

VMware Cloud Experience: Configuring VLC for Holodeck

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VCF Experience Program Lab Overview

The VMware Cloud Foundation (VCF) Experience Program is designed to provide a hands-on experience highlighting how VCF delivers a *Cloud Operating Model* for customer managed on-premises environments, capable of hosting traditional and modern applications. This Experience Program guide is intended for use with a VCF Lab Constructor (VLC) based nested environment built using the Automated Holodeck config.

Credentials

The following credentials are used in this lab. For your convenience, links to all management interfaces are in the bookmark bar of Google Chrome in your lab environment.

- **SDDC Manager**
 - Username: administrator@vsphere.local
 - Password: VMware123!
- **vCenter Server Admin Console**
 - Username: root
 - Password: VMware123!
- **vSphere Web Client**
 - Username: administrator@vsphere.local
 - Password: VMware123!
- **VMware NSX Manager**
 - Username: admin
 - Password NSX-T: VMware123!VMware123!
- **vRealize Automation Cloud Assembly**
 - Username: configadmin
 - Password: VMware123!
- **Windows Console (Jump Host)**
 - Username: administrator
 - Password: VMware123!
- **Opencart Apache and MySQL VMs**
 - Username: ocuser
 - Password: VMware123!

Configuring VLC for use in Holodeck Multi Region

Overview

The “VCF Holodeck Multi Region” configuration is an opinionated nested VMware Cloud Foundation configuration used as the baseline for several Private Cloud operation and consumption lab exercises created by the Cloud Foundation Technical Marketing team. This lab guide details deploying a nested Holodeck configuration with VCF Lab Constructor 4.4HH-3. This guide is intended to be used in conjunction with the VCF Lab Constructor 4.4 manual.

Prerequisites

- Server requirements
 - Minimum server: Single ESXi host with 20 cores, 512gb memory and 2TB SSD/NVME
 - Ideal server: Single ESXi host with 40+ cores, 1.5TB memory and 6TB SSD/NVME
- Default server configuration:
 - Stand alone, non vCenter Server managed host
- Licenses for 8 hosts minimum (16 hosts if planning to test Cloud Foundation Multi region with NSX Federation)
 - SDDC Manager
 - NSX Enterprise
 - vSAN Enterprise
 - vSphere Enterprise Plus
 - vCenter Server (One license)
 - vRealize Suite Advanced or Enterprise (Or access to Cloud Assembly Cloud)
- Holodeck internal networks (default deployment)
 - 10.0.0.0/24 - Management
 - 10.0.0.4/24 - vMotion

- 10.0.0.8/24 - vSAN
- 10.1.0.0/16 – Opencart “Supernet”
- 10.50.0.0/24 - AVN Region segment
- 10.60.0.0/24 – AVN X-Region seg
- 10.70.0.0/24 – Tanzu Ingress
- 10.80.0.0/24 – Tanzu Egress
- 172.27.11.0/24 – Edge TEP
- 172.27.12.0/24 – Edge Uplink 1
- 172.27.13.0/24 – Edge Uplink 2
- 172.16.254/24 – Host TEP/DHCP
- External networks required
 - ESXi host management IP
 - Windows console IP (user side accessible)
 - One jump host per Holodeck instance
 - Plan for 3-4 addresses per ESXi host for larger hosts
 - Lab Uplink (user side accessible)
 - 10.0.0.0/24 management network in each Holodeck instance requires internet access. Separate router instances allow overlapping Holodeck addressing
 - Plan for 3-4 router addresses on customer side network
 - Holodeck users guide documents PFsense CE 2.6 deployment for lab routers
 - User could configure Jump Host as alternate router if desired
- Software needed
 - ESXi 7.0u3 (for lab host)
 - [*Cloud Foundation Cloud Builder 4.4.1 OVA*](#)
 - [*VCF Lab Constructor 4.4_HH-2 or 4.4.1*](#)
 - [*Windows Server 2019 ISO*](#) on ESXi host datastore

- *PFSense 2.6 community edition* on ESXi datastore (for external lab connectivity)

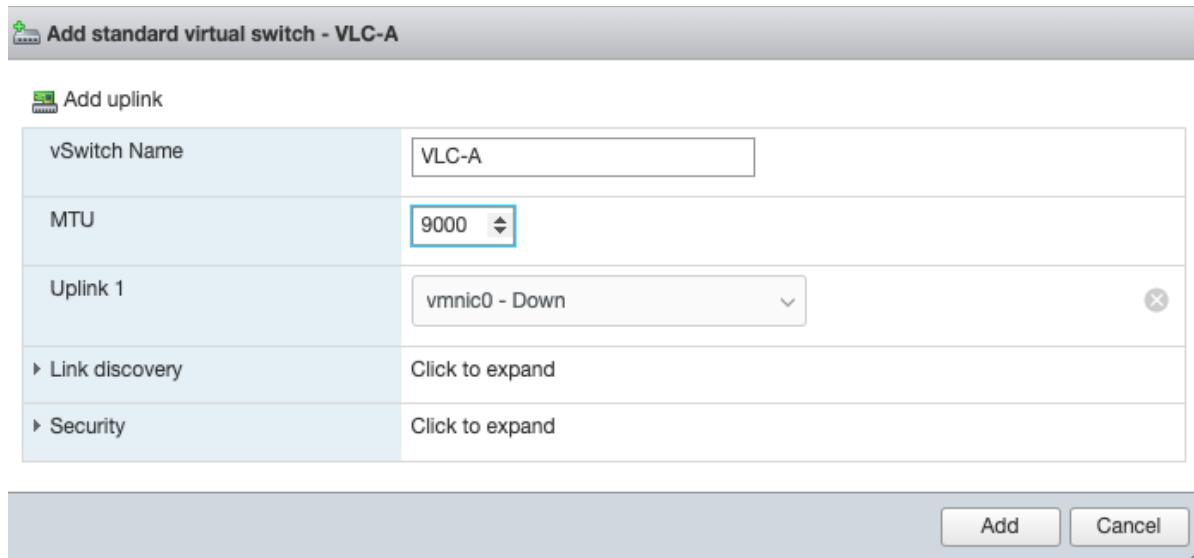
Task 1: Configure ESXi host networking

In this task we will configure ESXi networking to support the Holodeck configuration. This task assumes you have a stand-alone host not managed by vCenter Server.

** This task can be repeated for additional switches VLC-B, VLC-C and VLC-D and portgroups VLC-B-PG, VLC-C-PG, VLC-D-PG **

[Step 1] Configure VLC vSwitch for nested networking

- Create a standard switch called “VLC-A” with no uplinks, and MTU 9000. Click the x on the uplink line to remove uplink if necessary



- Click Add

[Step 2] Configure VLC Portgroup

- Add a new port group
- Name the portgroup VLC-A-PG
- Set VLAN ID to 4095 (Trunk all VLAN)
- Set virtual switch to VLC-A
- Open security and set all to accept
- Click Add

Add port group - VLC-A-PG

Name	VLC-A-PG
VLAN ID	4095
Virtual switch	VLC-A
▼ Security	
Promiscuous mode	<input checked="" type="radio"/> Accept <input type="radio"/> Reject <input type="radio"/> Inherit from vSwitch
MAC address changes	<input checked="" type="radio"/> Accept <input type="radio"/> Reject <input type="radio"/> Inherit from vSwitch
Forged transmits	<input checked="" type="radio"/> Accept <input type="radio"/> Reject <input type="radio"/> Inherit from vSwitch

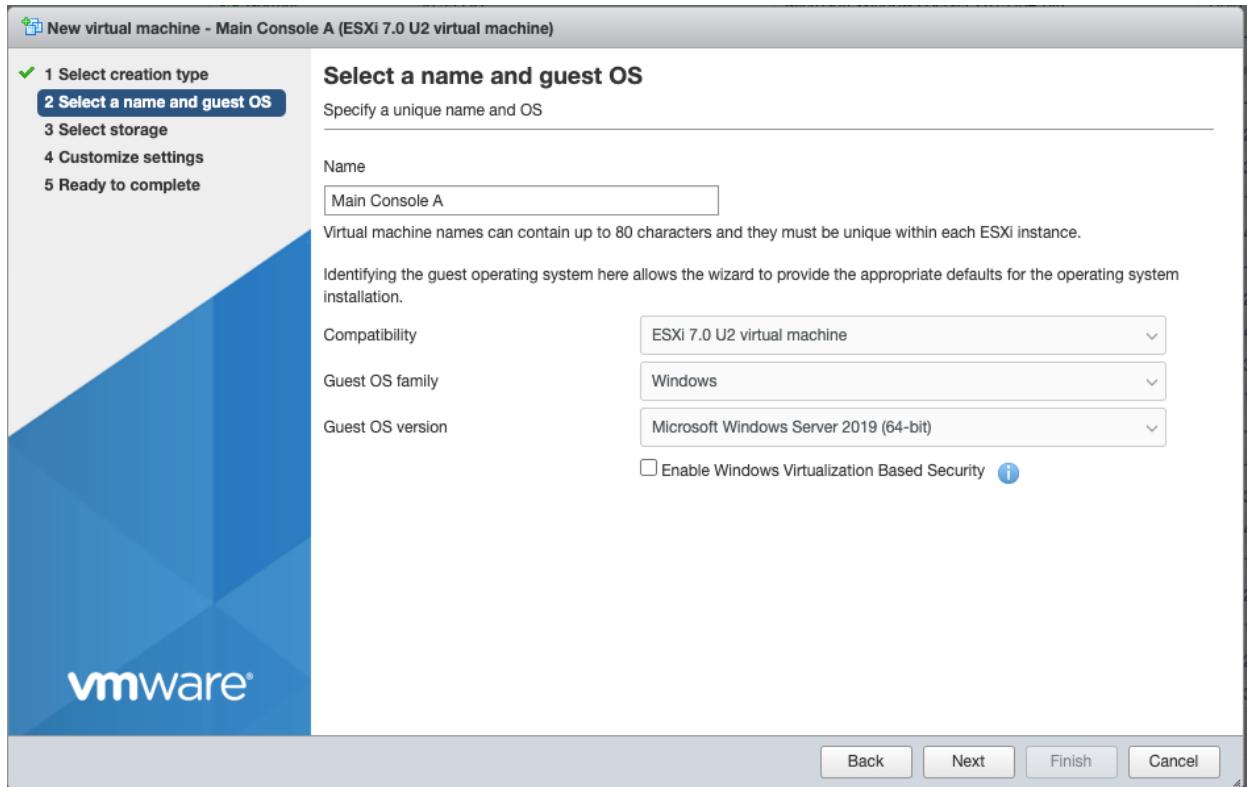
Add Cancel

Task 2a: Deploy nested jump host

In this task we will deploy and configure a nested Windows Server 2019 jump host. This task must be repeated for each additional Holodeck instance deployed on a host

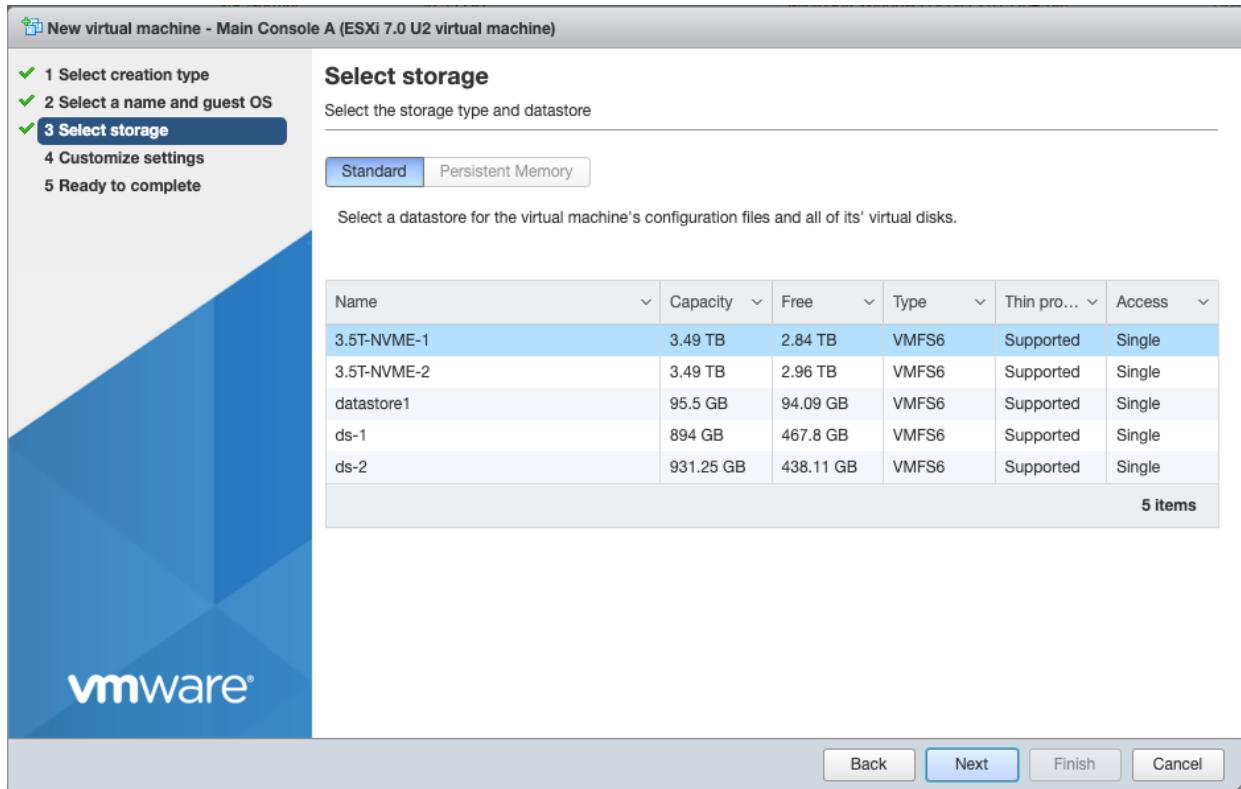
[Step 1] Create new virtual machine

- A. From the virtual machine tab select Create/Register VM
- B. Select create a new virtual machine
- C. Name the VM Main Console-A (In this Holodeck example we are using “Holo-Console-A”)
- D. Set OS family to Windows
- E. Set OS Version to Windows Server 2019

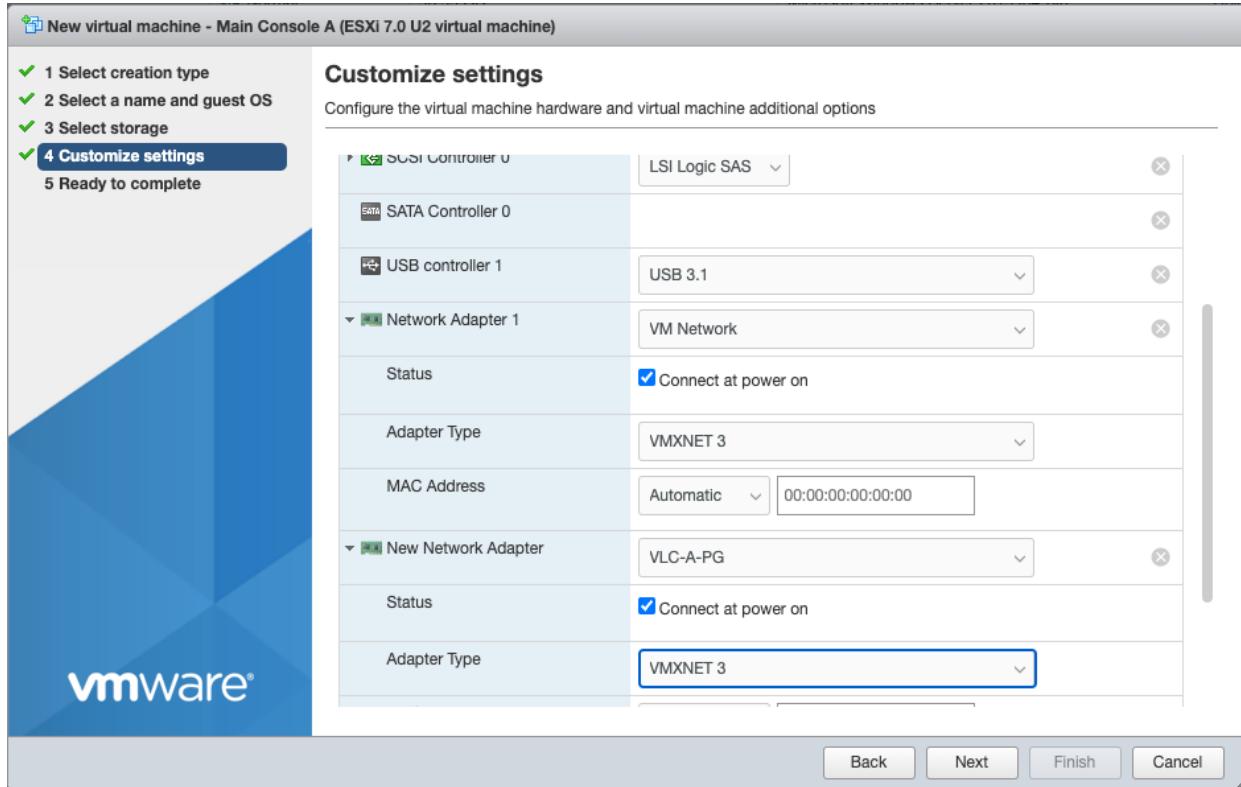


F. Click Next

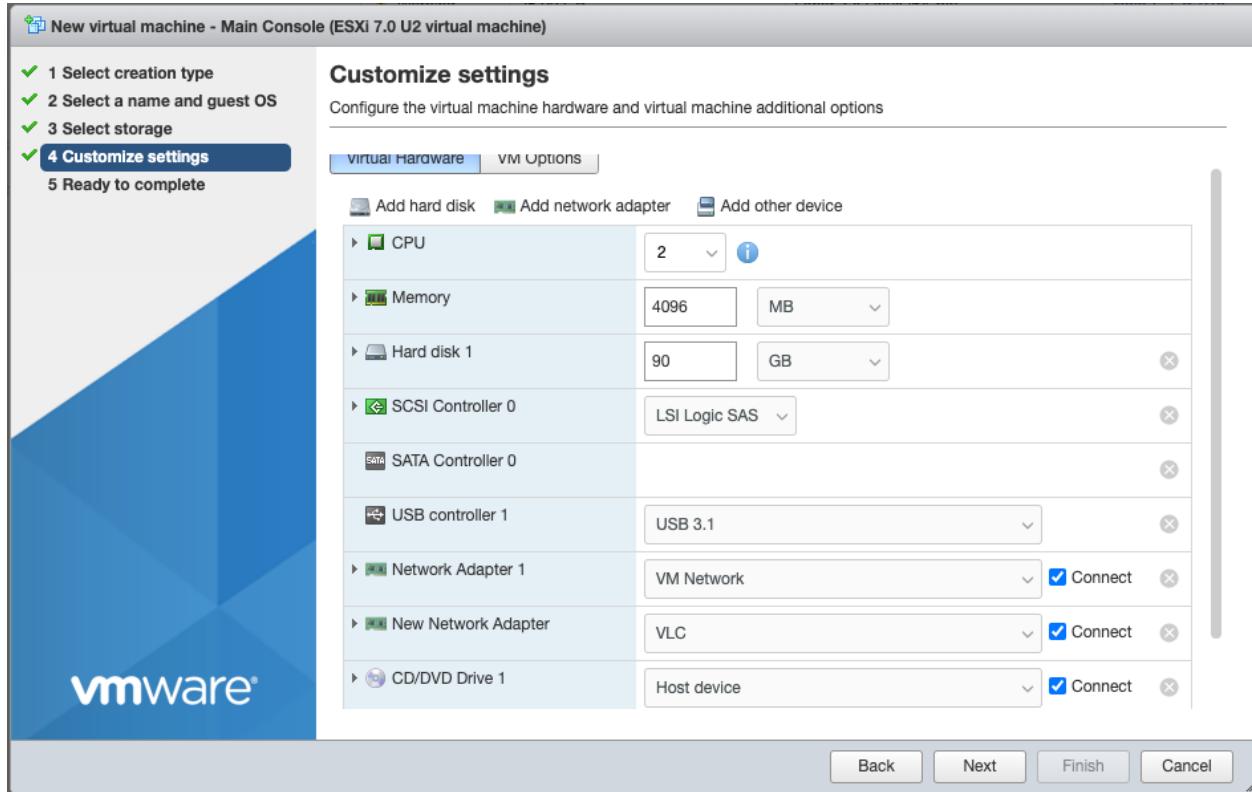
G. Select storage appropriate for your ESXi host then click next



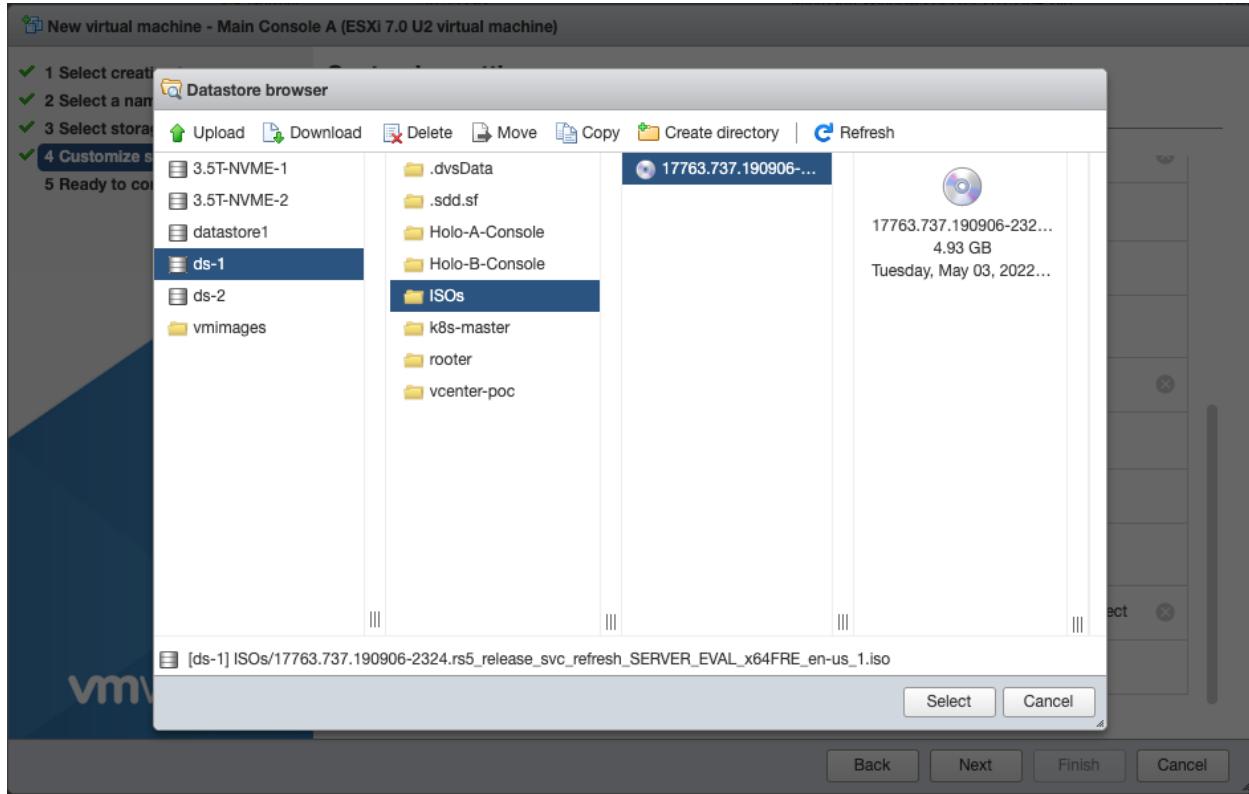
- H. Defaults for CPU, Memory and Hard Disk will usually suffice
- I. Set network adapter 1 to your external facing portgroup (VM Network in this example)
- J. Select VMXNET 3 as adapter type



- K. Click Add network adapter
- L. Connect to VLC-A-PG Portgroup (replace VLC-A-PG with VLC-B-PG, etc as needed for additional instances)
- M. Select VMXNET 3
- N. Click Next



- O. Click CD/DVD Drive and set to Datastore ISO
- P. Select the appropriate location for your Windows Server 2019 ISO (In this example we have the Windows Server 2019 ISO on ds-1)



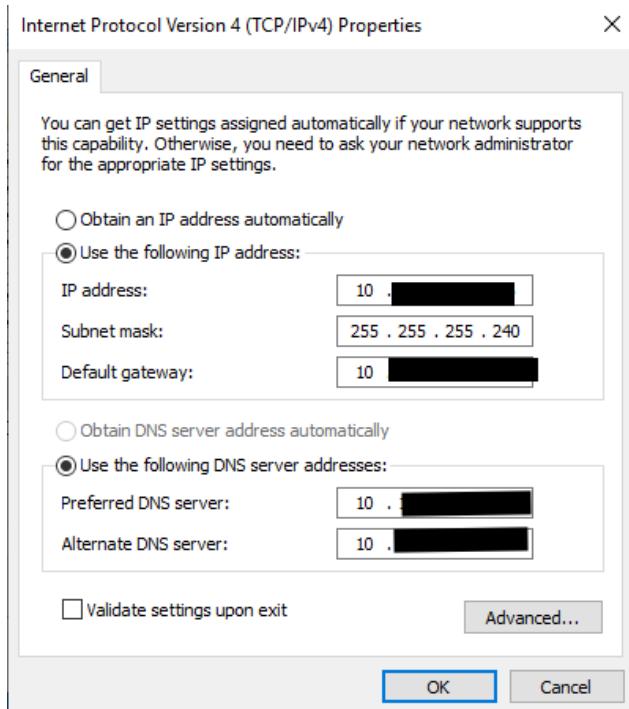
- Q. Click Next
- R. Click Finish

Task 2b: Configure jump host networking

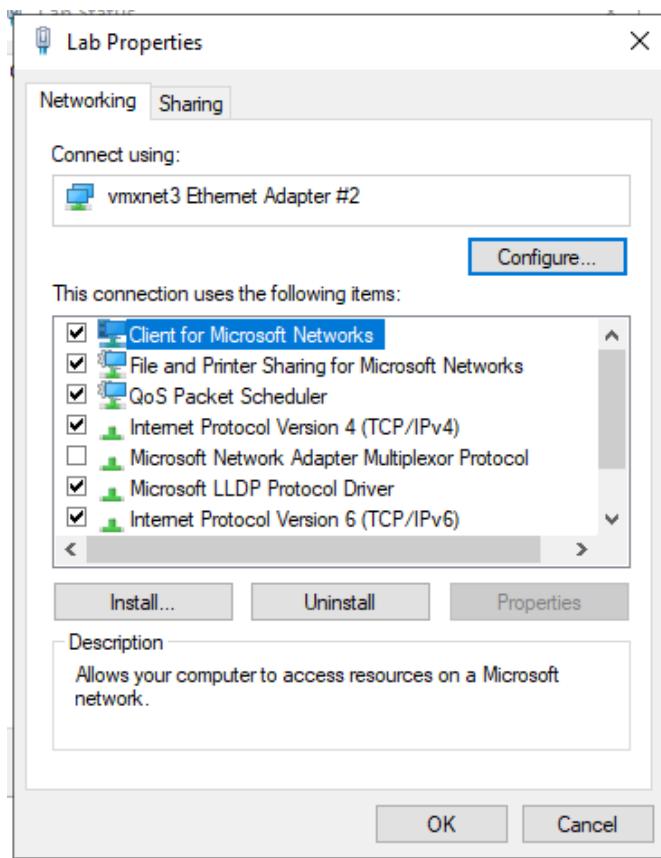
In this task we will configure networking on the Windows Server 2019 jump host

[Step 1] Set external networking

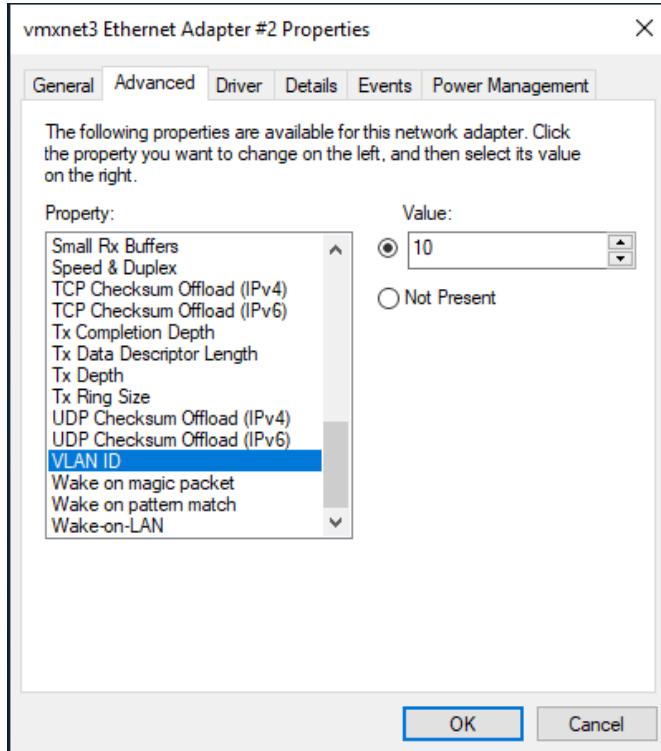
- A. Open Windows control panel
- B. Select Network and Internet
- C. Select your external facing interface and configure outward facing IP, gateway and DNS



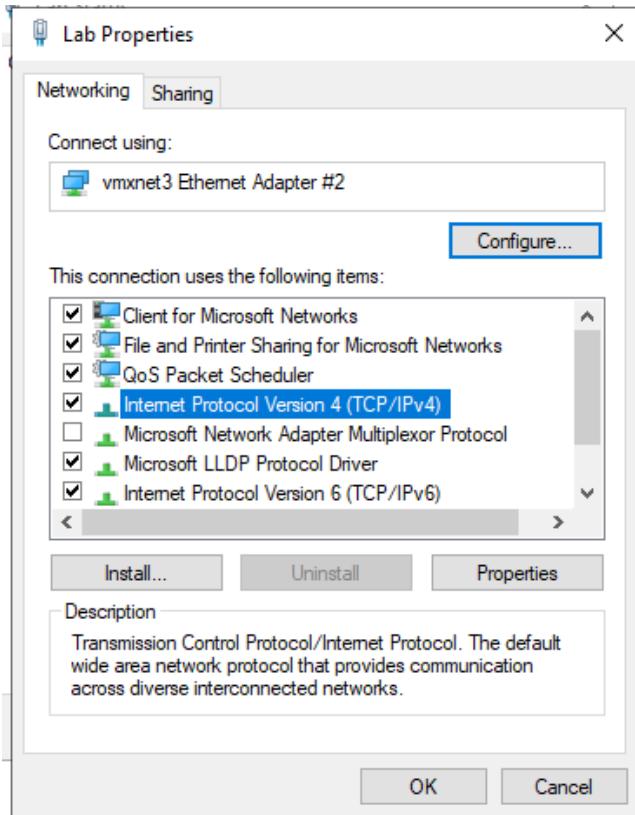
- D. Select the VLC facing interface and click properties
- E. Click Configure under the interface



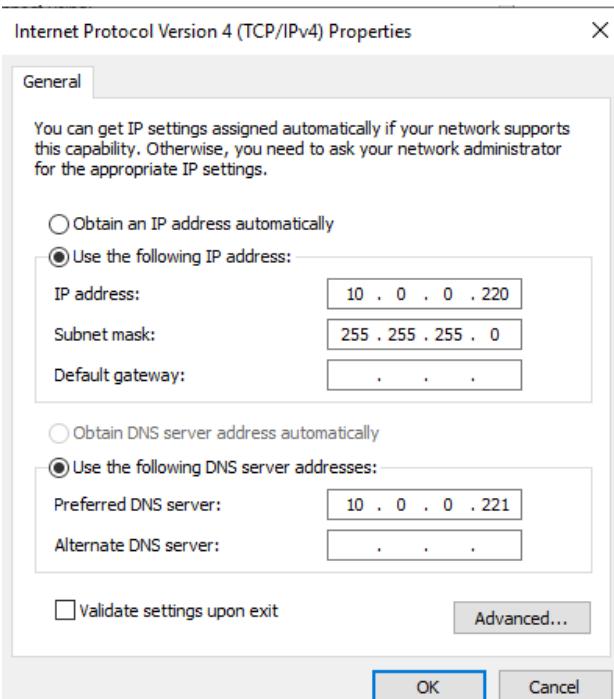
- F. Click Advanced, then scroll down to VLAN ID
G. Set VLAN ID 10, then ok



H. Click properties, then Internet Protocol Version 4, then properties



I. Set IP address to 10.0.0.220, netmask 255.255.255.0, DNS 10.0.0.221



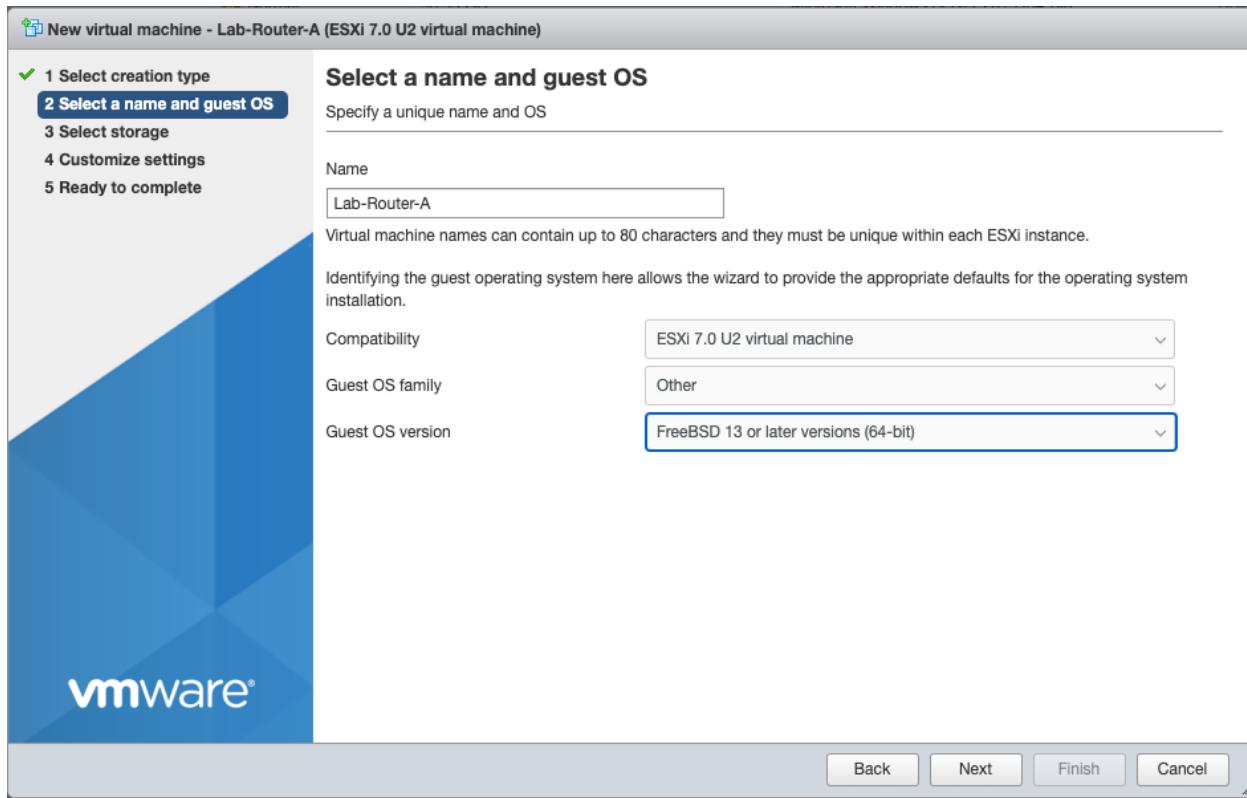
- J. Click OK, then close

Task 3a: Deploy PFsense Lab Gateway

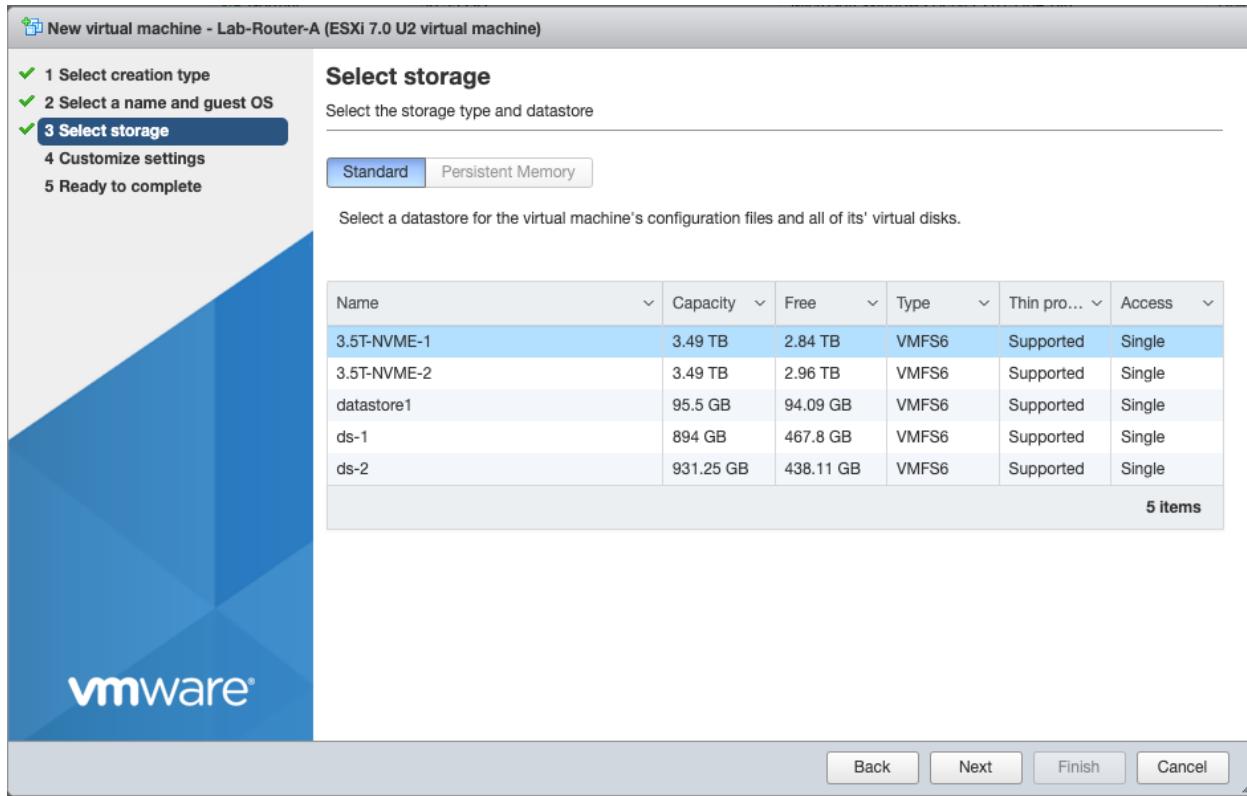
In this task we will deploy a PFsense router to act as a lab gateway. This step requires you have downloaded [PFsense CE 2.6](#)

[Step 1] Create new virtual machine

- A. From the virtual machine tab select Create/Register VM
- B. Select create new VM
- C. Name the VM Lab-Router-A (or similar)
- D. Select OS Other, and FreeBSD 13 or later 64 bit



- E. Select Storage

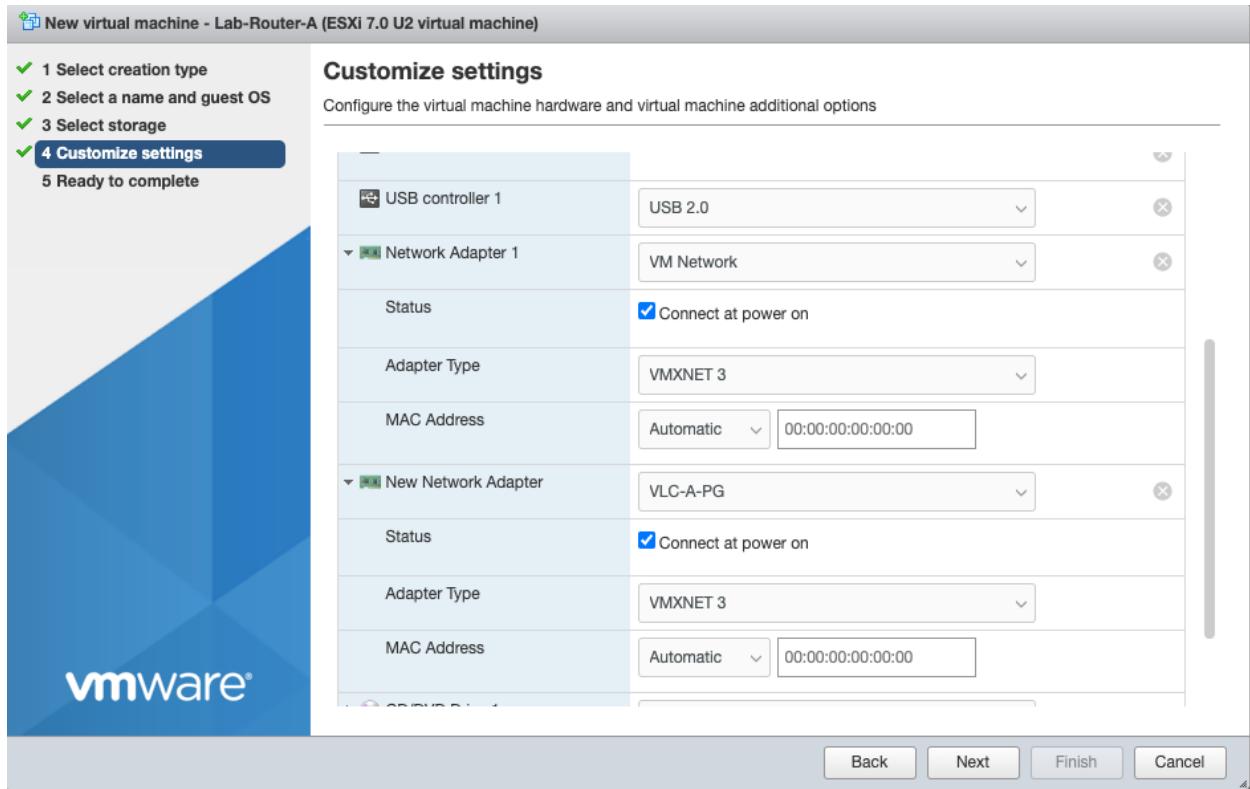


- F. Default CPU, memory and disk are adequate
G. Set SCSI Controller to LSI Logic Parallel

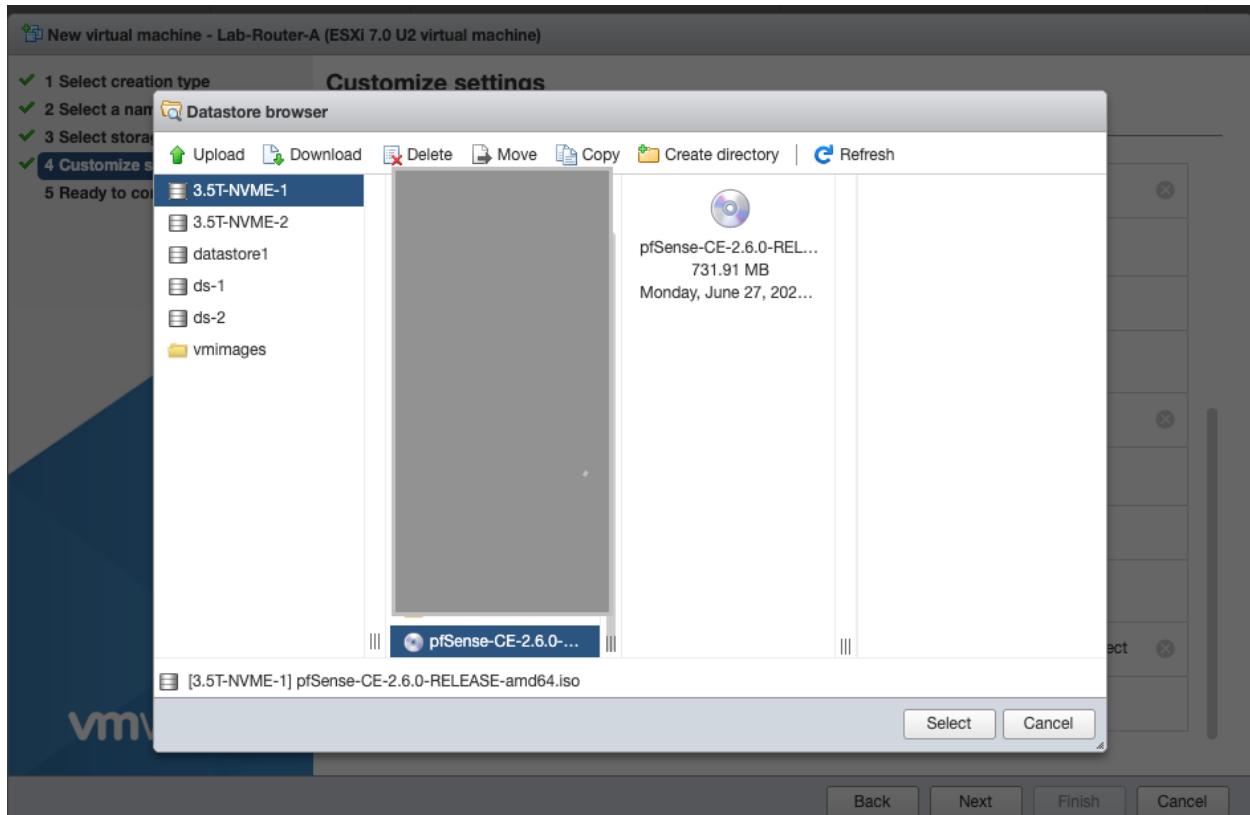
H. Configure Network Adapter 1 to point to your external network.



I. Add a second network adapter and connect to VLC-PG-A

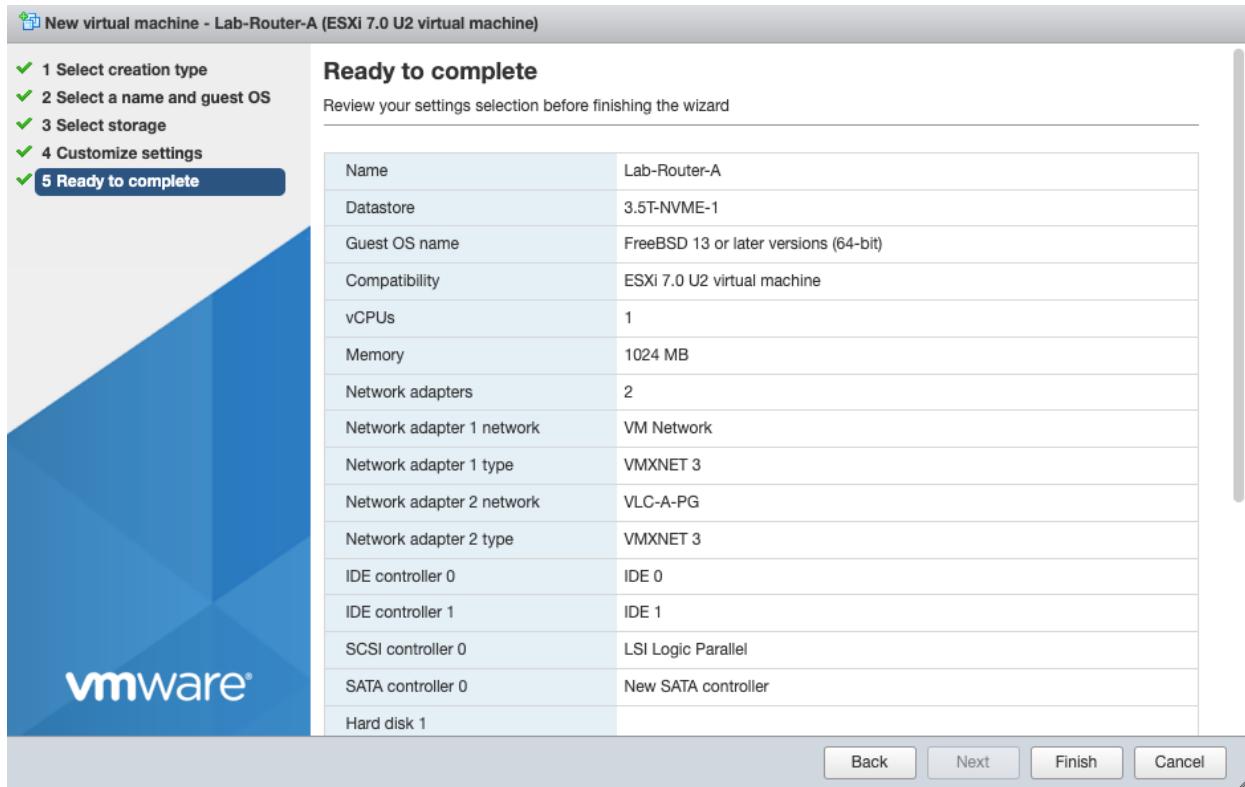


J. Set CD to Datastore ISO and select location of the PFsense iso

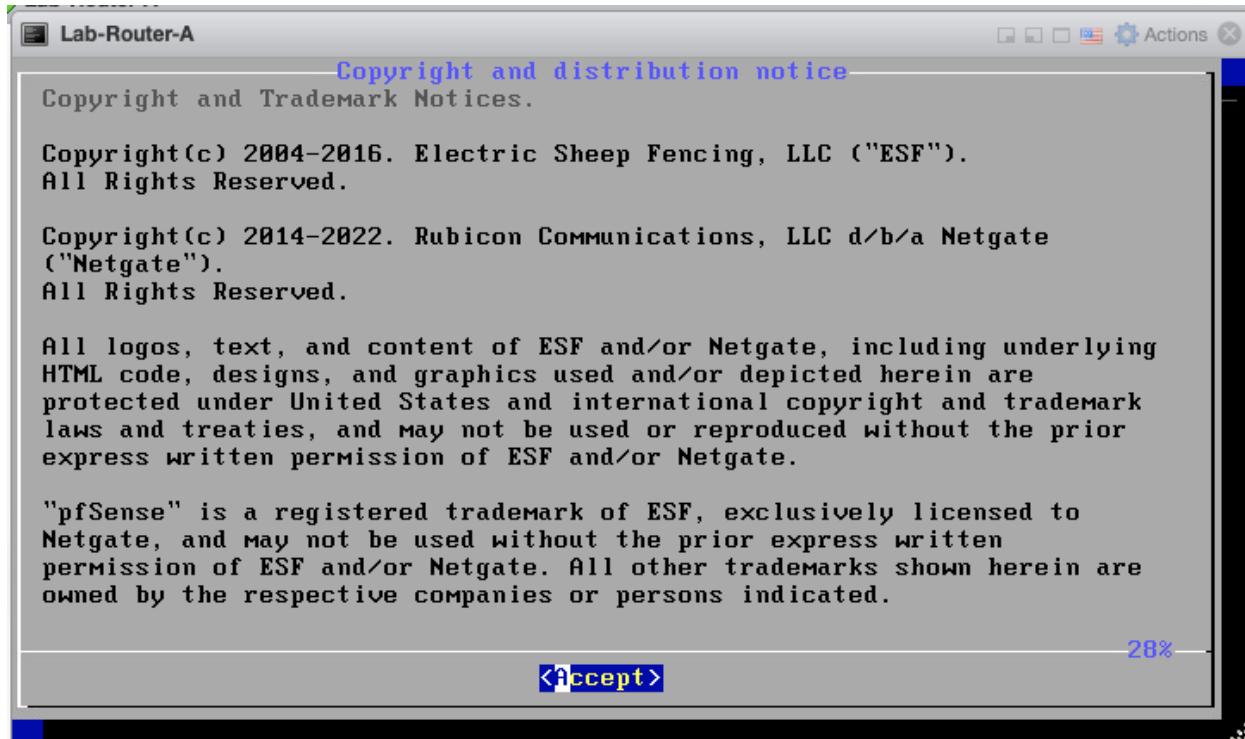


K. Click Next

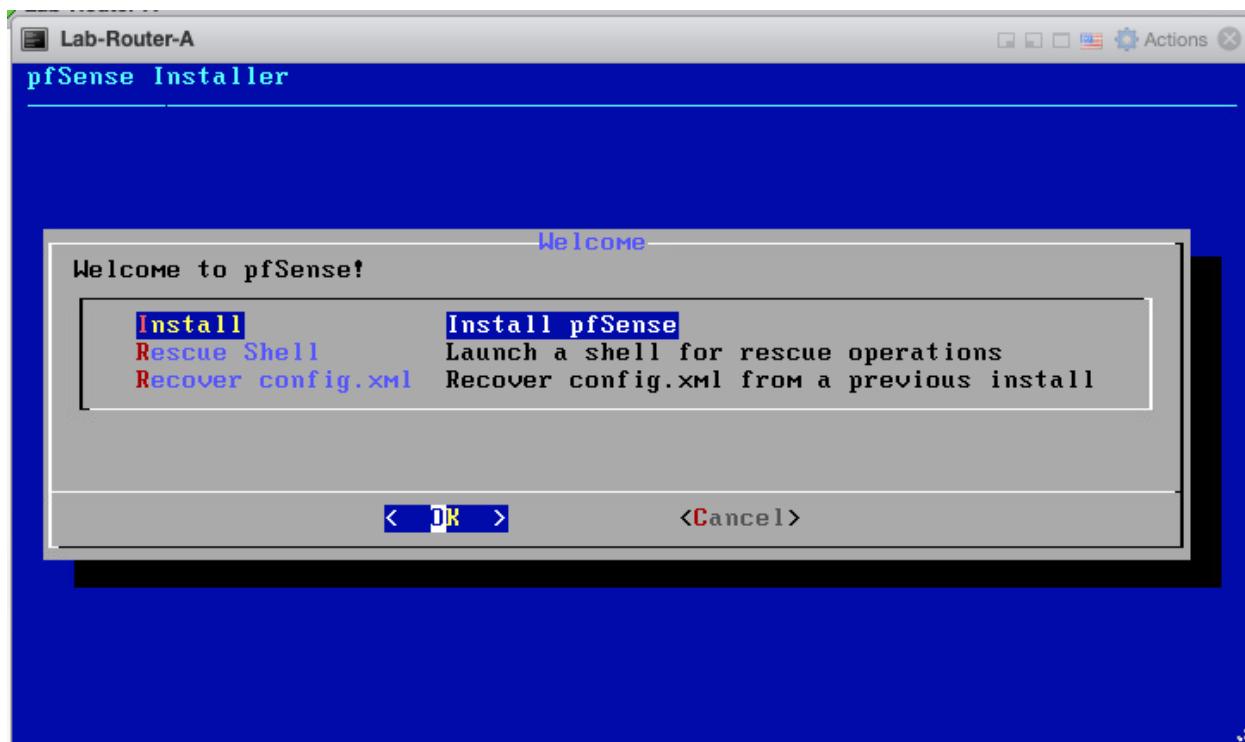
L. Your deployment should look like this



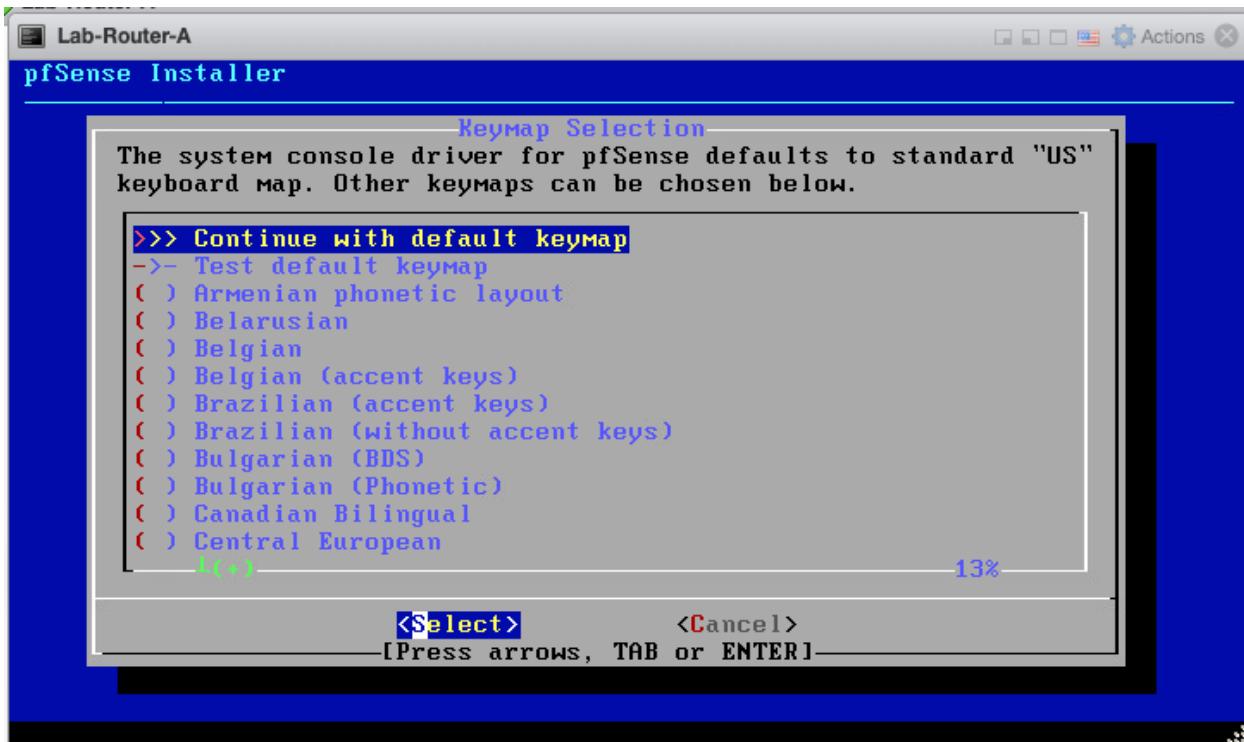
- M. Click Finish
- N. Power on the VM
- O. Open a console into the VM
- P. Accept the EULA



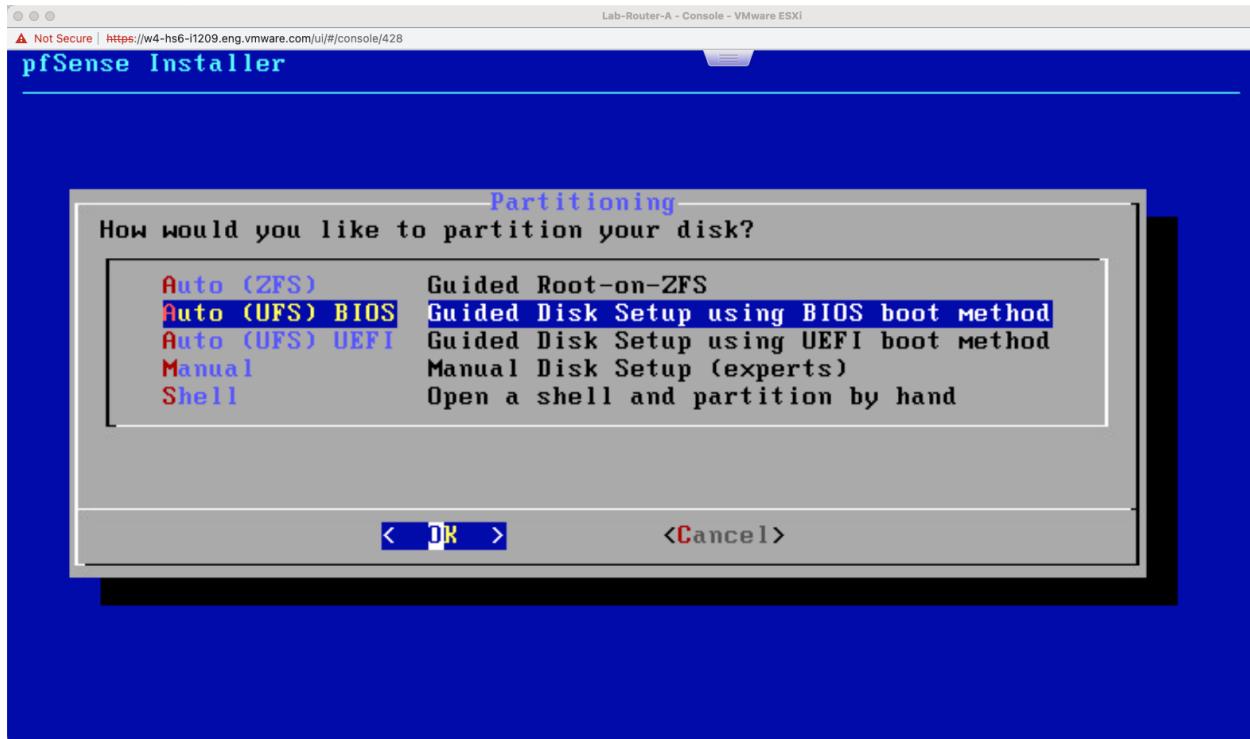
Q. Select install



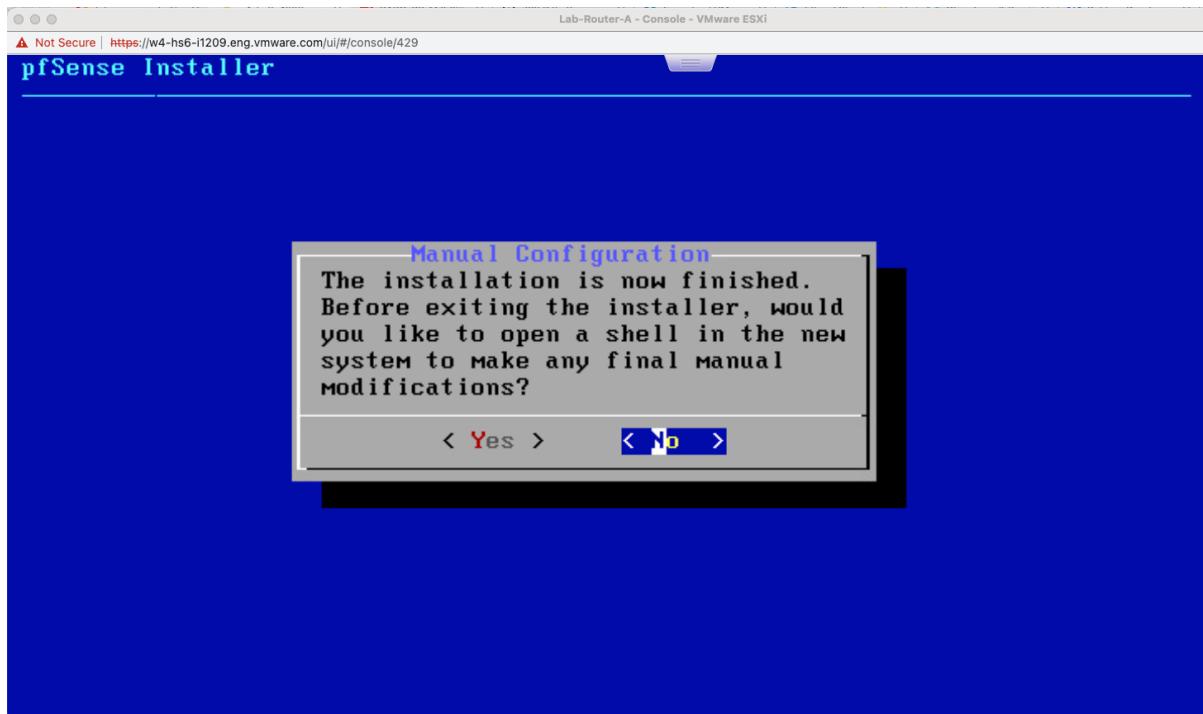
R. Select continue with default keymap



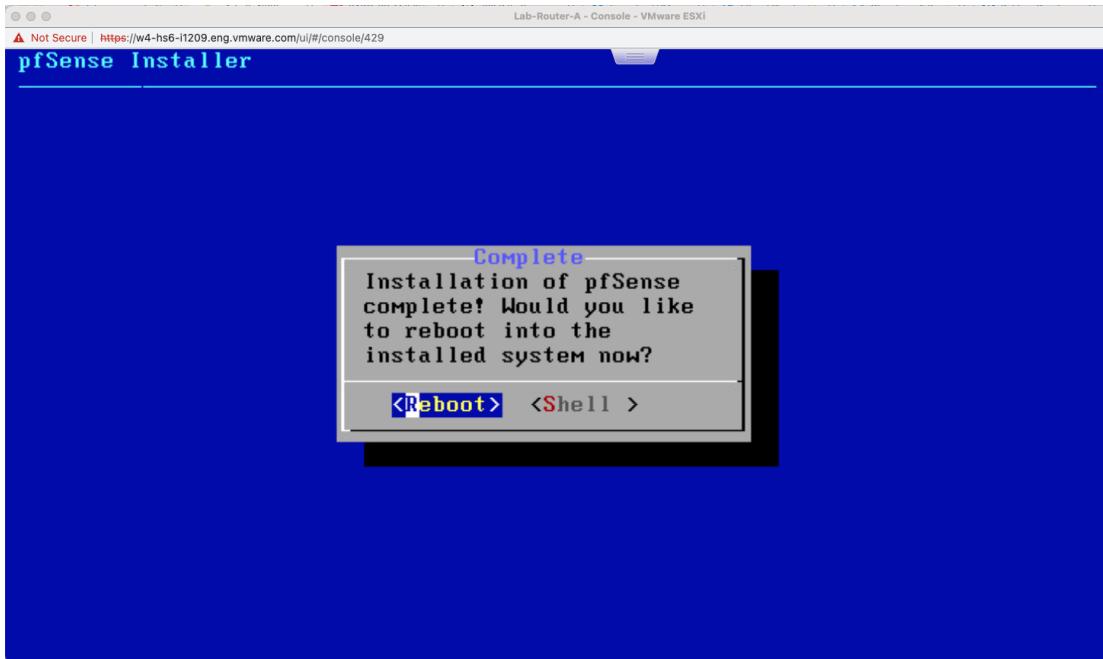
S. Select Auto (UFS) BIOS



- T. Select Proceed with install
- U. Select no when asked if you would like to open a shell



V. Select reboot



[Step 2] Configure PFsense

This step will configure PFsense for your environment.

- After initial boot, your PFsense config should look like the following

Lab-Router-A - Console - VMware ESXi
 ▲ Not Secure | https://w4-hs6-i1209.eng.vmware.com/ui/#/console/429

```
XSAVE Features=0xf<XSAVEOPT,XSAVEC,XINUSD,XSAVES>
AMD Extended Feature Extensions ID EBX=0x1201<CLZERO>
TSC: P-state invariant
Hypervisor: Origin = "VMwareVMware"
Done.
.... done.
Initializing..... done.
Starting device Manager (devd)...done.
Loading configuration.....done.
Updating configuration...done.

Default interfaces not found -- Running interface assignment option.
vmx0: link state changed to UP
vmx1: link state changed to UP

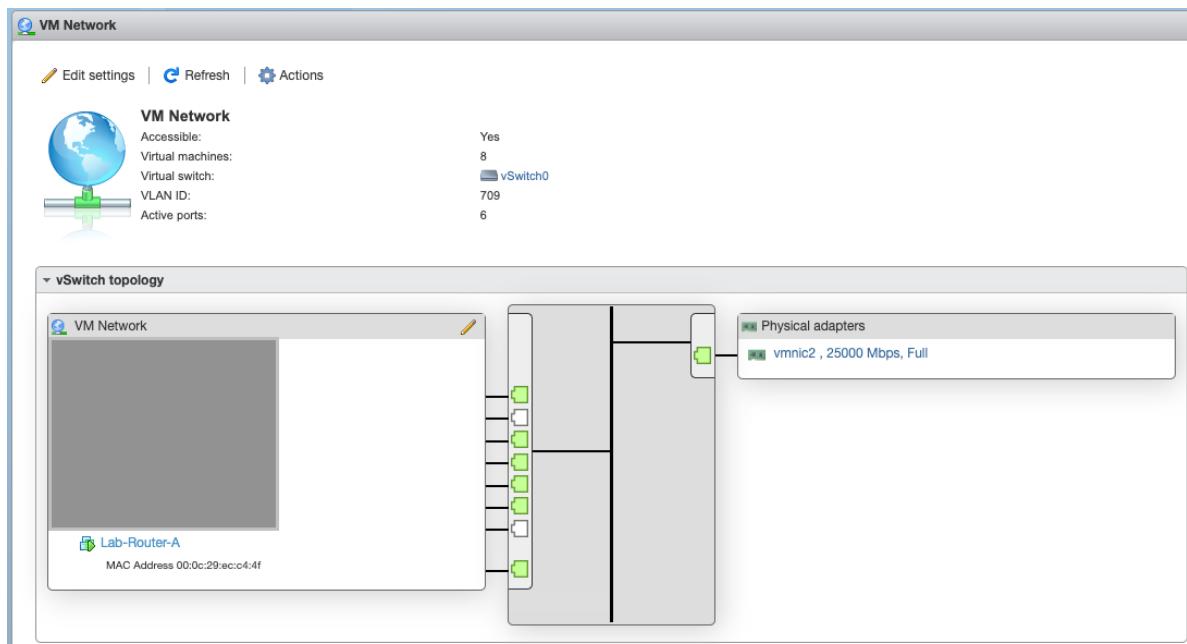
Valid interfaces are:

vmx0      00:0c:29:ec:c4:4f (down) VMware VMXNET3 Ethernet Adapter
vmx1      00:0c:29:ec:c4:59 (down) VMware VMXNET3 Ethernet Adapter

Do VLANs need to be set up first?
If VLANs will not be used, or only for optional interfaces, it is typical to
say no here and use the webConfigurator to configure VLANs later, if required.

Should VLANs be set up now [y\?n]? ■
```

- B. From your vSphere client, determine which interface (using mac address) connects to your external network. This will be your “WAN” interface later. In this example we can see that the vmx0 interface with MAC ending in c4:4f is connected to our external network



- C. For the VLC Holodeck configuration, we need the inside (LAN) interface to connect on VLAN 10. We will configure vmx0 for VLAN use. Select **y** on the PFsense console to configure VLANs

```

XSAUE Features=0xf<XSAVEOPT,XSAVEC,XINUSE,XSAVES>
AMD Extended Feature Extensions ID EBX=0x1201<CLZERO>
TSC: P-state invariant
Hypervisor: Origin = "VMwareVMware"
Done.
.... done.
Initializing..... done.
Starting device manager (devd)...done.
Loading configuration.....done.
Updating configuration...done.

Default interfaces not found -- Running interface assignment option.
vmx0: link state changed to UP
vmx1: link state changed to UP

Valid interfaces are:

vmx0      00:0c:29:ec:c4:4f (down) VMware VMXNET3 Ethernet Adapter
vmx1      00:0c:29:ec:c4:59 (down) VMware VMXNET3 Ethernet Adapter ←

Do VLANs need to be set up first?
If VLANs will not be used, or only for optional interfaces, it is typical to
say no here and use the webConfigurator to configure VLANs later, if required.

Should VLANs be set up now [y\?n]? y ←

```

- D. Enter the parent interface for the new VLAN. In this example our LAN interface will be on vmx1, so we will enter vmx1 and enter

```

Updating configuration...done.

Default interfaces not found -- Running interface assignment option.
vmx0: link state changed to UP
vmx1: link state changed to UP

Valid interfaces are:

vmx0      00:0c:29:ec:c4:4f (down) VMware VMXNET3 Ethernet Adapter
vmx1      00:0c:29:ec:c4:59 (down) VMware VMXNET3 Ethernet Adapter

Do VLANs need to be set up first?
If VLANs will not be used, or only for optional interfaces, it is typical to
say no here and use the webConfigurator to configure VLANs later, if required.

Should VLANs be set up now [y\?n]? y

VLAN Capable interfaces:

vmx0      00:0c:29:ec:c4:4f    (up)
vmx1      00:0c:29:ec:c4:59    (up)

Enter the parent interface name for the new VLAN (or nothing if finished): vmx1 ←

```

E. Enter VLAN tag 10

```

Lab-Router-A - Console - VMware ESXi
Not Secure | https://w4-hs6-i1209.eng.vmware.com/ui/#/console/429

Default interfaces not found -- Running interface assignment option.
vmx0: link state changed to UP
vmx1: link state changed to UP

Valid interfaces are:

vmx0    00:0c:29:ec:c4:4f (down) VMware VMXNET3 Ethernet Adapter
vmx1    00:0c:29:ec:c4:59 (down) VMware VMXNET3 Ethernet Adapter

Do VLANs need to be set up first?
If VLANs will not be used, or only for optional interfaces, it is typical to
say no here and use the webConfigurator to configure VLANs later, if required.

Should VLANs be set up now [y\?n]? y

VLAN Capable interfaces:

vmx0    00:0c:29:ec:c4:4f    (up)
vmx1    00:0c:29:ec:c4:59    (up)

Enter the parent interface name for the new VLAN (or nothing if finished): vmx1
Enter the VLAN tag (1-4094): 10

```

F. Hit enter when asked for parent interface for next VLAN (signaling we do not need another VLAN)

```

Lab-Router-A - Console - VMware ESXi
Not Secure | https://w4-hs6-i1209.eng.vmware.com/ui/#/console/429

vmx1    00:0c:29:ec:c4:59 (down) VMware VMXNET3 Ethernet Adapter

Do VLANs need to be set up first?
If VLANs will not be used, or only for optional interfaces, it is typical to
say no here and use the webConfigurator to configure VLANs later, if required.

Should VLANs be set up now [y\?n]? y

VLAN Capable interfaces:

vmx0    00:0c:29:ec:c4:4f    (up)
vmx1    00:0c:29:ec:c4:59    (up)

Enter the parent interface name for the new VLAN (or nothing if finished): vmx1
Enter the VLAN tag (1-4094): 10

VLAN Capable interfaces:

vmx0    00:0c:29:ec:c4:4f    (up)
vmx1    00:0c:29:ec:c4:59    (up)

Enter the parent interface name for the new VLAN (or nothing if finished): 

```

- G. Enter the interface that is connected to your external network for WAN interface. In this example, the WAN interface was determined to be on vmx0

```

Not Secure | https://w4-hs6-i1209.eng.vmware.com/ui/#/console/429
Lab-Router-A - Console - VMware ESXi

vmx0      00:0c:29:ec:c4:4f  (up)
vmx1      00:0c:29:ec:c4:59  (up)

Enter the parent interface name for the new VLAN (or nothing if finished): vmx1
Enter the VLAN tag (1-4094): 10

VLAN Capable interfaces:

vmx0      00:0c:29:ec:c4:4f  (up)
vmx1      00:0c:29:ec:c4:59  (up)

Enter the parent interface name for the new VLAN (or nothing if finished):

VLAN interfaces:

vmx1.10      VLAN tag 10, parent interface vmx1

If the names of the interfaces are not known, auto-detection can
be used instead. To use auto-detection, please disconnect all
interfaces before pressing 'a' to begin the process.

Enter the WAN interface name or 'a' for auto-detection
(vmx0 vmx1 vmx1.10 or a): vmx0

```

- H. Enter the interface for the LAN interface. In this example we need to select the vmx1.10 interface to enable VLAN10

```

Not Secure | https://w4-hs6-i1209.eng.vmware.com/ui/#/console/429
Lab-Router-A - Console - VMware ESXi

Enter the VLAN tag (1-4094): 10

VLAN Capable interfaces:

vmx0      00:0c:29:ec:c4:4f  (up)
vmx1      00:0c:29:ec:c4:59  (up)

Enter the parent interface name for the new VLAN (or nothing if finished):

VLAN interfaces:

vmx1.10      VLAN tag 10, parent interface vmx1

If the names of the interfaces are not known, auto-detection can
be used instead. To use auto-detection, please disconnect all
interfaces before pressing 'a' to begin the process.

Enter the WAN interface name or 'a' for auto-detection
(vmx0 vmx1 vmx1.10 or a): vmx0

Enter the LAN interface name or 'a' for auto-detection
NOTE: this enables full Firewalling/NAT mode.
(vmx1 vmx1.10 a or nothing if finished): vmx1.10

```

I. We do not need an optional interface, so hit enter

```

Not Secure | https://w4-hs6-i1209.eng.vmware.com/ui/#/console/429
Lab-Router-A - Console - VMware ESXi

VLAN Capable interfaces:
vmx0      00:0c:29:c4:4f    (up)
vmx1      00:0c:29:c4:59    (up)

Enter the parent interface name for the new VLAN (or nothing if finished):

VLAN interfaces:
vmx1.10      VLAN tag 10, parent interface vmx1

If the names of the interfaces are not known, auto-detection can
be used instead. To use auto-detection, please disconnect all
interfaces before pressing 'a' to begin the process.

Enter the WAN interface name or 'a' for auto-detection
(vmx0 vmx1 vmx1.10 or a): vmx0

Enter the LAN interface name or 'a' for auto-detection
NOTE: this enables full Firewalling/NAT Mode.
(vmx1 vmx1.10 a or nothing if finished): vmx1.10

Enter the Optional 1 interface name or 'a' for auto-detection
(vmx1 a or nothing if finished): █

```

J. Your output should look like this

```

Not Secure | https://w4-hs6-i1209.eng.vmware.com/ui/#/console/429
Lab-Router-A - Console - VMware ESXi

VLAN interfaces:
vmx1.10      VLAN tag 10, parent interface vmx1

If the names of the interfaces are not known, auto-detection can
be used instead. To use auto-detection, please disconnect all
interfaces before pressing 'a' to begin the process.

Enter the WAN interface name or 'a' for auto-detection
(vmx0 vmx1 vmx1.10 or a): vmx0

Enter the LAN interface name or 'a' for auto-detection
NOTE: this enables full Firewalling/NAT Mode.
(vmx1 vmx1.10 a or nothing if finished): vmx1.10

Enter the Optional 1 interface name or 'a' for auto-detection
(vmx1 a or nothing if finished):

The interfaces will be assigned as follows:
WAN  -> vmx0
LAN  -> vmx1.10

Do you want to proceed [y:n]? █

```

K. Enter y to proceed. PFsense will reconfigure and reboot

L. After reboot, select 2 to set IP addressing

```
Starting syslog...done.
Starting CRON... done.
pfSense 2.6.0-RELEASE amd64 Mon Jan 31 19:57:53 UTC 2022
Bootup complete

FreeBSD/amd64 (pfSense.home.arpa) (ttyv0)

VMware Virtual Machine - Netgate Device ID: d57493a2cc54727d8940

*** Welcome to pfSense 2.6.0-RELEASE (amd64) on pfSense ***

WAN (wan)      -> vmx0      ->
LAN (lan)      -> vmx1.10   -> v4: 192.168.1.1/24

0) Logout (SSH only)          9) pfTop
1) Assign Interfaces          10) Filter Logs
2) Set interface(s) IP address 11) Restart webConfigurator
3) Reset webConfigurator password 12) PHP shell + pfSense tools
4) Reset to factory defaults 13) Update from console
5) Reboot system              14) Enable Secure Shell (sshd)
6) Halt system                15) Restore recent configuration
7) Ping host                  16) Restart PHP-FPM
8) Shell

Enter an option: ■
```

M. Select 1 for WAN interface . Configure as per your environment. In this example, we will use a fixed /28 IPv4 address (no DHCP) and no IPv6

The screenshot shows a terminal session on a VMware ESXi host named 'Lab-Router-A'. The user is prompted to enter an option (2) and select a WAN interface (1). They then choose to configure the WAN interface via DHCP (n), enter a new IPv4 address (10. [REDACTED]), and specify a subnet bit count (28). Finally, they enter a new upstream gateway address (10. [REDACTED]).

```
Lab-Router-A - Console - VMware ESXi
A Not Secure | https://w4-hs6-i1209.eng.vmware.com/ui/#/console/429
Enter an option: 2
Available interfaces:
1 - WAN (vmx0 - dhcp, dhcp6)
2 - LAN (vmx1.10 - static)

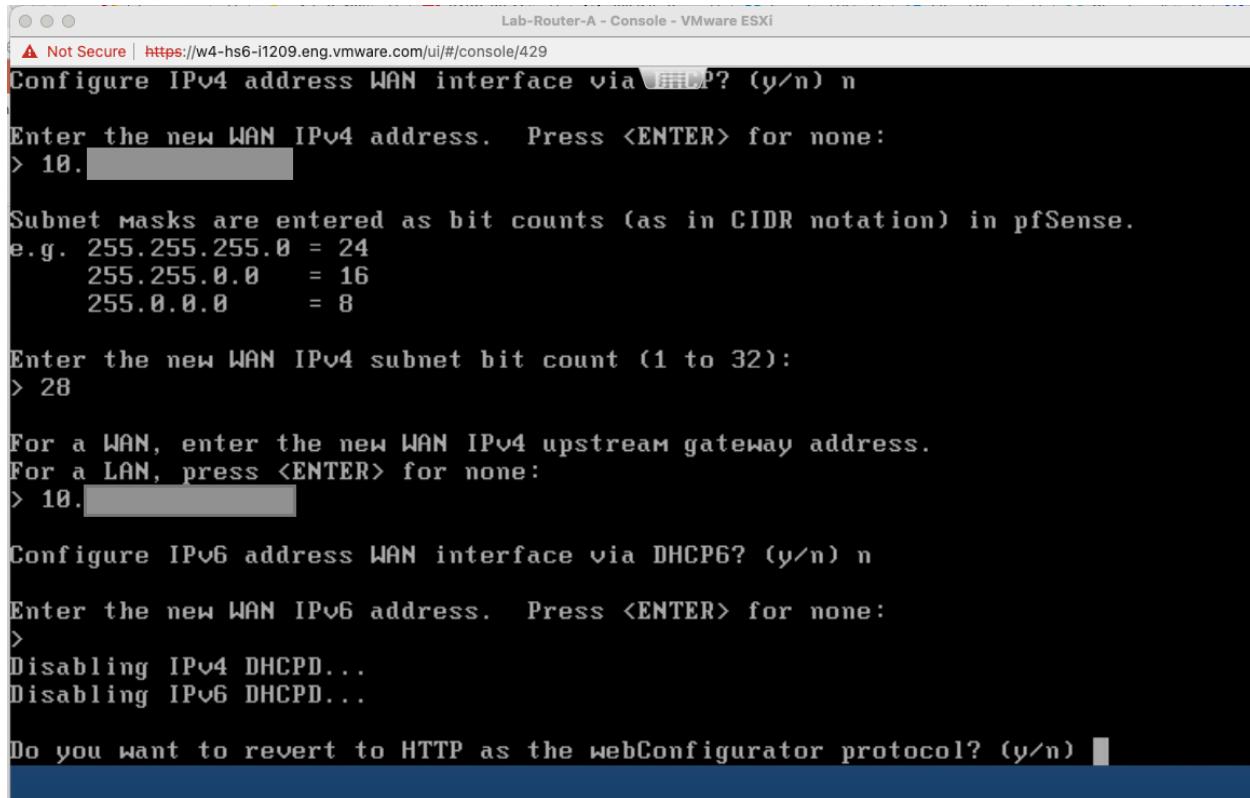
Enter the number of the interface you wish to configure: 1
Configure IPv4 address WAN interface via DHCP? (y/n) n
Enter the new WAN IPv4 address. Press <ENTER> for none:
> 10. [REDACTED]

Subnet masks are entered as bit counts (as in CIDR notation) in pfSense.
e.g. 255.255.255.0 = 24
     255.255.0.0 = 16
     255.0.0.0 = 8

Enter the new WAN IPv4 subnet bit count (1 to 32):
> 28

For a WAN, enter the new WAN IPv4 upstream gateway address.
For a LAN, press <ENTER> for none:
> 10. [REDACTED]
```

N. Select yes for HTTP for web configurator



```
Lab-Router-A - Console - VMware ESXi
▲ Not Secure | https://w4-hs6-i1209.eng.vmware.com/ui/#/console/429
Configure IPv4 address WAN interface via DHCP? (y/n) n
Enter the new WAN IPv4 address. Press <ENTER> for none:
> 10. [REDACTED]
Subnet Masks are entered as bit counts (as in CIDR notation) in pfSense.
e.g. 255.255.255.0 = 24
      255.255.0.0   = 16
      255.0.0.0     = 8
Enter the new WAN IPv4 subnet bit count (1 to 32):
> 28
For a WAN, enter the new WAN IPv4 upstream gateway address.
For a LAN, press <ENTER> for none:
> 10. [REDACTED]
Configure IPv6 address WAN interface via DHCP6? (y/n) n
Enter the new WAN IPv6 address. Press <ENTER> for none:
>
Disabling IPv4 DHCPD...
Disabling IPv6 DHCPD...
Do you want to revert to HTTP as the webConfigurator protocol? (y/n) [REDACTED]
```

O. Press enter to continue

```

Lab-Router-A - Console - VMware ESXi
▲ Not Secure | https://w4-hs6-i1209.eng.vmware.com/ui/#/console/429
Enter the new WAN IPv4 subnet bit count (to 32):
> 28

For a WAN, enter the new WAN IPv4 upstream gateway address.
For a LAN, press <ENTER> for none:
> 10. [REDACTED]

Configure IPv6 address WAN interface via DHCP? (y/n) n

Enter the new WAN IPv6 address. Press <ENTER> for none:
>

Disabling IPv4 DHCPD...
Disabling IPv6 DHCPD...

Do you want to revert to HTTP as the webConfigurator protocol? (y/n) y

Please wait while the changes are saved to WAN...
Reloading filter...
Reloading routing configuration...
DHCPD...
Restarting webConfigurator...

The IPv4 WAN address has been set to 10. [REDACTED]

Press <ENTER> to continue. [REDACTED]

```

P. Select option 2 to set IP for LAN interface, then 2 to select LAN

```

Lab-Router-A - Console - VMware ESXi
▲ Not Secure | https://w4-hs6-i1209.eng.vmware.com/ui/#/console/429
VMware Virtual Machine - Netgate Device 1f57493a2cc54727d8940

*** Welcome to pfSense 2.6.0-RELEASE (amd64) on pfSense ***

WAN (wan)      -> vmx0      -> v4: 10. [REDACTED]
LAN (lan)      -> vmx1.10   -> v4: 192.168.1.1/24

0) Logout (SSH only)          9) pfTop
1) Assign Interfaces           10) Filter Logs
2) Set interface(s) IP address 11) Restart webConfigurator
3) Reset webConfigurator password 12) PHP shell + pfSense tools
4) Reset to factory defaults   13) Update from console
5) Reboot system               14) Enable Secure Shell (sshd)
6) Halt system                 15) Restore recent configuration
7) Ping host                   16) Restart PHP-FPM

Enter an option: 2

Available interfaces:

1 - WAN (vmx0 - static)
2 - LAN (vmx1.10 - static)

Enter the number of the interface you wish to configure: 2 [REDACTED]

```

Q. Set LAN interface to 10.0.0.1/24. You do not need an upstream gateway, IPv6 info or DHCP server

```
Lab-Router-A - Console - VMware ESXi
⚠ Not Secure | https://w4-hs6-i1209.eng.vmware.com/ui/#/console/429

1 - WAN (vmx0 - static)
2 - LAN (vmx1.10 - static)

Enter the number of the interface you wish to configure: 2

Enter the new LAN IPv4 address. Press <ENTER> for none:
> 10.0.0.1

Subnet Masks are entered as bit counts (as in CIDR notation) in pfSense.
e.g. 255.255.255.0 = 24
     255.255.0.0   = 16
     255.0.0.0     = 8

Enter the new LAN IPv4 subnet bit count (1 to 32):
> 24

For a WAN, enter the new LAN IPv4 upstream gateway address.
For a LAN, press <ENTER> for none:
>

Enter the new LAN IPv6 address. Press <ENTER> for none:
>

Do you want to enable the DHCP server on LAN? (y/n) n
```

R. Your end result should look like this

```

Lab-Router-A - Console - VMware ESXi
⚠ Not Secure | https://w4-hs6-i1209.eng.vmware.com/ui/#/console/429
Enter the new LAN IPv4 subnet bit count (1 to 32):
> 24

For a WAN, enter the new LAN IPv4 upstream gateway address.
For a LAN, press <ENTER> for none:
>

Enter the new LAN IPv6 address. Press <ENTER> for none:
>

Do you want to enable the DHCP server on LAN? (y/n) n
Disabling IPv4 DHCPD...
Disabling IPv6 DHCPD...

Please wait while the changes are saved to LAN...
Reloading filter...
Reloading routing configuration...
DHCPD...

The IPv4 LAN address has been set to 10.0.0.1/24
You can now access the webConfigurator by opening the following URL in your web
browser:
      http://10.0.0.1/
Press <ENTER> to continue.

```

Task 4: Deploy VCF using VLC

In this task we deploy a nested VCF instance using VCF Lab Constructor. This task documentation is designed to act as an extension to the VCF Lab Constructor manual that comes with VLC. This step assumes you have downloaded VLC from <https://tiny.cc/getVLCBits> and unzipped to c:\vlc on your jump host

[Step 1] Add licensing info to EMS json

- Open c:\vlc\NOLIC-44-TMM-vcf-ems-public.json with your editor
- Within this file you will find and replace <INSERT LIC> with a valid license in 4 locations.
 - esxiLicense
 - nsxtLicense
 - vSAN licenseFile
 - vCenter licenseFile

```

1  {
2    "skipEsxThumbprintValidation": true,
3    "managementPoolName": "mgmt-networkpool",
4    "sddcManagerSpec": {
5      "secondUserCredentials": {
6        "username": "vcf",
7        "password": "VMware123!"
8      },
9      "ipAddress": "10.0.0.4",
10     "netmask": "255.255.255.0",
11     "hostname": "sddc-manager",
12     "rootUserCredentials": {
13       "username": "root",
14       "password": "VMware123!"
15     },
16     "localUserPassword": "VMware123!VMware123!",
17     "vcenterId": "vcenter-1"
18   },
19   "sddcId": "mgmt-domain",
20   "esxLicense": "<INSERT LIC>",
21   "taskName": "workflowconfig/workflowspec-ems.json",
22   "ceipEnabled": false,
23   "fipsEnabled": false,
24   "ntpServers": ["10.0.0.221"],
25   "dnsSpec": {
26     "subdomain": "vcf.sddc.lab",
27     "domain": "vcf.sddc.lab",
28     "searchDomains": []
29   }
30 }

```

C. Save the edited file as c:\vlc\NOLIC-44-TMM-vcf-ems-public.json

[Step 2] Download Cloud Foundation 4.4.1 Cloud Builder

- Access [VMware Customer Connect](#) to download Cloud Foundation 4.4.1 Cloud Builder.
Note: You will need a valid login to VMware Customer Connect to download cloud builder

The screenshot shows the VMware Customer Connect interface. At the top, there's a navigation bar with links for 'Products and Accounts', 'Knowledge', 'More', a search icon, a globe icon, and buttons for 'Register' and 'Login'. Below the navigation, the URL 'Home / VMware Cloud Foundation 4.4.1' is displayed. The main title 'Download Product' is centered above a table of product details. The table includes rows for 'Select Version' (set to '4.4.1'), 'Documentation' (link to 'Release Notes'), 'Release Date' ('2022-05-12'), and 'Type' ('Product Binaries'). To the right of the table is a sidebar titled 'Product Resources' with links to 'View My Download History', 'Product Information', and 'Documentation'. Below the table, a horizontal menu bar has 'Product Downloads' underlined, followed by 'Drivers & Tools', 'Open Source', 'Custom ISOs', and 'OEM Addons'. A large callout box highlights the 'VMware Cloud Builder' entry in the 'Product Downloads' section. This entry shows a file size of '19.82 GB' and a file type of 'ova'. It includes a 'Read More' link and a prominent blue 'DOWNLOAD NOW' button.

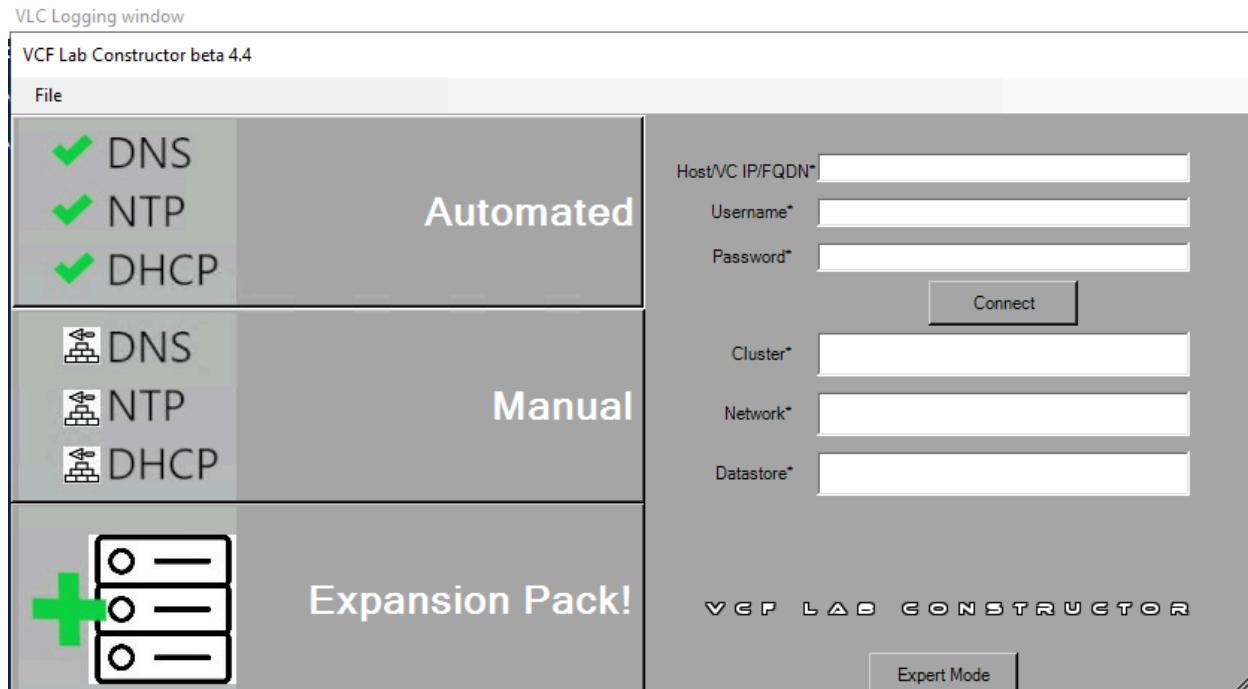
- B. Place the Cloud Builder OVA in C:\Cloud Builder (or similar directory)

[Step 3] Run VLC

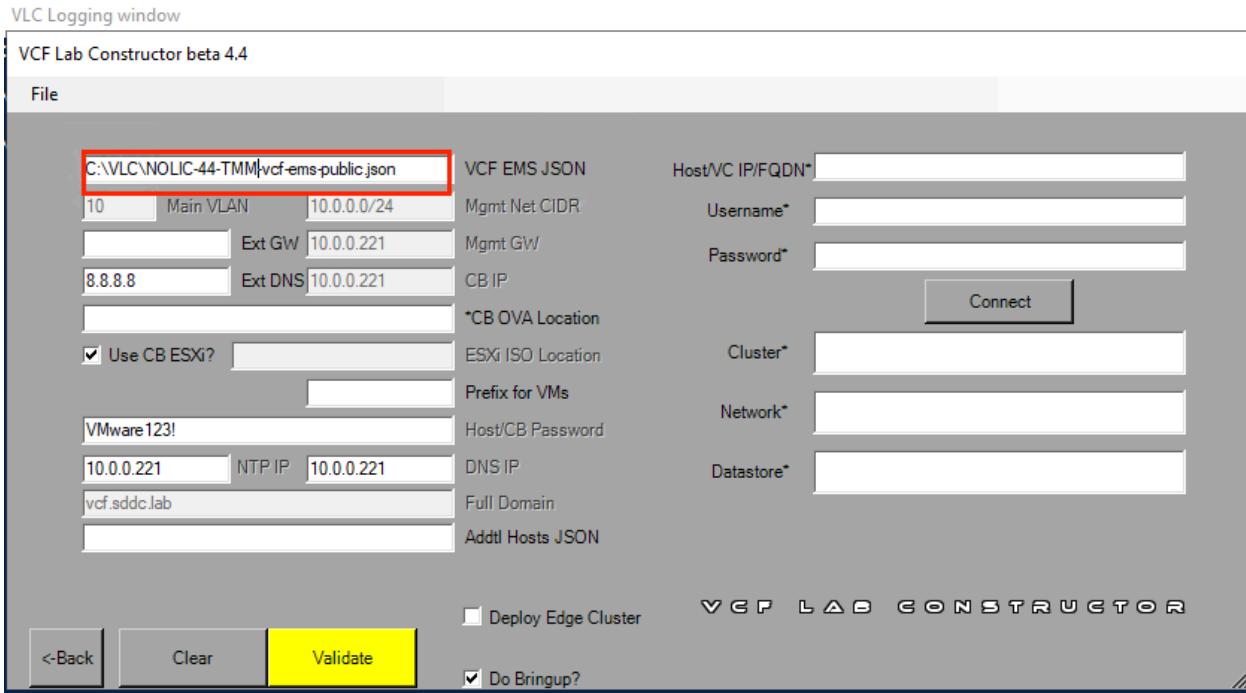
- A. While logged in to your jump host as administrator, right click on VLCGui.ps1 and click Run with Powershell (in this example I am using a pre-release version called VLCGuiHH-2.ps1)

Name	Date modified	Type	Size
automated_api_jsons	5/6/2022 3:43 AM	File folder	
bin	5/6/2022 3:43 AM	File folder	
cb_esx_iso	8/9/2022 12:30 AM	File folder	
conf	5/23/2022 10:04 PM	File folder	
etc	5/6/2022 3:43 AM	File folder	
Logs	8/9/2022 12:49 AM	File folder	
Templates	8/9/2022 12:31 AM	File folder	
add_3_big_hosts	5/26/2022 12:53 PM	JSON File	1 KB
add_3_hosts	2/7/2022 4:05 PM	JSON File	1 KB
add_3_hosts_bulk_commission VSAN	12/25/2020 8:39 AM	JSON File	1 KB
add_4_big_hosts	5/24/2022 4:46 PM	JSON File	1 KB
add_4_big_hosts_ESXi5-8	6/11/2022 2:01 PM	JSON File	1 KB
add_4_hosts_bulk_commission VSAN	5/24/2022 6:45 PM	JSON File	1 KB
LIC-44-TMM-vcf-ems-public	5/6/2022 6:39 AM	JSON File	6 KB
NOLIC-44-TMM-vcf-ems-public	2/7/2022 3:55 PM	JSON File	6 KB
NSXT Edge nodes AMD Ryzen Fix	2/11/2022 5:44 AM	Chrome HTML Do...	1,544 KB
VCF Lab Constructor Install Guide 44-021...	2/11/2022 6:05 AM	Chrome HTML Do...	1,947 KB
VLCGuiHH-2	8/9/2022 12:29 AM	Windows PowerS...	220 KB

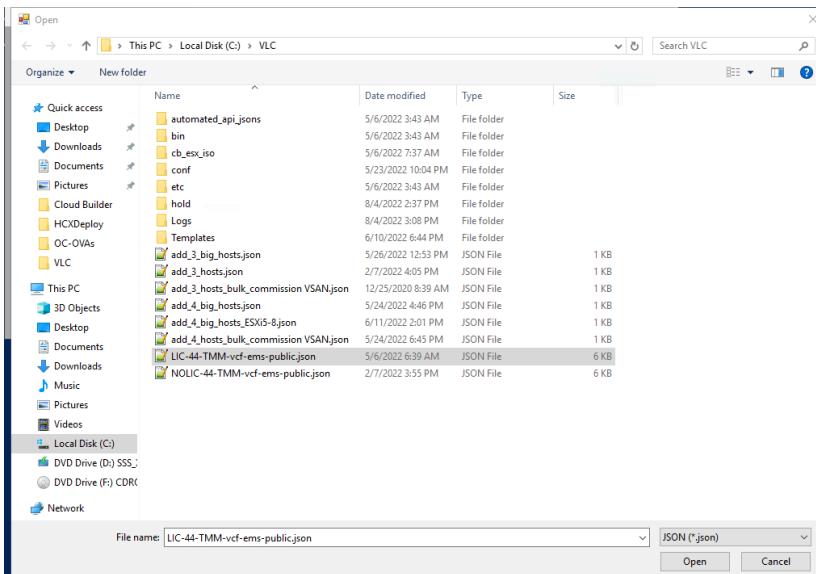
B. Click Automated on the VLC UI



C. Click on VCF EMS JSON field

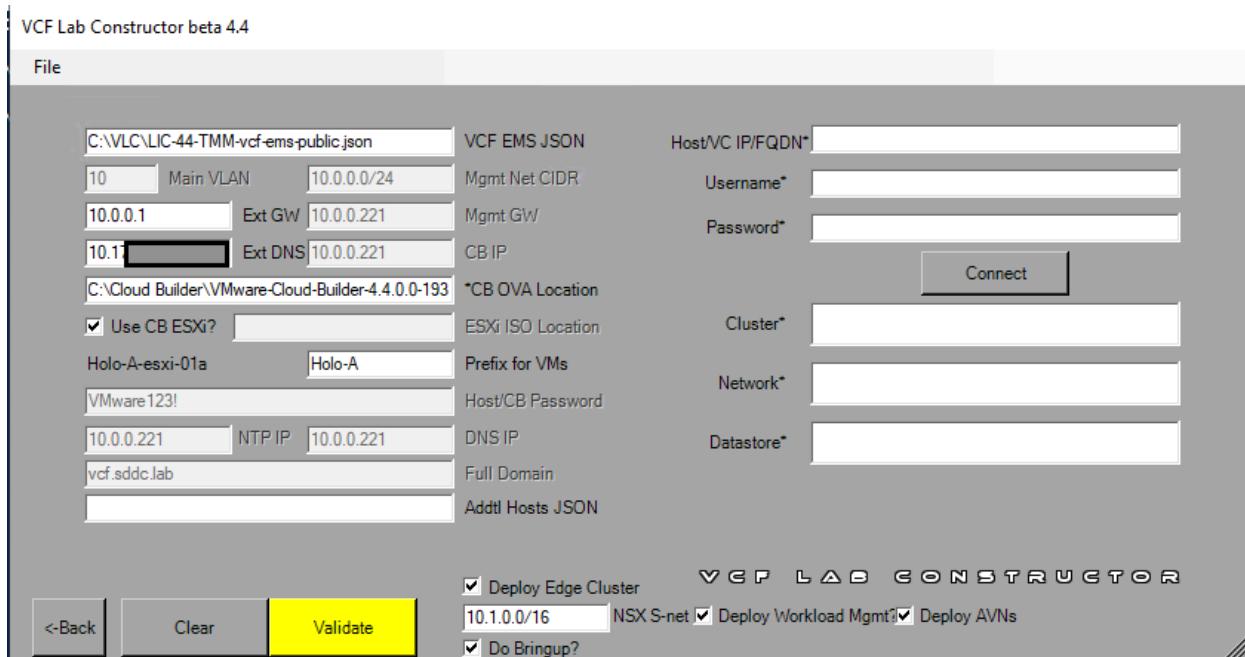


D. Select the modified EMS json with your license keys, then Open

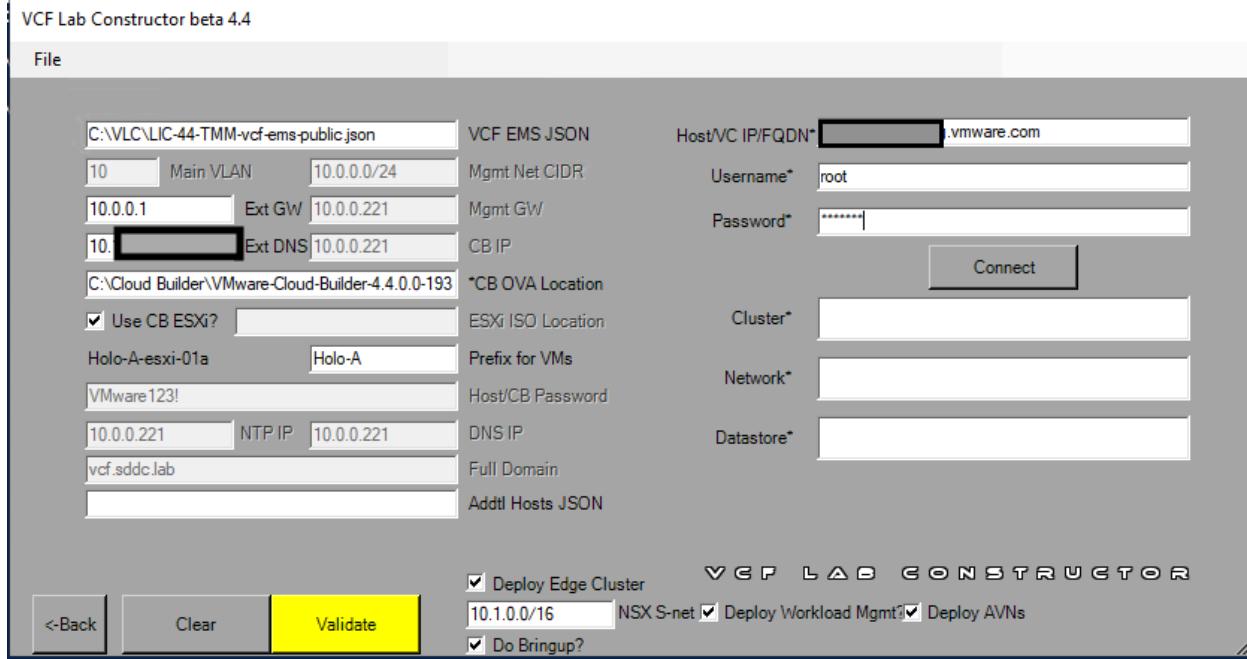


- E. Enter the address of the lab gateway created in previous steps (10.0.0.1) in the Ext GW field**
- F. If your lab requires use of DNS other than 8.8.8.8, enter in Ext DNS**
- G. Leave Mgmt Net CIDR, Mgmt GW and CB IP default**
- H. Leave "Use CB ESXi" checked**

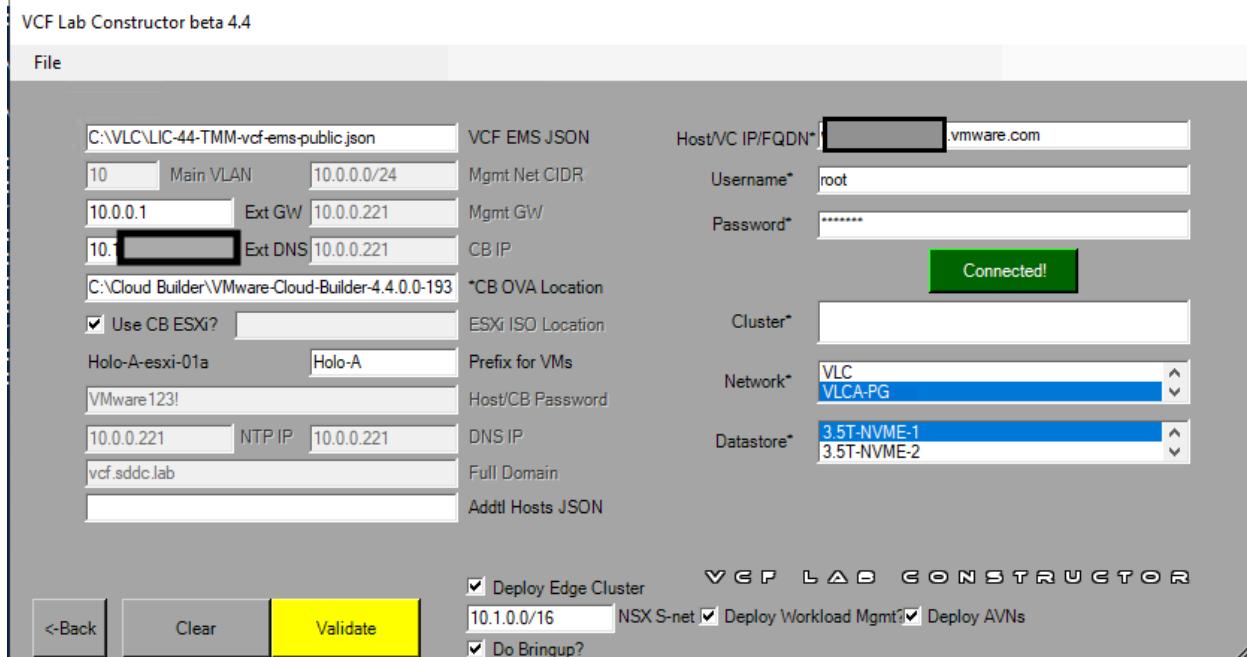
- I. If you plan to deploy more than one lab on this physical host, add a unique name in the Prefix for VMs field. In this example we use Holo-A
- J. Leave Host/CB Password, NTP IP and DNS IP at default
- K. Leave Full Domain at default
- L. Check Deploy Edge Cluster
- M. Leave NSX S-net default at 10.1.0.0/16 (This is used for the Holodeck labs later)
- N. Select Deploy Workload Mgmt (Enables Tanzu/Container workloads later)
- O. Select Deploy AVN (used for vRealize and other infrastructure later)



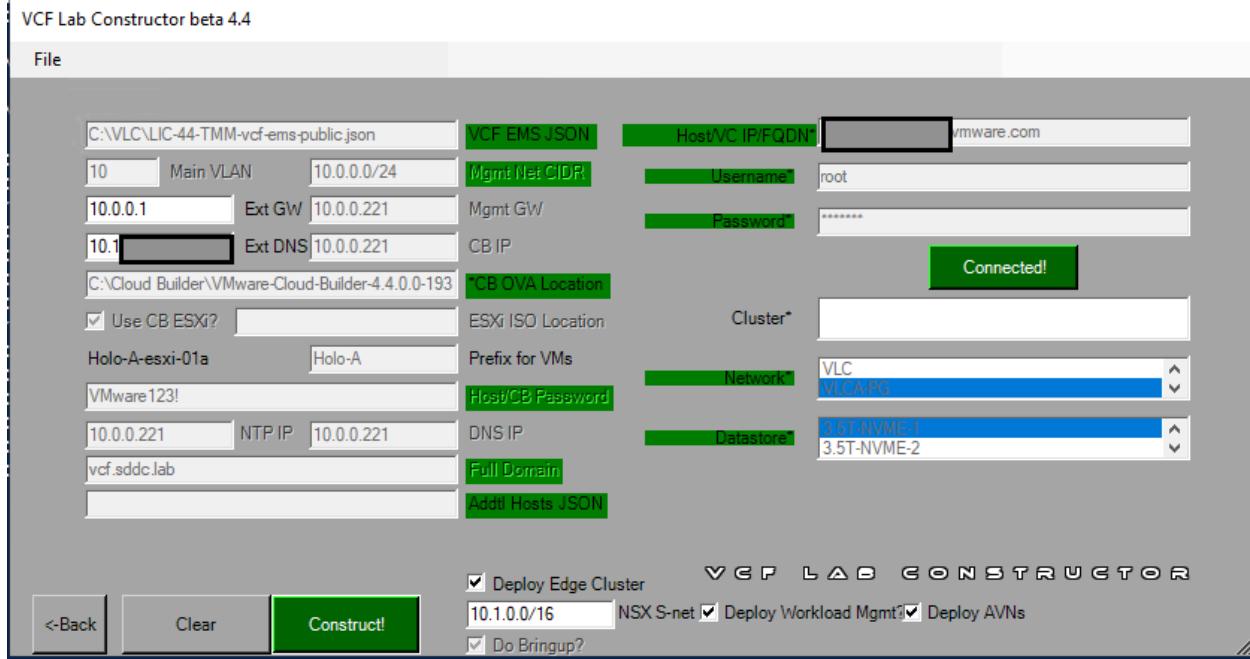
- P. Enter hostname, username and password for your ESXi host



- Q. Click Connect
- R. Select the portgroup and datastore you will use for this deployment. In this example we VLC-A-PG we created earlier



- S. Click Validate
- T. Your results should look like



U. Click Construct

V. VLC will deploy your configuration. The process takes about 3 hours

```

VCF Lab Constructor beta v4.4.1 - Process Window
03:33:05 :> Validating Free Space on Datastore 800GB or more for deployment, 300GB or more for Expansion.
03:33:06 :> current free space on datastore 3.5T-NVME-1 is 2172GB. Validation Passed.
Form is valid: True
03:33:06 :> Validation complete, all checks passed!
03:37:33 :> -----Inputs-----4.4.1--
03:37:33 :: password ca$hC0w
03:37:33 :: dnsServer 10.0.0.221
03:37:33 :: typeGuestDisk Thin
03:37:33 :: username root
03:37:33 :: cbiSOLoc C:\Cloud Builder\VMware-Cloud-Builder-4.4.0.0-19312029_ovf10.ova
03:37:33 :: useCBIso True
03:37:33 :: nestedVMPrefix Holo-A-
03:37:33 :: vcfDomainName vcf.sddc.lab
03:37:33 :: nsxSuperNet 10.1.0.0/16
03:37:33 :: deployWldMgmt True
03:37:33 :: masterPassword VMware123!
03:37:33 :: cbName CB-01a
03:37:33 :: deployAVNs True
03:37:33 :: cluster
03:37:33 :: esxhost [REDACTED] vmware.com
03:37:33 :: internalSvcs True
03:37:33 :: ds 3.5T-NVME-1
03:37:33 :: mgmtNetSubnet 10.0.0.0/24
03:37:33 :: mgmtNetVlan 10
03:37:33 :: addHostsJson
03:37:33 :: labDNS 10. [REDACTED]
03:37:33 :: vcfEMSFile C:\VLC\LIC-44-TMM-vcf-ems-public.json
03:37:33 :: buildOps
03:37:33 :: mgmtNetCidr 24
03:37:33 :: mgmtNetGateway 10.0.0.221
03:37:33 :: labGateway 10.0.0.1
03:37:33 :: deployEdgeCluster True
03:37:33 :: vsphereISOLOC
03:37:33 :: ntpServer 10.0.0.221
03:37:33 :: guestOS vmkernel165guest
03:37:33 :: cbIPAddress 10.0.0.221
03:37:33 :: netName VLCA-PG
03:37:33 :: bringupAfterBuild True
03:37:33 :> -----END-Inputs-----0
1
2
3
03:37:33 :> Importing CloudBuilder oVF
21
Opening OVA source: C:\Cloud Builder\VMware-Cloud-Builder-4.4.0.0-19312029_ovf10.ova
The manifest does not validate
Opening VI target: vi://root@w4-hs6-i1209.eng.vmware.com:443/
Deploying to VI: vi://root@w4-hs6-i1209.eng.vmware.com:443/
Disk progress: 55%

```

W. When complete, VLC will advise the user to click enter then access SDDC Manager via web browser

```
VCF Lab Constructor beta v4.4.1 - Process Window
id : urn:uuid:8bae5c5d-170d-4044-b35c-90def77c8b88
capabilities : @{transferIn=System.Object[]; transferOut=System.Object[]}
vcspVersion : 2

06:06:13 :> 8/4/2022 6:06:13 PM New-ContentLibrary An error occurred while trying to subscribe to a content library. For more details check the inner exception.
06:06:13 :> Problem connecting to https://wp-content.vmware.com/v2/latest/lib.json, setting up local content library.
06:06:13 :> You will need to manually download TKG photon images and put in this content library before you can deploy Tanzu.
06:06:15 :> Getting Cluster Info: domain-c8
06:06:19 :> Getting Storage Policy ID: aa6d5a82-1c88-45da-85d3-3d74b91a5bad
06:06:20 :> Getting DVS ID (key): 50 13 24 d3 ec af 25 8f-f6 bb bd 46 fd ed 93 aa
06:06:20 :> Getting portgroup ID: dvportgroup-12
06:06:20 :> Getting Edge Cluster ID: cfd0ad58-fb68-455f-bf8f-726ce41d3bfa
06:06:20 :> Load Workload Management API JSON for customization
06:06:20 :> Convert customized Workload Management config to JSON
06:06:21 :> POSTing Workload Management API - This takes ~45 minutes
06:06:21 :> Attempt: 0

06:06:22 :> workload Management config status: CONFIGURING
06:06:22 :> Checking again in 3 minutes.
06:09:23 :> workload Management config status: CONFIGURING
06:09:23 :> Checking again in 3 minutes.
06:12:24 :> Workload Management config status: CONFIGURING
06:12:24 :> Checking again in 3 minutes.
06:15:24 :> Workload Management config status: CONFIGURING
06:15:24 :> Checking again in 3 minutes.
06:18:25 :> Workload Management config status: CONFIGURING
06:18:25 :> Checking again in 3 minutes.
06:21:26 :> Workload Management config status: CONFIGURING
06:21:26 :> Checking again in 3 minutes.
06:24:27 :> Workload Management config status: CONFIGURING
06:24:27 :> Checking again in 3 minutes.
06:27:27 :> Workload Management config status: CONFIGURING
06:27:27 :> Checking again in 3 minutes.
06:30:28 :> Workload Management configured!
06:30:28 :> Configuring Namespace
06:30:28 :> Attempt: 0

06:30:28 :> Obtaining deployed Edge Cluster ID
06:30:28 :> Token Expired 06:30:28
06:30:29 :> Token Expired 06:30:29
06:30:35 :> Loading AVN API JSON - NSX_AVN_API.json
06:30:35 :> Adding Edge Cluster ID: c3e851b5-7441-4e48-af53-1c5d96558543
06:30:35 :> Calling AVN creation API - this takes < 5 minutes
06:30:45 :> Current task: Create Overlay AVN Segment in NSX-T
06:30:55 :> Complete!
06:30:55 :> Total RunTime: 02:53:22.7474564
06:30:55 :> Please open a browser and navigate to https://sddc-manager.vcf.sddc.lab
Your VCF SDDC setup is complete. Press enter to continue!: _
```

- X. Open a Chrome browser and click on the SDDC Manager bookmark
- Y. Ignore security warnings (click advanced and proceed to sddc-manager.vcf.sddc.lab)
- Z. Ignore security warnings (click advanced and proceed to vcenter-mgmt.vcf.sddc.lab as SDDC Manager use vCenter SSO for authentication)
- AA. Login as administrator@vsphere.local password VMware123!
- BB. Uncheck the VMware CEIP box
- CC. Your result should look like

The screenshot shows the VMware Cloud Foundation SDDC Manager Dashboard. The left sidebar includes sections for Solutions, Inventory (Workload Domains, Hosts), Lifecycle Management, Administration (Network Settings, Storage Settings, Licensing, Users, Repository Settings, Composable Infrastructure), vRealize Suite, and Security. A 'Tasks' section is also present. The main dashboard displays the following information:

- 1 Solutions**: Workload Management (1)
- 1 Workload Domains**: Management Domain (1), VI Domain (0)
- Host Type and Usage**: Host Types (Hybrid Host: 0, All Flash Host: 4), Usage (4 Total)
- CPU, Memory, Storage Usage**: CPU (112.61 GHz Total, 15.72 GHz Used, 96.88 GHz Free). Top Domains in allocated CPU Usage: mgmt-domain (13%).
- Memory**: 384 GB Total (165.92 GB Used, 218.08 GB Free). Top Domains in allocated Memory Usage: mgmt-domain (43%).
- Recent tasks**: Deploying overlay AVNs for default cluster of management domain (Succeeded, 8/4/22, 6:30 PM), Adding edge cluster EC-01 (Succeeded, 8/4/22, 5:27 PM).



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All rights reserved. This product is protected by U.S. and international copyright and intellectual property laws. VMware products are covered by one or more patents listed at vmware.com/go/patents. VMware is a registered trademark or trademark of VMware, Inc. and its subsidiaries in the United States and other jurisdictions. All other marks and names mentioned herein may be trademarks of their respective companies. Item No: vmw-wp-temp-uslet-word-101-proof 6/20