Configuring SingleConnect

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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.

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 1225T, Cisco UCS VIC 1227, Cisco UCS MLOM 1227T, Cisco UCS VIC 1385 and Cisco UCS MLOM 1387 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.

Important

VIC 1225 refers specifically to UCSC-PCIE-CSC-02.

VIC 1227 refers specifically to UCSC-MLOM-CSC-02.

VIC 1225T refers specifically to UCSC-PCIE-C10T-02.

VIC 1227T MLOM refers specifically to UCSC-MLOM-C10T-02.

VIC 1385 refers specifically to UCSC-PCIE-C40Q-03.

VIC 1387 MLOM refers specifically to UCSC-MLOM-C40Q-03.

- The Cisco UCS VIC 1225, Cisco UCS VIC 1225T, Cisco UCS VIC 1227, Cisco UCS VIC 1227T, Cisco UCS VIC 1385 and Cisco UCS MLOM 1387 also support dual-wire management. If you have these VICs installed, you can select either SingleConnect or dual-wire management as your connection option. If you select dual-wire, make sure LOM is also connected.

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 3 or Manually Acknowledging Connection Mode - CLI, on page 3 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**.

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.

	Command or Action	Purpose
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 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 1: 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

Server	CIMC	BIOS	UCS Manager	UCS Manager (CIMC)	UCS Manager (BIOS)
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
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

Note For Cisco UCS C220 M4, C240 M4, C220 M5, and C240 M5servers you can use either MLOM or VIC to integrate with Cisco UCS Manager in SingleConnect or direct connect mode. 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.

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 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

Cisco UCS 1225, Cisco UCS 1225T, Cisco UCS 1227T , Cisco UCS 1227, Cisco UCS 1385, and Cisco UCS 1387 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 2: 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
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

Server	PCIe Slot
	with GPUs, then VICs can be placed in slots 1 and 4.
Cisco UCS C480 M5 Server	1, 2

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

- Two Cisco UCS 6200 Series or 6300 Series FIs. 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 FIs. 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

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

Before you begin

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 , Cisco UCS VIC 1225T, Cisco UCS VIC 1227T or Cisco UCS VIC 1227, Cisco UCS VIC 1385 or Cisco UCS VIC 1387 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 SFP 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 enabled for server traffic.

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 enabled for server traffic.

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

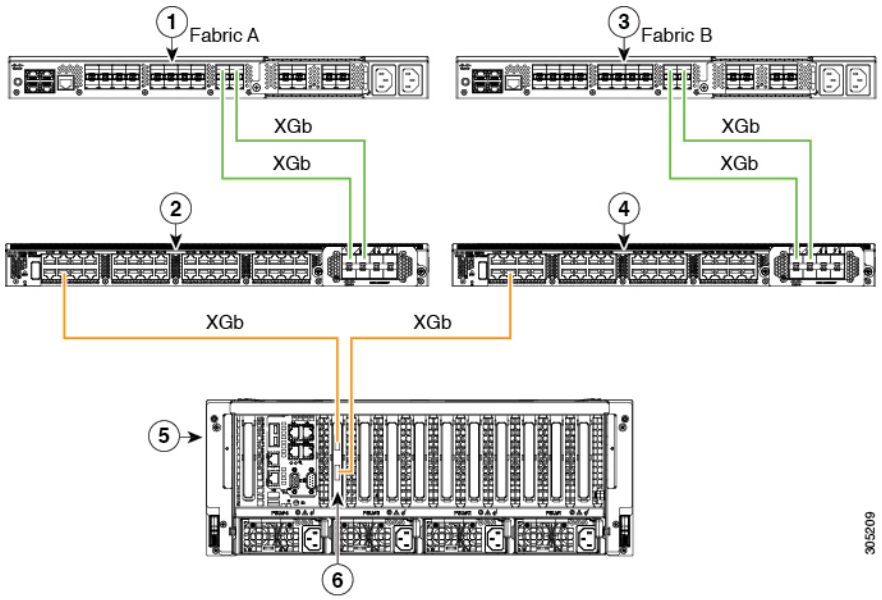
Step 4 Attach a power cord to each power supply in your server, and then attach the power cord to a grounded AC power outlet.

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 1: SingleConnect 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

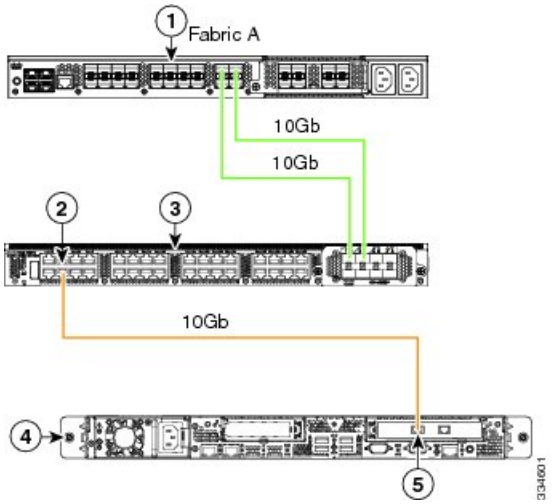
1	Cisco UCS 6200 Series or 6300 FI (Fabric A)	4	Cisco Nexus 2232PP or Cisco Nexus 2232TM-E or Cisco Nexus 2348UPQ FEX (Fabric B)
2	Cisco Nexus 2232PP or Cisco Nexus 2232TM-E or Cisco Nexus 2348UPQ FEX (Fabric A)	5	C-Series Rack-Mount Server
3	Cisco UCS 6200 Series or 6300 FI (Fabric B)	6	Cisco UCS VIC in supported PCIe or MLOM slot. **Note** MLOM based adapters (Cisco UCS VIC 1227, 1227T and 1387) are supported only on . MLOM based adapters (Cisco UCS VIC 1227, 1227T and 1387) Cisco UCS C220 M4, C240 M4, C220 M5 (only 1387), and C240 M5 (only 1387).

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 Connecting the C-Series Server with Cisco UCS Domain in Cluster Setup. Instead of connecting two FIs and two FEXes, you need to connect only one FI and one FEX.

Figure 2: 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 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	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)		

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, on page 15

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.