

==== VCF Lab Constructor (VLC) ==== Install Guide

Document Version 4 Rev 5

Created by

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Support Options

Questions about VCF ask  [@sddcommander](#)

Support for VLC on Slack [vlc-support.slack.com](#)

-----<Disclaimer>-----

If your reading this that means you want to test VMware Cloud Foundation (VCF) on Non-Certified Hardware in a nested environment. Just a word of caution before we start. While this does work for testing and demo's, **it is not supported by VMware GSS**. Use of this software is at your own risk, we are not responsible for damage to any systems. This software should only be used in a non-production lab environment. Also, because we're nesting three layers deep this will impact performance. So, if you are planning on showing any of this as a demo to a customer.

Please communicate to all customers that it will be slower than a physical environment.

-----</Disclaimer>-----

Welcome to VMware Cloud Foundation Lab Constructor

New Features for Version 4.1

- NSX Manager Timeout setting (45 minutes but further configurable if needed)
- PowerCLI 12.1 support <- This is required for VCF 4.1! (vSphere 7.0 U1)

Fixes

- Fixed tab stops in UI
- Fixed nested host OS type so Paravirtual can be seen/changed on single physical host
- Fixed Cluster pre-req checking on multiple clusters

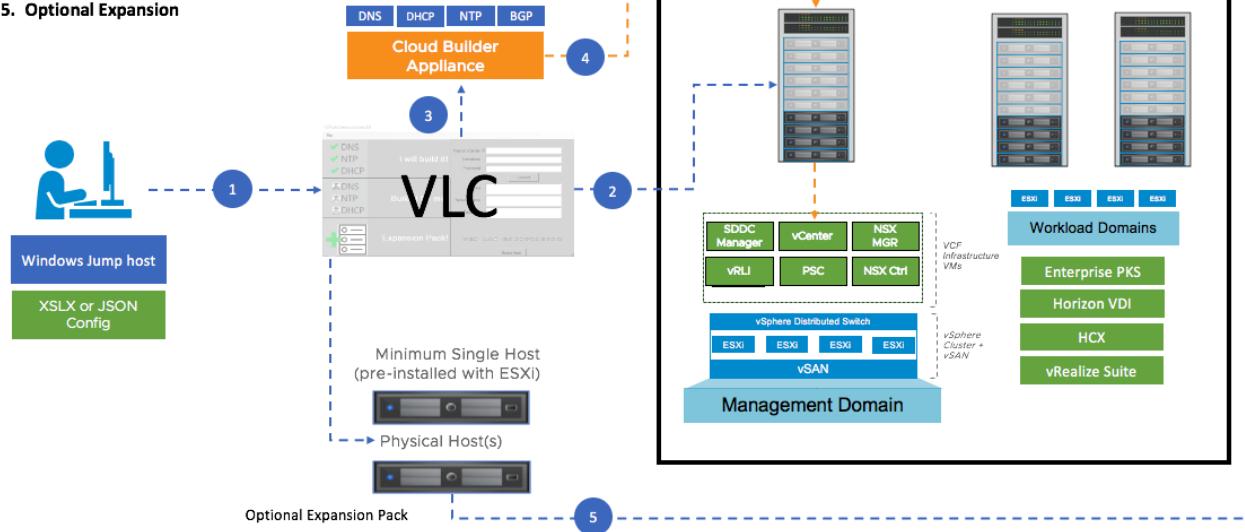
Overview

VMware Lab Constructor (VLC) is a utility intended to automate the deployment of VMware Cloud Foundation (VCF) in a nested environment. Although this is not a supported or recommended method for deploying VCF, this allows individuals to learn about VCF with a greatly reduced set of resource requirements.

In addition to deploying the nested infrastructure needed to support a VCF deployment, VMware Lab Constructor can also automate the deployment of VCF and configure required services, if desired.

The general flow of operations in a standard VLC enabled environment is depicted in the diagram below:

1. User Jump host runs VLC & provides JSON
2. VLC creates Nested HW based on JSON
3. VLC Deploys Cloud Builder & Imbedded Services
4. Cloud Builder deploys VCF via API or Manual
5. Optional Expansion



Quick Start Guide – using “Automated”

Step 1

You need a single physical host running ESXi 6.7+ with 12 cores, 128 GB RAM and 800 GB SSD. This is the minimum requirement for using VLC.

Configure the ESXi host in one of four configurations:

1. Standalone ESXi (no vCenter) – Using VSS
2. ESXi host with vCenter – Using VSS
3. Single ESXi host in a Cluster - Using VDS
4. Multiple ESXi hosts in a vSAN Cluster – Using VDS (**Note: This requires the use of extra ESX CLI commands. See below for more details.**)

Set the vSwitch to MTU = 9000

Set vSwitch = Trunked portgroup

On the vSwitch, create a portgroup for VCF. On the portgroup (not the switch) set the following security settings:

- Promiscuous Mode = Accept
- Allow Forged Transmits = Accept
- Allow MAC Address Changes = Accept

If in a cluster configuration, disable all HA and DRS and VMotion on the **physical host(s)**.

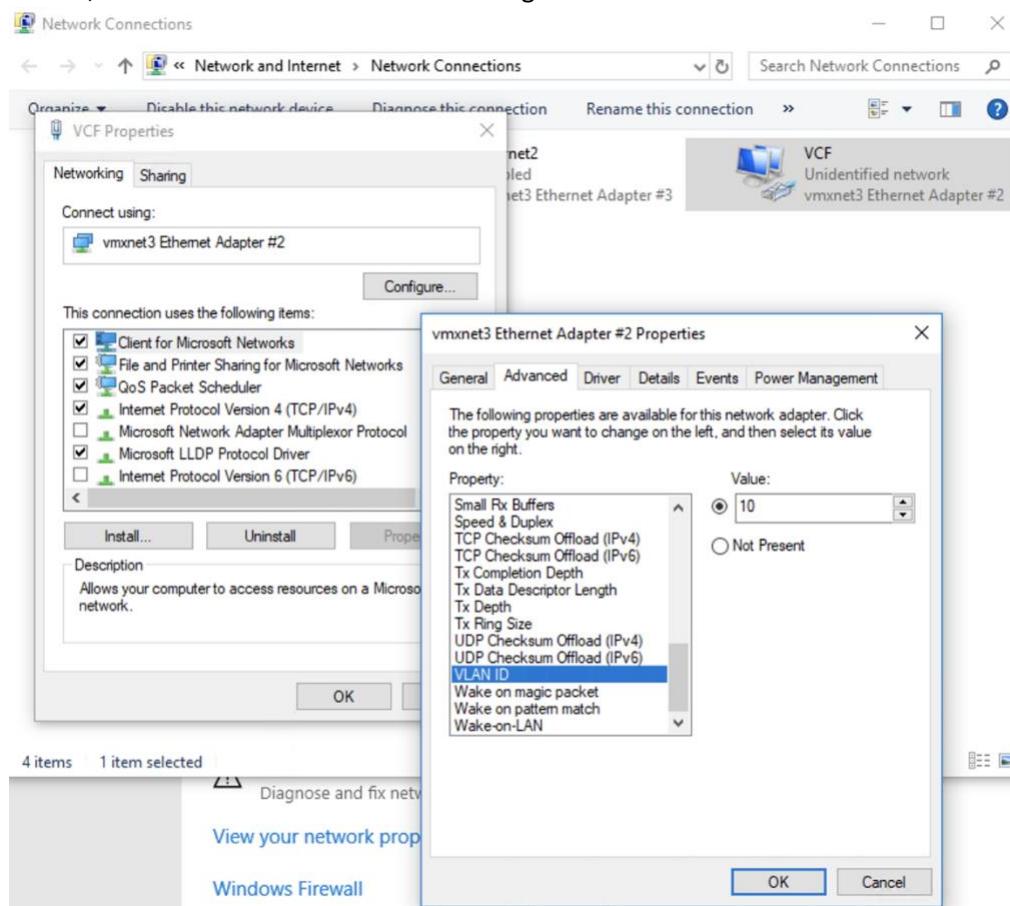
Step 2

Build a Windows-based jump host on this ESXi host as a VM.

- Windows 10/2012/2016 (Older versions are not supported)
- Powershell 5.1+
- PowerCLI 12.1+
- OVFTool 4.3+
- .Net Framework
- VMXNET3 NICs
 - MTU 1500

On this jump host, attach two virtual NICs.

- Attached one NIC to your local LAN Network so you can RDP to it.
- Attach the second NIC to the VCF PortGroup created in Step 1 and configure it with the IP 10.0.0.220. Set the DNS on the second NIC to 10.0.0.221. The 10.0.0.221 address will be the address assigned to the Cloud Builder appliance, by default. VLC will modify the Cloud Builder appliance so that it provides specific services, like DNS, for the nested environment. Thus, this using this IP for DNS will allow you to access the nested VCF environment when using the default configuration file in Automated mode.
- This second NIC will also need to be configured to use the VLAN of your management network, in the default Automated VLC configuration this is VLAN 10:



Note: Use of a jump host with a single NIC will work, but proper routing must be configured for all networks that VLC uses.

Disable Windows Firewall.

Turn off Windows Defender Real-time Scanning. Note: this has a habit of resetting after reboots of the Windows VM.

Step 3

On the Windows jump host, create a local disk folder for VLC. This must be a local attached disk (i.e. "C:\VLC\ ") as mapped Network drives will fail.

Download the VCF Software (Cloud Builder OVA) into this folder.

(Optional) Download the vSphere ESXi ISO that matches the version required for VCF. The easiest method to do this is to simply copy the .iso file located on the Cloud Builder appliance. To make this even easier, VLC now provides an option where it will download this file directly from the Cloud Builder appliance that it deploys.

Download and extract the VLC package to this folder as well

Optional software to download on the jump host:

- [Putty](#) - or your favorite SSH tool
- [Notepad++](#) - or your favorite text editor
- [WinSCP](#) - for easy file transfers

Ensure time is in relatively in sync (within a minute or so) across the jump host and physical infrastructure you are deploying to.

Choice of AVN or No AVN when Deploying VLC

What is AVN? [See this blog](#)

Multiple sample bringup JSON formatted files are provided with VLC. The selection of the bringup JSON file will dictate if AVN will be implemented at bringup or not. Regardless of which bringup file is to be used, you will need to edit the file to be used in order to define the license keys to be used. The default configuration files do not include any license keys.

Using a text editor, edit the appropriate file, as desired:

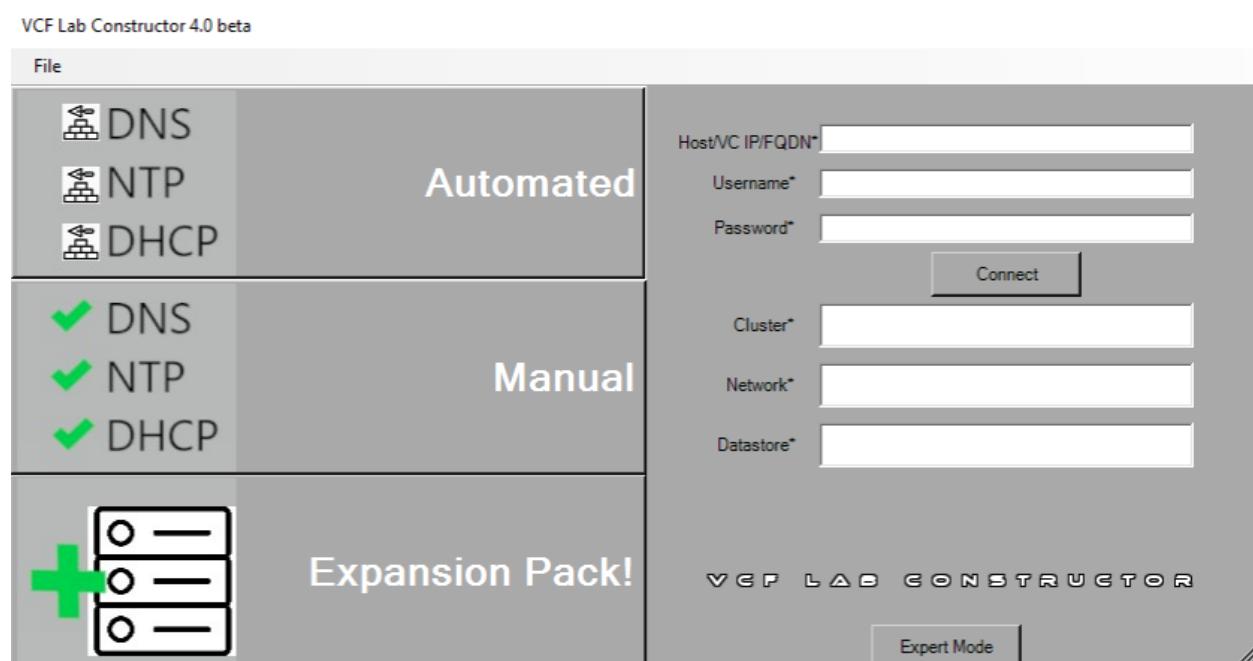
- **Without AVN**
 - **Insert your license keys into the AUTOMATED_NO_AVN_VCF_VLAN_10-13_NOLIC_v41.json file.**

- Look for all of the lines in the JSON file containing:
 - "licenseFile": "<Insert XXXXX License>"
 - Replace the quoted text with a valid license key
 - Do not edit anything else in the JSON
- With AVN
 - Insert your license keys into the AUTOMATED_AVN_VCF_VLAN_10-13_NOLIC_v41.json file.
 - Look for all of the lines in the JSON file containing:
 - "licenseFile": "<Insert XXXXX License>"
 - Replace the quoted text with a valid license key
 - Do not edit anything else in the JSON

Either open a Powershell window (as Administrator) and execute the VLC PowerShell Script "C:\VLC\VLCGUI.ps1" or right click on the VLCGUI.ps1 and select 'Run with PowerShell'.

VLC UI will Launch

Select the "Automated" Button

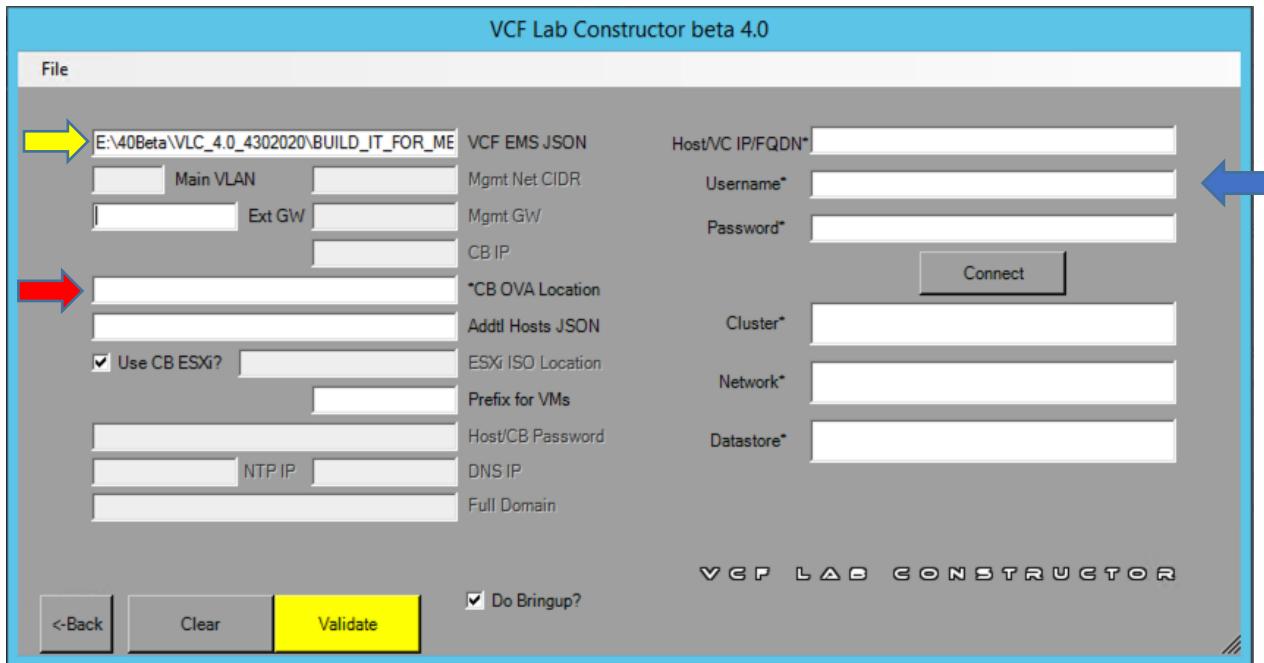


Click on the field titled 'VCF EMS JSON' and select the JSON file that you just entered the license keys for.

Click on the CB OVA Location field to select the location of the CB OVA.

(Optional) Enter the External GW for the Cloud Builder Appliance to use. This allows you to point to a gateway that will allow internet access.

On the right side of the UI, enter the information for where you wish to deploy to. This can be a vCenter Login or a direct ESXi login, depending on your lab.



Click the **Connect** Button

VLC will connect to the host or vCenter you specified and will validate all necessary settings. It will then populate the Cluster, Network, and Datastore fields with information gathered from your environment.

Select the cluster, network (port group) and datastore that you desire VLC to install the nested lab to. The Cluster field will not display any value if you are deploying directly to a single ESXi host.

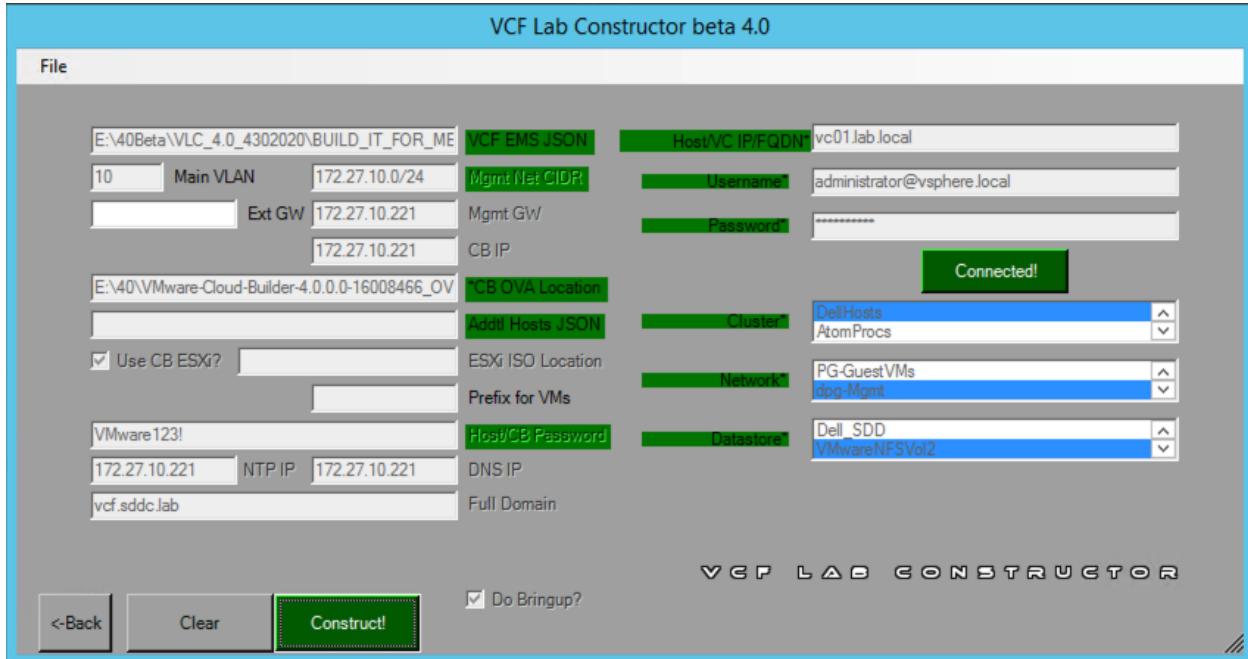
** If your port group does not show up, you may check to see if the following has been set explicitly on the port group and **not just the switch**:

- Promiscuous Mode = Accept
- Allow Forged Transmits = Accept
- Allow MAC Address Changes = Accept

Click the yellow **Validate** button

As VLC validates the information, it will mark the fields in green. When everything has been validated, the Validate button will change to a green button that says 'Construct'.

Click Construct to begin the deployment of VMware Cloud Foundation.



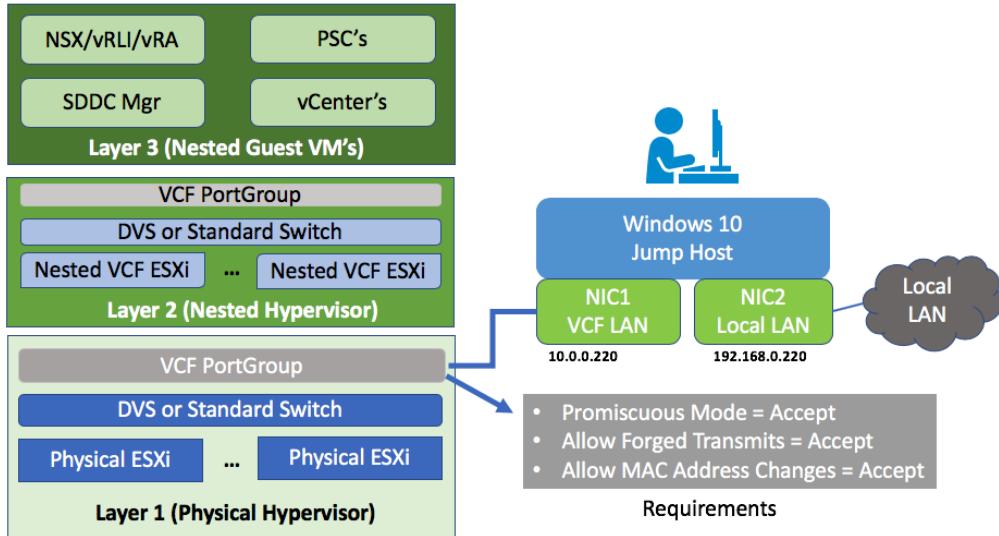
The process will take some time to complete. On average, expect to wait three and a half hours for the deployment process to complete.

VCF Lab Constructor Overview

This document will not explain what VCF is. Please see the [VMware Documentation](#) for that. This will only cover how this nested version works, how to set it up, and access it.

Let's start by explaining how we are virtualizing a full hardware set for VCF. Below is a physical to logical view of the setup.

Nested VCF Layers



Creating Layer 1

Layer 1 is your physical lab equipment. This can be one host or many hosts setup in a cluster with a vCenter. This can also run on a physical vSAN cluster. Providing the physical equipment to run this on is up to you. The requirements for the physical layer are listed below in the detailed requirements section.

Note: If you do use a physical vSAN, there is a requirement listed below.

Creating Layer 2 – Learning the 3 Methods

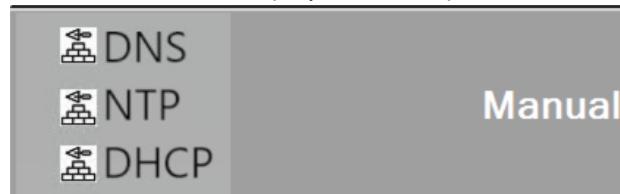
Layer 2 and layer 3 are installed by the VLC script. VLC will begin by setting up layer 2. (i.e., this will create a nested virtual version of the hardware requirements for VCF.)

Method 1 – Automated



Using Method 1 means you want this VLC software to provide the required services for you.

Method 2 - Manual (Expert Mode)



Using Method 2 assumes you will provide the required services as spelled out in the VCF documentation. This includes DNS, NTP, DHCP, and BGP routing services. Refer to the official [VMware VCF documentation](#) for exactly what is required.

Method 3 – Expansion Pack



Expansion Pack!

Using this method assumes that you have already built a complete lab using either Method 1 or 2 and now you want to add more nested hosts to this existing environment.

Building your first four Hosts with Method 1 or 2

Selecting Method 1 or 2 will build your first four hosts for the Management Domain. This is done by creating four virtual nested ESXi hosts. These nested hosts are automatically sized and created for you. You are able to configure the hostnames and IP addresses to be used within the configuration file that you provide the VCF Lab Constructor.

The VCF Lab Constructor package comes with two sample files. These are:

- AUTOMATED_NO_AVN_VCF_VLAN_10-13_LIC_v41.json
 - A sample configuration that will not deploy AVN
- AUTOMATED_AVN_VCF_VLAN_10-13_LIC_v41.json
 - A sample configuration that will deploy AVNs

These files not only define the information for the nested hosts to be created, but it also will be used to complete the VCF bringup process.

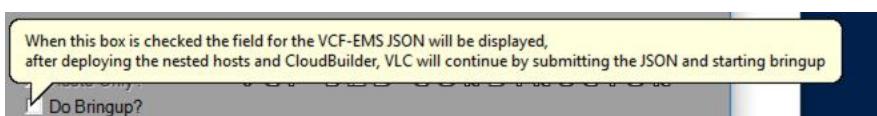
You can modify these files to suit your particular lab or preferences. It's advisable to create duplicates of the included files before you modify them.

You are required to insert your license keys into the configuration file to be used.

Look for the "licenseFile": "<Insert XXXXX License>", sections in the JSON file.

Creating Layer 3 - Cloud Builder – Bring-up

The next phase is called the “Bring-up process”. This is a fully [documented process](#) in the installation of VCF. Using the VCF Lab Constructor will allow you to manually do this so you can follow the steps of the official [VMware Documentation](#), or if you check the box in the GUI the VCF Lab Constructor will complete Bring-up for you automatically.



During the bring up process VCF will use the four nested hosts and build them into a vSAN cluster and create the Management Domain.

Once bring up is complete, you will have a fully deployed VCF in your nested environment.

Accessing the VCF UI

Because the VCF components are installed on Layer 3 you may be thinking “How do I get network access to it?”. To gain access, your jump host will need a NIC with multiple IP addresses or you will need multiple NICs. This is diagrammed below in the jump host requirements. Be aware that because everything is nested inside Layer 2 all network traffic is being broadcast back up to Layer 1 port groups. Simply having your jump host on this subnet or port group and listening on the default VCF subnet i.e. (192.168.0.0) will allow you to access everything in layer 3. The jump host can also be nested at layer 1 or a physical desktop that has access to the same subnet. Nesting it at Layer 1 has the best performance.

This concludes the overview of the VCF Lab Constructor.

Advanced Expert Mode Notes

Physical Install Requirements

Advanced Install

Use Case - Complete basic install and additionally be able to create multiple Workload Domains or install additional optional components (vROPs, vRA, vRNI)

4+ Sockets – 12+ Cores Each

Total RAM Requirements – 768GB – 2TB RAM

Note: your mileage may vary based upon how many of these optional components you choose to install. The more RAM and CPU you can provide the better.

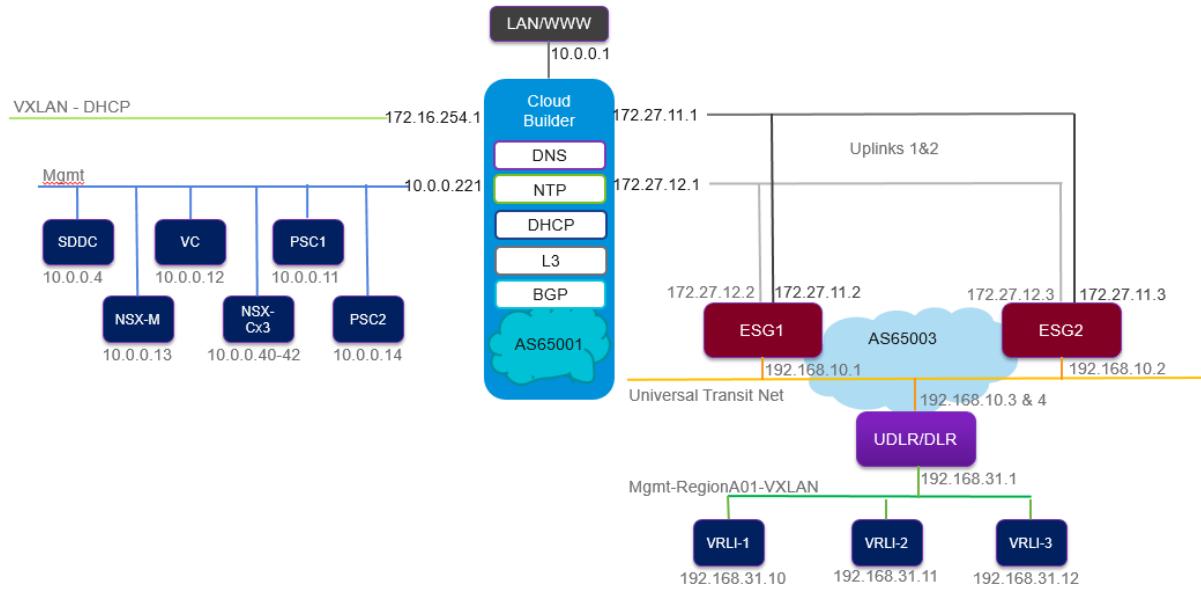
- **Physical Hardware Running vSphere 6.7 or Higher**
 - 2TB+ GB of Disk (preferably high-speed flash for best results)
 - If you try to deploy this on spinning disk, you may spend forever troubleshooting. **You have been warned!**
- **Note:** If you modify the included JSON for BringUp or use the XLSX, ensure that the MTU of the vSAN and vMotion Network Pools is set to 8940. This is required because the nested packet being passed up to the Physical Layer DVS needs overhead packet capacity
- Disable all HA and DRS and VMotion on the Physical Host(s)
- Build your own L3 BGP Router (**Required for VCF 3.9.1 and optional for VCF 4.0**)

- Instructions here include the use of a VLC built-in router injected using the *Automated* button with VLC using Cloud Builder. You can also use your own existing physical or virtual router. Regardless of the configuration you chose to use, the end requirement is to have a working BGP router correctly configured within the environment.
- **Optional – Other Scenarios**
 - If you are running vSAN on physical hosts, run this command on all hosts
 - `esxcli system settings advanced set -o /VSAN/FakeSCSIReservations -i 1`
 - If you are using an ESXi host that is controlled by a vCenter and you want to target that single host **instead** of the vCenter you will need to do the following:
 - Stop communication between the host and the vCenter Server by stopping these services with the commands:
 - `/etc/init.d/vpxa stop`
 - `/etc/init.d/hostd restart`
 - After these commands have executed, the ESXi host will have stopped communicating with the vCenter Server. At this point, execute the VLC script to build the lab. After the deployment completes, start the vpxa service to add the ESXi host back to vCenter by running the command:
 - `/etc/init.d/vpxa start`

Expert Mode – Manual

If you select the Manual deployment model, you are required to provide all the required VCF services. This includes DNS, DHCP, NTP, and BGP routing.

When using the Automated deployment model, VLC configures the Cloud Builder appliance to provide the required services. It will also automatically install software packages on the Cloud Builder appliances to support these services. This is represented in the diagram below. Use this diagram as a basis to build a similar network configuration for your environment, utilizing whatever you desire for these core services.



Performing the Manual Mode of deployment requires you to provide a suitable JSON formatted file. Two sample files are included with VLC:

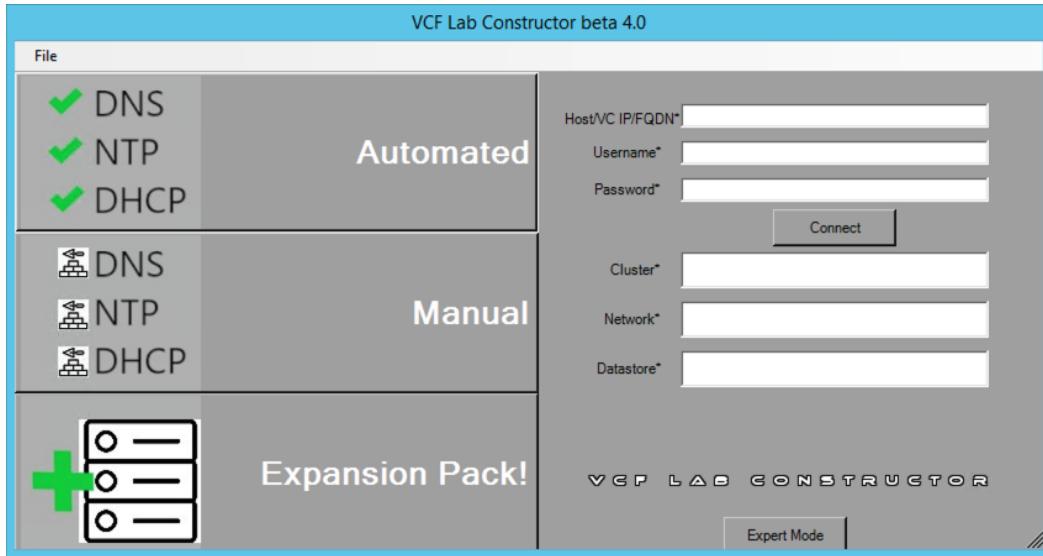
- AUTOMATED_NO_AVN_VCF_VLAN_10-13_LIC_v41.json
 - A sample configuration that will not deploy AVN
- AUTOMATED_AVN_VCF_VLAN_10-13_LIC_v41.json
 - A sample configuration that will deploy AVNs

When performing a Manual Mode deployment, you may wish to make a copy of one of these sample files and modify it to match your desired environment. Common changes include changing the naming, VLAN IDs, or the DNS/NTP IPs.

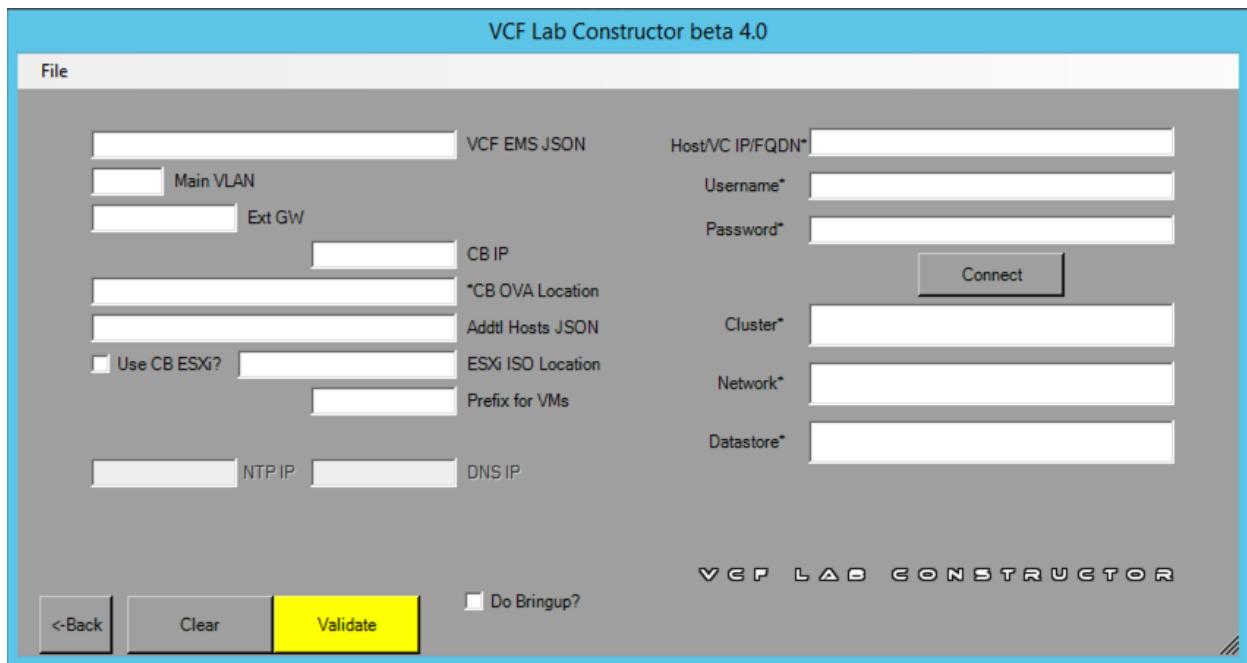
Note you can also use the Cloud Builder appliance to generate a json file based on a completed Bringup Excel worksheet. See the VMware Cloud Foundation documentation for details.

Building in Expert Mode

1. From the jump host, execute the VLC PowerShell script: VCLGui.ps1
2. Powershell will open and run a few checks.
3. Wait for the following window to appear:



4. Select the **Manual** Method.



5. Enter the path to your ***Custom VCF.json***
6. Enter the IP to use for the Cloud Builder appliance
7. Enter the path for the Cloud Builder OVA
8. (Optional) Enter the path for the Additional Hosts JSON file. This will automatically create additional nested hosts that you can use to expand your VCF deployment. You can always use the Expansion Pack option to add additional hosts after a deployment.
9. (Optional) Uncheck the 'Use CB ESXi' and enter the path for the ESXi ISO
10. Enter a naming prefix for the first four hosts in the Management Domain.

11. Enter the Host or vCenter IP information of the physical environment that you would like to use to deploy to.
 - a. Enter the Username and password to connect to this infrastructure, be advised that the password will be captured in clear text in the log and ini files. Secure as needed.
12. Click Connect
 - a. The Constructor will now connect to the host or vCenter you specified and will gather information on suitable targets. Once completed, it will populate the information in the Cluster, Network and Datastore fields for selection.
13. Using the all-flash button will deploy your Layer 2 ESXi hosts as All-Flash vSAN nodes. Note: By default, vSAN uses more RAM when using SSDs.
14. Click on File, to save your data entry configuration to an .ini file before you start the deployment. This will save you time when you start over. Note: You can also load previously saved configuration information from this menu.
15. Click Validate and wait until all the components turn green. Address any errors as needed.
16. Click Construct to begin the deployment process.

Once you click construct, VCF Lab Constructor will build the nested ESXi hosts you specified in the JSON and configures the hosts to work with the Cloud Builder appliance.

Next it will automatically deploy the Cloud Builder appliance

Once the Cloud Builder is deployed and running you can connect to it at this URL:

https://<Cloud_Builder_VM_IP>

If you selected the option for VLC to perform bring-up, no action is required form you. VLC will monitor the bringup progress for you in the PowerShell window. However, if you still want to see the UI, you can access by completing the following steps:

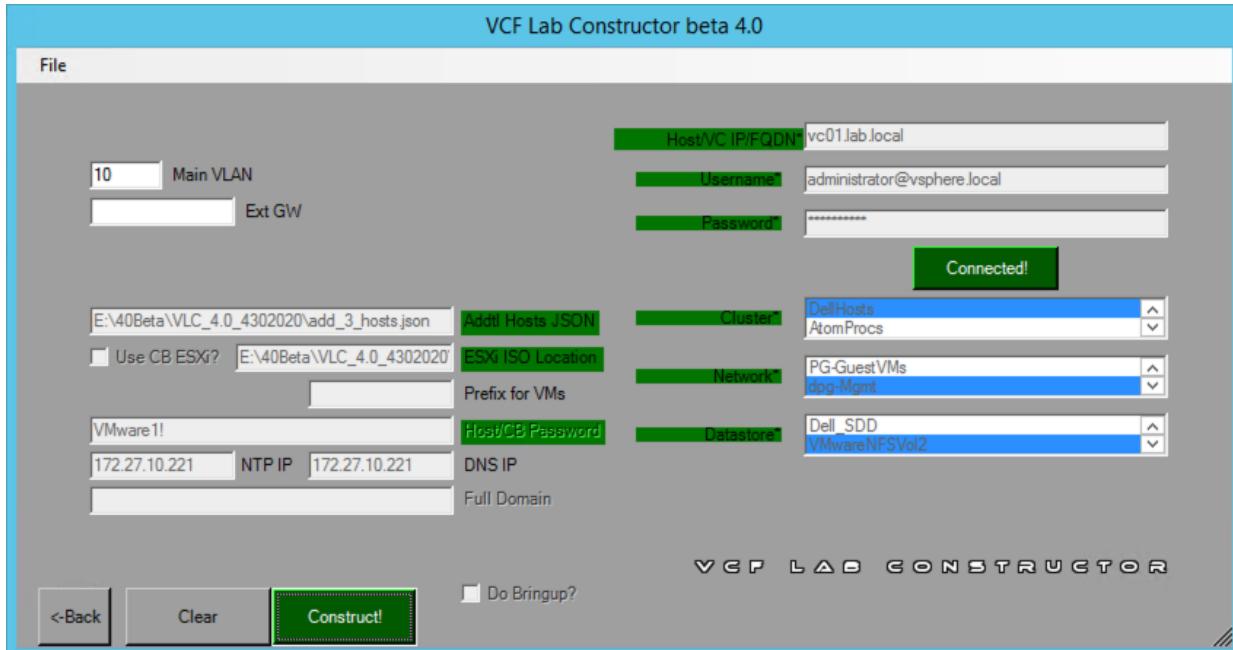
- Log in to the Cloud Builder UI. Use the username (admin) and password (VMware123!) that you set in the VLC GUI.
- Click the checkboxes and then continue to click Next until you get to the file upload.
- Select one of the sample json configuration files file and click Next
- IMMEDIATELY click "Cancel" in the blue bar to the left
- Change the end of the URL to /bringup-result and press enter

This will allow you to see all the bringup UI tasks and the progress of the deployment. If there are any errors or failures this will display the relevant error. Depending on what failed, you may be able to use the retry feature to restart a failed task after you have corrected the issue.

If you did not opt to have VLC perform bringup automatically, you will need to complete the bringup process manually as per the [VMware Documentation](#).

Using Expansion Pack

Congratulations! If you have traveled this far that means you have successfully deployed VCF in a nested lab and you are ready to scale out your installation.



There are two use case scenarios for the expansion pack.

Manual > Expansion Pack

Using this method means you have created DNS entries with the host names your adding to the environment on your DNS server. VLC will continue to use your DNS server.

Automated > Expansion Pack

This method means that you have used the Automated method to deploy your environment. As such, VLC has configured the Cloud Builder appliance to provide essential infrastructure services. Before adding additional hosts, you will need to add the appropriate DNS entries to the Cloud Builder configuration.

Adding DNS entries

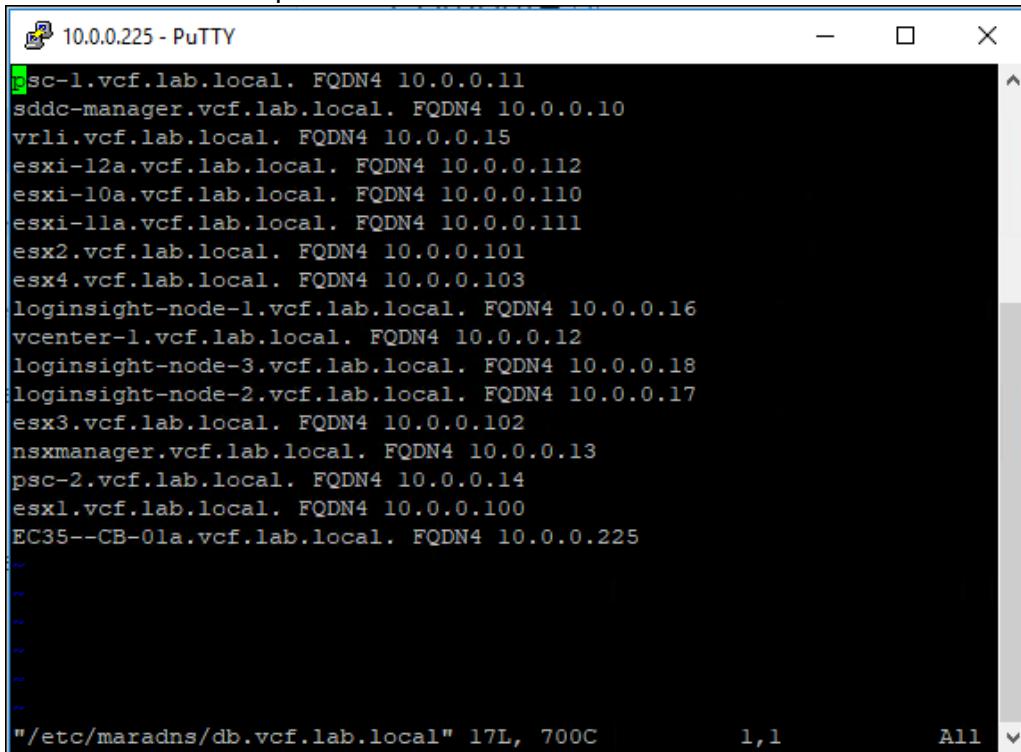
Use SSH to connect to your Cloud Builder VM and log in using the username (admin) and the password that you specified in the VLC GUI when you deployed the environment.

You will need to edit the DNS "db" file for the zone specified. As an example, assume that the domain 'vcf.lab.local' was used during the creation of the nested environment. This would mean the zone file would be located here: /etc/maradns/db.vcf.lab.local

Edit the file using vi:

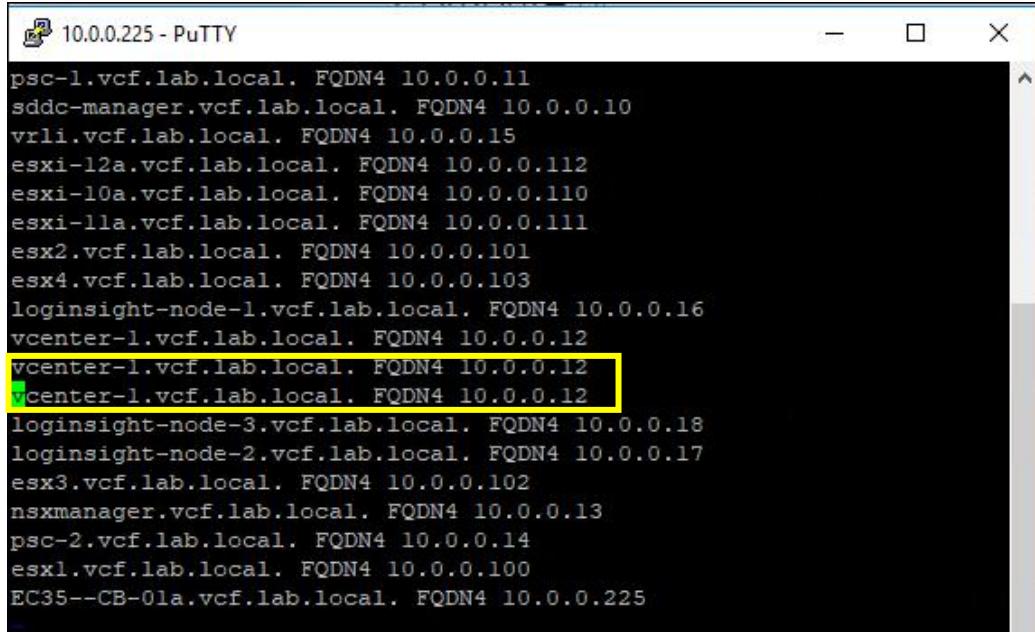
```
root@EC35--CB-0la [ ~ ]# vi /etc/maradns/db.vcf.lab.local
```

The result of this command opens the db zone file in the VI editor:



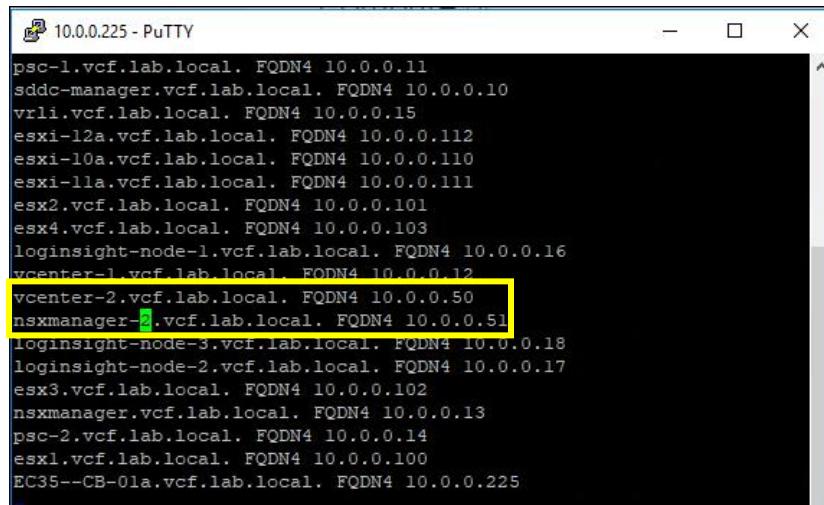
```
psc-1.vcf.lab.local. FQDN4 10.0.0.11
sddc-manager.vcf.lab.local. FQDN4 10.0.0.10
vrli.vcf.lab.local. FQDN4 10.0.0.15
esxi-12a.vcf.lab.local. FQDN4 10.0.0.112
esxi-10a.vcf.lab.local. FQDN4 10.0.0.110
esxi-11a.vcf.lab.local. FQDN4 10.0.0.111
esx2.vcf.lab.local. FQDN4 10.0.0.101
esx4.vcf.lab.local. FQDN4 10.0.0.103
loginsight-node-1.vcf.lab.local. FQDN4 10.0.0.16
vcenter-1.vcf.lab.local. FQDN4 10.0.0.12
loginsight-node-3.vcf.lab.local. FQDN4 10.0.0.18
loginsight-node-2.vcf.lab.local. FQDN4 10.0.0.17
esx3.vcf.lab.local. FQDN4 10.0.0.102
nsxmanager.vcf.lab.local. FQDN4 10.0.0.13
psc-2.vcf.lab.local. FQDN4 10.0.0.14
esx1.vcf.lab.local. FQDN4 10.0.0.100
EC35--CB-0la.vcf.lab.local. FQDN4 10.0.0.225
~  
~  
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~
```

Duplicate the line of the currently defined vcenter by moving the cursor to that line using the arrow down key and then pressing YYPP in that order. Once that is done, you should see something like this:



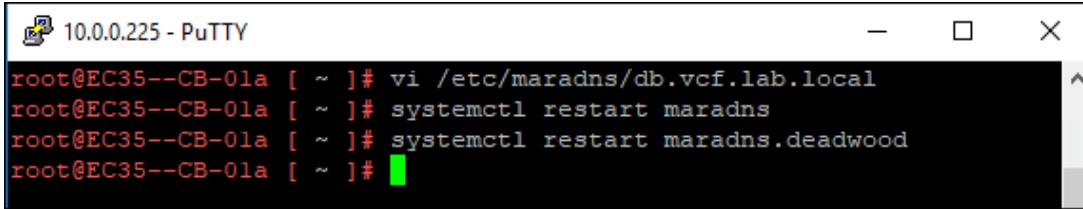
```
psc-1.vcf.lab.local. FQDN4 10.0.0.11
sddc-manager.vcf.lab.local. FQDN4 10.0.0.10
vrl1.vcf.lab.local. FQDN4 10.0.0.15
esxi-12a.vcf.lab.local. FQDN4 10.0.0.112
esxi-10a.vcf.lab.local. FQDN4 10.0.0.110
esxi-11a.vcf.lab.local. FQDN4 10.0.0.111
esx2.vcf.lab.local. FQDN4 10.0.0.101
esx4.vcf.lab.local. FQDN4 10.0.0.103
loginsight-node-1.vcf.lab.local. FQDN4 10.0.0.16
vcenter-1.vcf.lab.local. FQDN4 10.0.0.12
vccenter-1.vcf.lab.local. FQDN4 10.0.0.12
vccenter-1.vcf.lab.local. FQDN4 10.0.0.12
loginsight-node-3.vcf.lab.local. FQDN4 10.0.0.18
loginsight-node-2.vcf.lab.local. FQDN4 10.0.0.17
esx3.vcf.lab.local. FQDN4 10.0.0.102
nsxmanager.vcf.lab.local. FQDN4 10.0.0.13
psc-2.vcf.lab.local. FQDN4 10.0.0.14
esx1.vcf.lab.local. FQDN4 10.0.0.100
EC35--CB-0la.vcf.lab.local. FQDN4 10.0.0.225
```

After this you will change the newly copied lines name and IP addresses, ensuring that the IP addresses are not already in use! For those not familiar with VI commands here is a cheat sheet: <https://devhints.io/vim>



```
psc-1.vcf.lab.local. FQDN4 10.0.0.11
sddc-manager.vcf.lab.local. FQDN4 10.0.0.10
vrl1.vcf.lab.local. FQDN4 10.0.0.15
esxi-12a.vcf.lab.local. FQDN4 10.0.0.112
esxi-10a.vcf.lab.local. FQDN4 10.0.0.110
esxi-11a.vcf.lab.local. FQDN4 10.0.0.111
esx2.vcf.lab.local. FQDN4 10.0.0.101
esx4.vcf.lab.local. FQDN4 10.0.0.103
loginsight-node-1.vcf.lab.local. FQDN4 10.0.0.16
vccenter-1.vcf.lab.local. FQDN4 10.0.0.12
vccenter-2.vcf.lab.local. FQDN4 10.0.0.50
nsxmanager-2.vcf.lab.local. FQDN4 10.0.0.51
loginsight-node-3.vcf.lab.local. FQDN4 10.0.0.18
loginsight-node-2.vcf.lab.local. FQDN4 10.0.0.17
esx3.vcf.lab.local. FQDN4 10.0.0.102
nsxmanager.vcf.lab.local. FQDN4 10.0.0.13
psc-2.vcf.lab.local. FQDN4 10.0.0.14
esx1.vcf.lab.local. FQDN4 10.0.0.100
EC35--CB-0la.vcf.lab.local. FQDN4 10.0.0.225
```

After making your changes and saving the file you will need to reload maradns and the maradns.deadwood services. MaraDNS takes care of forward lookups and Deadwood takes care of Reverse DNS.

A screenshot of a PuTTY terminal window titled "10.0.0.225 - PuTTY". The window shows a root shell session on a host named "EC35--CB-01a". The user has run several commands: "vi /etc/maradns/db.vcf.lab.local", "systemctl restart maradns", "systemctl restart maradns.deadwood", and a final command whose output is partially obscured by a green highlighter.

You would follow this same procedure for adding DNS entries for vRSLCM, vROps, vRA, Horizon, or any other component. Note: Certain software (like vROps, vRA, and Horizon) are not automated in VCF 4.0 via SDDC Manager. You may need to follow the manual guidance presented in the VCF documentation to deploy these software packages.

Examples of the DNS files

```
psc-1.vcf.lab.local. FQDN4 172.27.10.11
esxi-4.vcf.lab.local. FQDN4 172.27.10.103
sddc-manager.vcf.lab.local. FQDN4 172.27.10.10
esxi-3.vcf.lab.local. FQDN4 172.27.10.102
nsxmanager.vcf.lab.local. FQDN4 172.27.10.13
loginsight-node-1.vcf.lab.local. FQDN4 172.27.10.16
vcenter-1.vcf.lab.local. FQDN4 172.27.10.12
loginsight-node-3.vcf.lab.local. FQDN4 172.27.10.18
loginsight-node-2.vcf.lab.local. FQDN4 172.27.10.17
esxi-1.vcf.lab.local. FQDN4 172.27.10.100
esxi-10a.vcf.lab.local. FQDN4 172.27.10.110
esxi-11a.vcf.lab.local. FQDN4 172.27.10.111
esxi-12a.vcf.lab.local. FQDN4 172.27.10.112
esxi-2.vcf.lab.local. FQDN4 172.27.10.101
psc-2.vcf.lab.local. FQDN4 172.27.10.14
load-balancer.vcf.lab.local. FQDN4 172.27.10.15
EC35-CB-01a.vcf.lab.local. FQDN4 172.27.10.225
esxi-100a.vcf.lab.local. FQDN4 10.1.0.110
esxi-110a.vcf.lab.local. FQDN4 10.1.0.111
esxi-120a.vcf.lab.local. FQDN4 10.1.0.112
```

If you add hosts on a different network, you'll need to update the /etc/dwood3rc file and add in the in-addr.arpa for that network.

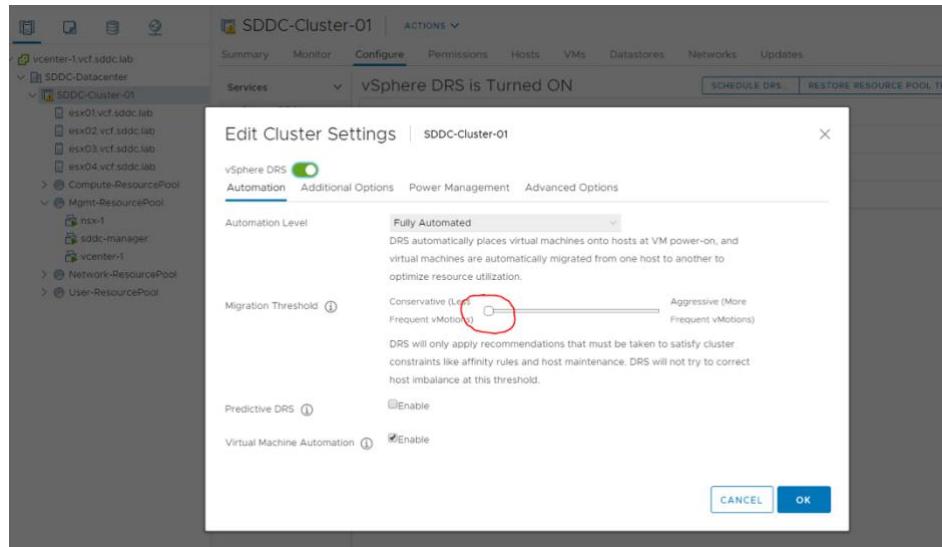
```
bind_address = "172.27.10.225"
chroot_dir = "/etc/maradns"
upstream_servers = {}
upstream_servers["."] = "8.8.8.8, 8.8.4.4"
upstream_servers["0.0.10.in-addr.arpa."] = "127.0.0.1"
upstream_servers["0.1.10.in-addr.arpa."] = "127.0.0.1"
```

```

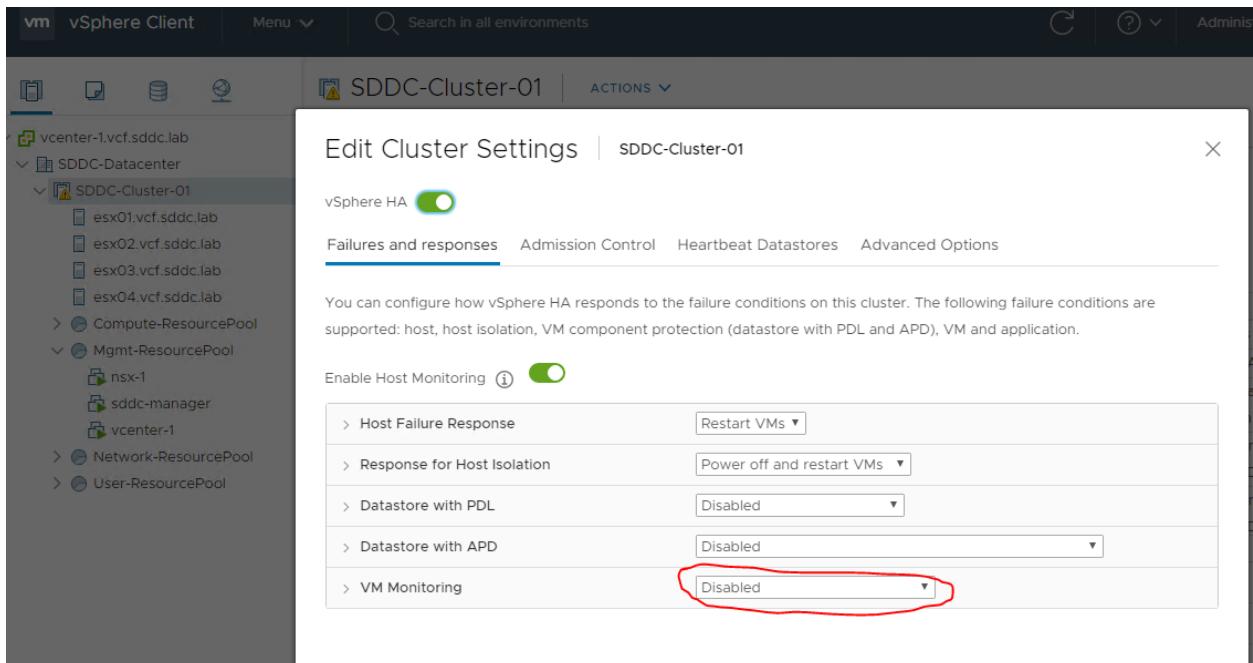
upstream_servers["vcf.lab.local."] = "127.0.0.1"
upstream_servers["corp.local."] = "172.27.10.250"
recursive_acl = "172.27.10.0/24"
filter_rfc1918 = 0

```

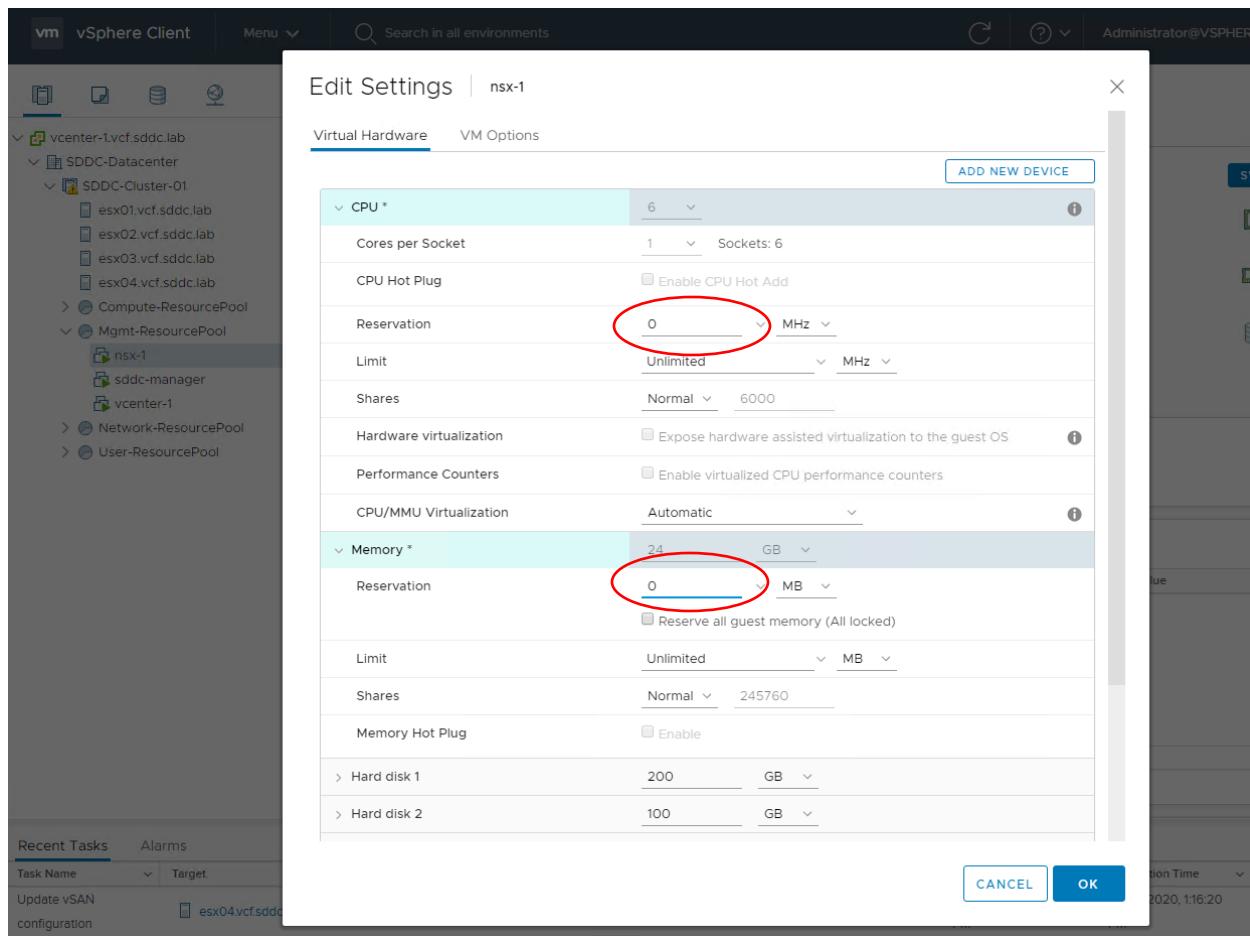
Screen shots - Step by Step - User Guide – Enabling vSphere with Kubernetes on VLC



1 In vcenter-1.vcf.lab.local Set DRS to Conservative on SDDC-Cluster-01



2 In vcenter-1.vcf.lab.local Disable HA- VM Monitoring on SDDC-Cluster-01



3: In vcenter-1.vcf.lab.local Remove reservation on NSX-1

SDDC Manager vSphere - SDDC-Cluster-01 - vSp +

Not secure | sddc-manager.vcf.sddc.lab/ui/sddc-manager/inventory/hosts/modal/bulk-host-commission//monitoring-panel:monitoring/tasks)

VM Cloud Foundation administrator@vsphere

Commission Hosts

1 Host Addition and Validation

2 Review

Host Addition and Validation

You can either choose to add host one at a time or download JSON template and perform bulk commission.

Add new **Import** (1)

Select JSON File **add_3_hosts_bulk_commission VSAN.json** (2)

CLEAR UPLOAD

Hosts Added

Confirm fingerprint (click to) and then validate hosts before proceeding to commission

FQDN	Network Pool	IP Address	Validation Status
esx10.vcf.sddc.lab	network-pool-1	172.27.10.110	Not Validated (3)
esx11.vcf.sddc.lab	network-pool-1	172.27.10.111	Not Validated (4)
esx12.vcf.sddc.lab	network-pool-1	172.27.10.112	Not Validated (5)

VALIDATE ALL (4)

CONFIRM FINGERPRINT (3)

CANCEL **NEXT** (5)

COMMISSION (6)

4 In sddc-manager.vcf.lab.local Commission hosts using import.

Licensing

Product Name	License Key	Description	Status	Expiry Date	Unit	Used	Available	Total
VMware vSphere	EJOTL-99GB5-88VUI-0YNAP-3BNNZ	VMware vSphere Licen...	Active	9/29/25	CPU Packages	4	995	1000

Add License Key

Product Name: VMware vSphere

License Key: WLD ESXi

Description: WLD ESXi

ADD

5 Add Licenses for WLD, may include vSphere w Kubernetes, additional vSAN, and NSX

Virtual Infrastructure (VI)

Capacity Utilization across Domains:

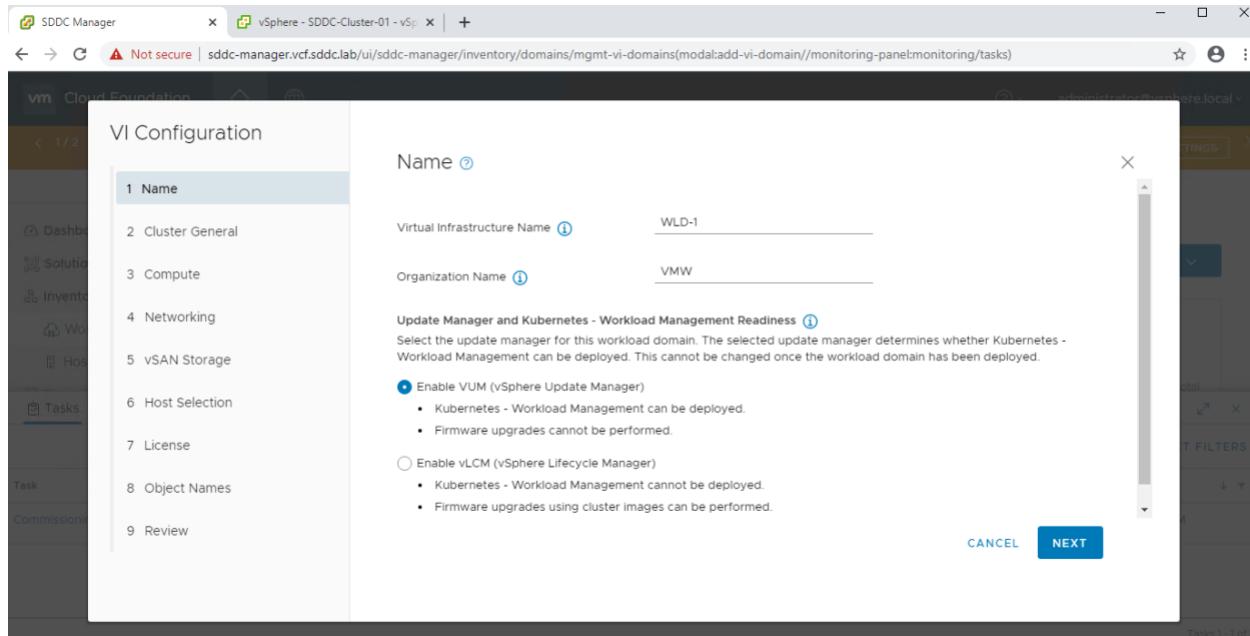
Storage Selection

Select the type of storage you would like to use for this Workload Domain.

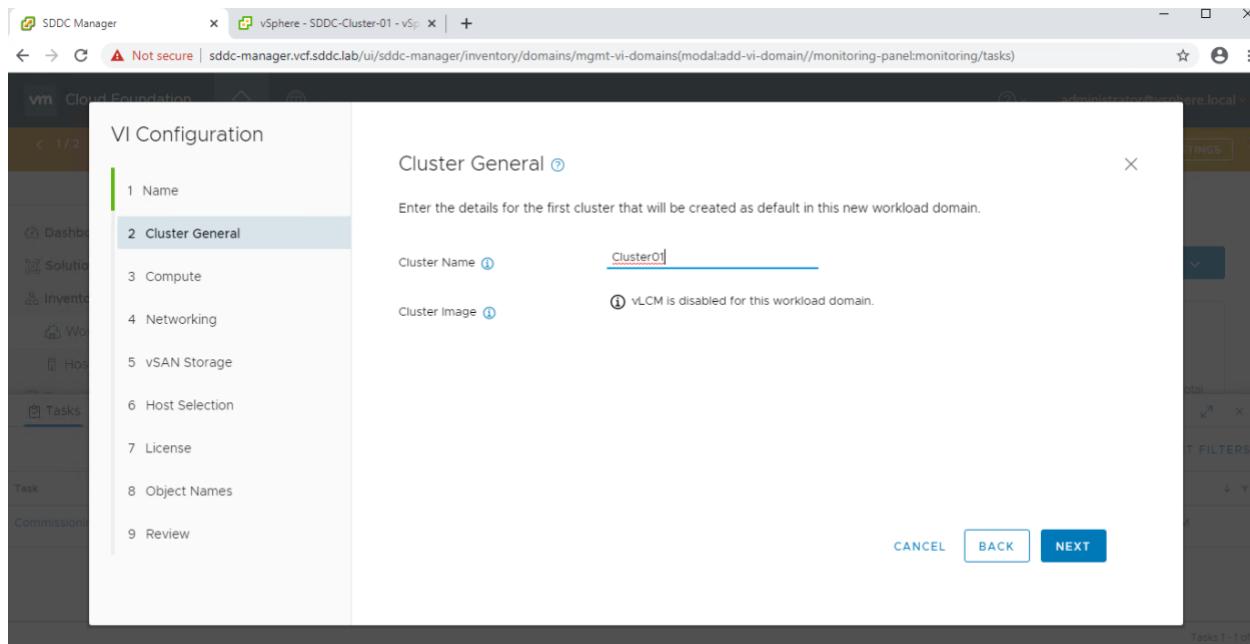
- vSAN Configure vSAN based workload domain.
- NFS Configure NFS based workload domain.
- VMFS on FC Configure Fibre Channel based workload domain.

BEGIN

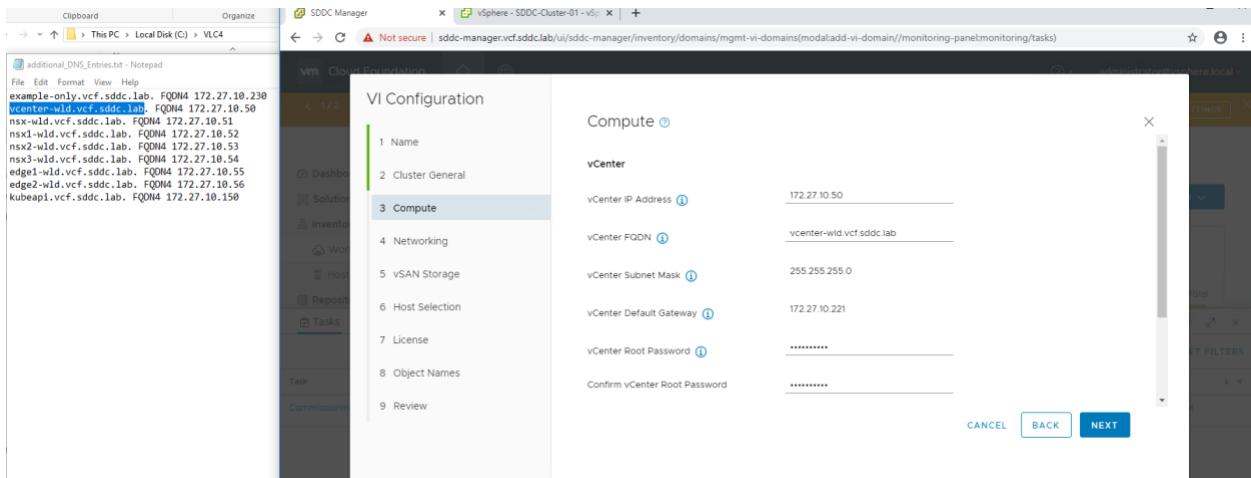
6 Create VI Workload Domain - Select storage



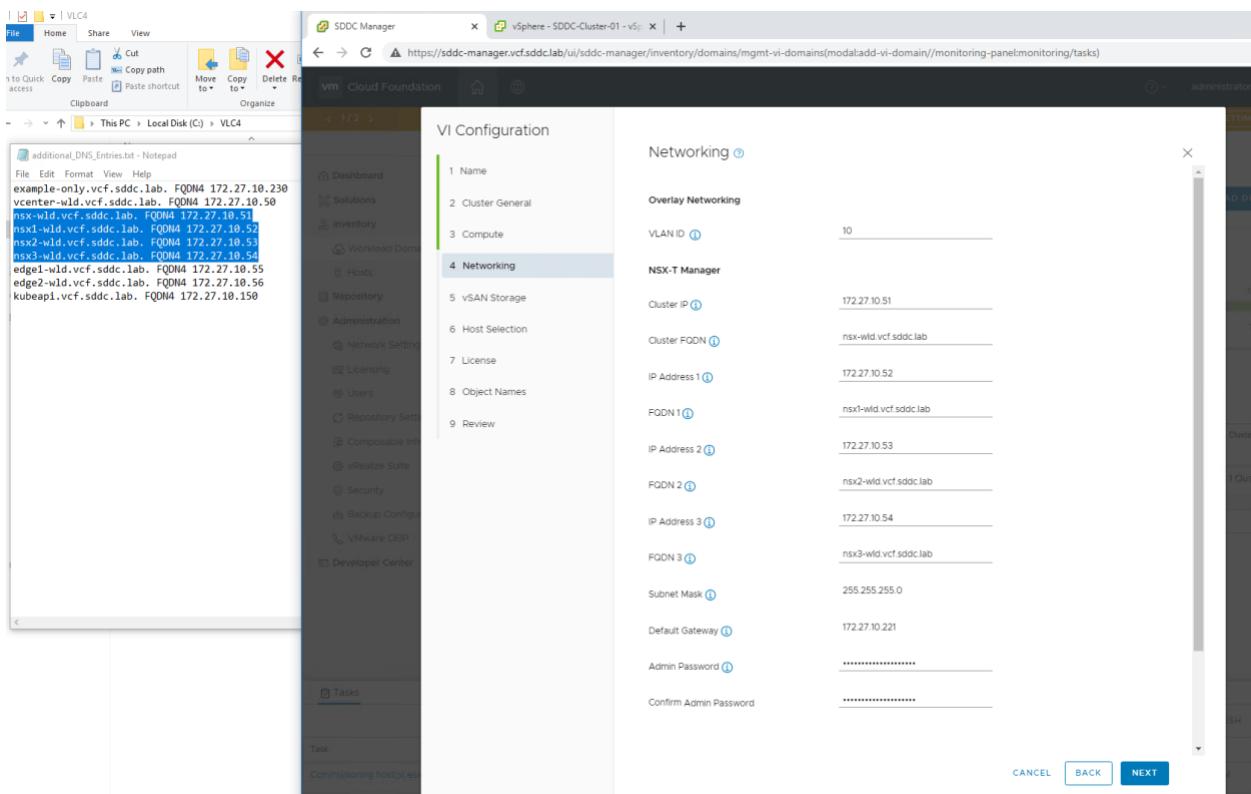
7 Workload Domain and Org Name and Select Update Manager



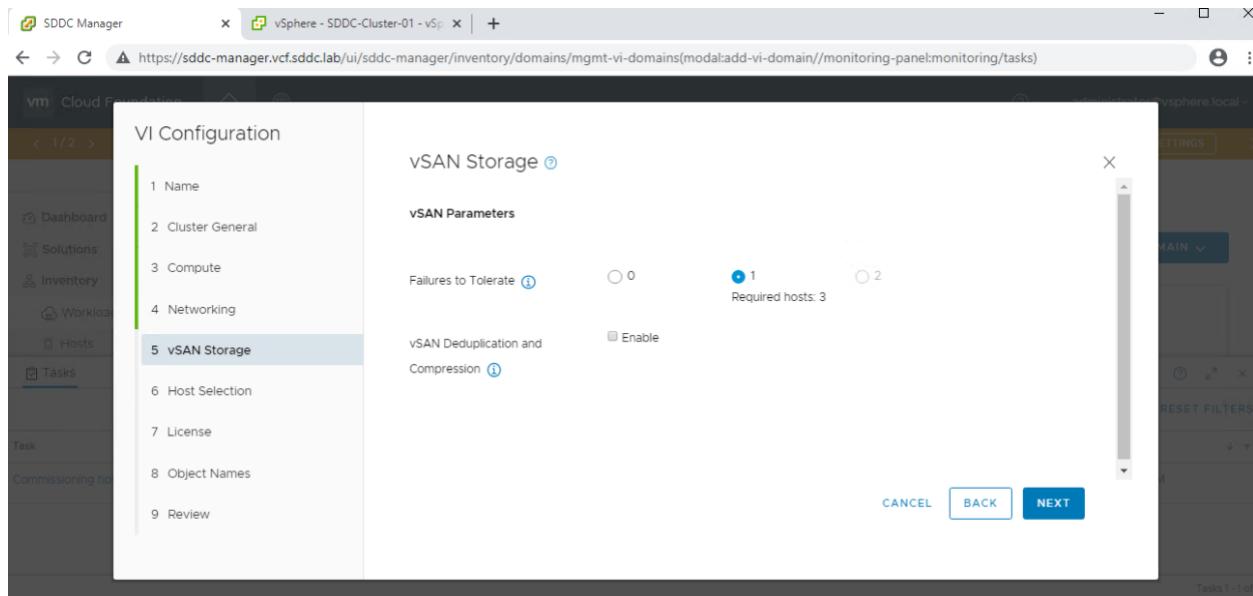
8 Cluster name



9 Workload Domain vCenter Info- Note additional_dns_entries.txt file open for reference



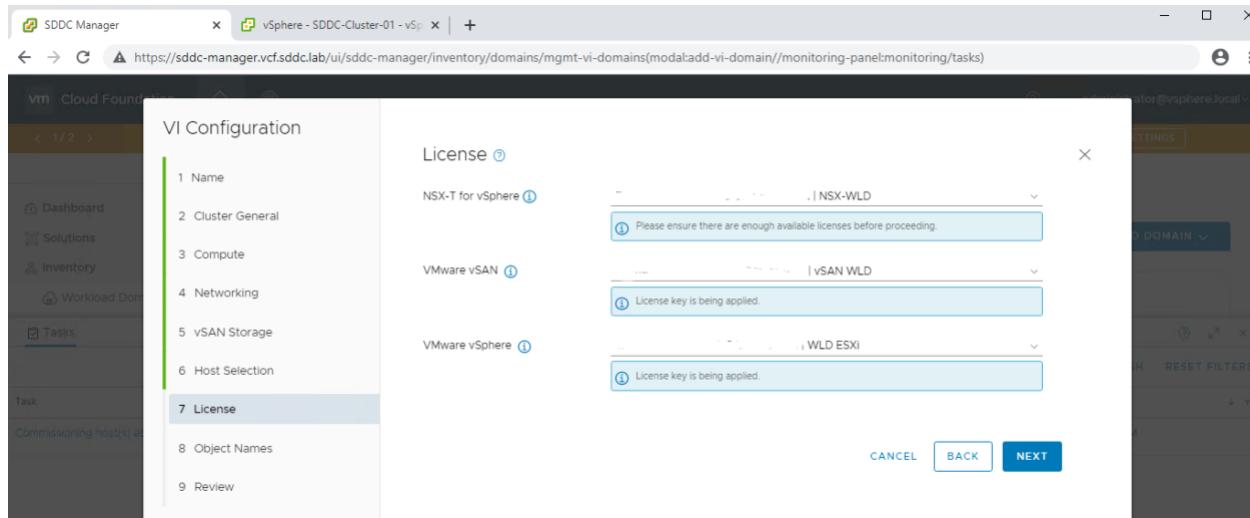
10 NSX Info



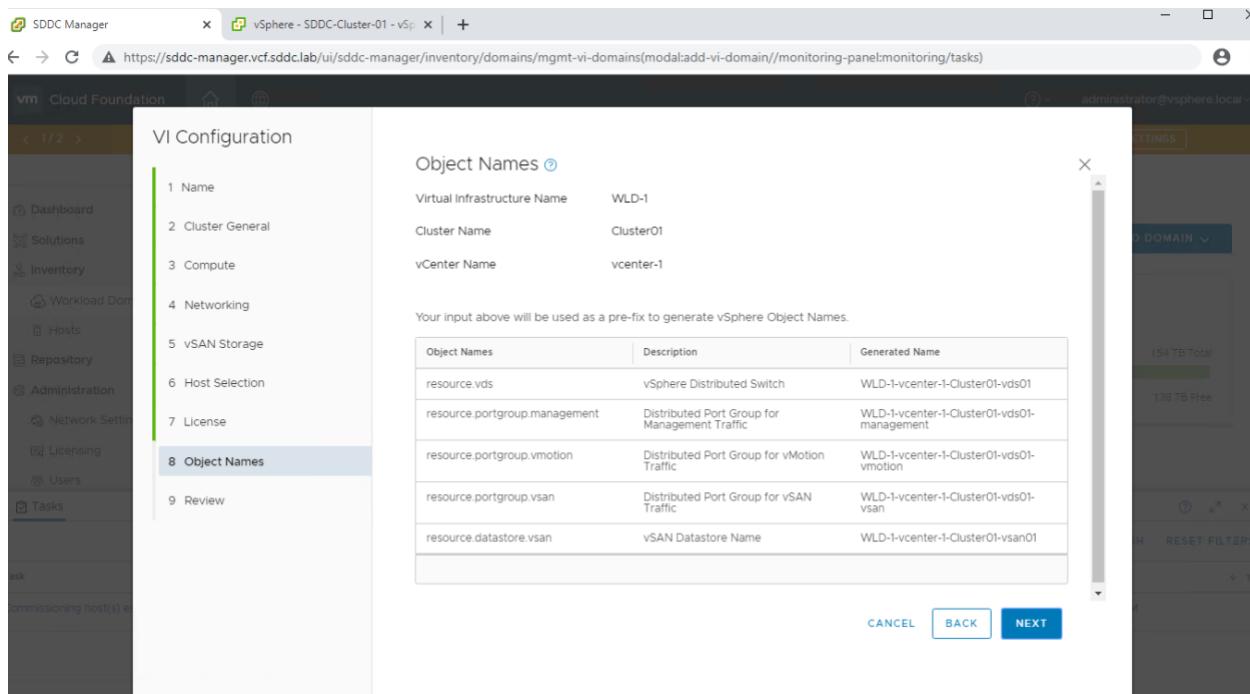
11 vSAN Storage Parameters

FQDN	Network Pool	Memory	Raw Storage	Disks	Storage Type	Dirty Host
esx10.vcf.sddc.lab	network-pool-1	64.00 GB	460.00 GB	4 SSD, 0 HDD	ALL-FLASH	
esx11.vcf.sddc.lab	network-pool-1	64.00 GB	460.00 GB	4 SSD, 0 HDD	ALL-FLASH	
esx12.vcf.sddc.lab	network-pool-1	64.00 GB	460.00 GB	4 SSD, 0 HDD	ALL-FLASH	

12 Host Selection - Select All



13 Assign Licenses



14 Review Object Names

VI Configuration

Review

General

- Virtual Infrastructure Name: WLD-1
- Organization Name: VMW

Cluster General

- Cluster Name: Cluster01
- Cluster Image: VLCM is disabled for this workload domain.

Compute

- vCenter IP Address: 172.27.10.50
- vCenter DNS Name: vcenter-1.vcf.sddc.lab
- vCenter Subnet Mask: 255.255.255.0
- vCenter Default Gateway: 172.27.10.221

Networking

- Overlay Networking VLAN ID: 10
- NSX Manager Cluster IP: 172.27.10.51
- NSX Manager Cluster FQDN: nsx-wld.vcf.sddc.lab
- NSX Manager IP Addresses: 172.27.10.52, 172.27.10.53, 172.27.10.54
- NSX Manager 1 FQDN: nsx1-wld.vcf.sddc.lab
- NSX Manager 2 FQDN: nsx2-wld.vcf.sddc.lab
- NSX Manager 3 FQDN: nsx3-wld.vcf.sddc.lab
- NSX Manager Subnet Mask: 255.255.255.0
- NSX Manager Default Gateway: 172.27.10.221

Host Selection

- esx10.vcf.sddc.lab: Network Pool Name: network-pool-1, Server: VMware, Inc. VMware Virtual Platform, Memory: 64.00 GB, Processor: 8 x Intel(R) Xeon(R) CPU E5-2695 v2 @ 2.40GHz, Storage: 460.00 GB, Disks: 4 SSD, 0 HDD, Storage Type: ALL-FLASH
- esx11.vcf.sddc.lab: Network Pool Name: network-pool-1, Server: VMware, Inc. VMware Virtual Platform, Memory: 64.00 GB

FINISH

15 Review Configuration and Finish

Tasks		REFRESH	RESET FILTERS
Task	Description	Status	Last Occurrence
Creating domain WLD-1	Creating domain WLD-1	Successful	4/26/20, 2:07 PM

16 Monitor Task

Cluster01

Summary

Total Processors: 24

CPU: Used: 2.77 GHz, Free: 54.83 GHz, Capacity: 57.0 GHz

Fault Domains:

- esx10.vcf.sddc.lab: Network connectivity lost
- esx10.vcf.sddc.lab: Network uplink redundancy lost
- esx12.vcf.sddc.lab: Network connectivity lost
- esx12.vcf.sddc.lab: Network uplink redundancy lost

Related Objects

vSphere DRS

Datacenter WLD-1-DC

17 In vcenter-wld.vcf.sddc.local Clear Errors on WLD Cluster01 and Suppress Warnings on the hosts

Edit Cluster Settings | Cluster01

vSphere DRS

Automation Additional Options Power Management Advanced Options

Automation Level: Fully Automated

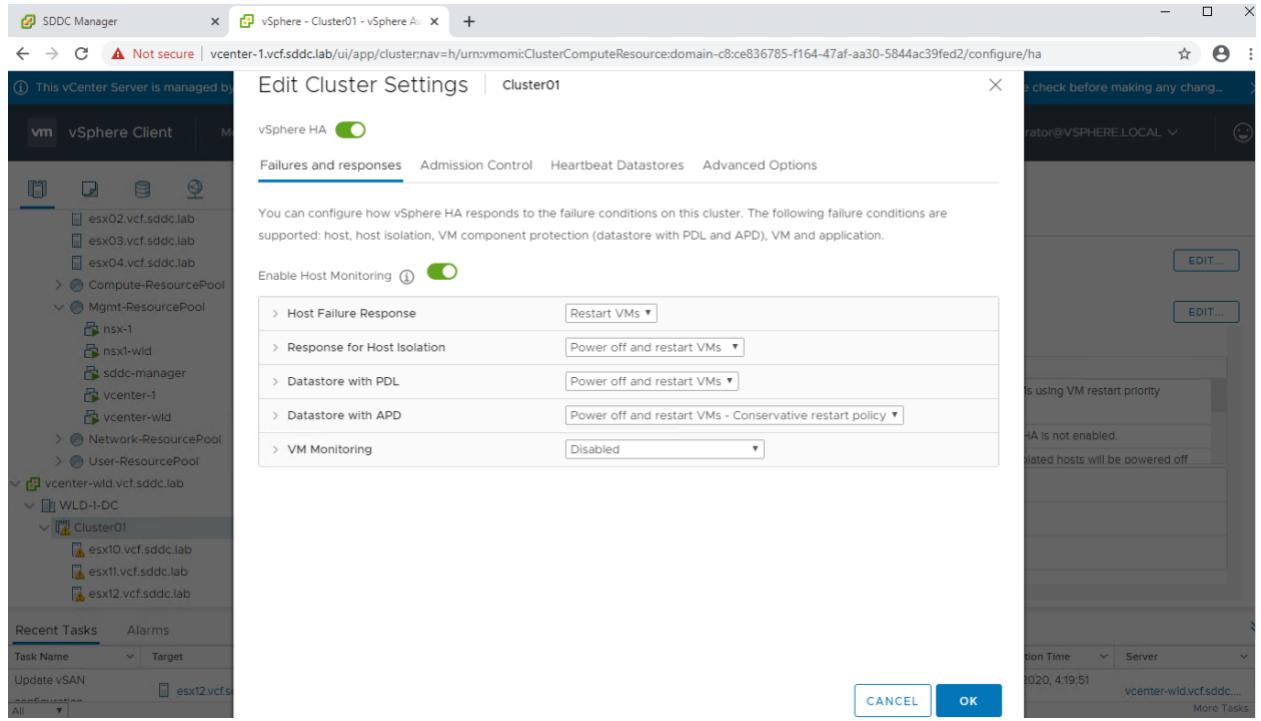
Migration Threshold: Conservative (Less Frequent VMotions) Aggressive (More Frequent VMotions)

Predictive DRS:

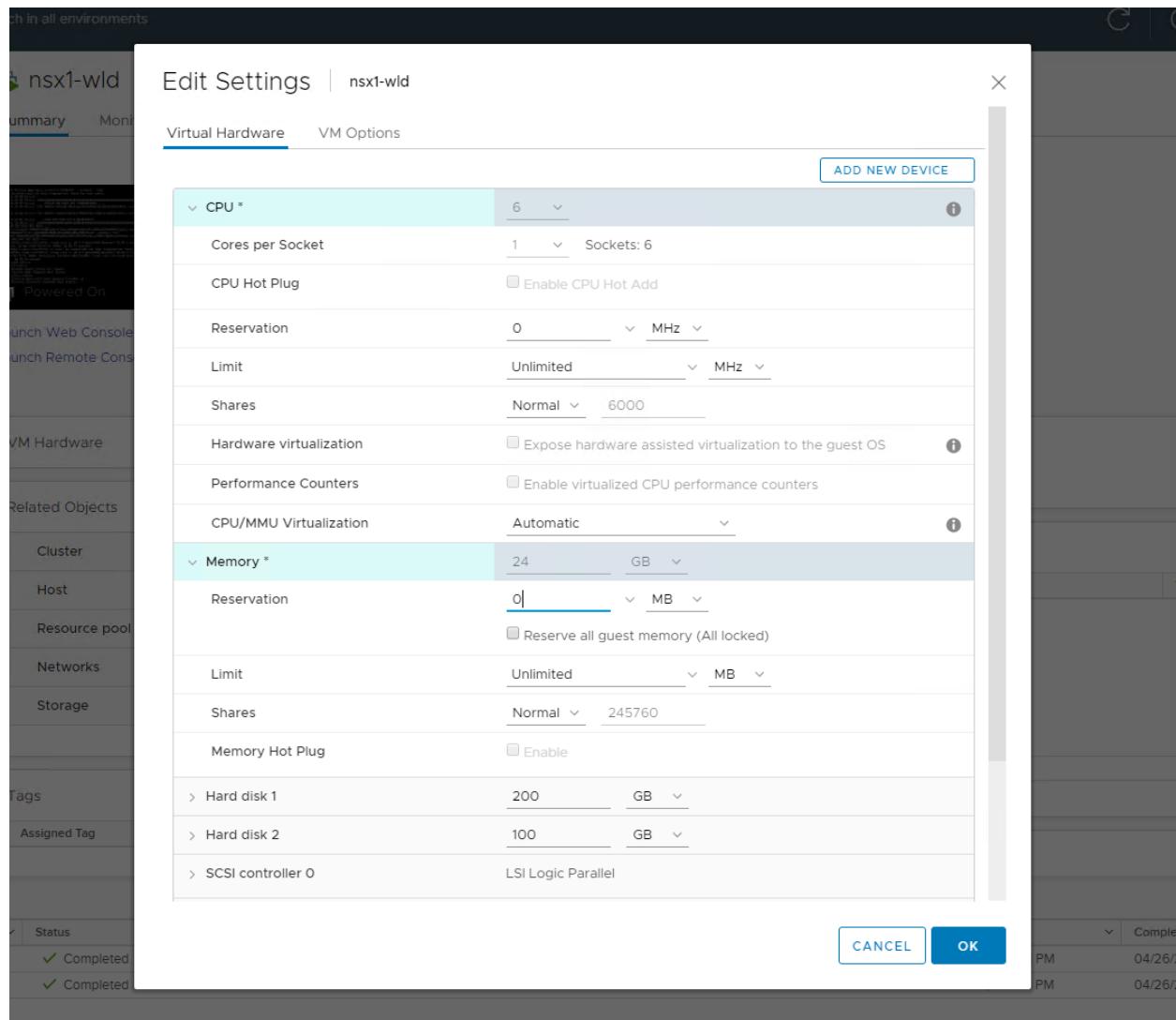
Virtual Machine Automation:

OK

18 In vcenter-wld.vcf.sddc.local Set DRS to Conservative on WLD-1 Cluster01



19 vcenter-wld.vcf.sddc.local Set HA - VM Monitoring to Disabled



20 Edit settings on NSX1-WLD and set CPU and Mem reservations to 0

The screenshot shows the SDDC Manager interface. On the left, a sidebar lists various management sections like Dashboard, Solutions, Inventory, Workload Domains, Repository, Administration, Licensing, Users, Repository Settings, Composable Infrastr., vRealize Suite, Security, Backup Configuration, and VMware CEIP. The main content area is titled 'WLD-1' and shows resource utilization for CPU, Memory, and vSAN Storage. A modal window titled 'Edge Cluster Prerequisites' is open, listing several requirements with checkboxes. At the bottom right of the modal are 'CANCEL' and 'BEGIN' buttons.

21 In sddc-manager.vcf.lab.local - Workload Domains - WLD-1 - Actions - Add Edge Cluster

The screenshot shows the 'Edge Cluster Prerequisites' modal window. It contains a list of requirements with checkboxes. The first checkbox, 'Select All', is checked. Other requirements listed include: 'Are Separate VLANs and subnets available to be used for Host TEP VLAN and Edge TEP VLAN.', 'Host TEP VLAN and Edge TEP VLAN need to be routed.', 'If dynamic routing is desired, set up two BGP Peers (on TORs or infra ESG) with an interface IP, ASN and BGP password.', 'Reserve an ASN to use for the NSX-T Edge cluster's TO interfaces.', 'DNS entries for NSX-T Edge components should be populated in customer managed DNS server.', and 'The vSphere clusters hosting the edge clusters should be L2 Uniform. All host nodes in a hosting vSphere cluster need to have identical management, uplink, Edge and host TEP networks.' At the bottom right of the modal are 'CANCEL' and 'BEGIN' buttons.

22 Select All – Begin

Add Edge Cluster

General

Use Case

Edge Node

Summary

Validation

NSX-T

NSX Manager

Virtual Infrastructure

Organizations

option

NSX Domain WU

NSX Manager WU

Virtual Infrastructure WU

Organizations WU

General Edge Cluster Info

Edge Cluster Name ⓘ edge-cluster

MTU ⓘ 1600

ASN ⓘ 65003

Tier 0 Name ⓘ TIERO

Tier 1 Name ⓘ TIER1

Edge Cluster Profile Type ⓘ Default

Create Passwords

Edge Root Password ⓘ VMware123!VMware123!

Confirm Root Password ⓘ ⓘ

Edge Admin Password ⓘ ⓘ

Confirm Admin Password ⓘ ⓘ

Edge Audit Password ⓘ ⓘ

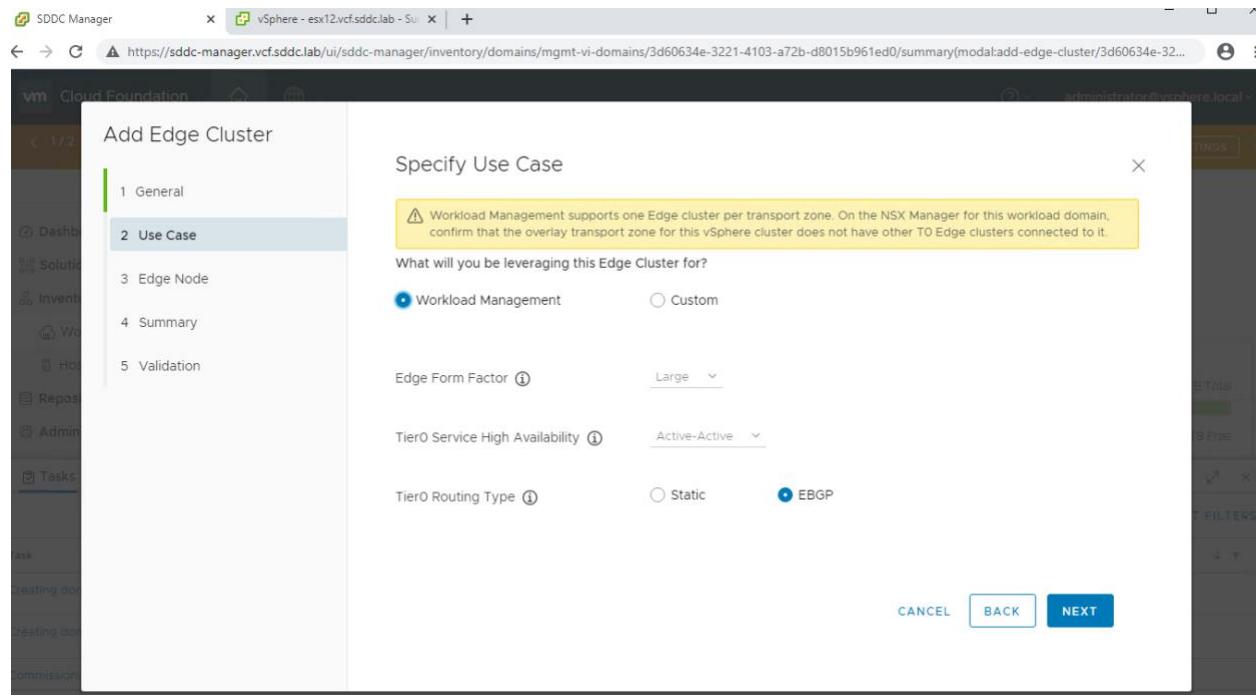
Confirm Edge Password for audit ⓘ ⓘ

CANCEL

NEXT

⚠ Workload Management supports one Edge cluster per transport zone. On the NSX Manager for this workload domain, confirm that the overlay transport zone for this vSphere cluster does not have other TO Edge clusters connected to it.

23 Enter Edge Cluster General Info



24 Select Workload Management and Next

⚠️ NSX Manager backups are configured using the SFTP server built into SDDC Manager. This configuration is not recommended. Please register an external SFTP server.

[BACKUP SETS]

Add Edge Cluster

1 General
2 Use Case
3 Edge Node
4 Summary
5 Validation

Edge Node Details

Edge Node Name(FQDN) <small> ⓘ </small>	edge1-wld.vcf.sddc.lab
Management IP(CIDR) <small> ⓘ </small>	172.27.10.55/24
Management Gateway <small> ⓘ </small>	172.27.10.221
Edge TEP 1 IP(CIDR) <small> ⓘ </small>	172.27.13.2/24
Edge TEP 2 IP(CIDR) <small> ⓘ </small>	172.27.13.3/24
Edge TEP Gateway <small> ⓘ </small>	172.27.13.253
Edge TEP VLAN <small> ⓘ </small>	13

Select the cluster that the edge node will reside on

Cluster <small> ⓘ </small>	Cluster01
----------------------------	-----------

Cluster Type L2 Uniform ⓘ L2 Non-uniform and L3 ⓘ

Two uplink configurations are required for every edge node creation

First Uplink

Uplink VLAN <small> ⓘ </small>	11
Uplink Interface IP(CIDR) <small> ⓘ </small>	172.27.11.2/24
Peer IP(CIDR) <small> ⓘ </small>	172.27.11.1/24
ASN Peer <small> ⓘ </small>	65001
BGP Peer Password <small> ⓘ </small>	VMware!! 
Confirm Password <small> ⓘ </small>	***** 

Second Uplink

Uplink VLAN <small> ⓘ </small>	12
Uplink Interface IP(CIDR) <small> ⓘ </small>	172.27.12.2/24
Peer IP(CIDR) <small> ⓘ </small>	172.27.12.1/24
ASN Peer <small> ⓘ </small>	65001
BGP Peer Password <small> ⓘ </small>	VMware!! 
Confirm Password <small> ⓘ </small>	***** 

ADD EDGE NODE

EdgeVM Name	Management IP
	

25 Input edge node info and Add Edge Node, Repeat for second edge node

Adding more than two nodes is not recommended for Workload Management.

Edge Node added successfully. X

EdgeVM Name	Management IP
edge1-wld.vcf.sddc.lab	172.27.10.55/24
edge2-wld.vcf.sddc.lab	172.27.10.55/24

[ADD MORE EDGE NODES](#)

[CANCEL](#)

[BACK](#)

[NEXT](#)

Add Edge Cluster

- 1 General
- 2 Use Case
- 3 Edge Node
- 4 Summary**
- 5 Validation

Summary

X

Workload Management supports one Edge cluster per transport zone. On the NSX Manager for this workload domain, confirm that the overlay transport zone for this vSphere cluster does not have other TO Edge clusters connected to it.

General

Edge Cluster Name	edge-cluster
MTU	1600
ASN	65003
Tier 0 Name	TIER0
Tier 1 Name	TIER1
Edge Cluster Profile Type	DEFAULT

Use Case

Edge Cluster For	Workload Management
Edge Form Factor	LARGE
Tier 0 Service High Availability	ACTIVE_ACTIVE
Tier 0 Routing Type	EBGP

Edge Node 1 Details

Edge Node 2 Details

Add Edge Cluster

1 General

2 Use Case

3 Edge Node

4 Summary

5 Validation

Summary

X

Edge Node 1 Details

Edge Node Name edge1-wld.vcf.sddc.lab

Management IP 172.27.10.55/24

Management Gateway IP 172.27.10.221

Edge TEP 1 IP 172.27.13.2/24

Edge TEP 2 IP 172.27.13.3/24

Edge TEP Gateway IP 172.27.13.253

Edge TEP VLAN 13

Cluster Name Cluster01

Cluster Type L2 uniform

First Uplink

Uplink Vlan 11

Uplink Interface IP 172.27.11.2/24

Peer IP 172.27.11.1/24

ASN Peer 65001

Second Uplink

Uplink Vlan 12

Uplink Interface IP 172.27.12.2/24

Peer IP 172.27.12.1/24

ASN Peer 65001

Add Edge Cluster

1 General

2 Use Case

3 Edge Node

4 Summary

5 Validation

Summary	
Edge Node 1 Details	
Edge Node Name	edge2-wld.vcf.sddc.lab
Management IP	172.27.10.56/24
Management Gateway IP	172.27.10.221
Edge TEP 1 IP	172.27.13.4/24
Edge TEP 2 IP	172.27.13.5/24
Edge TEP Gateway IP	172.27.13.253
Edge TEP VLAN	13
Cluster Name	Cluster01
Cluster Type	L2 uniform
First Uplink	
Uplink Vlan	11
Uplink Interface IP	172.27.11.3/24
Peer IP	172.27.11.1/24
ASN Peer	65001
Second Uplink	
Uplink Vlan	12
Uplink Interface IP	172.27.12.3/24
Peer IP	172.27.12.1/24
ASN Peer	65001

CANCEL

BACK

NEXT

26 Observe added edges and Next

[Tasks](#)

① ↻ ✕

[REFRESH](#) [RESET FILTERS](#)

Task	Description	Status	Last Occurrence
Adding edge cluster edge-clu...	Adding edge cluster edge-cluster	Running	4/26/20, 4:58 PM

27 Observe Task

Edit Settings | edge1-wld

Virtual Hardware **VM Options**

CPU * 8 **i**

Cores per Socket 1 Sockets: 8

CPU Hot Plug Enable CPU Hot Add

Reservation 0 MHz

Limit Unlimited MHz

Shares Normal 8000

Hardware virtualization Expose hardware assisted virtualization to the guest OS **i**

Performance Counters Enable virtualized CPU performance counters

CPU/MMU Virtualization Automatic **i**

Memory * 32 GB

Reservation 0 MB

Reserve all guest memory (All locked)

Limit Unlimited MB

Shares Normal 327680

Memory Hot Plug Enable

> Hard disk 1 200 GB

> SCSI controller 0 LSI Logic Parallel

> Network adapter 1 WLD-1-vcenter-wld--vds01-n Connected

ADD NEW DEVICE

CANCEL **OK**

28 In vcenter-wld.vcf.sddc.local Edit the settings for *both* edges and Change CPU shares to normal and Mem Reservation to 0

The screenshot shows the SDDC Manager interface. The left sidebar includes options like Dashboard, Solutions, Inventory (Workload Domains, Hosts), Repository, Administration (Network Settings, Licensing), and Tasks. The main content area is titled "Solutions" and features a section for "Kubernetes - Workload Management". It contains a brief description: "With Workload Management, you can deploy and configure the compute, networking, and storage infrastructure for vSphere with Kubernetes." Below this, it says "No Workload Management solution has been created." At the bottom of the section are three buttons: "LEARN MORE", "VIEW DETAILS", and "DEPLOY". A banner at the top right states: "⚠ NSX Manager backups are configured using the SFTP server built into SDDC Manager".

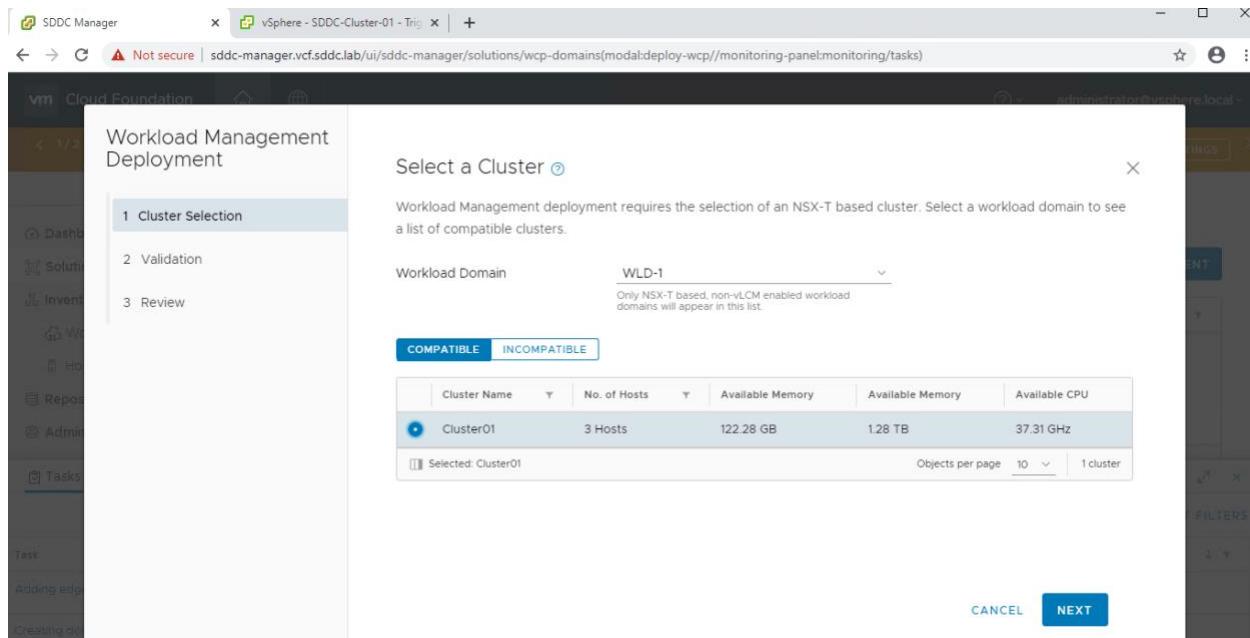
29 In sddc-manager.vcf.lab.local Solutions - DEPLOY

The screenshot shows a modal dialog titled "Workload Management Deployment Prerequisites". It contains a note: "Note that this Workload Management wizard does not represent the entire deployment process. It is intended to validate your inputs. Upon successful validation, you must complete deployment in vSphere." Below this, there is a list of prerequisites with checkboxes:

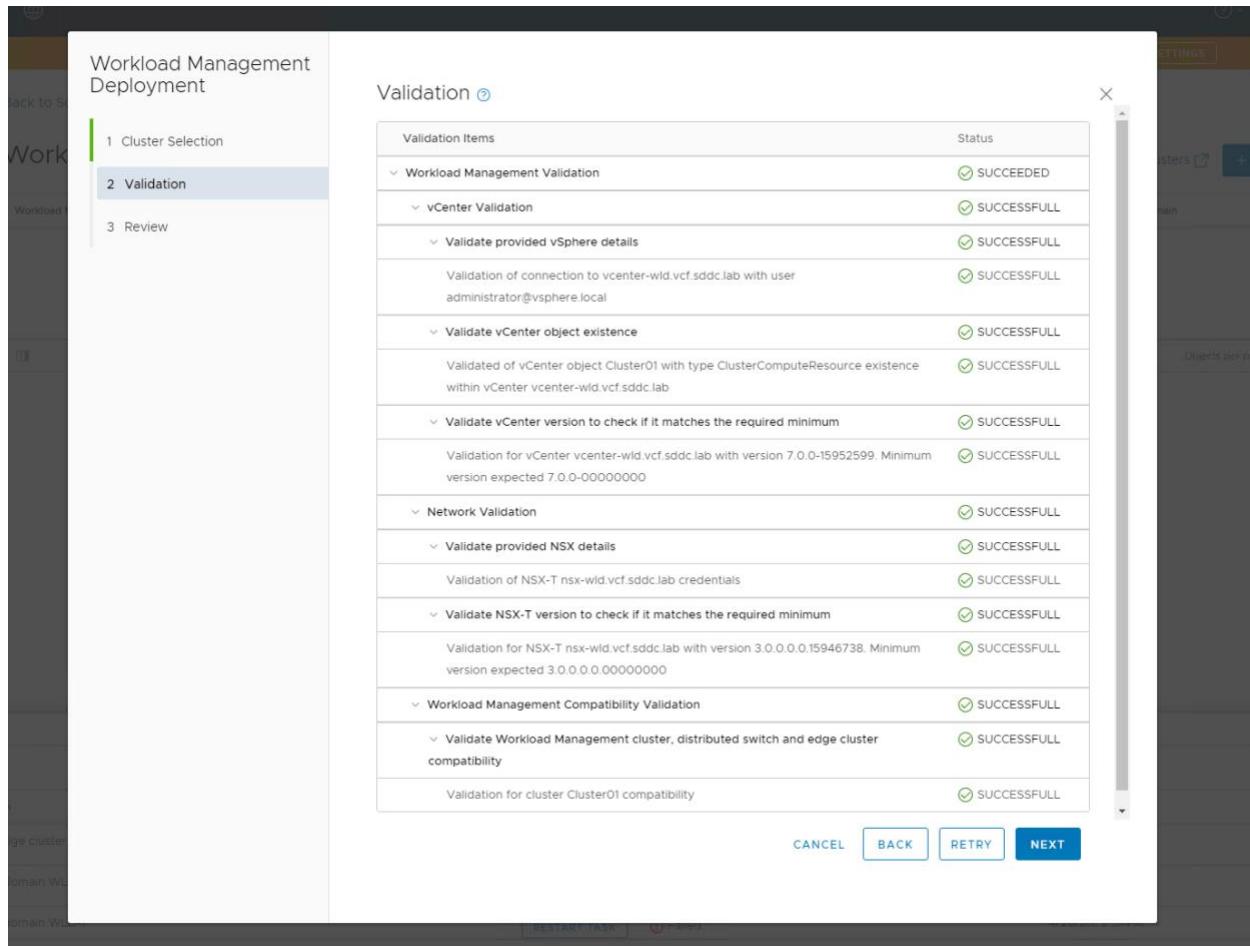
- Select All
- Licensing: "Within a workload domain, all hosts within the selected vSphere clusters must have the proper vSphere for Kubernetes licensing to support Workload Management."
- Workload Domain: "An NSX-T based workload domain deployed as Workload Management ready must be available." with a link "Add Workload Domain".
- NSX-T Edge Cluster: "At least one NSX-T Edge cluster must be deployed and available." with a link "Add Edge Cluster".
- IP Addresses: "Define a subnet for pod networking (non-routable), minimum of a /22 subnet." with a link "Add IP Subnet".

At the bottom right of the dialog are "CANCEL" and "BEGIN" buttons. To the right of the dialog, a partial view of the SDDC Manager interface shows a "WORKLOAD MANAGEMENT" section with a table of tasks and a timestamp of "4/26/20, 4:58 PM".

30 Select All and Begin



31 Select Workload Domain WLD-1, then Cluster01 and Next



32 Observe validation and Next

The screenshot shows the SDDC Manager interface for deploying a Workload Management solution. The left sidebar lists various management tasks like Dashboards, Solutions, Inventories, Repositories, Admin, Network, Locations, and Tasks. The main panel title is "Workload Management Deployment". The navigation bar indicates "1 / 2" steps completed. The current step is "Review". A note at the top right says "Not secure" and provides the URL "sddc-manager.vcf.sddc.lab/ui/sddc-manager/solutions/wcp-domains(modal:deploy-wcp://monitoring-panel:monitoring/tasks)". The review section displays configuration details under "Infrastructure" and "Networking".

Review

Note: Click the Complete in vSphere button to navigate to vSphere Workload Management, where you proceed with the deployment. Enter the 5 checked values below, into the vSphere wizard. They correspond to fields in Step 1 or Step 3.

Infrastructure	
Workload Domain	WLD-1
vCenter FQDN	vcenter-wld.vcf.sddc.lab
Compatible Cluster Name	Cluster01
DNS Servers	172.27.10.221
NTP Servers	172.27.10.221
Networking	
Edge Cluster	edge-cluster
vSphere Distributed Switch	WLD-1-vcenter-wld-Cluster01-vds01

BACK **CLOSE** **COMPLETE IN VSphere**

33 Review information and Complete in vSphere

The screenshot shows a browser window titled "vSphere - SDDC-Cluster-01 - Trig" with the URL "https://vcf.sddc.lab/ui/app/workload-platform/home/enable-wcp-wizard?serviceGuid=ce836785-f164-47af-aa30-5844ac39fed2". A warning message at the top right states: "Warning: By SDDC Manager (sddc-manager.vcf.sddc.lab), making modifications directly in vCenter Server may break SDDC Manager workflows. Please check before making any changes." The main interface is titled "Workload Management" and "Enable Workload Management". The first step, "1. Select a Cluster", is active. It displays a tree view of clusters: "vcenter-1.vcf.sddc.lab" (expanded) containing "SDDC-Datacenter" and "vcenter-wld.vcf.sddc.lab" (selected, indicated by a blue border). "vcenter-wld.vcf.sddc.lab" contains "WLD-1-DC". To the right is a "Cluster Details" panel for "vcenter-wld.vcf.sddc.lab" showing "Cluster01" with 3 hosts, 38.65 GHz CPU, and 122.28 GB memory. A "NEXT" button is visible at the bottom left of the panel.

1. Select a Cluster Select a cluster to enable namespaces

You are selecting a cluster that would support namespace creation and management. It's best to pick a cluster with enough space. This cluster will also need to run a couple of control plane nodes and worker VMs to support the namespace management.

vcenter-1.vcf.sddc.lab

SDDC-Datacenter

vcenter-wld.vcf.sddc.lab

WLD-1-DC

Cluster Details | vcenter-wld.vcf.sddc.lab

COMPATIBLE INCOMPATIBLE ⓘ

Cluster Name	Number of Hosts	Available CPU	Available Memory
Cluster01	3	38.65 GHz	122.28 GB

1 - 1 of 1 items

NEXT

2. Cluster Settings Select the master size and configure NSX on the selected cluster

3. Network Configure Networking for the Control Plane and Worker Nodes

4. Storage Specify the storage details for your namespaces

5. Review and Confirm Review all the details and confirm your namespaces set up

34 In vcenter-wld.vcf.lab.local Menu - Workload Management - Select Cluster01 and Next

vSphere - Workload Management x vSphere - SDDC-Cluster-01 - Trig x +

center-1.vcf.sddc.lab/ui/app/workload-platform/home/enable-wcp-wizard?serviceGuid=ce836785-f164-47af-aa30-5844ac39fed2

Any SDDC Manager (sddc-manager.vcf.sddc.lab), making modifications directly in vCenter Server may break SDDC Manager workflows. Please check before making any chan...

Menu ▾ Search in all environments C ? Administrator@VSPHERE.LOCAL ▾

Workload Management

BACK

Enable Workload Management

> 1. Select a Cluster Cluster01 Selected

▼ 2. Cluster Settings Select the master size and configure NSX on the selected cluster

We need to allocate some capacity for the Master VMs. The more resources you allocate, the more namespaces can be supported by this cluster

Control Plane size	Size	Maximum number of pods	CPU	Storage	Memory
	<input checked="" type="radio"/> Tiny	1000	2	16 GB	8 GB
	<input type="radio"/> Small	2000	4	16 GB	16 GB
	<input type="radio"/> Medium	4000	8	16 GB	24 GB
	<input type="radio"/> Large	8000	16	16 GB	32 GB

NEXT

3. Network Configure Networking for the Control Plane and Worker Nodes

4. Storage Specify the storage details for your namespaces

5. Review and Confirm Review all the details and confirm your namespaces set up

35 Select Tiny and Next

Workload Management

[◀ BACK](#)

Enable Workload Management

Enter network details to be used for namespaces.

[VIEW NETWORK TOPOLOGY](#)

Management Network

The workload platform consists of a control plane and set of workers per cluster. Each cluster sits on a management network that supports traffic to vCenter.

Network * ⓘ	WLD-1-vcenter-wld--vds01- ⓘ	Starting IP Address * ⓘ	172.27.10.150
Subnet Mask * ⓘ	255.255.255.0	Gateway * ⓘ	172.27.10.221
DNS Server ⓘ	172.27.10.221 Optional	NTP Server * ⓘ	172.27.10.221
DNS Search Domains	vcf.sddc.lab Optional		

Workload Network

The workload network supports traffic to the Kubernetes API and to the Pods/Services that are deployed on the Supervisor cluster. This network is supported by NSX.

vSphere Distributed Switch * ⓘ	WLD-1-vcenter-wld-Cluster ⓘ	Edge Cluster * ⓘ	edge-cluster ⓘ
API Server endpoint FQDN ⓘ	kubeapi.vcf.sddc.lab Optional		
DNS Server * ⓘ	172.27.10.221		
Pod CIDRs * ⓘ	10.244.0.0/21	Service CIDRs * ⓘ	10.96.0.0/24 <small>This field cannot be edited later once saved. Make sure all CIDR values are unique.</small>
Ingress CIDRs * ⓘ	10.50.0.0/24	Egress CIDRs * ⓘ	10.60.0.0/24

NEXT

36 Enter Network Info and Next

vSphere - Workload Management x vSphere - SDDC-Cluster-01 - Tri... x | +

https://vcenter-1.vcf.sddc.lab/ui/app/workload-platform/home/enable-wcp-wizard?serviceGuid=ce836785-f164-47af-aa30-5844ac39fed2

SDDC Manager (sddc-manager.vcf.sddc.lab), making modifications directly in vCenter Server may break SDDC Manager workflows. Please check before making any changes directly through the vCenter Server.

Workload Management

[BACK](#)

Enable Workload Management

- > 1. Select a Cluster Cluster01 Selected
- > 2. Cluster Settings Tiny: CPU 2, Storage 16 GB, Memory 8 GB
- > 3. Network
 - Management Network:**
Network Selected: WLD-1-vcenter-wld--vds01-management IP Address: 172.27.10.150 Subnet Mask: 255.255.255.0 Gateway: 172.27.10.221 DNS Servers: 172.27.10.221 NTP Servers: 172.27.10.221 DNS Search Domains vcf.sddc.lab
 - Namespace Network:**
vSphere Distributed Switch: 50 00 88 62 bd 04 41 0a-f9 25 4d ea c9 30 29 87 Edge Cluster: 7cca13ac-1937-4ccb-b80e-806ecad9950f FQDN: kubeapi.vcf.sddc.lab DNS Servers: 172.27.10.221 Pod CIDRs: 10.244.0.0/21 Service CIDR: 10.96.0.0/24 Ingress CIDRs: 10.50.0.0/24 Egress CIDRs: 10.60.0.0/24
- > 4. Storage
 - Control Plane Node Storage vSAN Default Storage Policy
 - Ephemeral Storage vSAN Default Storage Policy
 - Image Storage vSAN Default Storage Policy

The cluster is going to run a set of control plane VMs (master and workers) in order to support namespaces. We need a datastore where these master and worker control plane VMs will live.

Control Plane Node *	vSAN Default Storage Policy	SELECT STORAGE
Ephemeral Disks *	vSAN Default Storage Policy	SELECT STORAGE
Image Cache *	vSAN Default Storage Policy	SELECT STORAGE

[NEXT](#)

5. Review and Confirm Review all the details and confirm your namespaces set up

37 Select Storage Policy for each component and Next

Workload Management

[BACK](#)

Enable Workload Management

- > 1. Select a Cluster Cluster01 Selected
- > 2. Cluster Settings Tiny: CPU 2, Storage 16 GB, Memory 8 GB
- > 3. Network
 - Management Network:**
Network Selected: WLD-1-vcenter-wld--vds01-management IP Address: 172.27.10.150 Subnet Mask: 255.255.255.0 Gateway: 172.27.10.221 DNS Servers: 172.27.10.221 NTP Servers: 172.27.10.221 DNS Search Domains vcf.sddc.lab
 - Namespace Network:**
vSphere Distributed Switch: 50 00 88 62 bd 04 41 0a-f9 25 4d ea c9 30 29 87 Edge Cluster: 7cca13ac-1937-4ccb-b80e-806ecad9950f FQDN: kubeapi.vcf.sddc.lab DNS Servers: 172.27.10.221 Pod CIDRs: 10.244.0.0/21 Service CIDR: 10.96.0.0/24 Ingress CIDRs: 10.50.0.0/24 Egress CIDRs: 10.60.0.0/24
- > 4. Storage
 - Control Plane Node Storage vSAN Default Storage Policy
 - Ephemeral Storage vSAN Default Storage Policy
 - Image Storage vSAN Default Storage Policy
- > 5. Review and Confirm Review all the details and confirm your namespaces set up

You have successfully completed all the steps required to enable namespaces on Cluster01. Review and confirm all the details to enable namespace. Once the process is complete, you will be all set to create your first namespace.

[FINISH](#)

38 Review and Finish

Task Console

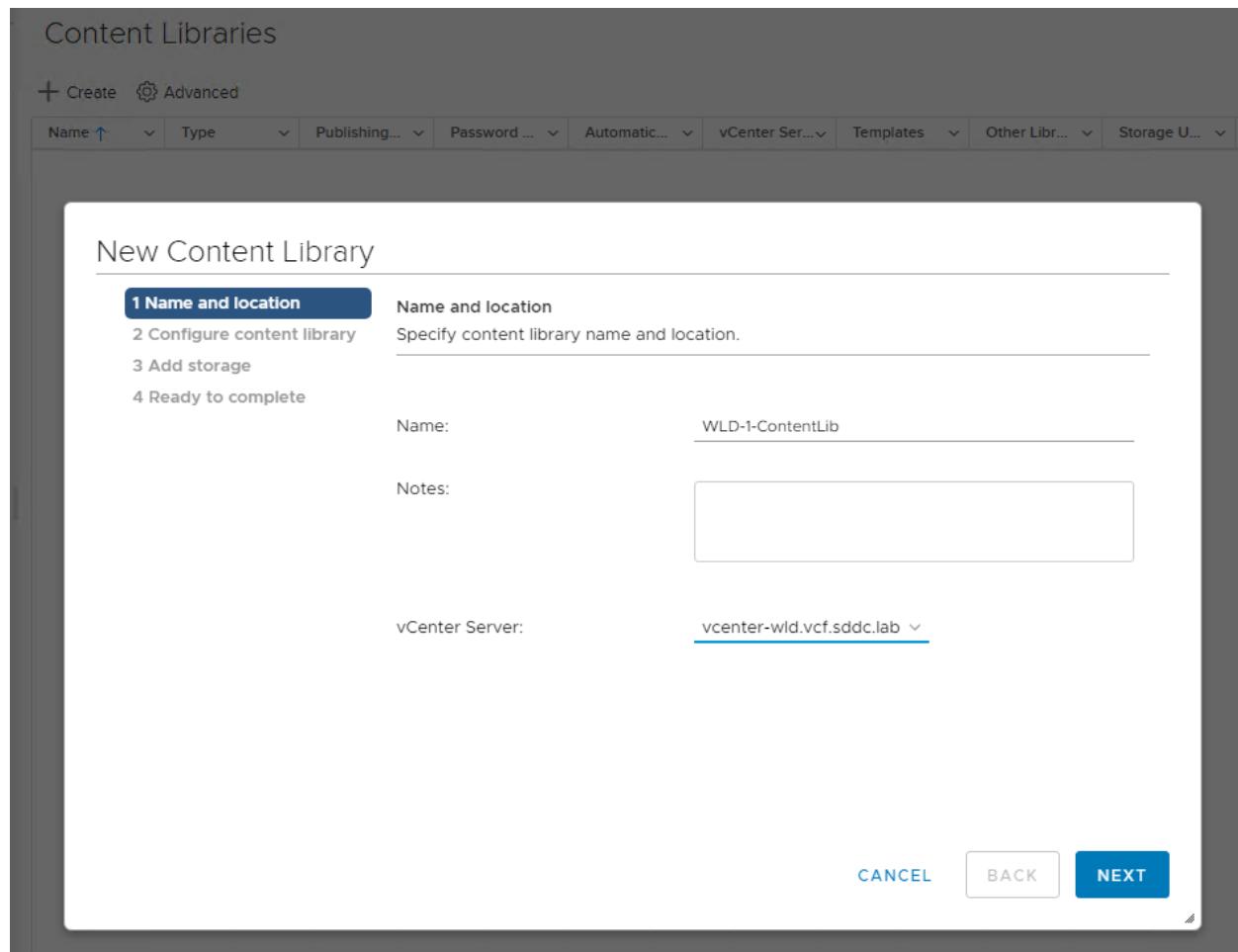
Task Name	Target	Status	Details	Initiator	Queued For	Start Time	Completion Ti...	Execution Time	Server
Deploy OVF te...	Supervisor...	5%	Copying Virtual...	com.vmware.vi...	16 ms	04/26/2020, 6...			vcenter-wld.vcf...
Deploy OVF te...	Supervisor...	5%	Copying Virtual...	com.vmware.vi...	40 ms	04/26/2020, 6...			vcenter-wld.vcf...
Deploy OVF te...	Supervisor...	5%	Copying Virtual...	com.vmware.vi...	14 ms	04/26/2020, 6...			vcenter-wld.vcf...
Update vSAN c...	esx11vcf.s...	✓ Completed		com.vmware.vi...	34 ms	04/26/2020, 6...	04/26/2020, 6...		vcenter-wld.vcf...
Update vSAN c...	esx10vcf.s...	✓ Completed		com.vmware.vi...	21 ms	04/26/2020, 6...	04/26/2020, 6...		vcenter-wld.vcf...
Update vSAN c...	esx12vcf.s...	✓ Completed		com.vmware.vi...	61 ms	04/26/2020, 6...	04/26/2020, 6...		vcenter-wld.vcf...
Update vSAN c...	esx10vcf.s...	✓ Completed		com.vmware.vi...	40 ms	04/26/2020, 6...	04/26/2020, 6...		vcenter-wld.vcf...
Update vSAN c...	esx11vcf.s...	✓ Completed		com.vmware.vi...	102 ms	04/26/2020, 6...	04/26/2020, 6...		vcenter-wld.vcf...
Download rem...	HTTP com...	HTTP com...		com.vmware.vi...	6 ms	04/26/2020, 6...	04/26/2020, 6...		vcenter-wld.vcf...
Download rem...	HTTP com...	HTTP com...		com.vmware.vi...	47 ms	04/26/2020, 6...	04/26/2020, 6...		vcenter-wld.vcf...
Download rem...	HTTP com...	HTTP com...		com.vmware.vi...	54 ms	04/26/2020, 6...	04/26/2020, 6...		vcenter-wld.vcf...
Deploy OVF te...	Supervisor...	HTTP com...	Copying Virtual...	com.vmware.vi...	19 ms	04/26/2020, 6...	04/26/2020, 6...		vcenter-wld.vcf...
Deploy OVF te...	Supervisor...	HTTP com...	Copying Virtual...	com.vmware.vi...	10 ms	04/26/2020, 6...	04/26/2020, 6...		vcenter-wld.vcf...
Deploy OVF te...	Supervisor...	HTTP com...	Copying Virtual...	com.vmware.vi...	7 ms	04/26/2020, 6...	04/26/2020, 6...		vcenter-wld.vcf...
Install agent	Cluster01	20%	Provisioning ag...	com.vmware.vi...	32 ms	04/26/2020, 6...			vcenter-wld.vcf...
Install agent	Cluster01	20%	Provisioning ag...	com.vmware.vi...	24 ms	04/26/2020, 6...			vcenter-wld.vcf...
Install agent	Cluster01	20%	Provisioning ag...	com.vmware.vi...	139 ms	04/26/2020, 6...			vcenter-wld.vcf...
Create folder	WLD-1-DC	✓ Completed		VSPHERE.LOC...	16 ms	04/26/2020, 6...	04/26/2020, 6...	30 ms	vcenter-wld.vcf...
Create resourc...	Cluster01	✓ Completed		VSPHERE.LOC...	59 ms	04/26/2020, 6...	04/26/2020, 6...		vcenter-wld.vcf...
Reconfigure vir...	nsx1-wld	✓ Completed		VSPHERE.LOC...	42 ms	04/26/2020, 5...	04/26/2020, 5...	1 s	vcenter-wld.vcf...
Reconfigure vir...	edge2-wld	✓ Completed		VSPHERE.LOC...	13 ms	04/26/2020, 5...	04/26/2020, 5...	665 ms	vcenter-wld.vcf...
Reconfigure vir...	edge1-wld	✓ Completed		VSPHERE.LOC...	103 ms	04/26/2020, 5...	04/26/2020, 5...	820 ms	vcenter-wld.vcf...

100 items

39 In vcenter-wld.vcf.lab.local Observe Task Console, the errors in the screenshot are normal.

```
172.27.10.221 - PuTTY
root@VCF4-CB-01a [ ~ ]# ip route
default via 172.27.10.250 dev eth0.10 proto static
10.50.0.0/24 proto static
    nexthop via 172.27.11.2 dev eth0.11 weight 1
    nexthop via 172.27.11.3 dev eth0.11 weight 1
    nexthop via 172.27.12.2 dev eth0.12 weight 1
    nexthop via 172.27.12.3 dev eth0.12 weight 1
10.60.0.0/24 proto static
    nexthop via 172.27.11.2 dev eth0.11 weight 1
    nexthop via 172.27.11.3 dev eth0.11 weight 1
    nexthop via 172.27.12.2 dev eth0.12 weight 1
    nexthop via 172.27.12.3 dev eth0.12 weight 1
172.16.254.0/24 dev eth0.10 proto kernel scope link src 172.16.254.199
172.27.10.0/24 dev eth0.10 proto kernel scope link src 172.27.10.221
172.27.11.0/24 dev eth0.11 proto kernel scope link src 172.27.11.253
172.27.12.0/24 dev eth0.12 proto kernel scope link src 172.27.12.253
172.27.13.0/24 dev eth0.13 proto kernel scope link src 172.27.13.253
root@VCF4-CB-01a [ ~ ]# ping depot.vmware.com
PING e751.dsccd.akamaiedge.net (23.35.73.238) 56(84) bytes of data.
64 bytes from a23-35-73-238.deploy.static.akamaitechnologies.com (23.35.73.238): icmp_seq=1 ttl=64 time=84.2 ms
64 bytes from a23-35-73-238.deploy.static.akamaitechnologies.com (23.35.73.238): icmp_seq=2 ttl=64 time=105 ms
^C
--- e751.dsccd.akamaiedge.net ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 2ms
rtt min/avg/max/mdev = 84.239/94.857/105.475/10.618 ms
root@VCF4-CB-01a [ ~ ]#
```

40 Ensure you have external network access from Cloud Builder



41 In vcenter-wld.vcf.lab.local Menu - Content Libraries - Create, enter a name and ensure vcenter-wld.vcf.lab.local is selected-
Next

Content Libraries

+ Create Advanced

Name ↑ Type Publishing... Password... Automatic... vCenter Ser... Templates Other Libr... Storage U...

New Content Library

✓ 1 Name and location

2 Configure content library

3 Add storage

4 Ready to complete

Configure content library

Local libraries can be published externally and optimized for syncing over HTTP. Subscribed libraries originate from other published libraries.

Local content library

Enable publishing

Enable authentication

Subscribed content library

Subscription URL:

Enable authentication

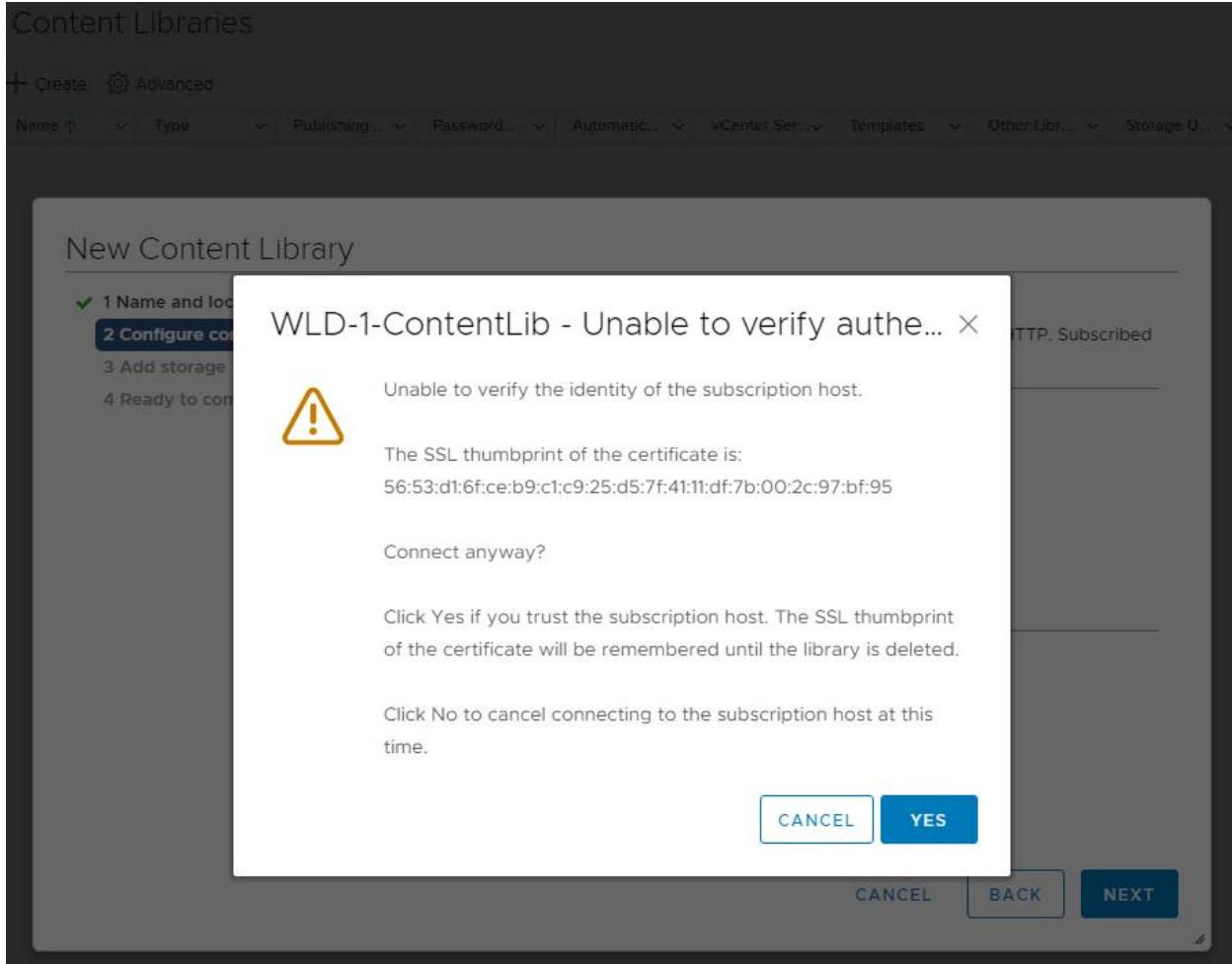
Download content immediately when needed

CANCEL

BACK

NEXT

42 Select Subscribed content library and enter URL – Next



43 Accept cert - Click Yes

Content Libraries

+ Create Advanced

Name ↑ Type Publishing... Password... Automatic... vCenter Ser... Templates Other Libr... Storage U...

New Content Library

✓ 1 Name and location
✓ 2 Configure content library
✓ 3 Add storage
4 Ready to complete

Add storage
Select a storage location for the library contents.

Filter

Name ↑	Status	Type	Datastore...
Icm-bundle-repo	✓ Normal	NFS 3	
WLD-1-vcenter-wld-Cluster01-vsa...	✓ Normal	vSAN	

2 items

CANCEL BACK NEXT

44 Select vSAN Datastore – Next

Content Libraries

+ Create Advanced

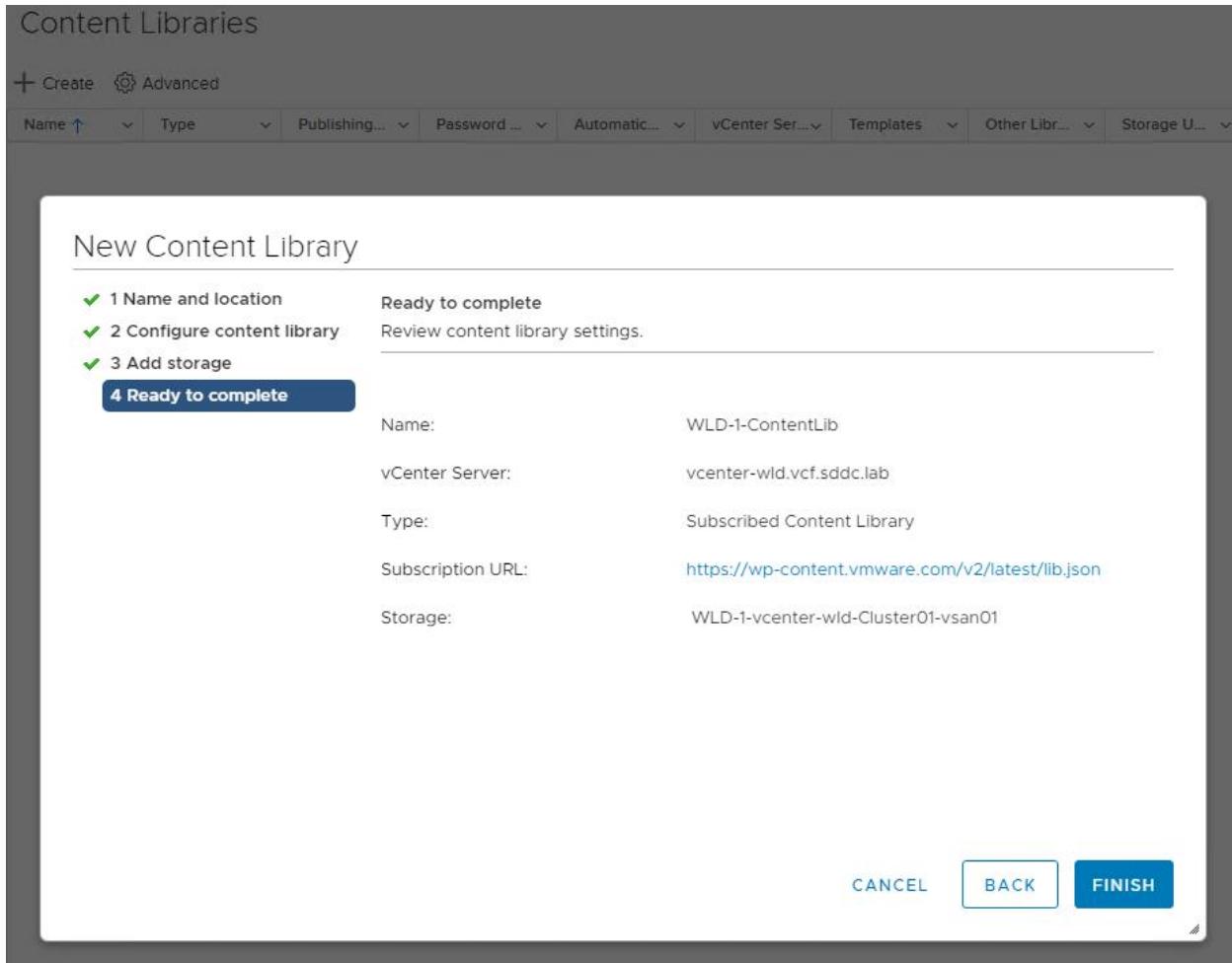
Name ↑ Type Publishing... Password ... Automatic... vCenter Ser... Templates Other Libr... Storage U...

New Content Library

✓ 1 Name and location Ready to complete
✓ 2 Configure content library Review content library settings.
✓ 3 Add storage
4 Ready to complete

Name: WLD-1-ContentLib
vCenter Server: vcenter-wld.vcf.sddc.lab
Type: Subscribed Content Library
Subscription URL: <https://wp-content.vmware.com/v2/latest/lib.json>
Storage: WLD-1-vcenter-wld-Cluster01-vsant01

CANCEL BACK FINISH



45 Click Finish

Workload Management

Namespaces Clusters Updates

ADD CLUSTER

Cluster	Namespaces	Hosts	Config Status	Control Plane Node	CPU for namespace	Memory for namespace
Cluster01	0	3	Configuring (1)	0	0	

Config Status

Current Status: Configuring

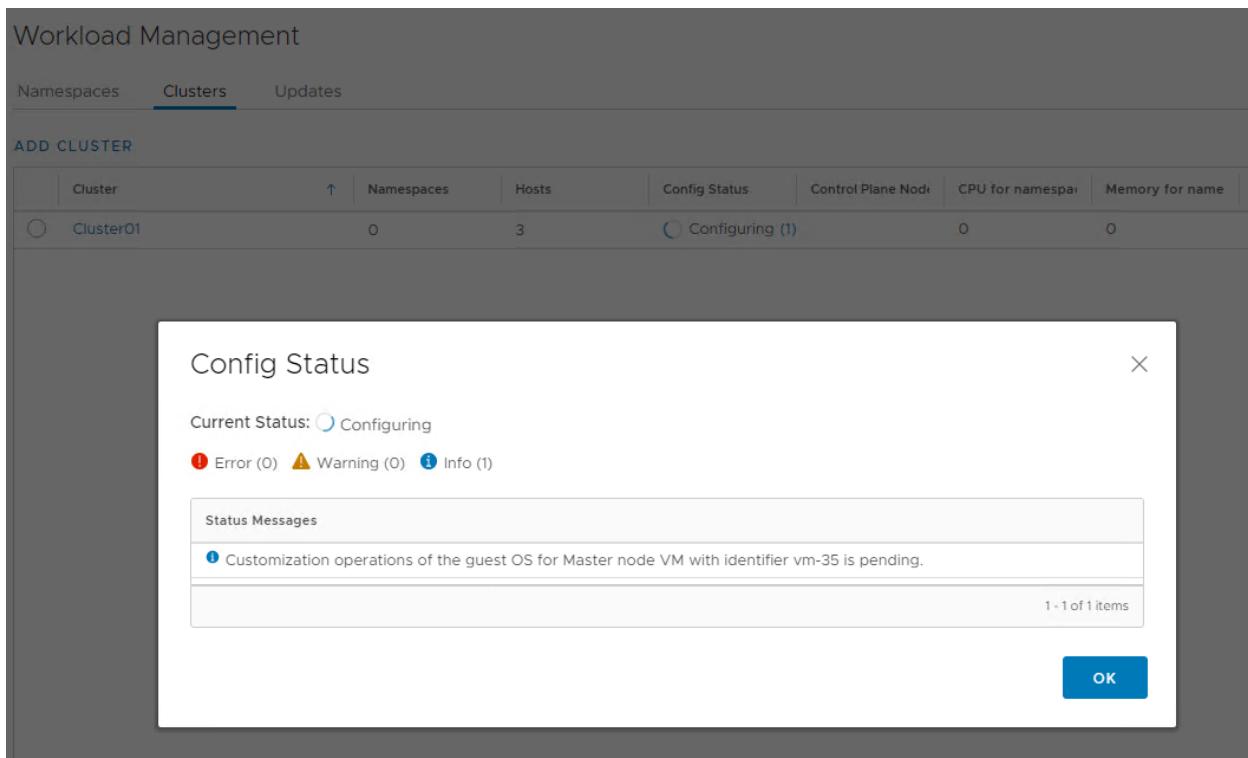
1 Error (0) 0 Warning (0) 1 Info (1)

Status Messages

1 Customization operations of the guest OS for Master node VM with identifier vm-35 is pending.

1 - 1 of 1 items

OK



46 Check on Workload management Task (If there is a number next to Config Status Click it)

Workload Management

Namespaces Clusters Updates

ADD CLUSTER

Cluster	Namespaces	Hosts	Config Status	Control Plane Node
Cluster01	0	3	Running	10.50.0.1

Workload Management

Namespaces Clusters Updates

You have successfully enabled Workload Management

This is your global view of namespaces across your clusters.

Next Steps

- To get started with namespace centric management, create your first namespace. [Learn more](#)
- You can also add a content library to support Tanzu Kubernetes clusters. [Go to Content Library](#)

CREATE NAMESPACE

47 When Clusters Tab Config Status changes to running you will be able to create a namespace on Namespaces Tab

```
C:\Windows\system32>route add 10.60.0.0 mask 255.255.255.0 172.27.10.221
OK!
```

```
C:\Windows\system32>route add 10.50.0.0 mask 255.255.255.0 172.27.10.221
OK!
```

```
C:\Windows\system32>
```

48 Add Routes to Jump Host

```
C:\Windows\system32>route print
=====
Interface List
 1...02 50 41 00 00 01 .....PANGP Virtual Ethernet Adapter
 15...00 50 56 96 ac 10 .....vmxnet3 Ethernet Adapter
 3...00 50 56 96 6a 59 .....vmxnet3 Ethernet Adapter #2
 1.....Software Loopback Interface 1
=====

IPv4 Route Table
=====
Active Routes:
Network Destination      Netmask        Gateway       Interface Metric
          0.0.0.0        0.0.0.0    192.168.10.1   192.168.1.41    271
        10.50.0.0    255.255.255.0  172.27.10.221  172.27.10.220     16
        10.60.0.0    255.255.255.0  172.27.10.221  172.27.10.220     16
        127.0.0.0     255.0.0.0     On-link            127.0.0.1    331
        127.0.0.1     255.255.255     On-link            127.0.0.1    331
 127.255.255.255  255.255.255.255     On-link            127.0.0.1    331
        172.27.10.0    255.255.255.0     On-link       172.27.10.220    271
      172.27.10.220  255.255.255.255     On-link       172.27.10.220    271
      172.27.10.255  255.255.255.255     On-link       172.27.10.220    271
        192.168.1.0    255.255.255.0     On-link       192.168.1.41    271
        192.168.1.41    255.255.255.255     On-link       192.168.1.41    271
      192.168.1.255  255.255.255.255     On-link       192.168.1.41    271
        192.168.10.0   255.255.255.0     On-link       192.168.1.41    271
    192.168.10.126  255.255.255.255     On-link       192.168.1.41    271
    192.168.10.255  255.255.255.255     On-link       192.168.1.41    271
        224.0.0.0     240.0.0.0     On-link            127.0.0.1    331
        224.0.0.0     240.0.0.0     On-link       192.168.1.41    271
        224.0.0.0     240.0.0.0     On-link       172.27.10.220    271
  255.255.255.255  255.255.255.255     On-link            127.0.0.1    331
  255.255.255.255  255.255.255.255     On-link       192.168.1.41    271
  255.255.255.255  255.255.255.255     On-link       172.27.10.220    271
=====

Persistent Routes:
  Network Address      Netmask  Gateway Address Metric
          0.0.0.0        0.0.0.0    192.168.10.1 Default
=====

IPv6 Route Table
=====
Active Routes:
If Metric Network Destination      Gateway
  1     331 ::1/128           On-link
  1     331 ff00::/8           On-link
=====

Persistent Routes:
  None

```

Workload Management

Namespaces Clusters Updates

You have successfully entered the Workload Management interface.

This is your global view of namespaces across all clusters.

Next Steps

- To get started with namespace centric management, click on one of the existing namespaces.
- You can also add a content library to a cluster or namespace.

CREATE NAMESPACE

Create Namespace

X

Select a cluster where you would like to create this namespace.

Cluster* ⓘ

- ▽ vcenter-1.vcf.sddc.lab
 - > SDDC-Datacenter
- ▽ vcenter-wld.vcf.sddc.lab
 - ▽ WLD-1-DC
 - Cluster01

Name* ⓘ

ns1

Description

Add description for the namespace here (limit 180 characters)

CANCEL

CREATE

50 In vcenter-wld.vcf.lab.local Workload Management - Create Namespace

(ns1) | ACTIONS ▾

Summary Monitor Configure Permissions Compute Storage Network

Your namespace ns1 has been successfully created.

Before sharing with your devops team, you might want to :

- Choose which storage policies the namespace can use
- Add your devops teams users and permissions
- Set some limits for this namespace
- Add a content library to the cluster to support Kubernetes functions

When you're ready, you can hand this namespace to the devops team.

GOT IT Don't show for future workloads

Status Created 4/27/20 Config Status ⓘ Running Kubernetes Status ⓘ Active Location Cluster01 vcenter-wld.vcf.sddc.lab Link to CLI Tools Copy link ⓘ Open ⓘ	Permissions You haven't given any devops access to this namespace. Add some permissions to let your devops team directly manage this namespace. ADD PERMISSIONS	Storage You haven't added any storage policies for this namespace. Add some policies to let your devops team access persistent storage. ADD STORAGE	Capacity and Usage CPU No limit 0 MHz Memory No limit 0 MB Storage No limit EDIT LIMITS
--	---	---	---

VMware - Download Kubernetes

Not secure | 10.50.0.1

vmware

Kubernetes CLI Tools

Kubectl + vSphere plugin

Download the CLI tools package to view and control Namespaces in vSphere. [LEARN MORE](#)

SELECT OPERATING SYSTEM ▾

CLI PLUGIN WINDOWS ↓

Checksum CLI plugin Windows ↓

51 Download kubectl plugin from CLI Tools Link

(ns) ns1 | ACTIONS ▾

Summary Monitor Configure Permissions Compute Storage Network

Status Created 4/27/20 ::

Config Status ⓘ **Running**

Kubernetes Status ⓘ **Active**

Location

Cluster01

vcenter-wld.vcf.sddc.lab

Link to CLI Tools

Copy link ⓘ Open ⓘ

Pods 0

Permissions

You haven't given any devops access to this namespace. Add

Storage

You haven't added any storage policies for this namespace. Add

Cap

CPU 0 M

Memory 0 M

Storage

Add Permissions

Add a user or a group to give access to this namespace

Identity source vsphere.local

User/Group Administrator

Role Can edit

CANCEL OK

The screenshot shows a namespace management interface for 'ns1'. On the left, there are sections for Status, Config Status, Kubernetes Status, Location, and Pods. In the center, there are sections for Permissions and Storage. A modal dialog titled 'Add Permissions' is open in the foreground, prompting the user to add a user or group with specific roles. The 'Identity source' is set to 'vsphere.local', the 'User/Group' is 'Administrator', and the 'Role' is 'Can edit'. There are 'CANCEL' and 'OK' buttons at the bottom of the dialog.

52 Set Permissions

Select Storage Policies

	Storage Policy	Total Capacity	Available Capacity
<input type="checkbox"/>	> VM Encryption Policy	2 TB	2 TB
<input checked="" type="checkbox"/>	> vSAN Default Storage P...	1 TB	1 TB
<input type="checkbox"/>	> Management Storage P...	1 TB	1 TB
<input type="checkbox"/>	> Management Storage p...	1 TB	1 TB
<input type="checkbox"/>	> Management Storage P...	1 TB	1 TB
<input type="checkbox"/>	> Management Storage p...	1 TB	1 TB
		1 - 6 of 6 items	

CANCEL **OK**

53 Add Storage

Content Library

Below are all the available libraries or create a new one

CREATE LIBRARY

Name	Type	Storage Used	Last Modified Date
WLD-1-ContentLib	Subscribed	11.73 GB	Apr 26, 2020 11:25 PM
1 - 1 of 1 items			

CANCEL **OK**

54 Add Content Library NS1 that we created before

```
E:\vsphere-plugin\bin>kubectl vsphere login --help
Authenticate user with vCenter Namespaces:
To access Kubernetes, you must first authenticate against vCenter Namespaces.
You must pass the address of the vCenter Namespaces server and the username of
the user to authenticate, and will be prompted to provide further credentials.

Usage:
  kubectl-vsphere login [flags]

Examples:
  kubectl vsphere login --vsphere-username user@domain --server=https://10.0.1.10

Flags:
  -h, --help             help for login
  --insecure-skip-tls-verify   Skip certificate verification (this is insecure).
  --server string        Address of the server to authenticate against.
  --tanzu-kubernetes-cluster-name string   Name of the Tanzu Kubernetes cluster to login to.
  --tanzu-kubernetes-cluster-namespace string   Namespace in which the Tanzu Kubernetes cluster resides.
  -u, --vsphere-username string   Username to authenticate.

Global Flags:
  --request-timeout string   Request timeout for HTTP client.
  -v, --verbose int          Print verbose logging information.

E:\vsphere-plugin\bin>kubectl vsphere login --insecure-skip-tls-verify --server=https://10.50.0.1 --vsphere-username administrator@vsphere.local

Password:
Logged in successfully.

You have access to the following contexts:
  10.50.0.1
  ns1

If the context you wish to use is not in this list, you may need to try
logging in again later, or contact your cluster administrator.

To change context, use `kubectl config use-context <workload name>`
```

E:\vsphere-plugin\bin>

55 Unzip kubectl and log in

```
E:\vsphere-plugin\bin>kubectl config use-context ns1
Switched to context "ns1".

E:\vsphere-plugin\bin>kubectl get vmimage
NAME                                     AGE
ob-15957779-photon-3-k8s-v1.16.8---vmware.1-tkg.3.60d2ffd  11m

E:\vsphere-plugin\bin>
```

56 Switch context to ns1 and check for VM Image from Content Library

```
E:\vsphere-plugin\bin>kubectl apply -f c:\vlc4\guestCluster1.yaml
tanzukubernetescluster.run.tanzu.vmware.com/gc1 created

E:\vsphere-plugin\bin>
```

57 Start Guest Cluster creation

Time

How long does this all take?

Your mileage will vary greatly depending on your hardware.

For reference, a single Dell R720 configured with 384 GB, & 4 SSD's can complete the deployment and bringup process in 2.5 hours on average.

Clean up, Rinse and Repeat.

If at any point you would like to start from a fresh deployment. You need to complete the following.

1. Login to the host or vCenter at Layer 1.
2. Power off all nested ESXi hosts and Cloud Builder
3. Delete them all from disk.
4. Delete the temp directory from the Lab Constructor directory.
5. Delete VLC_vSphere.iso from the Lab Constructor directory.
6. Optionally remove any old log files from the Lab Constructor directory.

Troubleshooting

Some general troubleshooting hints:

- If your ESXi Host or vCenter in Physical Environment has a self-signed or untrusted SSL cert
 - Set your PowerShell environment to ignore the certificate.
 - set-powercliconfiguration -invalidcertificateaction ignore
- Examine the Bring-up logs
 - https://docs.vmware.com/en/VMware-Cloud-Foundation/3.0/com.vmware.vcf.ovdeploy.doc_30/GUID-BD989650-BB59-4352-A278-CDF1B9AB9B47.html
- Most times a FAILED task can be restarted (Best practice is to retry three times before investigating deeper)
- If you think a task is stuck and it's been hours, try rebooting the SDDC Manager and retrying the bring-up task.
- Depending on what stage you're having any issues at, you can login to any of the layer 2 hosts, and vCenters to troubleshoot issues.
- Post questions on the #vlc-support, join slack by signing up here: <https://tiny.cc/getVLCSlack>.

Known Issues

- Because this software is originally to run on physical hardware with SSD's and 10GB networks, performance issues will break your deployment.
- **Do not Mount the ISO for ESXi from an NFS Datastore**

Logging

The VCF Lab Constructor creates a log to verify successful deployment. This log can be found in the VCF Directory where you launched the VCF Lab Constructor.