

Servicing Blade Server Components

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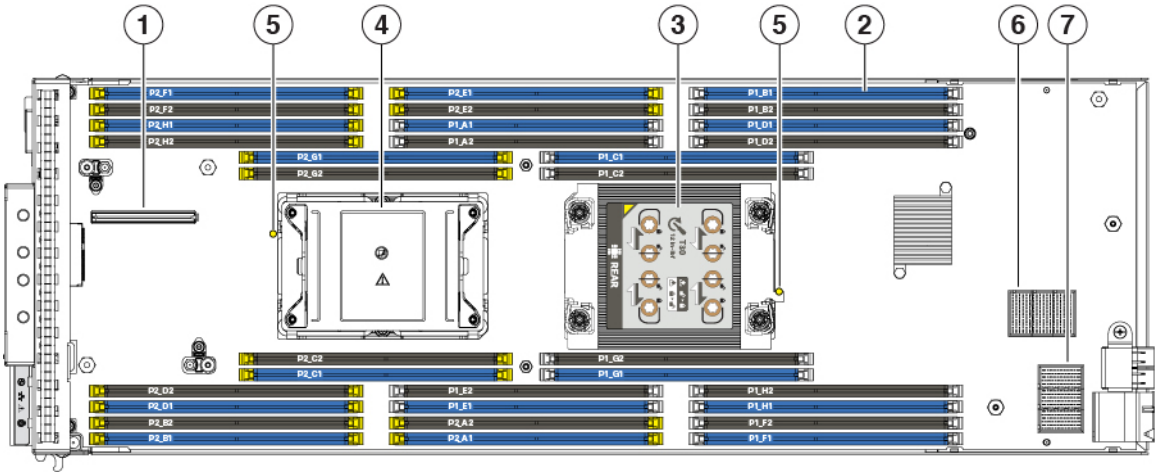
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Internal Components

The following figure shows the internal components of the Cisco UCS B200 M6 blade server. The blade also has a pair of plastic memory baffles (not shown) that cover the middle DIMM slots.

Figure 1: Inside View of Cisco UCS B200 M6 Blade Server

Note The CPUs on the Cisco UCS B200 M6 blade server are in opposite locations compared to previous generations. On the UCS B200 M6 blade server, CPU 1 is at the rear of the blade (the side nearest the internal connectors) and CPU 2 is at the front of the blade (the side nearest the faceplate and external ports and connectors).



1	Front mezzanine connector	2	DIMM slots DIMMs are secured by white or yellow latches. White latches indicate the memory is connected to CPU 1. Yellow latches indicate the memory is connected to CPU 2.
3	CPU socket 1 (Populated) CPU 1 connects to DIMMs with a white DIMM latch. This CPU socket must always be populated. If your server will run with only one CPU, the CPU must be installed in this socket.	4	CPU socket 2 (Unpopulated) CPU 2 connects to DIMMs with a yellow DIMM latch. This CPU socket is populated in a normal, dual-CPU deployment. If your server will run with only one CPU, the CPU must be installed CPU socket 1.
5	CPU heatsink install guide pins	6	mLOM connector
7	Rear mezzanine connector		

Removing and Installing the Top Cover

The server top cover provides protection and proper airflow for the internal components. The top cover is secured by a release button on the top of the blade.

To remove and replace the server top cover, follow this procedure:

- Removing the Top Cover, on page 3
- Installing the Top Cover, on page 3

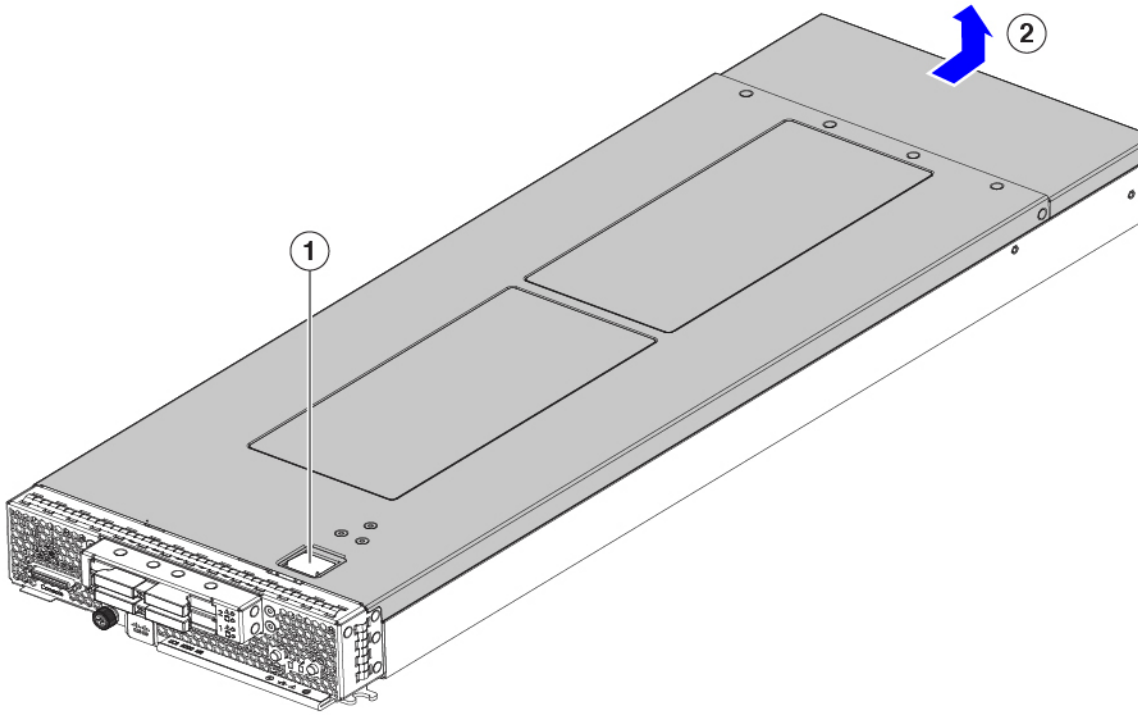
Removing the Top Cover

To remove the server top cover, the blade must be removed from the chassis.

Procedure

Step 1 Press and hold the release button down.

Step 2 While holding the release button down, lift the rear of the cover up, and slide it off of the blade.



What to do next

Reinstall the top cover. See Installing the Top Cover, on page 3.

Installing the Top Cover

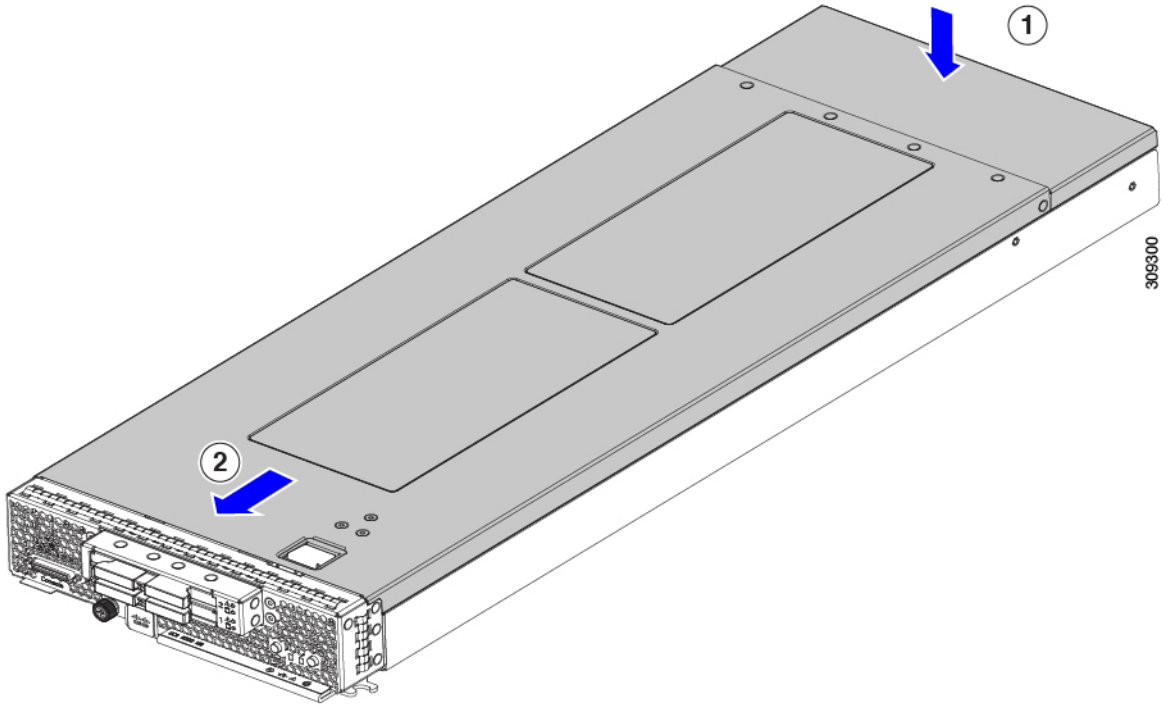
Use this procedure to install the server top cover.

Procedure

Step 1 Align the pins on the rear of the server with the channel in the top cover.

Step 2 Seat the cover on the sheet metal.

Step 3 Holding the front edge of the server down, slide it forward until it locks into place.



Replacing the Rear Mezzanine Module

To replace the rear mezzanine module, see the following:

- Installing the Rear Mezzanine Module, on page 6
- Removing the Rear Mezzanine Module, on page 4

Removing the Rear Mezzanine Module

Use this task to remove the rear mezzanine module.

If you are removing the virtual interface card (VIC) in the mLOM slot, you must first remove the rear mezzanine module.

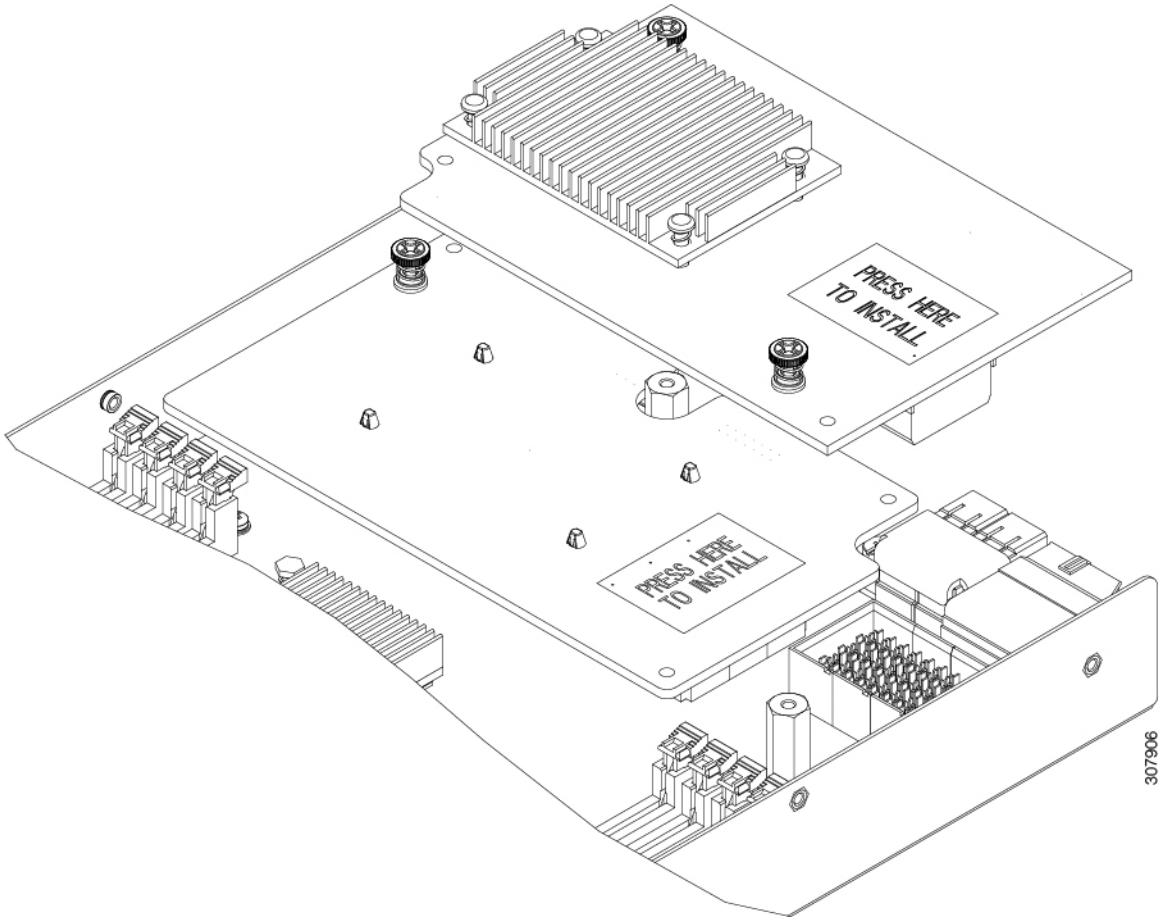
Procedure

Step 1 Using a #2 Phillips screwdriver, loosen the two rear mezzanine module captive screws.

Step 2 Grasp the rear mezzanine module where "PRESS HERE TO INSTALL" is stamped onto the module.

Step 3 Lift the module to disconnect it from its motherboard connector.

Figure 2: Removing the Rear Mezzanine Module



Note
While removing the rear mezzanine module from the motherboard, you might find it helpful to gently rock the rear mezzanine module along the length of the motherboard connector until it loosens.

What to do next

If you will be removing the virtual interface card (VIC), see Removing a Virtual Interface Card from the mLOM Slot, on page 31.

Installing the Rear Mezzanine Module

The rear mezzanine module slot is located above the mLOM module slot. Depending on your server, the mLOM module slot could host a virtual interface card (VIC). This procedure assumes that a VIC is installed.

If your server has a VIC, make sure that it is installed before installing the rear mezzanine module. See Installing Virtual Interface Card in the mLOM Slot, on page 32.

Use this procedure to install a rear mezzanine module.

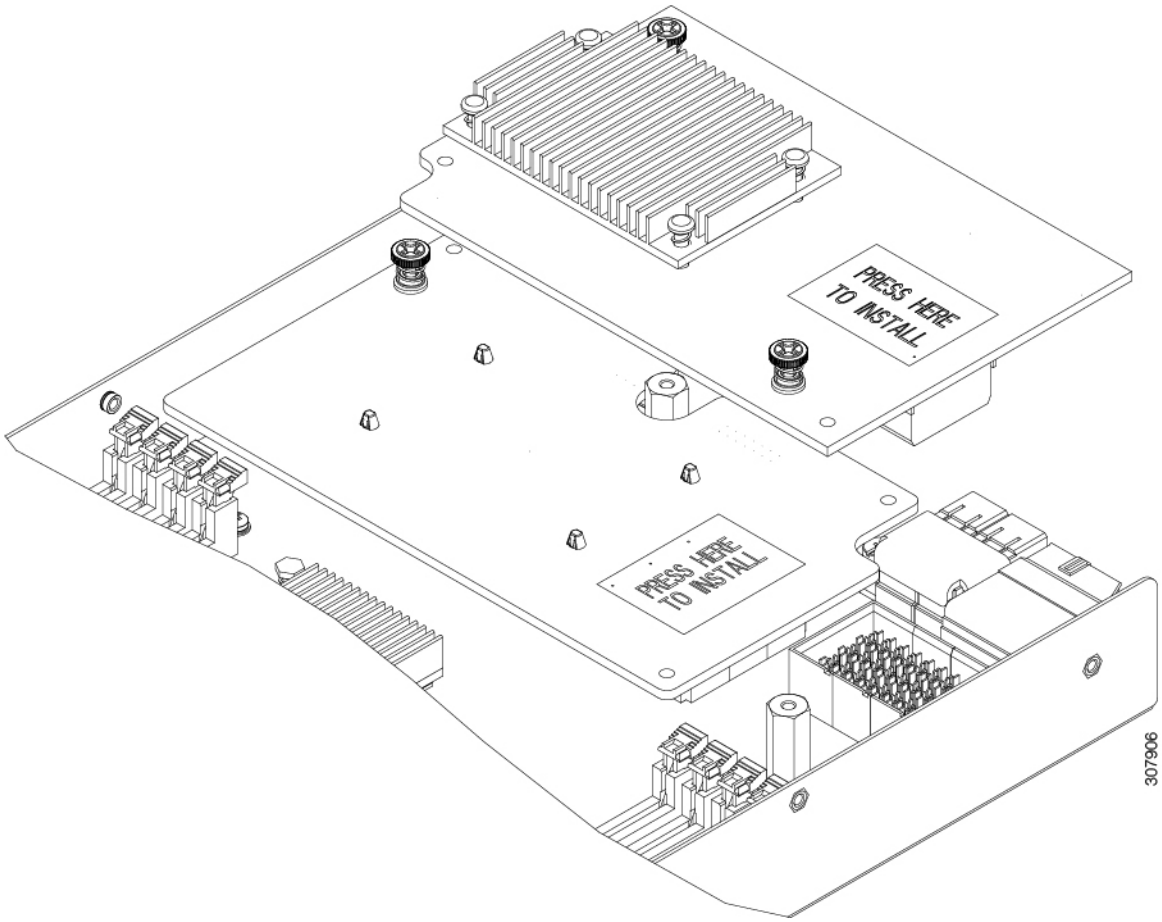
Procedure

Step 1 Position the rear mezzanine module above the motherboard connector and align the two rear mezzanine module captive screws with the standoff posts on the motherboard.

Step 2 Firmly press the rear mezzanine module into the motherboard connector where `PRESS HERE TO INSTALL` is stamped on the module.

Step 3 Using a #2 Phillip screwdriver, tighten the two rear mezzanine module captive screws.

Figure 3: Installing the Rear Mezzanine Module



Replacing CPUs and Heatsinks

When the blade server is shipped from the factory, all the components are installed. The following illustration shows the various parts of the assembled and installed CPU.

Figure 4: Overview of CPU Assembly

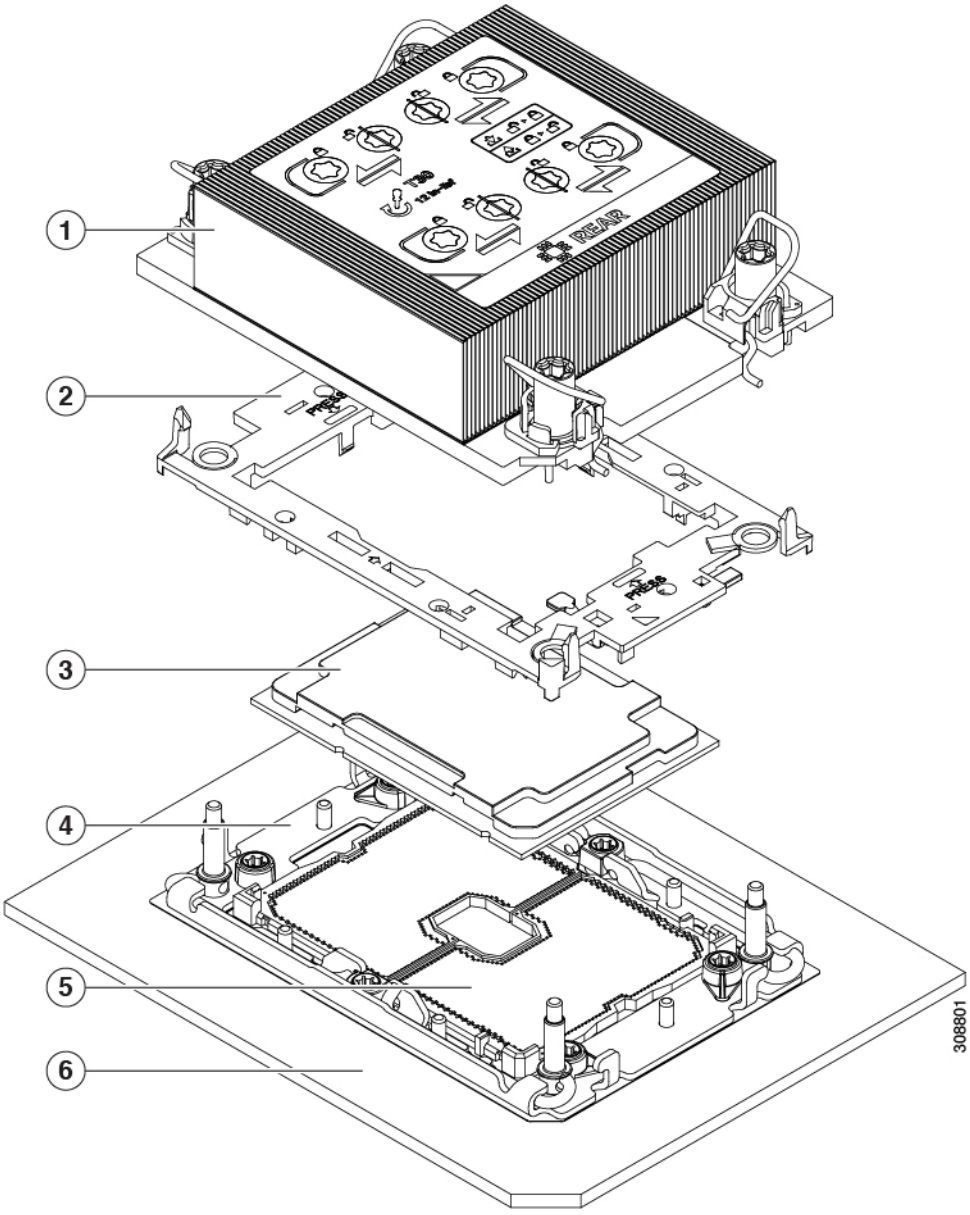


Table 1: CPU Assembly Parts

1	Heatsink	2	CPU carrier
3	CPU	4	Bolster Plate on server motherboard
5	CPU Socket	6	Blade server motherboard

Any replacement CPUs are shipped in a separate shipping package which contains the CPU, CPU carrier, and a fixture.

To replace a CPU, you will remove the CPU from the fixture, then install the CPU into the CPU socket on the server motherboard. See the following topics:

- Required Tools for CPU and Heatsink Replacement, on page 9
- Removing CPUs and Heatsinks, on page 9
- Installing CPUs and Heatsinks, on page 15

Required Tools for CPU and Heatsink Replacement

The following tools are required for replacing server CPUs and heatsinks:

- T-30 Torx driver—Supplied with replacement CPU.
- #1 flat-head screwdriver—Supplied with replacement CPU.
- CPU assembly tool—Supplied with replacement CPU.

  Can be ordered separately as Cisco PID UCS-CPUAT=.
- Heatsink cleaning kit—Supplied with replacement CPU.

  Can be ordered separately as Cisco PID UCSX-HSCK=.
- Thermal interface material (TIM)—Syringe supplied with replacement CPU.

  Can be ordered separately as Cisco PID UCS-CPU-TIM=.



Note Blades can ship with either a dual CPU or single CPU configuration. If your blade is a single CPU config, the unpopulated CPU socket will ship with a dust cover.

- If your blade ships with a dual CPU config, no CPU dust cover is shipped.
- If you have a dual CPU config, and you are removing one CPU to run as a single-CPU blade, you will need to install a CPU dust cover on the unpopulated CPU socket. In this situation, you will need to order the CPU dust cover, which is available directly from the dust cover manufacturer. Use the following information to order dust covers:
  - Manufacturer: Foxconn Interconnect Tech (FIT)
  - Dust Cover: WNMBD00-1NNK0-EH
  - Go the Manufacturer website.

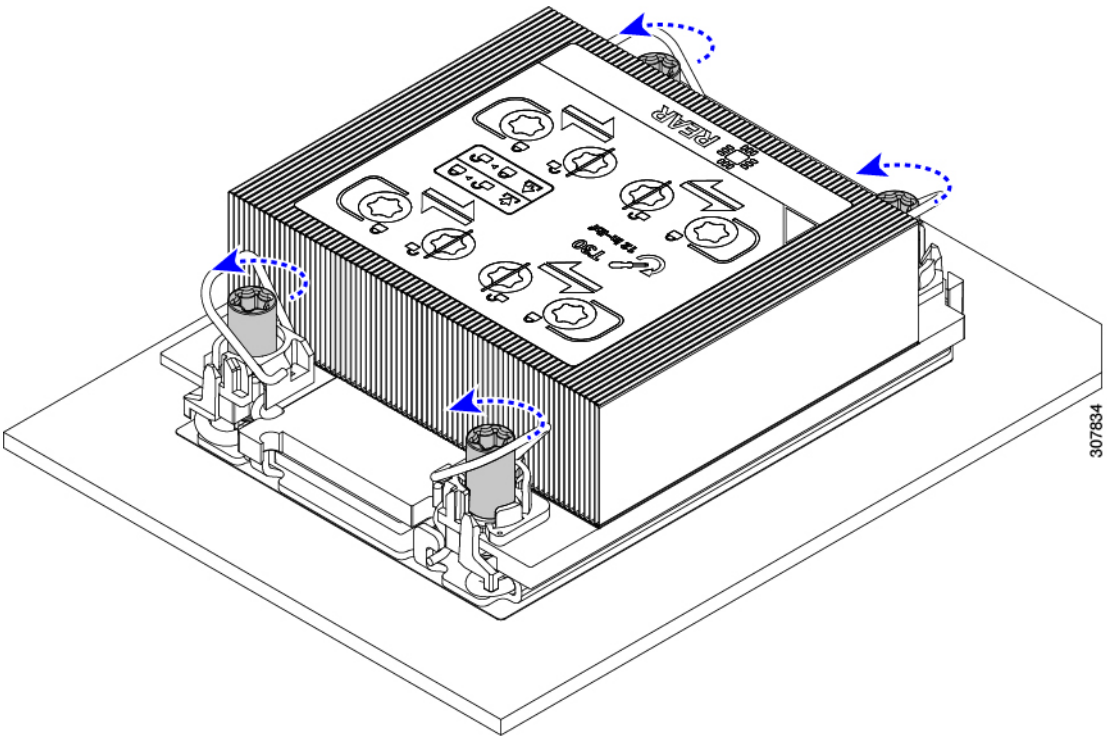
Removing CPUs and Heatsinks

Use the following procedure to remove an installed CPU and heatsink from the blade server. With this procedure, you will remove the CPU from the motherboard, disassemble individual components, then place the CPU and heatsink into the fixture that came with the CPU.

Procedure

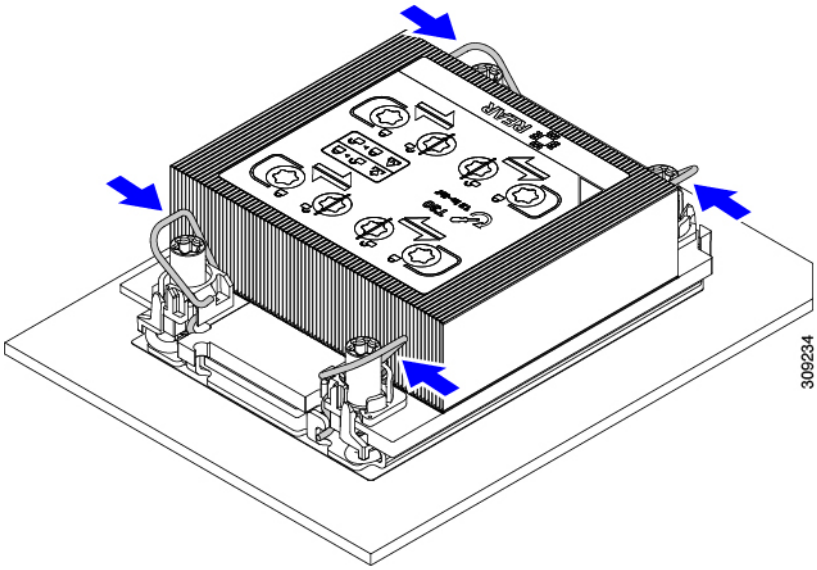
Step 1 Detach the CPU and heatsink (the CPU assembly) from the CPU socket.

a) Using the T30 Torx driver, loosen all the securing nuts.



b) Push the rotating wires towards each other to move them to the unlocked position.

Caution
Make sure that the rotating wires are as far inward as possible. When fully unlocked, the bottom of the rotating wire disengages and allows the removal of the CPU assembly. If the rotating wires are not fully in the unlocked position, you can feel resistance when attempting to remove the CPU assembly.



Step 2 Remove the CPU assembly from the motherboard.

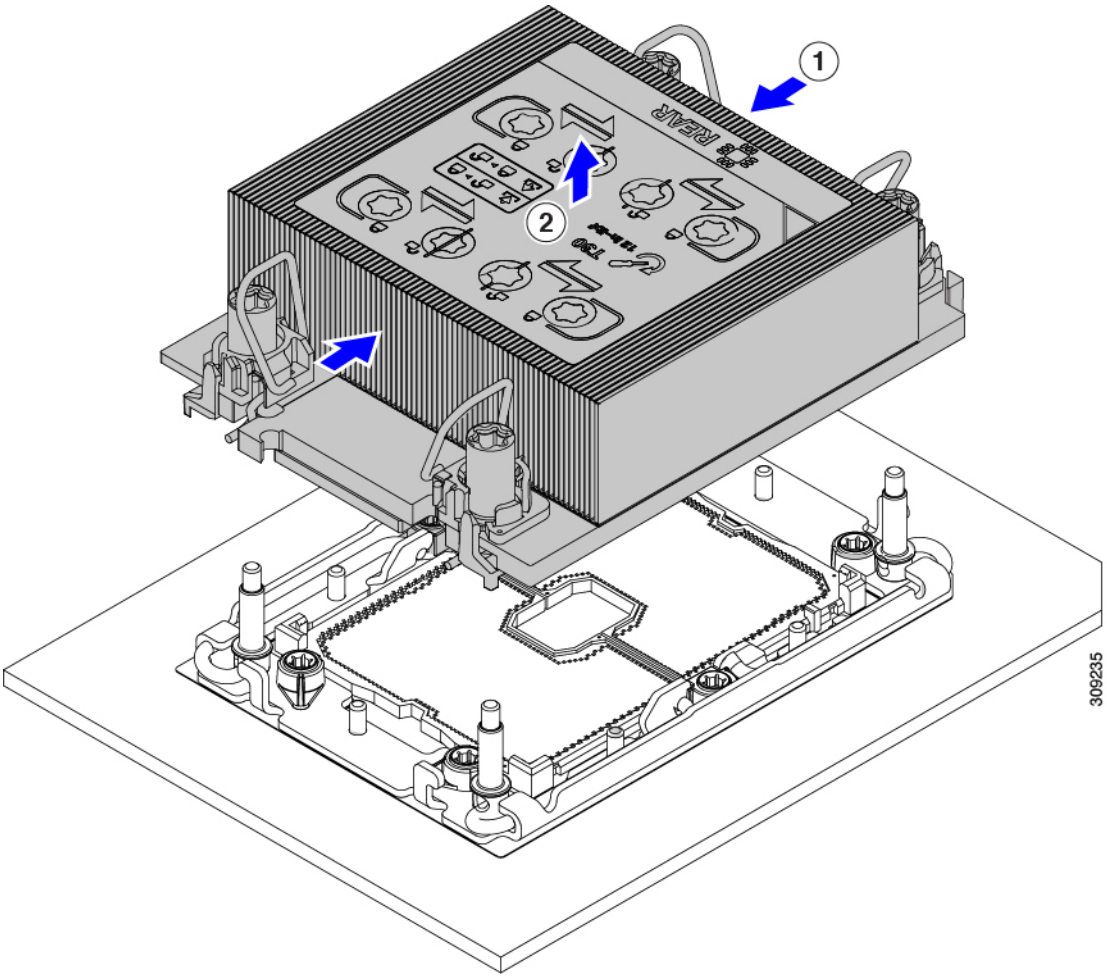
a) Grasp the heatsink along the edge of the fins and lift the CPU assembly off of the motherboard.

Caution
While lifting the CPU assembly, make sure not to bend the heatsink fins. Also, if you feel any resistance when lifting the CPU assembly, verify that the rotating wires are completely in the unlocked position.

b) Put the CPU assembly on a rubberized mat or other ESD-safe work surface.

When placing the CPU on the work surface, the heatsink label should be facing up. Do not rotate the CPU assembly upside down.

c) Ensure that the heatsink sits level on the work surface.

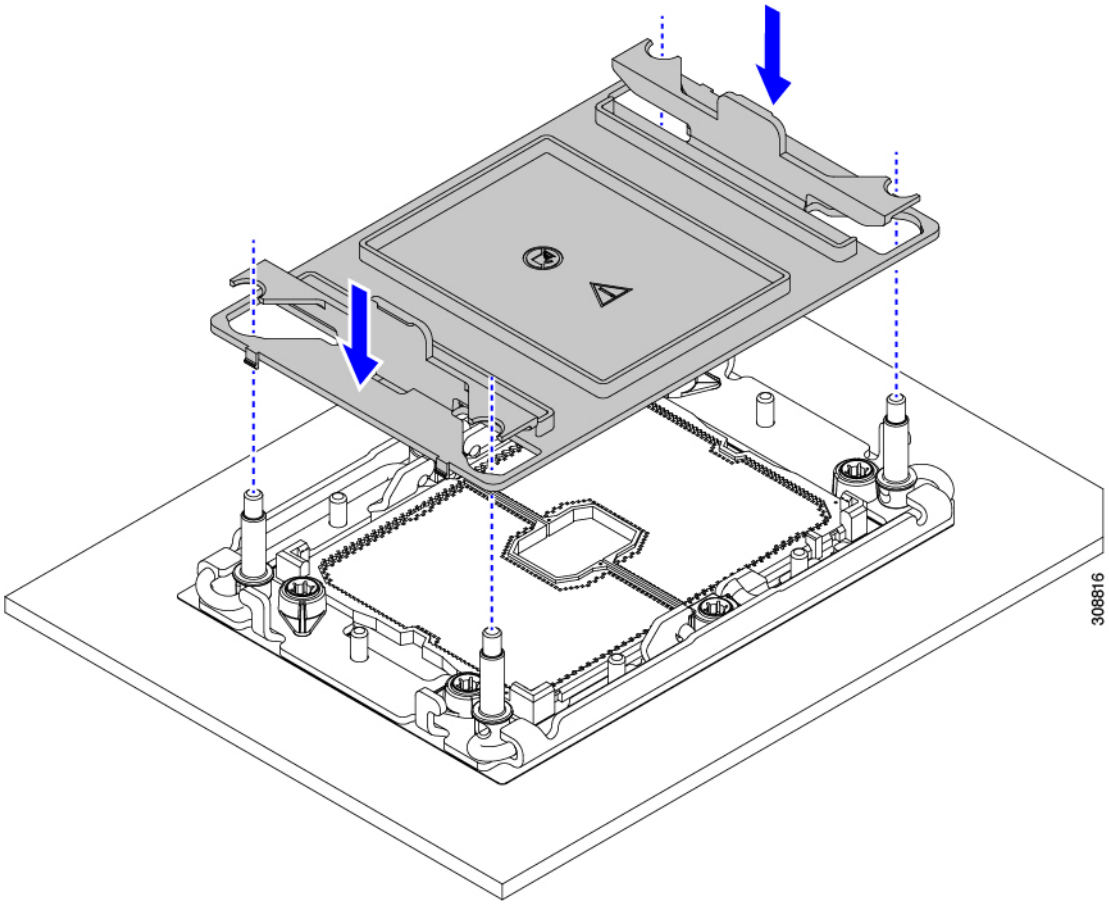


Step 3 Attach a CPU dust cover to the CPU socket.

The dust cover is orderable directly from the manufacturer. For more information, see Required Tools for CPU and Heatsink Replacement, on page 9.

a) Align the posts on the CPU bolstering plate with the cutouts at the corners of the dust cover.
b) Lower the dust cover and simultaneously press down on the edges until it snaps into place over the CPU socket.

Caution
Do not press down in the center of the dust cover!



Step 4 Detach the CPU from the CPU carrier by disengaging CPU clips and using the TIM breaker.

a) Turn the CPU assembly upside down, so that the heatsink is pointing down.

This step enables access to the CPU securing clips.

b) Gently lift the TIM breaker (1 in the following illustration) in a 90-degree upward arc to partially disengage the CPU clips on this end of the CPU carrier.

c) Lower the TIM breaker into the u-shaped securing clip to allow easier access to the CPU carrier.

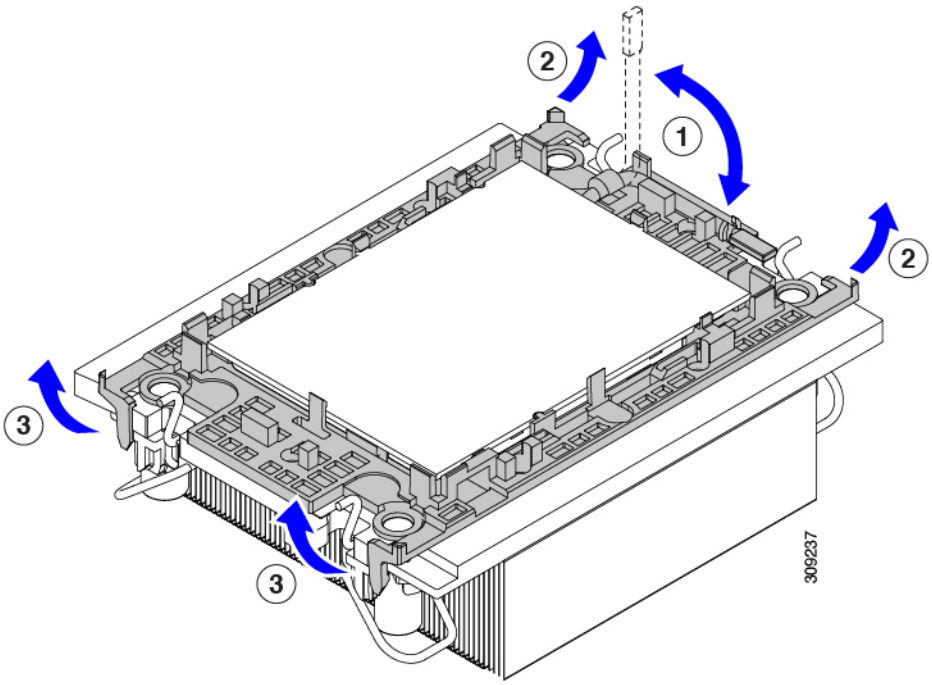
Note
Make sure that the TIM breaker is completely seated in the securing clip.

d) Gently pull up on the outer edge of the CPU carrier (2) so that you can disengage the second pair of CPU clips near both ends of the TIM breaker.

Caution
Be careful when flexing the CPU carrier! If you apply too much force you can damage the CPU carrier. Flex the carrier only enough to release the CPU clips. Make sure to watch the clips while performing this step so that you can see when they disengage from the CPU carrier.

e) Gently pull up on the outer edge of the CPU carrier so that you can disengage the pair of CPU clips (3 in the following illustration) which are opposite the TIM breaker.

f) Grasp the CPU carrier along the short edges and lift it straight up to remove it from the heatsink.



Step 5 Transfer the CPU and carrier to the fixture.

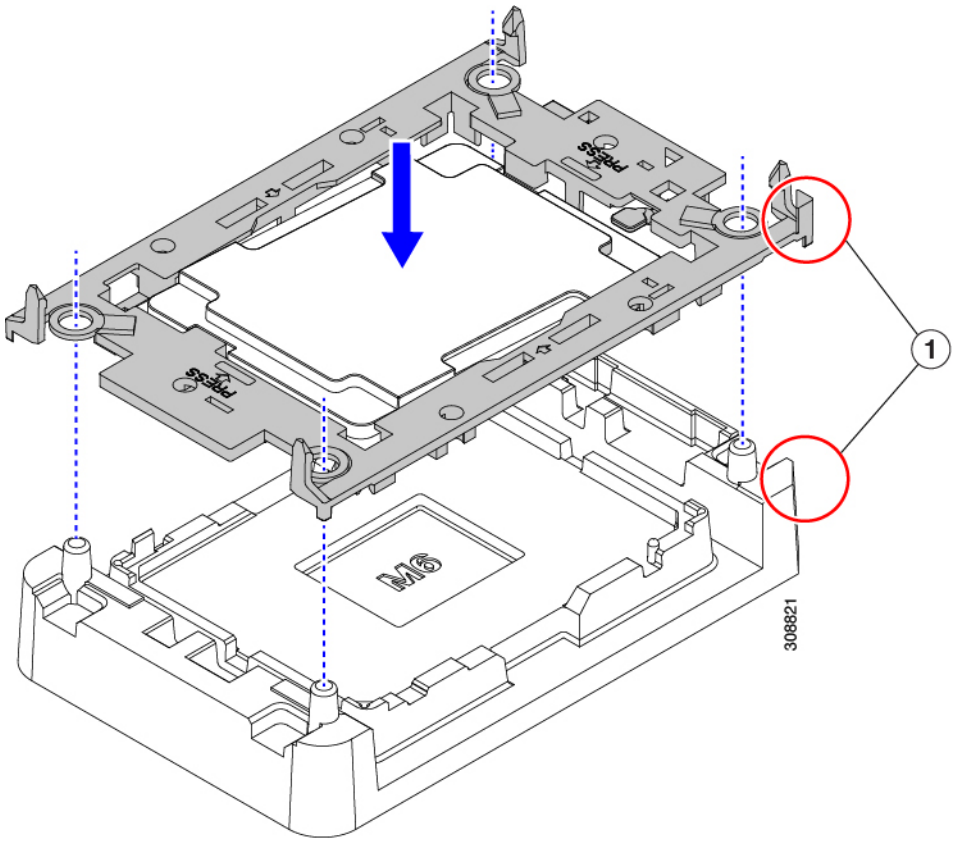
a) When all the CPU clips are disengaged, grasp the carrier and lift it and the CPU to detach them from the heatsink.

Note
If the carrier and CPU do not lift off of the heatsink, attempt to disengage the CPU clips again.

b) Flip the CPU and carrier right-side up so that the words PRESS are visible.

c) Align the posts on the fixture and the pin 1 locations on the CPU carrier and the fixture (1 in the following illustration).

d) Lower the CPU and CPU carrier onto the fixture.



Step 6 Use the provided cleaning kit (UCSX-HSCK) to remove all of the thermal interface barrier (thermal grease) from the CPU, CPU carrier, and heatsink.

Important
Make sure to use only the Cisco-provided cleaning kit, and make sure that no thermal grease is left on any surfaces, corners, or crevices. The CPU, CPU carrier, and heatsink must be completely clean.

What to do next

Choose the appropriate option:

- If you will be installing a CPU, go to Installing CPUs and Heatsinks, on page 15.
- If you will not be installing a CPU, verify that a CPU socket cover is installed. This option is valid only for CPU socket 2 because CPU socket 1 must always be populated in a runtime deployment.

Installing CPUs and Heatsinks

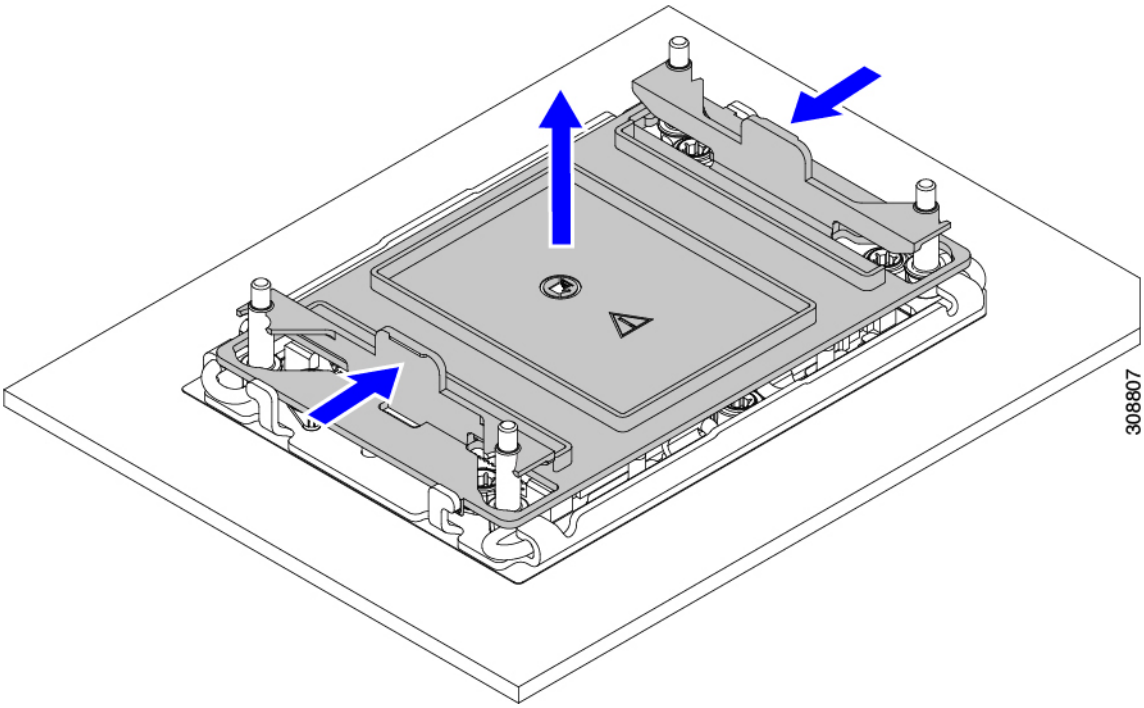
Use this procedure to install a CPU if you have removed one, or if you are installing a CPU in an empty CPU socket. To install the CPU, you will move the CPU to the fixture, then attach the CPU assembly to the CPU socket on the server mother board.

Procedure

Step 1 Remove the CPU socket dust cover on the server motherboard.

a) Push the two vertical tabs inward to disengage the dust cover.

b) While holding the tabs in, lift the dust cover up to remove it.



c) Store the dust cover for future use.

Caution
Do not leave an empty CPU socket uncovered. If a CPU socket does not contain a CPU, you must install a CPU dust cover.

Step 2 Grasp the CPU fixture on the edges labeled PRESS, lift it out of the tray, and place the CPU assembly on an ESD-safe work surface.

Step 3 Apply new TIM.

Note
The heatsink must have new TIM on the heatsink-to-CPU surface to ensure proper cooling and performance.

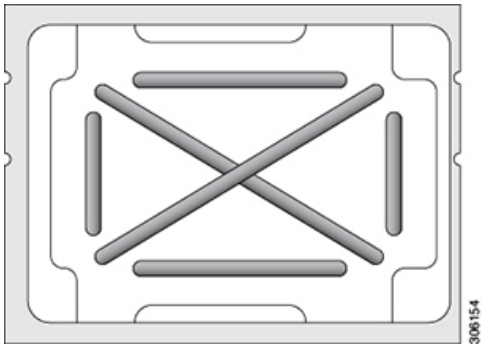
- If you are installing a new heatsink, it is shipped with a pre-applied pad of TIM. Go to step 4.
- If you are reusing a heatsink, you must remove the old TIM from the heatsink and then apply new TIM to the CPU surface from the supplied syringe. Continue with step **a** below.

a) Apply the Bottle #1 cleaning solution that is included with the heatsink cleaning kit (UCSX-HSCK=), as well as the spare CPU package, to the old TIM on the heatsink and let it soak for a least 15 seconds.

b) Wipe all of the TIM off the heatsink using the soft cloth that is included with the heatsink cleaning kit. Be careful to avoid scratching the heatsink surface.

c) Completely clean the bottom surface of the heatsink using Bottle #2 to prepare the heatsink for installation.
d) Using the syringe of TIM provided with the new CPU (UCS-CPU-TIM=), apply 1.5 cubic centimeters (1.5 ml) of thermal interface material to the top of the CPU. Use the pattern shown in the following figure to ensure even coverage.

Figure 5: Thermal Interface Material Application Pattern



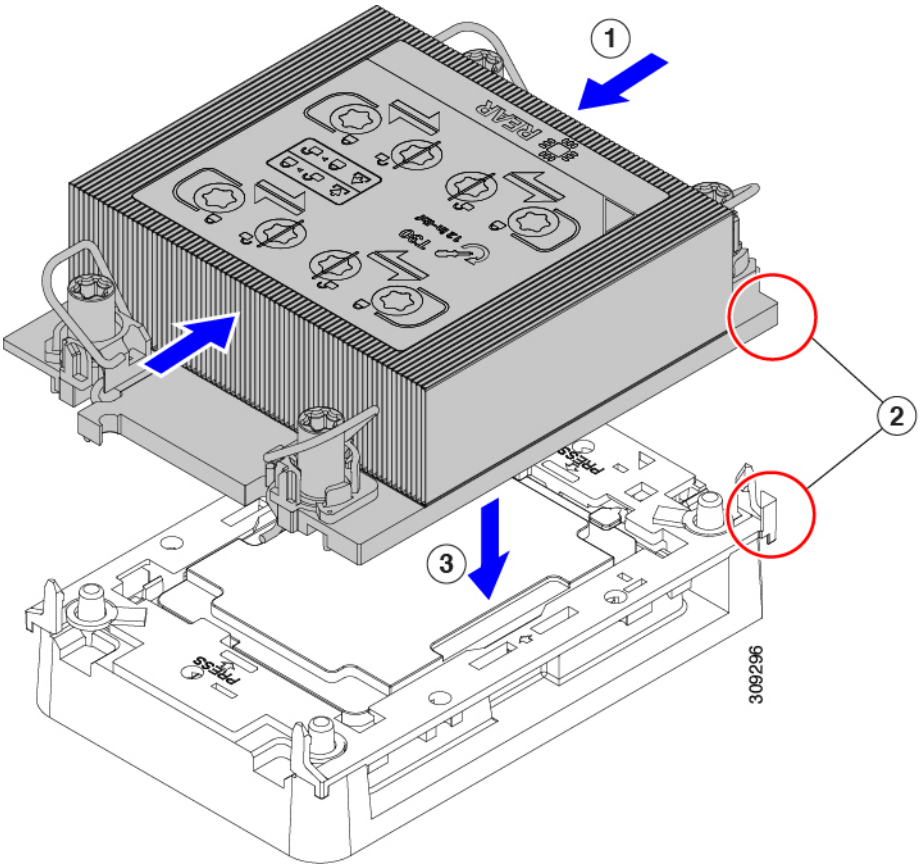
Caution
Use only the correct heatsink for your CPU. CPU 1 uses heatsink UCSB-HS-M6-R and CPU 2 uses heatsink UCSB-HS-M6-F.

Step 4 Attach the heatsink to the CPU fixture.

a) Grasp the heatsink by the fins (1, in the following illustration), align pin 1 location of the heatsink with the pin 1 location on the CPU fixture (2), then lower the heatsink onto the CPU fixture.

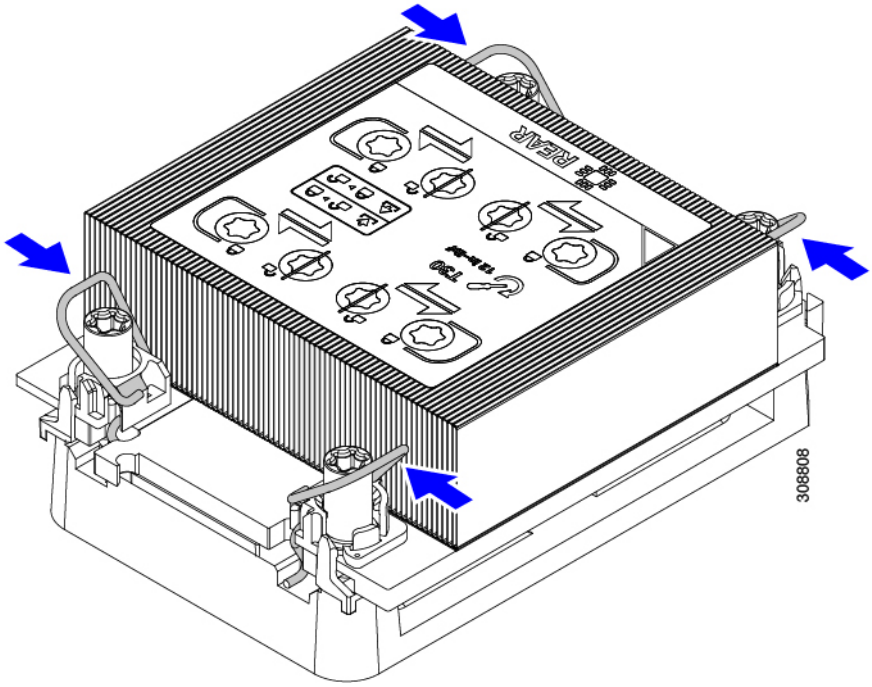
The heatsink is correctly oriented when the embossed triangle points to the CPU pin 1 location, as shown.

Caution
Make sure the rotating wires are in the unlocked position so that the feet of the wires do not impede installing the heatsink.



Step 5 Install the CPU assembly onto the CPU motherboard socket.

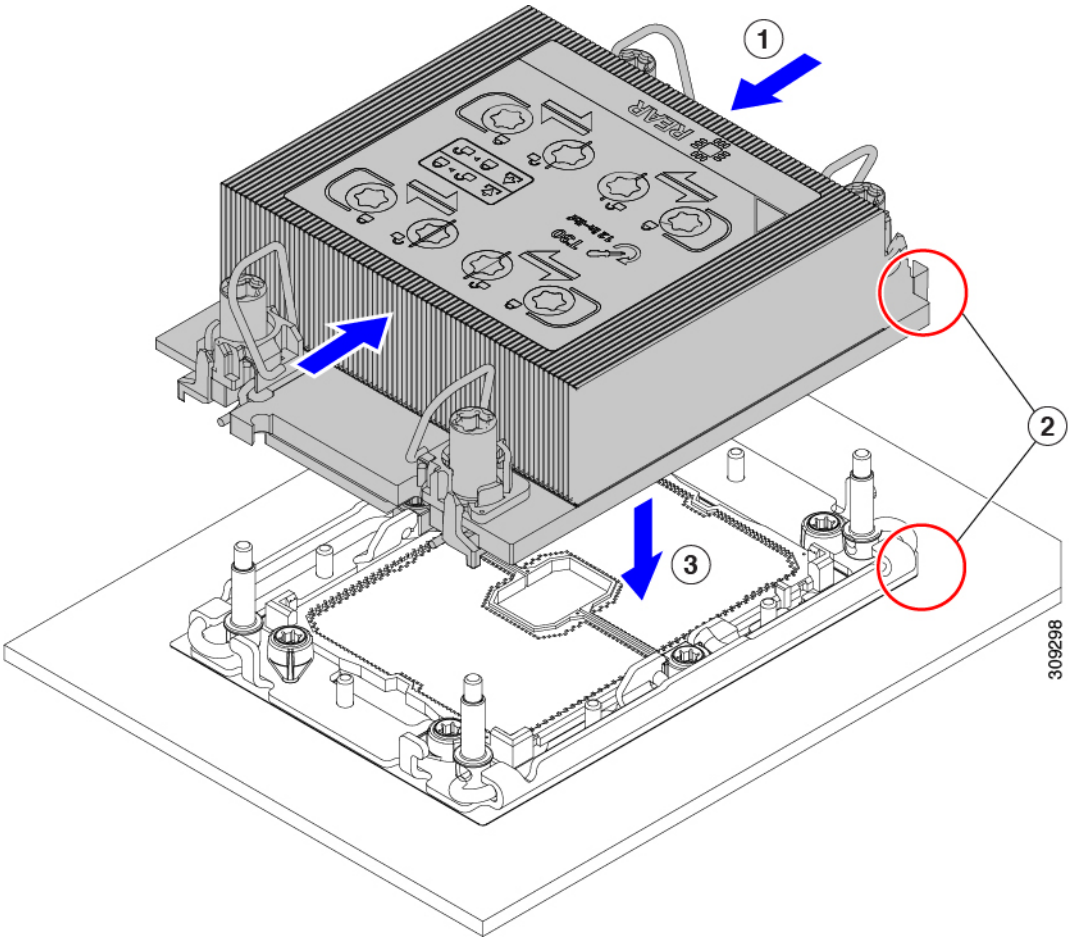
a) Push the rotating wires inward to the unlocked position so that they do not obstruct installation.



b) Grasp the heatsink by the fins (1 in the following illustration), align the pin 1 location on the heatsink with the pin 1 location on the CPU socket (2), then seat the heatsink onto the CPU socket.

The heatsink is correctly oriented when the embossed triangle points to the CPU pin 1 location, as shown.

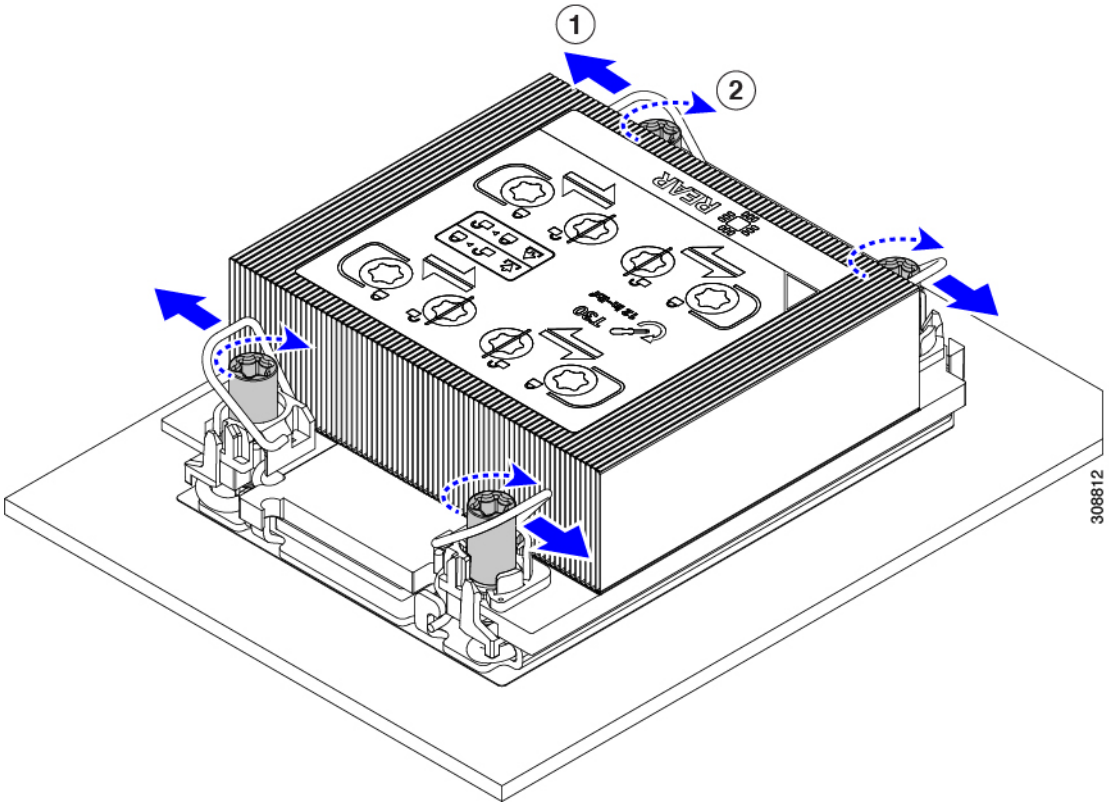
Caution
Make sure the rotating wires are in the unlocked position so that the feet of the wires do not impede installing the heatsink.



c) Push the rotating wires away from each other to lock the CPU assembly into the CPU socket (1 in the following illustration).

Caution
Make sure that you close the rotating wires completely before using the Torx driver to tighten the securing nuts.

d) Set the T30 Torx driver to 12 in-lb of torque and tighten the 4 securing nuts in a diagonal pattern to secure the CPU to the motherboard (2). You can start with any nut, but make sure to tighten the securing nuts in a diagonal pattern.



Replacing Memory DIMMs

To replace a memory DIMM, see the following topics:

- DIMM Slot Identifiers, on page 21
- Memory Population Guidelines, on page 23
- Removing DIMMs or DIMM Blanks, on page 26
- Installing DIMMs or DIMM Blanks, on page 28
- Memory Performance, on page 30
- Memory Mirroring and RAS, on page 31

DIMM Slot Identifiers

This blade server contains 32 DIMM slots—16 per CPU

To assist with identification, each DIMM slot displays its memory processor and slot ID on the motherboard. For example, P1 A1 indicates slot A1 for processor 1.

Also, you can further identify which DIMM slot connects to which CPU by the latch color for the DIMM slot.

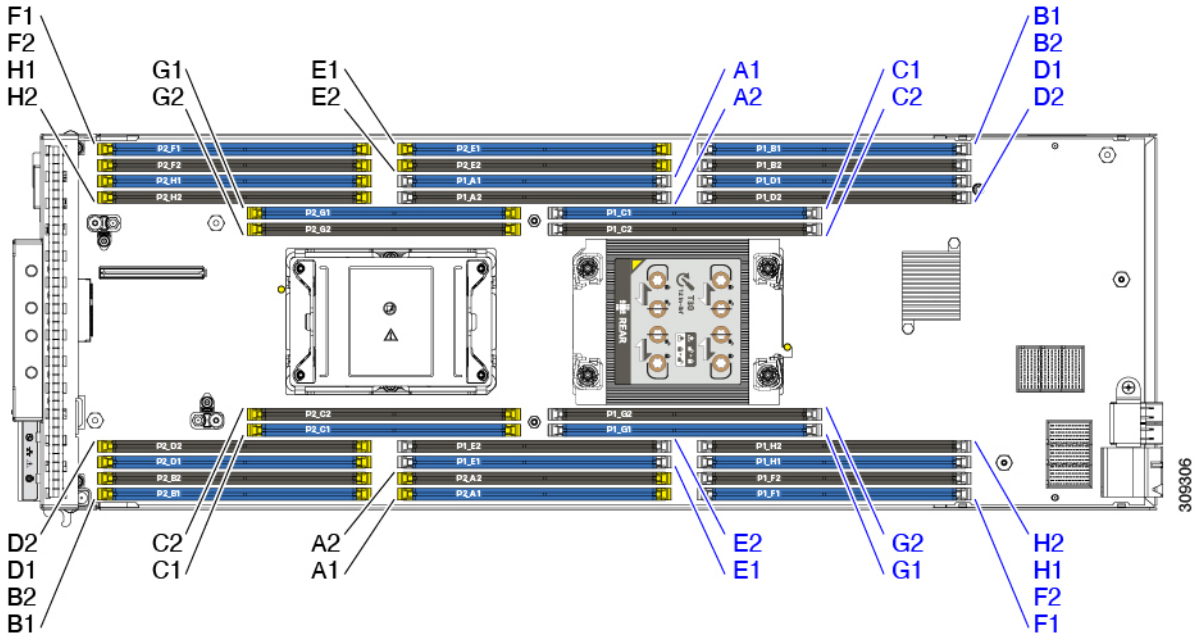
- All DIMM slots with white latches are connected to CPU 1.
- All DIMM slots with yellow latches are connected to CPU 2.
- DIMM slots with white and yellow latches are oriented 180 degrees from each other due to the keying in the slot. While installing DIMMs in sockets with white latches, you will need to rotate the DIMMs 180 degrees.

Caution If you feel resistance while seating a DIMM into its socket, do not force the DIMM or you risk damaging the DIMM or the slot. Check the keying on the slot and verify it against the keying on the bottom of the DIMM. When the DIMM's and slot's keys are aligned, reinstall the DIMM.

For each CPU, each set of 16 DIMMs is arranged into 8 channels, where each channel has two DIMMs. Each DIMM slot is numbered 1 or 2, and each DIMM slot 1 is blue and each DIMM slot 2 is black. Each channel is identified by two pairs of letters and numbers where the first pair indicates the processor, and the second pair indicates the memory channel and slot in the channel.

- Channels for CPU 1 are P1 A1 and A2, P1 B1 and B2, P1 C1 and C2, P1 D1 and D2, P1 E1 and E2, P1 F1 and F2, P1 G1 and G2, P1 H1 and H2.
- Channels for CPU 2 are P2 A1 and A2, P2 B1 and B2, P2 C1 and C2, P2 D1 and D2, P2 E1 and E2, P2 F1 and F2, P2 G1 and G2, P2 H1 and H2.

The following figure shows how DIMMs and channels are physically laid out and numbered. DIMM channel and slot IDs for CPU 1 are shown in blue text, and DIMM channel and slot IDs for CPU 2 are shown in black text.



Memory Population Guidelines

The following is a partial list of memory usage and population guidelines. For detailed information about memory usage and population, download the Cisco UCS C220/C240/B200 M6 Memory Guide.

Caution Only Cisco memory is supported. Third-party DIMMs are not tested or supported.

- All DIMMs must be all DDR4 DIMMs and/or DDR4 and Intel Optane persistent memory 200 series (Intel Optane PMem 200 series) DIMMs.
- x4 DIMMs are supported.
- DDR4 memory is supported as documented in the *Cisco UCS B200 M6 Spec Sheet*. See https://www.cisco.com/c/dam/en/us/products/collateral/servers-unified-computing/ucs-b-series-blade-servers/b200m6-specsheet.pdf.
- DDR4 and Intel Optane Persistent Memory Series 200 DIMMs are supported as specified in the *Cisco UCS B200 M6 Spec Sheet*. See https://www.cisco.com/c/dam/en/us/products/collateral/servers-unified-computing/ucs-b-series-blade-servers/b200m6-specsheet.pdf.
- For memory population rules, see the *Cisco UCS B200 M6 Spec Sheet*. See https://www.cisco.com/c/dam/en/us/products/collateral/servers-unified-computing/ucs-b-series-blade-servers/b200m6-specsheet.pdf.
- DIMMs must be loaded lowest number slot first.
- Memory ranks are 64- or 72-bit chunks of data that each memory channel for a CPU can use. Each memory channel can support a maximum of 8 memory ranks. For quad-rank DIMMs, a maximum of 2 DIMMs are supported per channel (4 ranks * 2 DIMMs).
- Mixed ranks of DIMMs are allowed in the same channel, but you must populate higher quantity rank DIMMs in the lower numbered slots.
- All slots must be populated with either a DIMM or a DIMM blank. For installation instructions, see Installing DIMMs or DIMM Blanks, on page 28.

Memory Population Order

The Cisco UCS B200 M6 blade has two memory options, DIMMs only or DIMMs plus Intel Optane PMem 200 series memory.

Memory slots are color coded, blue and black. The color-coded channel population order is blue slots first, then black.

For optimal performance, populate DIMMs in the order shown in the following table, depending on the number of CPUs and the number of DIMMs per CPU. If your server has two CPUs, balance DIMMs evenly across the two CPUs as shown in the table.

Note The table below lists recommended configurations. Using 3, 5, 7, 9, 10, 11, or 13-15 DIMMs per CPU is not recommended. Other configurations will result in reduced performance.

The following table shows the memory population order for DDR4 DIMMs.

Table 2: DIMMs Population Order

Number of DDR4 DIMMs per CPU (Recommended Configurations)	Populate CPU 1 Slot		Populate CPU2 Slots	
	P1 Blue #1 Slots P1_slot-ID	P1 Black #2 Slots P1_slot-ID	P2 Blue #1 Slots P2_slot-ID	P2 Black #2 Slots P2_slot-ID
1	A1	-	A1	-
2	A1, E1	-	A1, E1	-
4	A1, C1, E1, G1	-	A1, C1, E1, G1	-
6	A1, C1, D1, E1, G1, H1	-	A1, C1, D1, E1, G1, H1	-
8	A1, B1, C1, D1, E1, F1, G1, H1	-	A1, B1, C1, D1, E1, F1, G1, H1	-
12	A1, C1, D1, E1, G1, H1	A2, C2, D2, E2, G2, H2	A1, C1, D1, E1, G1, H1	A2, C2, D2, E2, G2, H2
16	All populated (A1 through H1)	All populated (A2 through H2)	All populated (A1 through H1)	All populated (A2 through H2)

The following table shows the memory population order for DIMMs plus Intel Optane PMem 200 Series memory.

Note CPU 1 and CPU 2 must be populated identically.

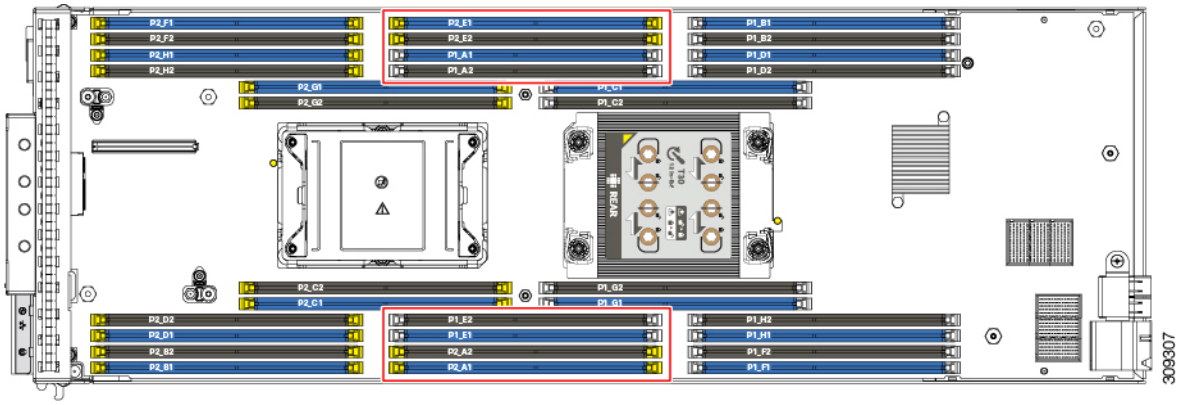
Note For only the 8+1 DIMM configuration, Memory mode is not supported. All other DIMM configuration support Memory mode and all other modes.

Table 3: DIMM Plus Intel Optane PMem 200 Series Memory Population Order Per CPU

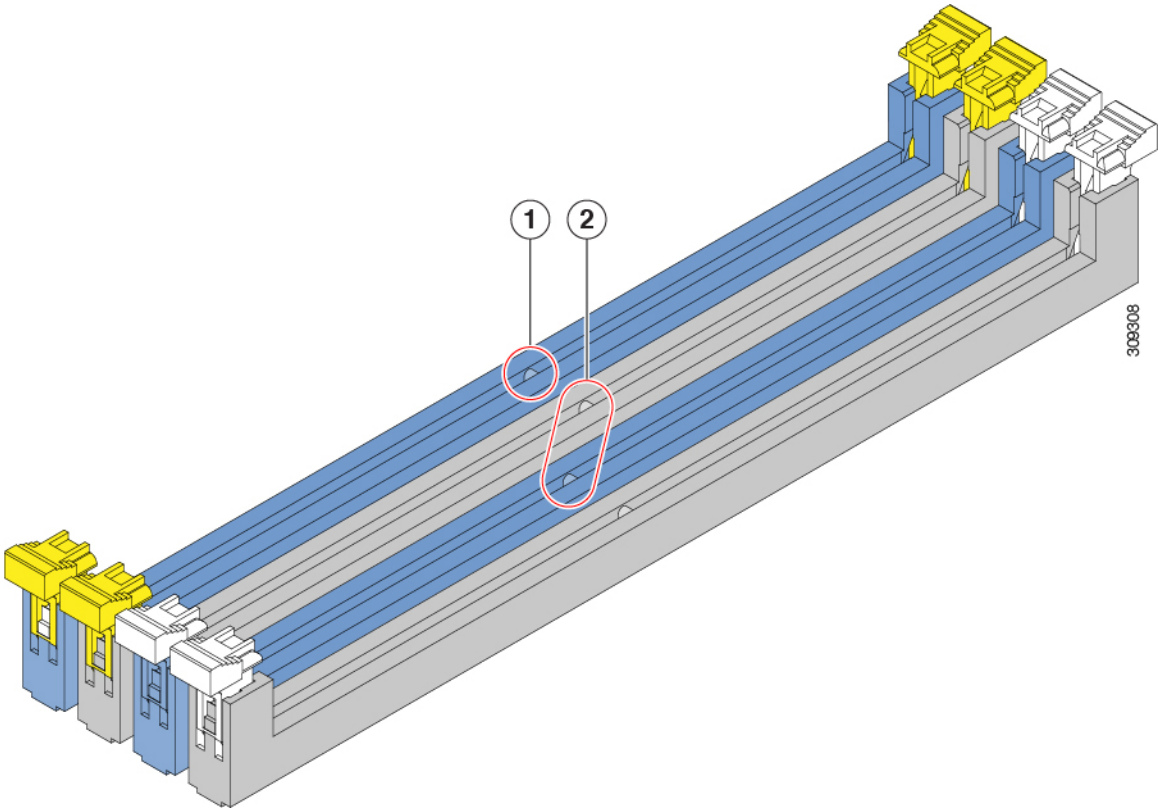
Total Number of DIMMs per CPU	DDR4 DIMM Slot	Intel Optane PMem 200 Series DIMM Slot
4+4 DIMM	A1, C1, E1, G1	B1, D1, F1, H1
8+1 DIMMs	A1, B1, C1, D1, E1, F1, G1, H1	A2
8+4 DIMMs	A1, B1, C1, D1, E1, F1, G1, H1	A2, C2, E2, G2
8+8 DIMMs	A1, B1, C1, D1, E1, F1, G1, H1	A2, B2, C2, D2, E2, F2, G2, H2

DIMM Slot Keying Consideration

DIMM slots with white and yellow latches are oriented 180 degrees from each other. In the center memory column, slots with white and yellow latches are next to each other, so the DIMM orientation must change depending on which slots you are populating with DIMMs.

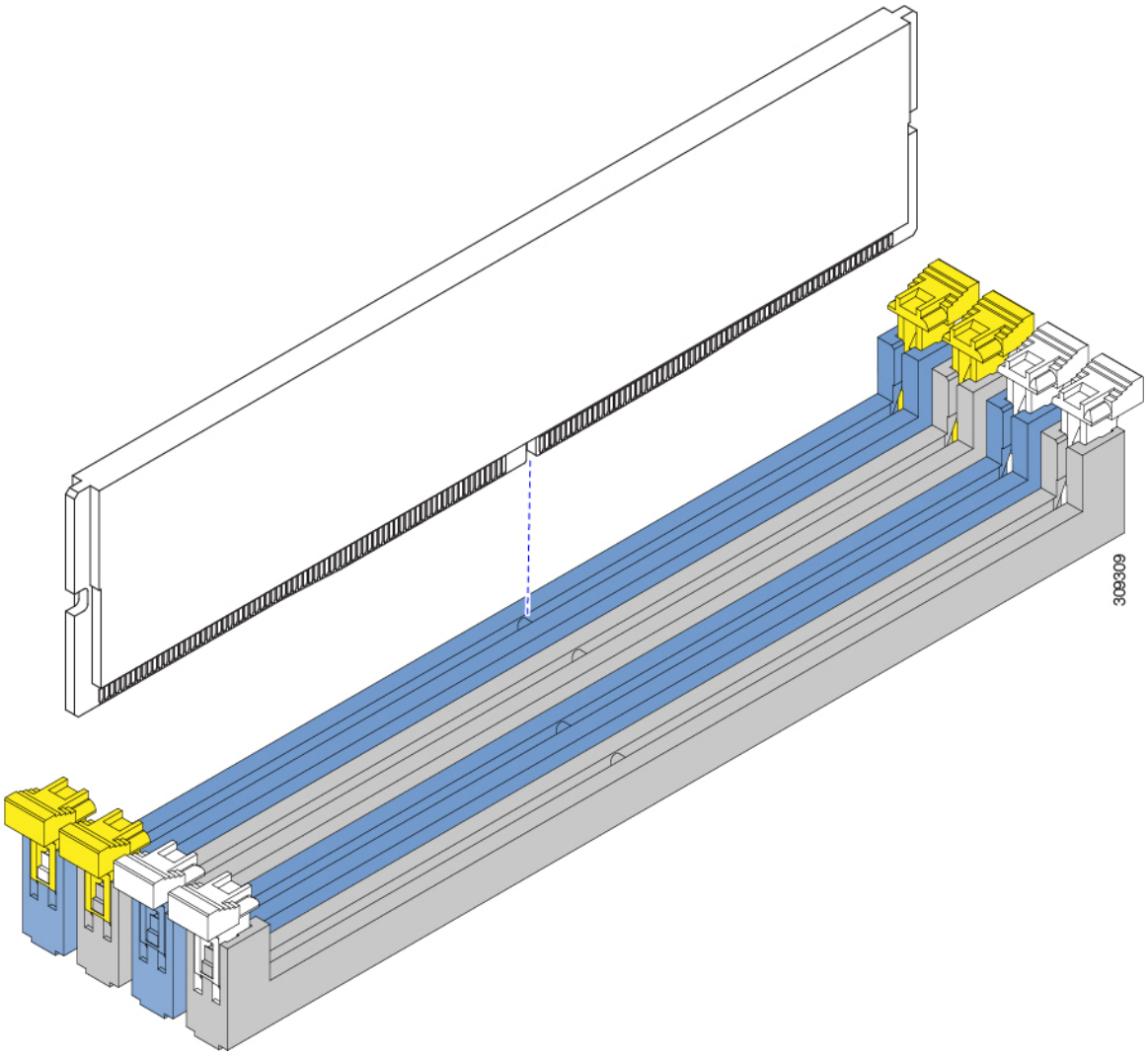


Each DIMM slot has a key that fits a notch in the DIMM, and because of the 180-degree orientation difference, the DIMM slot keys are at a different location for DIMM slots with white and yellow latches.



1	DIMM slot key
2	Example of DIMM slot key location difference

When installing a DIMM, always make sure that the key in the DIMM slot lines up with the notch in the DIMM.



Caution If you feel resistance while seating a DIMM into its socket, do not force the DIMM or you risk damaging the DIMM or the slot. Check the keying on the slot and verify it against the keying on the bottom of the DIMM. When the slot's key and the DIMM's notch are aligned, reinstall the DIMM.

Removing DIMMs or DIMM Blanks

The server top cover must be removed to access the DIMM slots.

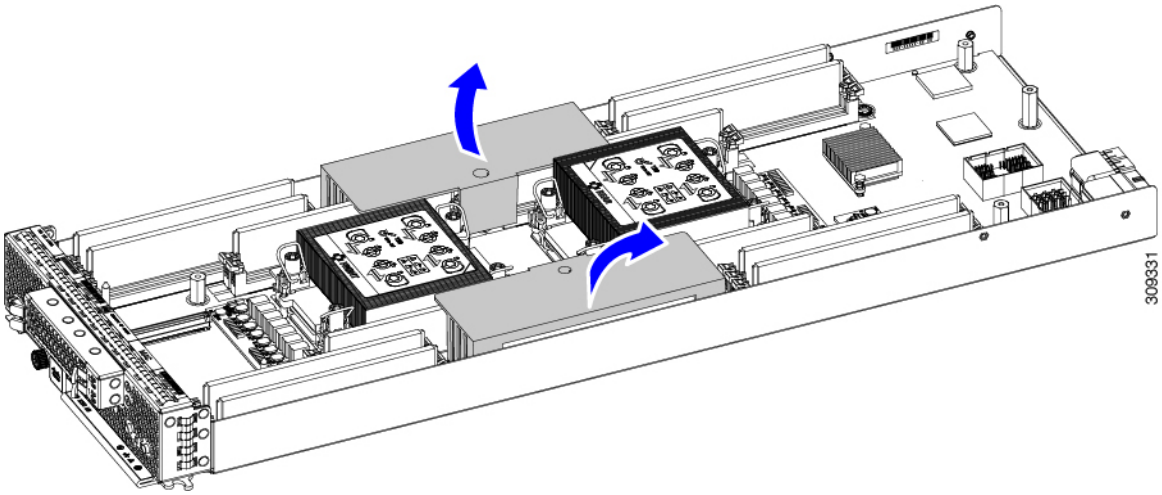
To remove a DIMM or a DIMM blank (UCS-DIMM-BLK=) from a slot on the blade server, follow these steps.

Procedure

Step 1 Grasp each DIMM baffle and lift it off of the blade.

Each DIMM baffle is fitted onto a standoff, so you need to pull straight up far enough to disconnect the baffle from the standoff.

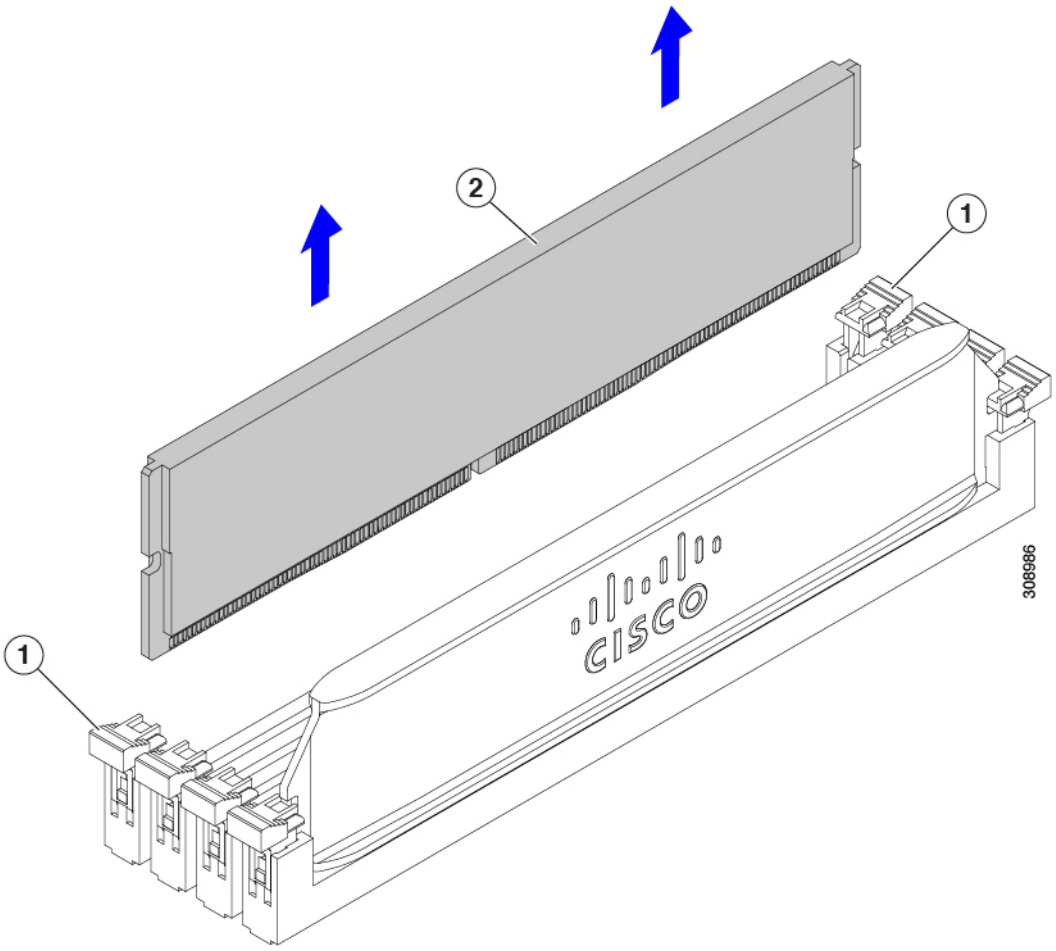
Note
You will find it helpful to remember each DIMM baffle's location on the blade.



Step 2 Open both DIMM connector latches by pushing them away from each other.

Step 3 Grasp each end of the DIMM or blank and lift it out of the socket.

Figure 6: Removing a DIMM or DIMM Blank



Step 4 If you are removing a DIMM blank and installing a DIMM, keep the DIMM blank in safe place.

Note
If you will not be installing a DIMM, you must install a DIMM blank. Do not operate the server with an empty DIMM slot.

What to do next

Go to Installing DIMMs or DIMM Blanks, on page 28.

Installing DIMMs or DIMM Blanks

To install a DIMM or a DIMM blank (UCS-DIMM-BLK=) into a slot on the blade server, follow these steps.

Caution White and yellow DIMM latches are oriented 180 degrees from other. Check the keying on the DIMM and its slot to verify that they are properly aligned before installing the DIMM. See DIMM Slot Identifiers, on page 21.

Procedure

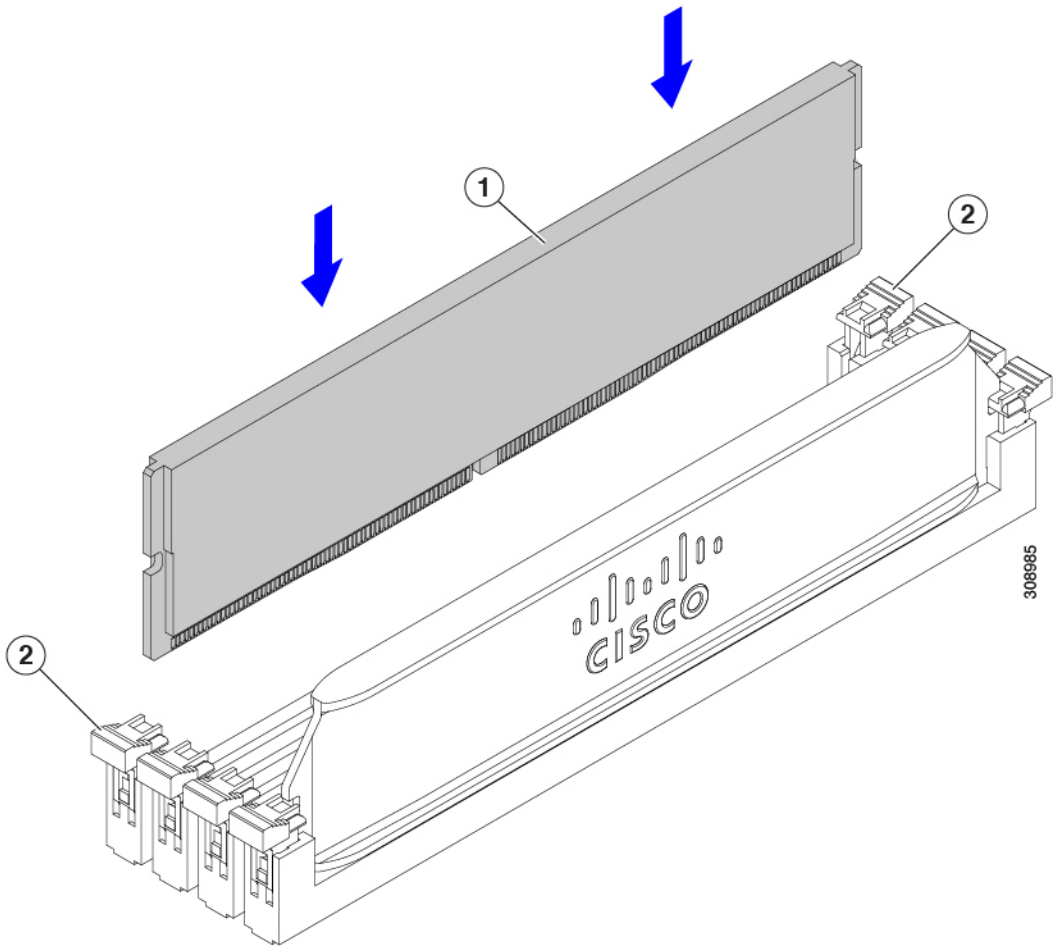
Step 1 Open both DIMM connector latches.

Step 2 Insert the DIMM and press evenly on both ends until it clicks into place in its slot.

Note
Ensure that the notch in the DIMM aligns with the key in the slot. If the notch is misaligned, it is possible to damage the DIMM, the slot, or both.

Step 3 Press the DIMM connector latches inward slightly to seat the DIMM or blank fully.

Figure 7: Installing a DIMM or DIMM Blank



Step 4 Populate all slots with a DIMM or DIMM blank.

A slot cannot be empty, so make sure all slots have either a DIMM or DIMM blank before reinserting the blade.

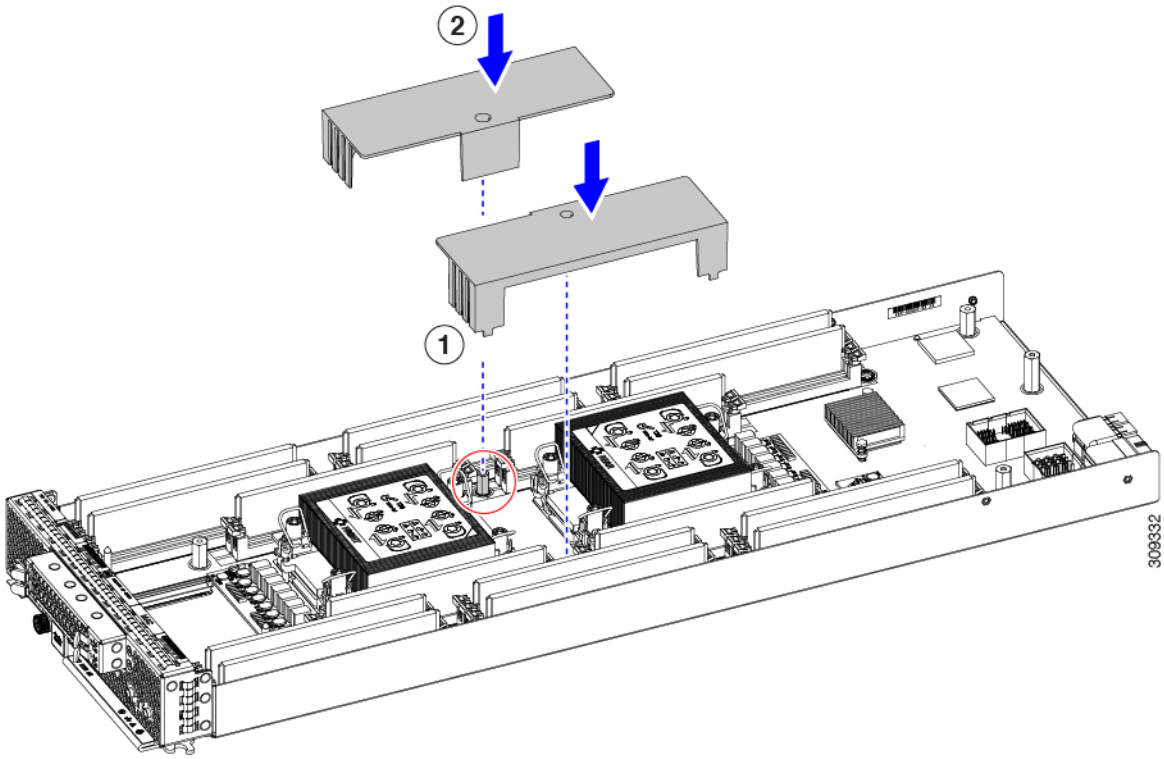
Step 5 Install each DIMM baffle.

a) Orient each DIMM baffle as shown.

b) Align each DIMM baffle so that the circle on the top of the DIMM baffle lines up with the standoff on the blade.

DIMM baffles are keyed so that they can be installed one way only. If a baffle does not install, remove both baffles, and try to install them in the opposite location.

c) Holding the DIMM baffle level, lower the baffle and press down to seat the baffle onto the standoff and the two feet onto the blade.



d) (Optional) Attach the top cover and return the blade to service.

Memory Performance

When considering the memory configuration of the blade server, there are several things to consider. For example:

- When mixing DIMMs of different densities (capacities), the highest density DIMM goes in slot 1 then in descending density.
- Besides DIMM population and choice, the selected CPU(s) can have some effect on performance.

Memory Mirroring and RAS

The Intel CPUs within the blade server support DDR4 memory mirroring only in 8 and 16 DIMM configurations on each CPU. If memory mirroring is used, DRAM size is reduced by 50 percent for reasons of reliability.

Replacing a Virtual Interface Card

Use the following topics to replace the VIC:

- Removing a Virtual Interface Card from the mLOM Slot, on page 31
- Installing Virtual Interface Card in the mLOM Slot, on page 32

Removing a Virtual Interface Card from the mLOM Slot

Use this task to remove a VIC card from the mLOM module slot. You might need to remove additional components to gain access to the mLOM module slot.

Procedure

Step 1 If a rear mezzanine module is installed, remove it to provide access to the mLOM slot.
See Removing the Rear Mezzanine Module, on page 4.

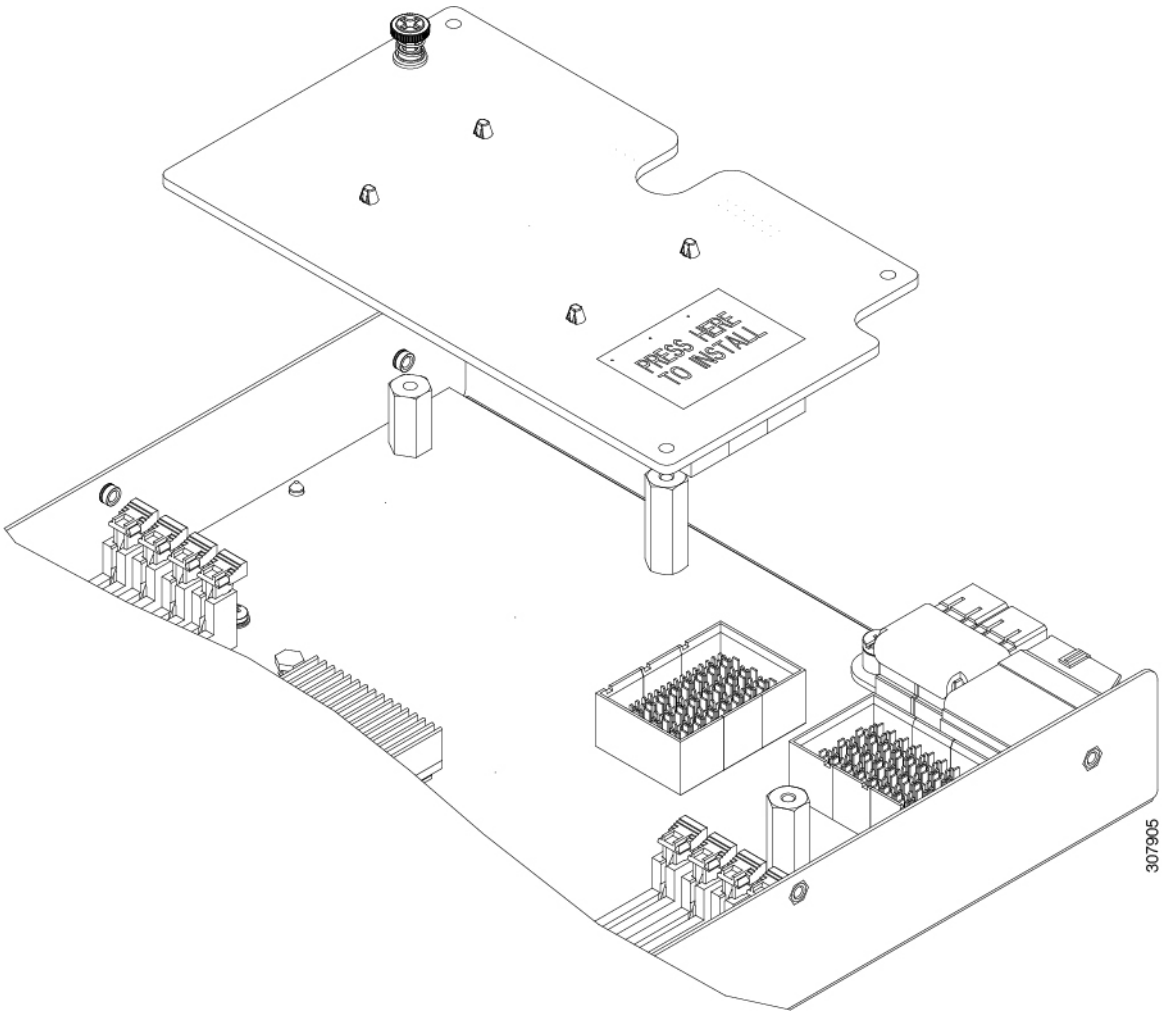
Step 2 Using a #2 Phillips screwdriver, loosen the captive screw.

Step 3 Grasp the VIC card where `PRESS HERE TO INSTALL` is stamped onto the VIC.

Step 4 Pull the VIC connector up to disconnect the VIC connector from the motherboard mLOM connector.

Note
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 8: Removing the VIC Card from the mLOM Slot



What to do next

Go to Installing Virtual Interface Card in the mLOM Slot, on page 32.

Installing Virtual Interface Card in the mLOM Slot

Use this task to install a virtual interface card (VIC) into the motherboard connector in the mLOM slot. You might need to remove additional components to gain access to the mLOM slot.

Procedure

Step 1 If a rear mezzanine module is installed, remove it to provide access to the mLOM slot.

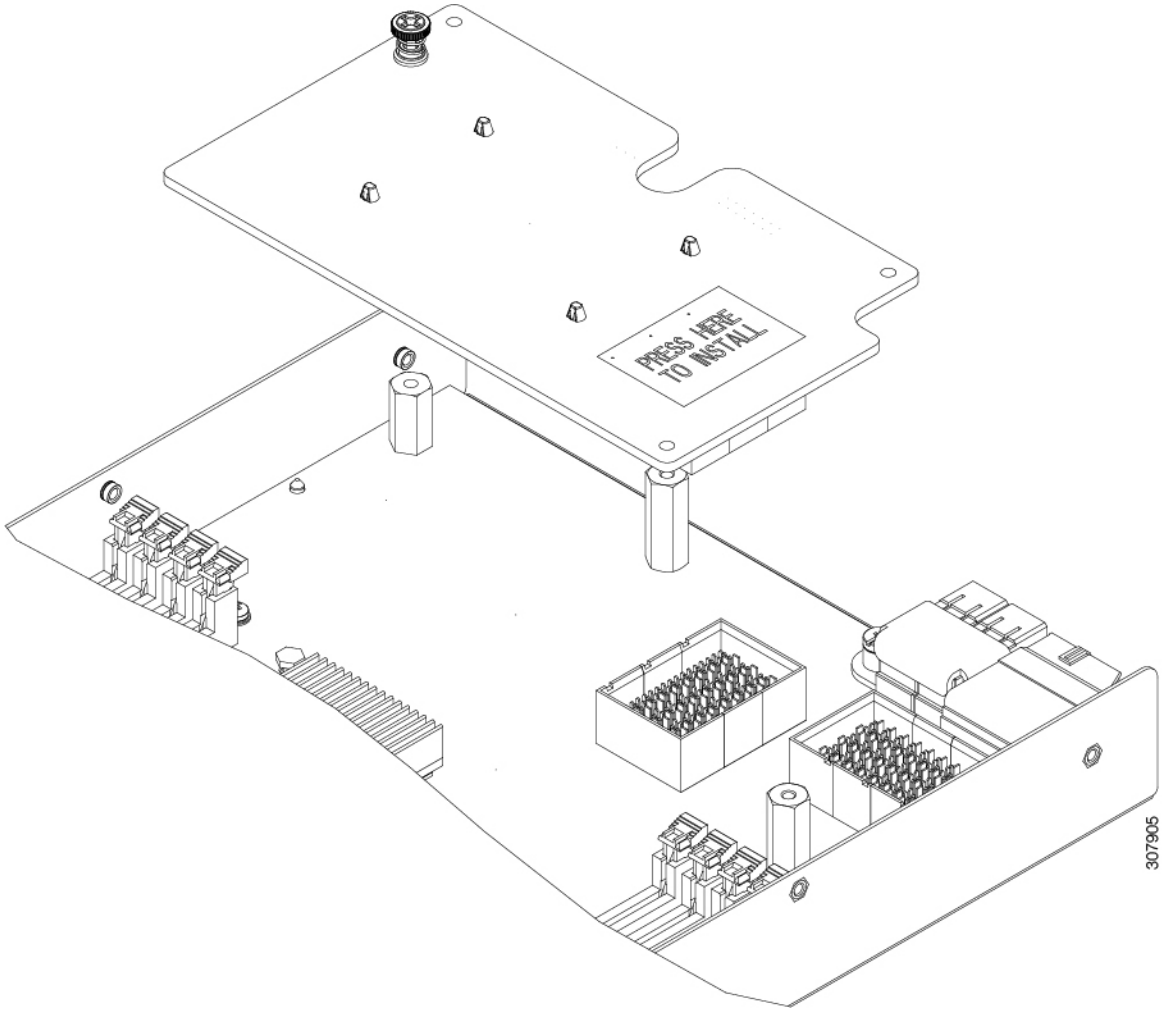
See Removing the Rear Mezzanine Module, on page 4

Step 2 Position the VIC connector above the motherboard connector and align the captive screw with the standoff post on the motherboard.

Step 3 Firmly press the VIC connector into the motherboard connector where `PRESS HERE TO INSTALL` is stamped on the VIC.

Step 4 Using a #2 Phillips screwdriver, tighten the captive screw.

Figure 9: Installing the VIC into the mLOM Slot

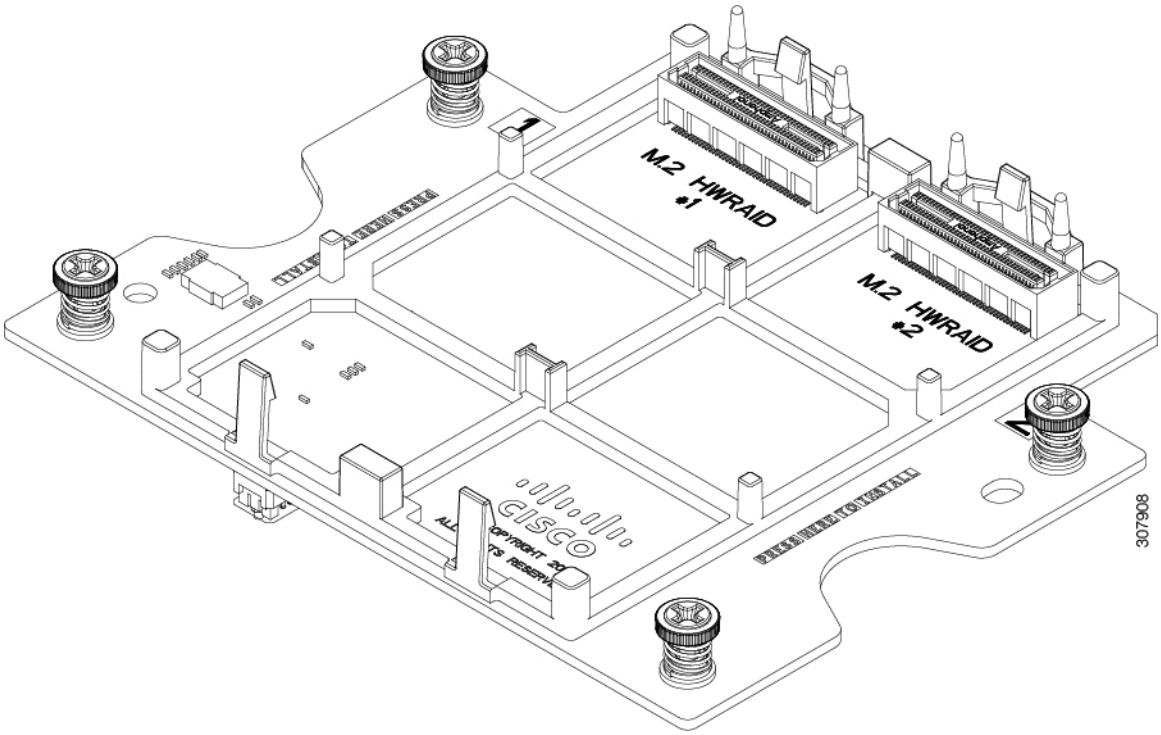


Replacing the Front Mezzanine Module

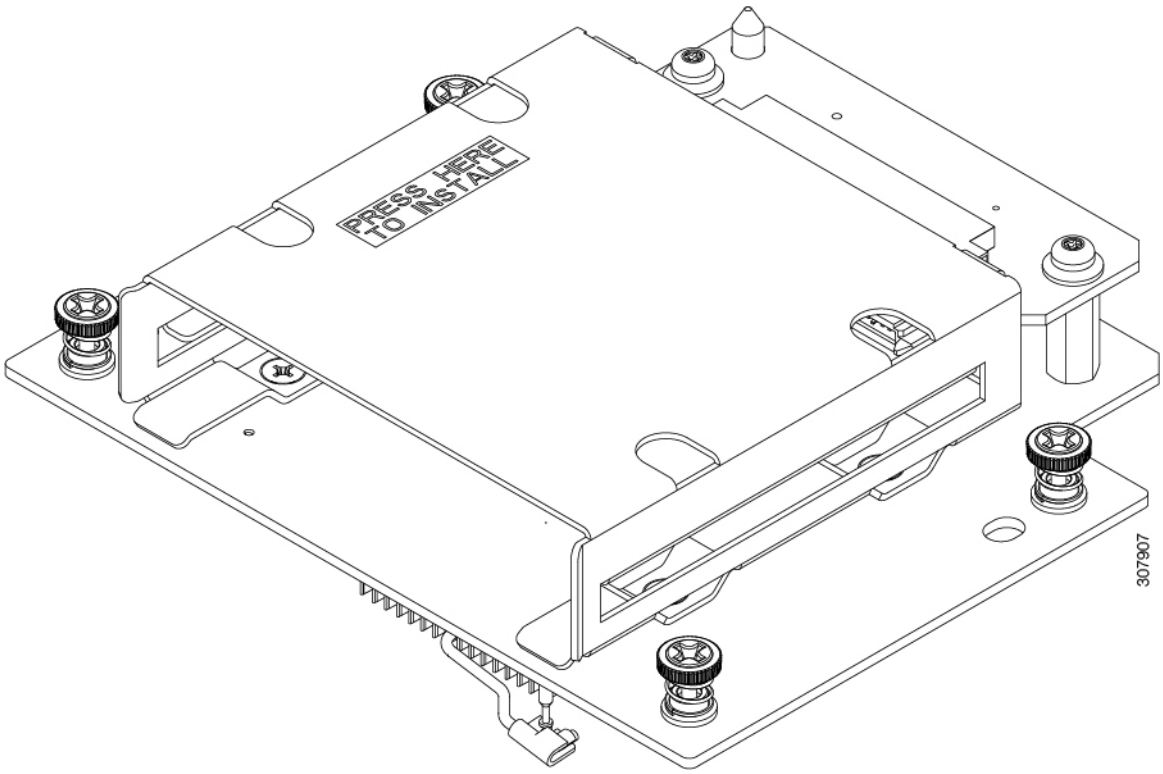
In the front mezzanine slot, the Cisco B200 M6 supports a front mezzanine module. The front mezzanine module mounts onto the motherboard, and provides connection to the power plane and communication to other components in the server. Depending on the type, the front mezzanine module accepts the server's M.2 mini storage modules or front-loading 7 mm SSDs.

The following front mezzanine modules are supported.

- A front mezzanine module that supports a mini-storage module for M.2 drives.



- A front mezzanine module that supports 12G SAS RAID.



To replace the front mezzanine module, use the following procedures:

- Removing the Front Mezzanine Module, on page 35
- Installing the Front Mezzanine Module, on page 36

Removing the Front Mezzanine Module

Both front mezzanine modules attach to the blade through four threaded standoffs. Two alignment pins in the blade's front mezzanine slot enforce the correct position for the module on the blade.

Note The front mezzanine mini-storage module for M.2 drives can be removed with the mini M.2 drives in place. However, if you want to remove them, you can.

The front mezzanine module for 12G SAS RAID supports front-loading 7 mm drives. You must remove the drives before removing the front mezzanine module.

Procedure

Step 1 Using a #2 Phillips screwdriver, loosen the four screws that secure the front mezzanine module to the standoffs.

Step 2 Grasp the front mezzanine module where it is labeled `Press Here to Install` and on the opposite edge.

Note

The front mezzanine mini-storage module for M.2 drives has semicircular finger holds to help you grasp it. The front mezzanine module for 12G SAS RAID has sheetmetal that you can grasp.

Step 3 Holding the front mezzanine module level, pull straight up to remove it from the blade.

Installing the Front Mezzanine Module

The front mezzanine module occupies the blade's front mezzanine slot. Guide pins on the blade help align with the guide holes on the front mezzanine module.

Use the following procedure to install the front mezzanine module.

Procedure

Step 1 Orient the guide holes on the front mezzanine module with the guide pins on the blade.

Step 2 Align the thumbscrews with the threaded standoffs.

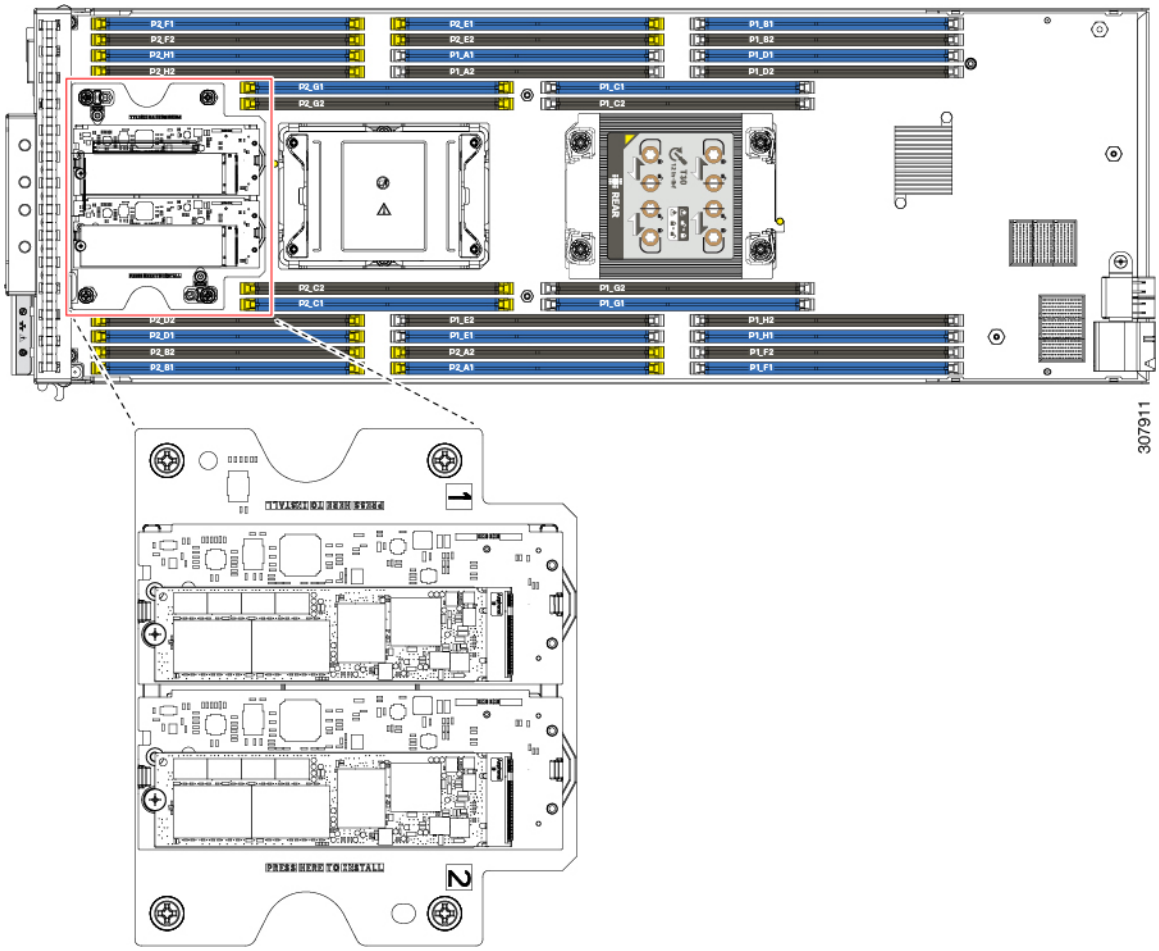
Step 3 Grasp the module where it is labeled `Press Here to Install` and on the opposite edge, then press down to seat the module on the blade.

Step 4 Using a #2 Phillips screwdriver, tighten the thumbscrews to secure the module to the blade.

Replacing a Cisco Boot-Optimized M.2 RAID Controller

The Cisco Boot-Optimized M.2 RAID controller sits in the front mezzanine storage slot and provides RAID connectivity for the M.2 SSD server storage. The RAID controller consists of small PCB daughter card, an M.2 SATA SSD drive carrier, and individual M.2 SSDs. The entire RAID controller and the individual SATA SSDs are field replaceable.

Figure 10: Cisco Boot-Optimized M.2 RAID Controller



To replace the M.2 RAID optimized RAID controller, see the following topics:

- Removing a Cisco Boot-Optimized M.2 RAID Controller, on page 37
- Installing a Cisco Boot-Optimized M.2 RAID Controller, on page 40

Removing a Cisco Boot-Optimized M.2 RAID Controller

Use this procedure to remove a Cisco boot-optimized M.2 RAID controller.

Before you begin

Use this procedure to remove the M.2 RAID controller from the blade. The M.2 RAID controller consists of two M.2 mini storage carriers, and each carrier can contain a pair of M.2 SATA drives. The embedded M.2 SATA mini storage SSDs (drives) in the front mezzanine mini storage module are not hot swappable.

Procedure

Step 1 If you have not already removed the top cover, do so now. See Removing the Top Cover, on page 3.

Step 2 (Optional) Remove the front mezzanine mini storage module for M.2 from the server. See Removing the Front Mezzanine Module, on page 35.

Step 3 Remove the M.2 mini storage carrier from the server.

a) Press out on the securing clips to disengage the carrier from the socket.

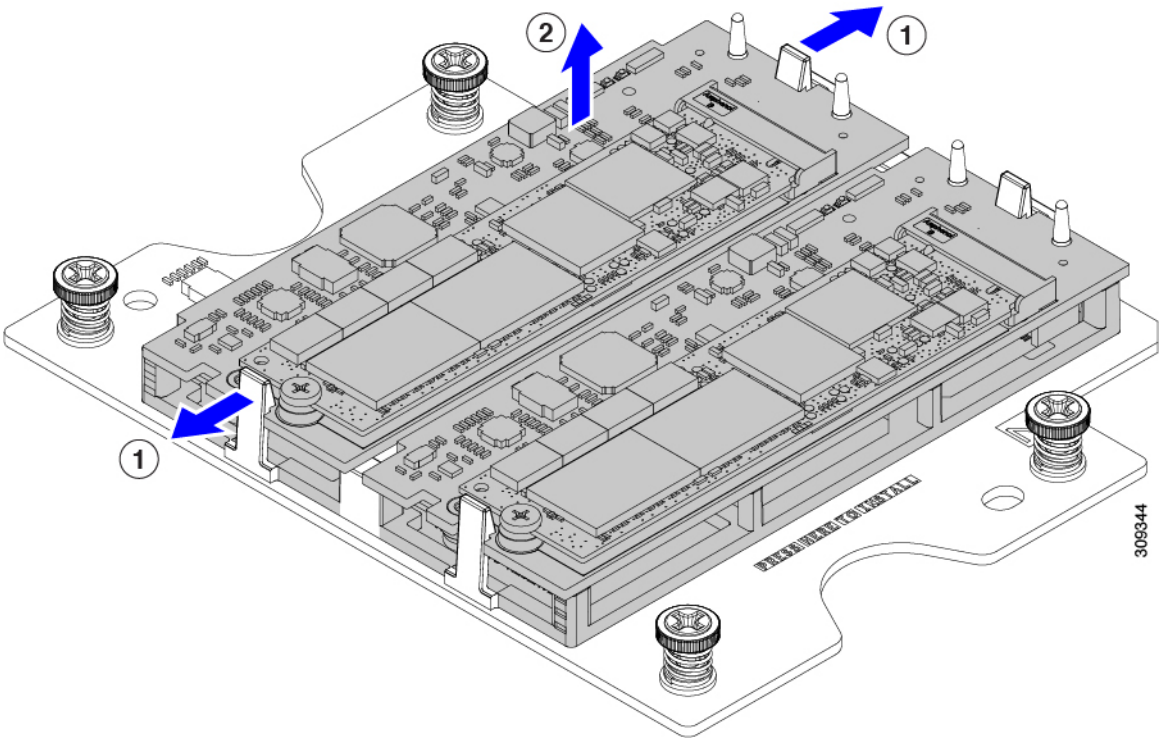
b) Pull straight up on the carrier to remove it.

These steps remove the carrier which contains the dual M.2 SATA drives.

Note
If you feel resistance verify the following:

- The securing clip is not contacting the carrier.
- The storage carrier is level. If not, the resistance might be the carrier.

Figure 11: Unseating the M.2 Mini Storage Carrier

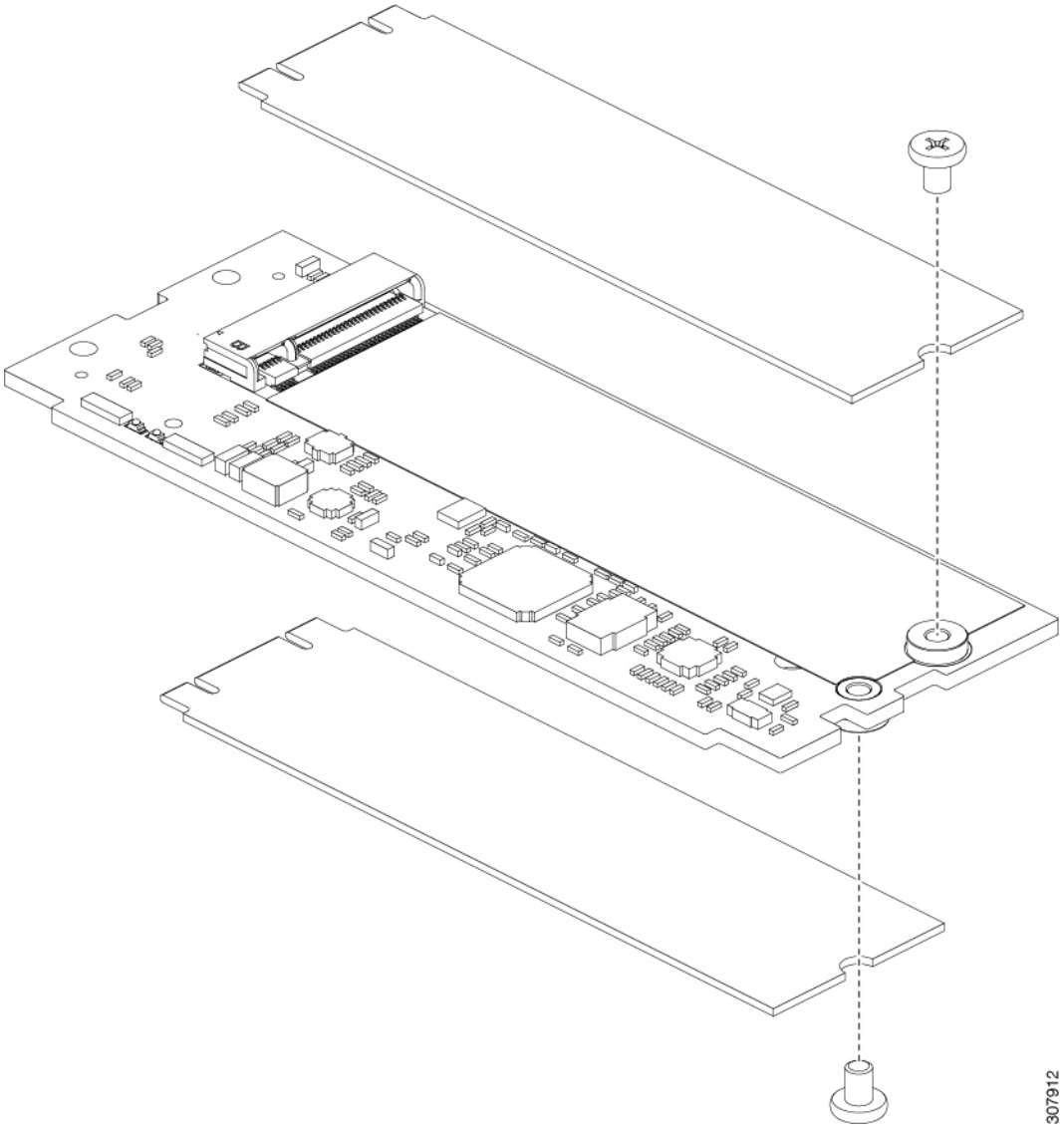


Step 4 If you are transferring SATA M.2 drives from an old M.2 controller to a replacement controller, complete the following steps before installing the replacement controller:

Note
Any previously configured volume and data on the SSDs are preserved when the M.2 SSDs are transferred to the new controller. The system will boot the existing OS that is installed on the SSDs.

a) Use a #1 Phillips-head screwdriver to remove the single screw that secures the M.2 SSD to the carrier.
b) Lift the M.2 drive from its socket on the carrier.
c) Position the replacement M.2 drive over the socket on the controller board so that the M.2 drive's label is facing up.
d) Angle the M.2 drive downward and insert the connector-end into the socket on the carrier.
e) Press the M.2 drive flat against the carrier.
f) Install the single screw that secures the end of the M.2 drive to the carrier.
g) Turn the controller over and install the second M.2 drive.

Figure 12: Installing Replacement M.2 Storage Drives into the Carrier



What to do next

Installing a Cisco Boot-Optimized M.2 RAID Controller, on page 40

Installing a Cisco Boot-Optimized M.2 RAID Controller

Use this procedure to install the Cisco boot-optimized M.2 RAID controller. Each slot on the controller is labeled with 1 and 2 to identify each slot for the carrier.

Before you begin

If you need to replace the RAID controller, the individual M.2 storage drives must be included in the replacement RAID controller. Make sure to remove them from the original RAID controller and install them on the RAID controller you are installing. See Removing a Cisco Boot-Optimized M.2 RAID Controller, on page 37.

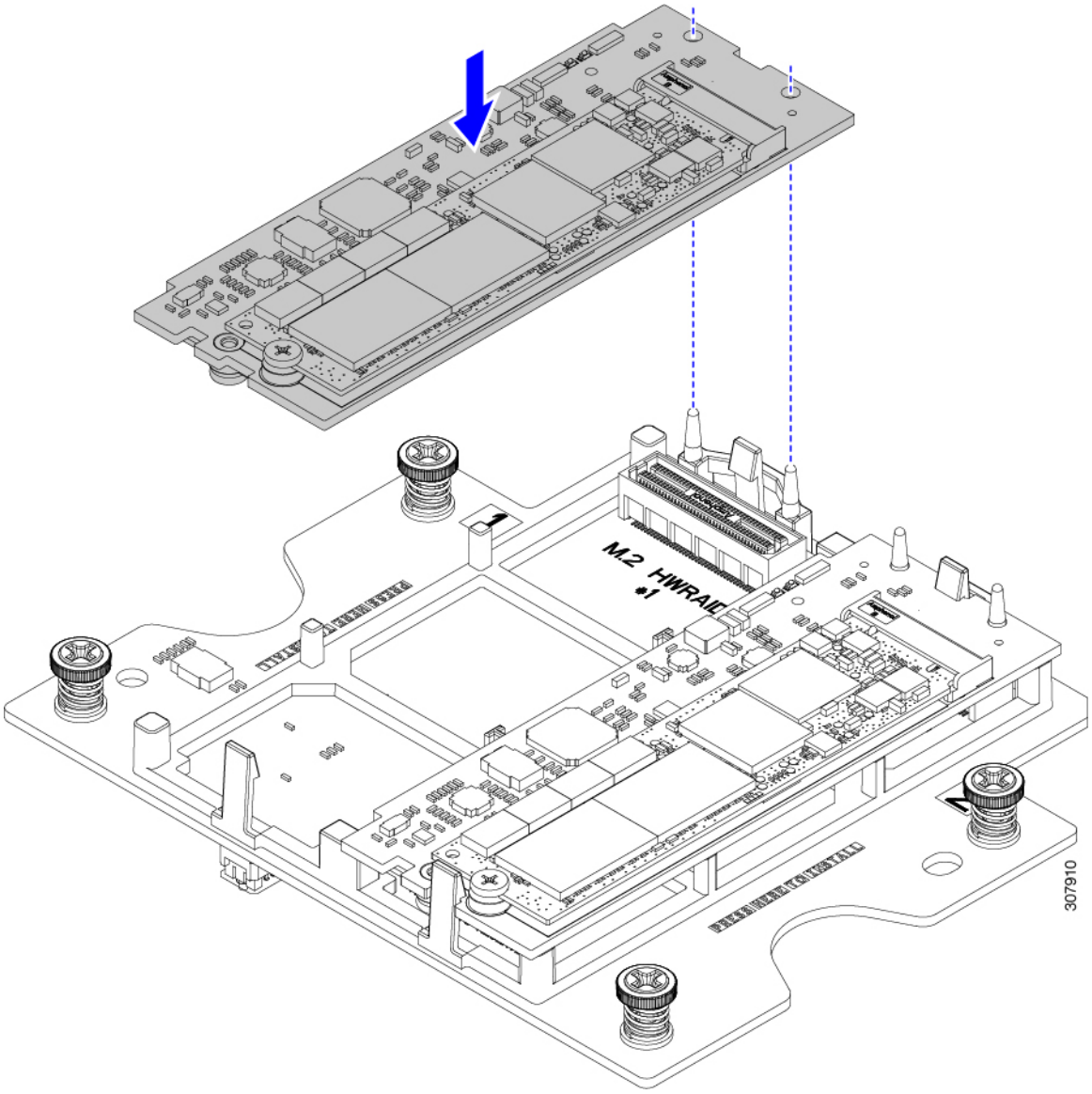
Procedure

Step 1 Align the two mounting holes on the carrier with the guide pins on the storage module.

Step 2 Lower the carrier onto the controller on both ends, making sure the securing clips snap in.

Step 3 Simultaneously push on the four corners of the carrier to fully seat it.

Figure 13: Seating the M.2 Storage Carrier



Step 4 If you removed the front mezzanine module for M.2, reinstall it now. See Installing the Front Mezzanine Module, on page 36.

Step 5 Reinsert the blade server into the server chassis.

Replacing 7 mm Front Mezzanine Drives

The Cisco UCS B200 M6 blade has a maximum of two front-loading 7 mm drives accessible through the front of the blade. Drives can be either SATA or NVMe. Drives are field-replaceable.

To replace the blade's front drives, use the following procedures:

- Removing a 7 mm SATA SSD, on page 42
- Installing a 7 mm SATA SSD, on page 42
- Removing an NVMe Drive, on page 43
- Installing an NVMe Drive, on page 44

Removing a 7 mm SATA SSD

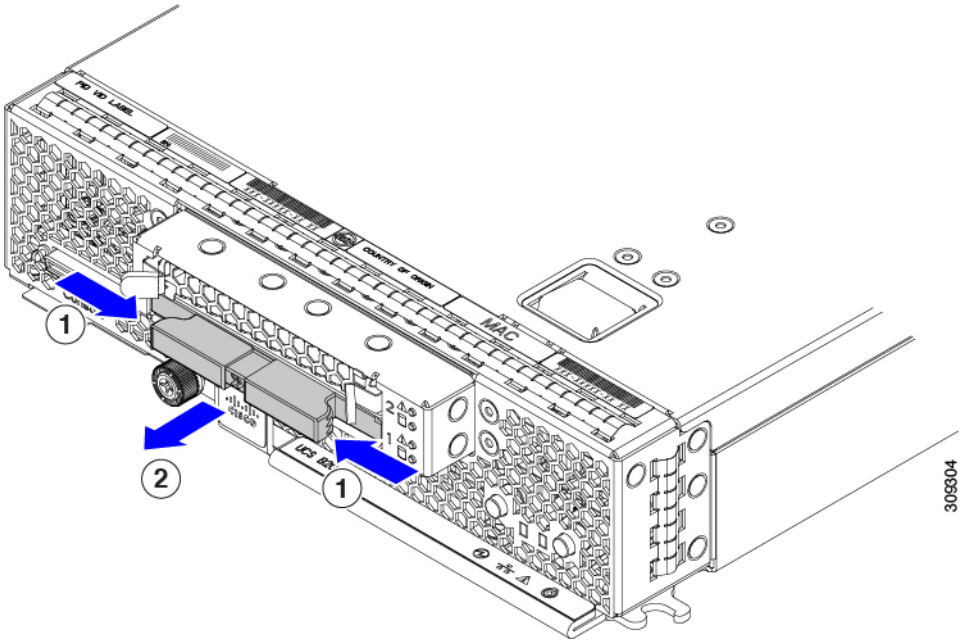
Front-loading 7 mm SATA SSDs are hot pluggable/hot swappable.

Use this procedure to remove a front-loading 7 mm SATA SSD.

Procedure

Step 1 Grasp the SSD by its finger holds and pinch them together.

Step 2 Slide the SSD out of the drive bay.



What to do next

Reinstall a SATA SSD. See Installing a 7 mm SATA SSD, on page 42.

Installing a 7 mm SATA SSD

If you removed a 7 mm SATA SSD, use this procedure to install another 7 mm SATA SSD.

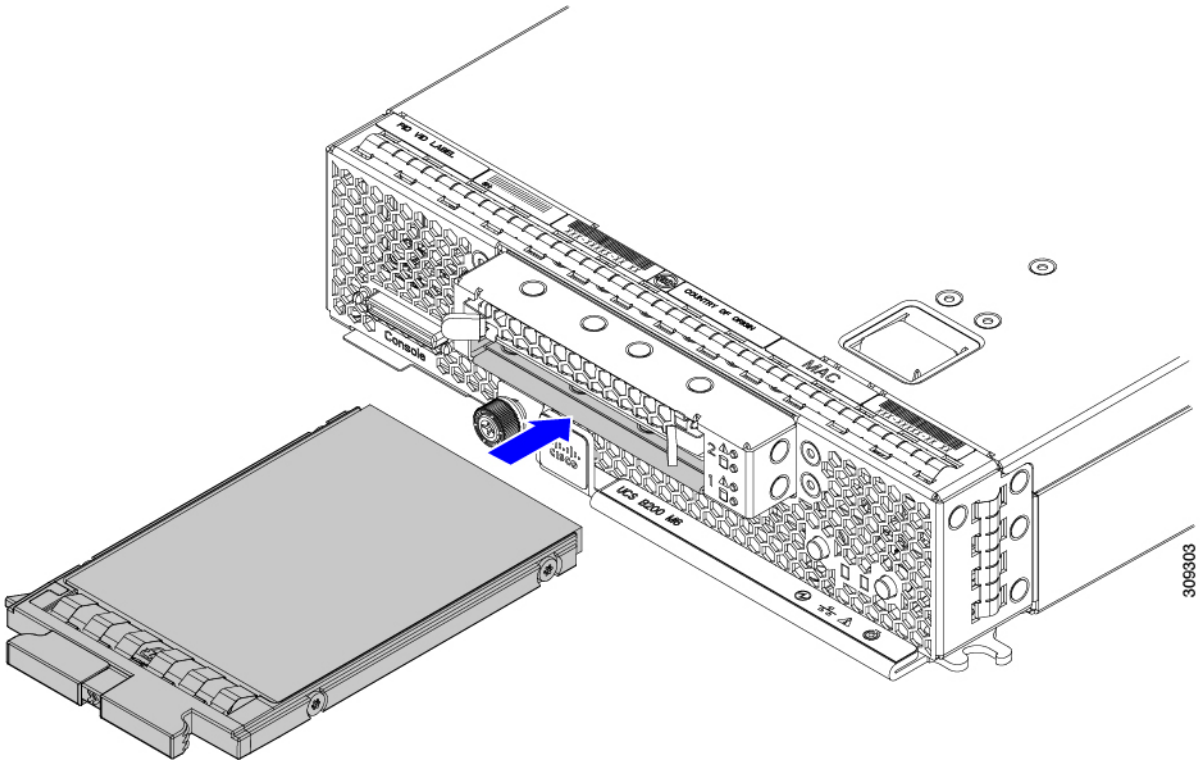
Procedure

Step 1 Check the drive label to ensure that you are installing a SATA SSD.

Step 2 Check the label on the faceplate to verify that the SSD is not upside down.

As a safeguard, the drives are designed with keys to enforce proper installation.

Step 3 Holding the SSD level, align it with the empty drive bay, then slide the SSD completely into the drive bay.



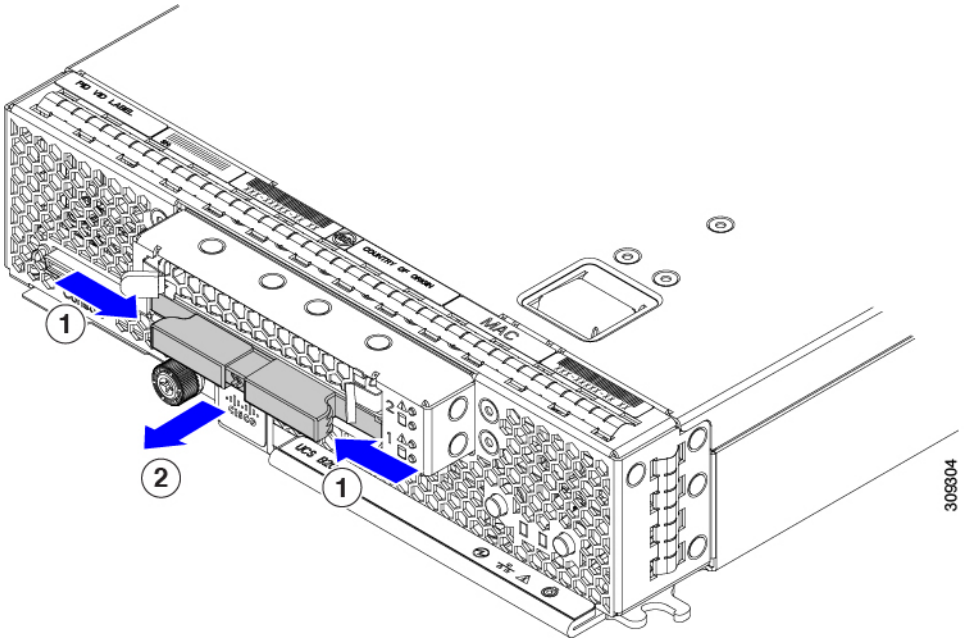
Removing an NVMe Drive

Front facing NVMe drives are hot pluggable/hot swappable. Use this procedure to remove an NVMe drive.

Caution NVMe drives are physically and visually the same as NVMe drives except for the label on the drive faceplate. When you remove an NVMe drive, make sure to install another NVMe drive.

Procedure

Grasp the drive by its finger holds and slide it out of the drive bay.



What to do next

Reinstall an NVMe drive. See Installing an NVMe Drive, on page 44.

Installing an NVMe Drive

If you removed an NVMe drive, use this procedure to install another NVMe drive.

Caution An NVMe drive are physically and visually the same as a SATA drive except for the label on the drive faceplate. Only install an NVMe drive into a bay where you removed a NVMe drive.

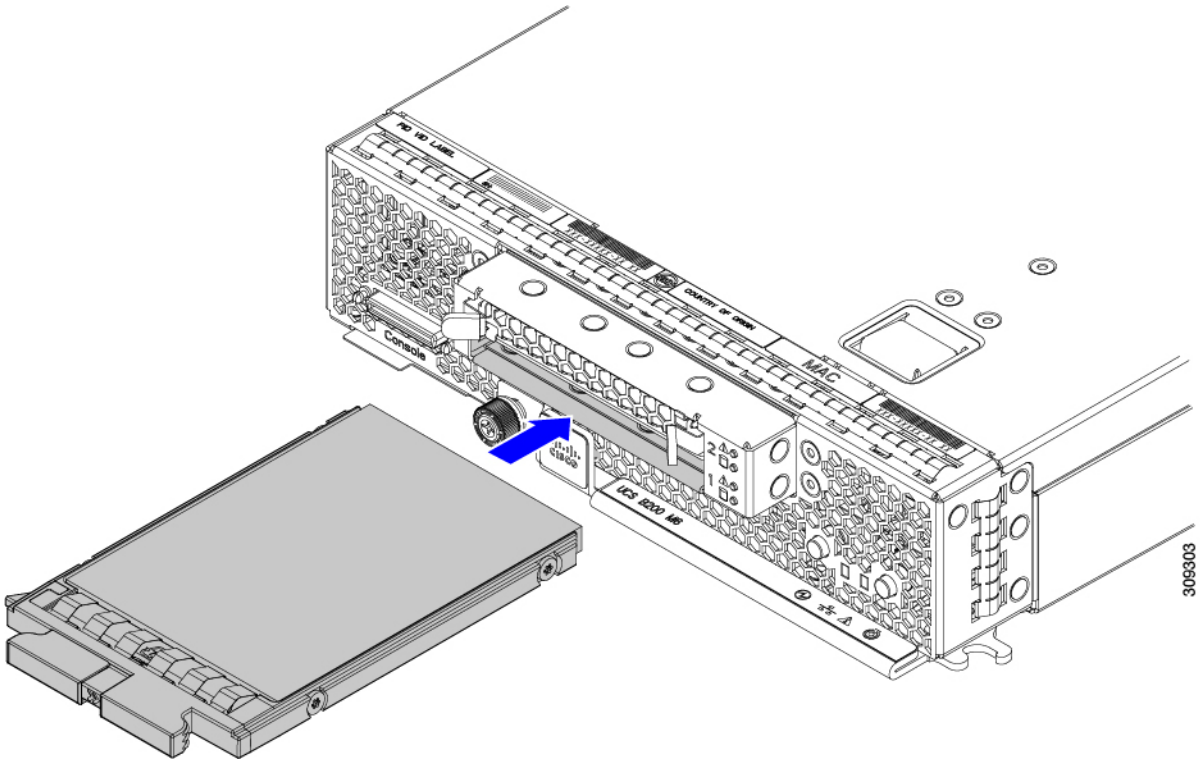
Procedure

Step 1 Check the drive label to ensure that you are installing a NVMe drive.

Step 2 Orient the drive so that the gasket is facing up.

Also, you can check the label on the faceplate to verify that the drive is oriented correctly.

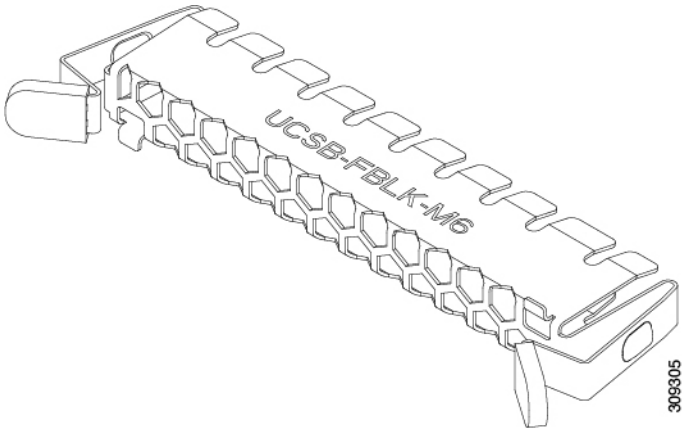
Step 3 Holding the drive level, align it with the empty drive bay, then slide the drive in until it no longer moves.



Replacing a Front Mezzanine Drive Blank

The Cisco UCS B200 M6 blade has two drive bays on the blade faceplate. A minimum of one drive must be installed.

A front mezzanine drive blank (UCSB-FBLK-M6) must be installed in any empty drive bay. Do not operate the blade with an empty drive bay.



To replace a front mezzanine drive blank, use the following procedures:

- Removing a Drive Blank, on page 46
- Installing a Drive Blank, on page 47

Removing a Drive Blank

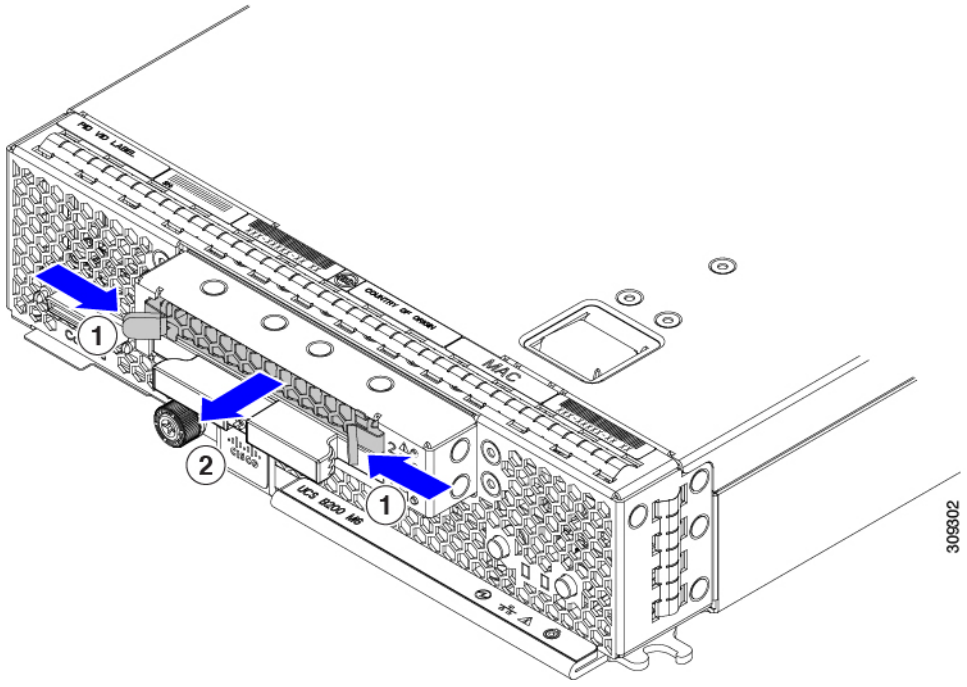
Drive blanks are accessible from the front of the blade. Use this procedure to remove a drive blank (UCSB-FBLK-M6).

Note Do not operate the blade with an empty drive bay. Always install a drive blank in a drive bay that does not have a drive installed.

Procedure

Step 1 Pinch the two retaining tabs towards each other.

Step 2 While holding the retaining tabs inward, pull the drive blank out of the drive bay.



What to do next

Choose the appropriate option:

- Install a front-loading 7 mm SATA SSD. See Installing a 7 mm SATA SSD, on page 42.
- Install a drive blank. See Installing a Drive Blank, on page 47.

Installing a Drive Blank

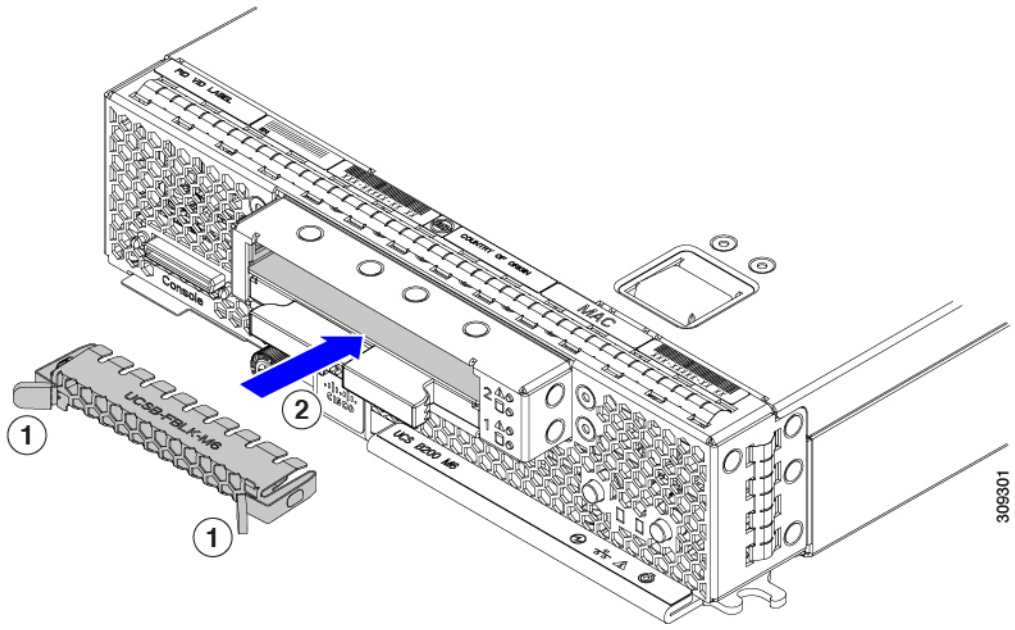
The blade has two drive bays accessible from the front of the blade. In a minimum configuration, the blade has one drive installed and one empty drive bay. Any empty drive bay must have a drive blank installed (UCSB-FBLK-M6). Do not operate the blade without a drive blank installed in an empty drive bay.

Use this procedure to install a drive blank.

Procedure

Step 1 Grasp the drive blank by the retaining tabs.

Step 2 Holding the drive blank level, align it with the empty drive bay and slide it into the bay until it no longer moves.



Installing the Trusted Platform Module

A Trusted Platform Module (TPM) is a computer chip (microcontroller) that can securely store artifacts used to authenticate the platform (server). These artifacts can include passwords, certificates, or encryption keys. A TPM can also be used to store platform measurements that help ensure that 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 environmeuts.

In most cases, the TPM is installed at the factory. When installed, the TPM uses a one-way screw, so that it cannot be easily removed.

Caution **Removing the TPM can be a destructive process!** The TPM is not a field-replaceable unit (FRU). Do not attempt to remove the TPM unless you are decommissioning/recycling the blade server, or unless you are directed to remove the TPM by Cisco personnel.

Use the following topics to replace a TPM.

- TPM Considerations, on page 48
- Installing the Trusted Platform Module, on page 48

TPM Considerations

Be aware of the following considerations for the trusted platform module (TPM).

- This server supports either TPM version 1.2 or TPM version 2.0.
- Field replacement of a TPM is not supported; you can install a TPM after-factory only if the server does not already have a TPM installed.
- If there is an existing TPM 1.2 installed in the server, you cannot upgrade to TPM 2.0. If there is no existing TPM in the server, you can install TPM 2.0.
- If the TPM 2.0 becomes unresponsive, reboot the server.
- On Cisco B Series blade servers, the TPM is enabled by default in the server BIOS regardless of whether a TPM is phyiscally installed on the server or not. The TPM's Enabled state is retained across reboots.
- The TPM 2.0 supports Intel TXT functionality if required for your deployment.

Installing the Trusted Platform Module

The trusted platform module (TPM) is a small circuit board that plugs into a motherboard socket and is then permanently secured with a one-way screw. The socket location is on the motherboard.

The trusted platform module (TPM) plugs into a motherboard socket and is then permanently secured with a one-way screw.

Note Field replacement of a TPM is not supported; you can install a TPM after-factory only if the server does not already have a TPM installed.

For security purposes, the TPM is installed with a one-way screw. It cannot be removed with a standard screwdriver.

Prepare the server for component installation:

Procedure

Step 1 Prepare the server for component installation:

a) Shut down and remove power from the server as described in Powering Off a Blade Server Using the Power Button.

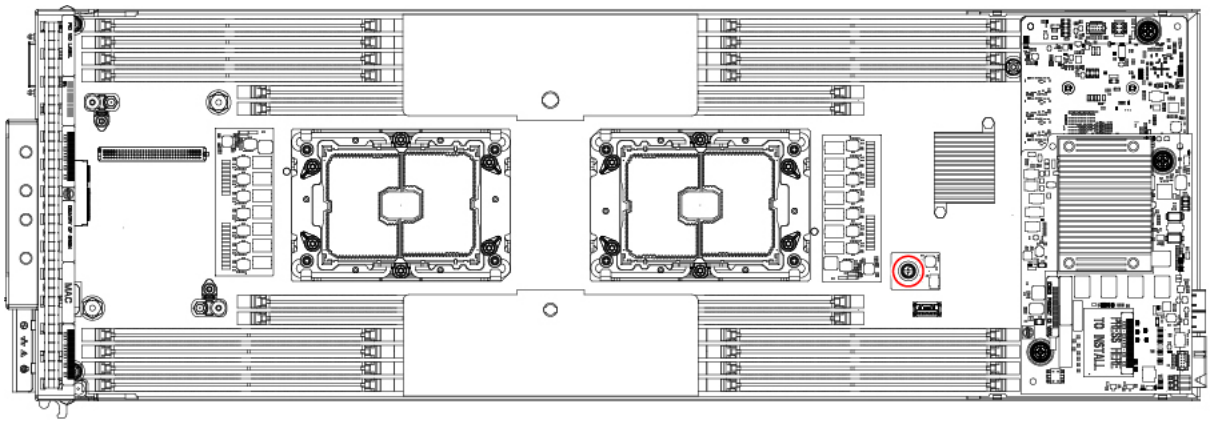
b) Slide the server out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution
If you cannot safely view and access the component, remove the server from the rack.

c) Remove the top cover from the server as described in Removing the Top Cover, on page 3.

Step 2 Install a Trusted Platform Module (TPM).

a) Locate the TPM socket on the motherboard, as shown below.



b) Align the connector that is on the bottom of the TPM circuit board with the motherboard TPM socket. Align the screw hole on the TPM board with the screw hole that is adjacent to the TPM socket.

c) Push down evenly on the TPM to seat it in the motherboard socket.

d) Install the single one-way screw that secures the TPM to the motherboard.

Step 3 Replace the blade's top cover.

Step 4 Replace the blade in the server chassis, reattach cables, and fully power on the blade by pressing the Power button.

Recycling the PCB Assembly (PCBA)

Each blade server has a PCBA that is connected to the blade server's faceplate and sheet metal tray. You must disconnect the PCBA from the blade server's faceplate and tray to recycle the PCBA. Each blade server is attached to the faceplate and tray by the following:

- Faceplate: Two M3 3mm screws.
- Tray:

- Five M3 screws
- Seven hex nut standoffs

You will need to recycle the PCBA for each blade server.

Before you begin

Note **For Recyclers Only!** This procedure is not a standard field-service option. This procedure is for recyclers who will be reclaiming the electronics for proper disposal to comply with local eco design and e-waste regulations.

To remove the printed circuit board assembly (PCBA), the following requirements must be met:

- The server must be disconnected from facility power.
- The server must be removed from the server chassis.

You will find it helpful to gather the following tools before beginning this procedure:

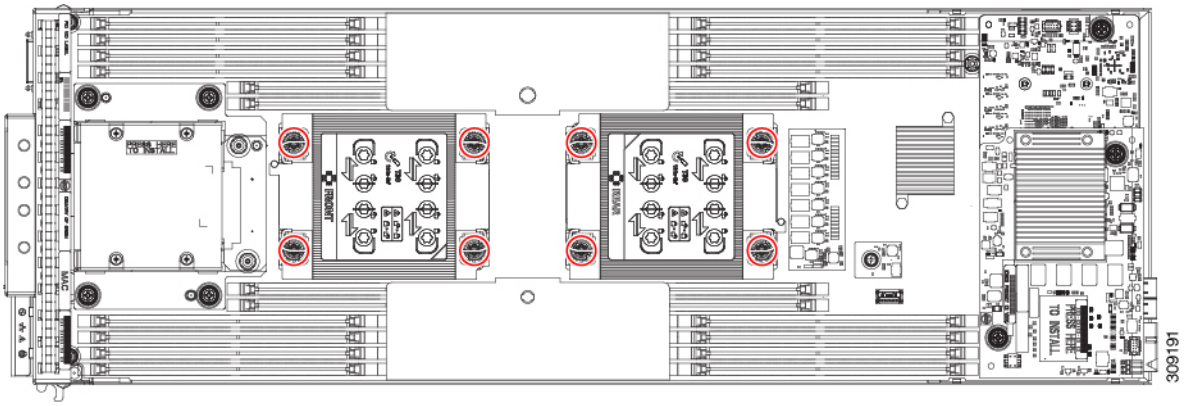
- Screwdrivers: One each of T10 and T30 Torx; Phillips #1 and #2; 8mm and 3 mm slotted.
- Hex nut drivers: One each of 8 mm and 4.5 mm.

Procedure

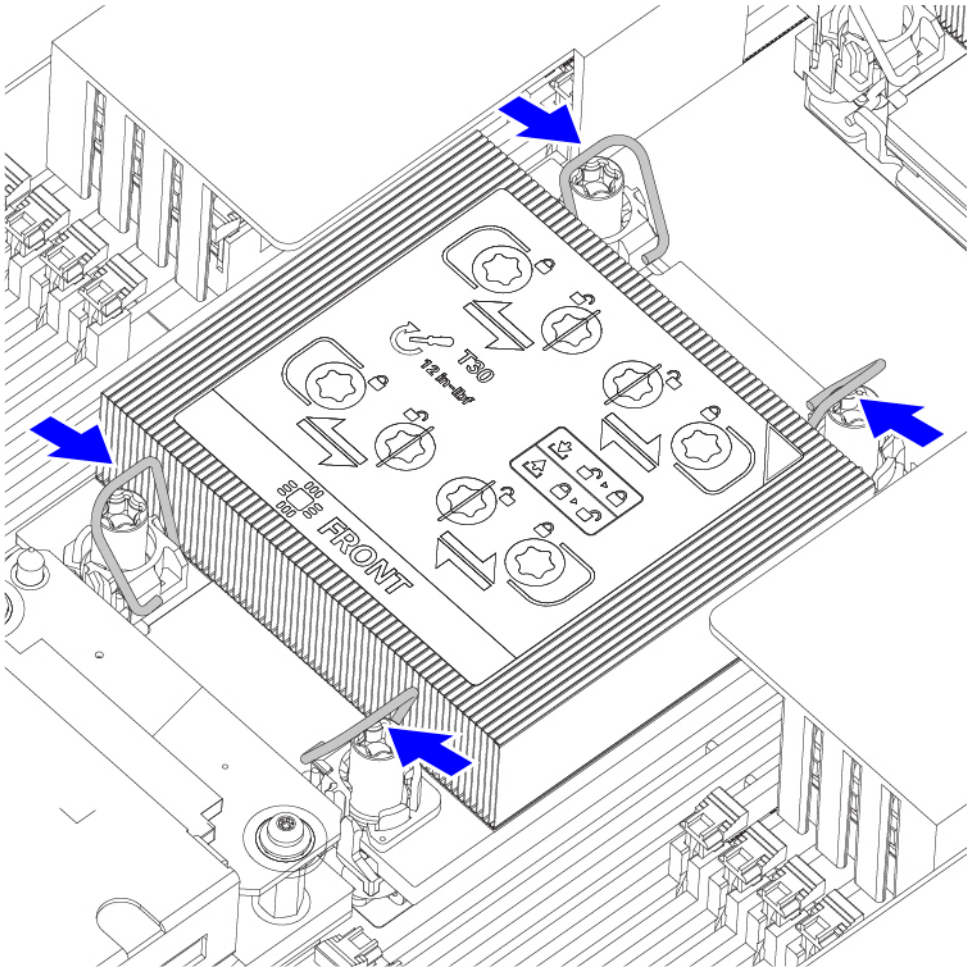
Step 1 (Optional) If the CPUs and heatsinks are still installed, remove them.

Note
This step outlines removing the CPU and heatsink, if required. For detailed instructions about how to remove the CPU, see Removing CPUs and Heatsinks, on page 9.

a) Using a T30 Torx screwdriver, loosen the eight captive screws.

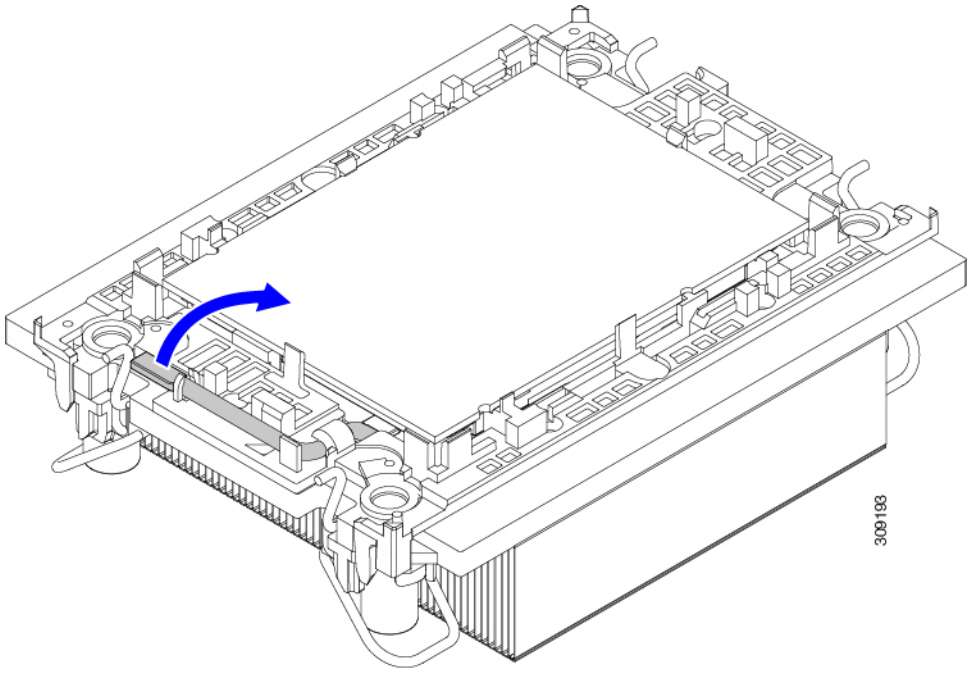


b) For each CPU, push the retaining wires toward each other (inwards) to unlock the CPU and heatsink.



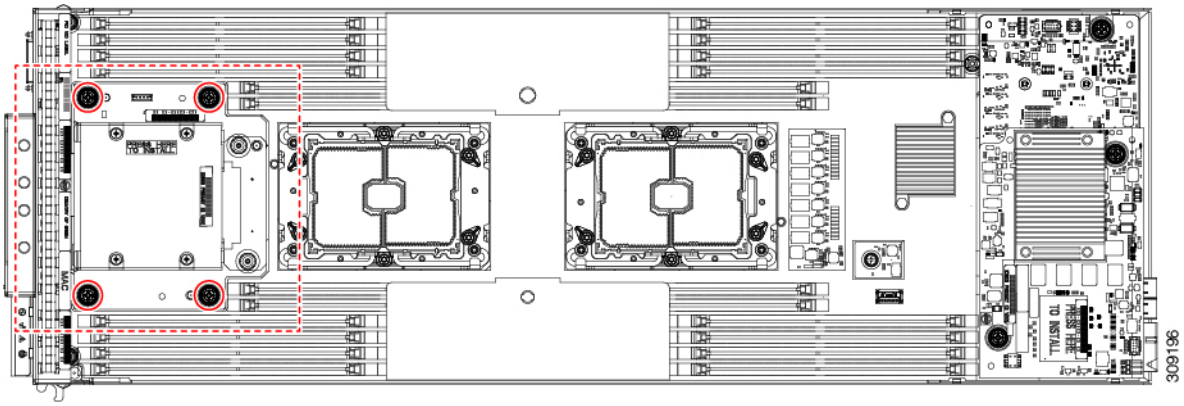
c) Remove each CPU from the motherboard and flip each CPU upside down.
d) Locate the TIM breaker and rotate it 90 degrees to break the thermal grease and disconnect the CPU from the heatsink.

Caution
Do not rotate the TIM breaker past 90 degrees.

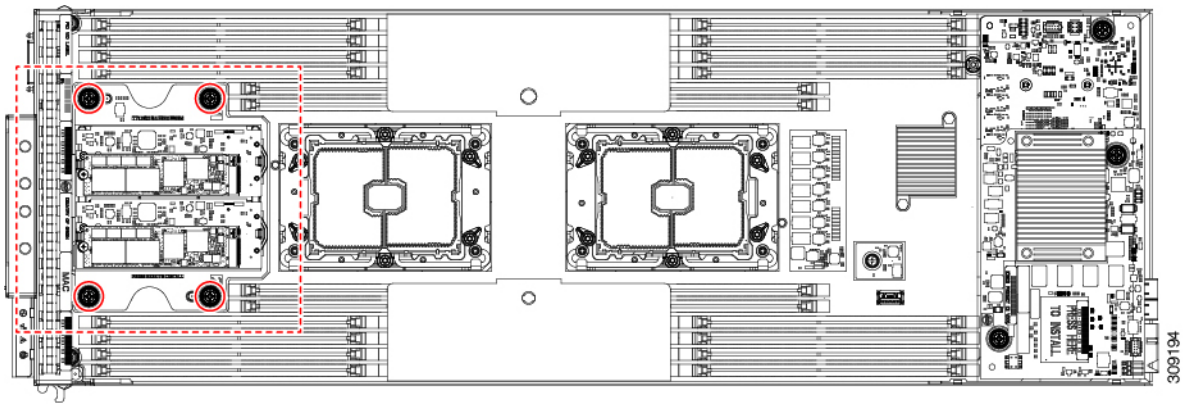


e) Flex the CPU carrier enough to disengage the retaining clips around each edge.

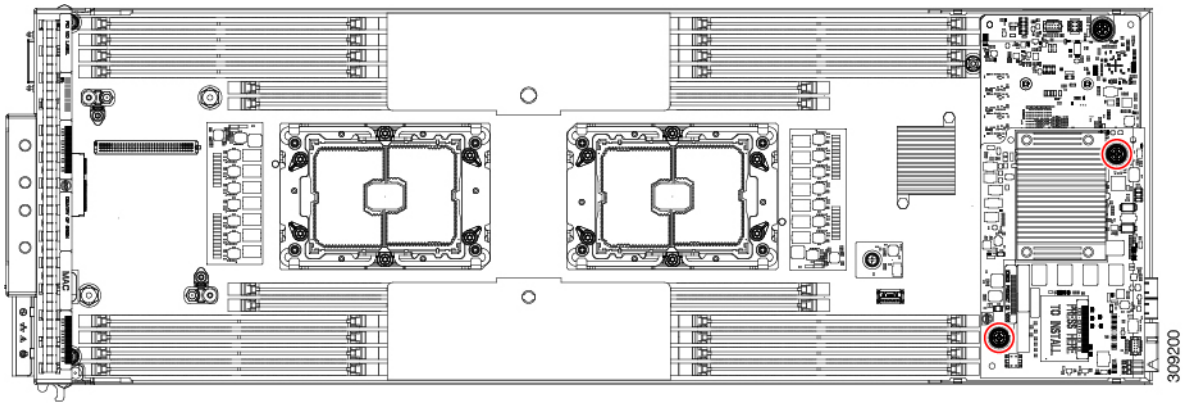
Step 2 (Optional) If the front mezzanine module for 12 G SAS is still installed, use a #2 Phillips screwdriver and remove it.



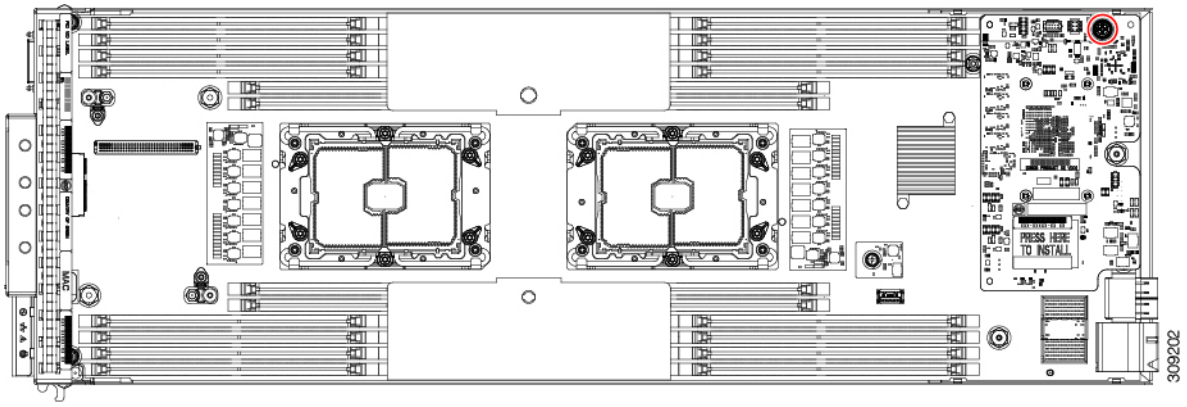
Step 3 (Optional) If the front mezzanine module for M.2 min storage is still installed, use a #2 Phillips screwdriver and remove it.



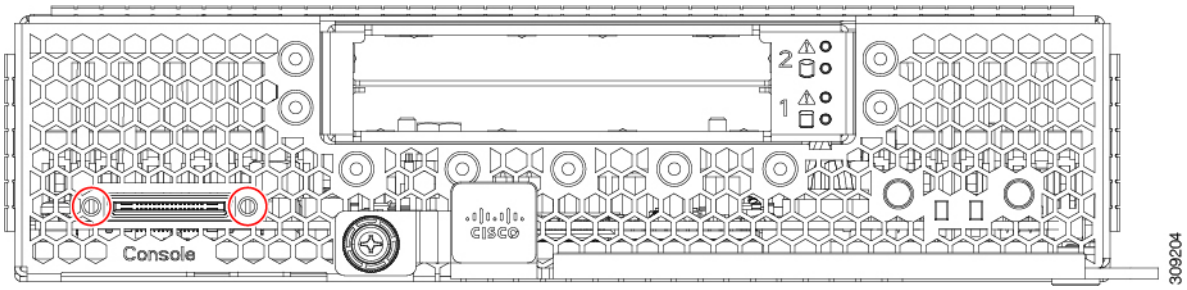
Step 4 (Optional) If the rear mezzanine module is still installed, use a #2 Phillips screwdriver and remove it.



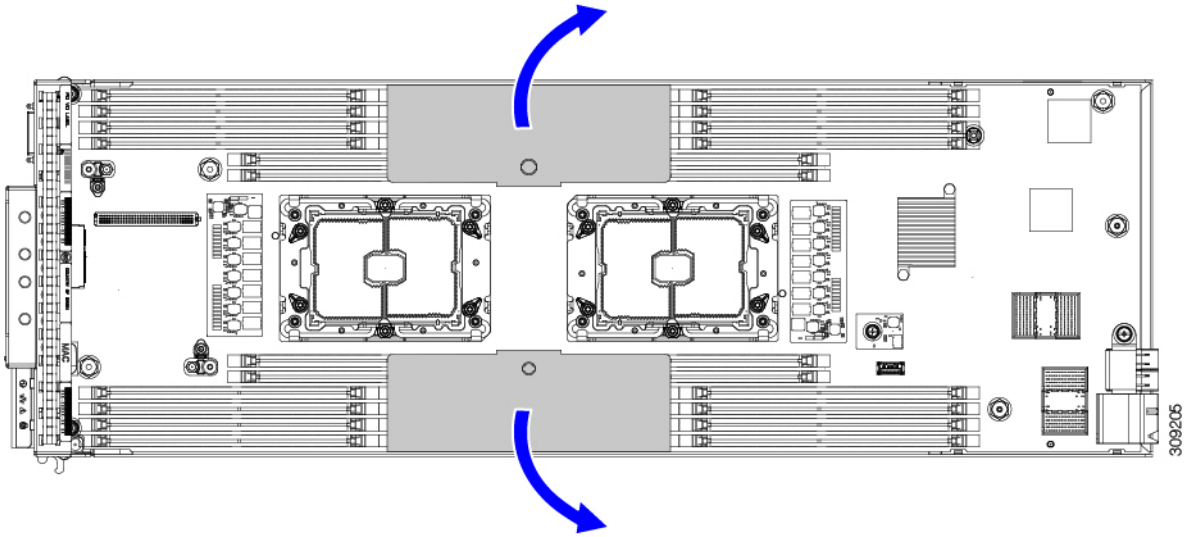
Step 5 Using a #2 Phillips screwdriver, unscrew the captive screw and remove the mLOM VIC.



Step 6 Using a 3mm slotted screwdriver, rotate each of the M3 faceplate screws counter clockwise until it disengages.



Step 7 For each DIMM air baffle, grasp it and disconnect it from the blade.

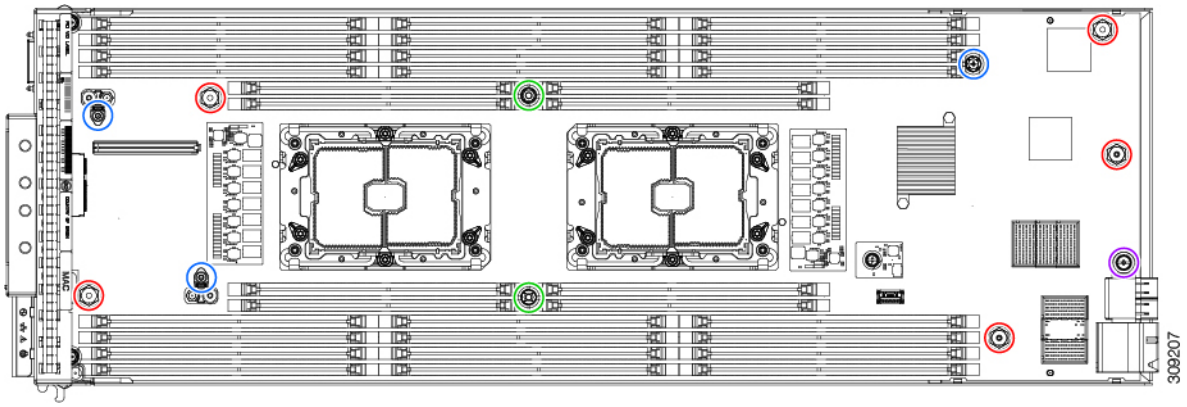


Step 8 Remove the TPM.

See Removing the Trusted Platform Module (TPM), on page 55.

Step 9 Disconnect the motherboard from the blade sheet metal:

a) Using an 8 mm hex nut driver, remove the 8mm standoffs.
b) Using a 4.5 mm hex nut driver, remove the 4.5mm standoffs.
c) Using a T10 Torx screwdriver, remove the M3 screws.
d) Using a #1 Phillips screwdriver, remove the retaining screw.



Red circles (○)	8 mm standoffs (5)
Green circles (○)	4.5 mm standoffs (2)
Blue circles (○)	M3 screws (3)
Purple circle (○)	Retaining screw (1)

Step 10 Recycle the motherboard in compliance with your local recycling and e-waste regulations.

Removing the Trusted Platform Module (TPM)

The TPM module is attached to the printed circuit board assembly (PCBA). You must disconnect the TPM module from the PCBA before recycling the PCBA. The TPM module is secured to a threaded standoff by a tamper-resistant screw. If you do not have the correct tool for the screw, you can use a pair of pliers to remove the screw.

Before you begin

Note **For Recyclers Only!** This procedure is not a standard field-service option. This procedure is for recyclers who will be reclaiming the electronics for proper disposal to comply with local eco design and e-waste regulations.

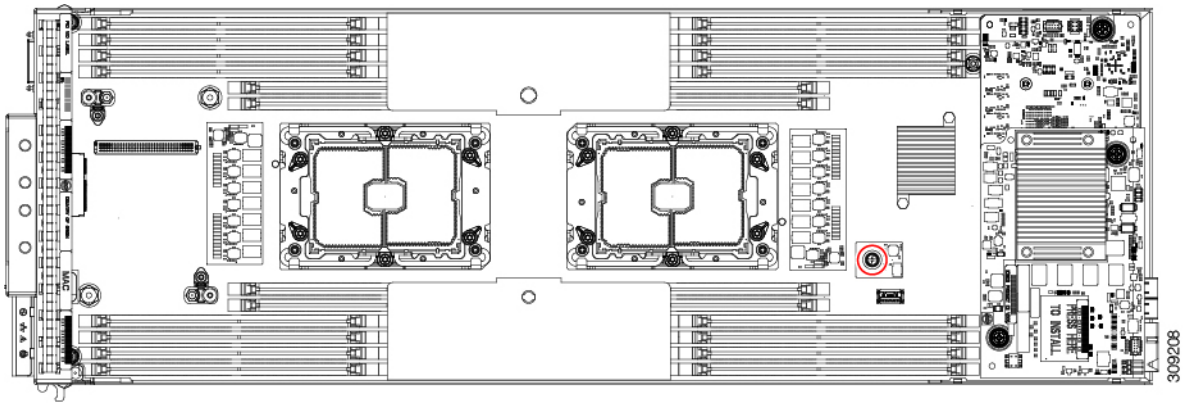
Caution **Removing the TPM is a destructive process and should be done only if you are decommissioning or recycling the server.**

To remove the Trusted Platform Module (TPM), the following requirements must be met for the server:

- It must be disconnected from facility power.
- It must be removed from the equipment rack.
- The top cover must be removed. If the top cover is not removed, see Removing the Top Cover, on page 3.

Procedure

Step 1 Locate the TPM module.



Step 2 Using a 6 mm slotted screwdriver or pliers, loosen the TPM screw and remove the TPM from the motherboard.

Step 3 Chose the appropriate option:

a) If you are decommissioning or recycling your blade server, remove and dispose of the TPM in accordance with your local laws about recycling and ewaste. Then proceed to Recycling the PCB Assembly (PCBA), on page 49.

b) If you are attempting to install a new TPM, see Installing the Trusted Platform Module, on page 48.