



White Paper

SimpliVity OmniStack with Cisco UCS Manager Integration

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Introduction to Cisco UCS C240 M3S Rack Server with Cisco UCS Manager Integration

This document describes how to integrate a Cisco UCS[®] C240 M3S Rack Server, a Cisco UCS C-Series Rack Server delivered as SimpliVity OmniStack infrastructure, into an existing or new environment managed by Cisco UCS Manager.

The Cisco UCS C240 M3 Rack Server is an enterprise-class server in a 2-rack-unit (2RU) form factor. It uses Intel[®] Xeon[®] processor E5-2600 v2 and E5-2600 CPUs. It provides 24 DIMM slots, supports up to 24 drives, and includes four 1 Gigabit Ethernet LAN-on-motherboard (LOM) ports.

The Cisco UCS C240 M3S model adds the following hardware:

- OmniStack Accelerator Card (with integrated mSATA boot drive)
- Two-port 10 Gigabit Ethernet network interface card (NIC)
- LSI MegaRAID SAS 9271-8i controller (controller for the mSATA boot drive)

Figure 1 shows the Cisco UCS C240 M3S. Figure 2 shows the setup for a Cisco UCS Manager environment.

Figure 1. Cisco UCS C240 M3S Server for Deployment as SimpliVity OmniStack Infrastructure

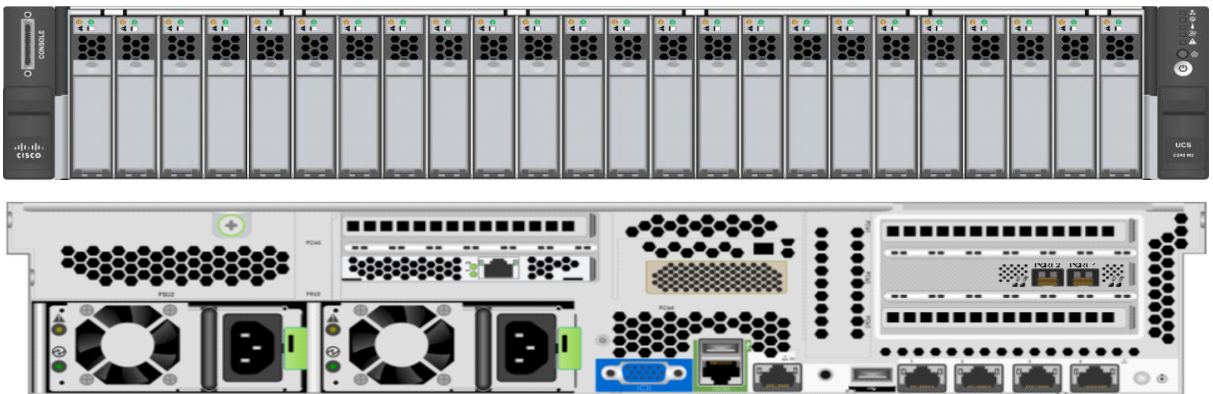
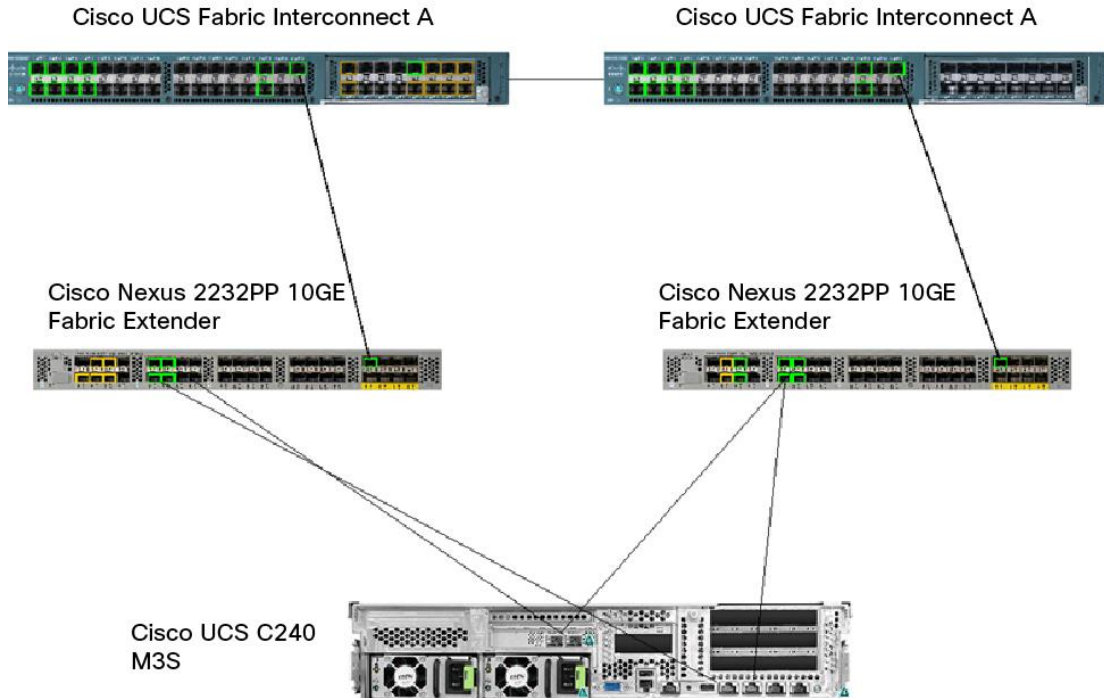


Figure 2. Cisco UCS C240 M3S Server Configured for Deployment in Cisco UCS Manager Environment



Note: The server must be configured in dual-wire mode for Cisco UCS Manager integration to accommodate PCI Express (PCIe) slot-order requirements.

Cisco UCS C240 M3S Integration Process Overview

Table 1 summarizes the main steps for deploying a Cisco UCS C240 M3S server for integration into a Cisco UCS Manager environment.

The basic requirements for integration of the Cisco UCS C240 M3S server for SimpliVity into a Cisco UCS Manager environment are listed here.

- The server must be configured with PCIe slots in the following order (the slots will be configured onsite and delivered by SimpliVity):
 - Slot 1: Must remain empty for I/O card to fit properly
 - Slot 2: SimpliVity I/O accelerator field-programmable gate array (FPGA) card
 - Slot 3: LSI 9271 RAID controller (front disks are attached to this controller)
 - Slot 4: LSI 9271 RAID controller (mSATA boot disk is attached to this card; required for boot)
 - Slot 5: Cisco virtual interface card (VIC) or other certified interface card for dual-wire integration

PCIe Slots Inventory

```
SlotID:2 Unknown Vendor Unknown Device
SlotID:3 LSI 9271-8i MegaRAID SAS HBA
SlotID:4 LSI 9271-8i MegaRAID SAS HBA
SlotID:5 UCS VIC 1225 10Gbps 2 port CNA SFP+
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- The following components are required for dual-wire management connection of the Cisco UCS C240 M3S to the fabric interconnects:
 - Two 32-port fabric extender (FEX) modules uplinked to a Cisco Unified Computing System™ (Cisco UCS) fabric interconnect
 - Four 10-Gbps direct-attached cable or eight Enhanced Small Form-Factor Pluggable (SFP+) modules for connection between the rack server to the FEX
 - Four 1-Gbps SFP modules for connection between the management network and the FEX

Table 1. Integration Process Overview

Step	Substep	Action	Notes
1	0	Receive the server from SimpliVity.	
	1	Reset Cisco® Integrated Management Controller (IMC).	Reset Cisco IMC from standalone mode to Cisco UCS Manager integrated mode
2	0	Connect the server to the Cisco UCS managed domain.	Assumes that all prerequisites are met
	1	Connect management network ports.	Must be connected to FEX with 1-Gbps uplinks
	2	Connect data network ports.	Must be connected to FEX with 10-Gbps uplinks
	3	Power on and discover the server in Cisco UCS Manager.	
3	0	Set up a Cisco UCS server profile template for SimpliVity.	Template used for SimpliVity nodes
	1	Configure the BIOS policy.	Configure the required SimpliVity BIOS settings
	2	Configure the firmware policy.	Determined by SimpliVity
	3	Create a local disk configuration policy.	Protects the initial configured disks from erasure
	4	Configure the boot policy.	Local boot configuration
	5	Configure the virtual NIC (vNIC) network template.	SimpliVity recommended network configuration for appliance nodes
	6	Create a service profile template.	
7	Assign the service profile to a host and boot.		

Parts and Tools Required

Table 2 lists the parts and tools required for the integration process.

Table 2. Parts and Tools

Part Description	Notes	Model or Description
Server	Minimum of 2 servers for cluster nodes	Cisco UCS C240 M3 Rack Server (UCSC-C240-M3S)
Fabric interconnect	Already present in environment	2 Cisco UCS 6200 Series Fabric Interconnects
Fabric extender	If not present, must be added to configuration	2 Cisco Nexus® 2232PP 10GE Fabric Extenders
Cables and modules		<ul style="list-style-type: none"> • Two 1-Gbps SFP modules • Two 10-Gbps direct-attached cables or four 10-Gbps SFP+ modules
10 Gigabit Ethernet NIC		Cisco UCS VIC 1225 2-port 10-GB SFP

Receive the Server

Carefully unpack the server

Install the server in the rack and attach the power cables.

Reset Cisco IMC to Cisco UCS Manager Integrated Mode

Reset the Cisco IMC to the factory default mode after it arrives from SimpliVity because SimpliVity will have configured the server in standalone mode. For Cisco UCS Manager to correctly identify the rack server, the Cisco IMC module must be set to the Cisco UCS Manager mode.

1. Connect to the server using Kernel-based Virtual Machine (KVM).
2. Turn on the server and press F8 on the POST options screen.
3. Select the option for factory default reset.
4. Power off the server.

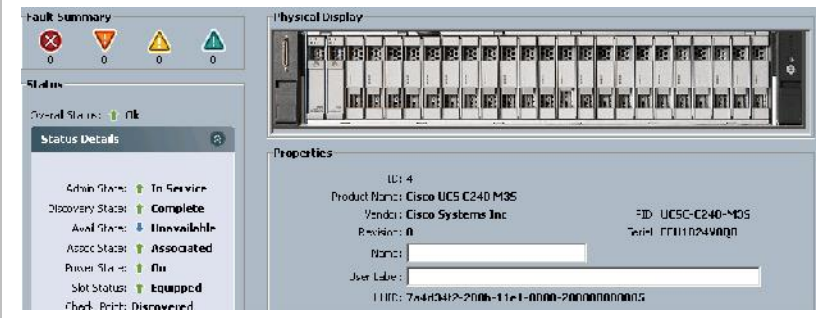
Connect the Server to the Cisco UCS Managed Domain

Install the Cisco UCS C240 M3S server in a Cisco UCS managed domain as outlined in the steps in Table 3.

These steps assume that the required FEX is already configured and connected to the fabric interconnect and that uplinks are configured as server ports on the fabric interconnect.

Table 3. Steps for Integrating the Cisco UCS C-Series Server in Dual-Wire Mode

Step	Procedure	Image
1	<p>Minimum of 2 servers for cluster nodes With the server powered off, connect the onboard 1-Gbps NIC ports to a FEX connected to Cisco UCS Manager.</p> <p>Connect port 1 to the FEX on fabric A.</p> <p>Connect port 2 to the FEX on fabric B.</p>	
2	<p>Connect a 10-Gbps VIC or other module to the same FEX module as the management network.</p> <p>Connect left port 1 on the FEX to fabric A.</p> <p>Connect right port 2 on the FEX to fabric B.</p>	

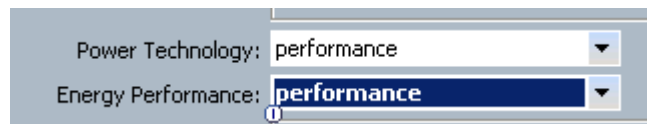
<p>3</p> <p>Power on the server. Let the system be discovered and become visible in Cisco UCS Manager.</p> <p>Note: This process will take several minutes to complete.</p>	 <p>The screenshot displays the Cisco UCS Manager interface. On the left, the 'Fault Summary' section shows four status icons (red X, orange triangle, yellow triangle, green triangle) with a count of 0 for each. Below this, the 'Status' section shows 'Overall Status: OK'. The 'Status Details' section lists various components and their states: Admin Group (In Service), Discovery Status (Complete), Asset Group (Unavailable), Assoc Status (Associated), Power Slot (On), Slot Status (Equipped), and Check Point (Discovered). On the right, the 'Physical Display' shows a rack of server blades. Below that, the 'Properties' section displays details for UC14, including Product Name (Cisco UCS C240 M3S), Vendor (Cisco Systems Inc), Revision (A), and other identifiers.</p>
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Set Up a Cisco UCS Server Profile Template for SimpliVity

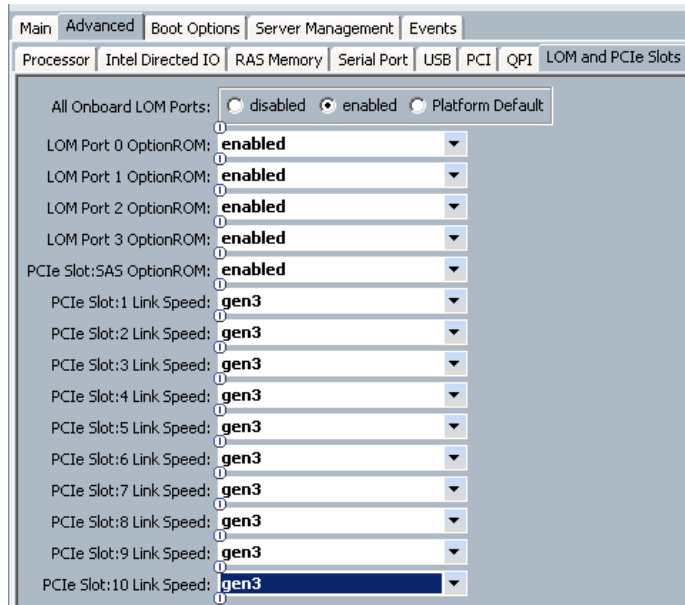
Configure the BIOS Policy

Configure the BIOS policy with the following settings defined for SimpliVity nodes. (Other settings can be defined in the policy as required by the end user.) The following instructions are for Cisco UCS Manager Firmware Release 2.2(2) and later. Previous to this release, several of these policies are not visible and must be set locally on the host server in the system setup (press F2).

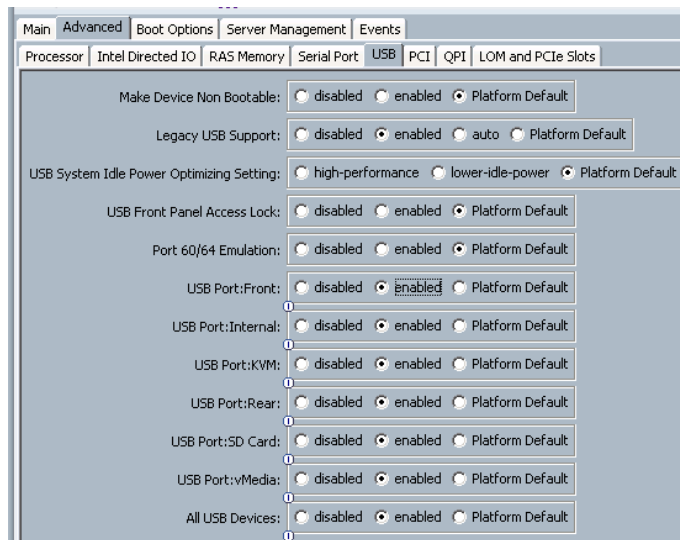
1. Select BIOS Policy and create a new policy.
2. Advanced > Processor
 - a. Power Technology: performance
 - b. Energy Performance: performance



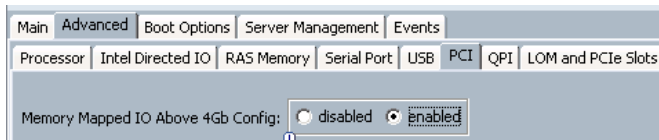
3. Advanced > LOM and PCIe Slots
 - a. Set All Onboard LOM Ports to enabled.
 - b. Set all LOM port OptionROM settings to enabled.
 - c. Set all PCIe slot link speed settings to gen3.



4. Advanced > USB: Enable all USB ports and devices.



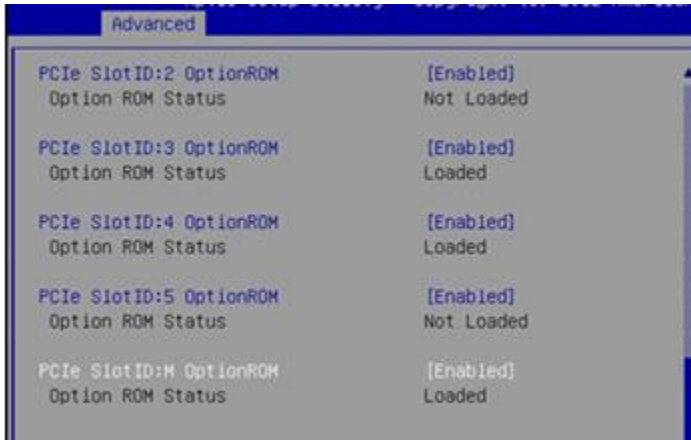
5. Advanced > PCI: Enable Memory Mapped IO Above 4GB Config.



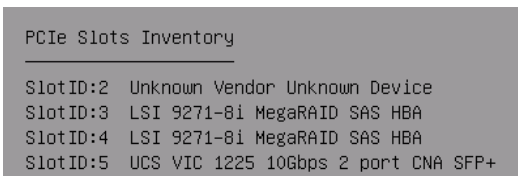
6. Advanced > Server Management: Enable FRB-2 Timer.



The PCIe slot configuration from the view of local system BIOS on the Cisco UCS C240 M3S server should look like this:



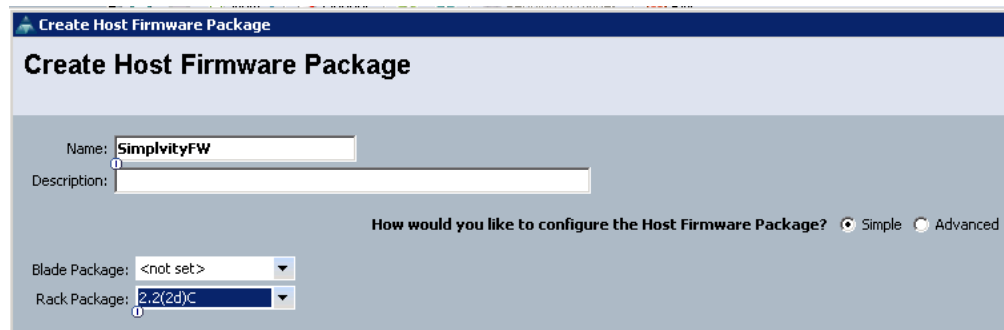
The following view show the PCIe device population:



Configure the Firmware Policy

Configure the firmware package policy for nodes based on the Cisco UCS C240 M3 firmware release by SimpliVity.

1. Policies > Create Host Firmware Package: Select the rack package from the list of uploaded firmware on the fabric interconnect.



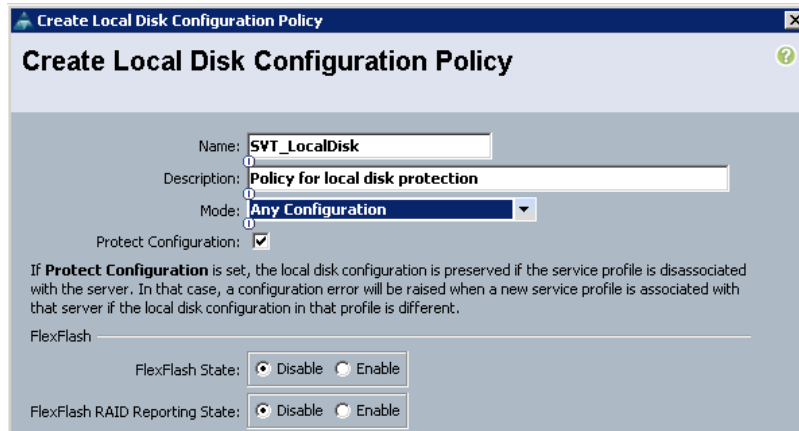
Create a Local Disk Configuration Policy

To protect the SimpliVity configured disks and RAID array, create a local disk configuration policy. With this policy, when a service profile is removed from the host server, the RAID and disk configurations will remain intact and protected against erasure.

Choosing Any Configuration carries forward the local disk configuration without any changes. Selecting Protect Configuration retains the local disk configuration policy even if the service profile is disassociated.

1. Select Local Disk Config Policies.

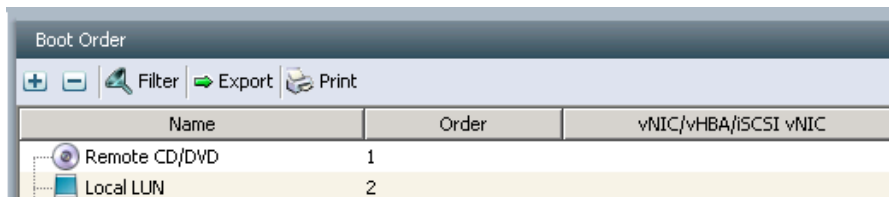
2. Create a new policy.
 - a. For Mode, choose Any Configuration.
 - b. Select the Protect Configuration option.



Configure the Boot Policy

Configure a Cisco UCS boot policy with the following settings for the local boot configuration. The boot controller is logically defined in Cisco UCS Manager integrated mode and uses the controller in slot 4.

1. Configure the boot order with local resources only: no Small Computer System Interface over IP (iSCSI), Fibre Channel, Secure Digital (SD) card, or USB booting devices. SimpliVity uses only the local disk for OS booting.
2. SimpliVity recommends that you disable NIC Preboot Execution Environment [PXE] booting. To do this, do not include the NIC interfaces in the boot-order configuration.


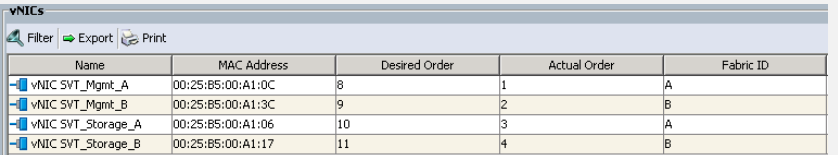
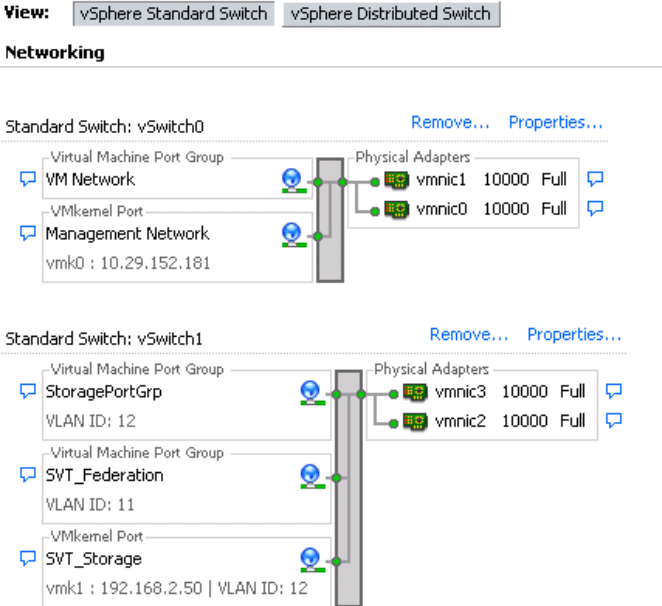


Configure the vNIC Network Template

This section covers the recommended vNIC template configuration for SimpliVity OmniCube cluster nodes. In the final server configuration, four 10-Gbps vNIC ports will be presented to the VMware ESXi host for all node communication.

Cisco encourages the use of vNIC templates and the creation of a SimpliVity based connectivity policy. Then assign this newly created template and policy to the service profile template. The steps in Table 4 summarize the high-level end results of the configuration. This document does not cover all the steps for creating the vNIC template or the connectivity policy.

Table 4. High-Level Steps for Configuring the vNIC Network Template

Step	Procedure	Image																									
1	<p>Create the VMware ESX host and virtual machine communication vNICs.</p> <p>Configure 2 vNICs: on fabric A and fabric B. Do not configure fabric failover; VMware ESXi NIC teaming will be used.</p>	 <table border="1"> <thead> <tr> <th>Name</th> <th>MAC Address</th> <th>Desired Order</th> <th>Actual Order</th> <th>Fabric ID</th> </tr> </thead> <tbody> <tr> <td>vNIC SVT_Mgmt_A</td> <td>00:25:B5:00:A1:0C</td> <td>8</td> <td>1</td> <td>A</td> </tr> <tr> <td>vNIC SVT_Mgmt_B</td> <td>00:25:B5:00:A1:3C</td> <td>9</td> <td>2</td> <td>B</td> </tr> </tbody> </table>	Name	MAC Address	Desired Order	Actual Order	Fabric ID	vNIC SVT_Mgmt_A	00:25:B5:00:A1:0C	8	1	A	vNIC SVT_Mgmt_B	00:25:B5:00:A1:3C	9	2	B										
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2	<p>Create SimpliVity storage and federation vNICs. VMware vMotion movement will occur over these vNICs as well.</p> <p>Configure 2 vNICs: on fabric A and fabric B. Do not configure fabric failover; VMware ESXi NIC teaming will be used.</p>	 <table border="1"> <thead> <tr> <th>Name</th> <th>MAC Address</th> <th>Desired Order</th> <th>Actual Order</th> <th>Fabric ID</th> </tr> </thead> <tbody> <tr> <td>vNIC SVT_Mgmt_A</td> <td>00:25:B5:00:A1:0C</td> <td>8</td> <td>1</td> <td>A</td> </tr> <tr> <td>vNIC SVT_Mgmt_B</td> <td>00:25:B5:00:A1:3C</td> <td>9</td> <td>2</td> <td>B</td> </tr> <tr> <td>vNIC SVT_Storage_A</td> <td>00:25:B5:00:A1:06</td> <td>10</td> <td>3</td> <td>A</td> </tr> <tr> <td>vNIC SVT_Storage_B</td> <td>00:25:B5:00:A1:17</td> <td>11</td> <td>4</td> <td>B</td> </tr> </tbody> </table>	Name	MAC Address	Desired Order	Actual Order	Fabric ID	vNIC SVT_Mgmt_A	00:25:B5:00:A1:0C	8	1	A	vNIC SVT_Mgmt_B	00:25:B5:00:A1:3C	9	2	B	vNIC SVT_Storage_A	00:25:B5:00:A1:06	10	3	A	vNIC SVT_Storage_B	00:25:B5:00:A1:17	11	4	B
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vNIC SVT_Storage_A	00:25:B5:00:A1:06	10	3	A																							
vNIC SVT_Storage_B	00:25:B5:00:A1:17	11	4	B																							
3	<p>View the VMware ESXi host network configuration after defining and assigning the Cisco UCS profile template.</p> <p>Build the VMware ESXi host network as shown here.</p>	 <p>View: vSphere Standard Switch vSphere Distributed Switch</p> <p>Networking</p> <p>Standard Switch: vSwitch0 Remove... Properties...</p> <ul style="list-style-type: none"> -Virtual Machine Port Group: VM Network -VMkernel Port: Management Network (vmk0 : 10.29.152.181) Physical Adapters: vmnic1 10000 Full, vmnic0 10000 Full <p>Standard Switch: vSwitch1 Remove... Properties...</p> <ul style="list-style-type: none"> -Virtual Machine Port Group: StoragePortGrp (VLAN ID: 12) -Virtual Machine Port Group: SVT_Federation (VLAN ID: 11) -VMkernel Port: SVT_Storage (vmk1 : 192.168.2.50 VLAN ID: 12) Physical Adapters: vmnic3 10000 Full, vmnic2 10000 Full 																									

Create a Service Profile Template

Create a new SimpliVity based service profile template using the policies outlined in the previous steps. This document does not detail the steps for creating this new service profile template.

Create all the required service profiles needed for every SimpliVity host added to Cisco UCS Manager.

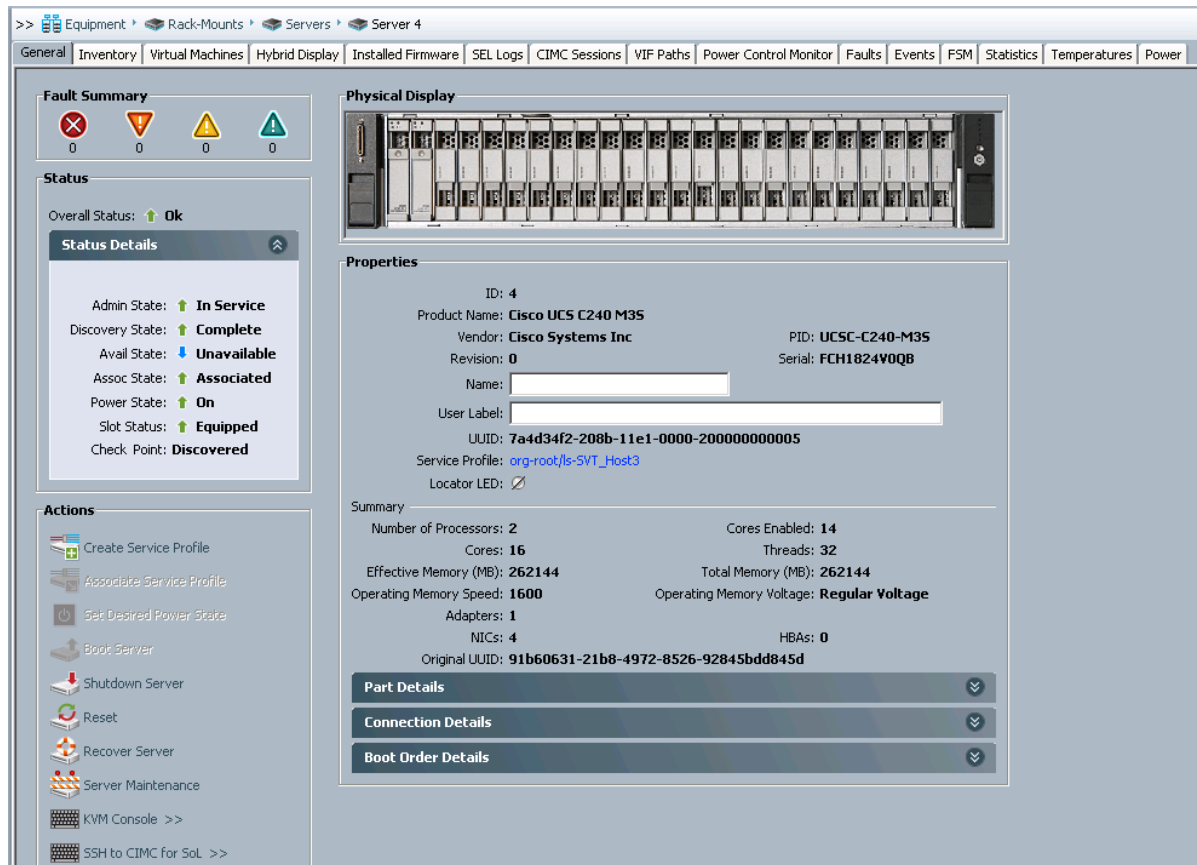
Assign the Service Profile to a Host and Boot

The final step is to associate the service profiles created from the template with the SimpliVity based Cisco UCS C240 M3S servers. Profiles can be automatically associated with a SimpliVity server pool or assigned manually.

Boot the server and continue with the OmniStack software configuration steps.

Figure 3 shows an example of a fully configured and operational Cisco UCS C240 M3S server managed by Cisco UCS Manager as a SimpliVity cluster node.

Figure 3. Fully Configured Cisco UCS C240 M3S Managed by Cisco UCS Manager as a SimpliVity Cluster Node



Install OmniStack Software

Please refer to the SimpliVity documentation OmniCube for vSphere Client Admin Guide for instructions for installing and configuring the required software.

For More Information

For more information go to the Omnistack Integrated Solution with Cisco UCS page:

<https://www.simplivity.com/products/omnistack-cisco-ucs/>



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Printed in USA

C11-733463-00 2/15