

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 baremetal 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 <u>Support Matrix</u> 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, <u>https://docs.vmware.com/en/VMware-Cloud-Foundation/3.9/rn/VMware-Cloud-Foundation-39-Release-Notes.html</u>.

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	2019.09.0
Note: All the other components firmware versions are based on the ProLiant SPP version	(P19473_001_spp-2019.09.0-SPP2019090.2019_0905.39.iso)
VMware vRO Appliance	8.0.1
VMware Cloud Foundation	3.9 (Click for <u>VCF 3.9 BOM</u>)
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 <u>VMware Compatibility Guide (VCG) for vSAN</u> and for Cloud Foundation <u>VMware Cloud</u> Foundation Planning and Preparation Guide.

Table 2. HPE Composable Rack hardware components

Components	Description		
HPE ProLiant DL 360 Gen10 x 4	2x Intel Xeon Gold 5118 CPU @ 2.30 Ghz, 12/12 cores		
(Management domain node)	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	2x Intel Xeon Silver 4114 CPU @ 2.20 Ghz, 10/10 cores		
(Workload domain node)	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 <u>OneView</u> 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.

1	Deploy OVF Template		(? H
ľ	1 Select template 2 Select name and location	Select name and location Enter a name for the OVF and select a deployment location.	
	 3 Select a resource 4 Review details 5 Select storage 6 Ready to complete 	Name HPEOneView-SSH_5.00.00-0400525 Fitter Browse Select a datacenter or folder.	
		Back Next Finish	Cancel

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.

🈚 Deploy OVF Template		•
 1 Select template 2 Select name and location 	Select networks Select a destination network for each source	e network.
✓ 3 Select a resource	Source Network	Destination Network
4 Review details	VM Network	os-management 🔹
✓ 5 Select storage		
✓ 6 Select networks		
 7 Ready to complete 		
	IP Allocation Settings	
	IP protocol: IPV4	iP allocation: Static - Manual 😈
		Back Next Finish Cancel

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.

() activity of the resulting			Sec.
 1 Select template 2 Select name and location 	Ready to complete Review configuration data.		
 3 Select a resource 4 Review details 	Name	HPEOneView-SSH_5.00.00-0400525	
 5 Select storage 	Source VM name Download size	HPEOneView-SSH_5.00.00-0400525_RC5 1.9 GB	
6 Select networks	Size on disk	275.0 GB	
7 Ready to complete	Folder	vcf	
	Resource	vcf	
	+ Storage mapping	1	
	All disks	Datastore: vsanDatastore; Format: Thick provision lazy zeroed	
	 Network mapping 	1	
	VM Network	os-management	
	✓ IP allocation settings		
	IP protocol	IPv4	
	IP allocation	Static - Manual	
		Back Next Finish Car	icel

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.

8	Deploy OVF Template		(?) >>>
~	1 Select template 2 Select name and location	Select name and location Enter a name for the OVF and select a deployment location.	
	3 Select a resource	Name ComposableFabricManager-5.1.1-5668-	
	4 Review details	Filter Browse	
	5 Select storage	Select a datacenter or folder	
	6 Ready to complete	✓ Image: Cedar ✓ Ima	
		Back Next Finish	Cancel

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.

Peploy OVF Template		3		
 1 Select template 2 Select name and location 	Customize template Customize the deployment prop	erties of this software solution.		
 ✓ 3 Selecta resource 	All properties have valid value	Jes Show next Collapse all		
4 Review details		address on your DNS server.		
 5 Accept license agreements 	composable-fabric-manager			
 6 Select storage 7 Select networks 	(2) Domain Name	Domain name to assign to this VM. For static IP addresses, this domain must resolve on your DNS server.		
8 Customize template		cfm.vcf.hpe.local		
9 Ready to complete	(3) Primary NTP Server	Hostname or IP address of primary NTP server. Leave blank if not using or if NTP servers are provided by DHCP.		
		172.22.0.254		
	(4) Secondary NTP Server	Hostname or IP address of secondary NTP server.		
	(B) Network - Static IP settings	5 settings		
	(1) IP Address	Static IP address to assign for this interface. (Note: For all IP address fields, specify as "0.0.0. to use DHCP)		
		172.22.0.49		
	(2) Network Mask	Network mask for this interface.		
		Back Next Finish Cancel		

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.

Peploy OVF Template			?)
 1 Select template 2 Select name and location 	Ready to complete Review configuration data.		
✓ 3 Select a resource	Name	ComposableFabricManager-5.1.1-5668-	
4 Review details	Source VM name	ComposableFabricManager-5.1.1-5668-vsw-63	
✓ 5 Accept license agreements	Download size	2.5 GB	
6 Select storage	Size on disk	100.0 GB	
 7 Select networks 	Folder	vcf	
 8 Customize template 	Resource	vcf	
9 Ready to complete	 Storage mapping 	1	
	▶ Network mapping	1	
	 IP allocation settings 	IPv4, Static - Manual	
	Properties	 (1) Hostname = composable-fabric-manager (2) Domain Name = cfm.vcf.hpe.local (3) Primary NTP Server = 172.22.0.254 (4) Secondary NTP Server = (1) IP Address = 172.22.0.49 (2) Network Mask = 255.255.255.0 (3) Default Gateway = 172.22.0.254 (4) Primary Name Server = 172.22.0.1 (5) Secondary Name Server = 0.0.0.0 Use DHCP = False 	
		Back Next Finish	Cancel

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.

← → C ▲ Not secure 172.22.0.42/#/	\Rightarrow	θ	0
HPE Composable Fabric			
v			
admin			
Remember Me Login			
© 2011-2020 Hewlett Packard Enterprise Development LP.			

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.

Composable Fabric Manager	Dashboard Configuration Visualizations *			أ≣ ጸ admin • ? •
Fabrics	Configuration / System / Fabrics			又為 Ct. Actions I
DNS	Name 📥	Segmented ≑	Health ≑	Switches 🗘
INTP	O fm3180-a	NORMAL	HEALTHY	fm3180-b, fm3180-a

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.

Composable Fabric Manager	Dashboard	Configuration			
HPE OneView	Configura	ation / Integratior	ns / HPE OneView		
UDE Simpli\/itt/					
		Status 🗢	Host 🗖	Username 🌲	Enabled 🌩
VMware NSX-V	۲	CONNECTED	172.22.0.41	Administrator	Yes
VMware vSphere					

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.

Name	CR_ <u>LSG</u>		
Туре	Rack Connectivity Module \sim		
0.8 6.85			
Number of switches	2		
Number of switches	2		
Number of switches	2		

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.

Create +

Cancel G

Name	Logical_Switch		
Logical switch group	CR_LSG	×Ô	
Switches			
Switch 1	fm3180-a	×Ç	
Switch 2	fm3180-b	×Q	

Figure 17. Logical switch creation on HPE OneView

Changed: Switch 2 to "fm3180-b"



3

Network and server profile template configuration

C

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.

	Oneview V	Search			
Netv	vorks 4			SDDC-DPort	Group-Mgmt_2000 Overview ~ 2
+	Create network			General 🖉 Edit	
	Name 🔺	VLAN	Туре	Type	Ethernet
	SDDC-DPortGroup-	2000	Ethernet	VLAN	2000
	Mgmt_2000			Associated with IPv4	none
	SDDC-DPortGroup-	2001	Ethernet	subnet ID	
	vMotion_2001			Associated with IPv6	none
J .	SDDC-DPortGroup-	2002	Ethernet	subnet ID	
	VSAN _2002			Purpose	Management
	VXLAN_2003	2003	Ethernet		
				Preferred bandwidth	2.5 Gb/s
				Maximum bandwidth	10 Gb/s

Figure 18. VCF network creation

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

D OneView V Search						
Network Sets 1	CC_Network_Set	t Overview → 🗧				
+ Create network set	General					
Name	Preferred bandwidth	2.5 Gb/s				
CC_Network_Set	Maximum bandwidth	10 Gb/s				
	Untagged network	SDDC-DPortGroup-Mgmt 2000				
	Туре	Regular				
	Used by	<u>4 server profiles</u> <u>1 server profile template</u>				
	Networks / Edi	it 2000 <u>SDDC-DPortGroup-</u> 2001 <u>SDDC-DPortGroup-</u> 2002 <u>VXLAN 2003</u> 2003				

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.

○ OneView ✓ Search	Edit SPT DL360 Gen10 1 Firmware ~				
Server Profile Templates 1	Firmware baseline managed manually				
+ Create server profile template	Connections				
Name SPT DL360 Gen10 1	 Manage connections Consistency checking Exact match ID Name Network 	Port			
	 O 1 Uplink1 <u>CC Network Set</u> (network set) Type Ethernet MAC address Physical Link aggregation group None 	FlexLOM 1:1 🧷 🗙			
	2 Uplink2 CC Network Set (network set) Type Ethernet MAC address Physical Link aggregation group None	FlexLOM 1:2 🧷 🗙			

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.

miguran	on / Ports / Ports								
		Fabric fm3180-a		- Switch *	fm3180-a	× •	Select All		
								C Ac	ions 💌
									70
8	Switch 🖨	Port 🌻	Enabled $ hinspace$	Link State 🗘	Туре ≑	Speed 🌐	VLANs 🛱	Native VLA	N \$
0	fm3180-a	1	Yes	up	Access	25Gbps	2000-2003	2000	Î
0	fm3180-a	2	Yes	up	Access	25Gbps	2000-2003	2000	
	fm3180-a	3	Yes	up	Access	25Gbps	2000-2003	2000	
0	fm3180-a	4	Yes	up	Access	25Gbps	2000-2003	2000	

Configuration / Ports / Ports

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.

 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.

🍘 Deploy OVF Template		(? H		
✓ 1 Select template	Customize template Customize the deployment prope	erties of this software solution.		
 2 Select name and location 				
 3 Select a resource 	All properties have valid value	es Show next Collapse all		
 4 Review details 		Example: P@ssword123!		
 5 Accept license agreements 		Enter password		
✓ 6 Select storage		Confirm password		
 7 Select networks 				
8 Customize template	Admin Username	Enter a username for the default Admin account. Example: admin		
9 Ready to complete		admin		
	DNS Domain Name	Enter the domain name for this virtual appliance. Example: rainpole.local		
		cb.vcf.hpe.local		
	DNS Domain Search Paths	Enter the domain name search paths for this virtual appliance (comma separated). Example: rainpole.local, sfo01.rainpole.local		
		vcf.hpe.local		
	DNS Servers	Enter the DNS servers for this virtual appliance (comma separated). WARNING: Do not specif more than two entries otherwise no configuration will be set.		
		172.22.0.1		
	Default Gateway	Enter a default gateway for the interface of this virtual appliance.		
		172.22.0.254		
		Back Next Finish Cancel		

Figure 24. VMWare CBVM customize template details

🎲 Deploy OVF Template		•	**
 1 Select template 2 Select name and location 	Ready to complete Review configuration data.		
	Name	VMware-Cloud-Builder-2.2.0.0-14866160	
 4 Review details 	Source VM name	VMware-Cloud-Builder-2.2.0.0-14866160_OVF10	
 5 Accept license agreements 	Download size	10.4 GB	
✓ 6 Select storage	Size on disk	350.0 GB	
✓ 7 Select networks	Folder	vcf	
✓ 8 Customize template	Resource	vcf	
✓ 9 Ready to complete	 Storage mapping 	1	
	 Network mapping 	1	
	▶ IP allocation settings	IPv4, Static - Manual	
	Properties	Admin Username = admin DNS Domain Name = cb.vcf.hpe.local DNS Domain Search Paths = vcf.hpe.local DNS Servers = 172.22.0.1 Default Gateway = 172.22.0.254 Deployment Architecture = vcf Hostname = vb NTP Servers = 172.22.0.254 Network 1 IP Address = 172.22.0.48 Network 1 Subnet Mask = 255.255.0	
		Back Next Finish Cancel	0

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.

Configuration File Validation

Configuration file validat	on in progress.	Cance
ation Report		🛓 DOWNLOAD 🗇 PRINT
Current	Validation Items	Status
5/31/19, 3:33 AM	Network Ip Pools	⊘ Success
	Cloud Builder Readiness	⊘ Success
	License Key Format	⊘ Success
	ESXI Host Readiness	⊘ Success
	Time Synchronization	⊘ Success
	Host and IP DNS records	⊘ Success
	Network Configuration	⊘ Success
	Network Connectivity	⊘ Success

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

vm

- 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>.

Foundation ™				
Bringing Up the SDDC System is being configured for Cloud Foundation				
SDDC has been successfully created. It can be reached at: https://sddc-	manager vcf hpe local			
Tasks			+ DOWNLOAD	
SDDC Bringup finished at 11/26/19, 7:02 AM. 0 tasks in progress		Q Search Tasks	Status	~
Tasks		End Time	Status	
Generate ESXi Host vSAN Deduplication Input Data			Success	4
Generate ESXI Host vSAN Deduplication Input Data		5:13:03 AM	Success	
 Generate ESXi Host Input Data 			Success	
Generate ESXi Host Input Data	\$ <mark>9</mark>	5:13:03 AM	Success	
 Prepare ESXI Hosts for vSAN with Deduplication 			Success	
Prepare ESXI Hosts for vSAN with Deduplication		5:14:18 AM	Success	
 Enable vSAN Deduplication for the First Host 			Success	
Enable vSAN Deduplication for the First Host		5:14:23 AM	Success	
 Create "VM Network" Portgroup on ESXI Hosts 			Success	

Figure 31. SDDC Manger Bring-up

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

vm Cloud Foundation			⊙ ∽ administrator@vsph
O Dashboard	SDDC Manager Dashb	oard +	WORKLOAD DOMAIN Y COMMISSION HOSTS
♣ Inventory ∨ ♠ Workload Domains	To view available updates, Authorize My VMwar	e Account	
🛛 Hosts	2 Workload Domains	CPU, Memory, Storage Usage	Recent tasks
Repository Administration Ca Network Settings	Management Domain VI Domain	Q 1 CPU 352.02 GH2 TOTAl L L L S2.02 GH2 TOTAl S2.02 GH2 S2.	12/1/19, 8:37 AM VSucceeded Creating domain WildAPI
間 Licensing 砂 Users C Repository Settings	Host Type and Usage Host Types Hybrid Host	Top Domains in allocated CPU Usage	12/1/19, 8:15 AM Succeeded Commissioning host(s) widnodet.vcf.hpe.local,widnode2.vcf.hpe.local,widnor to VMware Cloud Foundation
Composable infrast VRealize Suite	All Flash Host Usage 7 Hosts 1	7 Memory 187 TB Total Iotal 0.39 TB Used 158 TB Free	TI/28/19, 514 AM ✓ Succeeded Commissioning host(s) widnodet.vcf.hpe.local.widnode2.vcf.hpe.local.widnor
ela Backup Configurati	7 Hosts Used 0 Hosts Unetoc Top Domains in Host Allocation	Top Domains in allocated Memory Usage	to VMware Cloud Foundation 11/27/19, 11:33 PM O Failed

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.

Composable Fabric Manager		Configuration Visuali							讀■ A admin • ? •
HPE OneView	Configura	ation / Integrations / VMw	are vSphere	È.					
- HPE SimpliVity									Y 💱 G Actions 🔹
									Isolate vSAN Network
WMware NSX-V		Status 🖶	Hos	it *	Username ≑	Enabled ≑		Provisioning ≑	Traffic ≑
			* E	nter Regex for Host_	Enter Regex for Usernar		~	Enter Regex for Provisio	Enter Regex for Isolate v
VMware vSphere	۲	CONNECTED	172.	22.0.118	administrator@vsphere.loca	Yes	Junit		No
					1				

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.

vm Cloud Foundation	
《 ② Dashboard ▲ 品 Inventory ~	Edit Network Pool Edit Network Pool Details
Workload Domains Hosts Repository	Network Pool Name mgmt-networkpool Network Type ① VSAN NFS vMotion
Administration	
Network Settings Licensing	vMotion Network Information vSAN Network Information
咨 Users	VLAN ID 2001 VLAN ID 2002 MTU 9000 MTU 9000
Composable Infrast Repository Settings Composable Infrast Repository Settings	Network 172.22.1.0 Network 172.22.2.0 Subnet Mask 255.255.05 Subnet Mask 255.255.255.05 Default Gateway 172.22.1.254 Default Gateway 172.22.254
⊘ Security	Included IP Address Ranges Included IP Address Ranges
由 Backup Configurati	172.22.1.101 To 172.22.1.104 172.22.2.104 172.22.2.104
VMware CEIP Developer Center	172.22.1.160 To 172.22.1.165 To 172.22.2.165

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.

vm Cloud Foundation	Ĝ ⊕					⑦ · administrator@vsphere.local ·
 Dashboard Inventory 	- Hosts					
Workload Domains	Capacity Utilization across F CPU	Hosts 351.97 GHz Total	Hosts	7 Hosts Total	Memory	187 TB Total
Repository	12.23.GHz Used	339.74 GHz Free	7 Hosts Used	0 Hosts Unallocated	0.29 TB Used	1.58 TB Free
Administration Administration Administration Setup: Administratin Setup: Admininter Setup: Admininter Setup: Administ	ALL HOSTS ASSIGNED H	IOSTS UNASSIGNED HOSTS				
쯩 Users	FODN † T	Host IP T Network Pool	τ Configuration Status τ	Host State + Cluster	т CPU Usage т М	femory Usage + Storage Type +
C Repository Settings	mgmtnode1.vcf.hpe.local	172.22.0.101 mgmt-networkpr	ool Active	in MGMT mgmt-m01- mgmt01	9% 🚺 4	3% 🚾 📖 Ali Flash
Composable infrast. VRealize Suite	mgmtnode2.vcf.hpe.local	172.22.0.102 mgmt-networkpt	ool Active	in MGMT mgmt-m01- mgmt01	2%	3% All Flash
Ø Security	mgmtnode3.vcf.hpe.local	172.22.0.103 mgmt-networkpt	Active Active	in MGMT mgmt-m01- mgmt01	6% (3	3% All Flash

Figure 36. Commission workload domain network

Commission Hosts	Host Addition and	Validation 🤊			×
1 Host Addition and Validation					•
0. Daviau	Host FQDN	Specify full	y qualified domain nar	ne	
2 Review	Storage Type	⊖ VSAN		VMFS on FC	
	Network Pool Name	Select poo	Iname	<u> </u>	
	User Name				
	Password			0	ADD
	Confirm fingerprint (click 📀 to), and then valid Add more or confirmed and more or confirmed a	date hosts before proc m fingerprint and valid	eeding to commission	×
	REMOVE				VALIDATE ALL
	FQDN	Network Pool	IP Address	📀 Confirm FingerPrint	Validation Status
	wid01.vcf.hpe.local	mgmt- networkpool (j)	172.22.0.160	SHA256:HSPUxWk 4PLX012LbFoNagd BGV0k5PgsbgJNU TXiVhbk	O Not Validated
					1 hosts
				CA	NCEL NEXT

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	е.	0%	2%	Hybrid
sfo01w01esx02.vcf.net	172.16.11.112	sfo01- networkpool	Active	Unassigned	G.	0%	2%	Hybrid
sfo01w01esx03.vcf.net	172.16.11.113	sfo01- networkpool	Active	Unassigned	đ	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.

Vm Cloud Foundation 🏠 🌐			
년 Tasks			
< Subtasks of Task Creating domain WIdAPI			
Sublask	Ψ.	Status v	Lest Occurrence
> Release Lock for Domain Addition		© Successful	12/1/19, 9:59 AM
> Update SSH Known Hosts Configuration		© Successful	12/1/19, 9:59 AM
> Update Workload Domain Data in Inventory		© Successful	12/1/19, 9:59 AM
> Clear Alarms on ESXi Hosts		Successful	12/1/19, 9:59 AM
> Create NSX Transport Zones		© Successful	12/1/19, 9:59 AM
> Create NSX Segment Range		Successful	12/1/19, 9:59 AM
Create Anti-Affinity Rules		Successful	12/1/19, 9:59 AM
> Configure NSX VXLAN		© Successful	12/1/19, 9:59 AM
> Apply NSX License in vCenter Server		Successful	12/1/19, 9:52 AM
> Apply NSX DLF in vCenter Server		© Successful	12/1/19, 9:52 AM
> Deploy NSX Controllers		Successful	12/1/19, 9:52 AM
> Configure NSX Backup		© Successful	12/1/19, 9:32 AM
Create NSX IP Pool(s)		© Successful	12/1/19, 9:32 AM
Register NSX Manager with vCenter Server		Successful	12/1/19, 9:32 AM
Register NSX Manager with Platform Services Controller Lookup Service		© Successful	12/1/19, 9:52 AN

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.

Composable Fabric Manager		Configuration Visu							≣ & admin * ? *
- HPE OneView	Configura	ation / Integrations / VN	1ware vS	phere					又 资 C Actions マ
- HPE SimpliVity									Isolate vSAN Network
WMware NSX-V		Status @		Host 🗖	Username ©	Enabled ©	-	Provisioning ©	Traffic 🗘
Juliusea uCobara		Select Status_	•	Enter Regex for Host	Enter Regex for Usernar		~	Enter Regex for Provisio	Enter Regex for isolate v
C vriwale vopilele	۲	CONNECTED		172.22.0.118	administrator@vsphere.loca	Yes			Yes
	0	CONNECTED		wkdm01-vc01.vcf.hpe.local	I administrator@vsphere.loca I	Yes		ļ	Yes

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.

び VMware vRealize	e Orchestrator 🗙	🖸 VMware v	Realize Orchestrato	· Cc × +				
< → C ▲	Not secure vro	.vcf.hpe.local:8	283/vco-controlo	enter/config/#/				
vm VMware	vRealize Orches	strator						Q Search
Manage								
1		~	*	⇒	0			
Host Settings	Configure Authentication Provider	Licensing	Certificates	Export/Import Configuration	Advanced Options	Orchestrator Cluster Management	Validate Configuration	
Monitor ar	nd Control							
¢	A	≔						
Runtime Metrics	Troubleshooting	System Properties	Extension Properties					
Log								
C	٢							

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

 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.

	🜔 🛯 🐇 😪 🗳 🥖			
1 🕺 🚪 🔜 🛃	General Inputs Outputs	Schema Pre	sentation Parameters References Workf	low Tokens Events
Administrator @ vro.vcf.hpe.local Call Call	•		O Start Workflow : Add a OneView Manage	ment Instance X
AMOP AMOP Samples Configuration	Name	Add a OneView	HPE OneView Credentials	★ HPE OneView Management Instance Name
Configuration Dynamic Types The OneView	Version	1 . 3 .		oneview.vcf.hpe.local
Clusters	Workflow icon			* HPE OneView Management Instance IP or Hostname
Add a OneView Management Instance Remove a OneView Management Instance	Owner	Check signa		HPE OneView Management Instance Username
Update a One∨iew Management Instance ► Instance ► Instance ► Instance	User permissions	🗹 View conte		administrator
Server Hardware Utilities HITD RECT	Server restart behavior	Do not resum		★ HPE One View Management Instance Password
HTTP-REST Samples	Resume from failed behavior	System defau		
► □ Locking ► □ Mail	User tags			HPE OneView Domain Name
Microsoft Crchestrator Crochestrator SNNP SNNP	Description	Configures Orc		Do you want to ignore certificate warnings? If you select yes, the OneView instance certificate is accepted silently and the certificate is added to the trust store \odot Yps \bigcirc No
 ► Sola 	Description			-9
Tagging VAPI Canter	✓ Attributes			
Center Venter Venter	R+ 🗙 🎾 🖍			Cancel Submit

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.

	0 4 9 4 /			
▲ 🛂 😹 🔜 🛃	General Inputs Outputs	Schema Pre	esentation Parameters References Workflow	Tokens Events
Configuration	Name ID Version Workflow icon Owner User permissions Server restart behavior Resume from failed behavior Global tags User tags	Add a vCenter si 1246b7b5-fe89 Check signs View conts Do not resum System defau Configures On	Start Workflow : Add a vCenter Server instant Set the vCenter Server i Set the connection prope Additional Endpoints	P or host name of the vCenter Server instance to add T72.22.0.86 ** HTTPS port of the vCenter Server instance 443 * Location of the SDK that you use to connect to the vCenter Server instance /SdK Will you orchestrate this instance? • Yes • No Do you want to ignore certificate warnings? If you select Yes, the vCenter Server instance certificate is accepted silently and the certificate is added to the trusted store • Yes • No
Add a Vorter Server Instance List the Vorter Orchestrator automatio Register Vorter Orchestrator as a V Register Vorter Server Instance Update a Vorter Server Instance Update a Vorter Server Instance Dotator and files Datastor and files	io C Description			
Guest operations Host management				Cancel Back Next Submit

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.

iLO 5 2.10 Oct 30 2019 R&D Server	×	 Firmware Update Completed. 						
Information								
System Information		Firmware & OS Software - Installed Fire	mware	(
Firmware & OS Software								
iLO Federation		Firmware Software Maintenance Windows	iLO Repository Install Sets Installatio	n Queue				
Remote Console & Media								
Power & Thermal		Einen Neme		Leasting				
Performance		Firmware Name	Firmware version	Location				
iLO Dedicated Network Port		ILO 5	2.10 Oct 30 2019	System Board				
iLO Shared Network Port		System ROM	System Board					
Remote Support		System Programmable Logic Device	0-20 9.11.0 Duild 34	System Board				
Administration		Power Management Controller Firmware	107	System Board				
Security		Innovation Engine (IE) Firmware	0.2.1.2	System Board				
Management		Server Platform Services (SPS) Firmware	4.1.4.339	System Board				
- Intelligent Provisioning		Smart Storage Energy Pack 0.60 Energy Pack 1						
HPE OneView		Redundant System ROM U30 v2.10 (05/21/2019) System Board						
	_	Intelligent Provisioning 3.20.154 System Board						
		Power Management Controller FW Bootloader 1.1 System Board						
		HPE Eth 10/25Gb 2p 640FLR-SFP28 Adptr	14.26.1040	Embedded ALOM				
		HPE Smart Array P408i-a SR Gen10	2.62	Embedded RAID				
		Embedded Video Controller	2.5	Embedded Device				

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, <u>HPE Reference Architectures</u>

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

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

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

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