⚠️ This support document is intended for users with an active VMware vSphere license. If you do not have a VMware vSphere license, you will need to purchase one to operate NETLAB+ until our team releases a version utilizing Proxmox.

NDG

NETLAB+

Remote PC Guide Series – Volume 2

Installing and Configuring VMware vSphere 7.0

Document Version: 2022-02-14

This guide will lead you through the process of adding remotely accessible PC or servers into your NETLAB+ equipment pods using the VMware ESXi and vCenter virtualization products.

This guide is part of a multi-volume series, designed to provide you with the guidance needed to implement remote PCs on your NETLAB+ system. Learn more about the Remote PC Guide Series. See the Documentation Library for a list of all NETLAB+ guides.

The details of this guide are specific to **vSphere version 7.0 with vCenter.**

Contents

1   Background

NETLAB+ pod remote PCs and servers can be implemented using virtual machines running on VMware vSphere 7.0. This guide is designed to help you set up your virtual machine infrastructure for use with NETLAB+.

- This guide assumes you are familiar with the Remote PC concept behind NETLAB+. Please review the *NETLAB+ Designated Operating Environment Guide* for information on the components required to configure a NETLAB+ system.

- This guide is designed to help you install and configure vSphere 7.0 for use with NETLAB+. You will be installing VMware ESXi 7.0 and a VMware vCenter 7.0 Server Appliance.

- This guide also assumes that you have configured the NDG supported servers, the Lenovo ThinkSystem SR630.

The basics of a NETLAB+ infrastructure consist of a NETLAB+ VE Appliance, Management Server, vCenter Appliance, and ESXi Host Server. The images that follow show two configuration options that illustrate how these all work together.

The following network topology is an overview of the Designated Operating Environment for NETLAB+ VE when configured behind a firewall DMZ (demilitarized zone).
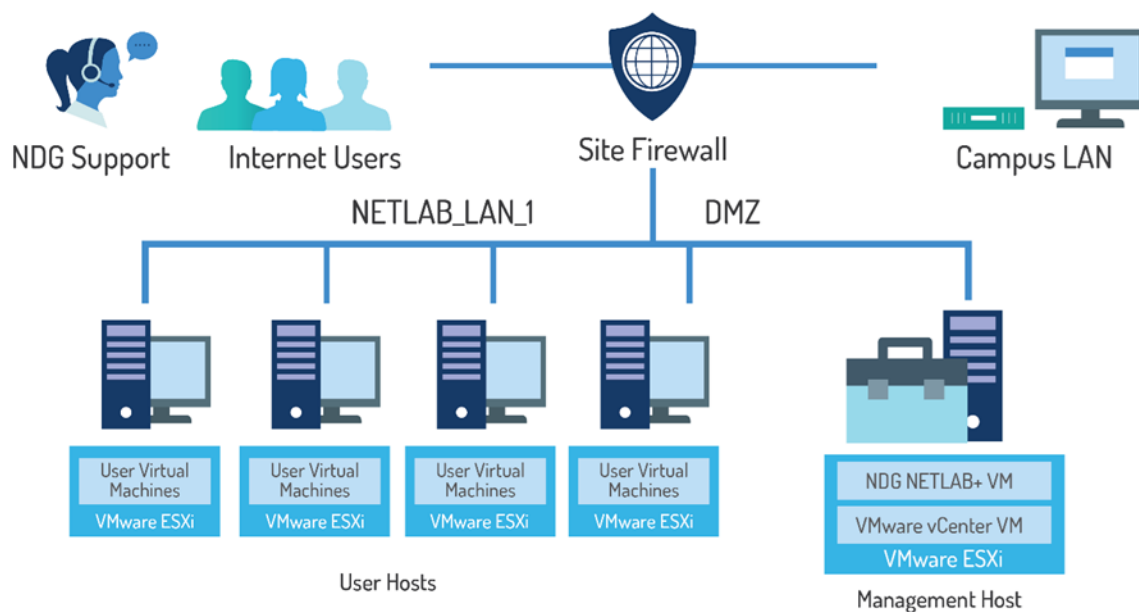
NETLAB+ VE Behind Firewall DMZ (demilitarized zone)

The following network topology is an overview of the Designated Operating Environment for NETLAB+ VE when configured through a campus LAN.
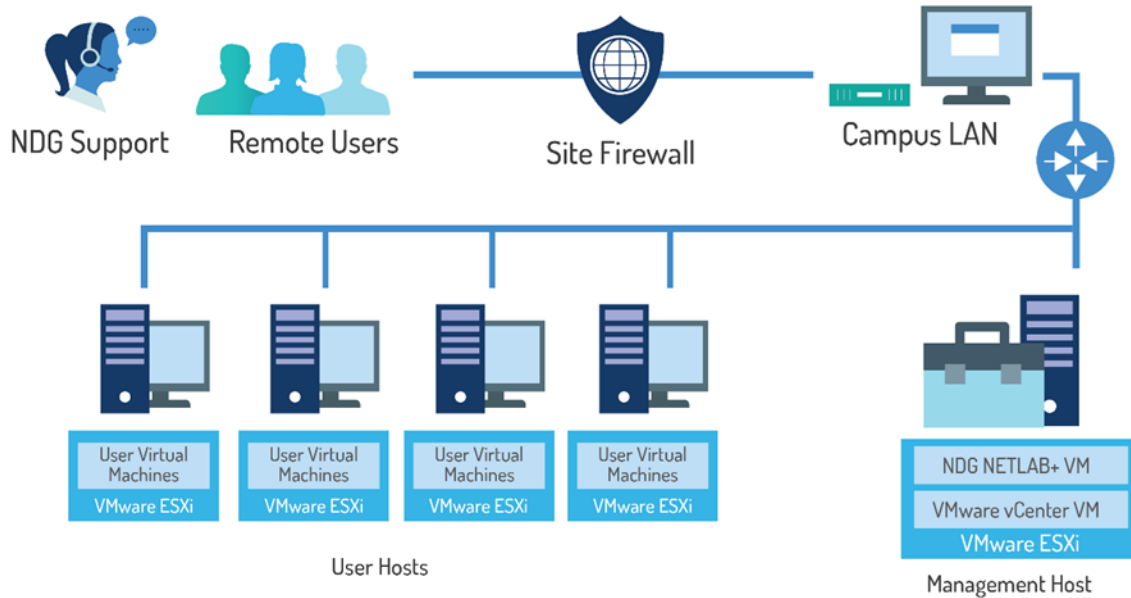
NETLAB+ VE Through Campus LAN

2   VMware Infrastructure Planning

There are two components to the VMware Infrastructure: (1) Physical VMware ESXi servers to host the virtual machines in your pods (2) VMware vCenter Server, which enables you to manage the resources of multiple ESXi hosts and allows you to monitor and manage your physical and virtual infrastructure.

Virtualization using ESXi is performed on separate physical servers, not included with NETLAB+ VE. You can interface with multiple ESXi servers for larger deployments. NETLAB+ VE integrates with VMware vCenter Server to assist the administrator with installing, replicating, and configuring virtual machine pods.

> NETLAB+ VE is compatible with VMware ESXi version 7.0 and vCenter Server version 7.0.

2.1 VMware ESXi Host Requirements

Please refer to our host server specifications page for the latest information on recommended ESXi Host servers. Use the following link to get detailed requirements: https://www.netdevgroup.com/support/documentation/netlabve/lenovo_for_netlabve.pdf

Please search the VMware Compatibility Guide to ensure your ESXi host hardware is compatible with the VMware version you wish to use: http://www.vmware.com/resources/compatibility/search.php

NDG Equipment Selection Disclaimer

NDG offers no warranties (expressed or implied) or performance guarantees (current or future) for third-party products, including those products NDG recommends. Due to the dynamic nature of the IT industry, our recommended specifications are subject to change at any time.

NDG recommended equipment specifications are based on actual testing performed by NDG. To achieve comparable compatibility and performance, we strongly encourage you to utilize the same equipment, exactly as specified and configure the equipment as directed in our setup documentation. Choosing other hardware with similar specifications may or may not result in the same compatibility and performance. The customer is responsible for compatibility testing and performance validation of any hardware that deviates from NDG recommendations. NDG has no obligation to provide support for any hardware that deviates from our recommendations, or for configurations that deviate from our standard setup documentation.

Hardware-Assisted Virtualization (Intel VT-x) is **REQUIRED** on any host you use.

Virtualization courses, such as the VMware IT Academy labs, have not been tested on server platforms using AMD processors and are not supported on server platforms using AMD processors. VMs available from CSSIA were created on the Intel platform. As such, they may not work as intended on a server platform utilizing AMD processors.

2.2   VMware vCenter Server Requirements

As of vSphere 5.1, NDG only supports the VMware vCenter Server Appliance. The physical server where the vCenter Server Appliance resides should be a dedicated "management server" to provide ample resources. It is strongly recommended you follow our server recommendations listed below to provide ample resources now and in the future.

https://www.netdevgroup.com/support/documentation/netlabve/lenovo_for_netlabve.pdf

> ⚠️ NDG does not support configurations where vCenter is running on a heavily loaded ESXi host and/or an ESXi host that is also used to host virtual machines for NETLAB+ pods. Such configurations have exhibited poor performance, API timeouts, and sporadic errors in NETLAB+ VE operations.

The vCenter server must have network access to your ESXi servers. Use any web browser to access the vCenter Server after it is deployed.

3   VMware Infrastructure Software and Licenses

To continue this process, you must have a VMware Customer Connect and VMware DL2 Brightspace account. Optionally you may use licenses provided by your organization.

3.1   Downloading ESXi Software for the Lenovo Think System SR630

⚠️ If you are not using the Dell R630, please skip to section 3.2.

Dell R630 Users: It is very important that you download the software from Dell, as they have customized the installer ISO with drivers for the server platform, including networking and storage adapters.

The following procedure assumes you are using a Lenovo Think System SR630 server.

1. Download the Custom VMware ESXi for Lenovo by going to:
   https://vmware.lenovo.com/content/custom_iso/7.0/7.0u3/
2. Click on **VMware-ESXi-7.0.3-18644231-LNV-20210922.iso.**
3. The ISO file should begin downloading.

3.2   Gaining Access to VMware Licenses for Your Infrastructure

Licensing considerations will vary, depending on your school's participation in the VMware IT Academy Program (VITA) and/or VMware Academic Software Licensing Program.

3.3   Obtaining VMware vCenter and ESXi Licenses

When downloading VMware vCenter and ESXi, it is important to select a version that is compatible with NETLAB+. NETLAB+ is compatible with VMware vCenter and ESXi versions 7.0.

1. Navigate to the VMware Academic Software Licensing Program.
2. Log in as an Academy Admin or Instructor.
3. You must be a registered Academy Admin or Instructor user. If you have questions or need additional support, please contact itacademy@vmware.com. If you need help on how to apply to the program, please follow these steps: D2L # 1 How to Apply to the Program - YouTube.
4. Obtain licenses for VMware vCenter Server 7.*x* Standard and VMware vSphere 7.*x* Enterprise Plus.
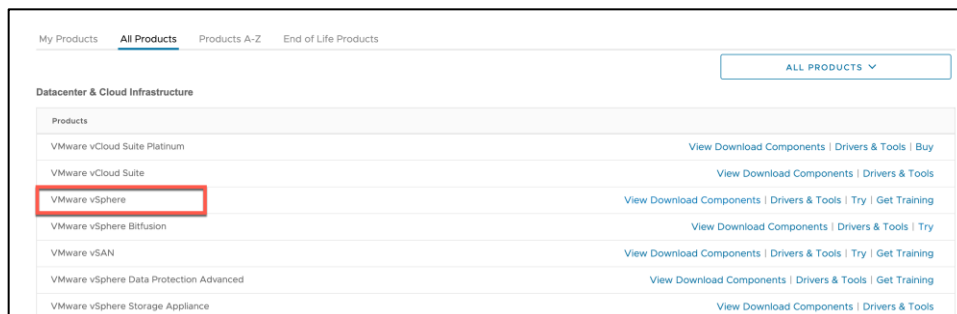
3.4 Obtaining VMware vCenter 7.0 Software

You must have a VMware Customer Connect account to continue this process. You can create one by going to https://customerconnect.vmware.com/.
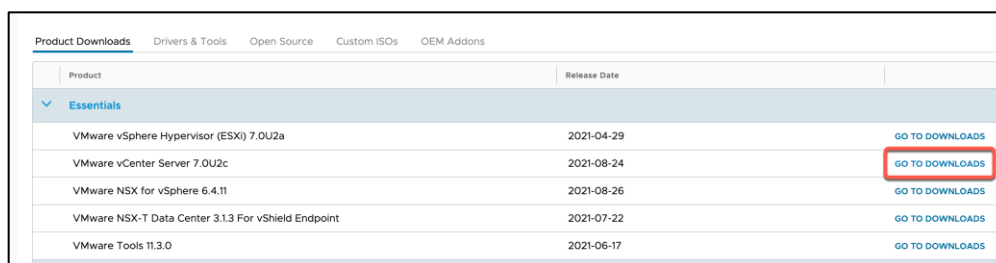
1. Log in to the VMware Customer Connect Portal.
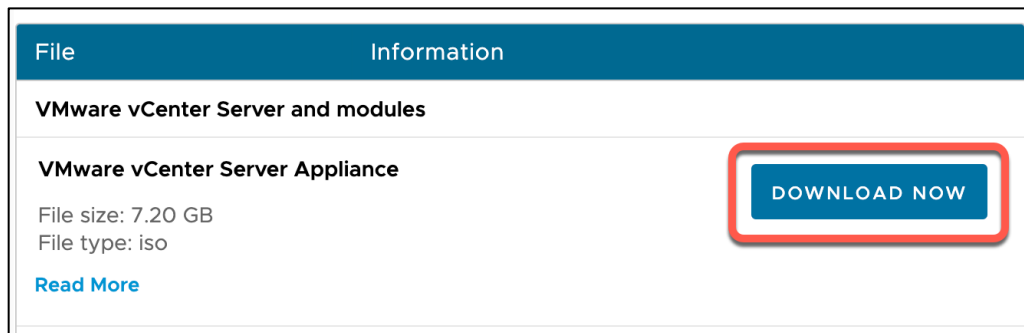2. Click on **All Products.**
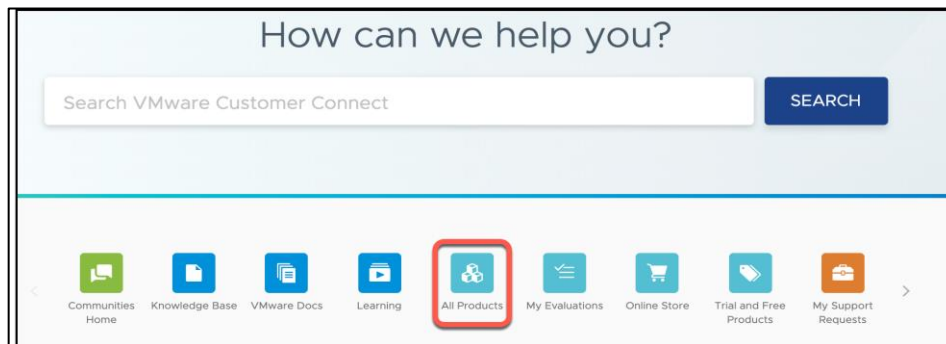
3. Click on **VMware vSphere**.

4. Click on the **GO TO DOWNLOADS** link for VMware vCenter Server 7.0.U3c or equivalent.

5. Click on the **Download Now** button for VMware vCenter Server Appliance.

File	Information
VMware vCenter Server and modules	
VMware vCenter Server Appliance File size: 7.20 GB File type: iso **Read More**	DOWNLOAD NOW

4   VMware Infrastructure Setup

This section describes the software installation on a VMware ESXi host server.

> ⚠️ All tasks in this section are performed on **separate dedicated physical servers** that you provide. Do not perform any of the tasks in this section on the NETLAB+ VE server appliance.

There should be a minimum of two (2) ESXi servers. One will be used for management, referred to as the Management Server, and the other will be your ESXi Host Server, which will hold the virtual machines for the pods. You may have one or more ESXi Host servers depending on the courses you plan to teach.

NDG supports the Lenovo Think System SR630 for use as a Management Server or as an ESXi Host Server. Please refer to the NDG requirements website for the latest supported server configurations:

https://www.netdevgroup.com/support/documentation/netlabve/lenovo_for_netlabve.pdf

4.1   Preparing the ESXi Server

NDG recommends the Lenovo Think System SR630 server platforms. If you are using non-supported servers, please contact your vendor for assistance in configuring the BIOS and RAID options.

The management server recommended by NDG should have physical hard drives installed. These may or may not have been configured as a RAID 5 array. This article will explain how to create a RAID array using Lenovo XClarity Provisioning Manager:

https://datacentersupport.lenovo.com/de/en/products/servers/thinksystem/sr630/7x02/solutions/ht507499

4.2   Installing ESXi on a Host Server

Depending on how the Lenovo Think System SR630 was ordered, VMware ESXi 7.0.X may have come preinstalled. NDG recommends using ESXi customized for Lenovo servers. The latest versions of ESXi 7.0 customized for Lenovo can be found here: https://vmware.lenovo.com/content/custom_iso/7.0/

If ESXi is not installed, please use the link below to find the installation instructions on the VMware website.

https://datacentersupport.lenovo.com/de/en/products/servers/thinksystem/sr630/solutions/ht510214-installation-instructions-for-vmware-esxi-7x-on-lenovo-thinksystem-servers

4.3   Basic Network Configuration

This section will refer you to the appropriate documentation on VMware's Website to configure the network settings on your servers. This will need to be performed on the Management Server and on each ESXi Host Server. The installation document can be found at the following link: *vSphere Installation and Setup*.

> Please let us know if the above links to documentation do not work so that we can update our documentation accordingly.

At a minimum, the following must be set up on each server:

- Administrator password
- Network settings including a static IP address, subnet mask, and default gateway
- If the network only requires an IPv4 address, it is strongly recommended that you disable it to prevent possible networking issues in a production environment DNS server address
- A hostname is optional and only needed if local policy requires it

All other settings are optional and only necessary if local policy requires them.

5   Management Console

The VMware vCenter Server Appliance can be managed through any web browser by simply navigating to the assigned IP addresses. This configuration requires a "management console" in order to configure the vCenter Server Appliance, ESXi Host Servers, and virtual machines. The management console can be either a virtual machine or a physical host like a workstation or laptop. The management console will need to be on the same network as the ESXi hosts and vCenter Server Appliance.

The management console is also used to download and deploy virtual machine images. As such, NDG strongly recommends this machine has a significant amount of storage, memory, and CPU power to successfully perform this task.

6 Creating Datastores in ESXi

In this section, datastores will be created. VMFS datastores serve as repositories for virtual machines. This will help organize and manage the VMs and other data stored on the ESXi hosts. See the subsections below for guidance on creating a datastore on the management and host server(s).

> ⚠️ The detailed steps and screenshots below may differ from your system, depending on your hardware and software selections.

6.1 Create a datastore on the Management Server
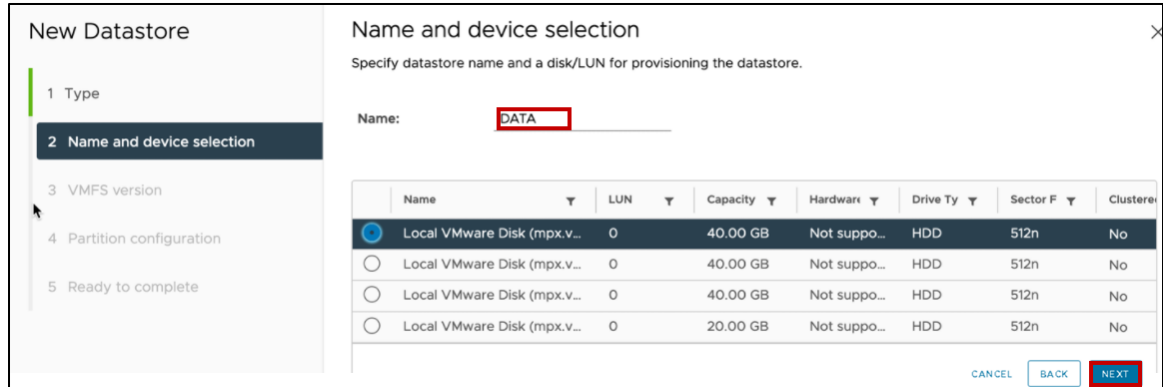
1. In the vSphere Client object navigator, browse to a host, a cluster, or a data center.
2. Right-click on the first host server that will store VMs, select **Storage > New Datastore**.
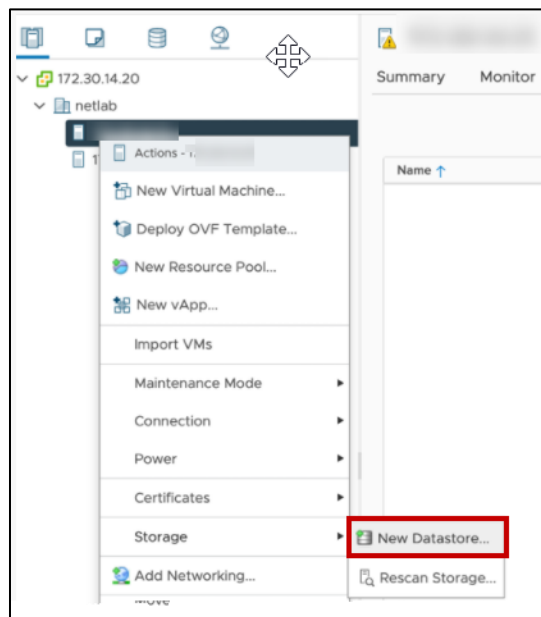
3. Select **VMFS** as the datastore type. Click **NEXT**.
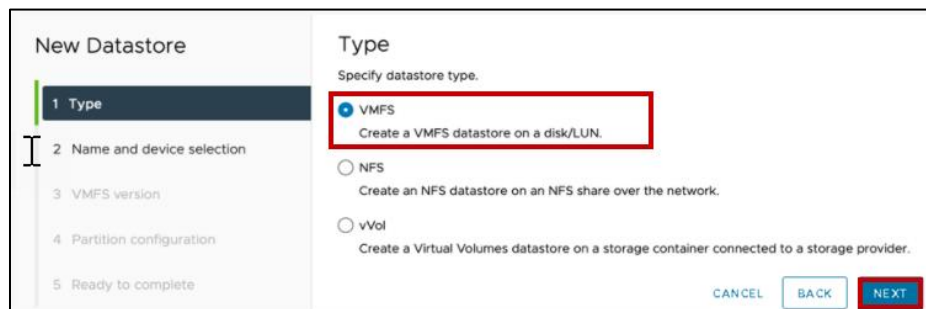
4. Name the new datastore **DATA** and select a local disk as the placement location for the datastore. Click **NEXT**.

5. Select **VMFS 6** as the datastore version. Click **NEXT.**
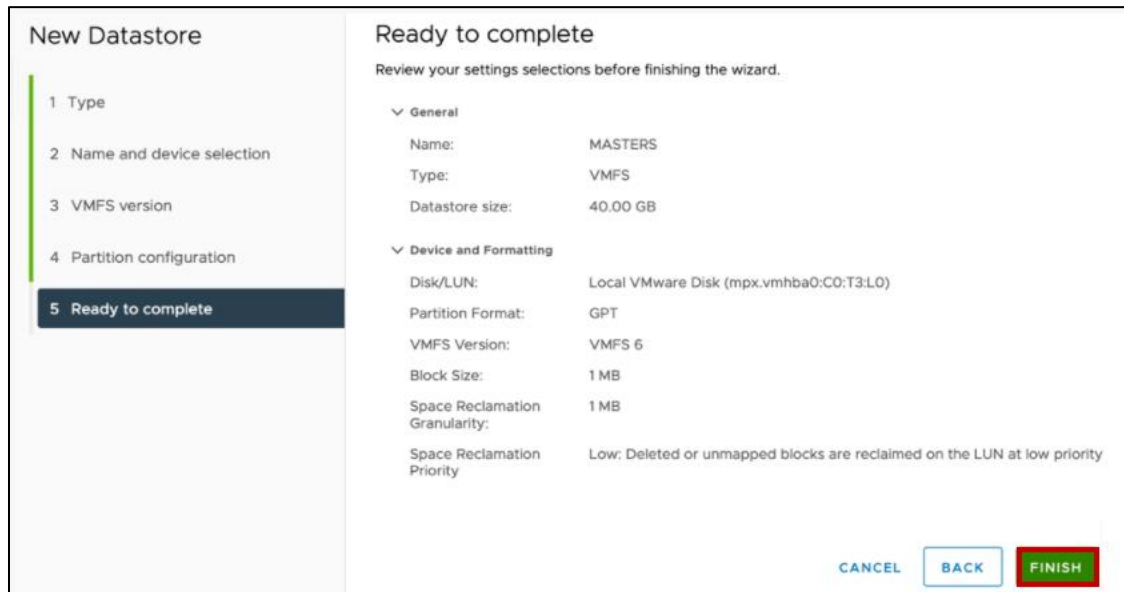

6. In the *Partition Configuration* dropdown box, select **Use all available partitions**.
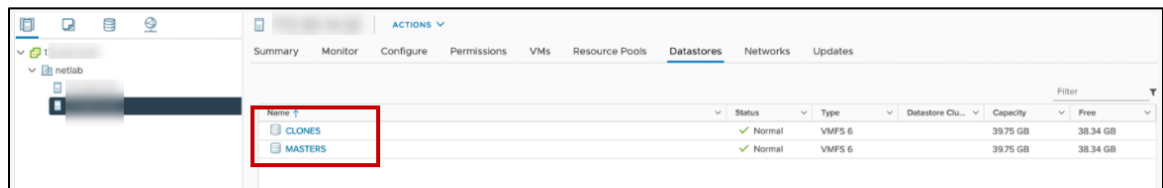7. Use the maximum available **Datastore Size**. Click **NEXT.**

8. Review the configuration settings for the new datastore and click **FINISH**.

6.2 Create datastores on the Host Server(s)

1. In the vSphere Client object navigator, browse to a host, a cluster, or a data center.
2. Right-click on the first host server that will store VMs, select **Storage > New Datastore.**
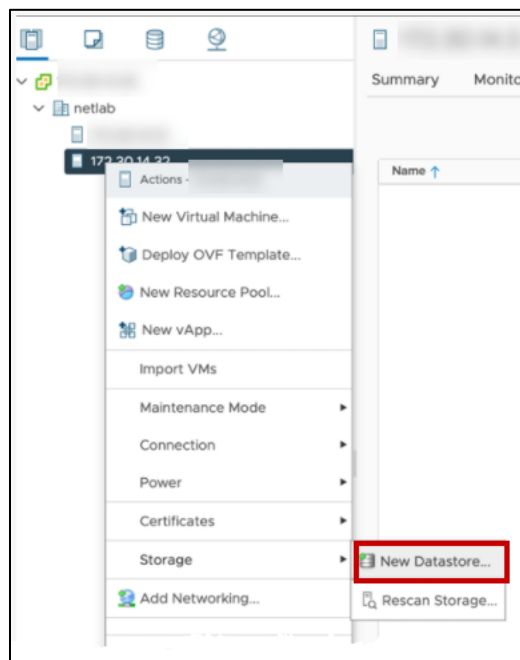
3. Select **VMFS** as the datastore type. Click **NEXT**.
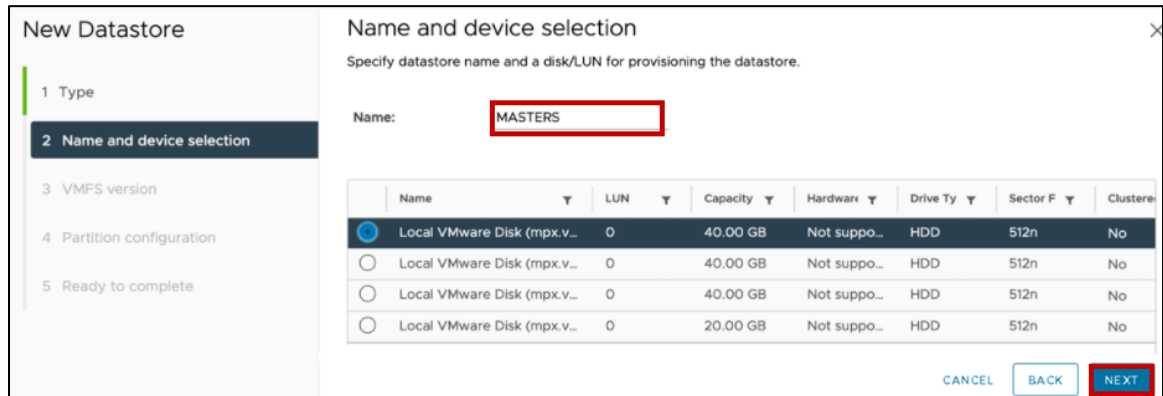
4. Name the new datastore **MASTERS** and select a local disk as the placement location for the datastore. Click **NEXT**.

5. Select **VMFS 6** as the datastore version. Click **NEXT.**

6. In the *Partition Configuration* dropdown box, select **Use all available partitions**.
7. Use the maximum available **Datastore Size**. Click **NEXT.**

8. Review the configuration settings for the new datastore and click **FINISH**.

9. Repeat these steps for a second datastore. Name the second datastore **CLONES**.
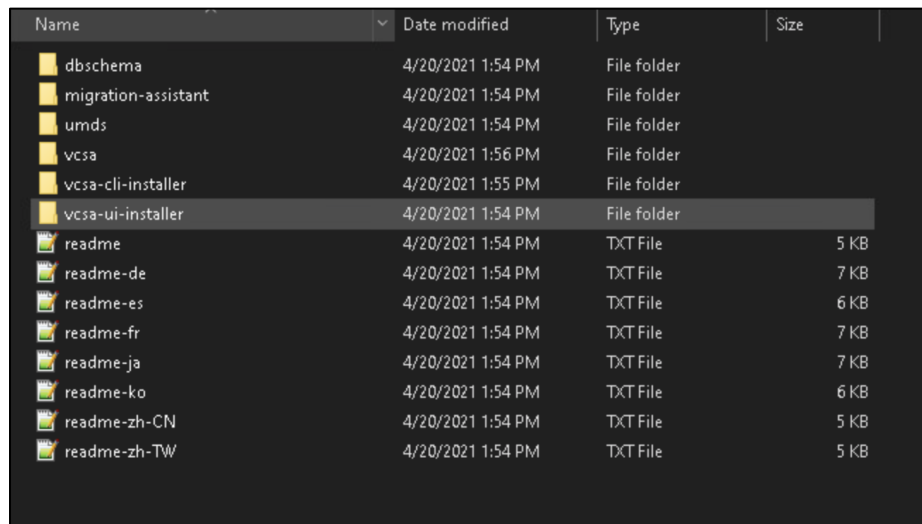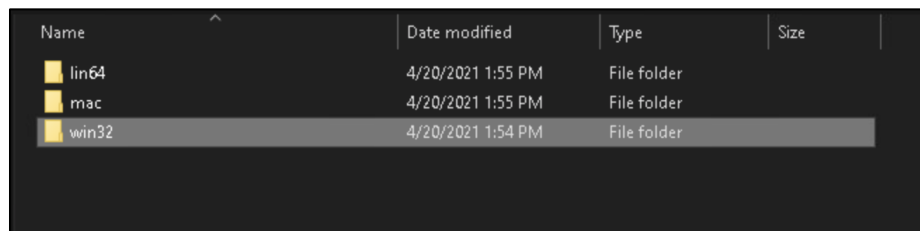
10. Repeat this process for any other host server that will be used to store VMs.

7   vCenter Server Appliance Deployment

NDG recommends deploying the vCenter Server Appliance by using the GUI. Full deployment options can be found in the vCenter Server Installation and Setup document.

> Please let us know if the above link to VMware's documentation does not work, so that we can update it accordingly.

> ⚠ NDG does not support configurations where vCenter is running on a heavily loaded ESXi host and/or an ESXi host that is also used to host virtual machines for NETLAB+ pods. Such configurations have exhibited poor performance, API timeouts, and sporadic errors in NETLAB+ operations.

7.1   Deploy and Install vCenter

1. From the *Management Console*, mount the vCenter ISO.

2. Open the ISO mount folder and navigate to **/vcsa-ui-installer/win32/.**

Name	Date modified	Type	Size
dbschema	4/20/2021 1:54 PM	File folder	
migration-assistant	4/20/2021 1:54 PM	File folder	
umds	4/20/2021 1:54 PM	File folder	
vcsa	4/20/2021 1:56 PM	File folder	
vcsa-cli-installer	4/20/2021 1:55 PM	File folder	
vcsa-ui-installer	4/20/2021 1:54 PM	File folder	
readme	4/20/2021 1:54 PM	TXT File	5 KB
readme-de	4/20/2021 1:54 PM	TXT File	7 KB
readme-es	4/20/2021 1:54 PM	TXT File	6 KB
readme-fr	4/20/2021 1:54 PM	TXT File	7 KB
readme-ja	4/20/2021 1:54 PM	TXT File	7 KB
readme-ko	4/20/2021 1:54 PM	TXT File	6 KB
readme-zh-CN	4/20/2021 1:54 PM	TXT File	5 KB
readme-zh-TW	4/20/2021 1:54 PM	TXT File	5 KB

Name	Date modified	Type	Size
lin64	4/20/2021 1:55 PM	File folder	
mac	4/20/2021 1:55 PM	File folder	
win32	4/20/2021 1:54 PM	File folder	

3. Run the installer file as administrator to start Stage 1 of the deployment.

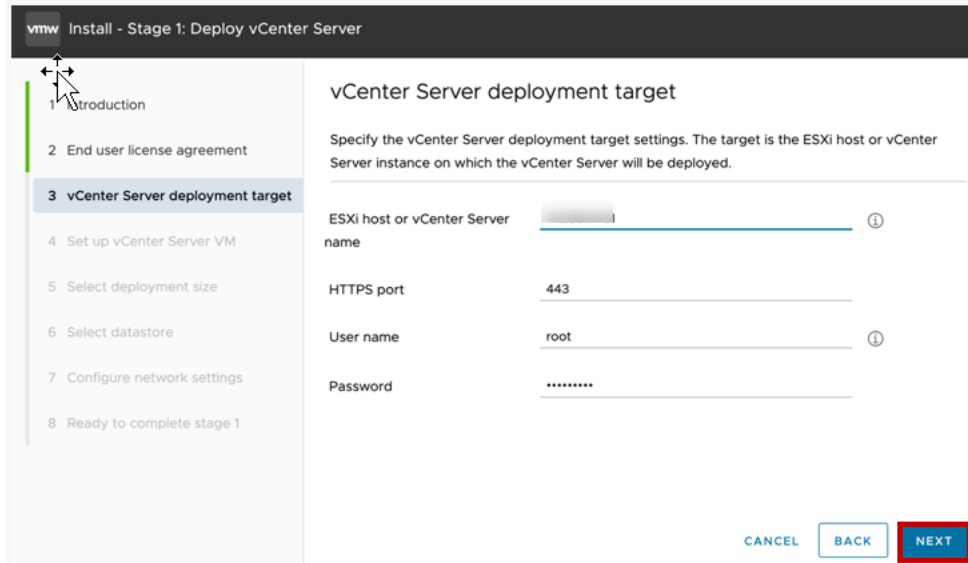|			
icudtl.dat	12/29/2020 2:12 AM	DAT File	10,272 KB
installer	12/29/2020 2:12 AM	Application	104,283 KB
libEGL.dll	Open	2 AM	Application exten...	366 KB
libGLESv2.d	Run as administrator	2 AM	Application exten...	8,170 KB
LICENSE	Troubleshoot compatibility	1 AM	File	2 KB
LICENSES.cl	Pin to Start	1 AM	Firefox HTML Doc...	4,503 KB
resources.p	7-Zip >	1 AM	PAK File	4,229 KB
snapshot_b	CRC SHA >	2 AM	BIN File	50 KB
v8_context_	Edit with Notepad++	2 AM	BIN File	168 KB
version	Share	2 AM	File	1 KB
vk_swiftsha	Send to >	2 AM	Application exten...	3,686 KB
vk_swiftsha		1 AM	JSON File	1 KB
vulkan-1.dll	Copy	2 AM	Application exten...	622 KB
	Create shortcut		
	Properties		

4. Click **NEXT**.

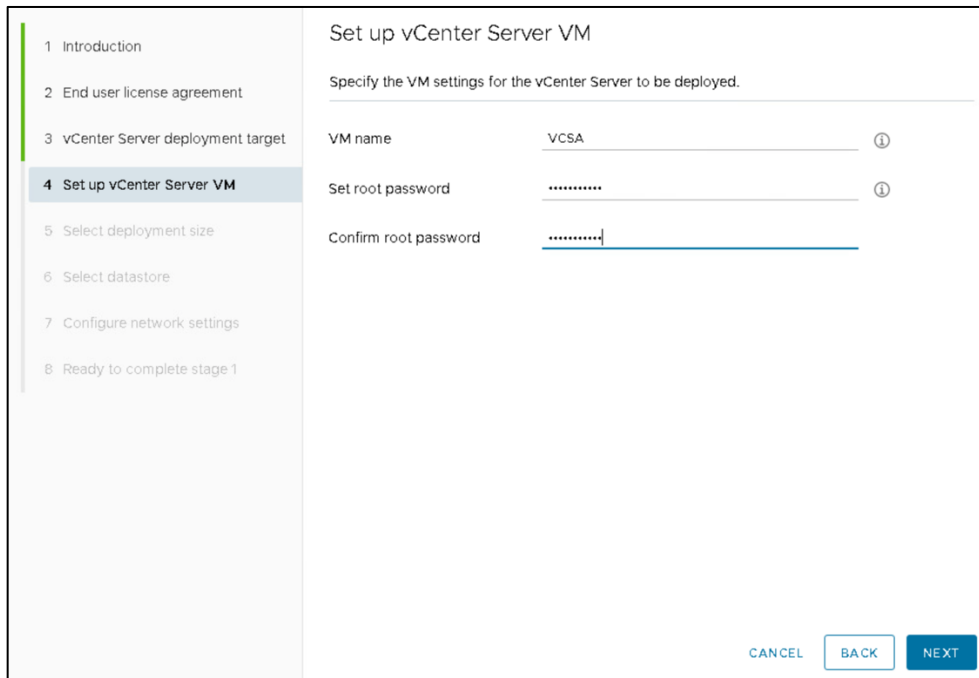5. Accept the terms of the license agreement and click **NEXT**.
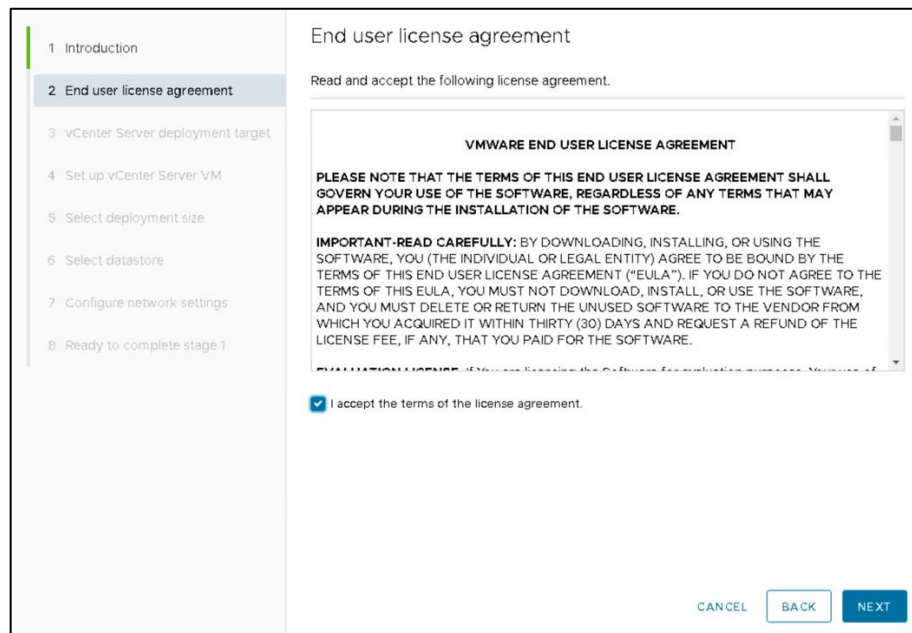
6. Enter the *IP address*, *user name (root)*, and *password* assigned to the Management Server and click **NEXT**. The *HTTPS port* should already be populated with **443**. Click **YES** to the Certificate Warning window.
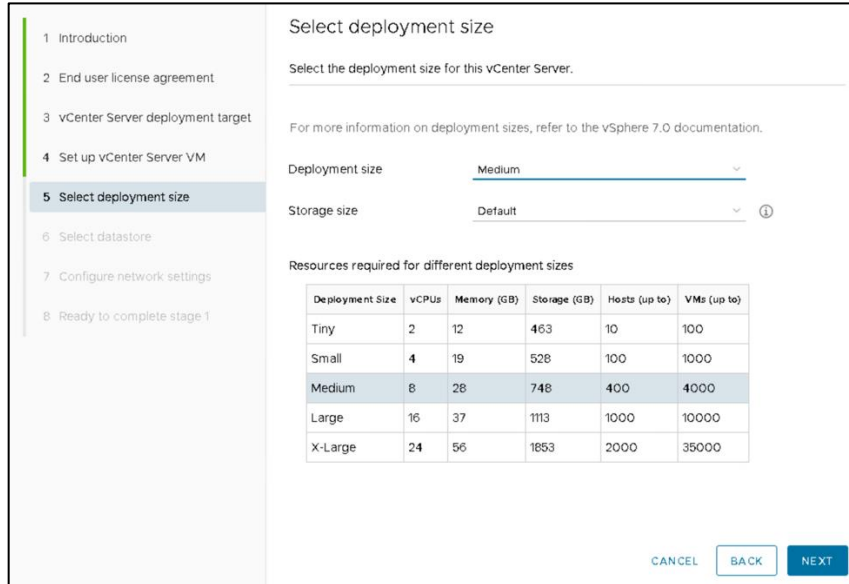

7. Enter **VCSA** as the *VM name* and set a password for the *root* user. Confirm the *password* and click **NEXT**.

8. Select **Medium** as the *Deployment size*. Leave the *Storage size* set to default. Click **NEXT**.

9. Click **Install** on an existing datastore accessible from the target host. Choose the datastore named **DATA** created on the management server in a previous step. Click **NEXT**.
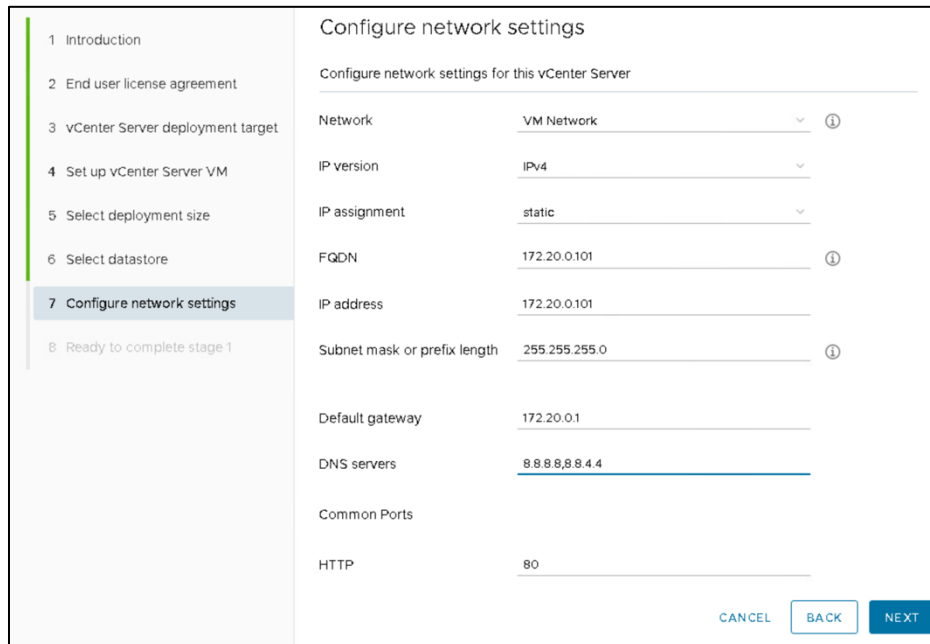
10. Configure the network settings for vCenter as follows and then click **NEXT**:

- Network: **VM Network**
- IP version: **IPv4**
- IP assignment: **static**
- FQDN: ***Enter the IP address to be assigned to vCenter***
- IP address: ***Enter the same IP address entered in the previous step***
- Subnet mask or prefix length: ***Enter the subnet mask***
- Default gateway: ***Enter the default gateway used for the subnet vCenter is assigned to***
- DNS servers: ***Enter the IP address for the DNS servers. Separate multiple server addresses by commas.***
- HTTP: **80**
- HTTPS: **443**

> ⚠️ Please be certain to configure all the network settings listed above, including both HTTP: 80 and HTTPS: 443 (which is not visible in the screenshot below, due to screen size constraints).

11. Verify the information entered is correct and click **FINISH**. Stage 1 deployment will begin. This process may take up to 10 minutes.

Ready to complete stage 1
Review your settings before starting the vCenter Server deployment.

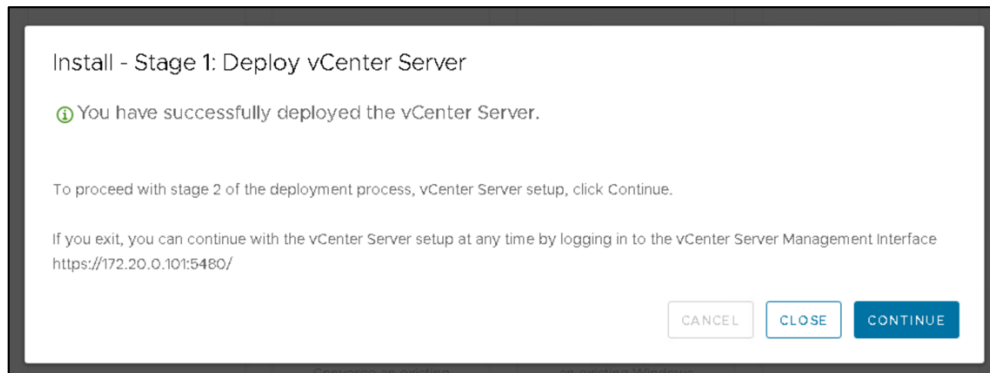| 1 | Introduction |
2	End user license agreement
3	vCenter Server deployment target
4	Set up vCenter Server VM
5	Select deployment size
6	Select datastore
7	Configure network settings
8	Ready to complete stage 1

⌄ Deployment Details

Target ESXi host	172.20.0.102
VM name	VCSA
Deployment size	Medium
Storage size	Default

⌄ Datastore Details

| Datastore , Disk mode | H27_LOCAL_SSD_MASTER , thin |

⌄ Network Details

Network	VM Network
IP settings	IPv4 , static
IP address	172.20.0.101
Host name	172.20.0.101
Subnet mask or prefix length	255.255.255.0
Default gateway	172.20.0.1

CANCEL   BACK   FINISH

12. Click **CONTINUE** to begin Stage 2.
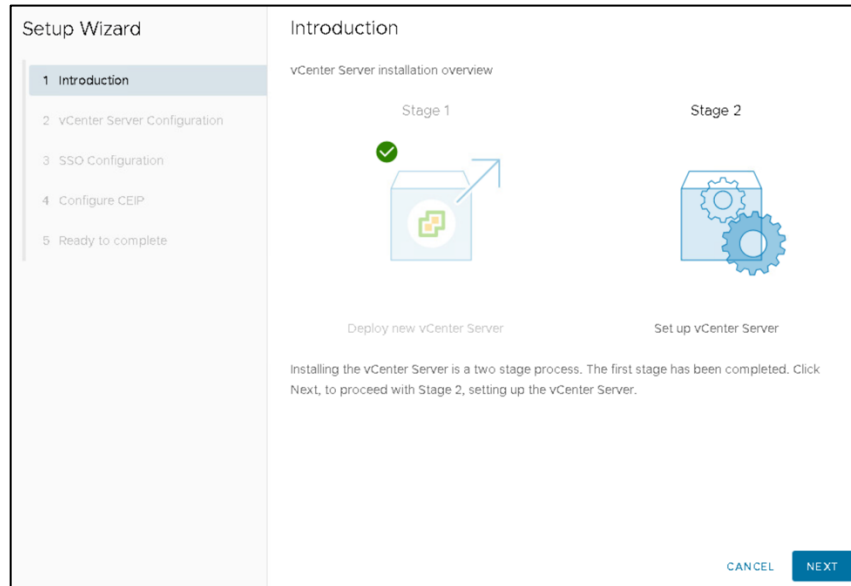
Install - Stage 1: Deploy vCenter Server

ⓘ You have successfully deployed the vCenter Server.

To proceed with stage 2 of the deployment process, vCenter Server setup, click Continue.

If you exit, you can continue with the vCenter Server setup at any time by logging in to the vCenter Server Management Interface https://172.20.0.101:5480/
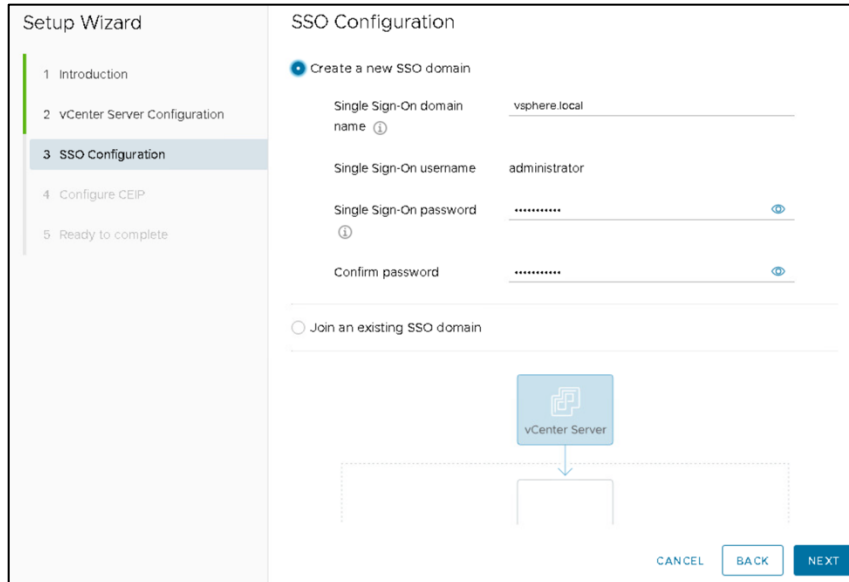
CANCEL   CLOSE   CONTINUE

13. Click **NEXT.**

14. Ensure **Synchronize time with host** is selected and *SSH access* is set to **Enabled**. Click **NEXT**.
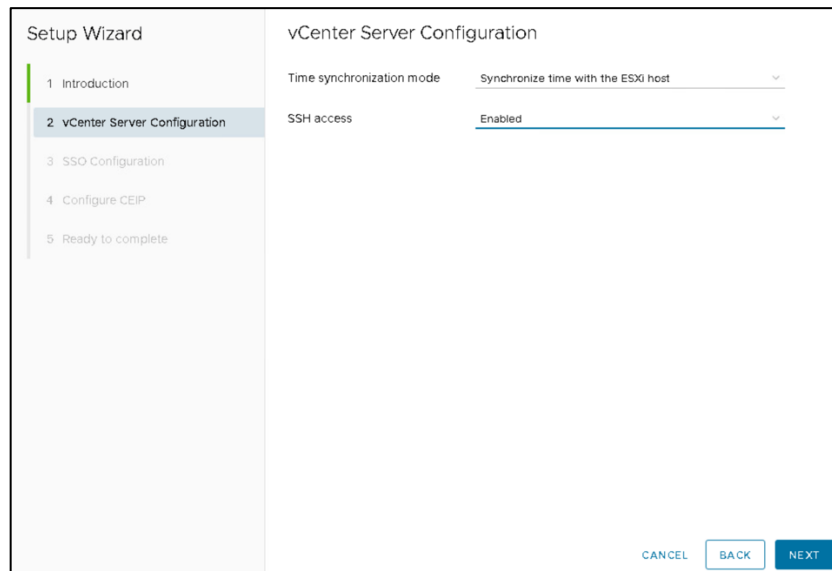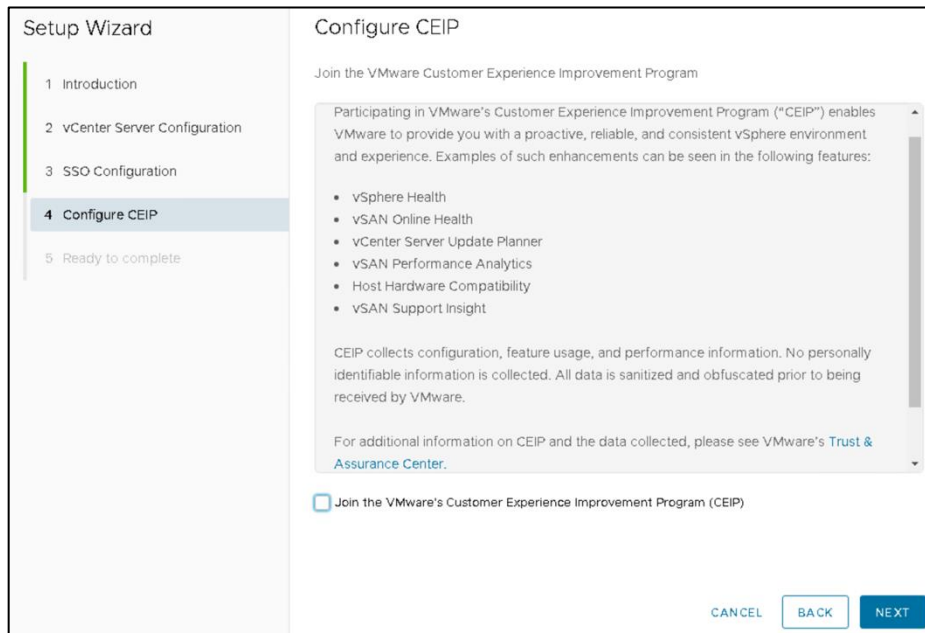
15. Click **Create a new SSO domain**. Enter **vsphere.local** for the *Single Sign-On domain name*. Enter and confirm a *Single Sign-On password*. Click **NEXT**.
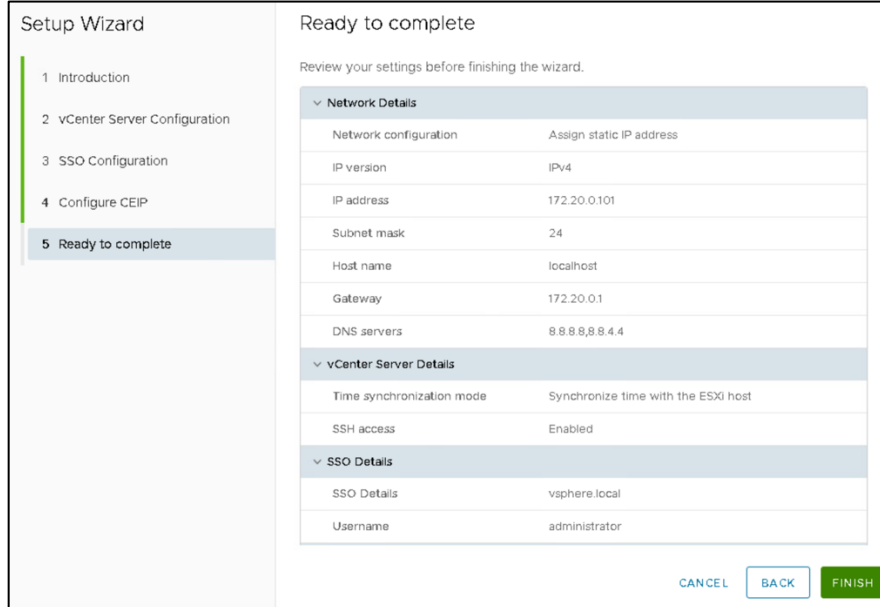
16. Uncheck the *CEIP* option box and click **NEXT**.

17. Verify that all of the information displayed is correct, and then click **FINISH**.

Setup Wizard

Ready to complete

Review your settings before finishing the wizard.

1 Introduction

2 vCenter Server Configuration

3 SSO Configuration

4 Configure CEIP

5 Ready to complete

Network Details

Network configuration	Assign static IP address
IP version	IPv4
IP address	172.20.0.101
Subnet mask	24
Host name	localhost
Gateway	172.20.0.1
DNS servers	8.8.8.8,8.8.4.4

vCenter Server Details

Time synchronization mode	Synchronize time with the ESXi host
SSH access	Enabled

SSO Details

SSO Details	vsphere.local
Username	administrator

CANCEL   BACK   FINISH

18. When Stage 2 is finished, the vCenter deployment is complete. This process may take up to 15 minutes.

8 vCenter Server Appliance Configuration

The subsections below provide instructions on performing the following tasks:

- Setting up and configuring a NETLAB+ datacenter
- Adding your ESXi Host Servers to the datacenter
- Configure automatic startup for vCenter
- Configure Network Time Protocol servers
- Allowing Remote PC Viewer sessions in the ESXi firewall
- Modifying Password Policies

8.1 Create NETLAB+ Datacenter in vCenter

In this section, we will be creating datacenters on the vCenter.

1. Using the vSphere Web Client, log into the vCSA using the IP address of the vCenter.
2. Click on **Hosts and Clusters**.
3. Right-click on your **vCSA** and select **New Datacenter.**
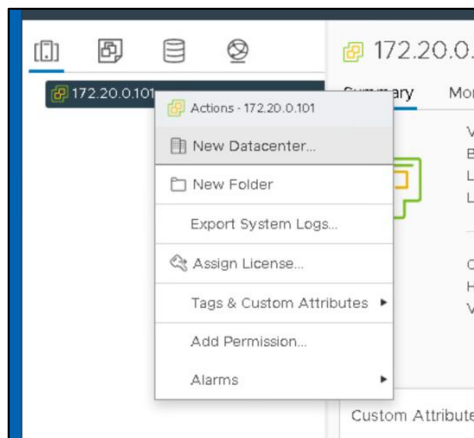
4. Set the datacenter name to **MANAGEMENT** and click **OK**.
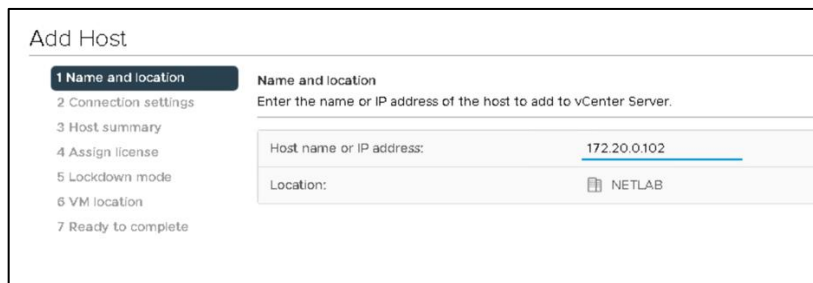5. Create a second datacenter, name it **NETLAB,** and then click **OK**.
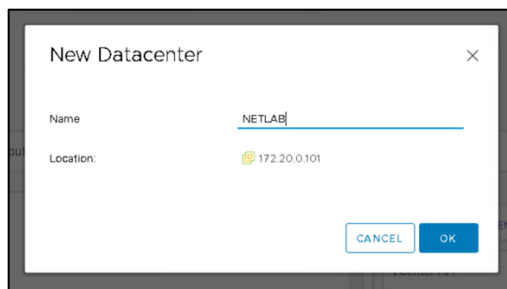
8.2   Adding ESXi Hosts to the NETLAB+ Datacenter

In this section, you will be adding ESXi Host Servers to the NETLAB datacenter so that they may be managed by vCenter.
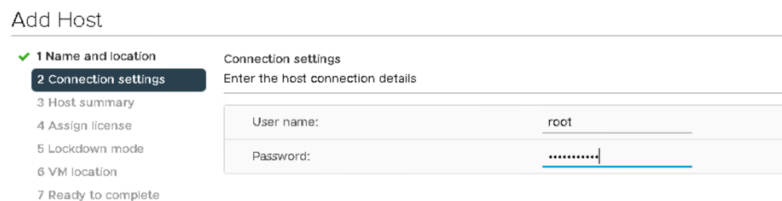
1. Right-click on the datacenter **MANAGEMENT** and select **Add Host**. The *Add Host* wizard appears.
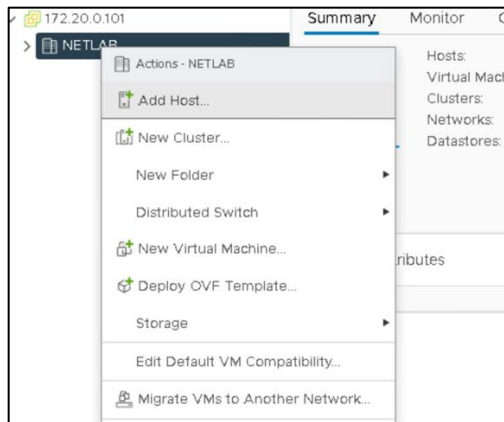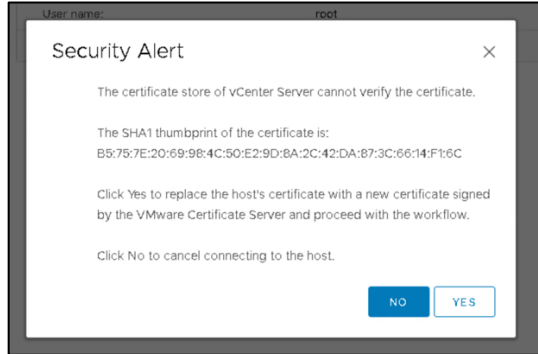
2. First, you are going to add the Management server to the datacenter. Enter the *IP address* for the Management server. Click **NEXT**.
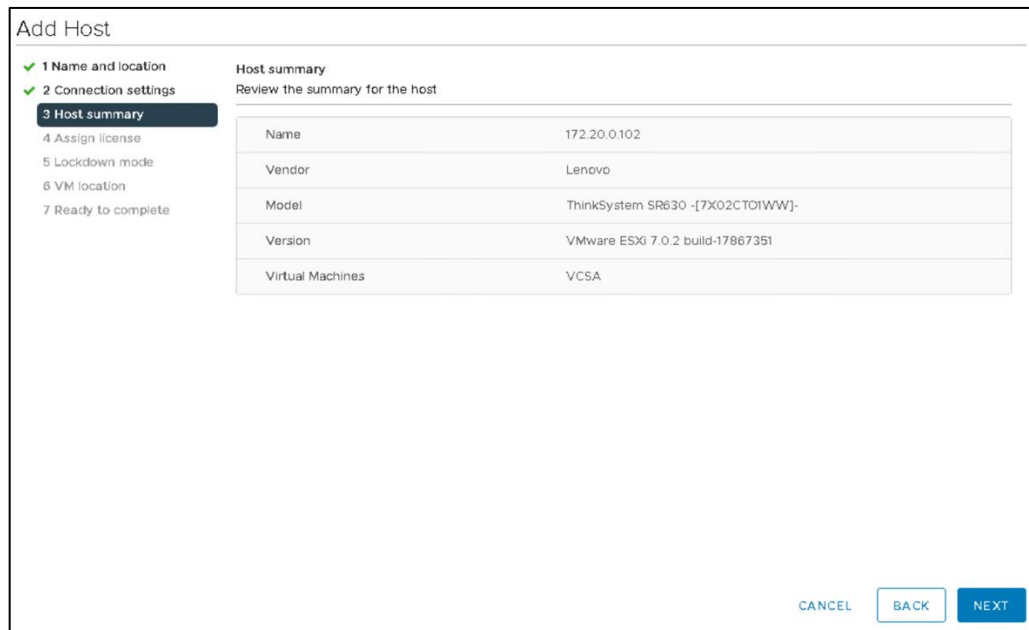
3. Enter the *username* and the *password* for ESXi, and then click **NEXT**.

4. When prompted with a *Security Alert* window, click **YES** to add the host.

User name: root

Security Alert ✕

The certificate store of vCenter Server cannot verify the certificate.

The SHA1 thumbprint of the certificate is:
B5:75:7E:20:69:98:4C:50:E2:9D:8A:2C:42:DA:87:3C:66:14:F1:6C

Click Yes to replace the host's certificate with a new certificate signed by the VMware Certificate Server and proceed with the workflow.

Click No to cancel connecting to the host.

NO   YES

5. On the *Host summary* page, review the information and click **NEXT**.
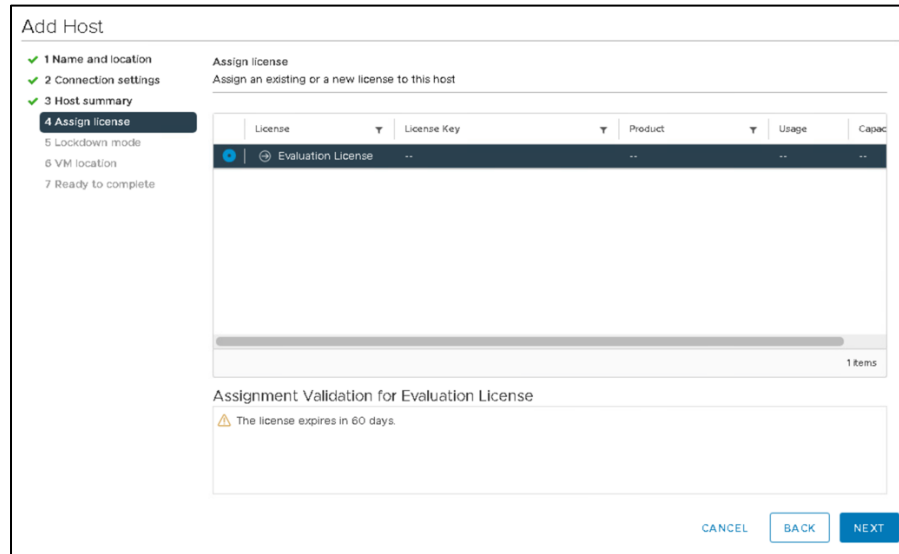
Add Host

✓ 1 Name and location
✓ 2 Connection settings
3 Host summary
4 Assign license
5 Lockdown mode
6 VM location
7 Ready to complete
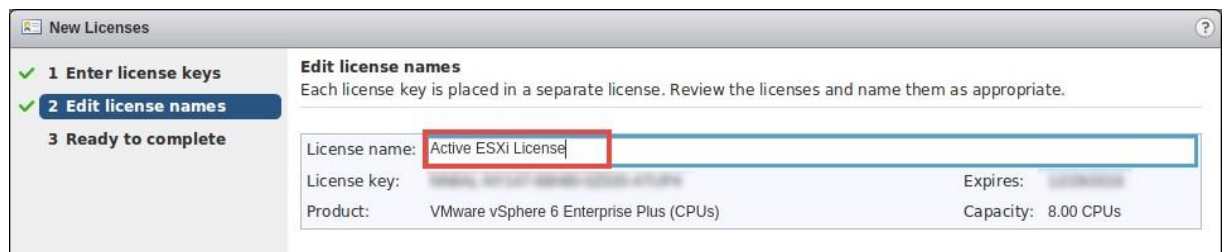
Host summary
Review the summary for the host

Name	172.20.0.102
Vendor	Lenovo
Model	ThinkSystem SR630 -[7X02CTO1WW]-
Version	VMware ESXi 7.0.2 build-17867351
Virtual Machines	VCSA

CANCEL   BACK   NEXT

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NDG

6. On the *Assign license* page, click on the **Create New Licenses** icon (green plus).

7. In the *New Licenses* window, on the *Enter license keys* page, enter the key you received from VMware in section 3.3. Click **NEXT**.
8. On the *Edit license names* page, enter any desired name for your records and click **NEXT**.

9. On the *Ready to complete* page, review the information and click **Finish**. You will be redirected to the *Add Host* window.

> If brought back to the *Connection settings* page, enter the username and the password once more and click Next. Click Yes on the Security Alert dialog. Review the information on the Host summary page and click Next. On the Assign license page, select the radio button to the newly added license key and click Next.

10. On the *Lockdown mode* page, leave lockdown mode **disabled** and click **NEXT**.
11. On the *VM location* page, make sure **MANAGEMENT** is selected and click **NEXT.**
12. On the *Ready to complete* page, review the information and click **FINISH**.

13. Expand the **MANAGEMENT** datacenter on the left pane and wait for the IP address of the Management server to be added.
14. Repeat steps 1-13 to add the remaining ESXi host servers to the **NETLAB** datacenter. Start the process by right-clicking on the **NETLAB** datacenter instead of the MANAGEMENT datacenter.

> ⚠️ Please be certain to add the remaining ESXi host servers to the **NETLAB datacenter**; do not add them to the MANAGEMENT datacenter.

8.3 Configure Automatic Startup for vCenter

For this section, you will configure ESXi Management Server to start the vCenter Appliance. This is important because if it is not set up and the ESXi Management Server powers off or is rebooted, the vCenter Appliance will not start up, causing NETLAB+ communication failure.

1. Using the *vSphere Web Client*, navigate to **Hosts and Clusters**.
2. Click on your **MANAGEMENT SERVER** in the inventory pane where the vCSA resides.
3. With the host selected, select **Configure** from the top pane.
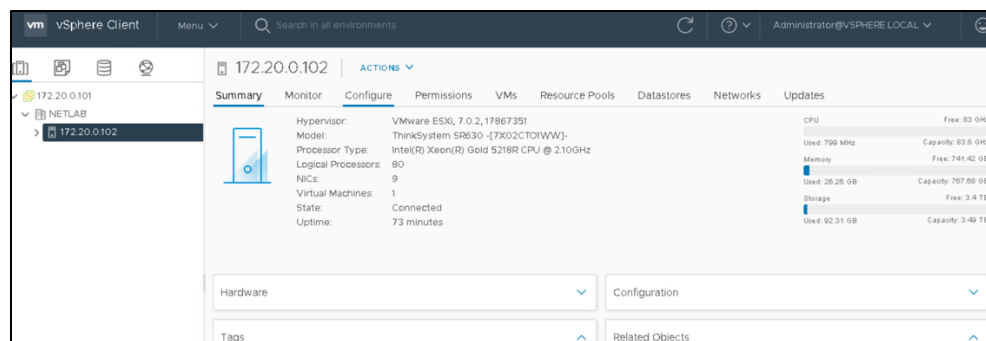
4. Scroll to **VM Startup/Shutdown** and click **Edit**.
5. On the *Edit VM Startup and Shutdown* window, click the checkbox for **Automatically start and stop the virtual machines with the system**.
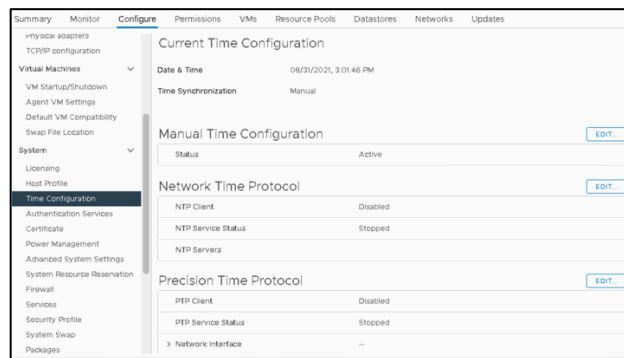
6. Select your vCenter VM in the list and click the **Move Up** icon until it is directly under **Automatic Startup**.
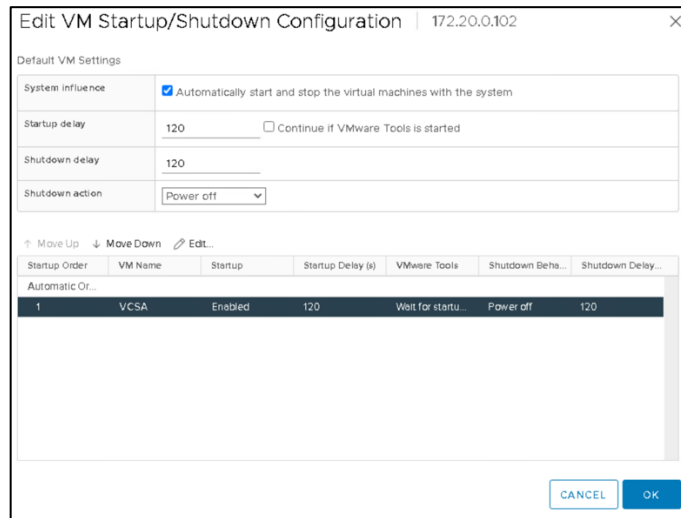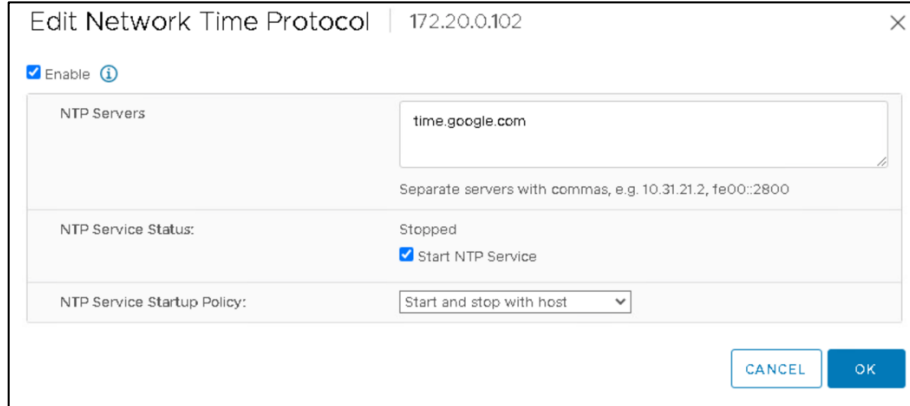

7. Click **OK**.

8.4 Configure Network Time Protocol Servers

1. From the *Configure* menu, click on **Time Configuration**.

2. Click **EDIT** in the *Network Time Protocol* section.
3. Type in the IP address or FQDN of the NTP Server(s).
4. Check the box to **Start NTP Service**.

5. From the dropdown box, choose **Start and stop with host** and click **OK**.
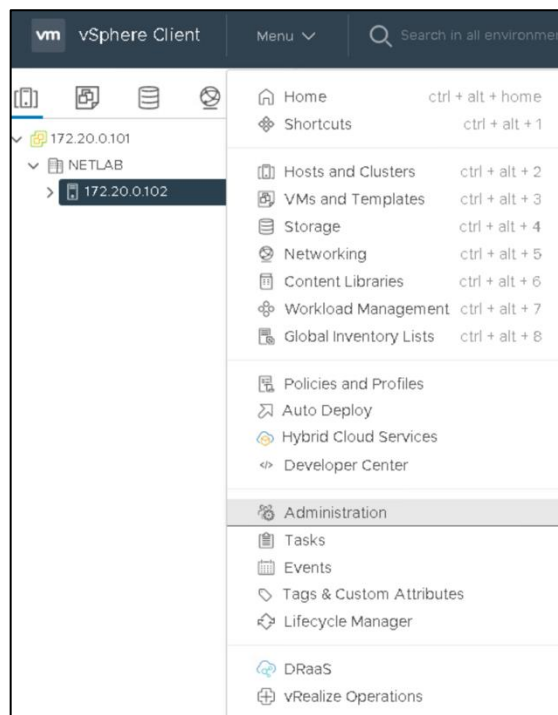

8.5   Modifying Password Policies

The subsections below provide details on modifying the password policies for SSO configuration and root configuration.
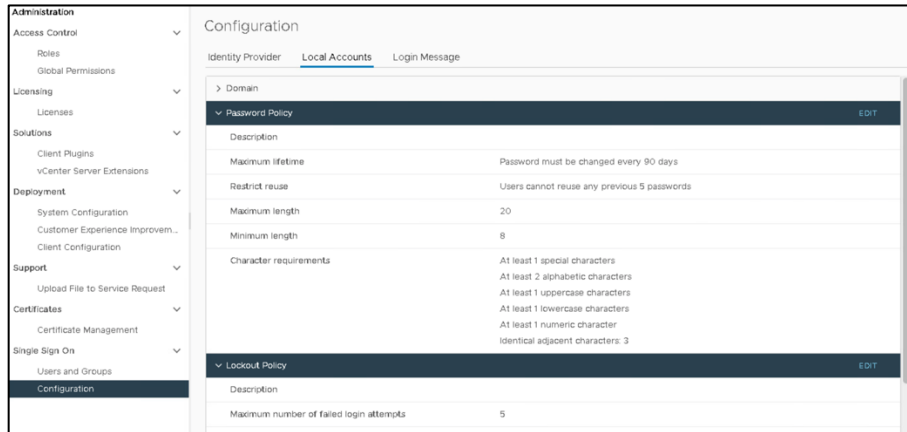
8.5.1 Modify the SSO Password Policy

In this section, you will be modifying the SSO password policy.
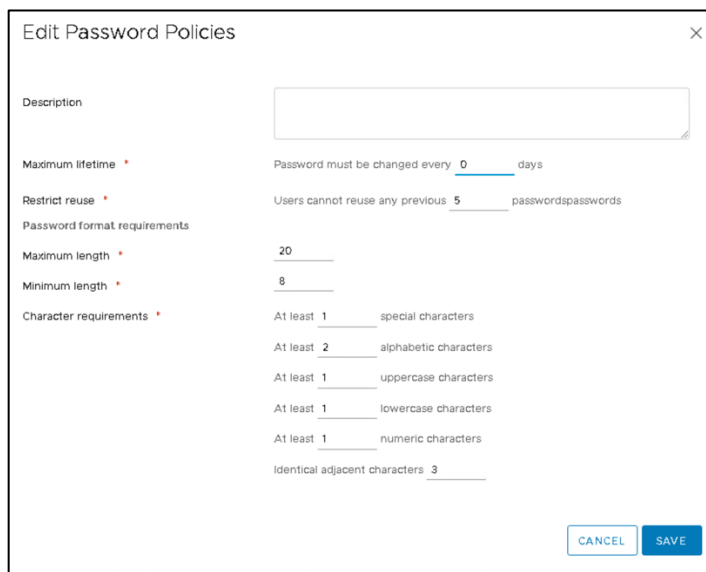
1. Using the *vSphere Web Client*, right-click on the **MANAGEMENT** server. Navigate to **Administration**.

2. In the *Navigator* pane located to the left, click on **Configuration** underneath the *Single Sign-On* header. Click on **Local Accounts**. Click **EDIT**.

3. In the *Edit Password Policies* window, change the value to reflect **0 days** for *Maximum lifetime*.

4. The remaining password policy options can be modified if desired.
5. When finished, click **OK**. Repeat for each ESXi host.

8.5.2 Modifying the root Password Policy

In this section, you will be modifying the password policy for root configuration.
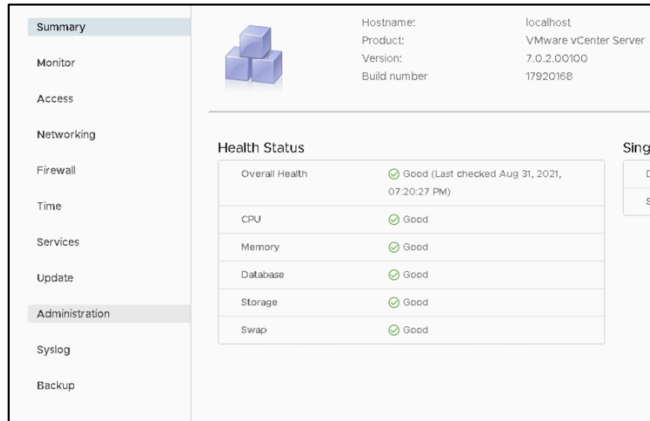
1. Using the *vSphere Client*, navigate to **https://your_vcenter_ip:5480**.
2. Log in with **root** as the *username* and its corresponding *password,* which was configured when *vCenter* was first deployed.
3. In the *Navigator* pane located to the left, click on **Administration**.

4. Click on **EDIT** in the *Single Sign-On Domain* section.
5. Click **EDIT** in the *Password expiration settings*.
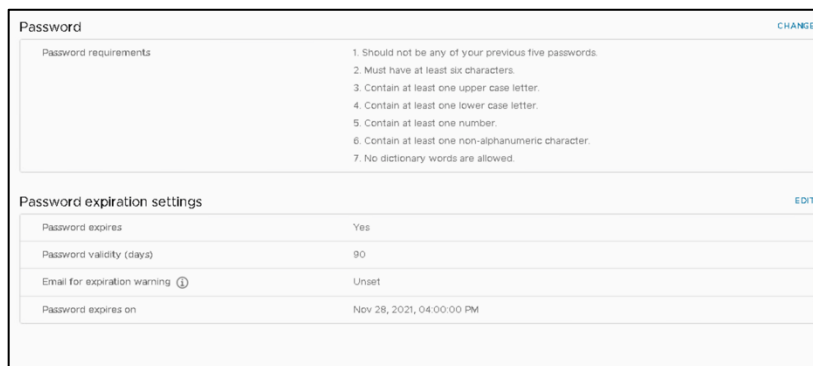
6. Change the *Password expires* option to **No**. Click **SAVE**.
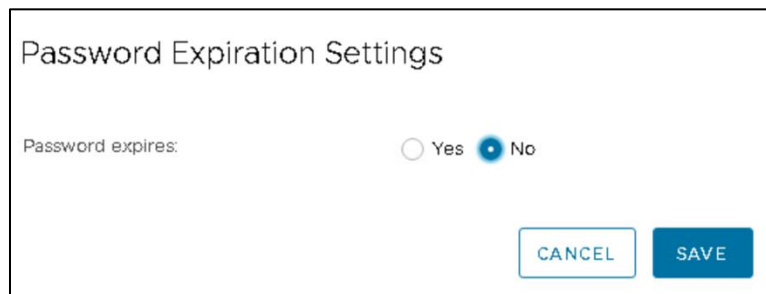
7. Logout of the *vSphere Client* as *root* and close the tab.

8.5.3 Verifying vSwitch0 Configuration

vSwitch0 is automatically created during the ESXi software installation. Using the vSphere Client, confirm that networking on vSwitch0 is properly configured.

1. *vSwitch0* is bound to the correct physical NIC (vmnic).
2. The physical NIC is connected and with the correct speed/duplex. (Refer to the red boxes in the graphic below.)
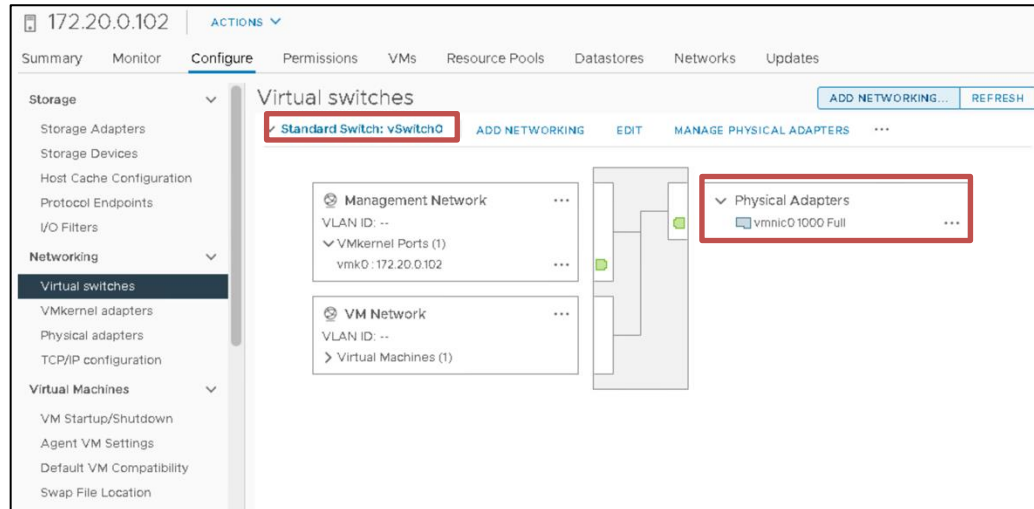

8.5.4 Create a Safe Staging Network

In this section, you will be creating a Safe Staging Network called "Safety Net" to connect the virtual machines temporarily. The Safe Staging Network consists of a virtual switch and a port group that is not connected to any other networks (virtual or real). Should the virtual machine be powered on, its traffic will be confined to the Safety Net. This ensures that the virtual machine will not pose a security risk to your campus LAN or interfere with other pods until it is relocated to its final network via automatic or manual networking.

1. Using the *vSphere Web Client*, navigate to **Hosts and Clusters**.
2. Select your first ESXi host in the **Inventory** pane on the left.

3. Click on the **Configure** tab.
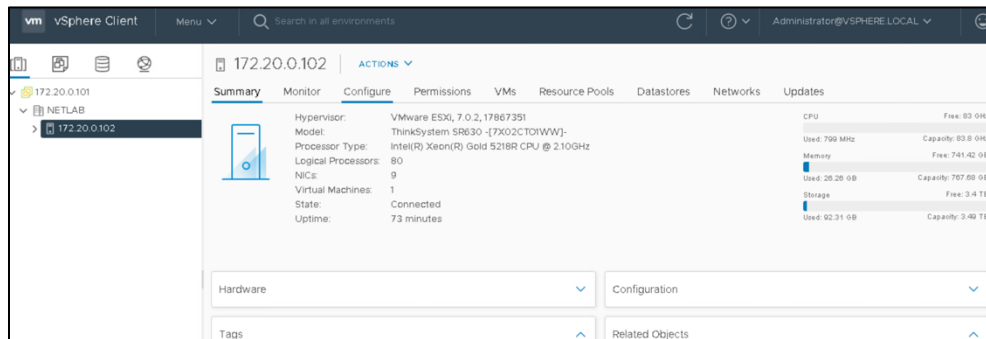
4. In the *Networking* section, click on **Virtual Switches** and then click **ADD NETWORKING**.
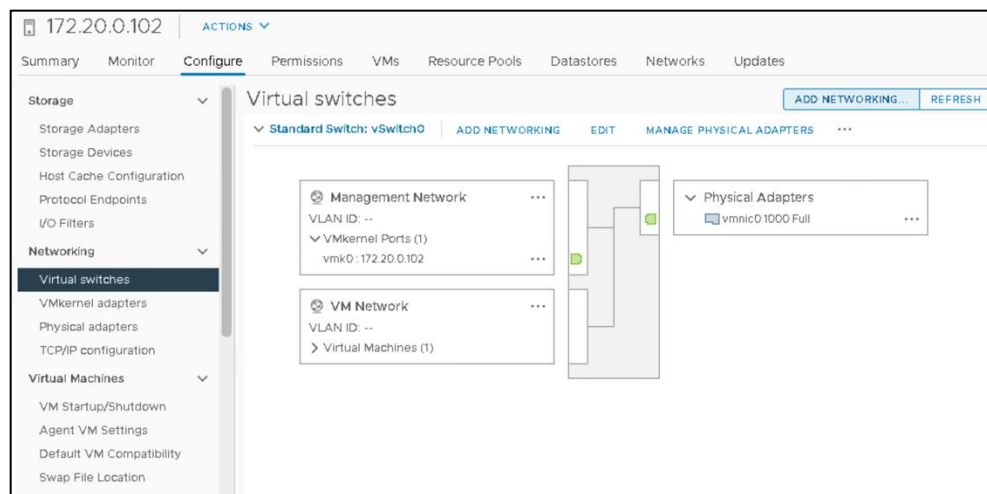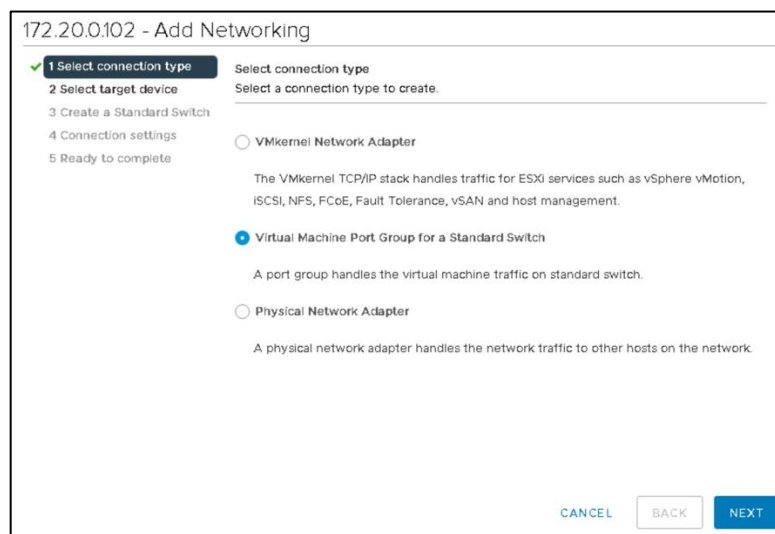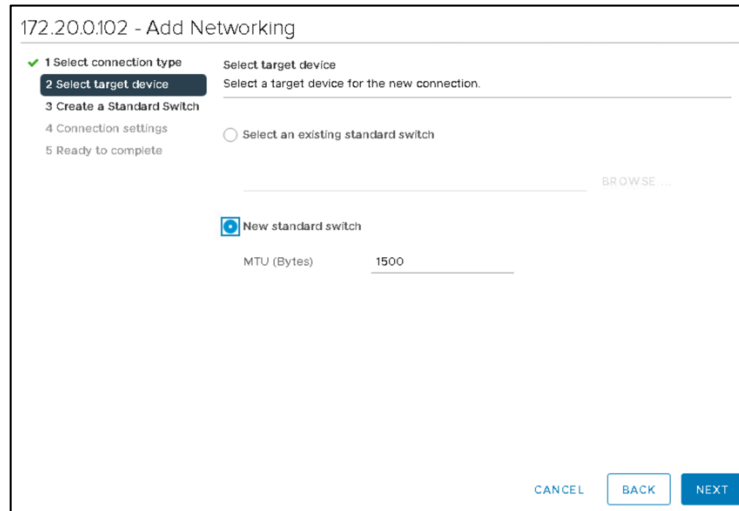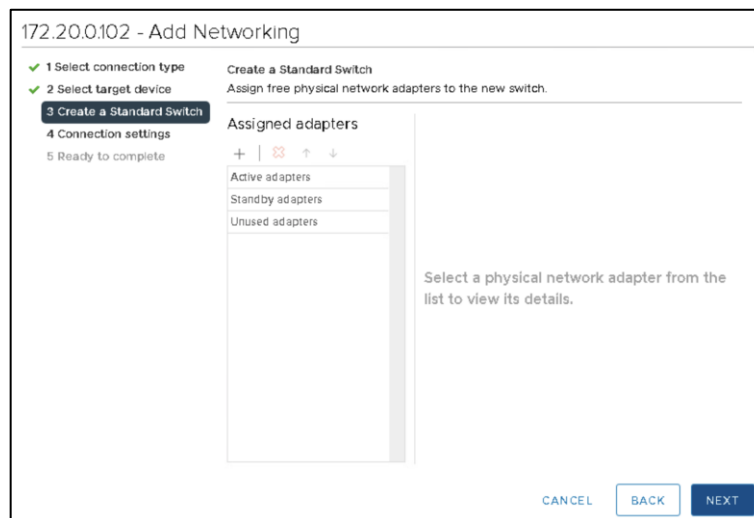

5. Select the *connection type* **Virtual Machine Port Group for a Standard Switch**. Click **NEXT**.
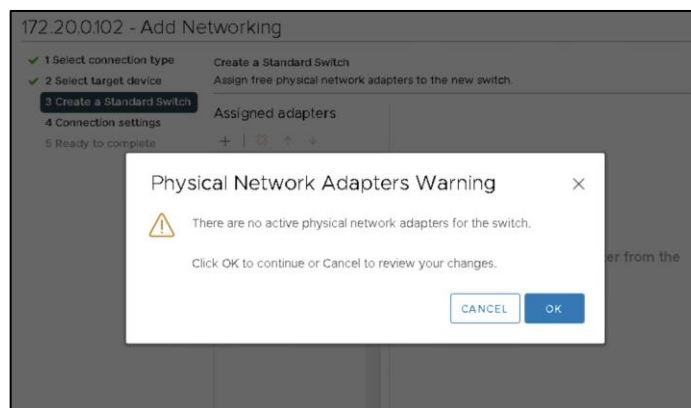
6. Select **New Standard Switch** as the *target device*. Click **NEXT**.

172.20.0.102 - Add Networking

✔ 1 Select connection type
2 Select target device
3 Create a Standard Switch
4 Connection settings
5 Ready to complete

Select target device
Select a target device for the new connection.

○ Select an existing standard switch

BROWSE...

⦿ New standard switch

MTU (Bytes)   1500

CANCEL   BACK   NEXT

7. Click **NEXT** on the *Create a Standard Switch* page without assigning an adapter.

172.20.0.102 - Add Networking

✔ 1 Select connection type
✔ 2 Select target device
3 Create a Standard Switch
4 Connection settings
5 Ready to complete

Create a Standard Switch
Assign free physical network adapters to the new switch.

Assigned adapters

+ | ✕ ↑ ↓

Active adapters
Standby adapters
Unused adapters

Select a physical network adapter from the list to view its details.

CANCEL   BACK   NEXT
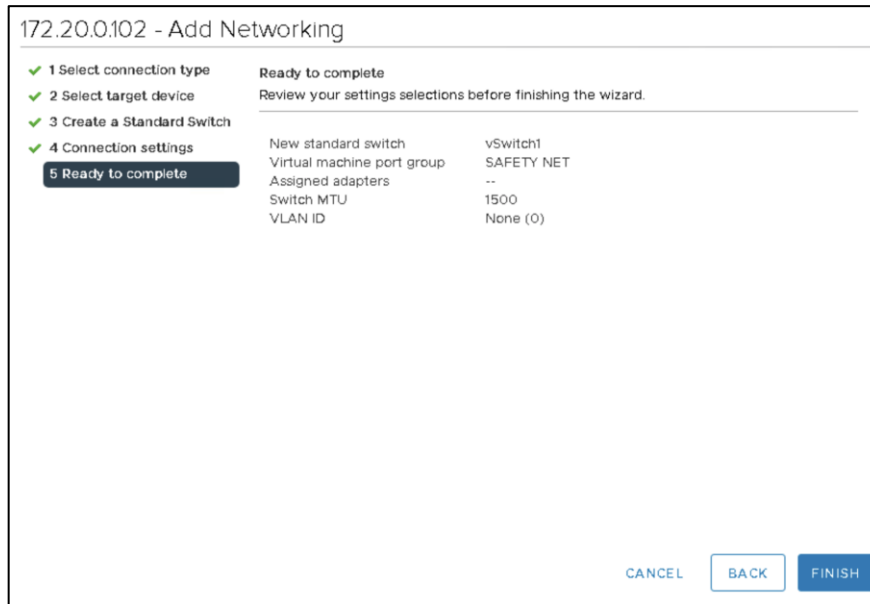
8. Click **OK** to the warning that appears.

172.20.0.102 - Add Networking

✔ 1 Select connection type
✔ 2 Select target device
3 Create a Standard Switch
4 Connection settings
5 Ready to complete

Create a Standard Switch
Assign free physical network adapters to the new switch.

Assigned adapters

+ ✕ ↑ ↓

Physical Network Adapters Warning   ✕

⚠ There are no active physical network adapters for the switch.

Click OK to continue or Cancel to review your changes.

CANCEL   OK

9. Type **SAFETY NET** on the *Network ID* line. Click **NEXT**.

10. Click **FINISH** to complete the process. There should now be two virtual switches displayed, *vSwitch0* and *vSwitch1*.

SAFETY NET is now available for use as a safe temporary network location for new virtual machines.

> ⚠️ The safety network is an ideal place to bind the network interface(s) of master virtual machines. Automatic networking will bind network interfaces of cloned VMs to their runtime networks when their respective pods are started.