White Paper

FlashStack Virtual Server Infrastructure Deployment Guide: Cisco PowerTool Addendum

February 2017

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Executive Summary

This document describes the configuration of Cisco Unified Computing System™ (Cisco UCS®) components detailed in the Cisco® Validated Design for FlashStack Virtual Server Infrastructure (VSI) design and deployment guides for VMware vSphere 6.0 U2 using cmdlets from the Cisco UCS PowerTool Suite for Microsoft PowerShell.

FlashStack VSI runs VMware vSphere using the Pure Storage FlashArray//M all-flash array, Cisco UCS, Cisco Nexus® 9000 Series Switches, and Cisco MDS 9000 Family Fibre Channel switches.

The scope of this document is limited to Cisco UCS PowerTool configuration for Cisco UCS in FlashStack VSI. For the complete FlashStack VSI deployment, see the FlashStack VSI deployment guide at http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_flashstack_vsi_vm6.html.

Introduction

Cisco and Pure Storage worked together to produce the FlashStack VSI Cisco Validated Design for VMware vSphere. The design uses best-in-class storage, server, and network components as the foundation for virtualized workloads, enabling efficient architectural designs that can be quickly and confidently deployed.

This document adds to the implementation of the FlashStack VSI a simplified option for configuring the Cisco UCS elements using the Cisco UCS Manager module of Cisco UCS PowerTool for Microsoft PowerShell. The Cisco UCS PowerTool Suite is a set of PowerShell modules that helps automate all aspects of Cisco UCS Manager, Cisco UCS Central Software, and Cisco Integrated Management Controller (IMC). It can also help automate server, network, storage, and hypervisor management.

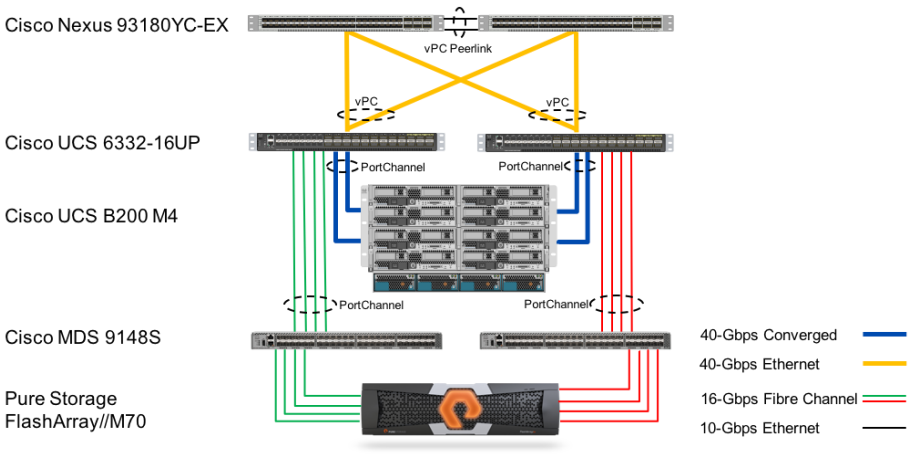
The steps presented in this document show the specific cmdlets for configuring the resources detailed in the FlashStack VSI validated designs. These cmdlet invocations can be adjusted to accommodate connectivity and component changes that differ from the equipment used in the FlashStack VSI validated designs, but details of these change options are not covered in this document and will need to be researched independently. For additional information about the Cisco UCS PowerTool Suite, including release notes and related documentation, see https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/sw/msft_tools/All_Plugin_RN/PowerTool/2x/b_Cisco_UCS_PowerTool_Suite_Release_Notes_2x.html.

FlashStack VSI Solution Overview

FlashStack Virtual Server Infrastructure is a validated reference architecture developed by Cisco and Pure Storage to serve enterprise data centers. The solution is built to deliver a VMware vSphere–based environment using the Cisco UCS platform, Cisco Nexus switches, Cisco MDS 9000 Family multilayer fabric switches, and Pure Storage FlashArray.

The architecture brings together a simple, wire-once solution that is SAN booted and highly resilient at each layer of the design. This approach creates an infrastructure that is well suited for a variety of virtual application deployments that can reliably scale when expansion is needed. **Error! Reference source not found.** shows the base physical architecture used in FlashStack VSI.

Figure 1. FlashStack with Cisco UCS 6332-16UP Fabric Extender and Pure Storage FlashArray//M70



The reference hardware configuration includes:

- Two Cisco Nexus 93180YC-EX Switches
- Two Cisco UCS 6332-16UP Fabric Interconnects
- Cisco UCS 5108 Chassis with two Cisco UCS 2304 Fabric Extenders
- Cisco UCS B200 M4 Blade Servers
- Two Cisco MDS 9148S Multilayer Fabric Switches
- Pure Storage FlashArray//M70

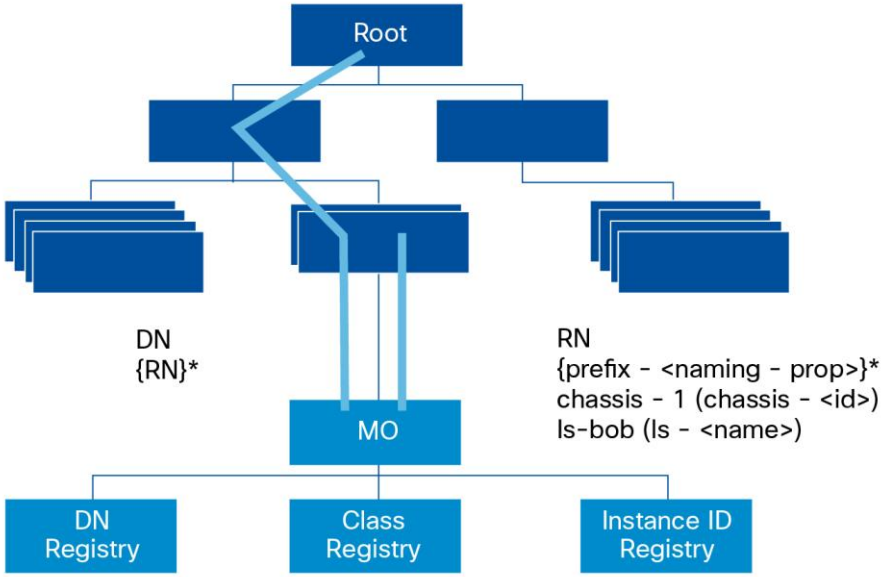
The virtual environment that this configuration supports uses VMware vSphere 6.0 U2. Virtual management and automation components from Cisco and Pure Storage can be either built in to the solution or installed as optional add-ons.

For a more thorough discussion of the design, refer to the FlashStack VSI Design Guide for VMware vSphere 6.0 U2 at http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_flashstack_vsi_vm6_designs.html.

Cisco UCS PowerTool Suite for Microsoft PowerShell

The Cisco UCS PowerTool Suite is a set of modules for Microsoft PowerShell that makes available cmdlets that can be used for Cisco UCS Manager, IMC, and Cisco UCS Central Software operations from within PowerShell. The cmdlets work within the Cisco UCS Manager management information tree (MIT), performing operations on the managed objects within the tree.

Figure 2. Cisco UCS Management Information Tree



For a more thorough discussion of the implementation, refer to the Cisco UCS Manager PowerTool User Guide at http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/sw/msft_tools/powertools/ucs_powertool_book/2x/b_Cisco_UCSM_PowerTool_UG_Release_2x/b_Cisco_UCSM_PowerTool_UG_Release_2x_chapter_00.html.

Installing Cisco UCS PowerTool

Microsoft PowerShell is required to run the Cisco UCS PowerTool cmdlets. PowerShell 3.0 can be downloaded from Microsoft at https://www.microsoft.com/en-us/download/details.aspx?id=34595.

The Cisco UCS PowerTool Suite for Microsoft PowerShell comes as a download from Cisco.com and can be found at https://software.cisco.com/download/release.html?i=!y&mdfid=286305108&softwareid=284574017&release=2.1.1.

The complete Microsoft Installer (MSI) installation package installs:

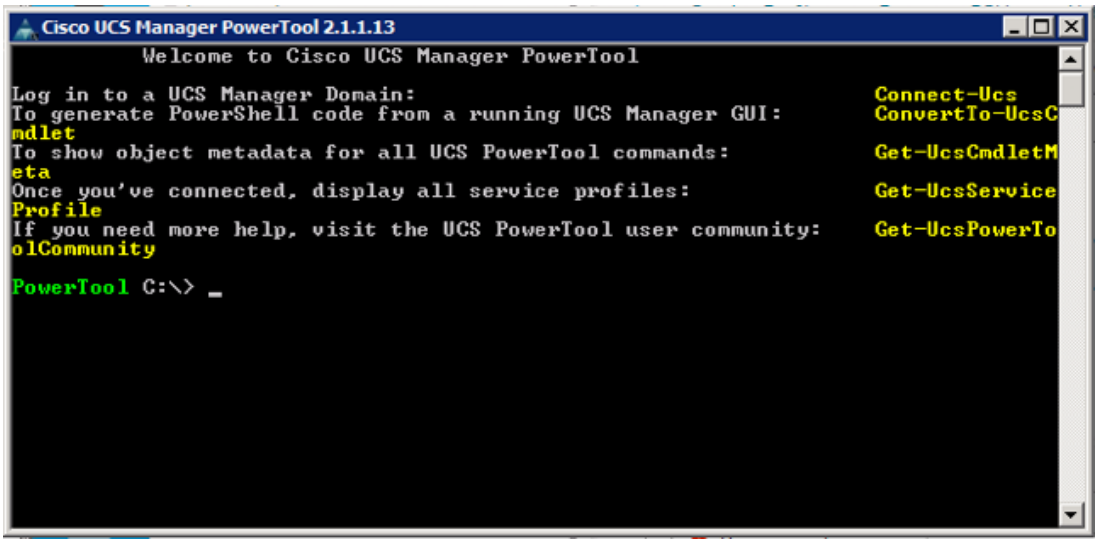
- Cisco UCS Manager PowerTool
- Cisco IMC PowerTool
- Cisco UCS Central PowerTool
- Cisco UCS Desired State Configuration (DSC) Resource

You can select the Custom installation option to install just the Cisco UCS Manager module for PowerTool, or you can select the Complete setup option to install all modules.

Using Cisco UCS PowerTool

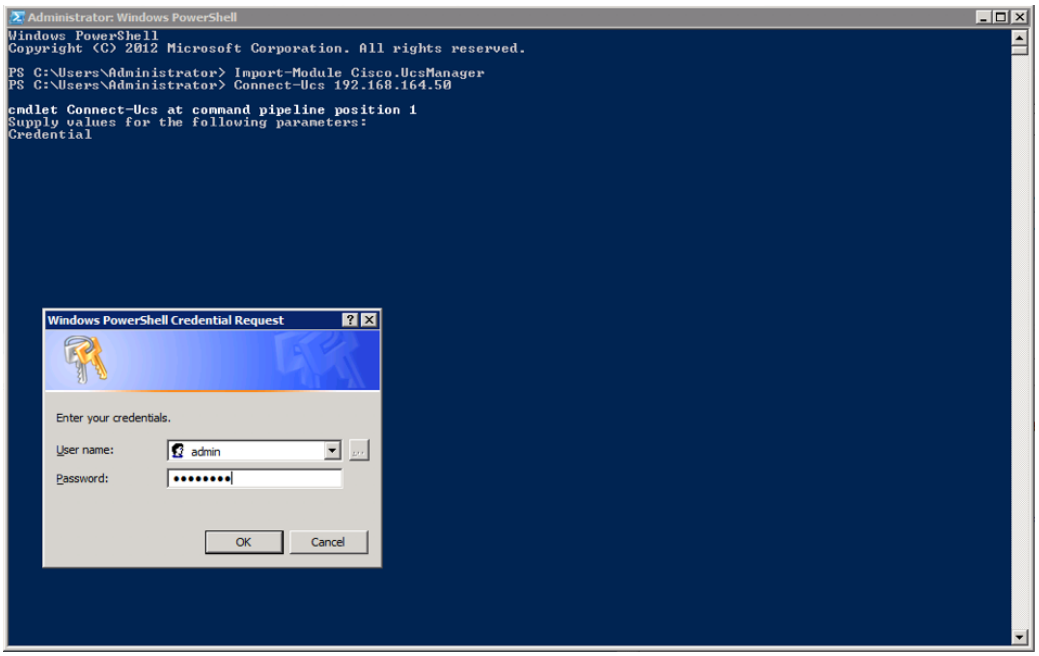
With the installation package in place, you can run cmdlets from the Cisco UCS Manager PowerTool terminal that will be installed (Figure 3).

Figure 3. Cisco UCS Manager PowerTool Terminal



However, if you prefer you can use the native Microsoft PowerShell terminal after you import the PowerTool module with the **Import-Module Cisco.UcsManager** command (Figure 4).

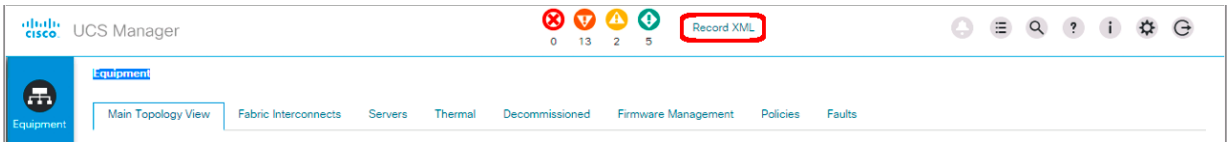
Figure 4. Microsoft PowerShell Terminal importing the Cisco UCS Manager PowerTool Module and Connecting to Cisco UCS Manager



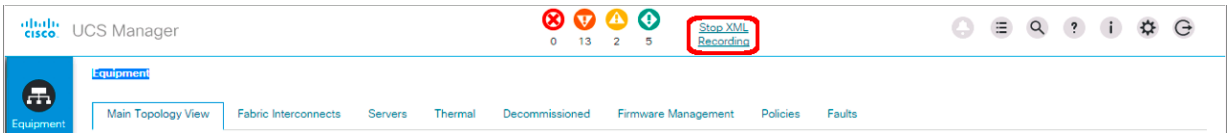
You can display a list of the cmdlets from within PowerShell by using the command **Get-Command –Module Cisco.UcsManager**. In addition, you can explore examples of use in the PowerTool user guide and samples published by at the Cisco Communities website.

A quick way to get started is to generate XML from the Cisco UCS Manager HTML interface.

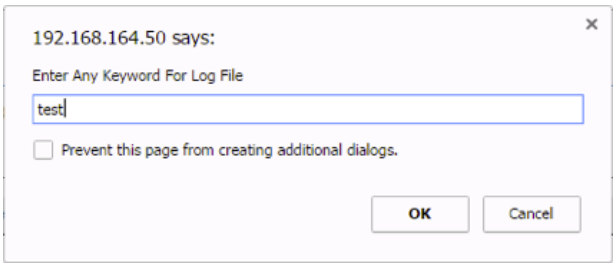
1. With the Cisco UCS Manger HTML interface open, capture the XML command by pressing the command sequence Ctrl+Alt+Q. Then click the Record XML button in Cisco UCS Manager.



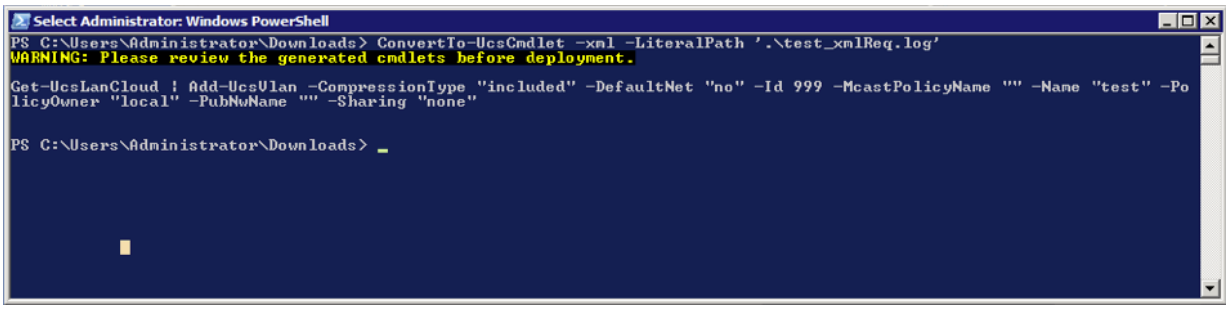
2. With the recording started, commands invoked through the Cisco UCS Manager HTML GUI will be collected as XML equivalents. To stop recording and save the commands to a file, click Stop XML Recording.



3. Stopping the recording displays a prompt asking you to name the generated XML file. Enter a keyword to name the file and then click OK to save the file.



4. The resulting XML log file will be named <keyword>_xmlReq.log. You can use it to generate the equivalent cmdlets by entering **ConvertTo-UcsCmdlet –xml –LiteralPath <XML_LogFile>**.

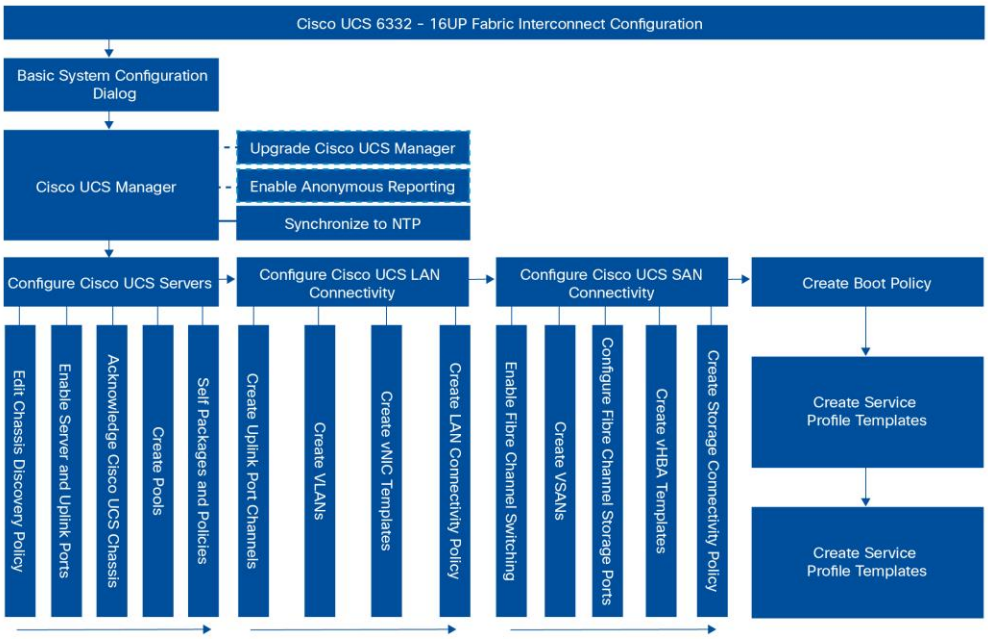


Configuring Cisco UCS in FlashStack VSI

This section presents the steps for configuring FlashStack VSI. The Cisco UCS Manager GUI configuration steps are presented first, and the equivalent PowerTool cmdlets are presented immediately following each set of instructions. These steps are appropriate for the specific physical cabling and network configuration for FlashStack VSI. They are provided as examples and will need to be adjusted if your environment differs.

This section presents the steps shown in **Error! Reference source not found.** with the exception of those for the Basic System Configuration Dialog and Upgrade Cisco UCS Manager workflows.

Figure 5. Cisco UCS Configuration Workflow from the FlashStack VSI Deployment Guide



The steps shown in **Error! Reference source not found.** will be shown with the exception of the Basic System Configuration Dialog and the Upgrade of Cisco UCS Manager. All other steps are included as follows:

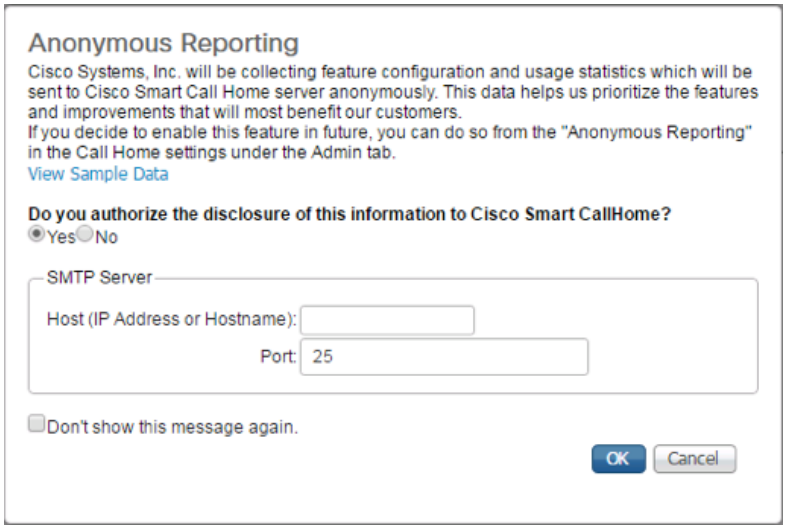
Configure Cisco UCS Manager: Initial Steps

This section presents the initial steps for configuring Cisco UCS Manager.

Configure Anonymous Reporting

When you first connect to the Cisco UCS Manager GUI, a pop-up window appears asking whether you want to allow Cisco to collect anonymous information about your use to help with future development. To configure anonymous reporting, complete the following step:

- In the Anonymous Reporting window, select Yes or No to indicate whether you want to send anonymous data to Cisco to help improve future products:



If you later want to enable or disable Anonymous Reporting, you can find the configuration in Cisco UCS Manager at Admin > Communication Management > Call Home. Click the tab at the far right for Anonymous Reporting.

PowerTool cmdlet Steps: Anonymous Reporting (Turned On)

```
Start-UcsTransaction
Add-UcsManagedObject -ModifyPresent  -ClassId CallhomeAnonymousReporting -PropertyMap
@{AdminState="on"; Dn="call-home/anonymousreporting"; }
Add-UcsManagedObject -ModifyPresent  -ClassId CallhomeSmtp -PropertyMap @{Dn="call-
home/smtp"; Host="192.168.164.25"; }
Complete-UcsTransaction
```

PowerTool cmdlet Steps: Anonymous Reporting (Turned Off)

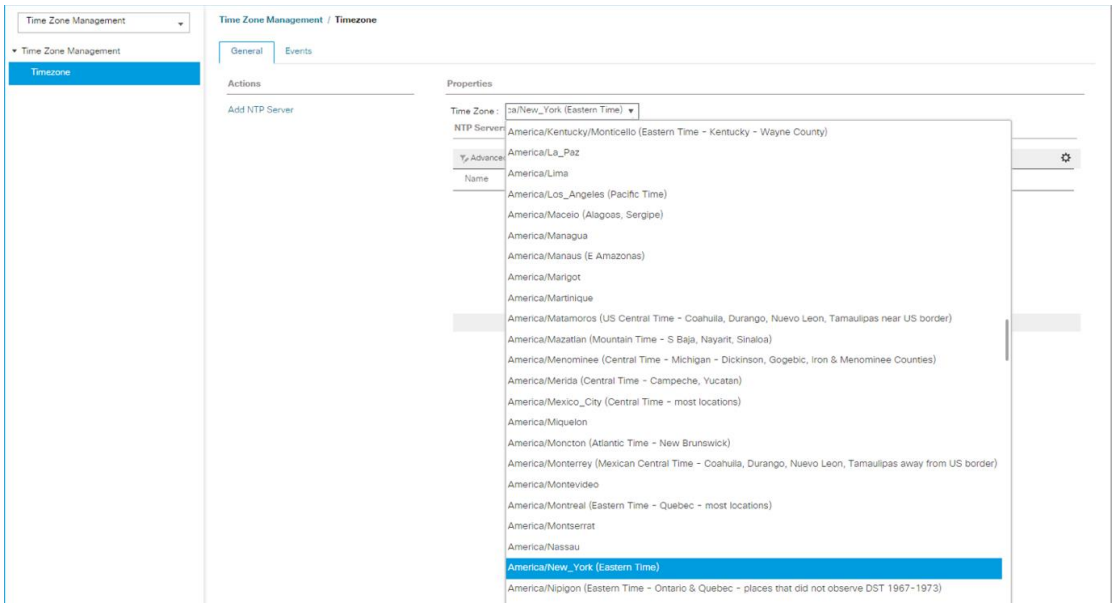
```
Add-UcsManagedObject -ModifyPresent  -ClassId CallhomeAnonymousReporting -PropertyMap
@{AdminState="off"; Dn="call-home/anonymousreporting"; }
```

Note: These cmdlets do not disable the Anonymous Reporting pop-up in the Cisco UCS Manager GUI or HTML interface. To disable the pop-up in the manager, you will need to be disable them from the Cisco UCS Manager GUI or HTML interface.

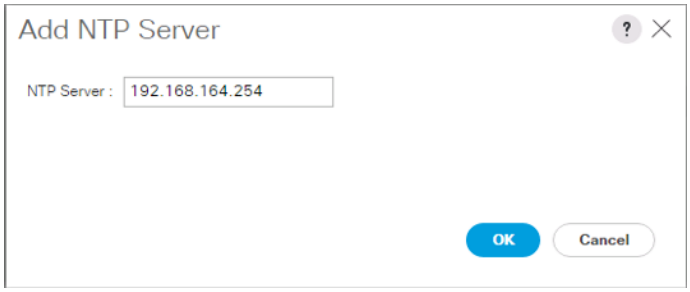
Synchronize Cisco UCS with NTP

To synchronize the Cisco UCS environment with the Network Time Protocol (NTP) server, complete the following steps:

1. In Cisco UCS Manager, click the Admin tab in the navigation pane.
2. Select All > Timezone Management.



3. In the Properties pane, select the appropriate time zone in the Timezone menu.
4. Click Save Changes and then click OK.
5. Click Add NTP Server.
6. Enter a valid NTP server address and click OK.



7. Click OK.

PowerTool cmdlet Steps: Synchronize Cisco UCS with NTP

```
Get-UcsSvcEp | Add-UcsManagedObject -ModifyPresent  -ClassId CommDateTime -
PropertyMap @{Timezone="America/New_York (Eastern Time)"; }
Get-UcsSvcEp | Get-UcsTimezone | Add-UcsNtpServer -Name "192.168.164.254"
```

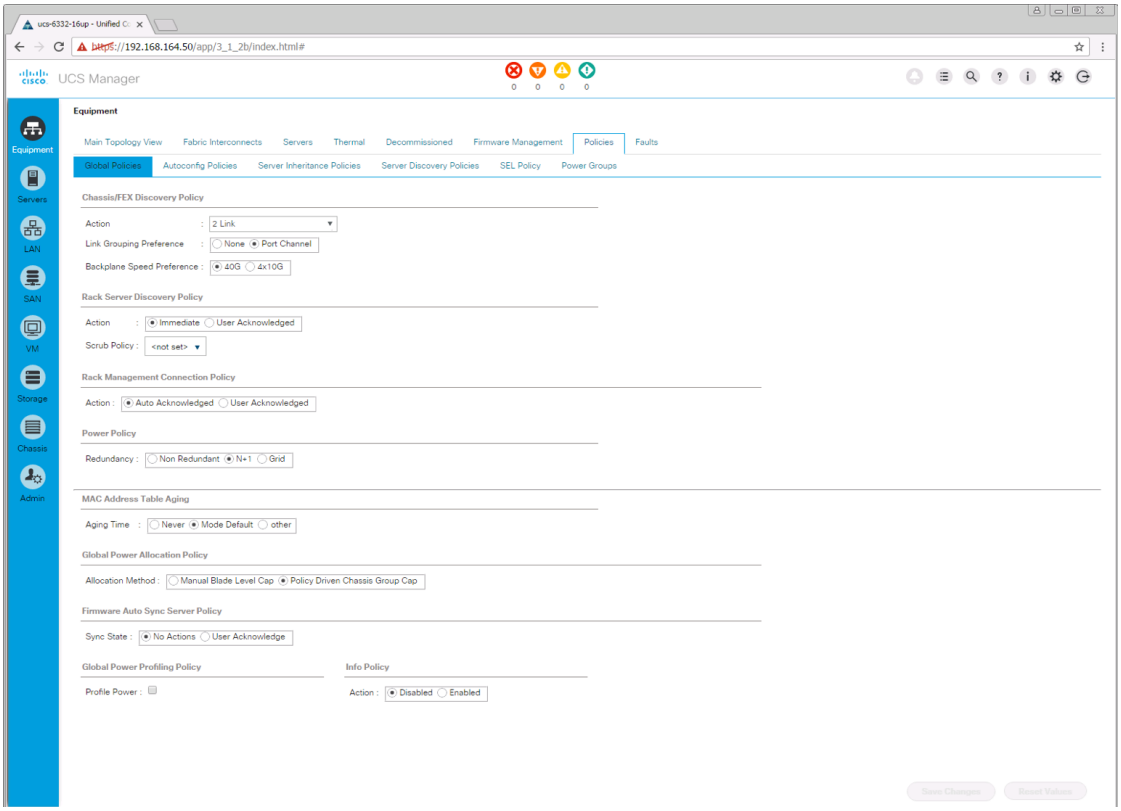
Configure Cisco UCS Servers

This section presents steps for configuring the Cisco UCS servers.

Edit Chassis Discovery Policy

Setting the discovery policy simplifies the addition of Cisco UCS B-Series Blade Server Chassis. To modify the chassis discovery policy, complete the following steps:

1. In Cisco UCS Manager, click the Equipment tab in the navigation pane and select Equipment in the list on the left under the pull-down menu.
2. In the right pane, click the Policies tab.
3. Under Global Policies, set the Chassis/FEX Discovery Policy to match the number of uplink ports that are cabled between the chassis or fabric extenders (FEXes) and the fabric interconnects.
4. Set the Link Grouping Preference to Port Channel.



5. Leave other settings alone or change if appropriate to your environment.
6. Click Save Changes.
7. Click OK.

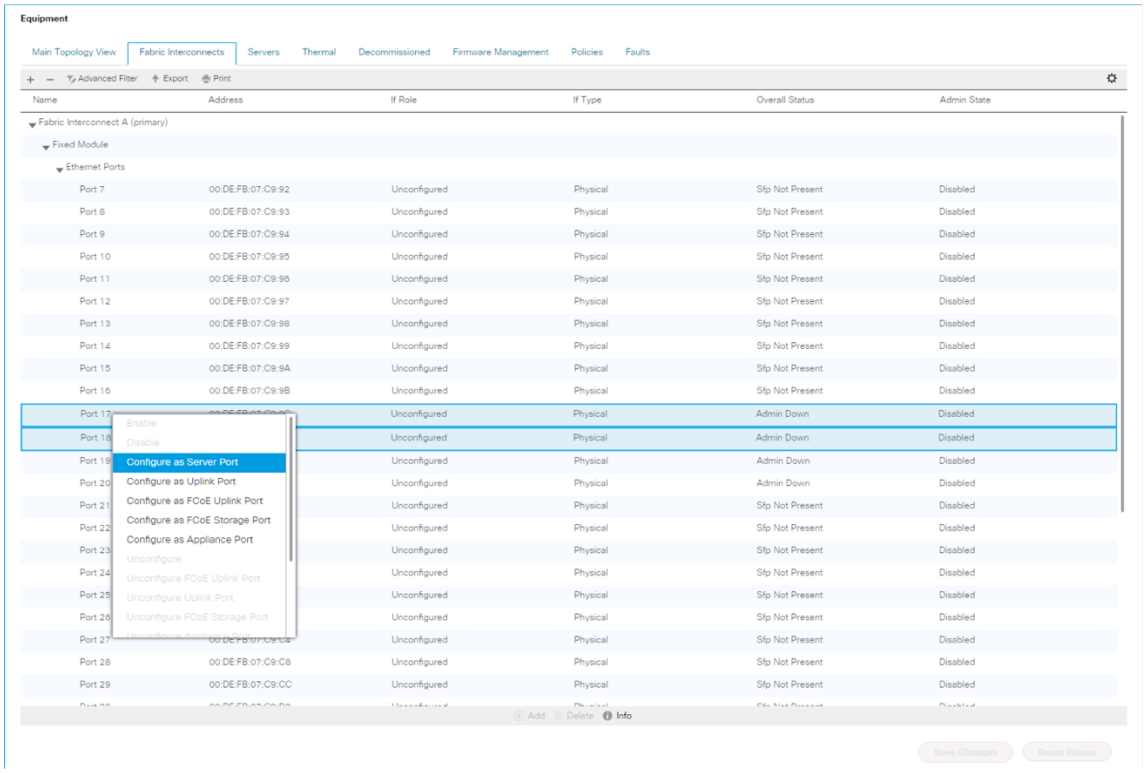
PowerTool cmdlet Steps: Edit Chassis Discovery Policy

```
Add-UcsManagedObject -ModifyPresent  -ClassId ComputeChassisDiscPolicy -
PropertyMap @{LinkAggregationPref="port-channel"; Action="2-link"; Dn="org-
root/chassis-discovery"; }
```

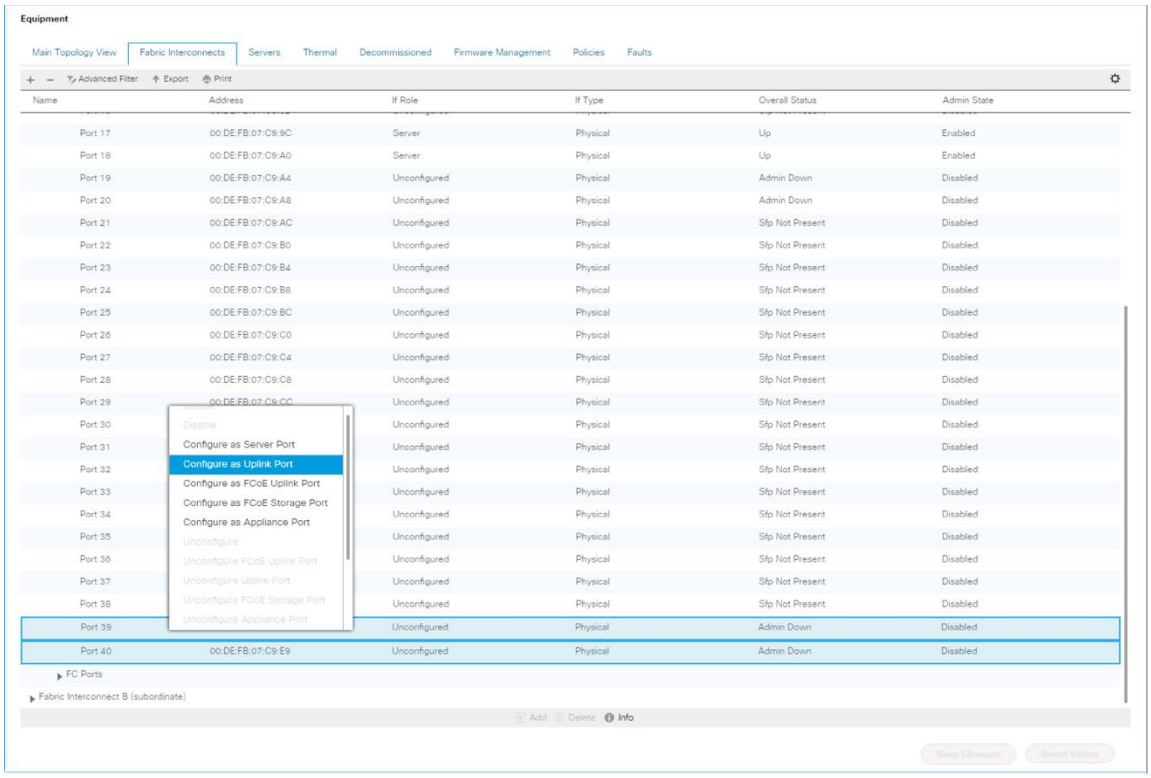
Enable Server and Uplink Ports

To enable server and uplink ports, complete the following steps:

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



5. Click Yes to confirm server ports and click OK.
6. Verify that the ports connected to the chassis are now configured as server ports.
7. Select ports 39 and 40 that are connected to the Cisco Nexus switches, right-click them, and select Configure as Uplink Port.



8. Click Yes to confirm uplink ports and click OK.
9. Select Equipment > Fabric Interconnects > Fabric Interconnect B (subordinate) > Fixed Module.
10. Expand Ethernet Ports.
11. Select the ports that are connected to the chassis, right-click them, and select Configure as Server Port.
12. Click Yes to confirm server ports and click OK.
13. Select ports 39 and 40 that are connected to the Cisco Nexus switches, right-click them, and select Configure as Uplink Port.
14. Click Yes to confirm the uplink ports and click OK.

PowerTool cmdlet Steps: Enable Server and Uplink Ports

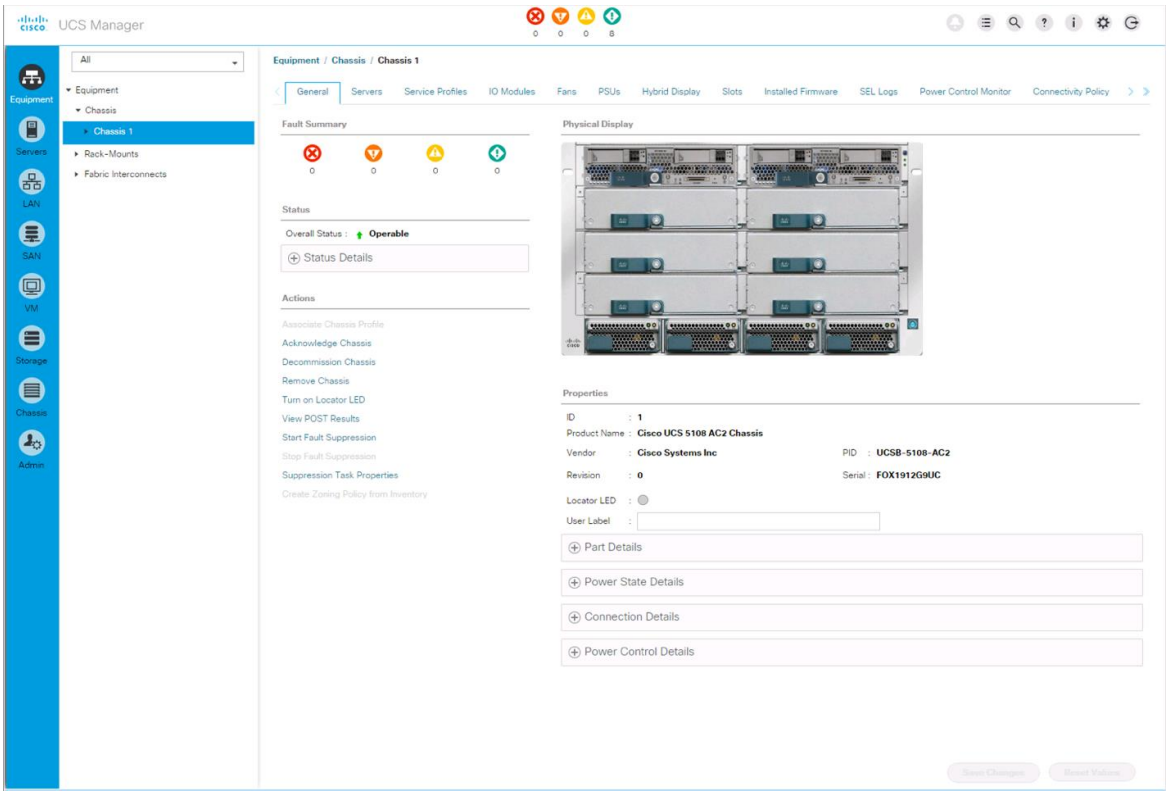
```
Start-UcsTransaction
$mo = Add-UcsManagedObject -ModifyPresent  -ClassId FabricDceSwSrv -PropertyMap
@{Id="A"; Dn="fabric/server/sw-A"; }
$mo_1 = $mo | Add-UcsServerPort -AdminState "enabled" -AutoNegotiate "yes" -Name
"" -PortId 17 -SlotId 1 -UsrLbl ""
$mo_2 = $mo | Add-UcsServerPort -AdminState "enabled" -AutoNegotiate "yes" -Name
"" -PortId 18 -SlotId 1 -UsrLbl ""
Complete-UcsTransaction


Start-UcsTransaction
$mo = Add-UcsManagedObject -ModifyPresent  -ClassId FabricEthLan -PropertyMap
@{Id="A"; Dn="fabric/lan/A"; }
$mo_1 = $mo | Add-UcsUplinkPort -ModifyPresent -AdminSpeed "10gbps" -AdminState
"enabled" -AutoNegotiate "yes" -EthLinkProfileName "default" -FlowCtrlPolicy
"default" -Name "" -PortId 39 -SlotId 1 -UsrLbl ""
```

```
$mo_2 = $mo | Add-UcsUplinkPort -ModifyPresent -AdminSpeed "10gbps" -AdminState
"enabled" -AutoNegotiate "yes" -EthLinkProfileName "default" -FlowCtrlPolicy
"default" -Name "" -PortId 40 -SlotId 1 -UsrLbl ""
Complete-UcsTransaction


Start-UcsTransaction
$mo = Add-UcsManagedObject -ModifyPresent  -ClassId FabricDceSwSrv -PropertyMap
@{Id="B"; Dn="fabric/server/sw-B"; }
$mo_1 = $mo | Add-UcsServerPort -AdminState "enabled" -AutoNegotiate "yes" -Name
"" -PortId 17 -SlotId 1 -UsrLbl ""
$mo_2 = $mo | Add-UcsServerPort -AdminState "enabled" -AutoNegotiate "yes" -Name
"" -PortId 18 -SlotId 1 -UsrLbl ""
Complete-UcsTransaction


Start-UcsTransaction
$mo = Add-UcsManagedObject -ModifyPresent  -ClassId FabricEthLan -PropertyMap
@{Id="B"; Dn="fabric/lan/B"; }
$mo_1 = $mo | Add-UcsUplinkPort -ModifyPresent -AdminSpeed "10gbps" -AdminState
"enabled" -AutoNegotiate "yes" -EthLinkProfileName "default" -FlowCtrlPolicy
"default" -Name "" -PortId 39 -SlotId 1 -UsrLbl ""
$mo_2 = $mo | Add-UcsUplinkPort -ModifyPresent -AdminSpeed "10gbps" -AdminState
"enabled" -AutoNegotiate "yes" -EthLinkProfileName "default" -FlowCtrlPolicy
"default" -Name "" -PortId 40 -SlotId 1 -UsrLbl ""
Complete-UcsTransaction
```

Acknowledge Cisco UCS Chassis

To acknowledge all Cisco UCS chassis, complete the following steps:

1. In Cisco UCS Manager, click the Equipment tab in the navigation pane.
2. Expand Chassis and select each chassis that is listed.
3. Right-click each chassis and select Acknowledge Chassis.



4. Click Yes and then click OK to complete acknowledgement of the chassis.

PowerTool cmdlet Steps: Acknowledge Cisco UCS Chassis

```
Add-UcsManagedObject -ModifyPresent  -ClassId EquipmentChassis -PropertyMap
@{Id=1; AdminState="re-acknowledge"; Dn="sys/chassis-1"; }
```

Create Pools

This section presents the steps for creating pools.

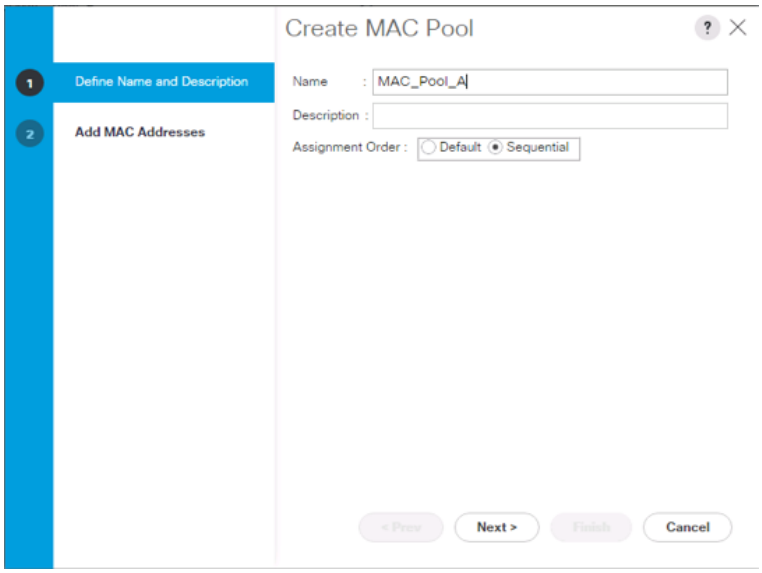
Create MAC Address Pools

To configure the necessary MAC address pools for the Cisco UCS environment, complete the following steps:

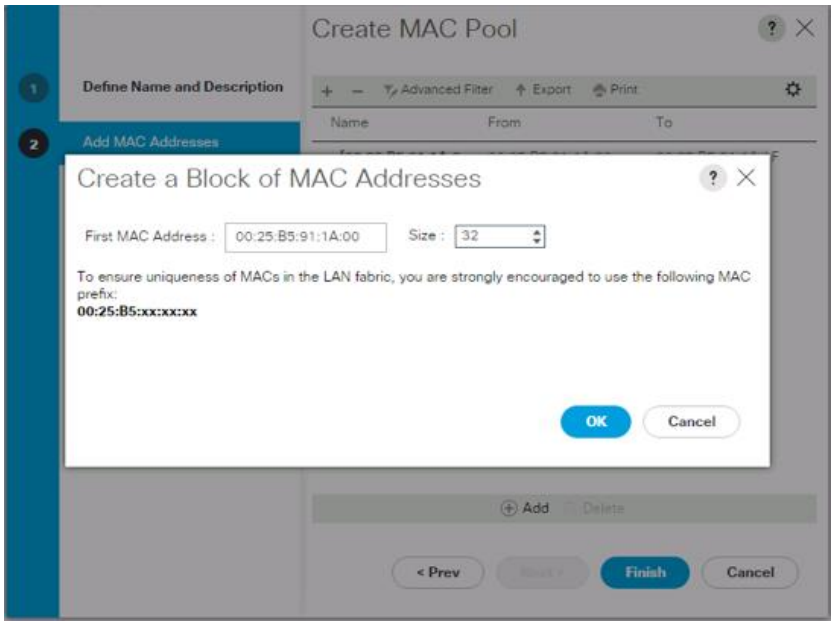
1. In Cisco UCS Manager, click the LAN tab in the navigation pane.
2. Select Pools > root.

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

3. Right-click MAC Pools under the root organization.
4. Select Create MAC Pool to create the MAC address pool.
5. Enter **MAC_Pool_A** as the name of the MAC address pool.
6. Optional: Enter a description for the MAC address pool.
7. For Assignment Order, select Sequential.

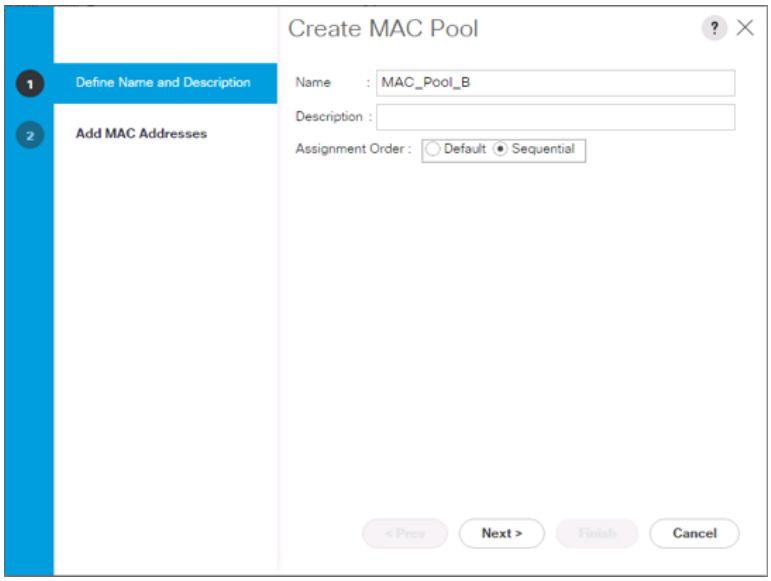


8. Click Next.
9. Click Add.
10. Specify a starting MAC address.
11. Specify a size for the MAC address pool that is sufficient to support the available blade or server resources.

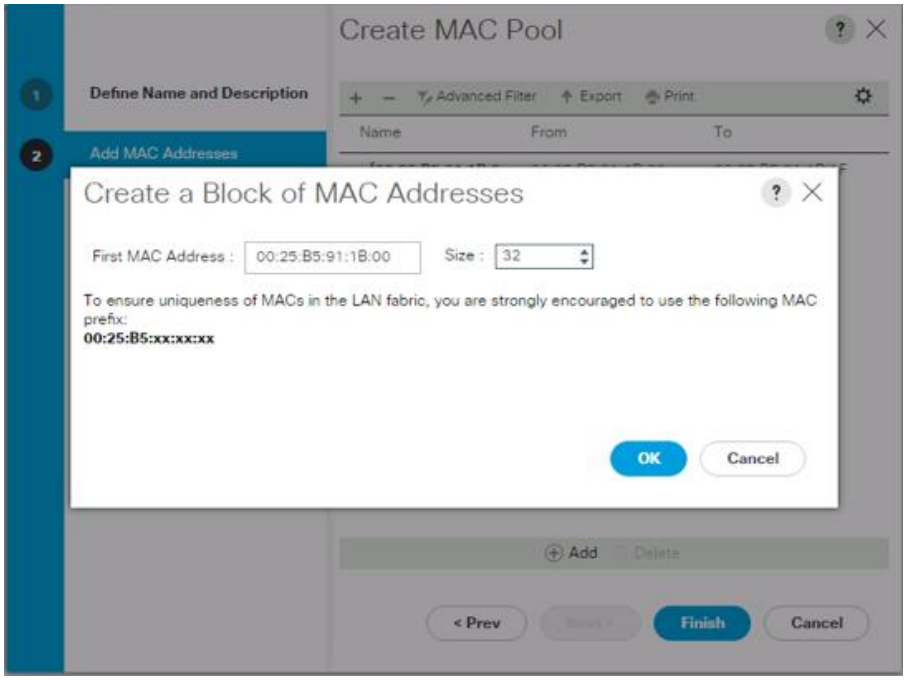


12. Click OK.
13. Click Finish.
14. In the confirmation message, click OK.
15. Right-click MAC Pools under the root organization.
16. Select Create MAC Pool to create the MAC address pool.
17. Enter **MAC_Pool_B** as the name of the MAC address pool.

18. Optional: Enter a description for the MAC address pool.



19. Click Next.
20. Click Add.
21. Specify a starting MAC address.
22. Specify a size for the MAC address pool that is sufficient to support the available blade or server resources.



23. Click OK.
24. Click Finish.
25. In the confirmation message, click OK.

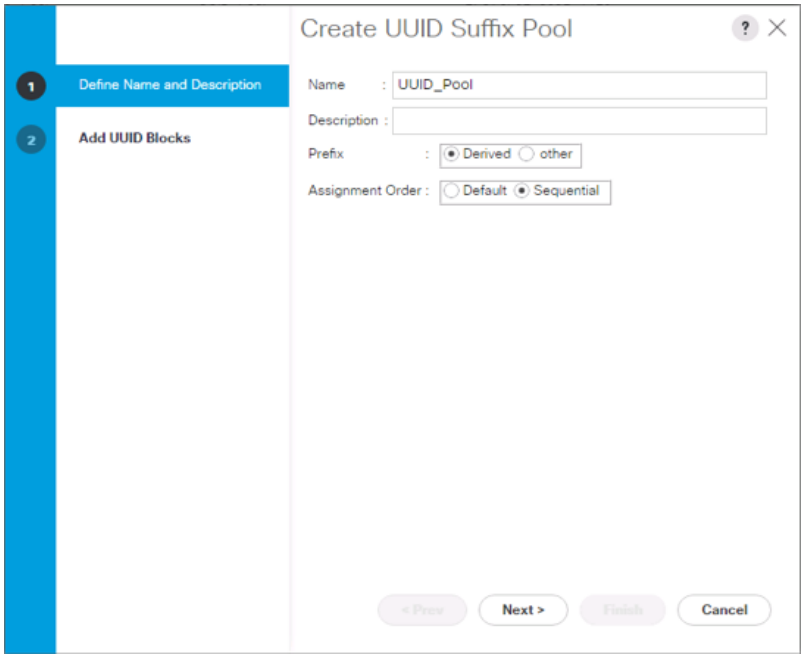
PowerTool cmdlet Steps: Create MAC Address Pools

```
Start-UcsTransaction
$mo = Get-UcsOrg -Level root  | Add-UcsMacPool -AssignmentOrder "sequential" -
Name "MAC_Pool_A"
$mo_1 = $mo | Add-UcsMacMemberBlock -From "00:25:B5:91:1A:00" -To
"00:25:B5:91:1A:1F"
Complete-UcsTransaction


Start-UcsTransaction
$mo = Get-UcsOrg -Level root  | Add-UcsMacPool -AssignmentOrder "sequential" -
Name "MAC_Pool_B"
$mo_1 = $mo | Add-UcsMacMemberBlock -From "00:25:B5:91:1B:00" -To
"00:25:B5:91:1B:1F"
Complete-UcsTransaction
```

Create UUID Suffix Pool

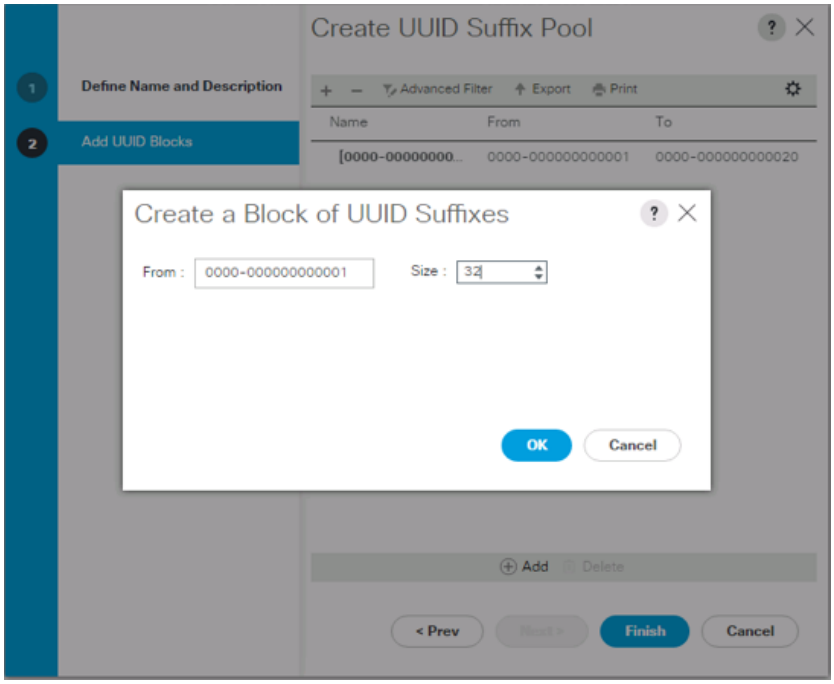
To configure the necessary universally unique identifier (UUID) suffix pool for the Cisco UCS environment, complete the following steps:

1. In Cisco UCS Manager, click the Servers tab in the navigation pane.
2. Select Pools > root.
3. Right-click UUID Suffix Pools.
4. Select Create UUID Suffix Pool.
5. Enter **UUID_Pool** as the name of the UUID suffix pool.



6. Optional: Enter a description for the UUID suffix pool.
7. For Prefix, use the Derived option.
8. For Assignment Order, select Sequential.

9. Click Next.
10. Click Add to add a block of UUIDs.



11. Keep the From field at the default setting.
12. Specify a size for the UUID block that is sufficient to support the available blade or server resources.
13. Click OK.
14. Click Finish.
15. Click OK.

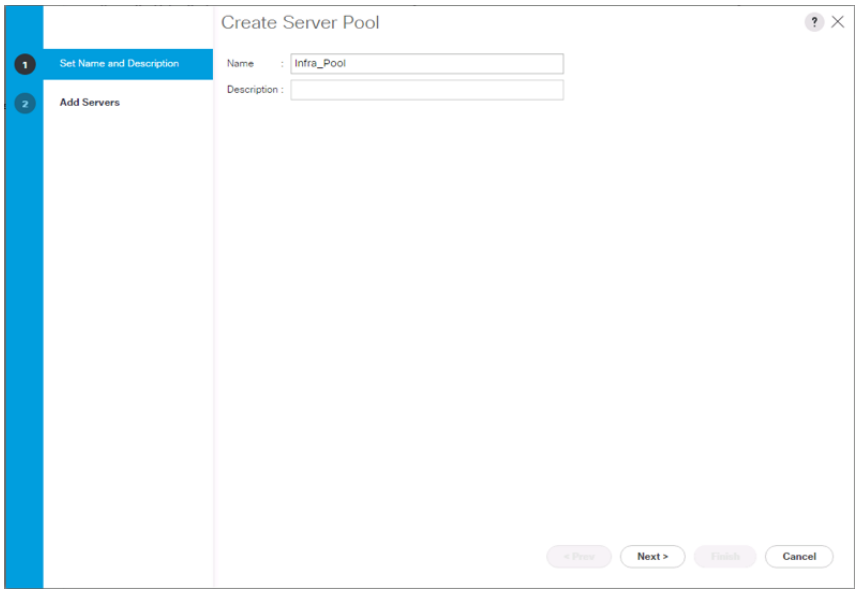
PowerTool cmdlet Steps: Create UUID Suffix Pools

```
Start-UcsTransaction
$mo = Get-UcsOrg -Level root  | Add-UcsUuidSuffixPool -AssignmentOrder
"sequential" -Name "UUID_Pool"
$mo_1 = $mo | Add-UcsUuidSuffixBlock -From "0000-000000000001" -To "0000-
000000000020"
Complete-UcsTransaction
```

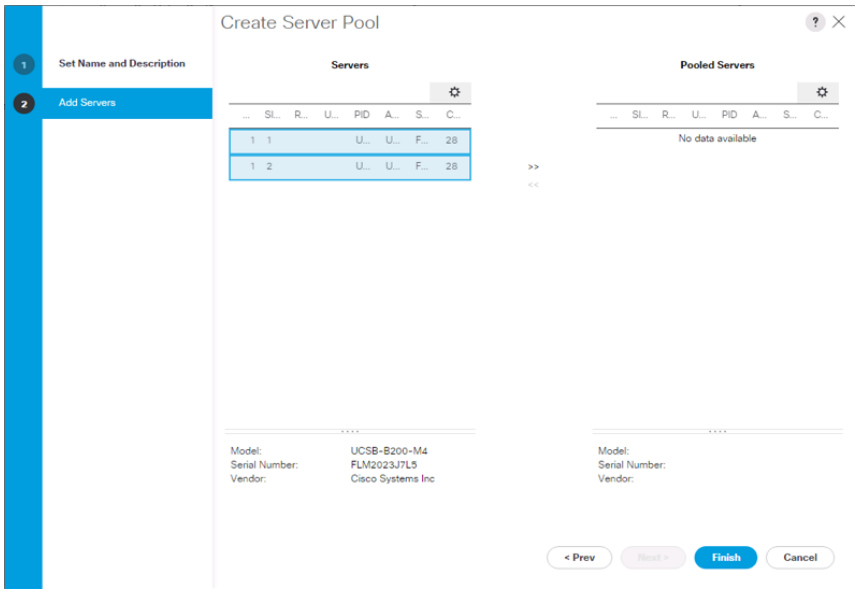
Create Server Pool

To configure the necessary server pool for the Cisco UCS environment, complete the following steps:

1. In Cisco UCS Manager, click the Servers tab in the navigation pane.
2. Select Pools > root.
3. Right-click Server Pools.
4. Select Create Server Pool.
5. Enter **Infra_Pool** as the name of the server pool.



6. Optional: Enter a description for the server pool.
7. Click Next.
8. Select two (or more) servers to be used for the VMware management cluster and click >> to add them to the Infra_Pool server pool.



9. Click Finish.
10. Click OK.

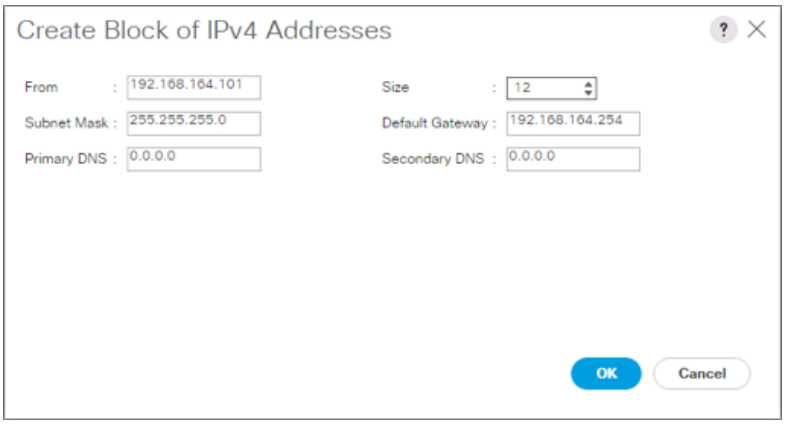
PowerTool cmdlet Steps: Create Server Pool

```
Start-UcsTransaction
$mo = Get-UcsOrg -Level root  | Add-UcsServerPool -Name "Infra_Pool"
$mo_1 = $mo | Add-UcsComputePooledSlot -ModifyPresent -ChassisId "1" -SlotId 1
$mo_2 = $mo | Add-UcsComputePooledSlot -ModifyPresent -ChassisId "1" -SlotId 2
Complete-UcsTransaction
```

Add a Block of IP Addresses for KVM Access

To create a block of IP addresses for in-band server keyboard, video, and mouse (KVM) access in the Cisco UCS environment, complete the following steps:

1. In Cisco UCS Manager, click the LAN tab in the navigation pane.
2. Select Pools > root > IP Pools.
3. Right-click IP Pool ext-mgmt and select Create Block of IPv4 Addresses.



4. Enter the starting IP address of the block, the number of IP addresses required, and the subnet and gateway information.
5. Click OK to create the block of IP addresses.
6. Click OK.

PowerTool cmdlet Steps: Add a Block of IP Addresses for KVM Access

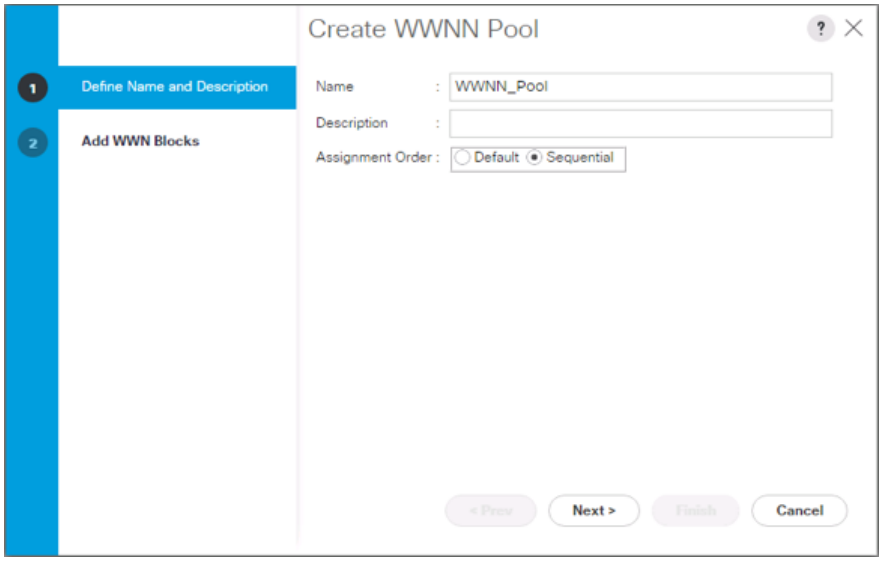
```
Get-UcsOrg -Level root | Get-UcsIpPool -Name "ext-mgmt" -LimitScope | Add-
UcsIpPoolBlock -DefGw "192.168.164.254" -From "192.168.164.101" -To
"192.168.164.112"
```

Create a WWNN Pool

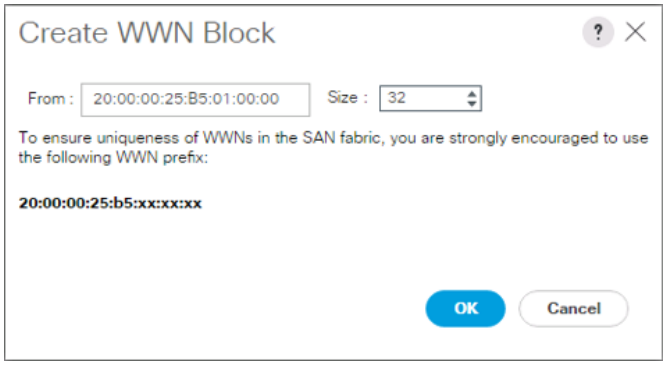
To configure the necessary worldwide node name (WWNN) pool for the Cisco UCS environment, complete the following steps:

1. Select the SAN tab on the left.
2. Select Pools > root.
3. Right-click WWNN Pools under the root organization.
4. Select Create WWNN Pool to create the WWNN pool.
5. Enter **WWNN_Pool** as the name of the WWNN pool.

6. Optional: Enter a description for the WWNN pool.
7. For Assignment Order, select Sequential.



8. Click Next.
9. Click Add.
10. Modify the From field as necessary for your Cisco UCS environment.
11. Specify a size of the WWNN block sufficient to support the available server resources.



12. Click OK.
13. Click Finish to create the WWNN Pool.
14. Click OK.

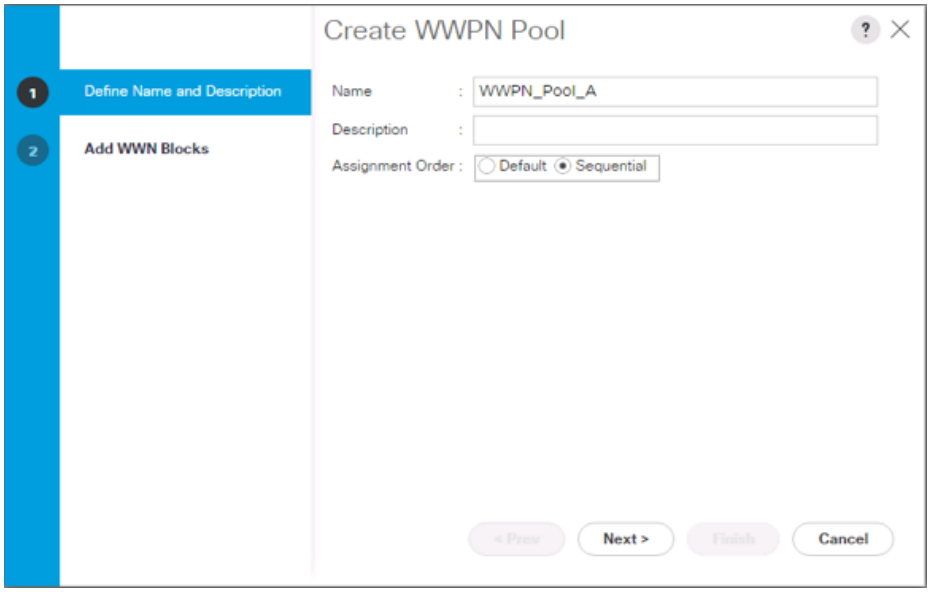
PowerTool cmdlet Steps: Create a WWNN Pool

```
Start-UcsTransaction
$mo = Get-UcsOrg -Level root  | Add-UcsWwnPool -AssignmentOrder "sequential" -Name "WWNN_Pool" -Purpose "node-wwn-assignment"
$mo_1 = $mo | Add-UcsWwnMemberBlock -From "20:00:00:25:B5:01:00:00" -To "20:00:00:25:B5:01:00:1F"
Complete-UcsTransaction
```

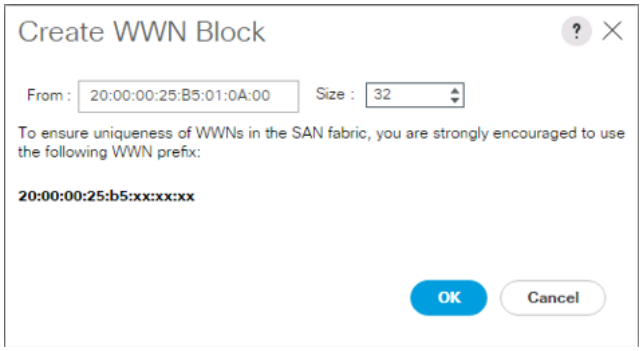
Create WWPN Pools

To configure the necessary worldwide port name (WWPN) pools for the Cisco UCS environment, complete the following steps:

1. In Cisco UCS Manager, click the SAN tab in the navigation pane.
2. Select Pools > root.
3. In this procedure, two WWPN pools are created: one for each switching fabric.
4. Right-click WWPN Pools under the root organization.
5. Select Create WWPN Pool to create the first WWPN pool.
6. Enter **WWPN_Pool_A** as the name of the WWPN pool.
7. Optional: Enter a description for the WWPN pool.
8. For Assignment Order, select Sequential.

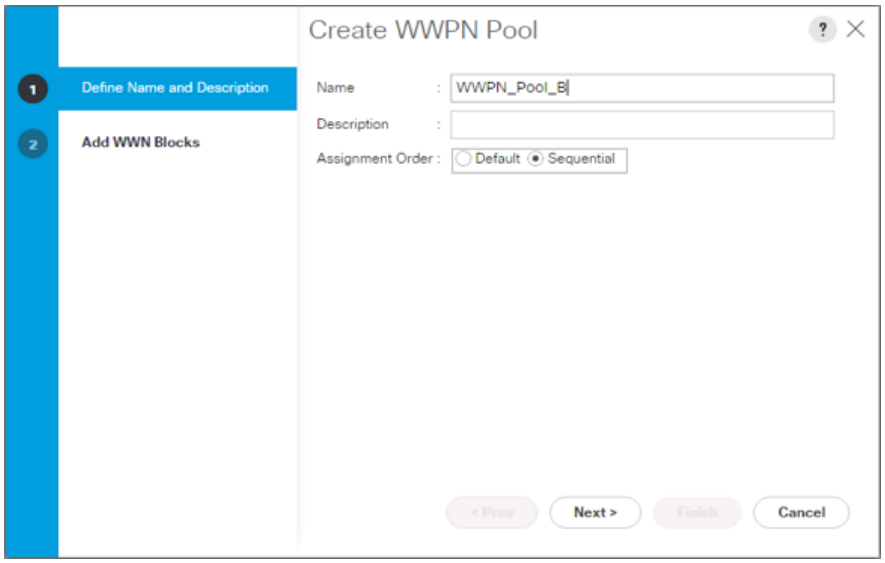


9. Click Next.
10. Click Add.
11. Specify a starting WWPN.
12. Specify a size for the WWPN pool that is sufficient to support the available blade or server resources.

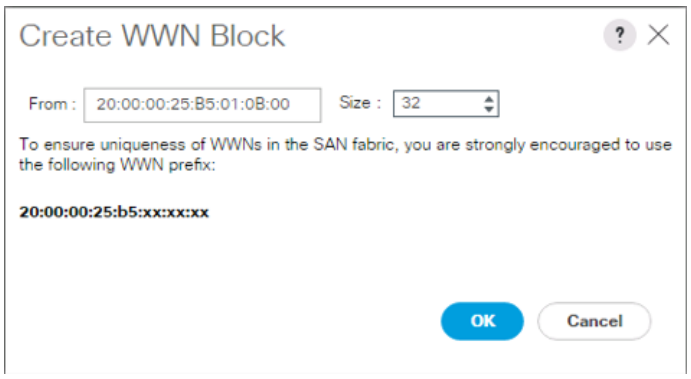


13. Click OK.

14. Click Finish.
15. In the confirmation message, click OK.
16. Right-click WWPN Pools under the root organization.
17. Select Create WWPN Pool to create the second WWPN pool.
18. Enter **WWPN_Pool_B** as the name of the WWPN pool.
19. Optional: Enter a description for the WWPN pool.
20. For Assignment Order, select Sequential.



21. Click Next.
22. Click Add.
23. Specify a starting WWPN.
24. Specify a size for the WWPN address pool that is sufficient to support the available blade or server resources.



25. Click OK.
26. Click Finish.
27. In the confirmation message, click OK.

PowerTool cmdlet Steps: Create WWPN Pools

```
Start-UcsTransaction
$mo = Get-UcsOrg -Level root  | Add-UcsWwnPool -AssignmentOrder "sequential" -
Name "WWPN_Pool_A"
$mo_1 = $mo | Add-UcsWwnMemberBlock -From "20:00:00:25:B5:01:0A:00" -To
"20:00:00:25:B5:01:0A:1F"
Complete-UcsTransaction


Start-UcsTransaction
$mo = Get-UcsOrg -Level root  | Add-UcsWwnPool -AssignmentOrder "sequential" -
Name "WWPN_Pool_B"
$mo_1 = $mo | Add-UcsWwnMemberBlock -From "20:00:00:25:B5:01:0B:00" -To
"20:00:00:25:B5:01:0B:1F"
Complete-UcsTransaction
```

Set Packages and Policies

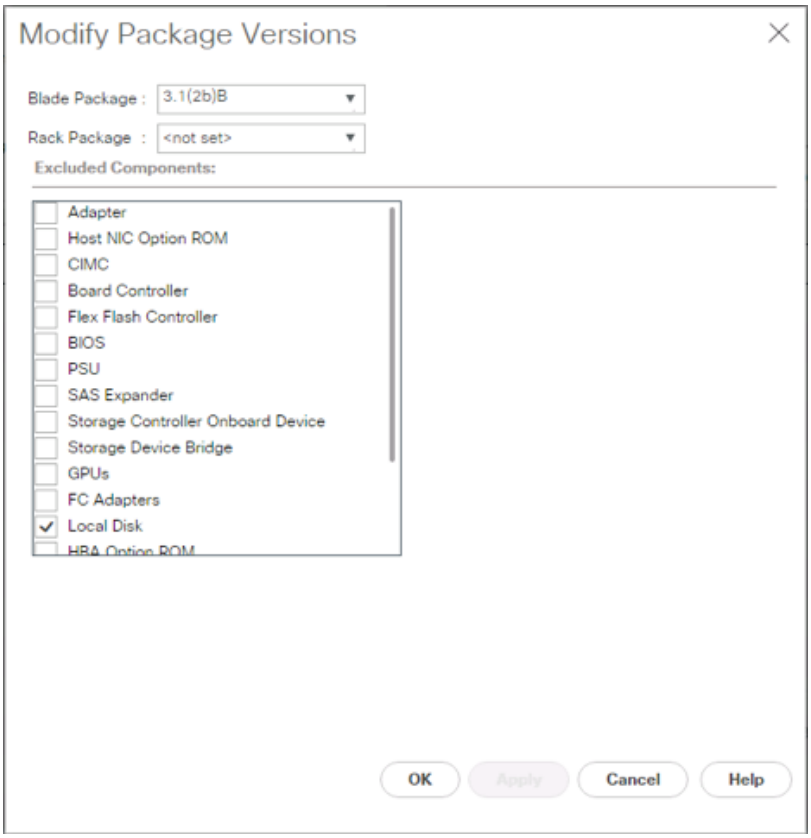
This section presents steps for configuring packages and policies.

Create Host Firmware Package

Firmware management policies allow the administrator to select the corresponding packages for a given server configuration. These policies often include packages for adapter, BIOS, board controller, Fibre Channel adapter, host bus adapter (HBA) option ROM (to enable the HBA firmware called by the system BIOS), and storage controller properties.

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

1. In Cisco UCS Manager, click the Servers tab in the navigation pane.
2. Select Policies > root.
3. Expand Host Firmware Packages.
4. Select default.
5. In the Actions pane, select Modify Package Versions.
6. Select Version 3.1(2b)B for Blade Package and leave Rack Package not set.
7. Leave Excluded Components with only Local Disk selected.



8. Click OK to modify the host firmware package.

PowerTool cmdlet Steps: Create Host Firmware Package

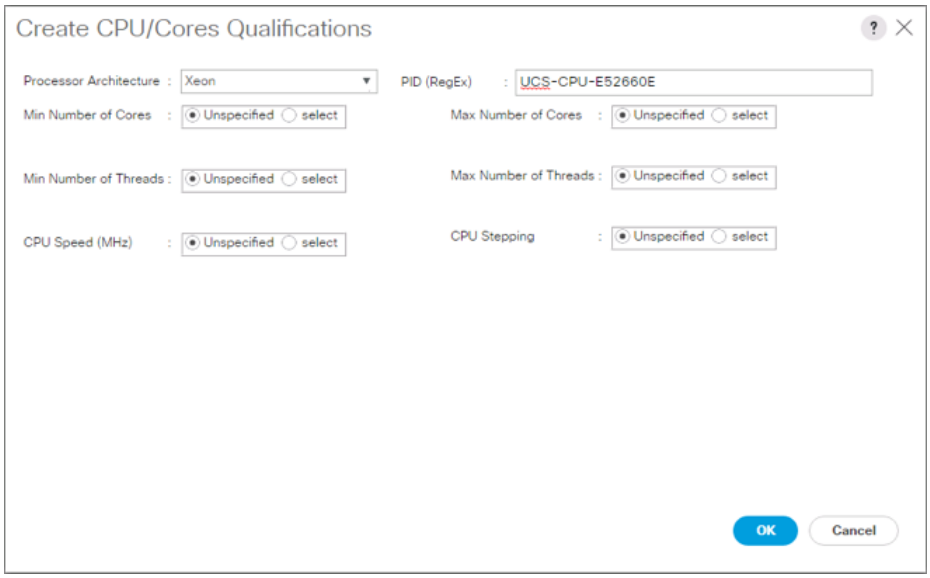
```
Get-UcsOrg -Level root  | Add-UcsFirmwareComputeHostPack -ModifyPresent  -
BladeBundleVersion "3.1(2b)B" -Name "default"
```

Create Server Pool Qualification Policy (Optional)

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

Note: This example creates a policy for Cisco UCS B-Series Blade Servers and Cisco UCS C-Series Rack Servers with Intel® Xeon® processor E2660 v4 Xeon Broadwell CPUs.

1. In Cisco UCS Manager, click the Servers tab in the navigation pane.
2. Select Policies > root.
3. Right-click Server Pool Policy Qualifications.
4. Select Create Server Pool Policy Qualification.
5. Name the policy **UCS-Broadwell**.
6. Select Create CPU/Core Qualifications.
7. Select Xeon for the Processor/Architecture.
8. Select UCS-CPU-E52660E as the part number (PID).
9. Click OK to create the CPU/Core qualification.



10. Click OK to create the policy. Click OK again to confirm.

PowerTool cmdlet Steps: Create Server Pool Qualification Policy (Optional)

```
Start-UcsTransaction
$mo = Get-UcsOrg -Level root  | Add-UcsServerPoolQualification -Name "UCS-Broadwell"
$mo_1 = $mo | Add-UcsCpuQualification -Model "UCS-CPU-E52660E"
Complete-UcsTransaction
```

Download Cisco Custom Image for VMware ESXi 6.0 U2

You will need to download the VMware Cisco Custom image for use during installation by manually accessing the Cisco UCS Kernel-based Virtual Machine (KVM) virtual media (vMedia) or by using the vMedia policy covered in the next subsection.

To download the Cisco Custom image, perform the following steps:

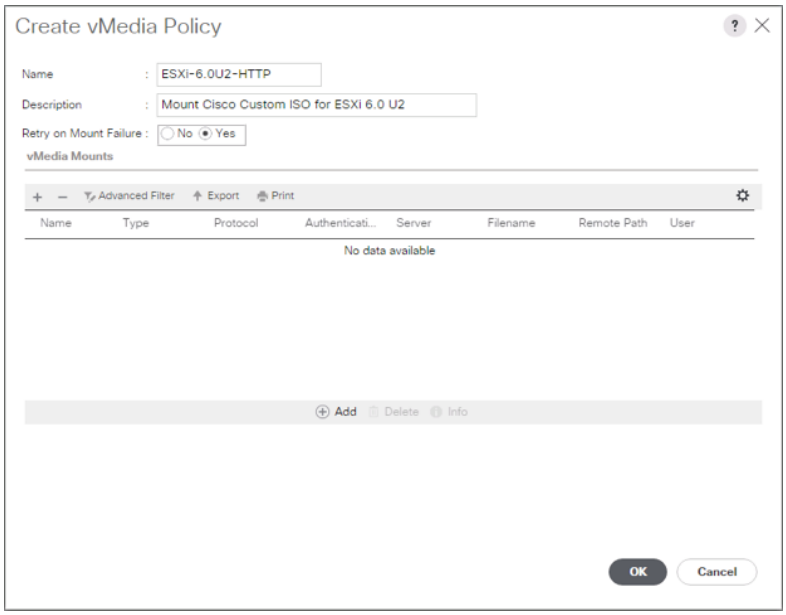
1. Log in to VMware by clicking the following link: VMware login page.
2. Type your email address or customer number and password. Then click Log in.
3. Download the Cisco Custom image by clicking the following link: Cisco Custom Image 6.0 U2.
4. Click Download Now.
5. Save the image file in your destination folder.

Create vMedia Policy for VMware ESXi 6.0 U2 Install Boot (Optional If You Are Manually Attaching ISO Image Through KVM)

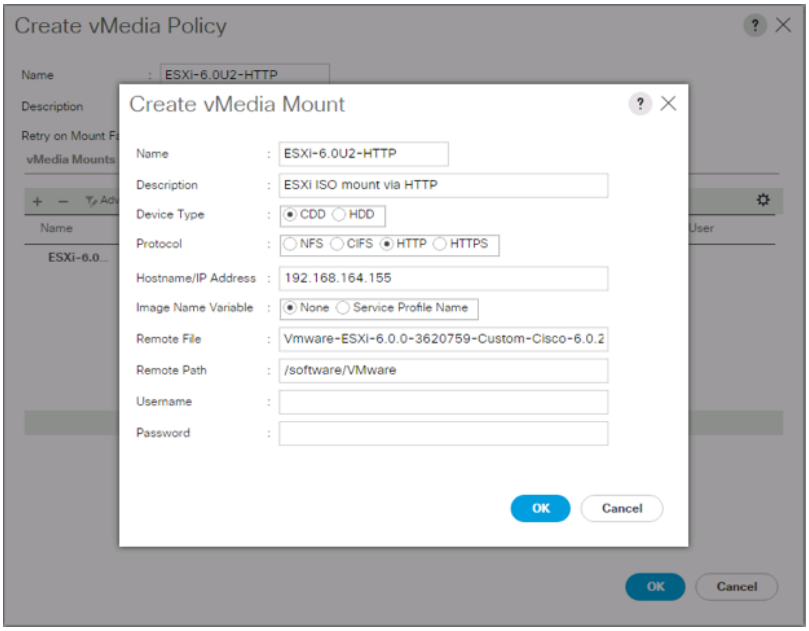
You need a separate HTTP web server to automate the availability of the ESXi image for each service profile at power-up. The creation of this web server is not covered in this document, but you can use any existing web server that can serve files through HTTP that are accessible on the out-of-band network on which the ESXi image resides.

Place the Cisco Custom image VMware ESXi 6.0 U2 ISO on the HTTP server and complete the following steps to create a vMedia policy:

1. In Cisco UCS Manager, select the Servers tab.
2. Select Policies > root.
3. Right-click vMedia Policies.
4. Select Create vMedia Policy.
5. Name the policy **ESXi-6.0U2-HTTP**.
6. In the Description field, enter **Mounts Cisco Custom ISO for ESXi 6.0 U2**.
7. Leave Yes selected for Retry on Mount Failure.



8. Click Add.
9. Name the mount **ESXi-6.0U2-HTTP**.
10. In the Description field, enter **ESXi ISO mount via HTTP**.
11. Select CDD Device Type.
12. Select HTTP Protocol.
13. Enter the IP address of the web server.
14. Leave None selected for Image Name Variable.
15. Enter Vmware-ESXi-6.0.0-3620759-Custom-Cisco-6.0.2.1.iso as the remote file name.
16. Enter the web server path to the ISO file in the Remote Path field.
17. Leave the Username and Password fields blank.



18. Click OK to create the vMedia mount.
19. Click OK. Then click OK again to complete the creation the vMedia policy.

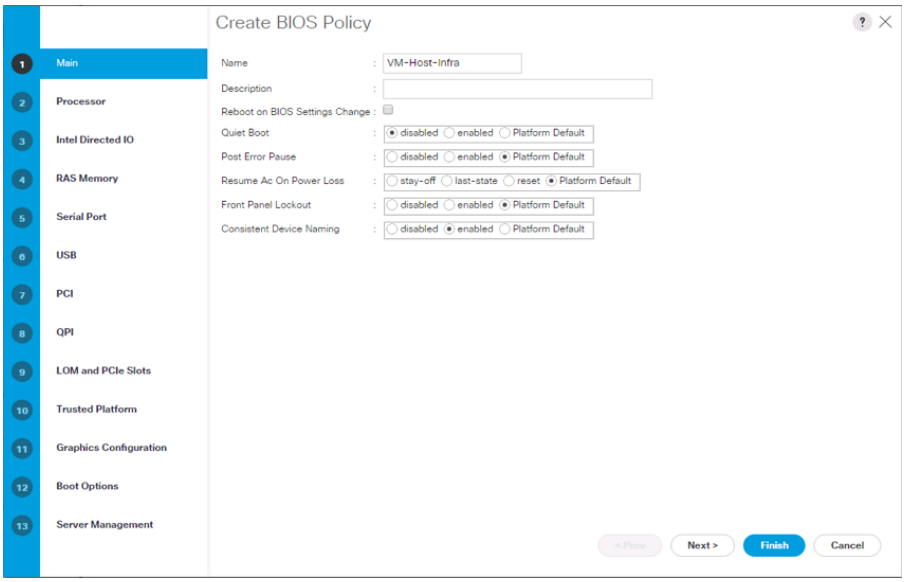
PowerTool cmdlet Steps: Create vMedia Policy for VMware ESXi 6.0 U2 Install Boot

```
Start-UcsTransaction
$mo = Get-UcsOrg -Level root  | Add-UcsVmediaPolicy -Descr "Mounts Cisco Custom ISO for ESXi 6.0 U2" -Name "ESXi-6.0U2-HTTP"
$mo_1 = $mo | Add-UcsVmediaMountEntry -DeviceType "cdd" -ImageFileName "Vmware-ESXi-6.0.0-3620759-Custom-Cisco-6.0.2.1.iso" -ImagePath "/software/VMware" -MappingName "ESXi-6.0U2-HTTP" -MountProtocol "http" -RemoteIpAddress "192.168.164.155"
Complete-UcsTransaction
```

Create Server BIOS Policy

To create a server BIOS policy for the Cisco UCS environment, complete the following steps:

1. In Cisco UCS Manager, click the Servers tab in the navigation pane.
2. Select Policies > root.
3. Right-click BIOS Policies.
4. Select Create BIOS Policy.
5. Enter **VM-Host-Infra** as the BIOS policy name.
6. Leave Reboot on BIOS Setting Change unselected.
7. Change the Quiet Boot setting to disabled.
8. Change Consistent Device Naming to enabled.



9. Click Finish to create the BIOS policy.
10. Click OK.

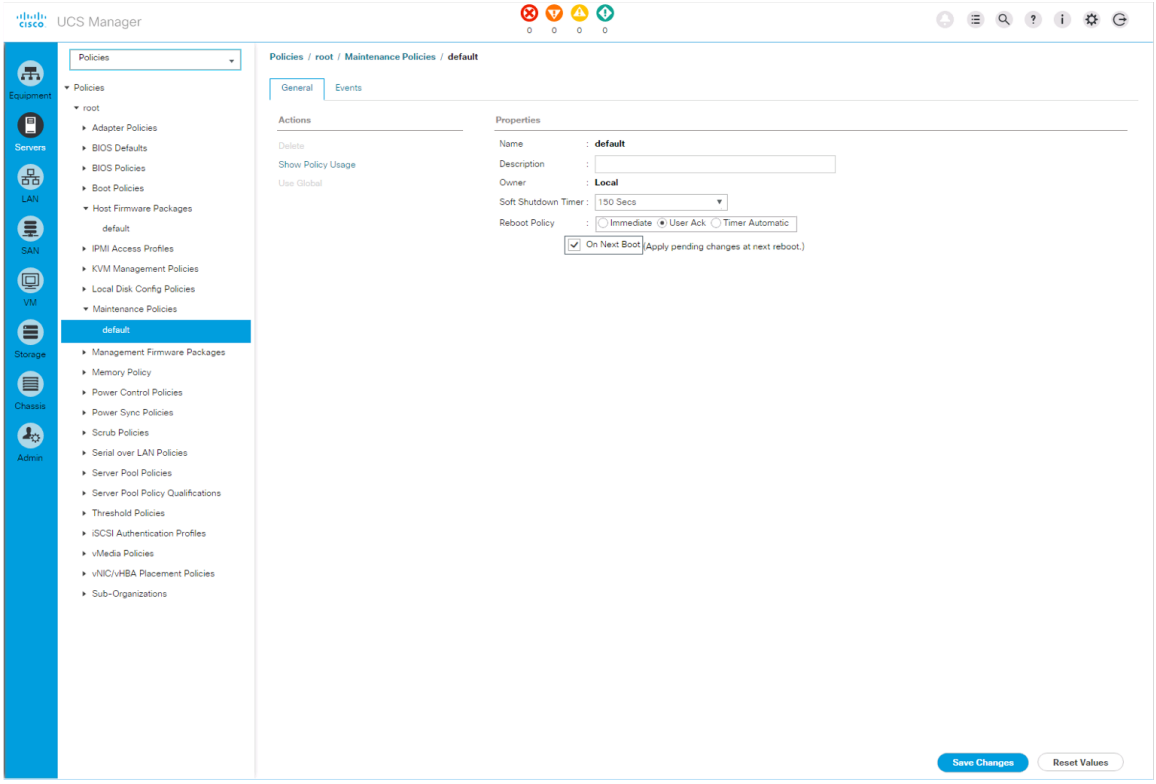
PowerTool cmdlet Steps: Create Server BIOS Policy

```
Start-UcsTransaction
$mo = Get-UcsOrg -Level root  | Add-UcsBiosPolicy -Name "VM-Host-Infra"
$mo_1 = $mo | Set-UcsBiosVfQuietBoot -VpQuietBoot "disabled"
$mo_2 = $mo | Set-UcsBiosVfPOSTErrorPause -VpPOSTErrorPause "platform-default"
$mo_3 = $mo | Set-UcsBiosVfResumeOnACPowerLoss -VpResumeOnACPowerLoss "platform-default"
$mo_4 = $mo | Set-UcsBiosVfFrontPanelLockout -VpFrontPanelLockout "platform-default"
$mo_5 = $mo | Set-UcsBiosVfConsistentDeviceNameControl -VpCDNControl "enabled"
Complete-UcsTransaction
```

Update the Default Maintenance Policy

To update the default maintenance policy, complete the following steps:

1. In Cisco UCS Manager, click the Servers tab in the navigation pane.
2. Select Policies > root.
3. Select Maintenance Policies > default.
4. Change Reboot Policy to User Ack.
5. Optional: Click On Next Boot to delegate maintenance windows to server owners.



6. Click Save Changes.
7. Click OK to accept the change.

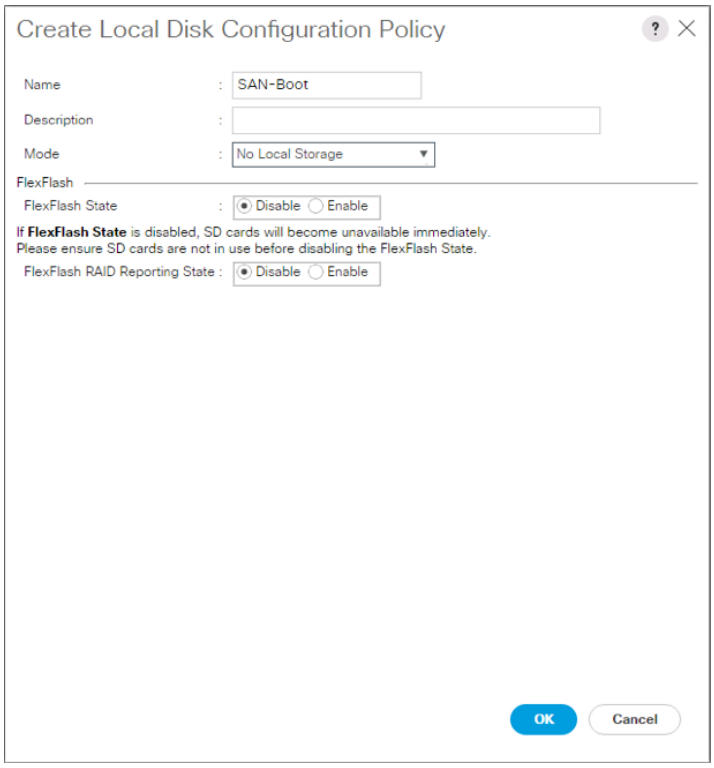
PowerTool cmdlet Steps: Update the Default Maintenance Policy

```
Get-UcsOrg -Level root  | Add-UcsMaintenancePolicy -ModifyPresent  -Name
"default" -TriggerConfig "on-next-boot" -UptimeDisr "user-ack"
```

Create Local Disk Configuration Policy (Optional)

You need to create a local disk configuration policy for the Cisco UCS environment if the servers in the environment do not have a local disk. To create a local disk configuration policy, complete the following steps:

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



8. Click OK.

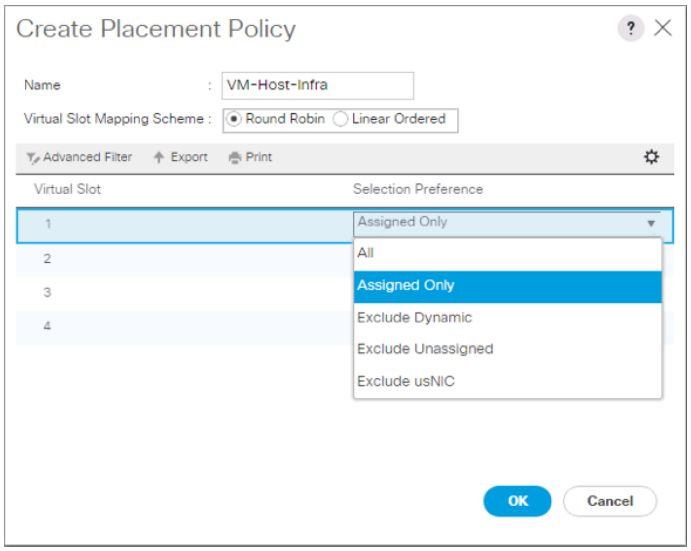
PowerTool cmdlet Steps: Create Local Disk Configuration Policy

```
Get-UcsOrg -Level root  | Add-UcsLocalDiskConfigPolicy -Mode "no-local-storage" -
Name "SAN-Boot"
```

Create vNIC and vHBA Placement Policy for Virtual Machine Infrastructure Hosts

To create a virtual network interface card (vNIC) and virtual HBA (vHBA) placement policy for the infrastructure hosts, complete the following steps:

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



7. Click OK. Then click OK again.

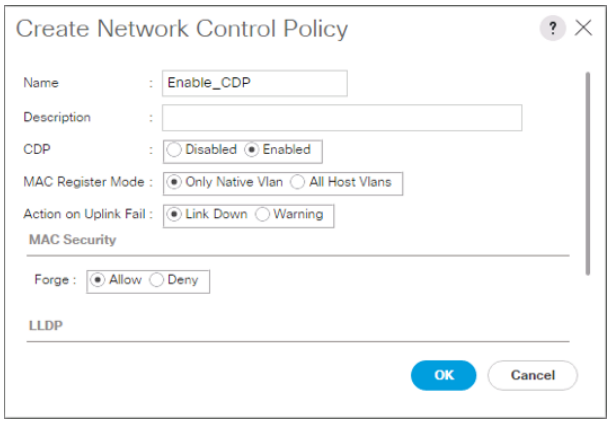
PowerTool cmdlet Steps: Create vNIC and vHBA Placement Policy for Virtual Machine Infrastructure Hosts

```
Start-UcsTransaction
$mo = Get-UcsOrg -Level root  | Add-UcsPlacementPolicy -Name "VM-Host-Infra"
$mo_1 = $mo | Add-UcsFabricVCon -ModifyPresent -Fabric "NONE" -Id "1" -InstType
"auto" -Placement "physical" -Select "assigned-only" -Share "shared" -Transport
"ethernet","fc"
$mo_2 = $mo | Add-UcsFabricVCon -ModifyPresent -Fabric "NONE" -Id "2" -InstType
"auto" -Placement "physical" -Select "all" -Share "shared" -Transport
"ethernet","fc"
$mo_3 = $mo | Add-UcsFabricVCon -ModifyPresent -Fabric "NONE" -Id "3" -InstType
"auto" -Placement "physical" -Select "all" -Share "shared" -Transport
"ethernet","fc"
$mo_4 = $mo | Add-UcsFabricVCon -ModifyPresent -Fabric "NONE" -Id "4" -InstType
"auto" -Placement "physical" -Select "all" -Share "shared" -Transport
"ethernet","fc"
Complete-UcsTransaction
```

Create Network Control Policy for Cisco Discovery Protocol

To create a network control policy that enables Cisco Discovery Protocol (CDP) on virtual network ports, complete the following steps:

1. In Cisco UCS Manager, click the LAN tab in the navigation pane.
2. Select Policies > root.
3. Right-click Network Control Policies.
4. Select Create Network Control Policy.
5. Enter **Enable_CDP** as the policy name.
6. For CDP, select the Enabled option.
7. Click OK to create the network control policy.



8. Click OK.

PowerTool cmdlet Steps: Create Network Control Policy for Cisco Discovery Protocol

```
Start-UcsTransaction
$mo = Get-UcsOrg -Level root  | Add-UcsNetworkControlPolicy -Cdp "enabled" -Name "Enable_CDP"
$mo_1 = $mo | Add-UcsPortSecurityConfig -ModifyPresent -Descr "" -Forge "allow" -Name "" -PolicyOwner "local"
Complete-UcsTransaction
```

Configure Cisco UCS LAN Connectivity

This section presents steps for configuring LAN connectivity in the Cisco UCS environment.

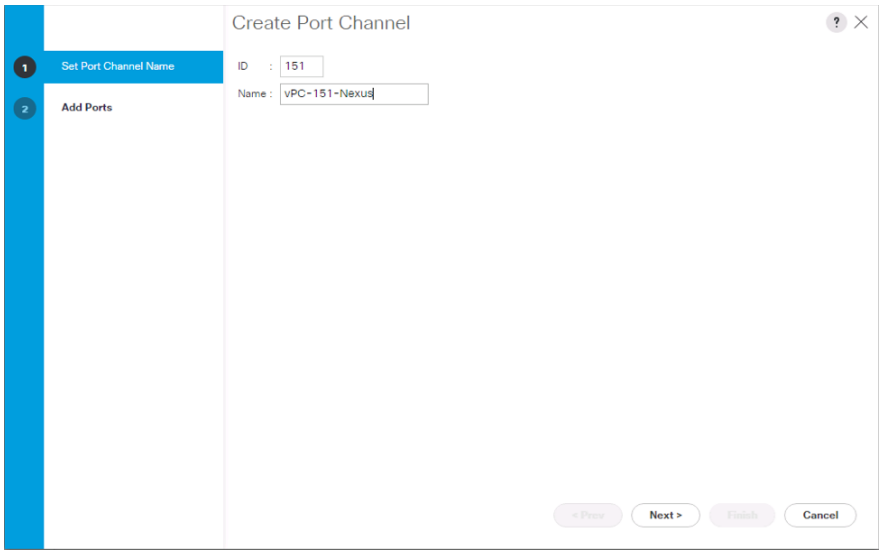
Create Uplink Port Channels

To configure the necessary port channels in the Cisco UCS environment, complete the following steps:

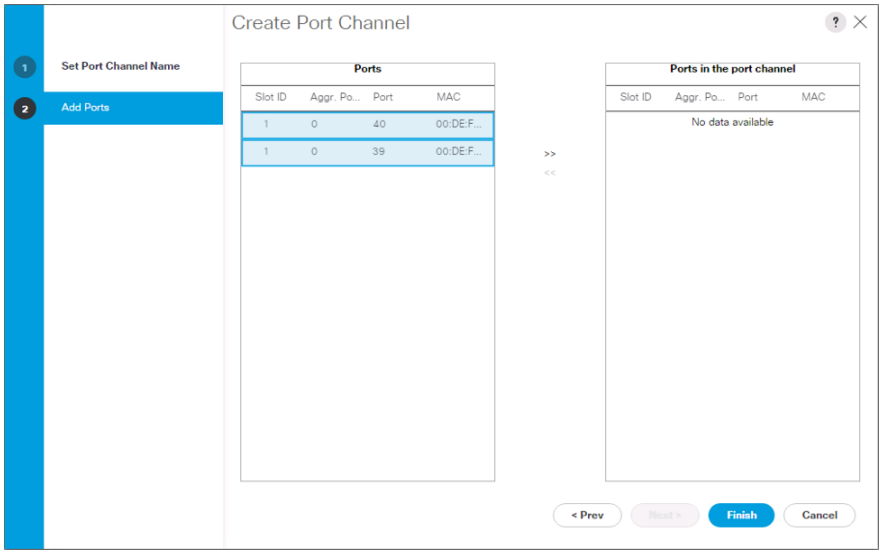
1. In Cisco UCS Manager, click the LAN tab in the navigation pane.

Note: In this procedure, two port channels are created: one from fabric A to both Cisco Nexus switches, and one from fabric B to both Cisco Nexus switches.

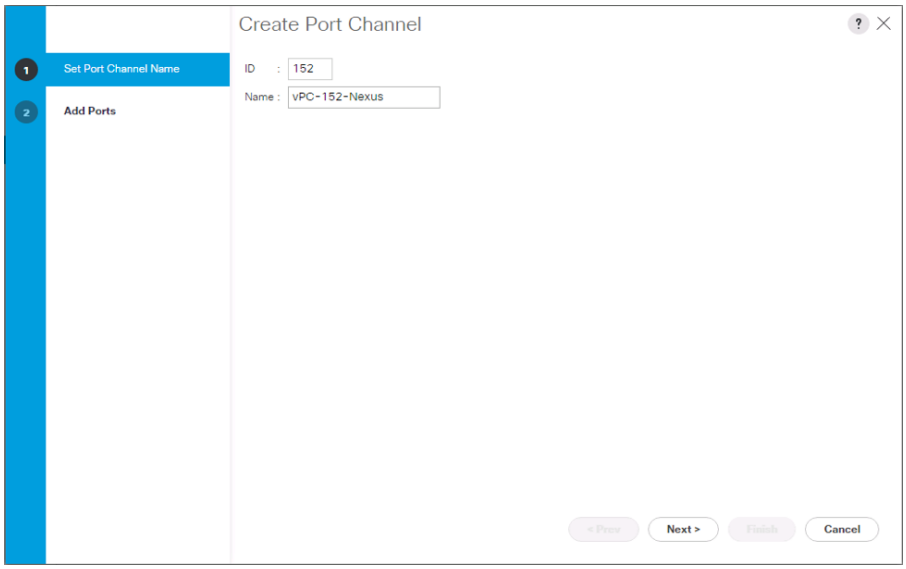
2. Under LAN > LAN Cloud, expand the Fabric A tree.
3. Right-click Port Channels.
4. Select Create Port Channel.
5. Enter a unique ID for the port channel, (**151** in this example to correspond with the upstream Cisco Nexus port channel).
6. With 151 selected, enter **vPC-151-Nexus** as the name of the port channel.



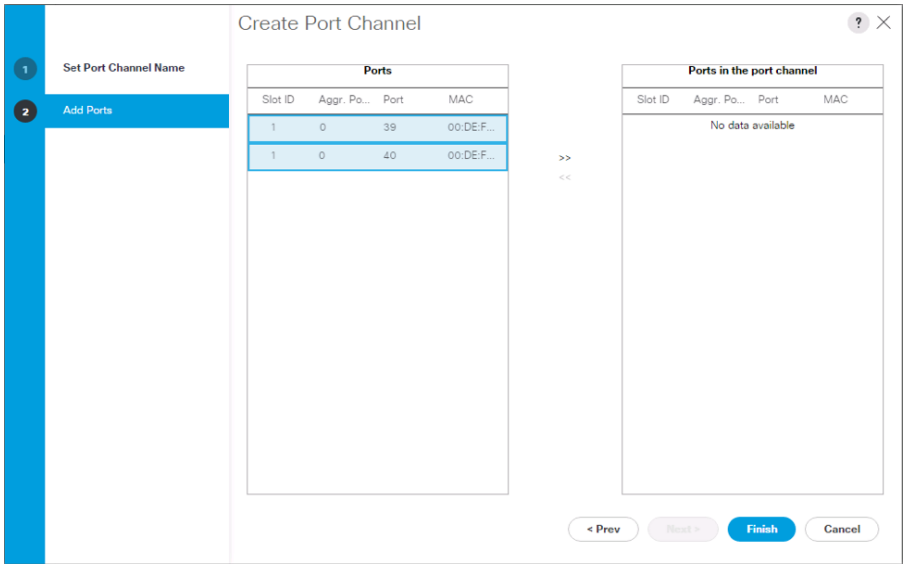
7. Click Next.
8. Select the following ports to be added to the port channel:
   - Slot ID 1 and port 39
   - Slot ID 1 and port 40



9. Click >> to add the ports to the port channel.
10. Click Finish to create the port channel.
11. Click OK.
12. In the navigation pane, under LAN > LAN Cloud, expand the Fabric B tree.
13. Right-click Port Channels.
14. Select Create Port Channel.
15. Enter a unique ID for the port channel, (**152** in this example to correspond with the upstream Cisco Nexus port channel).
16. With 152 selected, enter **vPC-152-Nexus** as the name of the port channel.



17. Click Next.
18. Select the following ports to be added to the port channel:
    - Slot ID 1 and port 39
    - Slot ID 1 and port 40



19. Click >> to add the ports to the port channel.
20. Click Finish to create the port channel.
21. Click OK.

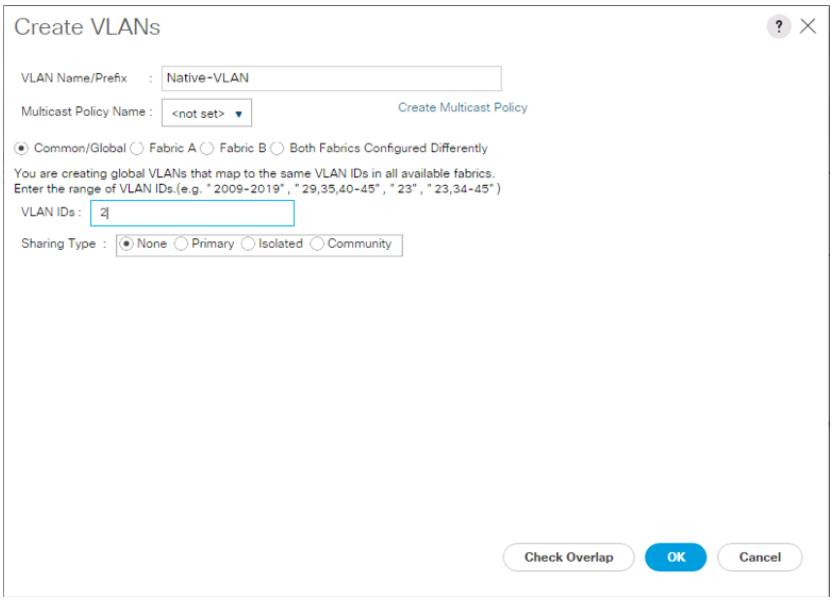
PowerTool cmdlet Steps: Create Uplink Port Channels

```
Start-UcsTransaction
$mo = Get-UcsFiLanCloud -Id "A" | Add-UcsUplinkPortChannel -Name "vPC-151-Nexus"
-PortId 151
$mo_1 = $mo | Add-UcsUplinkPortChannelMember -ModifyPresent -AdminState "enabled"
-AutoNegotiate "yes" -EthLinkProfileName "default" -Name "" -PortId 39 -SlotId 1
$mo_2 = $mo | Add-UcsUplinkPortChannelMember -ModifyPresent -AdminState "enabled"
-AutoNegotiate "yes" -EthLinkProfileName "default" -Name "" -PortId 40 -SlotId 1
Complete-UcsTransaction


Start-UcsTransaction
$mo = Get-UcsFiLanCloud -Id "B" | Add-UcsUplinkPortChannel -Name "vPC-152-Nexus"
-PortId 152
$mo_1 = $mo | Add-UcsUplinkPortChannelMember -ModifyPresent -AdminState "enabled"
-AutoNegotiate "yes" -EthLinkProfileName "default" -Name "" -PortId 39 -SlotId 1
$mo_2 = $mo | Add-UcsUplinkPortChannelMember -ModifyPresent -AdminState "enabled"
-AutoNegotiate "yes" -EthLinkProfileName "default" -Name "" -PortId 40 -SlotId 1
Complete-UcsTransaction
```

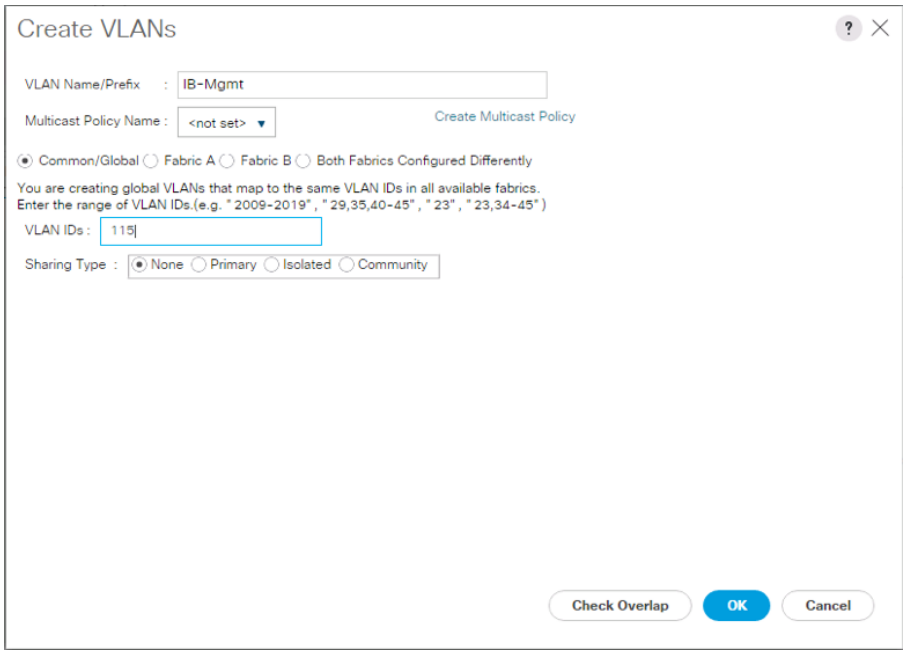
Create VLANs

To configure the necessary virtual local area networks (VLANs) for the Cisco UCS environment, complete the following steps:

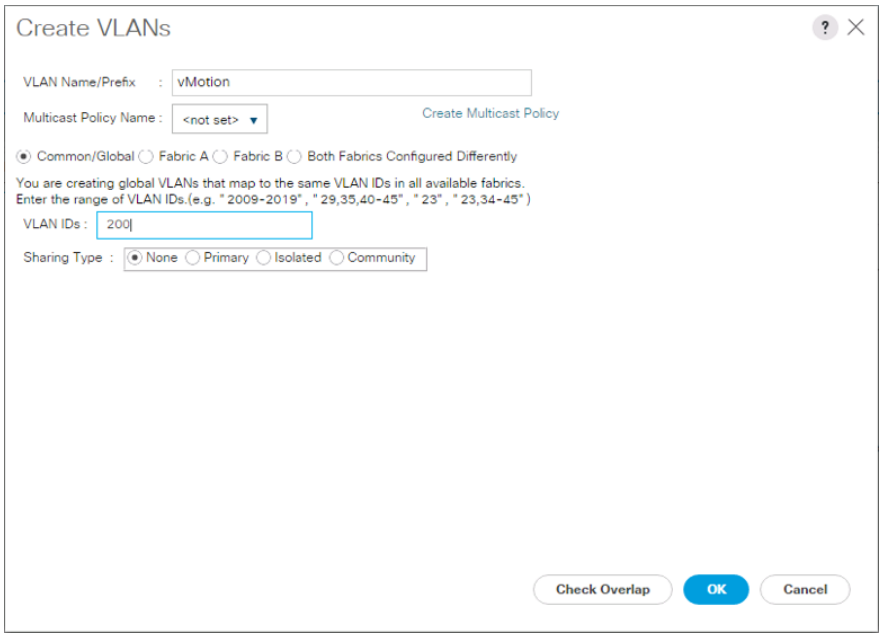
1. In Cisco UCS Manager, click the LAN tab in the navigation pane.
2. Select LAN > LAN Cloud.
3. Right-click VLANs.
4. Select Create VLANs.
5. Enter **Native-VLAN** as the name of the VLAN to be used as the native VLAN.
6. Keep the Common/Global option selected as the scope of the VLAN.
7. Enter the native VLAN ID.
8. Keep Sharing Type set to None.



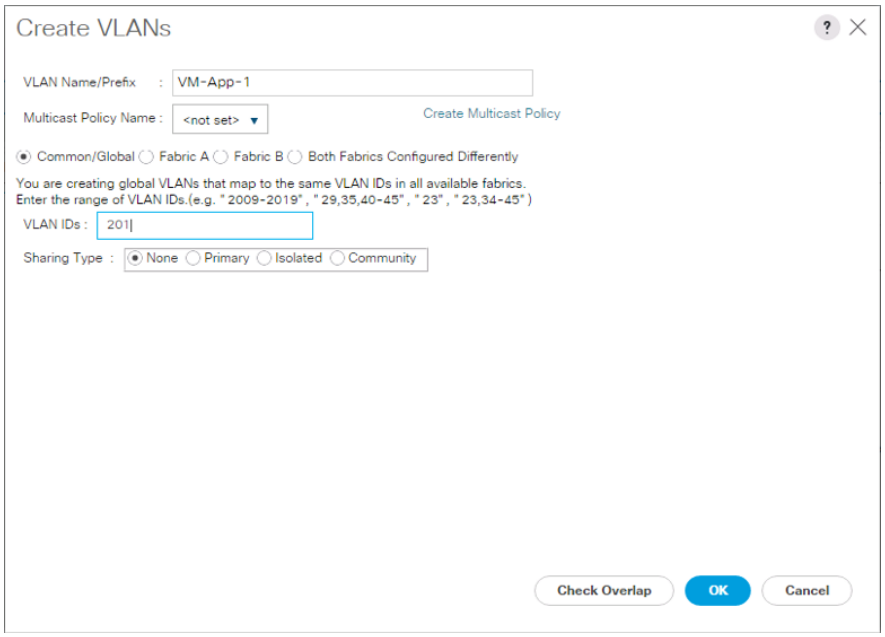
9. Click OK. Then click OK again.
10. Expand the list of VLANs in the navigation pane, right-click the newly created Native-VLAN, and select Set as Native VLAN.
11. Click Yes. Then click OK again.
12. Right-click VLANs.
13. Select Create VLANs.
14. Enter **IB-Mgmt** as the name of the VLAN to be used for management traffic.
15. Keep the Common/Global option selected as the scope of the VLAN.
16. Enter the in-band management VLAN ID.
17. Keep Sharing Type set to None.



18. Click OK. Then click OK again.
19. Right-click VLANs.
20. Select Create VLANs.
21. Enter **vMotion** as the name of the VLAN to be used for VMware vMotion.
22. Keep the Common/Global option selected as the scope of the VLAN.
23. Enter the vMotion VLAN ID.
24. Keep Sharing Type set to None.



25. Click OK/ Then click OK again.
26. Right-click VLANs.
27. Select Create VLANs.
28. Enter **VM-App-1** as the name of the VLAN to be used for virtual machine traffic.
29. Keep the Common/Global option selected as the scope of the VLAN.
30. Enter the virtual machine traffic VLAN ID.
31. Keep Sharing Type set to None.



32. Click OK. Then click OK again.
33. Repeat these steps as needed for any additional VLANs created on the upstream Cisco Nexus switches.

PowerTool cmdlet Steps: Create VLANs

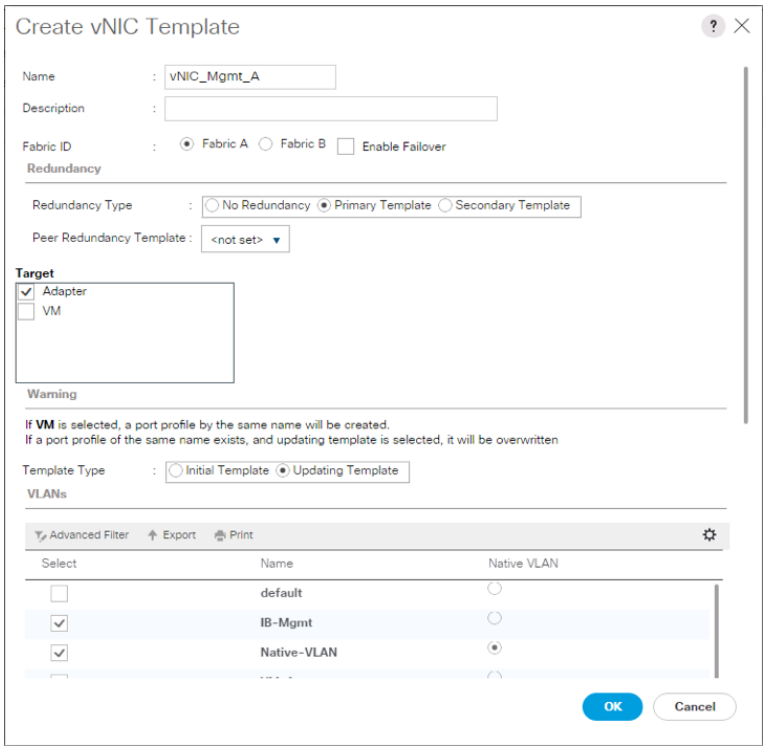
```
Get-UcsLanCloud | Add-UcsVlan -CompressionType "included" -DefaultNet "no" -Id 2
-McastPolicyName "" -Name "Native-VLAN" -PolicyOwner "local" -PubNwName "" -
Sharing "none"

Get-UcsLanCloud | Add-UcsVlan -CompressionType "included" -DefaultNet "no" -Id
115 -McastPolicyName "" -Name "IB-Mgmt" -PolicyOwner "local" -PubNwName "" -
Sharing "none"

Get-UcsLanCloud | Add-UcsVlan -CompressionType "included" -DefaultNet "no" -Id
200 -McastPolicyName "" -Name "vMotion" -PolicyOwner "local" -PubNwName "" -
Sharing "none"

Get-UcsLanCloud | Add-UcsVlan -CompressionType "included" -DefaultNet "no" -Id
201 -McastPolicyName "" -Name "VM-App-1" -PolicyOwner "local" -PubNwName "" -
Sharing "none"

Get-UcsLanCloud | Add-UcsVlan -CompressionType "included" -DefaultNet "no" -Id
202 -McastPolicyName "" -Name "VM-App-2" -PolicyOwner "local" -PubNwName "" -
Sharing "none"

Get-UcsLanCloud | Add-UcsVlan -CompressionType "included" -DefaultNet "no" -Id
203 -McastPolicyName "" -Name "VM-App-3" -PolicyOwner "local" -PubNwName "" -
Sharing "none"
```

Create vNIC Templates

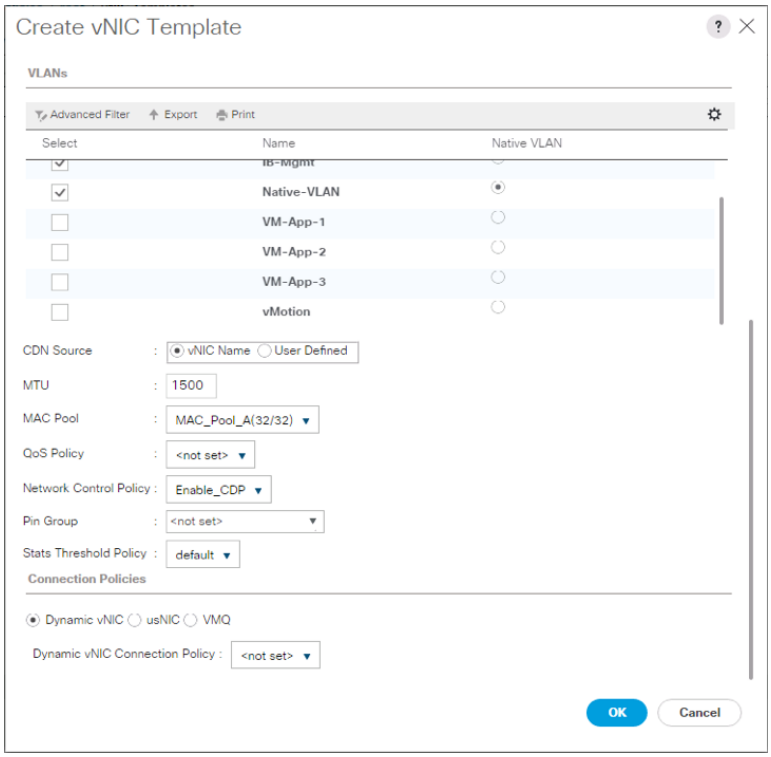
To create multiple vNIC templates for the Cisco UCS environment, complete the following steps. A total of six vNIC templates will be created.

Create a Management vNIC Template

1. In Cisco UCS Manager, click the LAN tab in the navigation pane.
2. Select Policies > root.
3. Right-click vNIC Templates.
4. Select Create vNIC Template.
5. Enter **vNIC_Mgmt_A** as the vNIC template name.
6. Keep Fabric A selected.
7. Do not select the Enable Failover checkbox.
8. Select Primary Template for Redundancy Type.
9. Leave Peer Redundancy Template not set.
10. Under Target, make sure that the virtual machine (VM) checkbox is not selected.
11. Select Updating Template for Template Type.
12. Under VLANs, select the checkboxes for IB-MGMT and Native-VLAN VLANs.



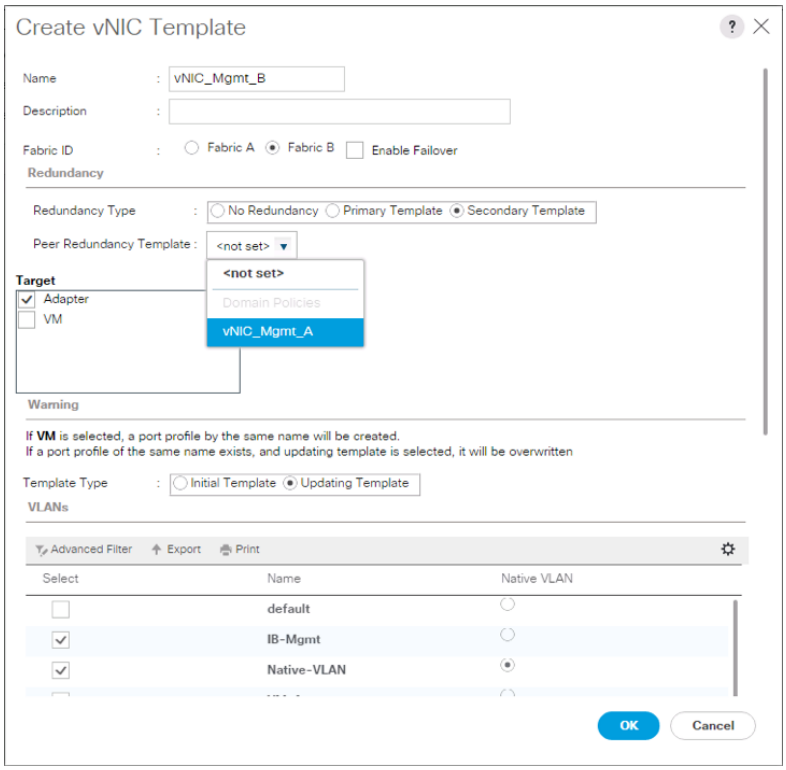
13. Set Native-VLAN as the native VLAN.
14. Leave vNIC Name selected as the content delivery network (CDN) source.
15. Leave 1500 set for the maximum transmission unit (MTU).
16. In the MAC Pool list, select MAC_Pool_A.
17. In the Network Control Policy list, select Enable_CDP.



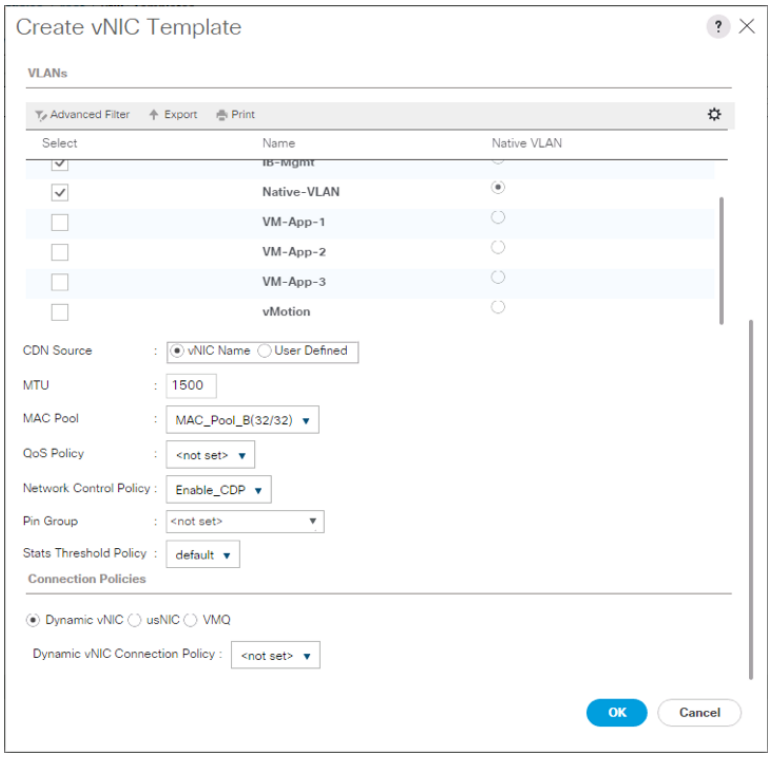
18. Click OK to create the vNIC template.
19. Click OK.

Create the vNIC_Mgmt_B Template

1. In the navigation pane, select the LAN tab.
2. Select Policies > root.
3. Right-click vNIC Templates.
4. Select Create vNIC Template
5. Enter **vNIC_Mgmt_B** as the vNIC template name.
6. Select Fabric B.
7. Do not select the Enable Failover checkbox.
8. Select Secondary Template for Redundancy Type.
9. From the Peer Redundancy Template pull-down menu, select vNIC_Mgmt_A.
10. Under Target, make sure that the VM checkbox is not selected.
11. Select Updating Template as the template type.
12. Under VLANs, select the checkboxes for IB-MGMT and Native-VLAN VLANs.



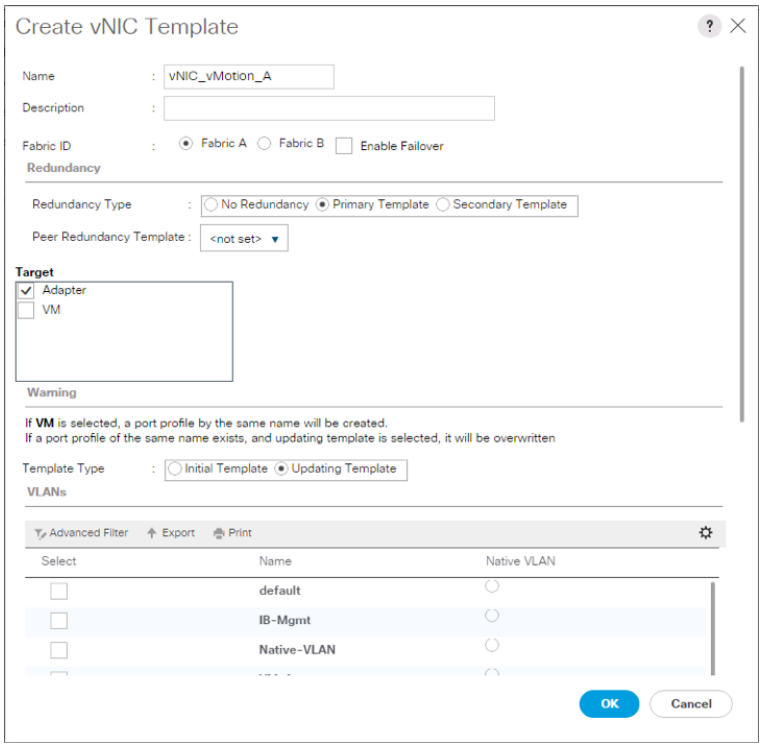
13. Set default as the native VLAN.
14. Leave vNIC Name selected as the CDN source.
15. Leave 1500 set for the MTU.
16. In the MAC Pool list, select MAC_Pool_B.
17. In the Network Control Policy list, select Enable_CDP.



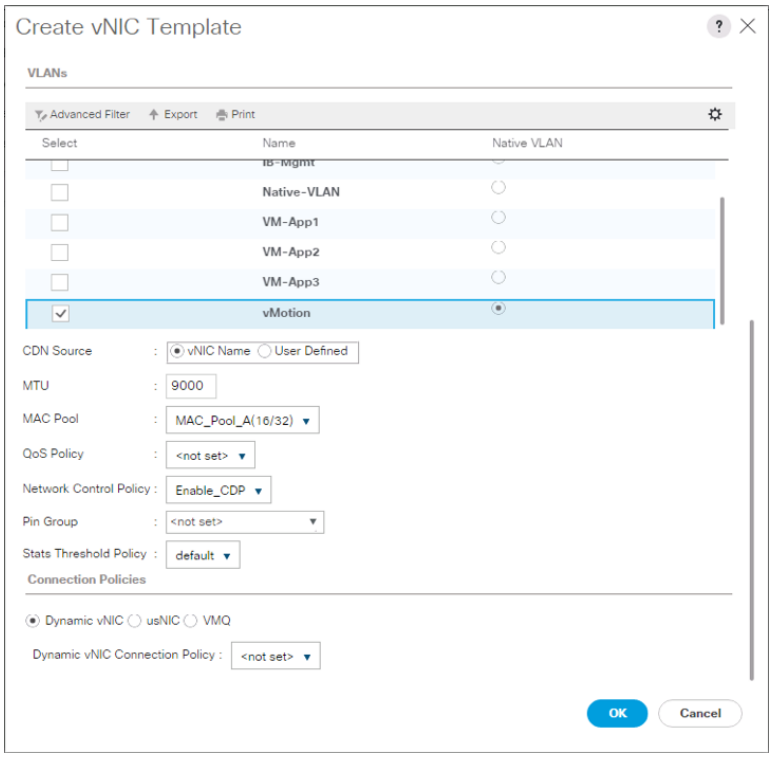
18. Click OK to create the vNIC template.
19. Click OK.

Create a vMotion vNIC Template

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



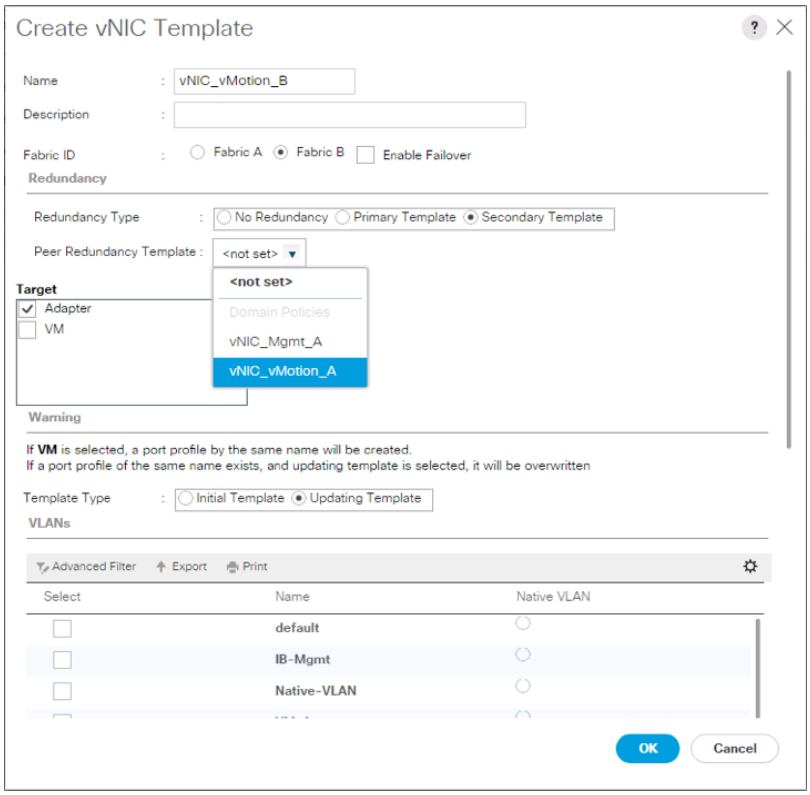
12. Under VLANs, select the checkbox for vMotion as the only VLAN.
13. Set vMotion as the native VLAN.
14. For MTU, enter **9000**.
15. In the MAC Pool list, select MAC_Pool_A.
16. In the Network Control Policy list, select Enable_CDP.



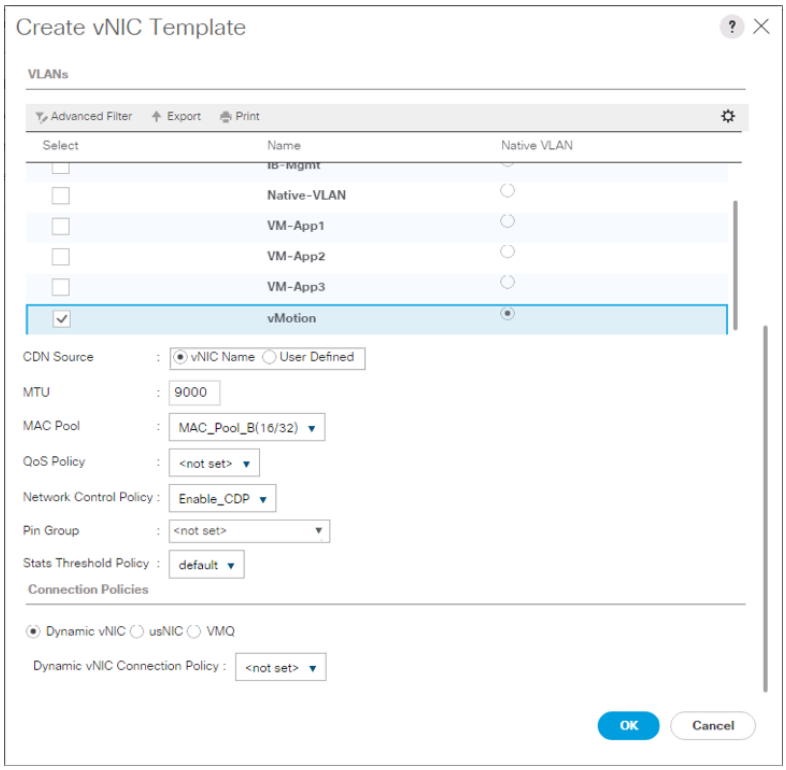
17. Click OK to create the vNIC template.
18. Click OK.

Create the vNIC_vMotion_B Template

1. In the navigation pane, select the LAN tab.
2. Select Policies > root.
3. Right-click vNIC Templates.
4. Select Create vNIC Template
5. Enter **vNIC_vMotion_B** as the vNIC template name.
6. Select Fabric B.
7. Do not select the Enable Failover checkbox.
8. Select Secondary Template for Redundancy Type.
9. From the Peer Redundancy Template pull-down menu, select vNIC_vMotion_A.
10. Under Target, make sure that the VM checkbox is not selected.
11. Select Updating Template as the template type.
12. Under VLANs, select the checkbox for the vMotion VLAN.



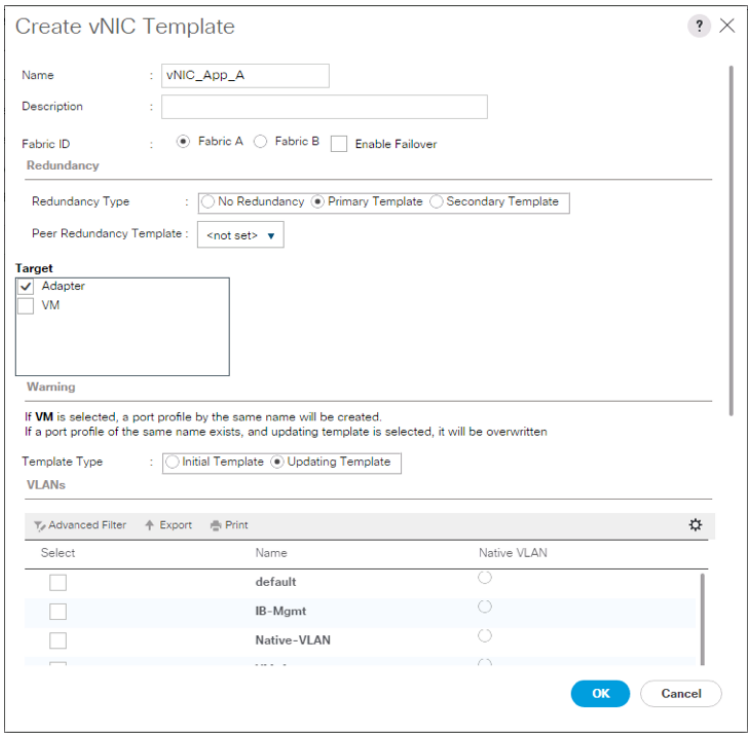
13. Select vNIC Name for CDN Source.
14. For MTU, enter **9000**.
15. In the MAC Pool list, select MAC_Pool_B.
16. In the Network Control Policy list, select Enable_CDP.



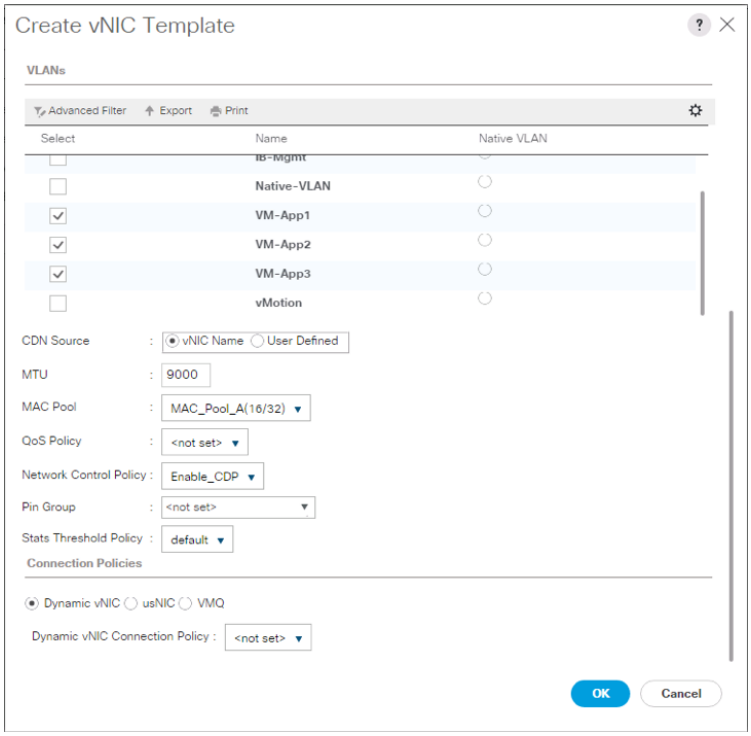
17. Click OK to create the vNIC template.
18. Click OK.

Create an Application vNIC Template

1. In Cisco UCS Manager, click the LAN tab in the navigation pane.
2. Select Policies > root.
3. Right-click vNIC Templates.
4. Select Create vNIC Template.
5. Enter **vNIC_App_A** as the vNIC template name.
6. Keep Fabric A selected.
7. Do not select the Enable Failover checkbox.
8. Select Primary Template for Redundancy Type.
9. Leave Peer Redundancy Template not set.
10. Under Target, make sure that the VM checkbox is not selected.
11. Select Updating Template for Template Type.
12. Under VLANs, select the checkboxes for any application or production VLANs that should be delivered to the ESXi hosts.



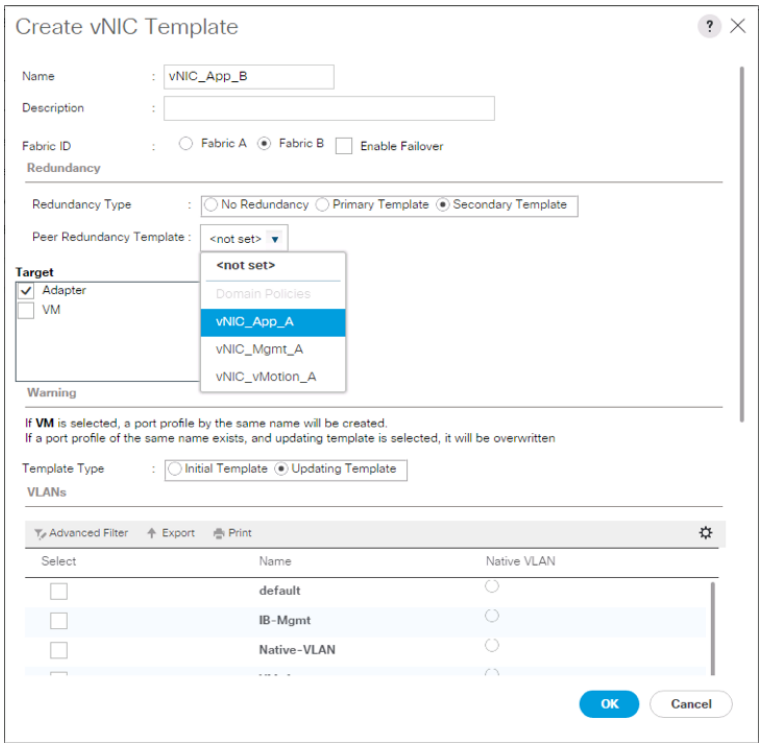
13. For MTU, enter **9000**.
14. In the MAC Pool list, select MAC_Pool_A.
15. In the Network Control Policy list, select Enable_CDP.



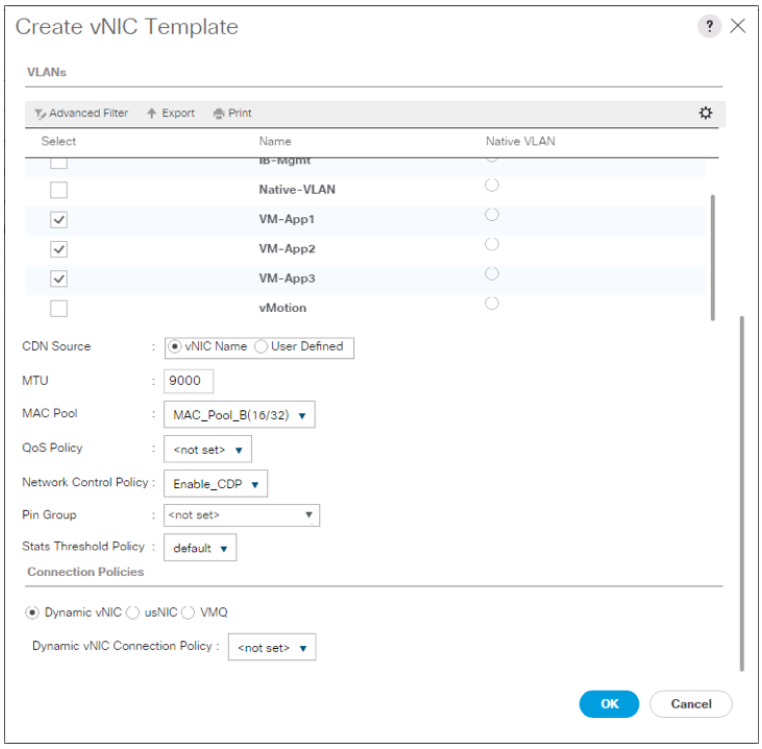
16. Click OK to create the vNIC template.
17. Click OK.

Create the vNIC_App_B Template

1. In the navigation pane, select the LAN tab.
2. Select Policies > root.
3. Right-click vNIC Templates.
4. Select Create vNIC Template
5. Enter **vNIC_App_B** as the vNIC template name.
6. Select Fabric B.
7. Do not select the Enable Failover checkbox.
8. Select Secondary Template for Redundancy Type.
9. From the Peer Redundancy Template pull-down menu, select vNIC_App_A.
10. Under Target, make sure the VM checkbox is not selected.



11. Select Updating Template as the template type.
12. Under VLANs, select the same checkboxes for the application or production VLANs selected for the vNIC_App_A vNIC Template.
13. Set default as the native VLAN.
14. Select vNIC Name for CDN Source.
15. For MTU, enter **9000**.
16. In the MAC Pool list, select MAC_Pool_B.
17. In the Network Control Policy list, select Enable_CDP.



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

PowerTool cmdlet Steps: Create vNIC Templates

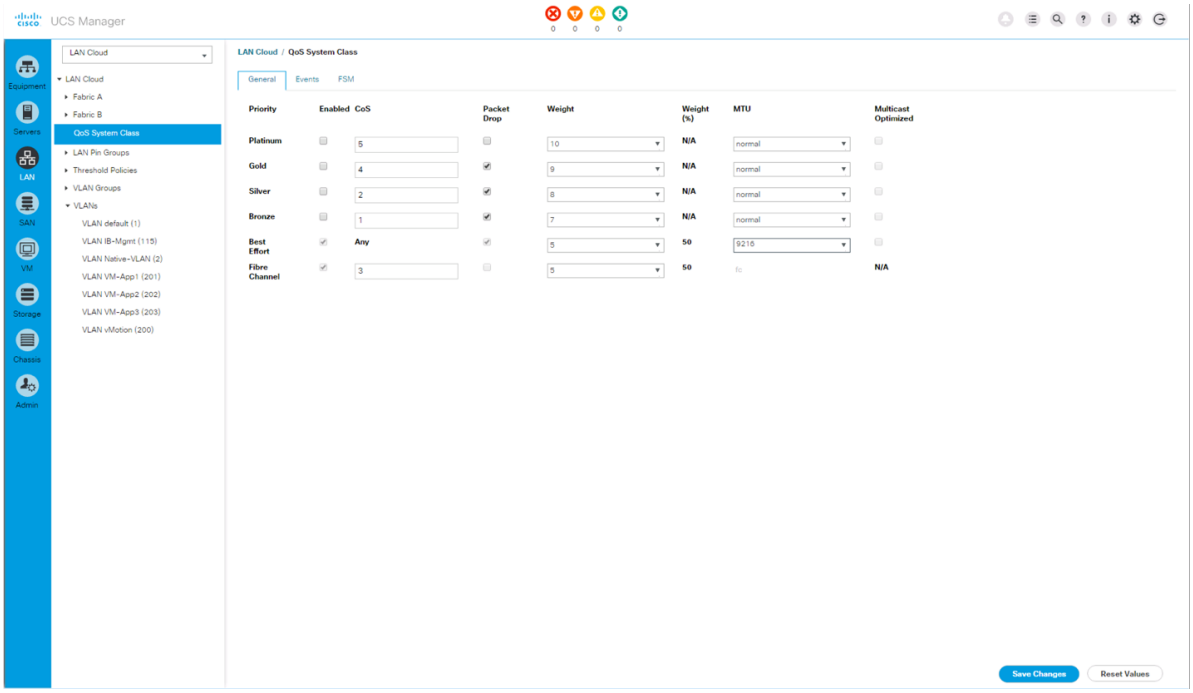
```
Start-UcsTransaction
$mo = Get-UcsOrg -Level root  | Add-UcsVnicTemplate -IdentPoolName "MAC_Pool_A" -
Name "vNIC_Mgmt_A" -NwCtrlPolicyName "Enable_CDP" -RedundancyPairType "primary" -
TemplType "updating-template"
$mo_1 = $mo | Add-UcsVnicInterface -ModifyPresent -DefaultNet "no" -Name "IB-
Mgmt"
$mo_2 = $mo | Add-UcsVnicInterface -ModifyPresent -DefaultNet "yes" -Name
"Native-VLAN"
Complete-UcsTransaction
Start-UcsTransaction
$mo = Get-UcsOrg -Level root  | Add-UcsVnicTemplate -IdentPoolName "MAC_Pool_B" -
Name "vNIC_Mgmt_B" -NwCtrlPolicyName "Enable_CDP" -PeerRedundancyTemplName
"vNIC_Mgmt_A" -RedundancyPairType "secondary" -SwitchId "B" -TemplType "updating-
template"
$mo_1 = $mo | Add-UcsVnicInterface -ModifyPresent -DefaultNet "no" -Name "IB-
Mgmt"
$mo_2 = $mo | Add-UcsVnicInterface -ModifyPresent -DefaultNet "yes" -Name
"Native-VLAN"
Complete-UcsTransaction


Start-UcsTransaction
$mo = Get-UcsOrg -Level root  | Add-UcsVnicTemplate -IdentPoolName "MAC_Pool_A" -
Mtu 9000 -Name "vNIC_vMotion_A" -NwCtrlPolicyName "Enable_CDP" -
RedundancyPairType "primary" -TemplType "updating-template"
```

```
$mo_1 = $mo | Add-UcsVnicInterface -ModifyPresent -DefaultNet "no" -Name
"vMotion"
Complete-UcsTransaction


Start-UcsTransaction
$mo = Get-UcsOrg -Level root  | Add-UcsVnicTemplate -IdentPoolName "MAC_Pool_B" -
Mtu 9000 -Name "vNIC_vMotion_B" -NwCtrlPolicyName "Enable_CDP" -
PeerRedundancyTemplName "vNIC_vMotion_A" -RedundancyPairType "secondary" -
SwitchId "B" -TemplType "updating-template"
$mo_1 = $mo | Add-UcsVnicInterface -ModifyPresent -DefaultNet "no" -Name
"vMotion"
Complete-UcsTransaction


Start-UcsTransaction
$mo = Get-UcsOrg -Level root  | Add-UcsVnicTemplate -IdentPoolName "MAC_Pool_A" -
Mtu 9000 -Name "vNIC_App_A" -NwCtrlPolicyName "Enable_CDP" -RedundancyPairType
"primary" -TemplType "updating-template"
$mo_1 = $mo | Add-UcsVnicInterface -ModifyPresent -DefaultNet "no" -Name "VM-App-
1"
$mo_2 = $mo | Add-UcsVnicInterface -ModifyPresent -DefaultNet "no" -Name "VM-App-
2"
$mo_3 = $mo | Add-UcsVnicInterface -ModifyPresent -DefaultNet "no" -Name "VM-App-
3"
Complete-UcsTransaction


Start-UcsTransaction
$mo = Get-UcsOrg -Level root  | Add-UcsVnicTemplate -IdentPoolName "MAC_Pool_B" -
Mtu 9000 -Name "vNIC_App_B" -NwCtrlPolicyName "Enable_CDP" -
PeerRedundancyTemplName "vNIC_App_A" -RedundancyPairType "secondary" -SwitchId
"B" -TemplType "updating-template"
$mo_1 = $mo | Add-UcsVnicInterface -ModifyPresent -DefaultNet "no" -Name "VM-App-
1"
$mo_2 = $mo | Add-UcsVnicInterface -ModifyPresent -DefaultNet "no" -Name "VM-App-
2"
$mo_3 = $mo | Add-UcsVnicInterface -ModifyPresent -DefaultNet "no" -Name "VM-App-
3"
Complete-UcsTransaction
```

Set Jumbo Frames in Cisco UCS Fabric

To configure jumbo frames and enable quality of service (QoS) in the Cisco UCS fabric, complete the following steps:

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



6. Click OK.

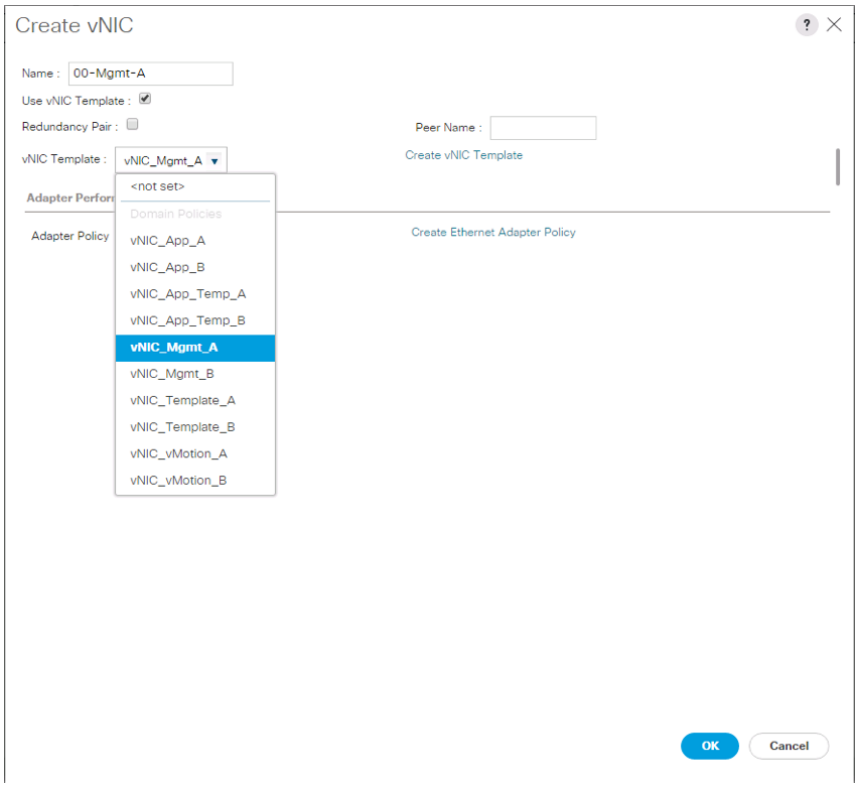
PowerTool cmdlet Steps: Set Jumbo Frames in Cisco UCS Fabric

```
Add-UcsManagedObject -ModifyPresent  -ClassId QosclassEthBE -PropertyMap
@{Dn="fabric/lan/classes/class-best-effort"; Mtu="9216"; }
```

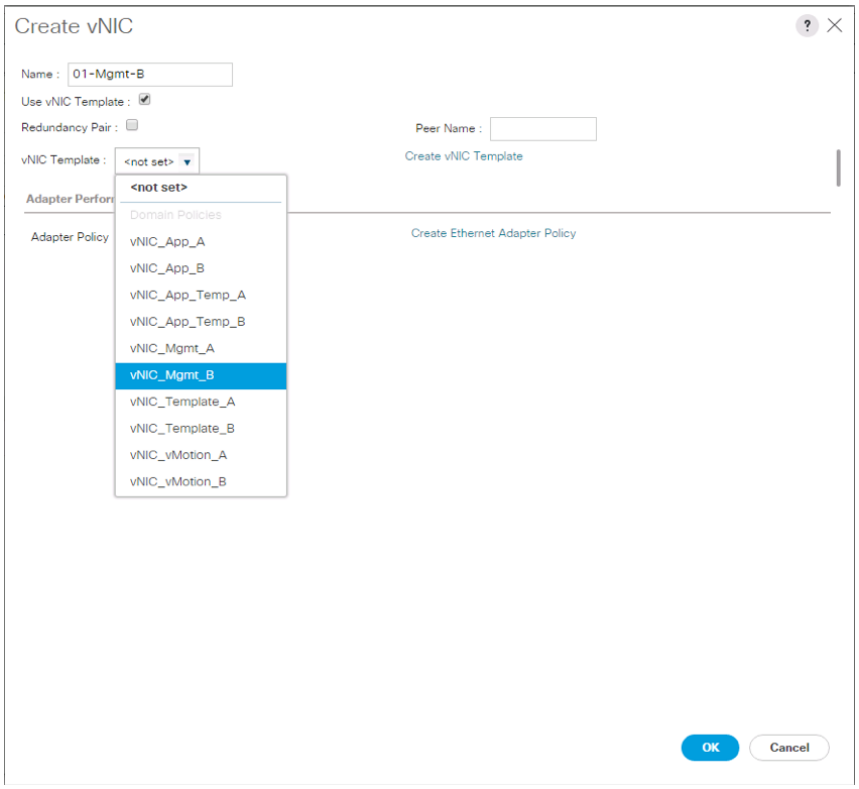
Create LAN Connectivity Policy

To configure the necessary Infrastructure LAN connectivity policy, complete the following steps:

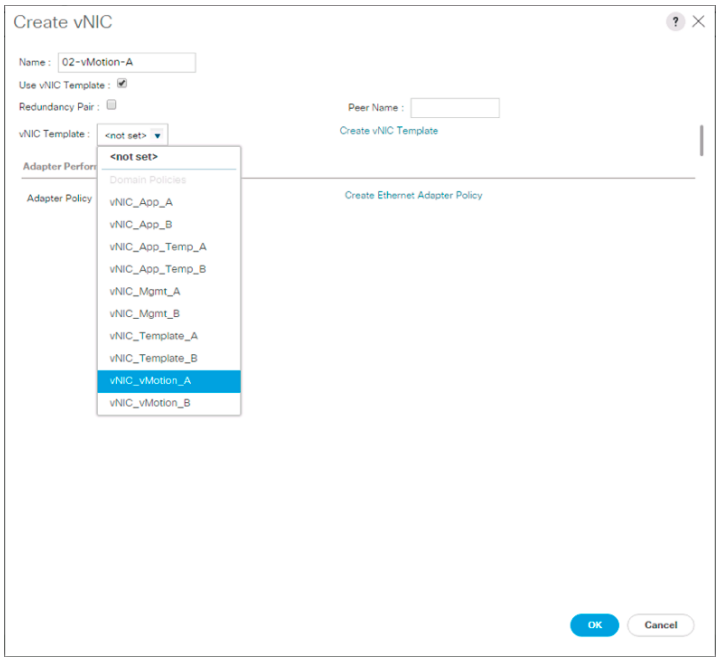
1. In Cisco UCS Manager, click the LAN tab in the navigation pane.
2. Select LAN > Policies > root.
3. Right-click LAN Connectivity Policies.
4. Select Create LAN Connectivity Policy.
5. Enter **Infra-LAN-Policy** as the name of the policy.
6. Click the upper Add button to add a vNIC.
7. In the Create vNIC dialog box, enter **00-Mgmt-A** as the name of the vNIC.
8. Select the Use vNIC Template checkbox.
9. In the vNIC Template list, select vNIC_Mgmt_A.
10. In the Adapter Policy list, select VMware.



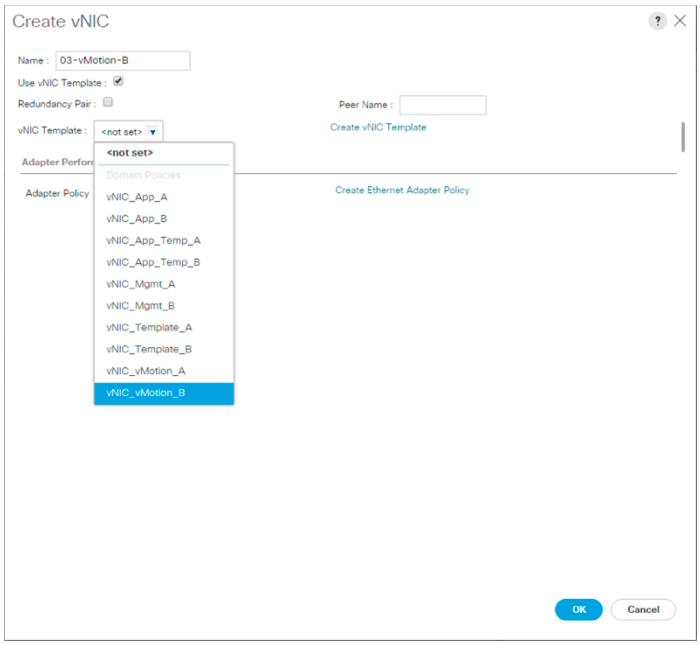
11. Click OK to add this vNIC to the policy.
12. Click the upper Add button to add another vNIC to the policy.
13. In the Create vNIC box, enter **01-Mgmt-B** as the name of the vNIC.
14. Select the Use vNIC Template checkbox.
15. In the vNIC Template list, select vNIC_Mgmt_B.
16. In the Adapter Policy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



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

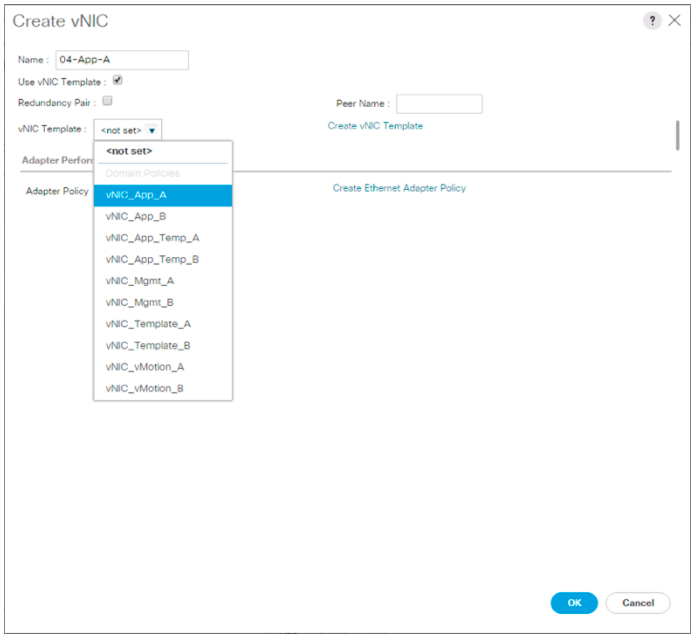


24. Click the upper Add button to add a vNIC to the policy.
25. In the Create vNIC dialog box, enter **03-vMotion-B** as the name of the vNIC.
26. Select the Use vNIC Template checkbox.
27. In the vNIC Template list, select vNIC_vMotion_B.
28. In the Adapter Policy list, select VMware.

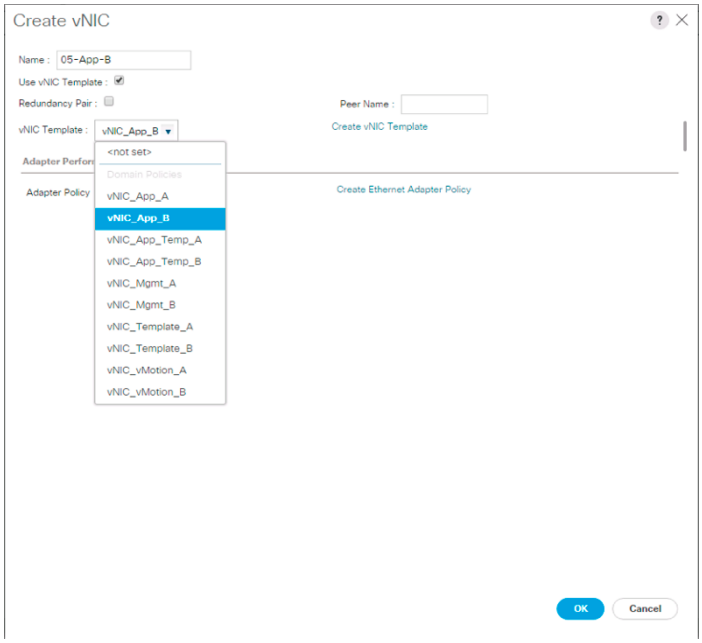


29. Click OK to add this vNIC to the policy.
30. Click the upper Add button to add a vNIC.
31. In the Create vNIC dialog box, enter **04-App-A** as the name of the vNIC.
32. Select the Use vNIC Template checkbox.

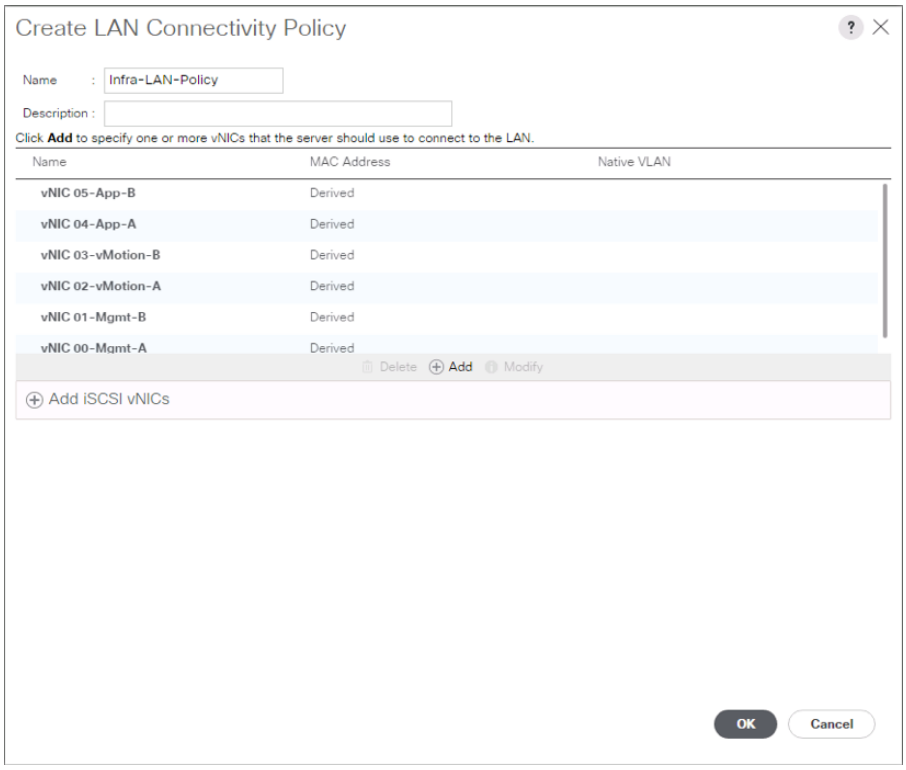
33. In the vNIC Template list, select vNIC_App_A.
34. In the Adapter Policy list, select VMware.
35. Click OK to add this vNIC to the policy.



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



41. Click OK to add this vNIC to the policy.



42. Click OK to create the LAN connectivity policy.
43. Click OK.

PowerTool cmdlet Steps: Create LAN Connectivity Policy

```
Start-UcsTransaction
$mo = Get-UcsOrg -Level root  | Add-UcsVnicLanConnPolicy -Name "Infra-LAN-Policy"
$mo_1 = $mo | Add-UcsVnic -AdaptorProfileName "VMWare" -Name "00-Mgmt-A" -
NwTemplName "vNIC_Mgmt_A" -Order "1"
$mo_2 = $mo | Add-UcsVnic -AdaptorProfileName "VMWare" -Name "01-Mgmt-B" -
NwTemplName "vNIC_Mgmt_B" -Order "2" -SwitchId "B"
$mo_3 = $mo | Add-UcsVnic -AdaptorProfileName "VMWare" -Name "02-vMotion-A" -
NwTemplName "vNIC_vMotion_A" -Order "3"
$mo_4 = $mo | Add-UcsVnic -AdaptorProfileName "VMWare" -Name "03-vMotion-B" -
NwTemplName "vNIC_vMotion_B" -Order "4" -SwitchId "B"
$mo_5 = $mo | Add-UcsVnic -AdaptorProfileName "VMWare" -Name "04-App-A" -
NwTemplName "vNIC_App_A" -Order "5"
$mo_6 = $mo | Add-UcsVnic -AdaptorProfileName "VMWare" -Name "05-App-B" -
NwTemplName "vNIC_App_B" -Order "6" -SwitchId "B"
Complete-UcsTransaction
```

Configure Cisco UCS SAN Connectivity

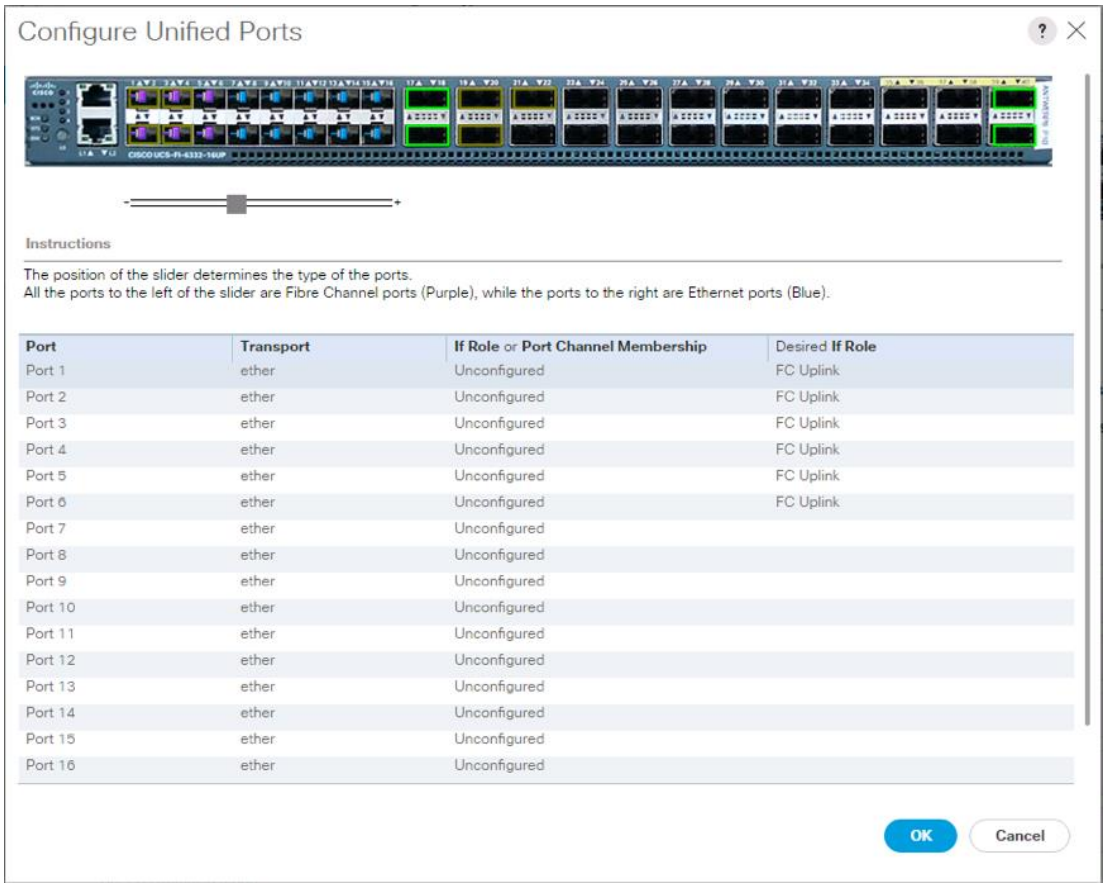
This section presents the steps for configuring SAN connectivity in the Cisco UCS environment.

Configure Unified Ports

The Cisco UCS 6332-16UP Fabric Interconnects have a slider mechanism in the Cisco UCS Manager GUI that controls the 16 ports. You can enable and configure the first 6, the first 12, or all 16 of the unified ports.

To configure the Fibre Channel ports, complete the following steps:

1. In Cisco UCS Manager, click the Equipment tab in the navigation pane.
2. Select Equipment > Fabric Interconnects > Fabric Interconnect A (primary)
3. Select Configure Unified Ports.
4. Click Yes in the pop-up window warning that changes to the fixed module will require a reboot of the fabric interconnect and that changes to the expansion module will require a reboot of that module.
5. In the Configured Fixed Ports pop-up window, move the gray slider bar from the left to the right to select 6, 12, or 16 ports to be set as Fibre Channel uplinks.



6. Click OK to continue.
7. Select Equipment > Fabric Interconnects > Fabric Interconnect B (primary).
8. Select Configure Unified Ports.

9. Click Yes in the pop-up window warning that changes to the fixed module will require a reboot of the fabric interconnect and that changes to the expansion module will require a reboot of that module.
10. In the Configured Fixed Ports pop-up window, move the gray slider bar from the left to the right to select 6, 12, or 16 ports to be set as Fibre Channel uplinks.
11. Click OK to continue.

Note: The fabric interconnects will reboot and then will reconnect to Cisco UCS Manager after they are back up.

PowerTool cmdlet Steps: Configure Unified Ports

```
Start-UcsTransaction
$mo = Add-UcsManagedObject -ModifyPresent  -ClassId FabricFcSan -PropertyMap
@{Id="A"; Dn="fabric/san/A"; }
$mo_1 = $mo | Add-UcsFcUplinkPort -AdminState "enabled" -AutoNegotiate "yes" -
FillPattern "arbff" -Name "" -PortId 1 -SlotId 1 -UsrLbl ""
$mo_2 = $mo | Add-UcsFcUplinkPort -AdminState "enabled" -AutoNegotiate "yes" -
FillPattern "arbff" -Name "" -PortId 2 -SlotId 1 -UsrLbl ""
$mo_3 = $mo | Add-UcsFcUplinkPort -AdminState "enabled" -AutoNegotiate "yes" -
FillPattern "arbff" -Name "" -PortId 3 -SlotId 1 -UsrLbl ""
$mo_4 = $mo | Add-UcsFcUplinkPort -AdminState "enabled" -AutoNegotiate "yes" -
FillPattern "arbff" -Name "" -PortId 4 -SlotId 1 -UsrLbl ""
$mo_5 = $mo | Add-UcsFcUplinkPort -AdminState "enabled" -AutoNegotiate "yes" -
FillPattern "arbff" -Name "" -PortId 5 -SlotId 1 -UsrLbl ""
$mo_6 = $mo | Add-UcsFcUplinkPort -AdminState "enabled" -AutoNegotiate "yes" -
FillPattern "arbff" -Name "" -PortId 6 -SlotId 1 -UsrLbl ""
Complete-UcsTransaction


Start-UcsTransaction
$mo = Add-UcsManagedObject -ModifyPresent  -ClassId FabricFcSan -PropertyMap
@{Id="B"; Dn="fabric/san/B"; }
$mo_1 = $mo | Add-UcsFcUplinkPort -AdminState "enabled" -AutoNegotiate "yes" -
FillPattern "arbff" -Name "" -PortId 1 -SlotId 1 -UsrLbl ""
$mo_2 = $mo | Add-UcsFcUplinkPort -AdminState "enabled" -AutoNegotiate "yes" -
FillPattern "arbff" -Name "" -PortId 2 -SlotId 1 -UsrLbl ""
$mo_3 = $mo | Add-UcsFcUplinkPort -AdminState "enabled" -AutoNegotiate "yes" -
FillPattern "arbff" -Name "" -PortId 3 -SlotId 1 -UsrLbl ""
$mo_4 = $mo | Add-UcsFcUplinkPort -AdminState "enabled" -AutoNegotiate "yes" -
FillPattern "arbff" -Name "" -PortId 4 -SlotId 1 -UsrLbl ""
$mo_5 = $mo | Add-UcsFcUplinkPort -AdminState "enabled" -AutoNegotiate "yes" -
FillPattern "arbff" -Name "" -PortId 5 -SlotId 1 -UsrLbl ""
$mo_6 = $mo | Add-UcsFcUplinkPort -AdminState "enabled" -AutoNegotiate "yes" -
FillPattern "arbff" -Name "" -PortId 6 -SlotId 1 -UsrLbl ""
Complete-UcsTransaction


#
#
# Wait for FIs to reboot before proceeding
# (Credentials may need to be re-established within PowerShell after reboot)
#
#
```

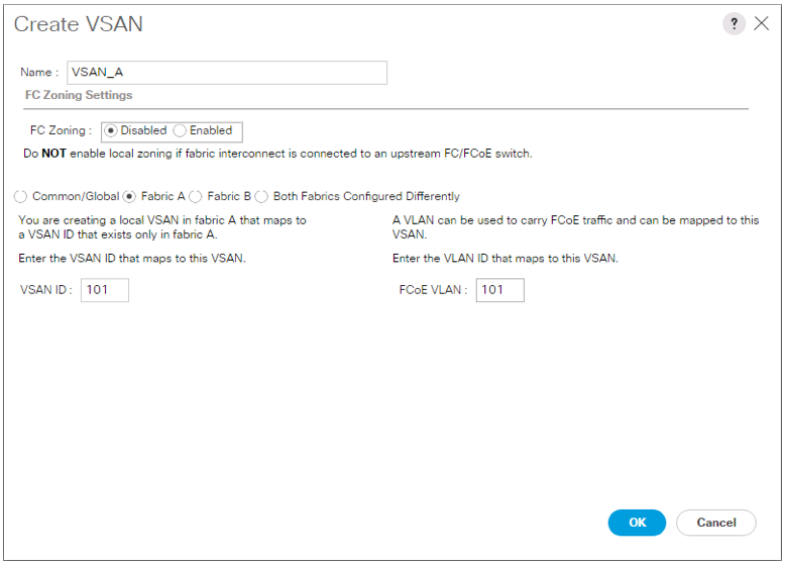
Create VSANs

To configure the necessary virtual storage area networks (VSANs) for the Cisco UCS environment, complete the following steps:

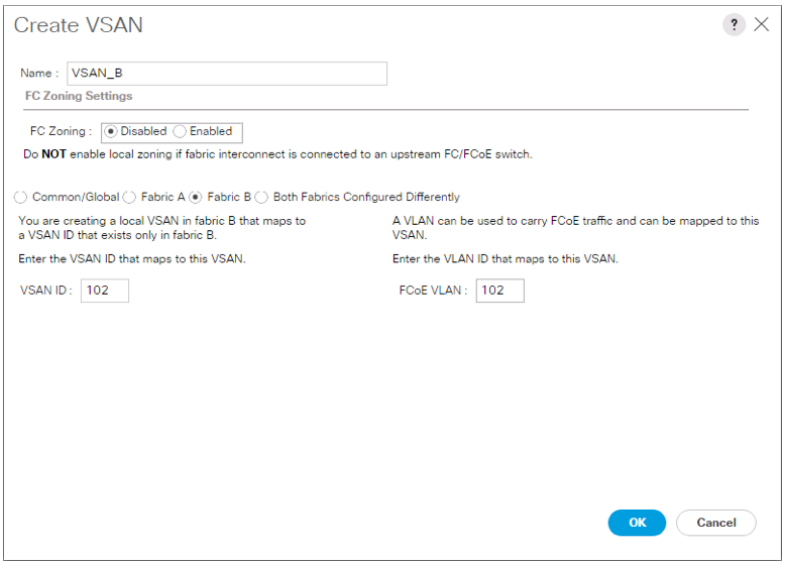
1. In Cisco UCS Manager, click the SAN tab in the navigation pane.

Note: In this procedure, two VSANs are created.

2. Select SAN > SAN Cloud.
3. Right-click VSANs.
4. Select Create VSAN.
5. Enter **VSAN_A** as the name of the VSAN to be used for Fabric A
6. Leave Disabled selected for FC Zoning.
7. Select Fabric A.
8. Enter a unique VSAN ID and a corresponding Fibre Channel over Ethernet (FCoE) VLAN ID. The recommended approach is to use the same ID for both parameters and to use something other than 1.



9. Click OK. Then click OK again.
10. Under SAN Cloud, right-click VSANs.
11. Select Create VSAN.
12. Enter **VSAN_B** as the name of the VSAN to be used for Fabric B.
13. Leave Disabled selected for FC Zoning.
14. Select Fabric B.
15. Enter a unique VSAN ID and a corresponding FCoE VLAN ID. The recommended approach is to use the same ID for both parameters and to use something other than 1.



16. Click OK. Then click OK again.

PowerTool cmdlet Steps: Create VSANs

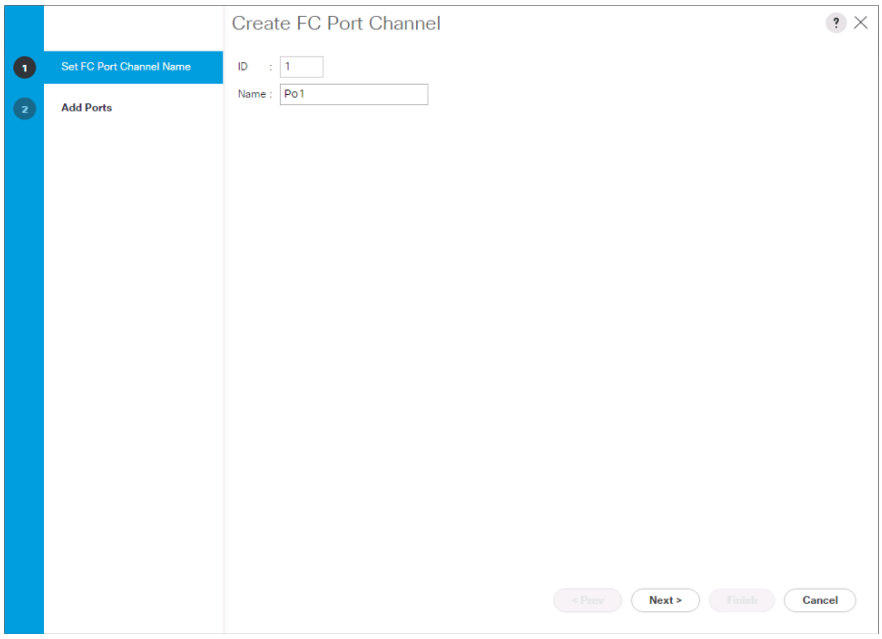
```
Get-UcsFiSanCloud -Id "A" | Add-UcsVsan -FcZoneSharingMode "coalesce" -FcoeVlan
101 -Id 101 -Name "VSAN_A" -PolicyOwner "local" -ZoningState "disabled"
Get-UcsFiSanCloud -Id "B" | Add-UcsVsan -FcZoneSharingMode "coalesce" -FcoeVlan
102 -Id 102 -Name "VSAN_B" -PolicyOwner "local" -ZoningState "disabled"
```

Create Fibre Channel Port Channels

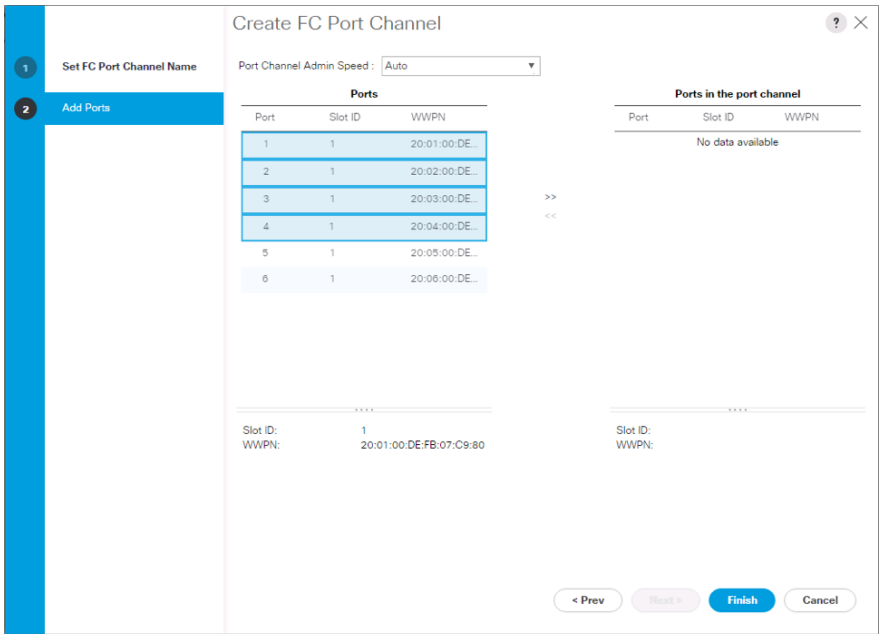
To configure the necessary port channels for the Cisco UCS environment, complete the following steps:

Create a Port Channel for Fabric-A

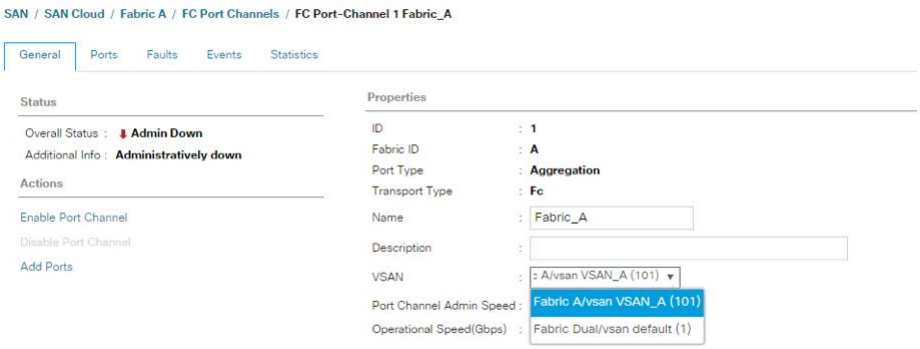
1. In the navigation pane, under SAN > SAN Cloud, expand the Fabric A tree.
2. Right-click FC Port Channels.
3. Select Create Port Channel.
4. Enter **1** as the ID and **Po1** as the port channel name.



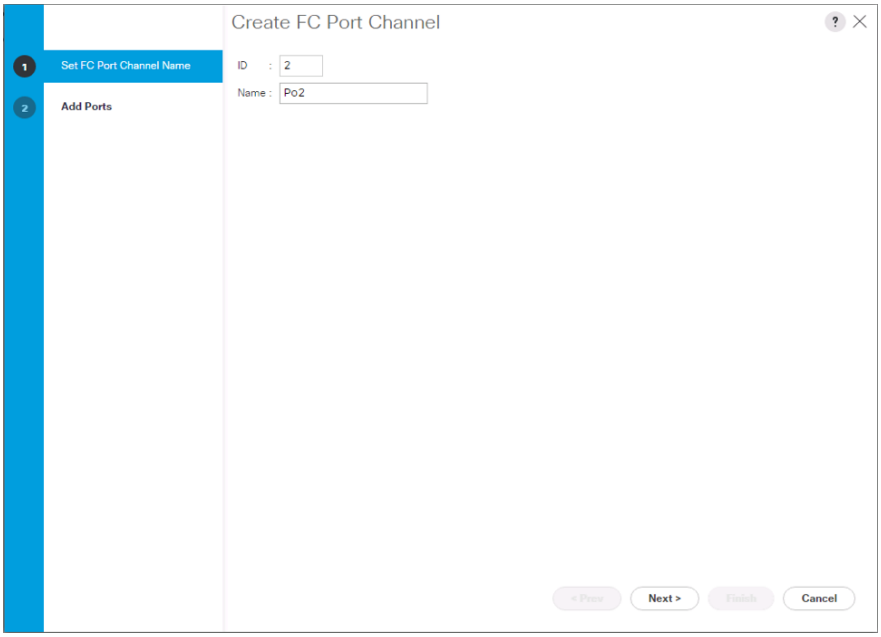
5. Click Next. Then choose appropriate ports and click **>>** to add the ports to the port channel.



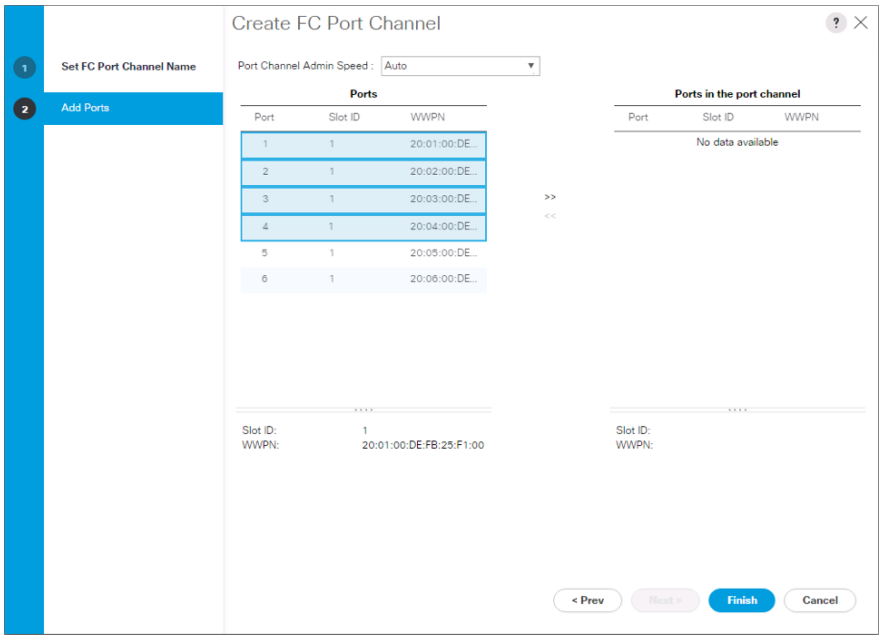
6. Click Finish.
7. Click OK.
8. From the VSAN pull-down menu for Port-Channel 1, select VSAN_A 101.



9. Click Save Changes and then click OK.
10. Create a Port Channel for Fabric-B
11. In the navigation pane, under SAN > SAN Cloud, expand the Fabric B tree.
12. Right-click FC Port Channels.
13. Select Create Port Channel.
14. Enter **2** as the ID and **Po2** as the port channel name.



15. Click Next. Then choose appropriate ports and click **>>** to add the ports to the port channel.



16. Click Finish.
17. Click OK.
18. From the VSAN pull-down menu for Port-Channel 2, select VSAN_B 102.

19. Click Save Changes and then click OK.

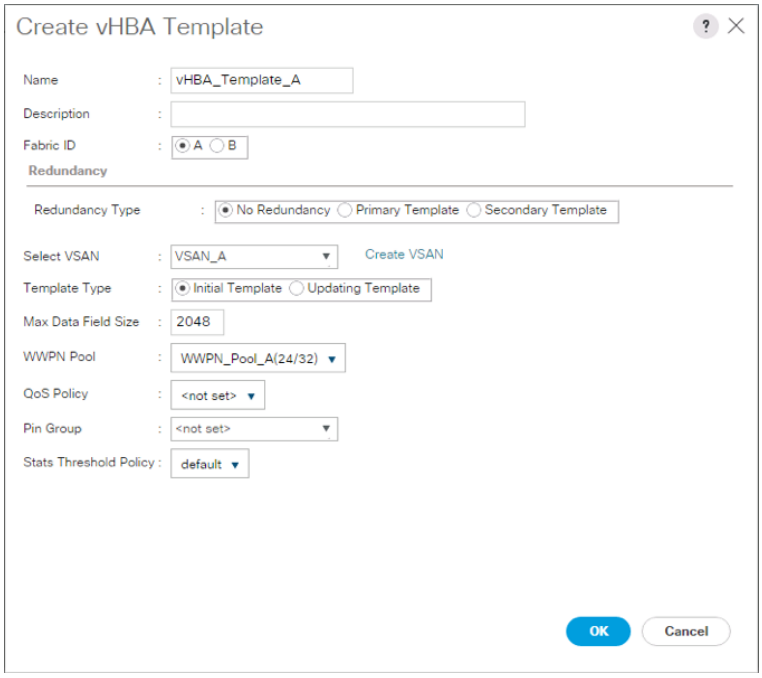
PowerTool cmdlet Steps: Create Fibre Channel Port Channels

```
Start-UcsTransaction
$mo = Get-UcsFiSanCloud -Id "A" | Add-UcsFcUplinkPortChannel -Name "Po1" -PortId
1
$mo_1 = $mo | Add-UcsFabricFcSanPcEp -ModifyPresent -AdminSpeed "auto" -
AdminState "enabled" -AutoNegotiate "yes" -FillPattern "arbff" -Name "" -PortId 1
-SlotId 1
$mo_2 = $mo | Add-UcsFabricFcSanPcEp -ModifyPresent -AdminSpeed "auto" -
AdminState "enabled" -AutoNegotiate "yes" -FillPattern "arbff" -Name "" -PortId 2
-SlotId 1
$mo_3 = $mo | Add-UcsFabricFcSanPcEp -ModifyPresent -AdminSpeed "auto" -
AdminState "enabled" -AutoNegotiate "yes" -FillPattern "arbff" -Name "" -PortId 3
-SlotId 1
$mo_4 = $mo | Add-UcsFabricFcSanPcEp -ModifyPresent -AdminSpeed "auto" -
AdminState "enabled" -AutoNegotiate "yes" -FillPattern "arbff" -Name "" -PortId 4
-SlotId 1
Complete-UcsTransaction


Start-UcsTransaction
$mo = Get-UcsFiSanCloud -Id "A" | Add-UcsVsan -ModifyPresent  -Name "VSAN_A"
$mo_1 = $mo | Add-UcsVsanMemberFcPortChannel -ModifyPresent -AdminState "enabled"
-Descr "" -Name "" -PortId 1 -SwitchId "A"
Complete-UcsTransaction


Start-UcsTransaction
$mo = Get-UcsFiSanCloud -Id "B" | Add-UcsFcUplinkPortChannel -Name "Po2" -PortId
2
$mo_1 = $mo | Add-UcsFabricFcSanPcEp -ModifyPresent -AdminSpeed "auto" -
AdminState "enabled" -AutoNegotiate "yes" -FillPattern "arbff" -Name "" -PortId 1
-SlotId 1
$mo_2 = $mo | Add-UcsFabricFcSanPcEp -ModifyPresent -AdminSpeed "auto" -
AdminState "enabled" -AutoNegotiate "yes" -FillPattern "arbff" -Name "" -PortId 2
-SlotId 1
$mo_3 = $mo | Add-UcsFabricFcSanPcEp -ModifyPresent -AdminSpeed "auto" -
AdminState "enabled" -AutoNegotiate "yes" -FillPattern "arbff" -Name "" -PortId 3
-SlotId 1
$mo_4 = $mo | Add-UcsFabricFcSanPcEp -ModifyPresent -AdminSpeed "auto" -
AdminState "enabled" -AutoNegotiate "yes" -FillPattern "arbff" -Name "" -PortId 4
-SlotId 1
Complete-UcsTransaction


Start-UcsTransaction
```

Create vHBA Templates

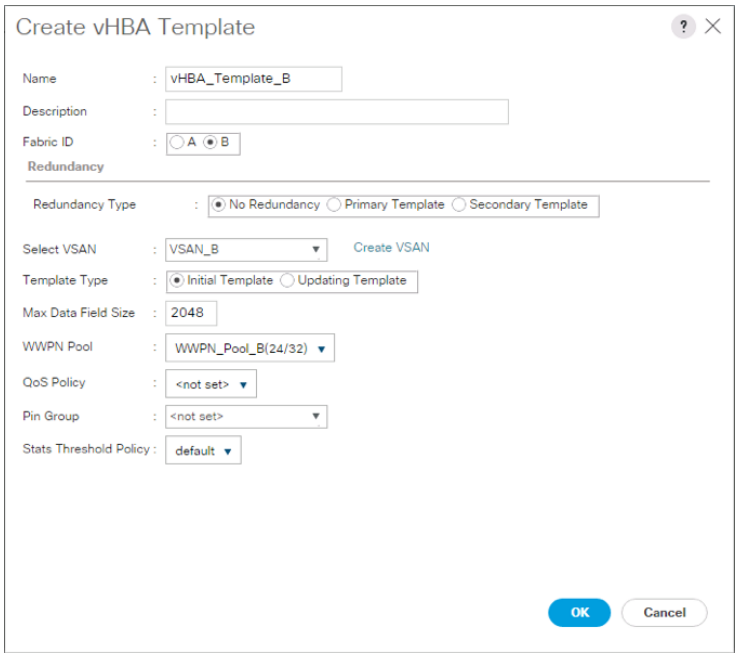
To create the necessary vHBA templates for the Cisco UCS environment, complete the following steps:

1. In Cisco UCS Manager, click the SAN tab in the navigation pane.
2. Select Policies > root.
3. Right-click vHBA Templates.
4. Select Create vHBA Template.
5. Enter **vHBA_Template_A** as the vHBA template name.
6. Keep Fabric A selected.
7. Leave Redundancy Type as No Redundancy.
8. Select VSAN_A.
9. Leave Initial Template as the template type.
10. Select WWPN_Pool_A for WWPN Pool.
11. Click OK to create the vHBA template.



12. Click OK.
13. Right-click vHBA Templates.
14. Select Create vHBA Template.
15. Enter **vHBA_Template_B** as the vHBA template name.
16. Select Fabric B for Fabric ID.
17. Select VSAN_B.
18. Leave Redundancy Type as No Redundancy.
19. Leave Initial Template as the template type.
20. Select WWPN_Pool_B for WWPN Pool.

21. Click OK to create the vHBA template.



22. Click OK.

PowerTool cmdlet Steps: Create vHBA Templates

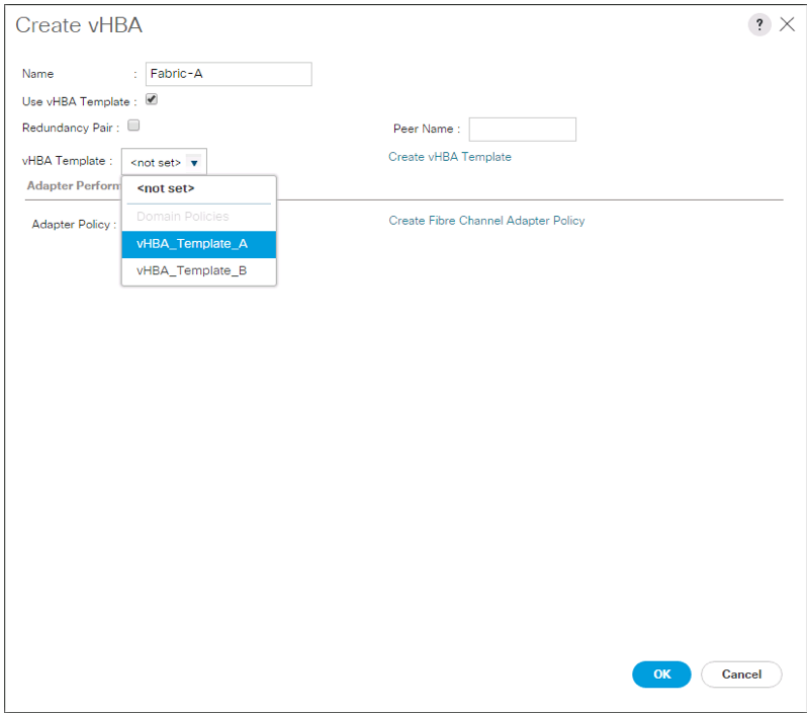
```
Start-UcsTransaction
$mo = Get-UcsOrg -Level root  | Add-UcsVhbaTemplate -IdentPoolName "WWPN_Pool_A"
-Name "vHBA_Template_A"
$mo_1 = $mo | Add-UcsVhbaInterface -ModifyPresent -Name "VSAN_A"
Complete-UcsTransaction

Start-UcsTransaction
$mo = Get-UcsOrg -Level root  | Add-UcsVhbaTemplate -IdentPoolName "WWPN_Pool_B"
-Name "vHBA_Template_B" -SwitchId "B"
$mo_1 = $mo | Add-UcsVhbaInterface -ModifyPresent -Name "VSAN_B"
Complete-UcsTransaction
```

Create SAN Connectivity Policy

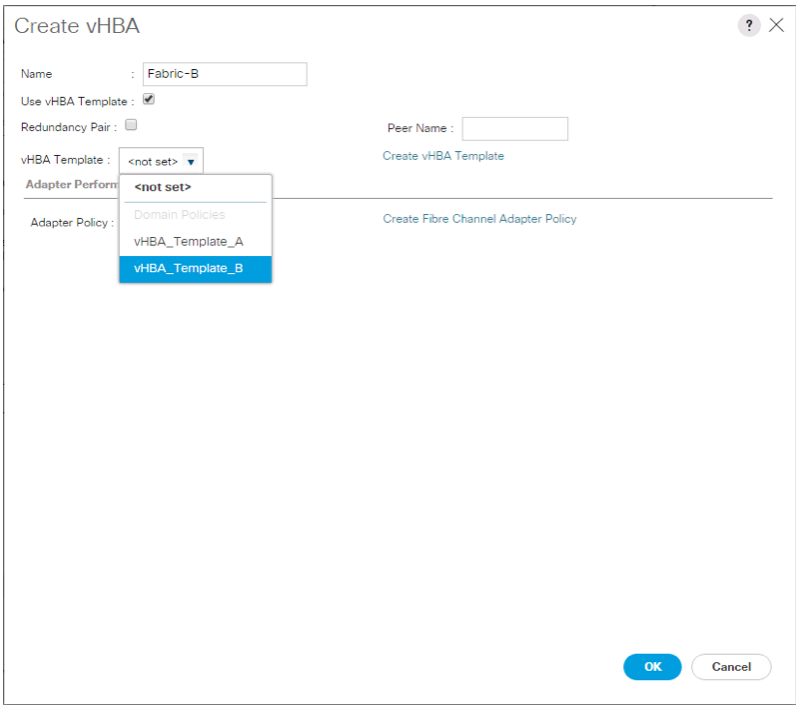
To configure the necessary Infrastructure SAN connectivity policy, complete the following steps:

1. In Cisco UCS Manager, click the SAN tab in the navigation pane.
2. Select SAN > Policies > root.
3. Right-click SAN Connectivity Policies.
4. Select Create SAN Connectivity Policy.
5. Enter **Infra-SAN-Policy** as the name of the policy.
6. Select the previously created WWNN_Pool for the WWNN assignment.
7. Click the Add button at the bottom to add a vHBA.
8. In the Create vHBA dialog box, enter **Fabric-A** as the name of the vHBA.

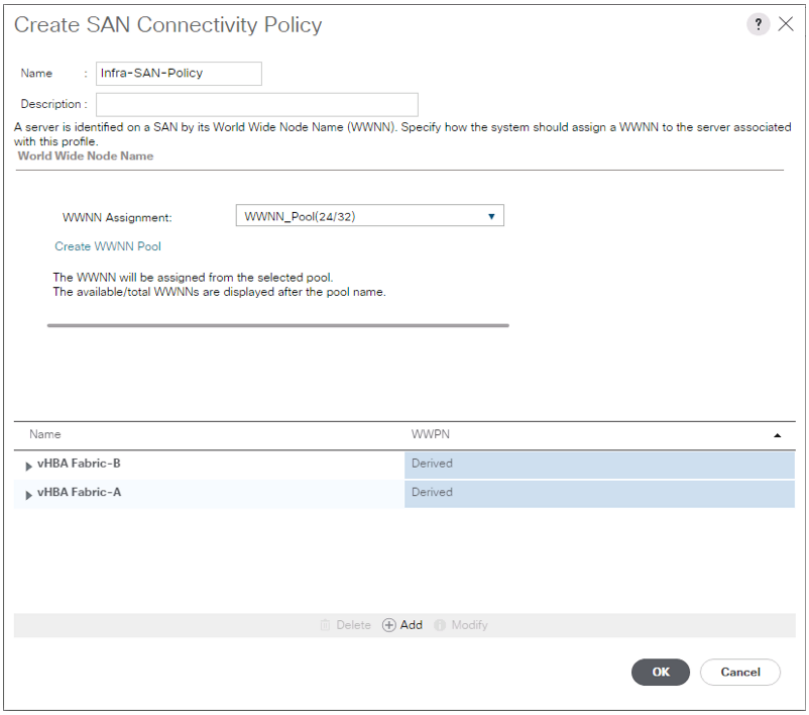
9. Select the Use vHBA Template checkbox.
10. Leave Redundancy Pair unselected.
11. In the vHBA Template list, select vHBA_Template_A.



12. In the Adapter Policy list, select VMware.
13. Click OK.
14. Click the Add button at the bottom to add a second vHBA.
15. In the Create vHBA dialog box, enter **Fabric-B** as the name of the vHBA.
16. Select the Use vHBA Template checkbox.
17. Leave Redundancy Pair unselected.
18. In the vHBA Template list, select vHBA_Template_B.



19. In the Adapter Policy list, select VMware.
20. Click OK.



21. Click OK to create the SAN connectivity policy.
22. Click OK to confirm the policy creation.

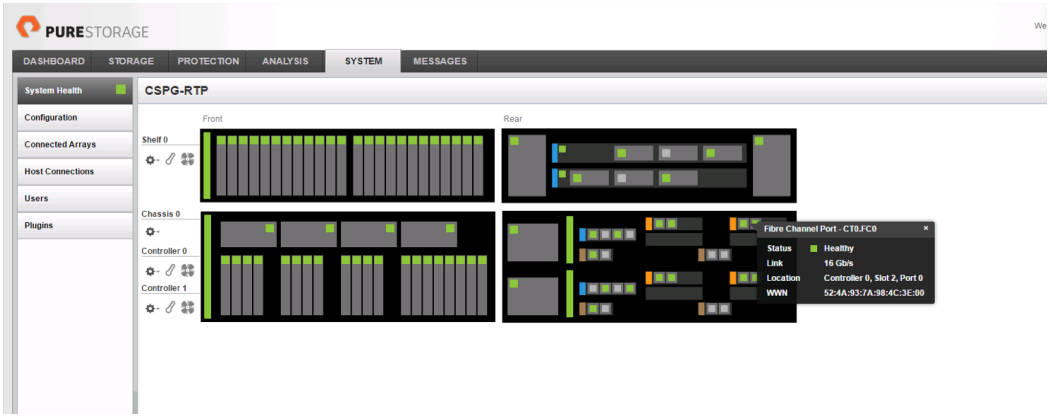
PowerTool cmdlet Steps: Create SAN Connectivity Policy

```
Start-UcsTransaction
$mo = Get-UcsOrg -Level root  | Add-UcsVnicSanConnPolicy -Name "Infra-SAN-Policy"
$mo_1 = $mo | Add-UcsVnicFcNode -ModifyPresent -Addr "pool-derived" -
IdentPoolName "WWNN_Pool"
$mo_2 = $mo | Add-UcsVhba -AdaptorProfileName "VMWare" -Name "Fabric-A" -
NwTemplName "vHBA_Template_A" -Order "1"
$mo_2_1 = $mo_2 | Add-UcsVhbaInterface -ModifyPresent -Name "default"
$mo_3 = $mo | Add-UcsVhba -AdaptorProfileName "VMWare" -Name "Fabric-B" -
NwTemplName "vHBA_Template_B" -Order "2"
$mo_3_1 = $mo_3 | Add-UcsVhbaInterface -ModifyPresent -Name "default"
Complete-UcsTransaction
```

Create Boot Policies

This procedure defines the primary and secondary boot targets for each fabric side (fabrics A and B). These targets are the worldwide names (WWNs) that need to be collected from the first adapter of each controller on the Pure Storage FlashArray//M. They are visible on the System Health tab in the System section of the Pure Storage web portal (Figure 6).

Figure 6. System View on the System Health Tab



Find the FC0 adapters for each controller in the System view and record the values to be used for the primary and secondary targets. In the sample environment described in this document, these appear as the first ports on the right side of each controller in Figure 6 (see Table 1).

Table 1. Fabric A Boot Targets for the FlashArray//M

	Port Name	Target Role	WWN and WWPN Sample Environment	WWN and WWPN Customer Environment
FlashArray//M Controller 0	CT0.FC0	Primary	52:4a:93:7a:98:4c:3e:00	
FlashArray//M Controller 1	CT1.FC0	Secondary	52:4a:93:7a:98:4c:3e:10	

In the same System view, find the FC1 adapters for each controller and record the values to be used for the primary and secondary targets. In the sample environment described in this document, these appear as the second ports on the right side of each controller shown in Figure 6 (see Table 2).

Table 2. Fabric B Boot Targets for the FlashArray//M

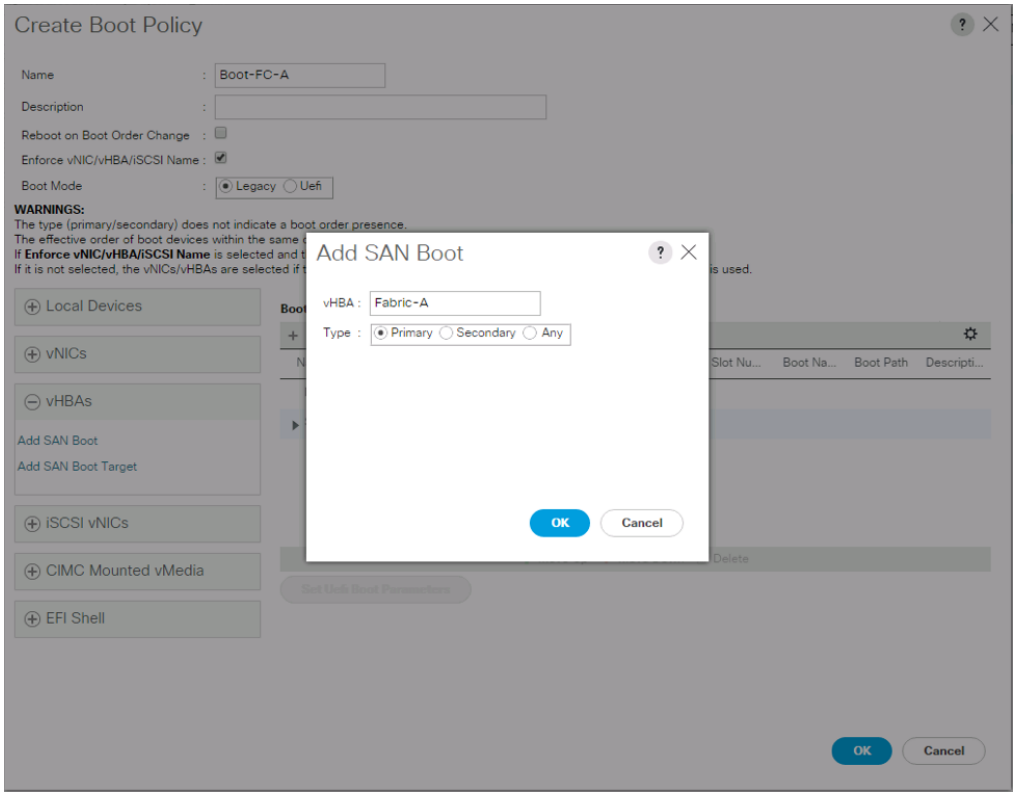
	Port Name	Target Role	WWN and WWPN Sample Environment	WWN and WWPN Customer Environment
FlashArray//M Controller 0	CT0.FC1	Primary	52:4a:93:7a:98:4c:3e:01	
FlashArray//M Controller 1	CT1.FC1	Secondary	52:4a:93:7a:98:4c:3e:11	

To create boot policies for the Cisco UCS environment, complete the following steps:

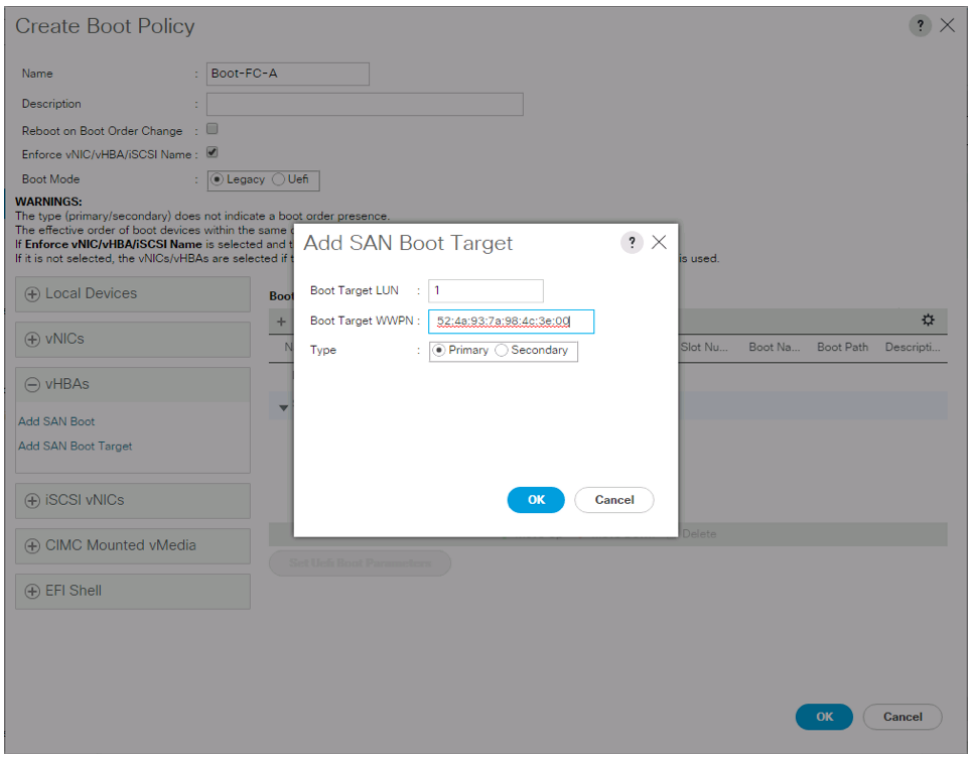
1. In Cisco UCS Manager, click the Servers tab in the navigation pane.
2. Select Policies > root.
3. Right-click Boot Policies.
4. Select Create Boot Policy.
5. Enter **Boot-FC-A** as the name of the boot policy.
6. Optional: Enter a description for the boot policy.

Note: Do not select the Reboot on Boot Order Change checkbox.

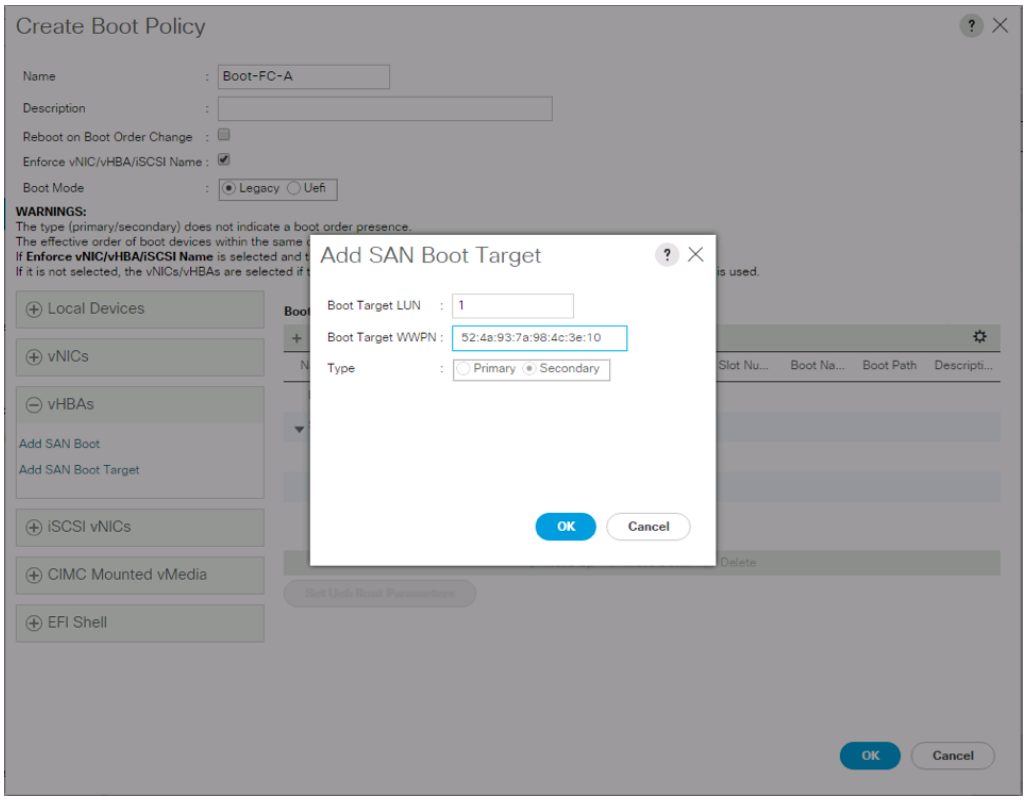
7. Keep the Reboot on Boot Order Change option unselected.
8. From the Local Devices drop-down menu, select Add Remote CD/DVD.
9. From the vHBAs drop-down menu, select Add SAN Boot.
10. In the Add SAN Boot dialog box, enter **Fabric-A** in the vHBA field.
11. Confirm that Primary is selected for the Type option.



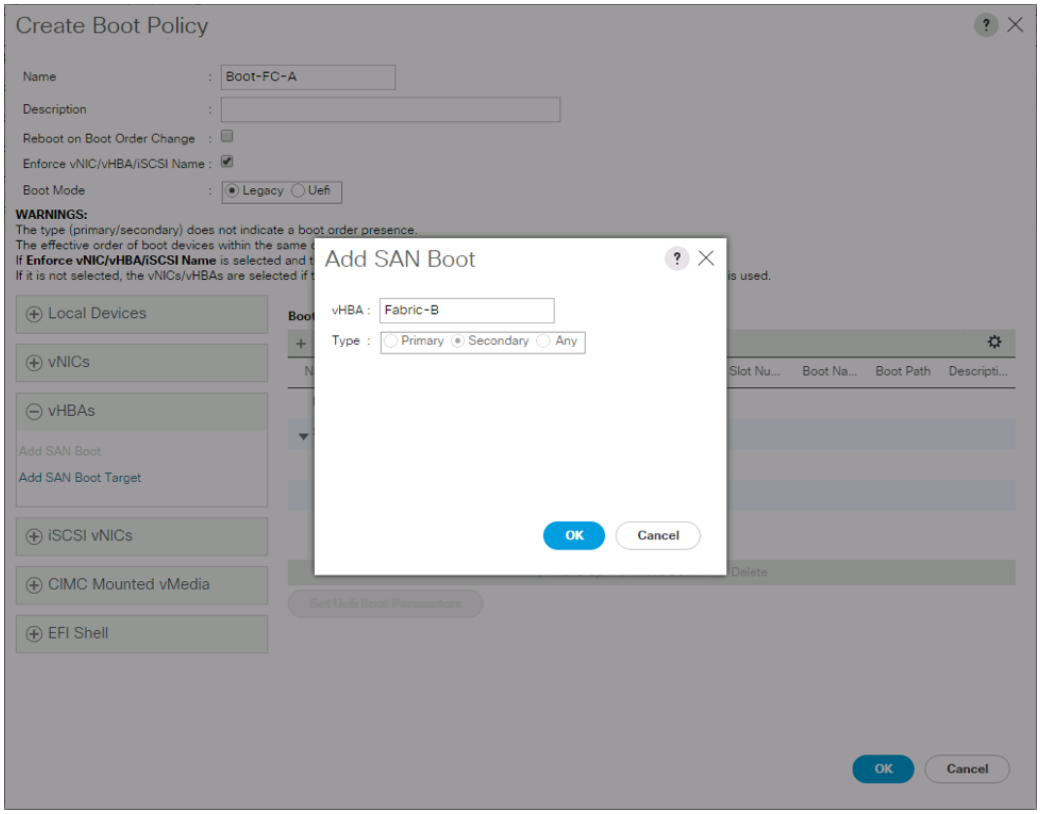
12. Click OK to add the SAN boot initiator.
13. From the vHBA drop-down menu, select Add SAN Boot Target.
14. Enter **1** as the value for Boot Target LUN.
15. Enter the WWPN for CT0.FC0 recorded in **Error! Reference source not found.**.
16. Select Primary for the SAN boot target type.



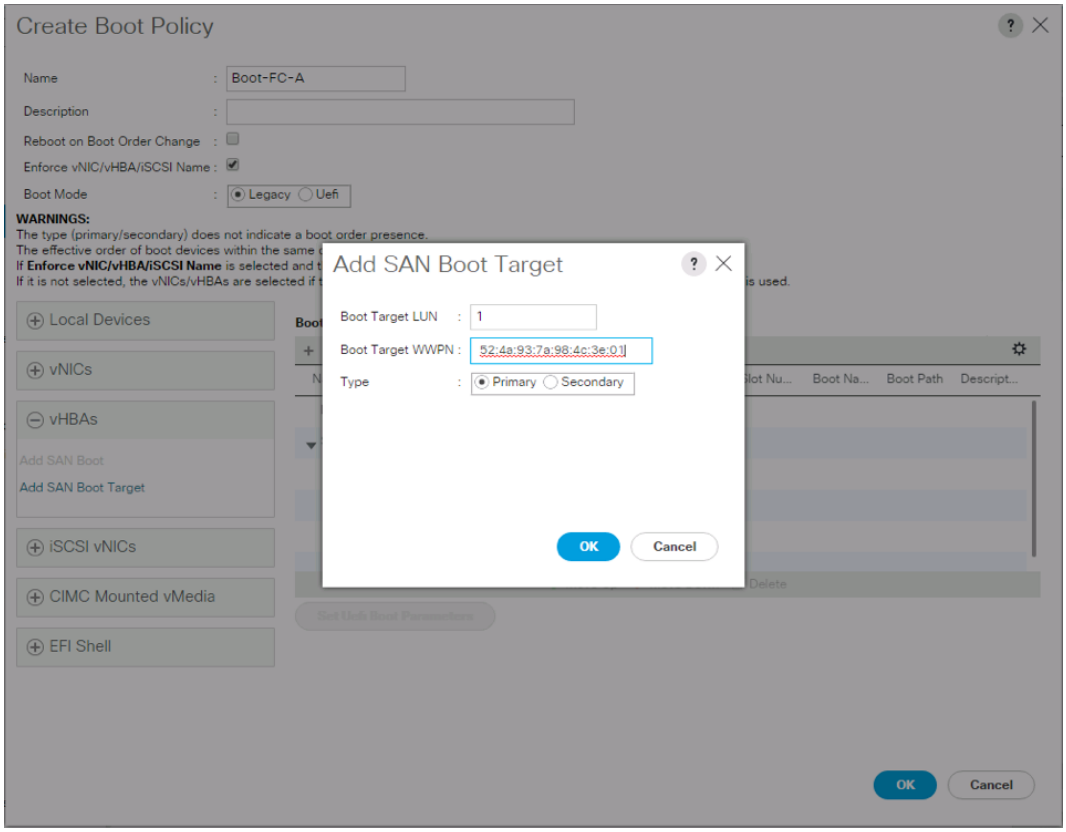
17. Click OK to add the SAN boot target.
18. From the vHBA drop-down menu, select Add SAN Boot Target.
19. Enter **1** as the value for Boot Target LUN.
20. Enter the WWPN for CT1.FC0 recorded in **Error! Reference source not found.**.



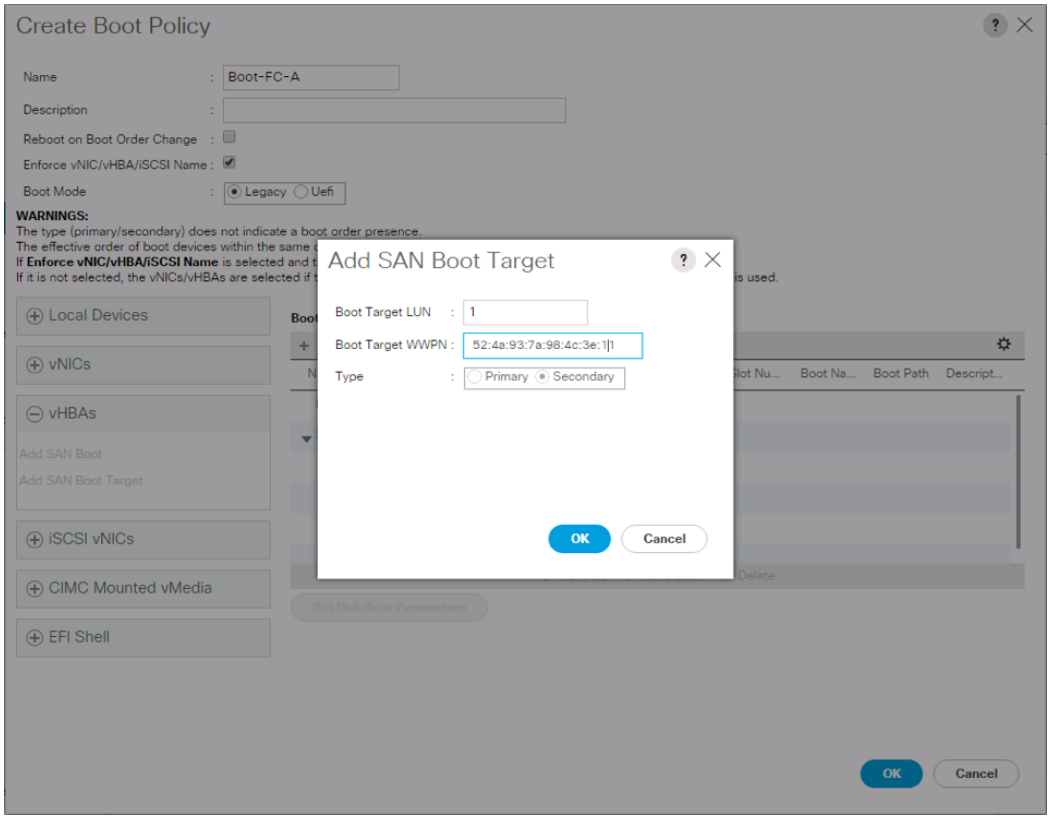
21. Click OK to add the SAN boot target.
22. From the vHBA drop-down menu, select Add SAN Boot.
23. In the Add SAN Boot dialog box, enter **Fabric-B** in the vHBA box.
24. Verify that the SAN boot type is automatically set to Secondary and that the Type option is unavailable.



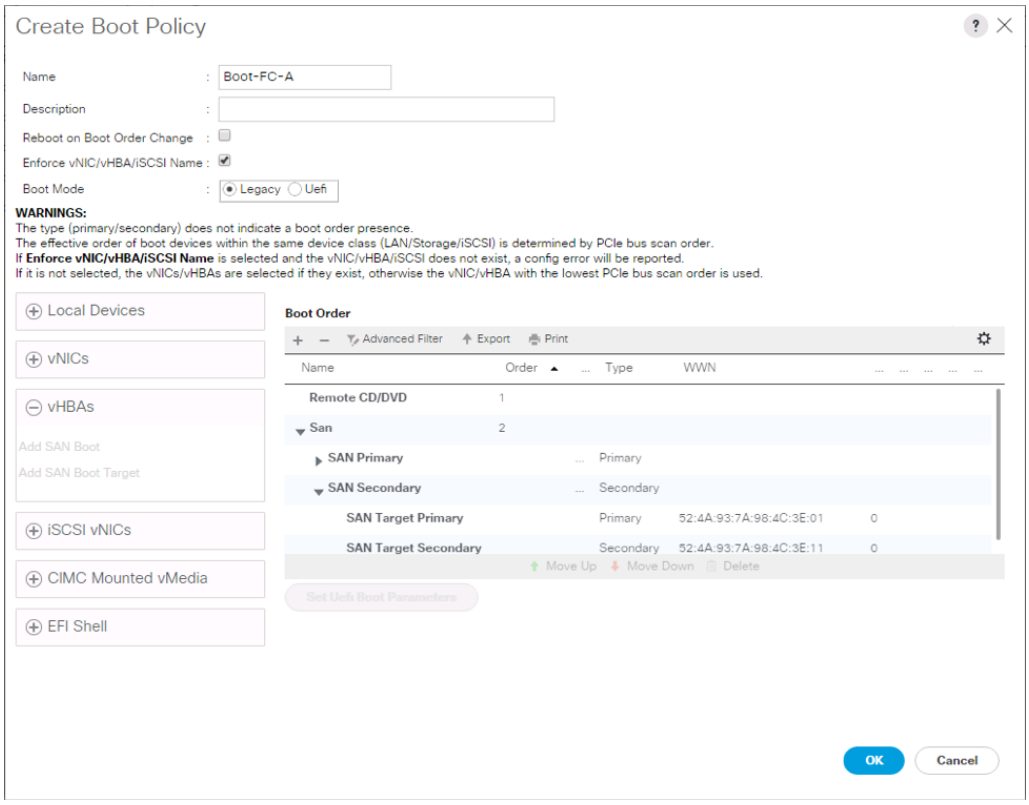
25. Click OK to add the SAN boot initiator.
26. From the vHBA drop-down menu, select Add SAN Boot Target.
27. Enter **1** as the value for Boot Target LUN.
28. Enter the WWPN for CT0.FC1 recorded in **Error! Reference source not found.**
29. Select Primary for the SAN boot target type.



30. Click OK to add the SAN boot target.
31. From the vHBA drop-down menu, select Add SAN Boot Target.
32. Enter **1** as the value for Boot Target LUN.
33. Enter the WWPN for CT1.FC1 recorded in **Error! Reference source not found.**



34. Click OK to add the SAN boot target.
35. Expand CIMC Mounted Media and select Add CIMC Mounted CD/DVD.



36. Click OK. Then click OK again to create the boot policy.

PowerTool cmdlet Steps: Create Boot Policies

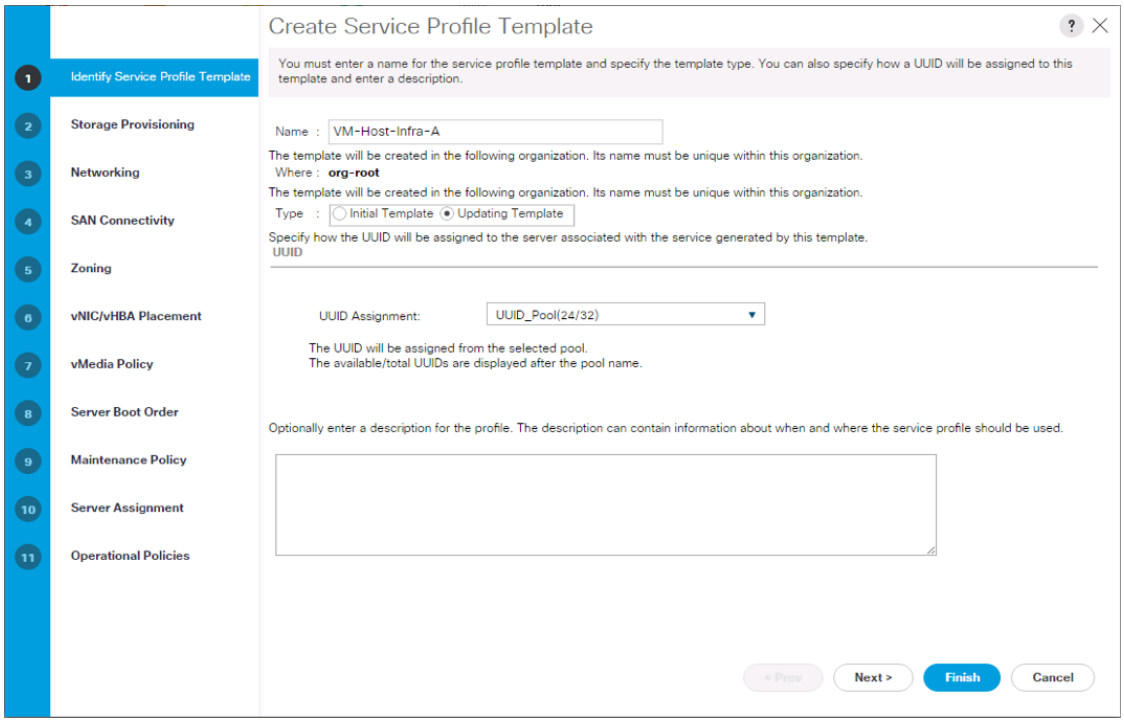
```
Start-UcsTransaction
$mo = Get-UcsOrg -Level root  | Add-UcsBootPolicy -Name "Boot-FC-A"
$mo_1 = $mo | Add-UcsLsbootVirtualMedia -Access "read-only-remote" -LunId "0" -Order 1
$mo_2 = $mo | Add-UcsLsbootSan -Order 2
$mo_2_1 = $mo_2 | Add-UcsLsbootSanCatSanImage -Type "primary" -VnicName "Fabric-A"
$mo_2_1_1 = $mo_2_1 | Add-UcsLsbootSanCatSanImagePath -Lun "1" -Type "primary" -Wwn "52:4A:93:7A:98:4C:3E:00"
$mo_2_1_2 = $mo_2_1 | Add-UcsLsbootSanCatSanImagePath -Lun "1" -Type "secondary" -Wwn "52:4A:93:7A:98:4C:3E:10"
$mo_2_2 = $mo_2 | Add-UcsLsbootSanCatSanImage -Type "secondary" -VnicName "Fabric-B"
$mo_2_2_1 = $mo_2_2 | Add-UcsLsbootSanCatSanImagePath -Lun "1" -Type "primary" -Wwn "52:4A:93:7A:98:4C:3E:01"
$mo_2_2_2 = $mo_2_2 | Add-UcsLsbootSanCatSanImagePath -Lun "1" -Type "secondary" -Wwn "52:4A:93:7A:98:4C:3E:11"
$mo_3 = $mo | Add-UcsLsbootVirtualMedia -Access "read-only-remote-cimc" -LunId "0" -Order 3
Complete-UcsTransaction
```

Create a Service Profile Template

In this procedure, you create one service profile template for infrastructure ESXi hosts for fabric A boot.

To create the service profile template, complete the following steps:

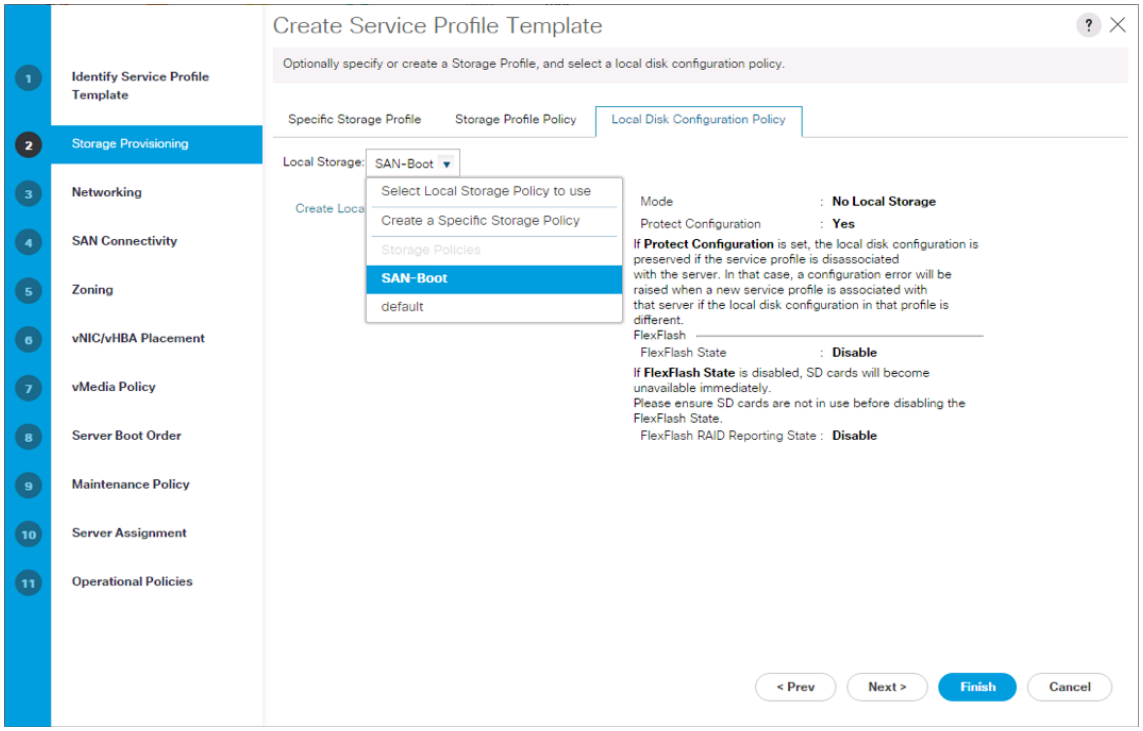
1. In Cisco UCS Manager, click the Servers tab in the navigation pane.
2. Select Service Profile Templates > root.
3. Right-click root.
4. Select Create Service Profile Template to open the Create Service Profile Template wizard.
5. Enter **VM-Host-Infra-A** as the name of the service profile template.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



8. Click Next.

Configure Storage Provisioning

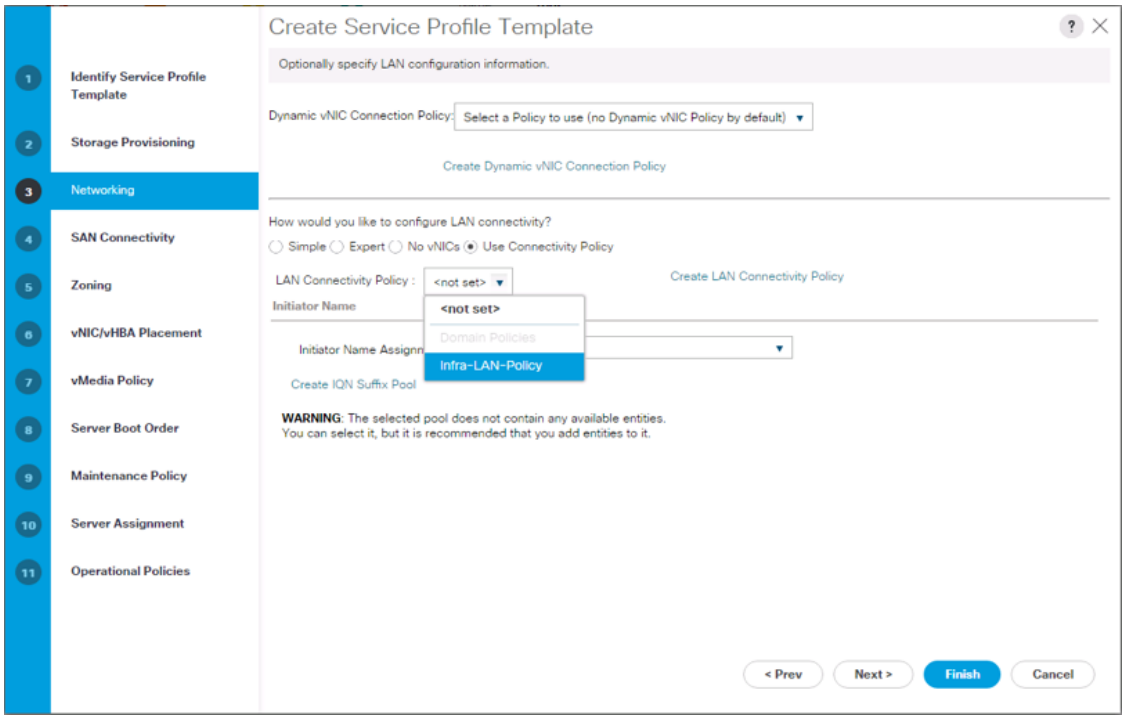
1. If you have servers with no physical disks, click the Local Disk Configuration Policy tab and select the SAN-Boot Local Storage Policy. Otherwise, select the default Local Storage Policy.



2. Click Next.

Configure Networking Options

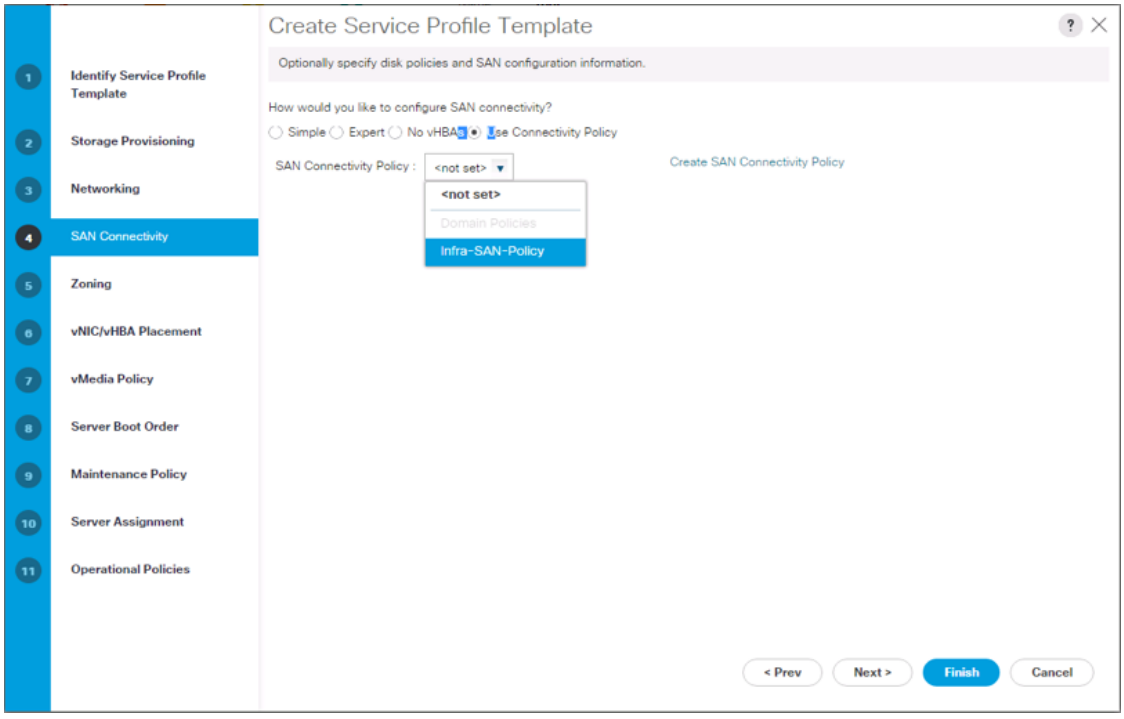
1. Keep the default setting for Dynamic vNIC Connection Policy.
2. Select the Use Connectivity Policy option to configure the LAN connectivity.
3. Select Infra-LAN-Policy from the LAN Connectivity Policy pull-down menu.



4. Click Next.

Configure Storage Options

1. Select the Use Connectivity Policy option for the “How would you like to configure SAN connectivity?” field.
2. Select the Infra-SAN-Policy option from the SAN Connectivity Policy pull-down menu.



3. Click Next.

Configure Zoning Options

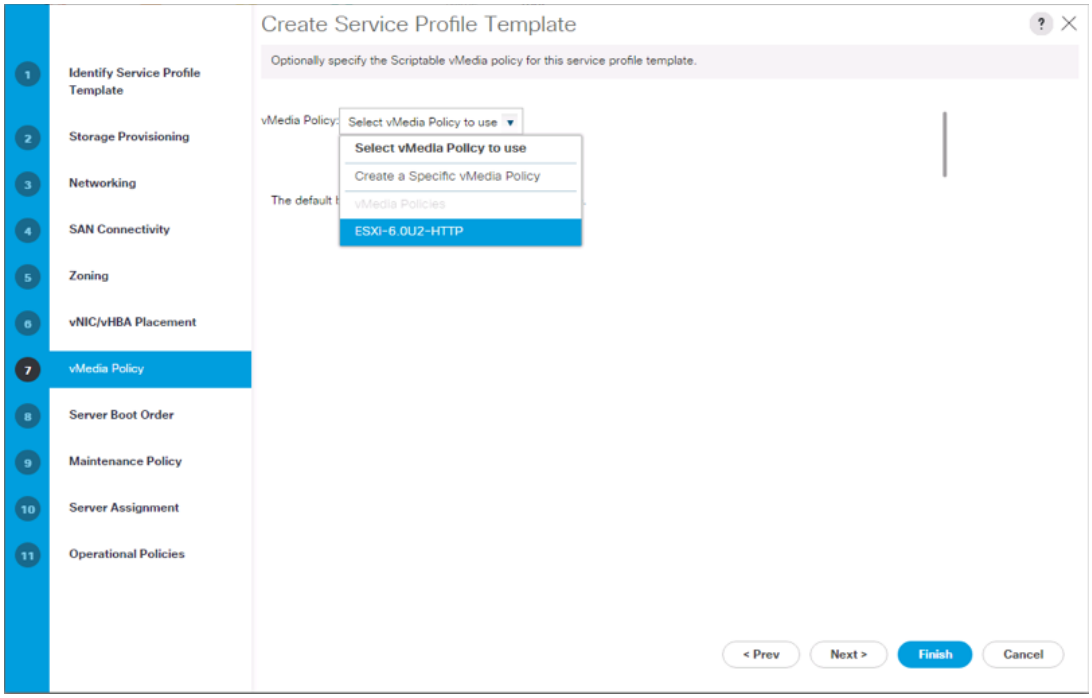
1. Do not set any zoning options.
2. Click Next.

Configure vNIC/HBA Placement

1. In the Select Placement list, leave the placement policy set to Let System Perform Placement.
2. Click Next.

Configure vMedia Policy

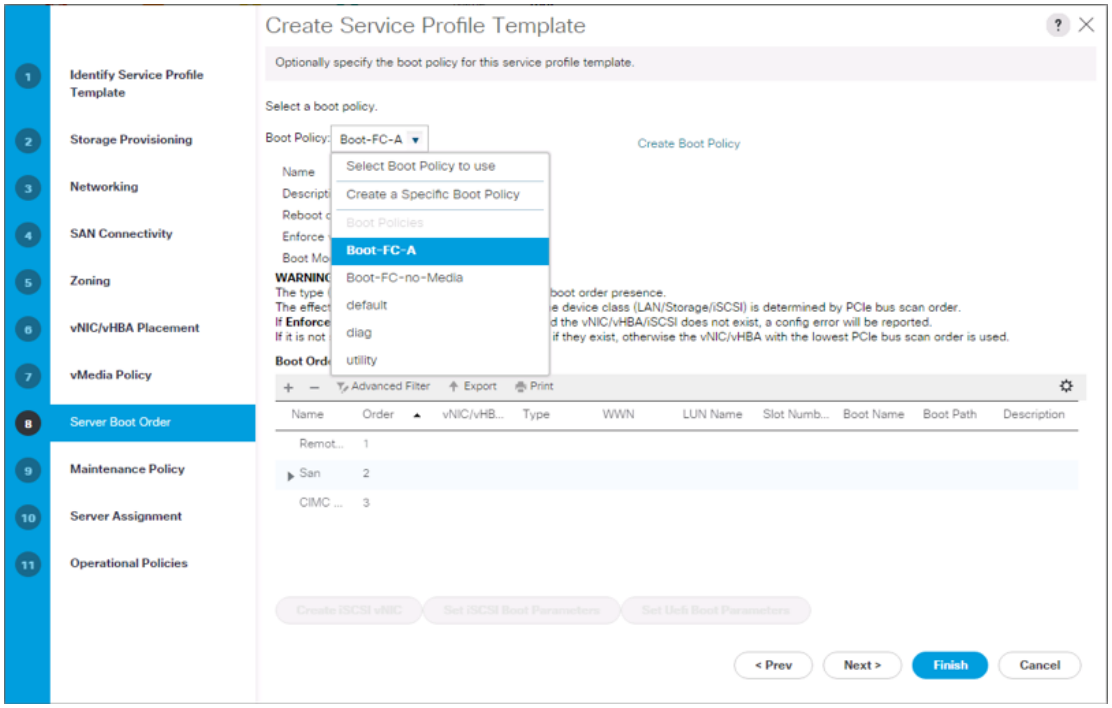
1. From the vMedia Policy pull-down menu, select ESXi-6.0U2-HTTP.



2. Click Next.

Configure Server Boot Order

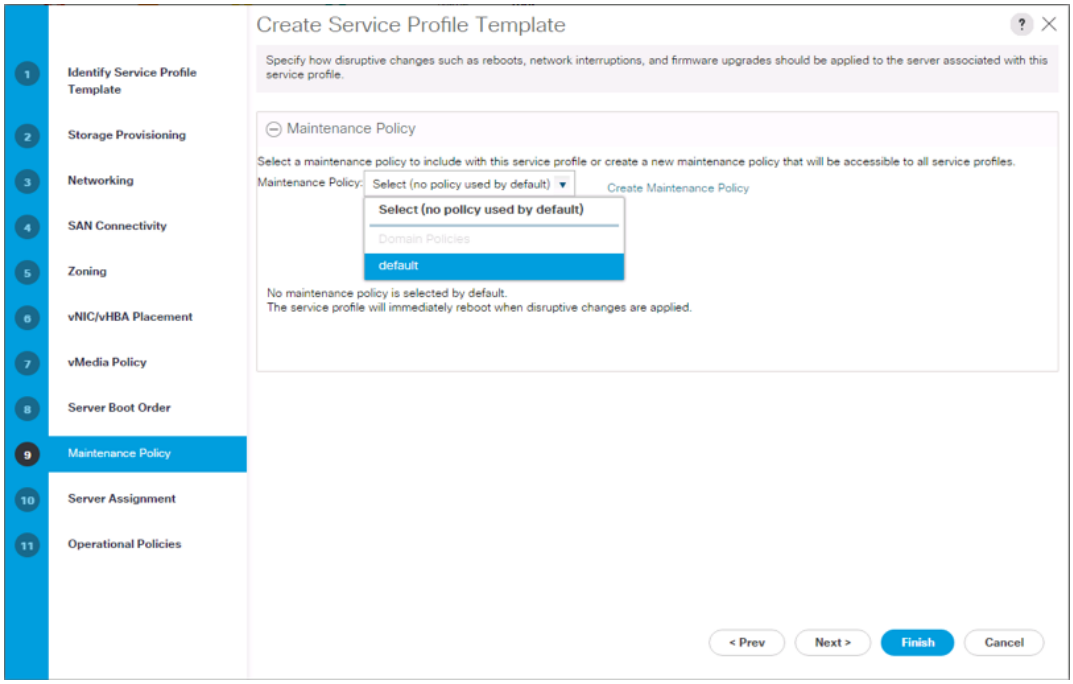
1. Select Boot-FC-A for Boot Policy.



2. Click Next to continue to the next section.

Configure Maintenance Policy

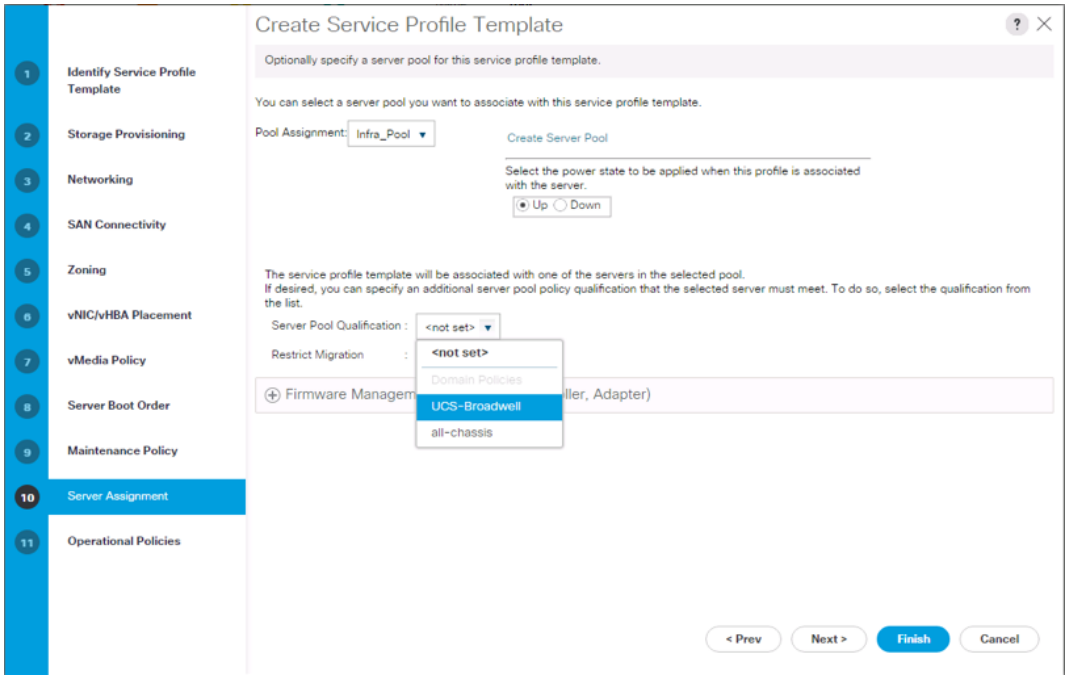
1. Change Maintenance Policy to default.



2. Click Next.

Configure Server Assignment

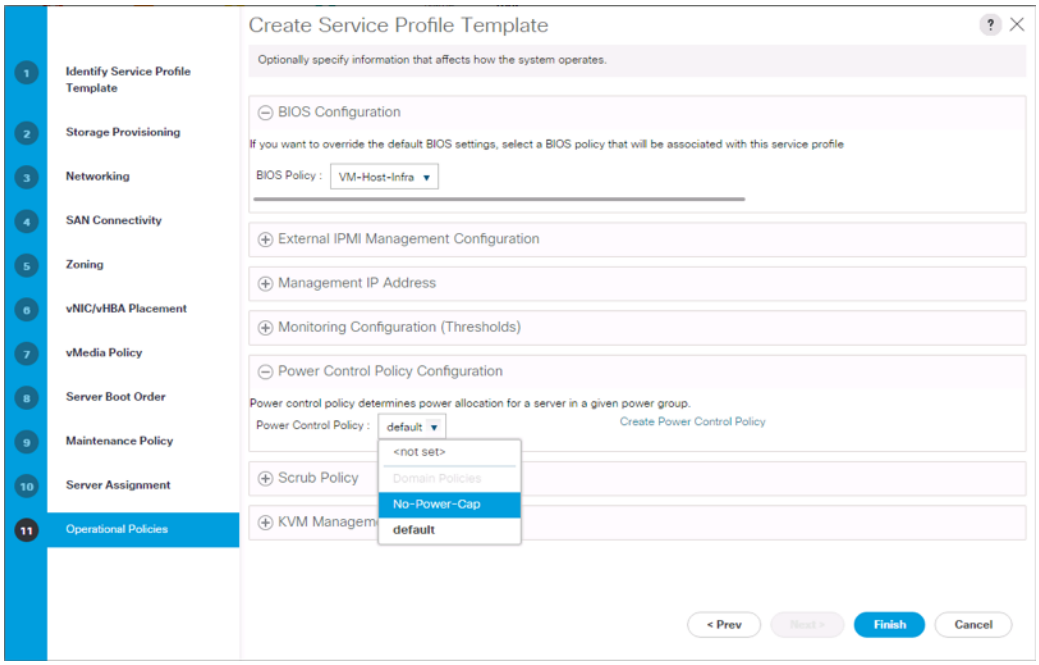
1. In the Pool Assignment list, select Infra_Pool.
2. Optional: Select a server pool qualification policy.
3. Select Down as the power state to be applied when the profile is associated with the server.
4. Select UCS-Broadwell for Server Pool Qualification.
5. Leave the Firmware Management setting at the bottom of the page as is. The default setting from the Host Firmware list will be used.



6. Click Next.

Configure Operational Policies

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



Complete the Template

1. Click Finish to create the service profile template.
2. Click OK in the confirmation message.

PowerTool cmdlet Steps: Create a Service Profile Template

```
Start-UcsTransaction

$mo = Get-UcsOrg -Level root  | Add-UcsServiceProfile -BiosProfileName "VM-Host-
Infra" -BootPolicyName "Boot-FC-A" -IdentPoolName "UUID_Pool" -
LocalDiskPolicyName "SAN-Boot" -MaintPolicyName "default" -Name "VM-Host-Infra-A"
-PowerPolicyName "No-Power-Cap" -Type "updating-template" -VmediaPolicyName
"ESXi-6.0U2-HTTP"

$mo_1 = $mo | Add-UcsVnicConnDef -ModifyPresent -LanConnPolicyName "Infra-LAN-
Policy" -SanConnPolicyName "Infra-SAN-Policy"

$mo_2 = $mo | Add-UcsVnic -AdaptorProfileName "" -Addr "derived" -AdminCdnName ""
-AdminHostPort "ANY" -AdminVcon "any" -CdnPropInSync "yes" -CdnSource "vnic-name"
-IdentPoolName "" -Mtu 1500 -Name "03-vMotion-B" -NwCtrlPolicyName "" -
NwTemplName "" -Order "4" -PinToGroupName "" -QosPolicyName "" -StatsPolicyName
"default" -SwitchId "A"

$mo_3 = $mo | Add-UcsVnic -AdaptorProfileName "" -Addr "derived" -AdminCdnName ""
-AdminHostPort "ANY" -AdminVcon "any" -CdnPropInSync "yes" -CdnSource "vnic-name"
-IdentPoolName "" -Mtu 1500 -Name "02-vMotion-A" -NwCtrlPolicyName "" -
NwTemplName "" -Order "3" -PinToGroupName "" -QosPolicyName "" -StatsPolicyName
"default" -SwitchId "A"

$mo_4 = $mo | Add-UcsVnic -AdaptorProfileName "" -Addr "derived" -AdminCdnName ""
-AdminHostPort "ANY" -AdminVcon "any" -CdnPropInSync "yes" -CdnSource "vnic-name"
-IdentPoolName "" -Mtu 1500 -Name "01-Mgmt-B" -NwCtrlPolicyName "" -NwTemplName
```

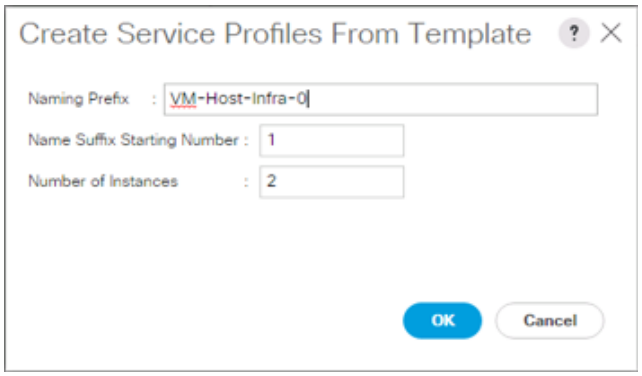
```
"" -Order "2" -PinToGroupName "" -QosPolicyName "" -StatsPolicyName "default" -
SwitchId "A"

$mo_5 = $mo | Add-UcsVnic -AdaptorProfileName "" -Addr "derived" -AdminCdnName ""
-AdminHostPort "ANY" -AdminVcon "any" -CdnPropInSync "yes" -CdnSource "vnic-name"
-IdentPoolName "" -Mtu 1500 -Name "00-Mgmt-A" -NwCtrlPolicyName "" -NwTemplName
"" -Order "1" -PinToGroupName "" -QosPolicyName "" -StatsPolicyName "default" -
SwitchId "A"

$mo_6 = $mo | Add-UcsVnic -AdaptorProfileName "" -Addr "derived" -AdminCdnName ""
-AdminHostPort "ANY" -AdminVcon "any" -CdnPropInSync "yes" -CdnSource "vnic-name"
-IdentPoolName "" -Mtu 1500 -Name "05-App-B" -NwCtrlPolicyName "" -NwTemplName ""
-Order "6" -PinToGroupName "" -QosPolicyName "" -StatsPolicyName "default" -
SwitchId "A"

$mo_7 = $mo | Add-UcsVnic -AdaptorProfileName "" -Addr "derived" -AdminCdnName ""
-AdminHostPort "ANY" -AdminVcon "any" -CdnPropInSync "yes" -CdnSource "vnic-name"
-IdentPoolName "" -Mtu 1500 -Name "04-App-A" -NwCtrlPolicyName "" -NwTemplName ""
-Order "5" -PinToGroupName "" -QosPolicyName "" -StatsPolicyName "default" -
SwitchId "A"

$mo_8 = $mo | Add-UcsVnicFcNode -ModifyPresent -Addr "pool-derived" -
IdentPoolName "node-default"

$mo_9 = $mo | Add-UcsVhba -AdaptorProfileName "" -Addr "derived" -AdminCdnName ""
-AdminHostPort "ANY" -AdminVcon "any" -CdnPropInSync "yes" -CdnSource "vnic-name"
-IdentPoolName "" -MaxDataFieldSize 2048 -Name "Fabric-A" -NwTemplName "" -Order
"7" -PersBind "disabled" -PersBindClear "no" -PinToGroupName "" -QosPolicyName ""
-StatsPolicyName "default" -SwitchId "A"

$mo_10 = $mo | Add-UcsVhba -AdaptorProfileName "" -Addr "derived" -AdminCdnName
"" -AdminHostPort "ANY" -AdminVcon "any" -CdnPropInSync "yes" -CdnSource "vnic-
name" -IdentPoolName "" -MaxDataFieldSize 2048 -Name "Fabric-B" -NwTemplName "" -
Order "8" -PersBind "disabled" -PersBindClear "no" -PinToGroupName "" -
QosPolicyName "" -StatsPolicyName "default" -SwitchId "A"

$mo_11 = $mo | Add-UcsFabricVCon -ModifyPresent -Fabric "NONE" -Id "1" -InstType
"auto" -Placement "physical" -Select "all" -Share "shared" -Transport
"ethernet","fc"

$mo_12 = $mo | Add-UcsFabricVCon -ModifyPresent -Fabric "NONE" -Id "2" -InstType
"auto" -Placement "physical" -Select "all" -Share "shared" -Transport
"ethernet","fc"

$mo_13 = $mo | Add-UcsFabricVCon -ModifyPresent -Fabric "NONE" -Id "3" -InstType
"auto" -Placement "physical" -Select "all" -Share "shared" -Transport
"ethernet","fc"

$mo_14 = $mo | Add-UcsFabricVCon -ModifyPresent -Fabric "NONE" -Id "4" -InstType
"auto" -Placement "physical" -Select "all" -Share "shared" -Transport
"ethernet","fc"

$mo_15 = $mo | Set-UcsServerPower -State "admin-up"

$mo_16 = $mo | Add-UcsServerPoolAssignment -ModifyPresent -Name "Infra_Pool" -
Qualifier "UCS-Broadwell" -RestrictMigration "no"

Complete-UcsTransaction
```

Create Service Profiles

To create service profiles from the service profile template, complete the following steps:

1. Connect to the Cisco UCS 6332-16UP Fabric Interconnect through Cisco UCS Manager and click the Servers tab in the navigation pane.
2. Select Service Profile Templates > root > Service Template VM-Host-Prod-Fabric-A.
3. Right-click VM-Host-Infra-Fabric-A and select Create Service Profiles from Template.
4. Enter **VM-Host-Infra-0** as the service profile prefix.

5. Leave Name Suffix Starting Number set to 1.
6. Leave Number of Instances set to 2.
7. Click OK to create the service profiles.



8. Click OK in the confirmation message to provision two FlashStack service profiles.

PowerTool cmdlet Steps: Create Service Profiles

```
Get-UcsOrg -Level root | Get-UcsServiceProfile -Name "VM-Host-Infra-A" -LimitScope | Add-
UcsServiceProfileFromTemplate -NewName @("VM-Host-Infra-01","VM-Host-Infra-02") -
DestinationOrg "org-root"
```

Conclusion

Cisco UCS PowerTool cmdlets provide powerful options for configuring and implementing Cisco UCS using the XML API that Cisco UCS has incorporated from its creation. By using the PowerTool cmdlets, you can configure the Cisco UCS solution for FlashStack VSI much more quickly than with the Cisco UCS Manager GUI. You can also quickly find PowerTool cmdlet syntax by interacting with the GUI.

For More Information

For additional information, see the following:

- FlashStack Virtual Server Infrastructure Design Guide for VMware vSphere 6.0 U2: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_flashstack_vsi_vm6_designs.html
- FlashStack Virtual Server Infrastructure Deployment Guide for VMware vSphere 6.0 U2: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/ucs_flashstack_vsi_vm6.html
- Cisco UCS Manager: http://www.cisco.com/c/en/us/products/servers-unified-computing/ucs-manager/index.html
- Cisco UCS PowerTool documentation: http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/sw/msft_tools/powertools/ucs_powertool_book/2x/b_Cisco_UCSM_PowerTool_UG_Release_2x/b_Cisco_UCSM_PowerTool_UG_Release_2x_chapter_00.html
- Cisco UCS PowerTool download: https://software.cisco.com/download/release.html?i=!y&mdfid=286305108&softwareid=284574017&release=2.1.1

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