



Hewlett Packard
Enterprise

HPE Converged Architecture 700 with HPE Nimble Storage Deployment Guide

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Support

All documentation and knowledge base articles are available on HPE InfoSight at <https://infosight.hpe.com>. To register for HPE InfoSight, click the *Create Account* link on the main page.

Email: support@nimblestorage.com

For all other general support contact information, go to <https://www.nimblestorage.com/customer-support/>.

Executive Summary

In the last several years, integrated infrastructures have emerged as a more efficient, less risk-prone method of deploying IT gear. Hewlett Packard Enterprise (HPE) introduces a new best-in-class solution in this space, the HPE Converged Architecture 700 with HPE Nimble Storage.

The HPE Converged Architecture 700 with HPE Nimble Storage delivers a scalable, converged infrastructure platform for virtualization that provides tuned infrastructure for running workloads and applications. These solutions are delivered through qualified channel partners and provide infrastructure your way, delivered as one integrated stack, saving you time and resources.

The HPE Converged Architecture 700 with HPE Nimble Storage includes HPE lab-tested components, such as HPE network switches, HPE industry-leading x86 servers, and HPE Nimble Storage arrays, plus the VMware vSphere hypervisor. This foundation can be used to support a wide variety of workloads:

- Data center server consolidation and cloud solutions
- Business-critical applications, such as databases and applications from Oracle, Microsoft, and SAP
- Virtual desktop infrastructure (VDI) solutions, such as Citrix VDI and VMware Horizon View
- Workforce-enablement applications, such as Microsoft Exchange Server, SharePoint Server, and Lync Server

The HPE Converged Architecture 700 with HPE Nimble Storage is a robust, fault-tolerant, scalable, high-performance, high-availability solution. It has been validated in lab testing to meet these high standards so that customers can purchase and deploy the solution with the confidence and knowledge that stringent design and testing have been performed.

Solution Overview

The HPE Converged Architecture 700 with HPE Nimble Storage can be thought of as a solution template whose components have been prevalidated together. The template indicates which families of hardware and software to deploy and how to connect and configure them. The HPE Converged Architecture 700 with HPE Nimble Storage simplifies and accelerates deployment with a prescribed and validated deployment guide that produces predictable results and reduces the risk of failure caused by a lack of knowledge of the hardware and software interdependencies.

The HPE Converged Architecture 700 with HPE Nimble Storage described in this deployment guide is intended for midsize businesses, large enterprises, and IT service providers who are looking for and understand the value to be gained from the combination of consolidation, efficiency, and consistency enabled by the solution. The deployment contains the following components:

- **Ethernet switches.** A pair of HPE FlexFabric 5940 10/40 GbE switches
- **Storage.** HPE Nimble Storage arrays with a converged fabric-attached topology
- **Computing resources:**
 - Industry-leading HPE ProLiant Gen9 server blades in the HPE BladeSystem c7000 chassis form factor for compute power
 - A pair of HPE ProLiant Gen9 rack servers for solution management
- **Hypervisor.** VMware vSphere 6.5

Testing for the reference architecture described in this deployment guide was performed in May 2017.

Target Audience

The target audience for this deployment guide is solution engineers, distributors, and value-added resellers who are HPE authorized partners. Readers can use this document to achieve the following goals:

- Gain insight into the value proposition for the HPE Converged Architecture 700 with HPE Nimble Storage.
- Better understand the requirements for the solution components.
- Better understand the recommended software and features that are part of the solution.
- Leverage design guidance to architect the solution to fit a particular set of business cases.
- Better understand the design considerations related to fault tolerance, performance, and scalability when architecting the solution.

Business Need

One of the biggest challenges for IT is to provide a wide variety of software services with appropriate service levels and performance for the applications and services that customers need. New workloads and business demands are forcing customers to reevaluate the way they buy and manage infrastructure.

Rather than do-it-yourself systems or integrated systems that are assembled from components provided by multiple vendors, customers want pre-engineered systems. They need repeatable and flexible building blocks that are tuned to handle unpredictable workloads. These systems must deliver fast time-to-value and must include software-defined management of servers, storage, and networking to automate all layers of the data center and streamline routine tasks.

The HPE Converged Architecture 700 with HPE Nimble Storage combines industry-leading HPE x86 servers, HPE Nimble Storage arrays, HPE network switches, and a validated management software stack to provide a highly available, scalable, and high-performing virtualization platform from one vendor, HPE. These components are configured according to HPE best practices, providing a prescriptively defined foundation onto which IT workloads can be deployed.

Terms and Abbreviations

The following terms and abbreviations appear frequently in this deployment guide. You can use the definitions in this list as a quick reference for how the terms apply to the HPE Converged Architecture 700 with HPE Nimble Storage.

bridge aggregation

The HPE name for link aggregation. Link aggregation combines multiple network interface connections on a network device to increase throughput beyond the level that a single connection can sustain. It also provides redundancy if a link fails.

HPE Insight Control server provisioning (ICsp)

A virtual appliance that is used to install and configure HP ProLiant servers. ICsp uses resources such as OS build plans and scripts to run deployment jobs.

HPE Integrated Lights-Out (iLO)

The proprietary HPE embedded server management technology that provides out-of-band management capabilities.

HPE Intelligent Resilient Framework (IRF)

A technology in HPE Comware-based switches that converges up to nine network devices into a single fabric (on both the management and control planes) through physical IRF ports. The configuration of all devices that participate in the IRF configuration is managed through a single IP address, and all network switches in the IRF configuration look like one device to the network components.

HPE OneView

A powerful converged management appliance that simplifies the deployment and management of converged infrastructure services. HPE OneView is an appliance virtual machine (VM) that runs on the VMware management server cluster.

HPE ROM-Based Setup Utility (RBSU)

A utility that has a menu-driven interface and a BIOS serial CLI that allow users to perform configuration activities on the server.

HPE Service Pack for ProLiant (SPP)

A consolidated set of solution-tested HPE ProLiant system software (firmware, drivers, agents, and utilities) that is available as a single download from an easy-to-use website. You spend less time on maintenance with resulting confidence in the stability of the update.

logical interconnect group

Groups of Virtual Connect interconnects that share a common network and storage configuration. HPE OneView administrators create logical interconnect groups.

management servers

The VMware 6.5–based ESXi DL360 Gen9 servers that host the VMs for management and for other infrastructure.

management VM

The Windows Server 2012 R2–based VM that is used as the HPE ICsp media server and that runs the HPE OneView for VMware vCenter plugin software. This VM can also be the primary management system for the solution, managing the VMware vSphere hosts and the HPE Nimble Storage arrays.

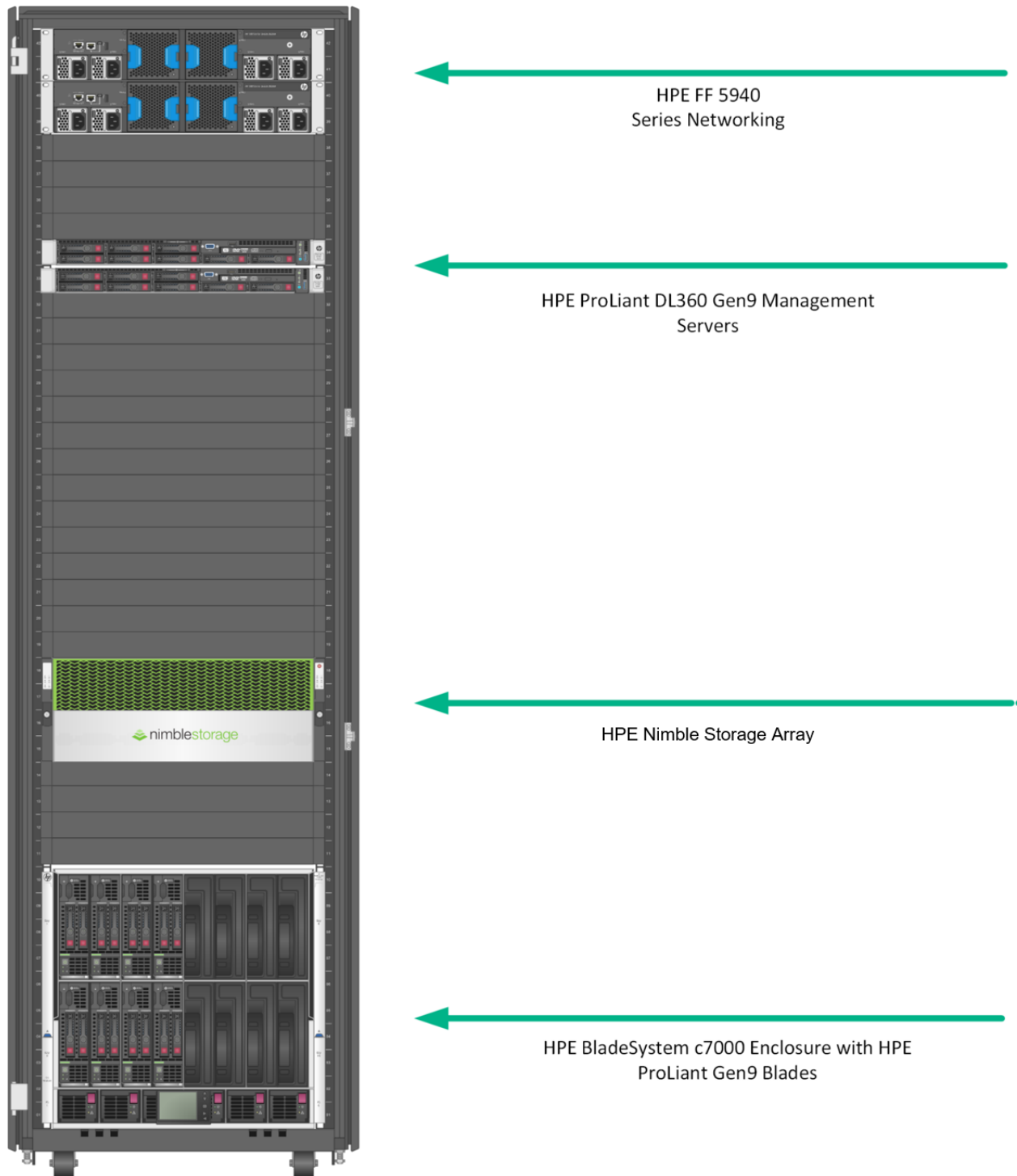
multi-active detection (MAD)

A mechanism that manages switches during an IRF failure. MAD detects other switches in the IRF stack that come online as masters and keeps online only the switch with the lowest master IRF ID. The others shut down their interfaces, effectively removing them from the network and stopping any network loops.

System Setup

To deploy the HPE Converged Architecture 700 with HPE Nimble Storage solution described in this guide, complete the following tasks:

- Lay out the physical infrastructure.
- Complete the configuration worksheet.
- Configure the network.
- Configure the HPE compute infrastructure.
- Configure the management servers:
 - Configure the hypervisor for the management server.
 - Deploy the VMware vCenter management appliance.
 - Build the management VM.
- Configure the storage arrays:
 - Deploy the HPE Nimble Storage arrays.
 - Configure the converged SAN.
 - Configure the HPE Nimble Storage VMware vCenter integration.
 - Deploy the HPE Nimble Storage datastores to the management hosts.
- Configure the HPE management software:
 - Deploy HPE OneView.
 - Deploy HPE ICsp.
 - Deploy the HPE OneView for VMware vCenter plugin.
- Configure the compute servers:
 - Build the compute servers.
 - Deploy the HPE Nimble Storage datastores to the compute hosts.

Figure 1: Tested and verified configuration

Validated Software and Firmware Levels

The HPE Converged Architecture 700 with HPE Nimble Storage solution was thoroughly tested to validate the design and the interoperability of the components. The precise software and firmware versions that were tested for this configuration are presented in the sections that follow.

HPE OneView Custom Firmware Bundle

The following table lists the HPE Service Pack for ProLiant (SPP) firmware versions for the infrastructure components that were verified for the solution. Access to the SPP requires validation from the HPE Support Center. An active warranty or HPE support agreement is required to download the SPP.

Table 1: HPE Service Pack for ProLiant

Component	Verified Version
HPE Service Pack for ProLiant	2017.04
HPE Onboard Administrator	4.60
HPE Virtual Connect	4.45
HPE ProLiant BL460c Gen9	ROM Version: I36 v2.40 (02/17/2017)
HPE ProLiant DL360 Gen9	ROM Version: P89 v2.40 (02/17/2017)
HPE Integrated Lights-Out 4 (iLO 4)	2.54*
HPE Smart Array P440ar/2G FIO controller (DL360 Gen9)	5.04
HPE Smart Array P244br/1G FIO controller (BL460c)	5.04
HPE Ethernet 1Gb 4-port 331i adapter (Broadcom)	bc 1.46 ncsi 1.3.16.0
HPE FlexFabric 10Gb 2P 556FLR-SFP+ adapter (Emulex)	11.1.183.62
HPE FlexFabric 20Gb 2P 650FLB adapter (Emulex)	11.1.183.62

Components marked with an asterisk (*) are not included in the base SPP. Use HPE OneView to build a custom firmware bundle that includes these components and the SPP. For instructions on how to create the bundle, see *Create a Custom SSP* in the [HPE OneView 3.0 User Guide](#).

HPE Nimble Storage Software

The following table lists the HPE Nimble Storage software components and versions that were verified for the solution.

Table 2: HPE Nimble Storage software

Component	Verified Version
NimbleOS	4.3
HPE Nimble Storage Windows Toolkit	4.1.0.132
HPE Nimble Storage Connection Manager for VMware ESXi 6.5	4.1.0

HPE Infrastructure Firmware

The following table lists the HPE infrastructure firmware components and versions that were verified for the solution. The firmware versions noted in the table are not contained in the SPP; they must be downloaded separately to a local repository. For update procedures for these components, see the documentation for the respective component.

Table 3: HPE infrastructure firmware

Component	Verified Version
HPE Intelligent Provisioning	2.50

Component	Verified Version
HPE FF 5940-4Slot	7.1.070, Release 2606
HPE metered and switched power distribution unit	2.00.0038

HPE Infrastructure Software

The following table lists the HPE infrastructure software components and versions that were verified for the solution.

Table 4: HPE infrastructure software

Component	Verified Version
HPE OneView	3.0.07
HPE Insight Control server provisioning (ICsp)	7.6

VMware Infrastructure Software

The following table lists the VMware infrastructure software components and versions that were verified for the solution.

Table 5: VMware infrastructure software

Component	Current Supported Version
VMware vCenter Server	6.5 (Build: 4602587) (ISO Build: 4602587)
VMware vSphere	6.5 (Build: 5224529)
HPE Custom Image for VMware ESXi 6.5	VMware-ESXi-6.5.0-OS-Release-5146846-HPE-650.9.6.5.27-May2017 (6.5)
VMware vSphere 6.5 patch bundle	ESXi650-201703002.zip
HPE OneView for VMware vCenter	8.2.1
Windows Server (Windows management VM)	2012 R2 (Standard Edition)

HPE Customized VMware Image

HPE publishes a separate VMware recipe specific to HPE ProLiant hardware to ensure compatibility of driver and firmware releases with the VMware ESXi hypervisor. The recipe details the HPE customized VMware image and the components necessary for a successful deployment of ESXi. The relevant components in the recipe are listed in the table.

HPE publishes a new version of the HPE customized VMware image in the following scenarios:

- When HPE publishes a new SPP
- When HPE publishes a new Maintenance Supplement Bundle (MSB)
- When VMware publishes a new OS release
- When VMware publishes a new update release
- When HPE releases a hotfix for a critical driver or a firmware fix

The drivers for the network and storage controllers in the ProLiant servers are integrated into the HPE customized image and are not part of the generic ESXi image that is distributed by VMware. ESXi requires the drivers for these key controllers to be integrated with the base image. You will not be prompted to install key drivers during the installation process for ESXi.

For more information about the HPE customized image, including how to add VMware patches or hotfixes to the image, see *Getting Started with HPE Customized Images* in the [Software Delivery Repository - vibsdepot \(aka HPE Online Depot\)](#) site.

Windows Server VM

The Windows Server VM is used as a centralized management server within the solution and as a place to install Windows components, such as the Windows-based VMware vCenter deployment. HPE recommends applying Microsoft updates to the VM in accordance with your data center's operations policies.

For information about available hotfixes, visit the [Microsoft Support](#) site.

Resources for Physical Deployment

When building the physical infrastructure for the solution, ensure that your site meets the physical installation requirements for the system. Consult the following resources for information about these requirements and for detailed installation instructions for each physical component.

Compute Physical Deployment

HPE BladeSystem c7000 Enclosure

For site requirements, installation instructions, and other general reference materials, see [HPE BladeSystem c7000 Enclosures](#) on the HPE Support Site.

HPE ProLiant BL460c Gen9 Servers

For site requirements, installation instructions, and other general reference materials, see [HPE ProLiant BL460c Gen9 Servers](#) on the HPE Support Site.

HPE ProLiant WS460c Gen9 Graphics Server Blade

For site requirements, installation instructions, and other general reference materials, see [HPE ProLiant WS460c Gen9 Graphics Server Blade](#) on the HPE Support Site.

HPE ProLiant WS460c Gen9 Graphics Expansion Blade

For site requirements, installation instructions, and other general reference materials, see [HPE ProLiant WS460c Gen9 Graphics Server Blade](#) on the HPE Support Site.

HPE ProLiant BL660c Gen9 Servers

For site requirements, installation instructions, and other general reference materials, see [HPE ProLiant BL660c Gen9 Servers](#) on the HPE Support Site.

HPE ProLiant DL360 Gen9 Servers

For site requirements, installation instructions, and other general reference materials, see [HPE ProLiant DL360 Gen9 Servers](#) on the HPE Support Site.

Network Physical Deployment

HPE FlexFabric 5940 Switch Series

For site requirements, installation instructions, and other general reference materials, see [HPE FlexFabric 5940 Switch Series](#) on the HPE Support Site.

Cabling for Networking, Storage, and Power

Before you install and configure the solution software, connect the physical components for networking and power.

Network Cabling

The following diagram shows the SAN connections for the solution.

Figure 2: Cabling overview: SAN connections

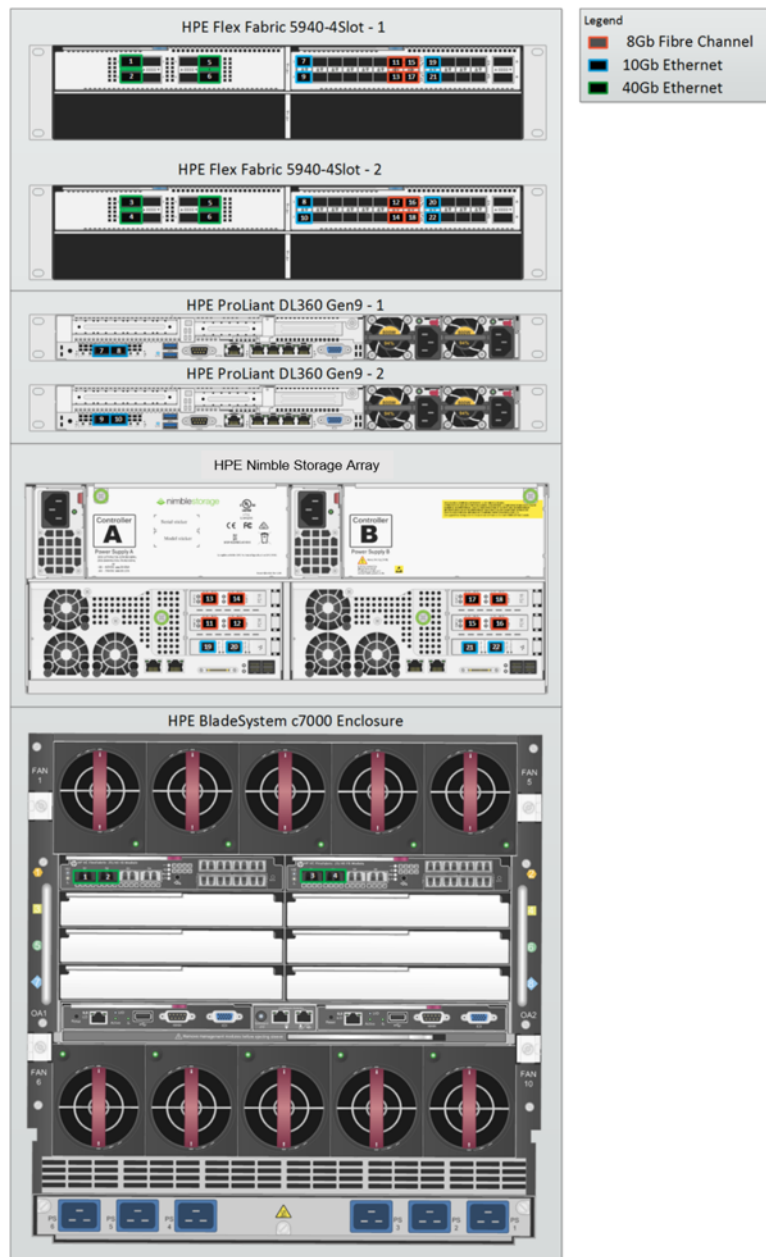
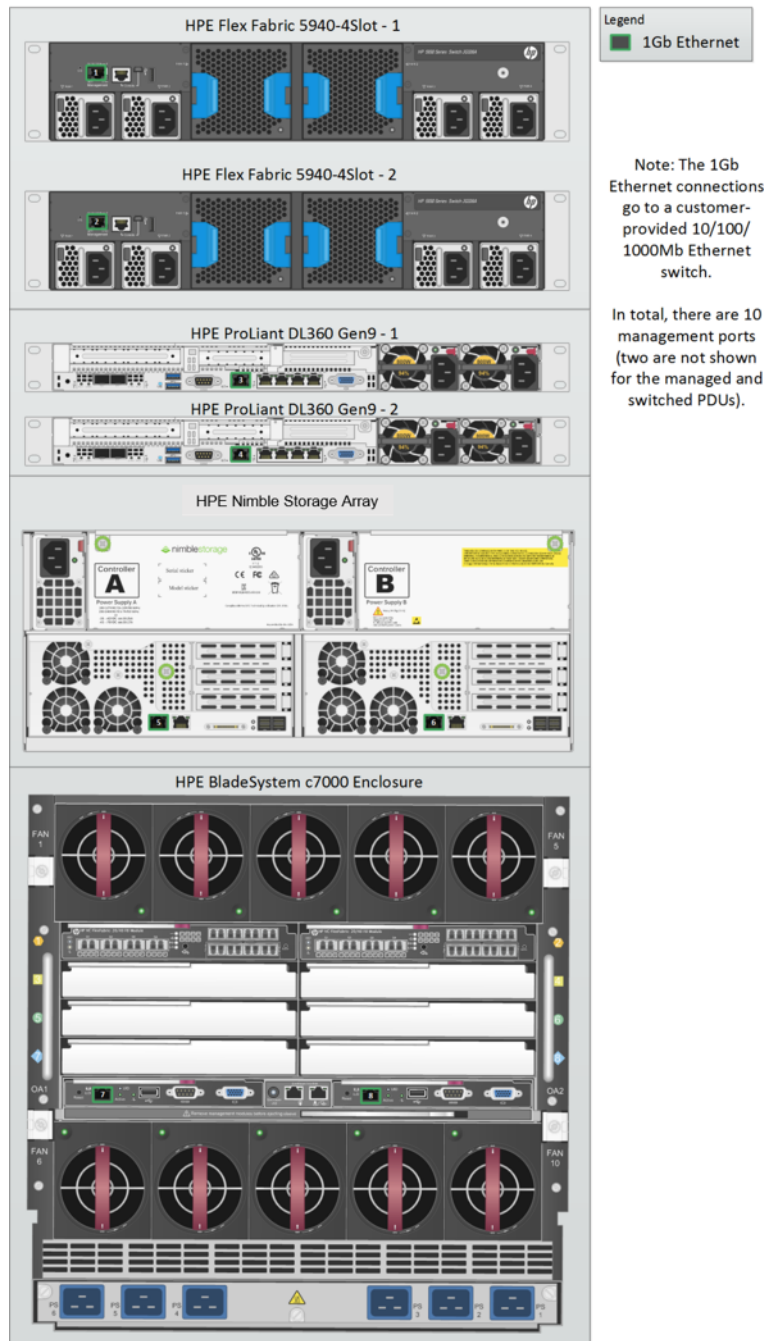


Table 6: SAN connection mapping: HPE FF 5940-4Slot networking

Switch	Port	Device	Port	Cabling Code
HPE FF 5940-4Slot – 1	1/1/1	HPE BladeSystem c7000 enclosure	Interconnect 1 Q1	1
HPE FF 5940-4Slot – 1	1/1/2	HPE BladeSystem c7000 enclosure	Interconnect 1 Q2	2
HPE FF 5940-4Slot – 2	2/1/1	HPE BladeSystem c7000 enclosure	Interconnect 2 Q1	3
HPE FF 5940-4Slot – 2	2/1/2	HPE BladeSystem c7000 enclosure	Interconnect 2 Q2	4
HPE FF 5940-4Slot – 1	1/1/7	HPE FF 5940-4Slot – 2	2/1/7	5
HPE FF 5940-4Slot – 1	1/1/8	HPE FF 5940-4Slot – 2	2/1/8	6
HPE FF 5940-4Slot – 1	1/2/1	HPE ProLiant DL360 Gen9 – 1	PCI 1 – 1	7
HPE FF 5940-4Slot – 2	2/2/1	HPE ProLiant DL360 Gen9 – 1	PCI 1 – 2	8
HPE FF 5940-4Slot – 1	1/2/2	HPE ProLiant DL360 Gen9 – 2	PCI 1 – 1	9
HPE FF 5940-4Slot – 2	2/2/2	HPE ProLiant DL360 Gen9 – 2	PCI 1 – 2	10
HPE FF 5940-4Slot – 1	1/2/13	HPE Nimble Storage controller A	FC5	11
HPE FF 5940-4Slot – 2	2/2/13	HPE Nimble Storage controller A	FC6	12
HPE FF 5940-4Slot – 1	1/2/14	HPE Nimble Storage controller A	FC9	13
HPE FF 5940-4Slot – 2	2/2/14	HPE Nimble Storage controller A	FC10	14
HPE FF 5940-4Slot – 1	1/2/15	HPE Nimble Storage controller B	FC5	15
HPE FF 5940-4Slot – 2	2/2/15	HPE Nimble Storage controller B	FC6	16
HPE FF 5940-4Slot – 1	1/2/16	HPE Nimble Storage controller B	FC9	17
HPE FF 5940-4Slot – 2	2/2/16	HPE Nimble Storage controller B	FC10	18
HPE FF 5940-4Slot – 1	1/2/17	HPE Nimble Storage controller A	tg1	19
HPE FF 5940-4Slot – 2	2/2/17	HPE Nimble Storage controller A	tg2	20
HPE FF 5940-4Slot – 1	1/2/18	HPE Nimble Storage controller B	tg1	21
HPE FF 5940-4Slot – 2	2/2/18	HPE Nimble Storage controller B	tg2	22

The following diagram shows the 1 GbE connections for solution management.

Figure 3: Cabling overview: 1 GbE networking

Power Cabling

The following diagram shows the power connections for the solution.

Figure 4: Power cabling overview

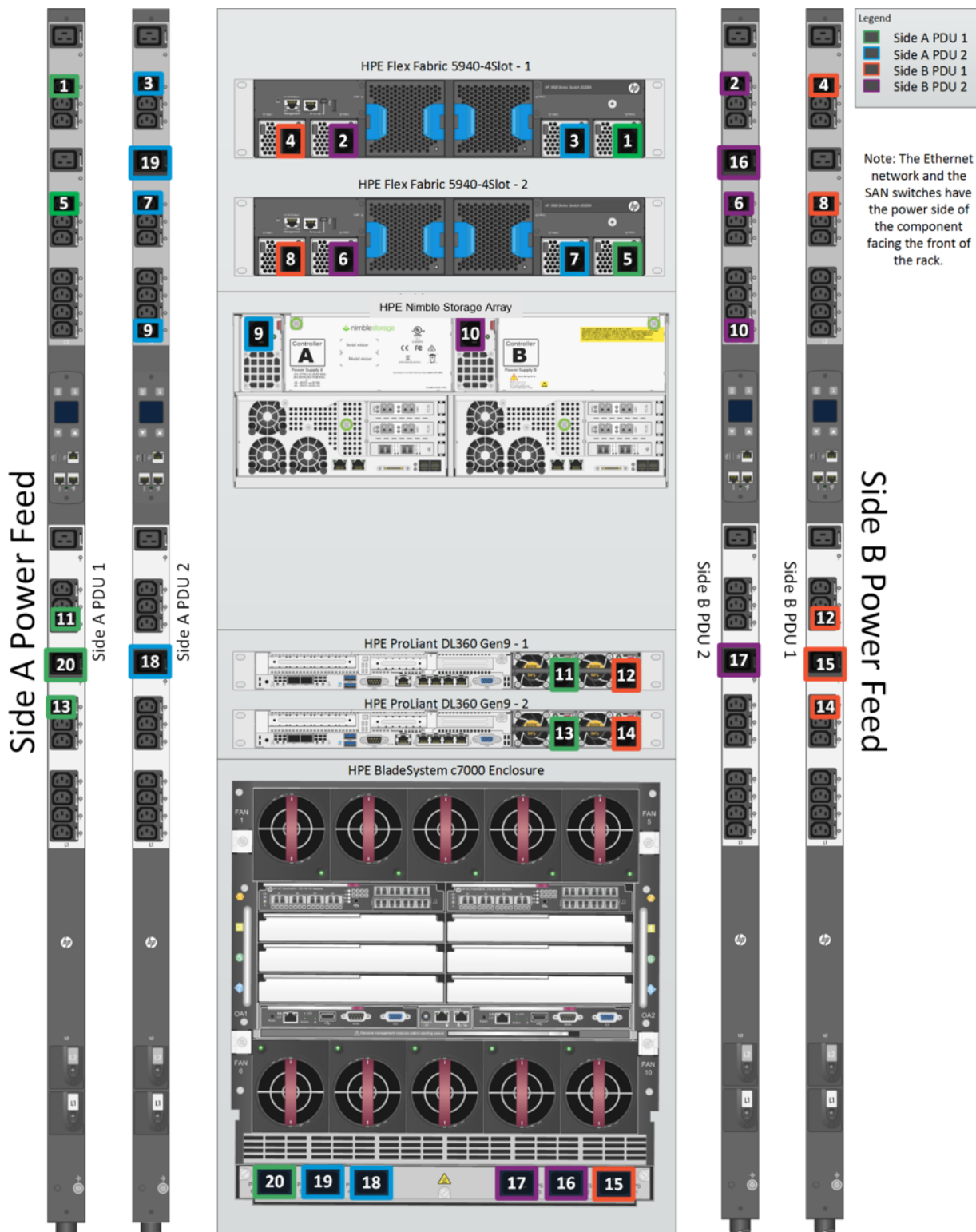


Table 7: Power configuration with HPE switching and 4 x HPE 4.9kVA 208 Volt L6-30 input (20xC13/4xC19) NA/JP managed PDU (H8B50A)

Device	Port	PDU	Port	Cabling Code
HPE FF 5940-4Slot – 1	PS 1	Side A PDU 1	L2 – 11	1
HPE FF 5940-4Slot – 1	PS 2	Side B PDU 2	L2 – 11	2
HPE FF 5940-4Slot – 1	PS 3	Side A PDU 2	L2 – 11	3
HPE FF 5940-4Slot – 1	PS 4	Side B PDU 1	L2 – 11	4
HPE FF 5940-4Slot – 2	PS 1	Side A PDU 1	L2 – 7	5
HPE FF 5940-4Slot – 2	PS 2	Side B PDU 2	L2 – 7	6
HPE FF 5940-4Slot – 2	PS 3	Side A PDU 2	L2 – 7	7
HPE FF 5940-4Slot – 2	PS 4	Side B PDU 1	L2 – 7	8
HPE Nimble Storage array controller A	PS 1	Side A PDU 2	L2 – 1	9
HPE Nimble Storage array controller B	PS 1	Side B PDU 2	L2 – 1	10
HPE ProLiant DL360 Gen9 – 1	PS 2	Side A PDU 1	L2 – 9	11
HPE ProLiant DL360 Gen9 – 1	PS 1	Side B PDU 1	L2 – 9	12
HPE ProLiant DL360 Gen9 – 2	PS 2	Side A PDU 1	L1 – 7	13
HPE ProLiant DL360 Gen9 – 2	PS 1	Side B PDU 1	L1 – 7	14
HPE BladeSystem c7000 enclosure	PS 1	Side B PDU 1	L1 – 8	15
HPE BladeSystem c7000 enclosure	PS 2	Side B PDU 2	L2 – 8	16
HPE BladeSystem c7000 enclosure	PS 3	Side B PDU 2	L1 – 8	17
HPE BladeSystem c7000 enclosure	PS 4	Side A PDU 2	L1 – 8	18
HPE BladeSystem c7000 enclosure	PS 5	Side A PDU 2	L2 – 8	19
HPE BladeSystem c7000 enclosure	PS 6	Side A PDU 1	L1 – 8	20

Preparing to Install and Configure the HPE Converged Architecture 700 with HPE Nimble Storage

The Configuration Worksheet

[Appendix A: Configuration Worksheet](#) on page 97 lists the variables that are required to complete the tasks in this deployment guide. Before beginning the deployment of the HPE Converged Architecture 700 with HPE Nimble Storage, ensure that the configuration worksheet is completed with the correct and validated values. You are free to expand the configuration worksheet to suit your needs.

Fully Qualified Domain Names Versus IP Addresses

All components that are deployed with the HPE Converged Architecture 700 with HPE Nimble Storage must have correct forward and reverse domain name system (DNS) entries in the network DNS server. This guide assumes that the site where the solution will be deployed already has a DNS server and that the server configuration will be modified to accommodate the solution. It is also possible to deploy and configure a DNS server specifically for use with this solution; however, the deployment steps for a DNS server are not covered in the guide.

Throughout the guide, when you are asked to enter the IP address of a component, you can usually use the DNS name or the fully qualified domain name (FQDN) of the component instead. Although you can use just IP addresses, HPE recommends that you use the FQDNs of the components whenever possible. In addition, FQDNs are required for configuring the VMware components. The solution requires a valid DNS server with host name entries for every component, even if you use only IP addresses.

Resources for Automation Efforts

This deployment guide covers the manual steps that are required to build a verified configuration of the HPE Converged Architecture 700 with HPE Nimble Storage. The guide does not cover automation, except for the automation that is built into products; for example, HPE OneView for VMware vCenter Enhanced Grow Cluster.

Libraries that can be used for automation efforts (such as REST, Python, Java, and PowerShell libraries) are available for most of the components of the solution. You can use these resources to streamline deployments.

HPE OneView

[HPE OneView API Reference and HP OneView 3.0 REST API Reference](#)

[HPE OneView REST API scripting help](#)

[HPE OneView SDK and Libraries on GitHub](#)

HPE Insight Control server provisioning

HPE Insight Control server provisioning API Reference:

https://<<icsp_mgmt_ip>>/api-docs/current/#about

Note To access this reference, you must be logged in to a deployed instance of HPE ICsp.

[HPE Insight Control server provisioning SDK and Libraries on GitHub](#)

HPE Integrated Lights Out

[iLO RESTful API Data Management Model Reference \(iLO 4\)](#)

[Managing Hewlett Packard Enterprise Servers Using the RESTful API](#)

[HPE Integrated Lights Out SDK and Libraries on GitHub](#)

HPE Nimble Storage Array

API documentation is available on the [HPE InfoSight](#) documentation portal (login required).

VMware

[VMware API and SDK Documentation](#)

Connecting to the Components in the Solution

As you deploy the HPE Converged Architecture 700 with HPE Nimble Storage solution, you will need to connect to various components. Use the information in this section for guidance on how to connect to a specific component during the solution build or as a general reference.

HPE iLO

Use this procedure to log in to the HPE Integrated Lights-Out (iLO) of an HPE ProLiant server.

Procedure

- 1 Open a web browser and navigate to the iLO to which you want to connect.
For example, to connect to the iLO of the first management server, navigate to **https://<<mgmt_server_1_ilo_ip>>**.
- 2 Accept any security warnings to continue to the website.
- 3 Log in with the user name **admin** and the password **<<mgmt_server_ilo_password>>**.
- 4 To access the Integrated Remote Console, click the **.NET** link or the **Java** link on the Overview page.

HPE Onboard Administrator

Use this procedure to log in to the active HPE Onboard Administrator of an enclosure.

Procedure

- 1 Using a web browser, navigate to **https://<<enclosure_1_oa_1_ip>>**.
- 2 Accept any security warnings to continue to the website.
- 3 Log in with the user name **admin** and the password **<<enclosure_1_password>>**.
- 4 Alternatively, connect to the Onboard Administrator CLI through an SSH connection, using PuTTY, TeraTerm, or another SSH client.

Network Switches

How you connect to the network switches depends on whether networking has been configured on them. A serial connection is always possible. If the switch is available on the network, you can use an SSH connection instead of a serial connection.

Procedure

- 1 Connect a serial cable between the deployment PC and the switch.
- 2 Using a terminal emulation program that supports serial connections (for example, TeraTerm), select the correct serial port.
- 3 Configure the port settings for 9600 baud, 8 bits, no parity, 1 stop bit, and no flow control.
- 4 Log in:

- If the switch has not been configured yet, there is no user name and password.
 - If the switch has been configured, the **admin** password is `<<net_switch_admin_password>>`.
- 5 If the switch has been configured and you want to connect through SSH, open an SSH connection to the switch by using an SSH client, such as TeraTerm, and log in with the user name **admin** and the password `<<net_switch_admin_password>>`.

VMware Host Client

Use this procedure to open the VMware Host Client to manage a local VMware ESXi node.

Procedure

- 1 Open a web browser on the management workstation and navigate to the ESXi node management IP address; for example, `<<mgmt_server_1_ip>>`.
- 2 Accept any security warnings to continue to the website.
- 3 Click **Open the VMware Host Client**.
- 4 Log in with the user name **root** and the password `<<mgmt_server_root_password>>`.
- 5 Clear the **Join CEIP** checkbox and click **OK**.

VMware vSphere Client for Windows

You must download and install the vSphere Client for Windows application so that you can use it to connect to VMware hosts or to vCenter.

Procedure

- 1 Download the client:
 - a Using a web browser, navigate to <http://vsphereclient.vmware.com/vsphereclient/5/1/1/2/5/0/8/VMware-viclient-all-6.0.0-5112508.exe>.
 - b Download and install the vSphere Client for Windows.

You will later use the vSphere Web Client for administration tasks, but the thick client installed in this step is used to ease installation.
 - c After you download and install the thick client, run the application.

A shortcut to the vSphere Client for Windows may have been added to the desktop.
- 2 Connect to a VMware host:
 - a In the vSphere Client application, enter the IP address or the host name for the host; for example, `<<mgmt_server_1_ip>>`.
 - b Log in with the user name **root** and the password `<<mgmt_server_root_password>>`.
 - c Click **Login**.
- 3 Connect to the VMware vCenter instance:
 - a Enter the IP address or the FQDN for vCenter; for example, `<<vcenter_fqdn>>`.
 - b Log in with the user name **administrator@<<mgmt_net_domain_name>>** and the password `<<vcenter_administrator_password>>`.

VMware vSphere Web Client

Use this procedure to connect to the vSphere Web Client.

Procedure

- 1 Open a web browser and navigate to `https://<<vcenter_fqdn>>/vsphere-client`.

- 2 Accept any certificate warnings.
- 3 Log in with the user name **administrator@<<mgmt_net_domain_name>>** and the password **<<vcenter_administrator_password>>**.

VMware vCenter Server Appliance Web Console

Use this procedure to connect to the VMware vCenter Server Appliance web console.

Procedure

- 1 Open a web browser and navigate to **https://<<vcenter_mgmt_ip>>:5480**.
- 2 Log in with the user name **root**.
- 3 Enter the password:
 - The first time that you log in to the web console, the default password is **vmware**.
 - Otherwise, the password is **<<vcenter_root_password>>**.

VMware VM Console: vSphere Web Client

Use this procedure to open a VM console from the vSphere Web Client.

Procedure

- 1 Log in to the vSphere Web Client.
- 2 From the Home page, click **VMs and Templates**.
- 3 In the left pane, expand the data tree to display the VM for which you want to open the console.
- 4 Click the VM to select it:
 - a Click the **Summary** tab for the VM.
 - b Click **Launch Console**.

You may have to allow pop-up windows in the browser for the console window to open.

 - c Accept any security warnings in the new browser window or tab that opens.

VMware VM Console: vSphere Client for Windows

Use this procedure to open a VM console from the vSphere Client for Windows.

Procedure

- 1 Log in to the vSphere Client for Windows.
- 2 From the Home page, click **VMs and Templates**.
- 3 In the left pane, expand the data tree to display the VM for which you want to open the console.
- 4 Right-click the VM and choose **Open Console**:
 - a To enter console commands, click anywhere in the console window or use the mouse in the console.
 - b To release the keyboard and the mouse from the console, press and release Ctrl+Alt.
 - c To send a Ctrl+Alt-Del sequence to the VM, click **VM > Guest > Send Ctrl+Alt+Del** from the console toolbar.

HPE OneView Web Administration Portal

Use this procedure to log in to the HPE OneView Web Administration Portal.

If you are uploading a file to HPE OneView, such as a patch update or the HPE Service Pack for ProLiant, do not use Microsoft Internet Explorer to upload the update package because this browser cannot handle large file sizes. Use Google Chrome or Mozilla Firefox to complete this setup.

Procedure

- 1 Using a web browser, navigate to **https://<<oneview_fqdn>>**.
- 2 Accept any security warnings to continue to the website.
- 3 Log in with the user name **Administrator** and the password **<<oneview_administrator_password>>**.

HPE OneView for vCenter Plugin Administrator Console

Use this procedure to log in to the HPE OneView for vCenter Plugin Administrator Console.

Procedure

- 1 Open a web browser and navigate to **https://<<ov4vc_fqdn>>/ui/index.html**.
- 2 Accept any security warnings to continue to the website.
- 3 Log in with the user name **Admin** and the password **<<ov4vc_admin_password>>**.

NimbleOS CLI

Use this procedure to access the NimbleOS CLI through SSH.

Procedure

- 1 Open a terminal emulator that supports SSH connections and connect to **<<nimble_fqdn>>**.
- 2 Log in with the user name **admin** and the password **<<nimble_adm_pwd>>**.

NimbleOS GUI

Use this procedure to log in to the NimbleOS GUI.

Procedure

- 1 Open a web browser and navigate to **https://<<nimble_fqdn>>**.
- 2 Accept any security warnings to continue to the website.
- 3 Log in with the user name **admin** and the password **<<nimble_adm_pwd>>**.

HPE Insight Control Server Provisioning Web Administration Page

Use this procedure to log in to the HPE ICsp Web Administration page.

Procedure

- 1 Open a web browser and navigate to **https://<<icsp_fqdn>>**.
- 2 Accept any security warnings to continue to the website.
- 3 Log in with the user name **Administrator** and the password **<<icsp_administrator_password>>**.

Configuring the Ethernet Network

The HPE Converged Architecture 700 with HPE Nimble Storage described in this deployment guide has been tested with the HPE FlexFabric 5940-4Slot switch. The HPE FlexFabric 5940-slot-2QSFP+ switch can also be leveraged for deployments, but those steps are not documented in the guide.

These procedures describe how to configure the HPE FlexFabric 5940-4Slot switches for use in a base HPE Converged Architecture 700 environment. Before configuring the switches, ensure that they are running the HPE Comware version specified in [Validated Software and Firmware Levels](#) on page 12. A base HPE Converged Architecture 700 deployment must use a minimum of two network switches of this model.

Set Up IRF Configuration

The procedure for configuring the Intelligent Resilient Framework (IRF) begins at switch A, moves to switch B, and concludes back at switch A.

Procedure

- 1 Starting at the serial port of HPE FlexFabric 5940-4Slot switch A, configure the switch.

At initial boot and connection to the serial or console port of the switch, the Comware setup should automatically start and attempt to enter automatic configuration.

Note When instructions call for network configuration in *system-view* context, if you are at the **<HPE>** prompt, issue the **system-view** command to get to the **[HPE]** prompt.

```
Startup configuration file does not exist.
Started automatic configuration, press CTRL_C or CTRL_D to break.

Automatic configuration attempt: 1.
Not ready for automatic configuration: no interface available.
Waiting for the next...

Automatic configuration attempt: 2.
Interface used: M-GigabitEthernet0/0/0.
Enable DHCP client on M-GigabitEthernet0/0/0.
M-GigabitEthernet0/0/0 failed to obtain IP address.
Interface used: Vlan-interfaces1.
Enable DHCP client on Vlan-interfaces1.
Vlan-interfaces1 failed to obtain IP address.
Waiting for the next... Line aux0 is available.
Press ENTER to get started.
<HPE> system-view
System View: return to User View with Ctrl+Z.
```

- 2 Configure the IRF ports.

```
[HPE] interface range FortyGigE 1/1/7 to FortyGigE 1/1/8
[HPE-if-range] shutdown
[HPE-if-range] quit

[HPE] irf-port 1/1
[HPE-irf-port1/1] port group interface FortyGigE 1/1/7
[HPE-irf-port1/1] port group interface FortyGigE 1/1/8
[HPE-irf-port1/1] quit

[HPE] save
```

```
The current configuration will be written to the device. Are you sure? [Y/N]:y
Please input the file name(*.cfg)[flash:/startup.cfg]
(To leave the existing filename unchanged, press the enter key):
```

3 Moving to the serial port of HPE FlexFabric 5940-4Slot switch B, configure the switch.

```
Startup configuration file does not exist.
Started automatic configuration, press CTRL_C or CTRL_D to break.

Automatic configuration attempt: 1.
Not ready for automatic configuration: no interface available.
Waiting for the next...

Automatic configuration attempt: 2.
Interface used: M-GigabitEthernet0/0/0.
Enable DHCP client on M-GigabitEthernet0/0/0.
M-GigabitEthernet0/0/0 failed to obtain IP address.
Interface used: Vlan-interfacel.
Enable DHCP client on Vlan-interfacel.
Vlan-interfacel failed to obtain IP address.
Waiting for the next...

Line aux0 is available.
Press ENTER to get started.
<HPE> system-view
System View: return to User View with Ctrl+Z.
```

4 Change the IRF member ID and reboot the switch.

```
[HPE] irf member 1 renumber 2
Renumbering the member ID may result in configuration change or loss.
Continue?[Y/N] y

[HPE] save
The current configuration will be written to the device. Are you sure? [Y/N]:y
Please input the file name(*.cfg)[flash:/startup.cfg]
(To leave the existing filename unchanged, press the enter key):
Validating file. Please wait...
Saved the current configuration to mainboard device successfully.
[HPE] quit
<HPE> reboot
Start to check configuration with next startup configuration file, please
wait.....DONE!
This command will reboot the device.
Continue? [Y/N]:y
Now rebooting, please wait...
```

5 When the switch reboot is complete, configure the IRF ports.

```
<HPE> system-view

[HPE] interface range FortyGigE 2/1/7 to FortyGigE 2/1/8
[HPE-if-range] shutdown
[HPE-if-range] quit

[HPE] irf-port 2/2
[HPE-irf-port2/2] port group interface FortyGigE 2/1/7
[HPE-irf-port2/2] port group interface FortyGigE 2/1/8
[HPE-irf-port2/2] quit

[HPE] irf-port-configuration active
```

```
[HPE] interface range FortyGigE 2/1/7 to FortyGigE 2/1/8
[HPE-if-range] undo shutdown
[HPE-if-range] quit

[HPE] save
The current configuration will be written to the device. Are you sure? [Y/N]:y
Please input the file name(*.cfg)[flash:/startup.cfg]
(To leave the existing filename unchanged, press the enter key):
flash:/startup.cfg exists, overwrite? [Y/N]:y
Validating file. Please wait...
Saved the current configuration to mainboard device successfully.
[HPE]
```

6 Back at HPE FlexFabric 5940-4Slot switch A, enable the IRF ports on switch A.

```
<HPE> system-view
[HPE] irf-port-configuration active

[HPE] interface range FortyGigE 1/1/7 to FortyGigE 1/1/8
[HPE-if-range] undo shutdown
[HPE-if-range] quit
```

7 Allow switch B to reboot to merge into the IRF fabric.

From this point on, all configurations happen only on switch A. No further configuration is needed on switch B because the control and management planes have been merged as part of the IRF configuration.

Configure Multi-Active Detection and Remote Access to the Switch

HPE recommends implementing a multi-active detection (MAD) mechanism, which is useful for these purposes:

- To detect the presence of multiple identical IRF fabrics
- To handle collisions
- To recover from faults in the unlikely event of an IRF split or failure

For more information, see the [HPE FlexFabric 5940 IRF Configuration Guide](#). This guide explains how to use the management links to configure MAD Bidirectional Forwarding Detection (BFD).

Note The switch configuration code in this procedure does not include switch prompts.

Procedure

1 From system view, run the following commands, substituting the values from the configuration worksheet.

```
interface M-GigabitEthernet 0/0/0
ip address <<net_switch_mgmt_ip>> <<mgmt_net_netmask>>
mad bfd enable
mad ip address <<net_switch1_mad_ip>> <<mad_net_netmask>> member 1
mad ip address <<net_switch2_mad_ip>> <<mad_net_netmask>> member 2
quit

ip route-static 0.0.0.0 0.0.0.0 <<mgmt_net_gw>>

local-user admin
password simple <<net_switch_admin_password>>
authorization-attribute user-role network-admin
service-type ssh terminal
quit
```

```
ssh server enable

user-interface vty 0 63
 authentication-mode scheme
 protocol inbound ssh
 quit

user-interface aux 0 1
 authentication-mode scheme
 quit

save
```

- 2 Create the public keys on the switch.

```
public-key local create rsa
Input the modulus length [default = 1024]:Enter

public-key local create dsa
Input the modulus length [default = 1024]:Enter

public-key local create ecdsa secp256r1
```

- 3 Open an SSH session to the switch by using **<<net_switch1_mgmt_ip>>**, the user name **admin**, and the password **<<net_switch_admin_password>>**.

Configure IRF Priority

Configure the domain and IRF parameters. The **<<net_switch_domain_id>>** value is an arbitrary number, but it must be unique from other IRF domains.

Procedure

- 1 From system view, run the following commands:

```
irf domain <<net_switch_domain_id>>

irf member 1 priority 32
irf member 2 priority 30

irf mac-address persistent always
```

Convert the Chassis Working Mode

To configure the interfaces and the switch to use Fibre Channel (FC) or Fibre Channel over Ethernet (FCoE), you must convert the system working mode. Before running the commands, ensure that both switches are merged into the IRF fabric.

Procedure

- 1 From system view, run the following commands:

```
system-working-mode advance
Do you want to change the system working mode? [Y/N]:y
The system working mode is changed, please save the configuration and reboot
```

```
the system to make it effective.  
  
return  
save  
reboot
```

Configure NTP

Configure Network Transport Protocol (NTP) on the switch.

Procedure

- 1 From system view, run the following commands:

```
clock protocol none  
return  
  
clock datetime 13:28:00 02/17/2016  
system-view  
  
ntp-service unicast-server <<mgmt_net_ntp1>> priority  
clock protocol ntp  
  
save
```

Configure VLANs

To create the necessary VLANs, perform this procedure on both switches.

Procedure

- 1 From system view, run the following commands:

```
vlan <<mgmt_net_vlan>>  
name MGMT-VLAN  
quit  
  
vlan <<deployment_net_vlan>>  
name Native-Deployment-VLAN  
quit  
  
vlan <<mgmt_vmotion_net_vlan>>  
name MGMT-vMotion-VLAN  
quit  
  
vlan <<mgmt_ft_net_vlan>>  
name MGMT-FT-VLAN  
quit  
  
vlan <<compute_vmotion_net_vlan>>  
name Compute-vMotion-VLAN  
quit  
  
vlan <<compute_ft_net_vlan>>  
name Compute-FT-VLAN  
quit
```

```

vlan <<vm_production_net_1_vlan>>
  name VM-Production-VLAN1
  quit

vlan <<fcoe_san_a_vlan>>
  name FCoE-SAN-A-VLAN
  description FCOE SAN A (VSAN <<net_fcoe_vsan_a_id>>)
  quit

vlan <<fcoe_san_b_vlan>>
  name FCoE-SAN-B-VLAN
  description FCOE SAN B (VSAN <<net_fcoe_vsan_b_id>>)
  quit

save

```

Convert Interfaces to Use the FC Protocol

Convert the needed ports to serve as FC ports.

Procedure

- 1 From system view, run the following command:

```

interface range Ten-GigabitEthernet 1/2/1 to Ten-GigabitEthernet 1/2/6
Ten-GigabitEthernet 2/2/1 to Ten-GigabitEthernet 2/2/6
port-type fc

```

Add Individual Port Descriptions for Troubleshooting

Add individual port descriptions for troubleshooting activity and verification. The following examples use a single HPE Nimble Storage array with dual controllers.

Procedure

- 1 From system view, run the following commands:

```

interface FortyGigE 1/1/1
  description <<enclosure_1_name>>-VC1:Q1
  quit
interface FortyGigE 1/1/2
  description <<enclosure_1_name>>-VC1:Q2
  quit

interface FortyGigE 2/1/1
  description <<enclosure_1_name>>-VC2:Q1
  quit
interface FortyGigE 2/1/2
  description <<enclosure_1_name>>-VC2:Q2
  quit

interface FortyGigE 1/1/7
  description Switch1-IRF-Switch2-IRF-2/1/7
  quit
interface FortyGigE 1/1/8

```

```

description Switch1-IRF-Switch2-IRF-2/1/8
quit
interface FortyGigE 2/1/7
description Switch2-IRF-Switch1-IRF-1/1/7
quit
interface FortyGigE 2/1/8
description Switch2-IRF-Switch1-IRF-1/1/8
quit

interface Fc1/2/13
description <<nimble_system_name>> CA-fc5
quit
interface Fc1/2/14
description <<nimble_system_name>> CA-fc9
quit
interface Fc1/2/15
description <<nimble_system_name>> CB-fc5
quit
interface Fc1/2/16
description <<nimble_system_name>> CB-fc9
quit

interface Fc2/2/13
description <<nimble_system_name>> CA-fc6
quit
interface Fc2/2/14
description <<nimble_system_name>> CA-fc10
quit
interface Fc2/2/15
description <<nimble_system_name>> CB-fc6
quit
interface Fc2/2/16
description <<nimble_system_name>> CB-fc10
quit

interface Ten-GigabitEthernet 1/2/1
description <<mgmt_server_1_hostname>>-LOM1
quit
interface Ten-GigabitEthernet 1/2/2
description <<mgmt_server_2_hostname>>-LOM1
quit
interface Ten-GigabitEthernet 2/2/1
description <<mgmt_server_1_hostname>>-LOM2
quit
interface Ten-GigabitEthernet 2/2/2
description <<mgmt_server_2_hostname>>-LOM2
quit

save

```

Configure Global FCoE Parameters

Before you enable the FCoE mode, you must configure quality of service (QoS) for Data Center Bridging Exchange (DCBX) on the switch. Configuring QoS for DCBX prevents FCoE traffic in the switch from being blocked and ensures that the FCoE traffic is lossless.

Procedure

- 1 On the switch, run the following commands from system view to configure the Enhanced Transmission Selection local precedence QoS table.

Set level 3 traffic (critical applications) to the highest level to ensure that FCoE traffic is given the highest priority.

```
qos map-table dot1p-lp
import 0 export 0
import 1 export 0
import 2 export 0
import 3 export 1
import 4 export 0
import 5 export 0
import 6 export 0
import 7 export 0
quit
```

- 2 Create an access control list (ACL) in the switch to allow FCoE (Ethernet protocol number 0x8906) packets and FCoE Initiation Protocol (FIP) (Ethernet Protocol 0x8914) packets to pass through the switch.

This rule is also applied to the DCBX traffic classifier (created in a later step). FCoE and FIP packets on the switch receive the highest priority because they are mapped to 802.1p priority value 3.

```
acl number 4000 name DCBX
rule 0 permit type 8906 ffff
rule 5 permit type 8914 ffff
quit
```

- 3 Create a traffic classifier rule called *DCBX* with the operator class *or* and map it to ACL 4000, which you created in the previous step.

```
traffic classifier DCBX operator or
if-match acl 4000
quit
```

- 4 Create a traffic behavior named *DCBX* and configure it to mark packets with an 802.1p priority of 3.

```
traffic behavior DCBX
remark dot1p 3
quit
```

- 5 Create a QoS policy that associates the traffic classifier created in step 3 with the traffic behavior created in step 4, and specify that this classifier-behavior mode is associated with *DCBX*.

```
qos policy DCBX
classifier DCBX behavior DCBX mode dcbx
quit

save
```

Configure the Interface FCoE Parameters

To enable FCoE traffic to be passed to the CNAs of the management servers and to each enclosure, you must configure the interface with LLDP, DCBX support, and the QoS policy that you created earlier.

Procedure

- 1 In system view, configure priority flow control and spanning tree:
 - To prevent FCoE packets from being dropped, enable priority flow control and ensure that any packet with the dot1p classifier of 3 is not dropped and is forwarded.

- Set the interfaces to edge ports in spanning tree so that these ports can directly transition to the forwarding state in the spanning tree topology if spanning tree is enabled on the switch.

```
interface range FortyGigE 1/1/1 to FortyGigE 1/1/3 FortyGigE 2/1/1 to FortyGigE
2/1/3 Ten-GigabitEthernet 1/2/17 to Ten-GigabitEthernet 1/2/18
Ten-GigabitEthernet 2/2/17 to Ten-GigabitEthernet 2/2/18
priority-flow-control auto
priority-flow-control no-drop dot1p 3
qos trust dot1p
stp edged-port
```

- 2 While still on the interface range from step 1, run the following commands in system view to configure LLDP and DNCX TLV advertising on the interfaces:

```
lldp tlv-enable dot1-tlv dcbx
qos apply policy DCBX outbound
```

- 3 While still on the interface range from step 1, run the following commands in system view to enable weighted round robin (WRR) on the interfaces:

- Set 50% of the bandwidth to networking for best effort (be).
- Set 50% of the bandwidth to storage traffic for assured forwarding (af1).
- Set the rest of the WRR values to strict priority because they are not being used.

```
qos wrr be group 1 byte-count 5
qos wrr af1 group 1 byte-count 5
qos wrr af2 group sp
qos wrr af3 group sp
qos wrr af4 group sp
qos wrr ef group sp
qos wrr cs6 group sp
qos wrr cs7 group sp
quit

save
```

Configure the FCoE Mode and VSANs

Enable FCoE mode on the switch, set it to Fibre Channel forwarder (FCF) mode, create the VSANs for FCoE SAN A and FCoE SAN B, and attach them to the appropriate VLAN IDs.

Procedure

- 1 In system view, set the FCoE mode to FCF.

```
fcoe-mode fcf
```

- 2 Create the VSAN for FCoE SAN A and set the domain ID.

```
vsan <<net_fcoe_vsan_a_id>>
domain-id <<net_fcoe_vsan_a_domain_id>> preferred
Non-disruptive reconfiguration or isolating the switch may be performed.
Continue? [Y/N]:y
quit
```

3 Create the VSAN for FCoE SAN B and set the domain ID.

```
vsan <<net_fcoe_vsan_b_id>>
  domain-id <<net_fcoe_vsan_b_domain_id>> preferred
  Non-disruptive reconfiguration or isolating the switch may be performed.
  Continue? [Y/N]:y
quit
```

4 Associate the VSAN for FCoE SAN A with the VLAN for SAN A.

```
vlan <<fcoe_san_a_vlan>>
  fcoe enable vsan <<net_fcoe_vsan_a_id>>
quit
```

5 Associate the VSAN for FCoE SAN B with the VLAN for SAN B.

```
vlan <<fcoe_san_b_vlan>>
  fcoe enable vsan <<net_fcoe_vsan_b_id>>
quit
```

Add FC Interfaces to the Appropriate VSANs

Associate all FC interfaces on HPE FlexFabric 5940-4Slot switch A with the VSAN for FCoE SAN A and all FC interfaces on HPE FlexFabric 5940-4Slot switch B with the VSAN for FCoE SAN B.

Procedure**1 In system view, associate the FC interfaces on HPE FlexFabric 5940-4Slot switch A with the VSAN for FCoE SAN A.**

```
interface range Fc 1/2/1 to Fc 1/2/12
  port access vsan <<net_fcoe_vsan_a_id>>
```

2 Associate the FC interfaces on HPE FlexFabric 5940-4Slot switch B with the VSAN for FCoE SAN B.

```
interface range Fc 2/2/1 to Fc 2/2/12
  port access vsan <<net_fcoe_vsan_b_id>>
```

Configure SNMPv3

Configure SNMPv3 on the switches to enable HPE OneView to manage them.

Procedure**1 In system view, run the following commands to configure SNMPv3:**

```
snmp-agent
snmp-agent community read <<net_snmp_ro_string>>
snmp-agent sys-info contact <<net_snmp_contact_info>>
snmp-agent sys-info location HPE CA700 <<net_switch1_hostname>>
snmp-agent sys-info version v3
snmp-agent group v3 admin write-view <<net_snmp_wr_string>>
snmp-agent mib-view included SolutionRW iso
snmp-agent mib-view included SolutionRW snmp
snmp-agent mib-view included view1 iso
```

```
snmp-agent usm-user v3 <<net_snmp_user>> user-role network-admin simple
authentication-mode sha <<net_snmp_user_password>> privacy-mode aes128
<<net_snmp_user_password>>

save
```

Create Bridge Aggregations

Configure bridge aggregations for each enclosure and each management server.

Procedure

- 1 In system view, create a bridge aggregation for each Virtual Connect module in each enclosure.

```
interface Bridge-Aggregation 111
 link-aggregation mode dynamic
 description <<enclosure_1_name>>-VC1
 quit

interface Bridge-Aggregation 112
 link-aggregation mode dynamic
 description <<enclosure_1_name>>-VC2
 quit

interface range name <<enclosure_1_name>> interface Bridge-Aggregation111
 Bridge-Aggregation112
 quit

interface range FortyGigE 1/1/1 to FortyGigE 1/1/3
 port link-aggregation group 111
 quit

interface range FortyGigE 2/1/1 to FortyGigE 2/1/3
 port link-aggregation group 112
 quit

interface range name <<enclosure_1_name>>
 port link-type trunk
 undo port trunk permit vlan 1
 port trunk pvid vlan <<deployment_net_vlan>>
 port trunk permit vlan <<deployment_net_vlan>> <<mgmt_net_vlan>>
 <<compute_vmotion_net_vlan>> <<compute_ft_net_vlan>>
 <<vm_production_net_1_vlan>>
 quit
```

- 2 Add the appropriate FCoE VLAN to the appropriate bridge aggregation for the enclosure.

Note At this point, you are adding only the VLANs: The VLAN for SAN A is added to Bridge-Aggregation 111, and the VLAN for SAN B is added to Bridge-Aggregation 112. When you later configure the VSANs, SAN A is isolated to IRF member 1 and SAN B to IRF member 2.

```
interface Bridge-Aggregation 111
 port trunk permit vlan <<fcoe_san_a_vlan>>
 quit

interface Bridge-Aggregation 112
 port trunk permit vlan <<fcoe_san_b_vlan>>
 quit
```

3 Create a bridge aggregation for each management server.

```

interface Bridge-Aggregation 11
  description <<mgmt_server_1_hostname>>
  quit

interface Bridge-Aggregation 12
  description <<mgmt_server_2_hostname>>
  quit

interface range name mgmt_servers interface Bridge-Aggregation11
Bridge-Aggregation12
  quit

interface range Ten-GigabitEthernet 1/2/17 Ten-GigabitEthernet 2/2/17
  port link-aggregation group 11
  quit

interface range Ten-GigabitEthernet 1/2/18 Ten-GigabitEthernet 2/2/18
  port link-aggregation group 12
  quit

interface range name mgmt_servers
  port link-type trunk
  undo port trunk permit vlan 1
  port trunk pvid vlan <<deployment_net_vlan>>
  port trunk permit vlan <<deployment_net_vlan>> <<mgmt_net_vlan>>
<<mgmt_vmotion_net_vlan>> <<fcoe_san_a_vlan>> <<fcoe_san_b_vlan>>
  quit

save

```

Note The bridge aggregations created in this procedure do not become fully operational until the management and compute servers are deployed with VMware vSphere.

Uplink into the Existing Network Infrastructure

Depending on the available network infrastructure, several methods and features can be used to uplink the HPE Converged Architecture 700 with HPE Nimble Storage environment. HPE recommends using bridge aggregations to uplink the HPE FlexFabric 5940-4Slot switches into the infrastructure.

The preceding procedures can be used to create an uplink bridge aggregation to the existing environment. After the configuration is complete, be sure to run the **save** command to save the configuration on each switch.

Configuring the Computing Infrastructure and the Management Servers

To deploy the computing infrastructure and the management servers, complete the following tasks:

- Configure iLO on the ProLiant rack servers (and apply the iLO Advanced licenses, if necessary).
- Configure the c7000 enclosures.
- Build the management servers and install the hypervisor.
- Configure the management servers after the hypervisor installation.
- Deploy the VMware vCenter management appliance.
- Build the management VM.

Configuring iLO

You must manually set up the iLO configuration on all ProLiant DL rack servers in the solution to assign each of these servers an iLO IP address. The manual configuration process also adds an `admin` user to the iLO environment to manage the solution. The purpose of adding this user is to allow the default administrator account and password to remain unaltered.

Before starting to configure iLO, ensure that all firmware components are at the levels specified in [Validated Software and Firmware Levels](#) on page 12.

Note The iLO Advanced licenses might have been installed in the HPE factory, depending on how you purchased your HPE OneView licensing. Perform the steps to install the iLO Advanced licenses only if they are not already installed.

Install iLO Advanced Licenses

If the iLO Advanced licenses were not installed in the factory, perform the steps in this procedure. You must install the licenses before proceeding with the iLO configuration.

The following figure shows an example of an iLO Advanced license key:

- The information highlighted in yellow is the HPE part number that identifies whether this is a key for the DL server platform. In this example, `E5Y43A` is the part number for the "HPE OneView for ProLiant DL Server, including 3years 24x7 Support FIO Bundle Physical 1 Server" license.
- The information highlighted in green is the iLO Advanced license key string that you must enter into the iLO of the server.

Figure 5: Example of an HPE OneView key (with iLO)

```
QCTG XXXX XXXX KHXX XXXX XXXX Y9JL XXXX XXXX XXXX DXAU XXXX XXXX L762 XXXX XXXX XXXX D5KM
GFVW XXXX XXXX XXXX SPCM XXXX XXXX HWRR M3UC XXXX XXXX LHJQ XJUL LUQH ZUWD 9AAC XXXX CEJC
5S86 FC4X EKSZ XXXX XZLU FMXS FKS6 XXXX 4NMU XXXX N82E Z2HX DT3H XXXX 29JK 29MC
"E5Y43ATESTORDER E5Y43A HP_OV_3yr_24x7_Supp_FIO_Bundle_Physical_1_Svr_Lic 4U7JJHAA3Y4A" XXXXX -
XXXXX - XXXXX - XXXXX - XXXXX
```

Procedure

- 1 Locate the HPE OneView iLO license keys from the paper documentation for each rack server.
- 2 Manually enter each license key into the iLO of that respective server to enable advanced features, such as the remote console and the Virtual Media components.

Connect to the iLO and Enter RBSU

Procedure

- 1 Connect the keyboard and monitor to the first ProLiant DL rack server.
- 2 Power up the server.
- 3 Press F9 when the server POST displays `F9 System Utilities` at the bottom of the screen.
- 4 Select **System Configuration** and press Enter.
- 5 Select **BIOS/Platform Configuration (RBSU)** and press Enter.

Configuring the HPE c7000 Enclosures

To configure the HPE BladeSystem c7000 chassis, complete the following tasks:

- Configure the basic network parameters for the enclosures.
- Continue to configure the enclosure settings through HPE Onboard Administrator.
- Configure IP addressing for the enclosure bays.
- Create an administrator user for each iLO.

You must repeat the procedures in this chapter for each HPE BladeSystem c7000 in the solution.

Assign IP Addresses to the HPE c7000 Enclosures from the HPE Insight Display

Use this procedure to configure the basic network parameters for each enclosure from the Insight Display panel on the front of the c7000 enclosures.

Figure 6: Insight Display panel located on the front of the c7000 enclosures



Procedure

- 1 Starting with the first enclosure in the first compute rack, press **OK** to activate the Insight Display on the front of the enclosure.
- 2 Use the arrow buttons to scroll to **Enclosure Settings** and press **OK**.
- 3 Scroll to **OA1 IPV6** and press **OK**.
- 4 Scroll to **OA1 IPV4** and press **OK**.
- 5 Change the network mode from DHCP to **Static** and press **OK**.
- 6 Navigate to **Accept** and press **OK**.
- 7 Set the following parameters:
 - IP address: `<<enclosure_1_oa_1_ip>>`.
 - Subnet mask: `<<mgmt_net_netmask>>`.
 - Default gateway: `<<mgmt_net_gw>>`.
- 8 Navigate to **Accept** and press **OK**.
- 9 Repeat this procedure to set the network information on the other enclosures, substituting the IP address as appropriate.

Configure Enclosures Through HPE Onboard Administrator

After you set the basic network parameters from HPE Insight Display, continue to configure the enclosures through the HPE Onboard Administrator web UI.

Procedure

1 Log in to and configure HPE Onboard Administrator:

- a Connect to the primary HPE Onboard Administrator for the first enclosure.
- b If a security warning appears, choose the option **Continue to this website (not recommended)** to proceed.
- c Log in to HPE Onboard Administrator with the **Administrator** user and the password from the pull tag on the Onboard Administrator module.
- d On the First Time Setup Wizard Welcome page, click **Next**.
- e On the FIPS page, click **Skip**.
- f On the Enclosure Selection page, click **Next**.
- g On the Configuration Management page, click **Skip**.
- h On the Rack and Enclosure Settings page, set the following values, and then click **Next**:
 - Rack name: Enter the appropriate name.
 - Enclosure name: **<<enclosure_1_name>>**.
 - Asset tag (optional): Enter the asset tag for the system, if required.
- i On the Administrator Account Setup page, click **Skip**.

2 Add the admin user:

- a On the Local User Accounts page, click **New**.
- b Set the following values:
 - User name: **admin**.
 - Enter and confirm password: **<<enclosure_1_password>>**.
 - Privilege level: **Administrator**.
 - User permissions pane: Select the **Onboard Administrator Bays** checkbox.
 - Add user: Click **Add User** and add any additional users requested.
- c Back on the Local User Accounts page, click **Next**.
- d On the EBIPA page, click **Skip**.
You will configure the enclosure bay IP addressing (EBIPA) later.
- e On the Directory Groups page, click **Skip**.
- f On the Directory Settings page, click **Skip**.

3 Configure the Onboard Administrator IP address:

- a On the Onboard Administrator Network Settings page, click **Next**.
- b For each Onboard Administrator in the enclosure, ensure that the **Use static IP settings for each active Onboard Administrator** option is selected and that the appropriate settings are specified.

The following example shows the settings for Onboard Administrator 1:

- DNS host name: **<<enclosure_1_oa_1_hostname>>**.
- IP address: **<<enclosure_1_oa_1_ip>>**.
- Subnet mask: **<<mgmt_net_netmask>>**.
- Gateway: **<<mgmt_net_gw>>**.
- DNS server 1: **<<mgmt_net_dns1>>**.

**Active Onboard Administrator Network Settings
(Bay 1)**

☐ DHCP

☐ Enable Dynamic DNS

☒ Static IP Settings

*Required Field **

DNS Host Name:*

MAC Address: 74:46:A0:F9:E4:CD

Domain Name:

IP Address:*

Subnet Mask:*

Gateway:

DNS Server 1:

DNS Server 2:

**Standby Onboard Administrator Network Settings
(Bay 2)**

☐ DHCP

☐ Enable Dynamic DNS

☒ Static IP Settings

*Required Field **

DNS Host Name:*

MAC Address: 10:60:4B:B2:47:07

Domain Name:

IP Address:*

Subnet Mask:*

Gateway:

DNS Server 1:

DNS Server 2:

- c** After you enter the settings, click **Next**, and then click **OK** in the warning message.

If you changed the information for the active Onboard Administrator, you must reconnect to Onboard Administrator.

- d** On the **IPv6** page, clear the selection for the **Enable IPv6** checkbox and click **Next**.

- e** On the **SNMP Settings** page, click **Skip**.

4 Configure the power and finish the wizard:

- a** On the Power Management page, select **AC Redundant** and click **Next**.
- b** On the Finish page, ensure that the **Do not automatically show this wizard again** checkbox is selected, and then click **Finish**.

Configure Enclosure Bay IP Addressing

After the First Time Setup wizard is finished, configure the enclosure bay IP addressing (EBIPA) so that the blade iLOs and the enclosure interconnects can obtain IP addresses.

Procedure

- From the Onboard Administrator left pane, choose **Enclosure Information > Enclosure Bay IP Addressing > IPv4**.
- In the Device tab, enter the IP address, subnet mask, gateway, domain, and DNS server information that is specified in the configuration worksheet for bay 1.

Bay	<input checked="" type="checkbox"/> Enabled	EBIPA Address	Subnet Mask	Gateway	Domain	DNS Servers	Autofill	Current Address
1	<input checked="" type="checkbox"/>	172.28.3.1	255.255.240.0	172.28.15.254	ca700.hpe.net	172.28.11.254 <input type="text"/> <input type="text"/>		172.28.3.1
2	<input checked="" type="checkbox"/>	172.28.3.2	255.255.240.0	172.28.15.254	ca700.hpe.net	172.28.11.254 <input type="text"/> <input type="text"/>		172.28.3.2
3	<input checked="" type="checkbox"/>	172.28.3.3	255.255.240.0	172.28.15.254	ca700.hpe.net	172.28.11.254 <input type="text"/> <input type="text"/>		172.28.3.3
4	<input checked="" type="checkbox"/>	172.28.3.4	255.255.240.0	172.28.15.254	ca700.hpe.net	172.28.11.254 <input type="text"/> <input type="text"/>		N/A
5	<input checked="" type="checkbox"/>	172.28.3.5	255.255.240.0	172.28.15.254	ca700.hpe.net	172.28.11.254 <input type="text"/> <input type="text"/>		172.28.3.5
6	<input checked="" type="checkbox"/>	172.28.3.6	255.255.240.0	172.28.15.254	ca700.hpe.net	172.28.11.254 <input type="text"/> <input type="text"/>		172.28.3.6
7	<input checked="" type="checkbox"/>	172.28.3.7	255.255.240.0	172.28.15.254	ca700.hpe.net	172.28.11.254 <input type="text"/> <input type="text"/>		N/A
8	<input checked="" type="checkbox"/>	172.28.3.8	255.255.240.0	172.28.15.254	ca700.hpe.net	172.28.11.254 <input type="text"/> <input type="text"/>		N/A
9	<input checked="" type="checkbox"/>	172.28.3.9	255.255.240.0	172.28.15.254	ca700.hpe.net	172.28.11.254 <input type="text"/> <input type="text"/>		172.28.3.9

3 Choose the appropriate option to populate the EBIPA information for the other blades:

- If the IP addresses are contiguous for all blades in the enclosure, click **Autofill**.
- If the IP addresses are not contiguous, enter the information for each blade manually.

4 Select the **Enable** checkbox for each blade (or for all blades) as required.

If you used the Autofill option, delete the IP addresses from the blades as appropriate.

5 Click **Apply**.

6 In the Interconnect tab, enter the IP address, subnet mask, gateway, domain, and DNS server information that is specified in the configuration worksheet for the first interconnect.

7 Choose the appropriate option to populate the EBIPA information for the other blades:

- If the IP addresses are contiguous for all blades in the enclosure, click **Autofill**.
- If the IP addresses are not contiguous, enter the information for each blade manually.

8 Select the **Enable** checkbox for each blade (or for all blades) as required.

If you used the Autofill option, delete the IP addresses from the blades as appropriate.

9 Click **Apply**.

10 Log out of the enclosure.

Create Admin Users for All iLOs

This procedure creates an **admin** account with administrative privileges on each blade in the enclosure.

Procedure

- 1 Using a terminal emulation program, open an SSH session to the active Onboard Administrator.
- 2 In the SSH window, set the identifying information for the enclosure:
 - IP address: **<<enclosure_1_oa_1_ip>>**.
 - User name: **admin**.
 - Password: **<<enclosure_1_password>>**.
- 3 Run the following command to create an admin user on the iLO of each blade in the enclosure, replacing **<<blade_ilo_admin_password>>** with the appropriate values:

```
HPONCFG all << end_marker
<RIBCL VERSION="2.0">
<LOGIN USER_LOGIN="adminname" PASSWORD="password">
<USER_INFO MODE="write">
<ADD_USER
USER_NAME="admin"
USER_LOGIN="admin"
PASSWORD="<<blade_ilo_admin_password>>">
<ADMIN_PRIV value="Yes"/>
<REMOTE_CONS_PRIV value="Yes"/>
<RESET_SERVER_PRIV value="Yes"/>
<VIRTUAL_MEDIA_PRIV value="Yes"/>
<CONFIG_ILO_PRIV value="Yes"/>
</ADD_USER>
</USER_INFO>
</LOGIN>
</RIBCL>
end_marker
```

- 4 To exit the Onboard Administrator SSH session, type `exit` and press Enter.

Building the Management Servers and Installing the Hypervisor

The management servers are built manually to host the management infrastructure of the solution. The management server environment is a requirement for deploying and configuring the remaining solution components.

You must use the HPE custom image for VMware ESXi 6.5 for this task. This image is also required later for setting up HPE ICsp and building the compute server blades. Before beginning these procedures, ensure that all firmware components are at the levels specified in [Validated Software and Firmware Levels](#) on page 12.

Note HPE Intelligent Provisioning is not part of the HPE SPP. It is a separate ISO image that must be downloaded and booted from in order for the updates to be applied.

Perform the following procedures on the first management server and then repeat for the second management server in the solution, or, alternatively, perform the procedures in parallel on both management servers simultaneously:

- Configure the HPE Smart Array P440ar RAID level.
- Install VMware vSphere 6.5 on the management servers.

Launch the iLO Remote Console and Power On the Server

Before you can begin configuring the array, you must launch the Integrated Remote Console and power on the server.

Procedure

- 1 Open a connection and log in to the iLO of the first management server.
- 2 Launch the Integrated Remote Console by selecting either **.NET** or **Java** from the Information Overview window.
- 3 If prompted, click **Run** to allow the remote console to open.
- 4 With the server in the powered-off state, power on the server by selecting **Power Switch > Momentary Press**.

Enter Intelligent Provisioning and Configure the Smart Array

Procedure

- 1 Press **F10** when appropriate to enter Intelligent Provisioning.
- 2 If necessary, run through the Intelligent Provisioning setup wizard.
- 3 In the initial Intelligent Provisioning window, click **Perform Maintenance**.
- 4 Select **HPE Smart Storage Administrator (SSA)**.
- 5 Click **Smart Array P440ar** from the Array Controller(s) list under Available Device(s) in the left pane:
 - a Click **Configure** under the Actions list in the right pane.
 - b Click **Create Array** under the Actions list in the right pane.
 - c Select the drives you want to use for the new array and then click **Create Array** in the lower right.
- 6 Select **RAID 1+0** as the RAID level and leave the defaults for the remaining options.
- 7 Click **Create Logical Drive** in the lower right.
- 8 To configure spare drives, click **Manage Spare Drives**:
 - a Select the spare drive type that you want to use.

HPE recommends selecting **Auto Replace Drives** so that drives are automatically added to the RAID array if a drive fails.
 - b Select drives to use as spares.
 - c Click **Save**.
- 9 Confirm the array details and click **Finish**.
- 10 Click the **X** icon in the upper right, and then click **OK** to exit the HPE Smart Storage Administrator.

Continue the Intelligent Provisioning Configuration and Install the Hypervisor

Procedure

- 1 In the OS Selection step, set the following values:
 - OS family: **VMware ESXi/vSphere Custom Image**.
 - Installation: **Customized**.
 - Source media: **Physical DVD**.
- 2 Attach the HPE custom image for VMware ESXi 6.5 through iLO Virtual Media:
 - a On the Remote Console window, choose **Virtual Drives > Image File CD-ROM/DVD** from the iLO options menu bar and navigate to the ISO image located on the deployment system.
 - b Select the image and click **Open**.

3 Click Continue.

Intelligent Provisioning scans the ISO image to ensure that it is a valid ESXi image and displays the warning *Only VMware Custom images should be used*. If the image is the correct HPE custom image for ESXi, you may proceed.

4 In the OS Information step, set the following values:

- Host name: `<<mgmt_server_1_hostname>>`.
- Root password: `<<mgmt_server_root_password>>`.
- Network type: **Static**.
- IP address: `<<mgmt_server_1_ip>>`.
- Subnet mask: `<<mgmt_net_netmask>>`.
- Default gateway: `<<mgmt_net_gw>>`.
- DNS: `<<mgmt_net_dns1>>`.

5 Click Continue.**6 Confirm the presented information and click Continue.**

Intelligent Provisioning installs ESXi on the management server. This process takes several minutes. When the ESXi installation is finished, a message states that the server must be rebooted.

7 Press Enter to reboot the server.

The server reboots and loads the ESXi start screen. Leave the iLO Remote Console window open to continue configuring the host.

8 Repeat this procedure for the other management servers in the configuration.

Configuring the Management Server After Hypervisor Installation

Perform the following procedures on the first management server and then repeat for the second management server in the solution. You may perform these steps in parallel on both management servers simultaneously.

There are three general tasks to accomplish:

- Configure vSphere host parameters through the ESXi host UI.
- Configure vSphere host parameters from the CLI.
- Upload software files to the first management server.

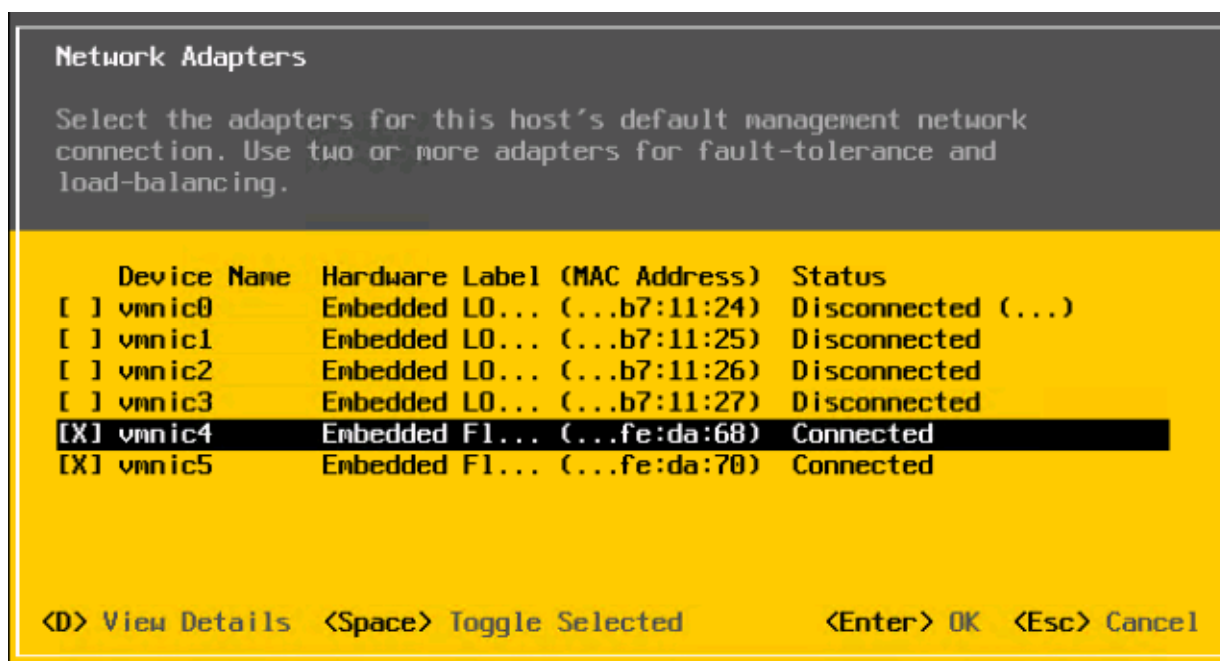
Configure vSphere Host Network Parameters Through the ESXi Host UI

You must configure an ESXi host with access to the management network.

Procedure

- 1** After the server has finished rebooting, press F2 to customize the system.
- 2** Log in as **root**, type the corresponding password, `<<mgmt_server_root_password>>`, and press Enter.
- 3** Select the **Configure the Management Network** option and press Enter.
- 4** Select the **Network Adapters** option and press Enter.
- 5** Select **vmnic4** and **vmnic5**.

These vmnics correspond to the embedded FlexibleLOM ports, and they should display a status of **Connected** if the network cables have been connected and are active.



- 6 Press Enter to confirm the network adapter selections.
- 7 If the management network VLAN is not a native (untagged) VLAN, select **VLAN (optional)** and press Enter.
- 8 Type `<<mgmt_net_vlan>>` and press Enter.
- 9 Select **Custom DNS Suffixes**.
- 10 Type `<<mgmt_net_domain_name>>` and press Enter.
- 11 Press Esc to exit the Configure Management Network submenu.
- 12 Press Y to confirm the changes and return to the main menu.

Configure the vSwitch Failover Policy

You must configure a policy to specify how the vSwitch will handle failover.

Procedure

- 1 From the System Customization menu, choose **Troubleshooting Options** and press Enter.
- 2 Select **Enable ESXi Shell** and press Enter.
- 3 Press Alt and F1 at the same time.
- 4 Log in with the user name **root** and the password `<<mgmt_server_root_password>>`.
- 5 Run the following command to set up the vSwitch load-balancing policy:

```
esxcli network vswitch standard portgroup policy failover set -p "Management Network" -l iphash
```

- 6 Type `exit` to log out of the console.
- 7 Press Alt and F2 at the same time.
- 8 Select **Disable ESXi Shell** and press Enter.
- 9 Press Esc to exit Troubleshooting Options.
- 10 Select **Test Management Network** to verify that the management network is set up correctly, and then press Enter.
- 11 Press Enter to run the test.
- 12 Press Enter to exit the window.

13 Press Esc to log out of the VMware console.

14 Repeat this procedure for the other management servers.

Download the VMware vSphere Client for Windows

Procedure

- 1 Using a web browser, navigate to <http://vsphereclient.vmware.com/vsphereclient/5/1/1/2/5/0/8/VMware-viclient-all-6.0.0-5112508.exe>.
- 2 Download and install the vSphere Client for Windows.

Note This application is downloaded from the VMware website. Therefore, Internet access is required on the management station.

Log in to VMware ESXi Hosts with the VMware vSphere Client for Windows

Log in to each ESXi host with the vSphere Client for Windows.

Procedure

- 1 Open the downloaded VMware vSphere Client for Windows and connect to the first management server.
- 2 Open another instance of the VMware vSphere Client for Windows and connect to the second management server.

Set Up VMkernel Ports and Virtual Switches

You must set up the VMkernel ports and virtual switches on each management server.

Procedure

- 1 From the vSphere Client, click the host in the inventory.
- 2 Click the **Configuration** tab and, in the Hardware pane, click **Networking**.
- 3 On the right side of **vSwitch0**, click **Properties**:
 - a From the Ports tab, select **vSwitch** and click **Edit**.
 - b From the General tab, change the MTU to **9000**.
 - c From the NIC Teaming tab, change load balancing to **Route based on IP Hash**.
 - d Ensure that both **vmnic4** and **vmnic5** are in the Active Adapters section.
If they are not, move them to that section.
 - e Click **OK** to close the properties for vSwitch0.
- 4 Select the **Management Network** configuration and click **Edit**:
 - a Change the network label to **VMkernel-MGMT** and select the **Management Traffic** checkbox:
 - If **<<mgmt_net_vlan>>** is 1 or untagged, ensure that the VLAN is set to **0 (None)**.
 - If **<<mgmt_net_vlan>>** has a value other than 1 or untagged, set **<<mgmt_net_vlan>>** as the VLAN ID and click **OK**.
 - b Click **OK** to finalize the edits for the management network.
- 5 Select the **VM Network** configuration and click **Edit**:
 - a Change the network label to **Management**:
 - If **<<mgmt_net_vlan>>** is 1 or untagged, ensure that the VLAN is set to **0 (None)**.
 - If **<<mgmt_net_vlan>>** has a value other than 1 or untagged, set **<<mgmt_net_vlan>>** as the VLAN ID and click **OK**.

- b** Click **OK** to finalize the edits for the management port group.
- 6** Optional: If using a separate network as a deployment network (that is, not running deployment over management), click **Add** to add a network element:
 - a** Select **Virtual Machine** and click **Next**.
 - b** Change the network label to **Deployment**.
Do not specify a VLAN ID because the deployment network must be a native VLAN.
 - c** Click **Next**, and then click **Finish** to finalize the creation of the deployment network.
- 7** To add the vMotion network, click **Add** to add a network element:
 - a** Select **VMkernel** and click **Next**.
 - b** Set the following values on the VMkernel – Connection Settings page:
 - Network label: **VMkernel-vMotion**.
 - VLAN ID (optional): **<<mgmt_vmotion_net_vlan>>**.
 - c** Select the **Use This Port Group for vMotion** checkbox and click **Next**.
 - d** Set the following values on the VMkernel – Connection Settings page:
 - IP address: **<<mgmt_server_1_vmotion_ip>>**.
 - Subnet mask: **<<mgmt_vmotion_net_netmask>>**.
 - e** Click **Next**, and then click **Finish** to finalize the creation of the vMotion VMkernel interface.
- 8** Select the **VMkernel-vMotion** configuration and click **Edit**:
 - a** Change the MTU to **9000**.
 - b** Click **OK** to finalize the edits for the VMkernel-vMotion network.
- 9** To add the FT network, click **Add** to add a network element:
 - a** Select **VMkernel** and click **Next**.
 - b** Set the following values on the VMkernel – Connection Settings page:
 - Network label: **VMkernel-FT**.
 - VLAN ID (optional): **<<mgmt_ft_net_vlan>>**.
 - c** Select the **Use This Port Group for Fault Tolerance Logging** checkbox and click **Next**.
 - d** Set the following values on the VMkernel – Connection Settings page:
 - IP address: **<<mgmt_server_1_ft_ip>>**.
 - Subnet mask: **<<mgmt_ft_net_netmask>>**.
 - e** Click **Next**, and then click **Finish** to finalize the creation of the VMkernel-FT interface.
- 10** Select the **VMkernel-FT** configuration and click **Edit**:
 - a** Change the MTU to **9000**.
 - b** Click **OK** to finalize the edits for the VMkernel-FT network.
- 11** Close the dialog box to finalize the ESXi host networking setup.
- 12** Repeat this procedure for the other management servers.

Rename the Local Datastore

Procedure

- 1** Click the **Configuration** tab and, in the Hardware pane, click **Storage**.
- 2** Right-click the local datastore and click **Rename**.

- 3 Rename the datastore to `<<mgmt_server_1_hostname>>-localdatastore`.
- 4 Repeat this procedure for the other management servers in the configuration.

Set Date and Time and Configure NTP

Procedure

- 1 Click the **Configuration** tab and, in the Software pane, click **Time Configuration**.
- 2 Toward the top right of the screen, click **Properties**:
 - a Adjust the date and time as appropriate for your installation.
 - b In the NTP Configuration pane, select **NTP Client Enabled**.
 - c Click **Options**.
 - d In the General tab, click **Start and stop with host**.
 - e In the NTP Settings tab, click **Add**, type `<<mgmt_net_ntp1>>` in the **Address** field, and click **OK**.
 - f Select the **Restart NTP service** checkbox to apply changes, and click **OK**.
 - g Click **OK** to exit the Time Configuration dialog box.
- 3 Repeat this procedure for the other management servers in the configuration.

Deploying the VMware vCenter Management Appliance

You must install and configure the VMware vCenter Appliance in the HPE Converged Architecture 700 with Nimble Storage environment. As part of this process, you will create a vCenter management cluster for the solution.

Prepare to Install the VMware vCenter Server Appliance

Procedure

- 1 From the [Download VMware vSphere](#) page on the VMware website, download the VMware vCenter Server Appliance ISO image and save it to the installation system.
- 2 Mount the ISO image through the native disk image mounting utility in Windows 8 or Windows Server 2012 and later, or use some other ISO disk image mounting utility.
- 3 Navigate to the `vcsa` folder in the location where you mounted the ISO image to install the VMware Client Integration Plugin and accept any warnings that are presented.
- 4 Complete the steps of the installation wizard, accepting the license agreement and all default settings.
- 5 Review the settings and click **Install**.

Install the Platform Services Controller

Before you can install the VMware vCenter Server Appliance, you must install the Platform Services Controller. The installation process is divided into two stages: deployment and configuration.

Procedure

- 1 Navigate to the `\vcsa-ui-installer\win32` directory in the location where you have mounted the vCenter ISO image and run the `installer.exe` file.
- 2 Click **Install**.

Stage 1

- 1 On the Introduction page of the wizard, click **Next**.
- 2 Read and accept the license agreement and click **Next**.

- 3 Under External Platform Services Controller, select the **Platform Services Controller** option and click **Next**.
- 4 Provide the appliance deployment target, and then click **Next**:
 - FQDN or IP address: `<<mgmt_server_1_fqdn>>`.
 - User name: **root**.
 - Password: `<<mgmt_server_root_password>>`.
- 5 Click **Yes** to accept the certificate warning.
- 6 Set up the appliance VM, and then click **Next**:
 - VM name: `<<vcenter_psc_vm_name>>`.
 - Root password: `<<vcenter_psc_root_password>>`.
 - Confirm root password: `<<vcenter_psc_root_password>>`.
- 7 Select the `<<mgmt_server_1_hostname>>`localdatastore datastore and click **Next**.
- 8 Configure the network settings, and then click **Next**:
 - Network: **Management**.
 - IP version: **IPv4**.
 - IP assignment: **static**.
 - System name: `<<vcenter_psc_fqdn>>`.
 - IP address: `<<vcenter_psc_mgmt_ip>>`.
 - Subnet mask or prefix length: `<<mgmt_net_netmask>>`.
 - Default gateway: `<<mgmt_net_gw>>`.
 - DNS servers: `<<mgmt_net_dns1>>`.
- 9 Review the settings and click **Finish**.

It takes several minutes for the VM to be deployed.
- 10 After the deployment is complete, click **Continue** to proceed to stage 2 of the installation process.

Stage 2

- 1 On the Introduction page of the wizard, click **Next**.

If needed, log in to the Platform Services Controller appliance with the password `<<vcenter_psc_root_password>>`.
- 2 Configure the appliance, and then click **Next**:
 - Time synchronization mode: **Synchronize time with NTP servers**.
 - NTP servers: `<<mgmt_net_ntp1>>`.
 - SSH access: **Disabled**.
- 3 Configure SSO, and then click **Next**:
 - a Select **Create a new SSO domain**.
 - b Specify the SSO settings:
 - SSO domain name: `<<mgmt_net_domain_name>>`.
 - SSO password: `<<vcenter_sso_password>>`.
 - Confirm password: `<<vcenter_sso_password>>`.
 - Site name: `<<vcenter_sso_site_name>>`.
- 4 Select whether to participate in the VMware Customer Experience Improvement Program and click **Next**.
- 5 Review the settings and click **Finish**.

It takes several minutes for SSO to be configured and started.

- 6 After the appliance has been successfully set up, click **Close**.

Install the VMware vCenter Management Appliance

The installation process for the VMware vCenter Server Appliance is divided into two stages: deployment and configuration.

Procedure

- 1 Navigate to the `vcasa-ui-installer/win32` directory in the location where you have mounted the vCenter ISO and run the `installer.exe` file.
- 2 Read and accept the license agreement and click **Next**.
- 3 Click **Install**.

Stage 1

- 1 On the Introduction page of the wizard, click **Next**.
- 2 Read and accept the license agreement and click **Next**.
- 3 Under External Platform Services Controller, select the **vCenter Server (Requires External Platform Services Controller)** option and click **Next**.
- 4 Specify the appliance deployment target, and then click **Next**:
 - FQDN or IP address: `<<mgmt_server_1_fqdn>>`.
 - User name: **root**.
 - Password: `<<mgmt_server_root_password>>`.
- 5 Click **Yes** to accept the certificate warning.
- 6 Set up the appliance VM, and then click **Next**:
 - VM name: `<<vcenter_vm_name>>`.
 - Root password: `<<vcenter_root_password>>`.
 - Confirm root password: `<<vcenter_root_password>>`.
- 7 Select the appropriate deployment size for the environment that you are building and click **Next**.

If you are unsure about the size, select **Medium** for the deployment size and **Default** for the storage size.
- 8 Select the `<<mgmt_server_1_hostname>>localdatastore` datastore and click **Next**.
- 9 Configure the network settings, and then click **Next**:
 - Network: **Management**.
 - IP version: **IPv4**.
 - IP assignment: **static**.
 - System name: `<<vcenter_fqdn>>`.
 - IP address: `<<vcenter_mgmt_ip>>`.
 - Subnet mask or prefix length: `<<mgmt_net_netmask>>`.
 - Default gateway: `<<mgmt_net_gw>>`.
 - DNS servers: `<<mgmt_net_dns1>>`.
- 10 Review the settings and click **Finish**.

It takes several minutes for the VM to be deployed.
- 11 After the deployment is complete, click **Continue** to proceed to stage 2 of the installation process.

Stage 2

- 1 On the Introduction page of the wizard, click **Next**.

If needed, log in to the vCenter Server Appliance with the password `<<vcenter_root_password>>`.

- 2 Configure the appliance, and then click **Next**:
 - Time synchronization mode: **Synchronize time with NTP servers**.
 - NTP servers: **<<mgmt_net_ntp1>>**.
 - SSH access: **Disabled**.
- 3 Configure SSO, and then click **Next**:
 - Platform Services Controller FQDN or IP address: **<<vcenter_psc_fqdn>>**.
Important Do not use **<<vcenter_psc_mgmt_ip>>** because it causes an installation failure.
 - SSO password: **<<vcenter_sso_password>>**.
- 4 Review the settings and click **Finish**.
- 5 Click **Close**.

Create a vCenter Data Center and the Management Cluster

Procedure

- 1 Using a web browser, connect to the VMware vSphere Web Client.
- 2 From the Home page, click **Hosts and Clusters**.
- 3 In the left pane, right-click **<<vcenter_fqdn>>** and choose **New Datacenter**.
- 4 Type **<<vcenter_dc_name>>** as the data center name.
- 5 Click **OK**.
- 6 In the left pane, right-click **<<vcenter_dc_name>>** and choose **New Cluster**.
- 7 Set the following values:

- Name: **<<vcenter_mgmt_cluster_name>>**.
- DRS: Select the **DRS** checkbox.
- vSphere HA: Select the vSphere **HA** checkbox and keep the default values.
- EVC: **Disabled**.

Note If servers with different Intel processor families are mixed within a vCenter cluster, it is necessary to enable the VMware Enhanced vMotion Compatibility (EVC) mode. For more information about setting up the EVC mode, see [Enhanced vMotion Compatibility \(EVC\) Processor Support](#) and [How to Enable EVC in vCenter Server](#).

- Virtual SAN: Do not select this checkbox.
- 8 Click **OK** to create the new cluster.

Add Hosts to the Management Cluster

Procedure

- 1 In the vSphere Web Client, right-click **<<vcenter_mgmt_cluster_name>>** in the bottom left pane, and choose **Add Host**.
- 2 Type the FQDN of the first management server (**<<mgmt_server_1_fqdn>>**) and click **Next**.
- 3 Type **root** as the user name and **<<mgmt_server_root_password>>** as the password. Click **Next**.
- 4 If prompted with a security alert, click **Yes** to accept the server's certificate.
- 5 Review the host summary information and click **Next**.
- 6 Assign a valid VMware vSphere license to the host and click **Next**.
- 7 On the Lockdown Mode page, click **Next**.
- 8 On the Resource Pool page, click **Next**.
- 9 Review the configuration settings and click **Finish** to add the host.
- 10 Repeat this procedure for all management servers.

Update the VMware vCenter Server Appliance

[Validated Software and Firmware Levels](#) on page 12 lists the updates and patches to VMware vCenter that are required for the solution. Perform the steps in this procedure to apply them to the vCenter Server Appliance. If no updates are required, skip this procedure.

Procedure

- 1 Obtain the necessary ISO images for the update.
- 2 Upload the ISO images to `<<mgmt_server_1_hostname>>localdatastore`:
 - a In the vSphere Web Client, navigate to **Home > Storage > <<mgmt_server_1_fqdn>>**, click the **Manage** tab, and select **Files**.
 - b Click **Upload a file to the Datastore** and browse to the update ISO image.
 - c Click **Open** to upload the ISO.
- 3 Attach the ISO to the `<<vcenter_vm_name>>` VM:
 - a Navigate to **Home > Hosts and Clusters** and locate `<<vcenter_vm_name>>` on `<<mgmt_server_1_fqdn>>`.
 - b Right-click `<<vcenter_vm_name>>` and choose **Edit Settings**.
 - c From the CD/DVD drive 1 list, select **Datastore ISO File**, and then select the update ISO.
 - d Select the **Connected** checkbox.
 - e Click **OK**.
- 4 Log in to the VMware vCenter Server Appliance web console and install updates:
 - a In the **Navigator**, on the left side, click **Update**.
 - b Click **Check updates** and select **Check CDROM**.
 - c Click **Install Updates**.

Configure vCenter Power Management

Before you can configure the power management setting, you must collect the iLO MAC address of each management server.

Procedure

- 1 Log in to HPE iLO web UI of the first management server and navigate to **Information > System Information > Network** to gather the MAC address of the iLO.

The iLO MAC address is listed in the Adapter 1 – iLO section. In this procedure, the iLO MAC address is referred to as `<<mac_address>>`.

- 2 In the left pane, click **Hosts** and select `<<mgmt_server_1_fqdn>>`.
- 3 Navigate to **Manage > Settings > System > Power Management**.
- 4 To the right of IPMI/iLO Settings for Power Management, click **Edit**.
- 5 Set the following values:
 - User name: **admin**.
 - Password: `<<mgmt_server_ilo_password>>`.
 - BMC IP address: `<<mgmt_server_1_ilo_ip>>`.
 - BMC MAC address: `<<mac_address>>`.
- 6 Click **OK**.
- 7 Repeat this procedure for all management servers.

Building the Management VM

To build the management VM that is used to manage the solution, complete the following tasks:

- Deploy the base Windows VM.
- Install VMware Tools.
- Enable the Desktop Experience role.
- Configure the second hard drive.
- Set the host name.
- Set the IP addresses.
- Disable the firewall.
- Enable remote desktop access.
- Configure NTP.
- Run updates and software installations.
- Configure IIS and the ICsp media server.

Deploy the Base Windows VM

Procedure

- 1 From the Home page of the vSphere Web Client, click **Hosts and Clusters**.
- 2 Expand `<<vcenter_dc_name>>`, right-click `<<vcenter_mgmt_cluster_name>>`, and choose **New Virtual Machine**:
 - a Name the VM `<<mgmt_vm_name>>`.
 - b Place the VM on the `<<mgmt_server_1_hostname>>localdatastore` datastore.
 - c Build the VM with the following specifications:
 - 16 GB of RAM
 - Two virtual disks:
 - One for Windows boot (suggested 100 GB)
 - The other for the ICsp media server (suggested 200 GB)
 - Four CPUs
 - Two cores per socket
 - Two virtual network interfaces:
 - One in the `<<mgmt_net_vlan>>` VLAN
 - The other in the `<<deployment_net_vlan>>` VLAN, if used
 - A VMXNET 3 adapter for the virtual network interfaces
- 3 After you create the VM, right-click it and choose **Open Console**.
- 4 Mount the ISO for Windows Server 2012 in the virtual CD/DVD ROM drive of the VM.
- 5 Power on the VM.

The Windows ISO image that you mounted should automatically boot.
- 6 Confirm or configure the options on the page and click **Next**.
- 7 Click **Install Now**.
- 8 Enter the license key and click **Next**.
- 9 Select **Windows Server 2012 R2 Standard (Server with a GUI)** and click **Next**.
- 10 Read and accept the license agreement and click **Next**.
- 11 Select the **Custom (advanced)** option to install a new copy of Windows.
- 12 To install Windows on the discovered virtual disk, click **Next**.

The installation begins. When the installation has completed, the VM restarts.

- 13 After the restart, when the VM prompts you to create a new administrator password, click **OK**, and then type **<<mgmt_vm_administrator_password>>** in the password fields.
- 14 Press Enter to set the password and log in to the server.
- 15 Click **OK** again when prompted.

Install VMware Tools

Procedure

- 1 From the vSphere Web Client, right-click **<<mgmt_vm_name>>** and choose **All vCenter Actions > Guest OS > Install VMware Tools**.
- 2 Click **Mount**.
- 3 Navigate to the VM console.
- 4 Click **Run setup64.exe**.
- 5 On the Welcome page of the VMware Tools installation wizard, click **Next**.
- 6 Keep the **Typical** installation option selected and click **Next**.
- 7 Click **Install**.
- 8 Click **OK** to finish the installation.
- 9 Click **Yes** to restart the VM.

Enable the Desktop Experience Role

Procedure

- 1 In Server Manager, choose **Manage > Add Roles and Features**.
- 2 On the Before You Begin page of the wizard, click **Next**.
- 3 Select **Role-based or feature-based installation** and click **Next**.
- 4 Select the server name from the pool and click **Next**.
- 5 On the Select Server Roles page, click **Next**.
- 6 Scroll down the list of features and select the **User Interfaces and Infrastructure** checkbox and all of the features beneath it. Click **Next**.
- 7 Click **Install**, accept any prompts given, and then reboot if prompted.

Configure the Second Hard Drive

Procedure

- 1 Log back in to the VM.
- 2 In Server Manager, click **Dashboard**, and choose **Tools > Computer Management**.
- 3 Expand **Storage** and click **Disk Management**.
- 4 Right-click **Disk 1** and choose **Online**.
- 5 Right-click **Disk 1** again and choose **Initialize Disk**.
- 6 In the Initialize Disk dialog box, click **OK**.
- 7 Right-click the unallocated disk space and choose **New Simple Volume**.
- 8 On the Welcome page of the wizard, click **Next**.
- 9 On the Specify Volume Size page, ensure that the Simple volume size in MB option is set to the value shown for **Maximum disk space in MB** and click **Next**.
- 10 On the Assign Drive Letter or Path page, ensure that the **Assign the following drive letter** option is selected and click **Next**.
- 11 On the Format Partition page, click **Format this volume with the following settings**:
 - a Set the following values:

- File system: **NTFS**.
- Allocation unit size: **Default**.
- Volume label: **Media**.

b Select **Perform a quick format** and ensure that **Enable file and folder compression** is not selected.

c Click **Next**.

12 Click **Finish**.

Set Host Name

Procedure

- 1** In Server Manager, click **Local Server**.
- 2** Click the link to the right of Computer Name.
- 3** In the dialog box, click **Change**.
- 4** Enter `<<mgmt_vm_hostname>>` as the new computer name and click **More**.
- 5** Enter `<<mgmt_net_domain_name>>` as the DNS suffix and click **OK**.
- 6** Close the dialog boxes and click **Restart Later**.

Set IP Addresses

Procedure

- 1** Right-click the **Start** button and click **Network Connections**.
- 2** Identify which Ethernet adapter on the VM is connected to the management network.
You can do this by comparing the MAC address of each NIC on the VM with the adapters in vCenter.
- 3** Right-click the adapter with the MAC address on the management network and choose **Rename**.
- 4** Type `Management Net` and press Enter.
- 5** Right-click the other adapter and click **Rename**.
- 6** Type `Deployment Net` and press Enter.
- 7** Right-click the **Management Net** adapter and choose **Properties**:
 - a** Select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**.
 - b** Set the static IP address to `<<mgmt_vm_mgmt_ip>>` and the other appropriate information for the management network.
 - c** Close the dialog boxes.
- 8** Right-click the **Deployment Net** adapter and click **Properties**:
 - a** Select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**.
 - b** Set the static IP address to `<<mgmt_vm_deployment_ip>>` and the netmask to `<<deployment_net_netmask>>`.
 - c** Leave all other fields blank.
 - d** Close the dialog boxes.
- 9** Reboot the VM.

Disable the Firewall

Procedure

- 1** In Server Manager, click **Local Server**.
- 2** Click the link to the right of Windows Firewall.
- 3** In the left pane of the Windows Firewall window, click **Advanced settings**.

- 4 In the center pane of the main window, click the **Windows Firewall Properties** link.
- 5 For the Domain Profile, Private Profile, and Public Profile tabs, set the firewall state to **Off**.
- 6 Click **OK** and close all firewall management windows to return to Server Manager.

Important If you want to re-enable the Windows firewall, complete the solution deployment procedures before doing so to prevent the firewall from causing problems during the installation. Completion of the deployment procedures also ensures that you know the proper ports to allow and to block after all required components are installed on this VM.

Enable Remote Desktop Access

Procedure

- 1 In Server Manager, click **Local Server**.
- 2 Click the link to the right of Remote Desktop.
- 3 Select **Allow remote connections to this computer**, accept any warnings, and click **OK**.

Configure NTP

Procedure

- 1 Right-click the clock in the taskbar (at the bottom-right corner of the Windows desktop) and choose **Adjust date/time**.
- 2 Change the time zone and set the time and date as appropriate for the deployment.
- 3 Click the **Internet Time** tab and click **Change Settings**.
- 4 Select the **Synchronize with an Internet time server** checkbox and enter `<<mgmt_net_ntp1>>`.
- 5 Click **OK**, and then click **OK** again to complete the setup.

Run Updates and Install Software

Procedure

- 1 Open a Remote Desktop session to the management VM, `<<mgmt_vm_fqdn>>`.
- 2 Run Windows Update and apply all updates, which might require multiple reboots of the VM.
- 3 Install the VMware vSphere Client for Windows, if required:
 - a Open a web browser on the management workstation and navigate to `<<mgmt_server_1_ip>>`.
 - b Download and install the vSphere Client for Windows.

Note This application is downloaded from the VMware website. Therefore, Internet access is required for this VM.

- 4 Install the Nimble Windows Toolkit (NWT):
 - a Copy the NWT .zip file to the desktop of the management VM and extract it.
 - b Double-click the executable and navigate through the installation wizard, installing only the **Nimble Setup Wizard**.

Configuring IIS and the ICsp Media Server

The ICsp user is used to connect to the ICsp media server. You must create the ICsp user in the management VM and, in addition, configure the IIS server role to allow .vib files.

Create the ICsp User

Procedure

- 1 In Server Manager, choose **Tools > Computer Management**.
- 2 In the Computer Management window, choose **Local Users and Groups > Users**.
- 3 In the right pane, click **More Actions**, select **New User**, and set the following values:
 - User name: **icspUser**.
 - Description: **Insight Control server provisioning user**.
 - Password: **<<mgmt_vm_media_user_password>>**.
 - Confirm password: **<<mgmt_vm_media_user_password>>**.
- 4 Clear the selection for the **User must change password at next logon** checkbox.
- 5 Select the **User cannot change password** checkbox.
- 6 Select the **Password never expires** checkbox.
- 7 Click **Create**.
- 8 Click **Close**.

Add IIS Role

Procedure

- 1 In Server Manager, choose **Manage > Add roles and features**.
- 2 On the Before You Begin page of the wizard, click **Next**.
- 3 Verify that **Role-based or feature-based installation** is selected and click **Next**.
- 4 Verify that the local server is selected and click **Next**.
- 5 On the Select Server Roles page, select **Web Server (IIS)**, add the required features to the Web Server (IIS) role, and then click **Next**.
- 6 On the Select Features page, click **Next**.
- 7 On the Web Server Role (IIS) page, click **Next**.
- 8 To accept the default Web Server (IIS) role services, click **Next**.
- 9 Review the settings and click **Install**.
- 10 Wait for the installation to complete and click **Close**.

Add .vib to the IIS MIME Types List

Procedure

- 1 In Server Manager, choose **Tools > Internet Information Services (IIS) Manager**.
- 2 In the left pane, select the server name.
- 3 Click **No** to close the dialog box that appears.
- 4 Double-click the **MIME Types** icon to open the feature.
- 5 Click the **Add** link on the far right, under Actions.
- 6 Enter the file extension **.vib**.
- 7 Enter the MIME type **application/octet-stream**.
- 8 Click **OK**.
- 9 Close the Internet Information Services (IIS) Manager window.

Installing and Configuring the HPE Nimble Storage Array

Before powering on and initializing the array, you must properly cable the HPE Nimble Storage controllers and any disk shelves that you are using. You must also connect the networking for both controllers to the management network.

For more information about how to make these connections, refer to the manuals for the HPE Nimble Storage array that you are installing. HPE Nimble Storage documentation is available on [HPE InfoSight](#) (requires an HPE InfoSight login).

Note The uninitialized HPE Nimble Storage array must meet three conditions in order for the setup process to recognize it before configuring it:

- It must be connected to the same subnet or VLAN as the installation system.
- It must be powered on.
- It must be in a non-initialized state.

Initializing and Configuring the HPE Nimble Storage Array

Preparation for using the HPE Nimble Storage array involves these tasks:

- Initialize the array by using the HPE Nimble Storage Windows Toolkit (NWT).
- Perform the basic configuration and set up the NimbleOS vCenter integration.

Initialize the Array with NWT

Procedure

- 1 Use Remote Desktop to move to the management VM (`<<mgmt_vm_fqdn>>`).
- 2 From the Start Menu, select **Run the Nimble Setup Manager**.
- 3 On the Welcome page, find the array that is associated with this solution and select it. Click **Next**.
- 4 If you do not see your array, ensure that it is connected properly to the 1 GbE switches, that it is in VLAN `<<mgmt_net_vlan>>` as an access port, and that the firewall is disabled on the management VM.
- 5 Click **OK** in the Information dialog box to allow it to open a web browser session to the array so that the array can be configured.
- 6 Read and accept the license agreement and click **Proceed**.
- 7 Set up the HPE Nimble Storage array:
 - a Review the array serial number to confirm that you are configuring the correct array.
 - b Select **Set up this array but do not join an existing group** and click **Next**.
 - c Set the following values:
 - Array name: `<<nimble_system_name>>`.
 - Group name: `<<nimble_group_name>>`.
 - Management IP address: `<<nimble_mgmt_ip>>`.
 - Netmask: `<<mgmt_net_netmask>>`.
 - Default gateway: `<<mgmt_net_gw>>`.
 - Domain name: `<<mgmt_net_domain_name>>`.
 - Create and confirm password: `<<nimble_admin_pwd>>`.
- 8 Click **Finish** and wait a few minutes for the array to initialize.
- 9 When initialization is complete, click **Continue**.

Configure the Array

When initialization is complete, configure the array in the Subnet Configuration page.

Procedure

- 1 Select the traffic type of **Mgmt** for the management subnet only and click **Next**.
- 2 On the Network Settings page, set the following values:
 - Interface: **eth1**.
 - Subnet: **Management**.
 - Data IP address: N/A.
- 3 Provide the diagnostic IP addresses, and then click **Next**:
 - Controller A: **<<nimble_ctrl_a_diag_ip>>**.
 - Controller B: **<<nimble_ctrl_b_diag_ip>>**.
- 4 On the Domain tab, set the following values, and then click **Next**:
 - Domain name: **<<mgmt_net_domain_name>>**.
 - DNS servers: **<<mgmt_net_dns1>>**.
- 5 Set the appropriate time zone and **<<mgmt_net_ntp1>>**, and then click **Next**.
- 6 Complete the Support tab with the appropriate settings for the environment in which this array will be deployed, and then click **Finish**.
- 7 When the setup is complete, a Setup Complete dialog box displays. Click **Continue** to automatically log in to the array.

Update NimbleOS

If required, update NimbleOS to the version listed in [Validated Software and Firmware Levels](#) on page 12. You might need to repeat this procedure several times to update the firmware to the appropriate level if version stepping is required.

Procedure

- 1 Log in to the HPE Nimble Storage array and choose **Administration** > **Software** from the top ribbon bar.
- 2 Select **Download** to check for new versions of NimbleOS.

If you do not see the version listed in [Validated Software and Firmware Levels](#) on page 12, contact [HPE Nimble Storage Support](#).

- 3 Click **Update** and follow the instructions to update the software on the array.

Configure the Array to Communicate with VMware vCenter

You must configure the array to communicate with VMware vCenter through the NimbleOS vCenter plugin.

Procedure

- 1 Log out and close all sessions of VMware vCenter.
- 2 Log in to the HPE Nimble Storage array, and choose **Administration** > **VMware Integration** from the top menu.
- 3 Set the following values in the Register vCenter window:
 - vCenter name: **<<vcenter_vm_name>>**.
 - vCenter host: **<<vcenter_fqdn>>**.

- Description: **Solution VMware vCenter** (<<vcenter_vm_name>>).
- User name: **administrator@<<mgmt_net_domain_name>>**.
- Password: **<<vcenter_administrator_password>>**.

4 Select **Web Client** and **VASA Provider**.

5 Click **Save**.

Configuring the FCoE SAN and Presenting the HPE Nimble Storage Array to the Management Servers

You must configure the SAN zoning in the switches to allow the storage LUNs from the HPE Nimble Storage array to be presented to and recognized by the management servers.

Zoning the HPE Nimble Storage Array to the Management Servers

You must configure the virtual Fibre Channel (vFC) interfaces for each management server and create the zoning configuration connections for the HPE Nimble Storage array and the management servers.

Create and Configure the vFC Interfaces for the Management Servers

Procedure

- 1 Log in to `<<net_switch1_mgmt_ip>>` through SSH.
- 2 From system view, run the following commands to create the vFC interface for the LOM1 port of the first management server and associate it with FCoE VSAN A.

```
interface vfc 711
description <<mgmt_server_1_hostname>>-LOM1
port trunk vsan <<net_fcoe_vsan_a_id>>
bind interface Ten-GigabitEthernet 1/2/17
quit
```

Note You can use any vFC identifier in the range of 1 to 1024. The vFC identifiers in the example code were used in the tested configuration.

- 3 Create the vFC interface for the LOM2 port of the first management server and associate it with FCoE VSAN B.

```
interface vfc 712
description <<mgmt_server_1_hostname>>-LOM2
port trunk vsan <<net_fcoe_vsan_b_id>>
bind interface Ten-GigabitEthernet 2/2/17
quit
```

- 4 Repeat this procedure for all management servers.
Ensure that you use unique vFC identifiers for each connection.

Create Aliases for the HPE Nimble Storage Array and the Management Systems

There are several ways to gather the data needed to create aliases for the HPE Nimble Storage array and the management systems. The easiest way is to get them directly from the switches themselves; the **display fc login vsan <<net_fcoe_vsan_a_id>>** command lists all port WWNs that are logged in to the fabric. By running the **fc --list** command on the HPE Nimble Storage array, you can identify which port WWN matches which controller and port name.

- 8 Repeat this procedure for the <<net_fcoe_vsan_b_id>> VSAN and its associated array ports and management server ports that are connected and logged in to it.

Create Zone Definitions for the HPE Nimble Storage Array and Management Servers

You must create zones for each management server in the solution. The procedure demonstrates how to create a zone from <<mgmt_server_1_hostname>> to <<nimble_system_name>>.

Procedure

- 1 Enter system view and the <<net_fcoe_vsan_a_id>> VSAN.

```
system-view
vsan <<net_fcoe_vsan_a_id>>
```

- 2 Create the zone for VSAN A.

```
zone name <<mgmt_server_1_hostname>>-LOM1-to-<<nimble_system_name>>
member zone-alias <<mgmt_server_1_hostname>>-LOM1
member zone-alias <<nimble_system_name>>-CA-fc5
member zone-alias <<nimble_system_name>>-CA-fc9
member zone-alias <<nimble_system_name>>-CB-fc5
member zone-alias <<nimble_system_name>>-CB-fc9
quit
```

- 3 Enter system view and the <<net_fcoe_vsan_b_id>> VSAN.

```
system-view
vsan <<net_fcoe_vsan_b_id>>
```

- 4 Create the zone for VSAN B.

```
zone name <<mgmt_server_1_hostname>>-LOM2-to-<<nimble_system_name>>
member zone-alias <<mgmt_server_1_hostname>>-LOM2
member zone-alias <<nimble_system_name>>-CA-fc6
member zone-alias <<nimble_system_name>>-CA-fc10
member zone-alias <<nimble_system_name>>-CB-fc6
member zone-alias <<nimble_system_name>>-CB-fc10
quit
```

- 5 Repeat this procedure to create zones for the second management server, substituting the host name accordingly.
- 6 Save the configuration.

Create and Activate the Zone Sets

Procedure

- 1 Enter system view and the <<net_fcoe_vsan_a_id>> VSAN.

```
system-view
vsan <<net_fcoe_vsan_a_id>>
```

- 2 Create the san-a zone set and add the appropriate zones.

```
zoneset name san-a
member <<mgmt_server_1_hostname>>-LOM1-to-<<nimble_system_name>>
member <<mgmt_server_2_hostname>>-LOM1-to-<<nimble_system_name>>
```



```
quit
```

3 Activate and save the san-a zone set.

```
zoneset activate name san-a
quit

save
```

4 Enter the other VSAN, <<net_fcoe_vsan_b_id>>.

```
system-view
vsan <<net_fcoe_vsan_b_id>>
```

5 Create the san-b zone set and add the appropriate zones.

```
zoneset name san-b
member <<mgmt_server_1_hostname>>-LOM2-to-<<nimble_system_name>>
member <<mgmt_server_1_hostname>>-LOM2-to-<<nimble_system_name>>

quit
```

6 Activate and save the san-b zone set.

```
zoneset activate name san-b
quit

save
```

Present Storage to the Management Servers

You must create at least two volumes in the HPE Nimble Storage array for the management servers. These volumes will host the Converged Architecture 700 management software stack and satisfy the VMware HA requirement of having at least two shared datastores between cluster hosts.

Note Present the volumes created in this procedure only to the management servers. They cannot be presented to the compute servers in the solution.

Procedure

- 1** Using a web browser, connect to the VMware vSphere Web Client and log in.
- 2** From the Home page, click **Hosts and Clusters**.
- 3** Right-click the <<vcenter_dc_name>> data center and choose **Nimble Storage Actions > Create Datastore** to create the first datastore:
 - a** On the Group Selection page, select <<nimble_group_name>> and click **Next**.
 - b** On the General page, set the following values, and then click **Next**:
 - Datastore name: <<vcenter_mgmt_cluster_name>>-Vol0.
 - Description: <<vcenter_mgmt_cluster_name>>-Vol0.
 - Select hosts: <<vcenter_mgmt_cluster_name>>.
 - c** On the Data page, set the datastore size to 2 TiB and click **Next**.
 - d** On the Protection page, select the **Create a new Volume Collection** option, name the volume collection as <<vcenter_mgmt_cluster_name>>-Volume-Collection, and click **Next**.

- e On the Scheduler page, set the schedule template to **Retain-48Hourly-30Daily-52Weekly** and click **Finish**.
- 4 Right-click the **<<vcenter_dc_name>>** data center and choose **Nimble Storage Actions > Create Datastore** to create the second datastore:
 - a On the Group Selection page, select **<<nimble_group_name>>** and click **Next**.
 - b On the General page, set the following values, and then click **Next**:
 - Datastore name: **<<vcenter_mgmt_cluster_name>>-Vol1**.
 - Description: **<<vcenter_mgmt_cluster_name>>-Vol1**.
 - Select hosts: **<<vcenter_mgmt_cluster_name>>**.
 - c On the Data page, set the datastore size to 2 TiB and click **Next**.
 - d On the Protection page, select the **Join existing Volume Collection** option, then select **<<vcenter_mgmt_cluster_name>>-Volume-Collection**, and click **Next**.
 - e On the Scheduler page, click **Finish**.

Migrate the Virtual Volumes on the Management Servers to Shared Storage

After presenting the storage to the management hosts, you must move **<<mgmt_vm_name>>**, **<<vcenter_vm_name>>**, and **<<vcenter_psc_vm_name>>** to the HPE Nimble Storage array.

Procedure

- 1 Using a web browser, log in to the VMware vSphere Web Client.
- 2 From the Home page, click **Hosts and Clusters**.
- 3 In the left pane, choose **<<vcenter_dc_name>> > <<vcenter_mgmt_cluster_name>>**.
- 4 Right-click **<<mgmt_vm_name>>** and choose **Migrate**:
 - a Select **Change storage only** and click **Next**.
 - b Select **Mgmt-Vol0** and click **Next**.
 - c Review the summary page and click **Finish**.
- 5 When the migration is complete, repeat this procedure for **<<vcenter_vm_name>>** and **<<vcenter_psc_vm_name>>**.

Deploying the HPE Infrastructure Management Software

The HPE management infrastructure is used to manage the HPE Converged Architecture 700 with HPE Nimble Storage solution throughout its lifecycle. To deploy the management software, you must install and configure the following components:

- HPE OneView
- HPE Insight Control server provisioning
- HPE OneView for VMware vCenter plugin

Deploying and Configuring HPE OneView

Before deploying HPE OneView, ensure that you have downloaded the appropriate HPE OneView version and any patches that are listed in [Validated Software and Firmware Levels](#) on page 12.

To deploy HPE OneView, complete the following tasks:

- Deploy the HPE OneView VM.
- Configure basic networking settings on the HPE OneView VM.
- Apply patches to HPE OneView, if needed.
- Upload HPE Service Pack for ProLiant.
- Add HPE OneView licenses to the license pool.
- Import the solution hardware.
- Create networks.
- Create server profile templates.

Deploy the HPE OneView VM

Procedure

- 1 From the Home page of the vSphere Web Client, choose **vCenter > Host and Clusters**.
- 2 Right-click **<<vcenter_mgmt_cluster_name>>** and select **Deploy OVF Template**.
- 3 Browse to the location of the HPE OneView OVA file, select the file, and open it.
- 4 Walk through the steps to create a VM:
 - a Name the VM as **<<oneview_vm_name>>**.
 - b Select **Thick Provision Eager Zeroed** for the disk format.
 - c Place the VM in the **Mgmt_Vo10** datastore.
 - d Ensure that the network connection is set to **Management**.
- 5 Power on the VM after you deploy the OVA file and open the VMware console.

Perform the Initial Configuration of the HPE OneView VM

Procedure

- 1 From the vSphere Web Client, right-click the **<<oneview_vm_name>>** VM and select **Open Console**.
- 2 After HPE OneView completes the boot process, read and accept the license agreement.
- 3 In the HPE OneView Support dialog box, verify that Authorized Services Access has a setting of **Enabled**. Click **OK**.
- 4 Log in with the user name **Administrator** and the password **admin**.
- 5 Set the new password to **<<oneview_administrator_password>>** and click **OK**.
- 6 In the Appliance Network dialog box, set the following values:

- Appliance host name: <<oneview_fqdn>>.
- Address assignment: **Manual**.
- IP address: <<oneview_mgmt_ip>>.
- Subnet mask or CIDR: <<mgmt_net_netmask>>.
- Gateway address: <<mgmt_net_gw>>.
- Preferred DNS server: <<mgmt_net_dns1>>.
- IPv6 address assignment: **Unassign**.

7 Click **OK**.

8 Wait for the settings to be applied. After the configuration is complete, close the OneView VM VMware console.

Apply Patches to the HPE OneView VM

Depending on the version of HPE OneView that you are using, you may need to apply patches to the VM. If an update is required, do not use Microsoft Internet Explorer to upload the update package because this browser cannot handle large file sizes. Use Google Chrome or Mozilla Firefox to complete this setup.

Procedure

- 1 Log in to the HPE OneView Web Administration Portal.
- 2 From the top left corner of the UI, choose **OneView > Settings**:

- a In the Appliance pane, click **Update Appliance**.
- b Click **Browse**, navigate to the patch, and click **Open**.
- c Click **Upload and Install**.

The upload process might take several minutes depending on the speed of the connection to the HPE OneView server.

- d When prompted, read and accept the license agreement and click **Update** to install the patch.

3 After the installation, the appliance may reboot.

Complete the HPE OneView Configuration from the Web UI

Procedure

- 1 Log in to the HPE OneView Web Administration Portal.
- 2 From the top left corner of the UI, choose **OneView > Settings**.
- 3 Delete the default ranges of MAC addresses, world wide names (WWNs), and serial numbers and add the custom values listed in [Appendix A: Configuration Worksheet](#) on page 97.

For example, to change the range of MAC addresses, do the following:

- a Hover your cursor over **Address and Identifiers** and, to the right, click **Edit**.
- b To the right of Remaining Column, click the **X** to delete the default range.
- c Click **Add custom range** and set the following values:
 - From: <<oneview_mac_start>>.
 - Count: <<oneview_mac_count>>.

- d Click **Add**.

- 4 Add the custom ranges of WWNs and serial numbers that are listed in the worksheet as you did for MAC addresses.
- 5 Click **OK** in the Edit Address and Identifiers dialog box.
- 6 From the top left corner of the UI, choose **OneView > Users and Groups**.
- 7 Click **Add user** and set the following values:

- Login name: **readUser**.
- Full name: **readUser**.
- Initial password: **<<oneview_readuser_password>>**.
- Confirm password: **<<oneview_readuser_password>>**.
- Role: **Read only**.

8 Click **Add**.

Upload the HPE Service Pack for ProLiant

Do not use Microsoft Internet Explorer to upload the SPP update package because this browser cannot handle large file sizes. Use Google Chrome or Mozilla Firefox to complete this setup.

Procedure

- 1 From the top left corner of the HPE OneView UI, choose **OneView > Firmware Bundles**.
- 2 Delete any included firmware packages by selecting them and choosing **Actions > Remove**.
- 3 Click **Remove bundle**.
- 4 Click **Add Firmware Bundle**:
 - a Click **Choose file**, browse to the location of the SPP ISO, and click **Open**.
 - b Click **Start Upload**.
 - c After the ISO has been successfully uploaded, click **Close**.

It takes several minutes for OneView to inventory the entire service pack. You can move on to the next tasks while this process is happening.

Add HPE OneView Licenses to the HPE OneView Appliance

HPE OneView requires a license for each managed server, but it imposes no restrictions on the number of VMs that can be associated with a license. For this solution, you should have received multiple HPE OneView license keys. HPE OneView automatically applies these licenses to the servers after you add the licenses to the license pool.

Example of an HPE OneView license key (with iLO):

```
QCTG XXXX H9PY KHXZ V7B5 HWWB Y9JL XXXX B89H MZVU DXAU 2CSM GHTG L762 XXXX
VDV4 KJVT D5KM GFVW XXXX 2XHM 4USC SPCM XXXX KKYP HWRR M3UC 4HTX XXXX LHJQ
XJUL LUQH ZUWD 9AAC XXXX CEJC 5S86 FC4X EKSZ XXXX XZLU FMXS FKS6 KKCE 4NMU
FGN5 N82E Z2HX DT3H XXXXX 29JK 29MC "E5Y34A HP OneView with iLO Advanced incl
3yr 24x7 Supp Phys 1 Svr Lic" _ XXXXX - XXXXX - XXXXX -XXXXX- XXXXX
```

Procedure

- 1 From the top left corner of the HPE OneView UI, choose **OneView > Settings**.
- 2 In the Licenses pane, click **Add**:
 - a Enter or paste the license key into the License Key box.
 - b Click **Add** to complete the action or click **Add+** to add another key.
- 3 Repeat the procedure to add all keys to the HPE OneView license pool.

Import the Management Servers

Procedure

- 1 From the top left corner of the HPE OneView UI, choose **OneView > Server Hardware**.
- 2 Click **Add server hardware** and set the following values:

- iLO IP address or host name: <<mgmt_server_1_ilo_ip>>.
- Add server hardware as: **Managed**.
- User name: **admin**.
- Password: <<mgmt_server_ilo_password>>.
- Licensing: **HP OneView Advanced**.

3 Click **Add**.

4 Repeat the procedure for each management server in the solution.

Create Networks

When creating networks, you must specify the purpose of the network for the HPE OneView for vCenter plugin to function and configure the compute hosts properly. You can have only one management network. The example in the procedure uses the Mgmt_A management network.

For ease of reference, the procedure shows how to configure separate management and deployment VLANs. This setup is more complex to configure but more likely to be implemented because the existing network probably already runs DHCP and PXE services that might conflict. However, it is acceptable to have management and deployment on the same network. In this case, for proper PXE support, the network that you use for deployment has to be a native/untagged VLAN to the blade.

Procedure

- 1 From the top left corner of the HPE OneView UI, choose **OneView > Networks**.
- 2 Click **Create network**.
- 3 Use the information in the following table to create Ethernet networks. For all Ethernet networks, select the **Smart Link** checkbox and do not select the **Private Network** checkbox.

Table 8: HPE-recommended Ethernet networks

Name	Type	VLAN	VLAN ID	Purpose	Preferred Bandwidth (Gb)	Maximum Bandwidth (Gb)
Mgmt_A	Ethernet	Tagged	<<mgmt_net_vlan>>	Management	1	20
Mgmt_B	Ethernet	Tagged	<<mgmt_net_vlan>>	General	1	20
Deployment_A	Ethernet	Tagged	<<deployment_net_vlan>>	General	1	20
Deployment_B	Ethernet	Tagged	<<deployment_net_vlan>>	General	1	20
vMotion_A	Ethernet	Tagged	<<compute_vmotion_net_vlan>>	VM migration	2	20
vMotion_B	Ethernet	Tagged	<<compute_vmotion_net_vlan>>	VM migration	2	20
FT_A	Ethernet	Tagged	<<compute_ft_net_vlan>>	Fault tolerance	2	20
FT_B	Ethernet	Tagged	<<compute_ft_net_vlan>>	Fault tolerance	2	20
VM_Traffic_A	Ethernet	Tagged	<<vm_production_net_1_vlan>>	General	9	20
VM_Traffic_B	Ethernet	Tagged	<<vm_production_net_1_vlan>>	General	9	20

- 4 Create additional Ethernet networks as needed.

- 5 Use the information in the following table to create the SANs.

Table 9: HPE-recommended FC networks for fabric-attached networks

Name	Type	Associate with SAN	VLAN ID	Preferred Bandwidth (Gb)	Maximum Bandwidth (Gb)
SAN_A	FCoE	VSAN <<net_fcoe_vsan_a_id>>	<<fcoe_san_a_vlan>>	8	20
SAN_B	FCoE	VSAN <<net_fcoe_vsan_b_id>>	<<fcoe_san_b_vlan>>	8	20

- 6 Create additional SANs as needed.
- 7 If additional networks are not required, click **Cancel** in the Create Network window.

Create Network Sets

Procedure

- From the top left corner of the HPE OneView UI, choose **OneView > Network Sets**.
- Click **Create network set** to create the Mgmt_Set_A network set:
 - Name: **Mgmt_Set_A**.
 - Preferred Bandwidth: **1 Gb/s**.
 - Maximum Bandwidth: **20 Gb/s**.
 - Click **Add networks** and add the following networks to this network set:

Tip You can hold the Ctrl key to select multiple networks at one time.

 - Mgmt_A
 - Deployment_A
 - Any additional management networks that you have created for side A
 - Select the **Untagged** checkbox for the Deployment_A network.
- Click **Create+** to create the Mgmt_Set_B network set:
 - Name: **Mgmt_Set_B**.
 - Preferred Bandwidth: **1 Gb/s**.
 - Maximum Bandwidth: **20 Gb/s**.
 - Click **Add networks** and add the following networks to this network set:
 - Mgmt_B
 - Deployment_B
 - Any additional management networks that you have created for side B
 - Select the **Untagged** checkbox for the Deployment_B network.
- Click **Create+** to create the vMotion_FT_Set_A network set:
 - Name: **vMotion_FT_Set_A**.
 - Preferred Bandwidth: **2 Gb/s**.
 - Maximum Bandwidth: **20 Gb/s**.
 - Click **Add networks** and add the following networks to this network set:
 - vMotion_A
 - FT_A
 - Any additional vMotion and fault tolerance networks that you have created for side A

- 5 Click **Create+** to create the vMotion_FT_Set_B network set:
 - a Name: **Motion_FT_Set_B**.
 - b Preferred Bandwidth: **2 Gb/s**.
 - c Maximum Bandwidth: **20 Gb/s**.
 - d Click **Add networks** and add the following networks to this network set:
 - vMotion_B
 - FT_B
 - Any additional vMotion and fault tolerance networks that you have created for side B
- 6 Click **Create+** to create the VM_Traffic_Set_A network set:
 - a Name: **VM_Traffic_Set_A**.
 - b Preferred Bandwidth: **9 Gb/s**.
 - c Maximum Bandwidth: **20 Gb/s**.
 - d Click **Add networks** and add the following networks to this network set:
 - VM_Traffic_A
 - Any additional VM traffic networks that you have created for side A
- 7 Click **Create+** to create the VM_Traffic_Set_B network set:
 - a Name: **VM_Traffic_Set_B**.
 - b Preferred Bandwidth: **9 Gb/s**.
 - c Maximum Bandwidth: **20 Gb/s**.
 - d Click **Add networks** and add the following networks to this network set:
 - VM_Traffic_B
 - Any additional VM traffic networks that you have created for side B
- 8 Click **Create**.

Create Logical Interconnect Groups

The steps for creating logical interconnect groups might vary depending on whether you use 10 GbE or 40 GbE connections to the network switches.

Note You can select different ports from the ports indicated in the procedure. Ensure that you select ports that match the network and SAN topologies in the environment.

Procedure

- 1 From the top left corner of the HPE OneView UI, choose **OneView > Logical Interconnect Groups**.
- 2 Click **Create logical interconnect group**:
 - a Enter the name **Solution_LIG**.
 - b On bay 1 (top rectangle on the left side), select **HP VC FlexFabric 20/40 F8 Module**.
 - c On bay 2 (top rectangle on the right side), select **HP VC FlexFabric 20/40 F8 Module**.
 - d Click **Add uplink set** and create the Solution_SUS_A uplink set:
 - a Name: **Solution_SUS_A**.
 - b Type: **Ethernet**.
 - c Click **Add networks** and add the following networks to this uplink set:
 - Deployment_A
 - FT_A
 - Mgmt_A

- SAN_A
 - VM_Traffic_A
 - vMotion_A
 - Any additional networks that you have created for side A
- d** Select the **Native** checkbox for the Deployment_A network.
- e** Click **Add uplink ports** and add the following ports:
- HP VC FlexFabric-20/40 F8 Module 1 Q1.1
 - HP VC FlexFabric-20/40 F8 Module 1 Q2.1
 - HP VC FlexFabric-20/40 F8 Module 1 Q3.1
- e** Click **Create+** to create the Solution_SUS_B uplink set:
- a** Name: **Solution_SUS_B**.
- b** Type **Ethernet**.
- c** Click **Add networks** and add the following networks to this uplink set:
- Deployment_B
 - FT_B
 - Mgmt_B
 - SAN_B
 - VM_Traffic_B
 - vMotion_B
 - Any additional networks that you have created for side B
- d** Select the **Native** checkbox for the Deployment_B network.
- e** Click **Add uplink ports** and add the following ports:
- HP VC FlexFabric-20/40 F8 Module 2 Q1.1
 - HP VC FlexFabric-20/40 F8 Module 2 Q2.1
 - HP VC FlexFabric-20/40 F8 Module 2 Q3.1
- f** Click **Create**.
- f** Click **Create** to create the logical interconnect group.

Create an Enclosure Group

Procedure

- 1 From the top left corner of the HPE OneView UI, choose **OneView > Enclosure Groups**.
- 2 Click **Create enclosure group**:
 - a** Enter **Solution_EG** as the name of the enclosure group.
 - b** Select **Solution LIG** as the value of **Logical interconnect group** for interconnect bays 1 and 2.
 - c** Click **Create**.

Import the HPE BladeSystem c7000 Enclosures

Procedure

- 1 From the top left corner of the HPE OneView UI, choose **OneView > Enclosures**.
- 2 Click **Add enclosure** and set the following values:
 - OA IP address or host name: **<<enclosure_1_oa_1_ip>>**.
 - Action: **Add enclosure for management**.

- Username: **admin**.
- Password: **<<enclosure_1_password>>**.
- Enclosure group: **Solution_EG**.
- Licensing: **HP OneView Advanced**.
- Firmware baseline: Select the HPE SPP that you uploaded earlier.

3 Click **Add**.

It takes several minutes for HPE OneView to inventory, configure, and update the firmware on the Onboard Administrator and Virtual Connect modules, if needed.

4 Repeat the procedure to import all enclosures into HPE OneView.

Creating Profiles for the HPE DL360 Gen9 Management Servers

When creating server profiles for HPE ProLiant DL360 Gen9 management servers, ensure that the management server for which you are creating the profile does not have any VMs on it. At this point in the configuration of the solution, only the first management server (**<<mgmt_server_1_hostname>>**) should have VMs, but double-check to be sure. Before you apply a profile to a management server, you must migrate all VMs in that server to another management server.

The procedures in this section focus on the second management server (**<<mgmt_server_2_hostname>>**), but the same steps apply to the other management servers. After you apply the profile to the second management server and the server has rejoined the VMware cluster in VMware vCenter, apply the profile to any other management servers in the solution. Ensure that all VMs are migrated off of the servers and that they are shut down before you try to apply the profiles.

Leave the first management server for last because you will need to vacate all VMs off of it, including the HPE OneView VM, before you can apply the profile to this server.

Shut Down the Management Server

Procedure

- 1 Using a web browser, log in to the VMware vSphere Web Client.
- 2 From the Home tab, click **Hosts and Clusters**.
- 3 In the left pane, expand **<<vcenter_dc_name>>** > **<<vcenter_mgmt_cluster_name>>**.
- 4 Right-click **<<mgmt_server_2_hostname>>** and select **Enter Maintenance Mode**.
- 5 Right-click **<<mgmt_server_2_hostname>>** and choose **Power > Shut Down**.

Create the Server Profile Template for a Management Server

Procedure

- 1 From the top left corner of the HPE OneView UI, choose **OneView > Server Profile Templates**.
- 2 Click **Create server profile template**.
- 3 Set the following values:
 - Name: **CA700_DL360_Gen9_Management_Server_Template**.
 - Description: **CA700 DL360 Gen9 Management Server Template**.
 - Server profile description: **CA700 DL360 Gen9 Management Server Profile**.
 - Server hardware type: **DL360 Gen9 1**.
 - Firmware baseline: Select the HPE SPP that you uploaded earlier.
 - Installation method: **Firmware only**.
- 4 Select the **Manage boot mode** checkbox and set the following values:
 - Boot mode: **UEFI optimized**.
 - PXE boot policy: **Auto**.

- 5 Select the **Manage BIOS** checkbox and click **Edit BIOS Setting**:
 - a Choose **Power Management > Power Profile > Maximum Performance**.
 - b Click **OK**.
- 6 Click **Create**.

Apply the Management Server Profile Template to the Management Servers

Procedure

- 1 From the top left corner of the HPE OneView UI, choose **OneView > Server Profile Templates**.
- 2 Select **CA700_DL360_Gen9_Management_Server_Template**.
- 3 From the top right side, choose **Actions > Create server profile** and set the following values:
 - Name: **<<mgmt_server_2_hostname>>**.
 - Description: **<<mgmt_server_2_hostname>> management server profile**.
 - Server hardware: **<<mgmt_server_2_ilo_hostname>>**.

- 4 Click **Create**.

The firmware baseline is applied and the server should reboot several times. After the profile is completely applied, the server shuts down.

- 5 To power on the server, select the profile in HPE OneView and choose **Actions > Power On**.
- 6 Allow the server to boot into VMware vSphere and wait for the system to rejoin the cluster in VMware vCenter.

You must take the server out of maintenance mode before you can use it again.

- 7 Repeat this procedure for all management servers in the solution. Before you apply the profile, migrate any VMs out of each server and shut down the server.

Creating Profiles for the HPE BL460c Gen9 Compute Servers

Wait until the enclosure with the HPE ProLiant BL460c Gen9 servers is fully imported into HPE OneView before you create a template profile for an HPE ProLiant BL460c Gen9 blade.

If an HPE ProLiant BL460c Gen9 server has multiple NICs (for example, a LOM card and a NIC or CNA in mezz slot 1), the connection to the Mgmt_A and Mgmt_B management networks should be only on the LOM NIC or CNA. The HPE OneView for vCenter plugin does not support the use of Mgmt_A on multiple NICs because it causes deployment failures.

Create the Server Profile Template for an HPE ProLiant BL460c Gen9 Server

Procedure

- 1 From the top left corner of the HPE OneView UI, choose **OneView > Server Profile Templates**.
- 2 Click **Create server profile template**.
- 3 Set the following values:
 - Name: **CA700_BL460c_Gen9_Server_Profile_Template**.
 - Description: **CA700 BL460c Gen9 Server Profile Template**.
 - Server profile description: **CA700 BL460c Gen9 Server Profile Template**.
 - Server hardware type: **BL460c Gen9 1**.
 - Enclosure group: **Solution_EG**.
 - Affinity: **Device Bay**.
 - Firmware baseline: Select the HPE SPP that you uploaded earlier.
 - Installation method: **Firmware only**.

- 4 Click **Add Connection** and use the information in the following table to create the connections.

Table 10: HPE-recommended BL460c server profile connections

Name	Type	Network	Requested Bandwidth (Gb)	Port	Bootable
Mgmt_A	Ethernet	Mgmt_Set_A	1	FlexibleLOM 1:1-a	Not bootable
Mgmt_B	Ethernet	Mgmt_Set_B	1	FlexibleLOM 1:2-a	Not bootable
SAN_A	Fibre Channel	SAN_A	8	FlexibleLOM 1:1-b	Not bootable
SAN_B	Fibre Channel	SAN_B	8	FlexibleLOM 1:2-b	Not bootable
vMotion_FT_A	Ethernet	vMotion_FT_Set_A	2	FlexibleLOM 1:1-c	Not bootable
vMotion_FT_B	Ethernet	vMotion_FT_Set_B	2	FlexibleLOM 1:2-c	Not bootable
VM_Traffic_A	Ethernet	VM_Traffic_Set_A	9	FlexibleLOM 1:1-d	Not bootable
VM_Traffic_B	Ethernet	VM_Traffic_Set_B	9	FlexibleLOM 1:2-d	Not bootable

- 5 Select the **Manage boot mode** checkbox and set the following values:
 - Boot mode: **UEFI optimized**.
 - PXE boot policy: **Auto**.
- 6 Select the **Manage boot order** checkbox and then select **Hard Disk**.
- 7 Select the **Manage BIOS** checkbox.
- 8 Under Advanced, ensure that **Virtual** is selected for all appropriate options and that **Hide unused FlexNICs** is set to **Yes**.
- 9 Click **Create**.

Create the HPE BL460c Gen9 Server Profile for the HPE OneView for vCenter Plugin

Procedure

- 1 From the top left corner of the HPE OneView UI, choose **OneView > Server Profile Templates**.
- 2 Select **CA700_BL460c_Gen9_Server_Profile_Template**.
- 3 From the top right side, choose **Actions > Create server profile** and set the following values:
 - Name: **CA700_OV4VC_BL460c_Gen9_Server_Profile_Template**.
 - Description: **CA700 OV4VC BL460c Gen9 Server Profile Template**.
 - Server hardware: **Unassigned**.
- 4 Click **Create**.
- 5 If you have other configurations of HPE ProLiant BL460c Gen9 servers such as servers with different NIC or boot configurations, repeat this procedure for those server hardware types.
- 6 If you are using HPE ProLiant WS460c Gen9 servers, use this procedure to create a server profile for those servers as well.

Note This deployment guide does not cover HPE ProLiant WS460c Gen9 servers other than for the deployment of the vCenter plugin.

Creating Profiles for the HPE BL660c Gen9 Compute Servers

Wait until the enclosure with the HPE ProLiant BL660c Gen9 servers is fully imported into HPE OneView before you create a template profile for an HPE ProLiant BL660c Gen9 blade.

If an HPE ProLiant BL660c Gen9 server has two LOMs and additional NIC or CNA mezz cards, the connection to the Mgmt_A and Mgmt_B management networks should be on LOM2. The HPE OneView for vCenter plugin does not support the use of Mgmt_A on multiple NICs because it causes deployment failures.

Create the Server Profile Template for an HPE ProLiant BL660c Gen9 Server

Procedure

- 1 From the top left corner of the HPE OneView UI, choose **OneView > Server Profile Templates**.
- 2 Click **Create server profile template**.
- 3 Set the following values:
 - Name: **CA700_BL660c_Gen9_Server_Profile_Template**.
 - Description: **CA700 BL660c Gen9 Server Profile Template**.
 - Server profile description: **CA700 BL660c Gen9 Server Profile Template**.
 - Server hardware type: **BL660c Gen9 1**.
 - Enclosure group: **Solution_EG**.
 - Affinity: **Device Bay**.
 - Firmware baseline: Select the HPE SPP that you uploaded earlier.
 - Installation method: **Firmware only**.
- 4 Click **Add Connection** and use the information in the following table to create the connections.

Table 11: HPE-recommended BL660c server profile connections

Name	Type	Network	Requested Bandwidth (Gb)	Port	Bootable
SAN_A_LOM1	Fibre Channel	SAN_A	8	FlexibleLOM 1:1-b	Not bootable
SAN_B_LOM1	Fibre Channel	SAN_B	8	FlexibleLOM 1:2-b	Not bootable
vMotion_FT_A_LOM1	Ethernet	vMotion_FT_Set_A	2	FlexibleLOM 1:1-c	Not bootable
vMotion_FT_B_LOM1	Ethernet	vMotion_FT_Set_B	2	FlexibleLOM 1:2-c	Not bootable
VM_Traffic_A_LOM1	Ethernet	VM_Traffic_Set_A	10	FlexibleLOM 1:1-d	Not bootable
VM_Traffic_B_LOM1	Ethernet	VM_Traffic_Set_B	10	FlexibleLOM 1:2-d	Not bootable
Mgmt_A_LOM2	Ethernet	Mgmt_Set_A	1	FlexibleLOM 2:1-a	Not bootable
Mgmt_B_LOM2	Ethernet	Mgmt_Set_B	1	FlexibleLOM 2:2-a	Not bootable
SAN_A_LOM2	Fibre Channel	SAN_A	8	FlexibleLOM 2:1-b	Not bootable
SAN_B_LOM2	Fibre Channel	SAN_B	8	FlexibleLOM 2:2-b	Not bootable
vMotion_FT_A_LOM2	Ethernet	vMotion_FT_Set_A	2	FlexibleLOM 2:1-c	Not bootable

Name	Type	Network	Requested Bandwidth (Gb)	Port	Bootable
vMotion_FT_B_LOM2	Ethernet	vMotion_FT_Set_B	2	FlexibleLOM 2:2-c	Not bootable
VM_Traffic_A_LOM2	Ethernet	VM_Traffic_Set_A	9	FlexibleLOM 2:1-d	Not bootable
VM_Traffic_B_LOM2	Ethernet	VM_Traffic_Set_B	9	FlexibleLOM 2:2-d	Not bootable

- 5 Select the **Manage local storage** and the **Manage integrated controller** checkboxes. If a warning appears, click **Close** to acknowledge it.
- 6 Make the following further selections:
 - a Select the **Re-initialize internal storage** checkbox. If a warning appears, click **OK** to acknowledge it.
 - b For controller mode, select **RAID**.
 - c Click **Create logical drive** and enter the following information:
 - Name: **Boot_Vol**.
 - RAID Level: **RAID1**.
 - Number of physical drive: **2**.
 - Drive technology: Either select **Not Specified** or select the HDD technology to be used for the boot drives.
 - d Click **Create**.
 - e For boot drive, select **Boot_Vol**.
- 7 Select the **Manage boot mode** checkbox and set the following values:
 - Boot mode: **UEFI optimized**.
 - PXE boot policy: **Auto**.
- 8 Select the **Manage boot order** checkbox and then select **Hard Disk**.
- 9 Select the **Manage BIOS** checkbox.
- 10 Under Advanced, ensure that **Virtual** is selected for all appropriate options and **Hide unused FlexNICs** is set to **Yes**.
- 11 Click **Create**.

Create the HPE BL660c Gen9 Server Profile for the HPE OneView for vCenter Plugin

Procedure

- 1 From the top left corner of the HPE OneView UI, choose **OneView > Server Profile Templates**.
- 2 Select **CA700_BL660c_Gen9_Server_Profile_Template**.
- 3 From the top right side, choose **Actions > Create server profile** and set the following values:
 - Name: **CA700_OV4VC_BL660c_Gen9_Server_Profile_Template**.
 - Description: **CA700 OV4VC BL660c Gen9 Server Profile Template**.
 - Server hardware: **Unassigned**.
- 4 Click **Create**.
- 5 If you have other configurations of HPE ProLiant BL660c Gen9 servers such as servers with different NIC or boot configurations, repeat this procedure for those server hardware types.

Complete Additional HPE OneView Configuration

Depending on the amount of customization that you want to configure in the HPE OneView environment, you can perform additional tasks, such as adding unmanaged devices (for example, network switches), configuring power delivery devices (for example, HPE iPDUs), or configuring the rack and data center views for a more holistic display of the solution.

For more information, see [HPE OneView Deployment and Management Guide](#). Consult [Additional Resources](#) for additional links to the HPE OneView documentation.

Deploying and Configuring HPE ICsp

HPE Insight Control server provisioning (ICsp) is used to deploy operating systems and hypervisor environments within the solution. Ensure that you have downloaded the appropriate HPE ICsp version and any patches that are listed in [Validated Software and Firmware Levels](#) on page 12.

To deploy HPE ICsp, complete the following tasks:

- Deploy the HPE ICsp VM.
- Configure basic networking settings on the HPE ICsp VM.
- Apply patches to HPE ICsp, if needed.
- Create and populate the HPE ICsp media server.
- Configure the HPE ICsp media server.
- Configure an HPE OneView user in HPE ICsp.
- Create build plans for use in the solution.

Deploy the HPE ICsp VM

Procedure

- 1 From the Home page of the vSphere Web Client, click **Host and Clusters**.
- 2 Right-click **<<vcenter_mgmt_cluster_name>>** and choose **Deploy OVF Template**.
- 3 Browse to the location of the HPE ICsp OVA file, select the file, and open it.
- 4 Walk through the steps to create a VM:
 - a Name the VM as **<<icsp_vm_name>>**.
 - b Select **Thick Provision Eager Zeroed** as the disk format.
 - c Place the VM in the **Mgmt_Vol1** datastore.
 - d Ensure that the network connection is set to **Management**.
- 5 If you are using separate networks for management and deployment, do the following after the VM is deployed:
 - a Right-click the **<<icsp_vm_name>>** VM and select **Edit Settings**.
 - b Configure **Network adapter 2** to use **Deployment Network**.
 - c Verify that **Network adapter 1** is using **Management Network**.
 - d Click **Next** and then click **Finish**.
- 6 Power on the **<<icsp_vm_name>>** VM.

Perform the Initial Configuration of the HPE ICsp VM

Procedure

- 1 From the vSphere Web Client, right-click the **<<icsp_vm_name >>** VM and choose **Open Console**.
- 2 After ICsp completes the boot process, read and accept the license agreement.

- 3 In the Application Support window, verify that Authorized Services Access has a setting of **Enabled** and click **OK**.
- 4 Log in with the user name **Administrator** and the password **admin**.
- 5 Set the new password to **<<icsp_administrator_password>>** and click **OK**.
- 6 In the Appliance Network dialog box, set the following values:
 - **Appliance** settings:
 - Host name: **<<icsp_fqdn>>**.
 - IPv4 IP address: **<<icsp_mgmt_ip>>**.
 - IPv4 subnet mask: **<<mgmt_net_netmask>>**.
 - IPv4 gateway address: **<<mgmt_net_gw>>**.
 - Preferred DNS server: **<<mgmt_net_dns1>>**.
 - **Deployment** settings if using separate networks for management and deployment:
 - Select **Independent**.
 - IP address: **<<icsp_deployment_ip>>**.
 - Subnet mask: **<<deployment_net_netmask>>**.
 - **Deployment** settings if using the same network for management and deployment:
 - Select **Shared with appliance interface**.
 - IP address: **<<icsp_deployment_ip>>**.
- 7 Click **OK** to apply the changes and reboot the ICsp VM.
- 8 Ensure that the reboot process has been initiated and then close the virtual console window.
The reboot process takes several minutes.

Apply Patches to the HPE ICsp VM

Depending on the version of HPE ICsp that you are using, you may need to apply patches to the ICsp VM. See [Validated Software and Firmware Levels](#) on page 12 to determine whether you need to apply any patches to ICsp.

Procedure

- 1 Log in to the HPE Insight Control server provisioning Web Administration Portal.
- 2 From the top left corner of the UI, choose **HPE Insight Control server provisioning > Settings**:
 - a In the Appliance pane, click **Update Appliance**.
 - b Click **Browse**, navigate to the patch, and click **Open**.
 - c Click **Upload and install**.
 - d On the Update Summary page, click **Continue**.
 - e Click **Agree** to accept the license agreement and install the patch.

The installation requires a reboot of the ICsp VM. This process can take up to an hour to complete.

- 3 After the appliance reboots, log back in and verify that the version details have been updated to correspond to the correct patch level.

Connect to the Management VM and Obtain the ICsp Media Server Setup Utility

Procedure

- 1 Start a web browser session on the **<<mgmt_vm_name>>** system and log in to HPE ICsp.
- 2 From the top left corner of the HPE ICsp UI, choose **HPE Insight Control server provisioning > Settings**.

- 3 Hover the cursor to **Media Server** and, to the right, click **Edit**:
 - a In the Edit Media Server dialog box, click the **Download HPE Insight Control server provisioning Media Server setup utility** link.
 - b Click **Save** when prompted to download the utility and save it to the desktop.

Configure the Media Server and Load the HPE SPP and the HPE Provisioning Packages

To perform this procedure, locate the HPE SPP that is listed in [Validated Software and Firmware Levels](#) on page 12.

Procedure

- 1 Mount the SPP ISO file on the management VM either by using Virtual Media or by copying the ISO to the management VM and using Windows to mount it for you.
- 2 In Windows Explorer, navigate to the desktop of the <<mgmt_vm_name>> VM and double-click **icsp-mediaserver-setup.exe**.
- 3 In the HP Install Package dialog box, click **Run**.
- 4 Click **Continue**.

The Browse for Folder window opens.
- 5 Select **Data Volume (E:)** and click **Make New Folder**.
- 6 Name the folder **ICsp** and press Enter.

If necessary, select the new ICsp folder before pressing Enter.
- 7 Click **OK**.
- 8 Clear the **Select All** checkbox and select **HP Service Pack for ProLiant**.
- 9 Click **Install**.
- 10 Keep the Windows File Share Name option as **deployment**.
- 11 For Authorized Windows User, enter **icspUser**.
- 12 Click **Install**.
- 13 Click **Browse** and navigate to the location where you mounted the SPP ISO.
- 14 Click **Install**.
- 15 Click **Close**, and then click **Close** again.
- 16 Repeat this procedure for HPE Intelligent Provisioning.

Be sure to select the **HP Intelligent Provisioning** option in the ICsp media server setup utility.

Load the VMware ESXi Image

The latest version of HPE ICsp at the time that this solution was tested did not have an automatic setup utility for VMware ESXi 6.5. Follow the instructions in this procedure to configure the ICsp media server to serve VMware ESXi 6.5. You must run the media server setup utility to properly configure Microsoft IIS to serve out any VMware bits.

To perform this procedure, locate the HPE VMware ESXi ISO image that is listed in [Validated Software and Firmware Levels](#) on page 12.

Procedure

- 1 Mount the HPE VMware ESXi ISO image on the management VM either by using Virtual Media or by copying the ISO to the management VM and using Windows to mount it for you.
- 2 Navigate to the desktop of the <<mgmt_vm_name>> VM and double-click **icsp-mediaserver-setup.exe**.
- 3 In the HP Install Package dialog box, click **Run**.
- 4 Click **Continue**.

The Browse for Folder window opens.

- 5 Select **Media (E:)**, and then select **ICsp**.
- 6 Click **OK**.
- 7 Clear the **Select All** checkbox and select **ESXi 6.5**.
- 8 Click **Install**.
- 9 Keep the Windows File Share Name option as **deployment**.
- 10 Click **Install**.
- 11 Click **Install**, but do not specify the distribution location.

You will manually specify the location in a later procedure.

- 12 Click **Close**, and then click **Close** again.
- 13 Navigate to `E:\ICsp\Media`.
- 14 Create a directory called `esxi65` and copy the contents of the mounted HPE VMware ESXi ISO into this directory.

Load VMware VIB and Bundle Updates

[Validated Software and Firmware Levels](#) on page 12 lists the .vib updates and patches to VMware software that are required for the solution. Perform the steps in this procedure to add them to the media server. If no updates are required, skip this procedure.

Procedure

- 1 Obtain the necessary .vib updates and patch bundles (.zip files).
- 2 Navigate to the `E:\ICsp\Media` directory.
- 3 Add a new folder called `updates`, and then add another folder called `vmware` inside `updates` to create the `E:\ICsp\Media\updates\vmware` directory structure.
- 4 Copy the necessary .vib and .zip files to `E:\ICsp\Media\updates\vmware`.

Configure the ICsp Media Server

Procedure

- 1 Open the HPE Insight Control server provisioning Administration Portal.
- 2 From the top left corner of the UI, choose **HPE Insight Control server provisioning > Settings**.
- 3 Hover the cursor to the right of Media Server and click **Edit**.
- 4 Set the following values:
 - File share host: `<<mgmt_vm_deployment_ip>>`.
 - File share name: `/deployment`.
 - File share user: `icspUser`.
 - File share password: `<<mgmt_vm_media_user_password>>`.
 - HTTP server host: `<<mgmt_vm_deployment_ip>>`.
 - HTTP server path: `/deployment`.
- 5 Click **OK** to apply the media server settings.

Configure the HPE ICsp OneView Integration

Procedure

- 1 From the top left corner of the HPE ICsp UI, choose **HPE Insight Control server provisioning > HPE OneView Appliances**.
- 2 In the left pane, click **Add appliance**.

3 Set the following values:

- Host name: `<<oneview_fqdn>>`.
- User: `readUser`.
- Password: `<<oneview_readuser_password>>`.
- Description: **Solution HPE OneView Appliance**.

4 Click **Add** and accept the certificate when prompted.

If the HPE OneView appliance is successfully added, HPE ICsp displays the message `Appliance access is authorized`.

Configure OS Deployment Settings

Procedure

- 1 From the top left corner of the HPE ICsp UI, choose **HPE Insight Control server provisioning > Settings**.
- 2 Hover the cursor over **DHCP** and, to the right, click **Edit**.
- 3 Set the following values:
 - DHCP server: **Enable**.
 - Start of address range: `<<icsp_dhcp_range_start>>`.
 - End of address range: `<<icsp_dhcp_range_end>>`.
- 4 Click **OK**.

Adding a New Build Plan for Enhanced HPE OneView for VMware vCenter Builds

To be able to leverage the build path for the HPE OneView for VMware vCenter (OV4VC) Enhanced Grow Cluster feature that is presented later in this guide, you must create a new VMware ESXi build plan to use all of the inputs that the feature requires.

Currently, with an FCoE-based SAN, HPE OneView for VMware vCenter Enhanced Grow Cluster supports booting a server only from a local disk. If you are booting from a SAN, add a new build plan for basic OV4VC builds. This same build plan should set some parameters to tune the HPE Nimble Storage array.

Create a New Kickstart File for Use by HPE OneView for VMware vCenter Enhanced Grow Cluster

Procedure

- 1 From the top left corner of the HPE ICsp UI, choose **HPE Insight Control server provisioning > Configuration Files**.
- 2 From the list of files on the left side, click **ESXi 6.0 U2 Kickstart**.
- 3 Click **Actions > Save as**.
- 4 Name the new configuration file as **HPE Grow Cluster – ESXi 6.5 Kickstart**.
- 5 Click **OK**.
- 6 From the list of files on the left side, click **HPE Grow Cluster – ESXi 6.5 Kickstart**.
- 7 Hover your cursor over **Configuration File** and, to the right, click **Edit**.
- 8 Add the following lines to the kickstart file.

These lines must be added before the `## Post-install script` line in the kickstart file.

Note See [Appendix B: ESXi 6.5 Kickstart File for Grow Cluster](#) on page 105 for the full kickstart file.

```
## OV4VC custom values
%firstboot
## This will configure the management interface per the inputs into OV4VC
VMNIC=$(esxcli network nic list | grep -i @mgmt_mac_address@ | awk -F " " '{
```

```

    print $1 }')
esxcli network vswitch standard uplink remove --uplink-name=vmnic0
--vswitch-name=vSwitch0

## This ensures we still have a vmk that uses DHCP so it can communicate to
ICsp.
## OV4VC Will remove this for us later
esxcli network vswitch standard portgroup add -p vmkDeployment -v vSwitch0
esxcli network ip interface add -i vmk9 -p vmkDeployment --mac-address
@mgmt_mac_address@
esxcli network ip interface ipv4 set -i vmk9 -t dhcp

## Add solution management ip
esxcli network vswitch standard uplink add --uplink-name=$VMNIC
--vswitch-name=vSwitch0
esxcli network ip interface ipv4 set --interface-name=vmk0 --ipv4=@ip_address@
--netmask=@net_mask@ --type=static
esxcli network ip route ipv4 add --gateway @gate_way@ --network default
esxcli network ip dns server remove --server "" -a
esxcli network ip dns server add --server @primary_dns_server@
esxcli network ip dns server add --server @alternate_dns_server@
esxcli system hostname set --host @host_name@ --domain @domain_name@
esxcli network vswitch standard portgroup set --portgroup-name "Management
Network" --vlan-id @vlan_id@

## Configure NTP
cat > /etc/ntp.conf << __END_NTP_CONFIG__
server @NTP_Server@
__END_NTP_CONFIG__

/sbin/chkconfig ntpd on
esxcli network firewall ruleset set --ruleset-id ntpClient --enabled yes
/etc/init.d/ntpd start

## Configure MAC address
esxcfg-advcfg -s 1 /Net/FollowHardwareMac

# rename local datastore
vim-cmd hostsvc/datastore/rename datastore1 "$(hostname -s)-localdatastore"
services.sh restart

## Install Nimble Connection Manager ##
wget -P /vmfs/volumes/"$(hostname -s)-localdatastore"/
http://mgmtvm-ca700.hpe.net/deployment/Media/Nimble/nimble-ncm-for-esx6.5-4.1.0-650005.zip

esxcli software vib install -d /vmfs/volumes/"$(hostname
-s)-localdatastore"/nimble-ncm-for-esx6.5-4.1.0-650005.zip

```

9 Click **OK**.











Create a New OS Build Plan File for Use by HPE OneView for VMware vCenter Enhanced Grow Cluster

Procedure

- 1 From the top left corner of the HPE ICsp UI, choose **HPE Insight Control server provisioning > OS Build Plans**.
- 2 From the list of OS build plans on the left side, click **ProLiant OS - ESXi 6.0 U2 Scripted Install**.
- 3 Click **Actions > Save as**.
- 4 Name the new OS build plan as **HPE Grow Cluster - ESXi 6.5 Scripted Install**.

Note For the build plan to be available in the HPE OneView for VMware vCenter plugin, the name must contain ESX (case insensitive).

- 5 Click **OK**.
- 6 From the list of OS build plans on the left side, select **HPE Grow Cluster - ESXi 6.5 Scripted Install**.
- 7 Hover your cursor over **Custom Attributes** and click **Edit**.
- 8 Click **Create custom attribute** and set the following values:
 - Name: **NTP_Server**.
 - Value: **<<mgmt_net_ntp1>>**.
- 9 Click **Create** and then click **OK** in the Custom attributes window.
- 10 Hover your cursor over **Steps** and click **Edit**:
 - a Locate the **ESXi 6.0 U2 Kickstart** step and click the **Edit** icon (green pencil) to the right of the step.
 - b In the Configuration File list, select **HPE Grow Cluster – ESXi 6.5 Kickstart** and click **OK**.

6	Wait for HP SA Agent	--maintenance --atLeast=3 --atMost...	OGFS		
7	Set Media Source	@_OPSW-Media-LinURI@/esxi65	Python		
8	HPE Grow Cluster - ESXi 6.5 Kickstart	/tmp/user.ks.cfg	Config File		
9	Inject Required ESXi 5 Kickstart Settings	--accept-encrypted-password	OGFS		
10	Inject Kickstart Personalization Settings fo...		OGFS		

- 11 Click **OK**.

Installing and Configuring the HPE OneView for VMware vCenter Software

To install and configure HPE OneView for VMware vCenter, complete the following tasks:

- Install the HPE OneView for VMware vCenter plugin.
- Configure the HPE OneView for VMware vCenter plugin.
- Configure server module credentials.
- Generate the HPE OneView for VMware vCenter certificate and upload it to Onboard Administrator to enable SSO.
- Set host network configuration preferences.
- Restart the plugin.

Deploy the HPE OneView for VMware vCenter VM

Procedure

- 1 From the Home page of the vSphere Web Client, click **Host and Clusters**.
- 2 Right-click **<<vcenter_mgmt_cluster_name>>** and choose **Deploy OVF Template**.
- 3 Browse to the location of the HPE OneView for VMware vCenter OVA file, select the file, and open it.
- 4 Walk through the steps to create a VM:
 - a Name the VM as **<<ov4vc_vm_name>>**.
 - b Select **Thin Provision** for the disk format.
 - c Place the VM in the **Mgmt_VoIO** datastore.
 - d Ensure that the network connection is set to **Management**.
- 5 On the Customize template page, set the FQDN to **<<ov4vc_fqdn>>**.
- 6 Expand Network 1 Settings and set the following values:

- Network 1: IP address: <<ov4vc_mgmt_ip>>.
- Network 1: Subnet mask: <<mgmt_net_netmask>>.
- Network 1: Default gateway: <<mgmt_net_gw>>.
- Network 1: DNS servers: <<mgmt_net_dns1>>.

7 Select the **Power on after deployment** checkbox and click **Finish**.

Perform the Initial Configuration of the HPE OneView for vCenter Plugin

After the OneView for VMware vCenter VM is imported into vCenter and is powered on, you must register the vCenter instance in the configuration.

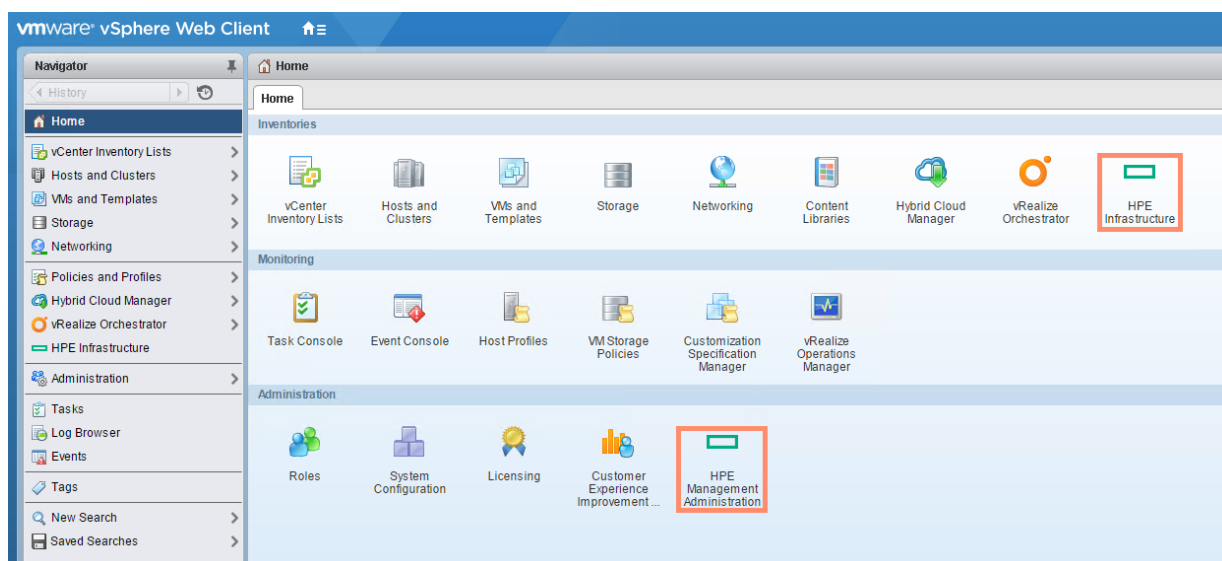
Procedure

- 1 Log out and close any open VMware vSphere Web Client and vSphere Client for Windows sessions.
- 2 Using a web browser, navigate to **https://<<ov4vc_fqdn>>**.
- 3 Accept any security warnings to continue to the website.
- 4 Click **Setup** and set the Admin password to <<ov4vc_admin_password>>.
- 5 Choose **HPE OneView for VMware vCenter > Settings**.
- 6 Click **Time** and choose **Actions > Edit**:
 - a Select **Synchronize with time server** and set the network time server 1 to <<mgmt_net_ntp1>>.
 - b Clear the values in the other NTP time server fields.
 - c Click **OK**.
- 7 Choose **HPE OneView for VMware vCenter > vCenters**, click **Add vCenter**, and set the following values:
 - Name: <<vcenter_fqdn>>.
 - User name: administrator@<<mgmt_net_domain_name>>.
 - Password: <<vcenter_administrator_password>>.
- 8 Click **Add** and then click **Accept** to accept the certificate.

Access the HPE OneView for vCenter Plugin in vCenter

Procedure

- 1 From the Home page of the vSphere Web Client, verify that the HPE Management Administration icon is available in the Administration grouping.



- 2 If the icon is not present, log out of the vSphere Web Client, close all browser sessions, and log back in to initialize the plugin.
- 3 If the icon is still not present after you log back in, reboot the `<<vcenter_vm_name>>` VM.
- 4 Click the **HPE Management Administration** icon.
- 5 Accept any security warnings to continue.

Configure Server Module Credentials

Procedure

- 1 From the HPE OneView for vCenter Getting Started page, in the left pane, choose **HPE Management > Server Module Credentials**.
- 2 Click the **Credentials for Platform/Infrastructure Integration** tab.
- 3 Set the following global device credentials for ESXi, iLO, and Onboard Administrator:
 - ESXi: User name **root** and password `<<compute_server_root_password>>`.
 - iLO: User name **admin** and password `<<blade_ilo_admin_password>>`.
 - Onboard Administrator: User name **admin** and password `<<enclosure_1_password>>`.

- 4 Click **Save** and then click **OK** after the credentials are successfully saved.

- 5 Optional: If the root password (<<mgmt_server_root_password>>) or the iLO password (<<mgmt_server_ilo_password>>) for the management servers is different from the password for the compute servers, click the **Add** icon (green plus sign) under Device Credentials to add these credentials:
 - a Add the credentials for the iLO:
 - Type: **iLO**.
 - Host name/IP address: <<mgmt_server_1_ilo_ip>>.
 - User name: **admin**.
 - Password: <<mgmt_server_ilo_password>>.
 - b Click **Save** and then click **OK** after the credentials are successfully saved.
 - c Add the credentials for the ESXi host:
 - Type: **VMware Host**.
 - Host name/IP address: <<mgmt_server_1_ip>>.
 - User name: **root**.
 - Password: <<mgmt_server_root_password>>.
 - d Click **Save** and then click **OK** after the credentials are successfully saved.
 - e Repeat these steps for each management server.
- 6 Click the **Credentials for HPE Management Software Integration** tab.
- 7 In the HPE Insight Control Server Provisioning Credential pane, add the credentials for HPE ICsp:
 - Host name: <<icsp_fqdn>>.
 - User name: **Administrator**.
 - Password: <<icsp_administrator_password>>.
- 8 Click **Save** and then click **OK** after the credentials are successfully saved.
- 9 Click the **Add** icon (green plus sign) to add the HPE OneView controllers:
 - Host name: <<oneview_fqdn>>.
 - User name: **Administrator**.
 - Password: <<oneview_administrator_password>>.

Server Module Credentials

Credentials for Platform/Infrastructure Integration Credentials for HP Management Software Integration

HP Smart Update Manager Credentials

Hostname/IP Address Username Password

HP Insight Control Server Provisioning Credential



Hostname/IP Address Username Password

HP Systems Insight Manager Credentials

Hostname/IP Address Username Password

Please enter credentials for all HP OneView Controllers that manage ProLiant servers running ESXi.

HP OneView Controllers

Hostname	Username
oneview.ca700.hpe.net	Administrator

10 Click **Save** and then click **OK** after the credentials are successfully saved.

Generate a Self-Signed Certificate

Procedure

- 1 In the left pane, click **HPE Management > Certificate Management**.
- 2 Click **Generate self-signed certificate**.
- 3 Add the appropriate information to the certificate and click **Generate**.
Do not change the common name; this name should be **<<ov4vc_fqdn>>**.
- 4 Click **Copy** to copy the certificate.
- 5 Keep the certificate in the clipboard.
You will paste the certificate when uploading it to Onboard Administrator.

Upload the Self-Signed Certificate to the Onboard Administrator of Each Enclosure

Procedure

- 1 Log in to the active Onboard Administrator of the first enclosure.

- 2 In the left pane, navigate to **Enclosure Information > Users / Authentication > HP SSO Integration**.
- 3 Click the **Certificate Upload** tab.
- 4 Paste the copied certificate into the box and click **Upload**.
- 5 Repeat the procedure to upload the certificate to each enclosure in the solution through the active Onboard Administrator.

Note If you are planning to leverage signed certificates, see the [HPE OneView for VMware vCenter User Guide](#) for detailed instructions on how to generate and upload the certificates.

Restart HPE OneView for VMware vCenter Services and Initialize the Plugin

After you generate a new certificate, you must restart the HPE OneView for VMware vCenter plugin.

Procedure

- 1 Log out and close any open VMware vSphere Web Client and vSphere Client for Windows sessions.
- 2 Using a web browser, navigate to the HPE OneView for VMware vCenter Administration Portal.
- 3 Choose **HPE OneView for VMware vCenter > Settings** and click **Management VM**.
- 4 Choose **Actions > Restart** and click **Yes, restart**.

After HPE OneView for VMware vCenter restarts, the login screen is displayed.

Set Host Network Configuration Preferences

For the OneView for VMware vCenter plugin to be able to call the vSwitches by their custom names during the grow cluster phase, you must set these vSwitch names.

Procedure

- 1 In the VMware vSphere Web Client, navigate to **Home > HP Management Administration > HP Management > Host Network Configuration Preferences**.
- 2 Click the **Network Preferences** tab.
- 3 Set custom names for the vSwitches:

- Deployment_A: **Deployment**.
- Deployment_B: **Deployment**.
- FT_A: **vmkFT**.
- FT_B: **vmkFT**.
- Mgmt_A: **vmkMgmt**.
- Mgmt_B: **vmkMgmt**.
- Mgmt_Set_A: **vSwitch0**.
- Mgmt_Set_B: **vSwitch0**.
- VM_Traffic_A: **VM_Traffic**.
- VM_Traffic_B: **VM_Traffic**.
- VM_Traffic_Set_A: **VM_Traffic_vSwitch**.
- VM_Traffic_Set_B: **VM_Traffic_vSwitch**.
- vMotion_A: **vmkvMotion**.
- vMotion_B: **vmkvMotion**.
- vMotion_FT_Set_A: **vMotion_FT_vSwitch**.
- vMotion_FT_Set_B: **vMotion_FT_vSwitch**.

This step lists the names that were used in the tested configuration described in this guide; they are based on the values that were set up in HPE OneView.

- 4 Click **Save**.

Building the Compute Servers

Most of the compute cluster build-out configuration tasks are automated by the Grow Cluster feature of the HPE OneView for VMware vCenter plugin, but you need to perform some post-installation steps manually to finish the deployment.

To deploy the compute cluster, complete the following tasks:

- Build the compute servers by using HPE Grow Cluster.
- Perform the post-installation steps to configure the network.
- Perform the post-installation steps to add the iLO information of the compute hosts to vCenter.
- Perform the post-installation steps to configure storage for the compute servers.

Build Compute Servers with HPE Grow Cluster

You can build the compute servers with VMware by using the Grow Cluster functionality of HPE OneView for VMware vCenter. This procedure applies to the deployment of HPE ProLiant BL460c Gen9 servers, but the process is similar for other models of compute servers.

Procedure

- 1 From the Home page of the vSphere Web Client, click **Host and Clusters**.
 - 2 In the left pane, right-click **<<vcenter_dc_name>>** and choose **New Cluster**:
 - a Create a cluster called **<<vcenter_prod_cluster_1_name>>** in which to deploy the new hosts.
 - b Enable **DRS** and **HA** and keep the defaults.
 - c Do not enable EVC or Virtual SAN.
 - d Click **OK**.
- Note** Depending on the number of servers and the planned cluster layout, you can create multiple clusters.
- 3 Right-click **<<vcenter_prod_cluster_1_name>>** and choose **HPE Management Actions > HP Grow Cluster**:
 - a On the Grow Cluster – Work Flow Selection page, select the bottom workflow and click **Next**.



- b On the Grow Cluster Step 1 page, make the following selections:
 - a For OS Build Plan, select **HPE Grow Cluster – ESXi 6.5 Scripted Install**.
 - b For Reference Server Profile, select **CA700_OV4VC_BL460c_Gen9_Server_Profile_Template**.
 - c Select the servers to include in the cluster.
 - d Click **Next**.
- c On the Grow Cluster Step 2 page, set the following values for the common host network configuration:
 - Netmask: **<<mgmt_net_netmask>>**.
 - DNS domain: **<<mgmt_net_domain_name>>**.

- Gateway: <<mgmt_net_gw>>.
- DNS server: <<mgmt_net_dns1>>.

d Set the following values for the first blade:

- NIC0 static IP address: <<enclosure_1_blade_bay_1_ip>>.
- ESXi root password: <<compute_server_root_password>>.
- Optional: Host name: <<enclosure_1_blade_bay_1_hostname>>.

e Repeat the preceding step for each of the blades that you are deploying, substituting the IP address and host name information accordingly. After filling in the information for all of the blades, click **Next**.

f Review the summary and click **Finish**.

The deployment takes between one and two hours, depending on the numbers of servers that you are deploying at once.

4 To view a high-level status of the deployment, select the cluster to which you are deploying the blade in vCenter, click the **Monitor** tab, and choose **HP Management > Task**.

vCenter does not automatically refresh this page, so manually refresh it to view updates on the current status.

5 When the deployment is complete, verify that the hosts are imported into vCenter and that their networking configuration is similar to the configuration in HPE OneView or in the reference host.

6 Repeat this procedure for each compute cluster and set of blades that you deploy.

Post-installation: Rename Server Profiles for HPE OneView

This task is optional, but HPE recommends renaming the profiles of compute servers to make the list more user-friendly for the end user.

Procedure

1 Open a web browser and connect to the HPE OneView Web Administration Portal.

2 From the top left corner, choose **OneView > Server Profiles**.

3 In the list of servers, locate blade 1 from enclosure 1.

The server names are prefixed with the name of the VMware cluster to which the servers were deployed.

4 In the General pane of the Overview window for the server profile, verify the IP address and host name in the Description field and the enclosure and bay in the Server Hardware field.

✓ **Compute-Hosts_host-2** | Overview ▾ | ⌵

General ▸

Description	Cloned profile of BL460cGen9_Server_Profile_Template applied on the host 172.28.0.9 (scs09). Created by HP OV4VC.
Server hardware	se01, bay 9
Server hardware type	BL460c Gen9 1
Enclosure group	Solution_EG
Affinity	Device bay
Server power	On
Serial number (v)	VCGG5GN00I
UUID (v)	595436bb-151d-4bce-904e-0215acab7915

- 5 Hover over **General** and click **Edit**.
- 6 Change the name to **Server_Profile_<<enclosure_1_blade_bay_1_hostname>>**.
- 7 Click **OK**.
- 8 Repeat this procedure for all compute servers.

Post-installation: Configure Compute Server Networking

After the servers are deployed and the vSwitches are set up, you must complete some post-configuration tasks manually on the vSwitches and the VMkernel adapters. These tasks are not handled by the plugin.

Procedure

- 1 Using a web browser, navigate to **<<vcenter_vm_name>>** to launch the vSphere Web Client.
- 2 Select the first host in the newly created cluster and click the **Manage** tab in the right pane.
- 3 In the left pane, select **Virtual Switches** under the Networking section.
- 4 Select the **vSwitch0** virtual switch.
The port groups for vSwitch0 are displayed.
- 5 Select the **vmkDeployment** port group and click the **Remove** icon (red X) to remove this port group.
- 6 Select the **vmkmgmt** port group and click the **Edit** icon (pencil):
 - a Select **Teaming and failover**.
 - b Move all of the adapters to **Active Adapters**.
 - c Click **OK**.
- 7 Select the **vmotion_FT_vSwitch** vSwitch and click the **Edit** icon (pencil):
 - a In the Properties tab, set the MTU to **9000**.
 - b Click **OK**.
- 8 In the left pane, select **VMkernel Adapters** under the Networking section.
- 9 Select the **vmkvMotion** VMkernel adapter and click the **Edit** icon (pencil):
 - a In the NIC Settings tab, set the MTU to **9000**.
 - b In the IPv4 Settings tab, select the **Use static IPv4 settings** option and set the following values:
 - IPv4 address: **<<enclosure_1_blade_vmotion_bay_1_ip>>**.

- Subnet mask: <<compute_vmotion_net_netmask>>.
 - c Click **OK**.
- 10** Select the **vmkFT** VMkernel adapter and click the **Edit** icon (pencil):
- a In the NIC Settings tab, set the MTU to **9000**.
 - b In the IPv4 Settings tab, select the **Use static IPv4 settings** option and set the following values:
 - IPv4 address: <<enclosure_1_blade_ft_bay_1_ip>>.
 - Subnet mask: <<compute_ft_net_netmask>>.
 - c Click **OK**.
- 11** Click the **Add Host Networking** icon (globe with the green plus sign):
- a Select the **Virtual Machine Port Group for a Standard Switch** option and click **Next**.
 - b Select the **Select an existing standard switch** option, set it to **vSwitch0**, and click **Next**.
 - c Set the network label to **Management** and the VLAN ID to <<mgmt_net_vlan>> and click **Next**.
 - d Review the settings and click **Finish**.
- 12** Repeat this procedure for all compute servers.

Post-installation: Configure Compute Server for VMware vCenter

To configure vCenter to manage power for the compute blades, you must add the HPE iLO information of each compute host to VMware vCenter. Before you can configure the power management setting, you must collect the iLO MAC address of each blade.

Procedure

- 1** From the HPE iLO web UI, navigate to **Information > System Information > Network** to gather the MAC address of the iLO.

The iLO MAC address is listed in the Adapter 1 - iLO section. In this procedure, the iLO MAC address is referred to as <<mac_address>>.
- 2** Select the first compute server in <<vcenter_prod_cluster_1_name>> and navigate to **Manage > Settings > System > Power Management**.
- 3** To the right of IPMI/iLO Settings for Power Management, click **Edit**.
- 4** Set the following values:
 - User name: **admin**.
 - Password: <<blade_iilo_admin_password>>.
 - BMC IP address: <<enclosure_1_ebipa_bay1_ip>>.
 - BMC MAC address: <<mac_address>>.
- 5** Click **OK**.
- 6** Repeat this procedure for all compute blades.

Post-installation: Provisioning Storage for the Compute Servers

After the servers are configured in each of the clusters, you can connect the servers to the HPE Nimble Storage array and provision datastores to them.

Gather the WWN of the Compute Server from HPE OneView

This procedure is necessary at this point only if you have not previously gathered the WWN of the compute host to which you are presenting storage.

Procedure

- 1 Open a web browser and connect to the HPE OneView Web Administration Portal.
- 2 From the top left corner, choose **OneView > Server Profiles**.
- 3 Click **Server_Profile_<<enclosure_1_blade_bay_1_hostname>>**.
- 4 Click **Connections** and record the MAC addresses that are associated with the connections to SAN_A and SAN_B.

**Connections** [Edit](#)

Expand all Collapse all		ID	Name	Address	Network	Port	Boot
▶	■	1		MAC BE:91:D3:E0:00:54 (v)	Mgmt_Set_A (network set)	FlexibleLOM 1:1-a	Not bootable
▶	■	2		MAC BE:91:D3:E0:00:55 (v)	Mgmt_Set_B (network set)	FlexibleLOM 1:2-a	Not bootable
▼	■	3		WWPN 10:00:76:29:9d:e0:00:2c (v)	SAN_A FCoE vlan4051	FlexibleLOM 1:1-b	Not bootable
			Interconnect	se01, interconnect 1			
			Type	Fibre Channel			
			WWNN	10:00:76:29:9d:e0:00:2d (v)			
			MAC address	BE:91:D3:E0:00:56 (v)			
			Requested bandwidth	8 Gb/s			
			Allocated bandwidth	8 Gb/s			
			Max bandwidth	20 Gb/s			
▼	■	4		WWPN 10:00:76:29:9d:e0:00:2e (v)	SAN_B FCoE vlan4052	FlexibleLOM 1:2-b	Not bootable
			Interconnect	se01, interconnect 2			
			Type	Fibre Channel			
			WWNN	10:00:76:29:9d:e0:00:2f (v)			
			MAC address	BE:91:D3:E0:00:57 (v)			
			Requested bandwidth	8 Gb/s			
			Allocated bandwidth	8 Gb/s			
			Max bandwidth	20 Gb/s			
▶	■	5		MAC BE:91:D3:E0:00:58 (v)	vMotion_FT_A (network set)	FlexibleLOM 1:1-c	Not bootable
▶	■	6		MAC BE:91:D3:E0:00:59 (v)	vMotion_FT_B (network set)	FlexibleLOM 1:2-c	Not bootable
▶	■	7		MAC BE:91:D3:E0:00:5A (v)	VM_Traffic_Set_A (network set)	FlexibleLOM 1:1-d	Not bootable
▶	■	8		MAC BE:91:D3:E0:00:5B (v)	VM_Traffic_Set_B (network set)	FlexibleLOM 1:2-d	Not bootable

Create and Configure the vFC Interfaces for the Compute Servers

In this procedure, <<san_a_mac_address>> refers to the MAC address for SAN_A, and <<san_b_mac_address>> refers to the MAC address for SAN_B.

Procedure

- 1 Log in to <<net_switch1_mgmt_ip>> through SSH.
- 2 Run the **system-view** command to enter system view mode.
- 3 From system view, create the vFC for the LOM 1 port of the first management server and associate it with FCoE VSAN A.

Note You can use any vFC identifier in the range of 1 to 1024. The vFC IDs shown in the example code were used in the tested configuration.

```
interface vfc 1
  description <<enclosure_1_blade_bay_1_hostname>>-LOM1
  port trunk vsan <<net_fcoe_vsan_a_id>>
  bind interface Bridge-Aggregation 111 mac <<san_a_mac_address>>
  quit
```

- 4 Create the vFC for the LOM 2 port of the first management server and associate it with FCoE VSAN B.

```
interface vfc 201
  description <<enclosure_1_blade_bay_1_hostname>>-LOM2
  port trunk vsan <<net_fcoe_vsan_b_id>>
  bind interface Bridge-Aggregation 112 mac <<san_b_mac_address>>
  quit
```

- 5 Repeat this procedure for all compute servers.
Be sure to use unique vFC identifiers for each connection.

Create Datastores for the Compute Cluster

Procedure

- 1 Using a web browser, navigate to <<vcenter_vm_name>> to launch the vSphere Web Client.
- 2 From the Home page, click **Hosts and Clusters**.
- 3 Right-click the <<vcenter_dc_name>> data center and choose **Nimble Storage Actions > Create Datastore**:
 - a On the Group Selection page, select <<nimble_group_name>> and click **Next**.
 - b On the General page, set the following values and click **Next**:
 - a Provide a name for the datastore and an optional description.
 - b Select the compute cluster <<vcenter_prod_cluster_1_name>>.
- Note** Selecting the compute cluster also selects all of the hosts that are part of the cluster.
- c On the Data page, enter the datastore size, keep the other options at their default values, and click **Next**.
- d On the Protection page, select the **Create New Volume Collection** option, name the volume collection, and click **Next**.
- e On the Scheduler page, select an appropriate schedule template or create a custom schedule that meets your snapshot retention requirements, and click **Next**.
- f Optional: Select IOPS or throughput limits for the datastore and click **Next**.
- g Review the settings and click **Finish**.
- 4 Repeat this procedure as necessary to create additional datastores.

Appendixes

Appendix A: Configuration Worksheet

The configuration worksheet lists the variables that are required to complete the tasks in this deployment guide. Before beginning the deployment of the HPE Converged Architecture 700 with HPE Nimble Storage, ensure that the configuration worksheet is completed with the correct and validated values. You are free to expand this configuration worksheet to suit your needs.

Global Networking

Description	Variable	Value
Management network VLAN	<<mgmt_net_vlan>>	
Management network netmask	<<mgmt_net_netmask>>	
Management network gateway	<<mgmt_net_gw>>	
Management network DNS server 1	<<mgmt_net_dns1>>	
Management network domain name	<<mgmt_net_domain_name>>	
Management network NTP server 1	<<mgmt_net_ntp1>>	
Deployment network VLAN	<<deployment_net_vlan>>	
Deployment network netmask	<<deployment_net_netmask>>	
Management vMotion network VLAN	<<mgmt_vmotion_net_vlan>>	
Management vMotion network netmask	<<mgmt_vmotion_net_netmask>>	
Management FT network VLAN	<<mgmt_ft_net_vlan>>	
Management FT network netmask	<<mgmt_ft_net_netmask>>	
Compute vMotion network VLAN	<<compute_vmotion_net_vlan>>	
Compute vMotion network netmask	<<compute_vmotion_net_netmask>>	
Compute FT network VLAN	<<compute_ft_net_vlan>>	
Compute FT network netmask	<<compute_ft_net_netmask>>	
VM production network VLAN	<<vm_production_net_1_vlan>>	

HPE Network Switches

Description	Variable	Value
Network switch 1 management IP address	<<net_switch1_mgmt_ip>>	
Network switch 1 host name	<<net_switch1_hostname>>	
Network switch 1 MAD IP address	<<net_switch1_mad_ip>>	
Network switch 2 MAD IP address	<<net_switch2_mad_ip>>	
MAD network netmask	<<mad_net_netmask>>	

Description	Variable	Value
Network switch admin password	<<net_switch_admin_password>>	
Network switch IRF domain ID	<<net_switch_domain_id>>	

Management Servers

Description	Variable	Value
Management server 1 iLO host name	<<mgmt_server_1_ilo_hostname>>	
Management server 2 iLO host name	<<mgmt_server_2_ilo_hostname>>	
Management server 1 iLO IP address	<<mgmt_server_1_ilo_ip>>	
Management server 2 iLO IP address	<<mgmt_server_2_ilo_ip>>	
Management servers iLO password	<<mgmt_server_ilo_password>>	
Management server 1 host name	<<mgmt_server_1_hostname>>	
Management server 2 host name	<<mgmt_server_2_hostname>>	
Management server 1 FQDN	<<mgmt_server_1_fqdn>>	
Management server 2 FQDN	<<mgmt_server_2_fqdn>>	
Management server 1 IP address	<<mgmt_server_1_ip>>	
Management server 2 IP address	<<mgmt_server_2_ip>>	
Management server 1 FT IP address	<<mgmt_server_1_ft_ip>>	
Management server 2 FT IP address	<<mgmt_server_2_ft_ip>>	
Management server 1 vMotion IP address	<<mgmt_server_1_vmotion_ip>>	
Management server 2 vMotion IP address	<<mgmt_server_2_vmotion_ip>>	
Management server root password	<<mgmt_server_root_password>>	

HPE Nimble Storage System

Description	Variable	Value
HPE Nimble Storage system name	<<nimble_system_name>>	
HPE Nimble Storage group name	<<nimble_group_name>>	
HPE Nimble Storage management IP address	<<nimble_mgmt_ip>>	
HPE Nimble Storage management FQDN	<<nimble_fqdn>>	
HPE Nimble Storage admin password	<<nimble_admin_pwd>>	
HPE Nimble Storage controller A diagnostic IP address	<<nimble_CA_diag_IP>>	

Description	Variable	Value
HPE Nimble Storage controller B diagnostic IP address	<<nimble_CB_diag_IP>>	

VMware vCenter

Description	Variable	Value
vCenter VM name	<<vcenter_vm_name>>	
vCenter IP address	<<vcenter_mgmt_ip>>	
vCenter host name	<<vcenter_hostname>>	
vCenter FQDN	<<vcenter_fqdn>>	
vCenter appliance root password	<<vcenter_root_password>>	
vCenter administrator password	<<vcenter_administrator_password>>	
vCenter Platform Services Controller VM name	<<vcenter_psc_vm_name>>	
vCenter Platform Services Controller IP address	<<vcenter_psc_mgmt_ip>>	
vCenter Platform Services Controller host name	<<vcenter_psc_hostname>>	
vCenter Platform Services Controller FQDN	<<vcenter_psc_fqdn>>	
vCenter Platform Services Controller root password	<<vcenter_psc_root_password>>	
vCenter SSO password	<<vcenter_sso_password>>	
vCenter SSO site name	<<vcenter_sso_site_name>>	
vCenter data center name	<<vcenter_dc_name>>	
vCenter management cluster name	<<vcenter_mgmt_cluster_name>>	
vCenter production cluster 1 name	<<vcenter_prod_cluster_1_name>>	

Management VM

Description	Variable	Value
Management VM name	<<mgmt_vm_name>>	
Management VM host name	<<mgmt_vm_hostname>>	
Management VM FQDN	<<mgmt_vm_fqdn>>	
Management VM administrator password	<<mgmt_vm_administrator_password>>	
Management VM mgmt network IP address	<<mgmt_vm_mgmt_ip>>	
Management VM deployment network IP address	<<mgmt_vm_deployment_ip>>	

Description	Variable	Value
Management VM media user password	<<mgmt_vm_media_user_password>>	

HPE OneView

Description	Variable	Value
HPE OneView VM name	<<oneview_vm_name>>	
HPE OneView host name	<<oneview_hostname>>	
HPE OneView FQDN	<<oneview_fqdn>>	
HPE OneView administrator password	<<oneview_administrator_password>>	
HPE OneView mgmt network IP address	<<oneview_mgmt_ip>>	
HPE OneView MAC address range start	<<oneview_mac_start>>	
HPE OneView MAC address count	<<oneview_mac_count>>	
HPE OneView WWN address range start	<<oneview_wwn_start>>	
HPE OneView WWN address count	<<oneview_wwn_count>>	
HPE OneView serial number range start	<<oneview_serial_start>>	
HPE OneView serial number count	<<oneview_serial_count>>	
HPE OneView readUser password	<<oneview_readuser_password>>	

HPE OneView for vCenter (OV4VC) Plugin

Description	Variable	Value
HPE OV4VC VM name	<<ov4vc_vm_name>>	
HPE OV4VC host name	<<ov4vc_hostname>>	
HPE OV4VC FQDN	<<ov4vc_fqdn>>	
HPE OV4VC admin password	<<ov4vc_admin_password>>	
HPE OV4VC mgmt network IP address	<<ov4vc_mgmt_ip>>	

HPE ICsp

Description	Variable	Value
HPE ICsp name	<<icsp_vm_name>>	
HPE ICsp host name	<<icsp_hostname>>	
HPE ICsp FQDN	<<icsp_fqdn>>	
HPE ICsp administrator password	<<icsp_administrator_password>>	

Description	Variable	Value
HPE ICsp mgmt network IP address	<<icsp_mgmt_ip>>	
HPE ICsp deployment network IP address	<<icsp_deployment_ip>>	
HPE ICsp DHCP range start	<<icsp_dhcp_range_start>>	
HPE ICsp DHCP range end	<<icsp_dhcp_range_end>>	

HPE BladeSystem c7000 Enclosure 1

Description	Variable	Value
HPE c7000 enclosure 1 name	<<enclosure_1_name>>	
HPE c7000 enclosure 1 password	<<enclosure_1_password>>	
HPE c7000 enclosure 1 Onboard Administrator 1 host name	<<enclosure_1_oa_1_hostname>>	
HPE c7000 enclosure 1 Onboard Administrator 2 host name	<<enclosure_1_oa_2_hostname>>	
HPE c7000 enclosure 1 Onboard Administrator 1 IP address	<<enclosure_1_oa_1_ip>>	
HPE c7000 enclosure 1 Onboard Administrator 2 IP address	<<enclosure_1_oa_2_ip>>	
HPE c7000 enclosure 1 EBIPA bay 1 IP address	<<enclosure_1_ebipa_bay1_ip>>	
HPE c7000 enclosure 1 EBIPA bay 2 IP address	<<enclosure_1_ebipa_bay2_ip>>	
HPE c7000 enclosure 1 EBIPA bay 3 IP address	<<enclosure_1_ebipa_bay3_ip>>	
HPE c7000 enclosure 1 EBIPA bay 4 IP address	<<enclosure_1_ebipa_bay4_ip>>	
HPE c7000 enclosure 1 EBIPA bay 5 IP address	<<enclosure_1_ebipa_bay5_ip>>	
HPE c7000 enclosure 1 EBIPA bay 6 IP address	<<enclosure_1_ebipa_bay6_ip>>	
HPE c7000 enclosure 1 EBIPA bay 7 IP address	<<enclosure_1_ebipa_bay7_ip>>	
HPE c7000 enclosure 1 EBIPA bay 8 IP address	<<enclosure_1_ebipa_bay8_ip>>	
HPE c7000 enclosure 1 EBIPA bay 9 IP address	<<enclosure_1_ebipa_bay9_ip>>	
HPE c7000 enclosure 1 EBIPA bay 10 IP address	<<enclosure_1_ebipa_bay10_ip>>	

Description	Variable	Value
HPE c7000 enclosure 1 EBIPA bay 11 IP address	<<enclosure_1_ebipa_bay11_ip>>	
HPE c7000 enclosure 1 EBIPA bay 12 IP address	<<enclosure_1_ebipa_bay12_ip>>	
HPE c7000 enclosure 1 EBIPA bay 13 IP address	<<enclosure_1_ebipa_bay13_ip>>	
HPE c7000 enclosure 1 EBIPA bay 14 IP address	<<enclosure_1_ebipa_bay14_ip>>	
HPE c7000 enclosure 1 EBIPA bay 15 IP address	<<enclosure_1_ebipa_bay15_ip>>	
HPE c7000 enclosure 1 EBIPA bay 16 IP address	<<enclosure_1_ebipa_bay16_ip>>	
HPE c7000 EBIPA interconnect bay 1 IP address	<<enclosure_1_ebipa_inter_bay1_ip>>	
HPE c7000 EBIPA interconnect bay 2 IP address	<<enclosure_1_ebipa_inter_bay2_ip>>	

Compute Servers

Description	Variable	Value
HPE Blade iLO admin password	<<blade_ilo_admin_password>>	
Compute server root password	<<compute_server_root_password>>	
Enclosure 1 blade bay 1 IP address	<<enclosure_1_blade_bay_1_ip>>	
Enclosure 1 blade bay 2 IP address	<<enclosure_1_blade_bay_2_ip>>	
Enclosure 1 blade bay 3 IP address	<<enclosure_1_blade_bay_3_ip>>	
Enclosure 1 blade bay 4 IP address	<<enclosure_1_blade_bay_4_ip>>	
Enclosure 1 blade bay 5 IP address	<<enclosure_1_blade_bay_5_ip>>	
Enclosure 1 blade bay 6 IP address	<<enclosure_1_blade_bay_6_ip>>	
Enclosure 1 blade bay 7 IP address	<<enclosure_1_blade_bay_7_ip>>	
Enclosure 1 blade bay 8 IP address	<<enclosure_1_blade_bay_8_ip>>	
Enclosure 1 blade bay 9 IP address	<<enclosure_1_blade_bay_9_ip>>	
Enclosure 1 blade bay 10 IP address	<<enclosure_1_blade_bay_10_ip>>	
Enclosure 1 blade bay 11 IP address	<<enclosure_1_blade_bay_11_ip>>	
Enclosure 1 blade bay 12 IP address	<<enclosure_1_blade_bay_12_ip>>	
Enclosure 1 blade bay 13 IP address	<<enclosure_1_blade_bay_13_ip>>	
Enclosure 1 blade bay 14 IP address	<<enclosure_1_blade_bay_14_ip>>	
Enclosure 1 blade bay 15 IP address	<<enclosure_1_blade_bay_15_ip>>	
Enclosure 1 blade bay 16 IP address	<<enclosure_1_blade_bay_16_ip>>	

Description	Variable	Value
Enclosure 1 blade bay 1 host name	<<enclosure_1_blade_bay_1_host-name>>	
Enclosure 1 blade bay 2 host name	<<enclosure_1_blade_bay_2_host-name>>	
Enclosure 1 blade bay 3 host name	<<enclosure_1_blade_bay_3_host-name>>	
Enclosure 1 blade bay 4 host name	<<enclosure_1_blade_bay_4_host-name>>	
Enclosure 1 blade bay 5 host name	<<enclosure_1_blade_bay_5_host-name>>	
Enclosure 1 blade bay 6 host name	<<enclosure_1_blade_bay_6_host-name>>	
Enclosure 1 blade bay 7 host name	<<enclosure_1_blade_bay_7_host-name>>	
Enclosure 1 blade bay 8 host name	<<enclosure_1_blade_bay_8_host-name>>	
Enclosure 1 blade bay 9 host name	<<enclosure_1_blade_bay_9_host-name>>	
Enclosure 1 blade bay 10 host name	<<enclosure_1_blade_bay_10_host-name>>	
Enclosure 1 blade bay 11 host name	<<enclosure_1_blade_bay_11_host-name>>	
Enclosure 1 blade bay 12 host name	<<enclosure_1_blade_bay_12_host-name>>	
Enclosure 1 blade bay 13 host name	<<enclosure_1_blade_bay_13_host-name>>	
Enclosure 1 blade bay 14 host name	<<enclosure_1_blade_bay_14_host-name>>	
Enclosure 1 blade bay 15 host name	<<enclosure_1_blade_bay_15_host-name>>	
Enclosure 1 blade bay 16 host name	<<enclosure_1_blade_bay_16_host-name>>	
Enclosure 1 blade vMotion bay 1 IP address	<<enclosure_1_blade_vmotion_bay_1_ip>>	
Enclosure 1 blade vMotion bay 2 IP address	<<enclosure_1_blade_vmotion_bay_2_ip>>	
Enclosure 1 blade vMotion bay 3 IP address	<<enclosure_1_blade_vmotion_bay_3_ip>>	
Enclosure 1 blade vMotion bay 4 IP address	<<enclosure_1_blade_vmotion_bay_4_ip>>	
Enclosure 1 blade vMotion bay 5 IP address	<<enclosure_1_blade_vmotion_bay_5_ip>>	

Description	Variable	Value
Enclosure 1 blade vMotion bay 6 IP address	<<enclosure_1_blade_vmotion_bay_6_ip>>	
Enclosure 1 blade vMotion bay 7 IP address	<<enclosure_1_blade_vmotion_bay_7_ip>>	
Enclosure 1 blade vMotion bay 8 IP address	<<enclosure_1_blade_vmotion_bay_8_ip>>	
Enclosure 1 blade vMotion bay 9 IP address	<<enclosure_1_blade_vmotion_bay_9_ip>>	
Enclosure 1 blade vMotion bay 10 IP address	<<enclosure_1_blade_vmotion_bay_10_ip>>	
Enclosure 1 blade vMotion bay 11 IP address	<<enclosure_1_blade_vmotion_bay_11_ip>>	
Enclosure 1 blade vMotion bay 12 IP address	<<enclosure_1_blade_vmotion_bay_12_ip>>	
Enclosure 1 blade vMotion bay 13 IP address	<<enclosure_1_blade_vmotion_bay_13_ip>>	
Enclosure 1 blade vMotion bay 14 IP address	<<enclosure_1_blade_vmotion_bay_14_ip>>	
Enclosure 1 blade vMotion bay 15 IP address	<<enclosure_1_blade_vmotion_bay_15_ip>>	
Enclosure 1 blade vMotion bay 16 IP address	<<enclosure_1_blade_vmotion_bay_16_ip>>	
Enclosure 1 blade FT bay 1 IP address	<<enclosure_1_blade_ft_bay_1_ip>>	
Enclosure 1 blade FT bay 2 IP address	<<enclosure_1_blade_ft_bay_2_ip>>	
Enclosure 1 blade FT bay 3 IP address	<<enclosure_1_blade_ft_bay_3_ip>>	
Enclosure 1 blade FT bay 4 IP address	<<enclosure_1_blade_ft_bay_4_ip>>	
Enclosure 1 blade FT bay 5 IP address	<<enclosure_1_blade_ft_bay_5_ip>>	
Enclosure 1 blade FT bay 6 IP address	<<enclosure_1_blade_ft_bay_6_ip>>	
Enclosure 1 blade FT bay 7 IP address	<<enclosure_1_blade_ft_bay_7_ip>>	
Enclosure 1 blade FT bay 8 IP address	<<enclosure_1_blade_ft_bay_8_ip>>	
Enclosure 1 blade FT bay 9 IP address	<<enclosure_1_blade_ft_bay_9_ip>>	
Enclosure 1 blade FT bay 10 IP address	<<enclosure_1_blade_ft_bay_10_ip>>	

Description	Variable	Value
Enclosure 1 blade FT Bay 11 IP address	<<enclosure_1_blade_ft_bay_11_ip>>	
Enclosure 1 blade FT bay 12 IP address	<<enclosure_1_blade_ft_bay_12_ip>>	
Enclosure 1 blade FT bay 13 IP address	<<enclosure_1_blade_ft_bay_13_ip>>	
Enclosure 1 blade FT bay 14 IP address	<<enclosure_1_blade_ft_bay_14_ip>>	
Enclosure 1 blade FT bay 15 IP address	<<enclosure_1_blade_ft_bay_15_ip>>	
Enclosure 1 blade FT bay 16 IP address	<<enclosure_1_blade_ft_bay_16_ip>>	

Appendix B: ESXi 6.5 Kickstart File for Grow Cluster

For reference, the kickstart file that was used to build the compute servers for the solution described in this deployment guide is provided in this section.

```
# (c) Copyright 2016 Hewlett Packard Enterprise Development LP
# Accept the VMware End User License Agreement
vmaccepteula

# Set the root password for the DCUI and Tech Support Mode
rootpw --iscrypted
"@encrypted_root_password:$1$7z4m7f1z$wliShMhVv2HuCAPmuiQzV1@"

# Choose the first discovered disk to install onto
# Note for more advanced partitioning, you may want to replace and customize
# this section
install --firstdisk --overwritevmfs

# reboot after installation
reboot

# Set the network to DHCP on the network adapter
network --bootproto=dhcp

#-----
# Command for server-based licensing
# To use: Set the Custom Attribute for Productkey_ESXi65 and uncomment the
# 2 lines below.
#%firstboot
#vim-cmd vimsvc/license --set @Productkey_ESXi65@
## OV4VC custom values
%firstboot
## This will configure the management interface per the inputs into OV4VC
VMNIC=$(esxcli network nic list | grep -i @mgmt_mac_address@ | awk -F " " '{
print $1 }')
esxcli network vswitch standard uplink remove --uplink-name=vmnic0
--vswitch-name=vSwitch0

## This ensures we still have a vmk that uses DHCP so it can communicate to
ICsp.
## OV4VC will remove this for us later
```

```
esxcli network vswitch standard portgroup add -p vmkDeployment -v vSwitch0
esxcli network ip interface add -i vmk9 -p vmkDeployment --mac-address
@mgmt_mac_address@
esxcli network ip interface ipv4 set -i vmk9 -t dhcp

## Add solution management ip
esxcli network vswitch standard uplink add --uplink-name=$VMNIC
--vswitch-name=vSwitch0
esxcli network ip interface ipv4 set --interface-name=vmk0 --ipv4=@ip_address@
--netmask=@net_mask@ --type=static
esxcli network ip route ipv4 add --gateway @gate_way@ --network default
esxcli network ip dns server remove --server "" -a
esxcli network ip dns server add --server @primary_dns_server@
esxcli network ip dns server add --server @alternate_dns_server@
esxcli system hostname set --host @host_name@ --domain @domain_name@
esxcli network vswitch standard portgroup set --portgroup-name "Management
Network" --vlan-id @vlan_id@

## Configure NTP
cat > /etc/ntp.conf << __END_NTP_CONFIG__
server @NTP_Server@
__END_NTP_CONFIG__

/sbin/chkconfig ntpd on
esxcli network firewall ruleset set --ruleset-id ntpClient --enabled yes
/etc/init.d/ntp start

## Configure MAC address
esxcfg-advcfg -s 1 /Net/FollowHardwareMac

# Rename local datastore
vim-cmd hostsvc/datastore/rename datastore1 "$(hostname -s)-localdatastore"
services.sh restart

## Install Nimble Connection Manager ##
wget -P /vmfs/volumes/"$(hostname -s)-localdatastore"/
http://mgmtvm-ca700.hpe.net/deployment/Media/Nimble/nimble-ncm-for-esx6.5-4.1.0-650005.zip

esxcli software vib install -d /vmfs/volumes/"$(hostname
-s)-localdatastore"/nimble-ncm-for-esx6.5-4.1.0-650005.zip

## Post-install script
### DO NOT MODIFY THE CODE BELOW. IT WILL RESULT IN BUILD PLAN FAILURE ###
%post --interpreter=python --ignorefailure=true
import time
stampFile = file("/finished.stamp", mode="w")
stampFile.write( time.asctime() )
```

Appendix C: Factory Resetting a Blade to Prepare for a New OV4VC Build or After a Failed Deployment

If a problem arises during the deployment of a blade with OV4VC Grow Cluster, you can restart the deployment process. To reset the environment before retrying the deployment, perform the following tasks:

- Remove the server entry from HPE ICsp, if needed.
- Power off and remove the server profile entry from HPE OneView, if needed.
- Connect to iLO and use Intelligent Provisioning to reset the server BIOS back to the factory defaults.

Remove the Server Entry from HPE ICsp

Depending on the error message that you received when you were performing the grow cluster operation and the step at which the error happened, you might need to delete the server entry in HPE ICsp. Do not be alarmed if you cannot find the entry; it might have already been removed for you, or you might not have reached the step for registering it in HPE ICsp.

Procedure

- 1 Log in to the HPE Insight Control server provisioning Web Administration Portal.
- 2 From the top left corner of the UI, choose **HPE Insight Control server provisioning > Servers**.
- 3 Locate the server entry for the failed server.

Use the enclosure and bay information displayed in the General pane for the server entries.

- 4 Delete the server entry for the failed server.

Remove the Server Profile Entry from HPE OneView

Depending on the error message that you received when you were performing the grow cluster operation and the step at which the error happened, you might need to delete the server profile entry in HPE OneView. Do not be alarmed if you cannot find the entry; it might have already been removed for you, or you might not have reached the step for registering it in HPE OneView.

Procedure

- 1 Log in to the HPE OneView Web Administration Portal.
- 2 From the top left corner of the UI, choose **OneView > Server Profiles**.
- 3 Locate the server profile for the failed server.

Use the enclosure and bay information displayed in the General pane of the Overview window for the servers.

- 4 To power off, choose **Actions > Power off**.
- 5 To remove the server profile, choose **Actions > Delete**.

Reset the Blade Through Intelligent Provisioning

Procedure

- 1 Connect and log in to the HPE iLO of the server that you are resetting.
- 2 Choose **Information > Overview**, and from the Overview window, launch the .NET or Java remote console.
- 3 Choose **Power Switch > Momentary Press**.
- 4 While the system is booting, press **F10** when the option becomes available to boot into HPE Intelligent Provisioning.
- 5 When Intelligent Provisioning is loaded, click **Perform Maintenance**:
 - a For a solution that uses local boot and HPE Smart Array, click the **HP Smart Storage Administrator (SSA)** icon.
 - b Click the Smart Array controller on the left side, and then click **Configure**.
 - c Click **Clear Configuration**, and then click **Clear** in the dialog box.
 - d Click **Finish**.
 - e Click the **X** on the top right corner of the window, and then click **OK**.
- 6 Click the **Erase** icon.
- 7 Select **Reset** for all three options, and click **Erase**.

When the operation is complete, the iLO might reset. If the iLO resets, reconnect to the iLO remote console after 30 seconds.

- 8 Back on the remote console, click **Reboot**, and if that does not work, choose **Power Switch > Reset** from the top left corner of the remote console window.
- 9 Wait several minutes for the system to restore back to the default configuration, which involves rebooting several times.

When the server attempts to PXE boot, the process is complete.

- 10 To shut down the server, select **Power Switch > Momentary Press** from the top left corner of the remote console.

Additional Resources

HPE Infrastructure

[HPE Intelligent Power Distribution Units](#)

[HPE Rack and Power Infrastructure](#)

Network

[HPE FlexFabric 5940 Switch Series](#)

Storage

[HPE Nimble Storage documentation](#)

Note You will need a valid HPE InfoSight account with the proper rights to view any documentation.

HPE ProLiant Servers

[HPE BladeSystem](#)

[HPE Onboard Administrator](#)

[HPE Servers](#)

[HPE ProLiant DL360 Gen9 Server](#)

[HPE ProLiant BL460c Gen9 Server Blade](#)

[HPE ProLiant BL660c Gen9 Server Blade](#)

[HPE ProLiant WS460c Gen9 Server Blade](#)

[HPE Virtual Connect](#)

[HPE Intelligent Provisioning software](#)

[HPE Service Pack for ProLiant download](#)

[HPE Service Pack for ProLiant documentation](#)

HPE Software

[HPE Nimble Storage Software](#)

Note You will need a valid HPE InfoSight account with the proper rights to download any software.

[HPE OneView software](#)

[HPE OneView documentation](#)

[HPE OneView Partner Integrations](#)

[HPE OneView for vCenter documentation](#)

[HPE VMware OEM Software Delivery Repository](#)

VMware Software

[VMware vCenter Server software](#)

Note You will need a valid user name and password with download access to VMware media from VMware.

Windows Software

[Microsoft Windows Server software](#)

About the Author

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David Fogaren is a lead R&D Architect for HPE Converged Architecture and Converged System 700 programs. David focuses on integrating HPE and third-party disaggregated hardware and software technologies to create simplified and validated solutions that customers can rely on to run their most critical applications.

Version History

Version	Release Date	Description
1.1	October 2017	Terminology updates
1.0	August 2017	Initial release