Hewlett Packard Enterprise | vmware

HPE Reference Architecture for VMware Cloud Foundation on HPE Composable Rack

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Executive summary

In today's digital world, organizations are under increasing pressure to deliver applications faster while reducing costs. As these applications grow more complex, it puts stress on IT infrastructure, IT teams and processes. To remain competitive, enterprises are modernizing their on-premises data centers by transforming IT solutions to be software-defined. This allows in standardization of IT infrastructure to lower capital costs, eliminate complexity, reduce operating expenses, and gain operational agility.

Hewlett Packard Enterprise offers a variety of solutions for enterprises to build their data center infrastructure and on-premises hybrid cloud. HPE Composable Rack is the foundation for an open hybrid cloud platform that enables IT to run cloud-native workloads on virtual machines, containers or on bare metal in the data center. Software-defined automation for HPE Composable Rack that are built on fully programmable HPE ProLiant servers and HPE Composable Fabric infrastructure enable IT to rapidly scale private cloud environments. HPE Composable Fabric is the flexible choice for enterprises who needs a scalable fabric infrastructure for their data center infrastructure to build a comprehensive private cloud solution. HPE Composable Rack solution includes HPE tools that offer a turnkey solution with software-defined automation to deliver faster deployment and lifecycle management in just a few clicks.

This Reference Architecture document describes the best practices to deploy VMware Cloud Foundation® (VCF) on HPE Composable Rack configured with HPE Composable Fabric Manager and HPE OneView server profiles. VCF is an integrated hybrid cloud platform that delivers a complete set of software-defined services for compute, storage, networking, security, and cloud management for the private and public cloud. VCF drastically simplifies data center operations by deploying a standardized architecture with an automated approach in using VMware vRealize Orchestrator® (vRO) to perform HPE Composable Rack firmware upgrades.

Benefits

- End to end solution stack fully tested and validated as per Hewlett Packard Enterprise and VMware Cloud Foundation software firmware compatibility matrix
- Simplifies management with unique integration for VMware Cloud Foundation and HPE Composable Rack
- New automated server firmware lifecycle management workflows with vRO
- Provides composability with as-a-service experience to customers with HPE GreenLake
- HPE Point Next customer incubation program enable 'First Time Right' approach to accelerate time to value

Target audience: This document is intended for Cloud architects, Chief Technology Officers (CTOs), data center managers, VMware administrators, and implementation personnel willing to learn more about VCF on HPE Composable Rack. Familiarity with HPE ProLiant servers, HPE Composable Fabric, HPE OneView, VMware Cloud Foundation, and core virtualization and networking knowledge are expected.

Document purpose: The purpose of this document is to describe best practices to deploy VCF on HPE Composable Rack using HPE Composable Fabric Manager and HPE OneView for HPE ProLiant servers and its automated firmware update process.

This Reference Architecture is based on the solution built and tested in February 2020.

Solution overview

This Reference Architecture demonstrates best practices for customers building a private cloud solution in an enterprise data center and deploying business critical applications in a fully secure manner. The solution design is based on VMware Cloud Foundation (VCF) on HPE Composable Rack. VCF delivers a unified software-defined data center (SDDC) platform integrating VMware vSphere®, VMware vSAN™ storage (vSAN) and VMware NSX® networking. VCF provides full automation and lifecycle management for all the VMware infrastructure components. In addition, VCF also delivers VMware vRealize® suite which includes VMware vRealize Automation™, VMware vRealize Orchestrator™ (vRO), VMware vRealize Suite Lifecycle Manager™ (VRLCM) and VMware vRealize operations™ to provide cloud management and automation capabilities.

VMware Cloud Foundation software is deployed on HPE Composable Rack, a software-defined infrastructure platform which provides a fluid pool of compute, storage, and fabric resources. VMware Cloud Foundation on HPE Composable Rack solution is implemented with the following operations:

- Deploy and configure HPE OneView on the infrastructure vCenter Server
- Deploy and configure HPE Composable Fabric Manger (CFM) on the infrastructure vCenter Server

- Deploy VMware ESXi on bare-metal, HPE Composable Rack, and HPE ProLiant nodes using iLO Virtual Media
- Deploy Cloud Builder VM on the infrastructure vCenter Server
- Deploy VMware Cloud Foundation management domain, which deploys the vCenter Server, Platform Service Controllers, vSAN, NSX Manager, NSX Controllers, vRealize Log Insight, and SDDC Manager
- Commission ESXi hosts for the VMware Cloud Foundation workload domain
- Deploy VMware Cloud Foundation workload domain through SDDC Manager
- HPE Composable rack hardware firmware management through VMware vRO using HPE OneView plug-in
- Decommission and delete the workload domain through SDDC manager

Figure 1 shows the VMware components of VMware Cloud Foundation solution for HPE Composable Rack.

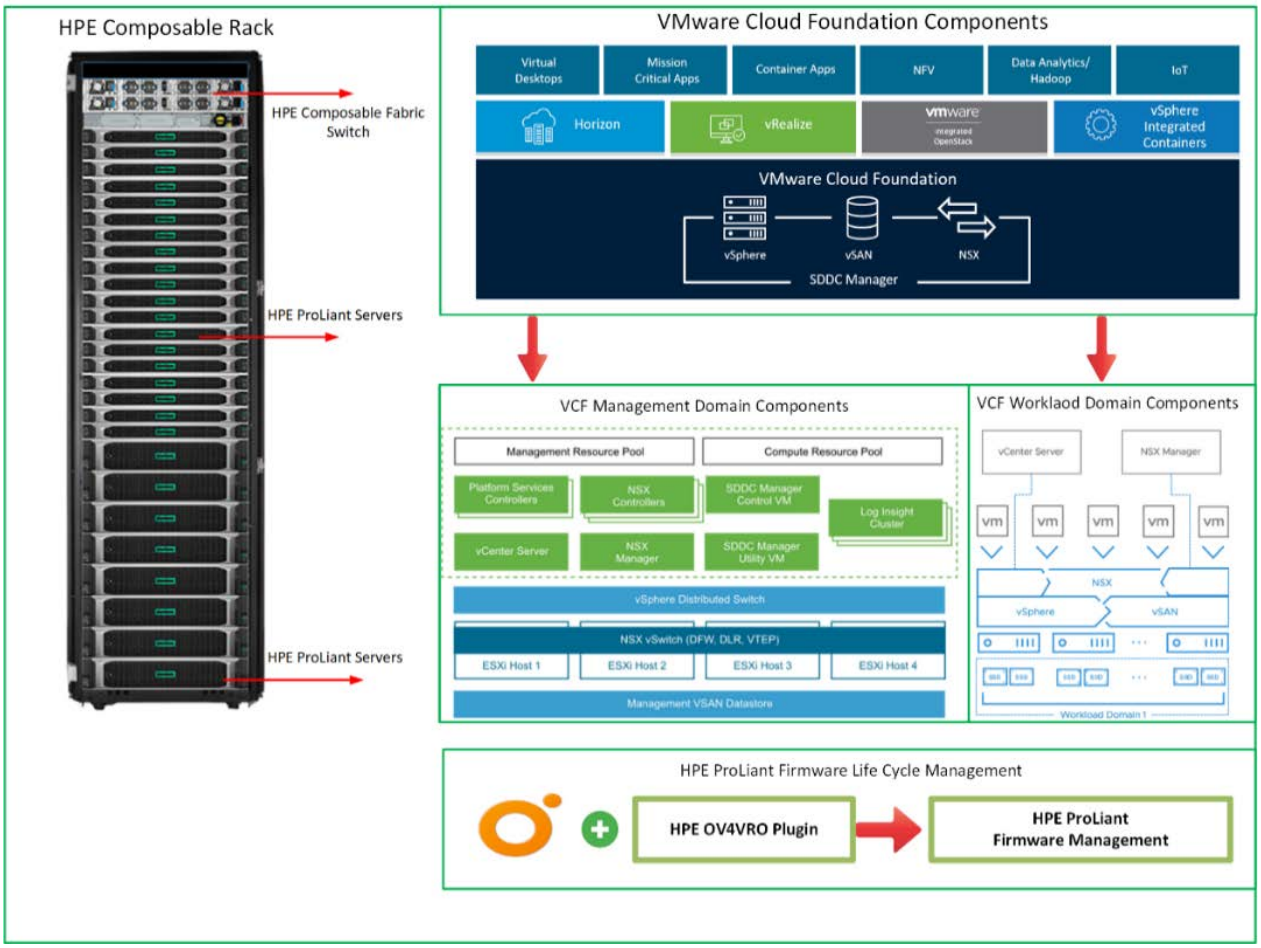


Figure 1. VMware components of VCF solution for HPE Composable Rack

HPE Composable Rack

HPE Composable Rack is the foundation for an open composable hybrid cloud platform that combines the unique capabilities of composability for your rack-scale environment, enabling IT to deploy new apps and workloads faster (faster deployment of new configurations).

The VCF on HPE Composable Rack solution automate operations and spend less time on management with a secure and cost-effective approach, so that IT can drive innovation and time-to-market, for the business.

HPE Composable Rack can be used by organizations to deploy cloud-native applications at rack scale on virtual machines, containers, or bare-metal in their data center, when combined with cloud software stacks, such as VMware Cloud Foundation. It enables automated IT operations to deliver apps and services faster and more efficiently, rapid provisioning, and ability to scale infrastructure on-demand (and non-disruptively) and helps align costs to utilization by leveraging as a Service consumption-based economics.

Figure 2 shows the overview of HPE Composable Rack.

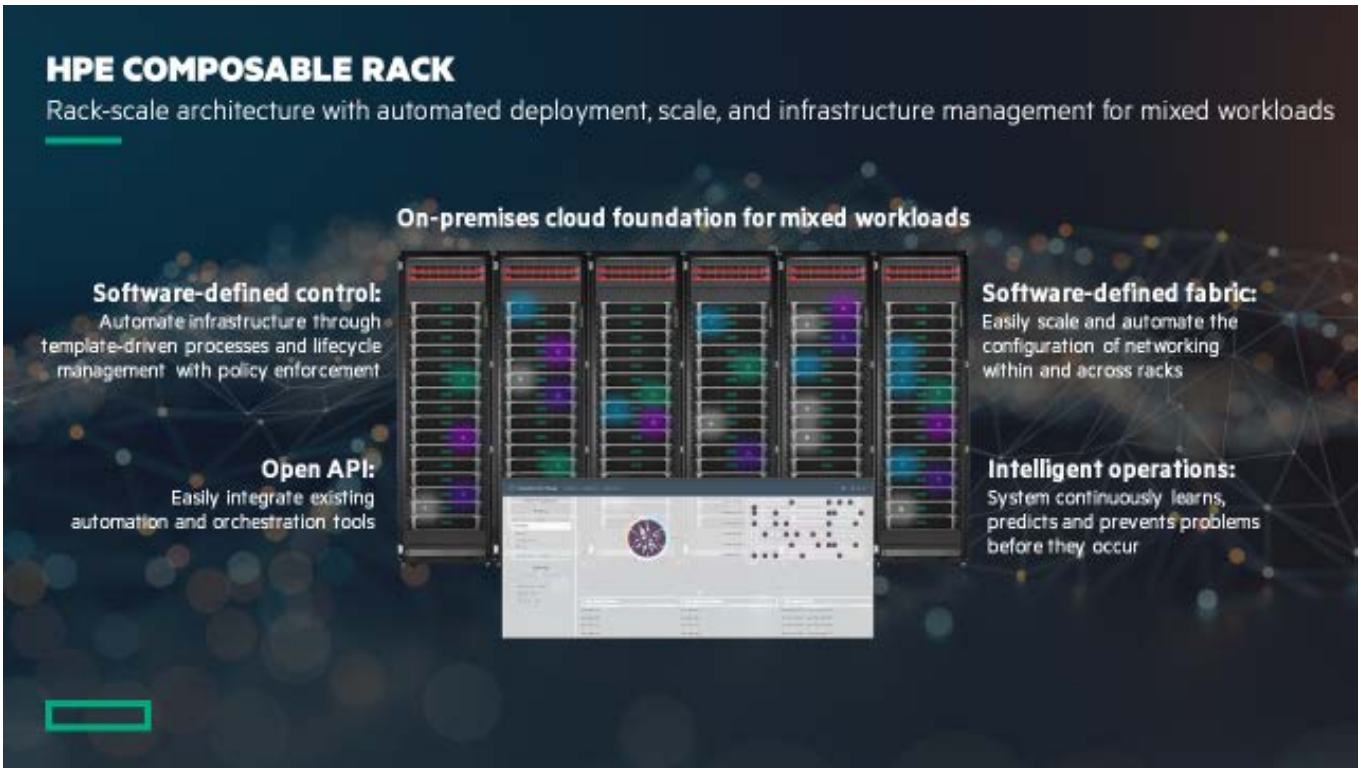


Figure 2. HPE Composable Rack overview

HPE Composable Rack is built on HPE leading industry standard servers with integration between HPE OneView, HPE Composable Fabric and the SDDC management environment. It offers an integrated composable management experience with HPE ProLiant DL360 Gen10, DL380 Gen10, DL560 Gen10, and HPE Composable Fabric. It includes a new HPE Composable Rack license per server, which grants rights and access to HPE OneView integration features with the HPE Composable Fabric Manager.

Figure 3 illustrates the HPE Composable Rack for HPE ProLiant components.

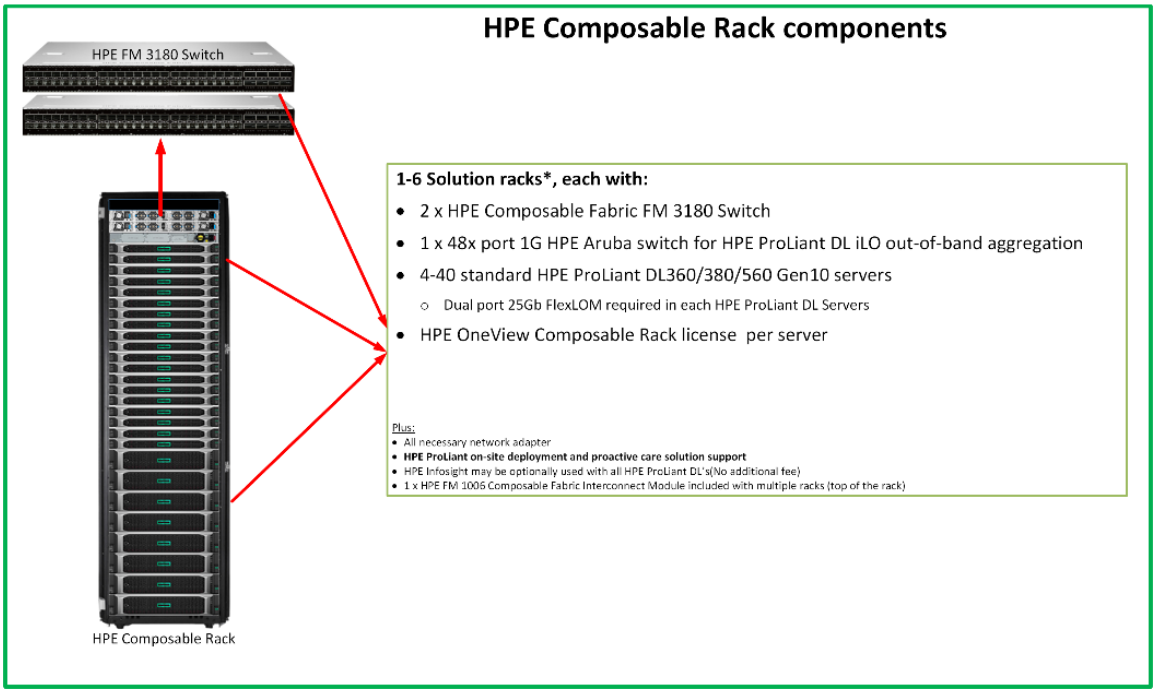


Figure 3. HPE Composable Rack environment

Key features

The template-driven automation is a combination of HPE ProLiant DL servers and HPE Composable Fabric that delivers an enhanced HPE OneView management experience. See HPE Composable Rack Support Matrix for the supported server details. The features include:

- Provides wire-once, top-of-rack 25G server connectivity with programmatic control and easy rack-to-rack scaling
- HPE ProLiant DL Gen10 Rack Servers support broad configuration flexibility
- Supports VMware, containers, and bare-metal deployment
- Auto-discovery of ProLiant server network connections
- Network connection status and continuous network cable validation
- HPE ProLiant DL Gen10 server profile templates with Fiber Channel connections, network connections, and link aggregation groups
- Simplified network provisioning enabling fast and easy scalability
- Comprehensive host view with visualization of physical and virtual network connections
- Fabric utilization visualization tools and dynamic fabric controls

HPE Composable Fabric

HPE Composable Fabric delivers a software-defined networking fabric purpose-built for workload-driven performance and scale. It is an integrated component of HPE Composable Rack.

HPE Composable Rack is managed using a combination of HPE OneView and HPE Composable Fabric Manager.

HPE Composable Rack can include up to six redundant pairs of HPE Fabric Module (FM) 3180 Rack connectivity modules (also called HPE Composable Fabric modules). Each pair can support up to 40 connected HPE ProLiant DL/DX Gen10 servers, thus offering a maximum of 240 servers.

The HPE Passive Optical Module FM 1006 is required for configurations with more than one redundant pair of HPE FM 3180 rack connectivity modules.

Solution components

The VCF on HPE Composable Rack solution is tested with the following hardware and software components. For additional component details, see the VCF 3.9 release notice, https://docs.vmware.com/en/VMware-Cloud-Foundation/3.9/rn/VMware-Cloud-Foundation-39-Release-Notes.html.

Software

The following softwares was configured for testing the HPE Composable Rack solution.

Table 1. HPE VCF firmware and software matrix

Component	Version
HPE OneView	5.00.01-0392358
HPE Composable Fabric Manager	5.1.1-135
HPE ProLiant SPP Bundle Note: All the other components firmware versions are based on the ProLiant SPP version	2019.09.0 (P19473_001_spp-2019.09.0-SPP2019090.2019_0905.39.iso)
VMware vRO Appliance	8.0.1
VMware Cloud Foundation	3.9 (Click for VCF 3.9 BOM)
VMware ESXi™ Server	6.7 Update 3 (Build: 14320388)
HPE OneView for VMware vRealize orchestrator	1.3.0.79
HPE OV4vRO plugin	1.2.1

Hardware

The following hardware components was used for testing HPE Composable Rack solution.

For additional details on vSAN Ready Nodes, refer VMware Compatibility Guide (VCG) for vSAN and for Cloud Foundation VMware Cloud Foundation Planning and Preparation Guide.

Table 2. HPE Composable Rack hardware components

Components	Description
HPE ProLiant DL 360 Gen10 x 4 (Management domain node)	2x Intel Xeon Gold 5118 CPU @ 2.30 Ghz, 12/12 cores 384 GB RAM HPE Eth 10/25 gb 2p 631flr-sfp28 adapter HPE Smart array controller p408i-a sr Gen10 HPE Smart array E208i-p SR Gen10 HPE 8 GB MicroSD USB kit 400 GB x 4 SSD drive for vSAN
HPE ProLiant DL 380 Gen10 x 4 (Workload domain node)	2x Intel Xeon Silver 4114 CPU @ 2.20 Ghz, 10/10 cores 128 GB RAM HPE Eth 10/25 Gb 2p 640flr-sfp28 adapter HPE Smart array controller p408i-a sr Gen10 HPE 12G SAS Expander Card HPE 8 GB MicroSD USB kit 1.92 TB x 10 SSD drive for vSAN

Components	Description
Network Components	HPE Eth 10/25Gb 2 P 631FLR-SFP28 Embedded ALOM HPE Ethernet 1Gb 4-port 331i Adapter Embedded LOM
Smart Array Controller	HPE Smart Array P408i-a SR Gen10 Embedded RAID HPE Smart Array E208i-p SR Gen10 PCI-E
Disks	2 x 400 GB SAS SSD Boot Vol

Deployment of VCF on HPE Composable Rack

HPE Composable Rack with VCF is an open, composable hybrid cloud platform that combines the unique capabilities of composability rack-scale environment. It enables IT to deploy new apps and workloads faster, automate operations, and spend less time on management with a secure and cost-effective approach. A fully compliant VCF solution on HPE ProLiant Gen10 servers with any published vSAN Ready Node configurations, delivers all the benefits of infrastructure composability supporting VMware software-defined infrastructure.

Figure 4 describes the workflow of VCF deployment on HPE Composable Rack.

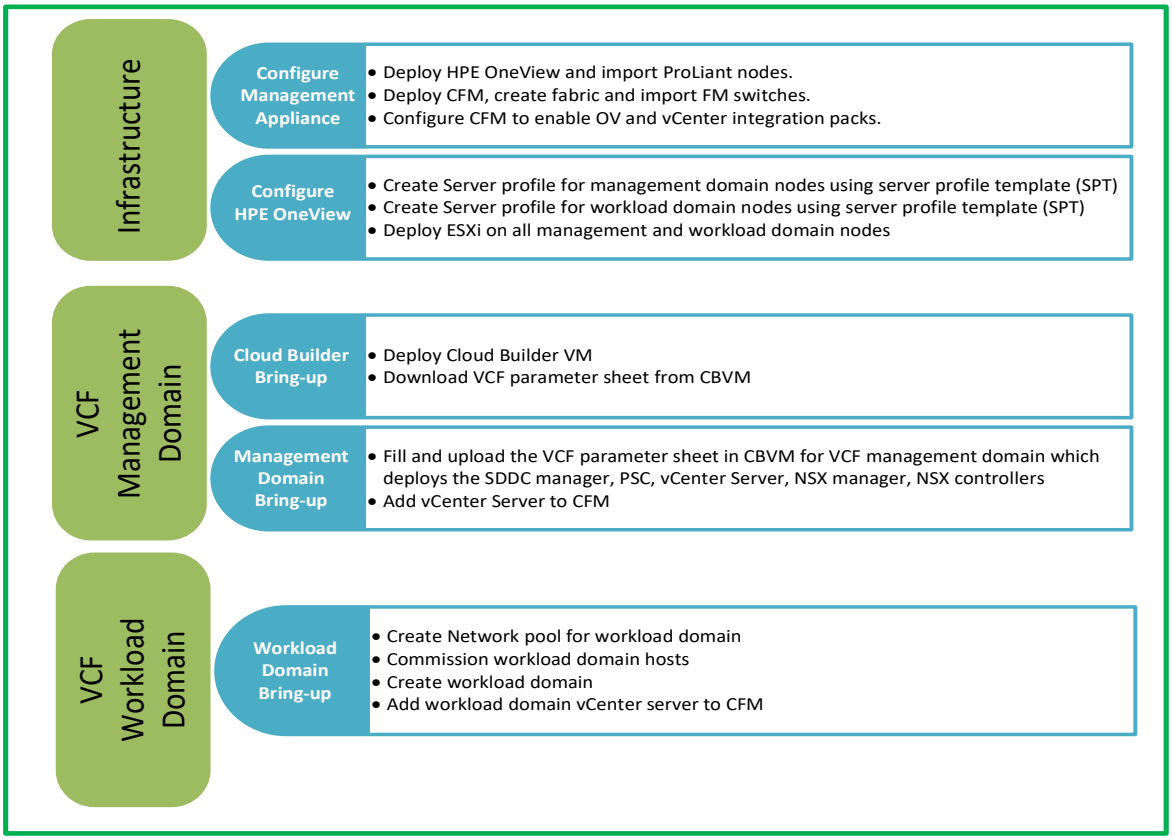


Figure 4. VCF deployment workflow on HPE Composable Rack

HPE OneView deployment

HPE OneView is the foundation of software-defined infrastructure. HPE OneView is designed in a way convenient for the people to work and it simplifies today's complex hybrid IT infrastructure. Through software-defined intelligence, HPE OneView takes a template-driven approach for deploying, provisioning, updating, and integrating compute, storage, and networking infrastructure.

HPE OneView is designed with modern standards-based API and help users to develop applications faster through integrations with a broad ecosystem of third-party management services and tools. HPE OneView supports HPE broad portfolio of servers, storage, and networking solutions, ensuring the simple and automated management of today's hybrid infrastructure and for the future. In addition, HPE OneView integration with a wide selection of partner cloud tools lets the business to manage better from their core to private cloud workloads.

The following are the steps to deploy HPE OneView appliance software.

1. Download the HPE OneView appliance software from OneView portal.
2. Login to the local environment vCenter Server and follow the VM deployment wizards using "Deploy OVF Template" option as shown in Figure 5.

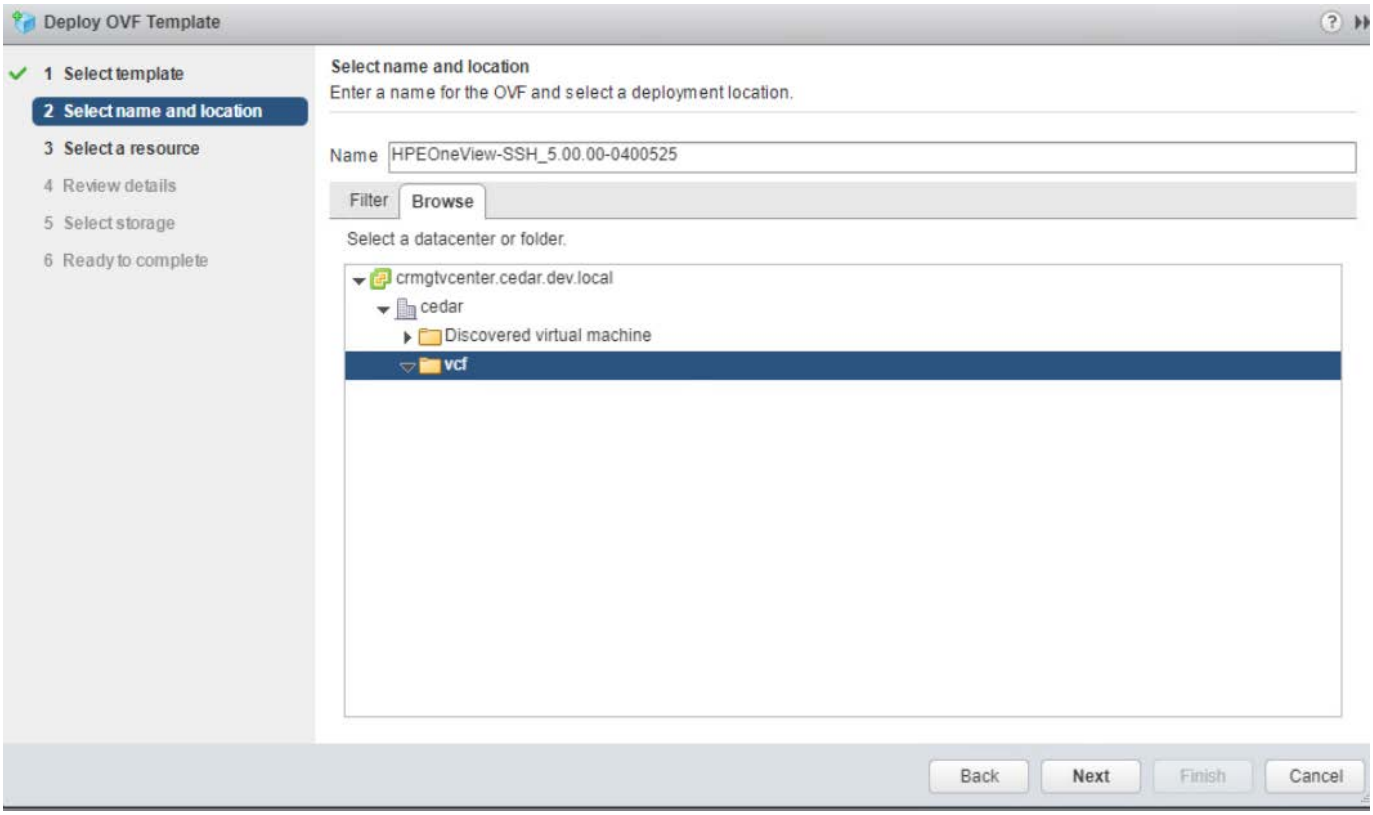


Figure 5. HPE OneView OVA deployment

3. Select the appropriate VCF management network, static IP assignment option and set the IP address for HPE OneView deployment as shown in Figure 6.

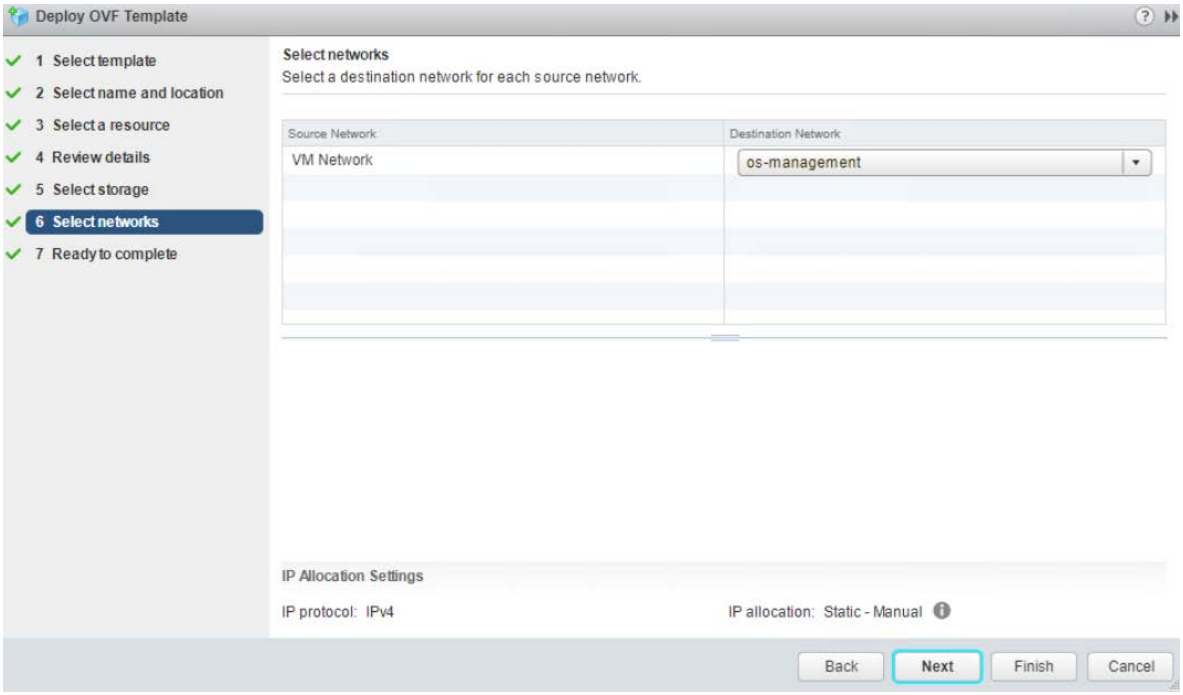


Figure 6. HPE OneView Management Network selection

4. Once the HPE OneView appliance deployment wizard completed, review the appliance configuration details and click finish as shown in Figure 7.

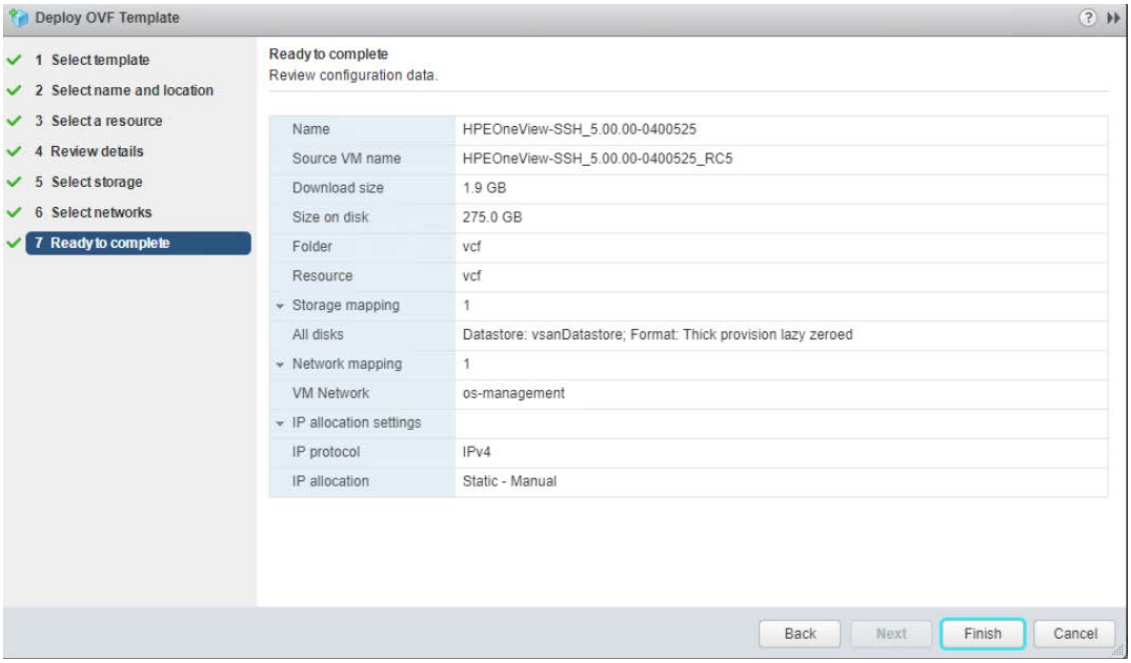


Figure 7. HPE OneView appliance deployment complete

5. Once the HPE OneView appliance deployment completed, launch the HPE OneView appliance VM console from the local vCenter server and set the IP address to access from the local environment.
6. Once the HPE OneView appliance installation completed, it powers on automatically, open the HPE OneView URL in a web browser and enter username as **Administrator**, password as **Admin** and verify the HPE OneView UI opens successfully.

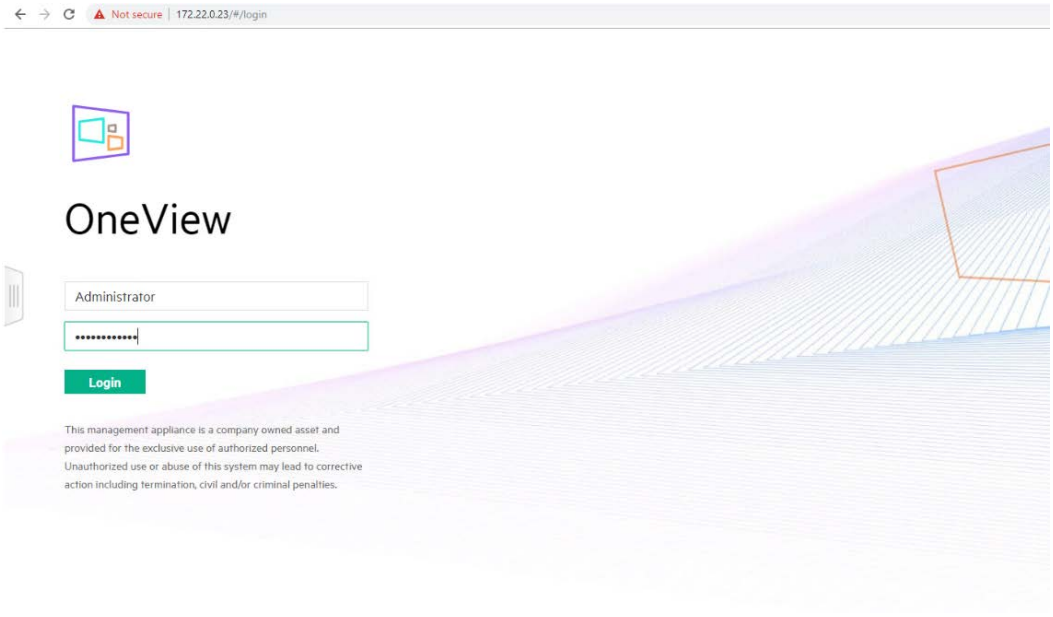


Figure 8. HPE OneView first time login

7. Once the HPE OneView UI opens successfully, add all the management domain and workload domain HPE ProLiant servers using HPE iLO credentials on HPE OneView as shown in Figure 9.

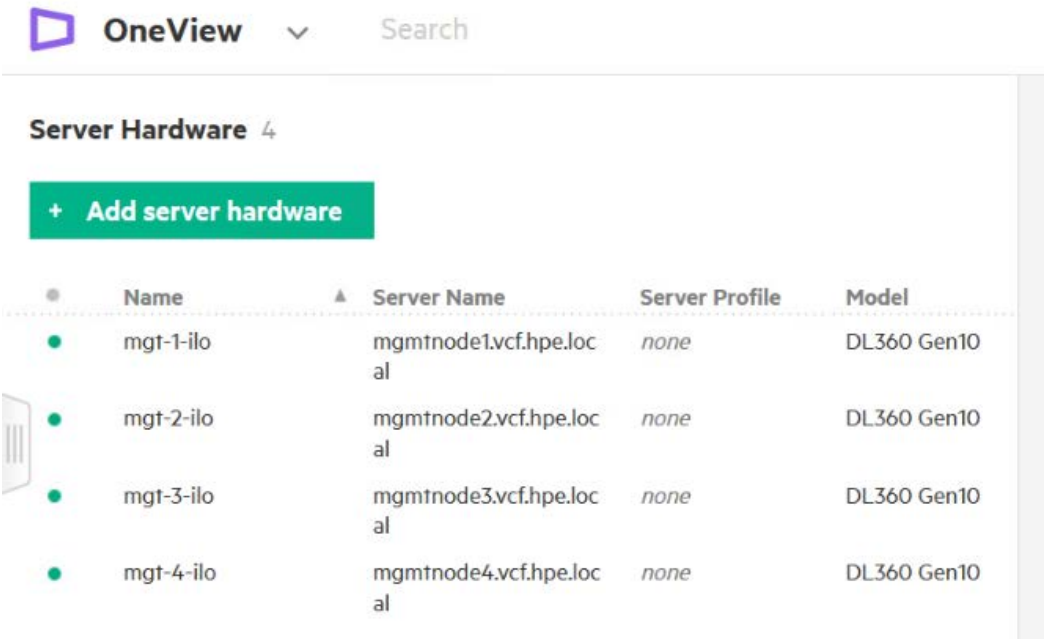


Figure 9. Adding HPE ProLiant servers on HPE OneView

HPE Composable Fabric Manager deployment

HPE Composable Fabric, an integrated component of HPE Composable Rack, delivers a software-defined networking fabric purpose-built for workload-driven performance and scale. HPE Composable Rack is managed using a combination of HPE OneView and HPE Composable Fabric Manager.

HPE Composable Rack can include up to six redundant pairs of HPE Fabric Module (FM) 3180 connectivity modules (also called HPE Composable Fabric modules). Each pair can support up to 40 connected HPE ProLiant DL Gen10 servers, thus offering a maximum of 240 servers.

The HPE Passive Optical Module FM 1006 is required for configurations with more than one redundant pair of HPE FM 3180 rack connectivity modules.

Download the HPE Composable Fabric Manager (CFM) appliance software from Composable Fabric Manager portal. Login to the local environment vCenter Server and follow the VM deployment wizards using “Deploy OVF Template” option further. The following are the steps to deploy HPE Composable Fabric Manager software.

1. Download the HPE Composable Fabric Manager (CFM) appliance software from Composable Fabric Manager portal.
2. Login to the local environment vCenter Server and follow the VM deployment wizards using “Deploy OVF Template” option as shown in Figure 10.

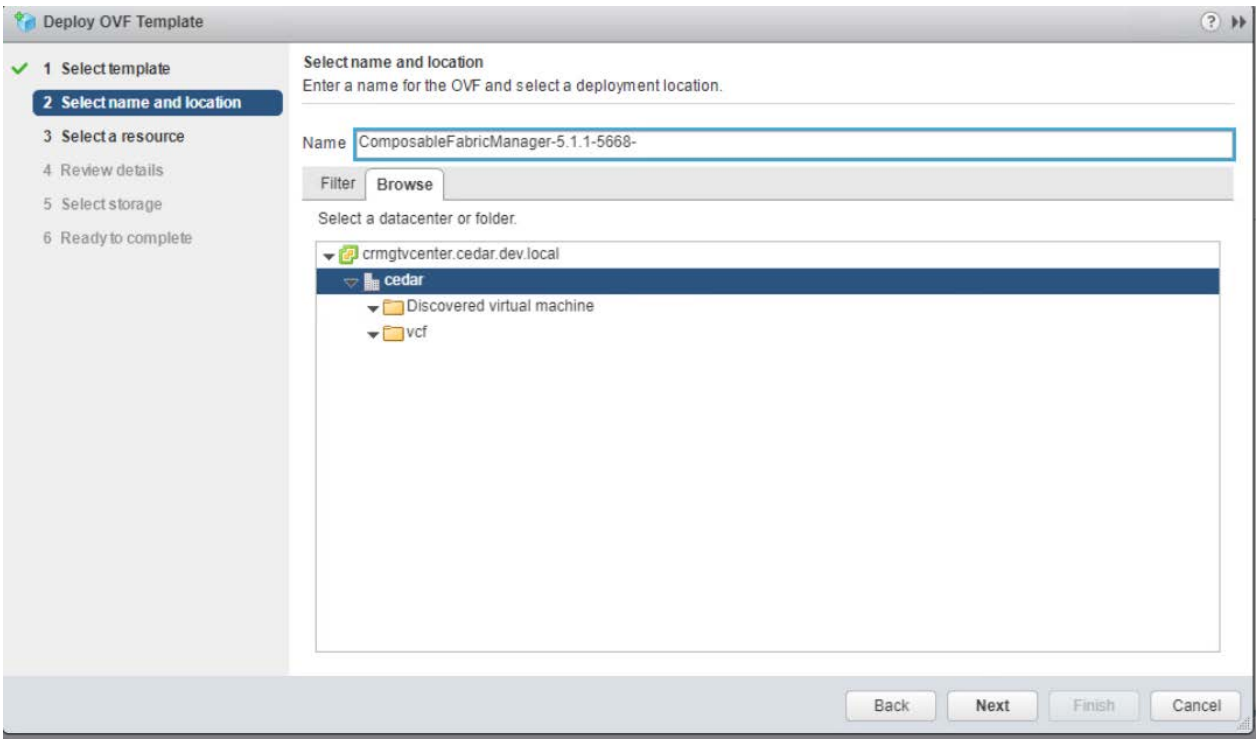


Figure 10. HPE Composable Fabric Manager deployment

3. Once the VCF management network is selected in the networks option, go to customize template option and fill the necessary appliance deployment parameter details as shown in Figure 11.

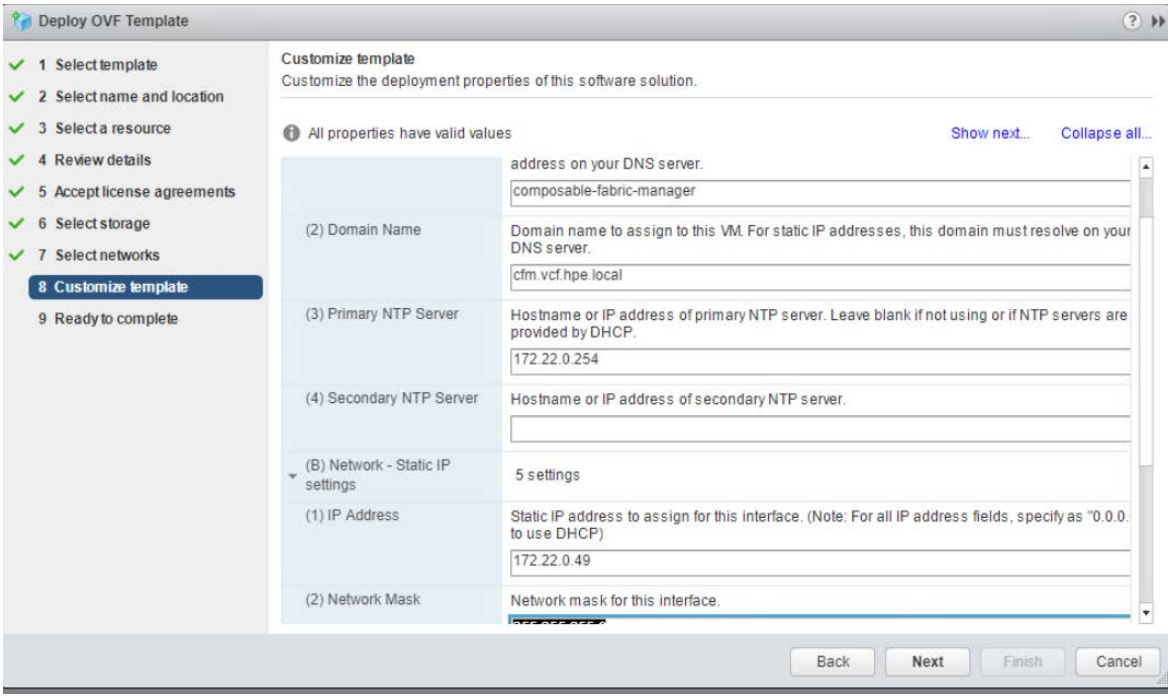


Figure 11. HPE CFM template customization

4. Once the template customization is completed, verify the configuration details in the ready to complete wizard and complete the deployment as shown in Figure 12.

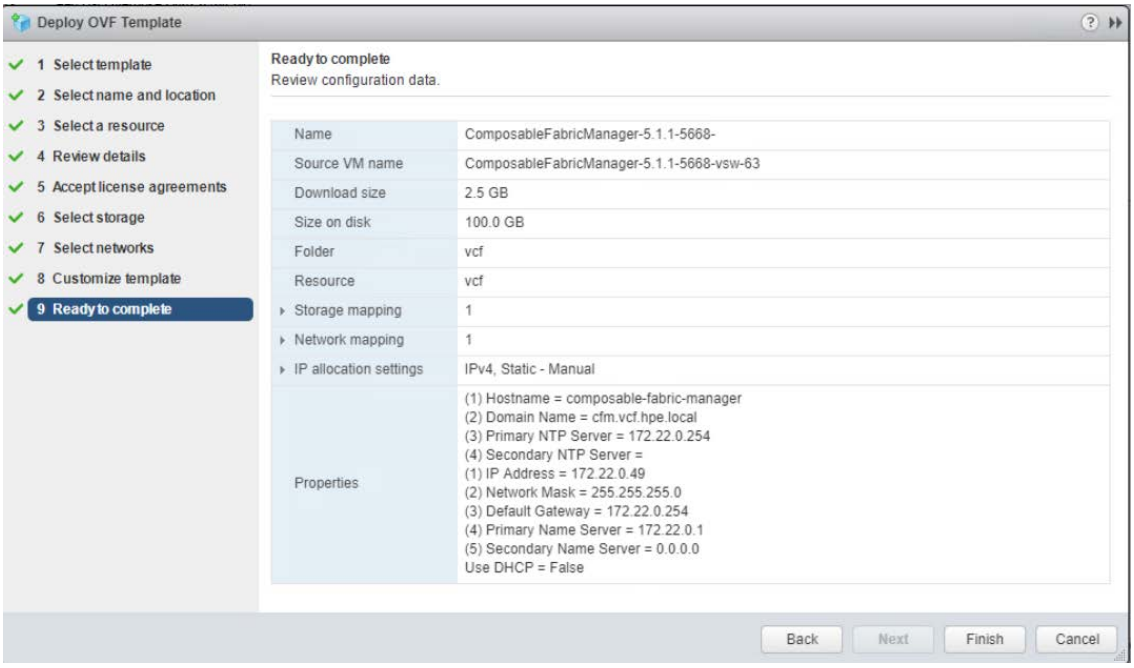


Figure 12. Finish the CFM deployment

5. Once the HPE CFM appliance installation is completed, power on the CFM VM and open the URL in a web browser, and enter username as **Administrator**, password as **plexxi** and verify the HPE Composable Fabric Manager UI opens successfully as shown in Figure 13.

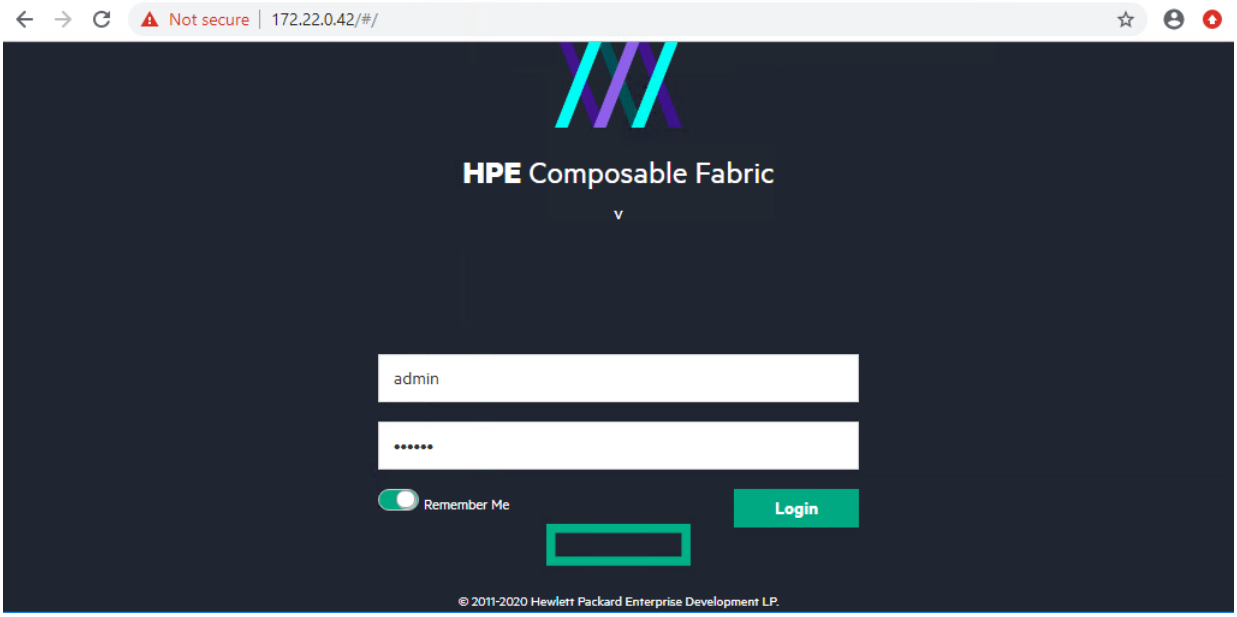


Figure 13. HPE Composable Fabric Manager first time login

6. Once HPE Composable Fabric Manager UI opens successfully, configure the Link Aggregation Group (LAG) for the external uplinks.
7. Once the LAG is configured, add both the composable fabric switches into CFM as shown in Figure 14.

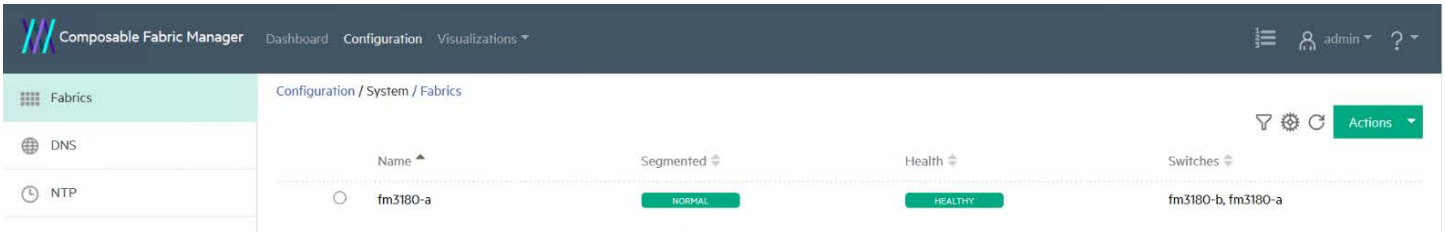


Figure 14. HPE Composable Fabric Switch adding in CFM

Note

If the Link Aggregation Group (LAG) is not configured for external uplinks, VCF network will not reach from outside the solution. You need to manually configure LAG in such scenarios.

8. Once the Composable Fabric Switches are added, HPE OneView needs to be on-boarded into CFM as shown in Figure 15.

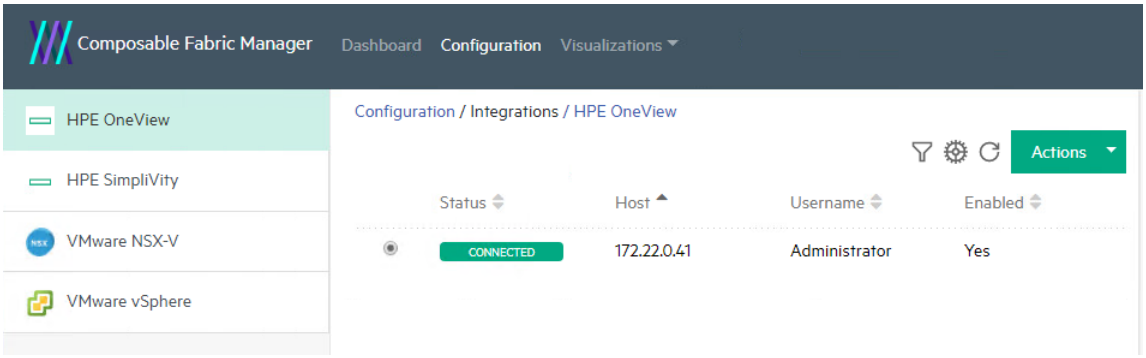


Figure 15. CFM configuration on HPE OneView

For more information about HPE Composable Fabric Manager, refer HPE Composable Fabric Manager Installation and Upgrade Guide

9. Once the HPE OneView integrated with CFM, the Logical Switch Group to be created for the Rack Connectivity Module and total number of switches are automatically detected as shown in Figure 16.

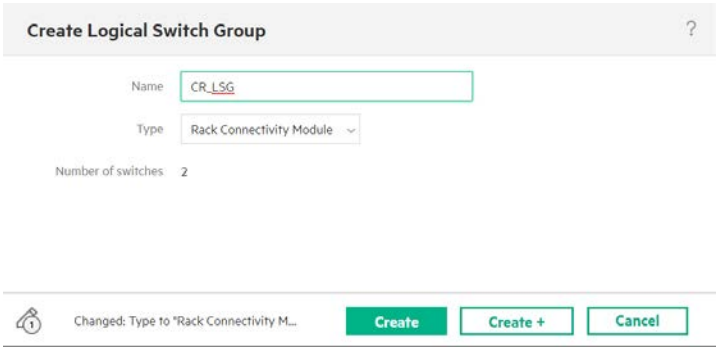


Figure 16. Logical switch group creation on HPE OneView

10. Once the logical switch group is created, the two FM switches to be created out of logical switch group as shown in Figure 17.

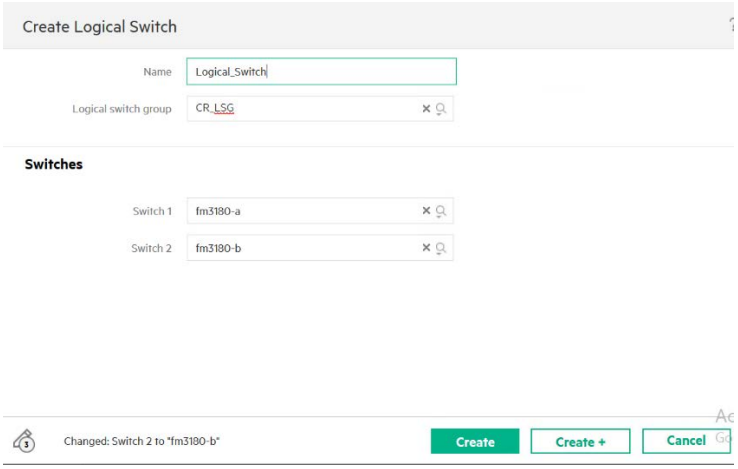


Figure 17. Logical switch creation on HPE OneView

Network and server profile template configuration

The HPE Composable Fabric Manager and HPE OneView configured. The network, network sets, server profile template (SPT) and server profile (SP) to be created as per the VCF deployment.

Network and network sets should be planned and created in HPE OneView as per VCF for management domain and workload domain. The steps include:

For more information about the VCF network requirement, refer VMware Cloud Foundation Planning and Preparation Guide.

1. Create VCF networks with VLAN ID for management domain and workload domain as shown in Figure 18.

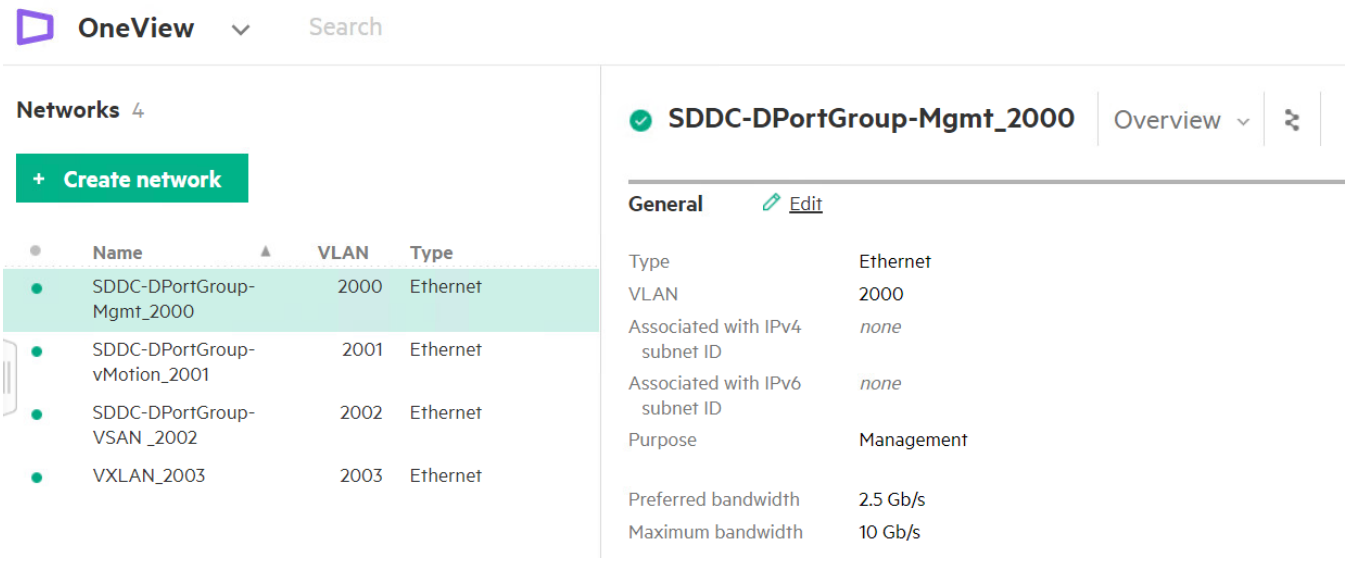


Figure 18. VCF network creation

2. Once the networks are created, create network sets as shown in Figure 19.

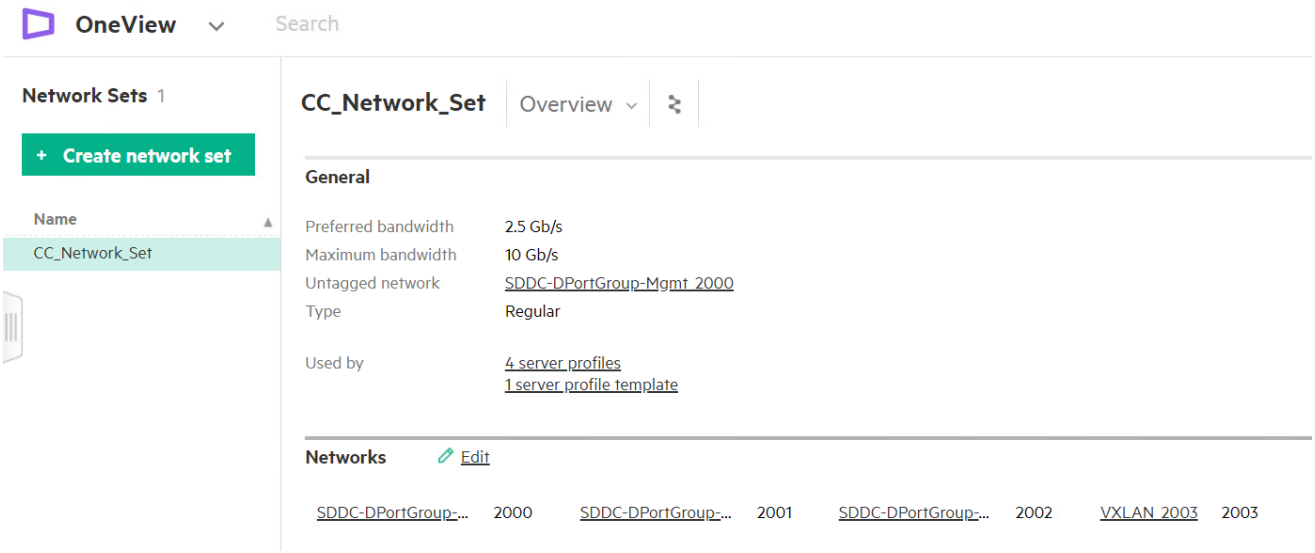


Figure 19. VCF network sets creation

3. Once the network sets are created, create a server profile template (SPT) and add the two network connections with VCF network sets as shown in Figure 20.

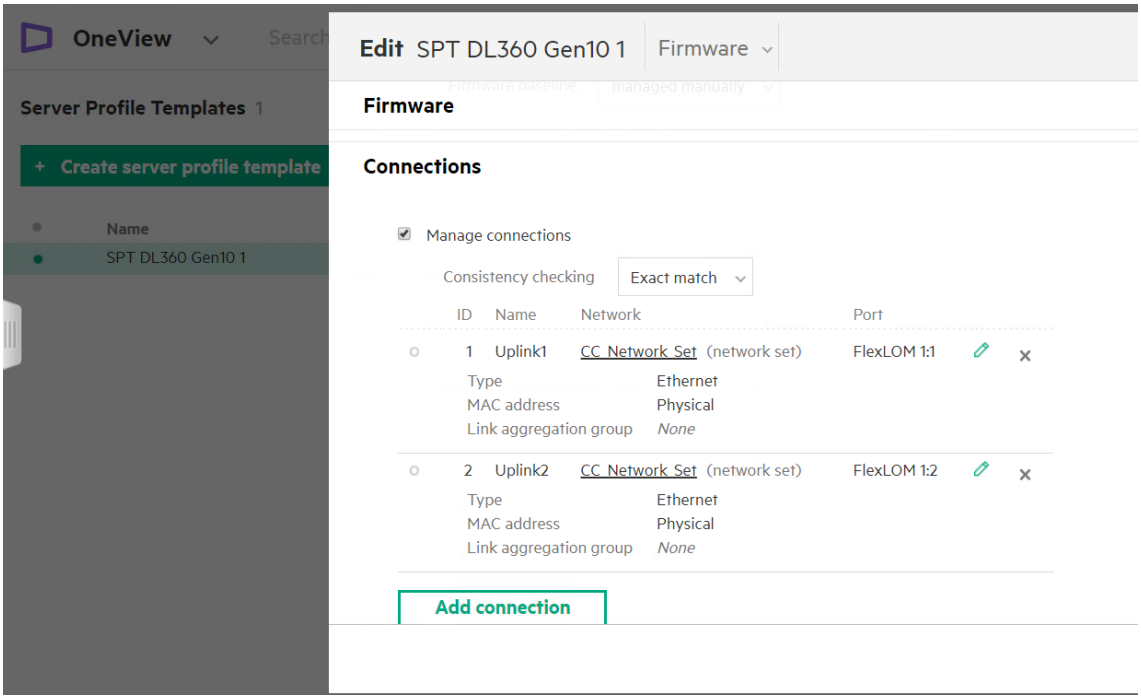


Figure 20. Server profile template creation

4. Once the server profile template is created, create server profiles for VCF management domain and workload domain nodes as shown in Figure 21.

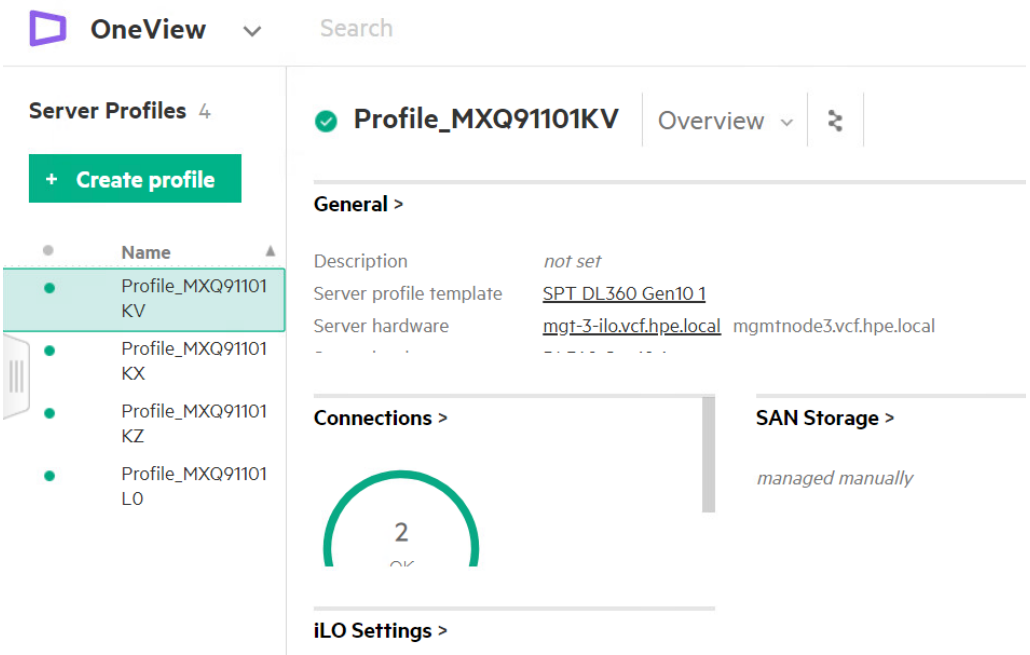


Figure 21. Server profile creation

5. Once all the server profiles are created for VCF management domain and workload domain, HPE OneView push the network configuration to CFM and creates all the VLAN's and VLAN groups on both FM switches as shown in Figure 22.

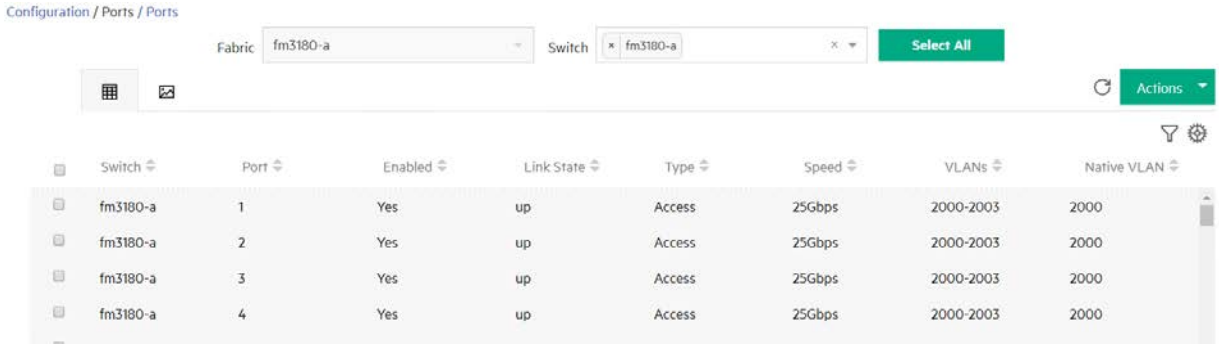


Figure 22. VLAN creation on FM switches

VMware Cloud builder VM (CBVM) deployment

The Cloud Foundation Builder VM is a one-time use VM which deploys and configures the VCF management domain and transfers inventory and control to SDDC Manager. During the VCF deployment process, the Cloud Foundation Builder VM validates network information provided in the deployment parameter spreadsheet. After the management domain is up and the SDDC Manager is running, the Cloud Foundation Builder VM must be powered off and archived.

The following are the steps to deploy VMware Cloud builder.

1. Download the Cloud Builder VM to the local environment vCenter Server and follow the VM deployment wizards using "Deploy OVF Template" option as shown in Figure 23.

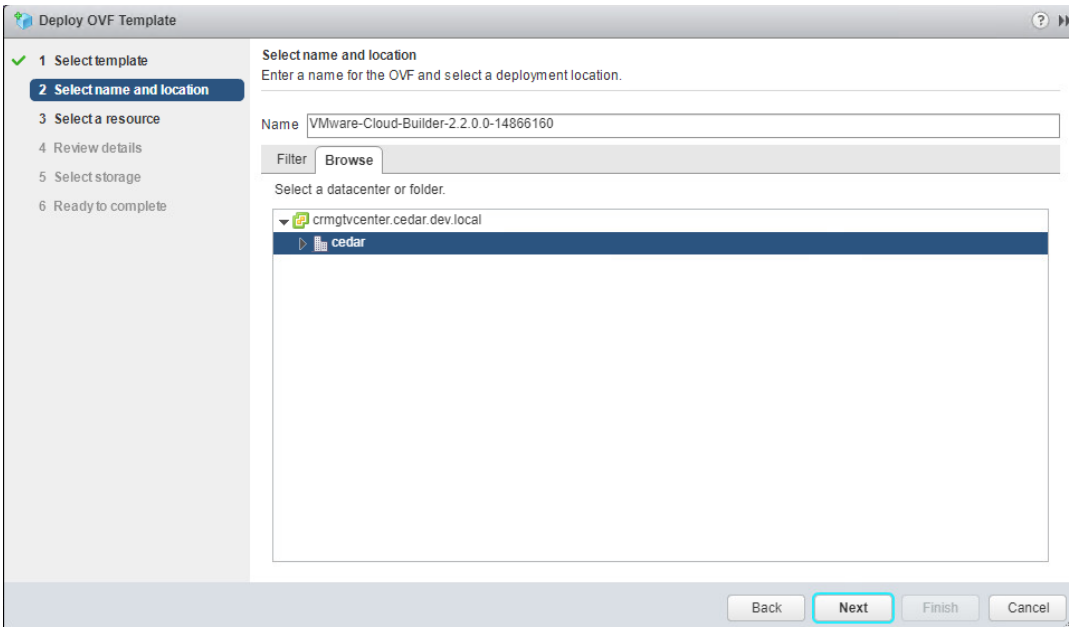


Figure 23. VMware Cloud builder deployment

2. Once the VCF management network selected in the networks option, go to customize template option and fill the necessary appliance deployment parameter details as shown in Figure 24 and Figure 25.

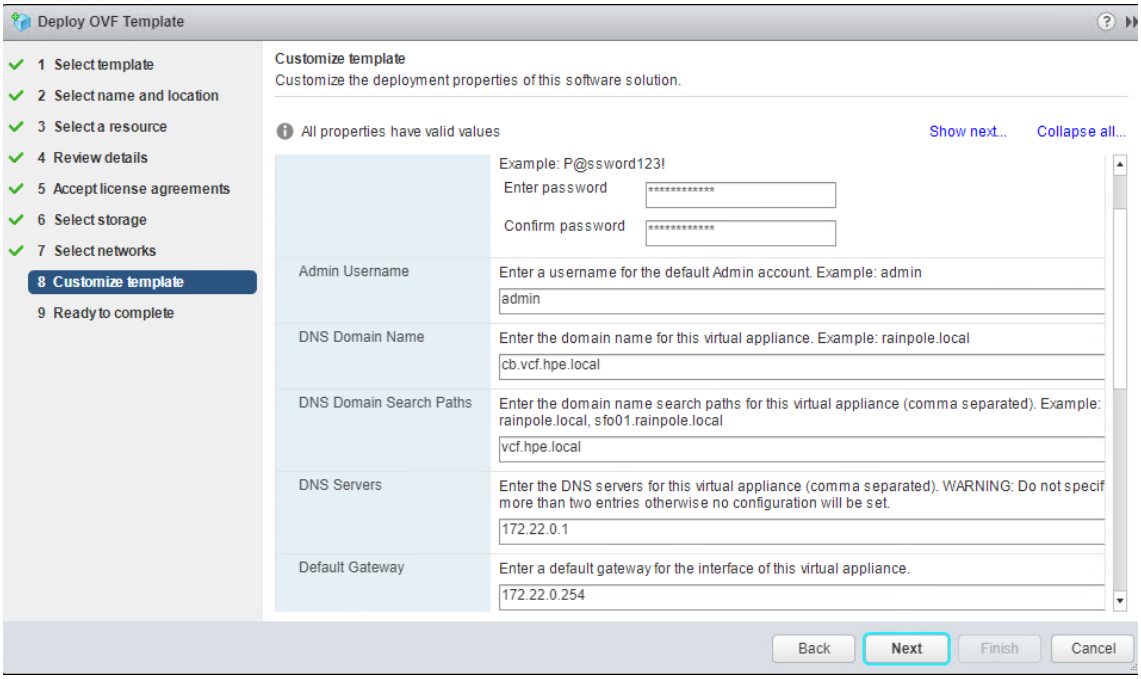


Figure 24. VMWare CBVM customize template details

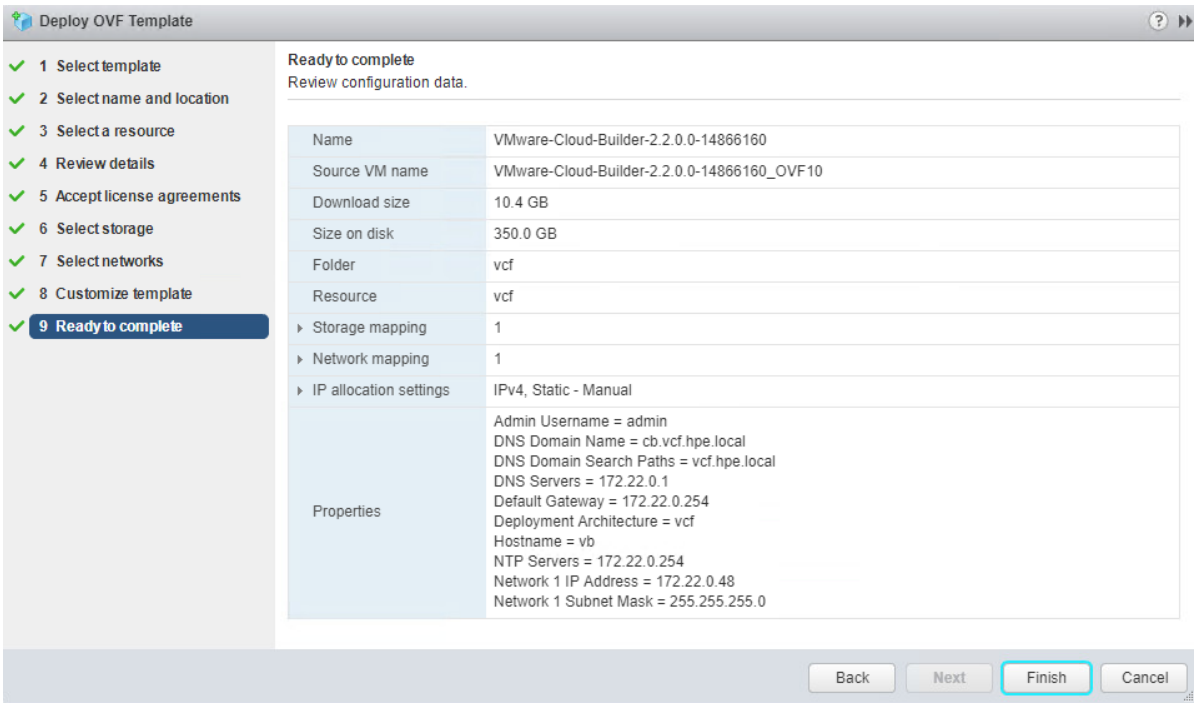


Figure 25. Complete the VMware CBVM deployment

3. Once the Cloud Builder VM deployed, power on the CBVM and open the URL in a web browser and verify the CBVM UI opens successfully.

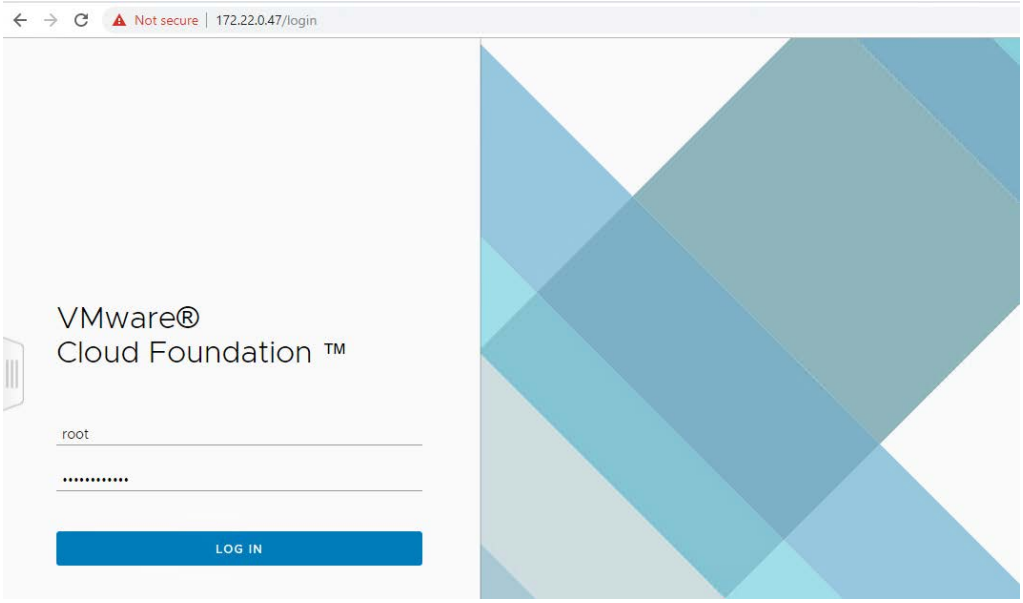


Figure 26. VMware CBVM login screen

For more information about VMware Cloud Builder VM, refer Deploy Cloud Foundation Builder VM section.

VCF Management Domain deployment

The management domain is a special purpose workload domain dedicated to infrastructure and management tasks.

During bring-up, the management domain is automatically created on four nodes vSAN cluster on the first rack in a Cloud Foundation system. It contains the following management components:

- SDDC Manager
- vCenter Server
- vCenter Server and Platform Services Controllers
- vRealize Log Insight™
- NSX Manager™
- NSX Controllers

Figure 27 shows the components of the VCF management domain.

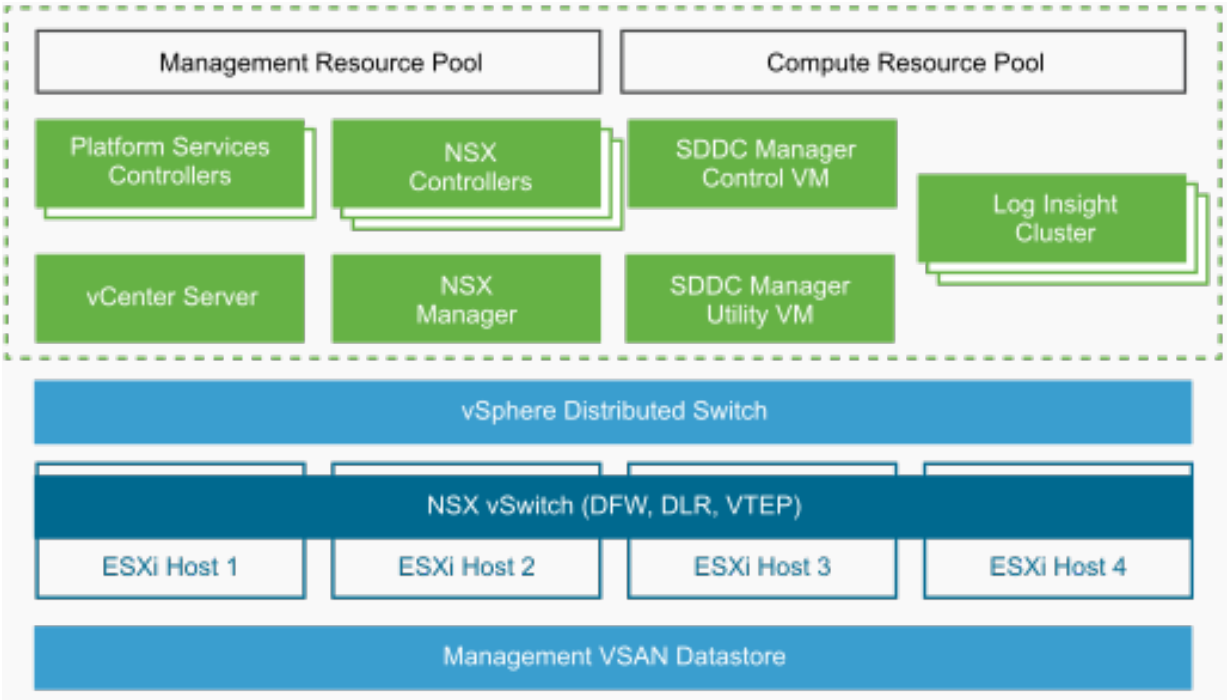


Figure 27. VCF management domain components

For more information about VMware Cloud Foundation management domain, refer VMware Cloud Foundation management domain document.

VMware SDDC Manager Bring-up process

1. Once the Cloud Builder VM deployment is completed, login to cloud builder UI page and make sure all the bring-up checklist criteria's are verified as shown in Figure 28.

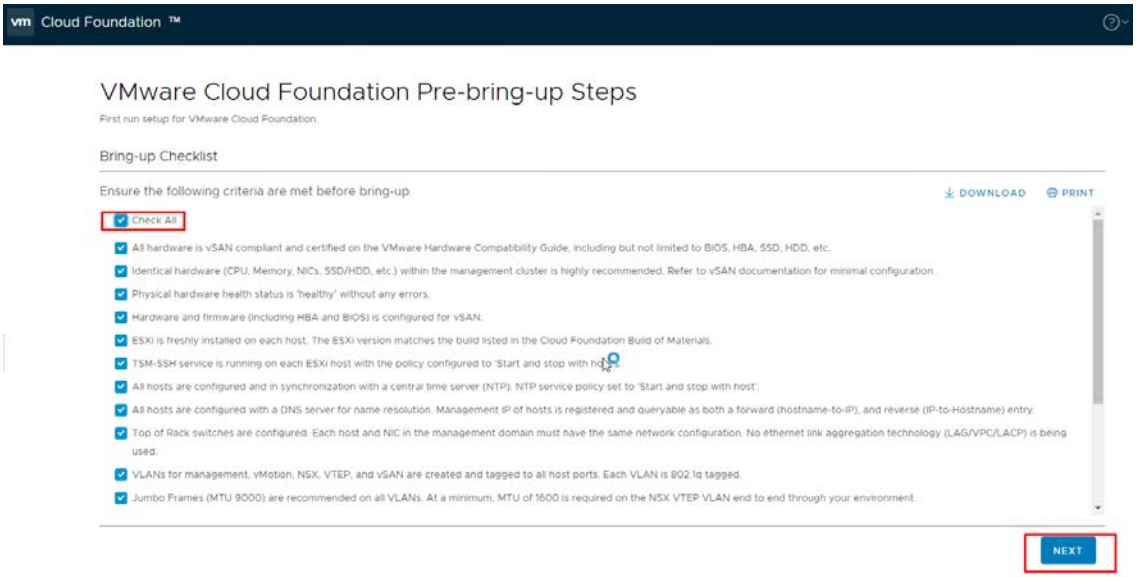


Figure 28. CBVM Bring-up checklist

2. After the VCF bring-up checklist is verified, download the bring-up parameter sheet from CBVM. Fill all the mandatory fields and upload as shown in Figure 29.

Figure 29. CBVM bring-up parameter sheet upload

3. After the VCF bring-up parameter sheet is uploaded and verified, CBVM configuration file validation process happens as shown in Figure 30.

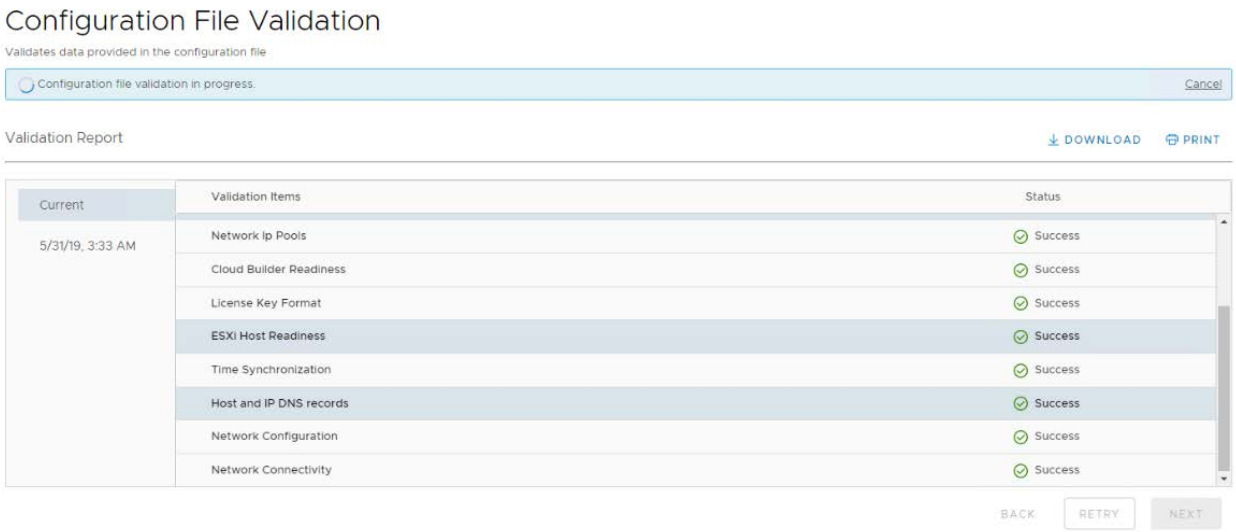


Figure 30. CBVM configuration file validation

4. Once the CBVM validation completed successfully, click **"Begin Bring-Up"** to deploy the SDDC manager bring-up. During the bring-up process, the following tasks are completed.

- VMware Platform Service Controller (PSC)

- VMware vCenter Server
- VMware vSAN
- VMware vRealize Log Insight
- VMware NSX components.

5. Once the SDDC manager bring-up process is successful, now login to SDDC manager. Click on the URL https://<SDDC_manager_fqdn>.

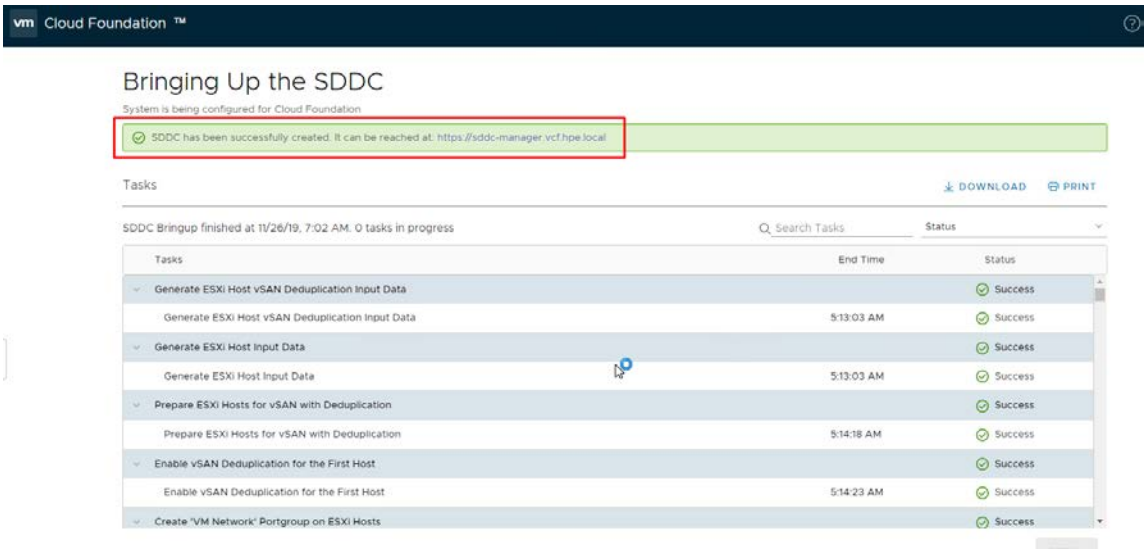


Figure 31. SDDC Manger Bring-up

6. Verify the dashboard view as shown in Figure 32.

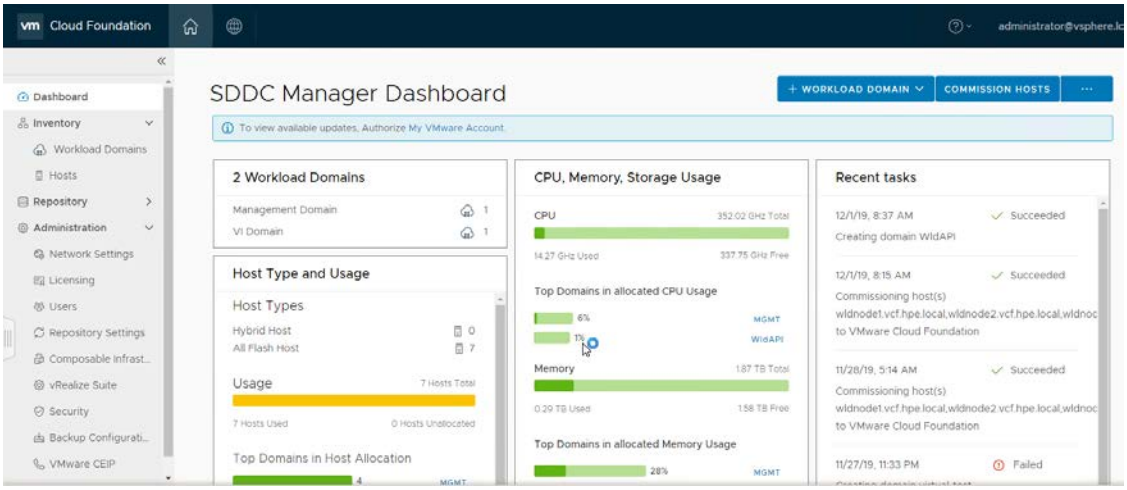


Figure 32. SDDC Manger dashboard

7. Once the management domain is deployed and SDDC manager UI opens successfully, the management domain vCenter Server needs to be added into the CFM for vSAN traffic isolation and CFM management on vCenter server using CFM vCenter server plug-in.

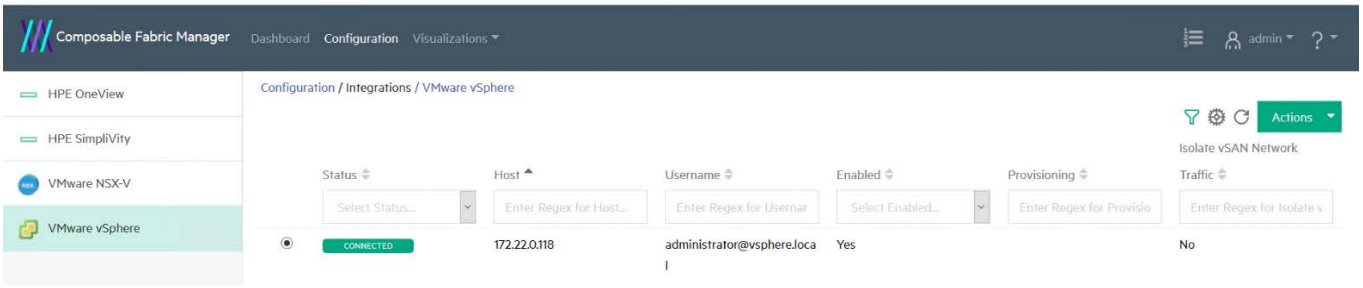


Figure 33. Management domain vCenter server integration for CFM

8. Once the management domain vCenter server is integrated into CFM, edit the VMware vSphere configuration and enable Isolate vSAN Network option as shown in Figure 34.

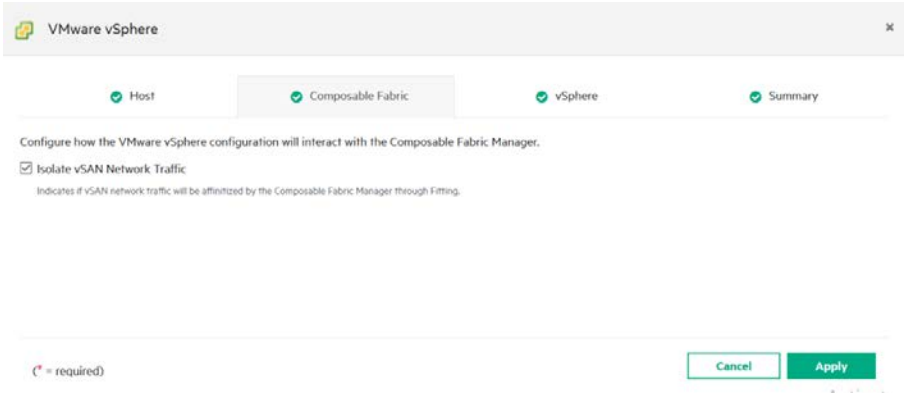


Figure 34. Isolate vSAN traffic on VMware vSphere

VCF Workload Domain deployment

The VCF workload domain can be either VI or VDI or PKS and are created on-demand by Cloud Foundation administrators. A compute workload is provisioned on a vSAN with a minimum of three hosts. Each workload domain is created according to user specified size, performance, and availability. A Cloud administrator can create one workload domain for test workloads that have balanced performance and low availability requirements, while creating a separate workload domain for production workloads requiring high availability and high-performance.

Start the VI Configuration wizard

Before starting to commission the workload domain nodes on SDDC manager, all the hosts should be deployed and configured with ESXi as per the VCF software matrix.

The following steps must be performed before workload domain creation:

1. Hosts should be deployed with ESXi as per the VCF recipe, and configuration to be done as per the VCF workload domain checklist
2. Network Pools must be configured for workload domain as shown in Figure 35.

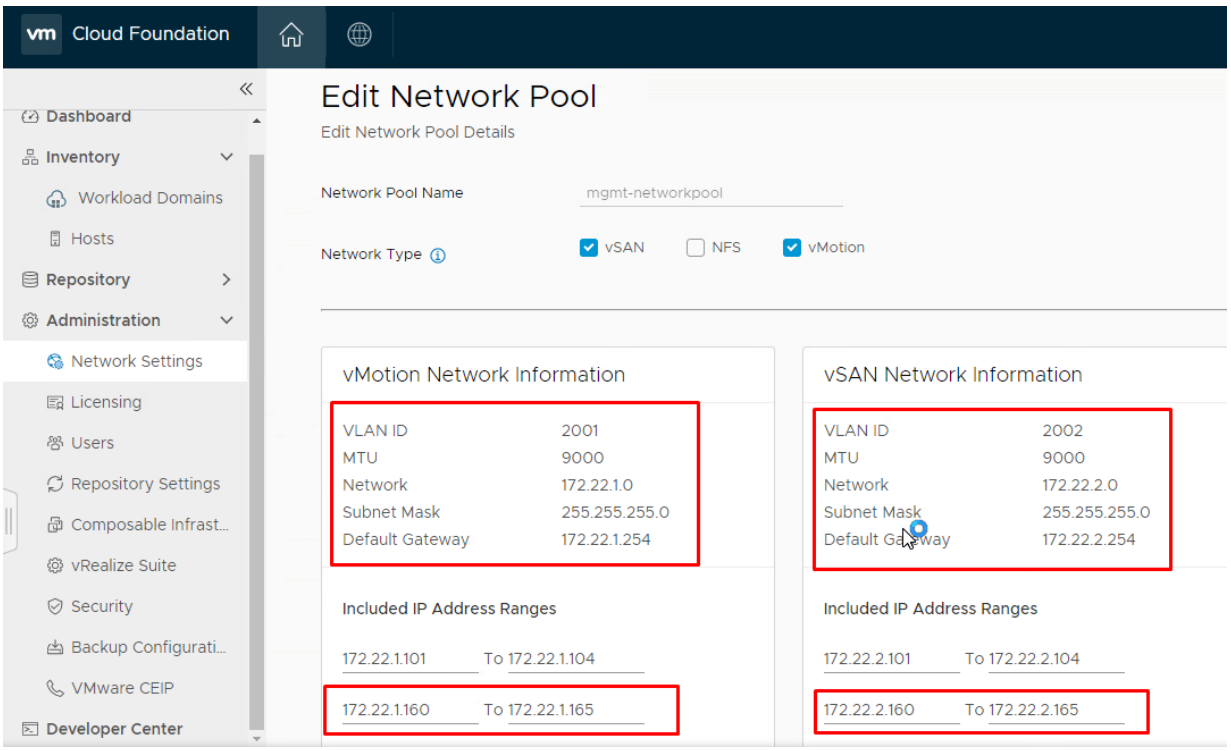


Figure 35. Workload domain network pool creation

3. ESXi hosts must be commissioned into SDDC manager. Commission all the workload domain ESXi hosts using Hosts tab in SDDC manager as shown in Figure 36.

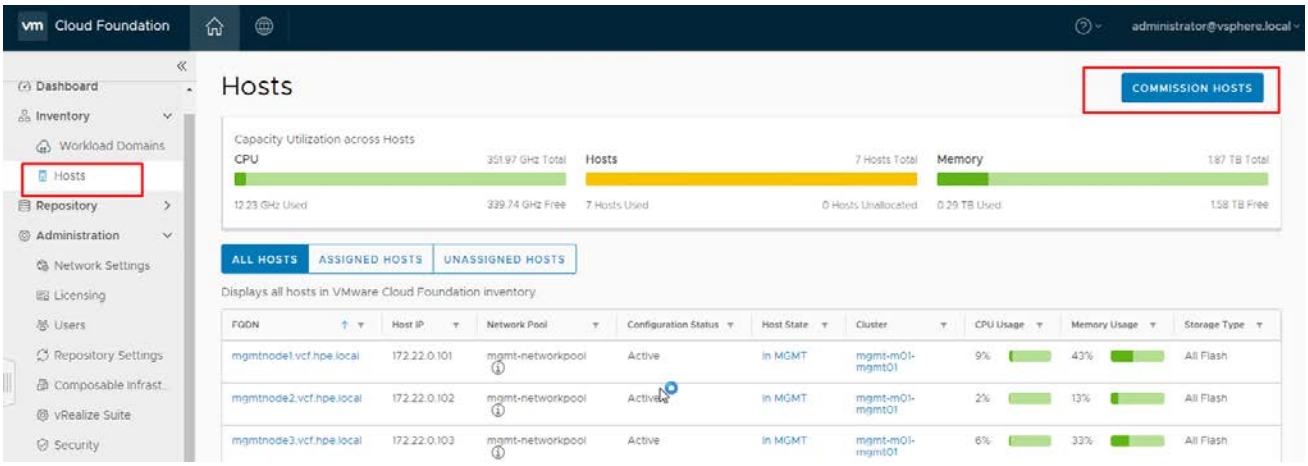


Figure 36. Commission workload domain network

4. Add and validate workload domain host details after the Host Addition and Validation window is launched as shown in Figure 37.

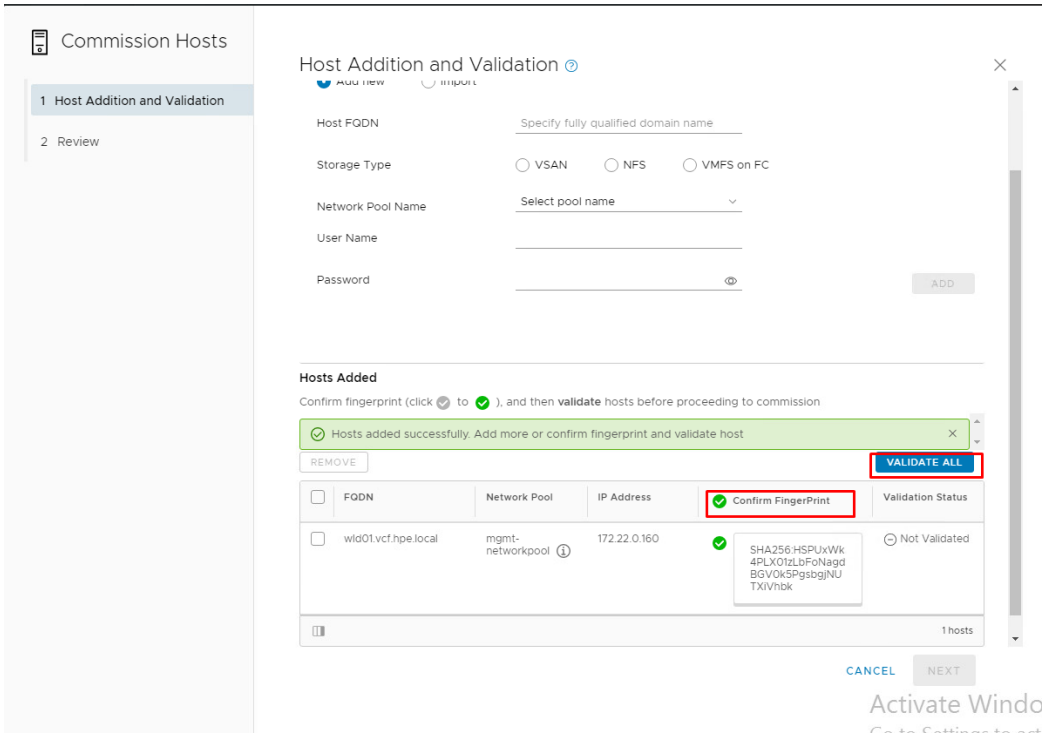
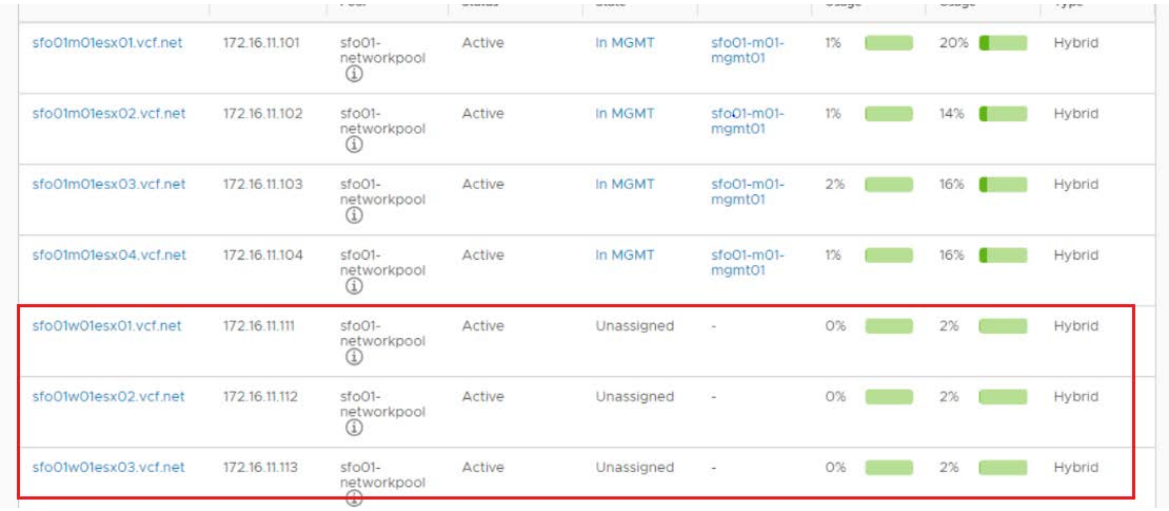


Figure 37. Add and validate workload domain

5. Once the workload domain hosts are commissioned successfully, all the hosts are available in the SDDC manager hosts list with un-assigned status as shown in Figure 38.



sfo01m01esx01.vcf.net	172.16.11.101	sfo01-networkpool	Active	In MGMT	sfo01-m01-mgmt01	1%	20%	Hybrid
sfo01m01esx02.vcf.net	172.16.11.102	sfo01-networkpool	Active	In MGMT	sfo01-m01-mgmt01	1%	14%	Hybrid
sfo01m01esx03.vcf.net	172.16.11.103	sfo01-networkpool	Active	In MGMT	sfo01-m01-mgmt01	2%	16%	Hybrid
sfo01m01esx04.vcf.net	172.16.11.104	sfo01-networkpool	Active	In MGMT	sfo01-m01-mgmt01	1%	16%	Hybrid
sfo01w01esx01.vcf.net	172.16.11.111	sfo01-networkpool	Active	Unassigned	-	0%	2%	Hybrid
sfo01w01esx02.vcf.net	172.16.11.112	sfo01-networkpool	Active	Unassigned	-	0%	2%	Hybrid
sfo01w01esx03.vcf.net	172.16.11.113	sfo01-networkpool	Active	Unassigned	-	0%	2%	Hybrid

Figure 38. Un-assigned workload domain hosts

6. Go to the workload domain tab under SDDC manager and start deploying workload VI infrastructure.
7. Select vSAN to configure workload domain and go through the workload domain deployment wizard further.

8. Once the workload domain deployment is triggered, current deployment status notification is displayed on the "**Tasks"** list in the SDDC manager.
9. Click "**View Task Status**" to view the workload domain creation tasks and sub tasks and if the deployment fails, task can be re-run after the issue is fixed.

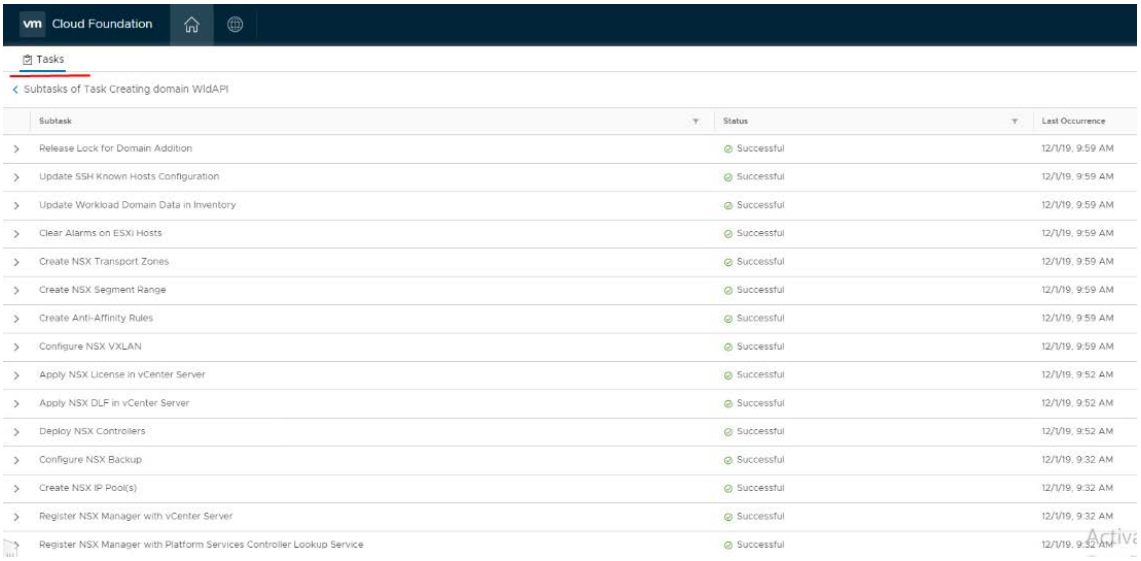


Figure 39. Workload domain deployment status

10. Once the workload domain is deployed, the workload domain vCenter Server needs to be added into the CFM for vSAN traffic isolation and CFM workload domain on vCenter server using CFM vCenter server plug-in.

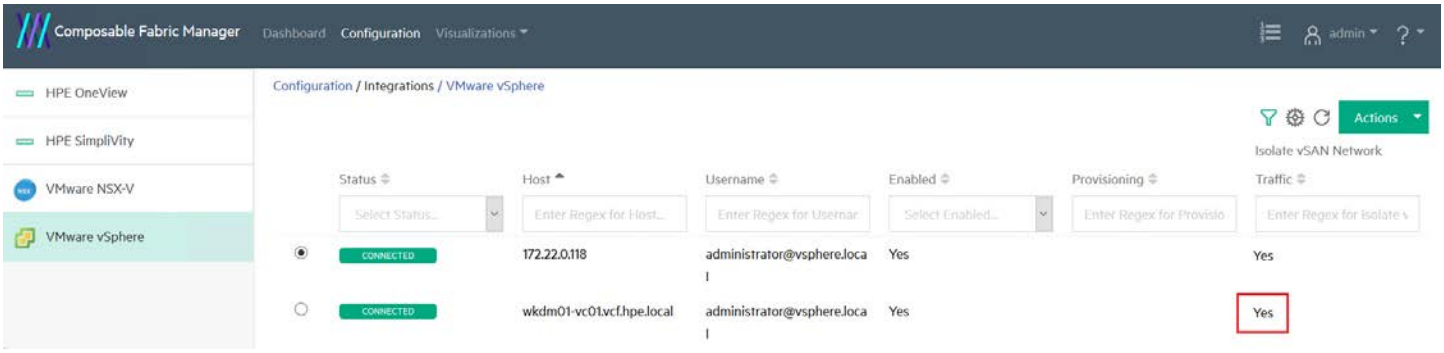


Figure 40. Workload domain vCenter server integration for CFM

Firmware update using VMware vRealize Orchestrator (vRO)

VMware vRealize Orchestrator (vRO) is a powerful automation tool designed to streamline tasks and remediation actions whilst integrating with third-party IT operations software. HPE is leveraging vRealize Orchestrator to automate and deliver firmware and driver updates for HPE servers within a VCF environment. Prior to the integration of the workflows, HPE Integrated Smart Update Tool (iSUT) should be installed on each of the VCF management and workload domain nodes.

The HPE Smart Update Tool (SUT) is a SUM extension that enables HPE OneView and HPE iLO Amplifier Pack to stage, schedule, and apply updates automatically to reduce IT operations. The SUT is an operating system (OS) utility that provides the ability to perform online firmware and/or driver updates via the HPE iLO management network without the need for ESXi hosts credentials.

HPE OneView for VMware vRealize Orchestrator (OV4vRO) plug-in installed on vRO to automate the firmware deployment for HPE ProLiant DL servers. OV4VvRO provides workflows for creating connections, management instances to HPE OneView appliances. The vRO workflows in the plug-in communicate with HPE OneView using a management instance. A management instance communicates with HPE OneView through its REST API over SSL. You can configure a management instance with a username, password, and an optional domain. All workflow processes are executed using these HPE OneView credentials.

The VCF management domain nodes and workload domain nodes firmware is updated using vRO workflow and OV4vRO plug-in.

For more information about vRO deployment, refer Installing and Configuring VMware vRealize Orchestrator guide.

Once the vRealize Orchestrator is deployed successfully, open the vRO UI URL and confirm.

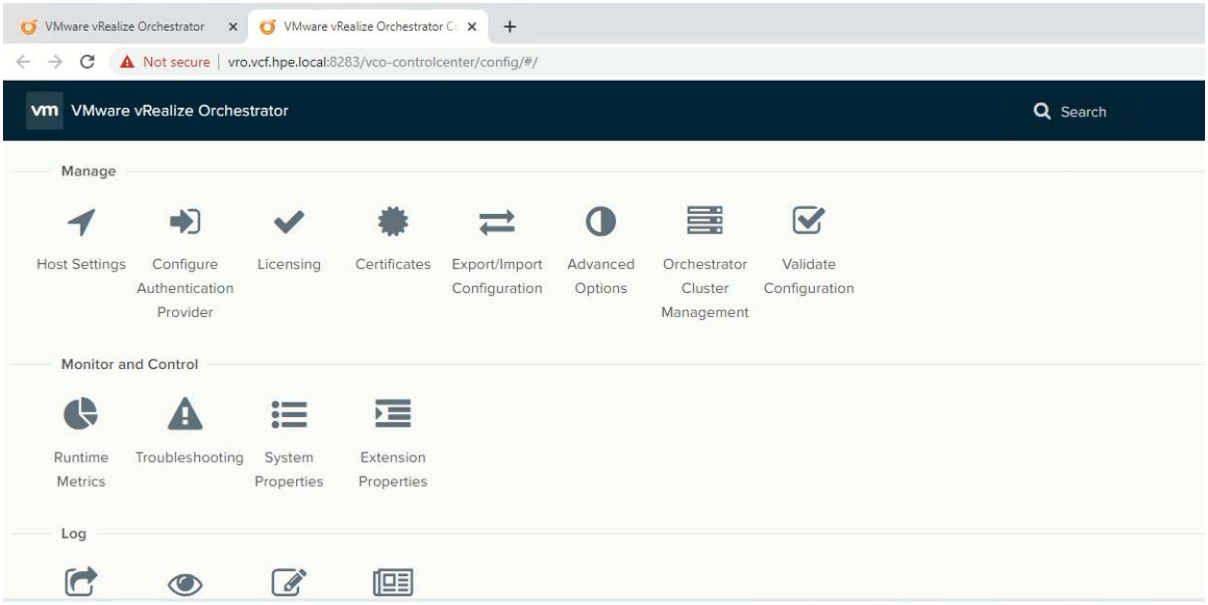


Figure 41. VMware vRO dashboard

Now HPE OneView plug-in for vRO needs to be installed on vRO, the OV4VRO can be downloaded from HPE software depot and needs to be uploaded to vRO as shown in Figure 42.

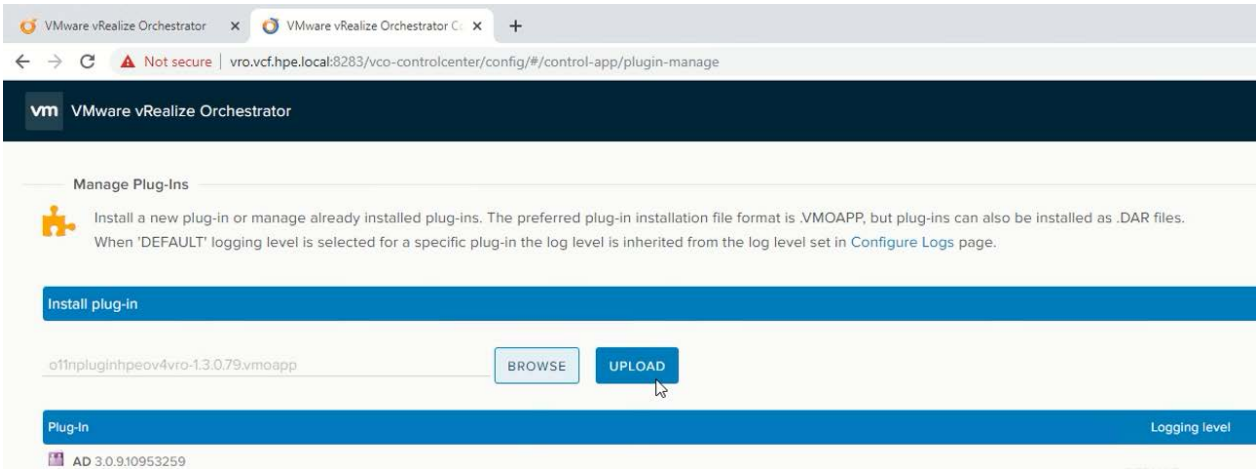


Figure 42. HPE OneView plug-in upload

Configure the vRO clients for the workflows

1. To Configure vRO client go to Configuration **->** Add HPE OneView Management Instance and then Click Start Workflow icon. Enter HPE OneView details to connect to the HPE OneView to vRO as shown in Figure 43.

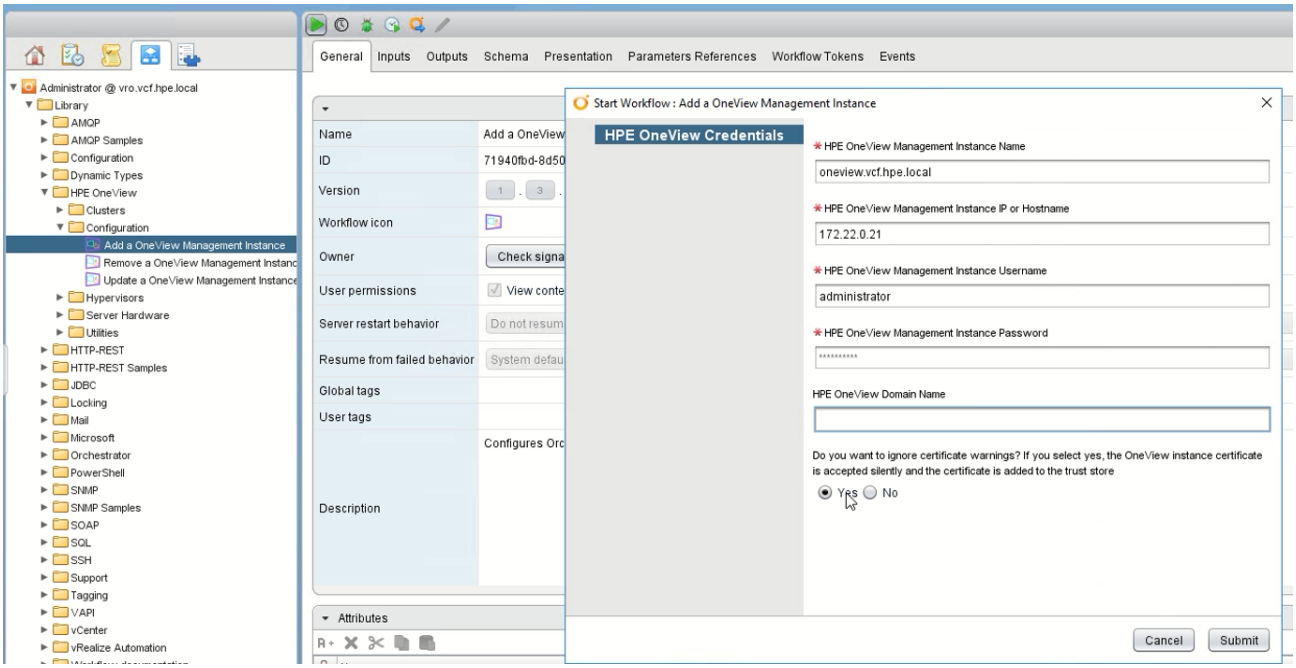


Figure 43. HPE OneView configuration

2. Once the HPE OneView configuration is completed on vRO configuration tab, add the VCF workload domain vCenter server for firmware updates using vRO workflow as shown in Figure 44.

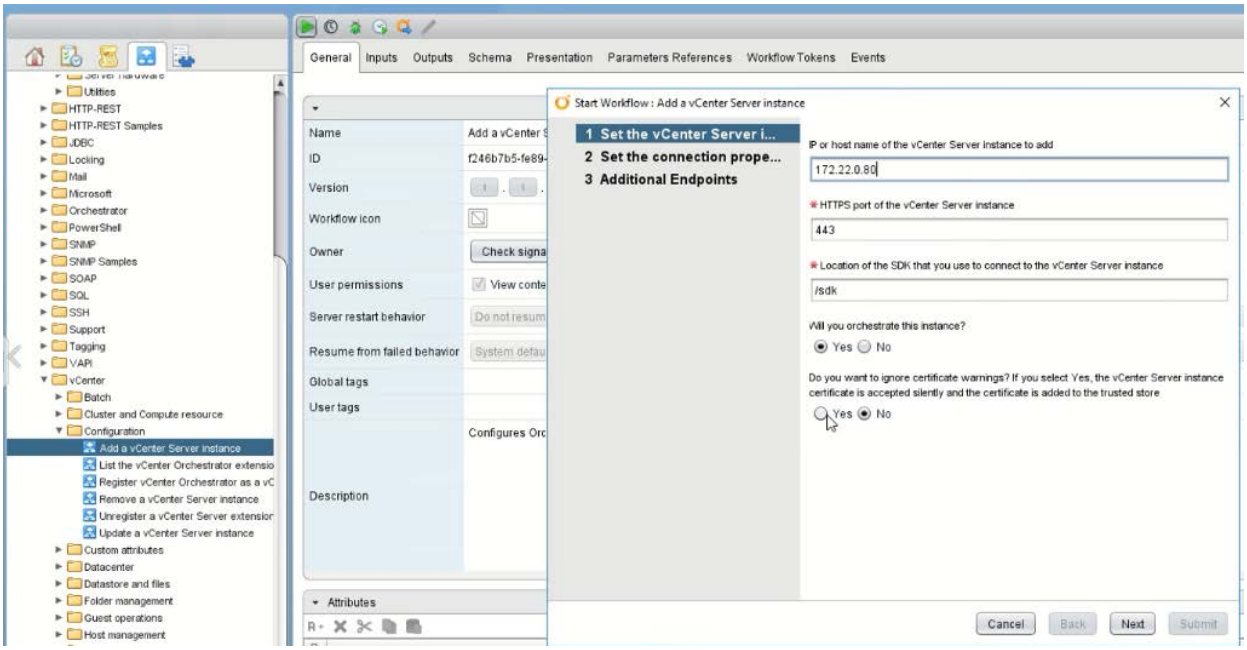


Figure 44. Workload domain vCenter server configuration

3. Navigate to HPE OneView **->** Clusters **->** Update Cluster Firmware. Click Start Workflows and select the vCenter cluster on which the HPE ProLiant DL host firmware would be upgraded.
4. The update version of the SPP to be uploaded to HPE OneView as per the HPE VCF firmware and software matrix section mentioned, then create a vRO workflow with uploaded version of SPP under **HPE OneView** cluster tab and trigger the firmware update task as shown in Figure 45.

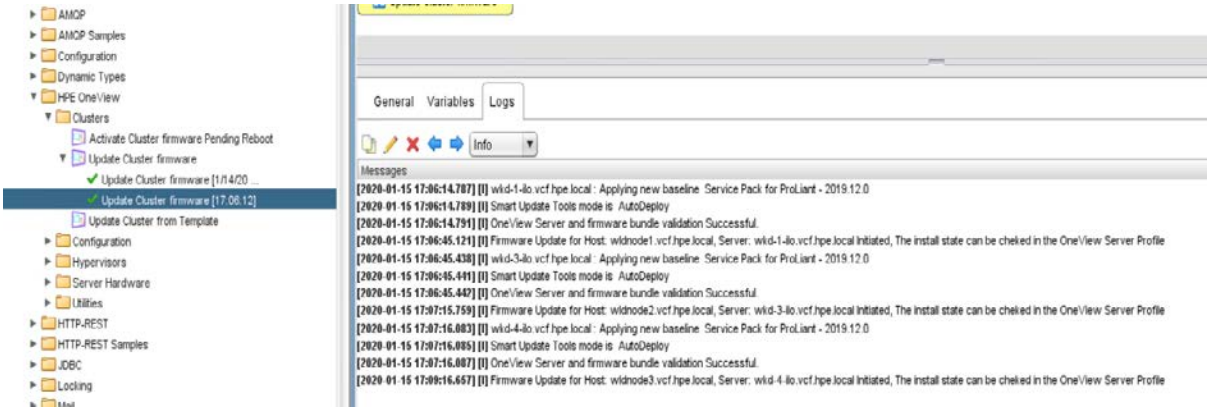


Figure 45. vRO workflow for VCF workload domain

5. Once the firmware update is complete, HPE ProLiant iLO shows the new firmware version for all the system components and the updated status displayed on HPE ProLiant iLO as shown in Figure 46.

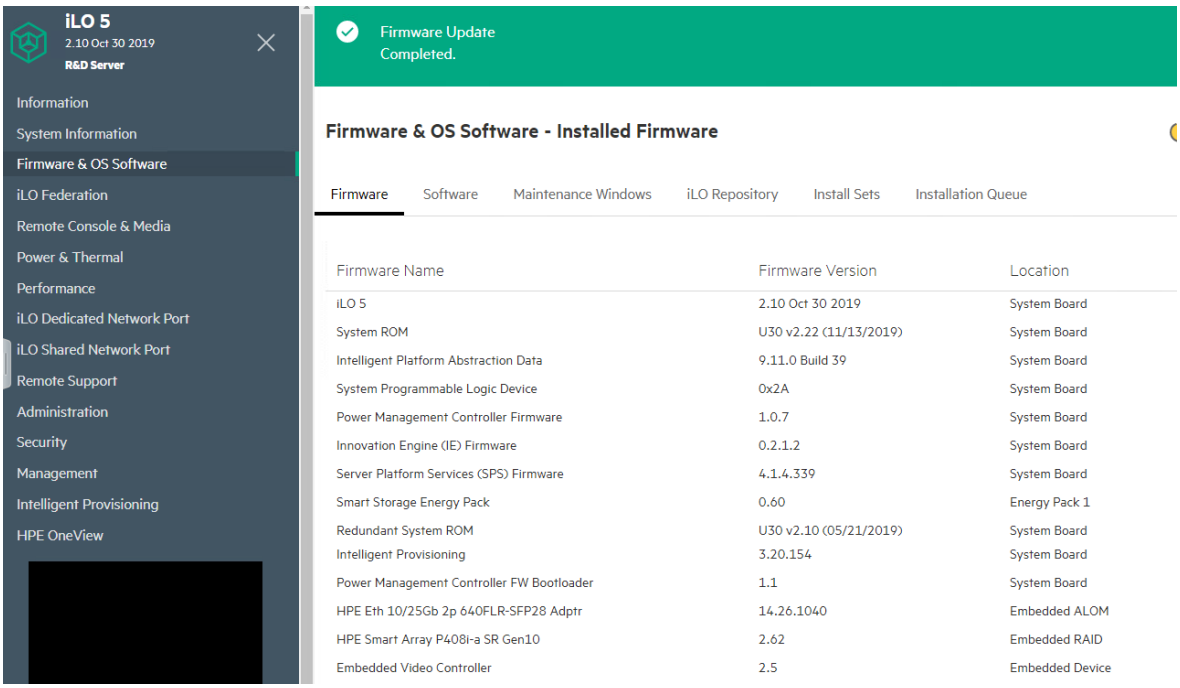


Figure 46. VCF workload domain firmware deployment

Note

VMware vRO workflow will not update operating system driver's firmware. It will update only the hardware firmware.

Summary

This solution can be effectively used to rapidly deploy VCF on HPE Composable Rack using automated workflows from vRealize Orchestrator/Automation. This solution also supports firmware life cycle management using VMware vRO. The following use cases were validated in this VCF on HPE Composable Rack solution:

- VCF management domain creation and deployment of SDDC Manager
- VCF workload domain commission and deployment through SDDC Manager
- Scale out workload domain through SDDC Manager
- Decommission and delete the workload domain through SDDC manager
- Upgrade the firmware on the HPE Composable Rack using VMware vRO

Version history

Document version	Date	Description of change
1.0	03/03/2020	Initial Publication

Resources and additional links

HPE Enterprise Support, https://www.hpe.com/in/en/contact-hpe.html

HPE Information Library, https://techlibrary.hpe.com/us/en/enterprise/servers/solutions/info-library/index.aspx#.Xk5bqWgzaMo

HPE Reference Architectures, HPE Reference Architectures

HPE Servers, hpe.com/servers

HPE Storage, hpe.com/storage

HPE Networking, hpe.com/networking

HPE Technology Consulting Services, hpe.com/us/en/services/consulting.html

VMware Cloud Foundation 3.9, https://docs.vmware.com/en/VMware-Cloud-Foundation/3.9/rn/VMware-Cloud-Foundation-39-Release-Notes.html

VMware vRealize Orchestrator, https://docs.vmware.com/en/vRealize-Orchestrator/

To help us improve our documents, please provide feedback at hpe.com/contact/feedback

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a50001074enw, version 1.0, March 2020