Cisco UCS B420 M4 Blade Server Installation and Service Note

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CHAPTER 1

Overview

This chapter contains the following sections:

Cisco UCS B420 M4 High Performance Blade Server

This document describes how to install and service the Cisco UCS B420 M4 high performance blade server, a full-width, high-density blade server that supports the following features:

- Up to four Intel Xeon E5-4600 v4 or v3 CPUs, interconnected with Intel QuickPath Interconnect (QPI) links. Two- and four-CPU configurations are supported.

- 48 DDR4 DIMMs, either RDIMMs, LRDIMMs, or TSV-RDIMMs.

- 3 mezzanine adapter slots.

- Up to 4 SAS or SATA hard disk drives (HDDs) or solid state drives (SSDs).

Up to four Cisco UCS B420 M4 blade servers can reside in a Cisco UCS 5108 Blade Server chassis.

Figure 1: Cisco UCS B420 M4 Blade Server Front Panel
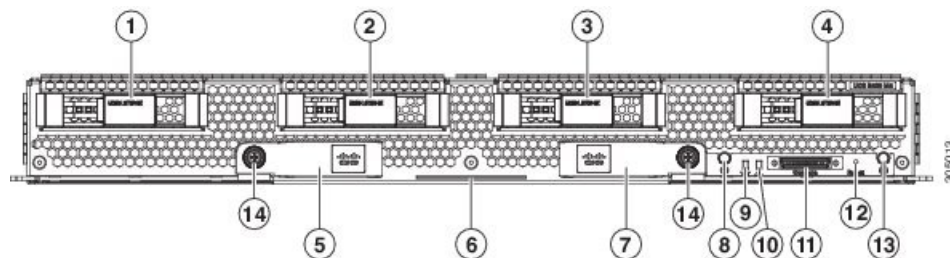
1	Hard drive bay 1	8	Power button and LED
2	Hard drive bay 2	9	Network link status LED

3	Hard drive bay 3	10	Blade health LED
4	Hard drive bay 4	11	Local console connector
5	Left ejector handle	12	Reset button access
6	Asset pull tab	13	Locator button LED
7	Right ejector handle	14	Ejector captive screw

LEDs

Server LEDs indicate whether the blade server is in active or standby mode, the status of the network link, the overall health of the blade server, and whether the server is set to give a flashing blue locator light from the locator button.

The removable drives also have LEDs indicating hard disk access activity and disk health.

Table 1: Blade Server LEDs

LED	Color	Description
Power	Off	Power off.
	Green	Main power state. Power is supplied to all server components and the server is operating normally.
	Amber	Standby power state. Power is supplied only to the service processor of the server so that the server can still be managed. **Note** Of you press and release the front-panel power button, the server performs an orderly shutdown of the 12 V main power and goes to standby power state. You cannot shut down standby power from the front-panel power button. See the Cisco UCS Manager Configuration Guide for information about completely power off the server from the software interface.
Link	Off	None of the network links are up.
	Green	At least one network link is up.
Health	Off	Power off.
	Green	Normal operation.
	Amber	Minor error.
	Blinking Amber	Critical error.

LED	Color	Description
Blue locator button and LED	Off	Blinking is not enabled.
	Blinking blue 1 Hz	Blinking to locate a selected blade—If the LED is not blinking, the blade is not selected. You can control the blinking in UCS Manager or by using the blue locator button/LED.
Activity (Disk Drive)	Off	Inactive.
	Green	Outstanding I/O to disk drive.
	Flashing Green 1 Hz	Rebuild in progress. Health LED will flash in unison.
	Flashing Green 4 Hz	Identify drive as active.
Health (Disk Drive)	Off	Either no fault is detected or the drive is not installed.
	Amber	Fault detected.
	Flashing Amber 4 Hz	Rebuild drive active. If the Activity LED is also flashing green, a drive rebuild is in progress.

Buttons

The Reset button is recessed in the front panel of the server. You can press the button with the tip of a paper clip or a similar item. Hold the button down for five seconds, and then release it to restart the server if other methods of restarting do not work.

The locator function for an individual server may get turned on or off by pressing the locator button/LED.

The power button allows you to manually take a server temporarily out of service but leave it in a state where it can be restarted quickly. If the desired power state for a service profile associated with a blade server is set to "off," using the power button or Cisco UCS Manager to reset the server will cause the desired power state of the server to become out-of-sync with the actual power state and the server may unexpectedly shut down at a later time. To safely reboot a server from a power-down state, use the Boot Server action in Cisco UCS Manager.

Local Console Connection

The local console connector allows a direct connection to a blade server to allow operating system installation and other management tasks to be done directly rather than remotely. The port uses the KVM dongle cable that provides a connection into a Cisco UCS blade server; it has a DB9 serial connector, a VGA connector for a monitor, and dual USB ports for a keyboard and mouse. With this cable, you can create a direct connection to the operating system and the BIOS running on a blade server. A KVM cable ships standard with each blade chassis accessory kit.

Figure 2: KVM Cable for Blade Servers
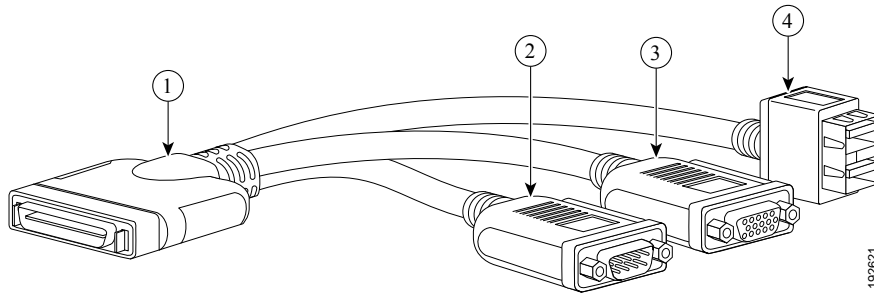
1	Connector to blade server local console connection	2	DB9 serial connector
3	VGA connector for a monitor	4	2-port USB connector for a mouse and keyboard

Secure Digital Cards

Secure Digital (SD) card slots are provided and one or two SD cards can be populated. If two SD cards are populated, they can be used in a mirrored mode.

> **Note** Do not mix different capacity cards in the same server.

Figure 3: SD Card Slots

Modular Storage Subsystem

The Cisco UCS B420 M4 blade server has two optional FlexStorage modular storage subsystems that can be configured with SAS or SATA hard disk drives (HDDs) or solid state disks (SSDs). The product IDs for the modular storage subsystems are as follows:

- UCSB-MRAID12G, Cisco FlexStorage 12G SAS RAID controller with drive bays

- UCSB-MRAID12G-HE, Cisco FlexStorage 12G SAS RAID controller with 2 GB flash-back write cache and drive bays

- UCSB-LSTOR-PT, passthrough module with drive bays

- UCSB-LSTOR-BK, Cisco FlexStorage blanking panels without controller or drive bays

Because the blade server can be used without disk drives, it does not come with any modular storage subsystems installed. Blanking panels should be used on a diskless UCS B420 M4 blade server to ensure proper airflow. Order the same number of blanking panels as there are empty drive bays.

There are two RAID controller options for the modular storage subsystems. One supports RAID 0, 1, 10 and the other supports RAID 0, 1, 10, 5, 6, with optional 2 GB flash-backed write cache, when four drives are present.

Drive Bay and RAID Controller Configurations

The Cisco UCS B420 M4 blade server supports the following configurations of drive bays and RAID controllers.

Configuration	Description
Four drive bays with RAID 0, 1, 10	This configuration includes: • One UCSB-MRAID12G that provides two drives bays on the left side of the blade server (when facing the front). The RAID controller is integrated in the drive bays and provides RAID 0, 1, 10. • One UCSB-LSTOR-PT that provides two drive bays installed on the right (when facing the front) and includes a passthrough connector that allows the drives to be managed from the RAID controller in UCSB-MRAID12G.
Four drive bays with RAID 0, 1, 10, 5, 6	This configuration includes: • One UCSB-MRAID12G-HE that provides two drives bays on the left side of the blade server (when facing the front). The RAID controller has a 2 GB flash-backed write cache (FBWC) for high performance, is integrated in the drive bays and provides RAID 0, 1, 10, 5, 6. • One UCSB-LSTOR-PT that provides two drive bays installed on the right (when facing the front) and includes a passthrough connector that allows the drives to be managed from the RAID controller in UCSB-MRAID12G-HE.
Two drive bays with RAID 0, 1, 10	This configuration includes: • One UCSB-MRAID12G that provides two drives bays on the left side of the blade server (when facing the front). The RAID controller is integrated in the drive bays and provides RAID 0, 1, 10. The right-hand bays have blanking panels installed to maintain proper airflow.
Two drive bays with RAID 0, 1, 10	This configuration includes: • One UCSB-MRAID12G-HE that provides two drives bays on the left side of the blade server (when facing the front). The RAID controller has a 2 GB flash-backed write cache (FBWC) for high performance, is integrated in the drive bays and provides RAID 0, 1, 10. The right-hand bays have blanking panels installed to maintain proper airflow.
No drive bays	This configuration does not include drive bays or RAID controllers. The diskless server must be booted from a network. Blanking panels must be installed in the empty drive bays.

Installing a Blade Server

This chapter contains the following sections:

Installing a Blade Server

For installations of UCS blades with differing widths and heights in a chassis, the guideline is to load the heaviest and largest blades at the bottom of the chassis. Therefore, if a UCS B460 blade server is present, it should be installed at the bottom, followed by full-width blades such as the UCS B420 or UCS B480 above the UCS B460, and then half-width blades such as the UCS B200 at the top of the chassis.

Before you begin

The blade server must have its cover installed before installing it into the chassis to ensure adequate airflow.

Procedure

Step 1   If necessary, remove the slot divider from the chassis.

a)   Simultaneously pull up on the left side catch and push down on the right side catch as shown in callout 1 of the following figure.

b)   Pull the slot divider out of the chassis as shown in callout 2 of the following figure. Keep the slot divider in case it is needed at another time.

Figure 4: Removing a Slot Divider
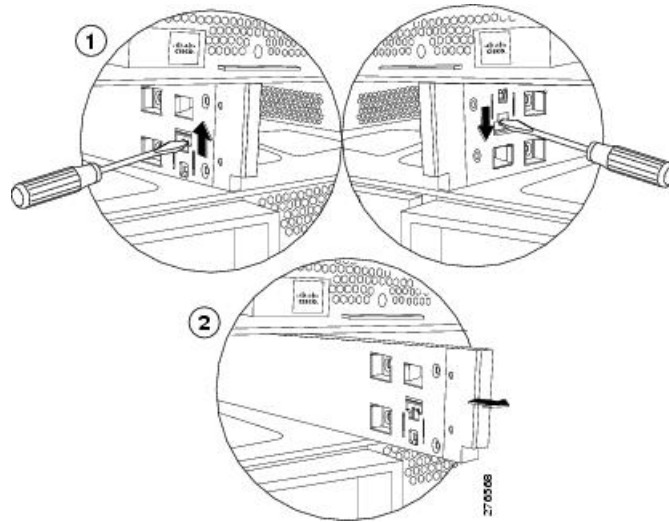
Tip   To reinstall the slot divider, align it with the dimples in the slot top and bottom and slide it back in until it clicks into place.

Step 2   Grasp the front of the blade server and place your other hand under the blade to support it.

Figure 5: Positioning a Blade Server in the Chassis
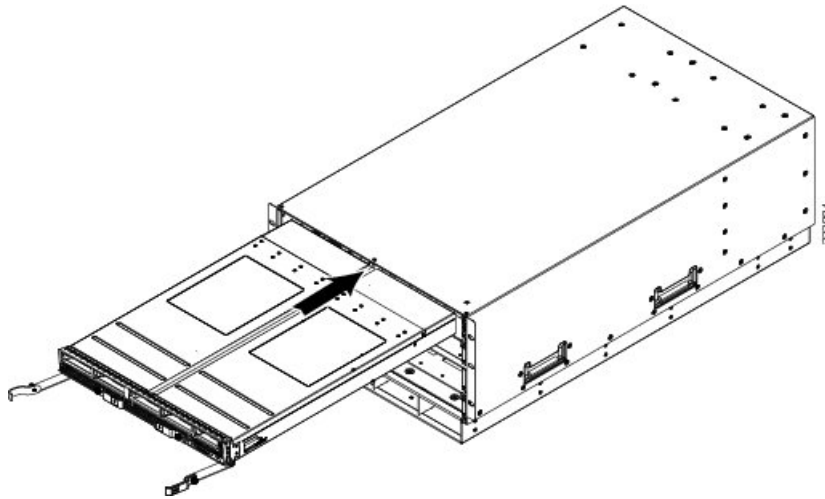
Step 3   Open the ejector levers in the front of the blade server.

Step 4   Gently slide the blade into the opening until you cannot push it any farther.

Step 5   Press the ejectors so that they catch the edge of the chassis and press the blade server all the way in.

Step 6   Tighten the captive screw on the front of the blade to no more than 3 in-lbs. Tightening only with bare fingers is unlikely to lead to stripped or damaged captive screws.

Cisco UCS Manager automatically reacknowledges, reassociates, and recommissions the server, provided any hardware changes are allowed by the service profile.

Server Configuration

Cisco UCS blade servers can be configured and managed using the following UCS management software interfaces.

Cisco Intersight Managed Mode

Cisco UCS blade servers can be configured and managed using the Cisco Intersight management platform in Intersight Managed Mode (Cisco Intersight Managed Mode). For details, see the *Cisco Intersight Managed Mode Configuration Guide*, which is available at the following URL: https://www.cisco.com/c/en/us/td/docs/unified_computing/Intersight/b_Intersight_Managed_Mode_Configuration_Guide.html

Cisco UCS Manager

Cisco UCS blade servers can be configured and managed using Cisco UCS Manager. For details, see the *Configuration Guide* for the version of Cisco UCS Manager that you are using. The configuration guides are available at the following URL:
http://www.cisco.com/en/US/products/ps10281/products_installation_and_configuration_guides_list.html

Powering Off the Blade Server

Use Cisco UCS Manager to shut down the server. For detailed steps on how to perform this operation, see the *Configuration Guide* for the version of Cisco UCS Manager that you are using. The configuration guides are available at the following URL: http://www.cisco.com/en/US/products/ps10281/products_installation_and_configuration_guides_list.html

Removing a Blade Server

You must decommission the server using Cisco UCS Manager before physically removing the blade server.

Procedure

Step 1 Turn off the blade server using either Cisco UCS Manager.

Step 2 Completely loosen the captive screws on the front of the blade.

Step 3 Remove the blade from the chassis by pulling the ejector levers on the blade until it unseats the blade server.

Step 4 Slide the blade part of the way out of the chassis, and place your other hand under the blade to support its weight.

Step 5 Once removed, place the blade on an antistatic mat or antistatic foam if you are not immediately reinstalling it.

Step 6   If the blade server slot is to remain empty, reinstall the slot divider and install two blade server blanking panels to maintain proper thermal temperatures and to keep dust out of the chassis.

Server Troubleshooting

For general troubleshooting information, see the Cisco UCS Manager Troubleshooting Reference Guide.

Basic Troubleshooting: Reseating a SAS/SATA Drive

Sometimes it is possible for a false positive UBAD error to occur on SAS/SATA HDDs installed in the server.

- Only drives that are managed by the UCS MegaRAID controller are affected.

- Drives can be affected regardless where they are installed in the server (front-loaded, rear-loaded, and so on).

- Both SFF and LFF form factor drives can be affected.

- Drives installed in all Cisco UCS C-Series servers with M3 processors and later can be affected.

- Drives can be affected regardless of whether they are configured for hotplug or not.

- The UBAD error is not always terminal, so the drive is not always defective or in need of repair or replacement. However, it is also possible that the error is terminal, and the drive will need replacement.

Before submitting the drive to the RMA process, it is a best practice to reseat the drive. If the false UBAD error exists, reseating the drive can clear it. If successful, reseating the drive reduces inconvenience, cost, and service interruption, and optimizes your server uptime.

Note   Reseat the drive only if a UBAD error occurs. Other errors are transient, and you should not attempt diagnostics and troubleshooting without the assistance of Cisco personnel. Contact Cisco TAC for assistance with other drive errors.

To reseat the drive, see Reseating a SAS/SATA Drive, on page 10.

Reseating a SAS/SATA Drive

Sometimes, SAS/SATA drives can throw a false UBAD error, and reseating the drive can clear the error.

Use the following procedure to reseat the drive.

Caution   This procedure might require powering down the server. Powering down the server will cause a service interruption.

Before you begin

Before attempting this procedure, be aware of the following:

- Before reseating the drive, it is a best practice to back up any data on it.

- When reseating the drive, make sure to reuse the same drive bay.

    - Do not move the drive to a different slot.

    - Do not move the drive to a different server.

    - If you do not reuse the same slot, the Cisco management software (for example, Cisco IMM) might require a rescan/rediscovery of the server.

- When reseating the drive, allow 20 seconds between removal and reinsertion.

Procedure

Step 1   Attempt a hot reseat of the affected drive(s). Choose the appropriate option:

a)   For a front-loading drive, see Drive Replacement, on page 13.

Step 2   During boot up, watch the drive's LEDs to verify correct operation.

See LEDs, on page 2.

Step 3   If the error persists, cold reseat the drive, which requires a server power down. Choose the appropriate option:

a)   Use your server management software to gracefully power down the server.

See the appropriate Cisco management software documentation.

b)   If server power down through software is not available, you can power down the server by pressing the power button.

See LEDs, on page 2.

c)   Reseat the drive as documented in Step 1.

d)   When the drive is correctly reseated, restart the server, and check the drive LEDs for correct operation as documented in Step 2.

Step 4   If hot and cold reseating the drive (if necessary) does not clear the UBAD error, choose the appropriate option:

a)   Contact Cisco Systems for assistance with troubleshooting.

b)   Begin an RMA of the errored drive.

Servicing the Blade Server

This chapter contains the following sections:

Removing a Blade Server Cover

Procedure

Step 1	Press and hold the button down as shown in the figure below.
Step 2	While holding the back end of the cover, pull the cover back and then up.

Drive Replacement

You can remove and install hard drives without removing the blade server from the chassis.

The drives supported in this blade server come with the drive sled attached. Spare drive sleds are not available. A list of currently supported drives is in the Cisco UCS B420 M4 Blade Server Specification Sheet.

Before upgrading or adding a drive to a running blade server, check the service profile in Cisco UCS Manager and make sure the new hardware configuration will be within the parameters allowed by the service profile.

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Caution To prevent ESD damage, wear grounding wrist straps during these procedures.

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Note See also 4K Sector Format SAS/SATA Drives Considerations, on page 15.

Removing a Blade Server Hard Drive

To remove a hard drive from a blade server, follow these steps:

Procedure

Step 1 Push the button to release the ejector, and then pull the hard drive from its slot.

Step 2 Place the hard drive on an antistatic mat or antistatic foam if you are not immediately reinstalling it in another server.

Step 3 Install a hard disk drive blank faceplate to keep dust out of the blade server if the slot will remain empty.

Installing a Blade Server Drive

To install a drive in a blade server, follow these steps:

Procedure

Step 1 Place the drive ejector into the open position by pushing the release button.

Step 2 Gently slide the drive into the opening in the blade server until it seats into place.

Step 3 Push the drive ejector into the closed position.

You can use Cisco UCS Manager to format and configure RAID services. For details, see the *Configuration Guide* for the version of Cisco UCS Manager that you are using. The configuration guides are available at the following URL:
http://www.cisco.com/en/US/products/ps10281/products_installation_and_configuration_guides_list.html

If you need to move a RAID cluster, see the Cisco UCS Manager Troubleshooting Reference Guide.

4K Sector Format SAS/SATA Drives Considerations

- You must boot 4K sector format drives in UEFI mode, not legacy mode. See the procedure in this section for setting UEFI boot mode in the boot policy.

- Do not configure 4K sector format and 512-byte sector format drives as part of the same RAID volume.

- Operating system support on 4K sector drives is as follows: Windows: Win2012 and Win2012R2; Linux: RHEL 6.5, 6.6, 6.7, 7.0, 7.2, 7.3; SLES 11 SP3, and SLES 12. ESXi/VMWare is not supported.

Setting Up UEFI Mode Booting in the UCS Manager Boot Policy

Procedure

Step 1	In the Navigation pane, click **Servers**.
Step 2	Expand **Servers > Policies**.
Step 3	Expand the node for the organization where you want to create the policy.
	If the system does not include multitenancy, expand the root node.
Step 4	Right-click **Boot Policies** and select **Create Boot Policy**.
	The Create Boot Policy wizard displays.
Step 5	Enter a unique name and description for the policy.
	This name can be between 1 and 16 alphanumeric characters. You cannot use spaces or any special characters other than - (hyphen), _ (underscore), : (colon), and . (period). You cannot change this name after the object is saved.
Step 6	(Optional) After you make changes to the boot order, check the **Reboot on Boot Order Change** check box to reboot all servers that use this boot policy.
	For boot policies applied to a server with a non-Cisco VIC adapter, even if the Reboot on Boot Order Change check box is not checked, when SAN devices are added, deleted, or their order is changed, the server always reboots when boot policy changes are saved.
Step 7	(Optional) If desired, check the **Enforce vNIC/vHBA/iSCSI Name** check box.
	• If checked, Cisco UCS Manager displays a configuration error and reports whether one or more of the vNICs, vHBAs, or iSCSI vNICs listed in the Boot Order table match the server configuration in the service profile.
	• If not checked, Cisco UCS Manager uses the vNICs or vHBAs (as appropriate for the boot option) from the service profile.
Step 8	In the **Boot Mode** field, choose the **UEFI** radio button.
Step 9	Check the Boot Security check box if you want to enable UEFI boot security.
Step 10	Configure one or more of the following boot options for the boot policy and set their boot order:
	• Local Devices boot—To boot from local devices, such as local disks on the server, virtual media, or remote virtual disks, continue with *Configuring a Local Disk Boot for a Boot Policy* in the Cisco UCS Manager Server Management Guide for your release.

    • SAN boot—To boot from an operating system image on the SAN, continue with *Configuring a SAN Boot for a Boot Policy* in the Cisco UCS Manager Server Management Guide for your release.

You can specify a primary and a secondary SAN boot. If the primary boot fails, the server attempts to boot from the secondary.

    • LAN boot—To boot from a centralized provisioning server, continue with *Configuring a LAN Boot For a Boot Policy* in the Cisco UCS Manager Server Management Guide for your release.

    • iSCSI boot—To boot from an iSCSI LUN, continue with *Creating an iSCSI Boot Policy* in the Cisco UCS Manager Server Management Guide for your release.

Air Baffles

The air baffles shown below ship with this server; they direct and improve air flow for the server components. No tools are necessary to install them. Place them over the DIMMs and align them to the standoffs.

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Caution   Be sure that the tabs on the baffles are set in the slots provided on the motherboard; otherwise, it may be difficult to replace the server cover or damage to the motherboard might occur.

Internal Components

Figure 6: Inside View of the Blade Server
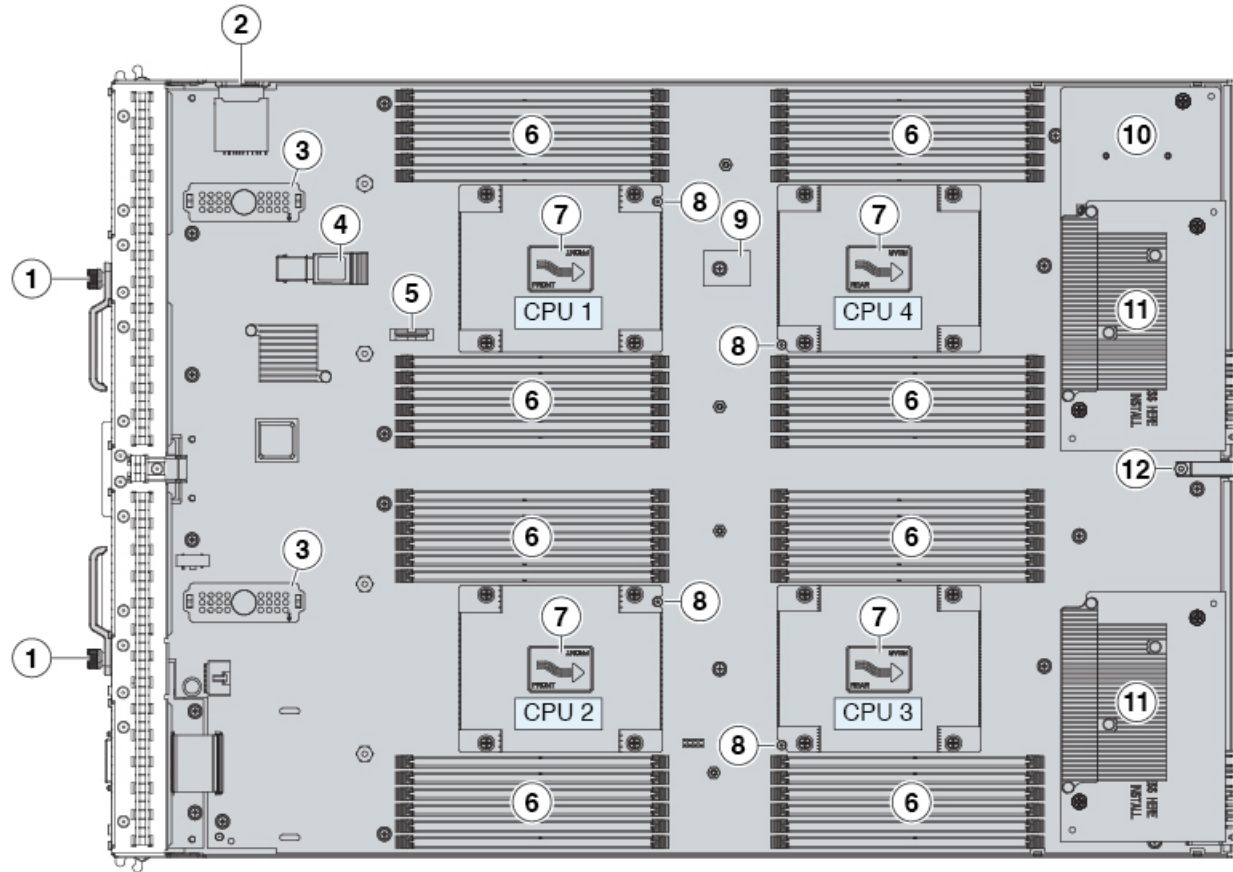
1	Ejector captive screw	7	Heat sink and CPU (underneath)
2	SD card slots	8	CPU heat sink install guide pins
3	Modular storage subsystem connector	9	Trusted Platform Module (TPM)
4	USB memory	10	Adapter 1 supports only the Cisco VIC 1340 adapter and the Cisco VIC 1240 adapter
5	CMOS battery	11	Adapter cards: • Adapter 2 is the slot on the left (facing the server) and partially covers Adapter 1 • Adapter 3 is the slot on the right (facing the server)
6	DIMM slots	12	Diagnostic button

Note	The heat sinks and CPUs are numbered as follows:

- Left front heat sink and CPU 1
- Right front heat sink and CPU 2
- Right rear heat sink and CPU 3
- Left rear heat sink and CPU 4

Diagnostics Button and LEDs

At blade start-up, POST diagnostics test the CPUs, DIMMs, HDDs, and adapter cards, and any failure notifications are sent to UCS Manager. You can view these notifications in the Cisco UCS Manager System Error Log or in the output of the **show tech-support** command. If errors are found, an amber diagnostic LED also lights up next to the failed component. During run time, the blade BIOS and component drivers monitor for hardware faults and will light up the amber diagnostic LED as needed.

LED states are saved, and if you remove the blade from the chassis the LED values will persist for up to 10 minutes. Press and hold the diagnostics button on the motherboard for 30 seconds to display component faults. LED fault values are reset when the blade is reinserted into the chassis and booted, and the process begins from its start.

If DIMM insertion errors are detected, they may cause the blade discovery process to fail and errors will be reported in the server POST information, which is viewable using the UCS Manager GUI or CLI. DIMMs must be populated according to specific rules. The rules depend on the blade server model. Refer to the Cisco UCS B420 M4 Blade Server Specification Sheet for the DIMM population rules.

Faults on the DIMMs or adapter cards also cause the server health LED to light solid amber for minor error conditions or blinking amber for critical error conditions.

Installing a CMOS Battery

All Cisco UCS blade servers use a CR2032 battery to preserve BIOS settings while the server is not installed in a powered-on chassis. Cisco supports the industry standard CR2032 battery that is available at most electronics stores.

Warning	There is danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

To install or replace the battery, follow these steps:

Procedure

Step 1 Remove the existing battery:

a) Power off the blade, remove it from the chassis, and remove the top cover.

     b) Push the battery socket retaining clip away from the battery.

     c) Lift the battery from the socket. Use needle-nose pliers to grasp the battery if there is not enough clearance for your fingers.

Step 2   Install the replacement battery:

     a) Push the battery socket retaining clip away from where the battery fits in the housing.

     b) Insert the new battery into the socket with the battery's positive (+) marking facing away from the retaining clip. Ensure that the retaining clip can click over the top of the battery to secure it in the housing.

     c) Replace the top cover.

     d) Replace the blade server in the chassis.

Installing a Modular Storage Subsystem

The UCS B420 M4 Blade Server uses an optional Cisco UCS FlexStorage modular storage subsystem that can provide support for two drive bays and RAID controller.

Figure 7: Modular Storage System Installation
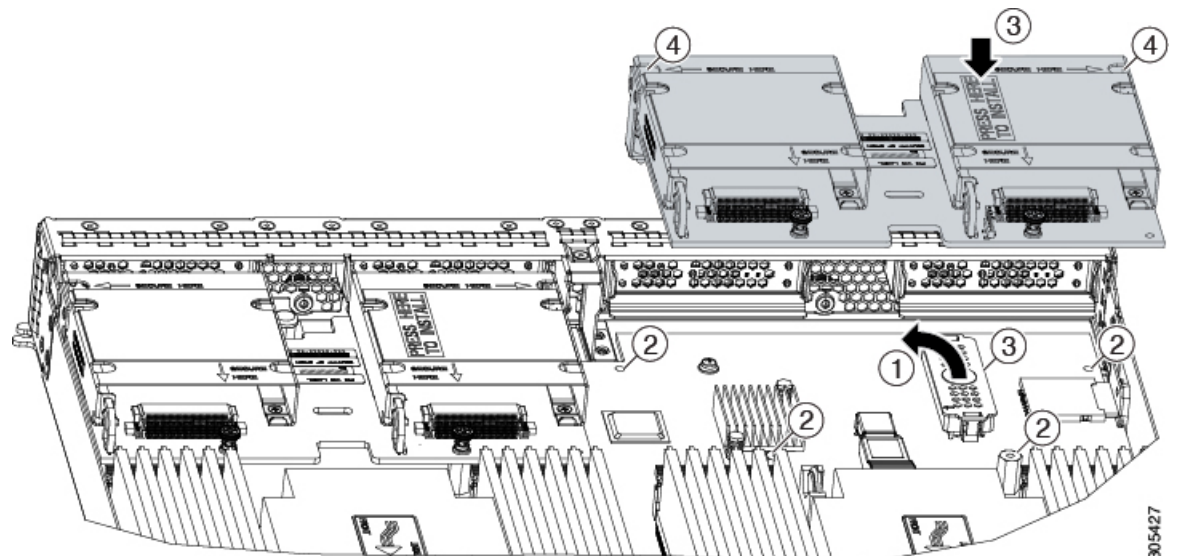
Procedure

Step 1   Remove the protective cover on the connector from both the modular storage subsystem and the motherboard.

Step 2   Position the modular storage subsystem connector above the motherboard connector and align the captive screws to the standoffs and the motherboard mounting holes.

Step 3   Press the modular storage subsystem where the label states "PRESS HERE TO INSTALL" onto the motherboard connector.

Step 4   Tighten the screws.

Replacing the SuperCap Module

The SuperCap module is a battery bank which connects to the front mezzanine storage module board and provides power to the RAID controller if facility power is interrupted.

To replace the SuperCap module, use the following topics:

Removing the SuperCap Module

The SuperCap module sits in a plastic tray. The module connects to the board through a ribbon cable with one connector to the module and one connector to the board. The SuperCap replacement PID (UCSB-MRAID-SC=) contains the module only, so you must leave the ribbon cable in place on the board.

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Caution   When disconnecting the SuperCap module, disconnect the ribbon cable from the module only. Do not disconnect the cable from the board. The board connection and the tape that secures the cable must remain connected and undamaged.
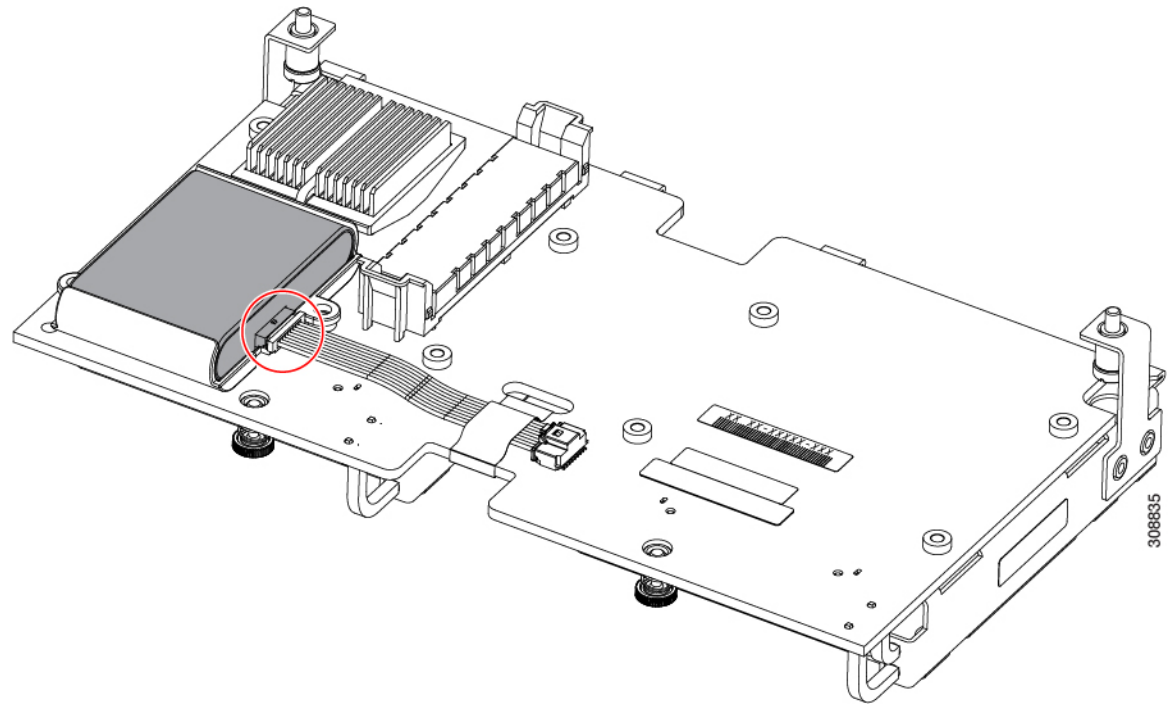
To replace the SuperCap module, follow these steps:

Procedure

Step 1   Grasp the cable connector at the SuperCap module and gently pull to disconnect the cable from the SuperCap module.

Do not grasp the cable itself, the tape, or the board connector.

Figure 8: Disconnecting the SuperCap Cable from the Module, Not the Board

Step 2   Before removing the SuperCap module, note its orientation in the tray.

When correctly oriented, the connector is on the bottom half of the module and faces the cable. You will need to install the new SuperCap module with the same orientation.

Step 3   Grasp the sides of the SuperCap module, but not the connector, and lift the SuperCap module out of the tray.

Figure 9: Removing the SuperCap Module
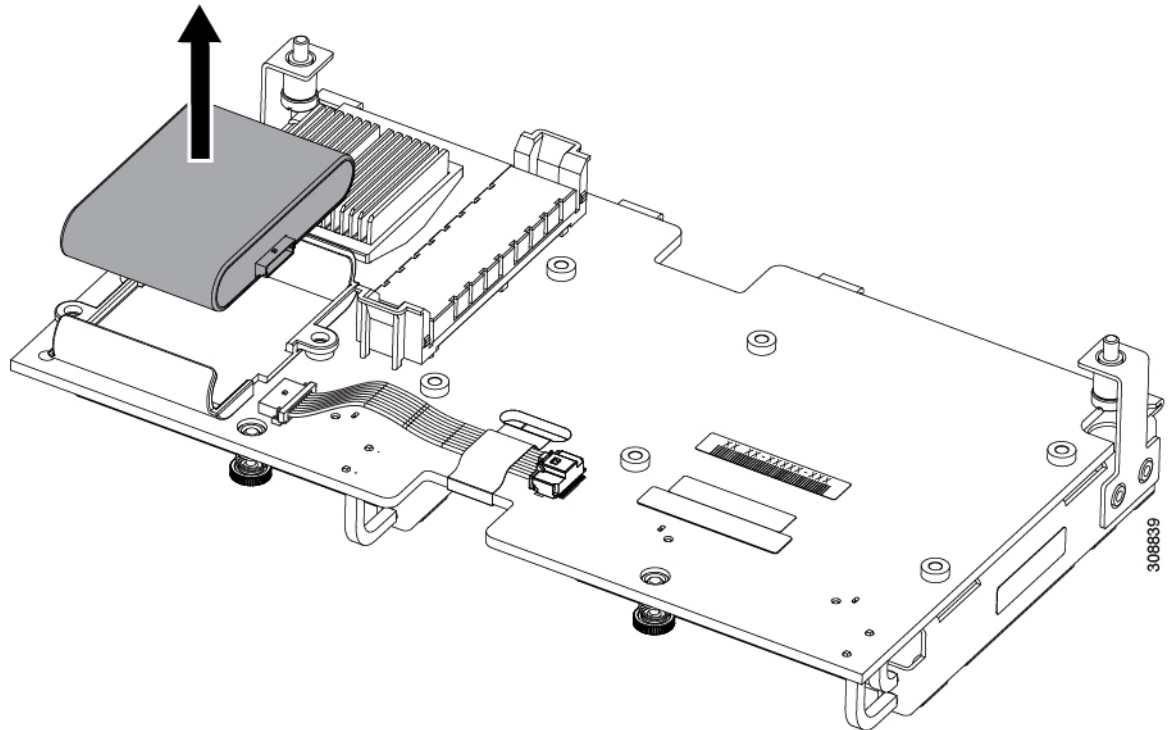
You might feel some resistance because the tray is curved to secure the module.

Installing the SuperCap Module

To install a SuperCap module (UCSB-MRAID-SC=), use the following steps:

Procedure

Step 1   Orient the SuperCap module correctly, as shown (1).

When correctly oriented:

- The connector is on the bottom half of the module facing the cable.

- The connector will fit into the rectangular notch in the tray. This notch is specifically designed to accept the SuperCap module connector.

Caution   Make sure the SuperCap module is properly oriented before proceeding. If the module is installed incorrectly, the ribbon cable can get snagged or damaged.

Step 2   When the module is correctly oriented, lower the module and press down until it clips into the tray.

You might feel some resistance while the module passes the curved clips at the top of the tray.

Step 3   When the module is seated in the tray, reconnect the cable (2):

a) Grasp the cable connector and verify that the pins and sockets on the cable connector and module connector are correctly aligned.

b) When the cable connector and module connector are properly aligned, plug the cable into the SuperCap module.

What to do next

Reinstall the blade server. Go to .

Upgrading to Intel Xeon E5-4600 v4 Series CPUs

Before upgrading to Intel Xeon E5-4600 v4 Series CPUs, ensure that the server is running the required minimum software and firmware versions that support Intel E5-4600 v4 Series CPUs, as listed in the following table.

Software or Firmware	Minimum Version
Cisco UCS Manager	Release 3.1(2) or Release 2.2(8) (See the following Note for additional supported versions.)
Cisco IMC	Release 3.1(2) or Release 2.2(8)
BIOS	Release 3.1(2) or Release 2.2(8)

Note Cisco UCS Manager Release 2.2(4) introduced a server pack feature that allows Intel E5-4600 v4 CPUs to run with Cisco UCS Manager Release 2.2(4) or later, provided that the Cisco IMC, BIOS and Capability Catalog are all running Release 2.2(8) or later.

Caution Ensure that the server is running the required software and firmware before installing the Intel E5-4600 v4 Series CPUs. Failure to do so can result in a non-bootable CPU.

Do one of the following actions:

- If the server software and firmware are already at the required minimum version as shown in the preceding table, replace the CPUs by using the procedure in the following section.
- If the server software or firmware is not at the required minimum version, follow the instructions in the Cisco UCS B420 M4 Server Upgrade Guide for E5-4600 v4 Series CPUs to upgrade it. Then replace the CPUs by using the procedure in the following section.

- For PID information when re-using or using new CPUs and heat sinks, see

Rules for Replacing CPUs and Heat Sinks

If you re-use both CPUs and heat sinks when replacing the motherboard, the following PIDs are used:

- UCSX-HSCK=
- UCS-CPU-GREASE=

When you replace CPUs and use new heat sinks that you ordered, the following PIDs are used:

- UCSB-HS-EP-M4-F= CPU Heat Sink for UCS B200/B420M4 Socket 1 (Front)

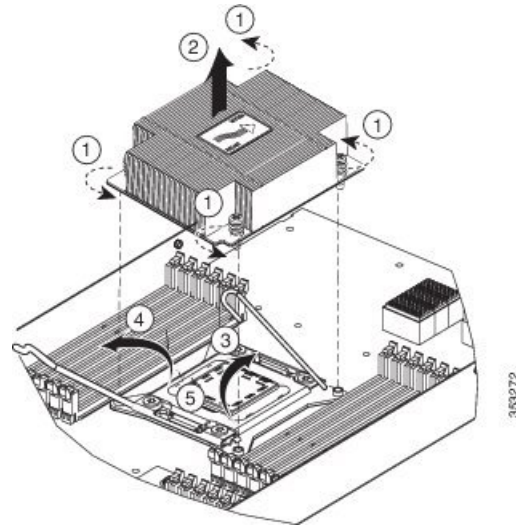- UCSB-HS-EP-M4-R= CPU Heat Sink for UCS B200/B420M4 Socket 2 (Rear)
- UCS-CPU-GREASE3=

Removing a Heat Sink and CPU

Before beginning this procedure, you may find it helpful to review the conditions in Rules for Replacing CPUs and Heat Sinks, on page 24.

Procedure

Step 1 Unscrew the four captive screws.

Step 2 Remove the heat sink.

Figure 11: Removing the Heat Sink and CPU

Step 3   Unhook the self-loading socket (SLS) lever that has the unlock icon ⌐⌐.

Step 4   Unhook the SLS lever that has the lock icon ⌂.

Step 5   Grasp the sides of the CPU carrier (indicated by the arrows in the illustration) and swing it into a standing position in the SLS plug seat.

Figure 12: CPU Carrier and SLS Plug Seat

Step 6   Pull the CPU carrier up and out of the SLS plug seat.

Installing a New CPU and Heat Sink

Before installing a new CPU in a server, verify the following:
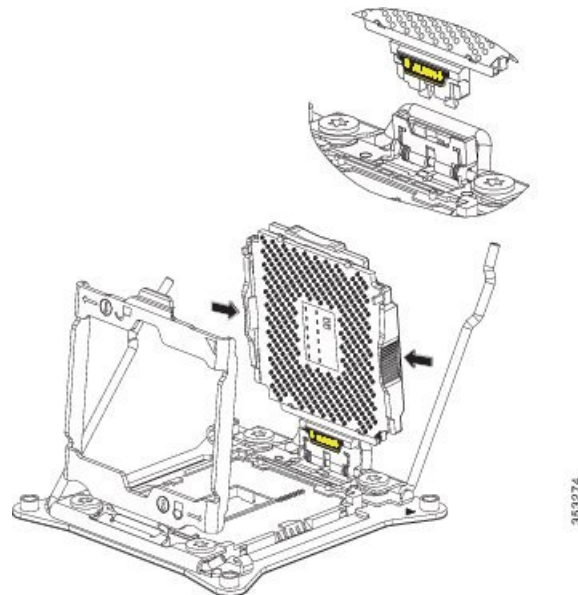
- A BIOS update is available and installed that supports the CPU and the given server configuration.

- The service profile for this server in Cisco UCS Manager will recognize and allow the new CPU.

Procedure

Step 1   Hold the CPU carrier by its sides (indicated by the arrows). Insert and align the two CPU carrier pegs into the self-loading socket (SLS) plug seat. To ensure proper seating, verify that the horizontal yellow line below the word ALIGN is straight.

Figure 13: Inserting the CPU Carrier
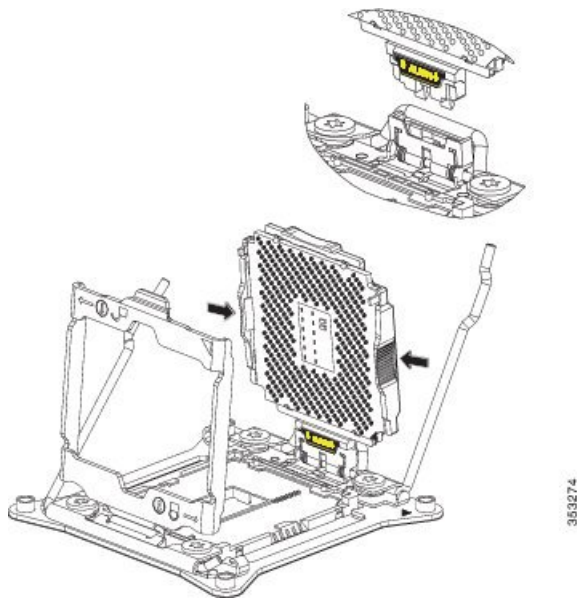
Step 2   Press gently on the top of the CPU carrier from the exterior side until it snaps into place.

Step 3   Close the socket latch.

Step 4   Hook the self-loading socket (SLS) lever that has the lock icon 🔒.

Step 5   Hook the SLS lever that has the unlock icon 🔓.

Step 6   Thermally bond the CPU and heat sink. Using the syringe of thermal grease provided with the replacement CPU, apply 2 cubic centimeters of thermal grease to the top of the CPU where it will contact the heat sink. Apply the grease in the pattern shown in the following figure, which should use approximately half the contents of the syringe.

Figure 14: Thermal Grease Application Pattern
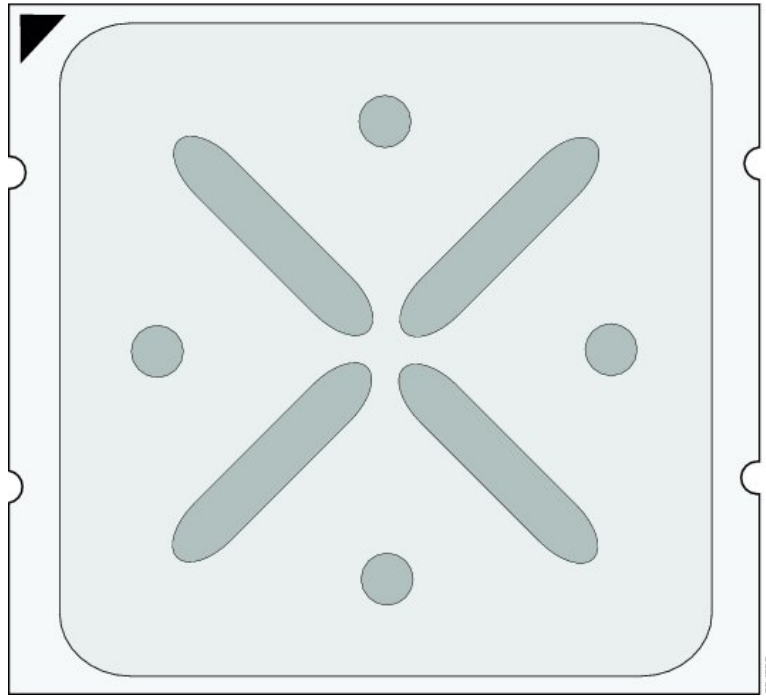
Step 7   Replace the heat sink. The yellow CPU heat sink install guide pins that are attached to the motherboard must align with the cutout on the heat sink to ensure proper installation of the heat sink.

Figure 15: Replacing the Heat Sink
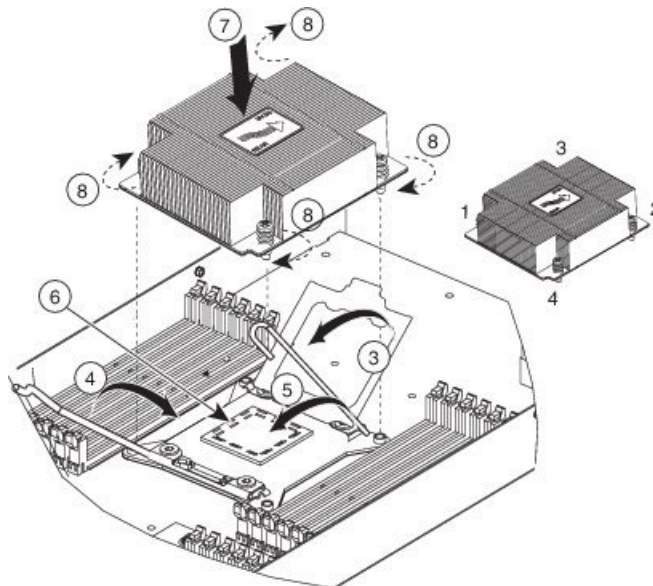
Step 8   Tighten the four captive screws in the order shown.

Installing Memory

To install a DIMM into the blade server, follow these steps:

Procedure

Step 1   Press the DIMM into its slot evenly on both ends until it clicks into place.

DIMMs are keyed. If a gentle force is not sufficient, make sure the notch on the DIMM is correctly aligned.

Note   Be sure that the notch in the DIMM aligns with the slot. If the notch is misaligned you may damage the DIMM, the slot, or both.

Step 2   Press the DIMM connector latches inward slightly to seat them fully.

Supported DIMMs

The DIMMs supported in this blade server are constantly being updated. A list of currently supported and available DIMMs is in the Cisco UCS B420 M4 Blade Server Specification Sheet.

Do not use any memory DIMMs other than those listed in the specification sheet. Doing so may irreparably damage the server and require down time.

Memory Arrangement

The Cisco UCS B420 high-performance blade server contains 48 slots for installing DIMMs—12 for each CPU. Each CPU has 12 DIMM slots spread over 4 channels. This blade server needs at least one DIMM attached to all populated CPUs. DIMMs installed in slots for an absent CPU will not be recognized. For optimal performance, distribute DIMMs evenly across all CPUs. DIMM connector latches are color coded blue, black, and white, and the DIMMs must be installed in that order.

Figure 16: Memory Slots Within the Blade Server
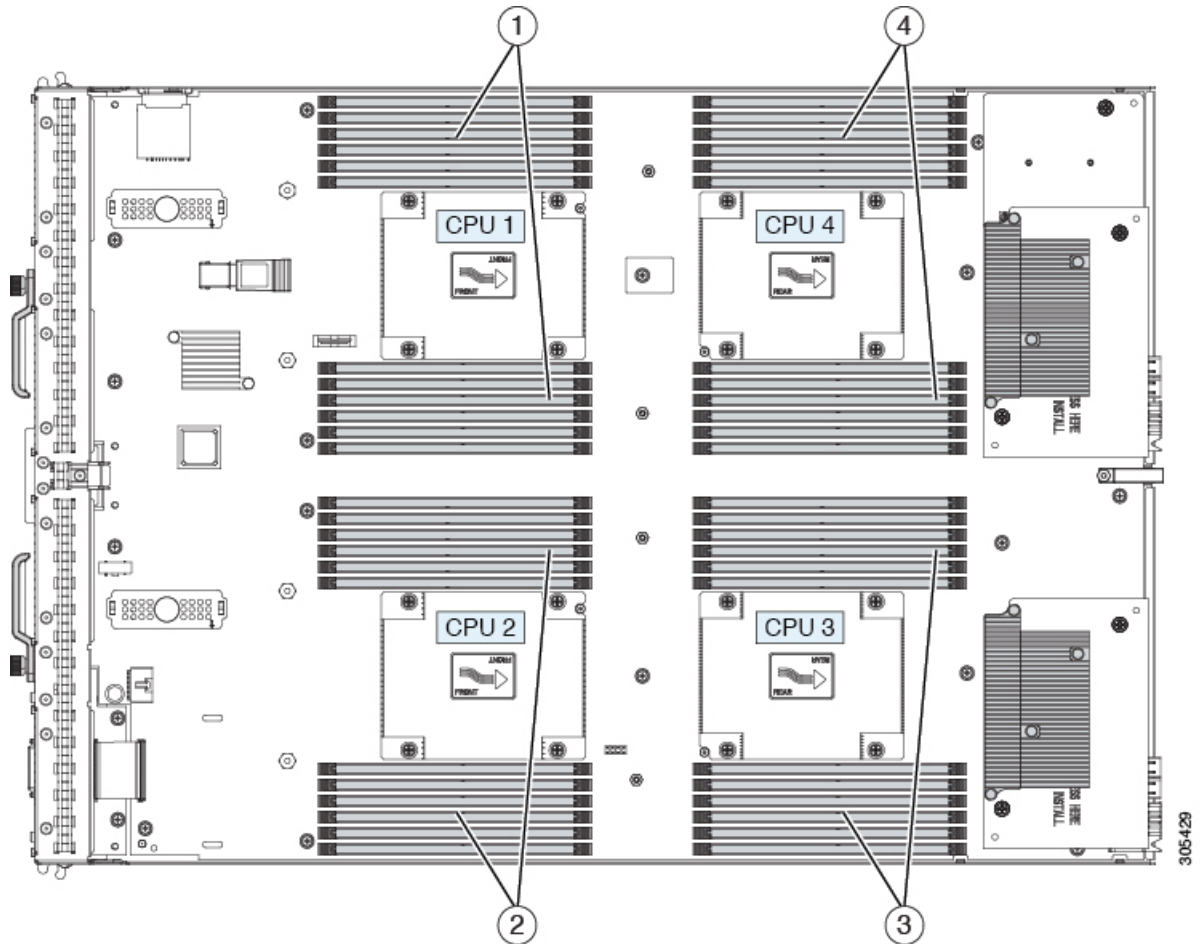
1	DIMMs for CPU 1	**3**	DIMMs for CPU 3
2	DIMMs for CPU 2	**4**	DIMMs for CPU 4

Channels

Each CPU has 4 channels, consisting of 3 DIMMs. Each channel is identified by a letter. Each channel member is identified by numbers, 1, 2 or 3.

The DIMM slots are contiguous to their associated CPU. When installing DIMMs, you must add them in the configurations shown in the following table.

Table 2: UCS B420 M4 DIMM Slot Population

DIMMs per CPU	Populate CPU 1 Slots	Populate CPU 2 Slots	Populate CPU 3 Slots	Populate CPU 4 Slots	Color Coding
1	A1	E1	I1	M1	Blue

DIMMs per CPU	Populate CPU 1 Slots	Populate CPU 2 Slots	Populate CPU 3 Slots	Populate CPU 4 Slots	Color Coding
2	A1, B1	E1, F1	I1, J1	M1, N1	Blue
3	A1, B1, C1	E1, F1, G1	I1, J1, K1	M1, N1, O1	Blue
4	A1, B1, C1, D1	E1, F1, G1, H1	I1, J1, K1, L1	M1, N1, O1, P1	Blue
5	Not recommended for performance reasons.				
6	A1, B1, C1, A2, B2, C2	E1, F1, G1, E2, F2, G2	I1, J1, K1, I2, J2, K2	M1, N1, O1, M2, N2, O2	Blue, Black
7	Not recommended for performance reasons.				
8	A1, B1, C1, D1, A2, B2, C2, D2	E1, F1, G1, H1, E2, F2, G2, H2	I1, J1, K1, L1, I2, J2, K2, L2	M1, N1, O1, P1, M2, N2, O2, P2	Blue, Black
9	A1, B1, C1, A2, B2, C2, A3, B3, C3	E1, F1, G1, E2, F2, G2, E3, F3, G3	I1, J1, K1, I2, J2, K2, I3, J3, K3	M1, N1, O1, M2, N2, O2, M3, N3, O3	Blue, Black, White
10	Not recommended for performance reasons.				
11	Not recommended for performance reasons.				
12	A1, B1, C1, D1, A2, B2, C2, D2, A3, B3, C3, D3	E1, F1, G1, H1, E2, F2, G2, H2, E3, F3, G3, H3	I1, J1, K1, L1, I2, J2, K2, L2, I3, J3, K3, L3	M1, N1, O1, P1, M2, N2, O2, P2, M3, N3, O3, P3	Blue, Black, White

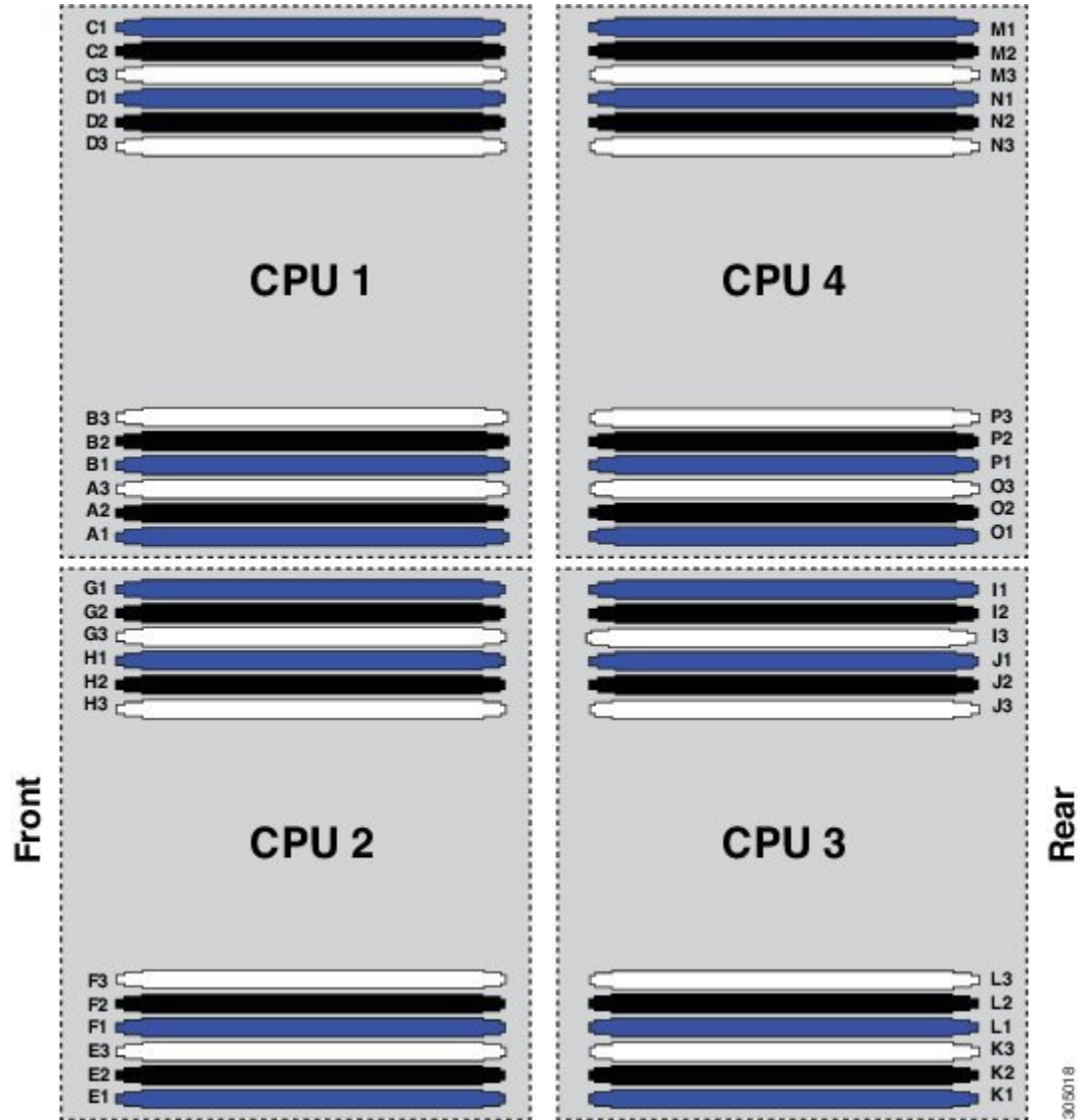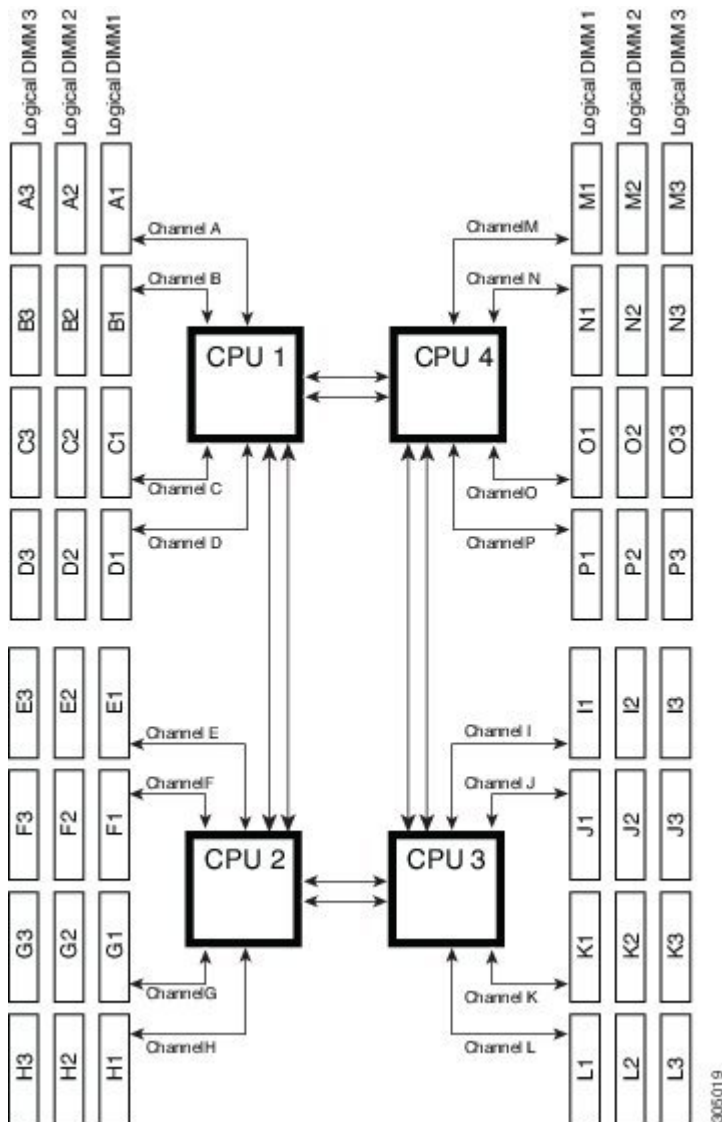*Figure 17: Physical Representation of DIMMs and CPUs*

Figure 18: Logical Representation of Channels

Memory Performance

When configuring your server, consider the following:

- DIMMs within the blade can be of different speeds, but all DIMMs will run at the speed of the DIMM with the lowest speed.

- No mixing of DIMM type (LRDIMM, RDIMM, TSV-RDIMM) is allowed.

- Your selected CPU(s) can have some affect on performance. CPUs used must be of the same type.

- Mixing DIMM ranks and densities can lower performance.

- Unevenly populating DIMMs between CPUs can lower performance.

Installing a Virtual Interface Card Adapter

Note   You must remove the adapter card to service it.

To install a Cisco VIC 1340 or VIC 1240 in the blade server, follow these steps:

Procedure

Step 1   Position the VIC board connector above the motherboard connector and align the captive screw to the standoff post on the motherboard.

Step 2   Firmly press the VIC board connector into the motherboard connector.

Step 3   Tighten the captive screw.

Tip   To remove a VIC, reverse the above procedure. You might find it helpful when removing the connector from the motherboard to gently rock the board along the length of the connector until it loosens.

Figure 19: Installing a VIC mLOM Adapter
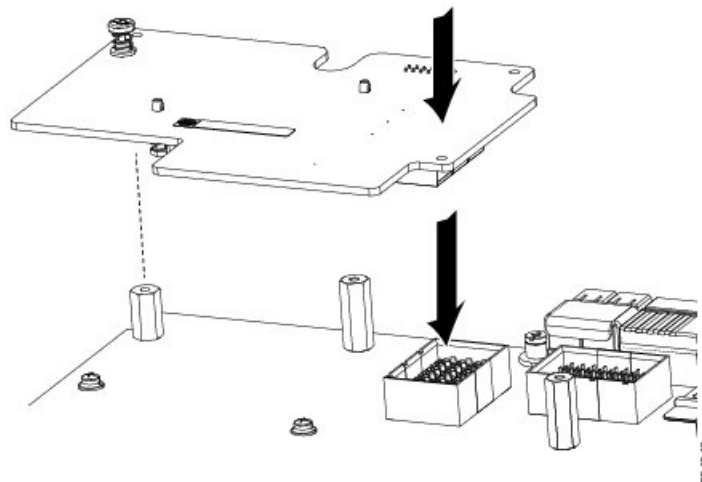
Installing an Adapter Card in Slots 2 or 3

The network adapters and interface cards share a common installation process. These cards are updated frequently. Currently supported models that are available for this server are listed in the specification sheets at this URL:

http://www.cisco.com/en/US/products/ps10280/products_data_sheets_list.html

- Adapter slot 1 (4 x 10 Gb) is for the VIC 1340 or VIC 1240 adapter. No other adapter card can be installed in slot 1.

- Adapter slot 2 (4 x 10 Gb) is for the VIC port expander card or the storage accelerator cards. The port expander can only be used if the VIC 1340 or VIC 1240 is installed.

- Adapter slot 3 (8 x 10 Gb) is for the VIC 1380 or VIC 1280 adapter or the storage accelerator cards.

The VIC 1340 and VIC 1380 adapters require a Cisco UCS 6200 Series Fabric Interconnect or Cisco UCS 6300 Series Fabric Interconnect, and they support the Cisco Nexus 2208XP, 2204XP, and 2348UPQ Fabric Extender (FEX) modules.

The VIC 1240 and VIC 1280 adapters support Cisco UCS 6100, 6200, and 6300 Series Fabric Interconnects, and they support the Cisco Nexus 2104XP, 2204XP, 2208XP, and 2304XP FEX modules.

If you switch from one type of adapter card to another, download the latest device drivers and load them into the server's operating system before you physically switch the adapters. For more information, see the firmware management chapter of one of the Cisco UCS Manager software configuration guides.

Procedure

Step 1	Position the adapter board connector above the motherboard connector and align the two adapter captive screws to the standoff posts on the motherboard (callout 1).
Step 2	Firmly press the adapter connector into the motherboard connector (callout 2).
Step 3	Tighten the captive screws (callout 3).

Figure 20: Installing an Adapter Card
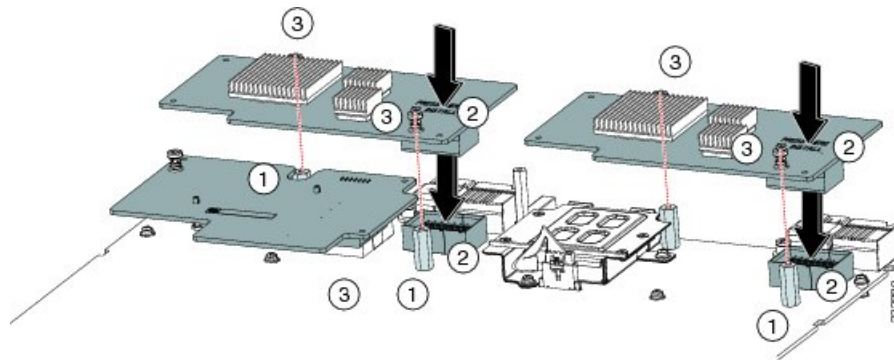

Enabling the Trusted Platform Module

The Trusted Platform Module (TPM) is a component that can securely store artifacts used to authenticate the server. These artifacts can include passwords, certificates, or encryption keys. A TPM can also be used to store platform measurements that help ensure the platform remains trustworthy. Authentication (ensuring that the platform can prove that it is what it claims to be) and attestation (a process helping to prove that a platform is trustworthy and has not been breached) are necessary steps to ensure safer computing in all environments.

It is a requirement for the Intel Trusted Execution Technology (TXT) security feature, which must be enabled in the BIOS settings for a server equipped with a TPM.

Procedure

Step 1   Install the TPM hardware.

a) Decommission and remove the blade server from the chassis.

b) Remove the blade server cover.

c) Install the TPM to the TPM socket on the server motherboard and secure it using the one-way screw that is provided. See the figure below for the location of the TPM socket.

d) Return the blade server to the chassis and allow it to be automatically reacknowledged, reassociated, and recommissioned.

e) Continue with enabling TPM support in the server BIOS in the next step.

Figure 21: TPM Socket
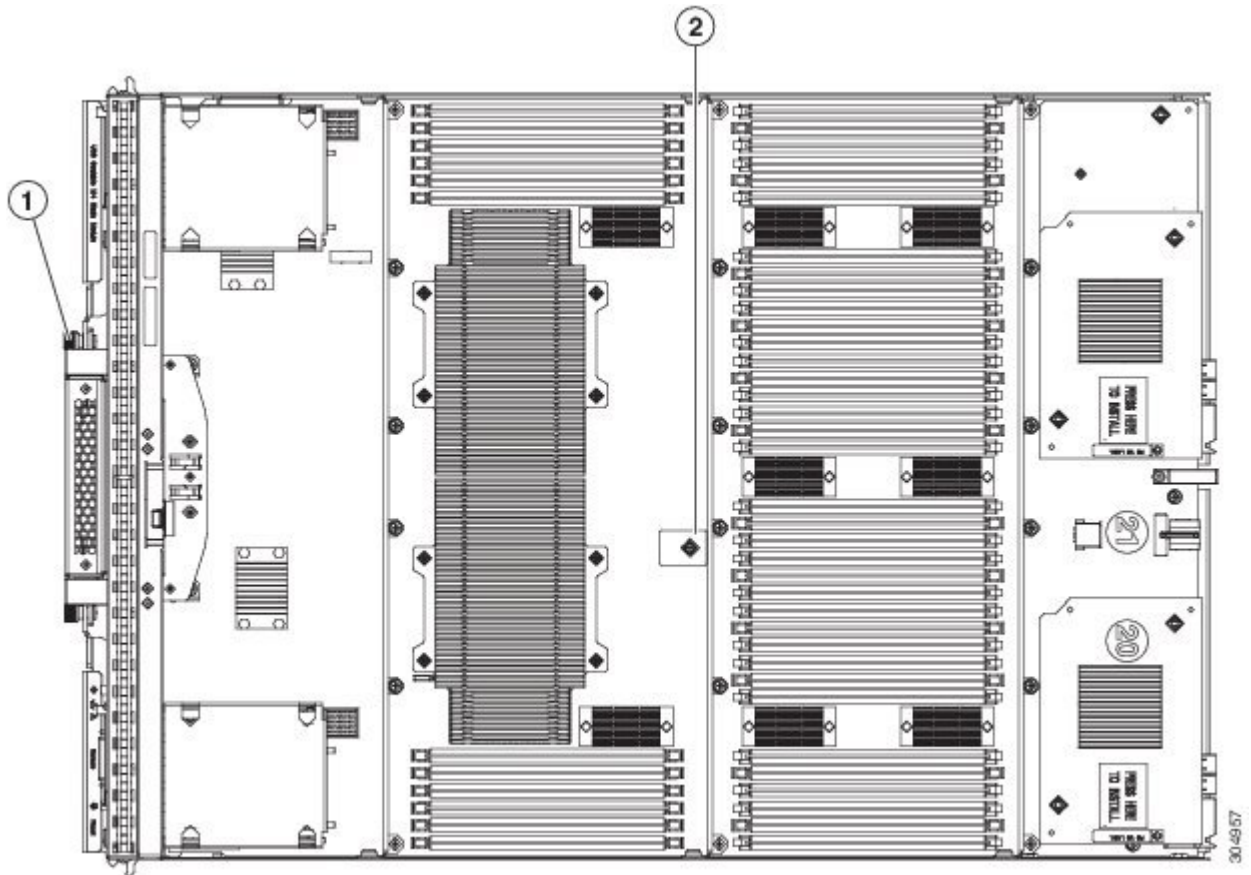
Step 2   Enable TPM Support in the BIOS.

If TPM support was disabled for any reason, use the following procedure to enable it.

a) In the Cisco UCS Manager Navigation pane, click the **Servers** tab.

b) On the Servers tab, expand **Servers > Policies**.

c) Expand the node for the organization where you want to configure the TPM.

d) Expand BIOS Policies and select the BIOS policy for which you want to configure the TPM.

e) In the Work pane, click the **Advanced** tab.

f) Click the **Trusted Platform** sub-tab.

g) To enable TPM support, click **Enable** or **Platform Default.**

h) Click **Save Changes**.

i) Continue with the next step.

Step 3 Enable TXT Support in the BIOS Policy.

Follow the procedures in the Cisco UCS Manager Configuration Guide for the release that is running on the server.

Technical Specifications

This chapter contains the following section:

Physical Specifications for the B420 M4 Blade Server

Specification	Value
Height	1.95 inches (50 mm)
Width	16.50 inches (419.1 mm)
Depth	24.4 inches (620 mm)
Weight	The weight depends on the components installed. • Base server weight: 17.7 lbs (8.0 kg) (No CPUs, no memory, no adapter cards, no USB, no SD cards, no HDDs, 4 HDD fillers, no TPM) • Minimally configured server weight with RDIMMs: 21.09 lbs (9.56 kg) (2 CPUs, 2 heat sinks, 2 RDIMMs, mLOM, no adapter cards, 4 HDD fillers) • Minimally configured server weight with LRDIMMs: 21.2 lbs (9.61 kg) (2 CPUs, 2 heat sinks, 2 LRDIMMs, mLOM, no adapter cards, 4 HDD fillers) • Fully configured server weight with RDIMMs: 30.7 lbs (13.9 kg) (4 CPUs, 4 heat sinks, 48 RDIMMs, mLOM, 2 adapter cards, 4 HDDs) • Fully configured server weight with LRDIMMs: 33.2 lbs (15.0 kg) (4 CPUs, 4 heat sinks, 48 LRDIMMs, mLOM, 2 adapter cards, 4 HDDs)