Cisco and Hitachi Adaptive Solutions with Cisco UCS X-Series, VMware 8U1, and Hitachi VSP 5600

Deployment Guide for the Adaptive Solutions Virtual Server Infrastructure with Cisco Intersight Managed Mode, VMware 8.0U1, and Hitachi VSP 5600

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About the Cisco Validated Design Program

The Cisco Validated Design (CVD) program consists of systems and solutions designed, tested, and documented to facilitate faster, more reliable, and more predictable customer deployments. For more information, go to: http://www.cisco.com/go/designzone.

Executive Summary

Cisco Validated Designs consist of 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 a portfolio of solutions that have been developed to address the business needs of our customers.

Cisco and Hitachi have joined forces to provide a converged infrastructure solution designed to address the current challenges faced by enterprise businesses and position them for future success. Drawing upon their extensive industry knowledge and innovative technology, this collaborative Cisco CVD presents a robust, flexible, and agile foundation for today's businesses. Moreover, the partnership between Cisco and Hitachi goes beyond a a singular solution, allowing businesses to leverage their ambitious roadmap of progressive technologies including advanced analytics, IoT, cloud, and edge capabilities. By partnering with Cisco and Hitachi, organizations can confidently embark on their modernization journey and position themselves to capitalize on emerging business opportunities facilitated by groundbreaking technology.

This document explains the deployment of the Cisco and Hitachi Adaptive Solutions for Converged Infrastructure as a Virtual Server Infrastructure (VSI), as it was described in the Cisco and Hitachi Adaptive Solutions with Cisco UCSX, VMware 8U1, and Hitachi VSP 5600 Design Guide. The recommended solution architecture is built on Cisco Unified Computing System (Cisco UCS) using the unified software release to support the Cisco UCS hardware platforms for Cisco UCS X series servers, Cisco UCS 6500 Fabric Interconnects, Cisco Nexus 9000 Series switches, Cisco MDS Fibre channel switches, and the Hitachi Virtual Storage Platform (VSP) 5600. This architecture is implemented on VMware vSphere 8.0 U1 to support the leading virtual server platform of enterprise customers.

Additional Cisco Validated Designs created in a partnership between Cisco and Hitachi can be found here: https://www.cisco.com/c/en/us/solutions/design-zone/data-center-design-guides/data-center-design-guides-all.html#Hitachi

Solution Overview

This chapter contains the following:

Introduction

Modernizing your data center can be overwhelming, and it's vital to select a trusted technology partner with proven expertise. With Cisco and Hitachi as partners, companies can build for the future by enhancing systems of record, supporting systems of innovation, and growing their business. Organizations need an agile solution, free from operational inefficiencies, to deliver continuous data availability, meet SLAs, and prioritize innovation.

Cisco and Hitachi Adaptive Solutions for Converged Infrastructure as a Virtual Server Infrastructure (VSI) is a best practice datacenter architecture built on the collaboration of Hitachi Vantara and Cisco to meet the needs of enterprise customers utilizing virtual server workloads. This architecture is composed of the Hitachi Virtual Storage Platform (VSP) 5000 series connecting through the Cisco MDS multilayer switches supporting both FC-SCSI and FC-NVMe protocols to Cisco Unified Computing System X-Series Servers managed through Cisco Intersight, and further enabled with the Cisco Nexus family of switches.

These deployment instructions are based on the buildout of the Cisco and Hitachi Adaptive Solutions for Converged Infrastructure validated reference architecture, which describes the specifics of the products utilized within the Cisco validation lab, but the solution is considered relevant for equivalent supported components listed within Cisco and Hitachi Vantara's published compatibility matrixes. Supported adjustments from the example validated build must be evaluated with care as their implementation instructions may differ.

Audience

The intended audience of this document includes but is not limited to IT architects, sales engineers, field consultants, professional services, IT managers, 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 a step by step configuration and implementation guide for the Cisco and Hitachi Adaptive Solutions for the Converged Infrastructure solution. This solution features a validated reference architecture composed of:

- Cisco UCS Compute
- Cisco Nexus Switches
- Cisco Multilayer SAN Switches

- Hitachi Virtual Storage Platform

For the design decisions and technology discussion of the solution, please refer to the Cisco and Hitachi Adaptive Solutions for Converged Infrastructure Design Guide: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/hitachi_adaptive_vmware_vsp_design.html

What's New in this Release?

The following design elements distinguish this version of the Adaptive Solutions Virtual Server Infrastructure from previous models:

- Cisco UCS X210c M7 servers with Intel Xeon Scalable Processors with up to 60 cores per processor and up to 8TB of DDR-4800 DIMMs
- 100Gbps Ethernet and 32Gbps Fibre Channel in Adaptive Solutions
- Integration of the 5th Generation Cisco UCS 6536 Fabric Interconnect into Adaptive Solutions
- Integration of the 5th Generation Cisco UCS 15000-series VICs into Adaptive Solutions
- Integration of the Cisco UCS X9108-100G Intelligent Fabric Module into the Cisco UCS X-Series X9508 Chassis
- Deployment of Cisco UCS with Cisco Intersight Managed Mode (IMM)
- Nexus Dashboard Fabric Controller
- VMware vSphere 8.0 Update 1
- FC-NVMe connectivity
- VMware vVols Datastores
- Hitachi Virtual Storage Platform (VSP) 5600
- Hitachi Ops Center release version 10.9.3
- Hitachi Storage Provider for VMware vCenter release version 3.7.3

Deployment Hardware and Software

This chapter contains the following:

- Physical Topology
- Software Revisions
- VLAN Configuration
- Device Connectivity

Physical Topology

The Adaptive Solutions Virtual Server Infrastructure consists of a high-performance Fibre Channel network built using the following hardware components:

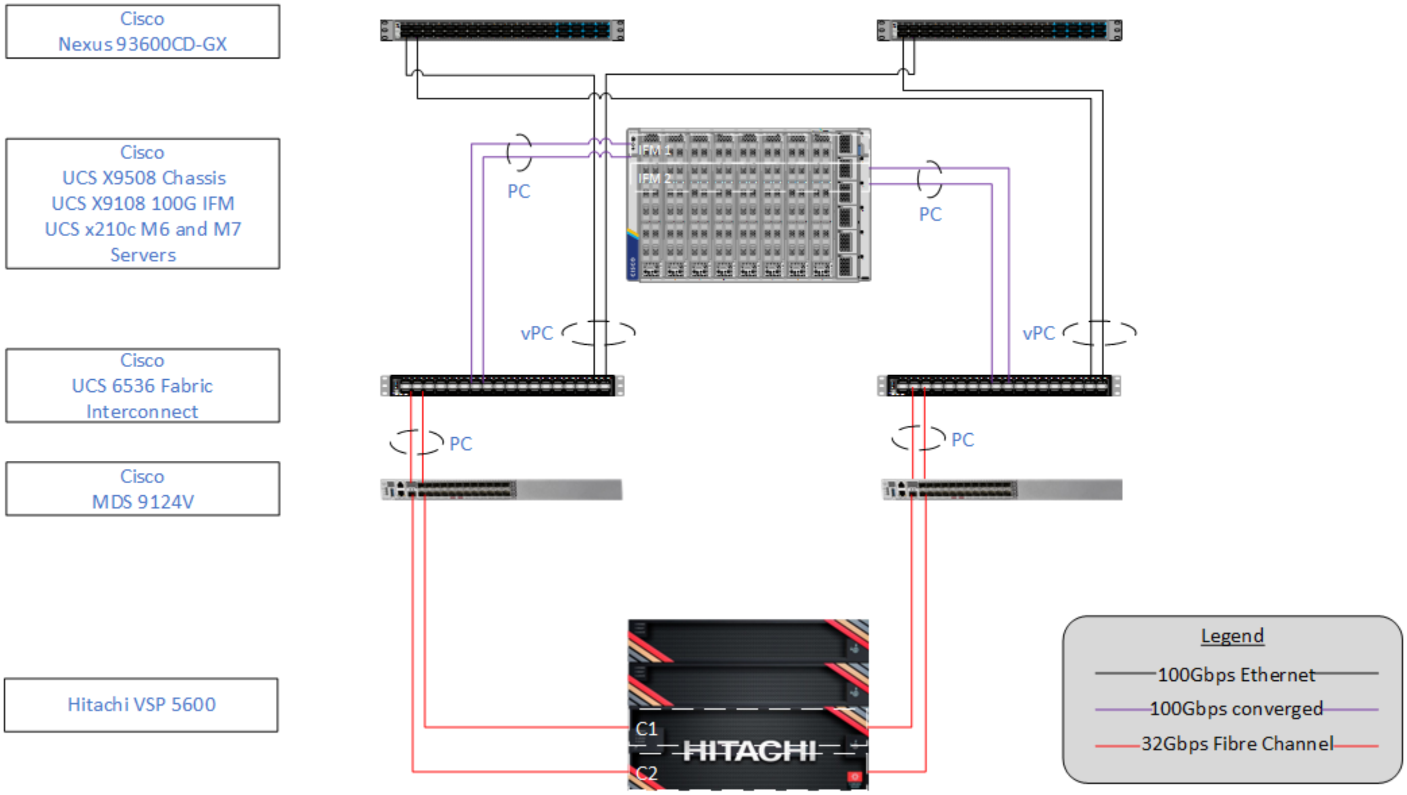
- Cisco UCS X9508 Chassis with Cisco UCSX-I-9108-100G Intelligent Fabric Modules (IFMs) and up to eight Cisco UCS X210c M7 Compute Nodes with 4th Generation Intel Xeon Scalable CPUs.
- Fifth-generation Cisco UCS 6536 Fabric Interconnects to support 100GbE, 25GbE, and 32GFC connectivity as needed.
- High-speed Cisco NX-OS-based Nexus 93600CD-GX switching design to support up to 100GE .
- Hitachi 5600 Virtual Storage Platform NVMe storage with 32G Fibre Channel connectivity.
- Cisco MDS 9124V switches to support Fibre Channel storage configuration.

The software components of the solution consist of:

- Cisco Intersight SaaS platform to deploy, maintain and support the Adaptive Solutions infrastructure.
- Cisco Intersight Assist Virtual Appliance to connect the Hitachi VSP 5600, VMware vCenter, and Cisco Nexus and MDS switches with Cisco Intersight.
- Cisco Nexus Dashboard Fabric Controller to give expanded insight and management into the MDS switching.
- Hitachi Ops Center Administrator is an infrastructure management solution that unifies storage provisioning, data protection, and storage management.
- Hitachi Ops Center API Configuration Manager to help connect the Hitachi VSP 5600 to the Intersight platform.
- VMware vCenter to set up and manage the virtual infrastructure as well as Cisco Intersight integration.

Figure 1 shows the validated hardware components and connections used in the Adaptive Solutions Virtual Server Infrastructure design.

Figure 1. Adaptive Solutions Virtual Server Infrastructure Physical Topology



The reference hardware configuration includes:

- Two Cisco Nexus 93600CD-GX Switches in Cisco NX-OS mode provide the switching fabric.
- Two Cisco UCS 6536 Fabric Interconnects (FI) provide the chassis connectivity. One 100 Gigabit Ethernet port from each FI, configured as a Port-Channel, is connected to each 93600CD-GX. Four FC ports are connected to the Cisco MDS 9124V switches via breakout using 32-Gbps Fibre Channel connections configured as a single port channel for SAN connectivity.
- One Cisco UCS X9508 Chassis connects to fabric interconnects using Cisco UCSX 9108-100G Intelligent Fabric Modules (IFMs), where four 100 Gigabit Ethernet ports are used on each IFM to connect to the appropriate FI. If additional bandwidth is required, all eight 100G ports can be utilized.
- The Cisco MDS 9124V sits between the compute and storage delivering 32Gbps Fibre Channel connectivity, as well as interfacing to resources present in an existing data center.
- The Hitachi VSP 5600 controllers connect with two 32Gbps FC ports from each controller to each Cisco MDS 9124V for delivering to the SAN network.

Software Revisions

Table 1 lists the software revisions for various components of the solution.

Table 1. Software Revisions

Layer	Device	Image	Comments
Network	Cisco Nexus 93600CD-GXNX-OS	10.2(5)M	
	Cisco MDS 9124V	9.3(2)	Requires SMART Licensing
	Nexus Dashboard	2.3(2d)	
	Cisco Nexus Dashboard Fabric Controller	12.1.2e on Nexus Dashboard 2.3(2d)	
Compute	Cisco UCS Fabric Interconnect 6536 and UCS 9108-100G IFM	4.3(2b)	Cisco UCS GA release for infrastructure including FIs and IOM/IFM.
	Cisco UCS X210c M7	5.1(1.230052)	
	Cisco UCS C220 M7	5.1(1.230052)	Connected but not a focus in the validation.
	Cisco UCS Tools	1.3.3-1OEM	
	VMware ESXi nfnic FC Driver	5.0.0.41	Supports FC-NVMe
	VMware ESXi nenic Ethernet Driver	2.0.11.0	
	VMware ESXi	8.0 Update 1a	Build 21813344 included in Cisco Custom ISO, updated with patch 8.0 Update 1c
	VMware vCenter Appliance	8.0 Update 1c	Build 20395099
	Cisco Intersight Assist Appliance	1.0.9-588	1.0.9-588 initially installed and then automatically upgraded
Storage	Hitachi VSP 5600	SVOS 90-09-21-00/01	
	Hitachi Ops Center Administrator/CM Rest	10.9.3	
	Hitachi Storage Provider for VMware vCenter	3.7.3	

VLAN Configuration

Table 2 lists the VLANs that are configured in the environment and details their usage.

Table 2. VLAN Usage

VLAN ID	Name	Usage	IP Subnet used in this deployment
2	Native-VLAN	Use VLAN 2 as native VLAN instead of default VLAN (1).	
19	OOB-MGMT-VLAN	Out-of-band management VLAN to connect management ports for various devices	192.168.168.0/24; GW: 192.168.168.254
119	IB-MGMT-VLAN	In-band management VLAN utilized for all in-band management connectivity - for example, ESXi hosts, VM management, and so on.	10.1.168.0/24; GW: 10.1.168.254
1000	vMotion	VMware vMotion traffic	10.0.0.0/24 *
1100	VM-Traffic	VM data traffic sourced from FI-A and FI-B	10.1.100.0/24; GW: 10.1.100.254
1101	VM-Traffic-A	VM data traffic sourced from FI-A	10.1.101.0/24; GW: 10.1.101.254
1101	VM-Traffic-B	VM data traffic sourced from FI-B	10.1.101.0/24; GW: 10.1.101.254

* IP gateway is not needed since no routing is required for these subnets

Table 3 lists the infrastructure VMs necessary for the VSI environment hosted on pre-existing management infrastructure.

Table 3. Virtual Machines

Virtual Machine Description	VLAN	IP Address
Cisco Intersight Assist	119	10.1.168.99
vCenter Server	119	10.1.168.100
Active Directory	119	10.1.168.101
Hitachi Ops Center	119	10.1.168.105

Device Connectivity

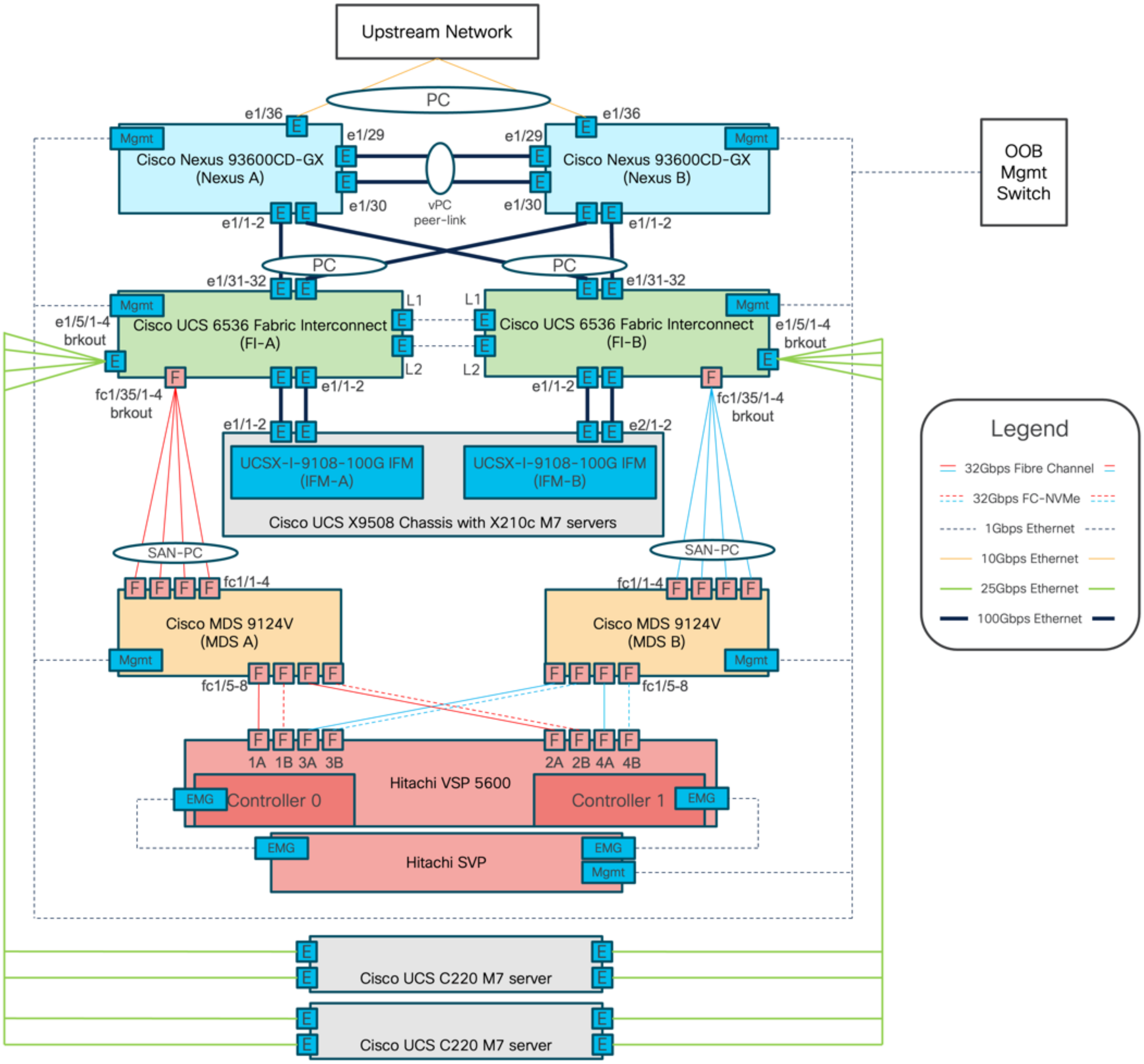
The information in this section is provided as a reference for cabling the physical equipment in the environment. This includes a diagram, as well as tables for each layer of infrastructure detailing the local and remote port locations.

Note: If you modify the validated architecture, see the Cisco Hardware Compatibility Matrix and the Hitachi Product Compatibility Guide for guidance.

This document assumes that 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.

Figure 2 details the cable connections used in the validation lab for the Adaptive Solutions VSI topology based on the Cisco UCS 6536 fabric interconnect and the Hitachi VSP 5600. Four 32Gb uplinks via breakout connect as SAN port-channels from each Cisco UCS Fabric Interconnect to the MDS switches, and a total of eight 32Gb links connect the MDS switches to the VSP controller ports. 100Gb links connect the Cisco UCS Fabric Interconnects as port-channels to the Cisco Nexus 93600CD-GX switch pair's vPCs, while upstream of the Nexus switches, 400G uplink connections are possible for the model. Additional 1Gb management connections will be needed for an out-of-band network switch that sits apart from the Adaptive Solutions infrastructure. Each Cisco UCS fabric interconnect and Cisco Nexus switch is connected to the out-of-band network switch, and the VSP is front-ended by the SVP, which has a connection to the out-of-band network switch. Layer 3 network connectivity is required between the Out-of-Band (OOB) and In-Band (IB) Management Subnets.

Figure 2. **Adaptive Solutions Cabling with Cisco UCS 6536 Fabric Interconnect**



Adaptive Solutions Cabling

Tables listing the specifics of the connections for each component are provided below.

Table 4. **Cisco Nexus 93600CD-GX A Cabling Information**

Local Device	Local Port	Connection	Remote Device	Remote Port
Cisco Nexus 93600CD-GX	1/1	QSFP-100G-AOC2M	Cisco UCS 6536 FI A	1/31

Local Device	Local Port	Connection	Remote Device	Remote Port
A	1/2	QSFP-100G-AOC2M	Cisco UCS 6536 FI B	1/31
	1/29	QSFP-100G-AOC1M	Cisco Nexus 93600CD-GX B	1/29
	1/30	QSFP-100G-AOC1M	Cisco Nexus 93600CD-GX B	1/30
	1/36	10Gbase-SR	Upstream Network	
	Mgmt	Cat 5	Management Switch	

Table 5. Cisco Nexus 93600CD-GX B Cabling Information

Local Device	Local Port	Connection	Remote Device	Remote Port
Cisco Nexus 93600CD-GX B	1/1	QSFP-100G-AOC2M	Cisco UCS 6536 FI A	1/32
	1/2	QSFP-100G-AOC2M	Cisco UCS 6536 FI B	1/32
	1/29	QSFP-100G-AOC1M	Cisco Nexus 93600CD-GX A	1/29
	1/30	QSFP-100G-AOC1M	Cisco Nexus 93600CD-GX A	1/30
	1/36	10Gbase-SR	Upstream Network	
	Mgmt	Cat 5	Management Switch	

Table 6. Cisco UCS 6536 Fabric Interconnect A Cabling Information

Local Device	Local Port	Connection	Remote Device	Remote Port
Cisco UCS 6536 FI A	1/1	QSFP-40/100-SRBD	Cisco UCS 9108-100G IFM A	1/1
	1/2	QSFP-40/100-SRBD	Cisco UCS 9108-100G IFM A	1/2
	1/5/1	QSFP-4SFP25G-CU2M	UCSC-C220-M7S-1	1
	1/5/2		UCSC-C220-M7S-1	2
	1/5/3		UCSC-C220-M7S-2	1
	1/5/4		UCSC-C220-M7S-2	2
	1/31	QSFP-100G-AOC2M	Cisco Nexus 93600CD-GX A	1/31

Local Device	Local Port	Connection	Remote Device	Remote Port
	1/32	QSFP-100G-AOC2M	Cisco Nexus 93600CD-GX A	1/31
	1/35/1	Cisco 128G FC QSP DS-SFP-4x32G-SW to MPO-LC breakout	Cisco MDS 9124V A	1/1
	1/35/2		Cisco MDS 9124V A	1/2
	1/35/3		Cisco MDS 9124V A	1/3
	1/35/4		Cisco MDS 9124V A	1/4
	L1	Cat 5	Cisco UCS 6536 FI B	L1
	L2	Cat 5	Cisco UCS 6536 FI B	L2
	Mgmt	Cat 5	Management Switch	

Table 7. Cisco UCS 6536 Fabric Interconnect B Cabling Information

Local Device	Local Port	Connection	Remote Device	Remote Port
Cisco UCS 6536 FI B	1/1	QSFP-40/100-SRBD	Cisco UCS 9108-100G IFM B	1/1
	1/2	QSFP-40/100-SRBD	Cisco UCS 9108-100G IFM B	1/2
	1/5/1	QSFP-4SFP25G-CU2M	UCSC-C220-M7S-1	3
	1/5/2		UCSC-C220-M7S-1	4
	1/5/3		UCSC-C220-M7S-2	3
	1/5/4		UCSC-C220-M7S-2	4
	1/31	QSFP-100G-AOC2M	Cisco Nexus 93600CD-GX B	1/32
	1/32	QSFP-100G-AOC2M	Cisco Nexus 93600CD-GX B	1/32
	1/35/1	Cisco 128G FC QSP DS-SFP-4x32G-SW to MPO-LC breakout	Cisco MDS 9124V B	1/1
	1/35/2		Cisco MDS 9124V B	1/2
	1/35/3		Cisco MDS 9124V B	1/3
	1/35/4		Cisco MDS 9124V B	1/4

Local Device	Local Port	Connection	Remote Device	Remote Port
	L1	Cat 5	Cisco UCS 6536 FI A	L1
	L2	Cat 5	Cisco UCS 6536 FI A	L2
	Mgmt	Cat 5	Management Switch	

Table 8. **Cisco UCS 9124V A Cabling Information**

Local Device	Local Port	Connection	Remote Device	Remote Port
Cisco MDS 9124V A	1/1	DS-SFP-FC32G-SW	Cisco UCS 6536 FI A	1/35/1
	1/2	DS-SFP-FC32G-SW	Cisco UCS 6536 FI A	1/35/2
	1/3	DS-SFP-FC32G-SW	Cisco UCS 6536 FI A	1/35/3
	1/4	DS-SFP-FC32G-SW	Cisco UCS 6536 FI A	1/35/4
	1/5	DS-SFP-FC32G-SW	Hitachi VS 5600 Controller 1	1A
	1/6	DS-SFP-FC32G-SW	Hitachi VS 5600 Controller 1	1B
	1/7	DS-SFP-FC32G-SW	Hitachi VS 5600 Controller 2	2A
	1/8	DS-SFP-FC32G-SW	Hitachi VS 5600 Controller 2	2B
	Mgmt	Cat 5	Management Switch	

Table 9. **Cisco UCS 9124V B Cabling Information**

Local Device	Local Port	Connection	Remote Device	Remote Port
Cisco MDS 9124V B	1/1	DS-SFP-FC32G-SW	Cisco UCS 6536 FI B	1/35/1
	1/2	DS-SFP-FC32G-SW	Cisco UCS 6536 FI B	1/35/2
	1/3	DS-SFP-FC32G-SW	Cisco UCS 6536 FI B	1/35/3
	1/4	DS-SFP-FC32G-SW	Cisco UCS 6536 FI B	1/35/4
	1/5	DS-SFP-FC32G-SW	Hitachi VS 5600 Controller 1	3A
	1/6	DS-SFP-FC32G-SW	Hitachi VS 5600 Controller 1	3B

Local Device	Local Port	Connection	Remote Device	Remote Port
	1/7	DS-SFP-FC32G-SW	Hitachi VS 5600 Controller 2	4A
	1/8	DS-SFP-FC32G-SW	Hitachi VS 5600 Controller 2	4B
	Mgmt	Cat 5	Management Switch	

Table 10. Hitachi VSP 5600 Controller 1

Local Device	Local Port	Connection	Remote Device	Remote Port
Hitachi VSP 5600 Controller 1	1A	DS-SFP-FC32G-SW	Cisco UCS 9124V A	1/5
	1B	DS-SFP-FC32G-SW	Cisco UCS 9124V A	1/6
	3A	DS-SFP-FC32G-SW	Cisco UCS 9124V B	1/5
	3B	DS-SFP-FC32G-SW	Cisco UCS 9124V B	1/6

Table 11. Hitachi VSP 5600 Controller 2

Local Device	Local Port	Connection	Remote Device	Remote Port
Hitachi VSP 5600 Controller 2	2A	DS-SFP-FC32G-SW	Cisco UCS 9124V A	1/7
	2B	DS-SFP-FC32G-SW	Cisco UCS 9124V A	1/8
	4A	DS-SFP-FC32G-SW	Cisco UCS 9124V B	1/7
	4B	DS-SFP-FC32G-SW	Cisco UCS 9124V B	1/8

Table 12. VSP Service Processor (SVP)

Local Device	Local Port	Connection	Remote Device	Remote Port
VSP Service Processor (SVP)	Public LAN	Cat 5	Management Switch	User Defined

The cables and transceivers used in the validated environment are not prescriptive to the solution but are examples of transceivers and cable connections that are valid in the design. Visit the specific product spec sheets and the Cisco Optics-to-Device Compatibility Matrix https://tmgmatrix.cisco.com/ to identify additional supported options.

Cisco Nexus LAN Switch Configuration

This chapter contains the following:

- Physical Connectivity
- Initial Configuration
- Cisco Nexus Switch Configuration

This chapter provides a detailed procedure for configuring the Cisco Nexus 93600CD-GX switches for use in the LAN switching of the Adaptive Solutions Virtual Server Infrastructure.

The following procedures describe how to configure the Cisco Nexus switches for use in a base Adaptive Solutions VSI environment. This procedure assumes the use of Cisco Nexus 9000 10.2(5)M.

Physical Connectivity

Follow the physical connectivity guidelines for infrastructure cabling as explained in the Adaptive Solutions Cabling section.

Initial Configuration

The following procedures describe this basic configuration of the Cisco Nexus switches for use in the Adaptive Solutions VSI. This procedure assumes the use of Cisco Nexus 9000 10.2(5)M, the Cisco suggested Nexus switch release at the time of this validation.

Procedure 1. Set up Initial Configuration

To set up the initial configuration for the Cisco Nexus A switch on <nexus-A-hostname>, follow these steps from a serial console:

Step 1. Configure the switch.

Note: On initial boot, the NX-OS setup should automatically start and attempt to enter Power on Auto Provisioning.

```
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 configuation 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-out_of_band_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]: Enter
Configure default interface layer (L3/L2) [L2]: Enter
Configure default switchport interface state (shut/noshut) [noshut]: shut
Enter basic FC configurations (yes/no) [n]: n
Configure CoPP system profile (strict/moderate/lenient/dense) [strict]: Enter
Would you like to edit the configuration? (yes/no) [n]: Enter
```

Step 2. Review the configuration summary before enabling the configuration.

```
Use this configuration and save it? (yes/no) [y]: Enter
```

Step 3. To set up the initial configuration of the Cisco Nexus B switch, repeat steps 1 and 2 with the appropriate host and IP address information.

Cisco Nexus Switch Configuration

To manually configure the Nexus switches, follow these steps:

Procedure 1. Enable Nexus Features

Cisco Nexus A and Cisco Nexus B (steps should be performed on both switches)

Step 1. Log in as admin using ssh.

Step 2. Run the following commands to enable Nexus features:

```
config t
feature nxapi
feature hsrp
feature udld
feature interface-vlan
feature lacp
feature vpc
feature lldp
```

Procedure 2. Set Global Configurations

Cisco Nexus A and Cisco Nexus B (steps should be performed on both switches)

Step 1. Run the following commands to set global configurations:

```
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 name-server <dns-server-1> <dns-server-2>
ip domain-name <dns-domain-name>
ip domain-lookup
ntp server <global-ntp-server-ip> use-vrf management
ntp master 3
clock timezone <timezone> <hour-offset> <minute-offset>
```

(For Example: clock timezone EST -5 0)

```
clock summer-time <timezone> <start-week> <start-day> <start-month> <start-time> <end-week> <end-day> <end-month>
<end-time> <offset-minutes>
```

(For Example: clock summer-time EDT 2 Sunday March 02:00 1 Sunday November 02:00 60)

```
copy run start
ip route 0.0.0.0/0 <oob-mgmt-vlan-gateway>
```

Note: For more information on configuring the timezone and daylight savings time or summer time, see Cisco Nexus 9000 Series NX-OS Fundamentals Configuration Guide, Release 10.2(x).

Procedure 3. Create VLANs

Cisco Nexus A and Cisco Nexus B (steps should be performed on both switches)

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

```
vlan <ib-mgmt-vlan-id for example, 19>
name ib-mgmt
vlan <native-vlan-id for example, 2>
name native-vlan
vlan <vmotion-vlan-id for example, 1000>
name vmotion
vlan <vm-traffic-vlan-id for example, 1100>
name vm-traffic
vlan <vm-traffic-a-vlan-id for example, 1101>
name vm-traffic-a
vlan <vm-traffic-b-vlan-id for example, 1102>
name vm-traffic-b
```

Procedure 4. Add NTP Distribution Interface in IB-MGMT Subnet (Optional)

This procedure will configure each IB-MGMT SVI to be available for redistribution of the NTP service to optionally configured application networks that might not be set up to reach an upstream NTP source.

Cisco Nexus A

Step 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 <nexus-B-mgmt0-ip> use-vrf management
```

Cisco Nexus B

Step 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 <nexus-A-mgmt0-ip> use-vrf management
```

Procedure 5. Create Application Network Interfaces (Optional)

This procedure creates Switched Virtual Interfaces (SVI) and Hot Standby Router Protocol (HSRP) configurations for each of these SVIs. The HSRP relationship allows an active/standby relationship between the two Nexus switches for these interfaces. The IB-Mgmt network is implemented for routing upstream of the Nexus switches, and these application networks could similarly be handled.

Cisco Nexus A

```
int vlan 1100
no shutdown
ip address <<var_nexus_A_App-1100>>/24
hsrp 100
preempt
ip <<var_nexus_App-1100_vip>>
```

Note: When HSRP priority is not set, it defaults to 100. Alternating SVIs within a switch are set to a number higher than 105 to set those SVIs to default to be the standby router for that network. Be careful when the VLAN SVI for one switch is set without a priority (defaulting to 100), the partner switch is set to a priority with a value other than 100.

```
int vlan 1101
no shutdown
ip address <<var_nexus_A_App-1101>>/24
hsrp 101
preempt
priority 105
ip <<var_nexus_App-1101_vip>>
```

```
int vlan 1102
no shutdown
ip address <<var_nexus_A_App-1102>>/24
hsrp 102
preempt
ip <<var_nexus_App-1102_vip>>
```

Cisco Nexus B

```
int vlan 1100
no shutdown
ip address <<var_nexus_B_App-1100>>/24
hsrp 100
preempt
priority 105
ip <<var_nexus_App-1100_vip>>
```

```
int vlan 1101
no shutdown
ip address <<var_nexus_B_App-1101>>/24
hsrp 101
preempt
ip <<var_nexus_App-1101_vip>>
```

```
int vlan 1102
no shutdown
ip address <<var_nexus_B_App-1102>>/24
hsrp 102
preempt
priority 105
ip <<var_nexus_App-1102_vip>>
```

Procedure 6. Create Port Channels

Cisco Nexus A

Note: For fibre optic connections to Cisco UCS systems (AOC or SFP-based), entering udld enable will result in a message stating that this command is not applicable to fiber ports. This message is expected. This command will enable UDLD on twinax connections.

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

```
interface Po10
description vPC peer-link
!
interface Eth1/29
description <nexus-b-hostname>:Eth1/29
!
interface Eth1/30
description <nexus-b-hostname>:Eth1/30
!
interface Eth1/29-30
channel-group 10 mode active
no shutdown
!
! UCS Connectivity
!
interface Po11
description <ucs-domainname>-a
!
interface Eth1/1
udld enable
description <ucs-domainname>-a:Eth1/35
channel-group 11 mode active
no shutdown
!
interface Po12
description <ucs-domainname>-b
!
interface Eth1/2
udld enable
description <ucs-domainname>-b:Eth1/35
channel-group 12 mode active
no shutdown
!
! Uplink Switch Connectivity
!
interface Po136
description MGMT-Uplink
!
interface Eth1/36
description <mgmt-uplink-switch-a-hostname>:<port>
channel-group 136 mode active
no shutdown
exit
copy run start
```

Cisco Nexus B

Note: For fibre optic connections to Cisco UCS systems (AOC or SFP-based), entering udld enable will result in a message stating that this command is not applicable to fiber ports. This message is expected. This command will enable UDLD on twinax copper connections.

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

```
interface Po10
```

```
description vPC peer-link
!
interface Eth1/29
description <nexus-a-hostname>:Eth1/29
!
interface Eth1/30
description <nexus-a-hostname>:Eth1/30
!
interface Eth1/29-30
channel-group 10 mode active
no shutdown
!
! UCS Connectivity
!
interface Po11
description <ucs-domainname>-a
!
interface Eth1/1
udld enable
description <ucs-domainname>-a:Eth1/36
channel-group 11 mode active
no shutdown
!
interface Po12
description <ucs-domainname>-b
!
interface Eth1/2
udld enable
description <ucs-domainname>-b:Eth1/36
channel-group 12 mode active
no shutdown
!
! Uplink Switch Connectivity
!
interface Po136
description MGMT-Uplink
!
interface Eth1/36
description <mgmt-uplink-switch-a-hostname>:<port>
channel-group 136 mode active
no shutdown
exit
copy run start
```

Procedure 7. Configure Port Channel Parameters

Cisco Nexus A and Cisco Nexus B (steps should be performed on both switches)

Note: To configure port channel parameters, follow this step on both switches.

Step 1. From the global configuration mode, run the following commands to set up the VPC Peer-Link port-channel:

```
interface Po10
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>,<vm-traffic-a-vlan-id>,<vm-traffic-b-vlan-id>
spanning-tree port type network
speed 100000
duplex full
```

Step 2. From the global configuration mode, run the following commands to set up port-channels for UCS FI 6536 connectivity:

```
interface Po11
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>,<vm-traffic-a-vlan-id>,<vm-traffic-b-vlan-id>
spanning-tree port type edge trunk
mtu 9216
!
interface Po12
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>,<vm-traffic-a-vlan-id>,<vm-traffic-b-vlan-id>
spanning-tree port type edge trunk
mtu 9216
```

Step 3. From the global configuration mode, run the following commands to setup port-channels for connectivity to existing management switch(es):

```
interface Po136
switchport mode trunk
switchport trunk native vlan <native-vlan-id>
switchport trunk allowed vlan <ib-mgmt-vlan-id>
spanning-tree port type network
mtu 9216
!
exit
copy run start
```

Procedure 8. Configure Virtual Port Channels

Cisco Nexus A

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

```
vpc domain <nexus-vpc-domain-id for example, 10>
role priority 10
peer-keepalive destination <nexus-B-mgmt0-ip> source <nexus-A-mgmt0-ip> vrf management
peer-switch
peer-gateway
auto-recovery
delay restore 150
ip arp synchronize
!
interface Po10
vpc peer-link
!
interface Po11
vpc 11
!
interface Po12
vpc 12
!
interface Po136
vpc 136
!
exit
copy run start
```

Cisco Nexus B

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

```
vpc domain <nexus-vpc-domain-id for example, 10>
```

```
role priority 20
peer-keepalive destination <nexus-A-mgmt0-ip> source <nexus-B-mgmt0-ip> vrf management
peer-switch
peer-gateway
auto-recovery
delay restore 150
ip arp synchronize
!
interface Po10
vpc peer-link
!
interface Po11
vpc 11
!
interface Po12
vpc 12
!
interface Po136
vpc 136
!
exit
copy run start
```

Hitachi Ops Center Configuration and Initial VSP Settings

This chapter contains the following:

- Configure Hitachi Ops Center

Hitachi Ops Center VM must be deployed on Cisco UCS Management cluster and the Ops Center environment must meet minimum system requirements to support management of various storage systems and servers. For additional details on Hitachi Ops Center, go to: https://knowledge.hitachivantara.com/Documents/Management_Software/Ops_Center/Administrator/10.9.x/Getting_started/02_Hitachi_Ops_Center_Administrator_environment#r_hid_system_req

The software can be obtained from your respective Hitachi representative, alternatively for partner access software can be downloaded here: https://support.hitachivantara.com/en/user/answers/downloads.htm

For additional information, see the Hitachi Ops Center document library: https://knowledge.hitachivantara.com/Documents/Management_Software/Ops_Center/10.9.x/Ops_Center_10.9.x_Documentation_Library

Configure Hitachi Ops Center

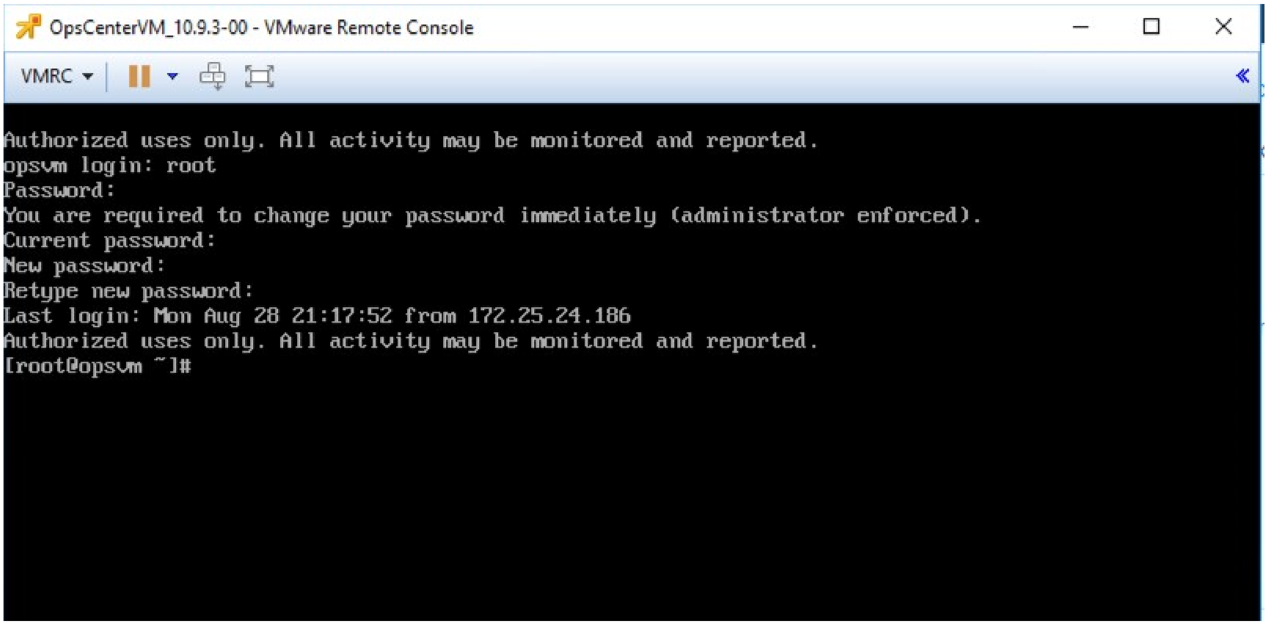
Procedure 1. Initial Configuration of the Hitachi Ops Center

Proceed with the following steps to configure the Hitachi Ops Center after deploying the OVA template:

Step 1. Log in with the following credentials:

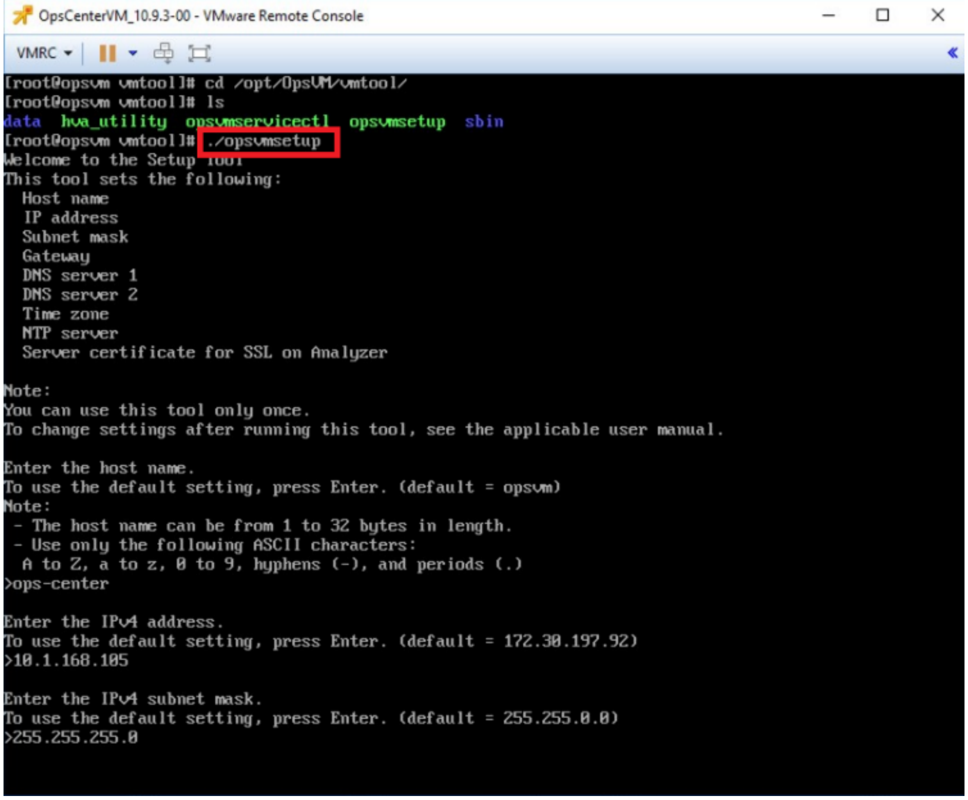
Username: root

Password: manager



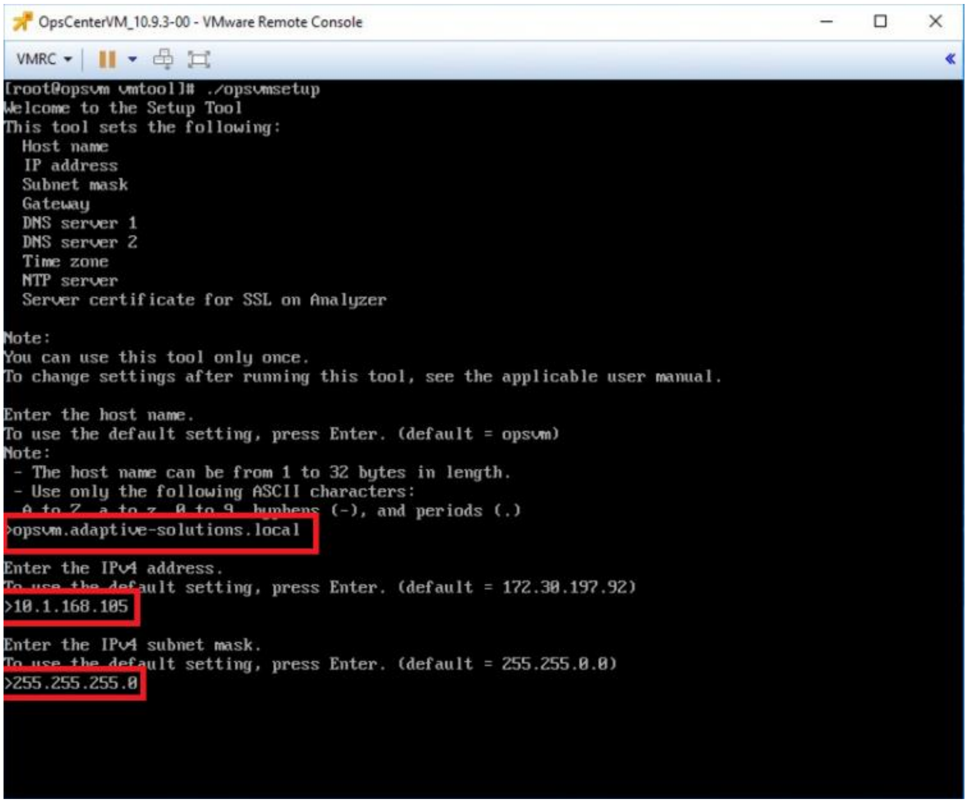
```
Authorized uses only. All activity may be monitored and reported.
opsvm login: root
Password:
You are required to change your password immediately (administrator enforced).
Current password:
New password:
Retype new password:
Last login: Mon Aug 28 21:17:52 from 172.25.24.186
Authorized uses only. All activity may be monitored and reported.
[root@opsvm ~]#
```

Step 2. Run the **opsvmsetup** command to start the setup tool.

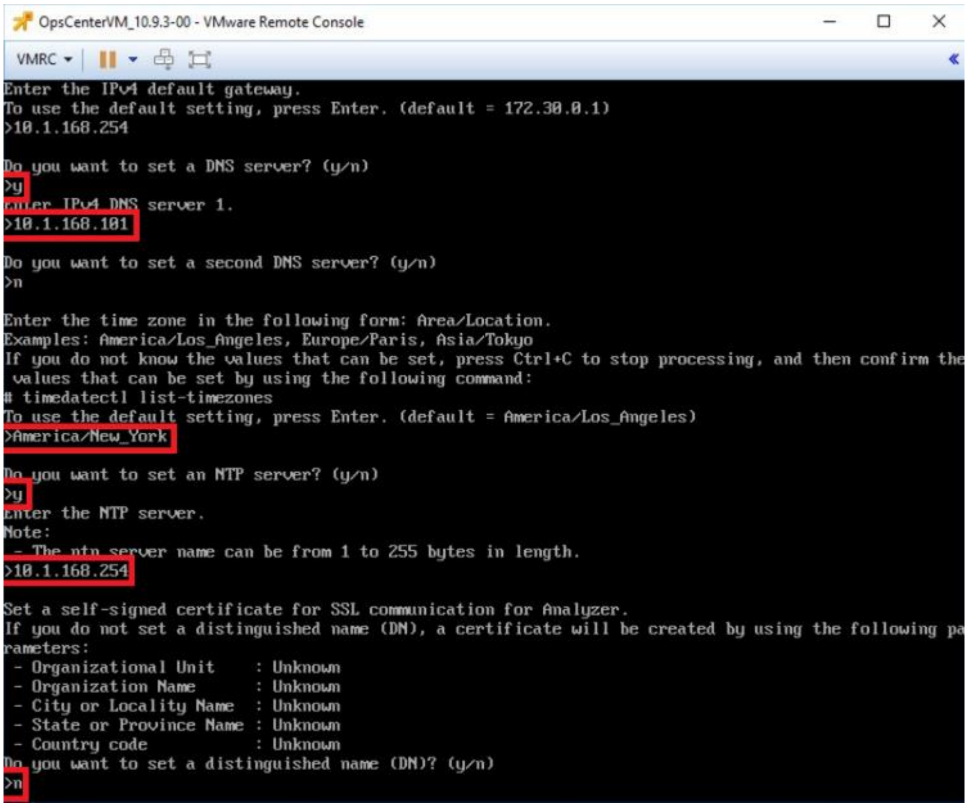


```
[root@opsvm vmtool]# cd /opt/OpsVM/vmtool/
[root@opsvm vmtool]# ls
data  hva_utility  opsvmservicectl  opsvmsetup  sbin
[root@opsvm vmtool]# ./opsvmsetup
Welcome to the Setup Tool
This tool sets the following:
  Host name
  IP address
  Subnet mask
  Gateway
  DNS server 1
  DNS server 2
  Time zone
  NTP server
  Server certificate for SSL on Analyzer

Note:
You can use this tool only once.
To change settings after running this tool, see the applicable user manual.

Enter the host name.
To use the default setting, press Enter. (default = opsvm)
Note:
 - The host name can be from 1 to 32 bytes in length.
 - Use only the following ASCII characters:
  A to Z, a to z, 0 to 9, hyphens (-), and periods (.)
>ops-center

Enter the IPv4 address.
To use the default setting, press Enter. (default = 172.30.197.92)
>10.1.168.105

Enter the IPv4 subnet mask.
To use the default setting, press Enter. (default = 255.255.0.0)
>255.255.255.0
```

Step 3. Enter the Hostname (FQDN), IP Address, Subnet mask, Gateway, DNS, Time zone, and NTP details, as shown in the following figures.



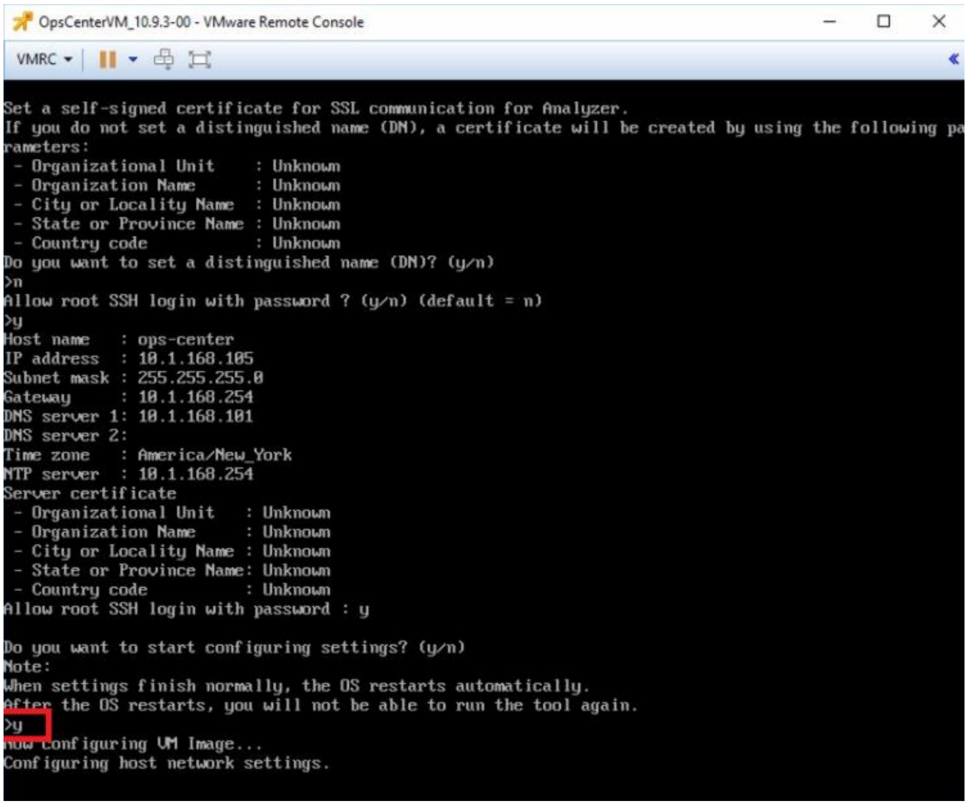
```
[root@opsvm vmtool]# ./opsvmsetup
Welcome to the Setup Tool
This tool sets the following:
  Host name
  IP address
  Subnet mask
  Gateway
  DNS server 1
  DNS server 2
  Time zone
  NTP server
  Server certificate for SSL on Analyzer

Note:
You can use this tool only once.
To change settings after running this tool, see the applicable user manual.

Enter the host name.
To use the default setting, press Enter. (default = opsvm)
Note:
 - The host name can be from 1 to 32 bytes in length.
 - Use only the following ASCII characters:
   A to Z, a to z, 0 to 9, hyphens (-), and periods (.)
>opsvm.adaptive-solutions.local

Enter the IPv4 address.
To use the default setting, press Enter. (default = 172.30.197.92)
>10.1.168.105

Enter the IPv4 subnet mask.
To use the default setting, press Enter. (default = 255.255.0.0)
>255.255.255.0
```



```
Enter the IPv4 default gateway.
To use the default setting, press Enter. (default = 172.30.0.1)
>10.1.168.254

Do you want to set a DNS server? (y/n)
>y
Enter IPv4 DNS server 1.
>10.1.168.101

Do you want to set a second DNS server? (y/n)
>n

Enter the time zone in the following form: Area/Location.
Examples: America/Los_Angeles, Europe/Paris, Asia/Tokyo
If you do not know the values that can be set, press Ctrl+C to stop processing, and then confirm the
 values that can be set by using the following command:
# timedatectl list-timezones
To use the default setting, press Enter. (default = America/Los_Angeles)
>America/New_York

Do you want to set an NTP server? (y/n)
>y
Enter the NTP server.
Note:
 - The ntp server name can be from 1 to 255 bytes in length.
>10.1.168.254

Set a self-signed certificate for SSL communication for Analyzer.
If you do not set a distinguished name (DN), a certificate will be created by using the following pa
rameters:
 - Organizational Unit     : Unknown
 - Organization Name       : Unknown
 - City or Locality Name   : Unknown
 - State or Province Name  : Unknown
 - Country code            : Unknown
Do you want to set a distinguished name (DN)? (y/n)
>n
```

Step 4. After providing the initial setup information, enter “**y**” to start the configuration.

Note: Do not press or enter any key while running the configuration setup. The OS will restart automatically after the configuration is completed.



```
Set a self-signed certificate for SSL communication for Analyzer.
If you do not set a distinguished name (DN), a certificate will be created by using the following pa
rameters:
 - Organizational Unit    : Unknown
 - Organization Name      : Unknown
 - City or Locality Name  : Unknown
 - State or Province Name : Unknown
 - Country code           : Unknown
Do you want to set a distinguished name (DN)? (y/n)
>n
Allow root SSH login with password ? (y/n) (default = n)
>y
Host name   : ops-center
IP address  : 10.1.168.105
Subnet mask : 255.255.255.0
Gateway     : 10.1.168.254
DNS server 1: 10.1.168.101
DNS server 2:
Time zone   : America/New_York
NTP server  : 10.1.168.254
Server certificate
 - Organizational Unit   : Unknown
 - Organization Name     : Unknown
 - City or Locality Name : Unknown
 - State or Province Name: Unknown
 - Country code          : Unknown
Allow root SSH login with password : y

Do you want to start configuring settings? (y/n)
Note:
When settings finish normally, the OS restarts automatically.
After the OS restarts, you will not be able to run the tool again.
>y
Now configuring VM Image...
Configuring host network settings.
```

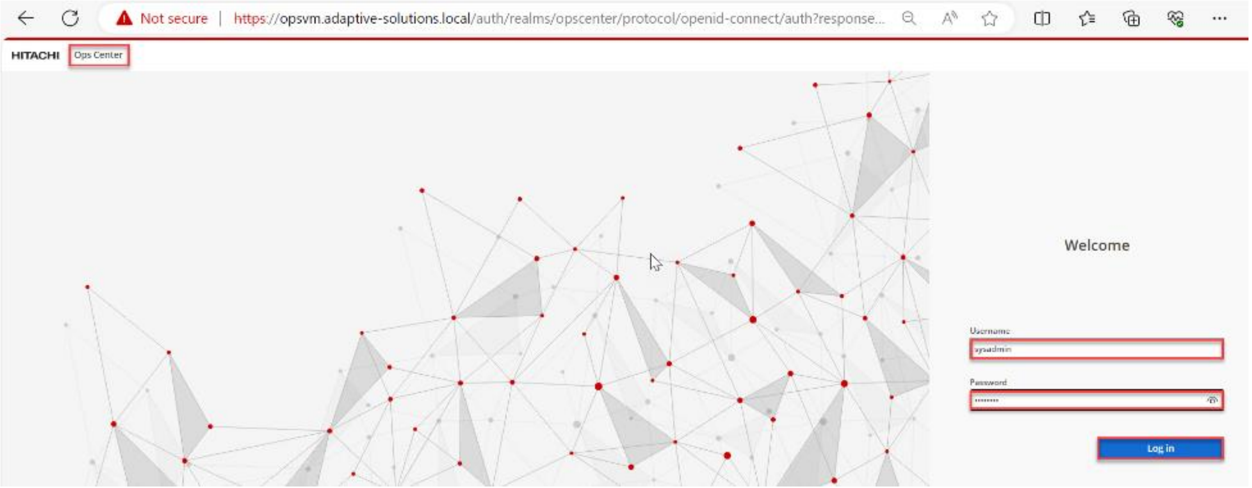
Procedure 2. Access Hitachi Ops Center Administrator

After the Ops Center configuration is completed, open a browser, and enter https://[FQDN or IP Address]/portal/#/inventory/products.

Step 1. Enter the following credentials and click **Log in**:

Username: sysadmin

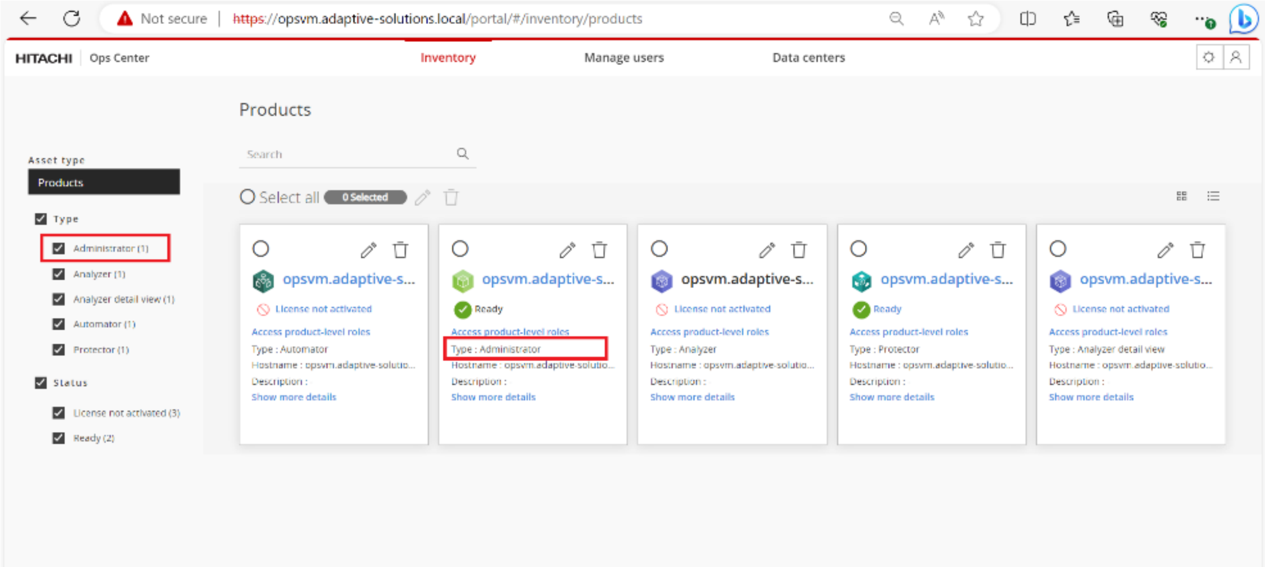
Password: sysadmin


Not secure
https://opsvm.adaptive-solutions.local/auth/realms/opscenter/protocol/openid-connect/auth?response...
HITACHI
Ops Center
Welcome
Log in

Username: sysadmin

Password: ••••••••

Step 2. After logging into the Hitachi Ops Center UI, you will find different product types such as **Administrator**, **Analyzer**, **Analyzer detail view**, **Automator**, and **Protector**.



☑ Type
- ☑ Administrator (1)
- ☑ Analyzer (1)
- ☑ Analyzer detail view (1)
- ☑ Automator (1)
- ☑ Protector (1)

☑ Status
- ☑ License not activated (3)
- ☑ Ready (2)

○ opsvm.adaptive-s... License not activated. Access product-level roles. Type : Automator. Hostname : opsvm.adaptive-solutio... Description : Show more details

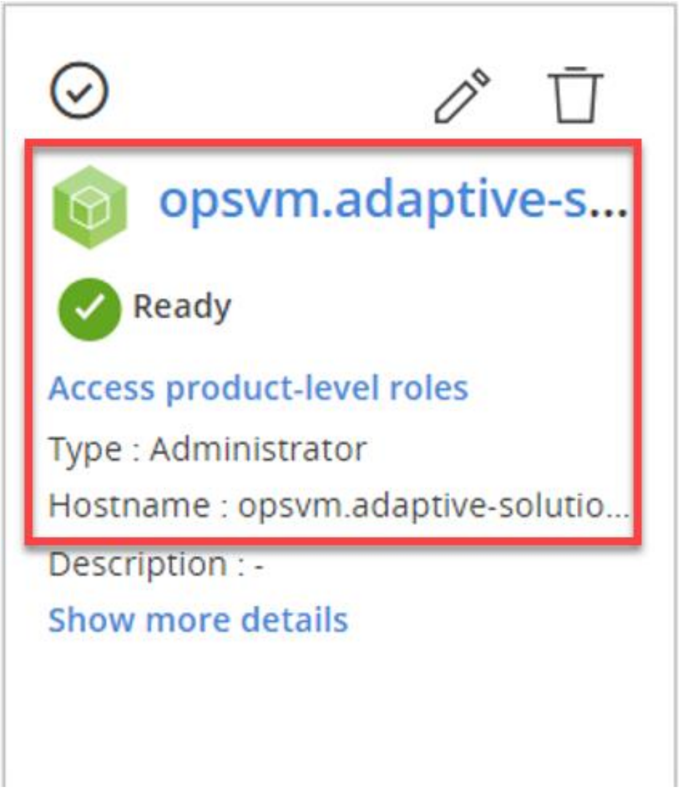
○ opsvm.adaptive-s... Ready. Access product-level roles. Type : Administrator. Hostname : opsvm.adaptive-solutio... Description : Show more details

○ opsvm.adaptive-s... License not activated. Access product-level roles. Type : Analyzer. Hostname : opsvm.adaptive-solutio... Description : Show more details

○ opsvm.adaptive-s... Ready. Access product-level roles. Type : Protector. Hostname : opsvm.adaptive-solutio... Description : Show more details

○ opsvm.adaptive-s... License not activated. Access product-level roles. Type : Analyzer detail view. Hostname : opsvm.adaptive-solutio... Description : Show more details

Step 3. Select the highlighted icon to launch **Ops Center Administrator**.



opsvm.adaptive-s...

Ready

Access product-level roles

Type : Administrator

Hostname : opsvm.adaptive-solutio...

Description : -

Show more details

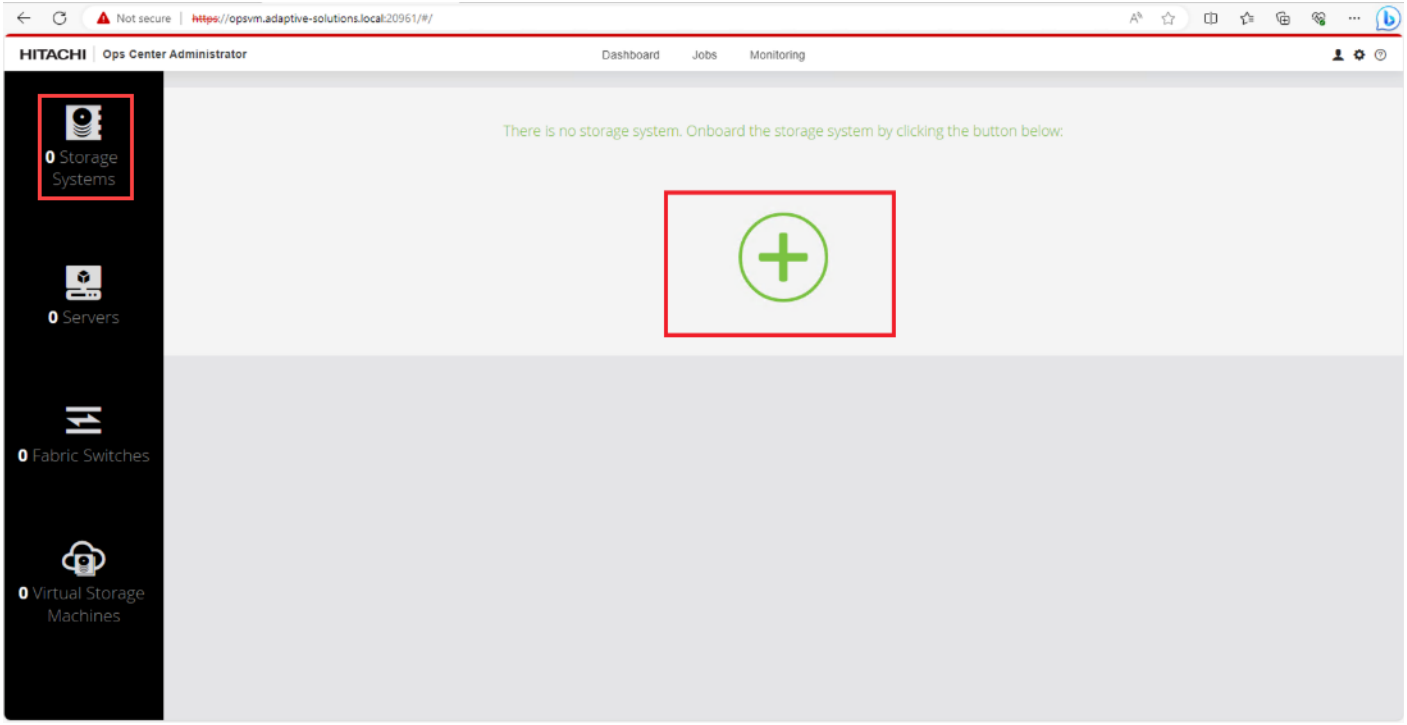
Procedure 3. Onboarding Hitachi Virtual Storage Platform to Ops Center Administrator

Onboarding a storage system is the process of associating it with Ops Center Administrator. After onboarding the storage system, you can manage it from the Ops Center Administrator dashboard.

Before you begin, verify the following:

- The service processor (SVP) username used to onboard a storage system in Ops Center Administrator has access to all resource groups on the storage system, including custom resource groups and meta resource groups, to ensure workflows function correctly.
- The user is a member of the Administration Users Group.

Step 1. On the **Ops Center Administrator** dashboard, click **Storage Systems**, and click the plus sign (**+**) to add a storage system.



There is no storage system. Onboard the storage system by clicking the button below:

Step 2. In the **Onboard Storage System** window, enter **values** for the following parameters:

- IP Address:

  For a storage system with an SVP, enter the IP address (IPv4) of the SVP for the storage system you want to discover.

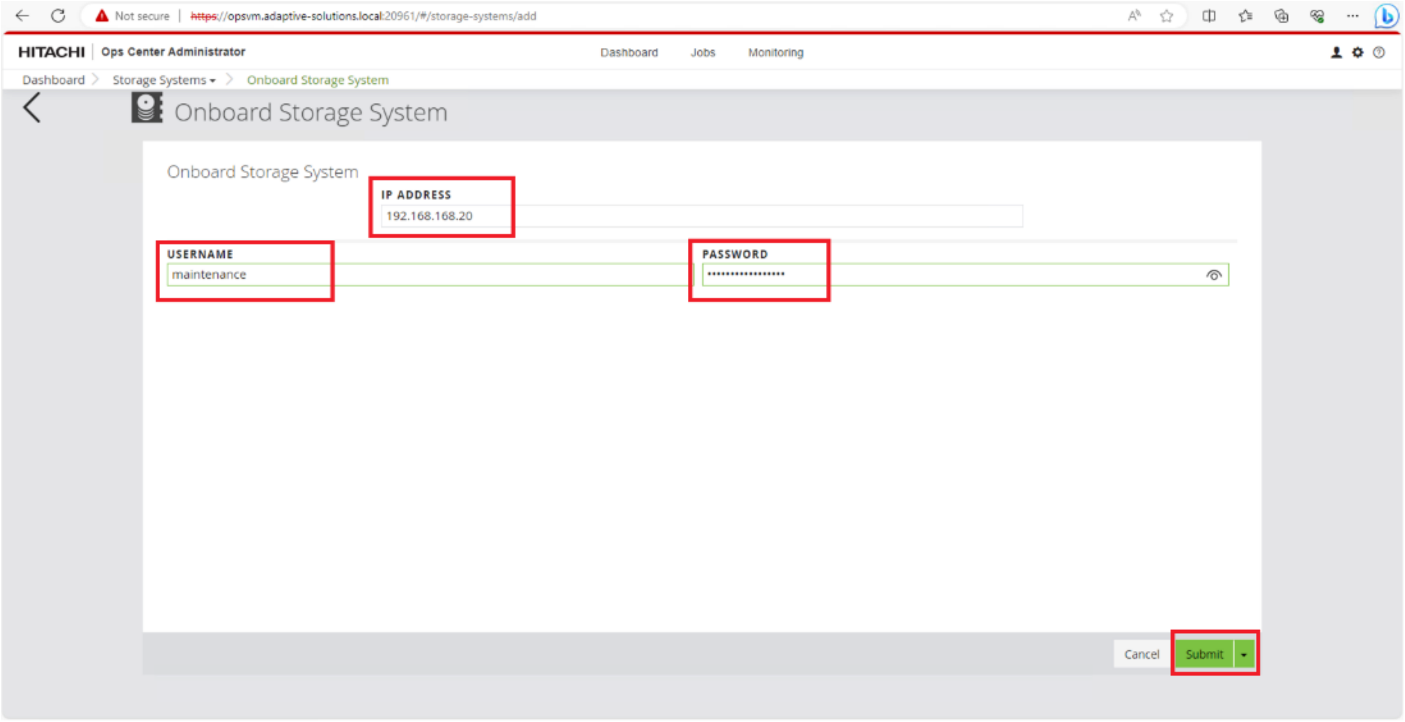
Note: For the VSP E1090, if there is no SVP, you can onboard storage using the IP address of the controllers.

- Username and password:

  Onboard the VSP system as a user with administrator privileges on the storage system. For example, you can use the following username and password:

  - Username: maintenance
  - Password: raid-maintenance

Step 3. Click **Submit.**



Not secure | https://opsvm.adaptive-solutions.local:20961/#/storage-systems/add
HITACHI | Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Storage Systems ▾ > Onboard Storage System
Cancel
Submit

Onboard Storage System

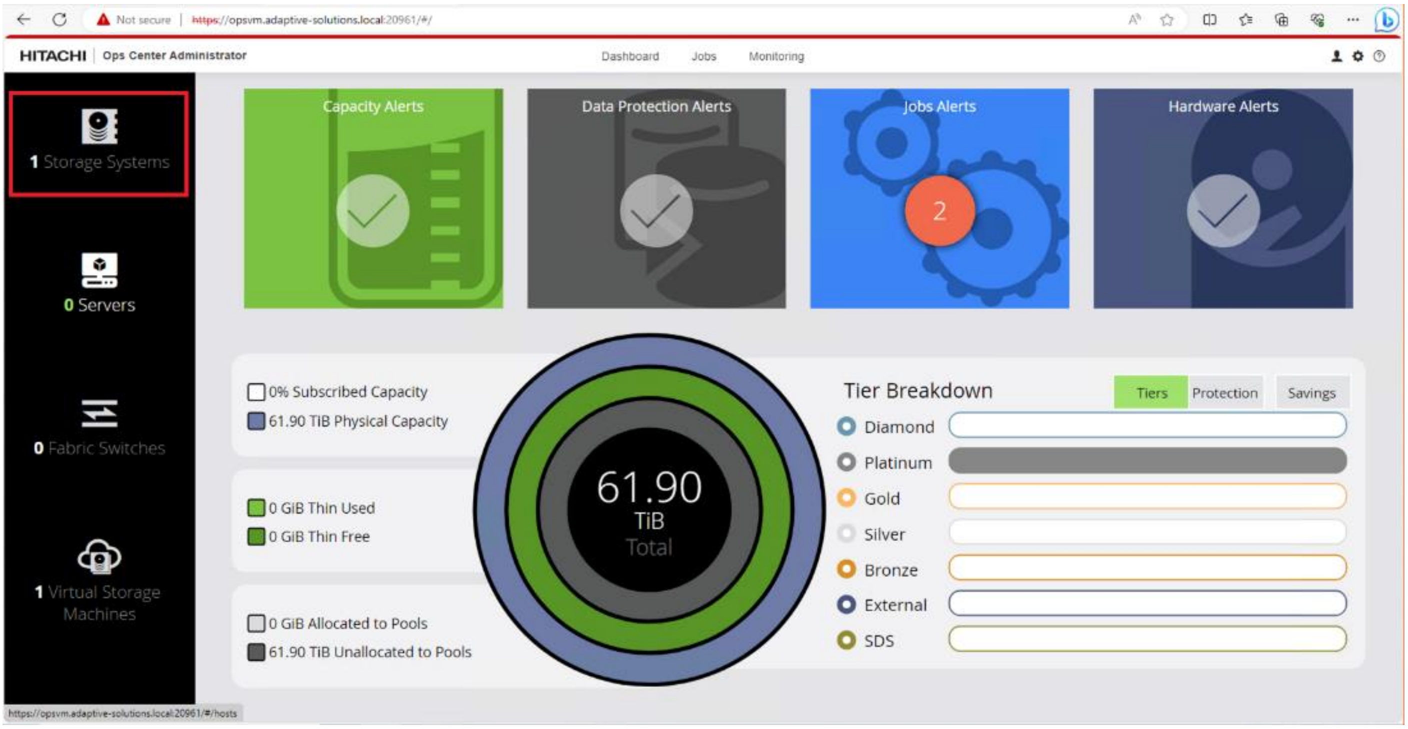
Onboard Storage System

IP ADDRESS: 192.168.168.20

USERNAME: maintenance

PASSWORD: ••••••••••••••••

Step 4. The dashboard now shows that the number of storage systems has been increased by one. Additionally, when you click **Storage Systems,** you are redirected to the storage system inventory window where you can see the newly-added storage system.



Not secure | https://opsvm.adaptive-solutions.local:20961/#/
HITACHI | Ops Center Administrator
Dashboard
Jobs
Monitoring
1 Storage Systems
0 Servers
0 Fabric Switches
1 Virtual Storage Machines
Capacity Alerts
Data Protection Alerts
Jobs Alerts
2
Hardware Alerts
Tiers
Protection
Savings
https://opsvm.adaptive-solutions.local:20961/#/hosts

□ 0% Subscribed Capacity
▨ 61.90 TiB Physical Capacity

🟩 0 GiB Thin Used
🟩 0 GiB Thin Free

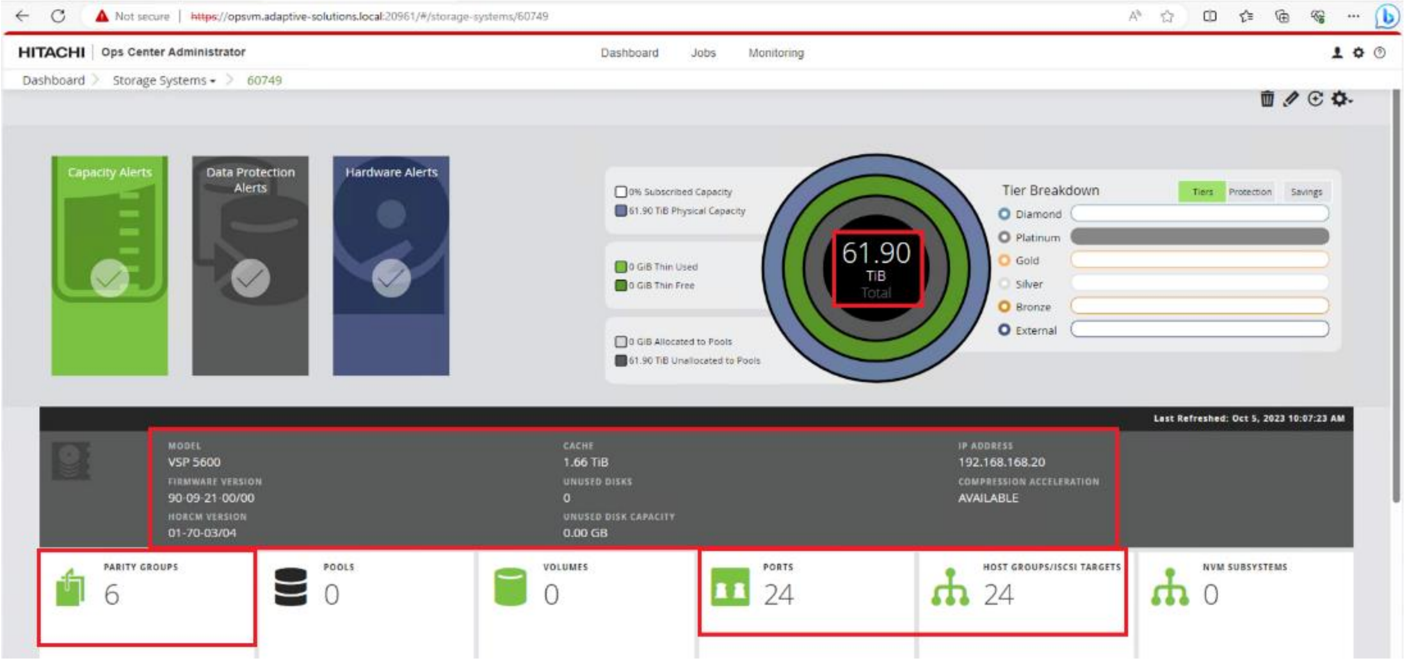
□ 0 GiB Allocated to Pools
▨ 61.90 TiB Unallocated to Pools

61.90 TiB Total

Tier Breakdown

- Diamond
- Platinum
- Gold
- Silver
- Bronze
- External
- SDS

When a storage system is onboarded, the Ops Center Administrator undergoes an initialization process to gather information about the current configuration of the storage system. During this time, you may observe that the ports, volumes, pools, and Parity Groups in the storage system are " Not accessible." After the initialization is completed, you can view information about PARITY GROUPS, POOLS, VOLUMES, PORTS, HOST GROUPS/SCSI TARGETS, and NEW SUBSYSTEMS in the Storage System tab.



Last Refreshed: Oct 5, 2023 10:07:23 AM

MODEL
VSP 5600
FIRMWARE VERSION
90-09-21-00/00
HORCM VERSION
01-70-03/04

CACHE
1.66 TiB
UNUSED DISKS
0
UNUSED DISK CAPACITY
0.00 GB

IP ADDRESS
192.168.168.20
COMPRESSION ACCELERATION
AVAILABLE

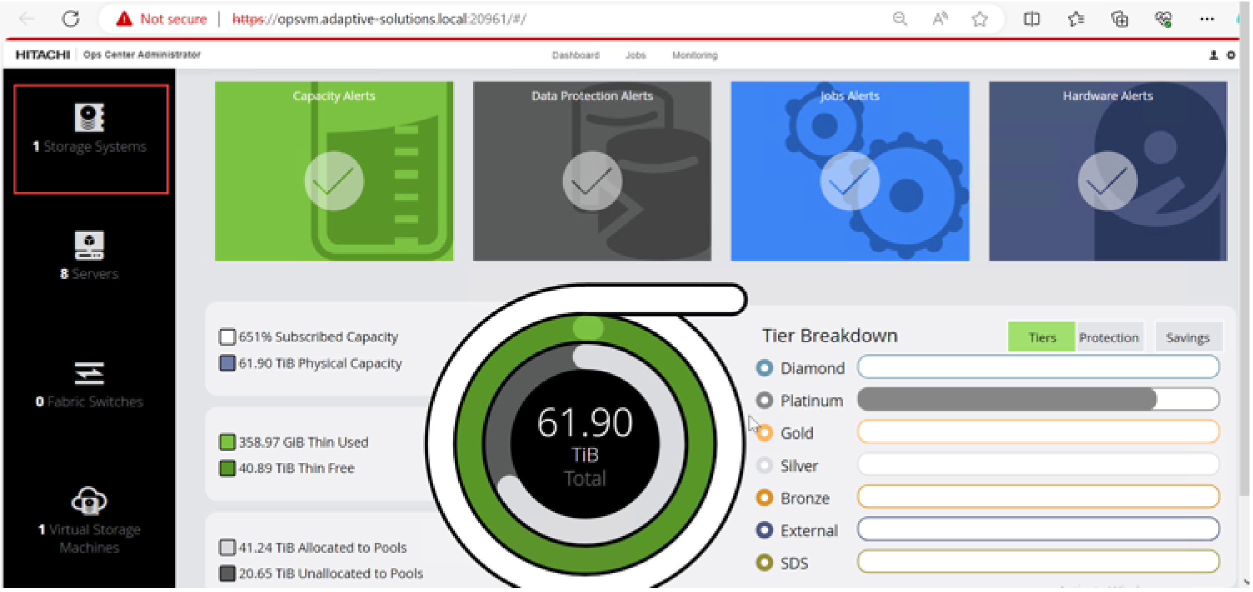
PARITY GROUPS 6
POOLS 0
VOLUMES 0
PORTS 24
HOST GROUPS/ISCSI TARGETS 24
NVM SUBSYSTEMS 0

Procedure 4. Configure Fibre Channel Ports on the Hitachi Virtual Storage Platform from Ops Center Administrator (FC-SCSI)

Before the Ops Center Administrator can create a host storage domain (HSD) on a port, you must change the port security and port attributes settings.

Port security must be enabled for fibre ports. By default, security is disabled on the VSP storage ports. Additionally, for VSP 5000 series systems, you must verify that the port attribute is set to TARGET.

Step 1. Log in to Hitachi Ops Center Administrator. From the navigation pane, click **Storage Systems**.



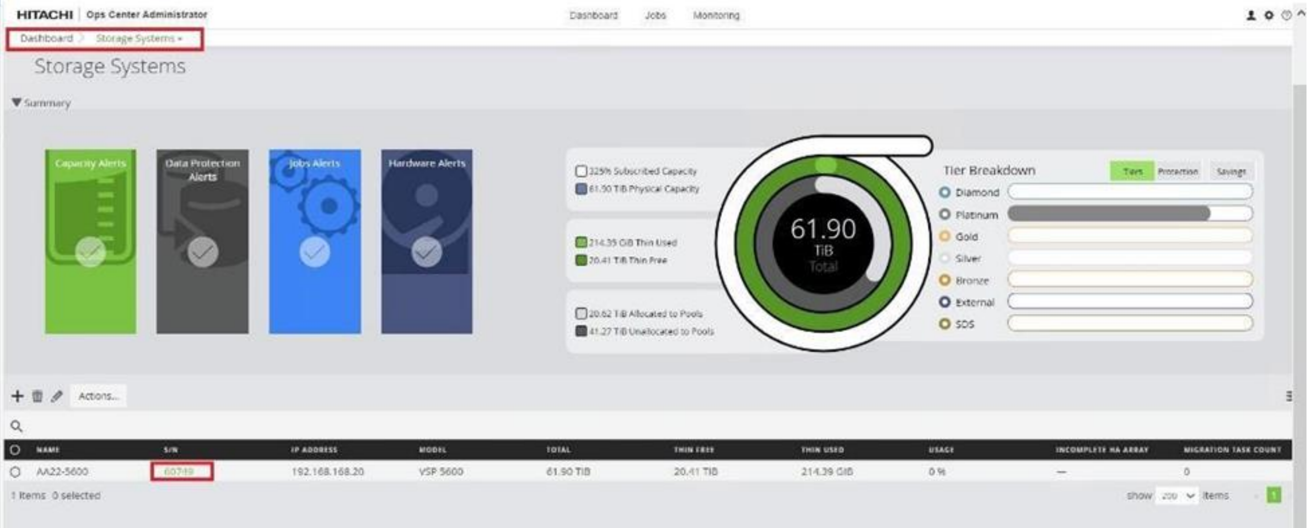
□ 651% Subscribed Capacity
▨ 61.90 TiB Physical Capacity

🟩 358.97 GiB Thin Used
🟩 40.89 TiB Thin Free

□ 41.24 TiB Allocated to Pools
▨ 20.65 TiB Unallocated to Pools

61.90 TiB Total

Step 2. Click the **S/N** listing of the Storage System.



□ 325% Subscribed Capacity
▨ 61.90 TiB Physical Capacity

🟩 214.35 GiB Thin Used
🟩 20.41 TiB Thin Free

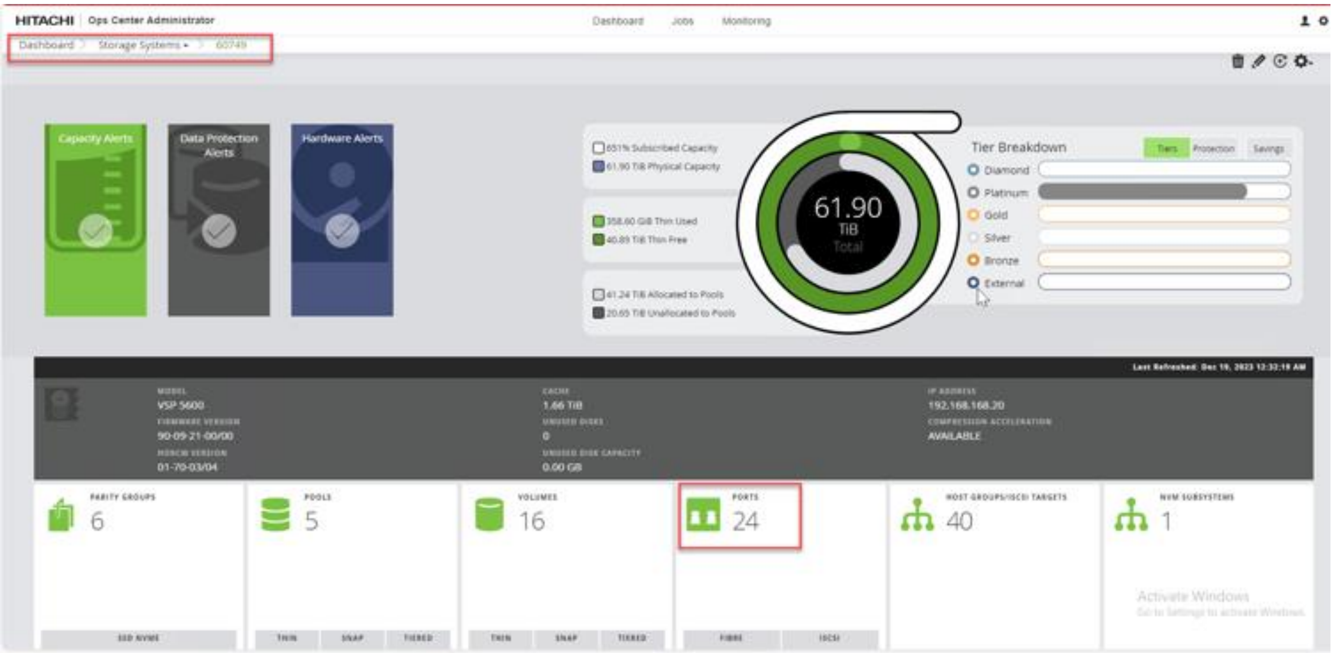
□ 20.62 TiB Allocated to Pools
▨ 41.27 TiB Unallocated to Pools

61.90 TiB Total

○	NAME	S/N	IP ADDRESS	MODEL	TOTAL	THIN FREE	THIN USED	USAGE	INCOMPLETE HA ARRAY	MIGRATION TASK COUNT
○	AA22-5600	60749	192.168.168.20	VSP 5600	61.90 TiB	20.41 TiB	214.39 GiB	0 %	—	0

1 Items 0 selected   Show 200 Items

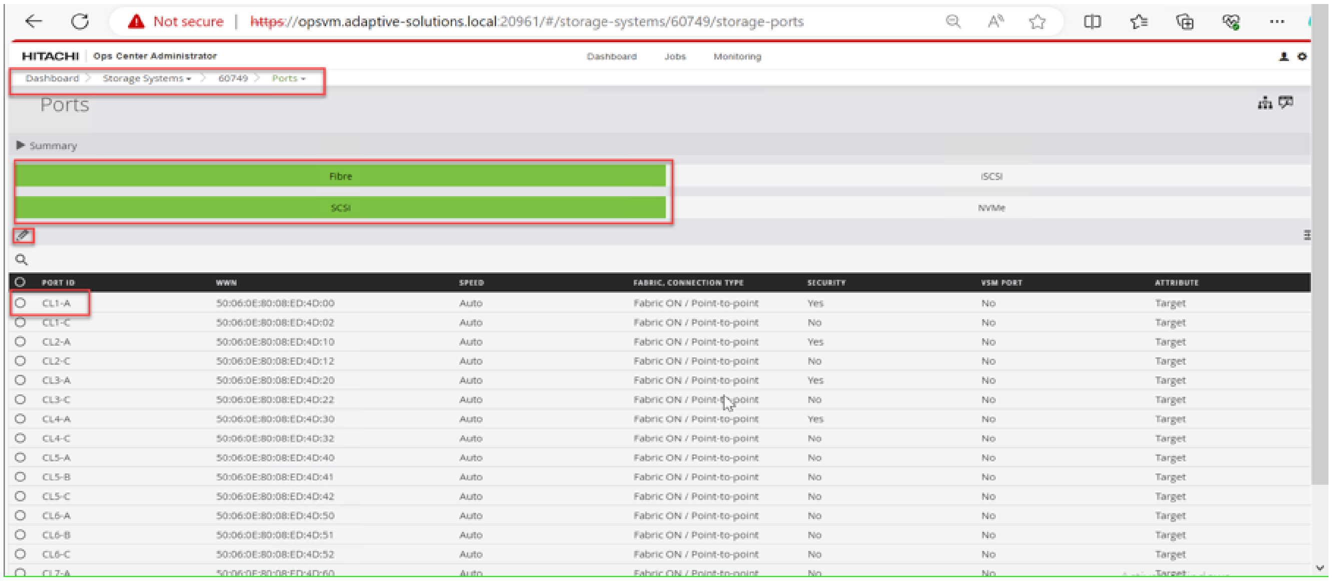
Step 3. Click **PORTS** to see the configured storage ports for the storage systems.



Last Refreshed: Dec 19, 2023 12:32:19 AM

MODEL: VSP 5600
FIRMWARE VERSION: 90-09-21-00/00
[illegible] VERSION: 01-70-03/04
CACHE: 1.66 TiB
UNUSED DISKS: 0
UNUSED DISK CAPACITY: 0.00 GB
IP ADDRESS: 192.168.168.20
COMPRESSION ACCELERATION: AVAILABLE

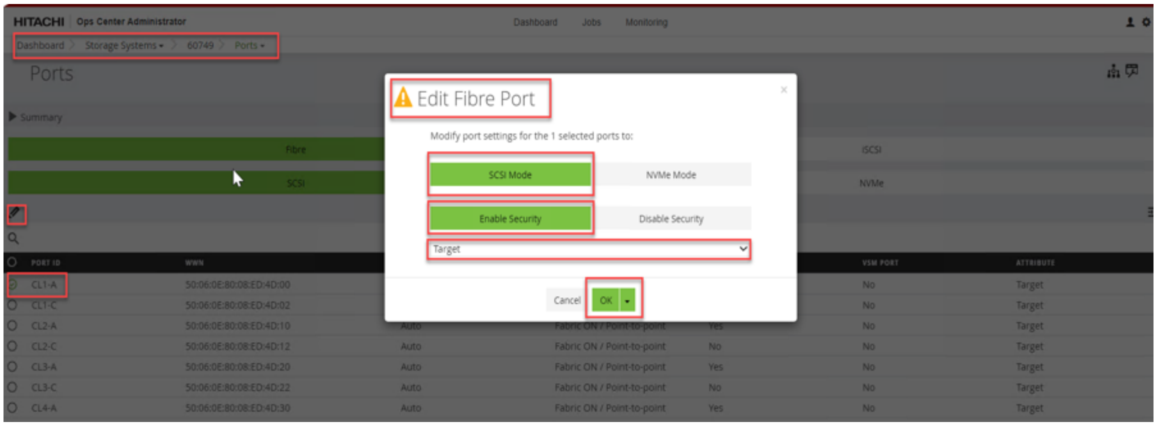
Step 4. To modify ports, select one or more Fibre Channel ports, and then click the edit pencil icon in the Actions pane.


Not secure | https://opsvm.adaptive-solutions.local:20961/#/storage-systems/60749/storage-ports
HITACHI | Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Storage Systems > 60749 > Ports
Ports
Summary
Fibre
iSCSI
SCSI
NVMe

○	PORT ID	WWN	SPEED	FABRIC, CONNECTION TYPE	SECURITY	VSM PORT	ATTRIBUTE
○	CL1-A	50:06:0E:80:08:ED:4D:00	Auto	Fabric ON / Point-to-point	Yes	No	Target
○	CL1-C	50:06:0E:80:08:ED:4D:02	Auto	Fabric ON / Point-to-point	No	No	Target
○	CL2-A	50:06:0E:80:08:ED:4D:10	Auto	Fabric ON / Point-to-point	Yes	No	Target
○	CL2-C	50:06:0E:80:08:ED:4D:12	Auto	Fabric ON / Point-to-point	No	No	Target
○	CL3-A	50:06:0E:80:08:ED:4D:20	Auto	Fabric ON / Point-to-point	Yes	No	Target
○	CL3-C	50:06:0E:80:08:ED:4D:22	Auto	Fabric ON / Point-to-point	No	No	Target
○	CL4-A	50:06:0E:80:08:ED:4D:30	Auto	Fabric ON / Point-to-point	Yes	No	Target
○	CL4-C	50:06:0E:80:08:ED:4D:32	Auto	Fabric ON / Point-to-point	No	No	Target
○	CL5-A	50:06:0E:80:08:ED:4D:40	Auto	Fabric ON / Point-to-point	No	No	Target
○	CL5-B	50:06:0E:80:08:ED:4D:41	Auto	Fabric ON / Point-to-point	No	No	Target
○	CL5-C	50:06:0E:80:08:ED:4D:42	Auto	Fabric ON / Point-to-point	No	No	Target
○	CL6-A	50:06:0E:80:08:ED:4D:50	Auto	Fabric ON / Point-to-point	No	No	Target
○	CL6-B	50:06:0E:80:08:ED:4D:51	Auto	Fabric ON / Point-to-point	No	No	Target
○	CL6-C	50:06:0E:80:08:ED:4D:52	Auto	Fabric ON / Point-to-point	No	No	Target
○	CL7-A	50:06:0E:80:08:ED:4D:60	Auto	Fabric ON / Point-to-point	No	No	Target

Step 5. In the **Edit Fibre Port** dialog box, you can change the security settings and port attributes. Verify that port settings for fibre ports used in FC-SCSI connectivity have **SCSI Mode**, **Enable Security**, and **Target** selected as the port attribute. In the context of this document, these settings apply to fibre ports CL1-A, CL2-A, CL3-A, and CL4-A.

Step 6. Click **OK**.



Edit Fibre Port

Modify port settings for the 1 selected ports to:

[✓ SCSI Mode] NVMe Mode

[✓ Enable Security] Disable Security

Target

Cancel [✓ OK]

PORT ID	WWN				VSM PORT	ATTRIBUTE
CL1-A	50:06:0E:80:08:ED:4D:00				No	Target
CL1-C	50:06:0E:80:08:ED:4D:02				No	Target
CL2-A	50:06:0E:80:08:ED:4D:10	Auto	Fabric ON / Point-to-point	Yes	No	Target
CL2-C	50:06:0E:80:08:ED:4D:12	Auto	Fabric ON / Point-to-point	No	No	Target
CL3-A	50:06:0E:80:08:ED:4D:20	Auto	Fabric ON / Point-to-point	Yes	No	Target
CL3-C	50:06:0E:80:08:ED:4D:22	Auto	Fabric ON / Point-to-point	No	No	Target
CL4-A	50:06:0E:80:08:ED:4D:30	Auto	Fabric ON / Point-to-point	Yes	No	Target

Cisco Intersight Managed Mode Configuration

This chapter contains the following:

Cisco Intersight Setup

The Cisco Intersight platform is a management solution delivered as a service with embedded analytics for Cisco and third-party IT infrastructures. The Cisco Intersight managed mode (also referred to as Cisco IMM) is a new architecture that manages Cisco Unified Computing System (Cisco UCS) fabric interconnect-attached systems through a Redfish-based standard model. Cisco Intersight managed mode standardizes both policy and operation management for the Cisco UCS X210c M7 compute nodes used in this deployment guide.

Cisco UCS C-Series M7 servers, connected and managed through Cisco UCS FIs, are also supported by IMM. For a complete list of supported platforms, go to: https://www.cisco.com/c/en/us/td/docs/unified_computing/Intersight/b_Intersight_Managed_Mode_Configuration_Guide/b_intersight_managed_mode_guide_chapter_01010.html

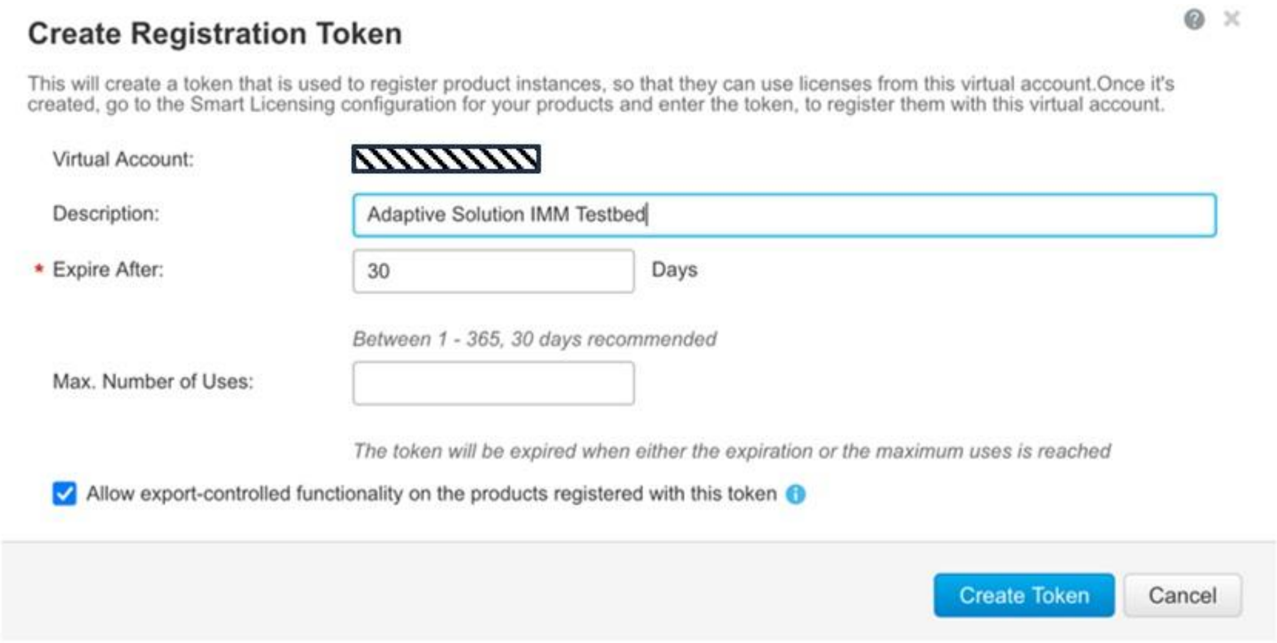
Procedure 1. Set Up Cisco Intersight Account

When setting up a new Cisco Intersight account (as explained in this document), the account must be enabled for Cisco Smart Software Licensing. Skip this step if starting out with a trial, or if a token has already been generated.

Step 1. Log into the Cisco Smart Licensing portal: https://software.cisco.com/software/smart-licensing/alerts.

Step 2. Verify that the correct virtual account is selected.

Step 3. Under **Inventory** > **General**, generate a new token for product registration.



Create Registration Token

This will create a token that is used to register product instances, so that they can use licenses from this virtual account.Once it's created, go to the Smart Licensing configuration for your products and enter the token, to register them with this virtual account.

Virtual Account: [redacted]

Description: Adaptive Solution IMM Testbed

* Expire After: 30 Days

Between 1 - 365, 30 days recommended

Max. Number of Uses:

The token will be expired when either the expiration or the maximum uses is reached

☑ Allow export-controlled functionality on the products registered with this token

Step 4. Copy this newly created token.

Procedure 2. Set Up Cisco Intersight Licensing

Step 1. Go to https://intersight.com and click **Create an account** if not using an existing account.

Step 2. Select the appropriate region for the account. Click **Next**.

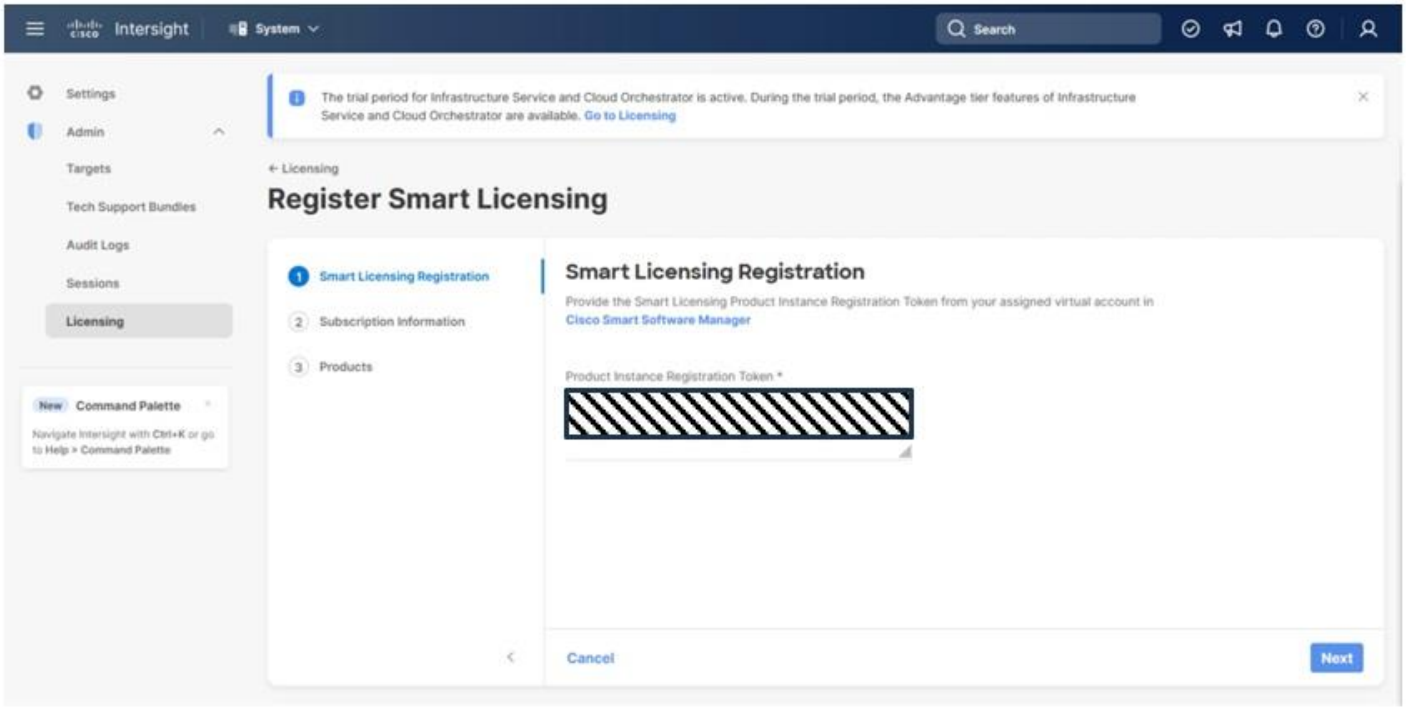
Step 3. Read and accept the license agreement. Click **Next**.

Step 4. Provide an Account Name. Click **Create**.

Step 5. Select to either **Register Smart Licensing** if that has been established or **Start Trial**.

Step 6. If registering, the **Register Smart Licensing** will take you to System > Admin > Licensing.

Step 7. Provide the copied token from the Cisco Smart Licensing Portal. Click **Next**.



The trial period for Infrastructure Service and Cloud Orchestrator is active. During the trial period, the Advantage tier features of Infrastructure Service and Cloud Orchestrator are available. Go to Licensing

← Licensing

Register Smart Licensing

1 Smart Licensing Registration
2 Subscription Information
3 Products

Smart Licensing Registration

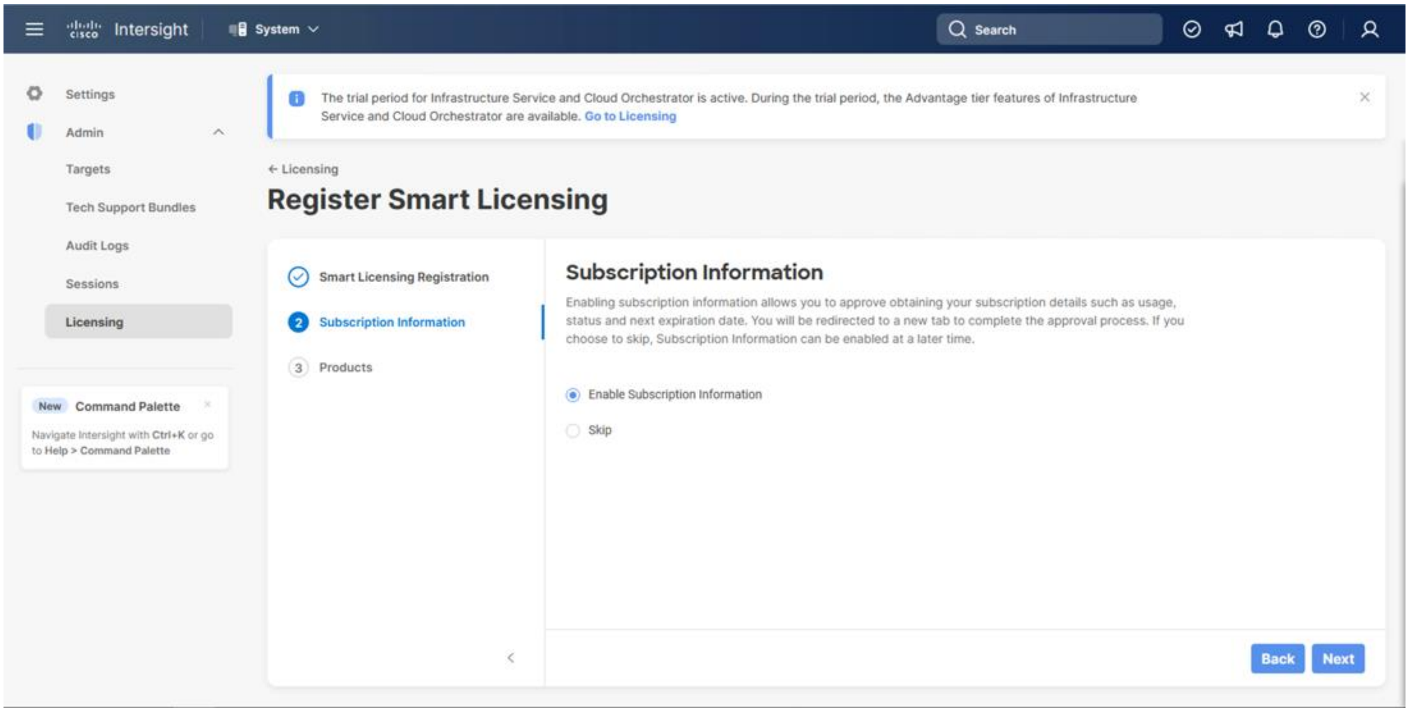
Provide the Smart Licensing Product Instance Registration Token from your assigned virtual account in Cisco Smart Software Manager

Product Instance Registration Token *

[redacted]

Cancel Next

Step 8. Select **Enable** or **Skip** subscription information and click **Next.**



The trial period for Infrastructure Service and Cloud Orchestrator is active. During the trial period, the Advantage tier features of Infrastructure Service and Cloud Orchestrator are available. Go to Licensing

← Licensing

Register Smart Licensing

✓ Smart Licensing Registration
2 Subscription Information
3 Products

Subscription Information

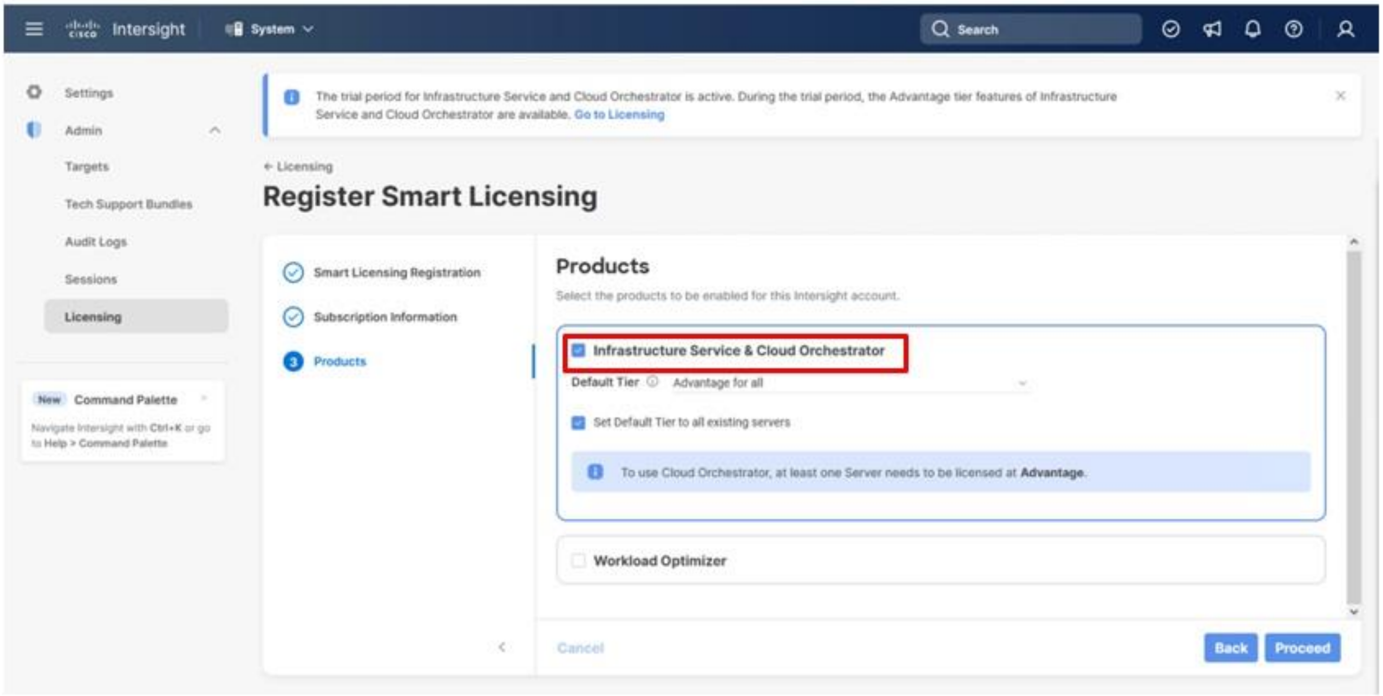
Enabling subscription information allows you to approve obtaining your subscription details such as usage, status and next expiration date. You will be redirected to a new tab to complete the approval process. If you choose to skip, Subscription Information can be enabled at a later time.

● Enable Subscription Information

○ Skip

Back Next

Step 9. Select the **Infrastructure Service & Cloud Orchestrator** option, adjust the default tier for licensing if needed, and if this should be used for existing servers, click **Proceed.** Click **Confirm** when asked to verify options.



The trial period for Infrastructure Service and Cloud Orchestrator is active. During the trial period, the Advantage tier features of Infrastructure Service and Cloud Orchestrator are available. Go to Licensing

← Licensing

Register Smart Licensing

- Smart Licensing Registration
- Subscription Information
- 3 Products

Products

Select the products to be enabled for this Intersight account.

☑ Infrastructure Service & Cloud Orchestrator

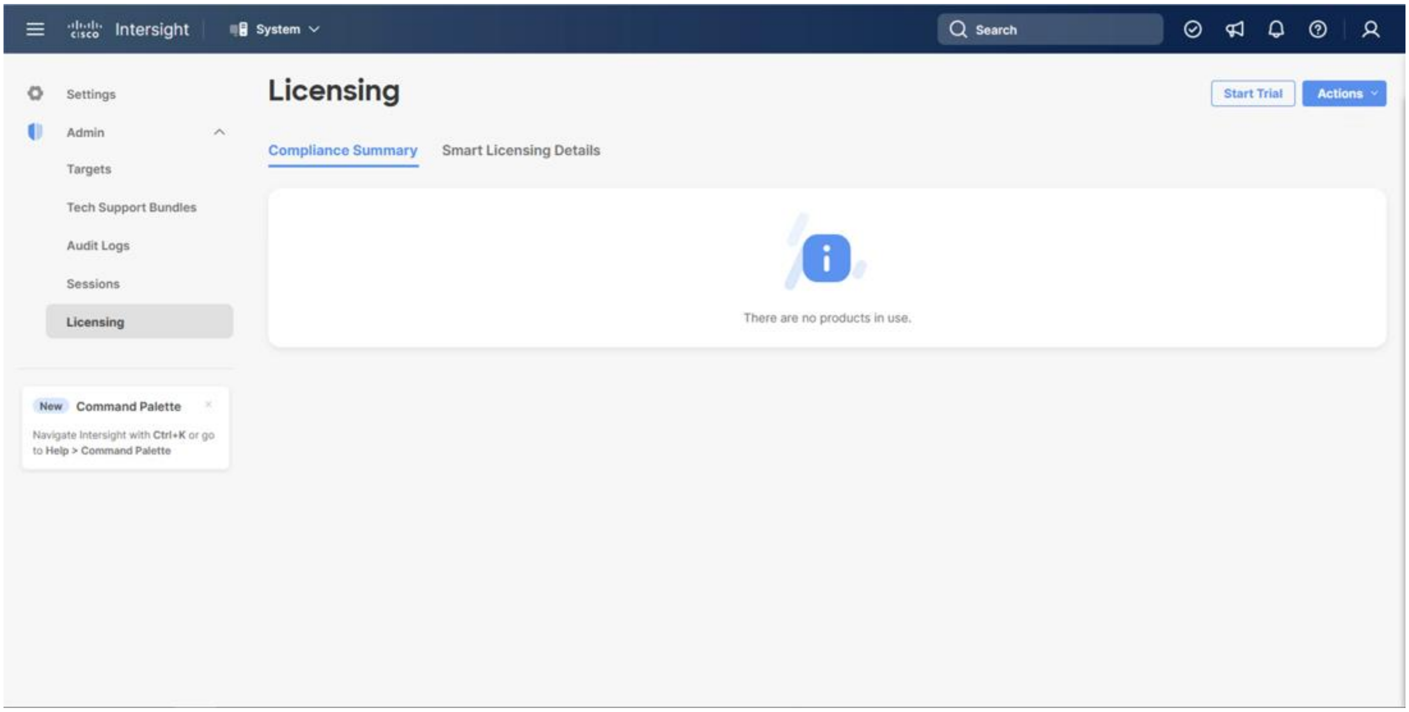
Default Tier: Advantage for all

☑ Set Default Tier to all existing servers

To use Cloud Orchestrator, at least one Server needs to be licensed at **Advantage**.

□ Workload Optimizer

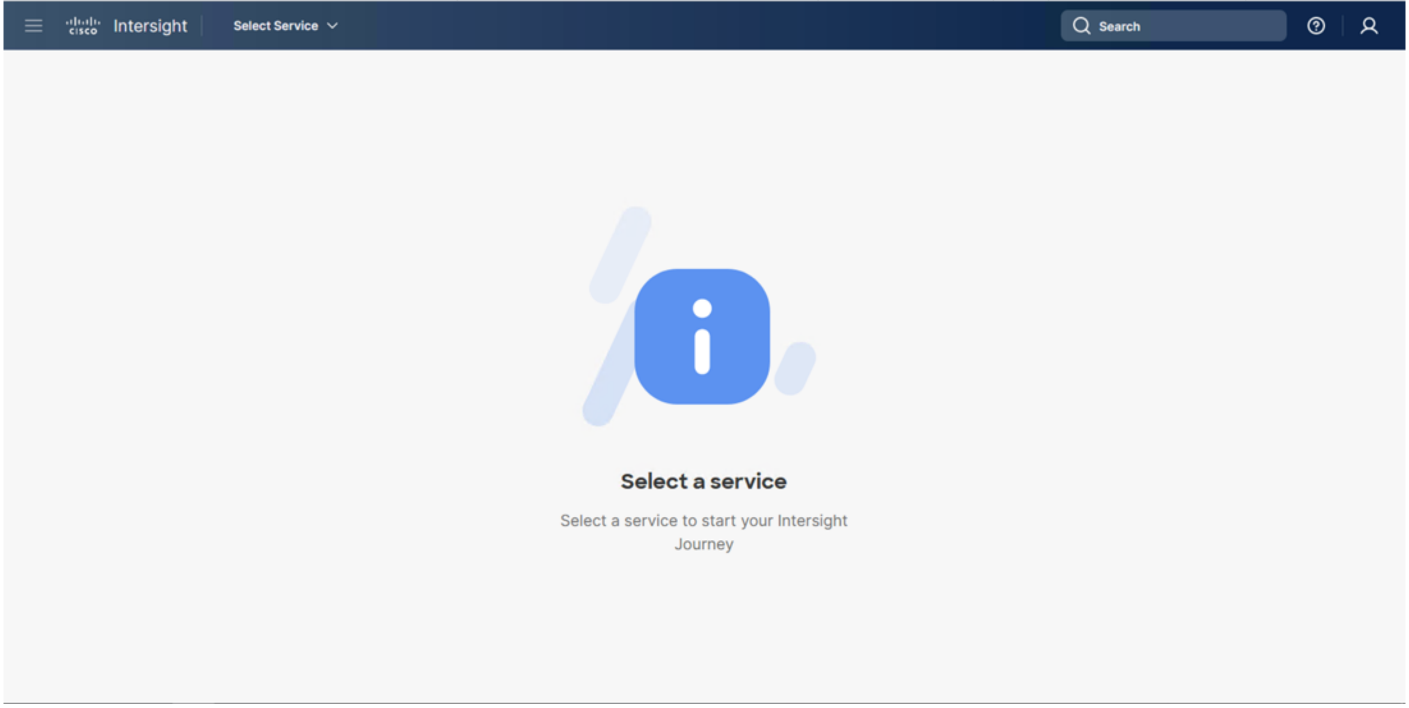
On successfully syncing of Smart Licensing, the following page will be displayed:



Licensing

There are no products in use.

On successful creation of the Intersight account with trial licensing, the following page will be displayed:



Select a service

Select a service to start your Intersight Journey

Procedure 3. Configure Cisco Intersight Resource Group

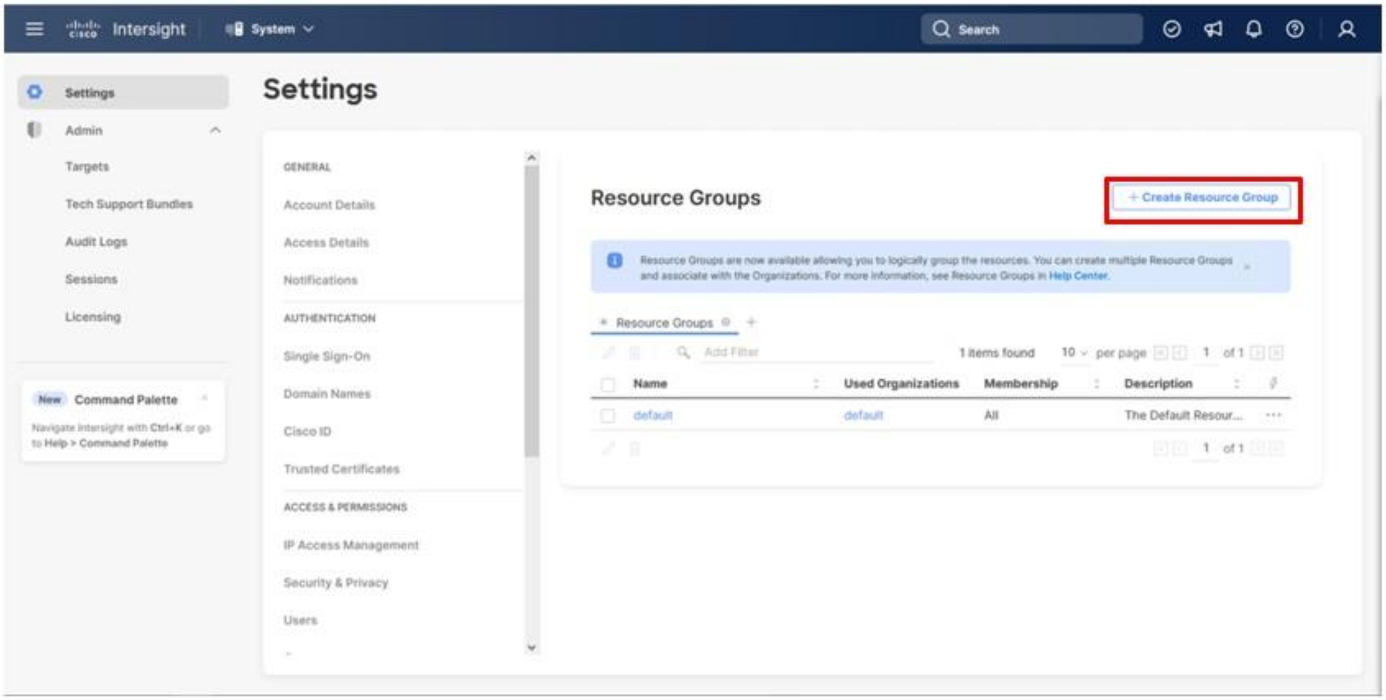
In this procedure, a Cisco Intersight resource group is created where resources such as targets will be logically grouped. In this deployment, a single resource group is created to host all the resources, but you can choose to create multiple resource groups for granular control of the resources.

Step 1. Log in to **Cisco Intersight**.

Step 2. At the top, select **System**. On the left, click **Settings** (the gear icon).

Step 3. Click **Resource Groups** in the middle panel.

Step 4. Click **+ Create Resource Group** in the top-right corner.



Settings

Resource Groups

+ Create Resource Group

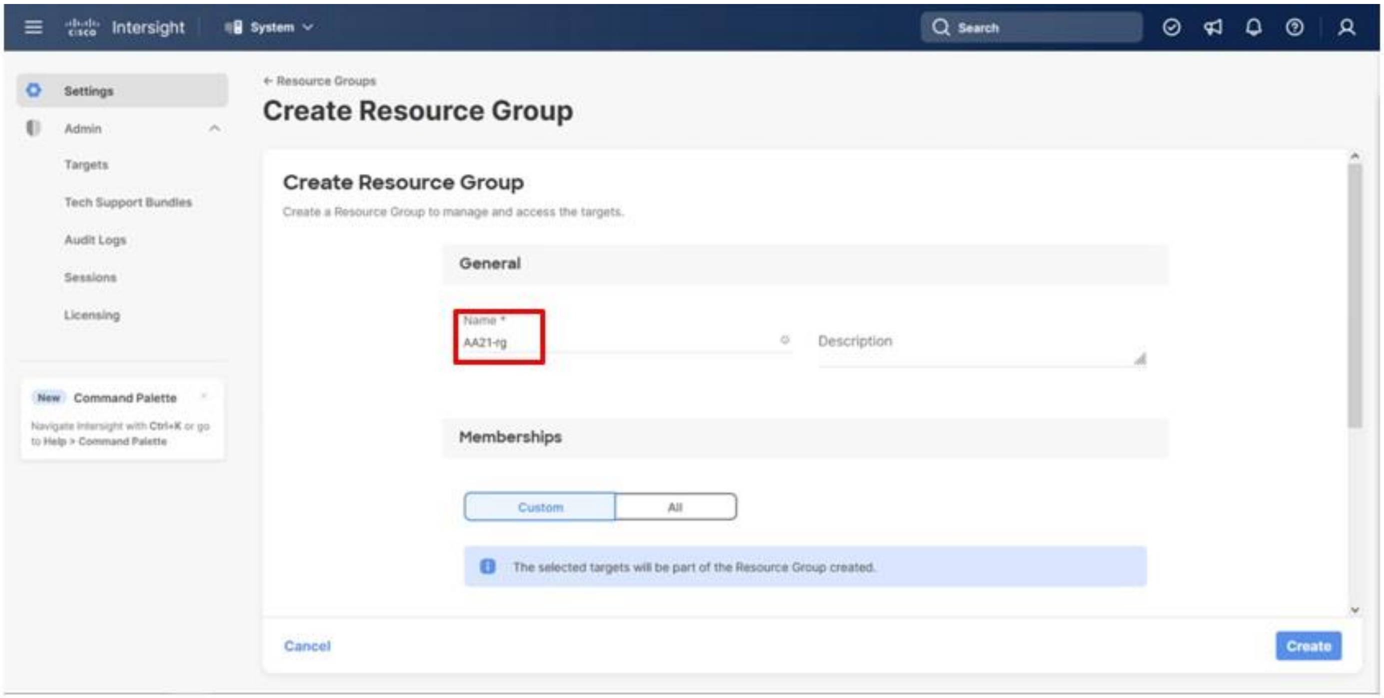
Resource Groups are now available allowing you to logically group the resources. You can create multiple Resource Groups and associate with the Organizations. For more information, see Resource Groups in Help Center.

Resource Groups

Add Filter   1 items found   10 per page   1 of 1

Name	Used Organizations	Membership	Description
default	default	All	The Default Resour...

Step 5. Provide a name for the **Resource Group** (for example, AA21-rg).



Create Resource Group

Create Resource Group

Create a Resource Group to manage and access the targets.

General

Name * AA21-rg

Description

Memberships

The selected targets will be part of the Resource Group created.

Step 6. Click **Create.**

Procedure 4. Configure Cisco Intersight Organization

This procedure creates an Intersight organization where all Cisco Intersight managed mode configurations including policies are defined. To create a new organization, follow these steps:

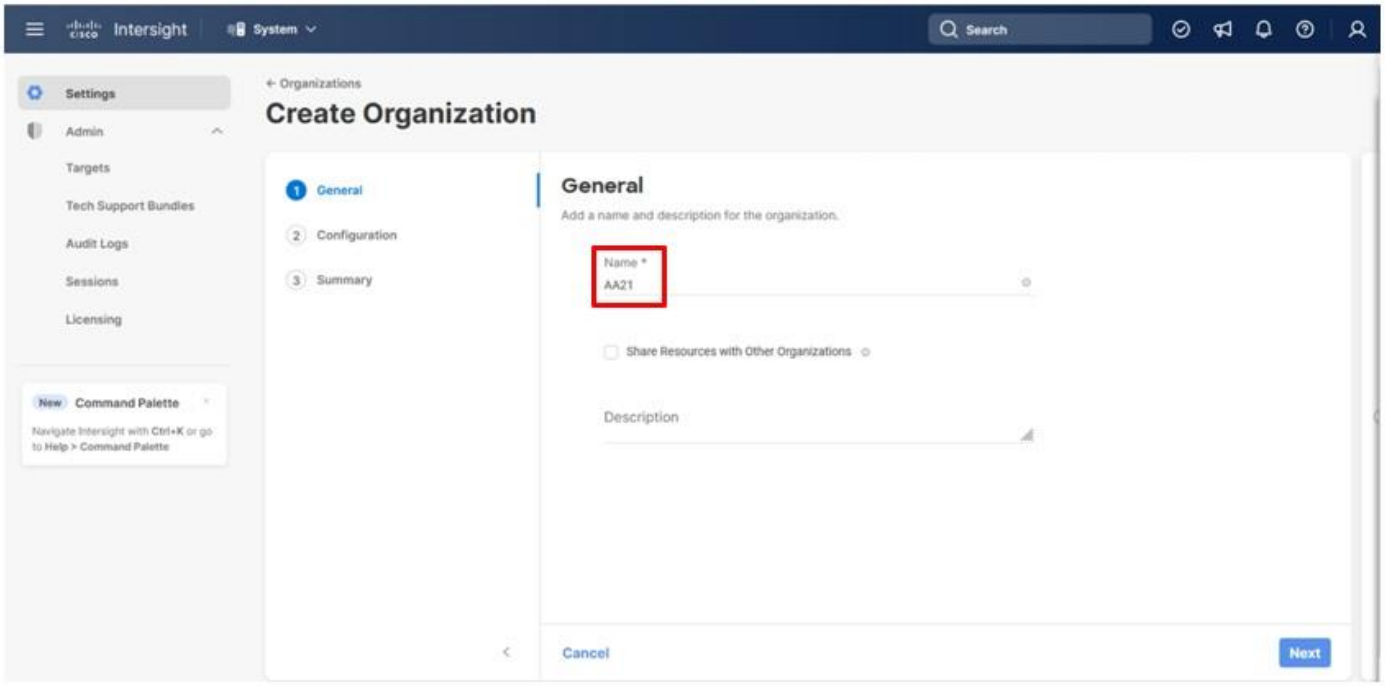
Step 1. Log in to the **Cisco Intersight** portal.

Step 2. At the top, select **System**. On the left, click **Settings** (the gear icon).

Step 3. Click **Organizations** in the middle panel.

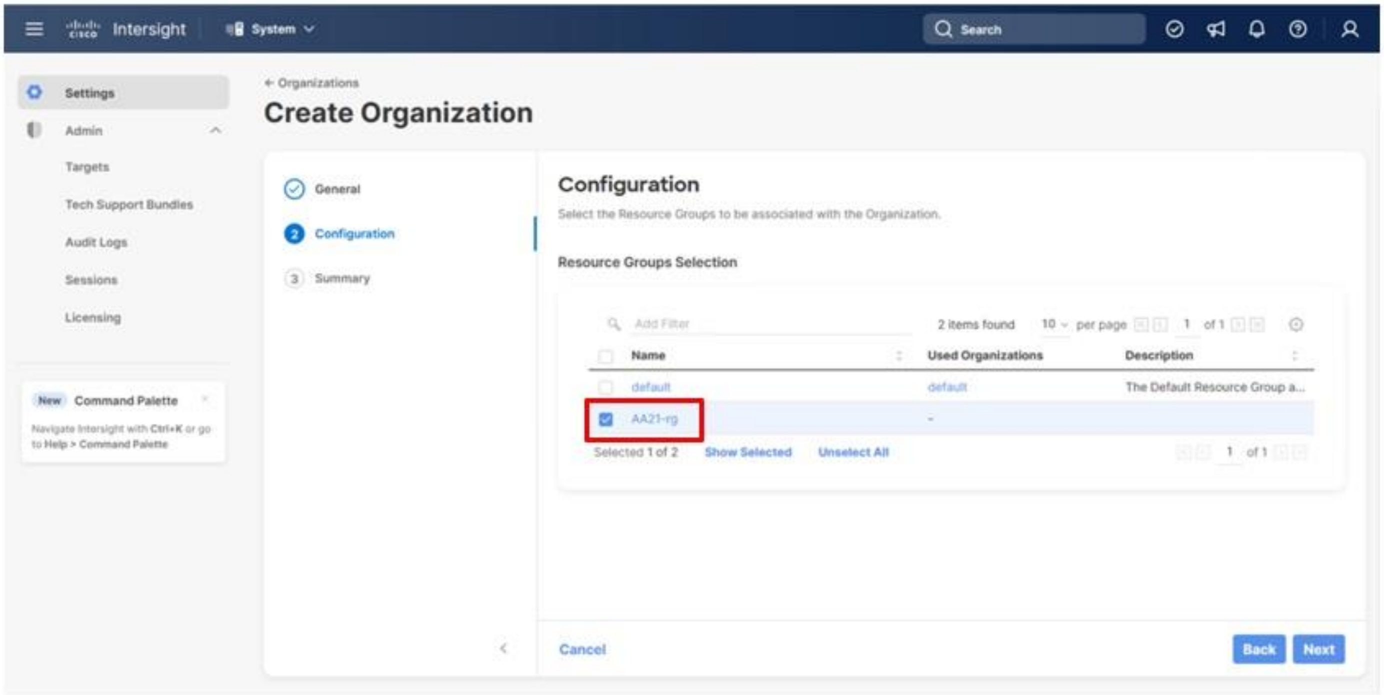
Step 4. Click **+ Create Organization** in the top-right corner.

Step 5. Provide a name for the organization (for example, AA21) and click **Next**.



Name * AA21

Step 6. Select the **Resource Group** created in the last step (for example, AA21-rg) and click **Next**.



Create Organization

Configuration

Select the Resource Groups to be associated with the Organization.

Resource Groups Selection

Add Filter — 2 items found — 10 per page — 1 of 1

	Name	Used Organizations	Description
□	default	default	The Default Resource Group a...
☑	AA21-rg	-	

Selected 1 of 2 — Show Selected — Unselect All — 1 of 1

Step 7. Review the **Summary** and click **Create**.

Onboarding to Intersight

The UCS domain contained within the Fabric Interconnects will be added directly to the account as targets. The other infrastructure components will be onboarded as targets through the Intersight Assist Appliance after it has been deployed, covered later in the Management section.

Procedure 1. Set Up Cisco Intersight Managed Mode on Cisco UCS Fabric Interconnects

The Cisco UCS fabric interconnects must be set up to support Cisco Intersight managed mode. When converting an existing pair of Cisco UCS fabric interconnects from Cisco UCS Manager mode to Intersight Managed Mode (IMM), first erase the configuration and reboot your system.

Converting fabric interconnects to Cisco Intersight managed mode is a disruptive process, and configuration information will be lost. You are encouraged to make a backup of you existing configuration. If a software version that supports Intersight Managed Mode (4.1(3) or later) is already installed on Cisco UCS Fabric Interconnects, do not upgrade the software to a recommended recent release using Cisco UCS Manager. The software upgrade will be performed using Cisco Intersight to make sure Cisco UCS X-series firmware is part of the software upgrade.

Step 1. Configure Fabric Interconnect A (FI-A) by connecting to the FI-A console. On the Basic System Configuration Dialog screen, set the management mode to Intersight.

```
Cisco UCS Fabric Interconnect A
  Enter the configuration method. (console/gui) ? console

  The Fabric interconnect will be configured in the intersight managed mode. Choose (y/n) to proceed: y

  Enforce strong password? (y/n) [y]: Enter

  Enter the password for "admin": <password>
  Confirm the password for "admin": <password>

  Enter the switch fabric (A/B) []: A

  Enter the system name:  <ucs-cluster-name>

  Physical Switch Mgmt0 IP address : <ucsa-mgmt-ip>

  Physical Switch Mgmt0 IPv4 netmask : <ucs-mgmt-mask>

  IPv4 address of the default gateway : <ucs-mgmt-gateway>

    DNS IP address : <dns-server-1-ip>

  Configure the default domain name? (yes/no) [n]: n <optional>

Following configurations will be applied:

    Management Mode=intersight
    Switch Fabric=A
    System Name=<ucs-cluster-name>
    Enforced Strong Password=yes
    Physical Switch Mgmt0 IP Address=<ucsa-mgmt-ip>
    Physical Switch Mgmt0 IP Netmask=<ucs-mgmt-mask>
    Default Gateway=<ucs-mgmt-gateway>
    DNS Server=<dns-server-1-ip>

  Apply and save the configuration (select 'no' if you want to re-enter)? (yes/no): yes
```

Step 2. After applying the settings, make sure you can ping the fabric interconnect management IP address. When Fabric Interconnect A is correctly set up and is available, Fabric Interconnect B will automatically discover Fabric Interconnect A during its setup process as shown in the next step.

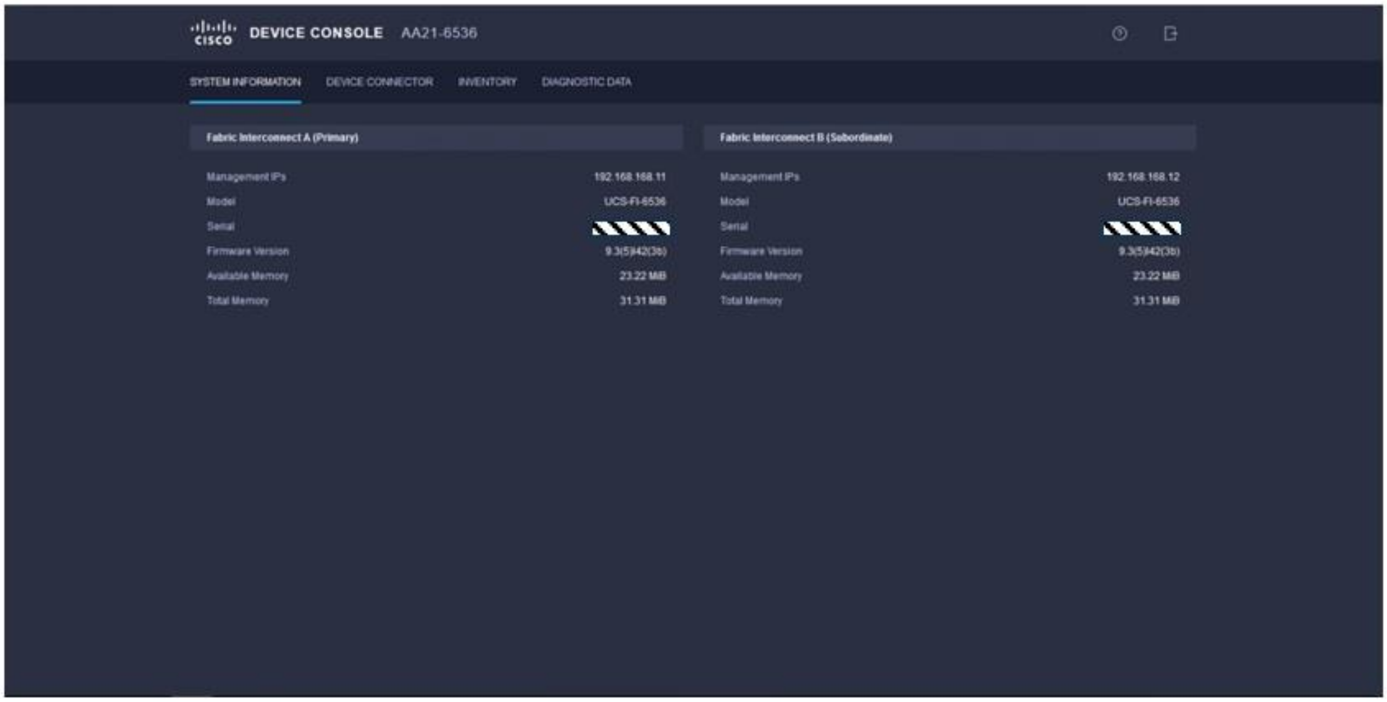
Step 3. Configure Fabric Interconnect B (FI-B). For the configuration method, choose console. Fabric Interconnect B will detect the presence of Fabric Interconnect A and will prompt you to enter the admin password for Fabric Interconnect A. Provide the management IP address for Fabric Interconnect B and apply the configuration.

```
Cisco UCS Fabric Interconnect B
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 of the peer Fabric interconnect: <password>
    Connecting to peer Fabric interconnect... done
    Retrieving config from peer Fabric interconnect... done
    Peer Fabric interconnect management mode   : intersight
    Peer Fabric interconnect Mgmt0 IPv4 Address: <ucsa-mgmt-ip>
    Peer Fabric interconnect Mgmt0 IPv4 Netmask: <ucs-mgmt-mask>

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

  Physical Switch Mgmt0 IP address : <ucsb-mgmt-ip>

  Local fabric interconnect model(UCS-FI-6536)
  Peer fabric interconnect is compatible with the local fabric interconnect. Continuing with the installer...

  Apply and save the configuration (select 'no' if you want to re-enter)? (yes/no): yes
```

Procedure 2. Claim Cisco UCS Fabric Interconnects in Cisco Intersight

Note: With the initial Basic System Configuration Dialog previously completed for the fabric interconnects, log into the Fabric Interconnect A Device Console using a web browser to capture the Cisco Intersight connectivity information.

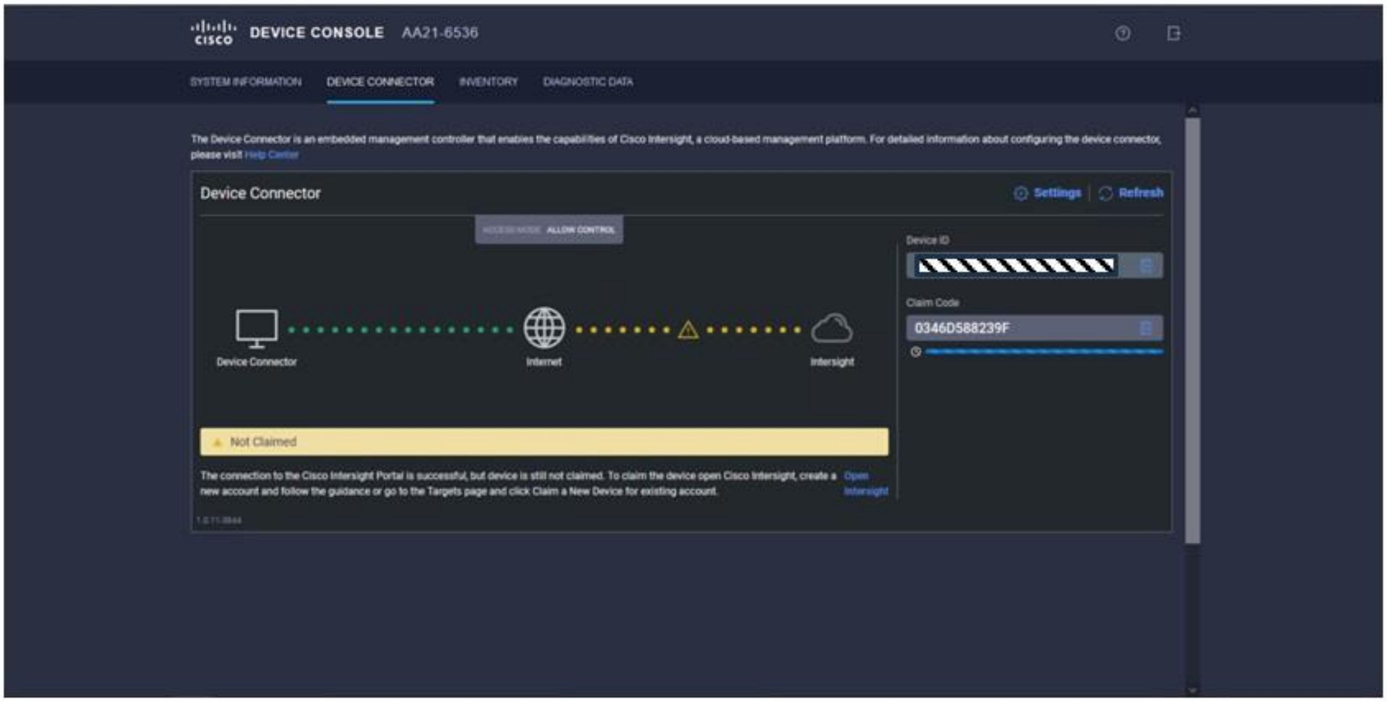
Step 1. Use the management IP address of Fabric Interconnect A to access the device from a web browser and the previously configured admin password to log into the device.



Fabric Interconnect A (Primary)	
Management IPs	192.168.168.11
Model	UCS-FI-6536
Serial	[redacted]
Firmware Version	9.3(5)I42(3b)
Available Memory	23.22 MiB
Total Memory	31.31 MiB

Fabric Interconnect B (Subordinate)	
Management IPs	192.168.168.12
Model	UCS-FI-6536
Serial	[redacted]
Firmware Version	9.3(5)I42(3b)
Available Memory	23.22 MiB
Total Memory	31.31 MiB

Step 2. Under **DEVICE CONNECTOR**, the current device status will show “Not claimed.” Note or copy the **Device ID** and **Claim Code** information for claiming the device in Cisco Intersight.



The Device Connector is an embedded management controller that enables the capabilities of Cisco Intersight, a cloud-based management platform. For detailed information about configuring the device connector, please visit Help Center

Device Connector

Device ID: [redacted]

Claim Code: 0346D588239F

Not Claimed

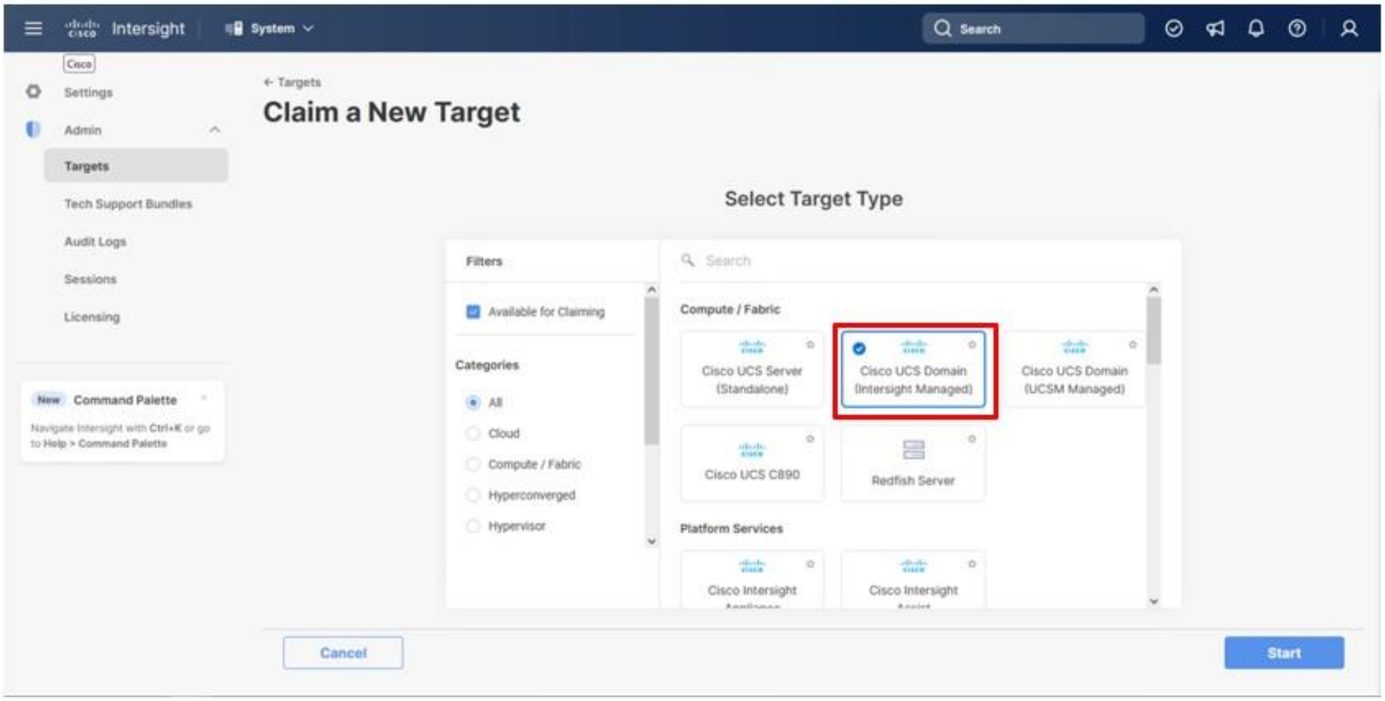
The connection to the Cisco Intersight Portal is successful, but device is still not claimed. To claim the device open Cisco Intersight, create a new account and follow the guidance or go to the Targets page and click Claim a New Device for existing account. Open Intersight

Step 3. Log in to **Cisco Intersight.**

Step 4. At the top, select **System.** On the left, click **Administration > Targets.**

Step 5. Click **Claim a New Target.**

Step 6. Select **Cisco UCS Domain (Intersight Managed)** and click **Start.**

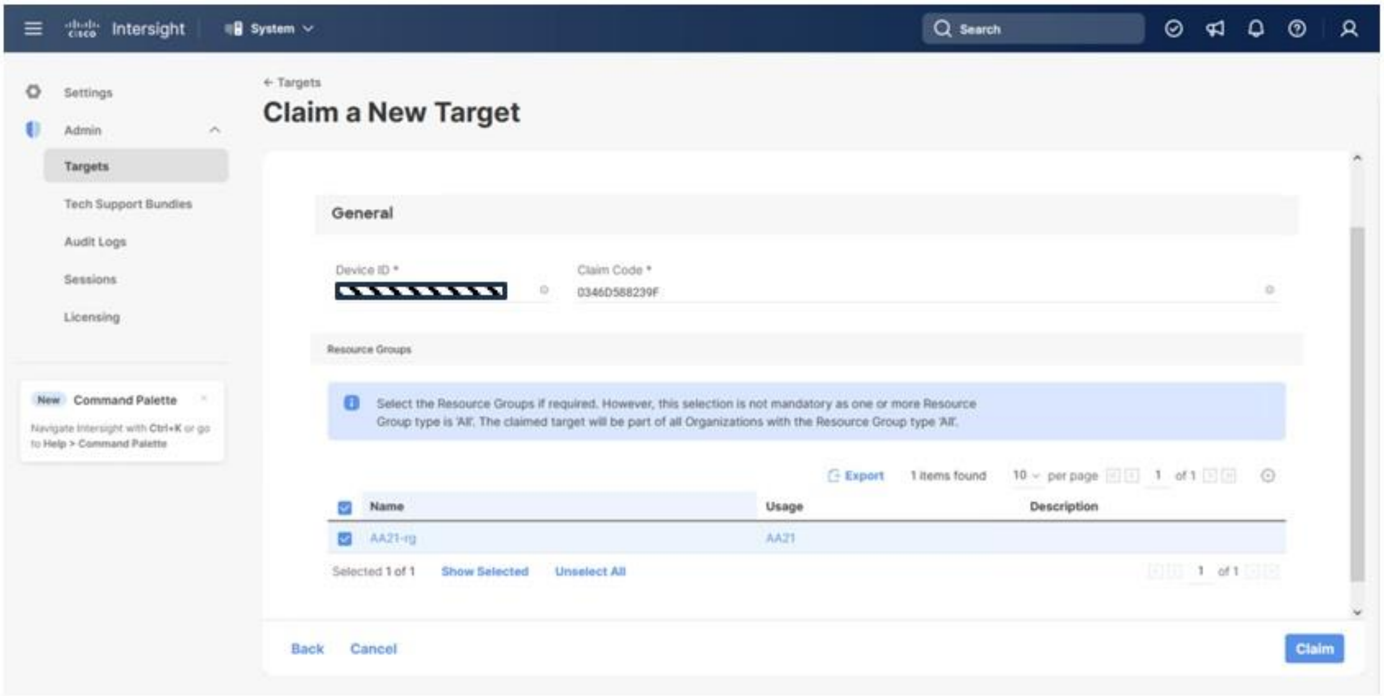


Claim a New Target

Select Target Type

Step 7. Copy and paste the Device ID and Claim Code from the Cisco UCS FI to Intersight.

Step 8. Select the previously created resource group and click **Claim**.



Claim a New Target

General

Device ID * [redacted]

Claim Code * 0346D588239F

Resource Groups

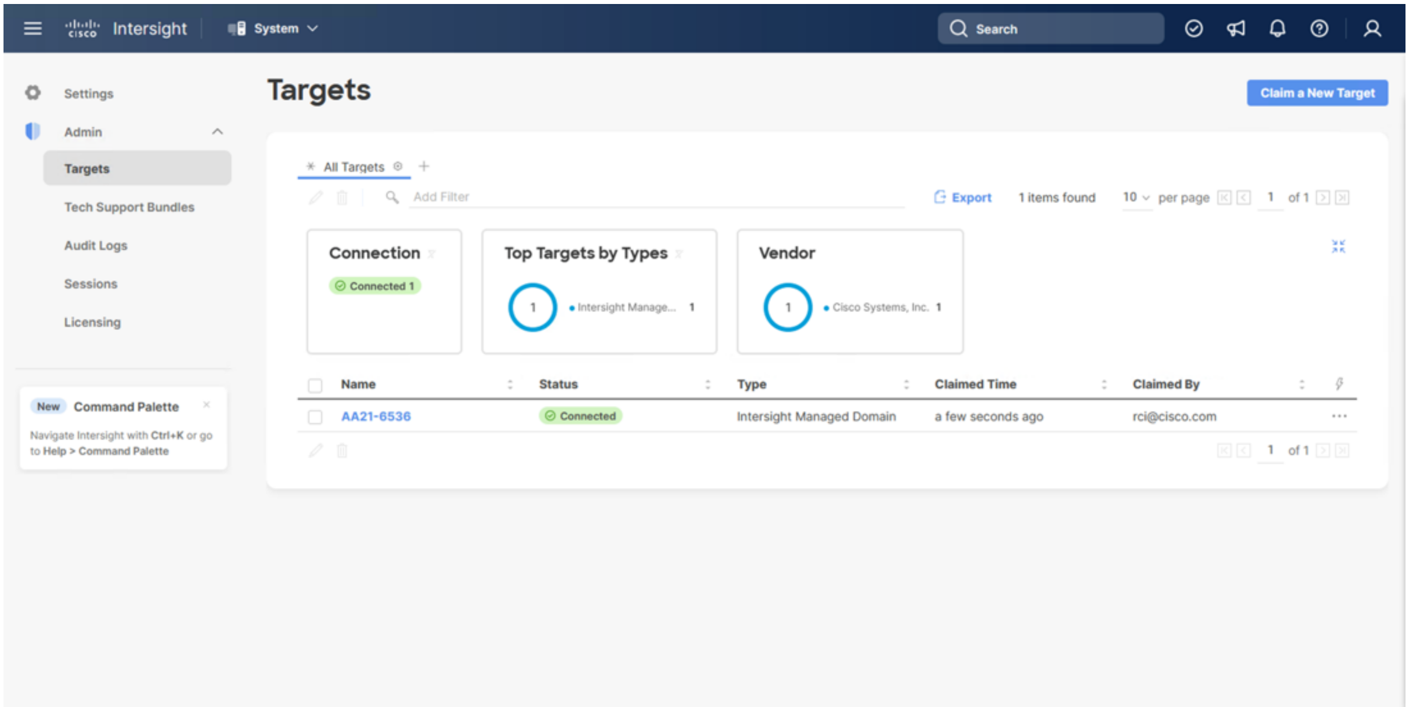
Select the Resource Groups if required. However, this selection is not mandatory as one or more Resource Group type is 'All'. The claimed target will be part of all Organizations with the Resource Group type 'All'.

Export 1 items found 10 per page 1 of 1

☑	Name	Usage	Description
☑	AA21-rg	AA21	

Selected 1 of 1 Show Selected Unselect All 1 of 1

On a successful device claim, Cisco UCS FI appears as a target in Cisco Intersight:



Targets

Export 1 items found 10 per page 1 of 1

Connection: Connected 1

Top Targets by Types: 1 • Intersight Manage... 1

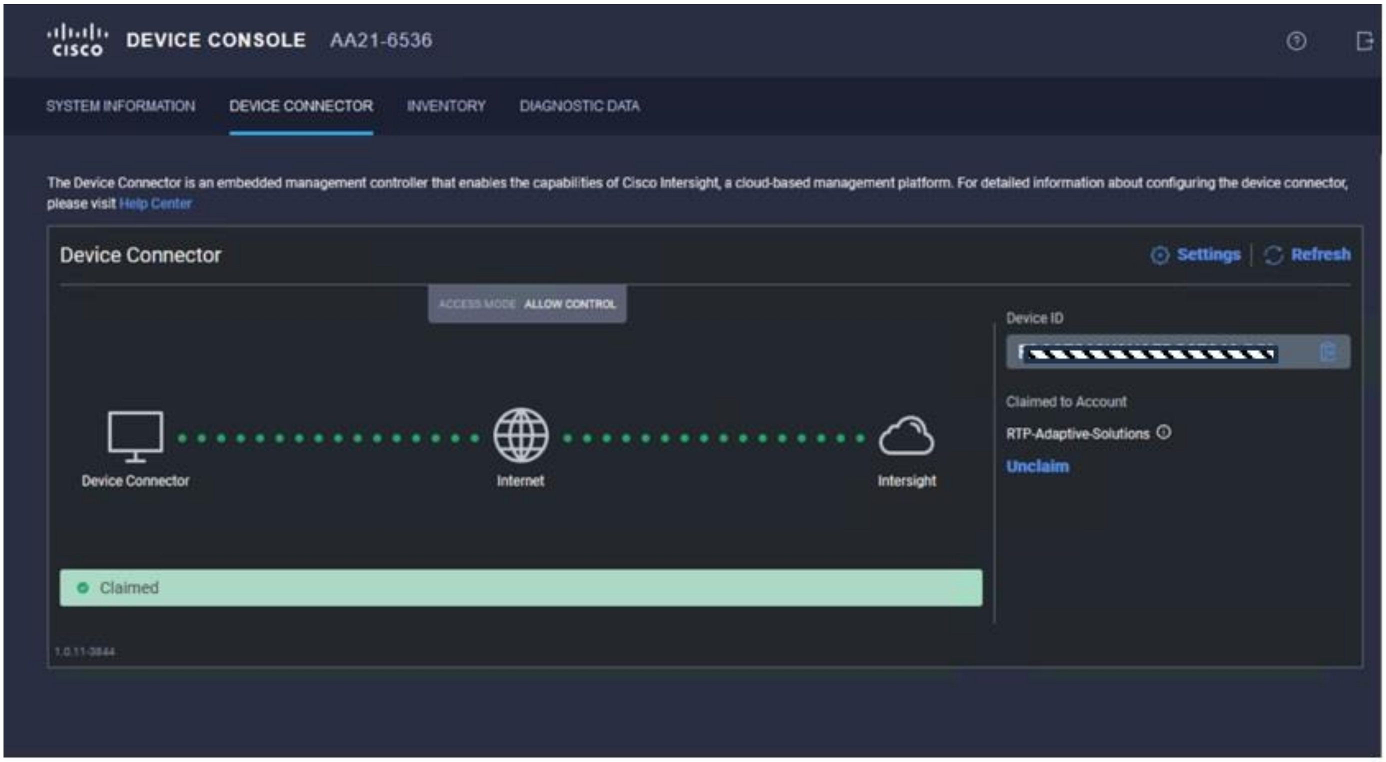
Vendor: 1 • Cisco Systems, Inc. 1

□	Name	Status	Type	Claimed Time	Claimed By
□	AA21-6536	Connected	Intersight Managed Domain	a few seconds ago	rci@cisco.com

1 of 1

Step 9. Log in to the web GUI of the Cisco UCS fabric interconnect and click the browser refresh button.

The fabric interconnect status is now set to Claimed:



The Device Connector is an embedded management controller that enables the capabilities of Cisco Intersight, a cloud-based management platform. For detailed information about configuring the device connector, please visit Help Center

Device Connector

Device ID [redacted]

Claimed to Account

RTP-Adaptive-Solutions

Claimed

Procedure 3. Upgrade Fabric Interconnect Firmware using Cisco Intersight

Note: If your UCS 6536 Fabric Interconnects are not already running firmware release 4.3(1), upgrade will be required to support M7 servers.

Note: If Cisco UCS Fabric Interconnects were upgraded to the latest recommended software using Cisco UCS Manager, this upgrade process through Intersight will still work and will copy the X-Series firmware to the Fabric Interconnects.

Step 1. Log into the **Cisco Intersight** portal.

Step 2. At the top, from the drop-down list to select **Infrastructure Service** and then select **Fabric Interconnects** under Operate on the left.

Step 3. Click the ellipses "…" at the end of the row for either of the Fabric Interconnects and select **Upgrade Firmware**.

Step 4. Click **Start**.

Step 5. Verify the Fabric Interconnect information and click **Next**.

Step 6. Enable Advanced Mode using the toggle switch and uncheck Fabric Interconnect Traffic Evacuation.

Step 7. Select the **4.3(2)** release from the list and click **Next**.

Step 8. Verify the information and click **Upgrade** to start the upgrade process.

Step 9. Watch the Request panel of the main Intersight screen as the system will ask prompt for user permission before upgrading each FI. Click on the Circle with Arrow and follow the prompts on the screen to grant permission.

Step 10. Wait for both the FIs to successfully upgrade.

Cisco UCS Domain Setup

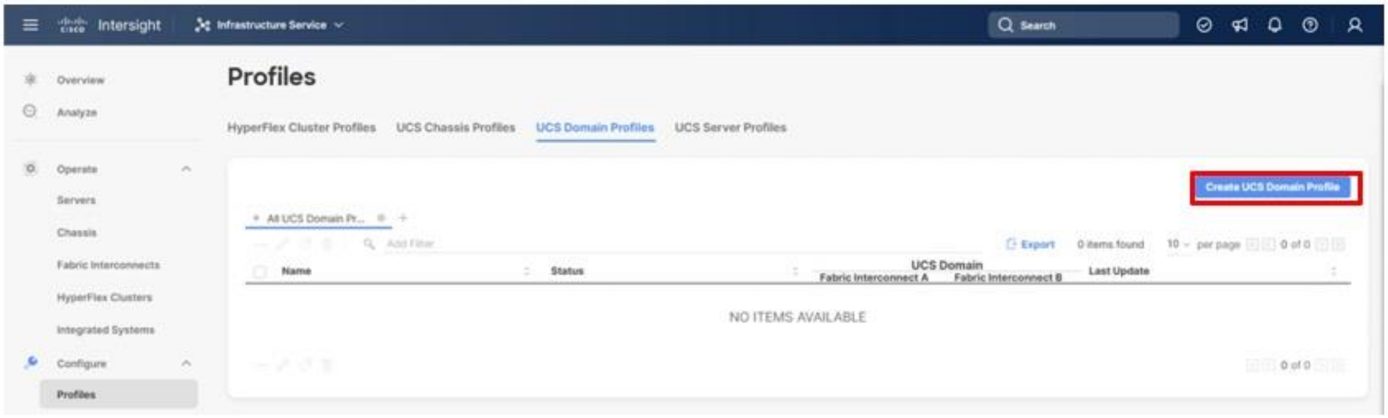
A Cisco UCS domain profile configures a fabric interconnect pair through reusable policies, allows configuration of the ports and port channels, and configures the VLANs and VSANs in the network. It defines the characteristics of and configured ports on fabric interconnects. The domain-related policies can be attached to the profile either at the time of creation or later. One Cisco UCS domain profile can be assigned to one fabric interconnect domain.

Procedure 1. Configure a Cisco UCS Domain Profile

Step 1. Log into the Cisco Intersight portal.

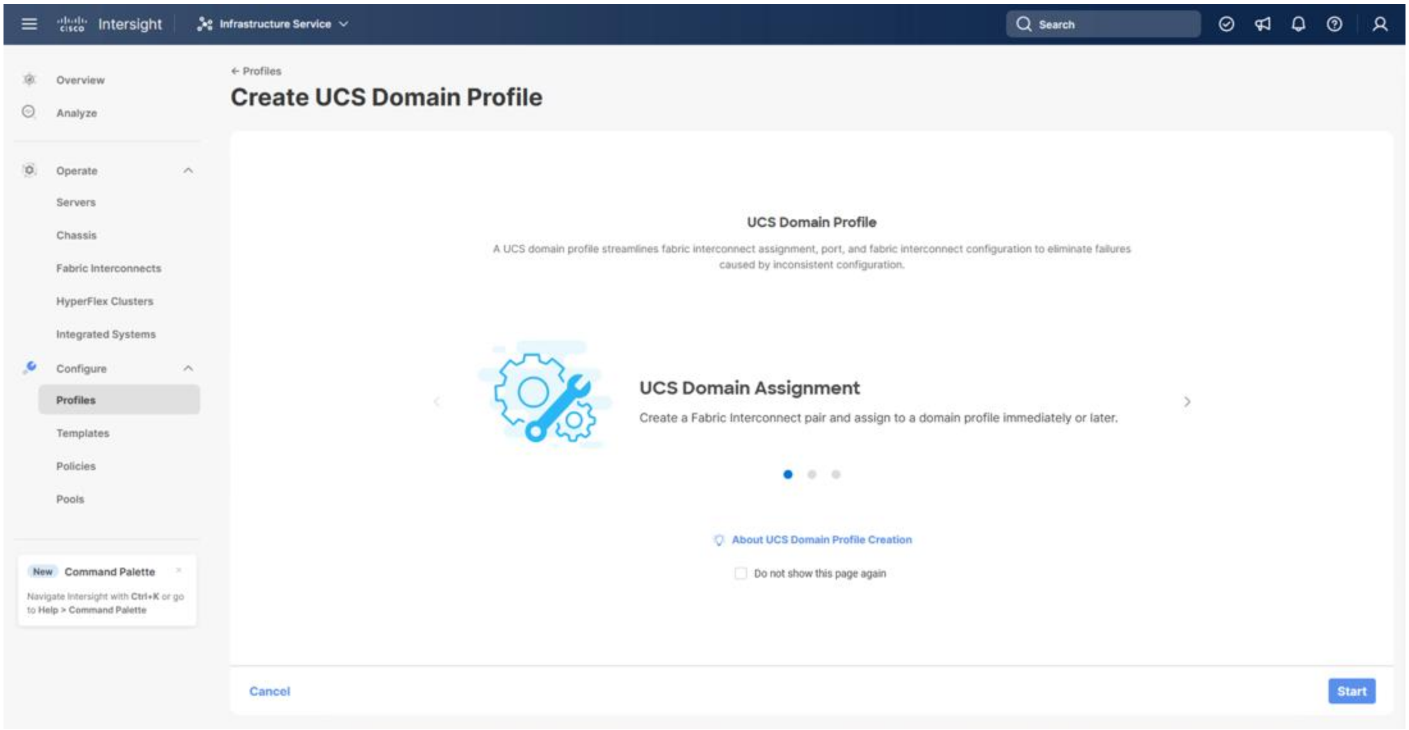
Step 2. At the top, from the drop-down list to select **Infrastructure Service**. Then, under Configure, select **Profiles**.

Step 3. In the main window, select **UCS Domain Profiles** and click Create **UCS Domain Profile**.



Profiles

Step 4. On the Create UCS Domain Profile screen, click **Start**.



Create UCS Domain Profile

UCS Domain Profile

A UCS domain profile streamlines fabric interconnect assignment, port, and fabric interconnect configuration to eliminate failures caused by inconsistent configuration.

UCS Domain Assignment

Create a Fabric Interconnect pair and assign to a domain profile immediately or later.

About UCS Domain Profile Creation

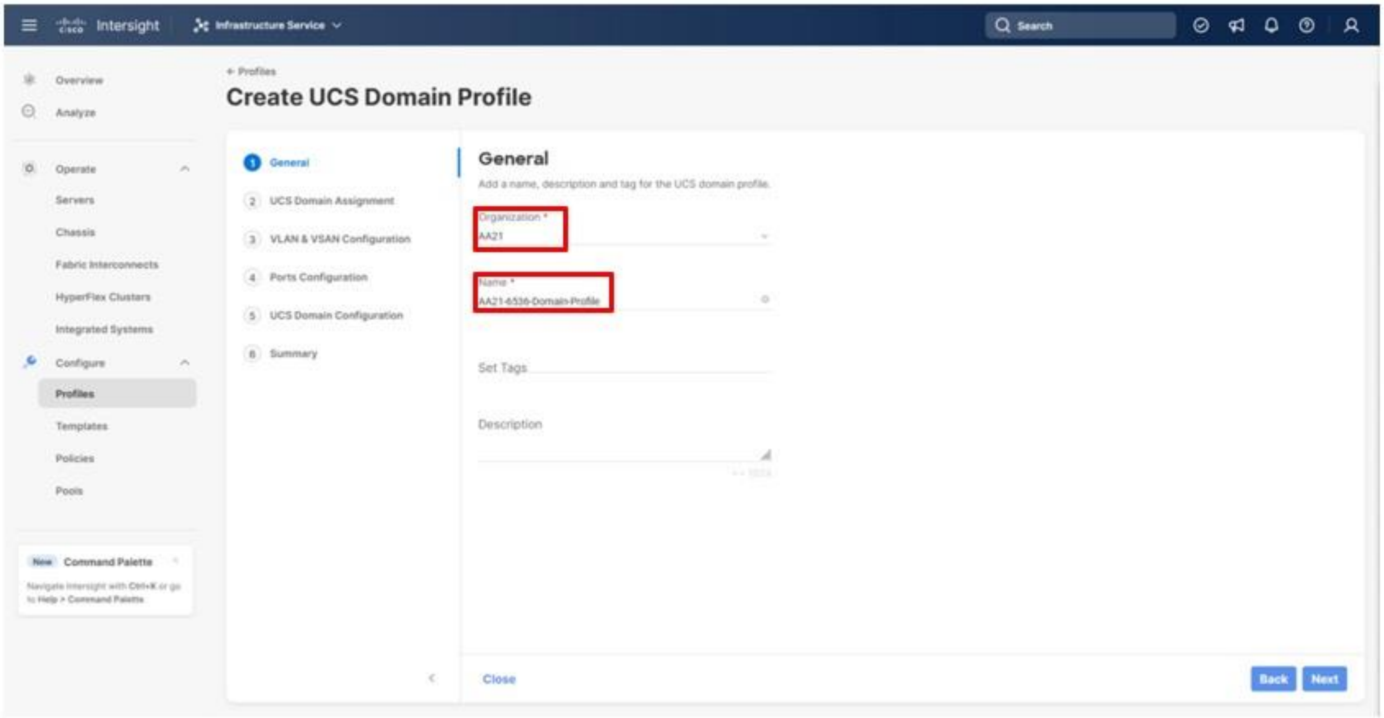
□ Do not show this page again

Procedure 2. UCS Domain Profile General Configuration

Step 1. Choose the organization from the drop-down list (for example, AA21).

Step 2. Provide a name for the domain profile (for example, AA21-6536-Domain-Profile).

Step 3. Provide an optional Description.



Create UCS Domain Profile

1 General
2 UCS Domain Assignment
3 VLAN & VSAN Configuration
4 Ports Configuration
5 UCS Domain Configuration
6 Summary

General

Add a name, description and tag for the UCS domain profile.

Organization * AA21

Name * AA21-6536-Domain-Profile

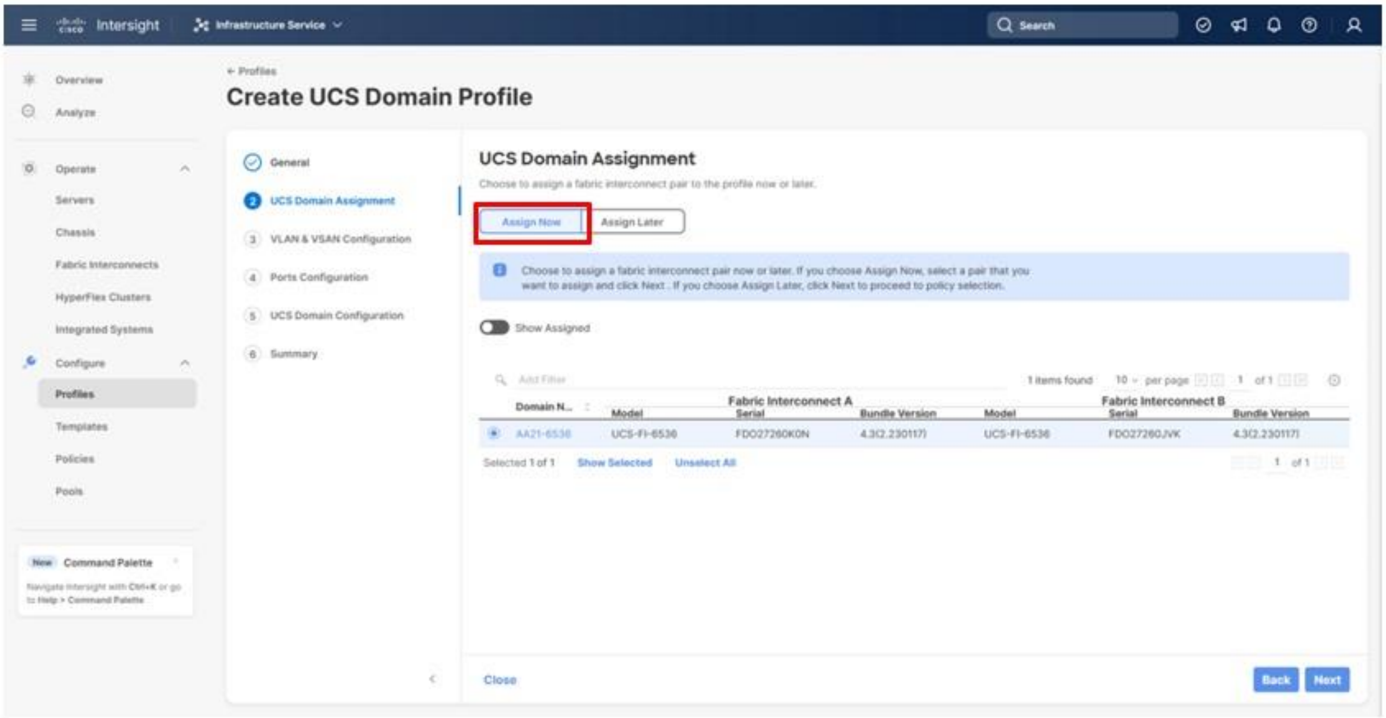
Set Tags

Description

Step 4. Click **Next.**

Procedure 3. UCS Domain Assignment

Step 1. Assign the Cisco UCS domain to this new domain profile by clicking **Assign Now** and selecting the previously added Cisco UCS domain (for example, AA21-6536).



Create UCS Domain Profile

UCS Domain Assignment

Choose to assign a fabric interconnect pair to the profile now or later.

Choose to assign a fabric interconnect pair now or later. If you choose Assign Now, select a pair that you want to assign and click Next . If you choose Assign Later, click Next to proceed to policy selection.

1 items found 10 per page 1 of 1

		Fabric Interconnect A			Fabric Interconnect B	
Domain N...	Model	Serial	Bundle Version	Model	Serial	Bundle Version
AA21-6536	UCS-FI-6536	FDO27260K0N	4.3(2.230117)	UCS-FI-6536	FDO27260JVK	4.3(2.230117)

Selected 1 of 1

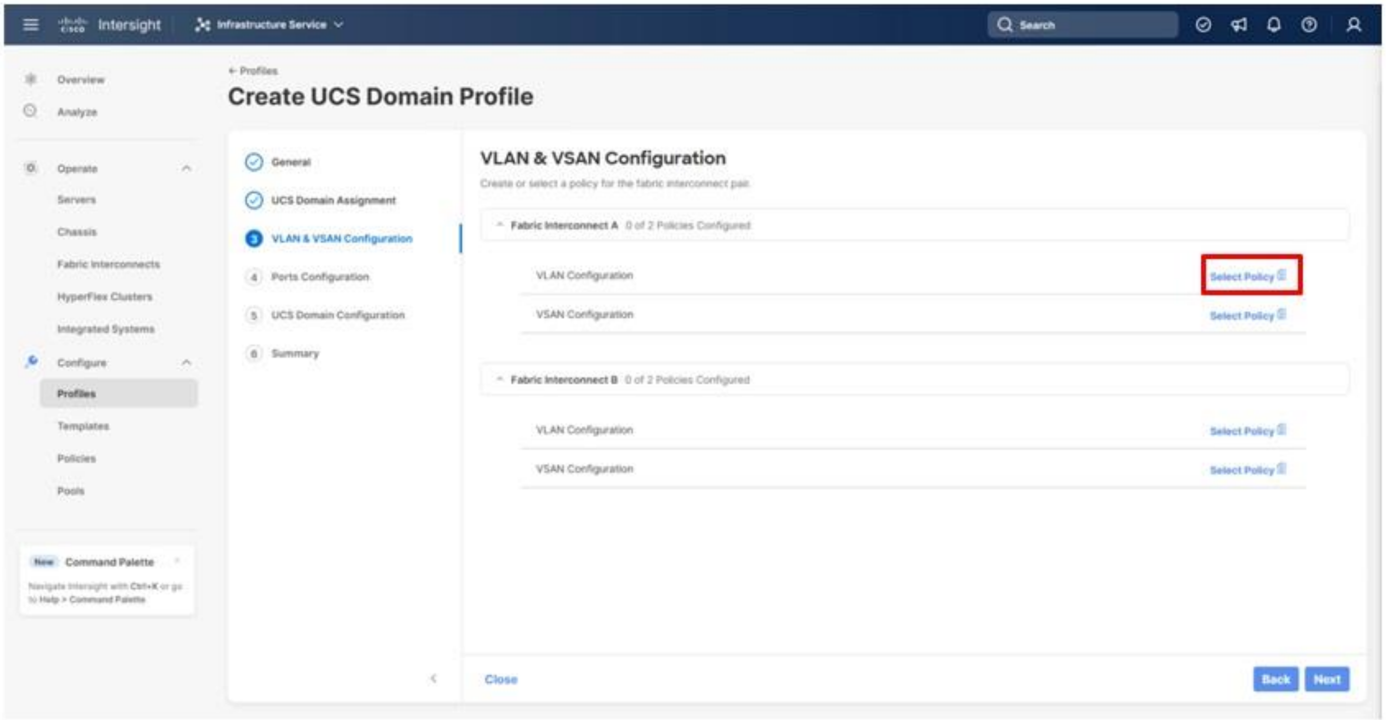
Step 2. Click **Next.**

Procedure 4. VLAN and VSAN Configuration

In this procedure, a single VLAN policy is created for both fabric interconnects and two individual VSAN policies are created because the VSAN IDs are unique for each fabric interconnect that will be applied to the UCS Domain.

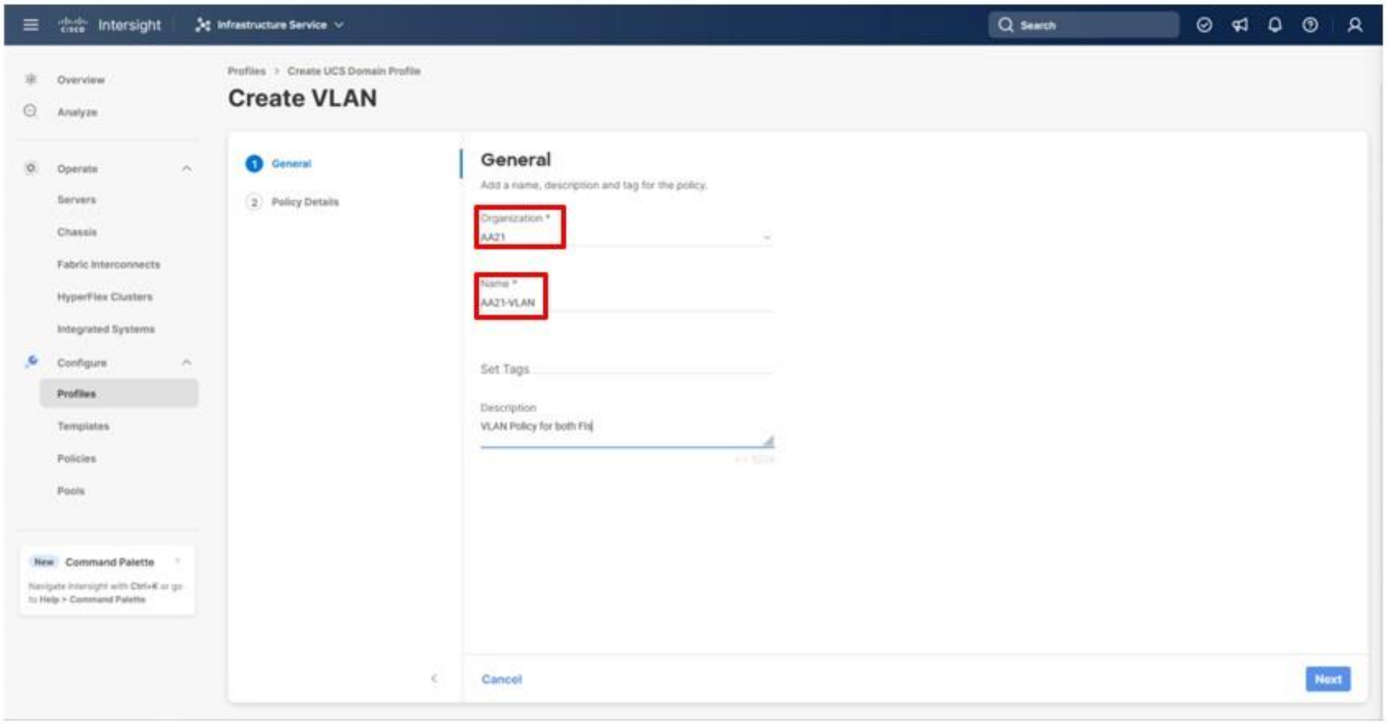
VLAN Configuration

Step 1. Click **Select Policy** next to VLAN Configuration under Fabric Interconnect A.



Step 2. In the pane on the right, click **Create New**.

Step 3. Verify the correct organization is selected from the drop-down list (for example, AA21) and provide a name for the policy (for example, AA21-VLAN).



Organization * AA21

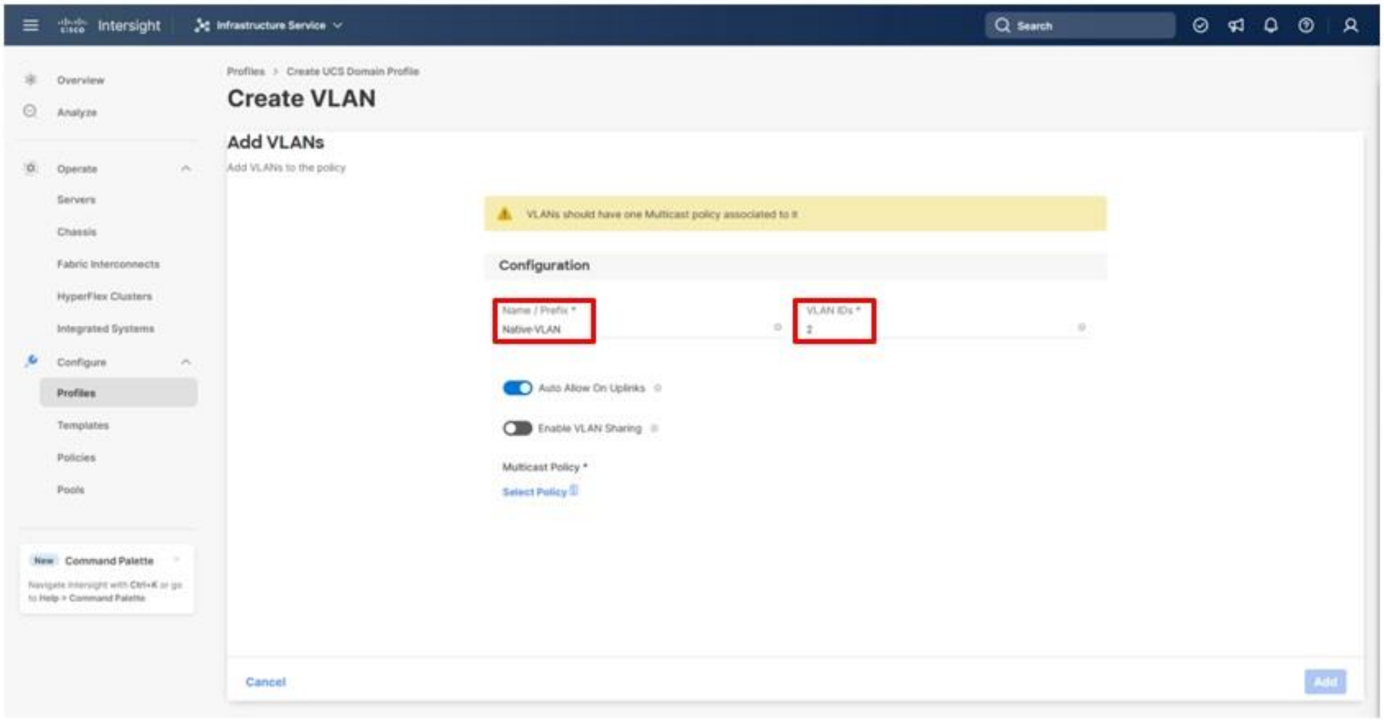
Name * AA21-VLAN

Description VLAN Policy for both FIs

Step 4. Click **Next.**

Step 5. Click **Add VLANs.**

Step 6. Provide a name and VLAN ID for the native VLAN.



Profiles > Create UCS Domain Profile

Create VLAN

Add VLANs

Add VLANs to the policy

VLANs should have one Multicast policy associated to it

Configuration

Name / Prefix *: Native-VLAN

VLAN IDs *: 2

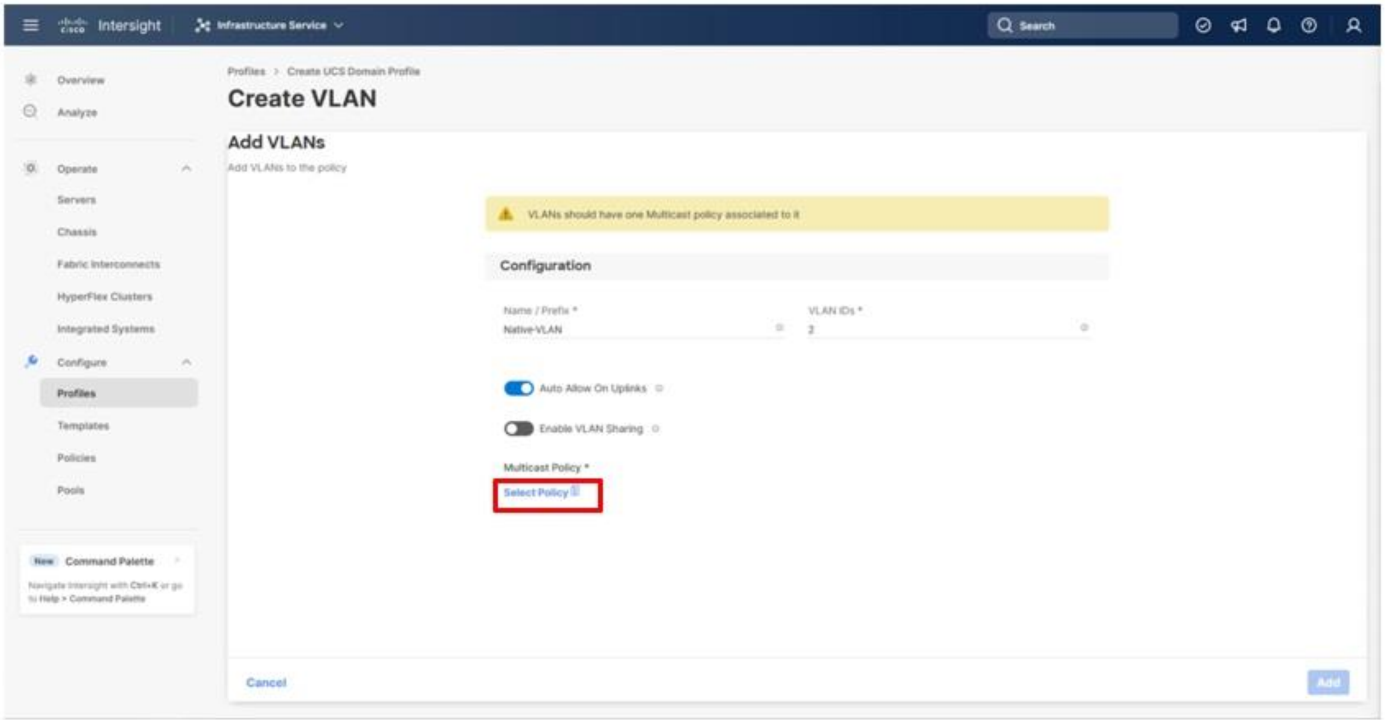
Auto Allow On Uplinks: enabled

Enable VLAN Sharing: disabled

Multicast Policy *: Select Policy

Step 7. Make sure **Auto Allow On** Uplinks is enabled.

Step 8. To create the required Multicast policy, click **Select Policy** under **Multicast*.**



Create VLAN

Add VLANs

Add VLANs to the policy

VLANs should have one Multicast policy associated to it

Configuration

Name / Prefix * Native-VLAN

VLAN IDs * 2

Auto Allow On Uplinks

Enable VLAN Sharing

Multicast Policy *

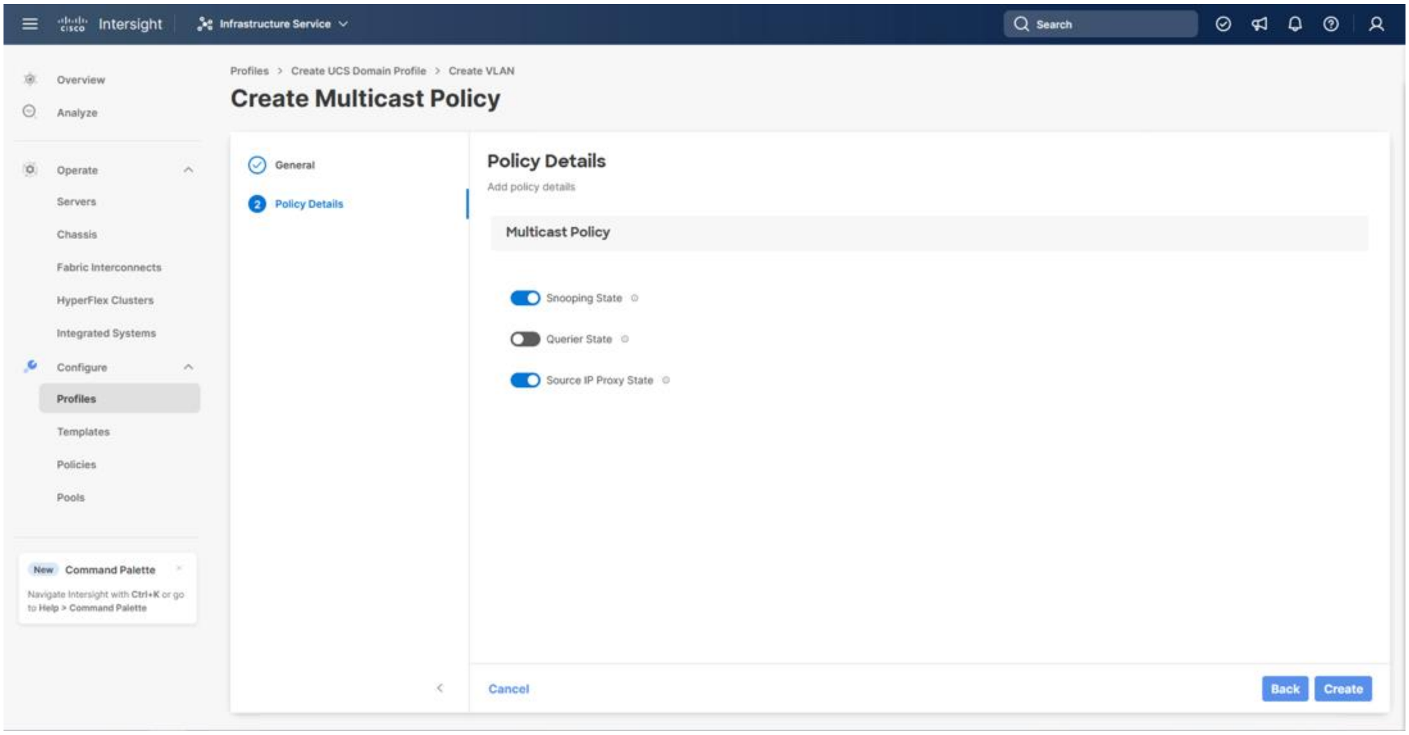
Select Policy

Step 9. In the window on the right, click **Create New** to create a new Multicast Policy.

Step 10. Provide a Name for the Multicast Policy (for example, AA21-MCAST).

Step 11. Provide an optional Description and click **Next**.

Step 12. Leave the default settings selected and click **Create**.



Create Multicast Policy

Policy Details

Add policy details

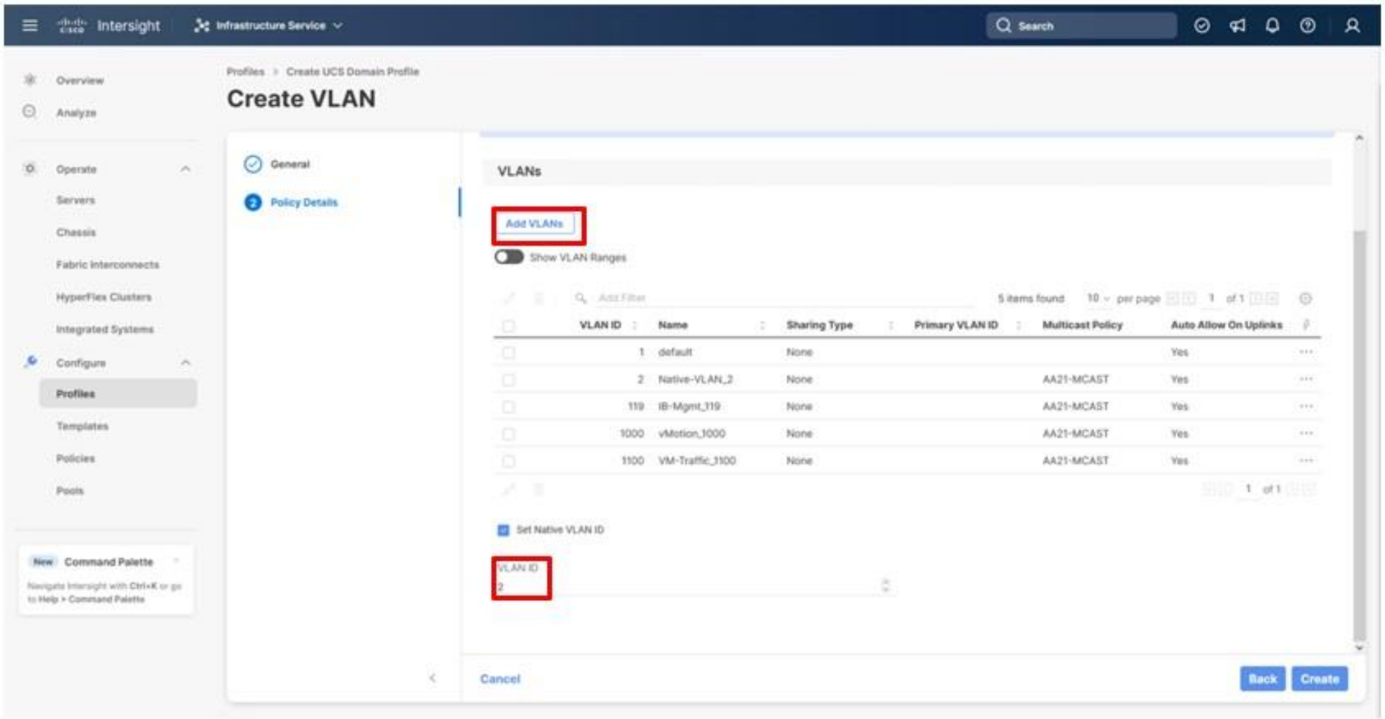
Multicast Policy

- ● Snooping State
- ○ Querier State
- ● Source IP Proxy State

Step 13. Click **Add** to add the VLAN.

Step 14. Add the remaining VLANs by clicking Add VLANs and entering the VLANs one by one. Reuse the previously created multicast policy for all the VLANs

Step 15. Select **Set Native VLAN ID** and enter the VLAN number (for example, 2) under VLAN ID.



Create VLAN

VLANs

VLAN ID	Name	Sharing Type	Primary VLAN ID	Multicast Policy	Auto Allow On Uplinks
1	default	None			Yes
2	Native-VLAN_2	None		AA21-MCAST	Yes
119	IB-Mgmt_119	None		AA21-MCAST	Yes
1000	vMotion_1000	None		AA21-MCAST	Yes
1100	VM-Traffic_1100	None		AA21-MCAST	Yes

☑ Set Native VLAN ID

VLAN ID
2

Step 16. Click **Create** in the bottom right to finish creating the VLAN policy and associated VLANs.

Step 17. Click **Select Policy** next to VLAN Configuration for Fabric Interconnect B and select the same VLAN policy.

VSAN Configuration

Step 1. Click **Select Policy** next to VSAN Configuration under Fabric Interconnect A. Then, in the pane on the right, click **Create New**.

Step 2. Verify the correct organization is selected from the drop-down list (for example, AA21) and provide a name for the policy (for example, AA21-VSAN-A).

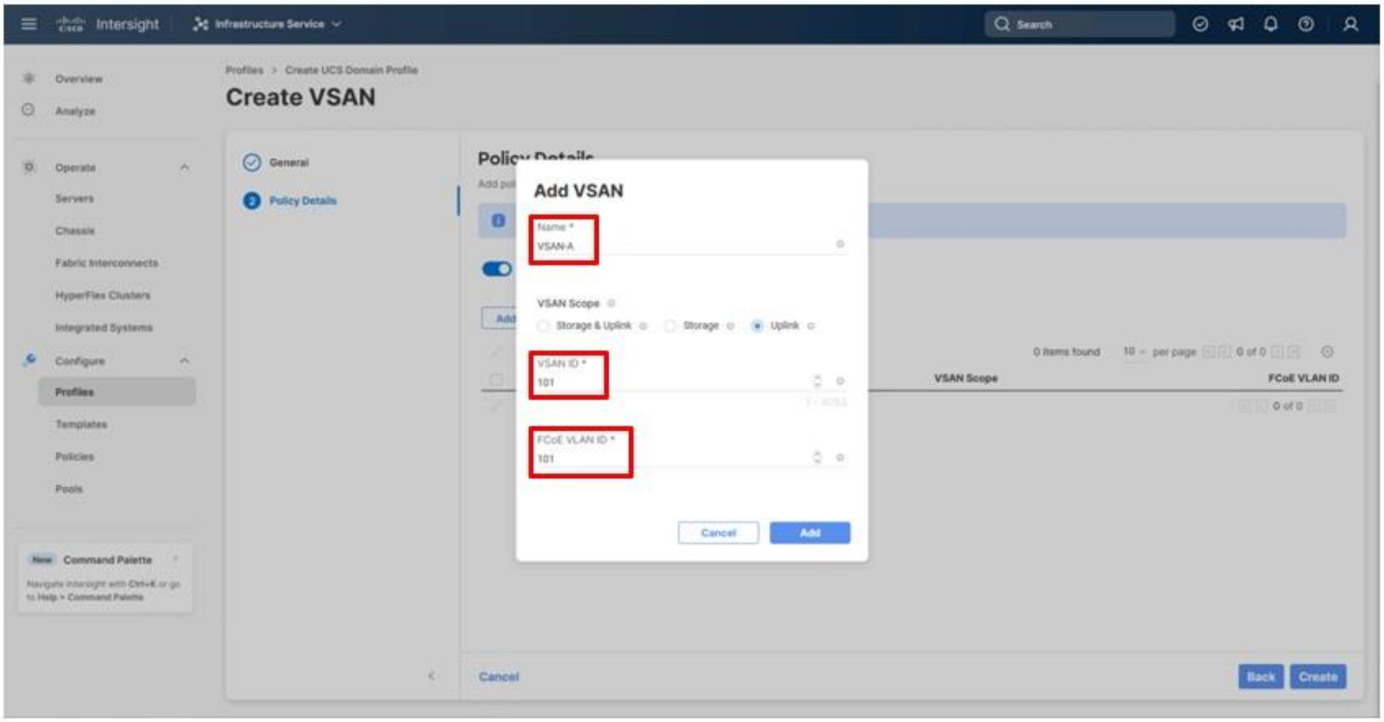
Note: As mentioned previously, a separate VSAN-Policy is created for each fabric interconnect.

Step 3. Click **Next**.

Step 4. Optionally, enable Uplink Trunking.

Step 5. Click **Add VSAN** and provide a name (for example, VSAN-A), VSAN ID (for example, 101), and associated Fibre Channel over Ethernet (FCoE) VLAN ID (for example, 101) for SAN A.

Step 6. Set VLAN Scope as **Uplink**.



Profiles > Create UCS Domain Profile

Create VSAN

Add VSAN

Name * VSAN-A

VSAN Scope ○ Storage & Uplink ○ Storage ● Uplink

VSAN ID * 101

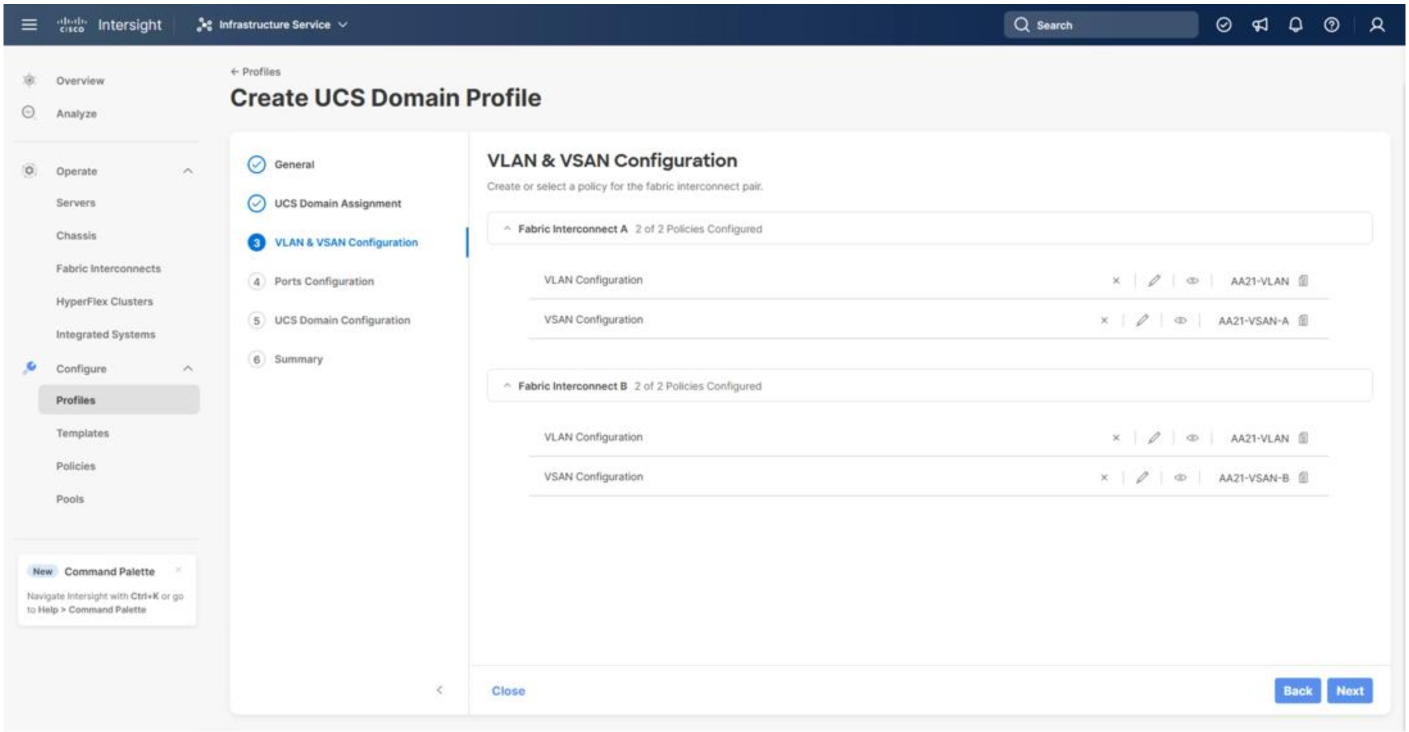
FCoE VLAN ID * 101

Step 7. Click **Add**.

Step 8. Click **Create** to finish creating the VSAN policy for fabric A.

Step 9. Repeat steps 1 – 8 to create a new VSAN policy for SAN-B. Name the policy to identify the SAN-B configuration (for example, AA21-VSAN- B) and use appropriate VSAN and FCoE VLAN IDs (for example, 102).

Step 10. Verify that a common VLAN policy and two unique VSAN policies are associated with the two fabric interconnects.



Create UCS Domain Profile

VLAN & VSAN Configuration

Create or select a policy for the fabric interconnect pair.

Fabric Interconnect A 2 of 2 Policies Configured

VLAN Configuration AA21-VLAN

VSAN Configuration AA21-VSAN-A

Fabric Interconnect B 2 of 2 Policies Configured

VLAN Configuration AA21-VLAN

VSAN Configuration AA21-VSAN-B

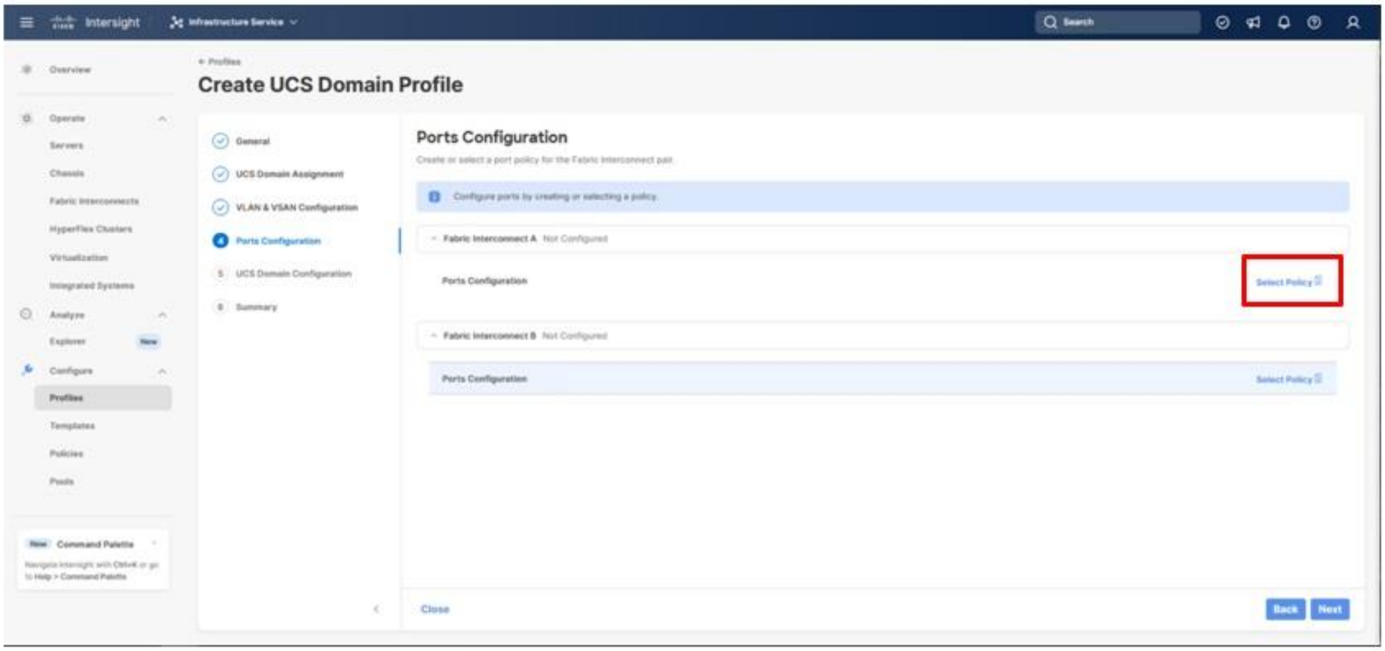
Step 11. Click **Next.**

Procedure 5. Ports Configuration

This procedure creates the Ports Configuration policies for Fabric Interconnect A, and these steps will be repeated for Fabric Interconnect B with certain specified differences. Using separate policies provides flexibility when port configuration (port numbers or speed) differs between the two FIs.

Note: Use two separate port policies for the fabric interconnects. When configuring Fibre Channel, two port policies are required because each fabric interconnect uses a unique Fibre Channel VSAN ID.

Step 1. Click **Select Policy** for Fabric Interconnect A.



Create UCS Domain Profile

Ports Configuration

Create or select a port policy for the Fabric Interconnect pair.

Configure ports by creating or selecting a policy.

Fabric Interconnect A Not Configured

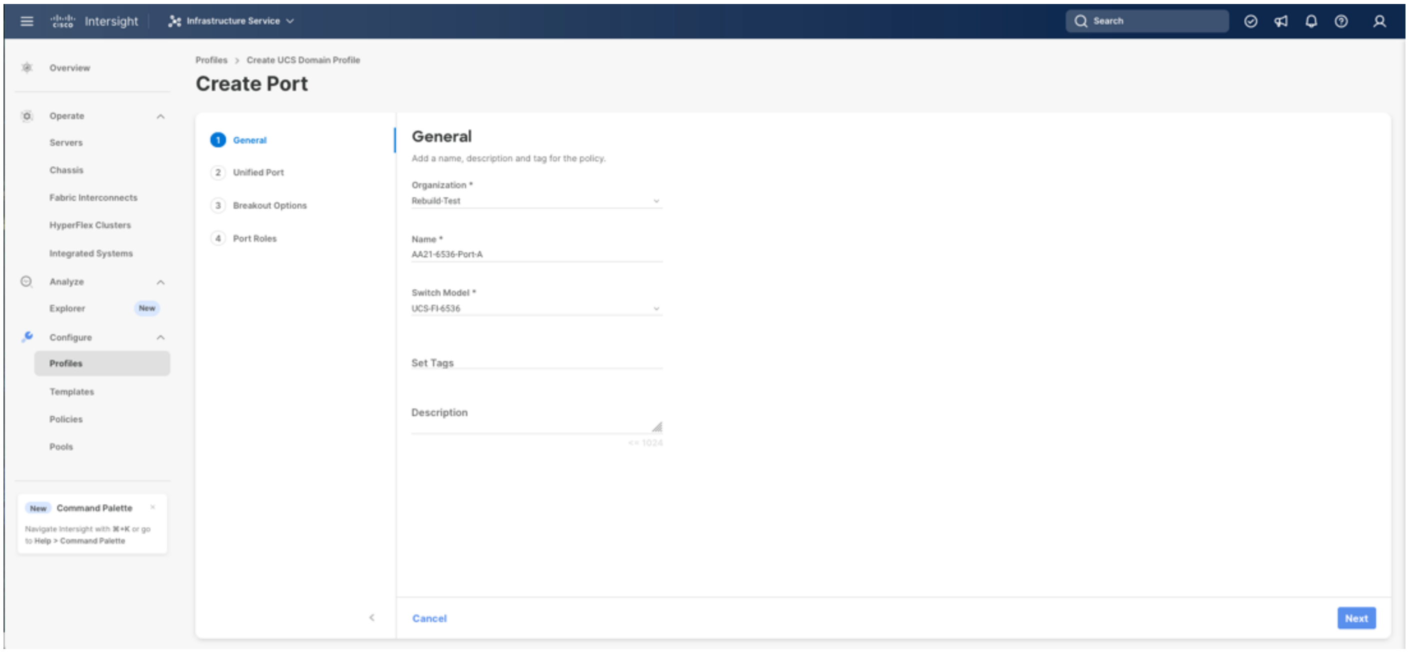
Ports Configuration

Fabric Interconnect B Not Configured

Ports Configuration

Step 2. Click **Create New** in the pane on the right to define a new port configuration policy.

Step 3. Verify that the correct organization is selected from the drop-down list (for example, AA02) and provide a name for the policy (for example, AA21-6536-Port-A). Select the UCS-FI-6536 Switch Model.



Create Port

General

Add a name, description and tag for the policy.

Organization *
Rebuild-Test

Name *
AA21-6536-Port-A

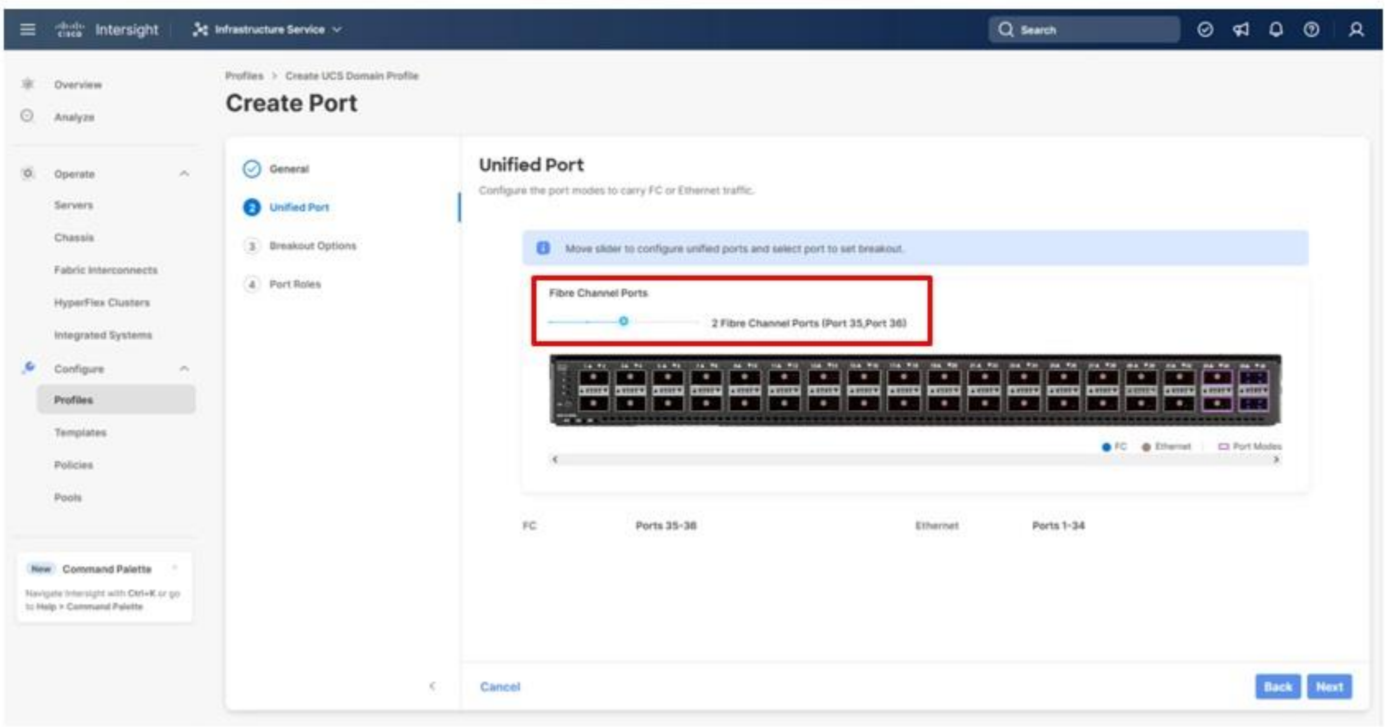
Switch Model *
UCS-FI-6536

Set Tags

Description

Step 4. Click **Next**.

Step 5. Move the slider to set up unified ports. In this deployment, the last two ports were selected as Fibre Channel ports as 4x32G breakouts. Click **Next**.



Create Port

Unified Port

Configure the port modes to carry FC or Ethernet traffic.

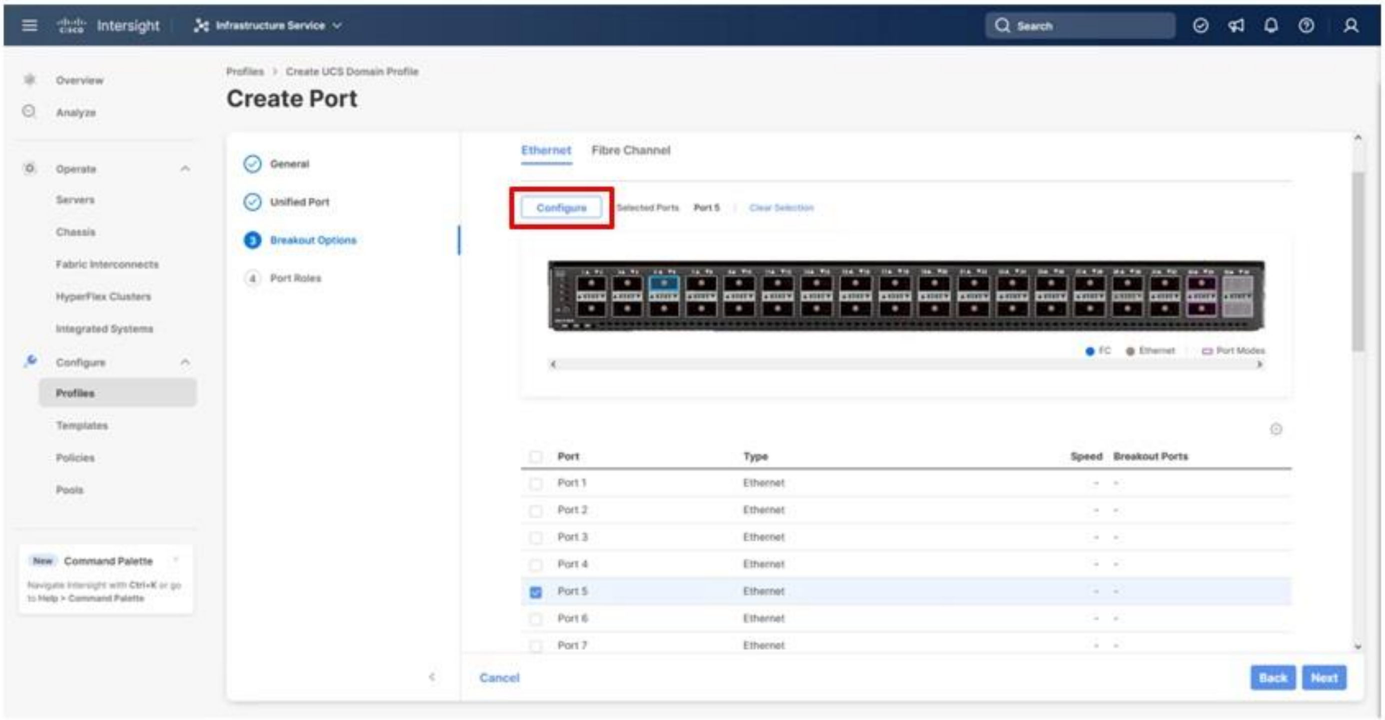
Move slider to configure unified ports and select port to set breakout.

Fibre Channel Ports

2 Fibre Channel Ports (Port 35,Port 36)

FC	Ports 35-36	Ethernet	Ports 1-34

Step 6. If any Ethernet ports need to be configured as breakouts, either 4x25G or 4x10G, for connecting C-Series servers or a UCS 5108 chassis, configure them here. In the list, select the checkbox next to any ports that need to be configured as breakout or select the ports on the graphic. When all ports are selected, click **Configure** at the top of the window.

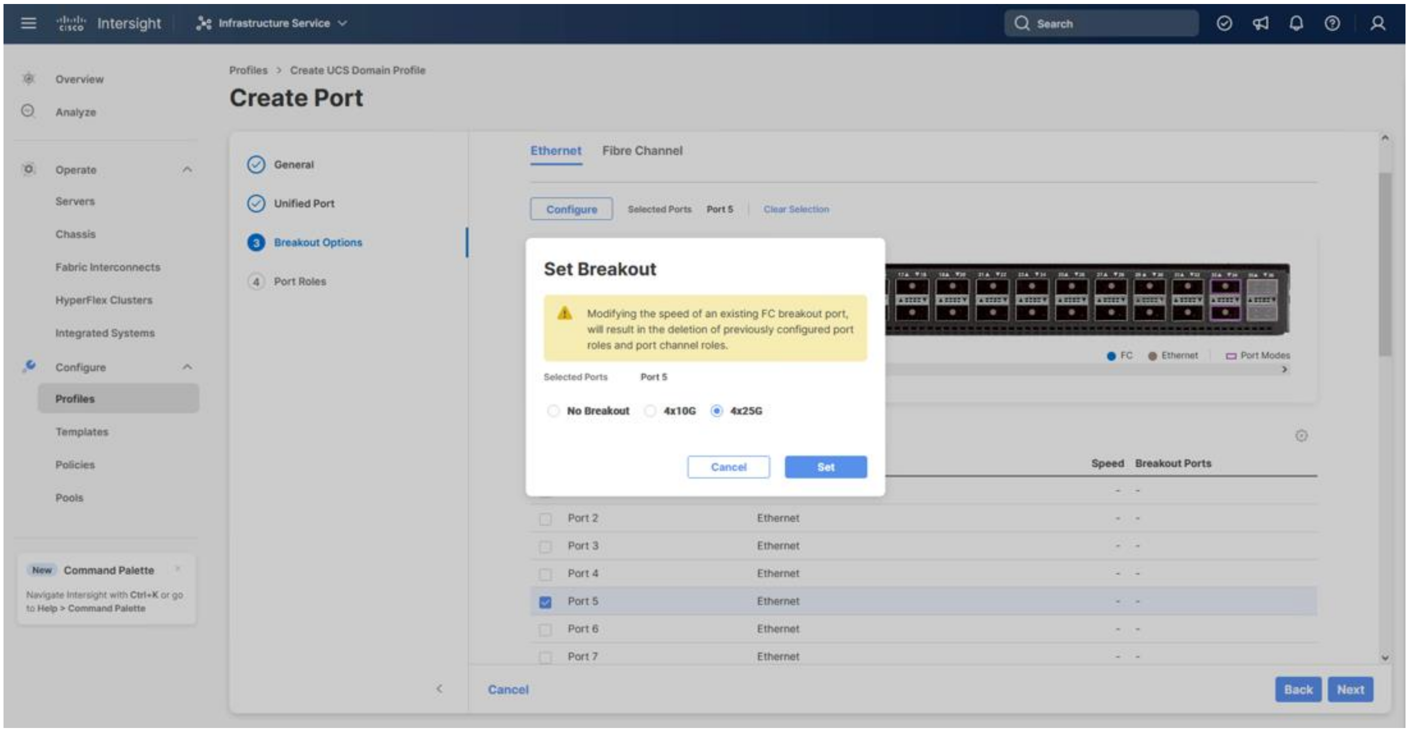


Create Port

Selected Ports Port 5

☐	Port	Type	Speed	Breakout Ports
☐	Port 1	Ethernet	-	-
☐	Port 2	Ethernet	-	-
☐	Port 3	Ethernet	-	-
☐	Port 4	Ethernet	-	-
☑	Port 5	Ethernet	-	-
☐	Port 6	Ethernet	-	-
☐	Port 7	Ethernet	-	-

Step 7. In the Set Breakout popup, select either 4x10G or 4x25G and click **Set**.



Intersight | Infrastructure Service | Search

Profiles > Create UCS Domain Profile

Create Port

General
Unified Port
3 Breakout Options
4 Port Roles

Ethernet | Fibre Channel

Configure | Selected Ports Port 5 | Clear Selection

Set Breakout

Modifying the speed of an existing FC breakout port, will result in the deletion of previously configured port roles and port channel roles.

Selected Ports Port 5

○ No Breakout ○ 4x10G ● 4x25G

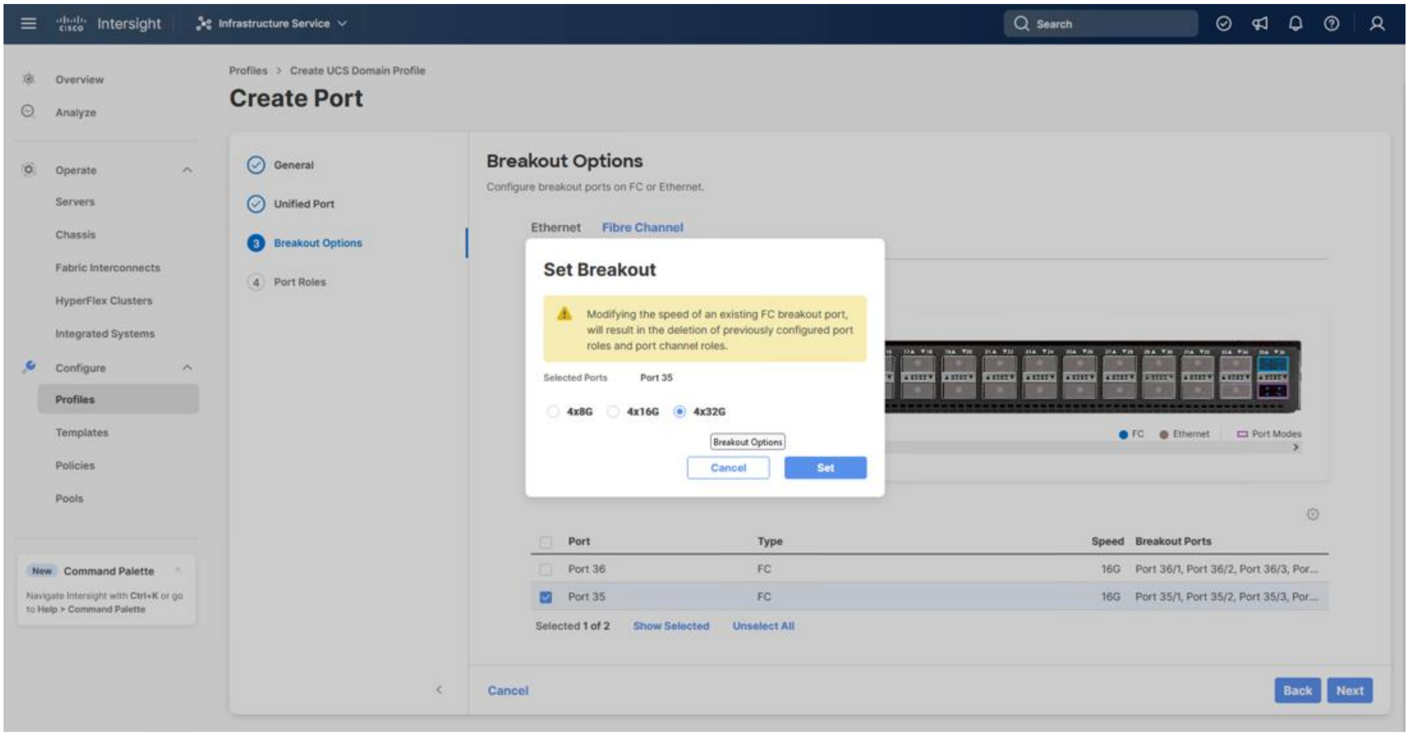
Cancel | Set

	Port	Type	Speed	Breakout Ports
□	Port 2	Ethernet	-	-
□	Port 3	Ethernet	-	-
□	Port 4	Ethernet	-	-
☑	Port 5	Ethernet	-	-
□	Port 6	Ethernet	-	-
□	Port 7	Ethernet	-	-

Cancel | Back | Next

Step 8. Under Breakout Options, select **Fibre Channel.** Select any ports that need the speed changed from 16G to 32G and click **Configure**.

Step 9. In the Set Breakout popup, select 4x32G and click **Set**.



Intersight | Infrastructure Service | Search

Profiles > Create UCS Domain Profile

Create Port

General
Unified Port
3 Breakout Options
4 Port Roles

Breakout Options

Configure breakout ports on FC or Ethernet.

Ethernet | Fibre Channel

Set Breakout

Modifying the speed of an existing FC breakout port, will result in the deletion of previously configured port roles and port channel roles.

Selected Ports Port 35

○ 4x8G ○ 4x16G ● 4x32G

Breakout Options

Cancel | Set

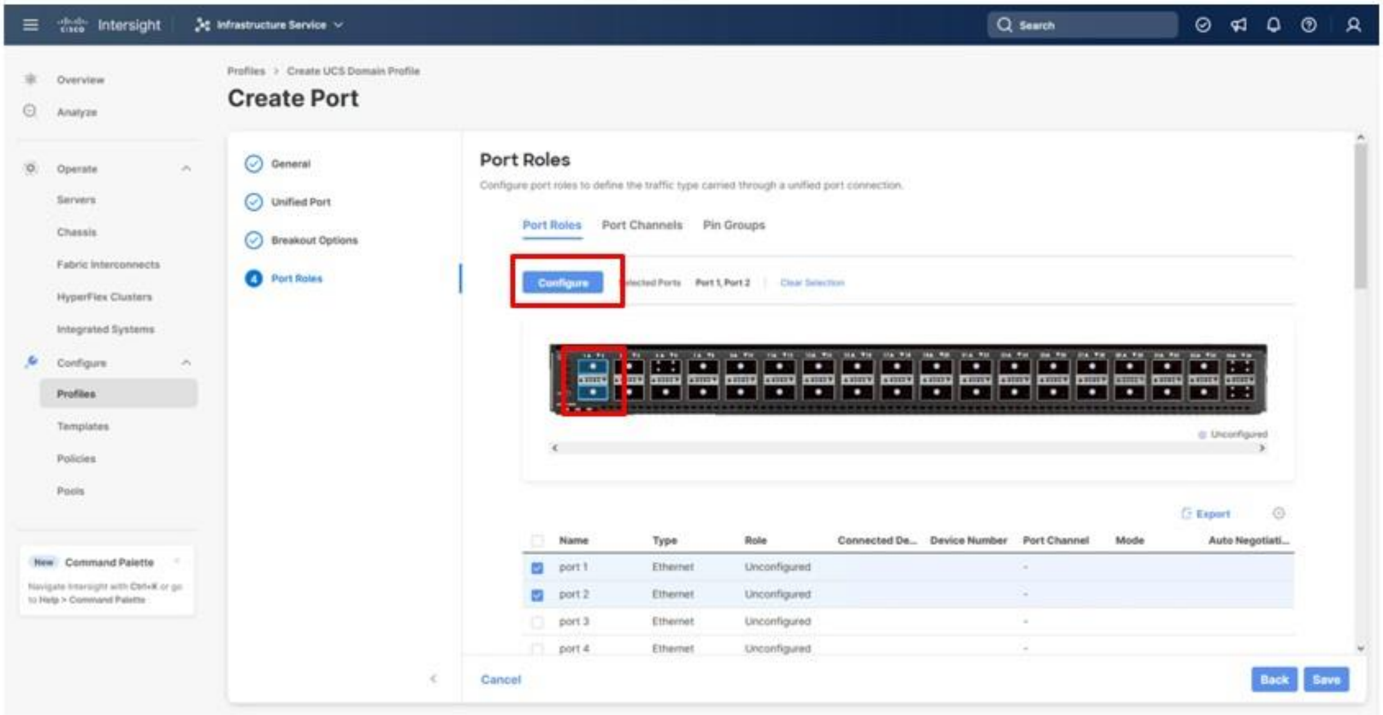
	Port	Type	Speed	Breakout Ports
□	Port 36	FC	16G	Port 36/1, Port 36/2, Port 36/3, Por...
☑	Port 35	FC	16G	Port 35/1, Port 35/2, Port 35/3, Por...

Selected 1 of 2 | Show Selected | Unselect All

Cancel | Back | Next

Step 10. Click **Next**.

Step 11. In the list, select the checkbox next to any ports that need to be configured as server ports, including ports connected to chassis or C-Series servers. Ports can also be selected on the graphic. When all ports are selected, click **Configure**. Breakout and non-breakout ports cannot be configured together. If you need to configure breakout and non-breakout ports, do this configuration in two steps.



Port Roles

Configure port roles to define the traffic type carried through a unified port connection.

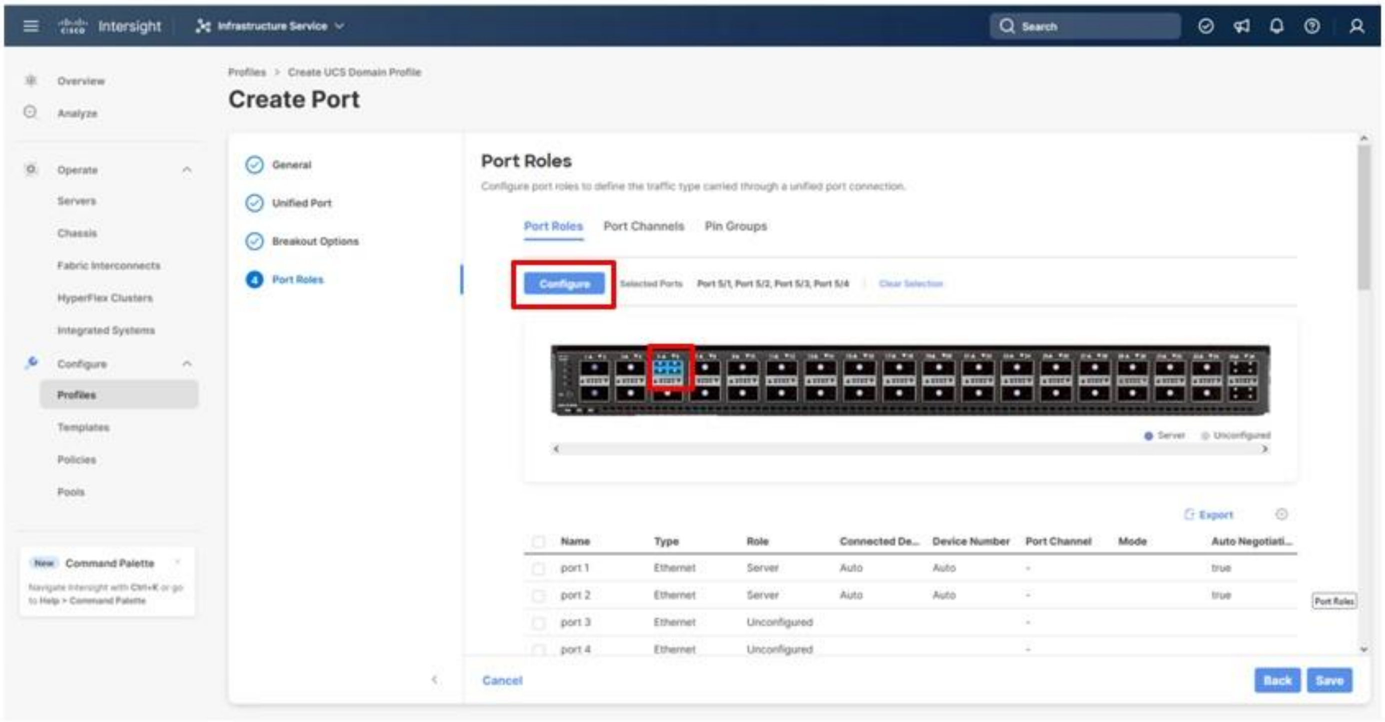
Selected Ports Port 1, Port 2

	Name	Type	Role	Connected De...	Device Number	Port Channel	Mode	Auto Negotiati...
☑	port 1	Ethernet	Unconfigured			-		
☑	port 2	Ethernet	Unconfigured			-		
□	port 3	Ethernet	Unconfigured			-		
□	port 4	Ethernet	Unconfigured			-		

Step 12. Specify the Role of Server for the selected IFM ports.

Step 13. Click **Save**.

Step 14. Select any breakout ports intended for C-Series and click **Configure**.



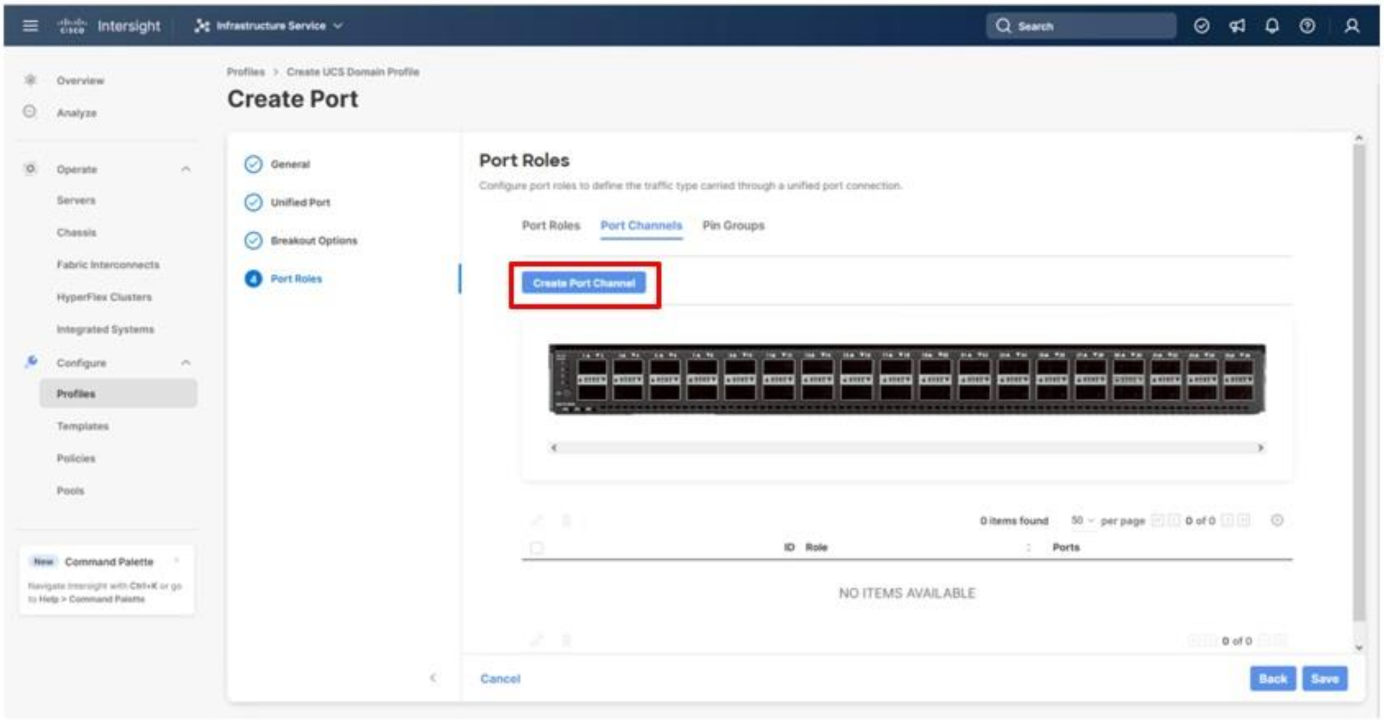
Selected Ports: Port 5/1, Port 5/2, Port 5/3, Port 5/4 | Clear Selection

Name	Type	Role	Connected De...	Device Number	Port Channel	Mode	Auto Negotiati...
port 1	Ethernet	Server	Auto	Auto	-		true
port 2	Ethernet	Server	Auto	Auto	-		true
port 3	Ethernet	Unconfigured			-		
port 4	Ethernet	Unconfigured			-		

Step 15. Repeat the selection of *Server* for the Role and click **Save**.

Step 16. Click the **Port Channels** tab under Port Roles.

Step 17. Click **Create Port Channel.**



0 items found 50 per page 0 of 0

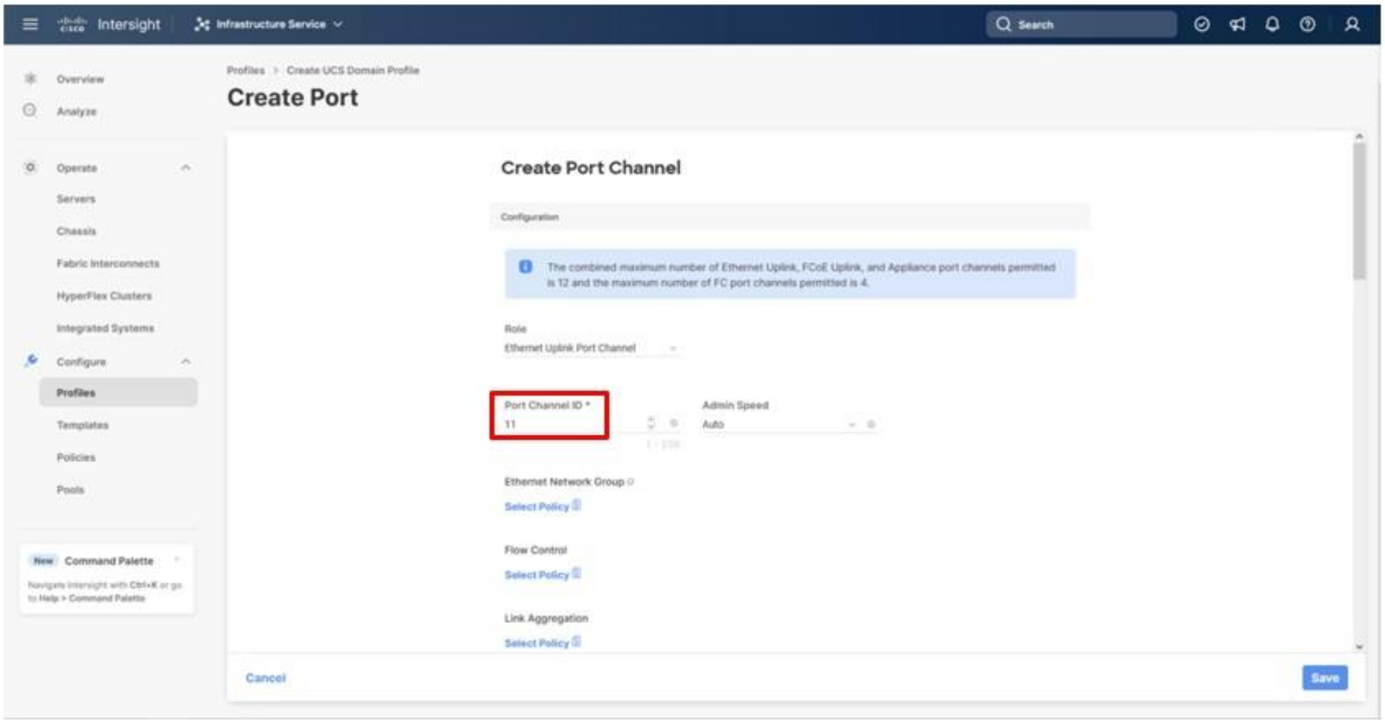
ID	Role	Ports

NO ITEMS AVAILABLE

0 of 0

Step 18. To create the network uplinks to the Nexus 93600CD-GX switches, leave the Role as **Ethernet Uplink Port** selected.

Step 19. Specify a Port Channel ID (example 11). Specify an Admin Speed if the upstream ports require it, otherwise leave it as **Auto**.



Create Port

Create Port Channel

Configuration

The combined maximum number of Ethernet Uplink, FCoE Uplink, and Appliance port channels permitted is 12 and the maximum number of FC port channels permitted is 4.

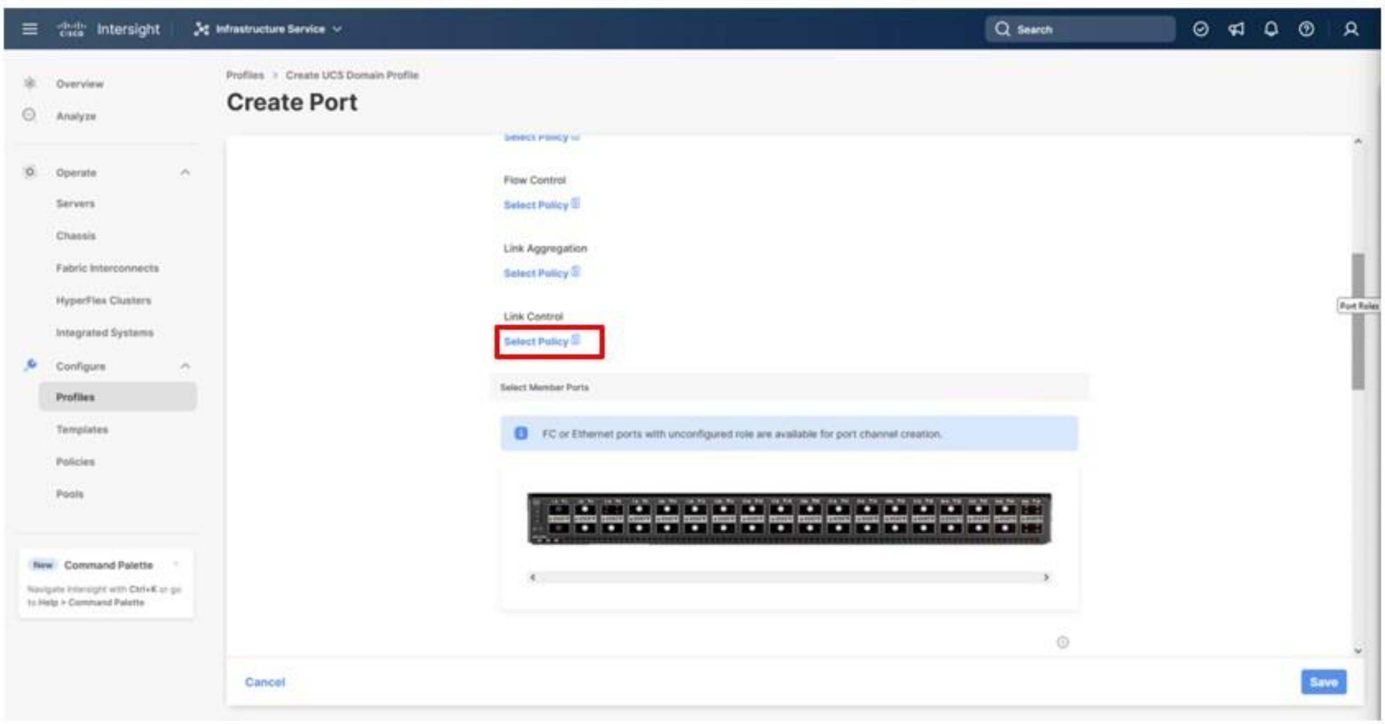
Role: Ethernet Uplink Port Channel

Port Channel ID *: 11

Admin Speed: Auto

Note: Ethernet Network Group, Flow Control, and Link Aggregation policies for defining a disjoint Layer-2 domain or fine tune port-channel parameters can be configured here, but these policies were not used in this deployment and system default values were utilized.

Step 20. Scroll down if Link Control and Select Member Ports is not visible within the **Create Port Channel** dialogue, click **Select Policy** under Link Control, and then select **Create New** in the upper area of the right-side pane.



Create Port

Flow Control
Select Policy

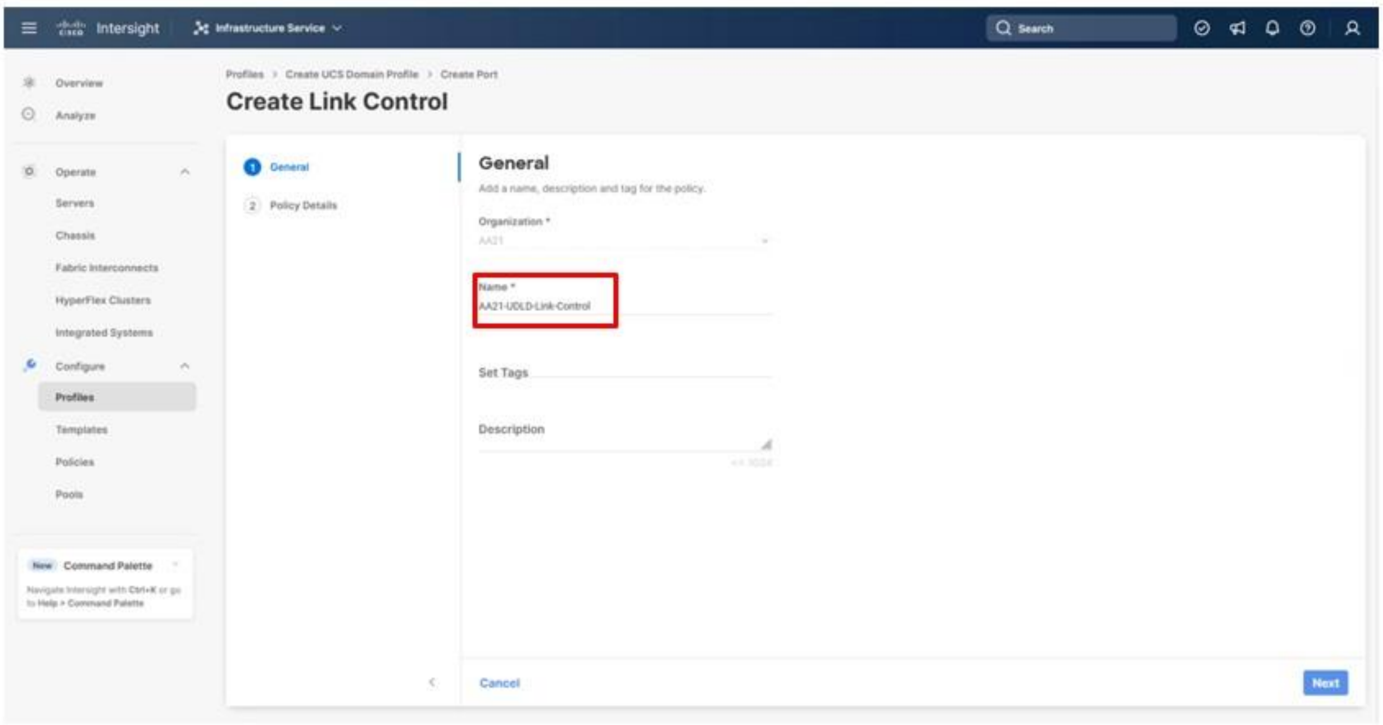
Link Aggregation
Select Policy

Link Control
Select Policy

Select Member Ports

FC or Ethernet ports with unconfigured role are available for port channel creation.

Step 21. Provide a name for the policy (example, AA21-UDLD-Link-Control), and click **Next**.



Create Link Control

General

Add a name, description and tag for the policy.

Organization *
AA21

Name *
AA21-UDLD-Link-Control

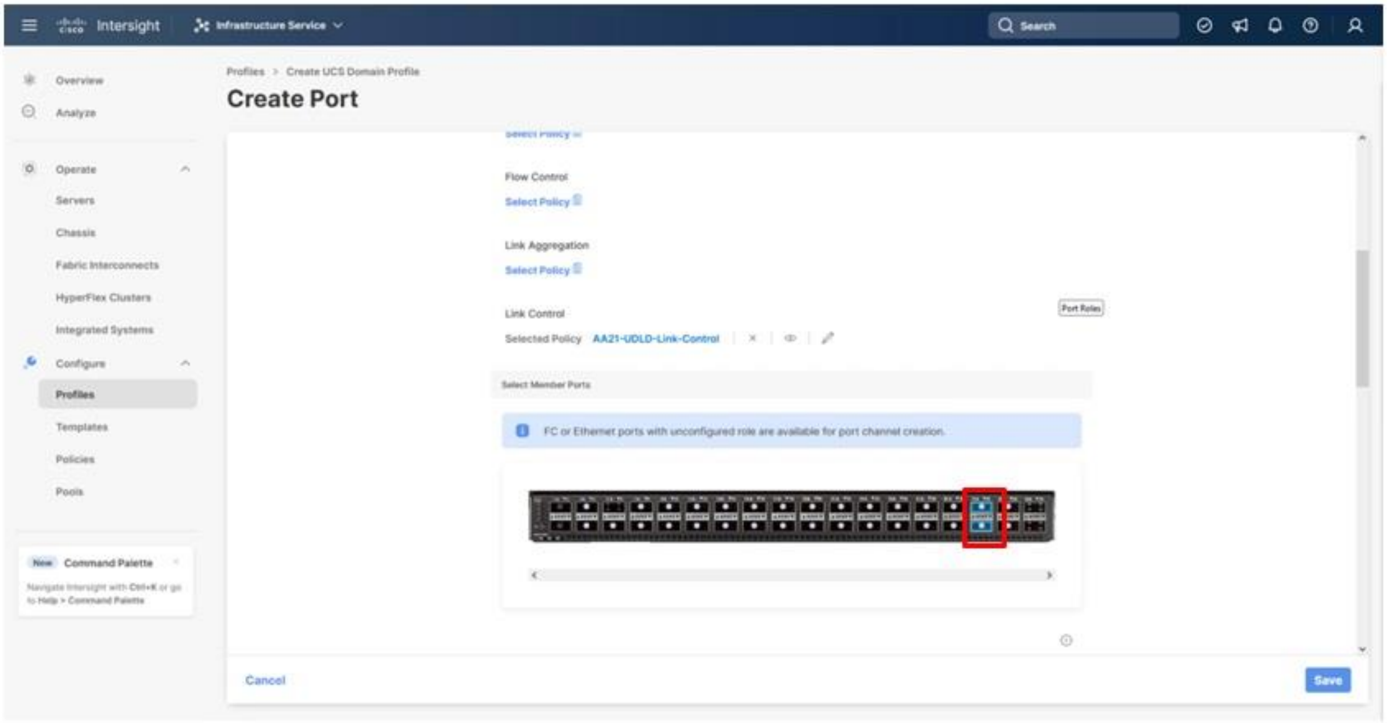
Set Tags

Description

<= 1024

Step 22. Leave the default values selected and click **Create**.

Step 23. Select the ports connected to the upstream Nexus switches (example, port 31 and 32).



Profiles > Create UCS Domain Profile

Create Port

Flow Control
Select Policy

Link Aggregation
Select Policy

Link Control
Selected Policy AA21-UDLD-Link-Control

Select Member Ports

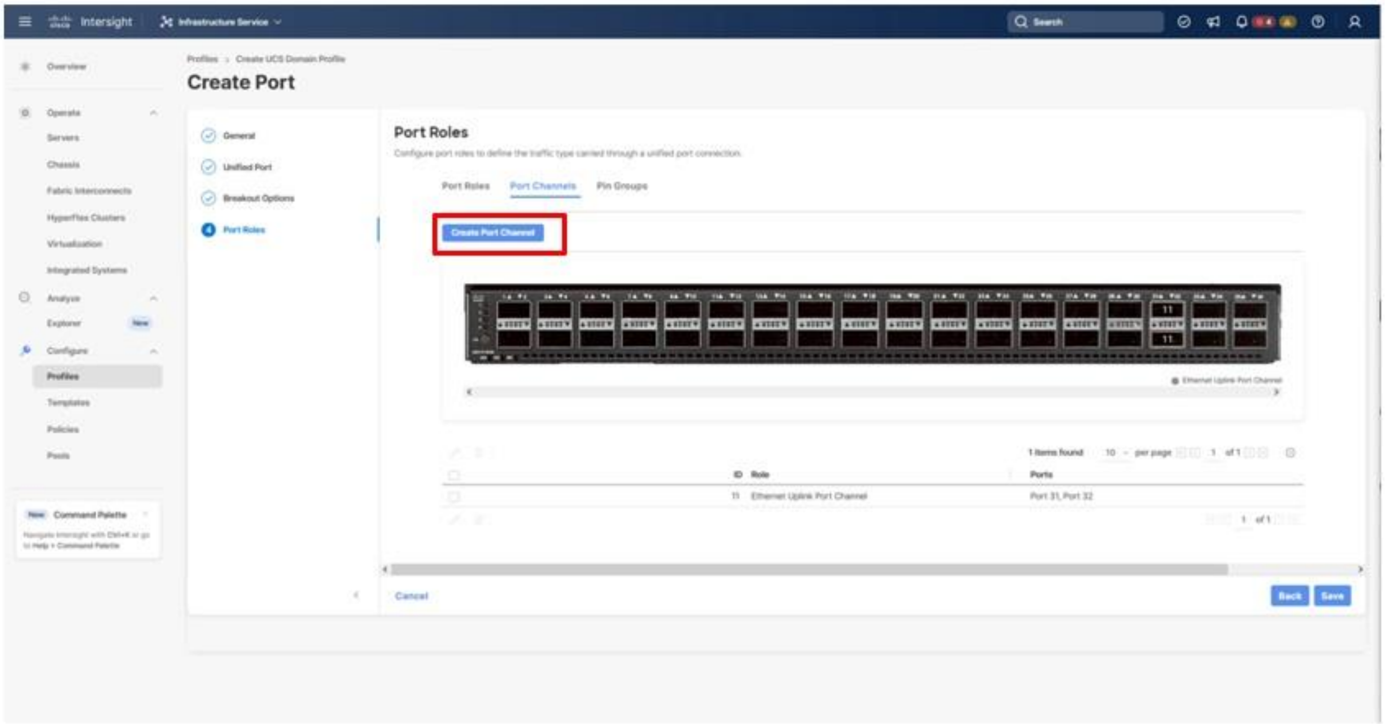
FC or Ethernet ports with unconfigured role are available for port channel creation.

Step 24. Click **Save**.

Procedure 6. Configure FC Port Channel

This procedure will create the Fibre Channel Port Channel for Fabric Interconnect A, and these steps will later be repeated for Fabric Interconnect B with certain specified differences. A difference is needed for these Fibre Channel Port Channel configurations because of the use of a unique Fibre Channel VSAN ID.

Step 1. Configure a Fibre Channel Port Channel by selecting the **Port Channel** in the main pane again and clicking **Create Port Channel**.



Create Port

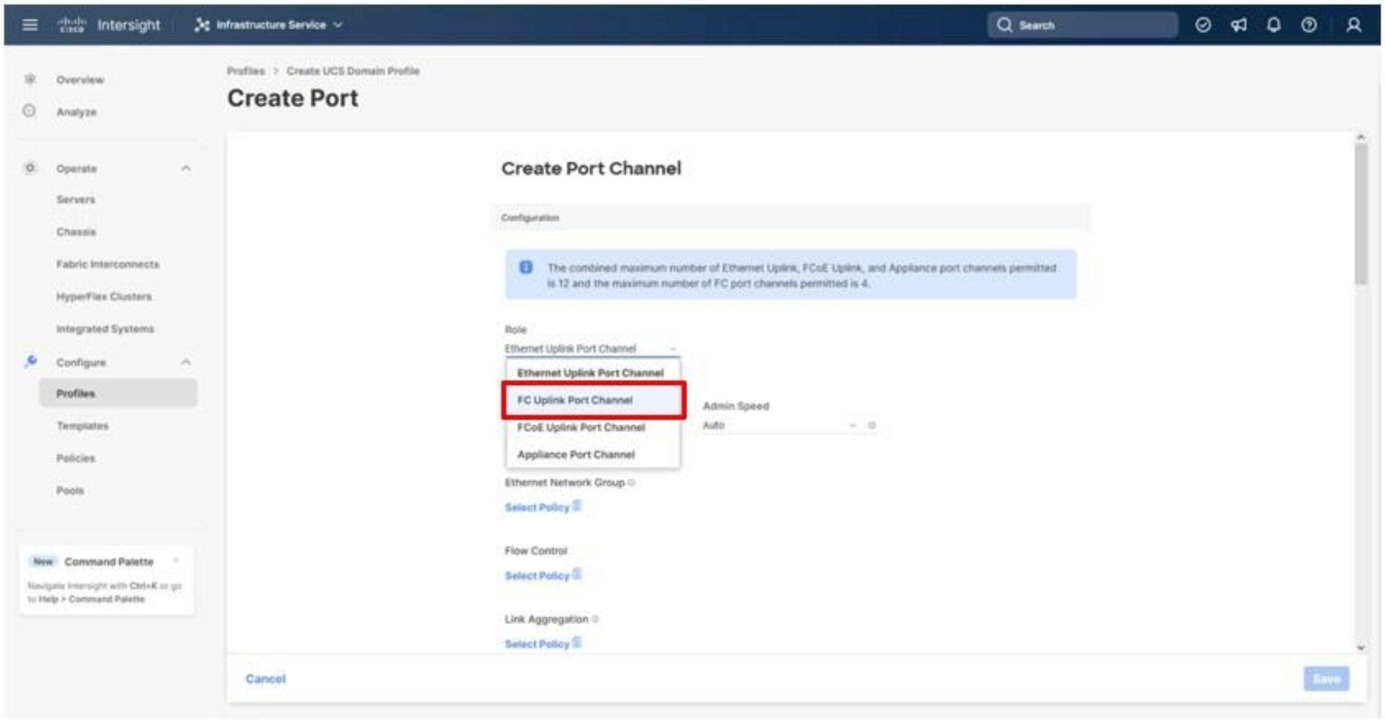
Port Roles

Configure port roles to define the traffic type carried through a unified port connection.

1 items found 10 per page 1 of 1

ID	Role	Ports
11	Ethernet Uplink Port Channel	Port 31, Port 32

Step 2. In the drop-down list under Role, choose **FC Uplink Port Channel**.



Create Port

Create Port Channel

Configuration

The combined maximum number of Ethernet Uplink, FCoE Uplink, and Appliance port channels permitted is 12 and the maximum number of FC port channels permitted is 4.

Role: Ethernet Uplink Port Channel

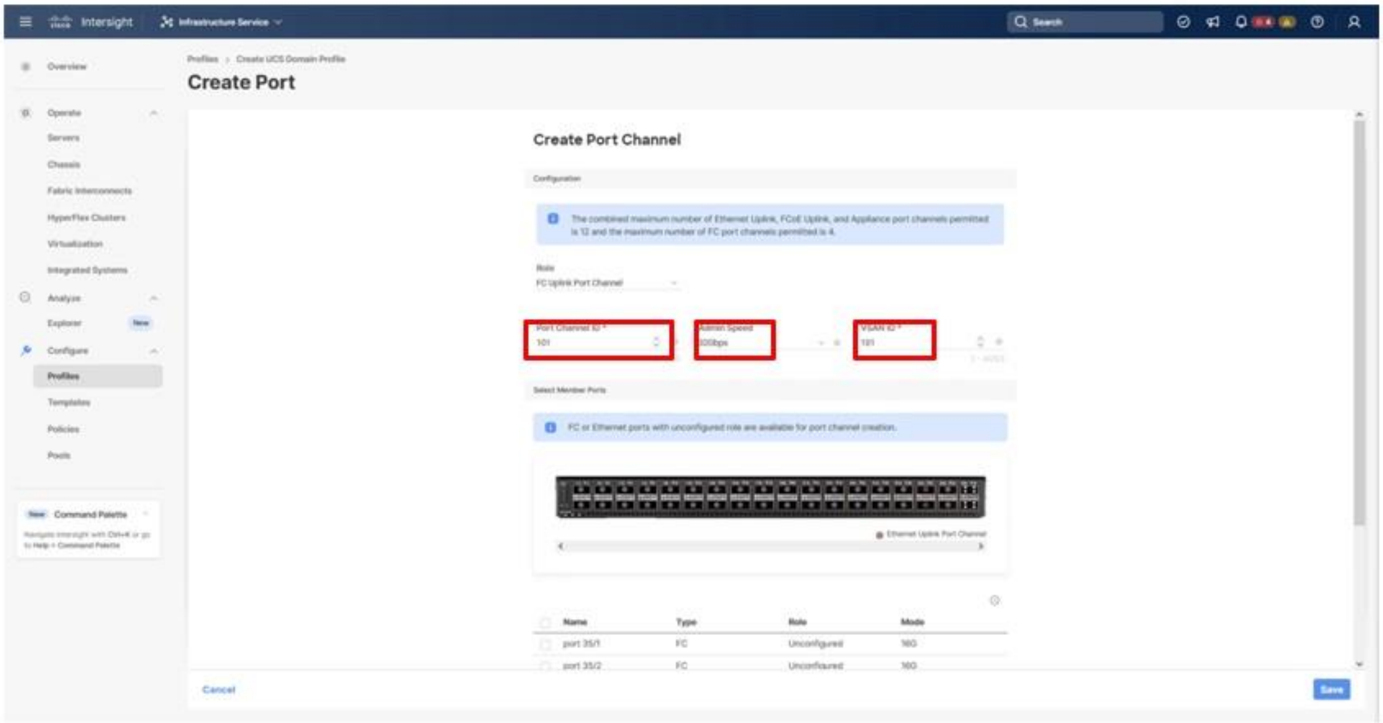
Admin Speed: Auto

Ethernet Network Group

Flow Control

Link Aggregation

Step 3. Provide a port-channel ID (for example, 101), select a value for Admin Speed (for example, 32Gbps), and provide a VSAN ID (for example, 101).



Create Port

Create Port Channel

Configuration

The combined maximum number of Ethernet Uplink, FCoE Uplink, and Appliance port channels permitted is 12 and the maximum number of FC port channels permitted is 4.

Role: FC Uplink Port Channel

Port Channel ID *: 101

Admin Speed: 32Gbps

VSAN ID *: 101

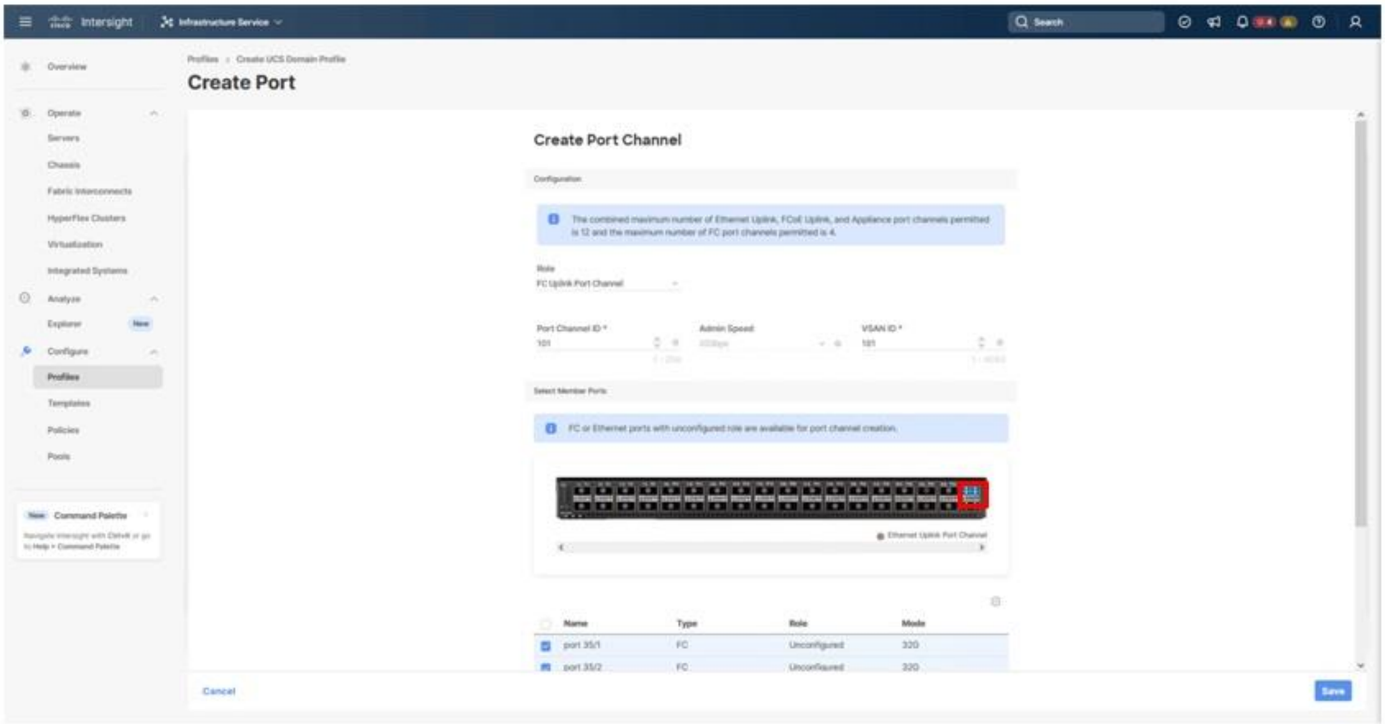
Select Member Ports

FC or Ethernet ports with unconfigured role are available for port channel creation.

● Ethernet Uplink Port Channel

	Name	Type	Role	Mode
□	port 35/1	FC	Unconfigured	16G
□	port 35/2	FC	Unconfigured	16G

Step 4. Select ports (for example, 35/1,35/2,35/3,35/4).



Create Port

Create Port Channel

Configuration

The combined maximum number of Ethernet Uplink, FCoE Uplink, and Appliance port channels permitted is 12 and the maximum number of FC port channels permitted is 4.

Role: FC Uplink Port Channel

Port Channel ID *: 101

Admin Speed: 32Gbps

VSAN ID *: 101

Select Member Ports

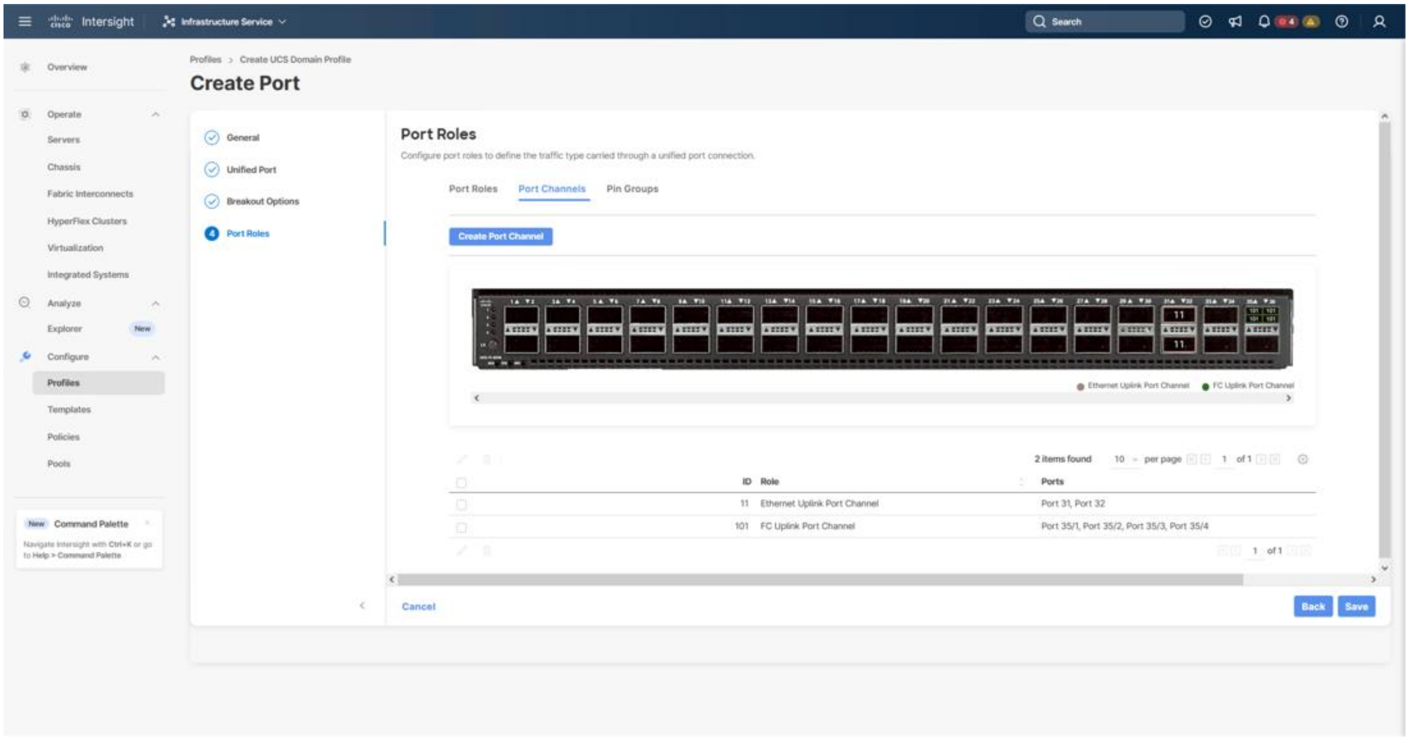
FC or Ethernet ports with unconfigured role are available for port channel creation.

● Ethernet Uplink Port Channel

	Name	Type	Role	Mode
☑	port 35/1	FC	Unconfigured	32G
☑	port 35/2	FC	Unconfigured	32G

Step 5. Click **Save**.

Step 6. Verify the port-channel IDs and ports after both the Ethernet uplink port channel and the Fibre Channel uplink port channel have been created.



2 items found 10 per page 1 of 1

ID	Role	Ports
11	Ethernet Uplink Port Channel	Port 31, Port 32
101	FC Uplink Port Channel	Port 35/1, Port 35/2, Port 35/3, Port 35/4

Step 7. Click **Save** to create the port policy for Fabric Interconnect A.

Procedure 7. Fabric Interconnect B Ports and Port Channel Configurations

Step 1. Repeat the steps in Ports Configuration and Configure FC Port Channel to create the port policy for Fabric Interconnect B including the Ethernet port-channel and the FC port-channel. Use the following values for various parameters:

- Name of the port policy: AA21-6536-Port-B
- Ethernet port-Channel ID: 12
- FC port-channel ID: 102
- FC VSAN ID: 102

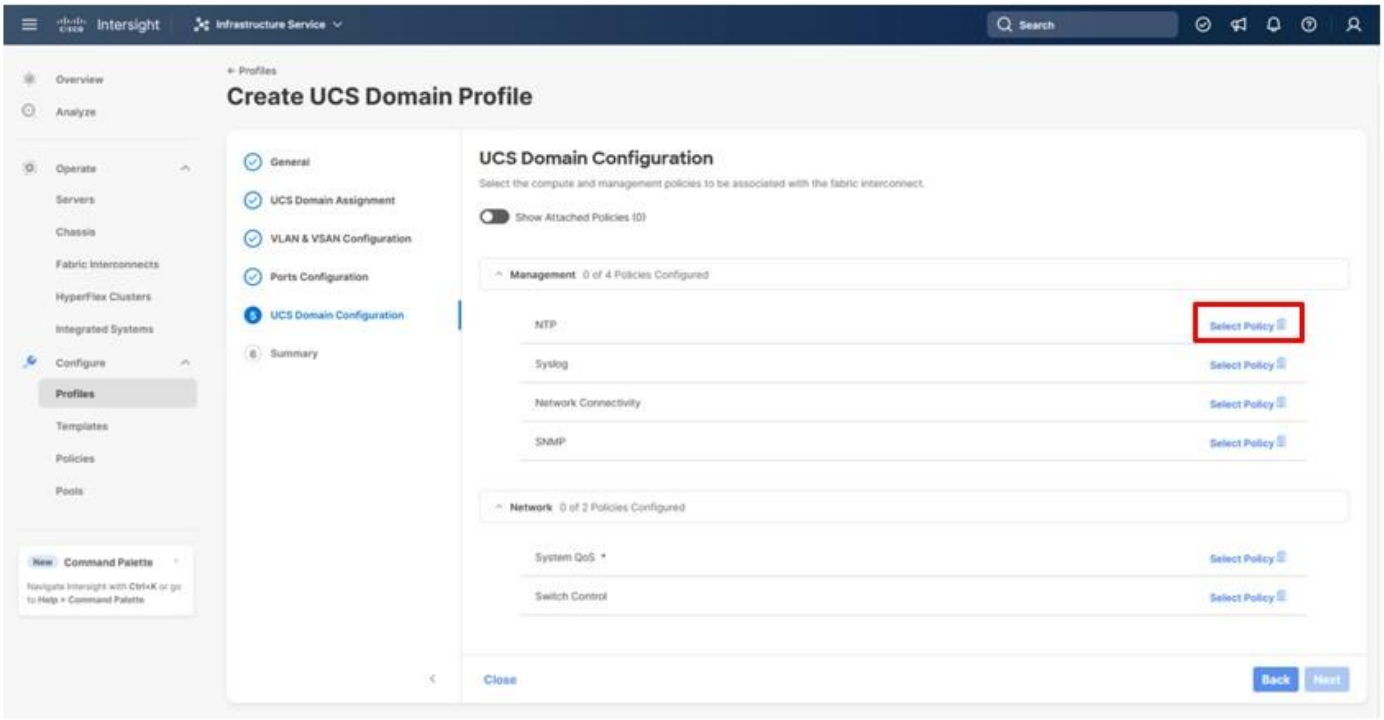
Step 2. When the port configuration for both fabric interconnects is complete and looks correct, click **Next.**

Procedure 8. UCS Domain Configuration

Under UCS domain configuration, additional policies can be configured to set up NTP, Syslog, DNS settings, SNMP, QoS and the UCS operating mode (end host or switch mode). For this deployment, four policies (NTP, Network Connectivity, SNMP, and System QoS) will be configured, as shown below:

Configure NTP Policy

Step 1. Click **Select Policy** next to NTP and in the pane on the right, click **Create New**.

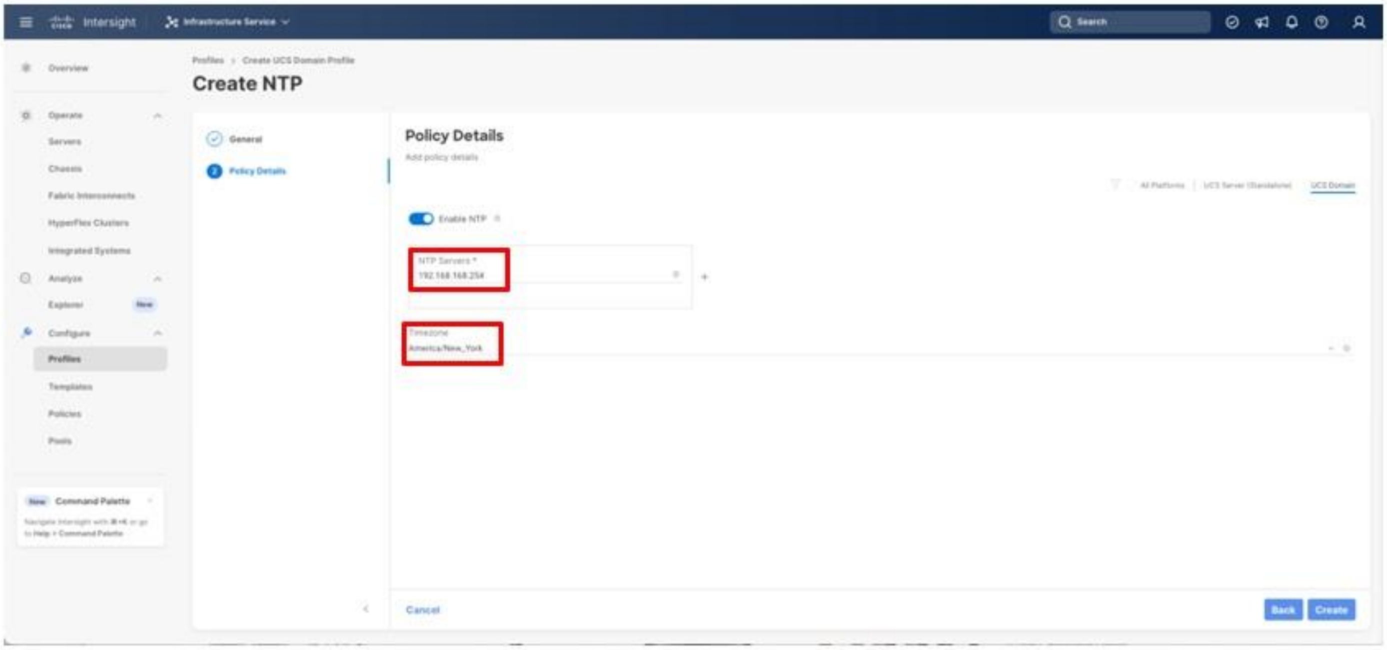

Intersight
Infrastructure Service
Search
Overview
Analyze
Operate
Servers
Chassis
Fabric Interconnects
HyperFlex Clusters
Integrated Systems
Configure
Profiles
Templates
Policies
Pools
New Command Palette
Navigate Intersight with Ctrl+K or go to Help > Command Palette
← Profiles
Create UCS Domain Profile
General
UCS Domain Assignment
VLAN & VSAN Configuration
Ports Configuration
5 UCS Domain Configuration
6 Summary
UCS Domain Configuration
Select the compute and management policies to be associated with the fabric interconnect.
Show Attached Policies (0)
Management 0 of 4 Policies Configured
NTP Select Policy
Syslog Select Policy
Network Connectivity Select Policy
SNMP Select Policy
Network 0 of 2 Policies Configured
System QoS * Select Policy
Switch Control Select Policy
Close
Back
Next

Step 2. Verify that the correct organization is selected from the drop-down list (for example, AA21) and provide a name for the policy (for example, AA21-NTP).

Step 3. Click **Next.**

Step 4. Enable NTP, provide the first NTP server IP address, and select the time zone from the drop-down list.

Step 5. (Optional) Add a second NTP server by clicking + next to the first NTP server IP address.



Create NTP

Policy Details

Add policy details

Enable NTP

NTP Servers *
192.168.168.254

Timezone
America/New_York

Step 6. Click **Create.**

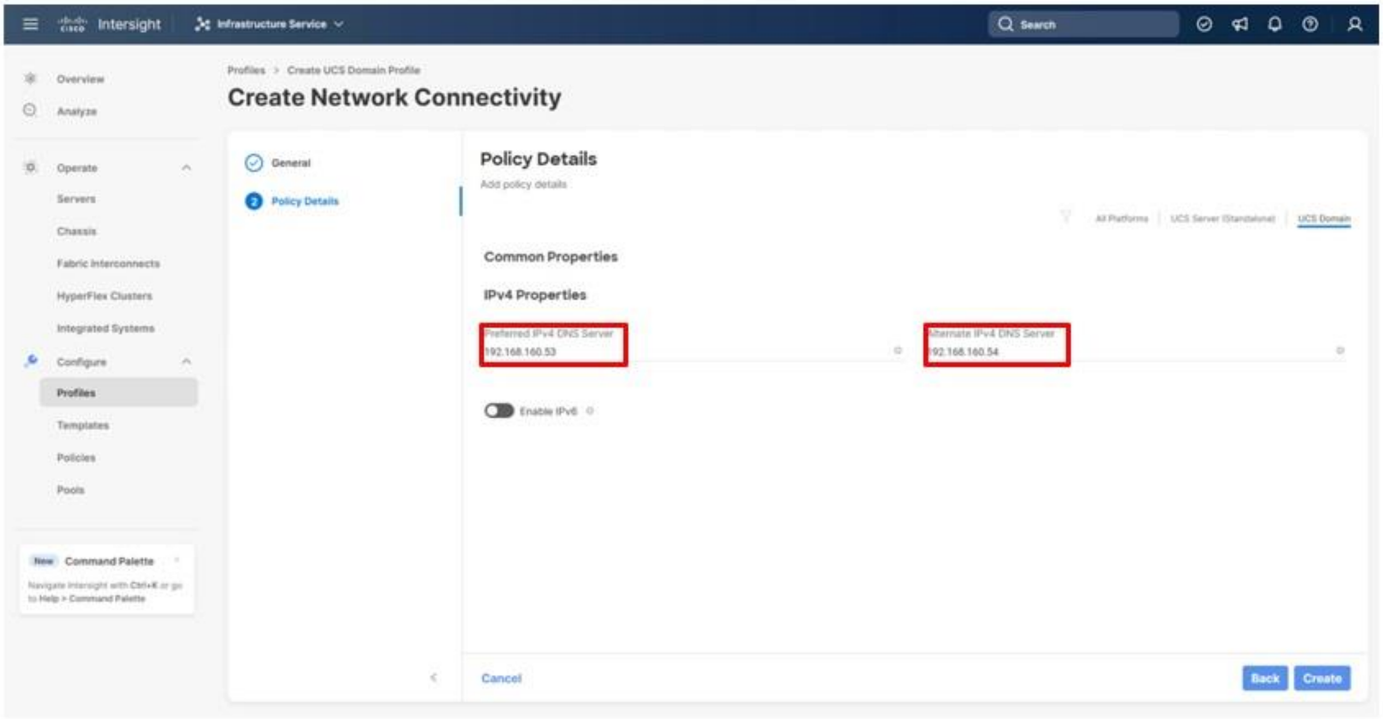
Configure Network Connectivity Policy

Step 1. Click **Select Policy** next to Network Connectivity and in the pane on the right, click **Create New.**

Step 2. Verify that the correct organization is selected from the drop-down list (for example, AA21) and provide a name for the policy (for example, AA21-NetConn).

Step 3. Click **Next.**

Step 4. Provide the appropriate DNS server IP addresses for the Cisco UCS domain.



Create Network Connectivity

Policy Details

Add policy details

Common Properties

IPv4 Properties

Preferred IPv4 DNS Server: 192.168.160.53

Alternate IPv4 DNS Server: 192.168.160.54

Enable IPv6

Step 5. Click **Create**.

Configure SNMP Policy (Optional)

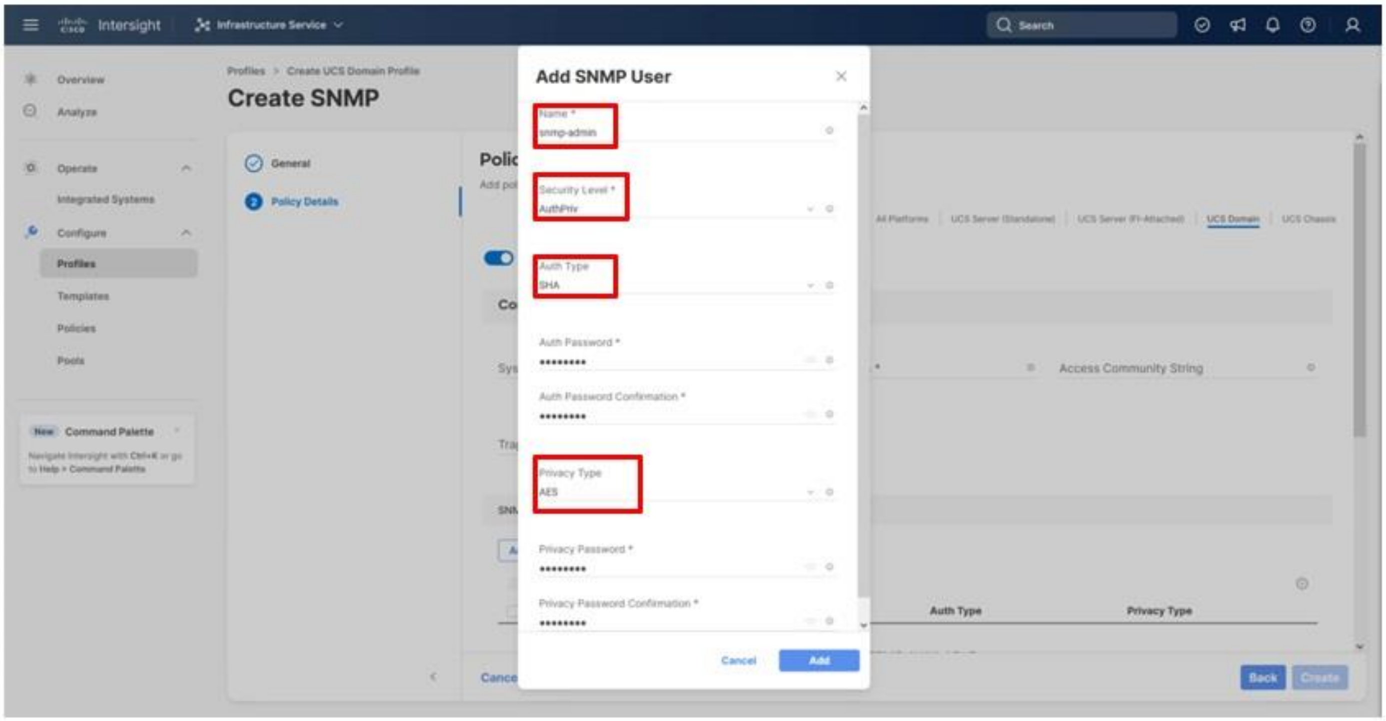
Step 1. Click **Select Policy** next to SNMP and in the pane on the right, click **Create New**.

Step 2. Verify that the correct organization is selected from the drop-down list (for example, AA21) and provide a name for the policy (for example, AA21-SNMP).

Step 3. Click **Next**.

Step 4. Provide a System Contact email address, a System Location, and optional Community Strings.

Step 5. Under SNMP Users, click **Add SNMP User**.



Create SNMP

Add SNMP User

Name * snmp-admin

Security Level * AuthPriv

Auth Type SHA

Auth Password * ••••••••

Auth Password Confirmation * ••••••••

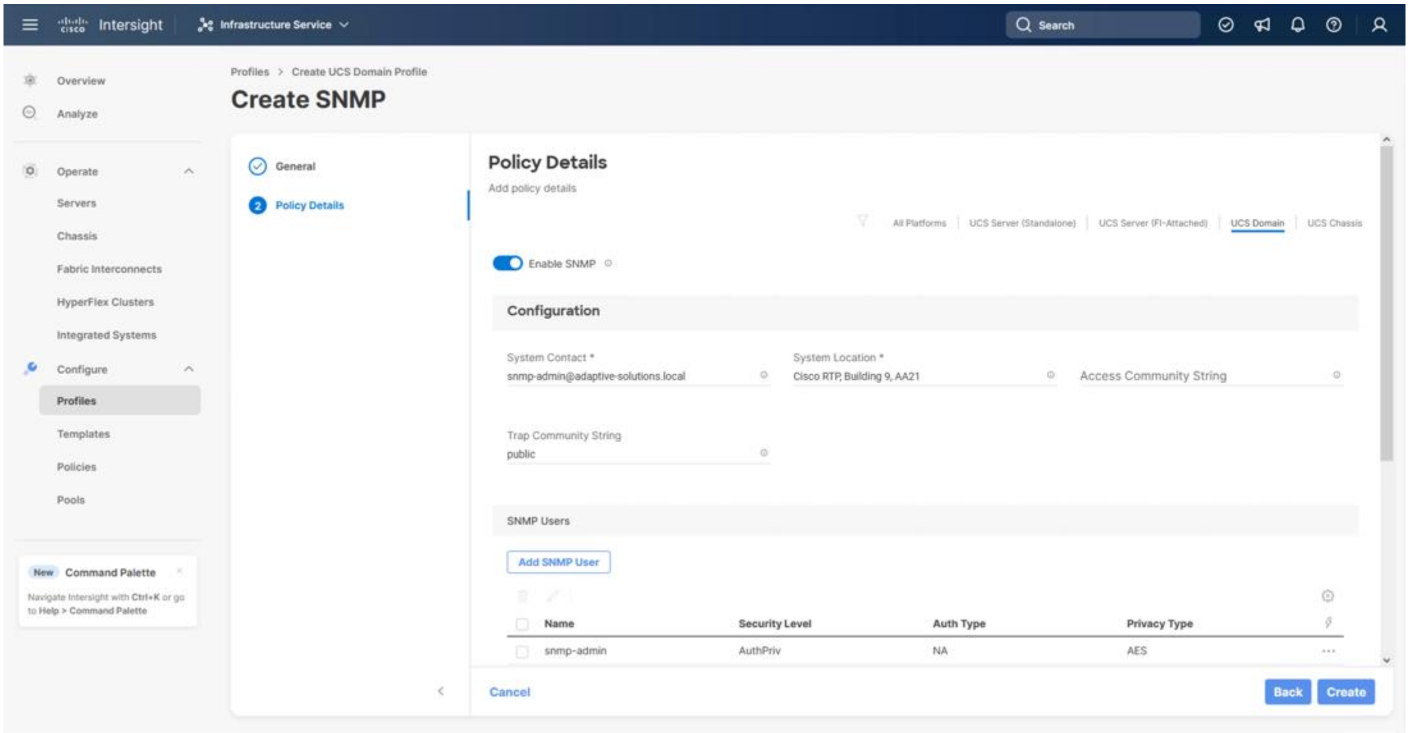
Privacy Type AES

Privacy Password * ••••••••

Privacy Password Confirmation * ••••••••

Cancel Add

Step 6. Optionally, add an SNMP Trap Destination (for example, the NDFC IP Address). If the SNMP Trap Destination is V2, you must add a **Trap Community String**.



Create SNMP

Policy Details

Add policy details

Enable SNMP

Configuration

System Contact * snmp-admin@adaptive-solutions.local

System Location * Cisco RTP, Building 9, AA21

Access Community String

Trap Community String public

SNMP Users

Add SNMP User

Name	Security Level	Auth Type	Privacy Type
snmp-admin	AuthPriv	NA	AES

Step 7. Click **Create.**

Procedure 9. Configure System QoS Policy

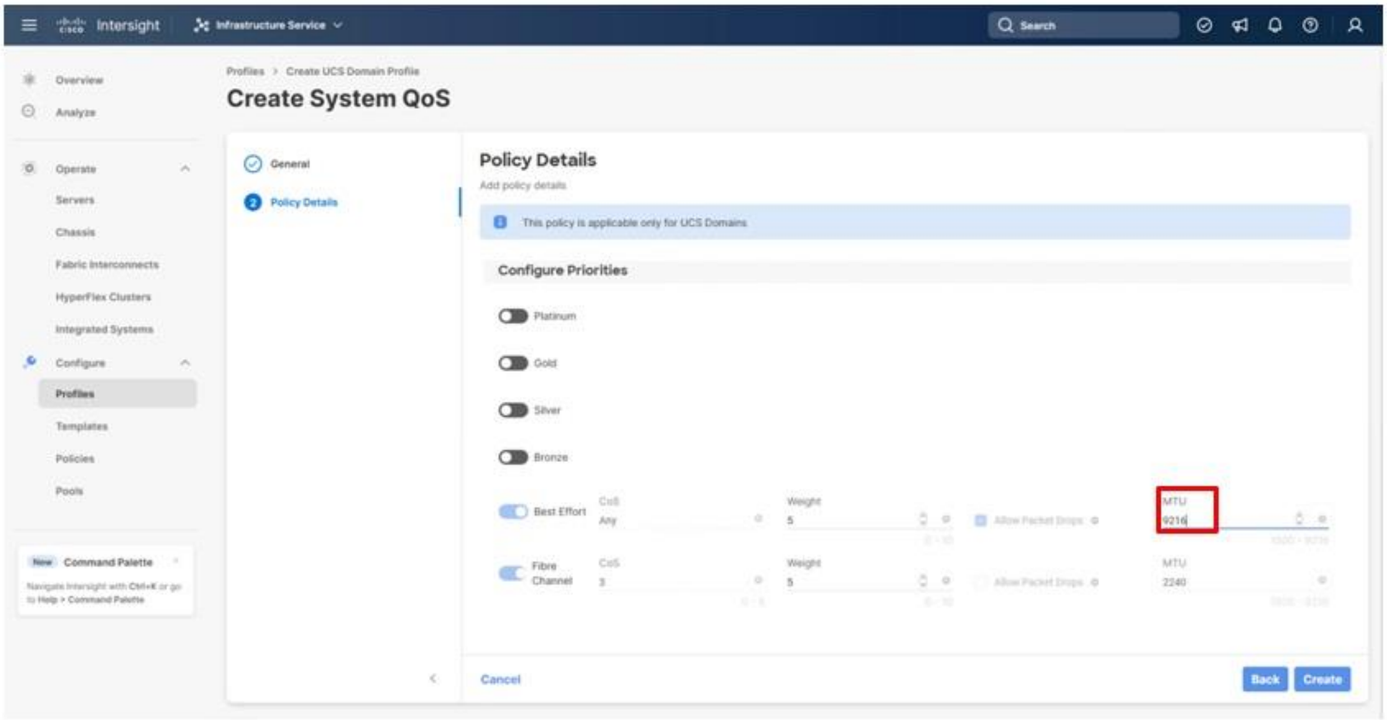
The System QoS policy will be adjusted to expand the capacity of the Ethernet uplinks to support jumbo frames. All Ethernet traffic is set within a common class of Best Effort in this design, which will have the MTU adjusted. Different strategies can be implemented for QoS giving weighted priorities, but any such effort would need to take care to match settings implemented upstream of the fabric interconnects.

Step 1. Click **Select Policy** next to System QoS* and in the pane on the right, click **Create New**.

Step 2. Verify that the correct organization is selected from the drop-down list (for example, AA21) and provide a name for the policy (for example, AA21-QoS).

Step 3. Click **Next**.

Step 4. Change the MTU for Best Effort class to **9216**.



Profiles > Create UCS Domain Profile

Create System QoS

Policy Details

Add policy details

This policy is applicable only for UCS Domains

Configure Priorities

Platinum

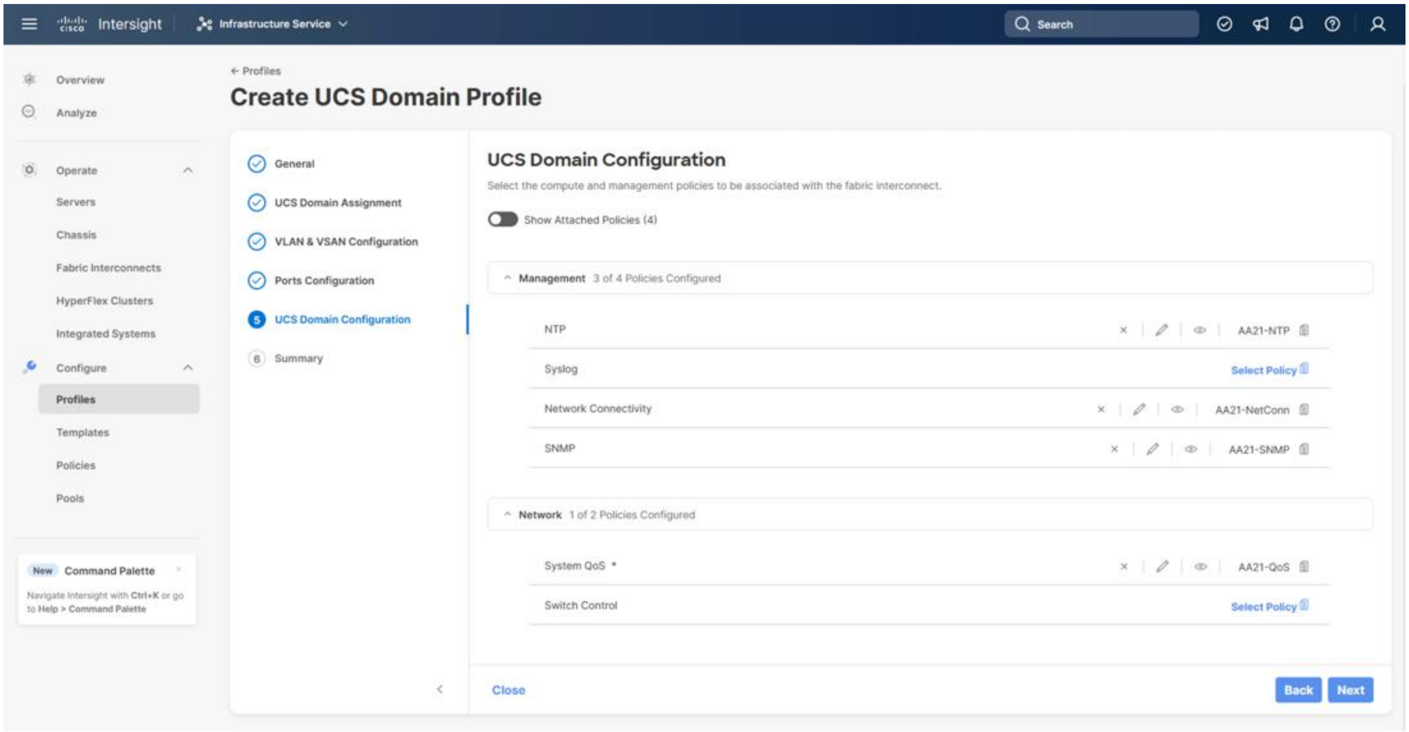
Gold

Silver

Bronze

	CoS	Weight		MTU
Best Effort	Any	5 0 - 10	☑ Allow Packet Drops	9216 1500 - 9216
Fibre Channel	3	5 0 - 10	□ Allow Packet Drops	2240

Step 5. Click **Create**.



Create UCS Domain Profile

UCS Domain Configuration

Select the compute and management policies to be associated with the fabric interconnect.

Show Attached Policies (4)

Management 3 of 4 Policies Configured

NTP	AA21-NTP
Syslog	Select Policy
Network Connectivity	AA21-NetConn
SNMP	AA21-SNMP

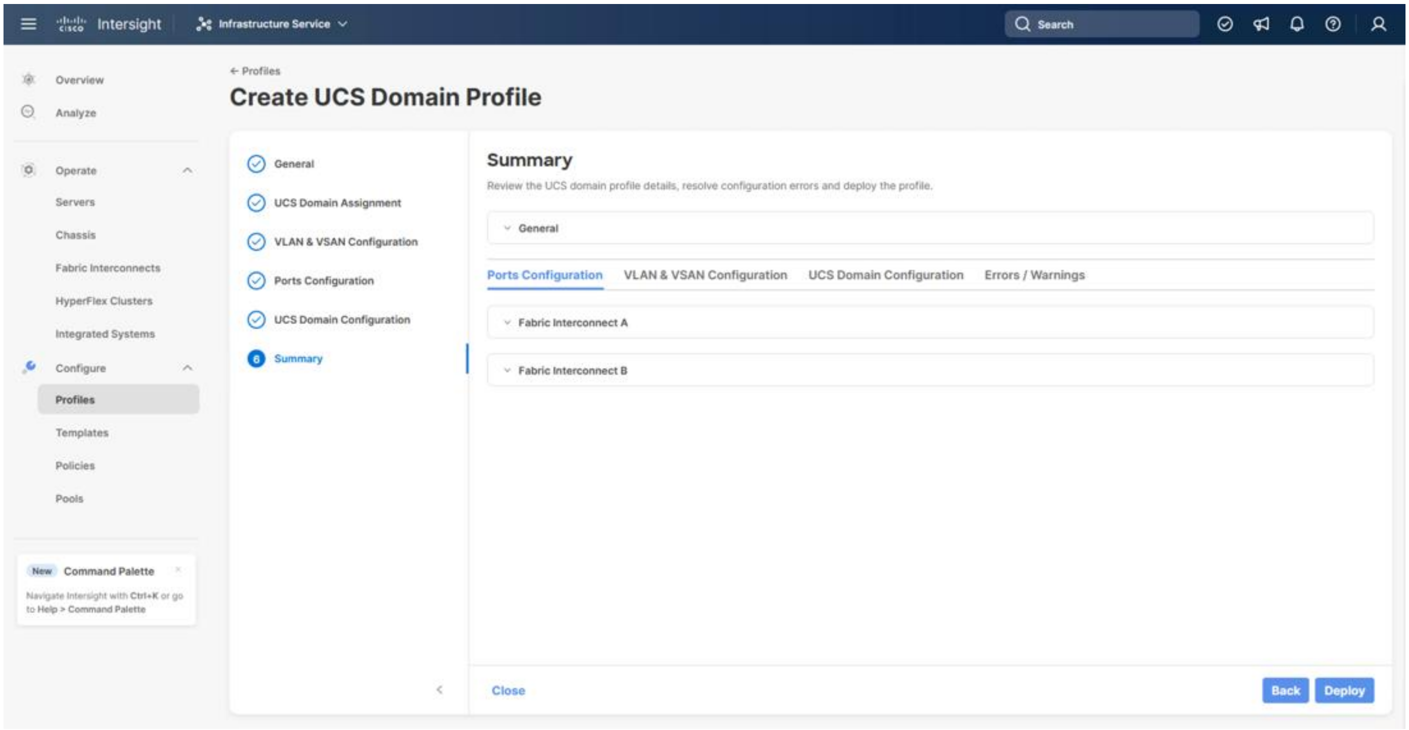
Network 1 of 2 Policies Configured

System QoS *	AA21-QoS
Switch Control	Select Policy

Step 6. Click **Next.**

Procedure 10. Deploy the UCS Domain Profile

Step 1. Verify that all the settings including the fabric interconnect settings, by expanding the settings and making sure that the configuration is correct.



Create UCS Domain Profile

Summary

Review the UCS domain profile details, resolve configuration errors and deploy the profile.

General

Ports Configuration | VLAN & VSAN Configuration | UCS Domain Configuration | Errors / Warnings

Fabric Interconnect A

Fabric Interconnect B

Step 2. Click **Deploy**.

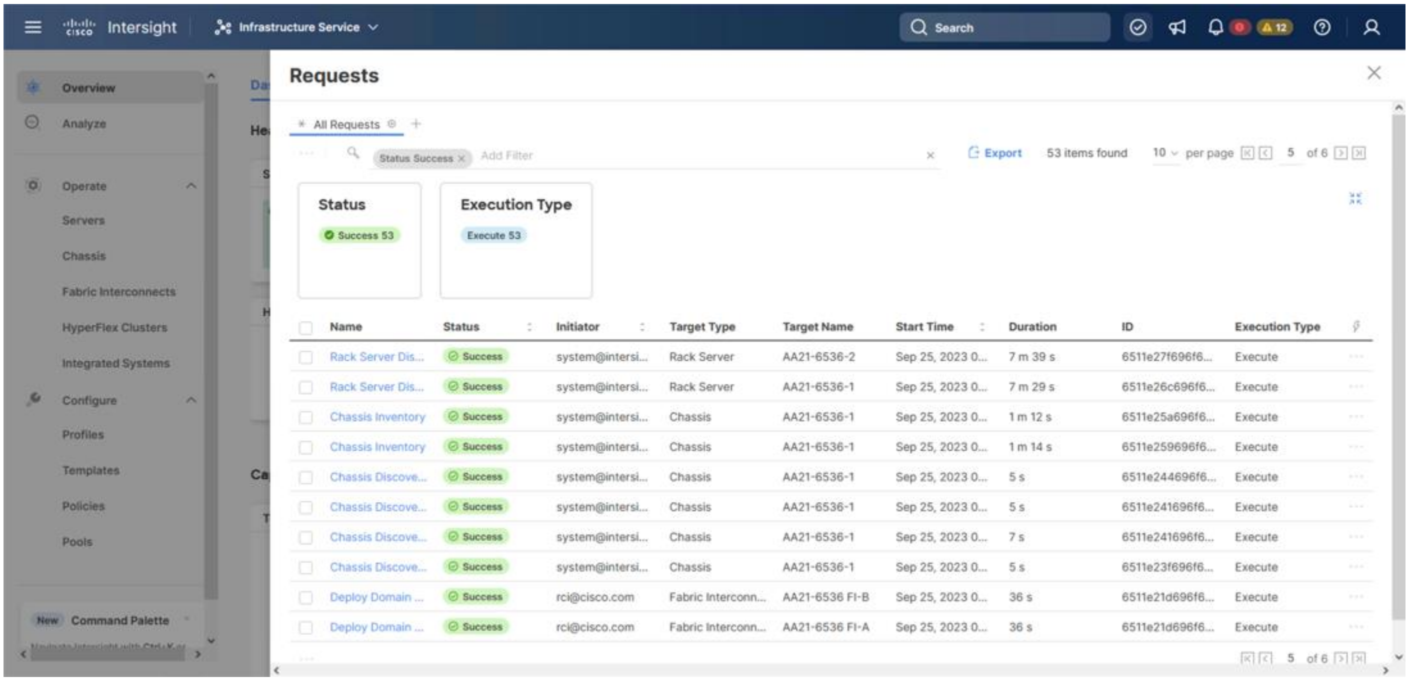
Step 3. Acknowledge any warnings and click **Deploy** again.

Note: The system will take some time to validate and configure the settings on the fabric interconnects. Log into the console servers to see when the Cisco UCS fabric interconnects have finished configuration and are successfully rebooted.

Procedure 11. Verify Cisco UCS Domain Profile Deployment

When the Cisco UCS domain profile has been successfully deployed, the Cisco UCS chassis and the blades should be successfully discovered.

Note: It takes a while to discover the blades for the first time. Watch the number of outstanding requests in Cisco Intersight:



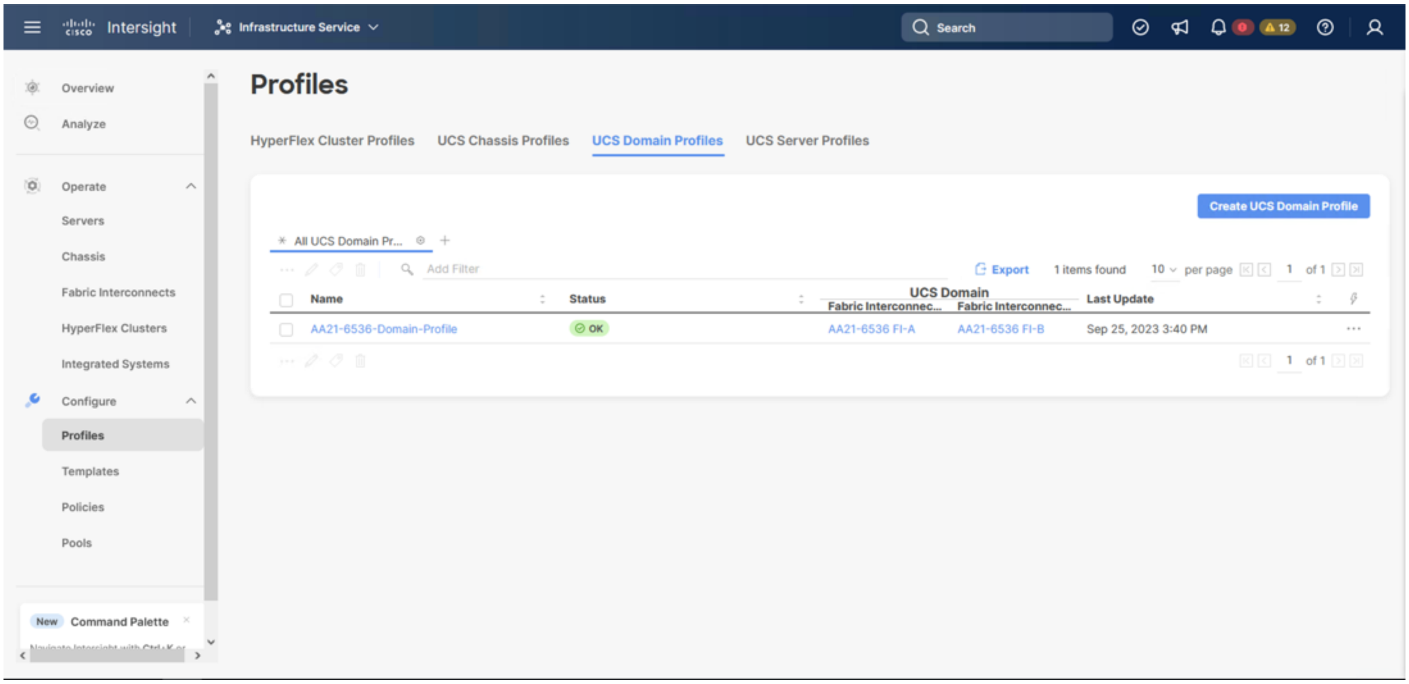
Requests

53 items found 10 per page 5 of 6

Name	Status	Initiator	Target Type	Target Name	Start Time	Duration	ID	Execution Type
Rack Server Dis...	Success	system@intersi...	Rack Server	AA21-6536-2	Sep 25, 2023 0...	7 m 39 s	6511e27f696f6...	Execute
Rack Server Dis...	Success	system@intersi...	Rack Server	AA21-6536-1	Sep 25, 2023 0...	7 m 29 s	6511e26c696f6...	Execute
Chassis Inventory	Success	system@intersi...	Chassis	AA21-6536-1	Sep 25, 2023 0...	1 m 12 s	6511e25a696f6...	Execute
Chassis Inventory	Success	system@intersi...	Chassis	AA21-6536-1	Sep 25, 2023 0...	1 m 14 s	6511e259696f6...	Execute
Chassis Discove...	Success	system@intersi...	Chassis	AA21-6536-1	Sep 25, 2023 0...	5 s	6511e244696f6...	Execute
Chassis Discove...	Success	system@intersi...	Chassis	AA21-6536-1	Sep 25, 2023 0...	5 s	6511e241696f6...	Execute
Chassis Discove...	Success	system@intersi...	Chassis	AA21-6536-1	Sep 25, 2023 0...	7 s	6511e241696f6...	Execute
Chassis Discove...	Success	system@intersi...	Chassis	AA21-6536-1	Sep 25, 2023 0...	5 s	6511e23f696f6...	Execute
Deploy Domain ...	Success	rci@cisco.com	Fabric Interconn...	AA21-6536 FI-B	Sep 25, 2023 0...	36 s	6511e21d696f6...	Execute
Deploy Domain ...	Success	rci@cisco.com	Fabric Interconn...	AA21-6536 FI-A	Sep 25, 2023 0...	36 s	6511e21d696f6...	Execute

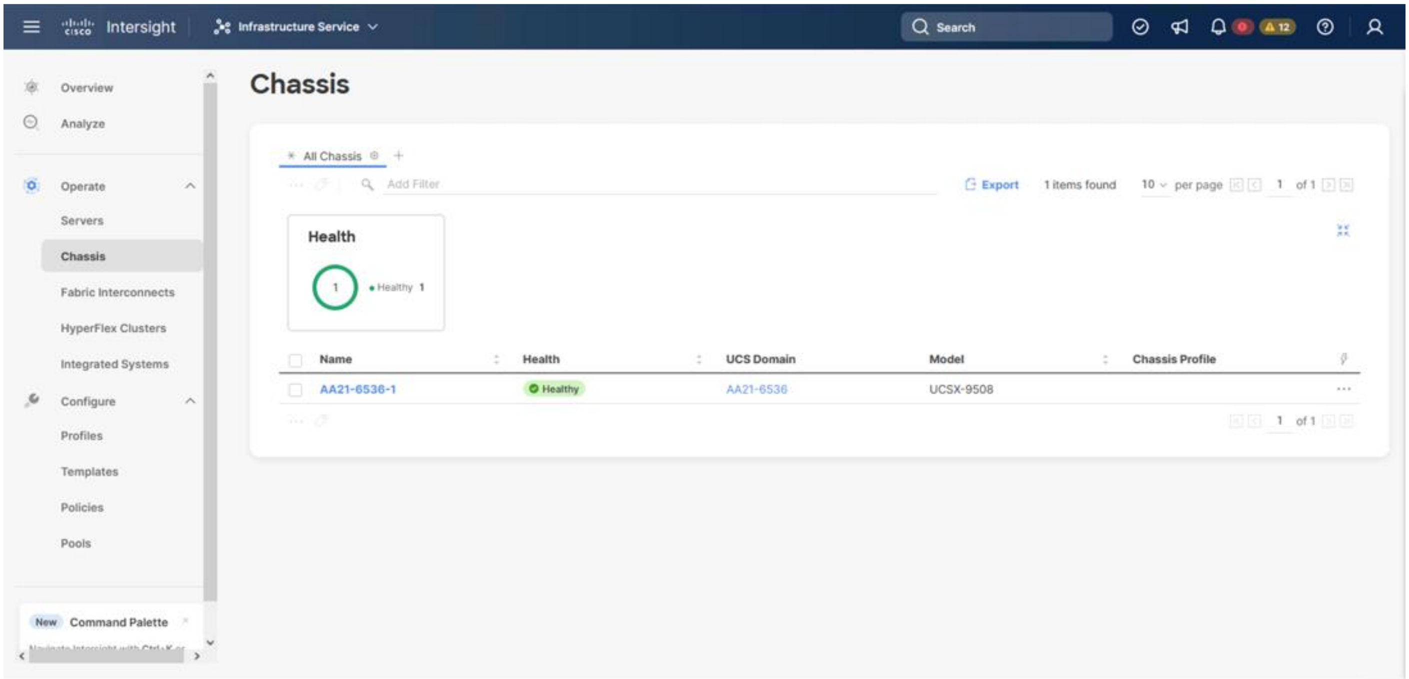
5 of 6

Step 1. Log in to **Cisco Intersight**. Go to **Infrastructure Service** > **Configure** > **Profiles** > **UCS Domain Profiles**, verify that the domain profile has been successfully deployed.



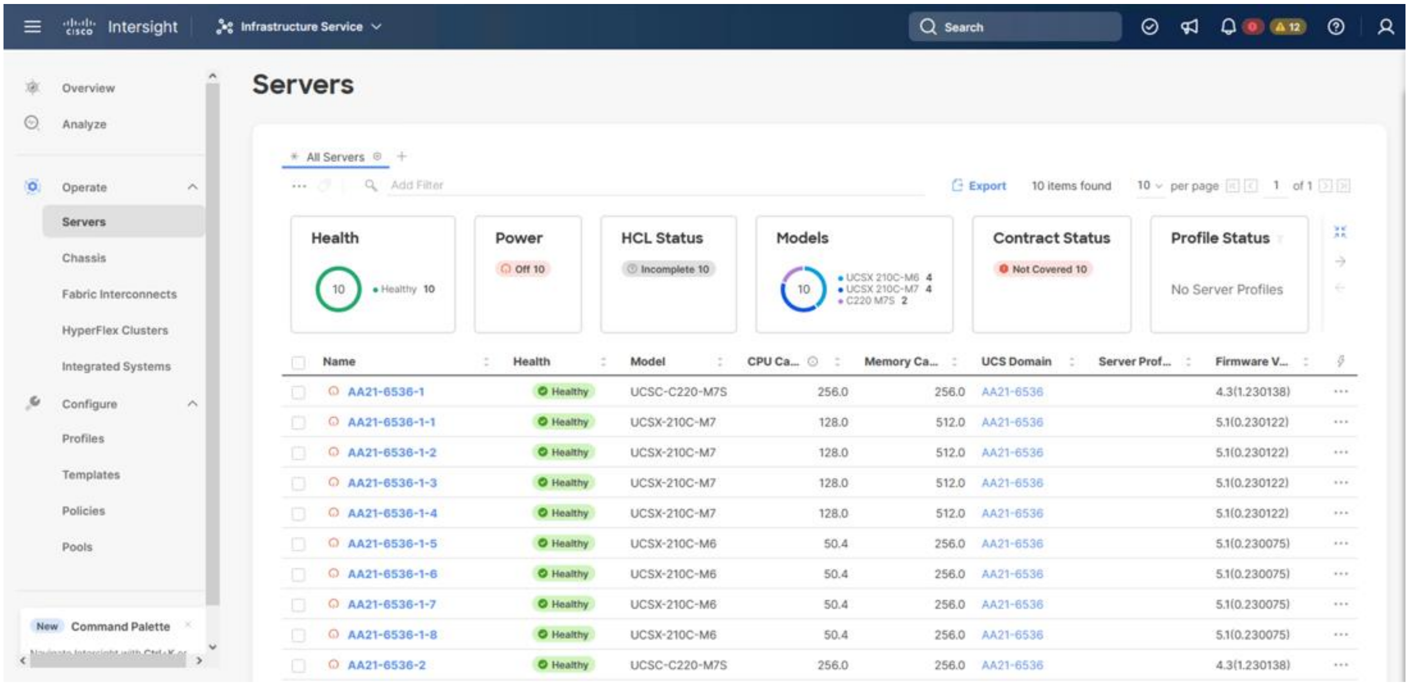
Name	Status	UCS Domain Fabric Interconnec...	UCS Domain Fabric Interconnec...	Last Update
AA21-6536-Domain-Profile	OK	AA21-6536 FI-A	AA21-6536 FI-B	Sep 25, 2023 3:40 PM

Step 2. Verify that the chassis (either UCSX-9508 or UCS 5108 chassis) has been discovered and is visible under **Infrastructure Service > Operate** > **Chassis**.



Name	Health	UCS Domain	Model	Chassis Profile
AA21-6536-1	Healthy	AA21-6536	UCSX-9508	

Step 3. Verify that the servers have been successfully discovered and are visible under **Infrastructure Service > Operate** > **Servers**.



Servers

All Servers

Add Filter

Export 10 items found 10 per page 1 of 1

Health: 10 ● Healthy 10

Power: Off 10

HCL Status: Incomplete 10

Models: 10 ● UCSX 210C-M6 4 ● UCSX 210C-M7 4 ● C220 M7S 2

Contract Status: Not Covered 10

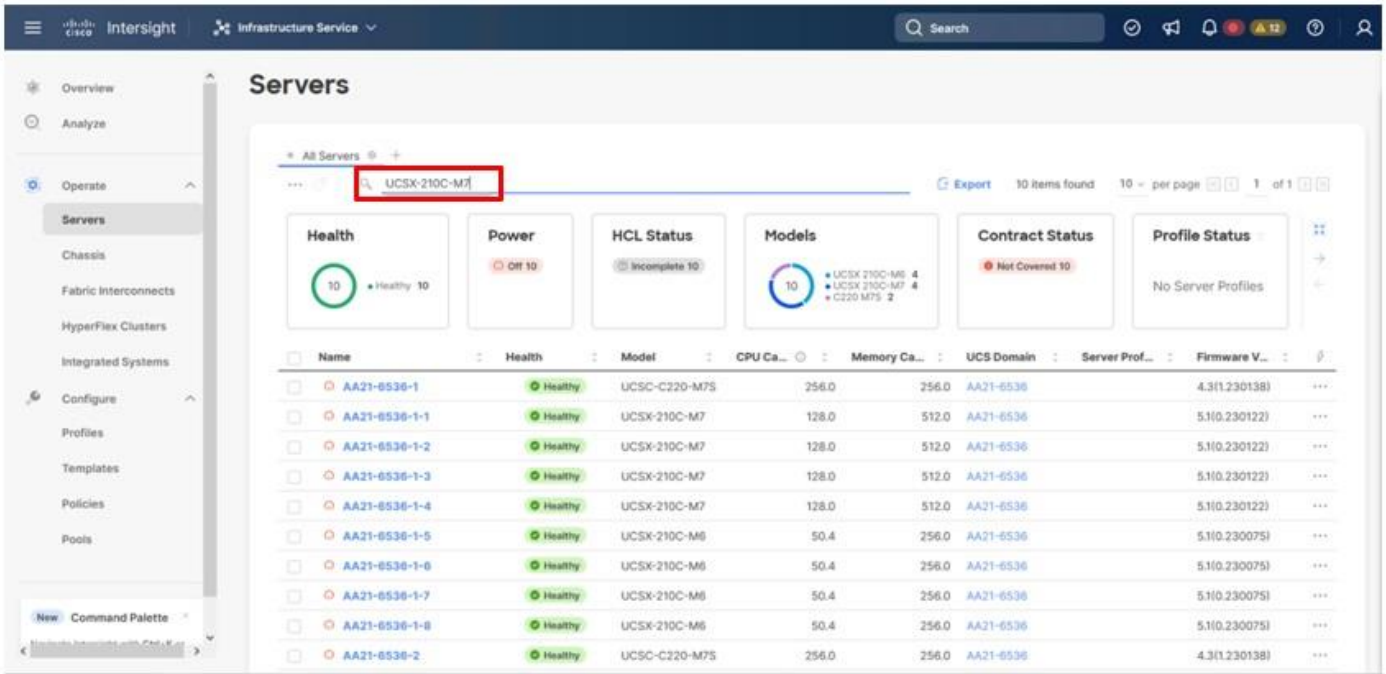
Profile Status: No Server Profiles

Name	Health	Model	CPU Ca...	Memory Ca...	UCS Domain	Server Prof...	Firmware V...
AA21-6536-1	Healthy	UCSC-C220-M7S	256.0	256.0	AA21-6536		4.3(1.230138)
AA21-6536-1-1	Healthy	UCSX-210C-M7	128.0	512.0	AA21-6536		5.1(0.230122)
AA21-6536-1-2	Healthy	UCSX-210C-M7	128.0	512.0	AA21-6536		5.1(0.230122)
AA21-6536-1-3	Healthy	UCSX-210C-M7	128.0	512.0	AA21-6536		5.1(0.230122)
AA21-6536-1-4	Healthy	UCSX-210C-M7	128.0	512.0	AA21-6536		5.1(0.230122)
AA21-6536-1-5	Healthy	UCSX-210C-M6	50.4	256.0	AA21-6536		5.1(0.230075)
AA21-6536-1-6	Healthy	UCSX-210C-M6	50.4	256.0	AA21-6536		5.1(0.230075)
AA21-6536-1-7	Healthy	UCSX-210C-M6	50.4	256.0	AA21-6536		5.1(0.230075)
AA21-6536-1-8	Healthy	UCSX-210C-M6	50.4	256.0	AA21-6536		5.1(0.230075)
AA21-6536-2	Healthy	UCSC-C220-M7S	256.0	256.0	AA21-6536		4.3(1.230138)

Procedure 12. Update Server Firmware

Step 1. With the servers recognized, the servers can be upgraded from the most recent Servers view in **Infrastructure Service > Operate** > **Servers.**

Step 2. Optionally, specify the desired model to work with from the list (example UCSX-210C-M7) and enter it within the filter box near the top.



UCSX-210C-M7

Servers

All Servers

Export 10 items found 10 per page 1 of 1

Health: 10 ● Healthy 10

Power: Off 10

HCL Status: Incomplete 10

Models: 10 ● UCSX 210C-M6 4 ● UCSX 210C-M7 4 ● C220 M7S 2

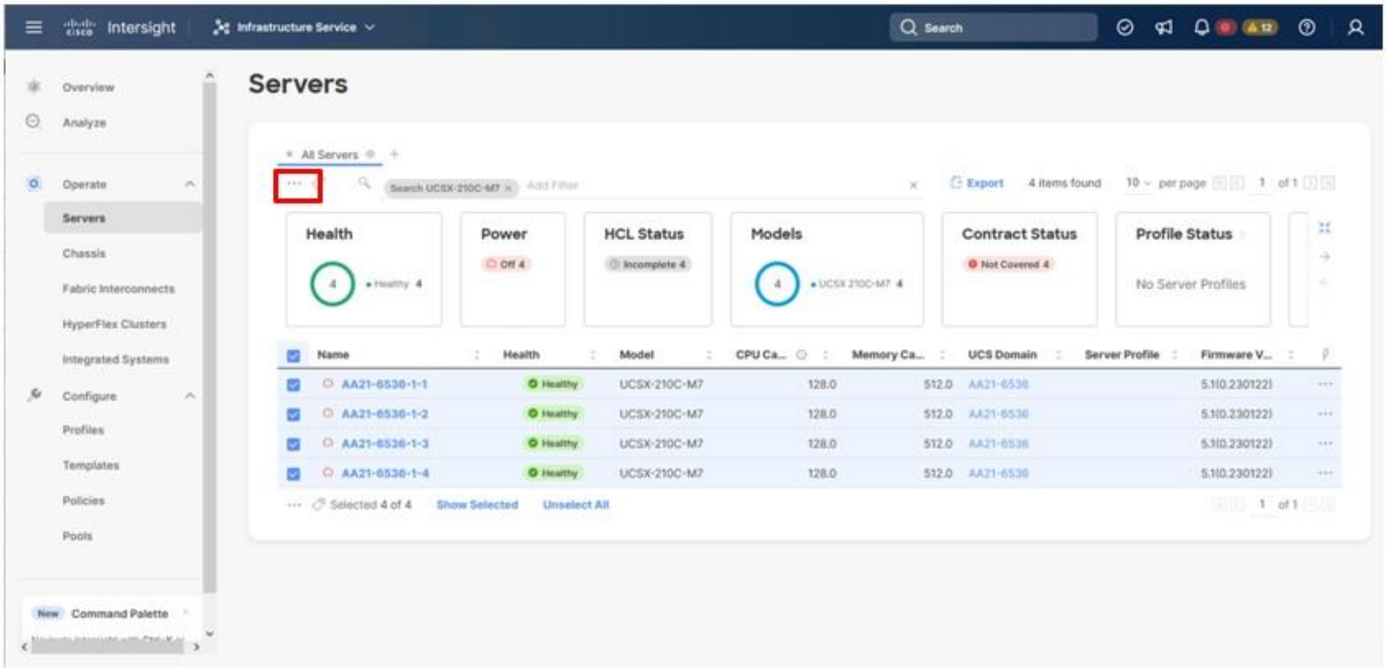
Contract Status: Not Covered 10

Profile Status: No Server Profiles

Name	Health	Model	CPU Ca...	Memory Ca...	UCS Domain	Server Prof...	Firmware V...
AA21-6536-1	Healthy	UCSC-C220-M7S	256.0	256.0	AA21-6536		4.3(1.230138)
AA21-6536-1-1	Healthy	UCSX-210C-M7	128.0	512.0	AA21-6536		5.1(0.230122)
AA21-6536-1-2	Healthy	UCSX-210C-M7	128.0	512.0	AA21-6536		5.1(0.230122)
AA21-6536-1-3	Healthy	UCSX-210C-M7	128.0	512.0	AA21-6536		5.1(0.230122)
AA21-6536-1-4	Healthy	UCSX-210C-M7	128.0	512.0	AA21-6536		5.1(0.230122)
AA21-6536-1-5	Healthy	UCSX-210C-M6	50.4	256.0	AA21-6536		5.1(0.230075)
AA21-6536-1-6	Healthy	UCSX-210C-M6	50.4	256.0	AA21-6536		5.1(0.230075)
AA21-6536-1-7	Healthy	UCSX-210C-M6	50.4	256.0	AA21-6536		5.1(0.230075)
AA21-6536-1-8	Healthy	UCSX-210C-M6	50.4	256.0	AA21-6536		5.1(0.230075)
AA21-6536-2	Healthy	UCSC-C220-M7S	256.0	256.0	AA21-6536		4.3(1.230138)

Step 3. Select all servers from the resulting list by clicking the left side box of the column header, or manually select a specific set from the results.

Step 4. Click the ellipsis (**...**) near the top left for the drop-down list.

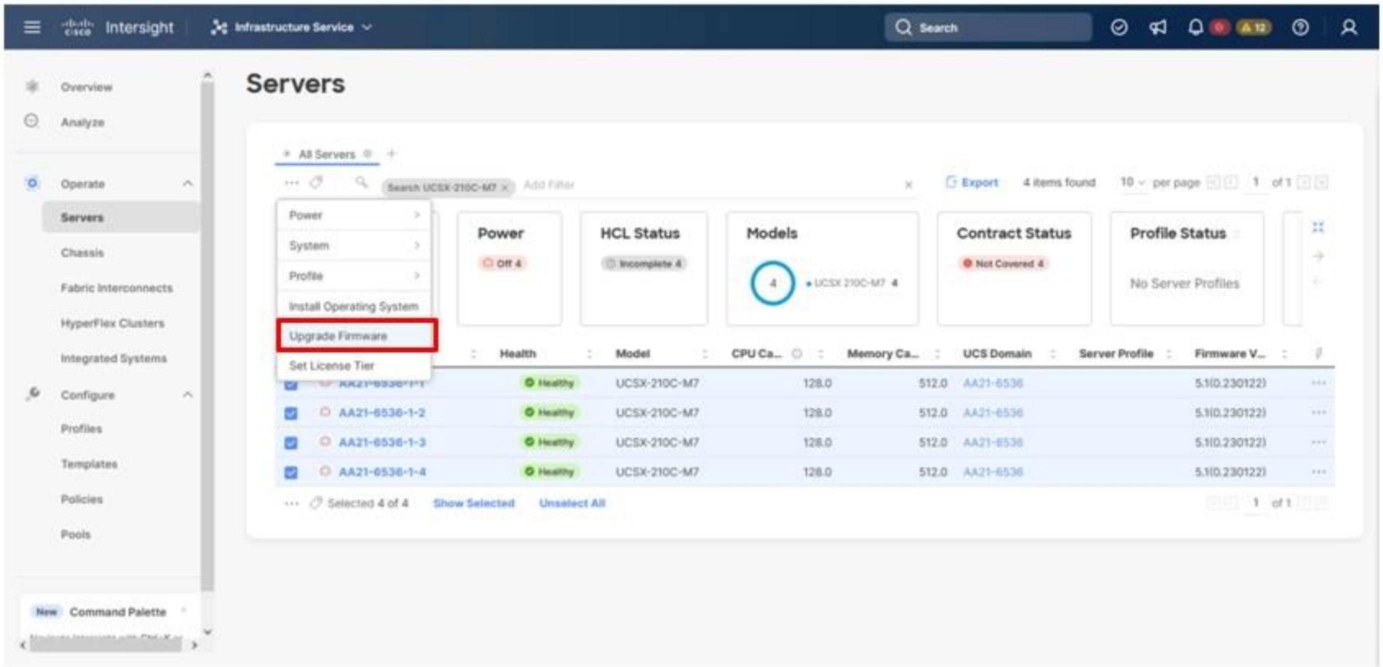


Servers

☑	Name	Health	Model	CPU Ca...	Memory Ca...	UCS Domain	Server Profile	Firmware V...
☑	AA21-6536-1-1	Healthy	UCSX-210C-M7	128.0	512.0	AA21-6536		5.1(0.230122)
☑	AA21-6536-1-2	Healthy	UCSX-210C-M7	128.0	512.0	AA21-6536		5.1(0.230122)
☑	AA21-6536-1-3	Healthy	UCSX-210C-M7	128.0	512.0	AA21-6536		5.1(0.230122)
☑	AA21-6536-1-4	Healthy	UCSX-210C-M7	128.0	512.0	AA21-6536		5.1(0.230122)

Selected 4 of 4 Show Selected Unselect All

Step 5. Select the **Upgrade Firmware** option.

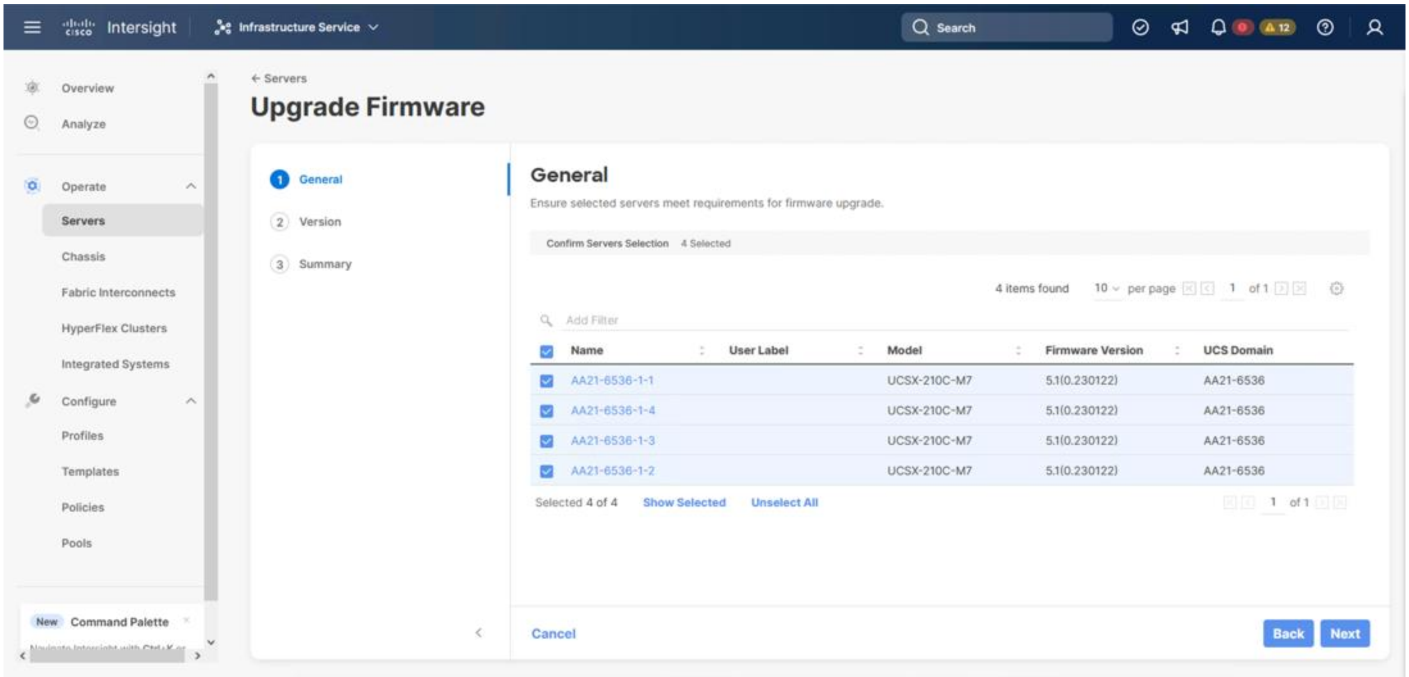


Servers

☑	Name	Health	Model	CPU Ca...	Memory Ca...	UCS Domain	Server Profile	Firmware V...
☑	AA21-6536-1-1	Healthy	UCSX-210C-M7	128.0	512.0	AA21-6536		5.1(0.230122)
☑	AA21-6536-1-2	Healthy	UCSX-210C-M7	128.0	512.0	AA21-6536		5.1(0.230122)
☑	AA21-6536-1-3	Healthy	UCSX-210C-M7	128.0	512.0	AA21-6536		5.1(0.230122)
☑	AA21-6536-1-4	Healthy	UCSX-210C-M7	128.0	512.0	AA21-6536		5.1(0.230122)

Selected 4 of 4 Show Selected Unselect All

Step 6. Click **Start** on the resulting page and click **Next** after confirming that the servers to be upgraded have been selected.



Upgrade Firmware

General

Ensure selected servers meet requirements for firmware upgrade.

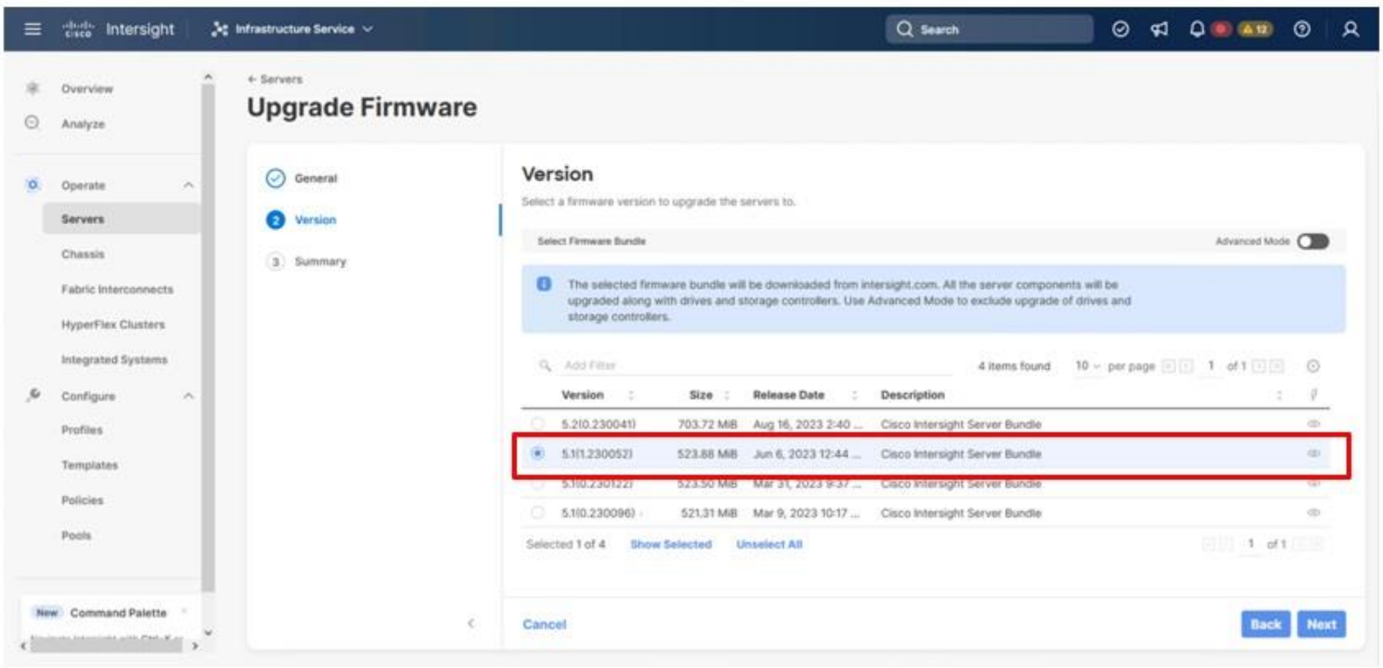
Confirm Servers Selection 4 Selected

4 items found 10 per page 1 of 1

	Name	User Label	Model	Firmware Version	UCS Domain
☑	AA21-6536-1-1		UCSX-210C-M7	5.1(0.230122)	AA21-6536
☑	AA21-6536-1-4		UCSX-210C-M7	5.1(0.230122)	AA21-6536
☑	AA21-6536-1-3		UCSX-210C-M7	5.1(0.230122)	AA21-6536
☑	AA21-6536-1-2		UCSX-210C-M7	5.1(0.230122)	AA21-6536

Selected 4 of 4 Show Selected Unselect All

Step 7. Select the version to upgrade the servers to and click **Next**.



Upgrade Firmware

Version

Select a firmware version to upgrade the servers to.

Select Firmware Bundle Advanced Mode

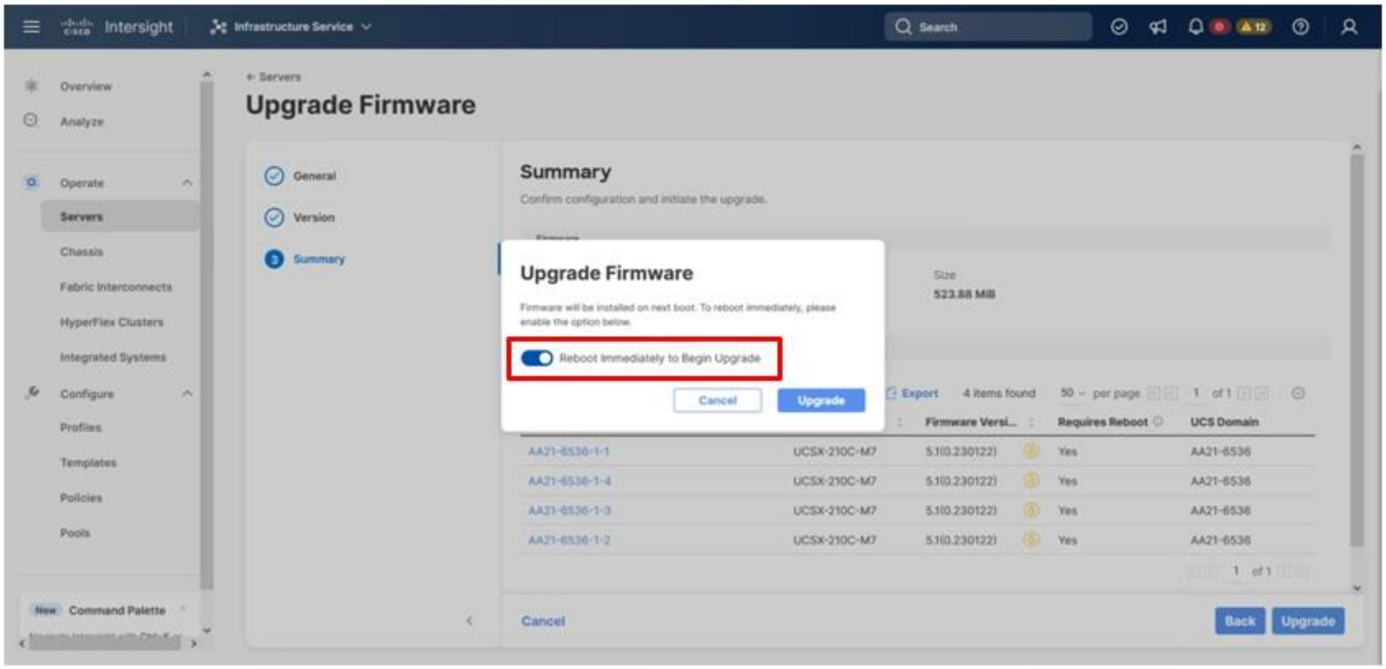
The selected firmware bundle will be downloaded from intersight.com. All the server components will be upgraded along with drives and storage controllers. Use Advanced Mode to exclude upgrade of drives and storage controllers.

4 items found 10 per page 1 of 1

	Version	Size	Release Date	Description
○	5.2(0.230041)	703.72 MiB	Aug 16, 2023 2:40 ...	Cisco Intersight Server Bundle
●	5.1(1.230052)	523.88 MiB	Jun 6, 2023 12:44 ...	Cisco Intersight Server Bundle
○	5.1(0.230122)	523.50 MiB	Mar 31, 2023 9:37 ...	Cisco Intersight Server Bundle
○	5.1(0.230096)	521.31 MiB	Mar 9, 2023 10:17 ...	Cisco Intersight Server Bundle

Selected 1 of 4 Show Selected Unselect All

Step 8. Click **Upgrade**, select the toggle to **Reboot Immediately to Begin Upgrade**, and click **Upgrade** again.



Upgrade Firmware

Summary

Confirm configuration and initiate the upgrade.

Size
523.88 MiB

Upgrade Firmware

Firmware will be installed on next boot. To reboot immediately, please enable the option below.

● Reboot Immediately to Begin Upgrade

Cancel | Upgrade

Export | 4 items found | 50 per page | 1 of 1

		Firmware Versi...		Requires Reboot	UCS Domain
AA21-6536-1-1	UCSX-210C-M7	5.1(0.230122)	⚠	Yes	AA21-6536
AA21-6536-1-4	UCSX-210C-M7	5.1(0.230122)	⚠	Yes	AA21-6536
AA21-6536-1-3	UCSX-210C-M7	5.1(0.230122)	⚠	Yes	AA21-6536
AA21-6536-1-2	UCSX-210C-M7	5.1(0.230122)	⚠	Yes	AA21-6536

1 of 1

Cancel | Back | Upgrade

Firmware upgrade times will vary, but 30-45minutes is a safe estimate to completion.

Configure Cisco UCS Chassis Profile (Optional)

The Cisco UCS Chassis profile in Cisco Intersight allows you to configure various parameters for the chassis, including:

- IMC Access Policy: IP configuration for the in-band chassis connectivity. This setting is independent of Server IP connectivity and only applies to communication to and from the chassis.
- SNMP Policy, and SNMP trap settings.
- Power Policy to enable power management and power supply redundancy mode.
- Thermal Policy to control the speed of FANs (only applicable to Cisco UCS 5108)

A chassis policy can be assigned to any number of chassis profiles to provide a configuration baseline for a chassis. In this deployment, no chassis profile was created or attached to the chassis, but you can configure policies to configure SNMP or Power parameters and attach them to the chassis.

Configure Server Profile Template

In the Cisco Intersight platform, a server profile enables resource management by simplifying policy alignment and server configuration. The server profiles are derived from a server profile template. A server profile template and its associated policies can be created using the server profile template wizard. After creating the server profile template, you can derive multiple consistent server profiles from the template.

The server profile templates captured in this deployment guide support Cisco UCS X210c M7 compute nodes with 5th Generation VICs. Cisco UCS C-Series connections were shown during the creation of the port profile policies used for the FIs to illustrate breakout ports but are otherwise not part of this validation. In deployments, Cisco UCS

C-Series profile templates can be nearly identical to configurations used for Cisco UCS X-Series or B-Series but might differ in aspects such as power policies.

vNIC and vHBA Placement for Server Profile Template

This section explains the vNIC and vHBA layout used in this deployment.

Four vNICs and four vHBAs are configured to support FC boot from SAN. The vNICs are split up into a pair up-linking to the standard vSwitch supporting the management vmkernel, and the remaining two connecting into a vSphere Distributed Switch (VDS) to carry vMotion and application traffic. Two vHBAs (FC-A and FC-B) are used for boot from SAN connectivity and the remaining two vHBAs (FC-NVMe-A and FC-NVMe-B) are used to support FC-NVMe. These devices are manually placed as listed in Table 13.

Table 13. vHBA and vNIC placement

vNIC/vHBA Name	Slot	Switch ID	PCI Order
00-vSwitch0-A	MLOM	A	0
01-vSwitch0-B	MLOM	B	1
02-VDS0-A	MLOM	A	2
03-VDS0-B	MLOM	B	3
FC-A	MLOM	A	4
FC-B	MLOM	B	5
FC-NVMe-A	MLOM	A	6
FC-NVMe-B	MLOM	B	7

Procedure 1. Server Profile Template Creation

Step 1. Log in to **Cisco Intersight**.

Step 2. Go to **Infrastructure Service** > **Configure** > **Templates** and in the main window click **Create UCS Server Profile Template**.

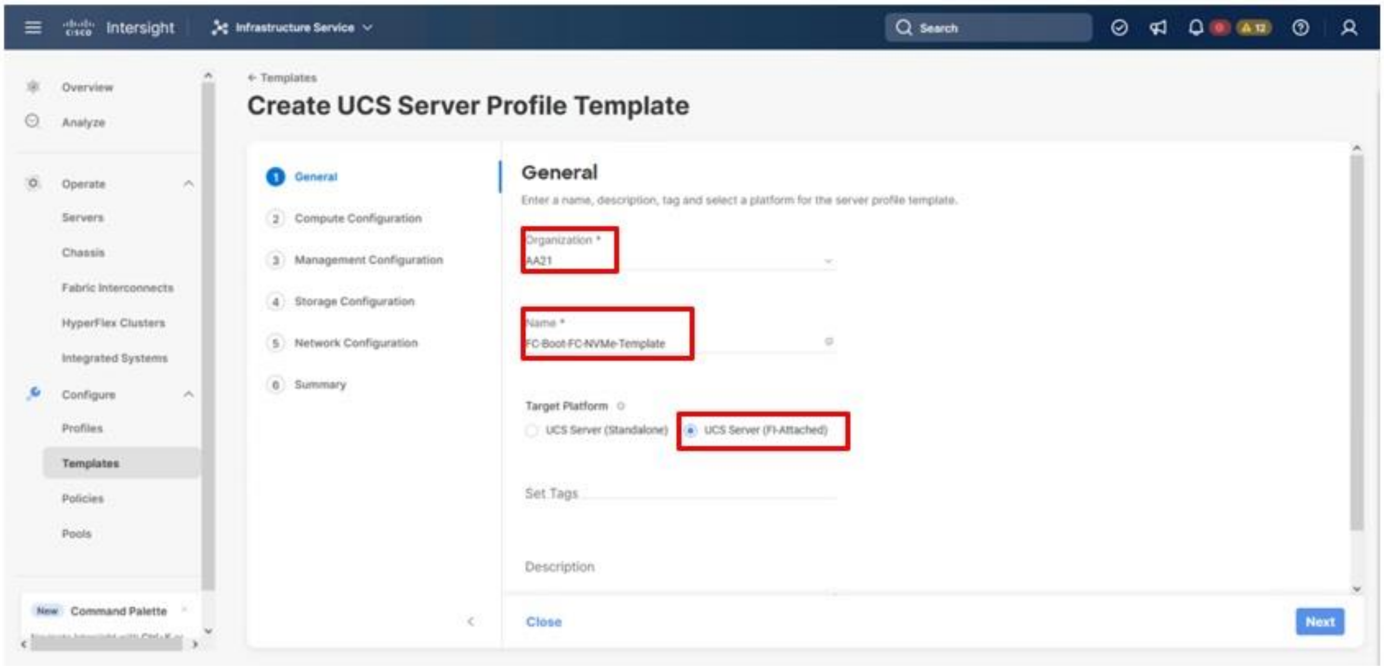
Procedure 2. General Configuration

Step 1. Select the organization from the drop-down list (for example, AA21).

Step 2. Provide a name for the server profile template. (for example, FC-Boot-FC-NVMe-Template)

Step 3. Select **UCS Server (FI-Attached)**.

Step 4. Provide an optional description.



Create UCS Server Profile Template

General

Enter a name, description, tag and select a platform for the server profile template.

Organization * AA21

Name * FC-Boot-FC-NVMe-Template

Target Platform

○ UCS Server (Standalone) ● UCS Server (FI-Attached)

Step 5. Click **Next**.

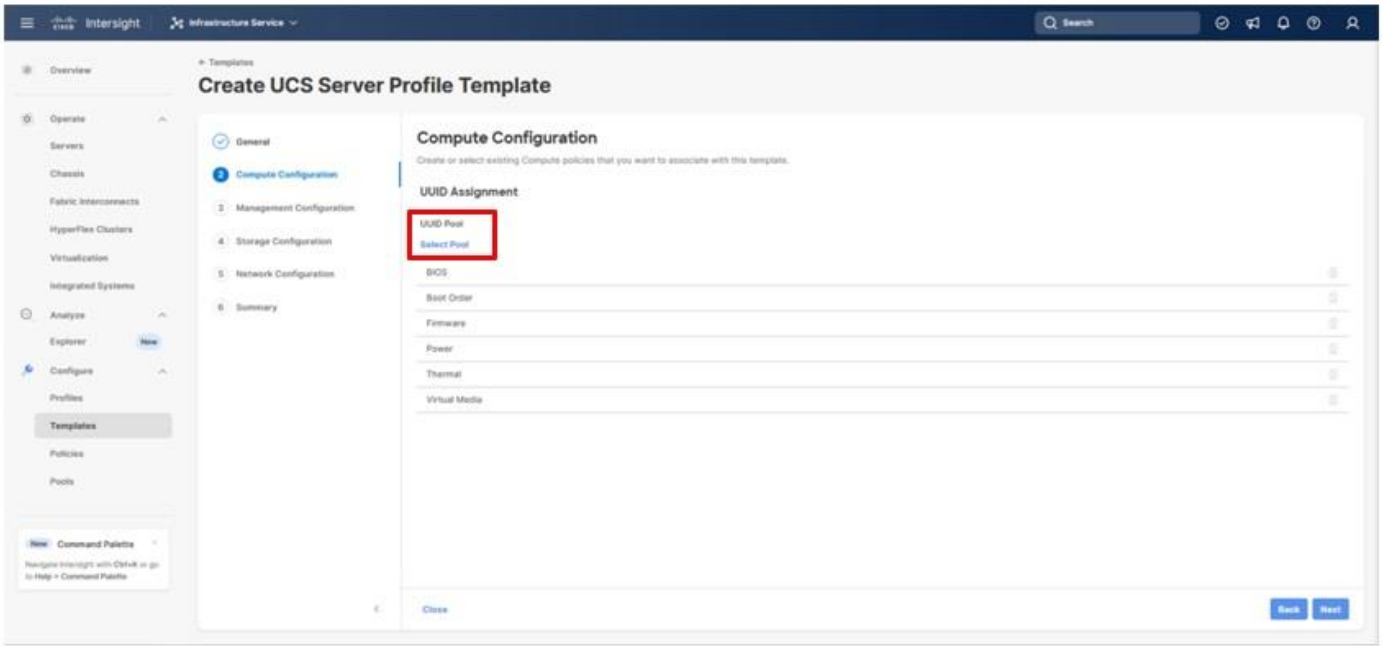
Compute Configuration

The following subcomponents of pools and policies will be addressed in the Compute Configuration:

- A UUID Pool will be created to be used for the identities of Server Profiles derived from the Server Profile Template
- A BIOS Policy to set the available settings for the underlying hardware of the UCS Compute Nodes
- A Boot Order Policy to set the boot order of the Compute Nodes
- A Virtual Media Policy to enable virtual media accessibility to the KVM

Procedure 1. Configure UUID Pool

Step 1. Click **Select Pool** under UUID Pool and then in the pane on the right, click **Create New**.



Create UCS Server Profile Template

Compute Configuration

Create or select existing Compute policies that you want to associate with this template.

UUID Assignment

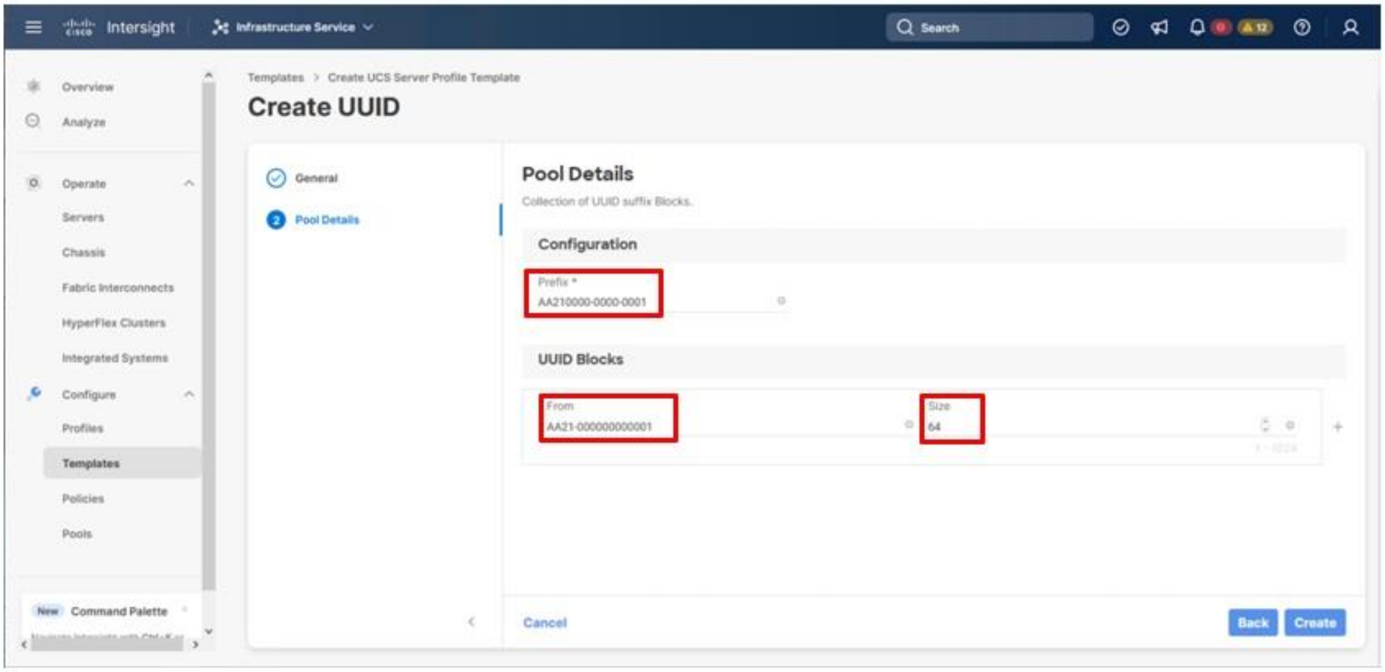
UUID Pool
Select Pool

Step 2. Verify that the correct organization is selected from the drop-down list (for example, AA21) and provide a name for the UUID Pool (for example, AA21-UUID-Pool).

Step 3. Provide an optional Description and click **Next.**

Step 4. Provide a hexadecimal UUID Prefix (for example, a prefix of AA210000-0000-0001 was used).

Step 5. Add a UUID block specifying a From starting value and a Size.



Create UUID

Pool Details

Collection of UUID suffix Blocks.

Configuration

Prefix * AA210000-0000-0001

UUID Blocks

From AA21-000000000001

Size 64

Step 6. Click **Create.**

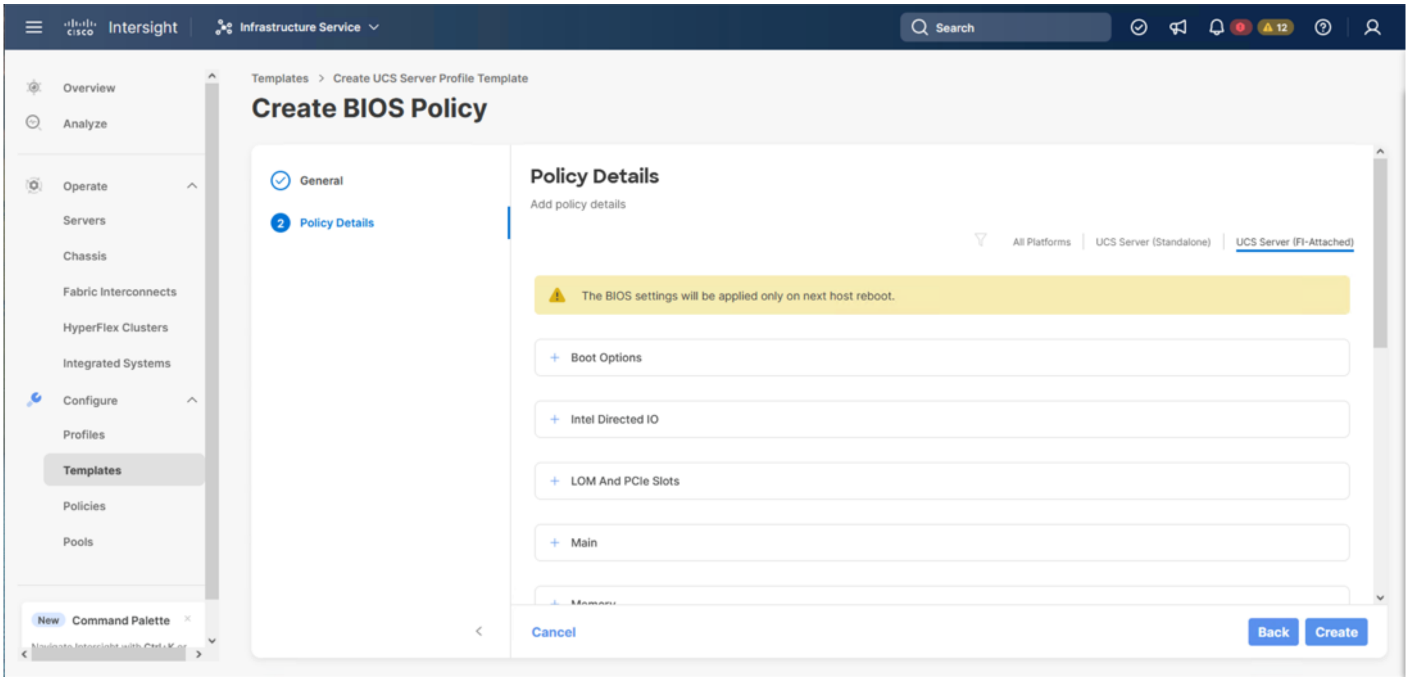
Procedure 2. Configure BIOS Policy

Step 1. Click **Select Policy** next to BIOS and in the pane on the right, click **Create New**.

Step 2. Verify that the correct organization is selected from the drop-down list (for example, AA21) and provide a name for the policy (for example, AA21-Intel-M7-VSI-BIOS).

Step 3. Click **Next**.

Step 4. On the Policy Details screen, select the appropriate values for the BIOS settings. In this deployment, the BIOS values were selected based on recommendations in the performance tuning guide for Cisco UCS M7 BIOS: https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-b-series-blade-servers/ucs-m7-platforms-wp.html. Set the parameters below and leave all other parameters set to **platform-default**.



- Processor > Processor C6 Report: **Enabled**
- Processor > Workload configuration: **Balanced**
- Server Management > Consistent Device Naming: **Enabled**

Step 5. Click **Create**.

Procedure 3. Configure Boot Order Policy

Note: The FC boot order policy applies to all FC hosts including hosts that support FC-NVMe storage access.

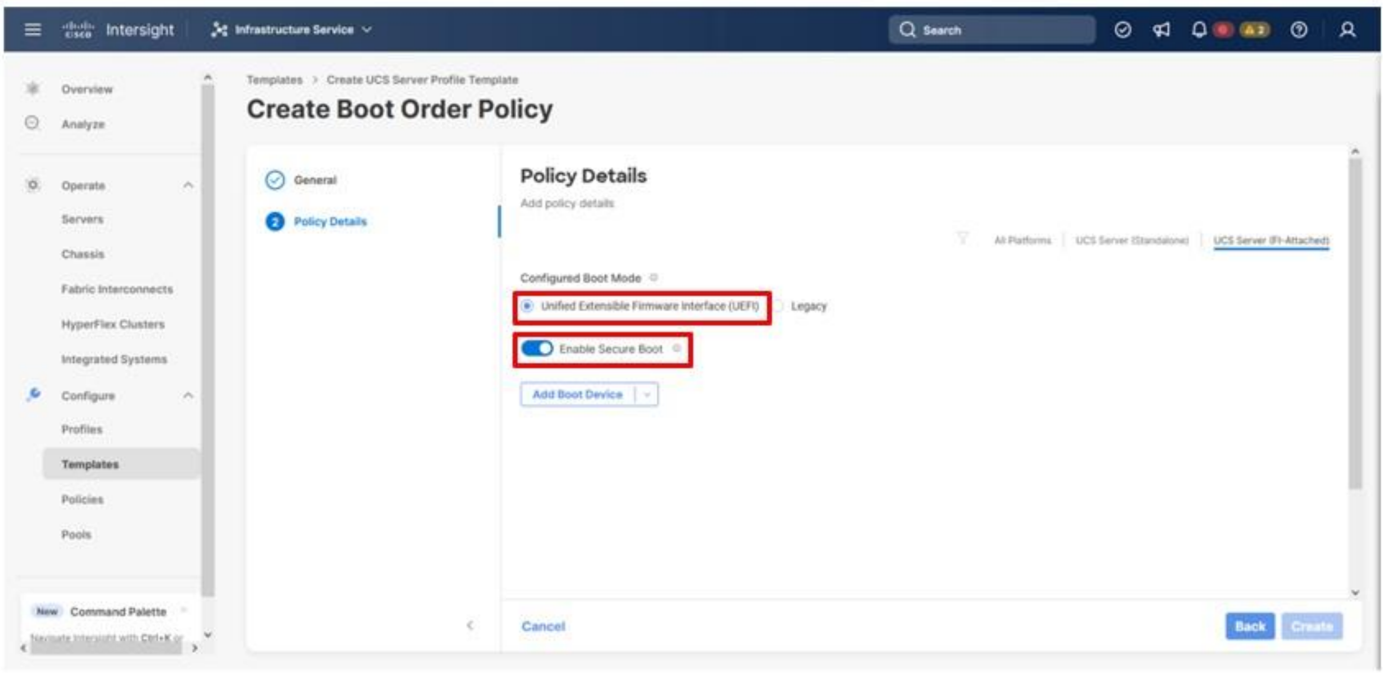
Step 1. Click **Select Policy** next to Boot Order and in the pane on the right, click **Create New**.

Step 2. Verify that the correct organization is selected from the drop-down list (for example, AA21) and provide a name for the policy (for example, AA21-FC-Boot-Order).

Step 3. Click **Next**.

Step 4. For Configured Boot Mode, select Unified Extensible Firmware Interface (UEFI).

Step 5. Turn on Enable Secure Boot.



Templates > Create UCS Server Profile Template

Create Boot Order Policy

Policy Details

Add policy details

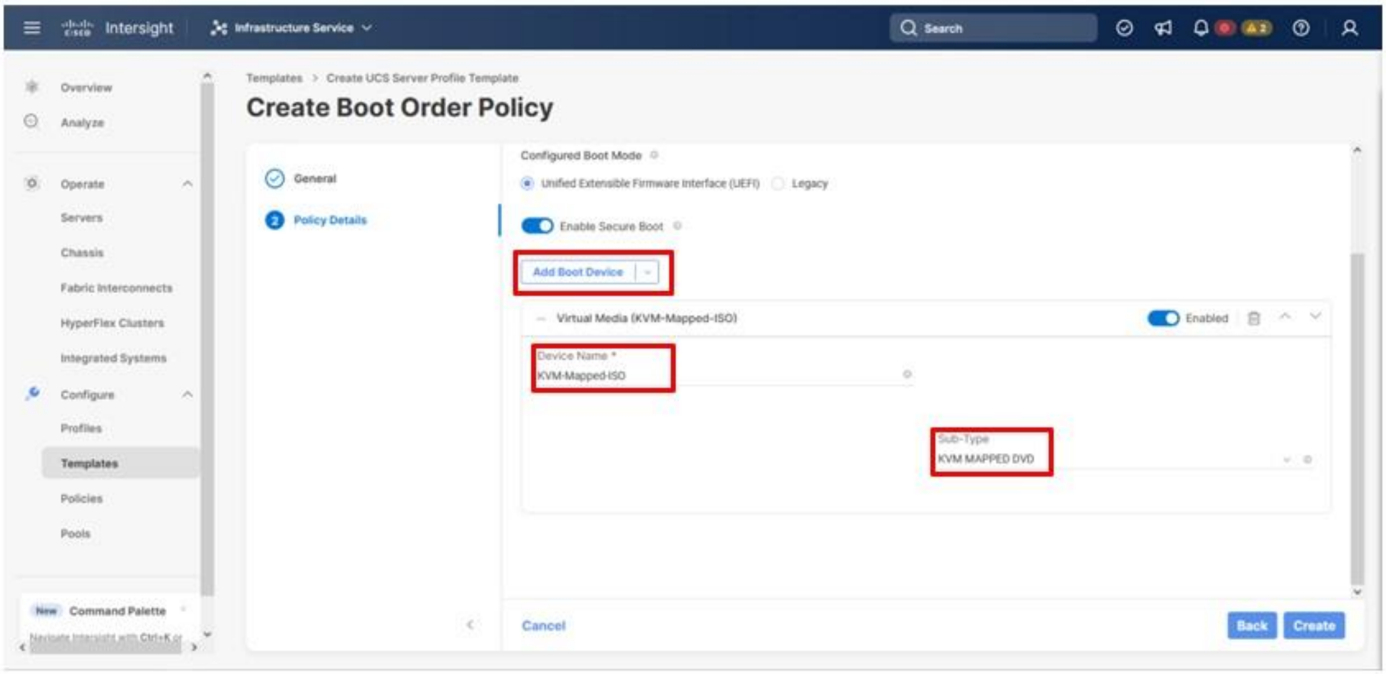
Configured Boot Mode

● Unified Extensible Firmware Interface (UEFI) ○ Legacy

Enable Secure Boot

Step 6. From the **Add Boot Device** drop-down list, select **Virtual Media**.

Step 7. Provide a Device Name (for example, KVM-Mapped-ISO) and for the Sub-Type, select **KVM Mapped DVD**.



Templates > Create UCS Server Profile Template

Create Boot Order Policy

Configured Boot Mode

● Unified Extensible Firmware Interface (UEFI) ○ Legacy

Enable Secure Boot

Virtual Media (KVM-Mapped-ISO) Enabled

Device Name * KVM-Mapped-ISO

Sub-Type KVM MAPPED DVD

Step 8. From the **Add Boot Device** drop-down list, select **SAN Boot**.

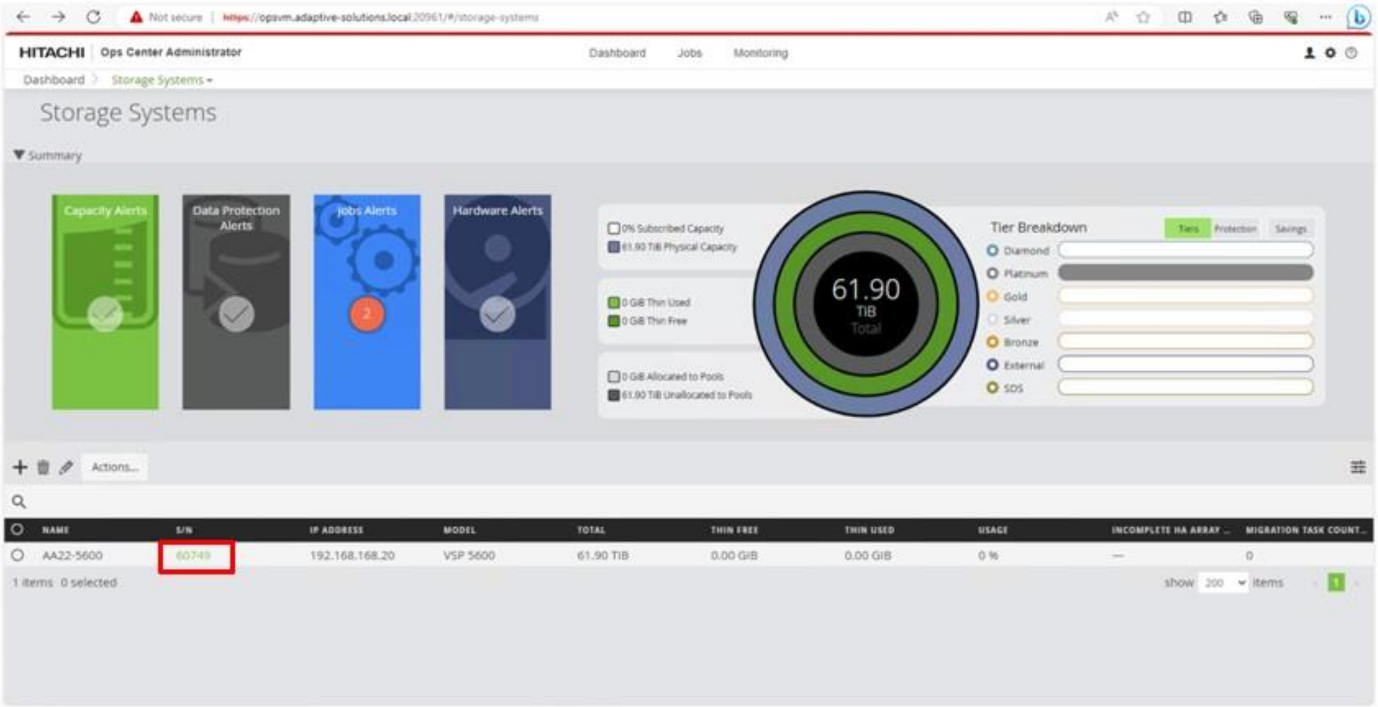
Step 9. Provide the Device Name: vsp-ctl0-1a and the Logical Unit Number (LUN) value (for example, 0).

Step 10. Provide an interface name FC-A. This value is important and should match the vHBA name.

Step 11. Add the appropriate World Wide Port Name (WWPN) as the Target WWPN (referenced within Hitachi Ops Center as World Wide Name (WWN)).

Note: To determine these, you need to reference the Port information from within Ops Center. All four Hitachi VSP WWN will be added as boot options.

Step 12. Open **Ops Center Administrator** Dashboard > **Storage Systems** > [**S/N of VSP listing**]

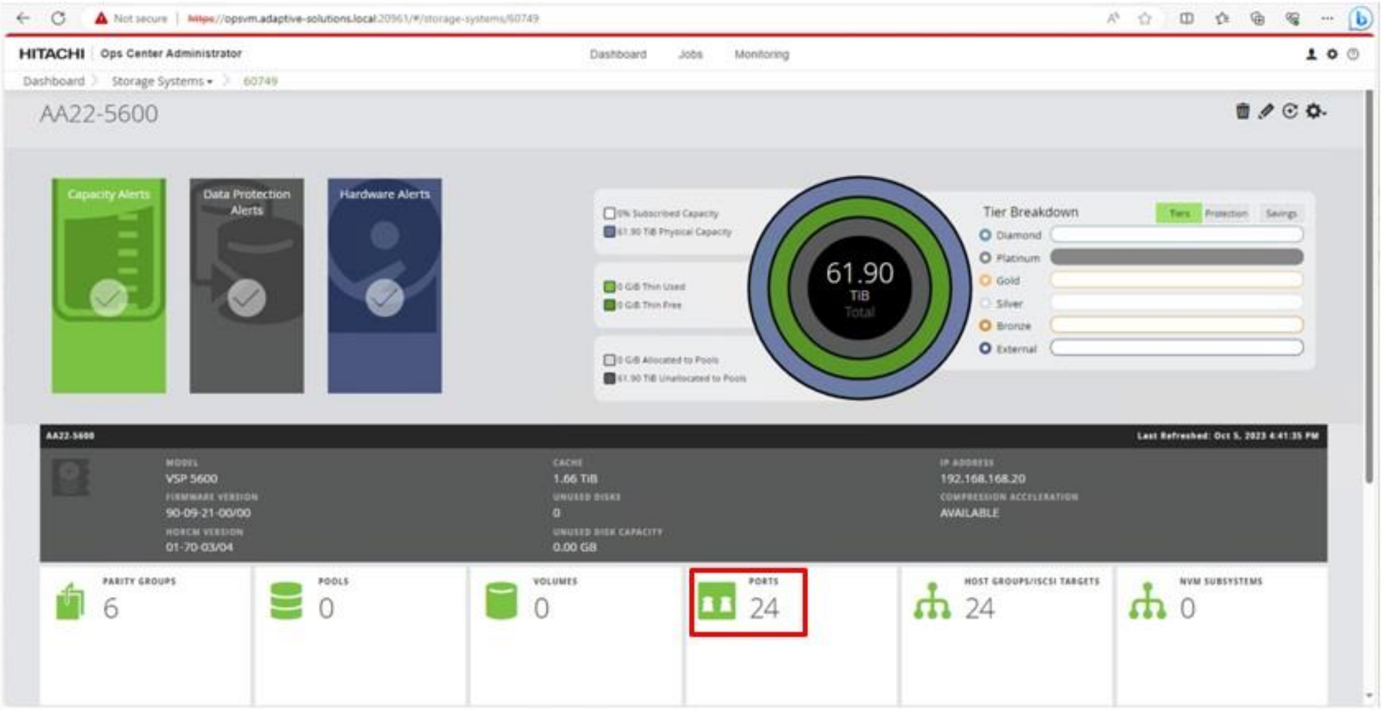


NAME	S/N	IP ADDRESS	MODEL	TOTAL	THIN FREE	THIN USED	USAGE	INCOMPLETE HA ARRAY ...	MIGRATION TASK COUNT...
AA22-5600	60749	192.168.168.20	VSP 5600	61.90 TiB	0.00 GiB	0.00 GiB	0 %	—	0

1 items 0 selected

show 200 items

Step 13. From the resulting view, click **Ports.**



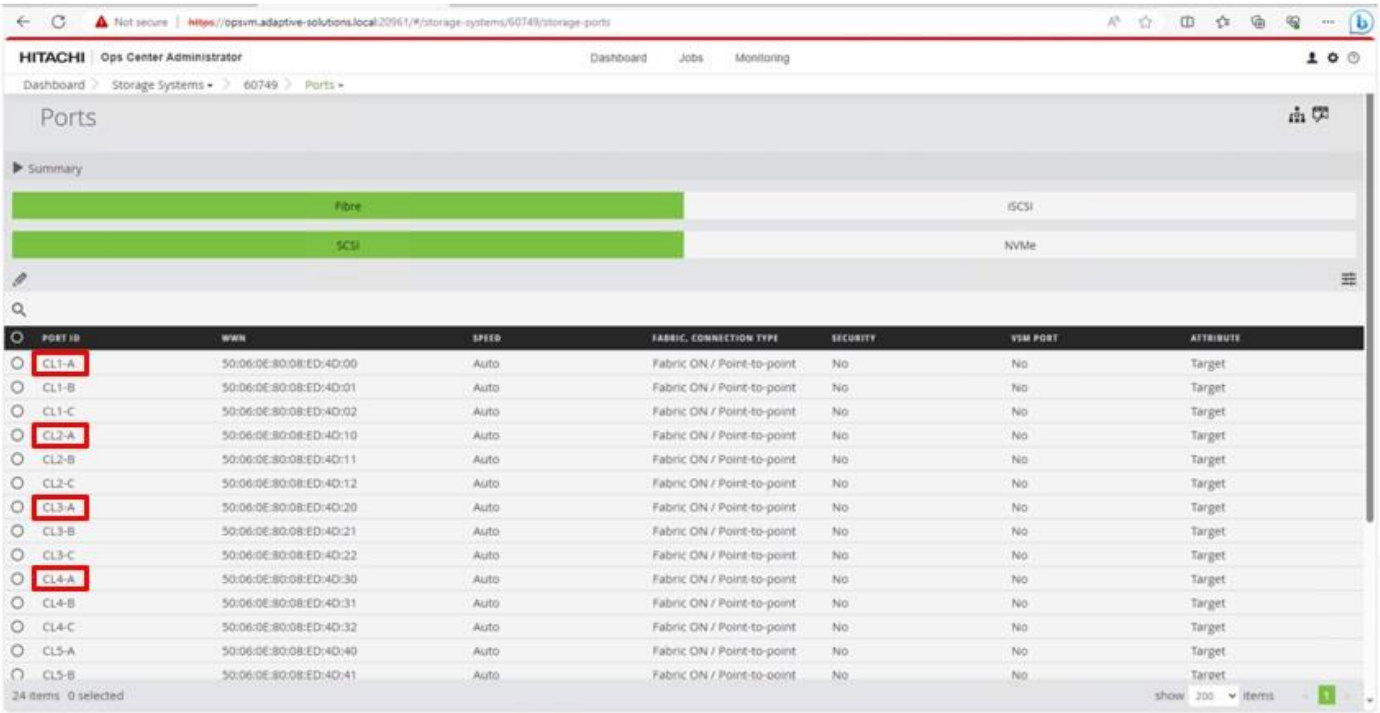
AA22-5600

AA22-5600 Last Refreshed: Oct 5, 2023 4:41:35 PM

MODEL VSP 5600	CACHE 1.66 TiB	IP ADDRESS 192.168.168.20
FIRMWARE VERSION 90-09-21-00/00	UNUSED DISKS 0	COMPRESSION ACCELERATION AVAILABLE
HORCM VERSION 01-70-03/04	UNUSED DISK CAPACITY 0.00 GB	

PARITY GROUPS	POOLS	VOLUMES	PORTS	HOST GROUPS/ISCSI TARGETS	NVM SUBSYSTEMS
6	0	0	24	24	0

Step 14. Find and add the WWN for each port connected to the MDS.


https://opsvm.adaptive-solutions.local:20961/#/storage-systems/60749/storage-ports
HITACHI Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Storage Systems > 60749 > Ports
Summary
Fibre
iSCSI
SCSI
NVMe

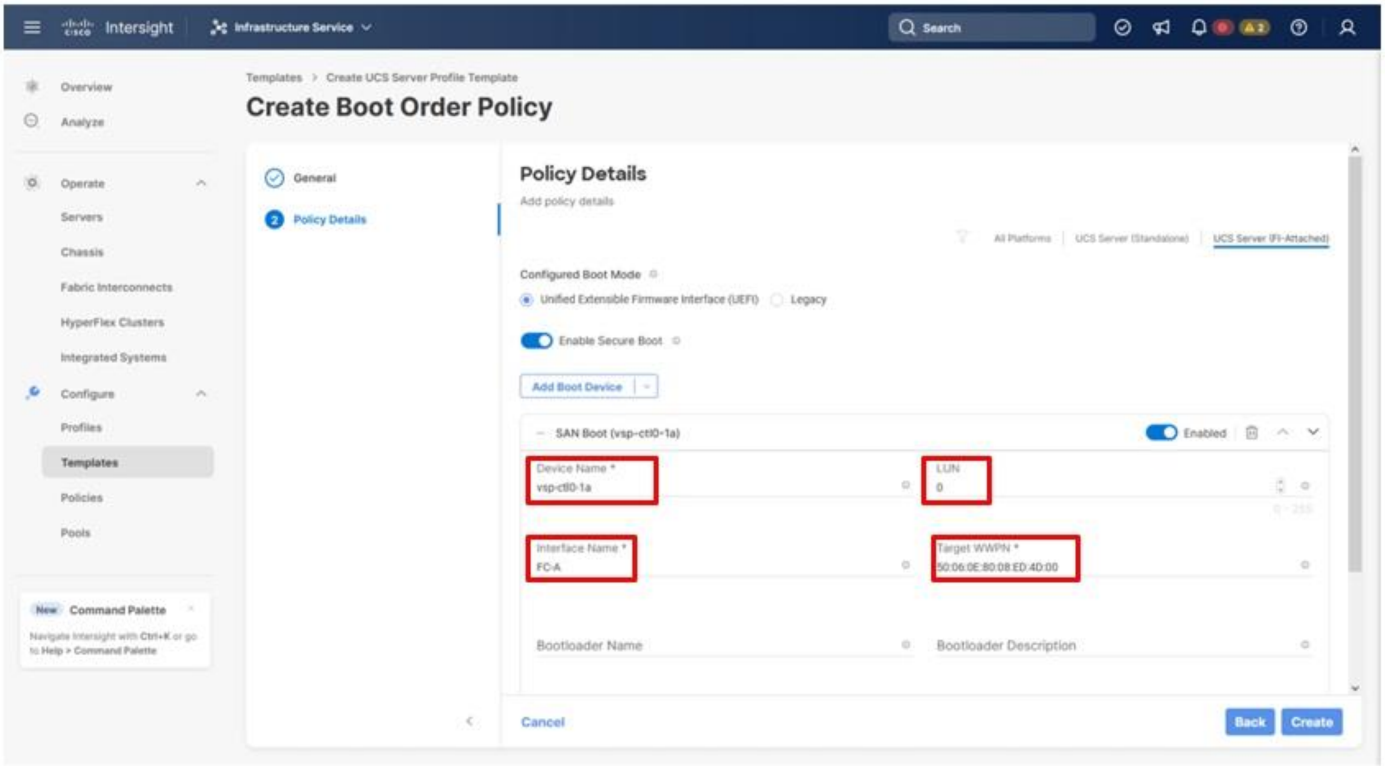
Ports

PORT ID	WWN	SPEED	FABRIC, CONNECTION TYPE	SECURITY	VSM PORT	ATTRIBUTE
CL1-A	50:06:0E:80:08:ED:4D:00	Auto	Fabric ON / Point-to-point	No	No	Target
CL1-B	50:06:0E:80:08:ED:4D:01	Auto	Fabric ON / Point-to-point	No	No	Target
CL1-C	50:06:0E:80:08:ED:4D:02	Auto	Fabric ON / Point-to-point	No	No	Target
CL2-A	50:06:0E:80:08:ED:4D:10	Auto	Fabric ON / Point-to-point	No	No	Target
CL2-B	50:06:0E:80:08:ED:4D:11	Auto	Fabric ON / Point-to-point	No	No	Target
CL2-C	50:06:0E:80:08:ED:4D:12	Auto	Fabric ON / Point-to-point	No	No	Target
CL3-A	50:06:0E:80:08:ED:4D:20	Auto	Fabric ON / Point-to-point	No	No	Target
CL3-B	50:06:0E:80:08:ED:4D:21	Auto	Fabric ON / Point-to-point	No	No	Target
CL3-C	50:06:0E:80:08:ED:4D:22	Auto	Fabric ON / Point-to-point	No	No	Target
CL4-A	50:06:0E:80:08:ED:4D:30	Auto	Fabric ON / Point-to-point	No	No	Target
CL4-B	50:06:0E:80:08:ED:4D:31	Auto	Fabric ON / Point-to-point	No	No	Target
CL4-C	50:06:0E:80:08:ED:4D:32	Auto	Fabric ON / Point-to-point	No	No	Target
CL5-A	50:06:0E:80:08:ED:4D:40	Auto	Fabric ON / Point-to-point	No	No	Target
CL5-B	50:06:0E:80:08:ED:4D:41	Auto	Fabric ON / Point-to-point	No	No	Target

24 items 0 selected show 200 items

- vsp-ctl0-1a: VSP Controller 0, LIF for Fibre Channel SAN A - 50:06:0E:80:08:ED:4D:00
- vsp-ctl0-3a: VSP Controller 0, LIF for Fibre Channel SAN B - 50:06:0E:80:08:ED:4D:20

- vsp-ctl1-2a: VSP Controller 1, LIF for Fibre Channel SAN A - 50:06:0E:80:08:ED:4D:10
- vsp-ctl0-4a: VSP Controller 1, LIF for Fibre Channel SAN B - 50:06:0E:80:08:ED:4D:30



Create Boot Order Policy

Policy Details

Add policy details

Configured Boot Mode

● Unified Extensible Firmware Interface (UEFI) ○ Legacy

Enable Secure Boot

SAN Boot (vsp-ctl0-1a)

Device Name * vsp-ctl0-1a

LUN 0

Interface Name * FC-A

Target WWPN * 50:06:0E:80:08:ED:4D:00

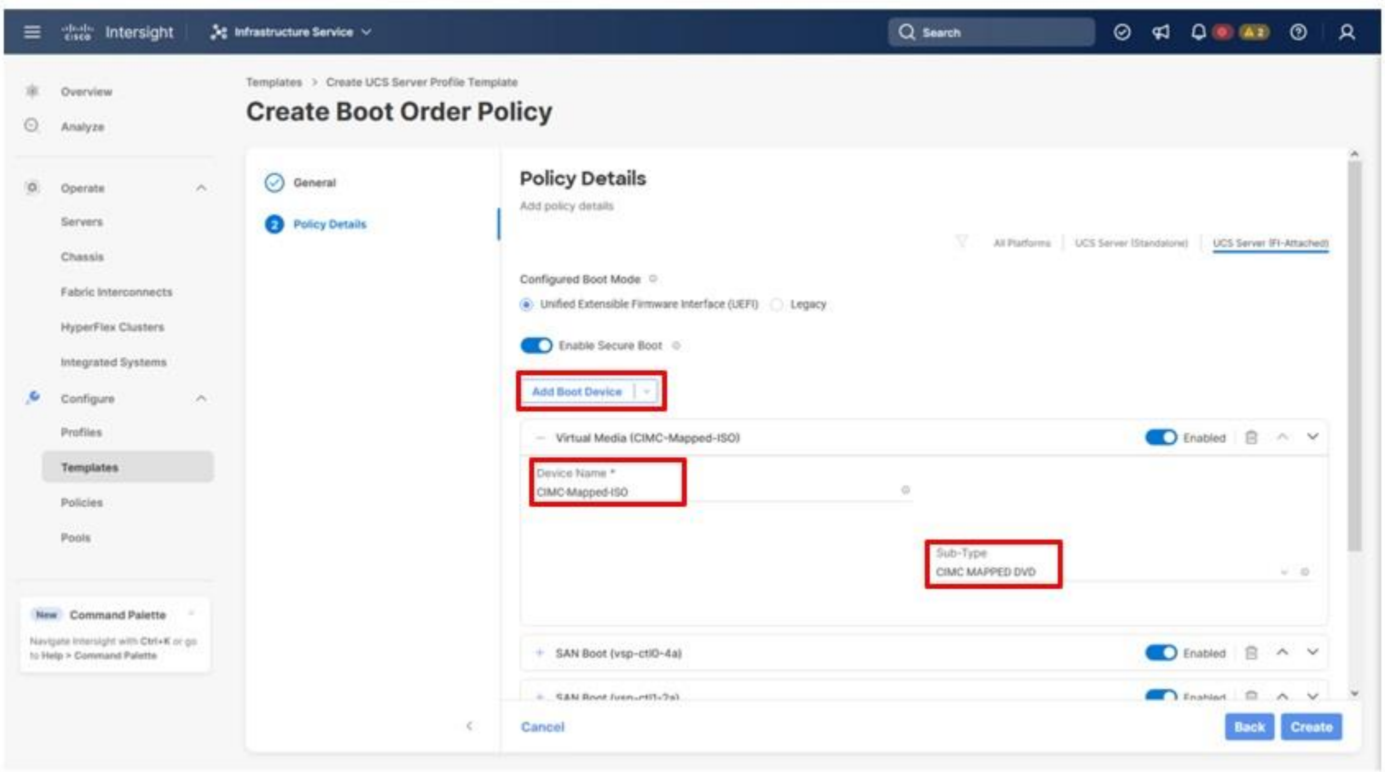
Bootloader Name

Bootloader Description

Step 15. Repeat steps 8-14 for the remaining VSP ports.

Step 16. From the **Add Boot Device** drop-down list, select **Virtual Media**.

Step 17. Add the Device Name example (CIMC-Mapped-ISO) and select the subtype **CIMC MAPPED DVD**.



Templates > Create UCS Server Profile Template

Create Boot Order Policy

Policy Details

Add policy details

Configured Boot Mode

● Unified Extensible Firmware Interface (UEFI) ○ Legacy

Enable Secure Boot

Virtual Media (CIMC-Mapped-ISO) Enabled

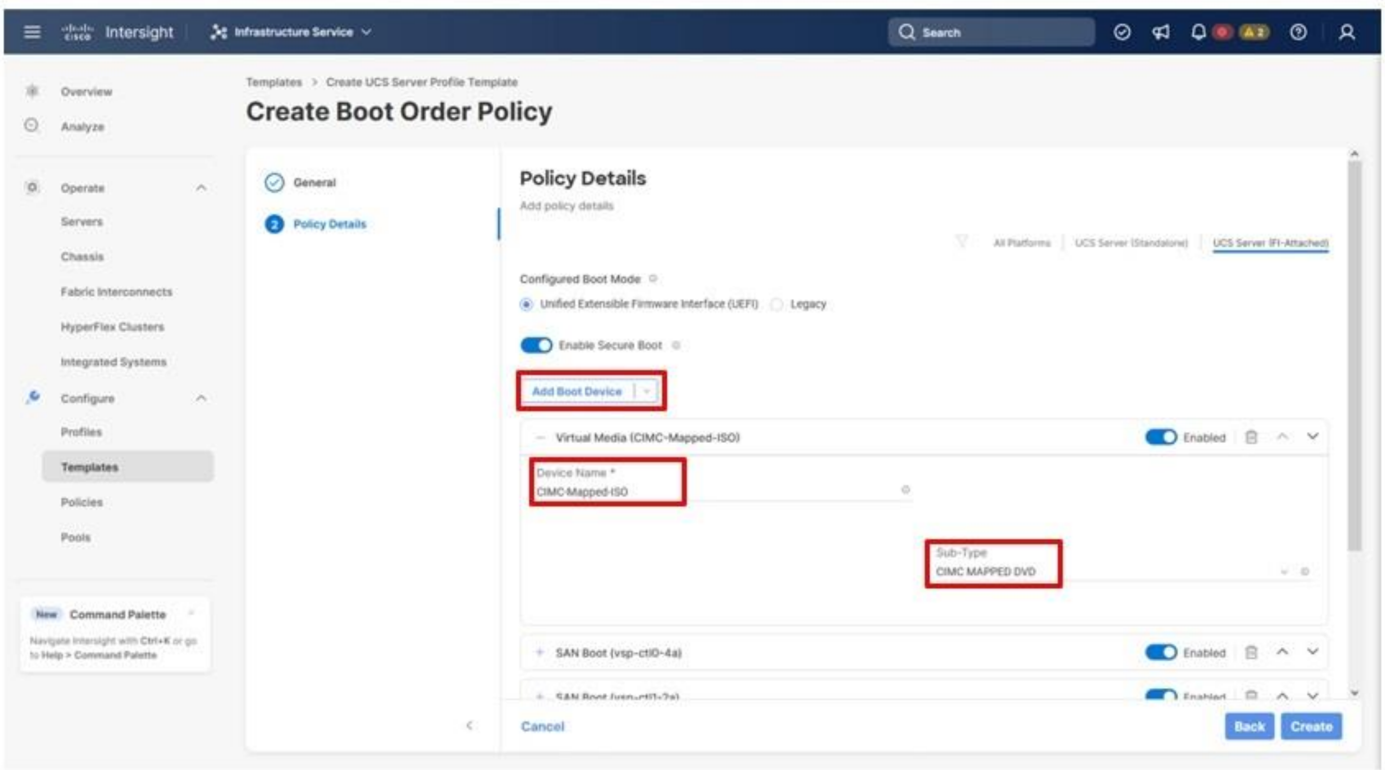
Device Name * CIMC-Mapped-ISO

Sub-Type CIMC MAPPED DVD

SAN Boot (vsp-ctl0-4a) Enabled

SAN Boot (vsp-ctl1-2a) Enabled

Step 18. Verify that the order of the boot policies and adjust the boot order as necessary using arrows next to the trashcan button.



Create Boot Order Policy

Policy Details

Add policy details

Configured Boot Mode

● Unified Extensible Firmware Interface (UEFI) ○ Legacy

Enable Secure Boot

Virtual Media (CIMC-Mapped-ISO) — Enabled

Device Name *
CIMC-Mapped-ISO

Sub-Type
CIMC MAPPED DVD

SAN Boot (vsp-ctl0-4a) — Enabled

SAN Boot (vsp-ctl1-2a) — Enabled

Step 19. Click **Create.**

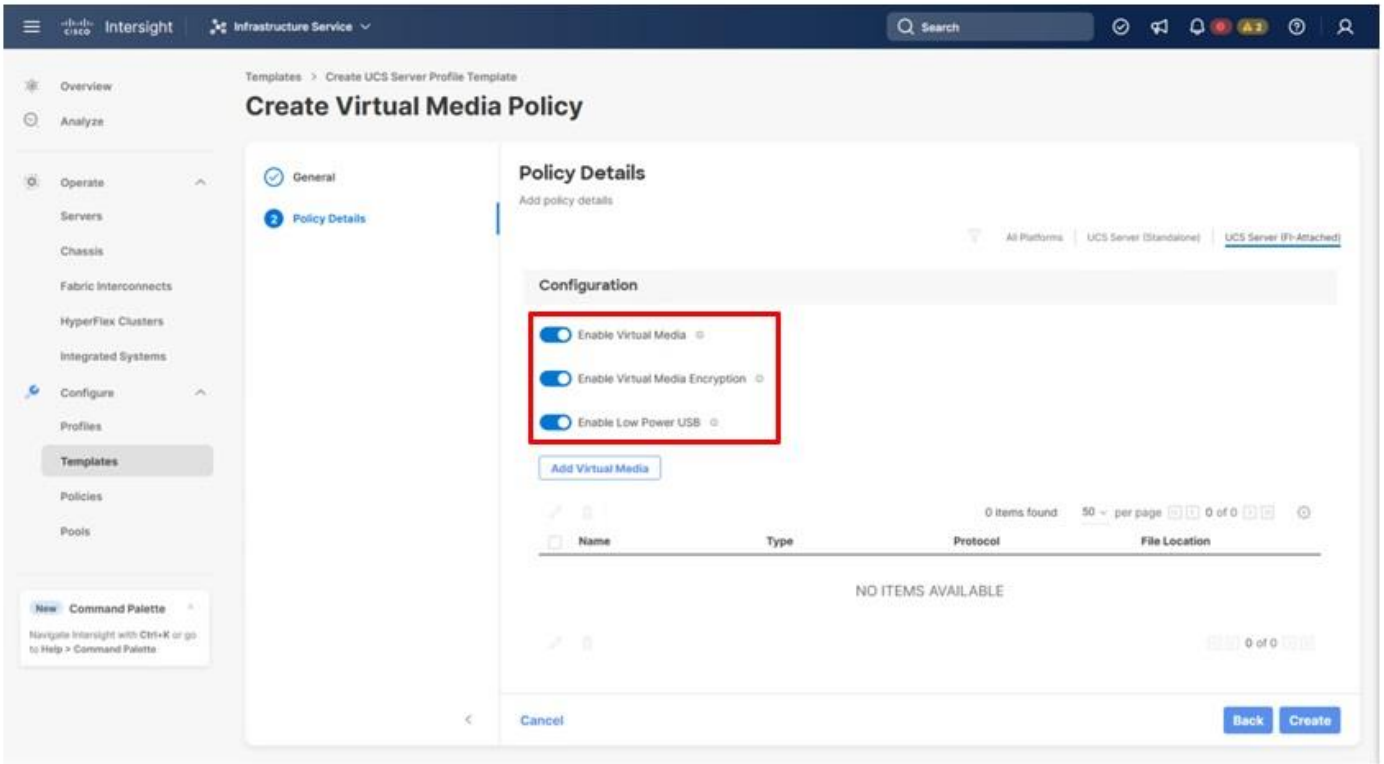
Procedure 4. Configure Virtual Media Policy

Step 1. Click **Select Policy** next to Virtual Media and in the pane on the right, click **Create New**.

Step 2. Verify that the correct organization is selected from the drop-down list (for example, AA21) and provide a name for the policy (for example, AA21-KVM-Mount-Media).

Step 3. Turn on **Enable Virtual Media**, **Enable Virtual Media Encryption**, and **Enable Low Power USB**.

Step 4. Do not select Add Virtual Media at this time, but the policy can be modified and used to map an ISO for a CIMC Mapped DVD.



Templates > Create UCS Server Profile Template

Create Virtual Media Policy

Policy Details

Add policy details

Configuration

- Enable Virtual Media: on
- Enable Virtual Media Encryption: on
- Enable Low Power USB: on

0 items found 50 per page 0 of 0

Name	Type	Protocol	File Location

NO ITEMS AVAILABLE

0 of 0

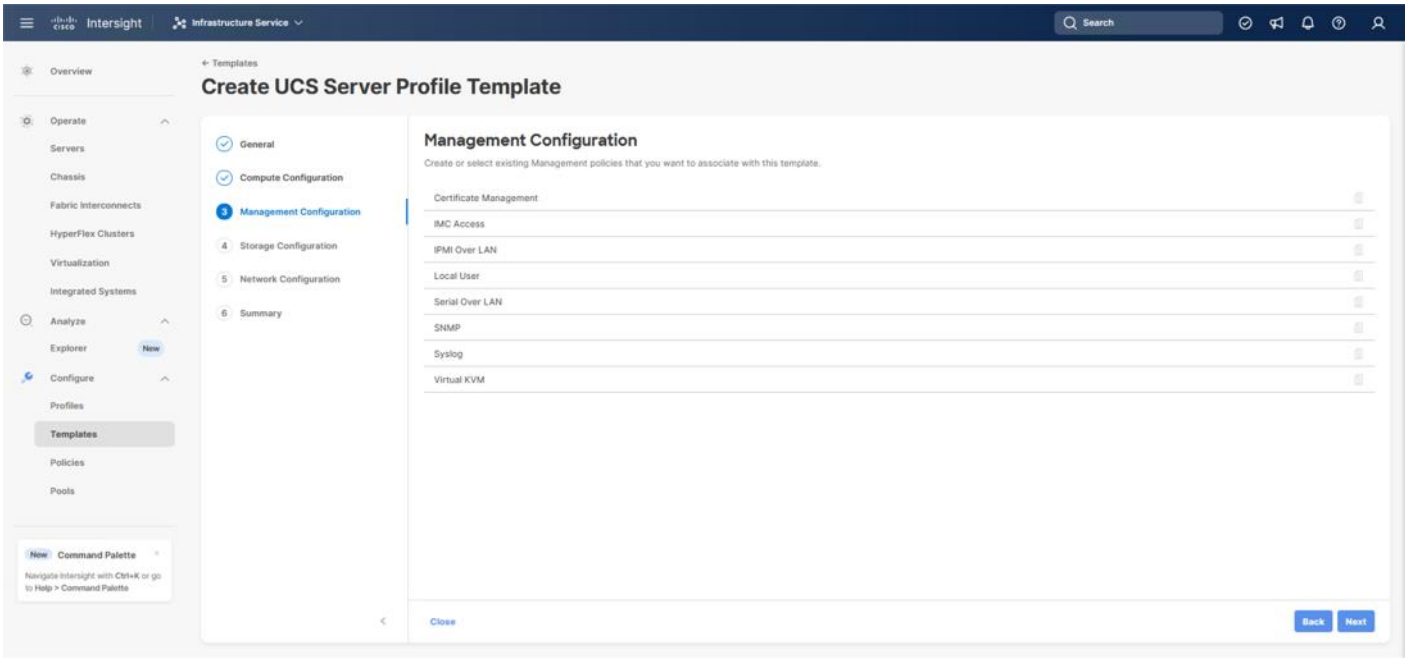
Step 5. Click **Create.**

Step 6. Click **Next** to go to Management Configuration.

Management Configuration

The following policies will be added to the management configuration:

- IMC Access to define the pool of IP addresses for compute node KVM access
- IPMI Over LAN to allow Intersight to manage IPMI messages
- Local User to provide local administrator to access KVM
- Virtual KVM to allow the Tunneled KVM



Create UCS Server Profile Template

Management Configuration

Create or select existing Management policies that you want to associate with this template.

Certificate Management
IMC Access
IPMI Over LAN
Local User
Serial Over LAN
SNMP
Syslog
Virtual KVM

Procedure 5. Configure Cisco IMC Access Policy

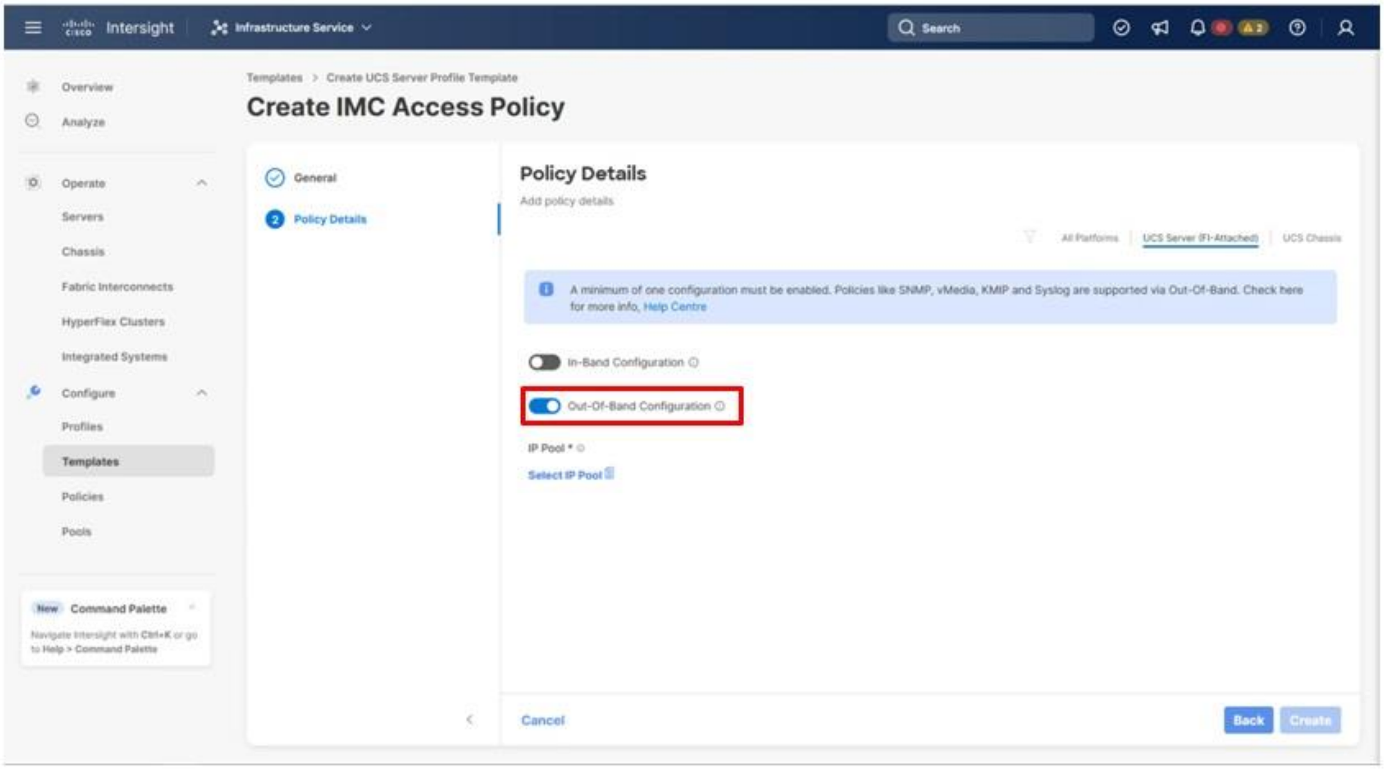
Step 1. Click **Select Policy** next to IMC Access and in the pane on the right, click **Create New**.

Step 2. Verify that the correct organization is selected from the drop-down list (for example, AA21) and provide a name for the policy (for example, AA21-IMC-Access-Policy).

Step 3. Click **Next.**

Step 4. Click **UCS Server (FI-Attached)** if not selected.

Step 5. Select the toggle to enable **Out-of-Band Configuration**. Click **Select IP Pool** and in the pane on the right, click **Create New.**



Create IMC Access Policy

Policy Details

Add policy details

A minimum of one configuration must be enabled. Policies like SNMP, vMedia, KMIP and Syslog are supported via Out-Of-Band. Check here for more info, Help Centre

In-Band Configuration: off

Out-Of-Band Configuration: on

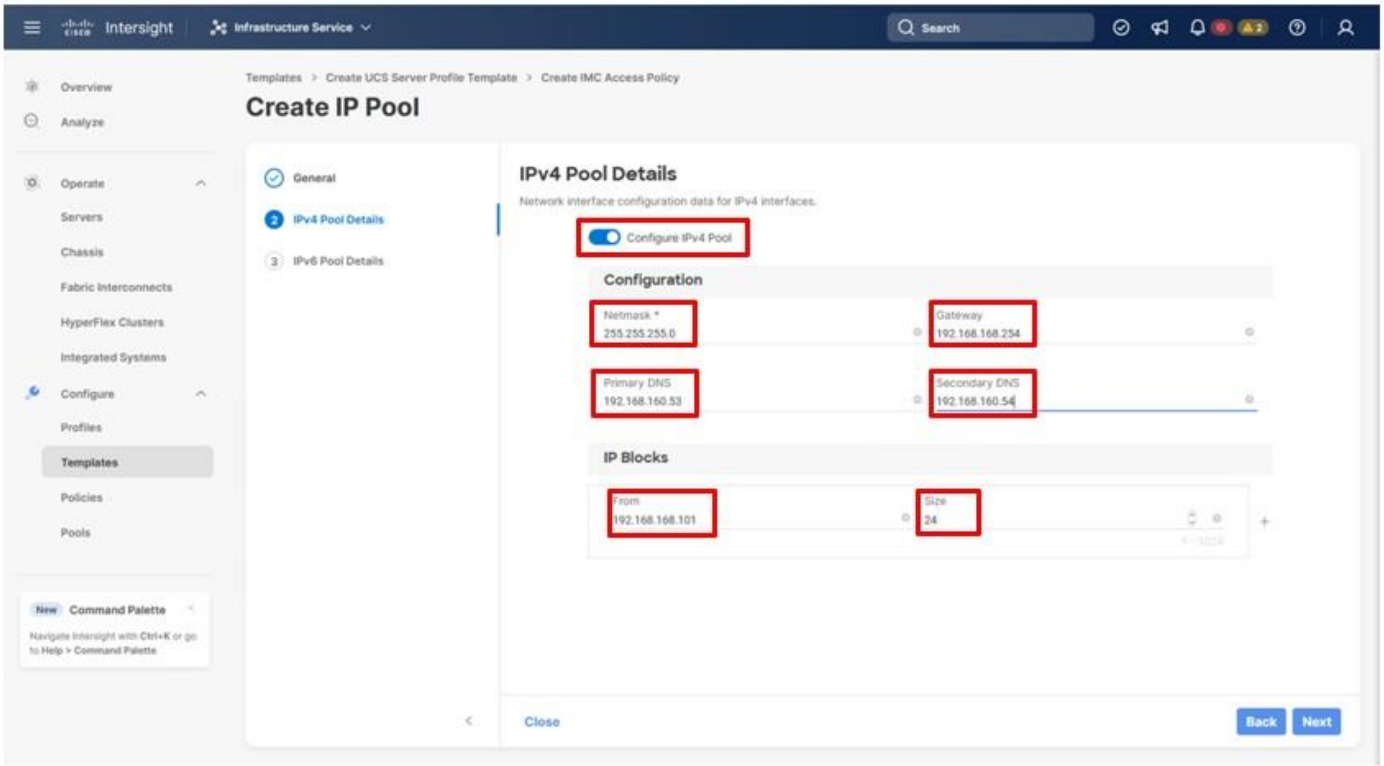
IP Pool *

Select IP Pool

Note: This example will use the Out-Of-Band configuration that will pass through the configured management interfaces of the fabric interconnect. The In-Band configuration option will use the fabric interconnect uplinks for connectivity and must specify the VLAN for the connectivity.

Step 6. Verify that the correct organization is selected from the drop-down list (for example, AA21) and provide a name for the policy (for example, AA21-OOB-Mgmt-Pool). Click **Next**.

Step 7. Select **Configure IPv4 Pool** and provide the information to define a pool for KVM IP address assignment including an IP Block.



Create IP Pool

IPv4 Pool Details

Network interface configuration data for IPv4 interfaces.

Configure IPv4 Pool

Configuration

Netmask *: 255.255.255.0

Gateway: 192.168.168.254

Primary DNS: 192.168.160.53

Secondary DNS: 192.168.160.54

IP Blocks

From: 192.168.168.101

Size: 24

Note: For tunneled KVM to work, the management IP pool subnet should be accessible from the Fabric Interconnect management interfaces.

Step 8. Click **Next**.

Step 9. Deselect **Configure IPv6 Pool**.

Step 10. Click **Create** to finish configuring the IP address pool.

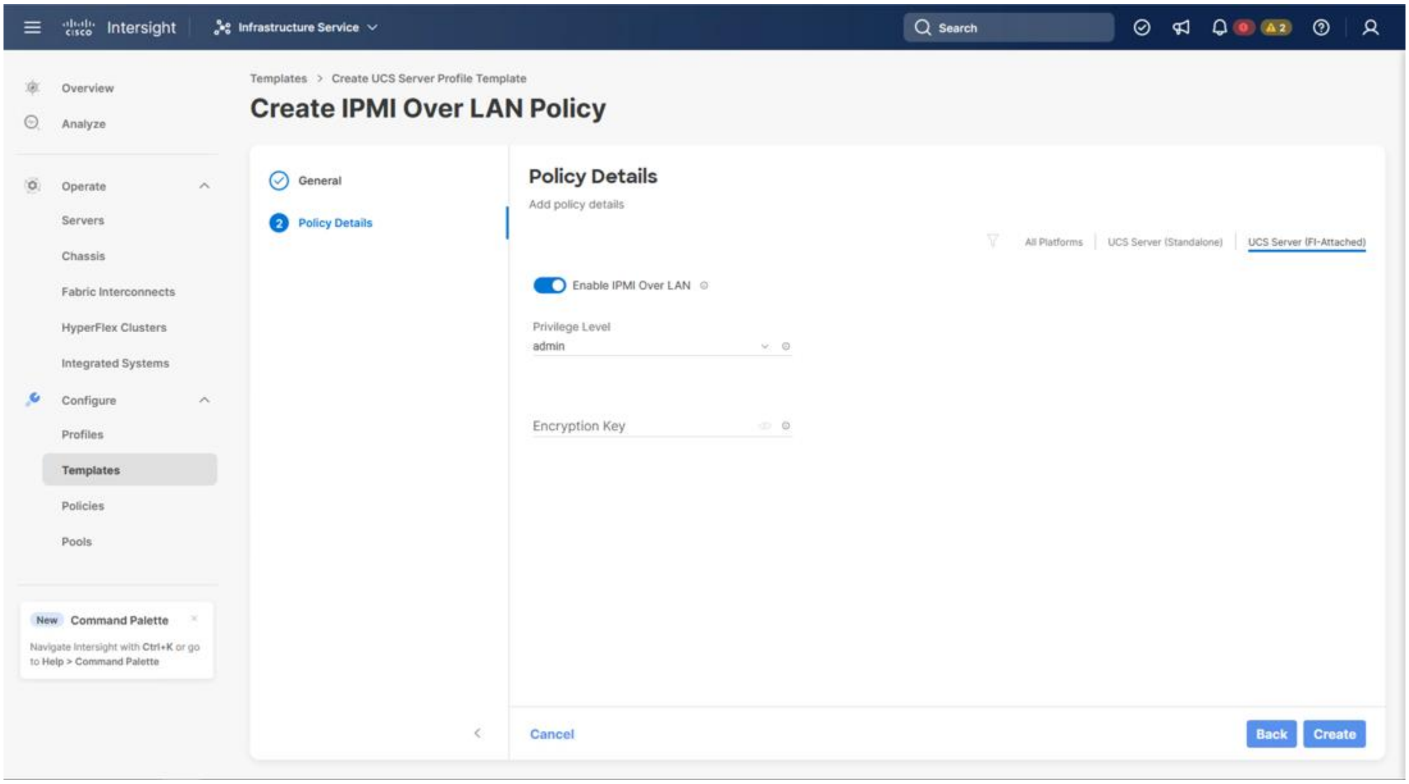
Step 11. Click **Create** to finish configuring the IMC access policy.

Procedure 6. Configure IPMI Over LAN Policy

Step 1. Click **Select Policy** next to IPMI Over LAN and in the pane on the right, click **Create New**.

Step 2. Verify that the correct organization is selected from the drop-down list (for example, AA21) and provide a name for the policy (for example, AA21-Enable-IPMIoLAN-Policy).

Step 3. Leave the default settings in place for this policy.



Create IPMI Over LAN Policy

Policy Details

Add policy details

Enable IPMI Over LAN

Privilege Level: admin

Encryption Key

Step 4. Click **Create.**

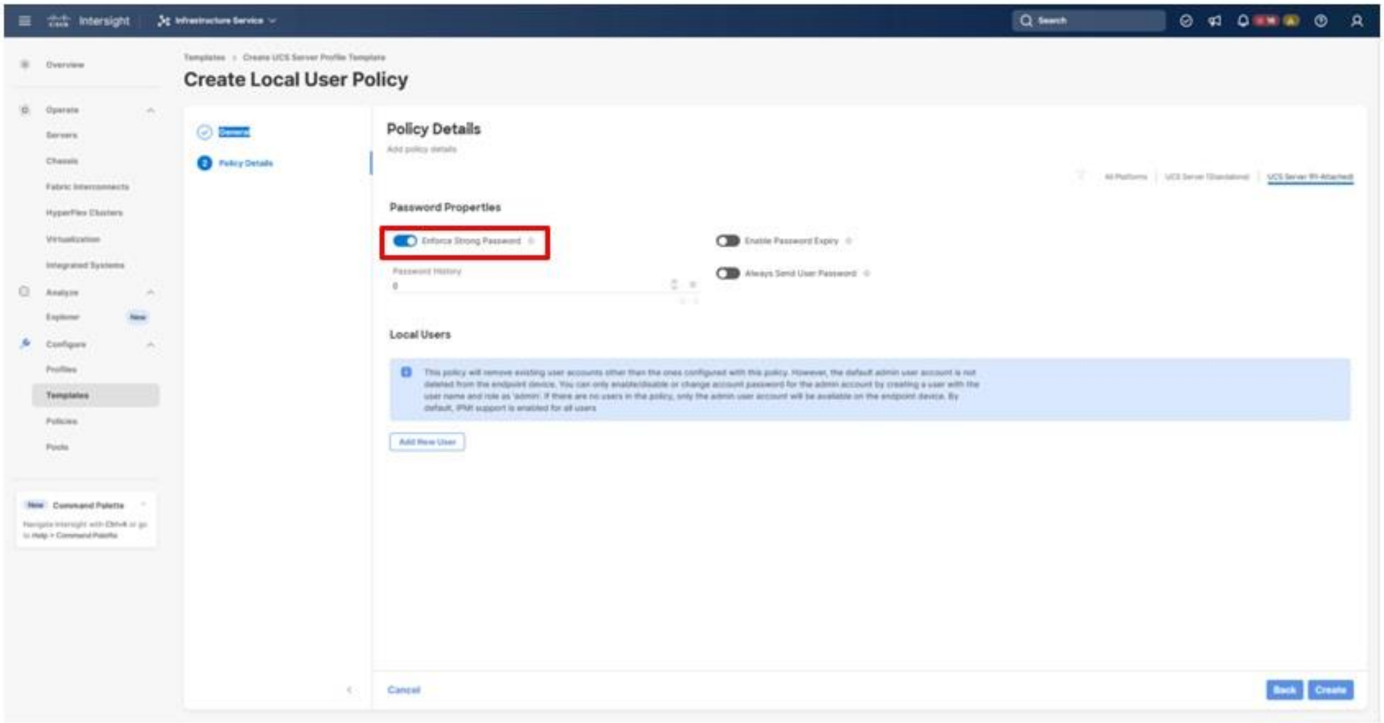
Procedure 7. Configure Local User Policy

Step 1. Click **Select Policy** next to Local User and in the pane on the right, click **Create New.**

Step 2. Verify that the correct organization is selected from the drop-down list (for example, AA21) and provide a name for the policy (for example, AA21-LocalUser).

Step 3. Verify that **UCS Server (FI-Attached)** is selected.

Step 4. Verify that **Enforce Strong Password** is selected.



Create Local User Policy

Policy Details

Add policy details

Password Properties

Enforce Strong Password: on

Password History: 0

Enable Password Expiry: off

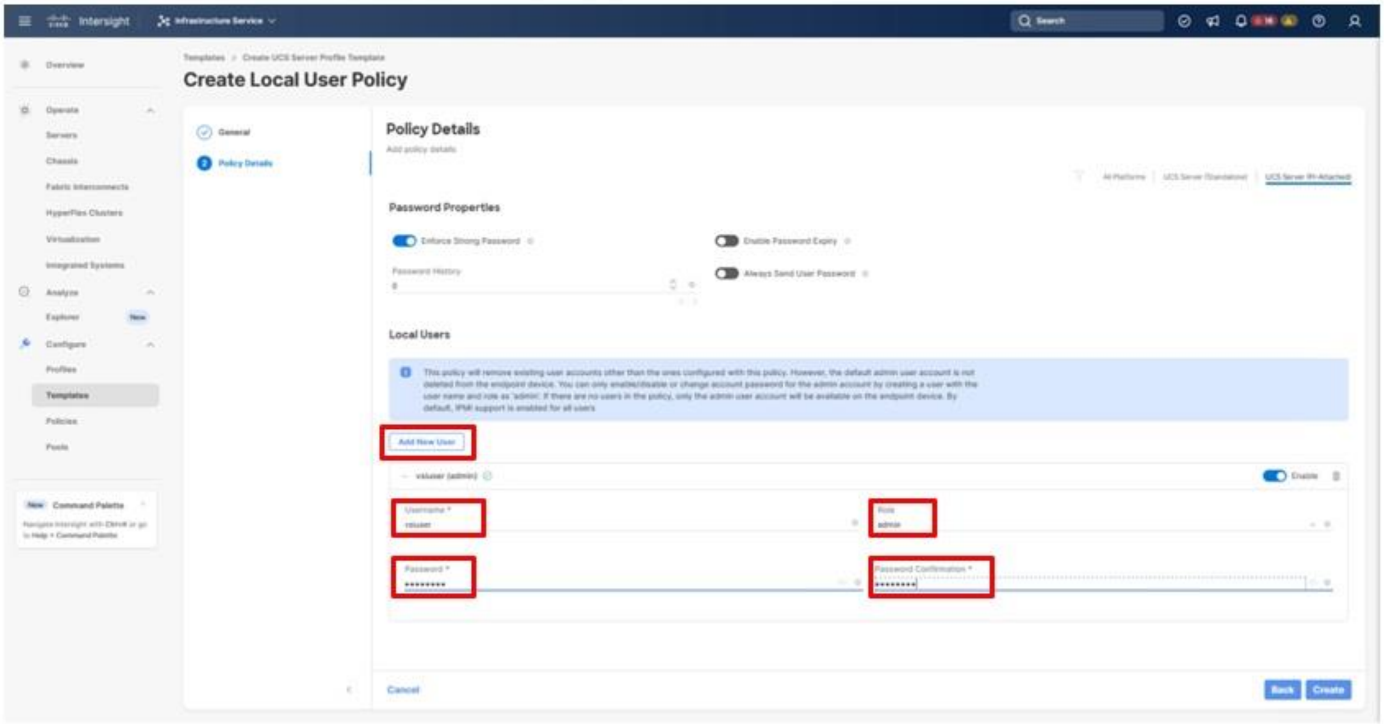
Always Send User Password: off

Local Users

This policy will remove existing user accounts other than the ones configured with this policy. However, the default admin user account is not deleted from the endpoint device. You can only enable/disable or change account password for the admin account by creating a user with the user name and role as 'admin'. If there are no users in the policy, only the admin user account will be available on the endpoint device. By default, IPMI support is enabled for all users

Step 5. Click **Add New User** and then click **+** next to the **New User.**

Step 6. Provide the username (for example, vsiuser), choose a role (for example, admin), and provide a password.



Create Local User Policy

Policy Details

Password Properties

Enforce Strong Password: on

Password History: 0

Enable Password Expiry: off

Always Send User Password: off

Local Users

This policy will remove existing user accounts other than the ones configured with this policy. However, the default admin user account is not deleted from the endpoint device. You can only enable/disable or change account password for the admin account by creating a user with the user name and role as 'admin'. If there are no users in the policy, only the admin user account will be available on the endpoint device. By default, IPMI support is enabled for all users

vsiuser (admin) — Enable

Username *: vsiuser

Role: admin

Password *: •••••••••

Password Confirmation *: •••••••••

Note: The username and password combination defined here will be used as an alternate to log in to KVMs and can be used for IPMI.

Step 7. Click **Create** to finish configuring the user.

Step 8. Click **Create** to finish configuring the Local User Policy.

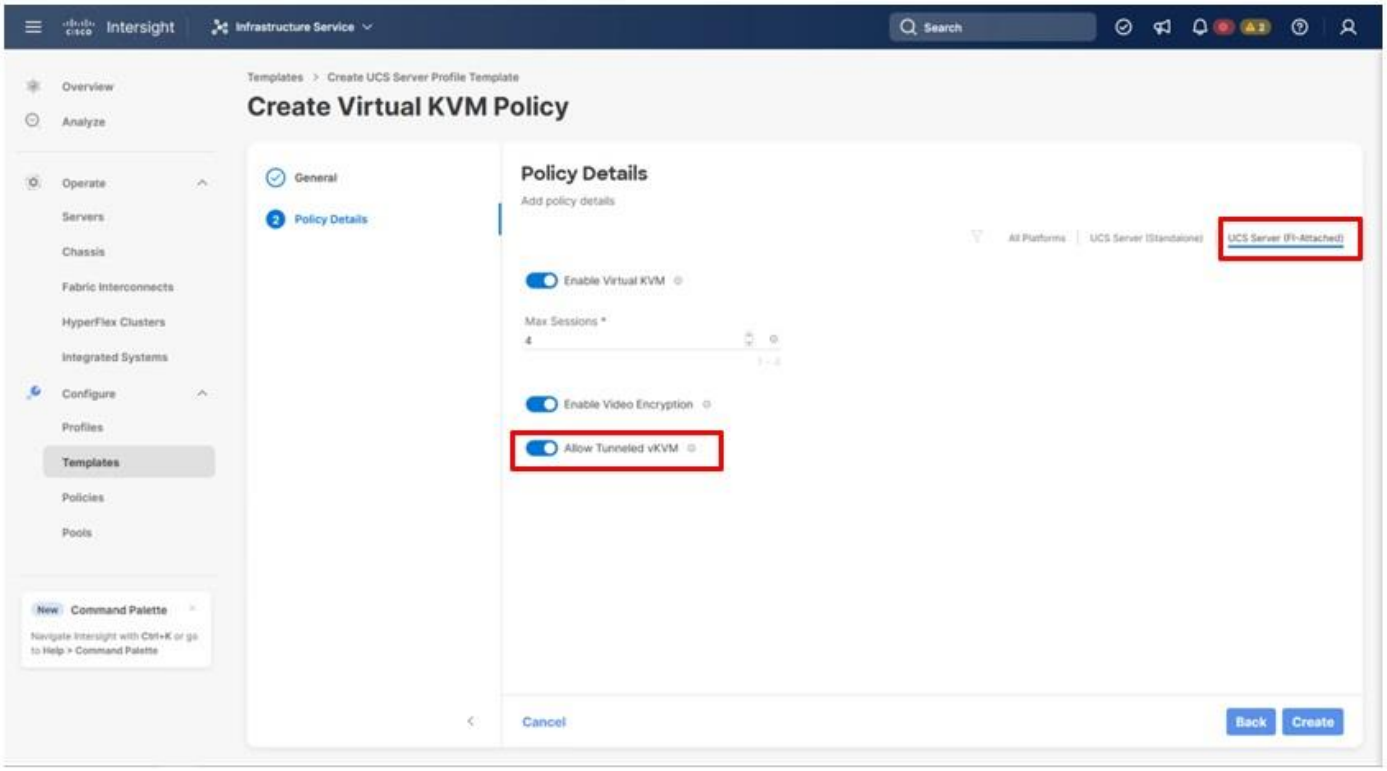
Procedure 8. Configure Virtual KVM Policy

Step 1. Click **Select Policy** next to Virtual KVM and in the pane on the right, click **Create New.**

Step 2. Verify that the correct organization is selected from the drop-down list (for example, AA21) and provide a name for the policy (for example, AA21-KVM-Policy).

Step 3. Verify that **UCS Server (FI-Attached)** is selected.

Step 4. Turn on **Allow Tunneled vKVM.**



Templates > Create UCS Server Profile Template

Create Virtual KVM Policy

Policy Details

Add policy details

All Platforms | UCS Server (Standalone) | UCS Server (FI-Attached)

Enable Virtual KVM: on

Max Sessions *: 4 (1 - 4)

Enable Video Encryption: on

Allow Tunneled vKVM: on

Step 5. Click **Create.**

Step 6. To fully enable Tunneled KVM, after the Server Profile Template has been created, go to **System > Settings > Security and Privacy** and click **Configure.** Turn on **Allow Tunneled vKVM Launch** and **Allow Tunneled vKVM Configuration.**

Step 7. Click **Next** to continue to Storage Configuration.

Storage Configuration

The Storage Configuration section of the Server Profile Template is not required for internal storage in the UCS servers because all storage for this solution is provided by the VSP. Click **Next** on the Storage Configuration screen.

Network Configuration

This section details how to create the LAN Connectivity and SAN Connectivity policies used by the derived Server Profiles.

LAN Connectivity

Procedure 1. Create Network Configuration – LAN Connectivity Policy

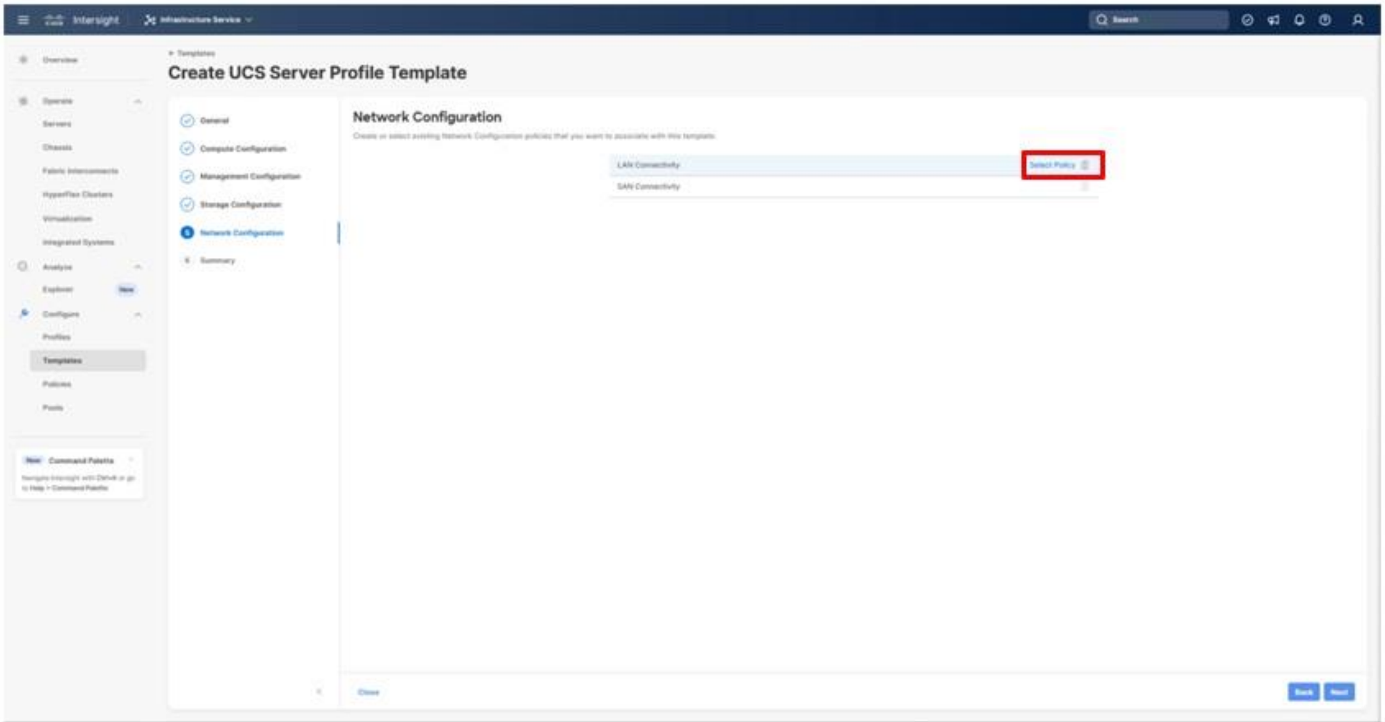
The LAN connectivity policy defines the connections and network communication resources between the server and the LAN. This policy uses pools to assign MAC addresses to servers and to identify the vNICs that the servers use to communicate with the network.

For consistent vNIC placement, manual vNIC placement is used. The four vNICs configured are listed in Table 14.

Table 14. vNICs defined in LAN Connectivity

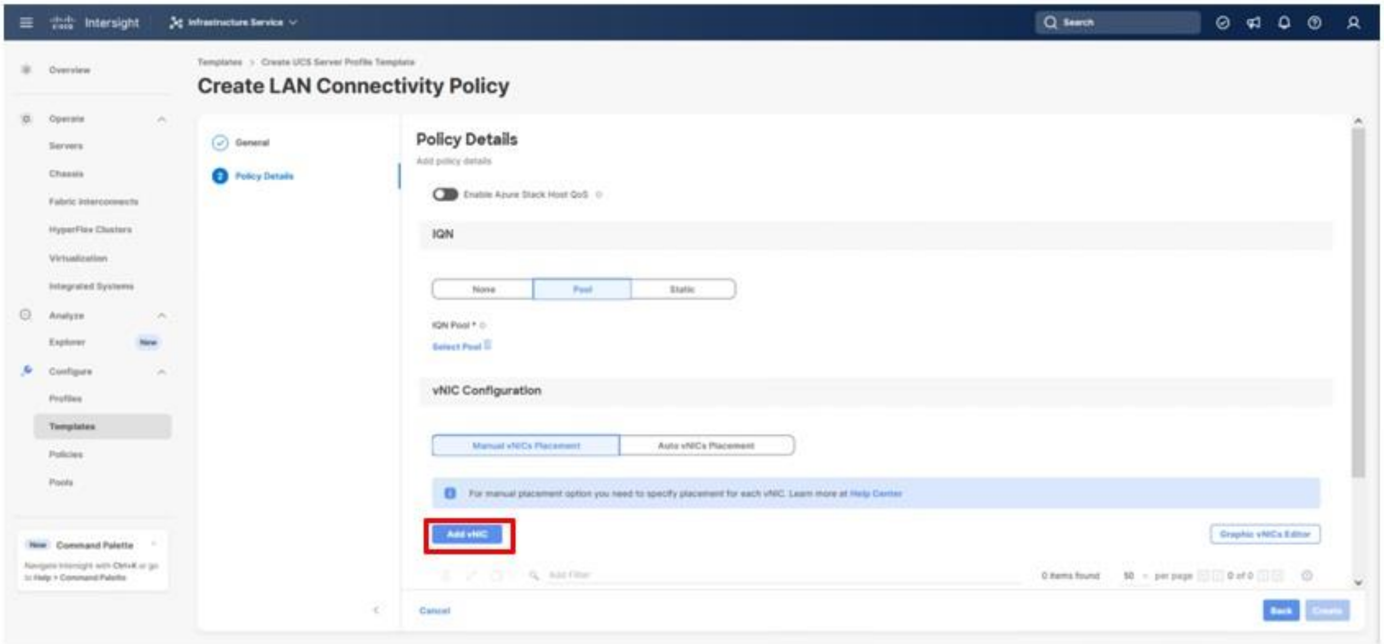
vNIC/vHBA Name	Slot ID	Switch ID	PCI Order	VLANs
00-vSwitch0-A	MLOM	A	0	IB-MGMT
01-vSwitch0-B	MLOM	B	1	IB-MGMT
02-vDS0-A	MLOM	A	2	VM Traffic, VM Traffic-A, VM Traffic-B, vMotion
03-vDS0-B	MLOM	B	3	VM Traffic, VM Traffic-A, VM Traffic-B, vMotion

Step 1. Click **Select Policy** next to LAN Connectivity and in the pane on the right, click **Create New** from the column that appears to the right.

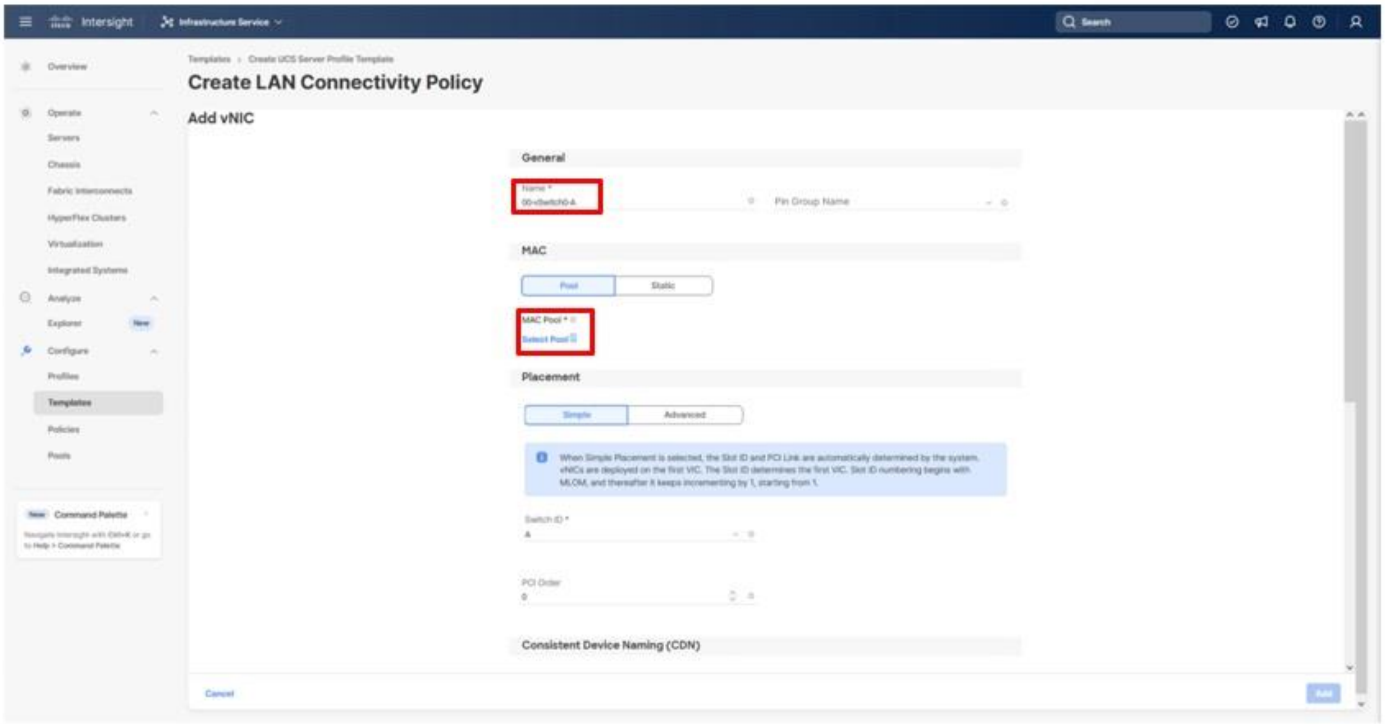


Step 2. Verify that the correct organization is selected from the drop-down list (for example, AA21) and provide a name for the policy (for example, AA21-FC-Boot-LanCon-Pol). Click **Next**.

Step 3. Click **Add vNIC** under the vNIC Configuration section.



Step 4. Referencing values from Table 14, specify the **Name** for the vNIC, and under **MAC Pool**, click **Select Pool**.



Create LAN Connectivity Policy

Add vNIC

General

Name * 00-vSwitch0-A

Pin Group Name

MAC

MAC Pool * Select Pool

Placement

When Simple Placement is selected, the Slot ID and PCI Link are automatically determined by the system. vNICs are deployed on the first VIC. The Slot ID determines the first VIC. Slot ID numbering begins with MLOM, and thereafter it keeps incrementing by 1, starting from 1.

Switch ID * A

PCI Order 0

Consistent Device Naming (CDN)

Note: When creating the first vNIC, the MAC address pool has not been defined yet therefore a new MAC address pool will need to be created. Two separate MAC address pools are configured for each fabric. MAC-Pool-A will be reused for all Fabric-A vNICs, and MAC-Pool-B will be reused for all Fabric-B vNICs.

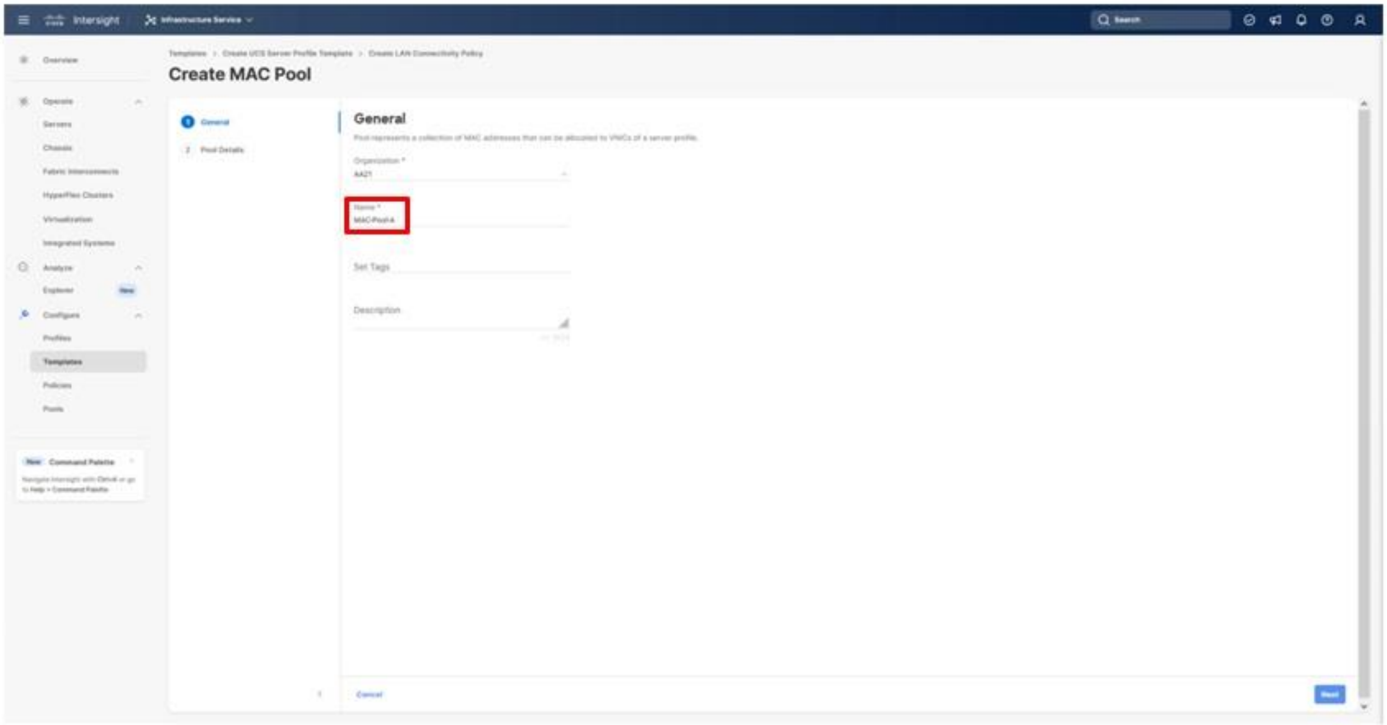
Table 15. MAC Address Pools

Pool Name	Starting MAC Address	Size	vNICs
MAC-Pool-A	00:25:B5:21:0A:00	256	00-vSwitch0-A, 02-VDS0-A
MAC-Pool-B	00:25:B5:21:0B:00	256	01-vSwitch0-B, 03-VDS0-B

Note: Each server requires 3 MAC addresses from the pool. Adjust the size of the pool according to your requirements.

Step 5. Select the MAC Pool appropriate fabric or click **Create New** if one has not been created yet.

Step 6. If creating a new pool, verify that the correct organization is selected from the drop-down list (for example, AA21) and provide a Name for the pool from Table 15 depending on the vNIC being created (for example, MAC-Pool-A for Fabric A).



Create MAC Pool

General

Pool represents a collection of MAC addresses that can be allocated to VNICs of a server profile.

Organization * AA21

Name * MAC-Pool-A

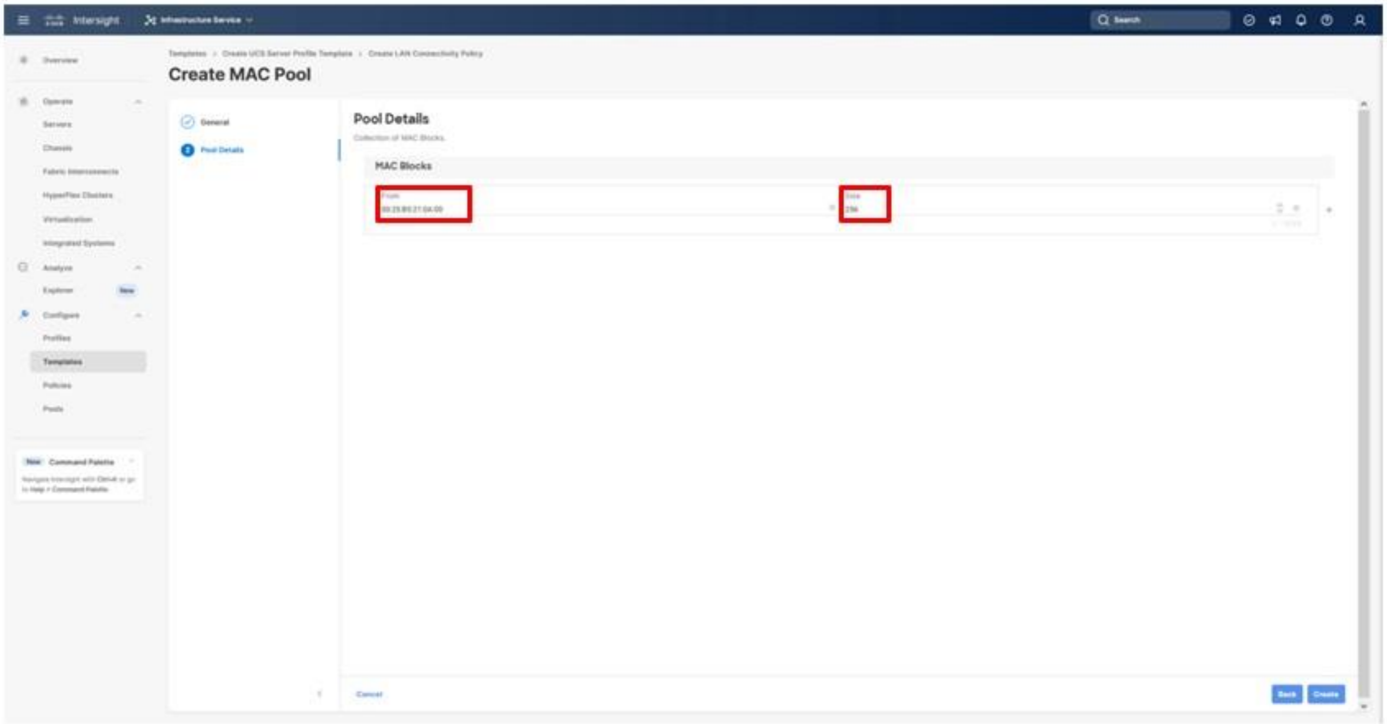
Set Tags

Description

Step 7. Click **Next**.

Step 8. Provide the starting MAC address from Table 14 (for example, 00:25:B5:21:0A:00)

Step 9. Provide the size of the MAC address pool from Table 15 (for example, 256).



Create MAC Pool

Pool Details

Collection of MAC Blocks.

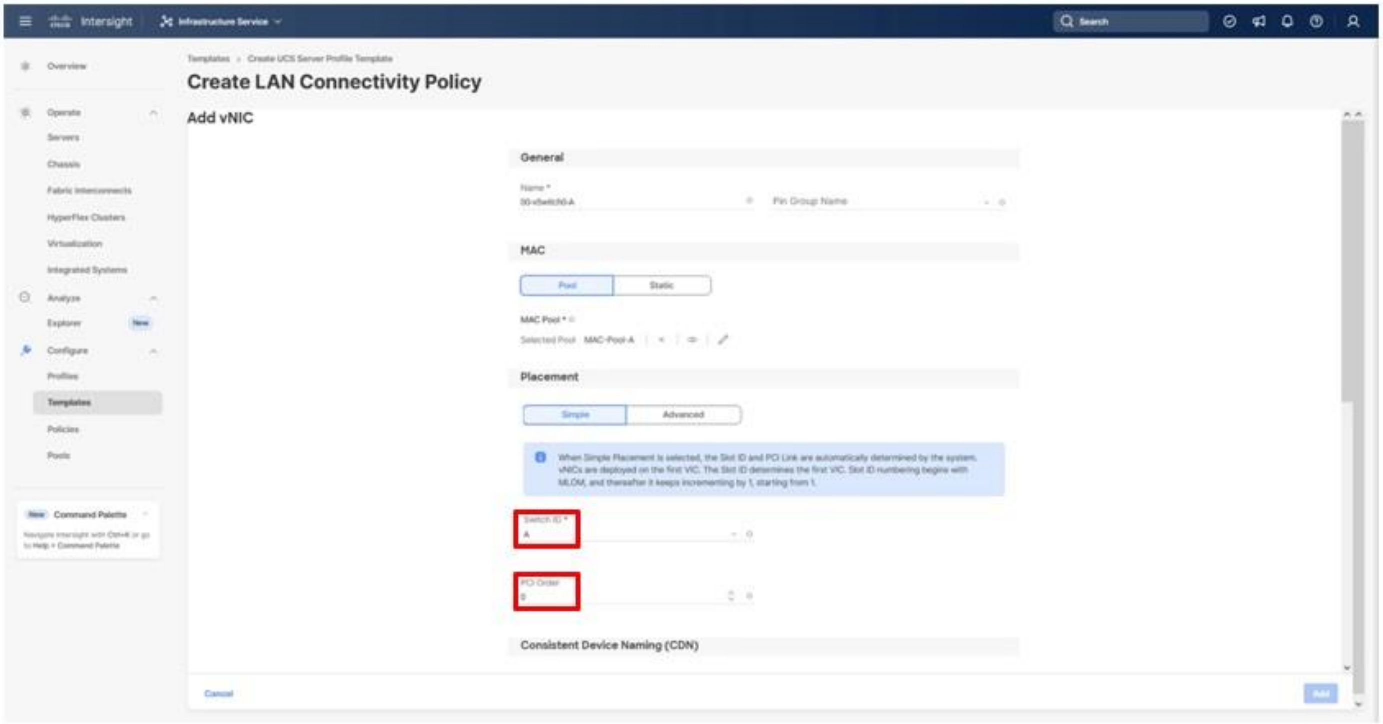
MAC Blocks

From 00:25:B5:21:0A:00

Size 256

Step 10. Click **Create** to finish creating the MAC address pool.

Step 11. Confirm the Switch ID and PCI Order values are correct for the vNIC being configured per [Table 14](#).



Create LAN Connectivity Policy

Add vNIC

General

Name * 00-vSwitch0-A

Pin Group Name

MAC

Pool | Static

MAC Pool *

Selected Pool MAC-Pool-A

Placement

Simple | Advanced

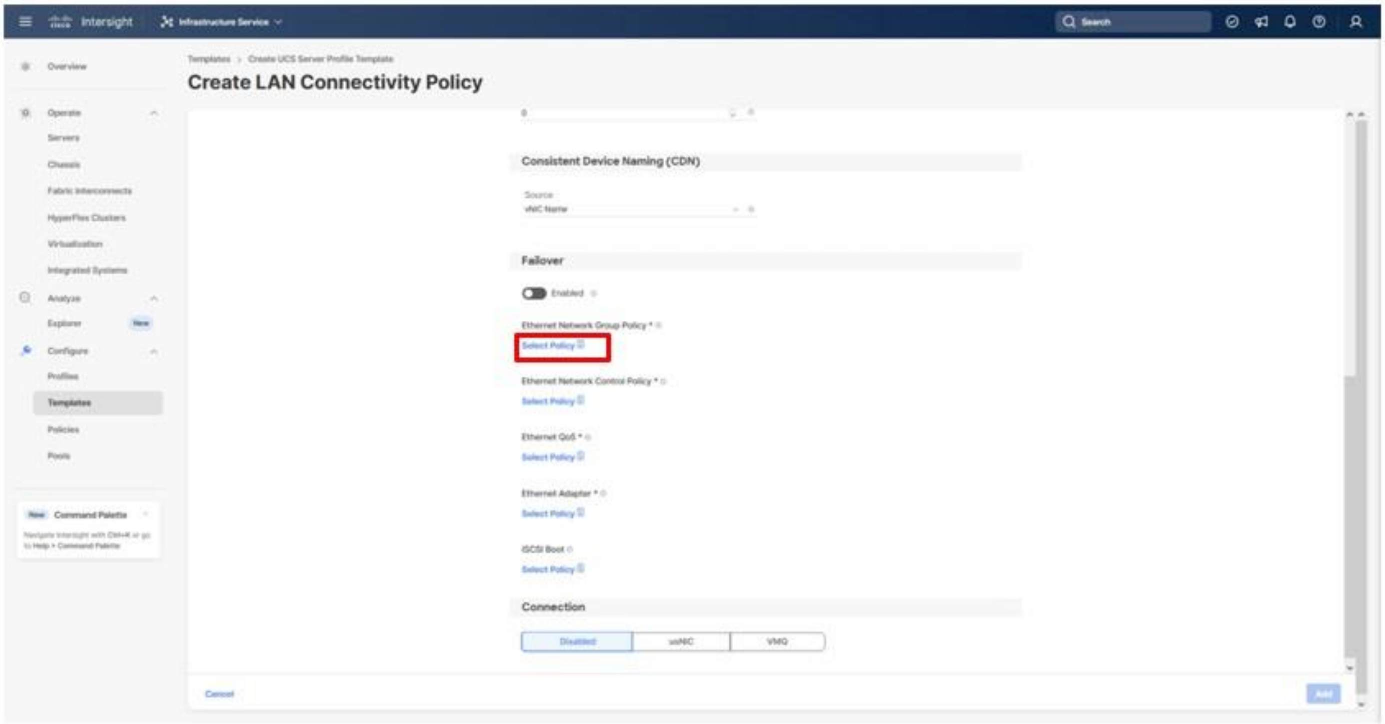
When Simple Placement is selected, the Slot ID and PCI Link are automatically determined by the system. vNICs are deployed on the first VIC. The Slot ID determines the first VIC. Slot ID numbering begins with MLOM, and thereafter it keeps incrementing by 1, starting from 1.

Switch ID * A

PCI Order 0

Consistent Device Naming (CDN)

Step 12. Click **Select Policy** for Ethernet Group Policy.



Create LAN Connectivity Policy

Consistent Device Naming (CDN)

Source: vNIC Name

Failover

Enabled

Ethernet Network Group Policy *
Select Policy

Ethernet Network Control Policy *
Select Policy

Ethernet QoS *
Select Policy

Ethernet Adapter *
Select Policy

iSCSI Boot
Select Policy

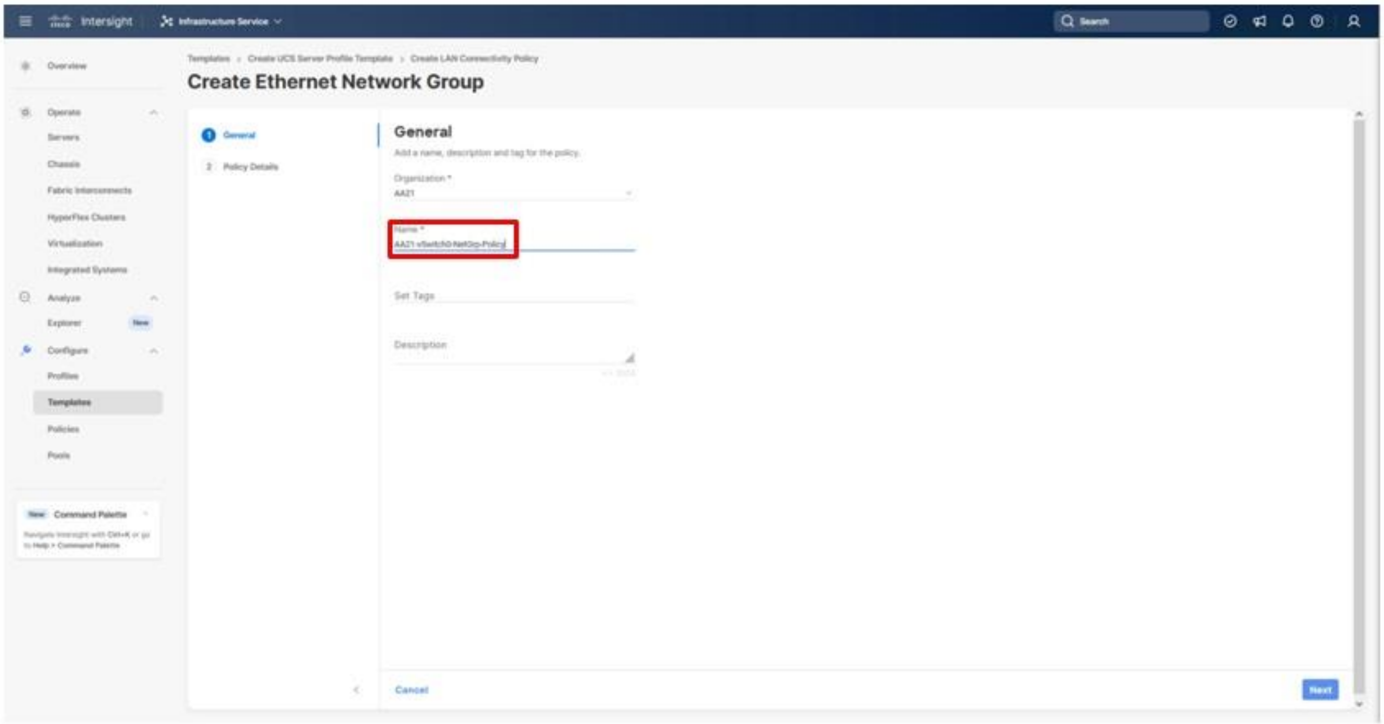
Connection

Disabled | usNIC | VMQ

Note: Two Ethernet Network Group Policies will be created, one for vSwitch0 and one for vDS0 to detail the Native VLAN and VLANs that will be carried within the vNICs.

Step 13. When creating the vSwitch0 vNICs and the vSwitch0 Ethernet Network Group Policy is not created, select the **Create New** option. Select the appropriate policy if it is created and skip the next two steps.

Step 14. Provide a Name for the policy and click **Next**.



Templates > Create UCS Server Profile Template > Create LAN Connectivity Policy

Create Ethernet Network Group

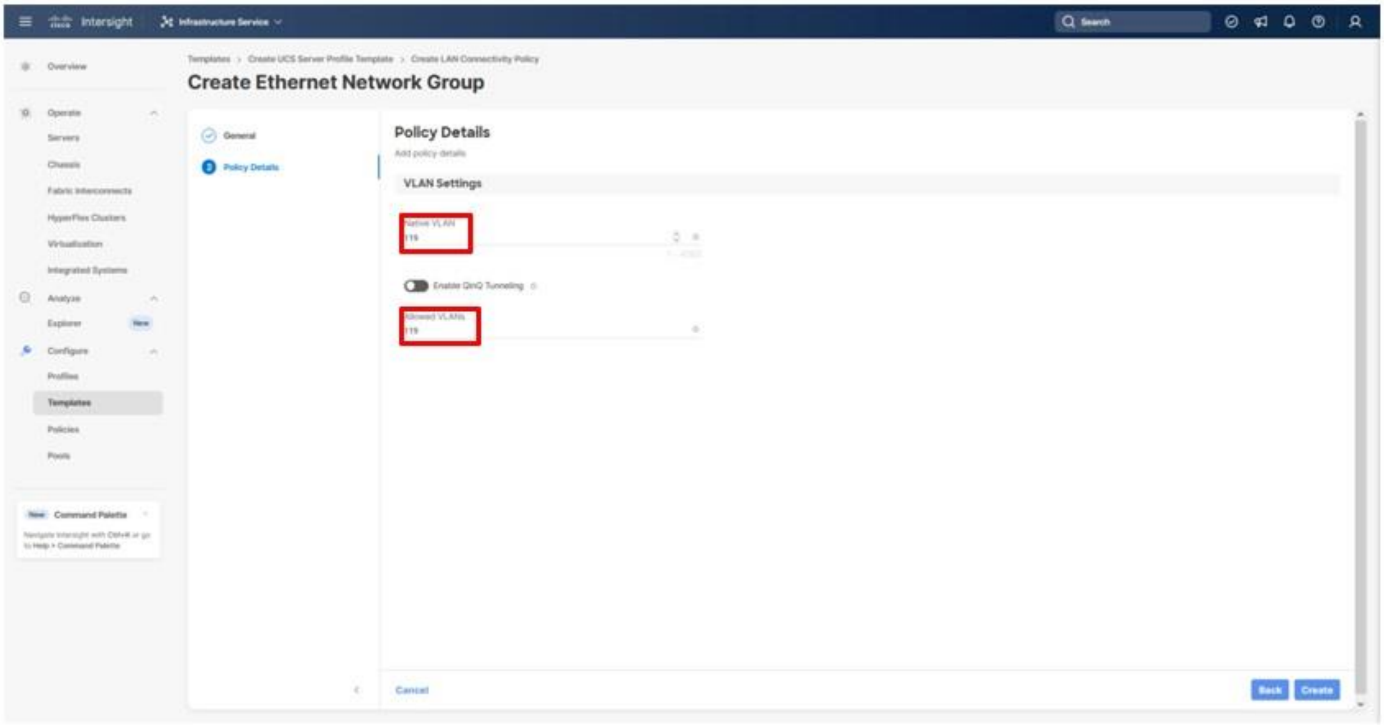
General

Add a name, description and tag for the policy.

Organization * AA21

Name * AA21-vSwitch0-NetGrp-Policy

Step 15. Specify the Native VLAN to be used and any VLANs allowed and click **Create**.



Templates > Create UCS Server Profile Template > Create LAN Connectivity Policy

Create Ethernet Network Group

Policy Details

Add policy details

VLAN Settings

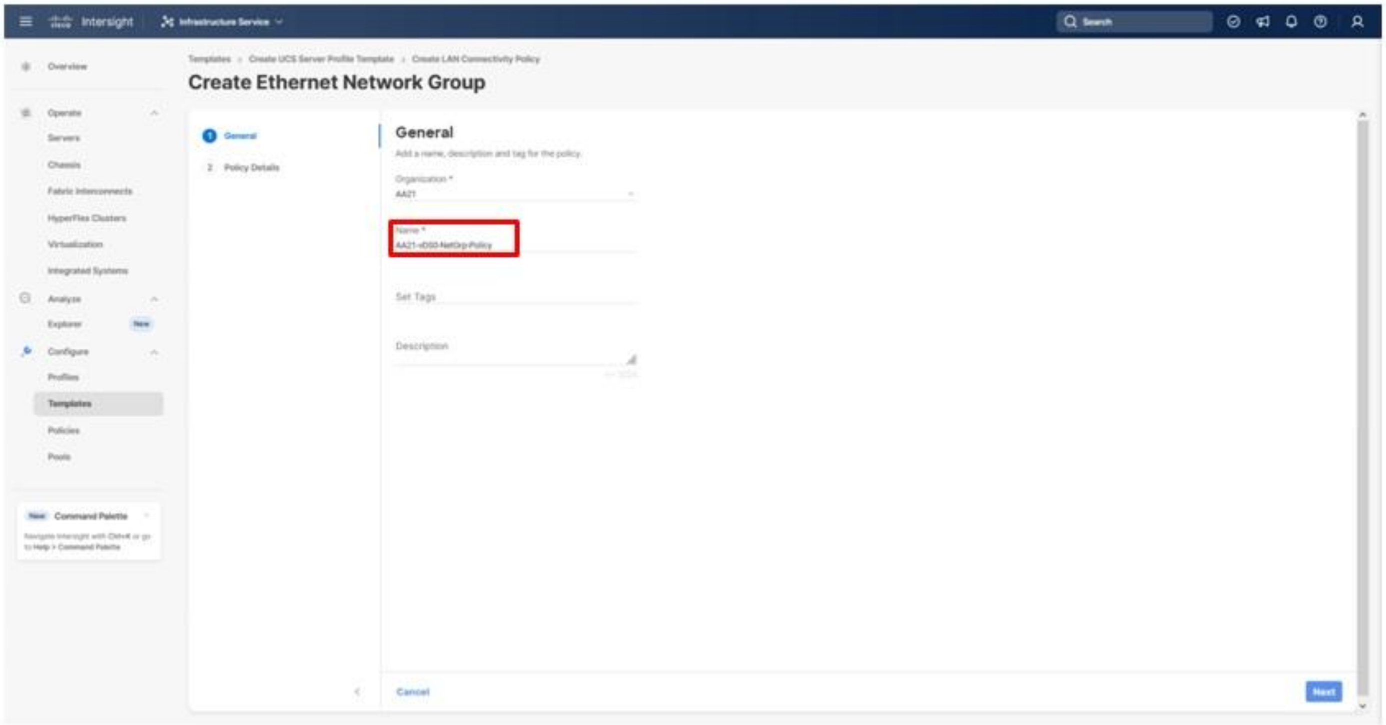
Native VLAN 119

Enable QinQ Tunneling

Allowed VLANs 119

Step 16. When creating the vDS0 vNICs and the vDS0 Ethernet Network Group Policy is not created, select the **Create New** option. Select the appropriate policy if it is created and skip the next two steps.

Step 17. Provide a Name for the policy and click **Next**.



Templates > Create UCS Server Profile Template > Create LAN Connectivity Policy

Create Ethernet Network Group

General

Add a name, description and tag for the policy

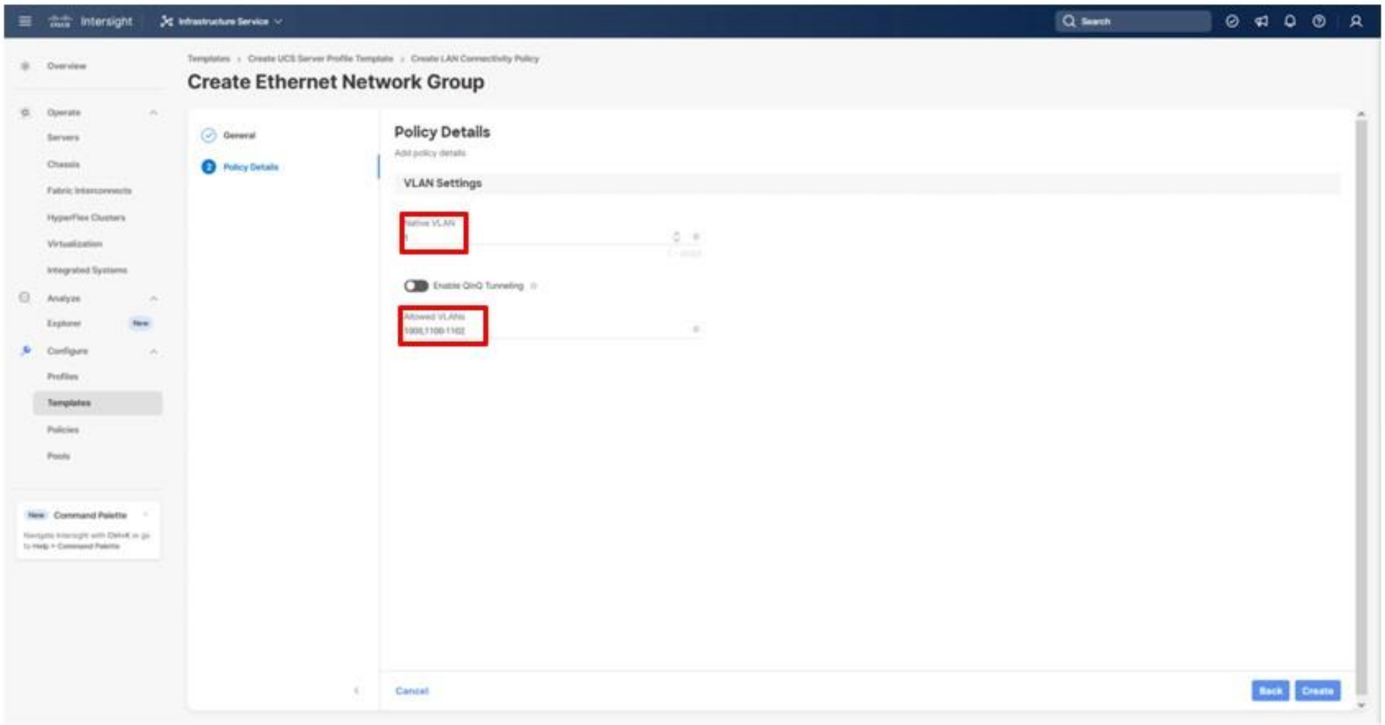
Organization *
AA21

Name *
AA21-vDS0-NetGrp-Policy

Set Tags

Description

Step 18. Specify the Native VLAN to be used and any VLANs allowed and click **Create**.



Templates > Create UCS Server Profile Template > Create LAN Connectivity Policy

Create Ethernet Network Group

Policy Details

Add policy details

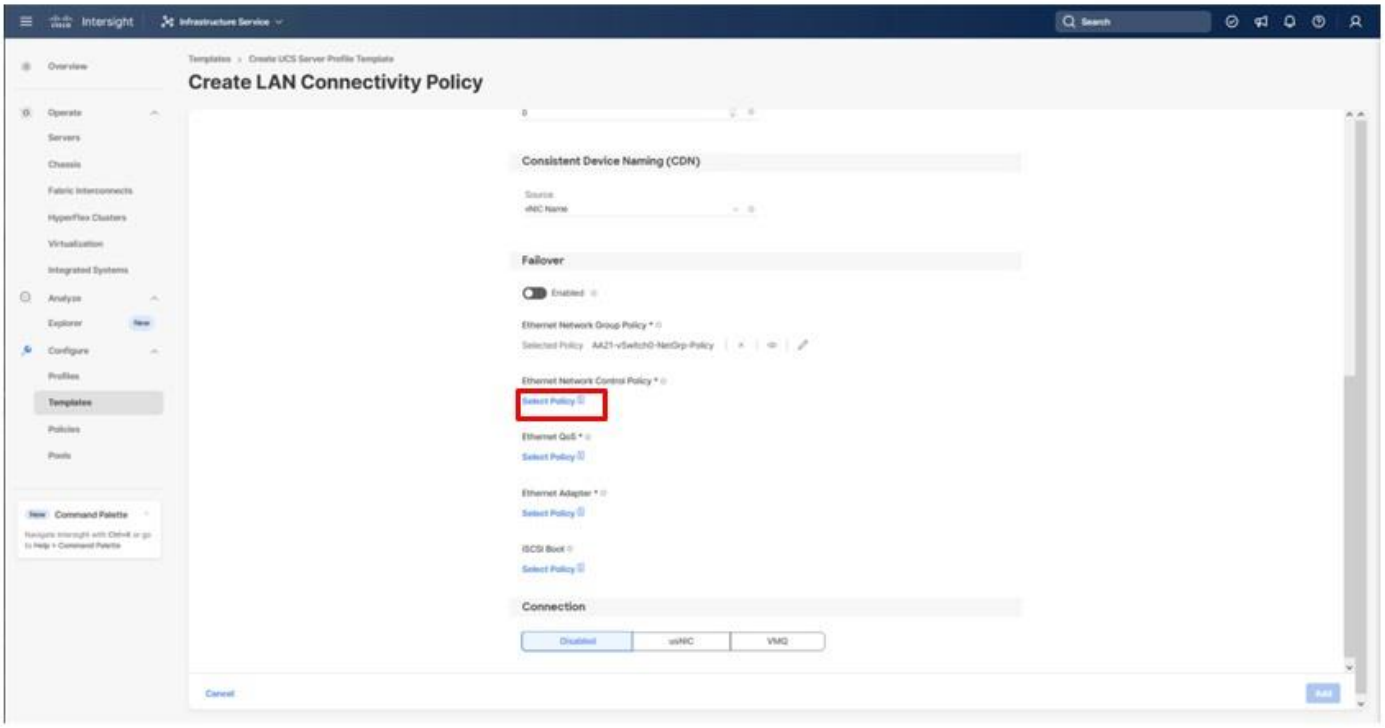
VLAN Settings

Native VLAN
1

Enable QinQ Tunneling

Allowed VLANs
1000,1100-1102

Step 19. For either type of vNIC, click **Select Policy** under Ethernet Network Control Policy.



Templates > Create UCS Server Profile Template

Create LAN Connectivity Policy

Consistent Device Naming (CDN)

Source: vNIC Name

Failover

Enabled

Ethernet Network Group Policy *

Selected Policy AA21-vSwitch0-NetGrp-Policy

Ethernet Network Control Policy *

Select Policy

Ethernet QoS *

Select Policy

Ethernet Adapter *

Select Policy

iSCSI Boot

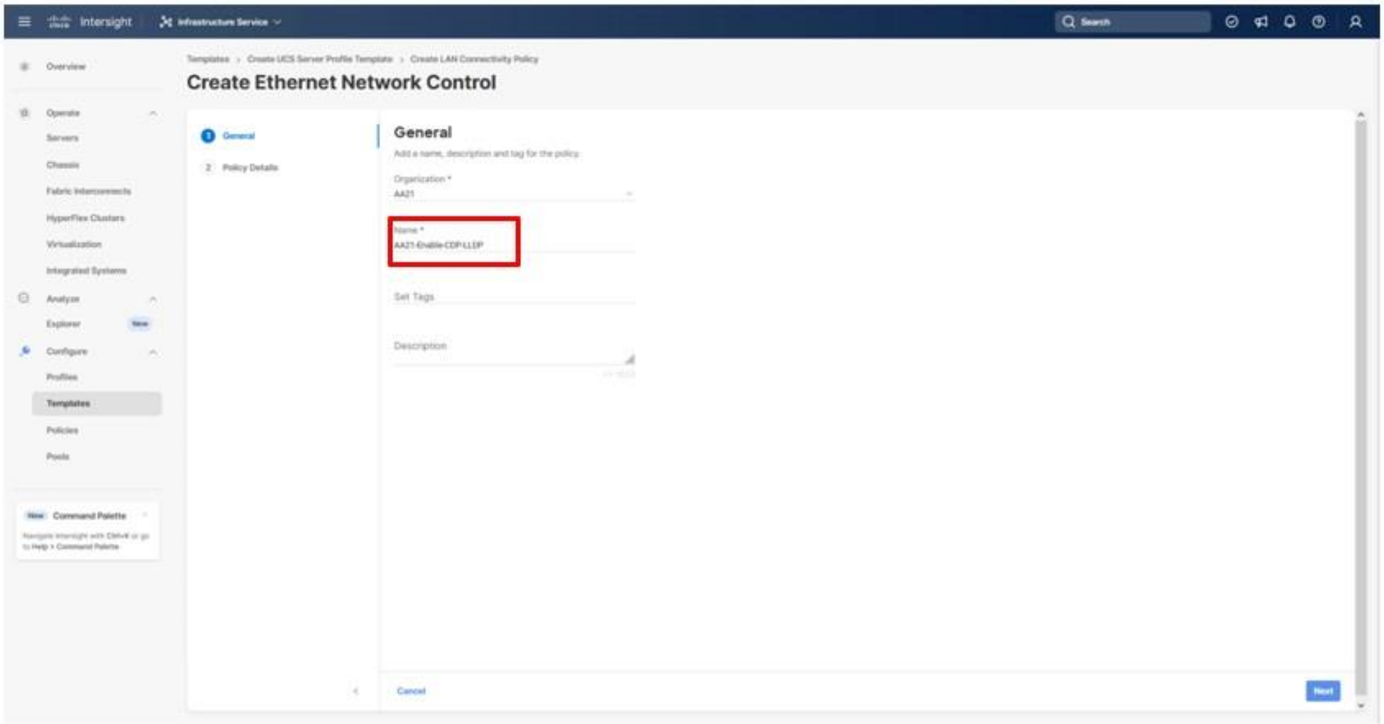
Select Policy

Connection

Disabled | usNIC | VMQ

Step 20. Click **Create New** from the right-hand column that appears or select the Ethernet Network Control Policy if it has already been created and skip the next two steps.

Step 21. Provide a Name for the policy and click **Next.**



Templates > Create UCS Server Profile Template > Create LAN Connectivity Policy

Create Ethernet Network Control

General

Add a name, description and tag for the policy.

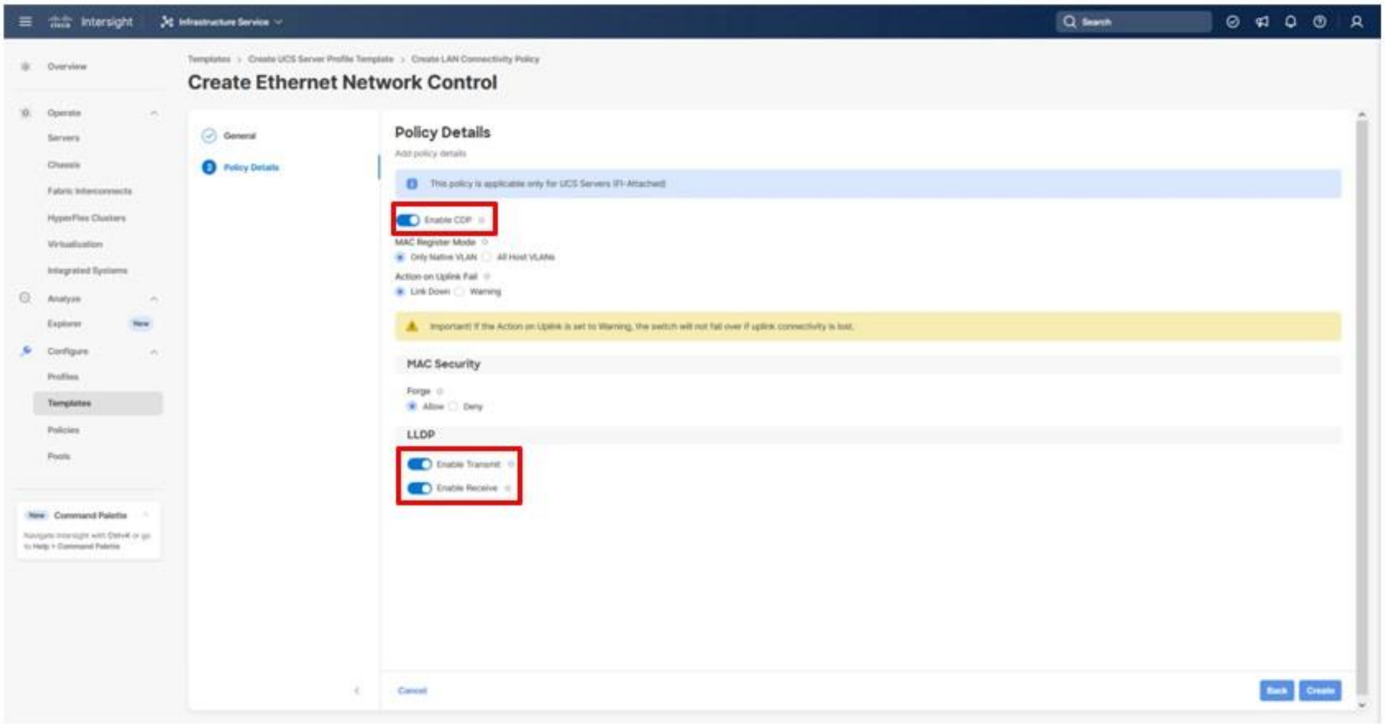
Organization *: AA21

Name *: AA21-Enable-CDP-LLDP

Set Tags

Description

Step 22. Select the **Enable CDP** toggle and the **Enable Transmit** and **Enable Receive** toggles under LLDP, and then click **Create**.



Templates > Create UCS Server Profile Template > Create LAN Connectivity Policy

Create Ethernet Network Control

Policy Details

Add policy details

This policy is applicable only for UCS Servers (FI-Attached)

Enable CDP: on

MAC Register Mode: ● Only Native VLAN ○ All Host VLANs

Action on Uplink Fail: ● Link Down ○ Warning

Important! If the Action on Uplink is set to Warning, the switch will not fail over if uplink connectivity is lost.

MAC Security

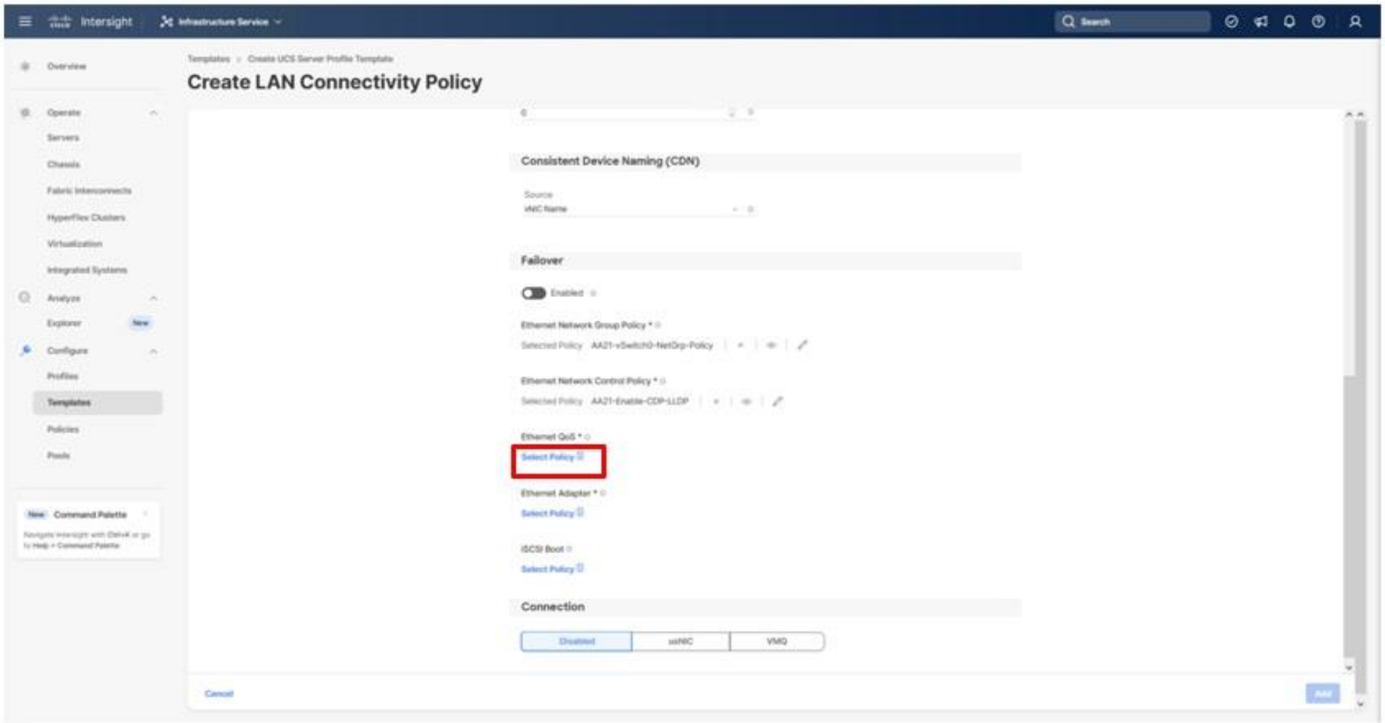
Forge: ● Allow ○ Deny

LLDP

Enable Transmit: on

Enable Receive: on

Step 23. For either type of vNIC, click **Select Policy** under Ethernet QoS.



Templates > Create UCS Server Profile Template

Create LAN Connectivity Policy

Consistent Device Naming (CDN)

Source: vNIC Name

Failover

Enabled: off

Ethernet Network Group Policy *

Selected Policy: AA21-vSwitch0-NetGrp-Policy

Ethernet Network Control Policy *

Selected Policy: AA21-Enable-CDP-LLDP

Ethernet QoS *

Select Policy

Ethernet Adapter *

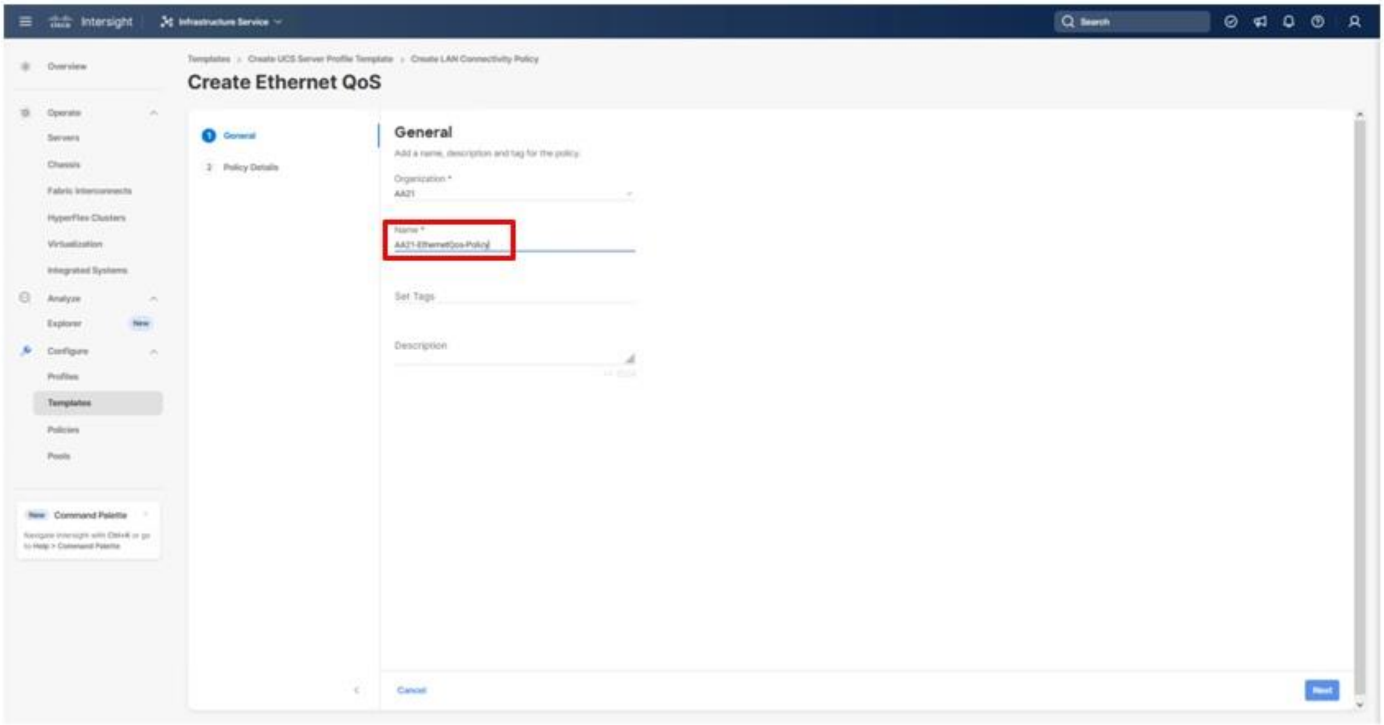
Select Policy

iSCSI Boot

Select Policy

Connection: [✓ Disabled] usNIC VMQ

Step 24. Click **Create New** from the right-hand column that appears or select the Ethernet QoS Policy if it has already been created and skip the next two steps.



Templates > Create UCS Server Profile Template > Create LAN Connectivity Policy

Create Ethernet QoS

1 General

2 Policy Details

General

Add a name, description and tag for the policy.

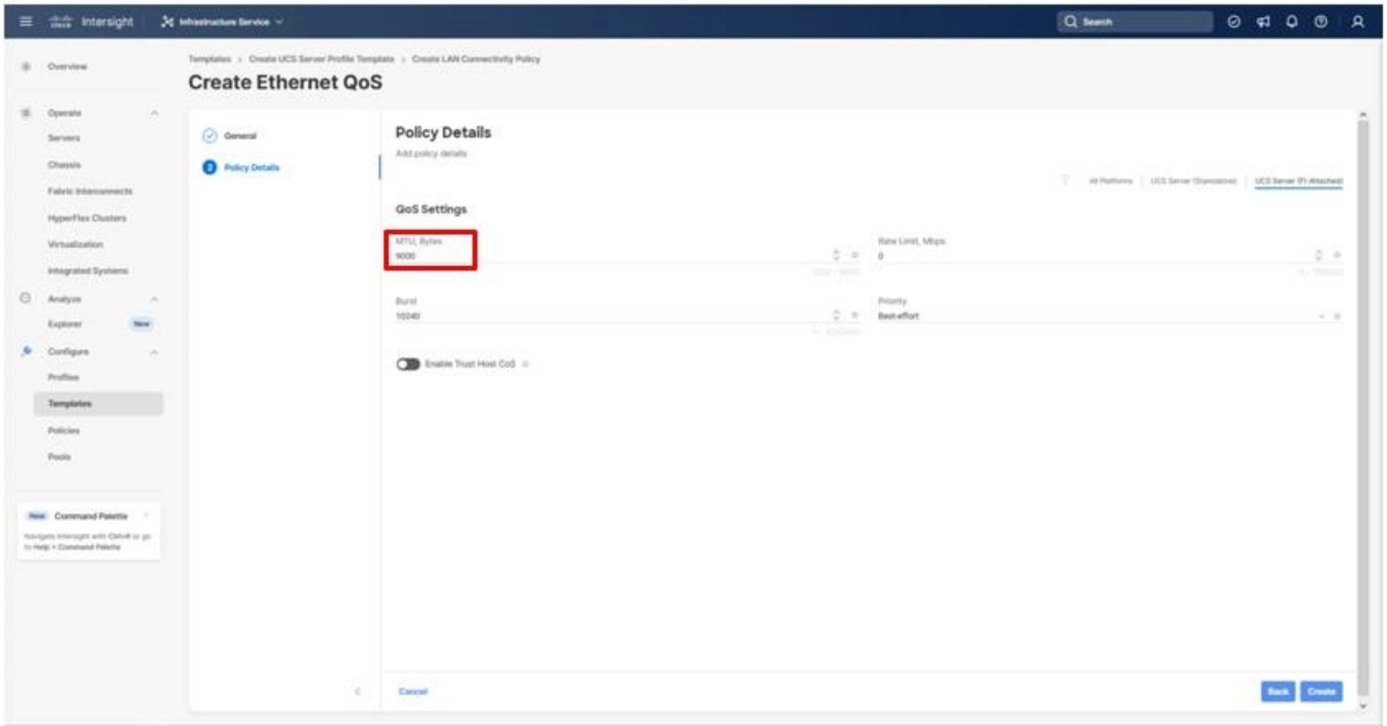
Organization * AA21

Name * AA21-EthernetQos-Policy

Set Tags

Description

Step 25. Change the MTU Bytes settings to 9000 and click **Create**.



Templates > Create UCS Server Profile Template > Create LAN Connectivity Policy

Create Ethernet QoS

General

2 Policy Details

Policy Details

Add policy details

QoS Settings

MTU, Bytes 9000

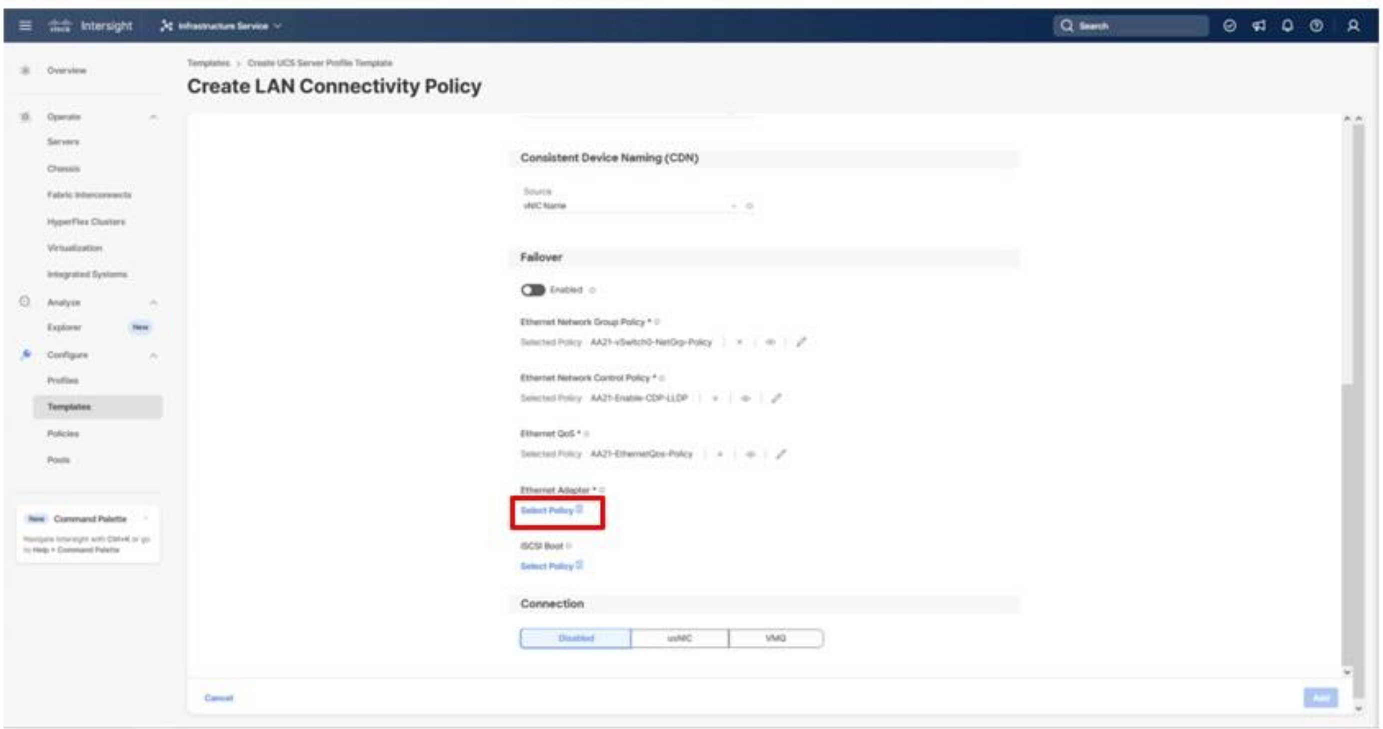
Rate Limit, Mbps 0

Burst 10240

Priority Best-effort

Enable Trust Host CoS

Step 26. For either type of vNIC, click **Select Policy** under Ethernet Adapter.



Create LAN Connectivity Policy

Consistent Device Naming (CDN)

Source: vNIC Name

Failover

Enabled

Ethernet Network Group Policy *
Selected Policy AA21-vSwitch0-NetGrp-Policy

Ethernet Network Control Policy *
Selected Policy AA21-Enable-CDP-LLDP

Ethernet QoS *
Selected Policy AA21-EthernetQos-Policy

Ethernet Adapter *
Select Policy

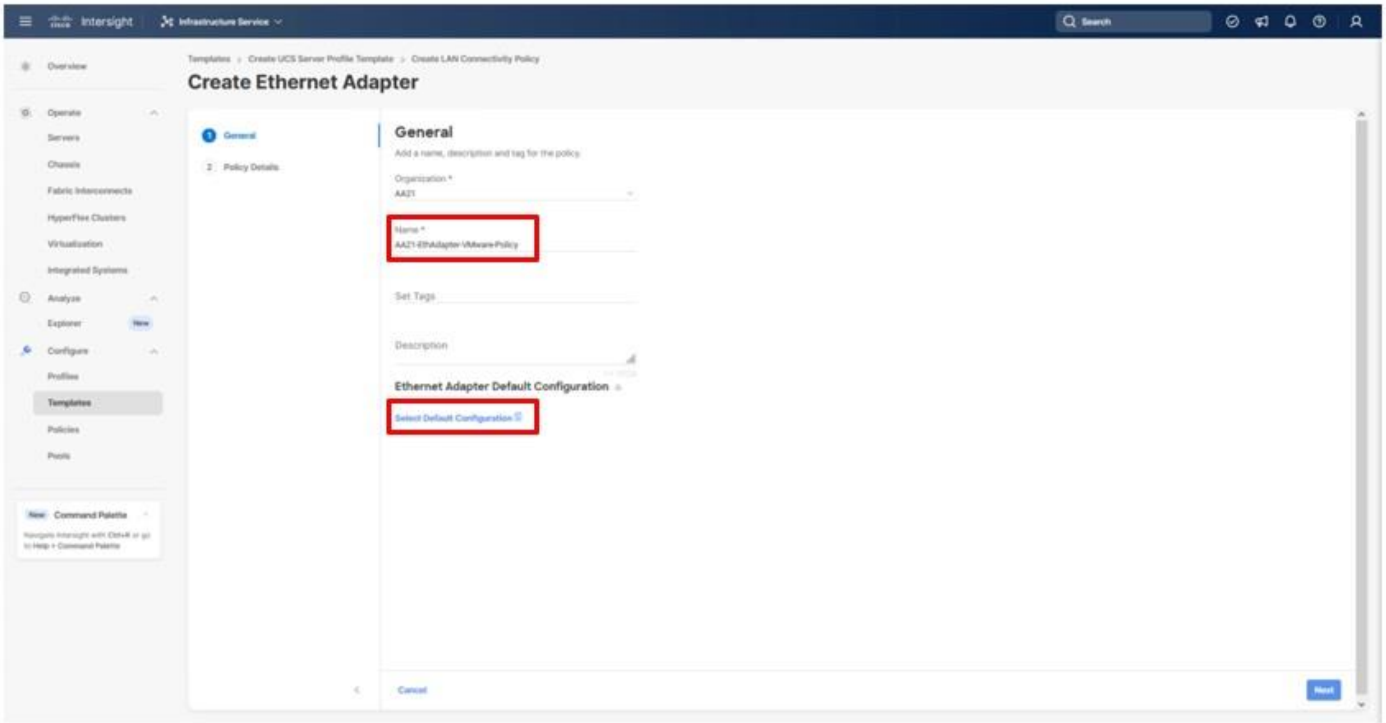
iSCSI Boot
Select Policy

Connection

Disabled | usNIC | VMQ

Step 27. Click **Create New** from the right-hand column that appears or select the Ethernet Adapter Policy if it has already been created and skip the next two steps. One policy will be created for the vSwitch0 vNICs, and a different policy will be created for the vDS0 vNICs.

Step 28. To create the vSwitch0 policy, specify a Name for the policy, and click **Select Default Configuration**.



Create Ethernet Adapter

General

Add a name, description and tag for the policy.

Organization * AA21

Name * AA21-EthAdapter-VMware-Policy

Set Tags

Description

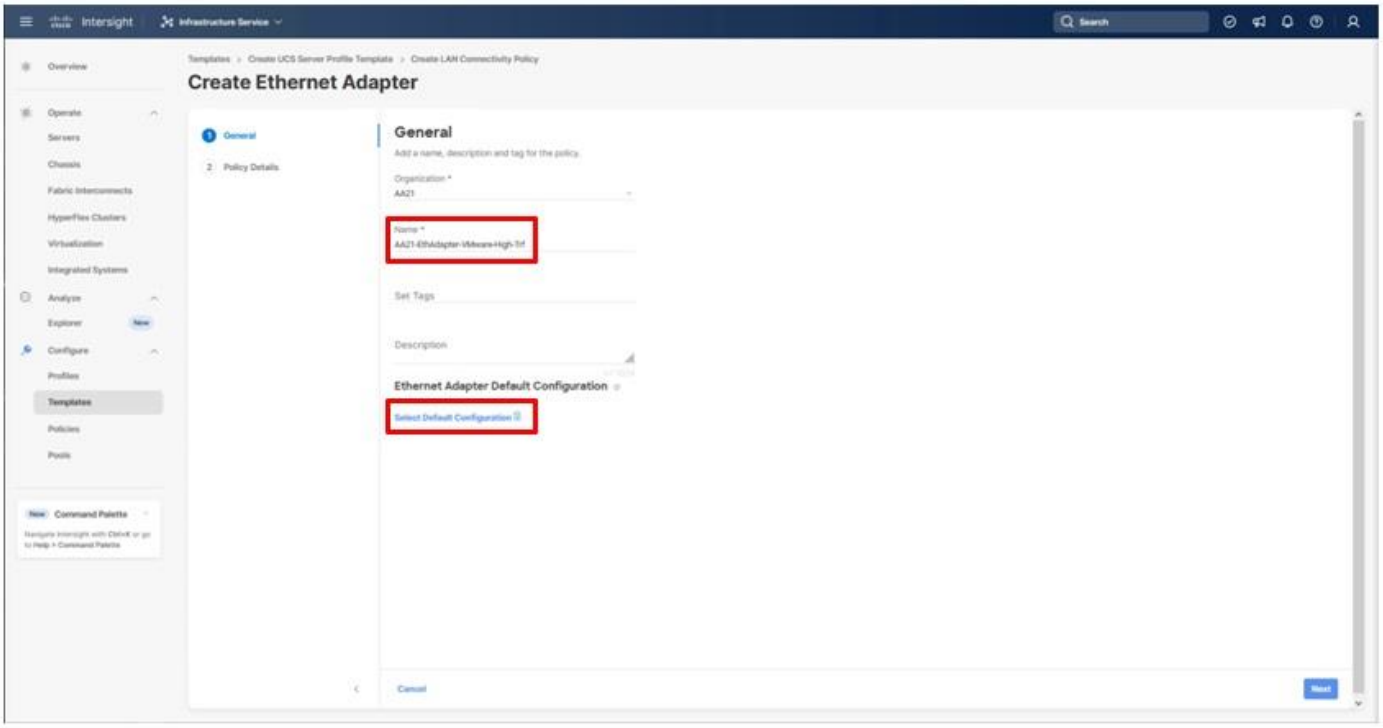
Ethernet Adapter Default Configuration

Select Default Configuration

Step 29. Select the **VMWare** option from the column that appears to the right and click **Next**.

Step 30. Leave all options set to their default settings in the resulting screen and click **Create**.

Step 31. To create the vDS0 policy, specify a Name for the higher traffic settings used in the policy, and click **Select Default Configuration**.



Templates > Create UCS Server Profile Template > Create LAN Connectivity Policy

Create Ethernet Adapter

General

Add a name, description and tag for the policy.

Organization *
AA21

Name *
AA21-EthAdapter-VMware-High-Trf

Set Tags

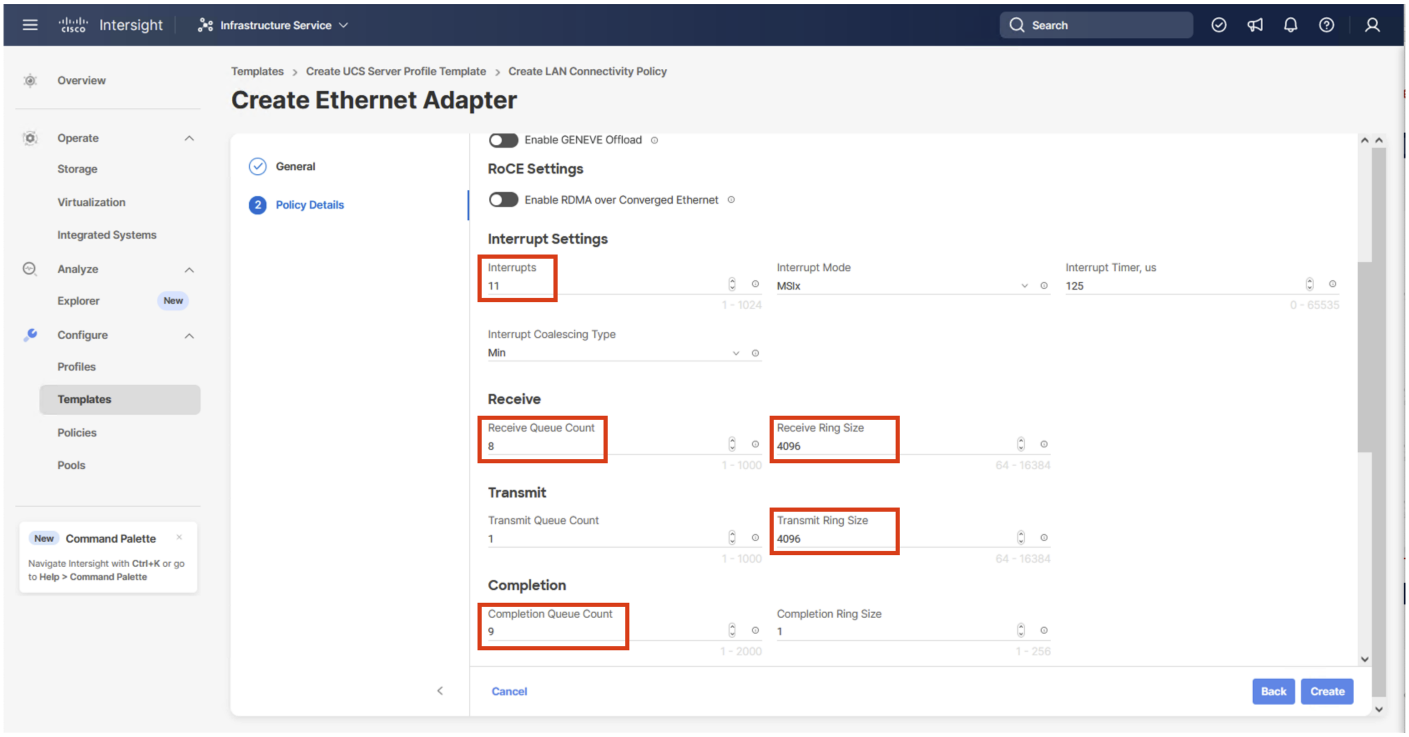
Description

Ethernet Adapter Default Configuration

Select Default Configuration

Step 32. Select the **VMWare** option from the column that appears to the right and click **Next**.

Step 33. Change the **Interrupts** to **11**, the **Receive Queue Count** to **8**, the **Receive Ring Size** to **4096**, the **Transmit Ring Size** to **4096**, and the **Completion Queue Count** to **9**. Click **Create**.



Templates > Create UCS Server Profile Template > Create LAN Connectivity Policy

Create Ethernet Adapter

Enable GENEVE Offload

RoCE Settings

Enable RDMA over Converged Ethernet

Interrupt Settings

Interrupts: 11 (1 - 1024)

Interrupt Mode: MSIx

Interrupt Timer, us: 125 (0 - 65535)

Interrupt Coalescing Type: Min

Receive

Receive Queue Count: 8 (1 - 1000)

Receive Ring Size: 4096 (64 - 16384)

Transmit

Transmit Queue Count: 1 (1 - 1000)

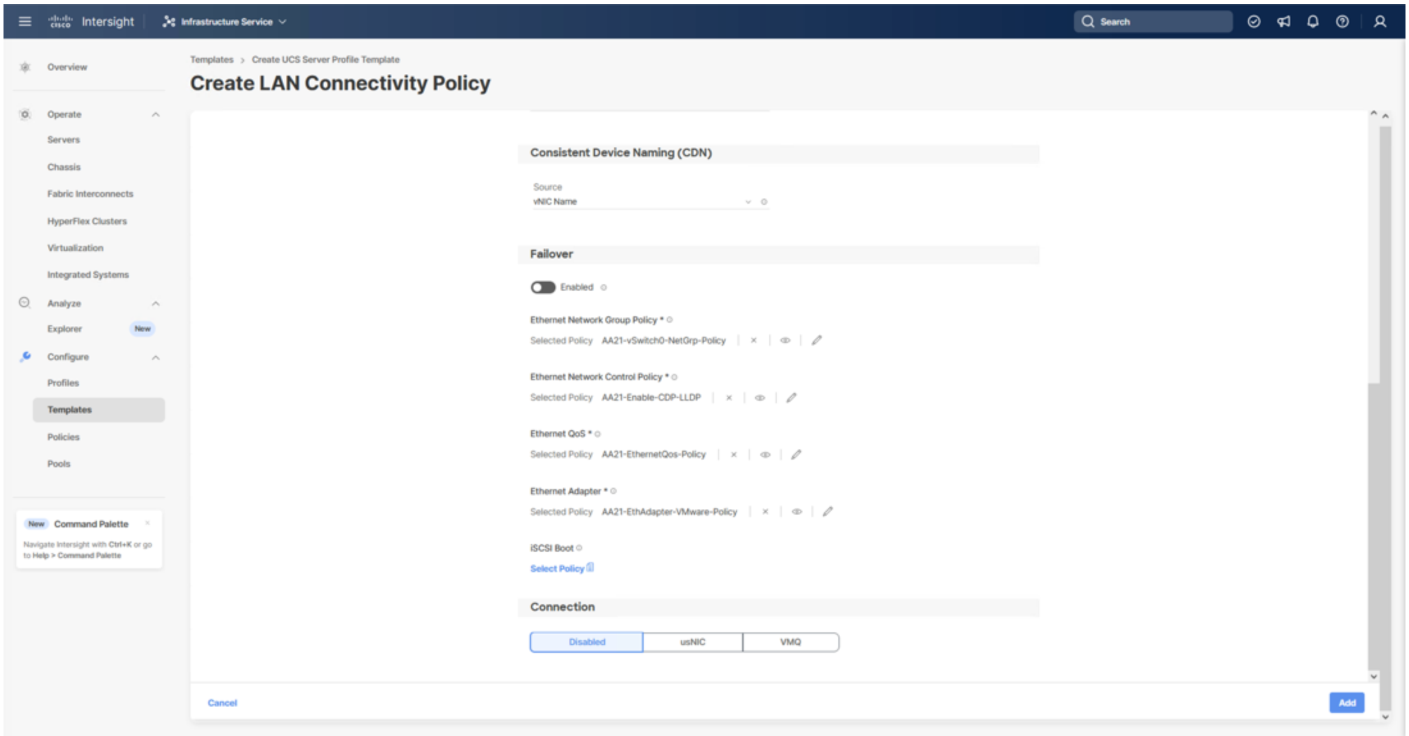
Transmit Ring Size: 4096 (64 - 16384)

Completion

Completion Queue Count: 9 (1 - 2000)

Completion Ring Size: 1 (1 - 256)

Step 34. Click **Add**.



Templates > Create UCS Server Profile Template

Create LAN Connectivity Policy

Consistent Device Naming (CDN)

Source: vNIC Name

Failover

Enabled

Ethernet Network Group Policy *
Selected Policy AA21-vSwitch0-NetGrp-Policy

Ethernet Network Control Policy *
Selected Policy AA21-Enable-CDP-LLDP

Ethernet QoS *
Selected Policy AA21-EthernetQos-Policy

Ethernet Adapter *
Selected Policy AA21-EthAdapter-VMware-Policy

iSCSI Boot
Select Policy

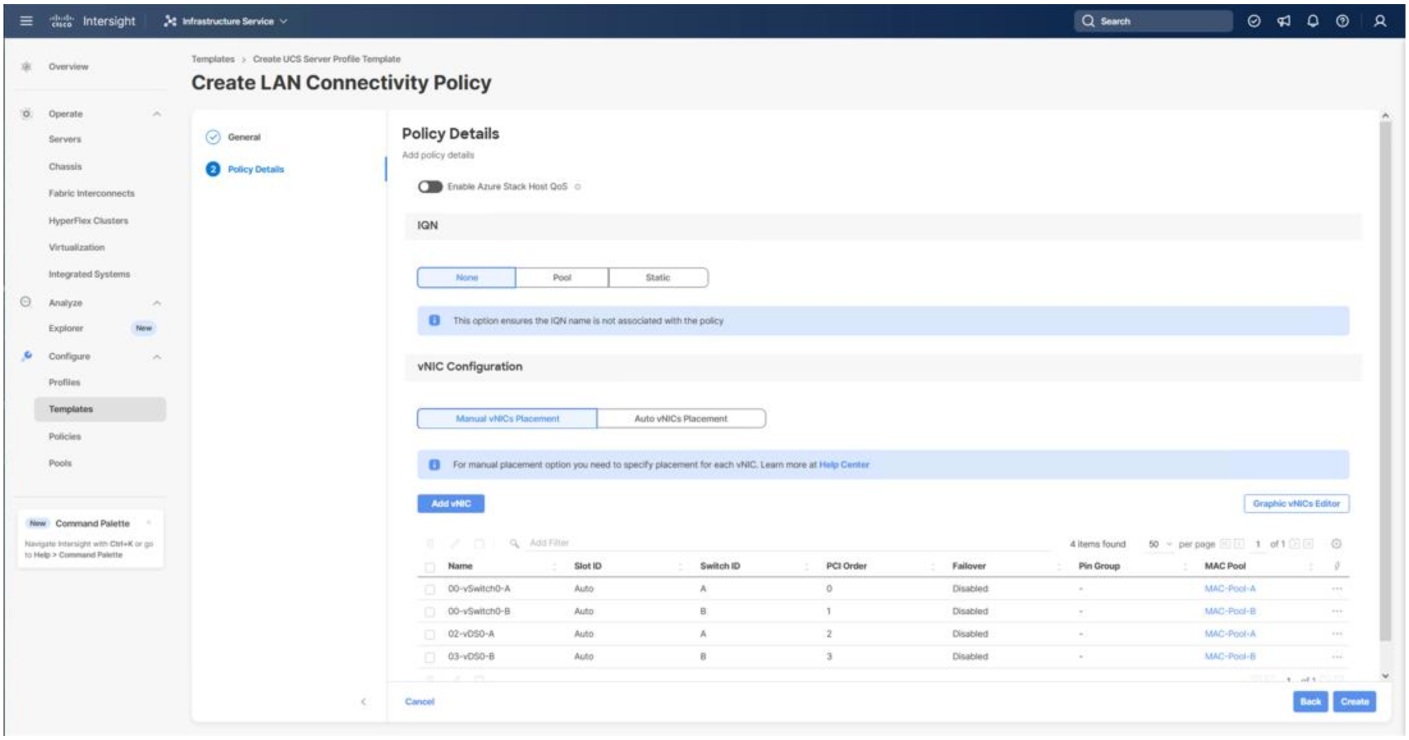
Connection

[✓ Disabled] usNIC VMQ

Cancel Add

Step 35. Repeat steps 3-34 for each additional vNIC, creating the appropriate pools and policies as required.

Step 36. Click **Create** to finish the LAN Connectivity Policy.



Templates > Create UCS Server Profile Template

Create LAN Connectivity Policy

Policy Details

Add policy details

Enable Azure Stack Host QoS

IQN

[✓ None] Pool Static

This option ensures the IQN name is not associated with the policy

vNIC Configuration

[✓ Manual vNICs Placement] Auto vNICs Placement

For manual placement option you need to specify placement for each vNIC. Learn more at Help Center

Add vNIC Graphic vNICs Editor

Add Filter 4 items found 50 per page 1 of 1

Name	Slot ID	Switch ID	PCI Order	Failover	Pin Group	MAC Pool
00-vSwitch0-A	Auto	A	0	Disabled	-	MAC-Pool-A
00-vSwitch0-B	Auto	B	1	Disabled	-	MAC-Pool-B
02-vDS0-A	Auto	A	2	Disabled	-	MAC-Pool-A
03-vDS0-B	Auto	B	3	Disabled	-	MAC-Pool-B

Cancel Back Create

SAN Connectivity

Procedure 1. Create Network Connectivity - SAN Connectivity

A SAN connectivity policy determines the network storage resources and the connections between the server and the storage device on the network. This policy enables you to configure the vHBAs that the servers use to communicate with the SAN.

Table 16 lists the details of four vHBAs that are used to provide FC connectivity, FC boot from SAN functionality, and FC-NVMe connectivity.

Table 16. SAN Connectivity vHBAs

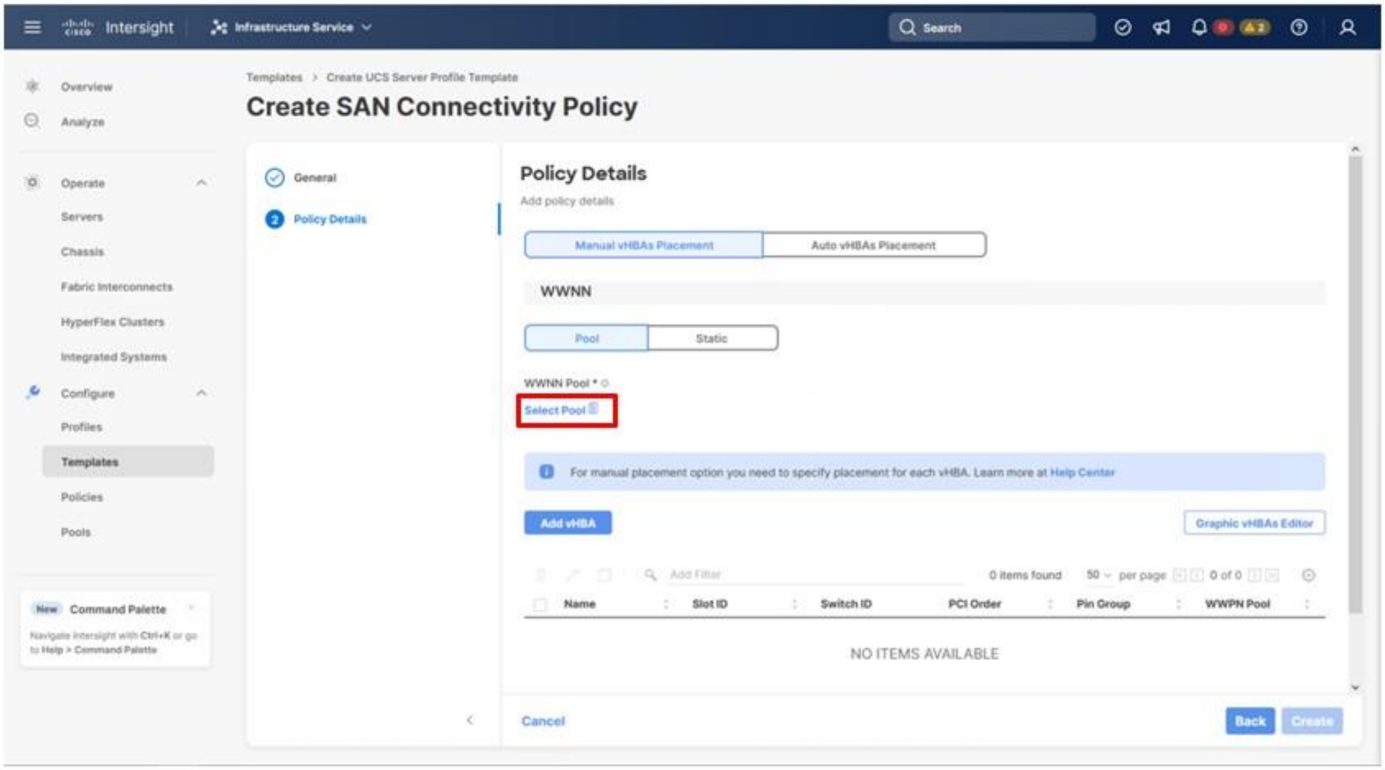
vNIC/vHBA Name	Slot	Switch ID	PCI Order
FC-A	MLOM	A	4
FC -B	MLOM	B	5
FC-NVMe-A	MLOM	A	6
FC-NVMe-B	MLOM	B	7

Step 1. Click **Select Policy** next to SAN Connectivity and in the pane on the right, click **Create New**.

Step 2. Verify that the correct organization is selected from the drop-down list (for example, AA21) and provide a Name for the policy (for example, AA21-FC-NVMe-FC-SAN). Click **Next**.

Step 3. Select **Manual vHBAs Placement**.

Step 4. Click **Select Pool** under WWNN Address.



For manual placement option you need to specify placement for each vHBA. Learn more at Help Center

Procedure 2. Create the WWNN Address Pool

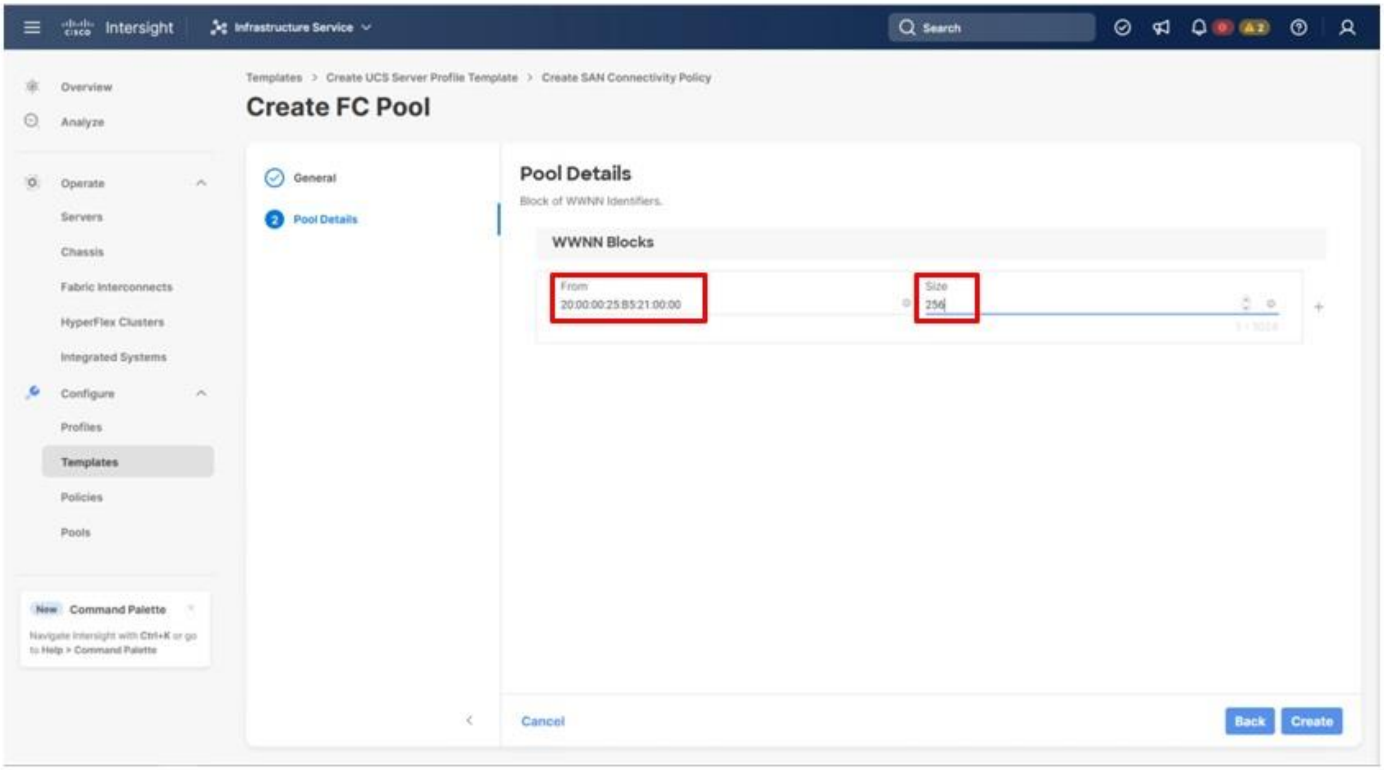
The WWNN address pools have not been defined yet therefore a new **WWNN Address Pool** has to be defined. To create the WWNN address pool, follow these steps:

Step 1. Click **Select Pool** under **WWNN Address Pool** and in the pane on the right, click **Create New**.

Step 2. Verify that the correct organization is selected from the drop-down list (for example, AA21) and provide a name for the policy (for example, AA21-WWNN-Pool).

Step 3. Click **Next**.

Step 4. Provide the starting WWNN block address and the size of the pool.



Create FC Pool

Pool Details

Block of WWNN Identifiers.

WWNN Blocks

From: 20:00:00:25:B5:21:00:00

Size: 256

Note: As a best practice, some additional information can be coded into the WWNN address pool for ease of troubleshooting. For example, the address 20:00:00:25:B5:21:00:00 contains a reference to the AA21 rack ID.

Step 5. Click **Create** to finish creating the WWNN address pool.

Procedure 3. Create the vHBA-A for SAN A

Step 1. Click **Add vHBA**.

Step 2. Provide the Name (for example, FC-A) and vHBA Type and choose **fc-initiator** from the drop-down list.

Procedure 4. Create the WWPN Pool for SAN A

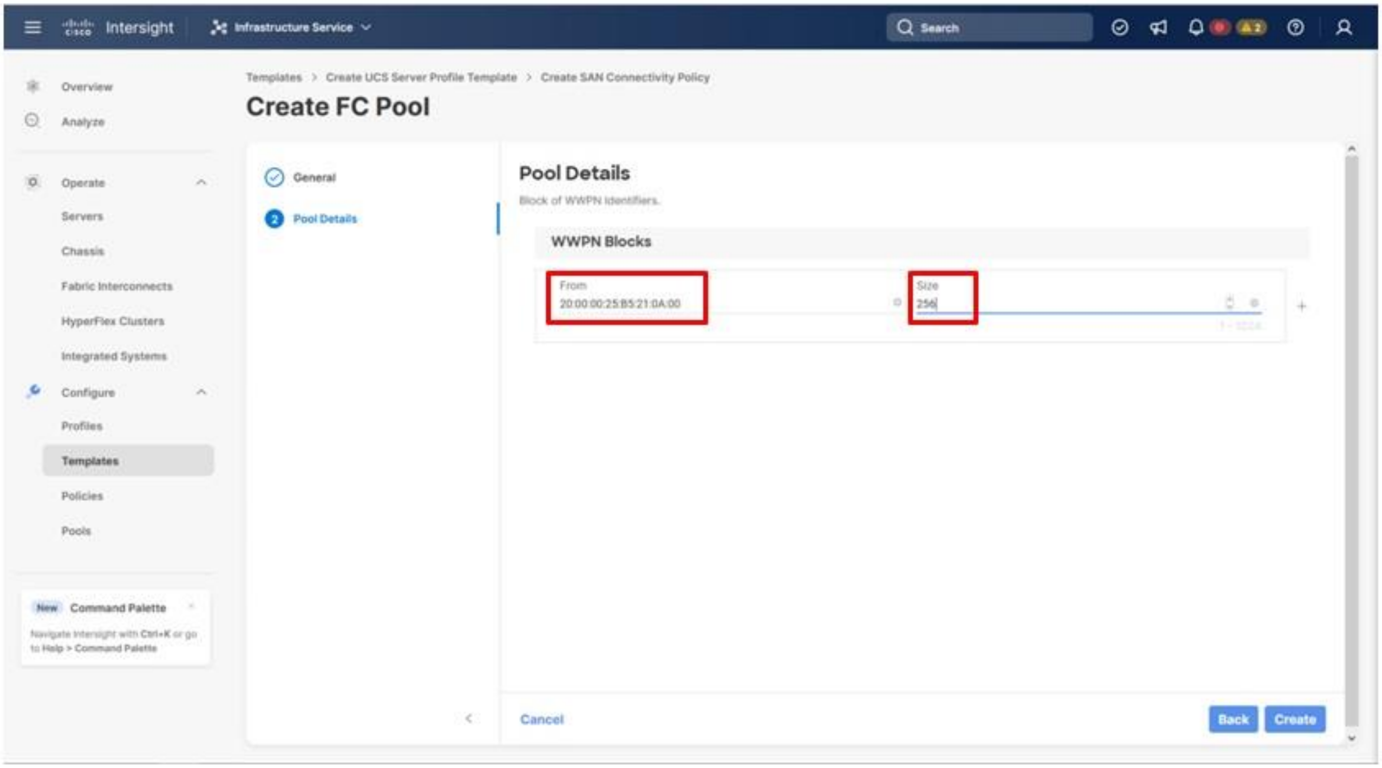
The WWPN address pool has not been defined yet therefore a WWPN address pool for Fabric A will be defined. This pool will also be used for the FC-NVMe vHBAs if the vHBAs are defined.

Step 1. Click **Select Pool** under WWPN Address Pool an in the pane on the right, click **Create New**.

Step 2. Verify that the correct organization is selected from the drop-down list (for example, AA21) and provide a name for the policy (for example, AA21-WWPN-Pool-A).

Step 3. Provide the starting WWPN block address for SAN A and the size.

Note: As with the WWNN, some additional information can be coded into the WWPN address pool for ease of troubleshooting. For example, the address 20:00:00:25:B5:21:0A:00, 21 references Rack ID 21 and 0A signifies SAN A.



Templates > Create UCS Server Profile Template > Create SAN Connectivity Policy

Create FC Pool

Pool Details

Block of WWPN identifiers.

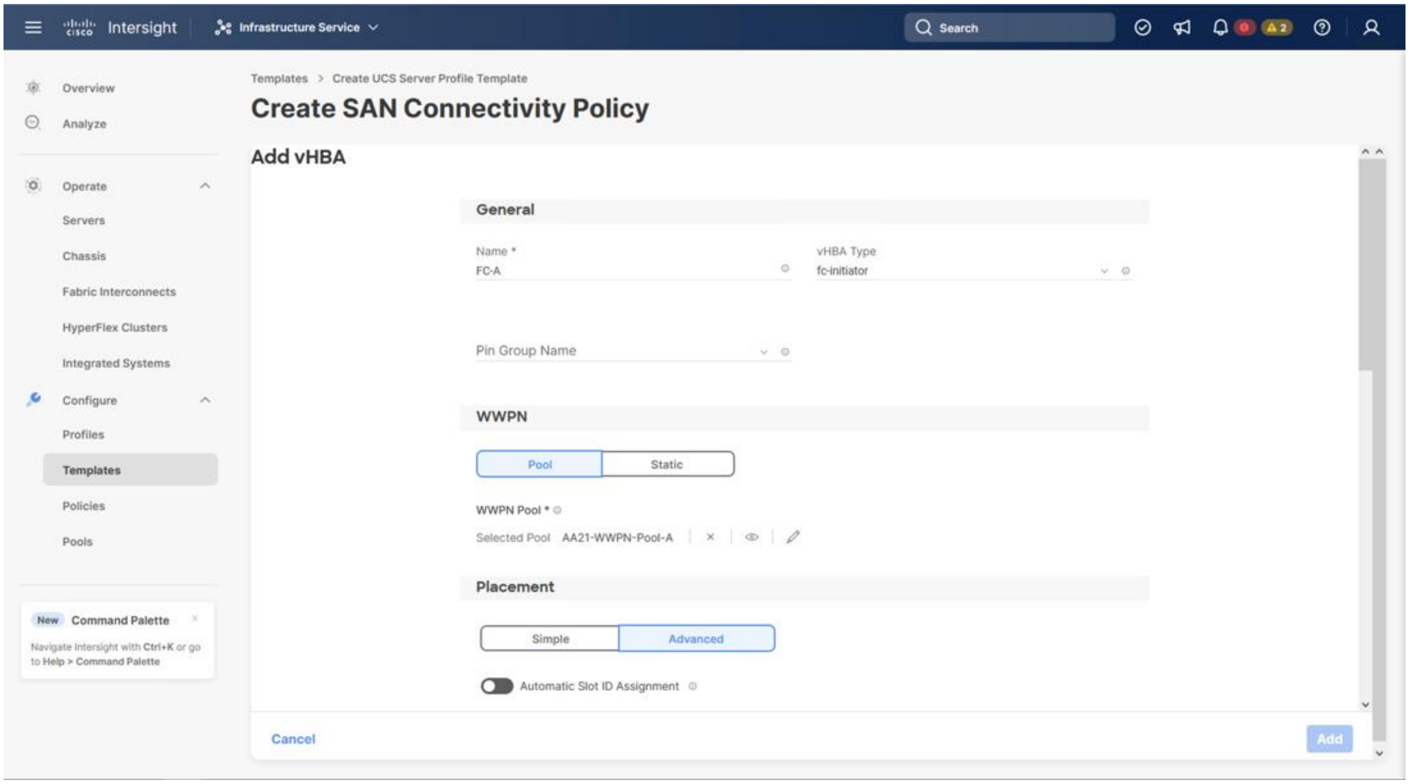
WWPN Blocks

From: 20:00:00:25:B5:21:0A:00

Size: 256

1 - 1024

Step 4. Click **Create** to finish creating the WWPN pool.



Templates > Create UCS Server Profile Template

Create SAN Connectivity Policy

Add vHBA

General

Name *: FC-A

vHBA Type: fc-initiator

Pin Group Name

WWPN

[✓ Pool] Static

WWPN Pool *

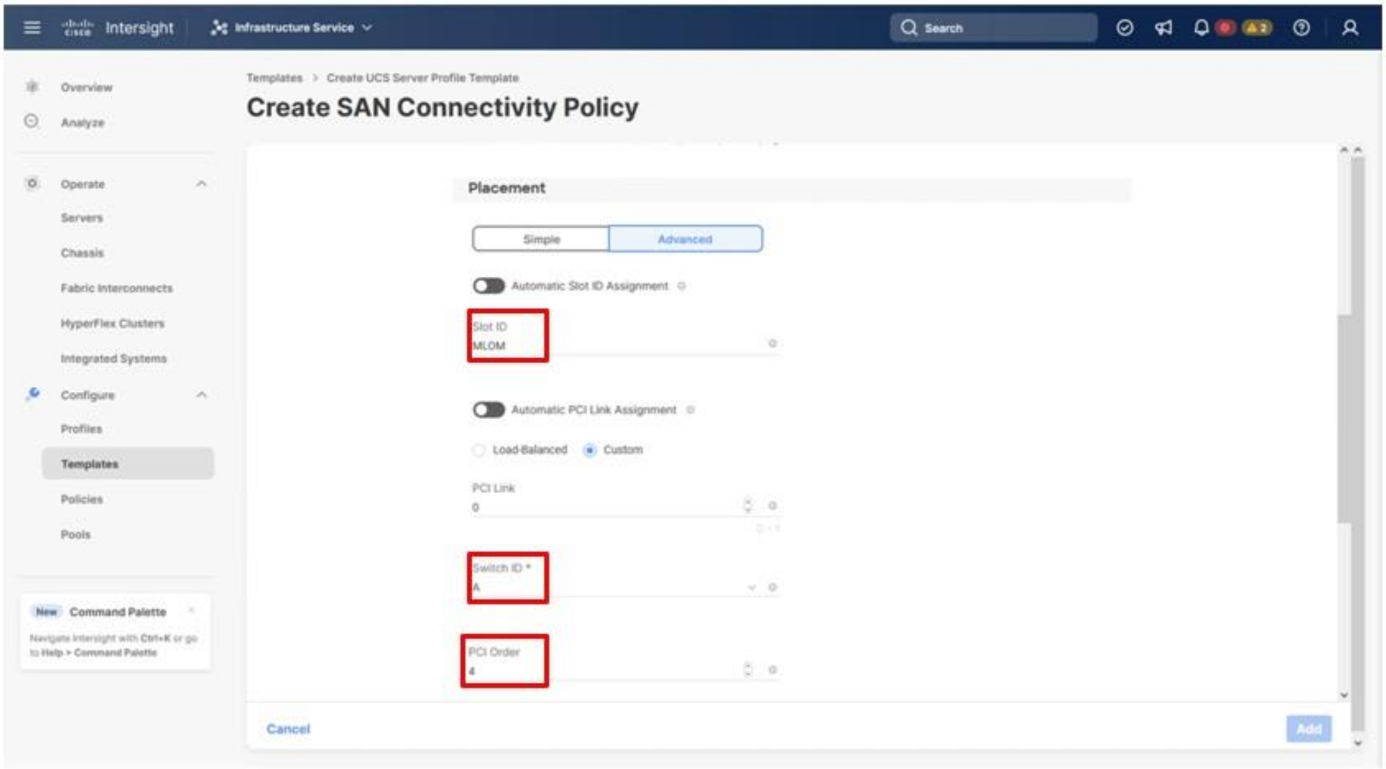
Selected Pool AA21-WWPN-Pool-A

Placement

Simple [✓ Advanced]

Automatic Slot ID Assignment

Step 5. Back in the **Create vHBA** window, using Advanced Placement, specify the **Slot ID**, **Switch ID** (for example, A) and **PCI Order** from Table 16.



Create SAN Connectivity Policy

Placement

Simple | Advanced

Automatic Slot ID Assignment

Slot ID
MLOM

Automatic PCI Link Assignment

○ Load-Balanced ● Custom

PCI Link
0

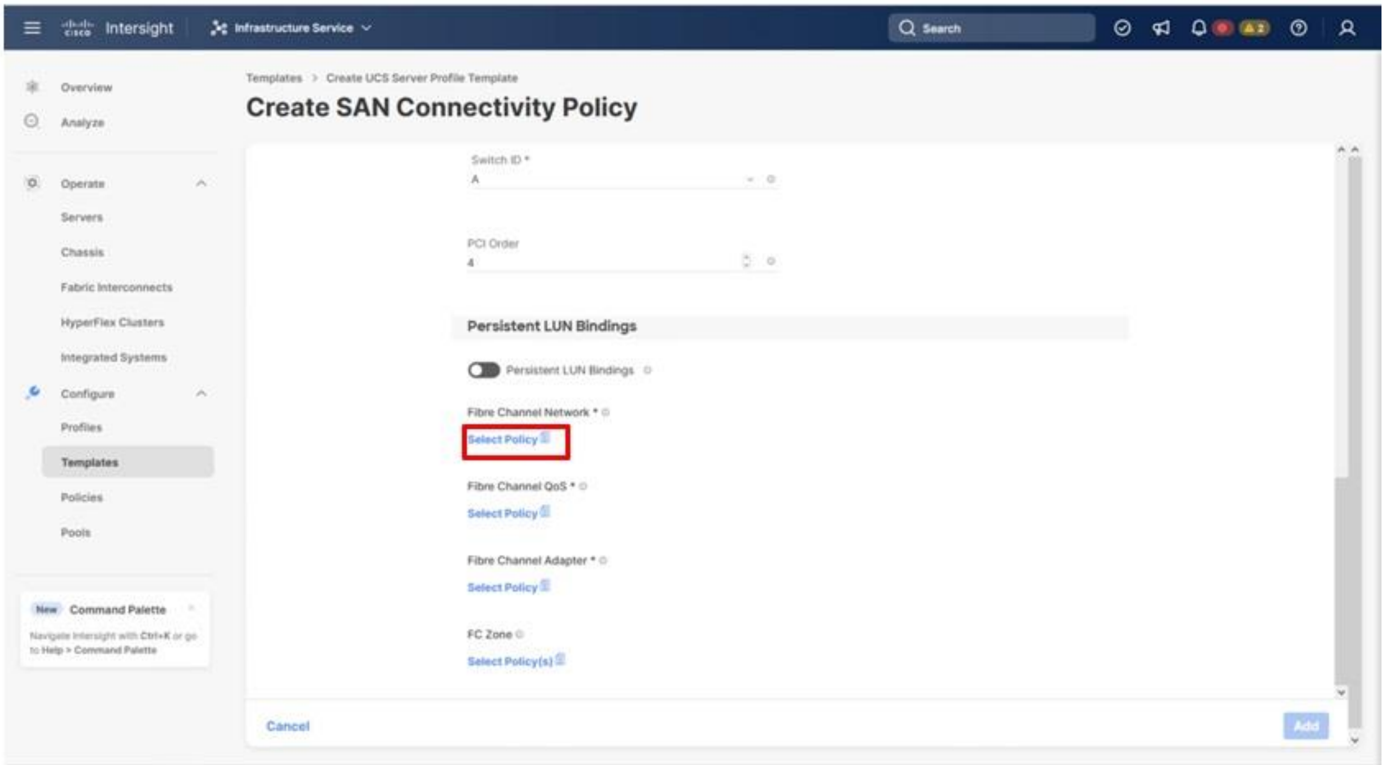
Switch ID *
A

PCI Order
4

Procedure 5. Create Fibre Channel Network Policy for SAN A

A Fibre Channel network policy governs the VSAN configuration for the virtual interfaces. In this deployment, VSAN 101 will be used for vHBA-A.

Step 1. Scroll down within the Create SAN Connectivity Policy dialogue and click **Select Policy** under Fibre Channel Network and in the pane on the right, click **Create New**.



Templates > Create UCS Server Profile Template

Create SAN Connectivity Policy

Switch ID *
A

PCI Order
4

Persistent LUN Bindings

Persistent LUN Bindings

Fibre Channel Network *
Select Policy

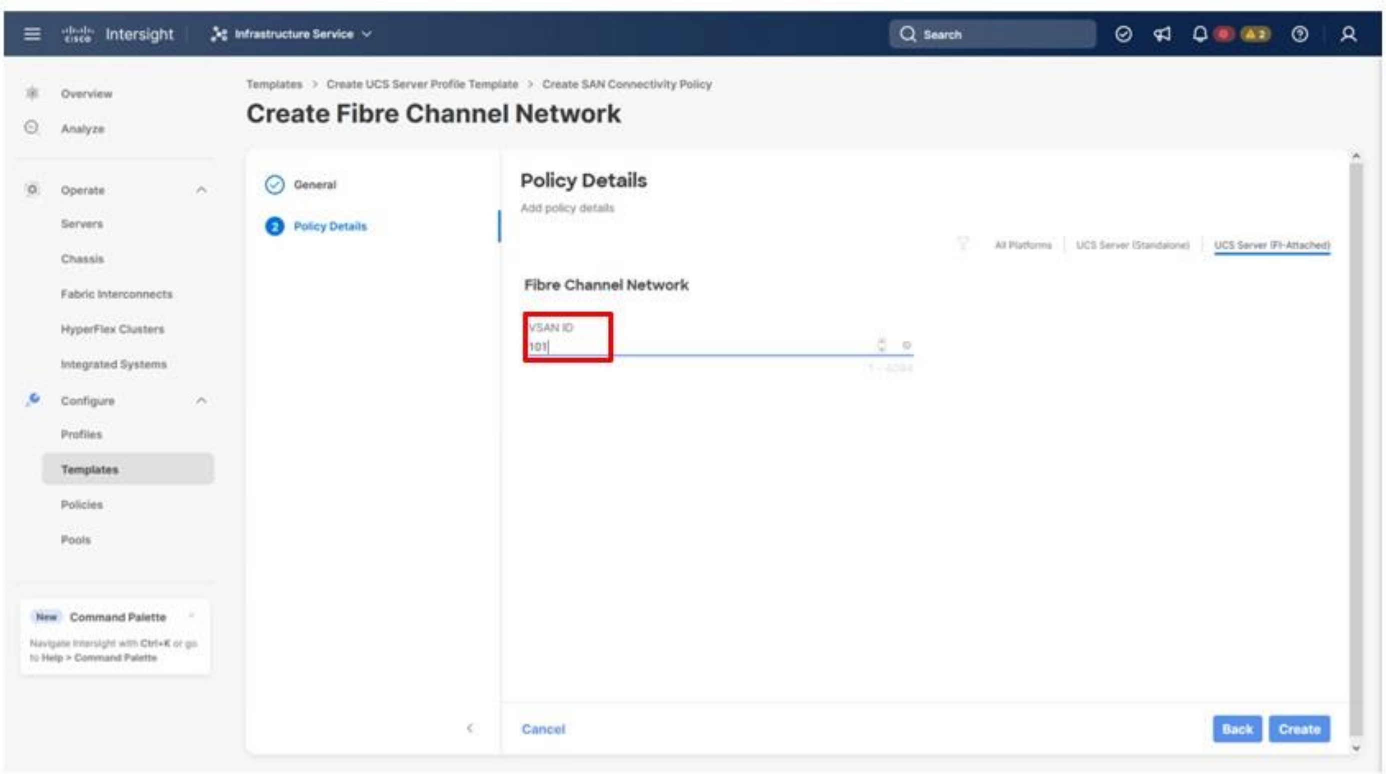
Fibre Channel QoS *
Select Policy

Fibre Channel Adapter *
Select Policy

FC Zone
Select Policy(s)

Step 2. Verify that the correct organization is selected from the drop-down list (for example, AA21) and provide a name for the policy (for example, AA21-FC-Network-SAN-A).

Step 3. Specify the VSAN ID for Fabric A, (for example, 101).



Create Fibre Channel Network

Policy Details

Fibre Channel Network

VSAN ID: 101 (1 - 4094)

Step 4. Click **Create** to finish creating the Fibre Channel network policy.

Procedure 6. Create Fibre Channel QoS Policy

The Fibre Channel QoS policy assigns a system class to the outgoing traffic for a vHBA. This system class determines the quality of service for the outgoing traffic. The Fibre Channel QoS policy used in this deployment uses default values and will be shared by all vHBAs.

Step 1. Click **Select Policy under Fibre Channel QoS** and in the pane on the right, click **Create New**.

Step 2. Verify that the correct organization is selected from the drop-down list (for example, AA21) and provide a name for the policy (for example, AA21-FC-QoS-Policy).

Step 3. Do not change the default values on the Policy Details screen.

Step 4. Click **Create** to finish creating the Fibre Channel QoS policy.

Procedure 7. Create Fibre Channel Adapter Policy

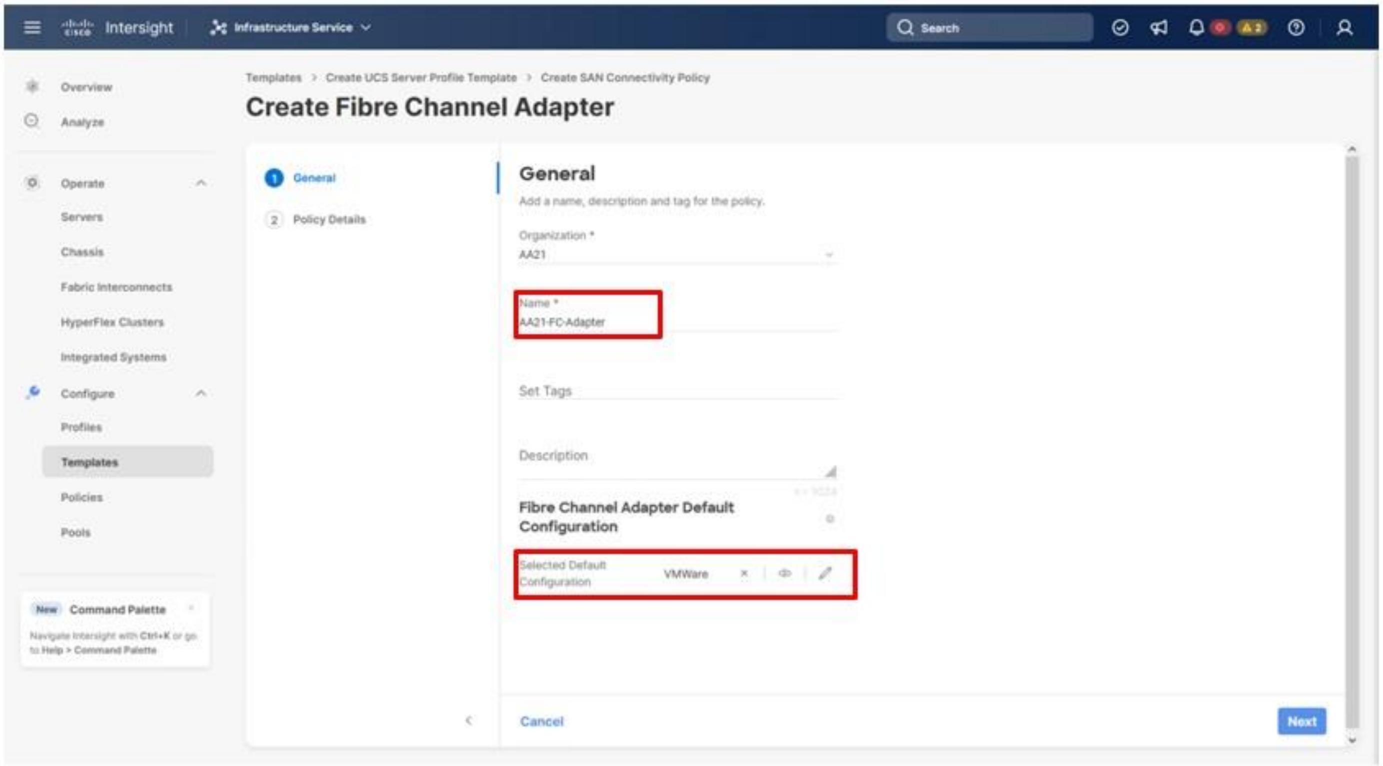
A Fibre Channel adapter policy governs the host-side behavior of the adapter, including the way that the adapter handles traffic. This validation uses the default values for the adapter policy, and the policy will be shared by all the vHBAs.

Step 1. Click **Select Policy** under Fibre Channel Adapter and in the pane on the right, click **Create New.**

Step 2. Verify that the correct organization is selected from the drop-down list (for example, AA21) and provide a name for the policy (for example, AA21-FC-Adapter).

Step 3. Under Fibre Channel Adapter Default Configuration, click **Select Default Configuration**.

Step 4. Select **VMWare** and click **Next**.



Templates > Create UCS Server Profile Template > Create SAN Connectivity Policy

Create Fibre Channel Adapter

1 General

2 Policy Details

General

Add a name, description and tag for the policy.

Organization *
AA21

Name *
AA21-FC-Adapter

Set Tags

Description

Fibre Channel Adapter Default Configuration

Selected Default Configuration: VMWare

Step 5. Do not change the default values on the Policy Details screen.

Step 6. Click **Create** to finish creating the Fibre Channel adapter policy.

Step 7. Click **Add** to create vHBA FC-A.

Procedure 8. Create the vHBA for SAN B

Step 1. Click **Add vHBA**.

Step 2. For **vHBA Type**, choose **fc-initiator** from the drop-down list.

Procedure 9. Create the WWPN Pool for SAN B

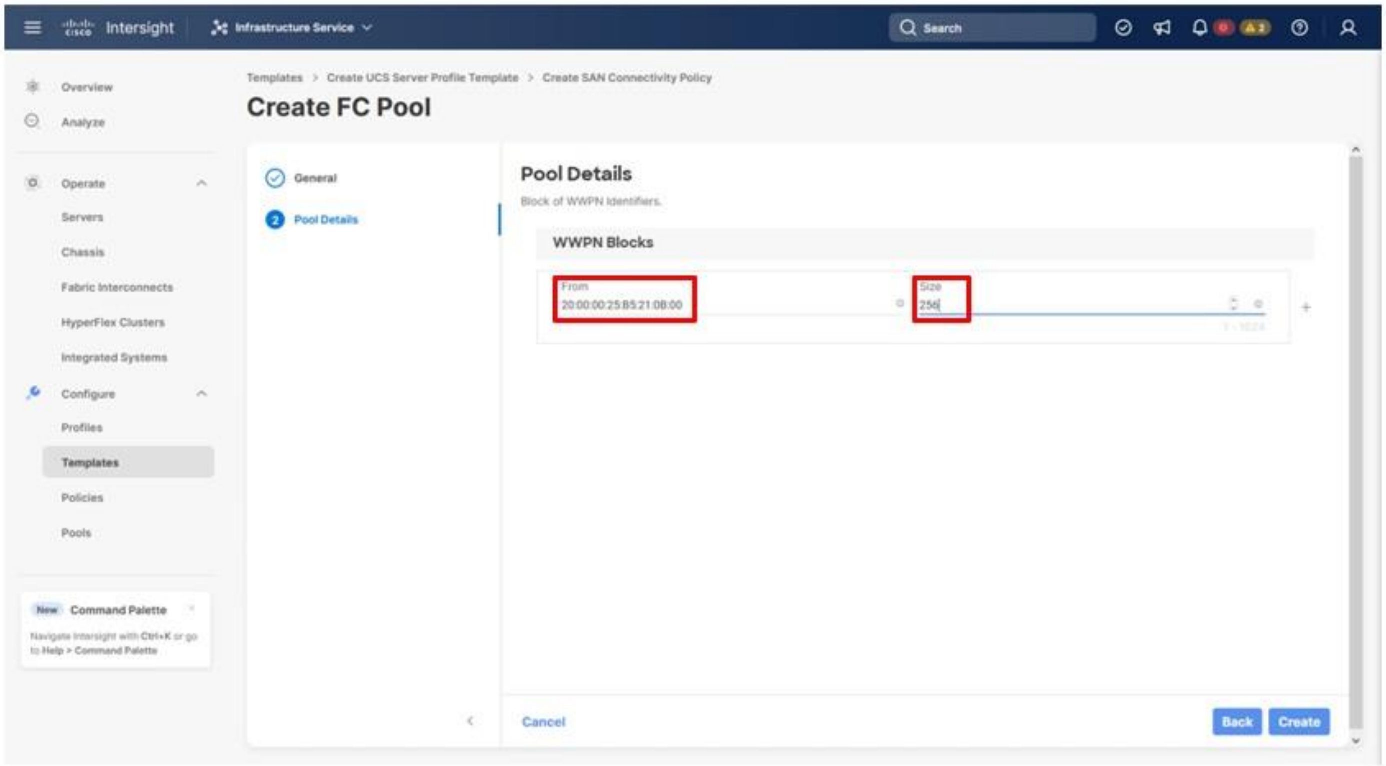
The WWPN address pool has not been defined yet therefore a WWPN address pool for Fabric B will be defined. This pool will also be used for the FC-NVMe vHBAs as well.

Step 1. Click **Select Pool** under WWPN Address Pool and in the pane on the right, click **Create New**.

Step 2. Verify that the correct organization is selected from the drop-down list (for example, AA21) and provide a name for the policy (for example, AA21-WWPN-Pool-B).

Step 3. Provide the starting WWPN block address for SAN B and the size.

Note: As a best practice, some additional information is once again coded into the WWPN address pool for ease of troubleshooting. For example, the address 20:00:00:25:B5:21:0B:00, 21 contains the rack ID and 0B signifies SAN B.



Templates > Create UCS Server Profile Template > Create SAN Connectivity Policy

Create FC Pool

Pool Details

Block of WWPN Identifiers.

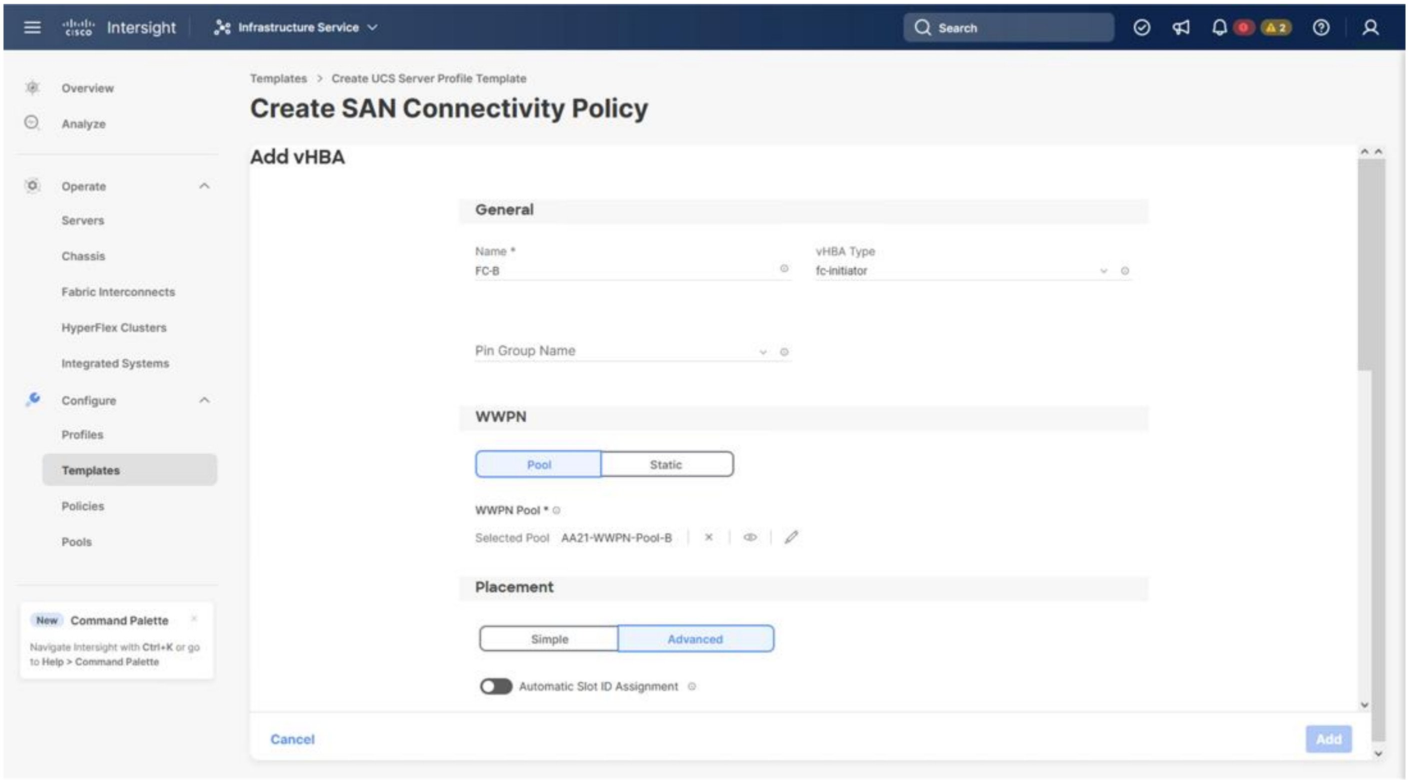
WWPN Blocks

From: 20:00:00:25:B5:21:0B:00

Size: 256

1 - 1024

Step 4. Click **Create** to finish creating the WWPN pool.



Templates > Create UCS Server Profile Template

Create SAN Connectivity Policy

Add vHBA

General

Name *: FC-B

vHBA Type: fc-initiator

Pin Group Name

WWPN

Pool | Static

WWPN Pool *

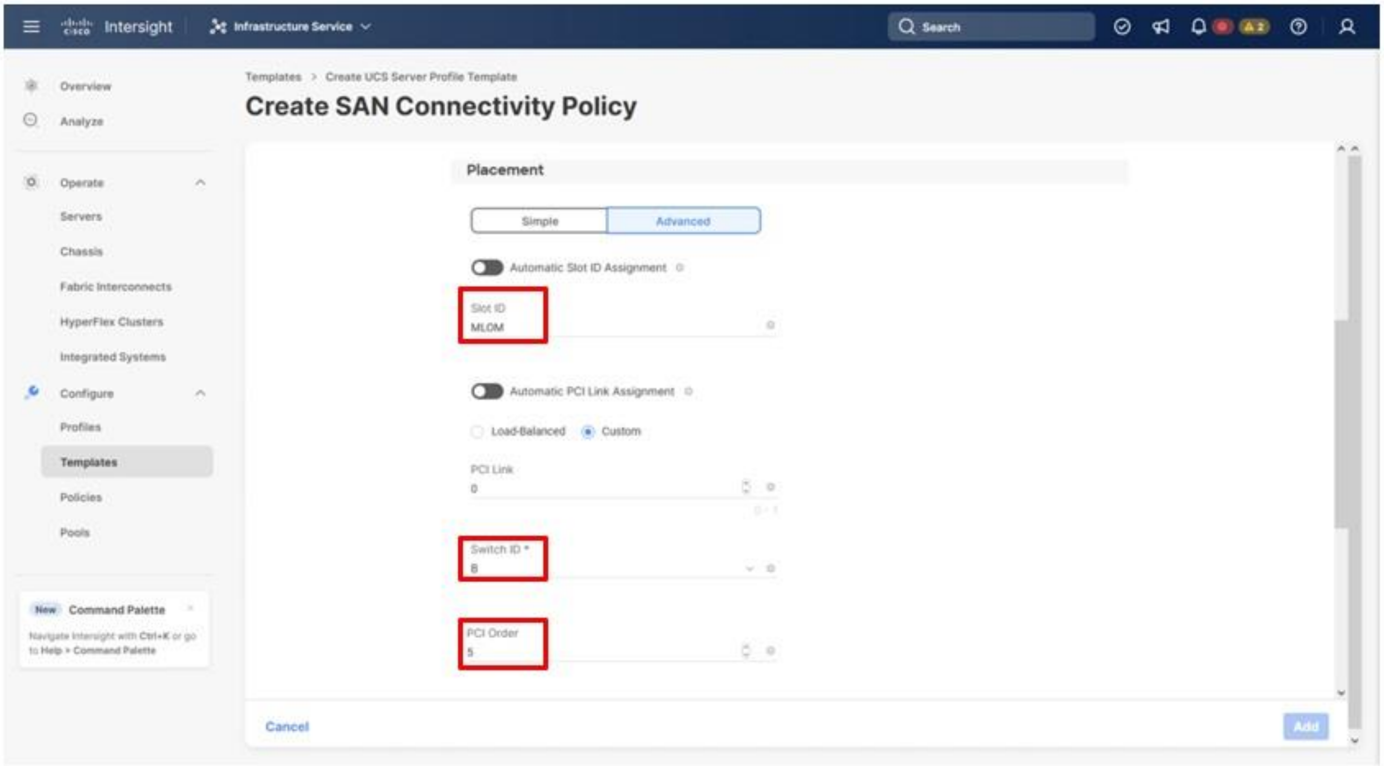
Selected Pool AA21-WWPN-Pool-B

Placement

Simple | Advanced

Automatic Slot ID Assignment

Step 5. Scroll down if needed to add the Slot ID, Switch ID (for example, A) and PCI Order from Table 15.



Templates > Create UCS Server Profile Template

Create SAN Connectivity Policy

Placement

Simple | Advanced

Automatic Slot ID Assignment

Slot ID: MLOM

Automatic PCI Link Assignment

○ Load-Balanced ● Custom

PCI Link: 0

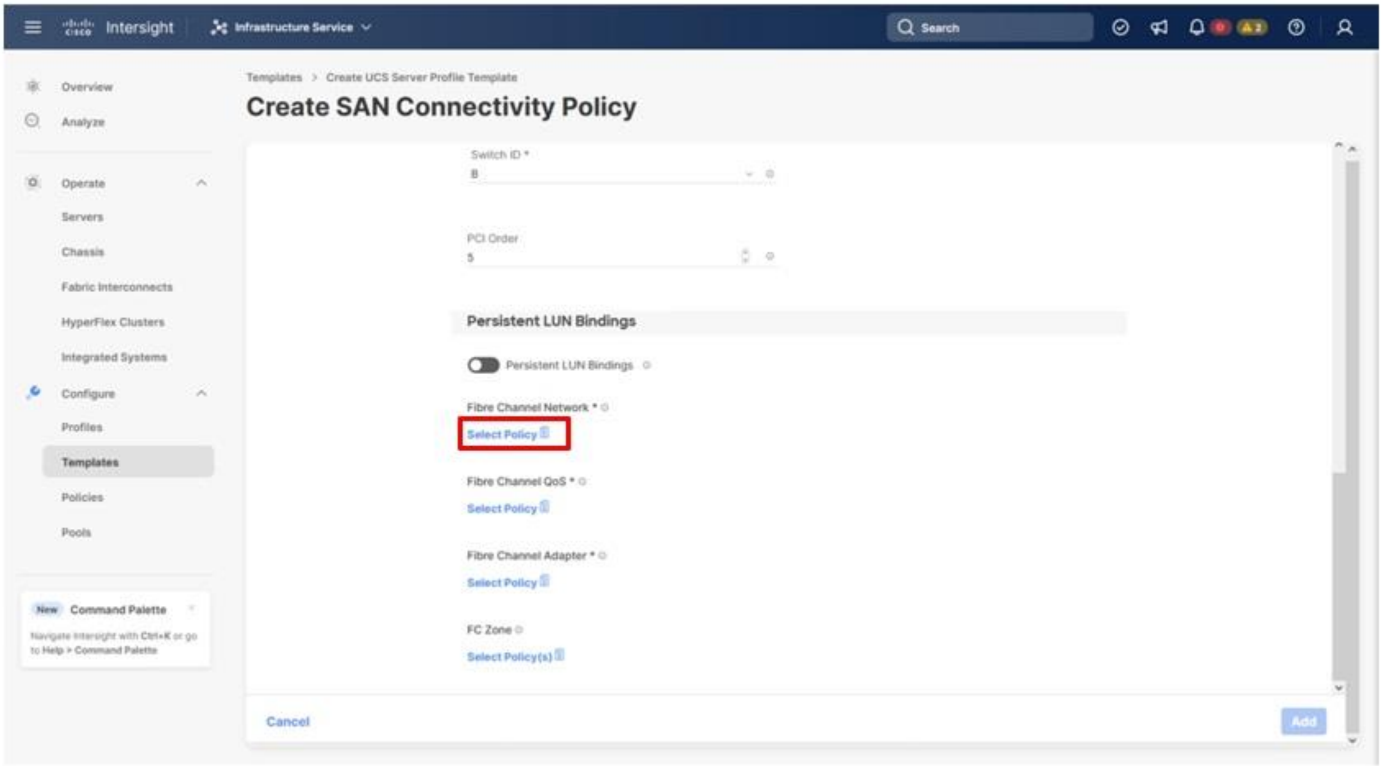
Switch ID *: B

PCI Order: 5

Procedure 10. Create Fibre Channel Network Policy for SAN B

Note: In this deployment, VSAN 102 is used for vHBA FC-B.

Step 1. Scroll down within the Create SAN Connectivity Policy dialogue and click **Select Policy** under Fibre Channel Network and in the pane on the right, click **Create New.**



Create SAN Connectivity Policy

Switch ID *
B

PCI Order
5

Persistent LUN Bindings

Persistent LUN Bindings

Fibre Channel Network *

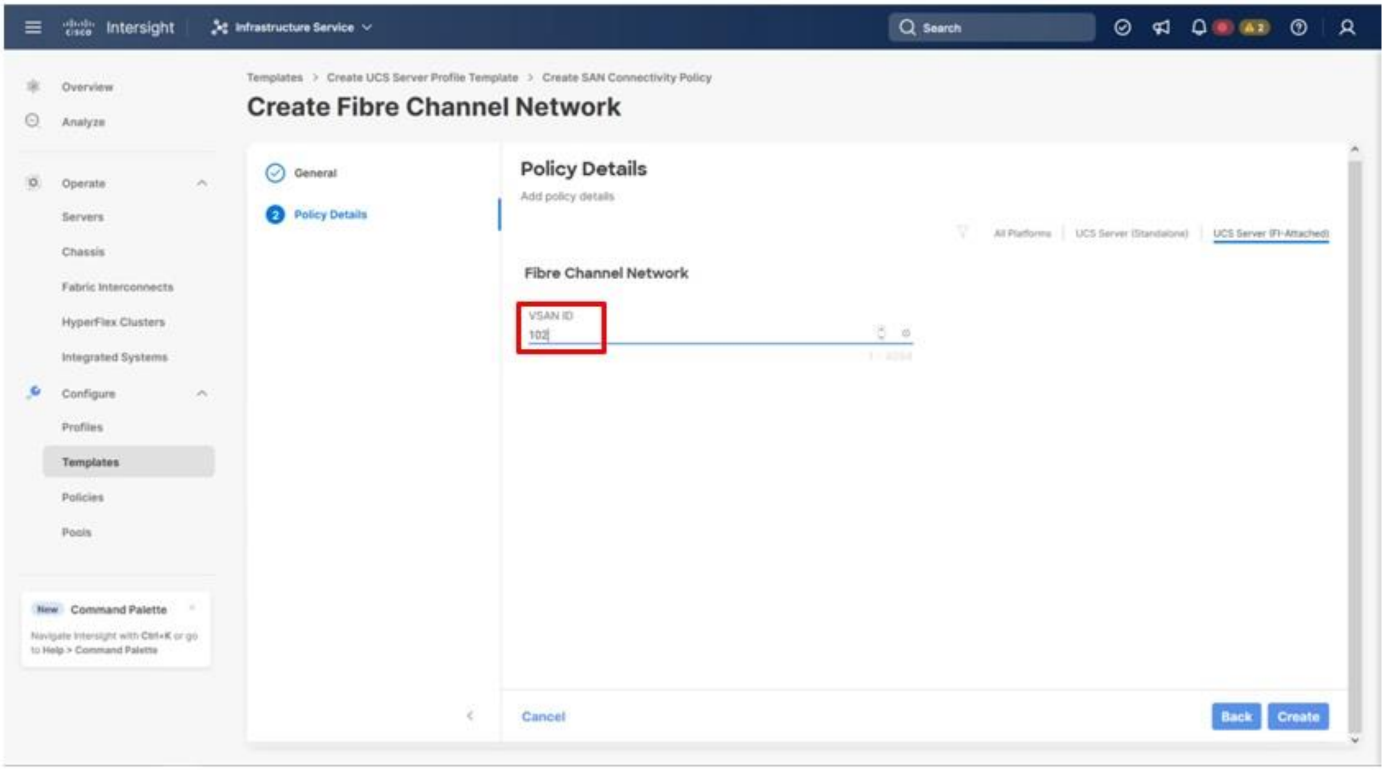
Fibre Channel QoS *

Fibre Channel Adapter *

FC Zone

Step 2. Verify that the correct organization is selected from the drop-down list (for example, AA21) and provide a name for the policy (for example, AA21-FC-Network-SAN-B).

Step 3. Specify the VSAN ID for Fabric B (for example, 102).



Templates > Create UCS Server Profile Template > Create SAN Connectivity Policy

Create Fibre Channel Network

Policy Details

Add policy details

Fibre Channel Network

VSAN ID: 102 (1 - 4094)

Step 4. Click **Create**.

Step 5. Select the Fibre Channel QoS Policy for SAN B. Click **Select Policy** under Fibre Channel QoS and in the pane on the right, select the previously created QoS policy **AA21-FC-QoS-Policy**.

Step 6. Select the Fibre Channel Adapter Policy for SAN B. Click **Select Policy** under Fibre Channel Adapter and in the pane on the right, select the previously created Adapter policy **AA21-FC-Adapter-Policy**.

Step 7. Click **Add** to add the vHBA FC-B.

Procedure 11. Create the FC-NVMe vHBAs

Note: To configure the FC-NVMe, two vHBAs, one for each fabric, must be added to the server profile template. These vHBAs are in addition to the FC boot from SAN vHBAs, FC-A and FC-B.

Table 17. vHBA placement for NVMe-o-FC

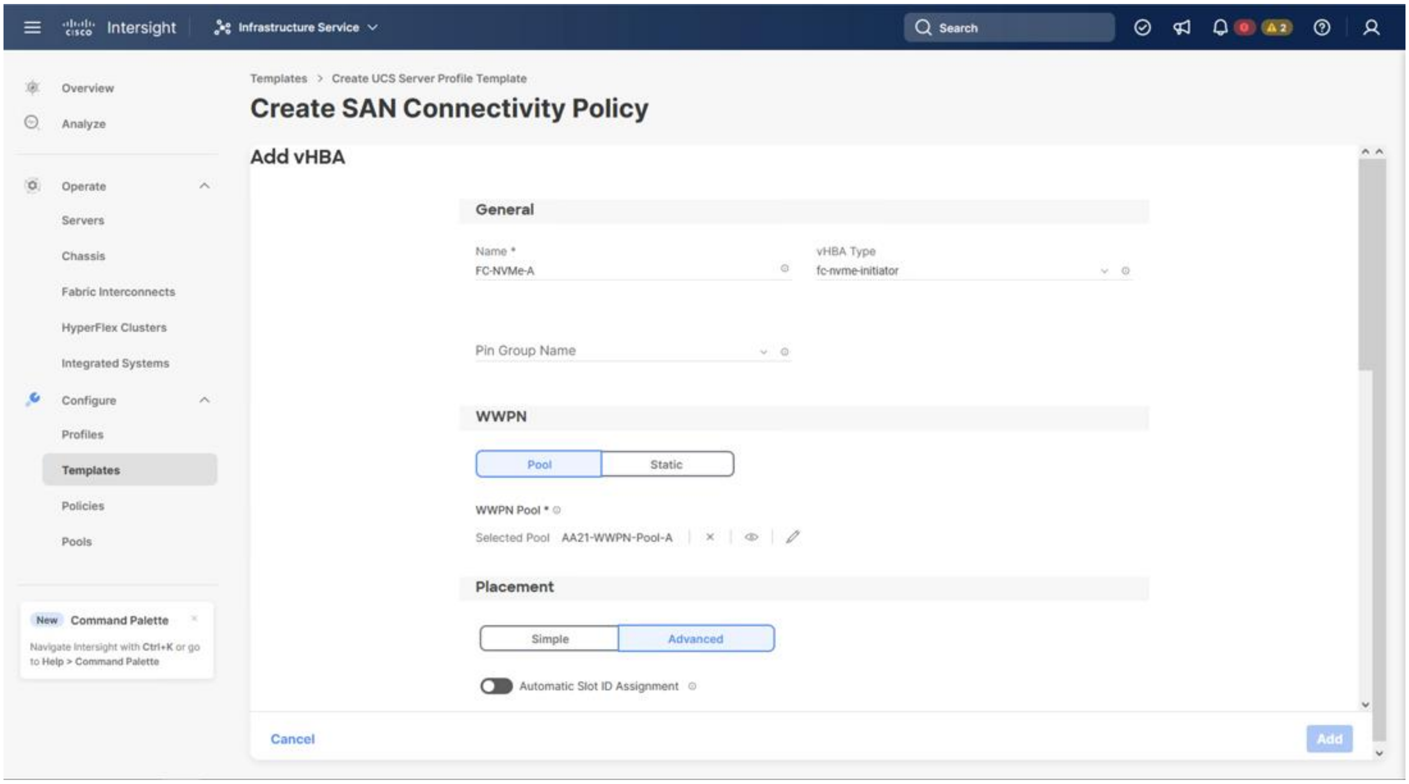
vNIC/vHBA Name	Slot	Switch ID	PCI Order
FC-NVMe-A	MLOM	A	6
FC-NVMe-B	MLOM	B	7

Procedure 12. Configure vHBA FC-NVMe-A

Step 1. Click **Add vHBA**.

Step 2. Name the vHBA **FC-NVMe-Fabric-A**. For vHBA Type and choose **fc-nvme-initiator** from the drop-down list.

Step 3. Click **Select Pool** under WWPN Address Pool and in the pane on the right, select the previously created pool AA21-WWPN-Pool-A.



Templates > Create UCS Server Profile Template

Create SAN Connectivity Policy

Add vHBA

General

Name * FC-NVMe-A

vHBA Type fc-nvme-initiator

Pin Group Name

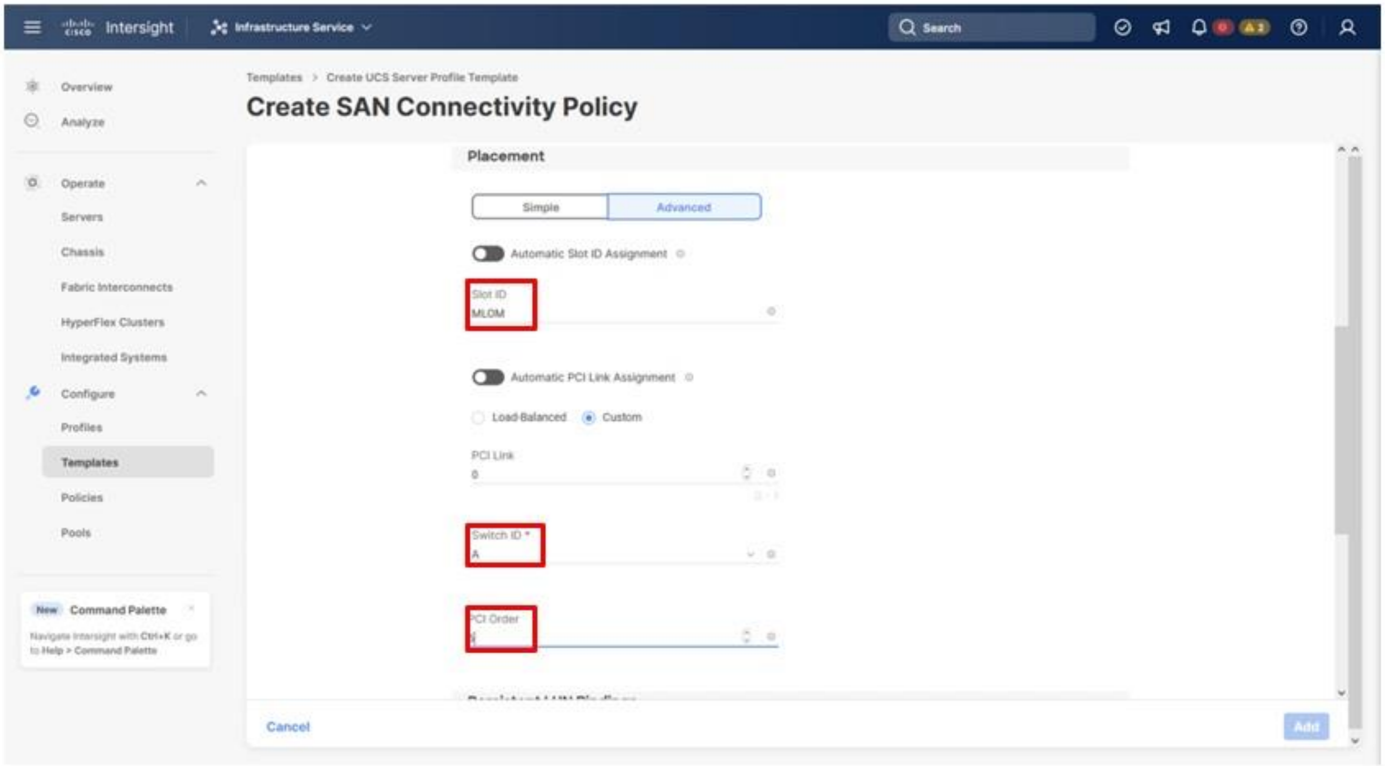
WWPN

WWPN Pool * Selected Pool AA21-WWPN-Pool-A

Placement

Automatic Slot ID Assignment

Step 4. With the **Advanced** option of **Placement** selected, scroll down if required to add the **Slot ID**, **Switch ID** (for example, A), and **PCI Order** from Table 16.



Create SAN Connectivity Policy

Placement

Placement: Advanced

Automatic Slot ID Assignment: off

Slot ID: MLOM

Automatic PCI Link Assignment: off

○ Load-Balanced ● Custom

PCI Link: 0

Switch ID *: A

PCI Order

Step 5. Scroll down within the Create SAN Connectivity Policy dialogue and click **Select Policy** under Fibre Channel Network and in the pane on the right, select the previously created policy for SAN A, **AA21-FC-Network-SAN-A**.

Step 6. Click **Select Policy** under Fibre Channel QoS and in the pane on the right, select the previously created QoS policy **AA21-FC-QoS-Policy**.

Procedure 13. Create FC-NVMe-Initiator Fibre Channel Adapter Policy

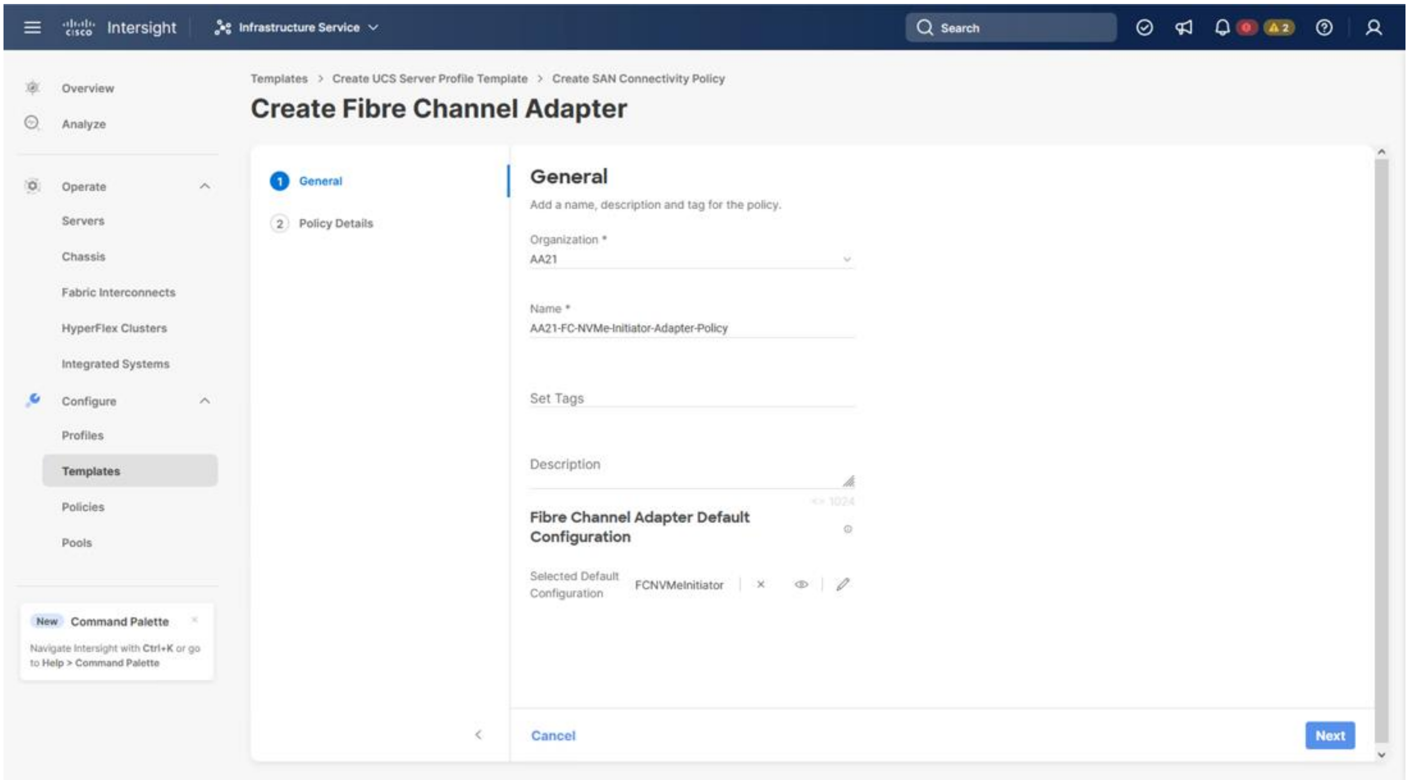
A Fibre Channel adapter policy governs the host-side behavior of the adapter, including the way that the adapter handles traffic. The FC-NVMe-Initiator Fibre Channel Adapter Policy is optimized for FC-NVMe.

Step 1. Click **Select Policy** under Fibre Channel Adapter and in the pane on the right, click **Create New.**

Step 2. Verify that the correct organization is selected from the drop-down list (for example, AA21) and provide a name for the policy (for example, AA21-FC-NVMe-Initiator-Adapter-Policy).

Step 3. Under Fibre Channel Adapter Default Configuration, click **Select Default Configuration**.

Step 4. Select **FCNVMeInitiator** and click **Next.**



Create Fibre Channel Adapter

General

Add a name, description and tag for the policy.

Organization * AA21

Name * AA21-FC-NVMe-Initiator-Adapter-Policy

Fibre Channel Adapter Default Configuration

Selected Default Configuration FCNVMeInitiator

Step 5. Do not change the default values on the Policy Details screen.

Step 6. Click **Create** to finish creating the Fibre Channel adapter policy.

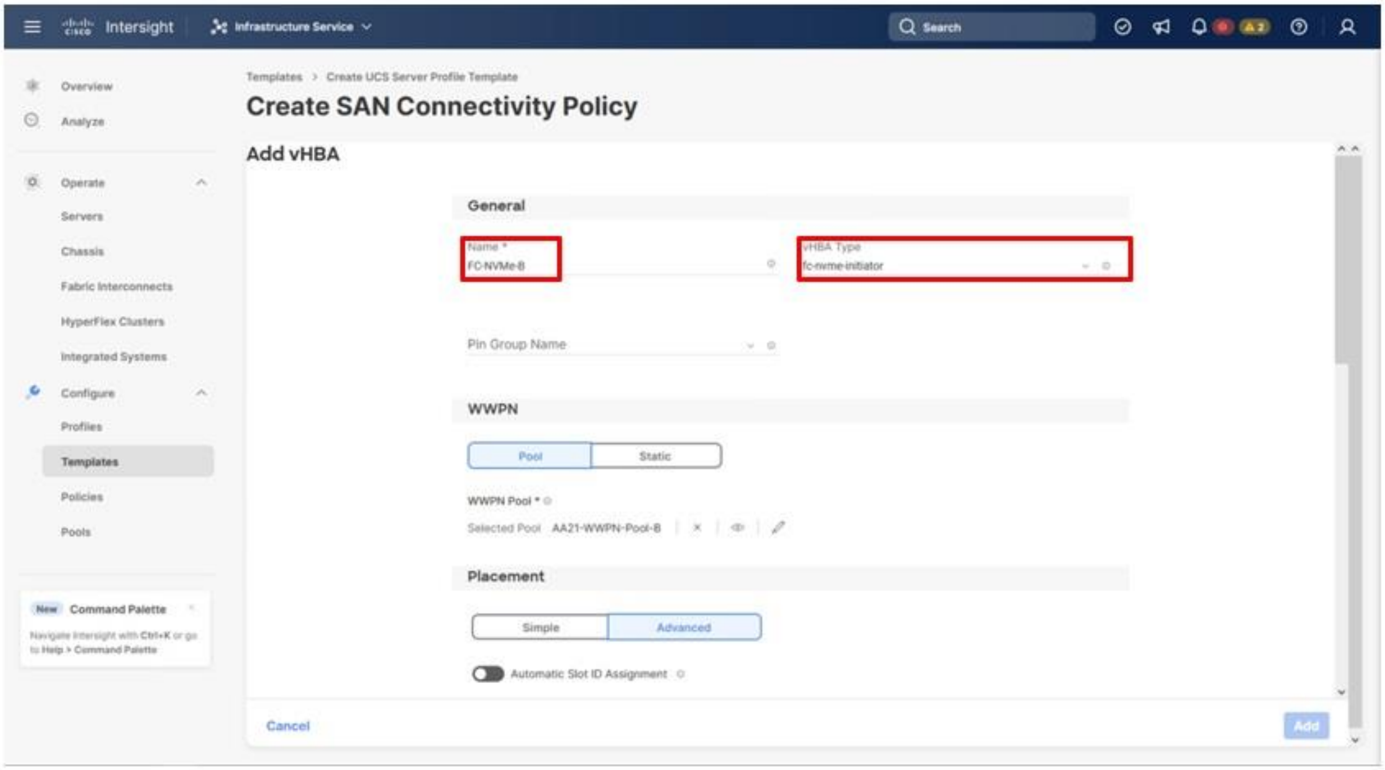
Step 7. Click **Add** to create vHBA FC-NVMe-A.

Procedure 14. Configure vHBA FC-NVMe-Fabric-B

Step 1. Click **Add vHBA**.

Step 2. Name the vHBA **FC-NVMe-B**. For vHBA Type, select **fc-nvme-initiator** from the drop-down list.

Step 3. Click **Select Pool** under WWPN Address Pool and in the pane on the right, select the previously created pool **AA21-WWPN-Pool-B**.



Create SAN Connectivity Policy

Add vHBA

General

Name * FC-NVMe-B

vHBA Type fc-nvme-initiator

Pin Group Name

WWPN

Pool | Static

WWPN Pool *

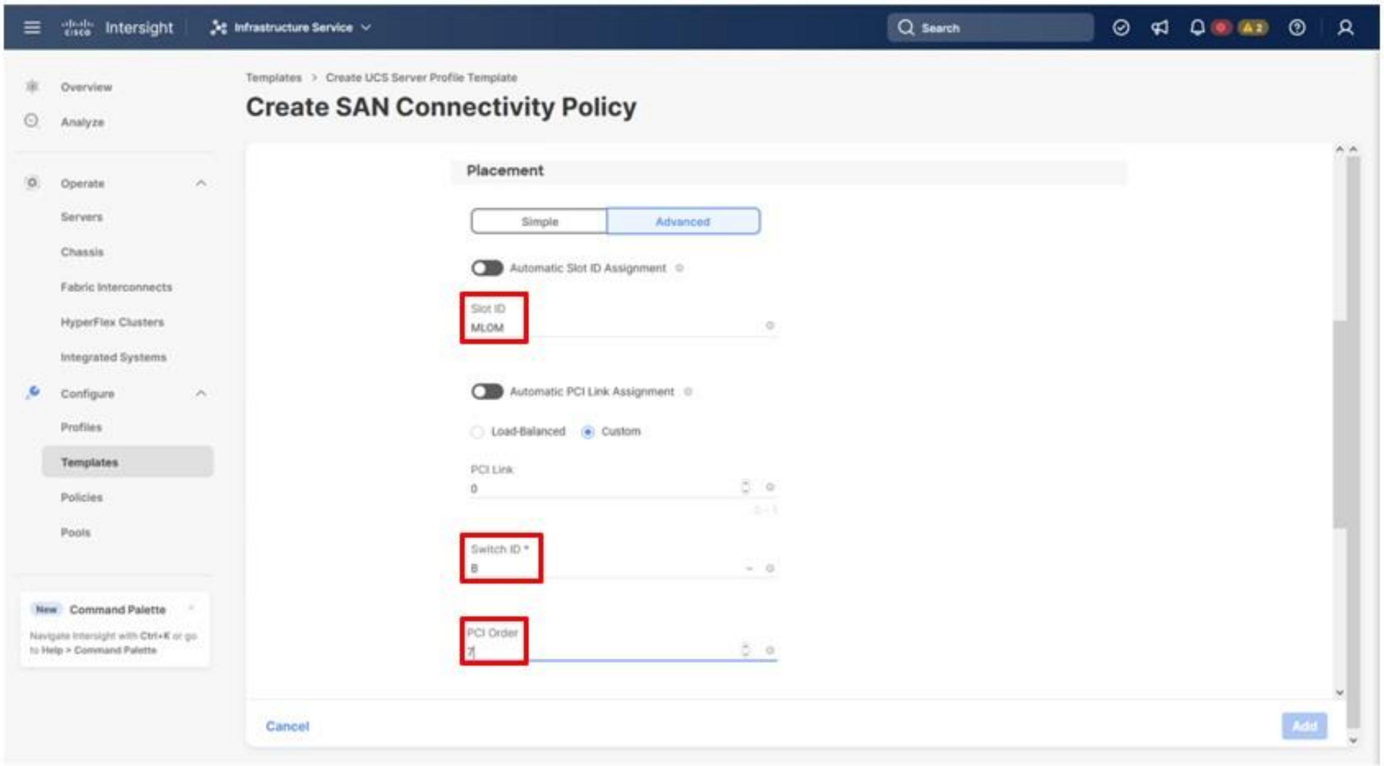
Selected Pool AA21-WWPN-Pool-B

Placement

Simple | Advanced

Automatic Slot ID Assignment

Step 4. Under Advanced Placement, provide the slot ID, Switch ID (for example, B) and PCI Order from Table 16.



Create SAN Connectivity Policy

Placement

Simple | Advanced

Automatic Slot ID Assignment

Slot ID
MLOM

Automatic PCI Link Assignment

○ Load-Balanced ● Custom

PCI Link
0
0 - 1

Switch ID *
B

PCI Order
7

Step 5. Scroll down within the Create SAN Connectivity Policy dialogue and click **Select Policy** under Fibre Channel Network and in the pane on the right, select the previously created policy for SAN B, AA21-FC-Network-SAN-B.

Step 6. Click **Select Policy** under Fibre Channel Network and in the pane on the right, select the previously created policy for SAN B, AA21-FC-Network-SAN-B.

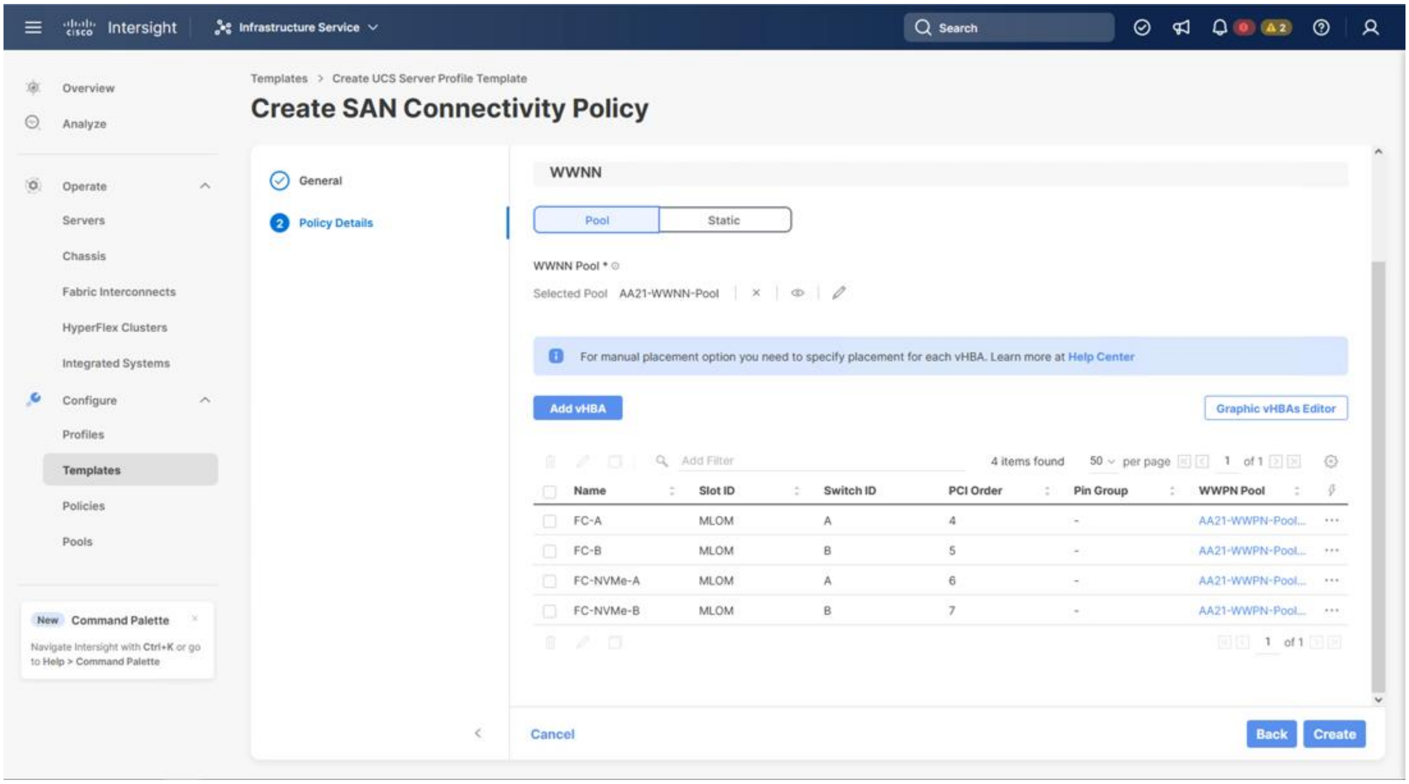
Step 7. Click **Select Policy** under Fibre Channel QoS and in the pane on the right, select the previously created QoS policy AA21-FC-QoS-Policy.

Step 8. Click **Select Policy** under Fibre Channel Adapter and in the pane on the right, select the previously created Adapter policy AA21-FC-NVMe-Initiator-Adapter-Policy.

Step 9. Click **Add** to add the FC-NVMe vHBA.

Procedure 15. Verify and create all vHBAs

Step 1. Verify that all four vHBAs are added to the SAN connectivity policy.



Templates > Create UCS Server Profile Template

Create SAN Connectivity Policy

WWNN

WWNN Pool *

Selected Pool AA21-WWNN-Pool

For manual placement option you need to specify placement for each vHBA. Learn more at Help Center

4 items found 50 per page 1 of 1

Name	Slot ID	Switch ID	PCI Order	Pin Group	WWPN Pool
FC-A	MLOM	A	4	-	AA21-WWPN-Pool...
FC-B	MLOM	B	5	-	AA21-WWPN-Pool...
FC-NVMe-A	MLOM	A	6	-	AA21-WWPN-Pool...
FC-NVMe-B	MLOM	B	7	-	AA21-WWPN-Pool...

1 of 1

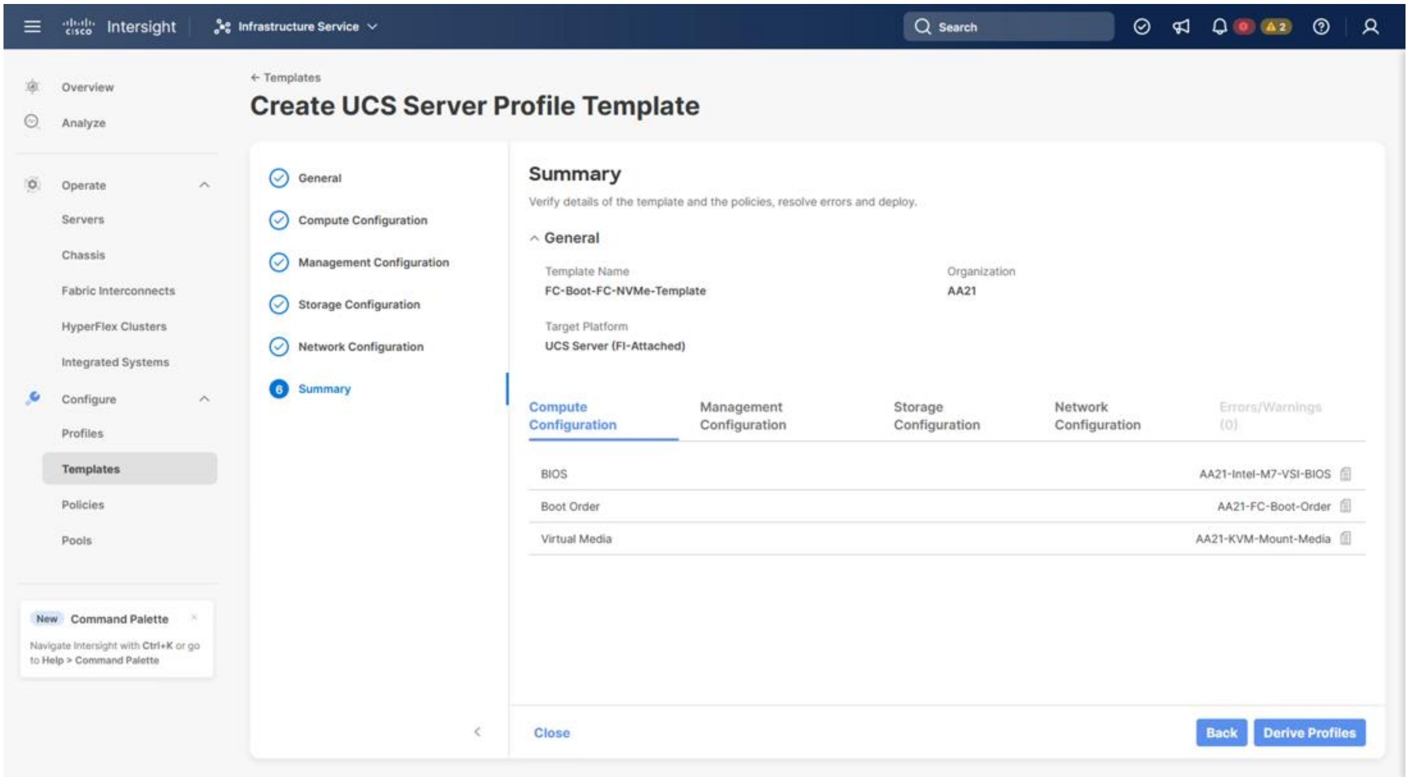
Step 2. Click **Create** to create the SAN connectivity policy with FC-NVMe support.

Procedure 16. Review Summary

Step 1. After the LAN connectivity policy and SAN connectivity policy have been created, click **Next** to continue to the **Summary** screen.

Step 2. On the **Summary** screen, verify that the intended policies are mapped to the appropriate settings.

Figure 3. **Compute Configuration**



Create UCS Server Profile Template

Summary

Verify details of the template and the policies, resolve errors and deploy.

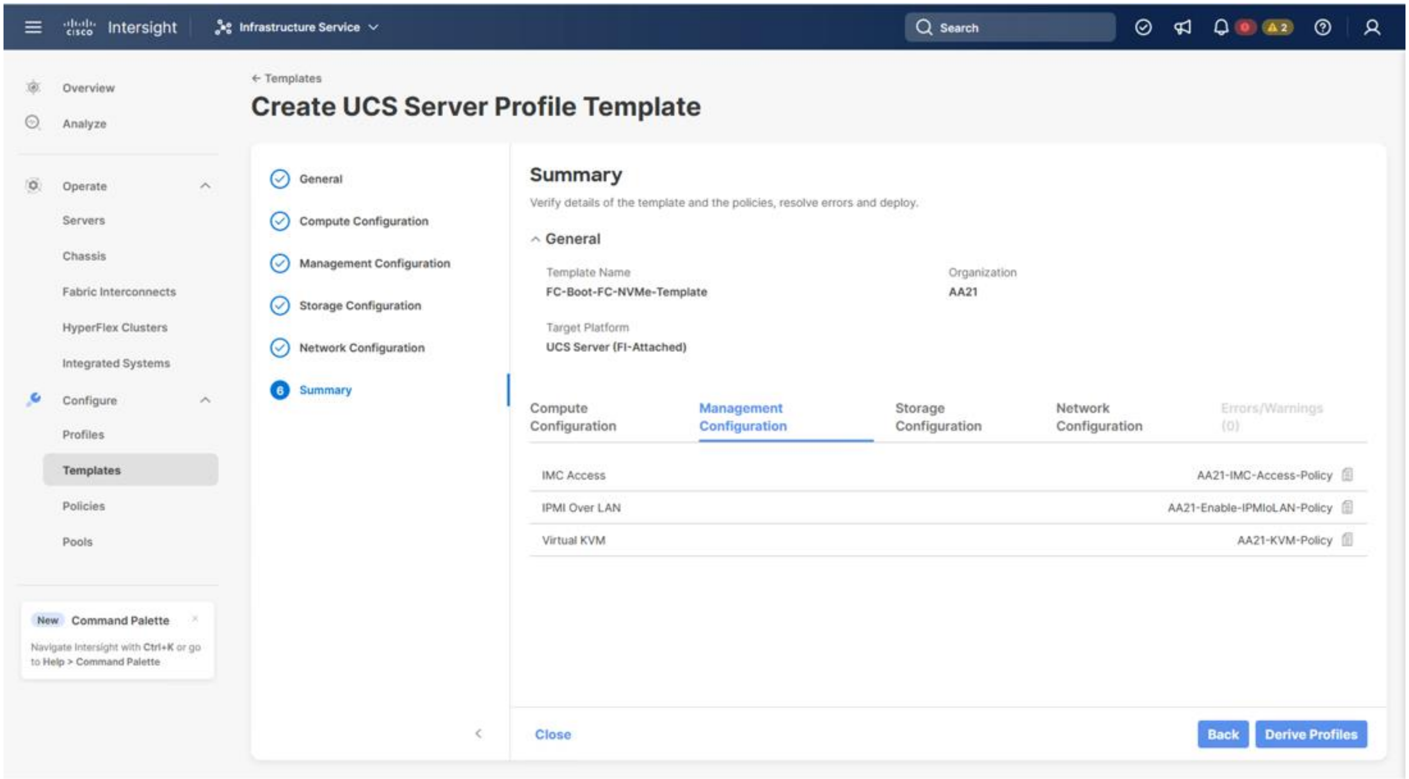
General

Template Name FC-Boot-FC-NVMe-Template	Organization AA21
Target Platform UCS Server (FI-Attached)	

Compute Configuration | Management Configuration | Storage Configuration | Network Configuration | Errors/Warnings (0)

BIOS	AA21-Intel-M7-VSI-BIOS
Boot Order	AA21-FC-Boot-Order
Virtual Media	AA21-KVM-Mount-Media

Figure 4. **Management Configuration**



Create UCS Server Profile Template

Summary

Verify details of the template and the policies, resolve errors and deploy.

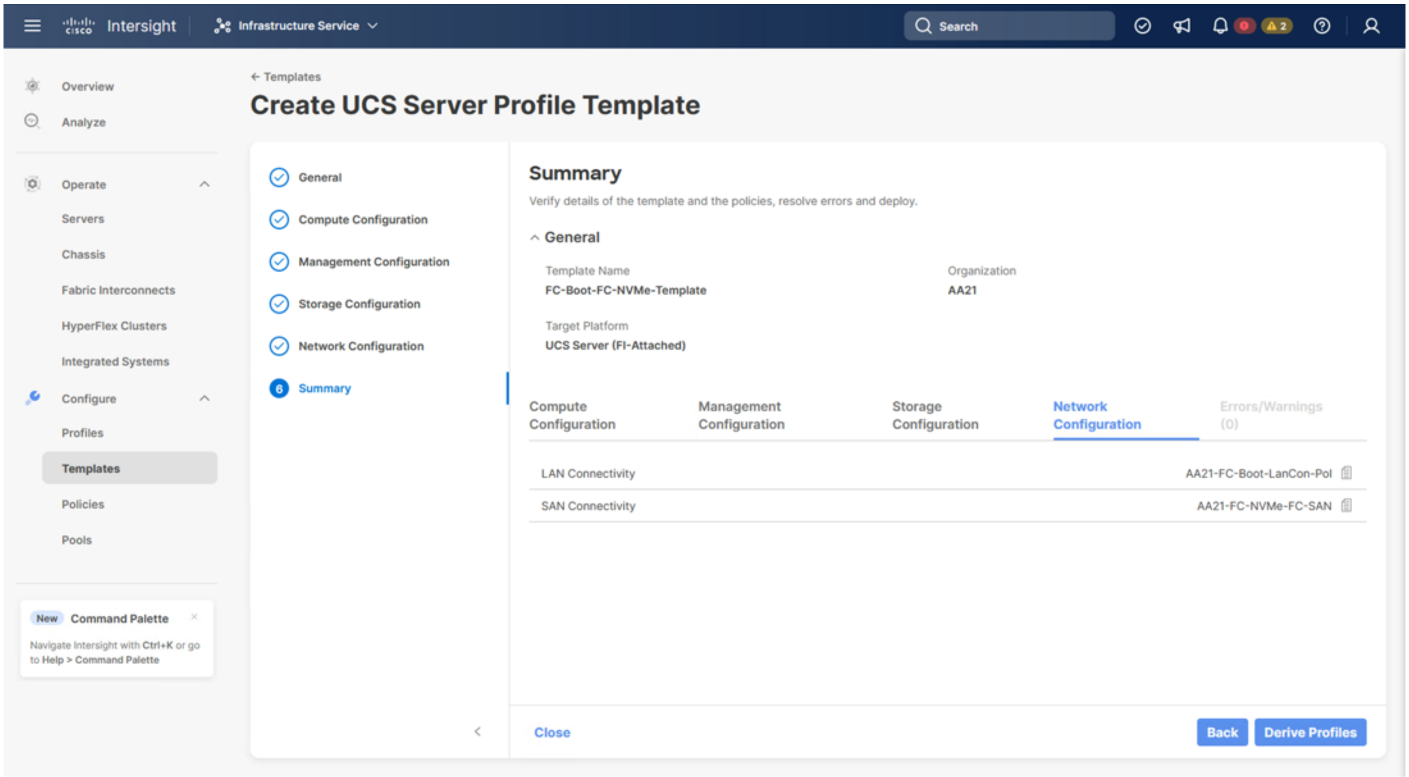
General

Template Name FC-Boot-FC-NVMe-Template	Organization AA21
Target Platform UCS Server (FI-Attached)	

Compute Configuration | Management Configuration | Storage Configuration | Network Configuration | Errors/Warnings (0)

IMC Access	AA21-IMC-Access-Policy
IPMI Over LAN	AA21-Enable-IPMIoLAN-Policy
Virtual KVM	AA21-KVM-Policy

Figure 5. Network Configuration



Create UCS Server Profile Template

Summary

Verify details of the template and the policies, resolve errors and deploy.

General

Template Name: FC-Boot-FC-NVMe-Template

Organization: AA21

Target Platform: UCS Server (FI-Attached)

Compute Configuration | Management Configuration | Storage Configuration | Network Configuration | Errors/Warnings (0)

LAN Connectivity	AA21-FC-Boot-LanCon-Pol
SAN Connectivity	AA21-FC-NVMe-FC-SAN

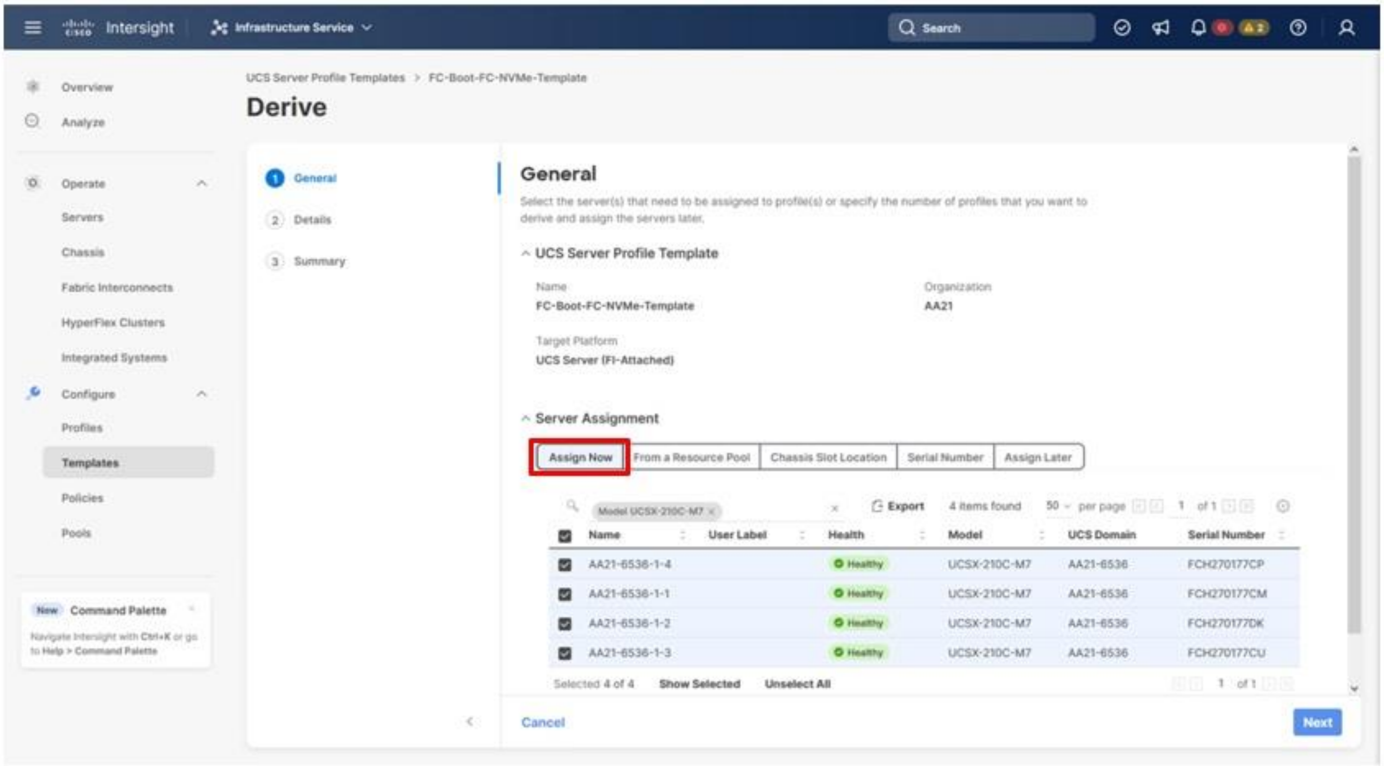
Cisco UCS IMM Setup Completion

Procedure 1. Derive Server Profiles

Step 1. From the Server profile template Summary screen, click **Derive Profiles**.

Note: This action can also be performed later by navigating to **Templates**, clicking **"…"** next to the template name and selecting **Derive Profiles**.

Step 2. Under Server Assignment, select **Assign Now** and select Cisco UCS X210c M7 server(s). You can select one or more servers depending on the number of profiles to be deployed. Optionally, provide a Model filter in this screen to exclude additional connected servers as required.



Derive

General

Select the server(s) that need to be assigned to profile(s) or specify the number of profiles that you want to derive and assign the servers later.

UCS Server Profile Template

Name: FC-Boot-FC-NVMe-Template

Organization: AA21

Target Platform: UCS Server (FI-Attached)

Server Assignment

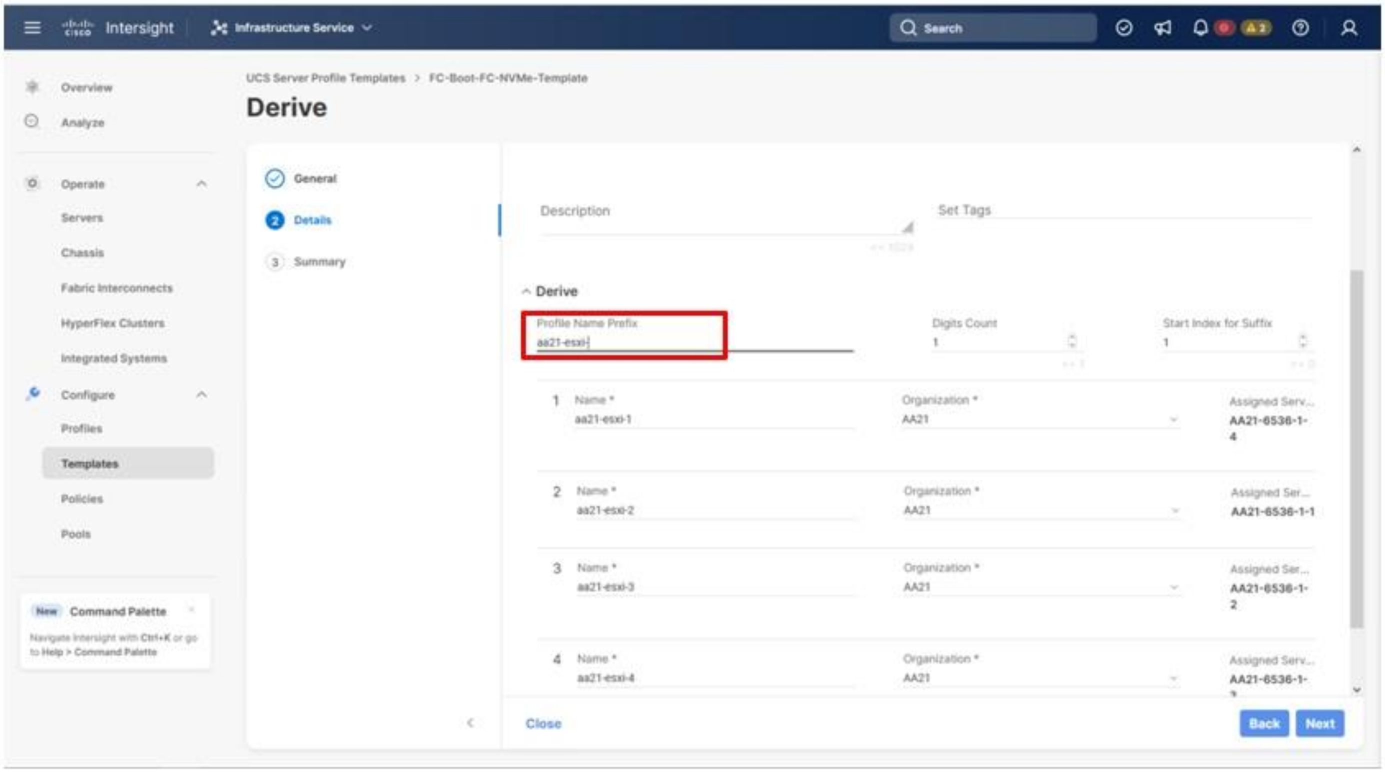
☑	Name	User Label	Health	Model	UCS Domain	Serial Number
☑	AA21-6536-1-4		Healthy	UCSX-210C-M7	AA21-6536	FCH270177CP
☑	AA21-6536-1-1		Healthy	UCSX-210C-M7	AA21-6536	FCH270177CM
☑	AA21-6536-1-2		Healthy	UCSX-210C-M7	AA21-6536	FCH270177DK
☑	AA21-6536-1-3		Healthy	UCSX-210C-M7	AA21-6536	FCH270177CU

Selected 4 of 4

Step 3. Click **Next**.

Note: Cisco Intersight will fill in the default information for the number of servers selected (4 in this case).

Step 4. Adjust the fields as needed. It is recommended to use the server hostname for the Server Profile name.



Derive

Description

Set Tags

Derive

Profile Name Prefix: aa21-esxi-

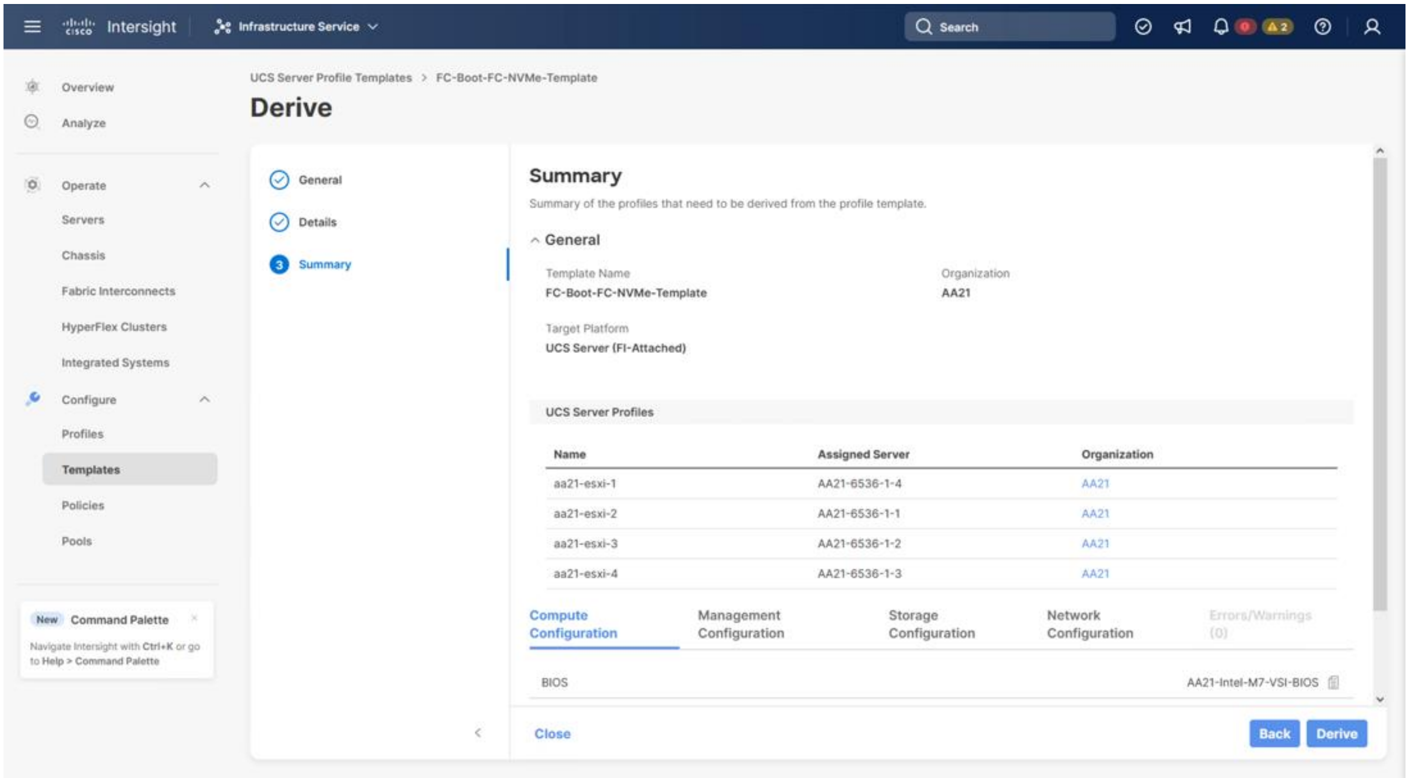
Digits Count: 1

Start Index for Suffix: 1

	Name *	Organization *	Assigned Serv...
1	aa21-esxi-1	AA21	AA21-6536-1-4
2	aa21-esxi-2	AA21	AA21-6536-1-1
3	aa21-esxi-3	AA21	AA21-6536-1-2
4	aa21-esxi-4	AA21	AA21-6536-1-3

Step 5. Click **Next**.

Step 6. Verify the information and click **Derive** to create the Server Profile(s).



UCS Server Profile Templates > FC-Boot-FC-NVMe-Template

Derive

Summary

Summary of the profiles that need to be derived from the profile template.

General

Template Name: FC-Boot-FC-NVMe-Template

Organization: AA21

Target Platform: UCS Server (FI-Attached)

UCS Server Profiles

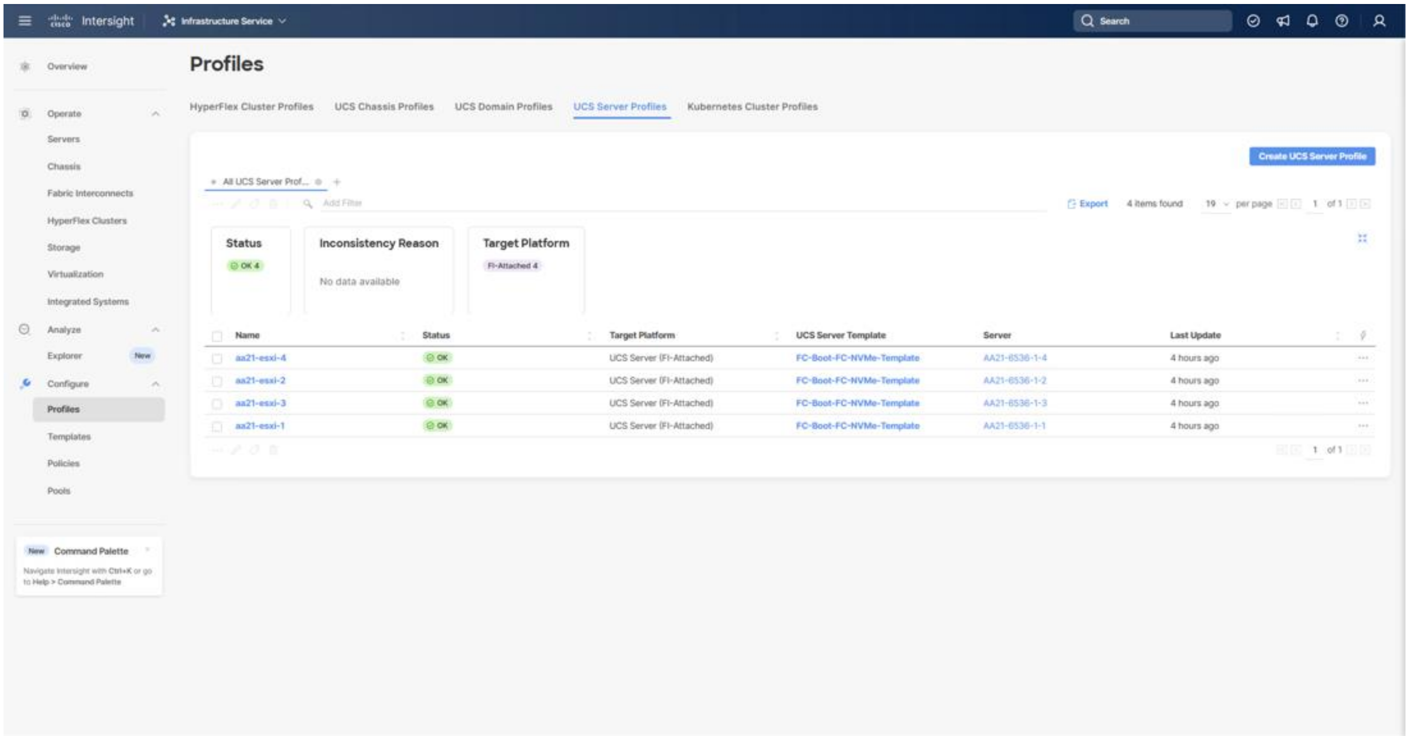
Name	Assigned Server	Organization
aa21-esxi-1	AA21-6536-1-4	AA21
aa21-esxi-2	AA21-6536-1-1	AA21
aa21-esxi-3	AA21-6536-1-2	AA21
aa21-esxi-4	AA21-6536-1-3	AA21

BIOS: AA21-Intel-M7-VSI-BIOS

Step 7. In the **Infrastructure Service > Configure > Profiles > UCS Server Profiles** list, select the profile(s) just created and click the **...** at the top of the column and select **Deploy**. Click Deploy to confirm.

Step 8. Cisco Intersight will start deploying the server profile(s) and will take some time to apply all the policies. Use the Requests tab at the top right-hand corner of the window to see the progress.

When the Server Profile(s) are deployed successfully, they will appear under the Server Profiles with the status of OK.



Name	Status	Target Platform	UCS Server Template	Server	Last Update
aa21-esxi-4	OK	UCS Server (FI-Attached)	FC-Boot-FC-NVMe-Template	AA21-6536-1-4	4 hours ago
aa21-esxi-2	OK	UCS Server (FI-Attached)	FC-Boot-FC-NVMe-Template	AA21-6536-1-2	4 hours ago
aa21-esxi-3	OK	UCS Server (FI-Attached)	FC-Boot-FC-NVMe-Template	AA21-6536-1-3	4 hours ago
aa21-esxi-1	OK	UCS Server (FI-Attached)	FC-Boot-FC-NVMe-Template	AA21-6536-1-1	4 hours ago

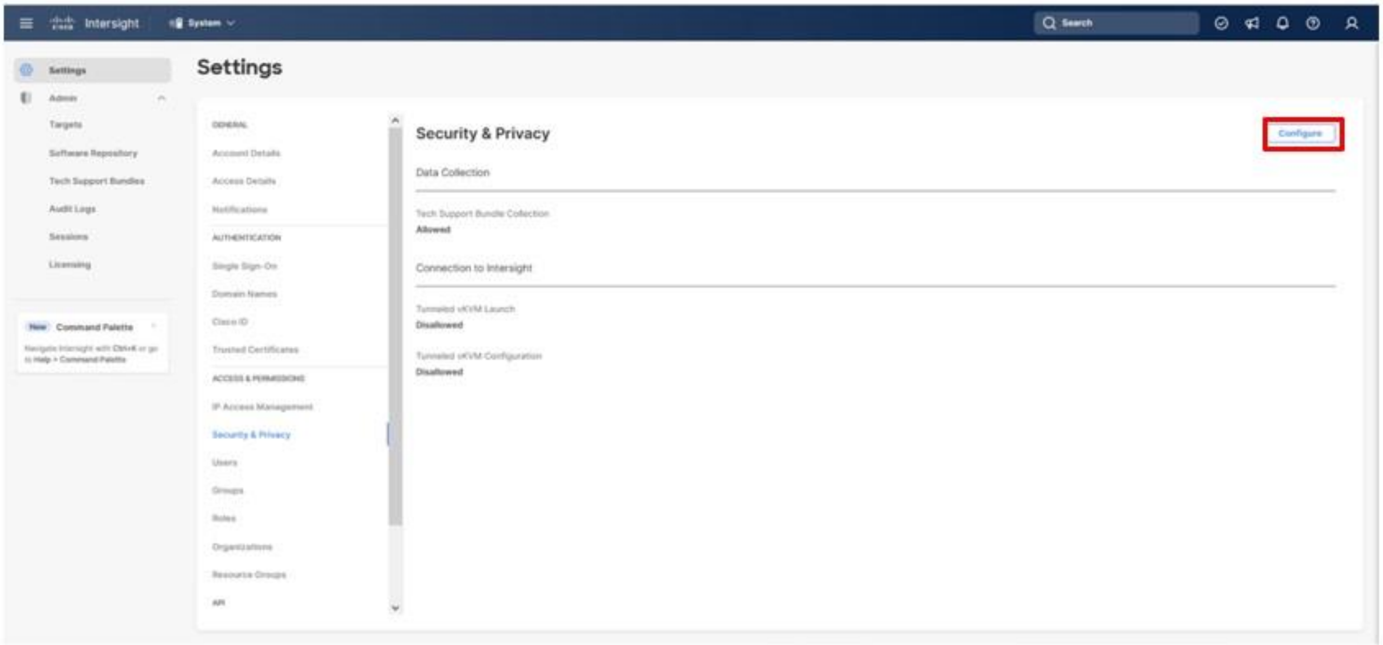
Tunneled KVM Setting within System

Additional settings within the System section of Intersight were mentioned during the Server Profile Template creation process to fully enable Tunneled KVM.

If this is still needed, complete the following procedure.

Procedure 1. Tunneled KVM Setting

Step 1. Go to **System** > **Settings** > **Security and Privacy** and click **Configure**.



Settings

Security & Privacy

Data Collection

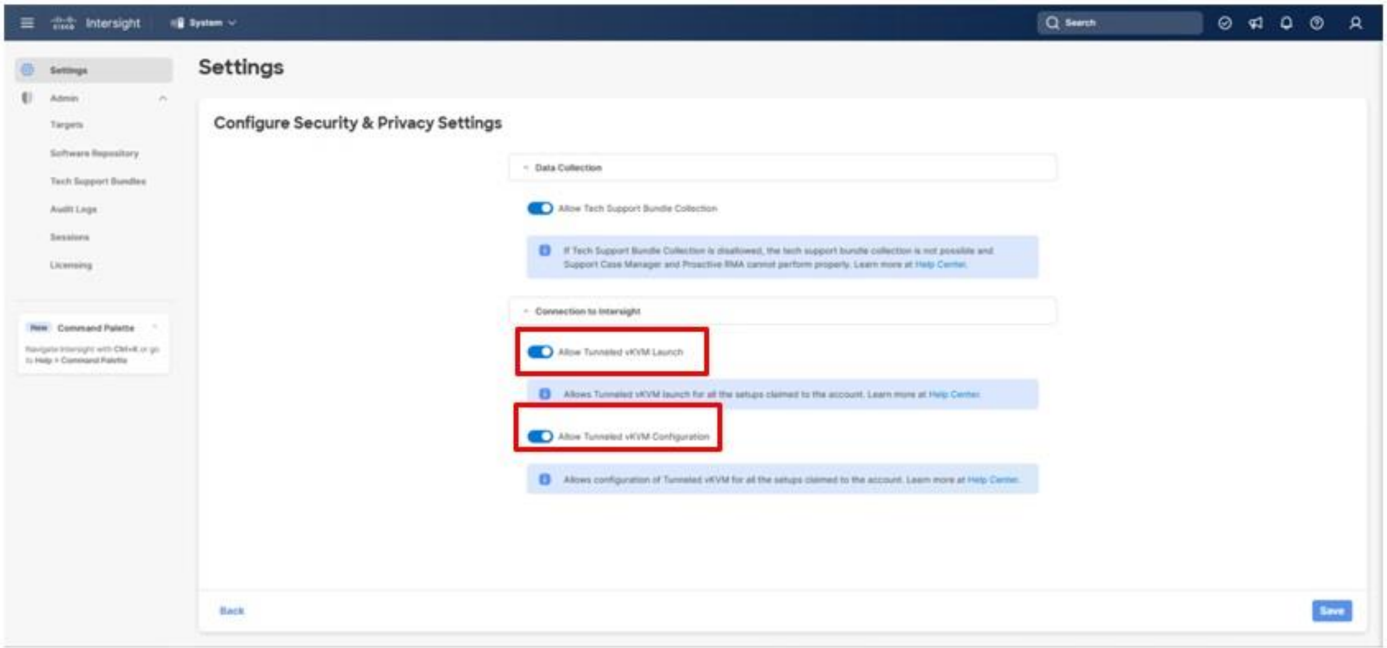
Tech Support Bundle Collection
Allowed

Connection to Intersight

Tunneled vKVM Launch
Disallowed

Tunneled vKVM Configuration
Disallowed

Step 2. Turn on **Allow Tunneled vKVM Launch** and **Allow Tunneled vKVM Configuration**.



Configure Security & Privacy Settings

Data Collection

Allow Tech Support Bundle Collection

If Tech Support Bundle Collection is disallowed, the tech support bundle collection is not possible and Support Case Manager and Proactive RMA cannot perform properly. Learn more at Help Center.

Connection to Intersight

Allow Tunneled vKVM Launch

Allows Tunneled vKVM launch for all the setups claimed to the account. Learn more at Help Center.

Allow Tunneled vKVM Configuration

Allows configuration of Tunneled vKVM for all the setups claimed to the account. Learn more at Help Center.

Step 3. Click **Save** to apply the changes.

Cisco MDS SAN Switch Configuration

This chapter contains the following:

This section explains how to configure the Cisco MDS 9000s for use in the environment. The configuration detailed in this section covers configuring Fibre Channel and FC-NVMe storage access.

Physical Connectivity

Follow the physical connectivity guidelines explained in the Physical Topology section.

Base Configuration

The following procedures describe how to configure the Cisco MDS switches for use in the Adaptive Solutions VSI environment. This procedure assumes you are using the Cisco MDS 9124V with NX-OS 9.3(2).

Procedure 1. Set up Cisco MDS 9124V A and 9124V B

Note: 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.

Step 1. Configure the switch using the 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]: Enter

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]: y

Configure default zone policy (permit/deny) [deny]: Enter

Enable full zoneset distribution? (yes/no) [n]: y

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

Step 4. Review the configuration.

```
Would you like to edit the configuration? (yes/no) [n]: Enter
Use this configuration and save it? (yes/no) [y]: Enter
```

Step 5. To set up the initial configuration of the Cisco MDS B switch, repeat steps 1 and 2 with appropriate host and IP address information.

Global Configuration on Both Switches

Procedure 1. Enable Features

Note: Run on both Cisco MDS 9124V A and Cisco MDS 9124V B Switches.

Step 1. Log in as **admin**.

Step 2. Run the following commands:

```
configure terminal
feature npiv
feature fport-channel-trunk
```

Procedure 2. Add NTP Servers and Local Time Configuration

Note: Run on both Cisco MDS 9124V A and Cisco MDS 9124V B.

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

```
ntp server <ntp-server-ip>
clock timezone <timezone> <hour-offset> <minute-offset>
clock summer-time <timezone> <start-week> <start-day> <start-month> <start-time> <end-week> <end-day> <end-month>
<end-time> <offset-minutes>
```

Note: It is important to configure the network time so that logging time alignment, any backup schedules, and SAN Analytics forwarding are correct. For more information on configuring the timezone and daylight savings time or summer time, see Cisco MDS 9000 Series Fundamentals Configuration Guide, Release 9.x. Sample clock commands for the United States Eastern timezone are:

```
clock timezone EST -5 0
clock summer-time EDT 2 Sunday March 02:00 1 Sunday November 02:00 60
```

Port and Port-Channel Configuration

Procedure 1. Configure Individual Ports on Cisco MDS 9124V A

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

```
interface port-channel101
channel mode active
switchport trunk allowed vsan <vsan-a-id for example, 101>
switchport description <ucs-domainname>-A
switchport speed 32000
no shutdown
!
interface fc1/1
switchport description <ucs-domainname>-A:1/35/1
channel-group 101 force
port-license acquire
no shutdown
!
interface fc1/2
switchport description <ucs-clustername>-A:1/35/2
channel-group 101 force
port-license acquire
no shutdown
!
interface fc1/3
switchport description <ucs-domainname>-A:1/35/3
channel-group 101 force
port-license acquire
no shutdown
!
interface fc1/4
switchport description <ucs-clustername>-A:1/35/4
channel-group 101 force
port-license acquire
no shutdown
!
interface fc1/5
switchport description <vsp-name>-0:1a
switchport speed 32000
switchport trunk mode off
port-license acquire
no shutdown
!
interface fc1/6
switchport description <vsp-name>-0:1b
switchport speed 32000
switchport trunk mode off
port-license acquire
no shutdown
!
interface fc1/7
switchport description <vsp-name>-1:2a
switchport speed 32000
switchport trunk mode off
port-license acquire
no shutdown
!
interface fc1/8
switchport description <vsp-name>-1:2b
switchport speed 32000
switchport trunk mode off
port-license acquire
no shutdown
```

Note: If VSAN trunking was not being configured for the port-channel connecting the Cisco UCS Fabric Interconnects to the Cisco MDS switches, do not enter "switchport trunk allowed vsan <vsan-a-id>" for interface port-channel101.

Procedure 2. Configure Individual Ports on Cisco MDS 9124V B

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

```
interface port-channel102
channel mode active
switchport trunk allowed vsan <vsan-b-id for example, 102>
switchport description <ucs-domainname>-B
switchport speed 32000
no shutdown
!
interface fc1/1
switchport description <ucs-domainname>-B:1/35/1
channel-group 102 force
port-license acquire
no shutdown
!
interface fc1/2
switchport description <ucs-clustername>-B:1/35/2
channel-group 102 force
port-license acquire
no shutdown
!
interface fc1/3
switchport description <ucs-domainname>-B:1/35/3
channel-group 102 force
port-license acquire
no shutdown
!
interface fc1/4
switchport description <ucs-clustername>-B:1/35/4
channel-group 102 force
port-license acquire
no shutdown
!
interface fc1/5
switchport description <vsp-name>-0:3a
switchport speed 32000
switchport trunk mode off
port-license acquire
no shutdown
!
interface fc1/6
```

```
switchport description <vsp-name>-0:3b
switchport speed 32000
switchport trunk mode off
port-license acquire
no shutdown
!
interface fc1/7
switchport description <vsp-name>-1:4a
switchport speed 32000
switchport trunk mode off
port-license acquire
no shutdown
!
interface fc1/8
switchport description <vsp-name>-1:4b
switchport speed 32000
switchport trunk mode off
port-license acquire
no shutdown
```

Note: If the VSAN trunk was not being configured for the port-channel connecting the Cisco UCS Fabric Interconnects to the Cisco MDS switches, do not enter “switchport trunk allowed vsan <vsan-b-id>” for interface port-channel102.

Procedure 3. Create VSANs on Cisco MDS 9124V A

Step 1. 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
Traffic on fc1/5 may be impacted. Do you want to continue? (y/n) [n] y
vsan <vsan-a-id> interface fc1/6
Traffic on fc1/6 may be impacted. Do you want to continue? (y/n) [n] y
vsan <vsan-a-id> interface fc1/7
Traffic on fc1/7 may be impacted. Do you want to continue? (y/n) [n] y
vsan <vsan-a-id> interface fc1/8
Traffic on fc1/8 may be impacted. Do you want to continue? (y/n) [n] y
vsan <vsan-a-id> interface port-channel101
exit
```

Procedure 4. Create VSANs on Cisco MDS 9124V B

Step 1. 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
Traffic on fc1/5 may be impacted. Do you want to continue? (y/n) [n] y
vsan <vsan-b-id> interface fc1/6
Traffic on fc1/6 may be impacted. Do you want to continue? (y/n) [n] y
vsan <vsan-b-id> interface fc1/7
Traffic on fc1/7 may be impacted. Do you want to continue? (y/n) [n] y
vsan <vsan-b-id> interface fc1/8
Traffic on fc1/8 may be impacted. Do you want to continue? (y/n) [n] y
vsan <vsan-b-id> interface port-channel102
```

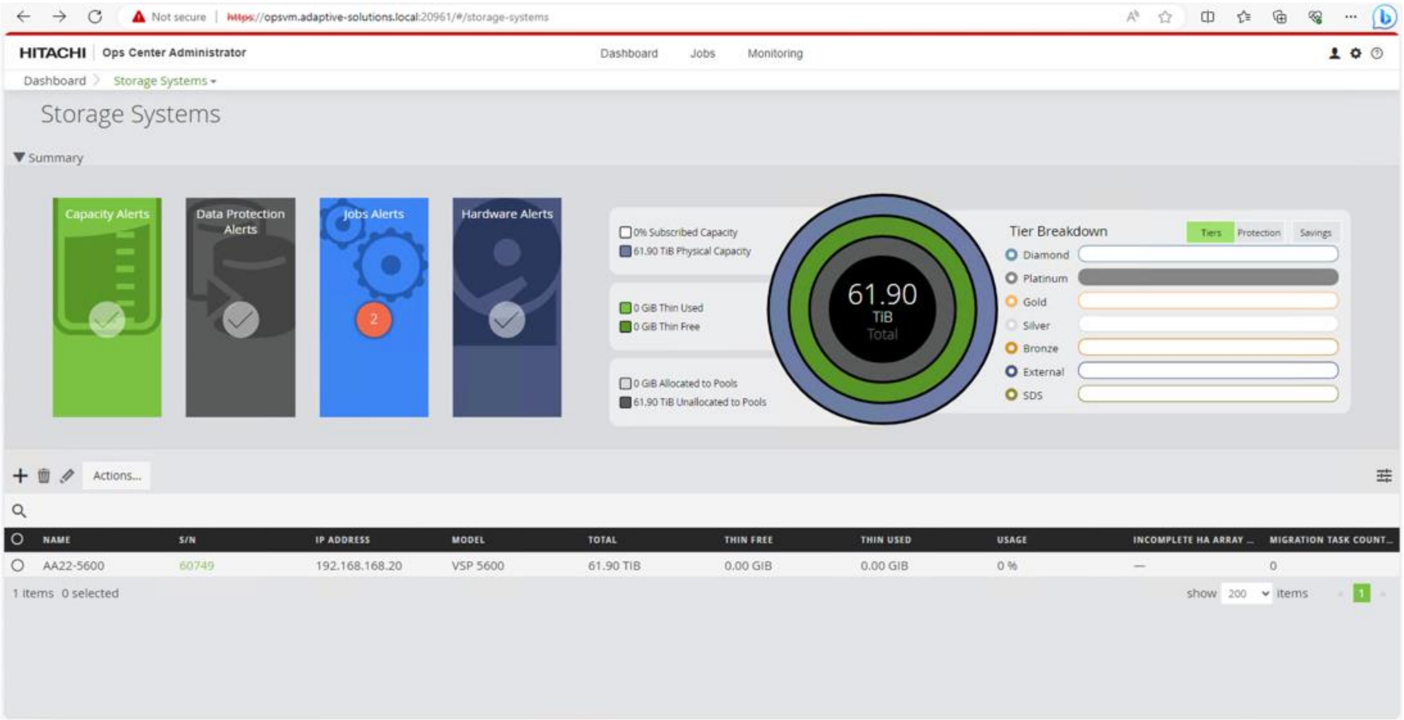
```
exit
```

Configure Device Aliases and SAN Zoning

Procedure 1. Gather Target and Initiator WWPNs

These procedures will gather the target and initiator WWPN information from the Hitachi VSP controllers and the Server Profiles associated with the UCS X-Series servers.

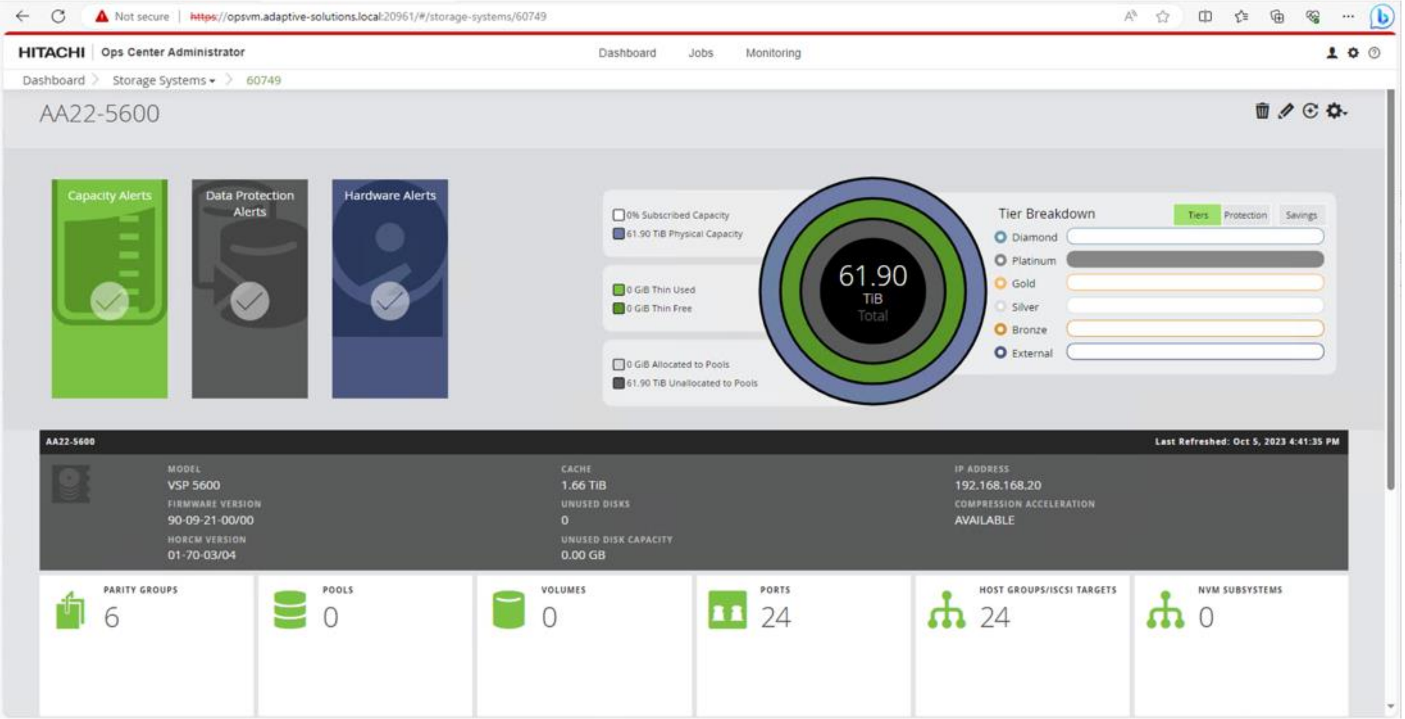
Step 1. Go to **Ops Center Administrator Dashboard** > **Storage Systems** > [**S/N of VSP listing**]



○	NAME	S/N	IP ADDRESS	MODEL	TOTAL	THIN FREE	THIN USED	USAGE	INCOMPLETE HA ARRAY ...	MIGRATION TASK COUNT...
○	AA22-5600	60749	192.168.168.20	VSP 5600	61.90 TIB	0.00 GIB	0.00 GIB	0 %	—	0

1 items 0 selected show 200 items 1

Step 2. From the resulting view, click **Ports**.



AA22-5600

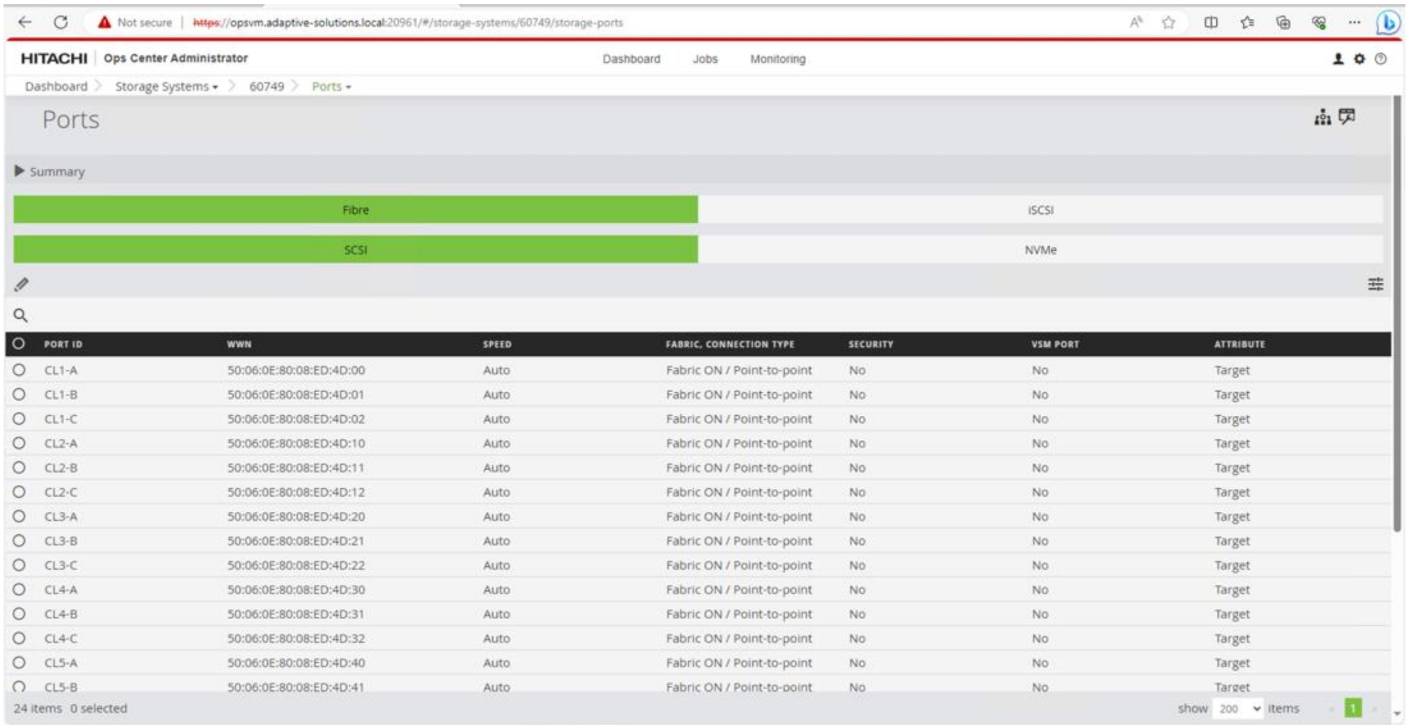
- 0% Subscribed Capacity
- 61.90 TiB Physical Capacity
- 0 GiB Thin Used
- 0 GiB Thin Free
- 0 GiB Allocated to Pools
- 61.90 TiB Unallocated to Pools

AA22-5600 Last Refreshed: Oct 5, 2023 4:41:35 PM

MODEL: VSP 5600
FIRMWARE VERSION: 90-09-21-00/00
HORCM VERSION: 01-70-03/04
CACHE: 1.66 TiB
UNUSED DISKS: 0
UNUSED DISK CAPACITY: 0.00 GB
IP ADDRESS: 192.168.168.20
COMPRESSION ACCELERATION: AVAILABLE

PARITY GROUPS	POOLS	VOLUMES	PORTS	HOST GROUPS/ISCSI TARGETS	NVM SUBSYSTEMS
6	0	0	24	24	0

Step 3. Find and gather the WWN for each port connected to the MDS used for FC-SCSI or FC-NVMe traffic.

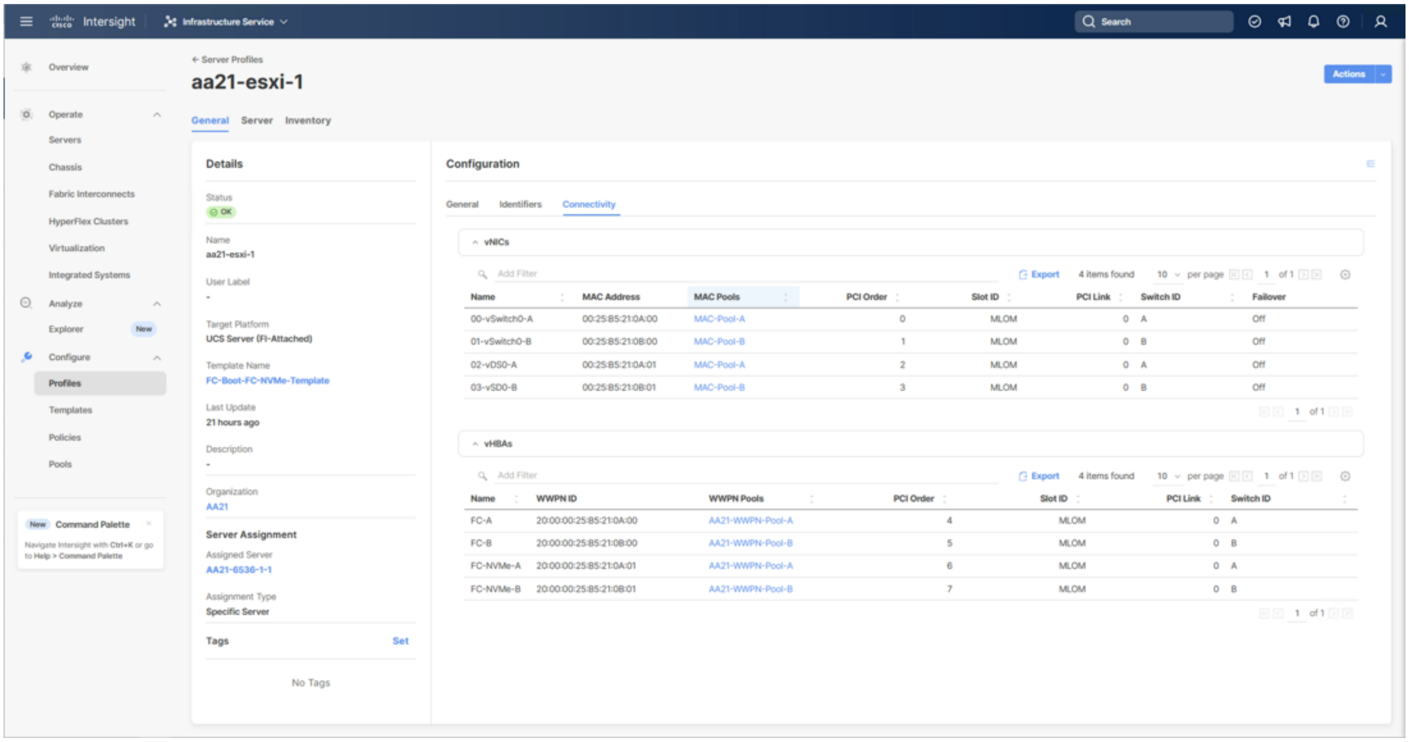

Not secure | https://opsvm.adaptive-solutions.local:20961/#/storage-systems/60749/storage-ports
HITACHI | Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Storage Systems > 60749 > Ports
Ports
Summary
Fibre
iSCSI
SCSI
NVMe

PORT ID	WWN	SPEED	FABRIC, CONNECTION TYPE	SECURITY	VSM PORT	ATTRIBUTE
CL1-A	50:06:0E:80:08:ED:4D:00	Auto	Fabric ON / Point-to-point	No	No	Target
CL1-B	50:06:0E:80:08:ED:4D:01	Auto	Fabric ON / Point-to-point	No	No	Target
CL1-C	50:06:0E:80:08:ED:4D:02	Auto	Fabric ON / Point-to-point	No	No	Target
CL2-A	50:06:0E:80:08:ED:4D:10	Auto	Fabric ON / Point-to-point	No	No	Target
CL2-B	50:06:0E:80:08:ED:4D:11	Auto	Fabric ON / Point-to-point	No	No	Target
CL2-C	50:06:0E:80:08:ED:4D:12	Auto	Fabric ON / Point-to-point	No	No	Target
CL3-A	50:06:0E:80:08:ED:4D:20	Auto	Fabric ON / Point-to-point	No	No	Target
CL3-B	50:06:0E:80:08:ED:4D:21	Auto	Fabric ON / Point-to-point	No	No	Target
CL3-C	50:06:0E:80:08:ED:4D:22	Auto	Fabric ON / Point-to-point	No	No	Target
CL4-A	50:06:0E:80:08:ED:4D:30	Auto	Fabric ON / Point-to-point	No	No	Target
CL4-B	50:06:0E:80:08:ED:4D:31	Auto	Fabric ON / Point-to-point	No	No	Target
CL4-C	50:06:0E:80:08:ED:4D:32	Auto	Fabric ON / Point-to-point	No	No	Target
CL5-A	50:06:0E:80:08:ED:4D:40	Auto	Fabric ON / Point-to-point	No	No	Target
CL5-B	50:06:0E:80:08:ED:4D:41	Auto	Fabric ON / Point-to-point	No	No	Target

24 items 0 selected show 200 items

Step 4. Connect to Cisco Intersight to gather the initiator WWPN information for the servers.

Step 5. Find the Server Profiles for each host by going to **Infrastructure Service** > **Configure** > **Profiles** > **UCS Server Profiles** > **<Desired Server Profile>** > **General** > **Configuration** > **Connectivity**. The required WWPNs can be found under HBA Interfaces.



aa21-esxi-1

Details

Status: OK

Name: aa21-esxi-1

User Label: -

Target Platform: UCS Server (FI-Attached)

Template Name: FC-Boot-FC-NVMe-Template

Last Update: 21 hours ago

Description: -

Organization: AA21

Server Assignment

Assigned Server: AA21-6536-1-1

Assignment Type: Specific Server

Tags

No Tags

Configuration

General | Identifiers | Connectivity

vNICs

Add Filter | Export | 4 items found | 10 per page | 1 of 1

Name	MAC Address	MAC Pools	PCI Order	Slot ID	PCI Link	Switch ID	Failover
00-vSwitch0-A	00:25:B5:21:0A:00	MAC-Pool-A	0	MLOM	0	A	Off
01-vSwitch0-B	00:25:B5:21:0B:00	MAC-Pool-B	1	MLOM	0	B	Off
02-vDS0-A	00:25:B5:21:0A:01	MAC-Pool-A	2	MLOM	0	A	Off
03-vSD0-B	00:25:B5:21:0B:01	MAC-Pool-B	3	MLOM	0	B	Off

1 of 1

vHBAs

Add Filter | Export | 4 items found | 10 per page | 1 of 1

Name	WWPN ID	WWPN Pools	PCI Order	Slot ID	PCI Link	Switch ID
FC-A	20:00:00:25:B5:21:0A:00	AA21-WWPN-Pool-A	4	MLOM	0	A
FC-B	20:00:00:25:B5:21:0B:00	AA21-WWPN-Pool-B	5	MLOM	0	B
FC-NVMe-A	20:00:00:25:B5:21:0A:01	AA21-WWPN-Pool-A	6	MLOM	0	A
FC-NVMe-B	20:00:00:25:B5:21:0B:01	AA21-WWPN-Pool-B	7	MLOM	0	B

1 of 1

Procedure 2. Create Device Aliases for Fabric A used to Create Zones

Step 1. From the global configuration mode of the Cisco MDS 9124V-A, run the following commands:

```
device-alias mode enhanced
device-alias database
device-alias name <vsp-name>-0-1a pwwn <vsp-0:1a-wwpn>
device-alias name <vsp-name>-1-2a pwwn <vsp-1:2a-wwpn>
device-alias name <server1-hostname> pwwn <server1-wwpna>
device-alias name <server2-hostname> pwwn <server2-wwpna>
device-alias name <server3-hostname> pwwn <server3-wwpna>
device-alias name <server4-hostname> pwwn <server4-wwpna>
device-alias name <vsp-name>-0-1b-fc-nvme pwwn <vsp-0:1b-wwpn>
device-alias name <vsp-name>-1-2b-fc-nvme pwwn <vsp-0:2b-wwpn>
device-alias name <server1>-fc-nvme pwwn <fc-nvme-server1-wwpna>
device-alias name <server2>-fc-nvme pwwn <fc-nvme-server2-wwpna>
device-alias name <server3>-fc-nvme pwwn <fc-nvme-server3-wwpna>
device-alias name <server4>-fc-nvme pwwn <fc-nvme-server4-wwpna>
```

Step 2. Commit the device alias database changes:

```
device-alias commit
```

Procedure 3. Create Device Aliases for Fabric B used to Create Zones

Step 1. From the global configuration mode of the Cisco MDS 9124V-B, run the following commands:

```
device-alias mode enhanced
device-alias database
device-alias name <vsp-name>-0-3a pwwn <vsp-0:1a-wwpn>
```

```
device-alias name <vsp-name>-1-4a pwwn <vsp-1:2a-wwpn>
device-alias name <server1-hostname> pwwn <server1-wwpnb>
device-alias name <server2-hostname> pwwn <server2-wwpnb>
device-alias name <server3-hostname> pwwn <server3-wwpnb>
device-alias name <server4-hostname> pwwn <server4-wwpnb>
device-alias name <vsp-name>-0-3b-fc-nvme pwwn <vsp-0:1b-wwpn>
device-alias name <vsp-name>-1-4b-fc-nvme pwwn <vsp-0:2b-wwpn>
device-alias name <server1>-fc-nvme pwwn <fc-nvme-server1-wwpnb>
device-alias name <server2>-fc-nvme pwwn <fc-nvme-server2-wwpnb>
device-alias name <server3>-fc-nvme pwwn <fc-nvme-server3-wwpnb>
device-alias name <server4>-fc-nvme pwwn <fc-nvme-server4-wwpnb>
```

Step 2. Commit the device alias database changes:

```
device-alias commit
```

Procedure 4. Create Zones and Zonesets on Cisco MDS 9124V-A

Step 1. To create the required zones for FC on Fabric A, run the following commands:

```
configure terminal

zone name FC-<vsp-name> vsan <vsan-a-id>
member device-alias <server1-hostname> init
member device-alias <server2-hostname> init
member device-alias <server3-hostname> init
member device-alias <server4-hostname> init
member device-alias <vsp-name>-0-1a target
member device-alias <vsp-name>-1-2a target
exit
```

Step 2. To create the required zones for FC-NVMe on Fabric A, run the following commands:

```
zone name FC-NVMe-<vsp-name> vsan <vsan-a-id>
member device-alias <server1>-fc-nvme init
member device-alias <server2>-fc-nvme init
member device-alias <server3>-fc-nvme init
member device-alias <server4>-fc-nvme init
member device-alias <vsp-name>-0-1b-fc-nvme target
member device-alias <vsp-name>-0-2b-fc-nvme target
exit
```

Step 3. To create the zoneset for the zone(s) defined earlier, run the following command:

```
zoneset name Fabric-A vsan <vsan-a-id>
member FCP-<vsp-name>
member FC-NVMe-<vsp-name>
exit
```

Step 4. Activate the zoneset:

```
zoneset activate name Fabric-A vsan <vsan-a-id>
```

Step 5. Save the configuration:

```
copy run start
```

Note: Because Smart Zoning is enabled, a single zone for each storage protocol (FCP and FC-NVMe) is created with all host initiators and targets for the VSP ports instead of creating separate zones for each host. If a new host is added, its initiator can simply be added to appropriate zone in each MDS switch and the zoneset is reactivated.

Procedure 5. Create Zones and Zonesets on Cisco MDS 9124V-B

Step 1. To create the required zones and zoneset on Fabric B, run the following commands:

```
configure terminal

zone name FC-<vsp-name> vsan <vsan-b-id>
member device-alias <server1-hostname> init
member device-alias <server2-hostname> init
member device-alias <server3-hostname> init
member device-alias <server4-hostname> init
member device-alias <vsp-name>-0-3a target
member device-alias <vsp-name>-1-4a target
exit
```

Step 2. To create the required zones for FC-NVMe on Fabric B, run the following commands:

```
zone name FC-NVMe-<vsp-name> vsan <vsan-b-id>
member device-alias <server1>-fc-nvme init
member device-alias <server2>-fc-nvme init
member device-alias <server3>-fc-nvme init
member device-alias <server4>-fc-nvme init
member device-alias <vsp-name>-0-3b-fc-nvme target
member device-alias <vsp-name>-0-4b-fc-nvme target
exit
```

Step 3. To create the zoneset for the zone(s) defined above, issue the following command:

```
zoneset name Fabric-B vsan <vsan-b-id>
member FC-<vsp-name>-B
member FC-NVMe-<vsp-name>-B
exit
```

Step 4. Activate the zoneset:

```
zoneset activate name Fabric-B vsan <vsan-b-id>
```

Step 5. Save the configuration:

```
copy run start
```

Hitachi VSP Storage Configuration

This chapter contains the following:

- [Hitachi Virtual Storage Platform Configuration for FC-SCSI]
- [Hitachi Storage Configuration for FC-NVMe]

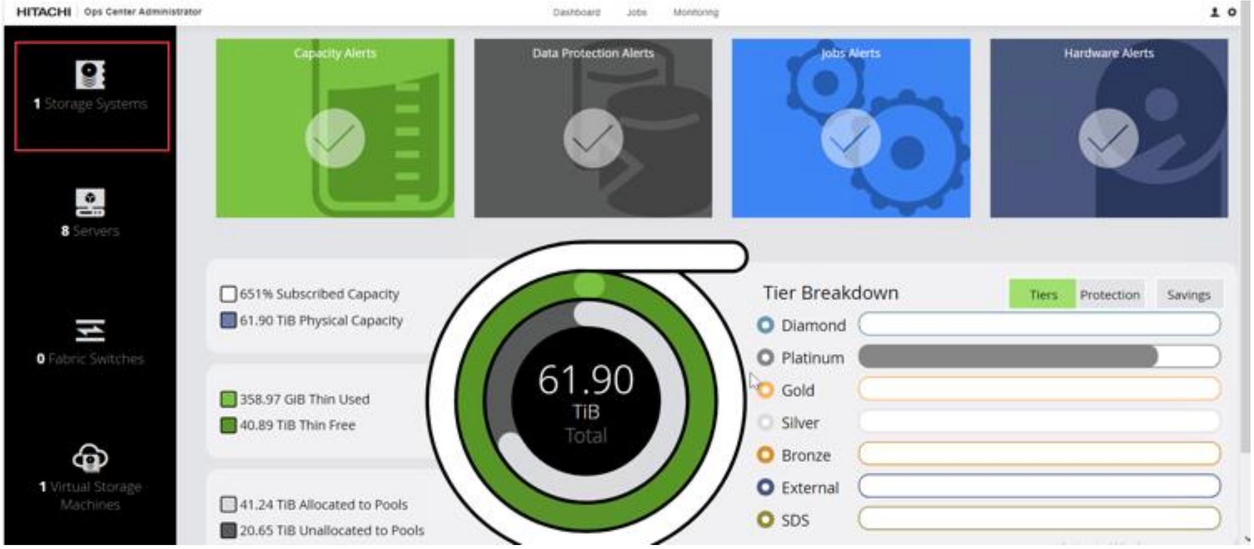
The following procedure explains the initial configuration for the Hitachi Virtual Storage Platform (VSP) storage.

Hitachi Virtual Storage Platform Configuration for FC-SCSI

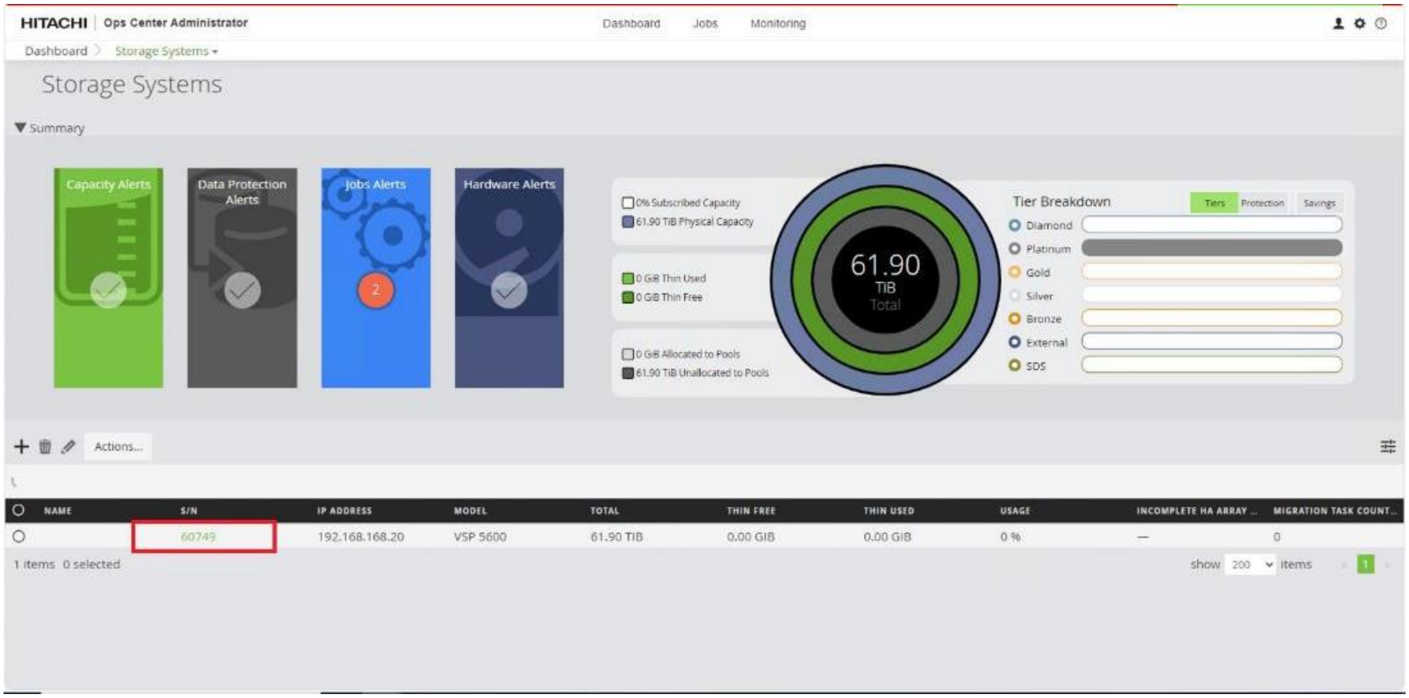
Procedure 1. Initialize Parity Groups with Hitachi Ops Center Administrator

The configuration steps in this procedure assume that Parity Groups have already been created by Hitachi professional services or from Hitachi Device Manager-Storage Navigator. To initialize Parity Groups from Hitachi Ops Center Administrator, proceed with the following steps:

Step 1. Log in to **Hitachi Ops Center Administrator** and from the navigation pane, select **Storage Systems**.



Step 2. Select the respective Virtual Storage Platform **S/N** from the **Storage Systems** list.

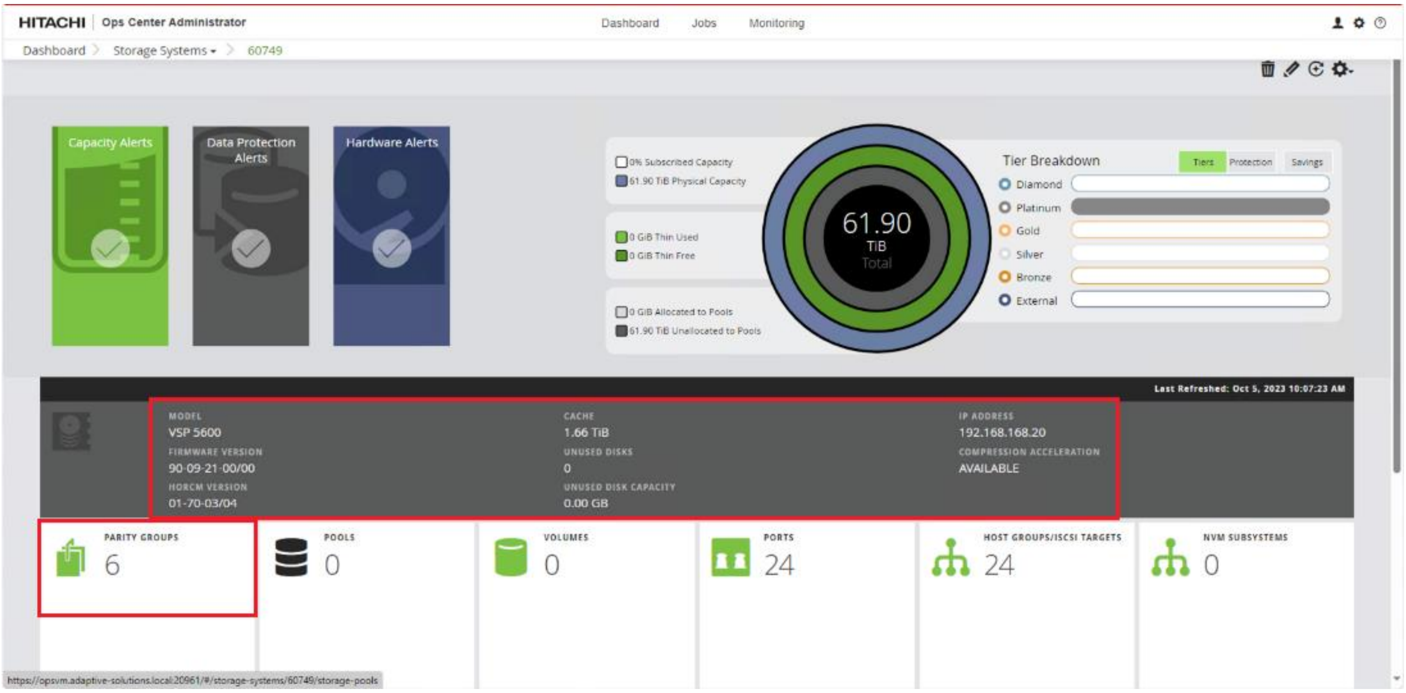


○	NAME	S/N	IP ADDRESS	MODEL	TOTAL	THIN FREE	THIN USED	USAGE	INCOMPLETE HA ARRAY ...	MIGRATION TASK COUNT...
○		60749	192.168.168.20	VSP 5600	61.90 TiB	0.00 GiB	0.00 GiB	0 %	—	0

1 items 0 selected

show 200 items

Step 3. Click the **PARITY GROUPS** icon under the selected storage system to view the Parity Groups.



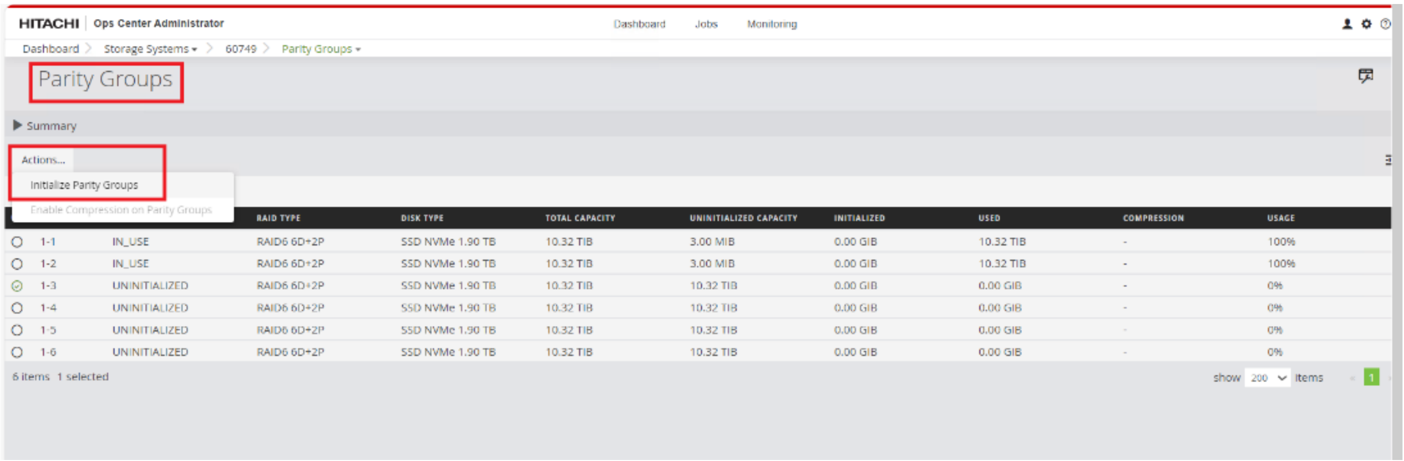
Last Refreshed: Oct 5, 2023 10:07:23 AM

MODEL: VSP 5600
FIRMWARE VERSION: 90-09-21-00/00
HORCM VERSION: 01-70-03/04
CACHE: 1.66 TiB
UNUSED DISKS: 0
UNUSED DISK CAPACITY: 0.00 GB
IP ADDRESS: 192.168.168.20
COMPRESSION ACCELERATION: AVAILABLE

PARITY GROUPS 6
POOLS 0
VOLUMES 0
PORTS 24
HOST GROUPS/ISCSI TARGETS 24
NVM SUBSYSTEMS 0

https://opsvm.adaptive-solutions.local:20961/#/storage-systems/60749/storage-pools

Step 4. Click any **Parity Group ID** that you want to initialize as parity for creating the boot volume pool. From the **Actions** pane, click **Initialize Parity Groups.**



HITACHI | Ops Center Administrator

Dashboard > Storage Systems > 60749 > Parity Groups

Parity Groups

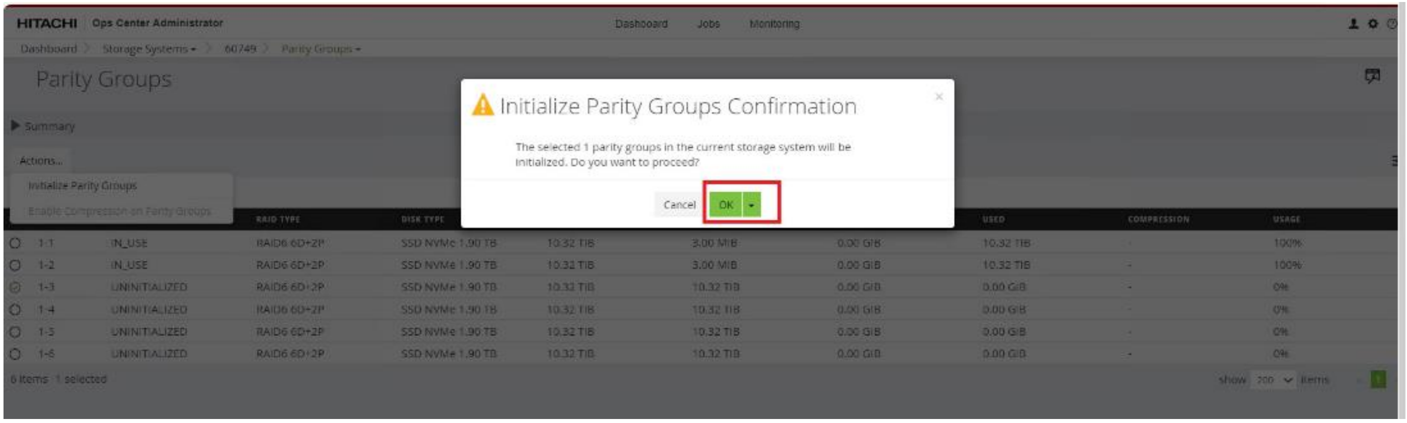
Actions...

- Initialize Parity Groups
- Enable Compression on Parity Groups

			RAID TYPE	DISK TYPE	TOTAL CAPACITY	UNINITIALIZED CAPACITY	INITIALIZED	USED	COMPRESSION	USAGE
○	1-1	IN_USE	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TIB	3.00 MIB	0.00 GIB	10.32 TIB	-	100%
○	1-2	IN_USE	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TIB	3.00 MIB	0.00 GIB	10.32 TIB	-	100%
✓	1-3	UNINITIALIZED	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TIB	10.32 TIB	0.00 GIB	0.00 GIB	-	0%
○	1-4	UNINITIALIZED	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TIB	10.32 TIB	0.00 GIB	0.00 GIB	-	0%
○	1-5	UNINITIALIZED	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TIB	10.32 TIB	0.00 GIB	0.00 GIB	-	0%
○	1-6	UNINITIALIZED	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TIB	10.32 TIB	0.00 GIB	0.00 GIB	-	0%

6 items 1 selected

Step 5. Click **OK**.



Initialize Parity Groups Confirmation

The selected 1 parity groups in the current storage system will be initialized. Do you want to proceed?

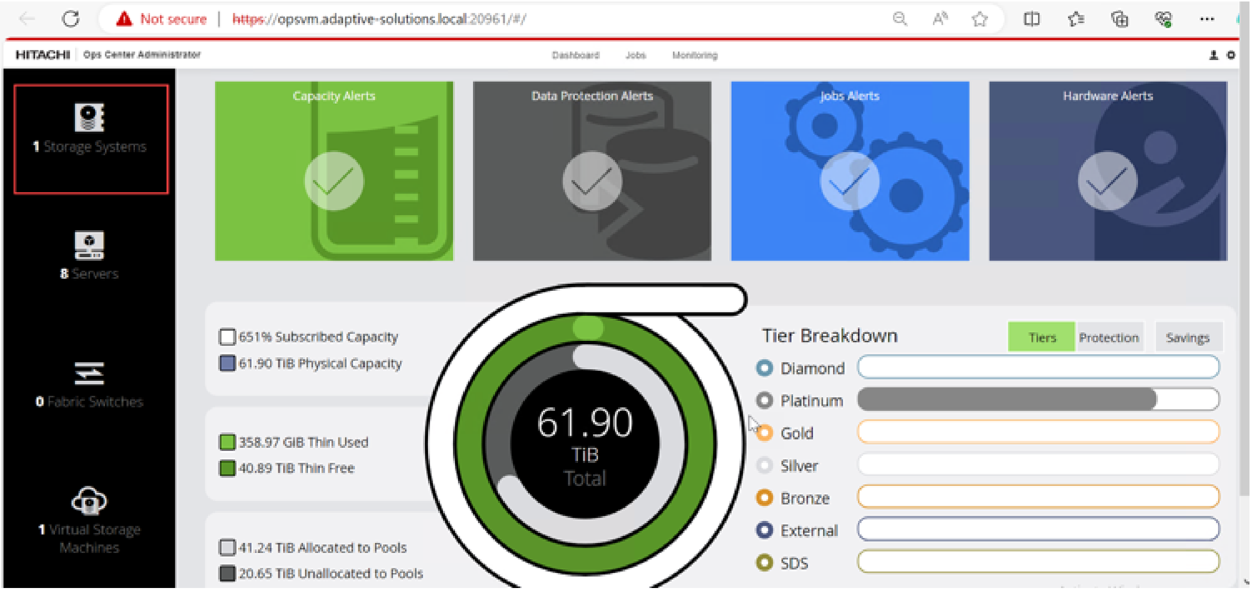
Note: Created Parity Groups initially have a status of UNINITIALIZED. Upon complete initialization, the status should change into IN_USE.

Procedure 2. Create a Hitachi Dynamic Provisioning Pool for UCS Server Boot LDEVs from Hitachi Ops Center Administrator

When creating a pool, select the basic option to leverage tiers of storage available on the VSP, following best practices. By default, the basic option creates a Hitachi Dynamic Provisioning Pool.

For increased flexibility and if best practices are not essential, choose the advanced option. This enables you to specify Parity Groups and define your pool types as either Tiered, Thin, or Snap.

Step 1. Log in to **Hitachi Ops Center Administrator**, and from the navigation pane, click **Storage Systems** to access the inventory of registered storage systems.

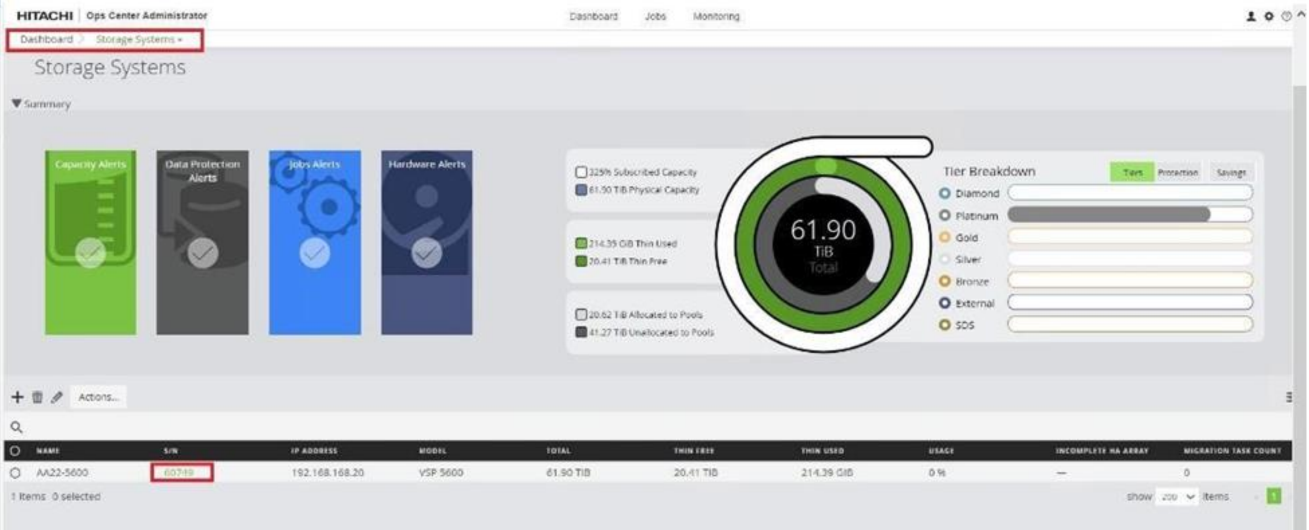


□ 651% Subscribed Capacity
▨ 61.90 TiB Physical Capacity

🟩 358.97 GiB Thin Used
🟩 40.89 TiB Thin Free

□ 41.24 TiB Allocated to Pools
■ 20.65 TiB Unallocated to Pools

Step 2. Click the **S/N** listing of the Storage System.



□ 325% Subscribed Capacity
▨ 61.90 TiB Physical Capacity

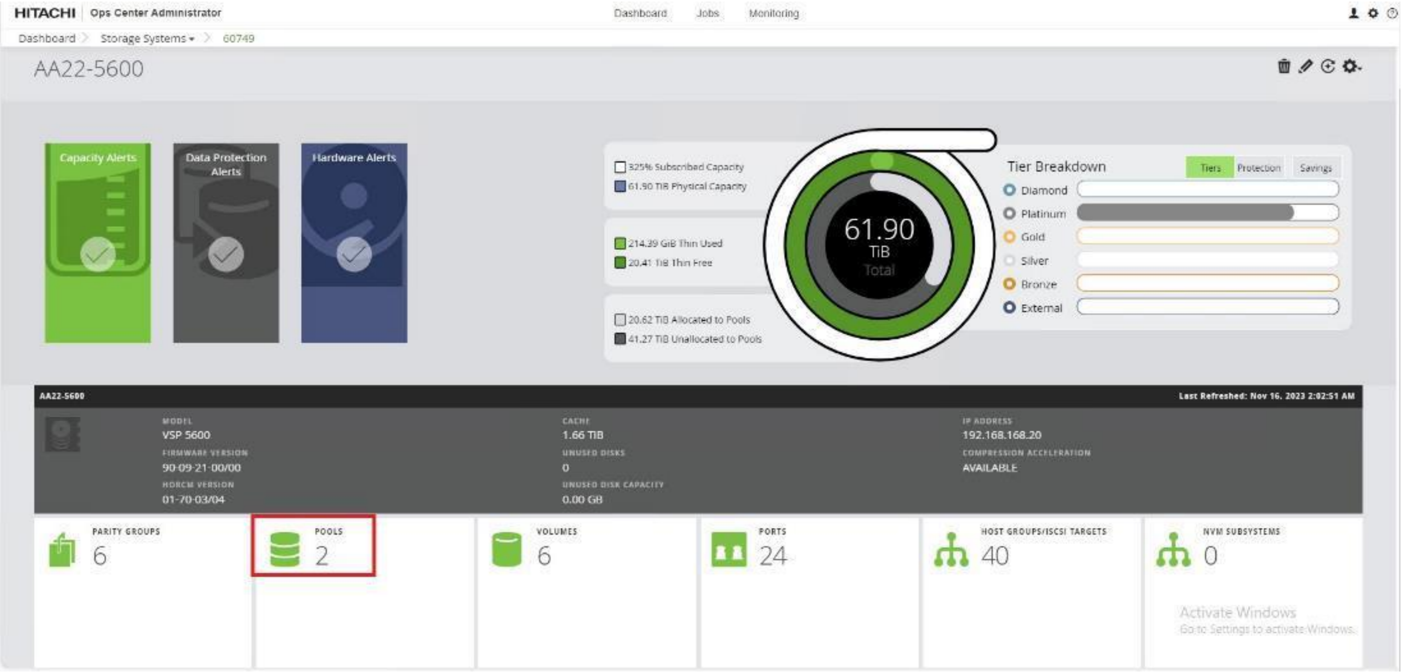
🟩 214.39 GiB Thin Used
🟩 20.41 TiB Thin Free

□ 20.62 TiB Allocated to Pools
■ 41.27 TiB Unallocated to Pools

○	NAME	S/N	IP ADDRESS	MODEL	TOTAL	THIN FREE	THIN USED	USAGE	INCOMPLETE HA ARRAY	MIGRATION TASK COUNT
○	AA22-5600	60749	192.168.168.20	VSP 5600	61.90 TiB	20.41 TiB	214.39 GiB	0 %	—	0

1 Items 0 selected

Step 3. From the selected **Storage Systems**, click **POOLS.**

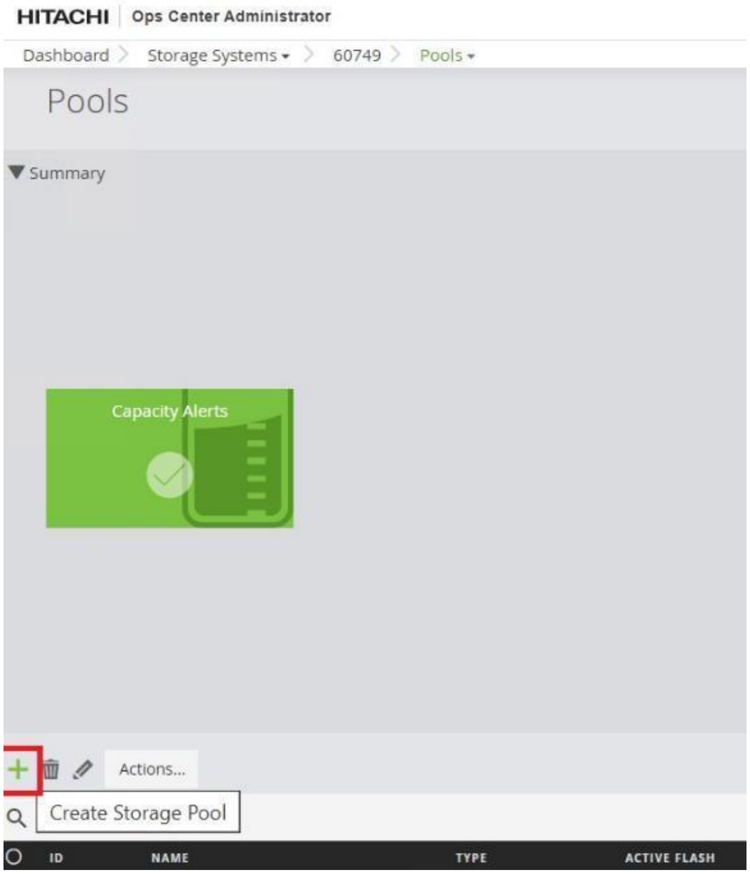


AA22-5600 Last Refreshed: Nov 16, 2023 2:02:51 AM

MODEL: VSP 5600
FIRMWARE VERSION: 90-09-21-00/00
HORCM VERSION: 01-70-03/04
CACHE: 1.66 TiB
UNUSED DISKS: 0
UNUSED DISK CAPACITY: 0.00 GB
IP ADDRESS: 192.168.168.20
COMPRESSION ACCELERATION: AVAILABLE

PARITY GROUPS 6
POOLS 2
VOLUMES 6
PORTS 24
HOST GROUPS/ISCSI TARGETS 40
NVM SUBSYSTEMS 0

Step 4. Click the plus sign (**+**), to open the **Create Pool** window.



Step 5. Enter the following details:

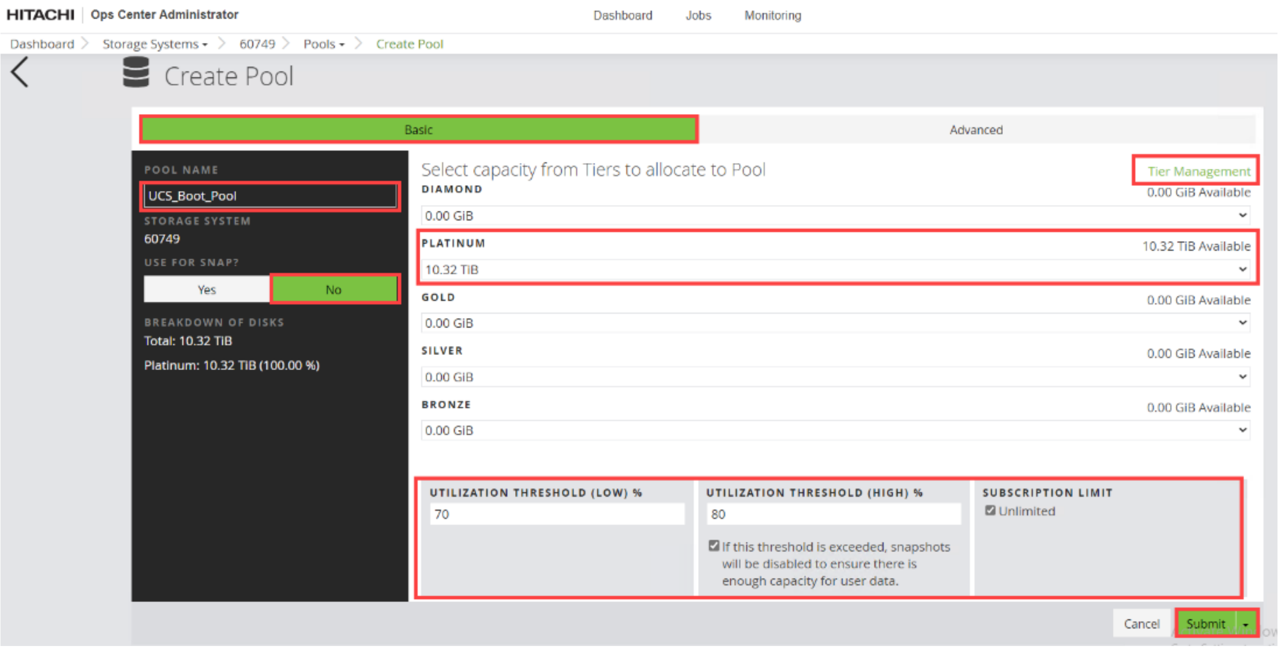
a. Enter **POOL NAME** as " UCS_Boot_Pool" (pool names can be any combination of alphanumeric characters, hyphens, and underscores only. Initial hyphens are not allowed).

b. Click an available **Tier** to view the storage capacity and select the required capacity.

c. Review the **high and low pool utilization thresholds**. By default, the low utilization threshold is set to 70%, and the high threshold is set to 80%. You can customize these thresholds to receive notifications based on their specific environment requirements.

d. To specify over allocation, you can set the limit to **Unlimited**.

e. Click **Submit**.


HITACHI | Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Storage Systems ▾ > 60749 > Pools ▾ > Create Pool
Create Pool
Basic
Advanced
Tier Management
Cancel
Submit ▾

POOL NAME: UCS_Boot_Pool

STORAGE SYSTEM: 60749

USE FOR SNAP? Yes [✓ No]

BREAKDOWN OF DISKS
Total: 10.32 TiB
Platinum: 10.32 TiB (100.00 %)

Select capacity from Tiers to allocate to Pool

Tier	Capacity	Available
DIAMOND	0.00 GiB	0.00 GiB Available
PLATINUM	10.32 TiB	10.32 TiB Available
GOLD	0.00 GiB	0.00 GiB Available
SILVER	0.00 GiB	0.00 GiB Available
BRONZE	0.00 GiB	0.00 GiB Available

UTILIZATION THRESHOLD (LOW) %: 70

UTILIZATION THRESHOLD (HIGH) %: 80

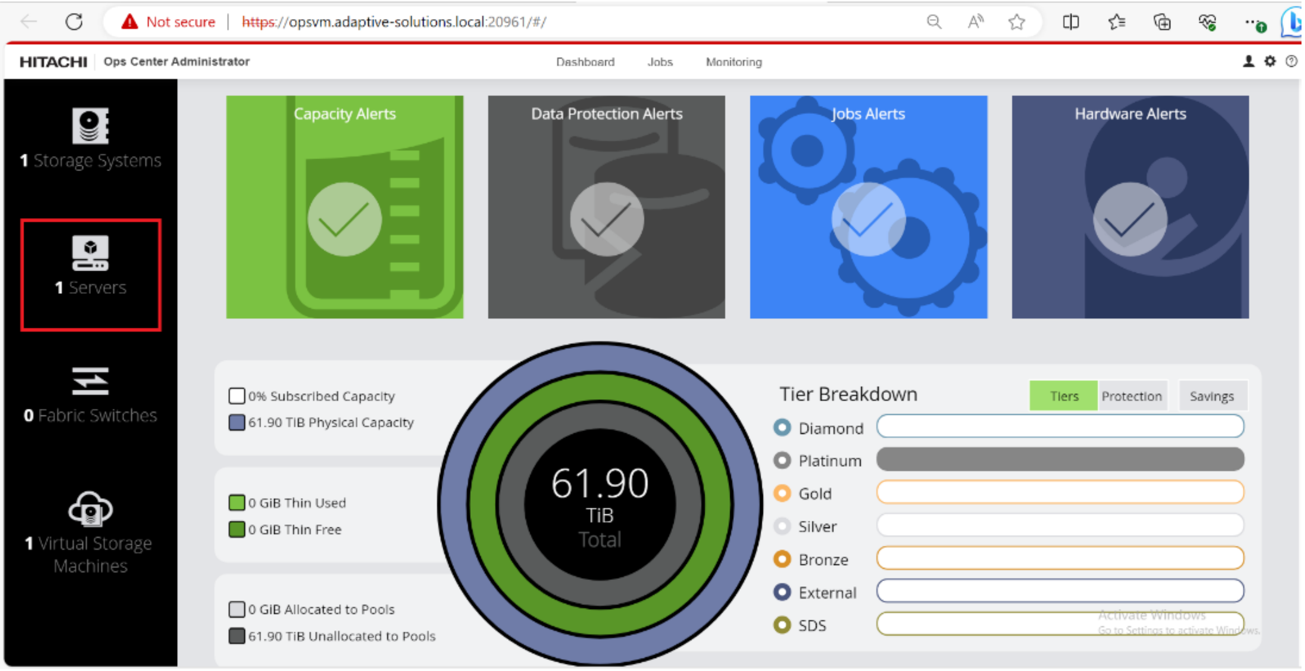
☑ If this threshold is exceeded, snapshots will be disabled to ensure there is enough capacity for user data.

SUBSCRIPTION LIMIT: ☑ Unlimited

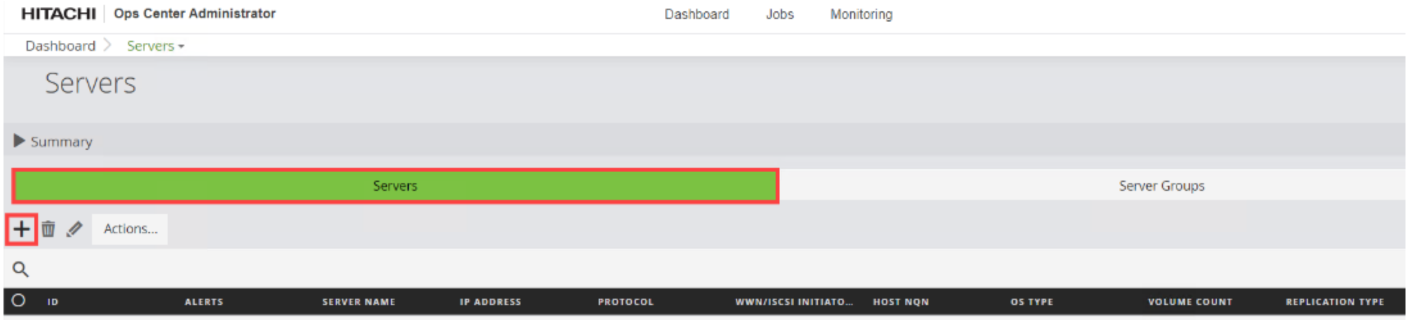
Procedure 3. Create FC-SCSI Servers from Hitachi Ops Center Administrator

Hitachi Ops Center Administrator supports provisioning storage from logical containers known as servers. These servers that host Cisco UCS server WWNs and the server IP. After Cisco UCS servers are onboarded in Ops Center Administrator, BOOT LDEVs can be provisioned using servers. Proceed with the following steps to create servers from Ops Center Administrator.

Step 1. Log in to **Hitachi Ops Center Administrator** and from the navigation pane, click **Servers**.



Step 2. Click the plus sign (**+**) to open the **Add Server** window.



Step 3. Click the plus sign (**+**) under the **Fibre Servers** and enter the following server information.

a. SERVER NAME

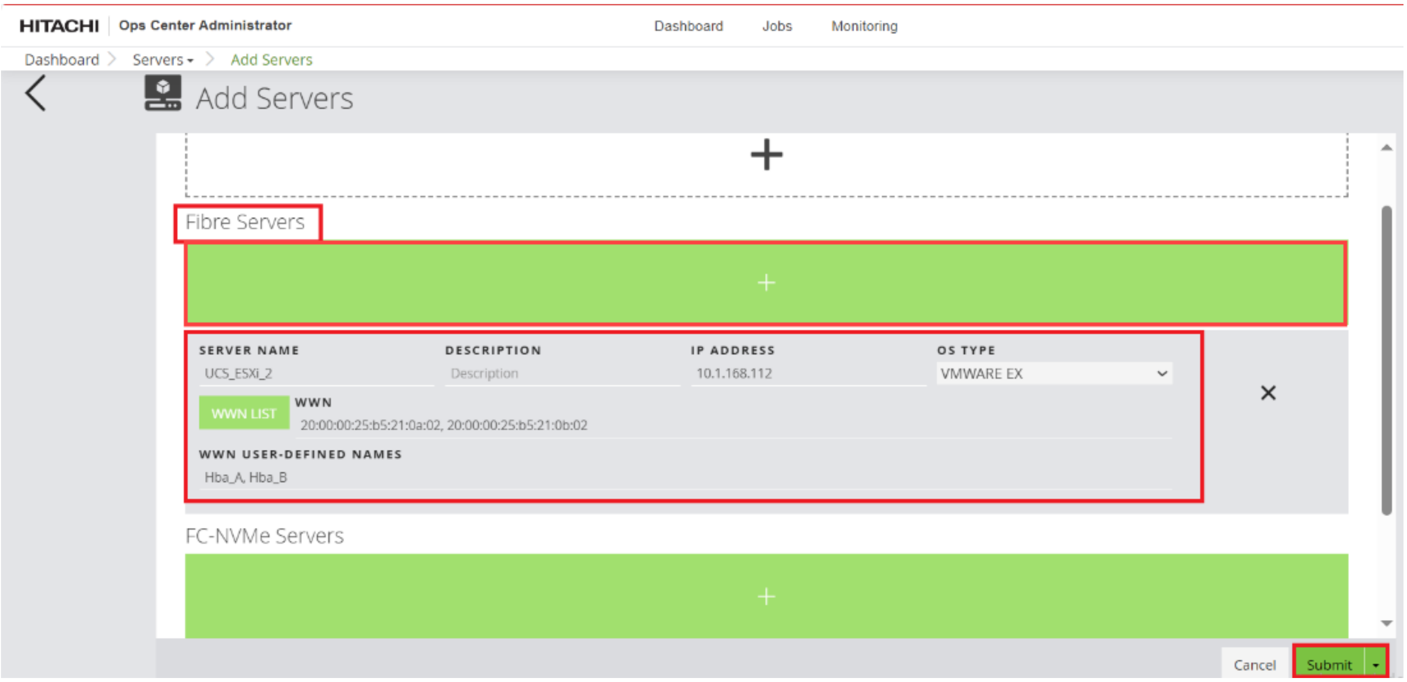
b. DESCRIPTION

c. IP ADDRESS

d. WWN LIST: Fabric A and Fabric B WWNs of the Cisco UCS Servers

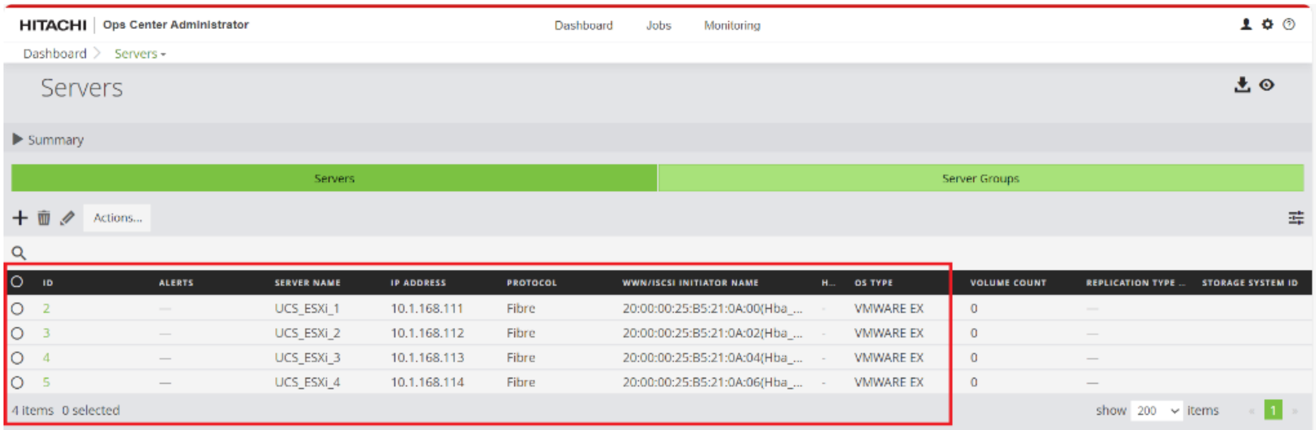
e. OS TYPE: Select the OS TYPE as VMWARE EX.

Step 4. Click **Submit** to add the server.



SERVER NAME: UCS_ESXi_2
DESCRIPTION: Description
IP ADDRESS: 10.1.168.112
OS TYPE: VMWARE EX
WWN LIST
WWN: 20:00:00:25:b5:21:0a:02, 20:00:00:25:b5:21:0b:02
WWN USER-DEFINED NAMES: Hba_A, Hba_B

Step 5. Repeat **Step 1** through **Step 4** for any additional Cisco UCS servers. Upon completion, you can expect the following representation of Cisco UCS servers.



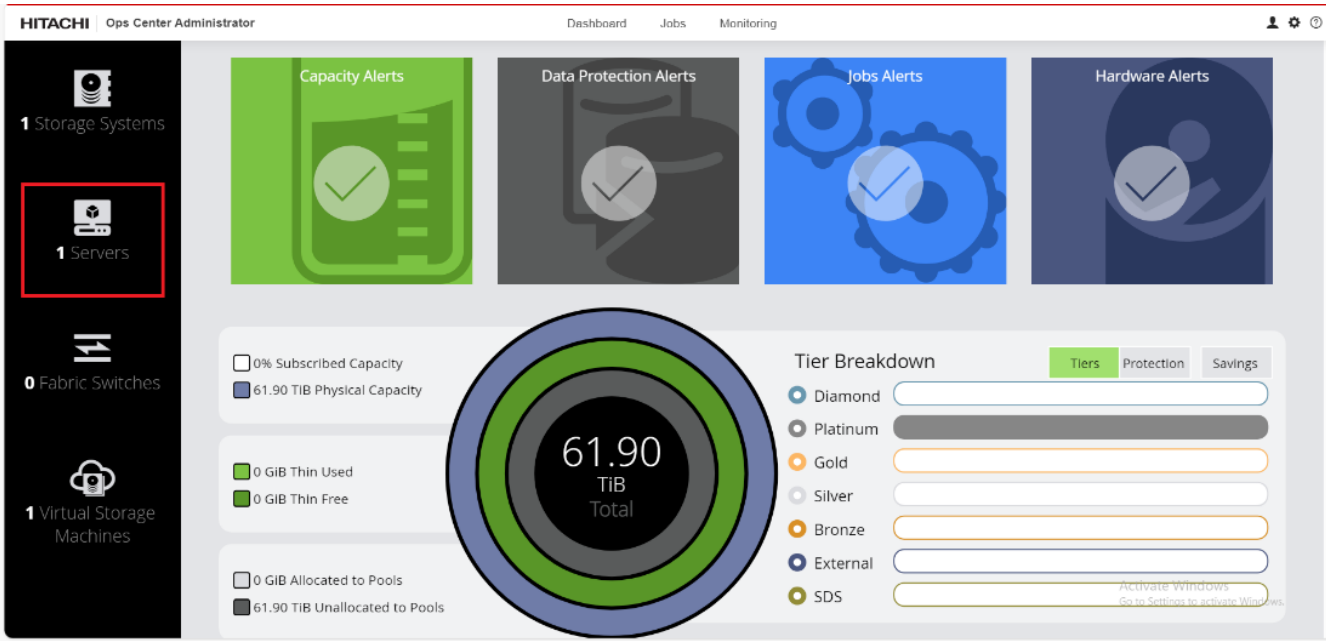
○	ID	ALERTS	SERVER NAME	IP ADDRESS	PROTOCOL	WWN/ISCSI INITIATOR NAME	H...	OS TYPE	VOLUME COUNT	REPLICATION TYPE ...	STORAGE SYSTEM ID
○	2	—	UCS_ESXi_1	10.1.168.111	Fibre	20:00:00:25:B5:21:0A:00(Hba_...	-	VMWARE EX	0	—	
○	3	—	UCS_ESXi_2	10.1.168.112	Fibre	20:00:00:25:B5:21:0A:02(Hba_...	-	VMWARE EX	0	—	
○	4	—	UCS_ESXi_3	10.1.168.113	Fibre	20:00:00:25:B5:21:0A:04(Hba_...	-	VMWARE EX	0	—	
○	5	—	UCS_ESXi_4	10.1.168.114	Fibre	20:00:00:25:B5:21:0A:06(Hba_...	-	VMWARE EX	0	—	

4 items 0 selected show 200 items 1

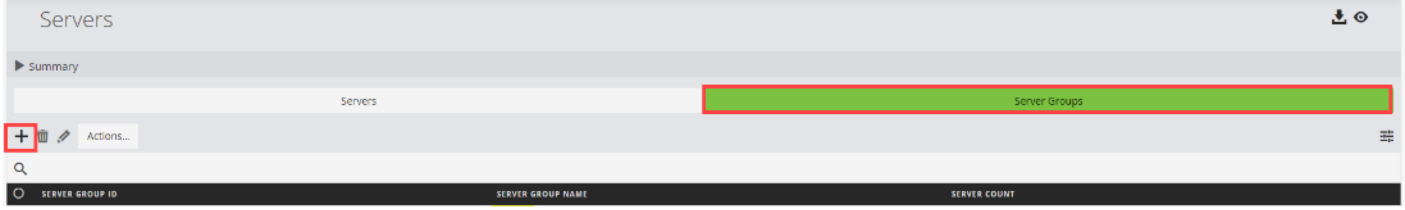
Procedure 4. Create FC-SCSI Server Groups from Ops Center Administrator

The Server Groups are created to manage multiple servers and attach volumes using a single workflow.

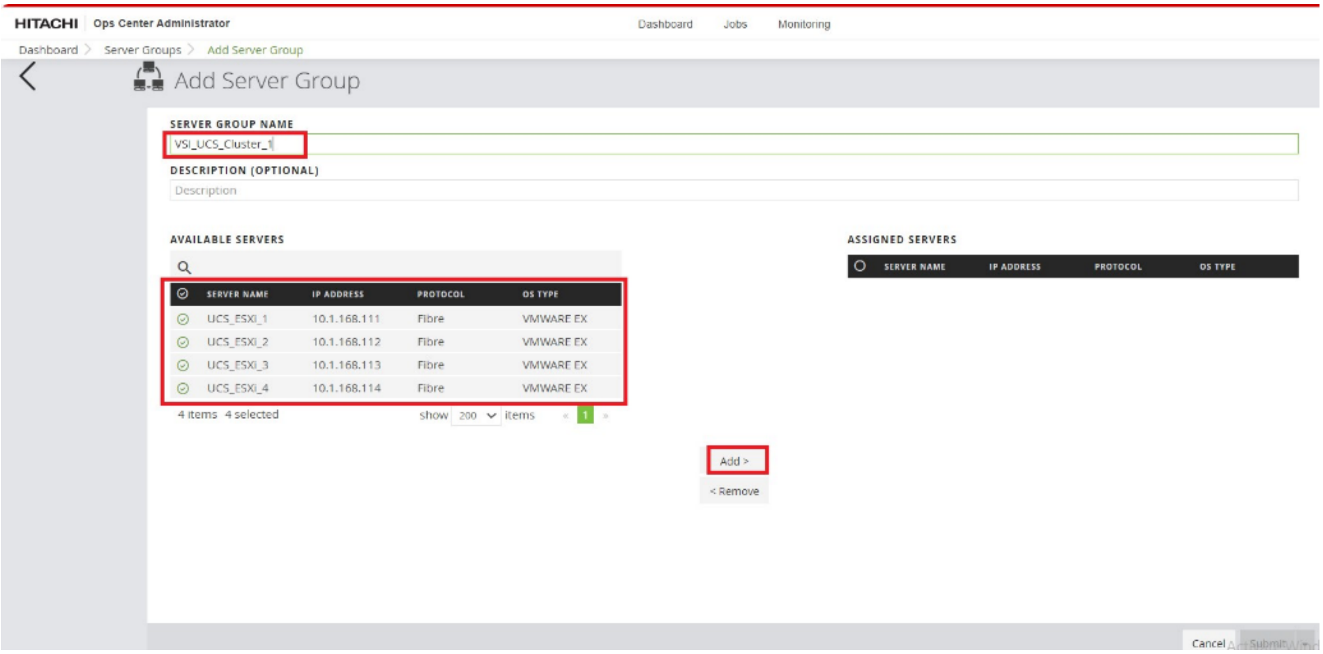
Step 1. Log in to **Hitachi Ops Center Administrator** and from the navigation pane, click **Servers.**



Step 2. Select **Server Groups**. Click the plus sign (**+**) icon to open the **Add Server Group** wizard.



Step 3. In the **Add Server Group** wizard, enter the **SERVER GROUP NAME** (for example,VSI_UCS_Cluster_1) and select the Cisco UCS servers that are going to be added to the server group. Click **Add** to move the selected servers from **AVAILABLE SERVERS** to **ASSIGNED SERVERS**.


HITACHI | Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Server Groups > Add Server Group
Add Server Group
Add >
< Remove
Cancel
Submit

SERVER GROUP NAME: VSI_UCS_Cluster_1

DESCRIPTION (OPTIONAL): Description

AVAILABLE SERVERS

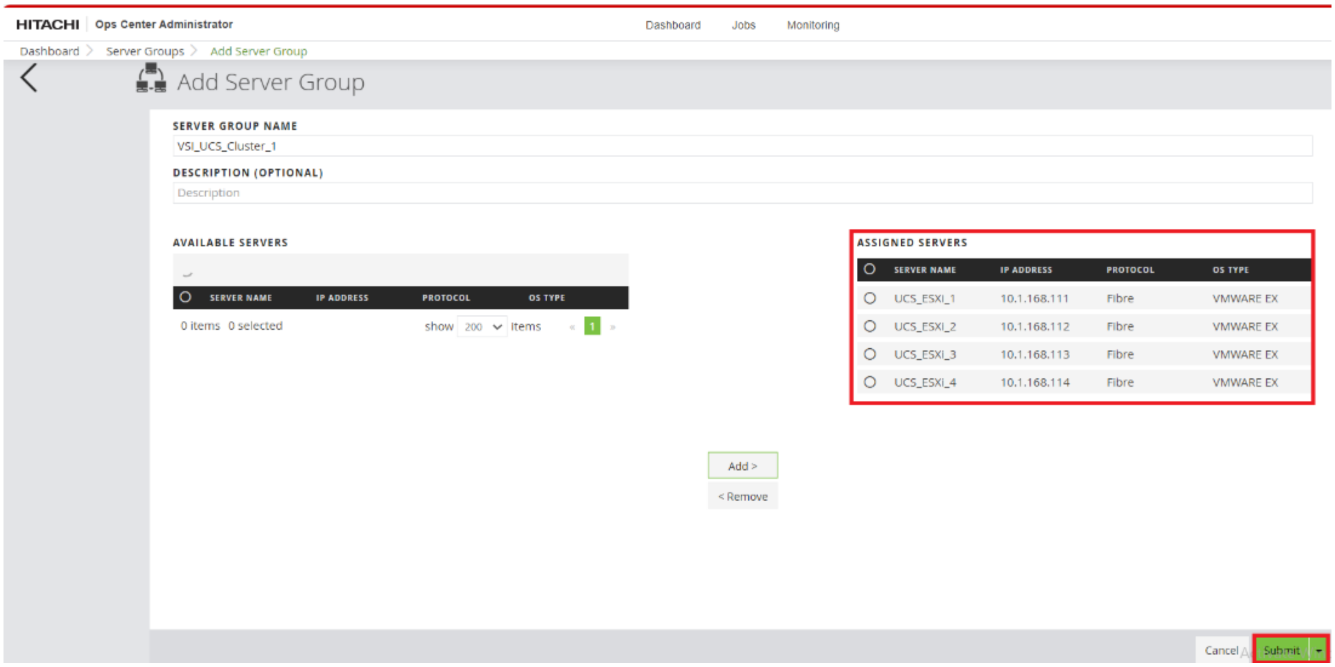
	SERVER NAME	IP ADDRESS	PROTOCOL	OS TYPE
✓	UCS_ESXI_1	10.1.168.111	Fibre	VMWARE EX
✓	UCS_ESXI_2	10.1.168.112	Fibre	VMWARE EX
✓	UCS_ESXI_3	10.1.168.113	Fibre	VMWARE EX
✓	UCS_ESXI_4	10.1.168.114	Fibre	VMWARE EX

4 items 4 selected show 200 items 1

ASSIGNED SERVERS

○	SERVER NAME	IP ADDRESS	PROTOCOL	OS TYPE

Step 4. Click **Submit.**


HITACHI | Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Server Groups > Add Server Group
Add Server Group
Add >
< Remove
Cancel
Submit

SERVER GROUP NAME: VSI_UCS_Cluster_1

DESCRIPTION (OPTIONAL): Description

AVAILABLE SERVERS

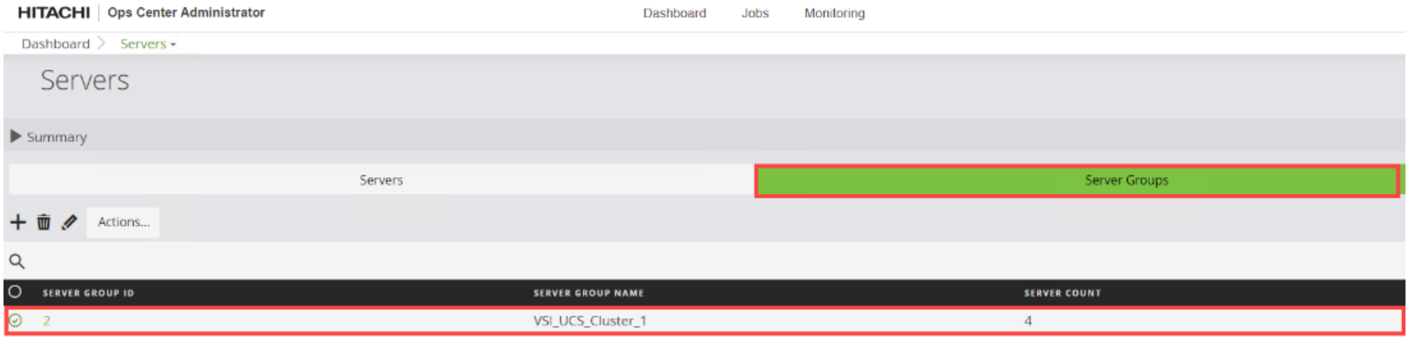
○	SERVER NAME	IP ADDRESS	PROTOCOL	OS TYPE

0 items 0 selected show 200 items 1

ASSIGNED SERVERS

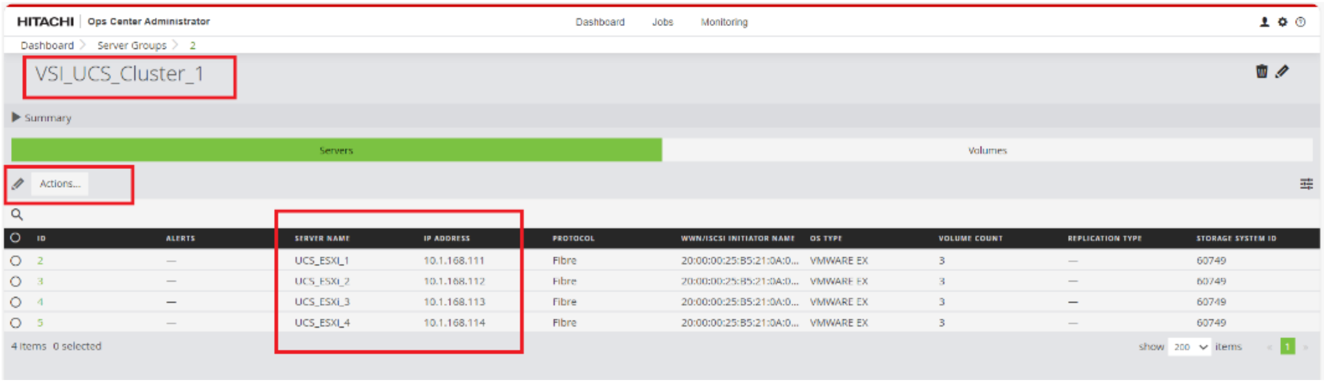
○	SERVER NAME	IP ADDRESS	PROTOCOL	OS TYPE
○	UCS_ESXI_1	10.1.168.111	Fibre	VMWARE EX
○	UCS_ESXI_2	10.1.168.112	Fibre	VMWARE EX
○	UCS_ESXI_3	10.1.168.113	Fibre	VMWARE EX
○	UCS_ESXI_4	10.1.168.114	Fibre	VMWARE EX

The **Server Group (VSI_UCS_Cluster_1)** was created and you can find it along with the **Server Group ID**.



SERVER GROUP ID	SERVER GROUP NAME	SERVER COUNT
2	VSI_UCS_Cluster_1	4

After your server group is created, you can expect the following representation:

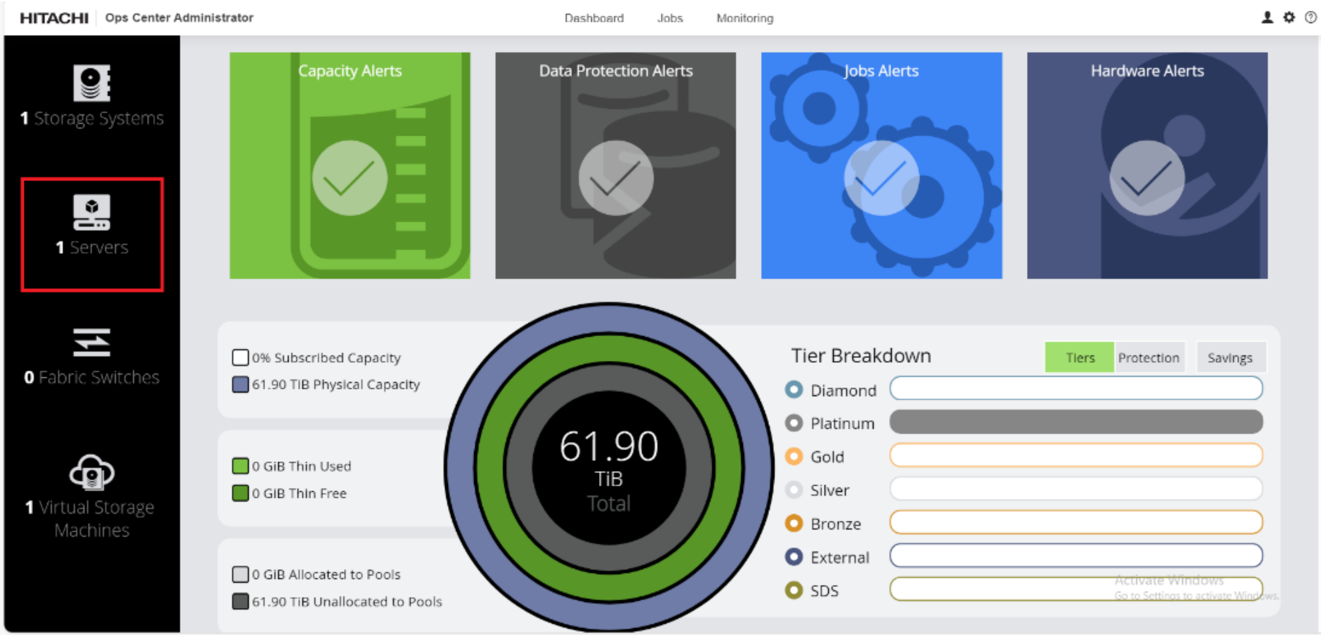


ID	ALERTS	SERVER NAME	IP ADDRESS	PROTOCOL	WWN/ISCSI INITIATOR NAME	OS TYPE	VOLUME COUNT	REPLICATION TYPE	STORAGE SYSTEM ID
2	—	UCS_ESXI_1	10.1.168.111	Fibre	20:00:00:25:B5:21:0A:0...	VMWARE EX	3	—	60749
3	—	UCS_ESXI_2	10.1.168.112	Fibre	20:00:00:25:B5:21:0A:0...	VMWARE EX	3	—	60749
4	—	UCS_ESXI_3	10.1.168.113	Fibre	20:00:00:25:B5:21:0A:0...	VMWARE EX	3	—	60749
5	—	UCS_ESXI_4	10.1.168.114	Fibre	20:00:00:25:B5:21:0A:0...	VMWARE EX	3	—	60749

Procedure 5. Allocate Boot LUNs to UCS Servers from Hitachi Ops Center Administrator with Multiple LDEV paths

When allocating Boot LUNs to the Cisco UCS servers, the allocation will be executed on a per-server basis using the Servers logical container.

Step 1. Log in to **Hitachi Ops Center Administrator** and from the navigation pane, click **Servers**.



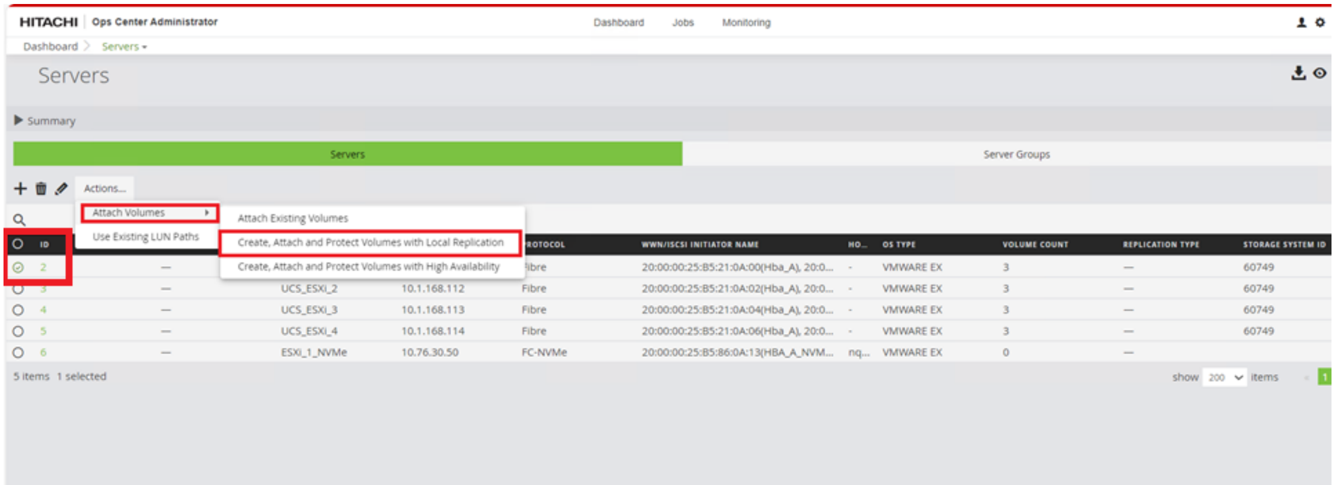
□ 0% Subscribed Capacity
▨ 61.90 TiB Physical Capacity

🟩 0 GiB Thin Used
🟩 0 GiB Thin Free

□ 0 GiB Allocated to Pools
▨ 61.90 TiB Unallocated to Pools

Step 2. Select the **Server ID.**

Step 3. From the Actions tab, click **Attach Volumes** and select **Create, Attach, and Protect Volumes with Local Replication**.


HITACHI | Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Servers
Servers
Summary
Servers
Server Groups
Actions...
Attach Volumes
Use Existing LUN Paths
Attach Existing Volumes
Create, Attach and Protect Volumes with Local Replication
Create, Attach and Protect Volumes with High Availability

○	ID				ROTOCOL	WWN/ISCSI INITIATOR NAME	HO...	OS TYPE	VOLUME COUNT	REPLICATION TYPE	STORAGE SYSTEM ID
✓	2	—			ibre	20:00:00:25:B5:21:0A:00(Hba_A), 20:0...	-	VMWARE EX	3	—	60749
○	3	—	UCS_ESXi_2	10.1.168.112	Fibre	20:00:00:25:B5:21:0A:02(Hba_A), 20:0...	-	VMWARE EX	3	—	60749
○	4	—	UCS_ESXi_3	10.1.168.113	Fibre	20:00:00:25:B5:21:0A:04(Hba_A), 20:0...	-	VMWARE EX	3	—	60749
○	5	—	UCS_ESXi_4	10.1.168.114	Fibre	20:00:00:25:B5:21:0A:06(Hba_A), 20:0...	-	VMWARE EX	3	—	60749
○	6	—	ESXi_1_NVMe	10.76.30.50	FC-NVMe	20:00:00:25:B5:86:0A:13(HBA_A_NVM...	nq...	VMWARE EX	0	—	

5 items 1 selected show 200 items 1

Step 4. Configure volumes for the specified Storage System. To add the volumes to UCS ESXi servers complete the following steps:

a. Verify that the required **STORAGE SYSTEM** is selected.

b. Select the NUMBER OF VOLUMES as 1.

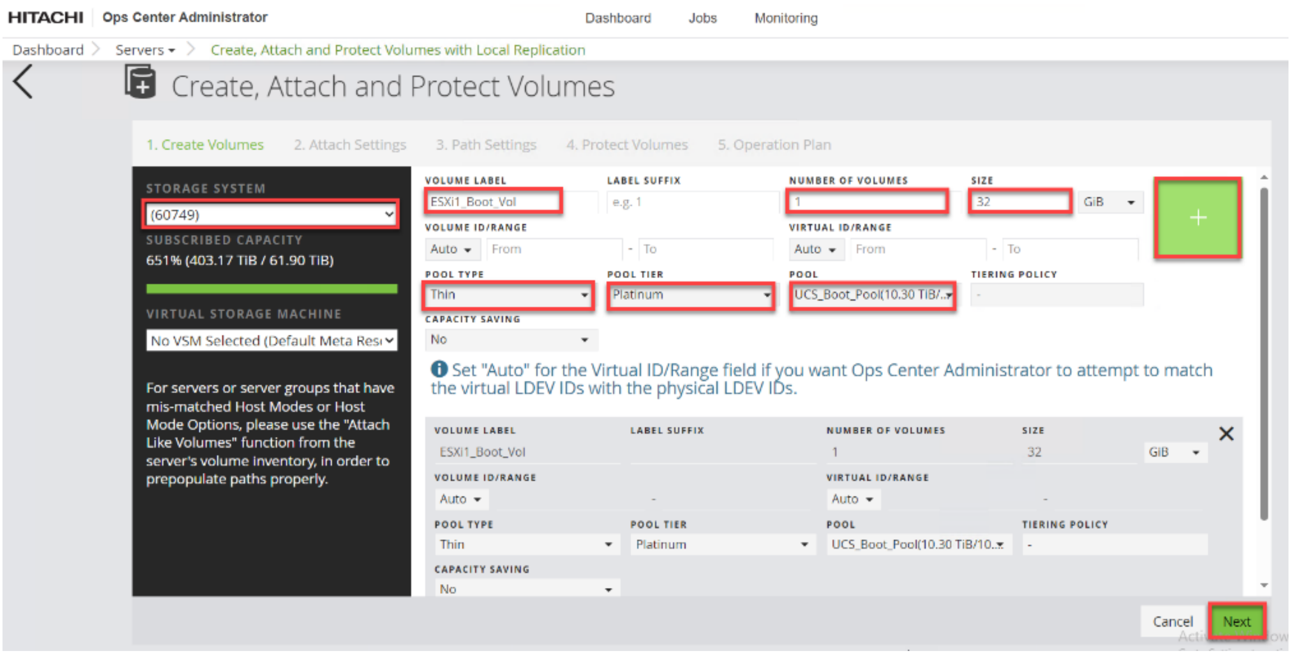
c. Enter the VOLUME LABEL (for example, ESXi1_Boot_Vol).

d. Enter the volume SIZE (for example, 32 GiB).

e. Select the **volume unit** as **GiB**.

f. Select the **POOL TYPE** as **Thin**.

Step 5. Click **Next** to continue.



HITACHI | Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Servers ▾ > Create, Attach and Protect Volumes with Local Replication

Create, Attach and Protect Volumes

1. Create Volumes
2. Attach Settings
3. Path Settings
4. Protect Volumes
5. Operation Plan

STORAGE SYSTEM: (60749)

SUBSCRIBED CAPACITY: 651% (403.17 TiB / 61.90 TiB)

VIRTUAL STORAGE MACHINE: No VSM Selected (Default Meta Resi

For servers or server groups that have mis-matched Host Modes or Host Mode Options, please use the "Attach Like Volumes" function from the server's volume inventory, in order to prepopulate paths properly.

VOLUME LABEL: ESXi1_Boot_Vol
LABEL SUFFIX: e.g. 1
NUMBER OF VOLUMES: 1
SIZE: 32 GiB
VOLUME ID/RANGE: Auto From - To
VIRTUAL ID/RANGE: Auto From - To
POOL TYPE: Thin
POOL TIER: Platinum
POOL: UCS_Boot_Pool(10.30 TiB/...
TIERING POLICY: -
CAPACITY SAVING: No

ℹ Set "Auto" for the Virtual ID/Range field if you want Ops Center Administrator to attempt to match the virtual LDEV IDs with the physical LDEV IDs.

VOLUME LABEL: ESXi1_Boot_Vol
LABEL SUFFIX:
NUMBER OF VOLUMES: 1
SIZE: 32 GiB
VOLUME ID/RANGE: Auto -
VIRTUAL ID/RANGE: Auto -
POOL TYPE: Thin
POOL TIER: Platinum
POOL: UCS_Boot_Pool(10.30 TiB/10...
TIERING POLICY: -
CAPACITY SAVING: No

Step 6. Select the following parameters:

a. Set the HOST MODE to **VMWARE EX.**

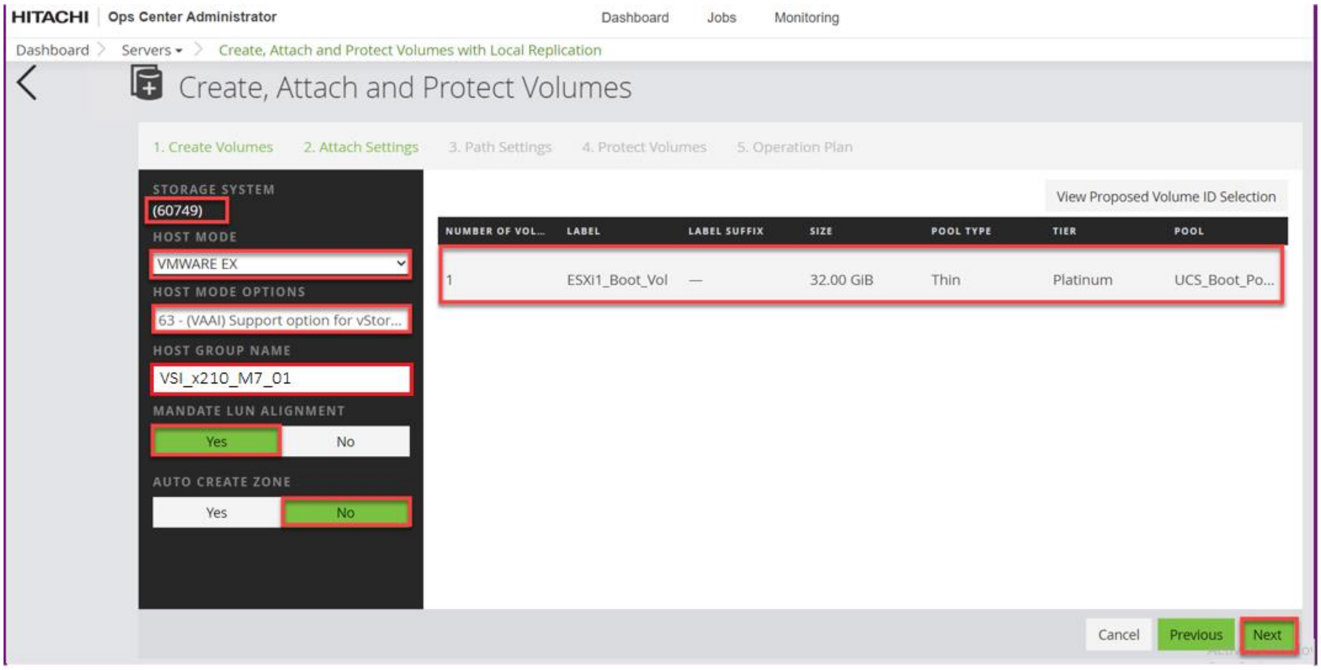
b. Select HOST MODE OPTION 63 **(VAAI) Support option for vStorage APIs based on T10 standards**.

c. Specify the HOST GROUP NAME; for VSI deployments in the context of this document, the nomenclature VSI_x210_M7_xx is used, where xx is the ESXi server ID.

d. Set MANDATE LUN ALIGNMENT as **Yes**; this option determines whether to assign the same LUN number to multiple servers for a volume. If Yes is specified, the same LUN number is always assigned.

e. Set AUTO CREATE ZONE as **No**.

f. Click **Next.**


HITACHI | Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Servers > Create, Attach and Protect Volumes with Local Replication
Create, Attach and Protect Volumes
1. Create Volumes
2. Attach Settings
3. Path Settings
4. Protect Volumes
5. Operation Plan
View Proposed Volume ID Selection
Cancel
Previous
Next

STORAGE SYSTEM: (60749)

HOST MODE: VMWARE EX

HOST MODE OPTIONS: 63 - (VAAI) Support option for vStor...

HOST GROUP NAME: VSI_x210_M7_01

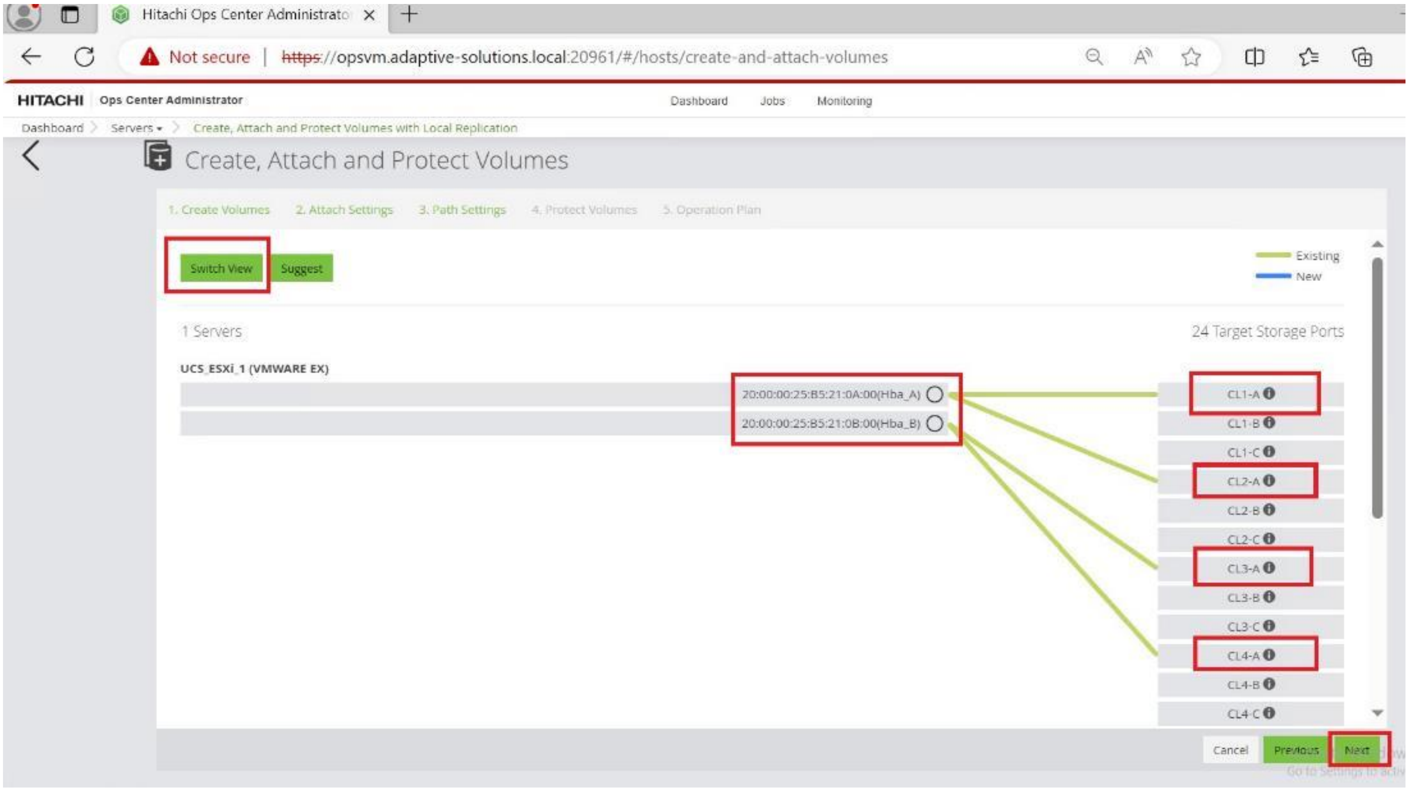
MANDATE LUN ALIGNMENT: [✓ Yes] No

AUTO CREATE ZONE: Yes [✓ No]

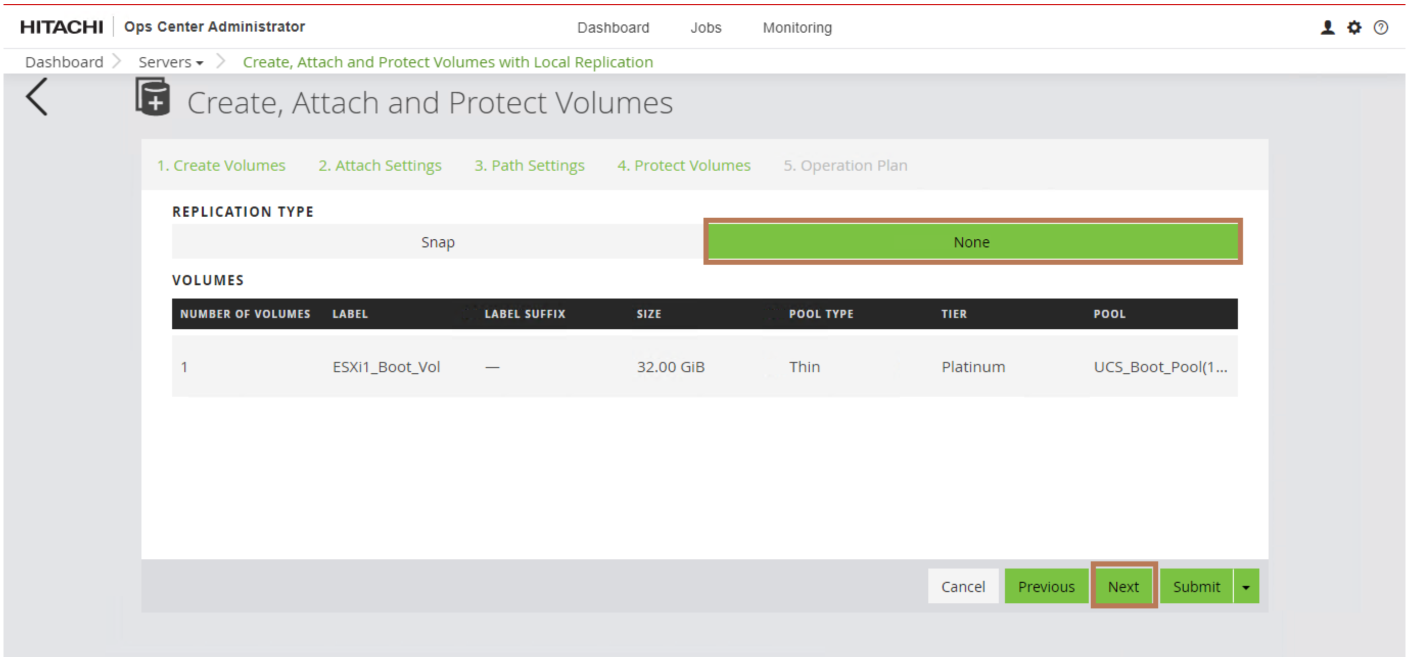
NUMBER OF VOL...	LABEL	LABEL SUFFIX	SIZE	POOL TYPE	TIER	POOL
1	ESXi1_Boot_Vol	—	32.00 GiB	Thin	Platinum	UCS_Boot_Po...

Step 7. In the Path Settings step, you can view servers and their WWNs, along with ports on the storage system and map based on initial zoning configurations. To create a path, click the Cisco UCS server WWNs and click the respective VSP Ports to which it is zoned.

Step 8. You can expect the following representation of the mapping after **Path Settings** are completed for a single ESXi host. Upon confirming the paths, click **Next** to view options for protecting volumes.



Step 9. Select **None** and click **Next**.



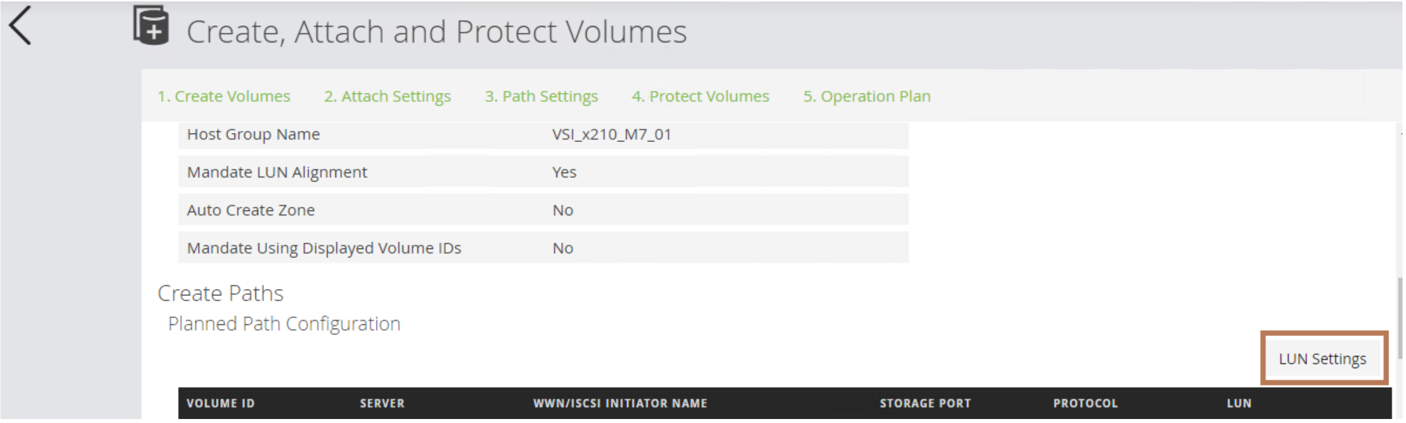
REPLICATION TYPE

Snap | None

VOLUMES

NUMBER OF VOLUMES	LABEL	LABEL SUFFIX	SIZE	POOL TYPE	TIER	POOL
1	ESXi1_Boot_Vol	—	32.00 GiB	Thin	Platinum	UCS_Boot_Pool(1…

Step 10. View the displayed **Operation Plan**, confirm the settings. For boot LUNs confirm that LUN ID 0 is assigned, if LUN ID 0 is not automatically selected, click **LUN Settings**. If LUN ID 0 is already assigned, go to step 12.



Create, Attach and Protect Volumes

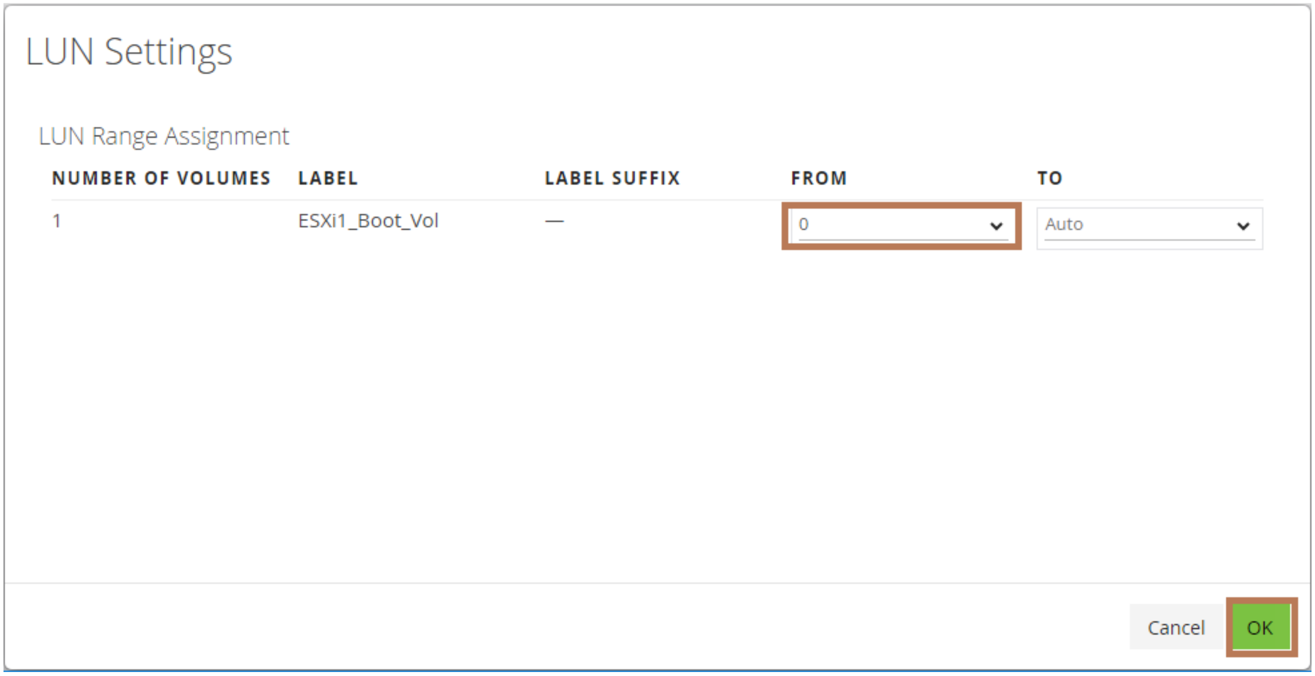
Host Group Name	VSI_x210_M7_01
Mandate LUN Alignment	Yes
Auto Create Zone	No
Mandate Using Displayed Volume IDs	No

Create Paths

Planned Path Configuration

VOLUME ID	SERVER	WWN/ISCSI INITIATOR NAME	STORAGE PORT	PROTOCOL	LUN

Step 11. From the LUN settings window, using the FROM the drop-down list, select **0**, and click **OK**.

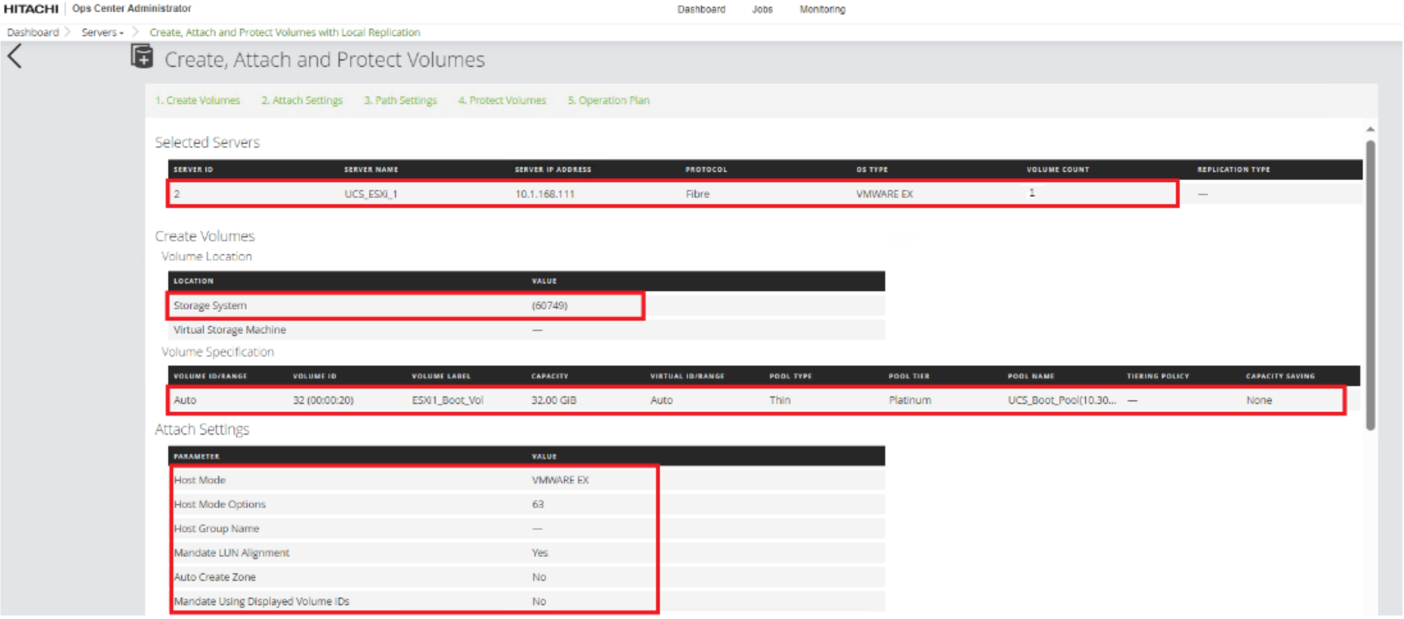


LUN Settings

LUN Range Assignment

NUMBER OF VOLUMES	LABEL	LABEL SUFFIX	FROM	TO
1	ESXi1_Boot_Vol	—	0	Auto

Step 12. Review the Operation plan. Click **Submit.**


HITACHI | Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Servers ▾ > Create, Attach and Protect Volumes with Local Replication

Create, Attach and Protect Volumes

1. Create Volumes
2. Attach Settings
3. Path Settings
4. Protect Volumes
5. Operation Plan

Selected Servers

SERVER ID	SERVER NAME	SERVER IP ADDRESS	PROTOCOL	OS TYPE	VOLUME COUNT	REPLICATION TYPE
2	UCS_ESXi_1	10.1.168.111	Fibre	VMWARE EX	1	—

Create Volumes

Volume Location

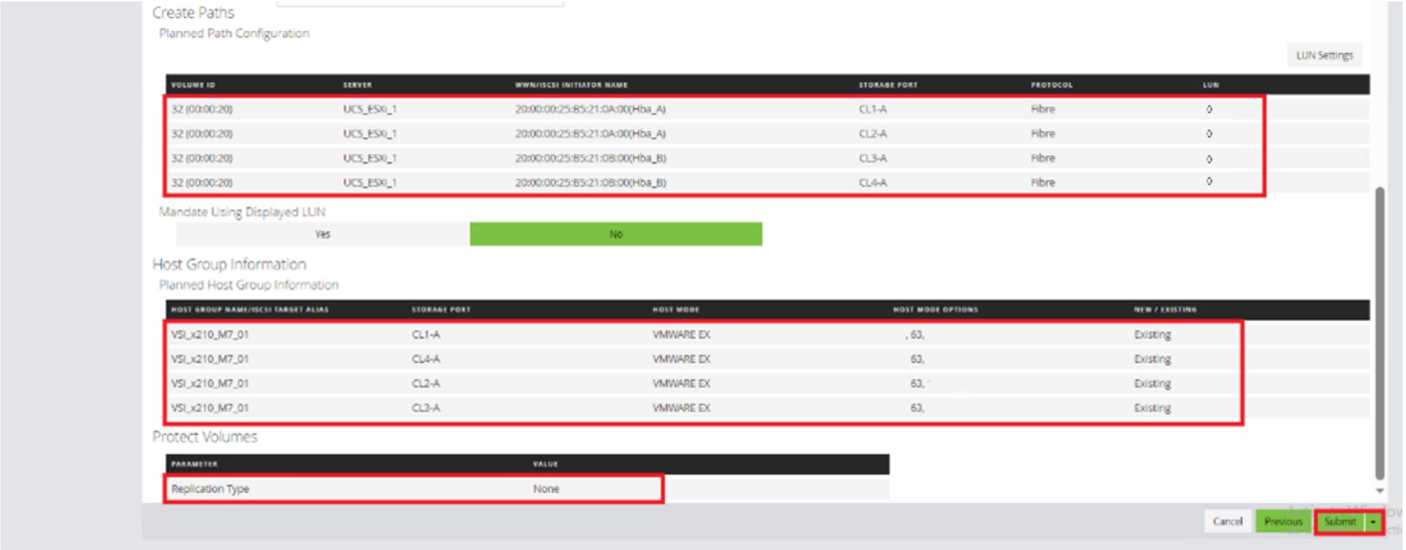
LOCATION	VALUE
Storage System	(60749)
Virtual Storage Machine	—

Volume Specification

VOLUME ID/RANGE	VOLUME ID	VOLUME LABEL	CAPACITY	VIRTUAL ID/RANGE	POOL TYPE	POOL TIER	POOL NAME	TIERING POLICY	CAPACITY SAVING
Auto	32 (00:00:20)	ESXI1_Boot_Vol	32.00 GIB	Auto	Thin	Platinum	UCS_Boot_Pool(10.30...	—	None

Attach Settings

PARAMETER	VALUE
Host Mode	VMWARE EX
Host Mode Options	63
Host Group Name	—
Mandate LUN Alignment	Yes
Auto Create Zone	No
Mandate Using Displayed Volume IDs	No



Create Paths

Planned Path Configuration

VOLUME ID	SERVER	WWN/ISCSI INITIATOR NAME	STORAGE PORT	PROTOCOL	LUN
32 (00:00:20)	UCS_ESXi_1	20:00:00:25:B5:21:0A:00(Hba_A)	CL1-A	Fibre	0
32 (00:00:20)	UCS_ESXi_1	20:00:00:25:B5:21:0A:00(Hba_A)	CL2-A	Fibre	0
32 (00:00:20)	UCS_ESXi_1	20:00:00:25:B5:21:0B:00(Hba_B)	CL3-A	Fibre	0
32 (00:00:20)	UCS_ESXi_1	20:00:00:25:B5:21:0B:00(Hba_B)	CL4-A	Fibre	0

Mandate Using Displayed LUN

Yes [✓ No]

Host Group Information

Planned Host Group Information

HOST GROUP NAME/ISCSI TARGET ALIAS	STORAGE PORT	HOST MODE	HOST MODE OPTIONS	NEW / EXISTING
VSI_x210_M7_01	CL1-A	VMWARE EX	, 63,	Existing
VSI_x210_M7_01	CL4-A	VMWARE EX	63,	Existing
VSI_x210_M7_01	CL2-A	VMWARE EX	63,	Existing
VSI_x210_M7_01	CL3-A	VMWARE EX	63,	Existing

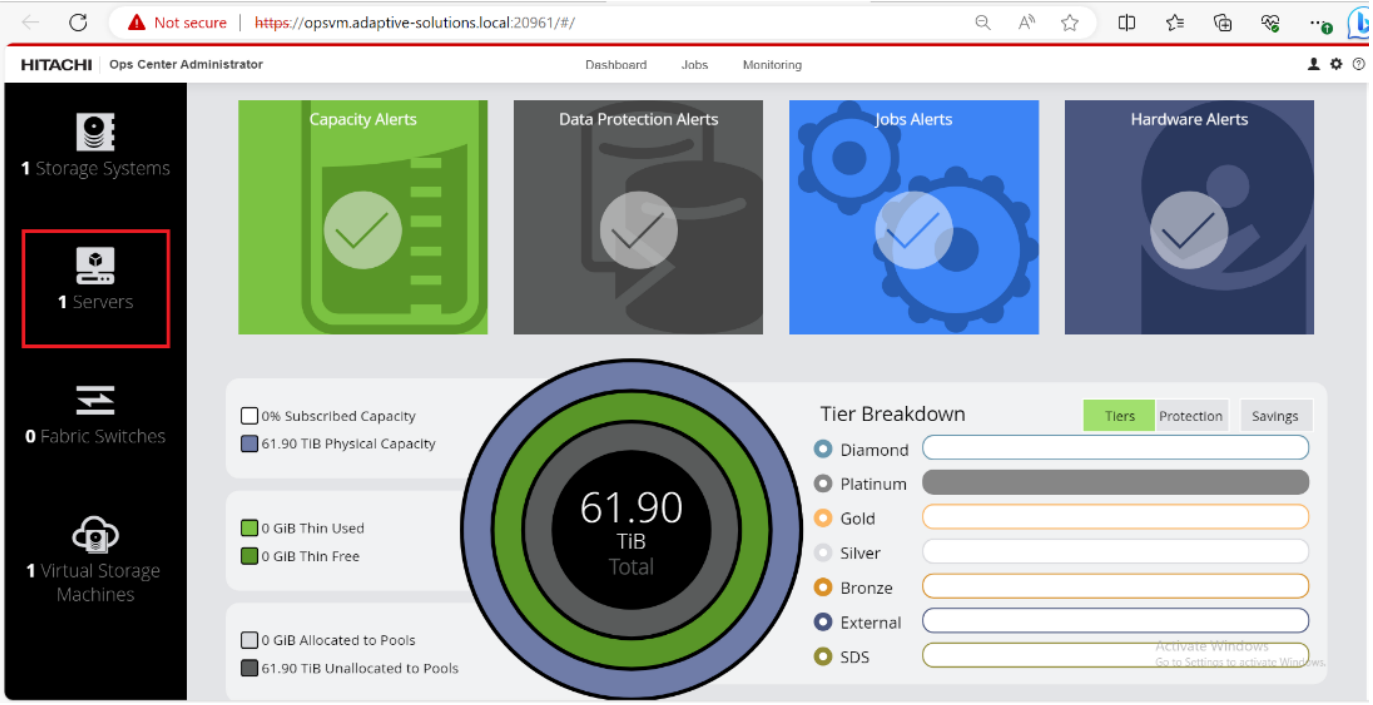
Protect Volumes

PARAMETER	VALUE
Replication Type	None

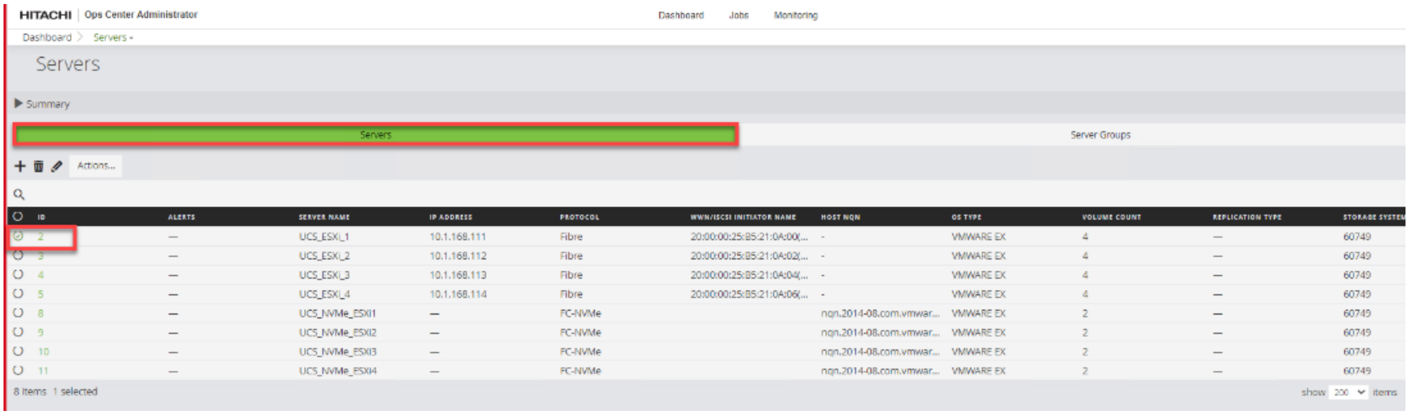
Step 13. Repeat **Steps 1** through **12** for any additional Cisco UCS servers.

Procedure 6. Edit Host Groups from Ops Center Administrator for Fabric A and Fabric B Representation

Step 1. Log in to **Hitachi Ops Center Administrator** and from the navigation pane select **Servers.**



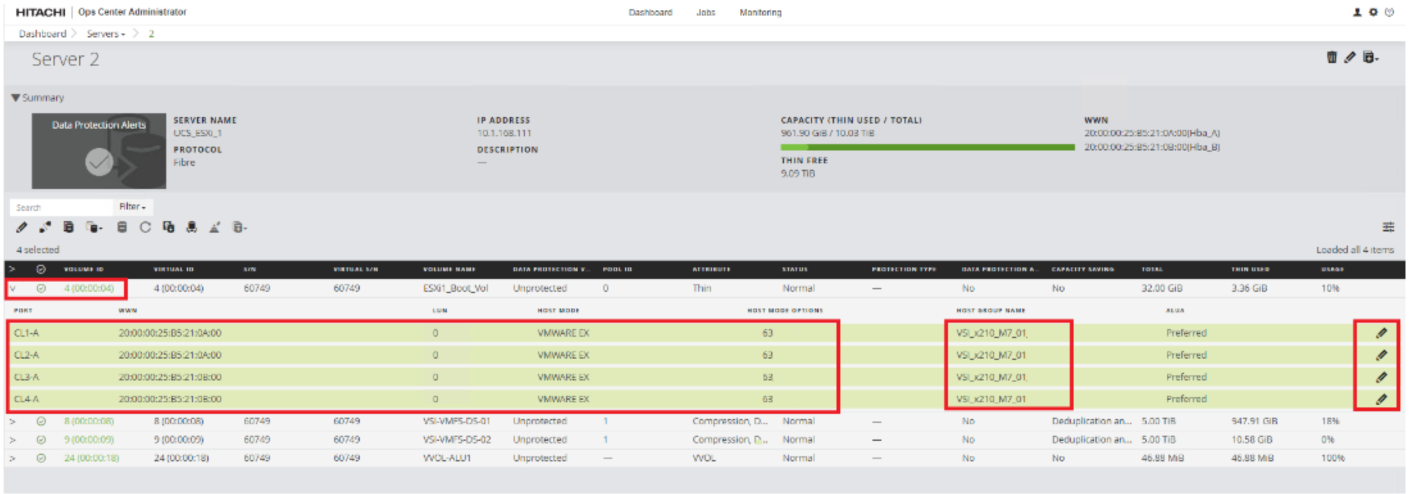
Step 2. Click the **Server ID** for **UCS_ESXi_1** as shown in the following figure:



○	ID	ALERTS	SERVER NAME	IP ADDRESS	PROTOCOL	WWN/ISCSI INITIATOR NAME	HOST NQN	OS TYPE	VOLUME COUNT	REPLICATION TYPE	STORAGE SYSTEM
✓	2	—	UCS_ESXi_1	10.1.168.111	Fibre	20:00:00:25:B5:21:0A:00(...	-	VMWARE EX	4	—	60749
○	3	—	UCS_ESXi_2	10.1.168.112	Fibre	20:00:00:25:B5:21:0A:02(...	-	VMWARE EX	4	—	60749
○	4	—	UCS_ESXi_3	10.1.168.113	Fibre	20:00:00:25:B5:21:0A:04(...	-	VMWARE EX	4	—	60749
○	5	—	UCS_ESXi_4	10.1.168.114	Fibre	20:00:00:25:B5:21:0A:06(...	-	VMWARE EX	4	—	60749
○	8	—	UCS_NVMe_ESXI1	—	FC-NVMe		nqn.2014-08.com.vmwar...	VMWARE EX	2	—	60749
○	9	—	UCS_NVMe_ESXI2	—	FC-NVMe		nqn.2014-08.com.vmwar...	VMWARE EX	2	—	60749
○	10	—	UCS_NVMe_ESXI3	—	FC-NVMe		nqn.2014-08.com.vmwar...	VMWARE EX	2	—	60749
○	11	—	UCS_NVMe_ESXI4	—	FC-NVMe		nqn.2014-08.com.vmwar...	VMWARE EX	2	—	60749

8 items 1 selected show 200 items

Step 3. Expand the **Volume ID** of the Boot volume created. Click the **Edit pencil** icon to edit CL1-A.



HITACHI | Ops Center Administrator

Dashboard > Servers > 2

Server 2

Summary

SERVER NAME
UCS_ESXi_1

PROTOCOL
Fibre

IP ADDRESS
10.1.168.111

DESCRIPTION
—

CAPACITY (THIN USED / TOTAL)
961.90 GiB / 10.03 TiB

THIN FREE
9.09 TiB

WWN
20:00:00:25:B5:21:0A:00(Hba_A)
20:00:00:25:B5:21:0B:00(Hba_B)

4 selected

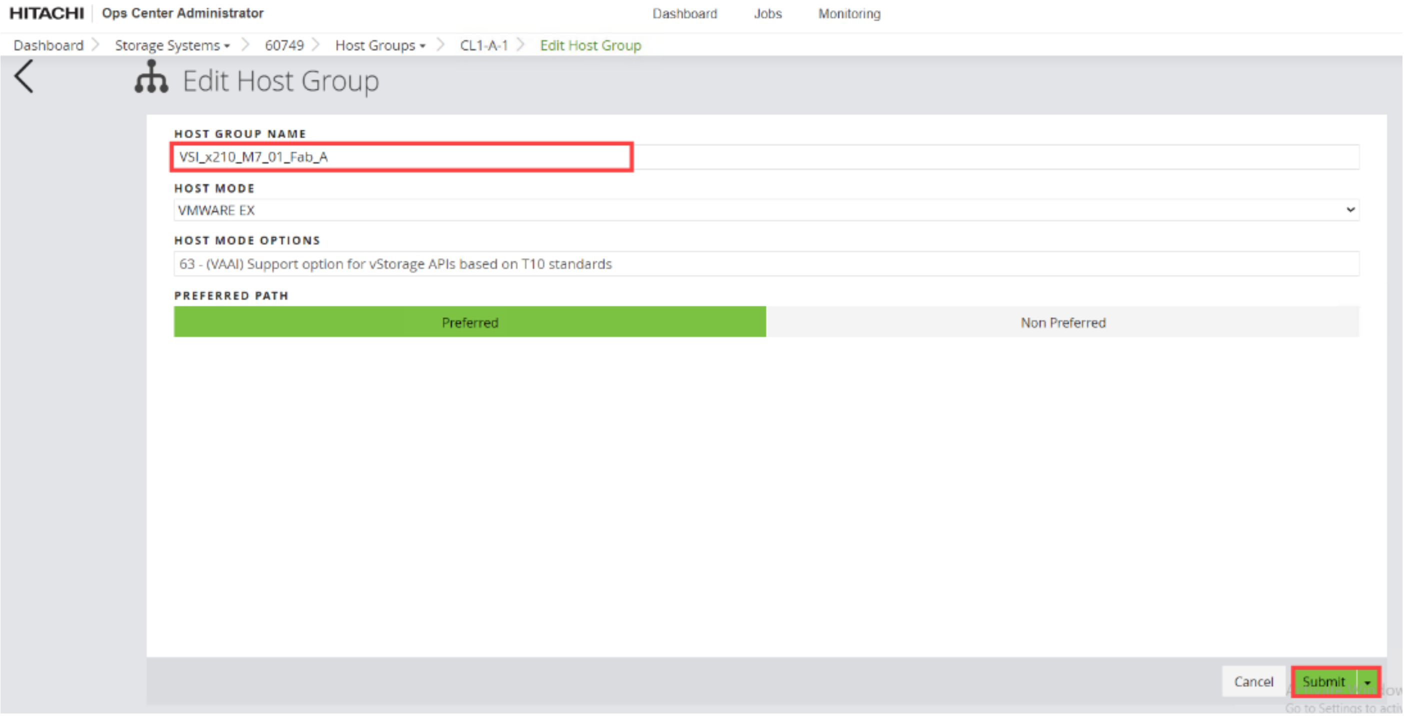
Loaded all 4 items

>	✓	VOLUME ID	VIRTUAL ID	S/N	VIRTUAL S/N	VOLUME NAME	DATA PROTECTION T...	POOL ID	ATTRIBUTE	STATUS	PROTECTION TYPE	DATA PROTECTION A...	CAPACITY SAVING	TOTAL	THIN USED	USAGE
v	✓	4 (00:00:04)	4 (00:00:04)	60749	60749	ESXi1_Boot_Vol	Unprotected	0	Thin	Normal	—	No	No	32.00 GiB	3.36 GiB	10%

PORT	WWN	LUN	HOST MODE	HOST MODE OPTIONS	HOST GROUP NAME	ALUA
CL1-A	20:00:00:25:B5:21:0A:00	0	VMWARE EX	63	VSI_x210_M7_01	Preferred
CL2-A	20:00:00:25:B5:21:0A:00	0	VMWARE EX	63	VSI_x210_M7_01	Preferred
CL3-A	20:00:00:25:B5:21:0B:00	0	VMWARE EX	63	VSI_x210_M7_01	Preferred
CL4-A	20:00:00:25:B5:21:0B:00	0	VMWARE EX	63	VSI_x210_M7_01	Preferred

>	✓	VOLUME ID	VIRTUAL ID	S/N	VIRTUAL S/N	VOLUME NAME	DATA PROTECTION T...	POOL ID	ATTRIBUTE	STATUS	PROTECTION TYPE	DATA PROTECTION A...	CAPACITY SAVING	TOTAL	THIN USED	USAGE
>	✓	8 (00:00:08)	8 (00:00:08)	60749	60749	VSI-VMFS-DS-01	Unprotected	1	Compression, D...	Normal	—	No	Deduplication an...	5.00 TiB	947.91 GiB	18%
>	✓	9 (00:00:09)	9 (00:00:09)	60749	60749	VSI-VMFS-DS-02	Unprotected	1	Compression, D...	Normal	—	No	Deduplication an...	5.00 TiB	10.58 GiB	0%
>	✓	24 (00:00:18)	24 (00:00:18)	60749	60749	VVOL-ALU1	Unprotected	—	VVOL	Normal	—	No	No	46.88 MiB	46.88 MiB	100%

Step 4. In the **HOST GROUP NAME** text box, update the host group name to include Fabric A**.** In the specific context outlined in this document, CL1-A for UCS_ESXi_1 is assigned VSI_x210_M7_01_Fab_A as the host group name. Click **Submit.**



HITACHI | Ops Center Administrator

Dashboard > Storage Systems > 60749 > Host Groups > CL1-A-1 > Edit Host Group

Edit Host Group

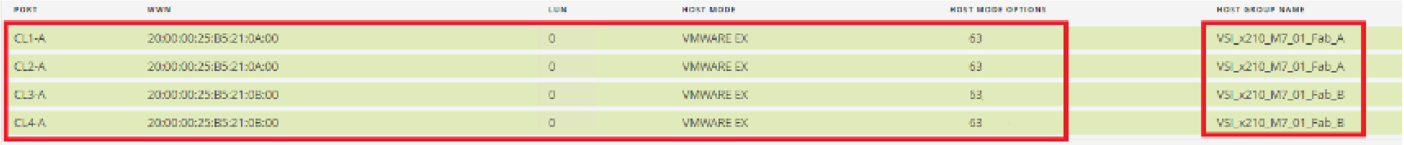
HOST GROUP NAME
VSI_x210_M7_01_Fab_A

HOST MODE
VMWARE EX

HOST MODE OPTIONS
63 - (VAAI) Support option for vStorage APIs based on T10 standards

PREFERRED PATH
Preferred | Non Preferred

Step 5. Repeat **Step 2** through **Step 4** for the remaining ports where CL2-A is Fabric A, CL3-A is Fabric B, and CL4- A is Fabric B. When completed, you can expect to see the following:



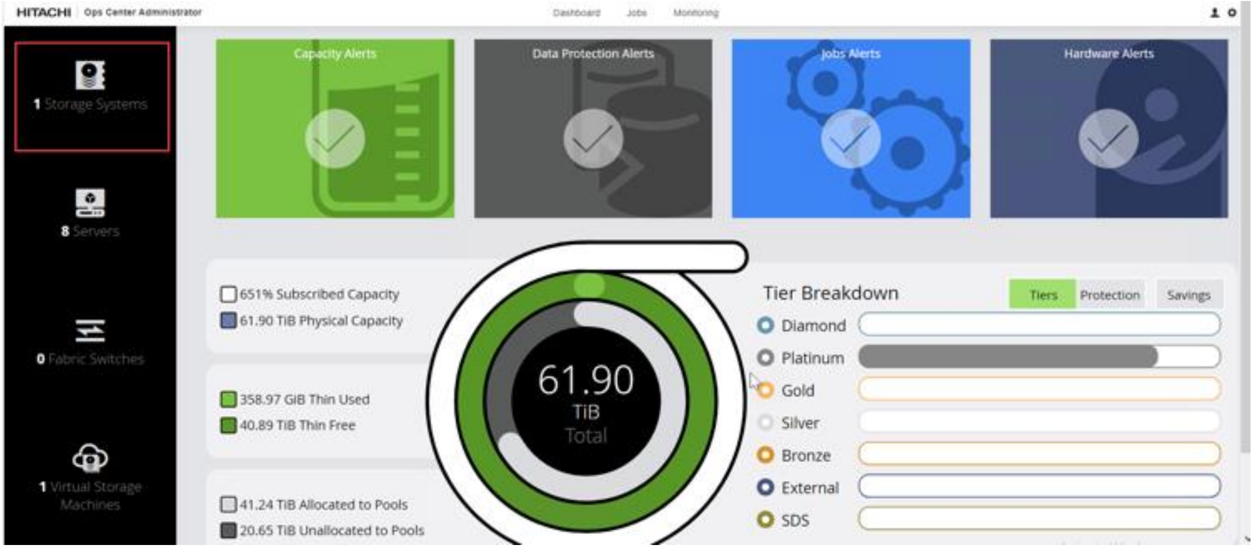
PORT	WWN	LUN	HOST MODE	HOST MODE OPTIONS	HOST GROUP NAME
CL1-A	20:00:00:25:B5:21:0A:00	0	VMWARE EX	63	VSI_x210_M7_01_Fab_A
CL2-A	20:00:00:25:B5:21:0A:00	0	VMWARE EX	63	VSI_x210_M7_01_Fab_A
CL3-A	20:00:00:25:B5:21:0B:00	0	VMWARE EX	63	VSI_x210_M7_01_Fab_B
CL4-A	20:00:00:25:B5:21:0B:00	0	VMWARE EX	63	VSI_x210_M7_01_Fab_B

Procedure 7. Create a Hitachi Dynamic Provisioning Pool for FC-SCSI VMFS LDEVs for UCS Servers

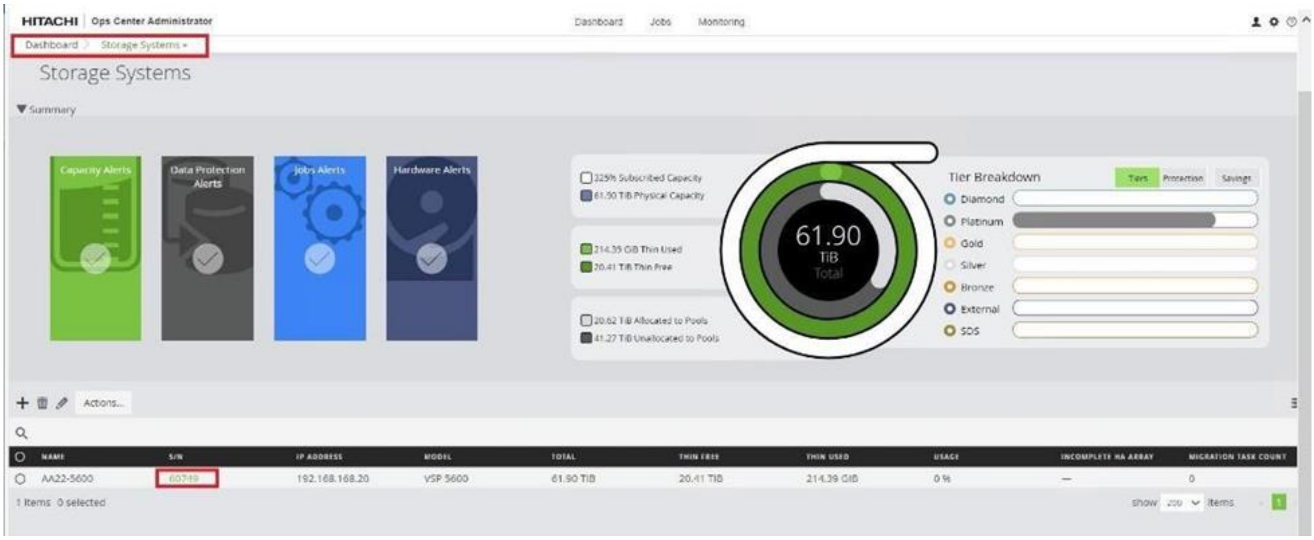
When creating a pool, use the basic option to leverage tiers of storage available on the VSP, following best practices. By default, the basic option creates a Hitachi Dynamic Provisioning Pool.

For increased flexibility and if best practices are not essential, choose advanced option. This enables you to select specific Parity Groups and define your pool types as either Tiered, Thin, or Snap.

Step 1. Log in to **Hitachi Ops Center Administrator**. In the **Dashboard**, click **Storage Systems** to access the inventory of registered storage systems.



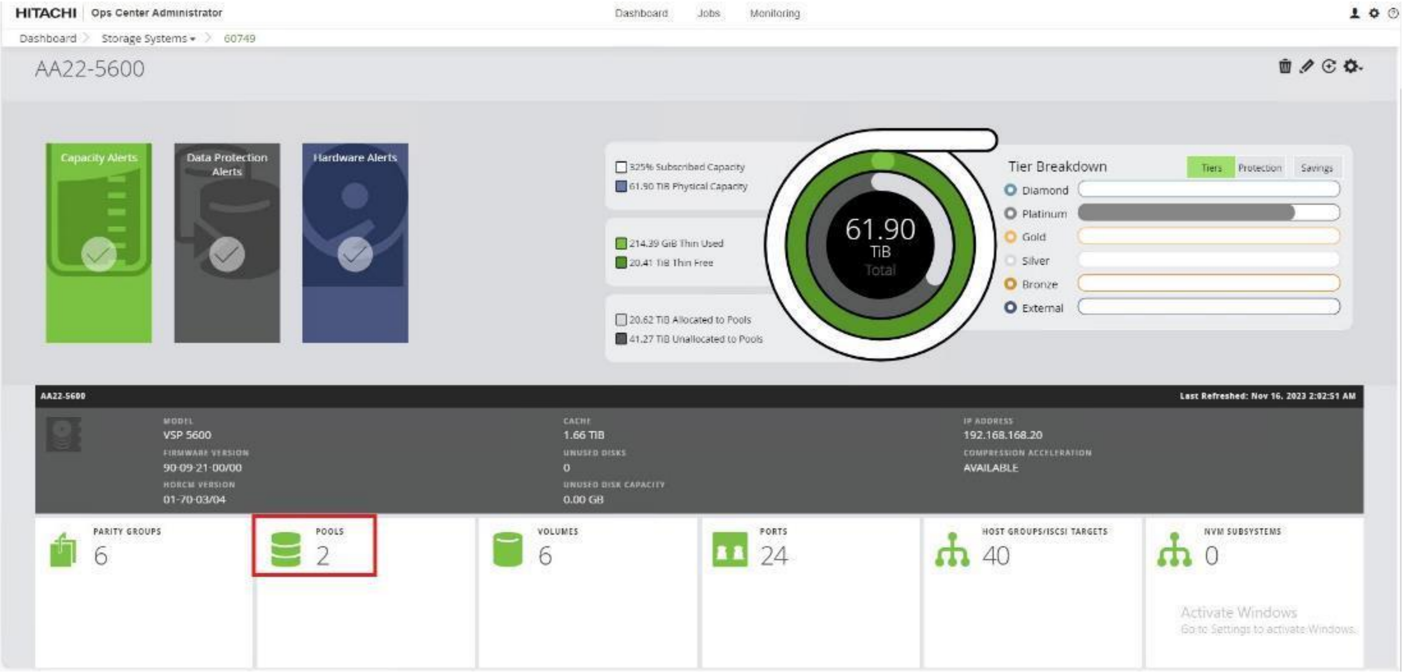
Step 2. Click the **S/N** listing of the Storage System.



○	NAME	S/N	IP ADDRESS	MODEL	TOTAL	THIN FREE	THIN USED	USAGE	INCOMPLETE HA ARRAY	MIGRATION TASK COUNT
○	AA22-5600	60749	192.168.168.20	VSP 5600	61.90 TiB	20.41 TiB	214.39 GiB	0 %	—	0

1 Items 0 selected

Step 3. From the Storage Systems, click **Pools**.



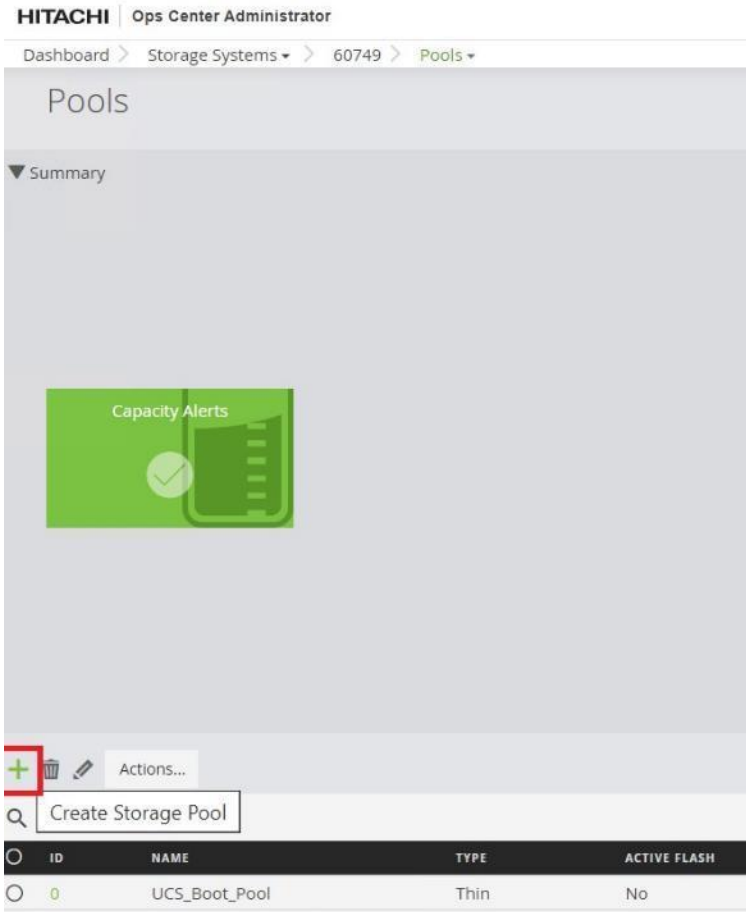
□ 325% Subscribed Capacity
■ 61.90 TiB Physical Capacity
■ 214.39 GiB Thin Used
■ 20.41 TiB Thin Free
□ 20.62 TiB Allocated to Pools
■ 41.27 TiB Unallocated to Pools

AA22-5600 Last Refreshed: Nov 16, 2023 2:02:51 AM

MODEL: VSP 5600
FIRMWARE VERSION: 90-09-21-00/00
HORCM VERSION: 01-70-03/04
CACHE: 1.66 TiB
UNUSED DISKS: 0
UNUSED DISK CAPACITY: 0.00 GB
IP ADDRESS: 192.168.168.20
COMPRESSION ACCELERATION: AVAILABLE

PARITY GROUPS	POOLS	VOLUMES	PORTS	HOST GROUPS/ISCSI TARGETS	NVM SUBSYSTEMS
6	2	6	24	40	0

Step 4. Click the plus sign (**+**) to open the **Create Pool** window.


HITACHI | Ops Center Administrator
Dashboard > Storage Systems ▾ > 60749 > Pools ▾
Pools
▼ Summary
Capacity Alerts
+
Actions...
Create Storage Pool

○	ID	NAME	TYPE	ACTIVE FLASH
○	0	UCS_Boot_Pool	Thin	No

Step 5. Enter the following details:

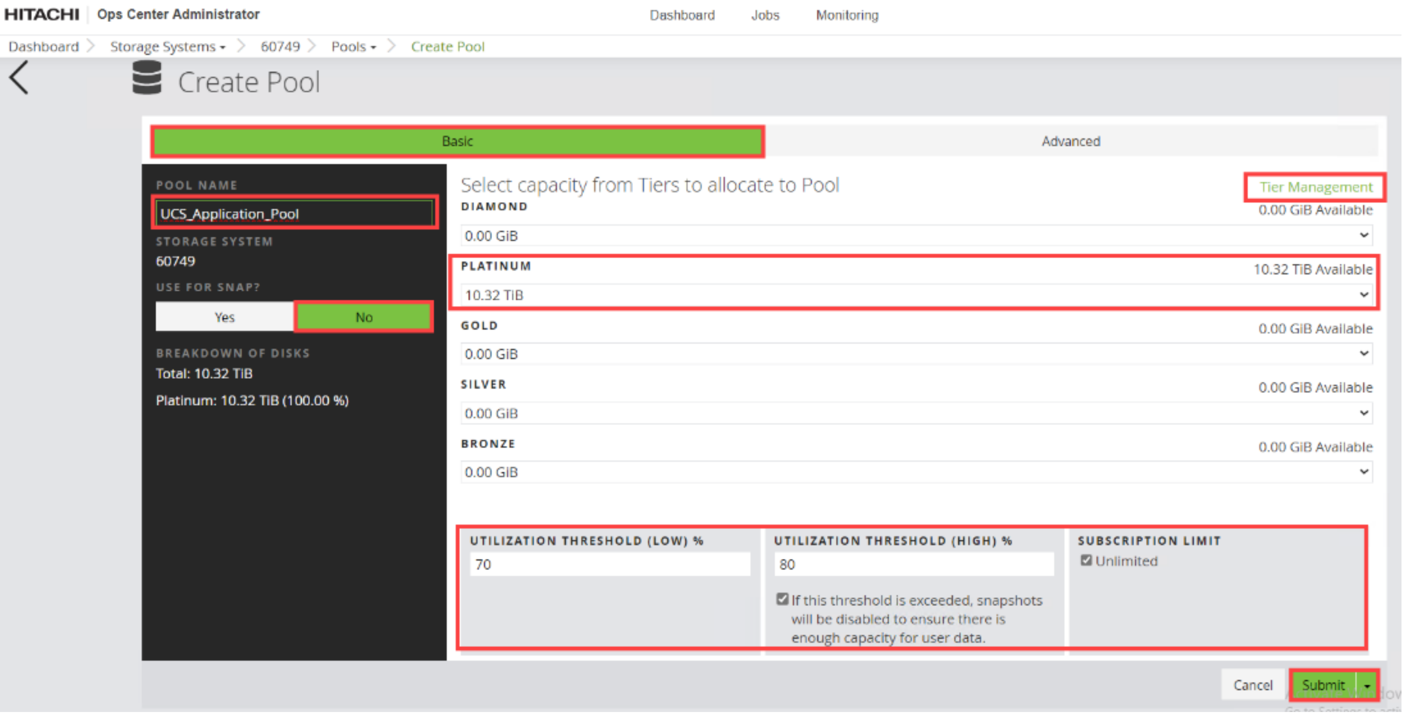
a. For the POOL NAME enter **UCS_Application_Pool** (Pool names can be any combination of alphanumeric characters, hyphens, and underscores only. Initial hyphens are not allowed).

b. Click an available **Tier** to view the storage capacity and select the required **capacity**.

c. Review the **high and low pool utilization thresholds**. By default, the low utilization capacity is set to 70%, and high threshold is set to 80%. You can customize thresholds to receive notifications based on their specific environment requirements.

d. To specify over allocation, you can set the limit to **Unlimited.**

e. Click **Submit.**


HITACHI | Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Storage Systems ▾ > 60749 > Pools ▾ > Create Pool
Create Pool
Basic
Advanced
Tier Management
Cancel
Submit

POOL NAME: UCS_Application_Pool

STORAGE SYSTEM: 60749

USE FOR SNAP? Yes [✓ No]

BREAKDOWN OF DISKS
Total: 10.32 TiB
Platinum: 10.32 TiB (100.00 %)

Select capacity from Tiers to allocate to Pool

Tier	Selected	Available
DIAMOND	0.00 GiB	0.00 GiB Available
PLATINUM	10.32 TiB	10.32 TiB Available
GOLD	0.00 GiB	0.00 GiB Available
SILVER	0.00 GiB	0.00 GiB Available
BRONZE	0.00 GiB	0.00 GiB Available

UTILIZATION THRESHOLD (LOW) %: 70

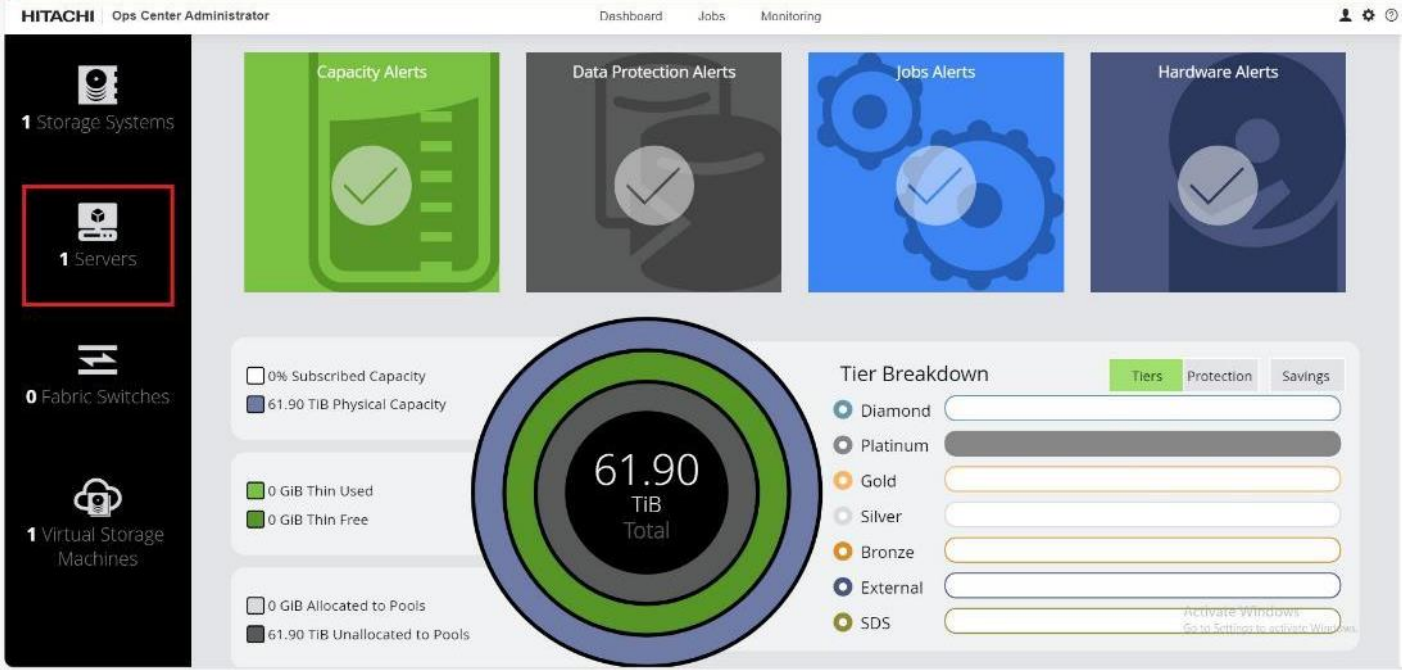
UTILIZATION THRESHOLD (HIGH) %: 80

☑ If this threshold is exceeded, snapshots will be disabled to ensure there is enough capacity for user data.

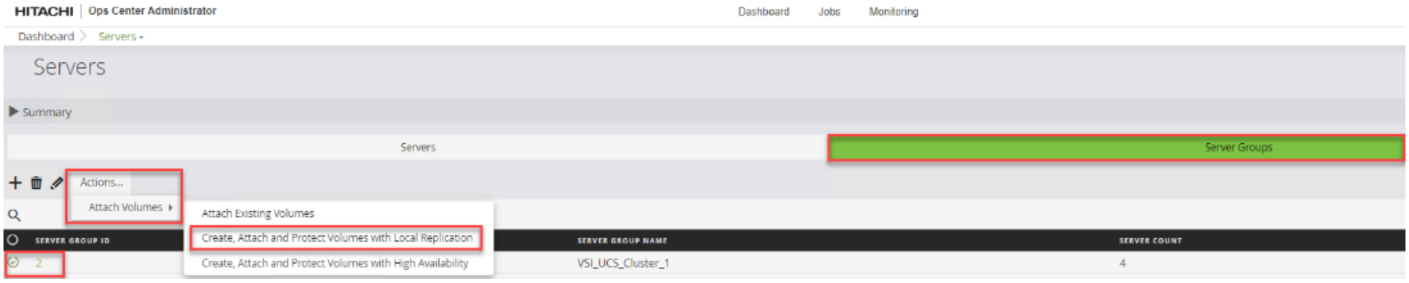
SUBSCRIPTION LIMIT: ☑ Unlimited

Procedure 8. Allocate FC-SCSI Shared VMFS LDEV and Adding LDEV Paths from Server Groups

Step 1. Log in to **Hitachi Ops Center Administrator** and from the navigation pane, select **Servers.**



Step 2. From the Servers tab, select **Server Groups**, and then select a SERVER GROUP ID. Under the Actions, pane select, **Attach Volumes**, and then click **Create, Attach and Protect Volumes with Local Replication**.



Step 3. Configure volumes for the specified Storage System. You can switch to another Storage System using the Storage System drop-down list. To allocate LDEVs for use as VMFS datastores:

a. For the VOLUME LABEL enter **VSI-VMFS-DS**.

b. Select the NUMBER OF VOLUMES.

c. Enter the Volume **SIZE** and select the volume unit: GiB, TiB, or Blocks.

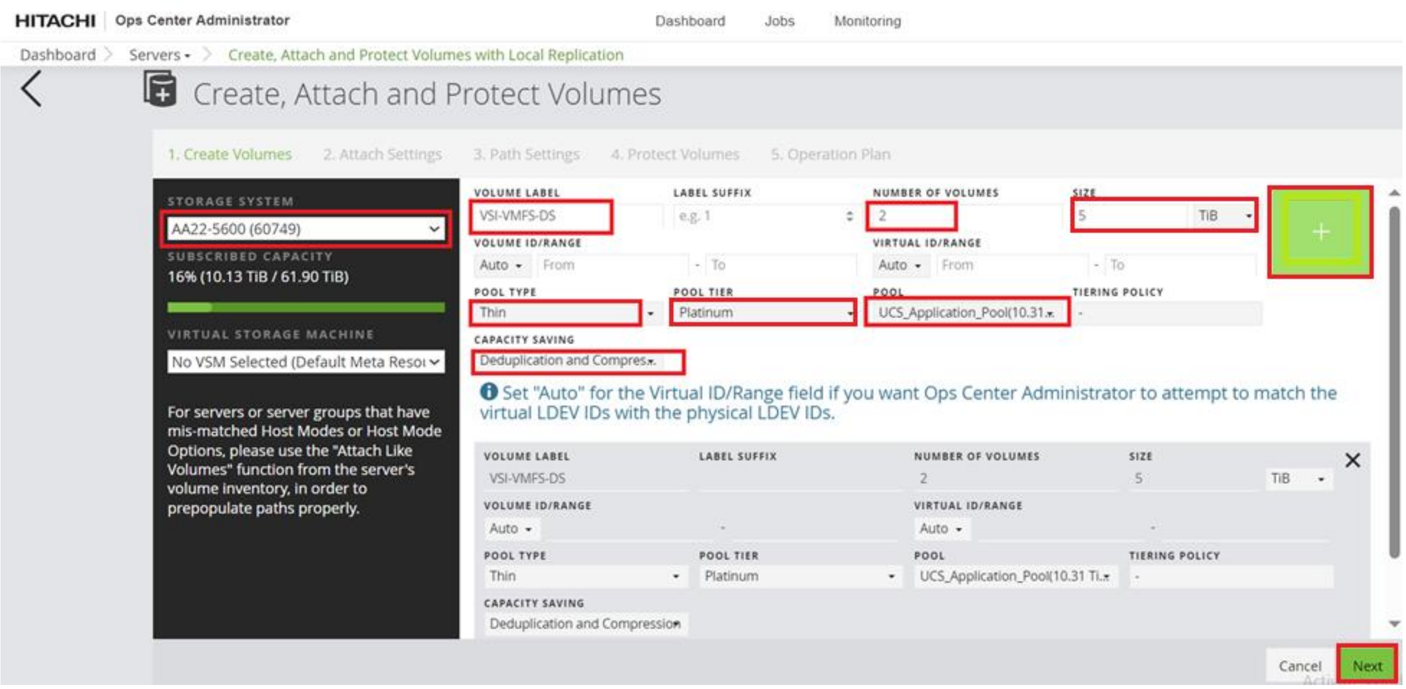
d. Select the POOL TYPE as **Thin**.

e. For a Thin pool, select the POOL TIER: Diamond, Platinum, Gold, Silver, or Bronze.

f. By default, the **POOL** is auto selected. Verify that the chosen **POOL** is the ''UCS_Application_Pool'' for provisioning VMFS datastores.

g. Click the plus sign (**+**) to verify volume settings.

h. Click **Next**.


HITACHI | Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Servers > Create, Attach and Protect Volumes with Local Replication

Create, Attach and Protect Volumes

1. Create Volumes 2. Attach Settings 3. Path Settings 4. Protect Volumes 5. Operation Plan

STORAGE SYSTEM: AA22-5600 (60749)

SUBSCRIBED CAPACITY: 16% (10.13 TiB / 61.90 TiB)

VIRTUAL STORAGE MACHINE: No VSM Selected (Default Meta Resou

For servers or server groups that have mis-matched Host Modes or Host Mode Options, please use the "Attach Like Volumes" function from the server's volume inventory, in order to prepopulate paths properly.

VOLUME LABEL: VSI-VMFS-DS
LABEL SUFFIX: e.g. 1
NUMBER OF VOLUMES: 2
SIZE: 5 TiB
VOLUME ID/RANGE: Auto From - To
VIRTUAL ID/RANGE: Auto From - To
POOL TYPE: Thin
POOL TIER: Platinum
POOL: UCS_Application_Pool(10.31
TIERING POLICY: -
CAPACITY SAVING: Deduplication and Compres

Set "Auto" for the Virtual ID/Range field if you want Ops Center Administrator to attempt to match the virtual LDEV IDs with the physical LDEV IDs.

VOLUME LABEL: VSI-VMFS-DS
LABEL SUFFIX:
NUMBER OF VOLUMES: 2
SIZE: 5 TiB
VOLUME ID/RANGE: Auto -
VIRTUAL ID/RANGE: Auto -
POOL TYPE: Thin
POOL TIER: Platinum
POOL: UCS_Application_Pool(10.31 Ti
TIERING POLICY: -
CAPACITY SAVING: Deduplication and Compression

Step 4. The **HOST MODE** and **HOST MODE OPTIONS** should be selected as follows:

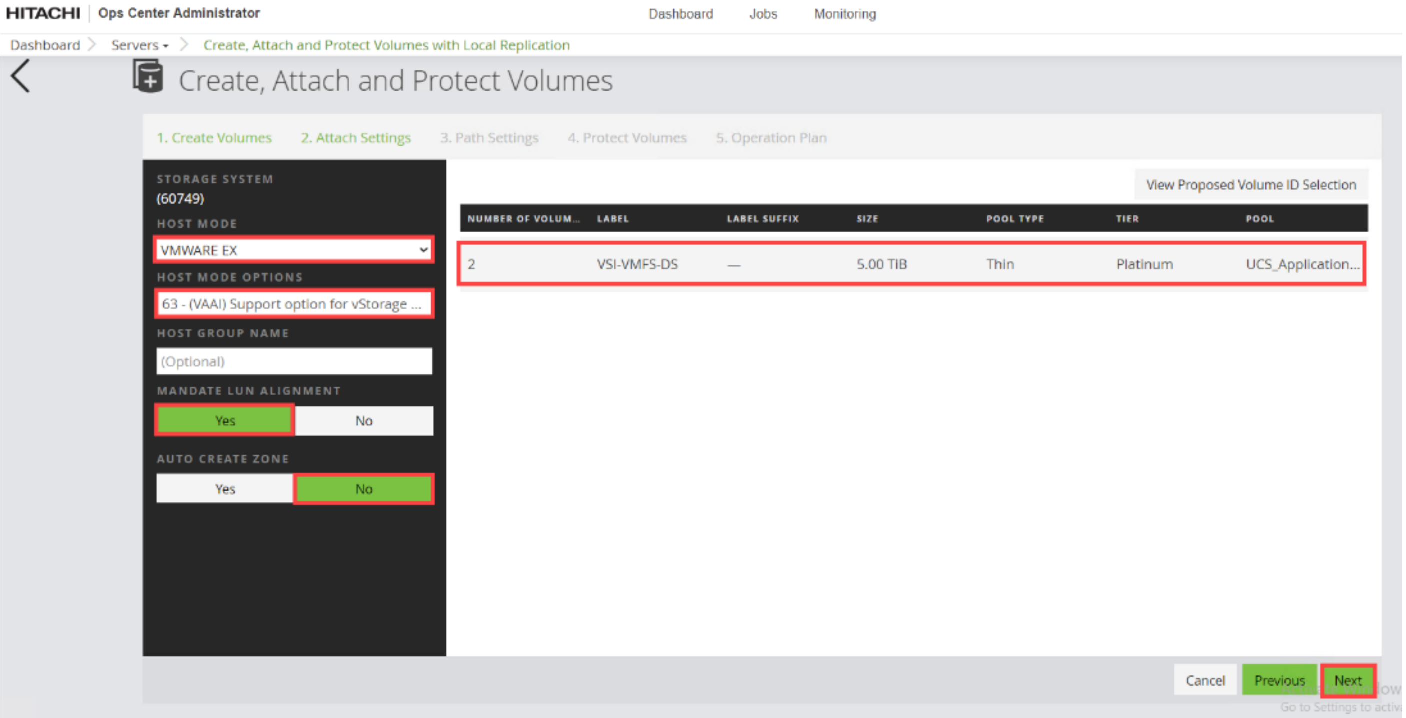
a. HOST MODE: **VMWARE EX**.

b. HOST MODE OPTIONS: 63 **(VAAI)** Support option for vStorage APIs based on T10 standards.

c. Select **MANDATE LUN ALIGNMENT** as **Yes**; this option determines whether to assign the same LUN number to multiple servers for a volume. If Yes is specified, the same LUN number is always assigned.

d. Set AUTO CREATE ZONE as No.

Step 5. Click **Next** to explore options for creating and editing LUN paths.



HITACHI | Ops Center Administrator — Dashboard · Jobs · Monitoring

Dashboard > Servers > Create, Attach and Protect Volumes with Local Replication

Create, Attach and Protect Volumes

1. Create Volumes · 2. Attach Settings · 3. Path Settings · 4. Protect Volumes · 5. Operation Plan

STORAGE SYSTEM
(60749)

HOST MODE
VMWARE EX

HOST MODE OPTIONS
63 - (VAAI) Support option for vStorage ...

HOST GROUP NAME
(Optional)

MANDATE LUN ALIGNMENT
[✓ Yes] No

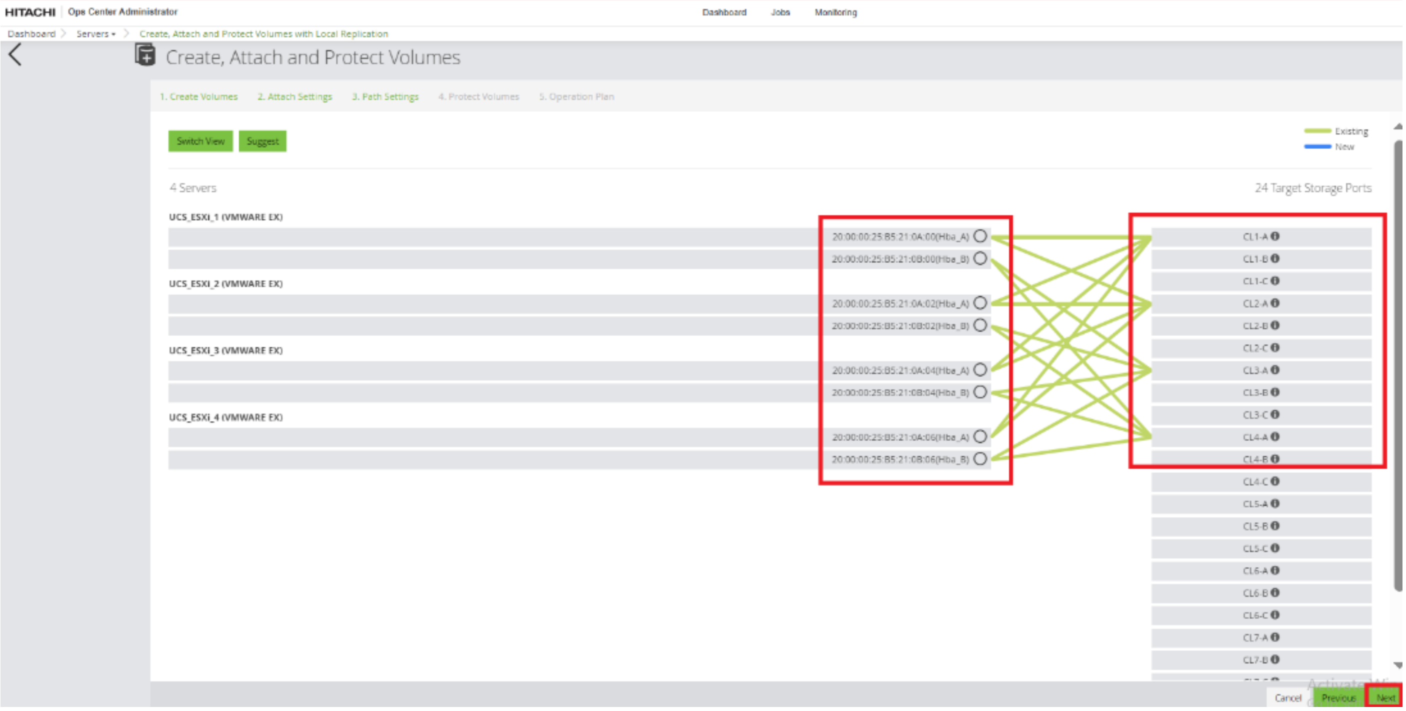
AUTO CREATE ZONE
Yes [✓ No]

View Proposed Volume ID Selection

NUMBER OF VOLUM...	LABEL	LABEL SUFFIX	SIZE	POOL TYPE	TIER	POOL
2	VSI-VMFS-DS	—	5.00 TiB	Thin	Platinum	UCS_Application...

Cancel · Previous · Next

Step 6. On the **Path Settings** pane, you need to click the respective server WWNs and map them to the VSP storage ports as based on MDS zoning. When completed, you can expect to see the following:



HITACHI | Ops Center Administrator — Dashboard · Jobs · Monitoring

Dashboard > Servers > Create, Attach and Protect Volumes with Local Replication

Create, Attach and Protect Volumes

1. Create Volumes · 2. Attach Settings · 3. Path Settings · 4. Protect Volumes · 5. Operation Plan

Switch View · Suggest

Existing · New

4 Servers

UCS_ESXi_1 (VMWARE EX)
20:00:00:25:B5:21:0A:00(Hba_A)
20:00:00:25:B5:21:0B:00(Hba_B)

UCS_ESXi_2 (VMWARE EX)
20:00:00:25:B5:21:0A:02(Hba_A)
20:00:00:25:B5:21:0B:02(Hba_B)

UCS_ESXi_3 (VMWARE EX)
20:00:00:25:B5:21:0A:04(Hba_A)
20:00:00:25:B5:21:0B:04(Hba_B)

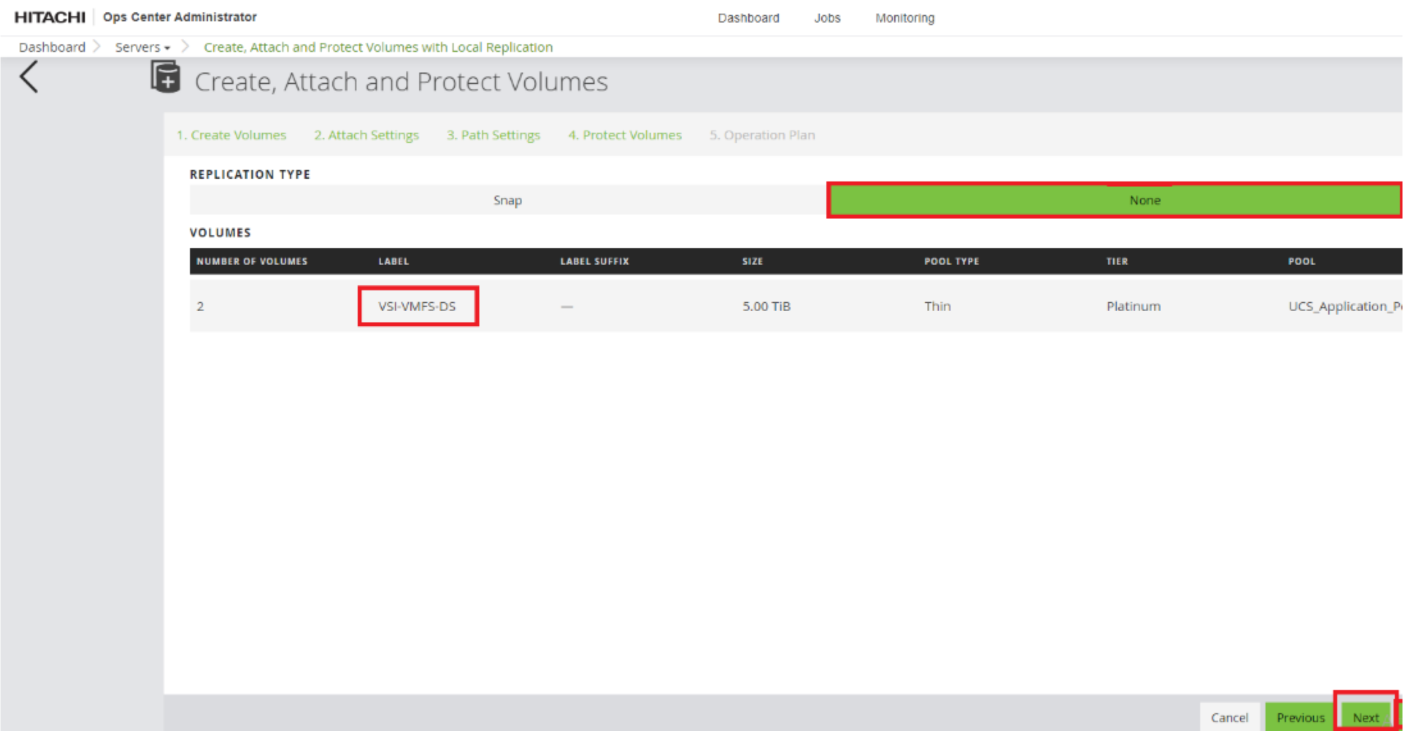
UCS_ESXi_4 (VMWARE EX)
20:00:00:25:B5:21:0A:06(Hba_A)
20:00:00:25:B5:21:0B:06(Hba_B)

24 Target Storage Ports

CL1-A, CL1-B, CL1-C, CL2-A, CL2-B, CL2-C, CL3-A, CL3-B, CL3-C, CL4-A, CL4-B, CL4-C, CL5-A, CL5-B, CL5-C, CL6-A, CL6-B, CL6-C, CL7-A, CL7-B

Cancel · Previous · Next

Step 7. For the **REPLICATION TYPE** select **None** and click **Next**.



HITACHI | Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Servers ▾ > Create, Attach and Protect Volumes with Local Replication

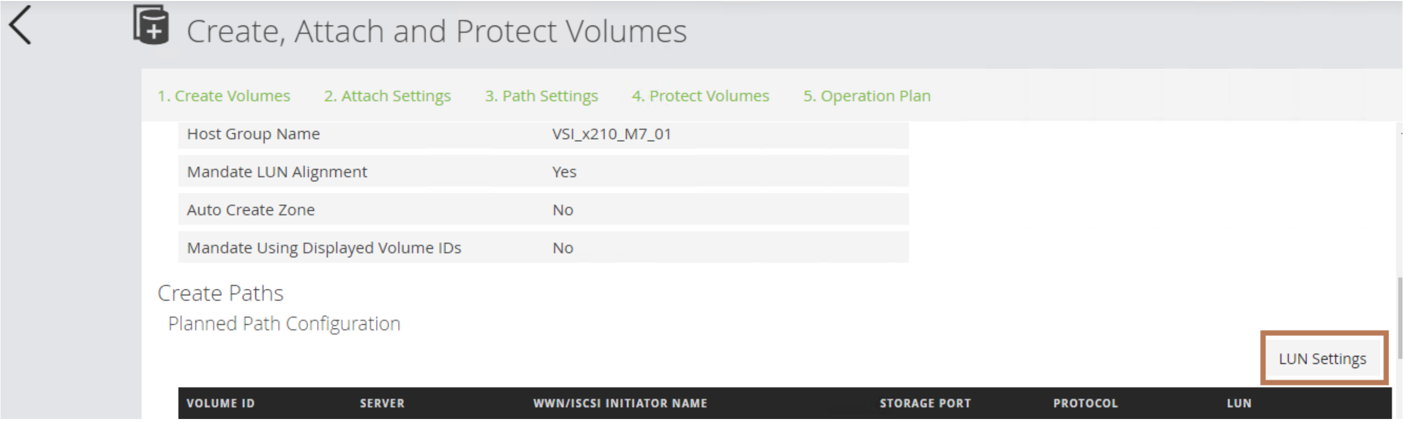
Create, Attach and Protect Volumes

REPLICATION TYPE

VOLUMES

NUMBER OF VOLUMES	LABEL	LABEL SUFFIX	SIZE	POOL TYPE	TIER	POOL
2	VSI-VMFS-DS	—	5.00 TiB	Thin	Platinum	UCS_Application_P

Step 8. If required to modify the LUN ID, click **LUN settings**. If LUN ID is correct skip to **Step 10**.



Create, Attach and Protect Volumes

Host Group Name	VSI_x210_M7_01
Mandate LUN Alignment	Yes
Auto Create Zone	No
Mandate Using Displayed Volume IDs	No

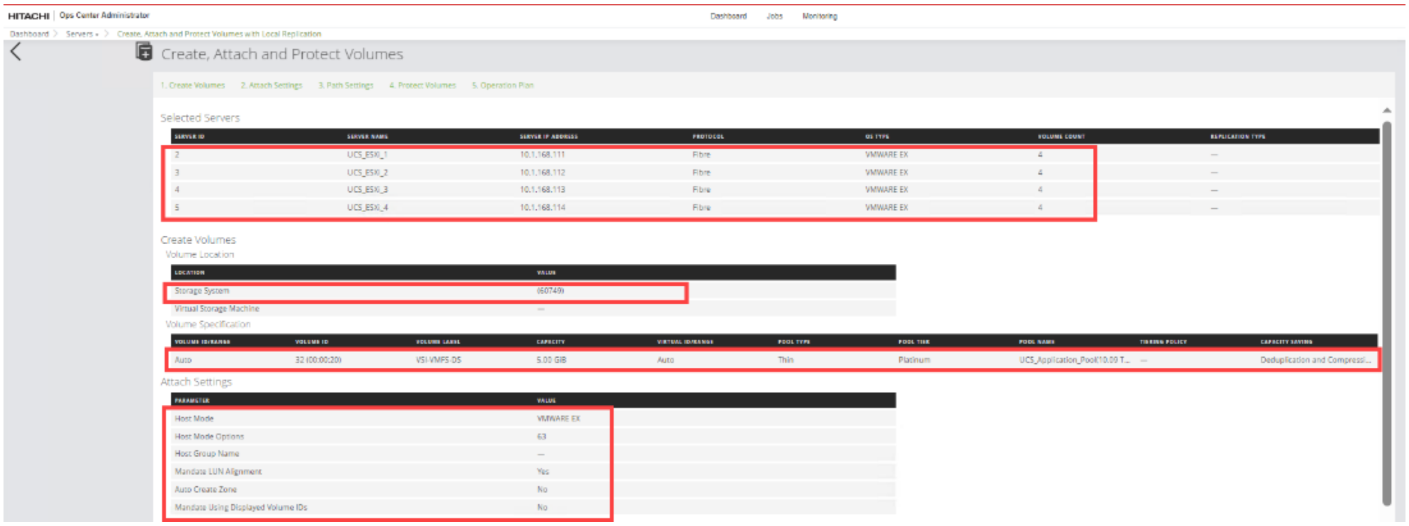
Create Paths

Planned Path Configuration

VOLUME ID	SERVER	WWN/ISCSI INITIATOR NAME	STORAGE PORT	PROTOCOL	LUN

Step 9. From the LUN settings window, choose the appropriate **LUN ID** using the FROM drop-down list, click **OK**.

Step 10. Verify the operation plan and click **Submit**.



HITACHI | Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Servers > Create, Attach and Protect Volumes with Local Replication

Create, Attach and Protect Volumes

1. Create Volumes
2. Attach Settings
3. Path Settings
4. Protect Volumes
5. Operation Plan

Selected Servers

SERVER ID	SERVER NAME	SERVER IP ADDRESS	PROTOCOL	OS TYPE	VOLUME COUNT	REPLICATION TYPE
2	UCS_ESXI_1	10.1.168.111	Fibre	VMWARE EX	4	—
3	UCS_ESXI_2	10.1.168.112	Fibre	VMWARE EX	4	—
4	UCS_ESXI_3	10.1.168.113	Fibre	VMWARE EX	4	—
5	UCS_ESXI_4	10.1.168.114	Fibre	VMWARE EX	4	—

Create Volumes

Volume Location

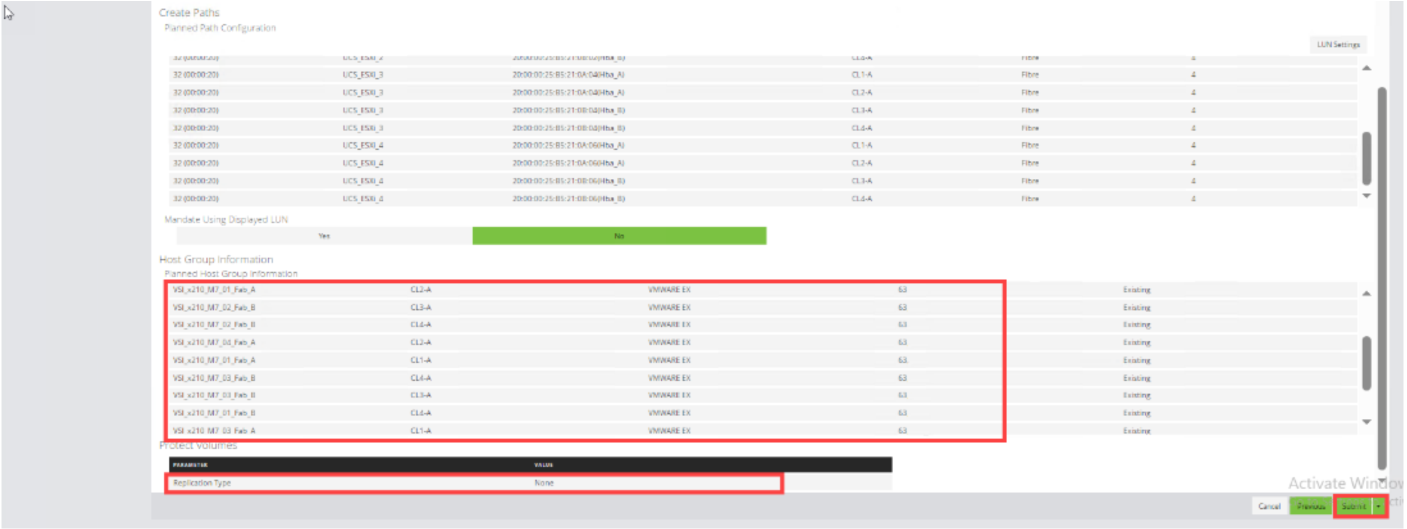
LOCATION	VALUE
Storage System	(60749)
Virtual Storage Machine	—

Volume Specification

VOLUME ID/RANGE	VOLUME ID	VOLUME LABEL	CAPACITY	VIRTUAL ID/RANGE	POOL TYPE	POOL TIER	POOL NAME	TIERING POLICY	CAPACITY SAVING
Auto	32 (00:00:20)	VSI-VMFS-DS	5.00 GIB	Auto	Thin	Platinum	UCS_Application_Pool(10.09 T...	—	Deduplication and Compressi...

Attach Settings

PARAMETER	VALUE
Host Mode	VMWARE EX
Host Mode Options	63
Host Group Name	—
Mandata LUN Alignment	Yes
Auto Create Zone	No
Mandata Using Displayed Volume IDs	No



Create Paths

Planned Path Configuration

32 (00:00:20)	UCS_ESXI_2	20:00:00:25:B5:21:0B:02(Hba_B)	CL4-A	Fibre	4
32 (00:00:20)	UCS_ESXI_3	20:00:00:25:B5:21:0A:04(Hba_A)	CL1-A	Fibre	4
32 (00:00:20)	UCS_ESXI_3	20:00:00:25:B5:21:0A:04(Hba_A)	CL2-A	Fibre	4
32 (00:00:20)	UCS_ESXI_3	20:00:00:25:B5:21:0B:04(Hba_B)	CL3-A	Fibre	4
32 (00:00:20)	UCS_ESXI_3	20:00:00:25:B5:21:0B:04(Hba_B)	CL4-A	Fibre	4
32 (00:00:20)	UCS_ESXI_4	20:00:00:25:B5:21:0A:06(Hba_A)	CL1-A	Fibre	4
32 (00:00:20)	UCS_ESXI_4	20:00:00:25:B5:21:0A:06(Hba_A)	CL2-A	Fibre	4
32 (00:00:20)	UCS_ESXI_4	20:00:00:25:B5:21:0B:06(Hba_B)	CL3-A	Fibre	4
32 (00:00:20)	UCS_ESXI_4	20:00:00:25:B5:21:0B:06(Hba_B)	CL4-A	Fibre	4

Mandate Using Displayed LUN

Yes [✓ No]

Host Group Information

Planned Host Group Information

VSI_x210_M7_01_Fab_A	CL2-A	VMWARE EX	63	Existing
VSI_x210_M7_02_Fab_B	CL3-A	VMWARE EX	63	Existing
VSI_x210_M7_02_Fab_B	CL4-A	VMWARE EX	63	Existing
VSI_x210_M7_04_Fab_A	CL2-A	VMWARE EX	63	Existing
VSI_x210_M7_01_Fab_A	CL1-A	VMWARE EX	63	Existing
VSI_x210_M7_03_Fab_B	CL4-A	VMWARE EX	63	Existing
VSI_x210_M7_03_Fab_B	CL3-A	VMWARE EX	63	Existing
VSI_x210_M7_01_Fab_B	CL4-A	VMWARE EX	63	Existing
VSI_x210_M7_03_Fab_A	CL1-A	VMWARE EX	63	Existing

Protect Volumes

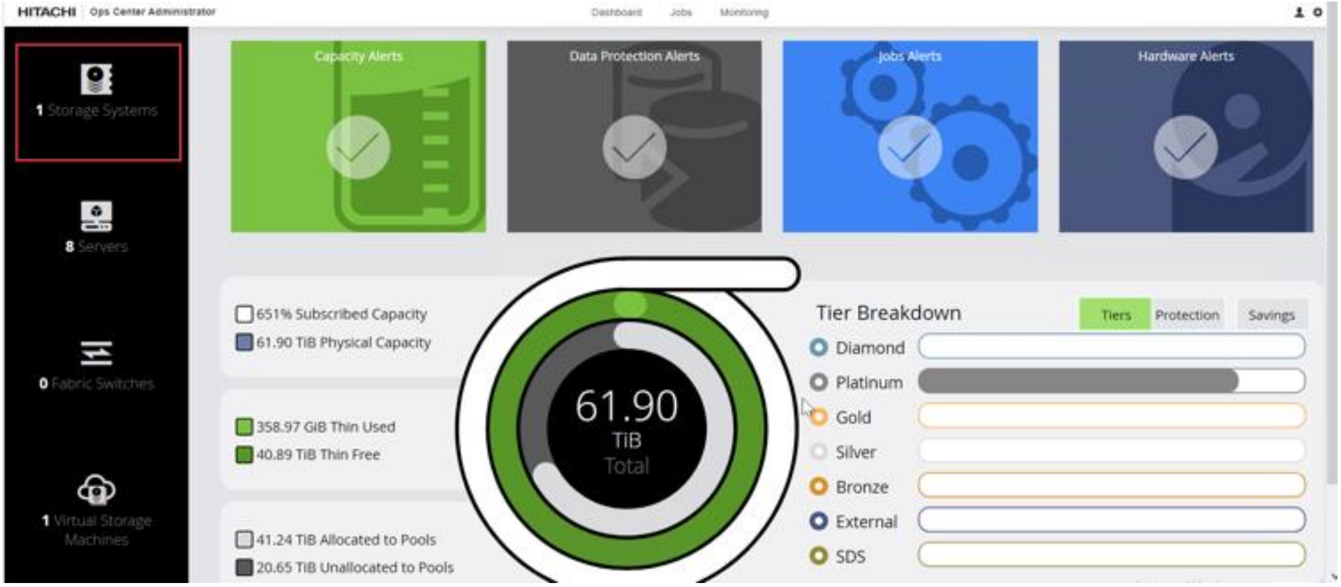
PARAMETER	VALUE
Replication Type	None

Hitachi Storage Configuration for FC-NVMe

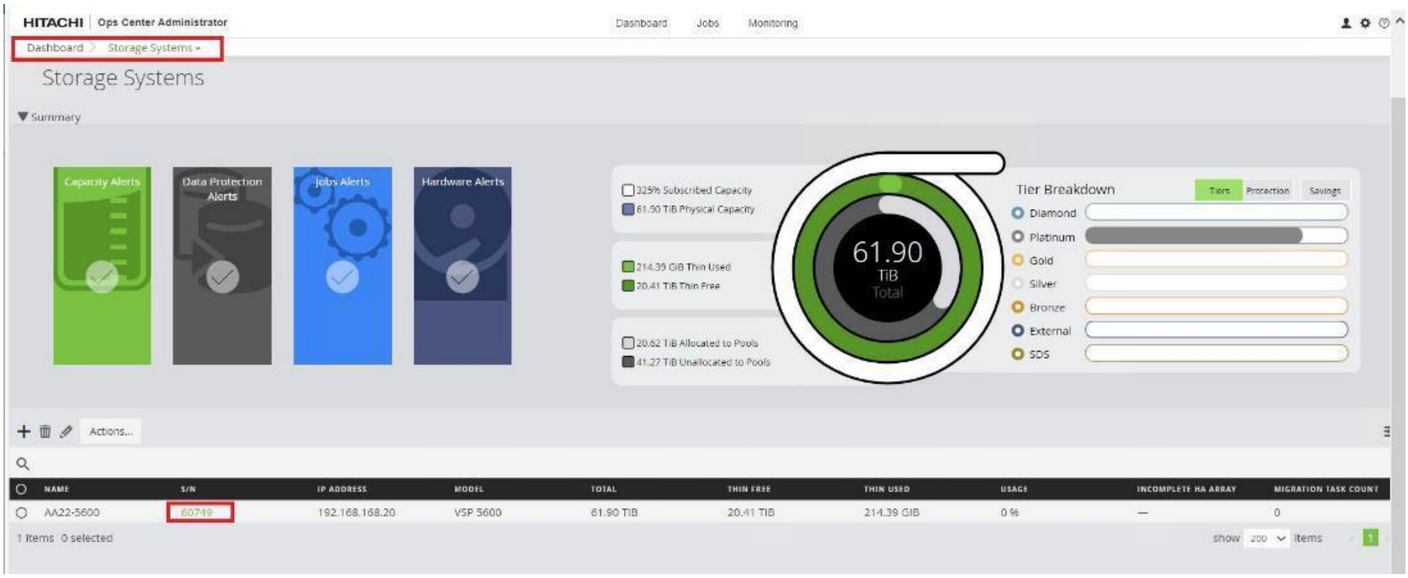
Procedure 1. Configure Fibre Channel Ports on Hitachi Virtual Storage Platform from Ops Center Administrator for FC-NVMe

Note: This procedure must be completed before provisioning the FC-NVMe VMFS datastore.

Step 1. Log in to **Hitachi Ops Center Administrator** and from the navigation pane, select **Storage Systems.**



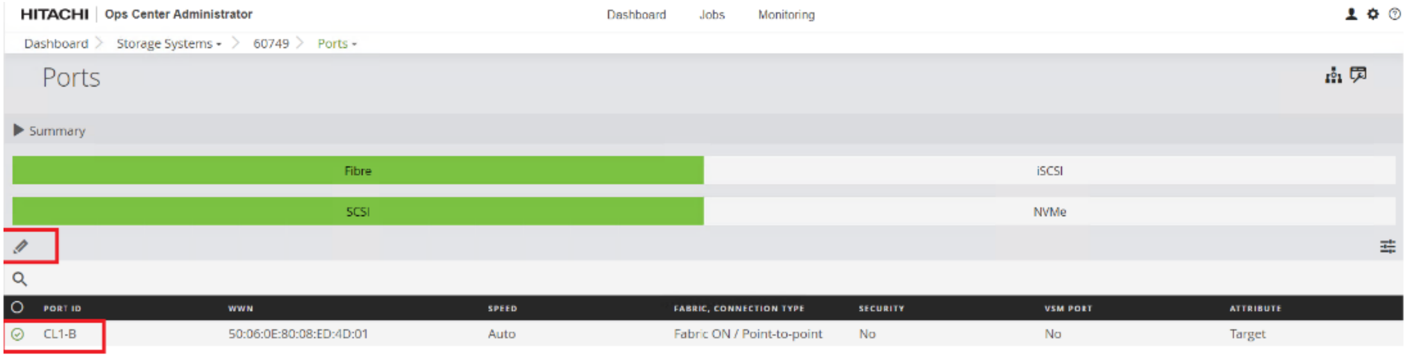
Step 2. Click the **S/N** listing for the Storage System.



○	NAME	S/N	IP ADDRESS	MODEL	TOTAL	THIN FREE	THIN USED	USAGE	INCOMPLETE HA ARRAY	MIGRATION TASK COUNT
○	AA22-5600	60749	192.168.168.20	VSP 5600	61.90 TIB	20.41 TIB	214.39 GIB	0 %	—	0

1 Items 0 selected show 200 Items

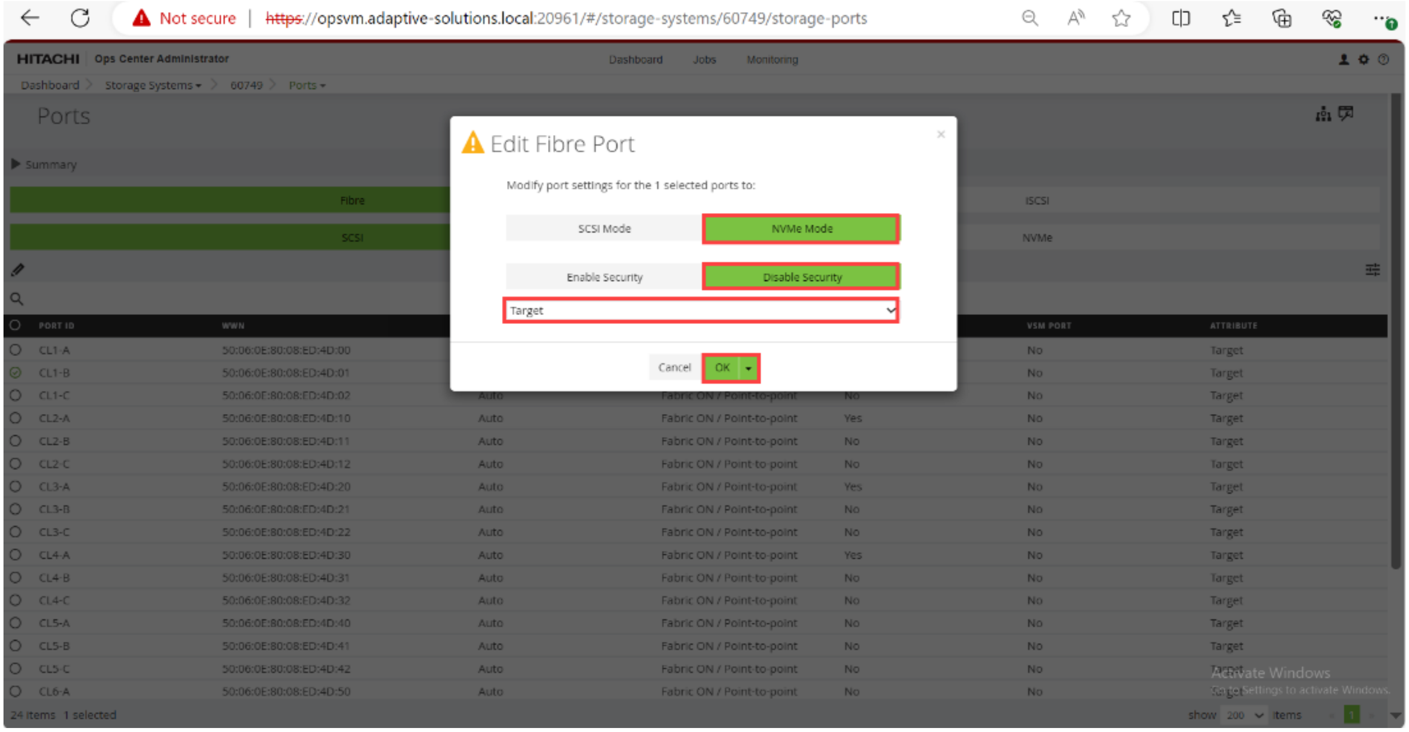
Step 3. Select **Fibre Channel Port** (for example, CL1-B). Click the **Edit sign** icon.


HITACHI | Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Storage Systems ▾ > 60749 > Ports ▾
Ports
▶ Summary
Fibre
iSCSI
SCSI
NVMe

○	PORT ID	WWN	SPEED	FABRIC, CONNECTION TYPE	SECURITY	VSM PORT	ATTRIBUTE
✓	CL1-B	50:06:0E:80:08:ED:4D:01	Auto	Fabric ON / Point-to-point	No	No	Target

Step 4. Select **NVMe Mode** and **Disable Security** and verify that the port attribute is **Target.** Click **OK.**

Note: For the VSP E1090 systems, you are not required to modify port attributes.



~~https~~://opsvm.adaptive-solutions.local:20961/#/storage-systems/60749/storage-ports

HITACHI | Ops Center Administrator
Dashboard Jobs Monitoring
Dashboard > Storage Systems > 60749 > Ports
Ports
Summary
Fibre
SCSI
iSCSI
NVMe

Edit Fibre Port

Modify port settings for the 1 selected ports to:

SCSI Mode | NVMe Mode

Enable Security | Disable Security

Target

Cancel | OK

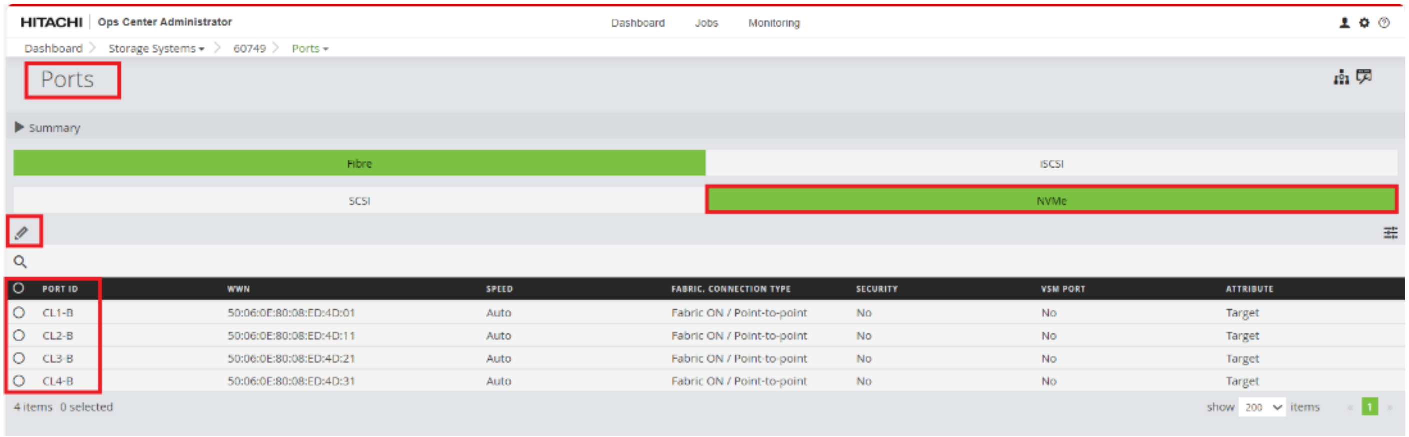
	PORT ID	WWN				VSM PORT	ATTRIBUTE
○	CL1-A	50:06:0E:80:08:ED:4D:00				No	Target
✓	CL1-B	50:06:0E:80:08:ED:4D:01				No	Target
○	CL1-C	50:06:0E:80:08:ED:4D:02	Auto	Fabric ON / Point-to-point	No	No	Target
○	CL2-A	50:06:0E:80:08:ED:4D:10	Auto	Fabric ON / Point-to-point	Yes	No	Target
○	CL2-B	50:06:0E:80:08:ED:4D:11	Auto	Fabric ON / Point-to-point	No	No	Target
○	CL2-C	50:06:0E:80:08:ED:4D:12	Auto	Fabric ON / Point-to-point	No	No	Target
○	CL3-A	50:06:0E:80:08:ED:4D:20	Auto	Fabric ON / Point-to-point	Yes	No	Target
○	CL3-B	50:06:0E:80:08:ED:4D:21	Auto	Fabric ON / Point-to-point	No	No	Target
○	CL3-C	50:06:0E:80:08:ED:4D:22	Auto	Fabric ON / Point-to-point	No	No	Target
○	CL4-A	50:06:0E:80:08:ED:4D:30	Auto	Fabric ON / Point-to-point	Yes	No	Target
○	CL4-B	50:06:0E:80:08:ED:4D:31	Auto	Fabric ON / Point-to-point	No	No	Target
○	CL4-C	50:06:0E:80:08:ED:4D:32	Auto	Fabric ON / Point-to-point	No	No	Target
○	CL5-A	50:06:0E:80:08:ED:4D:40	Auto	Fabric ON / Point-to-point	No	No	Target
○	CL5-B	50:06:0E:80:08:ED:4D:41	Auto	Fabric ON / Point-to-point	No	No	Target
○	CL5-C	50:06:0E:80:08:ED:4D:42	Auto	Fabric ON / Point-to-point	No	No	Target
○	CL6-A	50:06:0E:80:08:ED:4D:50	Auto	Fabric ON / Point-to-point	No	No	Target

24 items 1 selected

show 200 items

Step 5. Repeat **Step 1** through **Step 4** for the remaining Fibre ports CL2-B, CL3-B, and CL4-B.

After all the ports are configured, you can expect the following representation:



HITACHI | Ops Center Administrator
Dashboard Jobs Monitoring
Dashboard > Storage Systems > 60749 > Ports
Ports
Summary
Fibre
iSCSI
SCSI
NVMe

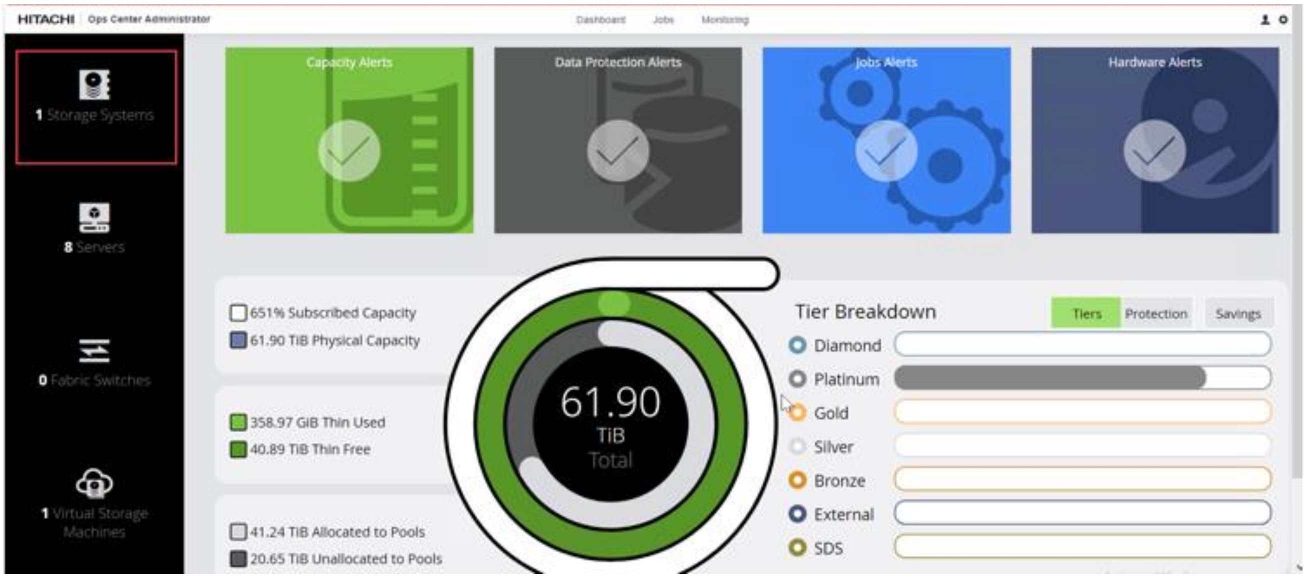
	PORT ID	WWN	SPEED	FABRIC, CONNECTION TYPE	SECURITY	VSM PORT	ATTRIBUTE
○	CL1-B	50:06:0E:80:08:ED:4D:01	Auto	Fabric ON / Point-to-point	No	No	Target
○	CL2-B	50:06:0E:80:08:ED:4D:11	Auto	Fabric ON / Point-to-point	No	No	Target
○	CL3-B	50:06:0E:80:08:ED:4D:21	Auto	Fabric ON / Point-to-point	No	No	Target
○	CL4-B	50:06:0E:80:08:ED:4D:31	Auto	Fabric ON / Point-to-point	No	No	Target

4 items 0 selected

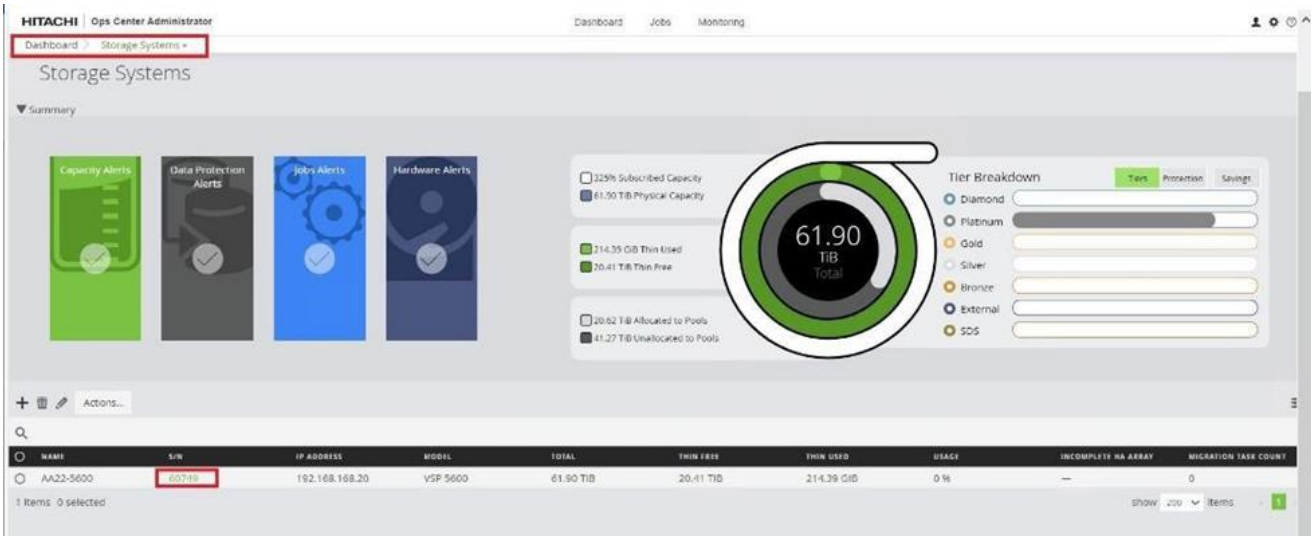
show 200 items

Procedure 2. Initialize Parity Groups from Ops Center Administrator for FC-NVMe

Step 1. Log in to **Hitachi Ops Center Administrator** and from the navigation pane, select **Storage Systems.**



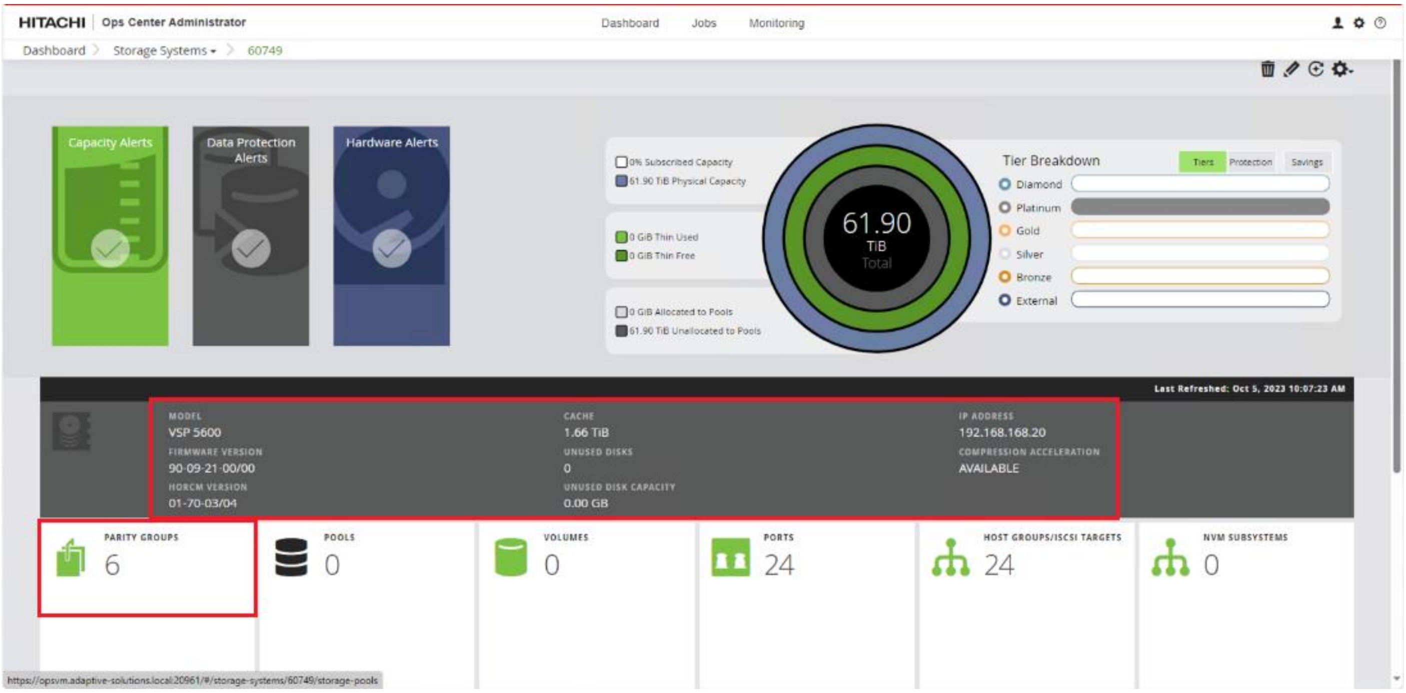
Step 2. Click the **S/N** listing of the Storage System.



○	NAME	S/N	IP ADDRESS	MODEL	TOTAL	THIN FREE	THIN USED	USAGE	INCOMPLETE HA ARRAY	MIGRATION TASK COUNT
○	AA22-5600	60749	192.168.168.20	VSP 5600	61.90 TiB	20.41 TiB	214.39 GiB	0 %	—	0

1 Items 0 selected Show 200 items

Step 3. Click the **PARITY GROUPS** icon, under the selected storage system, to view parity groups.



□ 0% Subscribed Capacity
▨ 61.90 TiB Physical Capacity
🟩 0 GiB Thin Used
🟩 0 GiB Thin Free
□ 0 GiB Allocated to Pools
▨ 61.90 TiB Unallocated to Pools

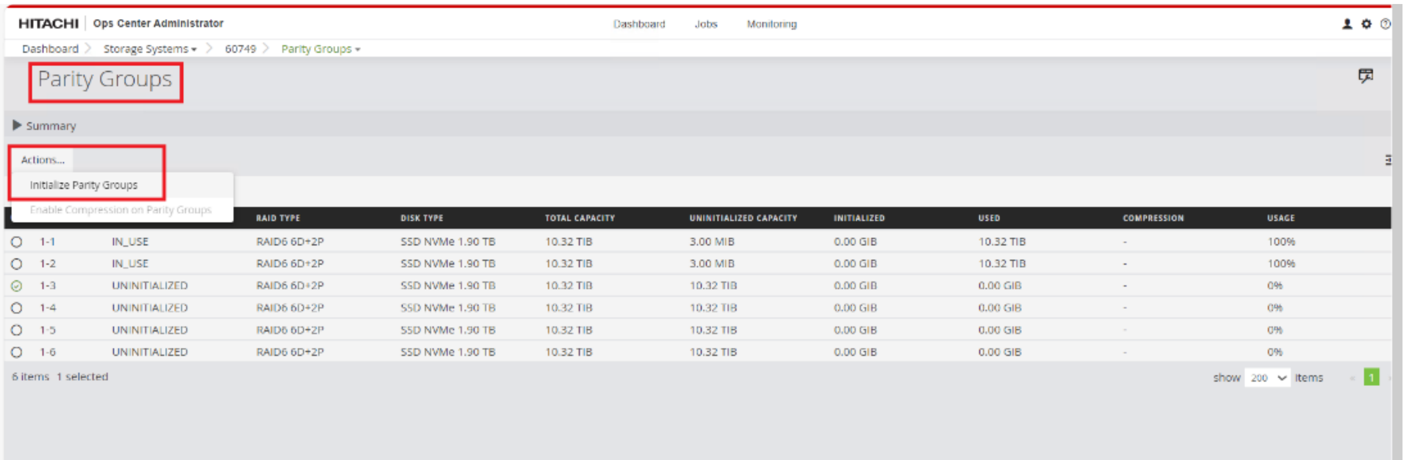
Last Refreshed: Oct 5, 2023 10:07:23 AM

MODEL: VSP 5600
FIRMWARE VERSION: 90-09-21-00/00
HORCM VERSION: 01-70-03/04
CACHE: 1.66 TiB
UNUSED DISKS: 0
UNUSED DISK CAPACITY: 0.00 GB
IP ADDRESS: 192.168.168.20
COMPRESSION ACCELERATION: AVAILABLE

PARITY GROUPS	POOLS	VOLUMES	PORTS	HOST GROUPS/ISCSI TARGETS	NVM SUBSYSTEMS
6	0	0	24	24	0

https://opsvm.adaptive-solutions.local:20961/#/storage-systems/60749/storage-pools

Step 4. Select any **Parity Group ID** you want to initialize as parity for creating the FC-NVMe pool. From the **Actions** pane, click **Initialize Parity Groups.**



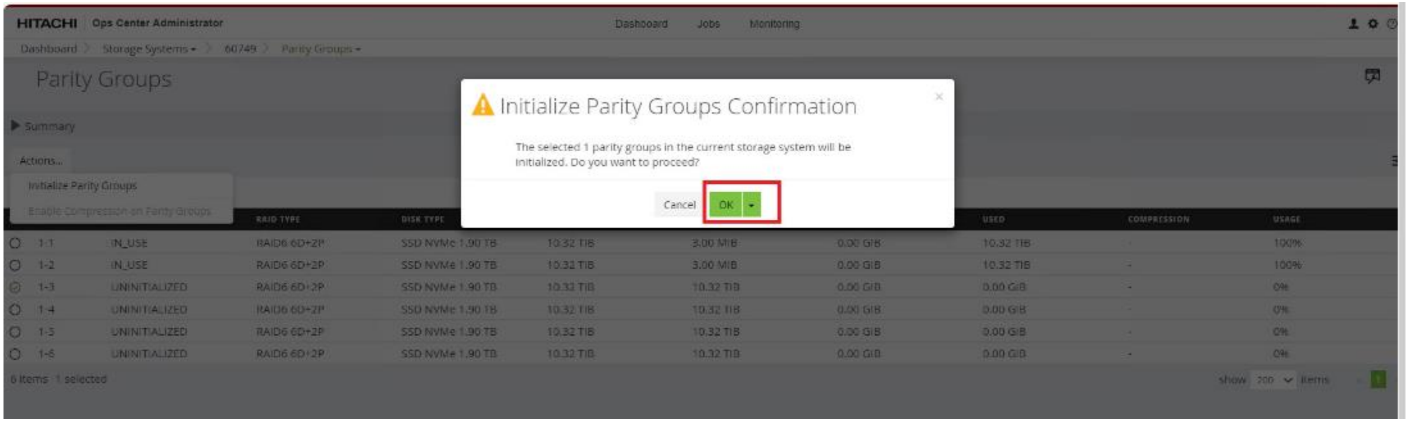
HITACHI | Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Storage Systems ▾ > 60749 > Parity Groups ▾
Parity Groups
▶ Summary
Actions...
Initialize Parity Groups
Enable Compression on Parity Groups

			RAID TYPE	DISK TYPE	TOTAL CAPACITY	UNINITIALIZED CAPACITY	INITIALIZED	USED	COMPRESSION	USAGE
○	1-1	IN_USE	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TIB	3.00 MIB	0.00 GIB	10.32 TIB	-	100%
○	1-2	IN_USE	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TIB	3.00 MIB	0.00 GIB	10.32 TIB	-	100%
✓	1-3	UNINITIALIZED	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TIB	10.32 TIB	0.00 GIB	0.00 GIB	-	0%
○	1-4	UNINITIALIZED	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TIB	10.32 TIB	0.00 GIB	0.00 GIB	-	0%
○	1-5	UNINITIALIZED	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TIB	10.32 TIB	0.00 GIB	0.00 GIB	-	0%
○	1-6	UNINITIALIZED	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TIB	10.32 TIB	0.00 GIB	0.00 GIB	-	0%

6 items 1 selected

show 200 items 1

Step 5. Click **OK**.


HITACHI Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Storage Systems > 60749 > Parity Groups
Parity Groups
Summary
Actions...
Initialize Parity Groups
Enable Compression on Parity Groups
Cancel
OK

Initialize Parity Groups Confirmation

The selected 1 parity groups in the current storage system will be initialized. Do you want to proceed?

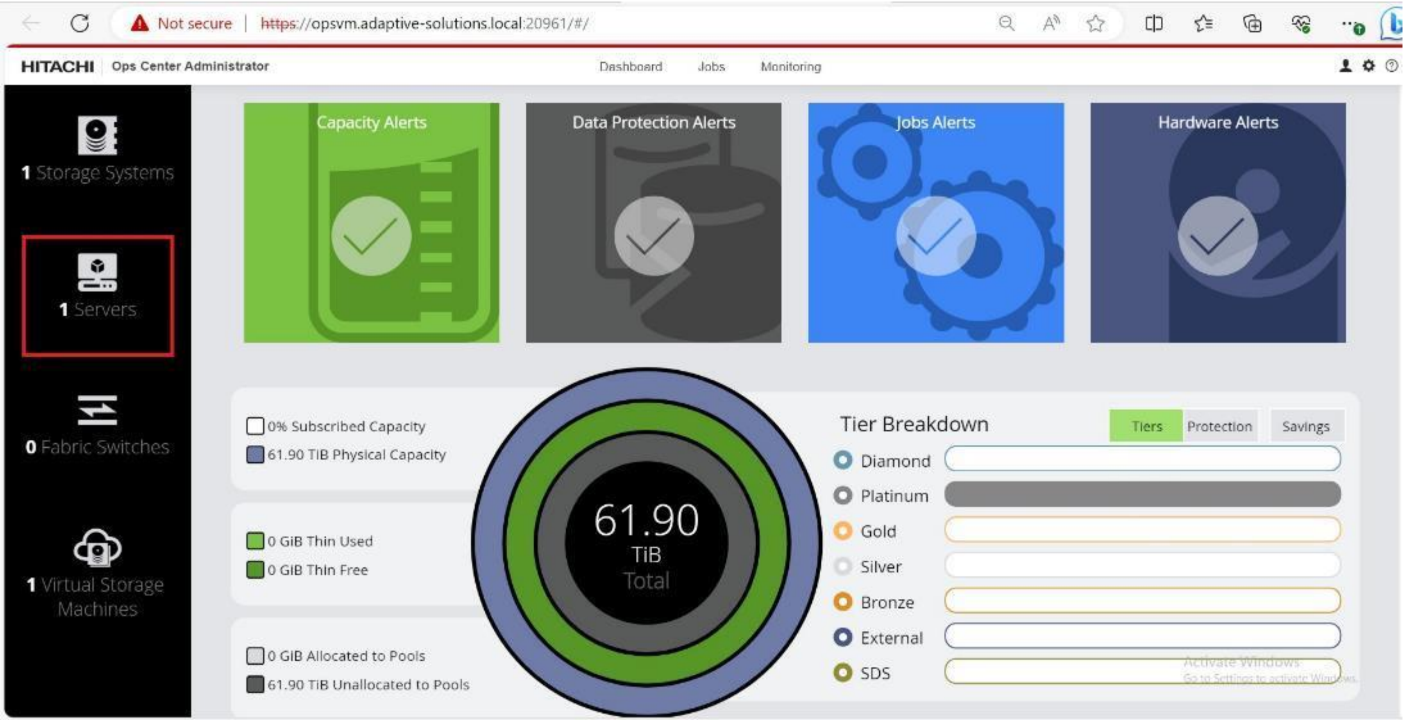
			RAID TYPE	DISK TYPE				USED	COMPRESSION	USAGE
○	1-1	IN_USE	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TIB	3.00 MIB	0.00 GIB	10.32 TIB	-	100%
○	1-2	IN_USE	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TIB	3.00 MIB	0.00 GIB	10.32 TIB	-	100%
✓	1-3	UNINITIALIZED	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TIB	10.32 TIB	0.00 GIB	0.00 GIB	-	0%
○	1-4	UNINITIALIZED	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TIB	10.32 TIB	0.00 GIB	0.00 GIB	-	0%
○	1-5	UNINITIALIZED	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TIB	10.32 TIB	0.00 GIB	0.00 GIB	-	0%
○	1-6	UNINITIALIZED	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TIB	10.32 TIB	0.00 GIB	0.00 GIB	-	0%

6 items 1 selected show 200 items

Note: Created Parity Groups initially have a status of UNINITIALIZED. Upon complete initialization, the status should change into IN_USE.

Procedure 3. Create FC-NVMe Servers from Ops Center Administrator

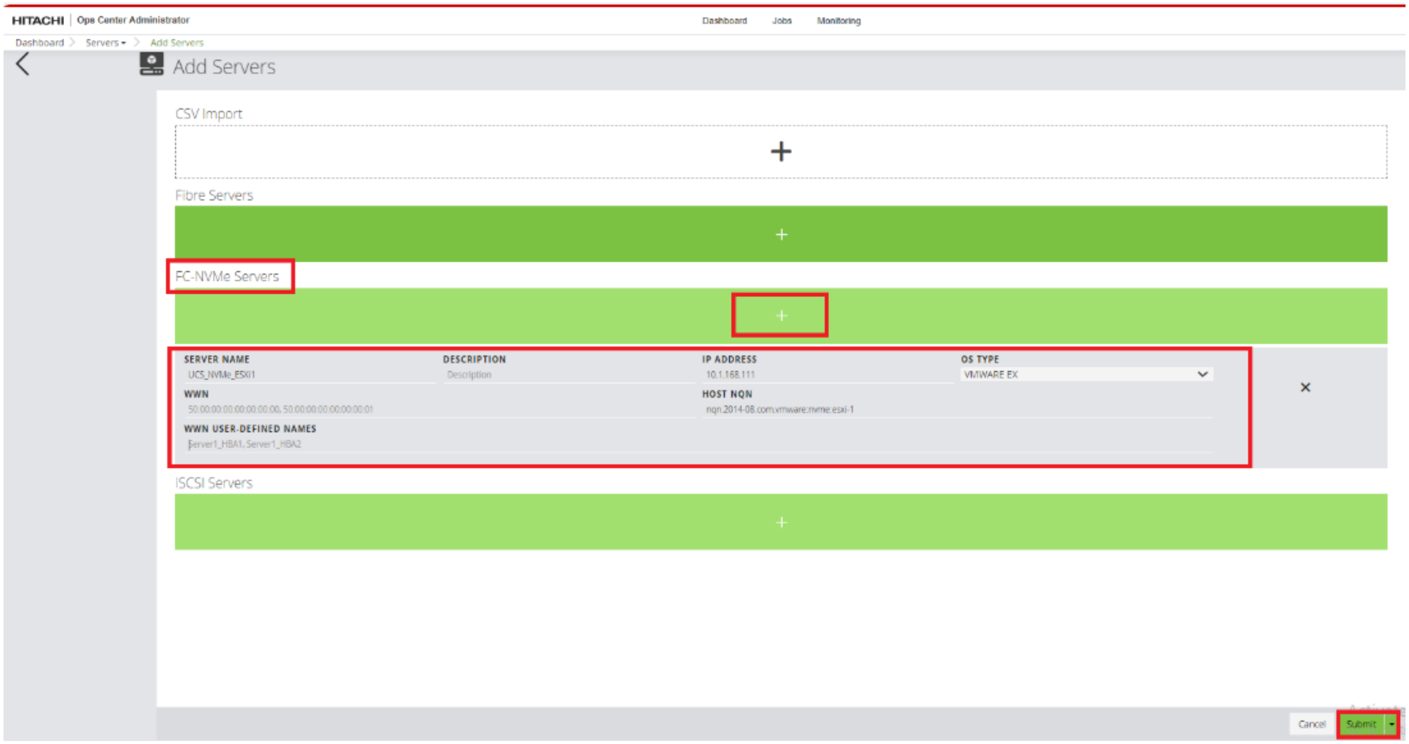
Step 1. Log in to **Hitachi Ops Center Administrator** and from the navigation pane, click **Servers**.



Step 2. Click the plus sign (+) under **FC-NVMe Servers** section.

Step 3. Enter the **SERVER NAME**, **IP ADDRESS**, OS TYPE as **VMWARE EX** and **HOST NQN**, and click **Submit**.

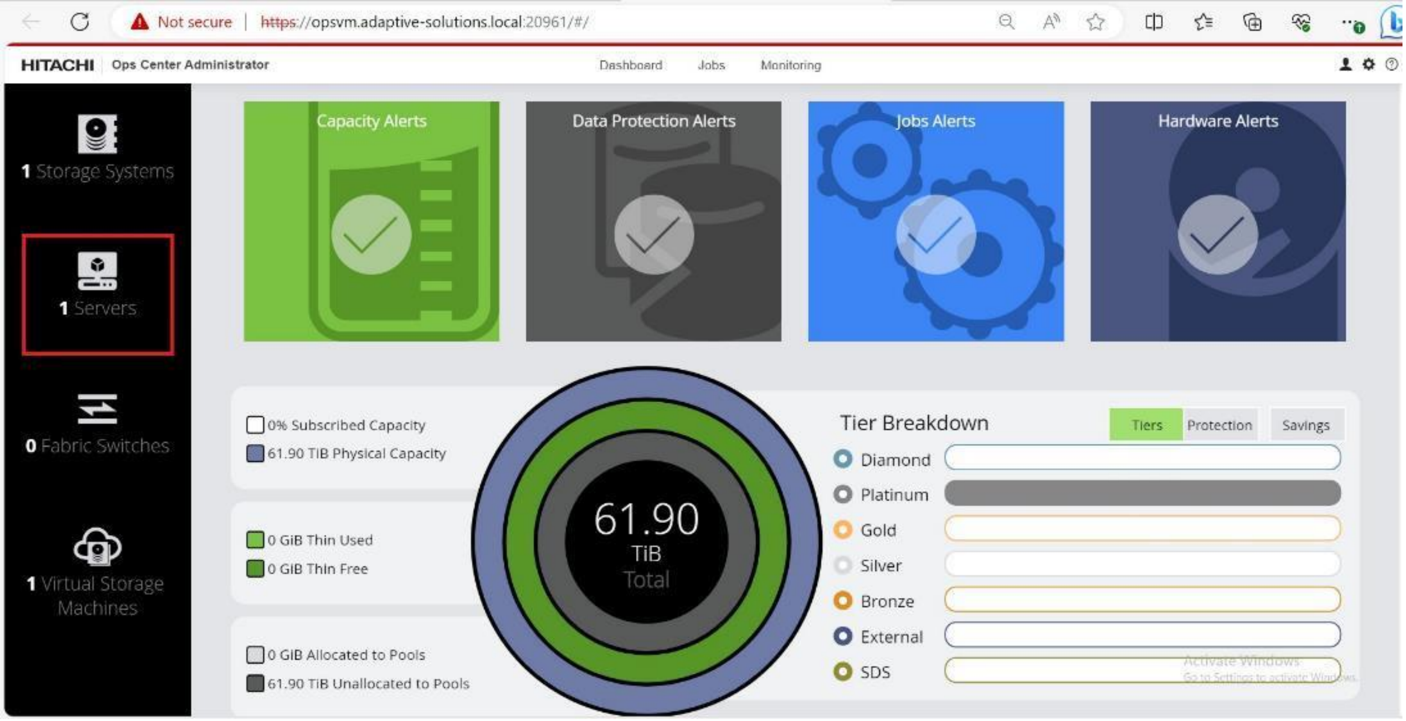
Step 4. Repeat **Step 1** through **Step 3** to add the remaining Cisco UCS servers that use the FC-NVMe protocol.



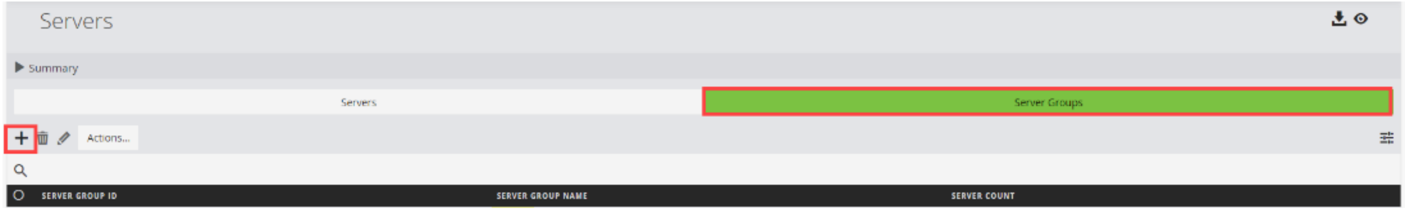
SERVER NAME: UCS_NVMe_ESXI1
DESCRIPTION: Description
IP ADDRESS: 10.1.168.111
OS TYPE: VMWARE EX
WWN: 50:00:00:00:00:00:00:00, 50:00:00:00:00:00:00:01
HOST NQN: nqn.2014-08.com.vmware:nvme:esxi-1
WWN USER-DEFINED NAMES: Server1_HBA1, Server1_HBA2

Procedure 4. Create FC-NVMe Server Groups from Ops Center Administrator

Step 1. In the Ops Center Administrator Dashboard, from the navigation pane, click **Servers**.



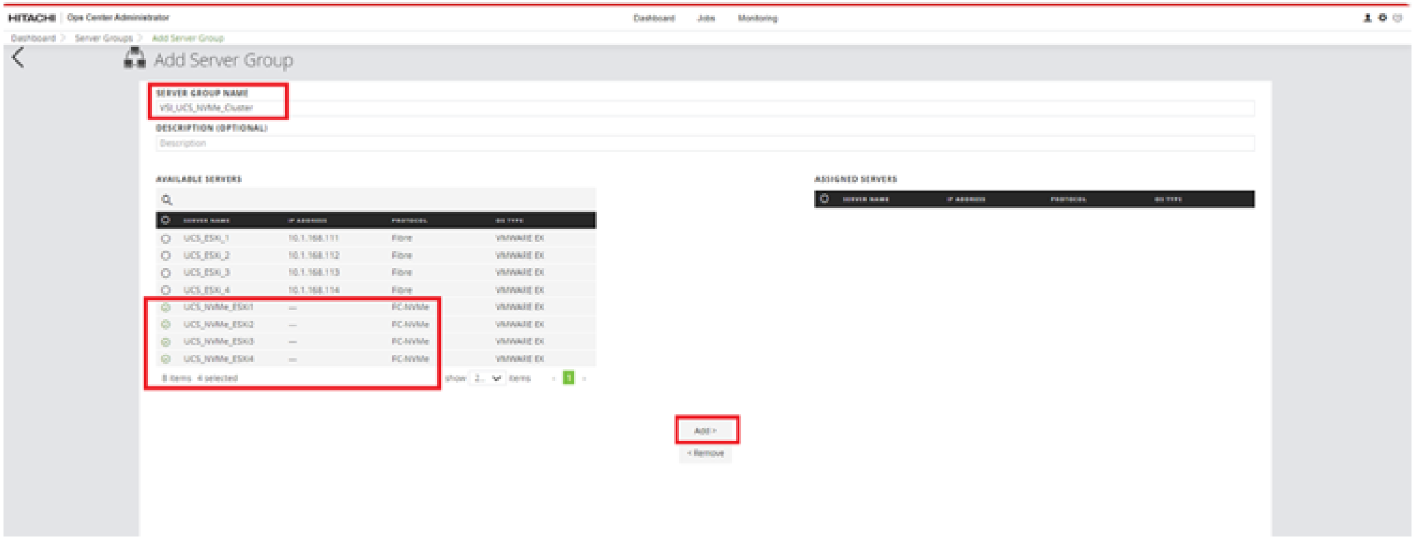
Step 2. Select the **Server Groups** tab. Click the plus sign (**+**).



SERVER GROUP ID	SERVER GROUP NAME	SERVER COUNT

Step 3. In the add **Server Group** wizard, enter the **SERVER GROUP NAME.**

Step 4. Select the FC-NVMe Servers from **AVAILABLE SERVERS** and click **Add.**


HITACHI | Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Server Groups > Add Server Group
Add Server Group
Add >
< Remove

SERVER GROUP NAME: VSI_UCS_NVMe_Cluster

DESCRIPTION (OPTIONAL): Description

AVAILABLE SERVERS

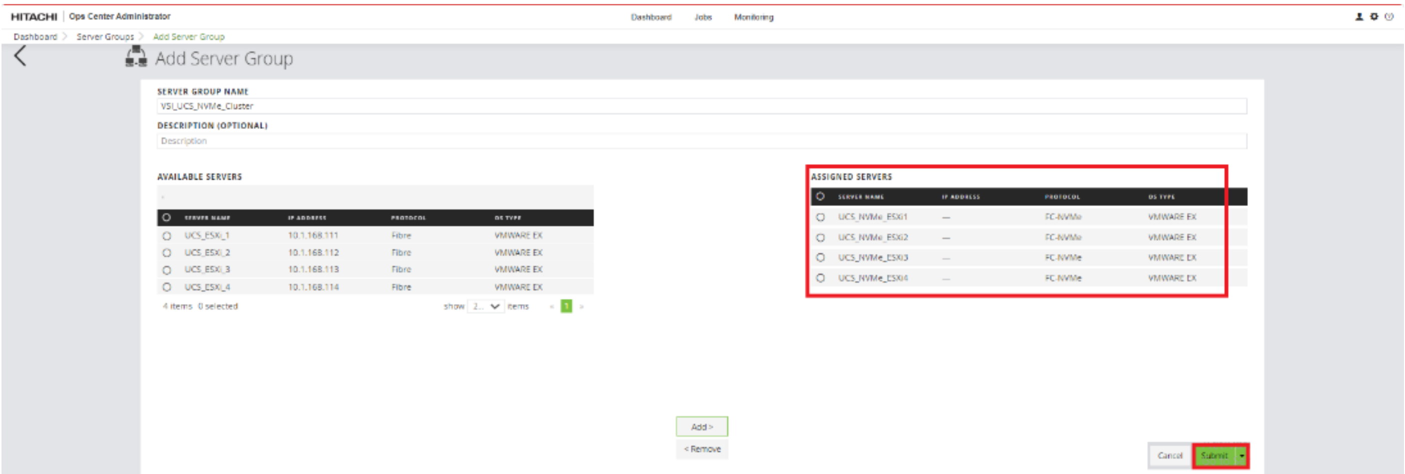
SERVER NAME	IP ADDRESS	PROTOCOL	OS TYPE
UCS_ESXi_1	10.1.168.111	Fibre	VMWARE EX
UCS_ESXi_2	10.1.168.112	Fibre	VMWARE EX
UCS_ESXi_3	10.1.168.113	Fibre	VMWARE EX
UCS_ESXi_4	10.1.168.114	Fibre	VMWARE EX
UCS_NVMe_ESXi1	—	FC-NVMe	VMWARE EX
UCS_NVMe_ESXi2	—	FC-NVMe	VMWARE EX
UCS_NVMe_ESXi3	—	FC-NVMe	VMWARE EX
UCS_NVMe_ESXi4	—	FC-NVMe	VMWARE EX

8 items 4 selected show 2... items 1

ASSIGNED SERVERS

SERVER NAME	IP ADDRESS	PROTOCOL	OS TYPE

Step 5. The FC-NVMe Servers are moved from the **AVAILABLE SERVERS** to the **ASSIGNED SERVERS** list. Click **Submit.**


HITACHI | Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Server Groups > Add Server Group
Add Server Group
Add >
< Remove
Cancel
Submit

SERVER GROUP NAME: VSI_UCS_NVMe_Cluster

DESCRIPTION (OPTIONAL): Description

AVAILABLE SERVERS

SERVER NAME	IP ADDRESS	PROTOCOL	OS TYPE
UCS_ESXi_1	10.1.168.111	Fibre	VMWARE EX
UCS_ESXi_2	10.1.168.112	Fibre	VMWARE EX
UCS_ESXi_3	10.1.168.113	Fibre	VMWARE EX
UCS_ESXi_4	10.1.168.114	Fibre	VMWARE EX

4 items 0 selected show 2... items 1

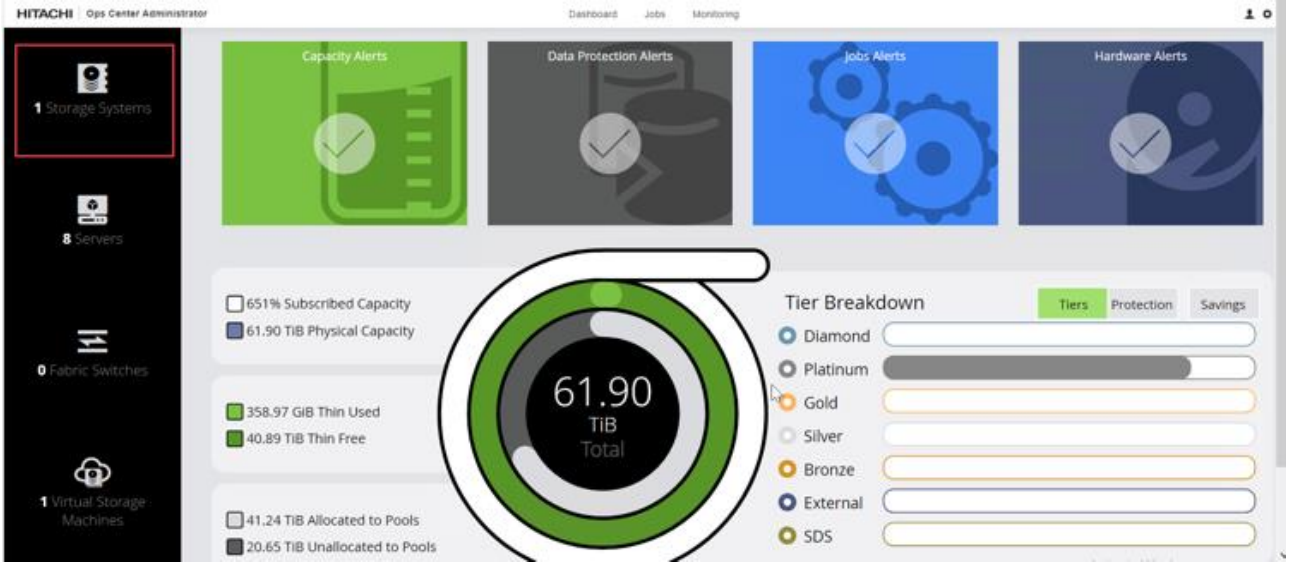
ASSIGNED SERVERS

SERVER NAME	IP ADDRESS	PROTOCOL	OS TYPE
UCS_NVMe_ESXi1	—	FC-NVMe	VMWARE EX
UCS_NVMe_ESXi2	—	FC-NVMe	VMWARE EX
UCS_NVMe_ESXi3	—	FC-NVMe	VMWARE EX
UCS_NVMe_ESXi4	—	FC-NVMe	VMWARE EX

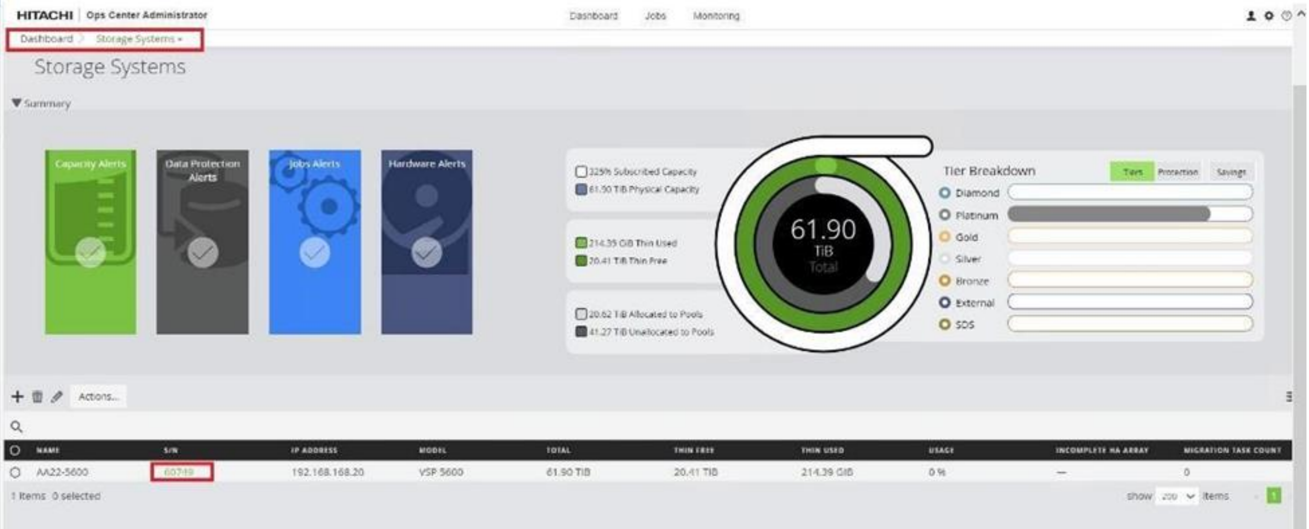
Procedure 5. Create a Hitachi Dynamic Provisioning Pool for UCS Servers for FC-NVMe VMFS Volume LDEVs

When creating a pool, use the basic option to take advantage of tiers of storage available on the VSP, following best practices. By default, the basic option will create a Hitachi Dynamic Provisioning Pool. For increased flexibility and if best practices are not essential, choose the advanced option. This enables you to specify Parity Groups and define your pool types as either Tiered, Thin, or Snap.

Step 1. Log in to **Hitachi Ops Center Administrator** and from the navigation pane, click **Storage Systems** to access the inventory of registered storage systems.



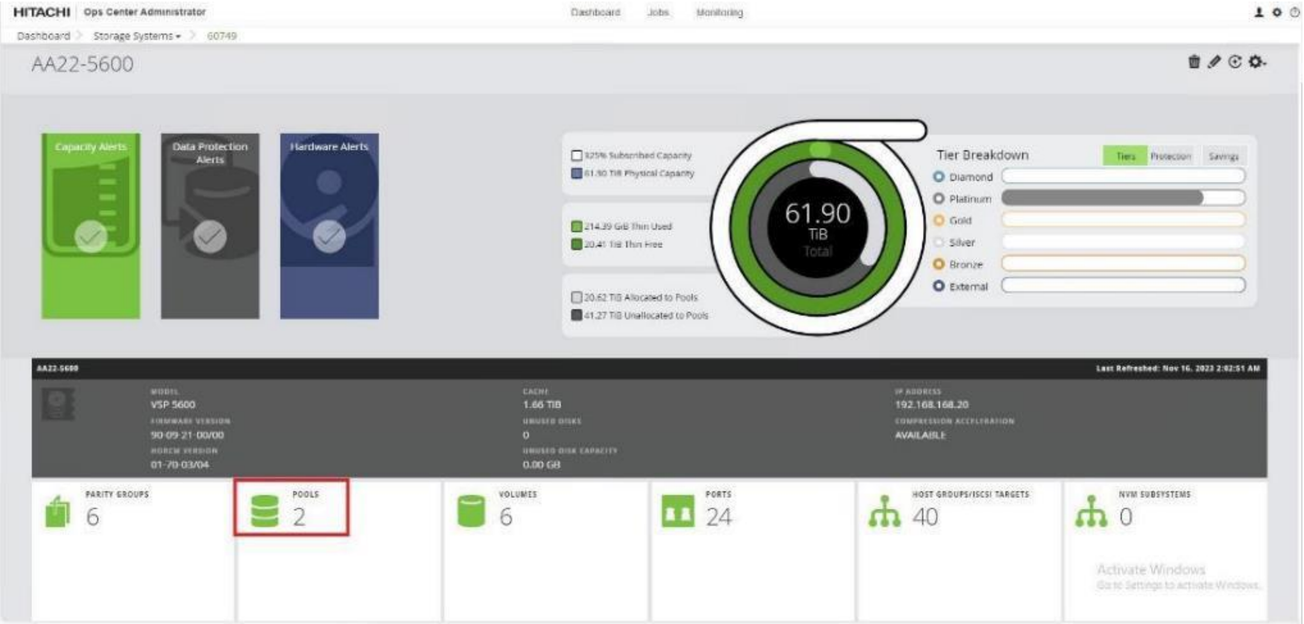
Step 2. Click the **S/N** listing of the Storage System.



○	NAME	S/N	IP ADDRESS	MODEL	TOTAL	THIN FREE	THIN USED	USAGE	INCOMPLETE HA ARRAY	MIGRATION TASK COUNT
○	AA22-5600	60749	192.168.168.20	VSP 5600	61.90 TiB	20.41 TiB	214.39 GiB	0 %	—	0

1 Items 0 selected

Step 3. From the Storage System, click **Pools.**



AA22-5600

Last Refreshed: Nov 16, 2023 2:02:51 AM

MODEL
VSP 5600

FIRMWARE VERSION
90-09-21-00/00

HORCM VERSION
01-70-03/04

CACHE
1.66 TiB

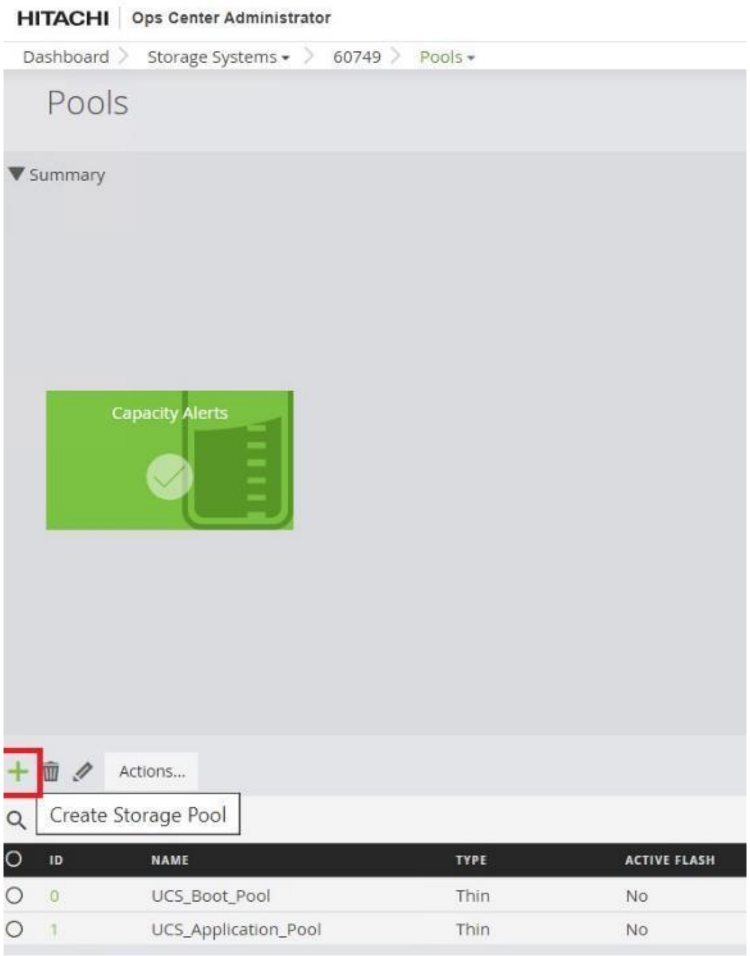
UNUSED DISKS
0

UNUSED DISK CAPACITY
0.00 GB

IP ADDRESS
192.168.168.20

COMPRESSION ACCELERATION
AVAILABLE

Step 4. Click the plus sign (**+**) to open the **Create Pool** window.


HITACHI | Ops Center Administrator
Dashboard > Storage Systems ▾ > 60749 > Pools ▾
Pools
Summary
Capacity Alerts
+
Actions...
Create Storage Pool

○	ID	NAME	TYPE	ACTIVE FLASH
○	0	UCS_Boot_Pool	Thin	No
○	1	UCS_Application_Pool	Thin	No

Step 5. Enter the following details:

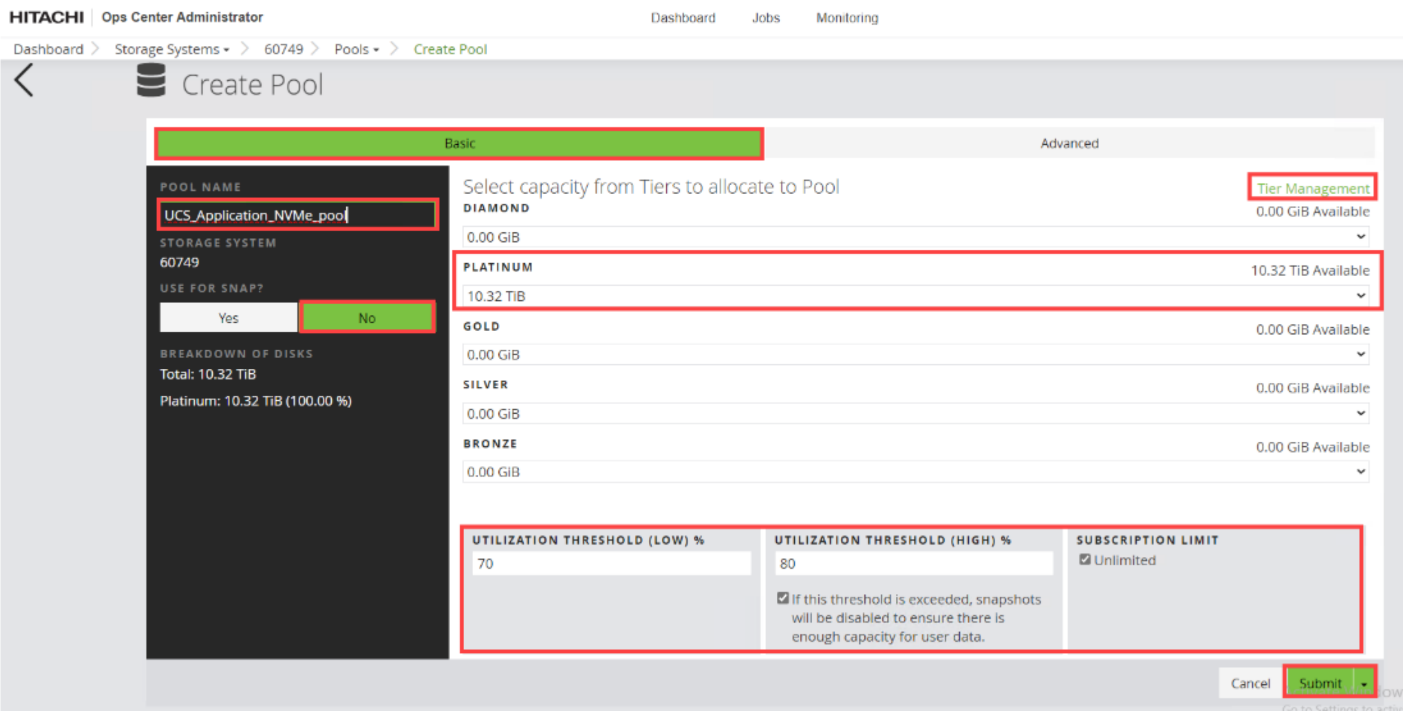
a. For the **POOL NAME** enter **UCS_Application_NVMe_pool** (Pool names can be any combination of alphanumeric characters, hyphens, and underscores only. Initial hyphens are not allowed.)

b. Click an available **Tier** to view the available storage capacity and select the available **capacity**.

c. Review the **high and low pool utilization thresholds**. By default, the low utilization threshold set to 70% and the high threshold is set to 80%. You can customize thresholds to receive notifications based on their specific environment requirements.

d. To specify over allocation, you can set the limit to **Unlimited**.

e. Click **Submit**.


HITACHI | Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Storage Systems ▾ > 60749 > Pools ▾ > Create Pool
Create Pool
Basic
Advanced
Tier Management
Cancel
Submit

POOL NAME: UCS_Application_NVMe_pool

STORAGE SYSTEM: 60749

USE FOR SNAP? Yes [✓ No]

BREAKDOWN OF DISKS
Total: 10.32 TiB
Platinum: 10.32 TiB (100.00 %)

Select capacity from Tiers to allocate to Pool

DIAMOND	0.00 GiB	0.00 GiB Available
PLATINUM	10.32 TiB	10.32 TiB Available
GOLD	0.00 GiB	0.00 GiB Available
SILVER	0.00 GiB	0.00 GiB Available
BRONZE	0.00 GiB	0.00 GiB Available

UTILIZATION THRESHOLD (LOW) %: 70

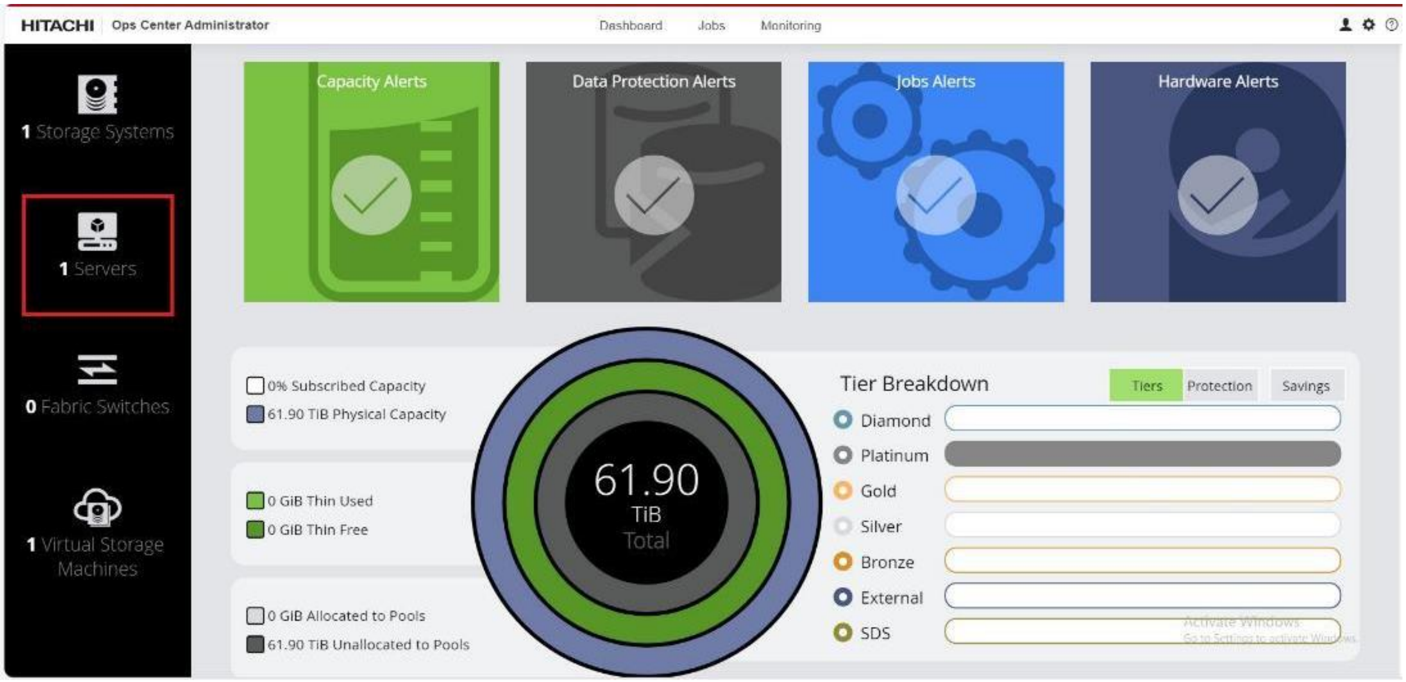
UTILIZATION THRESHOLD (HIGH) %: 80

☑ If this threshold is exceeded, snapshots will be disabled to ensure there is enough capacity for user data.

SUBSCRIPTION LIMIT: ☑ Unlimited

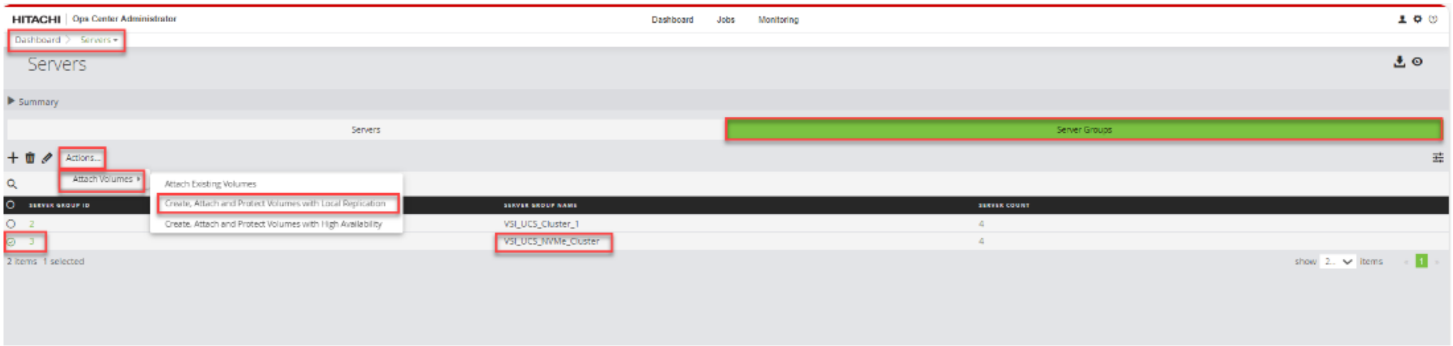
Procedure 6. Allocate FC-NVMe Shared VMFS LDEV and Adding LDEV Paths from Server Groups

Step 1. Log in to **Hitachi Ops Center Administrator** console and click the **Servers** tab.



Step 2. Select the **Server Groups** under the Servers tab, and then select **Server Group ID**.

Step 3. Under Actions, click **Attach Volumes**, select **Create, Attach and Protect Volumes with Local Replication.**



○	SERVER GROUP ID	SERVER GROUP NAME	SERVER COUNT
○	2	VSI_UCS_Cluster_1	4
☑	3	VSI_UCS_NVMe_Cluster	4

Step 4. Configure volumes for the specified storage System. Proceed with the following steps to add the volumes to UCS ESXi servers that use the FC-NVMe protocol.

a. For the VOLUME LABEL enter VSI-VMFS-DS-NVMe.

b. Select the NUMBER OF VOLUMES.

c. Enter the Volume **SIZE**. And select the volume unit: GiB, TiB, or Blocks.

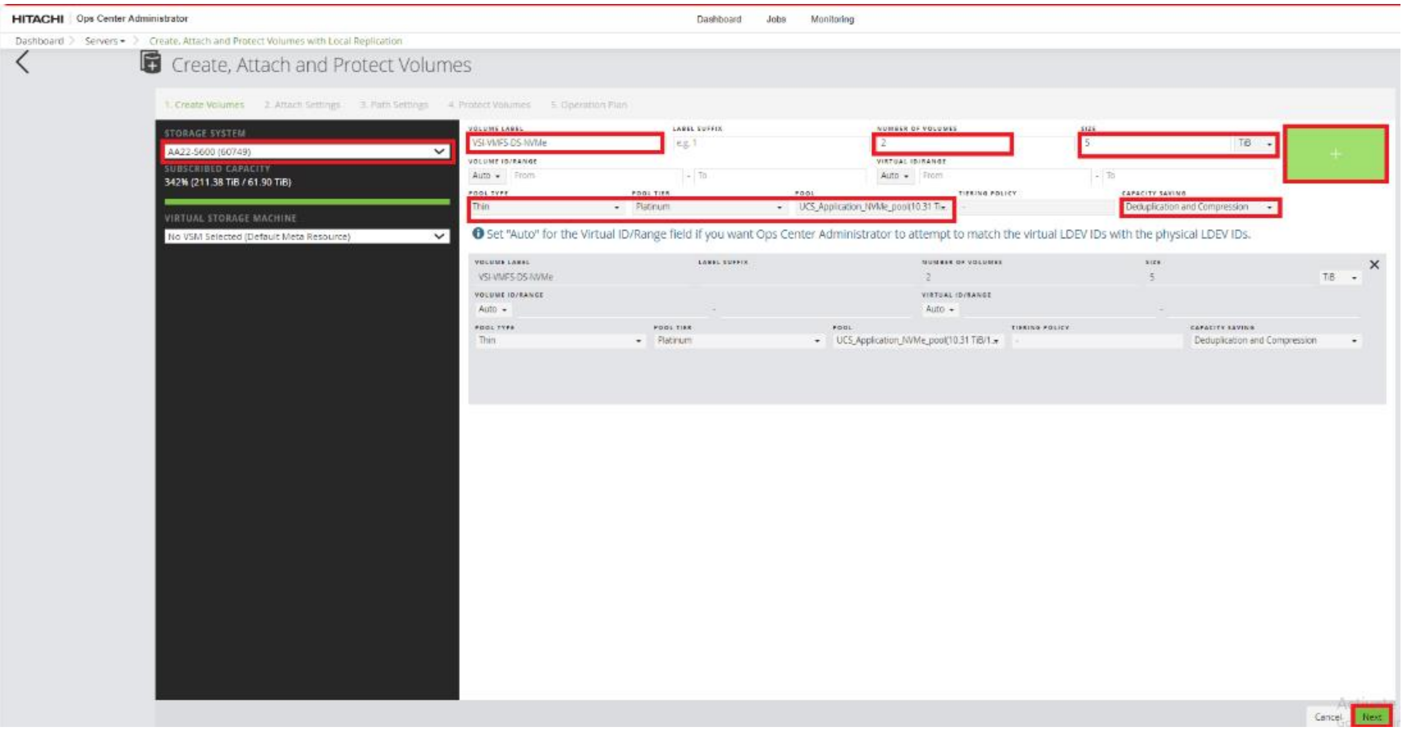
d. For the POOL TYPE select **Thin**.

e. For a Thin pool, select the POOL TIER: Diamond, Platinum, Gold, Silver, or Bronze

f. By default, the POOL is auto selected. Verify that the chosen **POOL** is the ''UCS_Application_NVMe_Pool'' for provisioning VMFS datastores.

g. Click the plus sign (**+**) to verify the volume settings.

h. Click **Next.**



Create, Attach and Protect Volumes

1. Create Volumes · 2. Attach Settings · 3. Path Settings · 4. Protect Volumes · 5. Operation Plan

STORAGE SYSTEM: AA22-5600 (60749)

SUBSCRIBED CAPACITY: 342% (211.38 TiB / 61.90 TiB)

VIRTUAL STORAGE MACHINE: No VSM Selected (Default Meta Resource)

VOLUME LABEL: VSI-VMFS-DS-NVMe

LABEL SUFFIX: e.g. 1

NUMBER OF VOLUMES: 2

SIZE: 5 TiB

VOLUME ID/RANGE: Auto

VIRTUAL ID/RANGE: Auto

POOL TYPE: Thin

POOL TIER: Platinum

POOL: UCS_Application_NVMe_pool(10.31 TiB/1...

TIERING POLICY: -

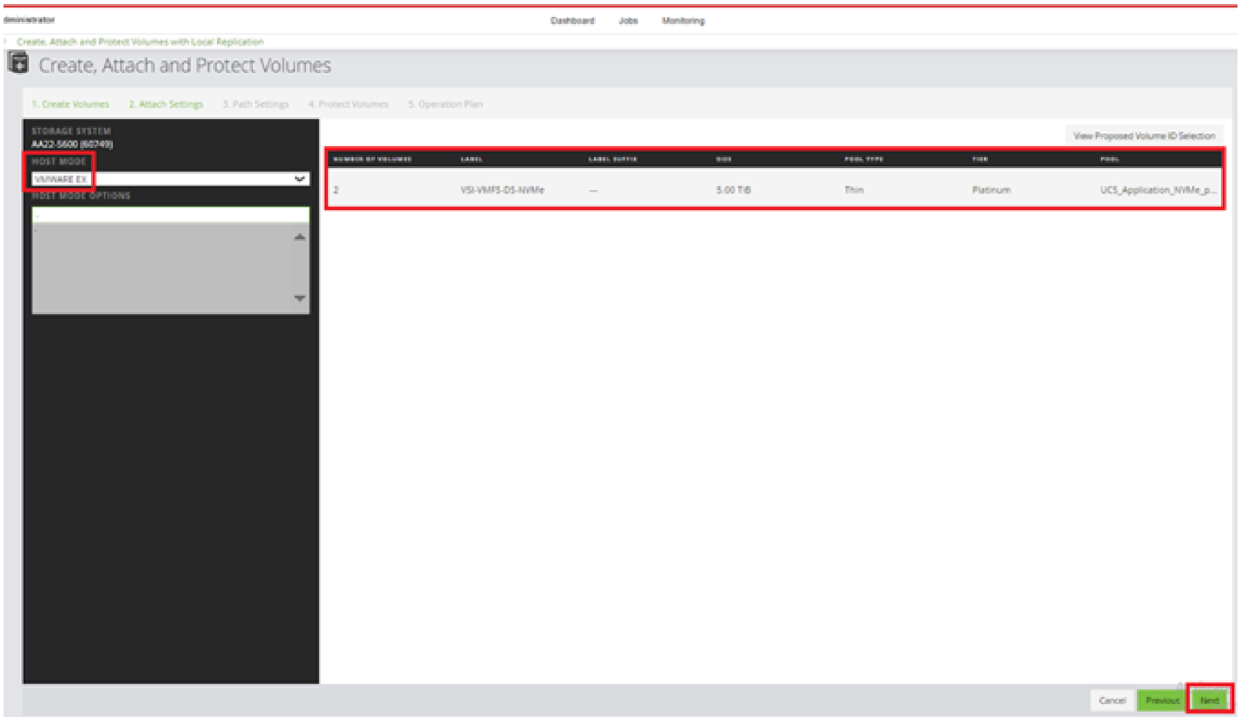
CAPACITY SAVING: Deduplication and Compression

Set "Auto" for the Virtual ID/Range field if you want Ops Center Administrator to attempt to match the virtual LDEV IDs with the physical LDEV IDs.

HITACHI
Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Servers > Create, Attach and Protect Volumes with Local Replication
+
Cancel
Next

Step 5. For the HOST MODE select **VMWARE EX**.

Step 6. Validate the Volume values and click **Next**.



Create, Attach and Protect Volumes

1. Create Volumes · 2. Attach Settings · 3. Path Settings · 4. Protect Volumes · 5. Operation Plan

STORAGE SYSTEM: AA22-5600 (60749)

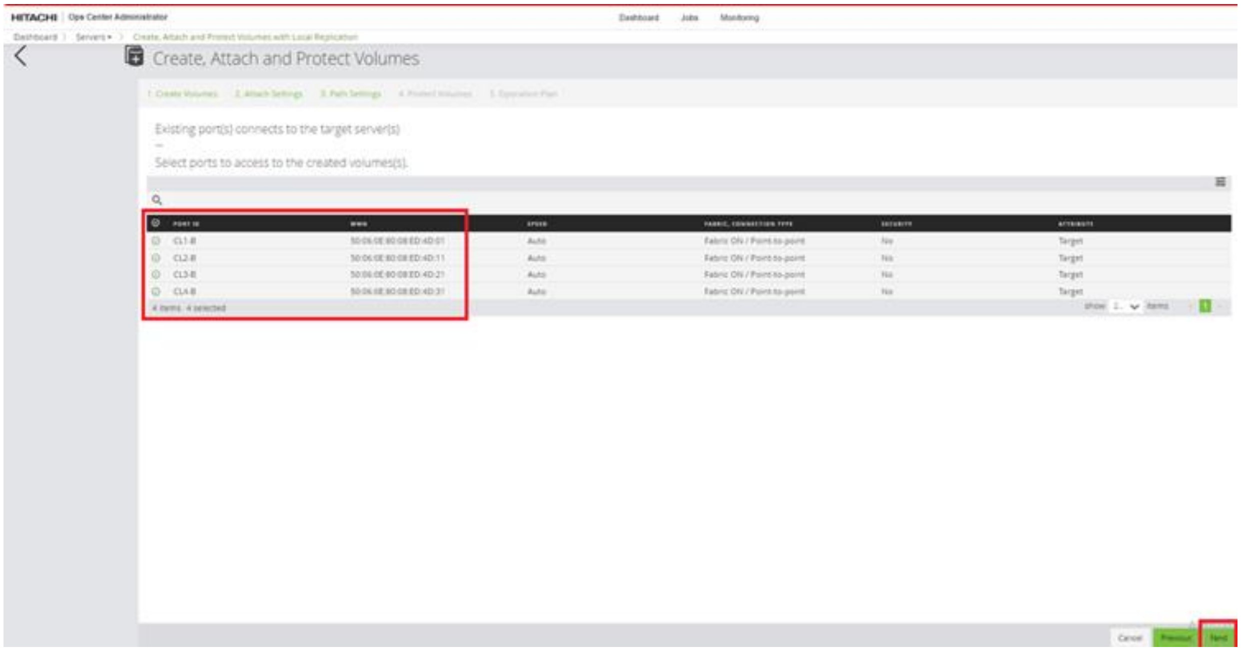
HOST MODE: VMWARE EX

HOST MODE OPTIONS: -

NUMBER OF VOLUMES	LABEL	LABEL SUFFIX	SIZE	POOL TYPE	TIER	POOL
2	VSI-VMFS-DS-NVMe	—	5.00 TiB	Thin	Platinum	UCS_Application_NVMe_p...

Administrator
Dashboard
Jobs
Monitoring
Create, Attach and Protect Volumes with Local Replication
View Proposed Volume ID Selection
Cancel
Previous
Next

Step 7. Under **Path Settings**, select the VSP ports that are in NVMe mode, and click **Next.**



HITACHI | Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Servers ▾ > Create, Attach and Protect Volumes with Local Replication
Create, Attach and Protect Volumes
1. Create Volumes
2. Attach Settings
3. Path Settings
4. Protect Volumes
5. Operation Plan

Existing port(s) connects to the target server(s)

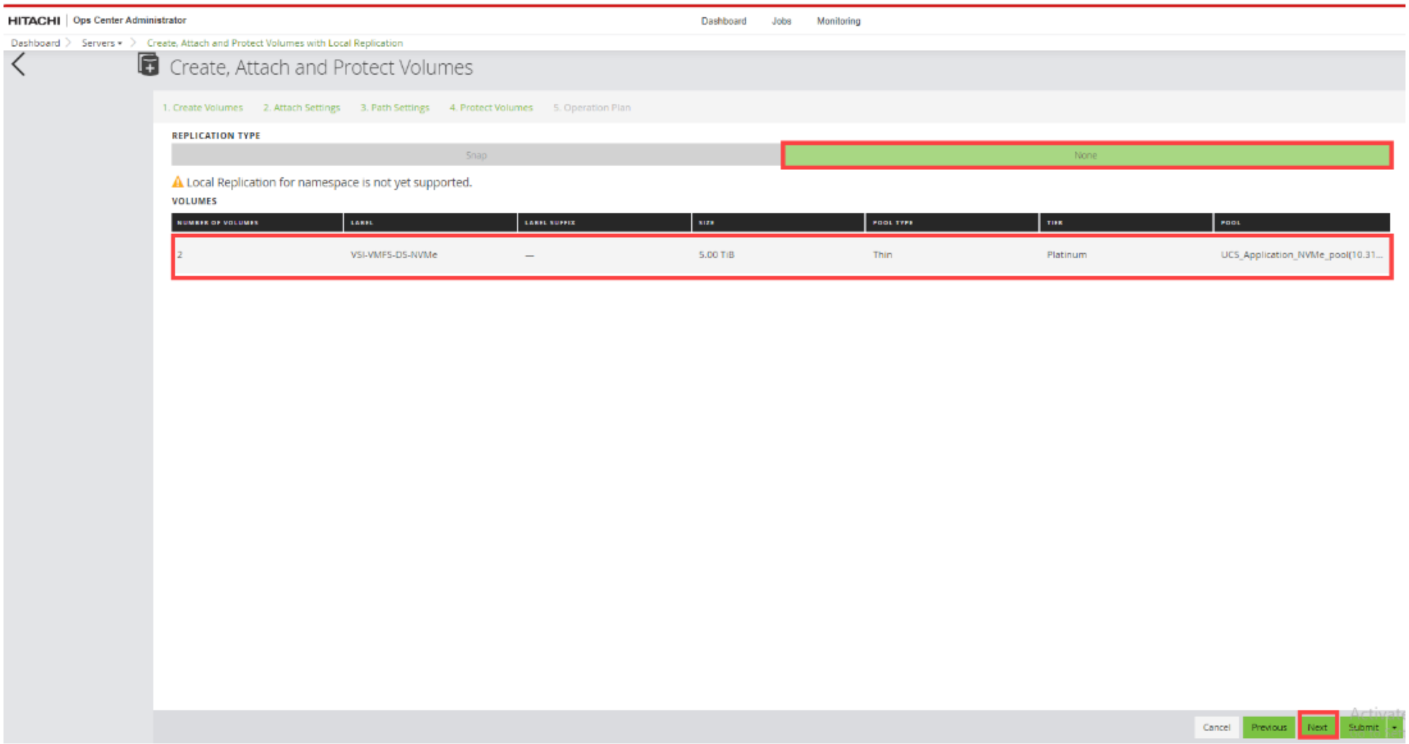
—

Select ports to access to the created volumes(s).

PORT ID	WWN	SPEED	FABRIC, CONNECTION TYPE	SECURITY	ATTRIBUTE
CL1-B	50:06:0E:80:08:ED:4D:01	Auto	Fabric ON / Point-to-point	No	Target
CL2-B	50:06:0E:80:08:ED:4D:11	Auto	Fabric ON / Point-to-point	No	Target
CL3-B	50:06:0E:80:08:ED:4D:21	Auto	Fabric ON / Point-to-point	No	Target
CL4-B	50:06:0E:80:08:ED:4D:31	Auto	Fabric ON / Point-to-point	No	Target

4 items 4 selected

Step 8. Select **None** for Replication Type and click **Next**.



HITACHI | Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Servers ▾ > Create, Attach and Protect Volumes with Local Replication
Create, Attach and Protect Volumes
1. Create Volumes
2. Attach Settings
3. Path Settings
4. Protect Volumes
5. Operation Plan
Snap
None
Cancel
Previous
Next
Submit

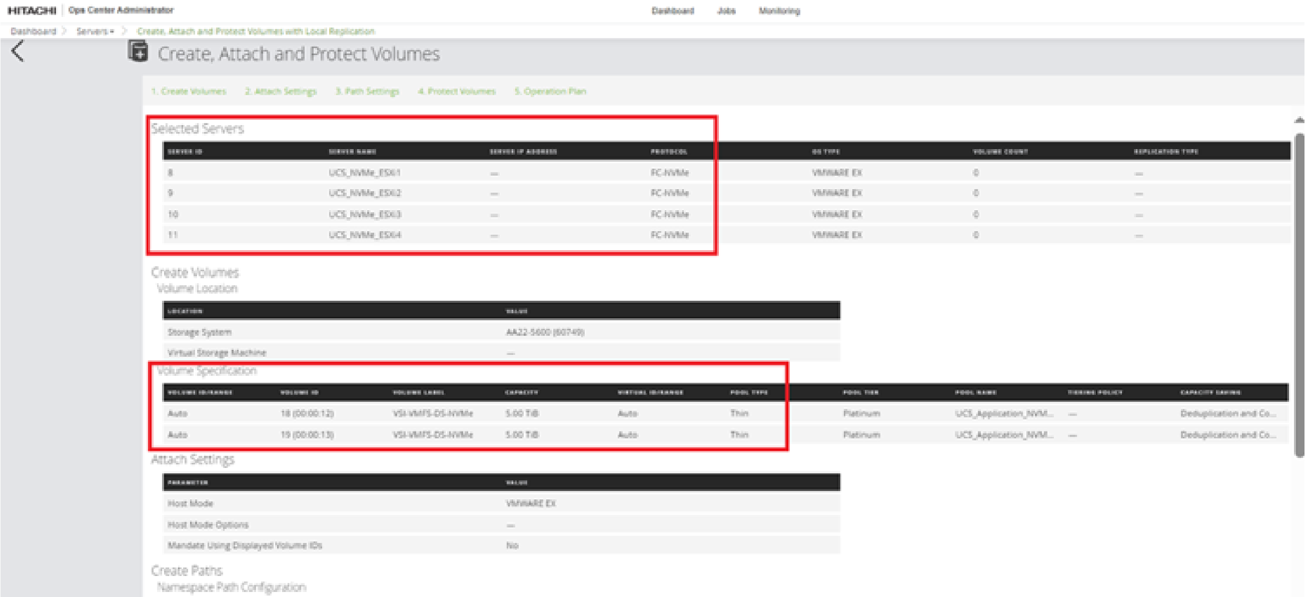
REPLICATION TYPE: None

⚠ Local Replication for namespace is not yet supported.

VOLUMES

NUMBER OF VOLUMES	LABEL	LABEL SUFFIX	SIZE	POOL TYPE	TIER	POOL
2	VSI-VMFS-DS-NVMe	—	5.00 TiB	Thin	Platinum	UCS_Application_NVMe_pool(10.31...

Step 9. Validate Selected Servers, Volume Specification, and Create Paths. Click **Submit**.



HITACHI | Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Servers ▾ > Create, Attach and Protect Volumes with Local Replication

Create, Attach and Protect Volumes

1. Create Volumes
2. Attach Settings
3. Path Settings
4. Protect Volumes
5. Operation Plan

Selected Servers

SERVER ID	SERVER NAME	SERVER IP ADDRESS	PROTOCOL	OS TYPE	VOLUME COUNT	REPLICATION TYPE
8	UCS_NVMe_ESXi1	—	FC-NVMe	VMWARE EX	0	—
9	UCS_NVMe_ESXi2	—	FC-NVMe	VMWARE EX	0	—
10	UCS_NVMe_ESXi3	—	FC-NVMe	VMWARE EX	0	—
11	UCS_NVMe_ESXi4	—	FC-NVMe	VMWARE EX	0	—

Create Volumes

Volume Location

LOCATION	VALUE
Storage System	AA22-5600 (60749)
Virtual Storage Machine	—

Volume Specification

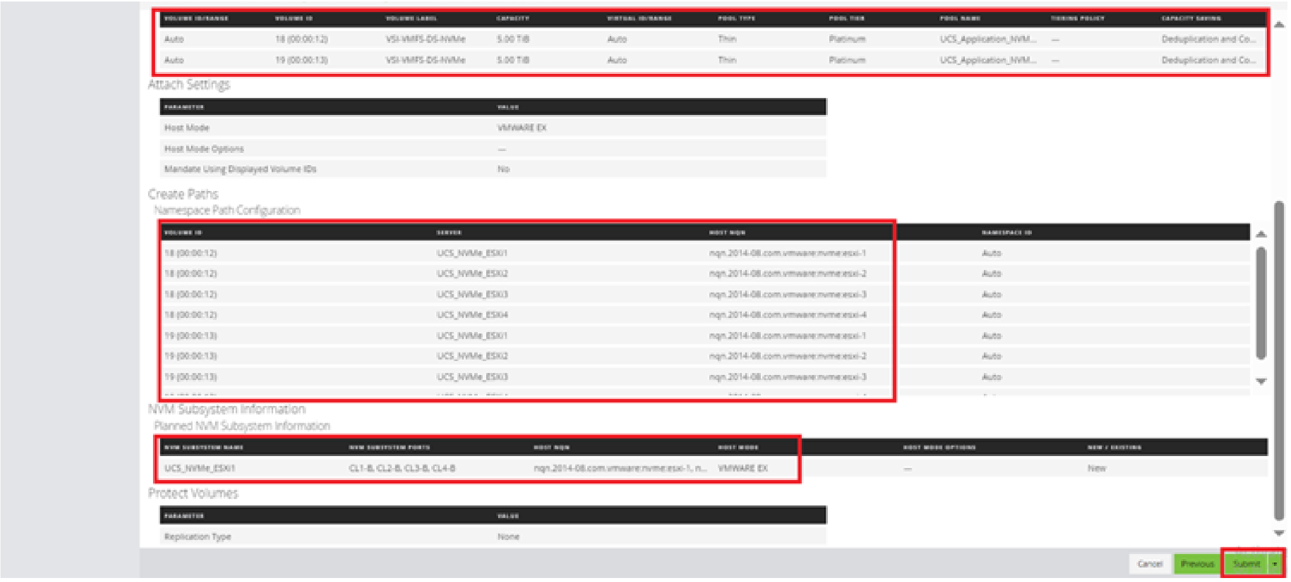
VOLUME ID/RANGE	VOLUME ID	VOLUME LABEL	CAPACITY	VIRTUAL ID/RANGE	POOL TYPE	POOL TIER	POOL NAME	TIERING POLICY	CAPACITY SAVING
Auto	18 (00:00:12)	VSI-VMFS-DS-NVMe	5.00 TiB	Auto	Thin	Platinum	UCS_Application_NVM...	—	Deduplication and Co...
Auto	19 (00:00:13)	VSI-VMFS-DS-NVMe	5.00 TiB	Auto	Thin	Platinum	UCS_Application_NVM...	—	Deduplication and Co...

Attach Settings

PARAMETER	VALUE
Host Mode	VMWARE EX
Host Mode Options	—
Mandate Using Displayed Volume IDs	No

Create Paths

Namespace Path Configuration



VOLUME ID/RANGE	VOLUME ID	VOLUME LABEL	CAPACITY	VIRTUAL ID/RANGE	POOL TYPE	POOL TIER	POOL NAME	TIERING POLICY	CAPACITY SAVING
Auto	18 (00:00:12)	VSI-VMFS-DS-NVMe	5.00 TiB	Auto	Thin	Platinum	UCS_Application_NVM...	—	Deduplication and Co...
Auto	19 (00:00:13)	VSI-VMFS-DS-NVMe	5.00 TiB	Auto	Thin	Platinum	UCS_Application_NVM...	—	Deduplication and Co...

Attach Settings

PARAMETER	VALUE
Host Mode	VMWARE EX
Host Mode Options	—
Mandate Using Displayed Volume IDs	No

Create Paths

Namespace Path Configuration

VOLUME ID	SERVER	HOST NQN	NAMESPACE ID
18 (00:00:12)	UCS_NVMe_ESXi1	nqn.2014-08.com.vmware:nvme:esxi-1	Auto
18 (00:00:12)	UCS_NVMe_ESXi2	nqn.2014-08.com.vmware:nvme:esxi-2	Auto
18 (00:00:12)	UCS_NVMe_ESXi3	nqn.2014-08.com.vmware:nvme:esxi-3	Auto
18 (00:00:12)	UCS_NVMe_ESXi4	nqn.2014-08.com.vmware:nvme:esxi-4	Auto
19 (00:00:13)	UCS_NVMe_ESXi1	nqn.2014-08.com.vmware:nvme:esxi-1	Auto
19 (00:00:13)	UCS_NVMe_ESXi2	nqn.2014-08.com.vmware:nvme:esxi-2	Auto
19 (00:00:13)	UCS_NVMe_ESXi3	nqn.2014-08.com.vmware:nvme:esxi-3	Auto

NVM Subsystem Information

Planned NVM Subsystem Information

NVM SUBSYSTEM NAME	NVM SUBSYSTEM PORTS	HOST NQN	HOST MODE	HOST MODE OPTIONS	NEW / EXISTING
UCS_NVMe_ESXi1	CL1-B, CL2-B, CL3-B, CL4-B	nqn.2014-08.com.vmware:nvme:esxi-1, n...	VMWARE EX	—	New

Protect Volumes

PARAMETER	VALUE
Replication Type	None

Management Tools

This chapter contains the following:

- Cisco Intersight Hardware Compatibility List (HCL) Status
- Deploy Cisco Intersight Assist Appliance
- Claim VMware vCenter using Cisco Intersight Assist Appliance
- Claim Cisco Nexus Switches using Cisco Intersight Assist Appliance
- Claim Cisco MDS Switches using Cisco Intersight Assist Appliance
- Claim Hitachi VSP using Cisco Intersight Assist Appliance
- Cisco Nexus Dashboard Fabric Controller

Cisco Intersight Hardware Compatibility List (HCL) Status

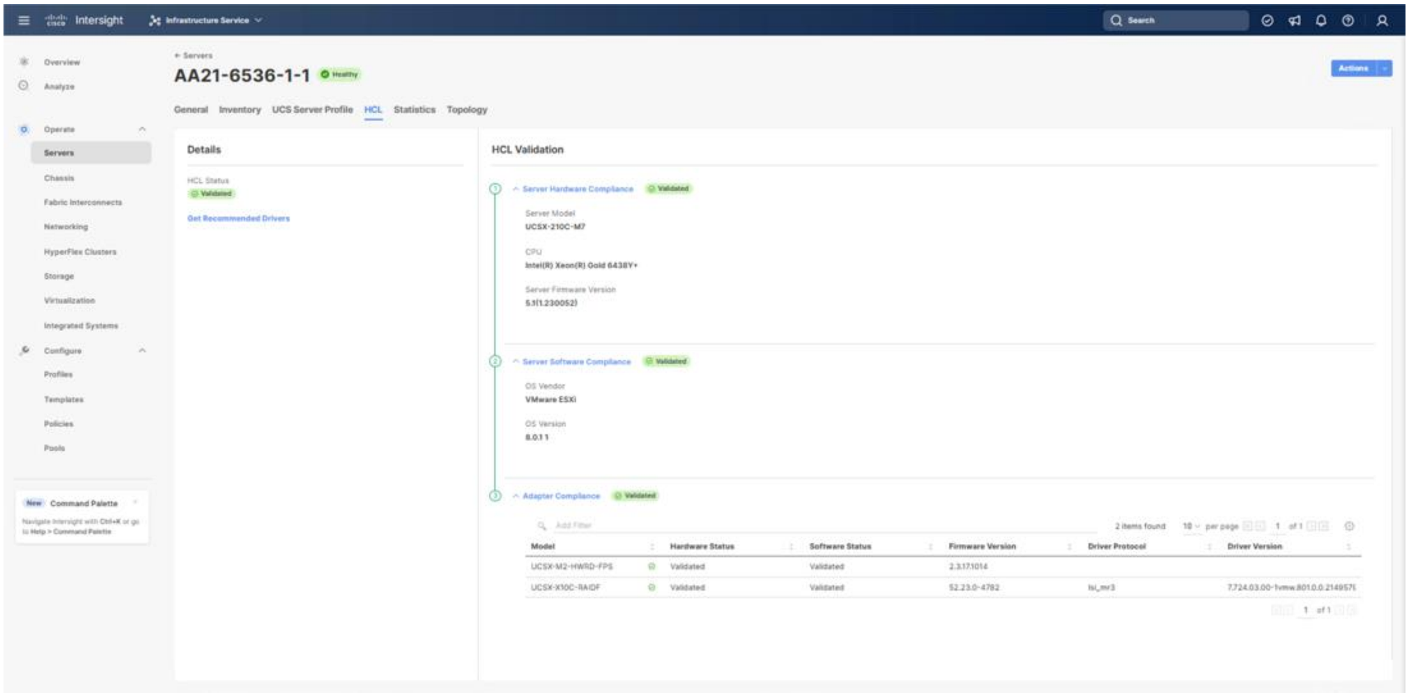
Cisco Intersight evaluates the compatibility your UCS system to check if the hardware and software have been tested and validated by Cisco or Cisco partners. Cisco Intersight reports validation issues after checking the compatibility of the server model, processor, firmware, adapters, operating system, and drivers, and displays the compliance status with the Hardware Compatibility List (HCL).

To determine HCL compatibility for VMware ESXi, Cisco Intersight uses Cisco UCS Tools as an installed VIB (vSphere Installation Bundle). The Cisco UCS Tools is part of VMware ESXi Cisco custom ISO, but the version for will be updated later during the vSphere Cluster image update.

For more information about Cisco UCS Tools manual deployment and troubleshooting, go to: https://intersight.com/help/saas/resources/cisco_ucs_tools

Procedure 1. View Compute Node Hardware Compatibility

Step 1. To find detailed information about the hardware compatibility of a compute node, in Cisco Intersight go to **Infrastructure Service > Operate > Servers** in the left menu bar, click a server and select **HCL**.



AA21-6536-1-1 Healthy

Details

HCL Status: Validated

Get Recommended Drivers

HCL Validation

1. Server Hardware Compliance: Validated

Server Model: UCSX-210C-M7

CPU: Intel(R) Xeon(R) Gold 6438Y+

Server Firmware Version: 5.1(1.230052)

2. Server Software Compliance: Validated

OS Vendor: VMware ESXi

OS Version: 8.0.1 1

3. Adapter Compliance: Validated

Add Filter — 2 items found — 10 per page — 1 of 1

Model	Hardware Status	Software Status	Firmware Version	Driver Protocol	Driver Version
UCSX-M2-HWRD-FPS	Validated	Validated	2.3.17.1014		
UCSX-X10C-RAIDF	Validated	Validated	52.23.0-4782	lsi_mr3	7.724.03.00-1vmw.801.0.0.2149575

1 of 1

Deploy Cisco Intersight Assist Appliance

Cisco Intersight works with Hitachi VSP and VMware vCenter using third-party device connectors and Cisco Nexus and MDS switches using Cisco device connectors. Since third-party infrastructure and Cisco switches do not contain any usable built-in Intersight device connector, Cisco Intersight Assist virtual appliance enables Cisco Intersight to communicate with these devices.

Note: A single Cisco Intersight Assist virtual appliance can support both the Hitachi VSP storage, VMware vCenter, and Cisco Nexus and MDS switches.

To install Cisco Intersight Assist from an Open Virtual Appliance (OVA), download the latest release of the Cisco Intersight Virtual Appliance for vSphere from https://software.cisco.com/download/home/286319499/type/286323047/release/1.0.9-588?catid=268439477

Procedure 1. Set up Intersight Assist DNS entries

Setting up Cisco Intersight Virtual Appliance requires an IP address and 2 hostnames for that IP address. The hostnames must be in the following formats:

- **myhost.mydomain.com**: A hostname in this format is used to access the GUI. This must be defined as an A record and PTR record in DNS. The PTR record is required for reverse lookup of the IP address. If an IP address resolves to multiple hostnames, the first one in the list is used.
- **dc-myhost.mydomain.com:** The "dc-" must be prepended to your hostname. This hostname must be defined as the CNAME of myhost.mydomain.com. Hostnames in this format are used internally by the appliance to manage device connections.

In this lab deployment the following example information was used to deploy a Cisco Intersight Assist VM:

- **Hostname:** as-assist.adaptive-solutions.local
- **IP address**: 10.1.168.99
- **DNS Entries** (Windows AD/DNS):
  - A Record: as-assist.adaptive-solutions.local
  - CNAME: dc-as-assist.adaptive-solutions.local

For more details, go to https://www.cisco.com/c/en/us/td/docs/unified_computing/Intersight/b_Cisco_Intersight_Appliance_Getting_Started_Guide/b_Cisco_Intersight_Appliance_Install_and_Upgrade_Guide_chapter_00.html.

Procedure 2. Deploy Cisco Intersight OVA

Note: Ensure that the appropriate entries of type A, CNAME, and PTR records exist in the DNS, as explained in the previous section. Log into the vSphere Client and select **Hosts and Clusters.**

Step 1. From **Hosts and Clusters**, right-click the cluster and click **Deploy OVF Template**.

Step 2. Select Local file and click **UPLOAD FILES**. Browse to and select the intersight-appliance-installer-vsphere-1.0.9-588.ova or the latest release file and click **Open**. Click **NEXT**.

Step 3. Name the Intersight Assist VM and select the location. Click **NEXT**.

Step 4. Select the cluster and click **NEXT**.

Step 5. Review details, click **Ignore**, and click **NEXT**.

Step 6. Select a deployment configuration. If only the Intersight Assist functionality is needed, the default configuration of 16 CPU and 32GB of RAM can be used. Click **NEXT**.

Step 7. Select the appropriate datastore (for example, VSI-DS-01) for storage and select the **Thin Provision** virtual disk format. Click **NEXT**.

Step 8. Select the appropriate management network (for example, IB-MGMT Network) for the OVA. Click **NEXT**.

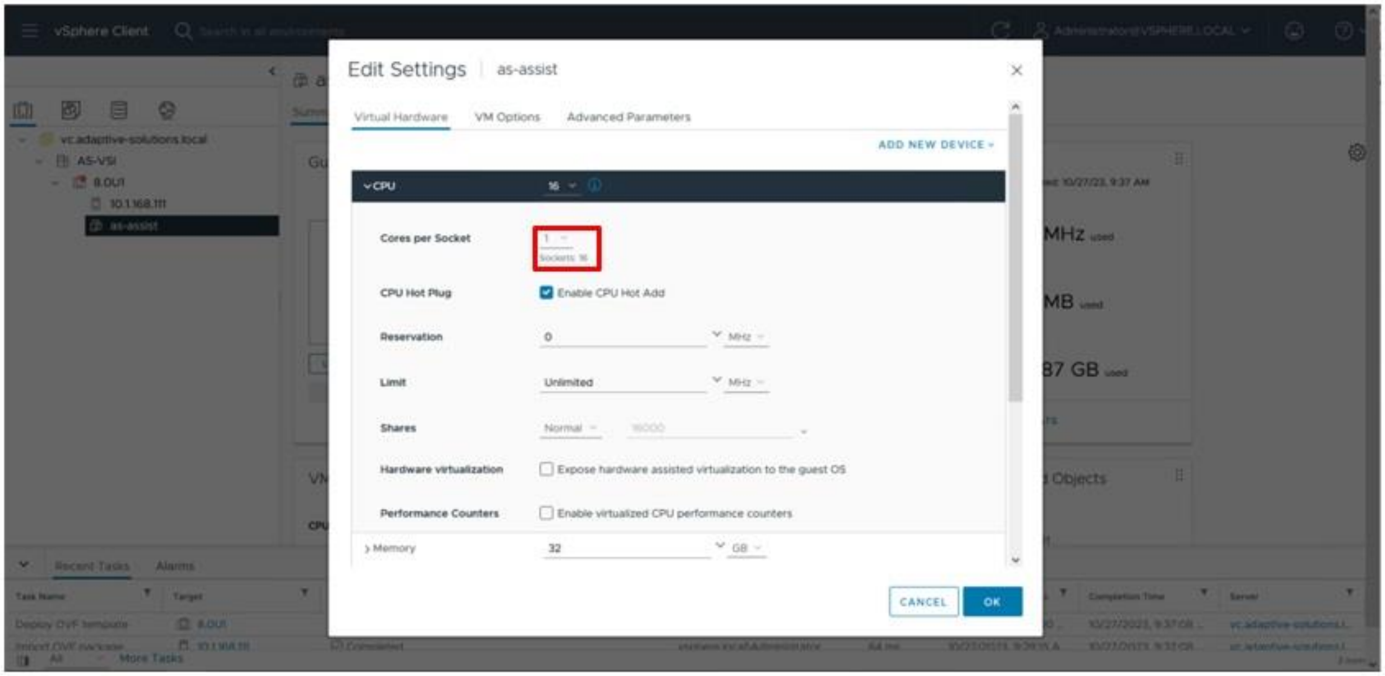
Note: The Cisco Intersight Assist VM must be able to access both the IB-MGMT network if holding the vCenter, OOB for connecting to the switches and the SVP of the 5600, and intersight.com. Select and configure the management network appropriately. If selecting IB-MGMT network on, make sure the routing and firewall is set up correctly to access the Internet and OOB as needed.

Step 9. Fill in all values to customize the template. Click **NEXT**.

Step 10. Review the deployment information and click **FINISH** to deploy the appliance.

Step 11. When the OVA deployment is complete, right-click the Intersight Assist VM and click **Edit Settings**.

Step 12. Expand CPU and verify the socket configuration. For example, in the following deployment, on a 2-socket system, the VM was configured for 16 sockets:



Edit Settings | as-assist

Virtual Hardware | VM Options | Advanced Parameters

ADD NEW DEVICE

CPU: 16

Cores per Socket: 1 (Sockets: 16)

CPU Hot Plug: ☑ Enable CPU Hot Add

Reservation: 0 MHz

Limit: Unlimited MHz

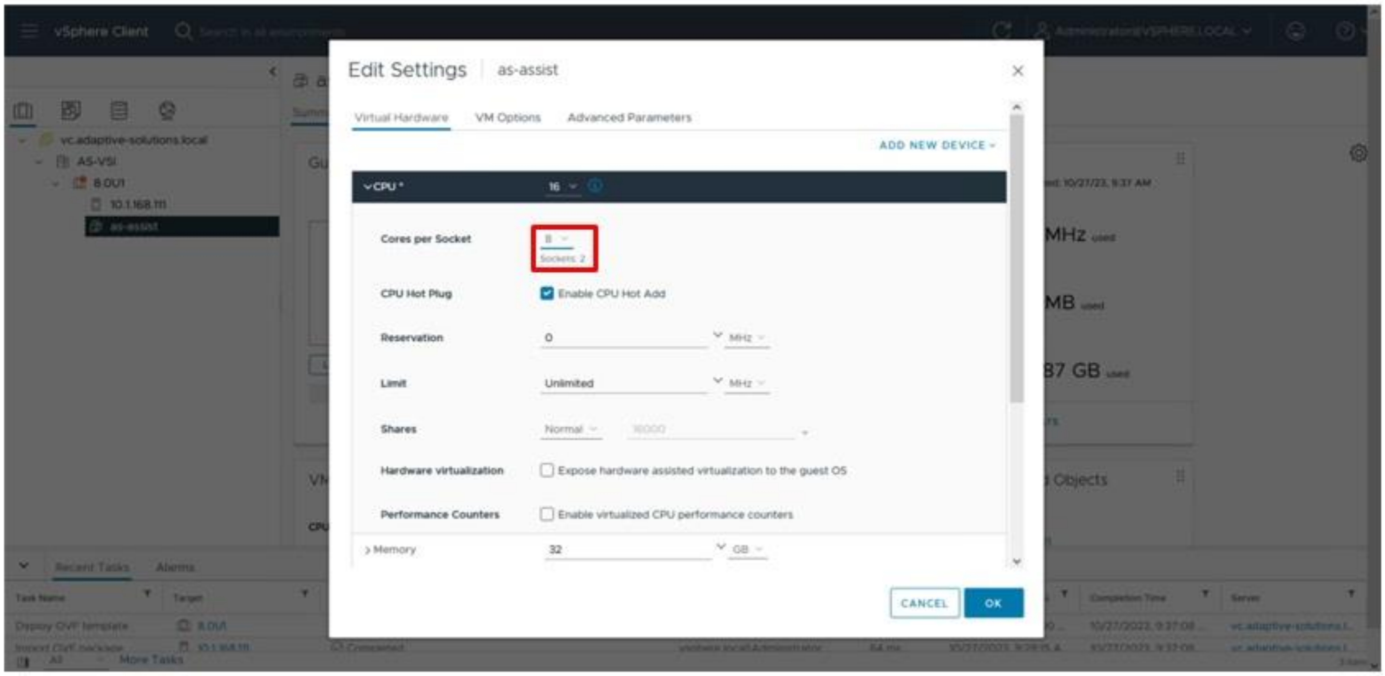
Shares: Normal 16000

Hardware virtualization: □ Expose hardware assisted virtualization to the guest OS

Performance Counters: □ Enable virtualized CPU performance counters

Memory: 32 GB

Step 13. Adjust the Cores per Socket so that the number of Sockets matches the server CPU configuration (2 sockets in this deployment):



Edit Settings | as-assist

Virtual Hardware | VM Options | Advanced Parameters

ADD NEW DEVICE

CPU *: 16

Cores per Socket: 8 (Sockets: 2)

CPU Hot Plug: ☑ Enable CPU Hot Add

Reservation: 0 MHz

Limit: Unlimited MHz

Shares: Normal 16000

Hardware virtualization: □ Expose hardware assisted virtualization to the guest OS

Performance Counters: □ Enable virtualized CPU performance counters

Memory: 32 GB

Step 14. Click **OK**.

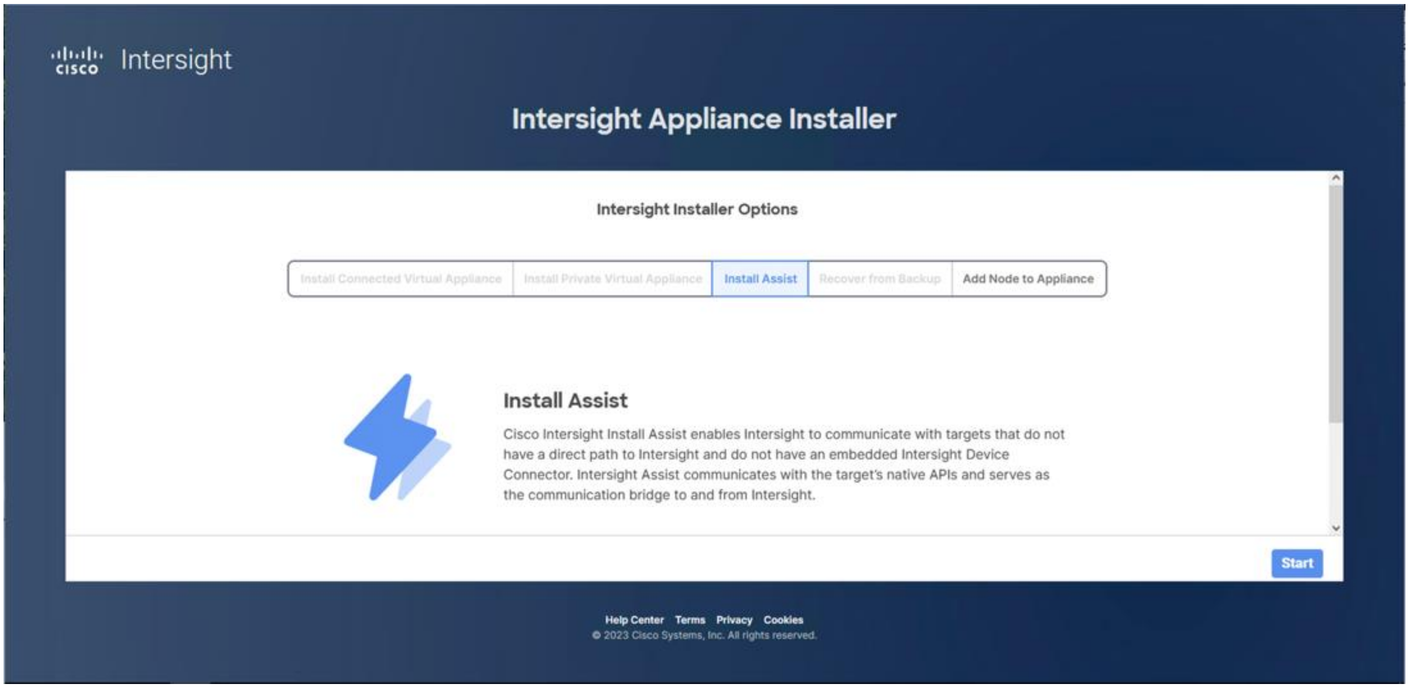
Step 15. Right-click the Intersight Assist VM and select **Power > Power On**.

Step 16. When the VM powers on and the login prompt is visible (use remote console), connect to https://intersight-assist-fqdn.

Note: It may take a few minutes for https://intersight-assist-fqdn to respond.

Step 17. Navigate the security prompts and select **Intersight Assist**. Click **Start**.

Note: If a screen appears prior to the certificate security prompt, the assist may not be ready, and a page refresh may be needed.



Intersight Appliance Installer

Intersight Installer Options

Install Assist

Cisco Intersight Install Assist enables Intersight to communicate with targets that do not have a direct path to Intersight and do not have an embedded Intersight Device Connector. Intersight Assist communicates with the target's native APIs and serves as the communication bridge to and from Intersight.

Intersight
Install Connected Virtual Appliance
Install Private Virtual Appliance
Install Assist
Recover from Backup
Add Node to Appliance
Start
Help Center
Terms
Privacy
Cookies
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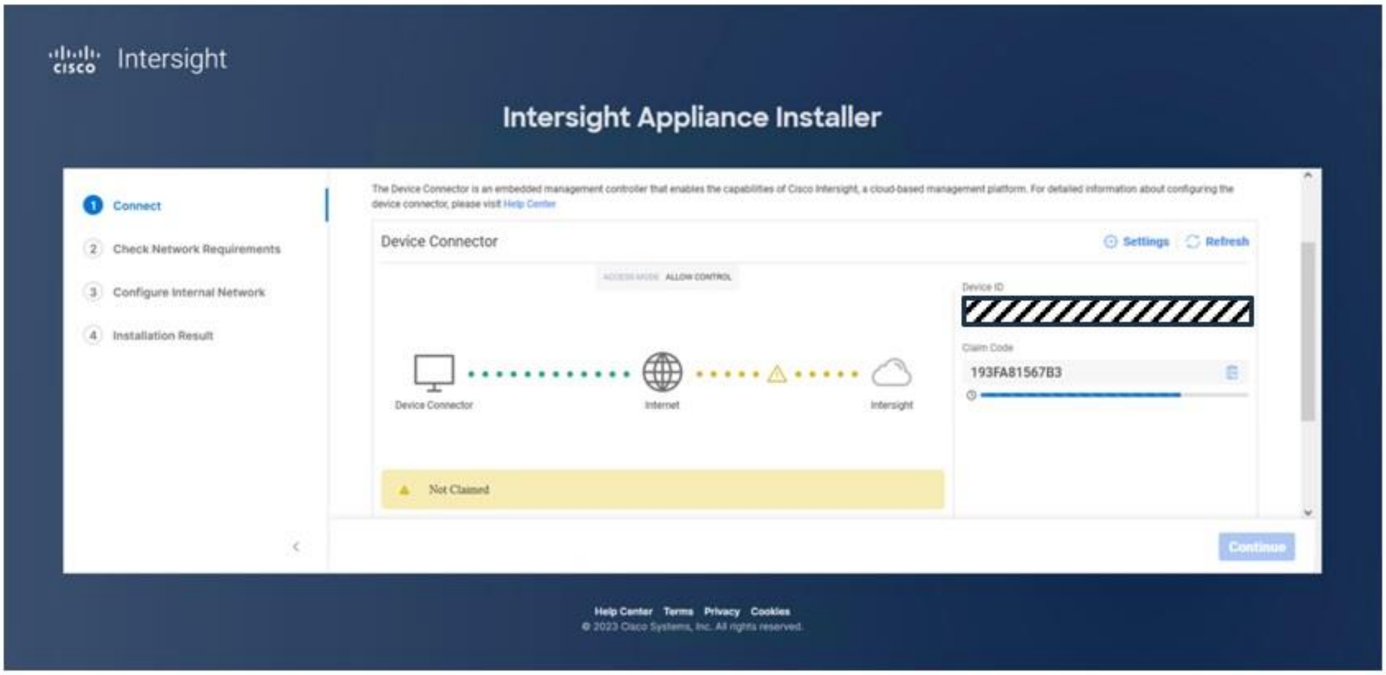
Step 18. Cisco Intersight Assist VM needs to be claimed in Cisco Intersight using the Device ID and Claim Code information visible in the GUI.



Intersight
Intersight Appliance Installer
1 Connect
2 Check Network Requirements
3 Configure Internal Network
4 Installation Result
Device Connector
Settings
Refresh
ACCESS MODE ALLOW CONTROL
Device Connector
Internet
Intersight
Continue
Help Center Terms Privacy Cookies
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The Device Connector is an embedded management controller that enables the capabilities of Cisco Intersight, a cloud-based management platform. For detailed information about configuring the device connector, please visit Help Center

Device ID
[redacted]

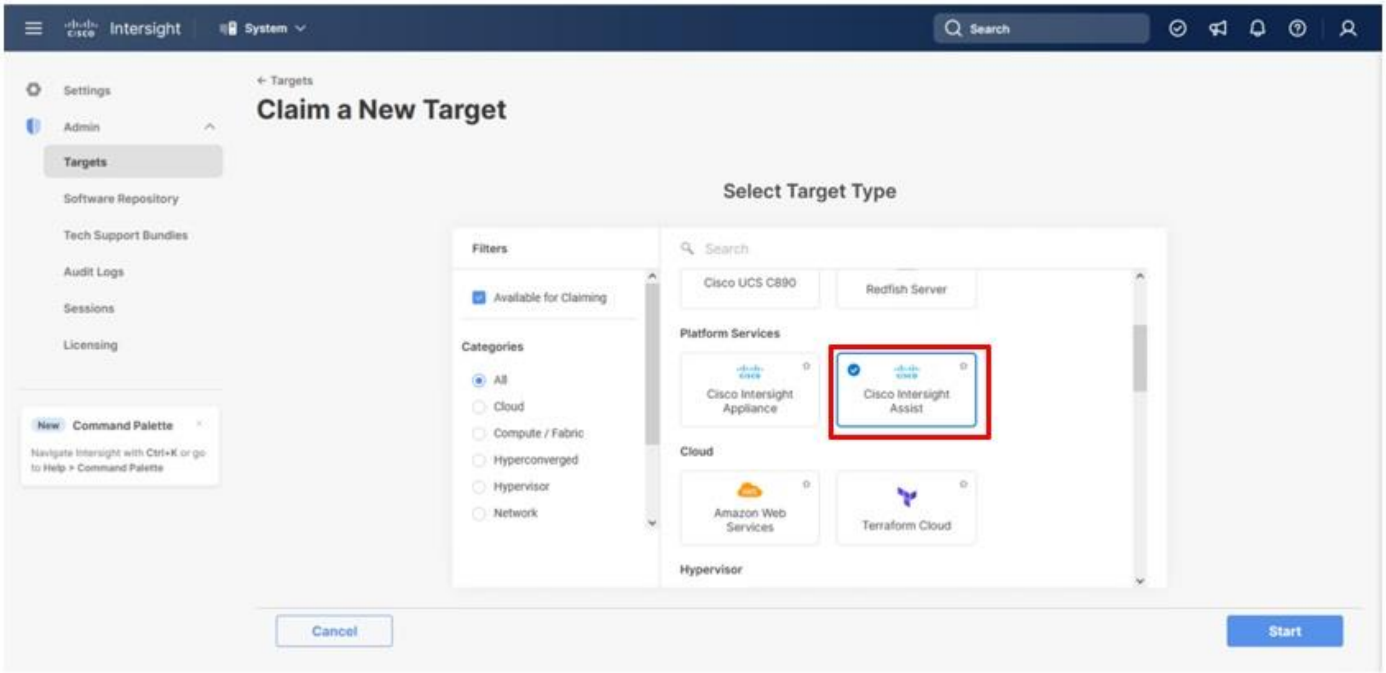
Claim Code
193FA81567B3

Not Claimed

Step 19. Log into **Cisco Intersight** and connect to the appropriate account.

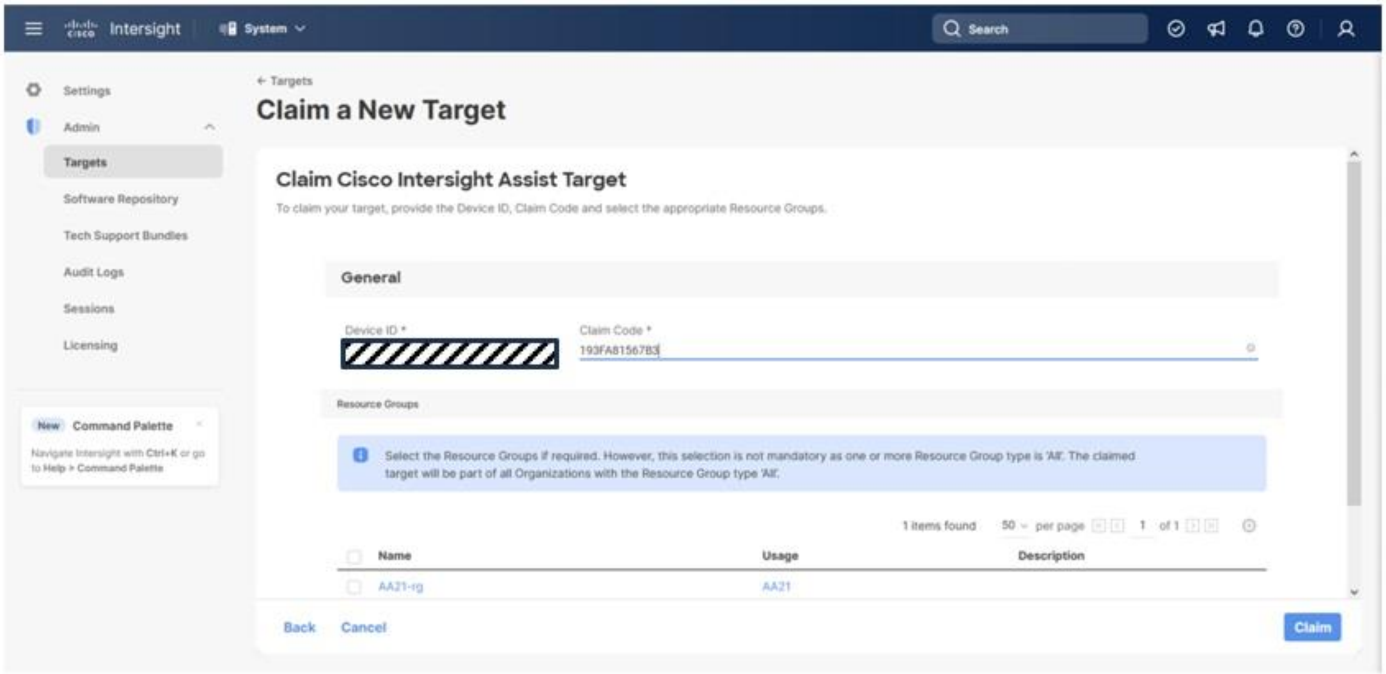
Step 20. From Cisco Intersight, at the top select **System**, then click **Administration > Targets**.

Step 21. Click **Claim a New Target.** Select Cisco Intersight Assist and click **Start**.



Step 22. Copy and paste the Device ID and Claim Code shown in the Intersight Assist web interface to the Cisco Intersight Device Claim window.

Step 23. Select the Resource Group and click **Claim**.



Navigate Intersight with Ctrl+K or go to Help > Command Palette

← Targets

Claim a New Target

Claim Cisco Intersight Assist Target

To claim your target, provide the Device ID, Claim Code and select the appropriate Resource Groups.

General

Device ID * [redacted]

Claim Code * 193FA81567B3

Resource Groups

Select the Resource Groups if required. However, this selection is not mandatory as one or more Resource Group type is 'All'. The claimed target will be part of all Organizations with the Resource Group type 'All'.

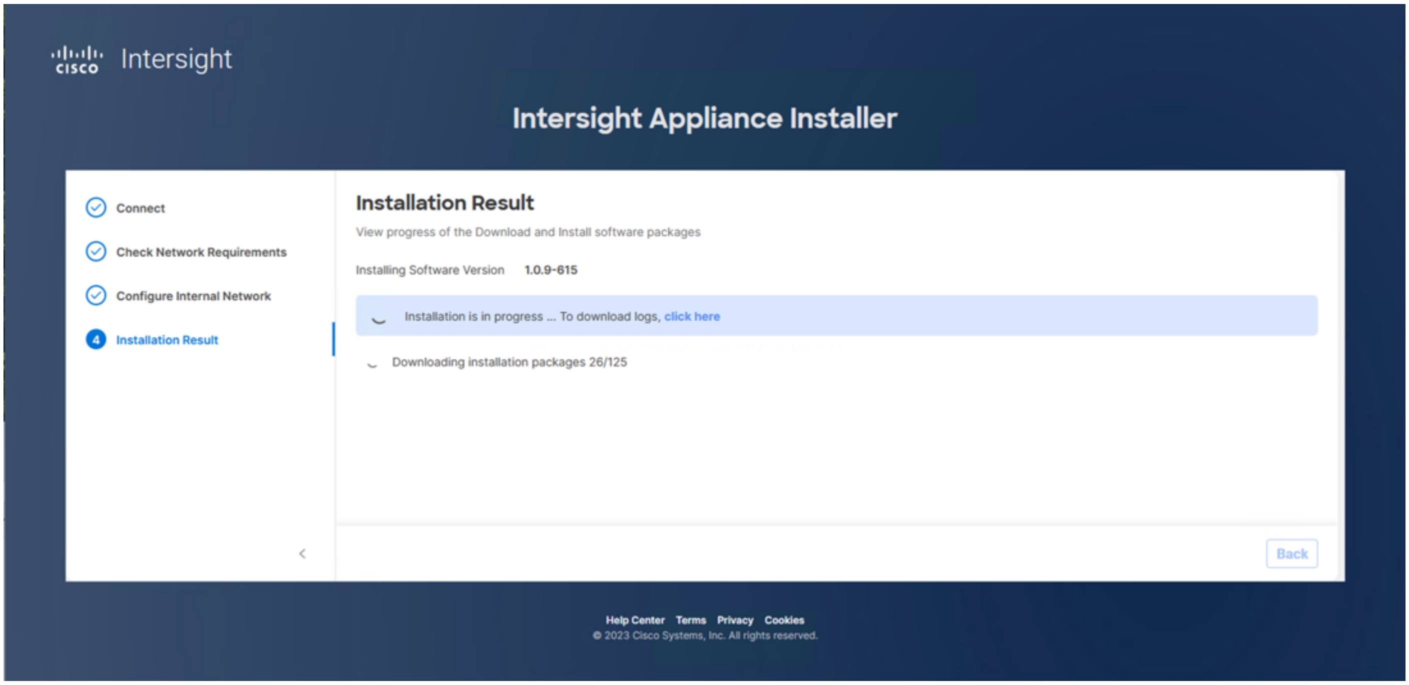
1 items found 50 per page 1 of 1

□	Name	Usage	Description
□	AA21-rg	AA21	

Intersight Assist now appears as a claimed device.

Step 24. In the Intersight Assist web interface, verify that Intersight Assist is Connected Successfully, and click **Continue**.

Step 25. Step through the additional network requirement checks and internal network configuration before starting the installation update.



Intersight
Intersight Appliance Installer
Connect
Check Network Requirements
Configure Internal Network
4 Installation Result
Back
Help Center Terms Privacy Cookies
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Installation Result

View progress of the Download and Install software packages

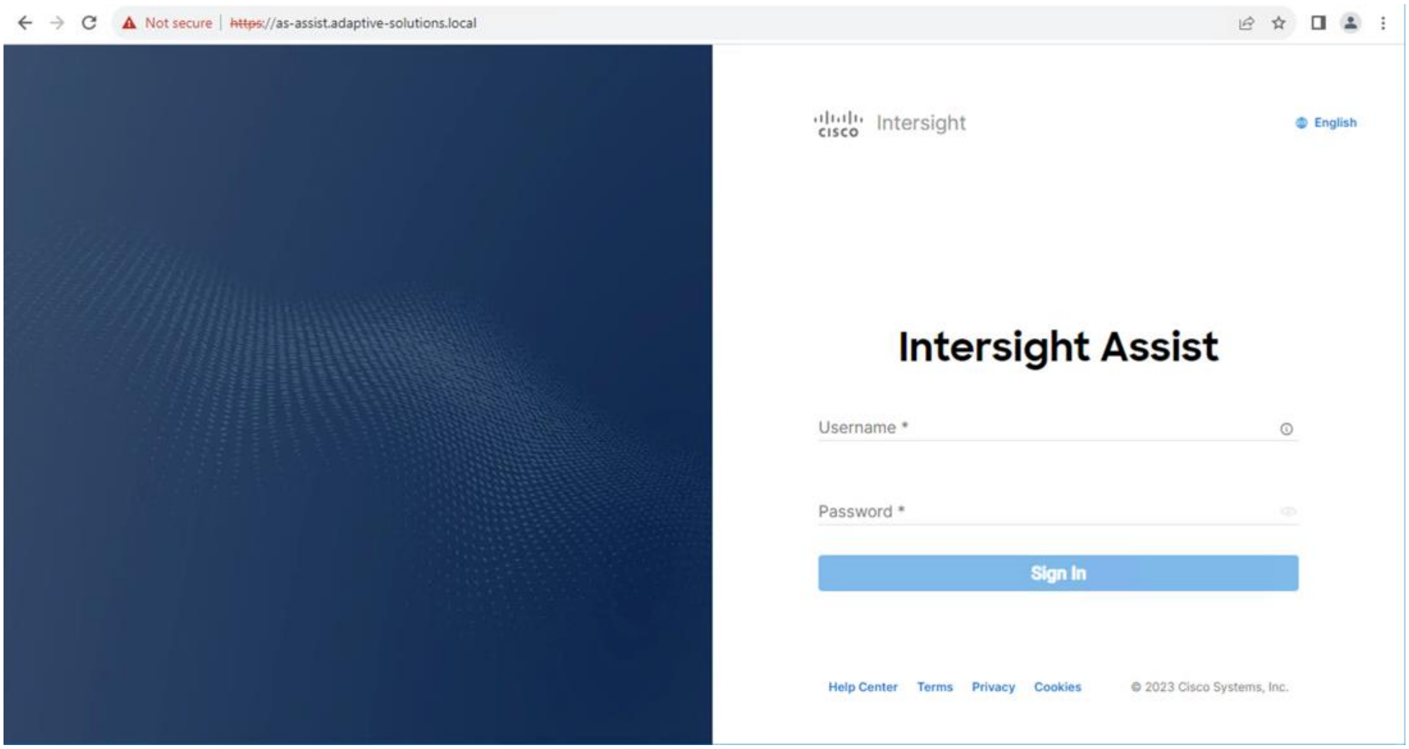
Installing Software Version 1.0.9-615

Installation is in progress ... To download logs, click here

Downloading installation packages 26/125

Note: The Cisco Intersight Assist software will now be downloaded and installed into the Intersight Assist VM. This can take up to an hour to complete and the Assist VM will be rebooted during this process. It may be necessary to refresh the web browser after the Assist VM has rebooted.

When the software download is complete, an Intersight Assist login screen appears.



Not secure | https://as-assist.adaptive-solutions.local
Intersight
English
Intersight Assist
Username *
Password *
Sign In
Help Center Terms Privacy Cookies
© 2023 Cisco Systems, Inc.

Claim VMware vCenter using Cisco Intersight Assist Appliance

Procedure 1. Claim the vCenter from Cisco Intersight

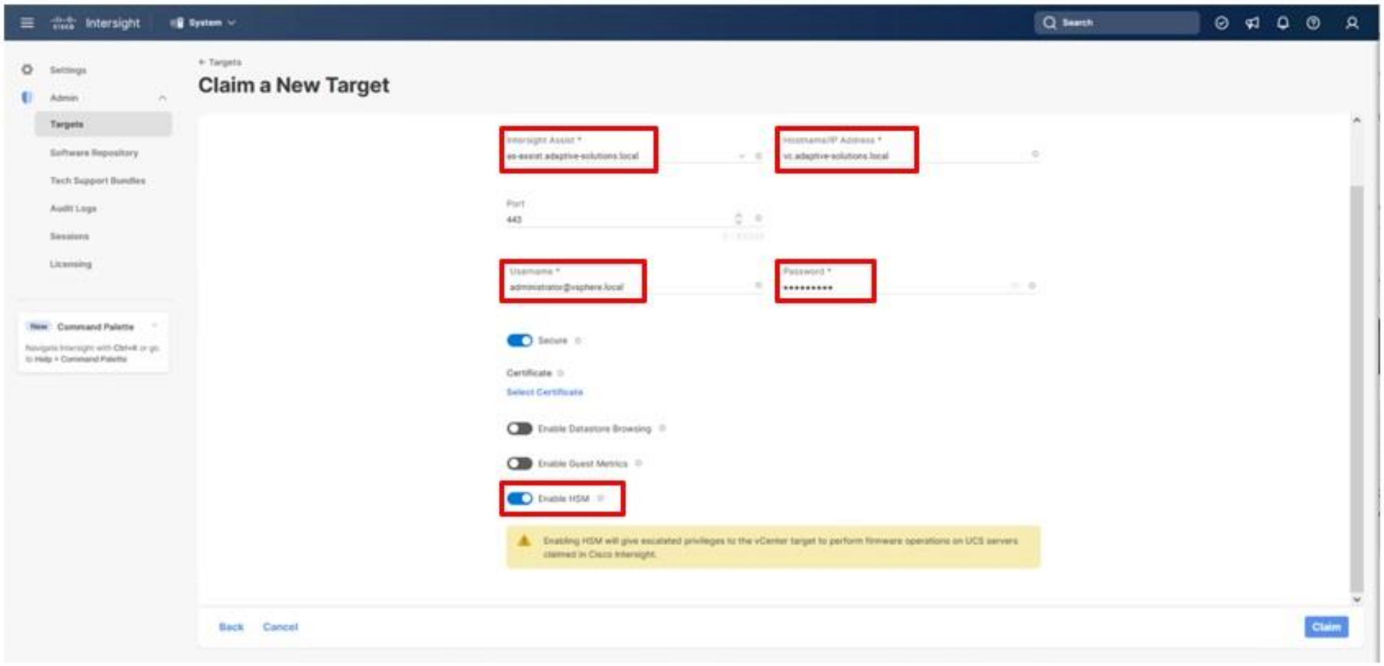
Step 1. Log into **Cisco Intersight** and connect to the account registered to the Intersight Assist.

Step 2. Go to **System** > **Administration** > **Targets** and click **Claim a New Target**.

Step 3. Under **Select Target Type**, select **VMware vCenter** under Hypervisor and click **Start**.

Step 4. In the **VMware vCenter** window, verify the correct Intersight Assist is selected.

Step 5. Fill in the vCenter information. Enable Hardware Support Manager (HSM) to be able to upgrade the IMM server firmware from VMware Lifecycle Manager. If Intersight Workflow Optimizer (IWO) will be used, turn on Datastore Browsing Enabled and Guest Metrics Enabled. Click **Claim**.



Claim a New Target

Intersight Assist * as-assist.adaptive-solutions.local

Hostname/IP Address * vc.adaptive-solutions.local

Port 443

Username * administrator@vsphere.local

Password * **********

Secure: on

Certificate: Select Certificate

Enable Datastore Browsing: off

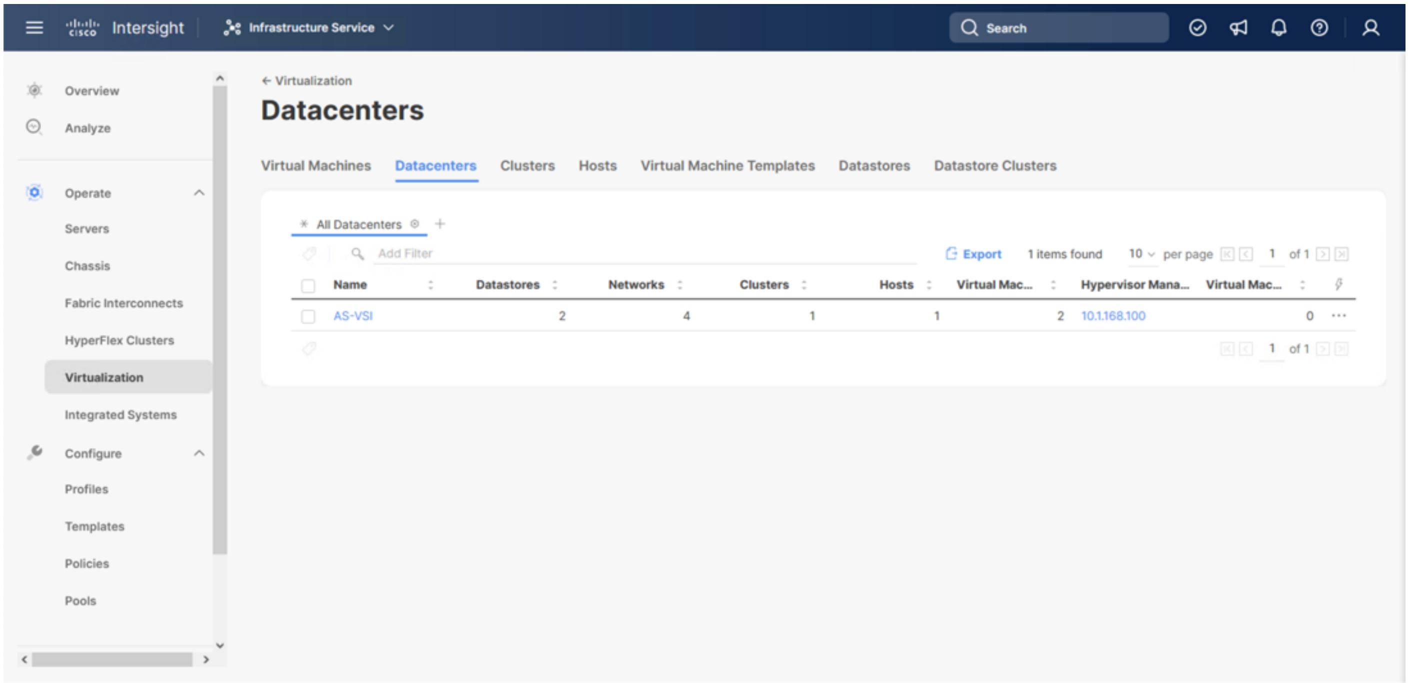
Enable Guest Metrics: off

Enable HSM: on

Enabling HSM will give escalated privileges to the vCenter target to perform firmware operations on UCS servers claimed in Cisco Intersight.

Step 6. After a few minutes, the VMware vCenter will show Connected in the Targets list and will also appear under **Infrastructure Service > Operate > Virtualization**.

Step 7. Detailed information obtained from the vCenter can now be viewed by clicking **Infrastructure Service > Operate > Virtualization** and selecting the Datacenters tab. Other VMware vCenter information can be obtained by navigating through the Virtualization tabs.



Datacenters

Name	Datastores	Networks	Clusters	Hosts	Virtual Mac...	Hypervisor Mana...	Virtual Mac...
AS-VSI	2	4	1	1	2	10.1.168.100	0

Procedure 2. Interact with Virtual Machines

VMware vCenter integration with Cisco Intersight allows you to directly interact with the virtual machines (VMs) from the Cisco Intersight dashboard. In addition to obtaining in-depth information about a VM, including the operating system, CPU, memory, host name, and IP addresses assigned to the virtual machines, you can use Cisco Intersight to perform the following actions on the virtual machines:

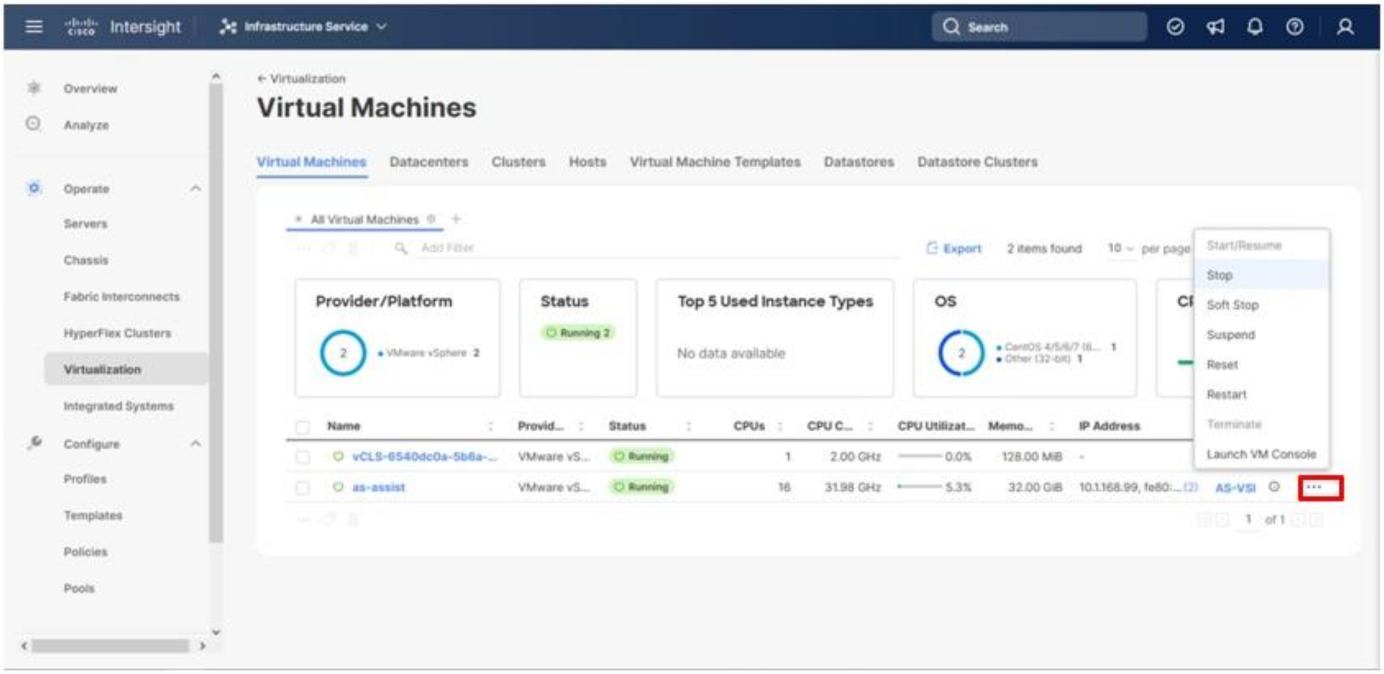
- Start/Resume
- Stop
- Soft Stop
- Suspend
- Reset
- Launch VM Console

Step 1. Log into **Cisco Intersight**.

Step 2. Go to **Infrastructure Service** > **Operate** > **Virtualization**.

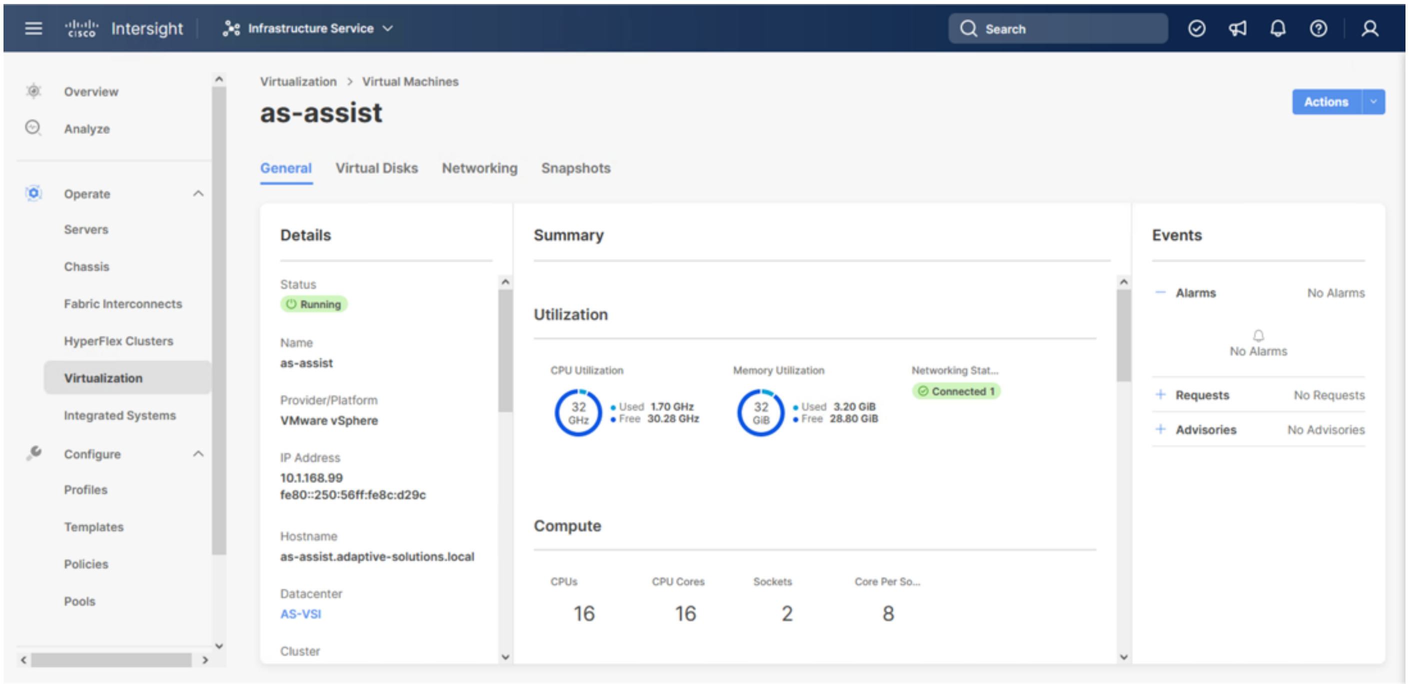
Step 3. Click the **Virtual Machines** tab.

Step 4. Click “**…**” to the right of a VM and interact with various VM options.



Name	Provid...	Status	CPUs	CPU C...	CPU Utilizat...	Memo...	IP Address		
vCLS-6540dc0a-5b6a-...	VMware vS...	Running	1	2.00 GHz	0.0%	128.00 MiB	-		
as-assist	VMware vS...	Running	16	31.98 GHz	5.3%	32.00 GiB	10.1.168.99, fe80:... (2)	AS-VSI	...

Step 5. To gather more information about a VM, click a VM name.



Status: Running

Name: as-assist

Provider/Platform: VMware vSphere

IP Address: 10.1.168.99 fe80::250:56ff:fe8c:d29c

Hostname: as-assist.adaptive-solutions.local

Datacenter: AS-VSI

Cluster

CPU Utilization: Used 1.70 GHz, Free 30.28 GHz

Memory Utilization: Used 3.20 GiB, Free 28.80 GiB

Networking Stat...: Connected 1

CPUs	CPU Cores	Sockets	Core Per So...
16	16	2	8

Alarms: No Alarms

No Alarms

Requests: No Requests

Advisories: No Advisories

Claim Cisco Nexus Switches using Cisco Intersight Assist Appliance

Procedure 1. Claim Cisco Nexus Switches (Optional)

Cisco Intersight can give direct visibility to Nexus switches independent of Cisco Nexus Dashboard Fabric Controller.

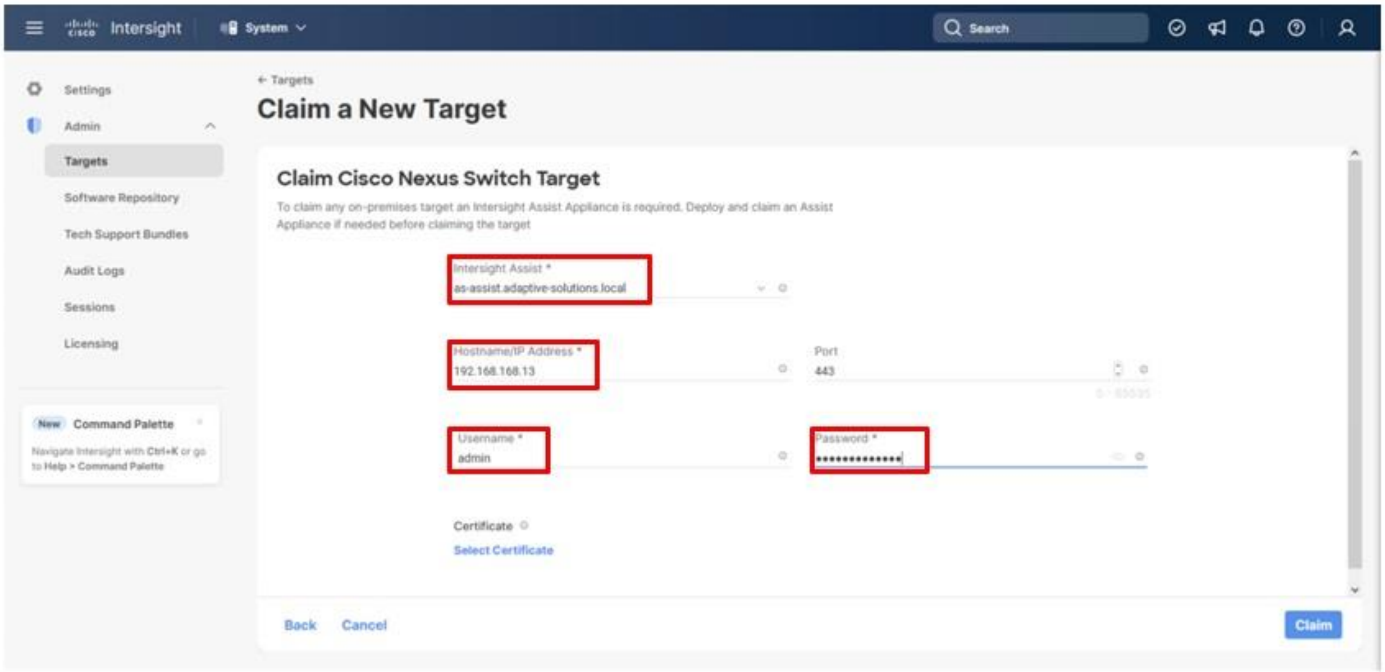
Step 1. Log into **Cisco Intersight**.

Step 2. Go to **System > Administration > Targets**.

Step 3. Click **Claim a New Target**. In the **Select Target Type** window, select Cisco Nexus Switch under Network and click **Start**.

Step 4. In the Claim Cisco Nexus Switch Target window, verify the correct Intersight Assist is selected.

Step 5. Fill in the Cisco Nexus Switch information and click **Claim**.



Claim a New Target

Claim Cisco Nexus Switch Target

To claim any on-premises target an Intersight Assist Appliance is required. Deploy and claim an Assist Appliance if needed before claiming the target

Intersight Assist *: as-assist.adaptive-solutions.local

Hostname/IP Address *: 192.168.168.13

Port: 443

Username *: admin

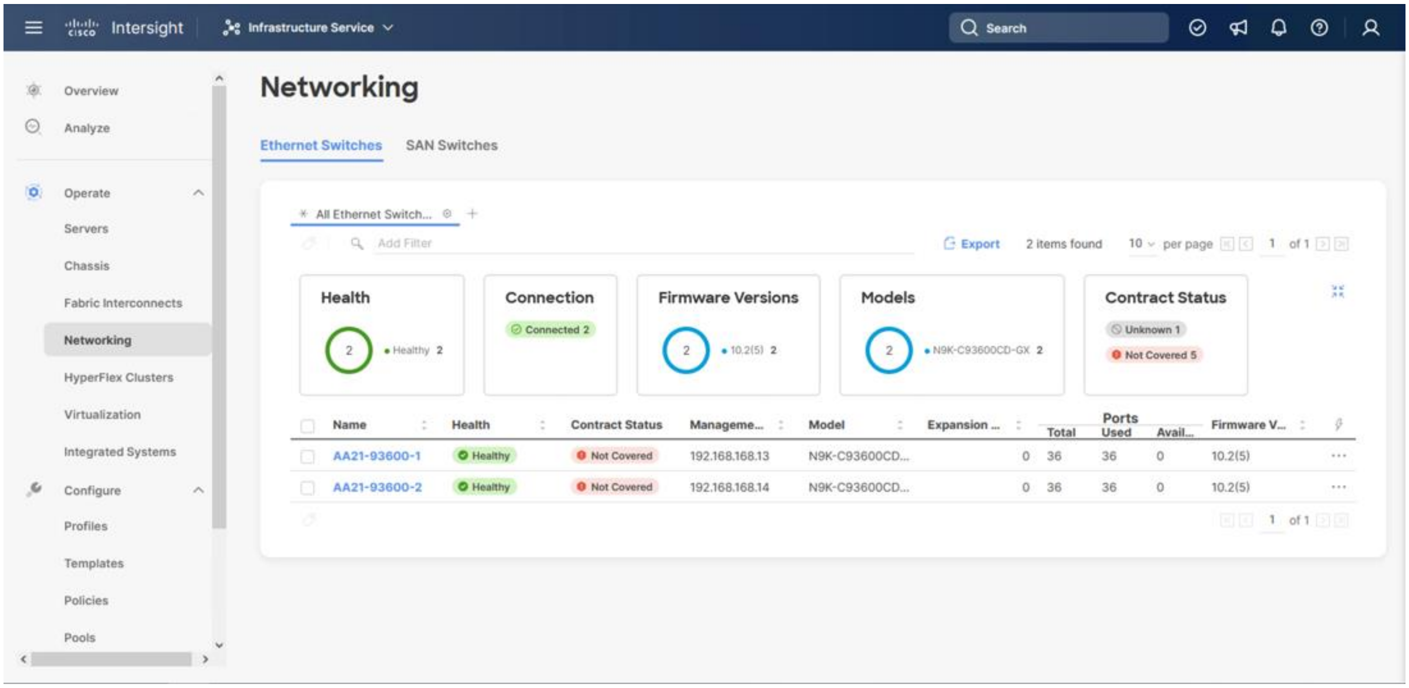
Password *: •••••••••••••

Certificate

Select Certificate

Step 6. Repeat **Step 1** through **Step 5** to add the second Cisco Nexus Switch.

Step 7. After a few minutes, the two switches will appear under Infrastructure Service > Operate > Networking > Ethernet Switches.



Name	Health	Contract Status	Manageme...	Model	Expansion ...	Ports			Firmware V...
						Total	Used	Avail...	
AA21-93600-1	Healthy	Not Covered	192.168.168.13	N9K-C93600CD...	0	36	36	0	10.2(5)
AA21-93600-2	Healthy	Not Covered	192.168.168.14	N9K-C93600CD...	0	36	36	0	10.2(5)

Step 8. Click one of the switch names to get detailed General and Inventory information on the switch.

Claim Cisco MDS Switches using Cisco Intersight Assist Appliance

Procedure 1. Claim Cisco MDS Switches (Optional)

Cisco Intersight can also give direct visibility to the MDS switches independent of Cisco Nexus Dashboard Fabric Controller. At the time of the writing of this document, adding the MDS as targets was still in Tech Preview, so care should be used in relying on received data for this feature in a production setting. To add the MDS switches, follow this procedure:

Step 1. Log in to **Cisco Intersight**.

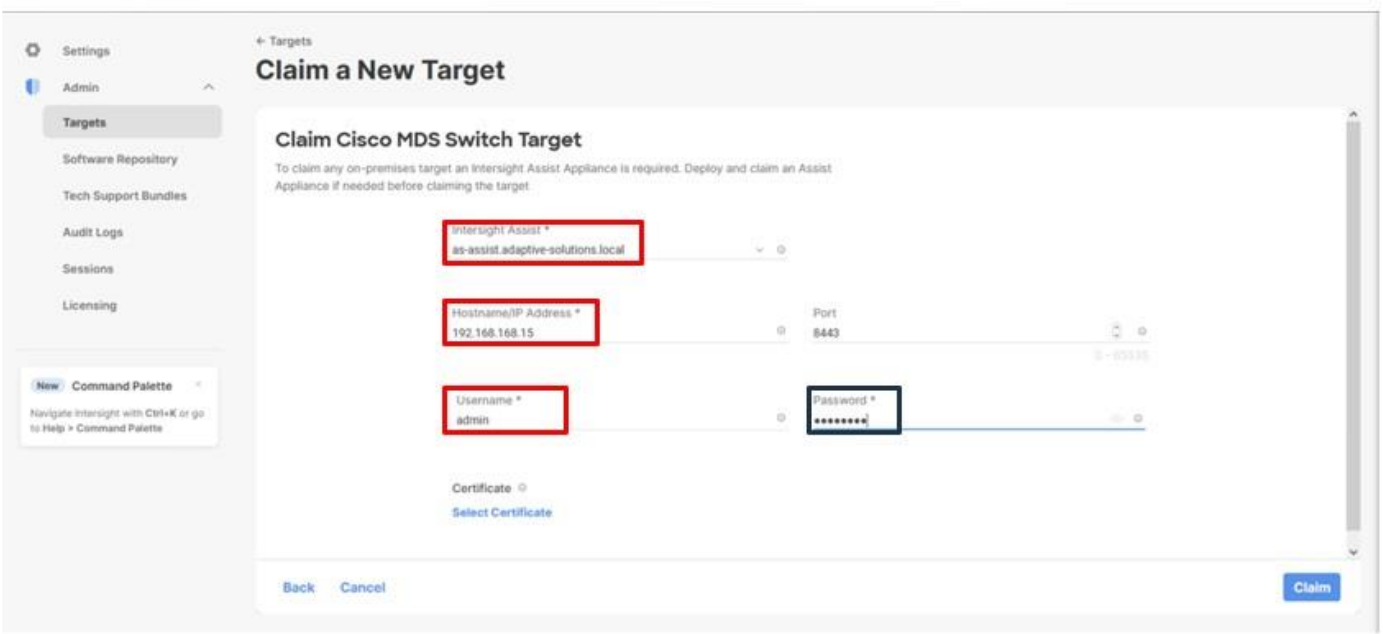
Step 2. Go to **System > Administration > Targets**.

Step 3. Click **Claim a New Target**. In the **Select Target Type** window, select Cisco MDS Switch under Network and click **Start**.

Step 4. In the **Claim Cisco MDS Switch Target** window, verify the correct Intersight Assist is selected.

Step 5. Fill in the Cisco MDS Switch information, including use of Port 8443 and click **Claim**.

Note: You can use the admin user login account on the switch.



Claim a New Target

Claim Cisco MDS Switch Target

To claim any on-premises target an Intersight Assist Appliance is required. Deploy and claim an Assist Appliance if needed before claiming the target

Intersight Assist *: as-assist.adaptive-solutions.local

Hostname/IP Address *: 192.168.168.15

Port: 8443

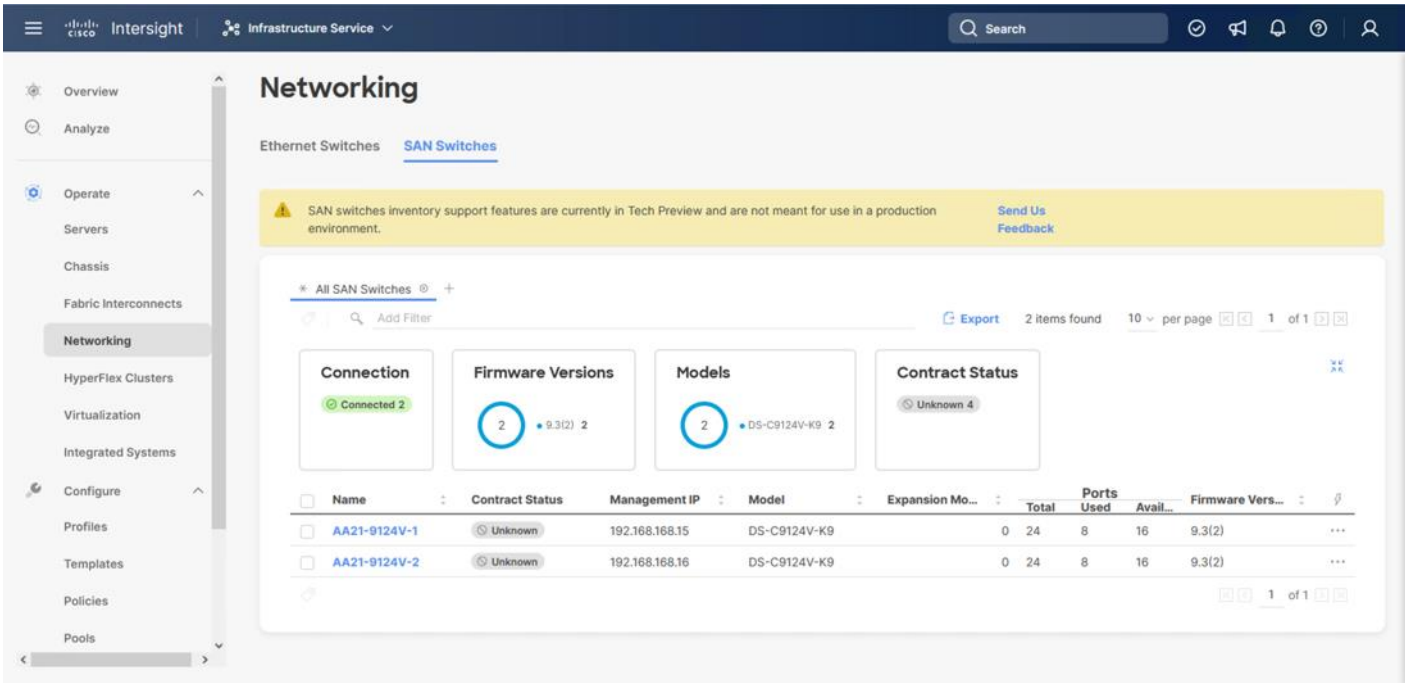
Username *: admin

Password *: ••••••••

Certificate

Step 6. Repeat **Step 1** through **Step 5** to add the second Cisco MDS Switch.

Step 7. After a few minutes, the two switches will appear under Infrastructure Service > Operate > Networking > SAN Switches.



Networking

SAN switches inventory support features are currently in Tech Preview and are not meant for use in a production environment.

2 items found · 10 per page · 1 of 1

Connection: Connected 2

Firmware Versions: 2 · 9.3(2) 2

Models: 2 · DS-C9124V-K9 2

Contract Status: Unknown 4

Name	Contract Status	Management IP	Model	Expansion Mo...	Ports Total	Ports Used	Ports Avail...	Firmware Vers...
AA21-9124V-1	Unknown	192.168.168.15	DS-C9124V-K9	0	24	8	16	9.3(2)
AA21-9124V-2	Unknown	192.168.168.16	DS-C9124V-K9	0	24	8	16	9.3(2)

Step 8. Click one of the switch names to get detailed General and Inventory information on the switch.

Claim Hitachi VSP with Cisco Intersight Appliance

Before onboarding the Hitachi VSP to Cisco Intersight, the prerequisites outlined in the following document need to be completed. Refer to the Integrating Hitachi Virtual Storage Platform with Cisco Intersight Quick Start Guide.

Begin State

- Hitachi virtual storage platform should be online and operational, but not claimed by Cisco Intersight.
- Intersight assist VM should be deployed using the Cisco provided OVA template.
- Hitachi Ops Center API Configuration Manager Rest should also be deployed as a VM or server, from a template or with manual installation, so that we can communicate between Cisco Intersight and Hitachi VSP storage. Hitachi Ops Center API Configuration Manager provides the Web API for getting information or changing the configuration of storage systems. Hitachi Ops Center API Configuration Manager is required to use Hitachi Virtual Storage Platform storage systems with Cisco Intersight.
- Communication between Hitachi Ops Center API Configuration Manager and the REST API client.

End State

- Cisco Intersight is communicating with Intersight assist.
- Hitachi VSP is onboarded via Hitachi Ops Center API configuration manager Rest.
- Hitachi VSP is claimed as a device with Cisco Intersight.

Procedure 1. Register Hitachi Virtual Storage Platform to Ops Center Configuration Manager Server

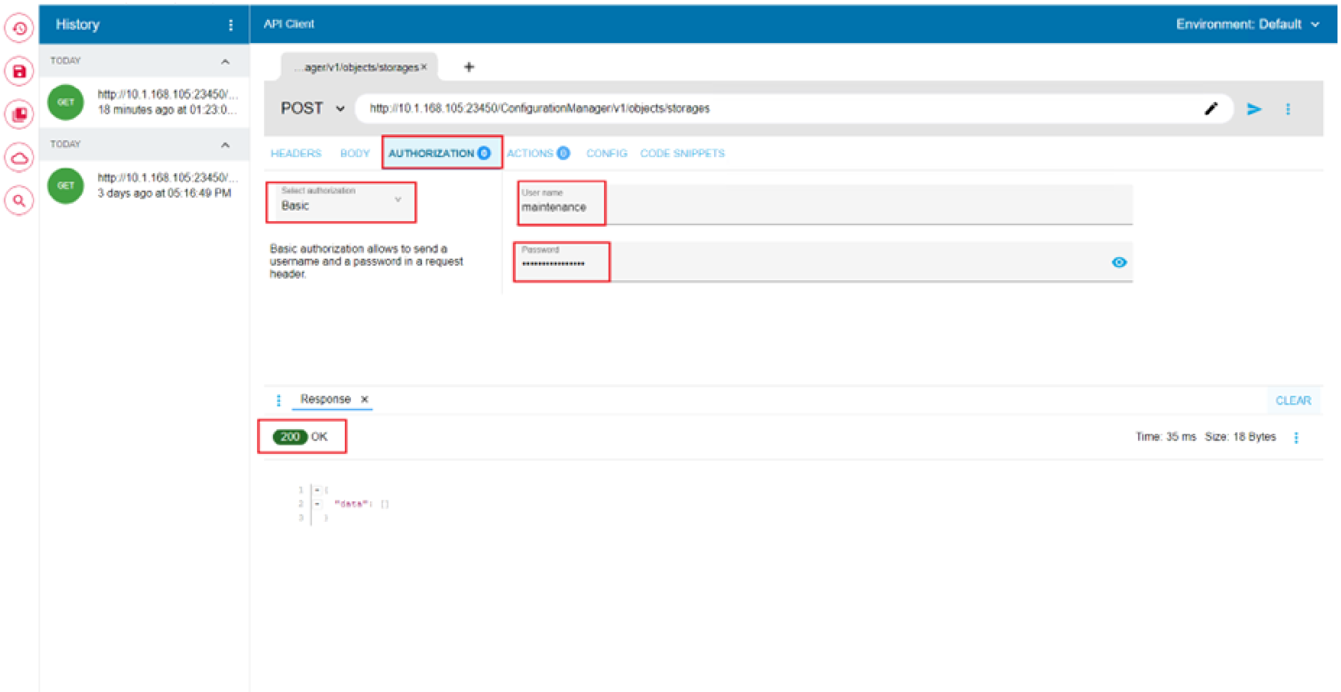
Step 1. Open your respective API client.

Step 2. Enter the base URL for the deployed Hitachi Ops Center API Configuration Manager IP address. For example, https://[Ops_Center_IP]:23450/ConfigurationManager/v1/objects/storages.

Step 3. Click the **Authorization** tab.

a. Select **Basic** from the **Select authorization** drop-down list.

b. Enter the **Username** and **Password** for the VSP storage system.



http://10.1.168.105:23450/... 18 minutes ago at 01:23:0...

http://10.1.168.105:23450/... 3 days ago at 05:16:49 PM

POST http://10.1.168.105:23450/ConfigurationManager/v1/objects/storages

Select authorization: Basic

Basic authorization allows to send a username and a password in a request header.

User name: maintenance

Password: ••••••••••••••••

200 OK

Time: 35 ms Size: 18 Bytes

```
{
  "data": []
}
```

Step 4. Click the **Body** tab. Enter the VSP storage SVP IP, Serial Number, and Model as indicated in the following examples in JSON format.

Note: If a midrange VSP storage, it will be CTL1 and CTL2 IP instead of SVP IP.

The following example uses a VSP 5600:

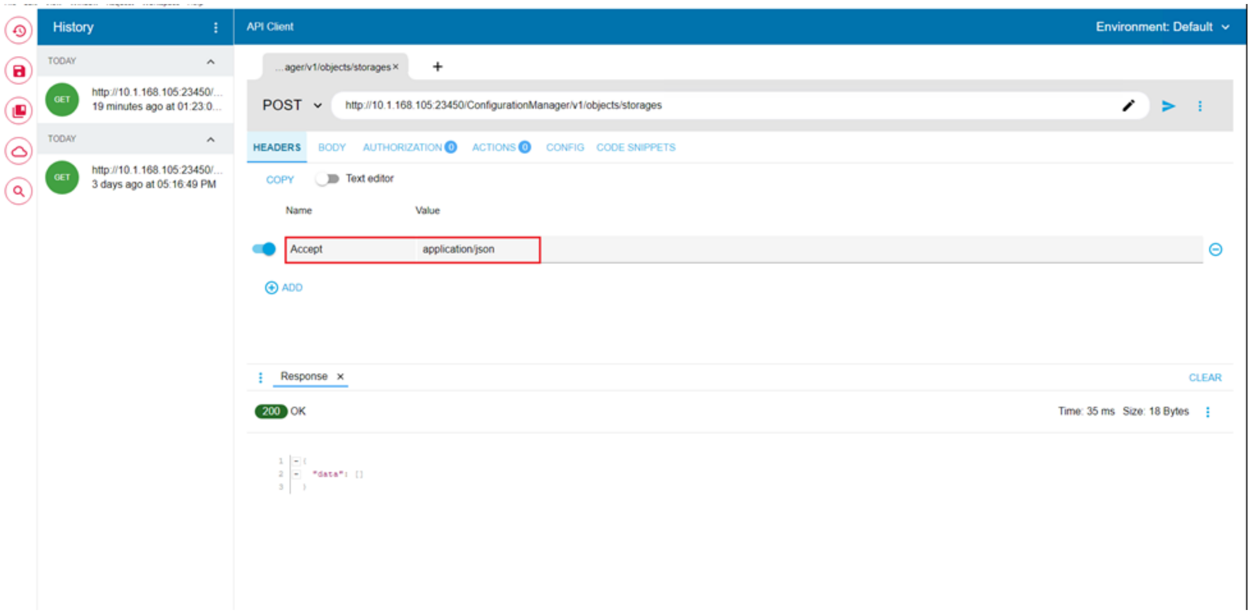
```
{
"svpIp": "192.168.1.10",
"serialNumber": 60749,
"model": "VSP 5600"
}
```

The following example uses a VSP E1090:

```
{ "ctl1Ip": "192.168.1.10",
"ctl2Ip": "192.168.1.11",
"model": "VSP E1090",
"serialNumber": 451139 }
```

Step 5. Under the HEADERS tab verify the following:

a. Accept: application/json


History
TODAY
GET
http://10.1.168.105:23450/...
19 minutes ago at 01:23:0...
TODAY
GET
http://10.1.168.105:23450/...
3 days ago at 05:16:49 PM
API Client
Environment: Default
...ager/v1/objects/storages
HEADERS
BODY
AUTHORIZATION 0
ACTIONS 0
CONFIG
CODE SNIPPETS
COPY
Text editor
ADD
Response
CLEAR

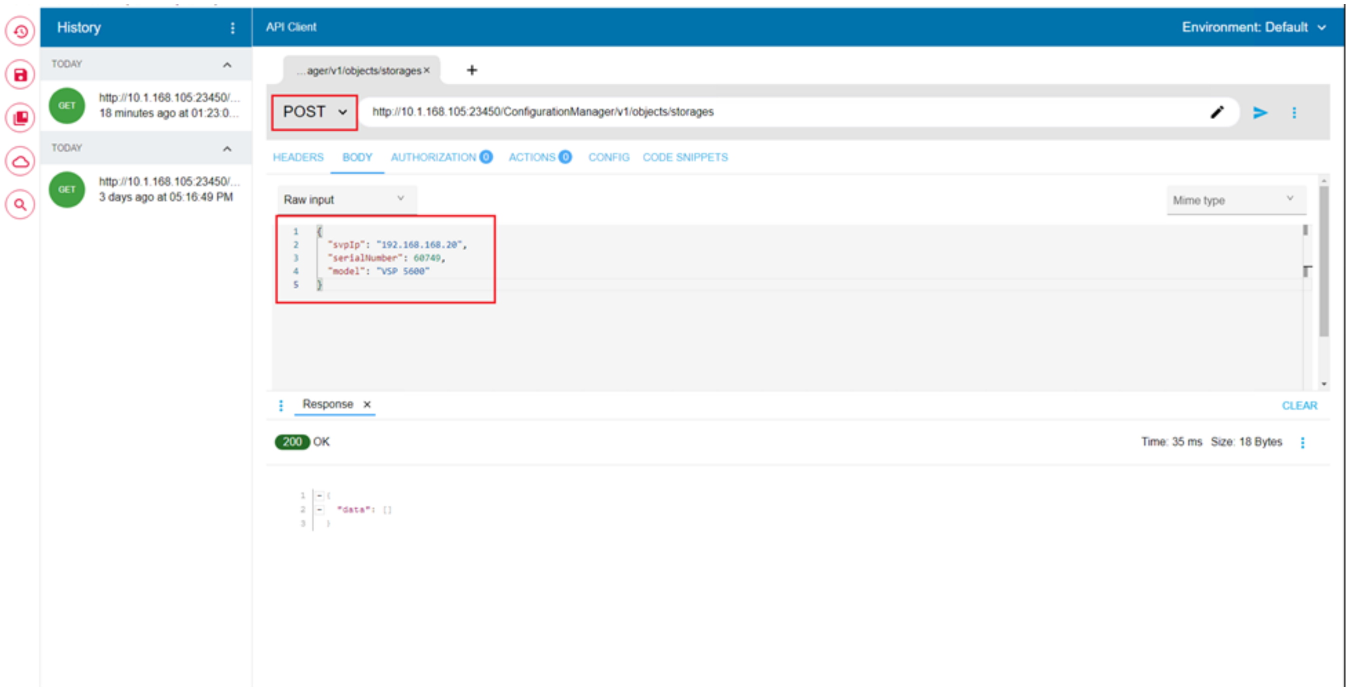
POST http://10.1.168.105:23450/ConfigurationManager/v1/objects/storages

Name	Value
Accept	application/json

200 OK — Time: 35 ms Size: 18 Bytes

```
{
  "data": []
}
```

Step 6. Verify that the REST call is set to **POST**. Click **Submit**.


History
TODAY
GET
http://10.1.168.105:23450/...
18 minutes ago at 01:23:0...
TODAY
GET
http://10.1.168.105:23450/...
3 days ago at 05:16:49 PM
API Client
Environment: Default
...ager/v1/objects/storages
HEADERS
BODY
AUTHORIZATION 0
ACTIONS 0
CONFIG
CODE SNIPPETS
Mime type
Response
CLEAR

POST http://10.1.168.105:23450/ConfigurationManager/v1/objects/storages

Raw input

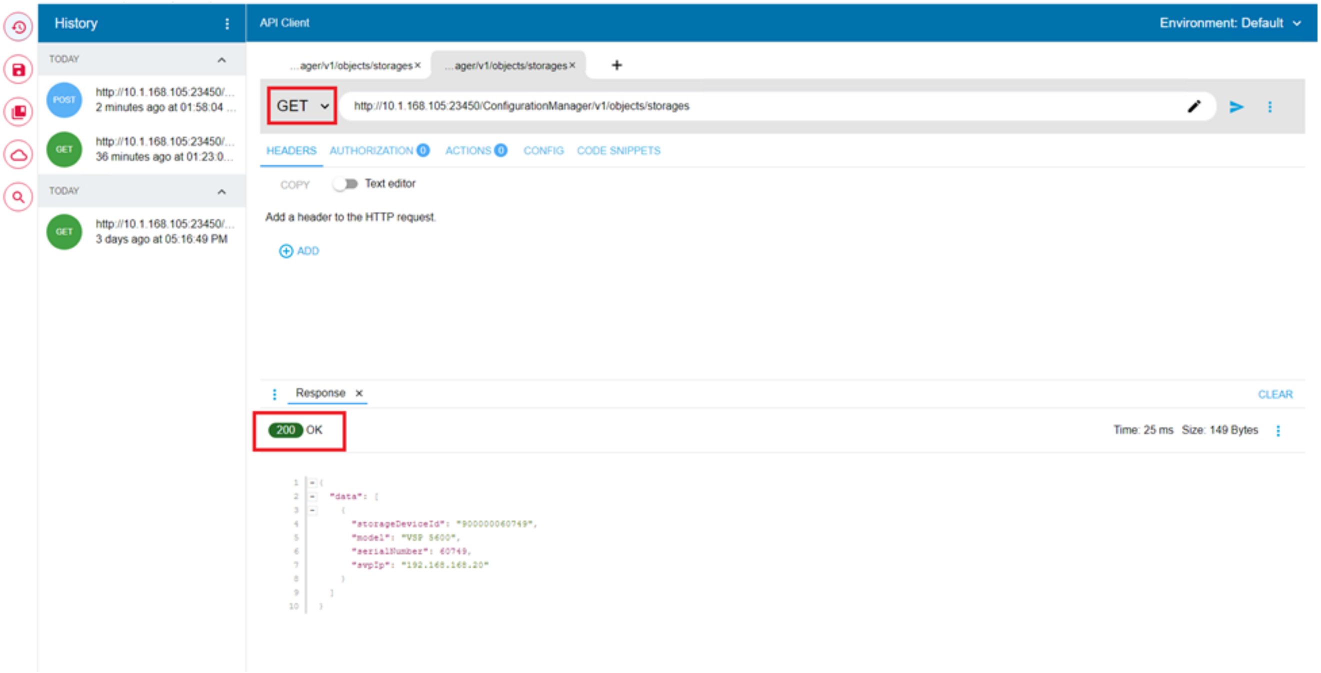
```
{
  "svpIp": "192.168.168.20",
  "serialNumber": 60749,
  "model": "VSP 5600"
}
```

200 OK — Time: 35 ms Size: 18 Bytes

```
{
  "data": []
}
```

Step 7. After successful registration, a response header is displayed as **200 OK**.

Step 8. To confirm onboarding, the API parameter can be updated to the **GET** method to retrieve storage system information and can be verified with **200 OK** status.



History
TODAY
POST http://10.1.168.105:23450/...
2 minutes ago at 01:58:04 ...
GET http://10.1.168.105:23450/...
36 minutes ago at 01:23:0...
TODAY
GET http://10.1.168.105:23450/...
3 days ago at 05:16:49 PM
API Client
Environment: Default
...ager/v1/objects/storages ×
...ager/v1/objects/storages ×
HEADERS
AUTHORIZATION 0
ACTIONS 0
CONFIG
CODE SNIPPETS
COPY
Text editor
Add a header to the HTTP request.
ADD
Response ×
CLEAR
Time: 25 ms Size: 149 Bytes

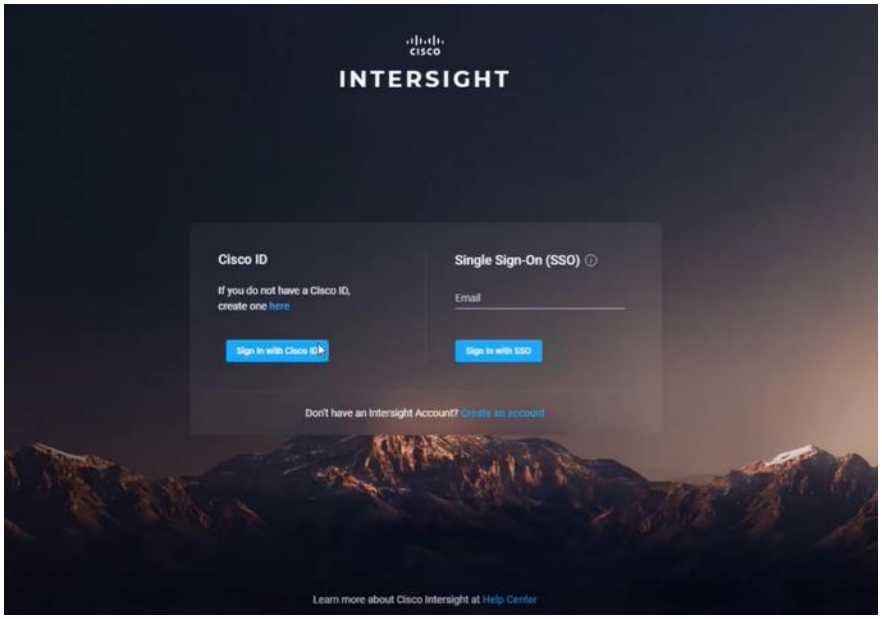
GET http://10.1.168.105:23450/ConfigurationManager/v1/objects/storages

200 OK

```
{
  "data": [
    {
      "storageDeviceId": "900000060749",
      "model": "VSP 5600",
      "serialNumber": 60749,
      "svpIp": "192.168.168.20"
    }
  ]
}
```

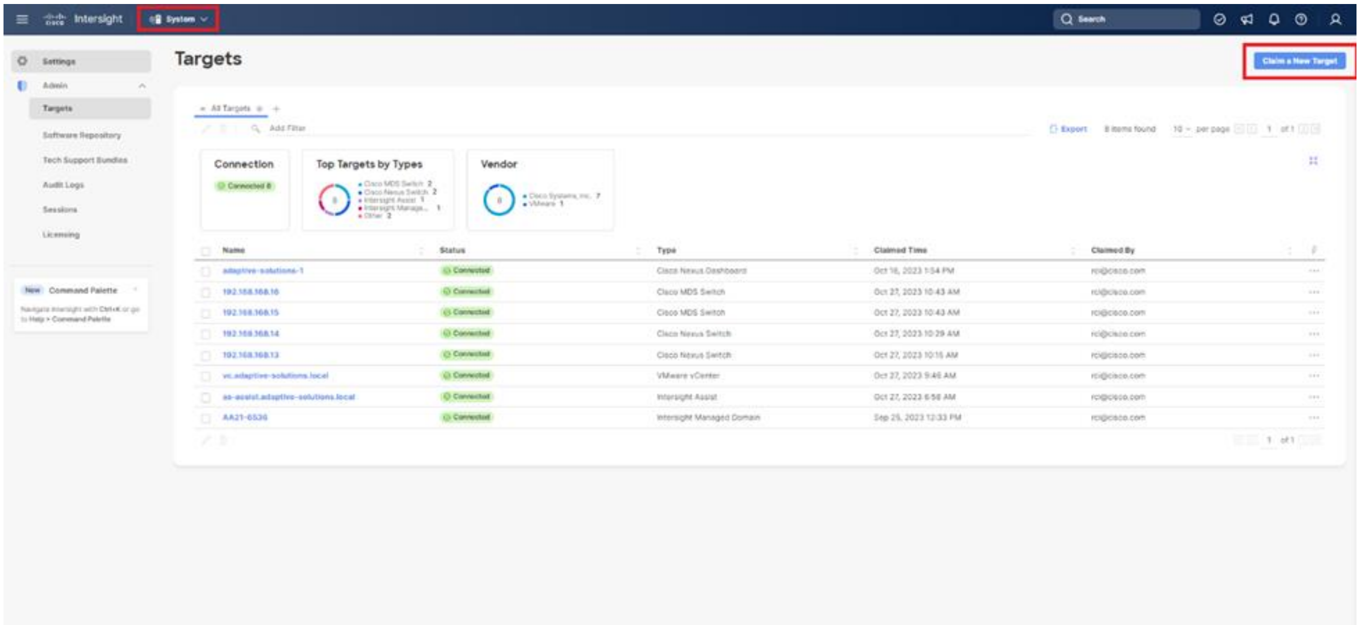
Procedure 2. Onboarding VSP storage to Cisco Intersight via Hitachi Ops Center API Configuration Manager

Step 1. Log in to **Cisco Intersight**.



INTERSIGHT
Cisco ID
If you do not have a Cisco ID, create one here
Sign In with Cisco ID
Single Sign-On (SSO)
Email
Sign In with SSO
Don't have an Intersight Account? Create an account
Learn more about Cisco Intersight at Help Center

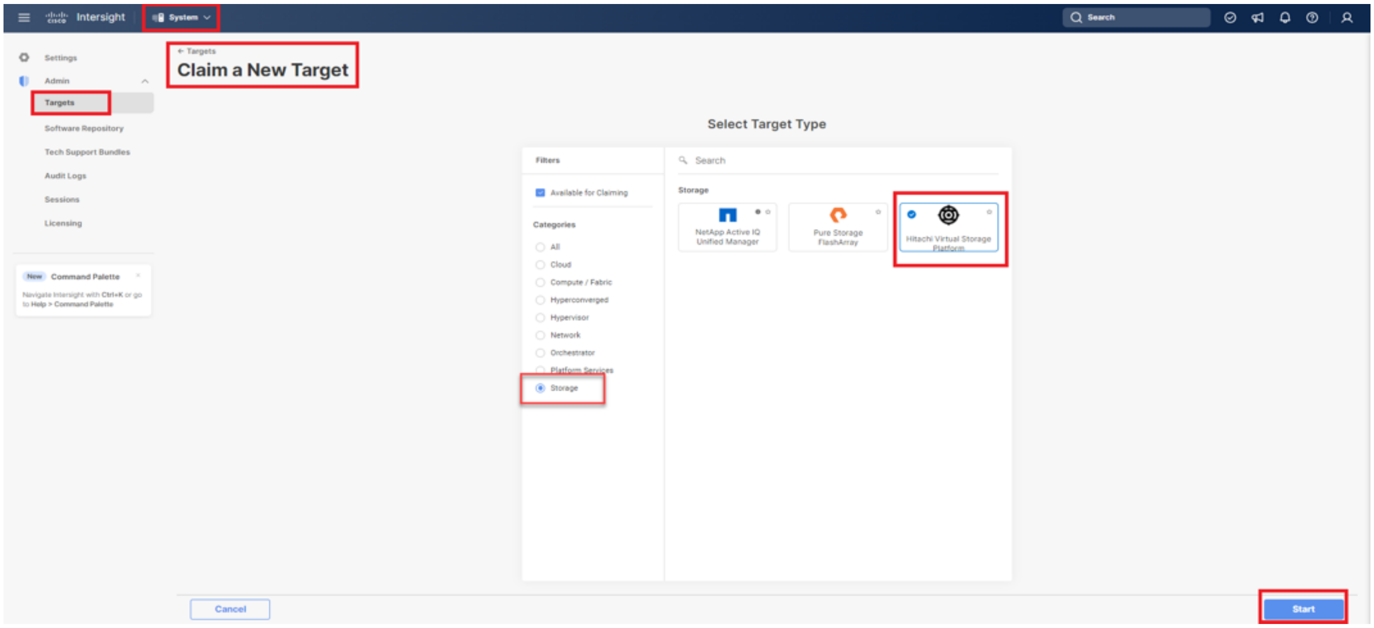
Step 2. From the Navigation tree, select the **Targets** and click to **Claim a new Target**.



Name	Status	Type	Claimed Time	Claimed By
adaptive-solutions-1	Connected	Cisco Nexus Dashboard	Oct 16, 2023 1:54 PM	rci@cisco.com
192.168.168.16	Connected	Cisco MDS Switch	Oct 27, 2023 10:43 AM	rci@cisco.com
192.168.168.15	Connected	Cisco MDS Switch	Oct 27, 2023 10:43 AM	rci@cisco.com
192.168.168.14	Connected	Cisco Nexus Switch	Oct 27, 2023 10:29 AM	rci@cisco.com
192.168.168.13	Connected	Cisco Nexus Switch	Oct 27, 2023 10:15 AM	rci@cisco.com
vc.adaptive-solutions.local	Connected	VMware vCenter	Oct 27, 2023 9:46 AM	rci@cisco.com
as-assist.adaptive-solutions.local	Connected	Intersight Assist	Oct 27, 2023 6:58 AM	rci@cisco.com
AA21-6536	Connected	Intersight Managed Domain	Sep 25, 2023 12:33 PM	rci@cisco.com

Step 3. Select categories list, select Storage as **Target Type,** and select **Hitachi Virtual Storage Platform.**

Step 4. Click **Start.**



Step 5. To claim Hitachi Virtual Storage Platform Target, Enter the following:

a. From the **Intersight Assist list,** select the deployed Intersight Assist Virtual Appliance **hostname/IP address.**

b. In the Port field, enter **23451.**

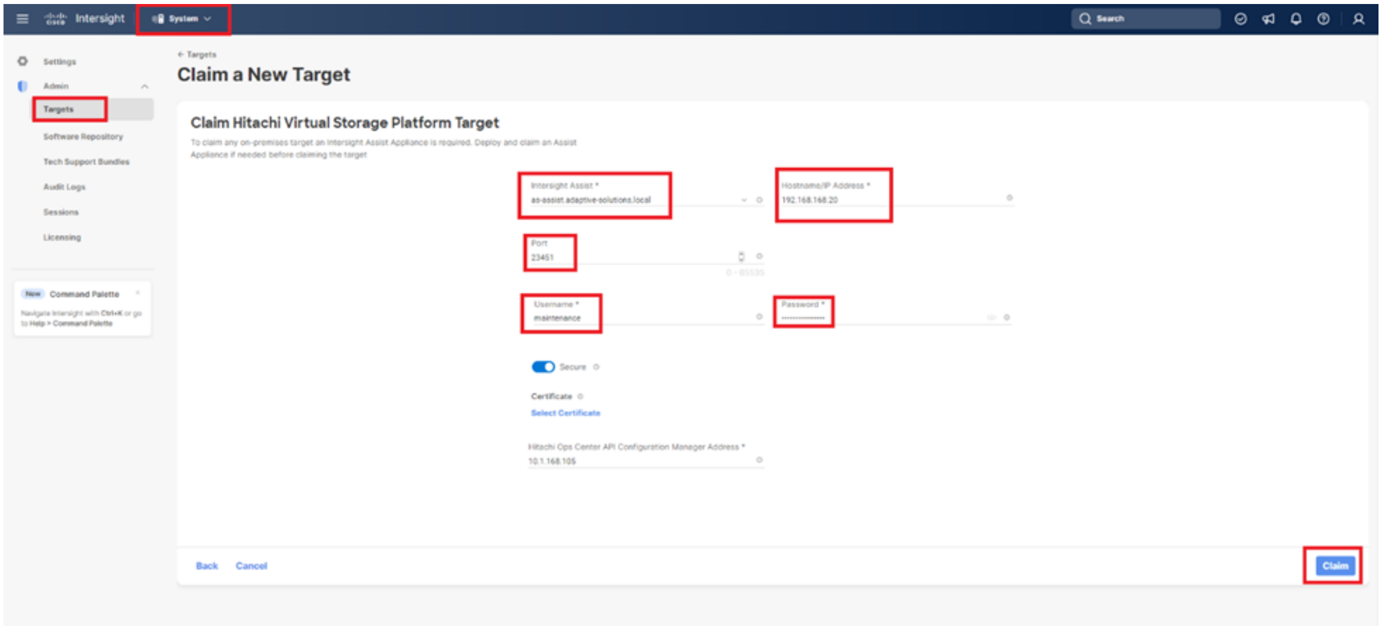
c. In the Username field enter the **VSP storage system username.**

d. In the Password field enter the **VSP storage system password.**

e. Enable the Secure option.

f. In the Hitachi Ops Center API Configuration Manager Address field, enter the **API Configuration Manager IP address** that has the registered **VSP storage system.**

Step 6. Click Claim.



Claim a New Target

Claim Hitachi Virtual Storage Platform Target

To claim any on-premises target an Intersight Assist Appliance is required. Deploy and claim an Assist Appliance if needed before claiming the target

Intersight Assist *: as-assist.adaptive-solutions.local

Hostname/IP Address *: 192.168.168.20

Port: 23451 (0 - 65535)

Username *: maintenance

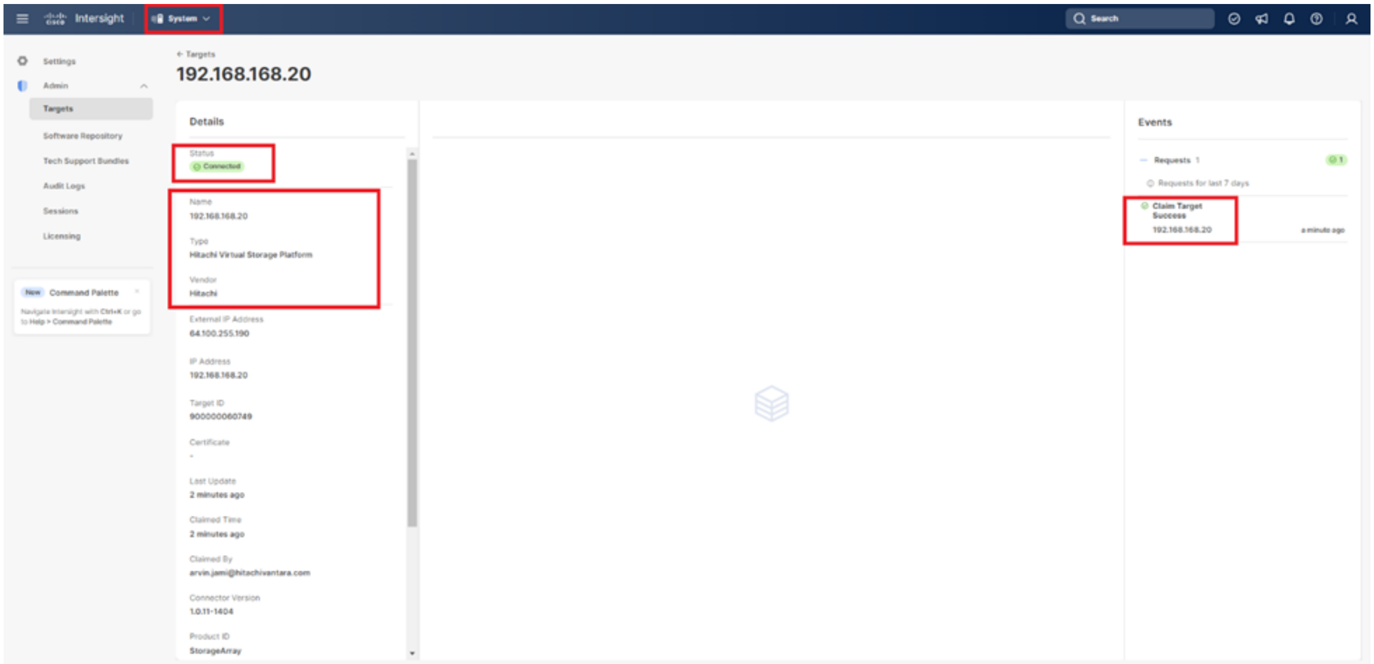
Password *: ••••••••••••••

Secure

Certificate: Select Certificate

Hitachi Ops Center API Configuration Manager Address *: 10.1.168.105

Step 7. Under **Systems** click **Targets** and **All Targets** to view newly connected Hitachi VSP storage with device type as **Hitachi Virtual Storage Platform.**



192.168.168.20

Details

Status: Connected

Name: 192.168.168.20

Type: Hitachi Virtual Storage Platform

Vendor: Hitachi

External IP Address: 64.100.255.190

IP Address: 192.168.168.20

Target ID: 900000060749

Certificate: -

Last Update: 2 minutes ago

Claimed Time: 2 minutes ago

Claimed By: arvin.jami@hitachivantara.com

Connector Version: 1.0.11-1404

Product ID: StorageArray

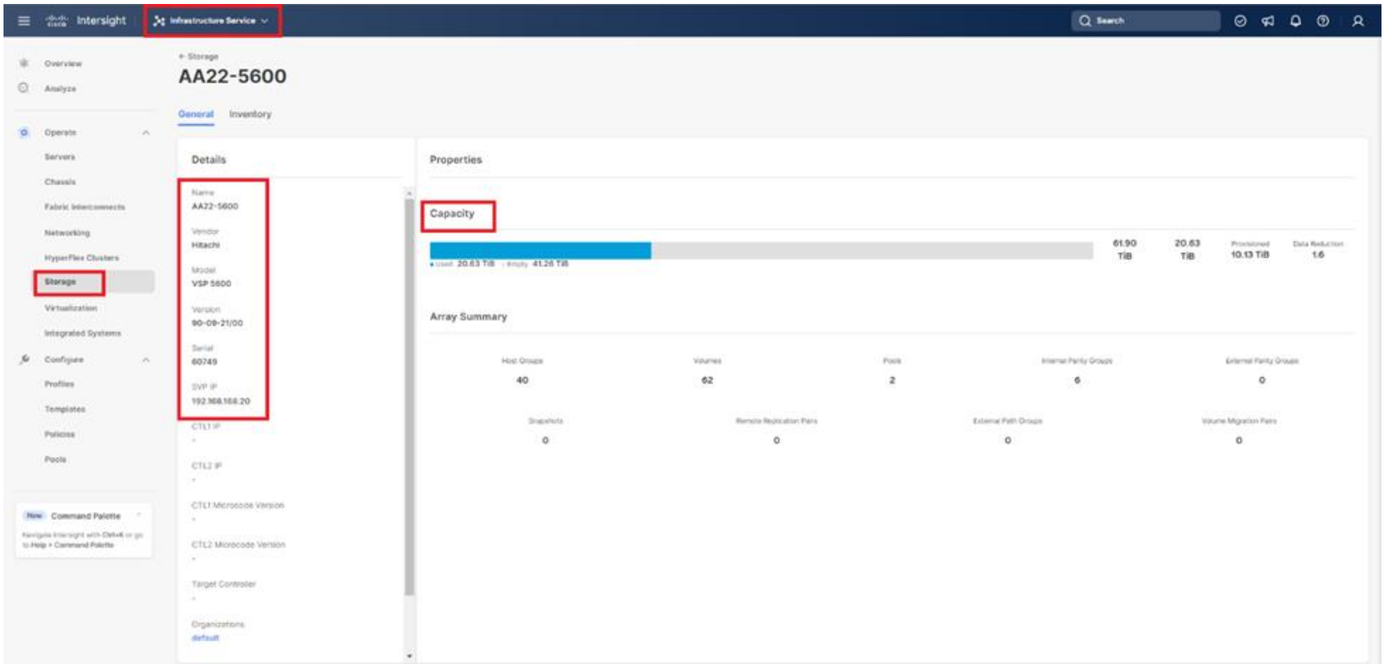
Events

Requests 1 — 1

Requests for last 7 days

Claim Target Success — 192.168.168.20 — a minute ago

Step 8. The properties of added VSP storage systems can be found under **Infrastructure Service > Storage**.



AA22-5600

Details

Name
AA22-5600

Vendor
Hitachi

Model
VSP 5600

Version
90-09-21/00

Serial
60749

SVP IP
192.168.168.20

CTL1 IP
-

CTL2 IP
-

CTL1 Microcode Version
-

CTL2 Microcode Version
-

Target Controller
-

Organizations
default

Properties

Capacity

Used 20.63 TiB · Empty 41.26 TiB

61.90 TiB	20.63 TiB	Provisioned	Data Reduction
		10.13 TiB	1.6

Array Summary

Host Groups	Volumes	Pools	Internal Parity Groups	External Parity Groups
40	62	2	6	0

Snapshots	Remote Replication Pairs	External Path Groups	Volume Migration Pairs
0	0	0	0

Cisco Nexus Dashboard Fabric Controller

Cisco Nexus Dashboard Fabric Controller, (NDFC formerly DCNM-SAN) can be used to monitor, configure, and analyze Cisco Fibre Channel fabrics using NDFC SAN. Cisco NDFC is deployed as an application from within the Cisco Nexus Dashboard that is installed as a virtual appliance from an OVA and is managed through a web browser. Nexus Dashboard Insights can be added to provide extended visibility into your fabric by allowing you to monitor, analyze, identify, and troubleshoot performance issues.

The installation and configuration of Nexus Dashboard can be accomplished by following the instructions within this deployment guide: https://www.cisco.com/c/en/us/td/docs/dcn/nd/2x/deployment/cisco-nexus-dashboard-deployment-guide-231.html

A single node is sufficient for NDFC, but a multi-node placement of Nexus Dashboard will be required to use Nexus Dashboard Insights. With the Nexus Dashboard installed, fabric connectivity for managed switches will need to be established as covered in this guide: https://www.cisco.com/c/en/us/td/docs/dcn/nd/2x/user-guide-23/cisco-nexus-dashboard-user-guide-231.html

Prerequisites

The following prerequisites need to be configured:

1. Licensing. Cisco NDFC includes a 60-day server-based trial license that can be used to monitor and configure Cisco MDS Fibre Channel switches and monitor Cisco Nexus switches. NDFC and Nexus Dashboard Insights can be enabled with any tier level of switch based licensing of DCN as covered in this document: https://www.cisco.com/c/en/us/products/collateral/data-center-analytics/nexus-dashboard/guide-c07-744361.html?ccid=cc001903&oid=giddnc023703

2. If SAN Analytics will be implemented, the deployment of the Nexus Dashboard should select the Data option as opposed the App option during the OVF deployment.

3. Passwords. Cisco NDFC passwords should adhere to the following password requirements:

   - It must be at least eight characters long and contain at least one alphabet and one numeral.
   - It can contain a combination of alphabets, numerals, and special characters.
   - Do not use any of these special characters in the NDFC password for all platforms: <SPACE> " & $ % ' ^ = < > ; : ` \ | / , .*

4. NDFC SNMPv3 user on switches. Each switch (both Cisco MDS and Nexus) needs an SNMPv3 user added for NDFC to use to query and configure the switch. On each switch, enter the following command in configure terminal mode (in the example, the userid is snmpadmin):

```
snmp-server user snmpadmin network-admin auth sha <password> priv aes-128 <privacy-password>
```

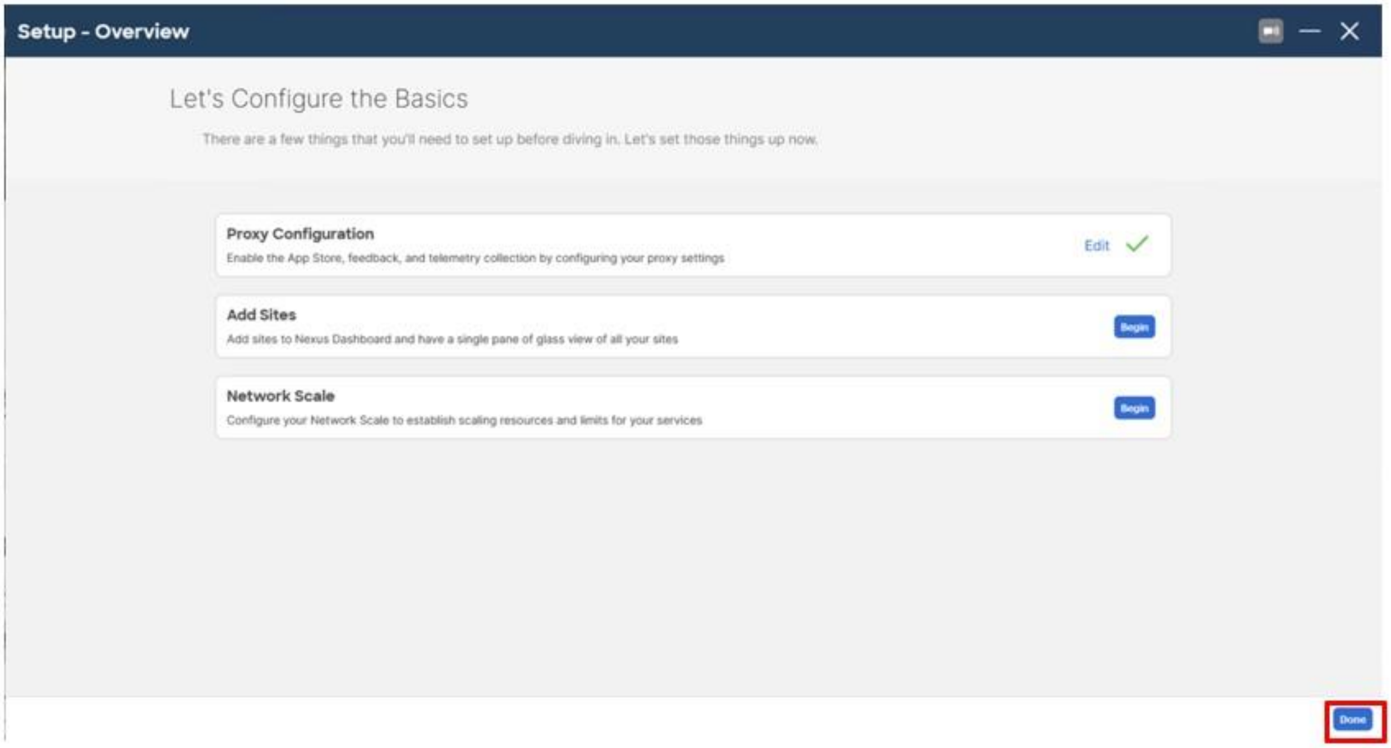
5. On Cisco MDS switches, type show run. If snmpadmin passphrase lifetime 0 is present, enter username snmpadmin passphrase lifetime 99999 warntime 14 gracetime 3.

Note: Nexus Dashboard is not supported within vSphere 8 at this time and was deployed for the validation as part of the independent supporting infrastructure hosted within a vSphere 7.0U3 cluster.

Procedure 1. Install Nexus Dashboard Fabric Controller

With the Nexus Dashboard installed, the initial login screen will present the option to Configure the Basics, this can be skipped for now.

Step 1. Click **Done**.



Setup - Overview

Let's Configure the Basics

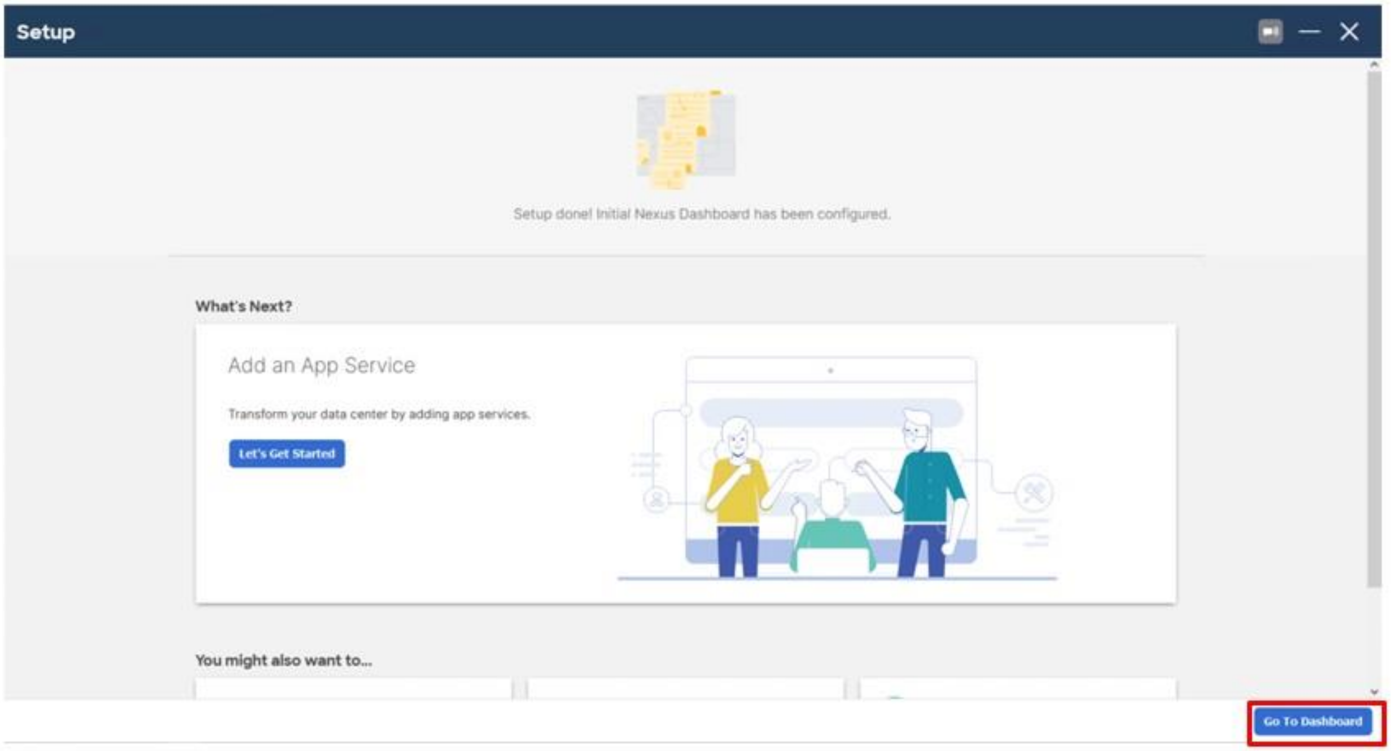
There are a few things that you'll need to set up before diving in. Let's set those things up now.

Proxy Configuration
Enable the App Store, feedback, and telemetry collection by configuring your proxy settings

Add Sites
Add sites to Nexus Dashboard and have a single pane of glass view of all your sites

Network Scale
Configure your Network Scale to establish scaling resources and limits for your services

Step 2. Service IPs will need to be added to the Nexus Dashboard before an App Service can be installed, click through the starting screen, and click **Go To Dashboard.**



Setup

Setup done! Initial Nexus Dashboard has been configured.

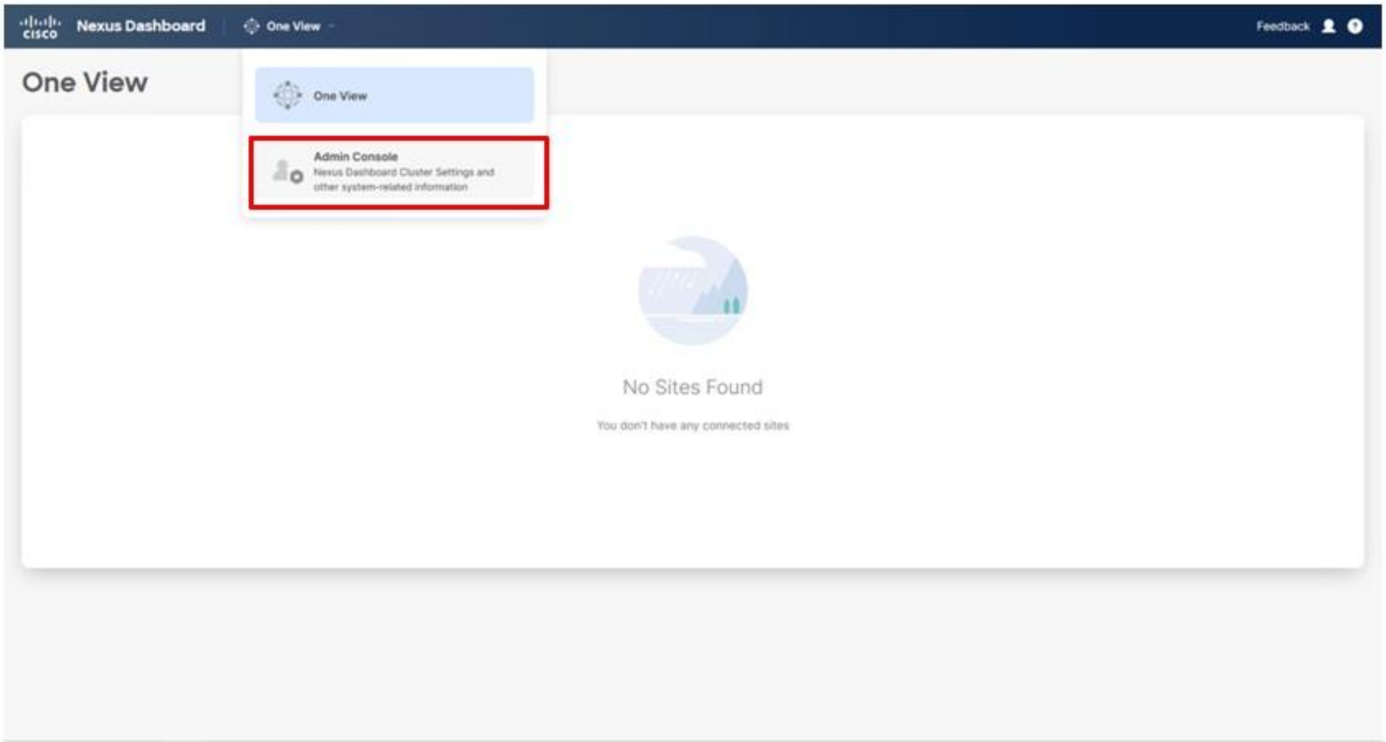
What's Next?

Add an App Service

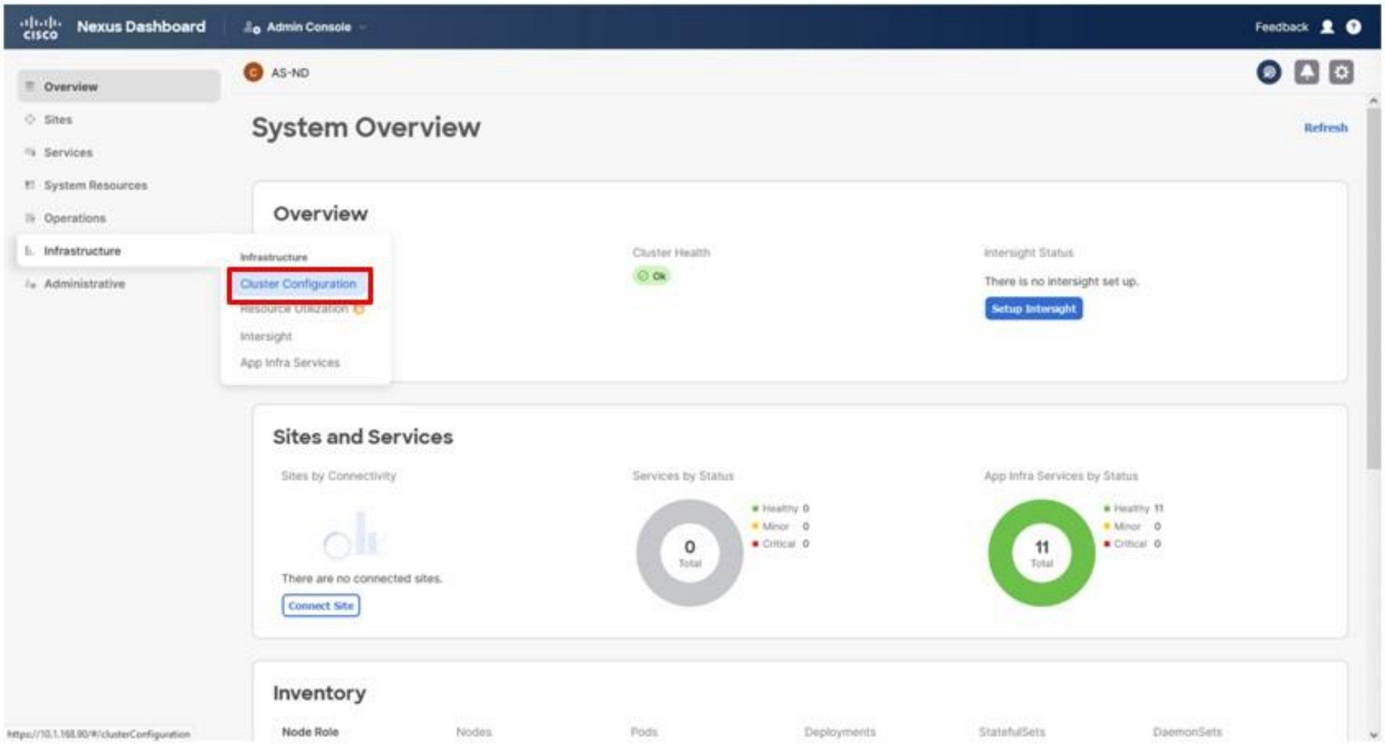
Transform your data center by adding app services.

You might also want to...

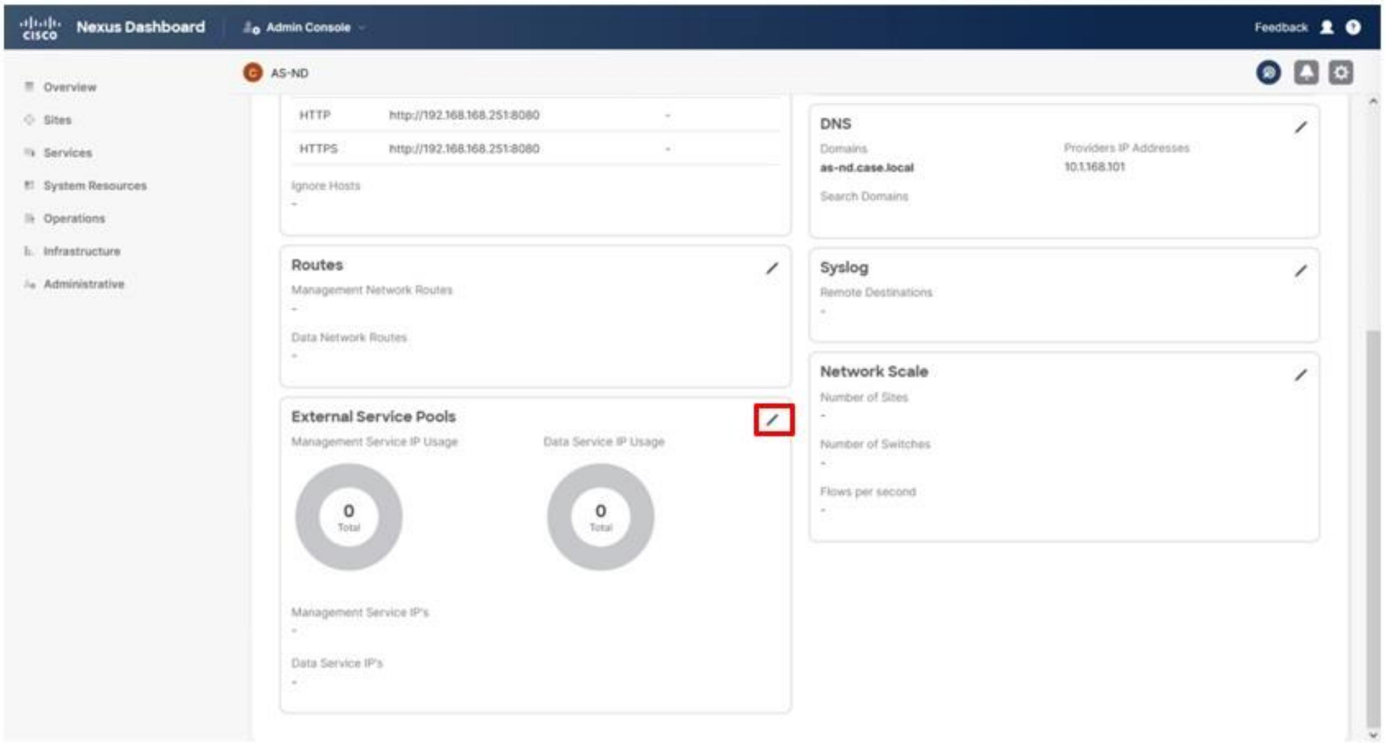
Step 3. From the drop-down list to the left of the Nexus Dashboard, choose **Admin Console**.


Nexus Dashboard
One View
Feedback
One View
One View
Admin Console
Nexus Dashboard Cluster Settings and other system-related information
No Sites Found
You don't have any connected sites

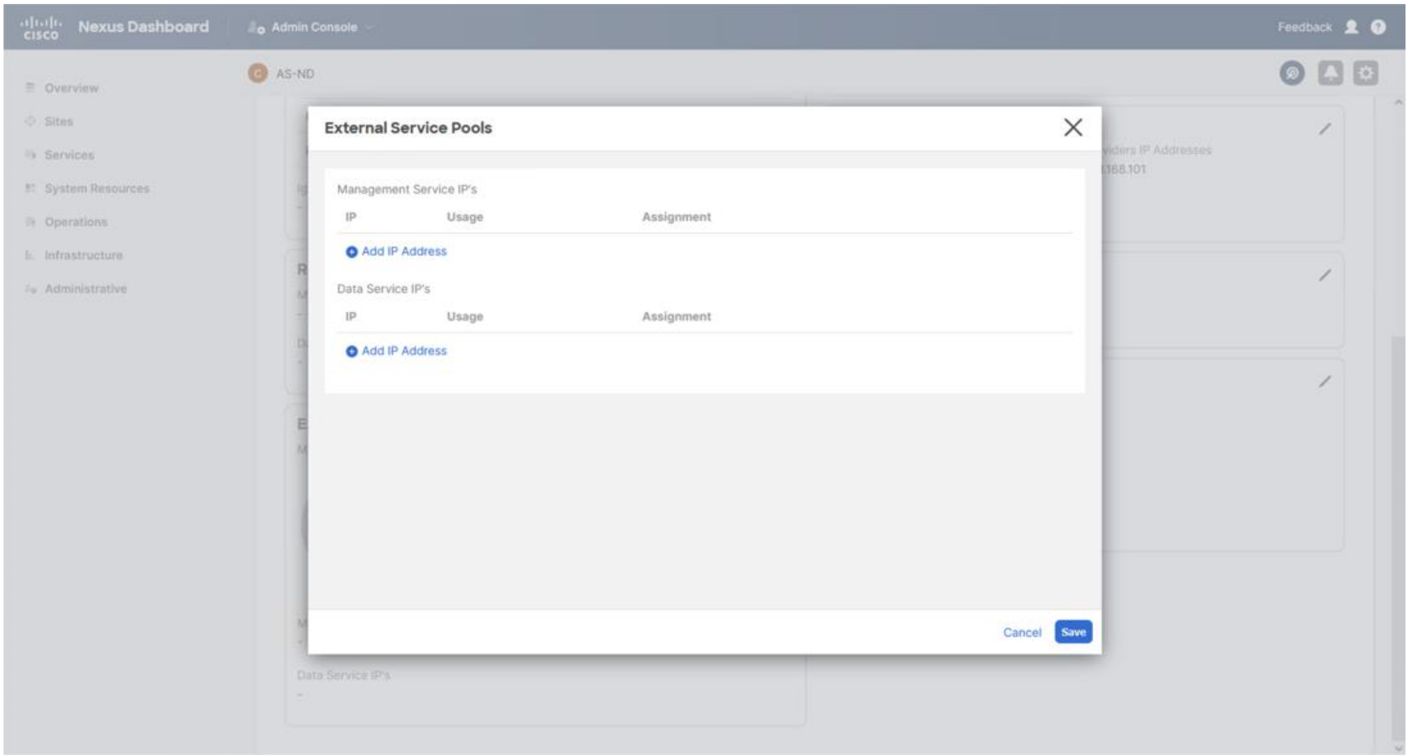
Step 4. From the System Overview go to **Infrastructure** > **Cluster Configuration**.



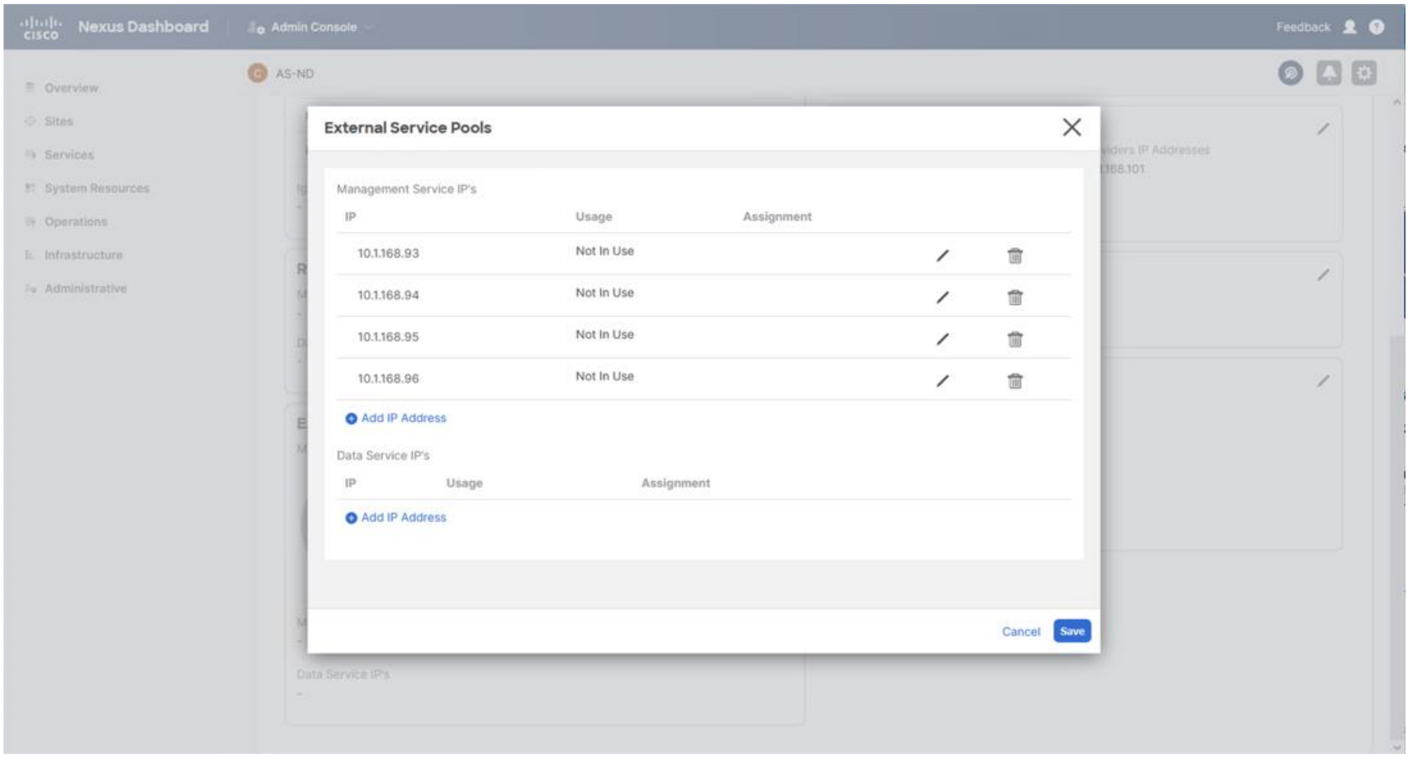
Step 5. Scroll down in the Cluster Configuration to the External Service Pools section and click the edit icon.



Step 6. Click **Add IP Address** under the Management Service IP’s.



Step 7. Add IP addresses in the IB-Mgmt network on which the Nexus Dashboard was deployed. Click **Save**.



External Service Pools

Management Service IP's

IP	Usage	Assignment
10.1.168.93	Not In Use	
10.1.168.94	Not In Use	
10.1.168.95	Not In Use	
10.1.168.96	Not In Use	

Add IP Address

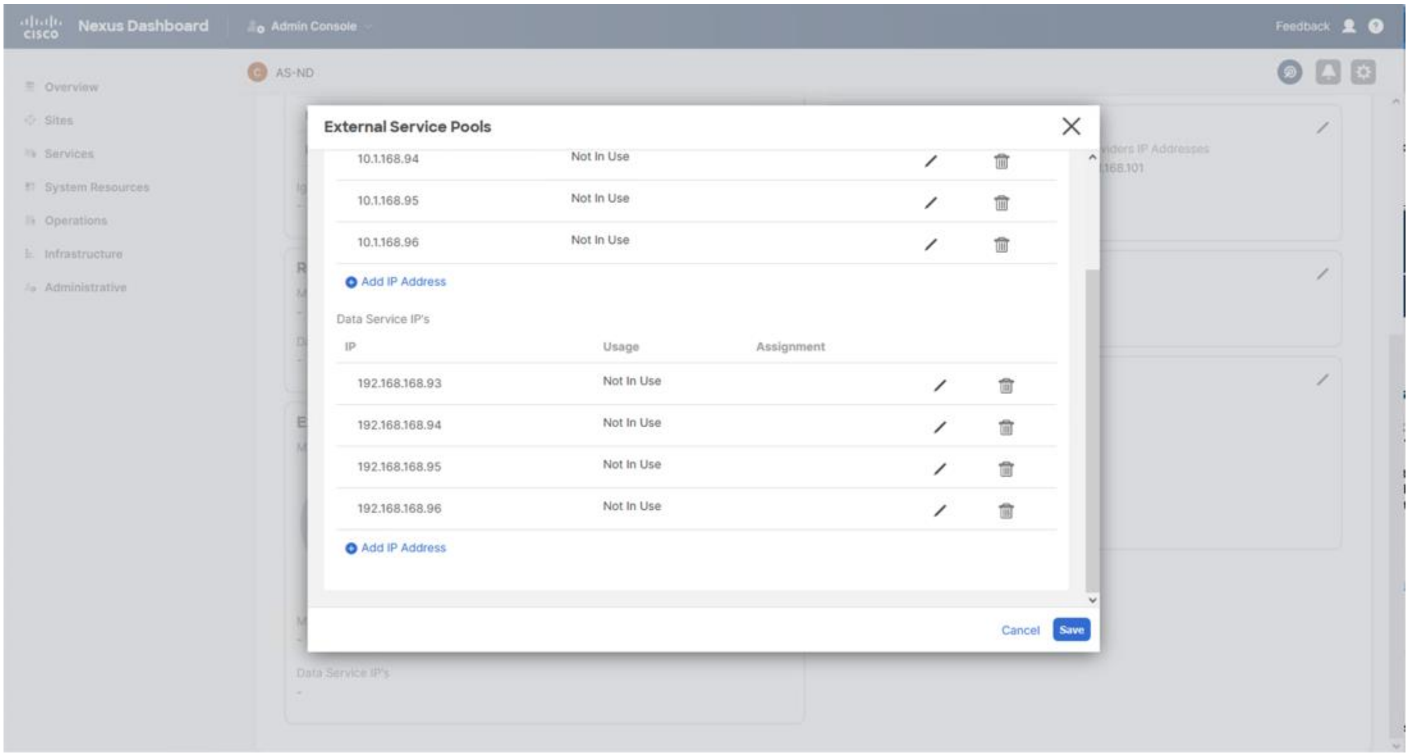
Data Service IP's

IP	Usage	Assignment

Add IP Address

Cancel Save

Step 8. Repeat these additions for the Data Service IP's associated with the OOB network that the mgmt interfaces of the MDS and potentially the Nexus switches. Click **Save**.



External Service Pools

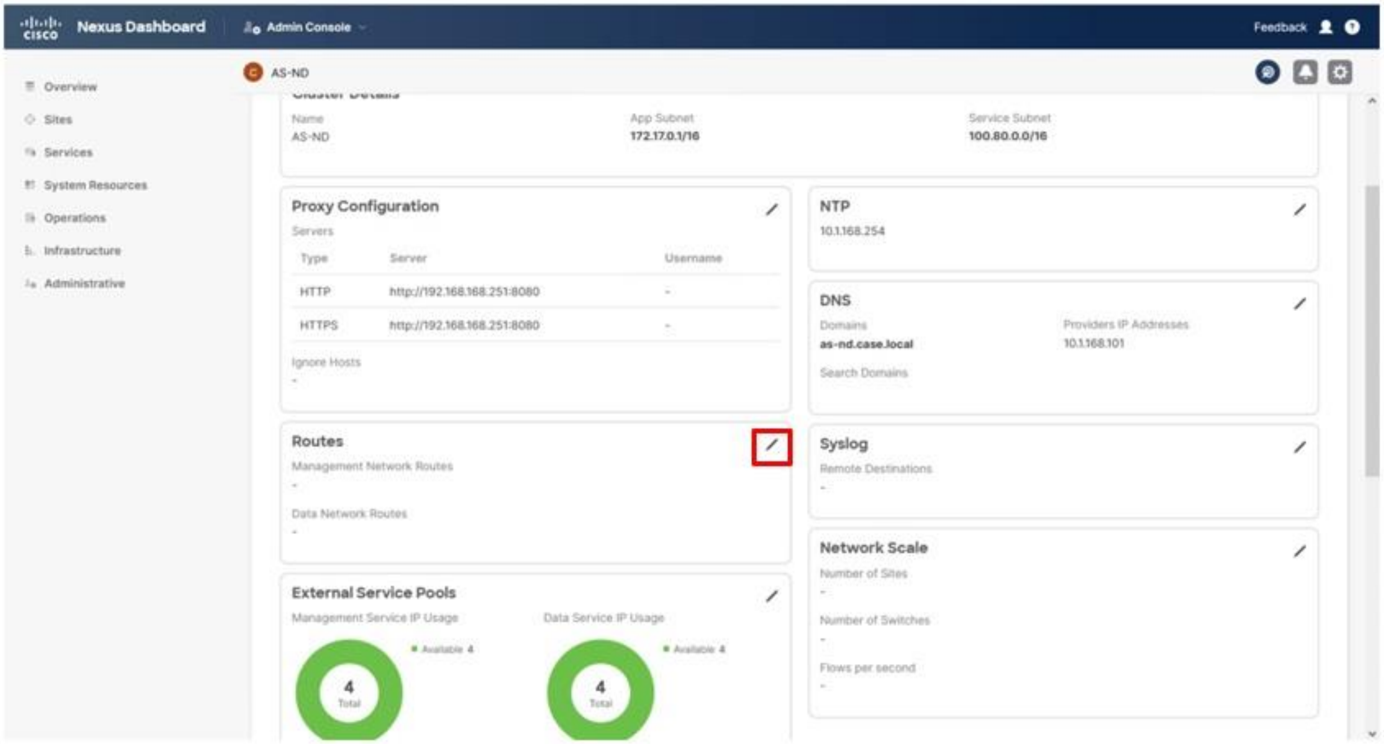
10.1.168.94	Not In Use
10.1.168.95	Not In Use
10.1.168.96	Not In Use

Data Service IP's

IP	Usage	Assignment
192.168.168.93	Not In Use	
192.168.168.94	Not In Use	
192.168.168.95	Not In Use	
192.168.168.96	Not In Use	

Note: The allocation of IPs in our example is four IPs for each service pool but will vary depending on the needs of services being deployed.

Step 9. Click the edit icon in the Routes section.



Cluster Details

Name: AS-ND
App Subnet: 172.17.0.1/16
Service Subnet: 100.80.0.0/16

Proxy Configuration

Servers

Type	Server	Username
HTTP	http://192.168.168.251:8080	-
HTTPS	http://192.168.168.251:8080	-

Ignore Hosts: -

NTP: 10.1.168.254

DNS
Domains: as-nd.case.local
Providers IP Addresses: 10.1.168.101
Search Domains

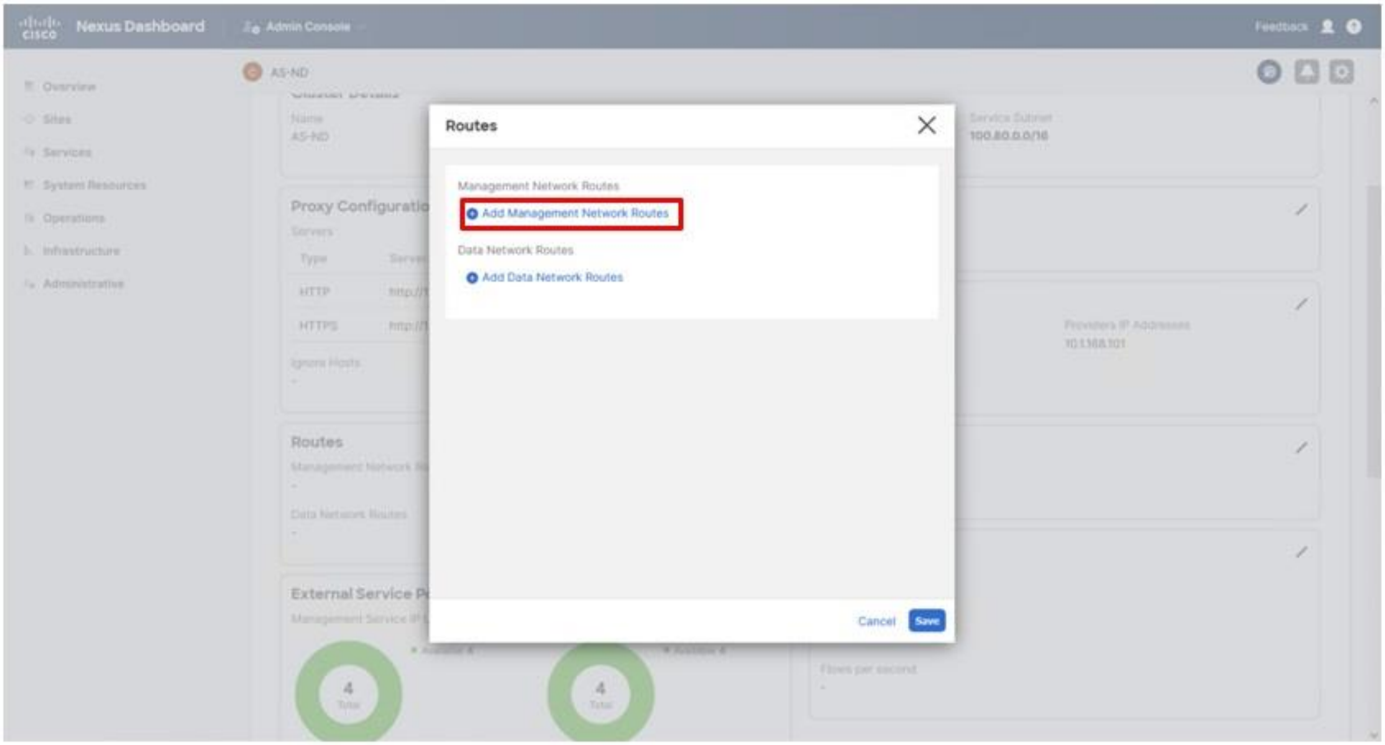
Routes
Management Network Routes: -
Data Network Routes: -

Syslog
Remote Destinations: -

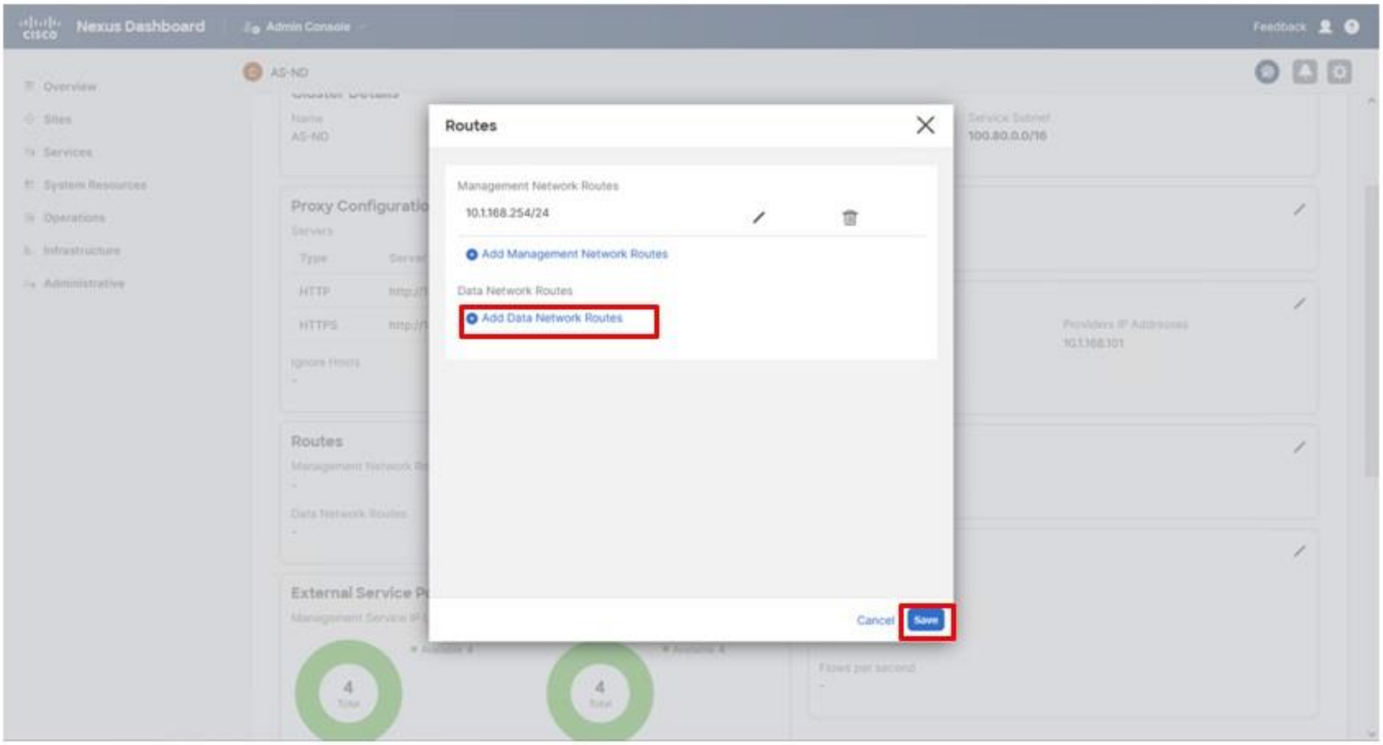
Network Scale
Number of Sites: -
Number of Switches: -
Flows per second: -

External Service Pools
Management Service IP Usage: 4 Total, Available 4
Data Service IP Usage: 4 Total, Available 4

Step 10. Click **Add Management Network Routes**.



Step 11. Repeat the addition for the appropriate Data Network gateway and click **Save**.



Routes

Management Network Routes

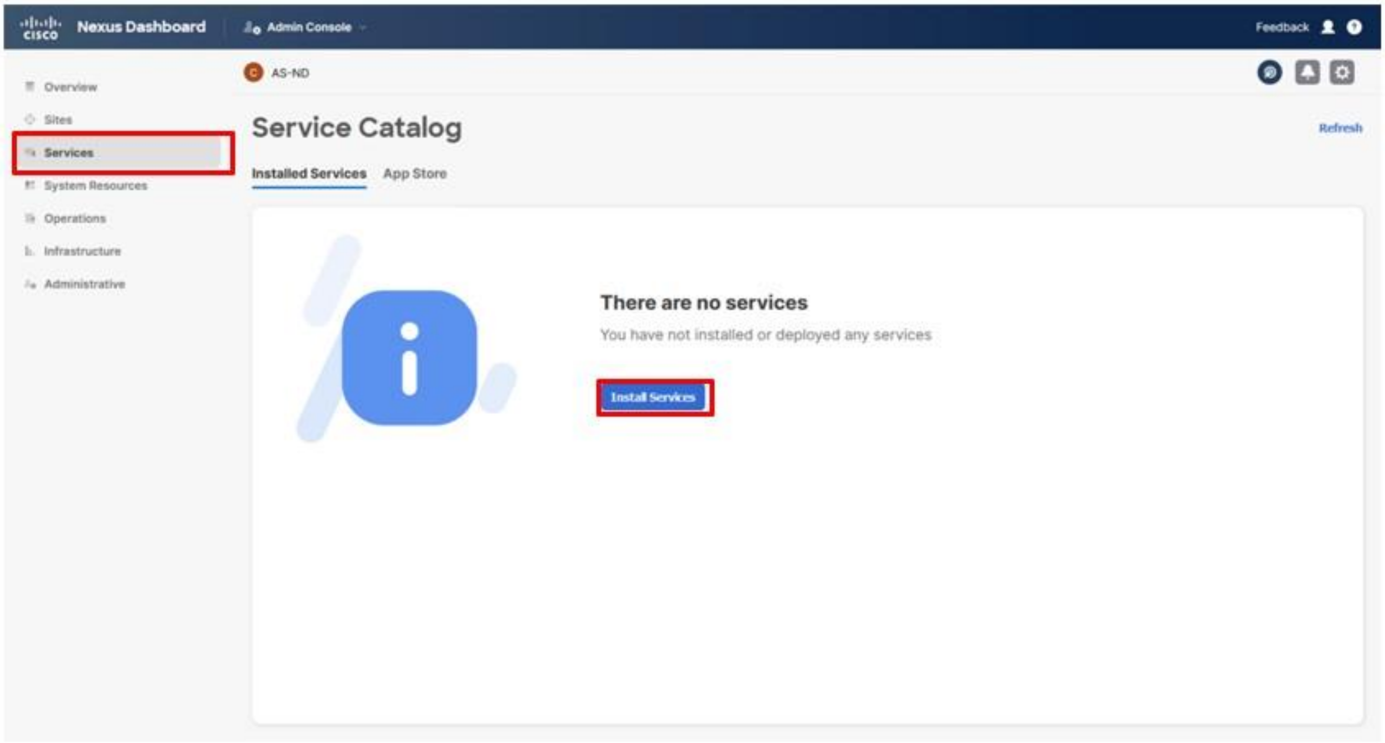
10.1.168.254/24

Add Management Network Routes

Data Network Routes

Add Data Network Routes

Step 12. Click **Services**, then click **Install Services**.

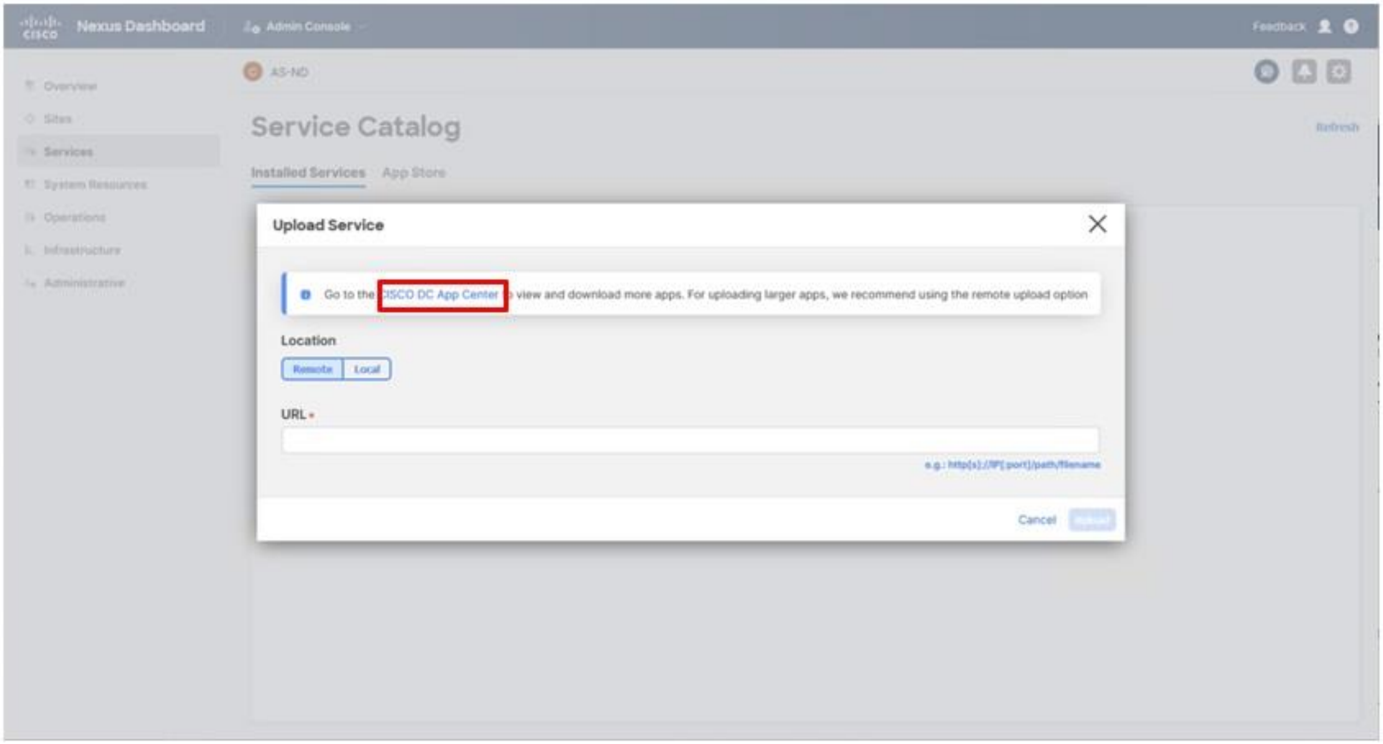


Service Catalog

There are no services

You have not installed or deployed any services

Step 13. Click **CISCO DC App Center** to access available apps.



Upload Service

Go to the CISCO DC App Center to view and download more apps. For uploading larger apps, we recommend using the remote upload option

Location

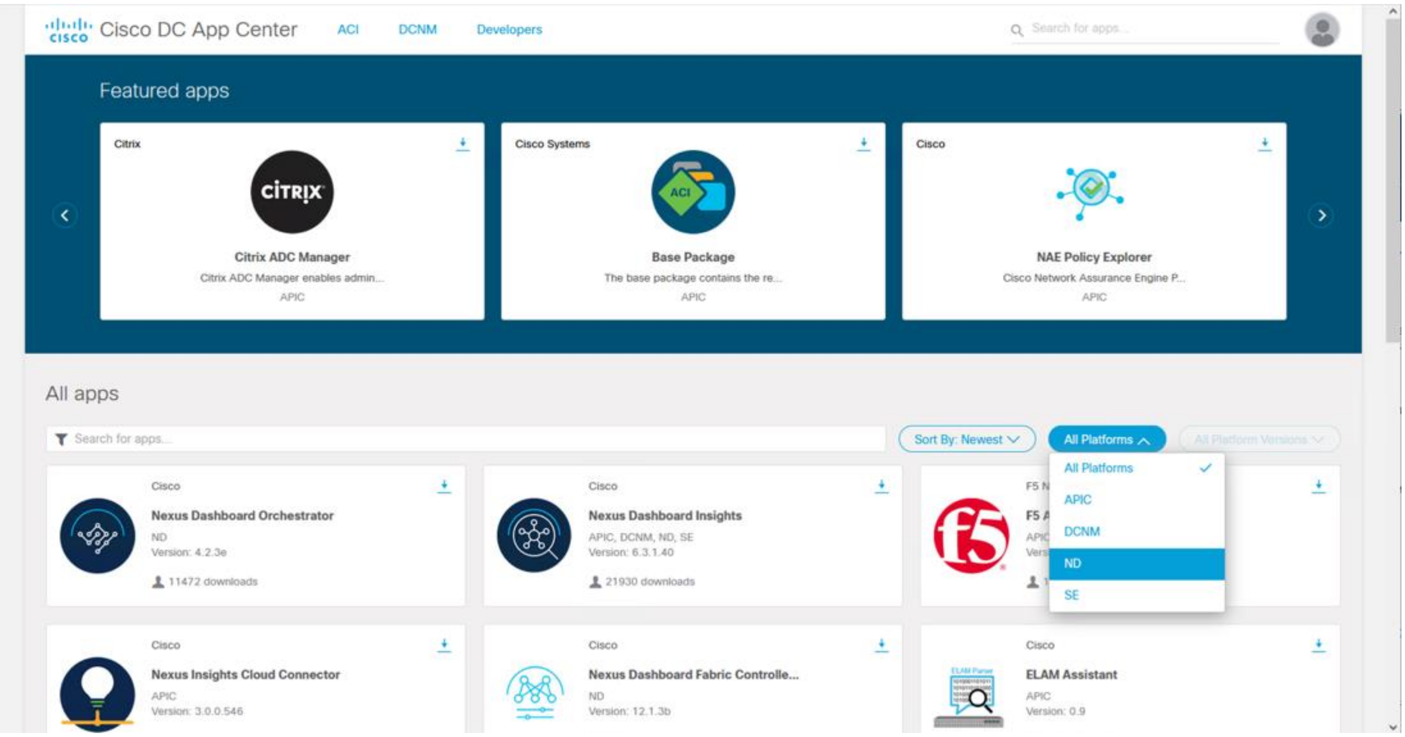
Remote | Local

URL *

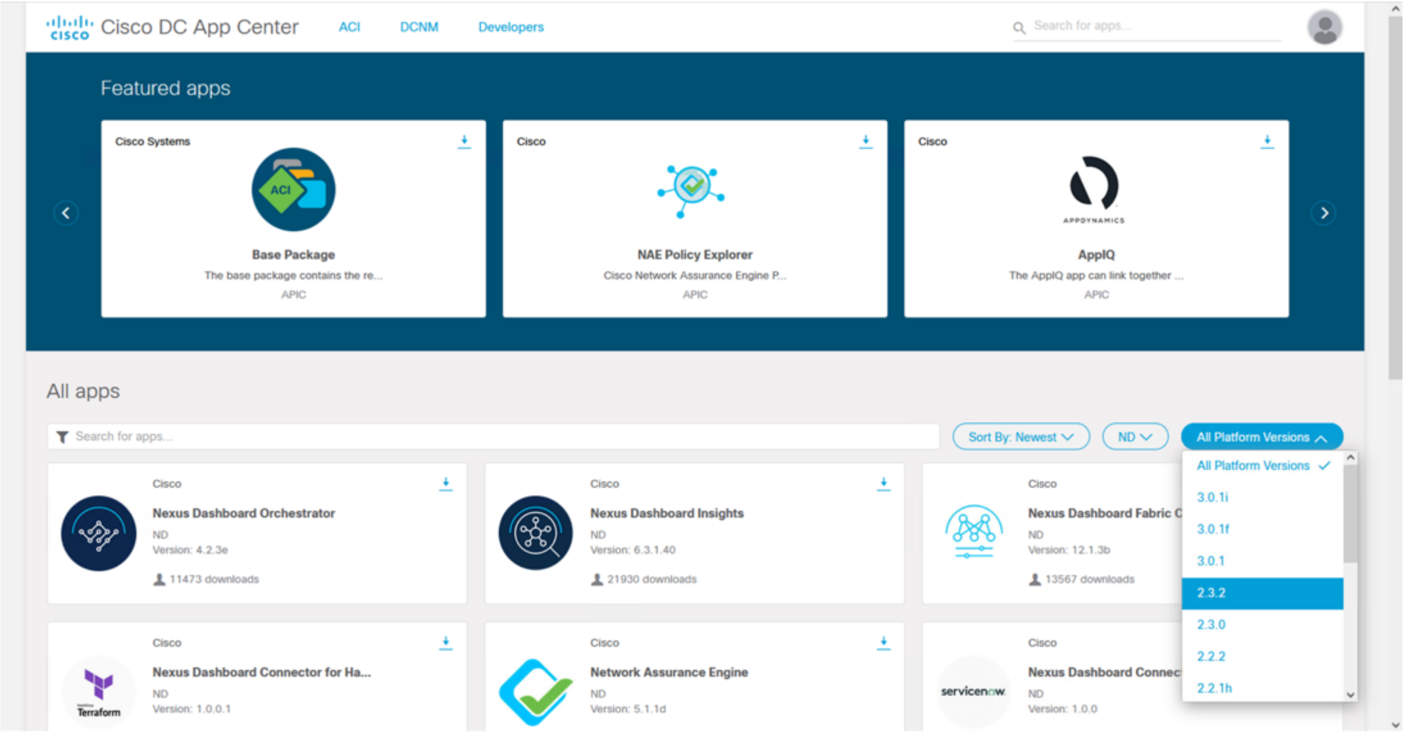
e.g.: http[s]://IP[:port]/path/filename

Cancel | Upload

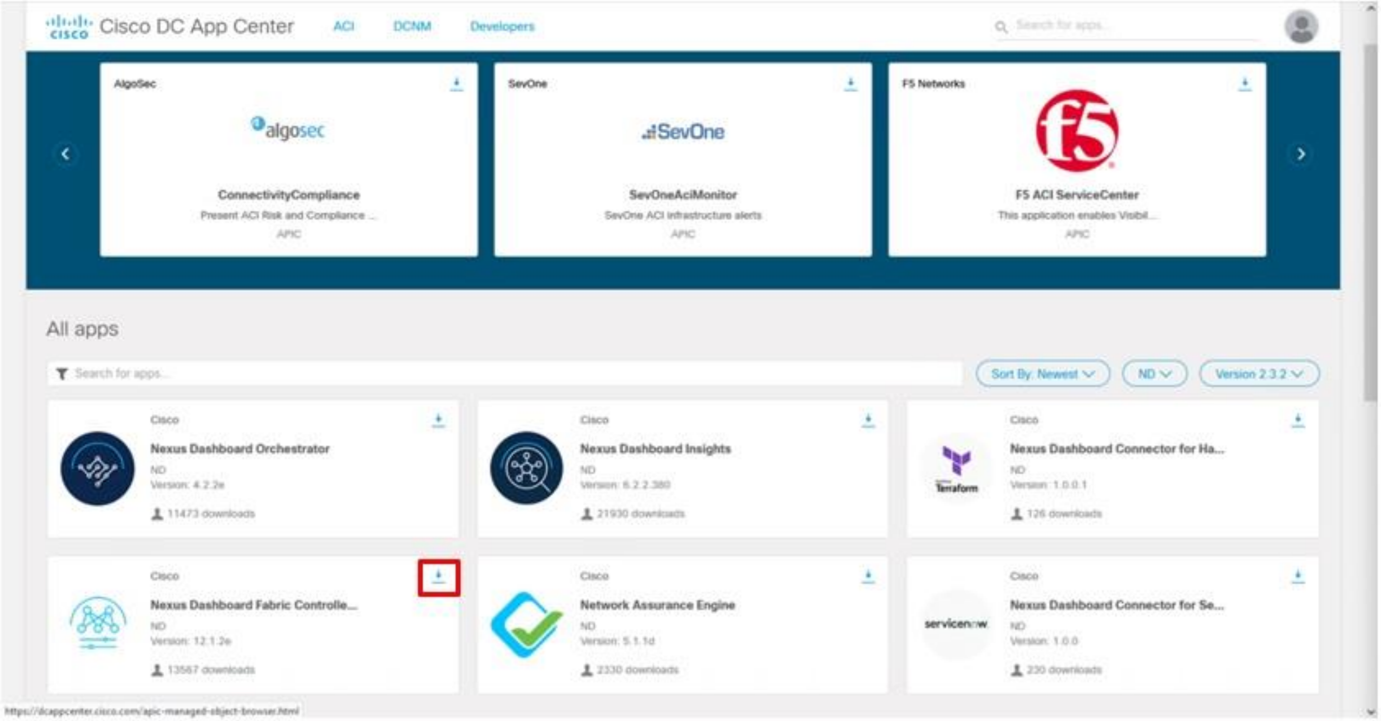
Step 14. Within the window that is open for the App Center, choose the **ND** option from the All Platforms drop-down list.



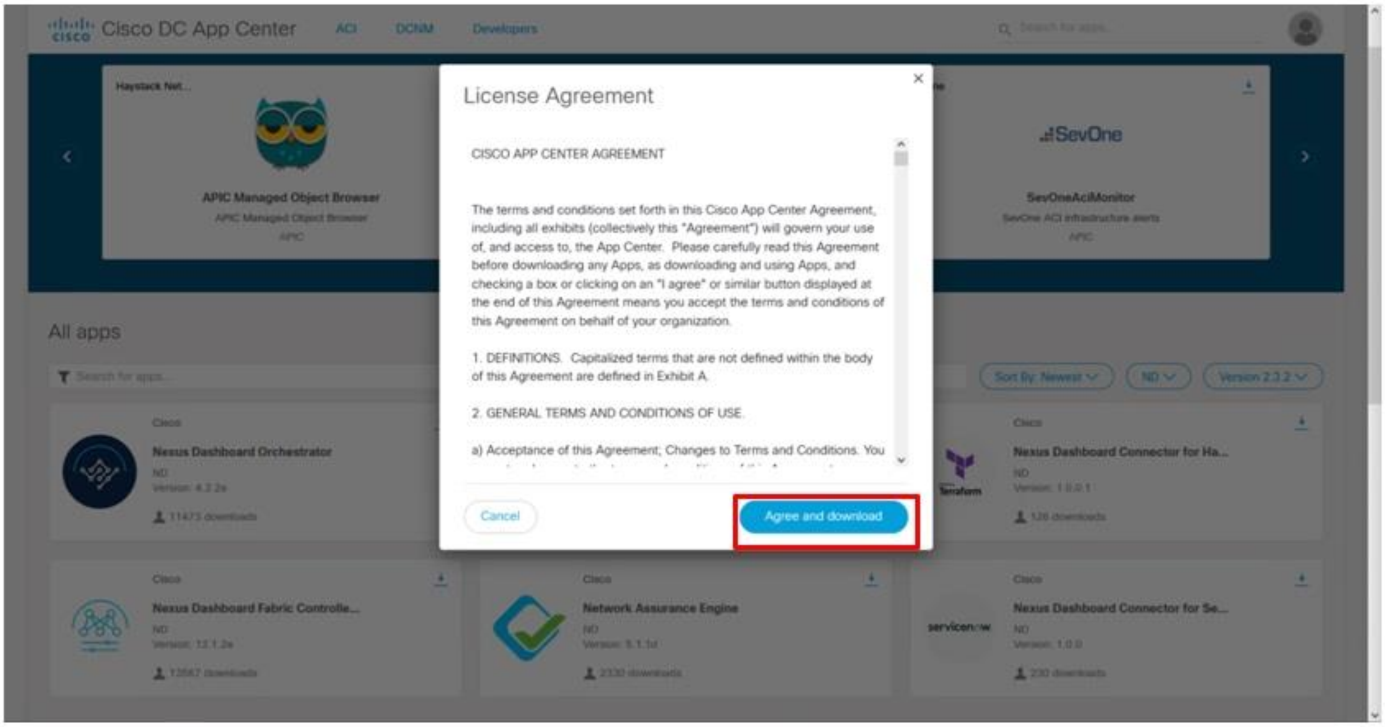
Step 15. Choose the **2.3.2** option From the All Platform Versions drop-down list.



Step 16. Click the Download icon within the Nexus Dashboard Fabric Controller box.



Step 17. Log in to id.cisco.com with CCO credentials and click **Agree and Download** within the License Agreement pop-up window.



Cisco DC App Center
ACI
DCNM
Developers
All apps
Nexus Dashboard Orchestrator
Nexus Dashboard Fabric Controller
Network Assurance Engine
SevOneAciMonitor
APIC Managed Object Browser

License Agreement

CISCO APP CENTER AGREEMENT

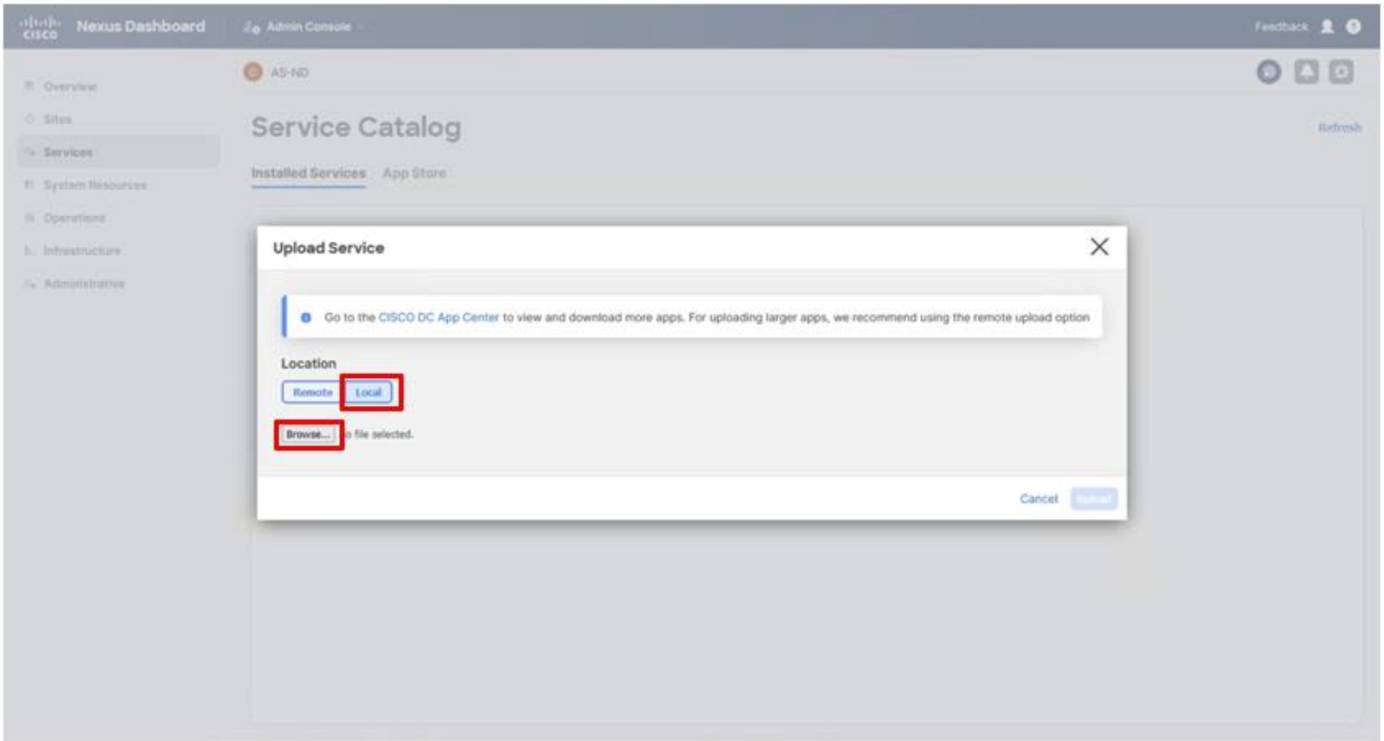
The terms and conditions set forth in this Cisco App Center Agreement, including all exhibits (collectively this "Agreement") will govern your use of, and access to, the App Center. Please carefully read this Agreement before downloading any Apps, as downloading and using Apps, and checking a box or clicking on an "I agree" or similar button displayed at the end of this Agreement means you accept the terms and conditions of this Agreement on behalf of your organization.

1. DEFINITIONS. Capitalized terms that are not defined within the body of this Agreement are defined in Exhibit A.

2. GENERAL TERMS AND CONDITIONS OF USE.

a) Acceptance of this Agreement; Changes to Terms and Conditions. You

Step 18. Return to the Nexus Dashboard window, click **Local** in the Upload Service dialogue window, and click **Browse...** to select the downloaded .nap application file for NDFC.



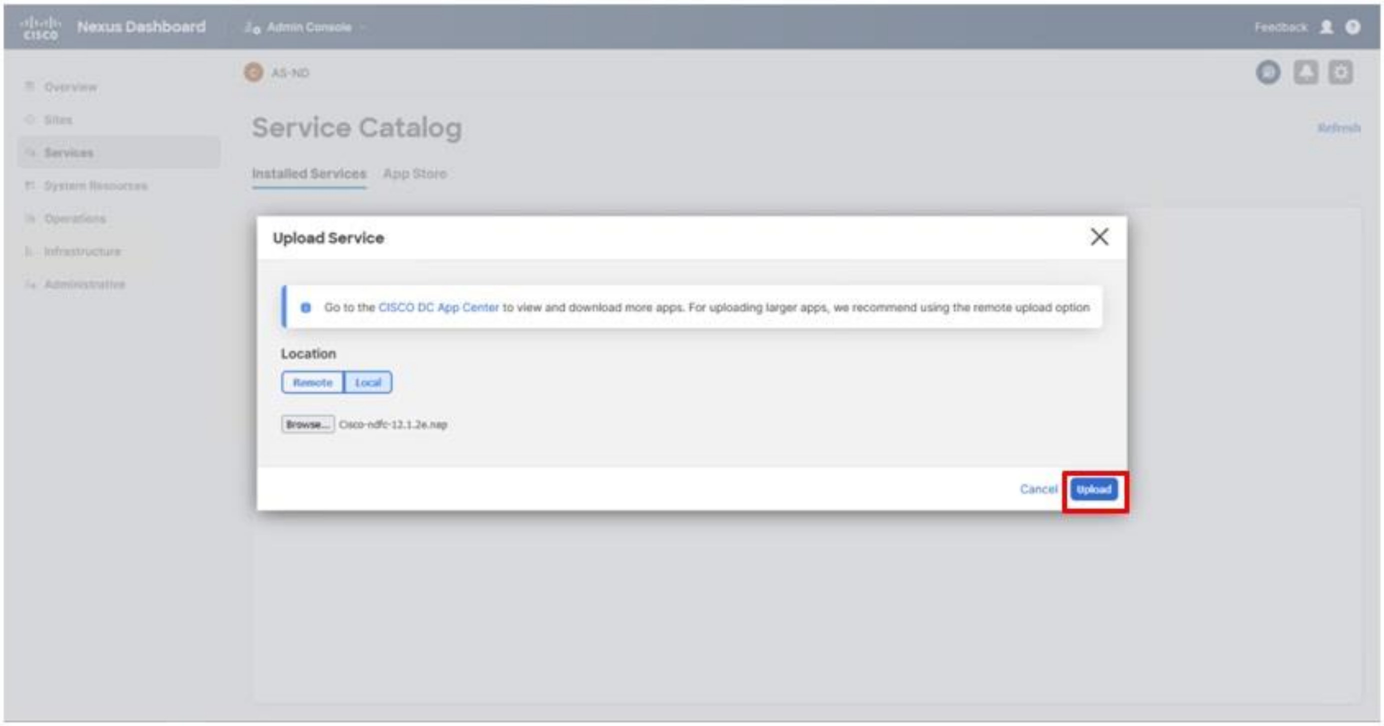
Upload Service

Go to the CISCO DC App Center to view and download more apps. For uploading larger apps, we recommend using the remote upload option

Location

o file selected.

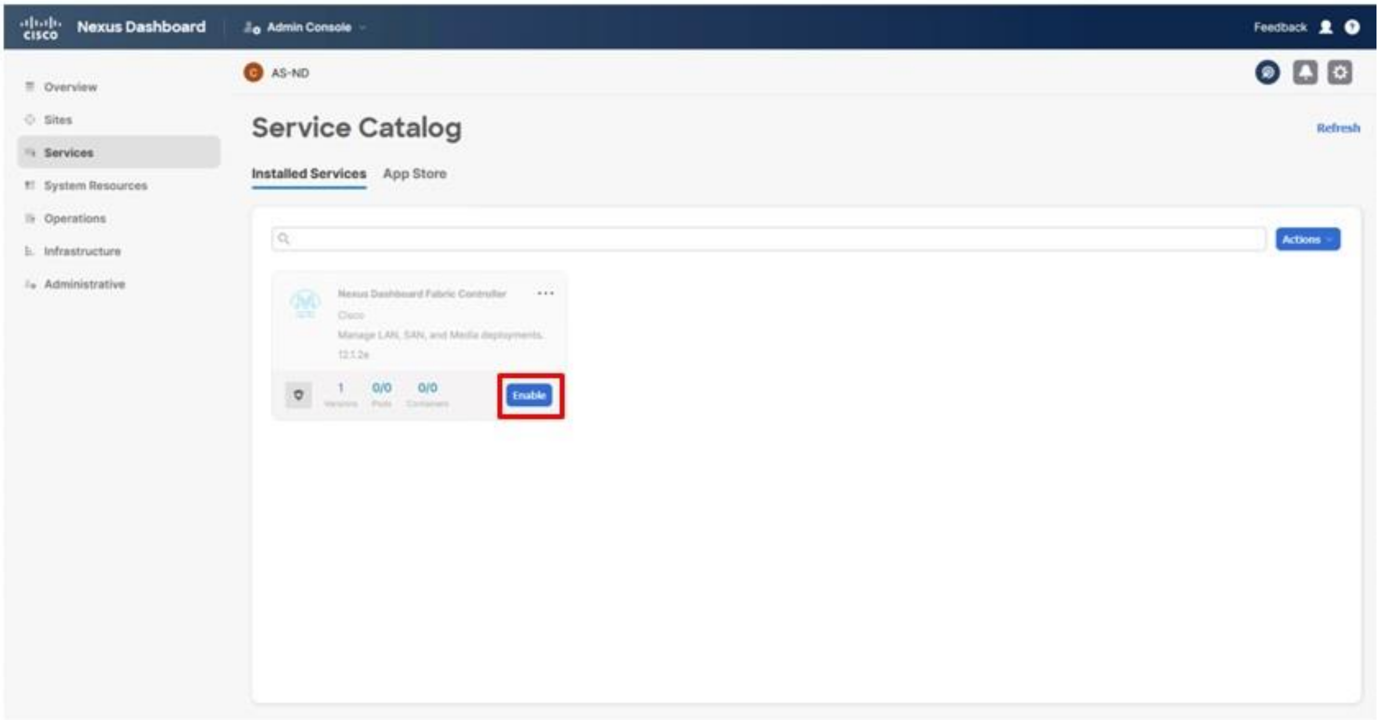
Step 19. Click **Upload**.



Go to the CISCO DC App Center to view and download more apps. For uploading larger apps, we recommend using the remote upload option

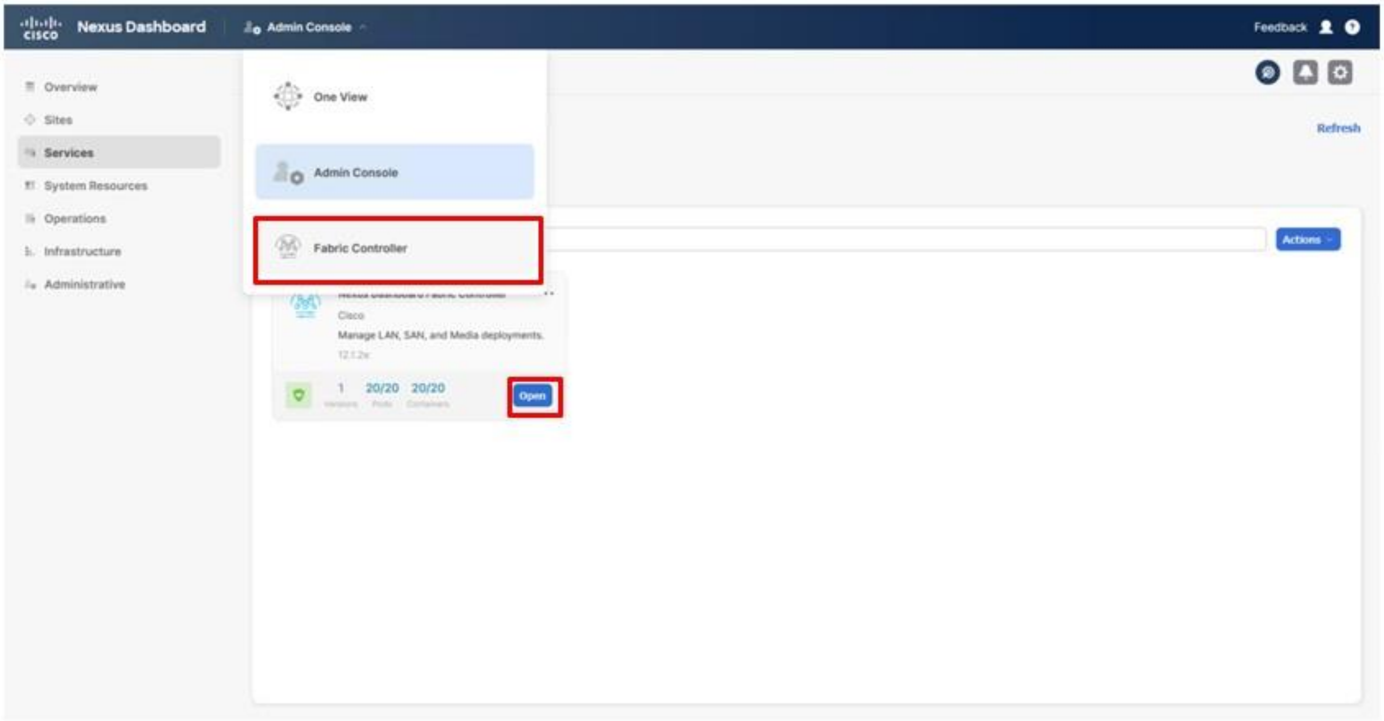
Cisco-ndfc-12.1.2e.nap

Step 20. After the upload and installation has completed, click **Enable**.

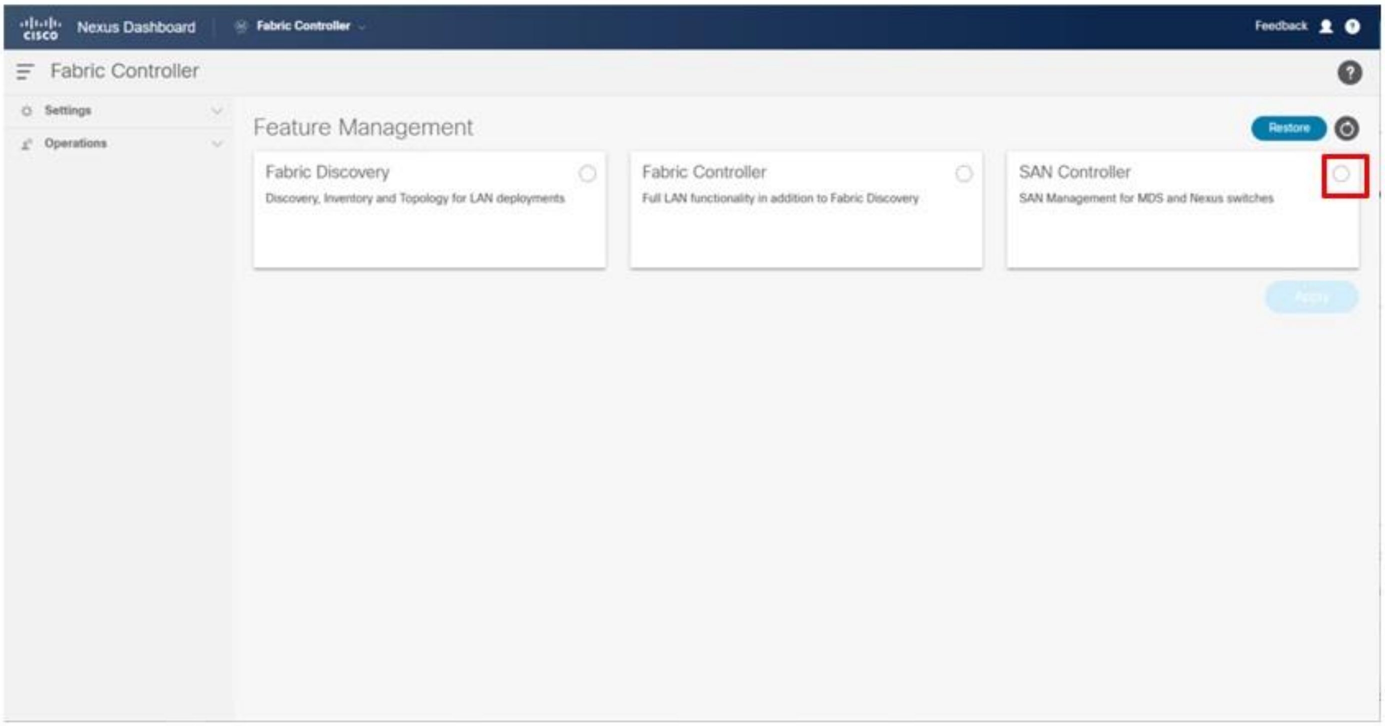


Procedure 2. Configure Nexus Dashboard Fabric Controller

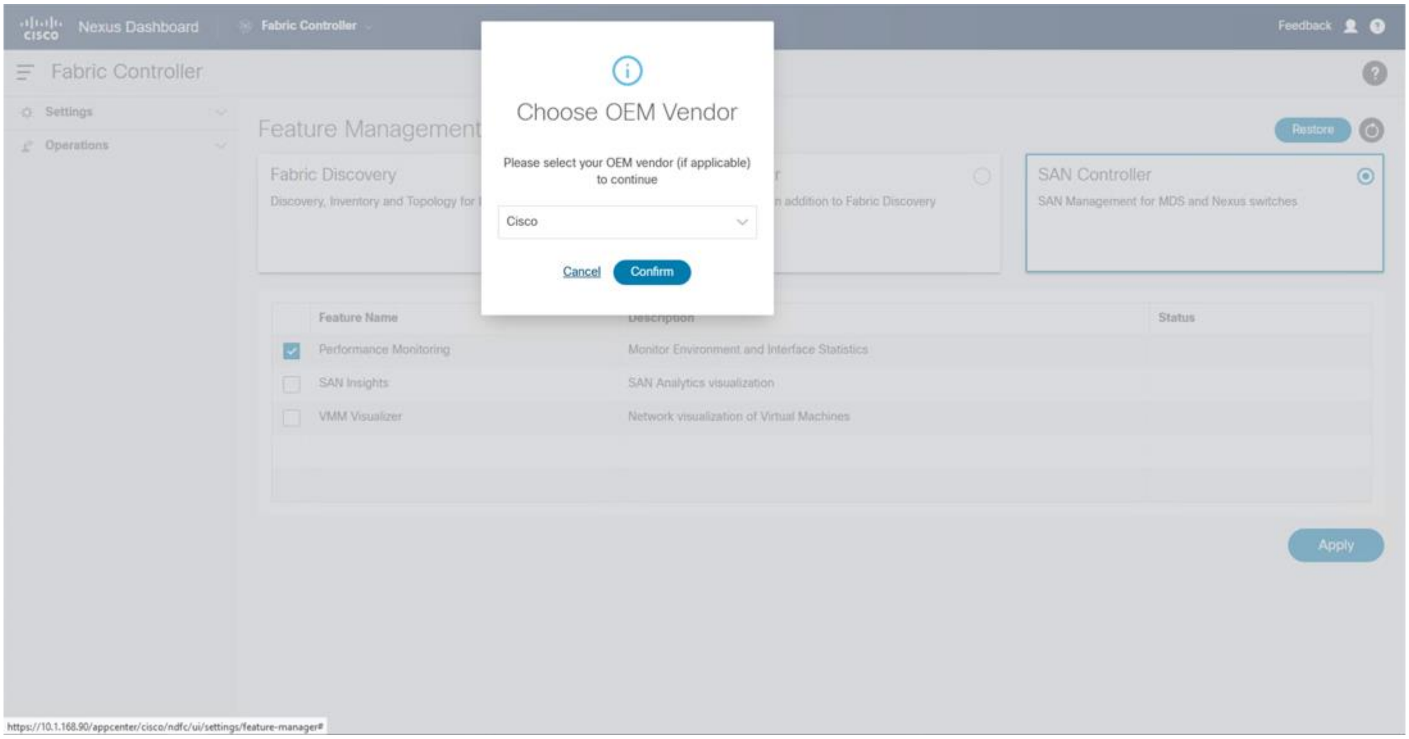
Step 1. Click **Open** or choose the option **Fabric Controller**.



Step 2. Click the **SAN Controller** option.



Step 3. Confirm Cisco as the OEM vendor.



Choose OEM Vendor

Please select your OEM vendor (if applicable) to continue

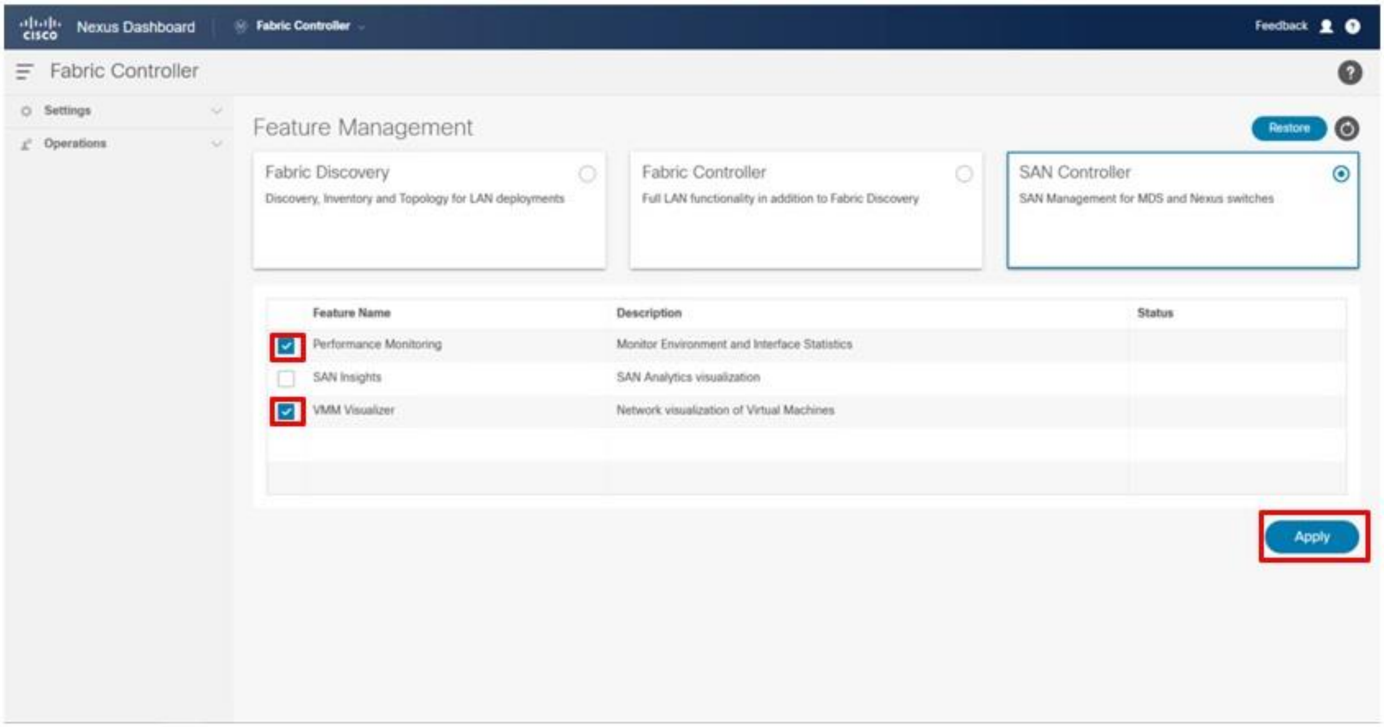
Cisco

Cancel Confirm

	Feature Name	Description	Status
☑	Performance Monitoring	Monitor Environment and Interface Statistics	
☐	SAN Insights	SAN Analytics visualization	
☐	VMM Visualizer	Network visualization of Virtual Machines	

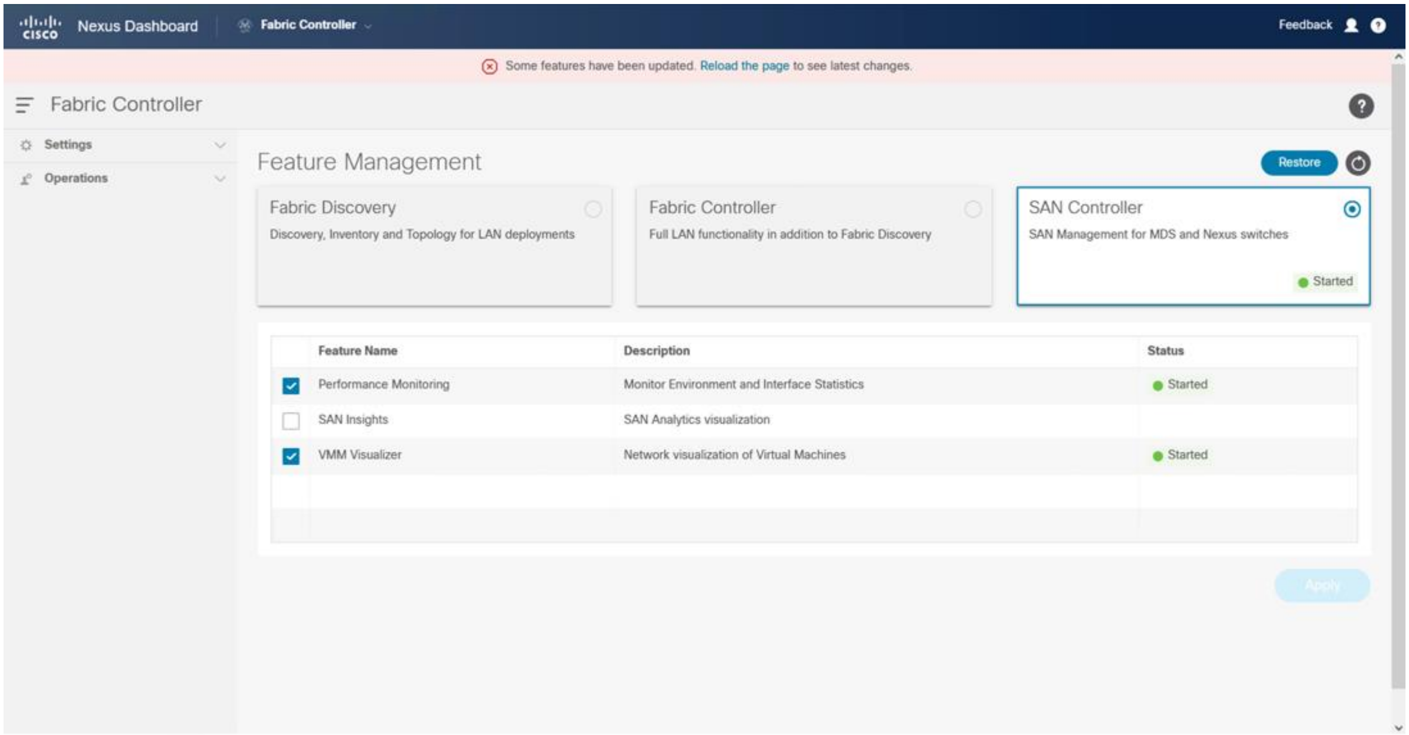
https://10.1.168.90/appcenter/cisco/ndfc/ui/settings/feature-manager#

Step 4. Select the Performance Monitoring and VMM Visualizer features and click **Apply**.



	Feature Name	Description	Status
☑	Performance Monitoring	Monitor Environment and Interface Statistics	
☐	SAN Insights	SAN Analytics visualization	
☑	VMM Visualizer	Network visualization of Virtual Machines	

Step 5. The status will display Started when complete and the page will need to be reloaded to continue.



Some features have been updated. Reload the page to see latest changes.

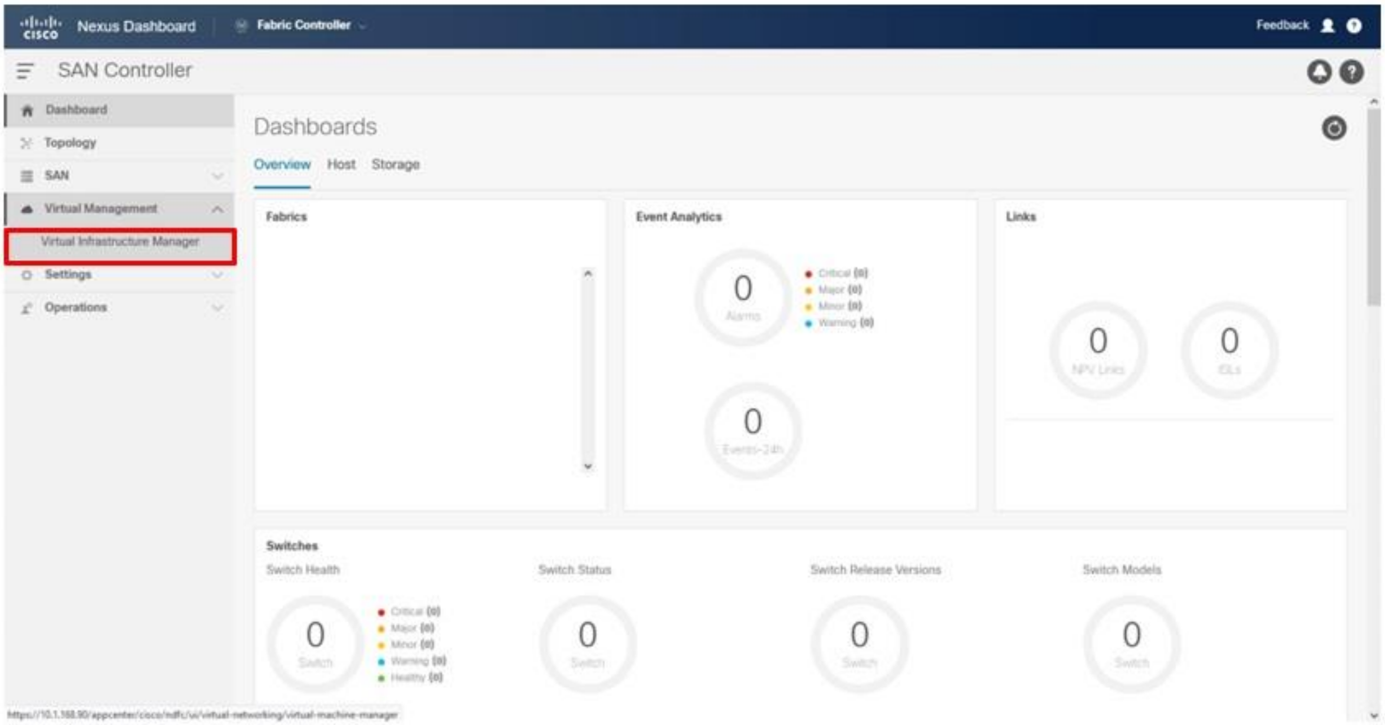
○ Fabric Discovery
Discovery, Inventory and Topology for LAN deployments

○ Fabric Controller
Full LAN functionality in addition to Fabric Discovery

● SAN Controller
SAN Management for MDS and Nexus switches
● Started

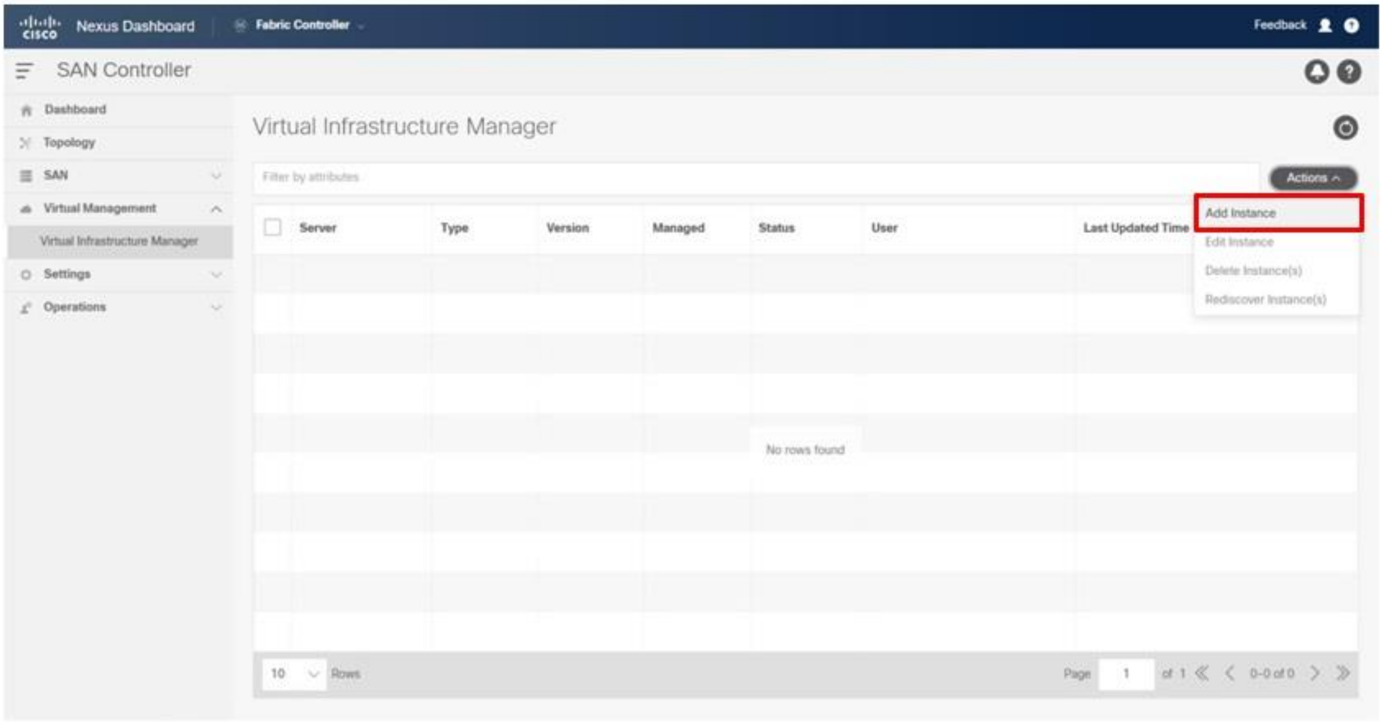
	Feature Name	Description	Status
☑	Performance Monitoring	Monitor Environment and Interface Statistics	● Started
□	SAN Insights	SAN Analytics visualization	
☑	VMM Visualizer	Network visualization of Virtual Machines	● Started

Step 6. Expand **Virtual Management** and click **Virtual Infrastructure Manager**.

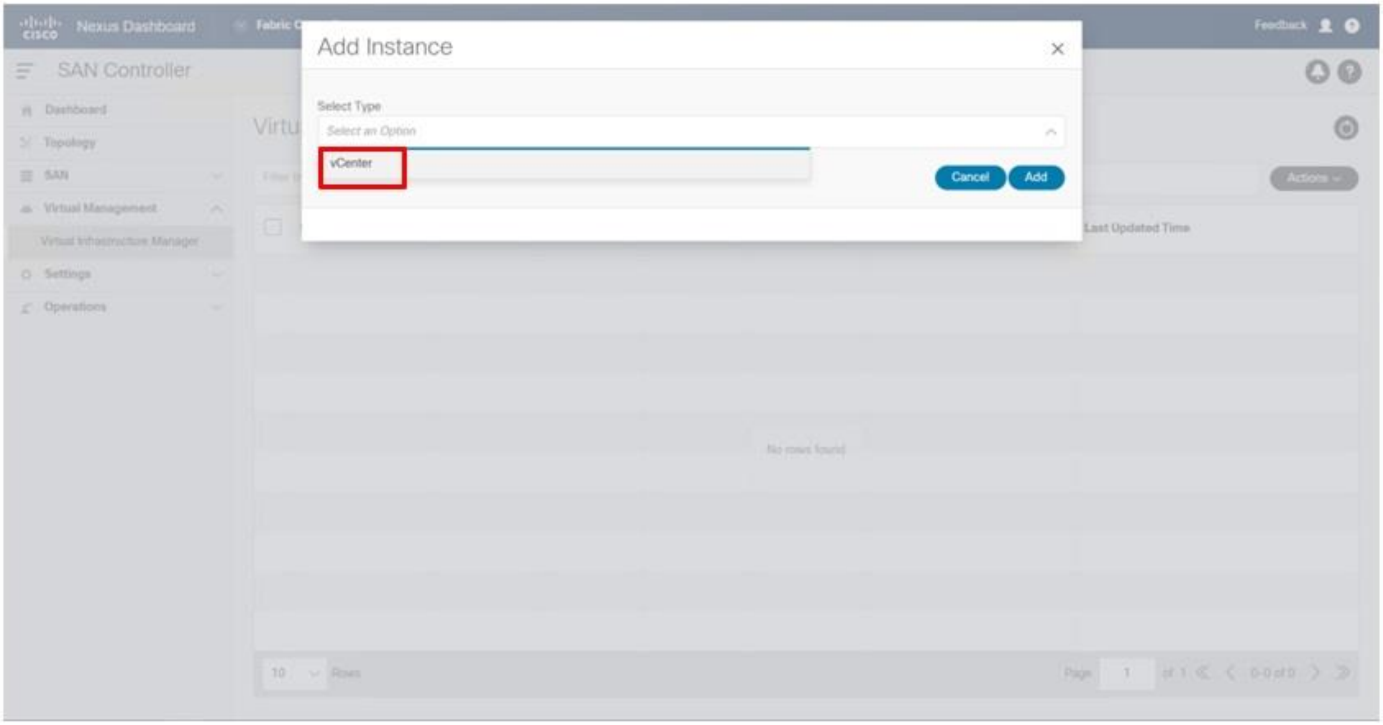


https://10.1.168.90/appcenter/cisco/ndfc/ui/virtual-networking/virtual-machine-manager

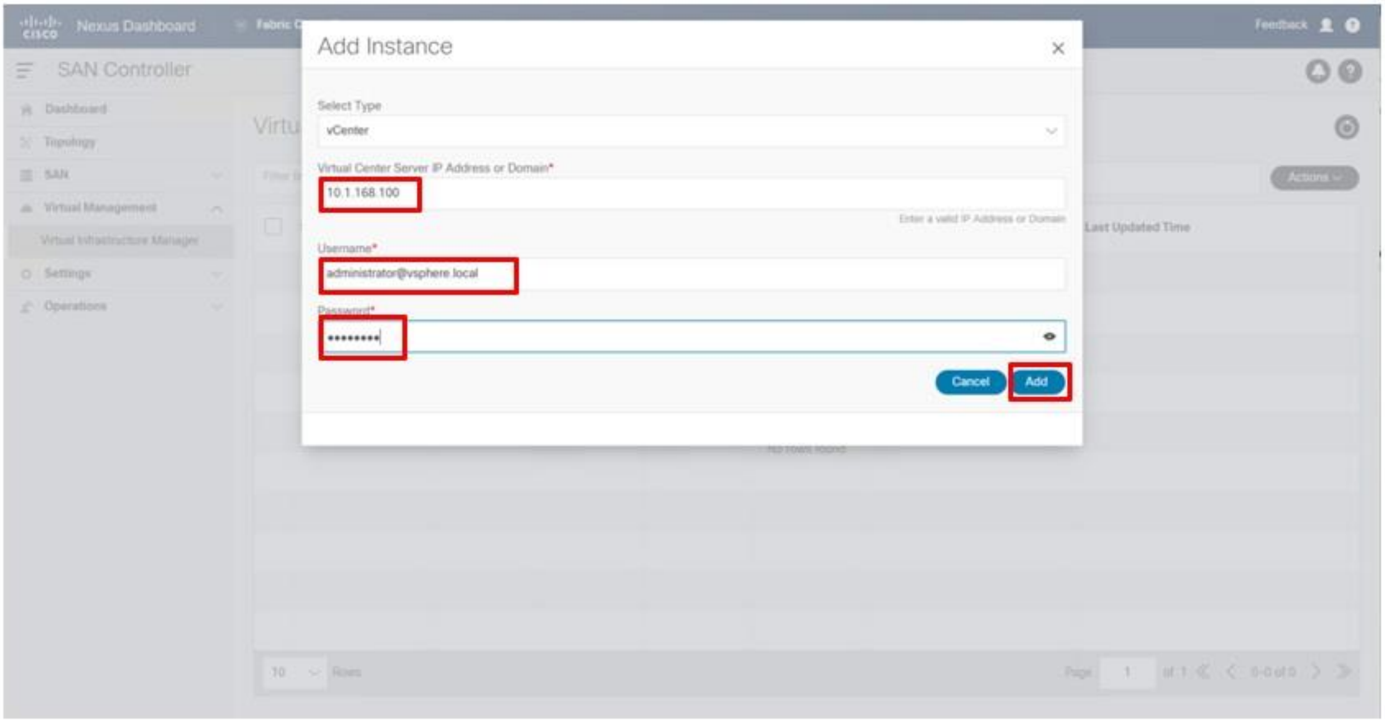
Step 7. Select **Actions** > **Add Instance**.



Step 8. From the Add Instance pop-up window, choose **vCenter**



Step 9. Provide the vCenter IP address or FQDN, and the appropriate Username and Password for access. Click **Add**.



Add Instance

Select Type: vCenter

Virtual Center Server IP Address or Domain*: 10.1.168.100

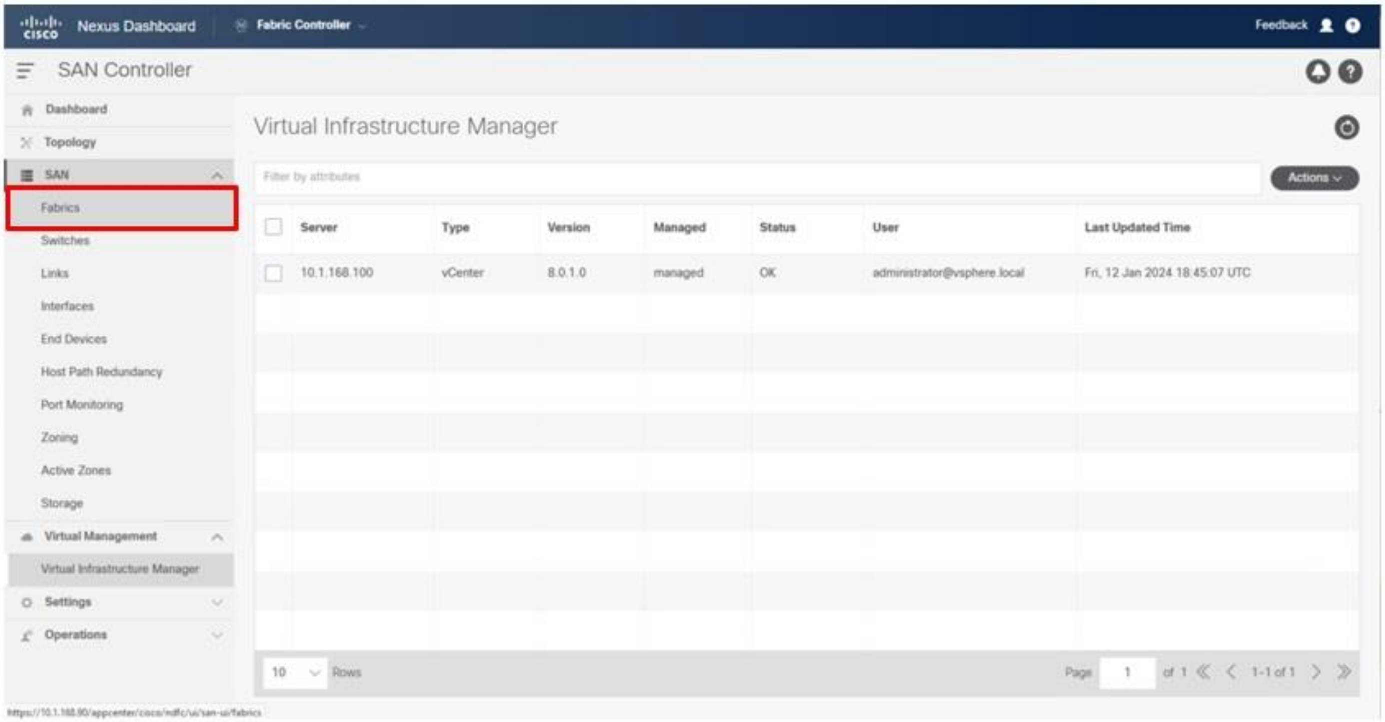
Enter a valid IP Address or Domain

Username*: administrator@vsphere.local

Password*: ••••••••

Cancel | Add

Step 10. Select **SAN** and click the **Fabrics** option from the expanded menu.

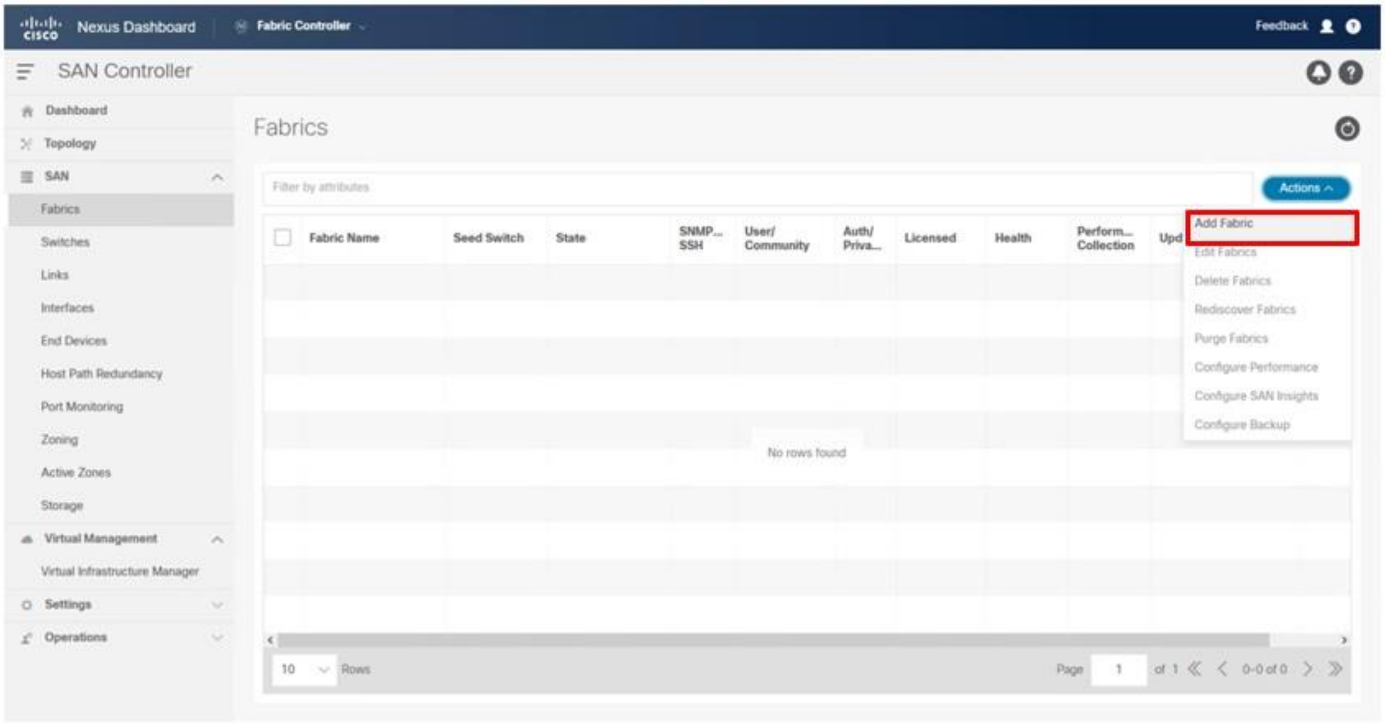


Virtual Infrastructure Manager

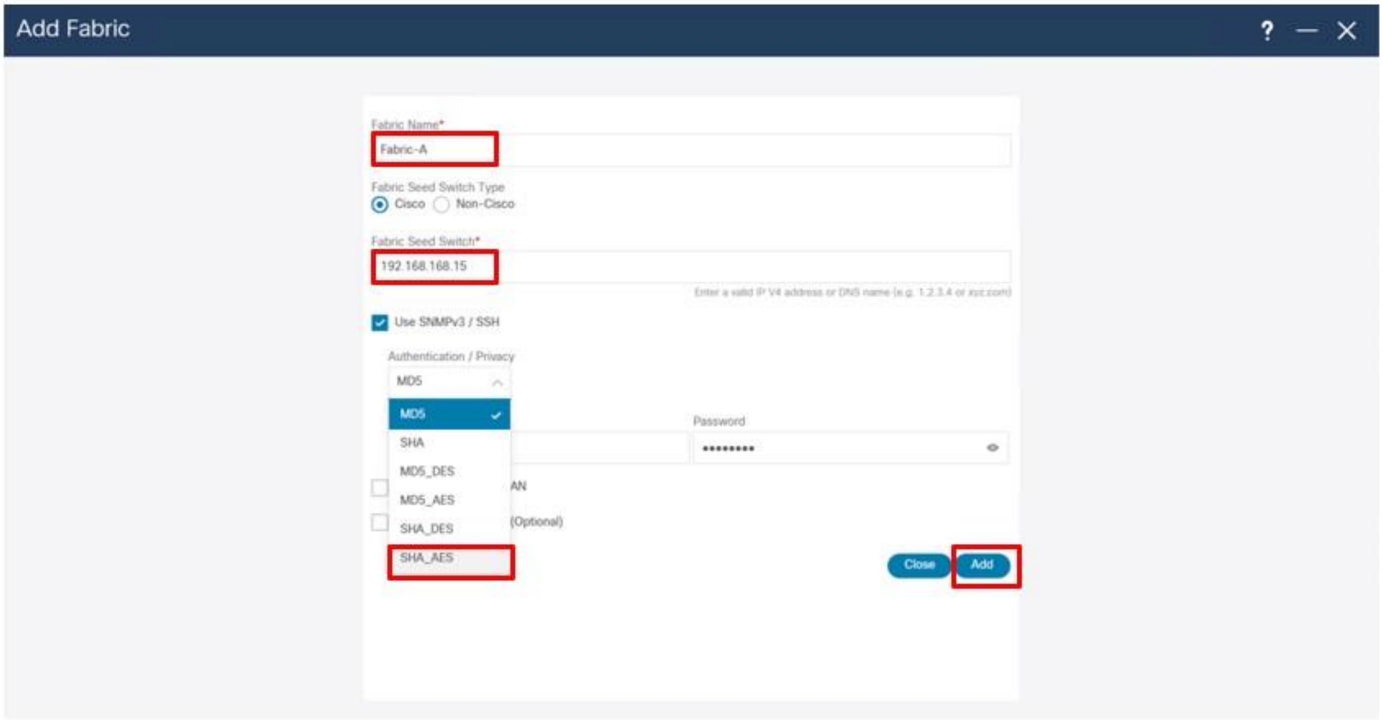
	Server	Type	Version	Managed	Status	User	Last Updated Time
□	10.1.168.100	vCenter	8.0.1.0	managed	OK	administrator@vsphere.local	Fri, 12 Jan 2024 18:45:07 UTC

https://10.1.168.90/appcenter/cisco/ndfc/ui/san-ui/fabrics

Step 11. Click **Actions** and choose **Add Fabric** from the drop-down list.



Step 12. Specify the Fabric Name for the A side Fabric, enter the IP address of the A side MDS, set the Authentication/Privacy to SHA_AES, provide the snmp user created on the switches, and click **Add.**



Add Fabric

Fabric Name*
Fabric-A

Fabric Seed Switch Type
● Cisco ○ Non-Cisco

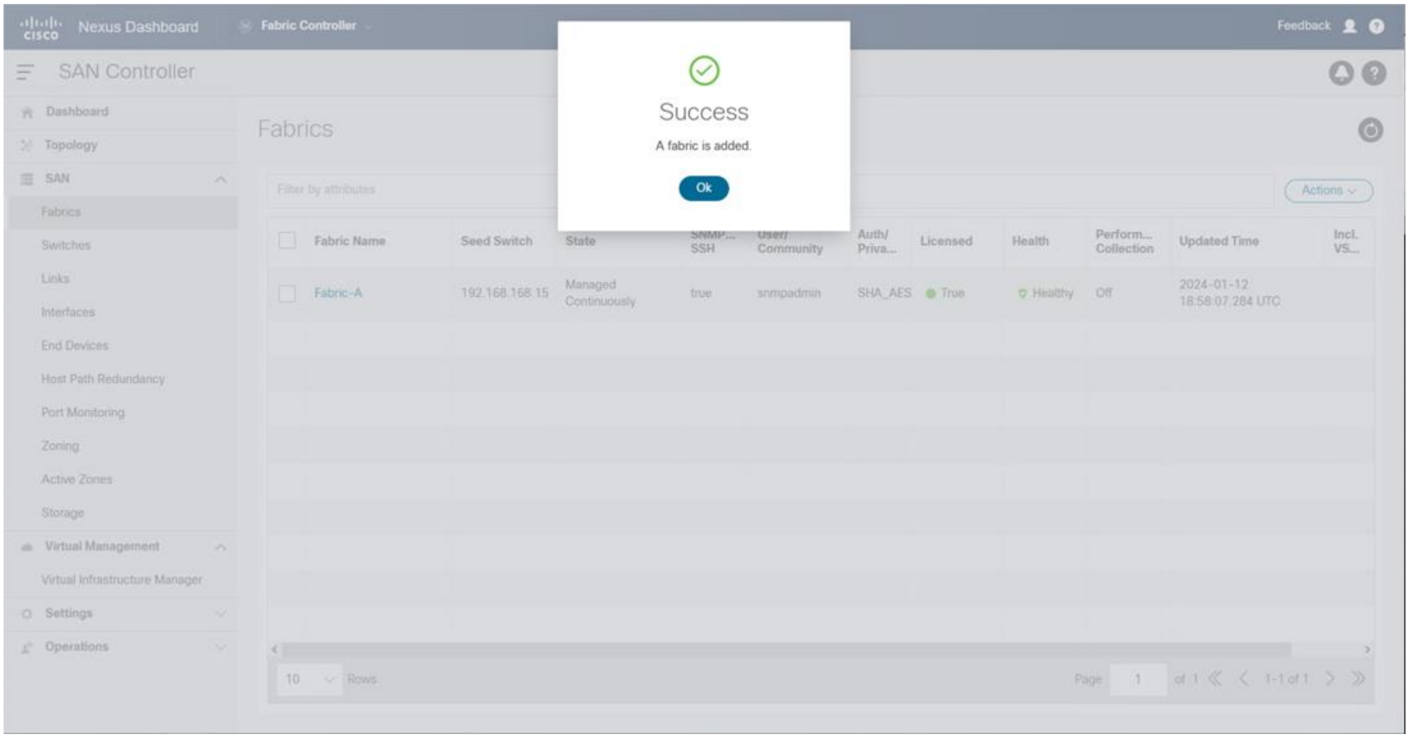
Fabric Seed Switch*
192.168.168.15
Enter a valid IP V4 address or DNS name (e.g. 1.2.3.4 or xyz.com)

☑ Use SNMPv3 / SSH

Authentication / Privacy
MD5

Password
••••••••

Step 13. Click **OK** upon completion and repeat steps 31-32 for Fabric-B.



Fabrics

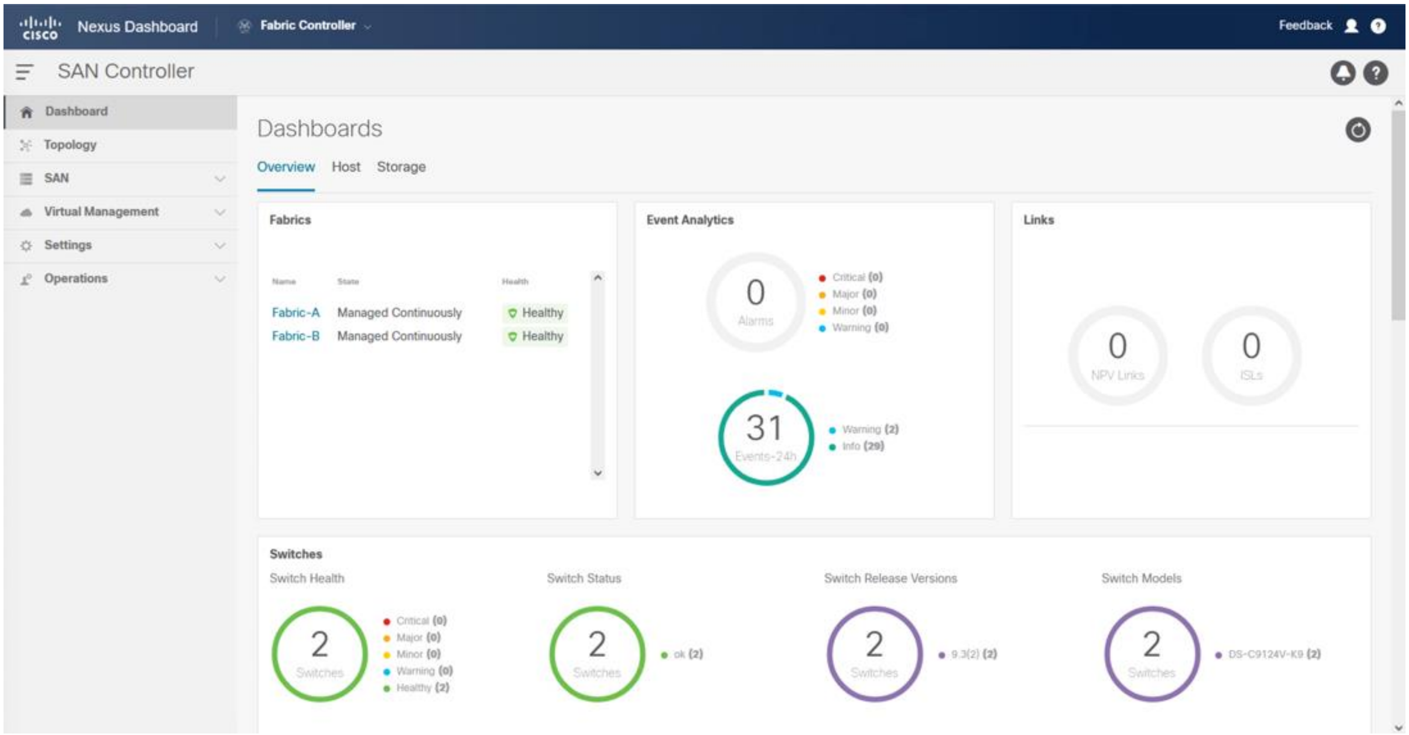
Success

A fabric is added.

Ok

Fabric Name	Seed Switch	State	SNMP... SSH	User/ Community	Auth/ Priva...	Licensed	Health	Perform... Collection	Updated Time	Incl. VS...
Fabric-A	192.168.168.15	Managed Continuously	true	snmpadmin	SHA_AES	● True	Healthy	Off	2024-01-12 18:58:07.284 UTC	

With NDFC SAN in place, the SAN resources can be seen from the Dashboard view:



Dashboards

Fabrics

Name	State	Health
Fabric-A	Managed Continuously	Healthy
Fabric-B	Managed Continuously	Healthy

Event Analytics

0 Alarms: ● Critical (0) ● Major (0) ● Minor (0) ● Warning (0)

31 Events-24h: ● Warning (2) ● Info (29)

Links

0 NPV Links

0 ISLs

Switches

Switch Health: 2 Switches: ● Critical (0) ● Major (0) ● Minor (0) ● Warning (0) ● Healthy (2)

Switch Status: 2 Switches: ● ok (2)

Switch Release Versions: 2 Switches: ● 9.3(2) (2)

Switch Models: 2 Switches: ● DS-C9124V-K9 (2)

The management and operation functions available include SAN zoning, image management of the MDS switches, Device Manager, and Backup/Restore functions.

VMware vSphere 8.0U1 Setup

This chapter contains the following:

This chapter provides detailed instructions for installing VMware ESXi 8.0U1 within Adaptive Solutions. On successful completion of these steps, multiple ESXi hosts will be provisioned and ready to be added to VMware vCenter.

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 Intersight to map remote installation media to individual servers.

VMware ESXi Installation

Procedure 1. Download VMware ESXi ISO

Step 1. Click the following link: Cisco Custom Image for ESXi 8.0 U1 Install CD.

Note: You will need a VMware user id and password on vmware.com to download this software.

Step 2. Download the **.iso** file.

Procedure 2. Log into Cisco Intersight and Access KVM

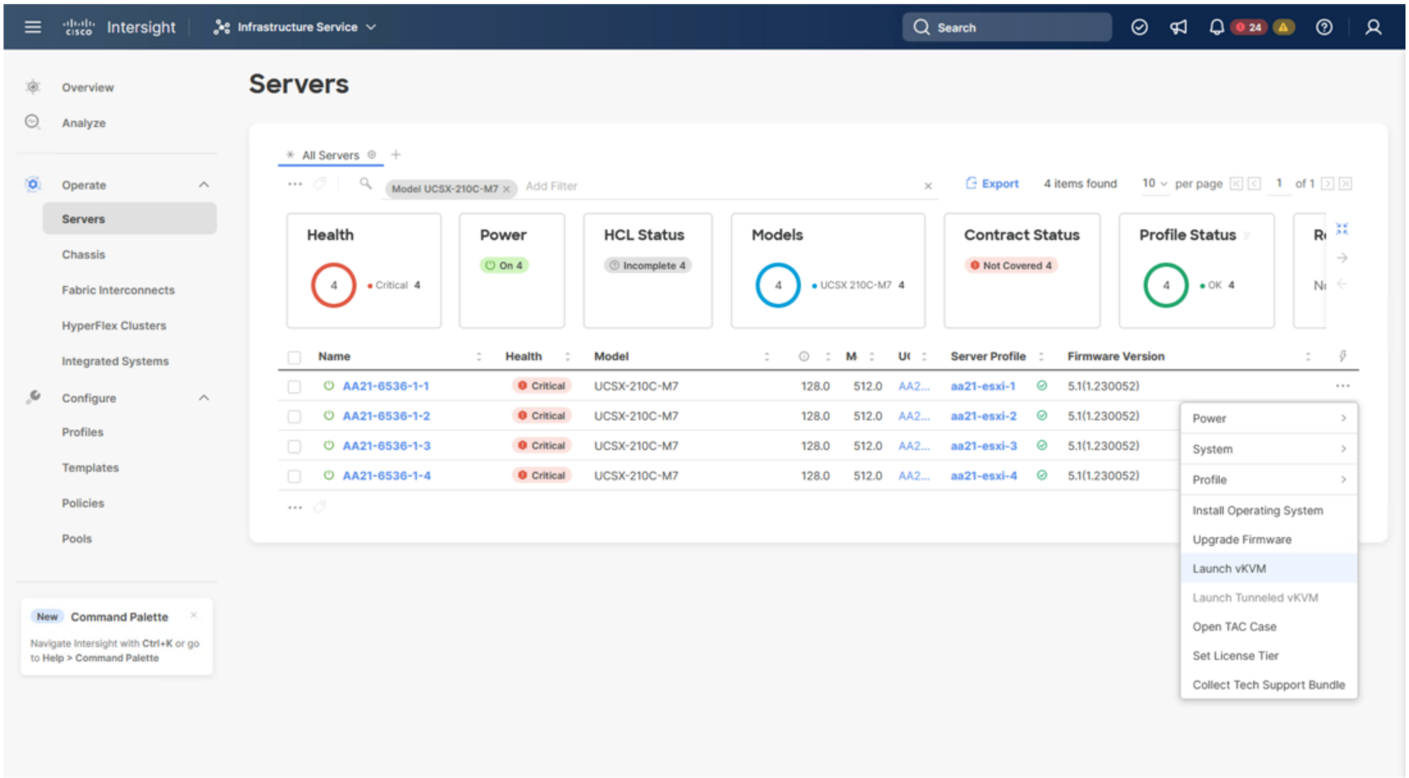
The Cisco Intersight KVM enables the administrators to begin the installation of the operating system (OS) through remote media. It is necessary to log into the Cisco Intersight to access the UCS Server KVM connections.

Step 1. Log into **Cisco Intersight**.

Step 2. From the main menu, go to **Infrastructure Service** > **Servers**.

Step 3. Find the Server with the desired Server Profile assigned and click “**...**” to see more options

Step 4. Click **Launch vKVM**.



Name	Health	Model	ⓘ	M	U(	Server Profile	Firmware Version
AA21-6536-1-1	Critical	UCSX-210C-M7	128.0	512.0	AA2...	aa21-esxi-1 ✓	5.1(1.230052)
AA21-6536-1-2	Critical	UCSX-210C-M7	128.0	512.0	AA2...	aa21-esxi-2 ✓	5.1(1.230052)
AA21-6536-1-3	Critical	UCSX-210C-M7	128.0	512.0	AA2...	aa21-esxi-3 ✓	5.1(1.230052)
AA21-6536-1-4	Critical	UCSX-210C-M7	128.0	512.0	AA2...	aa21-esxi-4 ✓	5.1(1.230052)

Step 5. Follow the prompts and ignore certificate workings (if any) and launch the HTML5 KVM console.

Step 6. Repeat steps 1 - 5 to launch the vKVM console for all the ESXi servers.

Procedure 3. Prepare the Server for the OS Installation

Note: Follow these steps on **each** ESXi host.

Step 1. In the KVM window, click **Virtual Media** > **vKVM-Mapped vDVD**.

Step 2. Browse and select the ESXi installer ISO image file downloaded in Procedure 1 Download VMware ESXi ISO (VMware-ESXi-8.0.U1a-21813344-Custom-Cisco-4.3.1-a).

Step 3. Click **Map Drive**.

Step 4. Go to **Power** > **Reset System and Confirm** to reboot the server if the server is showing a shell prompt. If the server is shut down, click **Power** > **Power On System**.

Step 5. Monitor the server boot process in the KVM. The server should find the boot LUNs and begin to load the ESXi installer.

Note: If the ESXi installer fails to load because the software certificates cannot be validated, reset the server, and when prompted, press F2 to go into BIOS and set the system time and date to current. The ESXi installer should load properly.

Procedure 4. Install VMware ESXi onto the bootable LUN of the UCS Servers

Note: Follow these steps on **each** host.

Step 1. After the ESXi installer is finished loading (from the last step), press **Enter** to continue with the installation.

Step 2. Read and accept the end-user license agreement (EULA). Press **F11** to accept and continue.

Note: It may be necessary to map function keys as User Defined Macros under the Macros menu in the KVM console.

Step 3. Select the Hitachi VSP boot LUN that was previously set up as the installation disk for ESXi and press **Enter** to continue with the installation.

Step 4. Select the appropriate keyboard layout and press **Enter**.

Step 5. Enter and confirm the root password and press **Enter**.

Step 6. The installer issues a warning that the selected disk will be repartitioned. Press **F11** to continue with the installation.

Step 7. After the installation is complete, press **Enter** to reboot the server. The ISO will be unmapped automatically.

Procedure 5. Add the Management Network for each VMware Host

Note: This is required for managing the host. To configure the ESXi host with access to the management network, follow these steps on **each** ESXi host.

Step 1. After the server has finished rebooting, in the UCS KVM console, press **F2** to customize VMware ESXi.

Step 2. Log in as **root**, enter the password set during installation, and press **Enter** to log in.

Step 3. Use the down arrow key to choose **Troubleshooting Options** and press **Enter**.

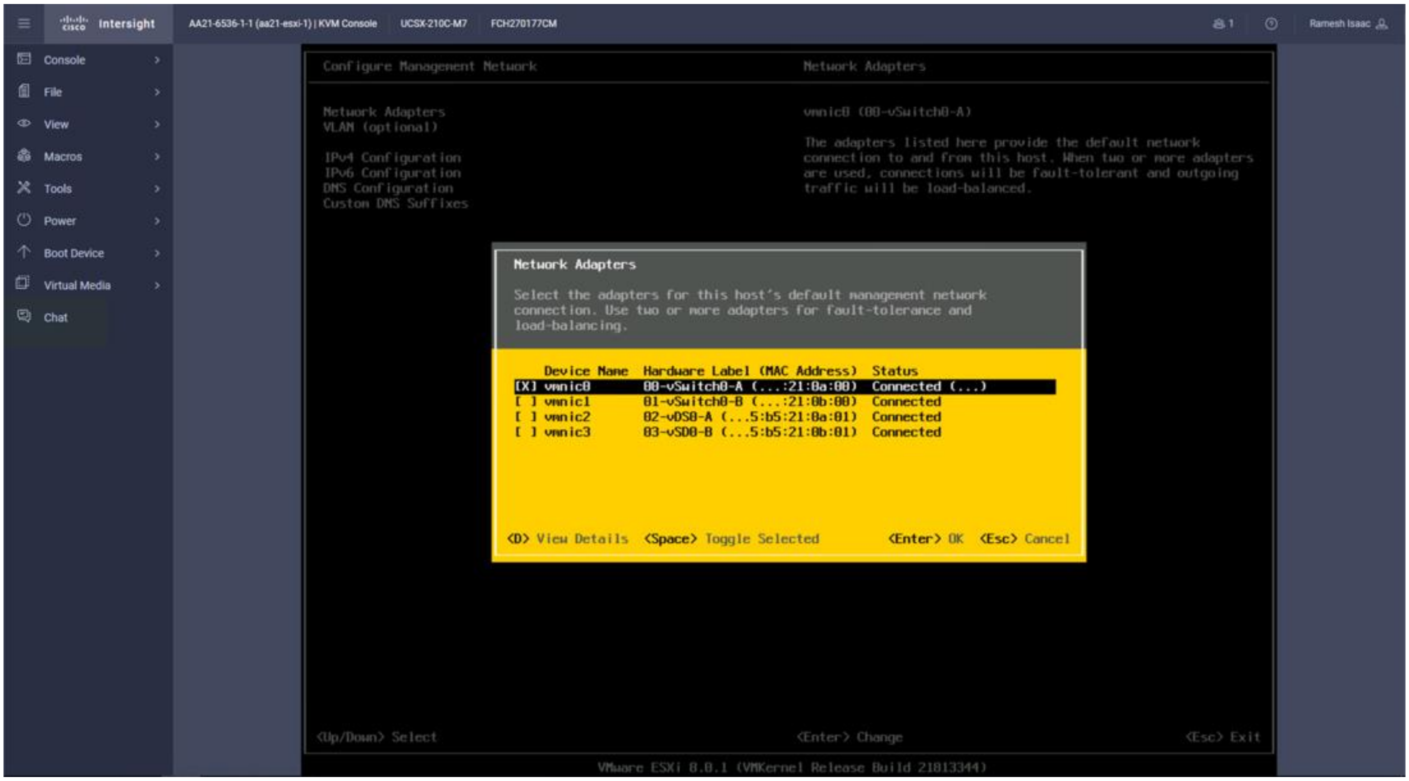
Step 4. Select **Enable ESXi Shell** and press **Enter**.

Step 5. Select **Enable SSH** and press **Enter**.

Step 6. Press **Esc** to exit the Troubleshooting Options menu.

Step 7. Select the **Configure Management Network** option and press **Enter**.

Step 8. Select **Network Adapters** and press **Enter**. Ensure the vmnic numbers align with the numbers under the Hardware Label (for example, vmnic0 and 00-vSwitch0-A). If these numbers do not align, note which vmnics are assigned to which vNICs (indicated under Hardware Label).



```
Configure Management Network                          Network Adapters

Network Adapters                                      vmnic0 (00-vSwitch0-A)
VLAN (optional)
                                                      The adapters listed here provide the default network
IPv4 Configuration                                    connection to and from this host. When two or more adapters
IPv6 Configuration                                    are used, connections will be fault-tolerant and outgoing
DNS Configuration                                     traffic will be load-balanced.
Custom DNS Suffixes

          Network Adapters

          Select the adapters for this host's default management network
          connection. Use two or more adapters for fault-tolerance and
          load-balancing.

              Device Name  Hardware Label (MAC Address)  Status
          [X] vmnic0       00-vSwitch0-A (...:21:0a:00)  Connected (...)
          [ ] vmnic1       01-vSwitch0-B (...:21:0b:00)  Connected
          [ ] vmnic2       02-vDS0-A (...5:b5:21:0a:01)  Connected
          [ ] vmnic3       03-vSD0-B (...5:b5:21:0b:01)  Connected

          <D> View Details  <Space> Toggle Selected        <Enter> OK  <Esc> Cancel

<Up/Down> Select                                <Enter> Change                                <Esc> Exit
                          VMware ESXi 8.0.1 (VMKernel Release Build 21813344)
```

Step 9. Arrow down to select **vmnic1** and press the spacebar to select it.

Step 10. Press **Enter**.

Note: In the UCS Configuration portion of this document, the IB-MGMT VLAN was set as the native VLAN on the 00-vSwitch0-A and 01-vSwitch0-B vNICs. Because of this, the IB-MGMT VLAN should not be set here and should remain **Not set**.

Step 11. Select **IPv4 Configuration** and press **Enter**.

Note: When using DHCP to set the ESXi host networking configuration, setting up a manual IP address is not required.

Step 12. Select the **Set static IPv4 address and network configuration** option by using the arrow keys and space bar.

Step 13. Under **IPv4 Address**, enter the IP address for managing the ESXi host.

Step 14. Under **Subnet Mask**, enter the subnet mask.

Step 15. Under **Default Gateway**, enter the default gateway.

Step 16. Press **Enter** to accept the changes to the IP configuration.

Step 17. Select the I**Pv6 Configuration** option and press **Enter**.

Step 18. Using the spacebar, choose **Disable IPv6 (restart required)** and press **Enter**.

Step 19. Select the **DNS Configuration** option and press **Enter**.

Note: If the IP address is configured manually, the DNS information must be provided.

Step 20. Using the spacebar, select the following DNS server addresses and hostname:

- Under **Primary DNS Server**, enter the IP address of the primary DNS server.
- Optional: Under **Alternate DNS Server,** enter the IP address of the secondary DNS server.
- Under **Hostname**, enter the fully qualified domain name (FQDN) for the ESXi host.
- Press **Enter** to accept the changes to the DNS configuration.
- Press **Esc** to exit the Configure Management Network submenu.
- Press **Y** to confirm the changes and reboot the ESXi host.

Procedure 6. (Optional) Reset VMware ESXi Host VMkernel Port MAC Address

Note: By default, the MAC address of the management VMkernel port vmk0 is the same as the MAC address of the Ethernet port it is placed on. If the ESXi host's boot LUN is remapped to a different server with different MAC addresses, a MAC address conflict will exist because vmk0 will retain the assigned MAC address unless the ESXi System Configuration is reset.

Step 1. From the ESXi console menu main screen, select **Macros > Static Macros > Ctrl + Alt + F's > Ctrl + Alt + F1** to access the VMware console command line interface.

Step 2. Log in as **root**.

Step 3. Type "`esxcfg-vmknic –l`" to get a detailed listing of interface vmk0. vmk0 should be a part of the "Management Network" port group. Note the IP address and netmask of vmk0.

Step 4. To remove vmk0, type `esxcfg-vmknic –d "Management Network"`.

Step 5. To re-add vmk0 with a random MAC address, type `esxcfg-vmknic –a –i <vmk0-ip> -n <vmk0-netmask> "Management Network"`.

Step 6. Verify vmk0 has been re-added with a random MAC address by typing `esxcfg-vmknic –l`.

Step 7. Tag vmk0 as the management interface by typing `esxcli network ip interface tag add -i vmk0 -t Management`.

Step 8. When vmk0 was re-added, if a message pops up saying vmk1 was marked as the management interface, type `esxcli network ip interface tag remove -i vmk1 -t Management`.

Step 9. Press **Ctrl-D** to log out of the ESXi console.

Step 10. Select **Macros** > **Static Macros** > **Ctrl + Alt + F's** > **Ctrl + Alt + F2** to return to the VMware ESXi menu.

VMware ESXi Configuration

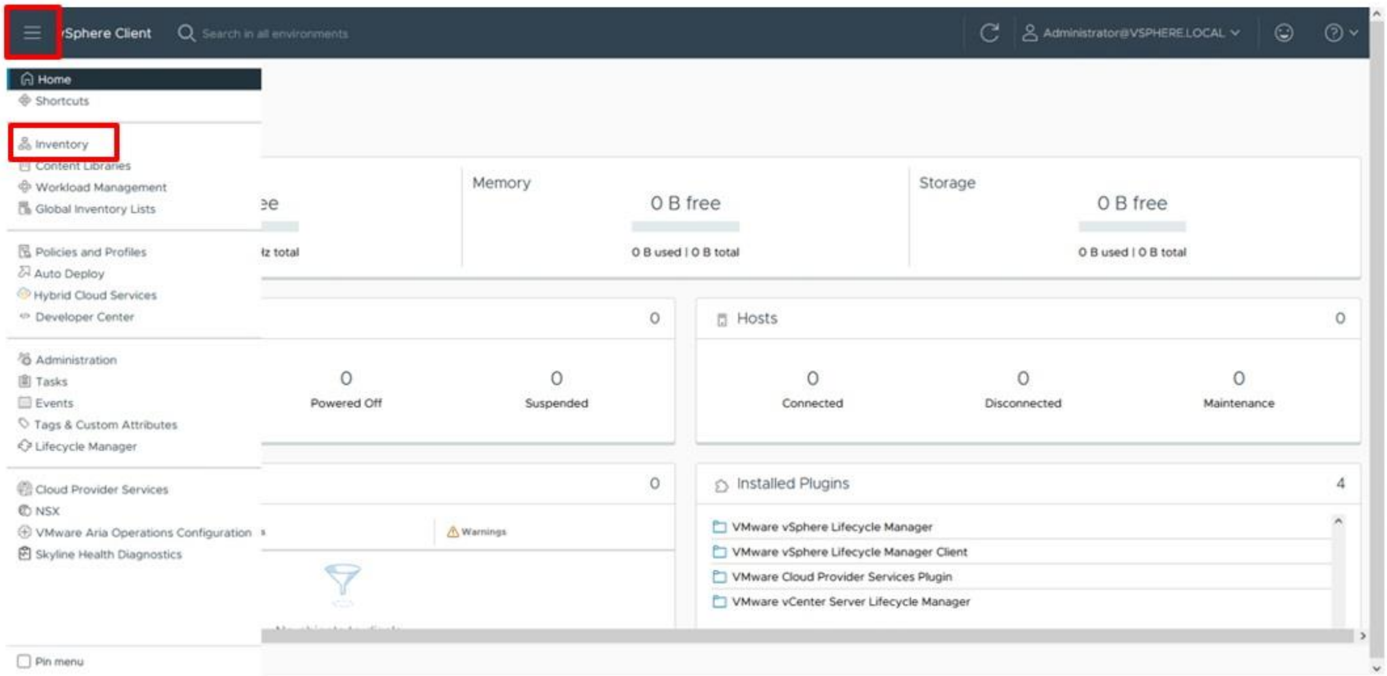
With the UCS servers finished with their ESXi installation and basic configuration, they can now be added to the vCenter.

Note: In the validated environment, the vCenter is deployed within an existing management cluster independent of the Adaptive Solutions VSI environment. The vCenter Appliance could be deployed within the VSI itself with a first host that is configured through the vSphere web client and had the VSP VMFS datastores associated to it, but that is not covered in our deployment example.

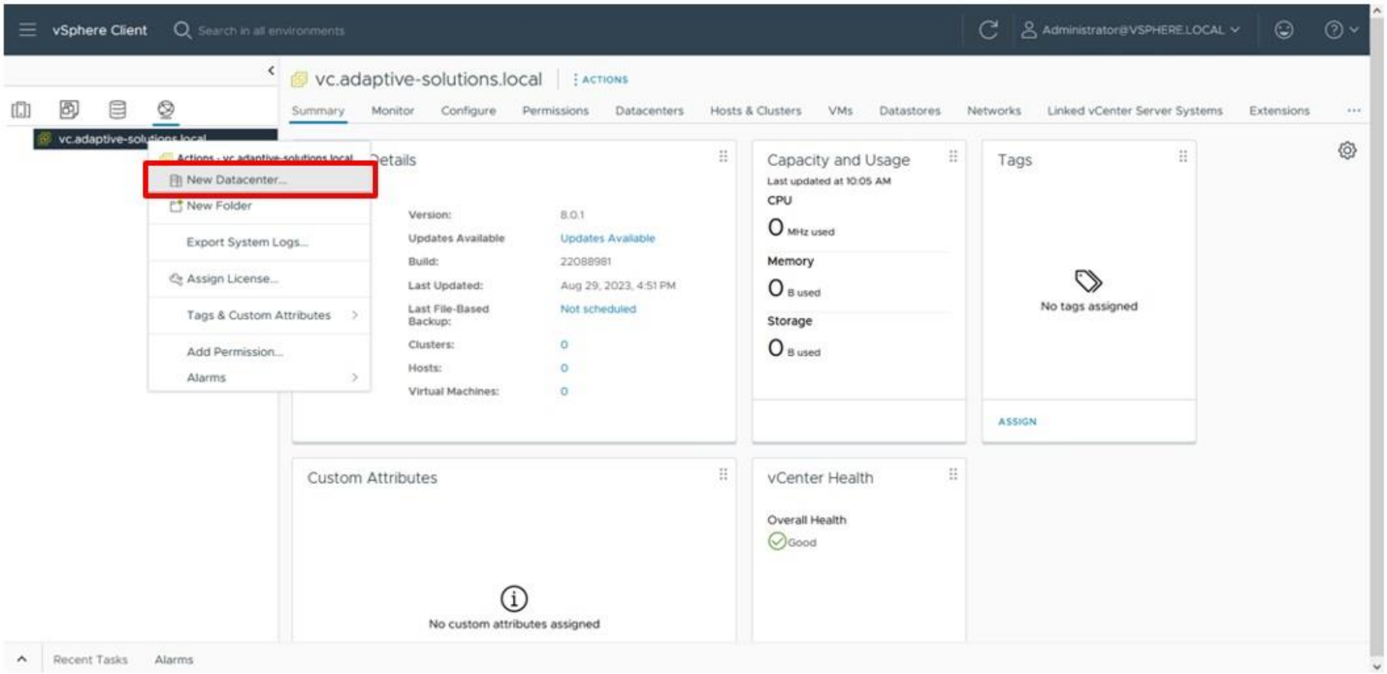
Procedure 1. Add deployed ESXi instance to the vCenter

Step 1. Open a web browser and navigate to the vCenter server.

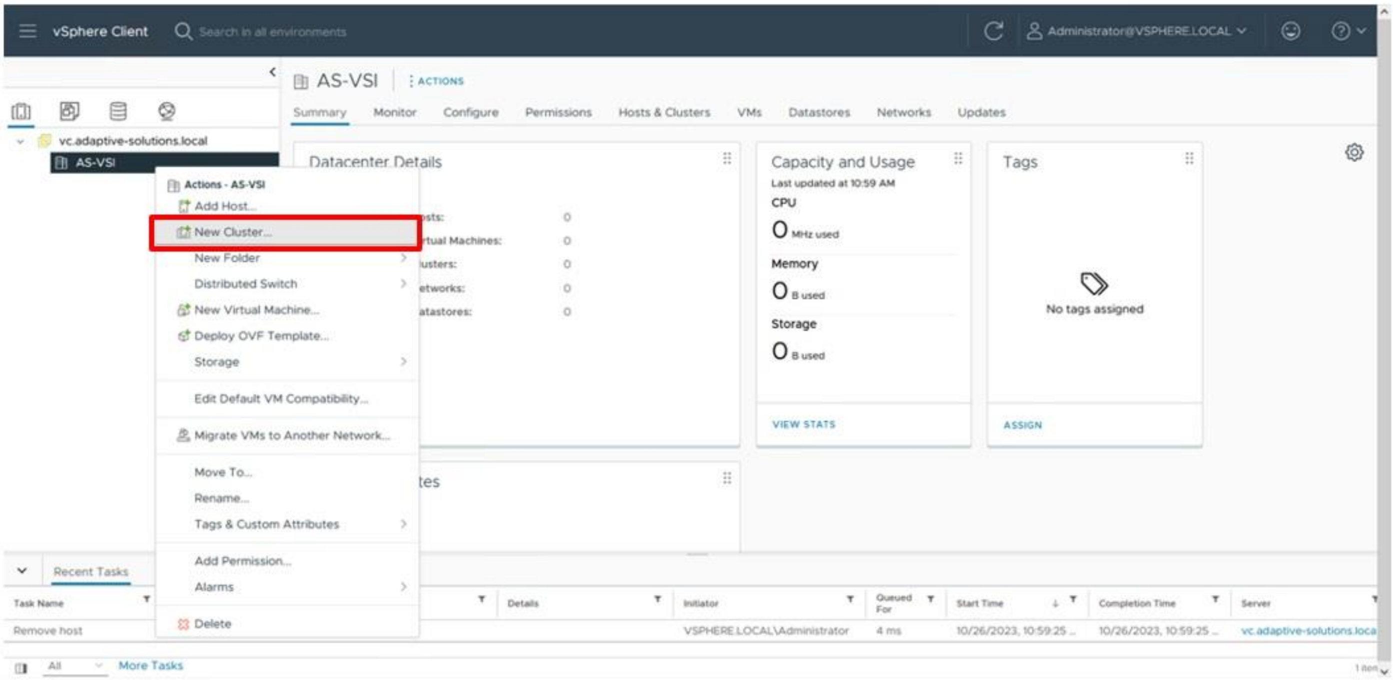
Step 2. Select the top left tribar symbol to open the menu options and select the **Inventory** option.



Step 3. If there is not an established Datacenter object within the vCenter, right-click the vCenter on the left and select **New Datacenter**... provide the Datacenter with an appropriate name.

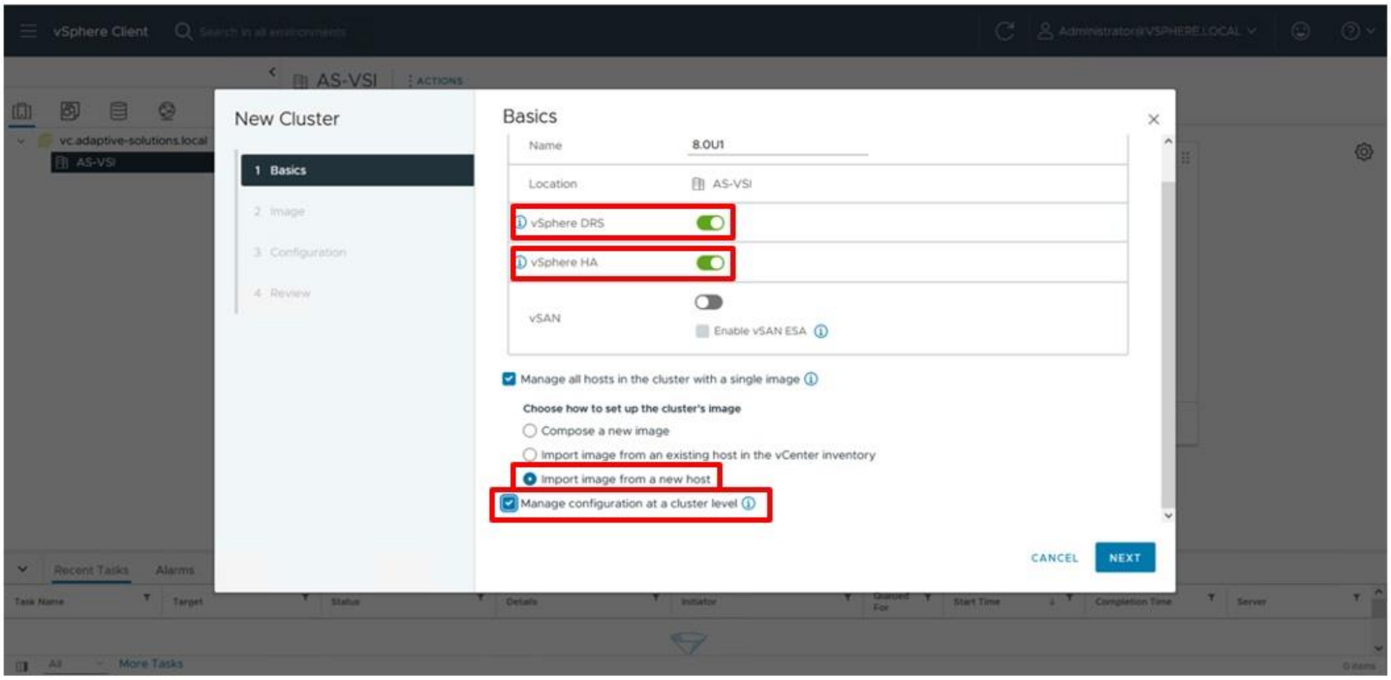


Step 4. Right-click the Datacenter object and select the **New Cluster...** option.



Task Name	Details	Initiator	Queued For	Start Time	Completion Time	Server
Remove host		VSPHERE.LOCAL\Administrator	4 ms	10/26/2023, 10:59:25 ...	10/26/2023, 10:59:25 ...	vc.adaptive-solutions.loca

Step 5. Provide a name for the Cluster, enable **vSphere DRS** and **vSphere HA**, select **Import image from a new host**, check the box for **Manage configuration at a cluster level**, and click **NEXT**.



Name: 8.0U1

Location: AS-VSI

vSphere DRS: on

vSphere HA: on

vSAN: off

□ Enable vSAN ESA

☑ Manage all hosts in the cluster with a single image

Choose how to set up the cluster's image

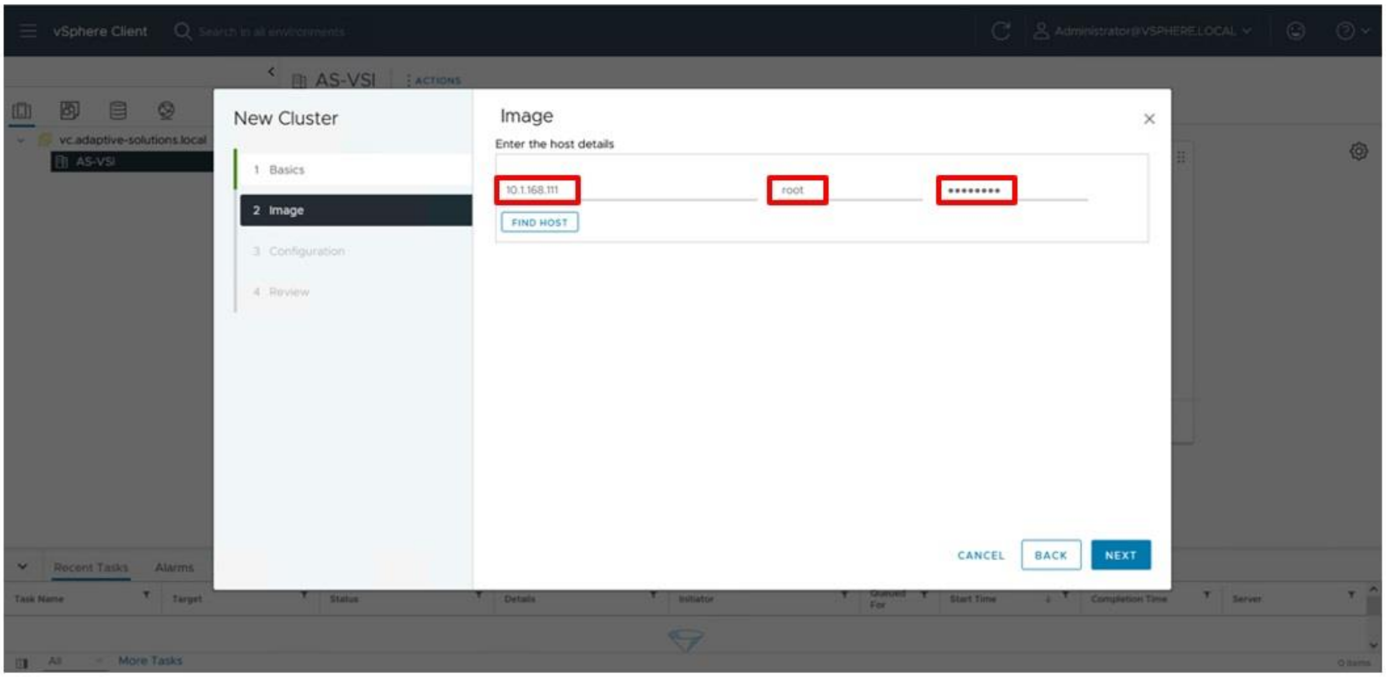
○ Compose a new image

○ Import image from an existing host in the vCenter inventory

● Import image from a new host

☑ Manage configuration at a cluster level

Step 6. Enter the IP or FQDN of the first host, enter root for the username, and provide the password specified during initial setup. Click **FIND HOST**.



Image

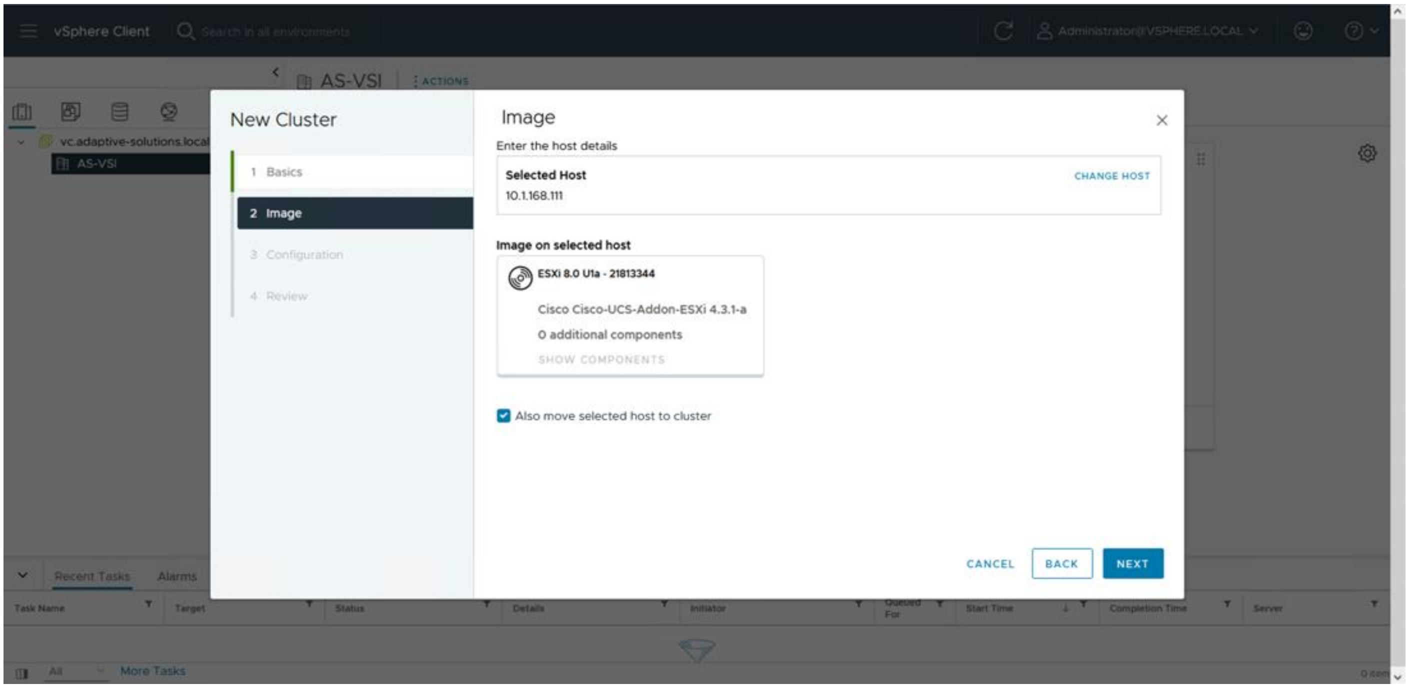
Enter the host details

10.1.168.111 | root | ********

FIND HOST

Step 7. Click **Yes** past the Security Alert if prompted.

Step 8. Confirm the host is found correctly. Leave Also move select host to cluster selected and click **Next**.



Image

Enter the host details

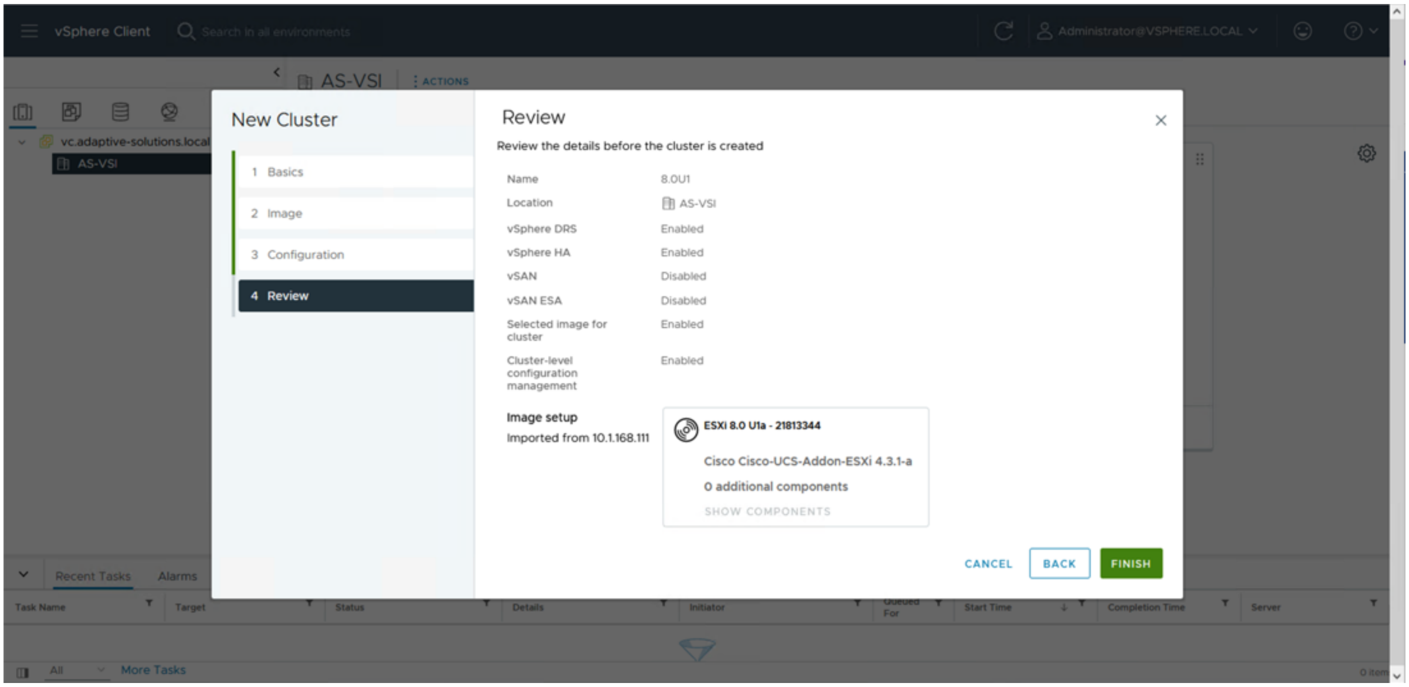
Selected Host
10.1.168.111

Image on selected host

ESXi 8.0 U1a - 21813344
Cisco Cisco-UCS-Addon-ESXi 4.3.1-a
0 additional components

☑ Also move selected host to cluster

Step 9. Click **NEXT** past the Configuration screen dialogue summary. Confirm the cluster options and image setup within Review and click **FINISH**.



New Cluster

1 Basics
2 Image
3 Configuration
4 Review

Review

Review the details before the cluster is created

Name	8.0U1
Location	AS-VSI
vSphere DRS	Enabled
vSphere HA	Enabled
vSAN	Disabled
vSAN ESA	Disabled
Selected image for cluster	Enabled
Cluster-level configuration management	Enabled

Image setup
Imported from 10.1.168.111

ESXi 8.0 U1a - 21813344
Cisco Cisco-UCS-Addon-ESXi 4.3.1-a
0 additional components
SHOW COMPONENTS

CANCEL BACK FINISH

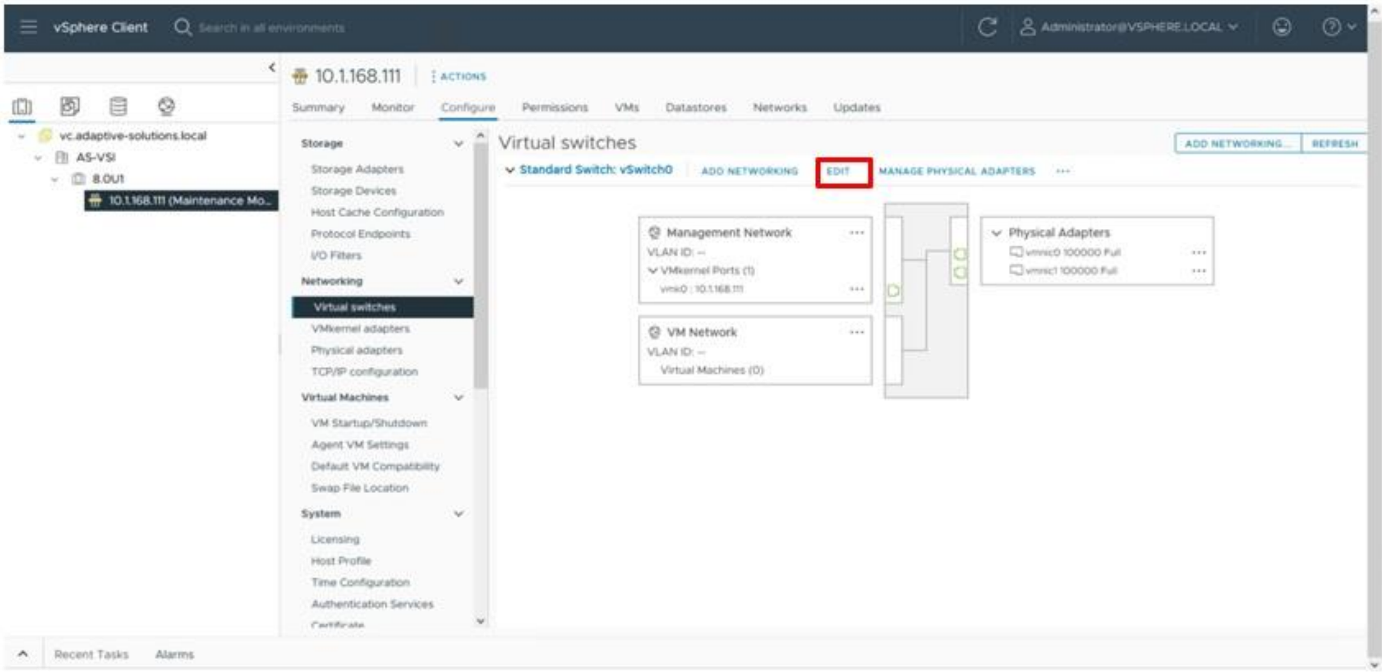
Note: The added ESXi host will have Warnings that the ESXi Shell and SSH have been enabled. These warnings can be suppressed. The host will also have a TPM Encryption Key Recovery alert that can be acknowledged and reset to green.

VMware ESXi Configuration for the first ESXi Host

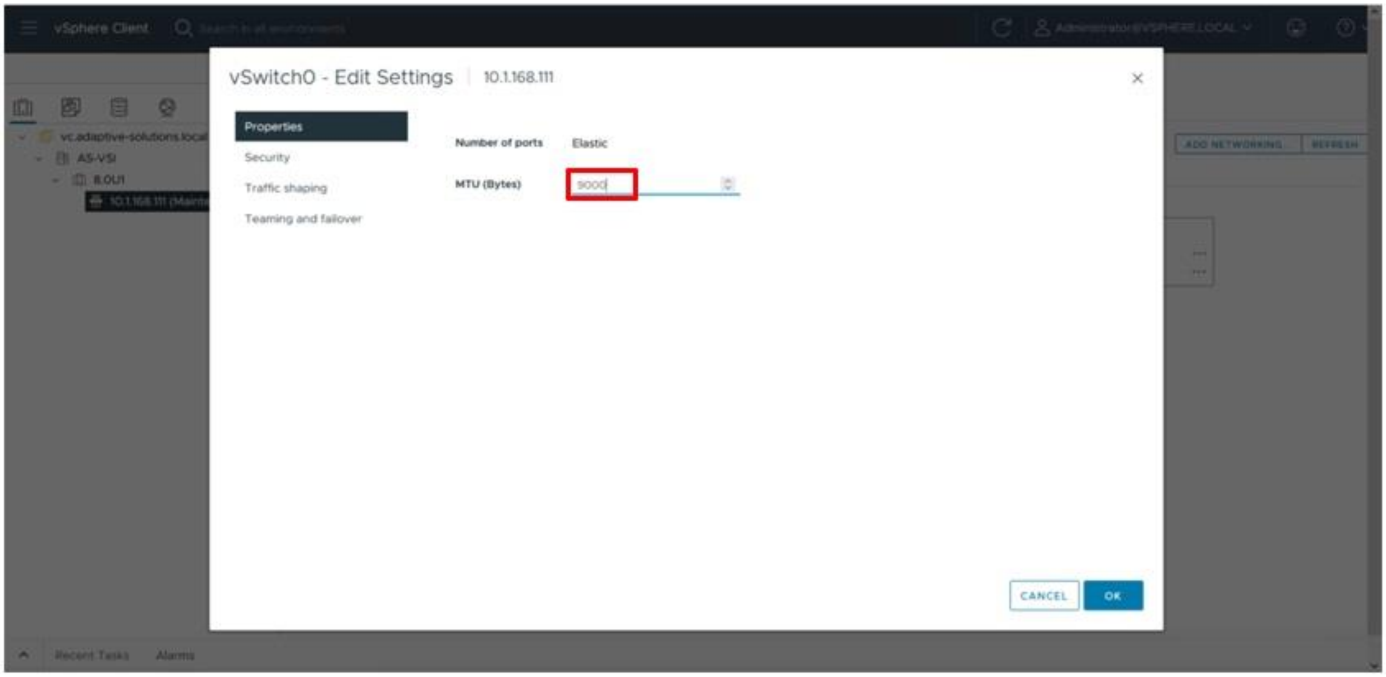
Procedure 1. Set Up VMkernel Ports and Virtual Switch

Step 1. Select the added host from within the new cluster, go to **Configure > Networking > Virtual Switches**.

Step 2. Click **EDIT**.



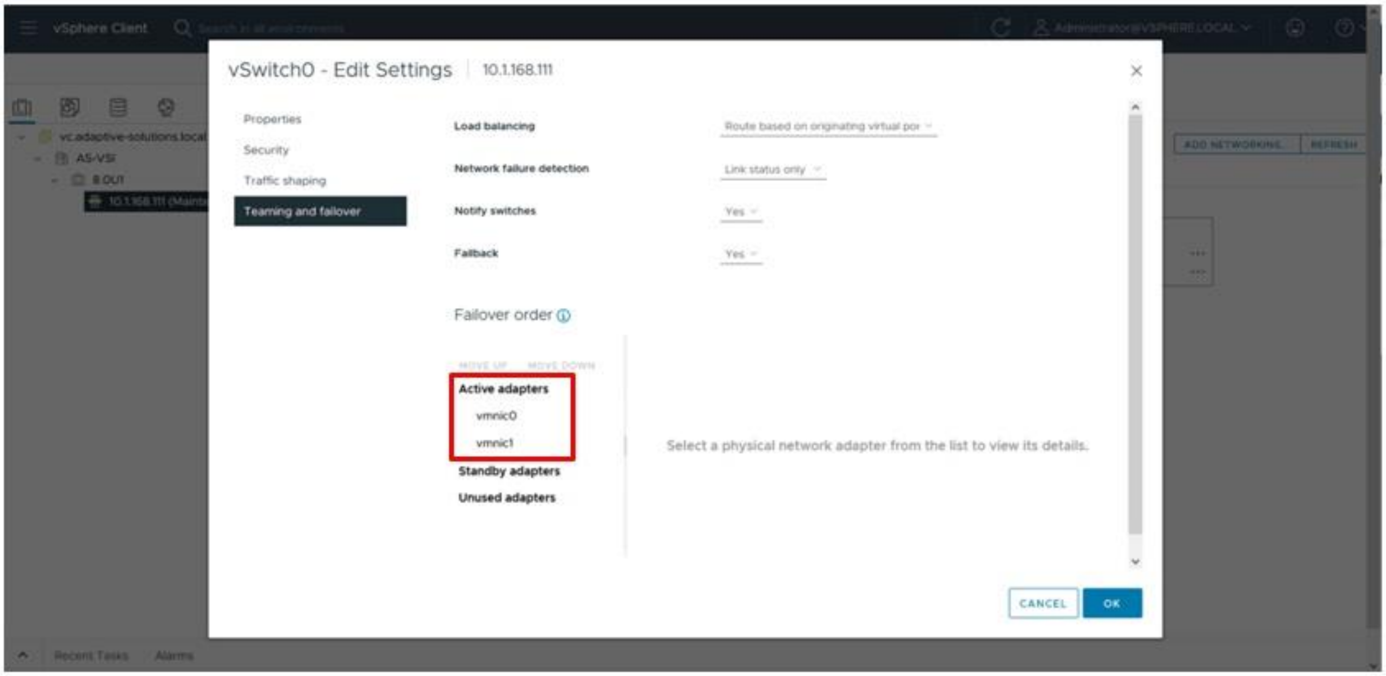
Step 3. Set the MTU to **9000**.


vSwitch0 - Edit Settings | 10.1.168.111

Number of ports: Elastic

MTU (Bytes): 9000

Step 4. Select Teaming and failover and confirm that both vmnic0 and vmnic1 are shown as Active adapters for vSwitch0, adjust adapters with **MOVE UP** and **MOVE DOWN** options if needed. Click **OK**.



vSwitch0 - Edit Settings | 10.1.168.111

Load balancing: Route based on originating virtual por

Network failure detection: Link status only

Notify switches: Yes

Fallback: Yes

Failover order

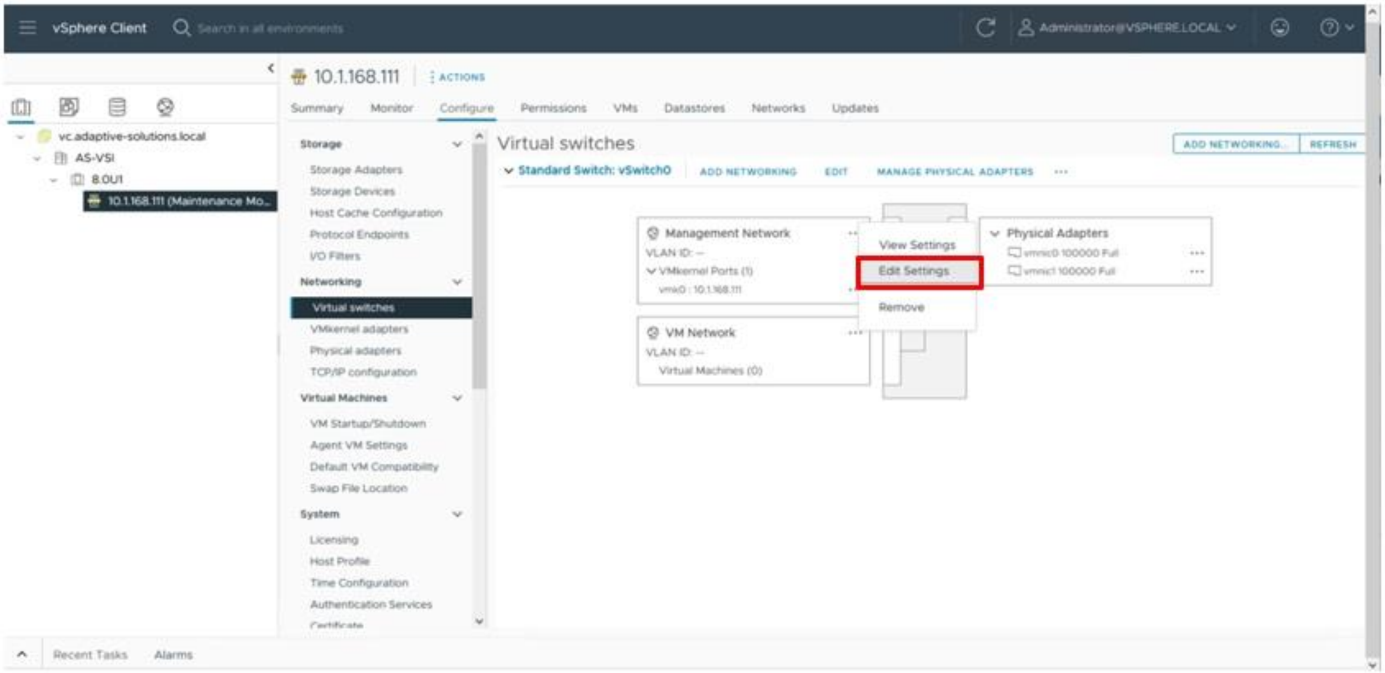
Active adapters
- vmnic0
- vmnic1

Standby adapters

Unused adapters

Select a physical network adapter from the list to view its details.

Step 5. Click the **...** next to the VM Network port group and select **Edit Settings**.

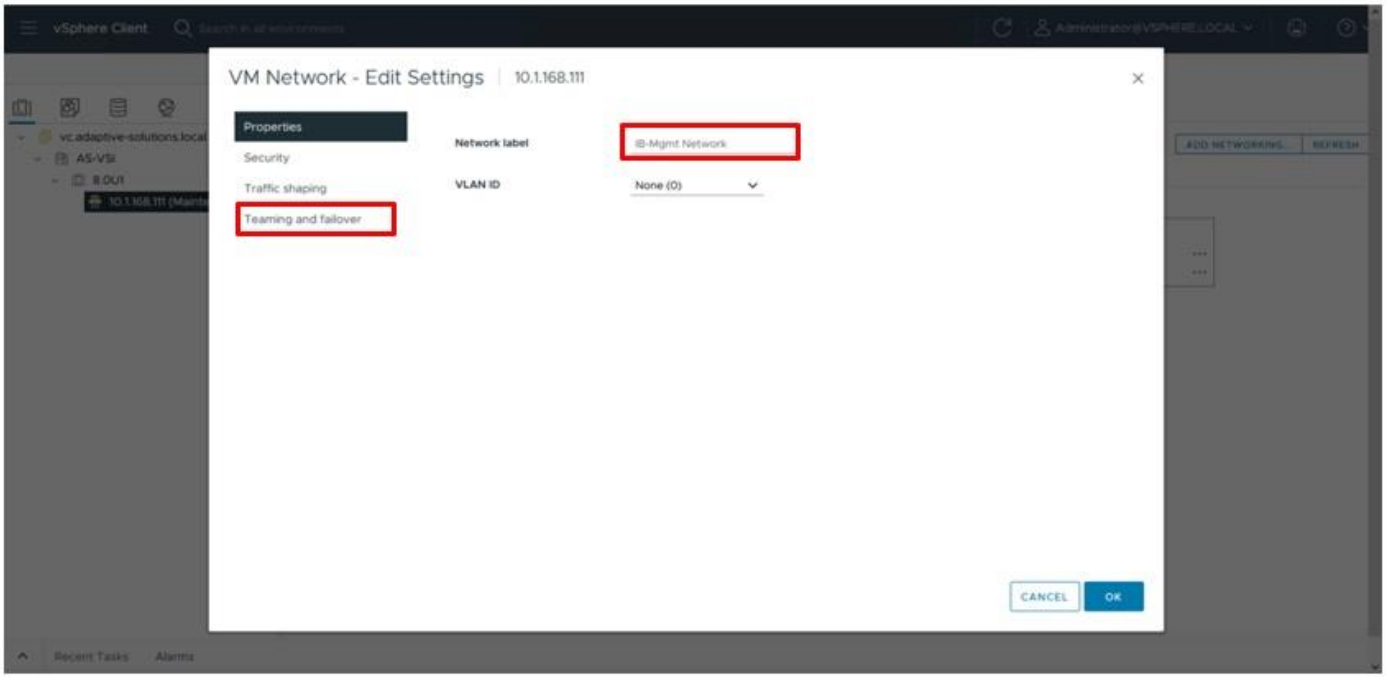


Management Network
VLAN ID: --
VMkernel Ports (1)
vmk0 : 10.1.168.111

VM Network
VLAN ID: --
Virtual Machines (0)

Physical Adapters
vmnic0 100000 Full
vmnic1 100000 Full

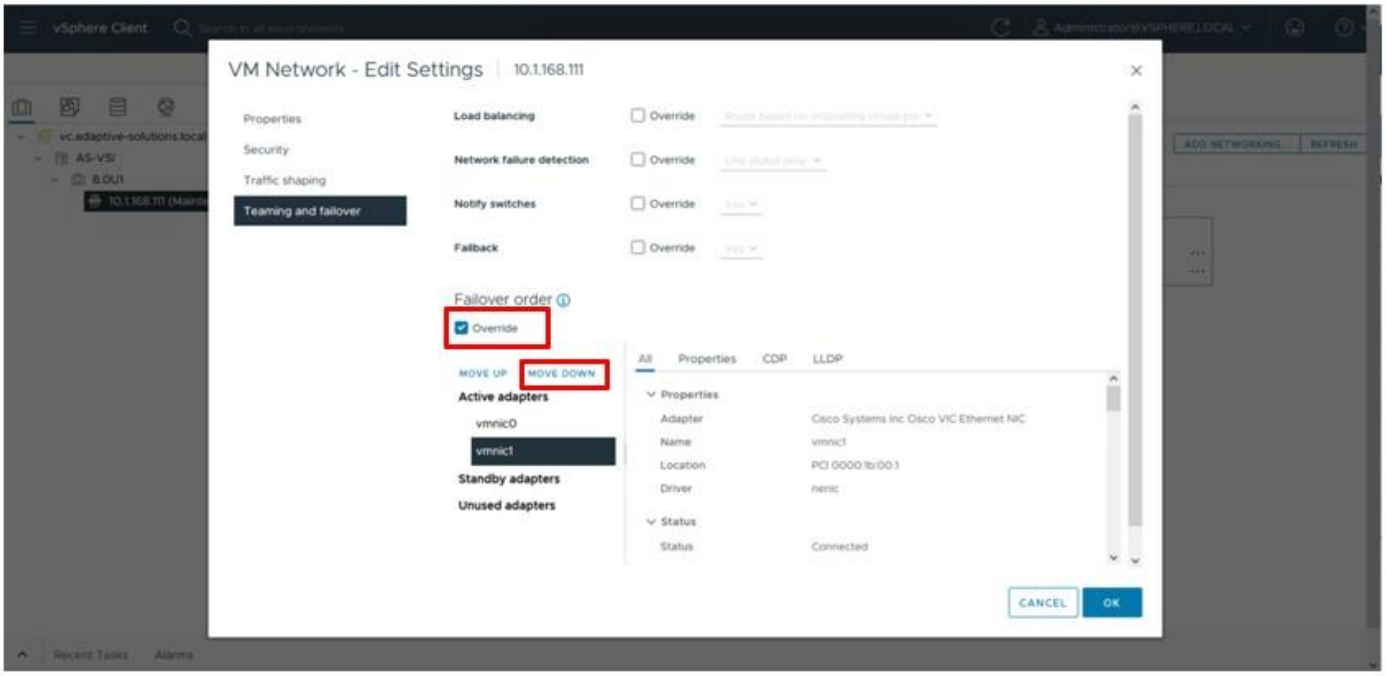
Step 6. Change the name of VM Network to **IB-Mgmt Network** and click **Teaming and failover.**



Network label: IB-Mgmt Network

VLAN ID: None (0)

Step 7. Select the **Override** checkbox, select the vmnic1 adapter and click the **MOVE DOWN** option. Click **OK**.



Load balancing ☐ Override Route based on originating virtual port

Network failure detection ☐ Override Link status only

Notify switches ☐ Override Yes

Failback ☐ Override Yes

Failover order

☑ Override

Active adapters
- vmnic0
- vmnic1

Standby adapters

Unused adapters

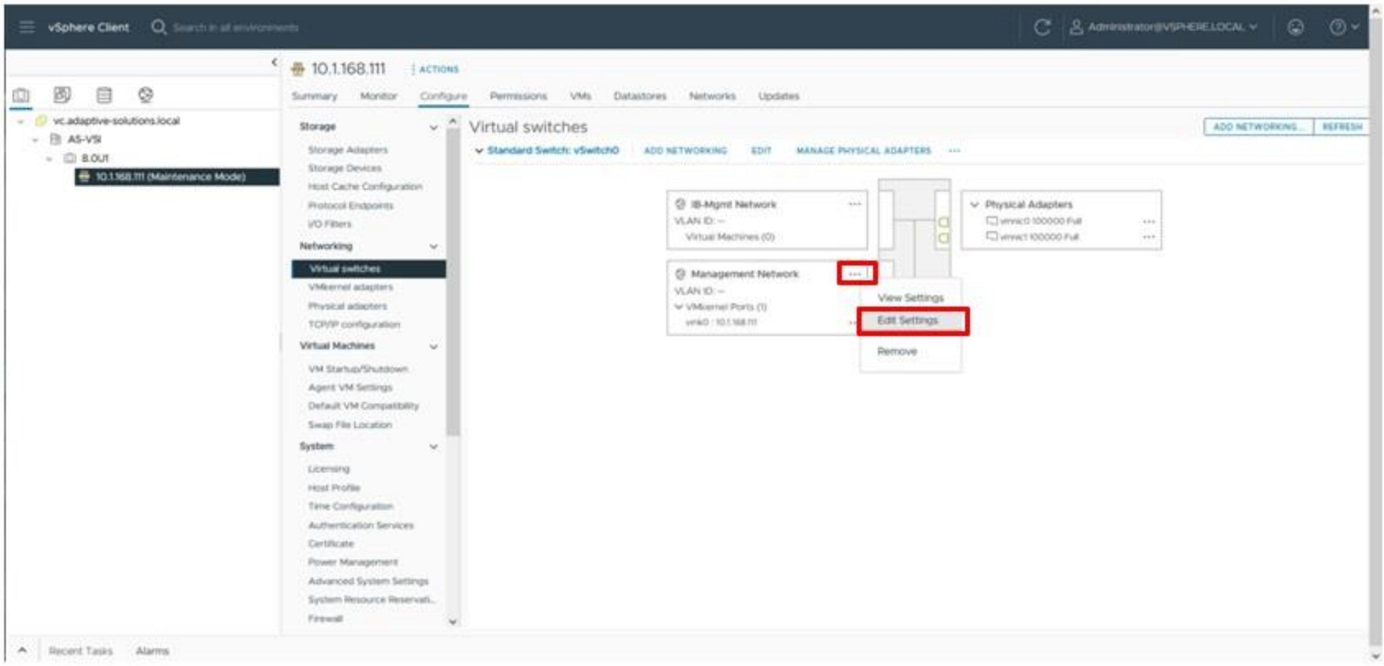
Properties

Adapter	Cisco Systems Inc Cisco VIC Ethernet NIC
Name	vmnic1
Location	PCI 0000:1b:00.1
Driver	nenic

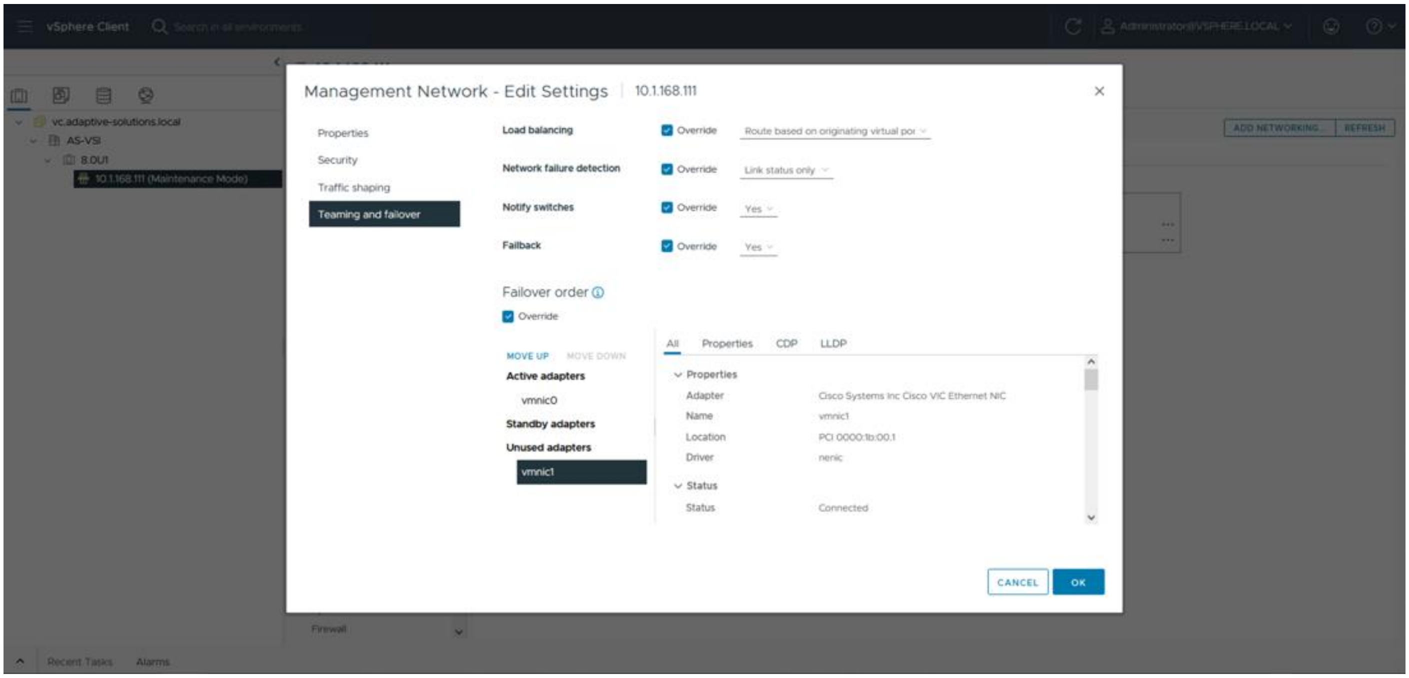
Status

Status	Connected

Step 8. Click the **...** next to the Management Network port group and select **Edit Settings**.



Step 9. Click **Teaming and failover**.

Management Network - Edit Settings | 10.1.168.111

Load balancing	☑ Override	Route based on originating virtual por
Network failure detection	☑ Override	Link status only
Notify switches	☑ Override	Yes
Failback	☑ Override	Yes

Failover order

☑ Override

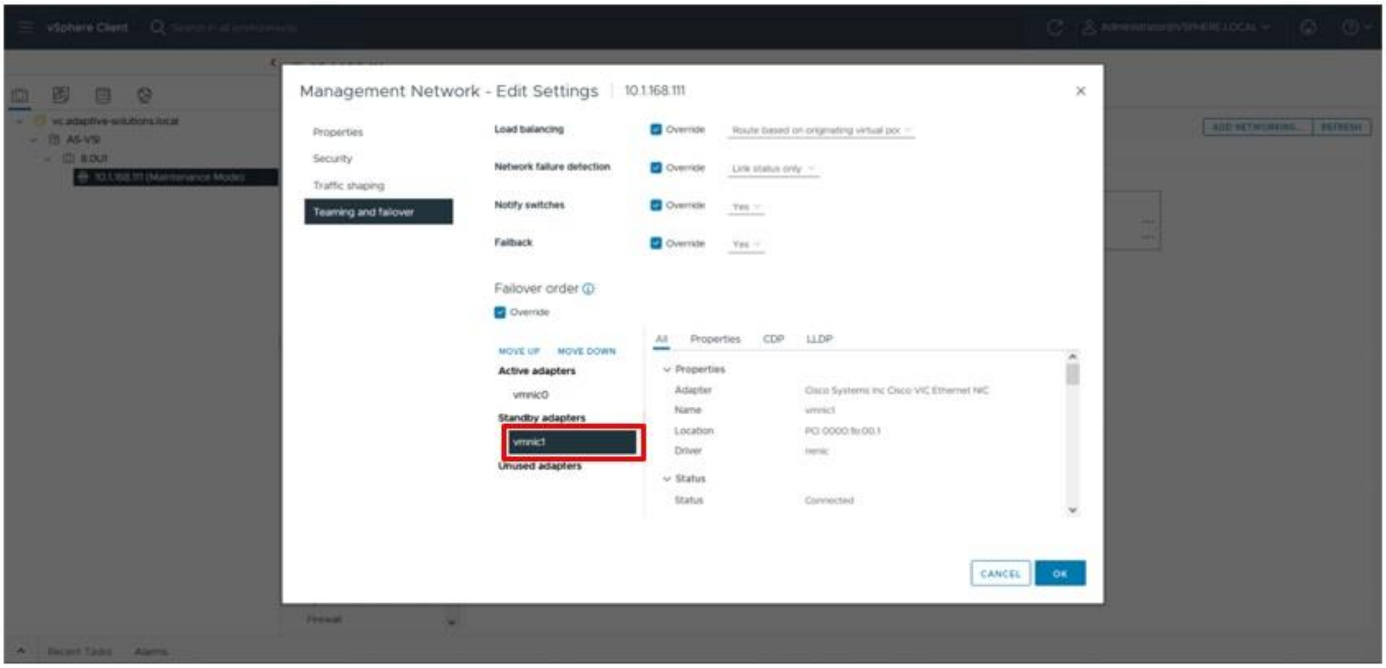
Active adapters: vmnic0

Standby adapters:

Unused adapters: vmnic1

Adapter	Cisco Systems Inc Cisco VIC Ethernet NIC
Name	vmnic1
Location	PCI 0000:1b:00.1
Driver	nenic
Status	Connected

Step 10. Select **vmnic1** and move it to the **Standby adapters** category within **Failover order** and click **OK**.



Management Network - Edit Settings | 10.1.168.111

Load balancing ☑ Override Route based on originating virtual por

Network failure detection ☑ Override Link status only

Notify switches ☑ Override Yes

Failback ☑ Override Yes

Failover order

☑ Override

Active adapters

vmnic0

Standby adapters

vmnic1

Unused adapters

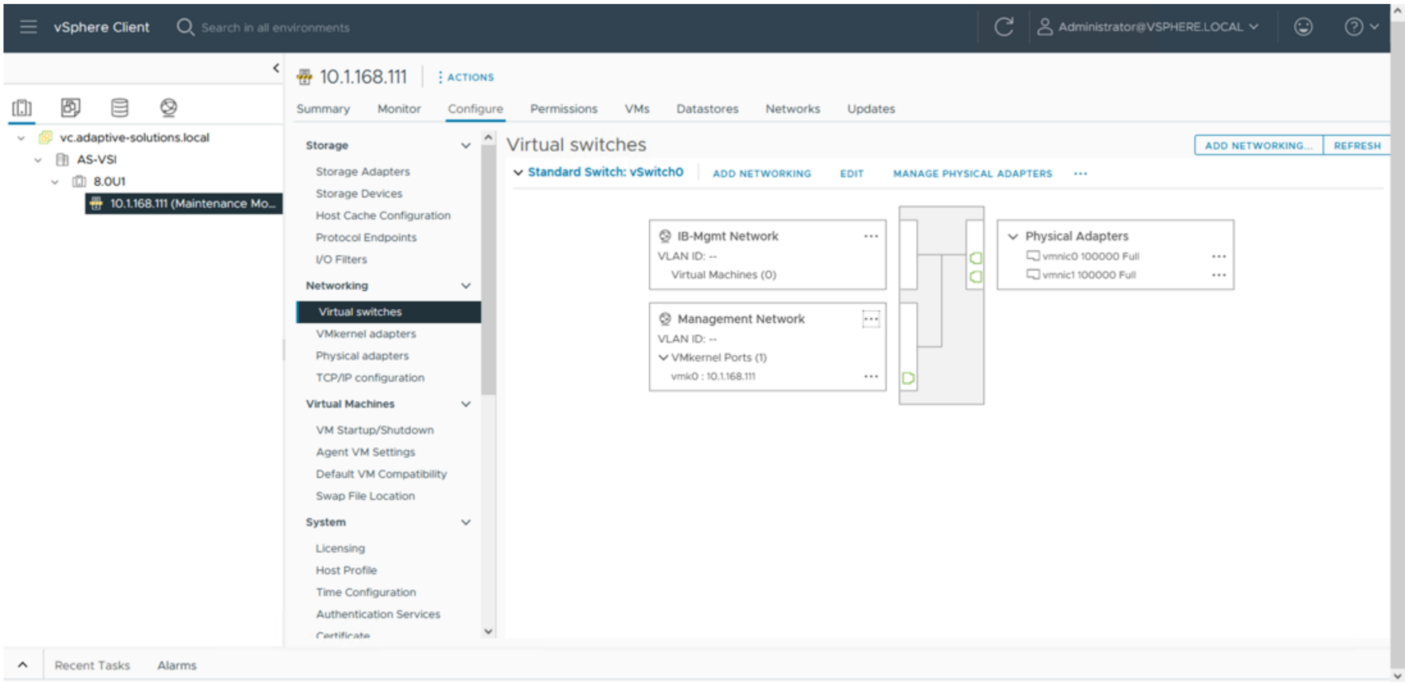
Properties

Adapter	Cisco Systems Inc Cisco VIC Ethernet NIC
Name	vmnic1
Location	PCI 0000:fe:00.1
Driver	nenic

Status

Status	Connected

The properties for vSwitch0 appear as shown below:



IB-Mgmt Network
VLAN ID: --
Virtual Machines (0)

Management Network
VLAN ID: --
VMkernel Ports (1)
vmk0 : 10.1.168.111

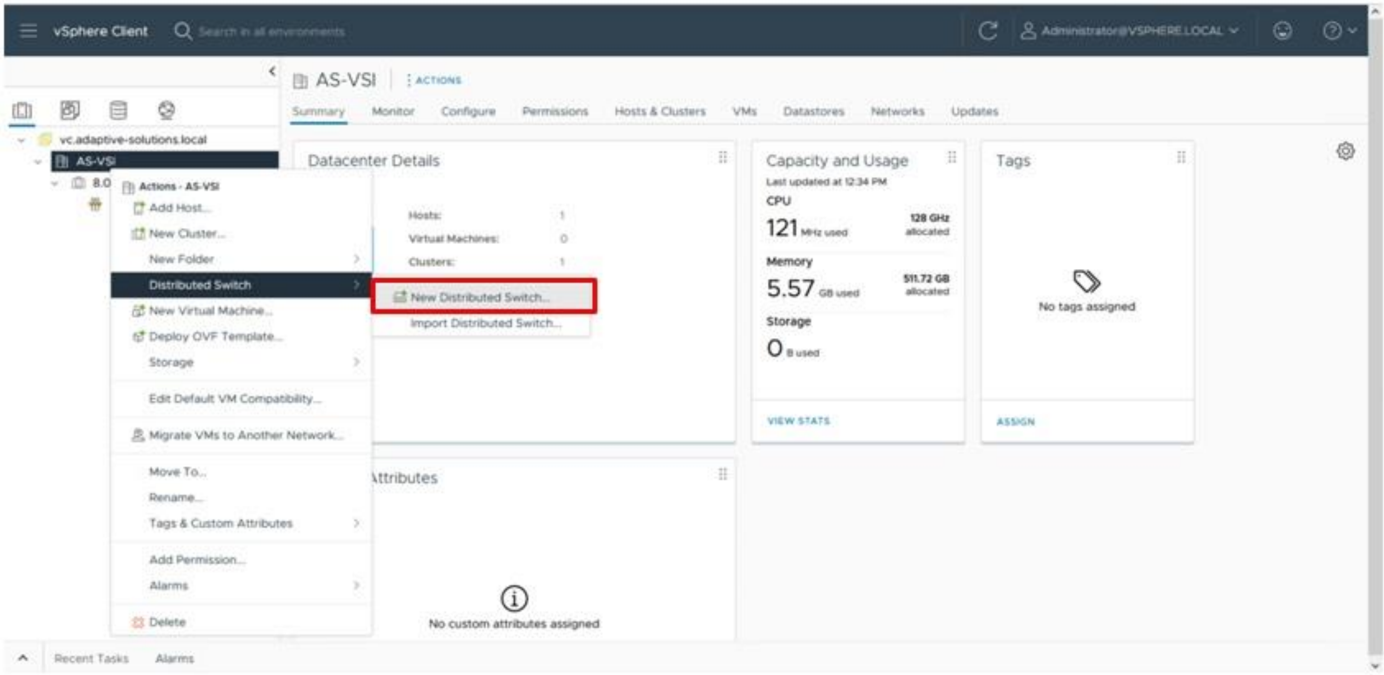
Physical Adapters
vmnic0 100000 Full
vmnic1 100000 Full

Procedure 2. Create VMware vDS for vMotion and Application Traffic

The VMware vDS setup will create a single vDS for vMotion and Application traffic.

To configure the first VMware vDS, follow these steps:

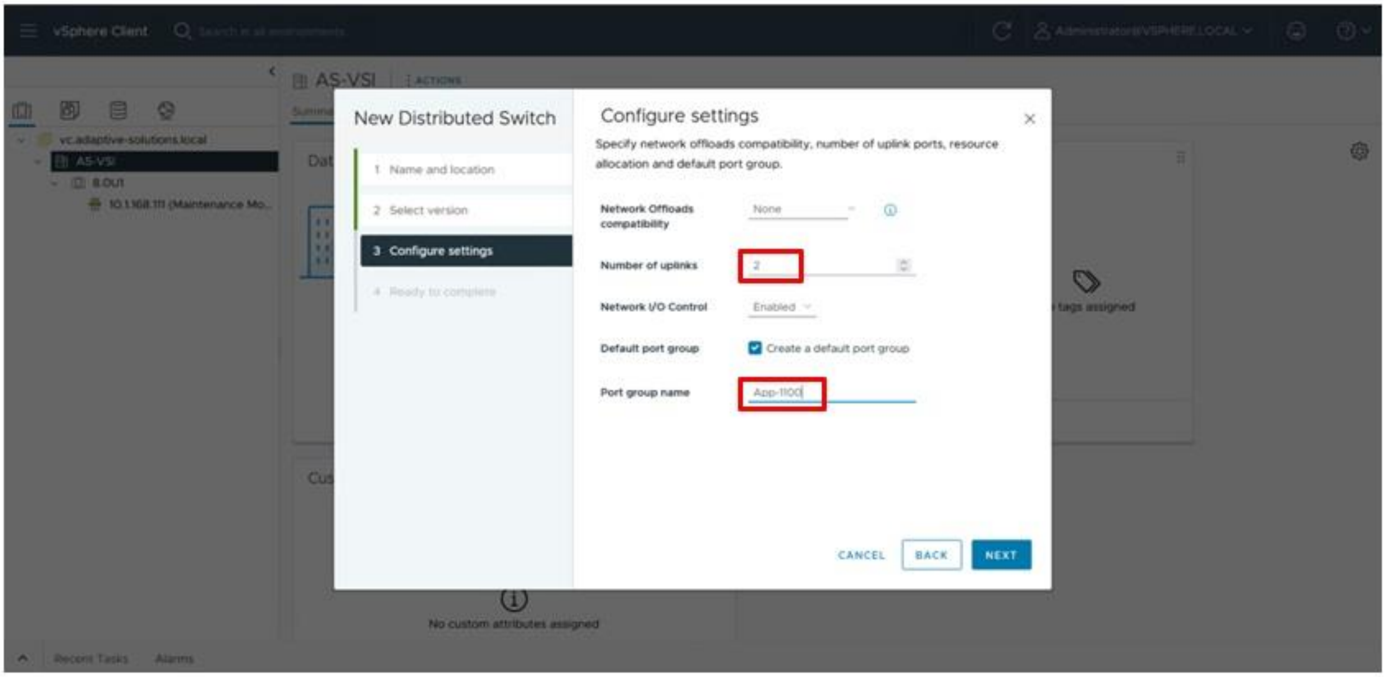
Step 1. Right-click the **AS-VSI** datacenter and select **Distributed Switch > New Distributed Switch…**



Step 2. Provide a name for the distributed switch and click **NEXT**.

Step 3. Leave 8.0.0 selected for the distributed switch version and click **NEXT**.

Step 4. Lower the **Number of uplinks** from 4 to 2 and provide **Port group name** for the default port group to align with the Application traffic. Click **NEXT**.


New Distributed Switch

Configure settings

Specify network offloads compatibility, number of uplink ports, resource allocation and default port group.

Network Offloads compatibility: None

Number of uplinks: 2

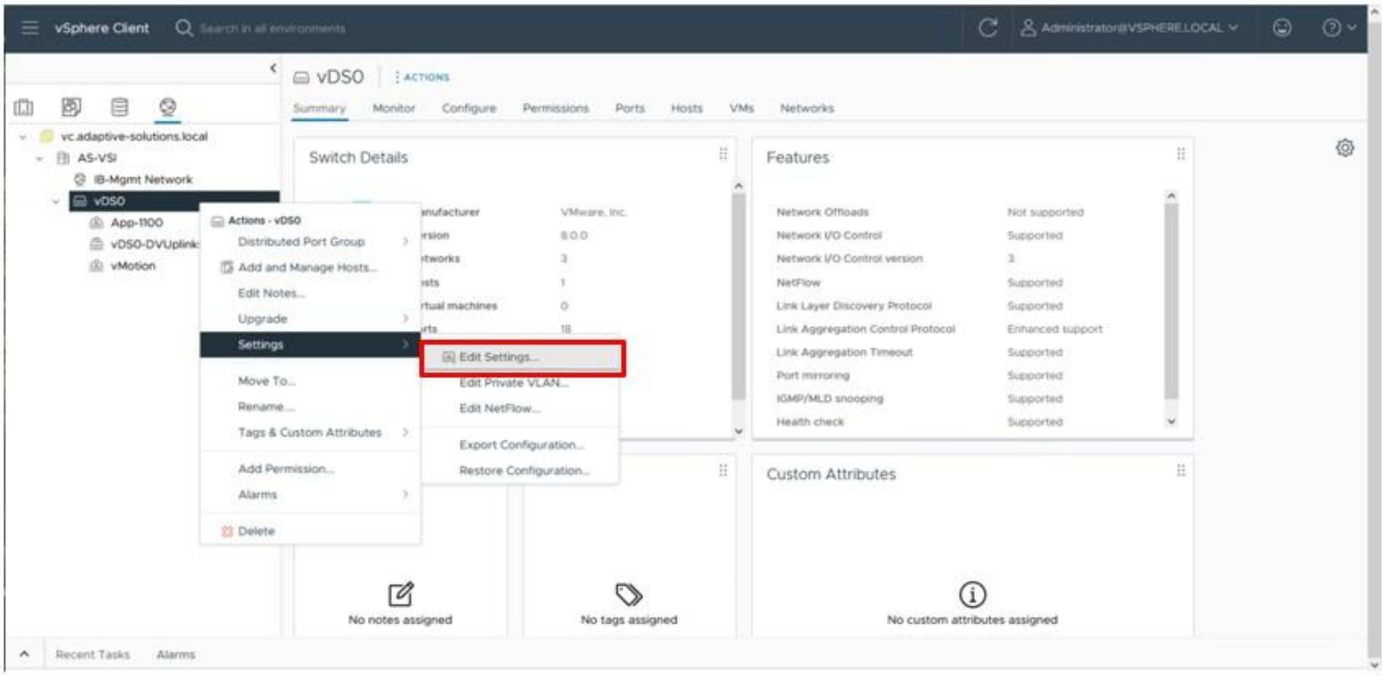
Network I/O Control: Enabled

Default port group: ☑ Create a default port group

Port group name: App-1100

Step 5. Review the settings for the distributed switch and click **FINISH**.

Step 6. Click the Networking icon of the left-side menu and right-click the newly created distributed switch. Under **Actions** select **Settings > Edit Settings... .**



Switch Details

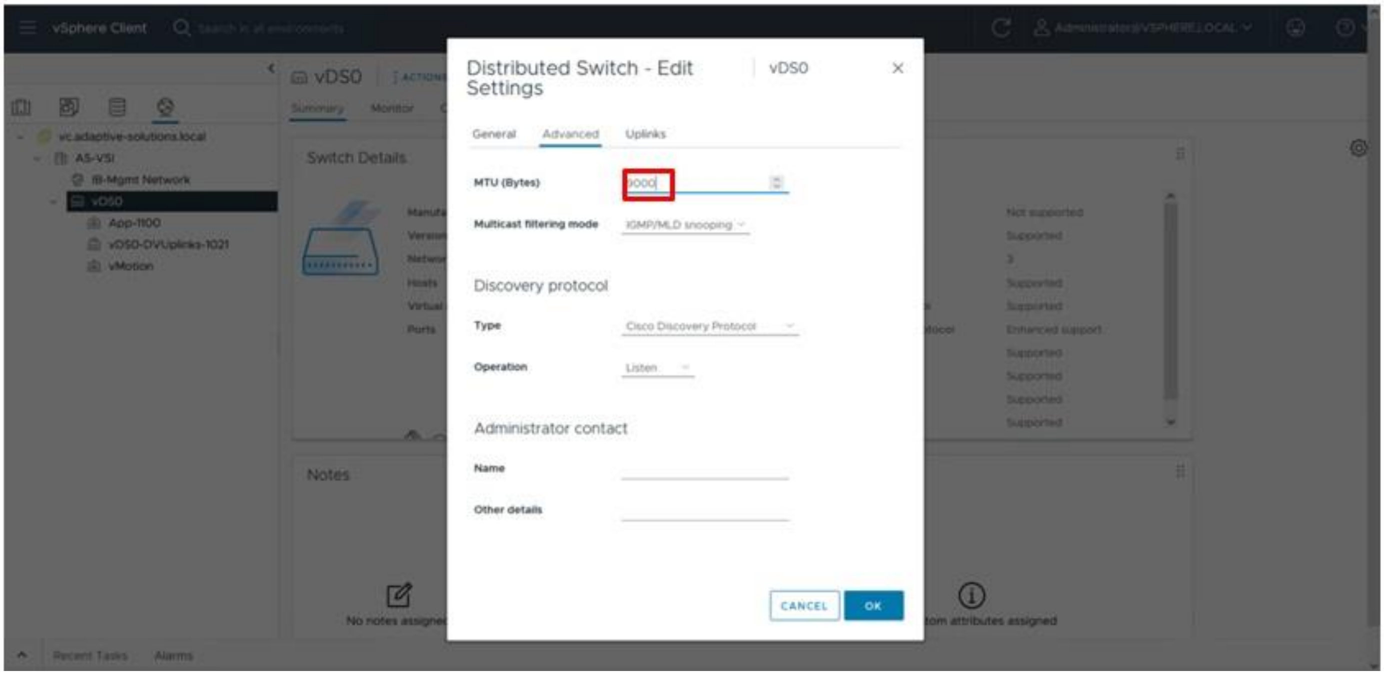
nufacturer	VMware, Inc.
rsion	8.0.0
tworks	3
sts	1
rtual machines	0
rts	18

Features

Network Offloads	Not supported
Network I/O Control	Supported
Network I/O Control version	3
NetFlow	Supported
Link Layer Discovery Protocol	Supported
Link Aggregation Control Protocol	Enhanced support
Link Aggregation Timeout	Supported
Port mirroring	Supported
IGMP/MLD snooping	Supported
Health check	Supported

Custom Attributes

Step 7. Select the Advanced tab and change the **MTU** from 1500 to 9000. Click **OK**.



MTU (Bytes) 9000

Multicast filtering mode IGMP/MLD snooping

Discovery protocol

Type Cisco Discovery Protocol

Operation Listen

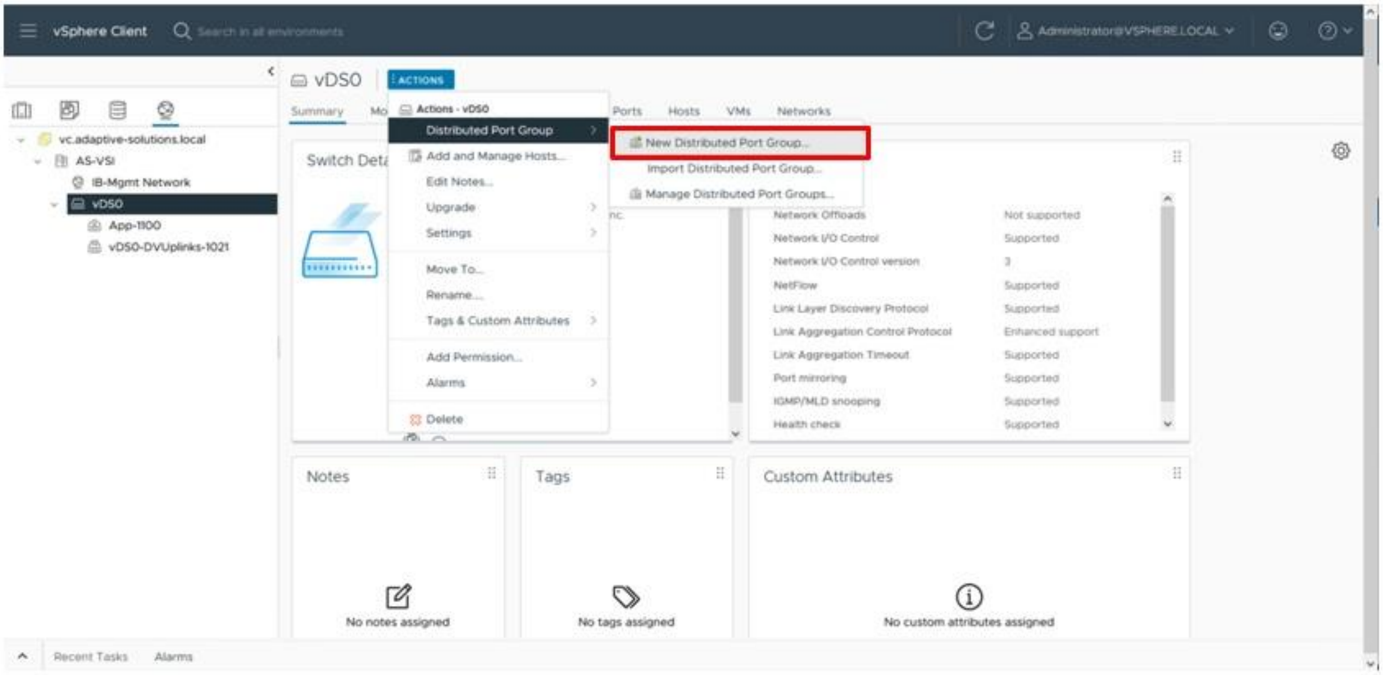
Administrator contact

Name

Other details

Procedure 3. Create vMotion distributed port group

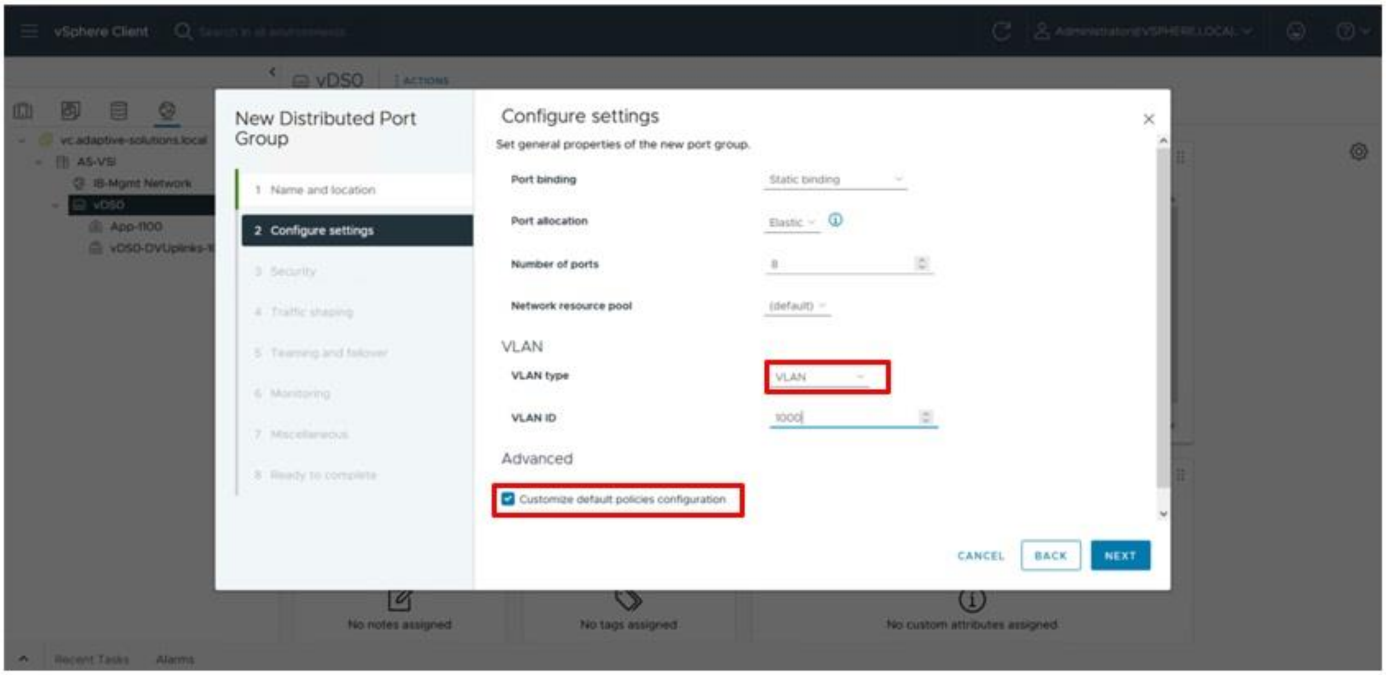
Step 1. Right-click the newly created distributed switch. Within **Actions,** select **Distributed Port Group > New Distributed Port Group...** .



Network Offloads	Not supported
Network I/O Control	Supported
Network I/O Control version	3
NetFlow	Supported
Link Layer Discovery Protocol	Supported
Link Aggregation Control Protocol	Enhanced support
Link Aggregation Timeout	Supported
Port mirroring	Supported
IGMP/MLD snooping	Supported
Health check	Supported

Step 2. Provide a name for the vMotion distributed port group and click **NEXT**.

Step 3. Choose **VLAN** from the **VLAN type** drop-down list and specify the appropriate VLAN for vMotion. Select the **Customize default policies configuration** checkbox and click **NEXT**.



Configure settings

Set general properties of the new port group.

Port binding	Static binding
Port allocation	Elastic
Number of ports	8
Network resource pool	(default)

VLAN

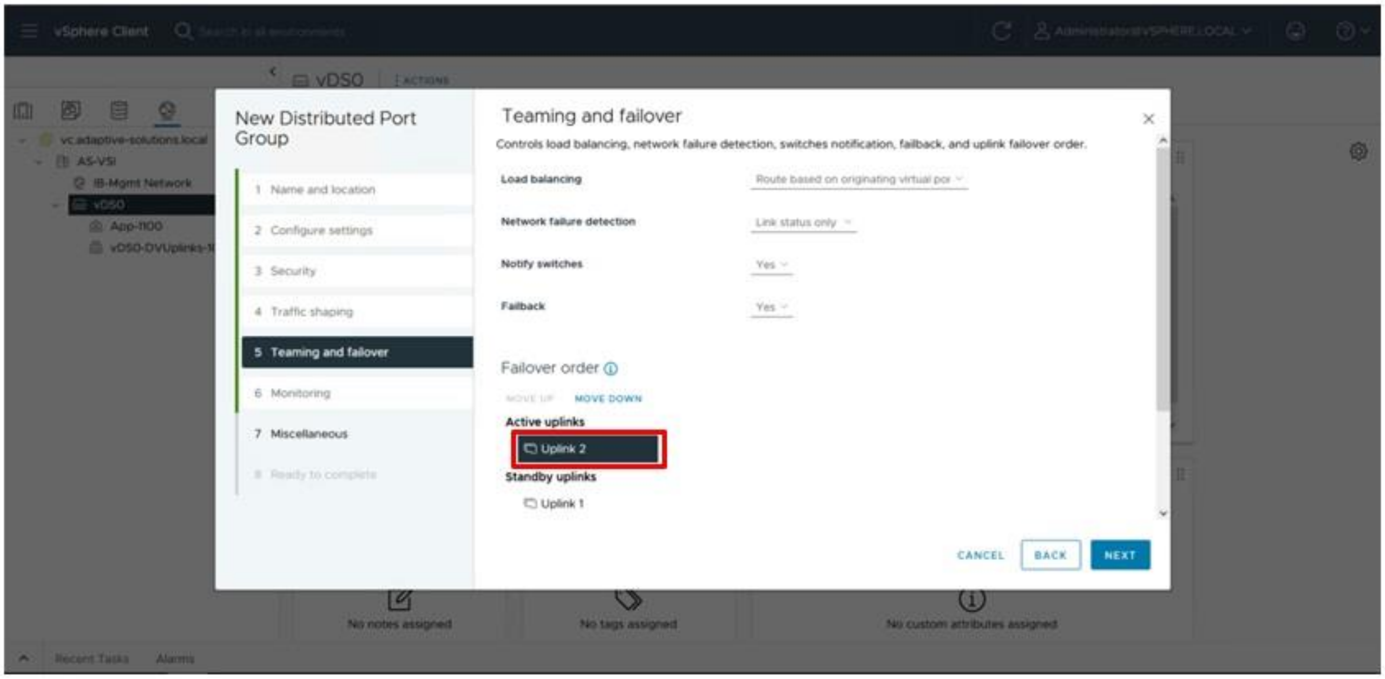
VLAN type	VLAN
VLAN ID	1000

Advanced

☑ Customize default policies configuration

Step 4. Click **NEXT** through the Security and Traffic shaping dialogue screens.

Step 5. Within Teaming and failover, select **Uplink 1** and click **MOVE DOWN** twice to have it set as a standby link. Click **NEXT**.



New Distributed Port Group

Teaming and failover

Controls load balancing, network failure detection, switches notification, failback, and uplink failover order.

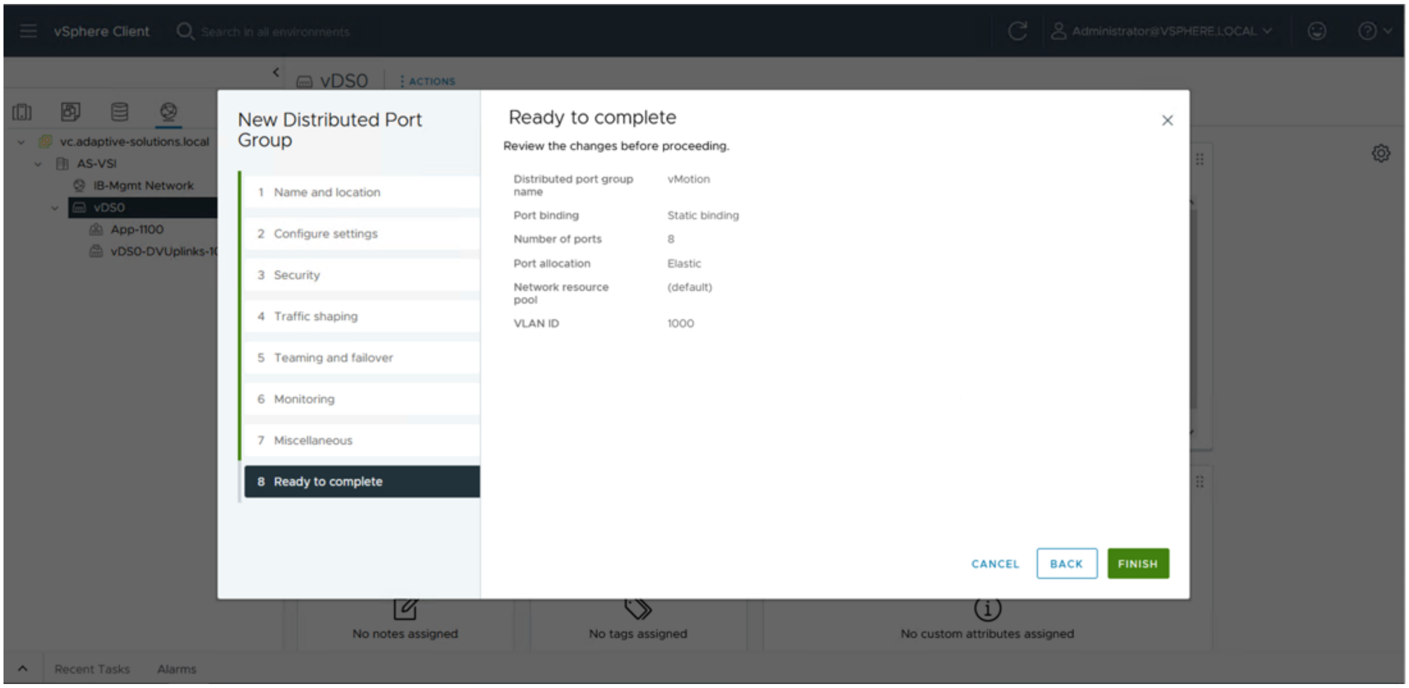
Load balancing	Route based on originating virtual por
Network failure detection	Link status only
Notify switches	Yes
Failback	Yes

Failover order

Active uplinks
- Uplink 2

Standby uplinks
- Uplink 1

Step 6. Click **NEXT** through the Monitoring and Miscellaneous dialogue screens, review the settings presented within Ready to complete, and click **FINISH** to create the distributed port group.



New Distributed Port Group

Ready to complete

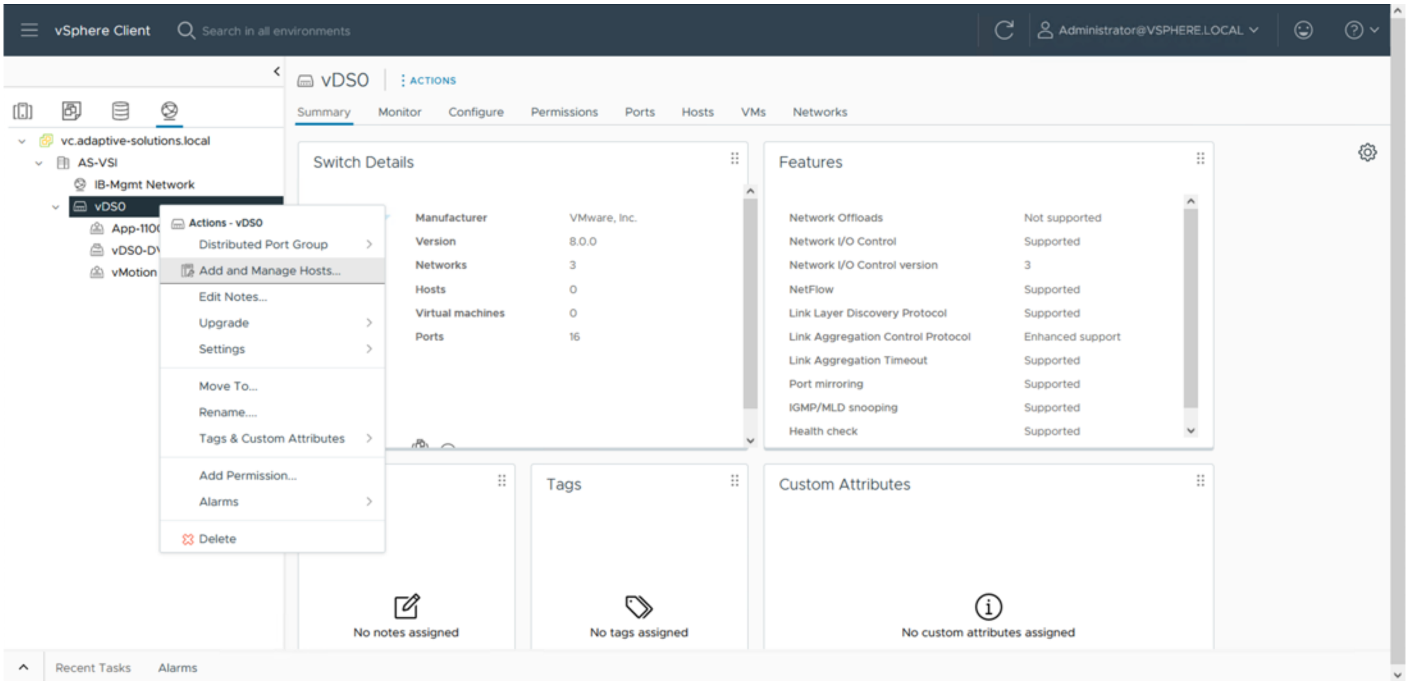
Review the changes before proceeding.

Distributed port group name	vMotion
Port binding	Static binding
Number of ports	8
Port allocation	Elastic
Network resource pool	(default)
VLAN ID	1000

Step 7. Repeat steps 1-6 for each VM application network taking note of desired teaming and failover, making both uplinks active if there is no path priority.

Procedure 4. Add ESXi host to the vDS

Step 1. Select the distributed switch, right-click it and select the **Add and Manage Hosts**... option.

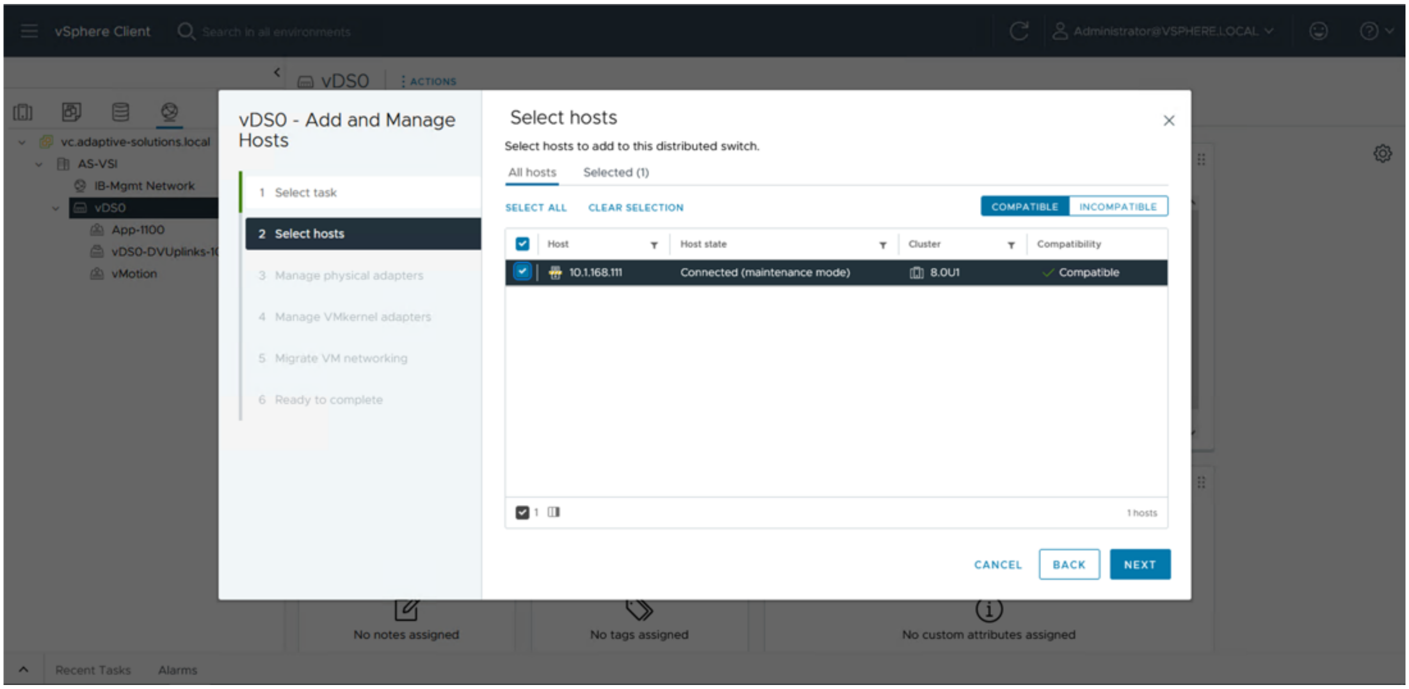


Switch Details	
Manufacturer	VMware, Inc.
Version	8.0.0
Networks	3
Hosts	0
Virtual machines	0
Ports	16

Features	
Network Offloads	Not supported
Network I/O Control	Supported
Network I/O Control version	3
NetFlow	Supported
Link Layer Discovery Protocol	Supported
Link Aggregation Control Protocol	Enhanced support
Link Aggregation Timeout	Supported
Port mirroring	Supported
IGMP/MLD snooping	Supported
Health check	Supported

Step 2. Leave Add hosts selected and click **NEXT**.

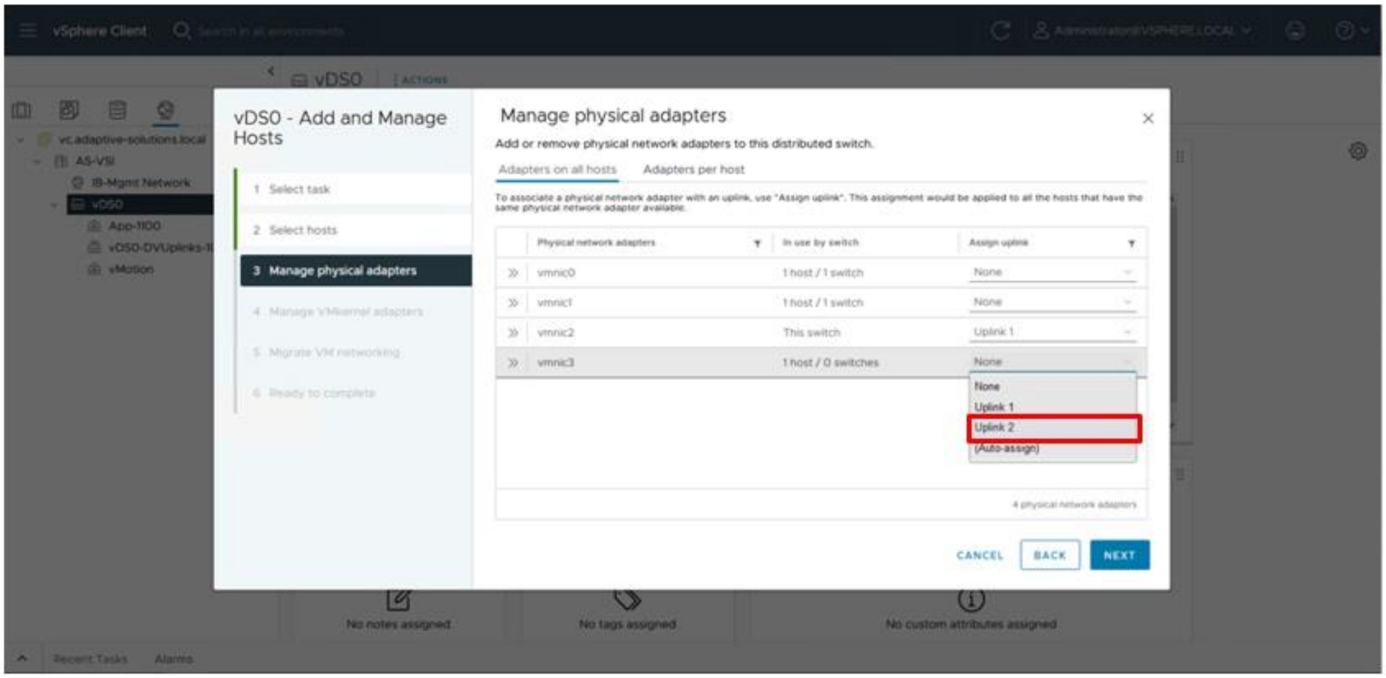
Step 3. Select the first ESXi host that was previously added to vCenter and click **NEXT**.



Select hosts to add to this distributed switch.

	Host	Host state	Cluster	Compatibility
☑	10.1.168.111	Connected (maintenance mode)	8.0U1	✓ Compatible

Step 4. Specify vmnic2 to be Uplink 1 and vmnic3 to be Uplink 2, and then click **NEXT**.



vDSO - Add and Manage Hosts

1 Select task
2 Select hosts
3 Manage physical adapters
4 Manage VMkernel adapters
5 Migrate VM networking
6 Ready to complete

Manage physical adapters

Add or remove physical network adapters to this distributed switch.

Adapters on all hosts | Adapters per host

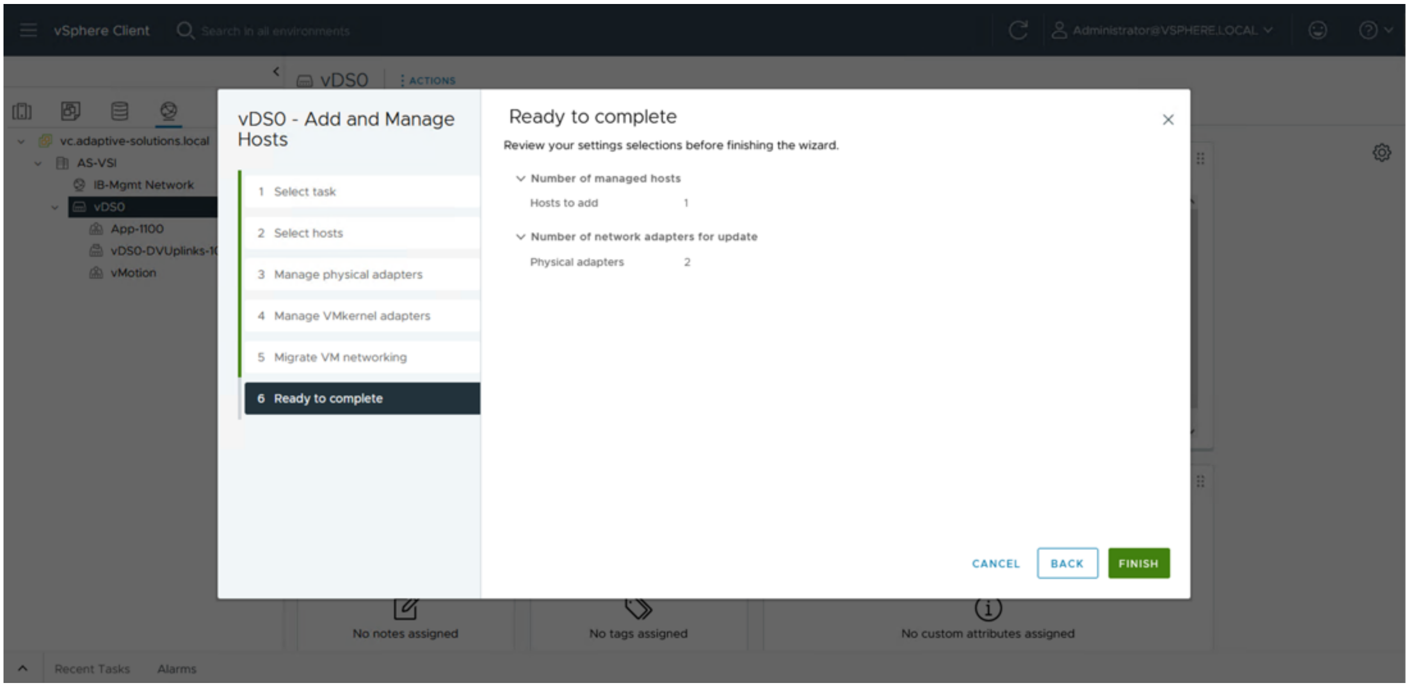
To associate a physical network adapter with an uplink, use "Assign uplink". This assignment would be applied to all the hosts that have the same physical network adapter available.

Physical network adapters	In use by switch	Assign uplink
vmnic0	1 host / 1 switch	None
vmnic1	1 host / 1 switch	None
vmnic2	This switch	Uplink 1
vmnic3	1 host / 0 switches	None

None
Uplink 1
Uplink 2
(Auto-assign)

4 physical network adapters

Step 5. Click **NEXT** past the Manage VMkernel adapters and Migrate VM networking dialogue screens. Review the summary within the Ready to compete screen and then click **FINISH**.



vDSO - Add and Manage Hosts

1 Select task
2 Select hosts
3 Manage physical adapters
4 Manage VMkernel adapters
5 Migrate VM networking
6 Ready to complete

Ready to complete

Review your settings selections before finishing the wizard.

Number of managed hosts

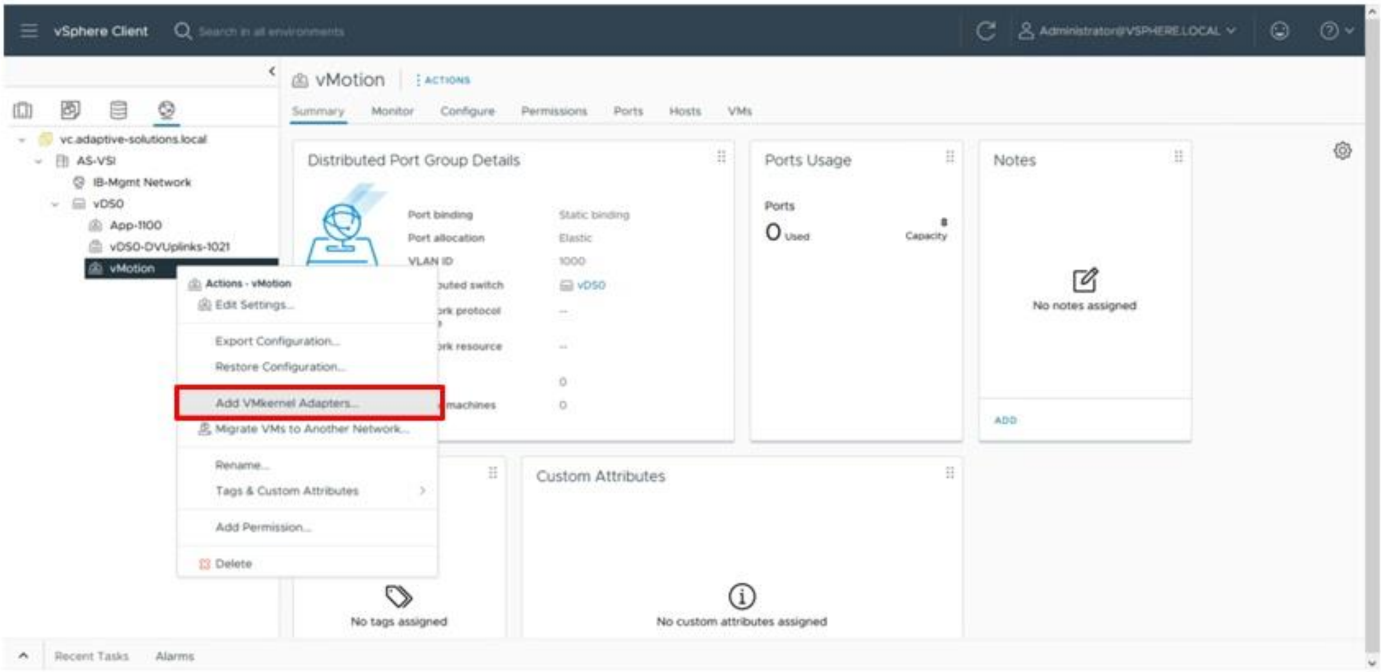
Hosts to add 1

Number of network adapters for update

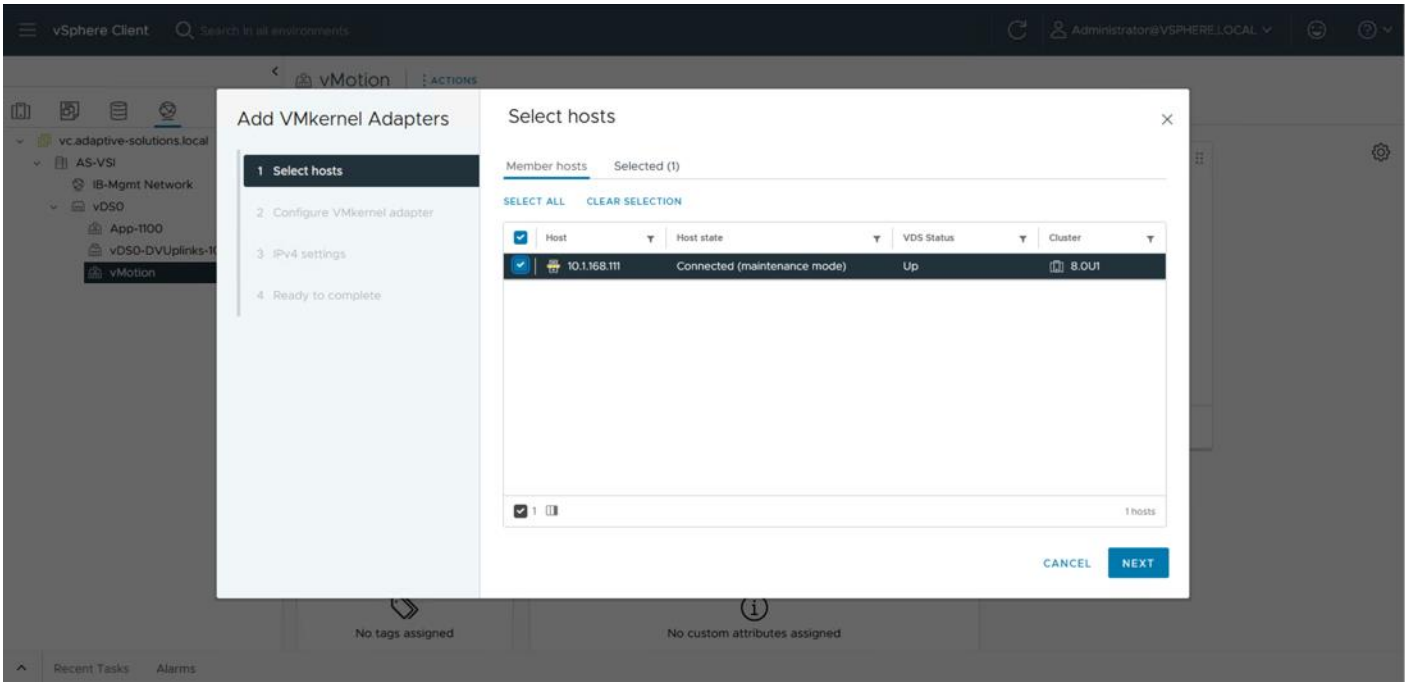
Physical adapters 2

Procedure 5. Add vMotion vmkernel to the first ESXi host

Step 1. Select the vMotion distributed port group, right-click it and select the **Add VMkernel Adapters…** option.



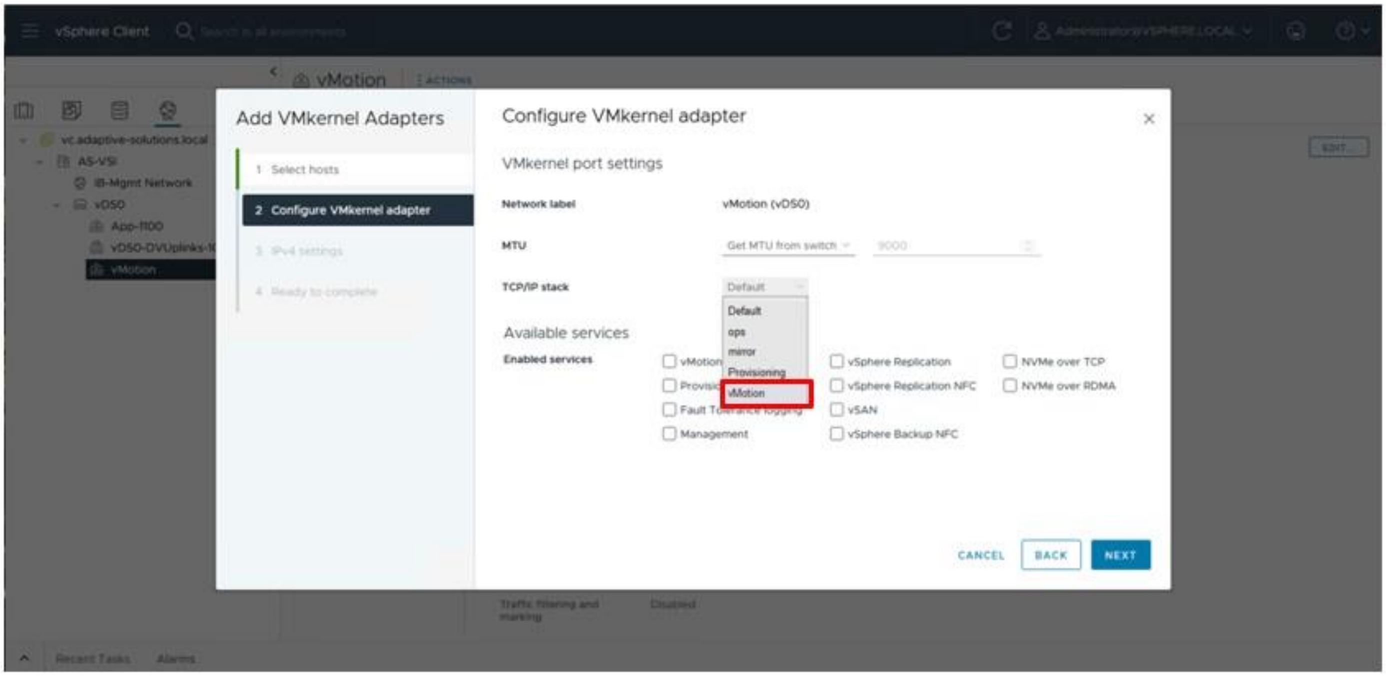
Step 2. Select the first ESXi host and click **NEXT**.



☑	Host	Host state	VDS Status	Cluster
☑	10.1.168.111	Connected (maintenance mode)	Up	8.0U1

1 hosts

Step 3. Select **vMotion** from the TCP/IP stack drop-down list. Click **NEXT**.


Add VMkernel Adapters

Configure VMkernel adapter

VMkernel port settings

Network label: vMotion (vDS0)

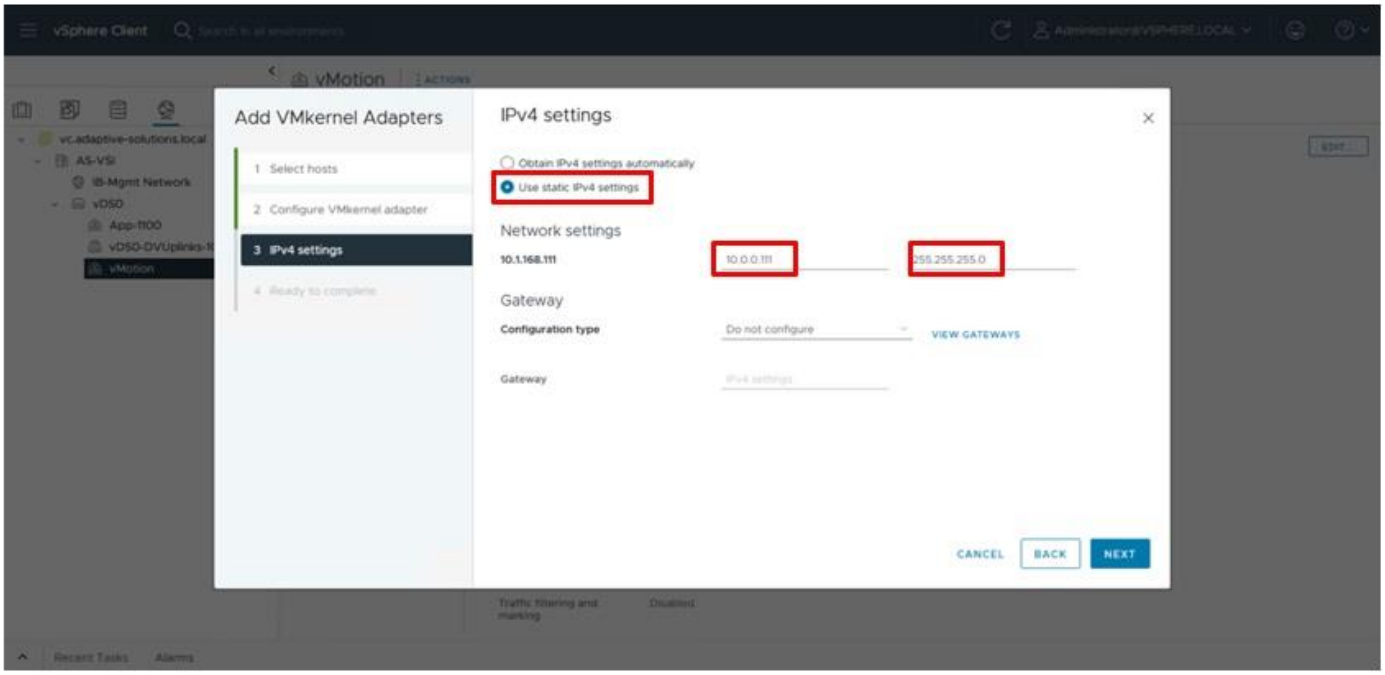
MTU: Get MTU from switch — 9000

TCP/IP stack: Default (Default, ops, mirror, Provisioning, vMotion)

Available services

Enabled services: □ vMotion □ Provisioning □ Fault Tolerance logging □ Management □ vSphere Replication □ vSphere Replication NFC □ vSAN □ vSphere Backup NFC □ NVMe over TCP □ NVMe over RDMA

Step 4. Select **Use static IPV4 settings** and provide an IP and netmask for the VMkernel. Click **NEXT**.


Add VMkernel Adapters

IPv4 settings

○ Obtain IPv4 settings automatically
● Use static IPv4 settings

Network settings

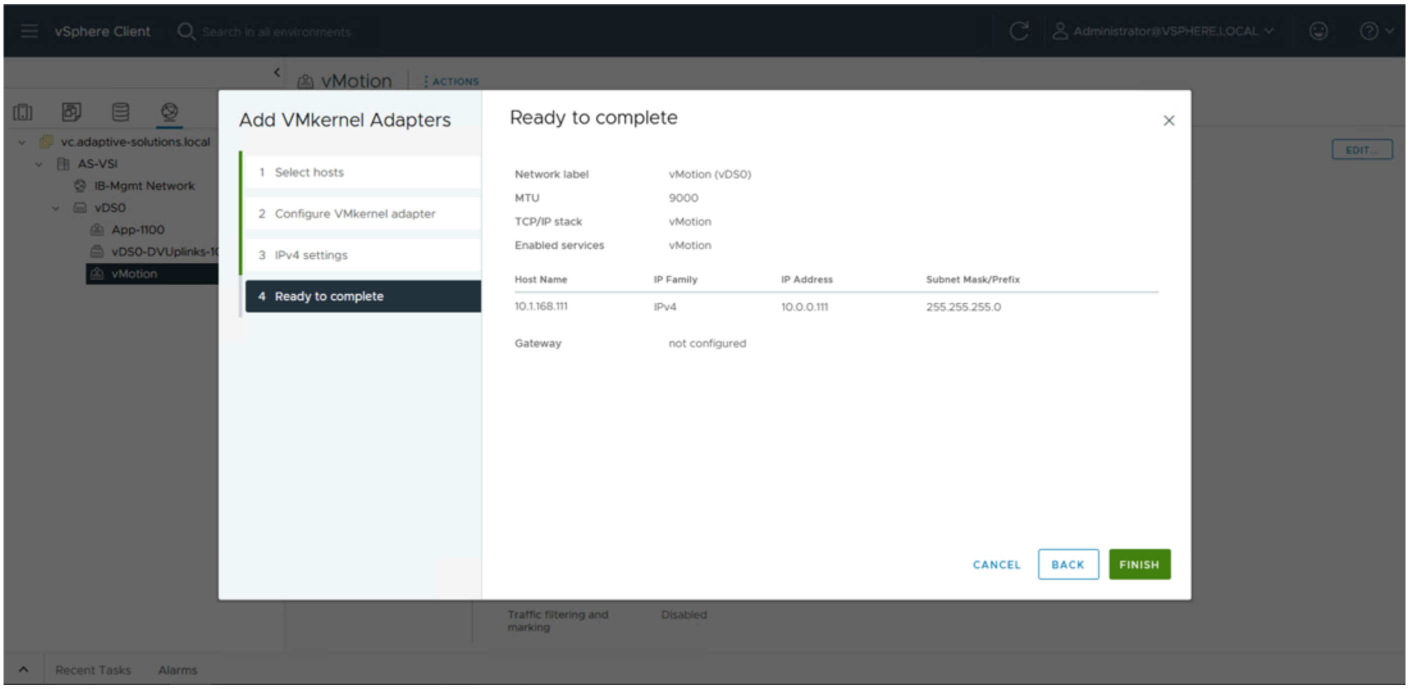
10.1.168.111: 10.0.0.111 — 255.255.255.0

Gateway

Configuration type: Do not configure

Gateway: IPv4 settings

Step 5. Review the summary within Ready to complete and click **FINISH**.



Add VMkernel Adapters

1 Select hosts
2 Configure VMkernel adapter
3 IPv4 settings
4 Ready to complete

Ready to complete

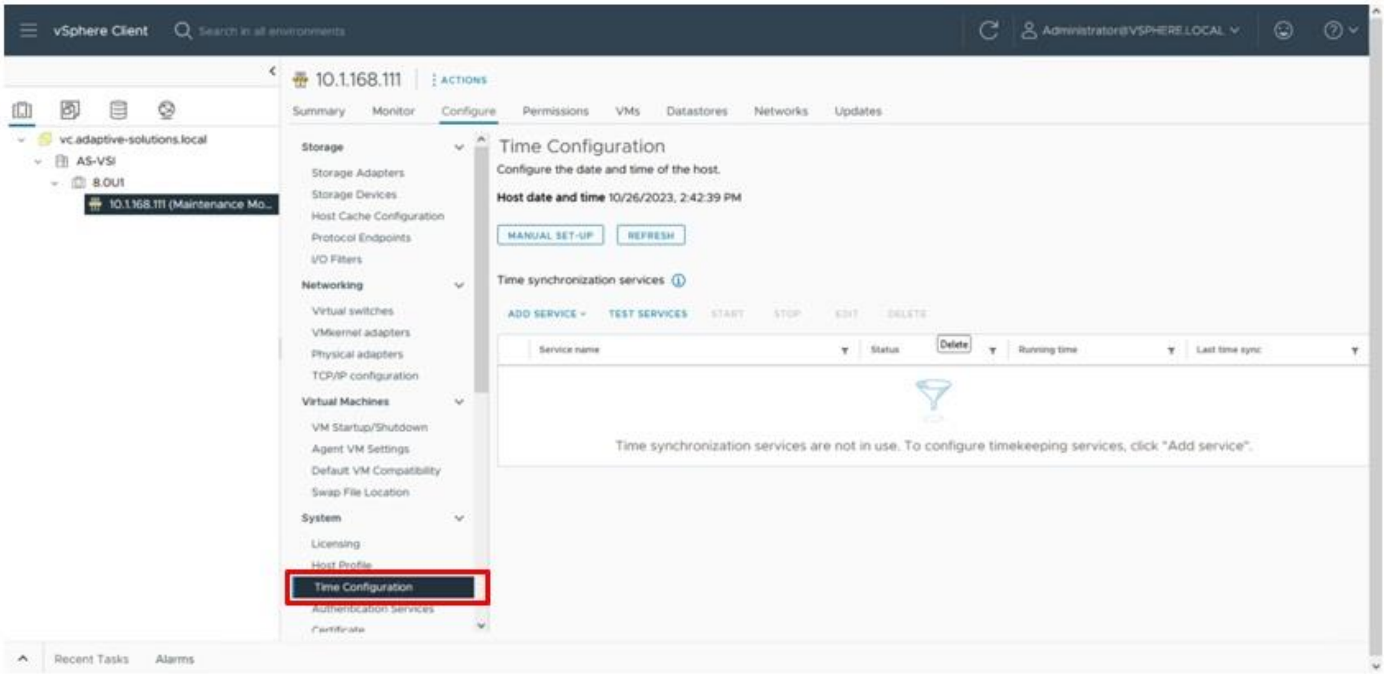
Network label	vMotion (vDS0)
MTU	9000
TCP/IP stack	vMotion
Enabled services	vMotion

Host Name	IP Family	IP Address	Subnet Mask/Prefix
10.1.168.111	IPv4	10.0.0.111	255.255.255.0

Gateway not configured

Procedure 6. Configure settings on the ESXi host

Step 1. Select the **Hosts and Clusters** icon, expand the datacenter and cluster to find the first ESXi host. Select **Configure > System > Time Configuration.**



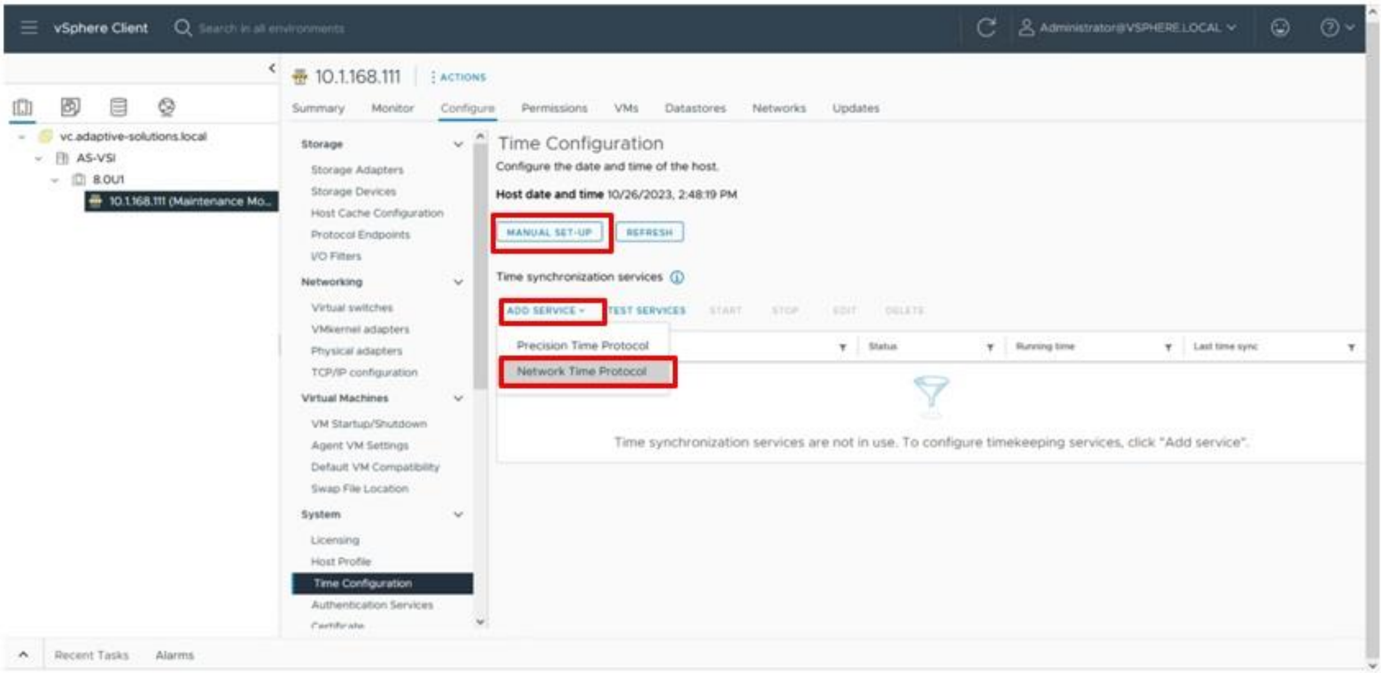
Time Configuration

Configure the date and time of the host.

Host date and time 10/26/2023, 2:42:39 PM

Time synchronization services are not in use. To configure timekeeping services, click "Add service".

Step 2. Select **MANUAL SET-UP** if the time is not correct and adjust it. From the **ADD SERVICE** drop-down list and select the **Network Time Protocol** option.



Time Configuration

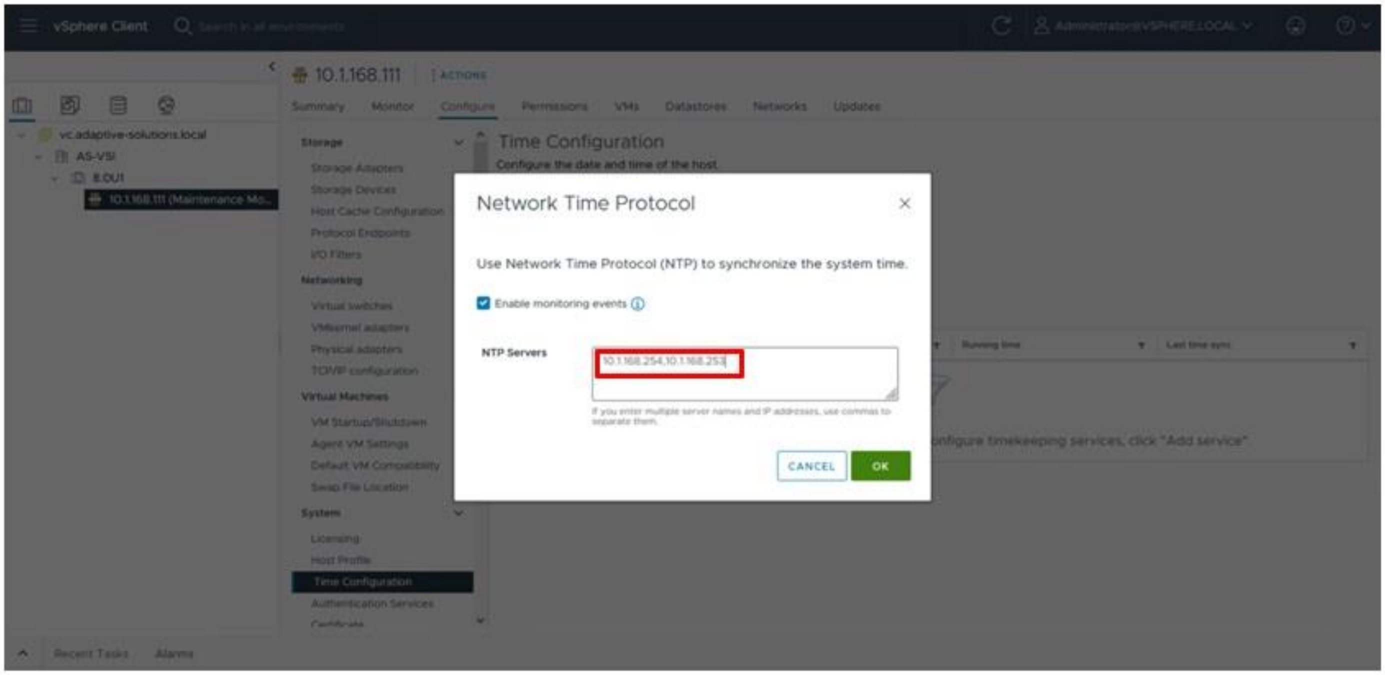
Configure the date and time of the host.

Host date and time 10/26/2023, 2:48:19 PM

Time synchronization services

Time synchronization services are not in use. To configure timekeeping services, click "Add service".

Step 3. Specify the appropriate IP/FQDN(s) for NTP server(s). Click **OK**.



Network Time Protocol

Use Network Time Protocol (NTP) to synchronize the system time.

☑ Enable monitoring events

NTP Servers: 10.1.168.254,10.1.168.253

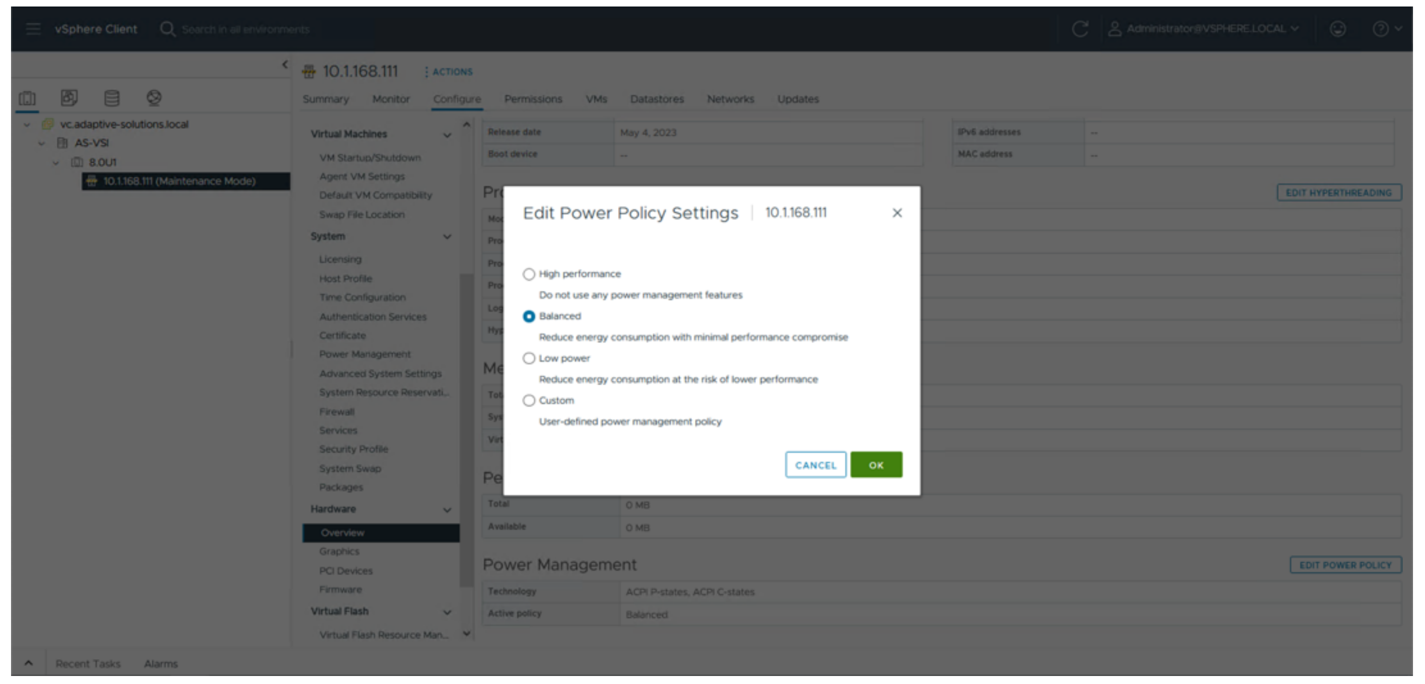
If you enter multiple server names and IP addresses, use commas to separate them.

Procedure 7. Configure Host Power Policy

Note: Implementing this policy is recommended in the Performance Tuning Guide for Cisco UCS M7 Servers: https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-b-series-blade-server s/ucs-m7-platforms-wp.html#AdditionalBIOSrecommendationsforenterpriseworkloads for maximum VMware ESXi performance. This policy can be adjusted based on your requirements.

Step 1. Within the first ESXi host, select **Configure > Hardware > Overview** and find Power Management at the bottom of the **Overview** section. Click **EDIT POWER POLICY**.

Step 2. Select **Balanced** from the options and click **OK**.



Edit Power Policy Settings | 10.1.168.111

○ High performance
Do not use any power management features

● Balanced
Reduce energy consumption with minimal performance compromise

○ Low power
Reduce energy consumption at the risk of lower performance

○ Custom
User-defined power management policy

CANCEL OK

Power Management

Technology	ACPI P-states, ACPI C-states
Active policy	Balanced

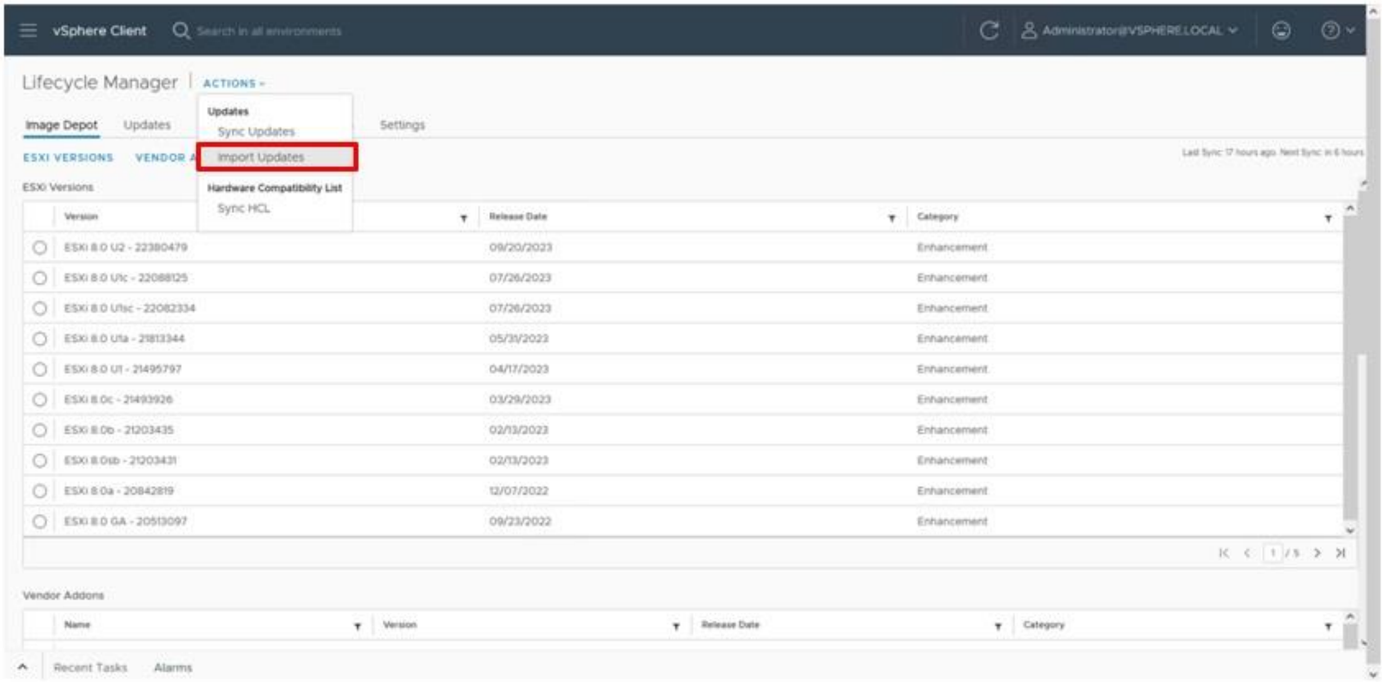
vSphere Cluster Image Update

Procedure 1. UCS Tools Update

The UCS Tools VIB for ESXi allows IPMI communication over the CISCO IMC of the underlying Cisco UCS server to communicate vSphere relevant host information to Intersight and UCSM managed placements.

Step 1. Download the UCS Tools VIB for ESXi 8.0 from https://software.cisco.com/download/home/286305108/type/286323573/release/1.3.3

Step 2. Go to **Lifecycle Manager** from the main vCenter left-hand menu, click **ACTIONS** and choose the **Import Updates** option.



ESXi Versions

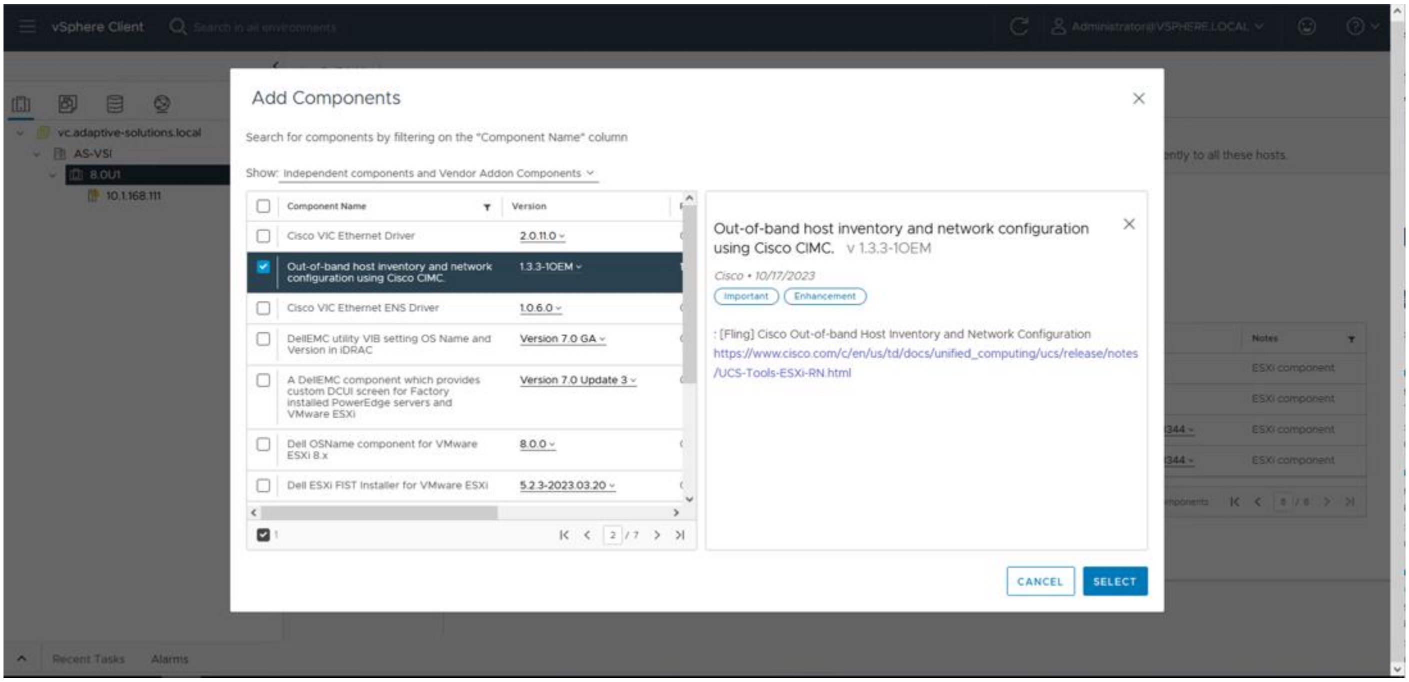
	Version	Release Date	Category
○	ESXi 8.0 U2 - 22380479	09/20/2023	Enhancement
○	ESXi 8.0 U1c - 22088125	07/26/2023	Enhancement
○	ESXi 8.0 U1sc - 22082334	07/26/2023	Enhancement
○	ESXi 8.0 U1a - 21813344	05/31/2023	Enhancement
○	ESXi 8.0 U1 - 21495797	04/17/2023	Enhancement
○	ESXi 8.0c - 21493926	03/29/2023	Enhancement
○	ESXi 8.0b - 21203435	02/13/2023	Enhancement
○	ESXi 8.0sb - 21203431	02/13/2023	Enhancement
○	ESXi 8.0a - 20842819	12/07/2022	Enhancement
○	ESXi 8.0 GA - 20513097	09/23/2022	Enhancement

Vendor Addons

	Name	Version	Release Date	Category

Step 3. Click **Browse** within the pop-up window and navigate to the downloaded location of the UCS Tools VIB package.

The uploaded VIB is now available from **Edit Image** for the cluster within the **ADD COMPONENTS** within the Independent components and Vendor Addon Components selection.



Add Components

Search for components by filtering on the "Component Name" column

Show: Independent components and Vendor Addon Components

□	Component Name	Version
□	Cisco VIC Ethernet Driver	2.0.11.0
☑	Out-of-band host inventory and network configuration using Cisco CIMC.	1.3.3-1OEM
□	Cisco VIC Ethernet ENS Driver	1.0.6.0
□	DellEMC utility VIB setting OS Name and Version in iDRAC	Version 7.0 GA
□	A DellEMC component which provides custom DCUI screen for Factory installed PowerEdge servers and VMware ESXi	Version 7.0 Update 3
□	Dell OSName component for VMware ESXi 8.x	8.0.0
□	Dell ESXi FIST Installer for VMware ESXi	5.2.3-2023.03.20

☑ 1 2 / 7

Out-of-band host inventory and network configuration using Cisco CIMC. v 1.3.3-1OEM

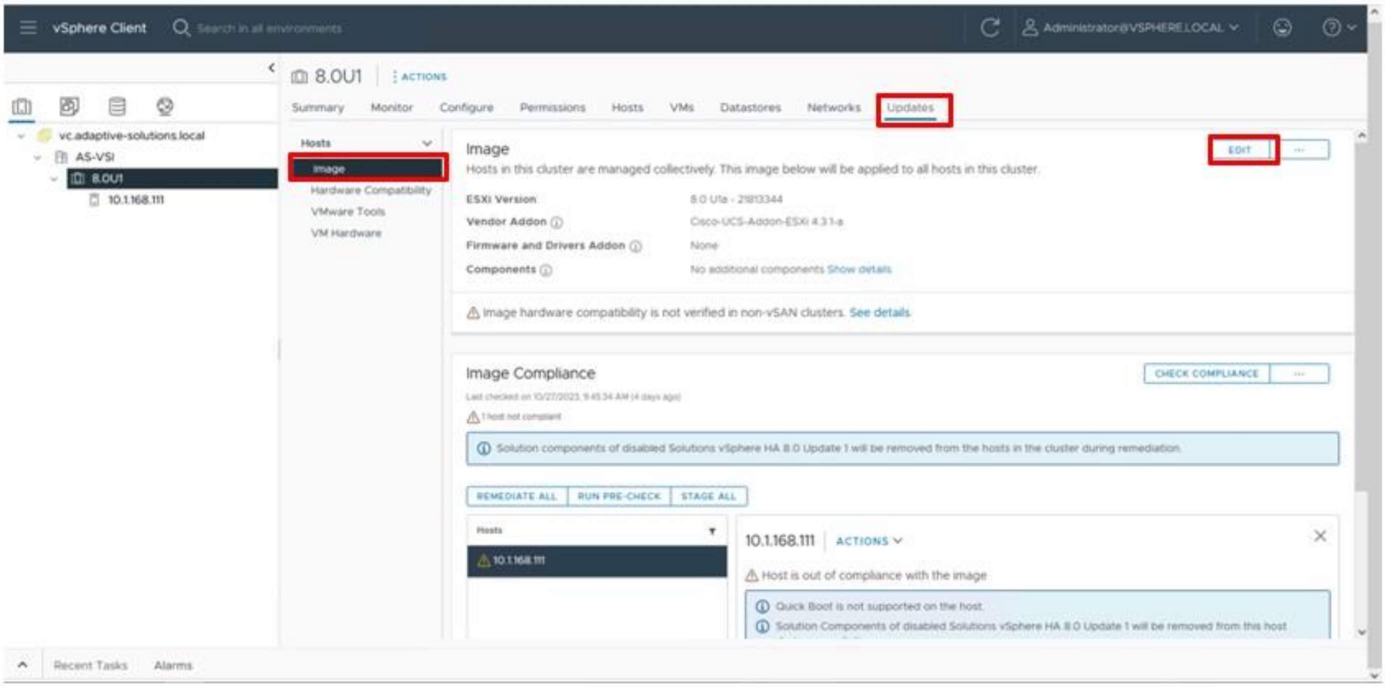
Cisco • 10/17/2023

Important Enhancement

: [Fling] Cisco Out-of-band Host Inventory and Network Configuration https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/release/notes/UCS-Tools-ESXi-RN.html

Procedure 2. Hardware Support Manager Configuration

Step 1. Select the cluster for the VSI servers and click the **Updates** tab, then click **EDIT** within the **Image** section.



Image

Hosts in this cluster are managed collectively. This image below will be applied to all hosts in this cluster.

ESXi Version: 8.0 U1a - 21813344

Vendor Addon: Cisco-UCS-Addon-ESXi 4.3.1-a

Firmware and Drivers Addon: None

Components: No additional components Show details

Image hardware compatibility is not verified in non-vSAN clusters. See details

Image Compliance

Last checked on 10/27/2023, 9:45:34 AM (4 days ago)

1 host not compliant

Solution components of disabled Solutions vSphere HA 8.0 Update 1 will be removed from the hosts in the cluster during remediation.

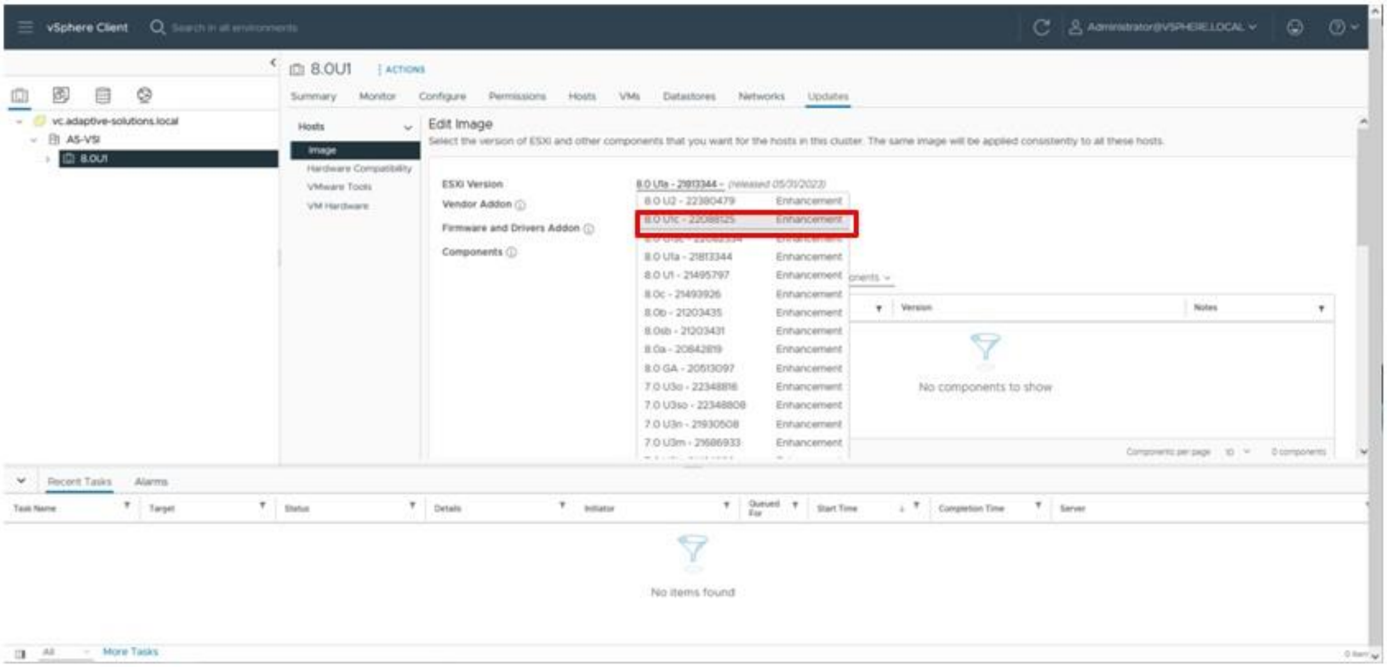
10.1.168.111 ACTIONS

Host is out of compliance with the image

Quick Boot is not supported on the host.

Solution Components of disabled Solutions vSphere HA 8.0 Update 1 will be removed from this host

Step 2. Select the ESXi Version from the drop-down list and select the 8.0 U1c version that will reflect the addition of the vSphere 8.0U1c patch.



Edit Image

Select the version of ESXi and other components that you want for the hosts in this cluster. The same image will be applied consistently to all these hosts.

ESXi Version: 8.0 U1a - 21813344 - (released 05/31/2023)

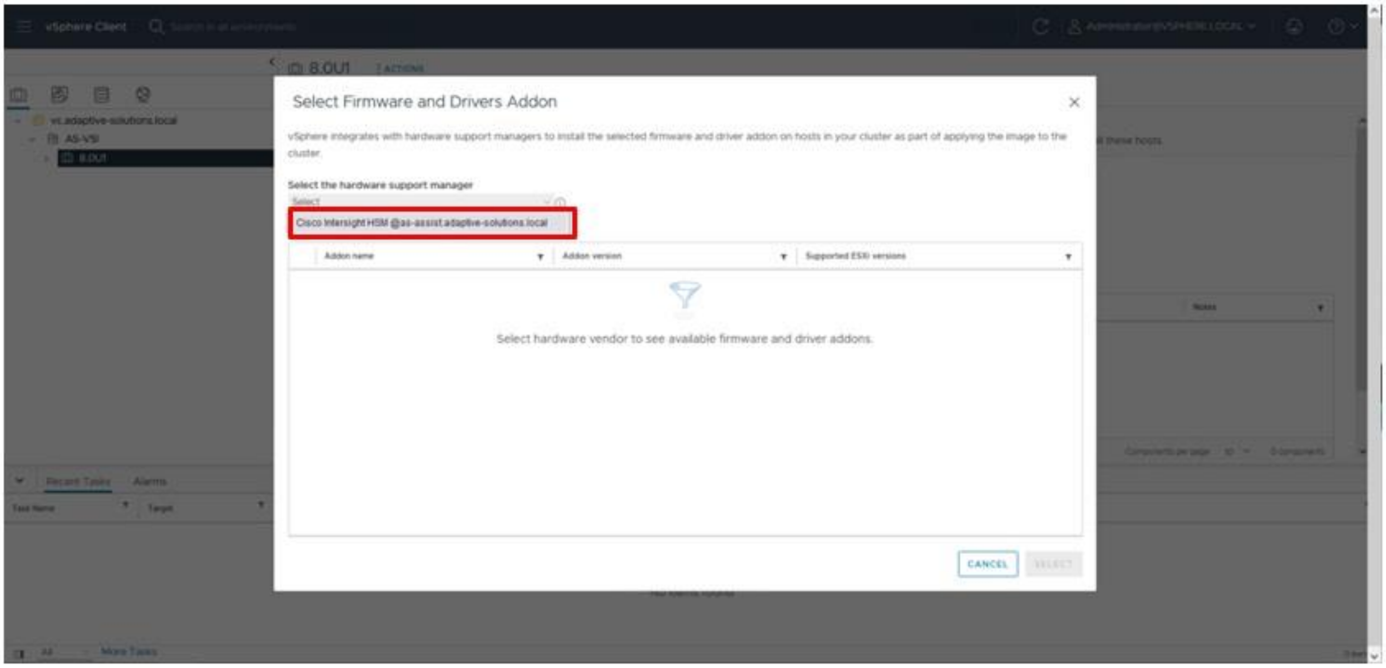
Vendor Addon

Firmware and Drivers Addon

Components

8.0 U2 - 22380479	Enhancement
8.0 U1c - 22088125	Enhancement
8.0 U1sc - 22088354	Enhancement
8.0 U1a - 21813344	Enhancement
8.0 U1 - 21495797	Enhancement
8.0c - 21493926	Enhancement
8.0b - 21203435	Enhancement
8.0sb - 21203431	Enhancement
8.0a - 20842819	Enhancement
8.0 GA - 20513097	Enhancement
7.0 U3o - 22348816	Enhancement
7.0 U3so - 22348808	Enhancement
7.0 U3n - 21930508	Enhancement
7.0 U3m - 21686933	Enhancement

Step 3. Click **SELECT** from Firmware and Drivers Addon. From the Select the hardware support manager drop-down list, select the **Cisco Intersight HSM @[the deployed Intersight Assist name].**



Select Firmware and Drivers Addon

vSphere integrates with hardware support managers to install the selected firmware and driver addon on hosts in your cluster as part of applying the image to the cluster.

Select the hardware support manager

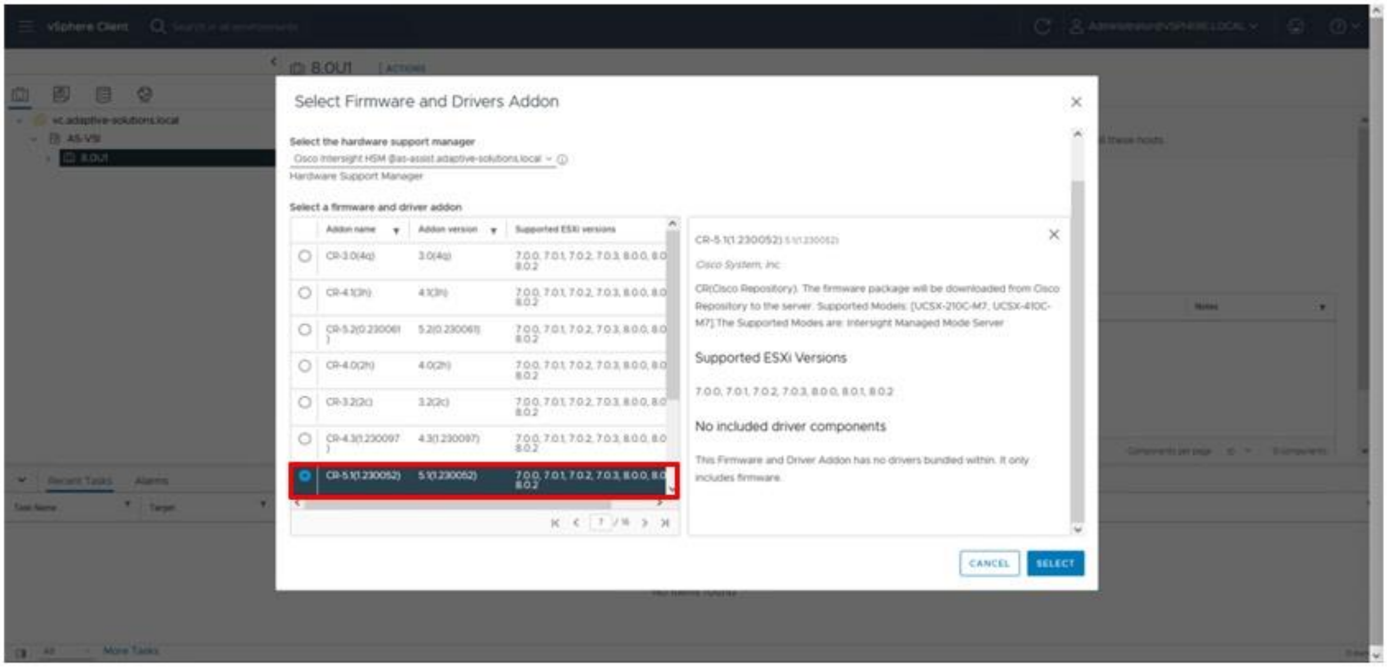
Select

Cisco Intersight HSM @as-assist.adaptive-solutions.local

Addon name	Addon version	Supported ESXi versions

Select hardware vendor to see available firmware and driver addons.

Step 4. Find the desired firmware to set for the servers and click **SELECT**.



Select Firmware and Drivers Addon

Select the hardware support manager

Cisco Intersight HSM @as-assist.adaptive-solutions.local

Hardware Support Manager

Select a firmware and driver addon

	Addon name	Addon version	Supported ESXi versions
○	CR-3.0(4q)	3.0(4q)	7.0.0, 7.0.1, 7.0.2, 7.0.3, 8.0.0, 8.0 8.0.2
○	CR-4.1(3h)	4.1(3h)	7.0.0, 7.0.1, 7.0.2, 7.0.3, 8.0.0, 8.0 8.0.2
○	CR-5.2(0.230061)	5.2(0.230061)	7.0.0, 7.0.1, 7.0.2, 7.0.3, 8.0.0, 8.0 8.0.2
○	CR-4.0(2h)	4.0(2h)	7.0.0, 7.0.1, 7.0.2, 7.0.3, 8.0.0, 8.0 8.0.2
○	CR-3.2(2c)	3.2(2c)	7.0.0, 7.0.1, 7.0.2, 7.0.3, 8.0.0, 8.0 8.0.2
○	CR-4.3(1.230097)	4.3(1.230097)	7.0.0, 7.0.1, 7.0.2, 7.0.3, 8.0.0, 8.0 8.0.2
●	CR-5.1(1.230052)	5.1(1.230052)	7.0.0, 7.0.1, 7.0.2, 7.0.3, 8.0.0, 8.0 8.0.2

CR-5.1(1.230052) 5.1(1.230052)

Cisco System, Inc

CR(Cisco Repository). The firmware package will be downloaded from Cisco Repository to the server. Supported Models: [UCSX-210C-M7, UCSX-410C-M7] The Supported Modes are: Intersight Managed Mode Server

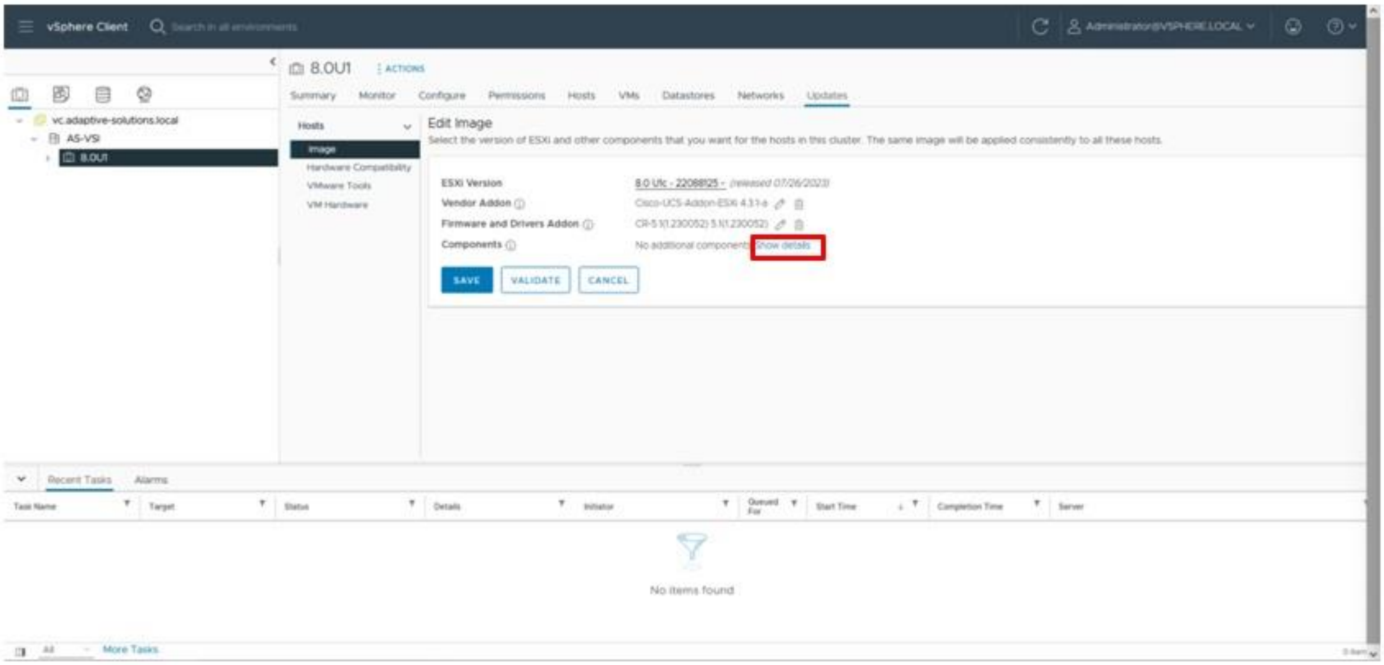
Supported ESXi Versions

7.0.0, 7.0.1, 7.0.2, 7.0.3, 8.0.0, 8.0.1, 8.0.2

No included driver components

This Firmware and Driver Addon has no drivers bundled within. It only includes firmware.

Step 5. Click **Show Details from Components.**



Edit Image

Select the version of ESXi and other components that you want for the hosts in this cluster. The same image will be applied consistently to all these hosts.

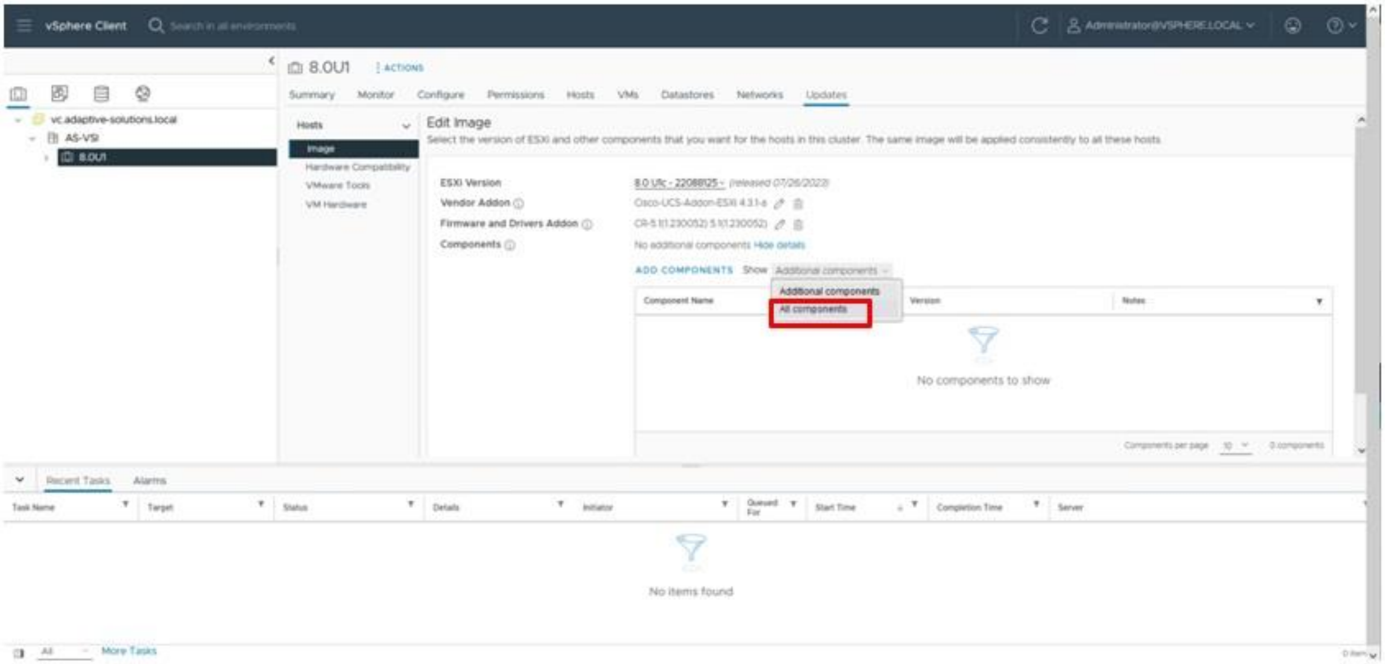
ESXi Version: 8.0 U1c - 22088125 - (released 07/26/2023)

Vendor Addon: Cisco-UCS-Addon-ESXi 4.3.1-a

Firmware and Drivers Addon: CR-5.1(1.230052) 5.1(1.230052)

Components: No additional components Show details

Step 6. From the Show drop-down list, select **All components**.



Edit Image

Select the version of ESXi and other components that you want for the hosts in this cluster. The same image will be applied consistently to all these hosts.

ESXi Version: 8.0 U1c - 22088125 - (released 07/26/2023)

Vendor Addon: Cisco-UCS-Addon-ESXi 4.3.1-a

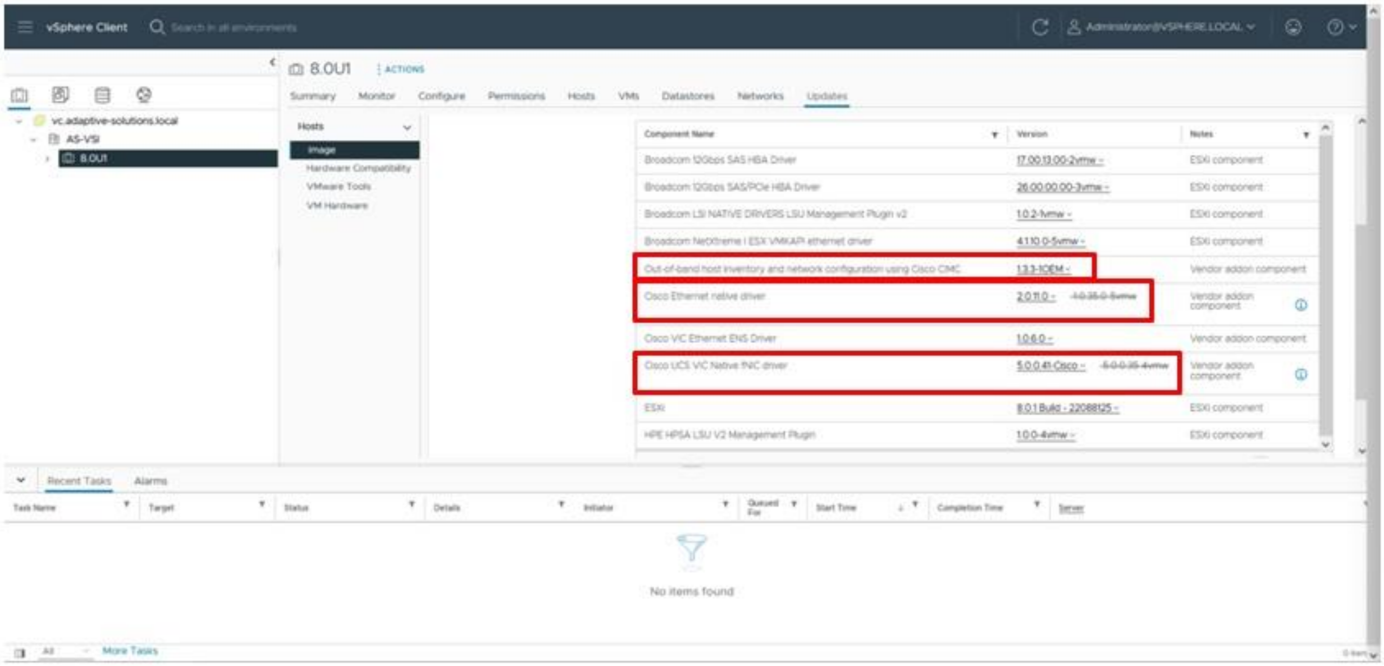
Firmware and Drivers Addon: CR-5.1(1.230052) 5.1(1.230052)

Components: No additional components Hide details

ADD COMPONENTS Show: Additional components

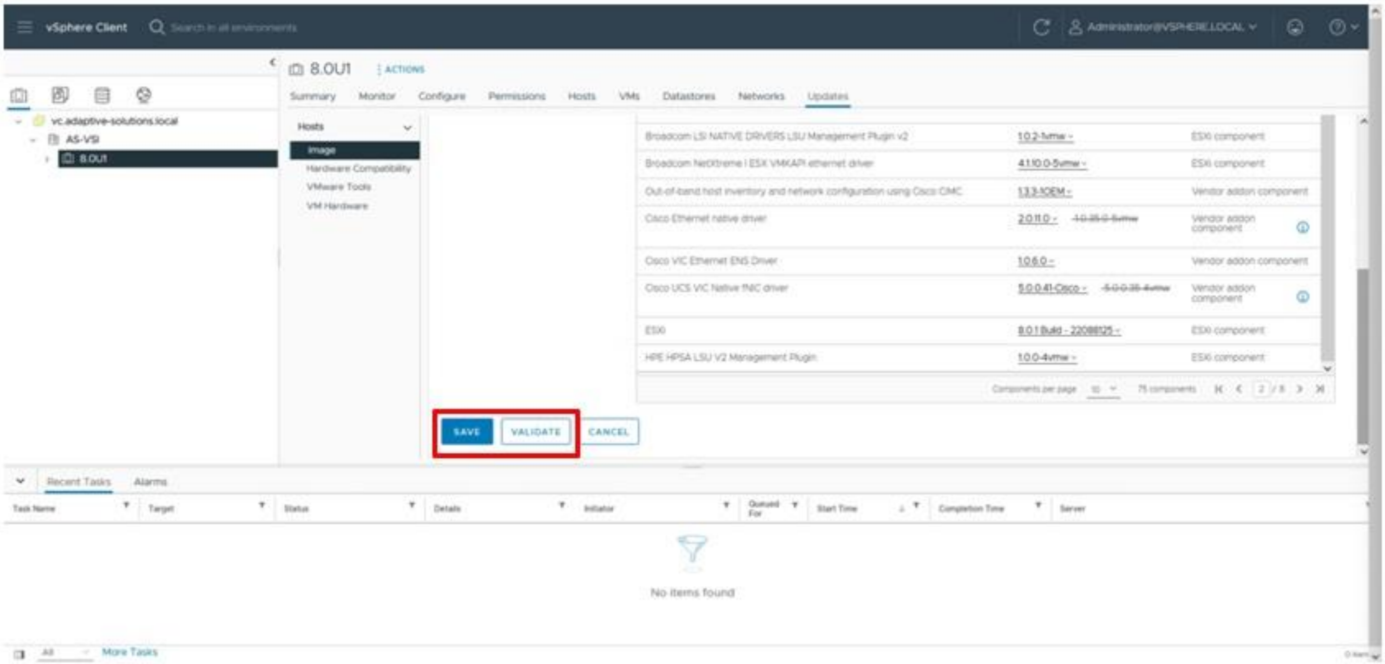
No components to show

Step 7. Find the **Cisco Native Ethernet Driver**, the **Cisco UCS VIC Native fNIC Driver**, and the **Out-of-band host inventory and network configuration** using Cisco CIMC (UCS Tools for ESXi) selections and from the drop-down list for each to select the recommended drivers (nenic 2.0.11.0, nfnic 5.0.0.41, 1.3.3-1OEM).



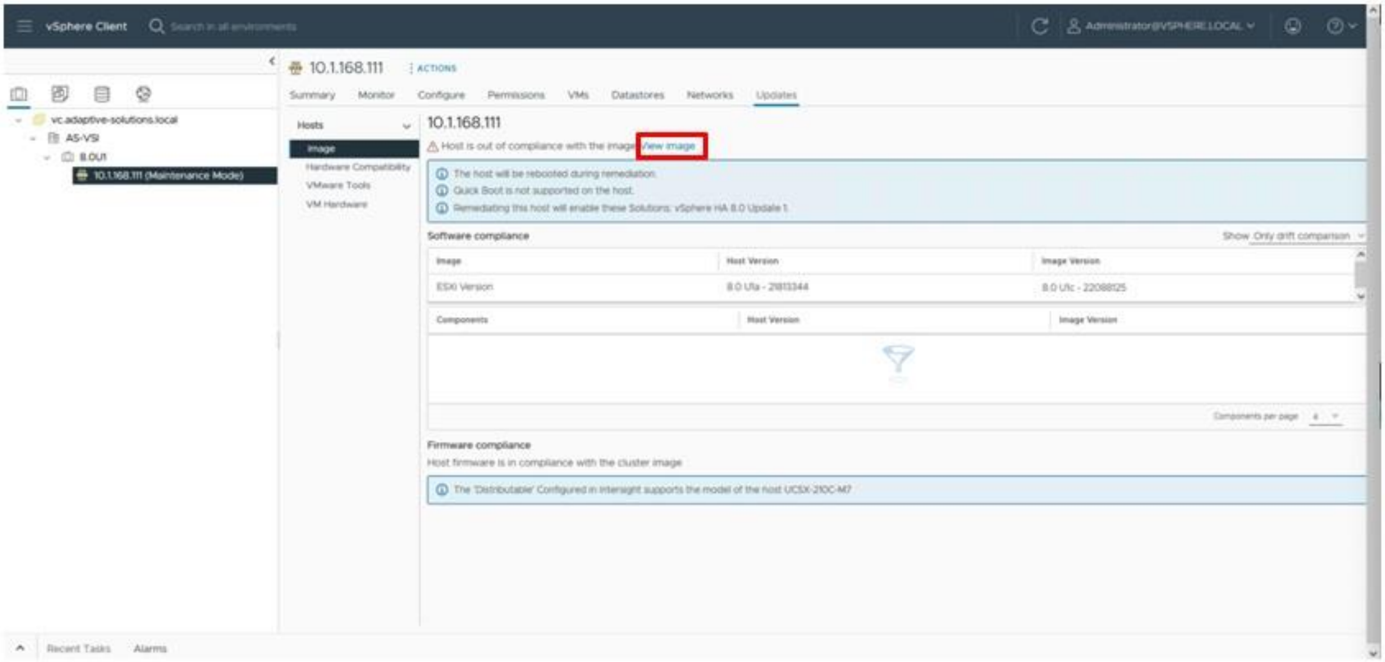
Component Name	Version	Notes
Broadcom 12Gbps SAS HBA Driver	17.00.13.00-2vmw	ESXi component
Broadcom 12Gbps SAS/PCIe HBA Driver	26.00.00.00-3vmw	ESXi component
Broadcom LSI NATIVE DRIVERS LSU Management Plugin v2	1.0.2-1vmw	ESXi component
Broadcom NetXtreme I ESX VMKAPI ethernet driver	4.1.10.0-5vmw	ESXi component
Out-of-band host inventory and network configuration using Cisco CIMC	1.3.3-1OEM	Vendor addon component
Cisco Ethernet native driver	2.0.11.0 ~~1.0.35.0-5vmw~~	Vendor addon component
Cisco VIC Ethernet ENS Driver	1.0.6.0	Vendor addon component
Cisco UCS VIC Native fNIC driver	5.0.0.41-Cisco ~~5.0.0.35-4vmw~~	Vendor addon component
ESXi	8.0.1 Build - 22088125	ESXi component
HPE HPSA LSU V2 Management Plugin	1.0.0-4vmw	ESXi component

Step 8. With the appropriate drivers selected, click **VALIDATE** and then click **SAVE**.



Component Name	Version	Notes
Broadcom LSI NATIVE DRIVERS LSU Management Plugin v2	1.0.2-1vmw	ESXi component
Broadcom NetXtreme I ESX VMKAPI ethernet driver	4.1.10.0-5vmw	ESXi component
Out-of-band host inventory and network configuration using Cisco CIMC	1.3.3-1OEM	Vendor addon component
Cisco Ethernet native driver	2.0.11.0 ~~1.0.35.0-5vmw~~	Vendor addon component
Cisco VIC Ethernet ENS Driver	1.0.6.0	Vendor addon component
Cisco UCS VIC Native fNIC driver	5.0.0.41-Cisco ~~5.0.0.35-4vmw~~	Vendor addon component
ESXi	8.0.1 Build - 22088125	ESXi component
HPE HPSA LSU V2 Management Plugin	1.0.0-4vmw	ESXi component

Step 9. Select the added host and go to **Updates > Hosts > Image** and then click **View Image**.



10.1.168.111

Host is out of compliance with the image. View image

The host will be rebooted during remediation.
Quick Boot is not supported on the host.
Remediating this host will enable these Solutions: vSphere HA 8.0 Update 1.

Software compliance

Image	Host Version	Image Version
ESXi Version	8.0 U1a - 21813344	8.0 U1c - 22088125

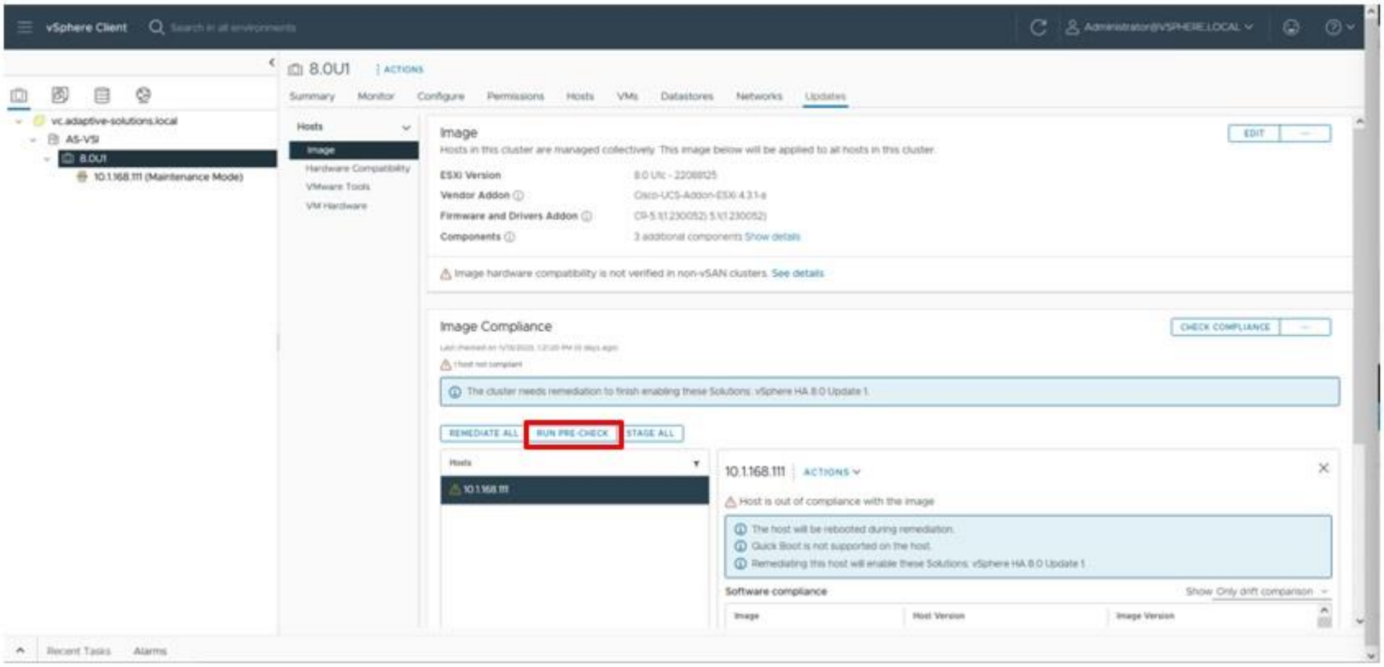
Components	Host Version	Image Version

Firmware compliance

Host firmware is in compliance with the cluster image

The 'Distributable' Configured in Intersight supports the model of the host UCSX-210C-M7

Step 10. With the host selected in the **Image Compliance** section, click **RUN PRE-CHECK**.



Image

Hosts in this cluster are managed collectively. This image below will be applied to all hosts in this cluster.

ESXi Version: 8.0 U1c - 22088125
Vendor Addon: Cisco-UCS-Addon-ESXi 4.3.1-a
Firmware and Drivers Addon: CP-5.1(1.230052) 5.1(1.230052)
Components: 3 additional components Show details

Image hardware compatibility is not verified in non-vSAN clusters. See details

Image Compliance

1 host not compliant

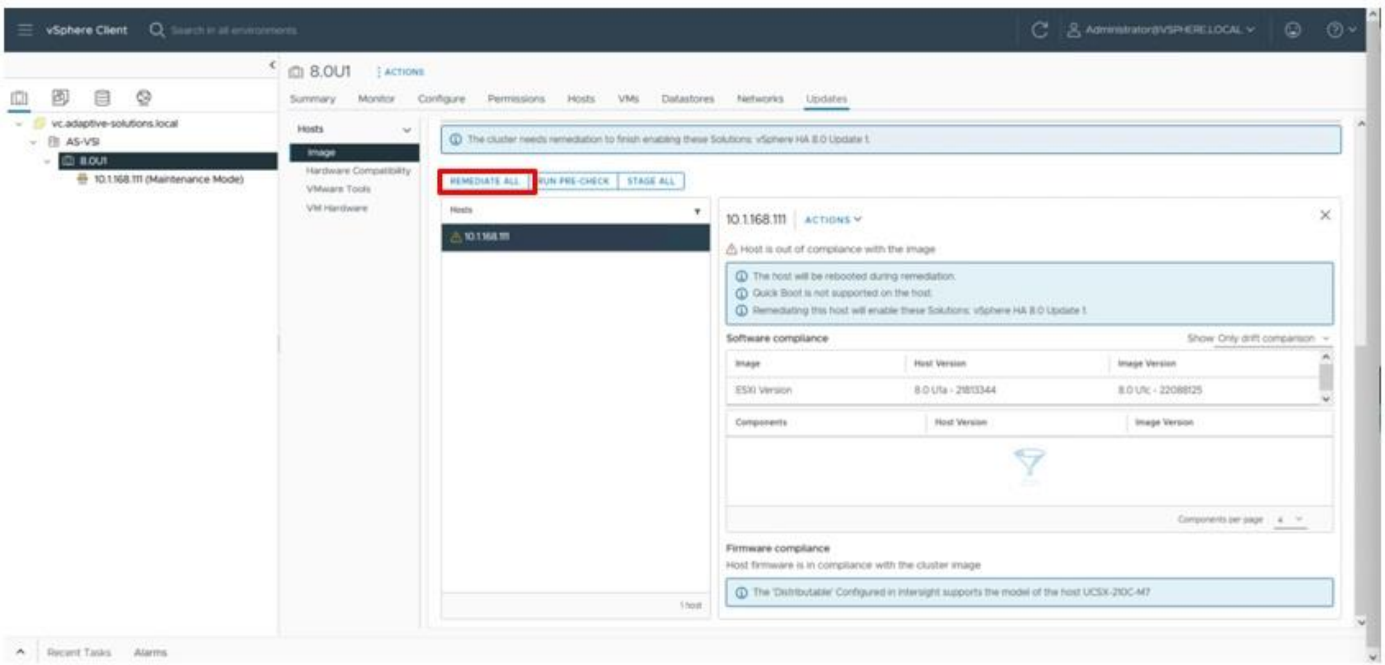
The cluster needs remediation to finish enabling these Solutions: vSphere HA 8.0 Update 1.

10.1.168.111

Host is out of compliance with the image

The host will be rebooted during remediation.
Quick Boot is not supported on the host.
Remediating this host will enable these Solutions: vSphere HA 8.0 Update 1.

Step 11. With the **RUN PRE-CHECK**, cleared, click **REMEDIATE ALL**.



The cluster needs remediation to finish enabling these Solutions: vSphere HA 8.0 Update 1.

10.1.168.111

Host is out of compliance with the image

- The host will be rebooted during remediation.
- Quick Boot is not supported on the host.
- Remediating this host will enable these Solutions: vSphere HA 8.0 Update 1.

Software compliance — Show: Only drift comparison

Image	Host Version	Image Version
ESXi Version	8.0 U1a - 21813344	8.0 U1c - 22088125

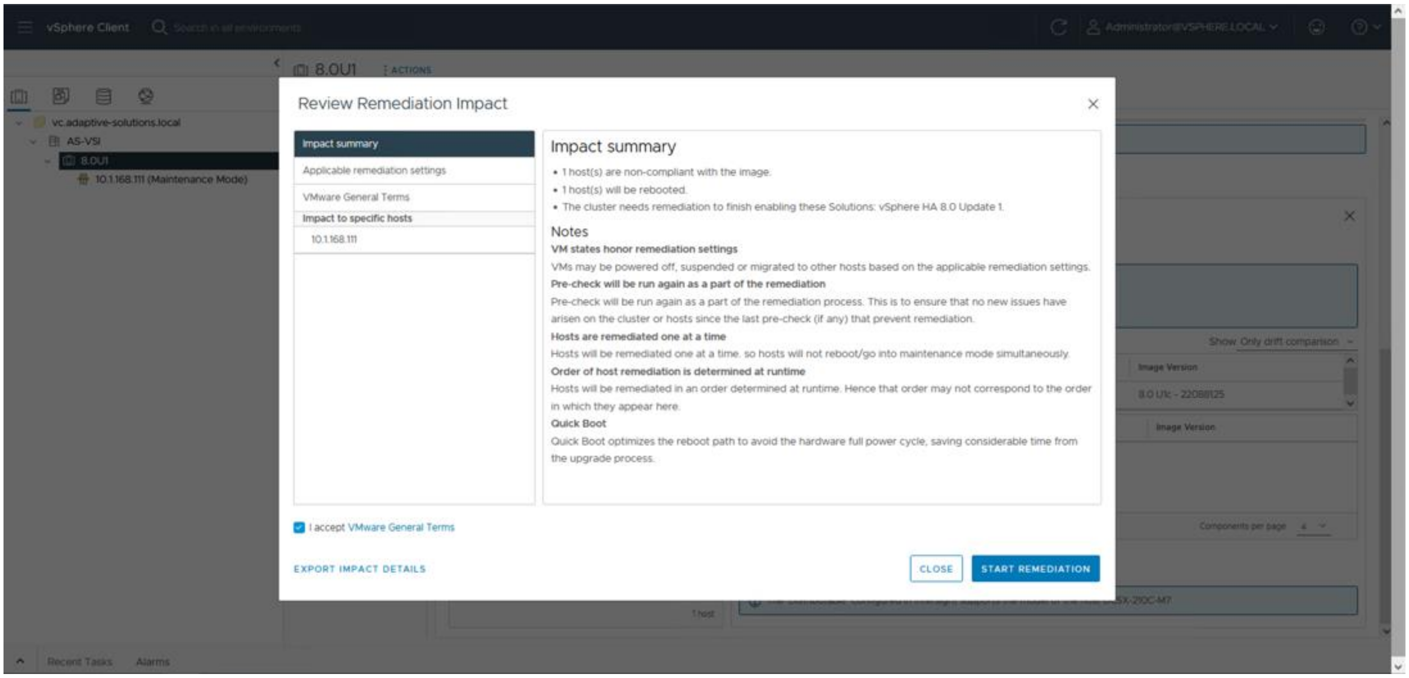
Components	Host Version	Image Version

Firmware compliance

Host firmware is in compliance with the cluster image

The 'Distributable' Configured in Intersight supports the model of the host UCSX-210C-M7

Step 12. Review the Impact summary and click **START REMEDIATION.**



Review Remediation Impact

Impact summary

- 1 host(s) are non-compliant with the image.
- 1 host(s) will be rebooted.
- The cluster needs remediation to finish enabling these Solutions: vSphere HA 8.0 Update 1.

Notes

VM states honor remediation settings

VMs may be powered off, suspended or migrated to other hosts based on the applicable remediation settings.

Pre-check will be run again as a part of the remediation

Pre-check will be run again as a part of the remediation process. This is to ensure that no new issues have arisen on the cluster or hosts since the last pre-check (if any) that prevent remediation.

Hosts are remediated one at a time

Hosts will be remediated one at a time. so hosts will not reboot/go into maintenance mode simultaneously.

Order of host remediation is determined at runtime

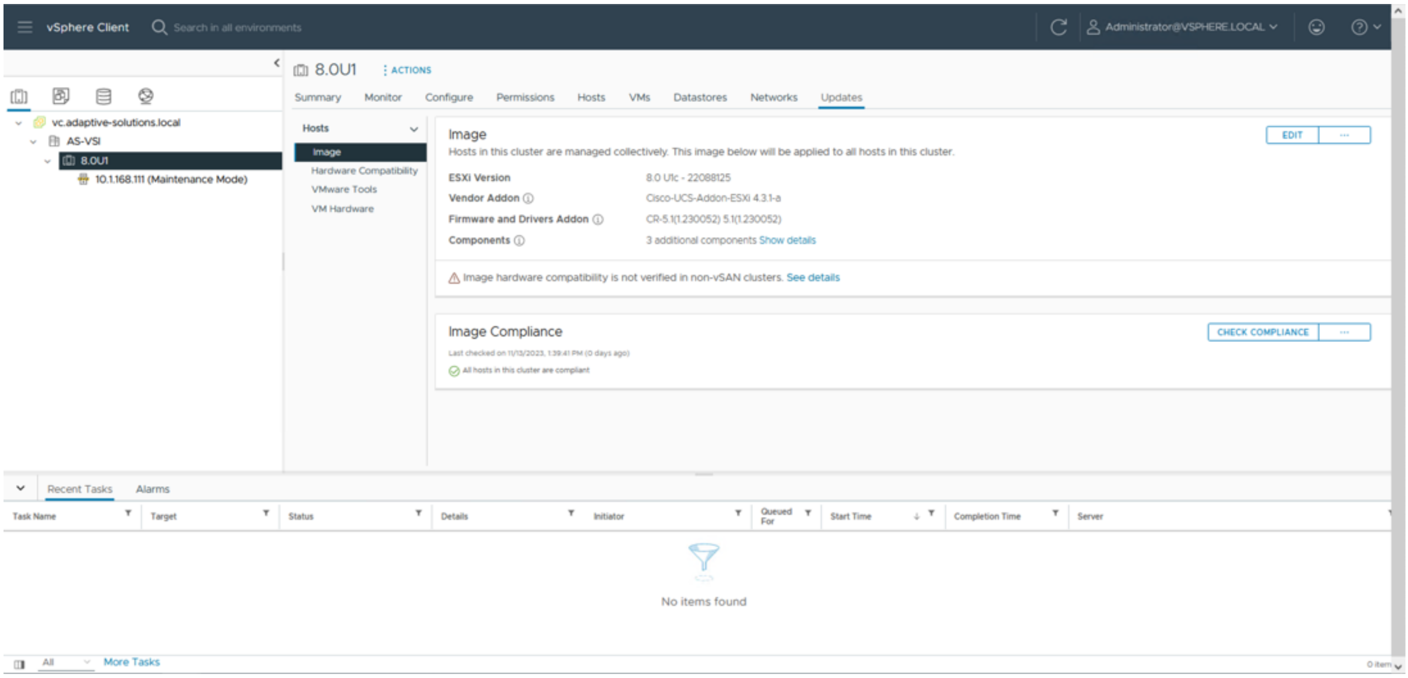
Hosts will be remediated in an order determined at runtime. Hence that order may not correspond to the order in which they appear here.

Quick Boot

Quick Boot optimizes the reboot path to avoid the hardware full power cycle, saving considerable time from the upgrade process.

☑ I accept VMware General Terms

The host will be patched to 8.0 U1c and the VIBs will be installed, after which the host will automatically reboot after remediation.



Image

Hosts in this cluster are managed collectively. This image below will be applied to all hosts in this cluster.

ESXi Version	8.0 U1c - 22088125
Vendor Addon	Cisco-UCS-Addon-ESXi 4.3.1-a
Firmware and Drivers Addon	CR-5.1(1.230052) 5.1(1.230052)
Components	3 additional components Show details

Image hardware compatibility is not verified in non-vSAN clusters. See details

Image Compliance

Last checked on 11/13/2023, 1:39:41 PM (0 days ago)

All hosts in this cluster are compliant

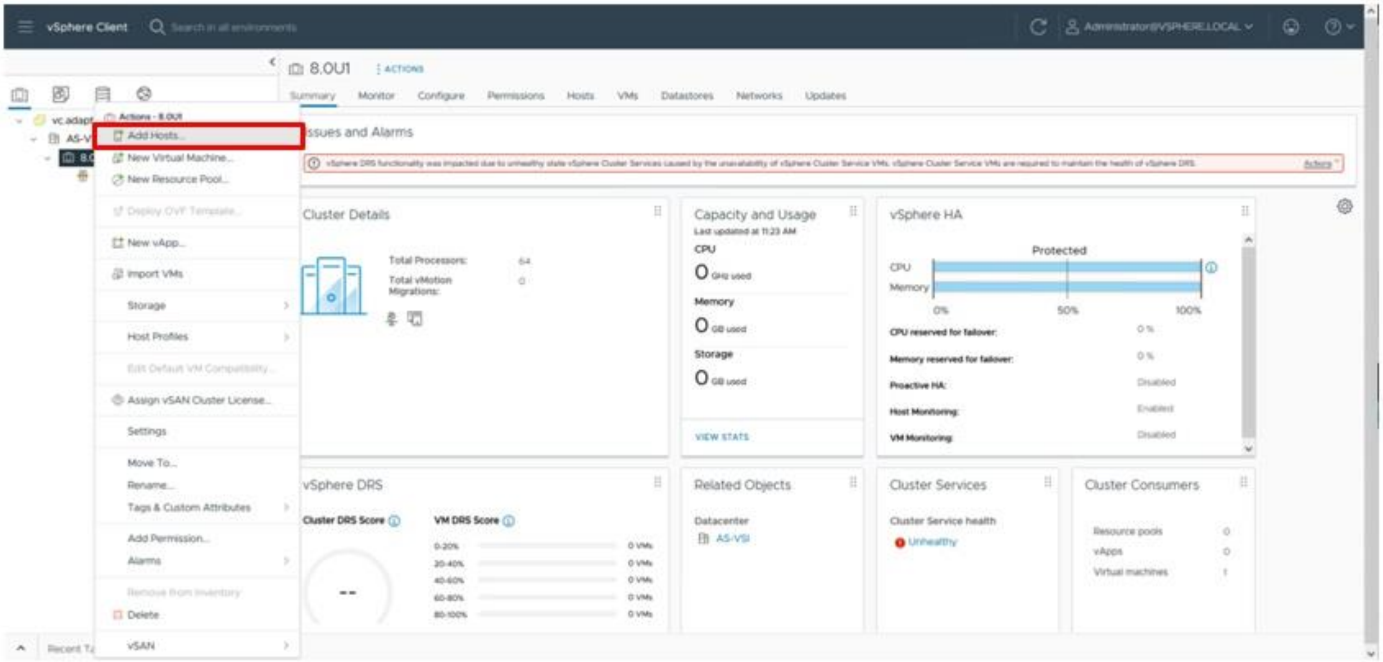
Add Remaining Hosts to vCenter

This procedure details the steps to add and configure an ESXi host in vCenter.

Procedure 1. Add the ESXi Hosts to vCenter

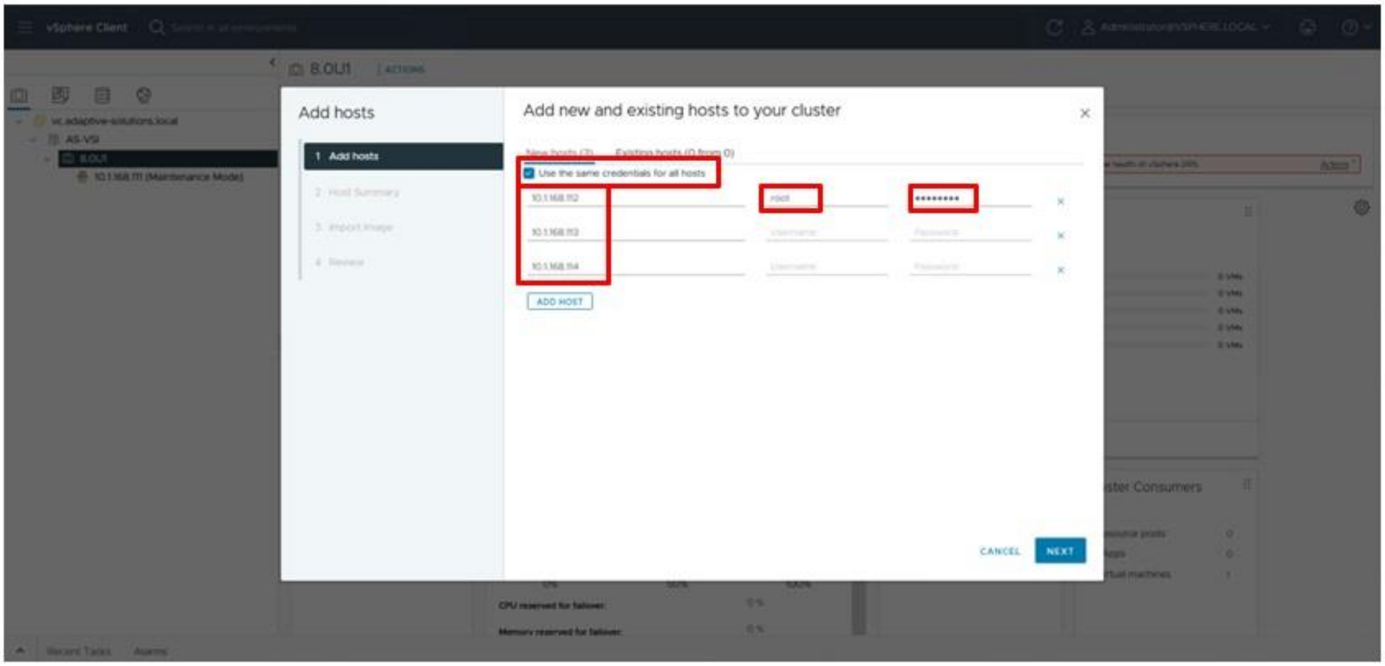
Step 1. From the Home screen in the VMware vCenter HTML5 Interface, select **Hosts and Clusters**.

Step 2. Right-click the cluster and click **Add Hosts**.



vSphere DRS functionality was impacted due to unhealthy state vSphere Cluster Services caused by the unavailability of vSphere Cluster Service VMs. vSphere Cluster Service VMs are required to maintain the health of vSphere DRS

Step 3. In the IP address or FQDN field, enter either the IP address or the FQDN name of the configured VMware ESXi host. Enter the user id (root) and associated password. If more than one host is being added, add the corresponding host information, optionally selecting “Use the same credentials for all hosts.” Click **NEXT**.



Add hosts

Add new and existing hosts to your cluster

New hosts (3) Existing hosts (0 from 0)

☑ Use the same credentials for all hosts

10.1.168.112	root	•••••••••
10.1.168.113	Username	Password
10.1.168.114	Username	Password

Step 4. Select all hosts being added and click **OK** to accept the thumbprint(s) when prompted with the Security Alert pop-up.

Step 5. Review the host details and click **NEXT** to continue.

Step 6. Leave **Don’t import an image** selected and click **NEXT**.

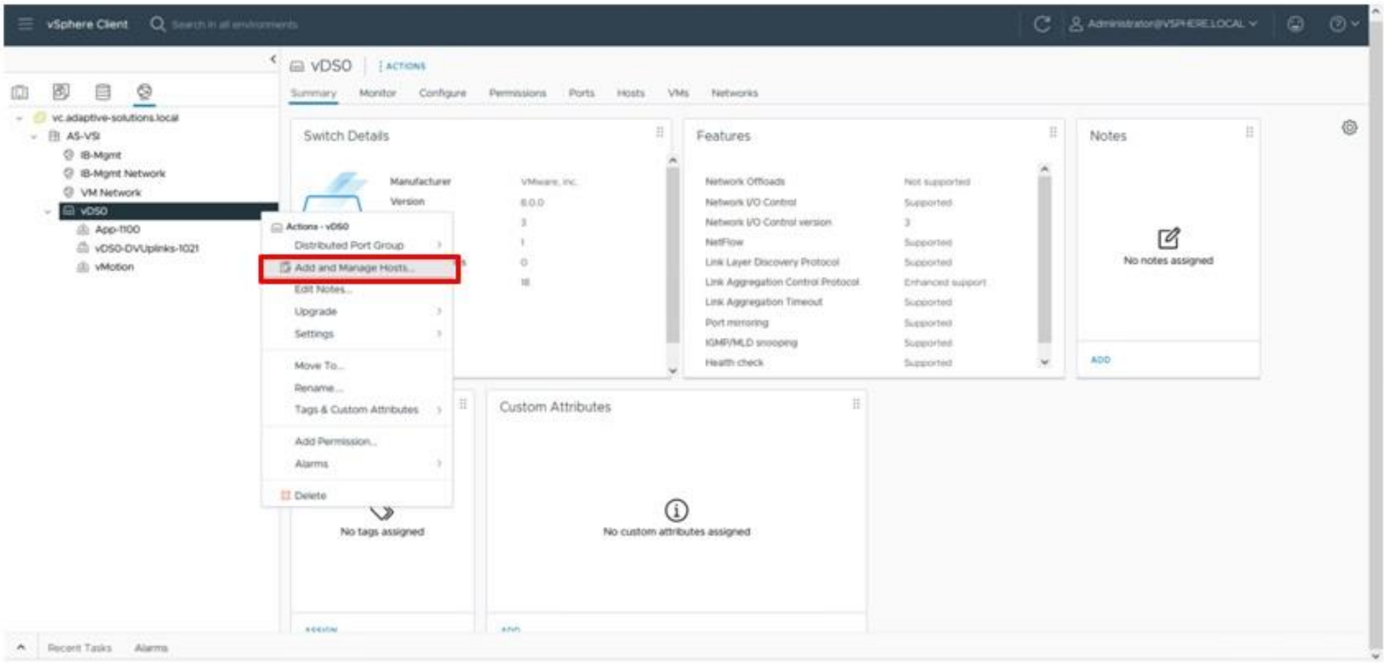
Step 7. Review the configuration parameters and click **FINISH** to add the host(s).

Note: The added ESXi host(s) will be placed in Maintenance Mode and will have Warnings that the ESXi Shell and SSH have been enabled. These warnings can be suppressed. The TPM Encryption Recovery Key Backup Alarm can also be Reset to Green.

Procedure 2. Add additional hosts to vDS

The additional host will need to join the vDS for vMotion and application traffic.

Step 1. Select the Network icon from the left side menu, right-click the created vDS and select the **Add and Manage Hosts…** option.



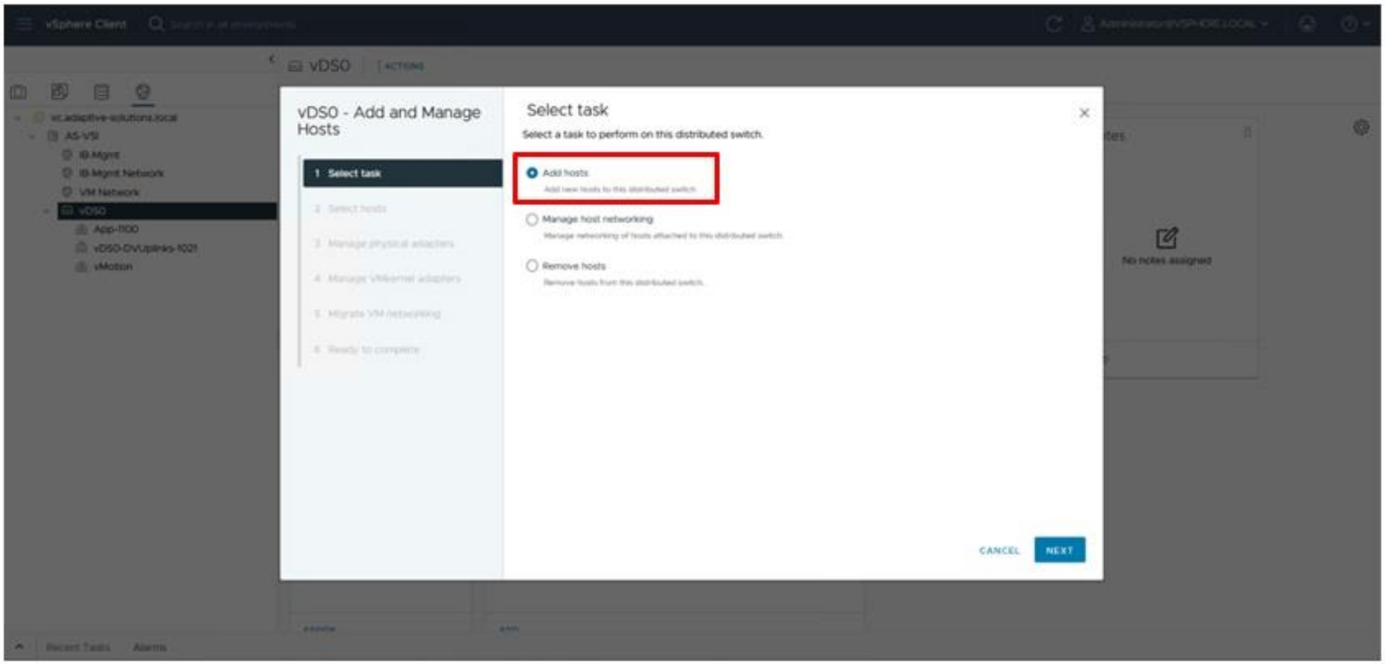
Switch Details

Manufacturer	VMware, Inc.
Version	8.0.0
	3
	1
	0
	18

Features

Network Offloads	Not supported
Network I/O Control	Supported
Network I/O Control version	3
NetFlow	Supported
Link Layer Discovery Protocol	Supported
Link Aggregation Control Protocol	Enhanced support
Link Aggregation Timeout	Supported
Port mirroring	Supported
IGMP/MLD snooping	Supported
Health check	Supported

Step 2. With **Add hosts** selected click **NEXT**.


vDS0 - Add and Manage Hosts
1 Select task
2 Select hosts
3 Manage physical adapters
4 Manage VMkernel adapters
5 Migrate VM networking
6 Ready to complete
CANCEL
NEXT

Select task

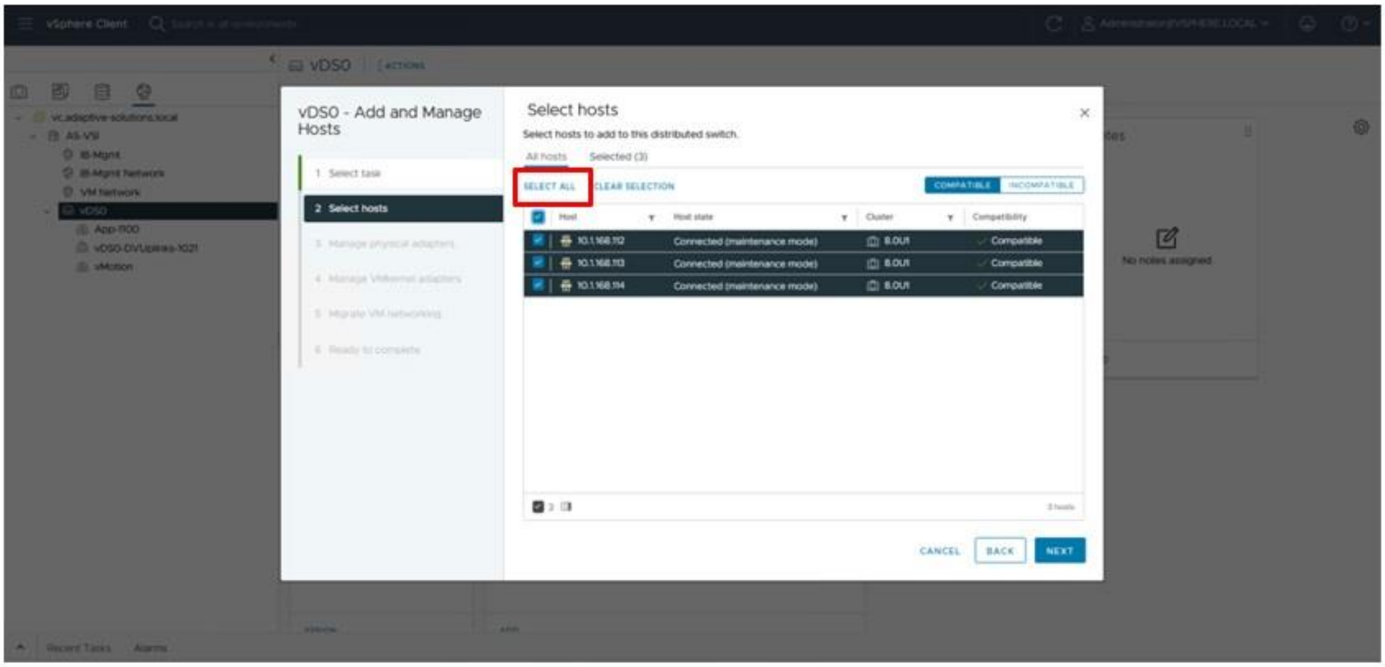
Select a task to perform on this distributed switch.

● 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.

Step 3. Select all additional hosts and click **NEXT**.



vDS0 - Add and Manage Hosts

1 Select task

2 Select hosts

3 Manage physical adapters

4 Manage VMkernel adapters

5 Migrate VM networking

6 Ready to complete

Select hosts

Select hosts to add to this distributed switch.

All hosts | Selected (3)

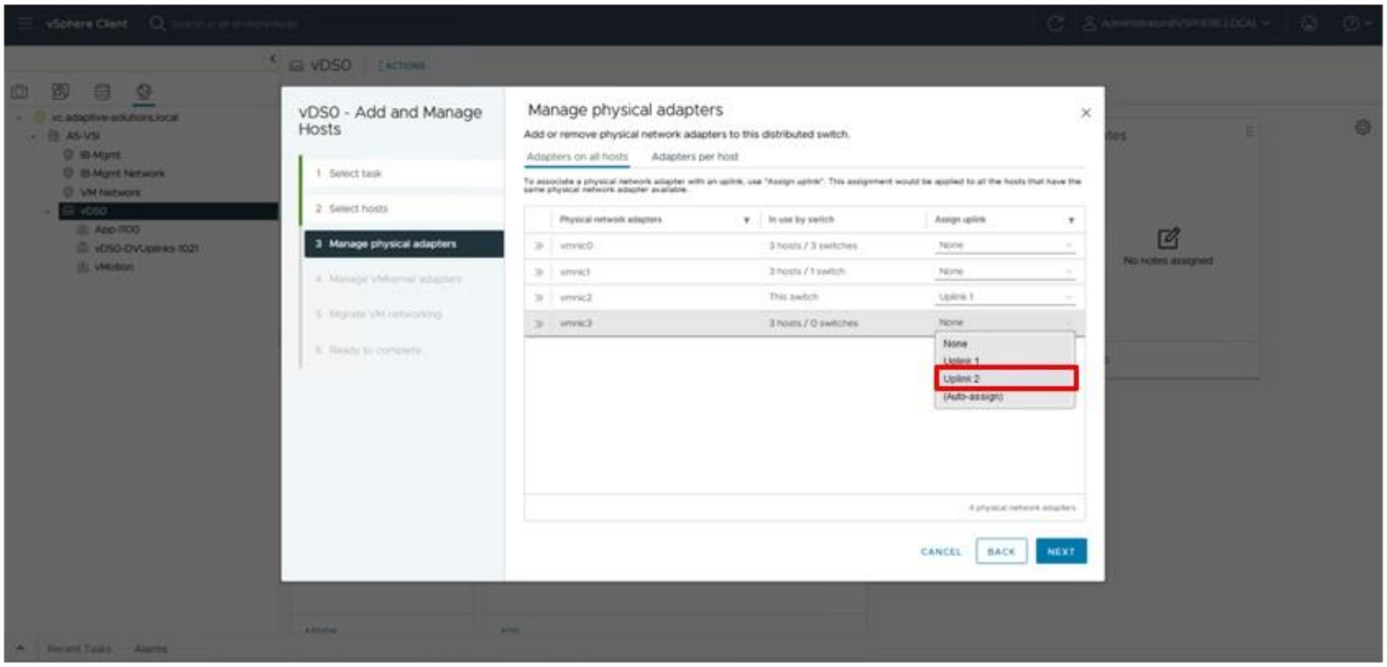
SELECT ALL | CLEAR SELECTION | COMPATIBLE | INCOMPATIBLE

☑	Host	Host state	Cluster	Compatibility
☑	10.1.168.112	Connected (maintenance mode)	8.0U1	✓ Compatible
☑	10.1.168.113	Connected (maintenance mode)	8.0U1	✓ Compatible
☑	10.1.168.114	Connected (maintenance mode)	8.0U1	✓ Compatible

3 hosts

CANCEL | BACK | NEXT

Step 4. Assign **Uplink 1** to vmnic2 and **Uplink 2** to vmnic3 and then click **NEXT**.



vDS0 - Add and Manage Hosts

1 Select task

2 Select hosts

3 Manage physical adapters

4 Manage VMkernel adapters

5 Migrate VM networking

6 Ready to complete

Manage physical adapters

Add or remove physical network adapters to this distributed switch.

Adapters on all hosts | Adapters per host

To associate a physical network adapter with an uplink, use "Assign uplink". This assignment would be applied to all the hosts that have the same physical network adapter available.

Physical network adapters	In use by switch	Assign uplink
vmnic0	3 hosts / 3 switches	None
vmnic1	3 hosts / 1 switch	None
vmnic2	This switch	Uplink 1
vmnic3	3 hosts / 0 switches	None

None

Uplink 1

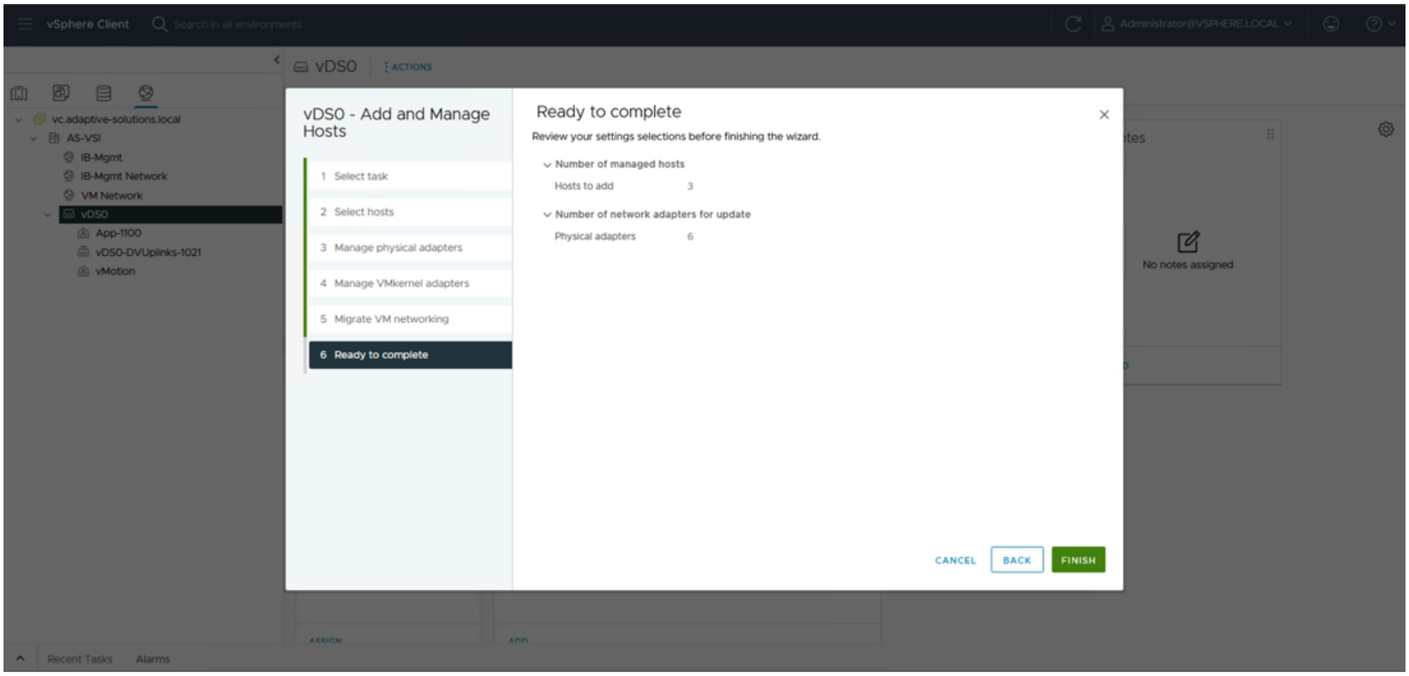
Uplink 2

(Auto-assign)

4 physical network adapters

CANCEL | BACK | NEXT

Step 5. Click **NEXT** through Manage VMkernel adapters and Migrate VM networking.



vDS0 - Add and Manage Hosts

1 Select task
2 Select hosts
3 Manage physical adapters
4 Manage VMkernel adapters
5 Migrate VM networking
6 Ready to complete

Ready to complete

Review your settings selections before finishing the wizard.

Number of managed hosts

Hosts to add	3

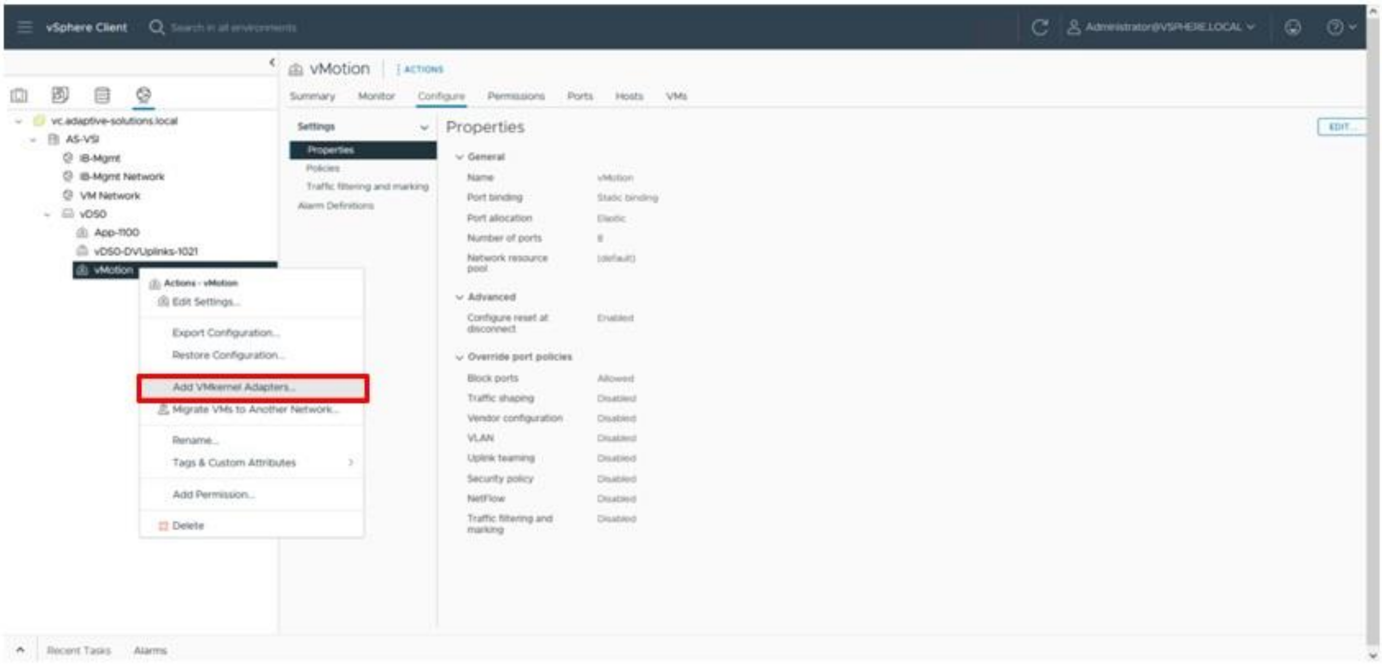
Number of network adapters for update

Physical adapters	6

CANCEL BACK FINISH

Step 6. Confirm the host addition numbers match and click **FINISH**.

Step 7. Right-click the **vMotion vDS** port group and click the **Add VMkernel Adapters…** option.



Properties

General

Name	vMotion
Port binding	Static binding
Port allocation	Elastic
Number of ports	8
Network resource pool	(default)

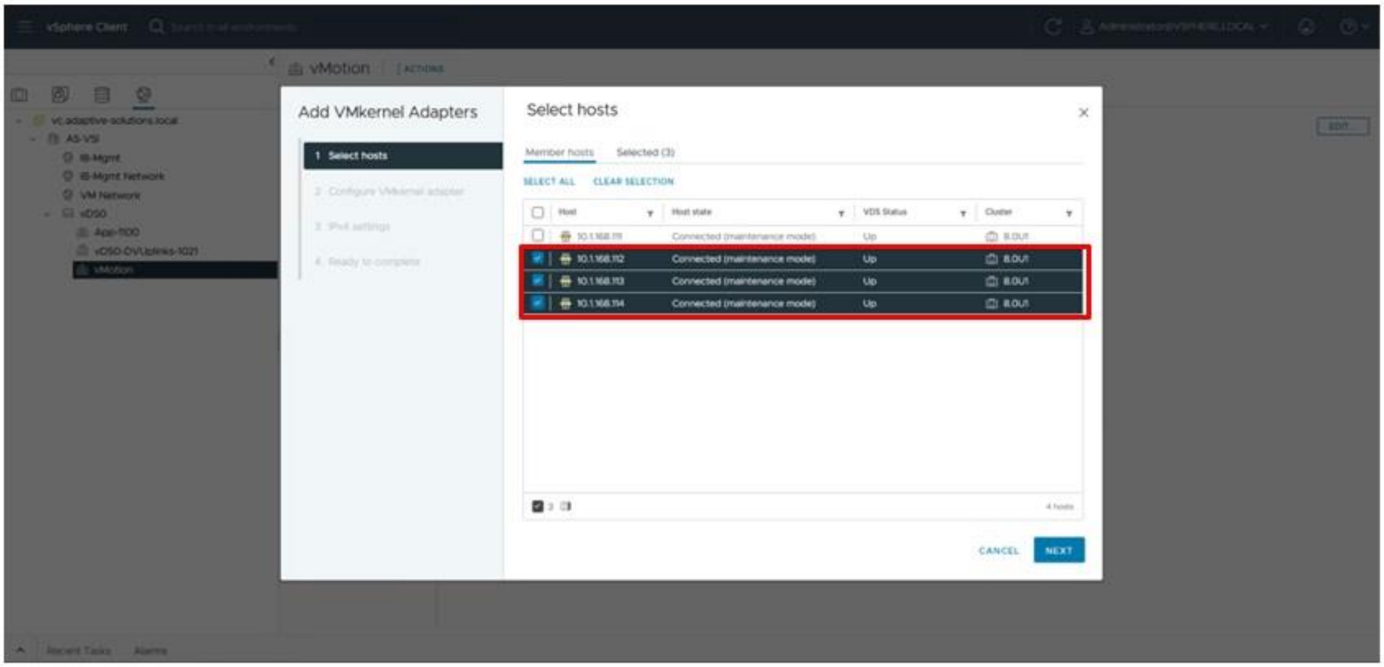
Advanced

Configure reset at disconnect	Enabled

Override port policies

Block ports	Allowed
Traffic shaping	Disabled
Vendor configuration	Disabled
VLAN	Disabled
Uplink teaming	Disabled
Security policy	Disabled
NetFlow	Disabled
Traffic filtering and marking	Disabled

Step 8. Select the added hosts and click **NEXT**.



Select hosts

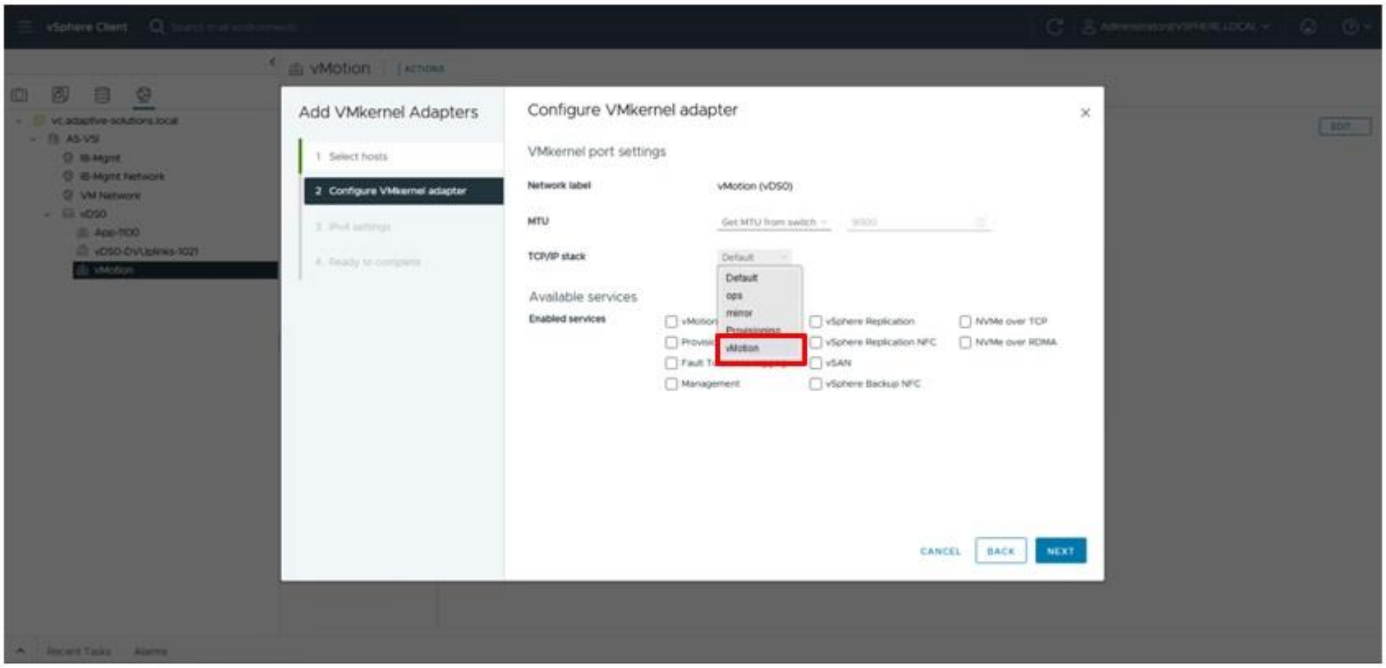
Member hosts | Selected (3)

SELECT ALL | CLEAR SELECTION

	Host	Host state	VDS Status	Cluster
□	10.1.168.111	Connected (maintenance mode)	Up	8.0U1
☑	10.1.168.112	Connected (maintenance mode)	Up	8.0U1
☑	10.1.168.113	Connected (maintenance mode)	Up	8.0U1
☑	10.1.168.114	Connected (maintenance mode)	Up	8.0U1

4 hosts

Step 9. From the drop-down list for TCP/IP stack, choose **vMotion** and click **NEXT**.



Configure VMkernel adapter

VMkernel port settings

Network label: vMotion (vDS0)

MTU: Get MTU from switch 9000

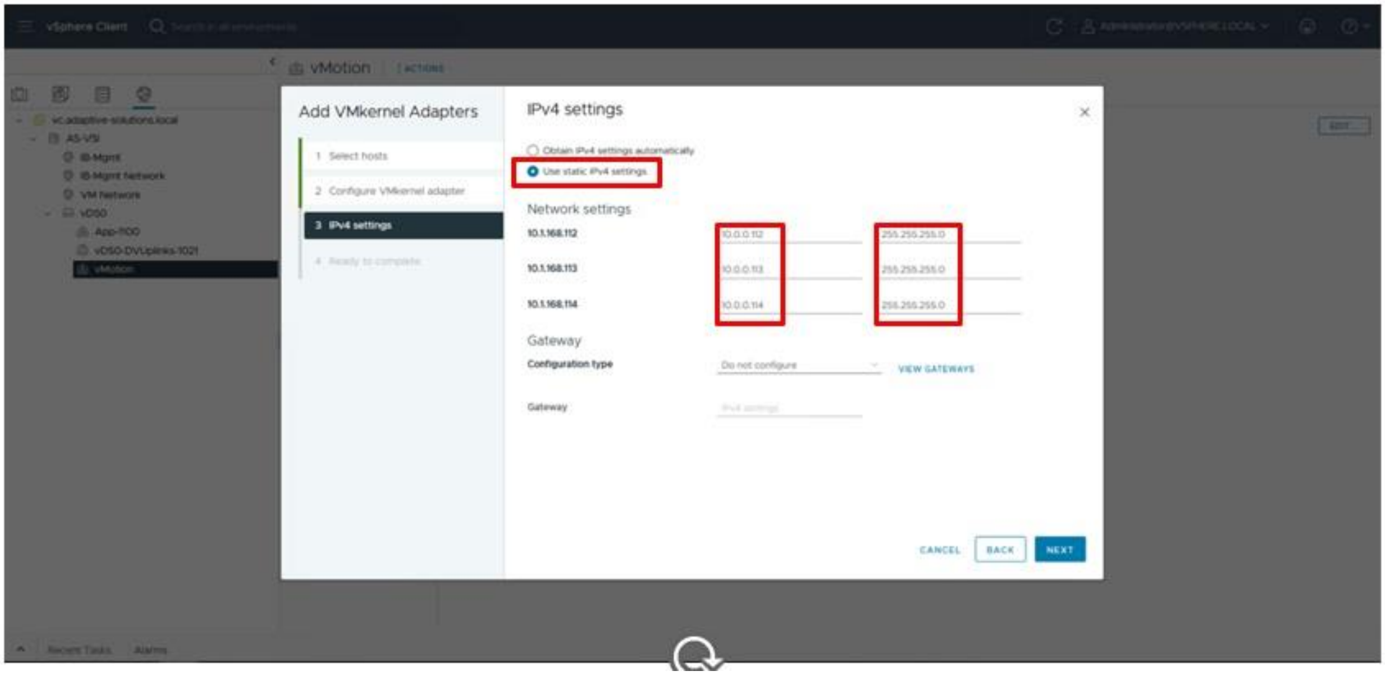
TCP/IP stack: Default

- Default
- ops
- mirror
- Provisioning
- vMotion

Available services

Enabled services: □ vMotion □ Provisioning □ Fault Tolerance □ Management □ vSphere Replication □ vSphere Replication NFC □ vSAN □ vSphere Backup NFC □ NVMe over TCP □ NVMe over RDMA

Step 10. Select the **Use static IPv4** settings option and provide **vMotion** IP and netmask information for each host. Click **NEXT**.



IPv4 settings

○ Obtain IPv4 settings automatically
● Use static IPv4 settings

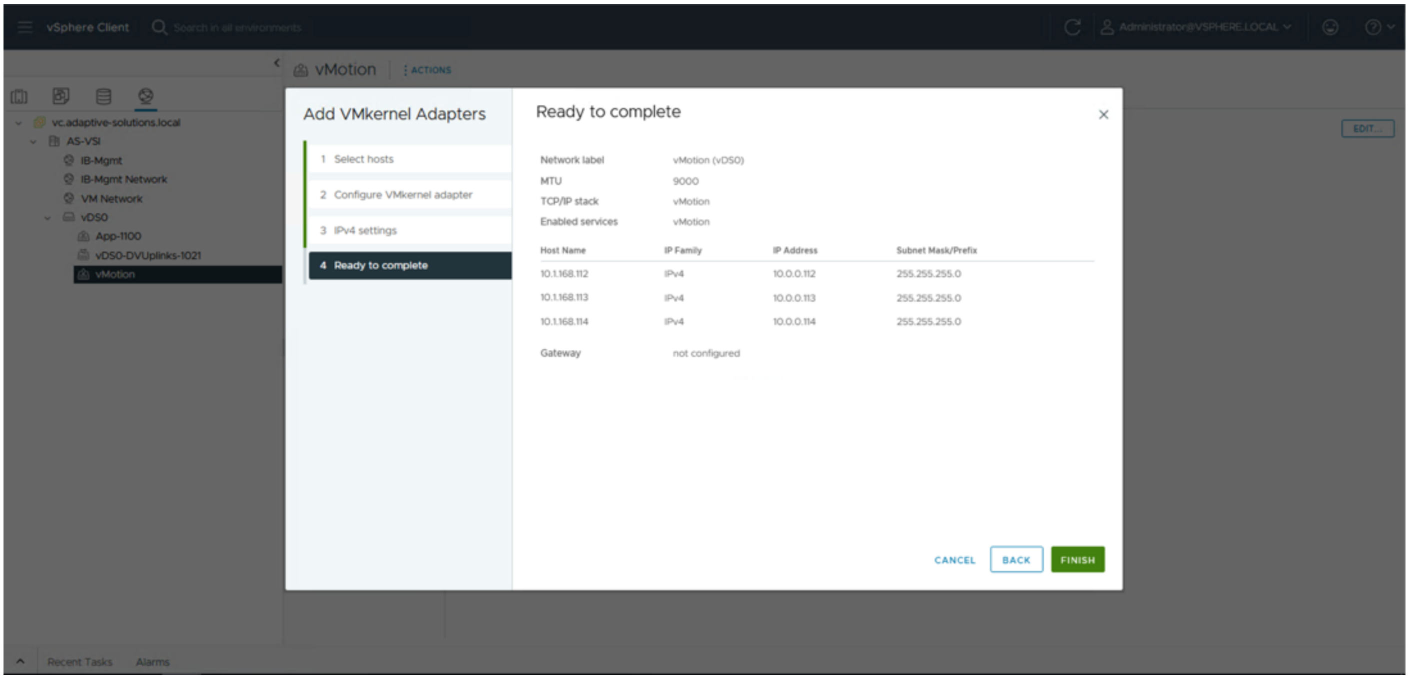
Network settings

10.1.168.112	10.0.0.112	255.255.255.0
10.1.168.113	10.0.0.113	255.255.255.0
10.1.168.114	10.0.0.114	255.255.255.0

Gateway

Configuration type: Do not configure

Step 11. Click **FINISH.**



Ready to complete

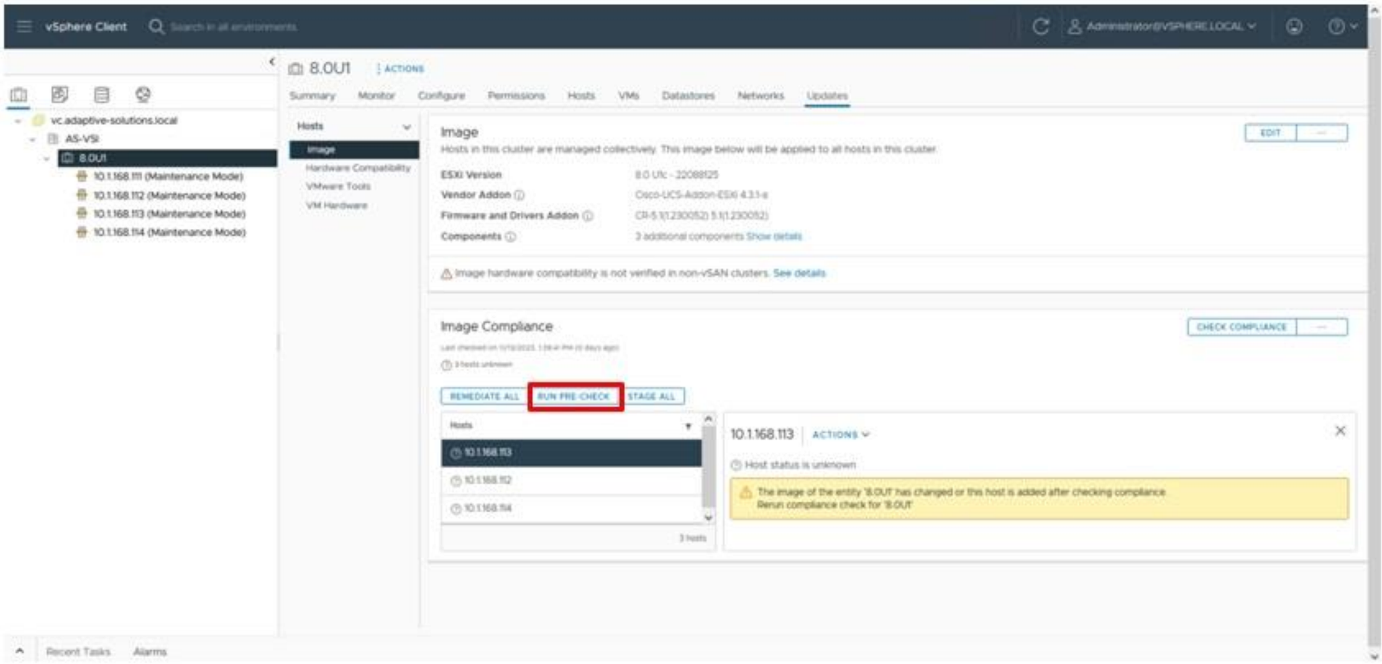
Network label	vMotion (vDS0)
MTU	9000
TCP/IP stack	vMotion
Enabled services	vMotion

Host Name	IP Family	IP Address	Subnet Mask/Prefix
10.1.168.112	IPv4	10.0.0.112	255.255.255.0
10.1.168.113	IPv4	10.0.0.113	255.255.255.0
10.1.168.114	IPv4	10.0.0.114	255.255.255.0

Gateway: not configured

Procedure 3. Image Reconciliation

Step 1. Click **Updates > Hosts > Image** for the VSI cluster and select **RUN PRE-CHECK**.



Image

Hosts in this cluster are managed collectively. This image below will be applied to all hosts in this cluster.

ESXi Version	8.0 U1c - 22088125
Vendor Addon	Cisco-UCS-Addon-ESXi 4.3.1-a
Firmware and Drivers Addon	CR-5.1(1.230052) 5.1(1.230052)
Components	3 additional components Show details

Image hardware compatibility is not verified in non-vSAN clusters. See details

Image Compliance

Last checked on 11/13/2023, 1:38:41 PM (0 days ago)

3 hosts unknown

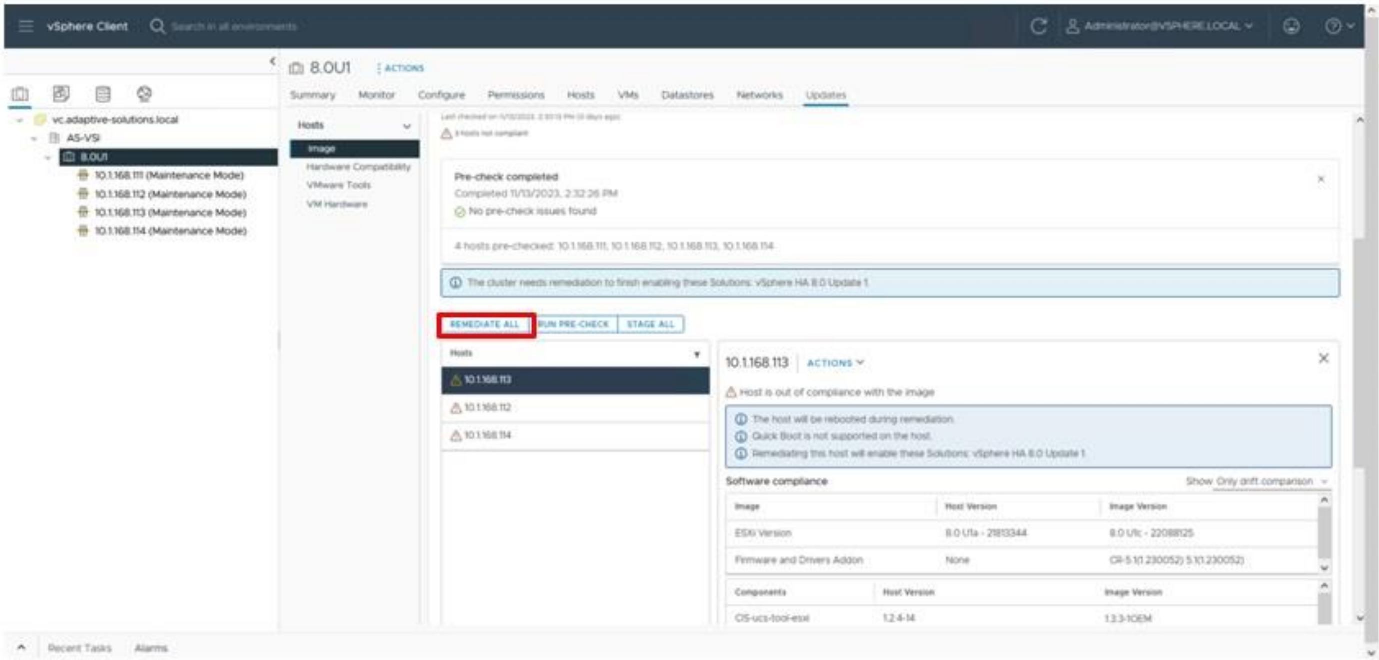
Hosts: 10.1.168.113, 10.1.168.112, 10.1.168.114 — 3 hosts

10.1.168.113

Host status is unknown

The image of the entity '8.0U1' has changed or this host is added after checking compliance.
Rerun compliance check for '8.0U1'

Step 2. After the pre-check resolves, click **REMEDIATE ALL**.



Last checked on 11/13/2023, 2:30:13 PM (0 days ago)

3 hosts not compliant

Pre-check completed

Completed 11/13/2023, 2:32:26 PM

No pre-check issues found

4 hosts pre-checked: 10.1.168.111, 10.1.168.112, 10.1.168.113, 10.1.168.114

The cluster needs remediation to finish enabling these Solutions: vSphere HA 8.0 Update 1

Hosts: 10.1.168.113, 10.1.168.112, 10.1.168.114

10.1.168.113

Host is out of compliance with the image

The host will be rebooted during remediation.

Quick Boot is not supported on the host.

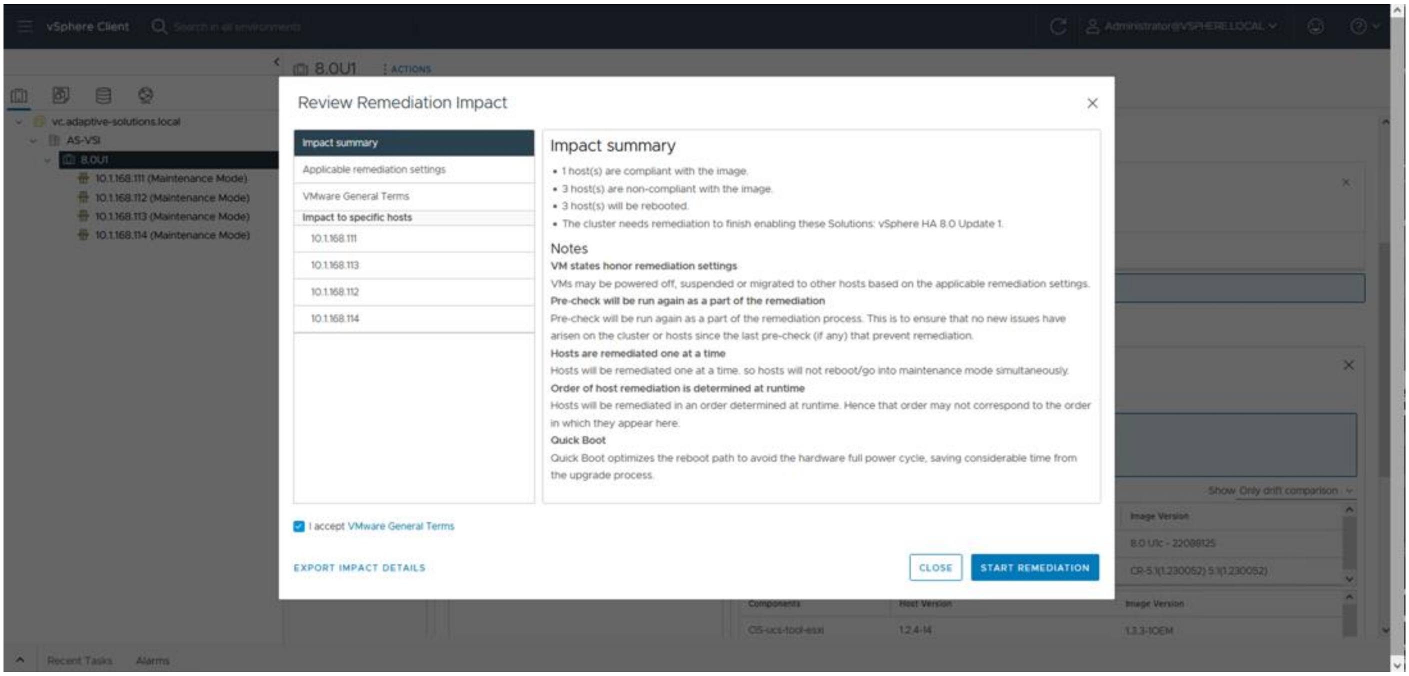
Remediating this host will enable these Solutions: vSphere HA 8.0 Update 1

Software compliance — Show Only drift comparison

Image	Host Version	Image Version
ESXi Version	8.0 U1a - 21813344	8.0 U1c - 22088125
Firmware and Drivers Addon	None	CR-5.1(1.230052) 5.1(1.230052)

Components	Host Version	Image Version
CIS-ucs-tool-esxi	1.2.4-14	1.3.3-1OEM

Step 3. Click **START REMEDIATION**.



Review Remediation Impact

Impact summary

- 1 host(s) are compliant with the image.
- 3 host(s) are non-compliant with the image.
- 3 host(s) will be rebooted.
- The cluster needs remediation to finish enabling these Solutions: vSphere HA 8.0 Update 1.

Notes

VM states honor remediation settings

VMs may be powered off, suspended or migrated to other hosts based on the applicable remediation settings.

Pre-check will be run again as a part of the remediation

Pre-check will be run again as a part of the remediation process. This is to ensure that no new issues have arisen on the cluster or hosts since the last pre-check (if any) that prevent remediation.

Hosts are remediated one at a time

Hosts will be remediated one at a time. so hosts will not reboot/go into maintenance mode simultaneously.

Order of host remediation is determined at runtime

Hosts will be remediated in an order determined at runtime. Hence that order may not correspond to the order in which they appear here.

Quick Boot

Quick Boot optimizes the reboot path to avoid the hardware full power cycle, saving considerable time from the upgrade process.

☑ I accept VMware General Terms

Step 4. Confirm the remediation has completed successfully.

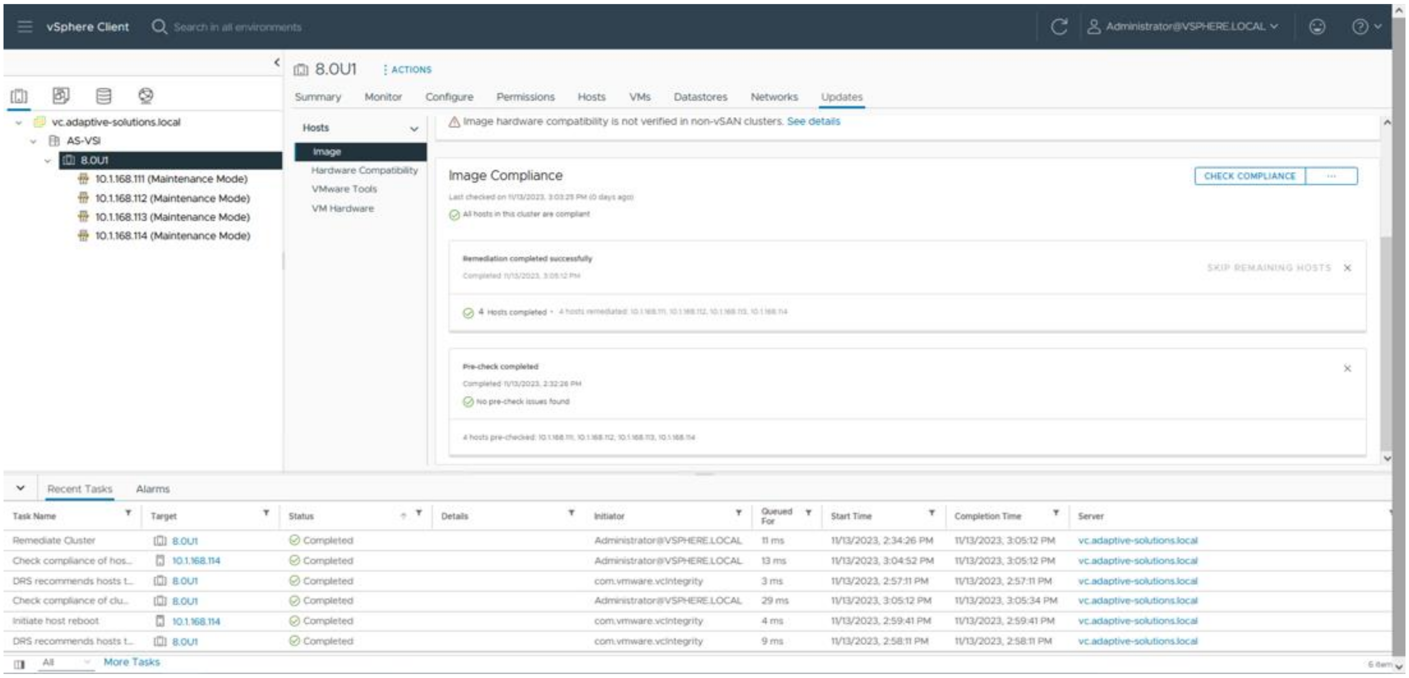


Image hardware compatibility is not verified in non-vSAN clusters. See details

Image Compliance

Last checked on 11/13/2023, 3:03:25 PM (0 days ago)

All hosts in this cluster are compliant

Remediation completed successfully

Completed 11/13/2023, 3:05:12 PM

4 Hosts completed • 4 hosts remediated: 10.1.168.111, 10.1.168.112, 10.1.168.113, 10.1.168.114

Pre-check completed

Completed 11/13/2023, 2:32:26 PM

No pre-check issues found

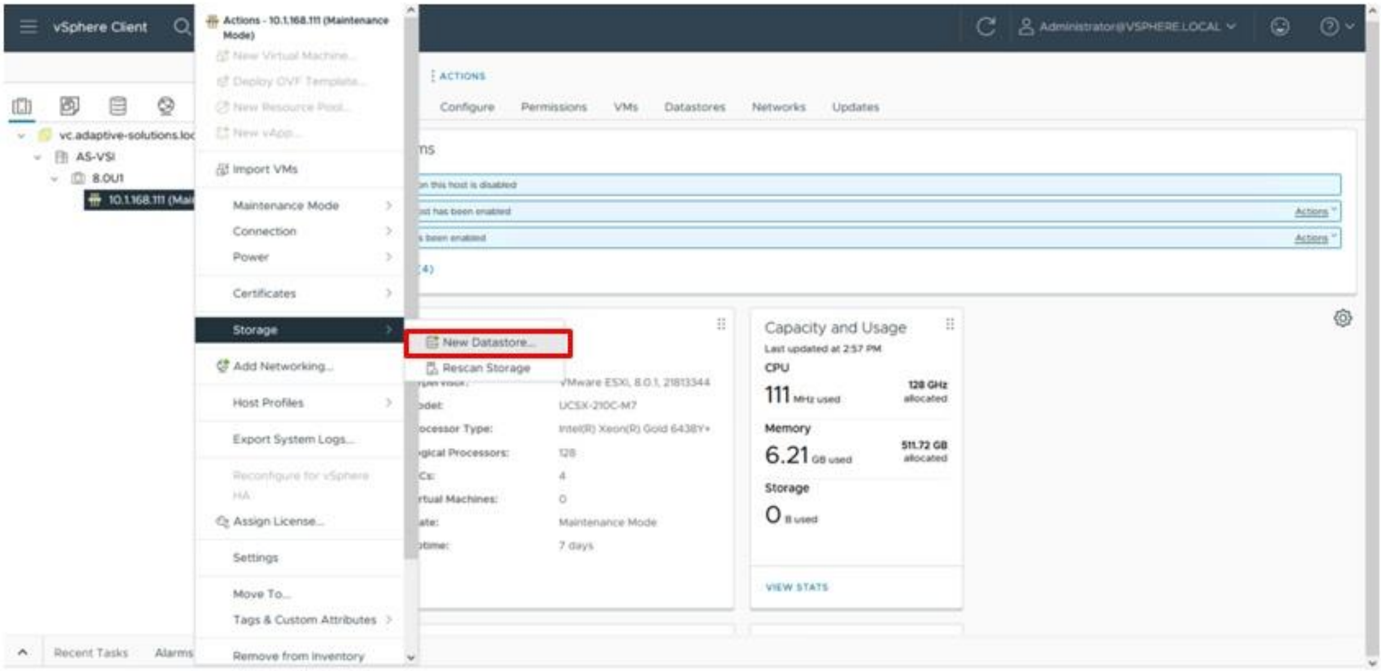
4 hosts pre-checked: 10.1.168.111, 10.1.168.112, 10.1.168.113, 10.1.168.114

Task Name	Target	Status	Details	Initiator	Queued For	Start Time	Completion Time	Server
Remediate Cluster	8.0U1	Completed		Administrator@VSPHERE.LOCAL	11 ms	11/13/2023, 2:34:26 PM	11/13/2023, 3:05:12 PM	vc.adaptive-solutions.local
Check compliance of hos...	10.1.168.114	Completed		Administrator@VSPHERE.LOCAL	13 ms	11/13/2023, 3:04:52 PM	11/13/2023, 3:05:12 PM	vc.adaptive-solutions.local
DRS recommends hosts t...	8.0U1	Completed		com.vmware.vcIntegrity	3 ms	11/13/2023, 2:57:11 PM	11/13/2023, 2:57:11 PM	vc.adaptive-solutions.local
Check compliance of clu...	8.0U1	Completed		Administrator@VSPHERE.LOCAL	29 ms	11/13/2023, 3:05:12 PM	11/13/2023, 3:05:34 PM	vc.adaptive-solutions.local
Initiate host reboot	10.1.168.114	Completed		com.vmware.vcIntegrity	4 ms	11/13/2023, 2:59:41 PM	11/13/2023, 2:59:41 PM	vc.adaptive-solutions.local
DRS recommends hosts t...	8.0U1	Completed		com.vmware.vcIntegrity	9 ms	11/13/2023, 2:58:11 PM	11/13/2023, 2:58:11 PM	vc.adaptive-solutions.local

Add VSP Storage to Hosts

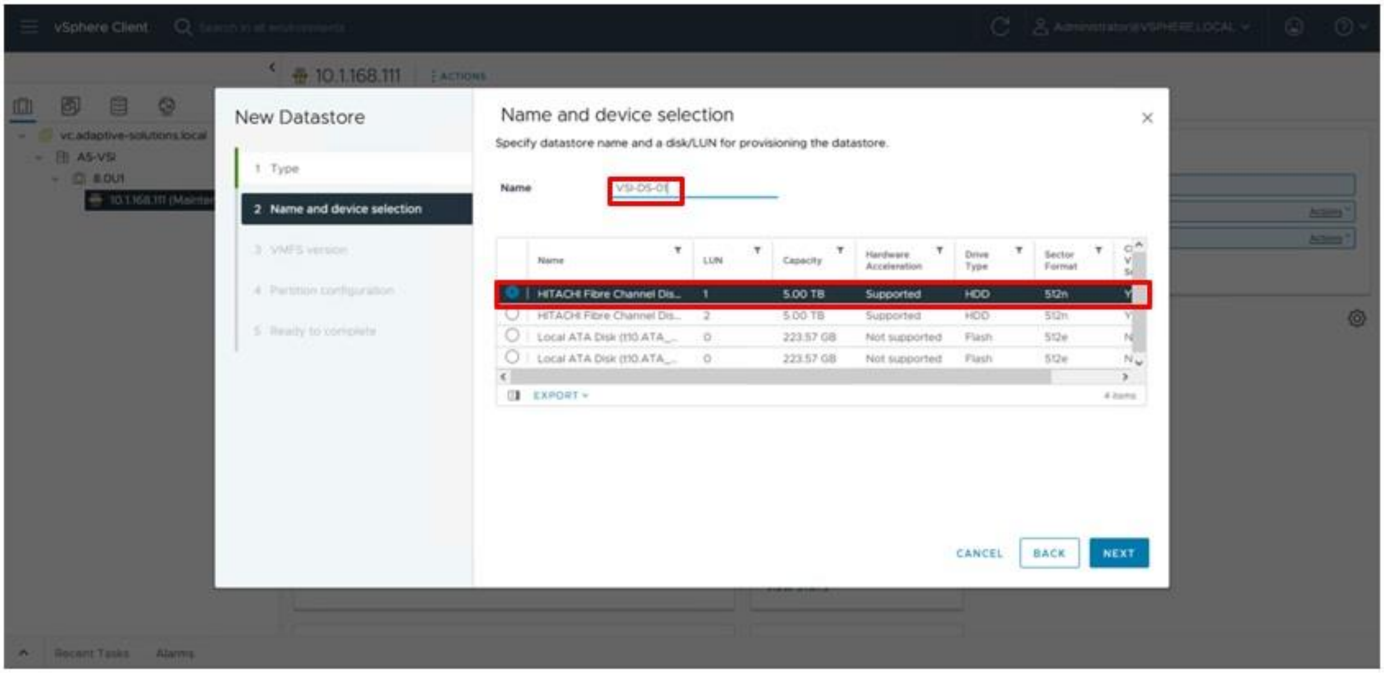
Procedure 1. Add FC-SCSI Datastores

Step 1. Select the first ESXi host, right-click and select **Storage > New Datastore...** .



Step 2. Leave VMFS selected for the type and click **NEXT**.

Step 3. Select the allocated LUN and provide an appropriate name and click **NEXT**.



Name and device selection

Specify datastore name and a disk/LUN for provisioning the datastore.

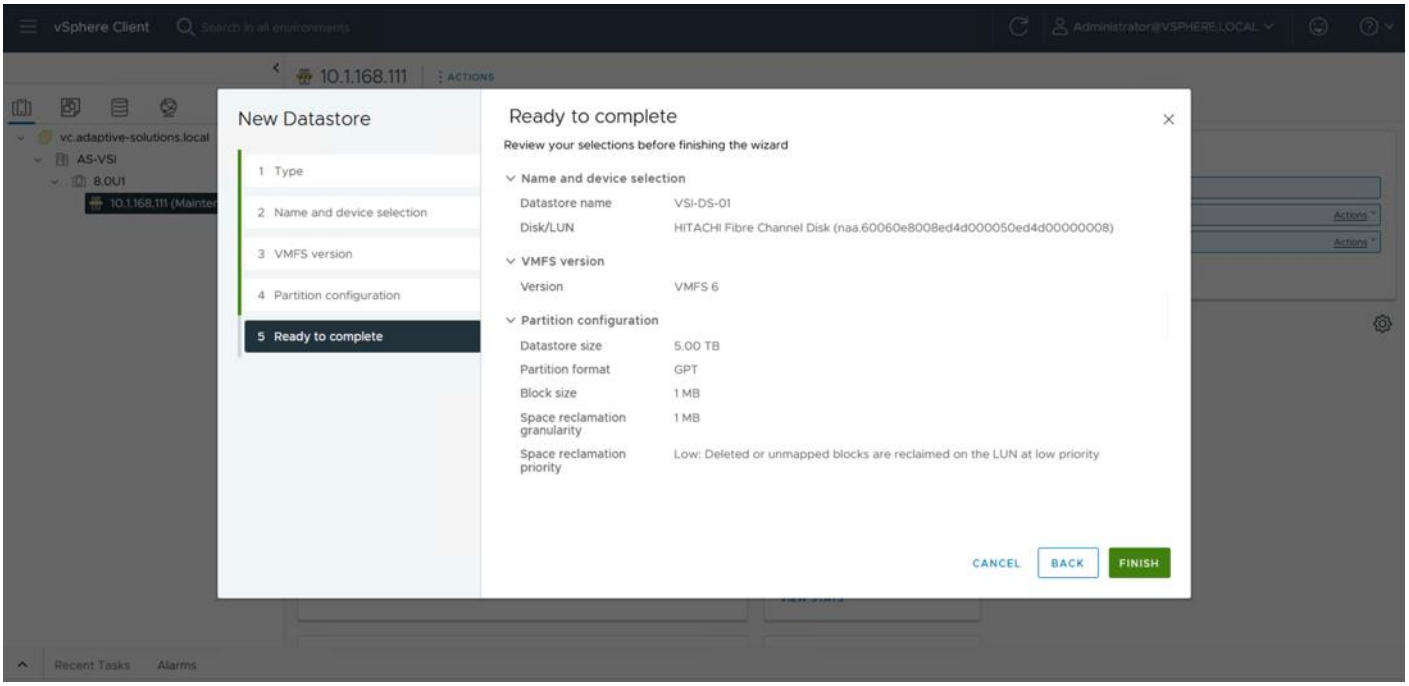
Name: VSI-DS-01

	Name	LUN	Capacity	Hardware Acceleration	Drive Type	Sector Format
●	HITACHI Fibre Channel Dis...	1	5.00 TB	Supported	HDD	512n
○	HITACHI Fibre Channel Dis...	2	5.00 TB	Supported	HDD	512n
○	Local ATA Disk (t10.ATA_...	0	223.57 GB	Not supported	Flash	512e
○	Local ATA Disk (t10.ATA_...	0	223.57 GB	Not supported	Flash	512e

Step 4. Leave VMFS 6 selected and click **NEXT**.

Step 5. Leave the default options to use all storage within the Partition configuration screen and click **NEXT**.

Step 6. Review the summary within the Ready to complete dialogue and click **FINISH**.



Ready to complete

Review your selections before finishing the wizard

Name and device selection

Datastore name	VSI-DS-01
Disk/LUN	HITACHI Fibre Channel Disk (naa.60060e8008ed4d000050ed4d00000008)

VMFS version

Version	VMFS 6

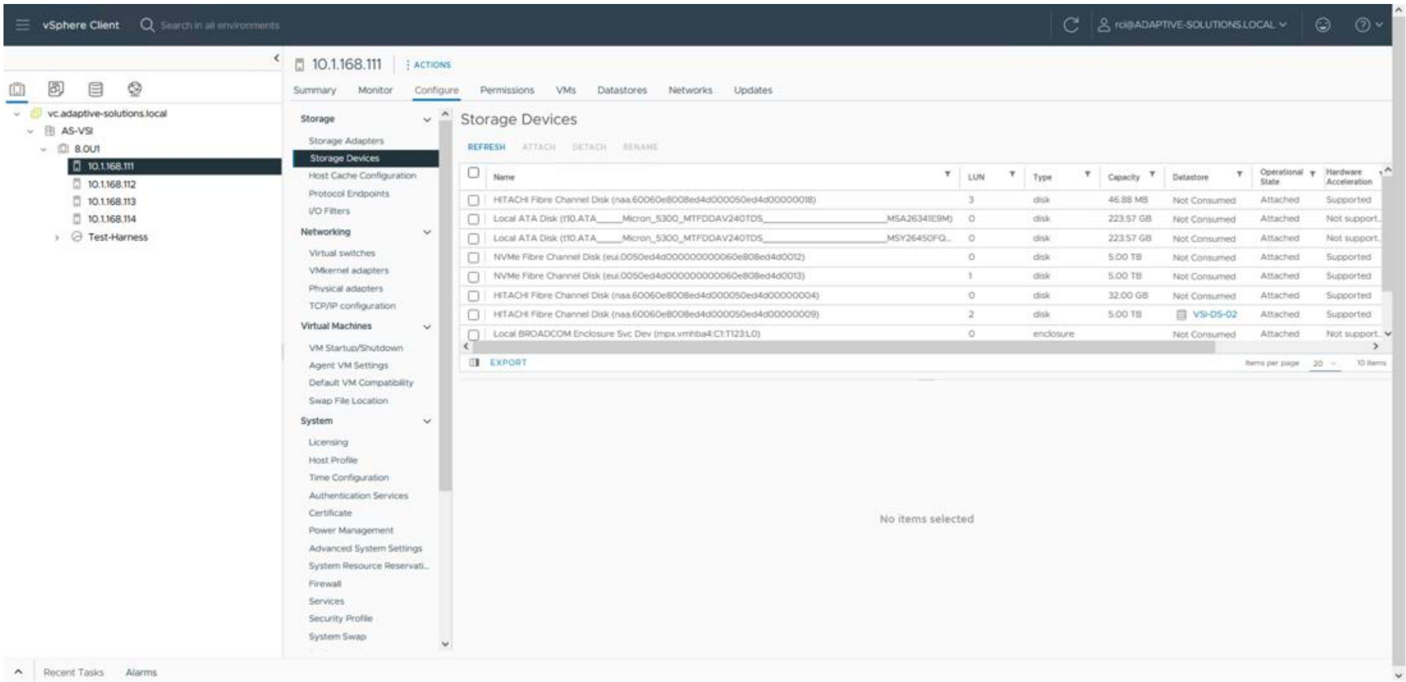
Partition configuration

Datastore size	5.00 TB
Partition format	GPT
Block size	1 MB
Space reclamation granularity	1 MB
Space reclamation priority	Low: Deleted or unmapped blocks are reclaimed on the LUN at low priority

Step 7. Repeat steps 1-6 for any additional datastores.

Procedure 2. Configure FC-NVMe Datastores

Step 1. Select the first host added within the cluster and click **Configure** > **Storage** > **Storage Devices**.

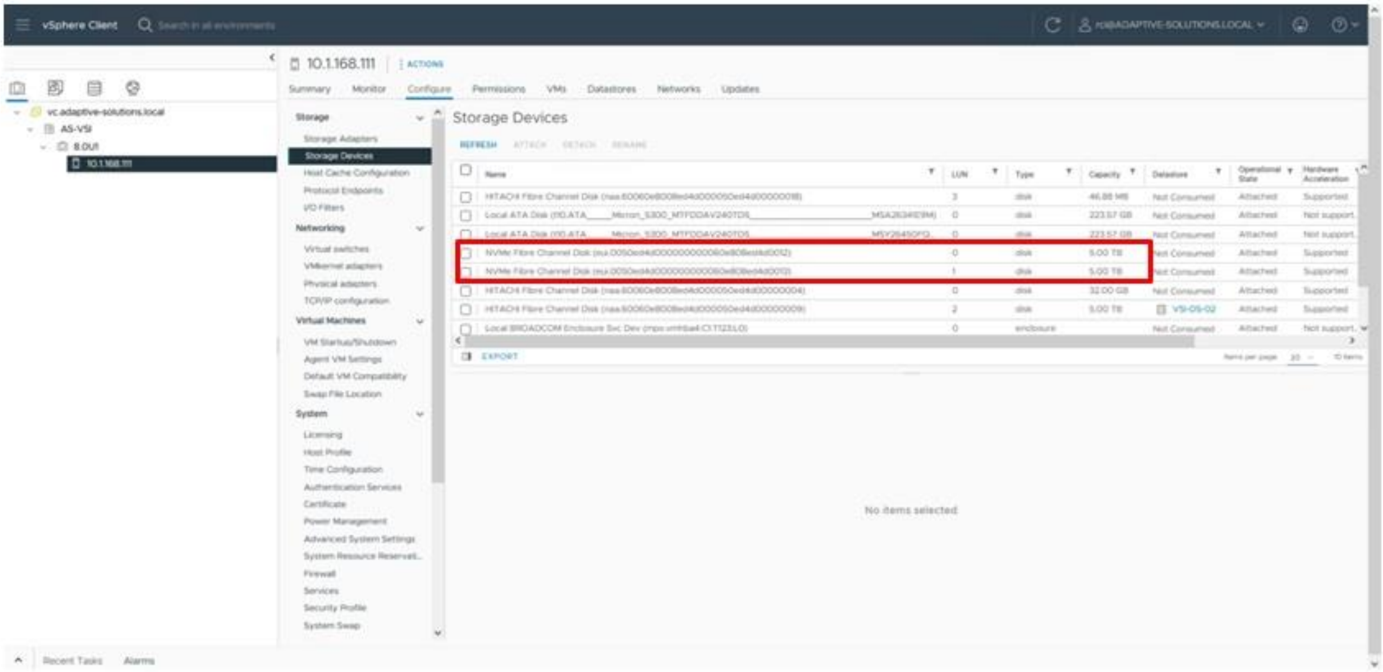


Storage Devices

Name	LUN	Type	Capacity	Datastore	Operational State	Hardware Acceleration
HITACHI Fibre Channel Disk (naa.60060e8008ed4d000050ed4d00000018)	3	disk	46.88 MB	Not Consumed	Attached	Supported
Local ATA Disk (t10.ATA_____Micron_5300_MTFDDAV240TDS_______________MSA26341E9M)	0	disk	223.57 GB	Not Consumed	Attached	Not support...
Local ATA Disk (t10.ATA_____Micron_5300_MTFDDAV240TDS_______________MSY26450FQ...	0	disk	223.57 GB	Not Consumed	Attached	Not support...
NVMe Fibre Channel Disk (eui.0050ed4d000000000060e808ed4d0012)	0	disk	5.00 TB	Not Consumed	Attached	Supported
NVMe Fibre Channel Disk (eui.0050ed4d000000000060e808ed4d0013)	1	disk	5.00 TB	Not Consumed	Attached	Supported
HITACHI Fibre Channel Disk (naa.60060e8008ed4d000050ed4d00000004)	0	disk	32.00 GB	Not Consumed	Attached	Supported
HITACHI Fibre Channel Disk (naa.60060e8008ed4d000050ed4d00000009)	2	disk	5.00 TB	VSI-DS-02	Attached	Supported
Local BROADCOM Enclosure Svc Dev (mpx.vmhba4:C1:T123:L0)	0	enclosure		Not Consumed	Attached	Not support...

No items selected

Step 2. Confirm that the NVMe Fibre Channel Disk devices are listed.

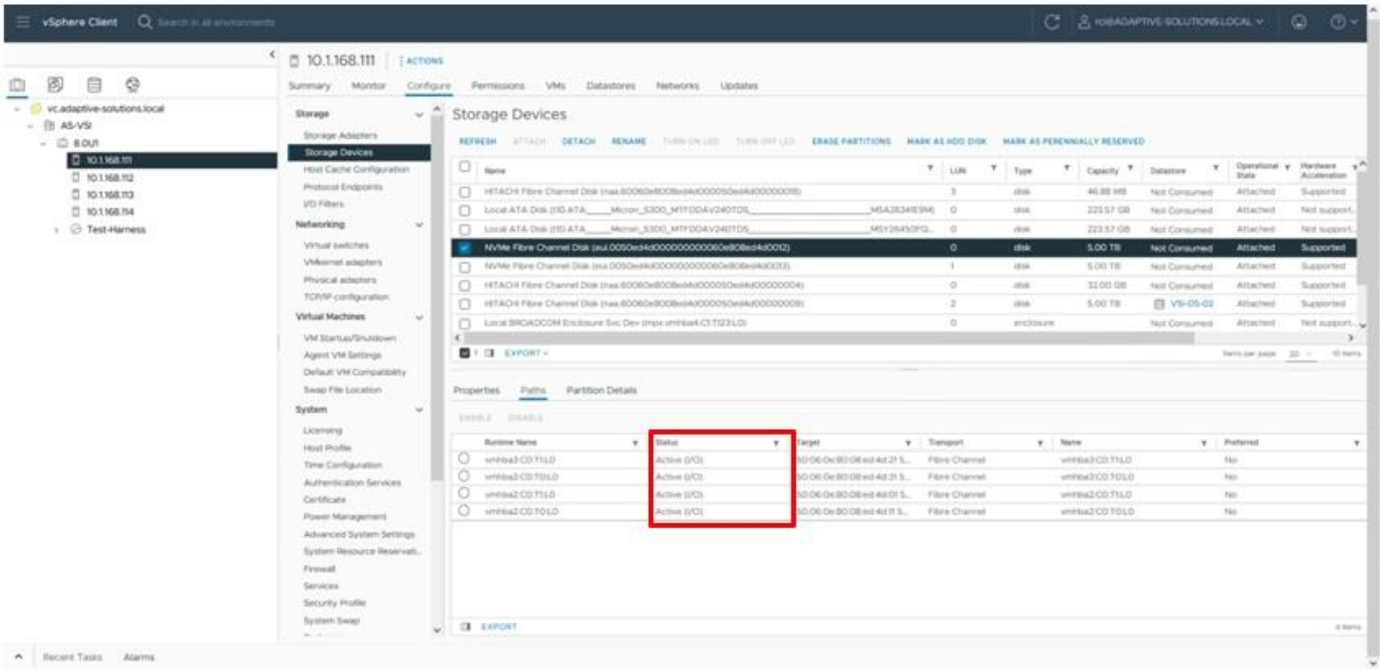


Storage Devices

Name	LUN	Type	Capacity	Datastore	Operational State	Hardware Acceleration
HITACHI Fibre Channel Disk (naa.60060e8008ed4d000050ed4d00000018)	3	disk	46.88 MB	Not Consumed	Attached	Supported
Local ATA Disk (t10.ATA_____Micron_5300_MTFDDAV240TDS_____MSA2634IE9M)	0	disk	223.57 GB	Not Consumed	Attached	Not support...
Local ATA Disk (t10.ATA_____Micron_5300_MTFDDAV240TDS_____MSY2645OFQ...	0	disk	223.57 GB	Not Consumed	Attached	Not support...
NVMe Fibre Channel Disk (eui.0050ed4d0000000000060e808ed4d0012)	0	disk	5.00 TB	Not Consumed	Attached	Supported
NVMe Fibre Channel Disk (eui.0050ed4d0000000000060e808ed4d0013)	1	disk	5.00 TB	Not Consumed	Attached	Supported
HITACHI Fibre Channel Disk (naa.60060e8008ed4d000050ed4d00000004)	0	disk	32.00 GB	Not Consumed	Attached	Supported
HITACHI Fibre Channel Disk (naa.60060e8008ed4d000050ed4d00000009)	2	disk	5.00 TB	VSI-OS-02	Attached	Supported
Local BROADCOM Enclosure Svc Dev (mpx.vmhba4:C1:T123:L0)	0	enclosure		Not Consumed	Attached	Not support...

No items selected

Step 3. Select the first NVMe Fibre Channel Disk, then select Paths. Verify that all paths have a status of Active (I/O).



Storage Devices

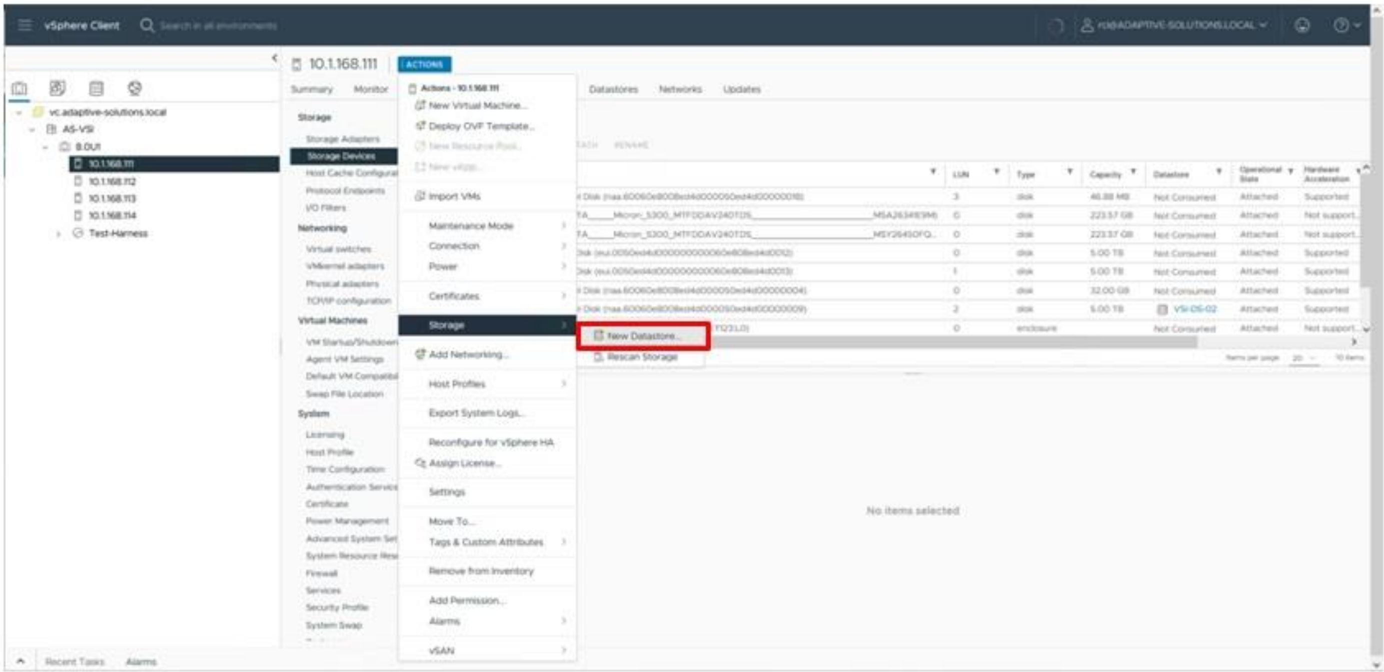
Name	LUN	Type	Capacity	Datastore	Operational State	Hardware Acceleration
HITACHI Fibre Channel Disk (naa.60060e8008ed4d000050ed4d00000018)	3	disk	46.88 MB	Not Consumed	Attached	Supported
Local ATA Disk (t10.ATA_____Micron_5300_MTFDDAV240TDS_____MSA2634IE9M)	0	disk	223.57 GB	Not Consumed	Attached	Not support...
Local ATA Disk (t10.ATA_____Micron_5300_MTFDDAV240TDS_____MSY2645OFQ...	0	disk	223.57 GB	Not Consumed	Attached	Not support...
NVMe Fibre Channel Disk (eui.0050ed4d0000000000060e808ed4d0012)	0	disk	5.00 TB	Not Consumed	Attached	Supported
NVMe Fibre Channel Disk (eui.0050ed4d0000000000060e808ed4d0013)	1	disk	5.00 TB	Not Consumed	Attached	Supported
HITACHI Fibre Channel Disk (naa.60060e8008ed4d000050ed4d00000004)	0	disk	32.00 GB	Not Consumed	Attached	Supported
HITACHI Fibre Channel Disk (naa.60060e8008ed4d000050ed4d00000009)	2	disk	5.00 TB	VSI-OS-02	Attached	Supported
Local BROADCOM Enclosure Svc Dev (mpx.vmhba4:C1:T123:L0)	0	enclosure		Not Consumed	Attached	Not support...

Properties | Paths | Partition Details

Runtime Name	Status	Target	Transport	Name	Preferred
vmhba3:C0:T1:L0	Active (I/O)	50:06:0e:80:08:ed:4d:21 5...	Fibre Channel	vmhba3:C0:T1:L0	No
vmhba3:C0:T0:L0	Active (I/O)	50:06:0e:80:08:ed:4d:31 5...	Fibre Channel	vmhba3:C0:T0:L0	No
vmhba2:C0:T1:L0	Active (I/O)	50:06:0e:80:08:ed:4d:01 5...	Fibre Channel	vmhba2:C0:T1:L0	No
vmhba2:C0:T0:L0	Active (I/O)	50:06:0e:80:08:ed:4d:11 5...	Fibre Channel	vmhba2:C0:T0:L0	No

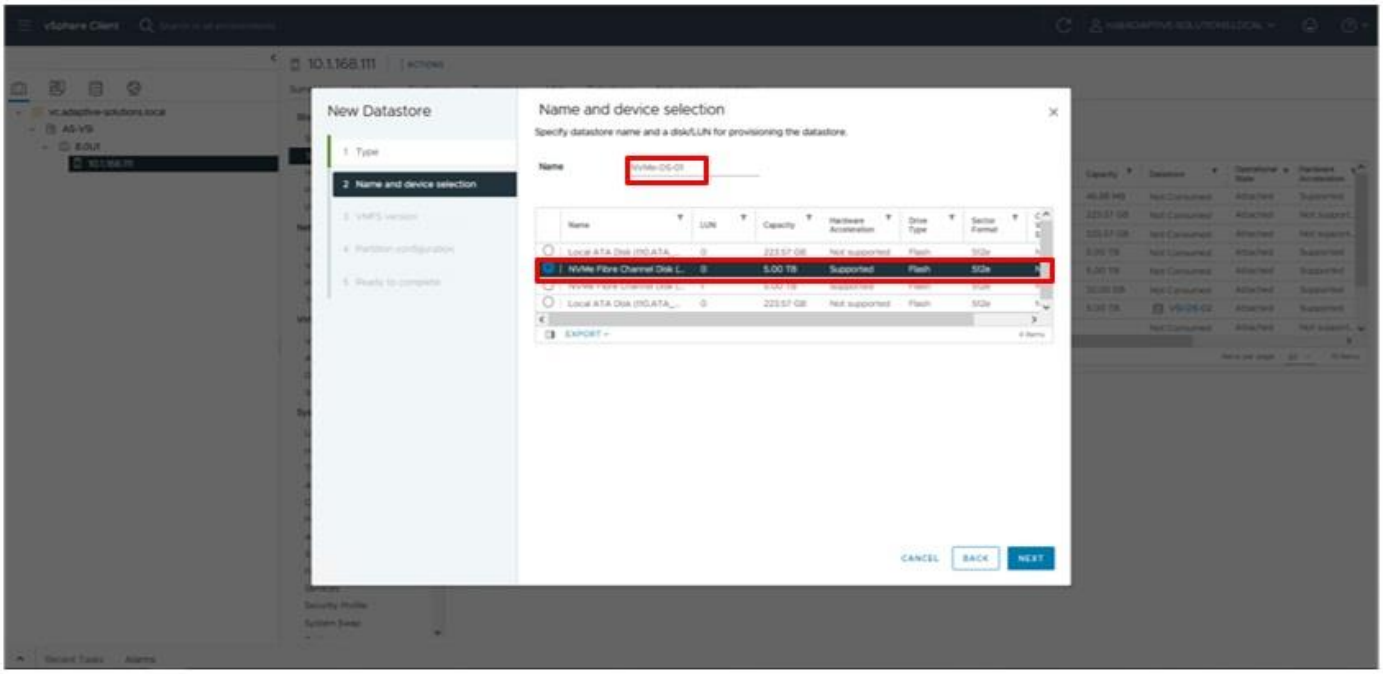
Step 4. Repeat **Step 3** for any additional NVMe Fibre Channel Disks that have been provisioned.

Step 5. Click **ACTIONS** for the host and choose **Storage > New Datastore…** from the drop-down list.



Step 6. Leave VMFS selected and click **NEXT**.

Step 7. Provide a name for the new datastore and select the LUN to use and click **NEXT**.



Name and device selection

Specify datastore name and a disk/LUN for provisioning the datastore.

Name NVMe-DS-01

	Name	LUN	Capacity	Hardware Acceleration	Drive Type	Sector Format
○	Local ATA Disk (t10.ATA_...	0	223.57 GB	Not supported	Flash	512e
●	NVMe Fibre Channel Disk (...	0	5.00 TB	Supported	Flash	512e
○	NVMe Fibre Channel Disk (...	1	5.00 TB	Supported	Flash	512e
○	Local ATA Disk (t10.ATA_...	0	223.57 GB	Not supported	Flash	512e

4 items

Step 8. Leave VMFS 6 selected and click **NEXT**.

Step 9. Leave the Partition configuration with the default values and click **NEXT**.

Step 10. Review the summary from Ready to complete and click **FINISH**.

Step 11. Repeat steps 5-10 for any additional LUNs provisioned.

Hitachi Storage Provider for VMware vCenter Initial Configuration

To prepare the VSP storage system for vVols, the storage administrator must configure a custom resource group. Within the resource group, admins must map the appropriate LDEVs that support the vVol pool, as well as a range of LDEVs IDs which are reserved for vVols creation. Additionally, you must map a single protocol endpoint (PE) to each ESXi server within the cluster.

Procedure 1. Access Hitachi Storage Navigator

You can access the storage system using the Hitachi Storage Navigator web user interface, which runs on the SVP. To connect to the SVP, ensure that Adobe AIR from HARMAN needs to be installed and configured on your machine, For more information, see the section Installing Storage Device Launcher on the management client here: https://knowledge.hitachivantara.com/Documents/Storage/VSP_5000_Series/90-07-0x/System_Configuration/01_Accessing_the_storage_system

After Adobe AIR from HARMAN is installed, you can proceed with the following steps to access Hitachi Storage Navigator.

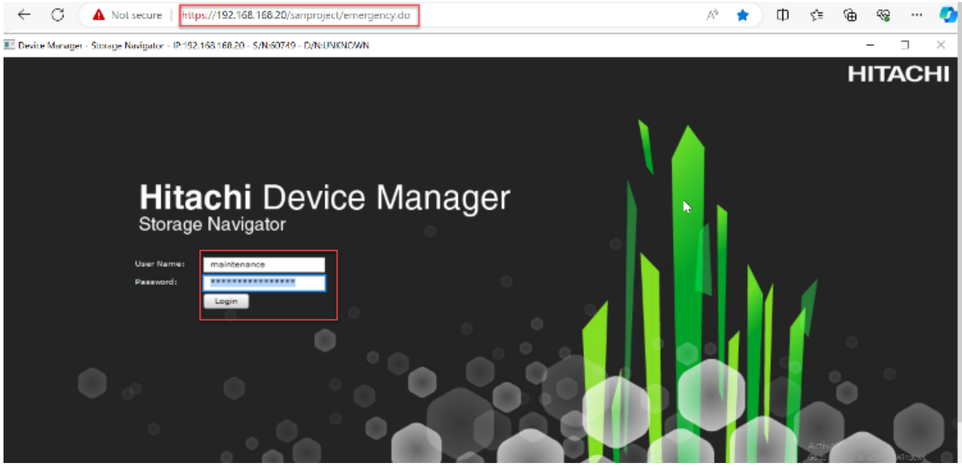
Note: VSP E1090 will require an SVP to access Storage Navigator.

Step 1. Using a web browser, navigate to https://[SVP-IP-ADDRESS]/sanproject/emergency.do.

Step 2. Use the following credentials for the first-time login.

a. Username: maintenance

b. Password: raid-maintenance



https://192.168.168.20/sanproject/emergency.do

Device Manager - Storage Navigator - IP:192.168.168.20 - S/N:60749 - D/N:UNKNOWN

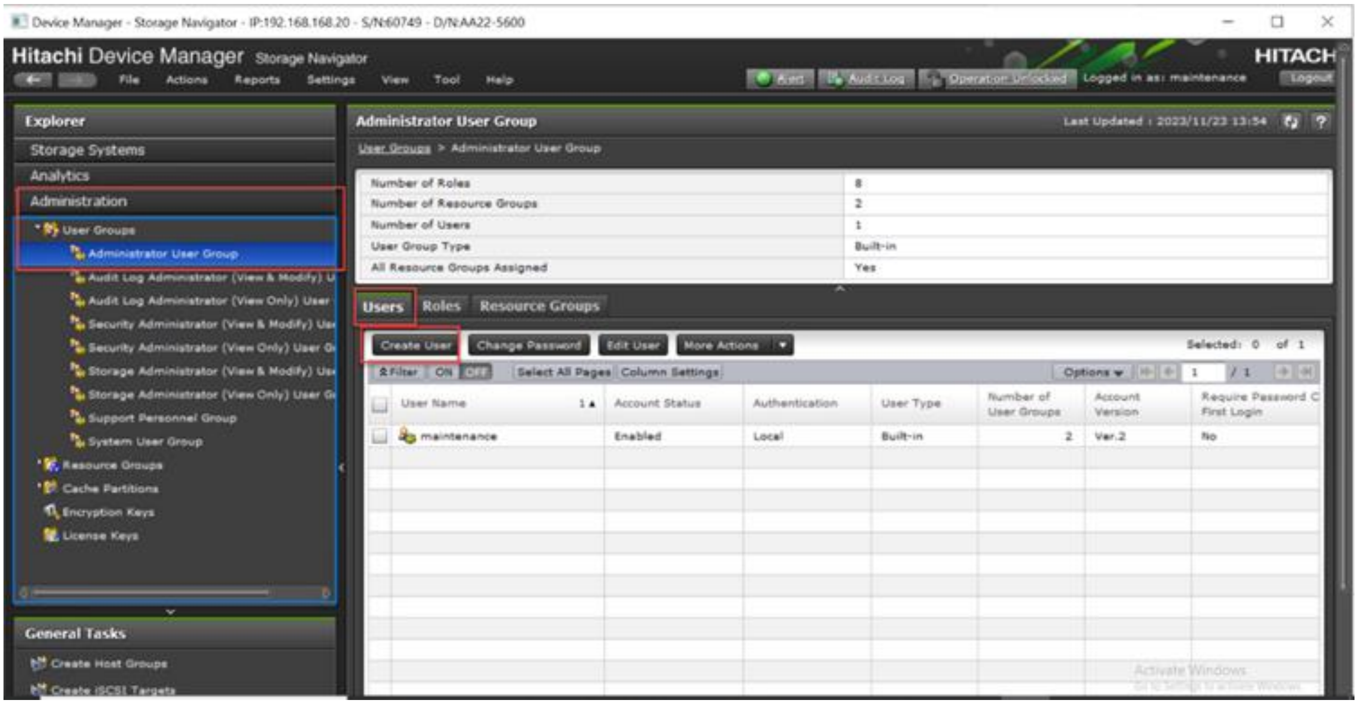
User Name: maintenance

Password: ****************

Procedure 2. Create vVols user from Hitachi Storage Navigator

Step 1. From the Hitachi Storage Navigator web user interface, select **Administration**.

Step 2. Expand **Administrator User Group** under the **Users** tab, and then click **Create User** under the **Users** tab.



Number of Roles	8
Number of Resource Groups	2
Number of Users	1
User Group Type	Built-in
All Resource Groups Assigned	Yes

☐	User Name	Account Status	Authentication	User Type	Number of User Groups	Account Version	Require Password C First Login
☐	maintenance	Enabled	Local	Built-in	2	Ver.2	No

Step 3. Provide the following information:

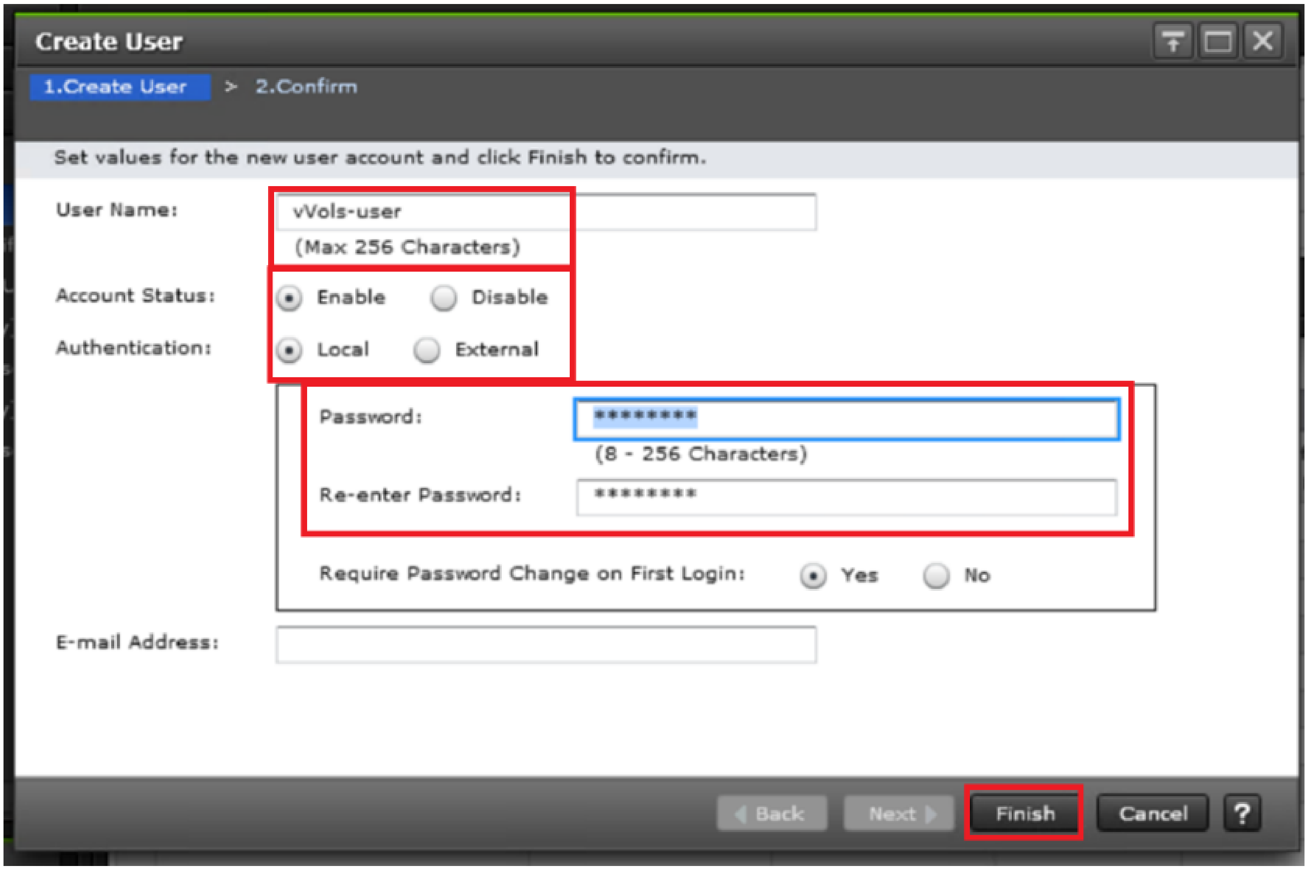
a. Enter the **Username.**

b. Select the **Enable** option to activate the **Account Status**.

c. Select **Authentication** as the Local option.

d. Enter the Password and Re-enter Password.

Step 4. Click **Finish**.



Create User

1.Create User > 2.Confirm

Set values for the new user account and click Finish to confirm.

User Name: vVols-user
(Max 256 Characters)

Account Status: ● Enable ○ Disable

Authentication: ● Local ○ External

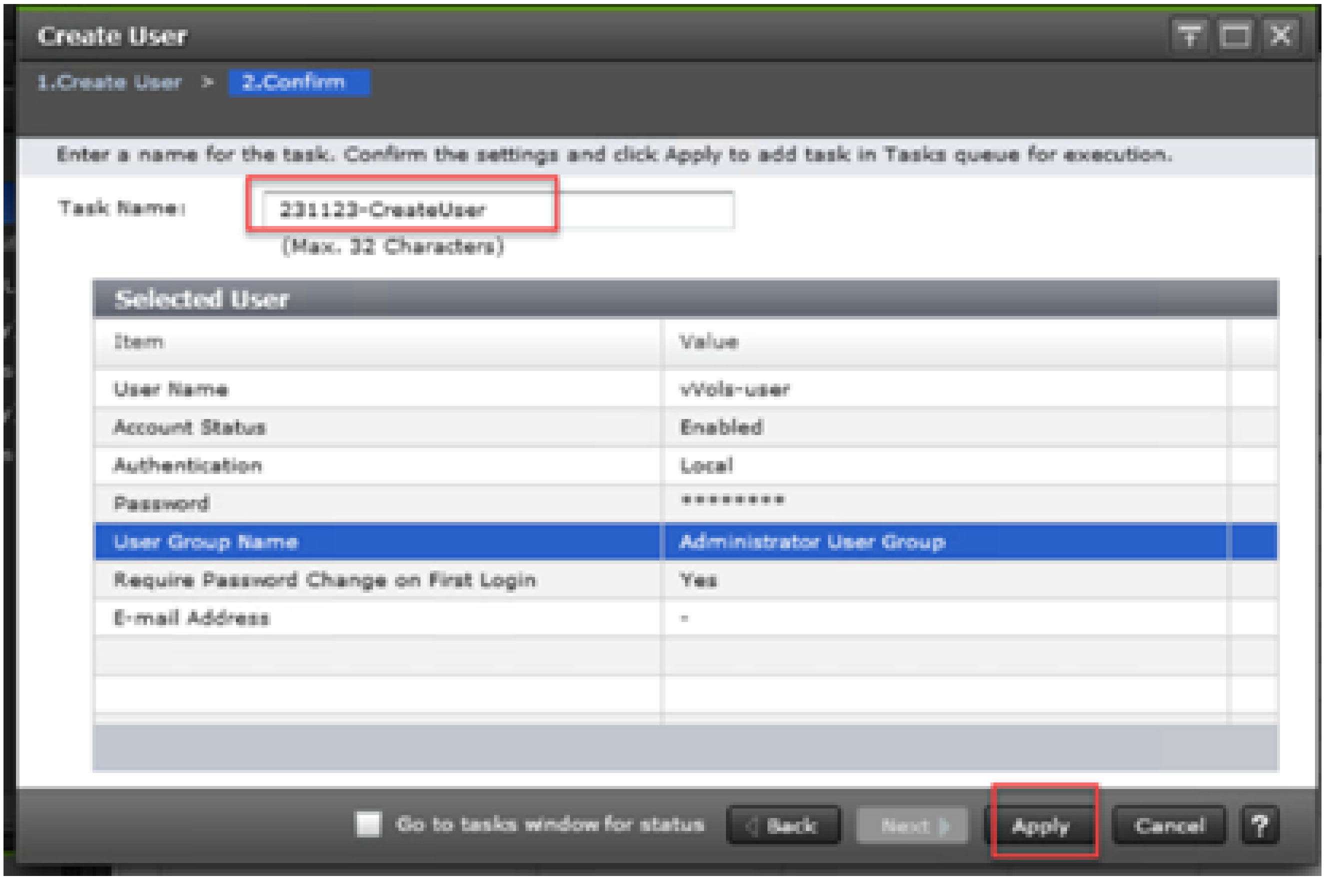
Password: *********
(8 - 256 Characters)

Re-enter Password: *********

Require Password Change on First Login: ● Yes ○ No

E-mail Address:

Step 5. Click **Apply** to create the Administrator User Account.



Enter a name for the task. Confirm the settings and click Apply to add task in Tasks queue for execution.

Task Name: 231123-CreateUser
(Max. 32 Characters)

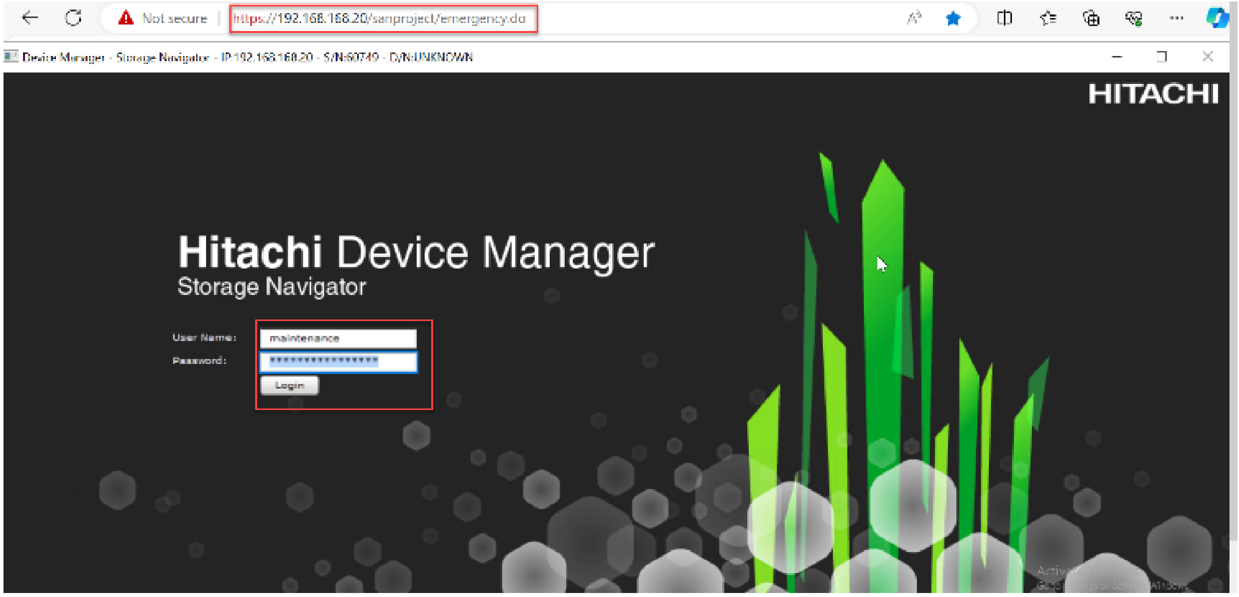
Selected User

Item	Value
User Name	vVols-user
Account Status	Enabled
Authentication	Local
Password	********
User Group Name	Administrator User Group
Require Password Change on First Login	Yes
E-mail Address	-

Note: If multiple Storage Providers for VMware vCenters are connecting to the storage, create a separate user account for each instance.

Procedure 3. Configure a Protocol Endpoint (PE) from Hitachi Device Manager - Storage Navigator

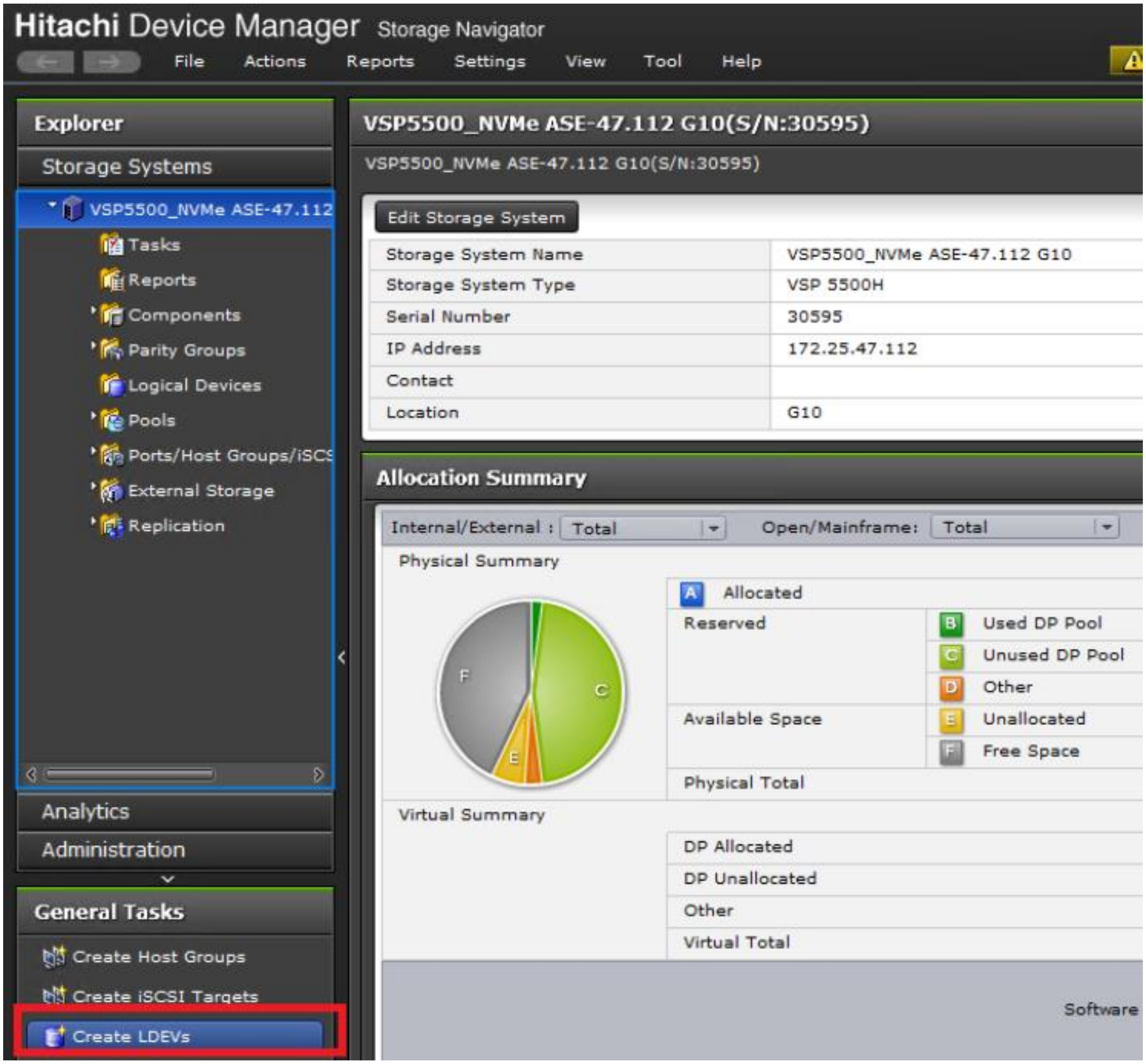
Step 1. Log in to **Hitachi Storage Navigator**.


Not secure
https://192.168.168.20/sanproject/emergency.do
Device Manager - Storage Navigator - IP:192.168.168.20 - S/N:60749 - D/N:UNKNOWN
HITACHI
Hitachi Device Manager
Storage Navigator
Login

User Name: maintenance

Password: ****************

Step 2. From the Navigation pane, select the **General Tasks** panel. Click **Create LDEVs.**



Storage System Name	VSP5500_NVMe ASE-47.112 G10
Storage System Type	VSP 5500H
Serial Number	30595
IP Address	172.25.47.112
Contact	
Location	G10

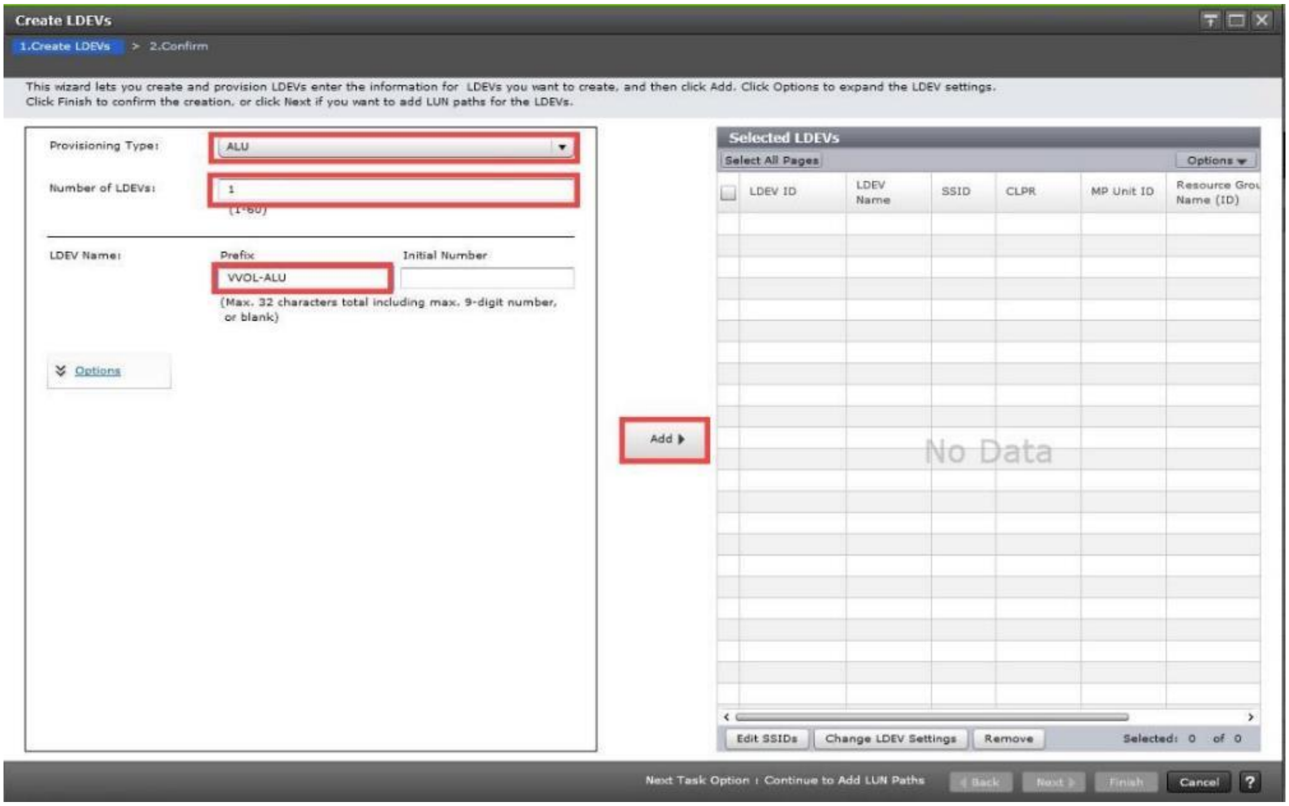
Step 3. Provide the following details:

a. Select **ALU** from the **Provisioning Type** drop-down list.

b. Enter the value **1** in the **Number of LDEVs** field.
Note: You only need one ALU.

c. Enter the **LDEV name** in the **LDEV Name Prefix** field.

d. Click **Add.**



This wizard lets you create and provision LDEVs enter the information for LDEVs you want to create, and then click Add. Click Options to expand the LDEV settings. Click Finish to confirm the creation, or click Next if you want to add LUN paths for the LDEVs.

Provisioning Type: ALU

Number of LDEVs: 1 (1-60)

LDEV Name: Prefix: VVOL-ALU Initial Number:

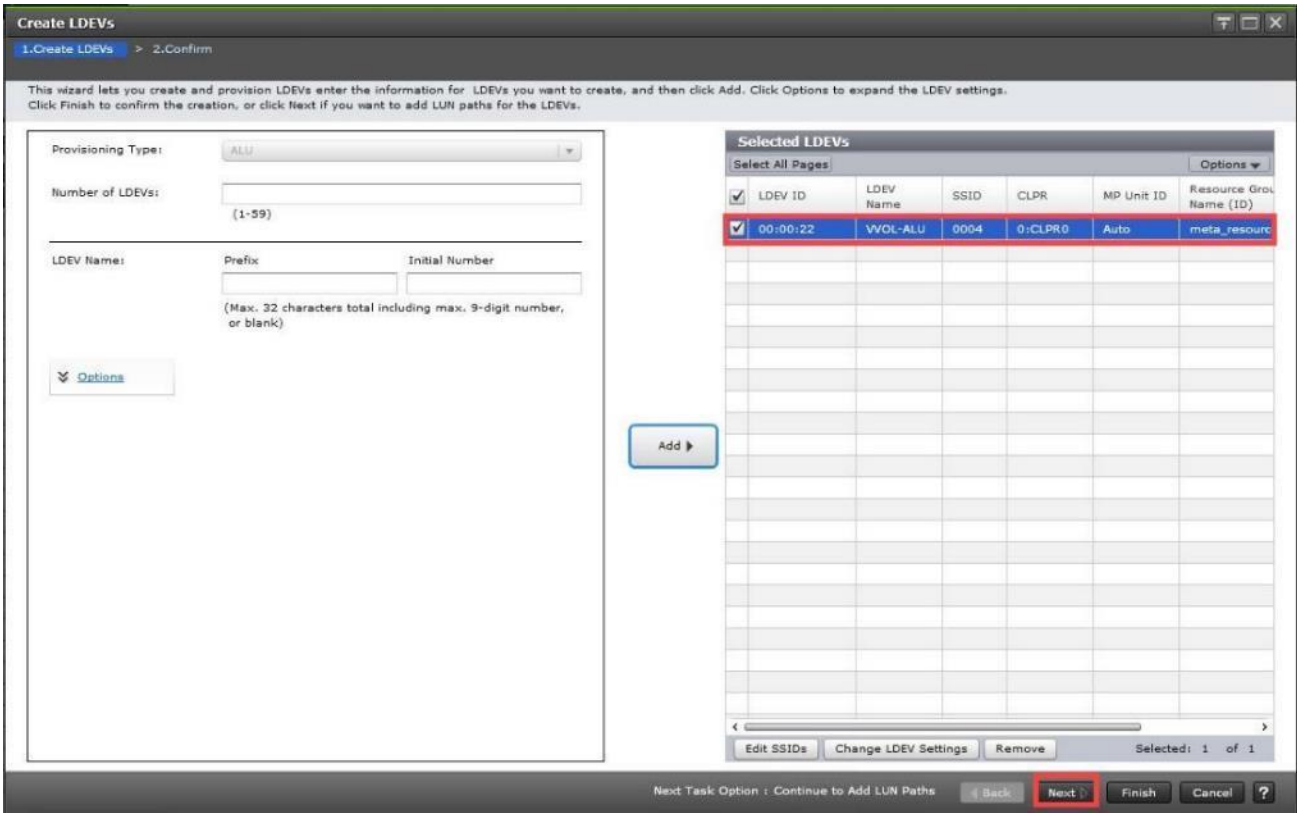
(Max. 32 characters total including max. 9-digit number, or blank)

□	LDEV ID	LDEV Name	SSID	CLPR	MP Unit ID	Resource Grou Name (ID)
			No Data			

Selected: 0 of 0

Next Task Option : Continue to Add LUN Paths

Step 4. The **Selected LDEVs** pane shows the PE created. Click **Next** to continue.



Create LDEVs

1.Create LDEVs > 2.Confirm

This wizard lets you create and provision LDEVs enter the information for LDEVs you want to create, and then click Add. Click Options to expand the LDEV settings.
Click Finish to confirm the creation, or click Next if you want to add LUN paths for the LDEVs.

Provisioning Type: ALU

Number of LDEVs: (1-59)

LDEV Name: Prefix Initial Number

(Max. 32 characters total including max. 9-digit number, or blank)

Selected LDEVs

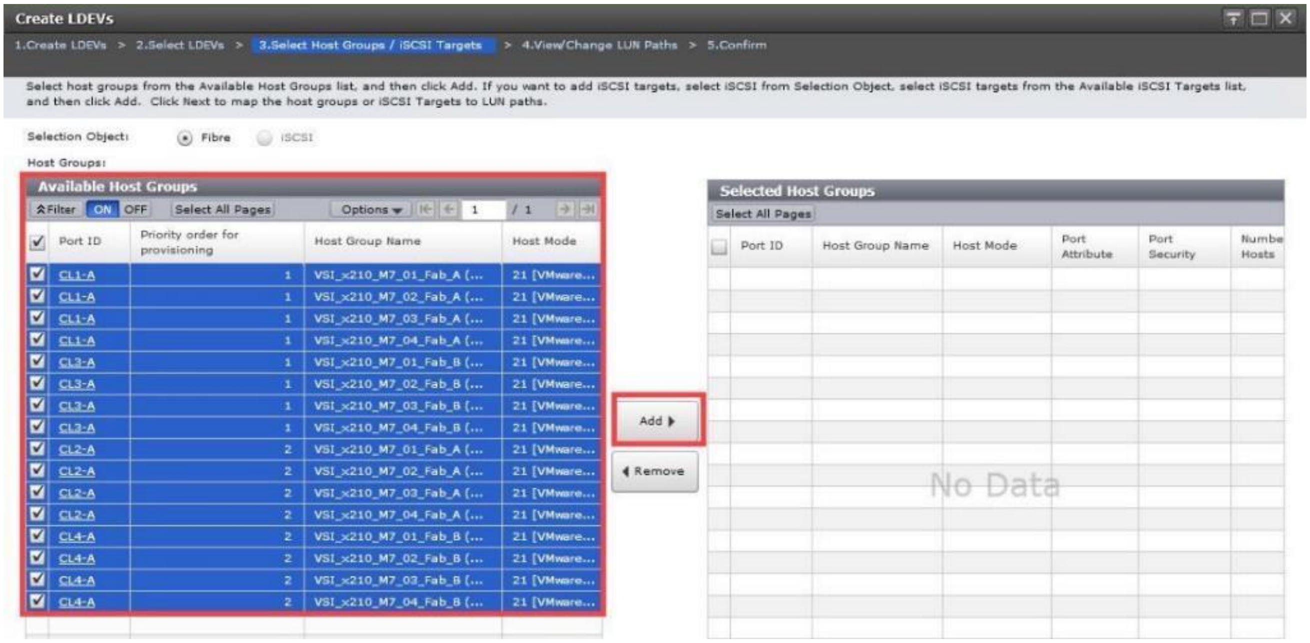
☑	LDEV ID	LDEV Name	SSID	CLPR	MP Unit ID	Resource Grou Name (ID)
☑	00:00:22	VVOL-ALU	0004	0:CLPR0	Auto	meta_resourc

Selected: 1 of 1

Next Task Option : Continue to Add LUN Paths

Step 5. Select the checkboxes for the available VSI **Host Groups** created from the Ops Center Administrator for the cluster.

Step 6. Click **Add** to move host groups to **Selected Host Groups.**



Create LDEVs

1.Create LDEVs > 2.Select LDEVs > 3.Select Host Groups / iSCSI Targets > 4.View/Change LUN Paths > 5.Confirm

Select host groups from the Available Host Groups list, and then click Add. If you want to add iSCSI targets, select iSCSI from Selection Object, select iSCSI targets from the Available iSCSI Targets list, and then click Add. Click Next to map the host groups or iSCSI Targets to LUN paths.

Selection Object: ● Fibre ○ iSCSI

Host Groups:

Available Host Groups

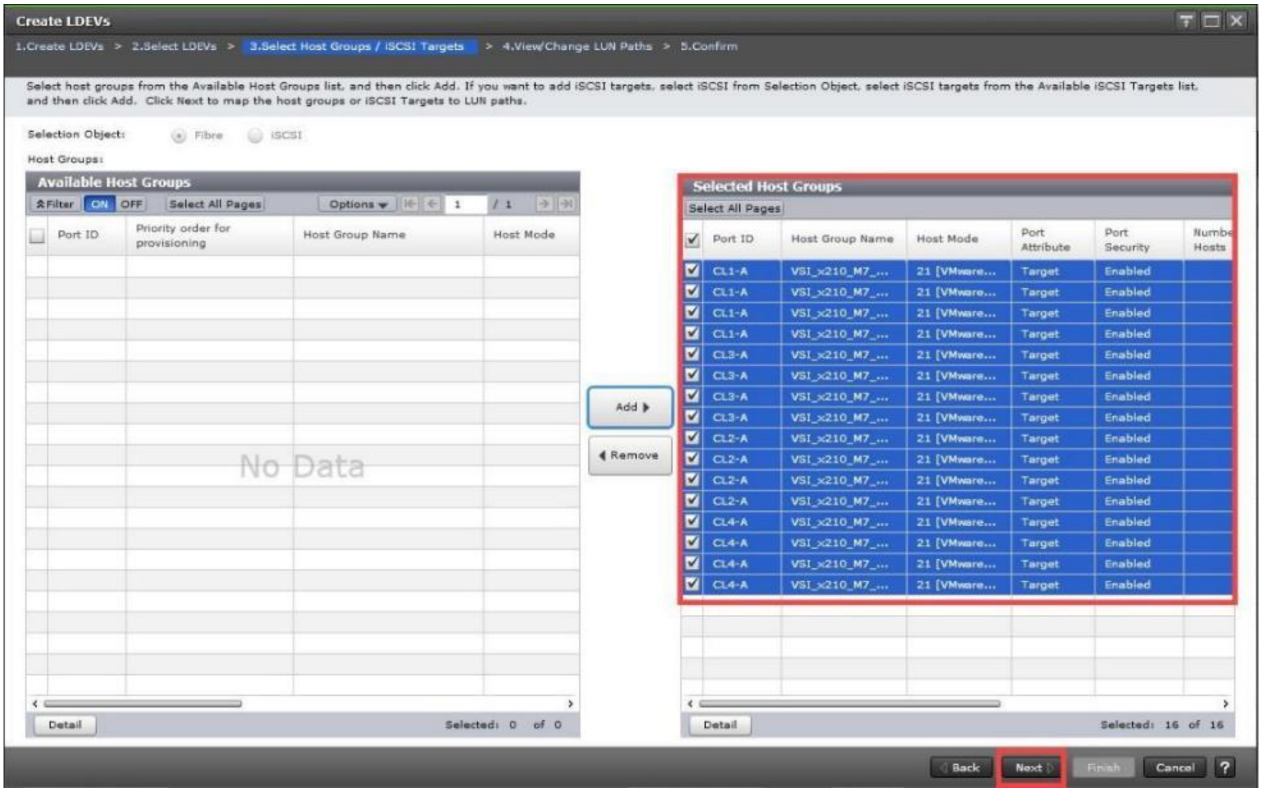
☑	Port ID	Priority order for provisioning	Host Group Name	Host Mode
☑	CL1-A	1	VSI_x210_M7_01_Fab_A (...	21 [VMware...
☑	CL1-A	1	VSI_x210_M7_02_Fab_A (...	21 [VMware...
☑	CL1-A	1	VSI_x210_M7_03_Fab_A (...	21 [VMware...
☑	CL1-A	1	VSI_x210_M7_04_Fab_A (...	21 [VMware...
☑	CL3-A	1	VSI_x210_M7_01_Fab_B (...	21 [VMware...
☑	CL3-A	1	VSI_x210_M7_02_Fab_B (...	21 [VMware...
☑	CL3-A	1	VSI_x210_M7_03_Fab_B (...	21 [VMware...
☑	CL3-A	1	VSI_x210_M7_04_Fab_B (...	21 [VMware...
☑	CL2-A	2	VSI_x210_M7_01_Fab_A (...	21 [VMware...
☑	CL2-A	2	VSI_x210_M7_02_Fab_A (...	21 [VMware...
☑	CL2-A	2	VSI_x210_M7_03_Fab_A (...	21 [VMware...
☑	CL2-A	2	VSI_x210_M7_04_Fab_A (...	21 [VMware...
☑	CL4-A	2	VSI_x210_M7_01_Fab_B (...	21 [VMware...
☑	CL4-A	2	VSI_x210_M7_02_Fab_B (...	21 [VMware...
☑	CL4-A	2	VSI_x210_M7_03_Fab_B (...	21 [VMware...
☑	CL4-A	2	VSI_x210_M7_04_Fab_B (...	21 [VMware...

Selected Host Groups

□	Port ID	Host Group Name	Host Mode	Port Attribute	Port Security	Numbe Hosts

No Data

Step 7. Click **Next.**



Create LDEVs

1.Create LDEVs > 2.Select LDEVs > 3.Select Host Groups / iSCSI Targets > 4.View/Change LUN Paths > 5.Confirm

Select host groups from the Available Host Groups list, and then click Add. If you want to add iSCSI targets, select iSCSI from Selection Object, select iSCSI targets from the Available iSCSI Targets list, and then click Add. Click Next to map the host groups or iSCSI Targets to LUN paths.

Selection Object: ● Fibre ○ iSCSI

Host Groups:

Available Host Groups

□	Port ID	Priority order for provisioning	Host Group Name	Host Mode

No Data

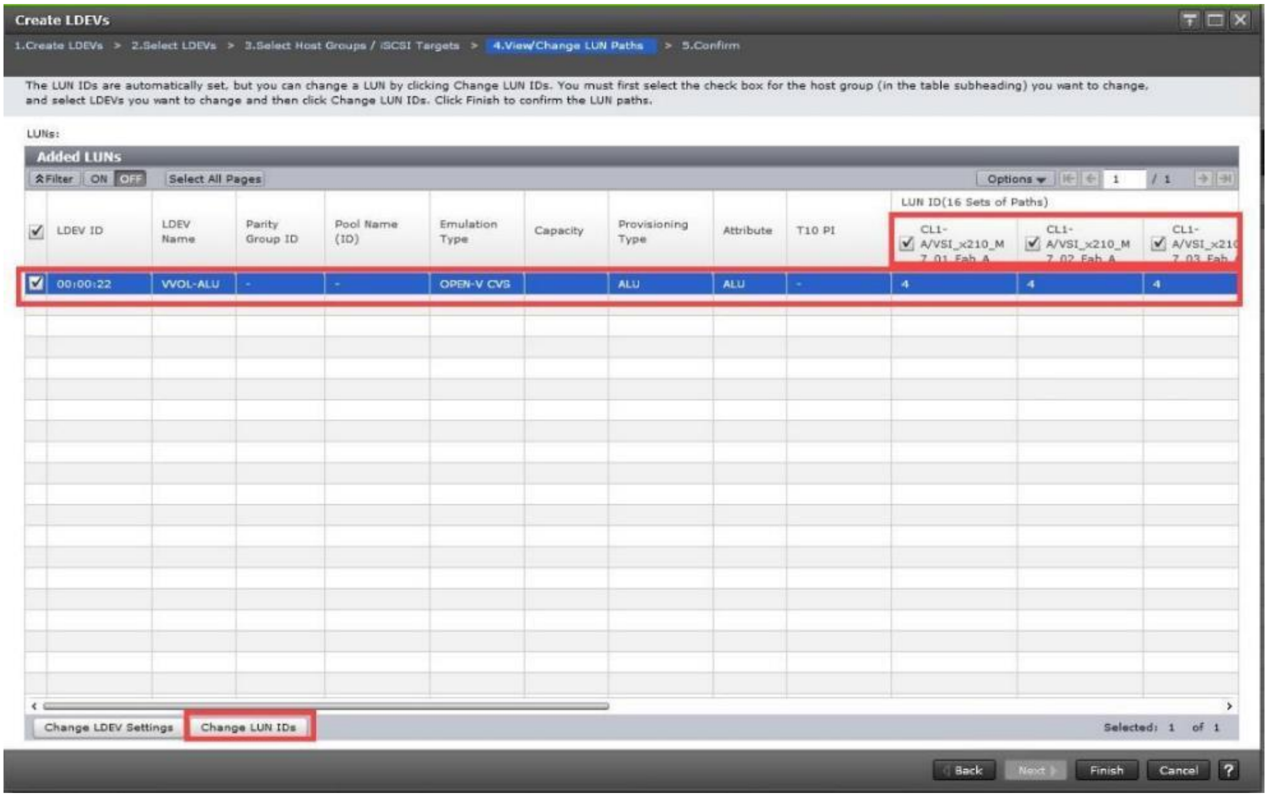
Selected: 0 of 0

Selected Host Groups

☑	Port ID	Host Group Name	Host Mode	Port Attribute	Port Security	Numbe Hosts
☑	CL1-A	VSI_x210_M7_...	21 [VMware...	Target	Enabled	
☑	CL1-A	VSI_x210_M7_...	21 [VMware...	Target	Enabled	
☑	CL1-A	VSI_x210_M7_...	21 [VMware...	Target	Enabled	
☑	CL1-A	VSI_x210_M7_...	21 [VMware...	Target	Enabled	
☑	CL3-A	VSI_x210_M7_...	21 [VMware...	Target	Enabled	
☑	CL3-A	VSI_x210_M7_...	21 [VMware...	Target	Enabled	
☑	CL3-A	VSI_x210_M7_...	21 [VMware...	Target	Enabled	
☑	CL3-A	VSI_x210_M7_...	21 [VMware...	Target	Enabled	
☑	CL2-A	VSI_x210_M7_...	21 [VMware...	Target	Enabled	
☑	CL2-A	VSI_x210_M7_...	21 [VMware...	Target	Enabled	
☑	CL2-A	VSI_x210_M7_...	21 [VMware...	Target	Enabled	
☑	CL2-A	VSI_x210_M7_...	21 [VMware...	Target	Enabled	
☑	CL4-A	VSI_x210_M7_...	21 [VMware...	Target	Enabled	
☑	CL4-A	VSI_x210_M7_...	21 [VMware...	Target	Enabled	
☑	CL4-A	VSI_x210_M7_...	21 [VMware...	Target	Enabled	
☑	CL4-A	VSI_x210_M7_...	21 [VMware...	Target	Enabled	

Selected: 16 of 16

Step 8. (Optional) Ensure you use the scrollbar at the bottom of the dialog to double-check that all **Host LUN IDs** are set consistently across all paths. To do this, select the **checkbox for all ports/paths listed**, select **the checkbox for the LDEV ID**, and then click **Change LUN IDs** to make changes.



Create LDEVs

1.Create LDEVs > 2.Select LDEVs > 3.Select Host Groups / iSCSI Targets > 4.View/Change LUN Paths > 5.Confirm

The LUN IDs are automatically set, but you can change a LUN by clicking Change LUN IDs. You must first select the check box for the host group (in the table subheading) you want to change, and select LDEVs you want to change and then click Change LUN IDs. Click Finish to confirm the LUN paths.

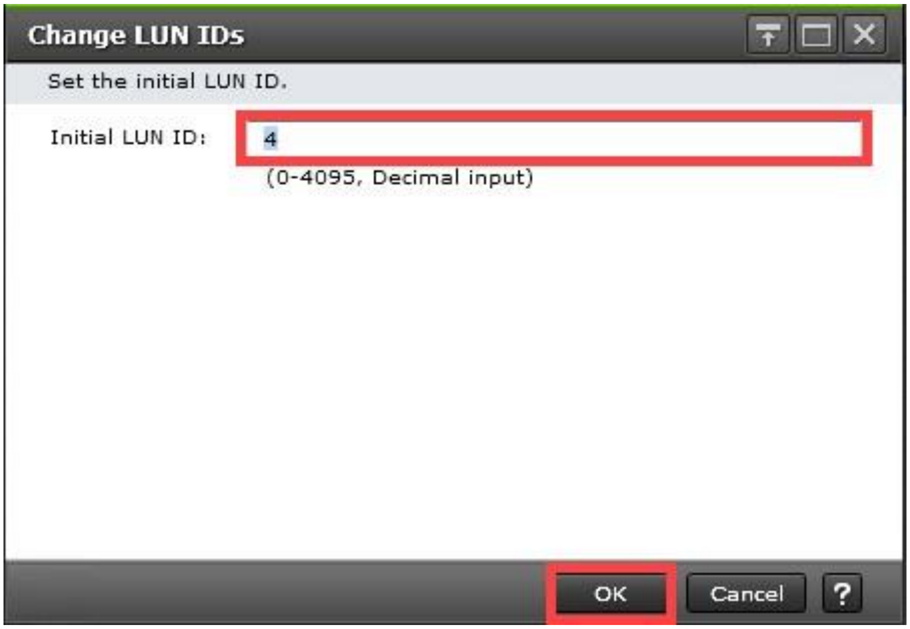
LUNs:

Added LUNs

										LUN ID(16 Sets of Paths)		
☑	LDEV ID	LDEV Name	Parity Group ID	Pool Name (ID)	Emulation Type	Capacity	Provisioning Type	Attribute	T10 PI	☑ CL1-A/VSI_x210_M7_01_Fab_A	☑ CL1-A/VSI_x210_M7_02_Fab_A	☑ CL1-A/VSI_x21 7_03_Fab
☑	00:00:22	VVOL-ALU	-	-	OPEN-V CVS		ALU	ALU	-	4	4	4

Selected: 1 of 1

Step 9. Click **OK.**



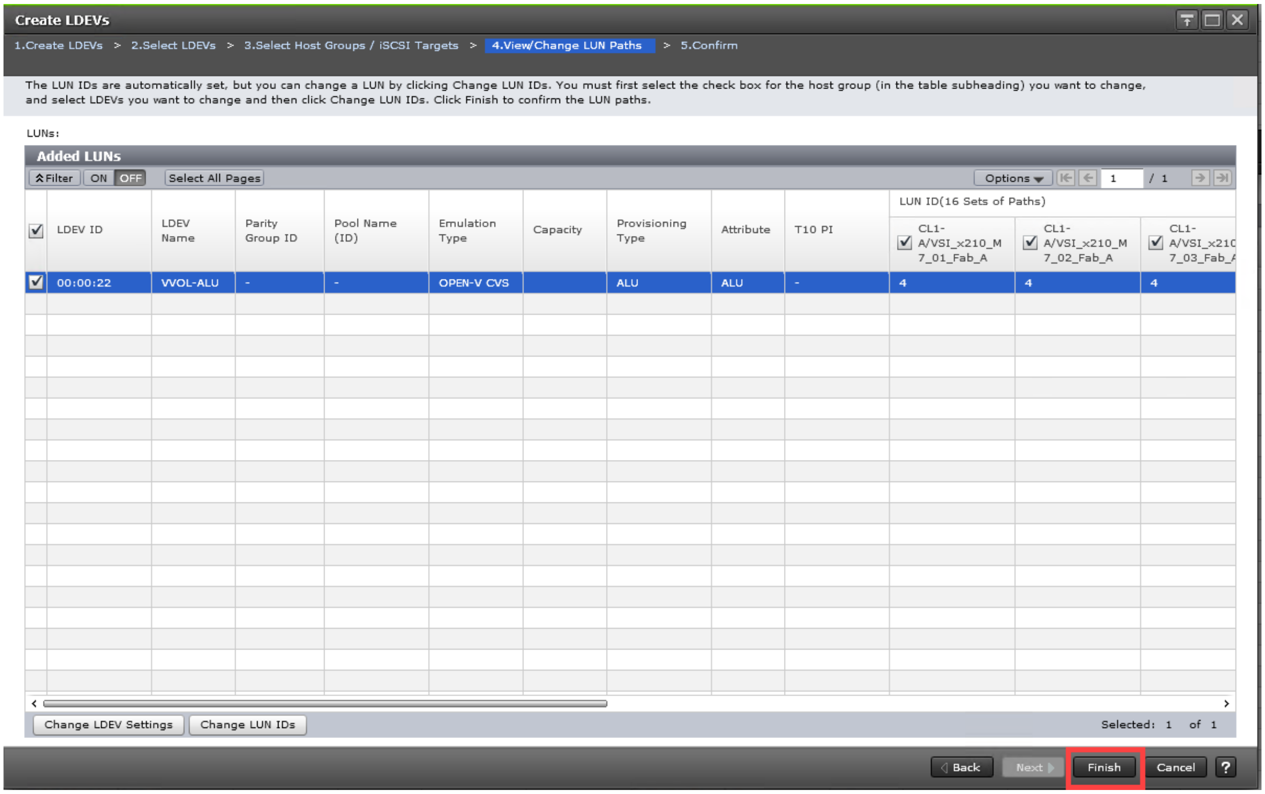
Change LUN IDs

Set the initial LUN ID.

Initial LUN ID: 4

(0-4095, Decimal input)

Step 10. Click **Finish.**



Create LDEVs
1.Create LDEVs > 2.Select LDEVs > 3.Select Host Groups / iSCSI Targets > 4.View/Change LUN Paths > 5.Confirm

The LUN IDs are automatically set, but you can change a LUN by clicking Change LUN IDs. You must first select the check box for the host group (in the table subheading) you want to change, and select LDEVs you want to change and then click Change LUN IDs. Click Finish to confirm the LUN paths.

LUNs:

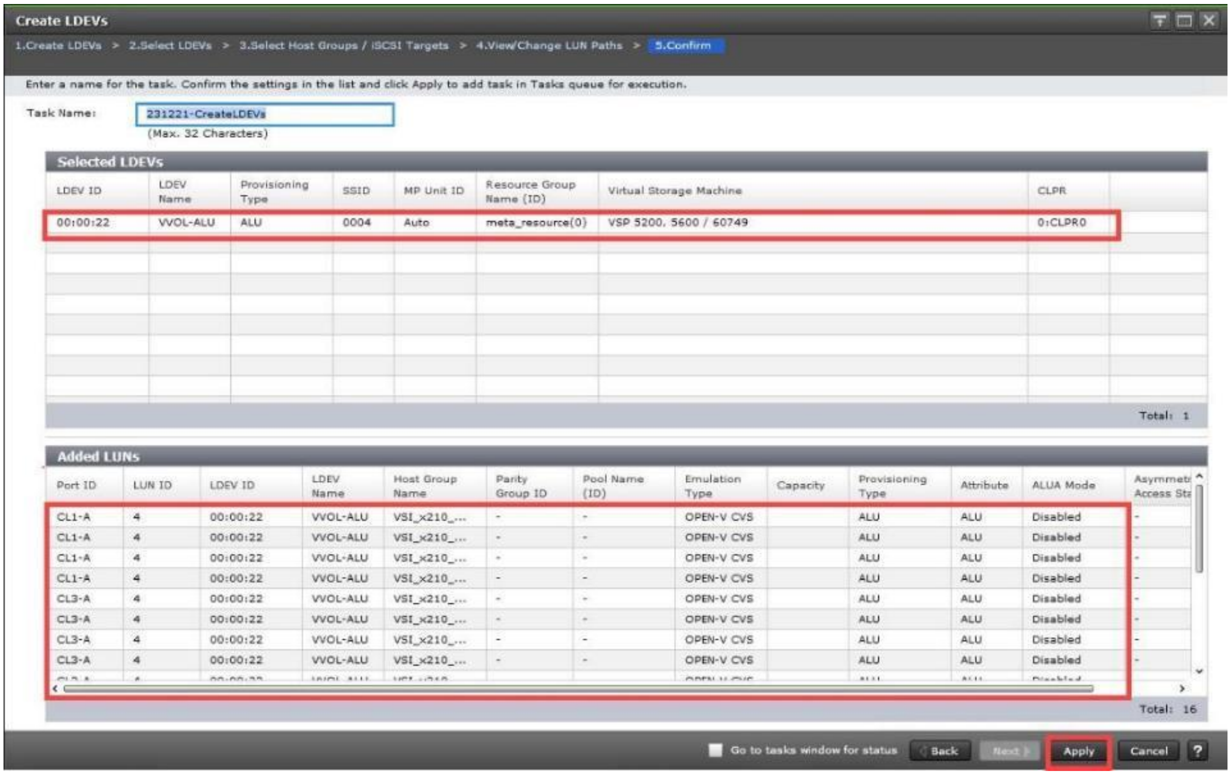
Added LUNs

Filter ON OFF Select All Pages Options 1 / 1

☑	LDEV ID	LDEV Name	Parity Group ID	Pool Name (ID)	Emulation Type	Capacity	Provisioning Type	Attribute	T10 PI	LUN ID(16 Sets of Paths)		
										☑ CL1-A/VSI_x210_M7_01_Fab_A	☑ CL1-A/VSI_x210_M7_02_Fab_A	☑ CL1-A/VSI_x210_M7_03_Fab_A
☑	00:00:22	VVOL-ALU	-	-	OPEN-V CVS		ALU	ALU	-	4	4	4

Selected: 1 of 1

Step 11. Click **Apply** to create the LDEV and add paths to the UCS servers.



Create LDEVs
1.Create LDEVs > 2.Select LDEVs > 3.Select Host Groups / iSCSI Targets > 4.View/Change LUN Paths > 5.Confirm

Enter a name for the task. Confirm the settings in the list and click Apply to add task in Tasks queue for execution.

Task Name: 231221-CreateLDEVs
(Max. 32 Characters)

Selected LDEVs

LDEV ID	LDEV Name	Provisioning Type	SSID	MP Unit ID	Resource Group Name (ID)	Virtual Storage Machine	CLPR
00:00:22	VVOL-ALU	ALU	0004	Auto	meta_resource(0)	VSP 5200, 5600 / 60749	0:CLPR0

Total: 1

Added LUNs

Port ID	LUN ID	LDEV ID	LDEV Name	Host Group Name	Parity Group ID	Pool Name (ID)	Emulation Type	Capacity	Provisioning Type	Attribute	ALUA Mode	Asymmetri Access Sta
CL1-A	4	00:00:22	VVOL-ALU	VSI_x210_...	-	-	OPEN-V CVS		ALU	ALU	Disabled	-
CL1-A	4	00:00:22	VVOL-ALU	VSI_x210_...	-	-	OPEN-V CVS		ALU	ALU	Disabled	-
CL1-A	4	00:00:22	VVOL-ALU	VSI_x210_...	-	-	OPEN-V CVS		ALU	ALU	Disabled	-
CL1-A	4	00:00:22	VVOL-ALU	VSI_x210_...	-	-	OPEN-V CVS		ALU	ALU	Disabled	-
CL3-A	4	00:00:22	VVOL-ALU	VSI_x210_...	-	-	OPEN-V CVS		ALU	ALU	Disabled	-
CL3-A	4	00:00:22	VVOL-ALU	VSI_x210_...	-	-	OPEN-V CVS		ALU	ALU	Disabled	-
CL3-A	4	00:00:22	VVOL-ALU	VSI_x210_...	-	-	OPEN-V CVS		ALU	ALU	Disabled	-
CL3-A	4	00:00:22	VVOL-ALU	VSI_x210_...	-	-	OPEN-V CVS		ALU	ALU	Disabled	-

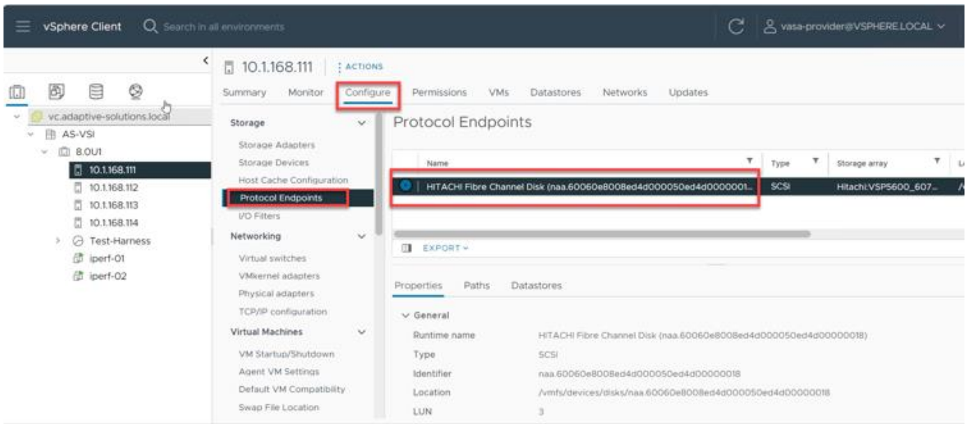
Total: 16

Procedure 4. Verify that the PE is Available and Visible

Verify that the protocol endpoint (PE) is visible in vSphere. On the storage system, the PE is the administrative logical unit (ALU) that the storage administrator presented to vSphere Cluster/ESXi hosts in the prior procedure.

Step 1. Log in to the **vSphere Client**, select **Inventory** from **Home** tab, and then select an **ESXi host.**

Step 2. Select **Protocol Endpoints** under the Configure tab.



Protocol Endpoints

Name	Type	Storage array
HITACHI Fibre Channel Disk (naa.60060e8008ed4d000050ed4d0000001...	SCSI	Hitachi:VSP5600_607...

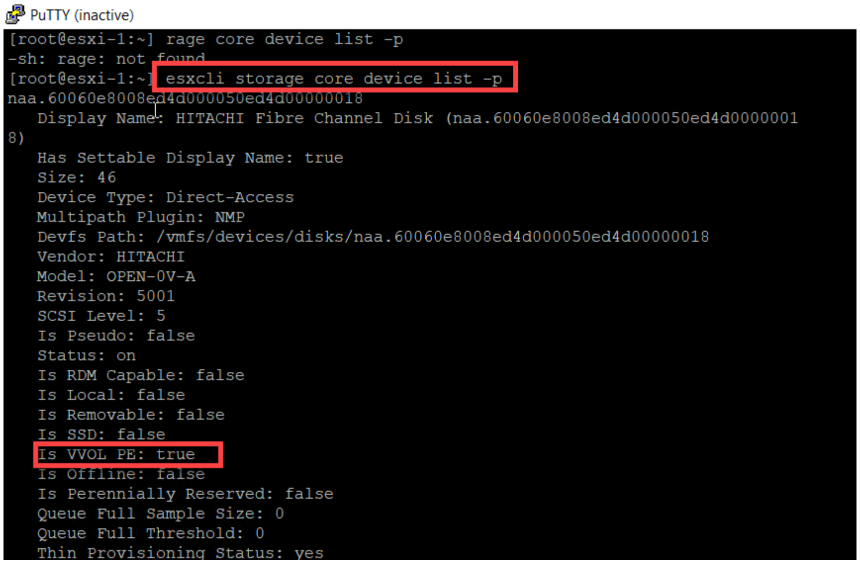
General

Runtime name	HITACHI Fibre Channel Disk (naa.60060e8008ed4d000050ed4d00000018)
Type	SCSI
Identifier	naa.60060e8008ed4d000050ed4d00000018
Location	/vmfs/devices/disks/naa.60060e8008ed4d000050ed4d00000018
LUN	3

Step 3. (Optional), Using the ESXi host root console, you can view the protocol endpoints (PEs) by running the following command from the esxcli command line.

```
#esxcli storage core device list -p
```

This will display the devices that are recognized as PEs. Note the **Is VVOL PE=True** value.

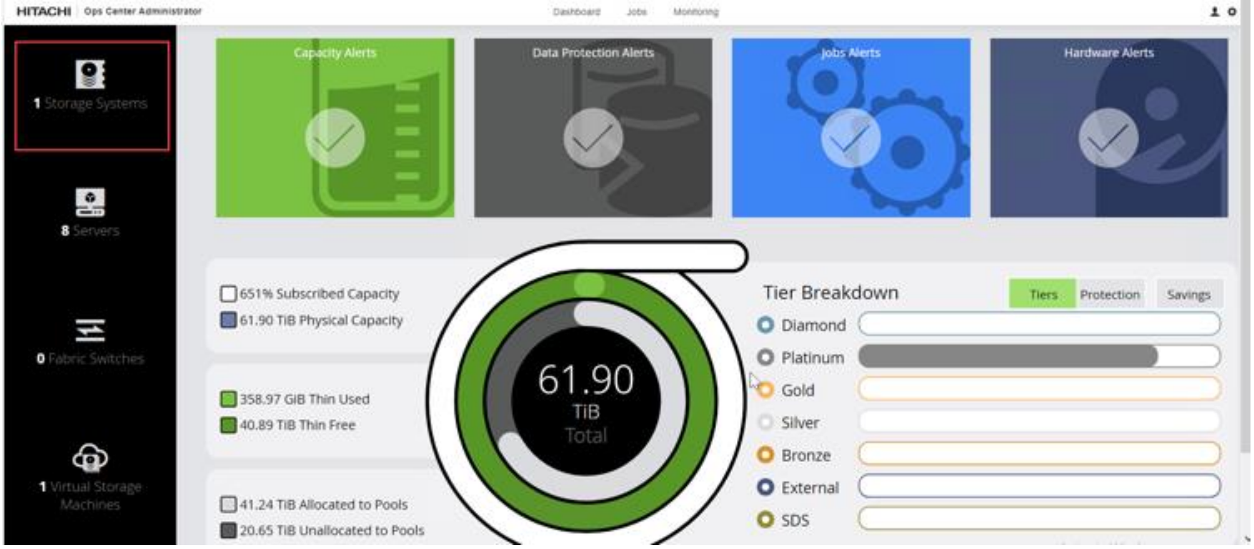


```
[root@esxi-1:~] rage core device list -p
-sh: rage: not found
[root@esxi-1:~] esxcli storage core device list -p
naa.60060e8008ed4d000050ed4d00000018
   Display Name: HITACHI Fibre Channel Disk (naa.60060e8008ed4d000050ed4d0000001
8)
   Has Settable Display Name: true
   Size: 46
   Device Type: Direct-Access
   Multipath Plugin: NMP
   Devfs Path: /vmfs/devices/disks/naa.60060e8008ed4d000050ed4d00000018
   Vendor: HITACHI
   Model: OPEN-0V-A
   Revision: 5001
   SCSI Level: 5
   Is Pseudo: false
   Status: on
   Is RDM Capable: false
   Is Local: false
   Is Removable: false
   Is SSD: false
   Is VVOL PE: true
   Is Offline: false
   Is Perennially Reserved: false
   Queue Full Sample Size: 0
   Queue Full Threshold: 0
   Thin Provisioning Status: yes
```

Procedure 5. Initialize Parity Groups with Hitachi Ops Center Administrator

Configuration steps in this section assume that Parity Groups have already been created by Hitachi professional services or using Hitachi Storage Navigator. For initializing Parity Groups from Hitachi Ops Center Administrator, proceed with the following steps:

Step 1. Log in to **Hitachi Ops Center Administrator** and select **Storage Systems** from the navigation pane.

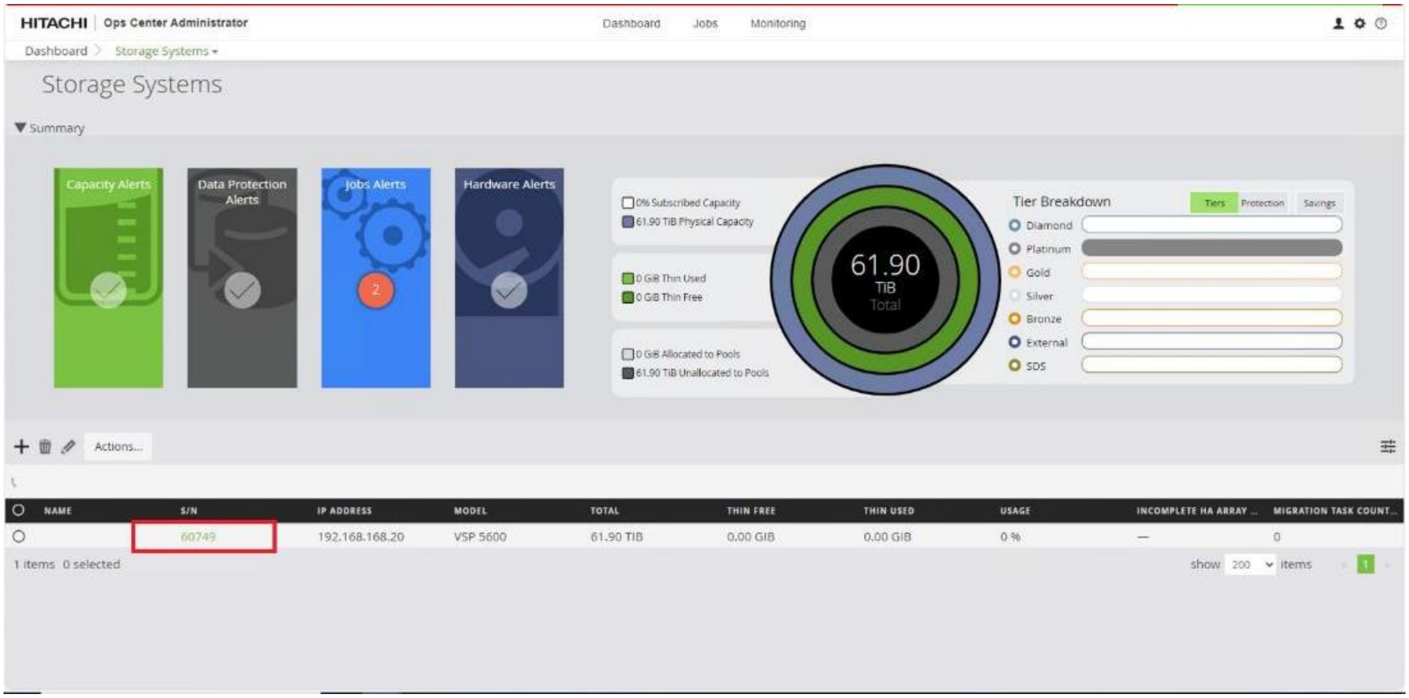


651% Subscribed Capacity
61.90 TiB Physical Capacity

358.97 GiB Thin Used
40.89 TiB Thin Free

41.24 TiB Allocated to Pools
20.65 TiB Unallocated to Pools

Step 2. Select the **S/N** of the Virtual Storage Platform from the **Storage Systems** list.



0% Subscribed Capacity
61.90 TiB Physical Capacity

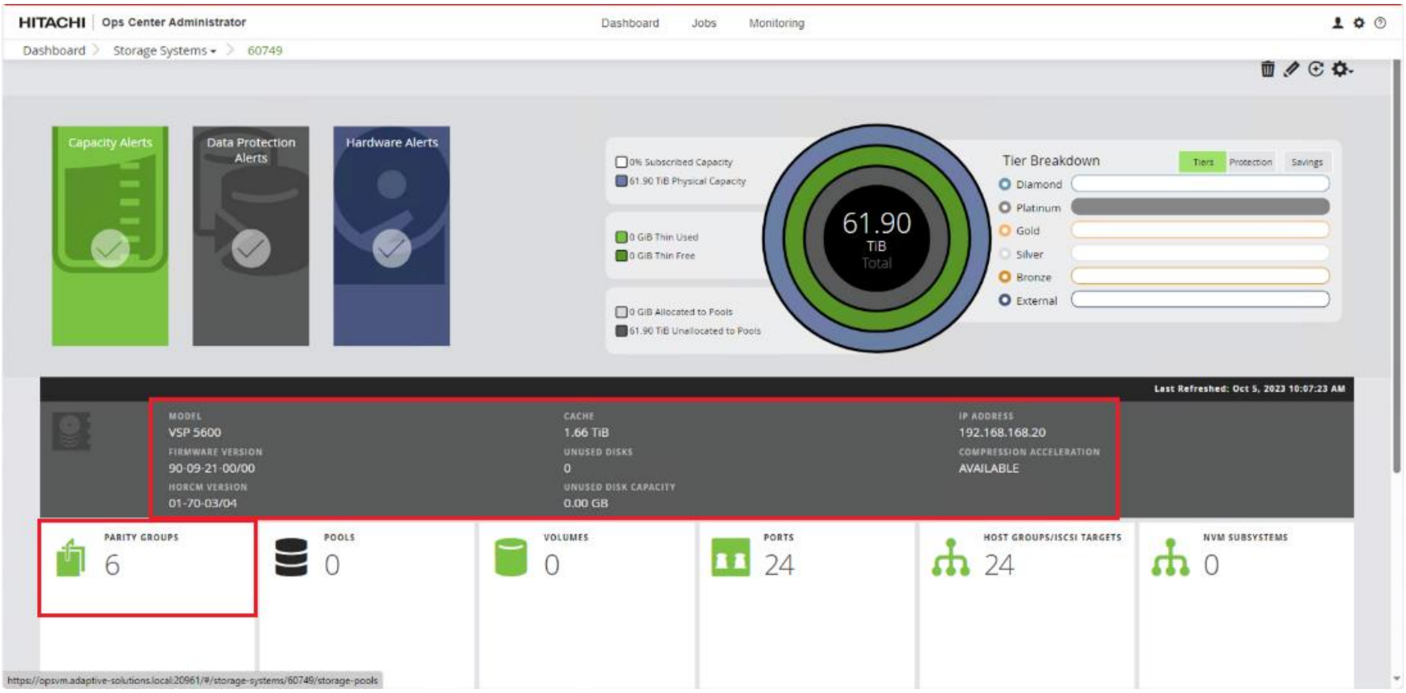
0 GiB Thin Used
0 GiB Thin Free

0 GiB Allocated to Pools
61.90 TiB Unallocated to Pools

○	NAME	S/N	IP ADDRESS	MODEL	TOTAL	THIN FREE	THIN USED	USAGE	INCOMPLETE HA ARRAY ...	MIGRATION TASK COUNT...
○		60749	192.168.168.20	VSP 5600	61.90 TIB	0.00 GIB	0.00 GIB	0 %	—	0

1 items 0 selected show 200 items 1

Step 3. Click the **PARITY GROUPS** icon under the selected storage system to view parity groups.



□ 0% Subscribed Capacity
▨ 61.90 TiB Physical Capacity
🟩 0 GiB Thin Used
🟩 0 GiB Thin Free
□ 0 GiB Allocated to Pools
▨ 61.90 TiB Unallocated to Pools

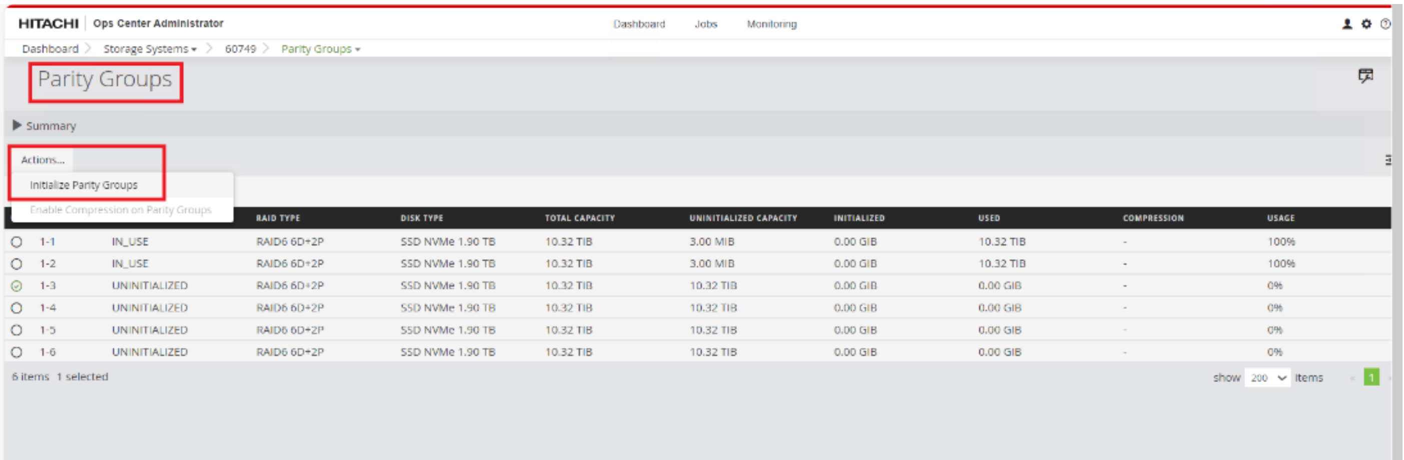
Last Refreshed: Oct 5, 2023 10:07:23 AM

MODEL: VSP 5600
FIRMWARE VERSION: 90-09-21-00/00
HORCM VERSION: 01-70-03/04
CACHE: 1.66 TiB
UNUSED DISKS: 0
UNUSED DISK CAPACITY: 0.00 GB
IP ADDRESS: 192.168.168.20
COMPRESSION ACCELERATION: AVAILABLE

PARITY GROUPS 6
POOLS 0
VOLUMES 0
PORTS 24
HOST GROUPS/ISCSI TARGETS 24
NVM SUBSYSTEMS 0

https://opsvm.adaptive-solutions.local:20961/#/storage-systems/60749/storage-pools

Step 4. Click any **Parity Group ID** to initialize it as parity for creating the vVol volume pool. From the **Actions** pane click **Initialize Parity Groups.**

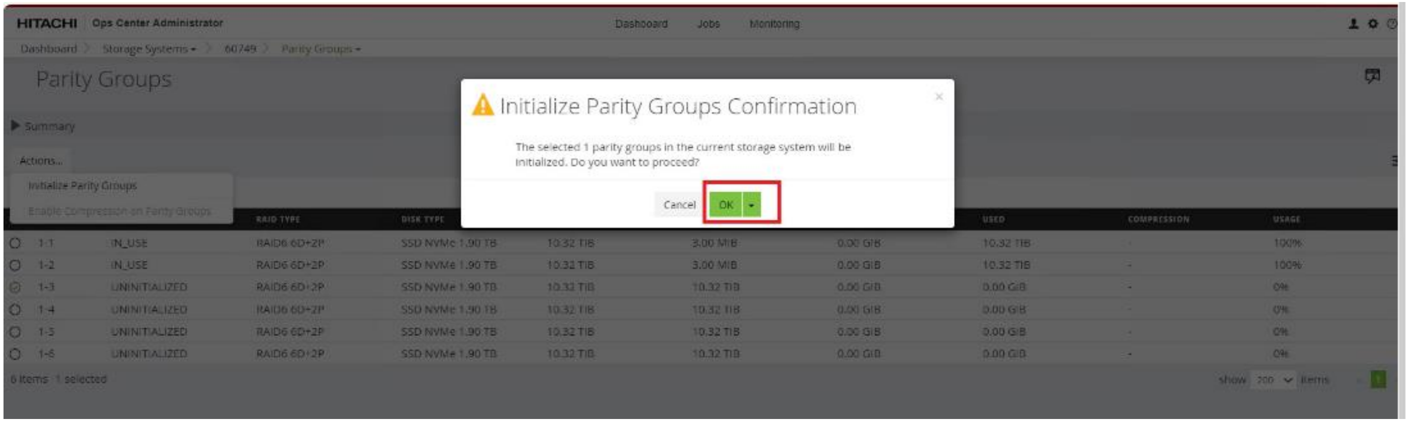


			RAID TYPE	DISK TYPE	TOTAL CAPACITY	UNINITIALIZED CAPACITY	INITIALIZED	USED	COMPRESSION	USAGE
○	1-1	IN_USE	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TIB	3.00 MIB	0.00 GIB	10.32 TIB	-	100%
○	1-2	IN_USE	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TIB	3.00 MIB	0.00 GIB	10.32 TIB	-	100%
✓	1-3	UNINITIALIZED	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TIB	10.32 TIB	0.00 GIB	0.00 GIB	-	0%
○	1-4	UNINITIALIZED	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TIB	10.32 TIB	0.00 GIB	0.00 GIB	-	0%
○	1-5	UNINITIALIZED	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TIB	10.32 TIB	0.00 GIB	0.00 GIB	-	0%
○	1-6	UNINITIALIZED	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TIB	10.32 TIB	0.00 GIB	0.00 GIB	-	0%

6 items 1 selected

show 200 items 1

Step 5. Click **OK**.



HITACHI Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Storage Systems > 60749 > Parity Groups
Parity Groups
Summary
Actions...
Initialize Parity Groups
Enable Compression on Parity Groups
Cancel
OK

Initialize Parity Groups Confirmation

The selected 1 parity groups in the current storage system will be initialized. Do you want to proceed?

		RAID TYPE	DISK TYPE				USED	COMPRESSION	USAGE
1-1	IN_USE	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TiB	3.00 MiB	0.00 GiB	10.32 TiB	-	100%
1-2	IN_USE	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TiB	3.00 MiB	0.00 GiB	10.32 TiB	-	100%
1-3	UNINITIALIZED	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TiB	10.32 TiB	0.00 GiB	0.00 GiB	-	0%
1-4	UNINITIALIZED	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TiB	10.32 TiB	0.00 GiB	0.00 GiB	-	0%
1-5	UNINITIALIZED	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TiB	10.32 TiB	0.00 GiB	0.00 GiB	-	0%
1-6	UNINITIALIZED	RAID6 6D+2P	SSD NVMe 1.90 TB	10.32 TiB	10.32 TiB	0.00 GiB	0.00 GiB	-	0%

6 items 1 selected

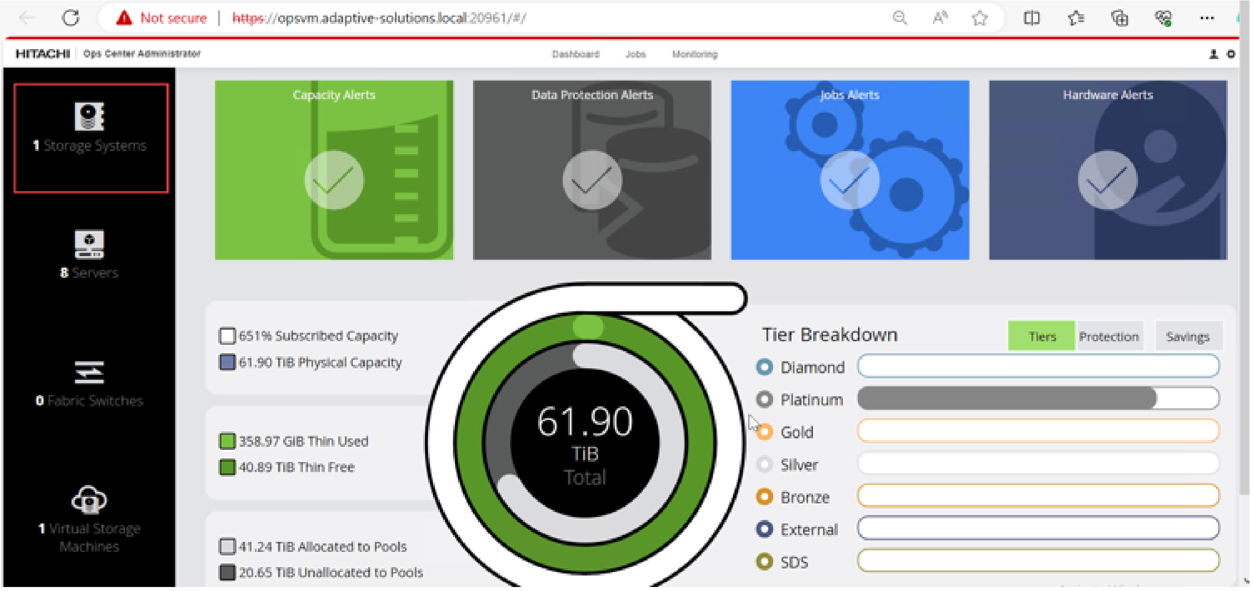
Note: Created Parity Groups have status as UNINITIALIZED and after it gets initialized completely, the status should change to IN_USE.

Procedure 6. Create a Dynamic Provisioning Pool for vVols

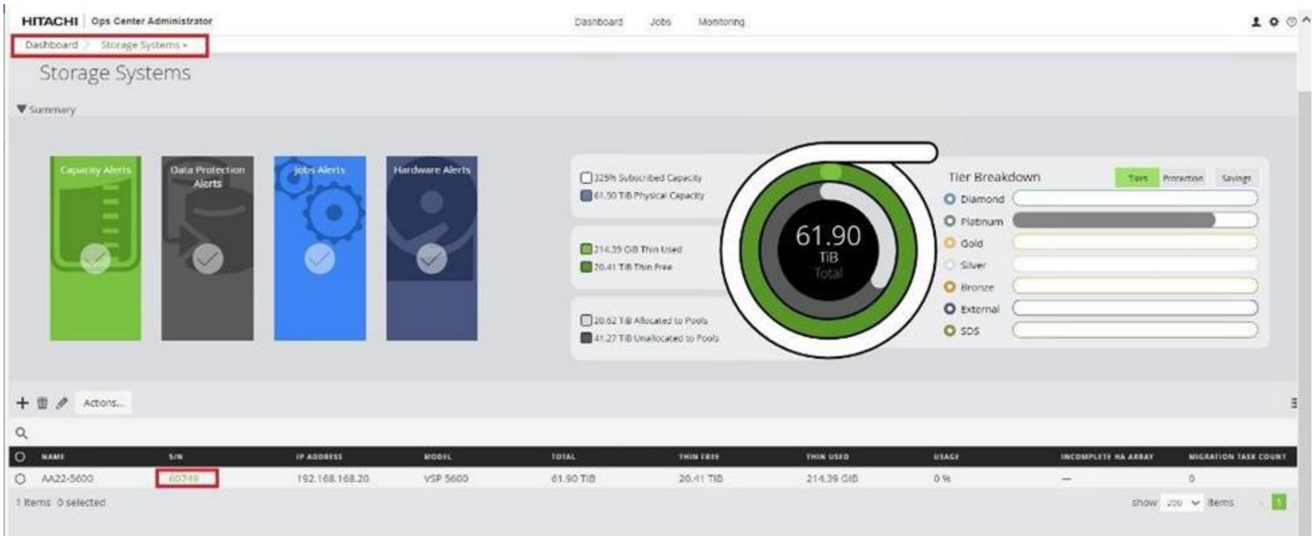
When creating a pool, use the Basic option to take advantage of tiers of storage available on the VSP that are based on best practices. By default, the basic option will create a Hitachi Dynamic Provisioning Pool.

If you want more flexibility and do not need to take advantage of best practices, you can use the advanced option to select specific Parity Groups and define your pool types as either Tiered, Thin, or Snap.

Step 1. On the **Ops Center Administrator dashboard**, click **Storage Systems** to see the inventory of registered storage systems.



Step 2. Click the **S/N** listing of the Storage System.

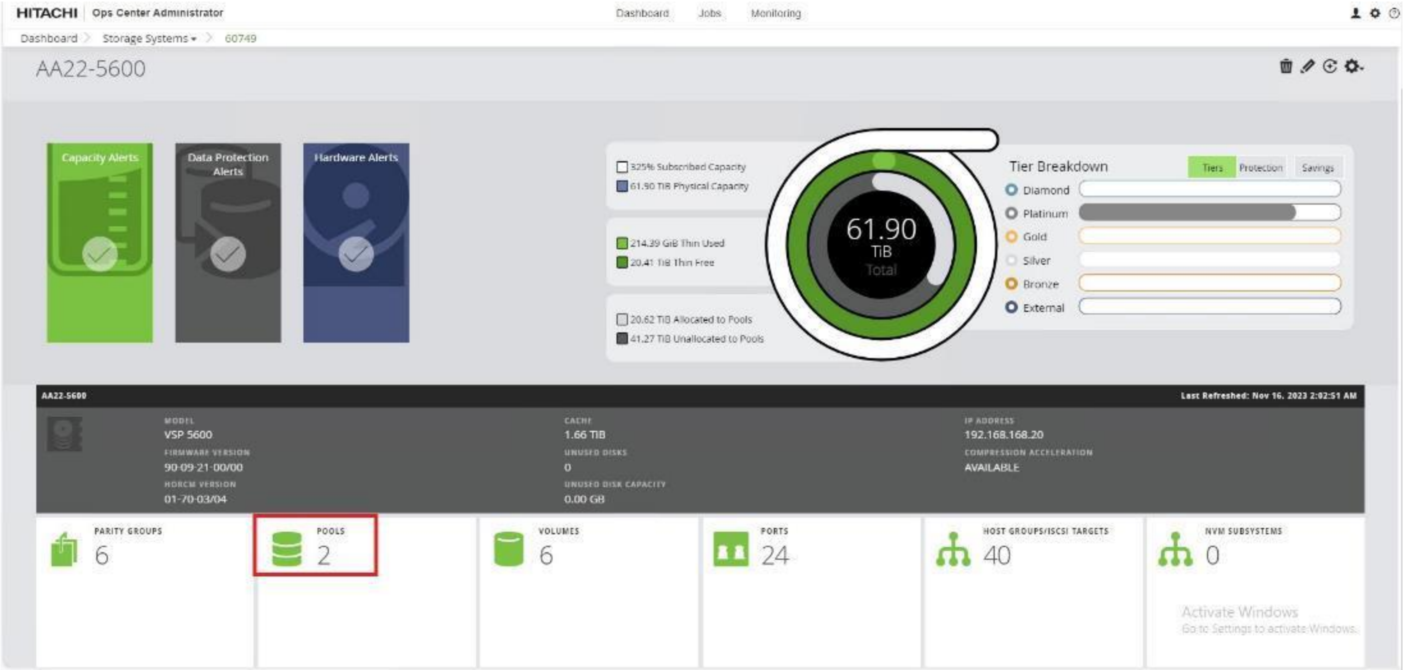


NAME	S/N	IP ADDRESS	MODEL	TOTAL	THIN FREE	THIN USED	USAGE	INCOMPLETE HA ARRAY	MIGRATION TASK COUNT
AA22-5600	60749	192.168.168.20	VSP 5600	61.90 TiB	20.41 TiB	214.39 GiB	0 %	—	0

1 Items 0 selected

Show 200 Items

Step 3. From the storage system, click **Pools.**



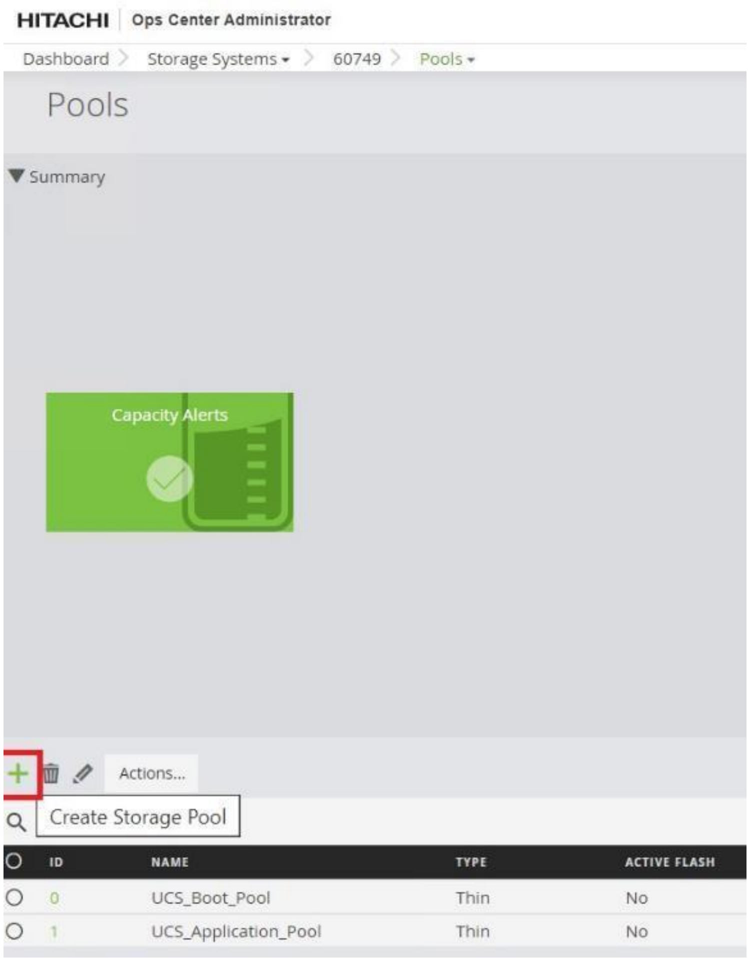
AA22-5600

Last Refreshed: Nov 16, 2023 2:02:51 AM

MODEL: VSP 5600
FIRMWARE VERSION: 90-09-21-00/00
HORCM VERSION: 01-70-03/04
CACHE: 1.66 TiB
UNUSED DISKS: 0
UNUSED DISK CAPACITY: 0.00 GB
IP ADDRESS: 192.168.168.20
COMPRESSION ACCELERATION: AVAILABLE

PARITY GROUPS 6
POOLS 2
VOLUMES 6
PORTS 24
HOST GROUPS/ISCSI TARGETS 40
NVM SUBSYSTEMS 0

Step 4. Click the plus sign (**+**) to open the **Create Storage Pool** window.


HITACHI | Ops Center Administrator
Dashboard > Storage Systems ▾ > 60749 > Pools ▾
Pools
▼ Summary
Capacity Alerts
Actions...
Create Storage Pool

○	ID	NAME	TYPE	ACTIVE FLASH
○	0	UCS_Boot_Pool	Thin	No
○	1	UCS_Application_Pool	Thin	No

Step 5. Enter the following details and click **Submit.**

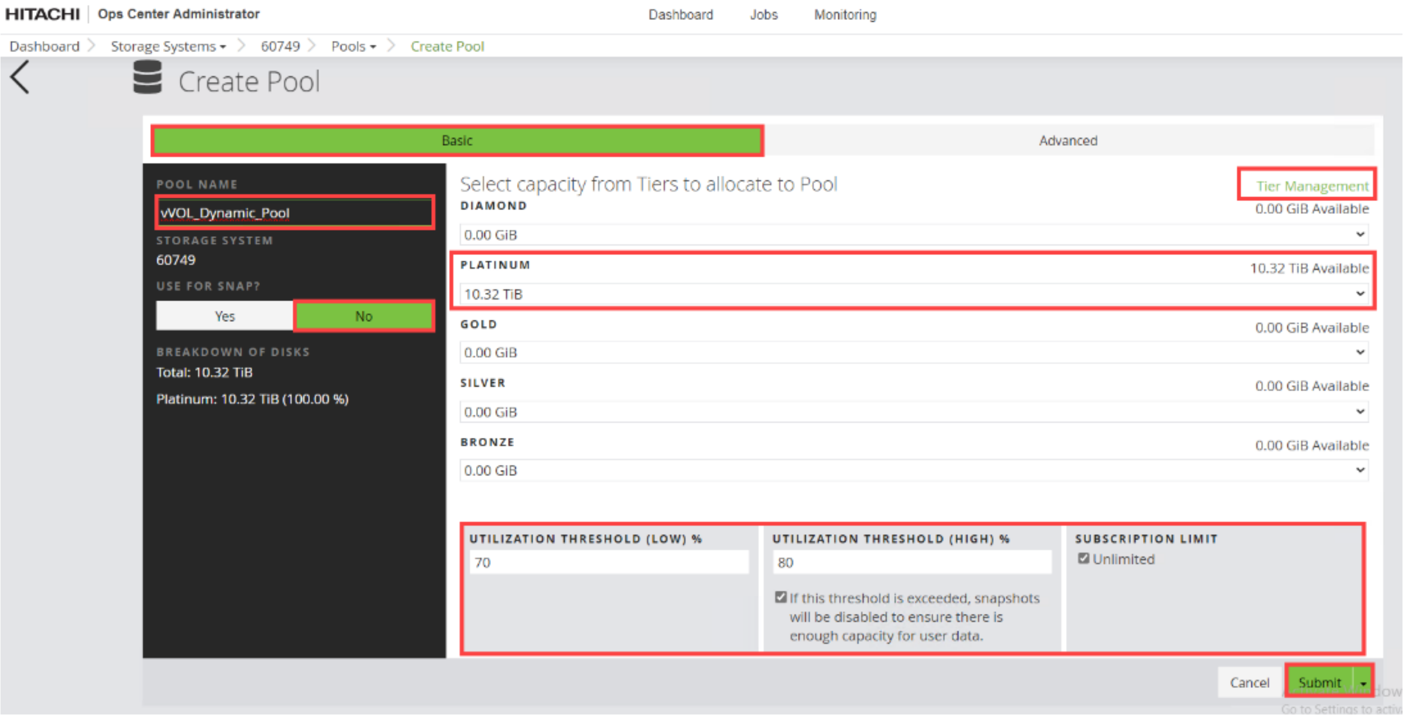
a. Enter **POOL NAME** as vVOL_Dynamic_Pool (Pool names can contain alphanumeric characters, hyphens, and underscores only. Initial hyphens are not allowed.)

b. Click an available **Tier** to view the available storage capacity and select the available **capacity**.

c. Review the **high and low pool utilization thresholds**. By default, the utilization threshold low is set to 70% and high respectively at 80%. If required, you can modify thresholds to receive notifications for the thresholds that meet your environment needs.

d. To specify over allocation, you can set the limit to **Unlimited.**

e. Click **Submit.**


HITACHI | Ops Center Administrator
Dashboard
Jobs
Monitoring
Dashboard > Storage Systems > 60749 > Pools > Create Pool
Create Pool
Basic
Advanced
Tier Management
Cancel
Submit

POOL NAME: vVOL_Dynamic_Pool

STORAGE SYSTEM: 60749

USE FOR SNAP? Yes [✓ No]

BREAKDOWN OF DISKS
Total: 10.32 TiB
Platinum: 10.32 TiB (100.00 %)

Select capacity from Tiers to allocate to Pool

Tier	Value	Available
DIAMOND	0.00 GiB	0.00 GiB Available
PLATINUM	10.32 TiB	10.32 TiB Available
GOLD	0.00 GiB	0.00 GiB Available
SILVER	0.00 GiB	0.00 GiB Available
BRONZE	0.00 GiB	0.00 GiB Available

UTILIZATION THRESHOLD (LOW) %: 70

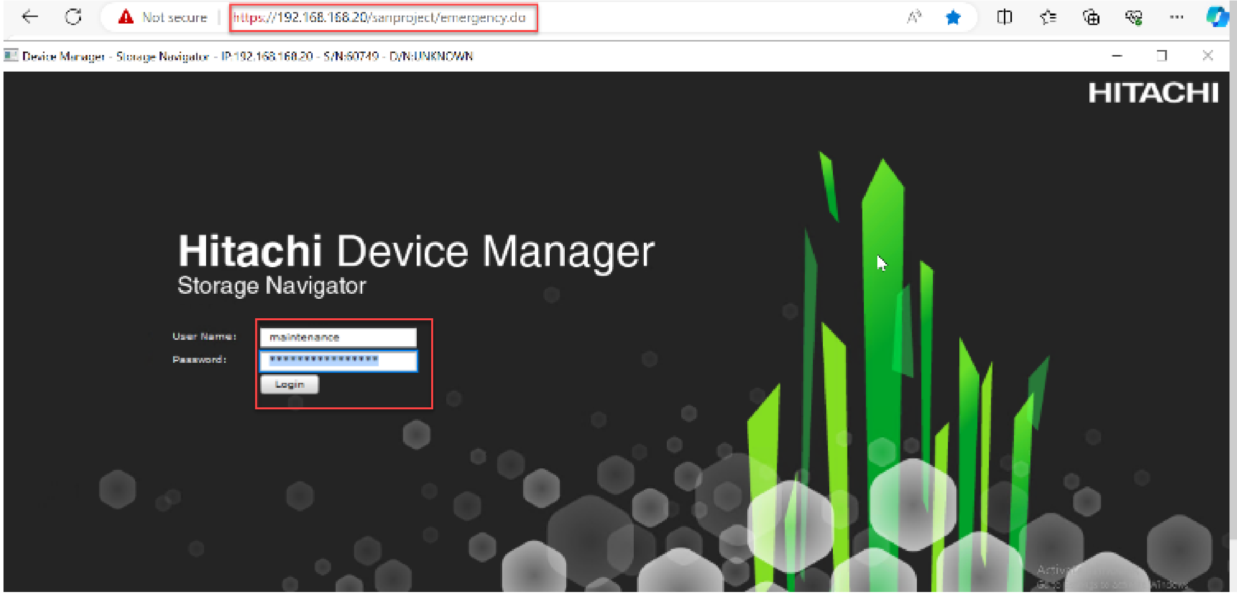
UTILIZATION THRESHOLD (HIGH) %: 80

☑ If this threshold is exceeded, snapshots will be disabled to ensure there is enough capacity for user data.

SUBSCRIPTION LIMIT: ☑ Unlimited

Procedure 7. Create vVols Resource Group from Hitachi Storage Navigator

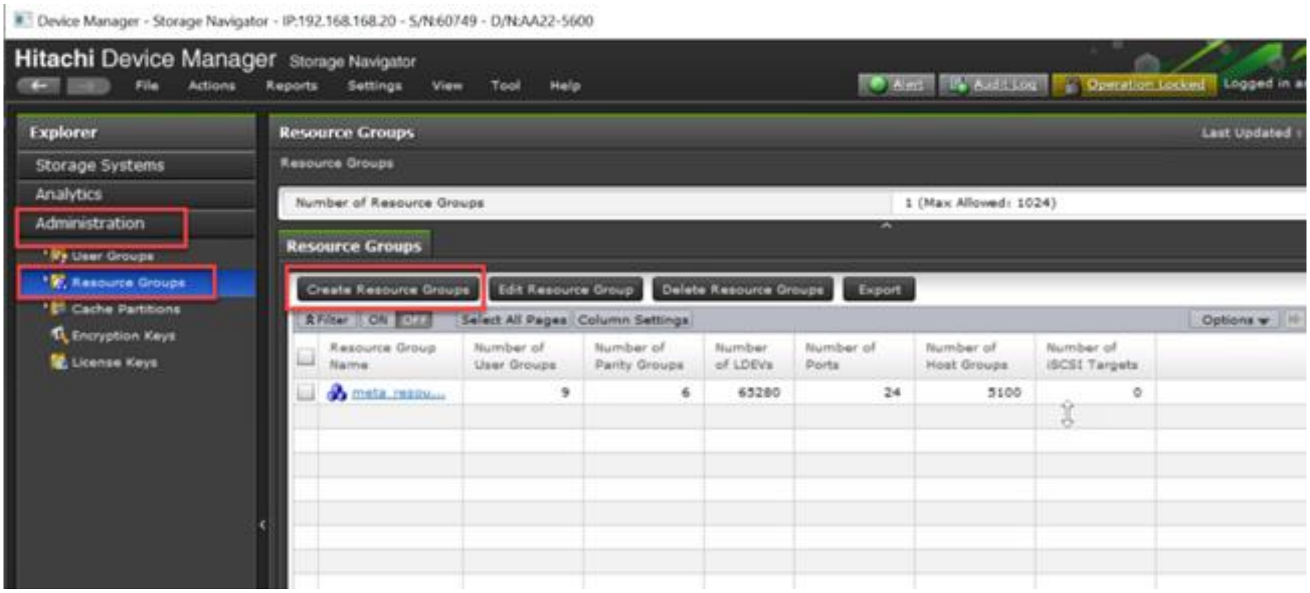
Step 1. Log in to **Hitachi Device Manager- Storage Navigator**.


Not secure
https://192.168.168.20/sanproject/emergency.do
Device Manager - Storage Navigator - IP:192.168.168.20 - S/N:60749 - D/N:UNKNOWN
HITACHI
Hitachi Device Manager
Storage Navigator
Login

User Name: maintenance

Password: ****************

Step 2. Expand **Administration**, select **Resource Groups**, and click **Create Resource Groups**.

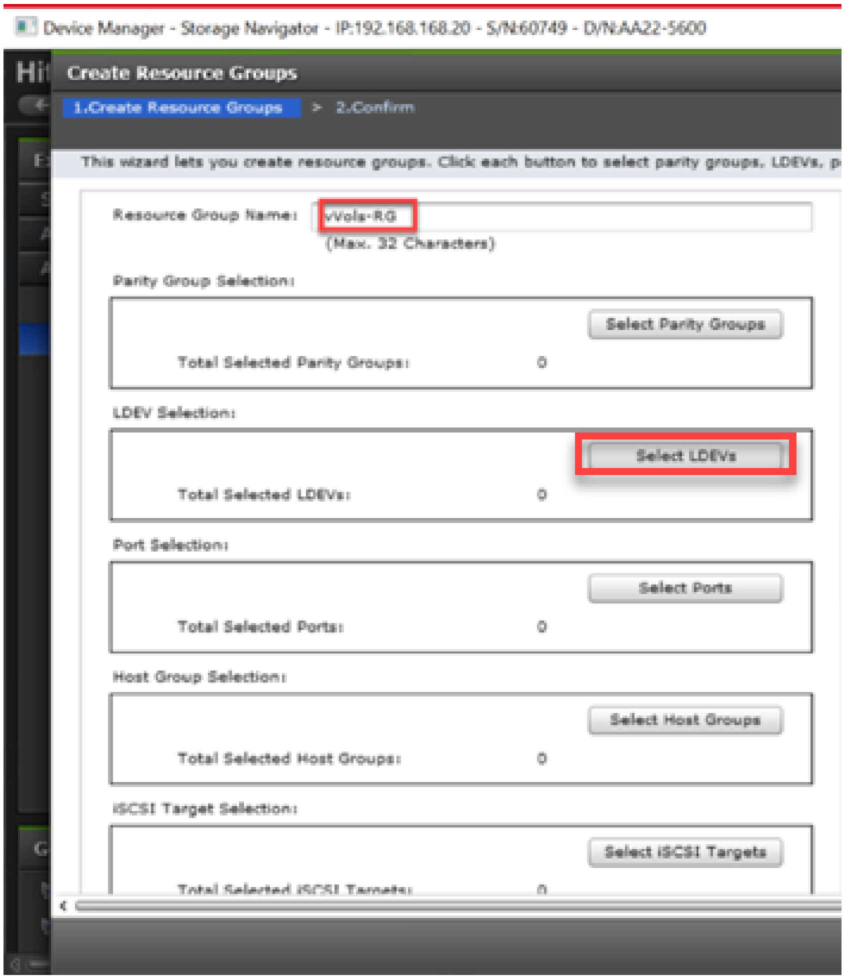


Resource Groups

Number of Resource Groups	1 (Max Allowed: 1024)

□	Resource Group Name	Number of User Groups	Number of Parity Groups	Number of LDEVs	Number of Ports	Number of Host Groups	Number of iSCSI Targets
□	meta_resou...	9	6	65280	24	5100	0

Step 3. Enter the Resource Group Name and click **Select LDEVs**.



This wizard lets you create resource groups. Click each button to select parity groups, LDEVs, p

Resource Group Name: vVols-RG
(Max. 32 Characters)

Parity Group Selection:
Total Selected Parity Groups: 0

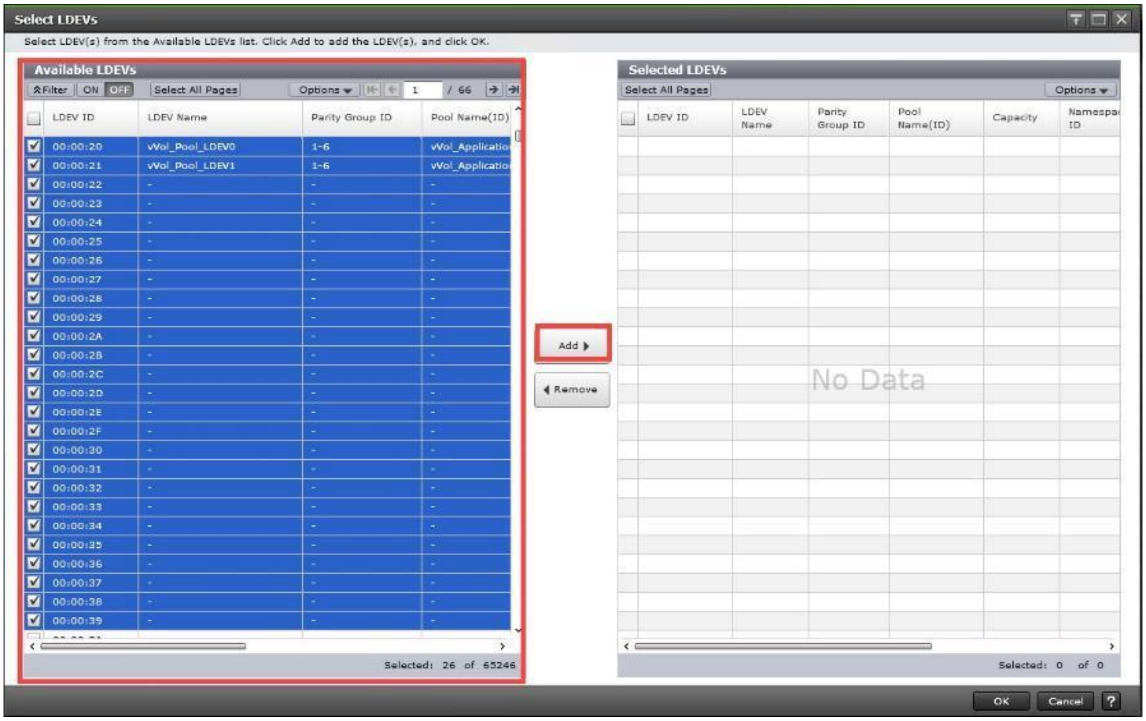
LDEV Selection:
Total Selected LDEVs: 0

Port Selection:
Total Selected Ports: 0

Host Group Selection:
Total Selected Host Groups: 0

iSCSI Target Selection:
Total Selected iSCSI Targets: 0

Step 4. Select an available range of **LDEV IDs for reservation** from the **Available LDEVs** tab, including the LDEVs created in the prior vVol pool step. Click **Add.**



Select LDEVs

Select LDEV(s) from the Available LDEVs list. Click Add to add the LDEV(s), and click OK.

Available LDEVs

⇑Filter ON OFF | Select All Pages | Options ▾ | 1 / 66

☐	LDEV ID	LDEV Name	Parity Group ID	Pool Name(ID)
☑	00:00:20	vVol_Pool_LDEV0	1-6	vVol_Applicatio
☑	00:00:21	vVol_Pool_LDEV1	1-6	vVol_Applicatio
☑	00:00:22	-	-	-
☑	00:00:23	-	-	-
☑	00:00:24	-	-	-
☑	00:00:25	-	-	-
☑	00:00:26	-	-	-
☑	00:00:27	-	-	-
☑	00:00:28	-	-	-
☑	00:00:29	-	-	-
☑	00:00:2A	-	-	-
☑	00:00:2B	-	-	-
☑	00:00:2C	-	-	-
☑	00:00:2D	-	-	-
☑	00:00:2E	-	-	-
☑	00:00:2F	-	-	-
☑	00:00:30	-	-	-
☑	00:00:31	-	-	-
☑	00:00:32	-	-	-
☑	00:00:33	-	-	-
☑	00:00:34	-	-	-
☑	00:00:35	-	-	-
☑	00:00:36	-	-	-
☑	00:00:37	-	-	-
☑	00:00:38	-	-	-
☑	00:00:39	-	-	-

Selected: 26 of 65246

Add ▸

◂ Remove

Selected LDEVs

Select All Pages | Options ▾

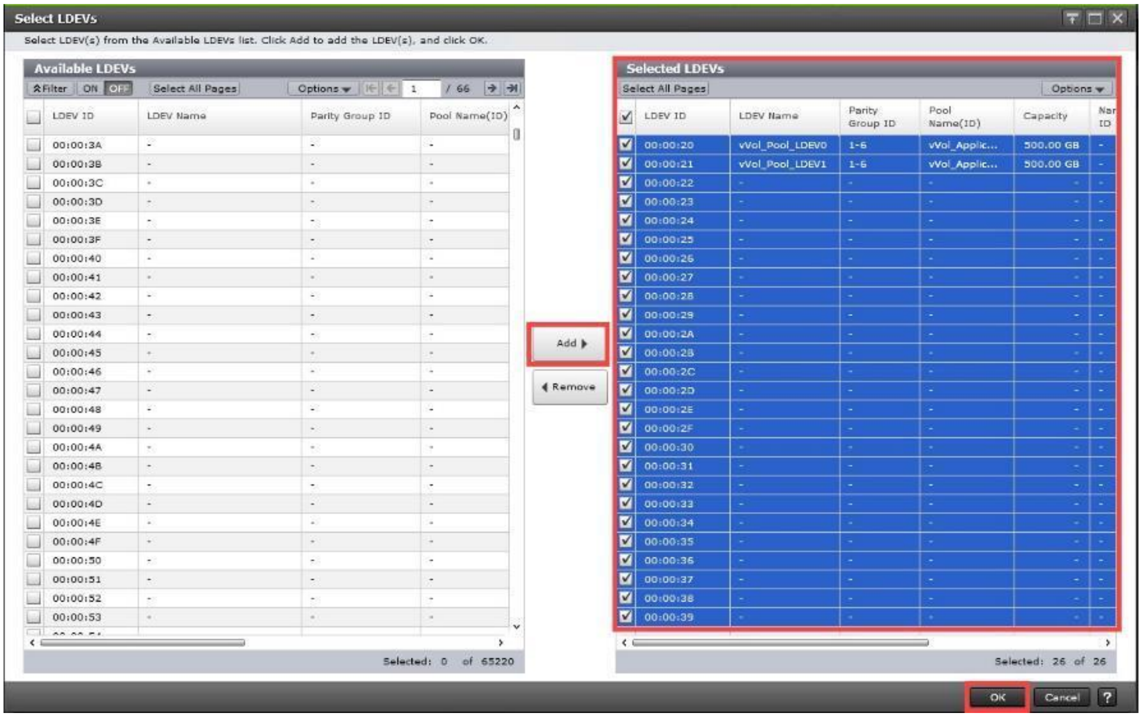
☐	LDEV ID	LDEV Name	Parity Group ID	Pool Name(ID)	Capacity	Namespa ID

No Data

Selected: 0 of 0

OK | Cancel | ?

Step 5. Click **OK** to reserve the selected LDEVs to the **Resource Group**.



Select LDEVs

Select LDEV(s) from the Available LDEVs list. Click Add to add the LDEV(s), and click OK.

Available LDEVs

⇑Filter ON OFF | Select All Pages | Options ▾ | 1 / 66

☐	LDEV ID	LDEV Name	Parity Group ID	Pool Name(ID)
☐	00:00:3A	-	-	-
☐	00:00:3B	-	-	-
☐	00:00:3C	-	-	-
☐	00:00:3D	-	-	-
☐	00:00:3E	-	-	-
☐	00:00:3F	-	-	-
☐	00:00:40	-	-	-
☐	00:00:41	-	-	-
☐	00:00:42	-	-	-
☐	00:00:43	-	-	-
☐	00:00:44	-	-	-
☐	00:00:45	-	-	-
☐	00:00:46	-	-	-
☐	00:00:47	-	-	-
☐	00:00:48	-	-	-
☐	00:00:49	-	-	-
☐	00:00:4A	-	-	-
☐	00:00:4B	-	-	-
☐	00:00:4C	-	-	-
☐	00:00:4D	-	-	-
☐	00:00:4E	-	-	-
☐	00:00:4F	-	-	-
☐	00:00:50	-	-	-
☐	00:00:51	-	-	-
☐	00:00:52	-	-	-
☐	00:00:53	-	-	-

Selected: 0 of 65220

Add ▸

◂ Remove

Selected LDEVs

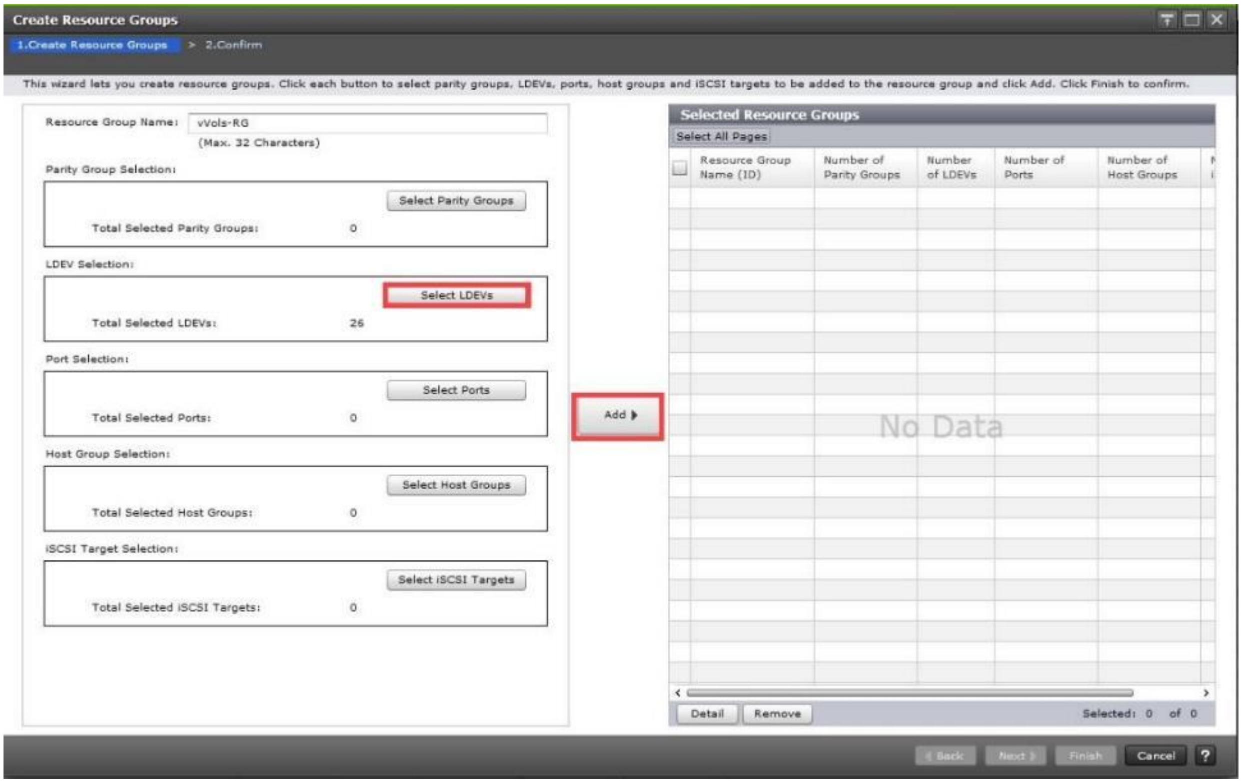
Select All Pages | Options ▾

☑	LDEV ID	LDEV Name	Parity Group ID	Pool Name(ID)	Capacity	Nar ID
☑	00:00:20	vVol_Pool_LDEV0	1-6	vVol_Applic...	500.00 GB	-
☑	00:00:21	vVol_Pool_LDEV1	1-6	vVol_Applic...	500.00 GB	-
☑	00:00:22	-	-	-	-	-
☑	00:00:23	-	-	-	-	-
☑	00:00:24	-	-	-	-	-
☑	00:00:25	-	-	-	-	-
☑	00:00:26	-	-	-	-	-
☑	00:00:27	-	-	-	-	-
☑	00:00:28	-	-	-	-	-
☑	00:00:29	-	-	-	-	-
☑	00:00:2A	-	-	-	-	-
☑	00:00:2B	-	-	-	-	-
☑	00:00:2C	-	-	-	-	-
☑	00:00:2D	-	-	-	-	-
☑	00:00:2E	-	-	-	-	-
☑	00:00:2F	-	-	-	-	-
☑	00:00:30	-	-	-	-	-
☑	00:00:31	-	-	-	-	-
☑	00:00:32	-	-	-	-	-
☑	00:00:33	-	-	-	-	-
☑	00:00:34	-	-	-	-	-
☑	00:00:35	-	-	-	-	-
☑	00:00:36	-	-	-	-	-
☑	00:00:37	-	-	-	-	-
☑	00:00:38	-	-	-	-	-
☑	00:00:39	-	-	-	-	-

Selected: 26 of 26

OK | Cancel | ?

Step 6. After the LDEVs selection is completed, click **Add.**



Create Resource Groups

1.Create Resource Groups > 2.Confirm

This wizard lets you create resource groups. Click each button to select parity groups, LDEVs, ports, host groups and iSCSI targets to be added to the resource group and click Add. Click Finish to confirm.

Resource Group Name: vVols-RG
(Max. 32 Characters)

Parity Group Selection:
Select Parity Groups
Total Selected Parity Groups: 0

LDEV Selection:
Select LDEVs
Total Selected LDEVs: 26

Port Selection:
Select Ports
Total Selected Ports: 0

Host Group Selection:
Select Host Groups
Total Selected Host Groups: 0

iSCSI Target Selection:
Select iSCSI Targets
Total Selected iSCSI Targets: 0

Selected Resource Groups

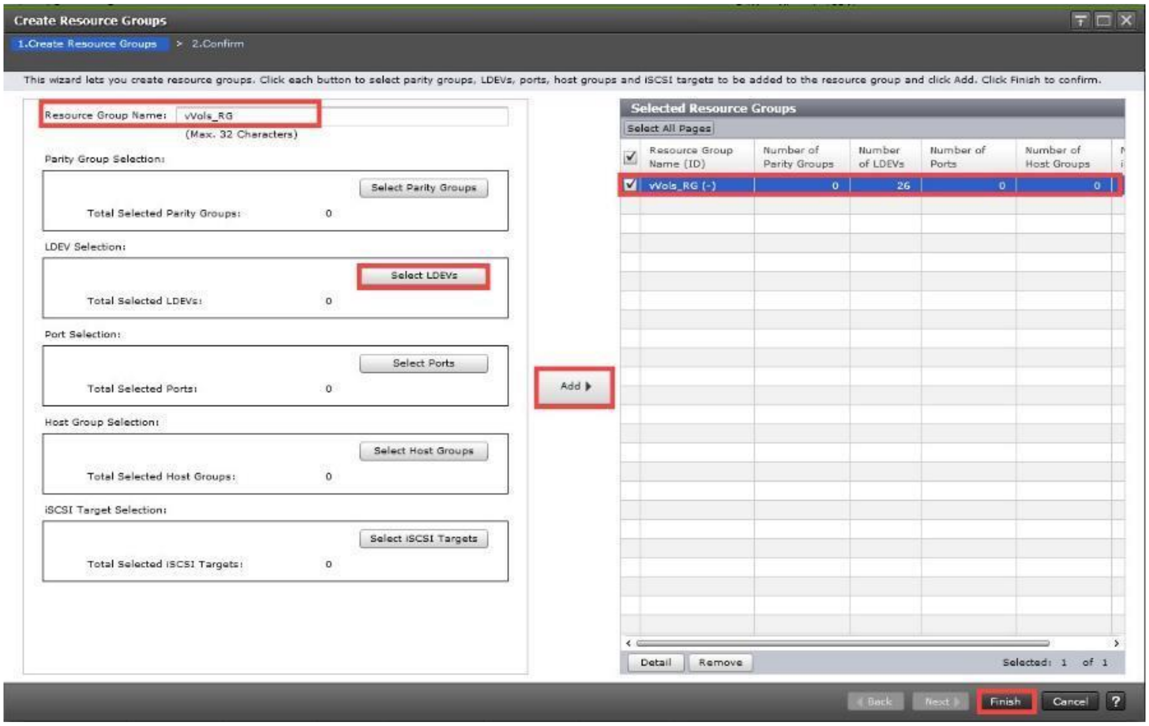
Select All Pages

□	Resource Group Name (ID)	Number of Parity Groups	Number of LDEVs	Number of Ports	Number of Host Groups

No Data

Selected: 0 of 0

Step 7. The created **Resource Group** is visible under the **Selected Resource Groups** pane, and the **Number of LDEVs** are presented as selected. Click **Finish.**



Create Resource Groups

1.Create Resource Groups > 2.Confirm

This wizard lets you create resource groups. Click each button to select parity groups, LDEVs, ports, host groups and iSCSI targets to be added to the resource group and click Add. Click Finish to confirm.

Resource Group Name: vVols_RG
(Max. 32 Characters)

Parity Group Selection:
Select Parity Groups
Total Selected Parity Groups: 0

LDEV Selection:
Select LDEVs
Total Selected LDEVs: 0

Port Selection:
Select Ports
Total Selected Ports: 0

Host Group Selection:
Select Host Groups
Total Selected Host Groups: 0

iSCSI Target Selection:
Select iSCSI Targets
Total Selected iSCSI Targets: 0

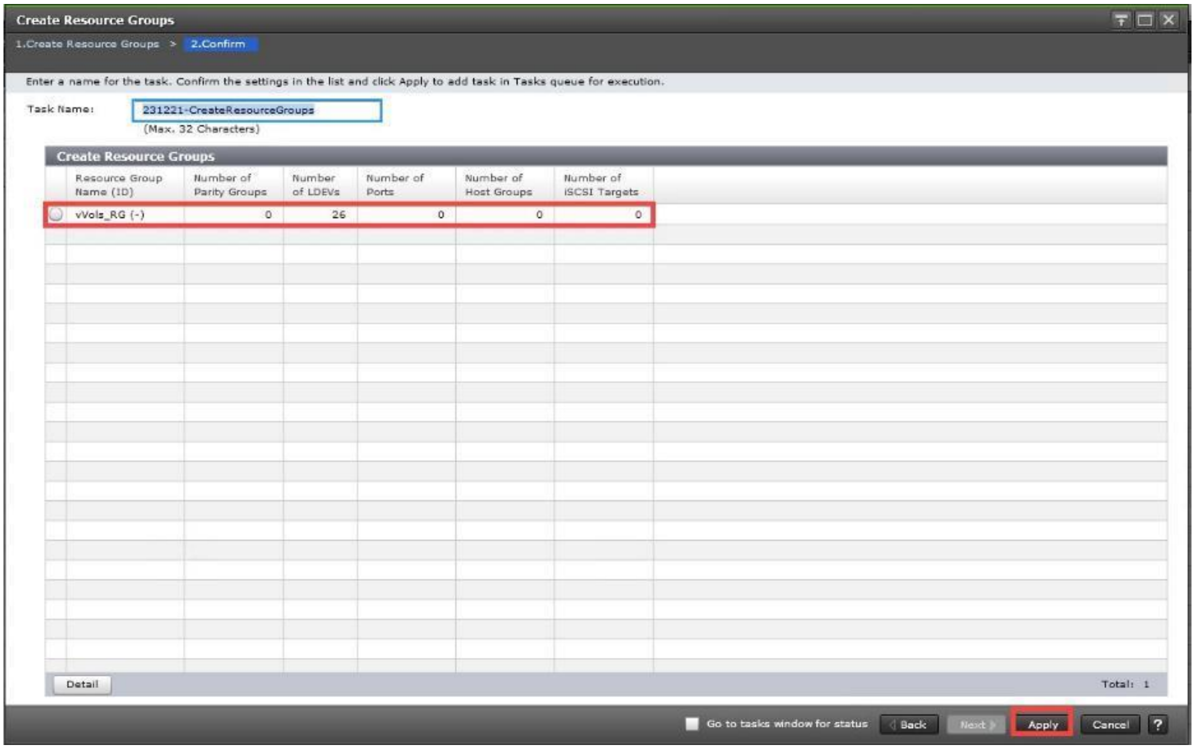
Selected Resource Groups

Select All Pages

☑	Resource Group Name (ID)	Number of Parity Groups	Number of LDEVs	Number of Ports	Number of Host Groups
☑	vVols_RG (-)	0	26	0	0

Selected: 1 of 1

Step 8. Click **Apply.**



Create Resource Groups

1.Create Resource Groups > 2.Confirm

Enter a name for the task. Confirm the settings in the list and click Apply to add task in Tasks queue for execution.

Task Name: 231221-CreateResourceGroups

(Max. 32 Characters)

Create Resource Groups

	Resource Group Name (ID)	Number of Parity Groups	Number of LDEVs	Number of Ports	Number of Host Groups	Number of iSCSI Targets
○	vVols_RG (-)	0	26	0	0	0

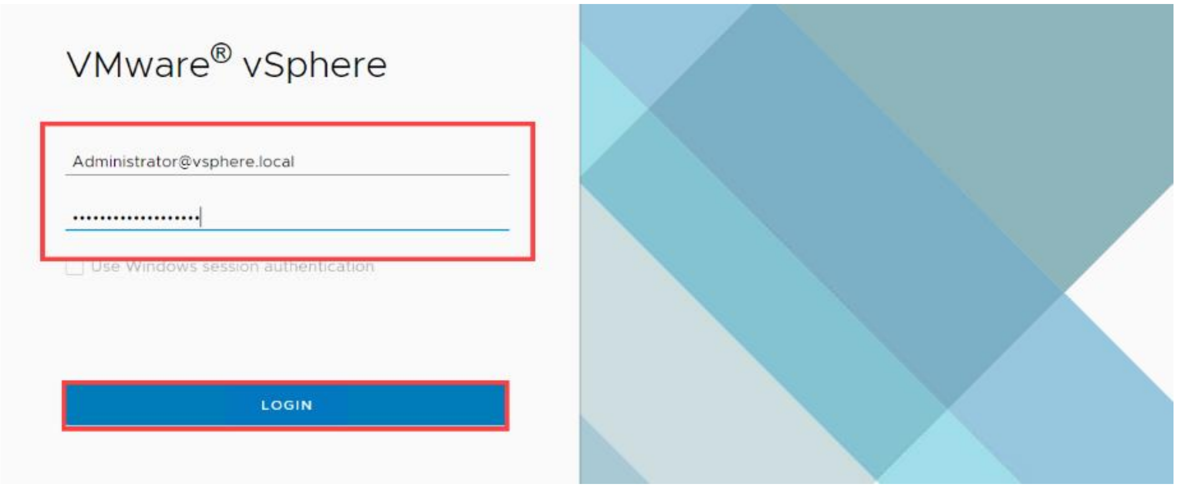
Total: 1

Procedure 8. Deploy Storage Provider for VMware vCenter

Storage Provider for VMware vCenter is deployed using an OVF template. You can obtain the binaries from your Hitachi representative or download the latest OVF file from - Support | Hitachi Vantara.

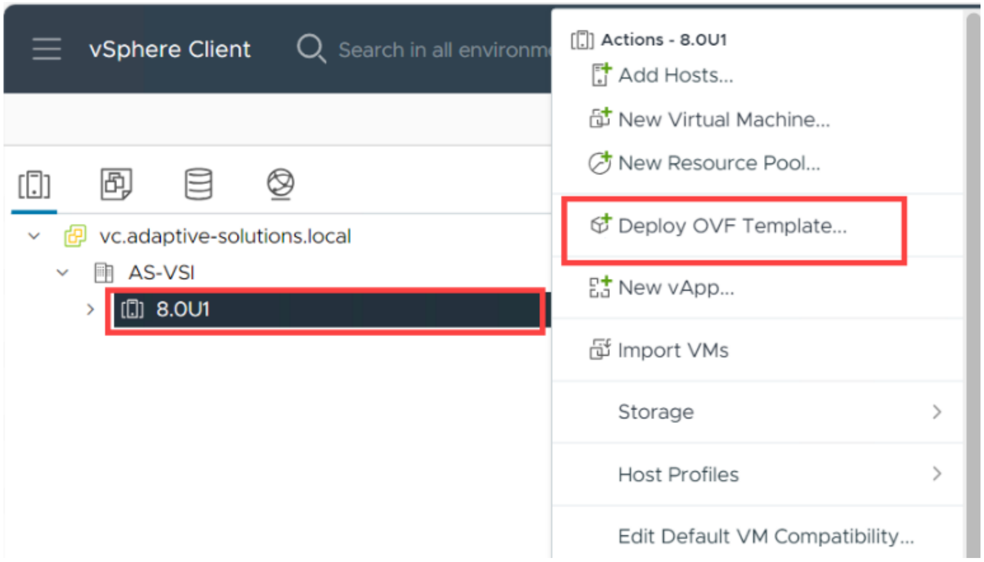
This virtual machine is typically deployed into the vSphere management cluster where the vCenter Appliance (VCSA) is deployed. You can also deploy this virtual machine to any vSphere environment if it has network access to the VSP storage.

Step 1. Log in to **VMware vSphere** web client.

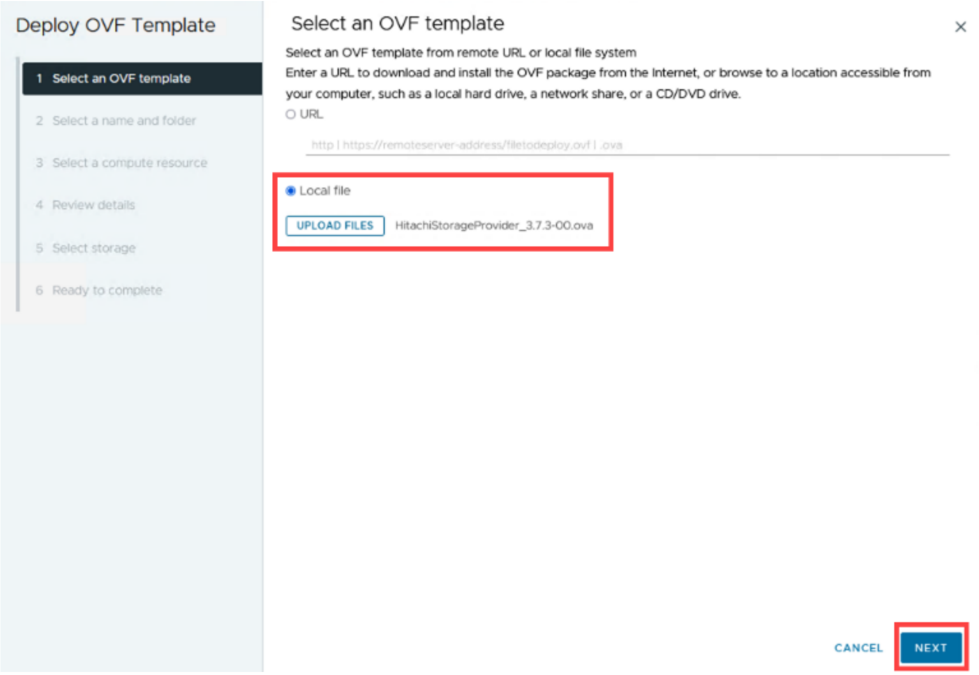


VMware® vSphere
Administrator@vsphere.local
••••••••••••••••••••
Use Windows session authentication
LOGIN

Step 2. From the vCenter Dashboard, right-click **Management Cluster** and select **Deploy OVF Template.**



Step 3. Select the **Local File**, click **UPLOAD FILES**, and then select the respective OVA. Click **Next.**



Select an OVF template

Select an OVF template from remote URL or local file system

Enter a URL to download and install the OVF package from the Internet, or browse to a location accessible from your computer, such as a local hard drive, a network share, or a CD/DVD drive.

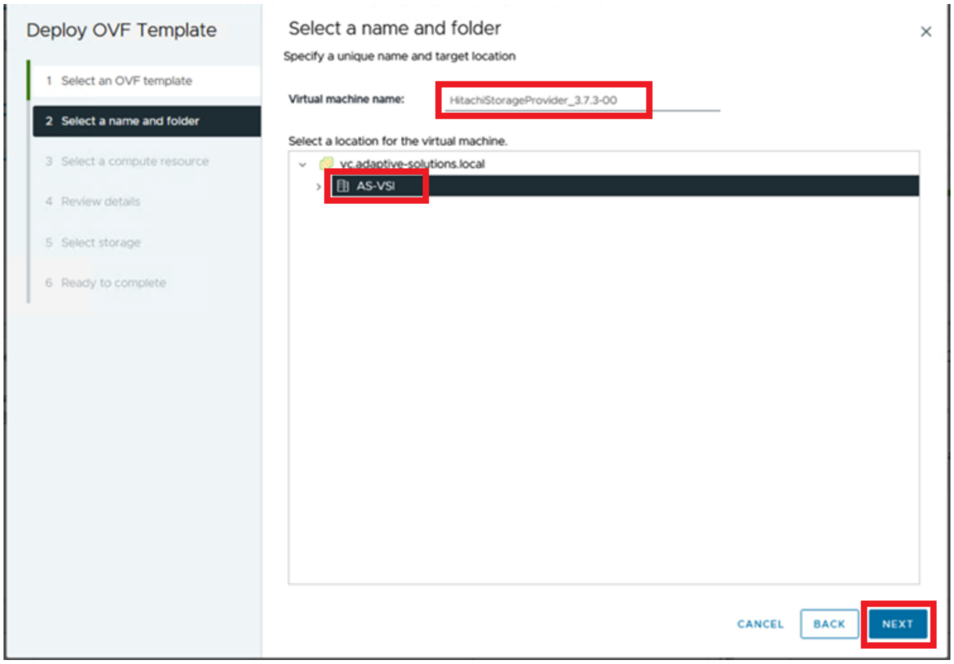
○ URL

http | https://remoteserver-address/filetodeploy.ovf | .ova

● Local file

UPLOAD FILES HitachiStorageProvider_3.7.3-00.ova

Step 4. Provide the name of the virtual machine and select the management cluster. Click **NEXT**.


Deploy OVF Template

Select a name and folder

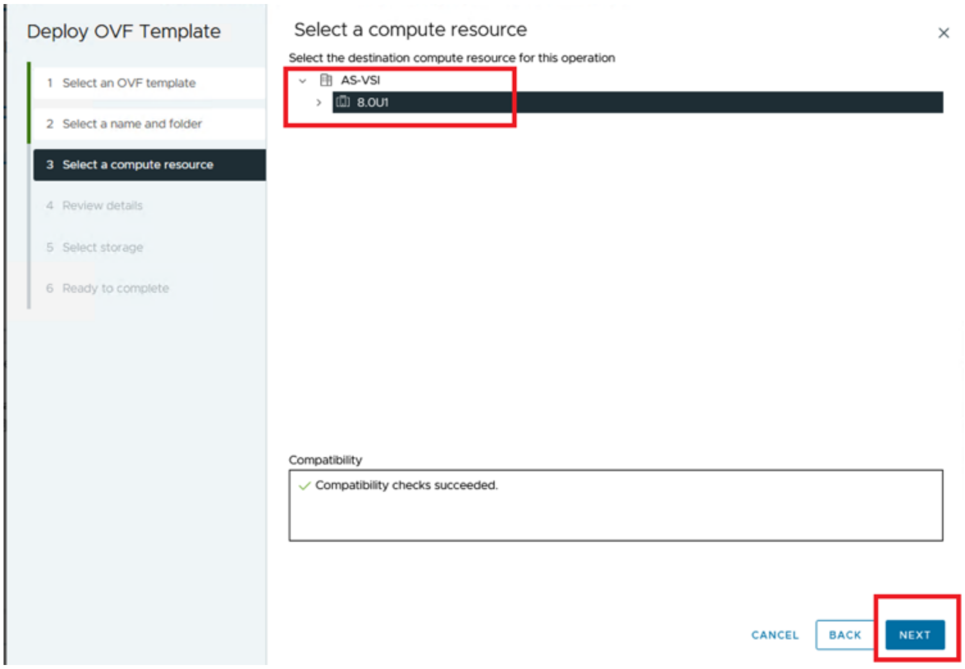
Specify a unique name and target location

Virtual machine name: HitachiStorageProvider_3.7.3-00

Select a location for the virtual machine.

- vc.adaptive-solutions.local
  - AS-VSI

Step 5. Select the Compute Resource and click Next.


Deploy OVF Template

Select a compute resource

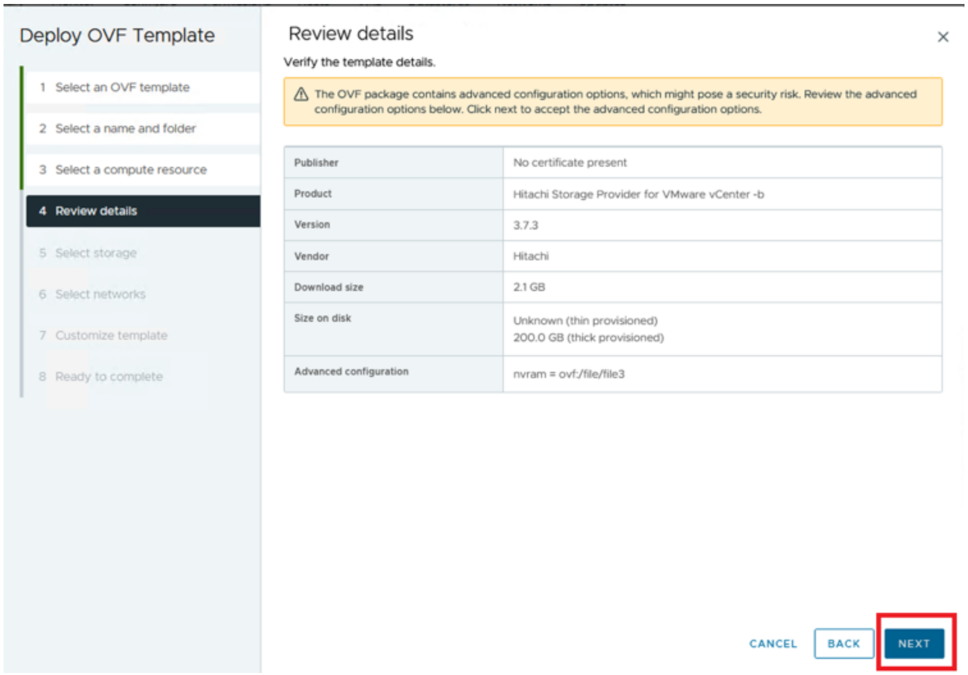
Select the destination compute resource for this operation

- AS-VSI
  - 8.0U1

Compatibility

✓ Compatibility checks succeeded.

Step 6. Verify the template details and click **Next**.



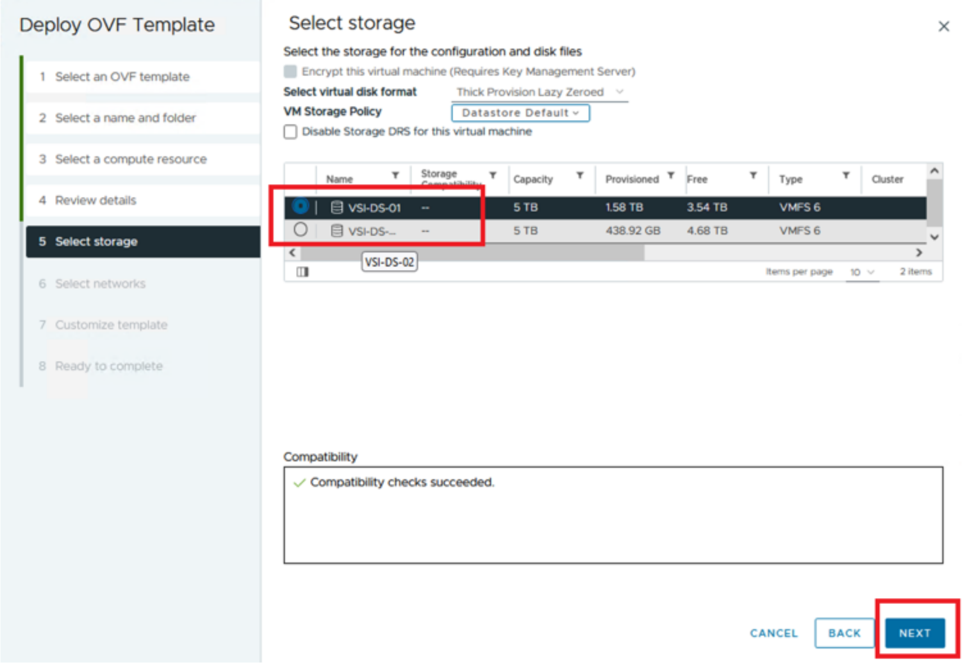
Review details

Verify the template details.

⚠ The OVF package contains advanced configuration options, which might pose a security risk. Review the advanced configuration options below. Click next to accept the advanced configuration options.

Publisher	No certificate present
Product	Hitachi Storage Provider for VMware vCenter -b
Version	3.7.3
Vendor	Hitachi
Download size	2.1 GB
Size on disk	Unknown (thin provisioned) 200.0 GB (thick provisioned)
Advanced configuration	nvram = ovf:/file/file3

Step 7. Select the compatible **Datastore** and click **Next.**



Select storage

Select the storage for the configuration and disk files

□ Encrypt this virtual machine (Requires Key Management Server)

Select virtual disk format: Thick Provision Lazy Zeroed

VM Storage Policy: Datastore Default

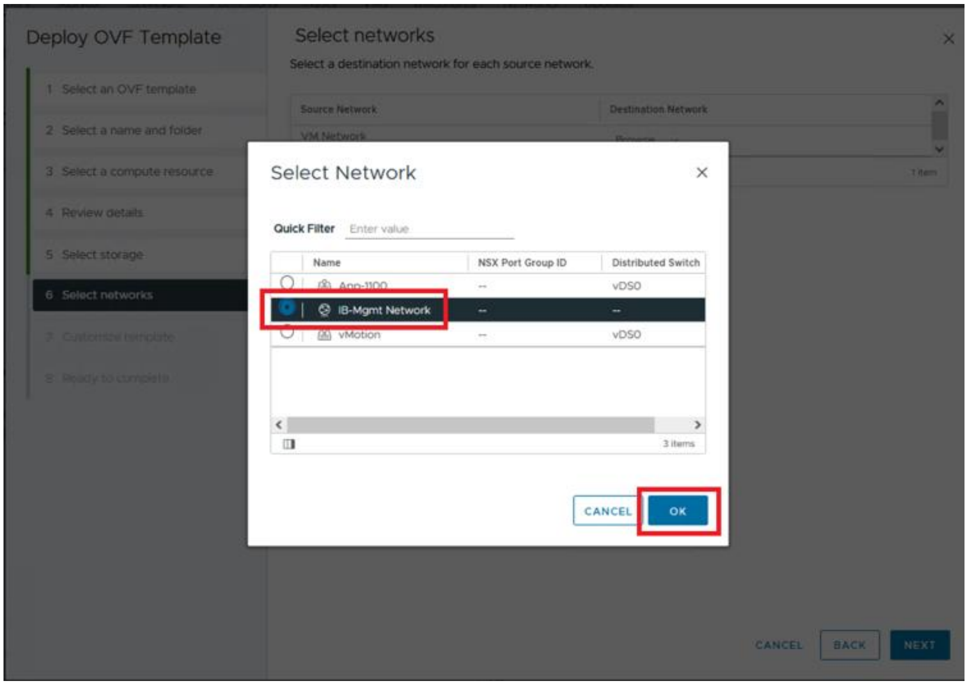
□ Disable Storage DRS for this virtual machine

	Name	Storage Compatibility	Capacity	Provisioned	Free	Type	Cluster
●	VSI-DS-01	--	5 TB	1.58 TB	3.54 TB	VMFS 6	
○	VSI-DS-...	--	5 TB	438.92 GB	4.68 TB	VMFS 6	

Compatibility

✓ Compatibility checks succeeded.

Step 8. Select the In-band Management Network and click **Next**.



Deploy OVF Template

1 Select an OVF template
2 Select a name and folder
3 Select a compute resource
4 Review details
5 Select storage
6 Select networks
7 Customize template
8 Ready to complete

Select networks

Select a destination network for each source network.

Source Network	Destination Network
VM Network	Browse ...

1 item

Select Network

Quick Filter Enter value

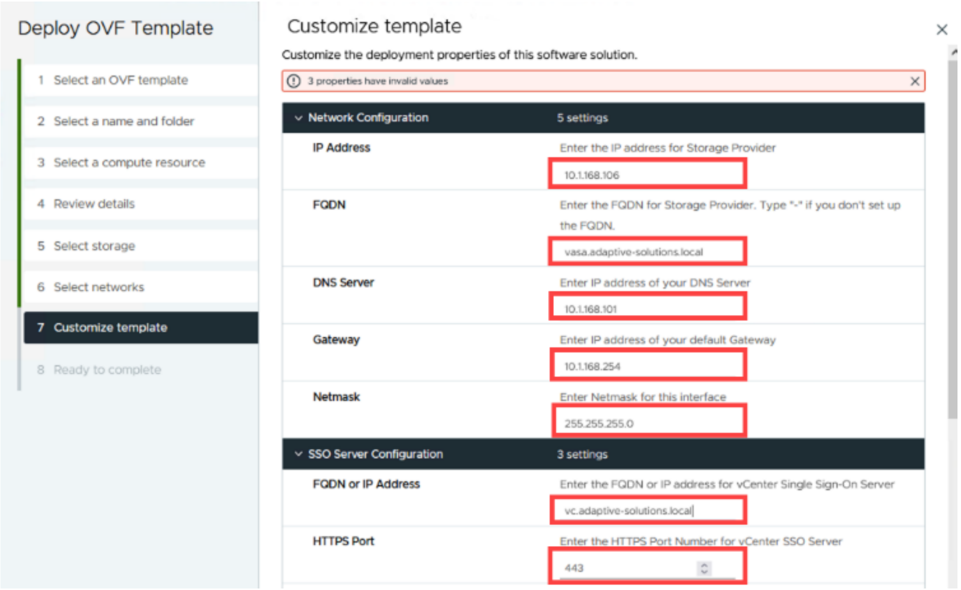
	Name	NSX Port Group ID	Distributed Switch
○	App-1100	--	vDSO
●	IB-Mgmt Network	--	--
○	vMotion	--	vDSO

3 items

Step 9. Provide the following details:

- Network Configuration
  - IP Address
  - FQDN
  - DNS
  - Gateway
  - Netmask
- SSO Server Configuration
  - FQDN or IP Address: Enter the FQDN or IP address for the vCenter Single Sign-On Server.
  - HTTPS Port: Enter the HTTPS Port Number 443 for vCenter SSO Server.
  - Single Sign-On domain name: Enter the domain name for the vCenter SSO Server as vSphere.local
- System Configuration
  - Domain Name
  - Host Name
  - NTP

Step 10. Click **Next.**



Deploy OVF Template

Customize template

Customize the deployment properties of this software solution.

3 properties have invalid values

Network Configuration 5 settings

IP Address: Enter the IP address for Storage Provider: 10.1.168.106

FQDN: Enter the FQDN for Storage Provider. Type "-" if you don't set up the FQDN.: vasa.adaptive-solutions.local

DNS Server: Enter IP address of your DNS Server: 10.1.168.101

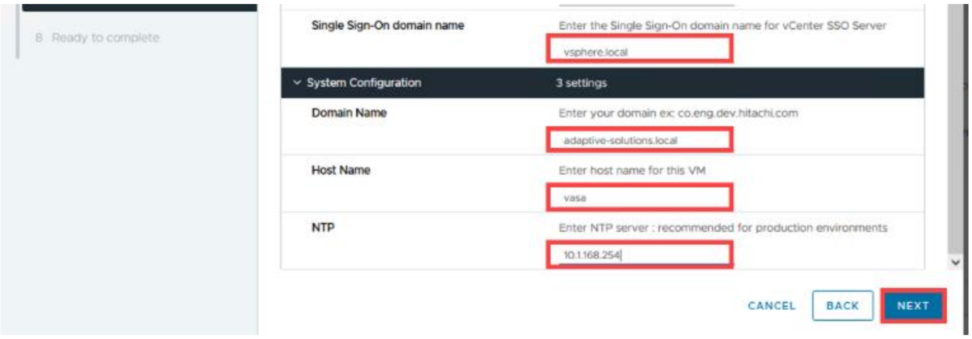
Gateway: Enter IP address of your default Gateway: 10.1.168.254

Netmask: Enter Netmask for this interface: 255.255.255.0

SSO Server Configuration 3 settings

FQDN or IP Address: Enter the FQDN or IP address for vCenter Single Sign-On Server: vc.adaptive-solutions.local

HTTPS Port: Enter the HTTPS Port Number for vCenter SSO Server: 443



Single Sign-On domain name: Enter the Single Sign-On domain name for vCenter SSO Server: vsphere.local

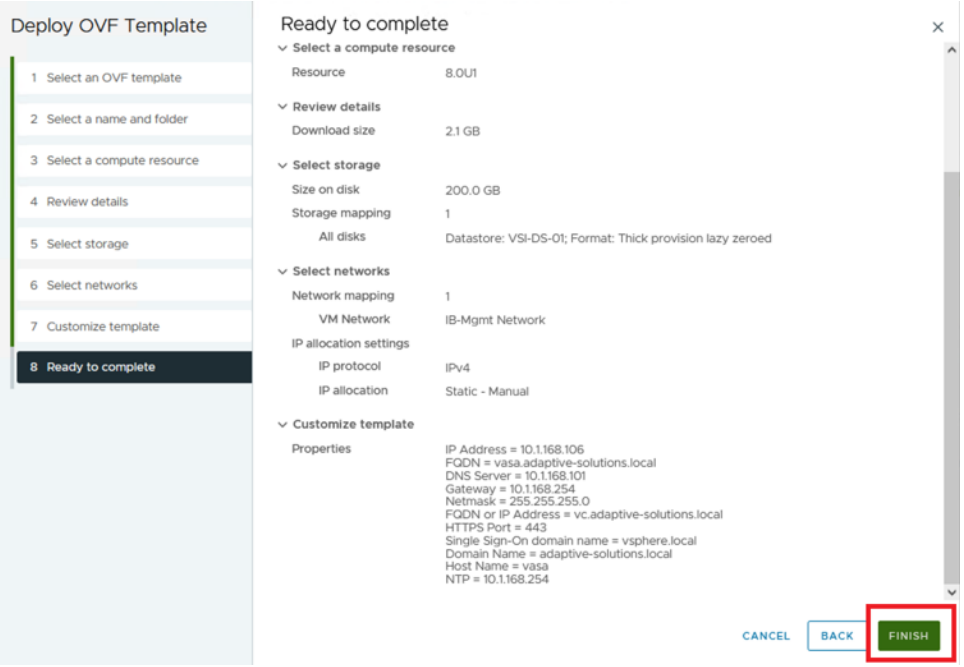
System Configuration 3 settings

Domain Name: Enter your domain ex: co.eng.dev.hitachi.com: adaptive-solutions.local

Host Name: Enter host name for this VM: vasa

NTP: Enter NTP server : recommended for production environments: 10.1.168.254

Step 11. Validate the details and click **Finish.**



Ready to complete

Select a compute resource

Resource	8.0U1

Review details

Download size	2.1 GB

Select storage

Size on disk	200.0 GB
Storage mapping	1
All disks	Datastore: VSI-DS-01; Format: Thick provision lazy zeroed

Select networks

Network mapping	1
VM Network	IB-Mgmt Network
IP allocation settings	
IP protocol	IPv4
IP allocation	Static - Manual

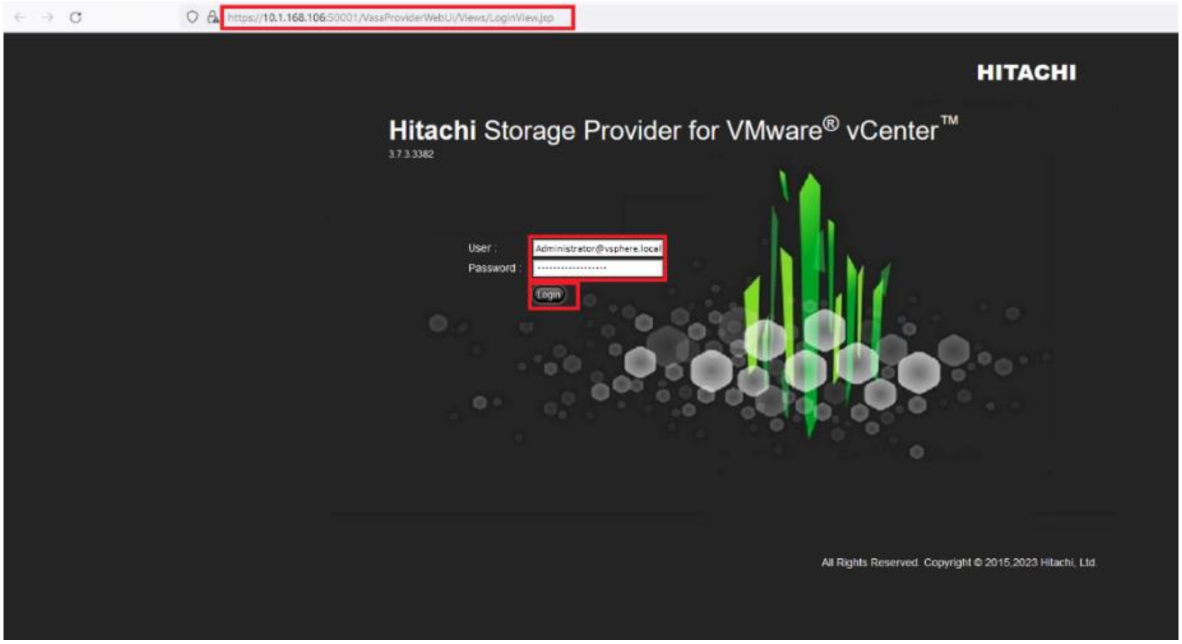
Customize template

Properties	IP Address = 10.1.168.106 FQDN = vasa.adaptive-solutions.local DNS Server = 10.1.168.101 Gateway = 10.1.168.254 Netmask = 255.255.255.0 FQDN or IP Address = vc.adaptive-solutions.local HTTPS Port = 443 Single Sign-On domain name = vsphere.local Domain Name = adaptive-solutions.local Host Name = vasa NTP = 10.1.168.254

Step 12. Once the Storage Provider OVA has been deployed, **Power On** the virtual machine.

Step 13. In the browser, enter the IP Address or FQDN of Storage Provider for VMware vCenter with the following port number 50001. https://[Storage-Provider-IP-Address or FQDN]:50001/

Step 14. Enter the administrator SSO credentials for logging in to the **VMware vCenter**. Click **Login.**



https://10.1.168.106:50001/VasaProviderWebUI/Views/LoginView.jsp

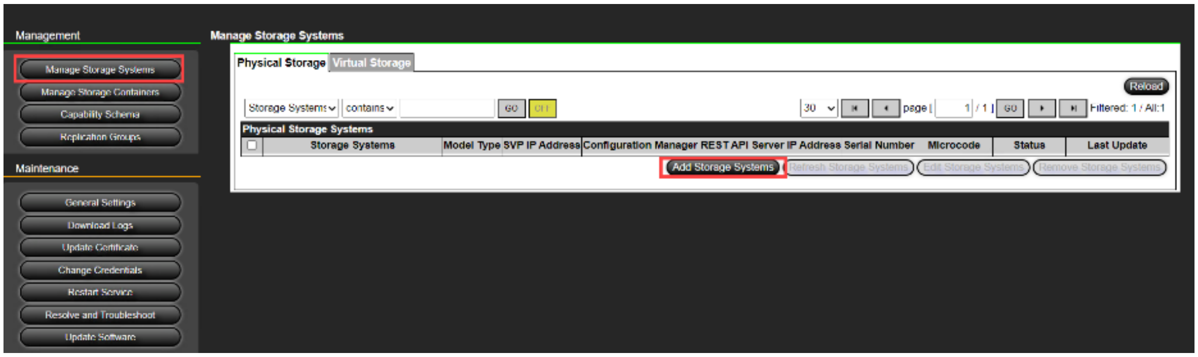
HITACHI
Hitachi Storage Provider for VMware® vCenter™
3.7.3.3382
Login
All Rights Reserved. Copyright © 2015,2023 Hitachi, Ltd.

User : Administrator@vsphere.local

Password : ••••••••••••••••••

Procedure 9. Onboard Hitachi VSP to Storage Provider for VMware vCenter

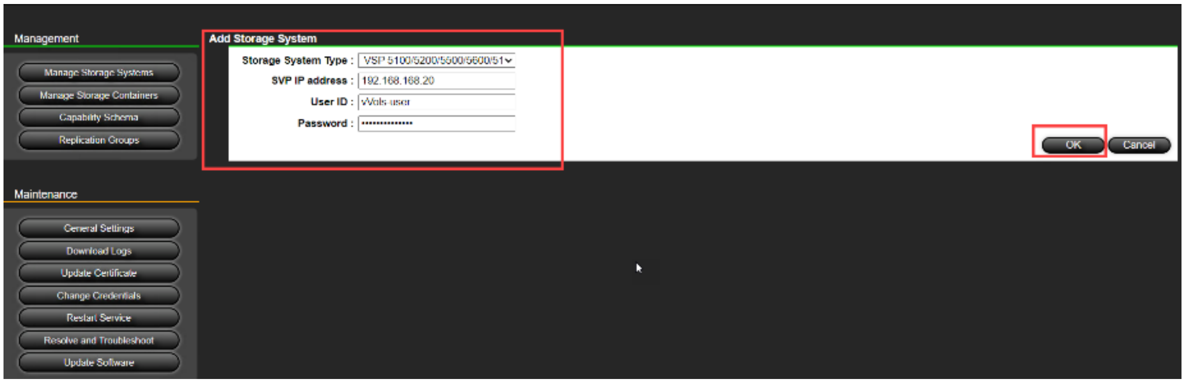
Step 1. In the **Storage Provider for VMware vCenter** console, from the Management pane, select **Manage Storage Systems**, and then click **Add Storage Systems.**



Physical Storage Systems

□	Storage Systems	Model Type	SVP IP Address	Configuration Manager REST API Server IP Address	Serial Number	Microcode	Status	Last Update

Step 2. Select a **Storage System Type** and enter the **SVP IP address.** Enter the **vVols User ID** and **Password** that you created earlier. Click **OK**.



Add Storage System

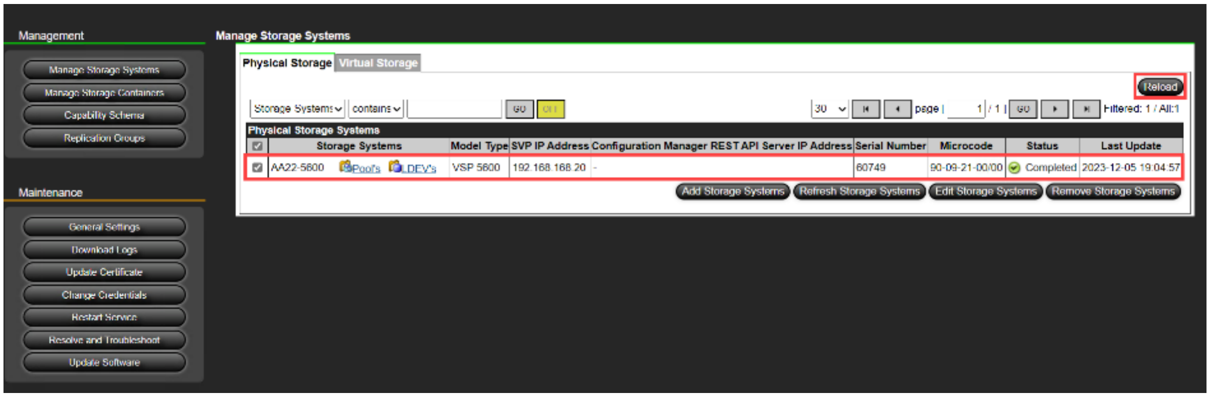
Storage System Type : VSP 5100/5200/5500/5600/51

SVP IP address : 192.168.168.20

User ID : vVols-user

Password : ••••••••••••••

Note: Click **Reload** to update the progress until the storage system is added successfully.

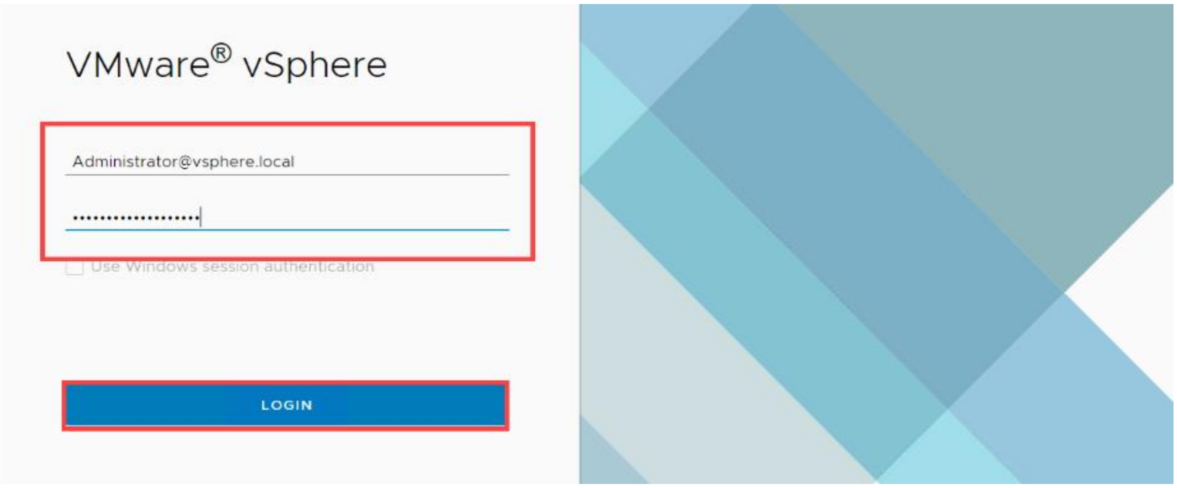


Physical Storage Systems

☑	Storage Systems	Model Type	SVP IP Address	Configuration Manager REST API Server IP Address	Serial Number	Microcode	Status	Last Update
☑	AA22-5600 Pools LDEV's	VSP 5600	192.168.168.20	-	60749	90-09-21-00/00	✓ Completed	2023-12-05 19:04:57

Procedure 10. Register Storage Provider for VMware vCenter in VMware vSphere

Step 1. Log in to the **vSphere Client.**



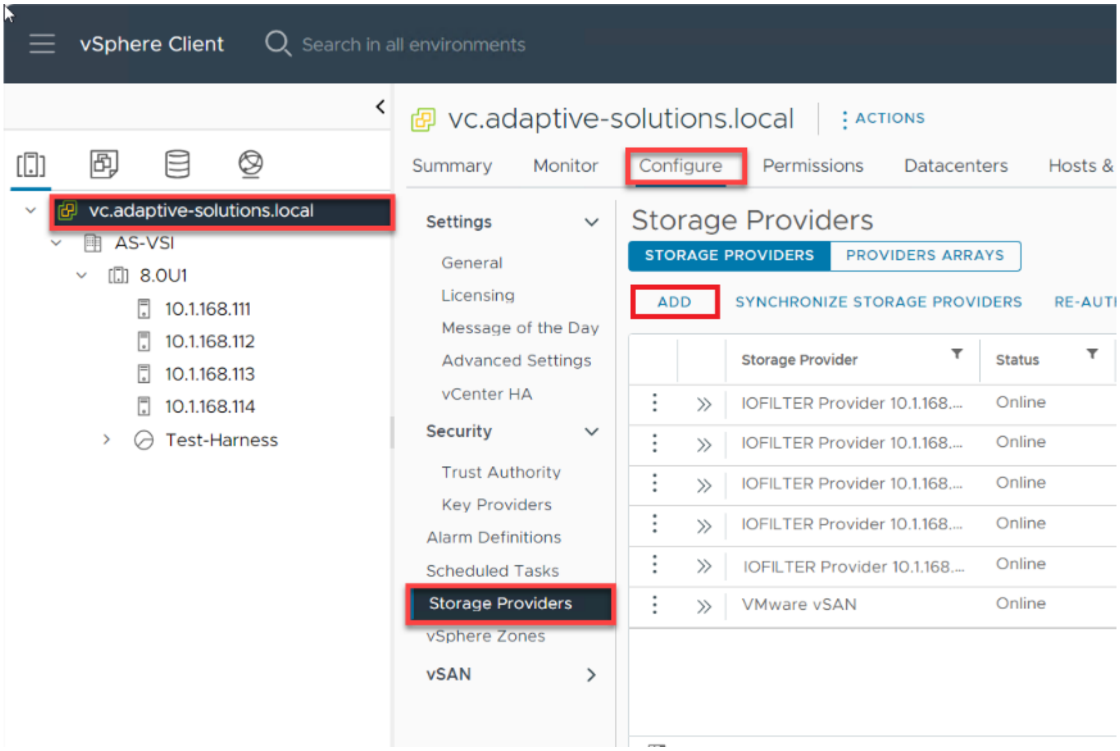
VMware® vSphere

Administrator@vsphere.local

••••••••••••••••••

□ Use Windows session authentication

Step 2. Select **vCenter**. Click the **Configure** tab and select **Storage Providers**, and then click **ADD.**



Storage Provider	Status
IOFILTER Provider 10.1.168....	Online
IOFILTER Provider 10.1.168....	Online
IOFILTER Provider 10.1.168....	Online
IOFILTER Provider 10.1.168....	Online
IOFILTER Provider 10.1.168....	Online
VMware vSAN	Online

Step 3. Enter the following information:

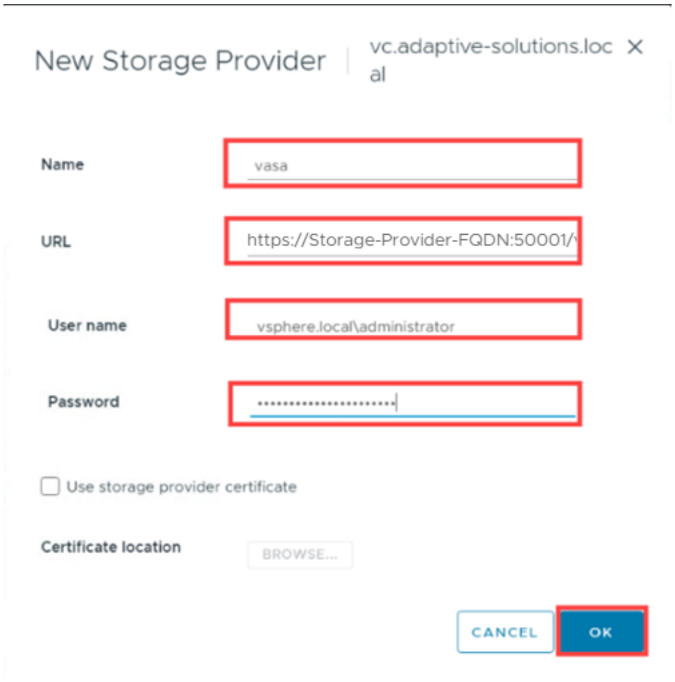
a. Enter the Name for the **New Storage Provider**.

b. In the URL field, enter https://[Storage-Provider-FQDN]:50001/version.xml

c. In the Username field, enter the vCenter username in the format shown in the following figure.

d. In the Password field, enter the vCenter password.

e. Click **OK**.



New Storage Provider | vc.adaptive-solutions.local

Name: vasa

URL: https://Storage-Provider-FQDN:50001/

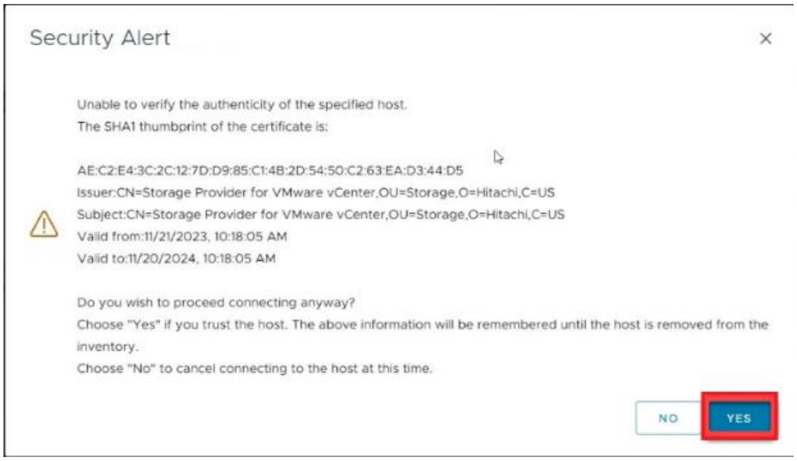
User name: vsphere.local\administrator

Password: ••••••••••••••••••••••

□ Use storage provider certificate

Certificate location

Step 4. In the **Security Alert** prompt, click **YES.**



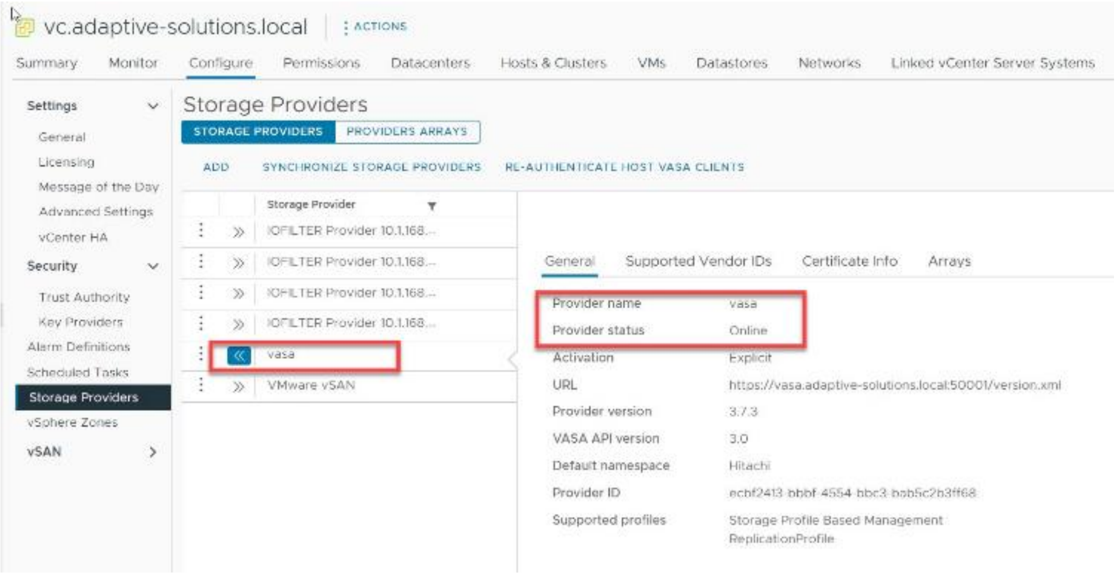
Security Alert

Unable to verify the authenticity of the specified host.
The SHA1 thumbprint of the certificate is:

AE:C2:E4:3C:2C:12:7D:D9:85:C1:4B:2D:54:50:C2:63:EA:D3:44:D5
Issuer:CN=Storage Provider for VMware vCenter,OU=Storage,O=Hitachi,C=US
Subject:CN=Storage Provider for VMware vCenter,OU=Storage,O=Hitachi,C=US
Valid from:11/21/2023, 10:18:05 AM
Valid to:11/20/2024, 10:18:05 AM

Do you wish to proceed connecting anyway?
Choose "Yes" if you trust the host. The above information will be remembered until the host is removed from the inventory.
Choose "No" to cancel connecting to the host at this time.

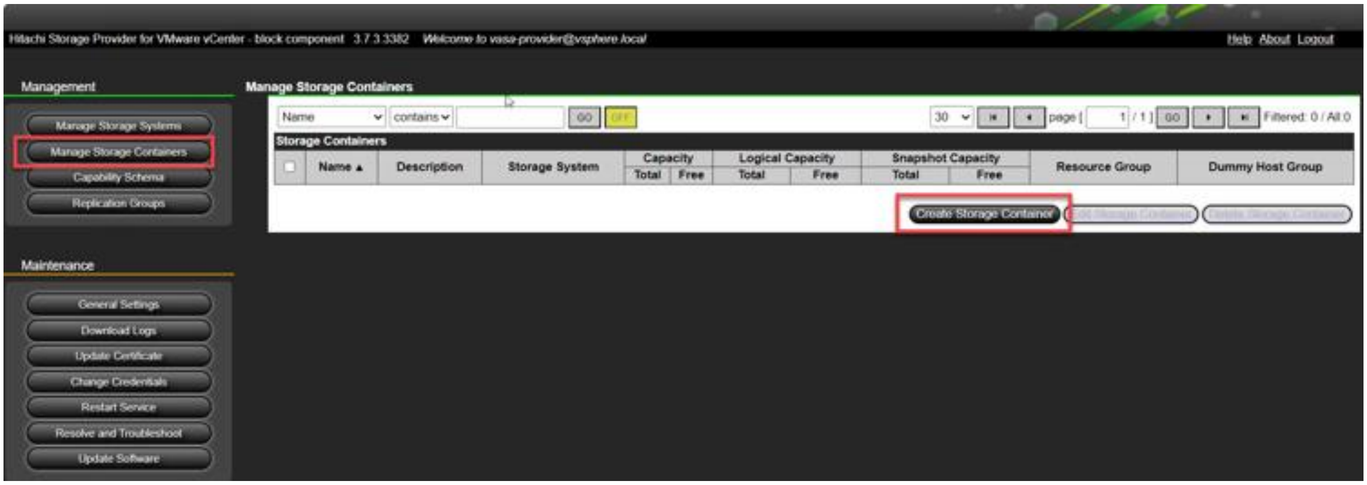
Step 5. After successful onboarding, the Storage Provider for VMware vCenter displays an **Online** status.



Provider name	vasa
Provider status	Online
Activation	Explicit
URL	https://vasa.adaptive-solutions.local:50001/version.xml
Provider version	3.7.3
VASA API version	3.0
Default namespace	Hitachi
Provider ID	ecbf2413-bbbf-4554-bbc3-bab5c2b3ff68
Supported profiles	Storage Profile Based Management ReplicationProfile

Procedure 11. Create a Storage Container for vVols and Define a Capability Profile from Storage Provider for VMware vCenter

Step 1. Log in to Storage Provider for VMware vCenter, from the Management pane select **Manage Storage Containers**, and then click **Create Storage Container**.



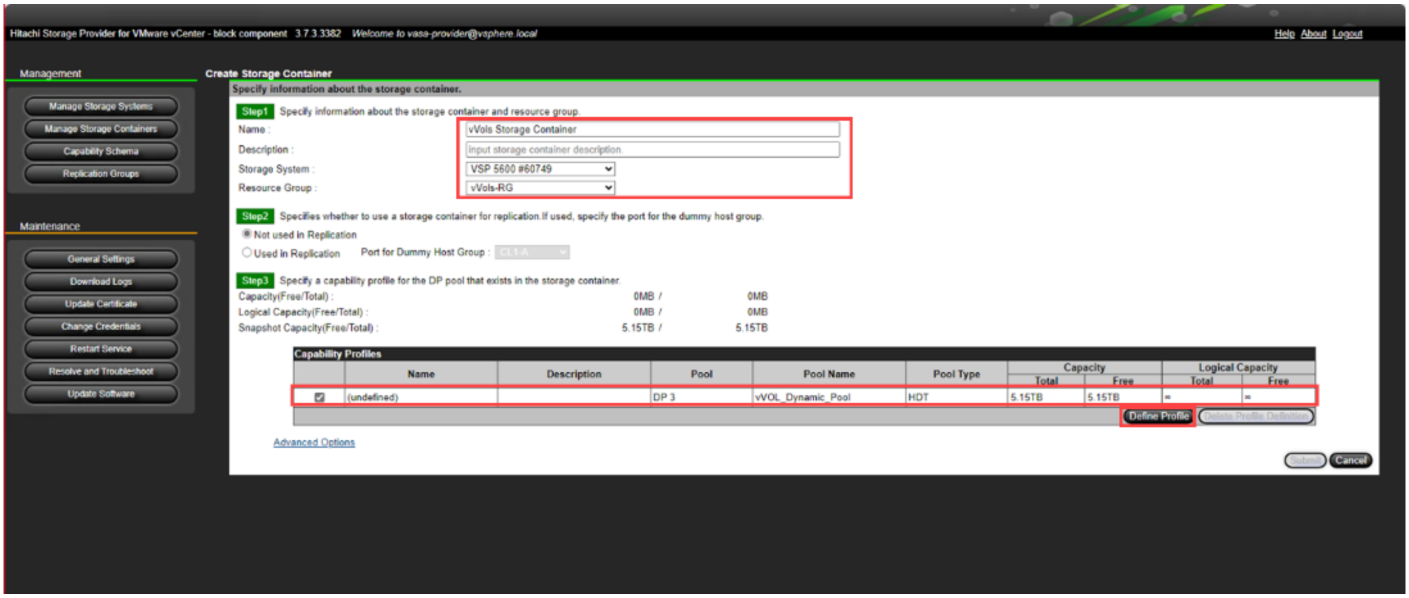
Step 2. Enter the following details:

a. Provide a **Name** for vVols **Storage Container.**

b. Select a Storage System.

c. Select the vVols Resource Group.

Step 3. Select the undefined Capability Profiles and click **Define Profile**.



Create Storage Container

Specify information about the storage container.

Step1 Specify information about the storage container and resource group.

Name : vVols Storage Container

Description : input storage container description.

Storage System : VSP 5600 #60749

Resource Group : vVols-RG

Step2 Specifies whether to use a storage container for replication.If used, specify the port for the dummy host group.

● Not used in Replication

○ Used in Replication Port for Dummy Host Group : CL1-A

Step3 Specify a capability profile for the DP pool that exists in the storage container.

Capacity(Free/Total) :	0MB /	0MB
Logical Capacity(Free/Total) :	0MB /	0MB
Snapshot Capacity(Free/Total) :	5.15TB /	5.15TB

Capability Profiles

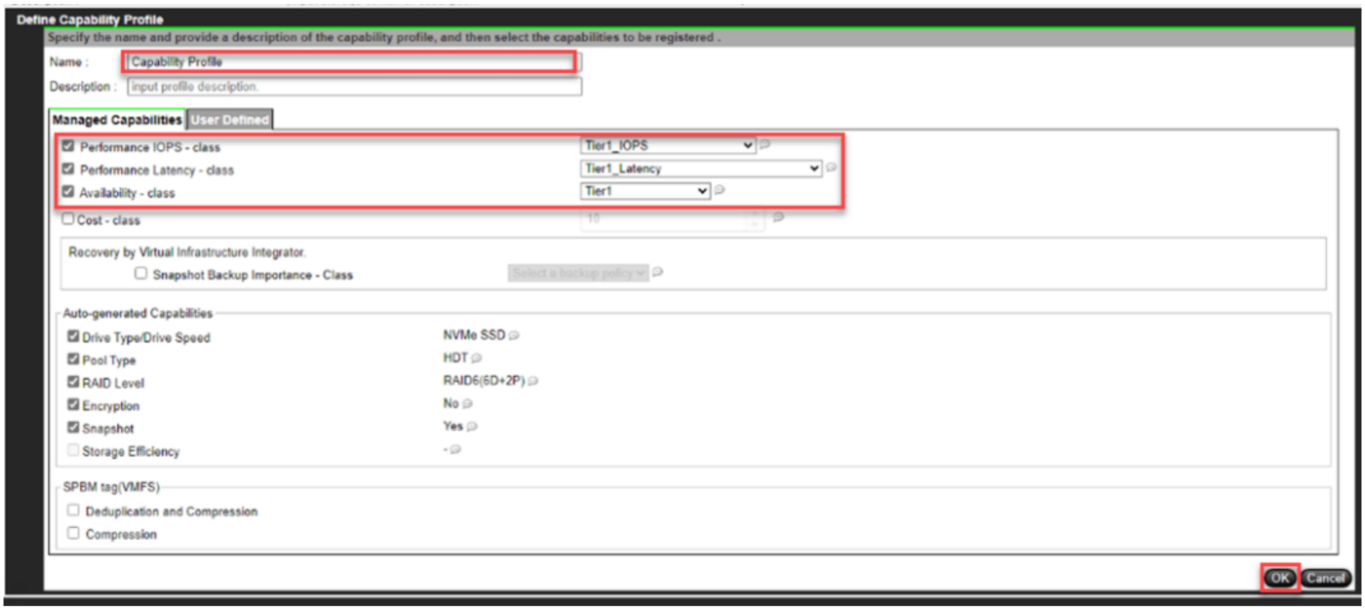
	Name	Description	Pool	Pool Name	Pool Type	Capacity		Logical Capacity	
						Total	Free	Total	Free
☑	(undefined)		DP 3	vVOL_Dynamic_Pool	HDT	5.15TB	5.15TB	∞	∞

Step 4. Select the parameters for **Managed Capabilities** based on your environment and click **OK.** In the context of this guide, the following capabilities were selected.

a. Performance IOPS - class - Tier1_IOPS

b. Performance Latency - class - Tier1_Latency

c. Availability - class - Tier1



Define Capability Profile

Specify the name and provide a description of the capability profile, and then select the capabilities to be registered .

Name : Capability Profile

Description : input profile description.

Managed Capabilities

☑ Performance IOPS - class Tier1_IOPS

☑ Performance Latency - class Tier1_Latency

☑ Availability - class Tier1

☐ Cost - class 10

Recovery by Virtual Infrastructure Integrator.

☐ Snapshot Backup Importance - Class Select a backup policy

Auto-generated Capabilities

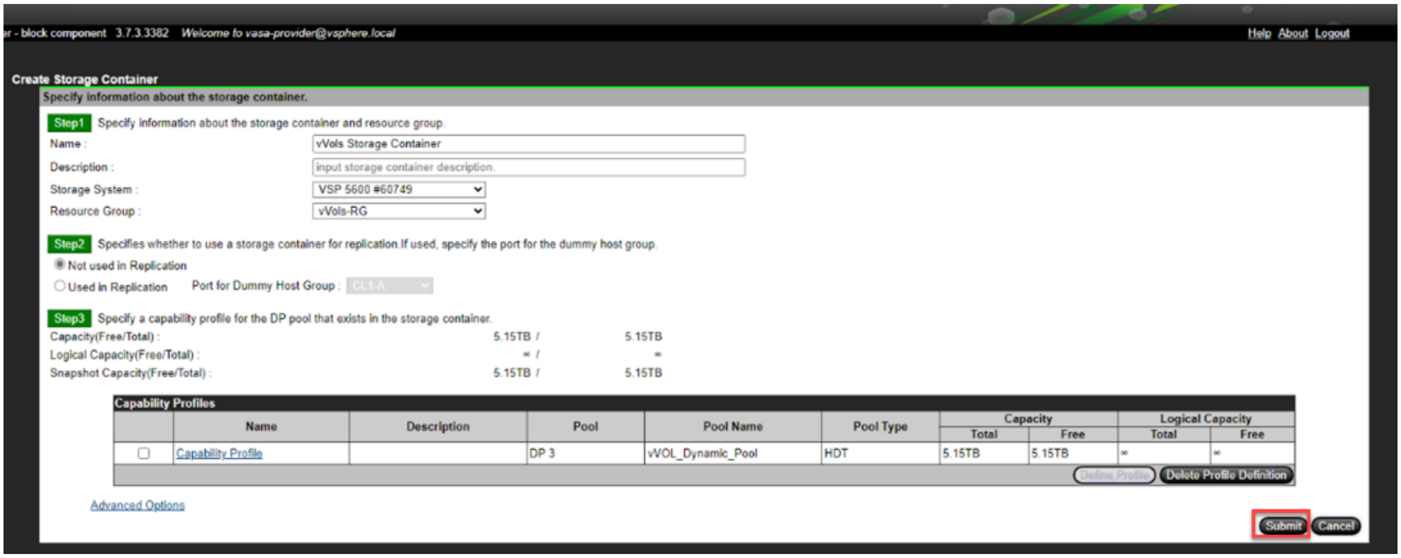
☑ Drive Type/Drive Speed	NVMe SSD
☑ Pool Type	HDT
☑ RAID Level	RAID6(6D+2P)
☑ Encryption	No
☑ Snapshot	Yes
☐ Storage Efficiency	-

SPBM tag(VMFS)

☐ Deduplication and Compression

☐ Compression

Step 5. Click **Submit.**


er - block component 3.7.3.3382 *Welcome to vasa-provider@vsphere.local*
Help About Logout

Create Storage Container

Specify information about the storage container.

Step1 Specify information about the storage container and resource group.

Name :	vVols Storage Container
Description :	input storage container description.
Storage System :	VSP 5600 #60749
Resource Group :	vVols-RG

Step2 Specifies whether to use a storage container for replication.If used, specify the port for the dummy host group.

● Not used in Replication

○ Used in Replication Port for Dummy Host Group : CL1-A

Step3 Specify a capability profile for the DP pool that exists in the storage container.

Capacity(Free/Total) :	5.15TB /	5.15TB
Logical Capacity(Free/Total) :	∞ /	∞
Snapshot Capacity(Free/Total) :	5.15TB /	5.15TB

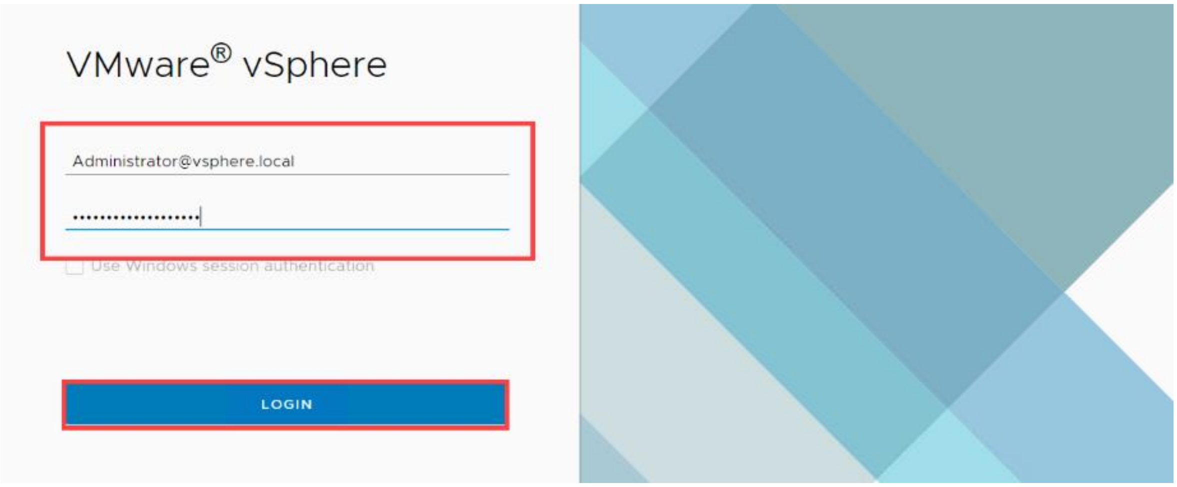
Capability Profiles

	Name	Description	Pool	Pool Name	Pool Type	Capacity		Logical Capacity	
						Total	Free	Total	Free
□	Capability Profile		DP 3	vVOL_Dynamic_Pool	HDT	5.15TB	5.15TB	∞	∞

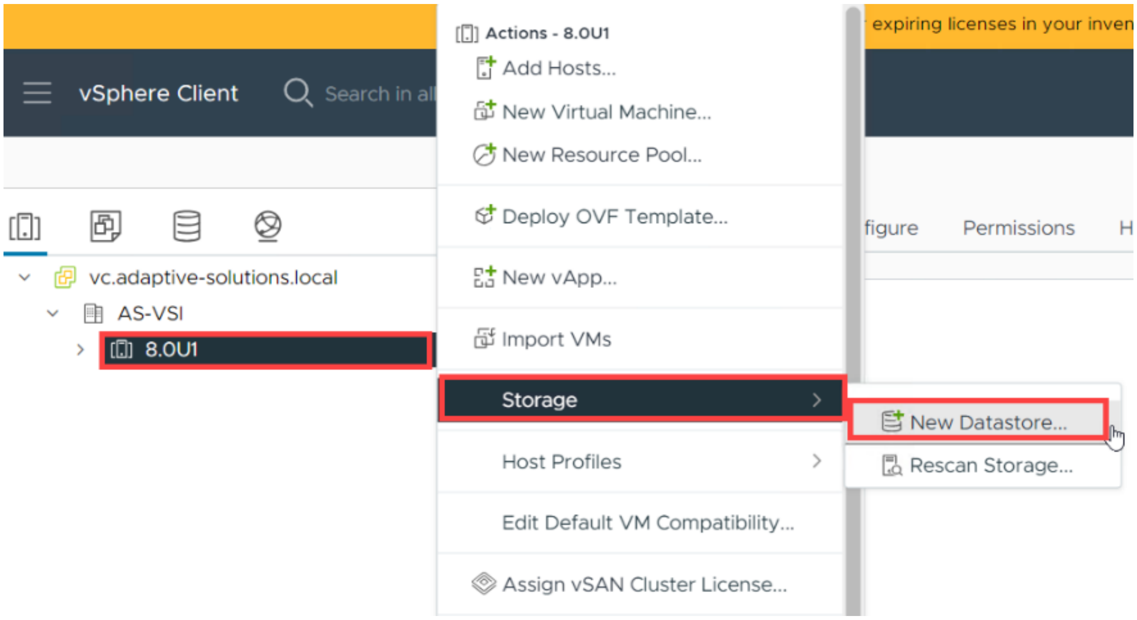
vVols Storage Configuration

Procedure 1. Deploy vVols Datastore

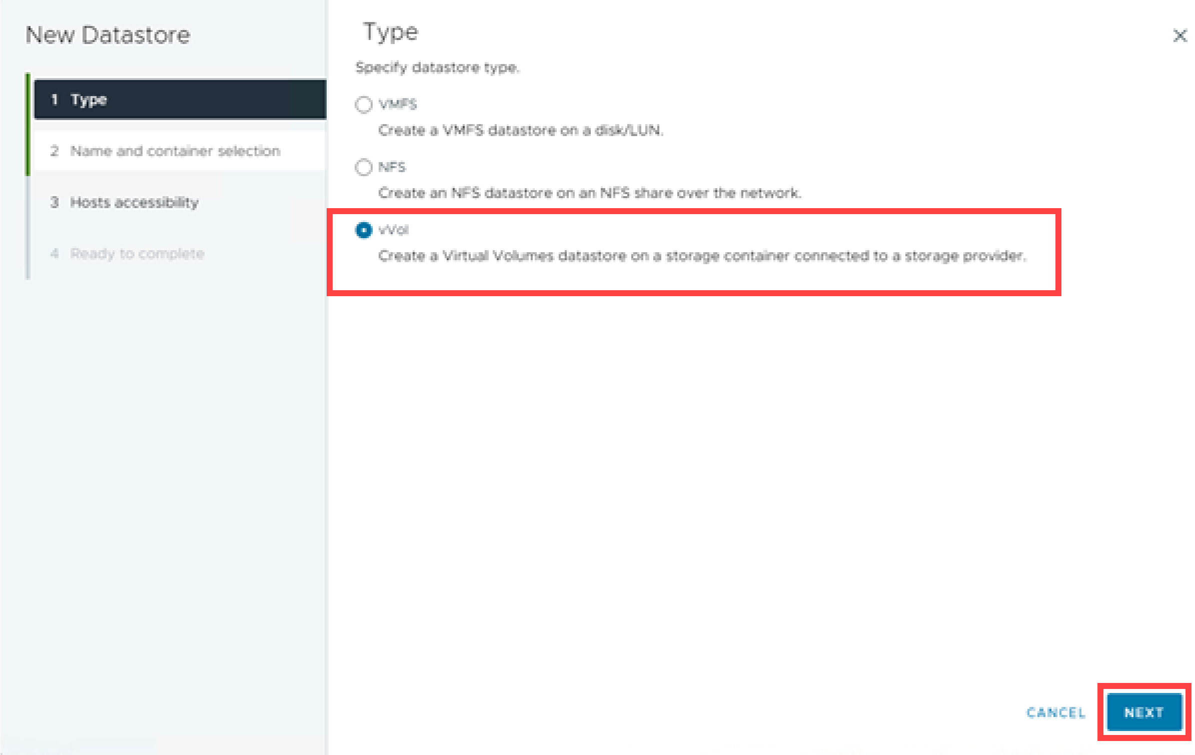
Step 1. Log in to **VMware vSphere** client.


VMware® vSphere
Administrator@vsphere.local
Use Windows session authentication
LOGIN

Step 2. Right-click the **Cluster**, select **Storage**, and then click **New Datastore.**



Step 3. In the **New Datastore** window, select **vVol** and click **Next.**



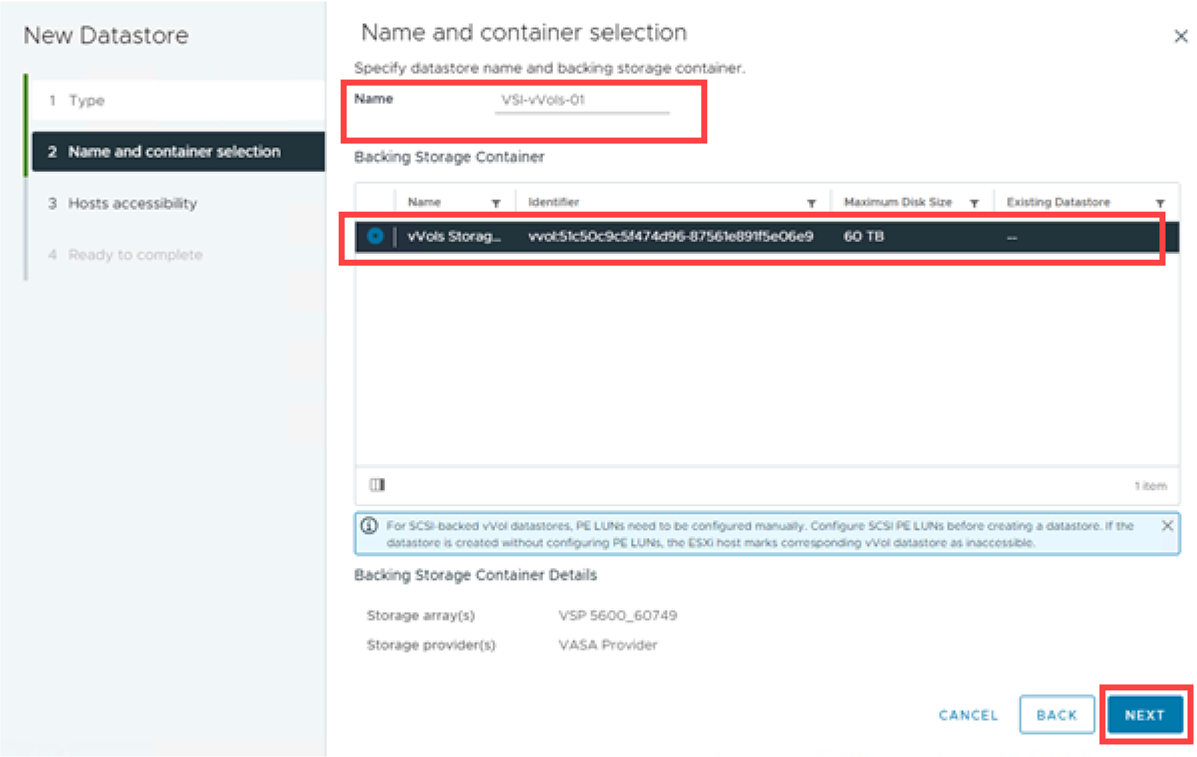
Specify datastore type.

○ VMFS
Create a VMFS datastore on a disk/LUN.

○ NFS
Create an NFS datastore on an NFS share over the network.

● vVol
Create a Virtual Volumes datastore on a storage container connected to a storage provider.

Step 4. Enter the **Name** for the datastore and select the **Storage Container**. Click **Next.**



Name and container selection

Specify datastore name and backing storage container.

Name VSI-vVols-01

Backing Storage Container

	Name	Identifier	Maximum Disk Size	Existing Datastore
●	vVols Storag...	vvol:51c50c9c5f474d96-87561e891f5e06e9	60 TB	--

1 item

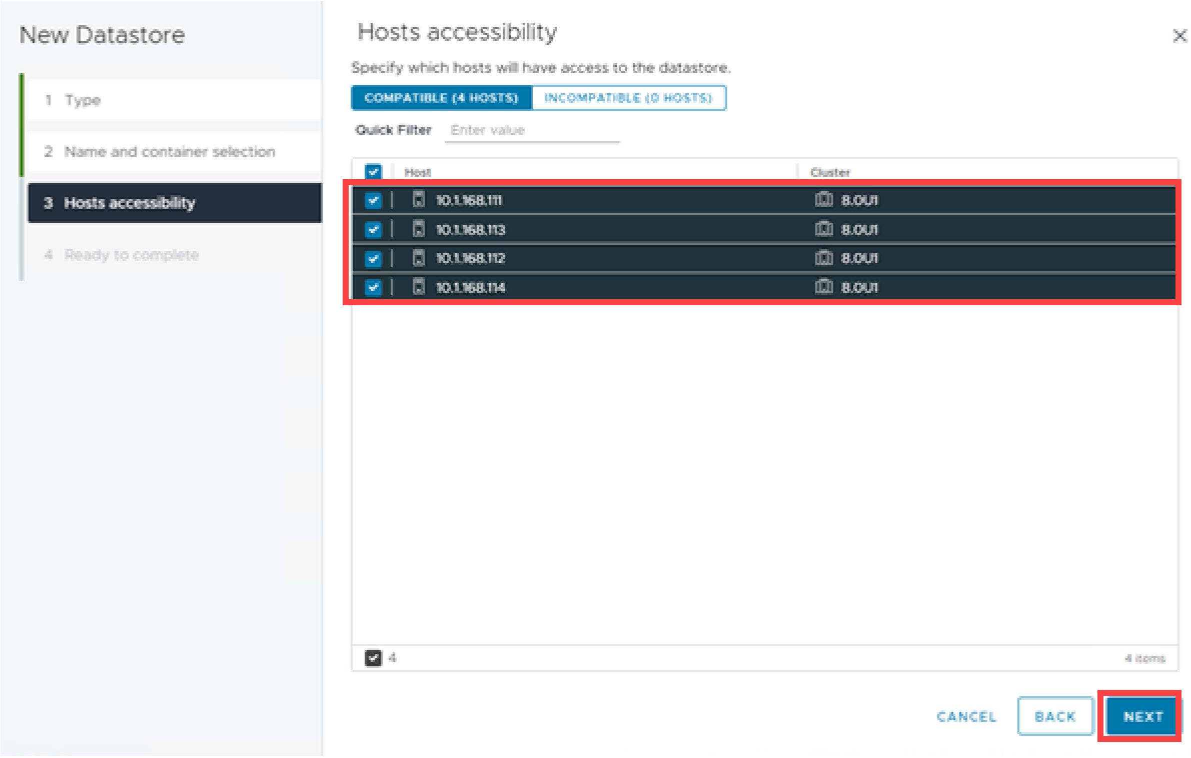
For SCSI-backed vVol datastores, PE LUNs need to be configured manually. Configure SCSI PE LUNs before creating a datastore. If the datastore is created without configuring PE LUNs, the ESXi host marks corresponding vVol datastore as inaccessible.

Backing Storage Container Details

Storage array(s) VSP 5600_60749

Storage provider(s) VASA Provider

Step 5. Select all the **Hosts** that will be included in the **vVols Datastore**. Click **Next.**



Hosts accessibility

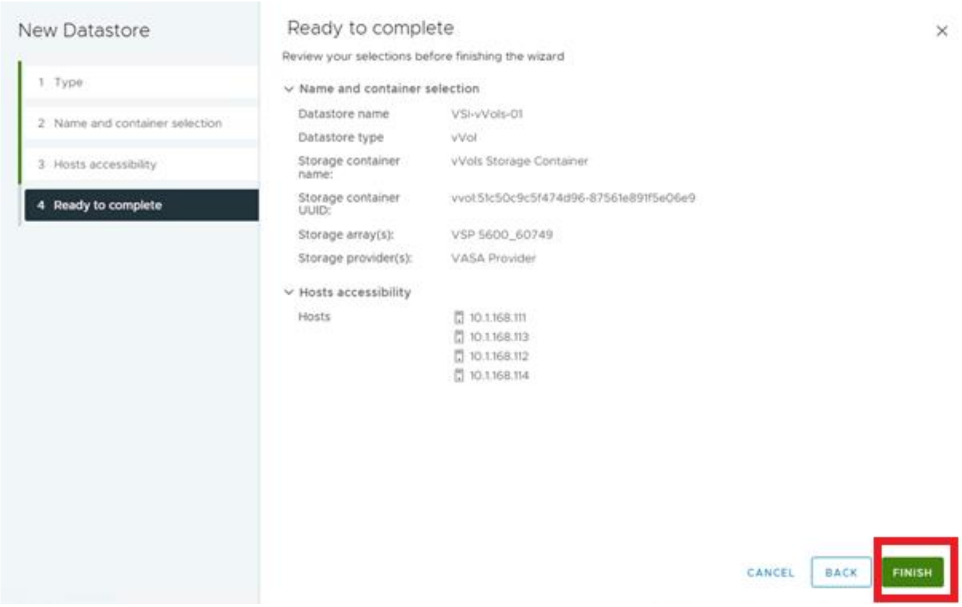
Specify which hosts will have access to the datastore.

Quick Filter Enter value

☑	Host	Cluster
☑	10.1.168.111	8.0U1
☑	10.1.168.113	8.0U1
☑	10.1.168.112	8.0U1
☑	10.1.168.114	8.0U1

☑ 4 4 items

Step 6. Click **Finish** to create a vVols Datastore.



Ready to complete

Review your selections before finishing the wizard

Name and container selection

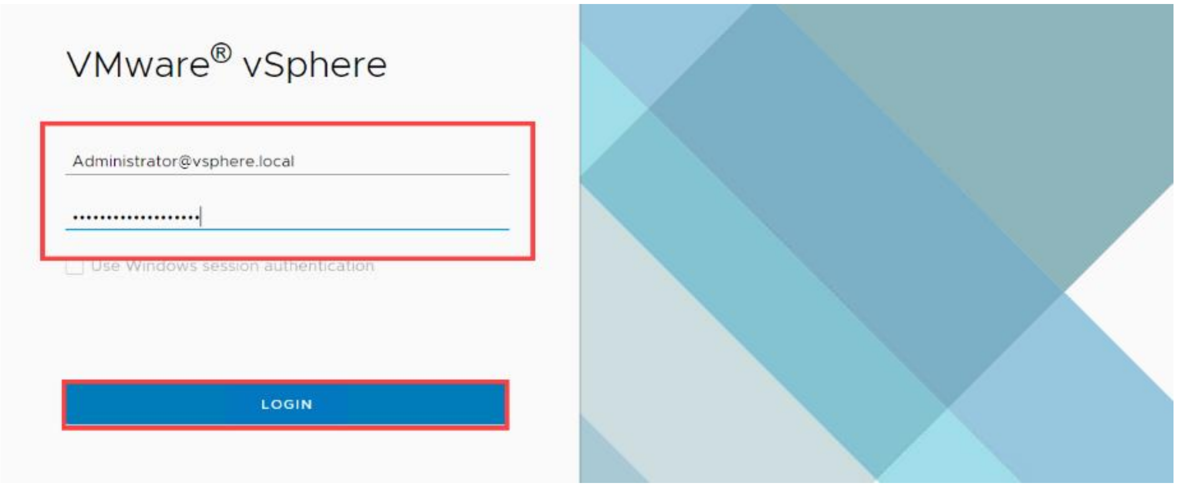
Datastore name	VSI-vVols-01
Datastore type	vVol
Storage container name:	vVols Storage Container
Storage container UUID:	vvol:51c50c9c5f474d96-87561e891f5e06e9
Storage array(s):	VSP 5600_60749
Storage provider(s):	VASA Provider

Hosts accessibility

Hosts	10.1.168.111 10.1.168.113 10.1.168.112 10.1.168.114

Procedure 2. Define a Virtual Machine Storage Profile

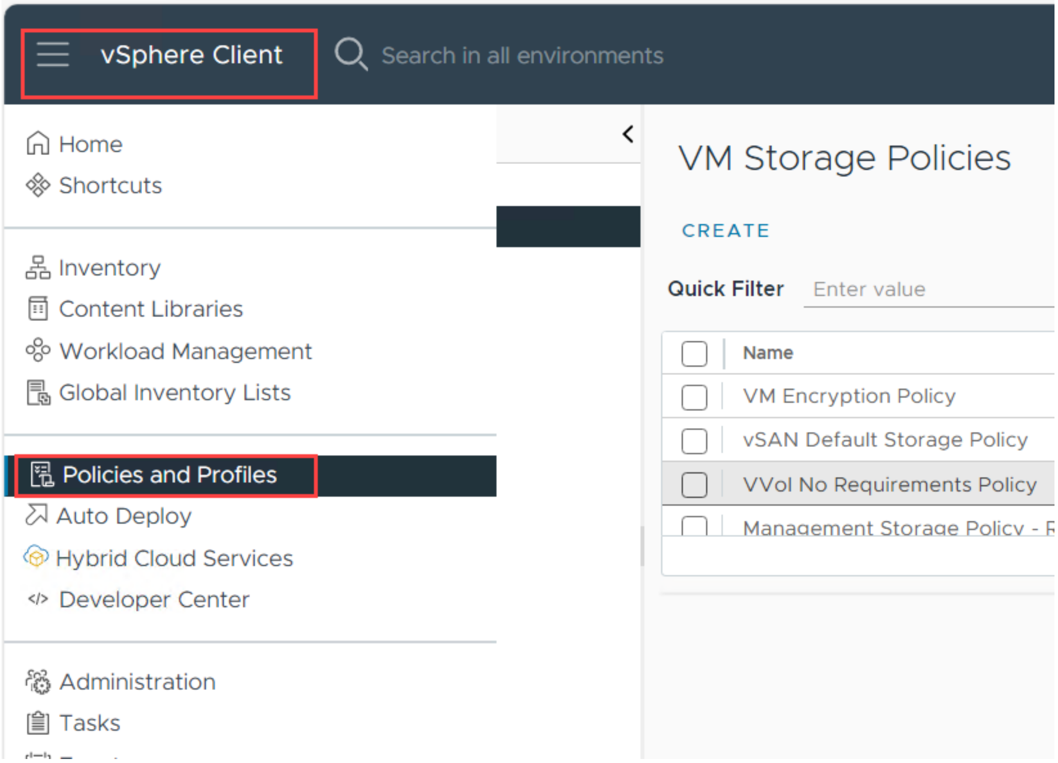
Step 1. Log in to **VMware vSphere** Client.



Administrator@vsphere.local

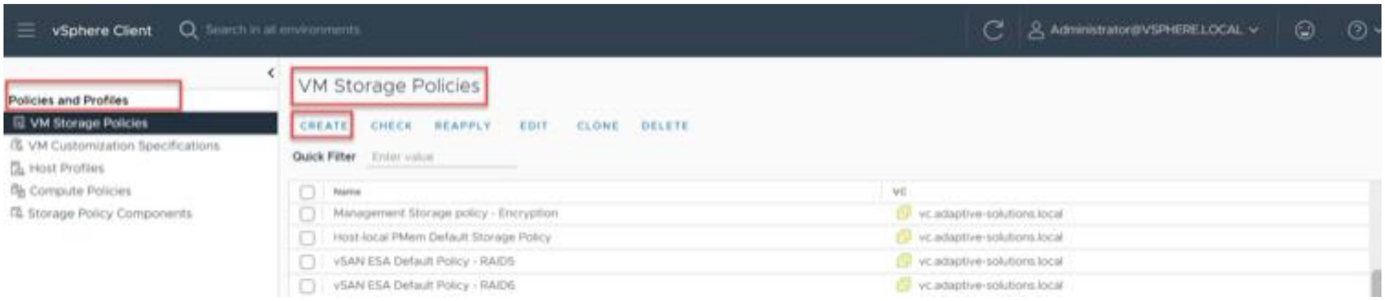
••••••••••••••••••••

Step 2. Navigate to Policies and Profiles under vSphere Client Home tab.



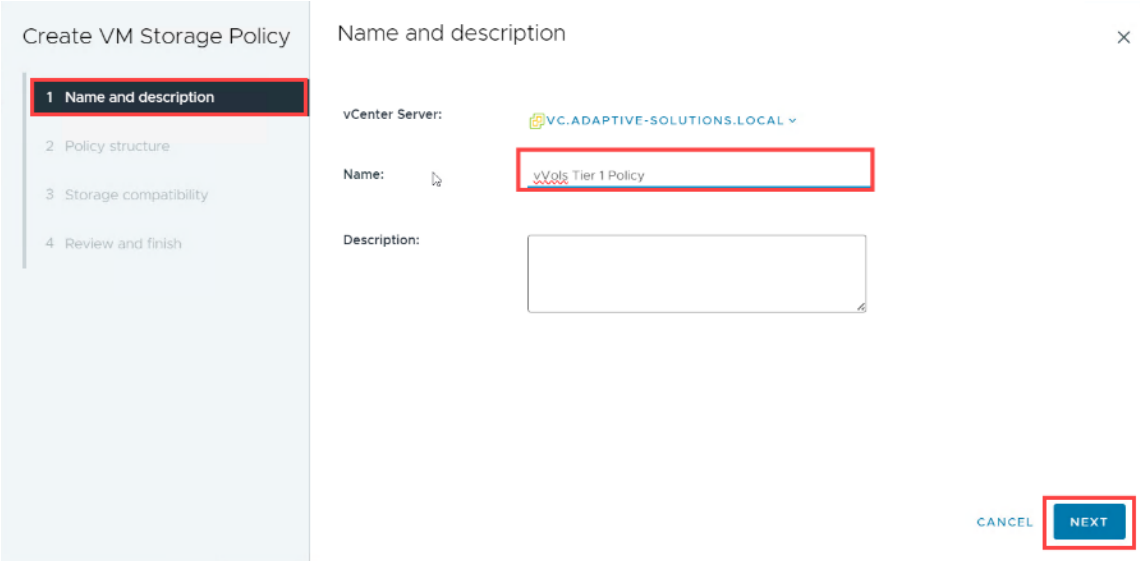
□	Name
□	VM Encryption Policy
□	vSAN Default Storage Policy
□	VVol No Requirements Policy
□	Management Storage Policy - R

Step 3. Select the VM storage Policies and click **Create**.



□	Name	VC
□	Management Storage policy - Encryption	vc.adaptive-solutions.local
□	Host-local PMem Default Storage Policy	vc.adaptive-solutions.local
□	vSAN ESA Default Policy - RAID5	vc.adaptive-solutions.local
□	vSAN ESA Default Policy - RAID6	vc.adaptive-solutions.local

Step 4. Enter the **Name** and click **Next.**



Create VM Storage Policy

1 Name and description

2 Policy structure

3 Storage compatibility

4 Review and finish

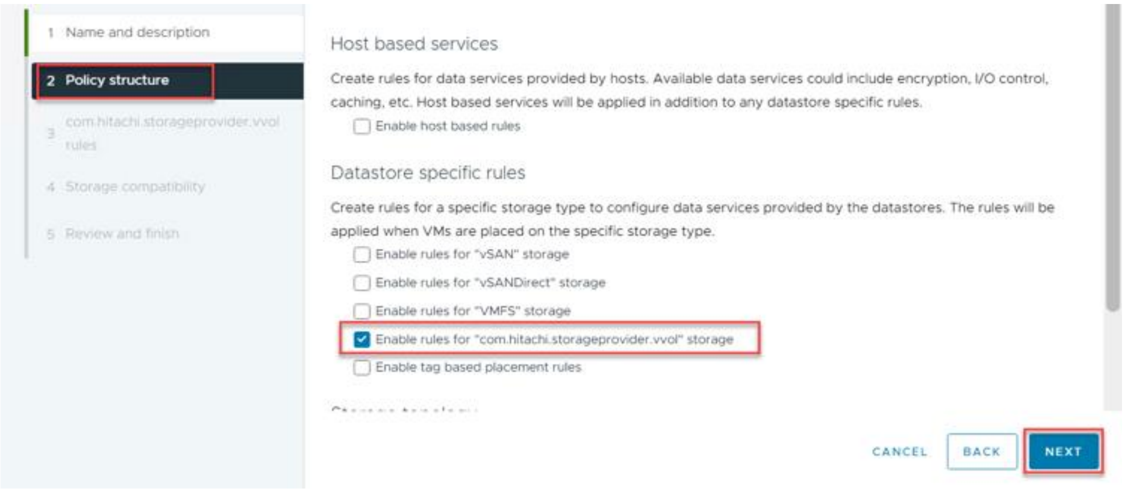
Name and description

vCenter Server: VC.ADAPTIVE-SOLUTIONS.LOCAL

Name: vVols Tier 1 Policy

Description:

Step 5. Select the **Datastore specific rules** for Hitachi Storage provider and click **Next.**



1 Name and description

2 Policy structure

3 com.hitachi.storageprovider.vvol rules

4 Storage compatibility

5 Review and finish

Host based services

Create rules for data services provided by hosts. Available data services could include encryption, I/O control, caching, etc. Host based services will be applied in addition to any datastore specific rules.

☐ Enable host based rules

Datastore specific rules

Create rules for a specific storage type to configure data services provided by the datastores. The rules will be applied when VMs are placed on the specific storage type.

☐ Enable rules for "vSAN" storage

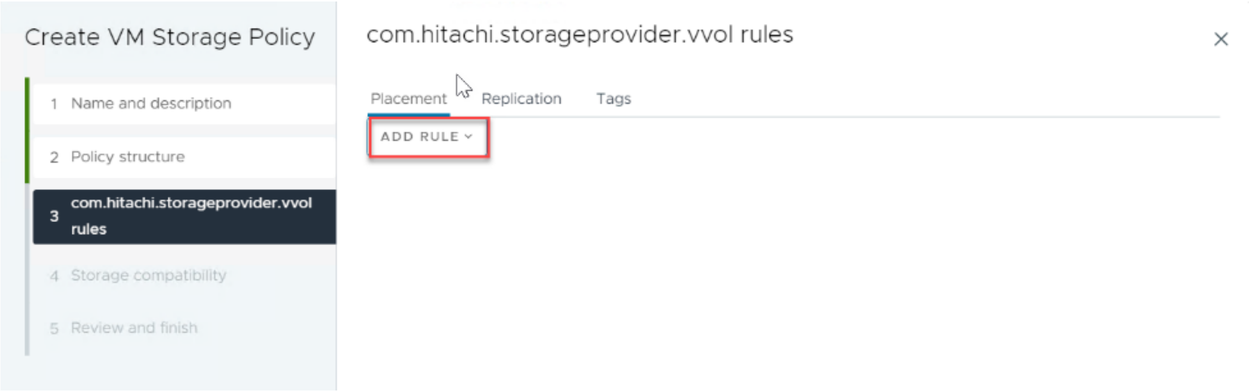
☐ Enable rules for "vSANDirect" storage

☐ Enable rules for "VMFS" storage

☑ Enable rules for "com.hitachi.storageprovider.vvol" storage

☐ Enable tag based placement rules

Step 6. Click **ADD RULE** for com.hitachi.storageprovider.vvol.



Create VM Storage Policy

1 Name and description

2 Policy structure

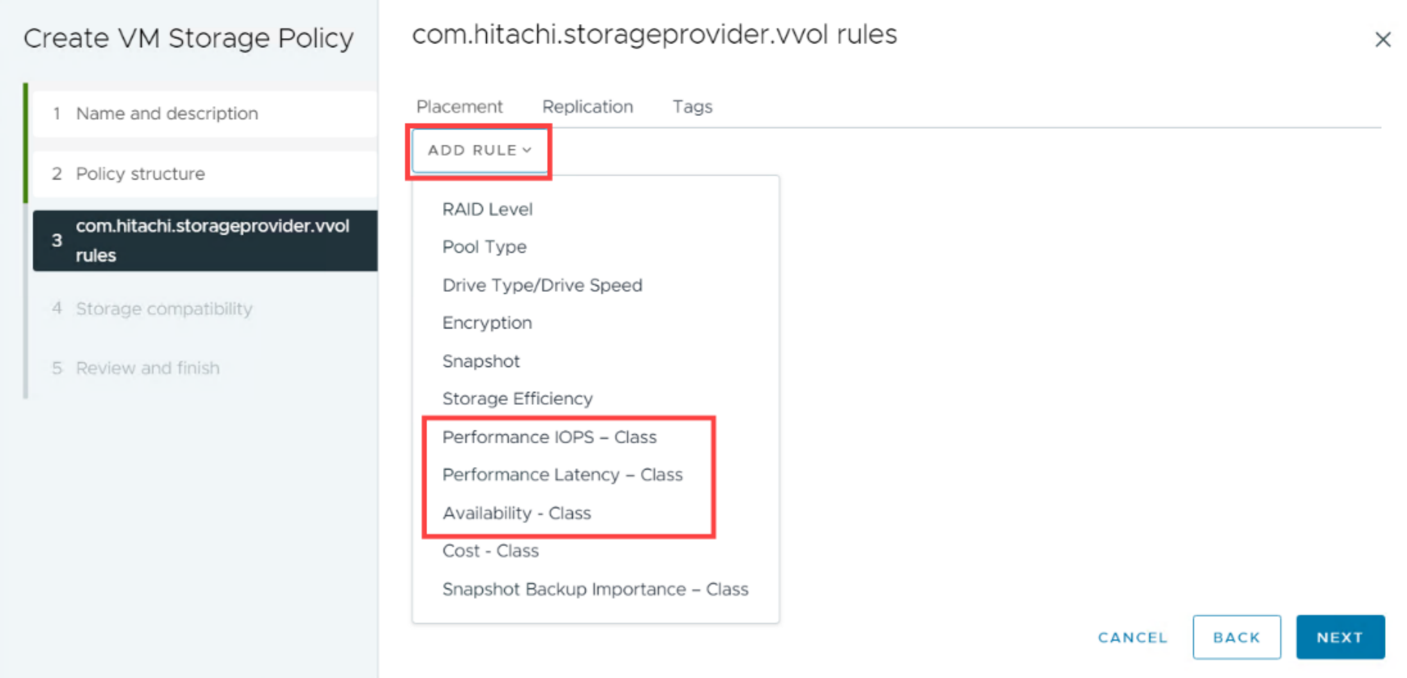
3 com.hitachi.storageprovider.vvol rules

4 Storage compatibility

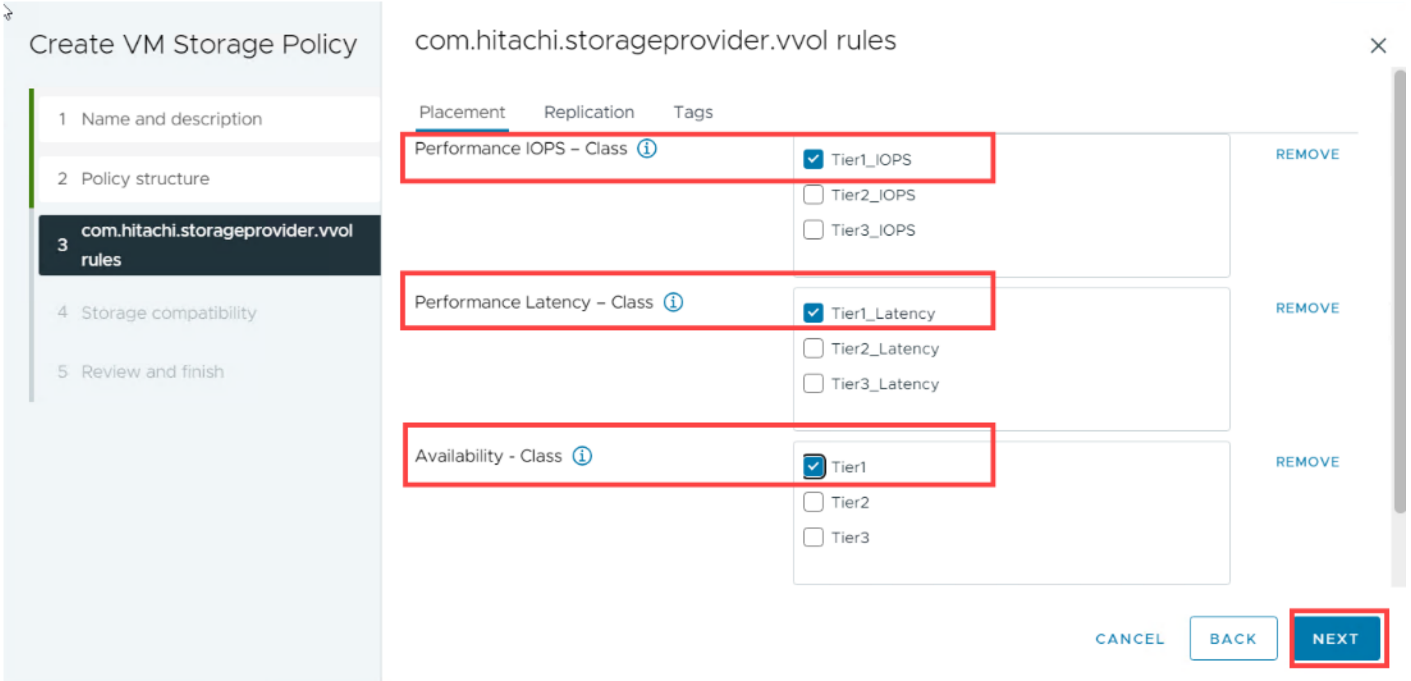
5 Review and finish

com.hitachi.storageprovider.vvol rules

Step 7. Add the capabilities profiles as shown below:



Step 8. Select the capabilities based on environment requirements. In the context of this document Tier1_IOPS, Tier1_Latency, and Tier1 Availability are selected. Click **Next.**

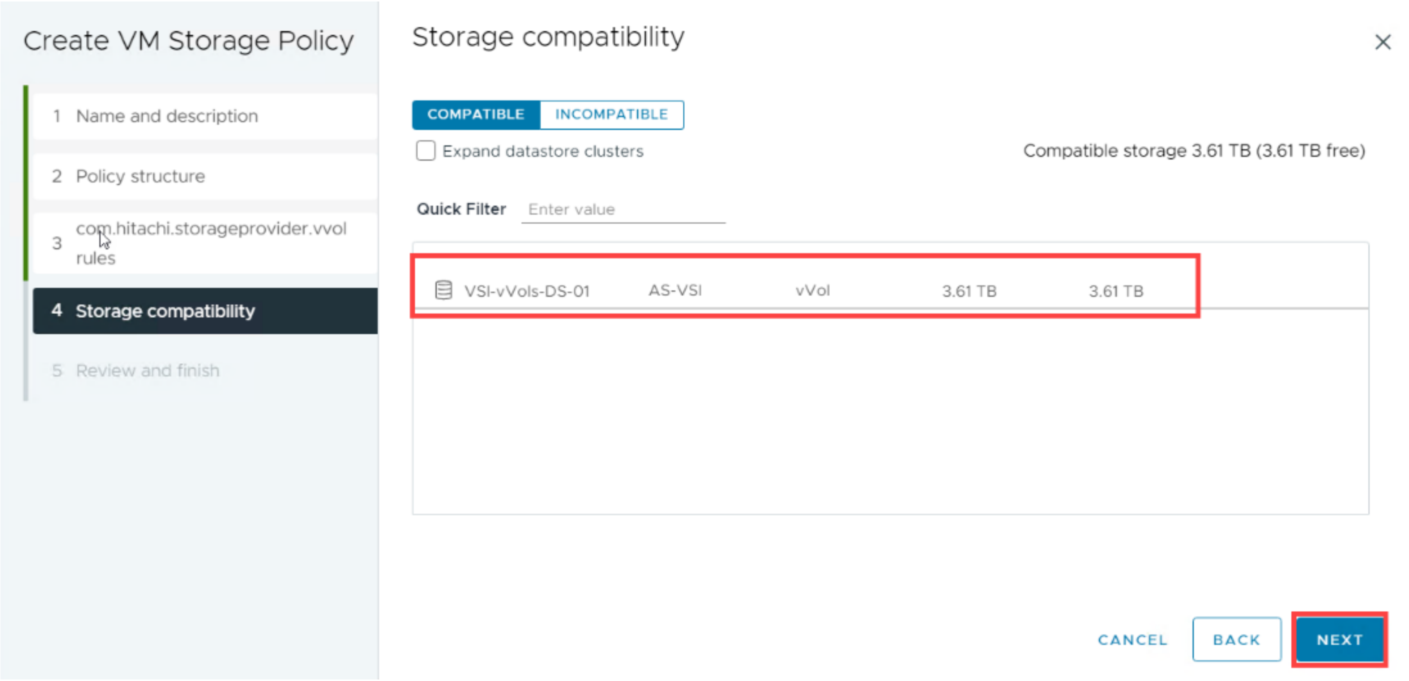


Performance IOPS – Class
☑ Tier1_IOPS
☐ Tier2_IOPS
☐ Tier3_IOPS

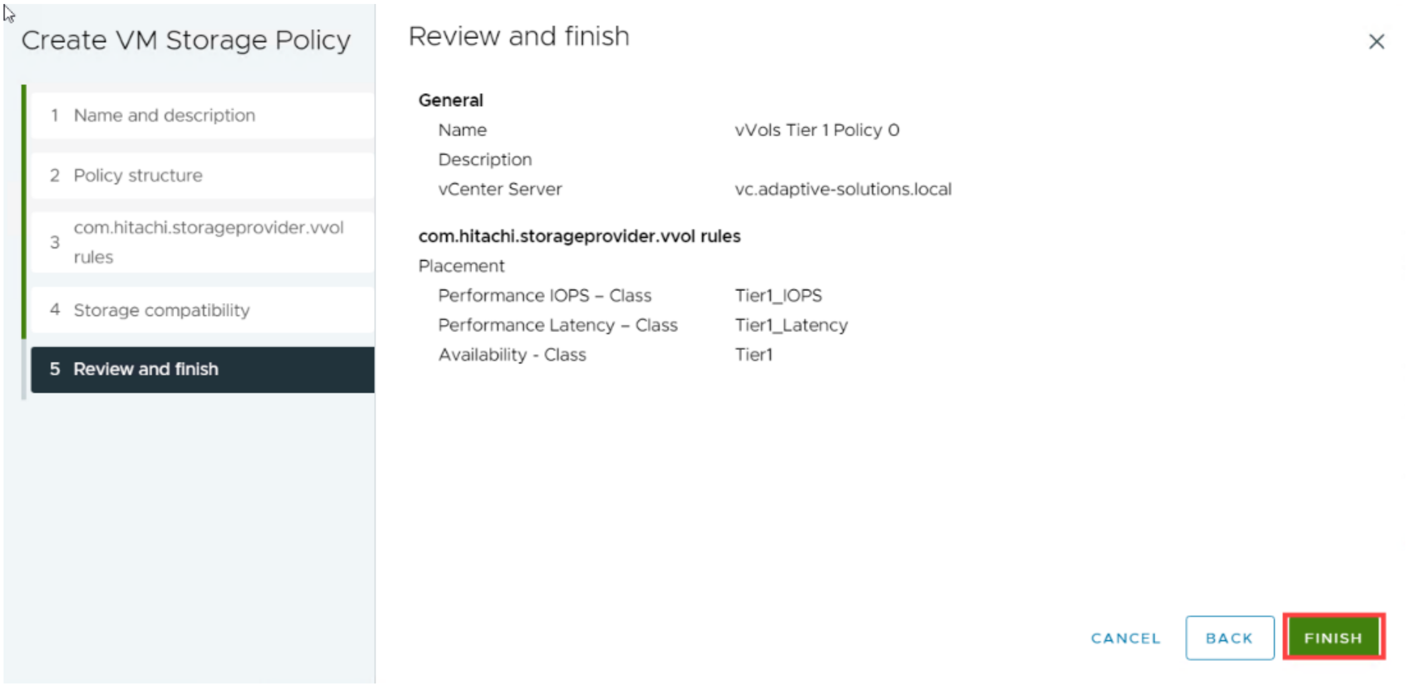
Performance Latency – Class
☑ Tier1_Latency
☐ Tier2_Latency
☐ Tier3_Latency

Availability - Class
☑ Tier1
☐ Tier2
☐ Tier3

Step 9. Select the compatible datastore. Click **Next.**



Step 10. Click **Finish.**



General

Name	vVols Tier 1 Policy 0
Description	
vCenter Server	vc.adaptive-solutions.local

com.hitachi.storageprovider.vvol rules

Placement

Performance IOPS – Class	Tier1_IOPS
Performance Latency – Class	Tier1_Latency
Availability - Class	Tier1

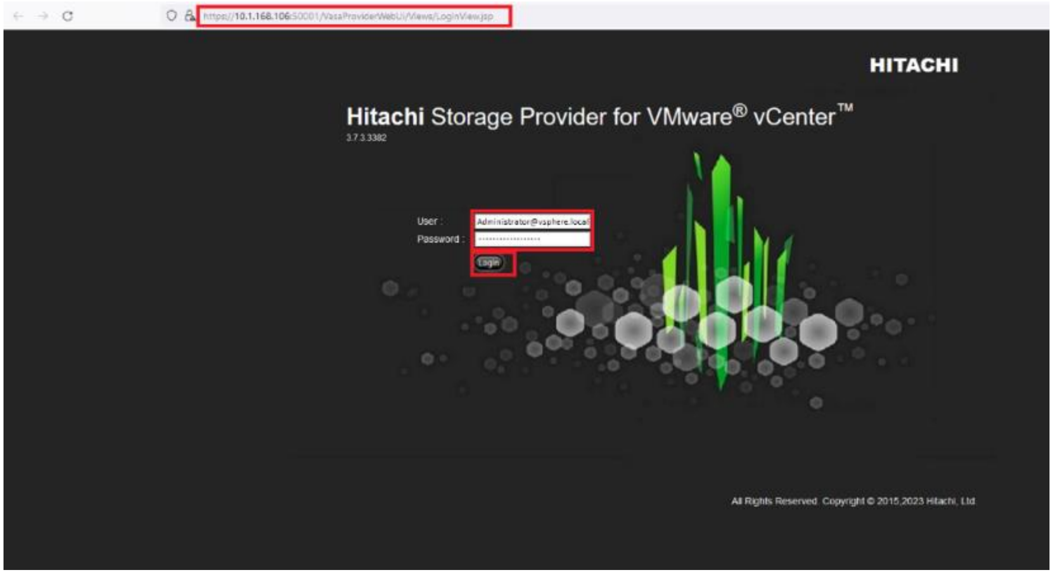
Storage Policy Based Management (SPBM) for VMFS LDEVs

Procedure 1. Storage Policy Based Management (SPBM) for VMFS LDEVs from Storage Provider for VMware vCenter

SPBM provides capabilities of applicable storage resources to VMware vCenter.

From the Hitachi Storage Provider for VMware vCenter, you define an LDEV profile to pass storage characteristics to VMware vCenter, such as IOPS, Latency, Availability, Drive RPM, and even storage location. To create an LDEV profile from Hitachi Storage Provider, follow these steps:

Step 1. Log in to **Hitachi Storage Provider**.



https://10.1.168.106:50001/VasaProviderWebUI/Views/LoginView.jsp

Hitachi Storage Provider for VMware® vCenter™

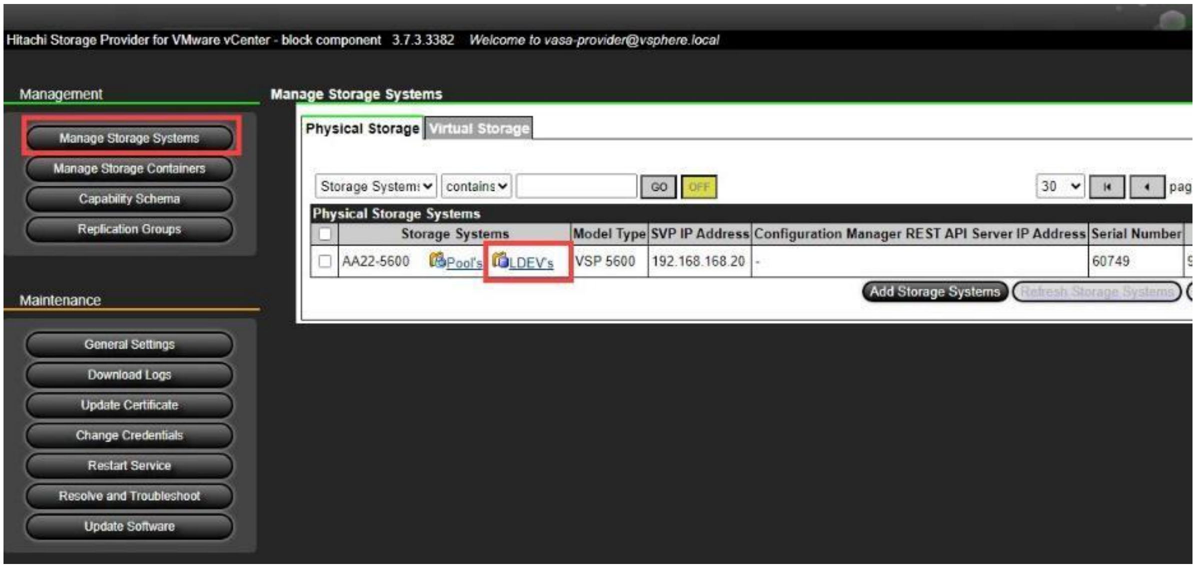
3.7.3.3382

User : Administrator@vsphere.local

Password : ••••••••••••••••••

All Rights Reserved. Copyright © 2015,2023 Hitachi, Ltd.

Step 2. Select **Manage Storage Systems**. Click **LDEVs**.

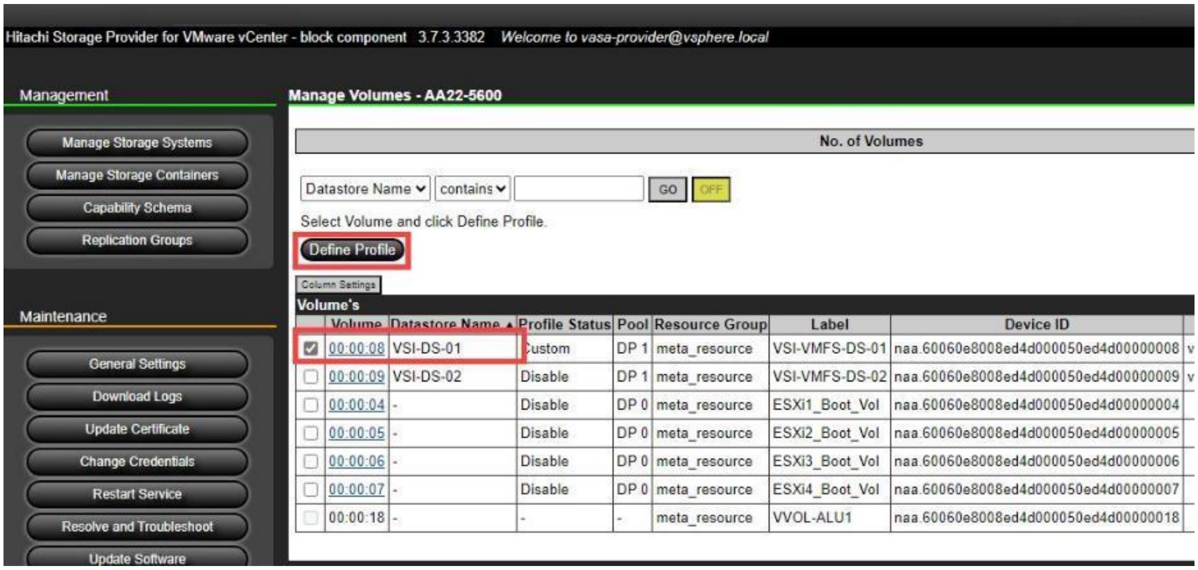


Hitachi Storage Provider for VMware vCenter - block component 3.7.3.3382 *Welcome to vasa-provider@vsphere.local*

Physical Storage Systems

□	Storage Systems			Model Type	SVP IP Address	Configuration Manager REST API Server IP Address	Serial Number
□	AA22-5600	Pool's	LDEV's	VSP 5600	192.168.168.20	-	60749

Step 3. Select the VMFS LDEV to provide capabilities for and click **Define Profile**.



Hitachi Storage Provider for VMware vCenter - block component 3.7.3.3382 *Welcome to vasa-provider@vsphere.local*

Manage Volumes - AA22-5600

No. of Volumes

Datastore Name contains GO OFF

Select Volume and click Define Profile.

Volume's

	Volume	Datastore Name ▲	Profile Status	Pool	Resource Group	Label	Device ID
☑	00:00:08	VSI-DS-01	Custom	DP 1	meta_resource	VSI-VMFS-DS-01	naa.60060e8008ed4d000050ed4d00000008
☐	00:00:09	VSI-DS-02	Disable	DP 1	meta_resource	VSI-VMFS-DS-02	naa.60060e8008ed4d000050ed4d00000009
☐	00:00:04	-	Disable	DP 0	meta_resource	ESXi1_Boot_Vol	naa.60060e8008ed4d000050ed4d00000004
☐	00:00:05	-	Disable	DP 0	meta_resource	ESXi2_Boot_Vol	naa.60060e8008ed4d000050ed4d00000005
☐	00:00:06	-	Disable	DP 0	meta_resource	ESXi3_Boot_Vol	naa.60060e8008ed4d000050ed4d00000006
☐	00:00:07	-	Disable	DP 0	meta_resource	ESXi4_Boot_Vol	naa.60060e8008ed4d000050ed4d00000007
☐	00:00:18	-	-	-	meta_resource	VVOL-ALU1	naa.60060e8008ed4d000050ed4d00000018

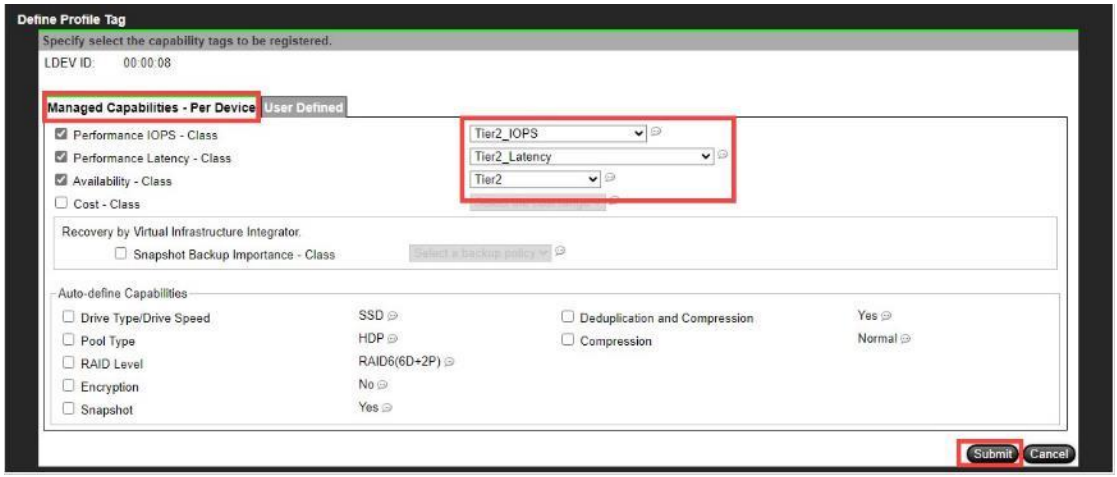
Step 4. Select the parameters for **Managed Capabilities** based on your environment and click **OK.** In the context of this guide the following capabilities were selected.

a. Performance IOPS – Class – Tier2_IOPS

b. Performance Latency – Class – Tier2_Latency

c. Availability – Class – Tier2

Step 5. Click **Submit**.



Define Profile Tag

Specify select the capability tags to be registered.

LDEV ID: 00:00:08

☑ Performance IOPS - Class: Tier2_IOPS

☑ Performance Latency - Class: Tier2_Latency

☑ Availability - Class: Tier2

☐ Cost - Class

Recovery by Virtual Infrastructure Integrator.

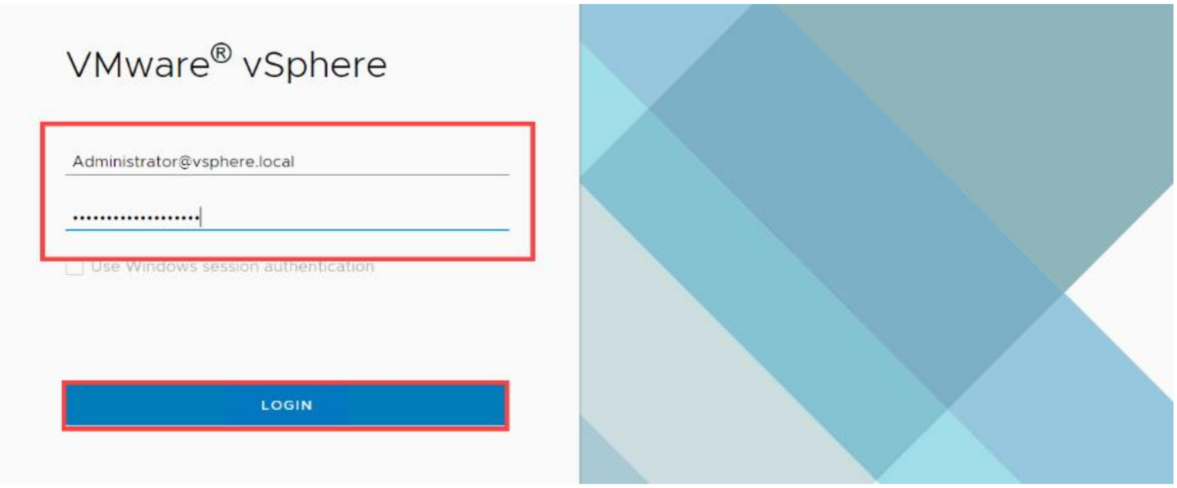
☐ Snapshot Backup Importance - Class: Select a backup policy

Auto-define Capabilities

☐ Drive Type/Drive Speed	SSD	☐ Deduplication and Compression	Yes
☐ Pool Type	HDP	☐ Compression	Normal
☐ RAID Level	RAID6(6D+2P)		
☐ Encryption	No		
☐ Snapshot	Yes		

Procedure 2. Show VMFS Datastore with SPBM tags

Step 1. Log in to **VMware vSphere** Client.

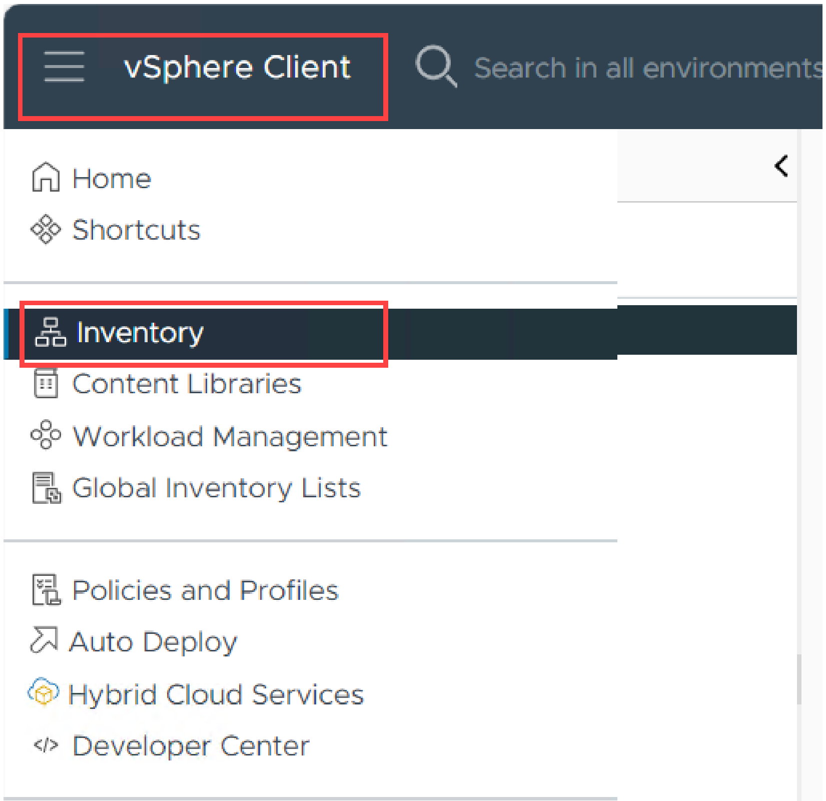


Administrator@vsphere.local

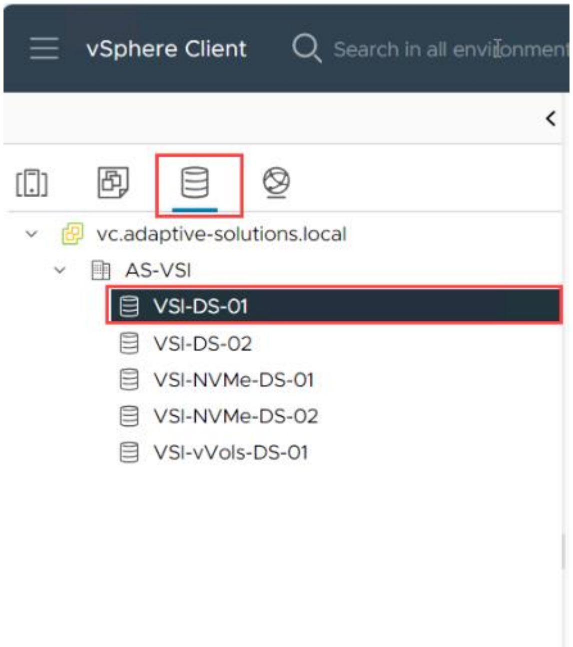
•••••••••••••••••••

□ Use Windows session authentication

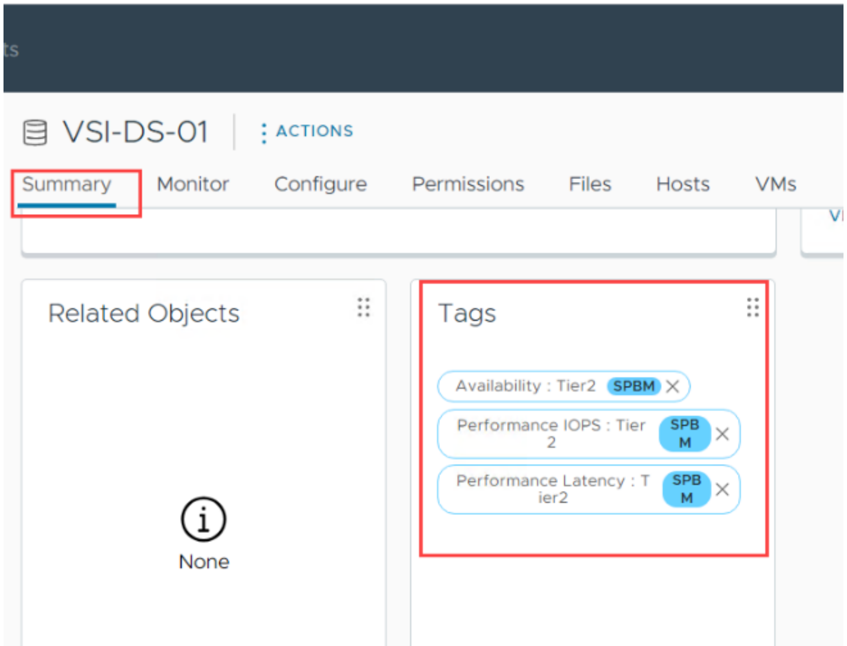
Step 2. From vCenter, navigate to **Inventory**.



Step 3. Navigate to the **Datastore** section and select the **VMFS Datastore.**



Step 4. After you have selected the **Datastore**, click **Summary** and view **Storage Capabilities** in the **Tags** pane.


VSI-DS-01
ACTIONS
Summary
Monitor
Configure
Permissions
Files
Hosts
VMs
Related Objects
None
Tags
Availability : Tier2 SPBM
Performance IOPS : Tier 2 SPBM
Performance Latency : Tier2 SPBM

Host Image and vSphere Configuration Profiles

Procedure 1. Image Remediation

Step 1. From the **Cluster** view, select **Updates** > **Hosts** > **Image**, and select the first added host, and from **ACTIONS**, select **Run pre-check**.

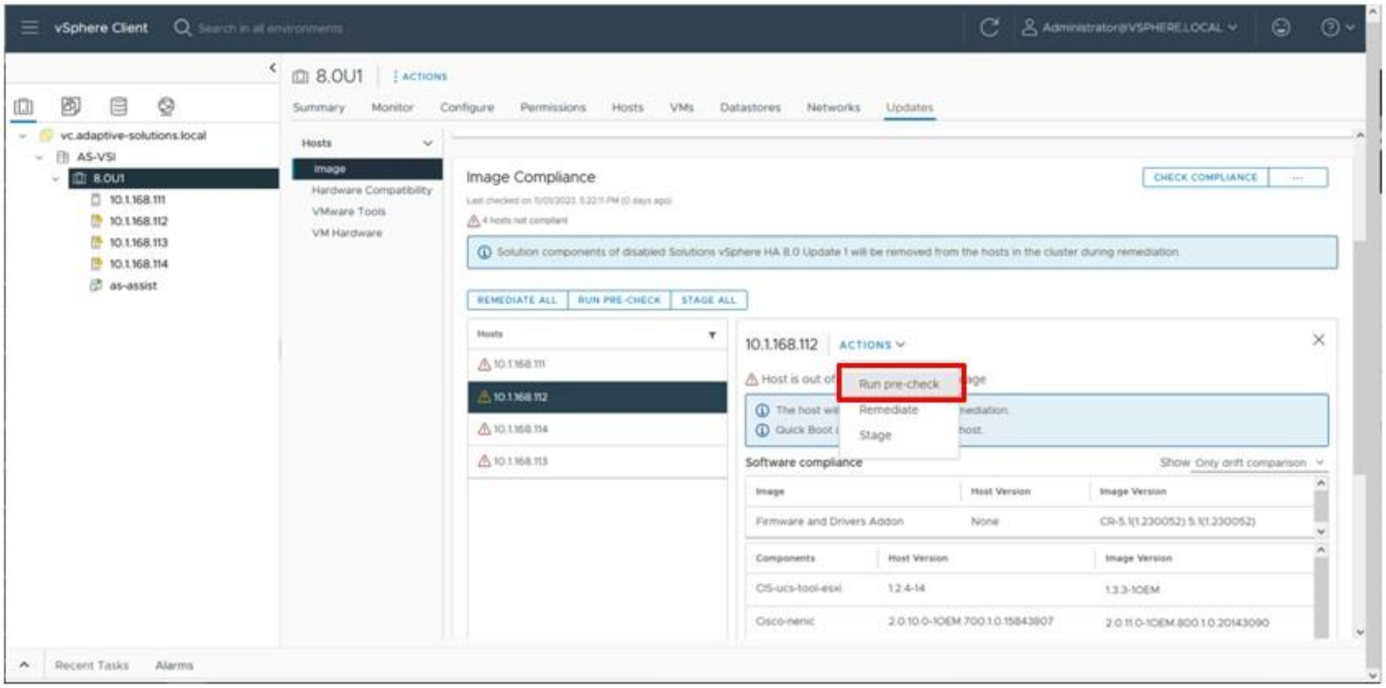


Image Compliance

Last checked on 11/01/2023, 5:22:11 PM (0 days ago)

4 hosts not compliant

Solution components of disabled Solutions vSphere HA 8.0 Update 1 will be removed from the hosts in the cluster during remediation.

Hosts
10.1.168.111
10.1.168.112
10.1.168.114
10.1.168.113

10.1.168.112

Host is out of ... age

The host wil ... mediation.

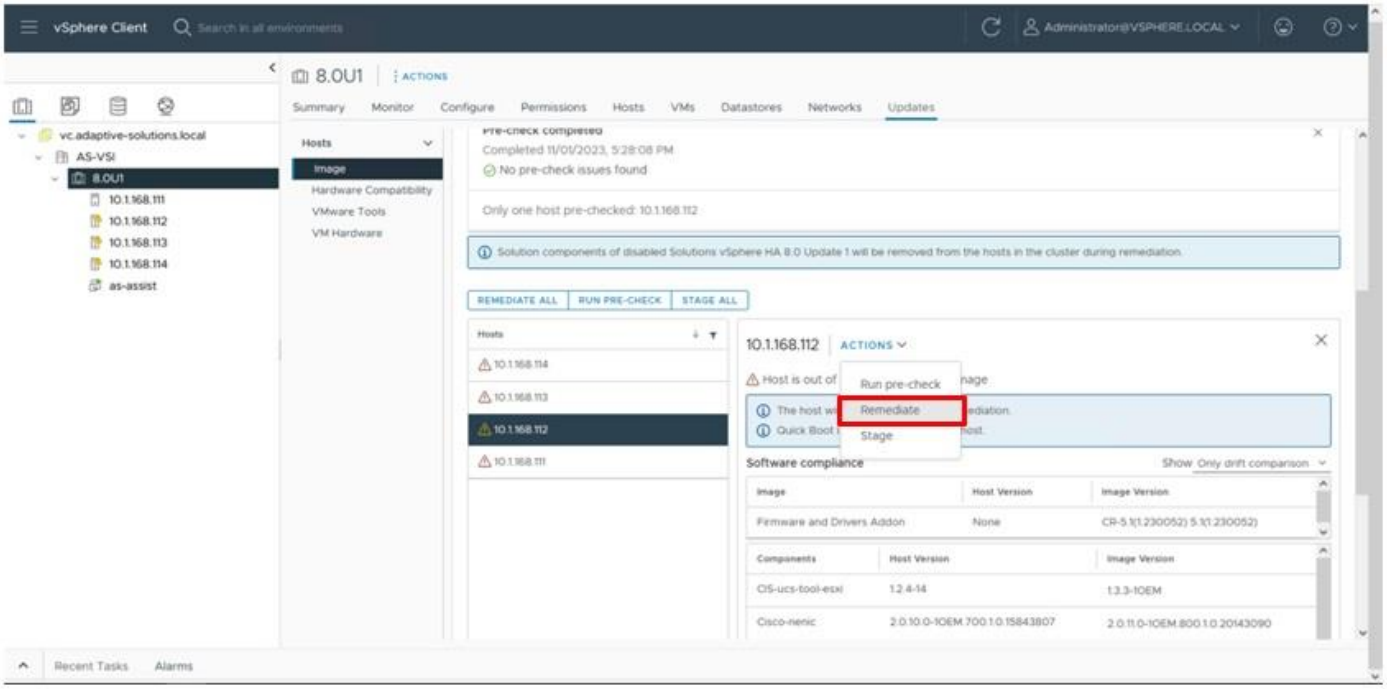
Quick Boot ... host.

Software compliance

Image	Host Version	Image Version
Firmware and Drivers Addon	None	CR-5.1(1.230052) 5.1(1.230052)

Components	Host Version	Image Version
CIS-ucs-tool-esxi	1.2.4-14	1.3.3-1OEM
Cisco-nenic	2.0.10.0-1OEM.700.1.0.15843807	2.0.11.0-1OEM.800.1.0.20143090

Step 2. With the pre-check run, re-select the added host and select **Remediate** from the ACTIONS menu.



Pre-check completed

Completed 11/01/2023, 5:28:08 PM

No pre-check issues found

Only one host pre-checked: 10.1.168.112

Solution components of disabled Solutions vSphere HA 8.0 Update 1 will be removed from the hosts in the cluster during remediation.

Hosts
10.1.168.114
10.1.168.113
10.1.168.112
10.1.168.111

10.1.168.112

Host is out of ... nage

The host wi ... ediation.

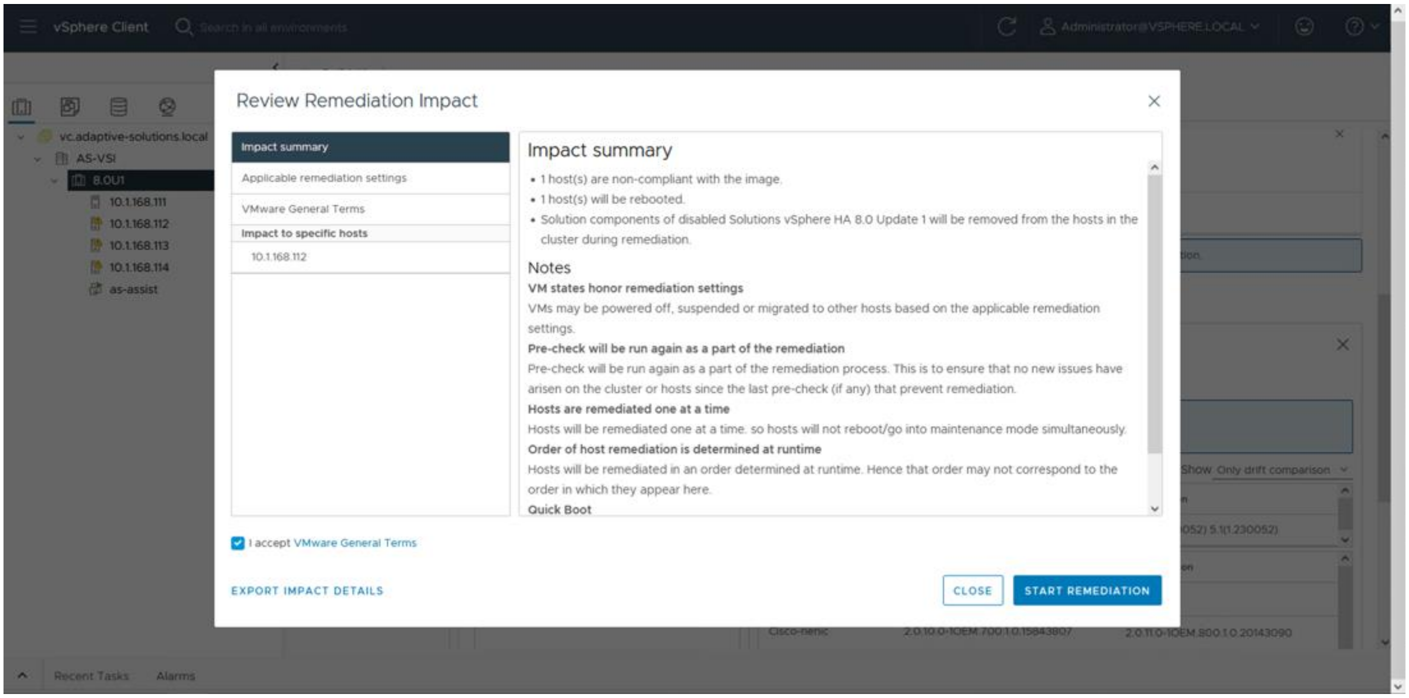
Quick Boot ... host.

Software compliance

Image	Host Version	Image Version
Firmware and Drivers Addon	None	CR-5.1(1.230052) 5.1(1.230052)

Components	Host Version	Image Version
CIS-ucs-tool-esxi	1.2.4-14	1.3.3-1OEM
Cisco-nenic	2.0.10.0-1OEM.700.1.0.15843807	2.0.11.0-1OEM.800.1.0.20143090

Step 3. Within the pop-up, click **START REMEDIATION**.



Review Remediation Impact

Impact summary

- 1 host(s) are non-compliant with the image.
- 1 host(s) will be rebooted.
- Solution components of disabled Solutions vSphere HA 8.0 Update 1 will be removed from the hosts in the cluster during remediation.

Notes

VM states honor remediation settings

VMs may be powered off, suspended or migrated to other hosts based on the applicable remediation settings.

Pre-check will be run again as a part of the remediation

Pre-check will be run again as a part of the remediation process. This is to ensure that no new issues have arisen on the cluster or hosts since the last pre-check (if any) that prevent remediation.

Hosts are remediated one at a time

Hosts will be remediated one at a time. so hosts will not reboot/go into maintenance mode simultaneously.

Order of host remediation is determined at runtime

Hosts will be remediated in an order determined at runtime. Hence that order may not correspond to the order in which they appear here.

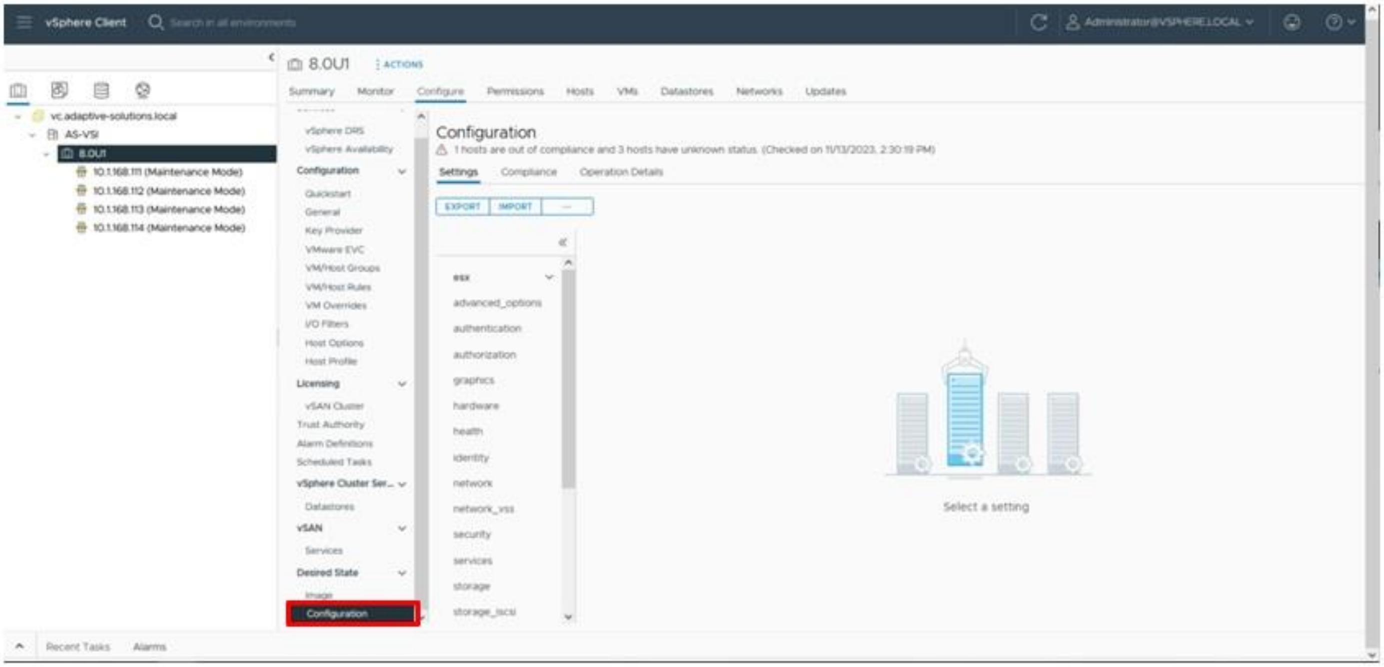
Quick Boot

☑ I accept VMware General Terms

Step 4. Repeat steps 1 – 3 for each of the remaining hosts.

Procedure 2. Create Reference Configuration

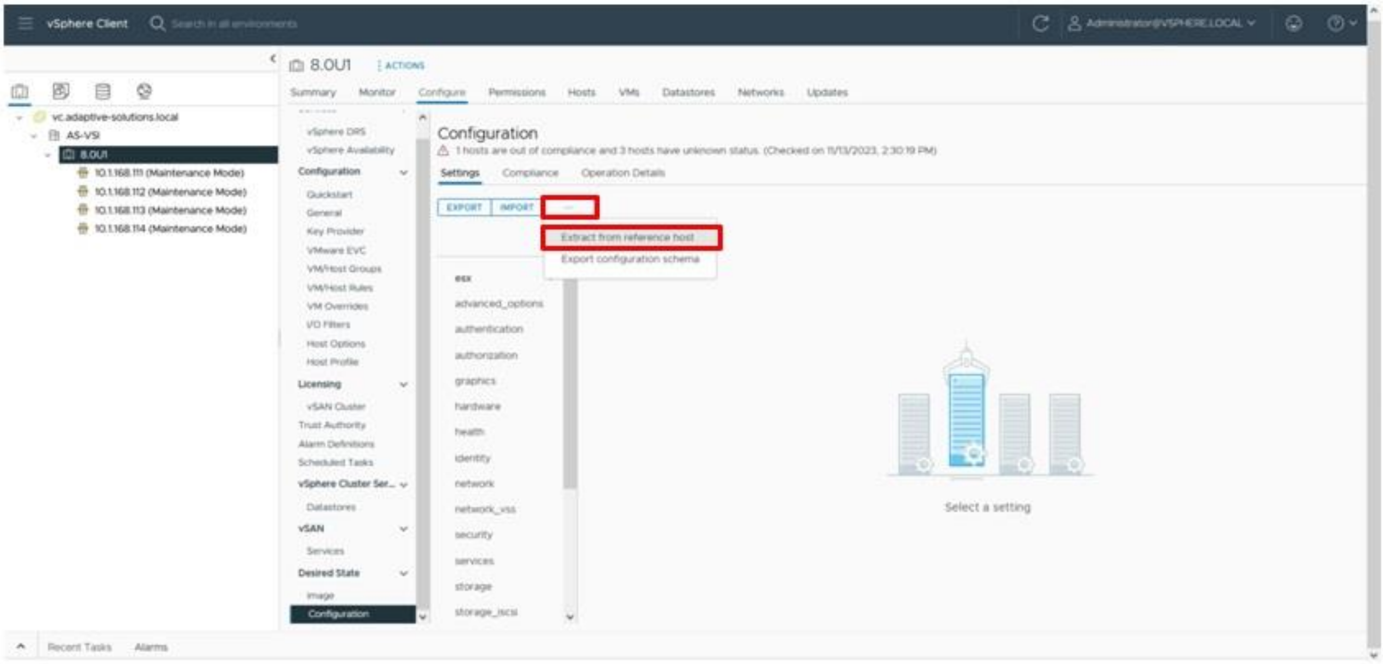
Step 1. From the VSI cluster, click **Configure** > **Desired State** > **Configuration**.



Configuration

⚠ 1 hosts are out of compliance and 3 hosts have unknown status. (Checked on 11/13/2023, 2:30:19 PM)

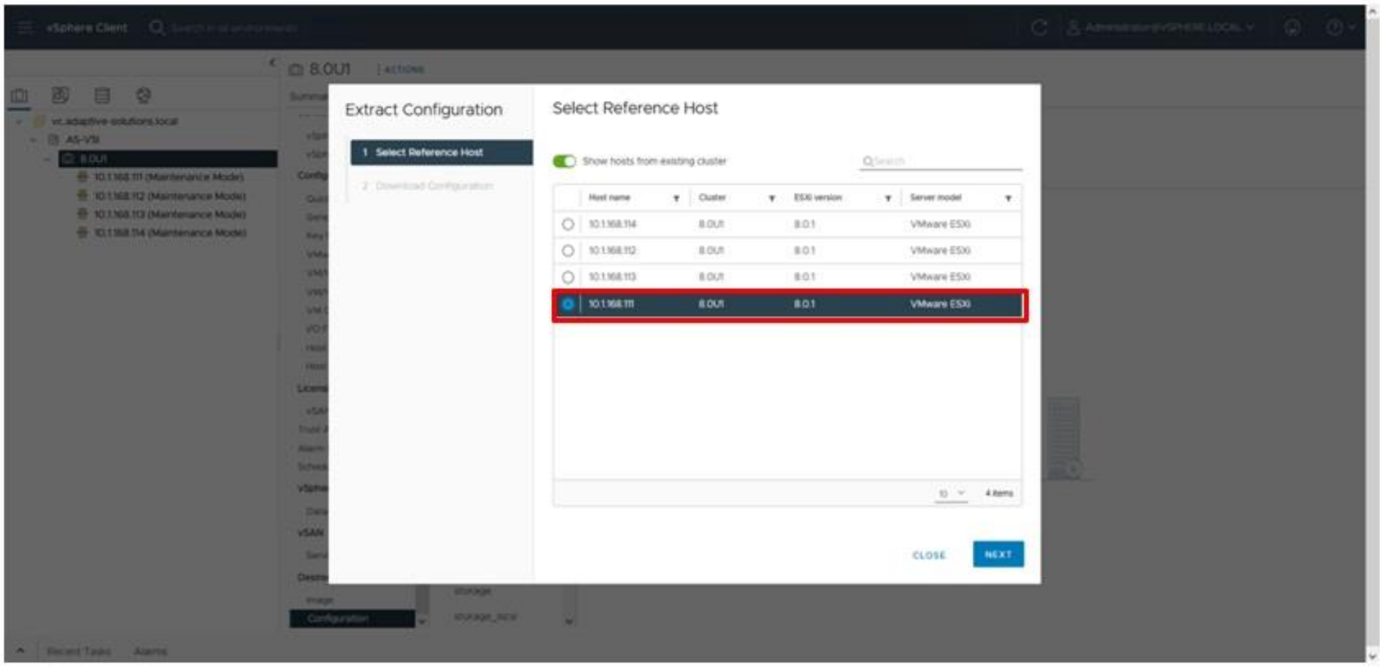
Step 2. Click the ... box and select **Extract from reference host**.



Configuration

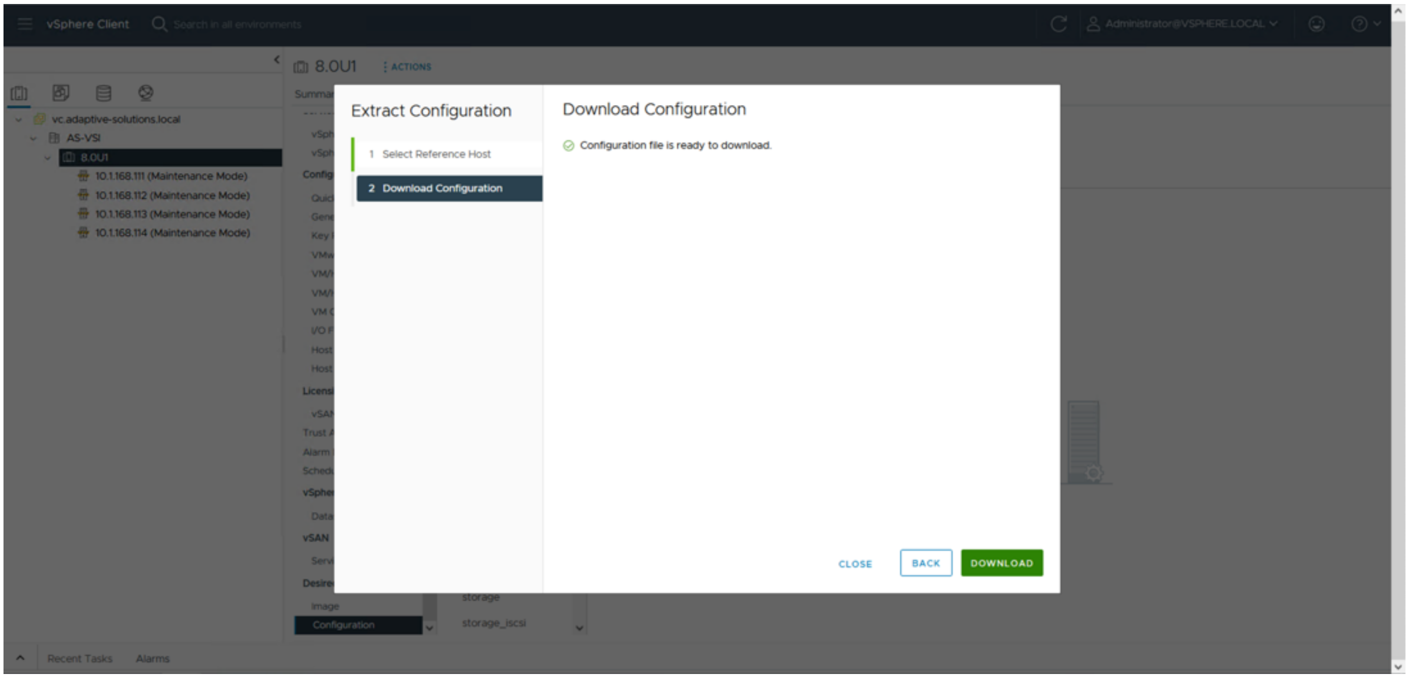
⚠ 1 hosts are out of compliance and 3 hosts have unknown status. (Checked on 11/13/2023, 2:30:19 PM)

Step 3. Select the first ESXi host that has been manually configured and click **NEXT**.



	Host name	Cluster	ESXi version	Server model
○	10.1.168.114	8.0U1	8.0.1	VMware ESXi
○	10.1.168.112	8.0U1	8.0.1	VMware ESXi
○	10.1.168.113	8.0U1	8.0.1	VMware ESXi
●	10.1.168.111	8.0U1	8.0.1	VMware ESXi

Step 4. Click **DOWNLOAD**.

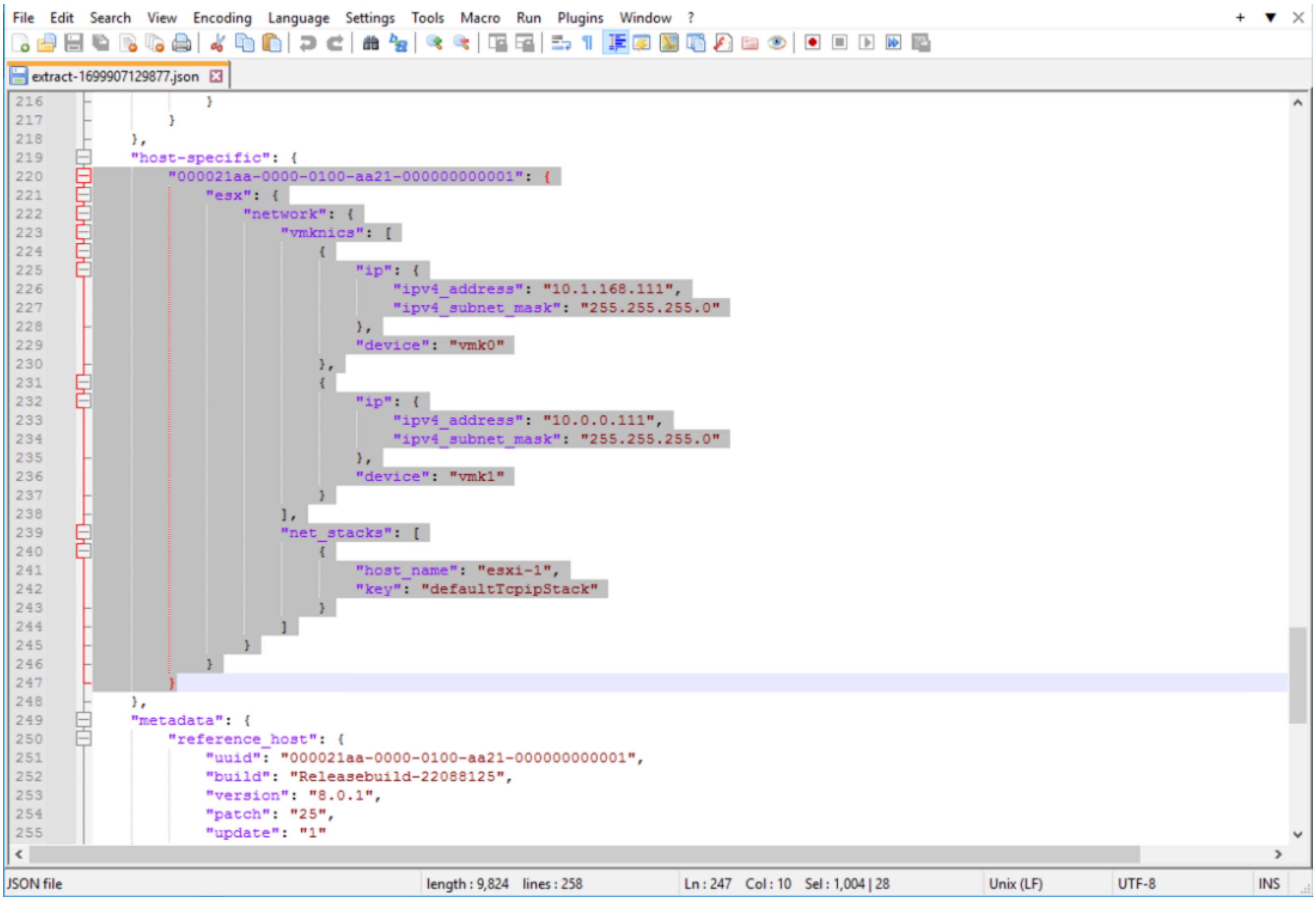


Configuration file is ready to download.

Procedure 3. Add Additional Hosts

Step 1. Open the downloaded **JSON file** in an editor. Notepad++ is used in our example.

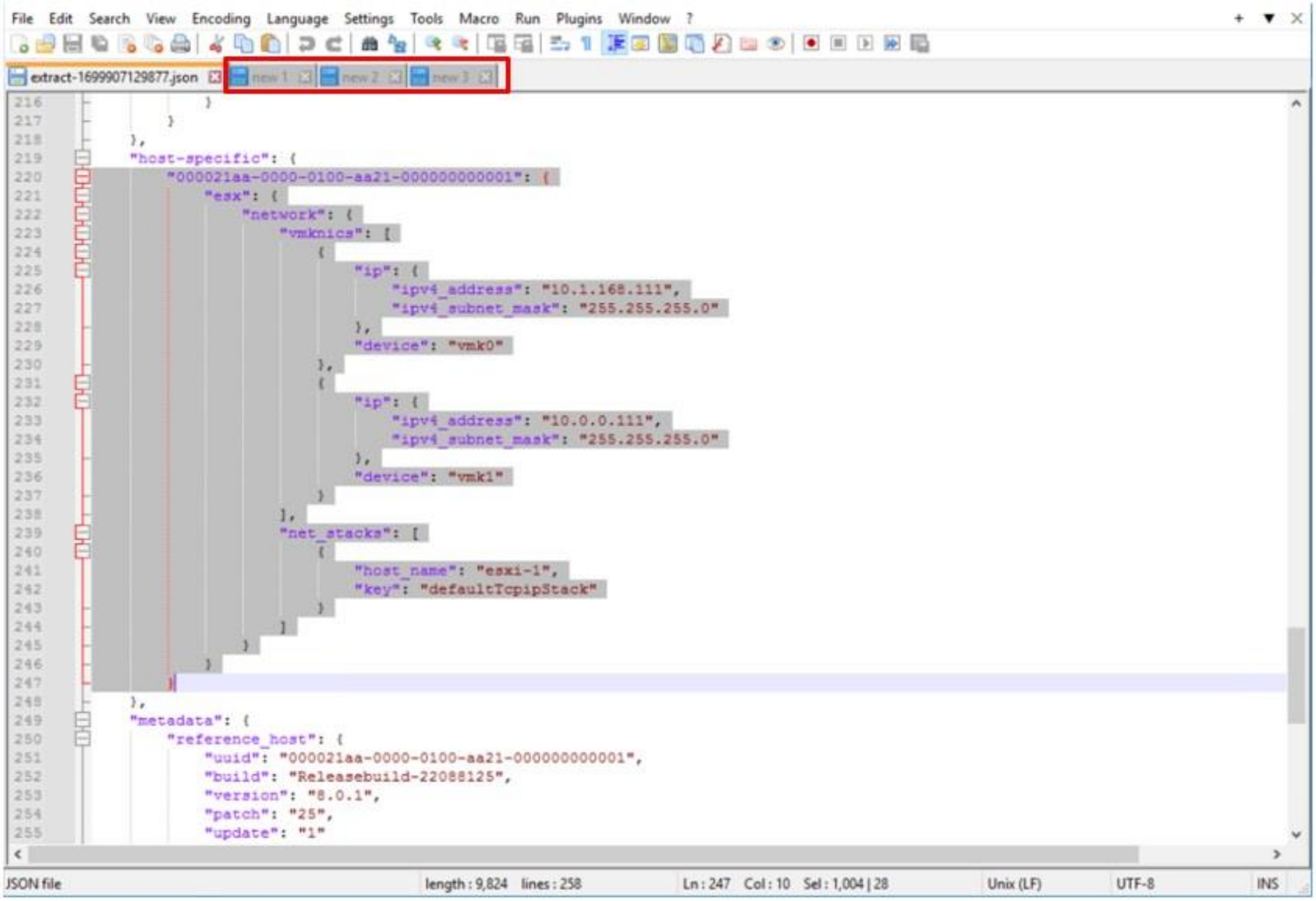
Step 2. Find the **host-specific** section within the JSON file, highlight the **UUID bracket** section and copy it.



File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
extract-1699907129877.json
JSON file
length : 9,824 lines : 258
Ln : 247 Col : 10 Sel : 1,004 | 28
Unix (LF)
UTF-8
INS

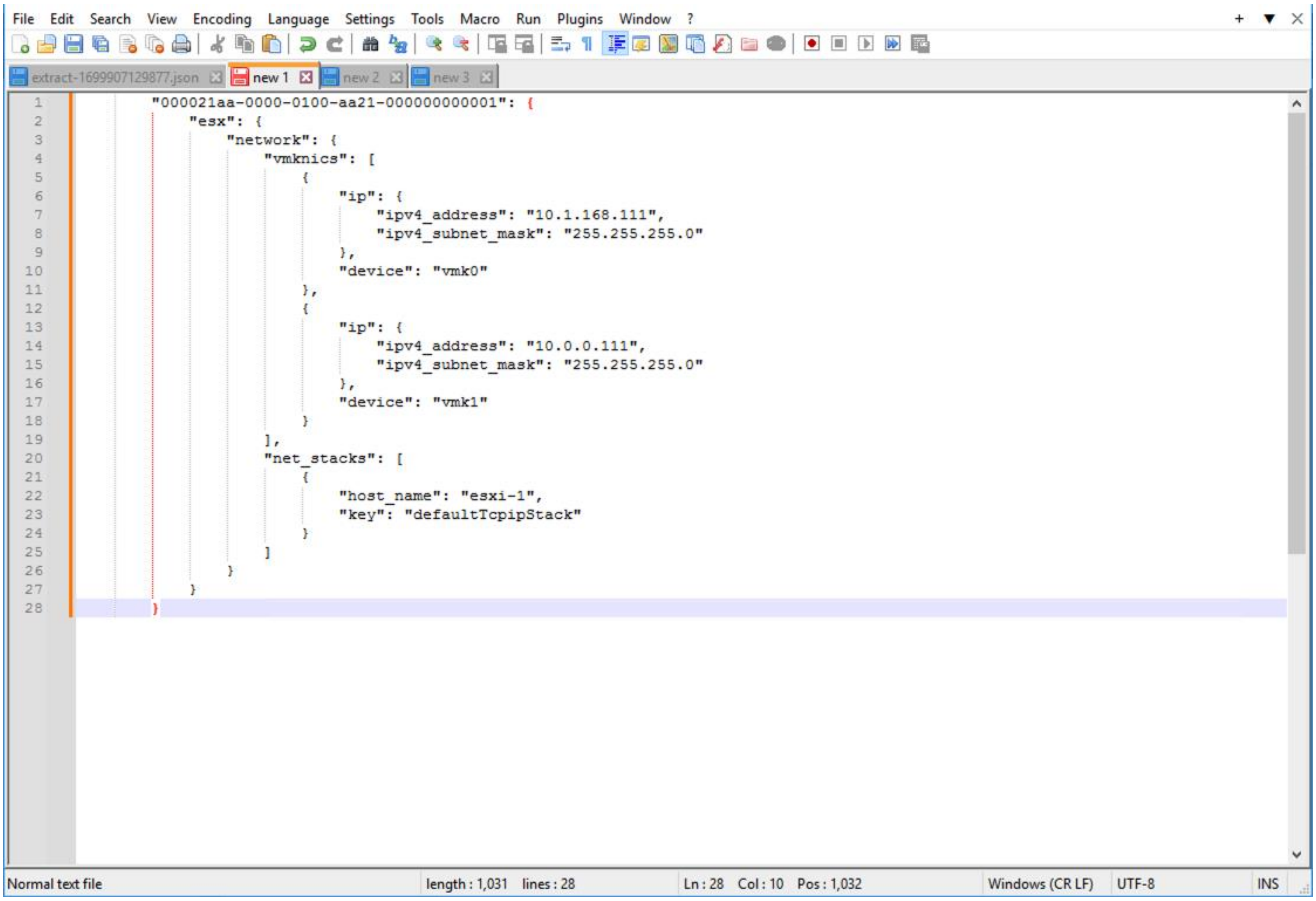
```
        }
    }
},
"host-specific": {
    "000021aa-0000-0100-aa21-000000000001": {
        "esx": {
            "network": {
                "vmknics": [
                    {
                        "ip": {
                            "ipv4_address": "10.1.168.111",
                            "ipv4_subnet_mask": "255.255.255.0"
                        },
                        "device": "vmk0"
                    },
                    {
                        "ip": {
                            "ipv4_address": "10.0.0.111",
                            "ipv4_subnet_mask": "255.255.255.0"
                        },
                        "device": "vmk1"
                    }
                ],
                "net_stacks": [
                    {
                        "host_name": "esxi-1",
                        "key": "defaultTcpipStack"
                    }
                ]
            }
        }
    }
},
"metadata": {
    "reference_host": {
        "uuid": "000021aa-0000-0100-aa21-000000000001",
        "build": "Releasebuild-22088125",
        "version": "8.0.1",
        "patch": "25",
        "update": "1"
```

Step 3. Create additional tabs or files for each host to be configured and copy the host-specific JSON text.


File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
extract-1699907129877.json
new 1
new 2
new 3
JSON file
length : 9,824 lines : 258
Ln : 247 Col : 10 Sel : 1,004 | 28
Unix (LF)
UTF-8
INS

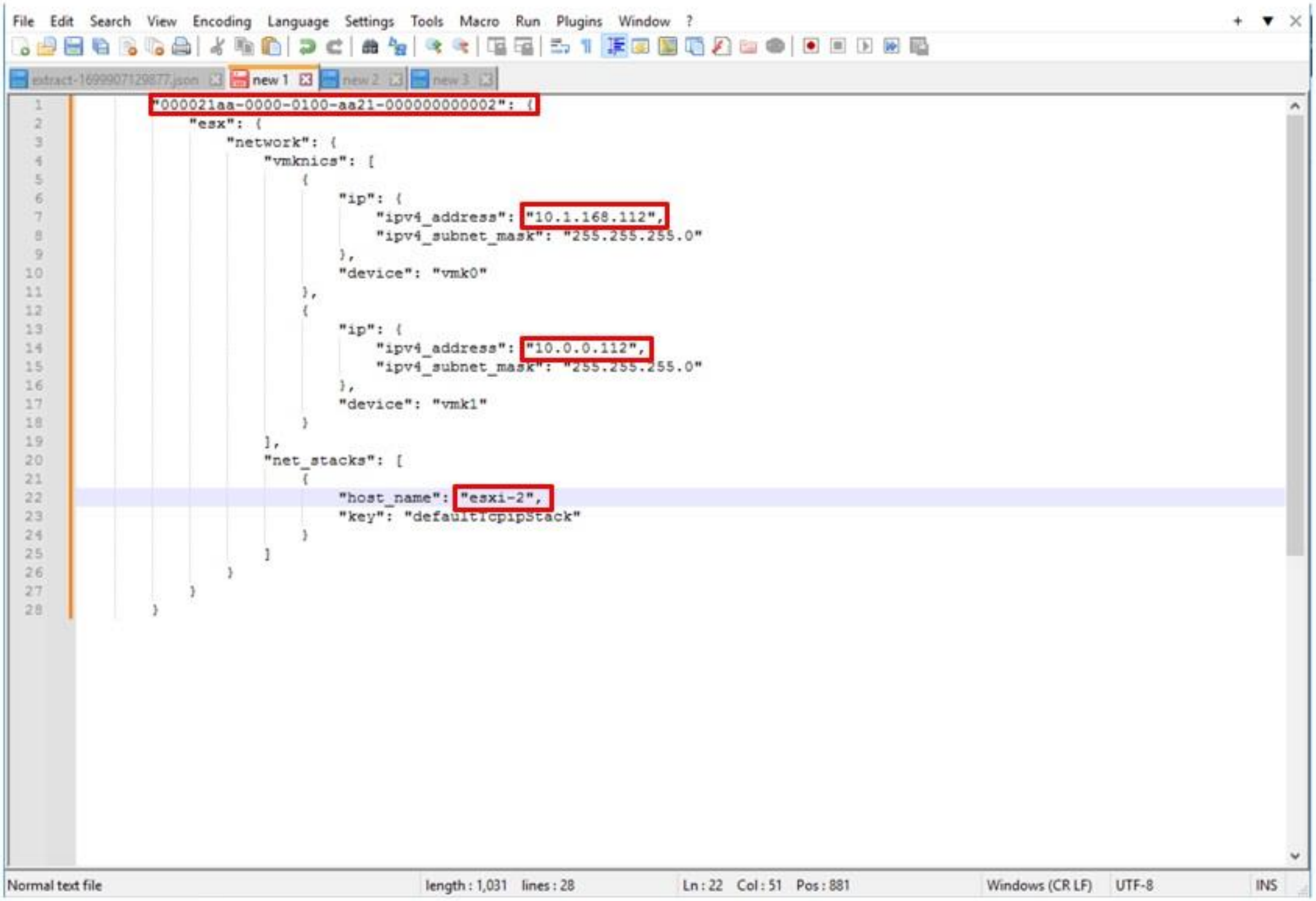
```
                }
            }
        },
        "host-specific": {
            "000021aa-0000-0100-aa21-000000000001": {
                "esx": {
                    "network": {
                        "vmknics": [
                            {
                                "ip": {
                                    "ipv4_address": "10.1.168.111",
                                    "ipv4_subnet_mask": "255.255.255.0"
                                },
                                "device": "vmk0"
                            },
                            {
                                "ip": {
                                    "ipv4_address": "10.0.0.111",
                                    "ipv4_subnet_mask": "255.255.255.0"
                                },
                                "device": "vmk1"
                            }
                        ],
                        "net_stacks": [
                            {
                                "host_name": "esxi-1",
                                "key": "defaultTcpipStack"
                            }
                        ]
                    }
                }
            }
        },
        "metadata": {
            "reference_host": {
                "uuid": "000021aa-0000-0100-aa21-000000000001",
                "build": "Releasebuild-22088125",
                "version": "8.0.1",
                "patch": "25",
                "update": "1"
```

Step 4. Paste this copied host-specific JSON section into each tab.


File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
extract-1699907129877.json
new 1
new 2
new 3
Normal text file
length : 1,031 lines : 28
Ln : 28 Col : 10 Pos : 1,032
Windows (CR LF)
UTF-8
INS

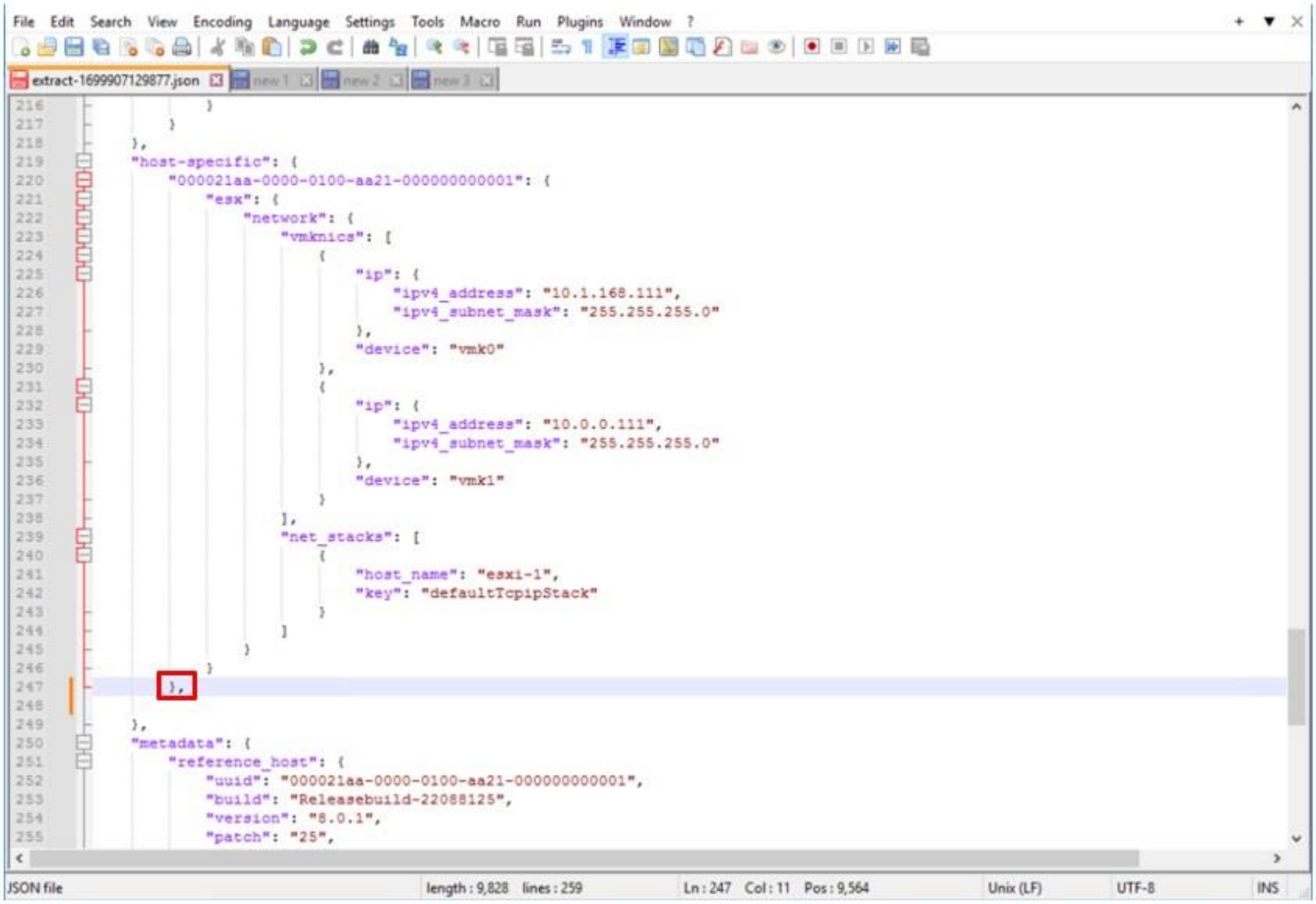
```
        "000021aa-0000-0100-aa21-000000000001": {
            "esx": {
                "network": {
                    "vmknics": [
                        {
                            "ip": {
                                "ipv4_address": "10.1.168.111",
                                "ipv4_subnet_mask": "255.255.255.0"
                            },
                            "device": "vmk0"
                        },
                        {
                            "ip": {
                                "ipv4_address": "10.0.0.111",
                                "ipv4_subnet_mask": "255.255.255.0"
                            },
                            "device": "vmk1"
                        }
                    ],
                    "net_stacks": [
                        {
                            "host_name": "esxi-1",
                            "key": "defaultTcpipStack"
                        }
                    ]
                }
            }
        }
```

Step 5. Adjust the UUID (top alpha-numeric sequence above the "esx": line) with the UUID values for each additional host, along with adjustments for their respective VMkernel IPs and host names.


File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
extract-1699907129877.json
new 1
new 2
new 3
Normal text file
length : 1,031 lines : 28
Ln : 22 Col : 51 Pos : 881
Windows (CR LF)
UTF-8
INS

```
        "000021aa-0000-0100-aa21-000000000002": {
            "esx": {
                "network": {
                    "vmknics": [
                        {
                            "ip": {
                                "ipv4_address": "10.1.168.112",
                                "ipv4_subnet_mask": "255.255.255.0"
                            },
                            "device": "vmk0"
                        },
                        {
                            "ip": {
                                "ipv4_address": "10.0.0.112",
                                "ipv4_subnet_mask": "255.255.255.0"
                            },
                            "device": "vmk1"
                        }
                    ],
                    "net_stacks": [
                        {
                            "host_name": "esxi-2",
                            "key": "defaultTcpipStack"
                        }
                    ]
                }
            }
        }
```

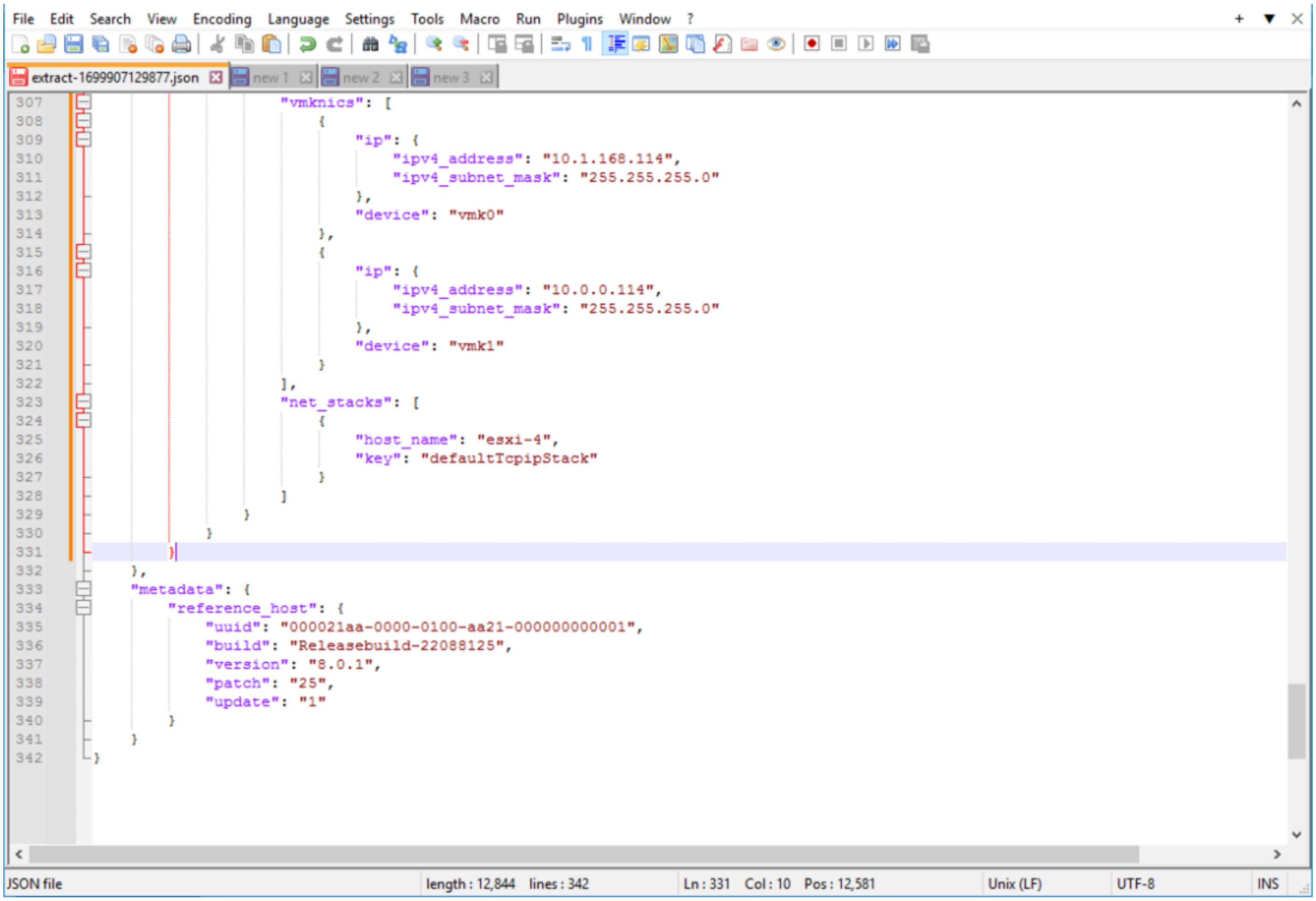
Step 6. Add a comma after the first UUID block in the original JSON file.


File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
extract-1699907129877.json
new 1
new 2
new 3
JSON file
length : 9,828 lines : 259
Ln : 247 Col : 11 Pos : 9,564
Unix (LF)
UTF-8
INS

```
            }
        }
    },
    "host-specific": {
        "000021aa-0000-0100-aa21-000000000001": {
            "esx": {
                "network": {
                    "vmknics": [
                        {
                            "ip": {
                                "ipv4_address": "10.1.168.111",
                                "ipv4_subnet_mask": "255.255.255.0"
                            },
                            "device": "vmk0"
                        },
                        {
                            "ip": {
                                "ipv4_address": "10.0.0.111",
                                "ipv4_subnet_mask": "255.255.255.0"
                            },
                            "device": "vmk1"
                        }
                    ],
                    "net_stacks": [
                        {
                            "host_name": "esxi-1",
                            "key": "defaultTcpipStack"
                        }
                    ]
                }
            }
        },

    },
    "metadata": {
        "reference_host": {
            "uuid": "000021aa-0000-0100-aa21-000000000001",
            "build": "Releasebuild-22088125",
            "version": "8.0.1",
            "patch": "25",
```

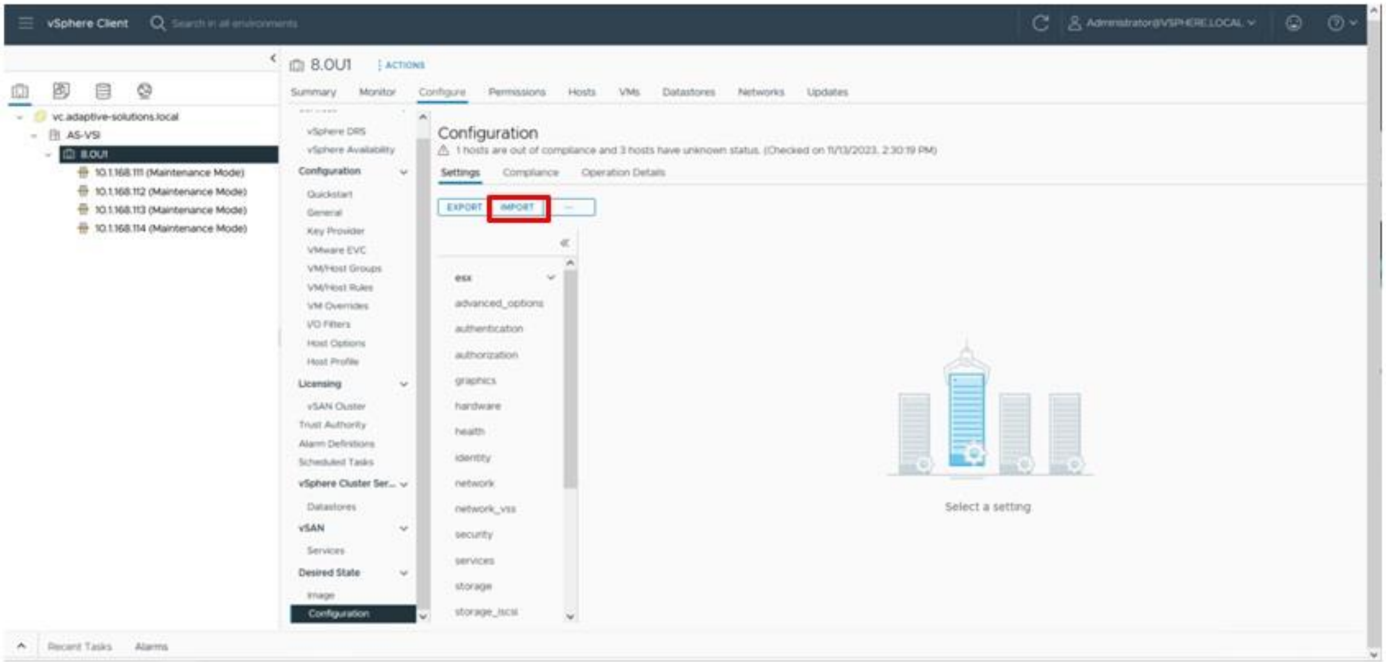
Step 7. Insert each additional host UUID block segments into the file after the comma, with commas separating each additional host, and then save the file.


File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
extract-1699907129877.json
new 1
new 2
new 3
JSON file
length : 12,844 lines : 342
Ln : 331 Col : 10 Pos : 12,581
Unix (LF)
UTF-8
INS

```
                    "vmknics": [
                        {
                            "ip": {
                                "ipv4_address": "10.1.168.114",
                                "ipv4_subnet_mask": "255.255.255.0"
                            },
                            "device": "vmk0"
                        },
                        {
                            "ip": {
                                "ipv4_address": "10.0.0.114",
                                "ipv4_subnet_mask": "255.255.255.0"
                            },
                            "device": "vmk1"
                        }
                    ],
                    "net_stacks": [
                        {
                            "host_name": "esxi-4",
                            "key": "defaultTcpipStack"
                        }
                    ]
                }
            }
        }
    },
    "metadata": {
        "reference_host": {
            "uuid": "000021aa-0000-0100-aa21-000000000001",
            "build": "Releasebuild-22088125",
            "version": "8.0.1",
            "patch": "25",
            "update": "1"
        }
    }
}
```

Note: The last host block inserted will not have a comma added to it.

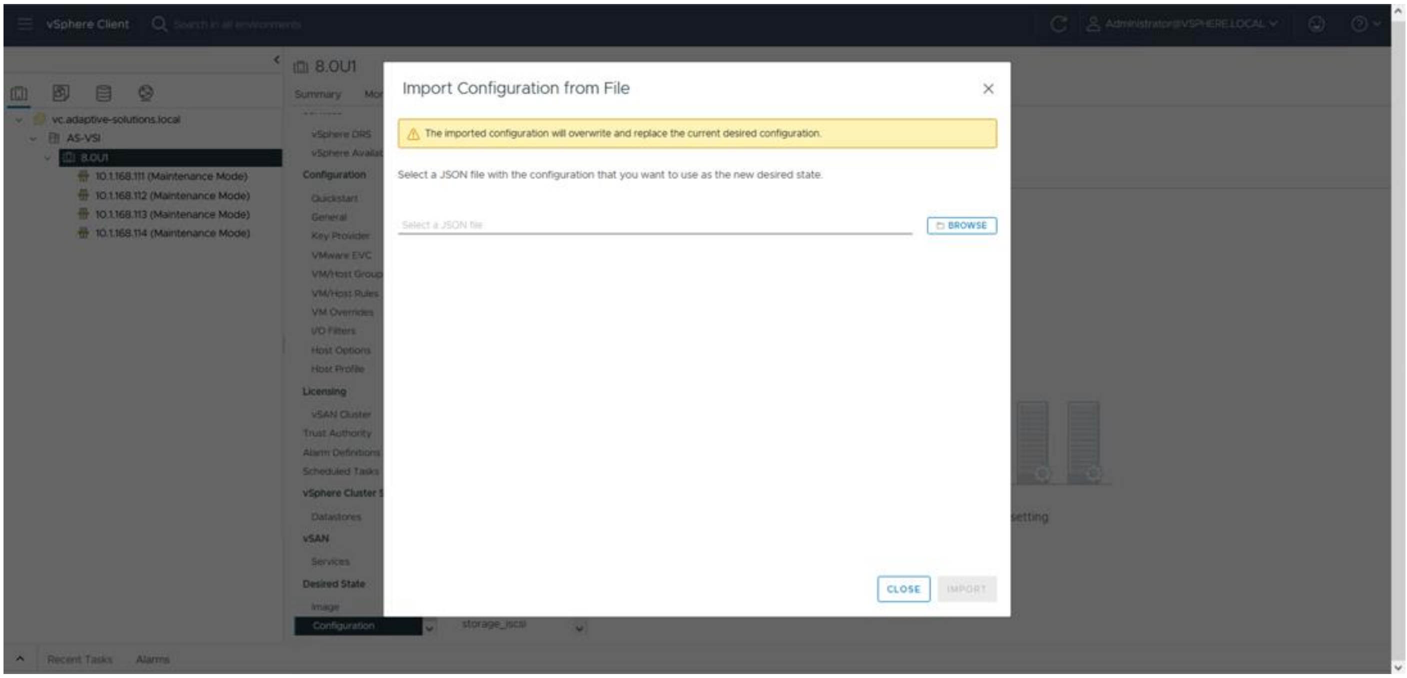
Step 8. From vCenter, return to the cluster **Configure > Configuration**, and click **IMPORT**.



Configuration

1 hosts are out of compliance and 3 hosts have unknown status. (Checked on 11/13/2023, 2:30:19 PM)

Step 9. Browse for the adjusted JSON file and click **IMPORT**.



Import Configuration from File

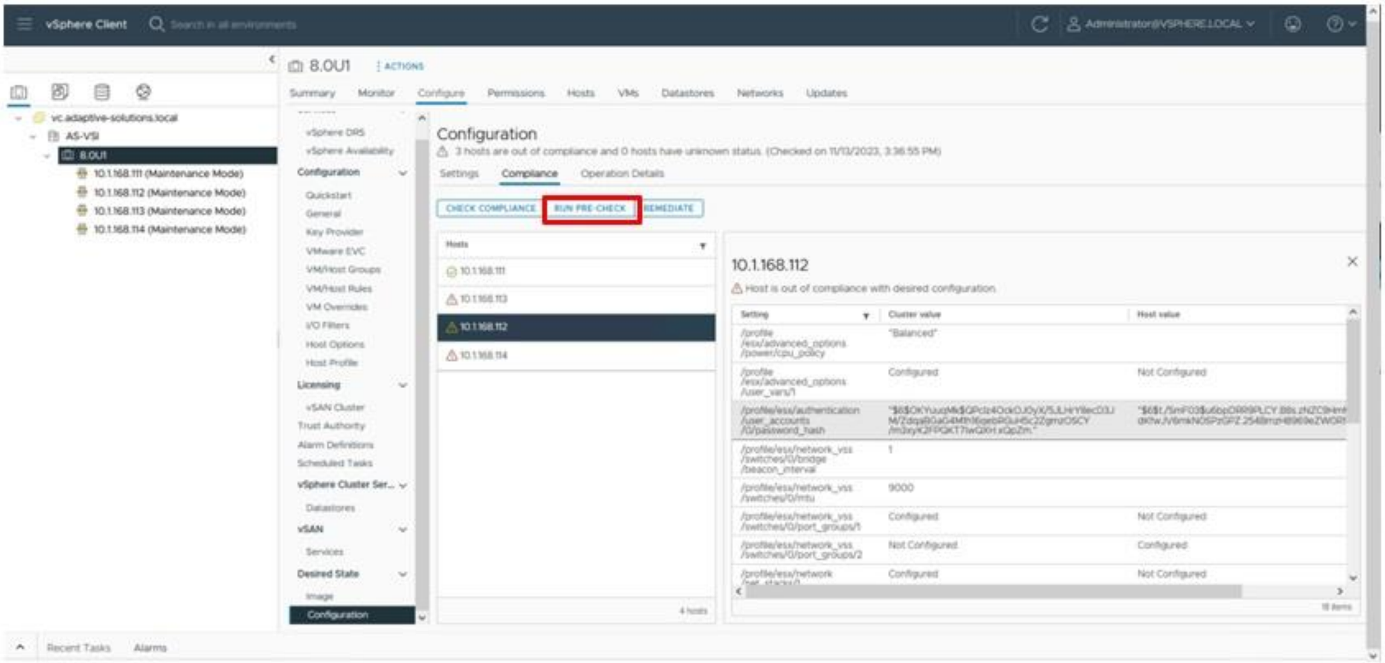
The imported configuration will overwrite and replace the current desired configuration.

Select a JSON file with the configuration that you want to use as the new desired state.

Step 10. Click **CLOSE** after the import completes.

Procedure 4. Remediate Hosts

Step 1. Click the **Compliance** tab of **Configure > Desired State > Configuration** of the VSI cluster, select a non-compliant host, and click **RUN PRE-CHECK**.



Configuration

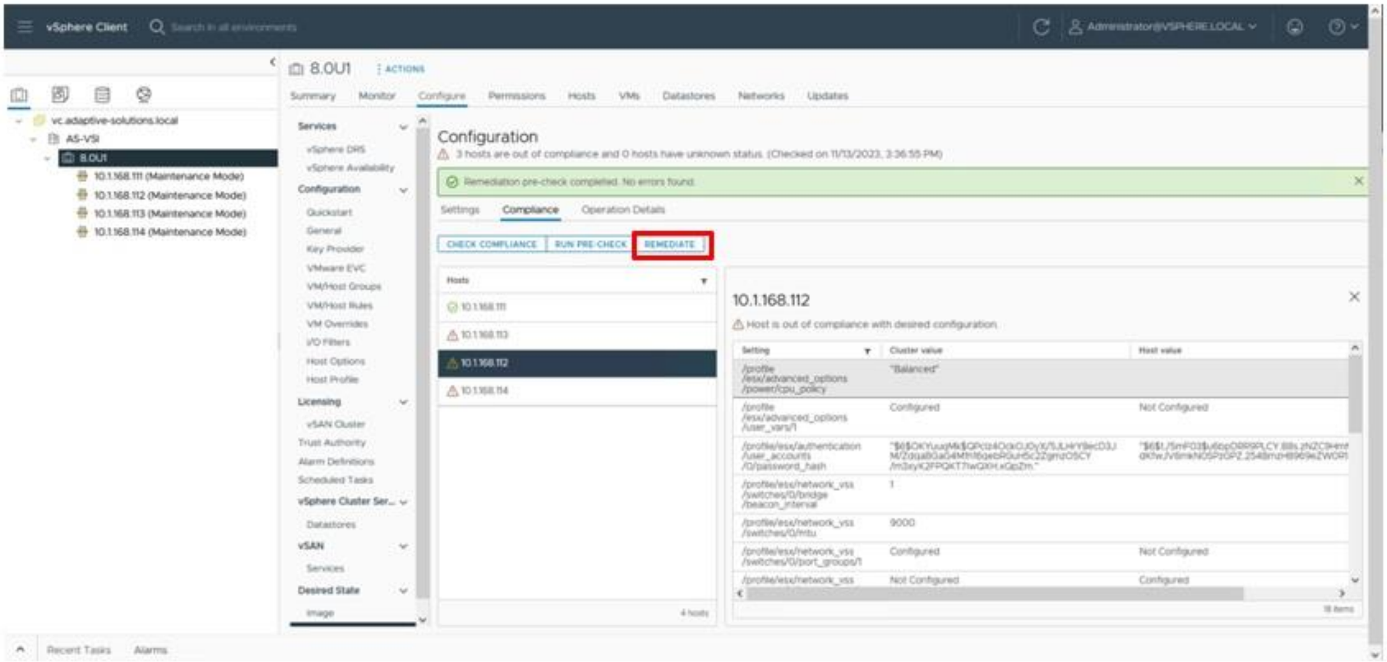
3 hosts are out of compliance and 0 hosts have unknown status. (Checked on 11/13/2023, 3:36:55 PM)

10.1.168.112

Host is out of compliance with desired configuration.

Setting	Cluster value	Host value
/profile/esx/advanced_options/power/cpu_policy	"Balanced"	
/profile/esx/advanced_options/user_vars/1	Configured	Not Configured
/profile/esx/authentication/user_accounts/0/password_hash	"$6$OKYuuqMk$QPclz4OckOJ0yX/5JLHrY8ecD3JM/ZdqaBGaG4Mth16qebRGuH5c2ZgmzOSCY/m3xyK2FPQKT7iwQXH.xQpZm."	"6t./SmF03$u6bpDRR9PLCY.B8s.zNZC9Hm dKfw./V6mkNOSPzGPZ.2548mzH8969eZWOR
/profile/esx/network_vss/switches/0/bridge/beacon_interval	1	
/profile/esx/network_vss/switches/0/mtu	9000	
/profile/esx/network_vss/switches/0/port_groups/1	Configured	Not Configured
/profile/esx/network_vss/switches/0/port_groups/2	Not Configured	Configured
/profile/esx/network/net_stacks/0	Configured	Not Configured

Step 2. With the pre-check completed, click **REMEDIATE**.



Configuration

3 hosts are out of compliance and 0 hosts have unknown status. (Checked on 11/13/2023, 3:36:55 PM)

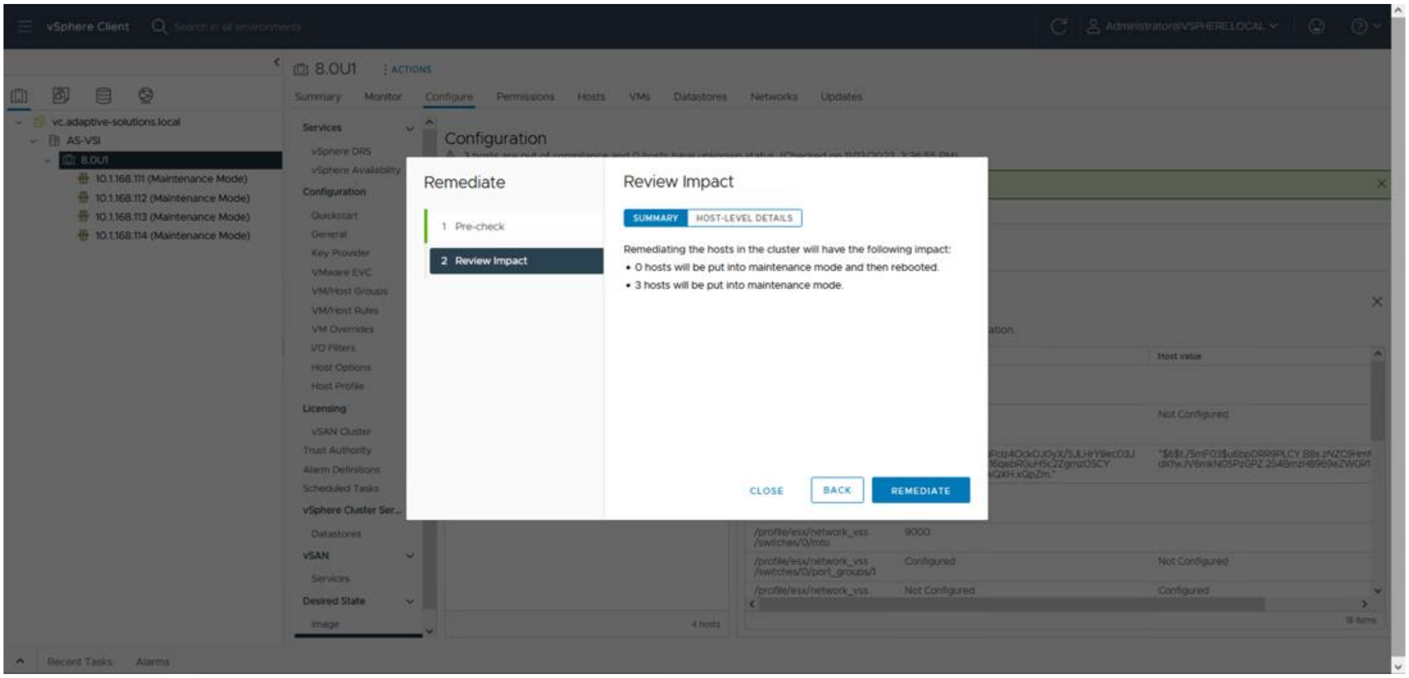
Remediation pre-check completed. No errors found.

10.1.168.112

Host is out of compliance with desired configuration.

Setting	Cluster value	Host value
/profile/esx/advanced_options/power/cpu_policy	"Balanced"	
/profile/esx/advanced_options/user_vars/1	Configured	Not Configured
/profile/esx/authentication/user_accounts/0/password_hash	"$6$OKYuuqMk$QPclz4OckOJ0yX/5JLHrY8ecD3JM/ZdqaBGaG4Mth16qebRGuH5c2ZgmzOSCY/m3xyK2FPQKT7iwQXH.xQpZm."	"6t./SmF03$u6bpDRR9PLCY.B8s.zNZC9Hm dKfw./V6mkNOSPzGPZ.2548mzH8969eZWOR
/profile/esx/network_vss/switches/0/bridge/beacon_interval	1	
/profile/esx/network_vss/switches/0/mtu	9000	
/profile/esx/network_vss/switches/0/port_groups/1	Configured	Not Configured
/profile/esx/network_vss	Not Configured	Configured

Step 3. Click **NEXT** after the PRE-CHECK and then click **REMEDIATE** on the Review Impact screen.

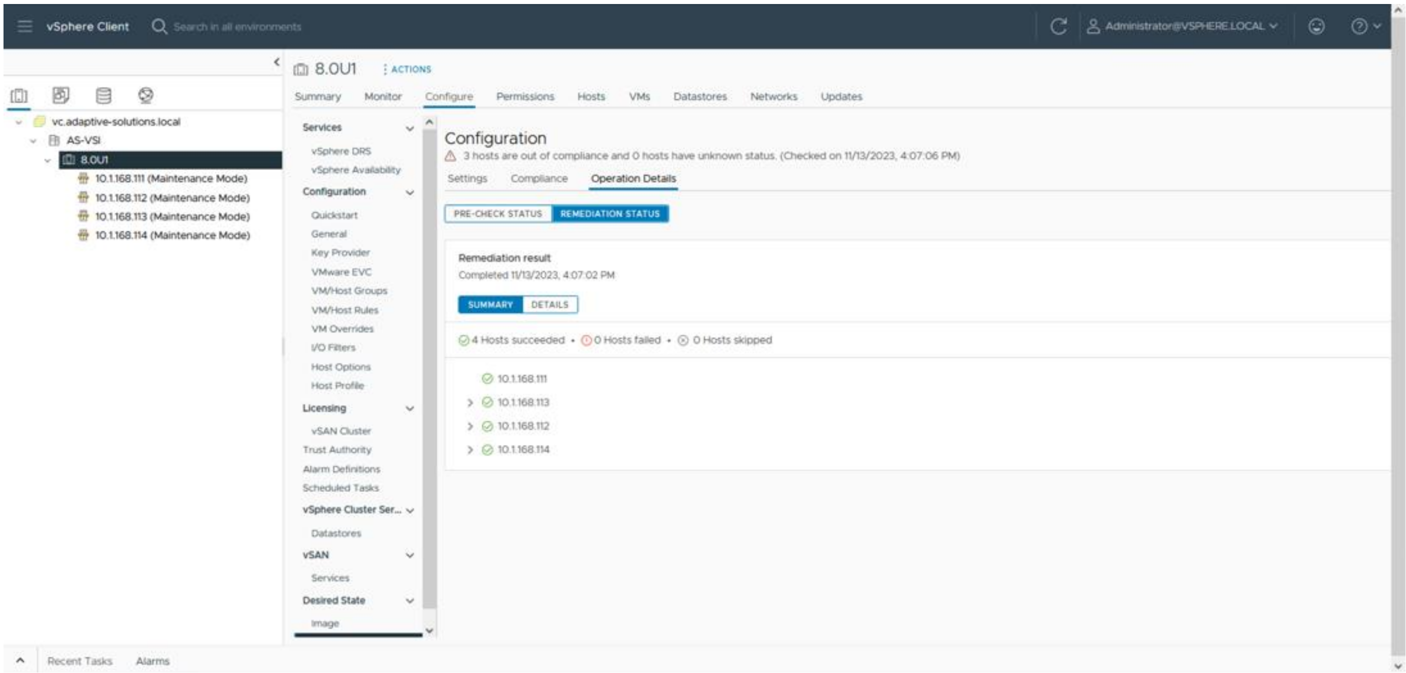


Review Impact

Remediating the hosts in the cluster will have the following impact:

- 0 hosts will be put into maintenance mode and then rebooted.
- 3 hosts will be put into maintenance mode.

Step 4. With remediation complete, remove all hosts from Maintenance Mode.



Configuration

3 hosts are out of compliance and 0 hosts have unknown status. (Checked on 11/13/2023, 4:07:06 PM)

Remediation result

Completed 11/13/2023, 4:07:02 PM

4 Hosts succeeded • 0 Hosts failed • 0 Hosts skipped

10.1.168.111
10.1.168.113
10.1.168.112
10.1.168.114

vSphere Additional Finishing Steps

Procedure 5. VMware ESXi 8.0 U1 TPM Attestation

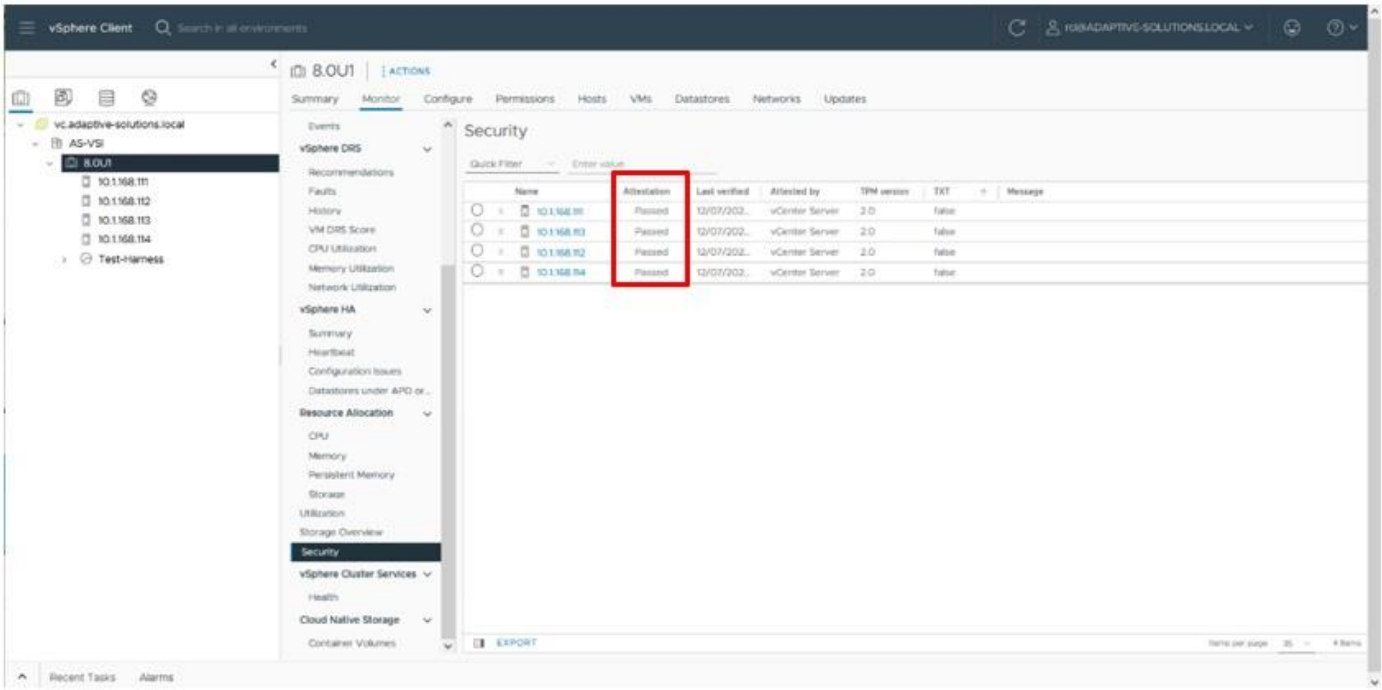
Note: If your Cisco UCS servers have Trusted Platform Module (TPM) 2.0 modules installed, the TPM can provide assurance that ESXi has booted with UEFI Secure Boot enabled and using only digitally signed code. In the Cisco UCS Configuration section of this document, UEFI secure boot was enabled in the boot order policy. A server can boot with UEFI Secure Boot with or without a TPM 2.0 module. If it has a TPM, VMware vCenter can attest that the server booted with UEFI Secure Boot. To verify the VMware ESXi 8.0 U1 TPM Attestation, follow these steps:

Step 1. For Cisco UCS servers that have TPM 2.0 modules installed, TPM Attestation can be verified within vCenter.

Step 2. In the vCenter under **Hosts and Clusters** select the cluster.

Step 3. In the center pane, choose the **Monitor** tab.

Step 4. Click **Monitor > Security**. The Attestation status will show the status of the TPM:



Security

Name	Attestation	Last verified	Attested by	TPM version	TXT	Message
10.1.168.111	Passed	12/07/202...	vCenter Server	2.0	false	
10.1.168.113	Passed	12/07/202...	vCenter Server	2.0	false	
10.1.168.112	Passed	12/07/202...	vCenter Server	2.0	false	
10.1.168.114	Passed	12/07/202...	vCenter Server	2.0	false	

Note: It may be necessary to disconnect and reconnect or reboot a host from vCenter to get it to pass attestation the first time.

Procedure 6. (Optional) Configure Distributed Power Management (DPM)

This procedure configures the host to be able to be shut down during low cluster utilization times to reduce power.

The CIMC Management interface associated with the DPM BMC MAC address will need to be gathered from the Fabric Interconnect Device Console CLI, either from direct console connection, or via ssh.

To gather the CIMC Management interface MAC addresses, perform the following steps:

Step 1. Connect to either Fabric Interconnect Device Console as admin.

```
% ssh admin@192.168.168.11
Cisco UCS 6500 Series Fabric Interconnect
admin@192.168.168.12's password:
UCS Intersight Management
```

```
AA21-6536-A#
```

Step 2. Connect to the CIMC Debug Firmware Utility Shell of the first server (*connect cimc <chassis>/<blade slot>*) from which to collect information.

```
AA21-6536-B# connect cimc 1/1

Entering character mode
Escape character is '^]'.


CIMC Debug Firmware Utility Shell [  ]
[ help ]#
```

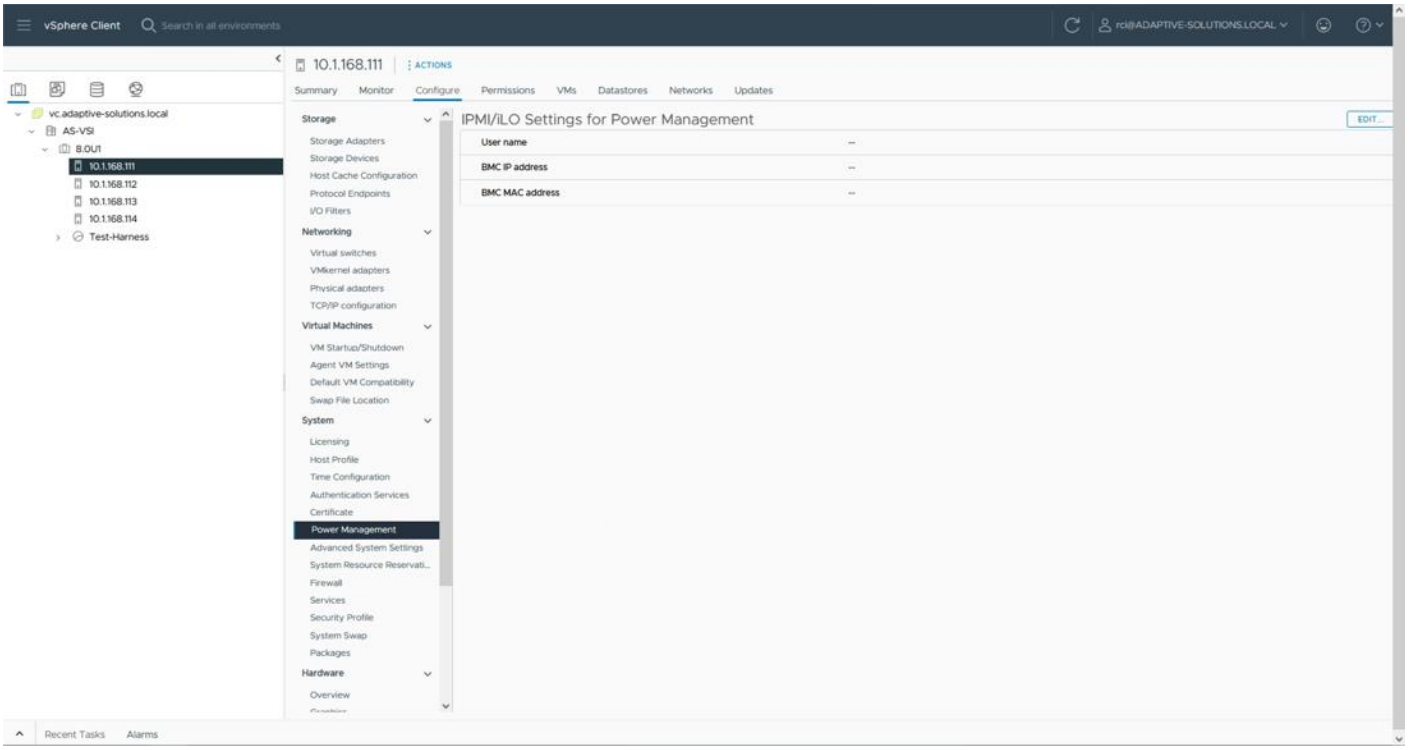
Step 3. Run the network command and identify the first server MAC (HWaddr) address for the eth0 value from the top of the output that returns.

```
[ help ]# network
eth0      Link encap:Ethernet  HWaddr 56:51:DE:D5:87:E9
          inet6 addr: fe80::5451:deff:fed5:87e9/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:48387344 errors:0 dropped:0 overruns:0 frame:0
          TX packets:37023312 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:18446744071908661842 (16777215.9 TiB)  TX bytes:1097208517 (1.0 GiB)
          Interrupt:50
```

Step 4. Type **exit** and repeat steps 2 and 3 for each server.

Note: With the information gathered for each server to configure, continue with the following steps:

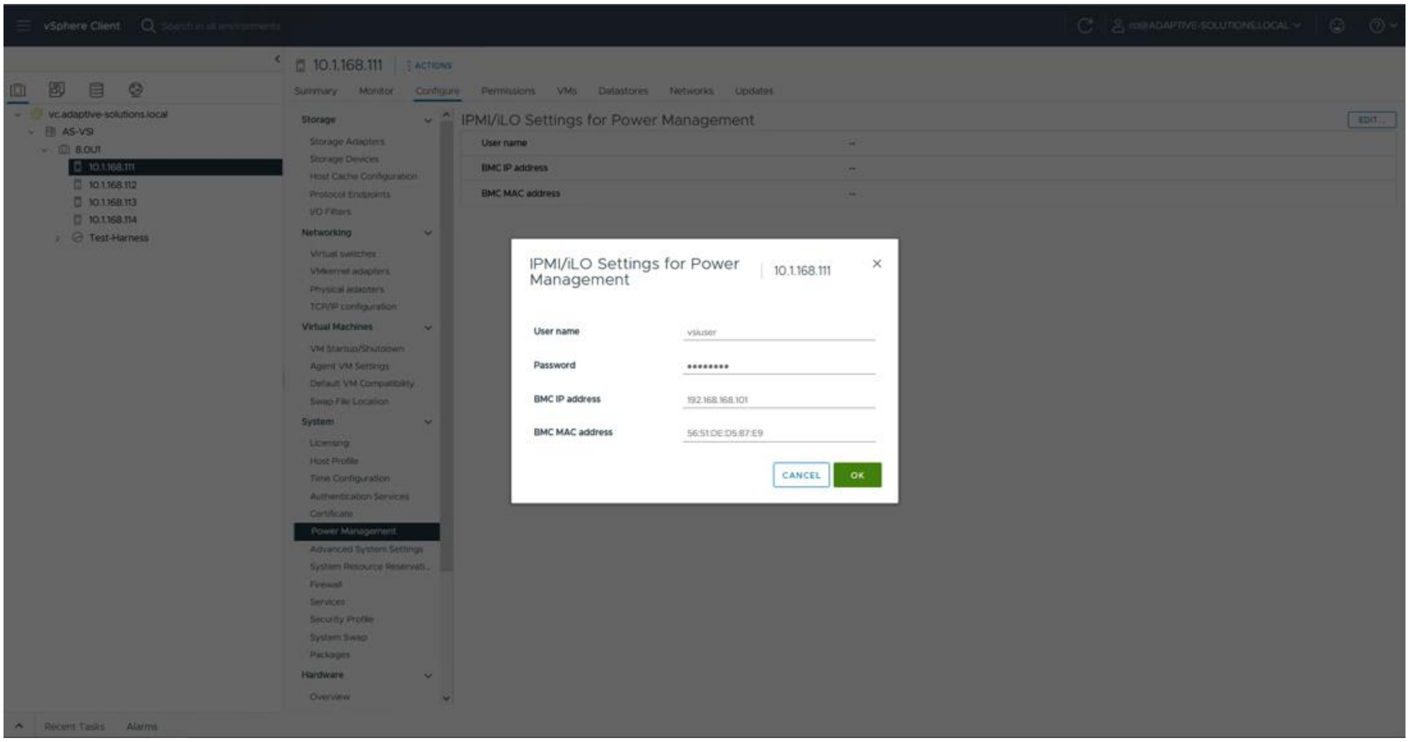
Step 5. From the first host that has been added, go to **Configure** > **System** > **Power Management** and click **EDIT…** .



IPMI/iLO Settings for Power Management

User name	--
BMC IP address	--
BMC MAC address	--

Step 6. Provide the credentials for a local user with admin privileges within the UCS domain, the assigned KVM mgmt IP from Intersight, and the CIMC MAC address previously collected from the Fabric Interconnect Device Console.



IPMI/iLO Settings for Power Management | 10.1.168.111

User name: vsiuser

Password: ••••••••

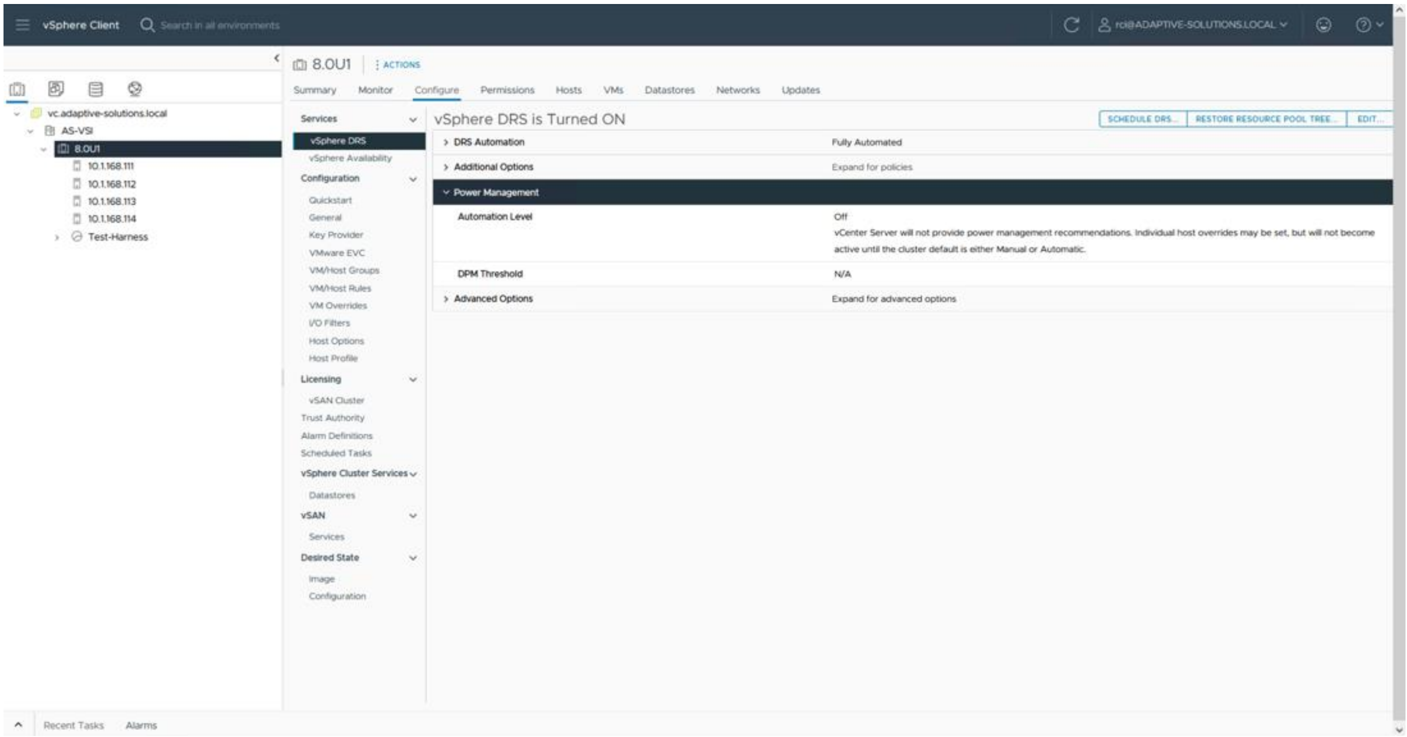
BMC IP address: 192.168.168.101

BMC MAC address: 56:51:DE:D5:87:E9

Step 7. Repeat **Step 2** for each additional host in the cluster.

Note: The MAC addresses used in this configuration are associated with the physical hardware of the server and will need to be re-entered if the server profiles associated with these hosts are deployed to different servers.

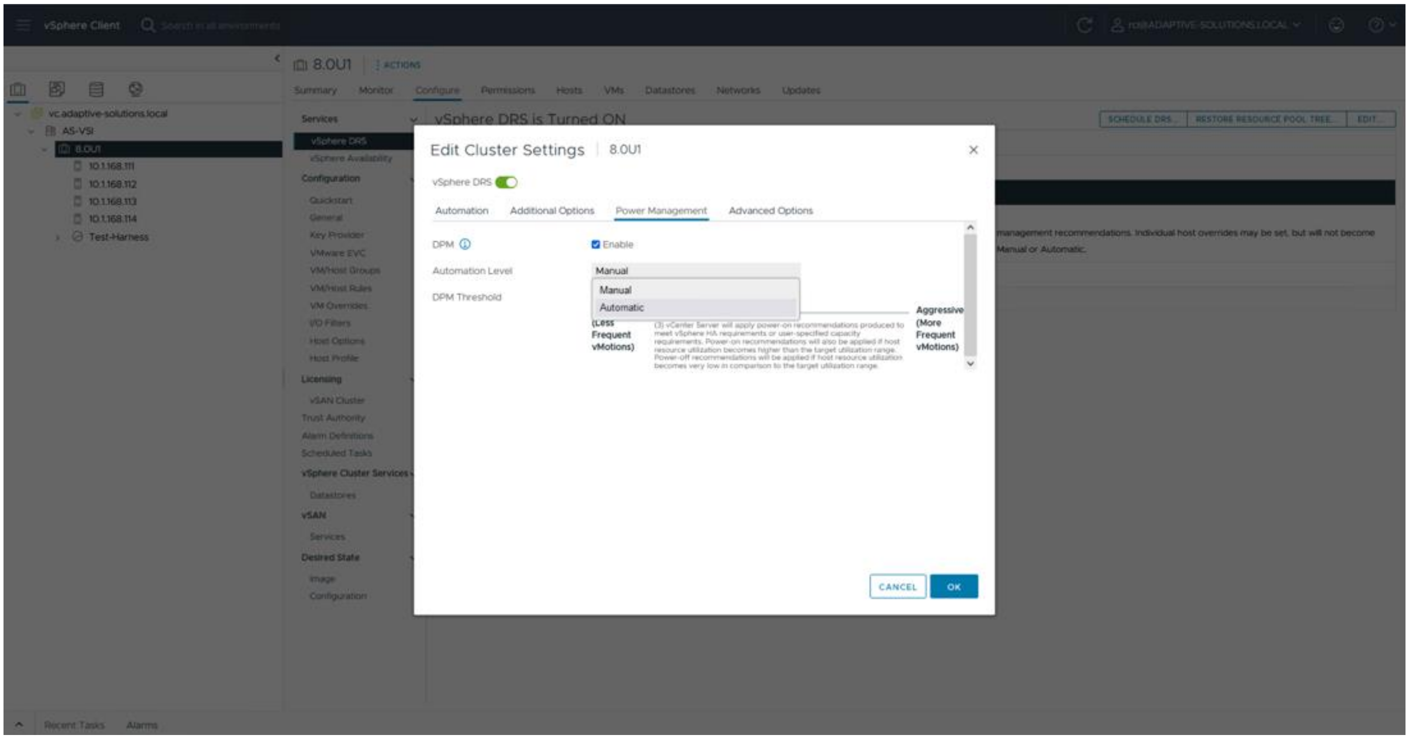
Step 8. Go to **Configure** > **Services** > **vSphere DRS** for the cluster and click **EDIT**....



vSphere DRS is Turned ON

DRS Automation	Fully Automated
Additional Options	Expand for policies
Power Management	
Automation Level	Off vCenter Server will not provide power management recommendations. Individual host overrides may be set, but will not become active until the cluster default is either Manual or Automatic.
DPM Threshold	N/A
Advanced Options	Expand for advanced options

Step 9. Select the **Power Management** tab within the **Edit Cluster Settings** window, click the **Enable** checkbox for DPM, and select the **Automatic** option from the Automation Level drop-down list.



Edit Cluster Settings | 8.0U1

vSphere DRS

DPM ☑ Enable

Automation Level: Manual

- Manual
- Automatic

DPM Threshold

(Less Frequent vMotions) — Aggressive (More Frequent vMotions)

(3) vCenter Server will apply power-on recommendations produced to meet vSphere HA requirements or user-specified capacity requirements. Power-on recommendations will also be applied if host resource utilization becomes higher than the target utilization range. Power-off recommendations will be applied if host resource utilization becomes very low in comparison to the target utilization range.

Step 10. Click **OK** to apply the changes.

Step 11. Click **OK** past any warnings about the standby functionality of certain hosts, or alternately test each host for standby now that it has been configured and repeat Step 5.

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Ramesh Isaac is a Technical Marketing Engineer in the Cisco UCS Data Center Solutions Group. Ramesh has worked in the data center and mixed-use lab settings for over 25 years. He started in information technology supporting UNIX environments and focused on designing and implementing multi-tenant virtualization solutions in Cisco labs before entering Technical Marketing where he has supported converged infrastructure and virtual services as part of solution offerings as Cisco. Ramesh has held certifications from Cisco, VMware, and Red Hat.

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Ramakrishna Manupuri is a Senior Software Development Engineer, in the Solutions Engineering team of Converged UCP group. He has worked as a Solution engineer with mainly experience in UCP products, Cloud services, SAN Storage solutions and Virtualization technologies with expertise in VMware products such as VMware Cloud Foundation (Hyperconverged infrastructure solution), vCloud Director, vSphere, vSAN, VMware Site Recovery Manager (SRM). Ramakrishna has held certifications from VMware (VCP), AWS Solutions Architect - Associate and Fortinet (NSE4).

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Appendix

This appendix contains the following:

- Allocate a VMFS Datastore with Cisco Intersight Cloud Orchestrator using Hitachi VSP
- MDS Configurations used in this validation
- Nexus Configurations used in this validation

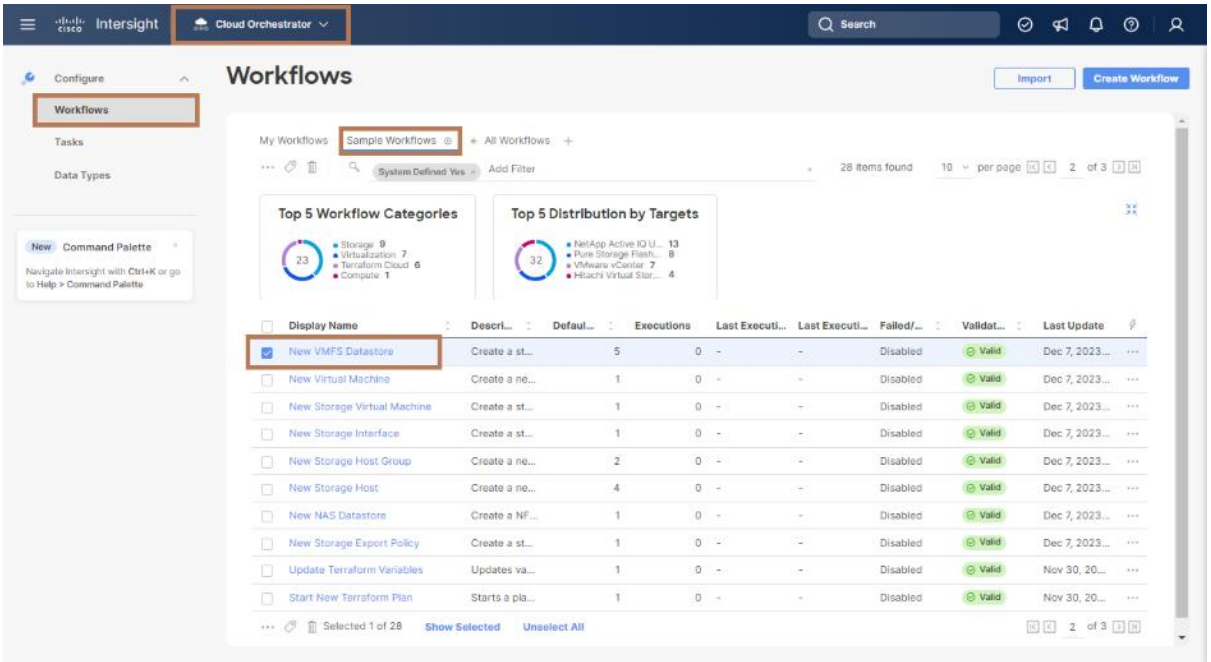
Note: The features and functionality explained in this Appendix are optional configurations that can be helpful in configuring and managing the Adaptive Solutions deployment.

Allocate a VMFS Datastore with Cisco Intersight Cloud Orchestrator using Hitachi VSP

Intersight Cloud Orchestrator (ICO) enables administrators to allocate a VMFS datastore from system-defined workflow New VMFS Datastore, this single workflow is a combination of tasks that carves the virtual volume from an existing pool, adds LUN paths to a single host in a cluster with an associated LUN ID, and then onboards the datastore within VMware vCenter to the selected host. After the initial datastore has been mounted, administrators can use the ICO workflow output logs to identify the volume backing the datastore, after identified administrators must use ICO task New Storage LUN ID to allocate to other hosts within the desired cluster and any other multipaths required. A storage rescan from the ESXi host will be required.

Procedure 1. Use the New VMFS Datastore from the system-defined workflow

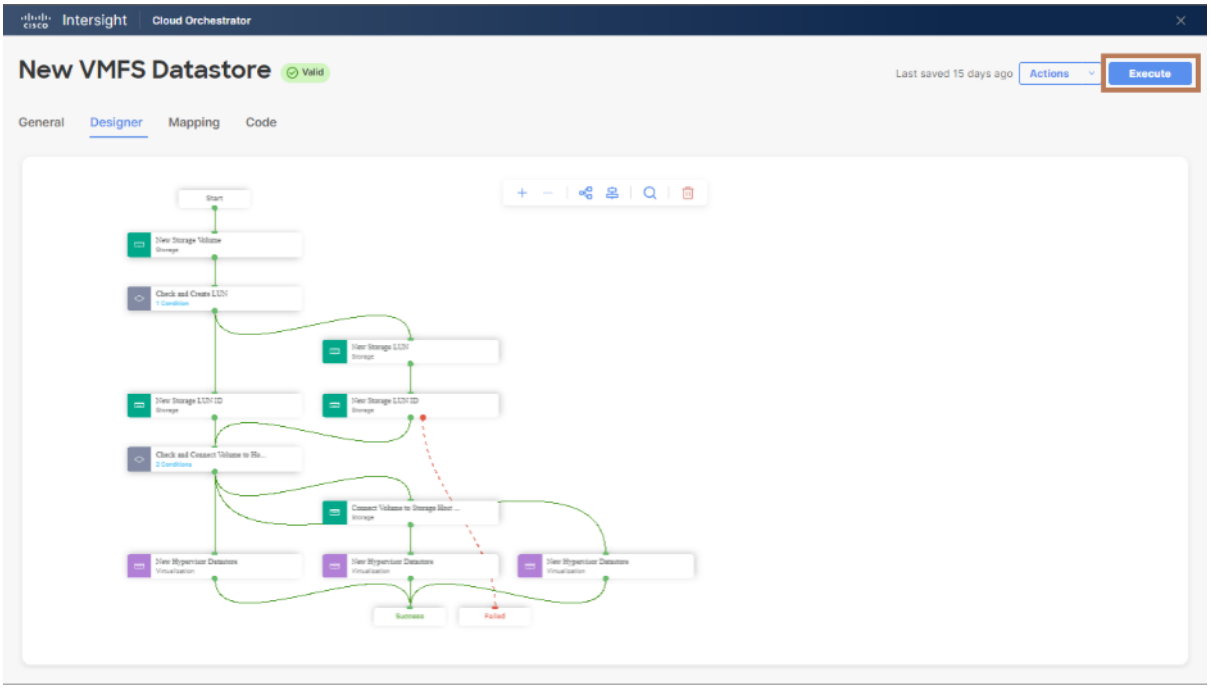
Step 1. Select **Cloud Orchestrator** from the system drop-down list, click **Workflows**, and click **Sample Workflows** tab.



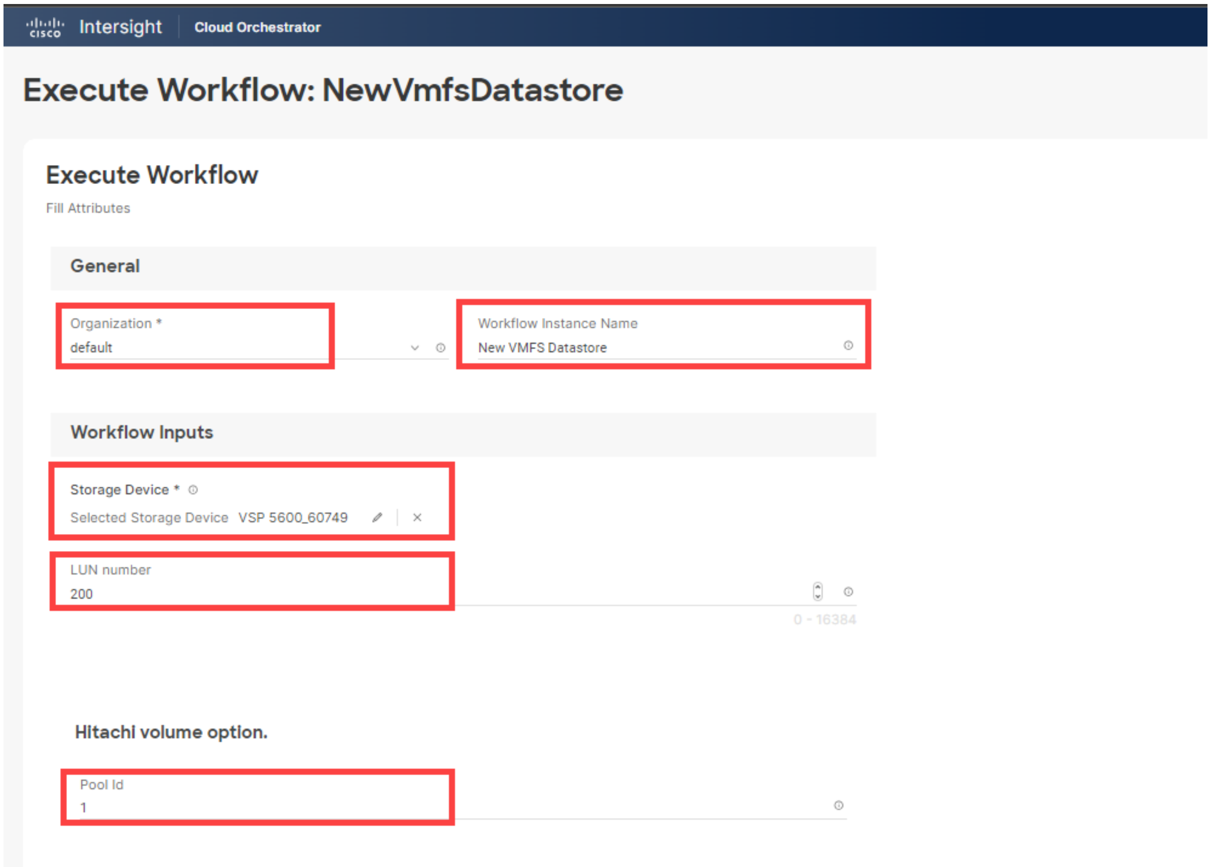
	Display Name	Descri...	Defaul...	Executions	Last Executi...	Last Executi...	Failed/...	Validat...	Last Update
☑	New VMFS Datastore	Create a st...	5	0	-	-	Disabled	Valid	Dec 7, 2023...
□	New Virtual Machine	Create a ne...	1	0	-	-	Disabled	Valid	Dec 7, 2023...
□	New Storage Virtual Machine	Create a st...	1	0	-	-	Disabled	Valid	Dec 7, 2023...
□	New Storage Interface	Create a st...	1	0	-	-	Disabled	Valid	Dec 7, 2023...
□	New Storage Host Group	Create a ne...	2	0	-	-	Disabled	Valid	Dec 7, 2023...
□	New Storage Host	Create a ne...	4	0	-	-	Disabled	Valid	Dec 7, 2023...
□	New NAS Datastore	Create a NF...	1	0	-	-	Disabled	Valid	Dec 7, 2023...
□	New Storage Export Policy	Create a st...	1	0	-	-	Disabled	Valid	Dec 7, 2023...
□	Update Terraform Variables	Updates va...	1	0	-	-	Disabled	Valid	Nov 30, 20...
□	Start New Terraform Plan	Starts a pla...	1	0	-	-	Disabled	Valid	Nov 30, 20...

Selected 1 of 28 Show Selected Unselect All 2 of 3

Step 2. From the predefined list, select **New VMFS Datastore.** Click **Execute.**



Step 3. From the Workflow Input wizard, select the **Storage Device**, **LUN ID**, **Volume Label**, **Data Reduction Mode**, **Volume Size and Unit**, **Storage Host (Host Group)**, **Port ID**, **Host Group Number**, **Hypervisor Manager**, **Data Center**, **Cluster**, **Host**, **Datastore Name**, and **Datastore Type**. Click **Execute**.



Execute Workflow: NewVmfsDatastore

Execute Workflow

Fill Attributes

General

Organization * default

Workflow Instance Name New VMFS Datastore

Workflow Inputs

Storage Device *

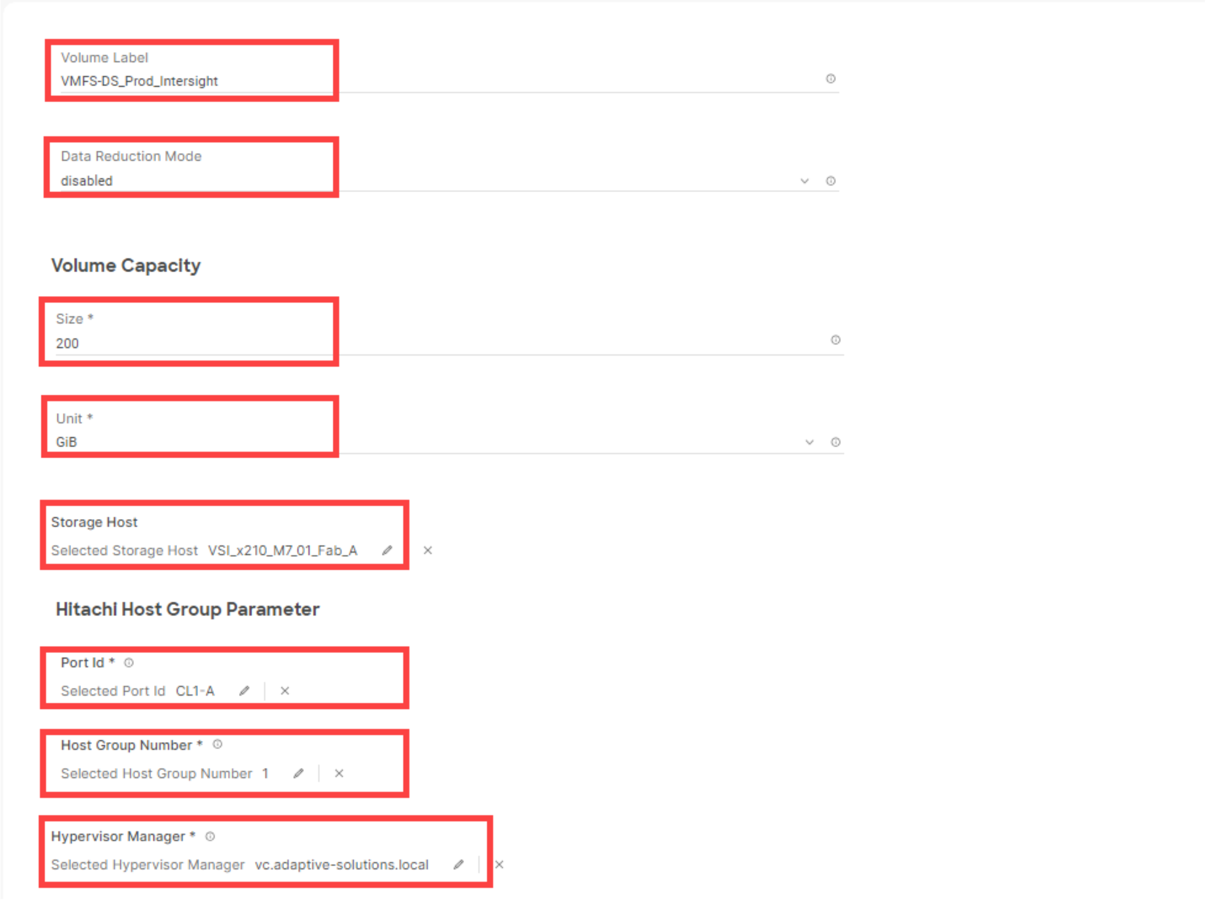
Selected Storage Device VSP 5600_60749

LUN number 200

0 - 16384

Hitachi volume option.

Pool Id 1



Volume Label
VMFS-DS_Prod_Intersight

Data Reduction Mode
disabled

Volume Capacity

Size *
200

Unit *
GiB

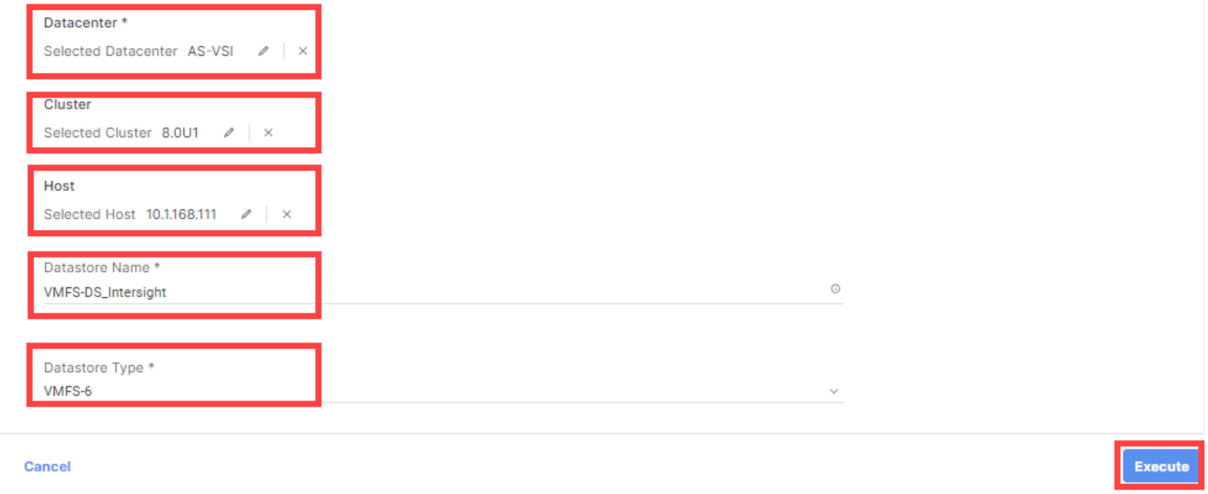
Storage Host
Selected Storage Host VSI_x210_M7_01_Fab_A

Hitachi Host Group Parameter

Port Id *
Selected Port Id CL1-A

Host Group Number *
Selected Host Group Number 1

Hypervisor Manager *
Selected Hypervisor Manager vc.adaptive-solutions.local



Datacenter *
Selected Datacenter AS-VSI

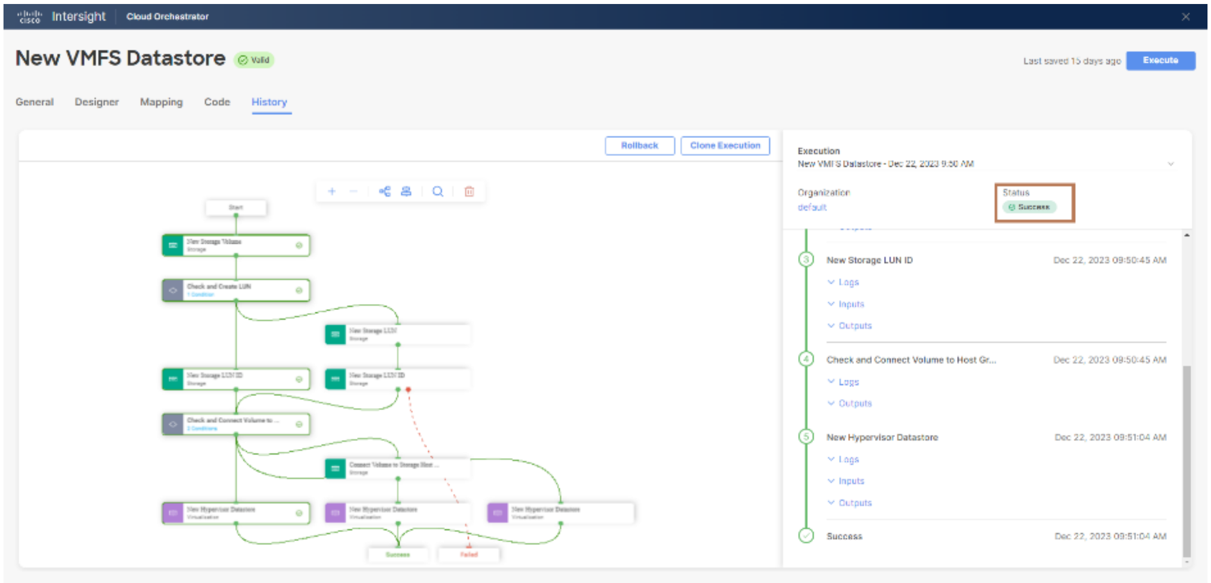
Cluster
Selected Cluster 8.0U1

Host
Selected Host 10.1.168.111

Datastore Name *
VMFS-DS_Intersight

Datastore Type *
VMFS-6

If input parameters are correct, ICO displays Success after the task is complete:



Execution
New VMFS Datastore - Dec 22, 2023 9:50 AM

Organization: default
Status: Success

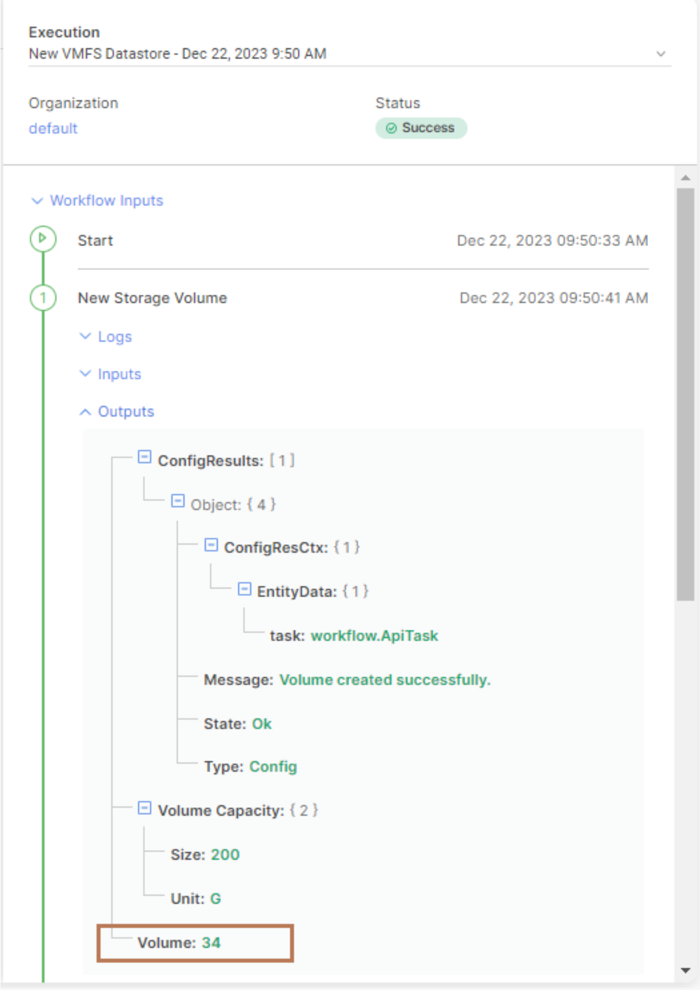
3 New Storage LUN ID — Dec 22, 2023 09:50:45 AM
- Logs
- Inputs
- Outputs

4 Check and Connect Volume to Host Gr... — Dec 22, 2023 09:50:45 AM
- Logs
- Outputs

5 New Hypervisor Datastore — Dec 22, 2023 09:51:04 AM
- Logs
- Inputs
- Outputs

Success — Dec 22, 2023 09:51:04 AM

Step 4. After the task is complete, expand **New Storage Volume Task** > **Outputs** to view the created LDEV ID in decimal:



Execution
New VMFS Datastore - Dec 22, 2023 9:50 AM

Organization: default
Status: Success

Workflow Inputs

Start — Dec 22, 2023 09:50:33 AM

1 New Storage Volume — Dec 22, 2023 09:50:41 AM
- Logs
- Inputs
- Outputs

```
ConfigResults: [ 1 ]
  Object: { 4 }
    ConfigResCtx: { 1 }
      EntityData: { 1 }
        task: workflow.ApiTask
    Message: Volume created successfully.
    State: Ok
    Type: Config
  Volume Capacity: { 2 }
    Size: 200
    Unit: G
  Volume: 34
```

If multipathing or any other pathing to additional hosts is required, administrators are required to use New Storage LUN ID as explained in the VSP with Cisco Intersight Cloud Orchestrator best practices guide: https://www.hitachivantara.com/en-us/pdfd/architecture-guide/vsp-with-cisco-intersight-cloud-orchestrator.pdf to allocate the volume to other hosts. A manual HBA rescan from the host is required to discover VMFS datastore after allocation is complete.

MDS Configurations used in this validation

MDS A Configuration

```
version 9.3(2)
power redundancy-mode redundant
license smart transport smart
system default switchport mode F
feature fport-channel-trunk
feature nxapi
role name default-role
  description This is a system defined role and applies to all users.
  rule 5 permit show feature environment
  rule 4 permit show feature hardware
  rule 3 permit show feature module
  rule 2 permit show feature snmp
  rule 1 permit show feature system
username admin password 5 $5$Wor/sHUt$qlWc3XEUwEufzrMpHVwPdQdWeOgOmlBQ0aoP0sAPE61  role network-admin
username svc-nxcloud password 5 !  role network-admin
username svc-nxcloud passphrase  lifetime 99999 warntime 14 gracetime 3
username snmpadmin password 5 $5$I87vpH8F$Nxo6Ss6qcqiq2Yt5nwjsdydxgV3KBdrKYI2et7wTro.  role network-admin
username snmpadmin passphrase  lifetime 99999 warntime 14 gracetime 3
ip domain-lookup
ip domain-name adaptive-solutions.local
ip name-server 192.168.160.53
ip host AA21-9124V-1  192.168.168.15
aaa group server radius radius
snmp-server contact vsiuser@adaptive-solutions.local
snmp-server user admin network-admin auth md5 0xe4c3b09168f2dc77ecb2ee99b1425233 priv aes-128 0xe4c3b09168
f2dc77ecb2ee99b1425233 localizedkey
snmp-server user snmpadmin network-admin auth sha 0x257e997f8e55f3c21deab856dc2bdc7bf6a7fa36 priv aes-128
0x257e997f8e55f3c21deab856dc2bdc7bf6a7fa36 localizedkey
snmp-server host 192.168.168.92 traps version 2c public udp-port 2162
snmp-server host 192.168.168.94 traps version 2c public udp-port 2162
rmon event 1 log trap public description FATAL(1) owner PMON@FATAL
rmon event 2 log trap public description CRITICAL(2) owner PMON@CRITICAL
rmon event 3 log trap public description ERROR(3) owner PMON@ERROR
rmon event 4 log trap public description WARNING(4) owner PMON@WARNING
rmon event 5 log trap public description INFORMATION(5) owner PMON@INFO

port-monitor name fabricmon_edge_policy
  logical-type edge
  counter link-loss poll-interval 30 delta rising-threshold 5 event 4 falling-threshold 1 event 4 alerts s
yslog rmon portguard FPIN
  counter sync-loss poll-interval 30 delta rising-threshold 5 event 4 falling-threshold 1 event 4 alerts s
yslog rmon portguard FPIN
  counter signal-loss poll-interval 30 delta rising-threshold 5 event 4 falling-threshold 1 event 4 alerts
 syslog rmon portguard FPIN
  counter invalid-words poll-interval 30 delta rising-threshold 1 event 4 falling-threshold 0 event 4 aler
ts syslog rmon portguard FPIN
  counter invalid-crc poll-interval 30 delta rising-threshold 5 event 4 falling-threshold 1 event 4 alerts
 syslog rmon portguard FPIN
  counter state-change poll-interval 60 delta rising-threshold 5 event 4 falling-threshold 0 event 4 alert
s syslog rmon
  counter tx-discards poll-interval 60 delta rising-threshold 200 event 4 falling-threshold 10 event 4 ale
rts syslog rmon
  counter lr-rx poll-interval 60 delta rising-threshold 5 event 4 falling-threshold 1 event 4 alerts syslo
g rmon
  counter lr-tx poll-interval 60 delta rising-threshold 5 event 4 falling-threshold 1 event 4 alerts syslo
g rmon
```

```
  counter timeout-discards poll-interval 60 delta rising-threshold 200 event 4 falling-threshold 10 event
4 alerts syslog rmon
  counter credit-loss-reco poll-interval 1 delta rising-threshold 1 event 4 falling-threshold 0 event 4 al
erts syslog rmon
  counter tx-credit-not-available poll-interval 1 delta rising-threshold 10 event 4 falling-threshold 0 ev
ent 4 alerts syslog rmon
  counter rx-datarate poll-interval 10 delta rising-threshold 80 event 4 falling-threshold 70 event 4 aler
ts syslog rmon obfl
  counter tx-datarate poll-interval 10 delta rising-threshold 80 event 4 falling-threshold 70 event 4 aler
ts syslog rmon obfl
  no monitor counter err-pkt-from-port
  no monitor counter err-pkt-to-xbar
  no monitor counter err-pkt-from-xbar
  counter tx-slowport-oper-delay poll-interval 1 absolute rising-threshold 50 event 4 falling-threshold 0
event 4 alerts syslog rmon
  counter txwait poll-interval 1 delta rising-threshold 30 event 4 falling-threshold 10 event 4 alerts sys
log rmon portguard FPIN
  counter txwait warning-signal-threshold 40 alarm-signal-threshold 60 portguard congestion-signals
  no monitor counter sfp-tx-power-low-warn
  no monitor counter sfp-rx-power-low-warn
  counter rx-datarate-burst poll-interval 10 delta rising-threshold 5 event 4 falling-threshold 1 event 4
alerts syslog rmon obfl datarate 90
  counter tx-datarate-burst poll-interval 10 delta rising-threshold 5 event 4 falling-threshold 1 event 4
alerts syslog rmon obfl datarate 90
  counter input-errors poll-interval 60 delta rising-threshold 5 event 4 falling-threshold 1 event 4 alert
s syslog rmon
callhome
  email-contact rci@cisco.com
  destination-profile xml transport-method http
  destination-profile xml email-addr sl-sch-test@cisco.com
  destination-profile xml email-addr rci@cisco.com
  destination-profile xml http https://tools.cisco.com/its/service/oddce/services/DDCEService
  enable
ntp server 192.168.168.254
vsan database
  vsan 101 name "Fabric-A"
device-alias database
  device-alias name AA21-esxi-1 pwwn 20:00:00:25:b5:21:0a:00
  device-alias name AA21-esxi-2 pwwn 20:00:00:25:b5:21:0a:02
  device-alias name AA21-esxi-3 pwwn 20:00:00:25:b5:21:0a:04
  device-alias name AA21-esxi-4 pwwn 20:00:00:25:b5:21:0a:06
  device-alias name AA21-esxi-5 pwwn 20:00:00:25:b5:21:0a:08
  device-alias name AA21-esxi-6 pwwn 20:00:00:25:b5:21:0a:0a
  device-alias name AA22-5600-0-1a pwwn 50:06:0e:80:08:ed:4d:00
  device-alias name AA22-5600-1-2a pwwn 50:06:0e:80:08:ed:4d:10
  device-alias name AA21-esxi-1-fc-nvme pwwn 20:00:00:25:b5:21:0a:01
  device-alias name AA21-esxi-2-fc-nvme pwwn 20:00:00:25:b5:21:0a:03
  device-alias name AA21-esxi-3-fc-nvme pwwn 20:00:00:25:b5:21:0a:05
  device-alias name AA21-esxi-4-fc-nvme pwwn 20:00:00:25:b5:21:0a:07
  device-alias name AA21-esxi-5-fc-nvme pwwn 20:00:00:25:b5:21:0a:09
  device-alias name AA21-esxi-6-fc-nvme pwwn 20:00:00:25:b5:21:0a:0b
  device-alias name AA22-5600-0-1b-fc-nvme pwwn 50:06:0e:80:08:ed:4d:01
  device-alias name AA22-5600-1-2b-fc-nvme pwwn 50:06:0e:80:08:ed:4d:11

device-alias commit

fcdomain fcid database
  vsan 1 wwn 50:06:0e:80:08:ed:4d:10 fcid 0x0e0000 dynamic
    !        [AA22-5600-1-2a]
  vsan 1 wwn 50:06:0e:80:08:ed:4d:11 fcid 0x0e0020 dynamic
    !        [AA22-5600-1-2b-fc-nvme]
  vsan 1 wwn 50:06:0e:80:08:ed:4d:00 fcid 0x0e0040 dynamic
    !        [AA22-5600-0-1a]
  vsan 1 wwn 50:06:0e:80:08:ed:4d:01 fcid 0x0e0060 dynamic
    !        [AA22-5600-0-1b-fc-nvme]
  vsan 101 wwn 50:06:0e:80:08:ed:4d:10 fcid 0xcc0000 dynamic
    !          [AA22-5600-1-2a]
  vsan 101 wwn 50:06:0e:80:08:ed:4d:11 fcid 0xcc0020 dynamic
    !          [AA22-5600-1-2b-fc-nvme]
  vsan 101 wwn 50:06:0e:80:08:ed:4d:00 fcid 0xcc0040 dynamic
    !          [AA22-5600-0-1a]
  vsan 101 wwn 50:06:0e:80:08:ed:4d:01 fcid 0xcc0060 dynamic
    !          [AA22-5600-0-1b-fc-nvme]
  vsan 101 wwn 24:01:00:08:31:33:76:7c fcid 0xcc0080 dynamic
  vsan 101 wwn 20:00:00:25:b5:21:0a:00 fcid 0xcc0081 dynamic
    !          [AA21-esxi-1]
  vsan 101 wwn 20:00:00:25:b5:21:0a:02 fcid 0xcc0082 dynamic
    !          [AA21-esxi-2]
  vsan 101 wwn 20:00:00:25:b5:21:0a:04 fcid 0xcc0083 dynamic
    !          [AA21-esxi-3]
  vsan 101 wwn 20:00:00:25:b5:21:0a:06 fcid 0xcc0084 dynamic
    !          [AA21-esxi-4]
  vsan 101 wwn 24:65:00:08:31:33:76:7c fcid 0xcc0085 dynamic
  vsan 101 wwn 20:00:00:25:b5:21:0a:01 fcid 0xcc0086 dynamic
    !          [AA21-esxi-1-fc-nvme]
  vsan 101 wwn 20:00:00:25:b5:21:0a:03 fcid 0xcc0087 dynamic
    !          [AA21-esxi-2-fc-nvme]
  vsan 101 wwn 20:00:00:25:b5:21:0a:05 fcid 0xcc0088 dynamic
    !          [AA21-esxi-3-fc-nvme]
  vsan 101 wwn 20:00:00:25:b5:21:0a:07 fcid 0xcc0089 dynamic
    !          [AA21-esxi-4-fc-nvme]
  vsan 101 wwn 20:00:00:25:b5:21:0a:0a fcid 0xcc008a dynamic
    !          [AA21-esxi-6]
  vsan 101 wwn 20:00:00:25:b5:21:0a:08 fcid 0xcc008b dynamic
    !          [AA21-esxi-5]
  vsan 101 wwn 20:00:00:25:b5:21:0a:09 fcid 0xcc008c dynamic
    !          [AA21-esxi-5-fc-nvme]
  vsan 101 wwn 20:00:00:25:b5:21:0a:0b fcid 0xcc008d dynamic
    !          [AA21-esxi-6-fc-nvme]
system default zone distribute full
zone smart-zoning enable vsan 101
zoneset distribute full vsan 101
!Active Zone Database Section for vsan 101
zone name FC-AA22-5600 vsan 101
    member device-alias AA21-esxi-1 init
    member device-alias AA21-esxi-2 init
    member device-alias AA21-esxi-3 init
    member device-alias AA21-esxi-4 init
    member device-alias AA22-5600-0-1a target
    member device-alias AA22-5600-1-2a target
    member device-alias AA21-esxi-5 init
    member device-alias AA21-esxi-6 init

zone name FC-NVMe-AA22-5600 vsan 101
    member device-alias AA21-esxi-1-fc-nvme init
    member device-alias AA21-esxi-2-fc-nvme init
    member device-alias AA21-esxi-3-fc-nvme init
    member device-alias AA21-esxi-4-fc-nvme init
    member device-alias AA22-5600-0-1b-fc-nvme target
    member device-alias AA22-5600-1-2b-fc-nvme target
    member device-alias AA21-esxi-5-fc-nvme init
    member device-alias AA21-esxi-6-fc-nvme init

zoneset name Fabric-A vsan 101
    member FC-AA22-5600
    member FC-NVMe-AA22-5600

zoneset activate name Fabric-A vsan 101
do clear zone database vsan 101
!Full Zone Database Section for vsan 101
zone name FC-AA22-5600 vsan 101
    member device-alias AA21-esxi-1 init
    member device-alias AA21-esxi-2 init
    member device-alias AA21-esxi-3 init
    member device-alias AA21-esxi-4 init
    member device-alias AA22-5600-0-1a target
    member device-alias AA22-5600-1-2a target
    member device-alias AA21-esxi-5 init
    member device-alias AA21-esxi-6 init

zone name FC-NVMe-AA22-5600 vsan 101
    member device-alias AA21-esxi-1-fc-nvme init
    member device-alias AA21-esxi-2-fc-nvme init
    member device-alias AA21-esxi-3-fc-nvme init
    member device-alias AA21-esxi-4-fc-nvme init
    member device-alias AA22-5600-0-1b-fc-nvme target
    member device-alias AA22-5600-1-2b-fc-nvme target
    member device-alias AA21-esxi-5-fc-nvme init
    member device-alias AA21-esxi-6-fc-nvme init

zoneset name Fabric-A vsan 101
    member FC-AA22-5600
    member FC-NVMe-AA22-5600



interface mgmt0
  ip address 192.168.168.15 255.255.255.0

interface port-channel101
  switchport trunk allowed vsan 101
  switchport description AA21-6536-A
  switchport speed 32000
  switchport rate-mode dedicated
vsan database
  vsan 101 interface port-channel101
  vsan 101 interface fc1/5
  vsan 101 interface fc1/6
  vsan 101 interface fc1/7
  vsan 101 interface fc1/8
clock timezone EST -5 0
clock summer-time EDT 2 Sunday March 02:00 1 Sunday November 02:00 60
switchname AA21-9124V-1
no terminal log-all
line console
line vty
boot kickstart bootflash:/m9124v-s8ek9-kickstart-mz-npe.9.3.2.bin
boot system bootflash:/m9124v-s8ek9-mz-npe.9.3.2.bin
interface fc1/5
  switchport speed 32000
interface fc1/6
  switchport speed 32000
interface fc1/7
  switchport speed 32000
interface fc1/8
  switchport speed 32000
interface fc1/1
  switchport speed 32000
interface fc1/2
  switchport speed 32000
interface fc1/3
  switchport speed 32000
interface fc1/4
  switchport speed 32000
interface fc1/9
interface fc1/10
interface fc1/11
interface fc1/12
interface fc1/13
interface fc1/14
interface fc1/15
interface fc1/16
interface fc1/17
interface fc1/18
interface fc1/19
interface fc1/20
interface fc1/21
interface fc1/22
interface fc1/23
interface fc1/24
interface fc1/5
interface fc1/6
interface fc1/7
interface fc1/8
interface fc1/1
  switchport mode auto
interface fc1/2
  switchport mode auto
interface fc1/3
  switchport mode auto
interface fc1/4
  switchport mode auto

interface fc1/1
  switchport description AA21-6536-A:1/35/1
  port-license acquire
  channel-group 101 force
  no shutdown

interface fc1/2
  switchport description AA21-6536-A:1/35/2
  port-license acquire
  channel-group 101 force
  no shutdown

interface fc1/3
  switchport description AA21-6536-A:1/35/3
  port-license acquire
  channel-group 101 force
  no shutdown

interface fc1/4
  switchport description AA21-6536-A:1/35/4
  port-license acquire
  channel-group 101 force
  no shutdown

interface fc1/5
  switchport description AA22-5600-0:1a
  switchport trunk mode off
  port-license acquire
  no shutdown

interface fc1/6
  switchport description AA22-5600-0:1b
  switchport trunk mode off
  port-license acquire
  no shutdown

interface fc1/7
  switchport description AA22-5600-1:2a
  switchport trunk mode off
  port-license acquire
  no shutdown

interface fc1/8
  switchport description AA22-5600-1:2b
  switchport trunk mode off
  port-license acquire
  no shutdown

interface fc1/9

interface fc1/10

interface fc1/11
interface fc1/12

interface fc1/13

interface fc1/14

interface fc1/15

interface fc1/16

interface fc1/17

interface fc1/18

interface fc1/19

interface fc1/20

interface fc1/21

interface fc1/22

interface fc1/23

interface fc1/24
ip default-gateway 192.168.168.254
```

MDS B Configuration

```
version 9.3(2)
power redundancy-mode redundant
license smart transport smart
system default switchport mode F
feature fport-channel-trunk
feature nxapi
role name default-role
  description This is a system defined role and applies to all users.
  rule 5 permit show feature environment
  rule 4 permit show feature hardware
  rule 3 permit show feature module
  rule 2 permit show feature snmp
  rule 1 permit show feature system
username admin password 5 $5$xpHyz.ti$lUhjNr3J4er5pJ4jxl6B2hfmMV/LMGNByCUqPfu76I7  role network-admin
username svc-nxcloud password 5 !  role network-admin
username svc-nxcloud passphrase  lifetime 99999 warntime 14 gracetime 3
username snmpadmin password 5 $5$eEEDJ3ip$JCExf.xkI1G0.BN.KiM12kaRnFFpNeOeyHVUop7clC/  role network-admin
username snmpadmin passphrase  lifetime 99999 warntime 14 gracetime 3
ip domain-lookup
ip domain-name adaptive-solutions.local
ip name-server 192.168.160.53
ip host AA21-9124V-2  192.168.168.16
aaa group server radius radius
snmp-server contact vsiuser@adaptive-solutions.local
snmp-server user admin network-admin auth md5 0x7232ee5c6e9db49adebf4c33a8afd5f6 priv aes-128 0x7232ee5c6e
9db49adebf4c33a8afd5f6 localizedkey
snmp-server user snmpadmin network-admin auth sha 0x45459c8d1d3ff0ec5c89cfd138e792b8ff48967a priv aes-128
0x45459c8d1d3ff0ec5c89cfd138e792b8ff48967a localizedkey
snmp-server host 192.168.168.92 traps version 2c public udp-port 2162
snmp-server host 192.168.168.94 traps version 2c public udp-port 2162
rmon event 1 log trap public description FATAL(1) owner PMON@FATAL
rmon event 2 log trap public description CRITICAL(2) owner PMON@CRITICAL
rmon event 3 log trap public description ERROR(3) owner PMON@ERROR
rmon event 4 log trap public description WARNING(4) owner PMON@WARNING
rmon event 5 log trap public description INFORMATION(5) owner PMON@INFO

port-monitor name fabricmon_edge_policy
  logical-type edge
  counter link-loss poll-interval 30 delta rising-threshold 5 event 4 falling-threshold 1 event 4 alerts s
yslog rmon portguard FPIN
  counter sync-loss poll-interval 30 delta rising-threshold 5 event 4 falling-threshold 1 event 4 alerts s
yslog rmon portguard FPIN
  counter signal-loss poll-interval 30 delta rising-threshold 5 event 4 falling-threshold 1 event 4 alerts
 syslog rmon portguard FPIN
  counter invalid-words poll-interval 30 delta rising-threshold 1 event 4 falling-threshold 0 event 4 aler
ts syslog rmon portguard FPIN
  counter invalid-crc poll-interval 30 delta rising-threshold 5 event 4 falling-threshold 1 event 4 alerts
 syslog rmon portguard FPIN
  counter state-change poll-interval 60 delta rising-threshold 5 event 4 falling-threshold 0 event 4 alert
s syslog rmon
  counter tx-discards poll-interval 60 delta rising-threshold 200 event 4 falling-threshold 10 event 4 ale
rts syslog rmon
  counter lr-rx poll-interval 60 delta rising-threshold 5 event 4 falling-threshold 1 event 4 alerts syslo
g rmon
  counter lr-tx poll-interval 60 delta rising-threshold 5 event 4 falling-threshold 1 event 4 alerts syslo
g rmon
  counter timeout-discards poll-interval 60 delta rising-threshold 200 event 4 falling-threshold 10 event
4 alerts syslog rmon
  counter credit-loss-reco poll-interval 1 delta rising-threshold 1 event 4 falling-threshold 0 event 4 al
erts syslog rmon
  counter tx-credit-not-available poll-interval 1 delta rising-threshold 10 event 4 falling-threshold 0 ev
ent 4 alerts syslog rmon
  counter rx-datarate poll-interval 10 delta rising-threshold 80 event 4 falling-threshold 70 event 4 aler
ts syslog rmon obfl
  counter tx-datarate poll-interval 10 delta rising-threshold 80 event 4 falling-threshold 70 event 4 aler
ts syslog rmon obfl
  no monitor counter err-pkt-from-port
  no monitor counter err-pkt-to-xbar
  no monitor counter err-pkt-from-xbar
  counter tx-slowport-oper-delay poll-interval 1 absolute rising-threshold 50 event 4 falling-threshold 0
event 4 alerts syslog rmon
  counter txwait poll-interval 1 delta rising-threshold 30 event 4 falling-threshold 10 event 4 alerts sys
log rmon portguard FPIN
  counter txwait warning-signal-threshold 40 alarm-signal-threshold 60 portguard congestion-signals
  no monitor counter sfp-tx-power-low-warn
  no monitor counter sfp-rx-power-low-warn
  counter rx-datarate-burst poll-interval 10 delta rising-threshold 5 event 4 falling-threshold 1 event 4
alerts syslog rmon obfl datarate 90
  counter tx-datarate-burst poll-interval 10 delta rising-threshold 5 event 4 falling-threshold 1 event 4
alerts syslog rmon obfl datarate 90
  counter input-errors poll-interval 60 delta rising-threshold 5 event 4 falling-threshold 1 event 4 alert
s syslog rmon
callhome
  email-contact rci@cisco.com
  destination-profile xml transport-method http
  destination-profile xml email-addr sl-sch-test@cisco.com
  destination-profile xml email-addr rci@cisco.com
  destination-profile xml http https://tools.cisco.com/its/service/oddce/services/DDCEService
  enable
ntp server 192.168.168.254
vsan database
  vsan 102 name "Fabric-B"
cfs ipv4 distribute
device-alias database
  device-alias name AA21-esxi-1 pwwn 20:00:00:25:b5:21:0b:00
  device-alias name AA21-esxi-2 pwwn 20:00:00:25:b5:21:0b:02
  device-alias name AA21-esxi-3 pwwn 20:00:00:25:b5:21:0b:04
  device-alias name AA21-esxi-4 pwwn 20:00:00:25:b5:21:0b:06
  device-alias name AA21-esxi-5 pwwn 20:00:00:25:b5:21:0b:08
  device-alias name AA21-esxi-6 pwwn 20:00:00:25:b5:21:0b:0a
  device-alias name AA22-5600-0-3a pwwn 50:06:0e:80:08:ed:4d:20
  device-alias name AA22-5600-1-4a pwwn 50:06:0e:80:08:ed:4d:30
  device-alias name AA21-esxi-1-fc-nvme pwwn 20:00:00:25:b5:21:0b:01
  device-alias name AA21-esxi-2-fc-nvme pwwn 20:00:00:25:b5:21:0b:03
  device-alias name AA21-esxi-3-fc-nvme pwwn 20:00:00:25:b5:21:0b:05
  device-alias name AA21-esxi-4-fc-nvme pwwn 20:00:00:25:b5:21:0b:07
  device-alias name AA21-esxi-5-fc-nvme pwwn 20:00:00:25:b5:21:0b:09
  device-alias name AA21-esxi-6-fc-nvme pwwn 20:00:00:25:b5:21:0b:0b
  device-alias name AA22-5600-0-3b-fc-nvme pwwn 50:06:0e:80:08:ed:4d:21
  device-alias name AA22-5600-1-4b-fc-nvme pwwn 50:06:0e:80:08:ed:4d:31

device-alias commit

fcdomain fcid database
  vsan 1 wwn 50:06:0e:80:08:ed:4d:20 fcid 0x340000 dynamic
    !        [AA22-5600-0-3a]
  vsan 1 wwn 50:06:0e:80:08:ed:4d:31 fcid 0x340020 dynamic
    !        [AA22-5600-1-4b-fc-nvme]
  vsan 1 wwn 50:06:0e:80:08:ed:4d:30 fcid 0x340040 dynamic
    !        [AA22-5600-1-4a]
  vsan 1 wwn 50:06:0e:80:08:ed:4d:21 fcid 0x340060 dynamic
    !        [AA22-5600-0-3b-fc-nvme]
  vsan 102 wwn 50:06:0e:80:08:ed:4d:30 fcid 0xdd0000 dynamic
    !          [AA22-5600-1-4a]
  vsan 102 wwn 50:06:0e:80:08:ed:4d:31 fcid 0xdd0020 dynamic
    !          [AA22-5600-1-4b-fc-nvme]
  vsan 102 wwn 50:06:0e:80:08:ed:4d:20 fcid 0xdd0040 dynamic
    !          [AA22-5600-0-3a]
  vsan 102 wwn 50:06:0e:80:08:ed:4d:21 fcid 0xdd0060 dynamic
    !          [AA22-5600-0-3b-fc-nvme]
  vsan 102 wwn 24:02:00:08:31:33:75:24 fcid 0xdd0080 dynamic
  vsan 102 wwn 20:00:00:25:b5:21:0b:00 fcid 0xdd0081 dynamic
    !          [AA21-esxi-1]
  vsan 102 wwn 20:00:00:25:b5:21:0b:02 fcid 0xdd0082 dynamic
    !          [AA21-esxi-2]
  vsan 102 wwn 20:00:00:25:b5:21:0b:04 fcid 0xdd0083 dynamic
    !          [AA21-esxi-3]
  vsan 102 wwn 20:00:00:25:b5:21:0b:06 fcid 0xdd0084 dynamic
    !          [AA21-esxi-4]
  vsan 102 wwn 24:66:00:08:31:33:75:24 fcid 0xdd0085 dynamic
  vsan 102 wwn 20:00:00:25:b5:21:0b:01 fcid 0xdd0086 dynamic
    !          [AA21-esxi-1-fc-nvme]
  vsan 102 wwn 20:00:00:25:b5:21:0b:03 fcid 0xdd0087 dynamic
    !          [AA21-esxi-2-fc-nvme]
  vsan 102 wwn 20:00:00:25:b5:21:0b:05 fcid 0xdd0088 dynamic
    !          [AA21-esxi-3-fc-nvme]
  vsan 102 wwn 20:00:00:25:b5:21:0b:07 fcid 0xdd0089 dynamic
    !          [AA21-esxi-4-fc-nvme]
  vsan 102 wwn 20:00:00:25:b5:21:0b:0a fcid 0xdd008a dynamic
    !          [AA21-esxi-6]
  vsan 102 wwn 20:00:00:25:b5:21:0b:08 fcid 0xdd008b dynamic
    !          [AA21-esxi-5]
  vsan 102 wwn 20:00:00:25:b5:21:0b:09 fcid 0xdd008c dynamic
    !          [AA21-esxi-5-fc-nvme]
  vsan 102 wwn 20:00:00:25:b5:21:0b:0b fcid 0xdd008d dynamic
    !          [AA21-esxi-6-fc-nvme]
system default zone distribute full
zone smart-zoning enable vsan 102
zoneset distribute full vsan 102
!Active Zone Database Section for vsan 102
zone name FC-AA22-5600 vsan 102
    member device-alias AA21-esxi-1 init
    member device-alias AA21-esxi-2 init
    member device-alias AA21-esxi-3 init
    member device-alias AA21-esxi-4 init
    member device-alias AA22-5600-0-3a target
    member device-alias AA22-5600-1-4a target
    member device-alias AA21-esxi-5 init
    member device-alias AA21-esxi-6 init

zone name FC-NVMe-AA22-5600 vsan 102
    member device-alias AA21-esxi-1-fc-nvme init
    member device-alias AA21-esxi-2-fc-nvme init
    member device-alias AA21-esxi-3-fc-nvme init
    member device-alias AA21-esxi-4-fc-nvme init
    member device-alias AA22-5600-0-3b-fc-nvme target
    member device-alias AA22-5600-1-4b-fc-nvme target
    member device-alias AA21-esxi-5-fc-nvme init
    member device-alias AA21-esxi-6-fc-nvme init

zoneset name Fabric-B vsan 102
    member FC-AA22-5600
    member FC-NVMe-AA22-5600

zoneset activate name Fabric-B vsan 102
do clear zone database vsan 102
!Full Zone Database Section for vsan 102
zone name FC-AA22-5600 vsan 102
    member device-alias AA21-esxi-1 init
    member device-alias AA21-esxi-2 init
    member device-alias AA21-esxi-3 init
    member device-alias AA21-esxi-4 init
    member device-alias AA22-5600-0-3a target
    member device-alias AA22-5600-1-4a target
    member device-alias AA21-esxi-5 init
    member device-alias AA21-esxi-6 init

zone name FC-NVMe-AA22-5600 vsan 102
    member device-alias AA21-esxi-1-fc-nvme init
    member device-alias AA21-esxi-2-fc-nvme init
    member device-alias AA21-esxi-3-fc-nvme init
    member device-alias AA21-esxi-4-fc-nvme init
    member device-alias AA22-5600-0-3b-fc-nvme target
    member device-alias AA22-5600-1-4b-fc-nvme target
    member device-alias AA21-esxi-5-fc-nvme init
    member device-alias AA21-esxi-6-fc-nvme init

zoneset name Fabric-B vsan 102
    member FC-AA22-5600
    member FC-NVMe-AA22-5600



interface mgmt0
  ip address 192.168.168.16 255.255.255.0

interface port-channel102
  switchport trunk allowed vsan 102
  switchport description AA21-6536-B
  switchport speed 32000
  switchport rate-mode dedicated
vsan database
  vsan 102 interface port-channel102
  vsan 102 interface fc1/5
  vsan 102 interface fc1/6
  vsan 102 interface fc1/7
  vsan 102 interface fc1/8
clock timezone EST -5 0
clock summer-time EDT 2 Sunday March 02:00 1 Sunday November 02:00 60
switchname AA21-9124V-2
no terminal log-all
line console
line vty
boot kickstart bootflash:/m9124v-s8ek9-kickstart-mz-npe.9.3.2.bin
boot system bootflash:/m9124v-s8ek9-mz-npe.9.3.2.bin
interface fc1/8
  switchport speed 32000
interface fc1/1
  switchport speed 32000
interface fc1/2
  switchport speed 32000
interface fc1/3
  switchport speed 32000
interface fc1/4
  switchport speed 32000
```

```
interface fc1/5
  switchport speed 32000
interface fc1/6
  switchport speed 32000
interface fc1/7
  switchport speed 32000
interface fc1/9
interface fc1/10
interface fc1/11
interface fc1/12
interface fc1/13
interface fc1/14
interface fc1/15
interface fc1/16
interface fc1/17
interface fc1/18
interface fc1/19
interface fc1/20
interface fc1/21
interface fc1/22
interface fc1/23
interface fc1/24
interface fc1/8
interface fc1/1
  switchport mode auto
interface fc1/2
  switchport mode auto
interface fc1/3
  switchport mode auto
interface fc1/4
  switchport mode auto
interface fc1/5
  switchport mode auto
interface fc1/6
  switchport mode auto
interface fc1/7
  switchport mode auto

interface fc1/1
  switchport description AA21-6536-B:1/35/1
  port-license acquire
  channel-group 102 force
  no shutdown

interface fc1/2
  switchport description AA21-6536-B:1/35/2
  port-license acquire
  channel-group 102 force
  no shutdown

interface fc1/3
  switchport description AA21-6536-B:1/35/3
  port-license acquire
  channel-group 102 force
  no shutdown

interface fc1/4
  switchport description AA21-6536-B:1/35/4
  port-license acquire
  channel-group 102 force
  no shutdown

interface fc1/5
  switchport trunk allowed vsan 102
  switchport description AA22-5600-0:3a
  switchport trunk mode off
  port-license acquire
  no shutdown
```

```
interface fc1/6
  switchport trunk allowed vsan 102
  switchport description AA22-5600-0:3b
  switchport trunk mode off
  port-license acquire
  no shutdown

interface fc1/7
  switchport trunk allowed vsan 102
  switchport description AA22-5600-1:4a
  switchport trunk mode off
  port-license acquire
  no shutdown

interface fc1/8
  switchport description AA22-5600-1:4b
  switchport trunk mode off
  port-license acquire
  no shutdown

interface fc1/9

interface fc1/10

interface fc1/11

interface fc1/12

interface fc1/13

interface fc1/14

interface fc1/15

interface fc1/16

interface fc1/17

interface fc1/18

interface fc1/19

interface fc1/20

interface fc1/21

interface fc1/22

interface fc1/23

interface fc1/24
ip default-gateway 192.168.168.254
```

Nexus Configurations used in this validation

Nexus A Configuration

```
version 10.2(5) Bios:version 05.47
switchname AA21-93600-1
vdc AA21-93600-1 id 1
  limit-resource vlan minimum 16 maximum 4094
  limit-resource vrf minimum 2 maximum 4096
  limit-resource port-channel minimum 0 maximum 511
  limit-resource m4route-mem minimum 58 maximum 58
  limit-resource m6route-mem minimum 8 maximum 8

feature nxapi
feature bash-shell
cfs eth distribute
feature udld
feature interface-vlan
feature hsrp
feature lacp
feature vpc
feature lldp
clock summer-time EDT 2 Sunday March 02:00 1 Sunday November 02:00 60
feature telemetry

username admin password 5 $5$LPEEDD$I8n0a/ovGkzLCgIq.OQgVrhrRa5QY0xLAddG.nrCxR4  role network-admin
ip domain-lookup
ip domain-name adaptive-solutions.local
ip name-server 10.1.168.101
crypto key generate rsa label AA21-93600-1 modulus 1024
copp profile strict
snmp-server user admin network-admin auth md5 3746D2E94FC8C30BAA3BC4F3699B8E0055C6 priv aes-128 5236DEF202
969C02A212A8AE7ED6934D5F8C localizedV2key
rmon event 1 log trap public description FATAL(1) owner PMON@FATAL
rmon event 2 log trap public description CRITICAL(2) owner PMON@CRITICAL
rmon event 3 log trap public description ERROR(3) owner PMON@ERROR
rmon event 4 log trap public description WARNING(4) owner PMON@WARNING
rmon event 5 log trap public description INFORMATION(5) owner PMON@INFO
ntp peer 192.168.168.14 use-vrf management
ntp server 10.81.254.202 use-vrf management
ntp master 3
system default switchport

ip route 0.0.0.0/0 10.1.168.254
vlan 1-2,119,1000,1100-1102
vlan 2
  name native-vlan
vlan 119
  name ib-mgmt
vlan 1000
  name vmotion
vlan 1100
  name vm-traffic
vlan 1101
  name vm-traffic-a
vlan 1102
  name vm-traffic-b

spanning-tree port type edge bpduguard default
spanning-tree port type edge bpdufilter default
spanning-tree port type network default
vrf context management
  ip route 0.0.0.0/0 192.168.168.254
port-channel load-balance src-dst l4port
vpc domain 10
  peer-switch
  role priority 10
  peer-keepalive destination 192.168.168.14 source 192.168.168.13
  delay restore 150
  peer-gateway
  auto-recovery
  ip arp synchronize


interface Vlan1
  no ip redirects
  no ipv6 redirects

interface Vlan119
  no shutdown
  no ip redirects
  ip address 10.1.168.13/24
  no ipv6 redirects
```

```
interface Vlan1100
  no shutdown
  no ip redirects
  ip address 10.1.100.252/24
  no ipv6 redirects
  hsrp 100
    preempt
    ip 10.1.100.254

interface Vlan1101
  no shutdown
  ip address 10.1.101.252/24
  hsrp 101
    preempt
    priority 105
    ip 10.1.101.254

interface Vlan1102
  no shutdown
  ip address 10.1.102.252/24
  hsrp 102
    preempt
    ip 10.1.102.254

interface port-channel10
  description vPC peer-link
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119,1000,1100-1102
  spanning-tree port type network
  speed 100000
  duplex full
  no negotiate auto
  vpc peer-link

interface port-channel11
  description AA21-6536-A:Eth1/35
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119,1000,1100-1102
  spanning-tree port type edge trunk
  mtu 9216
  vpc 11

interface port-channel12
  description AA21-6536-B:Eth1/35
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119,1000,1100-1102
  spanning-tree port type edge trunk
  mtu 9216
  vpc 12

interface port-channel13
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119,1000,1100-1102
  spanning-tree port type edge trunk
  mtu 9216
  vpc 13

interface port-channel14
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119,1000,1100-1102
  spanning-tree port type edge trunk
  mtu 9216
  vpc 14
```

```
interface port-channel136
  description MGMT-Uplink
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119
  spanning-tree port type network
  mtu 9216
  vpc 136

interface Ethernet1/1
  description <ucs-domainname>-a:Eth1/35
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119,1000,1100-1102
  mtu 9216
  channel-group 11 mode active
  no shutdown

interface Ethernet1/2
  description <ucs-domainname>-b:Eth1/35
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119,1000,1100-1102
  mtu 9216
  channel-group 12 mode active
  no shutdown

interface Ethernet1/3
  description C220-M6-1 mLOM1
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119,1000,1100-1102
  mtu 9216
  channel-group 13
  no shutdown

interface Ethernet1/4
  description C220-M6-2 mLOM1
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119,1000,1100-1102
  mtu 9216
  channel-group 14
  no shutdown

interface Ethernet1/5

interface Ethernet1/6

interface Ethernet1/7

interface Ethernet1/8

interface Ethernet1/9

interface Ethernet1/10

interface Ethernet1/11

interface Ethernet1/12

interface Ethernet1/13

interface Ethernet1/14

interface Ethernet1/15

interface Ethernet1/16
interface Ethernet1/17

interface Ethernet1/18

interface Ethernet1/19

interface Ethernet1/20

interface Ethernet1/21

interface Ethernet1/22

interface Ethernet1/23

interface Ethernet1/24

interface Ethernet1/25

interface Ethernet1/26

interface Ethernet1/27

interface Ethernet1/28

interface Ethernet1/29
  description <nexus-b-hostname>:Eth1/29
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119,1000,1100-1102
  speed 100000
  duplex full
  no negotiate auto
  channel-group 10 mode active
  no shutdown

interface Ethernet1/30
  description <nexus-b-hostname>:Eth1/30
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119,1000,1100-1102
  speed 100000
  duplex full
  no negotiate auto
  channel-group 10 mode active
  no shutdown

interface Ethernet1/31

interface Ethernet1/32

interface Ethernet1/33

interface Ethernet1/34

interface Ethernet1/35

interface Ethernet1/36
  description <mgmt-uplink-switch-a-hostname>:<port>
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119
  mtu 9216
  channel-group 136 mode active
  no shutdown

interface mgmt0
  vrf member management
  ip address 192.168.168.13/24
```

```
icam monitor scale

line console
line vty
boot nxos bootflash:/nxos64-cs.10.2.5.M.bin


telemetry
  certificate /bootflash/home/admin/telemetry-cert.pem localhost
  destination-profile
  destination-group timba-653bf02b6f726134012b59a2-0
    ip address 10.1.168.99 port 443 protocol HTTP encoding JSON
  sensor-group timba-653bf02b6f726134012b59a2-0
    data-source NX-API
    path "show system resources all-modules"
  sensor-group timba-653bf02b6f726134012b59a2-1
    data-source NX-API
    path "show module"
  sensor-group timba-653bf02b6f726134012b59a2-2
    data-source NX-API
    path "show environment power"
  sensor-group timba-653bf02b6f726134012b59a2-3
    data-source NX-API
    path "show interface fc regex *"
  sensor-group timba-653bf02b6f726134012b59a2-4
    data-source DME
    path sys/ch depth 1 query-condition query-target=subtree&target-subtree-class=eqptSensor
  sensor-group timba-653bf02b6f726134012b59a2-5
    data-source DME
    path sys/ch query-condition query-target=subtree&target-subtree-class=eqptSupC
  sensor-group timba-653bf02b6f726134012b59a2-6
    data-source DME
    path sys/ch query-condition query-target=subtree&target-subtree-class=eqptFt
  sensor-group timba-653bf02b6f726134012b59a2-7
    data-source DME
    path sys/intf query-condition query-target=subtree&target-subtree-class=ethpmPhysIf filter-condition u
pdated(ethpmPhysIf.operSt)
  subscription 884
    dst-grp timba-653bf02b6f726134012b59a2-0
    snsr-grp timba-653bf02b6f726134012b59a2-0 sample-interval 300000
    snsr-grp timba-653bf02b6f726134012b59a2-1 sample-interval 300000
    snsr-grp timba-653bf02b6f726134012b59a2-2 sample-interval 300000
    snsr-grp timba-653bf02b6f726134012b59a2-3 sample-interval 300000
    snsr-grp timba-653bf02b6f726134012b59a2-4 sample-interval 300000
    snsr-grp timba-653bf02b6f726134012b59a2-5 sample-interval 300000
    snsr-grp timba-653bf02b6f726134012b59a2-6 sample-interval 300000
    snsr-grp timba-653bf02b6f726134012b59a2-7 sample-interval 0
```

Nexus B Configuration

```
version 10.2(5) Bios:version 05.47
switchname AA21-93600-2
vdc AA21-93600-2 id 1
  limit-resource vlan minimum 16 maximum 4094
  limit-resource vrf minimum 2 maximum 4096
  limit-resource port-channel minimum 0 maximum 511
  limit-resource m4route-mem minimum 58 maximum 58
  limit-resource m6route-mem minimum 8 maximum 8

feature nxapi
feature bash-shell
cfs eth distribute
feature udld
feature interface-vlan
feature hsrp
feature lacp
feature vpc
feature lldp
```

```
clock summer-time EDT 2 Sunday March 02:00 1 Sunday November 02:00 60
feature telemetry

username admin password 5 $5$FFMNLD$jleNSaBR4dYYXNIU2WFfs.2BCl8tY3v/KsG.255JE5/  role network-admin
ip domain-lookup
ip domain-name adaptive-solutions.local
ip name-server 10.1.168.101
crypto key generate rsa label AA21-93600-2 modulus 2048
copp profile strict
snmp-server user admin network-admin auth md5 3777EB3A39B7335F9884B2EB1D3FC5E6D259 priv aes-128 4962845B19
D763649384E2E05F5CDCA4DB3A localizedV2key
rmon event 1 log trap public description FATAL(1) owner PMON@FATAL
rmon event 2 log trap public description CRITICAL(2) owner PMON@CRITICAL
rmon event 3 log trap public description ERROR(3) owner PMON@ERROR
rmon event 4 log trap public description WARNING(4) owner PMON@WARNING
rmon event 5 log trap public description INFORMATION(5) owner PMON@INFO
ntp server 10.81.254.202 use-vrf management
ntp peer 192.168.168.13 use-vrf management
ntp master 3
system default switchport

ip route 0.0.0.0/0 10.1.168.254
vlan 1-2,119,1000,1100-1102
vlan 2
  name native-vlan
vlan 119
  name ib-mgmt
vlan 1000
  name vmotion
vlan 1100
  name vm-traffic
vlan 1101
  name vm-traffic-a
vlan 1102
  name vm-traffic-b

spanning-tree port type edge bpduguard default
spanning-tree port type edge bpdufilter default
spanning-tree port type network default
vrf context management
  ip route 0.0.0.0/0 192.168.168.254
port-channel load-balance src-dst l4port
vpc domain 10
  peer-switch
  role priority 20
  peer-keepalive destination 192.168.168.13 source 192.168.168.14
  delay restore 150
  peer-gateway
  auto-recovery
  ip arp synchronize


interface Vlan1
  no ip redirects
  no ipv6 redirects

interface Vlan119
  no shutdown
  no ip redirects
  ip address 10.1.168.14/24
  no ipv6 redirects

interface Vlan1100
  no shutdown
  no ip redirects
  ip address 10.1.100.253/24
  no ipv6 redirects
  hsrp 100
    preempt
    priority 105
    ip 10.1.100.254

interface Vlan1101
  no shutdown
  ip address 10.1.101.253/24
  hsrp 101
    preempt
    ip 10.1.101.254

interface Vlan1102
  no shutdown
  ip address 10.1.102.253/24
  hsrp 102
    preempt
    priority 105
    ip 10.1.102.254

interface port-channel10
  description vPC peer-link
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119,1000,1100-1102
  spanning-tree port type network
  speed 100000
  duplex full
  no negotiate auto
  vpc peer-link

interface port-channel11
  description AA21-6536-A:Eth1/36
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119,1000,1100-1102
  spanning-tree port type edge trunk
  mtu 9216
  vpc 11

interface port-channel12
  description AA21-6536-B:Eth1/36
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119,1000,1100-1102
  spanning-tree port type edge trunk
  mtu 9216
  vpc 12

interface port-channel13
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119,1000,1100-1102
  spanning-tree port type edge trunk
  mtu 9216
  vpc 13

interface port-channel14
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119,1000,1100-1102
  spanning-tree port type edge trunk
  mtu 9216
  vpc 14

interface port-channel136
  description MGMT-Uplink
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119
  spanning-tree port type network
  mtu 9216
  vpc 136

interface Ethernet1/1
  description <ucs-domainname>-a:Eth1/36
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119,1000,1100-1102
  mtu 9216
  channel-group 11 mode active
  no shutdown

interface Ethernet1/2
  description <ucs-domainname>-b:Eth1/36
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119,1000,1100-1102
  mtu 9216
  channel-group 12 mode active
  no shutdown

interface Ethernet1/3
  description C220-M6-1 mLOM2
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119,1000,1100-1102
  mtu 9216
  channel-group 13
  no shutdown

interface Ethernet1/4
  description C220-M6-2 mLOM2
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119,1000,1100-1102
  mtu 9216
  channel-group 14
  no shutdown

interface Ethernet1/5

interface Ethernet1/6

interface Ethernet1/7

interface Ethernet1/8

interface Ethernet1/9

interface Ethernet1/10

interface Ethernet1/11

interface Ethernet1/12

interface Ethernet1/13

interface Ethernet1/14

interface Ethernet1/15

interface Ethernet1/16

interface Ethernet1/17

interface Ethernet1/18

interface Ethernet1/19
interface Ethernet1/20

interface Ethernet1/21

interface Ethernet1/22

interface Ethernet1/23

interface Ethernet1/24

interface Ethernet1/25

interface Ethernet1/26

interface Ethernet1/27

interface Ethernet1/28

interface Ethernet1/29
  description <nexus-a-hostname>:Eth1/29
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119,1000,1100-1102
  speed 100000
  duplex full
  no negotiate auto
  channel-group 10 mode active
  no shutdown

interface Ethernet1/30
  description <nexus-a-hostname>:Eth1/30
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119,1000,1100-1102
  speed 100000
  duplex full
  no negotiate auto
  channel-group 10 mode active
  no shutdown

interface Ethernet1/31

interface Ethernet1/32

interface Ethernet1/33

interface Ethernet1/34

interface Ethernet1/35

interface Ethernet1/36
  description <mgmt-uplink-switch-a-hostname>:<port>
  switchport mode trunk
  switchport trunk native vlan 2
  switchport trunk allowed vlan 119
  mtu 9216
  channel-group 136 mode active
  no shutdown

interface mgmt0
  vrf member management
  ip address 192.168.168.14/24
icam monitor scale

line console
line vty
boot nxos bootflash:/nxos64-cs.10.2.5.M.bin
```

```
telemetry
  destination-profile
  destination-group timba-653bf38b6f726134012b8087-0
    ip address 10.1.168.99 port 443 protocol HTTP encoding JSON
  sensor-group timba-653bf38b6f726134012b8087-0
    data-source NX-API
    path "show system resources all-modules"
  sensor-group timba-653bf38b6f726134012b8087-1
    data-source NX-API
    path "show module"
  sensor-group timba-653bf38b6f726134012b8087-2
    data-source NX-API
    path "show environment power"
  sensor-group timba-653bf38b6f726134012b8087-3
    data-source NX-API
    path "show interface fc regex *"
  sensor-group timba-653bf38b6f726134012b8087-4
    data-source DME
    path sys/ch depth 1 query-condition query-target=subtree&target-subtree-class=eqptSensor
  sensor-group timba-653bf38b6f726134012b8087-5
    data-source DME
    path sys/ch query-condition query-target=subtree&target-subtree-class=eqptSupC
  sensor-group timba-653bf38b6f726134012b8087-6
    data-source DME
    path sys/ch query-condition query-target=subtree&target-subtree-class=eqptFt
  sensor-group timba-653bf38b6f726134012b8087-7
    data-source DME
    path sys/intf query-condition query-target=subtree&target-subtree-class=ethpmPhysIf filter-condition u
pdated(ethpmPhysIf.operSt)
  subscription 2779
    dst-grp timba-653bf38b6f726134012b8087-0
    snsr-grp timba-653bf38b6f726134012b8087-0 sample-interval 300000
    snsr-grp timba-653bf38b6f726134012b8087-1 sample-interval 300000
    snsr-grp timba-653bf38b6f726134012b8087-2 sample-interval 300000
    snsr-grp timba-653bf38b6f726134012b8087-3 sample-interval 300000
    snsr-grp timba-653bf38b6f726134012b8087-4 sample-interval 300000
    snsr-grp timba-653bf38b6f726134012b8087-5 sample-interval 300000
    snsr-grp timba-653bf38b6f726134012b8087-6 sample-interval 300000
    snsr-grp timba-653bf38b6f726134012b8087-7 sample-interval 0
  subscription 3357
    dst-grp timba-653bf38b6f726134012b8087-0
    snsr-grp timba-653bf38b6f726134012b8087-0 sample-interval 300000
    snsr-grp timba-653bf38b6f726134012b8087-1 sample-interval 300000
    snsr-grp timba-653bf38b6f726134012b8087-2 sample-interval 300000
    snsr-grp timba-653bf38b6f726134012b8087-3 sample-interval 300000
    snsr-grp timba-653bf38b6f726134012b8087-4 sample-interval 300000
    snsr-grp timba-653bf38b6f726134012b8087-5 sample-interval 300000
    snsr-grp timba-653bf38b6f726134012b8087-6 sample-interval 300000
    snsr-grp timba-653bf38b6f726134012b8087-7 sample-interval 0
```

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