Cisco UCS C-Series Server Integration with Cisco UCS Manager 4.0

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Preface

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Audience

This guide is intended primarily for data center administrators with responsibilities and expertise in one or more of the following:

- Server administration

- Storage administration

- Network administration

- Network security

Conventions

Text Type	Indication
GUI elements	GUI elements such as tab titles, area names, and field labels appear in **this font**. Main titles such as window, dialog box, and wizard titles appear in **this font**.
Document titles	Document titles appear in *this font*.
TUI elements	In a Text-based User Interface, text the system displays appears in `this font`.
System output	Terminal sessions and information that the system displays appear in `this font`.
CLI commands	CLI command keywords appear in **this font**. Variables in a CLI command appear in *this font*.
[ ]	Elements in square brackets are optional.

Text Type	Indication
{x | y | z}	Required alternative keywords are grouped in braces and separated by vertical bars.
[x | y | z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
< >	Nonprinting characters such as passwords are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

Note Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the document.

Tip Means *the following information will help you solve a problem*. The tips information might not be troubleshooting or even an action, but could be useful information, similar to a Timesaver.

Timesaver Means *the described action saves time*. You can save time by performing the action described in the paragraph.

Caution Means *reader be careful*. In this situation, you might perform an action that could result in equipment damage or loss of data.

Warning IMPORTANT SAFETY INSTRUCTIONS

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

SAVE THESE INSTRUCTIONS

Related Cisco UCS Documentation

Documentation Roadmaps

For a complete list of all B-Series documentation, see the *Cisco UCS B-Series Servers Documentation Roadmap* available at the following URL: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/overview/guide/UCS_roadmap.html

For a complete list of all C-Series documentation, see the *Cisco UCS C-Series Servers Documentation Roadmap* available at the following URL: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/overview/guide/ucs_rack_roadmap.html.

For information on supported firmware versions and supported UCS Manager versions for the rack servers that are integrated with the UCS Manager for management, refer to Release Bundle Contents for Cisco UCS Software.

Other Documentation Resources

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Documentation Feedback

To provide technical feedback on this document, or to report an error or omission, please send your comments to ucs-docfeedback@external.cisco.com. We appreciate your feedback.

Cisco UCS C-Series Integration with Cisco UCS Manager

This chapter includes the following sections:

Overview

This guide contains information and procedures for installing Cisco UCS Rack Mount Servers for integration with Cisco UCS Manager.

Cisco UCS C-Series Rack-Mount Servers are managed by the built-in standalone software, Cisco Integrated Management Controller (CIMC) . When a C-Series Rack-Mount Server is integrated with Cisco UCS Manager, the Cisco IMC does not manage the server anymore. Instead it is managed with the Cisco UCS Manager software. You will manage the server using the Cisco UCS Manager GUI or Cisco UCS Manager CLI.

Important

If your server is not new, make sure to reset the Cisco IMC to factory default settings before integrating the server with Cisco UCS Manager. See *Server Utilities* chapter in Cisco UCS C-Series Integrated Management Controller GUI Configuration Guide for your release to reset the server to factory default settings.

You can integrate Cisco UCS C-Series Rack-Mount Servers with Cisco UCS Manager in either one of the following setup:

- **Cluster setup**: Using two fabric extenders (FEXes) to connect the C-Series Rack-Mount Server with two fabric interconnects.

- **Non-cluster setup**: Connecting the C-Series Rack-Mount Server with one FEX and one FI.

Note   For Cisco UCS C-Series Rack-Mount Servers integration with Cisco UCS Manager, Cisco VIC adapters can only be connected to Cisco UCS Fabric Interconnects and not to third-party switches.

For Cisco UCS S-Series Rack-Mount Servers integration with Cisco UCS Manager, see the Cisco UCS S3260 Server Integration with Cisco UCS Manager guide in your specific release.

Integrating C-Series Rack Mount Server with Cisco UCS Manager

Cisco UCS Manager provides three connectivity modes for Cisco UCS C-Series Rack-Mount Server management. The following are the connectivity modes:

- **Dual-wire Management (Shared LOM)**: Shared LAN on Motherboard (LOM) ports on the rack server are used exclusively for carrying management traffic. A separate cable connected to one of the ports on the PCIe card carries the data traffic. Using two separate cables for managing data traffic and management traffic is also referred to as dual-wire management.

- **SingleConnect (Sideband)**: Using Network Controller Sideband Interface (NC-SI), the Cisco VIC card connects one cable that can carry both data traffic and management traffic. This feature is referred to as SingleConnect.

- **Direct Connect Mode**: Cisco UCS Manager supports an option to connect the Cisco UCS C-Series Rack-Mount Server directly to the FIs. This option enables Cisco UCS Manager to manage the Cisco UCS C-Series Rack-Mount Servers using a single cable for both management traffic and data traffic. The Cisco UCS VIC connects to the FI of the system. This connection uses a single connection from each VIC to each FI.

Note   The LOM ports on Cisco UCS C-Series Rack-Mount Servers integrated with Cisco UCS Manager are not managed by Cisco UCS Manager.

Cisco UCS C125 M5 Servers do not contain any LOM ports.

The general prerequisites for Dual-wire integration with Cisco UCS Manager are built into the C-Series Rack-Mount Server CIMC release 1.4(6) or later. If you want to use the SingleConnect or direct connect modes you must have the following:

- Server CIMC release 1.4(6) or later

- Cisco UCS VIC 1225 Virtual Interface Card

- Cisco UCS VIC 1227 (MLOM)

- Cisco UCS VIC 1225T Virtual Interface Card

- Cisco UCS VIC 1227T (MLOM)

- Cisco UCS VIC 1387 (MLOM)

- Cisco UCS VIC 1385

- Cisco UCS VIC 1455 (supported in Cisco UCS C125 M5 Servers and other M5 Servers)
- Cisco UCS VIC 1457 (supported only in C220 M5 and C240 M5 servers)
- Cisco UCS VIC 1495 (supported in Cisco UCS C125 M5 Servers, and other M5 Servers)
- Cisco UCS VIC 1497 (supported only in C220 M5 and C240 M5 servers)

Note Cisco UCS C125 M5 Servers, Cisco UCS C480 M5 Servers, and Cisco UCS C480 M5 ML Servers do not support MLOM adapters.

Note The Cisco UCS VIC 1225T and 1227T adapters are supported only with Cisco Nexus 2232TM-E 10GE Fabric Extender using RJ45 Network cable.

The following table lists the C-Series Rack-Mount Servers and supported management options:

Note Dual-Wire Management is supported only with Cisco VIC adapters and not with third-party adapters.

Table 1: Supported Management Options

Servers	SingleConnect	Direct Connect Mode	Dual-wire Management
Cisco UCS C22 M3 Server	Yes	Yes	Yes
Cisco UCS C24 M3 Server	Yes	Yes	Yes
Cisco UCS C220 M3 Server	Yes	Yes	Yes
Cisco UCS C240 M3 Server	Yes	Yes	Yes
Cisco UCS C420 M3 Server	Yes	Yes	Yes
Cisco UCS C220 M4 Server	Yes	Yes	Yes
Cisco UCS C240 M4 Server	Yes	Yes	Yes
Cisco UCS C460 M4 Server	Yes	Yes	Yes

Servers	SingleConnect	Direct Connect Mode	Dual-wire Management
Cisco UCS C220 M5 Server	Yes	Yes	Yes
Cisco UCS C240 M5 Server	Yes	Yes	Yes
C480 M5 and C480 M5 ML servers	Yes	Yes	Yes
Cisco UCS C125 M5 Server	Yes	Yes	No

Note If you have a Cisco UCS Manager release earlier than 2.2(2a), integration is not supported for Cisco UCS C22 and C24 servers that have Intel E5-2400 **v2** CPUs at this time. This integration is supported only with Intel E5-2400 **v1** CPUs.

Based on your server model and CIMC version, you can use either one of these three integration options to connect the rack server with Cisco UCS Manager.

Cisco UCS Manager runs within the fabric interconnect (FI). With earlier Cisco UCS Manager releases, you need to use Fabric Extenders to connect the c-series server with the Fabric Interconnect to enable management with Cisco UCS Manager. You can directly connect the server adapter with the Fabric Interconnect without using the Fabric Extender.

You can use any of the interfaces available with this management service to access, configure, administer, and monitor the network and server resources for all chassis connected to the fabric interconnect. For information about the Cisco UCS 6454 Fabric Interconnect, Cisco UCS 6300 Series Fabric Interconnect, or Cisco UCS 6200 Series Fabric Interconnect, see the documentation at the following links:

- Cisco UCS 6400 Series Fabric Interconnect documentation
- Cisco UCS 6300 Series Fabric Interconnect documentation
- Cisco UCS 6200 Series Fabric Interconnect documentation

For information about the Cisco Nexus 2232PP, Cisco Nexus 2232TM-E or Cisco Nexus 2348UPQ fabric extenders (FEXes) in the configuration, see the documentation at the following link:

- Cisco Nexus 2000 Series Fabric Extender documentation

Hardware Maintenance

Replacing servers and certain adapter cards requires that the server be decommissioned and recommissioned. See the decommissioning a Rack-Mount server and recommissioning a Rack-Mount Server sections in the appropriate Cisco UCS Manager Configuration Guide.

FEX Connection Mode and Discovery

You can connect the FEX to the FI in two ways. Cisco UCS Manager FI discovers the FEX based on the FEX/Chassis discovery mode. The FEX connection modes are:

- **Hard-Pinning mode**: The server facing FEX ports are pinned to the connected uplink ports when the FEX is discovered. Cisco UCS Manager pins the server-facing ports to the uplink ports based on the number of acknowledged uplink ports. After the pinning, if you add a new uplink or delete an existing uplink, you must manually acknowledge the FEX to apply the changes.

- **Port-Channel mode**: Port-Channel mode does not have pinning. A single port channel works as the uplink to all server-facing ports. And all uplink ports are members of this single port channel. If one of the uplink ports goes down, the traffic is automatically distributed to another available uplink port.

In port-channel mode, when you cable between FEX and the FI, the available virtual interface (VIF) namespace varies, depending on where the uplinks are connected to the FI ports:

- When port-channel uplinks from the FEX are connected only within a set of eight ports managed by a single chip, Cisco UCS Manager maximizes the number of VIFs used in service profiles deployed on the servers.

- If uplink connections are distributed across ports managed by separate chips, the VIF count is decreased. For example, if you connect seven members of the port channel to ports 1–7, but the eighth member to port 9, this port channel can only support VIFs as though it had one member.

For more information on FEX discovery policies and port-channel allocation, see the appropriate Cisco UCS Manager Configuration Guide.

Maximum Configurable vNICs/vHBAs Based on Number of FEX Uplinks

The following table describes maximum configurable vNICs/vHBAs on a VIC adapter based on the number of FEX uplinks:

Table 2: Cisco UCS 6454 Fabric Interconnect

Acknowledged link between FEX and FI	Maximum configurable vNICs/vHBA on a VIC adapter for the VIC adapters 1225, 1225T, 1227, 1227T, 1385, 1387, 1455, 1457, 1495, and 1497
1	116
2	116
4	116
8	116

Table 3: Cisco UCS 6300 Fabric Interconnect

Acknowledged link between FEX and FI	Maximum configurable vNICs/vHBA on a VIC adapter for the VIC adapters 1225, 1225T, 1227, 1227T, 1385, 1387, 1455, 1457, 1495, and 1497
1	116
2	116
4	116
8	116

Table 4: Cisco UCS 6200 Fabric Interconnect

Acknowledged link between FEX and FI	Maximum configurable vNICs/vHBA on a VIC adapter for the VIC adapters 1225, 1225T, 1227, 1227T, 1385, 1387, 1455, 1457, 1495, and 1497
1	12
2	27
4	57
8	116

New Hardware

New Hardware in Release 4.0(2a)

M5 Servers

- Support for Cisco UCS C480 M5 ML Server (USC-C480-M5ML).

Peripherals

- Support for the following VIC cards:
    - Cisco UCS VIC 1495 (UCSC-PCIE-C100-04)
    - Cisco UCS VIC 1497 (UCSC-MLOM-C100-04)

New Hardware in Release 4.0(1a)

M5 Servers

- Support for Cisco UCS C125 M5 Server (UCSC-C125).

Fabric Interconnect

• Cisco UCS 6454 Fabric Interconnect

Peripherals

• Support for the following VIC cards:

• Cisco UCS VIC 1455 (UCSC-PCIE-C25Q-04)

• Cisco UCS VIC 1457 (UCSC-MLOMC25Q-04)

Supported C-Series Servers and Adapter Cards

Adapter Cards

The following table shows the supported adapter cards for C-Series Rack-Mount Servers integration with Cisco UCS Manager:

Table 5: Adapter Cards for Rack Server Integration

Adapter Model	Dual-Wire Connection	SingleWire Connection	Direct Connection
Cisco UCS VIC 1495 (UCSC-PCIE-C100-04)	No	No	Yes
Cisco UCS VIC 1497 (UCSC-MLOM-C100-04)	No	No	Yes
Cisco UCS VIC 1455 (UCSC-PCIE-C25Q-04)	Yes	Yes	Yes
Cisco UCS VIC 1457 (UCSC-MLOM-C25Q-04)	Yes	Yes	Yes
Cisco UCS VIC 1387 (UCSC-MLOM-C40Q-03)	Yes	Yes	Yes
Cisco UCS VIC 1385 (UCSC-PCIE-C40Q-03)	Yes	Yes	Yes
Cisco UCS VIC 1227T (UCSC-MLOM-C10T-02)	Yes	Yes	No
Cisco UCS VIC 1227 UCSC-MLOM-CSC-02	Yes	Yes	Yes

Adapter Model	Dual-Wire Connection	SingleWire Connection	Direct Connection
Cisco UCS VIC 1225 (UCSC-PCIE-CSC-02)	Yes	Yes	Yes
Cisco UCS VIC 1225T (UCSC-PCIE-C10T-02)	Yes	Yes	No
QLogic QL45412H 40GbE[1] (UCSC-PCIE-QD40GF)	Yes	No	No

[1] Supported only for Azure-stack solution with FI 6332/6332-16UP and the Qlogic ports should be connected to FI directly and additionally LOM ports needs to be connected to FEX for management.

Note Different generation VIC adapters are not supported in a single server. For example, if a server has two VIC cards, both these VIC adapters should be either 14XX series or 13XX series or 12XX series.

Note For rack server and adapter compatibility, see the respective rack server spec sheet. For connectivity options with Cisco UCS Manager, see Configuration Guides.

For any other adapter or card which is not listed in Table 5: Adapter Cards for Rack Server Integration, on page 7, Cisco UCS Manager supports only inventory and firmware management.

Cisco UCS Manager Upgrade Consideration

Rack server integration with Cisco UCS Manager 3.2(2b) and higher release is possible only with the adapters listed in Table 5: Adapter Cards for Rack Server Integration, on page 7. Beginning with 3.2(2b), Cisco UCS Manager does not allow provisioning any vNICs or vHBAs on adapters which are not listed in Table 5: Adapter Cards for Rack Server Integration, on page 7.

Network Topology and Supported Cables

The following image is a graphical representation of the over-all network topology supported in the C-Series server integration with Cisco UCS Manager.

Note Cisco UCS C125 M5 Server server can be integrated only with Cisco UCS 6454 Fabric Interconnect or 6300 series Fabric Interconnect. Cisco UCS C125 M5 Server does not support 6200 series Fabric Interconnect.

Figure 1: Network Topology for 6200 and 6300 Series Fabric Interconnect with 1300 Series VIC Cards
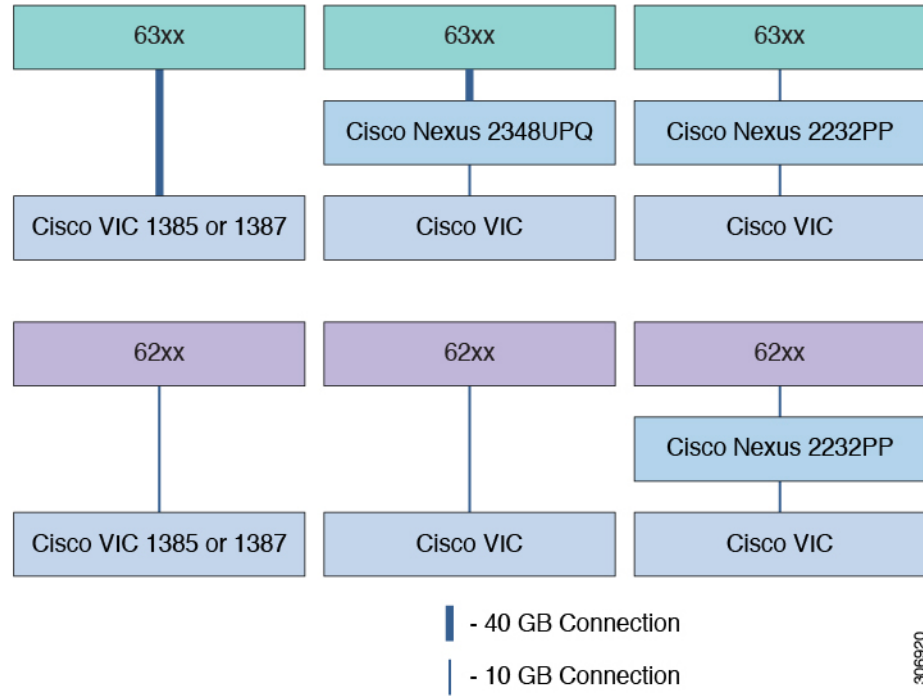
Figure 2: Network Topology for 6200, 6300, and 6400 Series Fabric Interconnect with 1400 Series VIC Cards
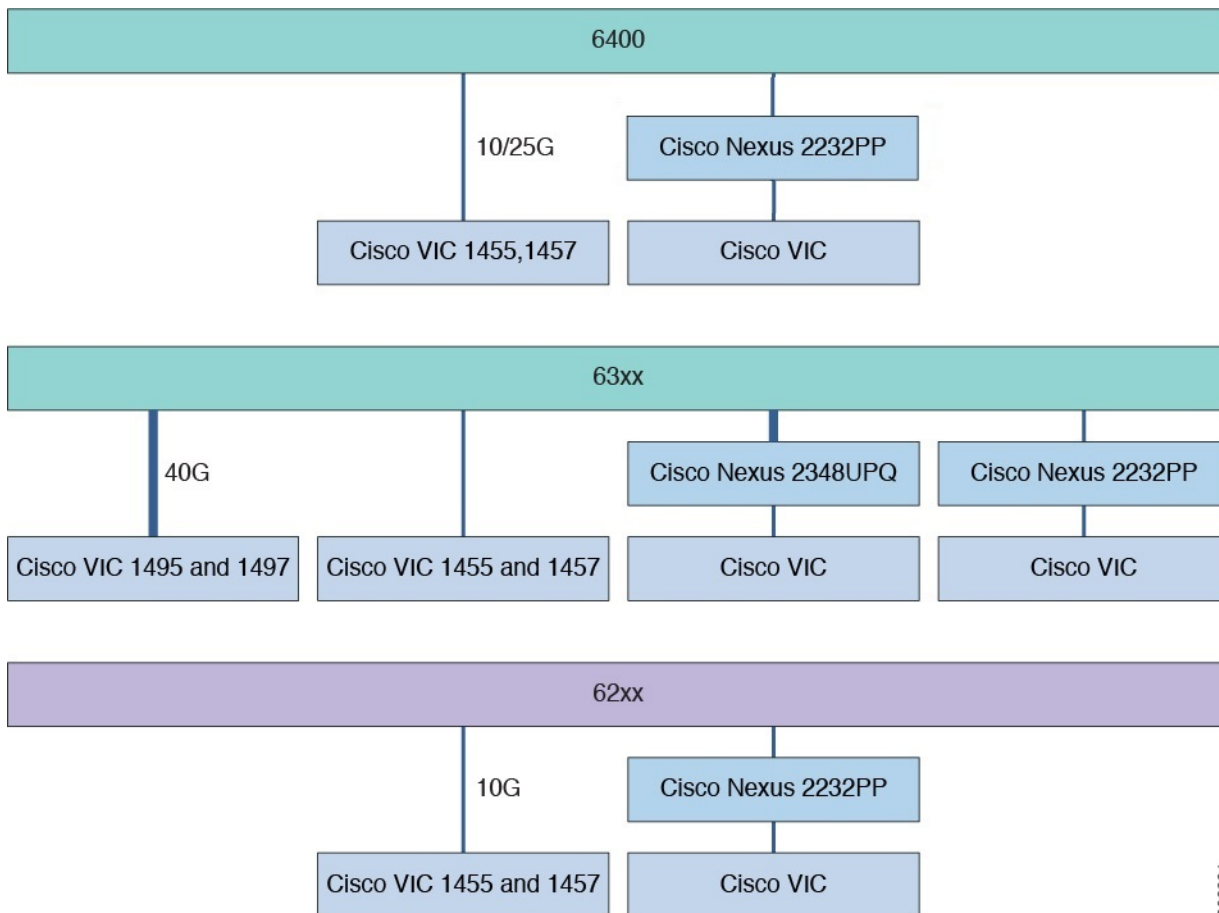
The Cisco UCS 6454 Fabric Interconnect, 6300, and 6200 Series FIs can be connected to Cisco VIC adapters and FEXs as shown in the table below. The thick blue line represents a 40 Gigabit Ethernet connection, the thin line represents a 10 Gigabit Ethernet connection. 40 Gigabit Ethernet connections are supported only on the Cisco VIC 1385, 1387 , 1495, and 1497 adapters. 10 Gigabit Ethernet connections are supported on the Cisco VIC 1225, 1227 1385, 1387, 1455, and 1457 adapters. 25 Gigabit Ethernet connections are supported only on the Cisco VIC 1455 and 1457. For the 10 Gigabit Ethernet, the following cables are used:

- 4x10 Breakout Small Form-Factor Pluggable (SFP) cables

- 4x10 Active Optical (OAC) cables

- 10G Small Form-Factor Pluggable (SFP) cable that uses the Qualified Security Assessor (QSA) module

For the 25 Gigabit Ethernet, the following cables are used:

- 25G SFP 28

Note While using Cisco VIC 1385 and 1387 in a 10G connection you would a require a 40G to 10G QSFP convertor and you cannot use the 4x10 Breakout Small Form-Factor Pluggable (SFP) cables or 4x10 Active Optical (OAC) cables. Break-out is not supported from VIC when connecting towards FI or FEX. Break-out cables are supported from FI towards VIC 1225/1227 and VIC 1455/1457.

Cisco UCS 6454 Fabric Interconnect	Cisco VIC 1385 or 1387 or 1455 or 1457
Cisco UCS 6454 Fabric Interconnect	Cisco Nexus 2232PP Cisco VIC 1385 or 1387 or 1455 or 1457 (10 G link)
Cisco UCS 6300 Series FI (63xx)	Cisco VIC 1385 or 1387 or 1455 or 1457 or 1495 or 1497
Cisco UCS 6300 Series FI (63xx)	Cisco Nexus 2232PP (4x10 G breakout cable) or 2348UQ (40 G link) Cisco VIC 1385 or 1387 or 1455 or 1457 (10 G link) Cisco VIC 1495 and 1497 (40 G link
Cisco UCS 6200 Series FI (62xx)	Cisco VIC 1385 or 1387 or 1455 or 1457
Cisco UCS 6200 Series FI (62xx)	Cisco Nexus 2232PP Cisco VIC 1385 or 1387 or 1455 or 1457 (10 G link) **Note** When you connect the 10 G cable to the Cisco VIC 1385 and 1387 adapter, you need to use a 40 G to 10 G converter.

Note Cisco C-Series servers cannot be integrated with Cisco UCS Manager using a combination of Cisco UCS 6324 Fabric Interconnect and Cisco UCS VIC 14xx.

Table 6: Supported 10G Adapter and Optics

FI / 10G Rack VIC / Connector	VIC 1225				VIC 1227			
	10 G	QSA	40 G	Breakout Cable	10 G	QSA	40 G	Breakout Cable
FI 62xx	Yes	NA	NA	NA	Yes	NA	NA	NA

FI / 10G Rack VIC / Connector	VIC 1225				VIC 1227			
FI 6324	Yes	NA	NA	Yes (4x10 fabric ports only)	Yes	NA	NA	Yes (4x10 fabric ports only)
FI 6332	NA	Yes	NA	Yes (4x10 fabric ports only)	NA	Yes	NA	Yes (4x10 fabric ports only)
FI 6332-16UP	Yes	Yes	NA	Yes (4x10 fabric ports only)	Yes	Yes	NA	Yes (4x10 fabric ports only)
Cisco UCS 6454 Fabric Interconnect	Yes	NA	NA	NA	Yes	NA	NA	NA

Table 7: Supported 10G/25G Adapter and Optics

FI / 10G Rack VIC / Connector	VIC 1455 and 1457			
	10 G	**QSA**	**25 G**	**Breakout Cable**
FI 62xx	Yes	NA	NA	NA
FI 6324	NA	NA	NA	NA
FI 6332	NA	NA	NA	Yes (4x10 fabric ports only)
FI 6332-16UP	Yes	NA	NA	NA
Cisco UCS 6454 Fabric Interconnect	Yes	NA	Yes	NA

Table 8: Supported 40G Adapter and Optics

FI / 40G Rack VIC / Connector	VIC 1495			VIC 1497		
	QSA	**40G**	**Breakout Cable**	**QSA**	**40G**	**Breakout Cable**
FI 62xx	NA	NA	NA	NA	NA	NA
FI 6324	NA	NA	NA	NA	NA	NA
FI 6332	NA	Yes	NA	NA	Yes	NA

FI / 40G Rack VIC / Connector	VIC 1495			VIC 1497		
FI 6332-16UP	NA	Yes	NA	NA	Yes	NA
Cisco UCS 6454 Fabric Interconnect	NA	NA	NA	NA	NA	NA

Table 9: Supported 40G Adapter and Optics

FI / 40G Rack VIC / Connector	VIC 1385			VIC 1387		
	QSA	40 G	Breakout Cable	QSA	40 G	Breakout Cable
FI 62xx	Yes	NA	NA	Yes	NA	NA
FI 6324	Yes	NA	NA	Yes	NA	NA
FI 6332	Yes	Yes	NA	Yes	Yes	NA
FI 6332-16UP	Yes	Yes	NA	Yes	Yes	NA
Cisco UCS 6454 Fabric Interconnect	Yes	NA	NA	Yes	NA	NA

Supported RAID/Storage Controller Configurations

Only servers without expanders can have more than one RAID controllers in the Cisco UCS Manager integrated mode. The following servers are allowed to have more than one RAID controllers in the Cisco UCS Manager integrated mode:

- Cisco UCS C24 M3 (UCSC-C24-M3S2)

- Cisco UCS C420 M3 (UCSC-C420-M3)

- Cisco UCS C240 M3 (UCSC-C240-M3S2)

- Cisco UCS C240 M3 NEBS (UCSC-C240-SNEBS)

- Cisco UCS C220 M4 (UCSC-C220-M4)

- Cisco UCS C240 M4 (UCSC-C240-M4)

- Cisco UCS C460 M4 (UCSC-C460-M4)

- Cisco UCS C240 M5 (UCSC-C240-M5L)

- Cisco UCS C240 M5 (UCSC-C240-M5S)

- Cisco UCS C240 M5 (UCSC-C240-M5SX)

- Cisco UCS C240 M5 (UCSC-C240-M5SN)

- Cisco UCS C220 M5 (UCSC-C220-M5L)

- Cisco UCS C220 M5 (UCSC-C220-M5SX)

- Cisco UCS C220 M5 (UCSC-C220-M5SN)

- Cisco UCS C480 M5 (UCSC-C480-M5)

- Cisco UCS C480 M5 ML Server (USC-C480-M5ML)

Note Cisco UCS C125 M5 Servers do not support multiple PICe RAID controllers. There are only 2 PCIe slots; one for a VIC card and the other for a RAID controller.

Any server not on this list that has more than one RAID controller installed, fails discovery.

The following RAID/Storage controllers are supported for C-Series rack-mount servers integration with Cisco UCS Manager.

Note A fully loaded LSI controller supports RAID 0, 1, 5, 50, 6, 10 and 60. If you remove a memory card from an LSI controller, UCS Manager cannot create RAID 6 and 10.

Table 10: Supported RAID/Storage Controllers

Server	Supported RAID Controller
Cisco UCS C240 M3 (UCSC-C240-M3)	- Cisco UCSC RAID SAS 2008M-8i - LSI MegaRAID SAS 9271-8i or 9271CV-8i 8-port PCIe RAID controller - LSI MegaRAID 9286CV-8e 8-port PCIe RAID controller - Cisco Nytro MegaRAID 200 GB PCIe RAID controller
Cisco UCS 220 M3 (UCSC-C220-M3)	- Cisco UCSC RAID SAS 2008M-8i - LSI MegaRAID SAS 9271-8i or 9271CV-8i RAID 8-port PCIe RAID controller - LSI MegaRAID 9286CV-8e PCIe RAID controller

Server	Supported RAID Controller
Cisco UCS 22 M3 (UCSC-C22-M3)	• LSI MegaRAID 9270CV-8i • LSI MegaRAID 9240-8i RAID 8-port PCIe RAID controller • LSI MegaRAID 9220-8i RAID 8-port PCIe RAID controller
Cisco UCS C24 M3 (UCSC-C24-M3)	• LSI MegaRAID 9270CV-8i • LSI MegaRAID 9240-8i RAID 8-port PCIe RAID controller • LSI MegaRAID 9220-8i RAID 8-port PCIe RAID controller
Cisco UCS C240 M4 (UCSC-C240-M4)	• Embedded SATA-only storage controller • Cisco 12G SAS Modular RAID controller • Cisco 12G Modular SAS Pass through Controller • Cisco 9300-8E 12G SAS HBA controller • Cisco UCSC-PSAS12GHBA storage controller
Cisco UCS C220 M4 (UCSC-C220-M4)	• Embedded SATA-only storage controller • Cisco 12G SAS Modular RAID controller • Cisco 12G Modular HBA pass through controller • Cisco 9300-8E 12G SAS HBA controller • Cisco UCSC-PSAS12GHBA storage controller
Cisco UCS C460 M4 (UCSC-C460-M4)	• Cisco 12G SAS Modular RAID controller • Cisco 12G SAS C460M4 RAID controller • Cisco 9300-8E 12G SAS HBA controller • LSI MegaRAID SAS 9361-8i RAID controller
Cisco UCS C220 M5 (UCSC-C220-M5SX)	• Cisco 12G Modular Raid controller with 2GB cache(max 16 drives) (UCSC-RAID-M5) • Cisco 12G Modular SAS HBA (max 16 drives) (UCSC-SAS-M5)
Cisco UCS C220 M5 (UCSC-C220-M5L)	• Cisco UCS 12G SAS Modular 8-Port RAID Controller (UCSC-MRAID12G)

Server	Supported RAID Controller
Cisco UCS C220 M5 (UCSC-C220-M5SN)	• Cisco UCS 12G SAS Modular 8-Port RAID Controller (UCSC-MRAID12G) or Cisco 12G Modular SAS HBA (max 16 drives) (UCSC-SAS-M5) • Up to 10 SFF NVMe PCIe SSDs. **Note** The drives in slots 1 and 2 are connected from Riser 2 and the drives in slots 3 through 10 are connected from the PCIe switch card plugged into the internal HBA slot. UCSC-C220-M5SN does not support embedded RAID.
Cisco UCS C240 M5 (UCSC-C240-M5S)	• Cisco 12G Modular Raid controller with 2GB cache(max 16 drives) (UCSC-RAID-M5) • Cisco 12G Modular SAS HBA (max 16 drives) (UCSC-SAS-M5)
Cisco UCS C240 M5 (UCSC-C240-M5L)	• Cisco 12G Modular Raid controller with 2GB cache(max 16 drives) (UCSC-RAID-M5) • Cisco 12G Modular SAS HBA (max 16 drives) (UCSC-SAS-M5)
Cisco UCS C240 M5 (UCSC-C240-M5SX)	• Cisco 12G Modular Raid controller with 4GB cache(max 26 drives) (UCSC-RAID-M5HD) • Cisco 12G Modular SAS HBA (max 26 drives)(UCSC-SAS-M5HD)

Server	Supported RAID Controller
Cisco UCS C240 M5 (UCSC-C240-M5SN)	• Up to eight front-facing SFF NVMe PCIe SSDs only (replacing SAS/SATA drives). **Note** These drives must be placed in front drive bays 1 through 8 only and are connected from Riser 2 slot 4 (from a PCIe switch). • 16 SFF front-facing SAS/SATA hard drives (HDDs) or SAS/SATA solid state drives (SSDs). **Note** Drives occupy slots 9-24. • Optionally, up to two SFF, rear-facing SFF NVMe PCIe SSDs (must be NVMe only). Rear facing NVMe drives are connected from Riser 2. UCSC-C240-M5SN does not support embedded RAID.
Cisco UCS C480 M5 (UCSC-C480-M5)	• Cisco 12G 9460-8i RAID controller with 2GB cache (UCSC-SAS9460-8I) • Cisco 12G Modular RAID (UCSC-RAID-M5HD) controller with a 4GB cache with a supercap cache backup (UCSC-SCAP-M5) • Cisco UCS C480 M5 (UCSC-C480-8AUX) Auxiliary Drive Modules for the Cisco 12G 9460-8i RAID controller
Cisco UCS C125 M5 Server (UCSC-C125)	• Cisco 12G 9460-8i RAID controller with 2GB cache (UCSC-SAS9460-8I) • Onboard SATA storage controller (FCH) in AHCI mode is supported • SWRAID is not supported
Cisco UCS C480 M5 ML Server (USC-C480-M5ML)	• Cisco 12G Modular RAID Controller (UCSC-RAID-M5HD) Includes 4-GB cache; controls up to 26 drives

Supported FlexFlash Configuration

Some Cisco UCS C-Series Rack-Mount Servers support an internal Cisco FlexFlash Secure Digital (SD) memory card for storage of server software tools and utilities. FlexFlash is disabled by default. You can enable FlexFlash in a local disk policy used in a service profile.

Note   Cisco UCS C-Series standalone servers with Cisco FlexFlash SD memory cards configured in Utility mode are not supported in the Cisco UCS Manager Integrated mode.

After upgrading CIMC if you are unable to install Cisco FlexFlash, apply the scrub policy before configuring the FlexFlash SD cards.

The FlexFlash SD cards can also be scrubbed using the format SD cards option, if the controller supports the same.

Configuring SingleConnect

This chapter includes the following sections:

SingleConnect

Cisco UCS Manager supports an option to integrate the C-Series Rack-Mount Server with Cisco UCS Manager using the NC-SI. This option enables Cisco UCS Manager to manage the C-Series Rack-Mount Servers using a single cable for both management traffic and data traffic. When you use the SingleConnect mode, one host facing port on the FEX is sufficient to manage one rack-mount server, instead of the two ports used in the Shared-LOM mode. This allows you to connect more number of rack-mount servers with Cisco UCS Manager for integrated server management. Make sure you have the correct server firmware for integration with Cisco UCS Manager. If not, upgrade your server firmware before integration. See Upgrading the C-Series Server Firmware, on page 66.

Important Guidelines for SingleConnect

SingleConnect has the following guidelines and limitations:

- To enable SingleConnect for the Cisco UCS Manager integration you must have the Cisco UCS VIC 1225, Cisco UCS VIC 1227, Cisco UCS VIC 1225T , Cisco UCS VIC 1227T, Cisco UCS VIC 1385,

Cisco UCS VIC 1387, Cisco UCS VIC 1455, Cisco UCS VIC 1457 installed in the specific slot assigned for SingleConnect in the rack server. If the VIC is not in the specific slot, SingleConnect does not work.

Note Cisco VIC 1225T is supported only on C220 M3, C240 M3, C240 M4, C220 M4, and C460 M4 servers. Cisco UCS MLOM 1227T and Cisco UCS MLOM 1387 are supported only on C240 M4 and C220 M4 servers.

Management Connection Policy and Connection Mode

When establishing physical connections for the C-Series Rack-Mount Server in the Cisco UCS Domain, you must specify the connection mode and management policy in Cisco UCS Manager GUI or Cisco UCS Manager CLI. The management policy is global to all connected C-Series Rack-Mount Servers. The connection mode determines the rack server discovery in Cisco UCS Manager.

You can specify either one of the following connection policies for the rack servers:

- **Auto Acknowledged**: This is the recommended and default connection mode for the C-Series Rack-Mount Server. If the connection mode is auto-acknowledged, immediately after establishing the physical connection, Cisco UCS Manager discovers the rack server and starts managing the server based on the specified management policy.

- **User Acknowledged**: If the connection mode is user-acknowledged, after establishing the physical connection, you must manually acknowledge the connection and specify the connection mode in the Cisco UCS Manager GUI or Cisco UCS Manager CLI to begin the discovery. Cisco UCS Manager does not begin the C-Series Rack-Mount Server discovery until you specify the connection mode. See Manually Acknowledging Connection Mode - GUI, on page 20 or Manually Acknowledging Connection Mode - CLI, on page 21 for detailed procedure.

Note When rack servers are discovered and are managed by Cisco UCS Manager, if you want to change the existing connection mode for one C-Series Rack-Mount Server, you have to decommission the server, re-commission it and specify the new connection mode. Only then Cisco UCS Manager can discover the server in the new connection mode.

Manually Acknowledging Connection Mode - GUI

If the connection mode is user-acknowledged, after establishing the physical connection, you must manually acknowledge the connection and specify the connection mode in the Cisco UCS Manager GUI to begin the discovery. Cisco UCS Manager does not begin the C-Series Rack-Mount Server discovery until you specify the connection mode.

SUMMARY STEPS

1. Expand **Equipment** > **Rack Mounts** > **Servers**.
2. Select the **Inventory** > **CIMC** tab.
3. Click **Configure Management Connection** and select **Enable**.

4. Select **Enabled** checkbox for **State**.

5. Click **OK**.

DETAILED STEPS

Step 1 Expand **Equipment** > **Rack Mounts** > **Servers**.

Note For Cisco UCS C125 M5 Servers, expand **Equipment** > **Rack Mounts** > **Enclosures** > **Rack Enclosure** *rack_enclosure_number* > **Servers**.

Step 2 Select the **Inventory** > **CIMC** tab.

Step 3 Click **Configure Management Connection** and select **Enable**.

Step 4 Select **Enabled** checkbox for **State**.

Step 5 Click **OK**.

Manually Acknowledging Connection Mode - CLI

If the connection mode is user-acknowledged, after establishing the physical connection, you must manually acknowledge the connection and specify the connection mode in the Cisco UCS Manager CLI to begin the discovery. Cisco UCS Manager does not begin the C-Series Rack-Mount Server discovery until you specify the connection mode.

SUMMARY STEPS

1. UCS-A# **Scope** *server_ID*

2. UCS-A/server # **Scope cimc**

3. UCS-A/server/cimc # **scope mgmt-conn sideband**

4. UCS-A/server/cimc/mgmt-conn #**set mgmt-conn-state enabled**

5. UCS-A/server/cimc/mgmt-conn* # **commit-buffer**

DETAILED STEPS

	Command or Action	Purpose
Step 1	UCS-A# **Scope** *server_ID*	Enters the specified server.
Step 2	UCS-A/server # **Scope cimc**	Enters the CIMC mode.
Step 3	UCS-A/server/cimc # **scope mgmt-conn sideband**	Enters the management connection mode.
Step 4	UCS-A/server/cimc/mgmt-conn #**set mgmt-conn-state enabled**	Acknowledges the connection mode.
Step 5	UCS-A/server/cimc/mgmt-conn* # **commit-buffer**	Saves the changes in the system.

Example

```
UCS-A# scope server 1
UCS-A /server # scope cimc
UCS-A /server/cimc # scope mgm
UCS-A /server/cimc # scope mgmt-conn
UCS-A /server/cimc # scope mgmt-conn sideband
UCS-A /server/cimc/mgmt-conn # set mgmt-conn-state enabled
UCS-A /server/cimc/mgmt-conn* # commit-buffer
UCS-A /server/cimc/mgmt-conn
```

Requirements for SingleConnect Integration with Cisco UCS Manager

Requirements for Cluster Setup

You must have the following items to create a single-wire integration for C-Series Rack-Mount Server with Cisco UCS Manager in a cluster setup:

- A Cisco UCS system that is running Cisco UCS Manager.

- Any of the C-Series Rack-Mount Servers and corresponding CIMC and UCS Manager release versions listed in the following table:

Table 11: Minimum Required Version of CIMC, BIOS and UCS Manager for SingleConnect Integration

Server	CIMC	BIOS	UCS Manager	UCS Manager (CIMC)	UCS Manager (BIOS)
Cisco UCS C22 M3 Server	1.4(6)	1.4.7a	2.1(2a)	1.5(1l)	1.5.1c
Cisco UCS C24 M3 Server	1.4(6)	1.4.7a	2.1(2a)	1.5(1l)	1.5.1c
Cisco UCS C220 M3 Server	1.4(6)	1.4.7a	2.1(2a)	1.5(1l)	1.5.1g
Cisco UCS C240 M3 Server	1.4(6)	1.4.7a	2.1(2a)	1.5(1l)	1.5.1c
Cisco UCS C420 M3 Server	1.4(7)	1.4.8	2.1(2a)	1.5(1l)	1.5.1b

Server	CIMC	BIOS	UCS Manager	UCS Manager (CIMC)	UCS Manager (BIOS)
Cisco UCS C220 M4 Server (requires 2.2.3 or above)	2.0(3d)	2.0.3	2.2(3a)	2.0(3d)	2.0.3
Cisco UCS C240 M4 Server (requires 2.2.3 or above)	2.0(3d)	2.0.3	2.2(3a)	2.0(3d)	2.0.3
Cisco UCS C460 M4 Server	1.5(7a)	1.5.7	2.2(2a)	1.5(7a)	1.5.7
Cisco UCS C220 M5 Server	3.1.1d	3.1.1i.0	3.2(1d)	3.1.1d	3.1.1i.0
Cisco UCS C240 M5 Server	3.1.1d	3.1.1h.0	3.2(1d)	3.1.1d	3.1.1h.0
Cisco UCS C480 M5 Server	3.1(2b)	3.1.2a.0	3.2(2b)	3.1(2b)	3.1.2a.0
Cisco UCS C125 M5 Server	4.0(1a)	4.0(1a)	4.0(1a)	4.0(1a)	4.0(1a)
Cisco UCS C480 M5 ML Server	4.0(2a)	4.0(2a)	4.0(2a)	4.0(2a)	4.0(2a)

✎

| Note | For Cisco UCS C220 M4 and Cisco UCS C240 M4Cisco UCS C220 M4, C240 M4, C220 M5, and C240 M5 servers you can use either MLOM or VIC to integrate with Cisco UCS Manager in SingleConnect or direct connect mode. |

Cisco UCS C125 M5 Servers do not support MLOM. For Cisco UCS C125 M5 Servers, you must place the VIC card in slot 2 only.

The adapter for connectivity is selected as explained below:

- **MLOM only**: When only MLOM is present in the server, the connectivity adapter is by default MLOM.

- **MLOM and VIC adapters**: MLOM is the default connectivity adapter.

- **No MLOM**:

  - If the Cisco UCS C220 M4/C220 M5 contains a VIC, it must be installed in Riser1 - Slot 1 for SingleConnect or direct connect integration.

  - If the Cisco UCS C240 M4/C240 M5 contains a VIC, it can be installed on any one of the following slots 1, 2, 4, or 5 for SingleConnect or direct connect integration.

- **No MLOM and VIC**: No single connect or direct connect support.

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Important

The server must have Cisco UCS VIC 1225 or Cisco VIC 1227 or Cisco VIC 1225T or Cisco VIC 1227T or Cisco VIC 1385 or Cisco VIC 1387 MLOM or Cisco VIC 1455 or Cisco VIC 1457 MLOM installed. The Firmware and Boot Loader versions for Cisco UCS VIC 1225 or Cisco VIC 1227 are:

For the Cisco UCS 1225 and 1227 cards:

- Recommended — 2.1(0.457a)

- Minimum required — 2.1(0.367e)

For the Cisco UCS 1225T and 1227T cards:

- Recommended version — 4.0.4b

- Minimum version needed — 4.0.4b

For Cisco UCS VIC 1385 and 1387 MLOM:

- Recommended 4.1.1a

- Minimum 4.1.1a

For Cisco UCS VIC 1455 and 1457 MLOM:

- Recommended 5.0(1a) and higher

Cisco UCS 1225, Cisco UCS 1225T, Cisco UCS 1227T , Cisco UCS 1227, Cisco UCS 1385, Cisco UCS 1387, Cisco UCS 1455, Cisco UCS 1457 VICs support single-connect. If you are using Cisco UCS VIC for single-connect, make sure the card is inserted in one of the slots as described in the following table:

Table 12: Cisco UCS VIC Slot for SingleConnect Integration

Server	PCIe Slot
Cisco UCS C22 M3 Server	1
Cisco UCS C24 M3 Server	1
Cisco UCS C220 M3 Server	1
Cisco UCS C240 M3 Server	2
Cisco UCS C420 M3 Server	4
Cisco UCS C220 M4 Server	MLOM, 1
Cisco UCS C240 M4 Server	MLOM, 1, 2, 4, 5 **Note** If slots 2 and 5 are occupied with GPUs, then VICs can be placed in slots 1 and 4.
Cisco UCS C460 M4 Server	4, 9, 5, 10

Server	PCIe Slot
Cisco UCS C220 M5 Server	MLOM, 1
Cisco UCS C240 M5 Server	MLOM, 1, 2, 4, 5 **Note** If slots 2 and 5 are occupied with GPUs, then VICs can be placed in slots 1 and 4.
Cisco UCS C480 M5 Server	1, 2
Cisco UCS C125 M5 Server	2
Cisco UCS C480 M5 ML Server	11, 12

Note   Cisco UCS 1225, 1225T, 1385, and 1455 are PCIe based adapters and Cisco VIC 1227, Cisco VIC 1227T, Cisco VIC 1387, Cisco VIC 1457 are MLOM based.

- Cisco UCS 6200 Series or 6300 Series or Cisco UCS 6454 Fabric Interconnect. The switch ports where Fabric Extenders (FEX) will be connected must be marked as server ports.

- Two of the following FEX type can be used:

  - Cisco Nexus 2232PP

  - Cisco Nexus 2232TM-E

  - Cisco Nexus 2348UPQ

    Note
    - You can connect the Cisco Nexus 2232PP or Cisco Nexus 2232TM-E FEXs to the 6200 series FIs, and Cisco Nexus 2232PP or Cisco Nexus 2232 TM-E or Cisco Nexus 2348UPQ FEXs to the 6300 series FIs.

    - You must plug a power cord into each of the two power supplies in the FEX. If the power is connected and there are issues in the hardware, you might see "Major" faults reported during the power-on self test (POST). For example, you might see this error: `Power supply 1 in fex 6 power: error`. You can clear errors by connecting any missing power cord to the FEX power supply.

- Four 10-Gb Small Form-Factor Pluggable (SFP) cables.

Note
- At least one cable to connect each FEX with the corresponding FI.
- At least one cable to link the data traffic path between server and FEX.
- At least four cables for uplinks from the FEX to FIs. You can either use 10 Gb twinaxial cable or one of the following SFP type cables:
  - SFP - 10GE-SR
  - FET - 10GE

Important

Do not mix SFP types on an uplink. If you mix the SFP types on an uplink, you will see `Discovery Failed` errors.

Requirement for Non-cluster Setup

If you are integrating the server in a non-cluster setup, along with the Cisco UCS Manager and C-series rack mount server, you will need the following components :

- One Cisco UCS 6200 Series or 6300 Series or Cisco UCS 6454 Fabric Interconnect. The switch ports where Fabric Extenders (FEX) will be connected must be marked as server ports.
- One of the following FEX types can be used:
  - Cisco Nexus 2232PP
  - Cisco Nexus 2232TM-E
  - Cisco Nexus 2348UPQ
- Three 10-Gb SFP cables.

Note
- If you are using 6200 Series FI, the minimum requirement for SFP cable is 2.
- At least one cable for linking the data traffic path between server and FEX.
- At least two cables for uplinks from the FEX to FIs. Each of these two cables used for uplink from the FEX to FIs can either use 10 Gb twinaxial cable or one of the following Small Form-Factor Pluggable (SFP) type cables:
  - SFP - 10GE-SR
  - FET - 10GE

- 40G SFP cable for connected Cisco Nexus 2348UPQ

Cisco UCS Manager Management for Mixed VIC Set-up in C240 M5 Server

Cisco UCS Manager does not provide full support in a setup with Cisco UCS C240 M5 Server and mixed VIC cards.

Table 13: Cisco UCS Manager Management

Slots	Cisco UCS Manager Management
Both slot 1 and slot 2 are occupied. Slot 1 - Cisco VIC 1455 Slot 2 - Any Cisco VIC card or third-party adapter	Cisco UCS Manager detects only slot 2.
Both slot 1 and slot 2 are occupied. Slot 1 - Any Cisco VIC card or third-party adapter except Cisco VIC 1455 Slot 2 - Cisco VIC 1455	Cisco UCS Manager detects both the slots.
Both slot 1 and slot 2 are occupied. Slot 1 - Any Cisco VIC card or third-party adapter except Cisco VIC 1455 Slot 2 - Any Cisco VIC card or third-party adapter	Cisco UCS Manager detects both the slots.
Only one slot is occupied. Slot 1 - Any Cisco VIC card or third-party adapter or Slot 2 - Any Cisco VIC card or third-party adapter	Cisco UCS Manager detects whichever slot is occupied.
Both slot 4 and slot 5 are occupied. Slot 4 - Cisco VIC 1455 Slot 5 - Any Cisco VIC card or third-party adapter	Cisco UCS Manager detects only slot 5.
Both slot 4 and slot 5 are occupied. Slot 4 - Any Cisco VIC card or third-party adapter except Cisco VIC 1455 Slot 5 - Cisco VIC 1455	Cisco UCS Manager detects both the slots.
Both slot 4 and slot 5 are occupied. Slot 4 - Any Cisco VIC card or third-party adapter except Cisco VIC 1455 Slot 5 - Any Cisco VIC card or third-party adapter	Cisco UCS Manager detects both the slots.

Slots	Cisco UCS Manager Management
Only one slot is occupied. Slot 4 - Any Cisco VIC card or third-party adapter or Slot 5 - Any Cisco VIC card or third-party adapter	Cisco UCS Manager detects whichever slot is occupied.

Connecting the C-Series Server with Cisco UCS Domain in Cluster Setup

Before you begin

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Important   Make sure the server CIMC is set to factory default settings to integrate with Cisco UCS Manager.

Before you connect the server, make sure the Cisco UCS VIC 1225 or Cisco VIC 1227 or Cisco VIC 1225T or Cisco VIC 1227T or Cisco VIC 1385 or Cisco VIC 1387 MLOM or Cisco VIC 1455 or Cisco VIC 1457 MLOM is installed in the correct slot for integration with Cisco UCS Manager. If the card is not installed in the correct slot, you cannot enable the single-wire management for the server.

Step 1   Install the server in the rack. See the *Install and Upgrade Guide* for the server that you are using. The install guides are available at the following url: Install and Upgrade Guides.

Step 2   Connect the path that carries both data traffic and management traffic to the FEXes:

a) Connect a supported cable between the adapter card in the server and a port on the FEX that is connected to Fabric A. You can use any port on the FEX.

b) Connect a supported SFP cable between the adapter card in the server and a port on the FEX that is connected to Fabric B. You can use any port on the FEX.

Step 3   Connect the paths from the FEXes to the FIs.

a) Connect at least two supported SFP cables between FEX A and two ports on FI A. You can use any ports on FI A, but the ports must be configured as server ports.

b) Connect at least two supported SFP cables between FEX B and two ports on FI B. You can use any ports on FI B, but the ports must be configured as server ports.

• For information on the C-Series integration network topology and cable connections, see the Network Topology and Supported Cables, on page 8 section.

• On the FEX, you can use only the right block of eight ports for uplinks. The maximum number of uplinks is eight

• Do not mix SFP types on an uplink. Doing so might result in a discovery failure.

Step 4   Attach a power cord to each power supply in your server, and then attach the power cord to a grounded AC power outlet.

Step 5   Reboot the server.

Physical Connectivity Illustrations for SingleConnect Cluster Setup
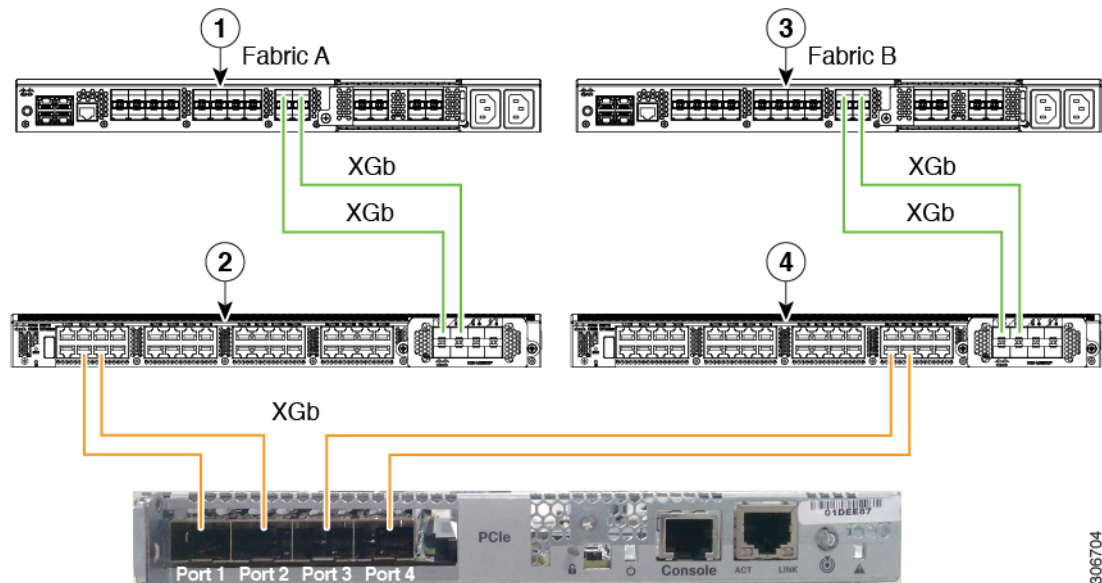
The following image shows a sample of SingleConnect physical connectivity for C-Series Rack-Mount Server with Cisco UCS Domain, Cisco UCS Manager. This image shows the cabling configuration for Cisco UCS Manager integration with a C-Series Rack-Mount Server. The paths shown in gold carry both management traffic and data traffic.

Figure 3: SingleConnect Cabling Configuration
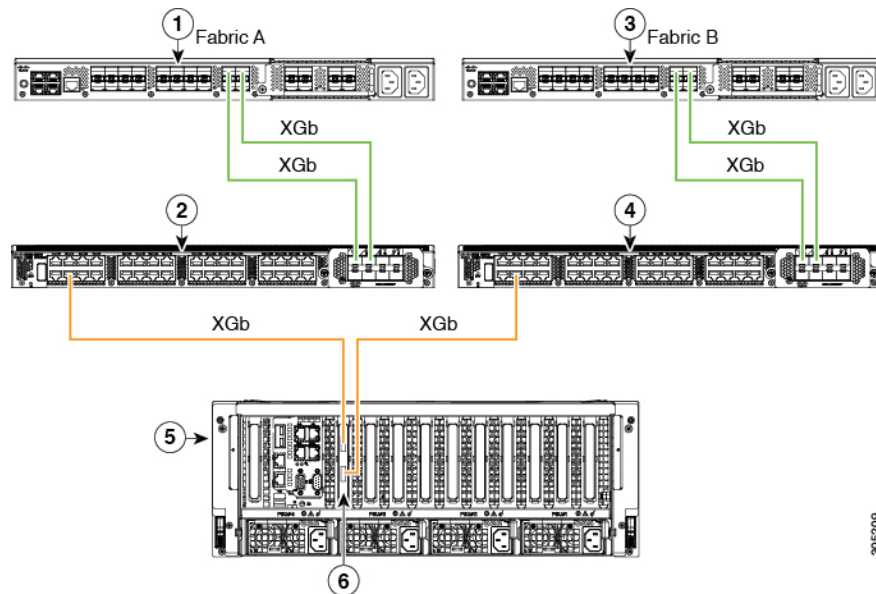
Figure 4: SingleConnect Cabling Configuration with Cisco VIC 1455/VIC 1457

Note XGb represents a 40 GB connection or a 10 GB connection or a 25 GB Ethernet connection. For the 10 Gigabit Ethernet, the following cables are used:

- 4x10 Breakout Small Form-Factor Pluggable (SFP) cables

- 4x10 Active Optical (OAC) cables

- 10G Small Form-Factor Pluggable (SFP) cable that uses the Qualified Security Assessor (QSA) module

For the 25 Gigabit Ethernet, the following cables are used:

- 25G SFP 28

1	Cisco UCS 6200 Series or 6300 or Cisco UCS 6454 Fabric Interconnect (Fabric A)	4	Cisco Nexus 2232PP or Cisco Nexus 2232TM-E (Not applicable with Cisco UCS VIC 1455) or Cisco Nexus 2348UPQ FEX (Fabric B)
2	Cisco Nexus 2232PP or Cisco Nexus 2232TM-E (Not applicable with Cisco UCS VIC 1455) or Cisco Nexus 2348UPQ FEX (Fabric A)	5	C-Series Rack-Mount Server

3	Cisco UCS 6200 Series or 6300 or Cisco UCS 6454 Fabric Interconnect (Fabric B)	6	Cisco UCS VIC in supported PCIe or MLOM slot.
			Note MLOM based adapters (Cisco UCS VIC 1227, 1227T, and 1387) are supported only on Cisco UCS C220 M4, C240 M4, C220 M5 (only 1387), and C240 M5 (only 1387). MLOM based adapter Cisco UCS VIC 1457 is supported only on Cisco UCS C-Series C220 and C240 M5 servers.

Connecting the C-Series Server with UCS Domain in Non-cluster Setup

To connect the C-Series Server with UCS domain, complete the same steps described in . Instead of connecting two FIs and two FEXes, you need to connect only one FI and one FEX.

Figure 5: Single-wire Non-Cluster Setup Example

The following illustration is an example of a non-cluster setup in single-wire management.
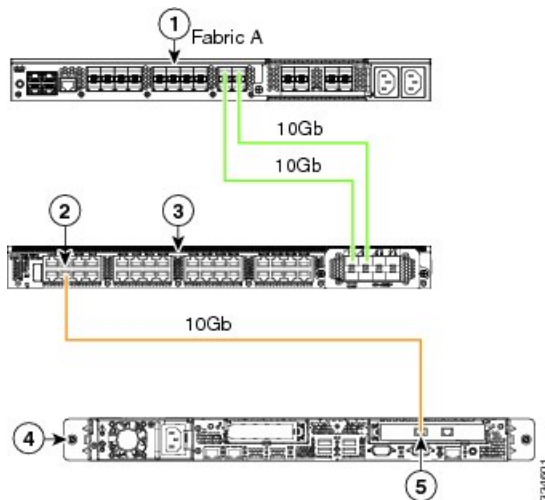
Note XGb represents a 40 GB Ethernet connection or a 10 GB Ethernet connection or 25 GB Ether connection. For the 10 Gigabit Ethernet, the following cables are used:

- 4x10 Breakout Small Form-Factor Pluggable (SFP) cables

- 4x10 Active Optical (OAC) cables

- 10G Small Form-Factor Pluggable (SFP) cable that uses the Qualified Security Assessor (QSA) module

For the 25 Gigabit Ethernet, the following cables are used:

- 25G SFP 28

1	Cisco UCS 6200 Series or 6300 or Cisco UCS 6454 Fabric Interconnect (Fabric A)	4	C-Series Rack-Mount Server
2	SingleConnect connection	5	Cisco UCS VIC adapter in supported PCIe slot
3	Cisco Nexus 2232PP or Cisco Nexus 2232TM-E or Cisco Nexus 2348UPQ FEX (Fabric A)		

Physical Connectivity Illustrations for SingleConnect Non-Cluster Setup

The following image shows a sample of SingleConnect physical connectivity for C-Series Rack-Mount Server with Cisco UCS Domain, Cisco UCS Manager. This image shows the cabling configuration for Cisco UCS Manager integration with a C-Series Rack-Mount Server. The paths shown in gold carry both management traffic and data traffic.

Figure 6: SingleConnect Cabling Configuration with Cisco VIC 1455/VIC 1457 - Single Cable
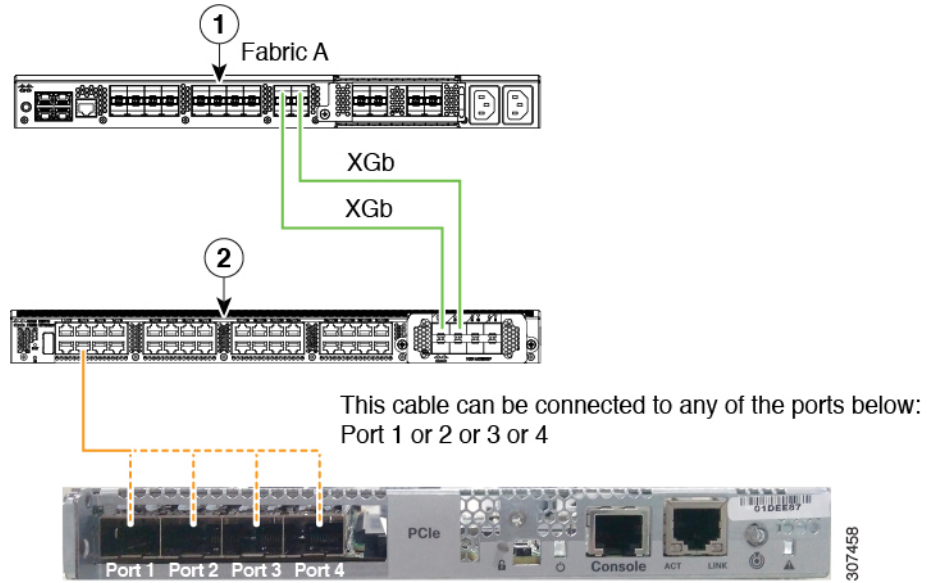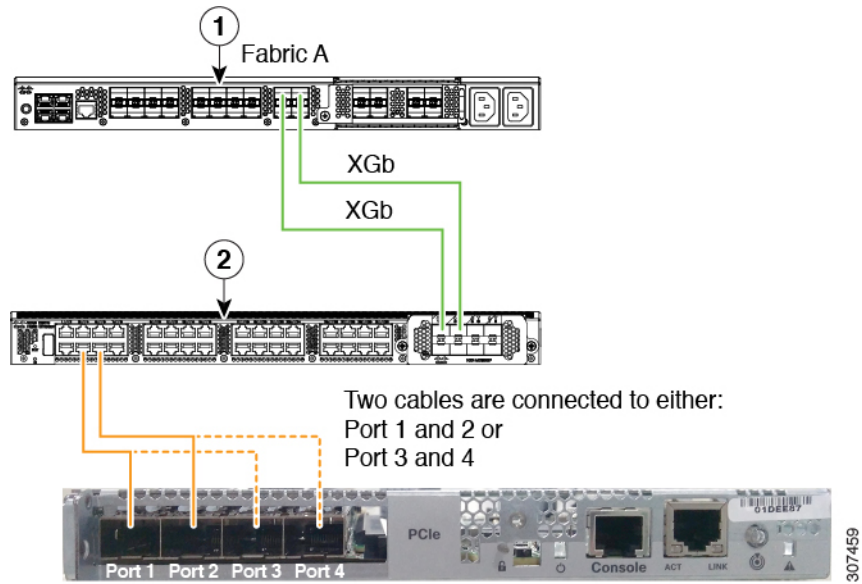

Figure 7: SingleConnect Cabling Configuration with Cisco VIC 1455/VIC 1457 - Dual Cable

Note XGb represents a 40 GB connection or a 10 GB connection or a 25 GB Ethernet connection. For the 10 Gigabit Ethernet, the following cables are used:

- 4x10 Breakout Small Form-Factor Pluggable (SFP) cables
- 4x10 Active Optical (OAC) cables
- 10G Small Form-Factor Pluggable (SFP) cable that uses the Qualified Security Assessor (QSA) module

For the 25 Gigabit Ethernet, the following cables are used:

- 25G SFP 28

Managing the Rack-Mount Server in Cisco UCS Manager after Integration

You can manage and monitor all rack-mount servers that have been integrated with a Cisco UCS domain through Cisco UCS Manager. After the integration, you can perform all rack-mount server management tasks only through the service profiles from Cisco UCS Manager GUI or Cisco UCS Manager CLI. The C-Series Rack-Mount Server Cisco IMC is not accessible when you start managing the server with Cisco UCS Manager.

Cisco UCS Manager provides information, errors, and faults for each rack-mount server that was discovered.

For more information on managing C-Series Rack-Mount Servers from Cisco UCS Manager, see the chapter on Managing Rack-Mount Servers in your release specific Cisco UCS Manager Configuration Guide.

Reverting a Server From Cisco UCS Domain Mode to Standalone Mode

When you manage a Cisco UCS C-Series server with Cisco UCS Manager software, a UCS Manager service profile is associated with the server. If you want to revert a C-Series server to standalone mode (so that it can be managed by Cisco IMC software), you must do the following actions in UCS Manager:

Step 1 Disassociate the UCS Manager service profile from the server.

Step 2 Remove the connections from the adapter.

Step 3 Manually power on the server.

Step 4 Connect the front panel KVM connection.

Step 5 Press **F8** during the boot up.

Step 6 Reset CIMC to factory defaults or stand-alone mode.

Caution   If you do not disassociate the service profile from the server, MAC and WWN numbers assigned by UCS Manager might be kept by the server. This can cause numbering duplication and conflicts with other servers that are managed by UCS Manager. Also, if you revert a server to standalone mode without disassociating its service profile, any LSI RAID controller will not show as a bootable device in the standalone server, preventing local booting.

Special Considerations for Integrated Servers

When you connect the C-Series servers in Cisco UCS system, make sure to review the following information:

FEX Considerations

Re-acknowledge Attached Servers After a FEX Is Decommissioned/Recommissioned

Whenever you decommission or recommission a Cisco UCS FEX, all the servers that are connected to that FEX must be re-acknowledged in UCS Manager.

Cisco VIC 1455 and 1457 Connectivity

The FEX to FI uplink should be configured in port channel.

Cisco VIC 1455 and 1457 Connectivity

For cluster setup, connect port 1 and 2 to one FEX. Connect port 3 and 4 to another FEX. For non-cluster setup, connect either port 1 and 2 or port 3 and 4 to the FEX.

C H A P T E R 3

Configuring Direct Connect

This chapter includes the following sections:

Direct Connect Mode

Beginning with release 3.1, Cisco UCS Manager supports an option to connect the C-Series Rack-Mount Server directly to the Fabric Interconnects. You do not need the Fabric Extenders. This option enables Cisco UCS Manager to manage the C-Series Rack-Mount Servers using a single cable for both management traffic and data traffic.

Note   After connecting the server with the FI, when the server is discovered, make sure to update the C-Series software bundle available for Cisco UCS Manager, release 3.1 or later.

While using Cisco VIC 1385 and 1387 in a 10G connection you would a require a 40G to 10G QSFP convertor but you cannot use the 4x10 Breakout Small Form-Factor Pluggable (SFP) cables and 4x10 Active Optical (OAC) cables.

When you use direct connect mode, all Cisco UCS Managed adapters must be connected to the server ports on the Fabric Interconnects. Make sure you have server firmware as listed in the Requirements for Direct Connect Mode Integration with Cisco UCS Manager, on page 40. If not, upgrade your server firmware before integrating the server with Cisco UCS Manager. See Upgrading the C-Series Server Firmware, on page 66.

VIF Scalability

For the maximum number of virtual interfaces allowed on each adapter in the server that is directly connected to the Fabric Interconnect, see

Cisco UCS Configuration Limits for Cisco UCS Manager Guide

Requirements for Direct Connect Mode Integration with Cisco UCS Manager

Requirements for Cluster Setup

You must have the following items to create a direct connect integration for C-Series Rack-Mount Server with Cisco UCS Manager in cluster setup:

• A Cisco UCS system that is running Cisco UCS Manager release 3.1 or later.

• Any of the following supported Cisco UCS C-Series servers and corresponding CIMC release versions listed in the following table:

Table 14: Minimum Required Version of CIMC, BIOS and UCS Manager for Direct Connect Mode Integration

Server	CIMC	BIOS	UCS Manager
Cisco UCS C22 M3 Server	1.4(6)	1.4.7a	2.1(2a)
Cisco UCS C24 M3 Server	1.4(6)	1.4.7a	2.1(2a)
Cisco UCS C220 M3 Server	1.4(6)	1.4.7a	2.1(2a)
Cisco UCS C240 M3 Server	1.4(6)	1.4.7a	2.1(2a)
Cisco UCS C420 M3 Server	1.4(7)	1.4.8	2.1(2a)
Cisco UCS C220 M4 Server (requires 2.2.3 or above)	2.0(3d)	2.0.3	2.2(3a)
Cisco UCS C240 M4 Server (requires 2.2.3 or above)	2.0(3d)	2.0.3	2.2(3a)
Cisco UCS C460 M4 Server	1.5(7a)	1.5.7	2.2(2a)
Cisco UCS C220 M5 Server	3.1.1d	3.1.1i.0	3.2(1d)

Server	CIMC	BIOS	UCS Manager
Cisco UCS C240 M5 Server	3.1.1d	3.1.1h.0	3.2(1d)
Cisco UCS C480 M5 Server	3.1(2b)	3.1.2a.0	3.2(2b)
Cisco UCS C125 M5 Server	4.0(1a)	4.0(1a)	4.0(1a)
Cisco UCS C480 M5 ML Server	4.0(2a)	4.0(2a)	4.0(2a)

Note For Cisco UCS C220 M4 and Cisco UCS C240 M4Cisco UCS C220 M4, C240 M4, C220 M5, and C240 M5 servers you can use either MLOM or VIC to integrate with Cisco UCS Manager in SingleConnect or direct connect mode.

Cisco UCS C125 M5 Servers do not support MLOM. For Cisco UCS C125 M5 Servers, you must place the VIC card in slot 2 only.

The adapter for connectivity is selected as explained below:

- **MLOM only**: When only MLOM is present in the server, the connectivity adapter is by default MLOM,

- **MLOM and VIC adapters**: MLOM is the default connectivity adapter.

- **No MLOM**:

    - For Cisco UCS C220 M4/C220 M5, the VIC must be installed in Riser1 - Slot 1 for direct connect integration.

    - For Cisco UCS C240 M4/C240 M5, the VIC can be installed on any one of the following slots: 1, 2, 4, or 5 for direct connect integration.

Note While using a VIC adapter, ensure that you remove MLOM if you want to use a 40 Gigabyte connection for integration.

Note
- **No MLOM and VIC**: No SingleConnect or direct connect support.

☞

Important

The server must have Cisco UCS VIC 1225 or Cisco VIC 1227 or Cisco VIC 1225T or Cisco VIC 1227T or Cisco VIC 1385 or Cisco VIC 1387 MLOM or Cisco VIC 1455 or Cisco VIC 1457 MLOM or Cisco VIC 1495 or Cisco VIC 1497 MLOM installed. The Firmware and Boot Loader versions for Cisco UCS VIC 1225 or Cisco VIC 1227 are:

- Recommended — 2.1(0.457a)

- Minimum required — 2.1(0.367e)

For Cisco UCS VIC 1385 and 1387 MLOM:

- Recommended 4.1.1a

- Minimum 4.1.1a

For Cisco UCS VIC 1455 and 1457 MLOM:

- Recommended 5.0(1a) and higher

For Cisco UCS VIC 1495 and 1497 MLOM:

- Recommended 5.0(2a) and higher

Cisco UCS 1225, Cisco UCS 1225T, Cisco UCS 1227T , Cisco UCS 1227, Cisco UCS 1385, Cisco UCS 1387, Cisco UCS 1455, and Cisco UCS 1457 , Cisco UCS 1495, and Cisco UCS 1497 VICs also support direct-connect. If you are using Cisco UCS VIC for direct-connect, make sure the card is inserted in one of the slots as described in the following table:

Table 15: Cisco VIC Slot for Direct Connect Integration

Server	PCIe Slot
Cisco UCS C22 M3 Server	1
Cisco UCS C24 M3 Server	1
Cisco UCS C220 M3 Server	1
Cisco UCS C240 M3 Server	2
Cisco UCS C420 M3 Server	4
Cisco UCS C220 M4 Server	MLOM, 1
Cisco UCS C240 M4 Server	MLOM, 1, 2, 4, 5 **Note** If slots 2 and 5 are occupied with GPUs, then VICs can be placed in slots 1 and 4.
Cisco UCS C460 M4 Server	4, 9, 5, 10
Cisco UCS C220 M5 Server	MLOM, 1

Server	PCIe Slot
Cisco UCS C240 M5 Server	MLOM, 1, 2, 4, 5
	Note If slots 2 and 5 are occupied with GPUs, then VICs can be placed in slots 1 and 4.
	See Cisco UCS Manager Management for Mixed VIC Set-up in C240 M5 Server, on page 29 for slot combination.
Cisco UCS C480 M5 Server	1, 2
Cisco UCS C125 M5 Server	2
Cisco UCS C480 M5 ML Server	11, 12

- Cisco UCS 6454 Fabric Interconnect, Cisco UCS 6200 Series or 6300 Series FIs. The ports must be configured as server ports.

- At least two 10-Gb Small Form-Factor Pluggable (SFP) cables for one card.

- 25G cable and 40G SFP cable to connect the 25G and 40G adapters

Requirement for Non-cluster Setup

If you are integrating the server in a non-cluster setup, along with the Cisco UCS Manager and C-series rack mount server, you need the following components :

- One Cisco UCS 6454 Fabric Interconnect, Cisco UCS 6200 Series or 6300 Series FIs. The ports must be configured as server ports.

- At least one 10-Gb SFP cable for each card. You cannot connect the card to the same FI from both the ports.

Cisco UCS Manager Management for Mixed VIC Set-up in C240 M5 Server

Cisco UCS Manager does not provide full support in a setup with Cisco UCS C240 M5 Server and mixed VIC cards.

Table 16: Cisco UCS Manager Management

Slots	Cisco UCS Manager Management
Both slot 1 and slot 2 are occupied. Slot 1 - Cisco VIC 1455 Slot 2 - Any Cisco VIC card or third-party adapter	Cisco UCS Manager detects only slot 2.

Slots	Cisco UCS Manager Management
Both slot 1 and slot 2 are occupied. Slot 1 - Any Cisco VIC card or third-party adapter except Cisco VIC 1455 Slot 2 - Cisco VIC 1455	Cisco UCS Manager detects both the slots.
Both slot 1 and slot 2 are occupied. Slot 1 - Any Cisco VIC card or third-party adapter except Cisco VIC 1455 Slot 2 - Any Cisco VIC card or third-party adapter	Cisco UCS Manager detects both the slots.
Only one slot is occupied. Slot 1 - Any Cisco VIC card or third-party adapter or Slot 2 - Any Cisco VIC card or third-party adapter	Cisco UCS Manager detects whichever slot is occupied.
Both slot 4 and slot 5 are occupied. Slot 4 - Cisco VIC 1455 Slot 5 - Any Cisco VIC card or third-party adapter	Cisco UCS Manager detects only slot 5.
Both slot 4 and slot 5 are occupied. Slot 4 - Any Cisco VIC card or third-party adapter except Cisco VIC 1455 Slot 5 - Cisco VIC 1455	Cisco UCS Manager detects both the slots.
Both slot 4 and slot 5 are occupied. Slot 4 - Any Cisco VIC card or third-party adapter except Cisco VIC 1455 Slot 5 - Any Cisco VIC card or third-party adapter	Cisco UCS Manager detects both the slots.
Only one slot is occupied. Slot 4 - Any Cisco VIC card or third-party adapter or Slot 5 - Any Cisco VIC card or third-party adapter	Cisco UCS Manager detects whichever slot is occupied.

Management Connection Policy and Connection Mode

When establishing physical connections for the C-Series Rack-Mount Server in the Cisco UCS Domain, you must specify the connection mode and management policy in Cisco UCS Manager GUI or Cisco UCS Manager CLI. The management policy is global to all connected C-Series Rack-Mount Servers. The connection mode determines the rack server discovery in Cisco UCS Manager.

You can specify either one of the following connection policies for the rack servers:

- **Auto Acknowledged**: This is the recommended and default connection mode for the C-Series Rack-Mount Server. If the connection mode is auto-acknowledged, immediately after establishing the physical connection, Cisco UCS Manager discovers the rack server and starts managing the server based on the specified management policy.

- **User Acknowledged**: If the connection mode is user-acknowledged, after establishing the physical connection, you must manually acknowledge the connection and specify the connection mode in the Cisco UCS Manager GUI or Cisco UCS Manager CLI to begin the discovery. Cisco UCS Manager does not begin the C-Series Rack-Mount Server discovery until you specify the connection mode. See Manually Acknowledging Connection Mode - GUI, on page 20 or Manually Acknowledging Connection Mode - CLI, on page 21 for detailed procedure.

Note   When rack servers are discovered and are managed by Cisco UCS Manager, if you want to change the existing connection mode for one C-Series Rack-Mount Server, you have to decommission the server, re-commission it and specify the new connection mode. Only then Cisco UCS Manager can discover the server in the new connection mode.

Connecting the C-Series Server with Cisco UCS Domain in Cluster Setup

Before you begin

Important   Make sure the server Cisco IMC is set to factory default settings to integrate with Cisco UCS Manager.

- Make sure the FI ports are configured as server ports. If they are not, reconfigure the ports as server ports using the Cisco UCS Manager GUI.

- Before you connect the server, make sure the Cisco UCS VIC is installed in the correct slot for integration with Cisco UCS Manager. If the card is not installed in the correct slot, you cannot enable the direct connect management for the server.

Step 1   Install the server in the rack. See the *Install and Upgrade Guide* for the server that you are using. The install guides are available at the following url: Install and Upgrade Guides.

Step 2   Configure the server ports on the FI.

Step 3   Connect the paths from Cisco UCS VIC adapter to the server ports on the FIs.

a)   Connect one supported SFP cable between the server and one port on FI A. You can use any port on FI A, but the port must be enabled for server traffic.

Make sure to connect one cable from the VIC to the FI for one card. You cannot connect both ports in the same FI.

b) Connect one supported SFP cable between the server and one port on FI B. You can use any port on FI B, but the port must be enabled for server traffic.

Note
- Do not mix SFP types on an uplink. If you do, you will get `Discovery Failed` errors.

- For information on the C-Series integration network topology and cable connections, see the Network Topology and Supported Cables, on page 8 section.

Step 4 Attach a power cord to each power supply in your server, and then attach the power cord to a grounded AC power outlet.

Server discovery begins when power is applied.

Physical Connectivity Illustrations for Direct Connect Mode Cluster Setup

The following images shows a sample of direct connect mode physical connectivity for C-Series Rack-Mount Server with Cisco UCS Domain, Cisco UCS Manager, release 3.1 or later. This image shows the cabling configuration for Cisco UCS Manager integration with a C-Series Rack-Mount Server. The paths shown in gold carry both management traffic and data traffic.

Figure 8: Direct Connect Cabling Configuration
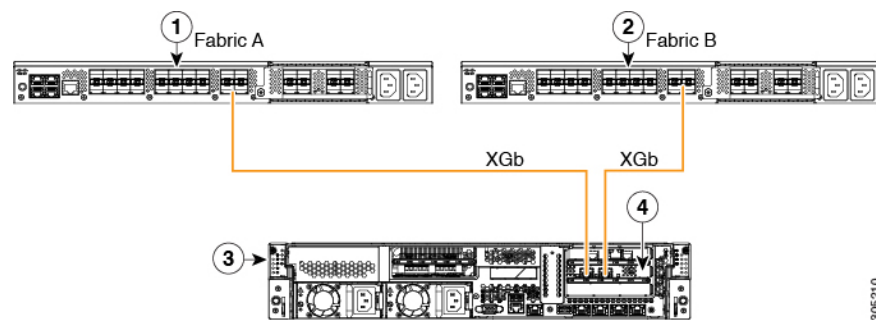
Cisco IMC on the C-Series Rack-Mount Server uses the first adapter for management and data connectivity and a second adapter only for data connectivity. Every virtual interface on the rack server needs to be connected to both Fabric Interconnect adapters. Different configurations require specific setup. For detailed instructions, use the information provided in the section *Physical Connectivity Illustrations for Direct Connect Mode Cluster Setup* in the appropriate C-Series Integration Guide.

This image shows the cabling configuration for Cisco UCS Manager integration on C-Series Rack-Mount Server with dual Cisco VIC adapters. The first adapter can be configured as management only and the second adapter can be configured as data traffic only. The gold color path carries management and the red color path carries data traffic.

Different servers require different slot locations for the management. Consult the appropriate C-Series Rack Server spec sheet to locate the slot that has Network Communications Services Interface protocol support (NCSI) and use as the management.

Figure 9: Direct Connect Cabling Configuration for Dual Adapter
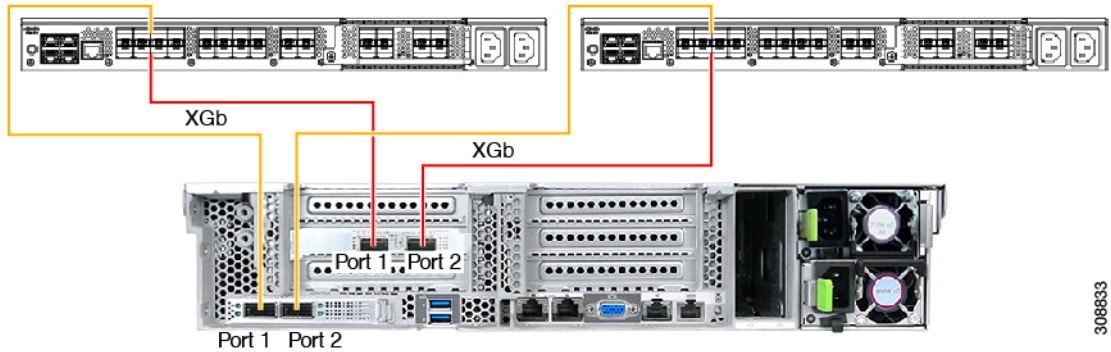
The images shown below are with Cisco UCS VIC 1455. The port connections remain same for Cisco UCS VIC 1457.

Figure 10: Direct Connect Cabling Configuration with Cisco VIC 1455 (4-Port Linking)

Figure 11: Direct Connect Cabling Configuration with Cisco VIC 1455 (2-Port Linking)
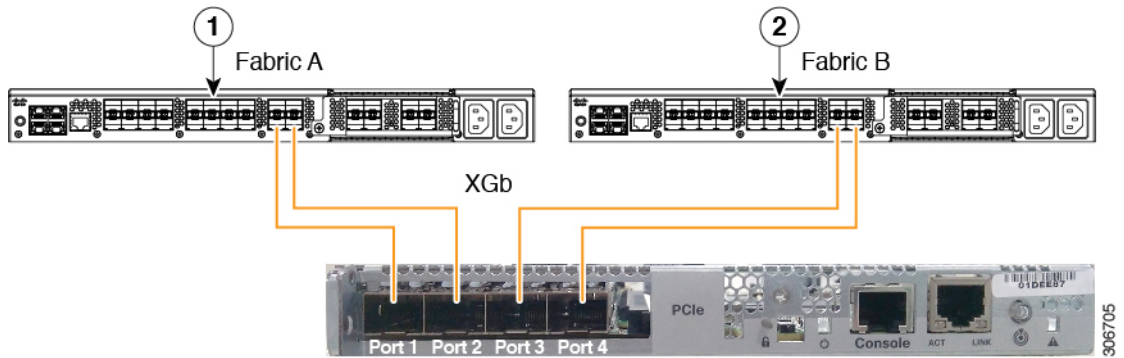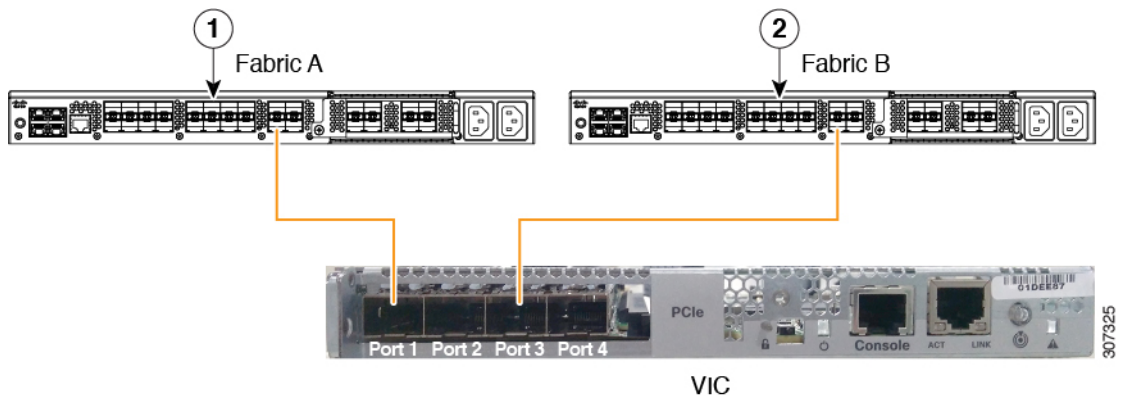

Note Ports 1 and 3 are used because the connections between ports 1 and 2 (also 3 and 4) form an internal port-channel.

⚠

Caution   Do not connect port 1 to Fabric Interconnect A and port 2 to Fabric Interconnect B. Use ports 1 and 3 only. Using ports 1 and 2 results in discovery and configuration failures.

XGb represents a 40 Gigabit Ethernet connection or a 10 Gigabit Ethernet connection. For the 10 Gigabit Ethernet, the following cables are used:

- 4x10 Breakout Small Form-Factor Pluggable (SFP) cables

- 4x10 Active Optical (OAC) cables

- 10G Small Form-Factor Pluggable (SFP) cable that uses the Qualified Security Assessor (QSA) module

1	Cisco UCS 6454 Fabric Interconnect or Cisco UCS 6200 Series or 6300 FI (Fabric A)	3	C-Series Rack-Mount Server
2	Cisco UCS 6454 Fabric Interconnect or Cisco UCS 6200 Series or 6300 FI (Fabric B)	4	Cisco UCS VIC in supported PCIe slot

Connecting the C-Series Server with UCS Domain in Non-Cluster Setup

To connect the C-Series server with a UCS domain in a non-cluster setup, complete the same steps described in . Instead of using two FIs to connect two cables as in cluster setup, you need to connect only one FI and one cable to the adapter.

Figure 12: Physical Connectivity Illustration Example for Direct Connect Mode Non-Cluster Setup

The following image show the cabling configuration for Cisco UCS Manager integration with the server. The path shown in gold carry both management and data traffic.
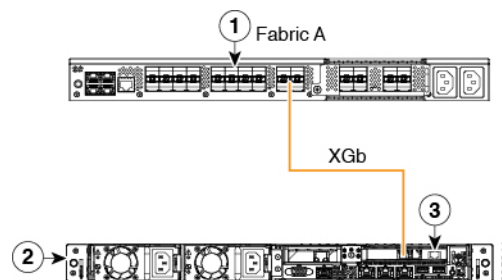
✎

Note   XGb represents a 40 Gigabit Ethernet connection or a 10 Gigabit Ethernet connection or a 25 Gigabit Ethernet connection. For the 10 Gigabit Ethernet, the following cables are used:

- 4x10 Breakout Small Form-Factor Pluggable (SFP) cables

- 4x10 Active Optical (OAC) cables

- 10G Small Form-Factor Pluggable (SFP) cable that uses the Qualified Security Assessor (QSA) module

1		2	C-Series Rack-Mount Server
Cisco UCS 6454 Fabric Interconnect or Cisco UCS 6200 Series or 6300 FI (Fabric A)		3	Cisco VIC in supported PCIe slot.

Physical Connectivity Illustrations for Direct Connect Mode Non-Cluster Setup

The following images shows a sample of direct connect mode physical connectivity for C-Series Rack-Mount Server with Cisco UCS Domain, Cisco UCS Manager, release 3.1 or later. This image shows the cabling configuration for Cisco UCS Manager integration with a C-Series Rack-Mount Server. The paths shown in gold carry both management traffic and data traffic.

The images shown below are with Cisco UCS VIC 1455. The port connections remain same for Cisco UCS VIC 1457.

Figure 13: Direct Connect Cabling Configuration with Cisco VIC 1455/1457 (Single Cable Configuration)
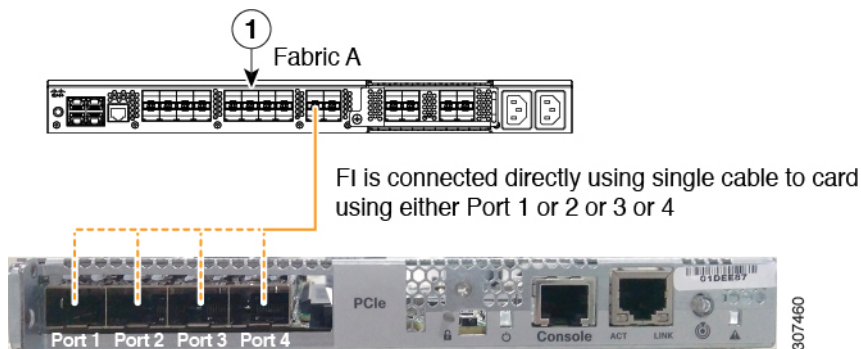
Figure 14: Direct Connect Cabling Configuration with Cisco VIC 1455/1457 (Dual Cable Configuration)
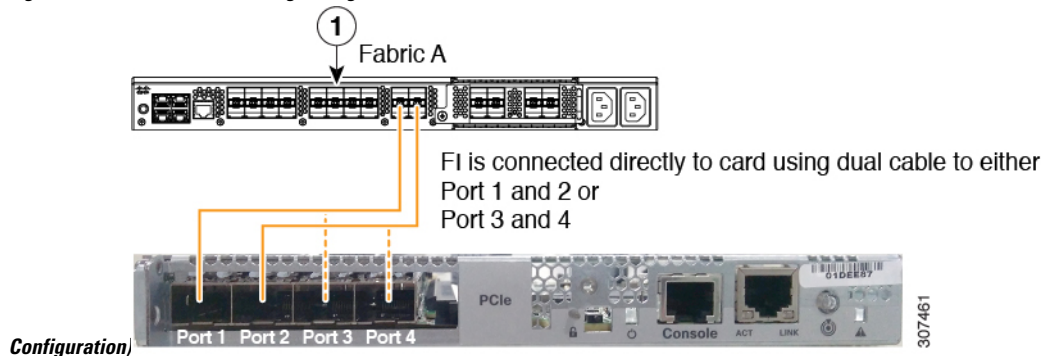
XGb represents a 40 Gigabit Ethernet connection or a 10 Gigabit Ethernet connection. For the 10 Gigabit Ethernet, the following cables are used:

- 4x10 Breakout Small Form-Factor Pluggable (SFP) cables
- 4x10 Active Optical (OAC) cables
- 10G Small Form-Factor Pluggable (SFP) cable that uses the Qualified Security Assessor (QSA) module

Migrating C-Series Servers from SingleConnect to Direct Connect Mode

Before performing the migration procedure, on the Cisco UCS Manager GUI, Global Policies page, make sure the **Rack Discovery Policy** and **Rack Management Connection Policies** are set to the defaults such as, **Immediate** and **Auto Acknowledge**. This will make sure after connecting the server directly to the FI, the server is discovered immediately and Cisco UCS Manager starts managing the server without waiting for your interaction.

⚠️

Caution   Migrating from SingleConnect FEX connectivity to direct connect is a disruptive process. Make sure you do this during a scheduled outage window. You might need 15 to 20 minutes to complete this procedure.

Step 1   Configure the server ports on the FI.

Step 2   Disconnect the cables from the FEX and connect them to the configured server ports on Fabric Interconnect.

Step 3   On the Cisco UCS Manager GUI, right click the server, from the pop-up menu, select **Recover Server** or **Server Maintenance**.

Step 4   Click **Re-acknowledge** and select **OK**.

This will cause server reboot.

After the server reboots, you can resume normal operations.

Migrating C-Series Servers from Dual-wire Management to Direct Connect Mode

Before performing the migration procedure, on the Cisco UCS Manager GUI, Global Policies page, make sure the **Rack Discovery Policy** and **Rack Management Connection Policies** are set to the defaults such as, **Immediate** and **Auto Acknowledge**. This will make sure after connecting the server directly to the FI, the server is discovered immediately and Cisco UCS Manager starts managing the server without waiting for your interaction.

⚠️

Caution   • Migrating from Dual-wire FEX connectivity to direct connect is a disruptive process. Make sure you do this during a scheduled outage window. You might need 15 to 20 minutes to complete this procedure.

• You must decommission the server before performing the migration.

To enable direct connect mode to a server connected in dual-wire management mode, you will need to change the adapter. Changing the adapter may impact the PCIe numbering on a bare metal Windows system. If you had Adapters listed in the OS, after you change them they will be Adapter 3 and 4. If you are using static

addressing, you will need to remove the previous adapters from the server. For more information, see http://support.microsoft.com/kb/269155

Step 1 Configure the server ports on the FI.

Step 2 Decommission the server.

Step 3 If you are not using Cisco UCS VIC 1225, Cisco UCS VIC 1227, Cisco UCS VIC 1385, or Cisco UCS VIC 1455, change the Cisco UCS VIC physically in the server:

a) Unplug power cable, management LOMs and SFP twinax connections from the back of the server.

b) Slide the server out of the rack and remove the top cover.

c) Remove the PCIe riser card from the slot and remove the existing Adapter and then install Cisco UCS VIC 1225.

d) Reinstate the PCIe riser card into the slot, place the top cover back on the server and push the server back into the rack.

e) (Optional)If you would no longer require the FEX to connect any server in dual wire mode, unplug the FEX from Cisco UCS Manager, and power and remove the FEX from the rack server.

Step 4 Connect the SFP twinax cables from the Cisco VIC port to the FI ports.

Step 5 Reconnect the power cable to the server.

CIMC has standby, so you need not power the server.

What to do next

Recommission the server from Cisco UCS Manager GUI. After the recommission is complete, the server is ready for operation and you can apply service profiles to the server.

Managing the Rack-Mount Server in Cisco UCS Manager after Integration

You can manage and monitor all rack-mount servers that have been integrated with a Cisco UCS domain through Cisco UCS Manager. After the integration, you can perform all rack-mount server management tasks only through the service profiles from Cisco UCS Manager GUI or Cisco UCS Manager CLI. The C-Series Rack-Mount Server Cisco IMC is not accessible when you start managing the server with Cisco UCS Manager.

Cisco UCS Manager provides information, errors, and faults for each rack-mount server that was discovered.

For more information on managing C-Series Rack-Mount Servers from Cisco UCS Manager, see the chapter on Managing Rack-Mount Servers in your release specific Cisco UCS Manager Configuration Guide.

Reverting a Server From Cisco UCS Domain Mode to Standalone Mode

When you manage a Cisco UCS C-Series server with Cisco UCS Manager software, a UCS Manager service profile is associated with the server. If you want to revert a C-Series server to standalone mode (so that it can be managed by Cisco IMC software), you must do the following actions in UCS Manager:

Step 1	Disassociate the UCS Manager service profile from the server.
Step 2	Remove the connections from the adapter.
Step 3	Manually power on the server.
Step 4	Connect the front panel KVM connection.
Step 5	Press **F8** during the boot up.
Step 6	Reset CIMC to factory defaults or stand-alone mode.

Caution If you do not disassociate the service profile from the server, MAC and WWN numbers assigned by UCS Manager might be kept by the server. This can cause numbering duplication and conflicts with other servers that are managed by UCS Manager. Also, if you revert a server to standalone mode without disassociating its service profile, any LSI RAID controller will not show as a bootable device in the standalone server, preventing local booting.

Special Considerations for Integrated Servers

When you connect the C-Series servers in Cisco UCS system, make sure to review the following information:

- Single Link Port Channel between VIC 1455 or VIC 1457 Adapters and UCS 6300 Fabric Interconnects, on page 53

Single Link Port Channel between VIC 1455 or VIC 1457 Adapters and UCS 6300 Fabric Interconnects

Cisco UCS Manager Release 4.0(1a) and later support only single link port channel between VIC 1455 or 1457 adapters on direct-connect rack-servers to UCS 6300 Series Fabric Interconnects.

Do not add a second port channel link between VIC 1455 or 1457 adapters and UCS 6300 Series Fabric Interconnects.

C H A P T E R   4

Configuring Dual-Wire Management

This chapter includes the following sections:

Dual-Wire Management

Cisco UCS Manager supports the existing rack server integration and management option through Shared LOM, using two separate cables for data traffic and management traffic. The prerequisites for integration with Cisco UCS Manager are built into the C-Series servers. Make sure you have correct server firmware for integration with Cisco UCS Manager. If not, upgrade your server firmware before integrating the server with Cisco UCS Manager. See Cisco UCS Host Upgrade Utility, User Guide.

Note   Cisco UCS C125 M5 Server does not support dual-wire management.

Requirements for Dual-wire Integration with Cisco UCS Manager

Requirements for Cluster Setup

The following are the requirements for C-series server integration with Cisco UCS Manager in cluster setup:

- A Cisco UCS system running Cisco UCS Manager.

- An adapter that supports dual-wire integration.

| **Note** | Dual-Wire Management is supported only with Cisco VIC adapters and not with third-party adapters. Refer Supported C-Series Servers and Adapter Cards, on page 7 for complete list of cards. |

• Any of the Cisco UCS C-Series servers and corresponding Cisco UCS Manager release version:

| **Note** | • Cisco UCS VIC 1225 or Cisco VIC 1227 or Cisco VIC 1225T or Cisco VIC 1227T or Cisco VIC 1385 or Cisco VIC 1387 MLOM also support dual-wire management. If you are using Cisco UCS VIC for dual-wire management, make sure the card is inserted in one of the slots as described in the following table: |

Table 17: Cisco UCS VIC Slot for Dual-wire Integration

Server	PCIe Slot
Cisco UCS C22 M3 Server	1
Cisco UCS C24 M3 Server	1
Cisco UCS C220 M3 Server	1
Cisco UCS C240 M3 Server	2, 5
Cisco UCS C420 M3 Server	1, 4, 7
Cisco UCS C220 M4 Server	Any x16 slot
Cisco UCS C240 M4 Server	Any x16 slot
Cisco UCS C460 M4 Server	2, 3, 4, 5, 7, 8, 9, 10 **Note** Slot 1 and 6 do not support installing Cisco VIC 1225.
Cisco UCS C220 M5 Server	Any slot
Cisco UCS C240 M5 Server	Any slot
Cisco UCS C480 M5 Server	1 to 8
Cisco UCS C480 M5 ML Server	11, 12, 13, 14

• Two Cisco UCS 6454 Fabric Interconnects or Cisco UCS 6200 Series or 6300 Series FIs. The switch ports that carry server traffic must be enabled as server ports.

• Two of the following FEX types can be used:

• Cisco Nexus 2232PP

• Cisco Nexus 2232TM-E

• Cisco Nexus 2348UPQ

Note	• You can connect the Cisco Nexus 2232PP or 2232TM-E FEXs to the 6200 series FIs, and Cisco Nexus 2232PP or 2232 TM-E or 2348UPQ to the 6300 series FIs.
	• You must plug a power cord into each of the two power supplies in the FEX. If a power supply is not connected to power, you might see "Major" faults reported during power-on self test (POST). For example, `Power supply 1 in fex 6 power: error.` You can clear these errors by connecting the missing power cord to the FEX power supply.

• Two RJ-45 Ethernet cables. The RJ-45 Ethernet cables are used to connect the management traffic paths.

• Two 1000BASE-T SFP transceivers (GLC-T)

• Four 10-Gb Small Form-Factor Pluggable (SFP) cables.

Note	• At least one cable to connect each FEX with corresponding FI.
	• At least two cables to link the data traffic path between server and FEX.
	• At least four cables for uplinks from the FEX to FIs. You can either use 10 Gb twinaxial cable or one of the following SFP type cables:
	• SFP - 10GE-SR
	• FET - 10GE

Important	Do not mix SFP types on an uplink. If you mix the SFP types on an uplink, a `Discovery Failed` error appears.

Requirement for Non-cluster Setup

If you integrate the server in a non-cluster setup along with the Cisco UCS Manager and C-series rack mount server, you need the following components :

• One Cisco UCS 6454 Fabric Interconnect or Cisco UCS 6200 Series or 6300 Series FI. The switch ports where Fabric Extenders (FEX) are connected must be marked as server ports.

• One of the following FEX types can be used:

    • Cisco Nexus 2232PP

> • Cisco Nexus 2232TM-E
>
> • Cisco Nexus 2348UPQ

• One RJ-45 Ethernet cable. The RJ-45 Ethernet cable connects the management traffic path.

• One 1000BASE-T SFP transceiver (GLC-T)

• Three 10-Gb SFP cables.

Note

• If you are using 6200 Series FI, a minimum of four SFP cables are required.

• Two cables for linking the data traffic path between server and FEX.

• Four cables for uplinks from FEX to fabric interconnects. Each of these four cables used for uplink from FEX to FIs can either use supported 10-gb twinaxial cable or one of the following SFP type cables:

> • SFP - 10GE-SR
>
> • FET - 10GE

Connecting the C-Series Server with Cisco UCS Domain in Cluster Setup

To view illustrations on the connectivity for each C-Series Rack-Mount Server, see Physical Connectivity Illustrations for Cluster Setup, on page 59.

Important Make sure the server Cisco IMC is set to factory default settings to integrate with Cisco UCS Manager.

Step 1 Install the server in the rack. See the *Install and Upgrade Guide* for the server that you are using. The install guides are available at the following url: Install and Upgrade Guides.

Step 2 To connect the management traffic paths, do the following:

a) Insert one GLC-T transceiver into a port of the FEX that is connected to Fabric A. You can use any port on the FEX.
b) Insert one GLC-T transceiver into a port of the FEX that is connected to Fabric B. You can use any port on the FEX.
c) Connect an RJ-45 Ethernet cable between a 1-Gb port on the rear panel of the server and the transceiver that you inserted into the FEX in Fabric A.
d) Connect an RJ-45 Ethernet cable between a 1-Gb port on the rear panel of the server and the transceiver that you inserted into the FEX in Fabric B.

Step 3 To connect the data traffic paths, do the following:

a) Connect a supported SFP cable between the adapter card in the server and a port on a FEX in Fabric A. You can use any port on the FEX.

b) Connect a supported SFP cable between the adapter card in the server and a port on a FEX in Fabric B. You can use any port on the FEX.

Step 4 Connect the paths from the FEXes to the FIs. These paths carry both data and management traffic.

a) Connect two a supported SFP cables between FEX A and two ports on FI A. You can use any ports on FI A, but the ports must be enabled for server traffic.

b) Connect two a supported SFP cables between FEX B and two ports on FI B. You can use any ports on FI B, but the ports must be enabled for server traffic.

- For information on the C-Series integration network topology and cable connections, see the Network Topology and Supported Cables, on page 8 section.

- On the FEX, you can use only the right block of eight ports for uplinks.

- The maximum number of uplinks is eight. Based on the Cisco UCS Manager FI discovery policy the port cabling requirement between the FEX and FI vary.

- Do not mix SFP types on an uplink. If you do, you will see `Discovery Failed` errors.

Step 5 Attach a power cord to each power supply in your server, and then attach the power cord to a grounded AC power outlet.

Step 6 Reboot the server.

Physical Connectivity Illustrations for Cluster Setup

The following image shows a samples of the physical connectivity for C-Series Rack-Mount Server with Cisco UCS Domain, Cisco UCS Manager.

This image shows the cabling configuration for Cisco UCS Manager integration with a C-Series Rack-Mount Server. The paths shown in blue carry management traffic. The paths shown in gold carry data traffic.

Figure 15: Cluster Setup Cabling Configuration

Note   XGb represents a 40 Gigabit Ethernet connection or a 10 Gigabit Ethernet connection. For the 10 Gigabit Ethernet, the following cables are used:

- 4x10 Breakout Small Form-Factor Pluggable (SFP) cables

- 4x10 Active Optical (OAC) cables

- 10G Small Form-Factor Pluggable (SFP) cable that uses the Qualified Security Assessor (QSA) module

1	Cisco UCS 6200 Series or 6300 FI (Fabric A)	6	Cisco Nexus 2232PP or Cisco Nexus 2232TM-E or Cisco Nexus 2348UPQ FEX (Fabric B)
2	GLC-T transceiver in FEX port (Fabric A)	7	C-Series Rack-Mount Server
3	Cisco Nexus 2232PP or Cisco Nexus 2232TM-E or Cisco Nexus 2348UPQ FEX (Fabric A)	8	1-Gb Ethernet LOM ports
4	Cisco UCS 6200 Series or 6300 FI (Fabric B)	9	10-Gb Adapter card in supported PCIe or MLOM slot.
5	GLC-T transceiver in FEX port (Fabric B)		

Connecting the C-Series Server with UCS Domain in Non-cluster Setup

To connect the C-Series server with the UCS domain, complete the same steps described in Connecting the C-Series Server with UCS Domain in Non-cluster Setup, on page 33. Instead of connecting two FIs and two FEXes, you will connect only one FI and one FEX.

Figure 16: Dual-wire Non-Cluster Setup Example

The following illustration is an example of non-cluster setup in dual-wire management.

Note   XGb represents a 40 Gigabit Ethernet connection or a 10 Gigabit Ethernet connection. For the 10 Gigabit Ethernet, the following cables are used:

- 4x10 Breakout Small Form-Factor Pluggable (SFP) cables

- 4x10 Active Optical (OAC) cables

- 10G Small Form-Factor Pluggable (SFP) cable that uses the Qualified Security Assessor (QSA) module
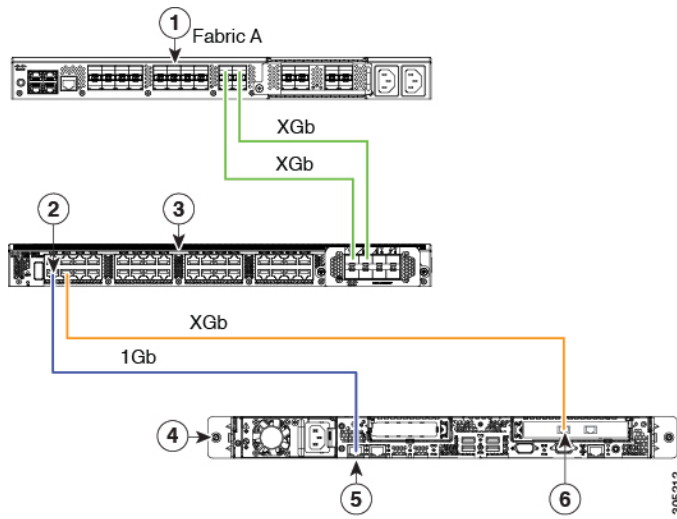
1	Cisco UCS 6200 Series or 6300 FI (Fabric A)	4	Cisco UCS C-series server
2	GLC-T transceiver in FEX port (Fabric A)	5	1-Gb Ethernet LOM ports
3	Cisco Nexus 2232PP or Cisco Nexus 2232TM-E or Cisco Nexus 2348UPQ FEX (Fabric A)	6	Cisco UCS VIC adapter in supported PCIe slot

Managing the Rack-Mount Server in Cisco UCS Manager after Integration

You can manage and monitor all rack-mount servers that have been integrated with a Cisco UCS domain through Cisco UCS Manager. After the integration, you can perform all rack-mount server management tasks only through the service profiles from Cisco UCS Manager GUI or Cisco UCS Manager CLI. The C-Series Rack-Mount Server Cisco IMC is not accessible when you start managing the server with Cisco UCS Manager.

Cisco UCS Manager provides information, errors, and faults for each rack-mount server that was discovered.

For more information on managing C-Series Rack-Mount Servers from Cisco UCS Manager, see the chapter on Managing Rack-Mount Servers in your release specific Cisco UCS Manager Configuration Guide.

Reverting a Server From Cisco UCS Domain Mode to Standalone Mode

When you manage a Cisco UCS C-Series server with Cisco UCS Manager software, a UCS Manager service profile is associated with the server. If you want to revert a C-Series server to standalone mode (so that it can be managed by Cisco IMC software), you must do the following actions in UCS Manager:

Step 1   Disassociate the UCS Manager service profile from the server.

Step 2   Remove the connections from the adapter.

Step 3   Manually power on the server.

Step 4   Connect the front panel KVM connection.

Step 5   Press **F8** during the boot up.

Step 6   Reset CIMC to factory defaults or stand-alone mode.

Caution   If you do not disassociate the service profile from the server, MAC and WWN numbers assigned by UCS Manager might be kept by the server. This can cause numbering duplication and conflicts with other servers that are managed by UCS Manager. Also, if you revert a server to standalone mode without disassociating its service profile, any LSI RAID controller will not show as a bootable device in the standalone server, preventing local booting.

Special Considerations for Integrated Servers

When you connect the C-Series servers in Cisco UCS system, make sure to review the following information:

Supported FEX-to-FI Uplink Cable SFP Types

The C-Series UCSM integration requires six 10-Gb SFP cables for the following purposes:

- Linking the data traffic paths between server and FEX - 2 cables

- Uplinks from the FEXes to the FIs - 4 cables

  Each of the four uplinks from the FEXes to the FIs can use either a Cisco 10-Gb twinax cable, or one of the following SFP types:

  - SFP-10GE-SR

  - FET-10GE

⚠

Caution   Do not mix SFP types on an uplink. If you mix SFP types on an uplink, you will get **Discovery failed** errors.

Integrated Server Power States vs Service Profile Power States

Using the power button or Cisco UCS Manager, if you set the desired power status to Down for an integrated C-Series server's associated service profile, when you try to rest the server to the desired power state, the server becomes out of sync with the actual power state. This may cause the server to shut down unexpectedly at a later time.

Use the Boot Server action in Cisco UCS Manager to safely reboot a server from a power-down state.

The following table shows how the physical server power states can differ from the Cisco UCS Manager service profile power states when the power button on the server is used.

Table 18: Difference in Server Power State and Service Profile Power State

Initial Service Profile Power State	Server Initial Power State	Action From Physical Power Button	Actual Server Power State After the Action	Power State Under UCSM Equipment Tab	Desired Power State Under Service Profile
Down	Off	Push button to turn on	On	On	Down
Up	On	Push button to turn off	Off	Off	Up

Cautions and Limitations for Adapter Cards

Make sure to consider the following when using the adapter cards in Cisco UCS C-Series server integration with Cisco UCS Manager:

- Cisco UCS Manager supports only four UCS managed adapter cards in the integrated Cisco UCS C-series servers, even if the server has more than four PCI slots. If you have more than four adapter cards in the server, after integration, the rack server discovery fails in Cisco UCS Manager.

- When you add, remove, or replace an adapter card in a UCS-managed server, you must first decommission the server in Cisco UCS Manager. After the operation, you must then recommission the server.

- If you install more than one adapter in the server each adapter in a cluster UCS Manager environment, each adapter must be connected to both path A and B. Attempting to connect both ports on an adapter to a single path results in a discovery failure due to an unsupported configuration. If you attempt to connect only one link from each adapter to the fabric, the server may reboot during a card failure to rediscover the data pathways. Neither of these scenarios are supported with connectivity options.

FEX Considerations

Re-acknowledge Attached Servers After a 22482232PP FEX Is Decommissioned/Recommissioned

Whenever you decommission or recommission a Cisco UCS 22482232PP FEX, all the servers that are connected to that FEX must be re-acknowledged in UCS Manager.

CHAPTER 5

Required Items for Upgrade

The following are the minimum Server CIMC version and Cisco UCS Manager version requirements for upgrade for C-Series server integration with Cisco UCS Manager:

Server	CIMC	BIOS	UCS Manager
Cisco UCS C22 M3 Server	1.4(6)	1.4.7a	2.1(2a)
Cisco UCS C24 M3 Server	1.4(6)	1.4.7a	2.1(2a)
Cisco UCS C220 M3 Server	1.4(6)	1.4.7a	2.1(2a)
Cisco UCS C220 M4 Server (requires 2.2.3 or above)	2.0(3d)	2.0.3	2.2(3a)
Cisco UCS C240 M3 Server	1.4(6)	1.4.7a	2.1(2a)
Cisco UCS C240 M4 Server (requires 2.2.3 or above)	2.0(3d)	2.0.3	2.2(3a)
Cisco UCS C420 M3 Server	1.4(7)	1.4.8	2.1(2a)
Cisco UCS C460 M4 Server	1.5(7a)	1.5.7	2.2(2a)
Cisco UCS C220 M5 Server	3.1.1d	3.1.1i.0	3.2(1d)
Cisco UCS C480 M5 Server	3.1(2b)	3.1.2a.0	3.2(2b)
Cisco UCS C125 M5 Server	4.0(1a)	4.0(1a)	4.0(1a)

Upgrading the C-Series Server Firmware

If your server CIMC release version does not meet the requirement for integration with Cisco UCS Manager, make sure to upgrade the server firmware before connecting the server with Cisco UCS domain. For more information on upgrading the C-Series server firmware, see the host upgrade utility quick start guide for your release http://www.cisco.com/en/US/products/ps10493/products_user_guide_list.html

☞

Important   When you upgrade the C-Series server firmware for Cisco UCS C220 M4 or C240 M4 servers to Cisco UCS Manager 2.2(6c), you will see the following critical alarm:

```
Board controller upgraded, manual a/c power cycle required on server x
```

This alarm, documented in CSCuv45173, is incorrectly categorized as a critical alarm. It does not impact the functionality of the server, and can be ignored.

To avoid seeing this alarm, you can do one of the following:

- Create a custom host firmware package in Cisco UCS Manager to exclude the board controller firmware from the Cisco UCS Manager 2.2(6c) update and keep the older version.

- Upgrade Cisco UCS Manager infrastructure (A Bundle) to Release 2.2(6c) and continue to run the host firmware (C Bundle) on any Cisco UCS C220 M4 or C240 M4 server at a lower version, according to the mixed firmware support matrix in Table 2 of the *Release Notes for Cisco UCS Manager, Release 2.2*.

Step 1   Download the HUU ISO file:
   a) Navigate to the following URL: http://www.cisco.com/cisco/software/navigator.html.
   b) In the middle column, click **Servers – Unified Computing**.
   c) In the right-hand column, click **Cisco UCS C-Series Rack-Mount Standalone Server Software**.
   d) Choose the name of your model of server in the right column.
   e) Click **Unified Computing System (UCS) Server Firmware**.
   f) Choose the release number.
   g) Click **Download Now** to download the ucs-*server platform*-huu-*version_number*.iso file.
   h) Verify the information on the next page, and click **Proceed With Download**.
   i) Continue through the subsequent screens to accept the license agreement and browse to a location where you want to save the file.

Step 2   If you want to prepare the ISO for a local upgrade, complete this step; Otherwise, go to Step 3.
   a) Burn the ISO image onto a writable disk (CD).
   b) Connect a VGA monitor and USB keyboard to the Cisco C-Series server.
   c) Insert the disk into the USB DVD drive of the Cisco C-Series server.
   d) Go to Step 4.

Step 3 Prepare the ISO for a remote upgrade using the **KVM Console**.

   a) Use a browser to connect to the Cisco IMC GUI software on the server that you are upgrading.

   b) in the address field of the browser, enter the Cisco IMC IP address for that server, and then enter your username and password.

   c) Click **Launch KVM Console** on the toolbar to launch the **KVM Console**.

   d) In the **KVM Console**, click the **Virtual Media**.

   e) Click **Add Image** and click the ucs-*server-name*-huu-*version_number*.iso file.

   f) In the **Client View** area, in the **Mapped** column, check the check box for the ISO file that you added and then wait for mapping to complete.

   g) After the ISO file appears as a mapped remote device, go to Step 4.

Step 4 Boot the server and press **F6** when prompted to open the **Boot Menu** screen.

Step 5 In the **Boot Menu** screen, choose the prepared ISO:

   • For a local upgrade, choose the physical or externally connected CD/DVD device and then press **Enter**.

   • For a remote upgrade, choose **Cisco vKVM-Mapped vDVD1.22,** and press **Enter**.

   The server boots from the selected device.

Step 6 After the HUU boots, Cisco End User License Agreement (EULA) appears, read the EULA and click:

   • **I Agree** to agree with the license agreement and proceed with the update.

   • **I Disagree** to cancel.

   After you accept the EULA, when the **Cisco Host Upgrade Utility** window appears with a list of all the components that are available for update.

Step 7 If you want to update all the listed components, click **Update all**.

Note	• If you are updating to 2.0 (x) from versions 1.5(1l) and before, or from version 1.5.3 both the active and the backup versions of Cisco IMC will be updated to 2.0(x).
	• During update the KVM connection will be lost, you have to reconnect to view the progress of the updates.

Step 8 If you want update specific components from the list, choose the components that you want to update.

Step 9 Click **Update**.

Note	• We recommend you update the firmware on all components using the **Update all** option, unless you want to specifically update the firmware of a component.
	• When you update the firmware of one of the following three components: BIOS, Cisco IMC, or CMC, we recommend that you also update the firmware of the other two components.
	• If you update the Cisco IMC firmware, click **Exit** and then **Ok** to activate the Cisco IMC firmware.
	• If you choose to update Cisco IMC and any other component with it and if you have not chosen BIOS, then on exit, you will be prompted to update the **Chassis Firmware**, click **Yes** in the confirmation box to update the chassis firmware.

   This initiates the update and the status of the update is displayed in the **Update Status** column. You can also view a more detailed log of a series of activities and statuses that are involved while updating the firmware in the **Execution Logs** section.

Step 10   If you want to update the firmware of the hard disk of a server, click **Update HDD Firmware**. A window displays a list of hard disk drives on the server that support new firmware. Hard disk drives that do not support firmware upgrades are not listed.

> **Important** Updating the firmware of the hard disk drive could result in data loss. Cisco recommends that you take a complete system backup prior to updating the firmware.

a) To update the firmware of all the hard disks, click **Update All**.

With this option, HDDs with the latest firmware installed are not updated.

b) To update a specific HDD, choose the HDD and click **Update**.

Step 11   Reboot the server.

Step 12   Reboot the server, and click **Last Update Verify** to verify if the update was successfully completed.

This action compares the previously updated firmware version for each component that was updated using the HUU with the current version of the firmware on the components and provides the status of the update.

Step 13   If you want to save the log files of the update status for later use, click **Save Logs**.

Log files that contain a detailed status of the update are saved to an external USB device that is connected to the server physically or through the KVM vMedia.

> **Note**   If an error occurs while updating the firmware, you are prompted to save the error log. Click **Save Logs** to save the log to an externally connected USB. This log can be used for identifying the cause of the error and troubleshooting.

Step 14   Click **Exit** to exit from the HUU.

> **Note**   • If you have updated the Cisco IMC and not the BIOS, when you click **Exit**, Cisco IMC gets activated and you lose connectivity to the Cisco IMC and KVM.
>
> • If you have selected LOM for update and you are on shared LOM mode, when you click **Exit**, you lose connectivity to the Cisco IMC and KVM.

What to do next

After upgrading the server to the compatible server release version, you must establish the physical connection for the server to make it a part of Cisco UCS domain. To connect the server to your Cisco UCS FEXes and FIs, see Connecting the C-Series Server with Cisco UCS Domain in Cluster Setup, on page 30 for SingleConnect or Connecting the C-Series Server with Cisco UCS Domain in Cluster Setup, on page 58 for dual-wire management.

Updating Cisco UCS VIC Firmware and uboot Image in Integrated Servers

If your Cisco UCS VIC firmware and uboot version is earlier than 2.0(2g), when you integrate the server with any Cisco UCS Manager version, the UCS Manager software will return discovery and associate/disassociate failures. To avoid such failures you can do the following:

• Before you integrate the server with UCS System, upgrade your VIC firmware and uboot image to the required minimum 2.0(2g) level in standalone mode.

• If your server is already integrated, you cannot upgrade the VIC uboot image in the UCS Manager software. You have to remove the server from the integration and then use Cisco Host Upgrade Utility to upgrade the card and server firmware.

The following procedure provides the process to upgrade when your server is integrated with Cisco UCS Manager.

Step 1 Decommission the server from UCS Manager.

Step 2 Disconnect the cables from the 1-Gb LOM ports on the server.

Step 3 Connect an Ethernet line from your LAN to one of the 1-Gb LOM ports (not to the dedicated management port, which is disabled in UCSM mode).

Step 4 Find the Host Upgrade Utility ISO file download for your server online and download it to a temporary location on your workstation:

a) See the following URL: **http://www.cisco.com/cisco/software/navigator.html**
b) Click **Unified Computing and Servers** in the middle column.
c) Click **Cisco UCS C-Series Rack-Mount Standalone Server Software** in the right-hand column.
d) Click your model of server in the right-hand column.
e) Click **Unified Computing System (UCS) Server Firmware**.
f) Click the release number that you are downloading.
g) Click **Download Now** to download the ISO file.
h) Verify the information on the next page, then click **Proceed With Download**.
i) Continue through the subsequent screens to accept the license agreement and then browse to a location where you will save the ISO file.

Step 5 Prepare the ISO. For local upgrade, on a local media and for remote upgrade, as a virtual device:

Option	Description
Local upgrade	Perform the steps before going to Step 3: a. Burn the ISO image onto a writable DVD. b. Connect a VGA monitor and USB keyboard to the Cisco C-Series server. c. Insert the DVD into the DVD drive of the Cisco C-Series server or an external DVD drive.
Remote upgrade	Perform the steps before going to Step 3: a. Use a browser to connect to the CIMC Manager software on the server that you are upgrading. b. Enter the CIMC IP address for that server in the address field of the browser, then enter your user name and password. c. Launch a KVM Console window (click the KVM keyboard icon). d. When the Virtual KVM Console window launches, select **Tools** > **Launch Virtual Media**. e. In the Virtual Media Session window, click **Add Image** and navigate to the utility ISO file and select it. Navigate to the location where you downloaded the ISO. The ISO image is displayed in the **Client View** area.

Option	Description
	f. In the **Virtual Media Session** window, select the check box in the **Mapped** column for the ISO file that you added, and then wait for mapping to complete. Observe the progress in the **Details** area. Now the ISO image is mapped to the remote device.

Step 6   Boot the server and press **F6** when prompted to open the Boot Menu screen.

Step 7   On the Boot Menu screen, select the device where you prepared the ISO in Step 2:

- If you are upgrading locally, select the physical CD/DVD device and then press **Enter** (for example, SATA5:TSSTcorp CDDVDW TS-L633C).

- If you are upgrading remotely, select **Cisco Virtual CD/DVD** and then press **Enter**.

The server is rebooted from the device you choose.

Step 8   A screen appears with the server BIOS and CIMC firmware versions. Answer the prompt, `Have you read the Cisco EULA (end user license agreement)?`

- Press **y** to accept the EULA and continue the update.

- Press **n** to read the EULA. The EULA is displayed and you are prompted to press **y** to continue the update, or **n** to cancel. If you press **n**, the server will reboot without updating.

- Press **q** to exit without updating. This selection reboots the server.

The **Host Upgrade Menu** screen displays.

Step 9   Select the option to **Update UCS VIC**. This will update the card firmware and uboot image to the required level.

Step 10   Select the option to **Update CIMC Firmware**. This will update the CIMC firmware.

Step 11   Verify the firmware levels on the next screen.

Step 12   Select the option to **Reboot the machine**.

Step 13   When you see the F8 prompt during rebooting, press F8 to open the CIMC Configuration Utility.

Step 14   In the CIMC Configuration Utility, select the option **CIMC Factory Default**, then press **F10** to save your changes.

Step 15   Return the cables from the FEXes to the 1-Gb LOM ports on the server.

Step 16   Recommission the server in UCS Manager.

Migrating the Configuration to Release 3.1 or Higher

When a Cisco UCS C-Series server is integrated with Cisco UCS Manager, discovered and associated with a service profile, you can migrate the configuration to a later version of Cisco UCS Manager.

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| **Note** | • This migration process causes server downtime.

• This procedure describes the scenario where management path from the server connects to the FEX and the data path connects directly to the FI.

| **Step 1** | Shut down the server OS.

| **Step 2** | In Cisco UCS Manager, decommission all C-series servers from the Cisco UCS domain.

| **Step 3** | **Unconfigure** all FI server ports that are connected to the 2248 FEX.

Issue an NX-OS **show fex** command to verify that the FEX is unconfigured. Wait until the command return does not list the FEX.

| **Step 4** | Disconnect the cable that connects the FEX and the FI.

| **Step 5** | In Cisco UCS Manager CLI, issue a **remove fex** *fex_ID* command to remove the FEX from the database.

| **Step 6** | In Cisco UCS Manager GUI, **Unconfigure** all FI server ports that are connected to the server's adapter card.

| **Step 7** | Disconnect the cable that connects the FI and the server's adapter card.

| **Step 8** | Disconnect the cable that connects the FEX and the server's LOM connector.

| **Step 9** | Upgrade your Cisco UCS Manager software to 3.1 or higher and the FI firmware to the corresponding level.

| **Step 10** | Repeat steps 3 through 9 on the second fabric interconnect in your configuration.

| **Step 11** | Connect the C-Series server directly to your network and upgrade the firmware by using the standalone CIMC utility.

a) Connect an Ethernet line from your LAN to one of the 1-Gb LOM ports on the server. Do not use the dedicated management port, this is disabled in the Cisco UCS Manager integrated mode.

b) Follow the instructions in Upgrading the C-Series Server Firmware, on page 66, then return to the next step in this procedure.

| **Step 12** | Physically replace the Nexus 2248 FEX with a Nexus 2232PP FEX in your rack.

| **Step 13** | Connect the cables as shown in the image. See Physical Connectivity Illustrations for Cluster Setup

In this new configuration, the data and management paths both connect from the server to the FEX. The paths between the FEX and the FI carry both data and management traffic.

| **Important** | Issuing an NX-OS **show fex** command to verify the FEX. Wait until the command return lists the new Nexus 2232PP FEX. The FEX will automatically upgrade to the corresponding FI firmware version.

| **Step 14** | After both fabric interconnects are cabled, from Cisco UCS Manager, re-commission the decommissioned C-series servers.

When the server is discovered in Cisco UCS Manager, the previously assigned service profile is automatically re-associated with the server.

CHAPTER 6

Troubleshooting

This chapter includes the following sections:

Replacing a Hardware Component on a Cisco UCS Manager Integrated C-Series Server

After you replace hardware with managed firmware component on a Cisco UCS Manager integrated C-Series server, the server may fail discovery. This could be due to a corrupt firmware on the hardware or incompatibility of the hardware component's firmware. Complete the following steps to ensure server does not fail discovery due to server firmware corruption or incompatibility after hardware replacement:

Step 1 Right-click **Server** -> **Server Maintenance** > **Decommission Server** to decommission the server.

Step 2 Disconnect the cables connecting the VICs to the FI (or FEX, if applicable).

Step 3 Remove the server from Cisco UCS Manager:

  a) Choose **Equipment** -> **Decommissioned** .

  b) Right-click on the server and click **Remove**.

Step 4 Reboot the server and perform a **CIMC Reset to Factory Defaults**.

Step 5 Connect a 1G cable to the MGMT port on the server and configure it for standalone access.

Step 6 Re-image all the server firmware to match the Cisco UCS Manager firmware bundle CIMC version with the server:

  a) Download the Host Upgrade Utility (HUU) from Cisco's software download site for the CIMC version that corresponds to the host firmware package applied to this server in the Cisco UCS Manager.

  b) Boot the server with the standalone KVM and run the HUU package.

  For information about steps to upgrade the firmware, refer to the Host Utility Upgrade User Guide that corresponds to the HUU CIMC version that was downloaded in the previous step.

Step 7 Reboot the server and perform a **CIMC Reset to Factory Defaults**.

Step 8 Unplug the power cables for 30 seconds.

Step 9 Reconnect the uplink cables.

Step 10 Connect the power cables and power on.

Step 11   Verify if the server displays on the Cisco UCS Manager, this may take a few minutes.

Step 12   After the server appears, re-acknowledge the server, if the rack server discovery policy is set to user acknowledge.

Changing Server Connectivity

Cisco UCS Manager maintains a mapping of which ports integrated rack servers are connected on.

When moving an integrated rack server or cabling of a chassis to a different Fabric Interconnect (FI) ports, the following procedure must be followed.

Step 1   Decommission the rack server that needs to be moved (or S3260 chassis, if applicable).

a)   In the **Navigation** pane, click **Equipment**.

b)   Expand **Equipment** > **Rack Mounts** > **Servers**.

c)   Choose the server that you want to decommission.

d)   In the **Work** pane, click the **General** tab.

e)   In the **Actions** area, click **Server Maintenance**.

f)   In the **Maintenance** dialog box, do the following:

    1.   Click **Decommission**.

    2.   Click **OK**.

The server is removed from the Cisco UCS configuration.

Step 2   Disconnect the cables connecting the VICs to the FIs (or FEX, if applicable).

Step 3   Connect the cables to the new ports on the FIs (or FEX, if applicable).

Step 4   Recommission the server (or S3260 chassis, if applicable).

a)   In the **Navigation** pane, click **Equipment**.

b)   In the **Work** pane, click the **Decommissioned** tab.

c)   On the row for each rack-mount server that you want to recommission, check the check box in the Recommission column.

d)   Click **Save Changes**.

Step 5   Verify if the server displays on the Cisco UCS Manager, this may take a few minutes.

Step 6   Monitor the progress of the server recommission and discovery on the FSM tab for the server.

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