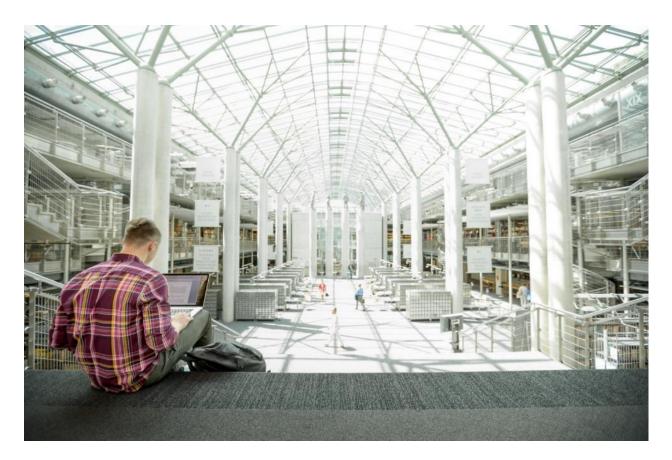
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VersaStack with VMware vSphere 6.7, Cisco UCS 4th Generation Fabric, and IBM FS9100 NVMe-accelerated Storage

Deployment Guide for VersaStack with VMware vSphere 6.7 U2, Cisco UCS Manager 4.0(4), and IBM Spectrum Virtualize 8.2.1

Last Updated: October 8, 2019

VALIDATED DESIGN

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Executive Summary

Cisco Validated Designs (CVDs) deliver systems and solutions that are designed, tested, and documented to facilitate and improve customer deployments. These designs incorporate a wide range of technologies and products into a portfolio of solutions that have been developed to address the business needs of the customers and to guide them from design to deployment.

Customers looking to deploy applications using shared data center infrastructure face a number of challenges. A recurrent infrastructure challenge is to achieve the levels of IT agility and efficiency that can effectively meet the company business objectives. Addressing these challenges requires having an optimal solution with the following key characteristics:

- Availability: Help ensure applications and services availability at all times with no single point of failure
- Flexibility: Ability to support new services without requiring underlying infrastructure modifications
- Efficiency: Facilitate efficient operation of the infrastructure through re-usable policies
- Manageability: Ease of deployment and ongoing management to minimize operating costs
- Scalability: Ability to expand and grow with significant investment protection
- Compatibility: Minimize risk by ensuring compatibility of integrated components
- Extensibility: Extensible platform with support for various management applications and configuration tools

Cisco and IBM have partnered to deliver a series of VersaStack solutions that enable strategic data center platforms with the above characteristics. VersaStack solution delivers an integrated architecture that incorporates compute, storage and network design best practices thereby minimizing IT risks by validating the integrated architecture to ensure compatibility between various components. The solution also addresses IT pain points by providing documented design guidance, deployment guidance and support that can be used in various stages (planning, designing and implementation) of a deployment.

The VersaStack solution, described in this CVD, delivers a Converged Infrastructure platform (CI) specifically designed for high-performance Virtual Server Infrastructure (VSI), which is a validated solution jointly developed by Cisco and IBM. In this deployment, IBM® FlashSystem 9100 combines the performance of flash and Non-Volatile Memory Express (NVMe) with the reliability and innovation of IBM FlashCore technology and the rich features of IBM Spectrum Virtualize. With the addition of Cisco UCS M5 servers including 2nd gen Intel Xeon Scalable processors and Cisco UCS 6400 series Fabric Interconnects, the solution provides superior compute performance and network throughput with 10/25/40/100GbE support for ethernet using Nexus 9000 series switches in the LAN and 32G support for fibre channel connectivity with the Cisco MDS 9000 portfolio of switches in the SAN.

The design showcases:

- Cisco UCS 6400 Series Fabric Interconnects (FI)
- Cisco UCS 5108 Blade Server chassis
- Cisco Unified Computing System (Cisco UCS) servers with 2nd gen Intel Xeon scalable processors
- Cisco Nexus 9336C-FX2 Switches running NX-OS mode
- Cisco MDS 9132T Fabric Switches
- IBM FlashSystem 9100 NVMe-accelerated Storage
- VMware vSphere 6.7 Update 2

Solution Overview

Introduction

VersaStack solution is a pre-designed, integrated and validated architecture for the data center that combines Cisco UCS servers, Cisco Nexus family of switches, Cisco MDS fabric switches, IBM Storage offerings into a single, flexible architecture. VersaStack is designed for high availability, with no single points of failure, while maintaining cost-effectiveness and flexibility in design to support a wide variety of workloads.

VersaStack designs can support different hypervisor options, bare metal servers and can also be sized and optimized based on customer workload requirements. The VersaStack design discussed in this document has been validated for resiliency (under fair load) and fault tolerance during system upgrades, component failures, and partial loss of power scenarios.

This document discusses the design of the high-performance VersaStack with flash and NVMe based solution. The solution is a predesigned, best-practice data center architecture with VMware vSphere built on the Cisco Unified Computing System (Cisco UCS). The solution architecture presents a robust infrastructure viable for a wide range of application workloads implemented as a Virtual Server Infrastructure (VSI).

Audience

The intended audience of this document includes, but is not limited to, sales engineers, field consultants, professional services, IT managers, architects, partner engineering, and customers who want to take advantage of an infrastructure built to deliver IT efficiency and enable IT innovation.

Purpose of this Document

This document provides step-by-step configuration and implementation guidelines for setting up VersaStack. The following design elements distinguish this version of VersaStack from previous models:

- Support for UCS 6454 Fabric Interconnects
- Support for VIC 1400 series adapter cards on UCS M5 servers
- Support for Cisco UCS C480 M5 ML Servers, not validated in this document
- Support for the Second Generation Intel[®] Xeon[®] Scalable processor (Cascade Lake) refresh and Intel[®] Optane[™] Data Center persistent memory modules on UCS Intel-based M5 servers
- Improved memory RAS features on M5 servers
- IBM FlashSystem 9100 release 8.2.1.6
- Support for the Cisco UCS release 4.0(4c)
- Validation of 25GbE IP-based storage design with Nexus NX-OS switches supporting iSCSI based storage access
- Validation of VMware vSphere 6.7 U2
- 100 Gigabit per second Ethernet Connectivity
- 32 Gigabit per second Fibre Channel Connectivity

The design that will be implemented is discussed in the VersaStack with VMware vSphere 6.7 Design Guide found at: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/versastack_vmw67_ibmfs9100_design.html

For more information on the complete portfolio of VersaStack solutions, please refer to the VersaStack guides:

http://www.cisco.com/c/en/us/solutions/enterprise/data-center-designs-cloud-computing/versastack-designs.html

Solution Design

Architecture

This VersaStack design aligns with the converged infrastructure configurations and best practices as identified in the previous VersaStack releases. The solution focuses on integration of IBM Flash System 9100 in to VersaStack architecture with Cisco UCS 4th Generation and support for VMware vSphere 6.7 U2.

The system includes hardware and software compatibility support between all components and aligns to the configuration best practices for each of these components. All core hardware components and software releases are listed and supported on the following lists:

http://www.cisco.com/en/US/products/ps10477/prod_technical_reference_list.html

and IBM Interoperability Matrix:

http://www-o3.ibm.com/systems/support/storage/ssic/interoperability.wss

The system supports high availability at network, compute and storage layers such that no single point of failure exists in the design. The system utilizes 10/25/40/100 Gbps Ethernet jumbo-frame based connectivity combined with port aggregation technologies such as virtual port-channels (VPC) for non-blocking LAN traffic forwarding. A dual SAN 32Gbps environment provides redundant storage access from compute devices to the storage controllers.

Physical Topology

The VersaStack infrastructure satisfies the high-availability design requirements and is physically redundant across the network, compute and storage stacks. Figure 1 provides a high-level topology of the system connectivity.

To provide the compute to storage system connectivity, this design guides highlights two different storage connectivity options:

- Option 1: iSCSI based storage access through Cisco Nexus Fabric
- Option 2: FC based storage access through Cisco MDS Fabric

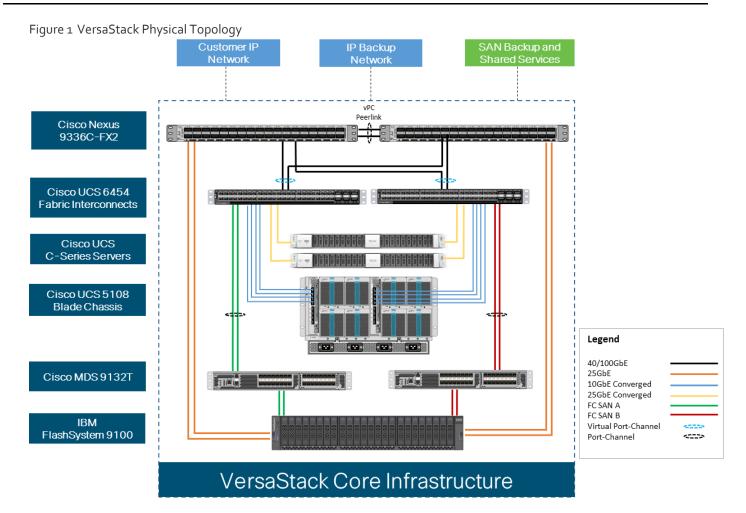
This VersaStack design utilizes Cisco UCS platform with Cisco UCS B200 M5 half-width blades and UCS C220 M5 servers connected and managed through Cisco UCS 6454 Fabric Interconnects and the integrated Cisco UCS manager. These high-performance servers are configured as stateless compute nodes where ESXi 6.7 U2 hypervisor is loaded using SAN (iSCSI and FC) boot. The boot disks to store ESXi hypervisor image and configuration along with the block based datastores to host application Virtual Machines (VMs) are provisioned on the IBM FS9100 storage array.

This design has following physical connectivity between the components of VersaStack:

- 4 X 10 Gb Ethernet connections port-channeled between the Cisco UCS 5108 Blade Chassis and the Cisco UCS Fabric Interconnects
- 25 Gb Ethernet connections port-channeled between the Cisco UCS C-Series rackmounts and the Cisco UCS Fabric Interconnects
- 100 Gb Ethernet connections port-channeled between the Cisco UCS Fabric Interconnect and Cisco Nexus 9000s
- 32 Gb Fibre Channel connections port-channeled between the Cisco UCS Fabric Interconnect and Cisco MDS 9132T
- 16 Gb Fibre Channel connections between the Cisco MDS 9132T and IBM FS9100 storage array for fibre channel block storage access

 25 Gb Ethernet connections between the Cisco Nexus 9000s and IBM FS9100 storage array for iSCSI block storage access

Any supported connectivity to existing customer IP and SAN Networks from the VersaStack core infrastructure is allowed.



This document guides customers through the low-level steps for deploying the base architecture. These procedures explain everything from physical cabling to network, compute, and storage device configurations.

For detailed information about the VersaStack design, see:

https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/versastack_vmw67_ibmfs9100_design.html

Software Revisions

Table 1 lists the hardware and software versions used for the solution validation.

It is important to note that Cisco, IBM, and VMware have interoperability matrices that should be referenced to determine support for any specific implementation of VersaStack. See the following links for more information:

- IBM System Storage Interoperation Center
- <u>Cisco UCS Hardware and Software Interoperability Tool</u>

<u>VMware Compatibility Guide</u>

Table 1Hardware and Software Revisions

Layer	Device	Image	Comments
Compute	Cisco UCS Fabric Interconnects 6400 Series, Cisco UCS B-200 M5, Cisco UCS C-220 M5	4.0(4c)	Includes the Cisco UCS-IOM 2208XP, Cisco UCS Manager, Cisco UCS VIC 1440 and Cisco UCS VIC 1457
	Cisco nenic Driver	1.0.29.0	Ethernet driver for Cisco VIC
	Cisco fnic Driver	4.0.0.40	FCoE driver for Cisco VIC
Network	Cisco Nexus Switches	7.0(3)17(6)	NXOS
	Cisco MDS 9132T	8.4(1)	FC switch firmware version
Storage	IBM FlashSystem 9100	8.2.1.6	Software version
Software	VMware vSphere ESXi	6.7 update 2	Software version
	VMware vCenter	6.7 update 2	Software version

Configuration Guidelines

This document provides details for configuring a fully redundant, highly available VersaStack configuration. Therefore, appropriate references are provided to indicate the component being configured at each step, such as o1 and o2 or A and B. For example, the Cisco UCS fabric interconnects are identified as FI-A or FI-B. This document is intended to enable customers and partners to fully configure the customer environment and during this process, various steps may require the use of customer-specific naming conventions, IP addresses, and VLAN schemes, as well as appropriate MAC addresses.



This document details network (Nexus and MDS), compute (Cisco UCS), virtualization (VMware) and related IBM FS9100 storage configurations (host to storage system connectivity).

Table 2 lists various VLANs, VSANs and subnets used to setup VersaStack infrastructure to provide connectivity between core elements of the design.

VLAN Name	VLAN	Subnet	Usage
IB-MGMT	11	192.168.160.0/22	Management VLAN to access and manage the servers
iSCSI-A	3161	10.29.161.0/24	iSCSI-A path for booting both B Series and C Series servers and datastore access

 Table 2
 VersaStack Infrastructure Configuration

VLAN Name	VLAN	Subnet	Usage
iSCSI-B	3162	10.29.162.0/24	iSCSI-B path for booting both B Series and C Series servers and datastore access
vMotion	3173	10.29.173.0/24	VMware vMotion traffic
Native-2	2	N/A	VLAN 2 used as Native VLAN instead of default VLAN (1)
VM Network	3174	10.29.174.0/24	VLAN to carry data traffic for both VM and bare-metal Servers
VSAN-A	101	N/A	Fabric A VSAN for FC Storage access
VSAN-B	102	N/A	Fabric B VSAN for FC Storage access

Physical Infrastructure

The information in this section is provided as a reference for cabling the equipment in VersaStack environment. To simplify the documentation, the architecture shown in Figure 2 is broken down into network, compute and storage related physical connectivity details.

This document assumes that the out-of-band management ports are plugged into an existing management infrastructure at the deployment site. These interfaces will be used in various configuration steps.

Customers can choose interfaces and ports of their liking but failure to follow the exact connectivity shown in figures below will result in changes to the deployment procedures since specific port information is used in various configuration steps



The Nexus 9336C-FX2 switches used in this design support 10/25/40/100 Gbps on all the ports. The switch supports breakout interfaces, each 100Gbps port on the switch can be split in to 4 X 25Gbps interfaces. The QSFP breakout cable has been leveraged to connect 25Gbps iSCSI ethernet ports on the FS9100 storage array to the 100Gbps QSFP port on the switch end. With this connectivity, IBM SFP transceiver on the FS9100 are not required.

Cisco UCS Connectivity to Nexus Switches

For physical connectivity details of Cisco UCS to the Cisco Nexus switches, refer to Figure 2.

Figure 2 Cisco UCS Connectivity to the Nexus Switches

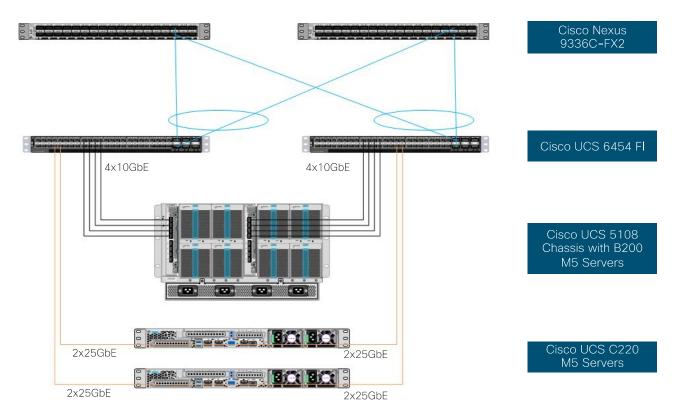


Table 3 Cisco UCS Connectivity to Nexus Switches

Local Device	Local Port	Connection	Remote Device	Remote Port
Cisco UCS Fabric Interconnect A	Eth1/17	10GbE	Cisco UCS Chassis FEX A	IOM 1/1
Cisco UCS Fabric Interconnect A	Eth1/18	10GbE	Cisco UCS Chassis FEX A	IOM 1/2
Cisco UCS Fabric Interconnect A	Eth1/19	10GbE	Cisco UCS Chassis FEX A	IOM 1/3
Cisco UCS Fabric Interconnect A	Eth1/20	10GbE	Cisco UCS Chassis FEX A	IOM 1/4
Cisco UCS Fabric Interconnect A	Eth1/53	100GbE	Cisco Nexus 9336C-FX2 A	Eth1/31
Cisco UCS Fabric Interconnect A	Eth1/54	100GbE	Cisco Nexus 9336C-FX2 B	Eth1/31
Cisco UCS Fabric Interconnect B	Eth1/17	10GbE	Cisco UCS Chassis FEX B	IOM 1/1
Cisco UCS Fabric Interconnect B	Eth1/18	10GbE	Cisco UCS Chassis FEX B	IOM 1/2
Cisco UCS Fabric Interconnect B	Eth1/19	10GbE	Cisco UCS Chassis FEX B	IOM 1/3
Cisco UCS Fabric Interconnect B	Eth1/20	10GbE	Cisco UCS Chassis FEX B	IOM 1/4
Cisco UCS Fabric Interconnect B	Eth1/53	100GbE	Cisco Nexus 9336C-FX2 A	Eth1/32
Cisco UCS Fabric Interconnect B	Eth1/54	100GbE	Cisco Nexus 9336C-FX2 B	Eth1/32

Local Device	Local Port	Connection	Remote Device	Remote Port
Cisco UCS C220 M5 Server 1	VIC Port 1, Port 3	25GbE	Cisco UCS Fabric Interconnect A	Eth1/21, Eth1/22
Cisco UCS C220 M5 Server 1	VIC Port 2, Port 4	25GbE	Cisco UCS Fabric Interconnect B	Eth1/21, Eth1/22
Cisco UCS C220 M5 Server 2	VIC Port 1, Port 3	25GbE	Cisco UCS Fabric Interconnect A	Eth1/23, Eth1/24
Cisco UCS C220 M5 Server 2	VIC Port 2, Port 4	25GbE	Cisco UCS Fabric Interconnect B	Eth1/23, Eth1/24
Cisco Nexus 9336C-FX2 A	Eth1/33	100GbE	Cisco Nexus 9336C-FX2 B	Eth1/33
Cisco Nexus 9336C-FX2 A	Eth1/34	100GbE	Cisco Nexus 9336C-FX2 B	Eth1/34

IBM FS9100 Connectivity to Nexus Switches

For physical connectivity details of IBM FS9100 node canisters to the Cisco Nexus Switches, refer to Table 3 . This deployment shows connectivity for a pair of IBM FS9100 node canisters. Additional nodes can be connected to open ports on Nexus switches as needed.

Figure 3 IBM FS9100 Connectivity to Nexus 9k Switches

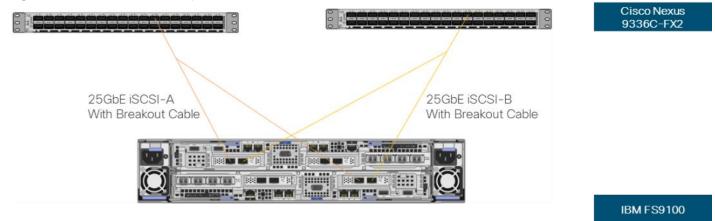


Table 4 IBM	FS9100 Connectivit	tv to the Nexus S	Switches
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Local Device	Local Port	Connection	Remote Device	Remote Port
IBM FS9100 node 1	Port 5	25GbE	Cisco Nexus 9336C-FX2 A	Eth1/11/1*
IBM FS9100 node 1	Port 6	25GbE	Cisco Nexus 9336C-FX2 B	Eth1/11/1*
IBM FS9100 node 2	Port 5	25GbE	Cisco Nexus 9336C-FX2 A	Eth1/11/2*
IBM FS9100 node 2	Port 6	25GbE	Cisco Nexus 9336C-FX2 B	Eth1/11/2*

* Breakout interfaces with one 100G QSFP port on the Nexus 9336C-FX2 is split in to 4 X 25Gbps SFP interfaces connected to the IBM FS9100. Cisco QSFP100G-4SFP25G breakout cable has been leveraged for this connectivity.

Cisco UCS connectivity to SAN Fabric

For physical connectivity details of Cisco UCS to an MDS 9132T based redundant SAN fabric, refer to Figure 4.

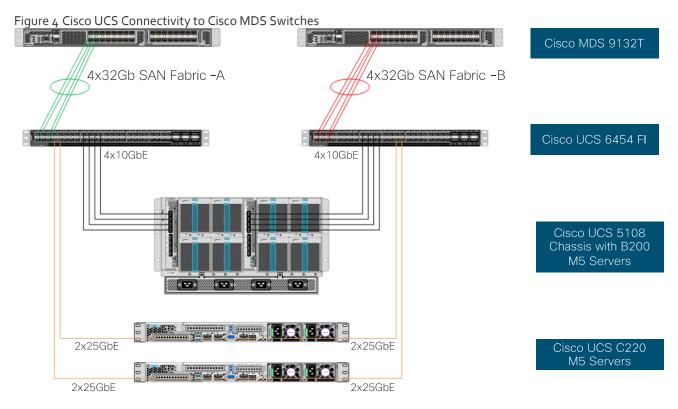


Table 5 Cisco UCS Connectivity to Cisco MDS Switches

Local Device	Local Port	Connection	Remote Device	Remote Port
Cisco UCS Fabric Interconnect A	FC1/1	32Gbps	Cisco MDS 9132T A	FC1/1
Cisco UCS Fabric Interconnect A	FC1/2	32Gbps	Cisco MDS 9132T A	FC1/2
Cisco UCS Fabric Interconnect A	FC1/3	32Gbps	Cisco MDS 9132T A	FC1/3
Cisco UCS Fabric Interconnect A	FC1/4	32Gbps	Cisco MDS 9132T A	FC1/4
Cisco UCS Fabric Interconnect B	FC1/1	32Gbps	Cisco MDS 9132T B	FC1/1
Cisco UCS Fabric Interconnect B	FC1/2	32Gbps	Cisco MDS 9132T B	FC1/2
Cisco UCS Fabric Interconnect B	FC1/3	32Gbps	Cisco MDS 9132T B	FC1/3
Cisco UCS Fabric Interconnect B	FC1/4	32Gbps	Cisco MDS 9132T B	FC1/4

Figure 5 illustrates FC connectivity for IBM FS9100 storage array. Additional nodes can be connected and configured by following the same design guidelines.

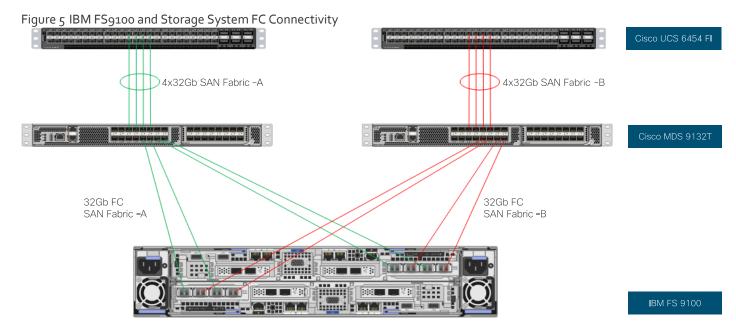


 Table 6
 IBM FS9100 Storage System FC Connectivity

Local Device	Local Ports	Connection	Remote Device	Remote Port
IBM FS9100 Node Canister 1	Port 1	16Gbps	Cisco MDS 9132T A	FC1/5
IBM FS9100 Node Canister 1	Port 2	16Gbps	Cisco MDS 9132T B	FC1/5
IBM FS9100 Node Canister 1	Port 3	16Gbps	Cisco MDS 9132T A	FC1/6
IBM FS9100 Node Canister 1	Port 4	16Gbps	Cisco MDS 9132T B	FC1/6
IBM FS9100 Node Canister 2	Port 1	16Gbps	Cisco MDS 9132T A	FC1/7
IBM FS9100 Node Canister 2	Port 2	16Gbps	Cisco MDS 9132T B	FC1/7
IBM FS9100 Node Canister 2	Port 3	16Gbps	Cisco MDS 9132T A	FC1/8
IBM FS9100 Node Canister 2	Port 4	16Gbps	Cisco MDS 9132T B	FC1/8

Network Configuration

The procedures in this section describe how to configure the Cisco Nexus switches for use in a base VersaStack environment. This procedure assumes the use of Nexus 9336C-FX2 switches running 7.0(3)I7(6) code. Configuration on a differing model of Nexus 9000 series switch should be comparable but may differ slightly with model and changes in NX-OS release. The Cisco Nexus 9336C-FX2 switch and NX-OS 7.0(3)I7(6) release were used in validation of this VersaStack solution, so steps will reflect this model and release.

Connectivity between the Nexus switches and IBM FS9100 for iSCSI access depends on the Nexus 9000 switch model used within the architecture. If any supported Nexus switch with 25Gbps capable SFP ports is used, breakout cable is not required and ports from the switch to IBM FS9100 can be connected directly using the SFP transceivers on both sides.



With Cisco Nexus 9000 release 7.0(3)17(6), autonegotiation (40G/100G) is not supported on ports 1-6 and 33-36 on the Cisco Nexus 9336C-FX2 switch. If these ports are used for connectivity, port speed and duplex should be hard set at both ends of the connection.

Physical Connectivity

Physical cabling should be completed by following the diagram and table references in the previous sections.

Cisco Nexus 9000 Initial Configuration Setup

The steps provided in this section details for the initial Cisco Nexus 9336C-FX2 Switch setup. In this case, we are connected using a Cisco Terminal Server that is connected via the console port on the switch.



Cisco Nexus A

To set up the initial configuration for the first Cisco Nexus switch <nexus-A-hostname>, follow these steps:

On initial boot and connection to the serial or console port of the switch, the NX-OS setup should automatically start and attempt to enter Power on Auto Provisioning.

1. Configure the switch:

```
Abort Power On Auto Provisioning [yes - continue with normal setup, skip - bypass password and basic configuration, no - continue with Power On Auto Provisioning] (yes/skip/no)[no]: yes
Disabling POAP.....Disabling POAP
```

poap: Rolling back, please wait... (This may take 5-15 minutes) ---- System Admin Account Setup ----Do you want to enforce secure password standard (yes/no) [y]: Enter Enter the password for "admin": <password> Confirm the password for "admin": <password> Would you like to enter the basic configuration dialog (yes/no): yes Create another login account (yes/no) [n]: Enter Configure read-only SNMP community string (yes/no) [n]: Enter Configure read-write SNMP community string (yes/no) [n]: Enter Enter the switch name: <nexus-A-hostname> Continue with Out-of-band (mgmt0) management configuration? (yes/no) [y]: Enter Mgmt0 IPv4 address: <nexus-A-mgmt0-ip> Mgmt0 IPv4 netmask: <nexus-A-mgmt0-netmask> Configure the default gateway? (yes/no) [y]: Enter IPv4 address of the default gateway: <nexus-A-mgmt0-gw> Configure advanced IP options? (yes/no) [n]: Enter Enable the telnet service? (yes/no) [n]: Enter Enable the ssh service? (yes/no) [y]: Enter Type of ssh key you would like to generate (dsa/rsa) [rsa]: Enter Number of rsa key bits <1024-2048> [1024]: Enter Configure the ntp server? (yes/no) [n]: y NTP server IPv4 address: <global-ntp-server-ip> Configure default interface layer (L3/L2) [L2]: Enter Configure default switchport interface state (shut/noshut) [noshut]: shut Configure CoPP system profile (strict/moderate/lenient/dense/skip) [strict]: Enter Would you like to edit the configuration? (yes/no) [n]: Enter

2. Review the configuration summary before enabling the configuration.

Cisco Nexus B

To set up the initial configuration for the second Cisco Nexus switch, follow these steps:



On initial boot and connection to the serial or console port of the switch, the NX-OS setup should automatically start and attempt to enter Power on Auto Provisioning.

1. Configure the switch:

Abort Power On Auto Provisioning [yes - continue with normal setup, skip - bypass password and basic configuration, no - continue with Power On Auto Provisioning] (yes/skip/no)[no]: yes

Disabling POAP.....Disabling POAP poap: Rolling back, please wait... (This may take 5-15 minutes) ---- System Admin Account Setup ----Do you want to enforce secure password standard (yes/no) [y]: Enter Enter the password for "admin": <password> Confirm the password for "admin": <password> Would you like to enter the basic configuration dialog (yes/no): yes Create another login account (yes/no) [n]: Enter Configure read-only SNMP community string (yes/no) [n]: Enter Configure read-write SNMP community string (yes/no) [n]: Enter Enter the switch name: <nexus-B-hostname> Continue with Out-of-band (mgmt0) management configuration? (yes/no) [y]: Enter Mgmt0 IPv4 address: <nexus-B-mgmt0-ip> Mgmt0 IPv4 netmask: <nexus-B-mgmt0-netmask> Configure the default gateway? (yes/no) [y]: Enter IPv4 address of the default gateway: <nexus-B-mgmt0-gw> Configure advanced IP options? (yes/no) [n]: Enter Enable the telnet service? (yes/no) [n]: Enter Enable the ssh service? (yes/no) [y]: Enter Type of ssh key you would like to generate (dsa/rsa) [rsa]: Enter Number of rsa key bits <1024-2048> [1024]: Enter Configure the ntp server? (yes/no) [n]: y NTP server IPv4 address: <global-ntp-server-ip> Configure default interface layer (L3/L2) [L2]: Enter Configure default switchport interface state (shut/noshut) [noshut]: shut Configure CoPP system profile (strict/moderate/lenient/dense/skip) [strict]: Enter Would you like to edit the configuration? (yes/no) [n]: Enter

2. Review the configuration summary before enabling the configuration.

Enable Appropriate Cisco Nexus 9000 Features and Settings

Enable Licenses

Cisco Nexus 9000 A and Cisco Nexus 9000 B

To license the Cisco Nexus switches, follow these steps:

1. Log in a admin.

2. Run the following commands:

config terminal	
feature udld	
feature lacp	
feature vpc	

Set Global Configurations

Cisco Nexus 9000 A and Cisco Nexus 9000 B

To set global configurations, follow these steps on both switches:

spanning-tree port type network default spanning-tree port type edge bpduguard default spanning-tree port type edge bpdufilter default port-channel load-balance src-dst l4port ip route 0.0.0.0/0 <ib-mgmt-vlan-gateway> copy run start

Setup NTP (optional)

The following procedure can be used to optionally enable the NTP service on the Nexus switches. The procedure includes the setup of NTP distribution on both the mgmto port and the in-band management VLAN. The interface-vlan feature and ntp commands are used to set this up. This procedure also assumes that the default VRF is used to route the in-band management VLAN.

Cisco Nexus 9000 A and Cisco Nexus 9000 B

1. Run the following commands

```
feature interface-vlan
ntp server <global-ntp-server-ip> use-vrf management
ntp master 3
```

Add NTP Distribution Interface

Cisco Nexus A

1. From the global configuration mode, run the following commands:

```
interface Vlan<IB-Mgmt VLAN id>
ip address <switch-a-ntp-ip>/<ib-mgmt-vlan-netmask-length>
no shutdown
```

```
exit
ntp peer <switch-b-ntp-ip> use-vrf default
```

Cisco Nexus B

1. From the global configuration mode, run the following commands:

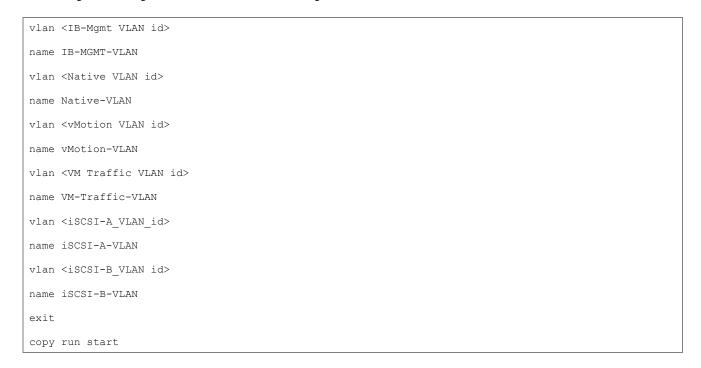
```
interface Vlan<IB-Mgmt VLAN id>
ip address <switch-b-ntp-ip>/<ib-mgmt-vlan-netmask-length>
no shutdown
exit
ntp peer <switch-a-ntp-ip> use-vrf default
```

Create VLANs for VersaStack IP Traffic

Cisco Nexus 9000 A and Cisco Nexus 9000 B

To create the necessary virtual local area networks (VLANs), follow this step on both switches:

1. From the global configuration mode, run the following commands:



Configure Virtual Port Channel Domain

Cisco Nexus 9000 A

To configure vPC domain for switch A, follow these steps:

1. From the global configuration mode, create a new vPC domain:

vpc domain 10

2. Make the Nexus 9000A the primary vPC peer by defining a low priority value:

role priority 10

3. Use the management interfaces on the supervisors of the Nexus gooos to establish a keepalive link:

peer-keepalive destination <Mgmt. IP address for Switch B> source <Mgmt. IP address for Switch A>

4. Enable the following features for this vPC domain:

```
peer-switch
delay restore 150
peer-gateway
ip arp synchronize
auto-recovery
copy run start
```

Cisco Nexus 9000 B

To configure the vPC domain for switch B, follow these steps:

1. From the global configuration mode, create a new vPC domain:

```
vpc domain 10
```

2. Make the Nexus 9000A the primary vPC peer by defining a low priority value:

role priority 20

3. Use the management interfaces on the supervisors of the Nexus 9000s to establish a keepalive link:

peer-keepalive destination <Mgmt. IP address for Switch A> source <Mgmt. IP address for Switch B>

4. Enable the following features for this vPC domain:

```
peer-switch
delay restore 150
peer-gateway
ip arp synchronize
auto-recovery
copy run start
```

Configure Network Interfaces for the vPC Peer Links

To configure the network interfaces for the vPC Peer links, follow these steps:

Cisco Nexus 9000 A

1. Define a port description for the interfaces connecting to vPC Peer <nexus-B-hostname>.

```
interface Eth1/33
description VPC Peer <Nexus-B Switch Name>:1/33
interface Eth1/34
description VPC Peer <Nexus-B Switch Name>:1/34
```

2. Apply a port channel to both vPC Peer links and bring up the interfaces.

```
interface Eth1/33,Eth1/34
channel-group 10 mode active
no shutdown
```

3. Define a description for the port-channel connecting to <nexus_B_hostname>.

```
interface Pol0
description vPC peer-link
```

4. Make the port-channel a switchport and configure a trunk to allow in-band management, VM traffic, vMotion and the native VLAN.

```
switchport
switchport mode trunk
switchport trunk native vlan <Native VLAN id>
switchport trunk allowed vlan <IB-MGMT VLAN id>, <vMotion VLAN id>, <VM Traffic VLAN id>, <iSCSI-A
VLAN id>, <iSCSI-B VLAN id>
```

5. Make the port channel and associated interfaces spanning tree network ports.

spanning-tree port type network

6. Set port speed and duplex.

```
speed 100000
duplex full
no negotiate
```

7. Make this port-channel the VPC peer link and bring it up.

vpc peer-link
no shutdown
copy run start

Cisco Nexus 9000 B

1. Define a port description for the interfaces connecting to VPC Peer <nexus_A_hostname>.

```
interface Eth1/33
description VPC Peer <Nexus-A Switch Name>:1/33
interface Eth1/34
description VPC Peer <Nexus-A Switch Name>:1/34
```

2. Apply a port channel to both VPC Peer links and bring up the interfaces.

```
interface Eth1/33,Eth1/34
channel-group 10 mode active
no shutdown
```

3. Define a description for the port-channel connecting to <nexus_A_hostname>.

```
interface Pol0
description vPC peer-link
```

4. Make the port-channel a switchport and configure a trunk to allow in-band management, VM traffic, vMotion and the native VLAN.

```
switchport
switchport mode trunk
switchport trunk native vlan <Native VLAN id>
switchport trunk allowed vlan <IB-MGMT VLAN id>, <vMotion VLAN id>, <VM Traffic VLAN id>, <iSCSI-A
VLAN id>, <iSCSI-B VLAN id>
```

5. Make the port channel and associated interfaces spanning tree network ports.

```
spanning-tree port type network
```

6. Set port speed and duplex.

speed 100000 duplex full no negotiate 7. Make this port-channel the VPC peer link and bring it up.

```
vpc peer-link
no shutdown
copy run start
```

Configure Network Interfaces to Cisco UCS Fabric Interconnects

To configure the network interfaces for the Cisco UCS Fabric Interconnects, follow these steps:

Cisco Nexus 9000 A

1. Define a description for the port-channel connecting to <UCS Cluster Name>-A.

```
interface Po13
description <UCS Cluster Name>-A
```

2. Make the port-channel a switchport and configure a trunk to allow in-band management, VM traffic, vMotion, iSCSI and the native VLANs.

```
switchport
switchport mode trunk
switchport trunk native vlan <Native VLAN id>
switchport trunk allowed vlan <IB-MGMT VLAN id>, <vMotion VLAN id>, <VM Traffic VLAN id>, <iSCSI-A
VLAN id>, <iSCSI-B VLAN id>
```

3. Set port speed and duplex.

spe	ed 100000
dur	lex full
no	negotiate auto

4. Make the port channel and associated interfaces spanning tree edge ports.

spanning-tree port type edge trunk

5. Set the MTU to be 9216 to support jumbo frames.

mtu 9216

6. Make this a VPC port-channel and bring it up.

vpc 13

no shutdown

7. Define a port description for the interface connecting to <UCS Cluster Name>-A.

```
interface Eth1/31
description <UCS Cluster Name>-A:53
```

8. Apply it to a port channel and bring up the interface.

```
channel-group 13 force mode active no shutdown
```

9. Define a description for the port-channel connecting to <UCS Cluster Name>-B.

```
interface Po14
description <UCS Cluster Name>-B
```

10. Make the port-channel a switchport and configure a trunk to allow in-band management, VM traffic, vMotion and the native VLANs.

switchport
switchport mode trunk
switchport trunk native vlan <Native VLAN id>
switchport trunk allowed vlan <IB-MGMT VLAN id>, <vMotion VLAN id>, <VM Traffic VLAN id>, <iSCSI-A
VLAN id>, <iSCSI-B VLAN id>

11. Set port speed.

speed 100000
duplex full
no negotiate auto

12. Make the port channel and associated interfaces spanning tree edge ports.

spanning-tree port type edge trunk

13. Set the MTU to be 9216 to support jumbo frames.

mtu 9216

14. Make this a VPC port-channel and bring it up.

```
vpc 14
no shutdown
```

15. Define a port description for the interface connecting to <UCS Cluster Name>-B.

interface Eth1/32
description <UCS Cluster Name>-B:1/53

16. Apply it to a port channel and bring up the interface.

```
channel-group 14 force mode active
no shutdown
copy run start
```

Cisco Nexus 9000 B

1. Define a description for the port-channel connecting to <UCS Cluster Name>-B.

```
interface Pol3
description <UCS Cluster Name>-A
```

2. Make the port-channel a switchport and configure a trunk to allow in-band management, VM traffic, vMotion and the native VLANs.

```
switchport
switchport mode trunk
switchport trunk native vlan <Native VLAN id>
switchport trunk allowed vlan <IB-MGMT VLAN id>, <vMotion VLAN id>, <VM Traffic VLAN id>, <iSCSI-A
VLAN id>, <iSCSI-B VLAN id>
```

3. Set port speed.

```
speed 100000
duplex full
no negotiate auto
```

4. Make the port channel and associated interfaces spanning tree edge ports.

spanning-tree port type edge trunk

5. Set the MTU to 9216 to support jumbo frames.

mtu 9216

6. Make this a VPC port-channel and bring it up.

vpc 13

no shutdown

7. Define a port description for the interface connecting to <UCS Cluster Name>-B.

```
interface Eth1/31
description <UCS Cluster Name>-A:1/54
```

8. Apply it to a port channel and bring up the interface.

```
channel-group 13 force mode active no shutdown
```

9. Define a description for the port-channel connecting to <UCS Cluster Name>-A.

```
interface Po14
description <UCS Cluster Name>-B
```

 Make the port-channel a switchport and configure a trunk to allow in-band management, VM traffic, vMotion and the native VLANs.

switchport
switchport mode trunk
switchport trunk native vlan <Native VLAN id>
switchport trunk allowed vlan <IB-MGMT VLAN id>, <vMotion VLAN id>, <VM Traffic VLAN id>, <iSCSI-A
VLAN id>, <iSCSI-B VLAN id>

11. Set port speed.

3	speed 100000
0	duplex full
1	no negotiate auto

12. Make the port channel and associated interfaces spanning tree edge ports.

spanning-tree port type edge trunk

13. Set the MTU to be 9216 to support jumbo frames.

mtu 9216

14. Make this a VPC port-channel and bring it up.

```
vpc 14
no shutdown
```

15. Define a port description for the interface connecting to <UCS Cluster Name>-A.

interface Eth1/32
description <UCS Cluster Name>-B:1/54

16. Apply it to a port channel and bring up the interface.

```
channel-group 14 force mode active
no shutdown
copy run start
```

Enable UDLD for Cisco UCS Interfaces

Enable aggressive unidirectional link detection (UDLD) on interfaces connected to Cisco UCS.

Cisco Nexus A and Cisco Nexus B

1. From the global configuration mode, run either of the following commands depending on the connectivity:

```
interface Eth1/x
#For Copper cable or twinnax connections use the following command
udld aggressive
#For fibre optic connections use the following command
udld enable
```

Configure Network Interfaces Connected to IBM FS9100 iSCSI Ports (iSCSI Deployment)

This configuration step can be skipped if the UCS environment does not need access to storage using iSCSI.

To configure the network interfaces for IBM FS9100 iSCSI ports, follow these steps:

Cisco Nexus 9000 A & B

The 100Gbs design in this document uses a pair of Nexus 9336C-FX2 switches built with all ports being capable of the 100Gbps Quad Small Form Factor Pluggable Plus (QSFP+) type. The IBM FS9100 has 25GbpsSFP+ ports for iSCSI connectivity. The 100Gbps QSFP+ ports on the Nexus 9336C-FX2 switches in this design have been connected to the IBM FS9100 iSCSI ethernet SFP+ ports using a QSFP+ Breakout Cable.

Configuration of the QSFP+ ports will use the interface breakout command as shown in this example to turn the 100G interface Ethernet 1/11 into 4x25G interfaces on both the Nexus switches:

```
show running-config interface Ethernet1/11
interface Ethernet1/11
no switchport
interface breakout module 1 port 11 map 25g-4x
show running-config interface Ethernet1/11/1-4
```

```
interface Ethernet1/11/1
interface Ethernet1/11/2
interface Ethernet1/11/3
interface Ethernet1/11/4
```



Connectivity between the Nexus switches and IBM FS9100 for iSCSI access depends on the Nexus 9000 switch model used within the architecture. If any supported Nexus switch with 25Gbps capable SFP ports is used, breakout cable is not required and ports from the switch to IBM FS9100 can be connected directly using the SFP transceivers on both sides.

Cisco Nexus 9000 A

1. Define a description for the Ethernet port connecting to <FS9100 Node1, P5>.

```
interface Ethernet1/11/1
description <FS9100-Node1-iSCSI-P5>
```

2. Make the Interface access port and configure the switchport access VLAN.

```
switchport mode access
switchport access vlan <iSCSI-A VLAN id>
```

3. Make the interface spanning normal.

spanning-tree port type edge

4. Set the MTU to be 9216 to support jumbo frames.

```
mtu 9216
no shutdown
copy run start
```

5. Define a description for the Ethernet port connecting to <FS9100 Node2, P5>.

```
interface Ethernet1/11/2
description <FS9100-Node2-iSCSI-P5>
```

6. Make the Interface a access port and configure the switchport access VLAN.

switchport mode access switchport access vlan <iSCSI-A VLAN id>

7. Make the interface spanning normal.

spanning-tree port type edge

8. Set the MTU to be 9216 to support jumbo frames.

mtu 9216 no shutdown copy run start

Cisco Nexus 9000 B

1. Define a description for the Ethernet port connecting to <FS9100 Node1, P6>.

interface Ethernet1/11/1
description <FS9100-Node1-iSCSI-P6>

2. Make the Interface access port and configure the switchport access VLAN.

switchport mode access
switchport access vlan <iSCSI-B VLAN id>

3. Make the interface spanning normal.

spanning-tree port type edge

4. Set the MTU to be 9216 to support jumbo frames.

```
mtu 9216
no shutdown
copy run start
```

5. Define a description for the Ethernet port connecting to <FS9100 Node1, P6>.

interface Ethernet1/11/2
description <FS9100-Node2-iSCSI-P6>

6. Make the Interface a access port and configure the switchport access VLAN.

```
switchport mode access
switchport access vlan <iSCSI-B VLAN id>
```

7. Make the interface spanning normal.

spanning-tree port type edge

8. Set the MTU to be 9216 to support jumbo frames.

mtu 9216

no shutdown

copy run start

Management Uplink into Existing Network Infrastructure

Depending on the available network infrastructure, several methods and features can be used to uplink the VersaStack Pod environment. If an existing Cisco Nexus environment is present, we recommend using vPCs to uplink the Cisco Nexus switches included in the VersaStack environment into the infrastructure. The following procedure can be used to create an uplink vPC to the existing environment.

Cisco Nexus 9000 A and B using Port Channel Example

To enable management access across the IP switching environment leveraging port channel in config mode run the following commands:

1. Define a description for the port-channel connecting to management switch.

```
interface po6
description IB-MGMT
```

2. Configure the port as an access VLAN carrying the InBand management VLAN traffic.

```
switchport
switchport mode access
switchport access vlan <IB-MGMT VLAN id>
```

3. Make the port channel and associated interfaces normal spanning tree ports.

spanning-tree port type normal

4. Make this a VPC port-channel and bring it up.

```
vpc 6
no shutdown
```

5. Define a port description for the interface connecting to the management plane.

```
interface Eth1/30
description IB-MGMT-SWITCH uplink
```

6. Apply it to a port channel and bring up the interface.

```
channel-group 6 force mode active no shutdown
```

7. Save the running configuration to start-up in both Nexus 9000s and run commands to look at port and port channel.

Copy run start sh int eth1/30 br sh port-channel summary

Switch Testing Commands

The following commands can be used to check for correct switch configuration:

Some of these commands need to run after further configuration of the VersaStack components are complete to see complete results.

show run
show vpc
show port-channel summary
show ntp peer-status
show cdp neighbors
show lldp neighbors
show udld neighbors
show run int
show int

Cisco MDS 9132T Configuration (FC Deployment)

This section explains how to configure the Cisco MDS 9000s for use in a VersaStack environment. Follow the steps precisely because failure to do so could result in an improper configuration.



If directly connecting storage to the Cisco UCS fabric interconnects or if only iSCSI storage access is required, skip this section.

Physical Connectivity

Follow the physical connectivity guidelines for VersaStack as explained in the section Physical Infrastructure.

VersaStack Cisco MDS Base Configuration

The following procedures describe how to configure the Cisco MDS switches for use in a base VersaStack environment. This procedure assumes you are using the Cisco MDS 9132T with NX-OS 8.3(1).

Cisco MDS 9132T A

To set up the initial configuration for the Cisco MDS A switch, <mds-A-hostname>, follow these steps:

On initial boot and connection to the serial or console port of the switch, the NX-OS setup should automatically start and attempt to enter Power on Auto Provisioning. Enter y to get to the System Admin Account Setup.

Cisco MDS 9132T A

1. Configure the switch using command line.

```
---- System Admin Account Setup ----
Do you want to enforce secure password standard (yes/no) [y]: Enter
Enter the password for "admin": <password>
Confirm the password for "admin": <password>
Would you like to enter the basic configuration dialog (yes/no): yes
Create another login account (yes/no) [n]: Enter
Configure read-only SNMP community string (yes/no) [n]: Enter
Configure read-write SNMP community string (yes/no) [n]: Enter
Enter the switch name : <mds-A-hostname>
Continue with Out-of-band (mgmt0) management configuration? (yes/no) [y]: Enter
Mgmt0 IPv4 address : <mds-A-mgmt0-ip>
Mgmt0 IPv4 netmask : <mds-A-mgmt0-netmask>
Configure the default gateway? (yes/no) [y]: Enter
IPv4 address of the default gateway : <mds-A-mgmt0-gw>
Configure advanced IP options? (yes/no) [n]: Enter
Enable the ssh service? (yes/no) [y]: Enter
Type of ssh key you would like to generate (dsa/rsa) [rsa]: Enter
Number of rsa key bits <1024-2048> [1024]: Enter
Enable the telnet service? (yes/no) [n]: Enter
Configure congestion/no credit drop for fc interfaces? (yes/no) [y]: Enter
Enter the type of drop to configure congestion/no credit drop? (con/no) [c]: Enter
Enter milliseconds in multiples of 10 for congestion-drop for logical-type edge
in range (<200-500>/default), where default is 500. [d]: Enter
Enable the http-server? (yes/no) [y]: Enter
Configure clock? (yes/no) [n]: Enter
Configure timezone? (yes/no) [n]: Enter
Configure summertime? (yes/no) [n]: Enter
Configure the ntp server? (yes/no) [n]: yes
NTP server IPv4 address : <nexus-A-mgmt0-ip>
Configure default switchport interface state (shut/noshut) [shut]: Enter
Configure default switchport trunk mode (on/off/auto) [on]: auto
Configure default switchport port mode F (yes/no) [n]: yes
Configure default zone policy (permit/deny) [deny]: Enter
Enable full zoneset distribution? (yes/no) [n]: Enter
```

Configure default zone mode (basic/enhanced) [basic]: Enter

2. Review the configuration summary before enabling the configuration.

Cisco MDS 9132T B

1. Configure the switch using command line.

---- System Admin Account Setup ----Do you want to enforce secure password standard (yes/no) [y]: Enter Enter the password for "admin": <password> Confirm the password for "admin": <password> Would you like to enter the basic configuration dialog (yes/no): yes Create another login account (yes/no) [n]: Enter Configure read-only SNMP community string (yes/no) [n]: Enter Configure read-write SNMP community string (yes/no) [n]: Enter Enter the switch name : <mds-B-hostname> Continue with Out-of-band (mgmt0) management configuration? (yes/no) [y]: Enter Mgmt0 IPv4 address : <mds-B-mgmt0-ip> Mgmt0 IPv4 netmask : <mds-B-mgmt0-netmask> Configure the default gateway? (yes/no) [y]: Enter IPv4 address of the default gateway : <mds-B-mgmt0-gw> Configure advanced IP options? (yes/no) [n]: Enter Enable the ssh service? (yes/no) [y]: Enter Type of ssh key you would like to generate (dsa/rsa) [rsa]: Enter Number of rsa key bits <1024-2048> [1024]: Enter Enable the telnet service? (yes/no) [n]: Enter Configure congestion/no credit drop for fc interfaces? (yes/no) [y]: Enter Enter the type of drop to configure congestion/no credit drop? (con/no) [c]: Enter Enter milliseconds in multiples of 10 for congestion-drop for logical-type edge in range (<200-500>/default), where default is 500. [d]: Enter Enable the http-server? (yes/no) [y]: Enter Configure clock? (yes/no) [n]: Enter Configure timezone? (yes/no) [n]: Enter Configure summertime? (yes/no) [n]: Enter Configure the ntp server? (yes/no) [n]: yes NTP server IPv4 address : <nexus-A-mgmt0-ip> Configure default switchport interface state (shut/noshut) [shut]: Enter Configure default switchport trunk mode (on/off/auto) [on]: auto

Configure default switchport port mode F (yes/no) [n]: yes Configure default zone policy (permit/deny) [deny]: Enter Enable full zoneset distribution? (yes/no) [n]: Enter Configure default zone mode (basic/enhanced) [basic]: Enter

2. Review the configuration summary before enabling the configuration.

Cisco MDS 9132T Initial Configuration Setup

To perform Cisco MDS Initial configuration, follow these steps:

Enable Licenses

Cisco MDS 9132T A and Cisco MDS 9132T B

To enable the correct features on the Cisco MDS switches, follow these steps:

- 1. Login as admin.
- 2. Run the following commands:

```
Configure terminal
feature npiv
feature fport-channel-trunk
feature lldp
device-alias mode enhanced
device-alias commit
```

Add Second NTP server

Cisco MDS 9132T A and Cisco MDS 9132T B

To configure the second NTP server, follow this step:

1. From the global configuration mode, run the following command:

```
ntp server <nexus-B-mgmt0-ip>
```

Configure Individual Ports

To configure Cisco MDS individual ports used for Cisco UCS and IBM FS9100 connectivity, follow these steps:

Cisco MDS 9132T A

To configure individual ports and port-channels for switch A, follow this step:

From the global configuration mode, run the following commands:

interface fc1/1

```
switchport description <ucs-clustername>-a:1/1
channel-group 1 force
no shutdown
exit
interface fc1/2
switchport description <ucs-clustername>-a:1/2
channel-group 1 force
no shutdown
exit
interface fc1/3
switchport description <ucs-clustername>-a:1/3
channel-group 1 force
no shutdown
exit
interface fc1/4
switchport description <ucs-clustername>-a:1/4
channel-group 1 force
no shutdown
exit
interface fc1/5
switchport description <FS9100-Node1-FC1>
switchport speed 16000
no shutdown
exit
interface fc1/6
switchport description <FS9100-Node1-FC3>
switchport speed 16000
no shutdown
exit
interface fc1/7
switchport description <FS9100-Node2-FC1>
```

```
switchport speed 16000
no shutdown
exit
interface fc1/8
switchport description <FS9100-Node2-FC3>
switchport speed 16000
no shutdown
exit
interface port-channel1
channel mode active
switchport description <ucs-clustername>-a
no shutdown
exit
```

Cisco MDS 9132T B

To configure individual ports and port-channels for switch B, follow this step:

From the global configuration mode, run the following commands:

```
interface fc1/1
switchport description <ucs-clustername>-b:1/1
channel-group 2 force
no shutdown
exit
interface fc1/2
switchport description <ucs-clustername>-b:1/2
channel-group 2 force
no shutdown
exit
interface fc1/3
switchport description <ucs-clustername>-b:1/3
channel-group 2 force
no shutdown
```

```
exit
interface fc1/4
switchport description <ucs-clustername>-b:1/4
channel-group 2 force
no shutdown
exit
interface fc1/5
switchport description <FS9100-Node1-FC2>
switchport speed 16000
no shutdown
exit
interface fc1/6
switchport description <FS9100-Node1-FC4>
switchport speed 16000
no shutdown
exit
interface fc1/7
switchport description <FS9100-Node2-FC2>
switchport speed 16000
no shutdown
exit
interface fc1/8
switchport description <FS9100-Node2-FC4>
switchport speed 16000
no shutdown
exit
interface port-channel2
channel mode active
switchport description <ucs-clustername>-b
no shutdown
```

exit

Create VSANs

Cisco MDS 9132T A

To create the necessary VSANs for fabric A and add ports to them, follow these steps:

From the global configuration mode, run the following commands:

```
vsan database
vsan <vsan-a-id>
vsan <vsan-a-id> name Fabric-A
exit
zone smart-zoning enable vsan <vsan-a-id>
vsan database
vsan <vsan-a-id> interface fc1/5
vsan <vsan-a-id> interface fc1/6
vsan <vsan-a-id> interface fc1/7
vsan <vsan-a-id> interface fc1/8
vsan <vsan-a-id> interface fc1/8
vsan <vsan-a-id> interface port-channel1
exit
```

Cisco MDS 9132T B

To create the necessary VSANs for fabric B and add ports to them, follow these steps:

From the global configuration mode, run the following commands:

```
vsan database
vsan <vsan-b-id>
vsan <vsan-b-id> name Fabric-B
exit
zone smart-zoning enable vsan <vsan-b-id>
vsan database
vsan <vsan-b-id> interface fc1/5
vsan <vsan-b-id> interface fc1/6
vsan <vsan-b-id> interface fc1/7
vsan <vsan-b-id> interface fc1/8
vsan <vsan-b-id> interface fc1/8
vsan <vsan-b-id> interface port-channel2
exit
```

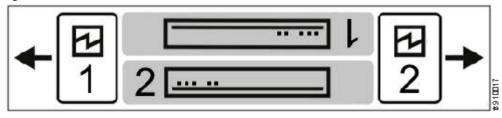
Initial Storage Configuration

IBM FlashSystem 9100

FlashSystem 9100 systems have specific connection requirements. Care must be taken to note the orientation of each node canister in the control enclosure.

The FlashSystem 9100 control enclosure contains two node canisters. A label on the control enclosure identifies each node canister and power supply unit (PSU). As Figure 6 shows, node canister 1 is on top and node canister 2 is on the bottom. Because the node canisters are inverted, the location of the ports and the port numbering are oriented differently on each node canister. It is important to remember this orientation when installing adapters and cables.

Figure 6 Orientation of the Node Canisters and PSUs



For example, Figure 7 shows the top node canister. On this canister, the PCIe slot and port numbering goes from right to left. PCIe adapter slot 1 contains a 4-port 16 Gbps Fibre Channel adapter, PCIe slot 2 contains a 2-port 25 Gbps iWARP Ethernet adapter, and PCIe slot 3 contains a 4-port 12 Gbps SAS adapter. The onboard Ethernet and USB ports are also shown.

Figure 7 Orientation of Ports on Node Canister 1

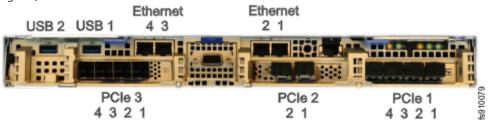
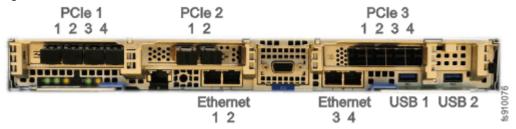


Figure 8 shows the bottom node canister. This node canister has the same type and number of adapters installed. However, on the bottom canister, the PCI slot and port numbering goes from left to right.

Figure 8 Orientation of Ports on Node Canister 2



Four 10 Gb Ethernet ports on each node canister provide system management connections and iSCSI host connectivity. A separate technician port provides access to initialization and service assistant functions. Table 7 describes each port.

On board Ethernet Port	Speed	Function
1	10 Gbps	Management IP, Service IP, Host I/O
2	10 Gbps	Secondary Management IP, Host I/O
3	10 Gbps	Host I/O
4	10 Gbps	Host I/O
Т	1 Gbps	Technician Port - DHCP/DNS for direct attach service management

Table 7 Summary of Onboard Ethernet Ports

The following connections are required for FlashSystem 9100 control enclosures:

- Each control enclosure requires two Ethernet cables to connect it to an Ethernet switch. One cable connects to port 1 of the top node canister, and the other cable connects to port 1 of the bottom node canister. For 10 Gbps ports, the minimum link speed is 1 Gbps. Both Internet Protocol Version 4 (IPv4) and Internet Protocol Version 6 (IPv6) are supported.
- To ensure system failover operations, Ethernet port 1 on each node canister must be connected to the same set of subnets. If used, Ethernet port 2 on each node canister must also be connected to the same set of subnets. However, the subnets for Ethernet port 1 do not have to be the same as Ethernet port 2.
- If you have more than one control enclosure in your system, the control enclosures communicate through their Fibre Channel ports.
- Each FlashSystem 9100 node canister also has three PCle interface slots to support optional host interface adapters. The host interface adapters can be supported in any of the interface slots. Table 8 provides an overview of the host interface adapters.
- The 2-port SAS host interface adapter supports expansion enclosures. In total, FlashSystem 9100 control enclosures can have up to 20 chain-linked expansion enclosures, 10 per port.

Protocol	Feature	Ports	FRU part number	Quantity supported
16 Gbs Fibre Channel	AHB ₃	4	01YM333	0-3
25 Gbs Ethernet (RoCE)	AHB6	2	01YM283	0-3
25 Gbs Ethernet (iWARP)	AHB7	2	01YM285	0-3
12 Gb SAS Expansion	АНВА	4, but only 2 are active for SAS expansion chains.	01YM338	0-1

Table 8 Summary of Supported Host Interface A	Adapters
---	----------

Each node canister within the control enclosure (I/O group) must be configured with the same host interface adapters.

Each node canister has four onboard 10 Gbps Ethernet ports. A node canister can also support up to three 2-port 25 Gbps Ethernet host interface adapters.

Table 9 lists the fabric types that can be used for communicating between hosts, nodes, and RAID storage systems. These fabric types can be used at the same time.

Communications type	Host to node	Node to storage system	Node to node
Fibre Channel SAN	Yes	Yes	Yes
iSCSI 10 Gbps Ethernet 25 Gbps Ethernet	Yes	Yes	No
iSER 25 Gbps Ethernet	Yes	No	No

Table 9 Communications types

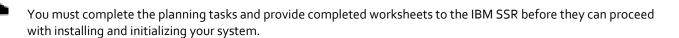
The feature codes for the 16 Gbps Fibre Channel adapter, 25Gbps iWarp adapter, and the 25Gbps RoCE adapter each include standard SFP transceivers for each adapter. In this design the 25Gbps RoCE adapter has been leveraged for iSCSI connectivity and the ports are connected to the Cisco Nexus 9336C-FX2 switches using breakout cables, SFP transceivers are not required with this connectivity.

The 2-port 25 GB Ethernet adapter for iWARP and the 2-port 25GB Ethernet adapter for RDMA over Converged Ethernet (RoCE) both support iSER host attachment. However, RoCE and iWARP are not cross-compatible; therefore, it is important to use the adapter that matches the iSER implementation on your SAN if iSER is planned to be implemented in the future.

This document implements traditional iSCSI, iSER based iSCSI implementation can be configured with the support of iSER on Cisco VIC 1400 series when available with the future releases of Cisco UCS software.

IBM Service Support Representative (SSR) Configuration

To install the FlashSystem 9100 hardware, an IBM SSR must complete the following tasks:



- An IBM SSR unpacks and installs the AF7/AF8 control enclosures and any optional SAS expansion enclosures in the rack.
- Referring to the worksheets that you completed, the IBM SSR completes the cabling.



If the IBM SSR is aware of your intent to add the FlashSystem 9100 to an existing system, the IBM SSR installs the FlashSystem 9100 control enclosure for you but does not initialize a system on it. If you are planning on adding a FlashSystem 9100 control enclosure to an existing Storwize® V7000 system, inform the IBM SSR of this intention. In these cases, the IBM SSR installs the FlashSystem 9100 control enclosure for you, but does not initialize a system on it, because the existing system is already initialized. After the hardware is installed, an IBM SSR connects a workstation to an AF7/AF8 control enclosure technician port and completes the following tasks:

- Configuring the system with a name, and management and service IP addresses.
- Logging in to the control enclosure using the management GUI and completing the system setup wizard using information from the customer-supplied worksheets.

The SSR configuration steps are documented below.

Initialize the System

The initial configuration requires a workstation be locally attached to the Ethernet port labelled "T" on the Upper node canister in the FS9100 enclosure. "T" refers to Tech Port and will allocate an IP address to the connected workstation using DHCP and will redirect any DNS queries to the System Initialization page. This page shows the status of each node canister in the enclosure and will guide you through the initialization process.

To initialize the system, follow these steps:

1. Ensure both node canisters have been detected and click **Proceed**.

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	System Initialization	×	
	System Initialization	-	
	System initialization Please verify the information below and select Proceed to begin your system configuration.		
	Canister 1: OPtected		
	Canister 2: Detected		
	Proceed	1	

2. Click **Next** through the Welcome screen.

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	System Initialization ×				
	This wizard initializes the system for the first time, Balona starting this procedure ansure that you have the management JP address information.				
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3. Select the option to define the enclosure as the first in a new system

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	×					
	System Initialization					
	Welcome How will this enclosure be used?					
	As the first enclosure in a new system.					
	 As an additional enclosure in an existing system. 					
	Cancel A Back Next ►					

4. Enter the network details for the management interface for the new system. This IP address is sometimes referred to as the Management IP, or Cluster IP and will be used to manage the FS9100 system via the web interface or CLI via SSH.

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	System Initialization Create a New System Prof Prof Prof Prof Prof Subnat mask: 255.255.264.0 Geterway: 9.77.48.1 Cancel • Rack Next +	×	

5. Acknowledge the Task Completion message.

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6. The initial configuration steps are now complete, and the system will now restart the Web Server.

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	System Initialization		
	Restarting Web Server		
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Prepare FS9100 for Customer Environments

Now the Management IP is enabled, all future configuration steps are made with this interface.

To prepare the FS9100 for customer environments, follow these steps:

1. Log in using the default credentials:

Username: Password:	superuser passw0rd			
VersaStackPS9100 - Log in - IØF				- ¤ ×
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		IBM		
		FlashSystem 9100 Storage Management (VersaStackFS9100)		
		Password		
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2. Click **Next** to proceed through the configuration wizard.

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Initial Se	tup		×			
O Welcome Call Home	Welcome to Service Setup Attach cables and power on all control enclosures and expansion enclosures before o	ontinuing.				
Storage Insights	Locate the customer worksheet and ensure that it has been completed by the custom	ner before you begin this procedure.				
Summary						
Cancel		✓ Back Next ►				

3. For optimal configuration, check the box to enable the Call Home feature.

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	Welcome O Call Home System Locati Contact Storage Insights	Call Home connects your system to service represer keep your system up and running.	7	lems efficiently and quickly to				
	Summary	 Enables ability to set up support assistance. Provides important data to IBM Storage In 	nter of detected issues. 2 hours. Jata, beginning the problem determination process. sights.					
		In order to function correctly, Call Home needs the f	ollowing information:					
		Send data to the support center						
		> Transmission Settings						
		IBM Privacy Policy						
	Cancel			▲ Back Next ►]			

4. Detail the System Location.

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Velcome Call Home Contact Contact Storage Insights Summary	Connection to the s	support center was successful: hipped to the same physical location as the system. VersaStack PLC 1000 San Jose CA 90210 United States • Rack 33, Lab D, Building C		× 		
Cancel			■ Back Next ►]		

5. Specify the contact details.

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Cancel			■ Back Apply and Next ►	

6. Specify the customer's **IBM ID** and contact details.

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Initial Setup Velcome Call Home Storage Insights Summary	and provide your customers w systems. It's easy to get them To get started, identify the IBI Customer's IBM ID: The following fields were prefi- be used for Storage Insights: Customer's First Name: Customer's First Name: Customer's Company: Customer's Email:	Customer doesn't have an IBH ID but wants to sign up. Customer doesn't have an IBH ID but wants to sign up. IIIed with the contact information from Call Home. Verify with the customer that the contact information ce OperationsCenter VersaStack PLC OpsMon@versastack.com nore information before continuing, provide them with the Storage ts Fact Sheet	x 			
Cancel		■ Back Next ►				

7. Click Next to finalize the IBM Storage Insights registration.

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		Initial Setup					×			
	0	Welcome	\sim							
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	0	Storage Insights	Your customer is now redistered y	with IBM Storage Insights! Let them k	know that they'll receive an email a	s soon as Storada Insidhts i				
	6	Add the storage system to IBM Storage Insights	ready.		,					
		Summary								
		Julinery								
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		Cancel				Back Next	<u> </u>			

8. Review the Initial Setup summary and click **Finish**.

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Initia	al Setup					×		
 Welcome Call Home Storage Ins Storage Ins 	ights	Summary System Information IP address: Subnet mask: Gateway: Code level:	9.71.49.97 255.255.254.0 9.71.48.1 8.2.1.3		_			
		System Ini	tialization	100%				
		View more details		Close				
Cance					A Back Finish			

9. Click **Close** to complete the Service Initialization.

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Welcome Call Home Storage Insights Summary	Summary System Information Predoms: 255,255,254,0 Settempre: 273,481 Setup Complete Service installation is complete. Contact the customer and instruct them to log in to 9.71.49.97 with the following credentials Usemame: superuser Password: password	×	×	٢	=
Cancel	Close	Back	Finish		

Customer Configuration Setup Tasks via the GUI

After completing the initial tasks above, launch the management GUI and continue configuring the IBM FlashSystem 9100.

To configure the customer's tasks, follow these steps:



Following e-Learning module introduces the IBM FlashSystem 9100 management interface and provides an overview of the system setup tasks, including configuring the system, migrating and configuring storage, creating hosts, creating and mapping volumes, and configuring email notifications: <u>Getting Started</u>

1. Log into the management GUI using the cluster IP address configured above.

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2. Log in using the default credentials:

```
Username: superuser
Password: passw0rd
```

3. Click **Next** to skip the Welcome message.

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System Setu	0	×
O Welcome	Welcome	
License Agreement Change Password	Congratulations! You now have unmatched performance, availability, advanced functions and highly-scalable capacity right at your fingerips.	
System Name	✓ Prerequisites • Ensure that all hardware is cabled correctly and powered on	
Licensed Functions	 Obtain any optional licenses Obtain email server IP address and port for Call Home and inventory emails 	
Date and Time Encryption	(Optional) Obtain IP addresses for Remote Support Proxy Servers	
Call Home		
Storage Insights		
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4. Read and accept the license agreement. Click **Accept**.

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Welcome Change Password System Name Liconsed Functions Date and Time Encryption	Read the license agreement carefully. License Java Notices Non-IBM Licenses Additional Licenses and Notices	-
Call Home Storago Insights Summary	I agree with the terms in the license agreement.	
Cancel	 I do not agree with the terms in the license agreement. 	Next P

5. Define new credentials for the superuser user account.

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System Setur) Change Password	×	
Change Password System Name Licensed Functions Date and Time Encryption Call Home Storage Insights Summary	The password must be reset before proceeding with system configuration User name: superuser New password: •••••••• Confirm password: ••••••••		
Cancel		■ Back Apply and Next	

6. Enter the System Name and click **Apply and Next** to proceed.

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@ Welcome	System Name		
C License Agreemen	t Enter a name for the system:		
Change Password	VersaStackFS9100		
System Name			
Date and Time	15		
Encryption			
Call Home			
Storage Insights			
Summary			
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7. Enter the license details that was purchased for FlashCopy, Remote Mirroring, Easy Tier, and External Virtualization. Click **Apply and Next** to proceed.

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(7) Need Help	Cancel			Back Apply and Next ►			

8. Configure the date and time settings, inputting NTP server details if available. Click **Apply and Next** to proceed.

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System	setup			
⊘ Welcome	Date and Time	e		
 License Agreement Change Password 	Select time ar Network Time	nd date settings. You can enter these settings manually or specify a Protocol (NTP) server to synchronize time on the system.		
System Name	O Manually	NTP Server		
Date and Time	IP address:	9.71.44.170		
Encryption Call Home	Time Zone:	(GMT-8:00) Pacific Time (US & Canada)		
Storage Insights		Sep 12, 2019, 10:27:07 AM	1	
Summary				

9. Enable the Encryption feature (or leave it disabled). Click **Next** to proceed.

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Syste	m Setup		×		
⊘ Welcome ⊘ License Agr	ement	Encryption			
Change Pas	N 100	Was the encryption feature purchased for this system?			
System Nan	e	No Yes			
Licensed Fu	nctions	Activate the encryption licenses for each enclosure.			
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		Type ↑ M/T-M S/N Licensed III			
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10. If using the encryption, select either Manual or Automatic activation and enter the authorization code or license key accordingly.

	IBM FlashSystem 9100 × +			-			×
System Setup Velcome License Agreement Change Password System Name License functions Date and Time Encryption Cell Home Storage Insights Summary She		tps:// 9.71.49.97 /login	⊠ ☆	hit\	•	9	≡
Need Help Cancel Eack Need Help	System Setu Welcome License Agreement Change Password System Name Licensed Functions Date and Time Encryption Call Home Storage Insights Summary	Encryption Was the encryption feature purchased for this system? No Ac Activate License Automatically Enter the authorization code for control enclosure: Type or paste the authorization code here She		_			

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It is highly recommended to configure email event notifications which will automatically notify IBM support centers when problems occur.

11. Enter the complete company name and address and then click **Next**.

System Setup		×	
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System Name Licensed Functions Date and Time Encryption	Cent non-context a pod graninu service representances mix cen noticen saves end respond to provins encoding to keep your system paid numming.		
Call Home System Location Contact	In order to function correctly, Call Home needs the following information: • The location of the system. • Contact information.		
Storago Insights Summasy	Send data to the support center Transmission Settings IBM Princy Policy		

12. Enter the contact person for the support center calls. Click **Apply and Next**.

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Contact Add the storage system to IBM Storage Insights	State or province:	GA		
IBM Storage Insights Summary	Postal code:	90210		
	Country or region:	United States 💌		
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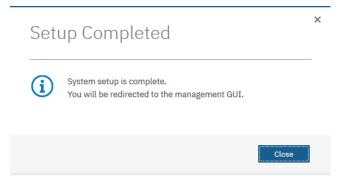
IBM Storage Insights is required to enable performance/health monitoring required by remote IBM Support representatives when assisting with any support issues.

IBM FlashSystem 9100	× +		-	- E	3	×
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13. Review the final summary page and click **Finish** to complete the System Setup wizard.

				×
System Setup				
Velcome	Summary			^
Geense Agreement	System Information System neme: Code level	VersaStackPS91 Date: 0.21.3 Time	Sep 13, 2019 1.15.31 PM	
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Licensed Functions	Licensed Functions External Virtualization:	99 only mail and opures		
Date and Time	PlashCopy: Remote Hirroring;	90 enclosures 99 enclosures		
Encryption	Call Home			
Call Home	Transmission setting:	Cloud		
Add the storage system to IBM Storage Insights	System Location Company name: Street address:	VerseStack PLC 1000		
O Summary	City: State or province: Postal code:	San Jose CA 90210		
	Country or region Comment:	United States Rack 33, Lab D, Building C		
	Contact Contact mamor Email address: Telephone (primery): Telephone (pilternate):	Openations/Denter Openations/Denter Open/openastisck.com 122123 123123		
				- -

14. Setup Completed. Click **Close**.



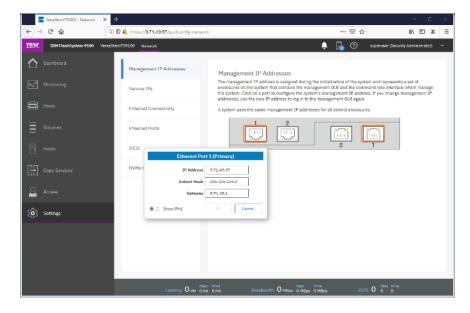
System Dashboard, and Post-Initialization Setup Tasks

To configure the necessary post-initialization setup tasks, follow these steps:

1. The System view of IBM FS9100 is now available, as shown below.

VersaStackFS9100 - Dashboard 🗙 🕂								- 0	×
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Dashboard	Performance						Node Comparis	on System	
مچ ⁰ Monitoring	Latency O ms	read O ms	write 0 ms	ms 100 -				read — writ	•
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Volumes	O IOPS CPU Utilization	read O IOPS standard	write O IOPS compressed	40 - 20 -					
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Copy Services	Capacity								
	Physical Capaci	ity (?)		Volume Capaci	ty 🕐	Capacity Sa	avings ?		
Access	0% O bytes Stored Capacity		0% O bytes Available Capacity	0% O bytes Written Capacity	0 % O bytes Available Capacity	0% O bytes <u>Compression</u>	0% 0 bytes Deduplication	0% 0 bytes Thin-Provisioning	
O Settings	MDisks		Total O bytes		Total Provisioned 0 bytes	Compression Rati	• N/A Tor w Compression [tal Savingo O bytes Details	
	System Health				Version: 8.2.1.3 (build 147.12	2.1904011742000]	Cluster ID: 00	00020424C0000	c
	Hardware C	Componen	ts	💢 Logical Cor	mponents	Conne	ctivity Compor	nents	
	 Au Onune 			 Au Online 		V All Onlin	C		~

- 2. In the left side menu, hover over each of the icons on the Navigation Dock to become familiar with the options.
- 3. Verify the configured Management IP Address (Cluster IP) and configuring Service Assistant IP addresses for each node canister in the system.
- 4. On the Network screen, highlight the Management IP Addresses section. Then click the number 1 interface on the lefthand side to bring up the Ethernet port IP menu. If required, change the IP address if necessary and click **OK**.



5. While still on the Network screen, select 1) Service IP Addresses from the list on the left and select each Node Canister Upper/Lower in turn, and change the IP address for port 1, click **OK**.

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IBM IBM FlashSystem 9100	kroustucké91200 📭 👔 🧿 superuser (Security Administrator)	~
Cashboard	Management IP Addresses Service IPs	
ag² Monitoring	Service IPs carries IPs dates provides access to the service instances on each individual robust effects on each individual robust effects on the service IP address can be carried and citized prot 1 service instances to the carries the relatives on the carries and the prot 1 service instances on the introduction of the IPV-6 address to 0.0.0.1 or t	
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6. Repeat this process for port 1 on the other Node Canisters.

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Dashboard	User Groups 🛛 🍹	Create User Group		
مه ^م Monitoring	All Users	All Users		
Pools	SecurityAdmin	⊕ Create User ≔ Actions ▾ 😃	Filter	74
Volumes	Administrator	Name 🛧 User Group	Password SSH	Key 🔢
Hosts	CopyOperator	superuser SecurityAdmin	Configured No	
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Settings	Audit Log			
		Showing 1 user Selected 0 users		
	Latency O ms 0	ad Write Read Write ms 0 ms Bandwidth 0 MBps 0 MBps 0 MBp	os IOPS 0 0 0	rite

7. Click the Access icon from the Navigation Dock on the left and select Users to access the Users screen.

User Groups 🖓 All Users	Create User Group] Il Users		
SecurityAdmin	① Create User	🗄 Actions 🖌 🖳		Filter
Administrator	Name	↑ User Group	Password	SSH Key
CopyOperator	superuser	SecurityAdmin	Configured	No
Service				
Monitor				
RestrictedAdmin				

8. Select Create User.

Creat	e User	>
0	Name VSAdmin	
- Auther	tication Mode	
Loc	al 🔘 Remote	
User Gr	oup	
Secu	rityAdmin 👻	
- Local C	redentials	
Users m	ust have a password, an SSH public key, or both.	
Passwo	rd Verify password	
••••	•••••	
SSH Pul Browse	uic Key No file selected.	
	Cancel]

9. Enter a new name for an alternative admin account. Leave the SecurityAdmin default as the User Group, and input the new password, then click Create. Optionally, an SSH Public Key generated on a Unix server through the command "ssh-keygen -t rsa" can be copied to a public key file and associated with this user through the Choose File button.

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Consider using Remote Authentication (via LDAP) to centrally manage authentication, roles, and responsibilities. For more information on Remote Authentication, refer to Redbook: <u>Implementing the IBM System Storage SAN Volume</u> <u>Controller with IBM Spectrum Virtualize V8.2.1</u>.

Create Storage Pools and Allocate Storage

Typically, the NVMe drives within the FlashSystem 9100 enclosure are grouped together into a Distributed RAID array (sometimes referred to as a Managed Disk or mdisk) and are added to a storage resource called a Storage Pool (sometimes referred to as Managed Disk Group or mdiskgrp. Volumes are then created within this storage pool and presented to the

host(s) within the UCS chassis. Data from a UCS host is striped across multiple drives for performance, efficiency and redundancy.

Data Reduction Pools, SCSI UNMAP, and Data Deduplication

If enabling Data reduction on the pool during creation, the pool will be created as a Data Reduction Pool (DRP). Data Reduction Pools are a new type of storage pool, implementing techniques such as thin-provisioning, compression, and deduplication to reduce the amount of physical capacity required to store data.

When using modern operating systems that support SCSI UNMAP, the storage pool also enables the automatic deallocation and reclaim capacity occupied by deleted data and, for the first time, enable this reclaimed capacity to be reused by other volumes in the pool.

Data deduplication is one of the methods of reducing storage needs by eliminating redundant copies of data. Existing or new data is categorized into chunks that are examined for redundancy. If duplicate chunks are detected, then pointers are shifted to reference a single copy of the chunk, and the duplicate data sets are then released.

Deduplication has several benefits, such as storing more data per physical storage system, saving energy by using fewer disk drives, and decreasing the amount of data that must be sent across a network to another storage for backup replication and for disaster recovery.

However, these data savings come at a cost. There is a performance overhead when using DRPs when compared to traditional storage pools. And a percentage of the capacity of a DRP is reserved for system usage. For more information on Data Reduction Pools and techniques, refer to the Redbook publication: Implementing the IBM System Storage SAN Volume Controller.

1. Select **Pools** from the Navigation Dock and select **MDisk by Pools**.

IBM	IBM FlashSystem 9100	VersaStack	FS9100	MDisks by Pools	
ᡎ	Dashboard		\oplus	Create Pool	\equiv Actions \checkmark
م وم	Monitoring		Nam	9	
₿	Pools			Unassigned MDis	ks (0)
00	Volumes				
	Hosts				

2. Click **Create Pool** and enter the name of the new storage pool. Click **Create**.

Name			State	Capacity
Una	ssigned MDisks (0)			
	Create Po Name: Data reduction:	VS-Pool0		×
<	0		Cance	el Create

3. Identify the available drives along the bottom of the window

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4. Right-click the new Pool and select **Add Storage**.

⊕ Create Pool ≔	Actions 👻		Default 🗸	Contains V Filter
Name		State	Capacity	Data Reduction
Unassigned MDisks (0)			
VS-Pool0	Create Child Pool	No Storage		No
	Rename Modify Threshold Add Storage Edit Throttle View All Throttles View Resources Delete Properties			

5. Select Internal to utilize drives within the enclosure, rather than from externally virtualized storage controllers.

Assign Storage to Pool							
	— Quick ———			- Advanced			
Internal				Internal Custom			
Drive Assignment:			Drives:	Size:			
744.21 GiB Tier 0 Flash, NVMe:	0	12	12 🔺	7.11 TiB			
MDisk summary		Pool VS-Pool) capacity:	7.11 TiB			
			Cancel	Assign			

6. The Managed Disk (mdisk) has now been created and allocated to the storage pool.

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€→	• C û	🛈 🙈 https://9.71.49.97/gui#physical-mdisks		⊡ ☆	II\ ⊡ : ≡
IBM.	IBM FlashSystem 9100 VersaSt	ackFS9100 MDisks by Pools		单 🔒 ၇ superuser (Secu	rity Administrator) 🛛 🗸
☆	Dashboard	⊕ Create Pool		Default V Contains V Filter	Z
~	Monitoring	Name	State	Capacity Data Reduction	III
-C		Unassigned MDisks (0)			
₿	Pools	✓ VS-Pool0	✓ Online	No	
8	Volumes	mdisk0	✓ Online	7.11 TiB	
=	Hosts				
Ð	Copy Services				
2	Access				
ŵ	Settings				
		Latency 0 ms 0 ms 0 ms	Bandwidth OMBps	MBps 0 MBps IOPS 0 0 0	

7. Reference the Running Tasks window to monitor the array initialization.

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IBM FlashSystem 9100 VersaStac	kFS9100 MDisks by Pools		📮 📑 🕐 superuser (Sec	urity Administrator) 🗸 🗸
Dashboard	\oplus Create Pool \coloneqq Actions \checkmark	Suggested Tasks		74
్రాలి Monitoring	Name	Sti There is a recommended up available for your system.	Not Now Learn More	Ш
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Volumes	mdisk0	 error information to IBM Se Personnel. Running Tasks 	View All Tasks	
Hosts		Array Initialization	View	
Copy Services				
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∑́⊙} Settings				
	Latency O ms 0 ms 0 ms	Bandwidth OMBps OMBps	Write 0 MBps IOPS 0 0 0	e

During the initialization, the array performance will be sub-optimal. Where possible, wait for the array initialization to complete before running resource intensive workloads.

Select a running task to see its progress.	Progress: Array Initialization					
Array Initialization	Name	Progress	Time Remaining	1		
	Array mdisk0	1%	02:13:15			

8. Select Internal, review the drive assignments and then select Assign.

Depending on customer configuration, select Internal Custom to manually create tired storage pools grouping together disk by capabilities. In this deployment, Flash and Enterprise class disk are utilized for Silver pool and Nearline disks are utilized for Bronze storage pool.

- 9. Validate the pools are online and have the relevant storage assigned.
- 10. Select Volumes from the Navigation Dock and then select **Volumes**.

	VersaStackFS9100 - Volumes 🛛 🗙	+						
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IBM	IBM FlashSystem 9100 Versa	Stack	FS9100 Volumes					
☆			⊕ Create Volumes	≡ Act	tions 👻	All Volumes 👻		De
ୢ୶ୄ			Name		State		Synchronized	Pc
₩							No items found.	
8	Volumes	\	'olumes					
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2				•				

11. Click Create Volumes.

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B		Create a preset volume with all the basic features. Poel:	^		
٦		VS-Pool0 * Total 7.10 TeB			
EÐ		Volume Details			
<u> </u>		Quantity: Capacity: Name: 1 + • • •]		
(\$) (\$)		Capacity savingst None Deduplicated	I.		
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		Need Help Cancel Create and Map Create and Map Create and Map			
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- 12. Define the volume characteristics, paying attention to any capacity saving, and/or high availability requirements, and specify a friendly name. Click **Create**.
- 13. Validate the created volumes.

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Creating volumes will be explained in following sections of this document

IBM FS9100 iSCSI Configuration (iSCSI Deployment)

Cisco UCS configuration requires information about the iSCSI IQNs on IBM FS9100. Therefore, as part of the initial storage configuration, iSCSI ports are configured on IBM FS9100

This configuration step can be skipped if the UCS environment does not need to access storage environment using iSCSI.

Two 25G ports from each of the IBM FS9100 node canisters are connected to each of Nexus 9336C-FX2 switches. These ports are configured as shown in Table 10.

System	Port	Path	VLAN	IP address					
Node canister 1	5	iSCSI-A	3161	10.29.161.249/24					
Node canister 1	6	iSCSI-B	3162	10.29.162.249/24					
Node canister 2	5	iSCSI-A	3161	10.29.161.250/24					
Node canister 2	6	iSCSI-B	3162	10.29.162.250/24					

Table 10 IBM FS9100 iSCSI Interface Configuration

To configure the IBM FS9100 system for iSCSI storage access, follow these steps:

1. Log into the IBM Management Interface GUI and navigate to **Settings > Network**.

2. Click the **iSCSI** icon and enter the system and node names as shown:

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IBM IBM FlashSystem 9100 V	VersaStackFS9100 Network	📙 🕐 superuser (Security Administrator) 🗸
Dashboard	Management IP Addresses iSCSI Configuration	
യു ^മ Monitoring	Service IPs	hed hosts.
Pools	Ethernet Connectivity System Name VersaStackFS9100	
Volumes	Ethernet Ports	
Hosts	iSCSI Node Canister Name ISCSI Alias	iSCSI Name (IQN) iqn.1986-03.com.ibm:2145.versastack:
Copy Services	NVMe Connectivity	iqn.1986-03.com.ibm:2145.versastack:
Access	ISNS (optional) ISNS Address	
Settings	Modify CHAP Configuration	
	¢	>
	Latency O ms 0 ms 0 ms Bandwidth O MBps 0 MBps	is IOPS 0 Read Write

Note the resulting iSCSI Name (IQN) in the Table 11 to be used later in the configuration procedure 3.

Table 11 IBM FS9100 IQI	N
Node	Example iSCSI name (IQN)
Node 1	iqn.1986-03.com.ibm:2145.versastack-fs9100.node1
Node 2	iqn.1986-03.com.ibm:2145.versastack-fs9100.node2

- hI

Click the Ethernet Ports icon 4.

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ж	TRM FlackSystem 9100 Verses	swarseinn Notwork				.	5 📀	superuser (Security Adv	inistana)	
2		Management LP Addresses	Ethernet Ports							
		Service IPs	The Ethernet ports can be use	ed for ISOSE or ISER	SCSI) connections, has	t attachment, and remot	е сору.			
		Ethernet Connectivity	= Actions +			Delauk V (Conterne 🗸	Aller		74
		contracting and a second	Nama	Port 1	State	TP	Spe	ed Host A	tech	II!
		Ethernet Ports	√io_grp0							_
			nodel	1	▲ Unconfigured		10	va No		
		(503)	node2	1	▲ Unconfigured		10	va No		
			node1	2	▲ Unconfigured			No		
		NVMe Connectivity	node2	2	A Unconfigured			No		
			nodel.	3	▲ Unconfigured			No		
			node2	3	🛦 Unconfigured			No		
			node1	4	▲ Unconfigured			No		
	Settings		node2	4	A Unconfigured			No		
			node1	5	A Unconfigured		250	ib/s No		
			node2	5	▲ Unconfigured		250	Sa/a No		
			node1	6	A Unconfigured		250	ib/a No		
			node2	6	▲ Unconfigured		266	ib/s No		
			e							>
									_	-

5. Click Actions and choose Modify iSCSI Hosts.

ervice IPs		n be used for iSCSI or iSER (S				
	I Actions -				Filter	
ernet Connectivity	Name	Port 个	State IP		Speed	Host Attach
ernet Ports	√io_grp0					
	node1	1	▲ Unconfigured		1Gb/s	No
	node2	1	▲ Unconfigured		1Gb/s	No
WMe Connectivity	node1	2	A Unconfigured			No
	node2	2	▲ Unconfigured			No
	node1	3	▲ Unconfigured			No
	node2	3	▲ Unconfigured			No
	node1	4	▲ Unconfigured			No
	node2	4	▲ Unconfigured			No
	node1	5	A Unconfigured		25Gb/s	No
	node2	Modify VLAN	jured		25Gb/s	No
	node1	Modify IP Settings	jured		25Gb/s	No
	node2	Modify Remote Copy	Jured		25Gb/s	No
		Modify iSCSI Hosts				

- Make sure IPv4 iSCSI hosts field is set to enable if not, change the setting to Enabled and click **Modify**. 6.
- If already set, click **Cancel** to close the configuration box. 7.
- For each of the four ports listed in Table 10 Table 10, repeat steps 1-7. 8.

- 9. Right-click the appropriate port and choose **Modify IP Settings**.
- 10. Enter the IP address, Subnet Mask and Gateway information in Table 10.

Modify F	°ort 5 of Node node1
IPv4 address:	10.29.161.249
Subnet mask:	255.255.255.0
Gateway:	10.29.161.1
▶ IPv6	
	Cancel Modify

11. Click Modify.

12. Right-click the newly updated port and choose **Modify VLAN**.

I Actions 👻					Filter			
Name	Port	\uparrow	State	IP	Speed	Host Attach	Ш	
∨io_grp0								
node1	1		A Unconfigured		1Gb/s	No		
node2	1		A Unconfigured		1Gb/s	No		
node1	2		A Unconfigured			No		
node2	2		A Unconfigured			No		
node1	3		▲ Unconfigured			No		
node2	3		▲ Unconfigured			No		
node1	4		▲ Unconfigured			No		
node2	4		A Unconfigured			No		
node1			10 5 1	10.29.161.249	25Gb/s	Yes		
node2	Modify VLAN			10.29.161.250	25Gb/s	Yes		
node1	Modify IP Se	0		10.29.162.249	25Gb/s	Yes		
node2	Modify Remo	ote Coj	ру	10.29.162.250	25Gb/s	Yes		
	Modify iSCSI	Hosts	\$					
	Modify Stora	ge Por	ts					
	Modify Maxir	num T	ransmission Unit					

13. Check the box to Enable VLAN.

Modify	VLAN for port 5 on Node 1 [*]
VLAN:	C Enable
VLAN tag:	1 through 4094
2 ports affecte	Apply change to the failover port too 💿
⑦ Need Help	Cancel Modify

14. Enter the appropriate VLAN from Table 2 .



- 15. Keep the Apply change to the failover port too check box checked.
- 16. Click Modify.
- 17. Repeat the steps for all for iSCSI ports listed in Table 10.
- 18. Verify all ports are configured as shown below. The output below shows configuration for two FS9100 node canisters.

	I Actions -				Filter		X
thernet Connectivity	Name	Port ↑	State	IP	Speed	Host Attach	بر اا
ernet Ports	√io_grp0						
	node1	1	▲ Unconfigured		1Gb/s	No	
I	node2	1	▲ Unconfigured		1Gb/s	No	
NVMe Connectivity	node1	2	▲ Unconfigured			No	
	node2	2	Unconfigured			No	
	node1	3	▲ Unconfigured			No	
	node2	3	▲ Unconfigured			No	
	nodel	4	▲ Unconfigured			No	
	node2	4	▲ Unconfigured			No	
	nodel	5	✓ Configured	10.29.161.249	25Gb/s	Yes	
	node2	5	✓ Configured	10.29.161.250	25Gb/s	Yes	
	nodel	6	✓ Configured	10.29.162.249	25Gb/s	Yes	
	node2	6	✓ Configured	10.29.162.250	25Gb/s	Yes	

Modify Interface MTU

Use the cfgportip CLI command to set Jumbo Frames (MTU 9000). The default value of port MTU is 1500. An MTU of 9000 (jumbo frames) provides improved CPU utilization and increased efficiency by reducing the overhead and increasing the size of the payload.

To modify the interface MTU, follow these steps:

1. The MTU configuration can be verified using the command:

FS9100info lsportip <port number> | grep mtu

2. SSH to the IBM FS9100 management IP address and use following CLI command to set the MTU for ports 5 and 6 in the FS9100 in iogrp 0:

FS9100task cfgportip -mtu 9000 -iogrp 0 5 FS9100task cfgportip -mtu 9000 -iogrp 0 6 This completes the initial configuration of the IBM systems. The payt section explains the Cisco

This completes the initial configuration of the IBM systems. The next section explains the Cisco UCS configuration.

Cisco UCS Server Configuration

This section explains the Cisco UCS setup for VersaStack infrastructure. This section includes setup for both iSCSI as well as FC SAN boot and storage access.

If a customer environment does require implementing some of the storage protocols explained in this deployment guide, the relevant configuration sections can be skipped.

Cisco UCS Initial Configuration

This section provides detailed procedures for configuring the Cisco Unified Computing System (Cisco UCS) for use in a VersaStack environment. The steps are necessary to provision the Cisco UCS C-Series and B-Series servers and should be followed precisely to avoid configuration errors.

Cisco UCS 6454 A

To configure the Cisco UCS for use in a VersaStack environment, follow these steps:

1. Connect to the console port on the first Cisco UCS 6454 fabric interconnect.

```
Enter the configuration method. (console/gui) ? console
Enter the setup mode; setup newly or restore from backup.(setup/restore)? setup
You have chosen to setup a new Fabric interconnect? Continue? (y/n): y
Enforce strong password? (y/n) [y]: y
Enter the password for "admin": <password>
Confirm the password for "admin": <password>
Is this Fabric interconnect part of a cluster(select no for standalone)? (yes/no) [n]: yes
Which switch fabric (A/B)[]: A
Enter the system name: <Name of the System>
Physical Switch Mgmt0 IP address: <Mgmt. IP address for Fabric A>
Physical Switch Mgmt0 IPv4 netmask: <Mgmt. IP Subnet Mask>
IPv4 address of the default gateway: <Default GW for the Mgmt. IP >
Cluster IPv4 address: <Cluster Mgmt. IP address>
Configure the DNS Server IP address? (yes/no) [n]: y
DNS IP address: <DNS IP address>
Configure the default domain name? (yes/no) [n]: y
Default domain name: <DNS Domain Name>
Join centralized management environment (UCS Central)? (yes/no) [n]: n
Apply and save configuration (select no if you want to re-enter)? (yes/no): yes
```

2. Wait for the login prompt to make sure that the configuration has been saved.

Cisco UCS 6454 B

To configure the second Cisco UCS Fabric Interconnect for use in a VersaStack environment, follow these steps:

1. Connect to the console port on the second Cisco UCS 6454 fabric interconnect.

```
Enter the configuration method. (console/gui) ? console

Installer has detected the presence of a peer Fabric interconnect. This

Fabric interconnect will be added to the cluster. Continue (y|n)? y

Enter the admin password for the peer Fabric interconnect: <Admin Password>

Connecting to peer Fabric interconnect... done

Retrieving config from peer Fabric interconnect... done

Peer Fabric interconnect Mgmt0 IPv4 Address: <Address provided in last step>

Peer Fabric interconnect Mgmt0 IPv4 Netmask: <Mask provided in last step>

Cluster IPv4 address : <Cluster IP provided in last step>

Peer FI is IPv4 Cluster enabled. Please Provide Local Fabric Interconnect Mgmt0 IPv4 Address

Physical switch Mgmt0 IP address: < Mgmt. IP address for Fabric B>

Apply and save the configuration (select no if you want to re-enter)?

(yes/no): yes
```

2. Wait for the login prompt to make sure that the configuration has been saved.

Cisco UCS Setup

Log into Cisco UCS Manager

To log in to the Cisco Unified Computing System (UCS) environment, follow these steps:

- 1. Open a web browser and navigate to the Cisco UCS 6454 fabric interconnect cluster address.
- 2. Click the Launch UCS Manager link to launch the Cisco UCS Manager User Interface.
- 3. When prompted, enter admin as the username and enter the administrative password.
- 4. Click Login to log in to Cisco UCS Manager.

Upgrade Cisco UCS Manager Software to Version 4.0(4c)

This document assumes the use of Cisco UCS 4.0(4c). To upgrade the Cisco UCS Manager software and the UCS 6454 Fabric Interconnect software to version 4.0(4c), refer to <u>Cisco UCS Manager Install and Upgrade Guides</u>.

Anonymous Reporting

To enable anonymous reporting, follow this step:

1. In the Anonymous Reporting window, select whether to send anonymous data to Cisco for improving future products. If you select Yes, enter the IP address of your SMTP Server. Click **OK**.

Anonymous Reporting

Cisco Systems, Inc. will be collecting feature configuration and usage statistics which will be sent to Cisco Smart Call Home server anonymously. This data helps us prioritize the features and improvements that will most benefit our customers.

If you decide to enable this feature in future, you can do so from the "Anonymous Reporting" in the Call Home settings under the Admin tab. View Sample Data

Do you authorize the disclosure of this information to Cisco Smart CallHome? Yes No

Don't show this message again.

OK) (Cancel	

Configure Cisco UCS Call Home

It is highly recommended by Cisco to configure Call Home in Cisco UCS Manager. Configuring Call Home will accelerate resolution of support cases. To configure Call Home, follow these steps:

- 1. In Cisco UCS Manager, click the Admin tab in the navigation pane on left.
- 2. Select All > Communication Management > Call Home.
- 3. Change the State to **On**.
- 4. Fill in all the fields according to your Management preferences and click **Save Changes** and **OK** to complete configuring Call Home.

æ	Communication Management	Communication Management / Call Home
B	 Communication Management 	General Profiles Call Home Policies System Inventory Anonymous Reporting Events FSM
	Call Home	Admin
格	Communication Services	State : Off () On
₽	DNS Management	
-	Management Interfaces	Switch Priority : Debugging
=	 UCS Central 	Thratting : Off On
		States
		Contact Information
		Contact :
30		Phone :
		Email :
		Address :
		lda
		Customer ID :
		Contract ID :
		Site ID :
		Email Addresses
		From :
		Reply To :
		SMTP Server
		Host (IP Address or Hostname) :
		Port : 25

Add a Block of Management IP Addresses for KVM Access

To create a block of IP addresses for out of band (mgmto) server Keyboard, Video, Mouse (KVM) access in the Cisco UCS environment, follow these steps:

- 1. In Cisco UCS Manager, click the LAN tab in the navigation pane.
- 2. Expand Pools > root > IP Pools.
- 3. Right-click IP Pool ext-mgmt and choose Create Block of IPv4 Addresses.
- 4. Enter the starting IP address of the block, the number of IP addresses required, and the subnet and gateway information. Click **OK**.

Create Block of IPv4 Addresse	es	? ×
From : 192.168.163.181	Size : 20 🜲	
Subnet Mask : 255.255.252.0	Default Gateway : 192.168.160.1	
Primary DNS: 192.168.163.50	Secondary DNS : 192.168.163.51	
	ОК Са	ncel
This block of IP addresses should be	in the out of band management subnet.	

- 5. Click OK.
- 6. Click **OK** in the confirmation message.

Synchronize Cisco UCS to NTP

To synchronize the Cisco UCS environment to the NTP server, follow these steps:

- 1. In Cisco UCS Manager, click the **Admin** tab in the navigation pane.
- 2. Select All > Timezone Management > Timezone.
- 3. In the Properties pane, select the appropriate time zone in the Timezone menu.
- 4. Click Save Changes, and then click OK.
- 5. Click Add NTP Server.

- 6. Enter <NTP Server IP Address> and click **OK**.
- 7. Click OK.

Time Zone Management / Timezone		
General Events		
Actions	Properties	
Add NTP Server	Time Zone : America/New_York (Eastern. •	
	NTP Servers	
	Ty Advanced Filter ↑ Export ⊕ Print	¢
	Name	
	NTP Server 192.168.160.254	
	Contra Contras Contra	

Add Additional DNS Server(s)

To add one or more additional DNS servers to the UCS environment, follow these steps:

- 1. In Cisco UCS Manager, click Admin.
- 2. Expand All > Communications Management.
- 3. Select DNS Management.
- 4. In the Properties pane, select Specify DNS Server.
- 5. Enter the IP address of the additional DNS server.

Specify DNS Server	? ×
DNS Server (IP Address) : 192.168.160.54]
	OK Cancel

6. Click **OK** and then click **OK** again. Repeat this process for any additional DNS servers.

Add an Additional Administrator User

To add an additional locally authenticated Administrative user (flexadmin) to the Cisco UCS environment in case issues arise with the admin user, follow these steps:

- 1. In Cisco UCS Manager, click Admin.
- 2. Expand User Management > User Services > Locally Authenticated Users.

- 3. Right-click Locally Authenticated Users and select Create User.
- 4. In the Create User fields it is only necessary to fill in the Login ID, Password, and Confirm Password fields. Fill in the Create User fields according to your local security policy.
- 5. Leave the Account Status field set to Active.
- 6. Set Account Expires according to your local security policy.
- 7. Under Roles, select admin.
- 8. Leave Password Required selected for the SSH Type field.

Create Use	∋r	? ×
Login ID	:	versaadmin
First Name	:	VersaStack
Last Name	:	Administrator
Email	;	
Phone	:	
Password	:	
Confirm Password	:	
Account Status	;	Active Inactive
Account Expires	:	
Roles		Locales
aaa admin facility-mana network operations read-only server-comp server-equip server-secur storage	me	e ant
		OK Cancel

9. Click **OK** and then Click **OK** again to complete adding the user.

Enable Port Auto-Discovery Policy

To enable the port auto-discovery policy, follow these steps:

- 1. Setting the port auto-discovery policy enables automatic discovery of Cisco UCS B-Series chassis server ports.
- 2. In Cisco UCS Manager, click Equipment, select All > Equipment in the Navigation Pane, and select the Policies tab on the right.
- 3. Under Port Auto-Discovery Policy, set Auto Configure Server Port to **Enabled**.

Main Topology Vie	w Fabric Interconn	ects Servers	Thermal	Decommissioned	Firmware Managem	ent Policies	Faults	Diagnostics	
Global Policies	Autoconfig Policies	Server Inheritand	ce Policies	Server Discovery Polic	ies SEL Policy	Power Groups	Port Aut	o-Discovery Policy	Securit
ctions									
lse Global									
roperties									
Owner	: Local								

4. Click Save Changes and then OK.

Enable Info Policy for Neighbor Discovery

Enabling the info policy enables Fabric Interconnect neighbor information to be displayed. To modify the info policy, follow these steps:

- 1. In Cisco UCS Manager, click Equipment, select All > Equipment in the Navigation Pane, and select the Policies tab on the right.
- 2. Under Global Policies, scroll down to Info Policy and select Enabled for Action.

Info Policy				
Action :	Oisabled Enabled			

- 3. Click Save Changes and then OK.
- 4. Under Equipment, select Fabric Interconnect A (primary). On the right, select the Neighbors tab. CDP information is shown under the LAN tab and LLDP information is shown under the LLDP tab.

Edit Chassis Discovery Policy

Setting the discovery policy simplifies the addition of B-Series Cisco UCS chassis and of additional fabric extenders for further C-Series connectivity. To modify the chassis discovery policy, follow these steps:

- 1. In Cisco UCS Manager, click the **Equipment** tab in the navigation pane and select Equipment from the list in the left pane.
- 2. In the right pane, click the **Policies** tab.
- 3. Under Global Policies, set the Chassis/FEX Discovery Policy to match the minimum the number of uplink ports that are cabled between any chassis IOM or fabric extender (FEX) and the fabric interconnects.



If varying numbers of links between chassis and the Fabric Interconnects will be used, leave Action set to 1 Link.

4. On the 6454 Fabric Interconnects, the Link Grouping Preference is automatically set to Port Channel and is greyed out. On a 6300 Series or 6200 Series Fabric Interconnect, set the Link Grouping Preference to Port Channel. If Backplane Speed Preference appears, leave it set at 40G.

æ	Ali	Equipment
	 Equipment 	Main Topology View Fabric Interconnects Servers Thermal Decommissioned Firmware Management Policies
	 Chassis 	Global Policies Autoconfig Policies Server Inheritance Policies Server Discovery Policies SEL Policy Power Groups
윦	▼ Rack-Mounts	
	Enclosures	Chassis/FEX Discovery Policy
	FEX	Action : 1 Link
=	 Servers 	Link Grouping Preference : O None O Port Channel
-	 Fabric Interconnects 	

- 5. If any changes have been made, Click Save Changes.
- 6. Click **OK**.

Enable Server and Uplink Ports

To enable and verify server and uplink ports, follow these steps:

- 1. In Cisco UCS Manager, click the **Equipment** tab in the navigation pane.
- 2. Select Equipment > Fabric Interconnects > Fabric Interconnect A (primary) > Fixed Module.
- 3. Expand Fixed Module.
- 4. Expand and select Ethernet Ports.
- 5. Select the ports that are connected to the Cisco UCS 5108 chassis and UCS C-Series servers, one by one, right-click and select **Configure as Server Port**.

 Fabric Interconnect A (subordinate) Fans 	Fault Summary	Physical Display		
 Fixed Module 	😢 🗘 🕚	andra andra brahra brahra andra andra brahra brahra andra		
	0 0 0 0	une un anticipation of the second sec		
Port 5 Port 6	Status	Properties		
Port 7	Overall Status : 4 Down	ID : 17		
Port 8 Port 9	Additional Info : Admin config change Admin State : Disabled	User Label : MAC : 00:DE:FB:FF:E8:B8		
Port 10	Actions	Mode : Fabric		
Port 11	Enable Port	Port Type : Physical Transceiver		
Port 12 Port 13	Disable Port	Type : H10GB CU3M		
Port 14	Reconfigure ▼ Unconfigure	Model : 74752-9026		
Port 15	Show Interface	Vendor : CISCO-MOLEX INC Serial : MOC13321331		
Port 16		License Details		
Pon Enable Pon Disable		License State : Not Applicable		
Port Configure as Server Port Port Configure as Uplink Port		License Grace Period : 0		

6. Click **Yes** to confirm server ports and click **OK**.

7. Verify that the ports connected to the UCS 5108 chassis and C-series servers are now configured as Server ports by selecting Fabric Interconnect A in the left and Physical Ports tab in the right pane.

 Fabric Interconnects 	Ethernet Ports							
 Fabric Interconnect A (subordinate) 	Te Advanced Filter	🕆 Export – 🖶 Print	All Vinconfigured V	Network Server VFC	CoE Uplink 🧹 Unified	d Uplink 🗸 Appliance Storag	e 🗸 FCoE Storage 🗸 Unifi	ed Storage 🗸 Monit
▶ Fans	Slot	Aggr. Port ID	Port ID	MAC	If Role	If Type	Overall Status	Admin State
	1	0	17	00:DE:FB:FF:E8:B8	Server	Physical	t Up	Enabled
 Ethernet Ports 	1	0	18	00:DE:FB:FF:E8:B9	Server	Physical	1 Up	1 Enabled
Port 5	1	0	19	00:DE:FB:FF:E8:BA	Server	Physical	🕈 Up	1 Enabled
Port 6	1	0	20	00:DE:FB:FF:E8:BB	Server	Physical	🕈 Up	1 Enabled
Port 7	1	0	21	00:DE:FB:FF:E8:BC	Server	Physical	↑ Up	1 Enabled
Port 8	1	0	22	00:DE:FB:FF:E8:BD	Server	Physical	1 Up	1 Enabled
Port 9	1	0	23	00:DE:FB:FF:E8:BE	Server	Physical	1 Up	1 Enabled
Port 10	1	0	24	00:DE:FB:FF:E8:BF	Server	Physical	🕈 Up	1 Enabled
Port 11								

8. Select the ports that are connected to the Cisco Nexus 9336C-FX2 switches, one by one, right-click and select **Config**ure as Uplink Port.

Enable
Disable
Configure as Server Port
Configure as Uplink Port
Configure as FCoE Uplink Port
Configure as FCoE Storage Port
Configure as Appliance Port
Unconfigure
Unconfigure FCoE Uplink Port
Unconfigure Uplink Port
Unconfigure FCoE Storage Port

- 9. Click **Yes** to confirm uplink ports and click **OK**.
- 10. Verify that the uplink ports are now configured as Network ports by selecting **Fabric Interconnect A** in the left and **Physical Ports** tab in the right pane.
- 11. Select Equipment > Fabric Interconnects > Fabric Interconnect B (subordinate) > Fixed Module.
- 12. Repeat above steps to configure server and uplink ports on Fabric Interconnect B.

Acknowledge Cisco UCS Chassis and FEX

When the UCS FI ports are configured as server ports, UCS chassis is automatically discovered and may need to be acknowledged. To acknowledge all Cisco UCS chassis, follow these steps:

- 1. In Cisco UCS Manager, click the **Equipment** tab in the navigation pane.
- 2. Expand Chassis and select each chassis that is listed.
- 3. Right-click each chassis and select Acknowledge Chassis.
- 4. Click Yes and then click OK to complete acknowledging the chassis.
- 5. If Nexus FEXes are part of the configuration, expand Rack Mounts and FEX.

- 6. Right-click each FEX that is listed and select Acknowledge FEX.
- 7. Click **Yes** and then click **OK** to complete acknowledging the FEX.

Enable Fibre Channel Ports (FC Deployment)

The FC port and uplink configurations can be skipped if the UCS environment does not need access to IBM storage using fibre channel.

Fibre Channel port configurations differ between the 6454, 6332-16UP and the 6248UP Fabric Interconnects. All Fabric Interconnects have a slider mechanism within the Cisco UCS Manager GUI interface, but the fibre channel port selection options for the 6454 are from the first 8 ports starting from the first port and configured in increments of 4 ports from the left. For the 6332-16UP the port selection options are from the first 16 ports starting from the first port, and configured in increments of the first 6, 12, or all 16 of the unified ports. With the 6248UP, the port selection options will start from the right of the 32 fixed ports, or the right of the 16 ports of the expansion module, going down in contiguous increments of 2. The remainder of this section shows configuration of the 6454. Modify as necessary for the 6332-16UP or 6248UP.

To enable FC uplink ports, follow these steps.

This step requires a reboot. To avoid an unnecessary switchover, configure the subordinate Fabric Interconnect first.

- 1. In the **Equipment** tab, select the **Fabric Interconnect B** (subordinate FI in this example), and in the **Actions** pane, select **Configure Unified Ports**, and click **Yes** on the splash screen.
- 2. Within the Configured Fixed Ports pop-up window move the gray slider bar from the left to the right to select either 4 or 8 ports to be set as FC Uplinks.
- 3. Slide the lever to change the ports 1-4 to Fiber Channel. Click Finish followed by Yes to the reboot message. Click OK.

Configure I	Unified Ports		?	\times
	+			
Instructions				
	slider determines the type of the left of the slider are Fibre Channe	ports. ports (Purple), while the ports to the right are Etherne	t ports (Blue).	
Port	Transport	If Role or Port Channel Membership	Desired If Role	-

4. When the subordinate has completed reboot, repeat the procedure to configure FC ports on primary Fabric Interconnect. As before, the Fabric Interconnect will reboot after the configuration is complete.

Create VSAN for the Fibre Channel Interfaces

To configure the necessary virtual storage area networks (VSANs) for FC uplinks for the Cisco UCS environment, follow these steps:

- 1. In Cisco UCS Manager, click the **SAN** tab in the navigation pane.
- 2. Expand the SAN > SAN Cloud and select Fabric A.

- 3. Right-click VSANs and choose Create VSAN.
- 4. Enter VSAN-A as the name of the VSAN for fabric A.
- 5. Keep the Disabled option selected for FC Zoning.
- 6. Click the **Fabric A** radio button.
- 7. Enter 101 as the VSAN ID for Fabric A.
- 8. Enter 101 as the FCoE VLAN ID for fabric A. Click **OK** twice.

Create VSAN	? ×
Name : VSAN-A	
FC Zoning Settings	
FC Zoning : Oisabled O Enabled	
Do NOT enable local zoning if fabric interconnect is connected	d to an upstream FC/FCoE switch.
○ Common/Global Fabric A Fabric B Both Fabrics C	ionfigured Differently
You are creating a local VSAN in fabric A that maps to a VSAN ID that exists only in fabric A.	A VLAN can be used to carry FCoE traffic and can be mapped to this VSAN.
Enter the VSAN ID that maps to this VSAN.	Enter the VLAN ID that maps to this VSAN.
VSAN ID : 101	FCoE VLAN : 101

- 9. In the SAN tab, expand SAN > SAN Cloud > Fabric-B.
- 10. Right-click VSANs and choose **Create VSAN**.
- **11**. Enter VSAN-B as the name of the VSAN for fabric B.
- 12. Keep the Disabled option selected for FC Zoning.
- 13. Click the Fabric B radio button.
- 14. Enter 102 as the VSAN ID for Fabric B. Enter 102 as the FCoE VLAN ID for Fabric B. Click **OK** twice.

OK Cancel

Create VSAN	•
Name : VSAN-B	
FC Zoning Settings	
FC Zoning : Disabled Enabled	
Do NOT enable local zoning if fabric interconnect is connected	d to an upstream FC/FCoE switch.
Common/Global Fabric A Fabric B Both Fabrics C You are creating a local VSAN in fabric B that maps to a VSAN ID that exists only in fabric B.	Configured Differently A VLAN can be used to carry FCoE traffic and can be mapped to this VSAN.
Enter the VSAN ID that maps to this VSAN.	Enter the VLAN ID that maps to this VSAN.
VSAN ID : 102	FCoE VLAN : 102

Create Port Channels for the Fibre Channel Interfaces

To configure the necessary port channels for the Cisco UCS environment, follow these steps:

OK Cancel

Fabric-A

- 1. In the navigation pane, under **SAN** > **SAN** Cloud, expand the Fabric A tree.
- 2. Right-click FC Port Channels and choose Create Port Channel.
- 3. Enter 1 for the port channel ID and Po1 for the port channel name.
- 4. Click **Next** then choose ports 1-4 and click >> to add the ports to the port channel. Click **Finish**.

		Create F	C Port C	hannel				? ×
0	Set FC Port Channel Name	Port Channel	Admin Speed :	4 Gbps 8 Gbps	16gbps 32gbps			
2	Add Ports		Ports				Ports in the port	channel
•	Had Fond	Port	Slot ID	WWPN		Port	Slot ID	WWPN
		1	1	20:01:00:DE			No data avail	able
		2	1	20:02:00:DE				
		3	1	20:03:00:DE	>>			
		4	1	20:04:00:DE	<<			
		Slot ID:	1			Slot ID:		
		WWPN:	20:0	11:00:DE:FB:FF:FD:40		WWPN:		
					< Prev	Next	> Finish	Cancel

- 5. Click OK.
- 6. Select FC Port-Channel 1 from the menu in the left pane and from the VSAN drop-down field, select VSAN 101 in the right pane.

Status	Properties	
Overall Status : 🕇 Up	ID	: 1
Additional Info :	Fabric ID	: A
8 - 11	Port Type	: Aggregation
Actions	Transport Type	: Fc
Enable Port Channel	Name	: PC1
Disable Port Channel	Description	:
Add Ports	VSAN	: A/vsan VSAN-A (101) 🔻
	Port Channel Admin	Speed : Fabric A/vsan VSAN-A (101) Ds
	Operational Speed(Gbps) : Fabric Dual/vsan default (1)

7. Click **Save Changes** and then click **OK**.

Fabric-B

- 1. Click the **SAN** tab. In the navigation pane, under **SAN** > **SAN** Cloud, expand the Fabric B.
- 2. Right-click FC Port Channels and choose Create Port Channel.

- 3. Enter 2 for the port channel ID and Po2 for the port channel name. Click Next.
- 4. Choose ports 1-4 and click >> to add the ports to the port channel.
- 5. Click **Finish**, and then click **OK**.
- 6. Select FC Port-Channel 2 from the menu in the left pane and from the VSAN drop-down list, select VSAN 102 in the right pane.
- 7. Click Save Changes and then click OK.

To initialize a quick sync of the connections to the MDS switch, right-click the recently created port channels, disable port channel and then re-enable the port channel.

Create Port Channels for Ethernet Uplinks

To configure the necessary Ethernet port channels out of the Cisco UCS environment, follow these steps:

In this procedure, two port channels are created one from each Fabric Interconnect (A and B) to both the Cisco Nexus 9336C-FX2 switches.

- 1. In Cisco UCS Manager, click the LAN tab in the navigation pane.
- 2. Under LAN > LAN Cloud, expand the Fabric A tree.
- 3. Right-click Port Channels and choose Create Port Channel.
- 4. Enter 13 as the unique ID of the port channel.
- 5. Enter Po13 as the name of the port channel and click Next.

		Create Port Channel
0	Set Port Channel Name	ID : 13
2	Add Ports	Name : Po13

- 6. Select the network uplink ports to be added to the port channel.
- 7. Click >> to add the ports to the port channel (53 and 54 in this design).

		Create	Port Cha	annel						? >
0	Set Port Channel Name		Po	orts				Ports in the	port char	inel
2	Add Ports	Slot ID	Aggr. Po	Port	MAC		Slot ID	Aggr. Po	Port	MAC
<u> </u>			No data	available			1	0	53	00:DE:F
						>>	1	0	54	00:DE:F
						<<				
						< Pr	ev N	ext >	Finish	Cancel

- 8. Click **Finish** to create the port channel and then click OK.
- 9. In the navigation pane, under LAN > LAN Cloud > Fabric A > Port Channels, select Port-Channel 13. Select 100 Gbps for the Admin Speed.
- 10. Click Save Changes and **OK**. After a few minutes, verify that the Overall Status is Up and the Operational Speed is correct.
- 11. In the navigation pane, under LAN > LAN Cloud, expand the Fabric B tree.
- 12. Right-click Port Channels and choose Create Port Channel.
- 13. Enter 14 as the unique ID of the port channel.
- 14. Enter Po14 as the name of the port channel and click **Next**.
- 15. Select the network uplink ports (53 and 54 in this design) to be added to the port channel.
- 16. Click >> to add the ports to the port channel.
- 17. Click **Finish** to create the port channel and click **OK**.
- 18. In the navigation pane, under LAN > LAN Cloud > Fabric B > Port Channels, select Port-Channel 14. Select 100 Gbps for the Admin Speed.
- 19. Click **Save Changes** and **OK**. After a few minutes, verify that the Overall Status is Up and the Operational Speed is correct.

Add UDLD to Uplink Port Channels

To configure the unidirectional link detection (UDLD) on the Uplink Port Channels to the Nexus switches, follow these steps:

1. In Cisco UCS Manager, click LAN.

- 2. Expand Policies > LAN Cloud > UDLD Link Policy.
- 3. Right-click UDLD Link Policy and select Create UDLD Link Policy.
- 4. If the uplink cables to the Nexus switches are copper cables, name the Policy UDLD-Aggressive and select Enabled for the Admin State and Aggressive for the Mode. If the uplink cables to the Nexus switches are fibre optic cables, name the Policy UDLD-Normal Aggressive and select Enabled for the Admin State and Aggressive for the Mode. In the validation lab configuration, UDLD-Aggressive was created.



5. Click OK, then click OK again to complete creating the policy.

It is important that the Nexus switch port UDLD configurations (Aggressive or Normal) match the UCS port UDLD configurations.

- 6. Expand Policies > LAN Cloud > Link Profile.
- 7. Right-click Link Profile and select Create Link Profile.
- 8. Give the Link Profile the same name as the UDLD Link Policy above and select the UDLD Link Policy created above.

Create Link	Profile			? ×
Name :	UDLD-Aggressive			
UDLD Link Policy :	UDLD-Aggressive	•		
			ок с	ancel

9. Click **OK**, then click **OK** again to complete creating the profile.

- 10. In the navigation pane, under LAN > LAN Cloud > Fabric A > Port Channels, expand Port-Channel 13.
- 11. Select the first Eth Interface under Port-Channel 13. From the drop-down list, select the Link Profile created above, click Save Changes and OK. Repeat this process for each Eth Interface under Port-Channel 13 and for each Eth Interface under Port-Channel 14 on Fabric B.

Actions	Properties
Delete	ID : 53
Enable Interface	Slot ID : 1
Disable Interface	Fabric ID : A
	Transport Type : Ether
	Port : sys/switch-A/slot-1/switch-ether/port-53
	Membership : Up
	Link Profile : UDLD-Aggressive •
	User Label :

To see that UDLD is set up correctly, log into each Nexus switch and type show udld neighbors.

Create MAC Address Pools

To configure the necessary MAC address pools for the Cisco UCS environment, follow these steps:

1. In Cisco UCS Manager, click the LAN tab in the navigation pane.

LAN / LAN Cloud / Fabric A / Port Channels / Port-Channel 13 vPC13 / Eth Interface 1/53

2. Select **Pools** > **root**.

In this procedure, two MAC address pools are created, one for each switching fabric.

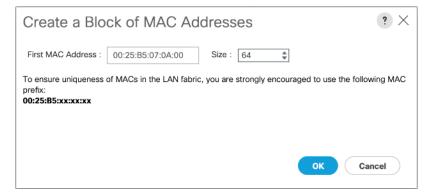
- 3. Right-click MAC Pools under the root organization.
- 4. Select Create MAC Pool to create the MAC address pool.
- 5. Enter MAC-Pool-A as the name of the MAC pool.
- 6. **Optional**: Enter a description for the MAC pool.
- 7. Select the option Sequential for the Assignment Order field and click Next.

		Create MAC Pool	? ×
0	Define Name and Description	Name : MAC-Pool-A	
2	Add MAC Addresses	Description : Assignment Order : Default Sequential	
		< Prev Next > Finish C	ancel
8. C	lick Add .		

9. Specify a starting MAC address.

It is recommended to place oA in the second last octet of the starting MAC address to identify all of the MAC addresses as Fabric A addresses. It is also recommended to not change the first three octets of the MAC address.

10. Specify a size for the MAC address pool that is sufficient to support the available blade or rack server resources. Remember that multiple Cisco VIC vNICs will be created on each server and each vNIC will be assigned a MAC address.



- 11. Click **OK** and then click **Finish**.
- 12. In the confirmation message, click **OK**.
- 13. Right-click MAC Pools under the root organization.
- 14. Select Create MAC Pool to create the MAC address pool.
- **15.** Enter MAC-Pool-B as the name of the MAC pool.

- 16. **Optional**: Enter a description for the MAC pool.
- 17. Select the Sequential Assignment Order and click Next.
- 18. Click Add.

19. Specify a starting MAC address.

It is recommended to place oB in the second last octet of the starting MAC address to identify all the MAC addresses in this pool as fabric B addresses. It is also recommended to not change the first three octets of the MAC address.

20. Specify a size for the MAC address pool that is sufficient to support the available blade or rack server resources.

Create a Block of MAC Addresses			
First MAC Address : 00:25:B5:07:0B:00 Size : 64 ‡			
To ensure uniqueness of MACs in the LAN fabric, you are strongly encouraged to use the followin prefix: 00:25:85:xx:xx:xx	ng MAC		
ОК Салс	el		

- 21. Click **OK** and then click **Finish**.
- 22. In the confirmation message, click OK.

Create UUID Suffix Pool

To configure the necessary universally unique identifier (UUID) suffix pool for the Cisco UCS environment, follow these steps:

- 1. In Cisco UCS Manager, click the **Servers** tab in the navigation pane.
- 2. Select **Pools** > root.
- 3. Right-click UUID Suffix Pools and choose Create UUID Suffix Pool.
- 4. Enter UUID-Pool as the name of the UUID suffix pool.
- 5. **Optional**: Enter a description for the UUID suffix pool.
- 6. Keep the prefix at the derived option.
- 7. Change the Assignment Order to Sequential.
- 8. Click Next.
- 9. Click Add to add a block of UUIDs.
- 10. Keep the From field at the default setting.

11. Specify a size for the UUID block that is sufficient to support the available blade or rack server resources.

Create a Block of UUID Suffixes ? ×				
From : 0000-00000000001	Size : 64 🌲			
	OK Car	ncel		

12. Click OK. Click Finish and then click OK.

Create Server Pool

To configure the necessary server pool for the Cisco UCS environment, follow these steps:

- 1. In Cisco UCS Manager, click the **Servers** tab in the navigation pane.
- 2. Select **Pools > root**.
- 3. Right-click Server Pools and choose Create Server Pool.
- 4. Enter Infra-Server-Pool as the name of the server pool.
- 5. **Optional**: Enter a description for the server pool.
- 6. Click **Next**.

		Create Se	erver Pool					? ×
0	Set Name and Description		Servers				Pooled Servers	
				¢				¢
2	Add Servers	C : I Use	PID 🗸	r = 1		CEFUse	PID	150
		1	UCSB-B200-M4	↓ F 2		4	UCSB-B200-M5	UFI1
		2	UCSB-B200-M4	4 F 2	>>	5	UCSB-B200-M5	UF 3
		3	UCSB-B200-M4	4 F 2	<<	6	UCSB-B200-M5	UF 3
		8	UCSB-B200-M5	1 F 1		7	UCSB-B200-M5	UF 3
		1	UCSC-C220-M5SN	υv				
		2	UCSC-C220-M5SN	υv				
		Model: Serial Number: Vendor:				Model: Serial Number: Vendor:		
					< Pret	Next>	Finish	Cancel

- 7. Select at least two (or more) servers to be used for the setting up the VMware environment and click >> to add them to the Infra-Server-Pool server pool.
- 8. Click **Finish** and click **OK**.

If Cisco UCS C-Series servers are leveraged in the design, create storage pool by selecting the appropriate server models intended to be used.

Create a WWNN Address Pool for FC based Storage Access

This configuration step can be skipped if the UCS environment does not need to access storage environment using FC.

For FC boot as well as access to FC LUNs, create a World Wide Node Name (WWNN) pool by following these steps:

- 1. In Cisco UCS Manager, click the **SAN** tab in the navigation pane.
- 2. Select **Pools** > **root**.
- 3. Right-click WWNN Pools under the root organization and choose **Create WWNN Pool** to create the WWNN address pool.
- 4. Enter WWNN-Pool as the name of the WWNN pool.
- 5. **Optional**: Enter a description for the WWNN pool.
- 6. Select the Sequential Assignment Order and click Next.
- 7. Click Add.
- 8. Specify a starting WWNN address.
- 9. Specify a size for the WWNN address pool that is sufficient to support the available blade or rack server resources. Each server will receive one WWNN.



Modifications of the WWNN block, as well as the WWPN and MAC Addresses, can convey identifying information for the Cisco UCS domain.



When there are multiple UCS domains sitting in adjacency, it is important that these blocks; the WWNN, WWPN, and MAC, hold differing values between each set. Modify the values accordingly to make them unique.

Create WWN Block ?	X
From : 20:00:00:25:B5:00:00:00 Size : 64	
To ensure uniqueness of WWNs in the SAN fabric, you are strongly encouraged t the following WWN prefix:	o use
20:00:00:25:b5:xx:xx	
OK Cancel)

- 10. Click **OK** and click **Finish**.
- 11. In the confirmation message, click **OK**.

Create a WWPN Address Pools for FC Based Storage Access

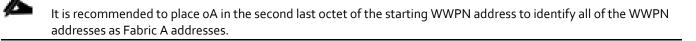
This configuration step can be skipped if the UCS environment does not need access to storage environment using FC.

If you are providing FC boot or access to FC LUNs, create a World Wide Port Name (WWPN) pool for each SAN switching fabric by completing the following steps:

- 1. In Cisco UCS Manager, click the **SAN** tab in the navigation pane.
- 2. Select **Pools** > **root**.

6

- Right-click WWPN Pools under the root organization and choose Create WWPN Pool to create the first WWPN address pool.
- 4. Enter WWPN-Pool-A as the name of the WWPN pool.
- 5. **Optional**: Enter a description for the WWPN pool.
- 6. Select the Sequential Assignment Order and click Next.
- 7. Click Add.
- 8. Specify a starting WWPN address.



9. Specify a size for the WWPN address pool that is sufficient to support the available blade or rack server resources. Each server's Fabric A vHBA will receive one WWPN from this pool.

Create WWN Block	? ×
From: 20:00:00:25:B5:07:0A:00	Size : 64
To ensure uniqueness of WWNs in the S the following WWN prefix:	AN fabric, you are strongly encouraged to use
20:00:00:25:b5:xx:xx:xx	
	OK Cancel

- 10. Click **OK** and click **Finish**.
- 11. In the confirmation message, click **OK**.
- 12. Right-click WWPN Pools under the root organization and choose **Create WWPN Pool** to create the second WWPN address pool.
- 13. Enter WWPN-Pool-B as the name of the WWPN pool.
- 14. **Optional**: Enter a description for the WWPN pool.
- 15. Select the Sequential Assignment Order and click Next.
- 16. Click Add.

13

17. Specify a starting WWPN address.

It is recommended to place oB in the second last octet of the starting WWPN address to identify all of the WWPN addresses as Fabric B addresses.

18. Specify a size for the WWPN address pool that is sufficient to support the available blade or rack server resources. Each server's Fabric B vHBA will receive one WWPN from this pool.

Create WWN Block	? ×
From : 20:00:00:25:B5:07:0B;00	Size : 64
To ensure uniqueness of WWNs in the the following WWN prefix:	SAN fabric, you are strongly encouraged to use
20:00:00:25:b5:xx:xx:xx	
	OK Cancel

19. Click OK and click Finish.

20. In the confirmation message, click **OK**.

Create IQN Pools for iSCSI Boot and LUN Access (iSCSI Deployment)

This configuration step can be skipped if the UCS environment does not need access to storage using iSCSI.

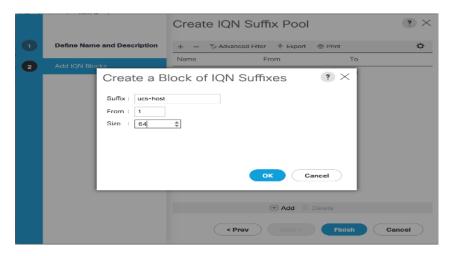
To enable iSCSI boot and provide access to iSCSI LUNs, configure the necessary IQN pools in the Cisco UCS Manager by completing the following steps:

- 1. In the UCS Manager, select the **SAN** tab.
- 2. Select **Pools** > **root**.
- 3. Right-click IQN Pools under the root organization and choose Create IQN Suffix Pool to create the IQN pool.
- 4. Enter Infra-IQN-Pool for the name of the IQN pool.
- 5. **Optional**: Enter a description for the IQN pool.
- 6. Enter iqn.1992-08.com.cisco as the prefix
- 7. Select the option Sequential for Assignment Order field. Click Next.

		Create IQN Suffix Pool ? ×
1	Define Name and Description	Name : Infra-IQN-Pool
2	Add IQN Blocks	Description : Prefix : iqn.1992-08.com.cisco IQN Prefix must have the following format: iqn.yyyy-mm.naming-authority,
		where <i>naming-authority</i> is usually the reverse syntax of the Internet domain name of the naming authority.
		Assignment Order : Obefault Sequential
		< Prev Next > Finish Cancel

- 8. Click Add.
- 9. Enter an identifier with ucs-host as the suffix. Optionally a rack number or any other identifier can be added to the suffix to make the IQN unique within a DC.
- 10. Enter 1 in the From field.

- 11. Specify a size of the IQN block sufficient to support the available server resources. Each server will receive one IQN.
- 12. Click **OK**.



13. Click **Finish**. In the message box that displays, click **OK**.

Create IP Pools for iSCSI Boot and LUN Access (iSCSI Deployment)

This configuration step can be skipped if the UCS environment does not need access to storage using iSCSI.

For enabling iSCSI storage access, these steps provide details for configuring the necessary IP pools in the Cisco UCS Manager:

- Two IP pools are created, one for each switching fabric.
- 1. In Cisco UCS Manager, select the LAN tab.
- 2. Select **Pools** > **root**.
- 3. Right-click IP Pools under the root organization and choose Create IP Pool to create the IP pool.
- 4. Enter iSCSI-initiator-A for the name of the IP pool.
- 5. **Optional**: Enter a description of the IP pool.
- 6. Select the option Sequential for the Assignment Order field. Click Next.

		Create IP Pool	? ×
0	Define Name and Description	Name : 1903-in Bator-A	
0	Add IPv4 Blocks	Descriptive : Assignment Order : Default (i) Sequented	
3	Add IPv6 Blocks		
		<pre> (Next>) Fields (C</pre>	ancel)

- 7. Click Add.
- 8. In the From field, enter the beginning of the range to assign an iSCSI IP addresses. These addresses are covered in Table 2.
- 9. Enter the Subnet Mask.
- 10. Set the size with sufficient address range to accommodate the servers. Click OK.

		Create IP Pool	? ×
1	Define Name and Descripti	on + - Ty Advanced Filter + Export - Print	\$
2	Add IPv4 Blocks	Create Block of IPv4 Addresses ? X Bry DNS	Secondary DNS
3	Add IPv5 Blocks	From : 10.29.161.151 Size : 60 \$ Submet Marks: 256.255.265.0 Default Gateway: 0.0.0 \$ 0.0.0 \$ \$ 0.0.0 \$ \$ \$ 0.0.0 \$	0.0.0.0
		OK Cancel	
		< Prov Next>	Cancel

- 11. Click **Next** and then click **Finish**.
- 12. Click **OK** in the confirmation message.
- 13. Right-click IP Pools under the root organization and choose Create IP Pool to create the IP pool.
- 14. Enter iSCSI-initiator-B for the name of the IP pool.
- 15. **Optional**: Enter a description of the IP pool.
- 16. Select the Sequential option for the Assignment Order field. Click Next.
- 17. Click Add.
- 18. In the From field, enter the beginning of the range to assign an iSCSI IP addresses. These addresses are covered in Table 2.

- 19. Enter the Subnet Mask.
- 20. Set the size with sufficient address range to accommodate the servers. Click **OK**.

		Create IP Pool	? ×
0	Define Name and Descripti	ion + - T/ Advanced Filter + Export + Print	¢
2	Add IPv4 Blocks	Create Block of IPv4 Addresses ? × ary DNS	
3	Add IPv6 Blocks	0.0 From : 10.29.162.151 Size : 50 ¢ Subnet Mask: 255.255.255.0 Default Gateway : 0.0.0.0 Primary DNS : 0.0.0.0 Secondary DNS : 0.0.0.0	0.00.0
		OK Cancel	
		(* Add = Doucto	Rinish Cancel

- 21. Click **Next** and then click **Finish**.
- 22. Click **OK** in the confirmation message.

Create VLANs

To configure the necessary VLANs in the Cisco UCS Manager, follow these steps for all the VLANs listed in Table 12 :

VLAN Name	VLAN			
IB-Mgmt	11			
iSCSI-A*	3161			
iSCSI-B*	3162			
Out of Band Mgmt	3171			
VM Traffic	3174			
vMotion	3173			
Native-2	2			

Table 12VLANs on Cisco UCS



* iSCSI-A and iSCSI-B VLANs are required for iSCSI deployments only.

- 1. In Cisco UCS Manager, click the LAN tab in the navigation pane.
- 2. Select LAN > LAN Cloud.
- 3. Right-click VLANs and choose Create VLANs.
- 4. Enter name from the VLAN Name column.

- 5. Keep the Common/Global option selected for the scope of the VLAN.
- 6. Enter the VLAN ID associated with the name.
- 7. Keep the Sharing Type as None.
- 8. Click **OK** and then click **OK** again.

Create VLANs	? ×
VLAN Name/Prefix : Native-VLAN	
Multicast Policy Name : <pre></pre>	
Common/Global Fabric A Fabric B Both Fabrics Configured Differently	
You are creating global VLANs that map to the same VLAN IDs in all available fabrics. Enter the range of VLAN IDs.(e.g. * 2009-2019", * 29,35,40-45", * 23*, * 23,34-45")	
VLAN IDs : 2	
Sharing Type : O None O Primary O Isolated O Community	
Check Overlap OK	Cancel

- 9. Click **Yes** and then click **OK** twice.
- 10. Repeat these steps for all the VLANs in Table 12.

Create Host Firmware Package

Firmware management policies allow the administrator to select the corresponding packages for a given server configuration. These policies often include packages for adapter, BIOS, board controller, FC adapters, host bus adapter (HBA) option ROM, and storage controller.

To create a firmware management policy for a given server configuration in the Cisco UCS environment, follow these steps:

- 1. In Cisco UCS Manager, click the **Servers** tab in the navigation pane.
- 2. Select Policies > root.
- 3. Right-click Host Firmware Packages and choose Create Host Firmware Package.
- 4. Enter Infra-FW-Pack as the name of the host firmware package.
- 5. Keep the Host Firmware Package as Simple.
- 6. Select the version 4.0(4c) for both the Blade and Rack Packages.

- 7. Click **OK** to create the host firmware package.
- 8. Click OK.

Create Host Firmware Package	? ×
Name : Infra-FW-Pack	1
Description :	
How would you like to configure the Host Firmware Package?	
Simple Advanced	
Blade Package : 4.0(4c)B v	
Rack Package : 4.0(4c)C v	
Service Pack : <not set=""></not>	
The images from Service Pack will take precedence over the images from Blade or Rack Package	
Excluded Components:	
BIOS	
Board Controller	
CIMC	
FC Adapters	
Flex Flash Controller	
GPUs	
HBA Option ROM	
Host NIC	
Host NIC Option ROM	
V Local Disk	
MARKE Manufactor Firmunan	
	OK Cancel

Set Jumbo Frames in Cisco UCS Fabric

Jumbo Frames are used in VersaStack for the iSCSI storage protocols. The normal best practice in VersaStack has been to set the MTU of the Best Effort QoS System Class in Cisco UCS Manager to 9216 for Jumbo Frames. In the Cisco UCS 6454 Fabric Interconnect the MTU for the Best Effort QoS System Class is fixed at normal and cannot be changed. Testing has shown that even with this setting of normal in the 6454, Jumbo Frames can pass through the Cisco UCS fabric without being dropped. The screenshot below is from Cisco UCS Manager on a 6454 Fabric Interconnect, where the MTU for the Best Effort class is not configurable. To configure jumbo frames in the Cisco UCS fabric in a 6300 or 6200 series Fabric Interconnect, follow these steps:

To configure jumbo frames in the Cisco UCS fabric, follow these steps:

- 1. In Cisco UCS Manager, click the LAN tab in the navigation pane.
- 2. Select LAN > LAN Cloud > QoS System Class.
- 3. In the right pane, click the **General** tab.
- 4. On the Best Effort row, enter 9216 in the box under the MTU column.
- 5. Click **Save Changes** in the bottom of the window.

LAN / LAN Clou	id / QoS Syst	tem Class					
General	Events FS	м					
Actions			Properties				
Use Global			Owner : Local				
Priority	Enabled	I CoS	Packet Drop	Weight	Weight (%)	мти	Multicast Optimized
Platinum		5		10	N/A	normal	
Gold		4		9 *	N/A	normal	
Silver		2		8 🔻	N/A	normal	
Bronze		1		7 🍷	N/A	normal	
Best Effort	1	Any	(d)	5	50	normal	
Fibre Channel	*	3		5 💌	50	fc	N/A

6. Click OK.

Create Local Disk Configuration Policy

When using an external storage system for OS boot, a local disk configuration for the Cisco UCS environment is necessary because the servers in the environment will not contain a local disk.

This policy should not be applied to the servers that contain local disks.

To create a local disk configuration policy for no local disks, follow these steps:

- 1. In Cisco UCS Manager, click the **Servers** tab in the navigation pane.
- 2. Select Policies > root.
- 3. Right-click Local Disk Config Policies and choose Create Local Disk Configuration Policy.
- 4. Enter SAN-Boot as the local disk configuration policy name.
- 5. Change the mode to **No Local Storage**.
- 6. Click **OK** to create the local disk configuration policy.

Create Local	Disk (Configuration	Policy		? ×
Name	:	SAN-Boot			
Description	:				
Mode	:	No Local Storage	•		
FlexFlash					
FlexFlash State	:	Disable Enable			
If FlexFlash State is disa Please ensure SD cards					
FlexFlash RAID Reportir	ng State :	Disable Enable			
FlexFlash Removable S	tate :	⊖ Yes ⊖ No ● No C	Change		
Please ensure SD cards	are not in i	use before changing the	FlexFlash Rem		
				ОК	Cancel

7. Click **OK** again.

Create Network Control Policy for Cisco Discovery Protocol (CDP) and Link Layer Discovery Protocol (LLDP)

To create a network control policy that enables Link Layer Discovery Protocol (LLDP) on virtual network ports, follow these steps:

- 1. In Cisco UCS Manager, click the **LAN** tab in the navigation pane.
- 2. Select Policies > root.
- 3. Right-click Network Control Policies and choose Create Network Control Policy.
- 4. Enter Enable-CDP-LLDP as the policy name.
- 5. For CDP, select Enabled option.
- 6. For LLDP, scroll down and select Enabled for both Transit and Receive.

_

Create Network Control Policy	? ×
CDP : Olisabled • Enabled	
MAC Register Mode : Only Native Vlan O All Host Vlans	
Action on Uplink Fail : 💿 Link Down 🔿 Warning	
MAC Security	
Forge : O Allow O Deny	
LLDP	
Transmit : Olisabled Enabled	
Receive : Olisabled I Enabled	
ОК Са	ncel

- 7. Click **OK** to create the network control policy.
- 8. Click OK.

Create Power Control Policy

To create a power control policy for the Cisco UCS environment, follow these steps:

- 1. In Cisco UCS Manager, click the **Servers** tab in the navigation pane.
- 2. Select Policies > root.
- 3. Right-click Power Control Policies and choose Create Power Control Policy.
- 4. Enter No-Power-Cap as the power control policy name.
- 5. Change the power capping setting to No Cap.
- 6. Click **OK** to create the power control policy.
- 7. Click OK.

Create Pov	ver Control Policy	? ×
Name :	No-Power-CAP	
Description :		
Fan Speed Policy :	Anv	
Power Capping		
within its power gr you choose no-ca	, the server is allocated a certain amount of power base roup. Priority values range from 1 to 10, with 1 being the up, the server is exempt from all power capping.	
🖲 No Cap 🔵 c	ар	
Cisco UCS Manager	only enforces power capping when the servers in a power	wer group require

Cisco UCS Manager only enforces power capping when the servers in a power group require more power than is currently available. With sufficient power, all servers run at full capacity regardless of their priority.



Create Server Pool Qualification Policy (Optional)

To create an optional server pool qualification policy for the Cisco UCS environment, follow these steps:

	This example creates a policy for selecting a Cisco UCS B200-M5 server.
1.	In Cisco UCS Manager, click the Servers tab in the navigation pane.
2.	Select Policies > root.
3.	Right-click Server Pool Policy Qualifications and choose Create Server Pool Policy Qualification.
4.	Enter UCSB-B200-M5 as the name for the policy.
5.	Choose Create Server PID Qualifications.

6. Select UCSB-B200-M5 as the PID.

Name : UCS-B200-M5				
Description :				
This server pool policy qualification will	apply to new or re-discovered servers. Existing servers are not qualified until they are re-dis	scovered		
Actions Create Adapter Qualifications	Create Server PID Qualifications	×		¢
Create Chassis/Server Qualifications	PID: UCSB-B200-M5	peed	Stepping	Power Gro
Create Memory Qualifications	· · · · · · · · · · · · · · · · · · ·			
reate CPU/Cores Qualifications				
Create Storage Qualifications				
reate Server PID Qualifications				
reate Power Group Qualifications				
Create Rack Qualifications	OK Cancel)		
	🕀 Add 🐵 Dolete 🐨 Info			

7. Click OK.

8. Click **OK** to create the server pool policy qualification.

The server pool qualification policy name and the PID values varies if the UCS C-Series or other B-Series server models are used, select appropriate values based on the server model being used.

Create Server BIOS Policy

To create a server BIOS policy for the Cisco UCS environment, follow these steps:

- 1. In Cisco UCS Manager, click the **Servers** tab in the navigation pane.
- 2. Select Policies > root.
- 3. Right-click BIOS Policies and choose Create BIOS Policy.
- 4. Enter Infra-Host-BIOS as the BIOS policy name.

С	create BIOS Policy	? ×
D	Jame : Infra-Host-BIC Description : Reboot on BIOS Settings Change :	os
5.	Click OK, then OK again to create the	OK Cancel BIOS Policy.
6.	Select the newly created BIOS Policy.	
7.	Set the following within the Main tab	of the Policy:
	 a. CDN Control -> Enabled b. Quiet Boot -> Disabled Servers / Policies / root / BIOS Policies / Infra-Host-BIOS 	
	Main Advanced Boot Options Server Management Event	ns
	Actions	

Delete					
Show Policy Usage					
Properties					
Name	: Infra-Host-BIOS				
Description	:				
Owner	: Local				
Reboot on BIOS Settings (Change: 🗌				
Ty Advanced Filter 🔶 Expo	ort				۵
BIOS Setting			Value		
CDN Control			Enabled	Υ.	
Front panel lockout		Platform Default	v		
POST error pause			Platform Default	Ψ.	
Quiet Boot			Disabled	Υ.	
Resume on AC power los	SS		Platform Default	Ţ	

Servers / Policies / root / BIOS Policies / Infra-Host-BIOS							
Main Advanced Boot Options Server Management Events							
Actions	Actions						
Delete							
Show Policy Usage							
Use Global							
Properties							
Name	: Infra-Host-BIOS						
Description	:						
Owner	: Local						
Reboot on BIOS Settings Chang	je: 🗆						
Ty Advanced Filter + Export	- Print		¢				
BIOS Setting		Value					
CDN Control		Enabled	v				
Front panel lockout		Platform Default	T				
POST error pause		Platform Default	T .				
Quiet Boot		Disabled	Ψ.				
Resume on AC power loss Platform Default							

- 8. Click the Advanced tab, leaving the Processor tab selected within the Advanced tab. Set the following within the Processor tab:
 - a. DRAM Clock Throttling -> Performance
 - b. Frequency Floor Override -> Enabled

Servers / Policies / root / BIOS Policies / Infra-Host-BIOS				
Main Advanced Boot Options Server Management Events				
Processor Intel Directed IO RAS Memory Serial Port USB PCI	QPI LOM and PCIe Slots Trusted Platfo	orm Graphics Configuration		
🖉 Advanced Filter 🔶 Export 🍵 Print			¢	
3IOS Setting	Value			
Altitude	Platform Default	¥ 		
CPU Hardware Power Management	Platform Default	v		
Boot Performance Mode	Platform Default	•		
CPU Performance	Platform Default	•		
Core Multi Processing	Platform Default	•		
DCPMM Firmware Downgrade	Platform Default	₹.		
DRAM Clock Throttling	Performance	Y ,		
Direct Cache Access	Platform Default	×.		
Energy Performance Tuning	Platform Default	T		
Enhanced Intel SpeedStep Tech	Platform Default	•		
Execute Disable Bit	Platform Default	T		
Frequency Floor Override	Enabled	7		
Intel HyperThreading Tech	Platform Default	Y.		
Energy Efficient Turbo	Platform Default	T		
Intel Turbo Boost Tech	Platform Default	Ψ.		
		_		

- 9. Scroll down to the remaining Processor options and select:
 - a. Processor C State -> Disabled
 - b. Processor C1E -> Disabled

- c. Processor C₃ Report -> Disabled
- d. Processor C7 Report -> Disabled
- e. Energy Performance -> Performance

Main Advanced Boot Options Server Management Events	
Processor Intel Directed IO RAS Memory Serial Port USB PCI QPI LOM and PCIe Slots	Trusted Platform Graphics Configuration
Y Advanced Filter ↑ Export ⊕ Print	¢
BIOS Setting	Value
Package C State Limit	Platform Default
Autonomous Core C-state	Platform Default
Processor C State	Disabled
Processor C1E	Disabled 👻
Processor C3 Report	Disabled
Processor C6 Report	Platform Default
Processor C7 Report	Disabled Y
Processor CMCI	Platform Default
Power Technology	Platform Default
Energy Performance	Performance T
ProcessorEppProfile	Platform Default
Adjacent Cache Line Prefetcher	Platform Default
DCU IP Prefetcher	Platform Default
DCU Streamer Prefetch	Platform Default
Hardware Prefetcher	Platform Default
LIPI Prefetch	Platform Default

10. Click the RAS Memory tab, and select:

a. LV DDR Mode -> Performance Mode

Servers / Policies / root / BIOS Policies / Infra-Host-BIOS							
Main Advanced Boot Options Server Management Events							
Processor Intel Directed IO RAS Memory Serial Port USB PCI QPI LOM and PCIe Slot	Trusted Platform Graphics Configuration						
Ty Advanced Filter ↑ Export ⊕ Print	Ty Advanced Filter ↑ Export ⊕ Print 🔅						
BIOS Setting	Value						
DDR3 Voltage Selection	Platform Default	T .					
DRAM Refresh Rate	Platform Default	7					
LV DDR Mode	Performance Mode	Υ.					
Mirroring Mode	Platform Default	T					
NUMA optimized	Platform Default	Ψ.					
Memory RAS configuration	Platform Default	Ψ,					
	Plaudini Delauk						

- 11. Click **Save Changes** to modify the BIOS policy.
- 12. Click OK.

Update Default Maintenance Policy

To update the default Maintenance Policy, follow these steps:

- 1. In Cisco UCS Manager, click the **Servers** tab in the navigation pane.
- 2. Select Policies > root and then select Maintenance Policies > default.

- 3. Change the Reboot Policy to User Ack.
- 4. Check the box to enable On Next Boot
- 5. Click Save Changes.
- 6. Click **OK** to accept the change.

Properties		
Name	:	default
Description	:	
Owner	:	Local
Soft Shutdown Timer	:	150 Secs
Storage Config. Deploym	ent Policy :	O Immediate User Ack
Reboot Policy	:	Immediate User Ack Timer Automatic
	Name Description Owner Soft Shutdown Timer Storage Config. Deploym	Name : Description : Owner : Soft Shutdown Timer : Storage Config. Deployment Policy :

Create vNIC/vHBA Placement Policy

To create a vNIC/vHBA placement policy for the infrastructure hosts, follow these steps:

- 1. In Cisco UCS Manager, click the **Servers** tab in the navigation pane.
- 2. Select Policies > root.
- 3. Right-click vNIC/vHBA Placement Policies and choose Create Placement Policy.
- 4. Enter Infra-Policy as the name of the placement policy.
- 5. Click 1 and select Assigned Only.
- 6. Click **OK** and then click **OK** again.

Create Placement Policy				
Name : Infra-Policy Virtual Slot Mapping Scheme : • Round Robin _ Linear Or		ered		
Advanced Filter	🕈 Export 🛛 🚔 Print	\$		
Virtual Slot	Selection Preference	Transport		
1	All	ethernet,fc		
2	All	ethernet,fc		
3	All	ethernet,fc		
4	All	ethernet,fc		
		OK Cancel		

Create vNIC Templates

Eight different vNIC Templates are covered in Table 13. Not all VNICs need to be created in all deployments. The vNICs templates covered below are for iSCSI vNICs, infrastructure (management, vMotion etc.) vNICs, and data vNICs (VM traffic) for VMware VDS. Refer to Usage column in Table 13. to see if a vNIC is needed for a particular ESXi host.

Name	Fabric ID	VLANs	Native VLAN	MAC Pool	Usage
vNIC_Mgmt_A	A	IB-Mgmt, Native-2	Native-2	MAC-Pool-A	All ESXi Hosts
vNIC_Mgmt_B	В	IB-Mgmt, Native-2	Native-2	MAC-Pool-B	All ESXi Hosts
vNIC_vMotion_A	A	vMotion	vMotion	MAC-Pool-A	All ESXi Hosts
vNIC_vMotion_B	A	vMotion	vMotion	MAC-Pool-B	All ESXi Hosts
vNIC_VM_A	A	VM Network	Native-2	MAC-Pool-A	All ESXi Hosts
vNIC_VM_B	A	VM Network	Native-2	MAC-Pool-B	All ESXi Hosts

Table 13	NIC Templates and Associated VLANs
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Name	Fabric ID	VLANs	Native VLAN	MAC Pool	Usage
vNIC_iSCSI_A	A	iSCSI-A	iSCSI-A	MAC-Pool-A	iSCSI hosts only
vNIC_iSCSI_B	В	iSCSI-B	iSCSI-B	MAC-Pool-B	iSCSI hosts only

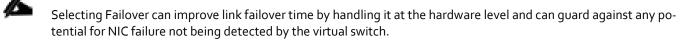
Create Management vNICs

For the vNIC_Mgmt_A Template, follow these steps:

- 1. In Cisco UCS Manager, click the **LAN** tab in the navigation pane.
- 2. Select Policies > root.
- 3. Right-click vNIC Templates.
- 4. Select Create vNIC Template.
- 5. Enter vNIC_Mgmt_A as the vNIC template name.
- 6. Keep Fabric A selected.

<u>6</u>

7. Optional: select the Enable Failover checkbox.



- 8. Select Primary Template for the Redundancy Type.
- 9. Leave Peer Redundancy Template as <not set>

Redundancy Type and specification of Redundancy Template are configuration options to later allow changes to the Primary Template to automatically adjust onto the Secondary Template.

- 10. Under Target, make sure that the VM checkbox is not selected.
- 11. Select Updating Template as the Template Type.

Create vNIC T	emplate	? ×
Name : Description :	vNIC_Mgmt_A	
Fabric ID : Redundancy	Fabric A Fabric B	Enable Failover
Redundancy Type Peer Redundancy Tem	: No Redundancy Primary Template Secondary Template (No Redundancy remplate rempla	8
Target Adapter VM		
	profile by the same name will be created. ne name exists, and updating template is selected, it will be overwritten	
VLANS VLAN Grou		
Ty Advanced Filter 🔶 E	xport 🖷 Print	Cancel

- 12. Under VLANs, select the checkboxes for IB-Mgmt and Native-VLAN VLANs.
- 13. Set Native-VLAN as the native VLAN.
- 14. Leave vNIC Name selected for the CDN Source.
- **15**. Leave 1500 for the MTU.
- **16.** In the MAC Pool list, select MAC_Pool_A.
- 17. In the Network Control Policy list, select Enable-CDP-LLDP.

Select	Name	Native VLAN	VLAN ID	
\checkmark	IB-Mgmt	0	11	
	ISCSI-A	0	3161	
	iSCSI-B	0	3162	
~	Native-VLAN	۲	2	
	VM-Net1	0	3174	
reate VLAN	vMotion	0	3173	
VTU : VAC Pool : QoS Policy : Network Control Policy : Pin Group : Stats Threshold Policy :	1500 MAC-Pool-A(52/64) <pre></pre> <pre></pre>			
Connection Policies	dordart			

- 18. Click **OK** to create the vNIC template.
- 19. Click OK.

For the vNIC_Mgmt_B Template, follow these steps:

- In the navigation pane, select the LAN tab. 1.
- Select Policies > root. 2.
- Right-click vNIC Templates. 3.
- Select Create vNIC Template 4.
- Enter vNIC Mgmt B as the vNIC template name. 5.
- Select Fabric B. 6.
- Select Secondary Template for Redundancy Type. 7.
- For the Peer Redundancy Template drop-down, select vNIC Mgmt A. 8.

23 With Peer Redundancy Template selected, Failover specification, Template Type, VLANs, CDN Source, MTU, and Network Control Policy are all pulled from the Primary Template.

Under Target, make sure the VM checkbox is not selected. 9.

Create vNIC	Template		? >
Name Description Fabric ID	: vNIC_Mgmt_B : : Fabric A	Fabric B	Enable Failover
Redundancy			
Redundancy Type Peer Redundancy		mary Template Secondary Template 	
Y Adapter VM VM			
If a port profile of th Template Type	port profile by the same name will be c e same name exists, and updating tem : Initial Template Updating 1 Groups	plate is selected, it will be overwritten	
T∉ Advanced Filter	🕈 Export 🖷 Print		¢
Select	Name	Native VLAN	
	default	0	1
	IB-MGMT	0	
	iSCSI-A		
	1000L B		
			OK Cancel

10. In the MAC Pool list, select MAC_Pool_B.

Create vNIC Template ?>					
VLANS VLAN Groups					
T∉ Advanced Filter 🔺 Export	r Print		\$		
Select	Name	Native VLAN			
	default	0			
	IB-MGMT				
	iSCSI-A				
	iSCSI-B				
	Native				
Create VLAN	OOR-MGMT				
CDN Source : •• vNIC Name User Defined MTU : 1500 MAC Pool : • QoS Policy : • anot set> • Network Control Policy: : <not set=""> • Pin Group : <not set=""> • Stats Threshold Policy: : <default td="" •<=""></default></not></not>					
Connection Policies					

- 11. Click **OK** to create the vNIC template.
- 12. Click OK.

Create vMotion vNICs

For the vNIC_vMotion_A Template, follow these steps:

- 1. In Cisco UCS Manager, click the LAN tab in the navigation pane.
- 2. Select Policies > root.
- 3. Right-click vNIC Templates.
- 4. Select Create vNIC Template.
- 5. Enter vNIC_vMotion_A as the vNIC template name.
- 6. Keep Fabric A selected.
- 7. Optional: select the Enable Failover checkbox.
- 8. Select Primary Template for the Redundancy Type.

- 9. Leave Peer Redundancy Template as <not set>
- 10. Under Target, make sure that the VM checkbox is not selected.
- 11. Select Updating Template as the Template Type.

Create vNIC	Template			? ×
Name Description	: vNIC_vMotion_A			
Fabric ID Redundancy	: Fabric A 	⊖ Fabric B		Enable Failover
Redundancy Type Peer Redundancy Ter		● Primary Template S	econdary Template	
Target				
✓ Adapter				
VM				
Warning				
	rt profile by the same name wi same name exists, and updatin :	g template is selected, it v	vill be overwritten	
VLANS VLAN G	roups			
🏹 Advanced Filter 🛛 🛧	Export 🖷 Print			\$
Select	Name		Native VLAN	
	ISCSI-A			
	iSCSI-B		0	
	Native		0	
	OOB-MG	ЛТ	0	
				OK Cancel

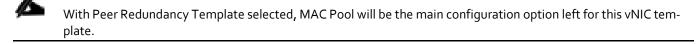
- 12. Under VLANs, select the checkboxes vMotion as the only VLAN.
- 13. Set vMotion as the native VLAN.
- **14**. For MTU, enter 9000.
- **15**. In the MAC Pool list, select MAC_Pool_A.
- **16.** In the Network Control Policy list, select Enable-CDP-LLDP.

Create vNIC T	emplate			? ×	
	ISCSI-B	0	3162	T.	
	Native-VLAN	0	2		
	VM-Net1	0	3174		
\checkmark	vMotion	۲	3173		
Create VLAN					
CDN Source :	● vNIC Name ◯ User Defined]			
MTU :	9000				
MAC Pool : MAC-Pool-A(52/64) •					
QoS Policy :	<not set=""> 🔻</not>			1	
Network Control Policy :	Enable-CDP-LLDP 🔻				
Pin Group :	<not set=""></not>				
Stats Threshold Policy : default					
Connection Policies					
O Dynamic vNIC) us					
usNIC Connection Polic	cy : <not set=""></not>				
			ОК Саг	ncel	

- 17. Click **OK** to create the vNIC template.
- 18. Click OK.

For the vNIC_vMotion_B Template, follow these steps:

- 1. In the navigation pane, select the LAN tab.
- 2. Select Policies > root.
- 3. Right-click vNIC Templates.
- 4. Select Create vNIC Template.
- 5. Enter vNIC_vMotion_B as the vNIC template name.
- 6. Select Fabric B.
- 7. Select Secondary Template for Redundancy Type.
- 8. For the Peer Redundancy Template drop-down, select vNIC_vMotion_A.



9. Under Target, make sure the VM checkbox is not selected.

Create vN	IC Template		?
Name	: vNIC_vMotion_B		
Description	:		
Fabric ID	: 🔿 Fabric A	Fabric B	Enable Failover
Redundancy	0	0	
Redundancy Ty	pe : No Redundancy O F	Primary Template 💿 Secondary Template	
Peer Redundan	cy Template : <not set=""></not>		
	<not set=""></not>		
Adapter			
VM	Domain Policies		
	vNIC_Mgmt_A		
	vNIC_vMotion_A		
Warning			
	, a port profile by the same name will be the same name exists, and updating te	e created. mplate is selected, it will be overwritten	
Template Type	: Initial Template O Updating 	g Template	
VLANs VL	AN Groups		
Te Advanced Filter	🛧 Export 🛛 🖶 Print		\$
Select	Name	Native VLAN	
	default	0	
	IB-MGMT	0	
	iSCSI-A	0	
	1000L B	0	
			OK Cancel

? ×

10. the MAC Pool list, select MAC_Pool_B.

🍢 Advanced Filter 🛛 🛧 Export 👘	9 Print		₽
Select	Name	Native VLAN	
	default	0	
	IB-MGMT	0	
	iSCSI-A	0	
	iSCSI-B	0	
	Native	0	
	OOR-MGMT	0	
QoS Policy : <a> Network Control Policy : <a>MACPin Group : <a>Stats Threshold Policy : 	t set> nain Pools >-Pool-A(60/64) >-Pool-B(60/64) ult(0/0)		
Dynamic vNIC usNIC V		ок	Cancel

- 11. Click **OK** to create the vNIC template.
- 12. Click OK.

Create Application vNICs

To create the vNIC_VM_A Template, follow these steps:

- 1. In Cisco UCS Manager, click the LAN tab in the navigation pane.
- 2. Select Policies > root.
- 3. Right-click vNIC Templates.
- 4. Select Create vNIC Template.
- 5. Enter vNIC_VM_A as the vNIC template name.
- 6. Keep Fabric A selected.
- 7. Optional: select the Enable Failover checkbox.
- 8. Select Primary Template for the Redundancy Type.
- Leave Peer Redundancy Template as <not set>.
- 10. Under Target, make sure that the VM checkbox is not selected.

11. Select Updating Template as the Template Type.

12. Set del autras the hative vern.	12.	Set default as the native VLAN.
-------------------------------------	-----	---------------------------------

Create vNIC	Template		? >
Name Description Fabric ID Redundancy Redundancy Type Peer Redundancy Te Farget Adapter VM Warning If VM is selected, a px	VNIC_VM_A		✓ Enable Failover
VLANS VLAN G	iroups		
	Export 🖶 Print		¢
Select	Name ISCSI-A	Native VLAN	
	iSCSI-B	0	
	Native	0	
	OOB-MGMT	0	
			OK Cancel

- 13. Under VLANs, select the checkboxes for any application or production VLANs that should be delivered to the ESXi hosts.
- **14**. For MTU, enter 9000.
- **15**. In the MAC Pool list, select MAC_Pool_A.
- **16**. In the Network Control Policy list, select Enable-CDP-LLDP.

Select	Name	Native VLAN	VLAN ID		
	is-ingmt	-	11		
	ISCSI-A	0	3161		
	iSCSI-B	0	3162	Ĩ	
\checkmark	Native-VLAN	۲	2		
\checkmark	VM-Net1	0	3174		
	vMotion 3173				
CDN Source MTU MAC Pool QoS Policy Network Control Policy Pin Group Stats Threshold Policies	: <not set=""></not>	ned			

- 17. Click **OK** to create the vNIC template.
- 18. Click **OK**.

To create the vNIC_VM_B Templates, follow these steps:

- 1. In the navigation pane, select the LAN tab.
- 2. Select Policies > root.
- 3. Right-click vNIC Templates.
- 4. Select Create vNIC Template
- 5. Enter vNIC VM B as the vNIC template name.
- 6. Select Fabric B.
- 7. Select Secondary Template for Redundancy Type.
- 8. From the Peer Redundancy Template drop-down list, select VNIC VM A.



With Peer Redundancy Template selected, MAC Pool will be the main configuration option left for this vNIC template.

9. Under Target, make sure the VM checkbox is not selected.

Create vNIC Template

Name : vNIC	VM_B		1
Description :			
Fabric ID :	Fabric A	Fabric B	Enable Failover
Redundancy	Fabric A	 Fabric B 	
Redundancy Type :	○ No Redundancy ○	Primary Template 💿 Secondary T	emplate
Peer Redundancy Template :	VNIC_VM_A		
-	<not set=""></not>		
Target ✓ Adapter	Domain Policies	-	
∨M	vNIC_Mgmt_A		
	VNIC_VM_A		
	vNIC_vMotion_A		
Warning			
If VM is selected, a port profile If a port profile of the same name		e created. emplate is selected, it will be over	written
Template Type : 🗌 Ini	itial Template 💿 Updatin	g Template	
VLANS VLAN Groups			
Ty Advanced Filter	Print		\$
Select	Name	Nati	ve VLAN
	default	0	1
	IB-MGMT	0	
	ISCSI-A	0	
	10001 B	0	
			ОК СапсеІ

? ×

10. In the MAC Pool list, select MAC_Pool_B.

? × Create vNIC Template Warning If VM is selected, a port profile by the same name will be created. If a port profile of the same name exists, and updating template is selected, it will be overwritten Template Type : O Initial Template O Updating Template VLANs VLAN Groups Ty Advanced Filter 🛛 🛧 Export 🛛 🖶 Print ₽ Select Name Native VLAN default IB-MGMT ISCSI-A iSCSI-B Native OOR-MGMT Create VLAN CDN Source : 💿 vNIC Name 🔿 User Defined MTU 1500 MAC Pool <not set> 🔻 <not set> QoS Policy Network Control Policy MAC-Pool-A(60/64) Pin Group default(0/0) Cancel

- 11. Click **OK** to create the vNIC template.
- 12. Click **OK**.

Create iSCSI vNICs

The configuration steps to create iSCSI vNICs can be skipped if the UCS environment does not need to access storage infrastructure using iSCSI.

- 1. In Cisco UCS Manager, click the **LAN** tab in the navigation pane.
- 2. Select Policies > root.
- 3. Right-click vNIC Templates.
- 4. Select Create vNIC Template.
- 5. Enter vNIC_iSCSI_A as the vNIC template name.
- 6. Keep Fabric A selected.
- 7. Do not select the Enable Failover checkbox.
- 8. Keep the No Redundancy options selected for the Redundancy Type.

- 9. Under Target, make sure that the Adapter checkbox is selected.
- 10. Select Updating Template as the Template Type.
- 11. Under VLANs, select iSCSI-A-VLAN as the only VLAN and set it as the Native VLAN.

Create vNI	C Template	9		? >
Name Description	: vnic_iscsi_	A		
Fabric ID Redundancy	: 🖲 Fabric	A	○ Fabric B	Enable Failover
Redundancy Type	e : 💽 No	o Redundancy 🔵 Prir	nary Template 🔵 Seconda	ary Template
Adapter				
If a port profile of t Template Type	he same name exis	same name will be ci its, and updating temp mplate	blate is selected, it will be o	overwritten
VLANs VLA	N Groups	nt		¢
Select		Name	1	Native VLAN
 Image: A start of the start of		iSCSI-A	(c
		iSCSI-B	(0
		Native	(0
		OOB-MGMT	(0
				OK Cancel

- **12**. For MTU, enter 9000.
- **13**. In the MAC Pool list, select MAC_Pool_A.
- 14. In the Network Control Policy list, select Enable-CDP-LLDP.

Native VLAN VLAN ID Select Name Native VLAN VLAN ID IB-Mgmt II II III III ISCSI-A ISCSI-B III III III Native-VLAN III III III III III VM-Net1 III III IIII IIII IIII IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	
IB-Mgmt II ISCSI-A ISCSI-B ISCSI-B 3162 Native-VLAN 2 VM-Net1 3174 VMotion 3173	*
ISCSI-A ISCSI-B 3161 ISCSI-B 3162 Native-VLAN 2 VM-Net1 3174 VMotion 3173	
ISCSI-A 3161 ISCSI-B 3162 Native-VLAN 2 VM-Net1 3174 vMotion 3173	
Native-VLAN 2 VM-Net1 3174 vMotion 3173	
VM-Net1 0 2 vMotion 3174	1
vMotion 3174	
VMotion 3173	
Create VLAN	
CDN Source : • vNIC Name User Defined	
MTU : 9000	
MAC Pool : MAC-Pool-A(52/64) •	
QoS Policy : <pre><not set=""> *</not></pre>	
Network Control Policy : Enable-CDP-LLDP	
Pin Group : 	
Stats Threshold Policy : default 🔻	
Connection Policies	
ОК Салс	el

- 15. Click **OK** to create the vNIC template.
- 16. Click **OK**.

To create the vNIC_iSCSI_B Template, follow these steps:

- 1. In the navigation pane, select the LAN tab.
- 2. Select Policies > root.
- 3. Right-click vNIC Templates.
- 4. Select Create vNIC Template.
- 5. Enter vNIC_iSCSI_B as the vNIC template name.
- 6. Keep Fabric B selected.
- 7. Do not select the Enable Failover checkbox.
- 8. Keep the No Redundancy options selected for the Redundancy Type.
- 9. Under Target, make sure that the Adapter checkbox is selected.
- 10. Select Updating Template as the Template Type.
- 11. Under VLANs, select iSCSI-B-VLAN as the only VLAN and set it as the Native VLAN.

Jeale VIV	C Template			?
Name	: vNIC_iSCSI_B	3		
Description	:			
abric ID	: O Fabric	A 💿 Fabr	ic B	Enable Failover
Redundancy	0	0.12		
If a port profile of	a port profile by the s the same name exists	Redundancy O Primary Template		
emplate Type	: O Initial Tem	plate) Updating Template		
	are choups			
Advanced Filter	🛧 Export 🛛 📥 Print	t		\$
	🔶 Export 👘 Print	t Name	Native VLAN	\$
	🕈 Export 📑 Prin		Native VLAN	\$
	🕈 Export 🖶 Prin	Name	Native VLAN	\$
	🔶 Export 🚔 Prin	Name default	0	\$
	🕈 Export 🚔 Prin	Name default IB-MGMT	0	\$
Advanced Filter	🔶 Export 🚔 Prin	Name default IB-MGMT ISCSI-A	0 0 0	\$

12. For MTU, enter 9000.

- 13. In the MAC Pool list, select ${\tt MAC_Pool_B}.$
- 14. In the Network Control Policy list, select <code>Enable-CDP-LLDP</code>.

Create vNIC T	emplate			? ×
T∉ Advanced Filter T E	xport 🖶 Print			¥
Select	Name	Native VLAN	VLAN ID	
	IB-Mgmt		11	
	ISCSI-A	0	3161	
\checkmark	iSCSI-B	۲	3162	. I.
	Native-VLAN	0	2	
	VM-Net1	0	3174	
	vMotion	0	3173	
Create VLAN				1
CDN Source :	● vNIC Name User Defined			
MTU :	9000			
MAC Pool :	MAC-Pool-B(52/64) 🔻			
QoS Policy :	<not set=""> 🔻</not>			
Network Control Policy :	Enable-CDP-LLDP 🔻			
Pin Group :	<not set=""></not>			
Stats Threshold Policy :	default 🔻			
Connection Policies				
			ОК	Cancel

- 15. Click **OK** to create the vNIC template.
- 16. Click **OK**.

0

Create LAN Connectivity Policy

To configure the necessary Infrastructure LAN Connectivity Policy, follow these steps:

- 1. In Cisco UCS Manager, click LAN on the left.
- 2. Select LAN > Policies > root.
- 3. Right-click LAN Connectivity Policies.
- 4. Select Create LAN Connectivity Policy.

Use Infra-LAN-Pol as the name if hosts boot from FC only.

- 5. Enter iSCSI-LAN-Policy as the name of the policy.
- 6. Click the upper Add button to add a vNIC.
- 7. In the **Create vNIC** dialog box, enter oo-Mgmt-A as the name of the vNIC.

The numeric prefix of "oo-" and subsequent increments on the later vNICs are used in the vNIC naming to force the device ordering through Consistent Device Naming (CDN). Without this, some operating systems might not respect the device ordering that is set within Cisco UCS.

- 8. Select the Use vNIC Template checkbox.
- 9. In the vNIC Template list, select 00-Mgmt-A.
- 10. In the Adapter Policy list, select VMWare.
- 11. Click **OK** to add this vNIC to the policy.

Create vNIC		? ×
Name : 00-Mgmt-A		
Use vNIC Template : 🗹		
Redundancy Pair :	Peer Name :	
vNIC Template : vNIC_Mgmt_A 🔻	Create vNIC Template	
Adapter Performance Profile		
Adapter Policy : VMWare 🔻	Create Ethernet Adapter Policy	
	(OK Cancel

- 12. Click the upper Add button to add another vNIC to the policy.
- 13. In the Create vNIC box, enter 01-Mgmt-B as the name of the vNIC.
- 14. Select the Use vNIC Template checkbox.
- 15. In the vNIC Template list, select 01-Mgmt-B.
- 16. In the Adapter Policy list, select VMWare.

Create vNIC		? ×
Name : 01-Mgmt-B		
Use vNIC Template : 🗹		
Redundancy Pair :	Peer Name :	
vNIC Template : vNIC_Mgmt_B •	Create vNIC Template	
Adapter Performance Profile		
Adapter Policy : VMWare V	Create Ethernet Adapter Policy	
		OK Cancel

- 17. Click **OK** to add the vNIC to the policy.
- 18. Click the upper Add button to add a vNIC.
- 19. In the Create vNIC dialog box, enter 02-vMotion-A as the name of the vNIC.
- 20. Select the Use vNIC Template checkbox.
- 21. In the vNIC Template list, select vNIC_vMotion_A.
- 22. In the Adapter Policy list, select VMWare.
- 23. Click **OK** to add this vNIC to the policy.

Create vNIC		? ×
Name : 02-vMotion-A		
Use vNIC Template : 🗹		
Redundancy Pair :	Peer Name :	
vNIC Template : vNIC_vMotion_A 🔻	Create vNIC Template	
Adapter Performance Profile		
Adapter Policy : VMWare	Create Ethernet Adapter Policy	
		OK Cancel

- 24. Click the upper Add button to add a vNIC to the policy.
- 25. In the **Create vNIC** dialog box, enter o3-vMotion-B as the name of the vNIC.
- 26. Select the Use vNIC Template checkbox.
- **27**. In the vNIC Template list, select vNIC_vMotion_B.
- 28. In the Adapter Policy list, select VMWare.

Create vNIC	? ×
Name : 03-vMotion-B	
Use vNIC Template :	
Redundancy Pair :	Peer Name :
vNIC Template : vNIC_vMotion_B •	Create vNIC Template
Adapter Performance Profile	
Adapter Policy : VMWare 🔻	Create Ethernet Adapter Policy
	OK Cancel
29. Click OK to add this vNIC to th	e policy.
30. Click the upper Add button to	add a vNIC.
31. In the Create vNIC dialog box,	enter $04 - VM - A$ as the name of the vNIC.
32. Select the Use vNIC Template	checkbox.
33. In the vNIC Template list, selec	t vNIC_VM_A.
34. In the Adapter Policy list, selec	tVMWare.
35. Click OK to add this vNIC to th	e policy.

Create vNIC		? ×
Name : 04-VM-A		
Use vNIC Template : 🗹		
Redundancy Pair :	Peer Name :	
vNIC Template : vNIC_VM_A 🔻	Create vNIC Template	
Adapter Performance Profile		
Adapter Policy : VMWare 🔻	Create Ethernet Adapter Policy	
		OK Cancel

- 36. Click the upper Add button to add a vNIC to the policy.
- 37. In the Create vNIC dialog box, enter 05-VM-B as the name of the vNIC.
- 38. Select the Use vNIC Template checkbox.
- 39. In the vNIC Template list, select $vNIC_VM_B$.
- 40. In the Adapter Policy list, select VMWare.

Create vNIC		? ×
Name : 05-VM_B		
Use vNIC Template : 🔽		
Redundancy Pair :	Peer Name :	
vNIC Template : vNIC_VM_B	Create vNIC Template	
Adapter Performance Profile		
Adapter Policy : VMWare T	Create Ethernet Adapter Policy	
		OK Cancel
1. Click OK to add this vNIC to	the policy.	
	/ -	

42. Click the upper Add button to add a vNIC.

The following iSCSI vNICs can be skipped if hosts need FC storage access only.

- 43. In the **Create vNIC** dialog box, enter <code>06-iSCSI-A</code> as the name of the vNIC.
- 44. Select the Use vNIC Template checkbox.

么

- 45. In the vNIC Template list, select iSCSI-Template-A.
- 46. In the Adapter Policy list, select VMWare.

Create vNIC			? ×
Name : 06-iSCSI-A			
Use vNIC Template : Redundancy Pair :		Peer Name :	
vNIC Template : vN	NIC_ISCSI_A T	Create vNIC Template	
Adapter Performan	ice Profile		
Adapter Policy	VMWare 🔻	Create Ethernet Adapter Policy	
			OK Cancel
47. Click OK	to add this vNI	C to the policy.	
48. Click the	upper Add butt	on to add a vNIC to the policy.	

- 49. In the Create vNIC dialog box, enter 07-iSCSI-B as the name of the vNIC.
- 50. Select the Use vNIC Template checkbox.
- 51. In the vNIC Template list, select iSCSI-Template-B.
- 52. In the Adapter Policy list, select VMWare.

Create vN	IIC		? ×
Name : 07-iSC	SI-B		
Use vNIC Templa	ate : 🔽		
Redundancy Pair	r: 🗆	Peer Name :	
vNIC Template :	vNIC_iSCSI_B V	Create vNIC Template	
Adapter Perfor	mance Profile		
Adapter Policy	: VMWare 🔻	Create Ethernet Adapter Policy	
			OK Cancel

53. Click **OK** to add this vNIC to the policy.

ame : iSCSI-LAN-Pol	ícy			
escription :				
:k Add to specify one or me ame	ore vNICs that the server should use to con MAC Address		e VLAN	
vNIC 07-iSCSI-B	Derived			
vNIC 06-iSCSI-A	Derived			
vNIC 05-VM-B	Derived			
vNIC 04-VM-A	Derived			
vNIC 03-vMotion-B	Derived			
vNIC 02-vMotion-A	Derived	Add 🔘 Modify		
ame	Overlay vNIC Name	iSCSI Adapter Policy	MAC Address	
	No da	ta available		
		Delete 🕕 Modify		

Add iSCSI vNICs in LAN Policy (iSCSI Deployment)

This configuration step can be skipped if the UCS environment does not need to access storage environment using iSCSI.

Follow these steps only if you are using iSCSI SAN access:

- 1. Verify the iSCSI base vNICs are already added as part of vNIC implementation.
- 2. Expand the Add iSCSI vNICs section to add the iSCSI boot vNICs.
- 3. Select Add in the Add iSCSI vNICs section.
- 4. Set the name to iSCSI—A-vNIC.

- 5. Select the OG-iSCSI-A as Overlay vNIC.
- 6. Set the VLAN to iSCSI-A (native) VLAN.
- 7. Set the iSCSI Adapter Policy to default
- 8. Leave the MAC Address set to None.

С	reate iSCSI	vNIC				? ×	
N	ame :	iSCSI-A-vNIC					
0	verlay vNIC :	06-iSCSI-A	T				
iS	CSI Adapter Policy :	<not set=""> 🔻</not>		Create iSCSI Adapter Policy			
VI	LAN :	iSCSI-A (native)					
iS	CSI MAC Address						
	MAC Address As	ssignment:	Select(Nor	ne used by default)	•		
	Create MAC Poo	bl					
						OK Cancel	
9.	Click OK .						
10.	b. Select Add in the Add iSCSI vNICs section.						
11.	Set the name to iSCSI-B-vNIC.						
12.	. Select the <code>07-iSCSI-B</code> as Overlay vNIC.						
13.	. Set the VLAN to iSCSI-B (native) VLAN.						

- 14. Set the iSCSI Adapter Policy to default.
- 15. Leave the MAC Address set to None.

Create iSCSI	vNIC					? ×
Name :	iSCSI-B-vNIC					
Overlay vNIC :	07-iSCSI-B	Ψ.				
iSCSI Adapter Policy :	<not set=""> 🔻</not>		Create iSCSI Adapter	r Policy		
VLAN :	iSCSI-B (native)	T				
ISCSI MAC Address						
MAC Address As	MAC Address Assignment:		e used by default)	•		
Create MAC Poo	l.					
					ОК	Cancel

16. Click **OK** then click **OK** again to create the LAN Connectivity Policy.

Create LAN Connectivity Policy

Name	MAC Address	Nati	ve VLAN	
vNIC 07-iSCSI-B	Derived			
vNIC 06-ISCSI-A	Derived			
vNIC 05-VM_B	Derived			
vNIC 04-VM-A	Derived			
vNIC 03-vMotion-B	Derived			
vNIC 02-vMotion-A	Derived	+ Add Modify		
 Add iSCSI vNICs 				
Name	Overlay vNIC Name	iSCSI Adapter Policy	MAC Address	
ISCSI VNIC ISCSI-B-VNIC	07-iSCSI-B		Derived	
ISCSI VNIC ISCSI-A-VNIC	06-iSCSI-A		Derived	

Create vHBA Templates for FC Connectivity (FC Deployment)

This configuration step can be skipped if the UCS environment does not need to access storage environment using FC.

? ×

To create virtual host bus adapter (vHBA) templates for the Cisco UCS environment, follow these steps:

- 1. In Cisco UCS Manager, click the **SAN** tab in the navigation pane.
- 2. Select Policies > root.

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- 3. Right-click vHBA Templates and choose Create vHBA Template.
- 4. Enter Infra-vHBA-A as the vHBA template name.
- 5. Click the radio button to select Fabric A.
- 6. In the Select VSAN list, Choose VSAN-A.
- 7. In the WWPN Pool list, Choose WWPN-Pool-A.

Create vHBA	1	Template	? ×
Name	:	Infra-vHBA-A	
Description	:		
Fabric ID	:	• A _ B	
Redundancy			
Redundancy Type		: No Redundancy O Primary Template O Secondary Template	
Select VSAN	:	VSAN-A Create VSAN	
Template Type	:	Initial Template Updating Template	
Max Data Field Size	:	2048	
WWPN Pool	:	WWPN-Pool-A(64/64)	
QoS Policy	:	<not set=""> T</not>	
Pin Group	:	<not set=""></not>	
Stats Threshold Polic	y :	default 🔻	

ОК	Cancel

- 8. Click **OK** to create the vHBA template.
- 9. Click OK.
- 10. Right-click **vHBA Templates** again and choose Create vHBA Template.
- **11.** Enter Infra-vHBA-B as the vHBA template name.
- **12.** Click the radio button to select Fabric B.
- **13**. In the Select VSAN list, Choose VSAN-B.
- 14. In the WWPN Pool, Choose WWPN-Pool-B.

Create vHBA Template

Name	: Infra-vHBA-B	
Description	:	
Fabric ID	: \(\color A \(\color B \)	
Redundancy		
Redundancy Type	: No Redundancy O Primary Template O Secondary Template	
Select VSAN	: VSAN-B Create VSAN	
Template Type	: • Initial Template Updating Template	
Max Data Field Size	: 2048	
WWPN Pool	: WWPN-Pool-B(32/32) 🔻	
QoS Policy	: <not set=""> •</not>	
Pin Group	: <not set=""></not>	
Stats Threshold Polic	/: default 🔻	

- 15. Click **OK** to create the vHBA template.
- 16. Click **OK**.

Create FC SAN Connectivity Policies (FC Deployment)

This configuration step can be skipped if the UCS environment does not need to access storage environment using FC.

A SAN connectivity policy defines the vHBAs that will be created as part of a service profile deployment.

To configure the necessary FC SAN Connectivity Policies, follow these steps:

- 1. In Cisco UCS Manager, click the **SAN** tab in the navigation pane.
- 2. Select SAN > Policies > root.
- 3. Right-click SAN Connectivity Policies and choose Create SAN Connectivity Policy.
- 4. Enter Infra-FC-pol as the name of the policy.
- 5. Select WWNN-Pool from the drop-down list under World Wide Node Name.

Create SAN Conn	ectivity Policy	? ×
Name : Infra-FC-Policy		1
Description :		
server is identified on a SAN by sociated with this profile. Vorld Wide Node Name	its World Wide Node Name (WWNN). Specify how the system should assign a WWNN to	the server
WWNN Assignment:	WWNN-Pool(60/64)	
Create WWNN Pool		
The WWNN will be assign The available/total WWNN	ed from the selected pool. s are displayed after the pool name.	
lame	WWPN	
	No data available	1
	or	Canad
Click Add . You migh	ок t have to scroll down the screen to see the Add link.	Cancel
-		Cancel
Under Create vHBA,	t have to scroll down the screen to see the Add link.	Cancel
Under Create vHBA, Check the check box	t have to scroll down the screen to see the Add link. enter $v HBA-A$ in the Name field.	Cancel
Under Create vHBA, Check the check box From the vHBA Tem	t have to scroll down the screen to see the Add link. enter vHBA-A in the Name field. Use vHBA Template.	Cancel
Under Create vHBA, Check the check box From the vHBA Tem From the Adapter Po	t have to scroll down the screen to see the Add link. enter vHBA-A in the Name field. Use vHBA Template. plate drop-down list, select Infra-vHBA-A.	Cancel
Under Create vHBA, Check the check box From the vHBA Tem From the Adapter Po Create vHBA	t have to scroll down the screen to see the Add link. enter vHBA-A in the Name field. Use vHBA Template. plate drop-down list, select Infra-vHBA-A.	Cancel
Under Create vHBA, Check the check box From the vHBA Tem From the Adapter Po Create vHBA	t have to scroll down the screen to see the Add link. enter vHBA-A in the Name field. Use vHBA Template. plate drop-down list, select Infra-vHBA-A. plicy drop-down list, select VMWare.	Cancel
Under Create vHBA, Check the check box From the vHBA Tem From the Adapter Po Create vHBA Name : VHI Use vHBA Template : C Redundancy Pair : C	t have to scroll down the screen to see the Add link. enter vHBA-A in the Name field. Use vHBA Template. plate drop-down list, select Infra-vHBA-A. olicy drop-down list, select VMWare.	Cancel

- 11. Click OK.
- 12. Click Add.

- **13**. Under Create vHBA, enter vHBA-B in the Name field.
- 14. Check the check box next to Use vHBA Template.
- 15. From the vHBA Template drop-down list, select Infra-vHBA-B.
- 16. From the Adapter Policy drop-down list, select VMWare.

Create VHBA VHBA		? ×
Name : VHBA-B		
Use vHBA Template : 🗹		
Redundancy Pair : 🔲	Peer Name :	
vHBA Template : Infra-vHBA-B 🔻	Create vHBA Template	
Adapter Performance Profile		
Adapter Policy : VMWare 🔻	Create Fibre Channel Adapter Policy	

- 17. Click **OK**.
- 18. Click OK again to accept creating the SAN connectivity policy.

Create iSCSI Boot Policy (iSCSI Deployment)

This configuration step can be skipped if the UCS environment does not need to access storage environment using iSCSI.

This procedure applies to a Cisco UCS environment in which iSCSI interface on Controller A is chosen as the primary target.

To create boot the policy for the Cisco UCS environment, follow these steps:

- 1. In Cisco UCS Manager, click the **Servers** tab in the navigation pane.
- 2. Select Policies > root.
- 3. Right-click Boot Policies and choose Create Boot Policy.
- 4. Enter Boot-iSCSI-X-A as the name of the boot policy.
- 5. **Optional**: Enter a description for the boot policy.
- 6. Keep the Reboot on Boot Order Change option cleared.
- 7. Expand the Local Devices drop-down list and select Add Remote CD/DVD.
- 8. Expand the iSCSI vNICs section and select Add iSCSI Boot.
- 9. In the Add iSCSI Boot dialog box, enter iSCSI-A-vNIC.

- 10. Click **OK**.
- 11. Select Add iSCSI Boot.
- 12. In the Add iSCSI Boot dialog box, enter iSCSI-B-vNIC.
- 13. Click **OK**.

Create	Boot	Polic	V
--------	------	-------	---

Name	:	Boot-iSCSI-X-A
Description	:	
Reboot on Boot Order Change	:	
Enforce vNIC/vHBA/iSCSI Name	:	
Boot Mode	:	● Legacy ◯ Uefi

WARNINGS:

The type (primary/secondary) does not indicate a boot order presence. The effective order of boot devices within the same device class (LAN/Storage/iSCSI) is determined by PCIe bus scan order. If **Enforce vNIC/vHBA/iSCSI Name** is selected and the vNIC/vHBA/iSCSI does not exist, a config error will be reported. If it is not selected, the vNICs/vHBAs are selected if they exist, otherwise the vNIC/vHBA with the lowest PCIe bus scan order is used.

\bigcirc Local Devices	Boot Order									
Add Local Disk	+ - Ty Advanced Filter + Export = Print									
Add Local LUN	Name	Ord▲	vNIC/v	Туре	LUN N	WWN	Slot N	Boot N	Boot P	Descri
Add Local JBOD	Remote CD/DVD	1								
Add SD Card	, iSCSI	2								
Add Internal USB	iSCSI		iSCSi-A	Primary						
Add External USB	iSCSI		iSCSi-B	Secon						
Add Embedded Local LUN										
Add Embedded Local Disk										
Add CD/DVD			1 Mo	ve Up 🛛 🖊	Move Dow	n 🗓 Dele	ete			
									ок	Cancel

? X

14. Click **OK** then **OK** again to save the boot policy.

Create FC Boot Policies (FC Deployment)

This configuration step can be skipped if the UCS environment does not need to access storage environment using FC.

This procedure applies to a Cisco UCS environment in which two FC interfaces are used on each of the FS9100 node canisters for host connectivity. This procedure captures a single boot policy which defines Fabric-A as the primary fabric. Customer can choose to create a second boot policy which can use Fabric-B as primary fabric to spread the boot-from-san traffic load on both the nodes in case of disaster recovery.

WWPN information from the IBM FS9100 node canisters is required to complete this section. This information can be found by logging into the IBM FS9100 management address using SSH and issuing the commands as captured below. The information can be recorded in Table 14.



Since NPIV feature is enabled on the IBM FS9100 systems, the WWPN permitted for host communication can be different from the physical WWPN. Refer to the example below.

1. Verify the node_id of the FS9100 node canisters using the following command (node1 through node 2 in this example):

lsportfc

id	fc_io_port_i	d port_id	d type	port_speed	node_id	node_name	WWPN	nportid	status	attachment	cluster_use	adapter_location	<pre>n adapter_port_i</pre>
)	1	1	fc	16Gb	1	node1	5005076810110516	720020	active	switch	local_partner	1	1
	2	2	fc	16Gb	1	node1	5005076810120516	C60040	active	switch	local_partner	1	2
	3	3	fc	16Gb	1	node1	5005076810130516	720040	active	switch	local_partner	1	3
	4	4	fc	16Gb	1	node1	5005076810140516	C60060	active	switch	local_partner	1	4
6	1	1	fc	16Gb	2	node2	500507681011050D	720060	active	switch	local_partner	1	1
7	2	2	fc	16Gb	2	node2	500507681012050D	C60080	active	switch	local_partner	1	2
8	3	3	fc	16Gb	2	node2	500507681013050D	720080	active	switch	local_partner	1	3
9	4	4	fc	16Gb	2	node2	500507681014050D	C600A0	active	switch	local partner	1	4

2. Use the following command to record the WWPN corresponding to ports connected to the SAN fabric:

lstargetportfc -filtervalue host_io_permitted=yes

id	WWPN	WWNN	port_id	owning_node_id	current_node_id	nportid	host_io_permitted	virtualized	protoco
2	5005076810150516	5005076810000516	1	1	1	720021	yes	yes	scsi
3	5005076810190516	5005076810000516	1	1	1	720022	yes	yes	nvme
5	5005076810160516	5005076810000516	2	1	1	C60041	yes	yes	scsi
5	50050768101A0516	5005076810000516	2	1	1	C60042	yes	yes	nvme
В	5005076810170516	5005076810000516	3	1	1	720041	yes	yes	scsi
9	50050768101B0516	5005076810000516	3	1	1	720042	yes	yes	nvme
11	5005076810180516	5005076810000516	4	1	1	C60061	yes	yes	scsi
12	50050768101C0516	5005076810000516	4	1	1	C60062	yes	yes	nvme
50	500507681015050D	500507681000050D	1	2	2	720061	yes	yes	scsi
51	500507681019050D	500507681000050D	1	2	2	720062	yes	yes	nvme
53	500507681016050D	500507681000050D	2	2	2	C60081	yes	yes	scsi
54	50050768101A050D	500507681000050D	2	2	2	C60082	yes	yes	nvme
56	500507681017050D	500507681000050D	3	2	2	720081	yes	yes	scsi
57	50050768101B050D	500507681000050D	3	2	2	720082	yes	yes	nvme
59	500507681018050D	500507681000050D	4	2	2	C600A1	yes	yes	scsi
60	50050768101C050D	500507681000050D	4	2	2	C600A2	yes	yes	nvme

Table 14 IBM FS9100 – WWPN Information

Node	Port ID	WWPN	Variable	Fabric
FS9100 node canister 1	1		WWPN-FS9100-Node1-FC1	A
FS9100 node canister 1	3		WWPN-FS9100-Node1-FC3	A
FS9100 node canister 1	2		WWPN-FS9100-Node1-FC2	В
FS9100 node canister 1	4		WWPN-FS9100-Node1-FC4	В
FS9100 node canister 2	1		WWPN-FS9100-Node2-FC1	A
FS9100 node canister 2	3		WWPN-FS9100-Node2-FC3	A
FS9100 node canister 2	2		WWPN-FS9100-Node2-FC2	В
FS9100 node canister 2	4		WWPN-FS9100-Node2-FC4	В

To create boot policies for the Cisco UCS environment, follow these steps:

- 1. In Cisco UCS Manager, click the Servers tab in the navigation pane.
- 2. Choose Policies > root.
- 3. Right-click Boot Policies and choose Create Boot Policy.
- 4. Enter Boot-Fabric-A as the name of the boot policy.
- 5. **Optional**: Enter a description for the boot policy.
- 6. Keep the Reboot on the Boot Order Change check box unchecked.
- 7. Expand the Local Devices drop-down list and Choose Add Remote CD/DVD.
- 8. Expand the vHBAs drop-down list and Choose Add SAN Boot.

Create Boot Policy								? ×
Name :	Boot-Fab	ric-A						
Description :								
Reboot on Boot Order Change :								
Enforce vNIC/vHBA/iSCSI Name :								
Boot Mode :	 Legac 	;y ⊖ Uefi						
The type (primary/secondary) does The effective order of boot devices If Enforce vNIC/vHBA/ISCSI Name If it is not selected, the vNICs/vHBA	within the is selected	same device cla d and the vNIC/v	iss (LAN/Storage/iSC /HBA/iSCSI does not	exist, a config error v	vill be reported.	s used.		
Local Devices		Boot Order						
① CIMC Mounted vMedia		+ - Ty A Name	Advanced Filter 🔶 E Order	vNIC/v Type	LUN N WWN	Slot N.,. Bo	oot N Boot P	Cescri
⊕ vNICs		Remote C	D/DVD 1					
⊖ vHBAs								
Add SAN Boot								
Add SAN Boot Target								
0.0000 100				1 Move Up	🔸 Move Down 🝈 D	elete		
							ок	Cancel

- 9. Make sure to select Primary radio button as the Type.
- **10.** Enter vHBA-A in the vHBA field.
- 11. Click **OK** to add the SAN boot initiator.

Add SAN Boot	? ×
vHBA : vHBA-A Type : • Primary Secondary Any	
OK Can	cel

- 12. From the vHBA drop-down list, choose Add SAN Boot Target.
- 13. Keep 0 as the value for Boot Target LUN.
- 14. Enter the WWPN < $\tt WWPN-FS9100-Node1-FC1>$ from Table 14 .
- 15. Keep the Primary radio button selected as the SAN boot target type.
- 16. Click **OK** to add the SAN boot target.

Add SAN Boo	? ×	
Boot Target LUN :	0	
Boot Target WWPN :	50:05:07:68:10:15:05:16	
Type :	Primary Secondary	
	ОК	Cancel

- 17. From the vHBA drop-down menu, choose Add SAN Boot Target.
- **18**. Keep 0 as the value for Boot Target LUN.

- 19. Enter the WWPN < $\mbox{WWPN-FS9100-Node2-FC1} > from Table 14$.
- 20. Click \mathbf{OK} to add the SAN boot target.

Add SAN Bo	? ×	
Boot Target LUN :	0	
Boot Target WWPN :	50:05:07:68:10:15:05:0d	
Type :	Primary Secondary	
	ОК	Cancel

- 21. From the vHBA drop-down list, choose Add SAN Boot.
- 22. In the Add SAN Boot dialog box, enter ${\tt vHBA-B}$ in the vHBA box.
- 23. The SAN boot type should automatically be set to Secondary.
- 24. Click **OK** to add the SAN boot initiator.

Add SAN Boot	? ×
vHBA : vHBA-B Type : Primary Secondary Any	
ОК С	ancel

- 25. From the vHBA drop-down list, choose Add SAN Boot Target.
- 26. Keep 0 as the value for Boot Target LUN.
- 27. Enter the WWPN<FS9100-Node1-FC2> from Table 14.
- 28. Keep Primary as the SAN boot target type.
- 29. Click **OK** to add the SAN boot target.

Add SAN Bo	? ×	
0	0	1
Boot Target WWPN :	50:05:07:68:10:16:05:16	
Туре :	Primary Secondary	
	ОК	Cancel

- 30. From the vHBA drop-down list, choose Add SAN Boot Target.
- 31. Keep 0 as the value for Boot Target LUN.
- 32. Enter the WWPN < $\mbox{WWPN-FS9100-Node2-FC2} > from Table 14$.
- 33. Click **OK** to add the SAN boot target.

Add SAN Bo	? ×	
Boot Target LUN :	0	
Boot Target WWPN :	50:05:07:68:10:16:05:0d	
Type :	Primary Secondary	
	ОК	Cancel

34. Click **OK**, and then click **OK** again to create the boot policy.

35. Verify that your SAN boot configuration looks similar to the screenshot below.

Boot Order				
+ - 🏹 Advanced Filter 🕈 Expor	t 🖶 Print			₽
Name	vNIC/vHBA/iSCS	Туре	WWN	
▼ SAN Primary	VHBA-A	Primary		
SAN Target Primary		Primary	50:05:07:68:10:15:05:16	
SAN Target Secondary		Secondary	50:05:07:68:10:15:05:0D	
SAN Secondary	vHBA-B	Secondary		
SAN Target Primary		Primary	50:05:07:68:10:16:05:16	
SAN Target Secondary		Secondary	50:05:07:68:10:16:05:0D	
	🕇 Move Up 👎 N	Move Down 🔟 🛙	Delete	

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Create iSCSI Boot Service Profile Template (iSCSI Deployment)

Service profile template configuration for the iSCSI-based SAN access is covered in this section.

This section can be skipped if iSCSI boot is not implemented in the customer environment.

To create the service profile template, follow these steps:

- 1. In Cisco UCS Manager, click the **Servers** tab in the navigation pane.
- 2. Select Service Profile Templates > root.
- 3. Right-click root.
- 4. Select Create Service Profile Template to open the Create Service Profile Template wizard.
- 5. Enter Infra-ESXi-iSCSI-Host as the name of the service profile template. This service profile template is configured to boot from storage node 1 on fabric A.
- 6. Select the "Updating Template" option.
- 7. Under UUID, select UUID_Pool as the UUID pool.

		Create Service Profile Template	?	\times
0	Identify Service Profile Template	You must enter a name for the service profile template and specify the template type. You can also specify how a UUID will be assigned to the template and enter a description.	his	
2	Storage Provisioning	Name : Infra-ESXi-iSCSI-Host		
3	Networking	The template will be created in the following organization. Its name must be unique within this organization. Where : org-root		
4	SAN Connectivity	The template will be created in the following organization. Its name must be unique within this organization. Type : Initial Template • Updating Template		
5	Zoning	Specify how the UUID will be assigned to the server associated with the service generated by this template. UUID		
6	vNIC/vHBA Placement	UUID Assignment: UUID-Pool(60/64)		
7	vMedia Policy	The UUID will be assigned from the selected pool. The available/total UUIDs are displayed after the pool name.		
8	Server Boot Order			
9	Maintenance Policy	Optionally enter a description for the profile. The description can contain information about when and where the service profile should be used	I.	
10	Server Assignment			
11	Operational Policies			
		< Prov Next > Finish Can	cel)

8. Click Next.

Configure Storage Provisioning

To configure the storage provisioning, follow these steps:

1. If you have servers with no physical disks, click the Local Disk Configuration Policy tab and select the SAN-Boot Local Storage Policy. Otherwise, select the default Local Storage Policy.

		Create Service Profile Templat	e		? ×
1	Identify Service Profile Template	Optionally specify or create a Storage Profile, and sele	ect a local disk configuration policy.		
2	Storage Provisioning	Specific Storage Profile Storage Profile Policy	Local Disk Configuration Policy		1
3	Networking	Create Local Disk Configuration Policy	Mode	: No Local Storage	
4	SAN Connectivity		Protect Configuration If Protect Configuration is s	: Yes et, the local disk configuration is	
5	Zoning		preserved if the service profi with the server. In that case, raised when a new service pu that server if the local disk co different.	le is disassociated a configuration error will be rofile is associated with	
6	vNIC/vHBA Placement		FlexFlash	Blackie	
7	vMedia Policy		FlexFlash State If FlexFlash State is disabled unavailable immediately.		
B	Server Boot Order		Please ensure SD cards are r FlexFlash State. FlexFlash RAID Reporting St	not in use before disabling the tate : Disable	
9	Maintenance Policy		FlexFlash Removable State	: No Change	
10	Server Assignment		If FlexFlash Removable Stat become unavailable tempora Please ensure SD cards are r FlexFlash Removable State.		
11	Operational Policies		< P1	rev Next > Finish	Cancel

2. Click Next.

Configure Networking Options

To configure the network options, follow these steps:

- 1. Keep the default setting for Dynamic vNIC Connection Policy.
- 2. Select the "Use Connectivity Policy" option to configure the LAN connectivity.
- 3. Select iSCSI-LAN-Policy from the LAN Connectivity Policy drop-down list.
- 4. Select IQN_Pool in Initiator Name Assignment.

		Create Service Profile Template	? ×
0	Identify Service Profile	Optionally specify LAN configuration information.	
	Template	Dynamic vNIC Connection Policy: Select a Policy to use (no Dynamic vNIC Policy by default) •	
2	Storage Provisioning		
3	Networking	Create Dynamic vNIC Connection Policy	
4	SAN Connectivity	How would you like to configure LAN connectivity? ○ Simple ○ Expert ○ No vNICS ④ Use Connectivity Policy	
5	Zoning	LAN Connectivity Policy : ISCSI-LAN-Policy Create LAN Connectivity Policy	
6	vNIC/vHBA Placement	Initiator Name Initiator Name Assignment: Infra-IQN-Pool(64/64)	
7	vMedia Policy	Initiator Name :	
8	Server Boot Order	Create IQN Suffix Pool The IQN will be assigned from the selected pool. The available/total IQNs are displayed after the pool name.	
9	Maintenance Policy		
10	Server Assignment		
U	Operational Policies		
		<prev next=""> Finish Car</prev>	ncel

5. Click Next.

Configure Storage Options

- 1. Select the **No vHBA** option for the "How would you like to configure SAN connectivity?" field.
- 2. Click Next.

Configure Zoning Options

1. Leave Zoning configuration unspecified and click **Next**.

Configure vNIC/HBA Placement

- 1. In the "Select Placement" list, leave the placement policy as "Let System Perform Placement."
- 2. Click Next.

Configure vMedia Policy

- 1. Do not select a vMedia Policy.
- 2. Click Next.

Configure Server Boot Order

1. Select Boot-iSCSI-X-A for Boot Policy.

		Create	Create Service Profile Template					? ×			
	Identify Service Profile	Optionally sp	Optionally specify the boot policy for this service profile template.								
	Template	Select a boot	policy.								
2	Storage Provisioning	Boot Policy:	Boot-iSCSI-X-	A 🔻		Create Boot P	olicy				
3	Networking	Name Description	1	: Boot-ISCSI-X-/	A						
4	SAN Connectivity	Enforce vN	Boot Order Ch IIC/vHBA/ISCS	I Name : Yes							
5	Zoning	Boot Mode WARNINGS		: Legacy ary) does not indicate a bo	ot order proc						
6	vNIC/vHBA Placement	The effective If Enforce v	e order of boo NIC/vHBA/ISC	t devices within the same of SI Name is selected and t ICS/vHBAs are selected if	device class (the vNIC/vHB	LAN/Storage/i A/iSCSI does r	not exist, a co	onfig error wi	Il be reported	i.	d.
7	vMedia Policy	Boot Order	Advanced Filt	er 🛧 Export 🖷 Print							¢
8	Server Boot Order	Name	Order 🔺	vNIC/vHBA/iSCSI vNIC	Туре	LUN Name	WWN	Slot Nu	Boot Na	Boot Path	Descripti
9	Maintenance Policy	Rem	1								
10	Server Assignment	iS		iSCSI-A-vNIC	Primary						
•	Operational Policies	iS		iSCSI-B-vNIC	Second						
							< Pre	v N	ext >	Finish	Cancel

- 2. In the **Boor order**, select iSCSI-A-vNIC.
- 3. Click Set iSCSI Boot Parameters button.
- 4. In the Set iSCSI Boot Parameters pop-up, leave Authentication Profile to <not set> unless you have independently created one appropriate to your environment.
- 5. Leave the "Initiator Name Assignment" dialog box <not set> to use the single Service Profile Initiator Name defined in the previous steps.
- 6. Set iSCSI-initiator-A as the "Initiator IP address Policy."
- 7. Select iSCSI Static Target Interface option.
- 8. Click Add.
- 9. In the Create iSCSI Static Target dialog box, add the iSCSI target node name for Node 1 (IQN) from Table 11
- 10. Enter the IP address of Node 1 iSCSI-A interface from Table 10.

Create iSCSI	Static Target	? ×
iSCSI Target Name :	iqn.1986-03.com.ibm:214	
Priority :	1	
Port :	3260	
Authentication Profile :	<not set=""> Create iSCSI Authentication Profile </not>	
IPv4 Address :	10.29.161.249	
LUN ID :	0	
	ОК Сап	cel

- 11. Click **OK** to add the iSCSI Static Target.
- 12. Keep the iSCSI Static Target Interface option selected and click **Add**.
- 13. In the Create iSCSI Static Target dialog box, add the iSCSI target node name for Node 2 (IQN) from Table 11 .
- 14. Enter the IP address of Node 2 iSCSI-A interface from Table 10 .

Create iSCS	Static Target	? ×
iSCSI Target Name	: iqn.1986-03.com.ibm:214	
Priority	: 2	
Port	: 3260	
Authentication Profile	Create iSCSI Authentication Profile	
IPv4 Address	: 10.29.161.250	
LUN ID	: 0	
	ОК Саг	ncel

- 15. Click **OK** to add the iSCSI Static Target.
- 16. Verify both the targets on iSCSI Path A as shown below:

Set iSCSI Boot Parameters

? ×

Initiator Name Assign					
	ment: <not set=""></not>	•			
Create IQN Suffix P	2001				
WARNING: The select You can select it, but					
Initiator Address					
Initiator IP Address Po	olicy: iSCSI-initiate	or-A(50/50) 🔻			
IPv4 Address :	0.0.0.0				
Subnet Mask :	255.255.255.0				
Default Gateway :	0.0.0				
	0.0.00				
Secondary DNS :	0.0.0.0				
Create IP Pool					
The IP address will	be automatically as	ssigned from the se	lected pool.		
 iSCSI Static Target 	t Interface 🔿 iSCS	il Auto Target Interfa	асе		
Name	Priority	Port	Authentication Pr	iSCSI IPV4 Addre	LUN Id
iqn.1986-03	1	3260		10.29.161.249	0
	2	3260		10.29.161.250	0
iqn.1986-03					-
iqn.1986-03					-
iqn.1986-03					
iqn.1986-03					
iqn.1986-03					
iqn.1986-03		+ Add	Delete 1 Info		
	ce of ISCSI Static	-	Delete 1 Info	red.	

- **17**. Click **OK** to set the <code>iSCSI-A-vNIC</code> **ISCSI** Boot Parameters.
- 18. In the Boor order, select iSCSI-B-vNIC.
- 19. Click Set iSCSI Boot Parameters button.

- 20. In the Set iSCSI Boot Parameters pop-up, leave Authentication Profile to <**not set>** unless you have independently created one appropriate to your environment.
- 21. Leave the "Initiator Name Assignment" dialog box <not set> to use the single Service Profile Initiator Name defined in the previous steps.
- 22. Set iSCSI-initiator-B as the "Initiator IP address Policy".
- 23. Select iSCSI Static Target Interface option.
- 24. Click Add.
- 25. In the Create iSCSI Static Target dialog box, add the iSCSI target node name for Node 1 (IQN) from Table 11 .
- 26. Enter the IP address of Node 1 iSCSI-B interface from Table 10.

Create iSCSI	Static Target	? ×
iSCSI Target Name :	iqn.1986-03.com.ibm:214	
Priority :	1	
Port :	3260	
Authentication Profile :	<not set=""> Create iSCSI Authentication Profile </not>	
IPv4 Address :	10.29.162.249	
LUN ID :	0	
	ОК Са	ncel

- 27. Click **OK** to add the iSCSI Static Target.
- 28. Keep the iSCSI Static Target Interface option selected and click Add.
- 29. In the Create iSCSI Static Target dialog box, add the iSCSI target node name for Node 2 (IQN) from Table 11 .
- 30. Enter the IP address of Node 2 iSCSI-B interface from Table 10 .

Create iSCSI	Static Target	? ×
iSCSI Target Name :	iqn.1986-03.com.ibm:214	
Priority :	2	
Port :	3260	
Authentication Profile :	<not set=""> Create iSCSI Authentication Profile </not>	
IPv4 Address :	10.29.162.250	
LUN ID :	0	
	ОК Са	ncel

31. Click **OK** to add the iSCSI Static Target.

		eters			? ×
inuator name					
Initiator Name Assign	iment: <not set=""></not>	•			
	cted pool does n	ot contain any available led that you add entitie			
		,,			
Initiator Address					
Initiator IP Address P	olicy: iSCSI-initi	ator-B(50/50) 🔻			
IPv4 Address : 0.0.0 Subnet Mask : 255.255.255.0 Default Gateway: 0.0.0 Primary DNS : 0.0.0 Secondary DNS : 0.0.0 Create IP Pool The IP address will be automatically assigned from the selected pool. • iSCSI Static Target Interface // iSCSI Auto Target Interface					
The IP address will iSCSI Static Targe	be automatically	CSI Auto Target Interfa	се		
The IP address will iSCSI Static Targe Name	be automatically t Interface () iSC Priority	CSI Auto Target Interfa		ISCSI IPV4 Addre	LUN Id
The IP address will iscsi Static Targe	be automatically	CSI Auto Target Interfa	се	iSCSI IPV4 Addre 10.29.162.249 10.29.162.250	LUN Id 0
The IP address will i iSCSI Static Targe Name iqn.1986-03	be automatically t Interface O ISC Priority 1 2	CSI Auto Target Interface Port 3260 3260 • Add	се	10.29.162.249 10.29.162.250	0

- 32. Click **OK** to set the iSCSI-B-vNIC ISCSI Boot Parameters.
- 33. Click **Next** to continue to the next section.

Configure Maintenance Policy

To configure the maintenance policy, follow these step:

1. Change the Maintenance Policy to default.

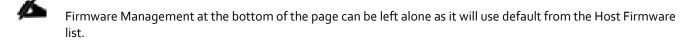
		Create Service Profile Template	? ×
1	Identify Service Profile Template	Specify how disruptive changes such as reboots, network interruptions, and firmware upgrades should be applied to the server associated service profile.	with this
2	Storage Provisioning	Maintenance Policy	
3	Networking	Select a maintenance policy to include with this service profile or create a new maintenance policy that will be accessible to all service profile Maintenance Policy: default Create Maintenance Policy	IS.
4	SAN Connectivity		
5	Zoning	Name : default Description :	
6	vNIC/vHBA Placement	Soft Shutdown Timer : 150 Secs Storage Config. Deployment Policy : User Ack	
7	vMedia Policy	Reboot Policy : Immediate	
8	Server Boot Order		
9	Maintenance Policy		
10	Server Assignment		
1	Operational Policies		
		< Prev Next > Finish Car	ncel

2. Click Next.

Configure Server Assignment

To configure server assignment, follow these steps:

- 1. In the Pool Assignment list, select Infra-Server-Pool.
- 2. Optional: Select a Server Pool Qualification policy.
- 3. Select Down as the power state to be applied when the profile is associated with the server.
- 4. Optional: Select "UCS-B200M5" for the Server Pool Qualification.



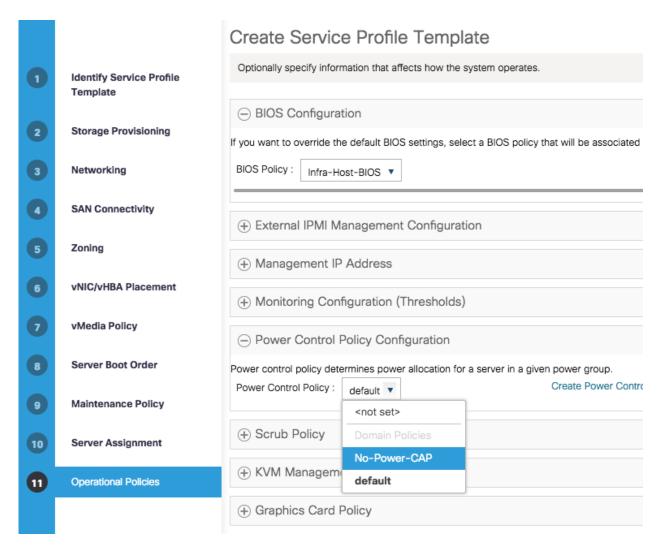
		Create Service P	rofile Te	mplate	
0	Identify Service Profile	Optionally specify a server po	ool for this serv	ice profile ter	nplate.
	Template	You can select a server pool yo	ou want to asso	ociate with thi	s service profile template.
2	Storage Provisioning	Pool Assignment: Infra-Serve	r-Pool 🔻	Create Ser	ver Pool
3	Networking			Select the p with the se	power state to be applied when rver.
•	SAN Connectivity			● Up C) Down
5	Zoning	The service profile template	will be associat	ed with one o	of the servers in the selected po-
6	vNIC/vHBA Placement	If desired, you can specify an the list.	additional ser	ver pool polic	y qualification that the selected :
		Server Pool Qualification :	<not set=""> 🔻</not>		
7	vMedia Policy	Restrict Migration :	<not set=""></not>		
		+ Firmware Managem	Domain Po	licies	ler, Adapter)
8	Server Boot Order		UCSB-B200-M5		
9	Maintenance Policy		all-chassis		J
10	Server Assignment				

5. Click Next.

Configure Operational Policies

To configure the operational policies, follow these steps:

- 1. In the BIOS Policy list, select Infra-Host-BIOS.
- 2. Expand Power Control Policy Configuration and select **No-Power-Cap** in the Power Control Policy list.



- 3. Click Finish to create the service profile template.
- 4. Click **OK** in the confirmation message.

Create iSCSI Boot Service Profiles (iSCSI Deployment)

To create service profiles from the service profile template, follow these steps:

- 1. Connect to the UCS 6454 Fabric Interconnect UCS Manager, click the Servers tab in the navigation pane.
- 2. Select Service Profile Templates > root > Service Template Infra-ESXi-iSCSI-Host.
- 3. Right-click Infra-ESXi-iSCSI-Host and select Create Service Profiles from Template.
- 4. Enter Infra-ESXi-Host-iSCSI-Host- for iSCSI deployment as the service profile prefix
- 5. Enter 1 as the Name Suffix Staring Number.
- 6. Enter the Number of servers to be deploy in the Number of Instances field.

7. Click **OK** to create the service profile.

Create Service Profiles From Template $? \times$
Naming Prefix : Infra-ESXi-iSCSI-Host-0
Name Suffix Starting Number: 1
Number of Instances : 4
OK Cancel
OK Cancel

8. Click OK in the confirmation message to provision four VersaStack Service Profiles.

Adjust the number of Service Profile instances based on the actual customer deployment with intended number of ESXi servers needed.

Create FC Boot Service Profile Template (FC Deployment)

In this procedure, a service profile template is created to use FC Fabric A as primary boot path.

This section can be skipped if FC boot is not implemented in the customer environment.

To create service profile templates, follow these steps:

- 1. In Cisco UCS Manager, click the **Servers** tab in the navigation pane.
- 2. Choose Service Profile Templates > root.
- 3. Right-click root and choose Create Service Profile Template. This opens the Create Service Profile Template wizard.
- 4. Enter Infra-ESXi-Host as the name of the service profile template.
- 5. Select the Updating Template option.
- 6. Under UUID, select UUID-Pool as the UUID pool.
- 7. Click Next.

		Create Service Profile Template	? ×
0	Identify Service Profile Template	You must enter a name for the service profile template and specify the template type. You can also specify how a UUID will be assigned to template and enter a description.	this
2	Storage Provisioning	Name : Infra-ESXI-Host	
3	Networking	The template will be created in the following organization. Its name must be unique within this organization. Where : org-root	
4	SAN Connectivity	The template will be created in the following organization. Its name must be unique within this organization. Type : Initial Template • Updating Template Specify how the UUID will be assigned to the server associated with the service generated by this template.	
5	Zoning	UUID	
6	vNIC/vHBA Placement	UUID Assignment: UUID-Pool(64/64)	
7	vMedia Policy	The UUID will be assigned from the selected pool. The available/total UUIDs are displayed after the pool name.	
8	Server Boot Order		
9	Maintenance Policy	Optionally enter a description for the profile. The description can contain information about when and where the service profile should be use	ed.
10	Server Assignment		
0	Operational Policies	6	
		< Prov Next > Finish Ca	incel

Configure Storage Provisioning

- 1. Select the Local Disk Configuration Policy tab.
- 2. Select the SAN-Boot Local Storage Policy. This policy usage requires servers with no local HDDs.
- 3. Click Next.

		Create Service Profile Template	2	? ×
0	Identify Service Profile Template	Optionally specify or create a Storage Profile, and select	ct a local disk configuration policy.	
	remplate	Specific Storage Profile Storage Profile Policy	Local Disk Configuration Policy	
2	Storage Provisioning			
3	Networking	Local Storage: SAN-Boot 🔻		
	networking	Create Local Disk Configuration Policy	Mode : No Local Storage Protect Configuration : Yes	
4	SAN Connectivity		If Protect Configuration is set, the local disk configuration is	
5	Zoning		preserved if the service profile is disassociated with the server. In that case, a configuration error will be raised when a new service profile is associated with that server if the local disk configuration in that profile is	
6	vNIC/vHBA Placement		dia server in the local disk configuration in data profile is different. FlexFlash FlexFlash State : Disable	
7	vMedia Policy		If FlexFlash State is disabled, SD cards will become unavailable immediately.	
8	Server Boot Order		Please ensure SD cards are not in use before disabling the FlexFlash State. FlexFlash RAID Reporting State : Disable	
9	Maintenance Policy		FlexFlash Removable State : No Change	
10	Server Assignment		If FlexFlash Removable State is changed, SD cards will become unavailable temporarily. Please ensure SD cards are not in use before changing the FlexFlash Removable State.	
11	Operational Policies			
			< Prev Next > Finish	Cancel

Configure Networking Options

- 1. Keep the default setting for Dynamic vNIC Connection Policy.
- 2. Select the Use Connectivity Policy option to configure the LAN connectivity.
- 3. Select the LAN-Policy as the LAN Connectivity Policy.
- 4. Click Next.

		Create Service Profile Template	? ×
1	Identify Service Profile Template	Optionally specify LAN configuration information.	
2	Storage Provisioning	Dynamic vNIC Connection Policy: Select a Policy to use (no Dynamic vNIC Policy by default)	
3	Networking	Create Dynamic vNIC Connection Policy	
4	SAN Connectivity	How would you like to configure LAN connectivity? Simple Expert No vNICS Use Connectivity Policy	
5	Zoning	LAN Connectivity Policy : LAN-Policy Create LAN Connectivity Policy Initiator Name	
6	vNIC/vHBA Placement	Initiator Name Assignment: <pre></pre>	
7	vMedia Policy	Create IQN Suffix Pool	
8	Server Boot Order	WARNING: The selected pool does not contain any available entities. You can select it, but it is recommended that you add entities to it.	
9	Maintenance Policy		
10	Server Assignment		
11	Operational Policies		
		< Prev Next > Finish Ca	ncel

Configure SAN Connectivity

- 1. Select the Use Connectivity Policy option to configure the SAN connectivity.
- 2. Select the Infra-FC-Policy as the SAN Connectivity Policy.
- 3. Click Next.

		Create Service Profile Template	? ×
		Optionally specify disk policies and SAN configuration information.	
0	Identify Service Profile Template		
		How would you like to configure SAN connectivity?	
2	Storage Provisioning		
3	Networking	SAN Connectivity Policy : Infra-FC-Policy * Create SAN Connectivity Policy	
1	SAN Connectivity		
5	Zoning		
6	vNIC/vHBA Placement		
0	vMedia Policy		
8	Server Boot Order		
9	Maintenance Policy		
10	Server Assignment		
11	Operational Policies		
		< Prev Next > Finish Canc	el

Configure Zoning

- 1. It is not necessary to configure any Zoning options.
- 2. Click Next.

Configure vNIC/HBA Placement

- 1. In the "Select Placement" list, leave the placement policy as "Let System Perform Placement."
- 2. Click Next.

		Create Service Prof	file Template		? ×
0	Identify Service Profile	Specify how vNICs and vHBAs are	a placed on physical network adapters		
2	Template Storage Provisioning	vNIC/vHBA Placement specifies how in a server hardware configuration in			
	Clouge Frenchishing	Select Placement: Let System	Perform Placement Create	Placement Policy	
3	Networking		cement of vNICs and vHBAs based on		
4	SAN Connectivity	vHBA vHBA-A	Address Derived	Order 1	· ·
6	Zoning	vHBA vHBA-B	Derived	2	
	Loning	vNIC 00-Mgmt-A	Derived	3	
6	vNIC/vHBA Placement	vNIC 01-Mgmt-B	Derived	4	
0	vMedia Policy	vNIC 02-vMotion-A	Derived	5	
8	Server Boot Order	vNIC 0.3-vMotion B	Derived There is a constraint of the termination of terminatio of termination of terminatio of termination of termin	elete ີ Reorder 🕤 Modify	
9	Maintenance Policy				
10	Server Assignment				
0	Operational Policies				
				< Prev Next > Finist	Cancel

Configure vMedia Policy

- 1. There is no need to set a vMedia Policy.
- 2. Click Next.

Configure Server Boot Order

- 1. Select Boot-Fabric-A as the Boot Policy
- 2. Verify all the boot devices are listed correctly
- 3. Click Next.

			GL				
		Create Service Pr	offile l'emplate				? ×
0	Identify Service Profile	Optionally specify the boot poli	cy for this service profile templa	ate.			
	Template	Select a boot policy.					
2	Storage Provisioning	Boot Policy: Boot-Fabric-A 🔻		Create Boot Policy			
	Networking	Name	: Boot-Fabric-A	,			
3	Networking	Description	:				
4	SAN Connectivity	Reboot on Boot Order Chang					
		Enforce vNIC/vHBA/iSCSI Nat Boot Mode	ne: Yes : Legacy				
5	Zoning	WARNINGS:					
6	vNIC/vHBA Placement	The type (primary/secondary) of The effective order of boot dev If Enforce vNIC/vHBA/iSCSI N If it is not selected, the vNICs/v	ices within the same device cla ame is selected and the vNIC/V	ss (LAN/Storage/ISCS HBA/ISCSI does not e	xist, a config error	will be reported.	ised.
7	vMedia Policy	Boot Order	,				
		+ - Ty Advanced Filter	🕈 Export 🛛 🖶 Print				¢
8	Server Boot Order	Name Order 🔺	NIC/vHB Type LU	N Name WWN	Slot Numb	Boot Name Boot Path	Description
9	Maintenance Policy	Remot 1					
	,	⊸ San 2					
10	Server Assignment	▶ SA	abric-A Primary				
		▶ SA	abric-B Secondary				
11	Operational Policies						
					< Prev	Next > Finish	Cancel

Configure Maintenance Policy

- 1. Choose the default Maintenance Policy.
- 2. Click Next.

		Create Service Profile Template	? ×
0	Identify Service Profile Template	Specify how disruptive changes such as reboots, network interruptions, and firmware upgrades should be applied to the server associated v service profile.	vith this
2	Storage Provisioning	Maintenance Policy	
3	Networking	Select a maintenance policy to include with this service profile or create a new maintenance policy that will be accessible to all service profiles. Maintenance Policy: default Create Maintenance Policy	з.
4	SAN Connectivity		
5	Zoning	Name : default Description :	
6	vNIC/vHBA Placement	Soft Shutdown Timer : 150 Secs Storage Config. Deployment Policy : User Ack	
7	vMedia Policy	Reboot Policy : Immediate	
8	Server Boot Order		
9	Maintenance Policy		
10	Server Assignment		
1	Operational Policies		
		< Prev Next > Finish Can	cel

Configure Server Assignment

- 1. For the Pool Assignment field, select Infra-Server-Pool.
- 2. **Optional**: Select a Server Pool Qualification policy.
- 3. Select the option Up for the power state to be applied when the profile is associated with the server.
- 4. Expand Firmware Management and select Infra-FW-Pack from the Host Firmware list.
- 5. Click Next.

		Create Service Profile Template (? \times						
	Identify Service Profile	Optionally specify a server pool for this service profile template.						
	Template	You can select a server pool you want to associate with this service profile template.						
2	Storage Provisioning	Pool Assignment: Infra-Server-Pool Create Server Pool						
3	Networking	Select the power state to be applied when this profile is associated with the server.						
4	SAN Connectivity	● Up ◯ Down						
5	Zoning	The service profile template will be associated with one of the servers in the selected pool. If desired, you can specify an additional server pool policy qualification that the selected server must meet. To do so, select the qualification from						
6	vNIC/vHBA Placement	in desired, you can specing an additional server pool policy qualification that the selected server must meet. To be so, select the qualification the list. Server Pool Qualification : UCS-B200-M5 V						
0	vMedia Policy	Restrict Migration :						
8	Server Boot Order	Firmware Management (BIOS, Disk Controller, Adapter)						
9	Maintenance Policy	If you select a host firmware policy for this service profile, the profile will update the firmware on the server that it is associated with. Otherwise the system uses the firmware already installed on the associated server. Host Firmware Package: Infra-FW-Pack 🔻						
10	Server Assignment	Create Host Firmware Package						
11	Operational Policies							
		< Prev Next > Finish Cancel						

Configure Operational Policies

- 1. For the BIOS Policy field, select Infra-Host-BIOS.
- 2. Expand Power Control Policy Configuration and select No-Power-Cap for the Power Control Policy field.

		Create Service Profile Template	? ×				
0	Identify Service Profile Template	Optionally specify information that affects how the system operates.					
2	Storage Provisioning	BIOS Configuration If you want to override the default BIOS settings, select a BIOS policy that will be associated with this service profile					
3	Networking	BIOS Policy : Infra-Host-BIOS V					
0	SAN Connectivity	External IPMI Management Configuration					
5	Zoning	(⊕) Management IP Address					
6	vNIC/vHBA Placement	Monitogenetic in Poerceo					
0	vMedia Policy	Power Control Policy Configuration					
8	Server Boot Order	Power control policy determines power allocation for a server in a given power group.					
0	Maintenance Policy	Power Control Policy: No-Power-CAP Create Power Control Policy					
10	Server Assignment	Scrub Policy					
0	Operational Policies	KVM Management Policy					
		⊕ Graphics Card Policy					
		< Prev Hint > Finish Ca	ncel				

- 3. Click **Finish** to create the service profile template.
- 4. Click **OK** in the confirmation message.

Create FC Boot Service Profiles (FC Deployment)

To create service profiles from the service profile template, follow these steps:

- 1. In Cisco UCS Manager, click the **Servers** tab in the navigation pane.
- Choose Service Profile Templates > root > Service Template Infra-ESXi-Host (Infra-ESXi-iSCSI-Host for iSCSI Deployment).
- 3. Right-click and choose Create Service Profiles from Template.

æ	All	•	Servers / Servi	ce Profile Temp	lates / r	oot / Service	Template Infra-E	SXi			
	▼ root			Storage Networks Netwo	work	iSCSI vNICs	vMedia Policy	Boot Order	Policies	Events	FSM
o	Service Templar	Create Service Profil	les From Templa	te							
格	Service Templa	Create a Clone					vNIC/vHBA	Placement Polic	зy		
Ē	 Sub-Organizati Disassociate Template 						Specific	vNIC/vHBA Place	ment Policy		
-	 Policies 	Policies Associate with Server Pool									
=	▼ root	Change UUID					Virtual S	Virtual Slot		Selection Preference	
	Adapter Policie:	Change World Wide	Node Name				1			All	
	BIOS Defaults	Change Local Disk Configuration Policy					2			All	
	BIOS Policies	Change Dynamic vN	IC Connection Po	olicy			3			All	
20	 Boot Policies 	Change Serial over L	AN Policy				4			All	
		Modify vNIC/vHBA P	lacement								
	Boot Policy E	Сору		- '							
	Boot Policy E	Copy YM								(+) Ac	id 📋 Dele
	Boot Policy de	efault									

- 4. Enter Infra-ESXi-Host- as the service profile prefix.
- 5. Enter 1 as the Name Suffix Staring Number.
- 6. Enter the Number of servers to be deploy in the Number of Instances field.
- 7. Click **OK** to create the service profile.

Create Service Pro	files From Template	? ×
Naming Prefix : Infra	a-ESXi-Host-0	
Name Suffix Starting Number: 1	1	
Number of Instances : 4	4	
	OK Cance	el

- 8. Click **OK** in the confirmation message.
- 9. Verify that the service profiles are successfully created and automatically associated with the servers from the pool.

Adjust the number of Service Profile instances based on the actual servers required for customer deployment.

Backup the Cisco UCS Manager Configuration

It is recommended to backup the Cisco UCS Configuration. For additional information, go to:

https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/ucs-manager/GUI-User-Guides/Admin-Management/4o/b_Cisco_UCS_Admin_Mgmt_Guide_4-o/b_Cisco_UCS_Admin_Mgmt_Guide_4-o_chapter_o1.html

Refer to the Appendix for example backup procedures

Add Servers

Additional server pools, service profile templates, and service profiles can be created under root or in organizations under the root. All the policies at the root level can be shared among the organizations. Any new physical blades can be added to the existing or new server pools and associated with the existing or new service profile templates.

Gather Necessary WWPN Information (FC Deployment)

After the Cisco UCS service profiles have been created, each infrastructure blade in the environment will be assigned certain unique configuration parameters. To proceed with the SAN configuration, this deployment specific information must be gathered from each Cisco UCS blade. Follow these steps:

- 1. To gather the vHBA WWPN information, launch the Cisco UCS Manager GUI. In the navigation pane, click the Servers tab. Expand Servers > Service Profiles > root. Select each service profile and expand to see the vHBAs.
- 2. Click **vHBAs** to see the WWPNs for both HBAs.

æ	AI +	Servers / Service Profiles / root / Service Profile Infra-ESXI-Host / vHBAs								
-	▶ vNICs	Storage F5M								
	▼ Infra-ESXi-Host-03	Actions World Wide Node Name								
몲	 ISCSI vNICs 									
Ŧ	✓ vHBAs	Change World Wide Node Name World Wide Node Name : 20:00:00:25:85:00:00:02 Modily vNC/vHBA Placement WWNN Pool : WWNN-Pool								
	▶ vHBA vHBA-A	Reset WWNN Address WWNN Pool Instance : org-root/wwn-pool-WWNN-Pool								
=	▶ vHBA vHBA-B	Local Disk Configuration Policy								
	▶ vNICs	Local Disk Policy : SAN-Boot								
	Infra-ESXI-Host-04	Local Dak Policy instance : on-root/ocal-disk-confor-SAN-Box								
	Infra-ESXi-Host-05	SAN Connectivity Policy								
7 ⁰	Infra-ESXi-Host-11	aan Connectivity Poscy								
	Infra-ESXI-Host-12	SAN Connectivity Policy : Infra-FC-Patty *								
	Infra-ESXi-iSCSI-Host-01	SAN Connectivity Policy Instance : org-root/san-com-pol-infra-FC-Policy								
	Infra-ESXI-ISCSI-Host-02	Create SAN Cennectivity Policy								
	 Sub-Organizations 	No Configuration Change of vNICs/vHBAs/ISCSI vNICs is allowed due to connectivity policy.								
	 Service Profile Templates 	vHBAs								
	▼ Policies	Ty Advanced Filter + Expert Print								
	* root	Name WWPN Desired Order A Actual Order Fabric D Desired Placement Actual Placement Admin Host Port Actual Host Port								
	 Adapter Policies 	VHBA-VHBA-A 20:00:00:25:85:00:04:02 1 7 A Arry 1 ANY NONE								
	 BIOS Defaults 	VHBA-VHBA-B 2000002585000002 2 8 8 8 Any 1 ANY NONE								
	▼ BIOS Policies									

3. Record the WWPN information that is displayed for both the Fabric A vHBA and the Fabric B vHBA for each service profile into the WWPN variable in Table 15. Add or remove rows from the table depending on the number of ESXi hosts.

Host	vHBA		Value
Infra-ESXi-Host-1	Fabric-A	WWPN-Infra-ESXi-Host-1-A	20:00:00:25:b5:
	Fabric-B	WWPN-Infra-ESXi-Host-1-B	20:00:00:25:b5:

Table 15 Cisco UCS WWPN Information

Infra-ESXi-Host-2	Fabric-A	WWPN-Infra-ESXi-Host-2-A	20:00:00:25:b5:
	Fabric-B	WWPN-Infra-ESXi-Host-2-B	20:00:00:25:b5:
Infra-ESXi-Host-3	Fabric-A	WWPN-Infra-ESXi-Host-3-A	20:00:00:25:b5:
	Fabric-B	WWPN-Infra-ESXi-Host-3-B	20:00:00:25:b5:
Infra-ESXi-Host-4	Fabric-A	WWPN-Infra-ESXi-Host-4-A	20:00:00:25:b5:
	Fabric-B	WWPN-Infra-ESXi-Host-4-B	20:00:00:25:b5:

Gather Necessary IQN Information (iSCSI Deployment)

After the Cisco UCS service profiles have been created, each infrastructure blade in the environment will be assigned certain unique configuration parameters. To proceed with the SAN configuration, this deployment specific information must be gathered from each Cisco UCS blade. Follow these steps:

- 1. To gather the vNIC IQN information, launch the Cisco UCS Manager GUI. In the navigation pane, click the **Servers tab**. Expand Servers > Service Profiles > root.
- 2. Click each service profile and then click the "iSCSI vNICs" tab on the right. Note "Initiator Name" displayed at the top of the page under "Service Profile Initiator Name."

General	Storage	Network	iSCSI vNICs	vMedia Policy	Boot Order	Virtual Machines	FC Zones	Policies	Server Details	CIMC Sessions	FSM	VIF
Actions Change Init	Actions Change Initiator Name				le Initiator Nam							
Reset Initia	tor Name			Initiator Nam	e : iqn.1992-	08.com.cisco:ucs-ho	ost:3					

No Configuration Change of vNICs/vHBAs/iSCSI vNICs is allowed due to connectivity policy.

ISCSI vNICs

+ — Ty Advanced Filter + Export = Print						
Name	Overlay vNIC Name	iSCSI Adapter Policy	MAC Address			
ISCSI VNIC ISCSI-A-VNIC	06-iSCSI-A		Derived			
iSCSI vNIC iSCSI-B-vNIC	07-iSCSI-B		Derived			

Table 16Cisco UCS iSCSI IQNs

Cisco UCS Service Profile Name	iscsi iqn
Infra-ESXi-iSCSI-Host-01	iqn.1992-08.com.cisco:ucs-host
Infra-ESXi-iSCSI-Host-02	iqn.1992-08.com.cisco:ucs-host
Infra-ESXi-iSCSI-Host-03	iqn.1992-08.com.cisco:ucs-host

Cisco UCS Service Profile Name	iSCSI IQN
Infra-ESXi—iSCSI-Host-04	iqn.1992-08.com.cisco:ucs-host

IBM FS9100 iSCSI Storage Configuration (iSCSI Deployment)



This configuration step can be skipped if the UCS environment does not need access to storage using iSCSI.

As part of IBM FS9100 storage configuration, follow these steps:

- 1. Create ESXi boot Volumes (Boot LUNs for all the ESXi hosts)
- 2. Create Share Storage Volumes (for hosting VMs)
- 3. Map Volumes to Hosts

Volume Name	Capacity (GB)	Purpose	Mapping
Infra-ESXi-iSCSI-Host-01	10	Boot LUN for the Host	Infra-ESXi-iSCSI-Host-01
Infra-ESXi-iSCSI-Host-02	10	Boot LUN for the Host	Infra-ESXi-iSCSI-Host-02
Infra-ESXi-iSCSI-Host-o3	10	Boot LUN for the Host	Infra-ESXi-iSCSI-Host-03
Infra-ESXi-iSCSI-Host-04	10	Boot LUN for the Host	Infra-ESXi-iSCSI-Host-04
Infra-iSCSI-datastore-1	2000**	Shared volume to host VMs	All ESXi hosts: Infra-ESXi-iSCSI-Host-01 to Infra-ESXi-iSCSI-Host-04
Infra-iSCSI-datastore-2	2000**	Shared volume to host VMs	All ESXi hosts: Infra-ESXi-iSCSI-Host-01 to Infra-ESXi-iSCSI-Host-04
Infra-iSCSI-swap	500**	Shared volume to host VMware VM swap directory	All ESXi hosts: Infra-ESXi-iSCSI-Host-01 to Infra-ESXi-iSCSI-Host-04

Table 17 List of Volumes for iSCSI on IBM FS9100*

* Customers should adjust the names and values used for server and volumes names based on their deployment

** The volume size can be adjusted based on customer requirements

Create Volumes on the Storage System

To create volumes on the storage system, follow these steps:

1. Log into the IBM FS9100 GUI and select the Volumes icon on the left screen and select Volumes

IBM	IBM FlashSystem 9100	VersaStac	kFS9100 Volumes				
\triangle			① Create Volumes	≔ Actio	ons 👻 All	Volumes 🔻	
ୢୖ୶			Name		State		Synchronia
₿							
	Volumes		Volumes				
			Volumes by Pool				
			Volumes by Host Cloud Volumes				
0							
Ś							

You will repeat the following steps to create and map the volumes shown in Table 17.

2. Click Create Volumes as shown below.

IBM	IBM FlashSystem 9100	VersaStack	FS9100 Volumes			
\triangle	Dashboard		① Create Volumes	≔ Act	ions 🔻	All Volumes 👻
~°	Monitoring		Name		State	
	Pools					

- 3. Click **Basic** and then select the pool (VS-Pool0 in this example) from the drop-down list.
- 4. When creating single volumes, input quantity 1 and the capacity and name from Table 17 . Select Thinprovisioned for Capacity savings and enter the Name of the volume. Select I/O group io_grpo.
- 5. When creating multiple volumes in bulk enter the quantity required and review the Name field. The number value will be appended to the specified volume name.

IBM FS9100 and Spectrum Virtualize is optimized for environments with more than 30 volumes. Consider distributing Virtual Machines over multiple VMFS datastores for optimal performance.

Create Volumes

6.

6

Basic	Mirrored	Custom	
Create a preset	volume with all the basic f	eatures.	
Pool:			
VS-Pool0	•	Total 7.10 Tie] 3
Volume Details			
Quantity:	Capacity:	Name:	
4	10 GiB	✓ Infra-ESXi-iSCSI-Host-0	1 - 4
Capacity sav	/ings:		
Thin-prov	isioned 🔻 🗌 Ded		
Define anoth	er volume		
I/O group:			
Automatic	-		
Su	mmary		
Click Create.			

During the volume creation, expand **view more details** to monitor the CLI commands utilized to create each volume. All commands run against the system by either the GUI or CLI will be stored in the Audit log, along with the associated user account and timestamp.

7. Repeat steps 1-6 to create all the required volumes and verify all the volumes have successfully been created as shown in the sample output below.

IBM	IBM FlashSystem 9100 VersaSt	ackFS9100 Volumes				ê 🖥	(?) superuser (Security Administrator	r) ~
☆		⊕ Create Volumes 🗮 Ac	tions 👻 🛛 All Volumes 🕶			Default 🗸	Contains V Filter	
~		Name	State	Synchronized	Pool	Protocol Type	UID	IIî
_		Infra-ESXi-iSCSI-Host-01	✓ Online		VS-Pool0		600507681093000030000000000000	
#		Infra-ESXi-iSCSI-Host-02	✓ Online		VS-Pool0		60050768109300003000000000000	
		Infra-ESXi-iSCSI-Host-03	✓ Online		VS-Pool0		600507681093000030000000000000	
	Volumes	Infra-ESXi-iSCSI-Host-04	✓ Online		VS-Pool0		600507681093000030000000000000	
		Infra-iSCSI-datastore-1	✓ Online		VS-Pool0		600507681093000030000000000000	
		Infra-iSCSI-swap	✓ Online		VS-Pool0		600507681093000030000000000000	
0								
<u></u>								
		Showing 6 volumes Selecting 0 volumes						>
			Read Wr Latency O ms 0ms 0r	ns Bandwie	Read Write dth OmBps OmBps OmBps	IOPS 0	ad Write O	

Create Host Cluster & Host objects

Host Cluster Shared & Private mappings

In traditional hypervisor environments such as VMware vSphere, each physical host requires access to the same shared datastores (or LUNs) in order to facilitate features such as vMotion, High Availability, Fault Tolerance. It is import for all ESXi hosts within a vSphere cluster to have identical access to LUNs presented from the FS9100.

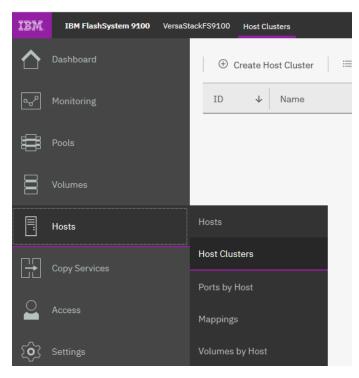
The Host Clusters feature in IBM Spectrum Virtualize products introduces a way to simplify administration when mapping volumes to host environments that require shared storage.



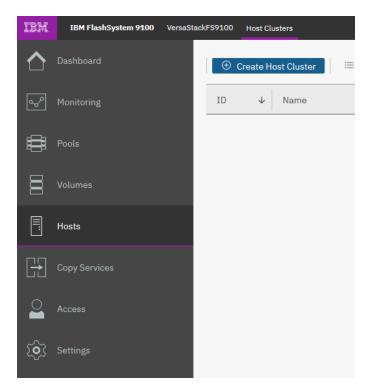
It is recommended that a Host Cluster object be created for each vSphere Cluster visible in vCenter, and any ESXi hosts within the vSphere cluster be defined as individual host objects within FS9100. This ensures that volume access is consistent across all members of the cluster and any hosts that are subsequently added to the Host Cluster will inherit the same LUN mappings.

To create host clusters and objects, follow these steps:

1. Click Hosts then click Host Clusters.



2. Click Create Host Cluster.



3. Give the Host Cluster a friendly name.

Name: VS-	UCS01					
Optionals Cal	aat baata ta aa		Justor A	nu ourropturel		arad
		n the host cluster.	cluster. A	iny current volum	e mappings become the sh	ared
i It is recor	nmended that	all hosts in a host c	luster ha	ave access to the	same I/O Groups.	
				· · · · · · · · · · · · · · · · · · ·		
⊥		Default	~	Contains 🗸	Filter	À
Name	\checkmark	Status		Host Type	Host Mappings	PⅢŰ
		١	No items	found.		
<						>
	sts Selecting	0 hosts				

4. Review the summary and click **Make Host Cluster**.

Create Host Cluster: Summary	
An empty host cluster VS-UCS01 will be created.	
Cancel	■ Back Make Host Cluster

Add Hosts to Host Cluster

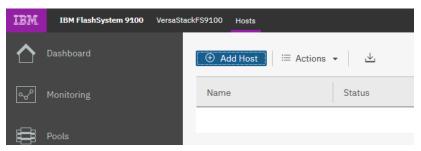
Create iSCSI Host Definitions

To create iSCSI host definitions, follow these steps:

1. Click **Hosts** and then **Hosts** from the navigation menu.

IBM	IBM FlashSystem 9100	VersaStack	(FS9100	Volumes	
	Dashboard		⊕ C	reate Volumes 🛛 🗮	Actions 👻 🛛 Al
مہم	Monitoring		Nam	e	State
				Infra-ESXi-iSCSI-Host-01	🗸 Online
	Pools			Infra-ESXi-iSCSI-Host-02	✓ Online
				Infra-ESXi-iSCSI-Host-03	🗸 Online
	Volumes			Infra-ESXi-iSCSI-Host-04	✓ Online
					🗸 Online
	Hosts	ł	losts		✓ Online
[]	Copy Services		Host Clu	sters	
			Ports by	Host	
	Access		Mapping	s	
ক্ট	Settings	١	/olumes	by Host	

- 2. For each ESXi host (Table 16), follow these steps on the IBM FS9100 system:
 - a. Click Add Host.



b. Select iSCSI or iSER (SCSI) Host. Add the name of the host to match the ESXi service profile name from Table 17. Type the IQN corresponding to the ESXi host from Table 16 and select the Host Cluster that we created in the previous step.

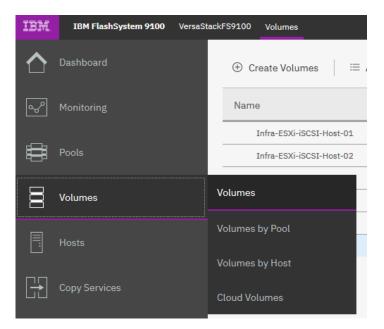
equired Fields	
Name:	Infra-ESXi-iSCSI-Host-01
Host connections:	iSCSI or iSER (SCSI)
Host IQN:	iqn.1992-08.com.cisco:ucs-host01
ptional Fields CHAP authentication:	
	Enter 1 to 79 characters
CHAP authentication:	Enter 1 to 79 characters Enter 1 to 31 characters
CHAP authentication: CHAP secret:	
CHAP authentication: CHAP secret: CHAP username:	Enter 1 to 31 characters

3. Click Add.

Map Volumes to Hosts and Host Cluster

To map volumes to hosts and clusters, follow these steps:

- 1. Now the Host Cluster and Host objects have been created, we need to map each LUN to the hosts.
- 2. Click Volumes.



3. Right-click the Boot LUN for each ESXi host in turn and choose **Map to Host**.

IBM.	IBM FlashSystem 9100	VersaStack	FS9100 Volumes	
	Dashboard		🕀 Create Volume	es 🛛 🗄 Actions 👻 🛛 All Volumes
~°			Name	State
			Infra-ESXi-iSC	SI-Host-01 V Online
	Pools		Infra-ESXi-iS(Rename
			Infra-ESXi-iS(Map to Host or Host Cluster
	Volumes		Infra-ESXi-iS(Shrink
			Infra-iSCSI-da	Expand
			Infra-iSCSI-sv	Modify Capacity Savings
				Market Minister Course Dates

4. Select the Hosts radio button, and select the corresponding Host in the list and click Next

reate Mapping				
and happing				
a				
Create Mappings to:				
Hosts				
 Host Clusters 				
Select hosts to map to Infra-ES	Xi-iSCSI-Host-01			
	Default	✓ Contains ✓ F	ilter	74
Name	↓ Host Type	Host Mappings	Protocol Type	Sta III
Infra-ESXi-iSCSI-Host-01	Generic			
Inte Eost (JCJT HOST OF	Generic	No	SCSI	8 Offlin
Ind Low SOOT TOST OF	Generic	No	SCSI	Offlin
	Generic	No	SCSI	Offlin
		No	SCSI	
< Showing 1 host Selecting 1 ho	st		SCSI	
Showing 1 host Selecting 1 ho Would you like the system to as	st		SCSI	
Showing 1 host Selecting 1 host Selecting 1 host Selecting 1 host System to as	st		SCSI	
Showing 1 host Selecting 1 ho Would you like the system to as	st		SCSI	
Showing 1 host Selecting 1 host Selecting 1 host Selecting 1 host System to as	st		SCSI	
Showing 1 host Selecting 1 host Selecting 1 host Selecting 1 host System to as	st		SCSI	

5. Click Map Volumes and when the process is complete, click Close.

he following volumes will be mapp	ed to Infra-ESXi-iSCS	I-Host-01:		
Name	SCSI ID	Caching I/O Group ID	New Mapping	П
Infra-ESXi-iSCSI-Host-01	0	0	New	

- 6. Repeat steps 1-5 to map a Boot volume for each ESXi host in the cluster.
- 7. When mapping shared volumes from Table 17 i.e. for shared VMFS datastores, right click on the volume in question (or select multiple volumes if mapping multiple LUNs) and select **Map to Host or Host Cluster**.

IBM	IBM FlashSystem 9100 Ve	rsaStack	FS9100 Volumes	
\triangle	Dashboard		\oplus Create Volumes \coloneqq	Actions 👻 All Volumes 👻
مهم	Monitoring		Name	State Sync
			Infra-ESXi-iSCSI-Host-01	✓ Online
	Pools		Infra-ESXi-iSCSI-Host-02	✓ Online
			Infra-ESXi-iSCSI-Host-03	✓ Online
	Volumes		Infra-ESXi-iSCSI-Host-04	✓ Online
			Infra-iSCSI-datastore-1	✓ Online
	Hosts		Infra-iSCSI-datastore-2	✓ Online
			Infra-iSCSI-datastore-3	✓ Online
	Copy Services		Infra-iSCSI-datastore-4	✓ Online
~			Infra-iSCSI-datastore-5	Rename
	Access		Infra-iSCSI-datastore-6	Map to Host or Host Cluster
_			Infra-iSCSI-swap	
হ ় হ	Settings			Shrink
				Expand
				Modify Capacity Savings

8. Select the Host Clusters radio button.

 \times

Create Mapping

Create Mappings to:				
Hosts				
Host Clusters				
Select host clusters	to map to 6 volumes			
	Default	 ✓ Contains ✓ 	Filter	¥.
Name	↓ Status	Host Count	Mappings Count	IIî
VS-UCS01	😵 Offline	1	0	1
	ter Selecting 1 host cluster			>
Showing 1 host clus	ter Selecting 1 host cluster ystem to assign SCSI LUN IDs or	manually assign these II)s?	>
Showing 1 host clus	ystem to assign SCSI LUN IDs or	manually assign these I[)s?	>
Would you like the sy	ystem to assign SCSI LUN IDs or	manually assign these II)s?	>

9. Review the summary and Click Map Volumes to confirm.

Infra-iSCSI-datastore-2 2 0 New
Infra-iSCSI-datastore-3 3 0 New
Infra-iSCSI-datastore-4 4 0 New
Infra-iSCSI-datastore-5 5 0 New
Infra-iSCSI-datastore-6 6 0 New

10. Any Shared host cluster mappings will be automatically inherited by any future ESXi hosts which are defined as members of the host cluster.

IBM FS9100 Fibre Channel Storage Configuration (FC Deployment)

Æ

This configuration step can be skipped if the UCS environment does not need access to storage using fibre channel.

As part of IBM FS9100 Fibre Channel storage configuration, follow these steps:

- 1. Setup Zoning on Cisco MDS switches
- 2. Setup Volumes on IBM FS9100
- 3. Map Volumes to Hosts

Create Device Aliases and SAN Zoning

The following steps will configure zoning for the WWPNs for the UCS hosts and the IBM FS9100 node canisters. WWPN information collected from the previous steps will be used in this section. Multiple zones will be created for servers in VSAN 101 on Switch A and VSAN 102 on Switch B.

The configuration below assumes 4 UCS services profiles have been deployed in this example. Customers can adjust the configuration according to their deployment size.

Cisco MDS - A Switch

To create device aliases for Fabric A that will be used to create zones, follow these steps:

The WWPNs recorded in Table 15 will be used in the next step. Replace the variables with actual WWPN values.

1. From the global configuration mode, run the following commands:

```
device-alias database
```

```
device-alias name Infra-ESXi-Host-01 pwwn <WWPN-Infra-ESXi-Host-1-A>
device-alias name Infra-ESXi-Host-02 pwwn <WWPN-Infra-ESXi-Host-2-A>
device-alias name Infra-ESXi-Host-03 pwwn <WWPN-Infra-ESXi-Host-3-A>
device-alias name Infra-ESXi-Host-04 pwwn <WWPN-Infra-ESXi-Host-4-A>
device-alias name FS9100-Node1-FC1 pwwn <WWPN-FS9100-Node1-FC1>
device-alias name FS9100-Node1-FC3 pwwn <WWPN-FS9100-Node1-FC3>
device-alias name FS9100-Node2-FC1 pwwn <WWPN-FS9100-Node2-FC1>
device-alias name FS9100-Node2-FC3 pwwn <WWPN-FS9100-Node2-FC3>
device-alias name FS9100-Node2-FC3 pwwn <WWPN-FS9100-Node2-FC3>
```

2. Create the zones and add device-alias members for the 4 blades.

```
zone name Infra-ESXi-Host-01 vsan 101
member device-alias Infra-ESXi-Host-01
```

```
member device-alias FS9100-Node1-FC1
member device-alias FS9100-Node1-FC3
member device-alias FS9100-Node2-FC1
member device-alias FS9100-Node2-FC3
!
zone name Infra-ESXi-Host-02 vsan 101
member device-alias Infra-ESXi-Host-02
member device-alias FS9100-Node1-FC1
member device-alias FS9100-Node1-FC3
member device-alias FS9100-Node2-FC1
member device-alias FS9100-Node2-FC3
!
zone name Infra-ESXi-Host-03 vsan 101
member device-alias Infra-ESXi-Host-03
member device-alias FS9100-Node1-FC1
member device-alias FS9100-Node1-FC3
member device-alias FS9100-Node2-FC1
member device-alias FS9100-Node2-FC3
!
zone name Infra-ESXi-Host-04 vsan 101
member device-alias Infra-ESXi-Host-04
member device-alias FS9100-Node1-FC1
member device-alias FS9100-Node1-FC3
member device-alias FS9100-Node2-FC1
member device-alias FS9100-Node2-FC3
!
```

3. Add zones to zoneset.

```
zoneset name versastackzoneset vsan 101
member Infra-ESXi-Host-01
member Infra-ESXi-Host-02
member Infra-ESXi-Host-03
member Infra-ESXi-Host-04
```

4. Activate the zoneset.

zoneset activate name versastackzoneset vsan 101



Validate all the HBA's are logged into the MDS switch. The FS9100 nodes and the Cisco servers should be powered on. To start the Cisco servers from Cisco UCS Manager, select the server tab, then click Servers>Service>Profiles>root, and right-click service profile then select boot server.

5. Validate that all the powered-on system's HBAs are logged into the switch through the show zoneset command.

```
show zoneset active
```

```
VersaStack-MDS-A# sh zoneset active
zoneset name versastackzoneset vsan 101
  zone name Infra-ESXi-Host-01 vsan 101
   pwwn 20:00:00:25:b5:00:0a:00 [Infra-ESXi-Host-01]
  * fcid 0x720021 [pwwn 50:05:07:68:10:15:05:16] [VS-FS9100-Node1-FC1]
  * fcid 0x720041 [pwwn 50:05:07:68:10:17:05:16] [VS-FS9100-Node1-FC3]
  * fcid 0x720061 [pwwn 50:05:07:68:10:15:05:0d] [VS-FS9100-Node2-FC1]
  * fcid 0x720081 [pwwn 50:05:07:68:10:17:05:0d] [VS-FS9100-Node2-FC3]
  zone name Infra-ESXi-Host-02 vsan 101
   pwwn 20:00:00:25:b5:00:0a:01 [Infra-ESXi-Host-02]
  * fcid 0x720021 [pwwn 50:05:07:68:10:15:05:16] [VS-FS9100-Node1-FC1]
  * fcid 0x720041 [pwwn 50:05:07:68:10:17:05:16] [VS-FS9100-Node1-FC3]
  * fcid 0x720061 [pwwn 50:05:07:68:10:15:05:0d] [VS-FS9100-Node2-FC1]
  * fcid 0x720081 [pwwn 50:05:07:68:10:17:05:0d] [VS-FS9100-Node2-FC3]
  zone name Infra-ESXi-Host-03 vsan 101
  * fcid 0x7200e4 [pwwn 20:00:00:25:b5:00:0a:02] [Infra-ESXi-Host-03]
  * fcid 0x720021 [pwwn 50:05:07:68:10:15:05:16] [VS-FS9100-Node1-FC1]
  * fcid 0x720041 [pwwn 50:05:07:68:10:17:05:16] [VS-FS9100-Node1-FC3]
  * fcid 0x720061 [pwwn 50:05:07:68:10:15:05:0d] [VS-FS9100-Node2-FC1]
  * fcid 0x720081 [pwwn 50:05:07:68:10:17:05:0d] [VS-FS9100-Node2-FC3]
  zone name Infra-ESXi-Host-04 vsan 101
  * fcid 0x7200e1 [pwwn 20:00:00:25:b5:00:0a:03] [Infra-ESXi-Host-04]
  * fcid 0x720021 [pwwn 50:05:07:68:10:15:05:16] [VS-FS9100-Node1-FC1]
  * fcid 0x720041 [pwwn 50:05:07:68:10:17:05:16] [VS-FS9100-Node1-FC3]
  * fcid 0x720061 [pwwn 50:05:07:68:10:15:05:0d] [VS-FS9100-Node2-FC1]
  * fcid 0x720081 [pwwn 50:05:07:68:10:17:05:0d] [VS-FS9100-Node2-FC3]
```

6. Save the configuration.

copy run start

Cisco MDS - B Switch

To create device aliases for Fabric B that will be used to create zones, follow these steps:

The WWPNs recorded in Table 15 will be used in the next step. Replace the variables with actual WWPN values.

1. From the global configuration mode, run the following commands:

```
device-alias database

device-alias name Infra-ESXi-Host-01 pwwn <WWPN-Infra-ESXi-Host-1-B>

device-alias name Infra-ESXi-Host-02 pwwn <WWPN-Infra-ESXi-Host-2-B>

device-alias name Infra-ESXi-Host-03 pwwn <WWPN-Infra-ESXi-Host-3-B>

device-alias name Infra-ESXi-Host-04 pwwn <WWPN-Infra-ESXi-Host-4-B>

device-alias name FS9100-Node1-FC2-NPIV pwwn <WWPN-FS9100-Node1-FC2>

device-alias name FS9100-Node1-FC4-NPIV pwwn <WWPN-FS9100-Node1-FC4>

device-alias name FS9100-Node2-FC2-NPIV pwwn <WWPN-FS9100-Node2-FC2>

device-alias name FS9100-Node2-FC4-NPIV pwwn <WWPN-FS9100-Node2-FC2>

device-alias name FS9100-Node2-FC4-NPIV pwwn <WWPN-FS9100-Node2-FC4>

device-alias name FS9100-Node2-FC4-NPIV pwwn <WWPN-FS9100-Node2-FC4>
```

2. Create the zones and add device-alias members for the 4 blades.

```
zone name Infra-ESXi-Host-01 vsan 102
member device-alias Infra-ESXi-Host-01
member device-alias FS9100-Node1-FC2
member device-alias FS9100-Node1-FC4
member device-alias FS9100-Node2-FC2
member device-alias FS9100-Node2-FC4
!
zone name Infra-ESXi-Host-02 vsan 102
member device-alias Infra-ESXi-Host-02
member device-alias FS9100-Node1-FC2-NPIV
member device-alias FS9100-Node1-FC4-NPIV
member device-alias FS9100-Node2-FC2-NPIV
member device-alias FS9100-Node2-FC4-NPIV
!
zone name Infra-ESXi-Host-03 vsan 102
member device-alias Infra-ESXi-Host-03
```

```
member device-alias FS9100-Node1-FC2-NPIV
member device-alias FS9100-Node1-FC4-NPIV
member device-alias FS9100-Node2-FC2-NPIV
!
zone name Infra-ESXi-Host-04 vsan 102
member device-alias Infra-ESXi-Host-04
member device-alias FS9100-Node1-FC2-NPIV
member device-alias FS9100-Node1-FC4-NPIV
member device-alias FS9100-Node2-FC2-NPIV
member device-alias FS9100-Node2-FC4-NPIV
!
```

3. Add zones to zoneset.

```
zoneset name versastackzoneset vsan 102
member Infra-ESXi-Host-01
member Infra-ESXi-Host-02
member Infra-ESXi-Host-03
member Infra-ESXi-Host-04
```

4. Activate the zoneset.

```
zoneset activate name versastackzoneset vsan 102
```

Validate all the HBA's are logged into the MDS switch. The FS9100 nodes and the Cisco servers should be powered on. To start the Cisco servers from Cisco UCS Manager, select the server tab, then click Servers + Service → Profiles → root, and right-click service profile then select boot server.

5. Validate that all the powered-on system's HBAs are logged into the switch through the show zoneset command.

```
show zoneset active
```

```
VersaStack-MDS-B# sh zoneset active
zoneset name versastackzoneset vsan 102
zone name Infra-ESXi-Host-01 vsan 102
    pwwn 20:00:00:25:b5:00:0b:00 [Infra-ESXi-Host-01]
* fcid 0xc60041 [pwwn 50:05:07:68:10:16:05:16] [VS-FS9100-Node1-FC2]
* fcid 0xc60061 [pwwn 50:05:07:68:10:18:05:16] [VS-FS9100-Node1-FC4]
* fcid 0xc60081 [pwwn 50:05:07:68:10:16:05:0d] [VS-FS9100-Node2-FC2]
* fcid 0xc600a1 [pwwn 50:05:07:68:10:18:05:0d] [VS-FS9100-Node2-FC4]
```

```
zone name Infra-ESXi-Host-02 vsan 102
 pwwn 20:00:00:25:b5:00:0b:01 [Infra-ESXi-Host-02]
* fcid 0xc60041 [pwwn 50:05:07:68:10:16:05:16] [VS-FS9100-Node1-FC2]
* fcid 0xc60061 [pwwn 50:05:07:68:10:18:05:16] [VS-FS9100-Node1-FC4]
* fcid 0xc60081 [pwwn 50:05:07:68:10:16:05:0d] [VS-FS9100-Node2-FC2]
* fcid 0xc600a1 [pwwn 50:05:07:68:10:18:05:0d] [VS-FS9100-Node2-FC4]
zone name Infra-ESXi-Host-03 vsan 102
* fcid 0xc60103 [pwwn 20:00:00:25:b5:00:0b:02] [Infra-ESXi-Host-03]
* fcid 0xc60041 [pwwn 50:05:07:68:10:16:05:16] [VS-FS9100-Node1-FC2]
* fcid 0xc60061 [pwwn 50:05:07:68:10:18:05:16] [VS-FS9100-Node1-FC4]
* fcid 0xc60081 [pwwn 50:05:07:68:10:16:05:0d] [VS-FS9100-Node2-FC2]
* fcid 0xc600a1 [pwwn 50:05:07:68:10:18:05:0d] [VS-FS9100-Node2-FC4]
zone name Infra-ESXi-Host-04 vsan 102
* fcid 0xc60104 [pwwn 20:00:00:25:b5:00:0b:03] [Infra-ESXi-Host-04]
* fcid 0xc60041 [pwwn 50:05:07:68:10:16:05:16] [VS-FS9100-Node1-FC2]
* fcid 0xc60061 [pwwn 50:05:07:68:10:18:05:16] [VS-FS9100-Node1-FC4]
* fcid 0xc60081 [pwwn 50:05:07:68:10:16:05:0d] [VS-FS9100-Node2-FC2]
* fcid 0xc600a1 [pwwn 50:05:07:68:10:18:05:0d] [VS-FS9100-Node2-FC4]
```

6. Save the configuration.

copy run start

IBM FS9100 FC Configuration

As part of IBM FS9100 FC configuration, follow these steps:

- 1. Create ESXi boot Volumes (Boot LUNs for all the ESXi hosts).
- 2. Create Share Storage Volumes (for hosting VMs).
- 3. Map Volumes to Hosts.

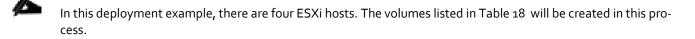


Table 18 List of FC Volu	umes on IBM FSg	100*	
Volume Name	Capacity (GB)	Purpose	Mapping

Volume Name	Capacity (GB)	Purpose	Mapping
Infra-ESXi-Host-01	10	Boot LUN for the Host	Infra-ESXi-Host-01
Infra-ESXi-Host-02	10	Boot LUN for the Host	Infra-ESXi-Host-02
Infra-ESXi-Host-o3	10	Boot LUN for the Host	Infra-ESXi-Host-03
Infra-ESXi-Host-04	10	Boot LUN for the Host	Infra-ESXi-Host-04
Infra-datastore-1	2000*	Shared volume to host VMs	All ESXi hosts: Infra-ESXi-Host-01 to Infra-ESXi- Host-04
Infra-datastore-2	2000*	Shared volume to host VMs	All ESXi hosts: Infra-ESXi-Host-01 to Infra-ESXi- Host-04
Infra-swap	500*	Shared volume to host VMware VM swap directory	All ESXi hosts: Infra-ESXi-Host-01 to Infra-ESXi- Host-04

* Customers should adjust the names and values based on their environment.

Create Volumes on the Storage System

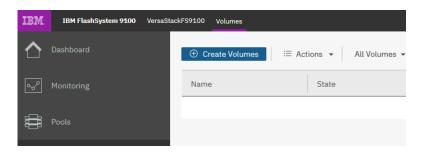
To create volumes on the storage system, follow these steps:

1. Log into the IBM FS9100 GUI and select the **Volumes** icon one the left screen and select **Volumes**.

IBM	IBM FlashSystem 9100 Ve	rsaStacki	FS9100 Volumes		
			① Create Volumes	≔ Actions - All	Volumes 👻
ୖୖ			Name	State	Synchroniz
₿					
8	Volumes	V	olumes		
			olumes by Pool		
			olumes by Host		
		с	loud Volumes		
\bigcirc					
ŝ					

You will repeat the following steps to create and map the volumes shown in Table 18.

2. Click Create Volumes as shown below.



- 3. Click **Basic** and the select the pool (VS-Pool0 in this example) from the drop-down list.
- 4. When creating single volumes, input quantity 1 and the capacity and name from Table 18 .Select Thin-provisioned for Capacity savings and enter the Name of the volume. Select I/O group io grp0.
- 5. When creating multiple volumes in bulk enter the quantity required and review the Name field. The number value will be appended to the specified volume name.

%	
	IBM FS9100 and Spectrum Virtualize is optimized for environments with more than 30 volumes. Consider distrib-
	uting Virtual Machines over multiple VMFS datastores for optimal performance.

Basic	Mirrored	Custom		
Create a preset v	volume with all the basic fe	eatures.		
Pool:	Effe	ctive Capacity:		
VS-Pool0	•			
Volume Details			otal 6.98 TiB	
Volume Details Quantity:	Capacity:	Name:	otal 6.98 TiB	
			otal 6.98 TiB	4
Quantity:	10 GiB	Name:		4
Quantity:	10 GiB	Name: Infra-ESXi-Host-0		4
4 🔔	10 GiB	Name: Infra-ESXi-Host-0		4

6. Click Create.

4

During the volume creation, expand **view more details** to monitor the CLI commands utilized to create each volume. All commands run against the system by either the GUI or CLI will be stored in the Audit log, along with the associated user account and timestamp.

7. Repeat steps 1-6 above to create all the required volumes and verify all the volumes have successfully been created as shown in the sample output below.

TRM.	JBM FlashSystem 9100 VersaSt	ack-FS9100 Volumes					🌲 🖡 🖗	superuser (Security Administra
≏	Dashboard	③ Create Volumes	ctions 👻 🕴 All Vol	lumes -			Default ~ Co	filler
°~°	Monitoring	Name	State	Synchronized	Paol	Protocol Type	UID	Host Mappings Capa
_		Infra-ESXI-Host-01	🗸 Online		VS-Pool0	SCSI	6005076810800028B00000000000000	Yes
*	Paols	Infra-ESXI-Host-02	🗸 Online		VS-Peel0	SCSI	6305076810800029B0003000300300	Yes
_		Infra-ESXI-Host-03	🗸 Online		VS-Peel0	SCSL	630507681060002980000000000000	Yes
	Volumes	Infra-ESXI-Host-04	🗸 Online		VS-Pool0	SCSI	63050768106300298000300300300	Yes
		Infra-ESXI-ISCSI-Host-01	🗸 Online		VS-PoolD	SCSI	6305076810830028B000300000000	Yes
	Hosts	Infra-ESXI-iSCSI-Host-02	🗸 Online		VS-Pool0	SCSI	63050768108000288000300000000	Yes
		Infra_Datastore1	🗸 Online		V5-Pool0	SCST	6005076810800028B0000000000000	Yes
÷	Copy Services	Infra_Datastore2	🗸 Online		V5-Pool0	SCST	6005076810800028B00000000000000	Yes
		Infra_Swap	🗸 Online		V5-Pool0	SCSI	6305076810800028B00030000000000	Yes

Create Host Cluster & Host Objects

Host Cluster Shared & Private Mappings

In traditional hypervisor environments such as VMware vSphere, each physical host requires access to the same shared datastores (or LUNs) in order to facilitate features such as vMotion, High Availability, Fault Tolerance. It is import for all ESXi hosts within a vSphere cluster to have identical access to LUNs presented from the FS9100.

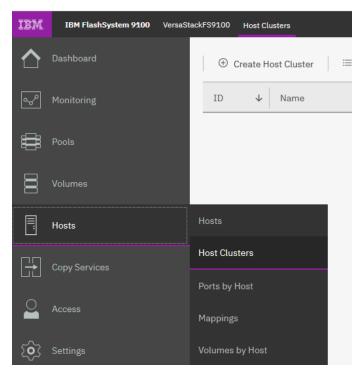
The Host Clusters feature in IBM Spectrum Virtualize products introduces a way to simplify administration when mapping volumes to host environments that require shared storage.



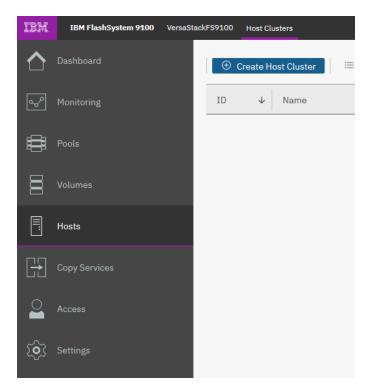
It is recommended that a Host Cluster object be created for each vSphere Cluster visible in vCenter, and any ESXi hosts within the vSphere cluster be defined as individual host objects within FS9100. This ensures that volume access is consistent across all members of the cluster and any hosts that are subsequently added to the Host Cluster will inherit the same LUN mappings.

To create host clusters and host objects, follow these steps:

1. Click Hosts then click Host Clusters.



2. Click Create Host Cluster.



3. Give the Host Cluster a friendly name.

lame: VS-UC	S01					
		ssign to a new host clu n the host cluster.	ister. Any o	current volum	e mappings become the sha	ared
It is recomm	ended that	all hosts in a host clu	ster have a	access to the	same I/O Groups.	
4		Default	~	Contains 🗸	Filter	Ŕ
Name	\checkmark	Status				
< Showing 0 hosts	: Selecting	No	items fou	lost Type	Host Mappings	P ₹
	: Selecting Cancel	No				
Showing 0 hosts	Cancel	No	items fou	Jind.	- Back N	>
Showing 0 hosts Need Help Review th	Cancel e summ	0 hosts	items fou	Jind.	- Back N	ext ►

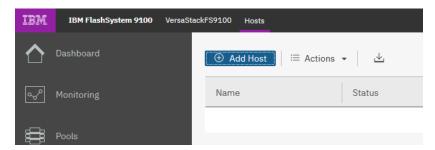


5. Click **Hosts** and then **Hosts** from the navigation menu.

IBM	IBM FlashSystem 9100	/ersaStacl	FS9100 Volur	nes	
	Dashboard		🕀 Create V	∕olumes ≔ A	Actions 👻 🛛 All
ୢ୶ୖ	Monitoring		Name		State
			Infra-E	SXi-iSCSI-Host-01	🗸 Online
	Pools		Infra-E	SXi-iSCSI-Host-02	✓ Online
_			Infra-E	SXi-iSCSI-Host-03	✓ Online
	Volumes		Infra-E	SXi-iSCSI-Host-04	🗸 Online
					🗸 Online
Ē	Hosts		Hosts		✓ Online
Ē	Copy Services		Host Clusters		
		I	Ports by Host		
	Access		Mappings		
ক্ট	Settings	ľ	/olumes by Hos	st	

For each ESXi host (Table 18), follow these steps on the IBM FS9100 system:

6. Click Add Host.



- 7. Select Fibre Channel (SCSI). Add the name of the host to match the ESXi service profile name from Table 18.
- 8. From the drop-down list, select both (Fabric A and B) WWPNs corresponding to the host in Table 15.
- 9. Select the Host Cluster that we created in the previous step.

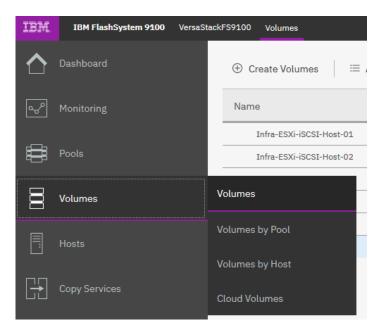
Add Host		
Required Fields		
Name:	Infra-ESXi-Host-01	
Host connections:	Fibre Channel (SCSI) 👻	
	2000002586000A00	$\oplus \ominus$
Host port (WWPN):	2000002586000B00 C -	$\oplus \ominus$
Optional Fields		
Host type:	Generic 👻	
I/O groups:	All	
Host cluster:	VS-UCS-01	

10. Click Add.

Map Volumes to Hosts and Host Cluster

To map volumes to hosts and host clusters, follow these steps:

1. Click Volumes.



2. Right-click the Boot LUN for each ESXi host in turn and choose **Map to Host**.

IBM.	IBM FlashSystem 9100 VersaSt	ack-FS9100 Volumes		
\triangle	Dashboard	🕀 Create Volumes	≔ Actions 👻 All Volumes	•
مرب ⁰	Monitoring	Name	State	Synchronized Pool
		Infra-ESXi-Host-01	- Conline	VS-Pool0
μ	Pools	Infra-ESXi-Host-02	Rename	VS-Pool0
_		Infra-ESXi-Host-03	Map to Host or Host Cluster	VS-Pool0
	Volumes	Infra-ESXi-Host-04	Shrink	VS-Pool0
		Infra-ESXi-iSCSI-Host-	Expand	VS-Paol0
	Hosts	Infra-ESXi-iSCSI-Host-	Modify Capacity Savings	VS-Paol0
		Infra_Datastore1	Modify Mirror Sync Rate	VS-Pool0
H	Copy Services	Infra_Datastore2	Cache Mode	VS-Pool0
		Infra_Swap	Modify Open VMS UDID	VS-Pool0

3. Select the Hosts radio button and select the corresponding Host in the list and click Next.

Create Ma	apping	5			
Create Mapping	s to:				
Hosts					
O Host Clus	ters				
Select hosts to	map to Infra	I-ESXi-Host-01			
		De	efault ~ Contains ~	Filter	۶ą.
Name	\downarrow	Status	Host Type	Host Mappings	Protoco III
Infra-ESXi-H	ost-01	🙁 Offline	Generic	Yes	SCSI
Infra-ESXi-H	ost-02	Offline	Generic	Yes	SCSI
Infra-ESXi-H	ost-03	🗸 Online	Generic	Yes	SCSI
Infra-ESXi-H	ost-04	🗸 Online	Generic	Yes	SCSI

4. Click Map Volumes and when the process is complete, click Close.

he following volumes will be ma	apped to Infra-ESXi-Hos	st-01:		
Name	SCSI ID	Caching I/O Group ID	New Mapping	llí
Infra-ESXi-Host-01	0	0	New	

- 5. Repeat above steps to map a Boot volume for each ESXi host in the cluster.
- 6. When mapping shared volumes from Table 18 i.e. for shared VMFS datastores, right click on the volume in question (or select multiple volumes if mapping multiple LUNs) and select **Map to Host or Host Cluster**.

Name	State	Synchronized Pool	Protocol Ty
Infra_Datastore1	🗸 Online		SCSI
Infra_Datastore2	🗸 Online	Rename	SCSI
Infra_Swap	🗸 Online	Map to Host or Host Cluster	SCSI
RAW1	🗸 Online	Shrink	
RAW2	🗸 Online	Expand	
RAW3	🗸 Online	Modify Capacity Savings	
RAW4	🗸 Online	Modify Mirror Sync Rate	
RAW5	🗸 Online	Cache Mode	
RAW6	🗸 Online	Modify Open VMS UDID	
RAW7	🗸 Online	Remove Private Mappings	
RAW8	 Online 	View Mapped Hosts	
RAW9	🗸 Online	View Member MDisks	SCSI
RAW10	🗸 Online	View Member MDISKS	SCSI

7. Select the **Host Clusters** radio button.

Create Mappings to:				
O Hosts				
Host Clusters				
Select host clusters to	map to 3 volumes			
	Default	∽ Contains ∽	Filter	×.
Name	↓ Status	Host Count	Mappings Count	IIÎ
VS-UCS-01	🙁 Offline	2	0	6

8. Review the summary and click **Map Volumes** to confirm.

he following volumes will be m	apped to VS-UCS-01:			
Name	SCSI ID	Caching I/O Group ID	New Mapping	II
Infra_Datastore1	1	0	New	
Infra_Datastore2	2	0	New	
Infra_Swap	3	0	New	

9. Any Shared host cluster mappings will be automatically inherited by any future ESXi hosts which are defined as members of the host cluster.

VMware vSphere Setup for Cisco UCS Host Environment

VMware ESXi 6.7 U2

This section provides detailed instructions for installing VMware ESXi 6.7 U₂ in the VersaStack UCS environment. After the procedures are completed, multiple ESXi hosts will be provisioned to host customer workloads.

Several methods exist for installing ESXi in a VMware environment. These procedures focus on how to use the built-in keyboard, video, mouse (KVM) console and virtual media features in Cisco UCS Manager to map remote installation media to individual servers and connect to their boot logical unit numbers (LUNs).

Log into Cisco UCS Manager

The IP KVM enables the administrator to begin the installation of the operating system (OS) through remote media. It is necessary to log into the UCS environment to run the IP KVM.

To log into the Cisco UCS environment, follow these steps:

- 1. Open a web browser and enter the IP address for the Cisco UCS cluster address. This step launches the Cisco UCS Manager application.
- 2. Under HTML, click the Launch UCS Manager link.
- 3. When prompted, enter admin as the user name and enter the administrative password.
- 4. To log in to Cisco UCS Manager, click Login.
- 5. From the main menu, click the **Servers** tab.
- 6. Select Servers > Service Profiles > root > Infra-ESXi-Host-o1.

For iSCSI setup, the name of the profile will be Infra-ESXi-iSCSI-Host-0.1

- 7. Right-click Infra-ESXi-Host-01 and select KVM Console.
- 8. If prompted to accept an Unencrypted KVM session, accept as necessary.
- 9. Open KVM connection to all the hosts by right-clicking the Service Profile and launching the KVM console
- 10. Boot each server by selecting Boot Server and clicking **OK**. Click **OK** again.

Install ESXi on the UCS Servers

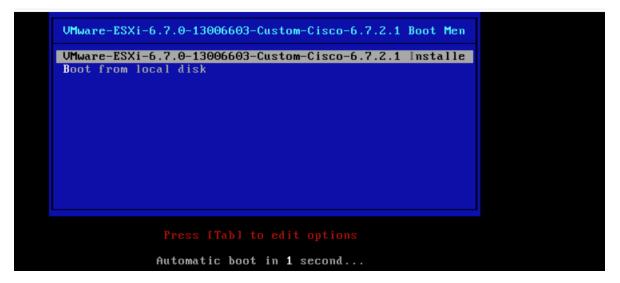
To install VMware ESXi to the boot LUN of the hosts, follow these steps on each host. The Cisco customer VMware ESXi image can be downloaded from:

https://my.vmware.com/web/vmware/details?downloadGroup=OEM-ESXI67U2-CISCO&productId=742

ß

VMware ESXi will be installed on two Cisco UCS servers as part of the deployment covered in the following sections. The number of ESXi servers can vary based on the customer specific deployment.

- 1. In the KVM windows, click Virtual Media in the upper right of the screen.
- 2. Click Activate Virtual Devices.
- 3. If prompted to accept an Unencrypted KVM session, accept as necessary.
- 4. Click Virtual Media and select Map CD/DVD.
- 5. Browse to the ESXi installer ISO image file and click **Open**.
- 6. Click Map Device.
- 7. Click the **KVM** tab to monitor the server boot.
- 8. Reset the server by clicking Reset button. Click **OK**.
- 9. Select Power Cycle on the next window and click **OK** and **OK** again.
- 10. On reboot, the machine detects the presence of the boot LUNs (sample output below).
- 11. From the ESXi Boot Menu, select the ESXi installer.



- 12. After the installer has finished loading, press **Enter** to continue with the installation.
- 13. Read and accept the end-user license agreement (EULA). Press F11 to accept and continue.
- 14. Select the LUN that was previously set up and discovered as the installation disk for ESXi and press **Enter** to continue with the installation.

(a	ny existing		isk to Install d Il be automatica	or Upgrade ally upgraded to	VMFS-5)
	ins a VMFS ed by VMwar				
Storage	Device				Capacity
Local: (non Renote:	e)				
* 181 * 18M * 18M * 18M	2145 2145 2145 2145 2145		(naa.6005076810 (naa.6005076810	080002850000) 080002850000) 080002850000) 080002850000)	2.00 TiB 2.00 TiB
(Esc) Cancel	(F1) Detai	ils (F5) Refr	resh (Enter)(ont inve

- 15. Select the appropriate keyboard layout and press **Enter**.
- 16. Enter and confirm the root password and press **Enter**.
- 17. The installer issues a warning that the selected disk will be repartitioned. Press **F11** to continue with the installation.
- 18. After the installation is complete, press Enter to reboot the server.
- 19. Repeat the ESXi installation process for all the Service Profiles.

In this deployment, we used two UCS server blades for the VMware vSphere deployment.

Set Up Management Networking for ESXi Hosts

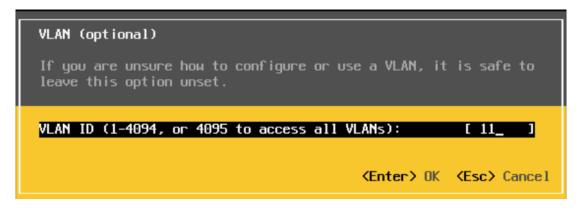
Adding a management network for each VMware host is necessary for managing the host. To add a management network for the VMware hosts, follow these steps on each ESXi host.

To configure the ESXi hosts with access to the management network, follow these steps:

- 1. After the server has finished post-installation rebooting, press F2 to customize the system.
- 2. Log in as root, enter the password chosen during the initial setup, and press Enter to log in.
- 3. Select the Configure Management Network option and press Enter.
- 4. Select Network Adapters
- 5. Select vmnic0 (if it is not already selected) by pressing the Space Bar.

Configure Management No	etwork Network Adapters	
Network Adapters VLAN (optional) IPv4 Configuration IPv6 Configuration DNS Configuration Custon DNS Suffixes	vmnic0 (SlotID:0(MLOM); relative bdf 03:00.0) The adapters listed here provide the default netw connection to and from this host. When two or nor are used, connections will be fault-tolerant and traffic will be load-balanced. Network Adapters Select the adapters for this host's default management network connection. Use two or more adapters for fault-tolerance and	re adapters
	Connection. Use two or more adapters for fault-tolerance and load-balancing. Device Name Hardware Label (MAC Address) Status [X] wnic0 SlotID:0(ML (07:0a:17) Connected () [] vnnic1 SlotID:0(ML (07:0b:17) Connected [] vnnic2 SlotID:0(ML (07:0a:18) Connected [] vnnic3 SlotID:0(ML (07:0b:18) Connected [] vnnic3 SlotID:0(ML (07:0b:18) Connected [] vnnic4 SlotID:0(ML (07:0b:19) Connected [] vnnic5 SlotID:0(ML (07:0b:19) Connected [] vnnic5 SlotID:0(ML (07:0b:19) Connected [] vnnic5 SlotID:0(ML (07:0b:19) Connected [] vnnic6 SlotID:0(ML (07:0b:10) Connected () [] vnnic7 SlotID:0(ML (07:0b:10) Connected	
	<pre> View Details <space> Toggle Selected <enter> DK <esc> Cancel </esc></enter></space></pre>	
⟨Up/Down≻ Select	<enter> Change</enter>	≪Esc≻ Exit

- 6. Press Enter to save and exit the Network Adapters window.
- 7. Select the VLAN (Optional) and press Enter.
- 8. Enter the <IB Mgmt VLAN> (11) and press Enter.



9. Select IPv4 Configuration and press Enter.

- 10. Select the Set Static IP Address and Network Configuration option by using the Space Bar.
- 11. Enter the IP address for managing the ESXi host.
- 12. Enter the subnet mask for the management network of the ESXi host.
- 13. Enter the default gateway for the ESXi host.

IPv4 Configuration					
This host can obtain network settings automatically if your network includes a DHCP server. If it does not, the following settings must be specified:					
() Disable IPv4 configuration for management () Use dynamic IPv4 address and network conf (o) Set static IPv4 address and network config	iguration				
IPv4 Address	[192.168.162.101]				
Subnet Mask	[255.255.252.0]				
Default Gateway	[192.168.160.1]				
<pre><up down=""> Select <space> Mark Selected</space></up></pre>	<pre> (Enter> OK (Esc> Cance1) </pre>				

- 14. Press **Enter** to accept the changes to the IP configuration.
- 15. Select the IPv6 Configuration option and press Enter.
- 16. Using the Space Bar, select Disable IPv6 (restart required) and press **Enter**.
- 17. Select the DNS Configuration option and press Enter.

Because the IP address is assigned manually, the DNS information must also be entered manually.

- 18. Enter the IP address of the primary DNS server.
- 19. **Optional**: Enter the IP address of the secondary DNS server.
- 20. Enter the fully qualified domain name (FQDN) for the ESXi host.

DNS Configuration				
This host can only obtain DNS settings automatically if it also obtains its IP configuration automatically.				
() Obtain DNS server addresses and a hostname automatically (o) Use the following DNS server addresses and hostname:				
Primary DNS Server [192.168.161.22] Alternate DNS Server []				
Hostname [Infra-ESXi-Host-01.versastack.local]				
<pre><up down=""> Select <space> Mark Selected <enter> OK <esc> Cancel</esc></enter></space></up></pre>				

- 21. Press **Enter** to accept the changes to the DNS configuration.
- 22. Press **Esc** to exit the Configure Management Network submenu.
- 23. Press **Y** to confirm the changes and reboot the host.
- 24. Repeat this procedure for all the ESXi hosts in the setup.

VMware vSphere Configuration

The vSphere configuration covered in this section is common to all the ESXi servers. In the procedure below, three shared datastores, two for hosting the VMs and another to host the VM swap files, will be mounted to all the ESXi servers. Customers can adjust the number and size of the shared datastores based on their particular deployments.

Log into VMware ESXi Hosts Using VMware vSphere Client

To log into the ESXi host using the VMware Host Client, follow these steps:

- 1. Open a web browser on the management workstation and navigate to the management IP address of the host.
- 2. Click Open the VMware Host Client.
- 3. Enter root for the user name.
- 4. Enter the root password configured during the installation process.
- 5. Click Login to connect.
- 6. Decide whether to join the VMware Customer Experience Improvement Program and click OK.
- 7. Repeat this process to log into all the ESXi hosts.

Install VMware Drivers for the Cisco Virtual Interface Card (VIC)

For the most recent versions, please refer to <u>Cisco UCS HW and SW Availability Interoperability Matrix</u>. If a more recent driver is made available that is appropriate for VMware vSphere 6.7 U2, download and install the latest drivers.

To install VMware VIC Drivers on the ESXi hosts using esxcli, follow these steps:

1. Download and extract the following VIC Drivers to the Management workstation:

NFNIC Driver version 4.0.0.40:

https://my.vmware.com/web/vmware/details?downloadGroup=DT-ESXI67-CISCO-NFNIC-40040&productId=742

NENIC Driver version 1.0.29.0:

https://my.vmware.com/web/vmware/details?downloadGroup=DT-ESXI67-CISCO-NENIC-10290&productId=742

To install VIC Drivers on ALL the ESXi hosts, follow these steps:

- 1. From each Host Client, select Storage.
- 2. Right-click datastore1 and select Browse.
- 3. In the Datastore browser, click **Upload**.
- 4. Navigate to the saved location for the downloaded VIC drivers and select VMW-ESX-6.7.0-nenic-1.0.29.0-offline_bundle-12897497.zip.
- 5. In the Datastore browser, click **Upload**.
- 6. Navigate to the saved location for the downloaded VIC drivers and select VMW-ESX-6.7.0-nfnic-4.0.0.40-offline_bundle-14303978.zip.
- 7. Click Open to upload the file to datastore1.
- 8. Make sure the file has been uploaded to both ESXi hosts.
- 9. Place each host into Maintenance mode if it isn't already.
- 10. Connect to each ESXi host through ssh from a shell connection or putty terminal.
- 11. Login as root with the root password.
- 12. Run the following commands on each host:

```
esxcli software vib update -d /vmfs/volumes/datastore1/VMW-ESX-6.7.0-nenic-1.0.29.0-offline_bundle-
12897497.zip
esxcli software vib update -d /vmfs/volumes/datastore1/VMW-ESX-6.7.0-nfnic-4.0.0.40-offline_bundle-
14303978.zip
```

reboot

13. Log into the Host Client on each host once reboot is complete and exit Maintenance Mode.

Mount Required Datastores

To mount the required datastores, follow these steps on each ESXi host:

1. From the Host Client, select **Storage**.

- 2. In the center pane, select the **Datastores** tab.
- 3. In the center pane, select New Datastore to add a new datastore.
- 4. In the New datastore popup, select Create new VMFS datastore.
- 5. Click Next.

New datastore							
1 Select creation type 2 Select device 3 Select partitioning options	Select creation type How would you like to create a datastore?						
4 Ready to complete	Create new VMFS datastore Add an extent to existing VMFS datastore Expand an existing VMFS datastore extent Mount NFS datastore	Create a new VMFS datastore on a local disk device					
vm ware [,]		Back Next Finish Cancel					

- 6. Enter Infra_datastore1 as the datastore name.
- 7. Verifying by using the size of the datastore LUN, select the LUN configured for VM hosting and click **Next**.

New datastore - Infra_datastore1							
 1 Select creation type 2 Select device 3 Select partitioning options 4 Ready to complete 	Select device Select a device on which to create a new VMFS partition						
	Infra_datastore1	e a new V	/MFS datas	store			
	Name ~	Туре	~	Capacity	~	Free spa	ice ~
	IBM ISCSI Disk (naa.6005076810800028b00000000	Disk		2 TB		2 TB	1 items
							A
vm ware [®]							
		(Back	Next) [F	inish	Cancel

- 8. Accept default VMFS setting and Use full disk option to retain maximum available space.
- 9. Click Next
- 10. Verify the details and Click Finish.
- 11. In the center pane, select the Datastores tab.
- 12. In the center pane, select New Datastore to add a new datastore.
- 13. In the New datastore popup, select Create new VMFS datastore.
- 14. Click Next.
- 15. Enter Infra_datastore2 as the datastore name.
- 16. Verifying by using the size of the datastore LUN, select the LUN configured for VM hosting and click Next.
- 17. Accept default VMFS setting and Use full disk option to retain maximum available space.
- 18. Click Next
- 19. Verify the details and Click Finish.
- 20. In the center pane, select the Datastores tab.
- 21. In the center pane, select New Datastore to add a new datastore.
- 22. In the New datastore popup, select Create new VMFS datastore.

- 23. Click Next.
- 24. Enter Infra swap as the datastore name.
- 25. Verifying by using the size of the datastore LUN, select the LUN configured for VM hosting and click Next.
- 26. Accept default VMFS setting and Use full disk option to retain maximum available space.
- 27. Click Next
- 28. Verify the details and Click Finish.
- 29. The storage configuration should look similar to figure shown below.
- 30. Repeat these steps on all the ESXi hosts.

Infra-ESXI-Host-OT.versastack.local - Storage								
Datastores Adaptes Device Persistent Memory								
🚼 New datastore 🖽 Increase capacity 💕 Register a VM 🤯 Datastore browser 🧭 Refresh 🔅 Actions								
Name	Drive Type ~	Capacity ~	Provisioned ~	Free ~	Туре			
datastore1	Non-SSD	2.5 GB	1.41 GB	1.09 GB	VMFS6			
Infra_datastore1	Non-SSD	2 TB	815.34 GB	1.2 TB	VMFS6			
Infra_datastore2	Non-SSD	2 TB	1.01 TB	1,015.83 GB	VMFS6			
Infra_swap	Non-SSD	499.75 GB	76.13 GB	423.62 GB	VMFS6			

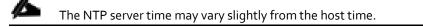
Configure NTP on ESXi Hosts

To configure NTP on the ESXI hosts, follow these steps on each host:

- 1. From the Host Client, select Manage.
- 2. In the center pane, select **Time & date**.
- 3. Click Edit settings.
- 4. Make sure Use Network Time Protocol (enable NTP client) is selected.
- 5. Use the drop-down to select Start and stop with host.
- 6. Enter the NTP addresses in the NTP servers box separated by a comma, Nexus switch addresses can be entered if NTP service is configured on the switches.

Edit time configuration Specify how the date and time of this host	should be set.
O Manually configure the date and time or 09/14/2019 10:46 AM	n this host
 Use Network Time Protocol (enable NTF 	P client)
NTP service startup policy	Start and stop manually \sim
NTP servers	192.168.162.128, 192.168.162.129
	Separate servers with commas, e.g. 10.31.21.2, fe00::2800

- 7. Click **Save** to save the configuration changes.
- 8. Select Actions > NTP service > Start.
- 9. Verify that NTP service is now running and the clock is now set to approximately the correct time.



Move VM Swap File Location

To move the VM swap file location, follow these steps on each ESXi host:

- 1. From the Host Client, select Manage.
- 2. In the center pane, select **Swap**.
- 3. Click Edit settings.
- 4. Use the drop-down list to select Infra swap. Leave all other settings unchanged.

Edit swap configuration	
Enabled	 Yes ○ No
Datastore	Infra_swap ~
Local swap enabled	 Yes ○ No
Host cache enabled	 Yes ○ No
	Save Cancel

5. Click **Save** to save the configuration changes.

Deploy VMware vCenter Appliance 6.7 (Optional)

The VCSA deployment consists of 2 stages: install and configuration. To build the VMware vCenter virtual machine, follow these steps:

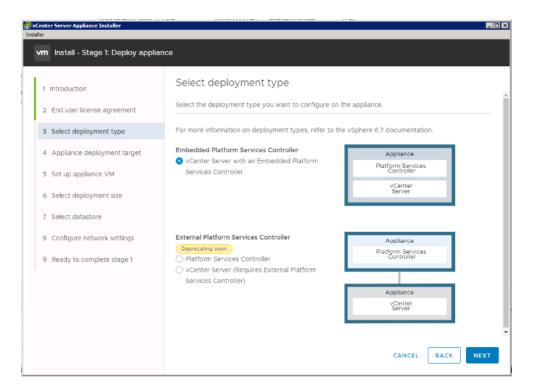
- 1. Download the VCSA ISO from VMware at https://my.vmware.com/group/vmware/details?downloadGroup=VC67U2C&productId=742&rPId=35624
- 2. Using ISO mounting software, mount the ISO image as a disk on the management workstation. (For example, with the Mount command in Windows Server 2012).
- 3. In the mounted disk directory, navigate to the vcsa-ui-installer > win32 directory and double-click installer.exe. The vCenter Server Appliance Installer wizard appears.

Center Server Appliance Installer							
vm vCe	enter Server Appliance 6	i.7 Installer		⊕ English ~			
			W -				
	Install	Upgrade	Migrate	Restore			
	Install a new vCenter Server Appliance or Platform Services Controller	Upgrade an existing vCenter Server Appliance or Platform Services Controller Appliance	Migrate from an existing vCenter Server or Platform Services Controller or Single Sign-On server for	Restore from a previously created vCenter Server Appliance or Platform Services Controller			
			Windows to Appliance	Appliance backup			

- 4. Click **Install** to start the vCenter Server Appliance deployment wizard.
- 5. Click **Next** in the Introduction section.
- 6. Read and accept the license agreement and click **Next**.

I Introduction	End user license agreement
2 End user license agreement	Read and accept the following license agreement.
3 Select deployment type	VMWARE END USER LICENSE AGREEMENT
4 Appliance deployment target	PLEASE NOTE THAT THE TERMS OF THIS END USER LICENSE AGREEMENT SHALL GOVERN YOUR USE OF THE SOFTWARE, REGARDLESS OF ANY TERMS THAT MAY APPEAR DURING THE INSTALLATION OF THE SOFTWARE.
5 Set up appliance VM	IMPORTANT-READ CAREFULLY: BY DOWNLOADING, INSTALLING, OR USING THE SOFTWARE, YOU (THE INDIVIDUAL OR LEGAL ENTITY) AGREE TO BE BOUND BY THE TERMS OF THIS END USER
6 Select deployment size	LICENSE AGREEMENT ("EULA"), IF YOU DO NOT AGREE TO THE TERMS OF THIS EULA, YOU MUST NOT DOWNLOAD, INSTALL, OR USE THE SOFTWARE, AND YOU MUST DELETE OR RETURN THE UNUSED SOFTWARE TO THE VENDOR FROM WHICH YOU ACQUIRED IT WITHIN THIRTY (30) DAYS
7 Select datastore	AND REQUEST A REFUND OF THE LICENSE FEE, IF ANY, THAT YOU PAID FOR THE SOFTWARE.
8 Configure network settings	EVALUATION LICENSE. If You are licensing the Software for evaluation purposes, Your use of the Software is only permitted in a non-production environment and for the period limited by the License Key. Notwithstanding any other onvoision in this FULA an Evaluation License of the Software is.
9 Ready to complete stage 1	I accept the terms of the license agreement.

7. In the "Select deployment type" section, select vCenter Server with an Embedded Platform Services Controller and click **Next**.



8. In the "Appliance deployment target", enter the ESXi host name or IP address for the first configured VSI host, User name and Password. Click **Next**.

Insta	ller					
	vm	Install - Stage 1: Deploy vCenter	Server Appliance with an Embe	dded Platform Services Co	ontroller	
	1	Introduction	Appliance deploymen	t target		
	2	End user license agreement	Specify the appliance deployment instance on which the appliance w		he ESXi host or vCen	ter Server
	3	Select deployment type	ESXI host or vCenter Server	192.168.162.101		٩
	4	Appliance deployment target	name			-
	5	Set up appliance VM	HTTPS port	443		
	6	Select deployment size	User name	root		(i)
	7		Password			
	8	Configure network settings				
	9	Ready to complete stage 1				
					CANCEL	NEXT

9. Click **Yes** to accept the certificate.

1 Introduction	Set up appliance \ Specify the VM settings for t	'M he appliance to be deployed.	
 2 End user license agreement 3 Select deployment type 	VM name	vCenter	(i)
4 Appliance deployment target	Set root password		(i)
5 Set up appliance VM	Confirm root password		
6 Select deployment size			
7 Select datastore			
8 Configure network settings			
9 Ready to complete stage 1			

10. Enter the Appliance name and password details in the "Set up appliance VM" section. Click **Next**.

11. In the "Select deployment size" section, Select the deployment size and Storage size. For example, "Tiny" Deployment size was selected in this CVD.

Introduction	Se	elect deploy	ment	size				
2 End user license agreement	Sel	Select the deployment size for this vCenter Server with an Embedded Platform Services						
Select deployment type	For	For more information on deployment sizes, refer to the vSphere 6.7 documentation.						
Appliance deployment target	Dep	oloyment size		Tiny			v	
5 Set up appliance VM	Sto	Storage size Default ~					٩	
Select deployment size	Res	Resources required for different deployment sizes						
Select datastore		Deployment Size	vCPUs	Memory (GB)	Storage (GB)	Hosts (up to)	VMs (up to)	
3 Configure network settings		Tiny	2	10	300	10	100	
		Small	4	16	340	100	1000	
Ready to complete stage 1		Medium	8	24	525	400	4000	
		Large	16	32	740	1000	10000	
		X-Large	24	48	1180	2000	35000	

12. Click Next.

13. Select preferred datastore e.g. the "Infra_datastore1" was created previously.

2 End user license agreement	Select the st	torage location f	or this appliance			
3 Select deployment type	Name	т Туре т	Capacity T	Free Y	Provisioned T	Thin Provisioning T
4 Appliance deployment target	datastore1	VMFS-6	2.5 GB	1.09 GB	1.41 GB	Supported
5 Set up appliance VM	Infra_datas ore1	t VMFS-6	2 TB	1.22 TB	801.18 GB	Supported
6 Select deployment size	Infra_datas ore2	it VMFS-6	2 TB	1,015.82 GB	1.01 TB	Supported
7 Select datastore	Infra_swap	VMFS-6	499.75 GB	433.45 GB	66.3 GB	Supported
8 Configure network settings						4 item
9 Ready to complete stage 1	🗌 Enable T	hin Disk Mode(D			

14. Click Next.

15. In the "Network Settings" section, configure the following settings:

- a. Choose a Network: VM Network
- b. IP version: IPV4
- c. IP assignment: static
- d. System name: <vcenter-fqdn> (optional)
- e. IP address: <vcenter-ip>
- f. Subnet mask or prefix length: <vcenter-subnet-mask>
- g. Default gateway: <vcenter-gateway>
- h. DNS Servers: <dns-server>

🛃 vCenter Server Appliance Installer Installer									
	vm Install - Stage 1: Deploy vCenter Server Appliance with an Embedded Platform Services Controller								
1 Introduction 2 End user license agreement	Configure network set Configure network settings for thi								
3 Select deployment type	Network	VM Network	<u>(</u>						
4 Appliance deployment target	IP version	IPv4							
5 Set up appliance VM	IP assignment	static	, 						
6 Select deployment size	FQDN	vcenter.versastack.local	í						
7 Select datastore	IP address	192.168.162.100	_						
8 Configure network settings	Subnet mask or prefix length	255.255.252.0	í						
9 Ready to complete stage 1	Default gateway	192.168.160.1	_						
	DNS servers	192.168.160.22	_						
	Common Ports								
	НТТР	80	_						
	HTTPS	443	_						
		CANCEL	ACK NEXT						

16. Click Next.

- 17. Review all values and click **Finish** to complete the installation.
- 18. The vCenter appliance installation will take a few minutes to complete.
- 19. Click **Continue** to proceed with stage 2 configuration.

- 20. Click Next.
- 21. In the Appliance Configuration, configure the below settings:
 - a. Time Synchronization Mode: Synchronize time with the ESXi host.

Since the ESXi host has been configured to synchronize the time with an NTP server, vCenter time can be synced to ESXi host. Customer can choose a different time synchronization setting.

b. SSH access: Enabled.

vm	Install - Stage 2: Set Up vCen	ter Server Appliance with an Embe	edded PSC	
1	Introduction	Appliance configuration	1	
2	Appliance configuration			
3	SSO configuration	Time synchronization mode	Synchronize time with the ESXi ho \sim	
4	Configure CEIP	SSH access	Enabled ~	
5	Ready to complete			
			CANCEL BACK NEXT	
			CANCEL BACK NEXT	

- 22. Click Next.
- 23. Complete the SSO configuration as shown below.

vm	Install - Stage 2: Set Up vCe	nter Server Appliance with an Embedded	Platform Services Controller	
1	Introduction	SSO configuration		4
2	Appliance configuration	Create a new SSO domain		
3	SSO configuration	Single Sign-On domain name	vsphere.local	í
4	Configure CEIP	Single Sign-On user name	administrator	
5	Ready to complete	Single Sign-On password		1
		Confirm password		- 1
		Join an existing SSO domain		_
			CANCEL BACK	VEXT

- 24. Click Next.
- 25. If preferred, select Join the VMware's Customer Experience Improvement Program (CEIP).
- 26. Click Next.
- 27. Review the configuration and click Finish.
- 28. Click OK.
- 29. Make note of the access URL shown in the completion screen.
- 30. Click Close.

Adjust vCenter CPU Settings

If a vCenter deployment size of Small or larger was selected in the vCenter setup, it is possible that the VCSA's CPU setup does not match the UCS server CPU hardware configuration. Cisco UCS B200 and C220 servers are 2-socket servers. In this validation, the Small deployment size was selected and vCenter was setup for a 4-socket server. This setup will cause issues in the VMware ESXi cluster Admission Control. To resolve the Admission Control issue, follow these steps:

- 1. Open a web browser on the management workstation and navigate to the Infra-esxi-host-01 management IP address.
- 2. Click Open the VMware Host Client.
- 3. Enter root for the user name.
- 4. Enter the root password.
- 5. Click Login to connect.

- 6. In the center pane, right-click the vCenter VM and select Edit settings.
- 7. In the Edit settings window, expand CPU and check the value of Sockets is not greater than 2.

🛱 Edit settings - VMware vCenter Server Appliance (ESXi 5.5 virtual machine)								
Virtual Hardware VM Options								
🔜 Add hard disk 🛛 🛤 Add network ada	apter 🔄 Add other device							
- 🗖 CPU 🛕	2 ~ ()							
Cores per Socket	1 v Sockets: 2							
CPU Hot Plug	Enable CPU Hot Add							
Reservation	None ~ MHz ~							

- 8. If the number of Sockets is greater than 2, it will need to be adjusted. Click **Cancel**.
- 9. If the number of Sockets needs to be adjusted:
- 10. Right-click the vCenter VM and select Guest OS > Shut down. Click **Yes** on the confirmation.
- 11. Once vCenter is shut down, right-click the vCenter VM and select Edit settings.
- 12. In the Edit settings window, expand CPU and change the Cores per Socket value to make the Sockets value 2.
- 13. Click Save.
- 14. Right-click the vCenter VM and select Power > Power on. Wait approximately 10 minutes for vCenter to come up.

Set Up VMware vCenter Server

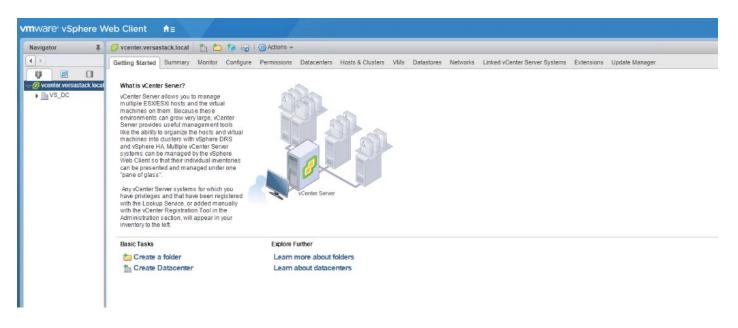
To setup the VMware vCenter Server, follow these steps:

1. Using a web browser, navigate to <u>https://<vcenter-ip>/vsphere-client</u>.



The VMware vSphere HTML₅ Client is fully featured in vSphere 6.7U₂ and can be used for setting up the vCenter if preferred by the customer. However, the Web Client is used in this document.

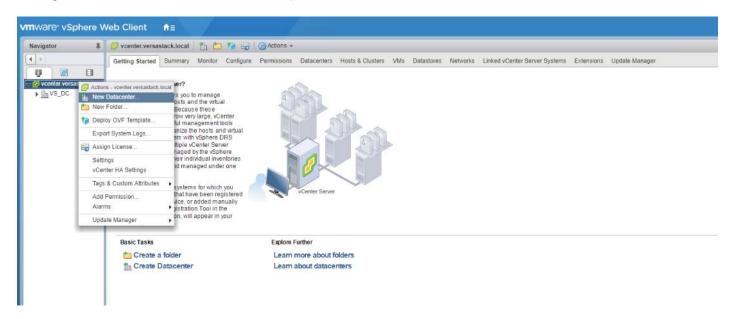
- 2. If the link is available, click Download Enhanced Authentication Plugin. Install the same by double-clicking the downloaded file.
- 3. Log in using the Single Sign-On username (<u>administrator@vsphere.local</u>) and password created during the vCenter installation.



Setup Data Center, Cluster, DRS and HA for ESXi Nodes

If a new data center is needed for the VersaStack, follow these steps on the vCenter:

- 1. Connect to the vSphere Web Client and click **Hosts and Clusters** from the left side Navigator window or the **Hosts and Clusters** icon from the Home center window
- 2. From Hosts and Clusters:
- 3. Right-click the vCenter icon and from the drop-down list select New Datacenter.



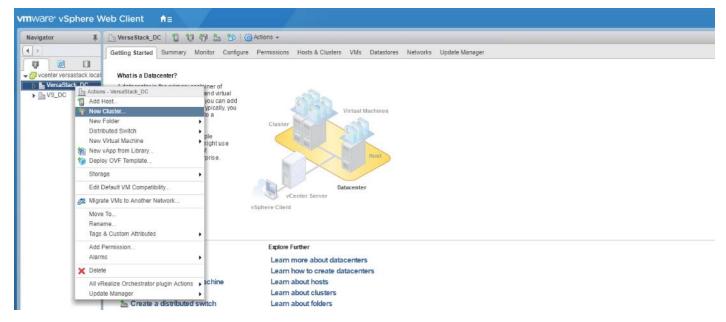
4. From the New Datacenter pop-up dialogue enter in a Datacenter name and click OK.

1 New Datacenter	(?) ₩
Datacenter name:	VersaStack_DC
Location:	🕝 vcenter.versastack.local
	OK Cancel

Add the VMware ESXi Hosts Using the VMware vSphere Web Client

To add the VMware ESXi Hosts using the VMware vSphere Web Client, follow these steps:

1. From the Hosts and Clusters tab, right-click the new or existing Datacenter within the Navigation window, and from the drop-down list select **New Cluster**.



2. Enter a name for the new cluster, select the DRS and HA checkmark boxes, leaving all other options with defaults.

New Cluster	?
Name	VersaStack_Cluster
Location	VersaStack_DC
- DRS	Turn ON
Automation Level	Fully automated 🔹
Migration Threshold	Conservative Aggressive
✓ vSphere HA	Turn ON
Host Monitoring	Enable host monitoring
Admission Control	Enable admission control
✓ VM Monitoring	
VM Monitoring Status	Disabled 🔹 Overrides for individual VMs can be set from the VM Overrides page from Manage Settings area.
Monitoring Sensitivity	Low ————————————————————————————————————
> EVC	Disable 🔹
vSAN	Turn ON
	OK Cancel

If mixing Cisco UCS B or C-Series M₂, M₃ or M₄ servers within a vCenter cluster, it is necessary to enable VMware Enhanced vMotion Compatibility (EVC) mode. For more information about setting up EVC mode, refer to <u>En-hanced vMotion Compatibility (EVC) Processor Support.</u>

3. Click **OK** to create the cluster.

<u>ل</u>

- 4. Expand "VersaStack_DC".
- 5. Right-click "VersaStack_Cluster" and select Settings.
- 6. Select Configuration > General in the list and select **Edit** to the right of General.
- 7. Select Datastore specified by host and click **OK**.

 Services vSphere DRS vSphere Availability vSAN General Disk Management Fault Domains & Stretched Cluster Health and Performance iSCSI Targets iSCSI Initiator Groups Configuration Assist 	General Swap file location Virtual machine directory Pefault VM Compatibility ? > Versa Stack_Cluster - Edit Cluster Settings ? >> Swap file location ? >> Virtual machine directory Store the swap files in the same directory as the virtual machine. ? >> Datastore specified by host Store the swap files in the datastore specified by the host to be used for swap files. If not possible, store the swap files in the same directory as the virtual machine. M Using a datastore that is not visible to both hosts during vMotion might affect the vMotion performance for the affected virtual machines.
Updates Configuration General Licensing	OK Cancel
VMware EVC VM/Host Groups	

8. Right-click the newly created cluster and from the drop-down list select the **Add Host**.

vigator	VersaStack_Cluster) In 🔠 😕	Actions 👻					
	Getting Started Summary Mo	nitor Configure	Permissions	Hosts VM	s Datastores	Networks	Update Manager	
0								
vcenter.versas								
VersaStack			L.	200				
VS_DC	La Actions - VersaStack_Cluster	irces. The	~		6)			
- <u>1964</u> -	🗃 Add Host	il nosts	Il hosts Cluster					
	Move Hosts into Cluster	vailability						
	New Virtual Machine	▶ Irce		0	0			
	New vApp	 utions. 			No.			
	bew Resource Pool		/	Host				
	Deploy OVF Template	_		\times				
	Restore Resource Pool Tree							
	Storage Host Profiles Edit Default VM Compatibility	Datacenter vCenter Server						
	Sea Assign License							
	Settings		Explore Fu	rther				
	Move To		Learn m	ore about	clusters			
	Rename	line	Learn m	ore about	resource poo	Is		
	Tags & Custom Attributes	•						
	Add Permission							
	Alarms	•						
	🗙 Delete							
	All vRealize Orchestrator plugin Actions	•						
	Update Manager	,						
	vSAN	•						

9. Enter the IP or FQDN of the first ESXi host and click **Next**.

🚰 Add Host		•	•				
1 Name and location	Enter the name or IP address of the host to add to vCenter Server.						
2 Connection settings	Host name or IP address:	Infra-ESXi-Host-01	1				
3 Hostsummary	Location:	🕼 VersaStack_Cluster					
4 Resource pool	Туре:	ESXi -					
5 Ready to complete	.,,						
		Back Next Finish Cancel					

- 10. Enter root for the User Name, provide the password set during initial setup and click Next.
- 11. Click **Yes** in the Security Alert pop-up to confirm the host's certificate.
- 12. Click **Next** past the Host summary dialogue.
- 13. Provide a license by clicking the green + icon under the License title, select an existing license, or skip past the Assign license dialogue by clicking **Next**.
- 14. Leave lockdown mode Disabled within the Lockdown mode dialogue window and click Next.
- 15. Skip past the Resource pool dialogue by clicking **Next**.
- 16. Confirm the Summary dialogue and add the ESXi host to the cluster by clicking Next.

Add Host			(?)	++
 1 Name and location 	Name	infra-esxi-host-01.versastack.local		
✓ 2 Connection settings	Version	VMware ESXi 6.7.0 build-13006603		
✓ 3 Host summary	License	ESXi		
 4 Assign license 	Networks	VM Network		
 5 Lockdown mode 6 Resource pool 7 Ready to complete 	Datastores	datastore1 Infra_datastore1 Infra_datastore2 Infra_swap		
	Lockdown mode	Disabled		ſ
	Resources destination	VersaStack_Cluster		
			Back Next Finish Cancel)

17. Repeat steps 1-16 for each ESXi host to be added to the cluster.

18. In vSphere, in the left pane right-click the newly created cluster, and under Storage click **Rescan Storage**.

vmware [®] vSphere Web Client	1						
Navigator I	VersaStack_Clust	er 📋 📑 📬	🔠 🤭 🎯 Act	ions 👻			
	Getting Started Sur	nmary Monitor	Configure Permis	sions Host	s VMs Datastores	Networks Update Mana	ager
Verastack_local Vera		Versa Stack_Cluster Total Processors: Total vMoliton Migratii	48 ons: 0				
New vApp New Resource Pool Deploy OVF Template		urces to satisfy vSpl iere HA failover reso		l on cluster Ve	ersaStack_Cluster in Vers	aStack_DC	
Restore Resource Pool Tree	uster Resour	ces		▶ v Sphe	ere DRS		
Storage	🕨 🛅 New Da	tastore		Cluste			
Host Profiles	Rescan Storage		Cluster Consumers				
Edit Default VM Compatibility	Add Vin	uai Flash Resource	Capacity	▼ Relate	ed Objects		
Re Assign License	d Tag	Category This list is empty.	Description	Datacente	er VersaStack_DC		
Settings		This list is empty.		- Updat	e Manager Compliance		
Move To				Status			
Rename Tags & Custom Attributes	•				S	can Detailed Status	
Add Permission Alarms	•		Assign Remove	-			
× Delete			Assign Remove				
All vRealize Orchestrator plugin	Actions > stom Attribu			-			
Update Manager vSAN	•	Value This list is empty.		-			

19. Click **OK** on the Rescan Storage popup window.

ESXi Dump Collector Setup for iSCSI Hosts (iSCSI Configuration Only)

ESXi hosts booted with iSCSI need to be configured with ESXi dump collection. The Dump Collector functionality is supported by the vCenter but is not enabled by default on the vCenter Appliance.

A

Make sure the account used to login is Administrator@vsphere.local (or a system admin account).

To setup the ESXi dump collector for iSCSI hosts, follow these steps:

- 1. In the vSphere web client, select **Home**.
- 2. In the center pane, click System Configuration.
- 3. In the left-hand pane, select Services and select VMware vSphere ESXi Dump Collector.
- 4. In the Actions menu, choose **Start**.
- 5. In the Actions menu, click Edit Startup Type.
- 6. Select Automatic.
- 7. Click OK.

- 8. Select Home > Hosts and Clusters.
- 9. Expand the Data Center and Cluster.
- 10. For each ESXi host, right-click the host and select **Settings**. Scroll down and select **Security Profile**. Scroll down to Services and select **Edit**. Select **SSH** and click **Start**. Click **OK**.
- 11. SSH to each ESXi hosts and use root for the user id and the associated password to log into the system. Type the following commands to enable dump collection:

```
[root@Infra-ESXi-Host-01:~] esxcli system coredump network set --interface-name vmk0 --server-ipv4
192.168.162.100 --server-port 6500
[root@Infra-ESXi-Host-01:~] esxcli system coredump network set --enable true
[root@Infra-ESXi-Host-01:~] esxcli system coredump network check
Verified the configured netdump server is running
```

12. **Optional**: Turn off SSH on the host servers.

Configure ESXi Networking

This section covers the virtual switch (vSwitch) setup for Management, vMotion and iSCSI storage traffic and vSphere Distributed Switch (vDS) for application traffic.

Update Management vSwitcho Configuration

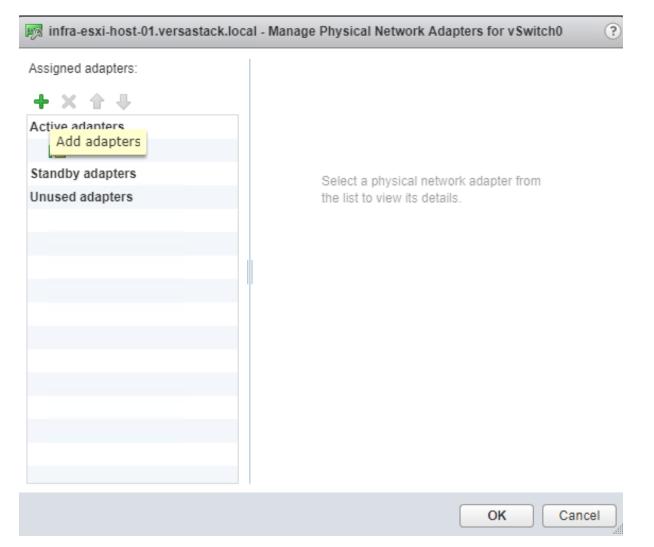
This design uses a separate vSwitch for management using two uplink vNICs with Active/Passive Failover for the port group and routing based on originating port ID for load balancing at the vSwitch level. Traffic from each vNIC take different paths across fabric to enable redundancy and load balancing.

To update the management vSwitcho configuration, follow these steps:

- 1. Using a web browser, browse to vCenter's IP address. Login to vCenter. From vSphere Web Client, navigate to the datacenter and cluster where the host resides.
- Select the ESXi host infra-esxi-host-01. On the right windowpane, click the Configure Tab. Navigate to Networking > Virtual switches and select vSwitcho from the Virtual Switches list. Click the Manage physical adapter (third icon) to open the Manage Physical Network Adapters for vSwitcho window.

vmware vSphere Web Client ♠≡				
Navigator I	🗟 infra-esxi-host-01.versastack.local	🔒 🕾 🕞 ն 🤮 🎯 Actions 🗸		
Navigator		Configure Permissions VU/s Datastores No Virtual switches Configure Permissions VU/s Datastores No Virtual switches Configure Permissions VU/s Datastores No Virtual switches Standard switche vSwitche (Management Network) Xandard switche vSwitche (Management Network) X X	etworks Update Manager Disovered Issues	Management Network Imagement Network V UAL ID :-1 Imagement Network

3. Click the green [+] to add a second Adapter. Select an unused vmnic from the list of Network Adapters.



4. Select vmnic1 and click **OK** to add the vmnic as a second Active adapter to vSwitcho.

infra-esxi-host-01.versastack.local - Manage Physical Network Adapters for vSwitch0 ?										
	Add Physical Adapters to the Switch									
Activ Failover order group: Network Adapters:	Active adapters 🔹									
Unu vmnic1 Unu vmnic2 vmnic3 vmnic4 vmnic5 vmnic7	All Properties CDP LLI Adapter Name Location Driver Status Status	DP Cisco Systems Inc Cisco VIC Ethernet NIC vmnic1 PCI 0000:62:00.1 nenic Connected								
		OK Cancel								
		OK Cancel								

5. Click **OK** to commit the change.

41	Virtual switches			
	32 😥 🕅 🖻 🦯 🗙 🙃			
Storage Adapters	Switch	Discovered Issues		
Storage Devices	T vSwitch0			
Datastores	1 IScsiBootvSwitch			
Host Cache Configuration				
Protocol Endpoints				
I/O Filters	Standard switch: vSwitch0 (Management Network)			
 Networking 	/ ×			
Virtual switches	~ ^			
VMkernel adapters			(a	
Physical adapters				Physical Adapters
TCP/IP configuration			VLAN ID: 11 VMkernel Ports (1)	vmnic0 20000 Full ()
Advanced				
 Virtual Machines 			VM Network	
VM Startup/Shutdown			VLAN ID:	
Agent VM Settings			Virtual Machines (0)	
Swap file location				
Default VM Compatibility				
👻 System				
Licensing				

- 6. While the vSwitcho of the host still selected, click the **Edit Settings** icon (5th icon) to open the Edit settings window.
- 7. Under Teaming and failover, verify the load balancing and failover configuration. Both vmnics should be listed as uplinks under Active adapters.

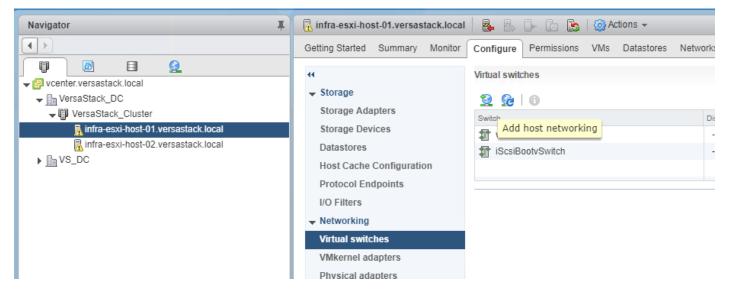
1 vSwitch0 - Edit Settings			(
Properties Security Traffic shaping Teaming and failover	Load balancing: Network failure detection: Notify switches: Failback:	Route based on originating virtual port Link status only Yes Yes	
	Failover order Active adapters Vmnic0 Vmnic1 Standby adapters Unused adapters Select active and standby adapters	Select a physical net	work adapter from the list to view its details.
			OK Cancel

8. Repeat steps 1-7 for all the ESXi hosts in the Cluster.

Create vSwitch1 for vMotion

This design uses a separate vSwitch for vMotion with two uplink vNICs. To create and setup vSwitch1 for vMotion, follow these steps:

- 1. Using a web browser, browse to vCenter's IP address. Login to vCenter. From vSphere Web Client, navigate to the datacenter and cluster where the host resides
- 2. Select the host infra-esxi-host-01. On the right windowpane, select the Configure Tab. Navigate to Networking > Virtual Switches. Click the Add host networking icon (1st icon).



3. Leave VMkernel Network Adapter selected within Select connection type of the Add Networking pop-up window that is generated and click **Next**.

infra-esxi-host-01.versastack.loca	al - Add Networking	?)
1 Select connection type 2 Select target device	Select connection type Select a connection type to create.	
 2 Select target device 3 Connection settings 3 a Port properties 3 b IPv4 settings 4 Ready to complete 	 Wikernel Network Adapter The VMkernel TCP/IP stack handles traffic for ESXI services such as vSphere vMotion, iSCSI, NFS, FCoE, Fault Tolerance, vSAN and host management. Physical Network Adapter A physical network Adapter A physical network adapter handles the network traffic to other hosts on the network. Virtual Machine Port Group for a Standard Switch A port group handles the virtual machine traffic on standard switch. 	
	Back Next Finish	Cancel

4. Select New Standard switch and click **Next**.

infra-esxi-host-01.versast	ack.local - Add Networking	(? H
 1 Select connection type 2 Select target device 	Select target device Select a target device for the new connection.	
 2 Select target device 3 Create a Standard Switch 4 Connection settings 4 a Port properties 4 b IPv4 settings 5 Ready to complete 	 Select an existing standard switch Browse New standard switch 	
	Back Next F	inish Cancel

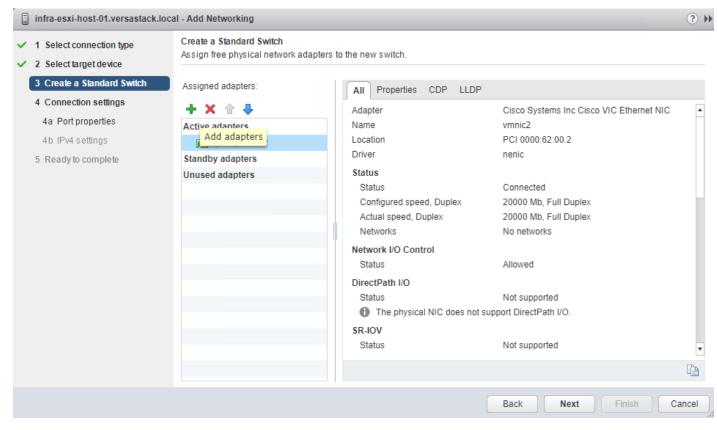
5. Within Select target device, click the New standard switch option, and click **Next**.

) infra-esxi-host-01.versastack.loc	al - Add Networking						?)
~		Create a Standard Switch Assign free physical network adapte	rs	to the new swite	ch.			
~	 2 Select target device 3 Create a Standard Switch 4 Connection settings 4a Port properties 4b IPv4 settings 5 Ready to complete 	Assigned adapters:			Select a physical net details.	twork adapter fro	om the list to view its	
						Back	Next Finish	Cancel

6. Within the Create Standard Switch dialogue press the green + icon below Assigned adapters.

infra-esxi-host-01.versastack.loca	- Add Networking		(?))
 1 Select connection type 2 Select target device 3 Create a Standard Switch 4 Connection settings 4a Port properties 4b IPv4 settings 5 Ready to complete 	Create a Standard Switch Add Physical Adapters to the Switch Failover order group: Active adapters Network Adapters: Vmnic2 Vmnic3 Vmnic4 Vmnic5 Vmnic7 Name Location Driver Status Status	CDP LLDP Cisco Systems Inc Cisco VIC Ethernet NIC Vmnic2 PCI 0000:62:00.2 nenic Connected OK Cancel	
		Back Next Finis	cancel

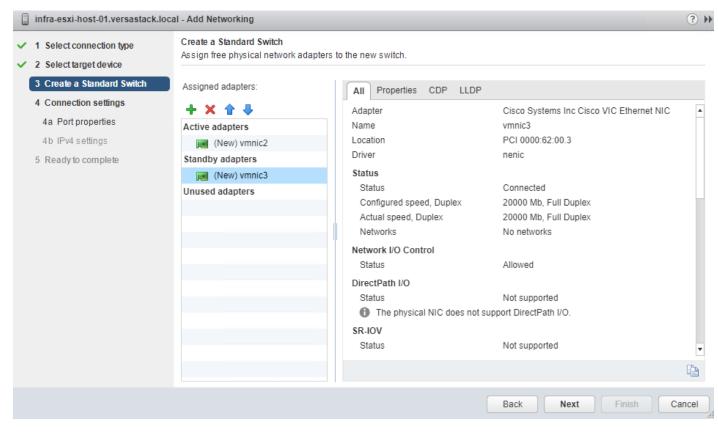
7. Select vmnic2 within the Network Adapters and click **OK**.



8. While still in the Create a Standard Switch dialogue, click the green + icon one more time.

1 Select connection type Create a Standard Switch 2 Select target device Add Physical Adapters to t 3 Create a Standard Switch Image: Create a Standard Switch	the Switch			
4 Connection settings 4a Port properties 4b IPv4 settings 5 Ready to complete Failover order group: Station 10 IPv4 settings 10 IPv4 settings 10 IPv4 settings 11 IPv4 settings 12 IPv4 settings 13 IPv4 settings 14 IPv4 settings 15 IPv4 settings 15 IPv4 settings 16 IPv4 settings 17 IPv4 settings 18 IPv4 settings 19 IPv4 settings 19 IPv4 settings 10 IPv4 settings 10 IPv4 settings 10 IPv4 settings 11 IPv4 settings 12 IPv4 settings 13 IPv4 settings 14 IPv4 settings 15 IPv4 settings 16 IPv4 settings 17 IPv4 settings 18 IPv4 settings 19 IPv4 settings 19 IPv4 settings 19 IPv4 settings 10 IPv4 settings 11 IPv4 settings 12 IPv4 settings <tr< th=""><th>All Properties CDP LLDP Adapter Name Location Driver Status Status</th><th>Cisco Systems Inc Cisco VIC Ethernet NIC vmnic3 PCI</th><th>ms Inc Cisco VIC Ethernet NIC 2:00.2 Full Duplex Full Duplex s</th><th></th></tr<>	All Properties CDP LLDP Adapter Name Location Driver Status Status	Cisco Systems Inc Cisco VIC Ethernet NIC vmnic3 PCI	ms Inc Cisco VIC Ethernet NIC 2:00.2 Full Duplex Full Duplex s	
	Status		ed h I/O. ed	•

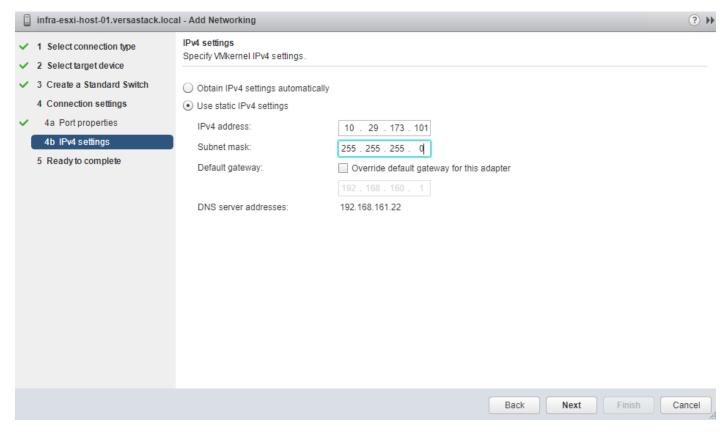
9. Select vmnic3, and from the Failover order group drop-down list, select Standby adapters. Click **OK**.



10. Click Next.

infra-esxi-host-01.versastack.loca	al - Add Networking		? 1
 1 Select connection type 2 Select target device 	Port properties Specify VMkernel port settings.		
 3 Create a Standard Switch 4 Connection settings 4a Port properties 4b IPv4 settings 5 Ready to complete 	VMkemel port settings Network label: VLAN ID: IP settings: TCP/IP stack:	VMkernel vMOtion 3173 IPv4 Default T	
	Available services		
	Enabled services:	 ✓ vMotion Provisioning Fault Tolerance logging Management vSphere Replication vSphere Replication NFC vSAN 	
		Back Next Finish Can	cel

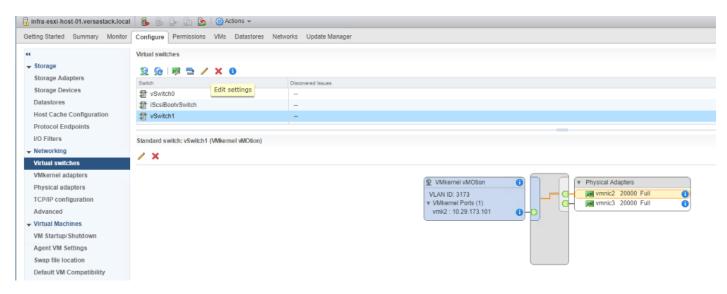
11. Within Port properties under Connection settings, set the Network label to be VMkernel vMotion, set the VLAN ID to the value for <vMotion VLAN id>, and checkmark vMotion traffic under Available services. Click Next.



12. Enter <vMotion IP Address> in the filed for IPv4 address, and <vMotion Subnet Mask> for the Subnet
mask. Click Next.

Ready to complete Review your settings selections b	efore finishing the wizard.				
New standard switch:	vSwitch1				
Assigned adapters:	vmnic2, vmnic3				
New port group:	VMkernel vMOtion				
VLAN ID:	3173				
TCP/IP stack:	Default				
vMotion:	Enabled				
Provisioning:	Disabled				
Fault Tolerance logging:	Disabled				
Management:	Disabled				
vSphere Replication:	Disabled				
vSphere Replication NFC:	Disabled				
vSAN:	Disabled				
IPv4 settings					
IPv4 address:	10.29.173.101 (static)				
Subnet mask:	255.255.255.0				
		Back	Next	Finish	Cancel
	New port group: VLAN ID: TCP/IP stack: vMotion: Provisioning: Fault Tolerance logging: Management: vSphere Replication: vSphere Replication NFC: vSAN: IPv4 settings IPv4 address:	New port group:VMkernel vMOtionVLAN ID:3173TCP/IP stack:DefaultvMotion:EnabledProvisioning:DisabledFault Tolerance logging:DisabledManagement:DisabledvSphere Replication:DisabledvSphere Replication NFC:DisabledvSAN:DisabledIPv4 settingsI0.29.173.101 (static)	New port group:VMkernel vMOtionVLAN ID:3173TCP/IP stack:DefaultvMotion:EnabledProvisioning:DisabledFault Tolerance logging:DisabledManagement:DisabledvSphere Replication:DisabledvSphere Replication NFC:DisabledvSAN:DisabledIPv4 settingsI0.29.173.101 (static)	New port group:VMkernel vMOtionVLAN ID:3173TCP/IP stack:DefaultvMotion:EnabledProvisioning:DisabledFault Tolerance logging:DisabledManagement:DisabledvSphere Replication:DisabledvSphere Replication NFC:DisabledvSAN:DisabledIPv4 settings10.29.173.101 (static)Subnet mask:255.255.255.0	New port group:VMkernel vMOctionVLAN ID:3173TCP/IP stack:DefaultvMotion:EnabledProvisioning:DisabledFault Tolerance logging:DisabledWanagement:DisabledvSphere ReplicationDisabledvSphere Replication NFC:DisabledVSAN:DisabledIPv4 address:10.29.173.101 (static)Subnet mask:255.255.255.0

- 13. Confirm the values shown on the Ready to complete summary page and click **Finish** to create the vSwitch and VMkernel for vMotion.
- 14. Within the **Configure** tab for the host, under Networking -> Virtual switches, make sure that vSwitch1 is selected, and click on the pencil icon under the Virtual Switches title to edit the vSwitch properties to adjust the MTU for the vMotion vSwitch.



15. Enter 9000 in the Properties dialogue for the vSwitch1 – Edit Settings pop-up that appears. Click **OK** to apply the change.

T vSwitch1 - Edit Settings			?
Properties Security Traffic shaping Teaming and failover	Number of ports: MTU (Bytes):	Elastic	
			OK Cancel

16. Click the VMkernel adapters under **Networking** for the host, and with the VMkernel for vMotion (vmk₂) selected, click the pencil icon to edit the VMkernel settings.

44	VMkernel ad	lapters				
✓ Storage Storage	ي 😥	/ 🗙 🗈-				
Storage Adapters	Device	Netv Edit settings	Switch	IP Address	TCP/IP Stack	vň
Storage Devices	👥 vmk1	ScsiBootPG	1 iScsiBootvSwitch	10.29.161.153	Default	C
Datastores	👥 vmk0	👰 Management Netw	T vSwitch0	192.168.162.101	Default	[
Host Cache Configuration	🗾 vmk2	VMkernel vMOtion	1 vSwitch1	10.29.173.101	Default	E
Protocol Endpoints						
I/O Filters						
Networking						
Virtual switches						
VMkernel adapters						
Dhusiaal adaptan	VMkernel ne	etwork adapter: vmk2				

17. Click the NIC settings in the vmk2 – Edit Settings pop-up window that appears and enter 9000 for the MTU value to use for the VMkernel. Click **OK** to apply the change.

🛤 vmk2 - Edit Settings			(
Port properties	MTU:	9000	
NIC settings			
IPv4 settings			
IPv6 settings			
Analyze impact			
			OK Cancel

18. Repeat steps 1-17 for each host being added to the cluster, changing the vMotion VMkernel IP to an appropriate unique value for each host.

Configure iSCSI Adapters (iSCSI Deployment Only)

The base ESXi installation will set up one vmkernel adapter for the iSCSI boot, with a generated vSwitch named iScsiBootvSwitch. vSwitch changes will be needed, as well as the creation of a second vmkernel adapter used for the B side iSCSI boot. To make the vSwitch changes and create the vmkernel adapter, follow these steps for each host:

Adjust iSCSI A vSwitch MTU

To adjust iSCSI A vSwitch MTU, follow these steps:

- 1. From the vSphere Web Client, select the installed iSCSI host, click the **Configure tab**, and select the Virtual switches section from the Networking section on the left.
- 2. Select the iScsiBootvSwitch and click the pencil icon to open up Edit settings for the vSwitch.

Virtual switches
22 G - 同 12 / × 0
Switch Edit settings Discovered Issues
1 vSwitch0
1 IScsiBoot/Switch
f vSwitch1 -
Standard switch: iScsiBootrSwitch (iScsiBootPG)
/ X
VLAN ID:
VLAN ID v VMkernel Ports (1)
vmk1 : 10.29.161.153 🚯 🗕 🖸

3. Within the Properties section, change the MTU from 1500 to 9000 and click **OK** to save the changes.

IScsiBootvSwitch - Edit Settings			?
Properties Security Traffic shaping Teaming and failover	Number of ports: MTU (Bytes):	Elastic 900	
			OK Cancel

4. Click the vmk1 entry within the iScsiBootPG and select the pencil icon on the left to edit the settings of the vmkernel adapter.

	Virtual switches		
	2 😥 🕸 🖻 🖊 🗙 😗		
Storage Adapters	Switch	Discovered Issues	
Storage Devices	1 vSwitch0	-	
Datastores	1 iScsiBootvSwitch		
Host Cache Configuration	T vSwitch1		
Protocol Endpoints			
I/O Filters	Standard switch: iScsiBootvSwitch (vmk	1)	
 Networking 	/ ×		
Virtual switches			
VMkernel adapters	Edit settings		
Physical adapters			IScsiBootPG IScsiBootPG IScsiBootPG
TCP/IP configuration			VLAN ID: VMkernel Ports (1)
Advanced			vmk1 : 10.29.161.153
 Virtual Machines 			
VM Startup/Shutdown			
Agent VM Settings			
Swap file location			
Default VM Compatibility			
Licensing			
Time Configuration			
Authentication Services			

5. Select NIC settings on the left side of the Edit Settings window and adjust the MTU from 1500 to 9000.

🛤 vmk1 - Edit Settings			?
Port properties	MTU:	9000	
NIC settings			
IPv4 settings			
IPv6 settings			
Analyze impact			
			OK Cancel

6. Click the IPv4 settings for vmk1 and change the IPv4 settings from the Cisco UCS Manager iSCSI-initiator-A assigned IP to one that is not in the IP block.

🛤 vmk1 - Edit Settings			?
Port properties	O No IPv4 settings		
NIC settings	 Obtain IPv4 settings automatically 		
IPv4 settings	 Use static IPv4 settings 		
IPv6 settings	IPv4 address:	10 . 29 . 161 . 111	
Analyze impact	Subnet mask:	255 . 255 . 255 . 0	
	Default gateway:	Override default gateway for this adapter	
		192.168.160.1	
	DNS server addresses:	192.168.161.22	
		OK	el

7. Click **OK** to apply the changes to the vmkernel adapter.

Create iSCSI B vSwitch and vmkernel Adapter

To create the iSCSI B vSwitch and vmkernel adapter, follow these steps:

1. Click the Add host networking icon under Virtual switches.

Getting Started Summary Monitor	Configure Permissions VMs Datastores Netwo	orks Update Manager
	Virtual switches	
✓ Storage	🧕 😥 👼 🖻 🥒 🗙 🚯	
Storage Adapters	Swite	Discovered Issues
Storage Devices	Add host networking	-
Datastores	iScsiBootvSwitch	-
Host Cache Configuration	T vSwitch1	-
Protocol Endpoints		
I/O Filters	Standard switch: iScsiBootvSwitch (vmk1)	
Virtual switches	/ ×	

- 2. Leave VMkernel Network Adapter selected and click **Next**.
- 3. Change the Select target device option to New standard switch and click Next.

infra-esxi-host-01.versastack.loca	al - Add Networking					? H
 1 Select connection type 2 Select target device 	Select target device Select a target device for the new connection.					
 3 Create a Standard Switch 4 Connection settings 4a Port properties 4b IPv4 settings 5 Ready to complete 	 Select an existing standard switch iScsiBootvSwitch New standard switch 	Browse				
			Back	Next	Finish	Cancel

4. Click the green plus icon under Assigned adapters and select vmnic7 from the listed adapters in the resulting window.

infra-esxi-host-01.versastack.loca	al - Add Networking	?))
 infra-esxi-host-01.versastack.loca 1 Select connection type 2 Select target device 3 Create a Standard Switch 4 Connection settings 4a Port properties 4b IPv4 settings 5 Ready to complete 	al - Add Networking Create a Standard Switch Add Physical Adapters to the Switch Failover order group: Active adapters Network Adapters: With Winic5 With Winic5 With Winic7 Adapter Cisco Systems Inc Cisco VIC Ethernet NIC Name Winic7 Driver Name Vinic7 Driver Name Status Status Connected Status Status Connected Status Status Connected Status Status Connected Status Connected Cisco Systems	
	OK Cancel	Finish Cancel

- 5. Click **OK** to add the vmnic to the vSwitch and click Next.
- 6. (Optional) Enter a relevant name for the Network label.

infra-esxi-host-01.versastack.lo	ocal - Add Networking		(?) H
 1 Select connection type 2 Select target device 	Port properties Specify VMkernel port settings.		
 2 Select target device 3 Create a Standard Switch 4 Connection settings 4a Port properties 4b IPv4 settings 5 Ready to complete 	VMkemel port settings Network label: VLAN ID: IP settings: TCP/IP stack:	VMkernel-ISCSI-B None (0) • IPv4 • Default •	
	Available services		
	Enabled services:	 Motion Provisioning Fault Tolerance logging Management vSphere Replication vSphere Replication NFC vSAN 	
		Back Next F	inish Cancel

- 7. Click Next.
- 8. Change the option for IPv4 settings to Use static IPv4 settings and enter valid IP and subnet mask information that is outside of the iSCSI-initiator-B pool.

infra-esxi-host-01.versastack.loca	al - Add Networking		? H
 1 Select connection type 2 Select type 	IPv4 settings Specify VMkernel IPv4 settings.		
 2 Select target device 			
 3 Create a Standard Switch 	 Obtain IPv4 settings automatically 		
4 Connection settings	 Use static IPv4 settings 		
 4a Port properties 	IPv4 address:	10 . 29 . 162 . 111	
4b IPv4 settings	Subnet mask:	255.255.255.0	
5 Ready to complete	Default gateway:	Override default gateway for this adapter	
		192.168.160.1	
	DNS server addresses:	192.168.161.22	
		Back Next Finish	Cancel

9. Click Next and click Finish in the resulting Summary window.

Setup iSCSI Multipathing

To setup the iSCSI multipathing on the ESXi hosts, follow these steps:

- 1. From the vSphere Web Client, select the host and select the Configure tab within the host view.
- 2. Select Storage Adapters from within the Storage section and vmhba64 under the iSCSI Software Adapter listing.
- 3. Select the Targets tab under the Adapter Details.

infra-esxi-host-01.versastack.loca				
etting Started Summary Monitor	Configure Permissions VMs I	Datastores N	letworks Up	odate Manager
н	Storage Adapters			
 Storage 	+ 🛃 💷 🔯 🗅 -			
Storage Adapters	Adapter	Tree	Status	Identifier
Storage Devices	Lewisburg SATA AHCI Controller	Туре	Status	Identifier
Datastores	♦ vmhba0	Block SCSI	Unknown	
Host Cache Configuration	iSCSI Software Adapter	block 0001	ondio	
Protocol Endpoints	i vmhba64	iSCSI	Online	iqn.1992-08.com.cisco:ucs-host:3
I/O Filters				
Networking				
Virtual switches				
VMkernel adapters				
Physical adapters				
TCP/IP configuration				
Advanced				
Virtual Machines				
VM Startup/Shutdown				
Agent VM Settings				
Swap file location				
Default VM Compatibility				
- System				
Licensing	Adapter Details			
Time Configuration				
Authentication Services	Properties Devices Paths T	argets Netw	ork Port Bindi	ing Advanced Options
Certificate	Dynamic Discovery Static Disc	overy		
Power Management		.,		
Advanced System Settings				
System Resource Reservation	iSCSI server			

- 4. With Dynamic Discovery selected, click Add.
- 5. Enter the first iSCSI interface IP address for IBM FS9100 Node 1 storage from Table 10 and click **OK**.

vmhba64 - Add	Send Target Server	?
iSCSI Server:	10.29.161.249	
Port:	3260	
Authentication	Settings	
🖌 Inherit settir	ngs from parent	

OK Cancel	OK	Cancel

6. Click **OK** and repeat the previous step to add all IP addresses for all the FS9100 nodes.

Storage Adapters								
Adapter	Туре	Status	Identifier		Targets	Devices	Paths	
Lewisburg SATA AHCI Controller								
vmhba0	Block SCSI	Unknown			0	0	0	
iSCSI Software Adapter								
🔥 🚱 vmhba64	iSCSI	Online	iqn.1992-08.com.cisco:ucs-host:3		1	4	4	
Due to recent configuration change	s, a rescan of t	his storage ad	apter is recommended.					
							=	
Adapter Details								
Properties Devices Paths T	argets Netw	ork Port Bindin	g Advanced Options					
Dynamic Discovery Static Disc	covery							
iSCSI server								
10.29.161.249:3260	10.29.161.249:3260							
10.29.161.250:3260								
10.29.162.249:3260								
10.29.162.250:3260								

- 7. Rescan the storage adapters with the third icon at the top of the page.
- 8. Click **OK** on the pop-up window.

Storage Adapters

Adapter		Туре	Status	Identifier	Targets	
Lewisburg SATA AH	Rescans the	host's storag	e adapter to	discover		
📀 vmhba0	newly addeo	d storage dev	ices.		0	
iSCSI Software Adap	ter					
🛕 🚱 vmhba64		iSCSI	Online	iqn.1992-08.com.cisco:ucs-host:3	1	

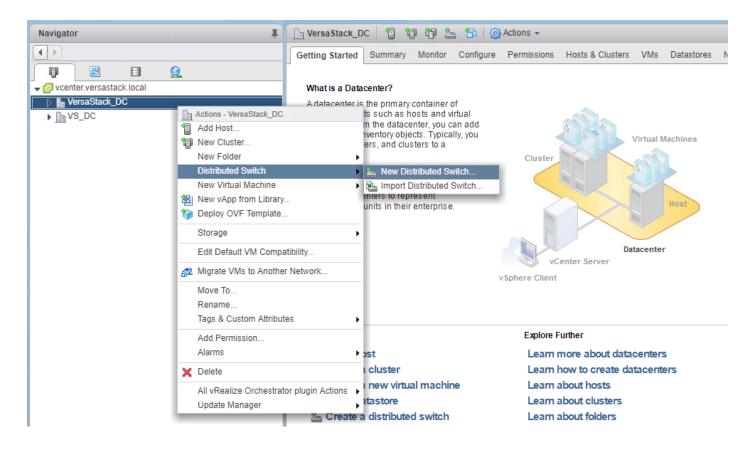
9. Observed Paths should now be four times what it previously was.

dapter Details						
Properties Devices Pat	hs Targets Network Port Binding	Advand	ced Options			
Enable Disable						
Runtime Name	Target	LUN	Status			
vmhba64:C0:T0:L0	iqn.1986-03.com.ibm:2145.versa	0	Active (I/O)			
vmhba64:C0:T0:L1	iqn.1986-03.com.ibm:2145.versa	1	Active (I/O)			
vmhba64:C0:T0:L2	iqn.1986-03.com.ibm:2145.versa	2	♦ Active			
vmhba64:C0:T0:L3	iqn.1986-03.com.ibm:2145.versa	3	Active (I/O)			
vmhba64:C1:T1:L0	iqn.1986-03.com.ibm:2145.versa	0	♦ Active			
vmhba64:C1:T1:L1	iqn.1986-03.com.ibm:2145.versa	1	♦ Active			
vmhba64:C1:T1:L2	iqn.1986-03.com.ibm:2145.versa	2	Active (I/O)			
vmhba64:C1:T1:L3	iqn.1986-03.com.ibm:2145.versa	3	♦ Active			
vmhba64:C1:T0:L0	iqn.1986-03.com.ibm:2145.versa	0	Active (I/O)			
vmhba64:C1:T0:L1	iqn.1986-03.com.ibm:2145.versa	1	Active (I/O)			
vmhba64:C1:T0:L2	iqn.1986-03.com.ibm:2145.versa	2	♦ Active			
vmhba64:C1:T0:L3	iqn.1986-03.com.ibm:2145.versa	3	 Active (I/O) 			

Create a VMware vDS for Application and Production Networks

Production networks will be configured on a VMware vDS to allow additional configuration, as well as consistency between hosts. To configure the VMware vDS, click the right-most icon within the Navigation window, and follow these steps:

1. Right-click the Datacenter (VersaStack_DC in the example screenshot below), select from the drop-down list **Distributed Switch** > New Distributed Switch.



2. Provide a relevant name for the Name field and click **Next**.

New Distributed Switch	?	
 Name and location Select version Edit settings Ready to complete 		tion.
	Cancel	Back Next Finis

3. Leave the version selected as Distributed switch: 6.6.0 and click **Next**.

La New Distributed Switch		(?)
 1 Name and location 2 Select version 	Select version Specify a distributed switch version.	
 3 Edit settings 4 Ready to complete 	 Distributed switch: 6.6.0 This version is compatible with VMware ESXi version 6.6 and later. The following new features are available: MAC Learning. Distributed switch: 6.5.0 This version is compatible with VMware ESXi version 6.5 and later. The following new features are 	
	 available: Port Mirroring Enhancements. Distributed switch: 6.0.0 This version is compatible with VMware ESXi version 6.0 and later. The following new features are available: Network I/O Control version 3, and IGMP/MLD snooping. 	
	Back Next Finish	Cancel

4. Change the Number of uplinks from 4 to 2. If VMware Network I/O Control is to be used for Quality of Service, Leave Network I/O Control Enabled. Otherwise, Disable Network I/O Control. Enter VM-Net-3174 for the name of the default Port group to be created. Click **Next**.

Len New Distributed Switch		(3) h
 1 Name and location 2 Select version 3 Edit settings 4 Ready to complete 	Edit settings Specify number of uplin Number of uplinks: Network I/O Control: Default port group: Port group name:	oorts, resource allocation and default port group.
		Back Next Finish Cancel

5. Review the summary in the Ready to complete page and click **Finish** to create the vDS.

Lange New Distributed Switch			(?)
 1 Name and location 2 Select version 	Ready to complete Review your settings selection	is before finishing the wizard.	
 3 Edit settings 4 Ready to complete 	Name: Version: Number of uplinks: Network I/O Control: Default port group: Suggested next actions New Distributed Port Of Add and Manage Host These actions will be a	s available in the Actions menu of the new distributed switch.	Next Finish Cancel
		Back	Next Finish Cancel

- 6. Right-click the newly created App-DSwitch vDS by selecting the Networking sub-tab of Hosts and Clusters of the Navigator window, and select Settings > Edit Settings...
- 7. Click the Advanced option for the Edit Settings window and change the MTU from 1500 to 9000.
- 8. Click **OK** to save the changes.
- 9. Right-click the VM-Net-3174 Distributed Port Group, and select Edit Settings...
- 10. Click VLAN, changing VLAN type from None to VLAN, and enter in the appropriate VLAN number for the first application network.

Navigator	🍰 VM-Net-3174 - Edit Settings			٩
Verastack_local Verastack_local Werastack_DC WM Network App-DSwitch-DVUplinks-96 VerAstact_J74 No.DC	General Advanced Security Traffic shaping VLN Teaming and failover Monitoring Traffic filtering and marking Miscellaneous	VLAN type: VLAN ID:	VLAN • 3174 •	
				OK Cancel

The application Distributed Port Groups will not need to adjust their NIC Teaming as they will be Active/Active within the two vNICs uplinks associated to the App-DSwitch, using the default VMware Route based on originating virtual port load balancing algorithm.

11. Click **OK** to save the changes.

么

12. Right-Click the App-DSwitch, selecting Distributed Port Group > New Distributed Port Group... for any additional application networks to be created, setting the appropriate VLAN for each new Distributed Port Group.

Add the ESXi Hosts to the vDS

With the vDS and the distributed port groups created within the vDS in place, the ESXi hosts will be added to the vDS.

To add the ESXi Hosts to the vDS, follow these steps:

1. Within the Networking sub-tab of Hosts and Clusters of the Navigator window, right-click the vDS and select Add and Manage Hosts...

Navigator I	App-DSwitch	2 &	12 🙉	🦗 🔯 A	ctions 👻				
	Getting Started	Summary	Monitor	Configure	Permissions	Ports	Hosts	VMs	Networ
 versastack.local Versastack_DC VM Network Network Actions - App-DSwitch Distributed Port Group Add and Manage Hosts Migrate VMs to Another Network Upgrade Settings Move To Rename Tags & Custom Attributes Alarms Delete 	What is a Distr A distributed s switch across allows virtual n consistent net migrate across Distributed virt consists of thre place at the da distributed swi place at the do distributed swi place at the ho networking see distributed swi host networkin profiles. The th virtual machine NICs are conn either through configuration o networking fro	witch acts as all association achines to work configu s hosts. ual networki ee parts. The tacenter lew tches are cr tches are cr tches. The s st level, whe vices are as st level, whe individual vi r by migratin	s a single v ed hosts. T maintain iration as th ng configui e first part t el, where eated, and s are added econd par ere host po is ociated w through in ion or usin s place at ributed pon tual maching y virtual m	his hey ration akes hosts d to t takes rts and vith dividual g host the achine t groups ne NIC achine	vSphere Distributed Switch				
	Basic Tasks Basic Tasks Add and Manage Create a	this distrik	outed swi	tch	switch Learn	more a es	bout dis set up a itch		-

2. Leave Add hosts selected and click **Next**.

Add and Manage Hosts		?
 Add and Manage Hosts Select task Select network adapter tasks Manage physical network adapters Manage VMkernel network adapters Analyze impact Ready to complete 	Select task Select a task to perform on this distributed switch. • Add hosts Add new hosts to this distributed switch. • Manage host networking Manage networking of hosts attached to this distributed switch. • Remove hosts Remove hosts from this distributed switch. • Add host and manage host networking (advanced) Add new hosts and manage networking of hosts already attached to this distributed switch. Use this option to unify the network configuration of new and existing hosts.	•
	Back Next Finish Cancel	

3. Click the green + icon next to New hosts...

	βA	dd and Manage Hosts		?
~	_	Select task Select hosts	Select hosts Select hosts to add to this distributed switch.	
	<u> </u>	Select network adapter tasks	-New hosts 🛛 🗶 Remove	
	4	Manage physical network adapters	Host Host Status	
	5	Manage VMkernel network adapters	This list is empty.	
	6	Analyze impact		
	7	Ready to complete		
			Configure identical network settings on multiple hosts (template mode). 🕚	
			Back	Next Finish Cancel

4. In the Select new hosts pop-up that appears, select the hosts to be added, and click **OK** to begin joining them to the vDS.

Add and Manage Hosts	S			?
1 Select task 2 Select hosts	Select hosts Select hosts to add to this o	listributed switch.		
3 Select network adap	Select new hosts		۲	
4 Manage physical net adapters	Incompatible Hosts		Q Filter	
 Manage VMkernel ne adapters Analyze impact Ready to complete 	 ✓ Host ✓ infra-esxi-host-01.versastack ✓ infra-esxi-host-02.versastack 	Host State Connected Connected	Cluster VersaStack_Cluster	
	M Q Find		2 items 🕒 Copy 🗸	
			OK Cancel	
	Configure identical netw	rork settings on multiple host	is (template mode).	
			Back Next Fi	nish Cancel

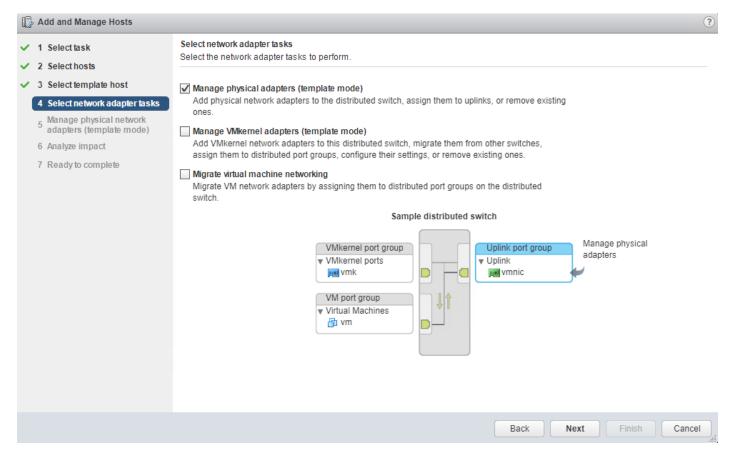
- 5. Click Next.
- 6. At the bottom of the dialog box, select Configure identical networking settings on multiple hosts and click **Next**.

	Add and Manage Hosts		?
~	1 Select task 2 Select hosts	Select hosts Select hosts to add to this distributed switch.	
	 2 Select hosts 3 Select template host 4 Select network adapter f 5 Manage physical networ adapters (template mod 6 Manage VMkernel networ adapters (template mod 7 Analyze impact 8 Ready to complete 	Host Host Status rk (New) infra-esxi-host-01.versastack.local Connected le) (New) infra-esxi-host-01.versastack.local Operated	
		🗹 Configure identical network settings on multiple hosts (template mode). 🕕	
		Back Next Finish	Cancel

7. Select a host to use as a template and click **Next**.

	Add and Manage Hosts				?	
`	Select task Select template host 2 Select hosts Select a template host to apply its network configuration on this switch to the other hosts.					
	3 Select template host					
	4 Select network adapter tasks	Host 1 🛦	Physical Adapters - On This Switch / All	VMkernel Adapters - On This Switch / All		
	5 Manage physical network adapters (template mode)	Infra-esxi-host-01.versa	0/8	0 / 4		
	6 Manage VMkernel network adapters (template mode)	infra-esxi-host-02.versast	0/8	0/4		
	7 Analyze impact					
	8 Ready to complete					
		Services (infra-esxi-host-01.versa Fault Tolerance logging:	astack.local)			
		Management:	vmk0			
		Provisioning:				
		vSphere Replication: vSphere Replication NFC:				
		vMotion:	umk?		•	
				Back Next	Finish Cancel	

8. Unselect Manage VMkernel adapters (template mode) if it is selected and click **Next**.



9. For each vmnic (vmnic4 and vmnic5) to be assigned from the Host/Physical Network Adapters column, select the vmnic and click the **Assign uplink**.

1 Select task	Manage physical network adapters (
2 Select hosts	Add or remove physical network ada	pters to this distributed switch.				
3 Select template host	 Configure or review physical network adapter assignments for the template host in this switch. 					
4 Select network adapter tasks	🔚 Assign uplink 🕼 Reset changes 🚯 View settings					
5 Manage physical network adapters (template mode)	Host/Physic Assign the selected ph		Uplink	Uplink Port Group		
6 Analyze impact	💌 to an uplink on this sw					
7 Ready to complete	wmnic1	vSwitch0				
1 Ready to complete	vmnic2	vSwitch1				
	vmnic3	vSwitch1				
	- umpic 4					
	🛒 vmnic4					
	vmnic5	-	-	-		
	vmnic5					
	vmnic5	ev settings		Uplink Port Group		
	Apply the physical network adapters	ev settings	the template host to all h			
	vmnic5 Apply the physical network adap Apply to all Reset all Viet Host/Physical Network Adapters Viet infra-esxi-host-02.versastack.	ev settings	the template host to all h			
	Apply the physical network adapters Apply to all Reset all Impication Most/Physical Network Adapters Infra-esxi-host-02.versastack. On this switch	ev settings	the template host to all h			
	vmnic5 vmnic5 vmnic6 vmnic6	ter assignments on this switch for f ew settings 1 In Use by Switch local	the template host to all h			
	 vmnic5 vmnic6 2 Apply the physical network adapters Apply to all Reset all Viet Host/Physical Network Adapters infra-esxi-host-02.versastack. On this switch On other switches/unclaimed w mnic0 	ter assignments on this switch for f ew settings 1 ▲ In Use by Switch local vSwitch0	the template host to all h	Uplink Port Group		

10. Assign the first to **Uplink 1** and assign the second to **Uplink 2**.

Add and Manage Hosts					?
✓ 1 Selecttask Ma ✓ 2 Selecthosts	nage physical network adapters (template Select an Uplink for vmnic4	mode)	×		
 ✓ 3 Select template host ✓ 4 Select petwork adapter tasks 		Assigned Adapter		witch.	
A select network duapter tasks Analyze physical network adapters (template mode) Analyze impact	Liplink 2			Up!	ink Port Group
7 Ready to complete				-	
2					•
He					ink Port Group
•	4	ОК	Cancel		▲
	 On other switches/unclaimed wmnic0 	vSwitch0		-	
	vmnic1 vmnic2	vSwitch0 vSwitch1			•
			Back	Next	Finish Cancel

- 11. Repeat steps 1-10 until all vmnics have been assigned.
- 12. Click Next.
- 13. Click **Apply to all** to create the same configuration on the other host.

 Configure or review physical network adapter assignments for the template host in this switch. 							
📾 Assign uplink 🕐 Reset changes 🚯 View settings							
-							
-							

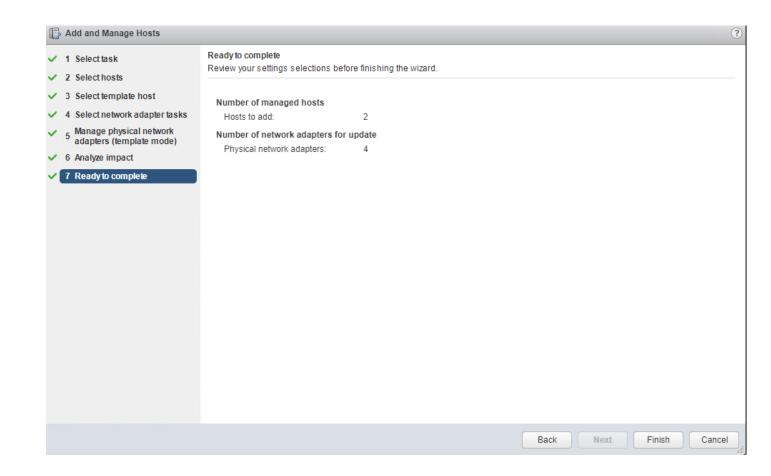
14. Verify the configuration has been applied to the second host and Click **Next**.

 1 Select task 2 Select host 		Manage physical network adapters (ta Add or remove physical network adap		ibuted switch.					
3 Select temp	plate host	 Configure or review physical net. 	 Configure or review physical network adapter assignments for the template host in this switch. 						
	vork adapter tasks	assign uplink 🕐 Reset change	🖥 Assign uplink 🕐 Reset changes 🚯 View settings						
5 Manage ph adapters (t	iysical network emplate mode)	Host/Physical Network Adapters	-	Jse by Switch	Uplink	Uplink Port Group			
6 Analyze im		ymnic0	vS	witch0					
		vmnic1	vS	witch0					
7 Ready to co	ompiete	vmnic2	vS	witch1		-			
		vmnic3	vS	witch1					
			:0	csiBootvSwitch					
		🗾 vmnic6	150	CSIBOOLVSWILCH					
		vmnic6		witch2		-			
		Apply the physical network adapt	vS er assignments	switch2					
		vmnic7	vS er assignments w settings	switch2					
		Apply the physical network adapt Apply to all Reset all Vie	er assignments w settings	witch2	 e template host to all hos	 sts.			
		Apply the physical network adapt Apply to all Reset all Ovie Host/Physical Network Adapters	er assignments w settings	witch2	 e template host to all hos	 sts.			
		Apply the physical network adapt Apply to all	er assignments w settings	witch2	 e template host to all hos	 sts.	'Uplink		
		Apply the physical network adapt Apply to all Reset all Vie Host/Physical Network Adapters ' infra-esxi-host-02.versastack.I On this switch	vS er assignments w settings	witch2	e template host to all hos	 sts. Uplink Port Group			
		Apply the physical network adapt Apply to all Reset all Vie Host/Physical Network Adapters Timfra-esxi-host-02.versastack.I On this switch M vmnic4 (Assigned)	vS er assignments w settings	witch2	e template host to all host Uplink Uplink 1	sts. Uplink Port Group App-DSwitch-DV			
		 Apply the physical network adapt Apply to all Reset all Vie Host/Physical Network Adapters infra-esxi-host-02.versastack.I On this switch vmnic4 (Assigned) vmnic5 (Assigned) 	vS er assignments w settings 1▲ In U ocal 	witch2	e template host to all host Uplink Uplink 1	sts. Uplink Port Group App-DSwitch-DV			

15. Proceed past the Analyze impact screen if no issues appear.

🔂 Add and Manage Hosts			?
 ✓ 1 Select task ✓ 2 Select hosts 	Analyze impact Review the impact this configuration change might	t have on some network dependent services.	
 ✓ 3 Select template host 	Overall impact status: 🥑 No impact		
 4 Select network adapter tasks 	Host / Impact Analysis per Service	1 🛦 Status	
 5 Manage physical network adapters (template mode) 	✓ infra-esxi-host-01.versastack.local		
6 Analyze impact	iSCSI	No impact	
7 Ready to complete	 infra-esxi-host-02.versastack.local 		
i nouuj to complota	iSCSI	No impact	
		No items selected	
		Back	Finish Cancel

16. Review the Ready to complete summary and click **Finish** to add the hosts to the vDS.



References

Products and Solutions

Cisco Unified Computing System:

http://www.cisco.com/en/US/products/ps10265/index.html

Cisco UCS 6400 Series Fabric Interconnects:

https://www.cisco.com/c/en/us/support/servers-unified-computing/ucs-6400-series-fabric-interconnects/tsdproductssupport-series-home.html

Cisco UCS 5100 Series Blade Server Chassis:

http://www.isco.com/en/US/products/ps10279/index.html

Cisco UCS B-Series Blade Servers:

http://www.cisco.com/c/en/us/products/servers-unified-computing/ucs-b-series-blade-servers/index.html

Cisco UCS C-Series Rack Servers:

http://www.cisco.com/c/en/us/products/servers-unified-computing/ucs-c-series-rack-servers/index.html

Cisco UCS Adapters:

http://www.cisco.com/en/US/products/ps10277/prod_module_series_home.html

Cisco UCS Manager:

http://www.cisco.com/en/US/products/ps10281/index.html

Cisco Intersight:

https://www.cisco.com/c/en/us/products/servers-unified-computing/intersight/index.html

Cisco Nexus 9000 Series Switches:

http://www.cisco.com/c/en/us/support/switches/nexus-9000-series-switches/tsd-products-support-serieshome.html

Cisco Application Centric Infrastructure:

http://www.cisco.com/c/en/us/solutions/data-center-virtualization/application-centric-infrastructure/index.html

Cisco Data Center Network Manager:

https://www.cisco.com/c/en/us/products/cloud-systems-management/prime-data-center-networkmanager/index.html

Cisco UCS Director:

https://www.cisco.com/c/en/us/products/servers-unified-computing/ucs-director/index.html

VMware vCenter Server:

http://www.vmware.com/products/vcenter-server/overview.html

VMware vSphere:

https://www.vmware.com/products/vsphere

IBM FlashSystem 9100:

https://www.ibm.com/us-en/marketplace/flashsystem-9100

Interoperability Matrixes

Cisco UCS Hardware Compatibility Matrix:

https://ucshcltool.cloudapps.cisco.com/public/

VMware and Cisco Unified Computing System:

http://www.vmware.com/resources/compatibility

IBM System Storage Interoperation Center:

http://www-o3.ibm.com/systems/support/storage/ssic/interoperability.wss

Appendix

VersaStack Configuration Backups

Cisco UCS Backup

Automated backup of the Cisco UCS domain is important for recovery of the Cisco UCS Domain from issues ranging from catastrophic failure to human error. There is a native backup solution within Cisco UCS that allows local or remote backup using FTP/TFTP/SCP/SFTP as options and is detailed below.

Backups created can be a binary file containing the Full State, which can be used for a restore to the original or a replacement pair of fabric interconnects. Alternately this XML configuration file consisting of All configurations, just System configurations, or just Logical configurations of the Cisco UCS Domain. For scheduled backups, options will be Full State or All Configuration, backup of just the System or Logical configurations can be manually initiated.

To schedule the backup, follow these steps within the Cisco UCS Manager GUI:

- 1. Select Admin within the Navigation pane and select All.
- 2. Click the Policy Backup & Export tab within All.
- 3. For a Full State Backup, All Configuration Backup, or both, specify the following:
 - a. Hostname : <IP or FQDN of host that will receive the backup>
 - b. Protocol: [FTP/TFTP/SCP/SFTP]
 - c. User: <account on host to authenticate>
 - d. Password: <password for account on host>
 - e. Remote File: <full path and filename prefix for backup file>
 - f. Admin State: <select Enable to activate the schedule on save, Disable to disable schedule on save>
 - g. Schedule: [Daily/Weekly/Bi Weekly]

General Policy Backup & Export
Full State Backup Policy
Hostname : 192.168.160.99
Protocol : FTP TFTP SCP SFTP
User : root
Password :
Remote File : /var/www/html/vs/configs/ucs/6454.full
Admin State : O Disable Enable
Schedule : Oaily OWeekly OBi Weekly
Max Files : 0
Description : Database Backup Policy
All Configuration Backup Policy
Hostname : 192.168.160.99
Protocol : CFTP OTFTP OSCP SFTP
User : root
Password :
Remote File : /var/www/html/vs/configs/ucs/6454.config
Admin State : O Disable Enable
Schedule : Oaily OWeekly OBi Weekly
Max Files : 0
Description : Configuration Export Policy
Backup/Export Config Reminder
Admin State : O Disable C Enable

4. Click Save Changes to create the Policy.

Cisco Nexus and MDS Backups

The configuration of the Cisco Nexus 9000 and MDS 9000 switches can be backed up manually at any time with the copy command, but automated backups can be put in place with the NX-OS feature scheduler. An example of setting up automated configuration backups of one of the VersaStack 9336C-FX2 switches is shown below:

```
AA10-9336-FX2-A# conf t
Enter configuration commands, one per line. End with CNTL/Z.
AA10-9336-FX2-A(config)# feature scheduler
AA10-9336-FX2-A(config)# scheduler logfile size 1024
AA10-9336-FX2-A(config)# scheduler job name backup-cfg
AA10-9336-FX2-A(config-job)# copy running-config tftp://192.168.160.242/9336/$(SWITCHNAMW)-
cfg.$(TIMESTAMP) vrf management
AA10-9336-FX2-A(config-job)# exit
AA10-9336-FX2-A(config-job)# exit
AA10-9336-FX2-A(config)# scheduler schedule name daily
AA10-9336-FX2-A(config-schedule)# job name backup-cfg
AA10-9336-FX2-A(config-schedule)# time daily 2:00
AA10-9336-FX2-A(config-schedule)# end
```

Show the job that has been setup:

```
AA10-9336-FX2-A# show scheduler job
Job Name: backup-cfg
_____
copy running-config tftp://192.168.160.242/9336/$(SWITCHNAMW)-cfg.$(TIMESTAMP) vrf management
_____
AA10-9336-FX2-A# show scheduler schedule
Schedule Name
            : daily
_____
User Name
            : admin
            : Run every day at 2 Hrs 0 Mins
Schedule Type
Last Execution Time : Yet to be executed
_____
   Job Name
                Last Execution Status
_____
backup-cfg
                         -NA-
```

For detailed information about the scheduler, go to:

http://www.cisco.com/c/en/us/td/docs/switches/datacenter/nexus9000/sw/7x/system_management/configuration/guide/b_Cisco_Nexus_9000_Series_NX-OS_System_Management_Configuration_Guide_7x/b_Cisco_Nexus_9000_Series_NX-OS_System_Management_Configuration_Guide_7x_chapter_01010.html

VMware VCSA Backup

Basic backup of the vCenter Server Appliance is also available within the native capabilities of the VCSA, though within the default solution this is manually initiated for each backup operation. To create a backup, follow these steps:

- 1. Connect to the VCSA Console at <a href="https://<VCSA">https://<VCSA IP>:5480
- 2. Click Backup In the left side menu.

Summary	① Before taking a backup, a backup server must be set up and configured such that the applance has occess to it. The protocol supported for backup are FTPS, HTTPS, SCP, FTP, NFS, SMB and HTTP.
Monitor	Backup Schedule conniguna
Access	Status Not configured
Networking	Activity sackup now
Firewall	ACLIVITY SACCUP NOV Backup Location v Type v Status v Data Transferred v Duration v End Time v
Time	
Services	
Update	No Items to display
Administration	
Syslog	
Backup	

- 3. Click Configure to open up the Backup Appliance Dialogue.
- 4. Fill in all the fields based on your requirement.

Create Backup Schedule

Backup location (\underline{i})	scp://192.168.160.242:22/versastack/vmware				
Backup server credentials	User name	root			
	Password				
Schedule (1)	Daily ~ 11 : 59 P.M.	Etc/UTC			
Encrypt backup (optional)	Encryption Password	•••••			
	Confirm Password				
Number of backups to retain	• Retain all backups				
	O Retain last back	ups			
Data	Inventory and configuration		616 MB		
	✓ Stats, Events, and Tasks		54 MB		
			CANCEL		

5. Review and click **CREATE** to create the backup schedule.

About the Authors

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Sreeni is a Technical Marketing Engineer in the UCS Data Center Solutions Engineering team focusing on converged and hyper-converged infrastructure solutions, prior to that he worked as a Solutions Architect at EMC Corporation. He has experience in Information Systems with expertise across Cisco Data Center technology portfolio, including DC architecture design, virtualization, compute, network, storage and cloud computing.

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Working as part of the development organization within IBM Storage, Warren Hawkins is also a speaker and published author detailing best practices for integrating IBM Storage offerings into virtualized infrastructures. Warren has a background in supporting Windows and VMware environments working in second-line and third-line support in both public and private sector organizations. Since joining IBM in 2013, Warren has played a crucial part in customer engagements and, using his field experience, has established himself as the Test Lead for the IBM Spectrum Virtualize™ product family, focusing on clustered host environments.