open Console. When the virtual machine console opens, you might see the Windows setup process continuing. It automatically reboots a few times to complete the process.

b. Log in as admin with the standard lab password.

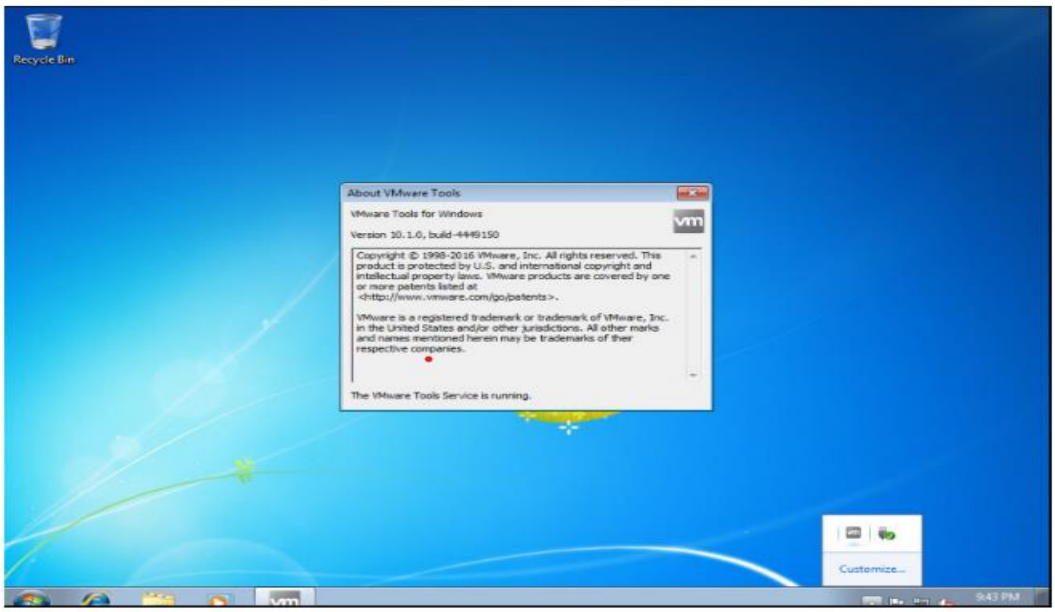
c. When the Set Network Location window opens, click Work network

d. Click Close



e. Verify that VMware Tools is installed by navigating to the Windows system tray at the lower-right corner to show hidden icons, and double-click the VMware Tools icon.

f. Ensure that VMware Tools for Windows is running.



g. Close the virtual machine console.

16. In vSphere Web Client, select each virtual machines individually in the Navigator pane, and click the Refresh icon in order for the Summary tab data to be updated.

4: Create a Content Library

1. Navigate to the vSphere Web Client Home page.
2. In the Navigator pane, click Content Libraries.
3. In the center pane, click the Create a new content library icon under the Objects tab.
4. On the Name and location page, enter VM_Library in the Name text box and click Next
5. In the Configure content library page, select Local content library, select the Publish externally check box, and click Next.

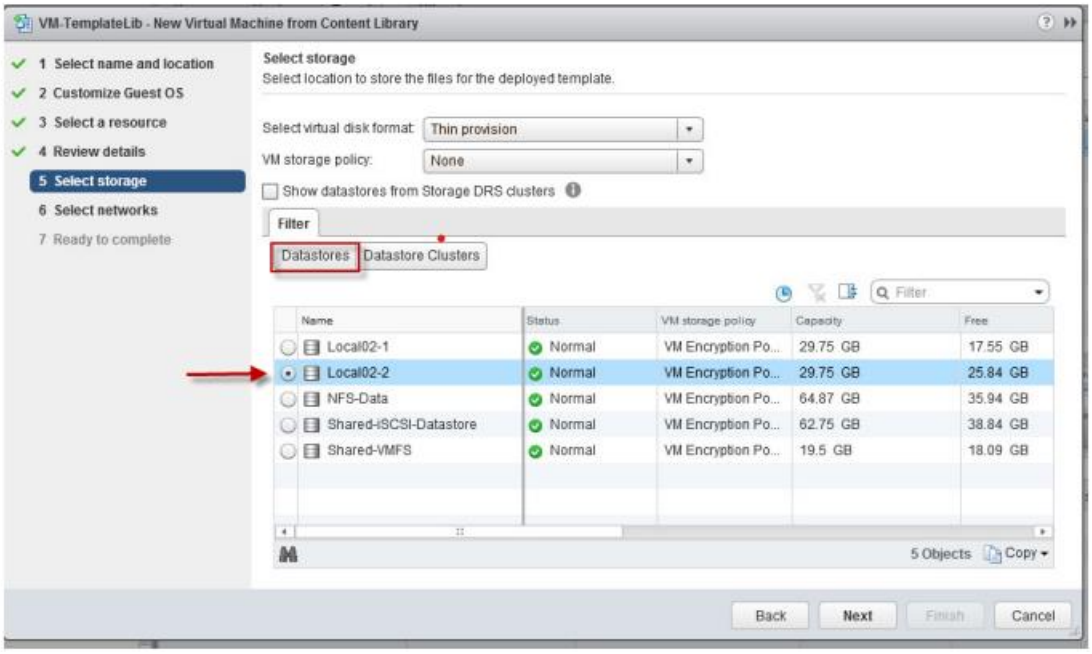
6. In the Add storage page, select Select a datastore and select Shared-iSCSI-Datastore and click Next.
7. On the Ready to complete page, review the information and click Finish.
8. Wait for this task to finish before you go to the next task.

5: Clone a VM Template to a Template in a Content Library

You clone virtual machines or VM templates from the vCenter Server inventory to templates in the content library and use them later to provision virtual machines on a cluster or a host. You can also clone a virtual machine or VM template to update an existing template in the library.
1. Navigate to the vSphere Web Client Home page, and click VMs and Templates.
2. Expand the view of the data center and all folders.
3. Right-click VM-Template and select Clone to Library.
4. For Clone as, verify that New template is selected.
5. Under the Filter tab, click VM_Library.
6. In the template name text box, enter VM-TemplateLib.
7. Click OK and wait for the task to finish before you go to the next task.
This process takes about five minutes.

6: Deploy a Virtual Machine from a VM Template in the Content Library

You use a VM template from a content library to deploy a virtual machine to a host or a cluster in your vSphere inventory. You can also apply a customization specification to the virtual machine.
1. Navigate to the vSphere Web Client Home page and click Content Libraries.
2. In the navigator pane, select VM_Library.
3. Click the Templates tab.
4. Right-click VM-TemplateLib and select New VM from This Template.
5. On the Select name and location page, enter VM-FromLib in the Name text box.
6. Ensure that the Browse tab is clicked and expand the view of Datacenter.
7. Select the LabVMs folder.
8. Select the Customize VM Options - Customize the operation system check box and click Next
9. On the Customize guest OS page, select VM-CustomSpec and click Next.
10. On the Select a resource page, expand the Lab Servers folder, select sa-esxi-02.vclass.local host, and click Next.
11. On the Review details page, verify the template details and click Next.
12. On the Select storage page, select Thin Provision from the Select virtual disk format dropdown menu.
13. Under Datastores tab in the Filter tab, ensure that Local02-2 is clicked.



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14. Click Next.
15. On the Select networks page, ensure that Production appears in the Destination Network field and click Next.
16. On the Ready to complete page, review the information and click Finish.
17. In the Recent Tasks pane, monitor the progress of the template deployment task and wait for completion. This task takes about five minutes.
18. In vSphere Web Client, click the Home icon and select VMs and Templates. 19. In the left pane, right-click VM-FromLib and select Power > Power On.
20. Open a console for the VM-FromLib virtual machine

a. In the left pane of vSphere Web Client, right-click the VM-FromLib virtual machine and select Open Console. When the virtual machine console opens, you might see the Windows setup process continuing. It automatically reboots a few times to complete the process.

b. Log in as admin with the standard lab password.

c. When the Set Network Location window opens, click Work network.

d. Click Close.

e. Verify that VMware Tools is installed by navigating to the Windows system tray at the lower-right corner to show hidden icons and double-click the VMware Tools icon.

f. Verify that VMware Tools for Windows is running.

21. Close the virtual machine console.
22. Navigate to the vSphere Web Client Home page.
23. Click Content Libraries.
24. Right-click the VM_Library content library in the Navigator pane and select Delete.
25. In the Delete library confirmation dialog box, click Yes.

7: Clone a Powered-On Virtual Machine

1. On the vSphere Web Client Home page, click VMs and Templates.
2. In the inventory, expand the Datacenter and LabVMs folders.
3. If the VM2-1 virtual machine is not powered on, right-click the virtual machine and select Power > Power on.
4. Right-click the VM2-1 virtual machine and select Clone > Clone to Virtual Machine. The Clone Existing Virtual Machine wizard starts.
5. On the Select a name and folder page, enter Hot-Clone in the Enter a name for the virtual machine text box.

6. For the Select a location for the virtual machine setting, expand Datacenter and select LabVMs.
7. Click Next.
8. On the Select a compute resource page, select Datacenter > Lab Servers > sa-esxi02.vclass.local and click Next.
9. On the Select storage page, select Shared-iSCSI-Datastore and click Next.
10. On the Select clone options page, select the Customize the operating system and the Power on virtual machine after creation check boxes.
11. Click Next.
12. On the Customize guest OS page, select VM-CustomSpec and click Next.
13. On the Ready to complete page, review the information and click Finish.
14. Monitor the progress of the task in the Recent Tasks pane.
15. Open a console for the Hot-Clone virtual machine.
    a. In the left pane of vSphere Web Client, right-click the Hot-Clone virtual machine and select Open Console. When the virtual machine console opens, you might see the Windows setup process continuing. It automatically reboots a few times to complete the process.
    b. Log in as admin with the standard lab password.
    c. Wait until the VM desktop and the Set Network Location page appear. d. When the Set Network Location window opens, click Work network.
    e. Click Close.
    f. Verify that VMware Tools is installed by navigating to the Windows system tray at the lower-right corner to show hidden icons and double-click the VMware Tools icon.
    g. Verify that VMware Tools for Windows is running.
16. Close the virtual machine console.
17. Leave vSphere Web Client open for the next lab

Practical No: 10

Modifying Virtual Machines

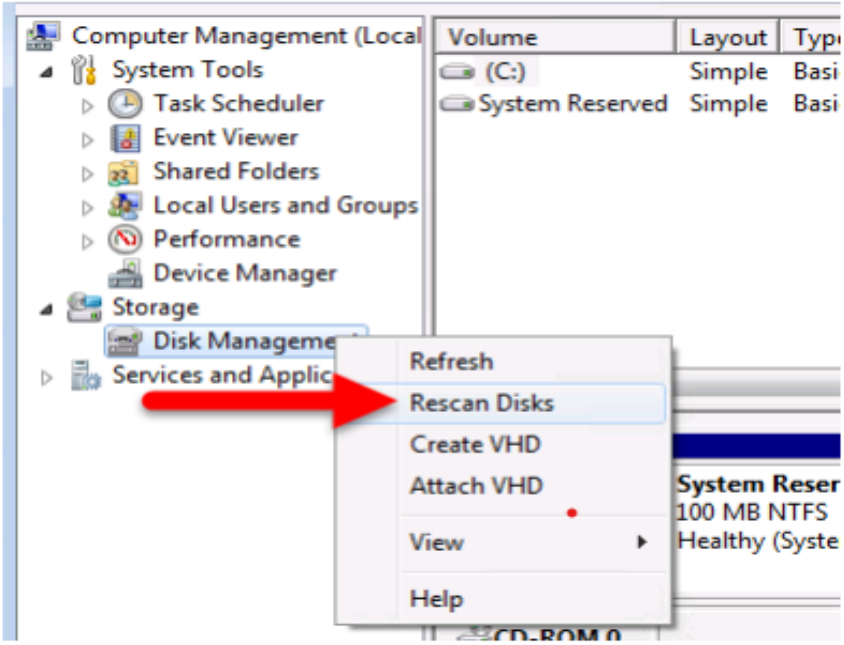
Objective: Modify a virtual machine's hardware and add In this lab, you perform the following tasks: a raw LUN to a virtual machine

1. Increase the Size of a VMDK File

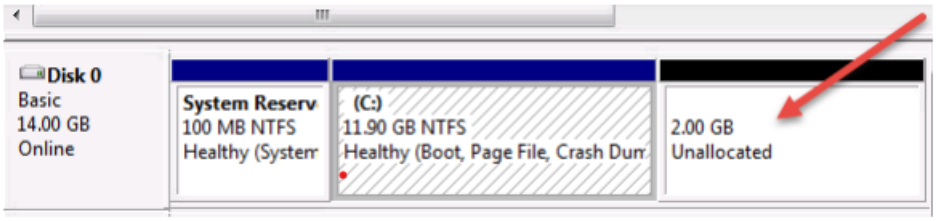
2. Adjust Memory Allocation on a Virtual Machine
3. Rename a Virtual Machine in the vCenter Server Inventory
4. Add and Remove a Raw LUN on a Virtual Machine

1: Increase the Size of a VMDK File

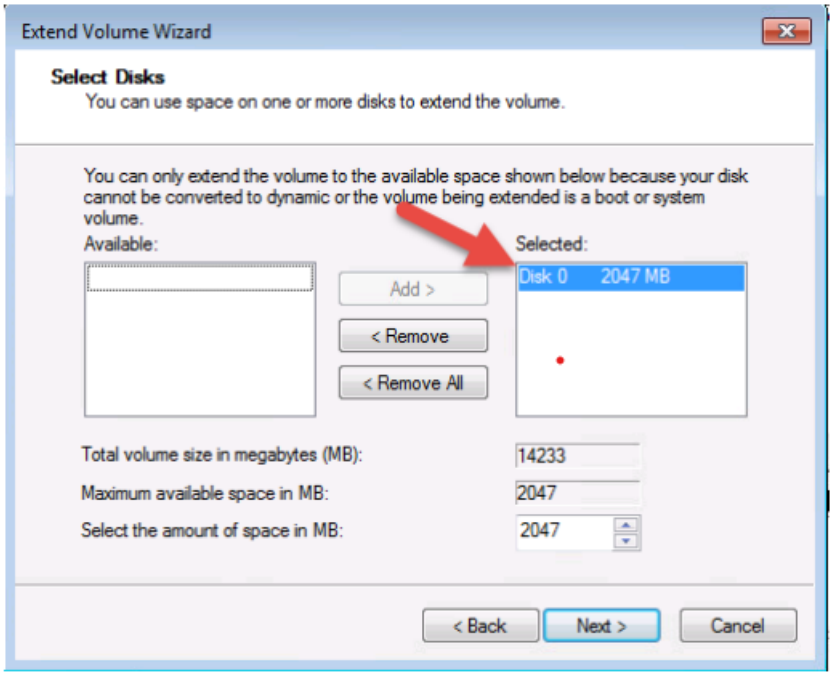
1. If vSphere Web Client is not active, open your Internet Explorer Web browser, click vSphere Web Client on the favorite bar, and select vSphere Web Client - sa-vcsa-01.vclass.local.
2. When the There is a problem with this website's security certificate warning message appears, click Continue to this website (not recommended).
3. Log in using administrator@vsphere.local as the user name and standard lab password.
4. On the vSphere Web Client Home page, click VMs and Templates.
5. In the left pane, expand the datacenter and folders.
6. Right-click your Hot-Clone virtual machine in the inventory and select Edit Settings.
7. On the Virtual Hardware tab, record the size (GB) of Hard Disk 1._____
8. In the Hard disk 1 text box, increase the disk size by 2 GB and click OK.
9. Right-click the Hot-Clone virtual machine and select Open Console.
10. If the Security Warning appears, click Continue to this website (not recommended).
11. If necessary, enter the standard lab password.
12. Configure the Hot-Clone virtual machine's guest operating system to detect and extend the increased disk space
    a. Click Start.
    b. Right-click on the Computer icon and choose Manage.
    c. In the left pane, select Disk Management.
    d. Right-click Disk Management and select Rescan Disks



e. In the lower-right pane, verify that the 2 GB unallocated disk space is discovered.



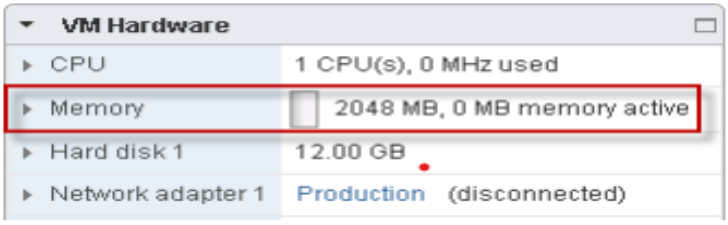
f. Right-click the C: drive and select Extend Volume. The Extend Volume wizard starts.
g. Click Next. h. On the Select Disks page, verify that Disk 0 is selected in the Selected pane and click Next



i. On the Completing the Extend Volume Wizard page, review the information and click Finish.
13. In the Disk Management window, verify that the local C: drive (Disk 0) is extended.
14. Record the value for the total size of the C: drive. _
15. Compare the value with that you recorded in step 7.
16. Close the Computer Management window.
17. Close the virtual machine console.

2: Adjust Memory Allocation on a Virtual Machine

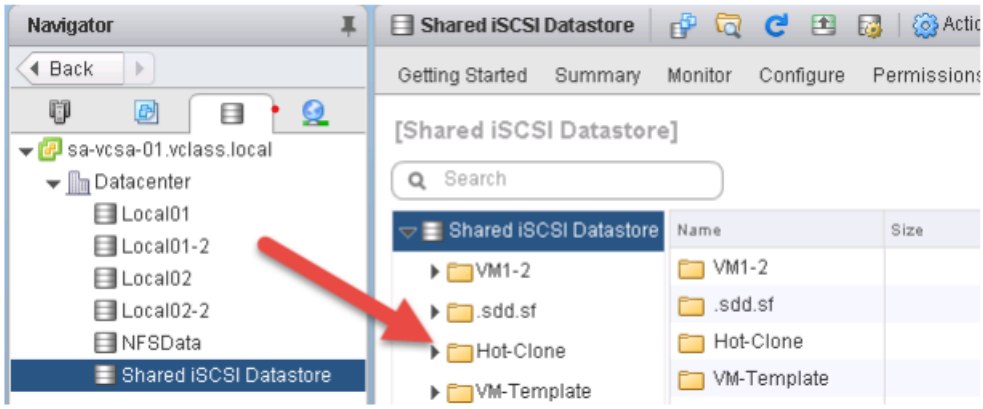
You add, change, or configure virtual machine memory resources or options to enhance virtual machine performance.
1. In the inventory, right-click the Hot-Clone virtual machine and select Power > Shut Down Guest OS. NOTE If your Shut Down Guest OS option is dimmed, refresh the vSphere Web Client screen and try again.
2. Click Yes to confirm the shutdown.
3. After the Hot-Clone virtual machine is shut down, right-click it and select Edit Settings.
4. On the Virtual Hardware tab, enter 2048 in the Memory text box and verify that MB is selected from the drop-down menu.
5. Click OK.
6. Click the virtual machine's Summary tab and expand the view of the VM Hardware pane to verify that the memory has been increased



3: Rename a Virtual Machine in the vCenter Server Inventory

You rename an existing virtual machine in the vCenter Server Appliance inventory.

1. Right-click the Hot-Clone virtual machine in the inventory and select Rename.
2. In the Enter the new name text box, enter VM2-3.
3. Click OK.
4. Select VM2-3 virtual machine from the inventory and click the Datastores tab.
5. Right-click Shared-iSCSI-Datastore and select Browse Files

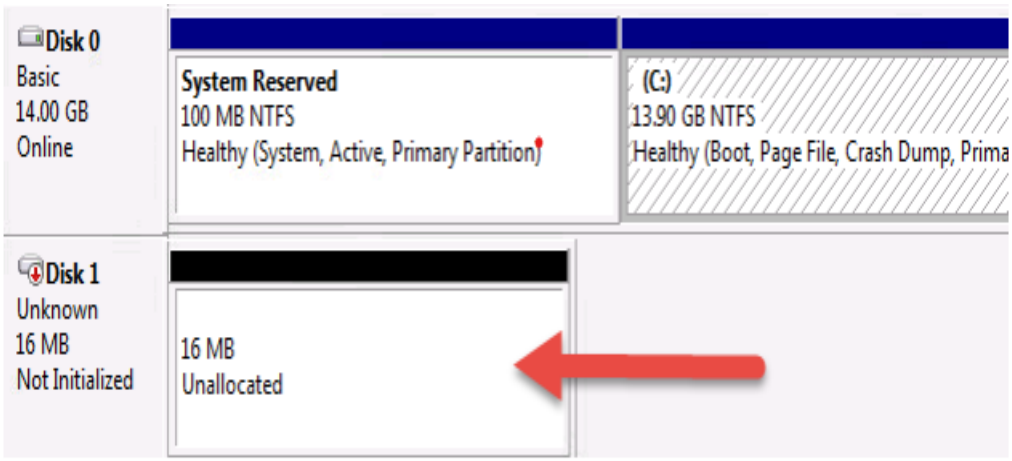


The screenshot shows the name of the virtual machine's folder

4: Add and Remove a Raw LUN on a Virtual Machine

1. In the vSphere Web Client Navigator pane, click the VMs and Templates icon.
2. Right-click the VM2-3 virtual machine and select Edit Settings.
3. On the Virtual Hardware tab, select RDM Disk from the New device drop-down menu and click Add.
4. In the Select Target LUN dialog box, select 1 and click OK.
5. Click the arrow next to New Hard disk to expand the view.
6. In the Location drop-down menu, verify that Store with the virtual machine is selected.
7. From the Compatibility Mode drop-down menu, select Virtual and click OK
8. Verify that the guest operating system can see the new disk
    a. In the left pane, right-click the VM2-3 virtual machine and select Power > Power On.
    b. Right-click the VM2-3 virtual machine and select Open console
    c. If the Security Warning appears, click Continue to this website (not recommended).
    d. Log in as admin with the standard lab password.
    e. Click Start.
    f. Right-click the Computer icon and choose Manage.
    g. In the left pane, select Disk Management.
    h. When the Initialize Disk wizard starts, click Cancel.
    i. Verify that Disk 1 is listed.

j. Close the Computer Management window.



9. Close the virtual machine console.
10. Remove the RDM hard disk from the VM2-3 virtual machine.
    a. Right-click the VM2-3 virtual machine and select Power > Shut Down Guest OS
    b. Click Yes to confirm the shutdown and wait for the virtual machine to power off.
    c. Right-click the VM2-3 virtual machine and click Edit Settings
    d. Under the Virtual Hardware tab, point to Hard disk 2.
    e. Click the x icon that appears at the right side of the row for Hard disk 2.

    f. Select the Delete files from datastore check box and click OK.
11. Leave vSphere Web Client open for the next lab

Practical No: 11

A] Migrating Virtual Machines

B] Managing Virtual Machines

A] Migrating Virtual Machines:

Objective: Use vSphere vMotion and vSphere Storage In this lab, you perform the following tasks: vMotion to migrate virtual machines

1. Migrate Virtual Machine Files from the Local Storage to the Shared Storage
2. Create a Virtual Switch and a VMkernel Port Group for vSphere vMotion Migration
3. Perform a vSphere vMotion Migration of a Virtual Machine on a Shared Datastore
4. Perform a Compute Resource and Storage Migration

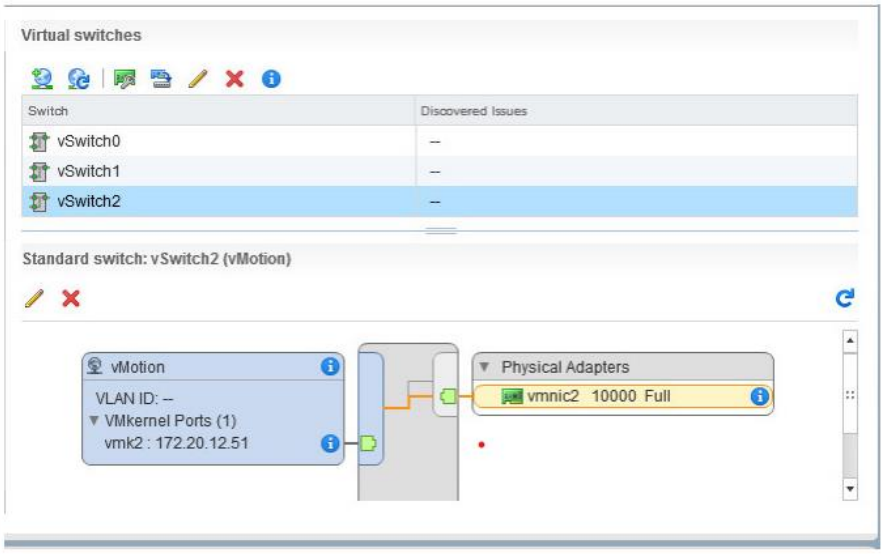
1: Migrate Virtual Machine Files from the Local Storage to the Shared Storage

1. If vSphere Web Client is not active, open your Internet Explorer Web browser, click vSphere Web Client on the favorite bar, and select vSphere Web Client - sa-vcsa-01.vclass.local.
2. When the There is a problem with this website's security certificate warning message appears, click Continue to this website (not recommended)
3. Log in using administrator@vsphere.local as the user name and standard lab password.
4. On the vSphere Web Client Home page, click VMs and Templates and expand the view of the inventory.
5. If the VM2-1 virtual machine is not powered on, right-click the VM2-1 virtual machine and select Power > Power On.
6. Select the VM2-1 virtual machine in the inventory and click the Summary tab
7. Expand the Related Objects pane and record the name of the storage on which the VM2-1 virtual machine resides. ___
8. In the inventory, right-click the VM2-1 virtual machine and select Migrate. The Migrate wizard starts.
9. On the Select the migration type page, click Change storage only and click Next.
10. On the Select storage page, select Shared-iSCSI-Datastore as the destination storage for the virtual machine files. In the Compatibility pane, the Compatibility checks succeeded message appears.
11. If the compatibility checks fail, troubleshoot the problem based on the message in the Compatibility pane.
12. Click Next.
13. On the Ready to complete page, review the information and click Finish.
14. Monitor the Recent Tasks pane and wait for the virtual machine files relocation process to complete. This task takes a few minutes.
15. Repeat steps 6 through 7 to verify that the VM2-1 virtual machine is on the new datastore, which is the Shared-iSCSI-Datastore.

2: Create a Virtual Switch and a VMkernel Port Group for vSphere vMotion Migration

1. In the left pane of vSphere Web Client, click the Hosts and Clusters tab.
2. Select the host sa-esxi-01.vclass.local in the inventory.
3. Click the Configure tab. 4. Select Virtual switches under Networking in the middle pane.
5. Click the Add Host Networking icon. The Add Networking wizard starts.
6. On the Select connection type page, click VMkernel Network Adapter and click Next.
7. On the Select target device page, click New standard switch and click Next.

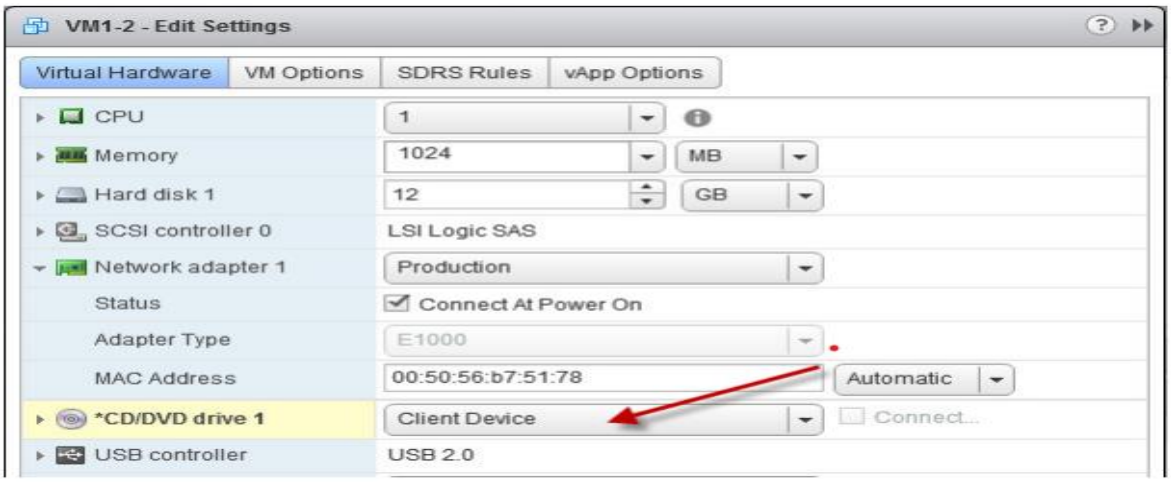
8. On the Create a Standard Switch page, click the green + sign to add a physical adapter to the switch
9. Select vmnic2 as the vmnic for the vSphere vMotion network and click OK.
10. Review the information shown and click Next
11. On the Port properties page for connection settings, enter vMotion in the Network label text box.
12. Select the vMotion check box, and click Next.
13. On the IPv4 settings page, click Use static IPv4 settings.
14. Enter 172.20.12.51 in the IPv4 address text box for sa-esxi-01. 1
5. Enter 255.255.255.0 in the Subnet mask text box for the vMotion VMkernel port IPv4.
16. Click Next.
17. On the Ready to complete page, review the information and click Finish.
18. In the Virtual Switches pane, verify that the new virtual switch for vSphere vMotion migration is listed.



19. Repeat task 2 for sa-esxi-02.vclass.local using the vMotion VMkernel port IPv4 address for sa-esxi-02 as 172.20.12.52. All other steps remain same

3: Perform a vSphere vMotion Migration of a Virtual Machine on a Shared Datastore

1. In the vSphere Web Client Navigator pane, click the Hosts and Clusters tab and expand the view of the inventory.
2. Click the arrow next to sa-esxi-01.vclass.local to expand the view.
3. Right-click the VM1-2 virtual machine and select Edit Settings.
4. On the Virtual Hardware tab, select Client Device from the CD/DVD drive 1 drop-down menu if it is not already selected



5. Click the arrow next to Network adapter 1 to expand the view.
6. Verify that Production is selected from the drop-down menu.
7. Ensure that the Connect At Power On check box is selected.
8. Click OK.
9. Repeat steps 3 through 8 for all the virtual machines.
10. If the VM1-2 virtual machine is powered-off, right-click the virtual machine and select Power > Power On.
11. Right-click the VM1-2 virtual machine and select Open Console.
12. Log in with the user name admin and the standard lab password.
13. Click the Start menu.
14. In the search box, enter cmd and press Enter to open a Command Prompt window.
15. When the Command Prompt window opens, enter the ipconfig command and record the virtual machine's default gateway IP address. _
16. Enter ping -t default_gateway IP address on the command line and press Enter start a continuous ping.
17. Leave the virtual machine console open and return to vSphere Web Client.
18. Migrate the VM1-2 virtual machine from host sa-esxi-01.vclass.local to host sa-esxi-02.vclass.local.

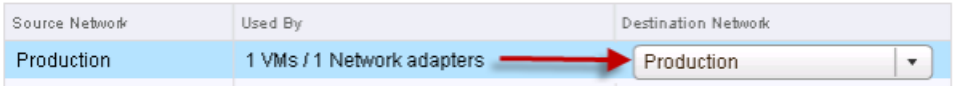
a. In the vSphere Web Client inventory, right-click the VM1-2 virtual machine and select Migrate.

b. On the Select the migration type page, click Change compute resource only and click Next.

c. On the Select a compute resource page, click sa-esxi-02.vclass.local. sa-esxi-02.vclass.local is the destination host to which you migrate the VM1-2 virtual machine. The migration requirements are validated. If the validation does not succeed, you receive warning or error messages. You cannot continue with the migration until the errors are resolved.

d. Click Next.

e. On the Select networks page, ensure that Production is selected from the Destination Network drop-down menu and click Next.



f. On the Select vMotion priority page, leave Schedule vMotion with high priority (recommended) clicked and click Next.

g. On the Ready to complete page, review the information and click Finish.

19. If VM1-2 virtual machine console is disconnected, reopen the console.

20. Return to the VM1-2 virtual machine console and monitor that no pings are dropped during the migration.
21. Press Ctrl+C to stop the ping.
22. Close the C:\Windows\system32\cmd.exe console.
23. Close the VM1-2 virtual machine console.
24. If your VM2-2 virtual machine is not powered on, right-click VM2-2 and select Power > Power On.
25. Select VM2-2 from the left pane and click the Summary tab.
26. Ensure that VM2-2 is on host sa-esxi-02.vclass.local.
27. In the left pane, drag the VM2-2 virtual machine from sa-esxi-02.vclass.local to sa-esxi01.vclass.local. The Migrate wizard appears.
28. On the Select the migration type page, click Change compute resource only and click Next.
29. On the Select a compute resource page, ensure that sa-esxi-01.vclass.local is selected and click Next.
30. On the Select network page, ensure that Production is selected from the Destination Network drop-down menu and click Next.
31. On the Select vMotion priority page, leave Schedule vMotion with high priority (recommended) clicked and click Next.
32. On the Ready to complete page, review the information and click Finish. 33. When the migration tasks are completed, view the inventory pane to verify that VM1-2 is under sa-esxi-02.vclass.local and VM2-2 is under sa-esxi-01.vclass.local.

4**: Perform a Compute Resource and Storage Migration**

1. In the inventory, right-click the VM-FromLib virtual machine and select Migrate.
2. On the Select the migration type page, click Change both compute resource and storage. 3. Accept the Select compute resource first default setting and click Next.
4. On the Select compute resource page, expand Datacenter and select Lab Servers > sa-esxi01.vclass.local.
5. Click Next.
6. On the Select storage page, select Local01-2 and click Next.
7. On the Select network page, ensure that Production is selected from the Destination Network drop-down menu and click Next.
8. On the Select vMotion priority page, leave Schedule vMotion with high priority (recommended) clicked and click Next.
9. On the Ready to complete page, review the information and click Finish.
10. In the Recent Tasks pane, monitor the progress of the virtual machine migration. This process takes approximately five minutes.
11. When the migration task is completed, view the inventory pane to verify that the VM-FromLib virtual machine is listed under your sa-esxi-01.vclass.local ESXi host in the inventory.
12. Right-click VM-FromLib and select Power > Shut Down Guest OS.

Managing Virtual Machines

Objective: Perform virtual machine management tasks

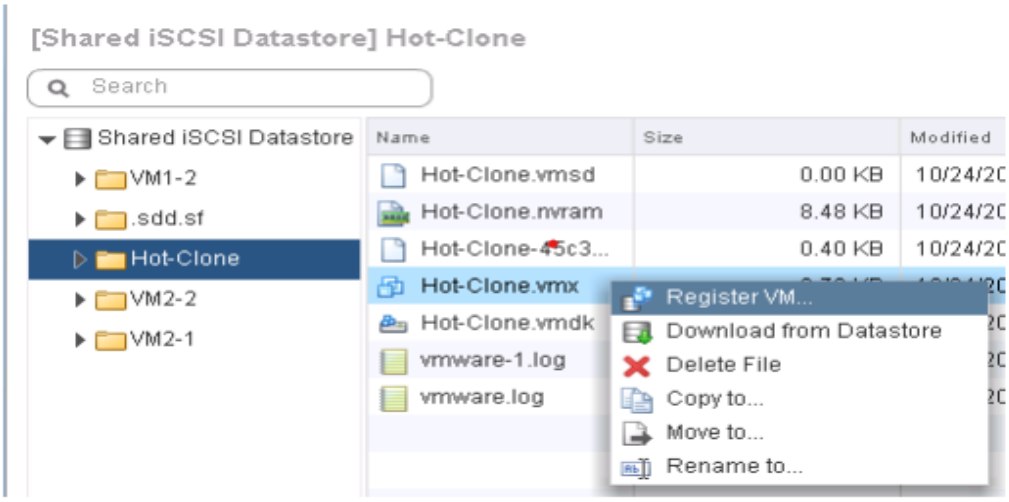
1. Unregister a Virtual Machine from the vCenter Server Appliance Inventory
2. Register a Virtual Machine in the vCenter Server Appliance Inventory
3. Unregister and Delete Virtual Machines from the Datastore
4. Take Snapshots of a Virtual Machine
5. Revert the Virtual Machine to a Snapshot
6. Delete an Individual Snapshot 7. Delete All Snapshots

1: Unregister a Virtual Machine from the vCenter Server Appliance Inventory

1. If vSphere Web Client is not active, open your Internet Explorer Web browser, click vSphere Web Client on the favorite bar, and select vSphere Web Client - sa-vcsa-01.vclass.local.
2. When the There is a problem with this website's security certificate warning message appears, click Continue to this website (not recommended).
3. Log in using administrator@vsphere.local as the user name and standard lab password.
4. On the vSphere Web Client Home page, click VMs and Templates and expand the view of the inventory.
5. Select theVM2-3 virtual machine and click the Datastores tab.
6. Record the VMware vSphere® VMFS datastore name where theVM2-3 virtual machine resides. __
7. If the VM2-3 virtual machine is powered on, right-click VM2-3, select Power > Shut Down Guest OS, and click Yes to confirm the shutdown
8. Right-click VM2-3 and select Remove from Inventory
9. Click Yes to confirm the removal.
10. Click the Refresh icon in vSphere Web Client.
11. Verify that theVM2-3 virtual machine no longer appears in the inventory.
12. In the Navigator pane, click the Storage icon and expand the view.
13. Right-click the datastore name that you recorded in step 6 and select Browse Files.
14. View the folders
15. Click the Hot-Clone folder to view the virtual machine files.

2: Register a Virtual Machine in the vCenter Server Appliance Inventory

1. In the list of virtual machine files in the right pane, right-click the Hot-Clone.vmx file and select Register VM



2. On the Name and Location page, enter VM2-3.
3. In the Select inventory location pane, expand Datacenter, select the LabVMs folder, and click Next.
4. On the Host/Cluster page, expand the Lab Servers folder under Datacenter.
5. Select sa-esxi-01.vclass.local and click Next.
6. On the Ready to Complete page, review the information and click Finish.
7. In the Navigator pane, click the VMs and Templates icon and verify that the VM2-3 virtual machine is in the LabVMs folder.

3: Unregister and Delete Virtual Machines from the Datastore

1. On the vSphere Web Client Home page, click VMs and Templates and expand the view of the inventory.
2. Select the VM2-3 virtual machine from the inventory and click the Datastores tab.
3. Record the VMFS datastore name on which the VM2-3 virtual machine resides. _

4. Right-click the VM2-3 virtual machine from the inventory, select Delete from Disk, and click Yes to confirm the deletion.
5. Verify that the VM2-3 virtual machine no longer appears in the inventory.
6. In the Navigator pane, click the Storage icon and expand the inventory view.
7. In the Navigator pane, right-click the datastore that you recorded in step 3 and select Browse Files.
8. Verify that the folder and files from which the VM2-3 virtual machine was registered no longer exist.
9. In the Navigator pane, click the VMs and Templates icon.
10. Right-click the VM-FromLib virtual machine, select Delete from Disk, and click Yes to confirm the deletion.

4: Take Snapshots of a Virtual Machine

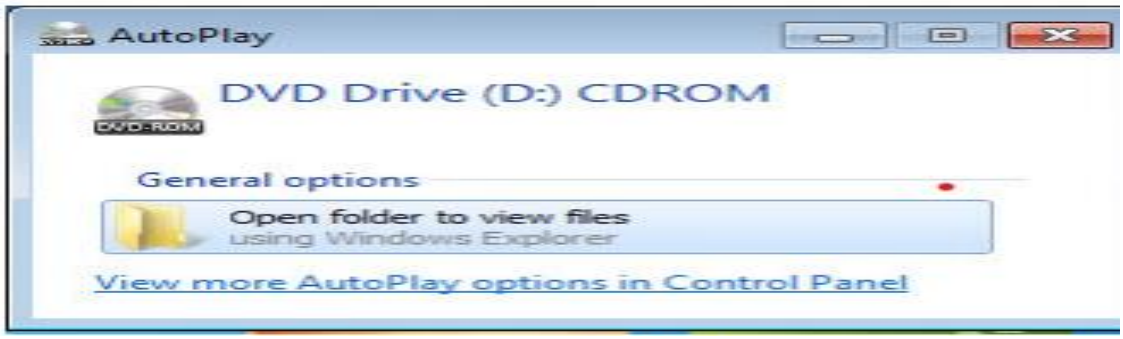
1. On the vSphere Web Client Home page, click VMs and Templates and expand the view of the inventory.
2. In the left pane, right-click the VM1-2 virtual machine and select Open Console.
3. Login as admin with the standard lab password.
4. From the desktop, drag the IOMETER file to the Recycle Bin.
5. Right-click the Recycle Bin icon and select Empty Recycle Bin to delete the IOMETER file permanently.
6. Click Yes to confirm the file deletion and leave the virtual machine console open
7. In vSphere Web Client, right-click the VM1-2 virtual machine and select Snapshots > Take Snapshot.
The Take VM Snapshot wizard appears.
8. Configure the snapshot

Option	Action
Name	Enter `Without iometer`.
Description	Enter `Deleted iometer`.
Snapshot the virtual machine's memory	Deselect the check box.
Quiesce guest file system (Needs VMware Tools installed)	Leave the check box deselected.

9. Click OK and monitor the task in the Recent Tasks pane.
10. Return to the virtual machine console and drag the CPUBUSY file to the Recycle Bin.
11. Right-click the Recycle Bin icon and select Empty Recycle Bin to delete the CPUBUSY file permanently.
12. Click Yes to confirm the file deletion and leave the virtual machine console open.
13. Return to vSphere Web Client.
14. In the inventory pane, right-click the VM1-2 virtual machine and select Snapshots > Take Snapshot take another snapshot.
15. Configure the snapshot.

Option	Action
Name	Enter `Without iometer or cpubusy`.
Description	Enter `Deleted cpubusy.`
Snapshot the virtual machine's memory	Deselect the check box.
Quiesce guest file system (Needs VMware Tools installed)	Leave the check box deselected.

16. Click OK and monitor the task in the Recent Tasks pane.
17. Connect the ClassFiles-vSphere.iso file on the CD/DVD drive to the VM1-2 virtual machine.
a. Right-click the VM1-2 virtual machine and select Edit Settings.
b. On the Virtual Hardware tab, select Datastore ISO File from the CD/DVD drive 1 drop-down menu.
c. In the left pane, select Local02-2/.
d. In the middle pane, select the Classfiles-vSphere.iso file.
e. Click OK. f. Select the Connected check box on the CD/DVD drive 1 row.
g. Click OK to close the Edit Settings dialog box
18. Return to the VM1-2 virtual machine console.
The DVD drive AutoPlay window should appear.



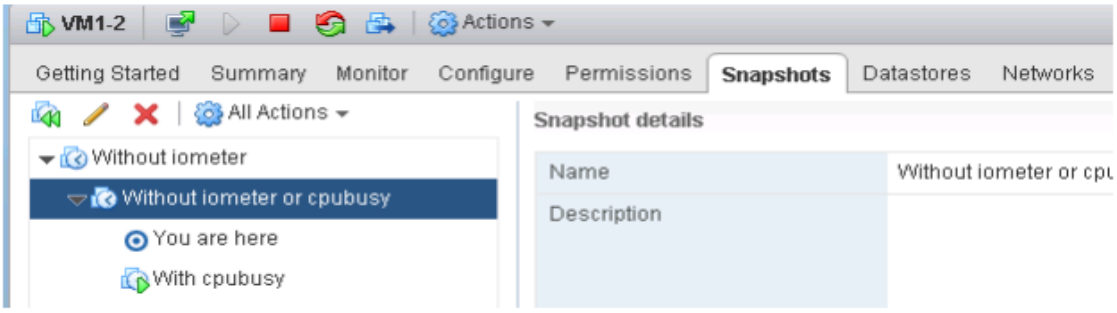
19. If the D: drive does not open automatically, open Windows Explorer and go to the D: drive.
20. Click Open folder to view files.
21. Copy the CPUBUSY file from the D: drive to the virtual machine's desktop.
22. Disconnect the CD/DVD drive from VM1-2 virtual machine.
a. From vSphere Web Client, right-click the VM1-2 virtual machine and select Edit Settings.
b. On the Virtual Hardware tab, click the arrow next to CD/DVD drive 1 to expand the view.
c. Select Client Device from the drop-down menu and click OK.
23. Right-click the VM1-2 virtual machine and select Snapshots > Take Snapshot to take another snapshot
24. Configure the snapshot

Option	Action
Name	Enter `With cpubusy`.
Description	Enter `Added cpubusy`.
Snapshot the virtual machine's memory	Leave the check box selected.
Quiesce guest file system (Needs VMware Tools installed)	Leave the check box deselected.

25. Click OK.
26. Monitor the task in the Recent Tasks pane and wait for completion.
This task takes slightly longer than previous snapshots because the guest memory is also being saved.
27. Right-click the VM1-2 virtual machine and select Snapshots > Manage Snapshots.
28. Leave the Snapshots tab open.
29. Close the VM1-2 virtual machine console

5: Revert the Virtual Machine to a Snapshot

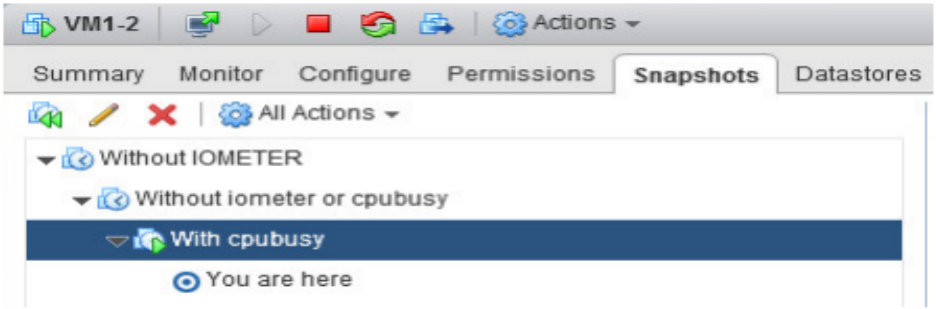
1. On the Snapshots tab, select the Without iometer or cpubusy snapshot, click All Actions, and select Revert to.
2. Click Yes to confirm the revert
3. Right-click the VM1-2 virtual machine in the inventory and select Power > Power On.
4. Right-click VM1-2 in the Navigator pane and select Open Console. Wait for the boot process to complete. 5. Log in as admin with the standard lab password.
6. Close the VM1-2 virtual machine console.
7. In vSphere Web Client, right-click the VM1-2 virtual machine and select Snapshots > Manage Snapshots.



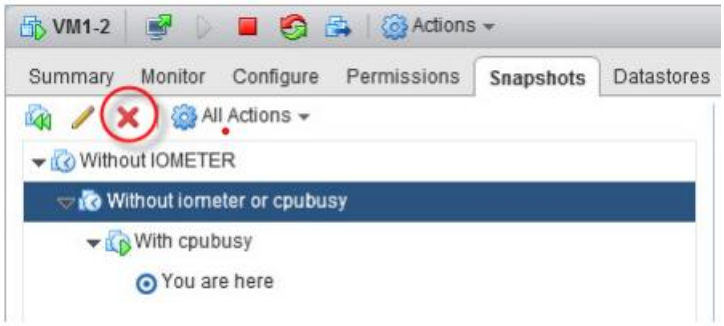
8. On the Snapshots tab, select the With cpubusy snapshot, click All Actions, and select Revert to.
9. Leave the Suspend this virtual machine when reverting to selected snapshot check box deselected and click Yes to confirm the revert operation
10. Open a console for the VM1-2 virtual machine

6: Delete an Individual Snapshot

1. Return to vSphere Web Client, ensure that VM1-2 is selected in the Navigator pane, and verify that the Snapshots tab is open.



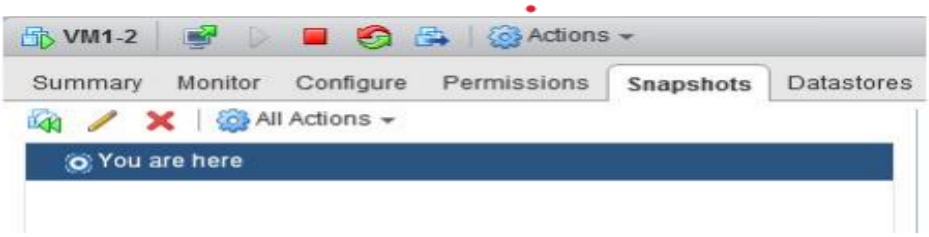
2. Select the Without iometer or cpubusy snapshot and click the delete icon



3. Click Yes to confirm the deletion

7: Delete All Snapshots

1. Under VMs and Templates in vSphere Web Client, right-click the VM1-2 virtual machine in the Navigator pane and select Snapshots > Delete All Snapshots.
2. Click Yes to confirm that you want to delete all the remaining snapshots. Only the You are here pointer should appear on the snapshots tab



3. Return to the VM1-2 virtual machine console.
4. Close the VM1-2 virtual machine console.
5. Leave vSphere Web Client open for the next lab.