Holodeck Toolkit 5.2x

Supporting VCF 5.2 and 5.2.1

vmware by Broadcom

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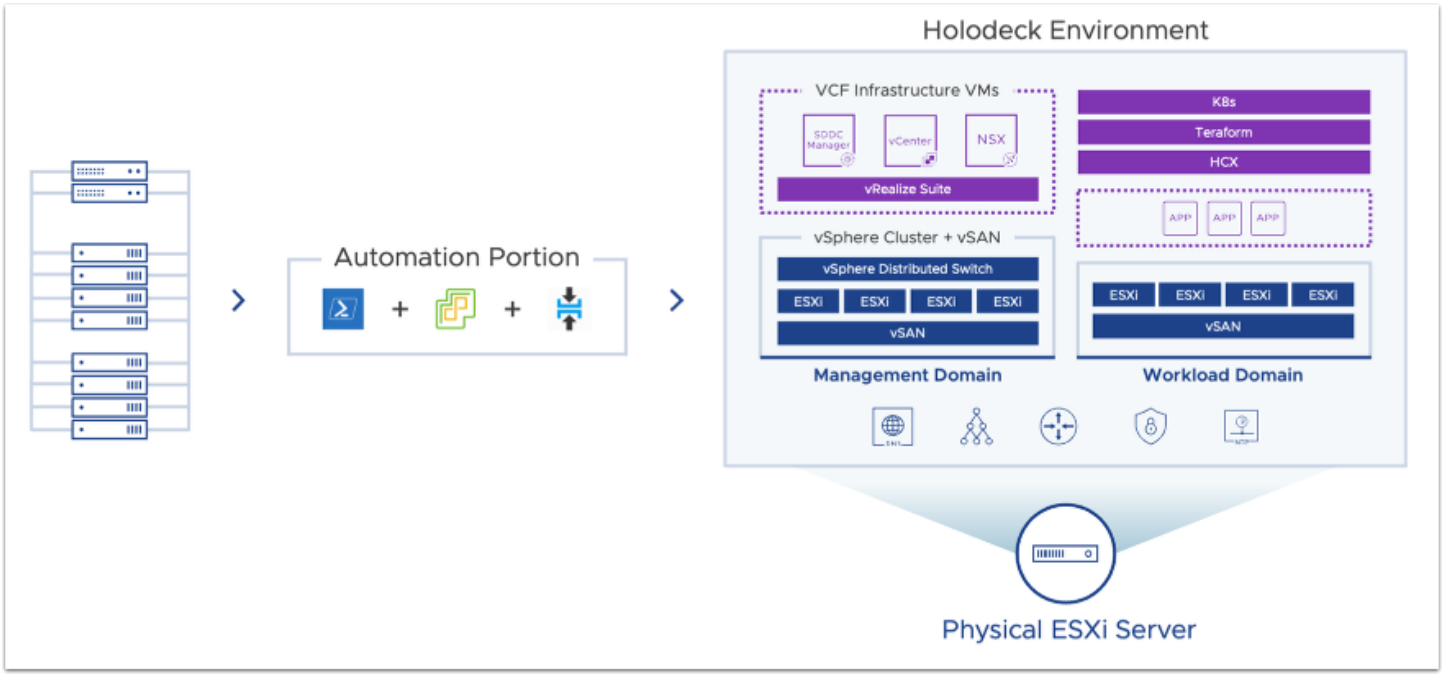
Holodeck Tool Kit (5.2x)

The Holodeck Toolkit is designed to provide a standardized and automated method to deploy nested VMware Cloud Foundation (VCF) environments on a VMware ESXi host. These environments are ideal for technical capability testing by multiple teams inside a data center to explore hands on exercises showcasing VCF capabilities to deliver a customer managed VMware Private Cloud. The Holodeck Toolkit is only to be used for a testing and training environment; it is ideal for anyone wanting to gain a better understanding of how VCF functions across many use cases and capabilities. Currently, there are three different versions of the Holodeck Toolkit - version 2.0 which supports VCF 4.5, 4.5.1 and 5.0, Holodeck Toolkit 5.1.1 which supports VCF 5.1.1 and Holodeck 5.2x supporting. VCF 5.2 and 5.2.1

The Holodeck Toolkit utilizes VCF Lab Constructor which enables the virtualization of the hardware and external services to. create a fully functional VCF environment that is completely isolated from external network services. Through increased automation, standardized configuration and comprehensive documentation the Toolkit is enabled for quick build and rebuild with a known configuration every time.



Delivering hands on labs in a nested environment solves several challenges with VMware Cloud Foundation.

Reduced hardware requirements: When operating in a physical environment, VCF requires four vSAN Ready Nodes for the management domain, and additional hosts for adding clusters or workload domains. In a nested environment, this same four to eight hosts are easily virtualized to run on a single ESXi host

Self-contained services: The Holodeck Toolkit configuration provides common infrastructure services, such as NTP, DNS, AD, Certificate Services and DHCP within the environment, removing the need to rely on datacenter provided services during testing. Each environment needs a single external IP.

Isolated networking: The Holodeck Toolkit configuration removes the need for VLAN and BGP connections in the customer network early in the testing phase.

Isolation between environments: Each Holodeck deployment is completely self-contained. This avoids conflicts with existing network configurations and allows for the deployment of multiple nested environments with no concerns for overlap.

Multiple VCF deployments on a single VMware ESXi host of sufficient capacity: A typical VCF Standard Architecture deployment of four node management domain and three node VI workload domain, plus add on such as VMware Aria Automation requires approximately 20 CPU cores, 512GB memory and 2.5TB disk.

Automation and repeatability: The deployment of a nested VCF environments is almost completely hands-off, and easily repeatable using configuration files. A typical deployment takes less than 3 hours, with less than 15 min keyboard time.

Holodeck Environment Overview

The Holodeck environment is automatically deployed utilizing VLC. Depending on the version of the Holodeck Toolkit it can be deployed as a Single-Site or a Multi-Site Configuration (Holodeck Toolkit 5.1.1 and greater).

Each Holodeck Environment contains:

- Four node VCF management domain on nested vSAN Ready Nodes
- Three additional nested hosts configured as a workload domain, a second cluster in management domain, or commissioned into SDDC inventory (Optional)
- NSX fully configured
- AVN/NSX Edge Deployed (recommended)
- Tanzu deployed
- Customized Cloud Builder VM configured to provide DHCP, NTP, DNS, BGP peering and L3 routing within the environment

Note: VCF Lab Constructor is not a VMware supported product, it is similar to a Fling.

The VLC-Holo-Site-1 is the primary configuration deployed. VLC-Holo-Site-1 configuration matches the lab configuration in the VCF Hands-On Lab and the nested configuration in the VCF Experience Program.

Each Holodeck environment runs an identical nested configuration. A Holodeck environment can be deployed as a Single or Multi-site Configuration (5.1.1 and later) configurations active. Separation of the environments and between sites within an environment is handled at the VMware vSphere Standard Switch (VSS) level. Each Holodeck pod is configured with a unique VSS per site. A VMware vSphere Port Group is configured on each VSS and configured as a VLAN trunk.

Components on the port group to use VLAN tagging to isolate communications between nested VLANs. This removes the need to have physical VLANs plumbed to the ESXi host to support nested labs.

When the Holo-Site-2 configuration is deployed it uses a second VSS and Port Group for isolation from Holo-Site-1

The VLC Holodeck configuration customizes the VCF Cloud Builder Virtual Machine to provide several support services within the pod to remove the requirement for specific customer side services. A Cloud Builder VM is deployed per Site to provide the following within the pod:

- DNS (local to Site1 and Site2 within the pod, acts as forwarder)
- NTP (local to Site1 and Site2 within the pod)
- DHCP (local to Site1 and Site2 within the pod)
- L3 TOR for vMotion, vSAN, Management, Host TEP and Edge TEP networks within each site
- BGP peer from VLC Tier 0 NSX Edge (Provides connectivity into NSX overlay networks from the lab console)

The Holodeck package also provides a preconfigured Photon OS VM, called **Holo-Router**, that functions as a virtualized router for the base environment. This VM allows for connecting the nested environment to the external world. The Holo-Router is

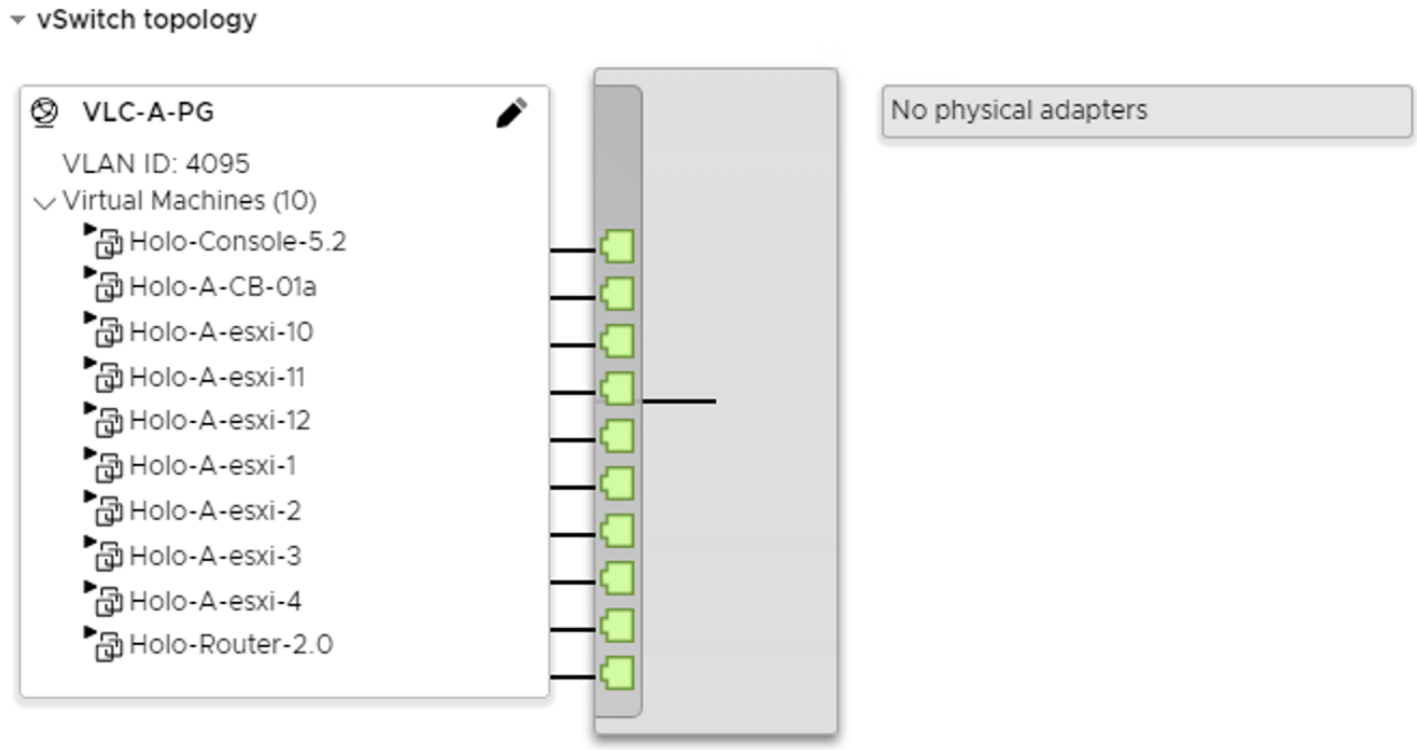
configured to forward any Microsoft Remote Desktop (RDP) traffic to the nested jump host, known as the Holo-Console, which is deployed within the pod.

The user interface to the nested VCF environment is via a Windows Server 2019 Holo-Console virtual machine. Holo-Console provides a place to manage the internal nested environment like a system administrators desktop in a datacenter. Holo-Console is used to run the VLC package to deploy the nested VCF instance inside the pod. Holo-Console VMs are deployed from a custom-built ISO that configures the following

Microsoft Windows Server 2019 Desktop Experience with:

- Active directory domain vcf.holo.lab
- DNS Forwarder to Cloud Builder
- Certificate Server, Web Enrollment and VMware certificate template
- RDP enabled
- IP, Subnet, Gateway, DNS and VLAN configured for deployment as Holo-Console
- Firewall and IE Enhanced security disabled
- SDDC Commander custom desktop deployed
- Additional software packages deployed and configured
- Google Chrome with Holodeck bookmarks
- VMware Tools
- VMware PowerCLI
- VMware PowerVCF
- VMware Power Validated Solutions
- PuTTY SSH client
- VMware OVFtool
- Additional software packages copied to Holo-Console for later use
- VMware Cloud Foundation Cloud Builder OVA to C:\CloudBuilder
- VCF Lab Constructor 5.0 with dual site Holodeck configuration (C:\VLC\VLC-Holo-Site-1 & C:\VLC\VLC-Holo-Site-2)
- VMware Aria Automation 8.18 Easy Installer

The figure below shows the virtual machines for a single site configuration running on the physical ESXi host to deliver a Holodeck Pod called Holo-A. Notice an instance of Holo-Console, Holo-Router, Cloud Builder and four nested ESXi hosts. They all communicate over the VLC-A-PG Port Group. Users will access the Holodeck environment via the Holo-Console.



Holodeck Toolkit 5.2x Components

The Holodeck Toolkit 5.2x package only supports VCF 5.2 and 5.2.1 in "License Later" deployment mode. This mode enables all functionality for 60 days from the date of install. After 60 days, the environment will need to be redeployed, or license keys must be added.

- VCF Lab Constructor (VLC) 5.2 package
  - PowerShell based utility
  - Can be utilized via a GUI or CLI (Multi-site can only be done via CLI)
  - Automates the deployment of standardized virtualized hardware and VCF configuration via configuration files
  - Complete configuration files for VLC supporting a standardized multi-site deployment of VCF
- Custom VMware Photon OS based Holo-Router
  - Support communications within a nested VCF environment
  - Facilitates communication within the environment to outside network.
- Custom Holo-Console utilizing Microsoft Windows Server 2019
  - Fully automated Holo-Console ISO generation
  - AD services
  - Microsoft Certificate Server
  - Full deployment and operations guidance for one or more Holodeck environments
- Curated lab set to demonstrate the Cloud Operating Model to multiple teams within the datacenter
  - Software Defined Networking and Security with VMware NSX Data Center

- VMware Cloud Foundation based private cloud automation
- Scaling application deployment and monitoring with VMware Aria Automation
- Workload Migration with VMware HCX
- Application Modernization with Kubernetes

Single Site Holodeck Environment Overview

The Single Site Holodeck environment can be automatically deployed utilizing VLC by using either the GUI or the CLI

A Single Site Environment contains:

- Four node VCF management domain on nested vSAN Ready Nodes
- Three additional nested hosts in a workload domain, or second vSphere cluster in the management domain, or just commissioned into inventory (Optional)
- NSX fully configured
- AVN/NSX Edge Deployed (recommended)
- Supervisor VMs deployed for Kubernetes
- Customized Cloud Builder VM configured to provide additional functionality within the environment

VLC can also automate deployment of an optional second VCF instance per environment to provide a multi-site configuration for advanced lab exercises if the physical host can support the resource requirements.

Note: multi-site deployments can only be performed using the CLI deployment method. Single site deployments can be deployed using the GUI, or the CLI.

The VLC-Holo-Site-1 is the primary configuration deployed. VLC-Holo-Site-1 configuration matches the lab configuration in the VCF Hands-On Lab and the nested configuration in the VCF Experience Program.

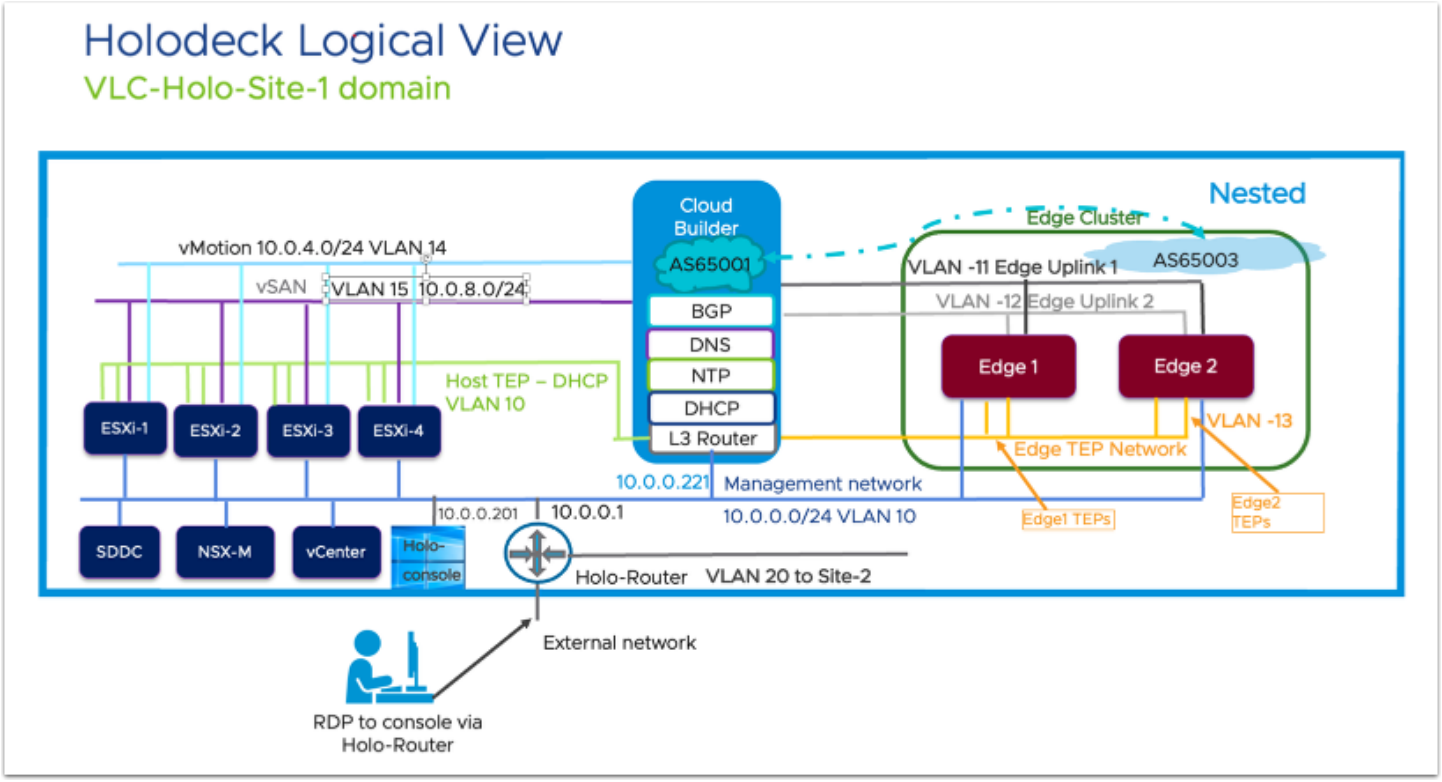
Each Holodeck deployment runs an identical nested configuration. A Holodeck environment can be deployed with a standalone VLC-Holo-Site-1 configuration, separation of the environments handled at the VMware vSphere Standard Switch (VSS) level. Each Holodeck pod is configured with a unique VSS per site. A VMware vSphere Port Group is configured on each VSS and configured as a VLAN trunk.

Components on the port group to use VLAN tagging to isolate communications between nested VLANs. This removes the need to have physical VLANs plumbed to the ESXi host to support nested labs.

The VLC Holodeck configuration customizes the VCF Cloud Builder Virtual Machine to provide several support services within the pod to remove the requirement for specific customer side services. A Cloud Builder VM is deployed per Site to provide the following within the pod:

- DNS (local to Site1 within the pod, acts as forwarder)
- NTP (local to Site1 within the pod)
- DHCP (local to Site1 within the pod)
- L3 TOR for vMotion, vSAN, Management, Host TEP and Edge TEP networks within the site
- BGP peer from VLC Tier 0 NSX Edge (Provides connectivity into NSX overlay networks from the lab console)

The figure below shows a logical view of the VLC-Holo-Site-1 configuration within a Holodeck Pod. The Site-1 configuration uses DNS domain vcf.sddc.lab and VLAN 10-15



Multi-Site Holodeck Environment Overview

The Multi-Site Holodeck environment is automatically deployed utilizing VLC only by using the CLI. Multi-site configuration is ideal for advanced lab exercises if the physical host can support the resource requirements. In order to support a multi-site configuration, additional networks are required created both on the Holo-Router and in Cloud Builder to allow for cross site communication.

A Multi-Site Environment contains:

- Four node VCF management domain on nested vSAN Ready Nodes
- Three additional nested hosts in a workload domain, or second vSphere cluster in the management domain, or just commissioned into inventory (Optional)
- NSX fully configured
- AVN/NSX Edge Deployed (Recommended)
- Tanzu deployed
- Customized Cloud Builder VM configured to provide additional functionality within the environment

The VLC-Holo-Site-1 is the primary configuration deployed. It is nearly identical to the single site configuration talked about above.

Each Holodeck deployment runs an identical nested configuration. A Multi-Site Holodeck environment is deployed with both VLC-Holo-Site-1 and VLC-Holo-Site-2 configurations active. Separation of the environments and between sites within an environment is handled at the VMware vSphere Standard Switch (VSS) level. Each Holodeck pod is configured with a unique VSS per site. A VMware vSphere Port Group is configured on each VSS and configured as a VLAN trunk.

Components on the port group to use VLAN tagging to isolate communications between nested VLANs. This removes the need to have physical VLANs plumbed to the ESXi host to support nested labs.

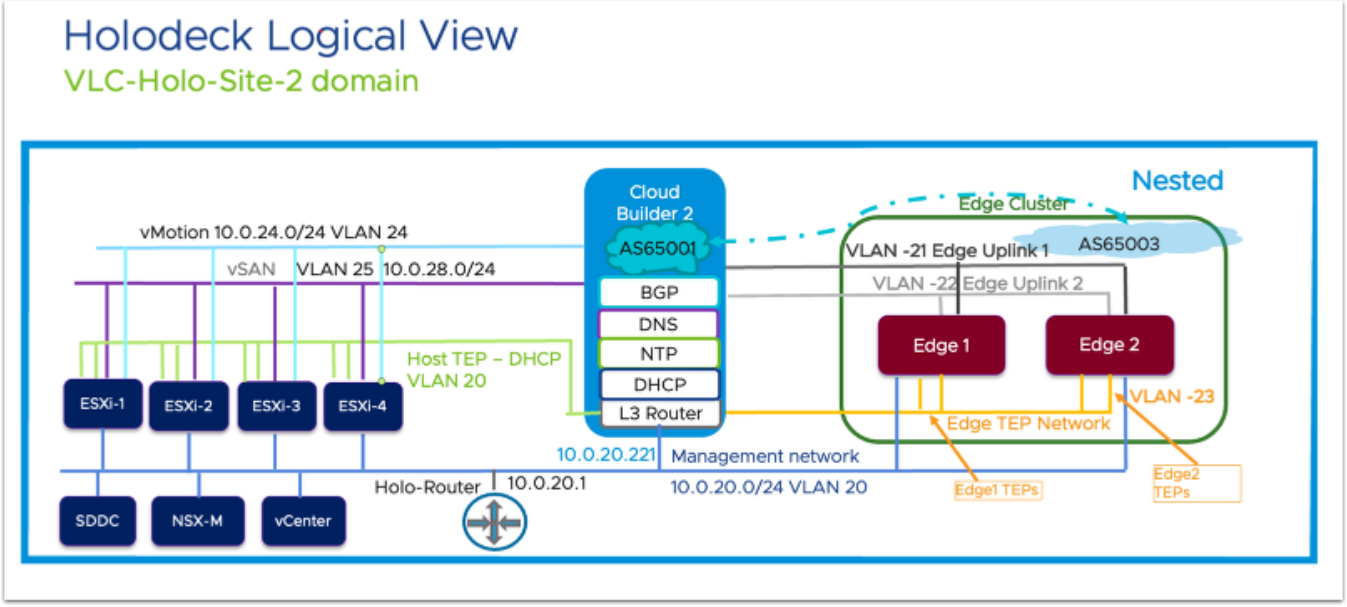
When the Holo-Site-2 configuration is deployed it uses a second VSS and Port Group for isolation from VLC-Holo-Site-1. The VLC-Holo-Site-2 can be deployed at any time later within a Holodeck environment via the VLC CLI. Adding the second site adds an additional instance of Cloud Builder and additional nested ESXi hosts. VLC-Holo-Site-2 connects to the second internal leg of the Holo-Router on VLAN 20. Network access from the Holo-Console to VLC-Holo-Site-2 is via Holo-Router.

The VLC Holodeck configuration customizes the VCF Cloud Builder Virtual Machine to provide several support services within the pod to remove the requirement for specific customer side services. A Cloud Builder VM is deployed per Site to provide the following within the pod:

- DNS (local to Site1 and Site2 within the pod, acts as forwarder)
- NTP (local to Site1 and Site2 within the pod)
- DHCP (local to Site1 and Site2 within the pod)
- L3 TOR for vMotion, vSAN, Management, Host TEP and Edge TEP networks within each site
- BGP peer from VLC Tier 0 NSX Edge (Provides connectivity into NSX overlay networks from the lab console)

The VLC-Holo-Site-2 can be deployed at any time later within a Holodeck environment via the VLC CLI. Adding the second site adds an additional instance of Cloud Builder and additional nested ESXi hosts. VLC-Holo-Site-2 connects to the second internal leg of the Holo-Router on VLAN 20. Network access from the Holo-Console to VLC-Holo-Site-2 is via Holo-Router.

The figure below shows a logical view of the VLC-Holo-Site-2 configuration within a Holodeck Pod. The Site-2 configuration uses DNS domain vcf2.sddc.lab and VLAN 20-25



Accessing Holodeck Environment

Users access to the Holodeck pod is via the Holo-Console. Access to Holo-Console is available via two paths:

Microsoft Remote Desktop Protocol (RDP) connection to the external IP of the Holo-Router. Holo-Router is configured to forward all RDP traffic to the instance of Holo-Console inside the pod.

- Microsoft Remote Desktop Client for Mac
- Remote Desktop Client for Windows (via Microsoft Store)

Access Holo-Console via ESXi host; by using the tools native to an ESXi host access to the desktop of the Holo-Console is simple.

- Browser console (native to vSphere Client)
- VMware Remote Console (Requires VMware Customer Connect login)

ESXi Host Sizing

- Good (One Single-Site Environment):
  - Single ESXi host with 16 cores,
  - 384gb memory
  - 3.5TB SSD/NVME
- Better (Two Single-Site Environments or One Dual-Site Environment):
  - Single ESXi host with 32 cores
  - 768gb memory
  - 7 TB SSD/NVME
- Best (Four or more Sites):
  - Single ESXi host with 64+ cores
  - 2.0TB memory
  - 14 TB SSD/NVME

ESXi Host Configuration

Running vSphere 7.0U3 or 8.0x

- Stand-alone non vCenter Server managed host or single host cluster managed by a vCenter server instance
  Multi host clusters are NOT supported in this release due to requiring physical VLAN support
- Virtual Standard switch and port groups configured per guidelines
- Holo-Build host (system used to create custom Holo-Console ISO)
  - Windows 2019 host or VM with local access to ESXI hosts used for Holodeck + internet access to download software. (This package has been tested on Microsoft Windows Server 2019 only)
  - 400GB free disk space
- External/Customer networks required
- ESXi host management IP (one per host)
- Holo-Router external IP address per Holodeck Environment

Prepare Physical ESXi for Holodeck Networking

Configuring Holodeck Networking on VMware ESXi Host

Overview

Each Holodeck environment requires an isolated (no uplinks) vSphere Standard Switch and corresponding Port Groups. If the user expects to deploy a dual site configuration, a second Switch/Port Group pair needs to be deployed for that instance.

Pre-Requisites

External facing Port Group configured with an IP address available for each Holodeck environment to be deployed on this host.

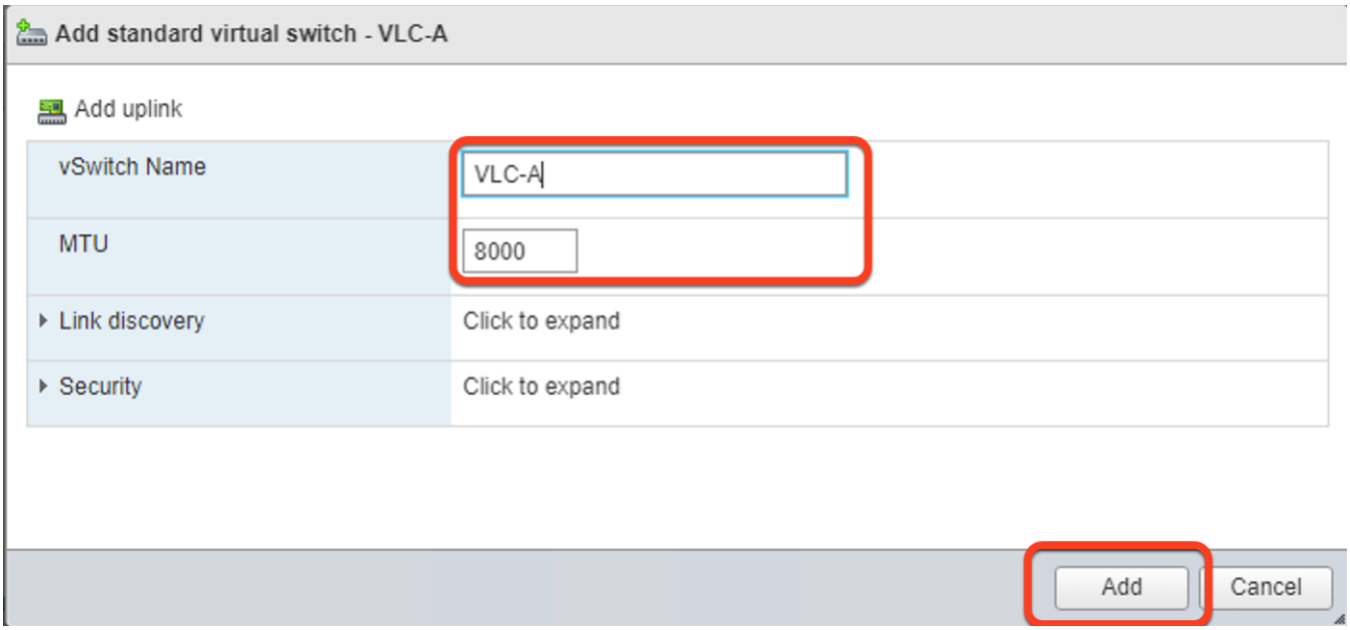
ESXi Host Networking Configuration

This task describes the process for configuring a vSwitch called *VLC-A* and a port group called *VLC-A-PG*, which would typically be used for the Site-1 configuration within the pod, and vSwitch VLC-A2 with port group VLC-A2-PG for Site-2.

Note: Adding the second switch and port group for Site-2 is recommended even if you do not initially deploy the second site within the pod.

Configure vSphere Standard Switches for Nested Networking

1. Create a standard switch called *VLC-A* and MTU **8000**.
2. Remove the uplink by clicking on the **X** on the uplink.

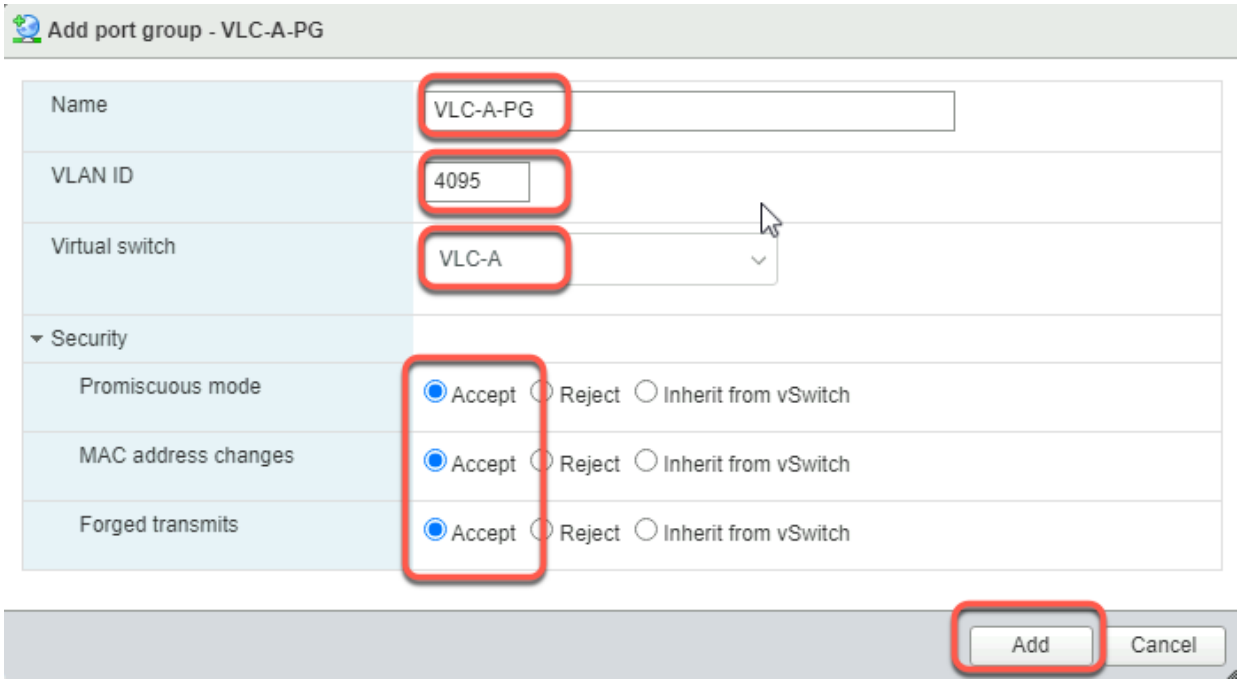


3. Verify the settings and click **Add**

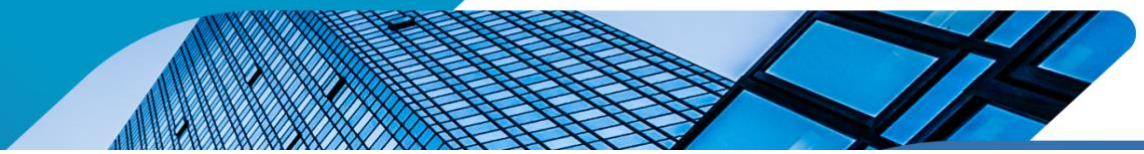
Repeat steps 1-3 to create vSphere Standard Switch VLC-A2 for the second site in the pod

Configure VLC Port Groups

1. Add a new Port Group
2. Name the Port Group *VLC-A-PG*
3. Set VLAN ID to *4095*
4. Set virtual switch to **VLC-A**
5. Open security and set all to accept
6. Click **Add**



Repeat steps 1-6 for Port Group VLC-A2-PG on Virtual Switch VLC-A2 to support addition of Site 2 in the pod



Build Holo-Console Custom ISO

Interaction with the VLC Holodeck Standard configuration is done through a virtual machine referred to as the *Holo-Console*. This VM is a specifically configured Microsoft Windows Server 2019 based VM deployed inside the Holodeck instance. Each Holodeck instance deployed must contain one Holo-Console.

Note: A single Holodeck instance(pod) can have site-1 and site-2 configurations. Only one instance of Holo-Console is required for a dual site Holodeck configuration

Stage Software to Build Host

Overview

This section details downloading and staging software components on to a Build host used bootstrap the Holodeck deployment.

Prerequisites

A Microsoft Windows Server 2019-based system with
Internet access
Local access to Holodeck ESXi hosts
Minimum of 250 GB of free space available

Disclaimer

The Holodeck Toolkit is a non-supported tool that deploys VMware Cloud Foundation in a nested environment. While this configuration works for testing and demo, it is not supported by VMware GSS. Use of this software is at your own risk. This software should only be used in a non-production lab environment.

Download the Required Software

Upon completion of this task, all the required software will be downloaded in preparation for the creation of the Holo-Console ISO image

Access the Holodeck Toolkit Intake Form

Navigate and complete Holodeck Toolkit Intake form
Follow the link in the intake form to download the **Holodeck-Toolkit-v52.zip** file to C:\Users\Administrator\Downloads

Download remaining software to the Holo-Build host

Download the following packages to C:\Users\Administrator\Downloads

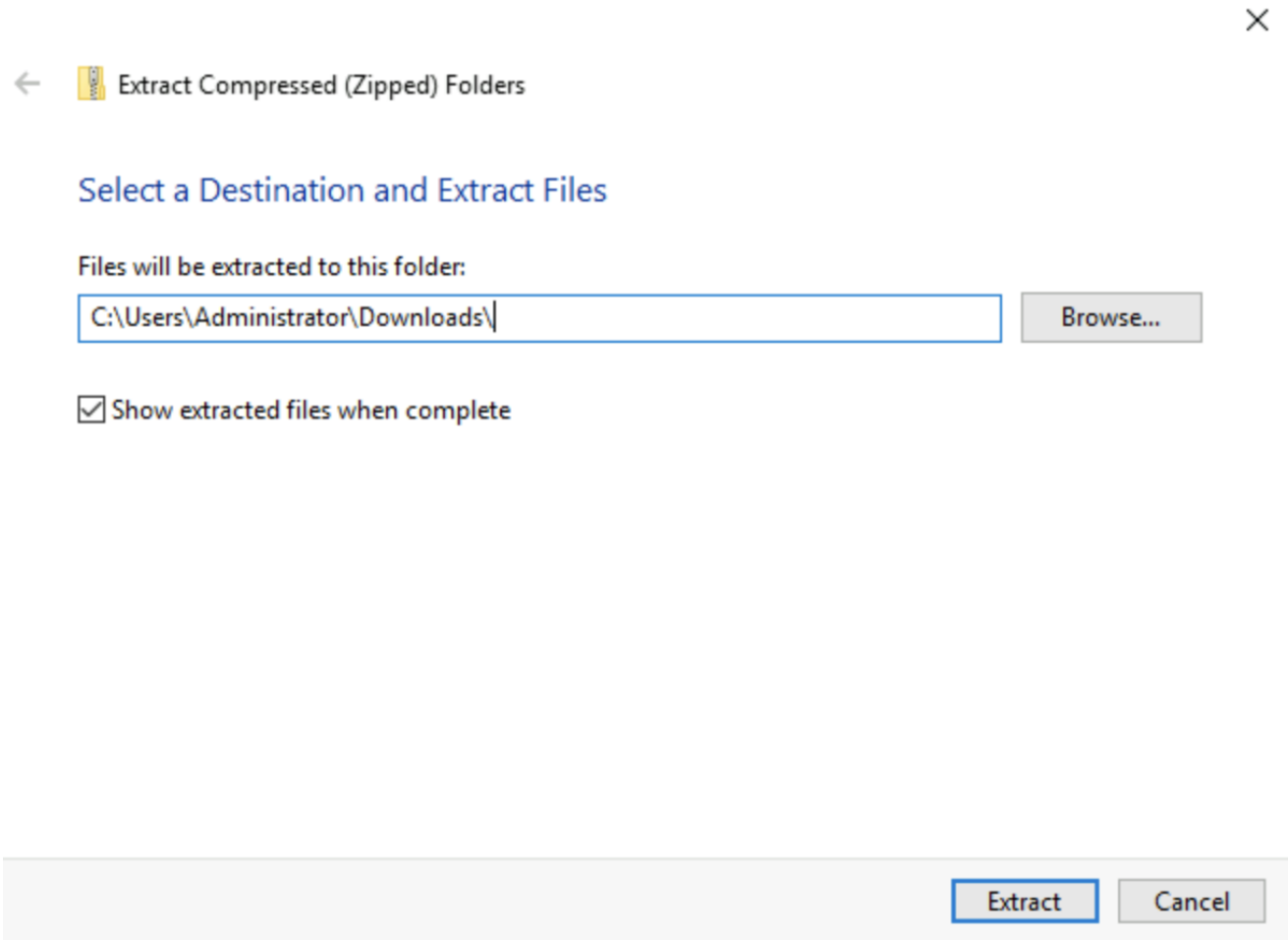
- Microsoft Server 2019 Desktop Experience (Eval copy with 6 month expiration)
- Latest Powershell 7.x
- Google Chrome Standalone (Download standalone EXE package via “Need the Chrome installer? Download here”)
- Latest PuTTY SSH Client MSI
- Notepad ++ 8.5.4
- Latest VMware PowerVCF zip file
- Latest VMware Power Validated Solutions Module zip file

The following software will require a login to Broadcom Support (support.broadcom.com) and entitlements to the software.

- Latest VMware VMTools package Download VMware Tools for Windows, 64-bit in-guest installer (Please unzip and put the executable in the base downloads folder)
- Latest VMware PowerCLI zip file - Requires PowerCLI 13 or higher
- VMware OVFtool 4.6.3 Download 64 Bit Windows Installer ** **Must use OVFTool 4.6.3 MSI file, not zip** **
- VMware Cloud Foundation 5.2 Cloud Builder OVA - Expand VMware Cloud Foundation 5.2 and browse to latest release to download the OVA
- VMware Aria Suite Lifecycle 8.18.0 Easy Installer for Automation & vIDM

Unzip VCF Lab Constructor

1. Unzip *Holodeck-Toolkit-v52.zip* (downloaded from link after successful form completion) into the C:\Users\Administrator\Downloads directory



Prepare Configuration files for Custom ISO

There are three different files that are important to validate and update prior to building the custom ISO for the Holodeck Console: **createISO.ps1**, **additionalfiles.txt, additionalcommands.bat**

Validate/Update createISO.ps1

1. Navigate to C:\Users\Administrator\Downloads\holodeck-standard-main\Holo-Console
2. Open createISO.ps1
3. Validate the filenames in the default createISO.ps1 match the downloaded file names. In cases where newer versions of files are downloaded, update the file names in createISO.ps1.

```
Holo-Console > createISO.ps1
$HoloConsoleParams = @{
    addHostsFile = "C:\Users\Administrator\Downloads\holodeck-standard-main\Holo-Console\holoHosts.txt"
    addCmdsFile = "C:\Users\Administrator\Downloads\holodeck-standard-main\Holo-Console\additionalcommands.bat"
    addFilesFile = "C:\Users\Administrator\Downloads\holodeck-standard-main\Holo-Console\additionalfiles.txt"
    bookMarksFile = "C:\Users\Administrator\Downloads\holodeck-standard-main\Holo-Console\bookmarks.json"
    chromeInstallerExeLoc = "C:\Users\Administrator\Downloads\ChromeStandaloneSetup64.exe"
    cloudBuilderISOLoc = "C:\Users\Administrator\Downloads\VMware-Cloud-Builder-5.2.0.0-24108943_OVF10.ova"
    holodeckZipLoc = "C:\Users\Administrator\Downloads\Holodeck-Toolkit-v52.zip"
    lcmInstallOVALoc = "C:\Users\Administrator\Downloads\VMware-Aria-Automation-Lifecycle-Installer-24029606.iso"
    ovfToolMsiLoc = "C:\Users\Administrator\Downloads\VMware-ovftool-4.6.3-24031167-win.x86_64.msi"
    powerCLIZipLoc = "C:\Users\Administrator\Downloads\VMware-PowerCLI-13.3.0-24145081.zip"
    powerVCFZipLoc = "C:\Users\Administrator\Downloads\powershell-module-for-vmware-cloud-foundation-main.zip"
    powerVSZipLoc = "C:\users\Administrator\Downloads\power-validated-solutions-for-cloud-foundation-main.zip"
    puttyMSILoc = "C:\users\Administrator\Downloads\putty-64bit-2024-07-14-installer.msi"
    vmToolsExeLoc = "C:\Users\Administrator\Downloads\VMware-tools-12.4.5-23787635-x86_64.exe"
    winIsoLoc = "C:\Users\Administrator\Downloads\17763.737.190906-2324.rs5_release_svc_refresh_SERVER_EVAL_x64FRE_en-us_1.
    isoRole = "AD"
```

4. Leave the license key fields blank in release 5.2 for VCF evaluation mode
   - esxLicense (vSphere)
   - nsxLicense (NSX)
   - vcLicense (vCenter Server)
   - vsanLicense (vSAN)
5. Save **createISO.ps1**

Note: the last set of variables is the default for the Holodeck configuration and should not be changed.

```
    winIsoLoc = "C:\Users\Administrator\Downloads\17763.737.190906-2324.rs5_release_svc_refresh_SERVER_EVAL_x64FRE_en-us
    isoRole = "AD"
    esxLicense = ""
    nsxLicense = ""
    vcLicense = ""
    vsanLicense = ""
    compName = "vcfad"
    compIP = "10.0.0.201"
    compSubnet = "255.255.255.0"
    compGw = "10.0.0.221"
    compVlan = "10"
    compDNSFwd = "10.0.0.221"
    adDomain = "vcf.holo.lab"
    adminPass = "VMware123!"
    }

.$PSScriptRoot\autoJump.ps1 @HoloConsoleParams
```

Validate additionalfiles.txt customization file

Powershell 7.x and Notepad++ is copied into the ISO using the **additionalfiles.txt** customization file. If you are not using Powershell version 7.4.5 or Notepad++ version 8.5.4 it will need to be updated here. This customization file also copies the SDDC Commander custom wallpaper and PowerShell script to do the customization into the console. This is a very handy feature if you need to make files available in each deployed console.

Holo-Console > additionalfiles.txt

```
1  C:\Users\Administrator\Downloads\holodeck-standard-main\Holo-Console\README.md
2  C:\Users\Administrator\Downloads\holodeck-standard-main\Holo-Console\sddccommander_vcf_wide_design.png
3  C:\Users\Administrator\Downloads\holodeck-standard-main\Holo-Console\setwallpaper.ps1
4  C:\Users\Administrator\Downloads\npp.8.5.4.Installer.x64.exe
5  C:\Users\Administrator\Downloads\PowerShell-7.4.4-win-x64.msi
6
```

Validate additionalcommands.bat customization file

Both PowerShell and Notepad++ is deployed in the Holo-Console using the **additionalcommands.bat** customization file. Commands placed here are run at the very last step of automated Holo-Console deploy.

Any files placed in the ISO via additionalfiles.txt are accessible at %WINDIR%\Setup\Scripts\ when this script is run. This is also a very handy feature for customizing Holo-Console deployment.

Note: If using a version of Notepad++ other than 8.5.4 or PowerShell version 7.4.4 an update to the installer filename is required here as well.

Holo-Console > additionalcommands.bat

```
13  :: Runs a powershell script to set wallpaper
14  ::
15  %WINDIR%\system32\WindowsPowerShell\v1.0\powershell.exe -c %WINDIR%\Setup\Scripts\setwallpaper.ps1
16  ::
17  :: Install new version of Powershell using the MSI installer with "quiet" switch and "no restart".
18  ::
19  msiexec.exe /package %WINDIR%\Setup\Scripts\PowerShell-7.4.4-win-x64.msi /quiet ADD_EXPLORER_CONTEXT_MENU
20  ::
21  ::
22  :: Futher Examples
23  :: You will need to download the binaries/installer for additional software and ensure it is copied to th
24  ::
25  :: Example - Install Notepad ++ using the executable installer with "Silent" switch
26  ::
27  %WINDIR%\Setup\Scripts\npp.8.5.4.Installer.x64.exe /S
28  ::
```

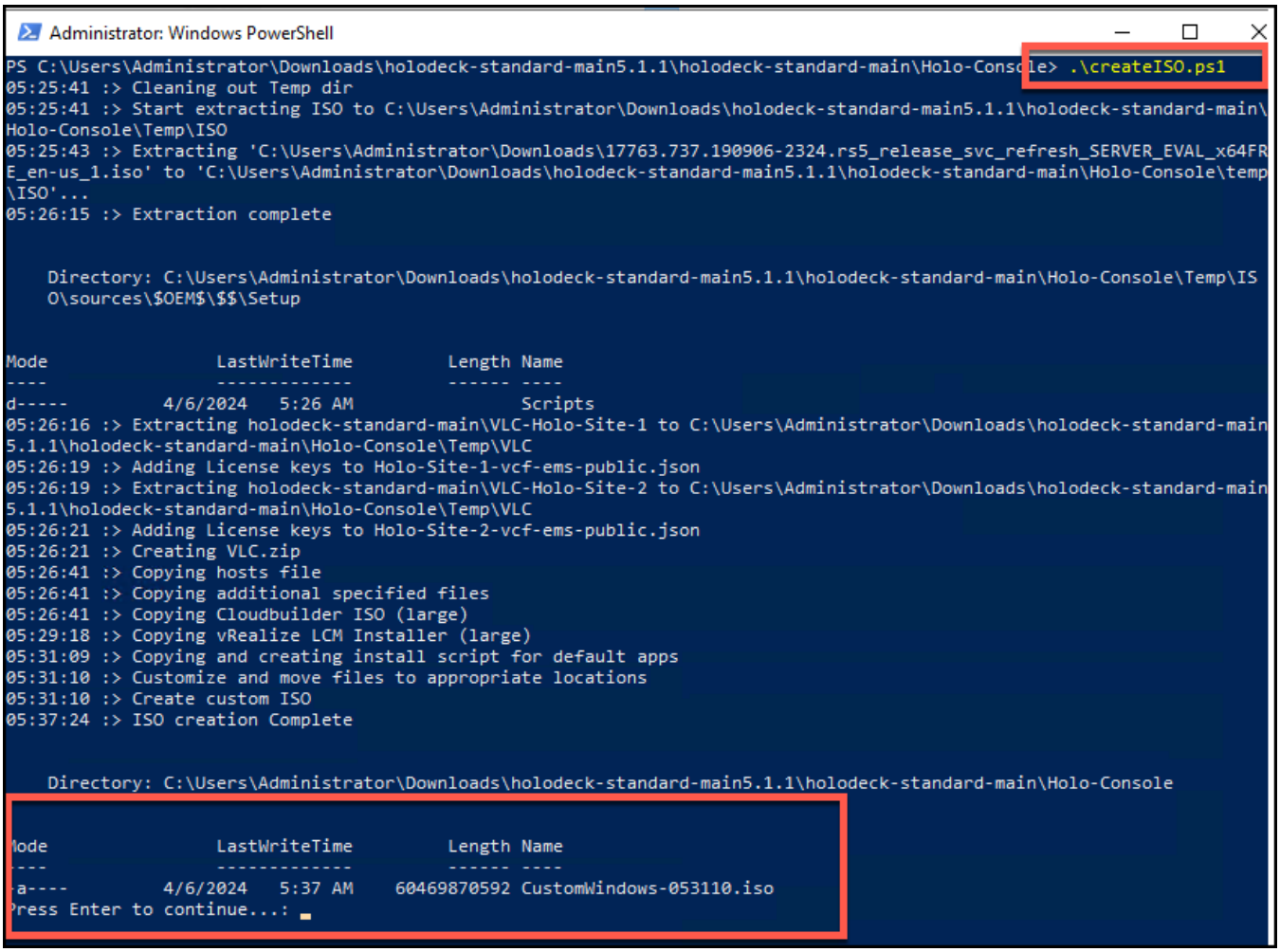
Holo-Console ISO Creation

This step uses PowerShell Automation to create a custom ISO that will provide complete hands-off deployment of Holo-Console. The following steps are performed to create the Holo-Console ISO after the customization files were validated in previous sections

1. Open a PowerShell window

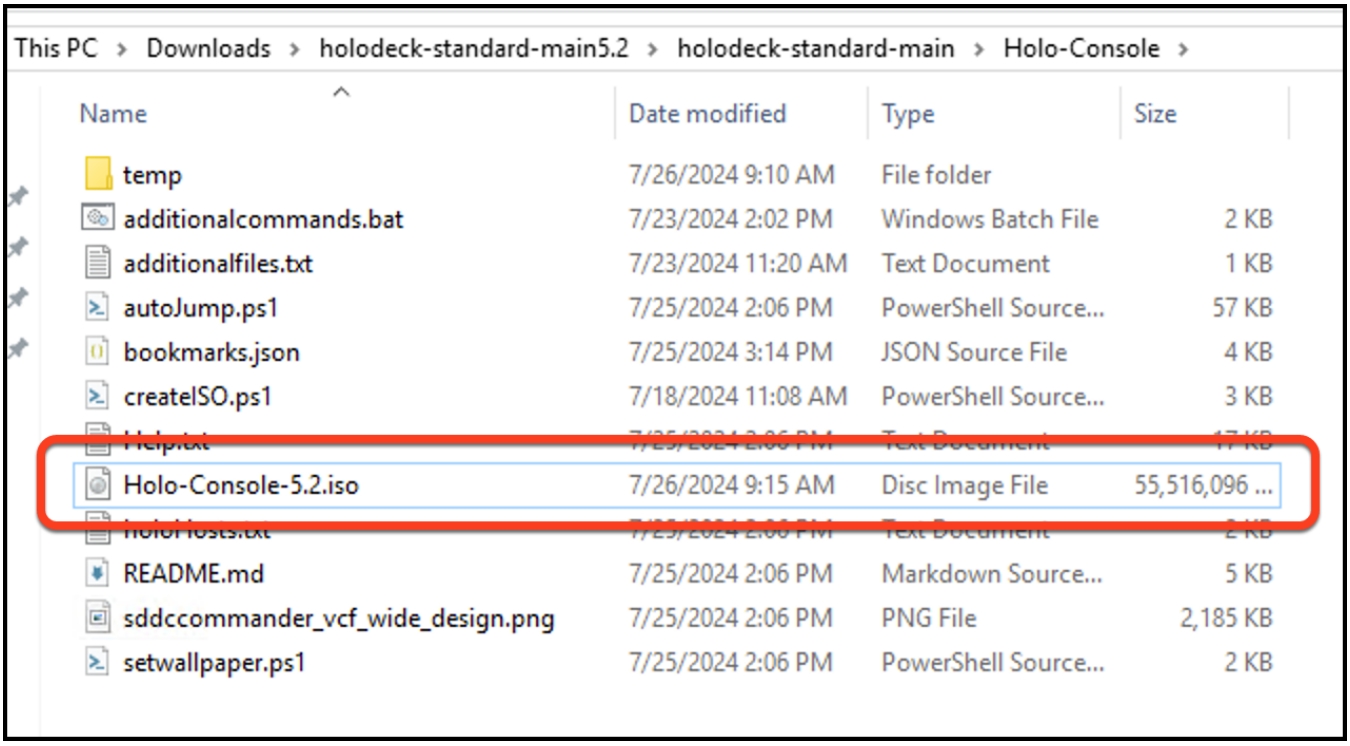
Note: Ensure a 64 bit PowerShell session is used versus an X86 session.

2. Change directories to C:\Users\Administrator\Downloads\holodeck-standard-main\Holo-Console
3. Run .\createISO.ps1



The final file size with Cloud Builder and VRA Easy Installer in the ISO is approximately 60GB. This file takes approximately 10 to 15 minutes to generate. The ISO file generated is located under C:\Users\Administrator\Downloads\holodeck-standard-main\Holo-Console with a filename similar to **"CustomWindows-XXXXXX.iso"**

4. Rename the ISO to something more descriptive. In this example we use **Holo-Console-5.2.iso**

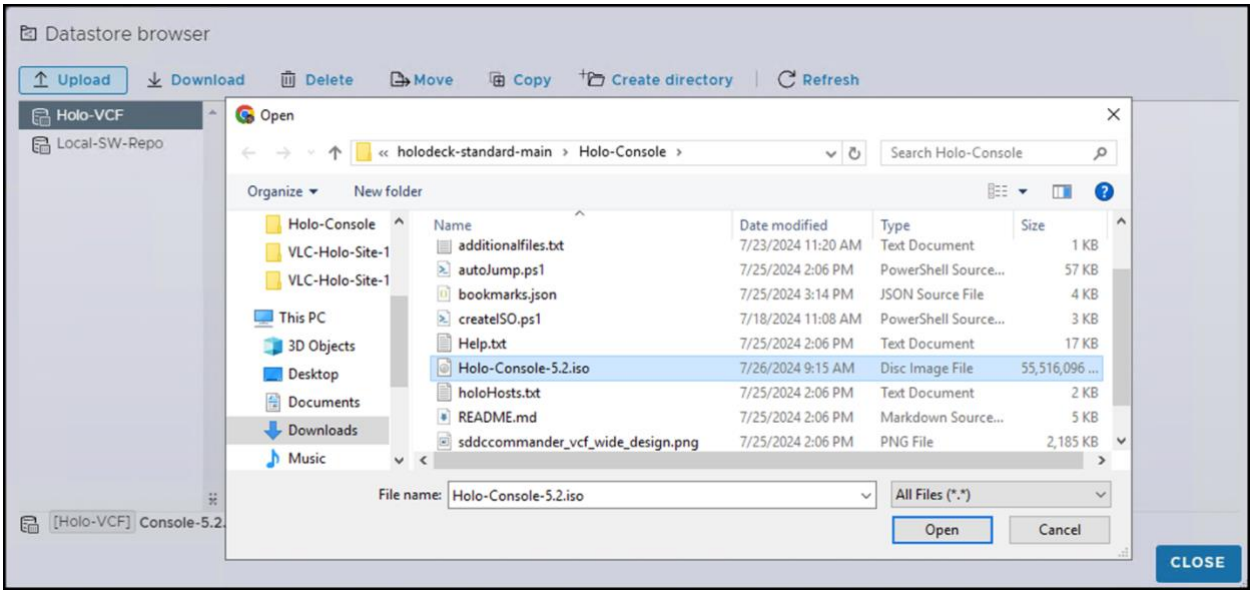


Staging of Holo-Console ISO to ESXi Host

After the Holo-Console customer ISO image has been created, it needs to be moved to a datastore accessible by the ESXi host to create a Holo-Console VM.

The following steps are performed move the ISO to ESXi local storage.

1. Using the vSphere Web UI, connect to the ESXi server
2. Select an appropriate datastore with enough spare capacity to host the Holo-Console custom ISO image
3. Open the Datastore Browser for the selected datastore
4. Select Upload
5. Select the Holo-Console-52.iso file (or your custom name) under C:\Users\Administrator\Downloads\holodeck-standard-main\Holo-Console



6. Due to file size, this can take 15 minutes or more
7. Wait for the upload to complete successfully
8. Close the Datastore Browser

Deploy Holo-Console

Holodeck Holo-Console Deployment

This section details the deployment of the Holo-Console for a Holodeck Toolkit environment.

Prerequisites

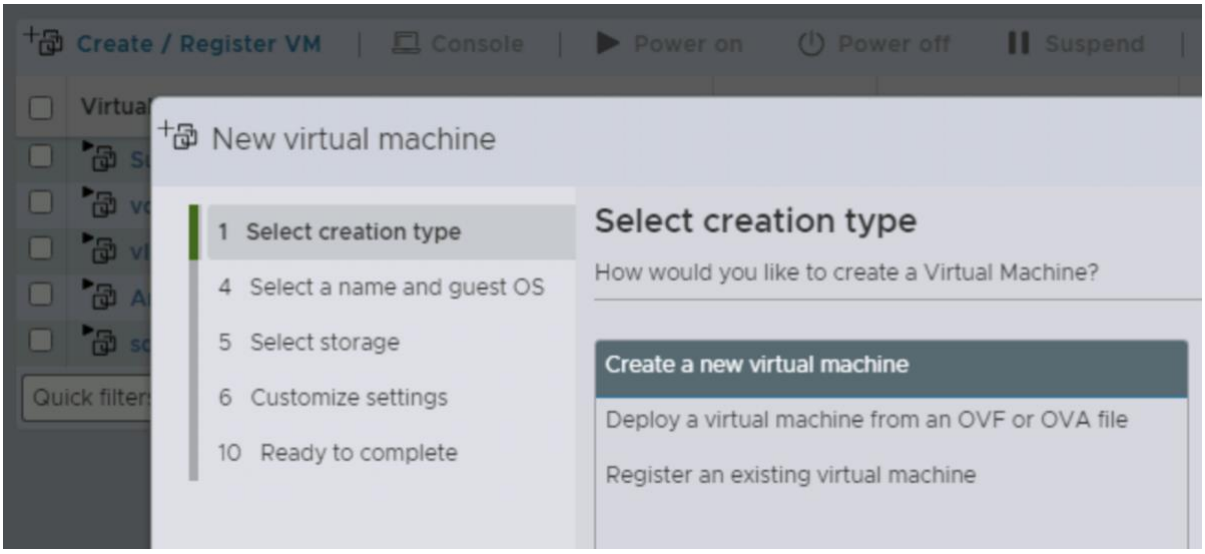
Holo-Console ISO has been created and staged to the ESXi host

Deploy Holo-Console

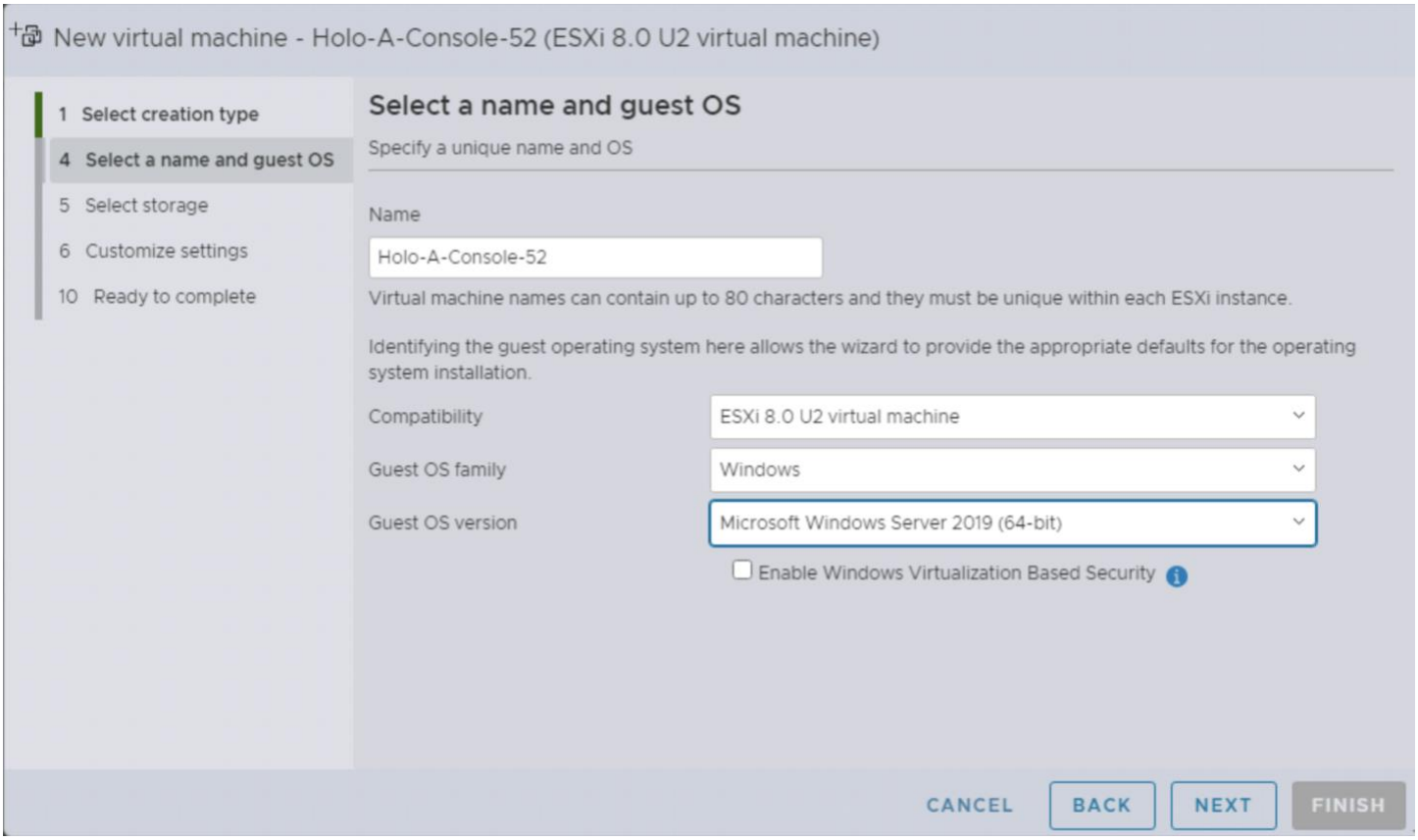
The following steps are performed to bring up a unique instance of Holo-Console. These instructions show the deployment of a Holo-Console called Holo-A-Console. As other Holo-Consoles may need to be deployed to support additional Holodeck pods, the names for the Holo-Console VMs will vary.

Deploy Holo-Console

1. On the vSphere Client, click Virtual Machines Create/Register VM
2. Select Create a new virtual machine
3. Click Next

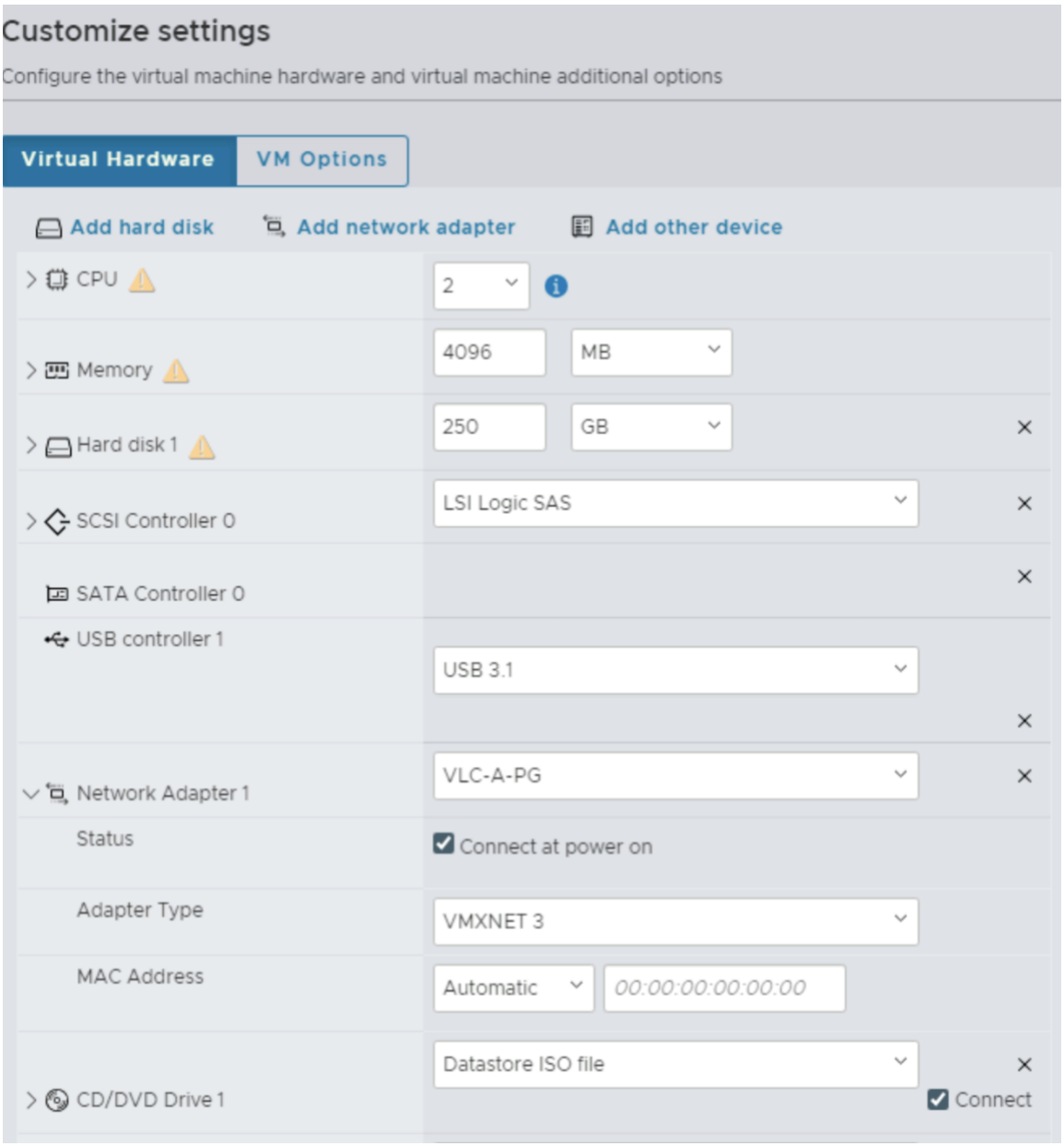


4. Set VM Name. This example uses the name **Holo-A-Console-52**
5. Set the Guest OS Family to **Windows** and the Guest OS Version to **Microsoft Windows Server 2019 (64-bit)**

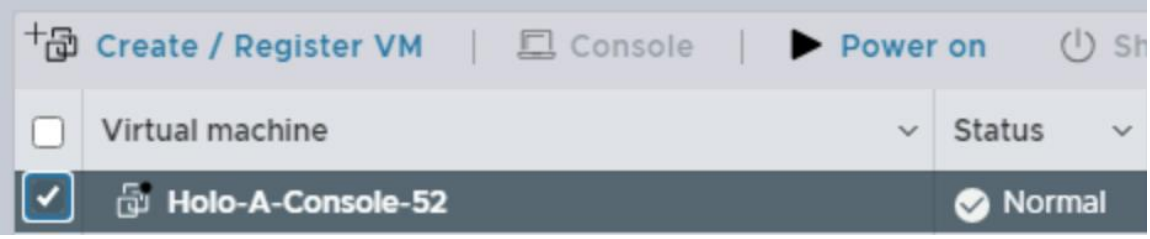


6. Click **Next**
7. Select a datastore with sufficient free space to host approximately 200GB available
8. Click **Next**

9. In the Customize Settings, changes need to be made to three areas
    A. **Hard Disk 1** object needs size to be increased to **250 GB**
    B. **Network Adapter 1** object expand the settings
        1. Select the port group created earlier in Physical ESXi setup **VLC-A-PG** port group.
        2. Put a checkmark for the **Status** to **Connect at power on**
        3. Set the **Adapter Type** to **VMXNET3**
    C. **CD/DVD Drive 1** object
        1. Select *Datastore ISO file*
        2. Browse to the Holo-Console-52.iso that was uploaded earier
        3. Put a checkmark for the **Status** to **Connect at power on**



10. Click **Next** to go to the Ready to Complete page
11. Click **Finish**
12. Select the newly created VM (**Holo-A-Console-52**)
13. Click on **Power On**



The Holo-Console will be deployed and configured automatically. This takes about 30 minutes to complete. The console will reboot several times during setup. When finished, the Holo-Console desktop will look like this

Deploy Holo-Router 2.0

The Holo-Router VM is deployed on the physical ESXi host to the same Port Group set as the corresponding Holo-Console. It can be deployed using the vCenter client or the vSphere client. This example demonstrates the use of the vSphere Client to deploy the OVA to the physical ESXi host. The Holo-Router can be deployed while the Holo-Console is building. This section details the deployment of the Holo-Router v2.0VM. The Holo-Router provides:

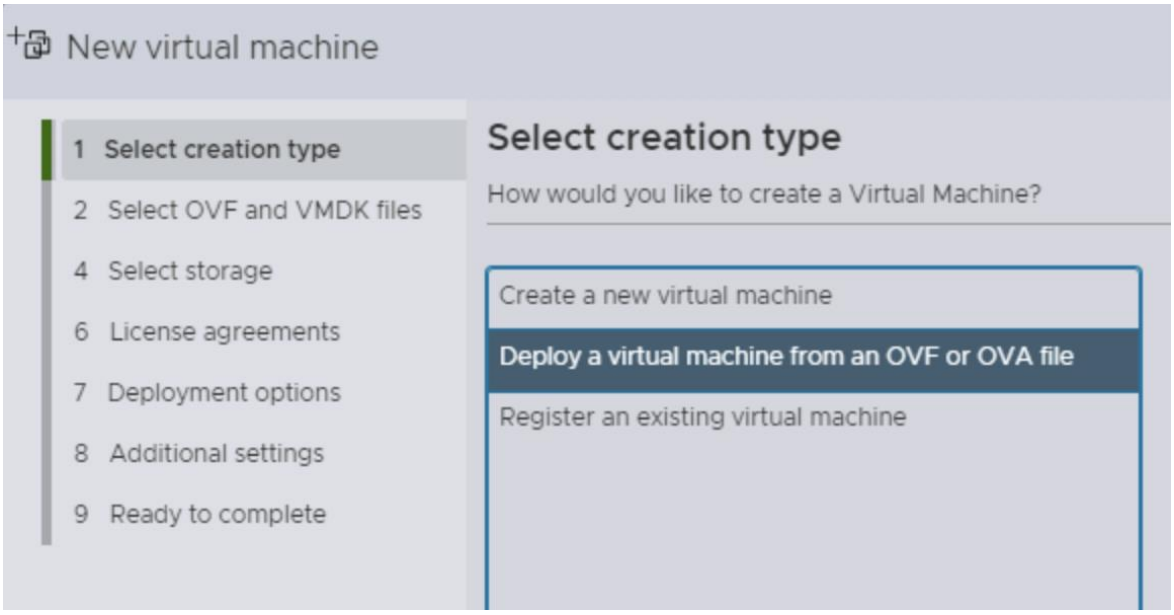
- External connectivity for a Holodeck environment
- RDP port forwarding from external network to Holo-Console
- Squid proxy functionality for outbound connections
- Routing between Holo-Site-1 and Holo-Site-2 inside a Holodeck environment

Prerequisites

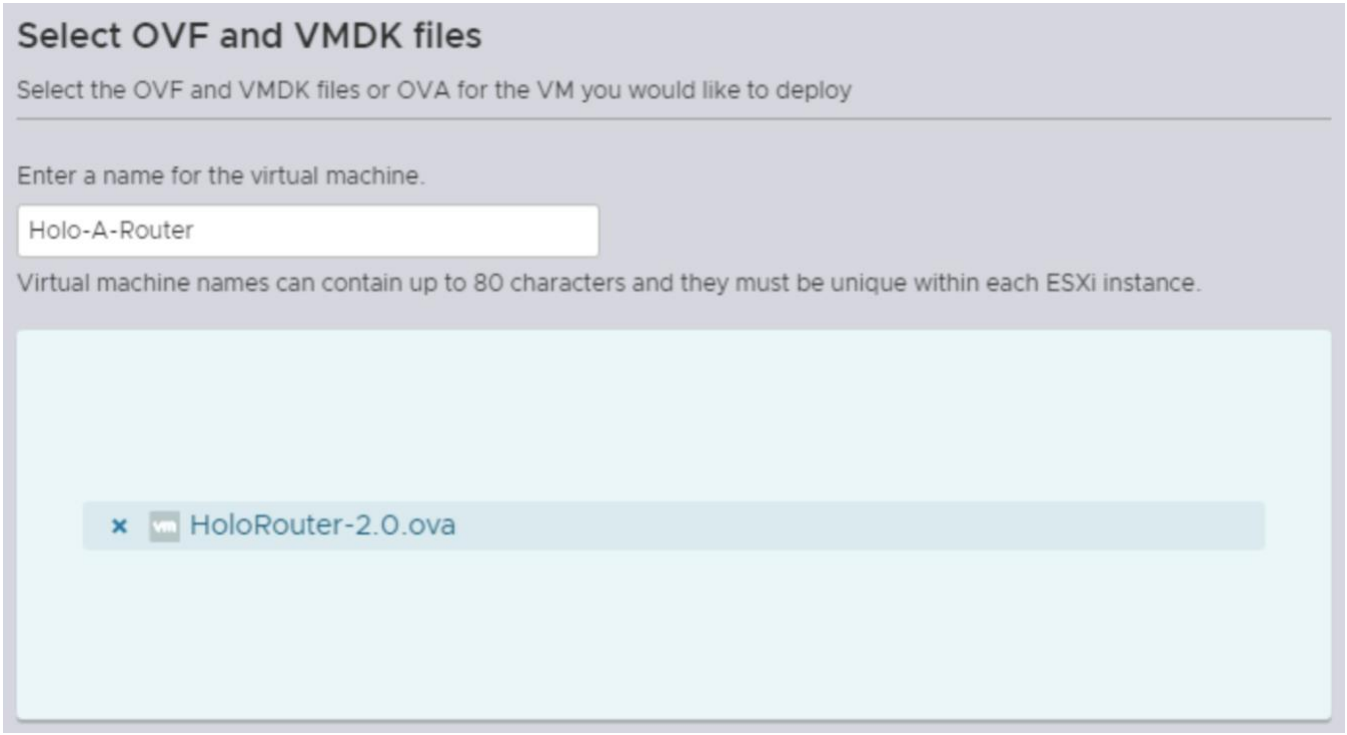
- External facing port group
- External IP, netmask and gateway information
- Site-1 and Site-2 Port Groups for this Holodeck environment

Provision the Holo-Router Virtual Machine

1. Using the vSphere Web client, login to the ESXi host
2. Click **Create/Register VM**
3. Choose **Deploy a virtual machine from an OVF or OVA file**
4. Click **Next**



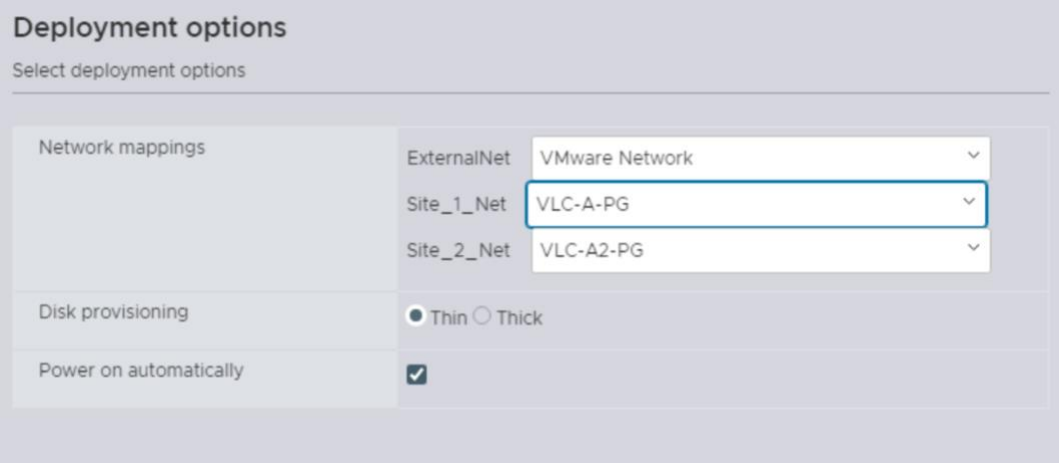
5. Name the router **Holo-x-Router**. **(This example uses Holo-A-Router)**
6. **Click to select files** and select the **C:\Users\Administrator\Downloads\holodeck-standard-main\HoloRouter-2.0.ova** file
7. Click **Next**



8. The Holo-Router VM takes less than 2GB on disk. Select an appropriate storage with enough available capacity
9. Click **Next**
10. Agree to the EULA
11. Click **Next**

12. Deployment Options: Add network mappings appropriate for environment (example uses port groups from earlier)
    A. **ExternalNet:** Select **VMware Network** (externally accessible port group typically created during ESXi installation)
    B. **Site_1_Net:** Select **VLC-A-PG** from drop down
    C. **Site_2_Net:** Select **VLC-A2-PG** from drop. down

    Note: If second site is not intended, deploying the Holo-Router to connect to both port groups is recommended.
13. Deployment Options: Leave **Disk Provisioning** to **Thin**
14. Deployment Options: Lease **Power on automatically** checked
15. Click **Next** to continue.

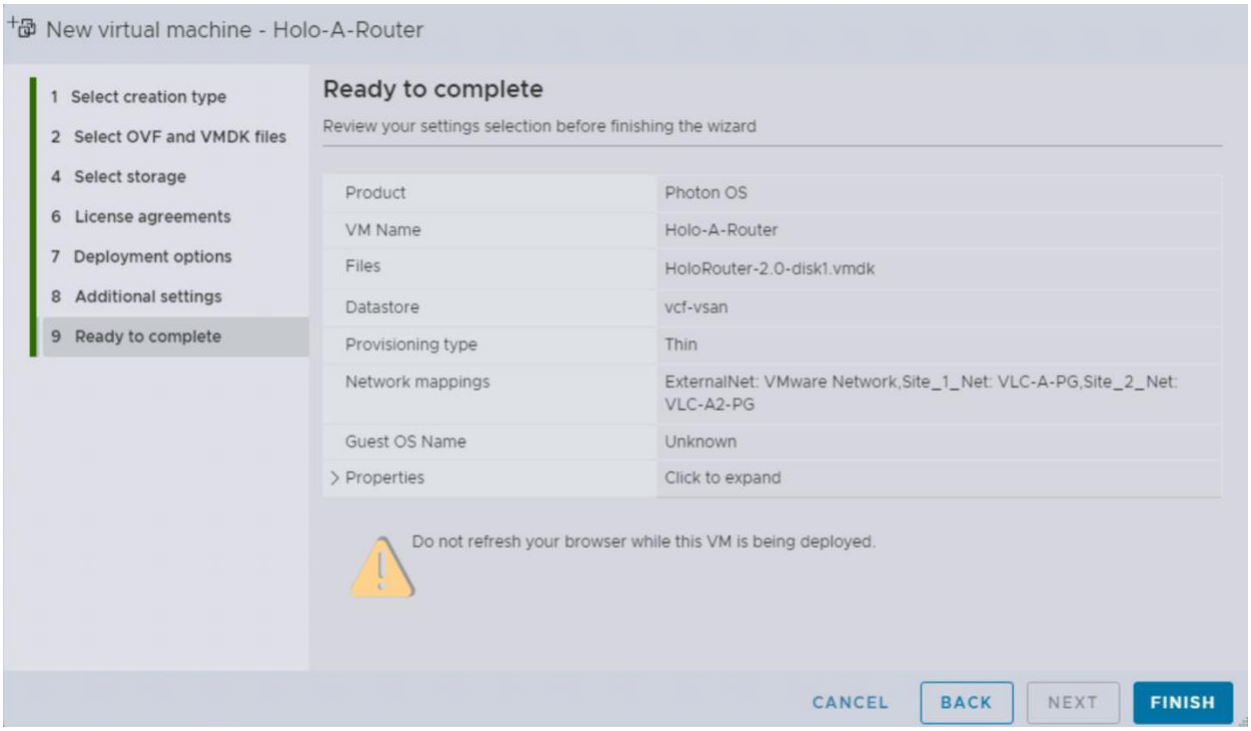


16. Click the arrow to access the Options attributes
17. Provide the appropriate values for the following attributes:
    A. External IP
    B. External Subnet Mask
    C. External gateway

    Note: Do not change any fields other than the three External fields

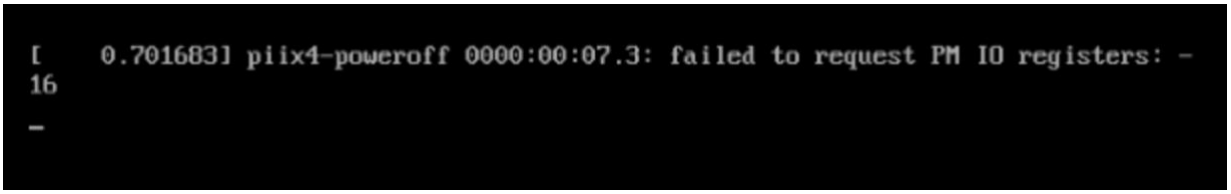
18. Click **Next**
19. Review the settings and click **Finish**

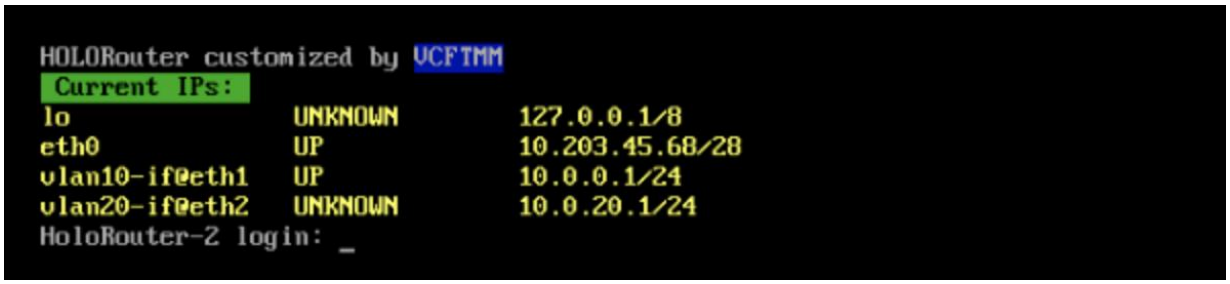
    Note: It should take about 5 minutes from the time the Finish button is clicked until router is up and running



20. Open a console for the new Holo-A-Router VM; a login screen with configuration information will display when initialization is complete

    Note: Ignore the following error while VM is still booting up





Deploy VLC-Holo-Site-1 and VLC-Holo-Site-2 with VLC CLI

Overview

This guide walks through the deployment of a nested lab on a single ESXi server using VMware Lab Constructor's (VLC) CLI for either a Single Site Environment (VLC-Holo-Site-1) or a Multi-Site Environment (VLC-Holo-Site-1 & VLC-Holo-Site-2) configuration. The multi-site environment will allow for some advanced use cases including HCX migrations and Aria automation to multiple data centers.

Note: Holodeck 5.2x Multi-site requires using the CLI deployment method for both sites.

Pre-requisites

The IP address for the ESXi host or vCenter Server instance managing the single host vSphere.

- DNS services are not available inside the Holodeck environment until VLC deploys an instance of Cloud Builder.
- **Multiple host clusters are not supported with the Holodeck toolkit**

Deployed Holo-Console 5.2x (created via automation in the Holodeck tool kit)

Deployed Holo-Router 2.0 (default multisite configuration)

Note: Deploying VLC can only be performed from the Holo-Console deployed inside the environment. Tasks can be carried out by directly accessing the Holo-Console via the ESXi console option, or via RDP to the Holo-Router IP address.

Edit VLC Holodeck configuration file(s)

The Holodeck INI file(s) used for command line mode must be modified with the ESXi server's specific information (i.e. IP, Datastore, PortGroup etc). The examples assume deploying the first site (VLC-Site-1) for named **Holo-A1** which runs on port group **VLC-A-PG;** the second site (VLC-Site-2) would be named **Holo-A2**, and be connected to port group **VLC-A2-PG**

This section uses Notepad++ to configure a site-specific Holodeck configuration file. This example delineates the Holodeck standard configuration for Site-1. These exact same instructions can be applied to Site-2 by substituting the appropriate values.

1. On the Holo-Console, use the Windows File Manager to navigate to **C:\VLC\VLC-Holo-Site-1**
2. Open **Holo-A1-52x.ini** for editing
3. Configure per site variables
   A. **nestedVMPrefix:** This defines the prefix to be used for all the VMs deployed by within this site.
   B. **netName**: This specifies the name of the port group to be used for this specific site within a Holodeck instance. Each site requires a unique port group. Normal naming standards are similar to VLC-A-PG and VLC-A2–PG
   C. **ds:** Datastore for this Site in a Holodeck instance.

      Note: building sites in parallel can add significant storage performance impact. Consider different datastores
   D. **cluster:** IP of Single host vSphere cluster. Holodeck 5.2x does not support multi host vSphere clusters.

      Note: FQDN of vCenter Server controlling single host cluster must be added to the holoHosts file to populate windows local hosts on Holo-Console

```
########## VLC iniConfigFile v5.2 #########
########## Holodeck 5.2 VLC-Holodeck-Standard-Main Site-1 configuration file #############

## <Variables set per Holodeck Site>  ##
# This will append a prefix to all VM's created by VLC
nestedVMPrefix=Holo-A1-52

# Target physical ESXi or vCenter infrastructure network
netName=VLC-A-PG

# Datastore to deploy to on physical environment
ds=3.5T-NVME-1

# Single node vSphere Cluster to deploy to on physical vSphere environment, leave blank if target is a single ESXi
# Multi host vSphere cluster is not supported on Holodeck 5.1
cluster=

```

E. **esxhost:** IP of ESXi host (DNS resolution is not available before cloud builder is deployed.)
F. **username:** user name for ESXI host or vCenter server. Typically root or administrator@vsphere.local
G. **password**: This specifies the password for the ESXi host or vCenter Server
H. **labDNS:** Provide IP of DNS server if 8.8.8.8 is not accessible. This example uses 10.172.40.1

```
# Target physical ESXi or vCenter infrastructure - Must use IP #
esxhost=10.203.42.1

# Target physical ESXi or vCenter infrastructure username
username=root

# Target physical ESXi or vCenter infrastructure password
password=H01@123!

# Defines external DNS server, helpful in certain situations when internal DNS must be used
labDNS=10.172.40.1

```

I. **CBISOLoc:** Defines the location of the Cloud Builder file to build the VCF instance
J. **addHostsJson:** Defines the file for building additional hosts. In Holodeck 5.1 the first three hosts can be used for further automation. Any additional hosts will be instantiated and ready for host commissioning
K. **bringupAfterBuild:** Defines whether VLC calls Cloudbuilder API to do automated deployment
L. **buildOPS:** Defines what VLC does with the first three additional hosts created.

```
# Location of the Cloudbuilder OVA on the local filesystem
# Configured by Holodeck createESX process
CBISOLoc=C:\CloudBuilder\VMware-Cloud-Builder-5.2.0.0-24108943_OVF10.ova

# Defines location of JSON file for building additional nested hosts when constructing.  Edit/Create a new JSON t
addHostsJson=C:\VLC\VLC-Holo-Site-1\add_3_hosts_ESXi10-12.json

# Executes the bringup API on Cloudbuilder after importing and building the nested hosts
# Set to false for manual deployment of VCF inside the Holodeck environment
bringupAfterBuild=True

# Defines operation to be performed with additional hosts that were built
# When left blank it will simply commission the hosts. Other options for the first 3 hosts are;
# "Cluster" -This will automagically create a cluster in the management domain using the CLUSTER_API.json
# "WLD Domain" -This will automagically create an additional workload domain using the WLD_DOMAIN_API.json
# "ISOWLD Domain" -This will automagically create an isolated workload domain using the ISOWLD_DOMAIN_API.json
buildOps=
```

M. **deployAVNs:** Determines if VLC will create the necessary infrastructure to support Application Virtual Networks. When set to true, Cloudbuilder (acting as the environment's gateway and BGP config) is configured with the necessary information to allow configuring of the AVNs to easily be done manually. If "bringupAfterBuild" is also true VLC will call SDDC manager to implement the AVN workflow after VCF has been successfully deployed.
N. **deployEdgeCluster**: Determines if NSX edge cluster will be deployed in the management domain automatically after successful VCF deployment. When set to true, Cloudbuilder (acting as the environment's gateway and BGP config) is configured with the necessary information to allow configuring of the edge cluster to easily be done manually. If "bringupAfterBuild" is also true VLC will call SDDC manager and NSX Manager to implement the edge cluster workflow after VCF has been successfully deployed.
O. **deployWldMgmt:** Determines if Tanzu will be deployed
P. **vsanSA:** Defines the storage architecture that the VCF Management Domain will utilize
Q. **VCFEMSFile:** Defines the Main Configuration file for VCF

```
# Deployment of additional functionality using the relevant API JSON files
# AVN's required for Aria deployment
# AVN and Tanzu (Workload Management) require Edge Cluster
# Set to true even if bringupAfterBuild=False to automate building of nested infrastructure to support manual

deployAVNs=True
deployEdgeCluster=True
deployWldMgmt=False

# Default VSAN storage architecture is OSA, change the line below to use ESA instead.
vsanSA=OSA

# Main configuration file for VCF -  configured by createISO process
VCFEMSFile=C:\VLC\VLC-Holo-Site-1\Holo-Site-1-vcf-ems-public.json
```

Note: Rest of file is default Holodeck Site/Environment specific configuration (Do Not Change).

All values below **## </Variables set per Holodeck Site> ##** should remain default to ensure Holodeck lab exercises operate as expected. The INI file is fully documented to allow users to potentially make changes in their own environment, but currently not supported

```
## </Variables set per Holodeck Site>  ##

## ###Default Holodeck VLC-Holo-Site-1 configuration below ######
## Do not modify if you are planning to use the Holodeck Multisite Automation scripts to deploy the multi site
# Domain name used across nested host and VCF deployment
vcfDomainName=vcf.sddc.lab
```

4. Save the file with a name representing the pod configuration. The name used in this example is *Holo-A1-52.ini* and is specific to Site-1

When deploying a Multi-Site Environment - repeat Steps 1-4 using the directories and files for Site-2

Deploy Holodeck Environment using VLC command line

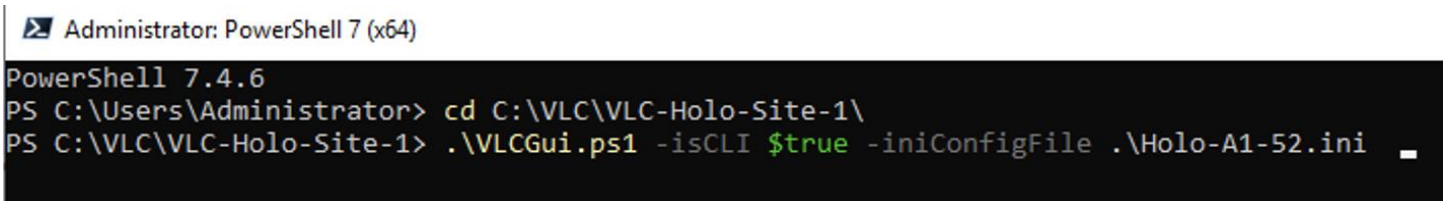
Once all the configuration files have been edited with the appropriate site-specific information, the deployment of the individual sites can proceed. If deploying a multi-site configuration; both Site-1 and Site-2 can be deployed at the same time depending on the hardware that is being utilized. If there are any concerns about the hardware, deploy each site serially. Use the appropriate directory/file that was edited in the earlier steps for Site-2.

1. From within the Holo-Console, click on **Windows Start Menu→ PowerShell→ PowerShell** 7 (if deploying multiple sites in parallel each deployment will require individual PowerShell sessions/window)
2. Type the following command at the prompt:

   cd C:\VLC\VLC-Holo-Site-1

3. Enter the following command:

   .\VLCGui.ps1 -isCLI $true -iniConfigFile .\Holo-A1-52.ini



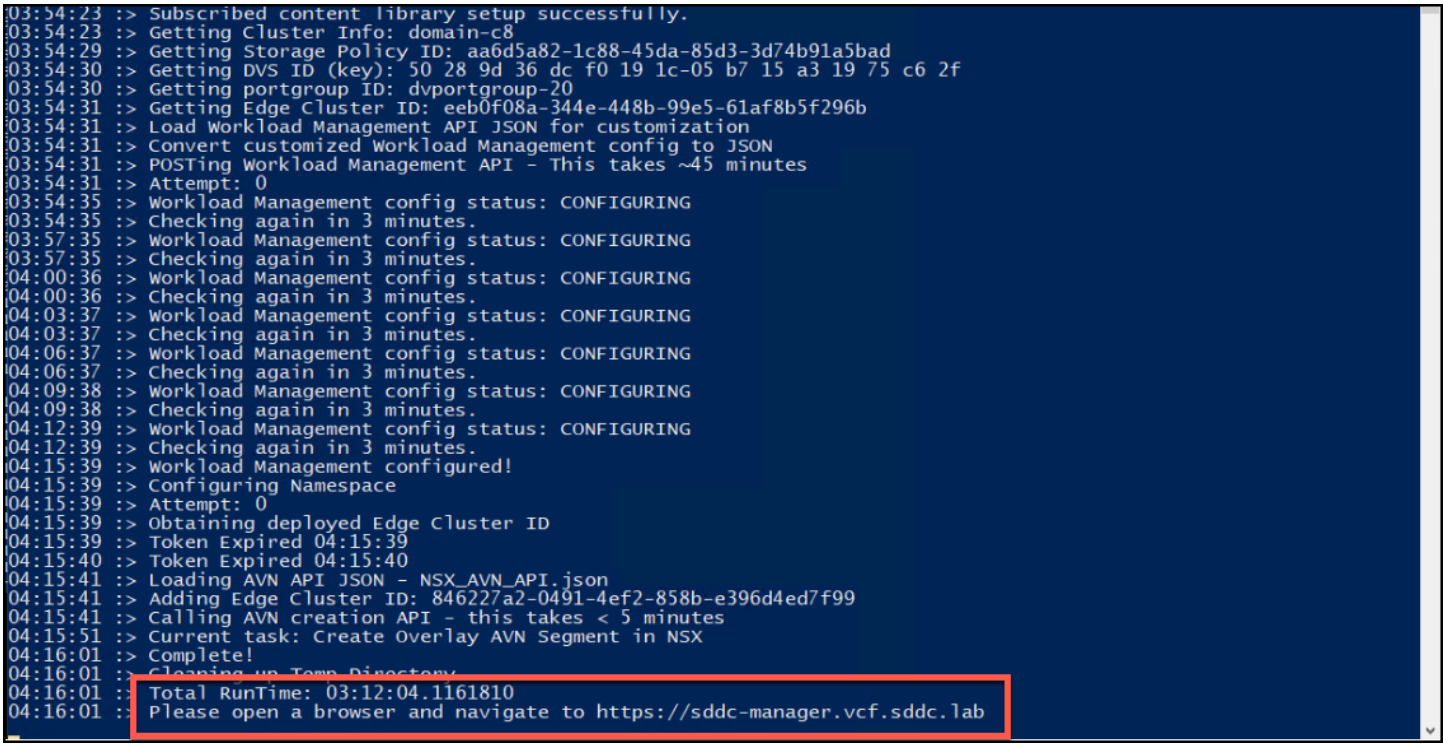
The deployment will begin and will spawn an additional VLC logging window. The VCF deployment takes approximately three hours to complete depending on hardware.

Note: Please make sure to not "Select" the process window as that can pause the script from running.

4. The deployment for a site is complete when the message for accessing the SDDC Manager is displayed.

   At this time the environment can be browsed and explored as a fully functional VCF Environment.

   Note: Please ensure to complete "Post Deployment Updates" and/or "Multi-Site Environment Prepare Holodeck". If planning on utilizing the curated labs guides written for the environment or as a multi-site configuration.



Deploy VLC-Holo-Site-1 environment via GUI

Overview

This section demonstrates the deployment of the VLC-Holo-Site-1 nested VCF 5.1 lab using the VLC GUI. The GUI is a great place to understand the configuration of the Holodeck environment before utilizing the CLI and needing to edit different text files.

Note: Deploying the Holodeck configuration using the GUI limits the user to a single site configuration. The user can deploy VLC-Holo-Site-1 and VLC-Holo-Site-2, but they will not be configured to communicate with each other.

Prerequisites

The IP address for the ESXi host or vCenter Server instance managing the single host vSphere cluster.

- DNS services are not available inside the Holodeck environment until VLC deploys an instance of Cloud Builder.
- Multiple host clusters **are not supported** with the Holodeck tool kit 5.2

Holo-Console 5.2 deployed using automation in the Holodeck tool kit.

Holo-Router 2.0 deployed in default multisite configuration

Note: Deploying VLC can only be performed from the Holo-Console deployed inside the environment. Tasks can be carried out by directly accessing the Holo-Console via the ESXi console option, or via RDP to the Holo-Router IP address.

Run VLC

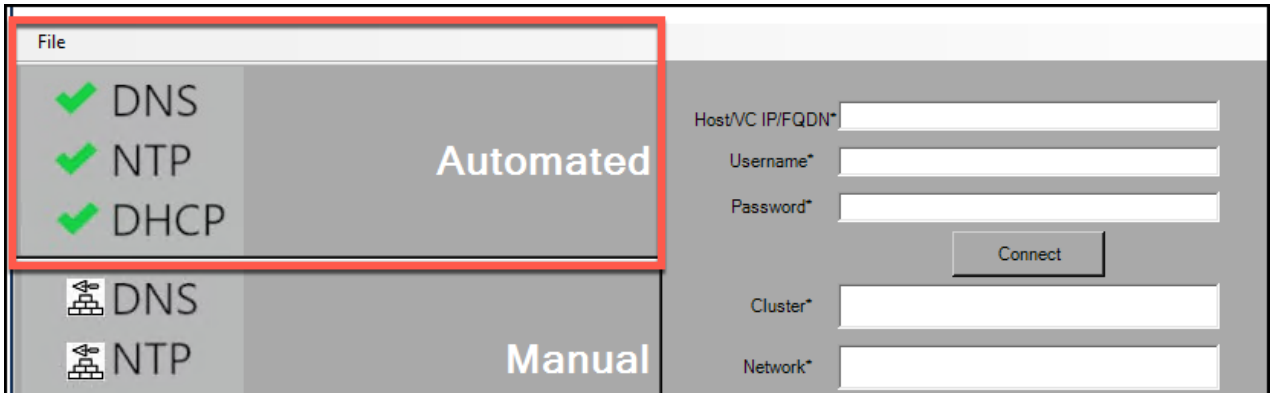
1. Connect to the Holo-Console Desktop (either via the vSphere client or via RDP to Holo-Router address)
2. Login as **Administrator** with a password of **VMware123!**
3. From within the Holo-Console, click on **Windows Start Menu-PowerShell-PowerShell 7.4 (x64)**
4. Type the following command at the prompt:

   cd C:\VLC\VLC-Holo-Site-1

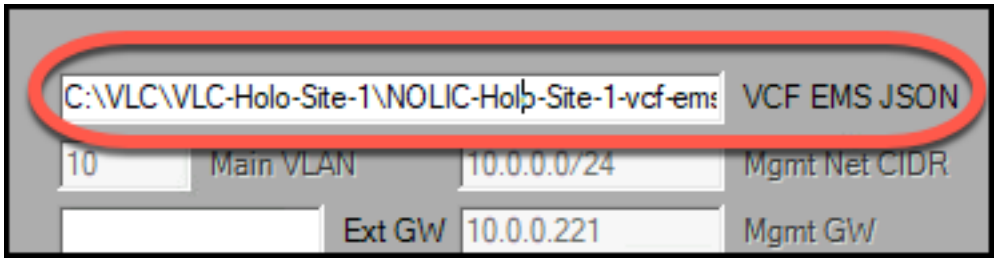
5. Enter the following command:

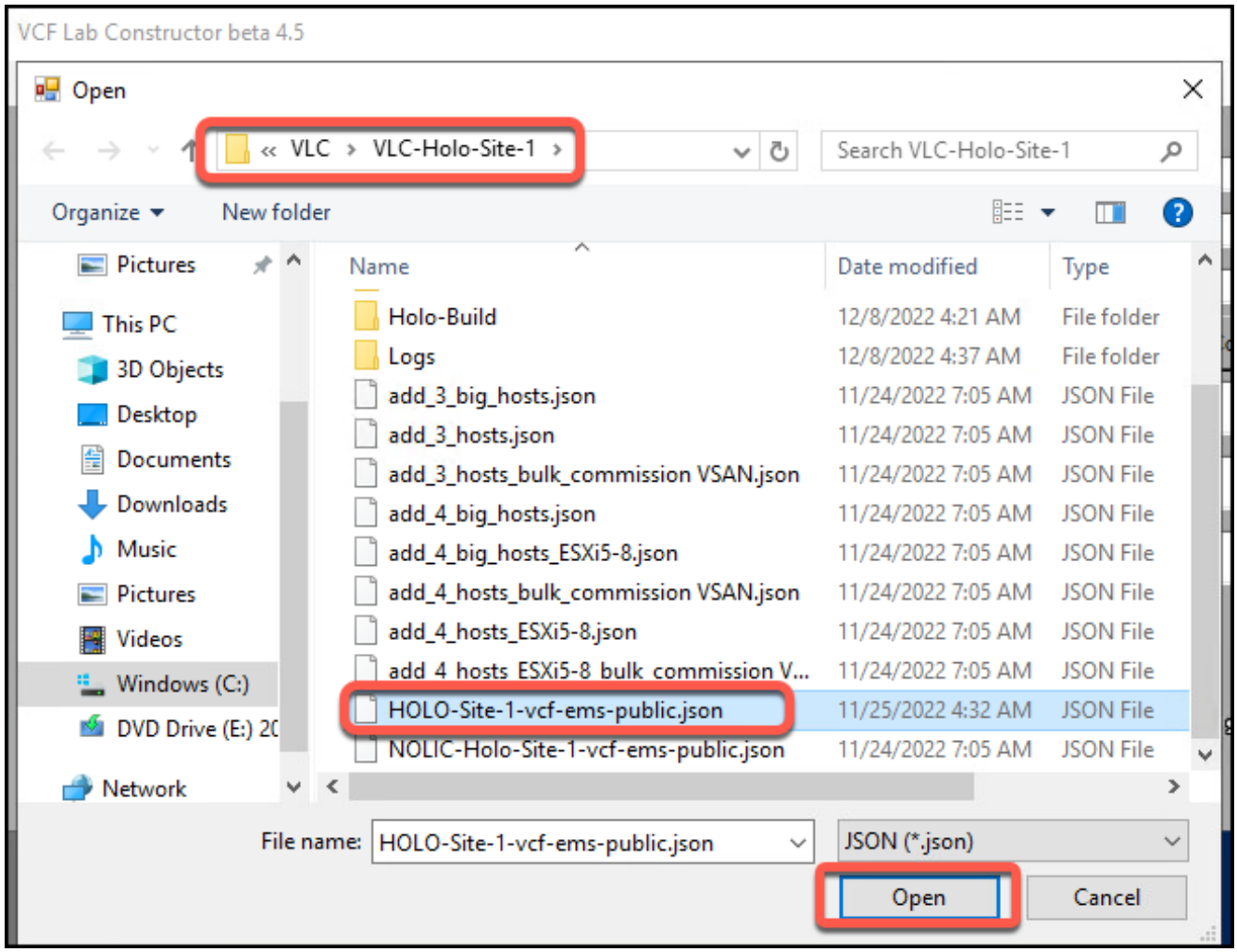
   .\VLCGui.ps1

6. Wait for the VLC UI to be displayed
7. Click **Automated** on the VLC UI
   This will open the VLC form UI with some fields pre-populated (which will need to be updated) and others that will need environment specific information provided.

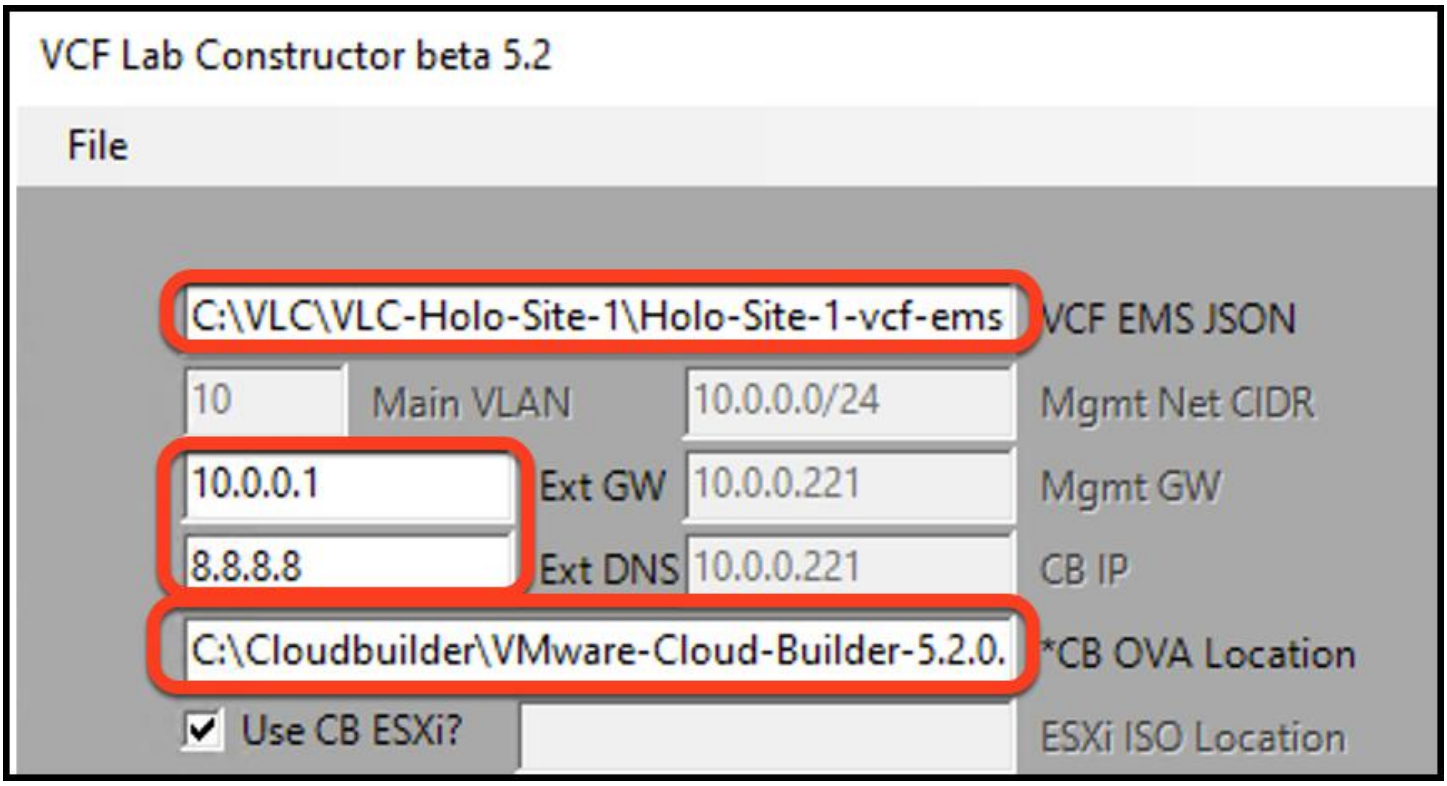


8. Click on the **VCF EMS JSON** field, the file explorer will open automatically
9. Browse to and select the **C:\VLC\VLC-Holo-Site-1\Holo-Site-1-vcf-ems-public.json**
10. Click **Open**



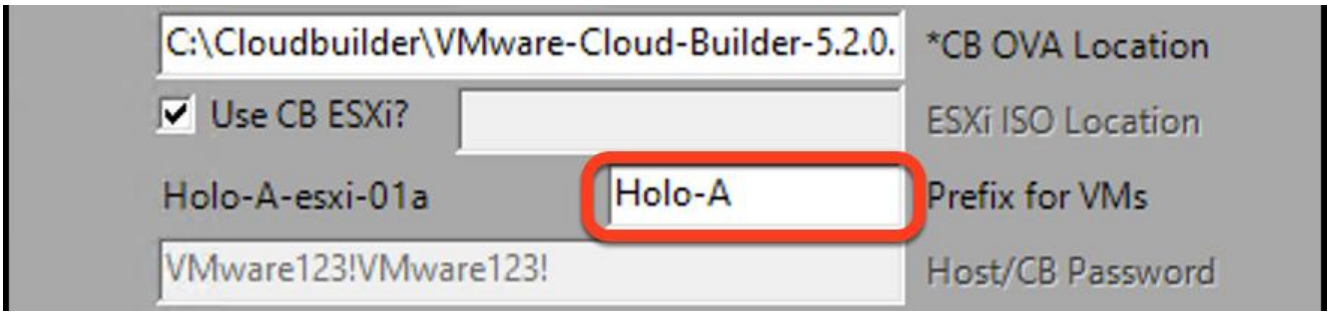


11. in the **Ext GW** field, enter **10.0.0.1** for the address of the gateway (this is the default in the Holodeck environment)
12. **Ext DNS** by default is set to **8.8.8.8** if the lab environment requires use of an internal DNS place it in this field
13. Click on the input field for **CB OVA Location**, the file explorer will open automatically
14. Browse to "C:\Cloudbuilder" and select the appropriate Cloud Builder OVA
15. Click *Open*



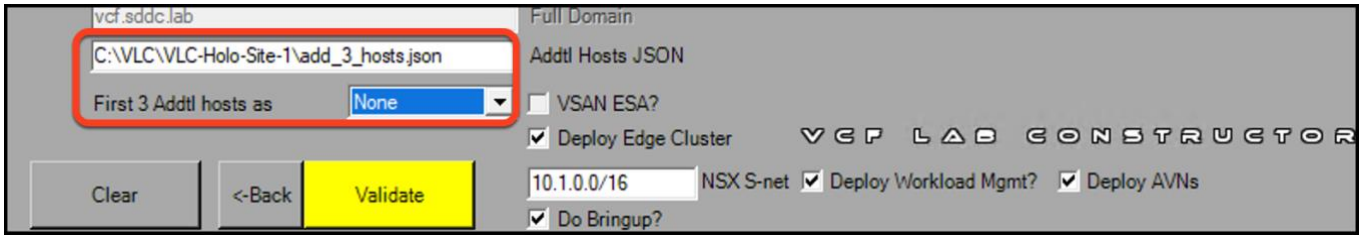
16. **Prefix for VMs** field should be an unique name in this allows for easy identification of the resources deployed for a given environment.

    This example uses the prefix of Holo-A. Best practice naming is use a common letter designator for the physical ESXi host port group, Holo-Console, Holo-Router and VM Prefix. Here we are using Holo-A-Console, Holo-A-Router and VM Prefix Holo-A, all running on port group VLC-A-PG

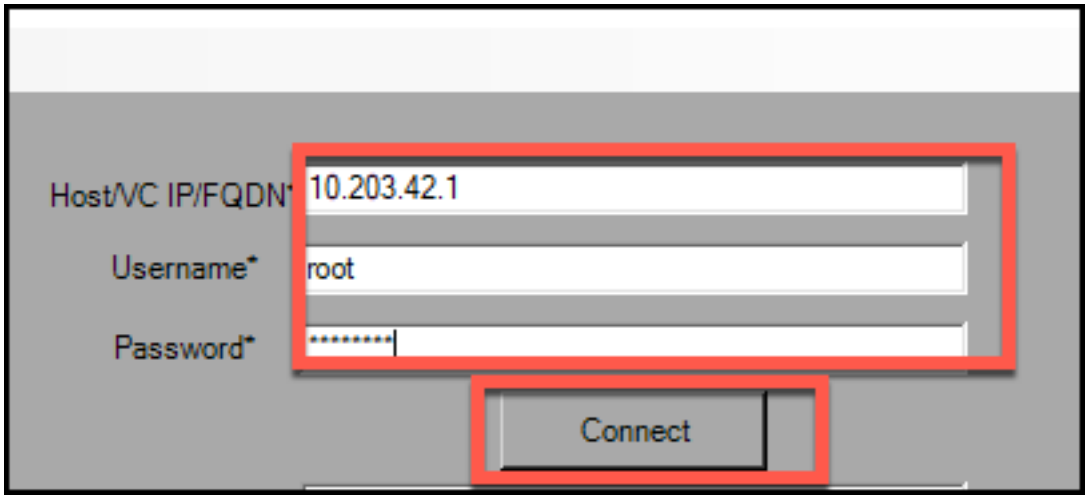


17. If additional hosts are wanted to work through process of adding or expanding a workload domain or cluster, there are additional JSONs in the **"C:\VLC\VLC-Holo-Site-1\"** folder to create additional ESXi servers to the Build. These hosts will automatically be imported into SDDC Manager, or they can be automatically created as a new cluster or VI workload domain.
18. By default, Holodeck will deploy with OSA vSAN - if ESA vSAN is desired put a check mark in the "VSAN ESA?" field.

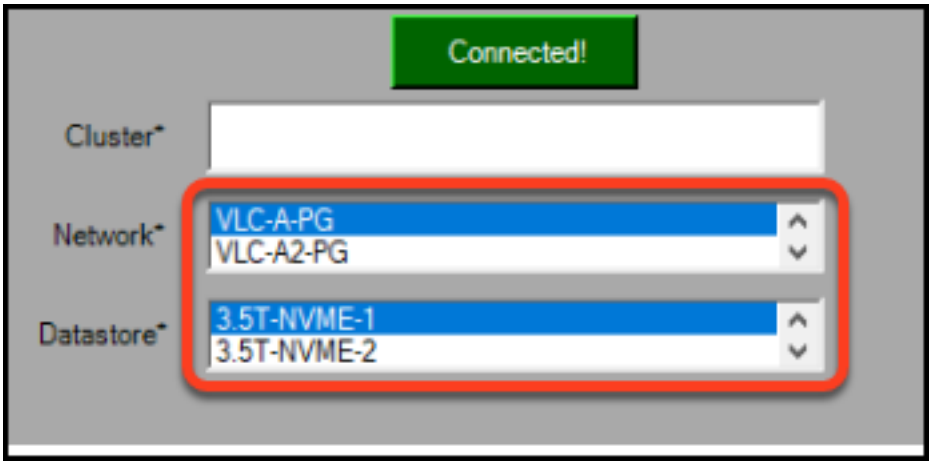
    Note: ESA will utilize more memory and will consume storage utilization much faster than OSA.
19. Check **Deploy Edge Cluster**
20. Check **Deploy Workload Mgmt?**
21. Check **Deploy AVNs**
22. Leave **NSX-S-net** as default (this is a Holodeck routing construct that will be deprecated in a future release)
23. Leave **Do Bringup?** checked



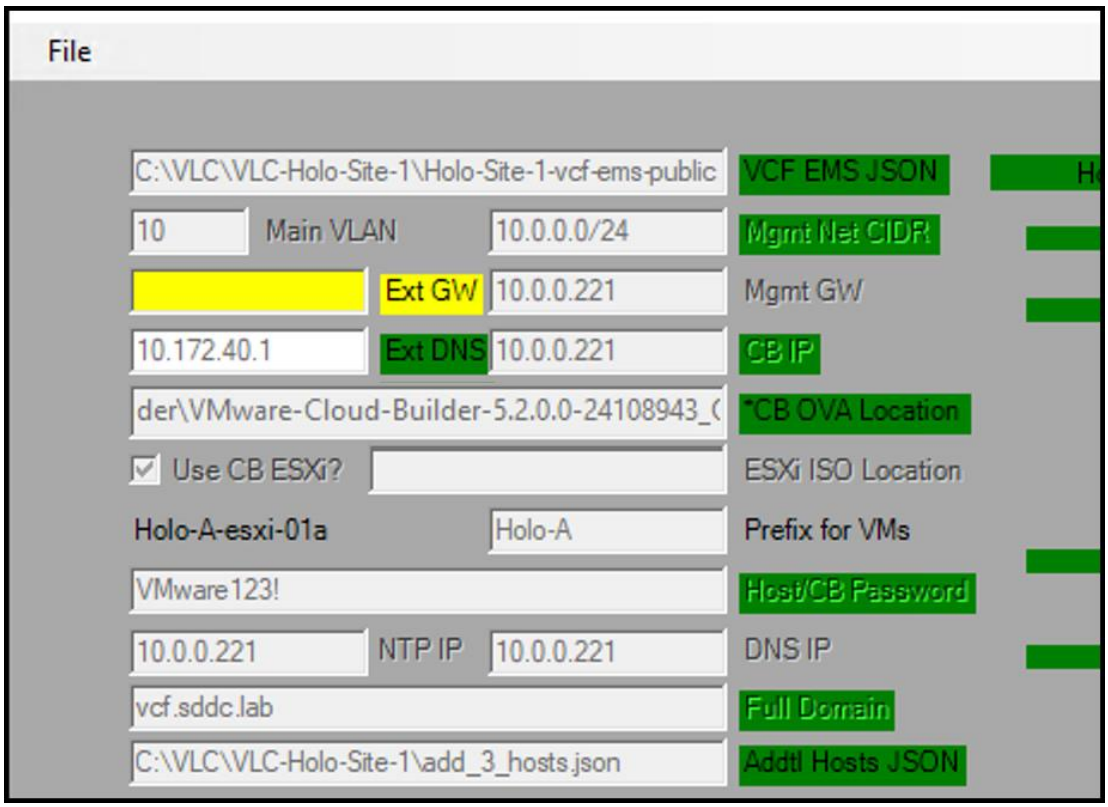
24. Enter the **IP address** of the ESXi host in the **Host/VC IP/FQDN field**. (note: FQDN cannot be used here. Only IP address.)
25. Specify the **Username** and **Password** for the ESXi host in the appropriate fields
26. Click the **Connect** button



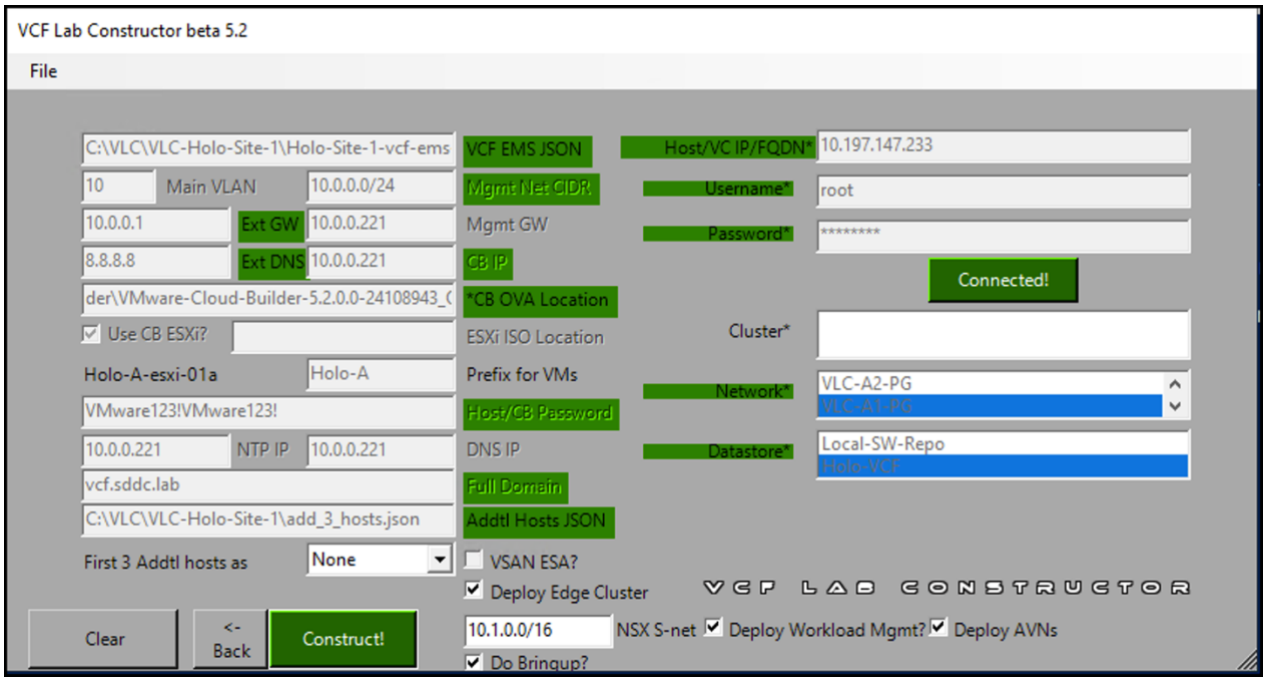
27. Select the port group - In this example *VLC-A-PG* is used (This should match the port group that the Holo-Console and Holo-Router is connected)
28. Select the datastore to be used for this deployment (Datastore should have at least 2 TB of free space)



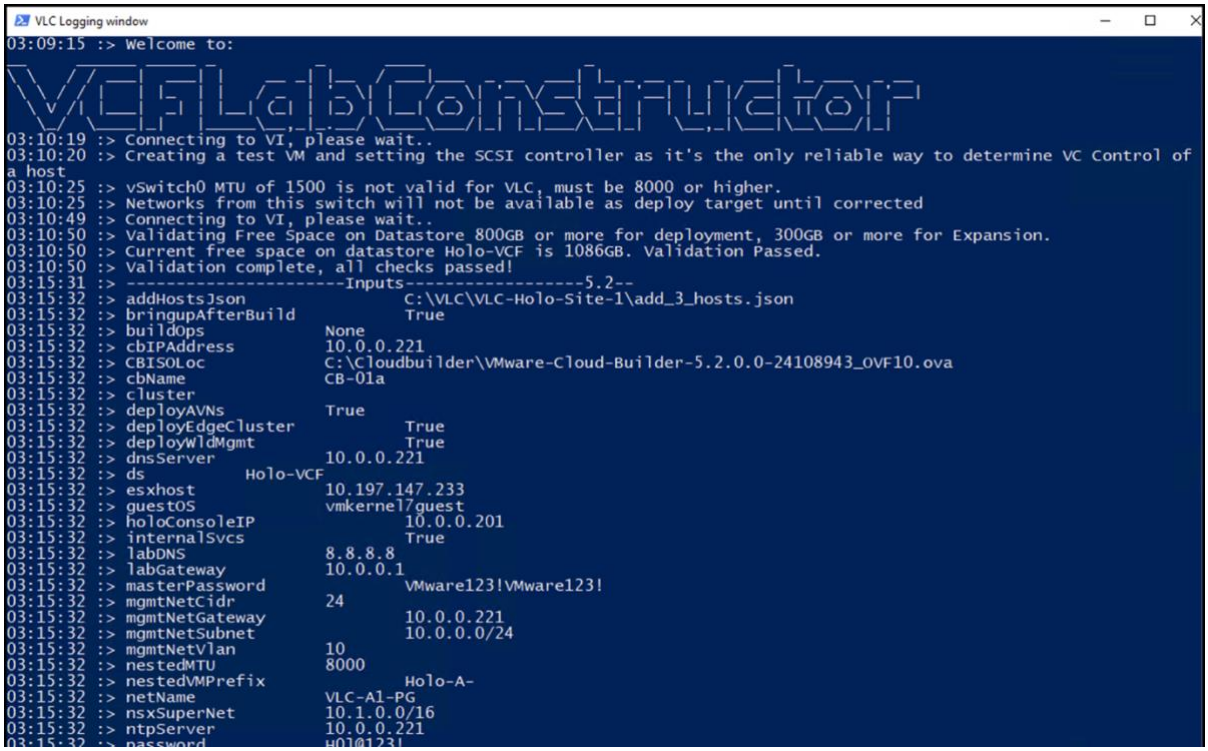
29. Click the **Validate** button
30. The **Validate** button will change to a green **Construct!** button and no fields should change to Yellow. If a field changes to yellow; click on the *"<< Back"* button and resolve the issue and Re-validate. (VLC/Holodeck can install without a Ext GW but it will cause problems in future labs requiring manual intervention)



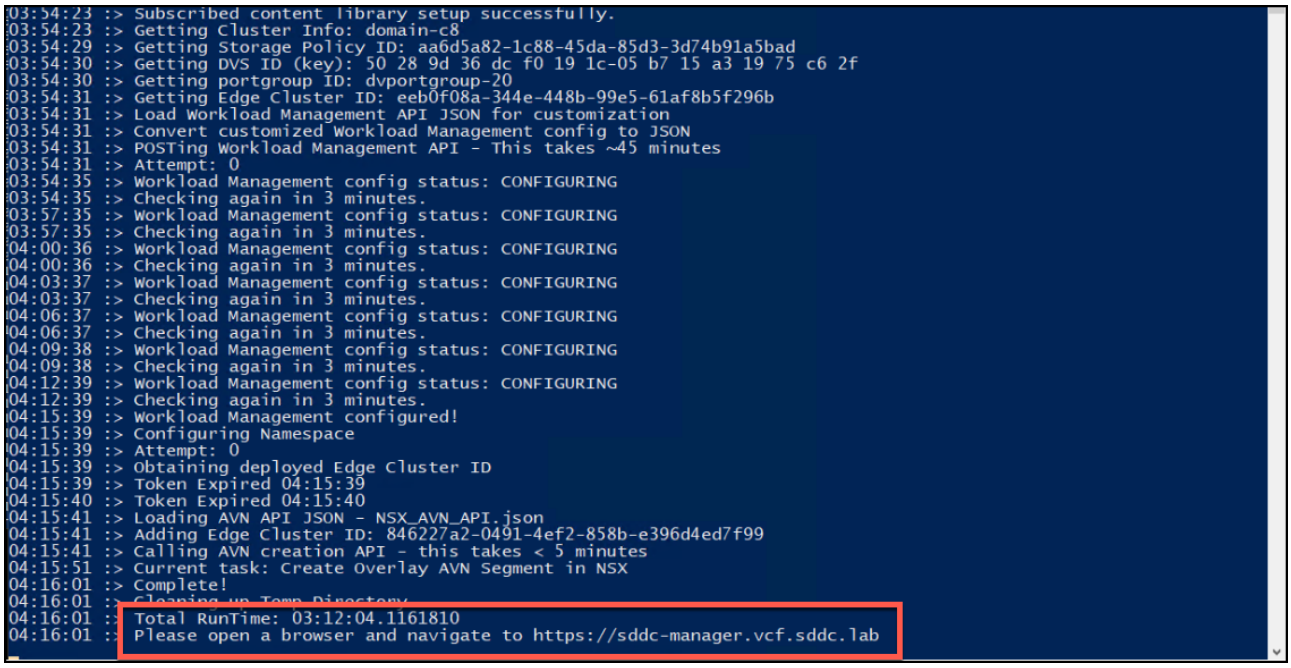
31. Click **Construct!**



VLC will launch a logging window begin to deploy the VCF environment. This process takes about four hours



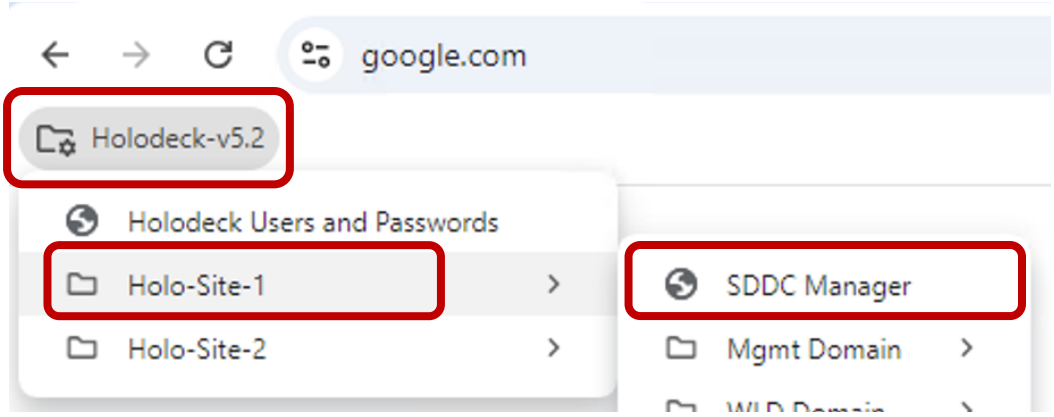
11. When complete, VLC will advise the user to press *Enter* to end the VLC process and provides information on how to access the SDDC Manager UI. Notice that it took right at 3 hours to deploy a complete SDDC; this time will vary depending on the hardware that is being utilized.



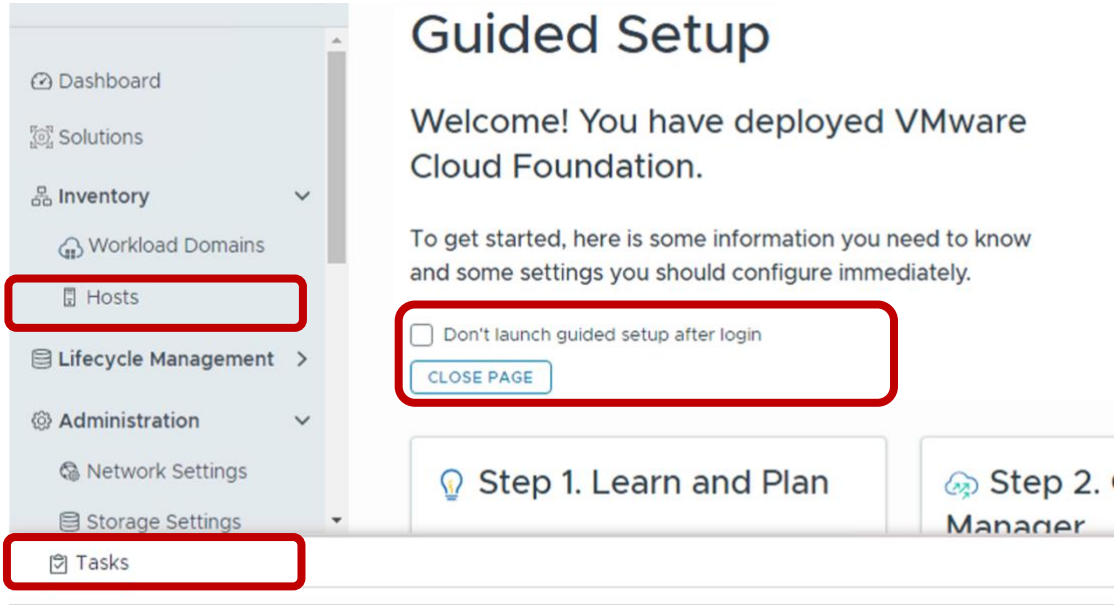
Post Deployment Updates

Test VLC Deployment

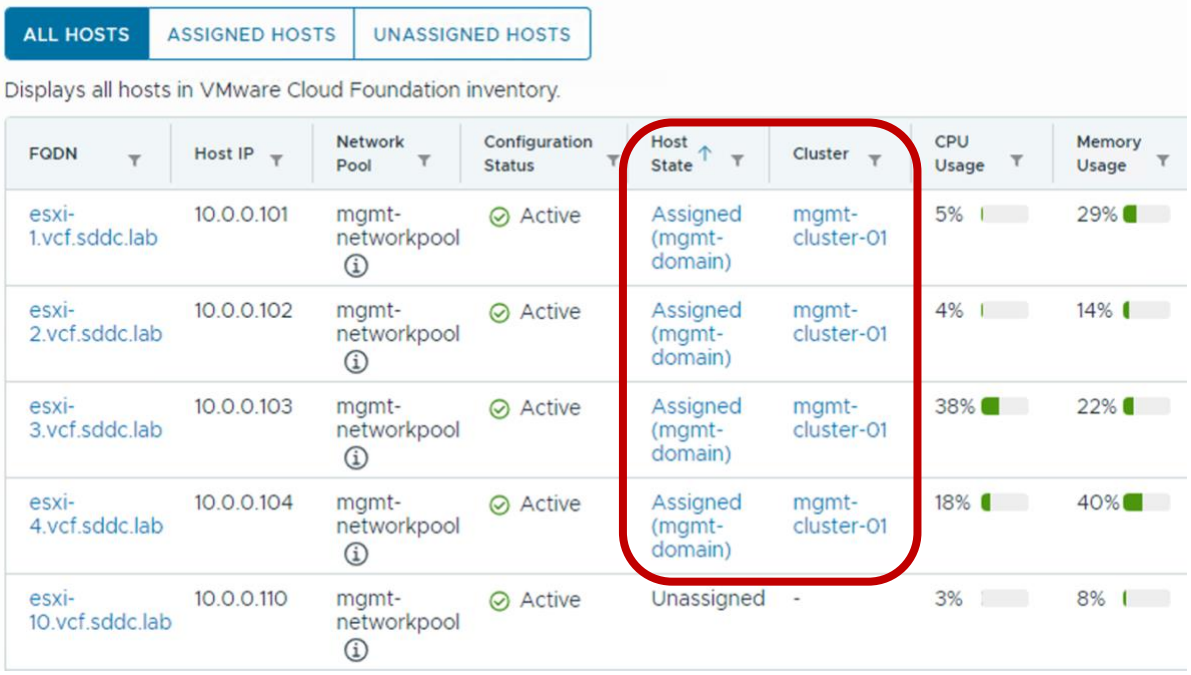
1. From the Holo-Console, open Chrome
2. Click on the "**Holodeck-v5.2**" folder on the Bookmark Bar
3. Select "**Holo-Site-**1" and then "**SDDC Manager**"



4. Acknowledge the security warning by clicking on **Advanced** followed by **Proceed to sddc-manager.vcf.sddc.lab (unsafe)**
5. Acknowledge the second security warning by clicking on **Advanced** followed by **Proceed to vcenter-mgmt.vcf.sddc.lab (unsafe)**
6. Login as the user **adminstrator@vsphere.local** with the password **VMware123!VMware123!**
7. On the first time accessing SDDC Manager Uncheck the box for **VMware CEIP**
8. There is also an option to check the box to "**Don't launch guided setup after login**"
9. Close the **Tasks** pane
10. Click on **Hosts** under **Inventory**



12. On the **Hosts** page view the four host VCF Management domain and unassigned hosts (if additional hosts were created)



Create Holodeck folders for VLC-Holo-Site-1

This will set up the folder infrastructure on the vCenter server for Site-1 Management domain that is utilized in the curated labs for Holodeck

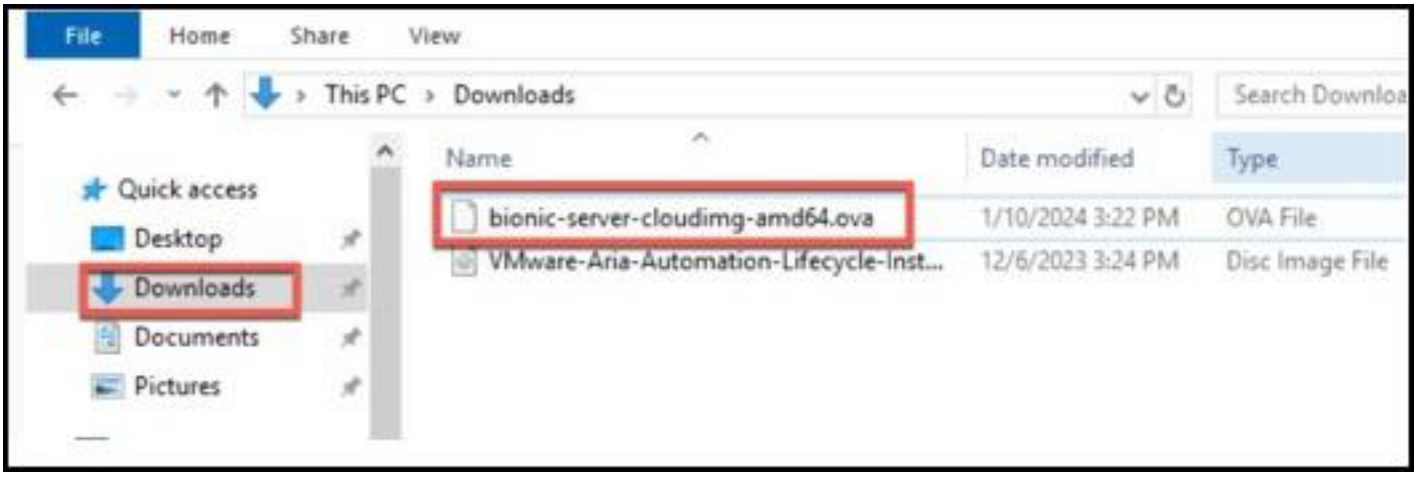
1. On Holo-Console, open a PowerShell window as Administrator
2. cd to **C:\VLC\VLC-Holo-Site-1\Holo-Build\Post-Deployment**
3. Run **.\Holodeck-Infrastructure.ps1**

```
PS C:\Users\Administrator> cd C:\vlc\VLC-Holo-Site-1\Holo-Build\Post-Deployment\
PS C:\vlc\VLC-Holo-Site-1\Holo-Build\Post-Deployment> dir


    Directory: C:\vlc\VLC-Holo-Site-1\Holo-Build\Post-Deployment


Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
-a----         3/6/2024   6:24 PM            483 Holodeck-Infrastructure.ps1


PS C:\vlc\VLC-Holo-Site-1\Holo-Build\Post-Deployment> .\Holodeck-Infrastructure.ps1
```

Download/Stage Ubuntu OVA Automation Enablement per site

The Ubuntu OVA is utilized to build VM by several different labs documented in this manual

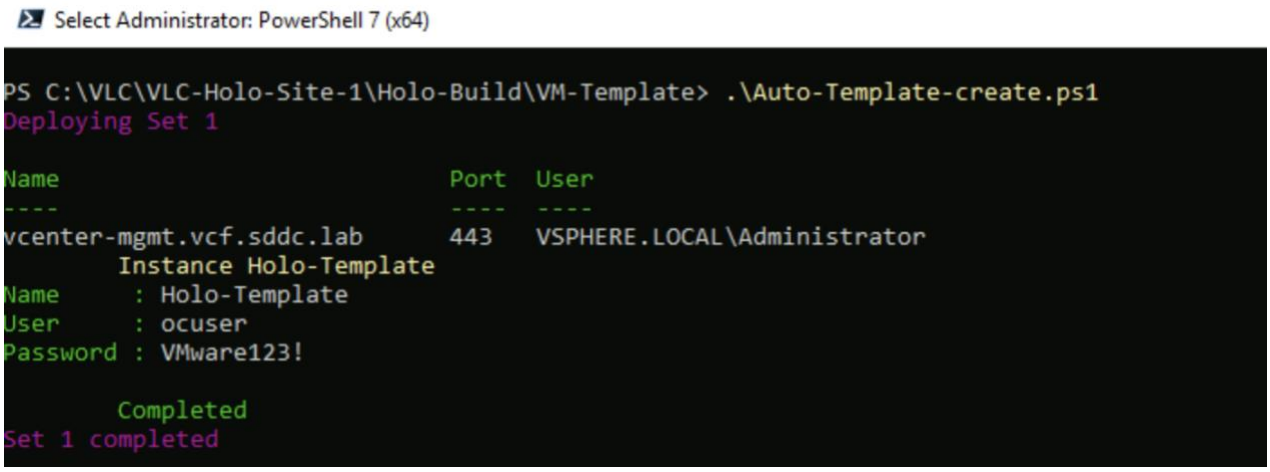
1. Within the Holo-Console desktop, open Chrome
2. Download the Ubuntu 18.04 LTS Daily Build to C:\Users\Administrator\Downloads



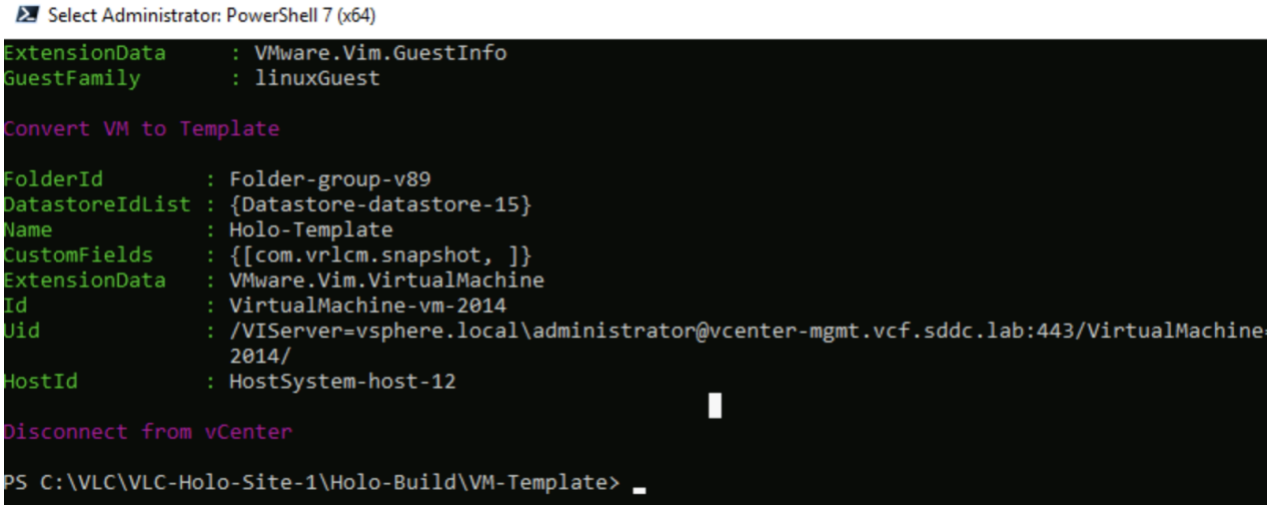
Build and Create Template

In this task the scripts are executed to automatically build a ubuntu virtual machine, update packages and turn it into a template. Each script takes approximately 5 minutes to complete, and it is needed to wait for the process to complete successfully before moving on. A red error message during the execution of the finalize script is expected behavior because the VM is shut down during the last test.

1. From within the Holo-Console, click on **Windows Start Menu→PowerShell→PowerShell** 7
2. In the PowerShell window, type the following commands:
   cd C:\VLC\VLC-Holo-Site-1\Holo-Build\VM-Template
   .\Auto-Template-create.ps1



3. In the PowerShell window, type the following commands:
   cd C:\VLC\VLC-Holo-Site-1\ Holo-Build\VM-Template
   .\ Auto-Template-finalize.ps1

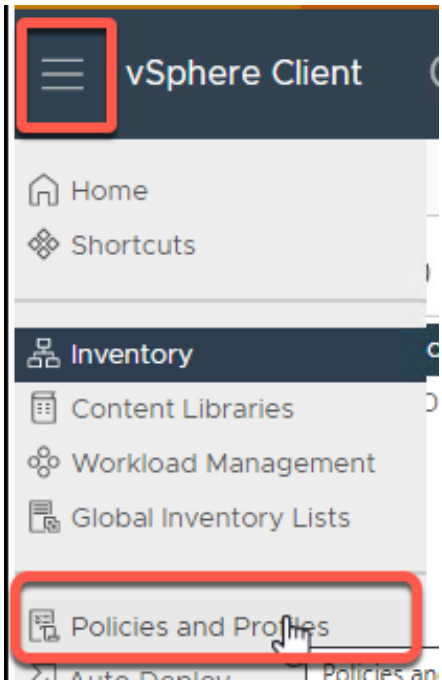


Optional: Set FTT=0 on Nested VSAN datastore

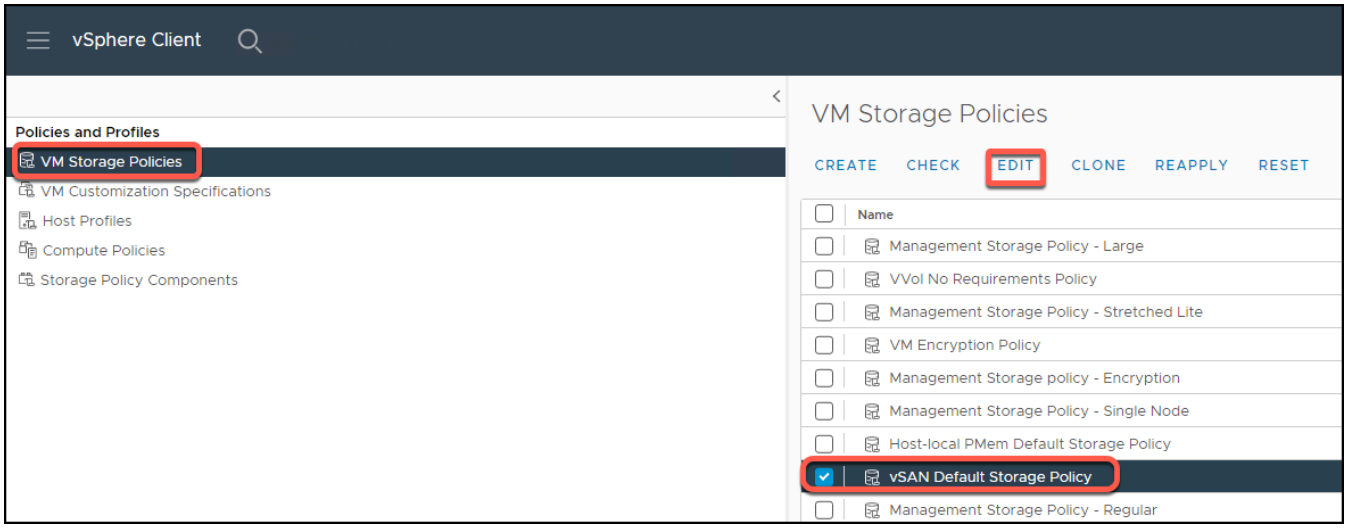
The following step is recommended to reduce out of space issues on the nested environment. As this is a lab environment, and running on underlying SSD, it is typically acceptable to reduce redundancy in the nested environment.

Note if there is a failure or corruption in the VCF environment vSAN will not be able rebuild the disk of the VMs that make up the VCF environment

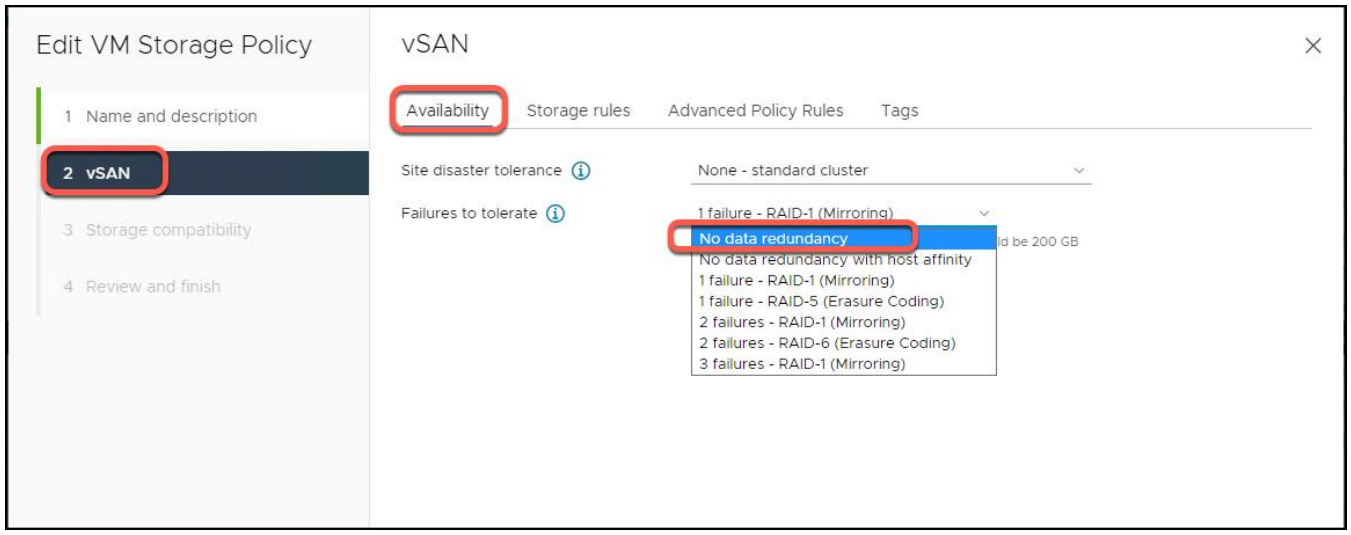
1. Using the site Specific vCenter web client,
2. Click on the **Hamburger Menu**
3. Choose **Policies and Profiles**



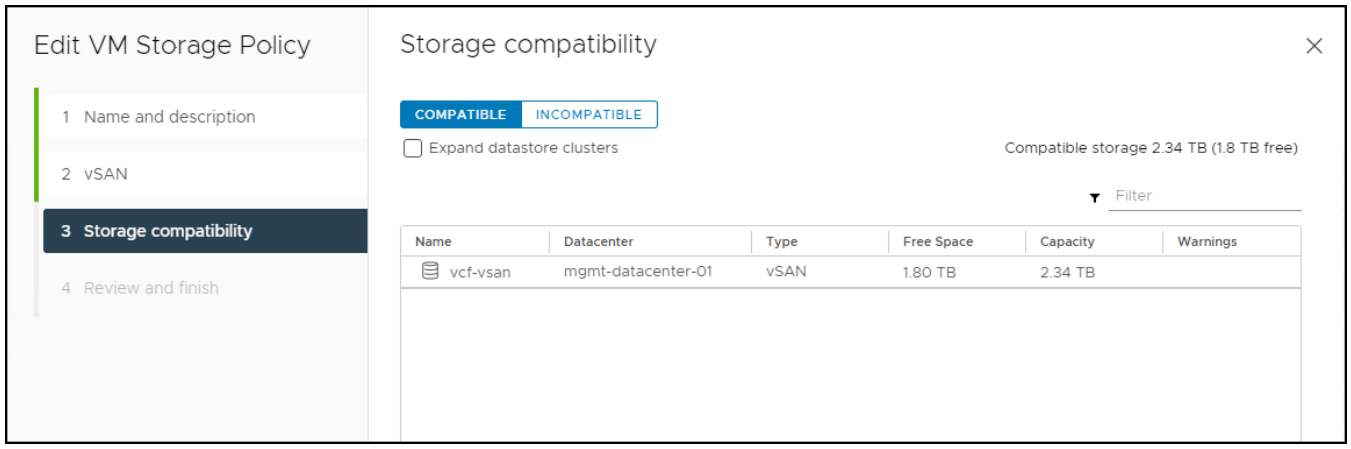
4. Select **VM Storage Policies** -> **vSAN Default Storage Policy** -> **Edit**



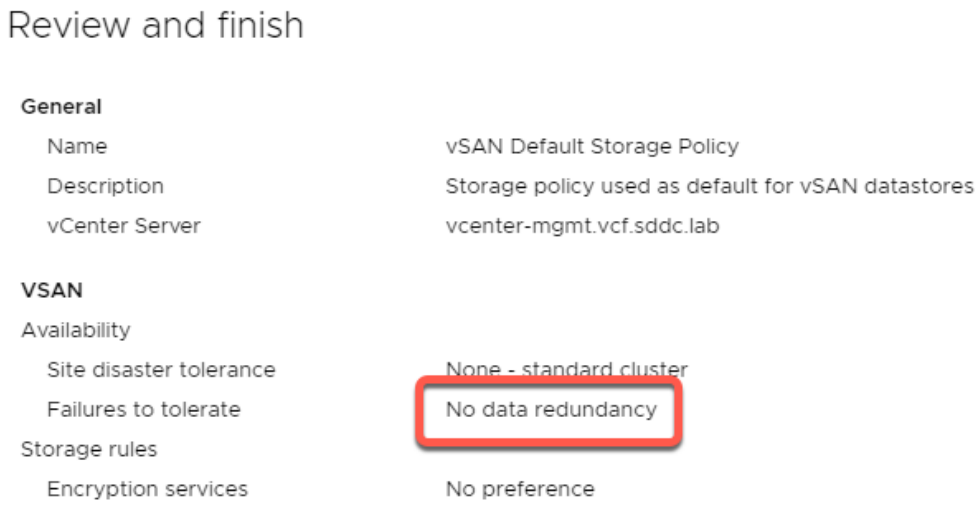
5. Leave Name and Description as is and click Next
6. On the vSAN Availability tab, set Failures to Tolerate to **No Data Redundancy**
7. Click on the **Next** button



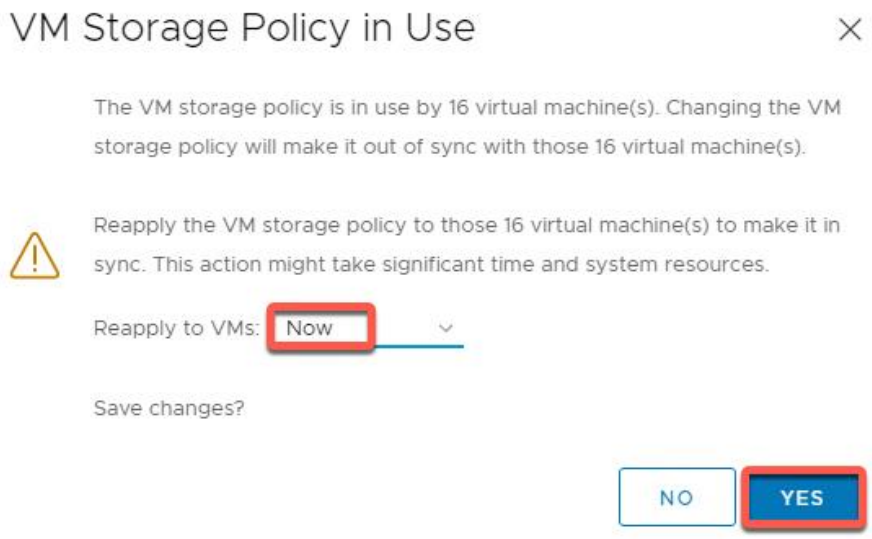
8. Select the **vcf-vsan**
9. Click on the **Next** button



10. Review settings
11. Click the **Finish** button



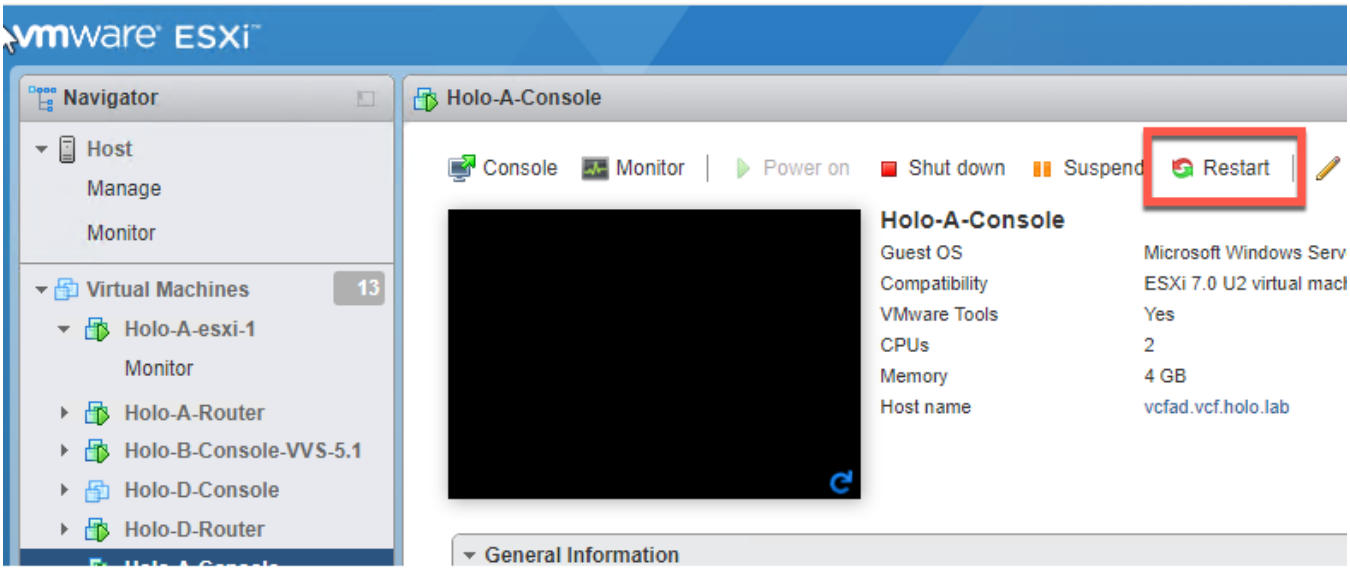
12. Select Now when prompted on Reapply to VM's, then Yes



Reboot Holo-Console VM

Using the vSphere Web Client, select the *Holo-A-Console* and click *Restart* to reboot the VM.

Note: This step is required to clear temporary Holo-Console network routing. After reboot Holo-Console receives routing, DNS, NTP, etc only from Cloud Builder (10.0.0.221) within the environment.



Multi-Site Environment Only: Create Holodeck folders VLC-Holo-Site-2

This will set up the folder infrastructure on the vCenter server for Site-2 Management domain that is utilized in the curated labs for Holodeck

1. On Holo-Console, open a PowerShell window as Administrator
2. cd to **C:\VLC\VLC-Holo-Site-2\Holo-Build\Post-Deployment**
3. Run **.\Holodeck-Infrastructure.ps1**

Multi-Site Environment Only: Update the Holo-Router for cross site network connectivity

Preparing the Holo-Router for cross site network connectivity is optional and only required if you intend to run the secondary site lab exercises. Holodeck Toolkit 5.2x supports a multi-site HCX lab as well as the ability for Aria Automation to deploy applications to the second site.

As mentioned previously the multi-site configuration requires deployment via the CLI

Prerequisites

- VLC-Holo-Site-1 configuration deployed from the Holodeck Standard Main 5.2x package using the VLC CLI and included Site-1 INI file with labSKUs=HCXsite1 set
- VLC-Holo-Site-2 configuration deployed from the Holodeck Standard Main 5.2x package using the VLC CLI and included Site-2 INI file with labSKUs=HCXsite2 set
- Holodeck 5.1 site1_additional_networks.json and site2_additional_networks.json files are available and unmodified in the VLC conf directory for each site
- External network access from the Holodeck environment

Update Holo-Router for Multi-Site

1. From within the Holo-Console, click on **Windows Start Menu→ PowerShell→ PowerShell** 7
2. Type the following command at the prompt:

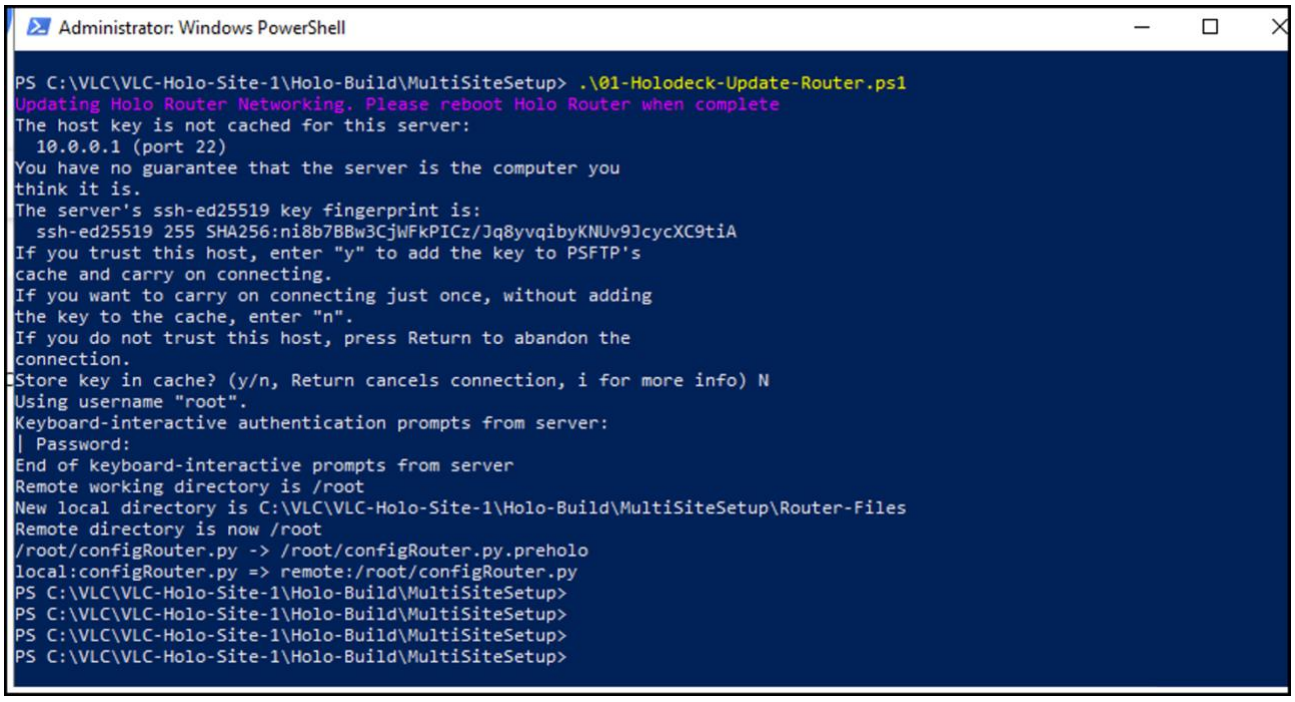
   cd C:\VLC\VLC-Holo-Site-1\Holo-Build\MultiSiteSetup

3. Enter the following command:

   .\01-Holodeck-Update-Router.ps1

4. A SFTP connection will be made to the Holo-Router – At the prompt to "Store key in cache" please answer **"Y"**
5. It will then ask for the root password to log into the router ("**VMware123!**" or the new password used during router set up)

   A new configuration file to the Holo-Router to enable cross site network connectivity will be put on the router



6. For new configuration to take effect the Holo-Router will need to be rebooted
   A. In Powershell

      ssh root@10.0.0.1

      reboot

   B. On physical ESXi

      Right click on the Holo-router

      Select "**Guest OS**" then "**Restart**"

Aria Easy Installer Deployment

Overview

This section details configuring VMware Aria Automation 8.18 On Prem for use in the Holodeck 5.2 nested lab environment.

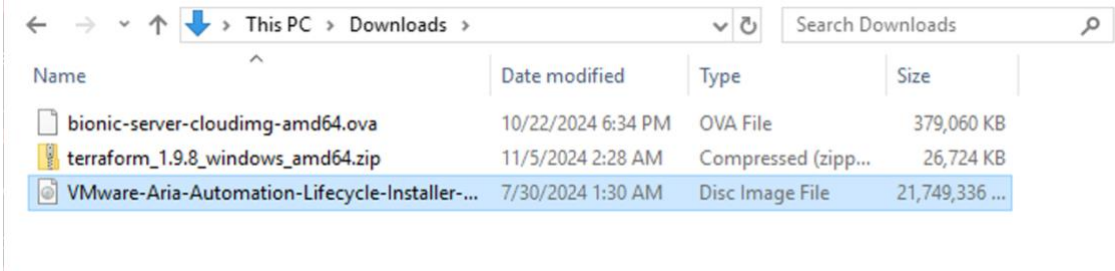
Prerequisites

This lab procedure has the following prerequisites:

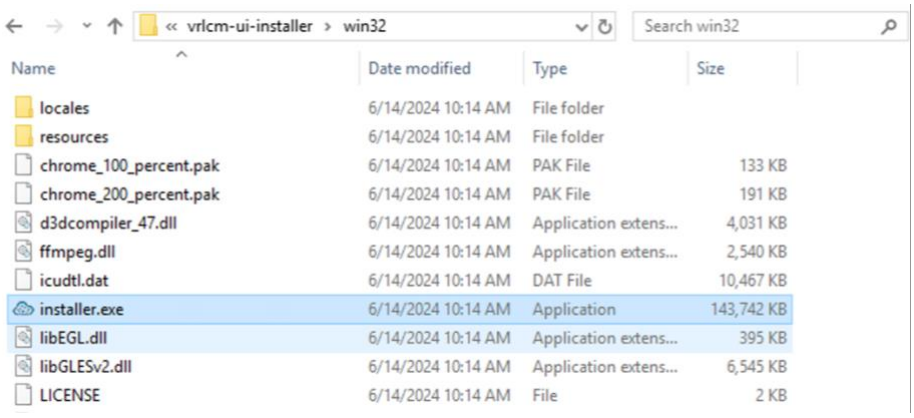
- VCF 5.2x is deployed in the VLC-Holo-Site-1 configuration
- No changes were made to the configuration, including changes of the host names, domains, IP addresses, or other information.
- AVN and Edge Cluster were deployed as part of VLC deployment.
- VMware Aria Automation Lifecycle Easy Installer is available.
- License key for Aria Automation 8.x Advanced or Enterprise

Deploy Aria Components using the Easy Installer

1. On Holo-Console navigate to the Downloads to open the ISO for Aria Automation Lifecycle Easy installer for 8.18



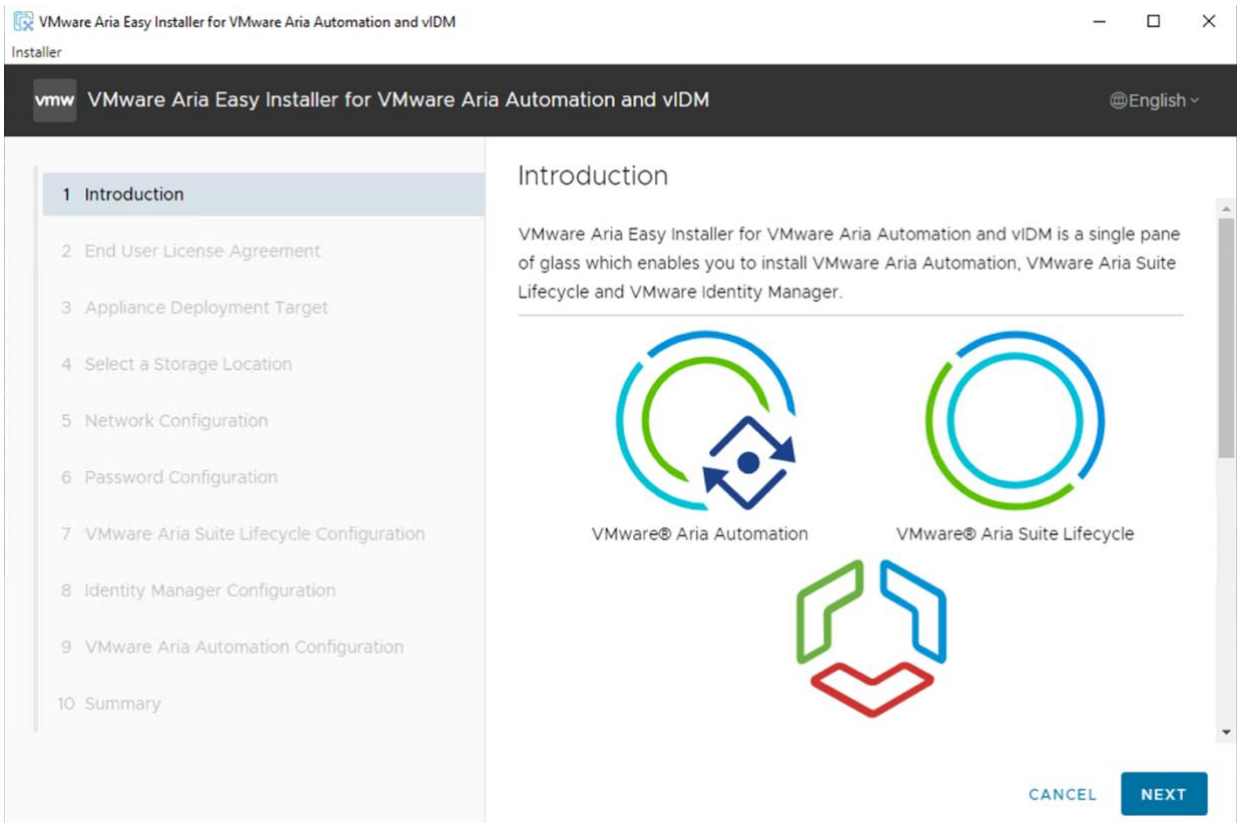
2. Once the image has been opened onto a CDROM navigate to: D:\vrlcm-ui-installer\win32
3. Open the **installer.exe** file to start the installation to deploy the installation program



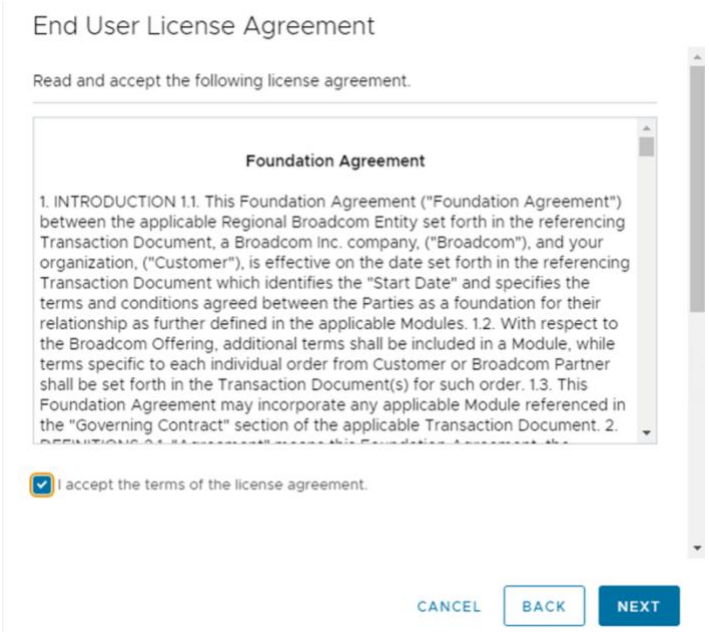
4. Click on **Install**

Introduction of the Easy Installer gives information about the applications and version being installed in this example 8.18 is being used. Additionally, the left frame shows the steps the install will run through

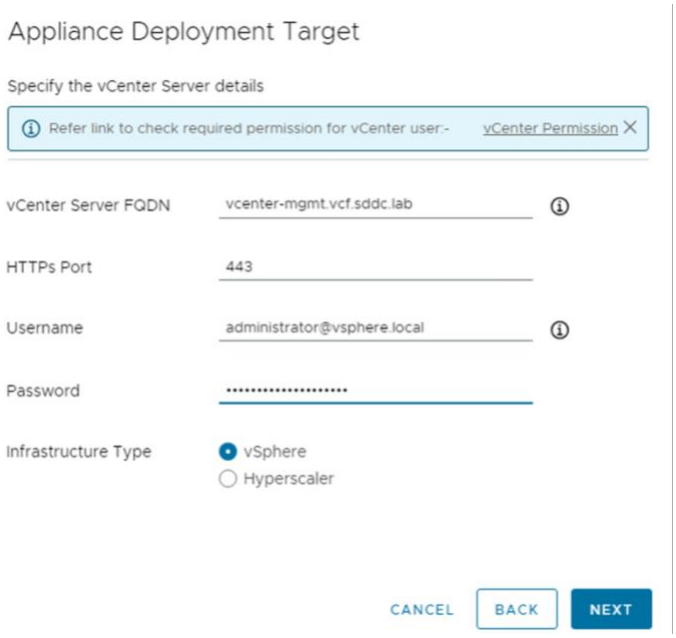
5. Click **Next**



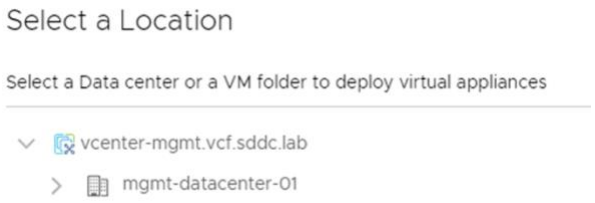
6. Check the checkbox to accept the license agreement
7. Click **Next**



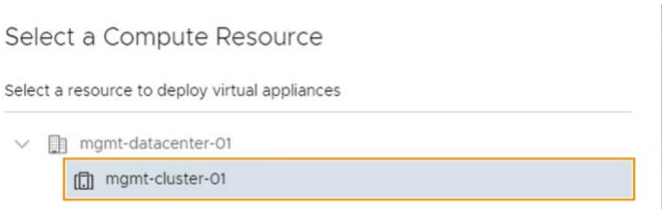
8. Enter the following information for the Appliance Deployment Target:
    a. vCenter Server FQDN: **vcenter-mgmt.vcf.sddc.lab**
    b. Username: **administrator@vsphere.local**
    c. Password: **VMware123!**
    d. Select Infrastructure Type **vSphere**
9. Click **Next**



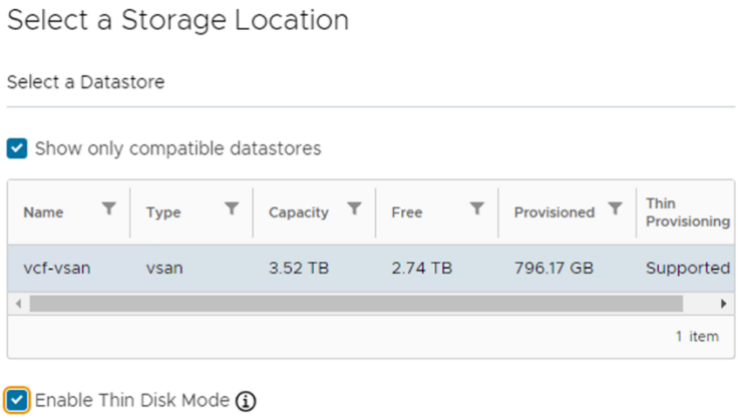
10. A certificate warning will pop up click **Accept**
11. Select location **mgmt-datacenter-01**
12. Click **Next**



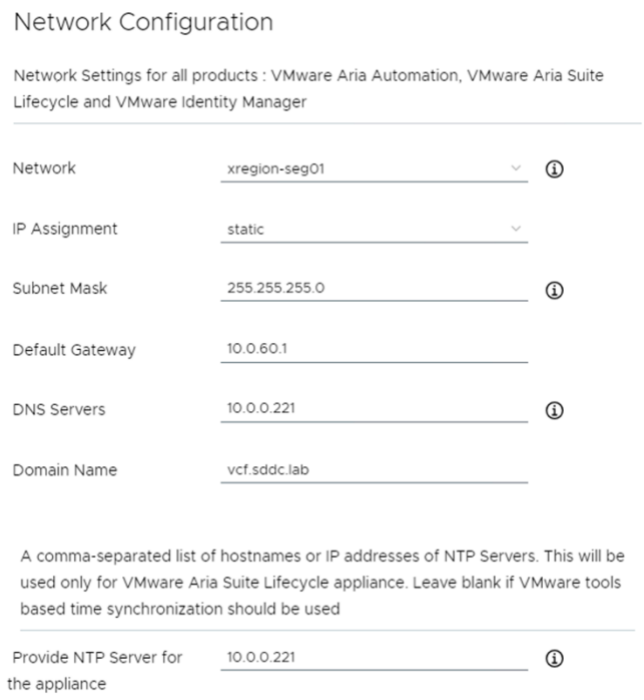
13. Select compute resource **mgmt-cluster-01**
14. Click **Next**



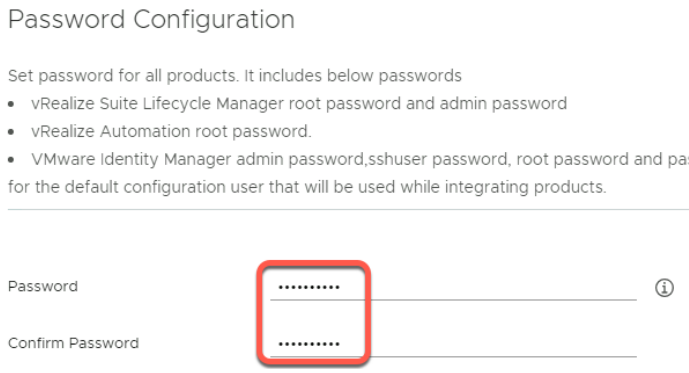
15. Select Datastore **vcf-vsan**
16. Check Enable Thin Disk Mode
17. Click **Next**



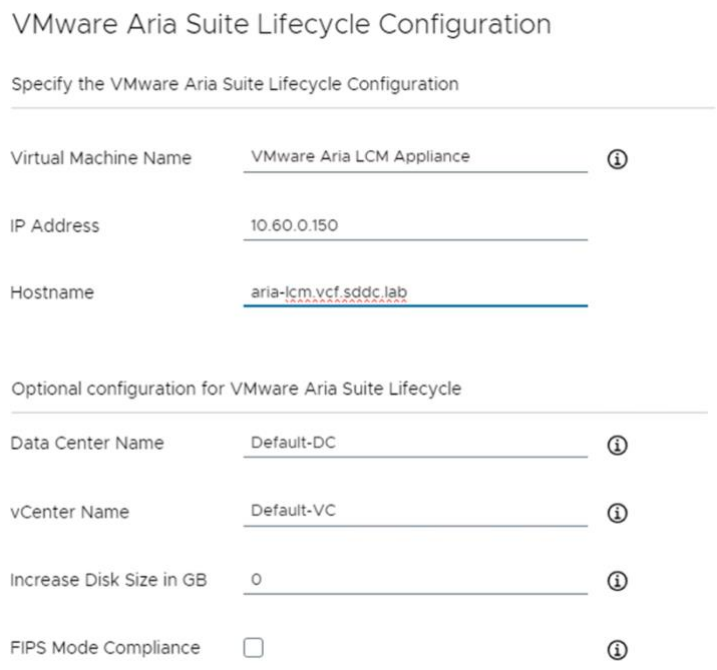
18. Use the dropdown box for **Network** to select **xregion-seg01** and leave **IP Assignment** as **static**
19. Enter the values below for each of the following attributes:
    - Subnet Mask = **255.255.255.0**
    - Default Gateway = **10.60.0.1**
    - DNS Servers = **10.0.0.221**
    - Domain Name = **vcf.sddc.lab**
    - NTP Server = **10.0.0.221**



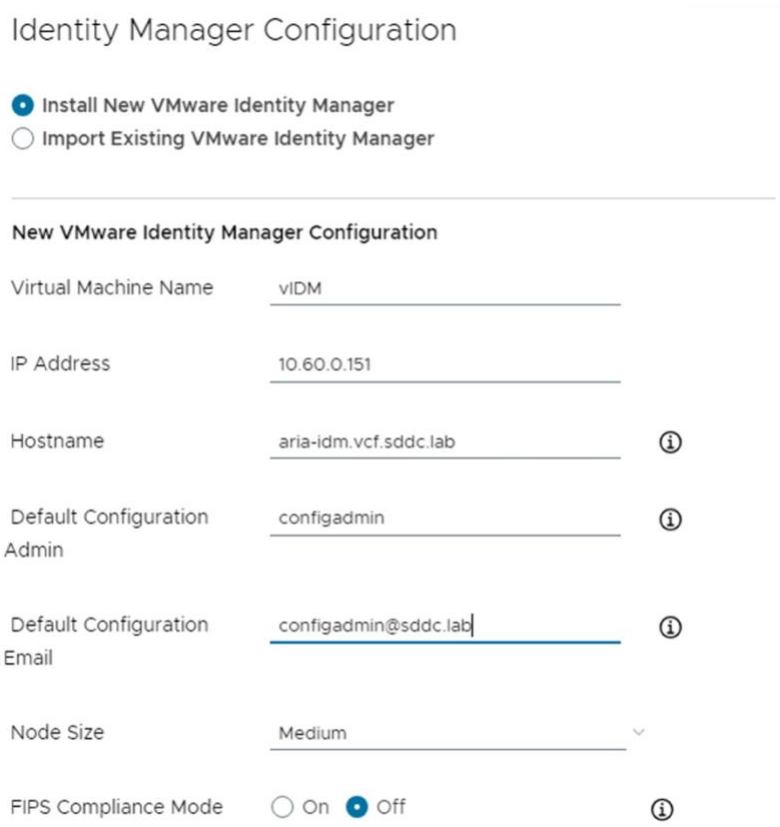
20. Enter **VMware123!** for the Password and Confirm Password fields (min 8 max 16)
21. Click **Next**



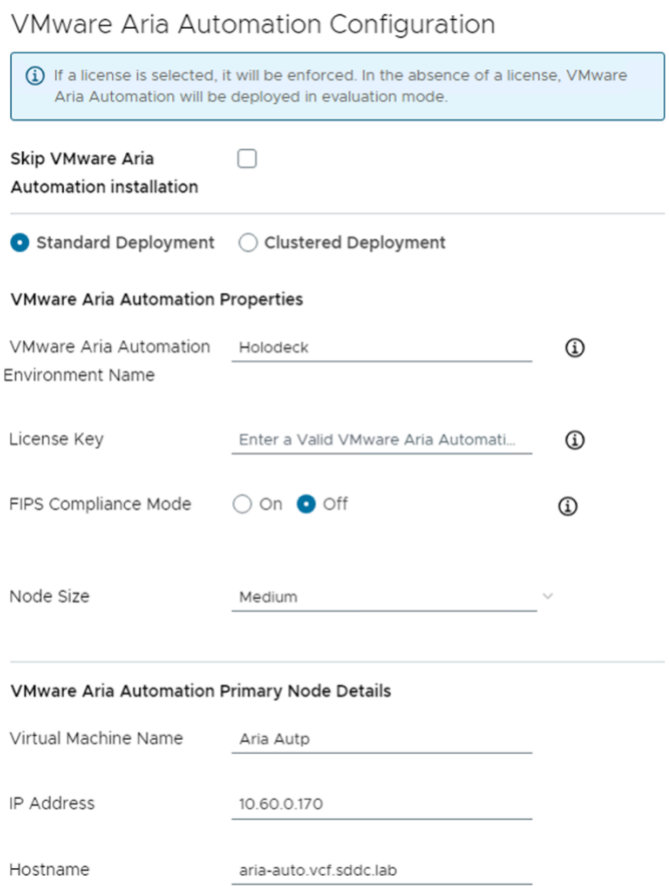
22. Use the following entries to configure the Aria LCM Appliance
    - Virtual Machine name can be left as "VMware Aria Lifecycle Appliance"
    - IP Address: **10.60.0.150**
    - Hostname: **aria-lcm.vcf.sddc.lab**
23. No additional changes need to be made in the **Optional Configuration**
24. Click **Next**



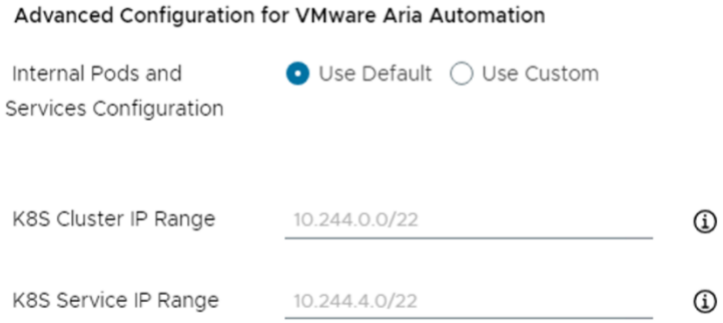
25. Use the following entries to configure the new VMware Identity Manager. Leave the default selections and provide the following values for the Identity Manager Configuration attributes listed below
    - Virtual Machine Name: **Aria IDM**
    - IP Address: **10.60.0.151**
    - Hostname: **aria-idm.vcf.sddc.lab**
    - Default Configuration Admin: **configadmin**
    - Default Configuration Email: configadmin@vcf.sddc.lab
26. Click **Next**



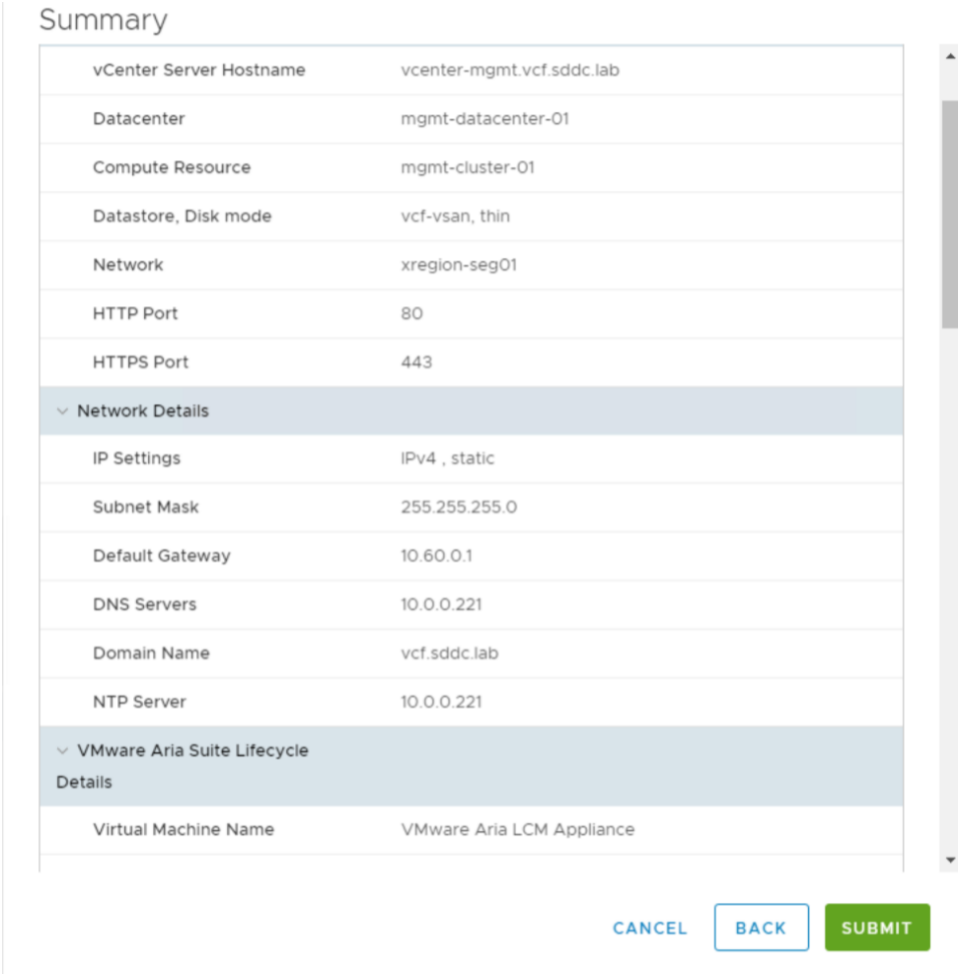
27. Use the following entries to configure the Aria Automation Configuration:
    - vRA Environment Name: **Holodeck**
    - License Key: <**LEAVE BLANK**>
    - FIPS Compliance: **Off**
    - Node Size: **medium**
    - Virtual Machine Name: **Aria Auto**
    - IP Address: **10.60.0.170**
    - Hostname: **aria-auto.vcf.sddc.lab**



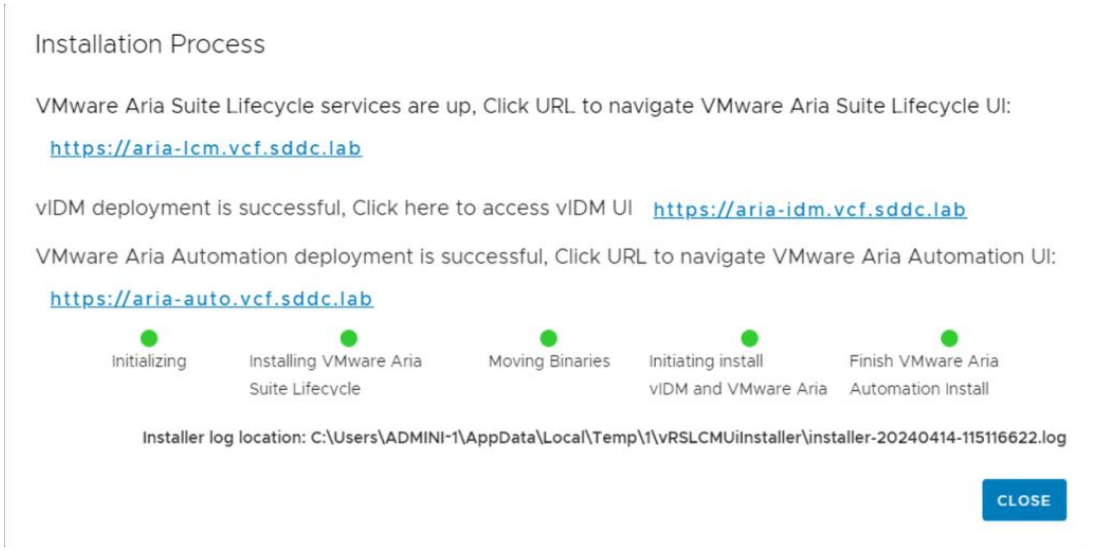
28. In section Advance Configuration for VMware Aria Automation for Internal Pods and Services Configuration **Use Default** selected
29. Click **Next**



30. Review the summary information and then click **Submit**

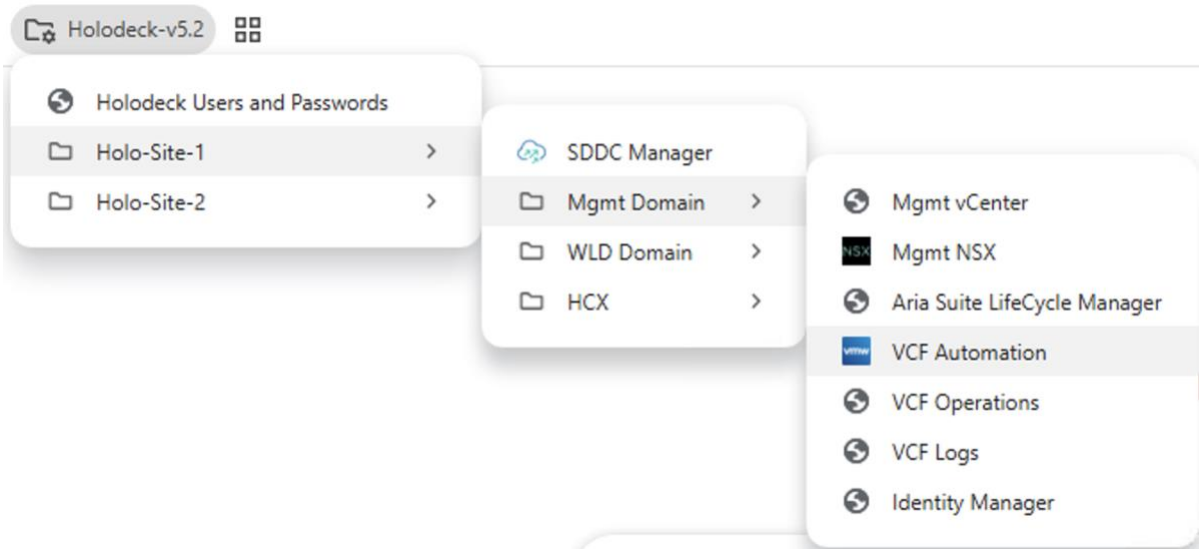


31. The deployment process takes approximately two hours to complete
32. Wait for the installation to complete, then click Close to quit the installer

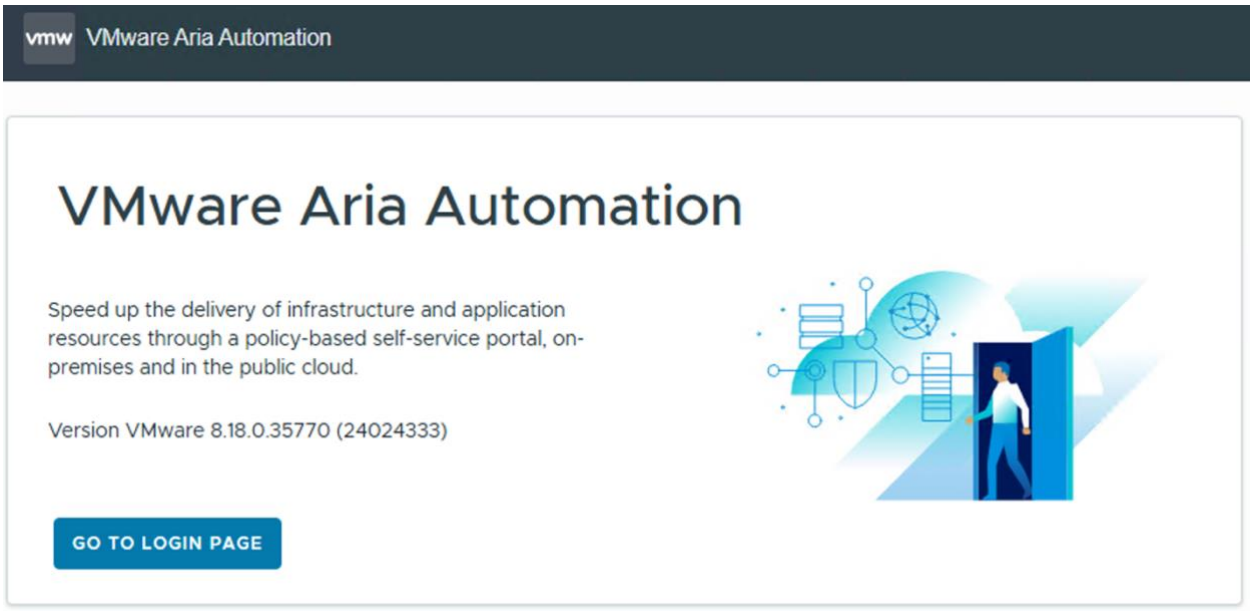


Aria Automation 8.18 QuickStart wizard

1. In Holo-Console open a new Chrome browser tab
2. On the bookmark bar click on the Holodeck 5.2 folder → Holo-Site-1, → Mgmt Domain →VCF Automation

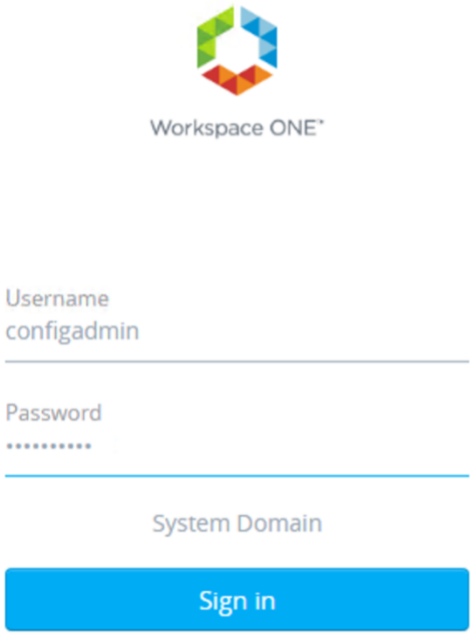


3. At the certificate warning, click **Advanced**, then click **Proceed to aria-auto.vcf.sddc.lab (unsafe)**
4. Click on **Go To Login Page**



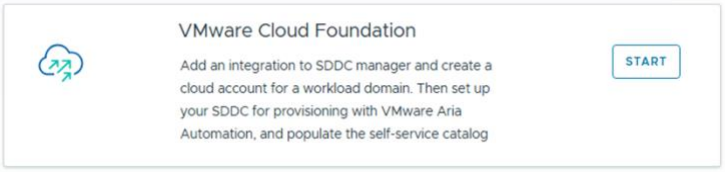
5. At the certificate warning, click **Advanced**, then click **Proceed to aria-idm.vcf.sddc.lab (unsafe)**

6. Authentication is done via Workspace One Identity Manager deployed earlier
7. Login as **configadmin** with the password of **VMware123!**

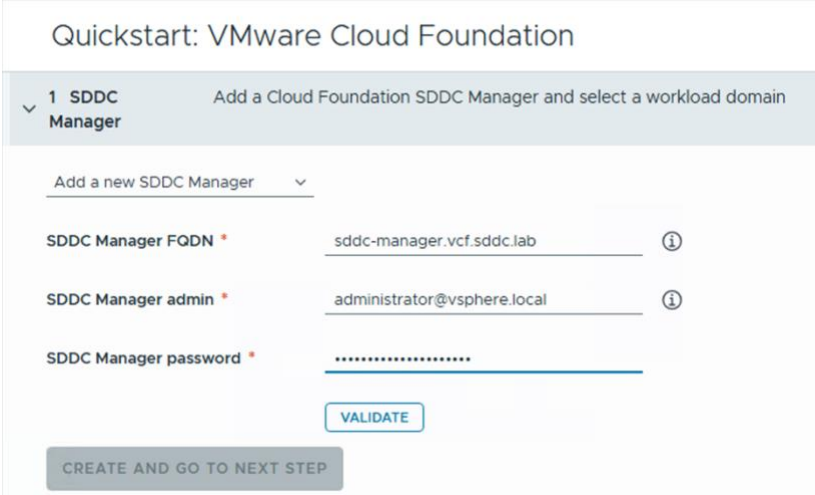


8. Click on **Launch QuickStart** button

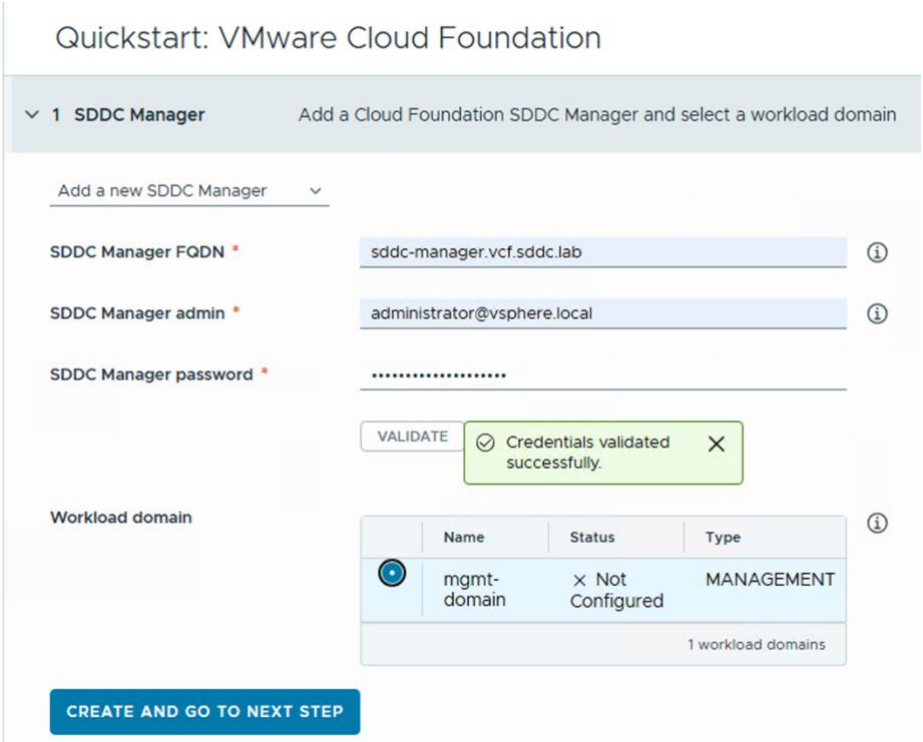
9. Select the Cloud account type need to be configure by clicking **Start** on VMware Cloud Foundation



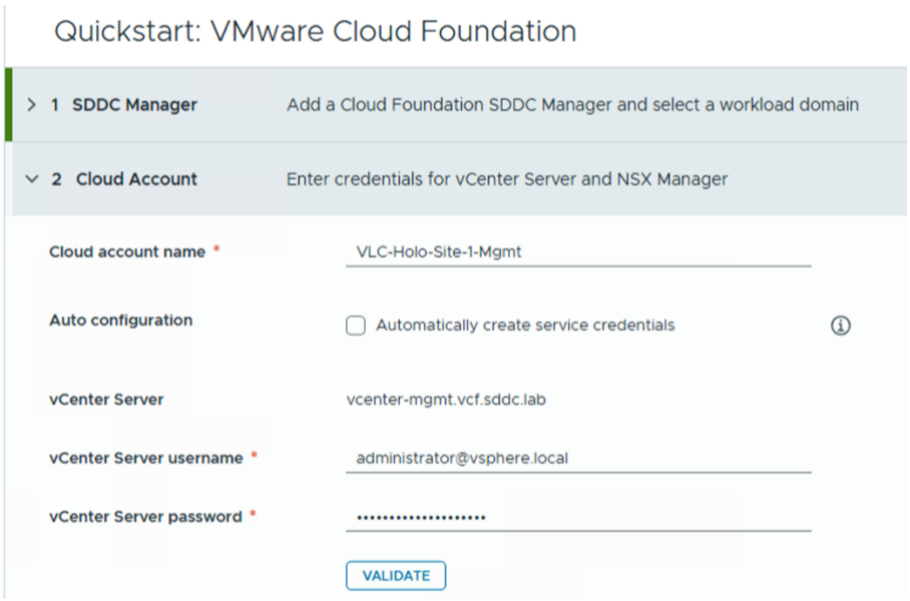
10. In the **Add a new SDDC Manager** section and provide the values for the following attributes:
    - SDDC Manager FQDN: **sddc-manager.vcf.sddc.lab**
    - SDDC Manager admin: **administrator@vsphere.local**
    - SDDC Manager password: **VMware123!VMware123!**
11. Click Validate



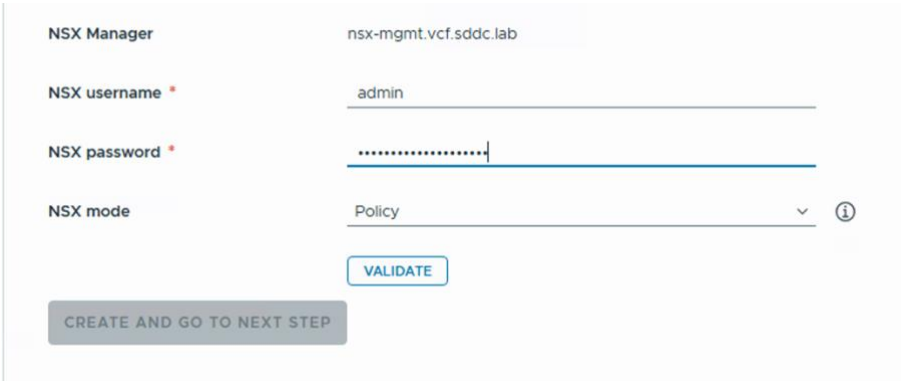
12. Accept the untrusted certificate
13. After the validation completes, the Workload domain section updates. Select the **mgmt-domain**,
14. Then **Create and Go To Next Step**



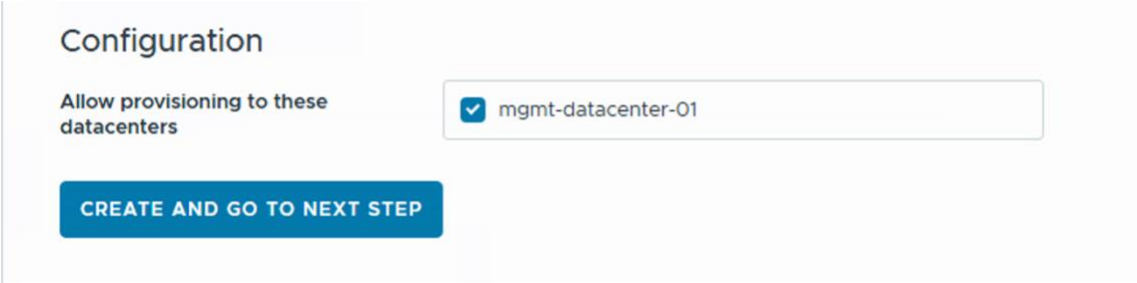
15. Enter the value of **VLC-Holo-Site-1-Mgmt** for the **Cloud Account Name** attribute
16. Leave **Automatically Create Service Credentials** unchecked
17. Enter **administrator@vsphere.local** for the vCenter Server username and **VMware123!VMware123!** for the vCenter Server password
18. Click **Validate**
19. Accept the Untrusted Certificate



20. Under NSX Manager, enter **admin** for the username and **VMware123!VMware123!** for the password.
21. Leave NSX Mode set to **Policy**
22. Click **Validate**

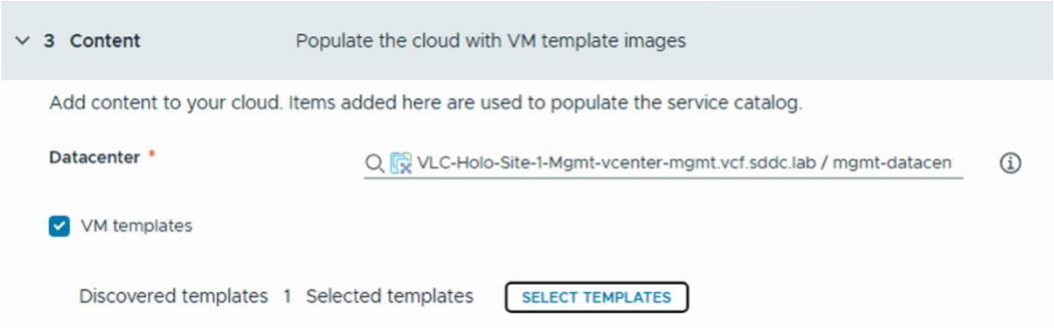


23. Accept untrusted certificate
24. Once Credentials validated successfully and **mgmt-datacenter-01** is checked for allow provisioning
25. Click **CREATE AND GO TO NEXT STEP**

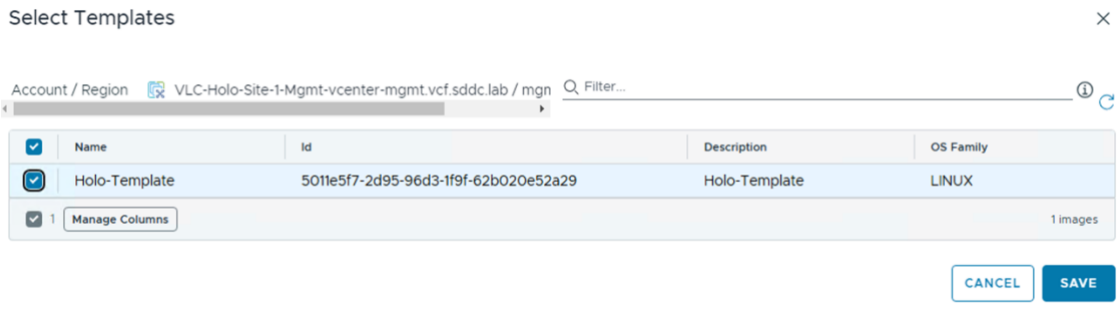


26. Select the checkbox for **VM Templates**

    Note: If Discovered Templates is 0. Please make sure that "Build and Create Template" was completed

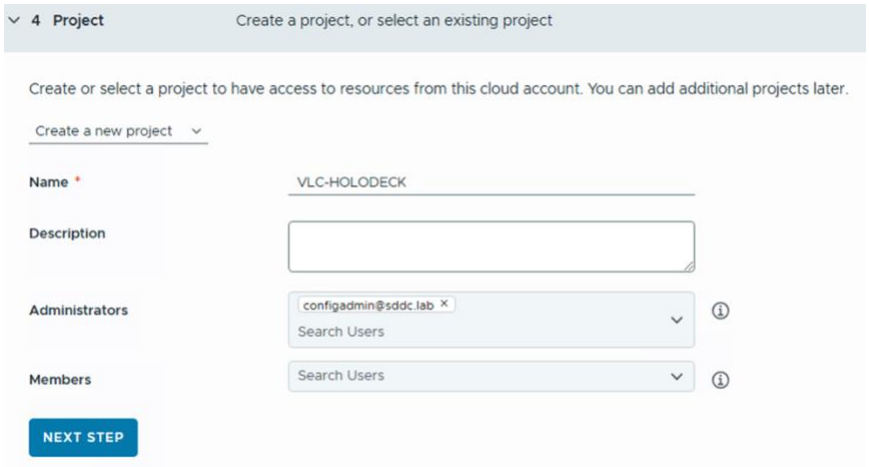


27. Click **Select Templates**
28. Select the **Holo-Template**
29. Click **Save**

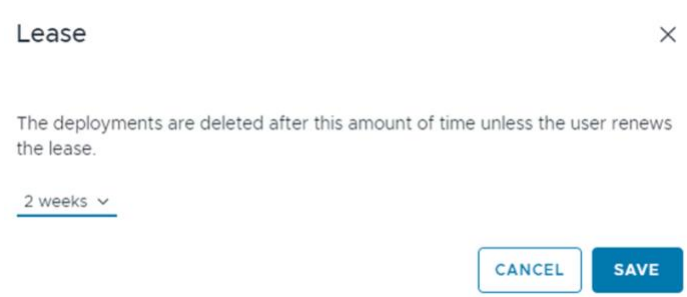


30. Verify that one template is selected.
31. Click **Next Step**

32. Create a new project called **VLC-Holodeck**
33. Search for **con** in the **Administrators** field to locate the **configadmin** user
34. Select **configadmin**
35. Click **Next Step**

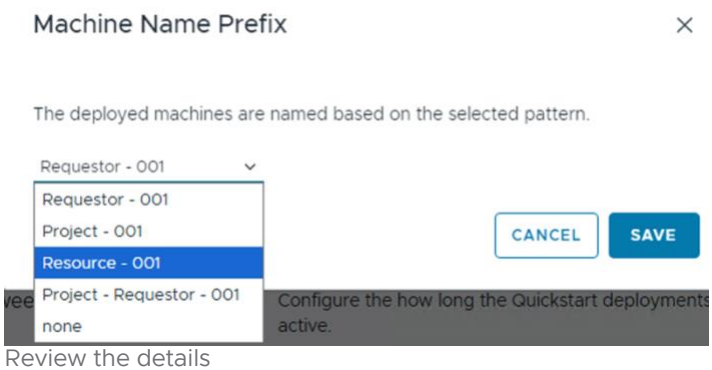


36. Click **Edit for Lease**
37. Set lease to **2 weeks**
38. Click **Save**

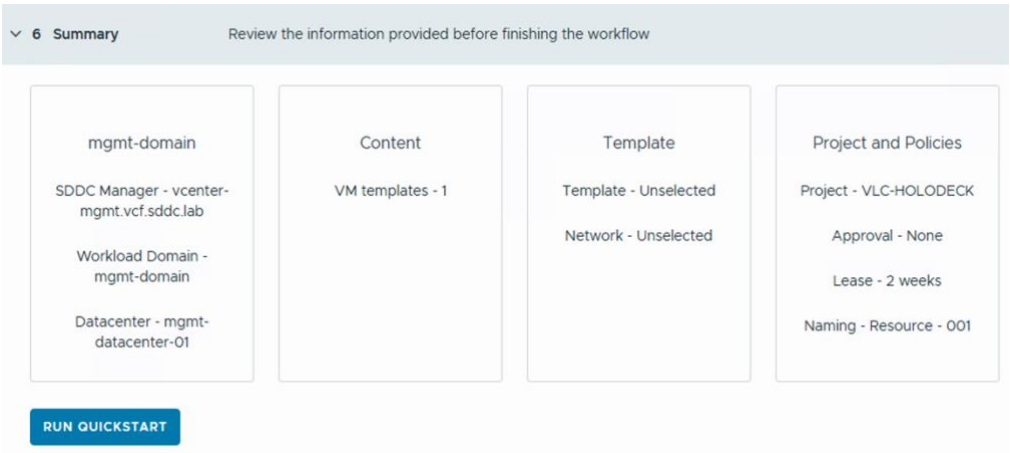


39. Click **Edit** on Machine name
40. Select the dropdown for the machine name prefix.
41. Select **Resource-001** then click **Save**

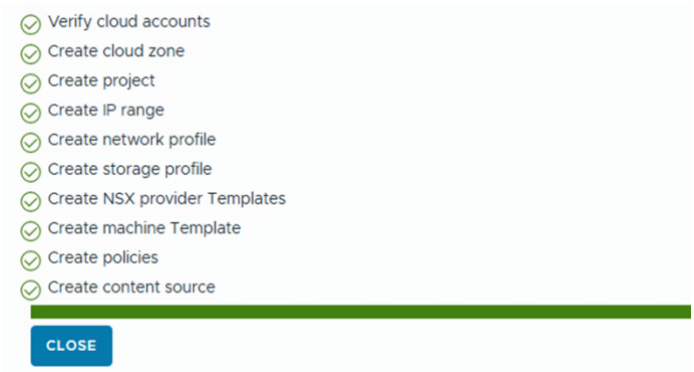
42. Click **Next Step**

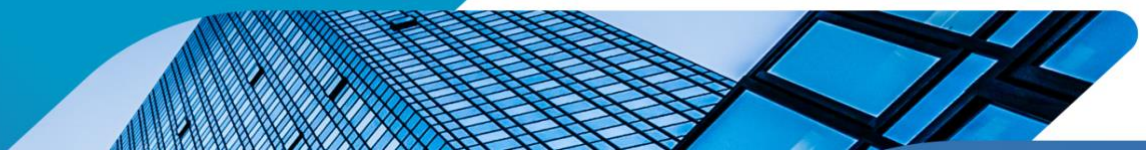


43. Review the details
44. Click **Run Quickstart**



45. Click **Close** when complete





Glossary

Holo-Router	Specially Configured Photon Router that acts as the North – South router between the Holodeck Environment and the internet
Holo-Console	Custom Windows Jump host to access the Holodeck Environment; also acts as an AD and certificate server for the environment – the ISO is built and customized as one of the first modules when utilizing the toolkit
Holodeck Cloud Builder	The VCF Cloud Builder has been modified to also act as DNS server, internal Holodeck environment Router and handles static BGP tasks
VCF Lab Constructor	Underlying set of scripts that automates the deployment of the virtualized Holodeck environment
Tags (context of NSX)	A virtual machine is not directly managed by NSX, however, NSX allows attachment of tags to a virtual machine. This tagging enables tag-based grouping of objects. For example, a tag called *AppServer* can be associated to all application servers) Tagging in NSX is distinct from tagging in vCenter Server. At this time, vCenter Server tags cannot be used to create groupings in NSX. In larger, more automated environments, customers use a solution such as Aria Automation to deploy virtual machines and containers with security tagging set at time of creation.
Security Groups (context of NSX)	A security group is a collection of assets or grouping objects from your vSphere inventory. Security Groups are containers that can contain multiple object types including logical switch, vNIC, IPset, and Virtual Machine (VM). Security groups can have dynamic membership criteria based on security tags, VM name or logical switch name. For example, all VMs that have the security tag *web* will be automatically added to a specific security group destined for Web servers. After creating a security group, a security policy is applied to that group.
Security Policy (context of NSX)	A security policy is a set of Guest Introspection, firewall, and network introspection services that can be applied to a security group. The order in which security policies are displayed is determined by the weight associated with the policy. By default, a new policy is assigned the highest weight so that it is at the top of the table. However, you can modify the default suggested weight to change the order assigned to the new policy. Policies can be stateful or stateless.

Item No: vmw-bc-wp-tech-temp-uslet-word-2024 1/24