Oracle Private Cloud Appliance

Hardware Maintenance Guide

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Oracle Private Cloud Appliance Hardware Maintenance Guide,

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Preface

This publication is part of the customer documentation set for Oracle Private Cloud Appliance Release 3.0. Note that the documentation follows the release numbering scheme of the appliance software, not the hardware on which it is installed. All Oracle Private Cloud Appliance product documentation is available at https://docs.oracle.com/en/engineered-systems/private-cloud-appliance/index.html.

Oracle Private Cloud Appliance Release 3.x is a flexible general purpose Infrastructure as a Service solution, engineered for optimal performance and compatibility with Oracle Cloud Infrastructure. It allows customers to consume the core cloud services from the safety of their own network, behind their own firewall.

Audience

This documentation is intended for owners, administrators and operators of Oracle Private Cloud Appliance. It provides architectural and technical background information about the engineered system components and services, as well as instructions for installation, administration, monitoring and usage.

Oracle Private Cloud Appliance has two strictly separated operating areas, known as enclaves. The Compute Enclave offers a practically identical experience to Oracle Cloud Infrastructure: It allows users to build, configure and manage cloud workloads using compute instances and their associated cloud resources. The Service Enclave is where privileged administrators configure and manage the appliance infrastructure that provides the foundation for the cloud environment. The target audiences of these enclaves are distinct groups of users and administrators. Each enclave also provides its own separate interfaces.

It is assumed that readers have experience with system administration, network and storage configuration, and are familiar with virtualization technologies. Depending on the types of workloads deployed on the system, it is advisable to have a general understanding of container orchestration, and UNIX and Microsoft Windows operating systems.

Feedback

Provide feedback about this documentation at https://www.oracle.com/goto/docfeedback.

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.

Convention	Meaning
monospace	Monospace type indicates commands within a paragraph, code in examples, text that appears on the screen, or text that you enter.
$ prompt	The dollar sign ($) prompt indicates a command run as a non-root user.
# prompt	The pound sign (#) prompt indicates a command run as the root user.

Documentation Accessibility

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Diversity and Inclusion

Oracle is fully committed to diversity and inclusion. Oracle respects and values having a diverse workforce that increases thought leadership and innovation. As part of our initiative to build a more inclusive culture that positively impacts our employees, customers, and partners, we are working to remove insensitive terms from our products and documentation. We are also mindful of the necessity to maintain compatibility with our customers' existing technologies and the need to ensure continuity of service as Oracle's offerings and industry standards evolve. Because of these technical constraints, our effort to remove insensitive terms is ongoing and will take time and external cooperation.

1

Replacing Oracle Server X9-2 Components

This section provides a list of customer servicable components for an Oracle Server X9-2 that is installed in Oracle Private Cloud Appliance.

> **Warning**
>
> If you require service for any other Oracle Server X9-2 components, contact Oracle.

- Storage Drives
- Fan Modules
- Power Supplies
- Battery
- Cable Management Arm
- Rack Rails

For instructions about servicing these components, see the Oracle Service X9-2 Service Manual.

2

Replacing Oracle Storage Drive Enclosure DE3-24C Components

This section provides a list of customer servicable components for an Oracle Storage Drive Enclosure DE3-24C that is installed in Oracle Private Cloud Appliance.

> **Warning**
>
> If you require service for any other Oracle Storage Drive Enclosure DE3-24C components, contact Oracle.

- Disk Shelf Drives
- Disk Shelf I/O Modules
- Disk Shelf Power Supplies
- Rack Rails

For instructions about servicing these components, see Servicing the Disk Shelves in the *Oracle ZFS Storage Appliance Customer Service Manual, Release OS8.8.x*.

3 Replacing Switch Components

This section provides a list of customer servicable components for the Cisco Nexus 9348GC-FXP Switch and Cisco Nexus 9336C-FX2 Switch models that are installed in Oracle Private Cloud Appliance.

> **Warning**
>
> If you require service for any other switch components, contact Oracle.

- Fans
- Power Supplies

For instructions about servicing these components, see:

- Replacing Components in the *Cisco Nexus 9348GC-FXP NX-OS Mode Hardware Installation Guide*.
- Replacing Components in the *Cisco Nexus 9336C-FX2 NX-OS Mode Switch Hardware Installation Guide*.
- My Oracle Support note with Doc ID 3002562.1 (switch fan replacement).
- My Oracle Support note with Doc ID 3002565.1 (switch power supply replacement).

4

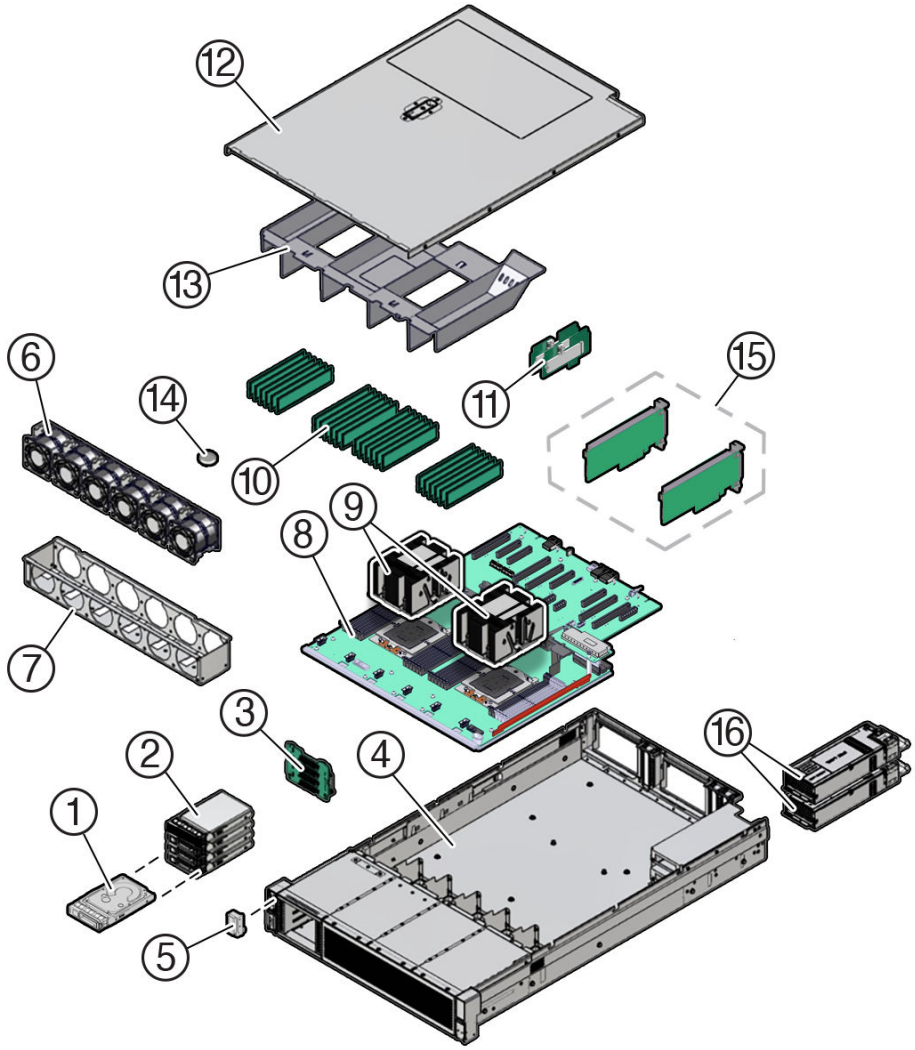
Replacing Oracle Server X10 Components

Compute nodes model Oracle Server X10 may be installed in your Oracle Private Cloud Appliance rack. Certain server components can be replaced by a data center administrator or technician in case of hardware failure. Please follow the step-by-step instructions provided in this guide.

> **Warning**
>
> If a replacement procedure is not listed in this guide, you must contact Oracle to have the malfunctioning component serviced.

Illustrated Parts Breakdown

The following figure identifies the major components of the Oracle Server X10.



Callout	Description
1	Storage drives – four 2.5-inch hot-pluggable PCIe-based NVMe SFF SSDs in 4-Drive backplane
2	Storage drive bay cage
3	4-Drive backplane (DBP)
4	System chassis
5	Front LED indicator module (FIM)
6	Six fan modules (FM0-5)
7	Fan tray
8	Motherboard assembly (MB)
9	Processors (P0, P1) and heatsinks
10	24 DIMMs
11	Internal M.2 SSD memory with two internal M.2 Risers
12	Top cover
13	Air baffle
14	System RTC battery

Callout	Description
15	HHHL PCIe cards – only slots 1 and 5 are populated in Private Cloud Appliance
16	Two power supplies (PS0, PS1)

Preparing the Server for Component Replacement

This section describes safety considerations and provides prerequisite procedures and information about replacing components in the server.

Before you can remove and install components that are inside the server, you must perform the procedures in some or all of the following sections. For more information, see the component replacement procedures in this guide.

Safety Precautions

For your protection, observe the following safety precautions when setting up your equipment:

- Follow all standard cautions, warnings, and instructions marked on the equipment and described in the "Oracle Server Safety and Compliance Guide" and "Important Safety Information for Oracle's Hardware Systems".
- Ensure that the voltage and frequency of your power source match the voltage and frequency that appear on the equipment electrical rating label.
- Follow the electrostatic discharge safety practices.
- Disconnect both power supply cords (if necessary) before servicing components.

> **Note**
>
> Power cords must be disconnected when servicing components that require cold service.

Safety Symbols

The following symbols might appear in this document. Note their meanings.

> **Caution**
>
> **Risk of personal injury or equipment damage.** To avoid personal injury or equipment damage, follow the instructions.

> **Caution**
>
> **Hot surface.** Avoid contact. Surfaces are hot and might cause personal injury if touched.

> **⚠ Caution**
>
> **Hazardous voltages are present.** To reduce the risk of electric shock and danger to personal health, follow the instructions.

Electrostatic Discharge Safety

Devices that are sensitive to electrostatic discharge (ESD), such as the motherboard, PCIe cards, drives, processors, and memory DIMMs require special handling.

> **⚠ Caution**
>
> The boards and drives contain electronic components that are extremely sensitive to static electricity. Ordinary amounts of static electricity from clothing or the work environment can destroy components. Do not touch the components along their connector edges.

Do the following when handling ESD-sensitive components:

- Use an antistatic wrist strap.

  Wear an antistatic wrist strap when handling components such as drive assemblies, boards, or cards. When servicing or removing server components, disconnect the power cords from the server. Attach an antistatic strap to your wrist and to a metal area on the chassis. Following this practice equalizes the electrical potentials between you and the server.

  > **ⓘ Note**
  >
  > An antistatic wrist strap is not included in the Accessory Kit for the server. However, antistatic wrist straps are included with optional components.

- Use an antistatic mat.

  Place ESD-sensitive components such as the motherboard, DIMMS (memory modules), and other printed circuit board (PCB) cards on an antistatic mat. The following items can be used as an antistatic mat:

  – Antistatic bag used to wrap an Oracle replacement part
  – Oracle ESD mat (orderable item)
  – Disposable ESD mat (shipped with some replacement parts or optional system components)

Powering Down the Server

Gracefully shut down the server host to prevent data from being corrupted. Performing a graceful shutdown ensures that the system is ready for restart. If the server is not responding, or you must shut down the server quickly, perform an immediate shutdown.

> **Note**
>
> Components that are hot-pluggable do not require the server to be powered down. For more information, see the component replacement procedures in this guide.

Before Powering Down a Node

Servers in a Private Cloud Appliance rack are integrated components of a multinode environment. Unless a server experiences a sudden failure or must be shut down in an emergency situation, powering down server nodes in the appliance should be planned and performed carefully to minimize impact on the performance and availability of the appliance services and resources.

When planning to power down server nodes, take these points into account:

System load
Powering down servers means system capacity is temporarily reduced. It makes sense to plan maintenance operations at a time when system load is typically at its lowest; for example during the night, over the weekend, and so on.

Instance availability
Many workloads need to remain available while a server is offline for maintenance. You can live-migrate compute instances to other compute nodes in the same fault domain, or restart them in another fault domain. The available compute capacity in the three fault domains determines whether all workloads can remain operational or if some need to be scaled down or even interrupted temporarily.

Maintenance mode
Before you can safely take a server offline, it must be placed in maintenance mode. In a Private Cloud Appliance environment this means that a compute node must not host any running compute instances, that it is under maintenance lock, and that provisioning has been disabled. An appliance administrator must perform these tasks from the Service Enclave.

For more information about locking nodes for maintenance, migrating compute instances, and configuring high availability in the Compute service, refer to the chapter Hardware Administration in the Oracle Private Cloud Appliance Administrator Guide.

Power Down a Node from the Service Enclave

> **Note**
>
> Always perform a graceful shutdown. It ensures that all data is saved and the system is ready for restart.

1. Ensure that no compute instances are running on this node, and that the maintenance and provisioning locks are active.
2. From the Service Enclave, issue the Stop command.

   See Hardware Administration in the Oracle Private Cloud Appliance Administrator Guide.

   - Service Web UI: In the Rack Units table, click the action menu (three vertical dots) and select Stop.
   - Service CLI: Enter the command `stop ComputeNode id=<node-id>`.

Alternative Ways to Power Down a Node

If the Stop command from the Service Enclave does not cause the node to power down as expected, try these alternatives:

- Use the Oracle Integrated Lights Out Manager (ILOM)
  1. Log in to the ILOM UI or CLI using an Administrator account.
  2. Perform a graceful shutdown.
     - ILOM UI: In the left pane, click Host Management, select Power Control, and click Graceful Shutdown and Power Off from the Select Action list. Click Save, and then click OK.
     - ILOM CLI: At the prompt, enter the command `stop /System`.
- Use the On/Standby Button

  Press and quickly release the On/Standby button on the front panel.

  This action causes ACPI-enabled operating systems to perform an orderly shutdown of the operating system.

The host server performs an orderly power shutdown to Standby power mode, and the System OK LED on the front panel begins blinking. Next, you can disconnect the cables from the server.

Disconnect Cables From the Server

> ⚠ **Caution**
>
> The system supplies Standby power to the circuit boards even when the system is powered off.

1. Ensure all cables connected to the server are labeled.
2. Power down the server.

   See Powering Down the Server.
3. Disconnect the power cords from the rear of the server.
4. Disconnect all data cables from the rear of the server.
5. Remove the cables from the cable management arm (CMA).

Extend the Server to the Maintenance Position

The following components can be replaced with the server in the maintenance position:

- Fan modules
- System battery

If the server is installed in a rack with extendable slide rails, use this procedure to extend the server to the maintenance position.

1. To prevent the rack from tipping forward when the server is extended, extend all rack anti-tilt mechanisms.

Refer to the "Oracle Rack Cabinet 1242 User's Guide" at Oracle Rack Cabinet 1242 Documentation Library.

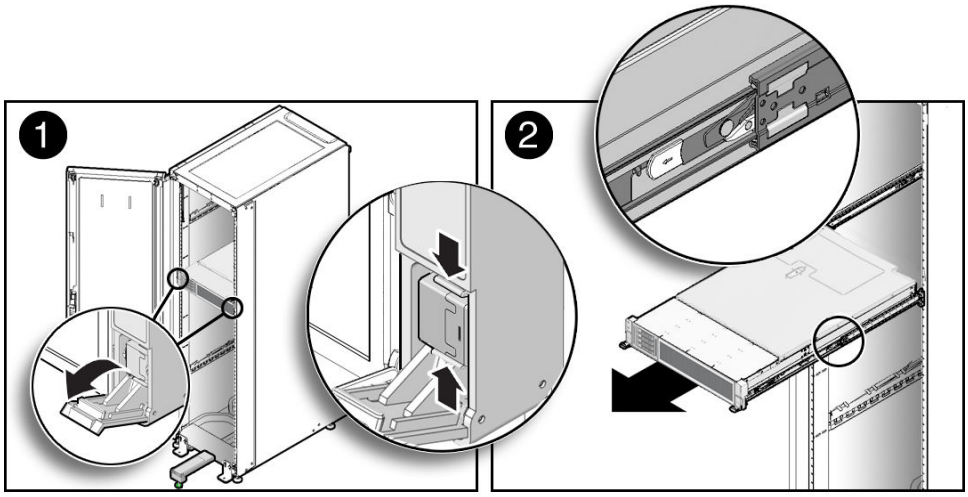
2. Verify that no cables will be damaged or will interfere when the server is extended.

   Although the cable management arm (CMA) that is supplied with the server is hinged to accommodate extending the server, ensure that all cables and cords are capable of extending.

3. From the front of the server, open and hold the left and right release latch covers in the open position.

   When in an open position, the release latch covers engage the slide rail release latches [1].

> ⚠ **Caution**
>
> Deploy any rack anti-tilt mechanism before releasing the slide rail release latches.



4. While the release latch covers are in the open position, slowly pull the server forward until the slide rails latch into a locked position [2].

   The server is now in the extended maintenance position.

Take Antistatic Measures

1. Prepare an antistatic surface on which to set parts during removal and installation.

   Place electrostatic discharge ESD-sensitive components such as the printed circuit boards on an antistatic mat. You can use the following items as an antistatic mat:

   - Antistatic bag used to wrap a replacement part
   - Oracle ESD mat (orderable item)
   - Disposable ESD mat (shipped with some replacement parts or optional system components)

2. Attach an antistatic wrist strap.

   When servicing or removing server components, attach an antistatic strap to your wrist and then to a metal area on the chassis. Then perform procedures for servicing the server.

> **Note**
>
> An antistatic wrist strap is not included in the Accessory Kit for the server. However, antistatic wrist straps might be included with options and components.

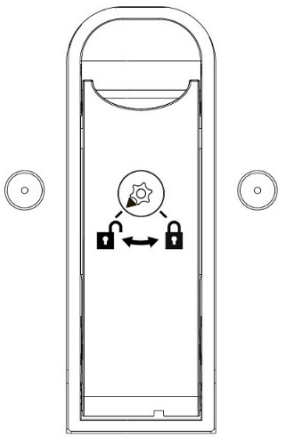
Remove the Server Top Cover

Replacing some components requires that the top cover be removed.

1. Ensure that AC power cords are disconnected from the server power supplies.

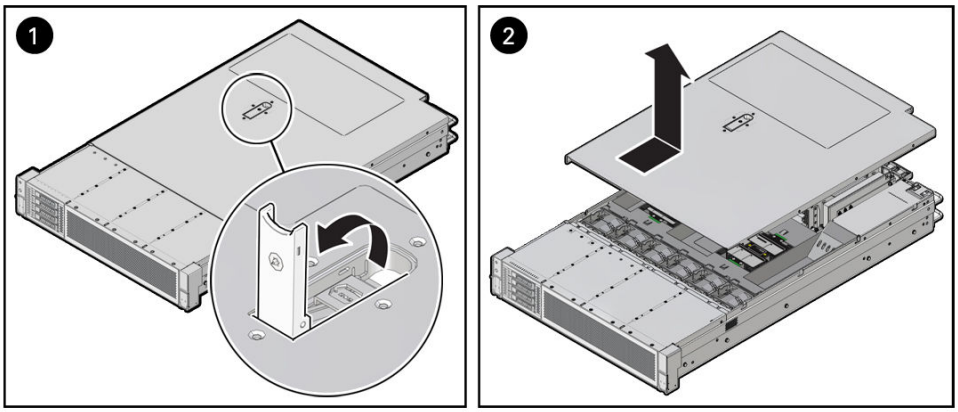
> **Note**
>
> Fan modules are hot-pluggable and do not require AC power cables to be disconnected from the server power supplies.

2. If the release button latch is in the locked position, use a Torx T15 screwdriver to turn the release button latch clockwise to the unlocked position.



3. Unlatch the top cover [1].

   Lift up on the release button on top of the server cover. Lifting the release button slides the server cover toward the rear of the chassis for easy removal.



4. Lift up and remove the top cover [2].

Replacing a Fan Module

Fan modules are replaceable components that do not require you to power off the server before servicing.

Fan modules are located in the front of the server.

> **Note**
>
> If the system detects a fan module fault, the front and back panel Fault-Service Required LEDs are lit, as is the front Top Fan LED.

> **Caution**
>
> When removing and replacing a fan module in the Oracle Server X10, you must complete the entire procedure within 60 seconds to maintain adequate cooling in the system. Remove and replace only one fan module at a time. Ensure that you have obtained the replacement fan module and that it is ready for installation before starting the replacement procedure.
>
> Each fan module contains one fan, with two fan motors per fan. The two fan motors provide separate tachometer signals so that the fan module reports two tach signals to Oracle ILOM. Even if only one fan motor is faulted within the fan module, the Oracle ILOM service processor detects that two fan motors have failed to spin while the fan module is removed. If the fan module is not replaced within 60 seconds of removal, Oracle ILOM will take the protective action to shut down the system to prevent thermal damage to the system.
>
> If the cover is not installed within 60 seconds, the system may shutdown due to over-temperature or a PCIe card may overheat, potentially damaging it.

Remove a Fan Module

You do not have to power off the server to replace fan modules.

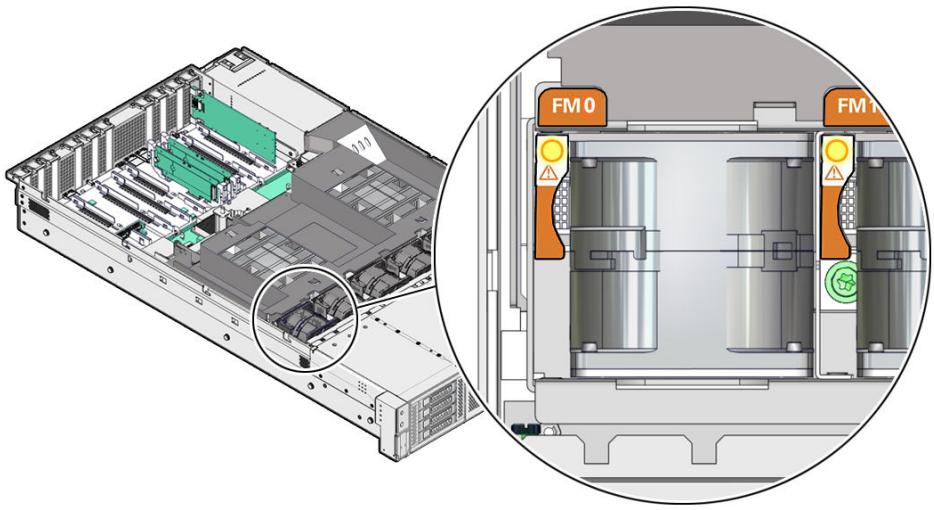
1. Extend the server to the maintenance position.

   See Extend the Server to the Maintenance Position.

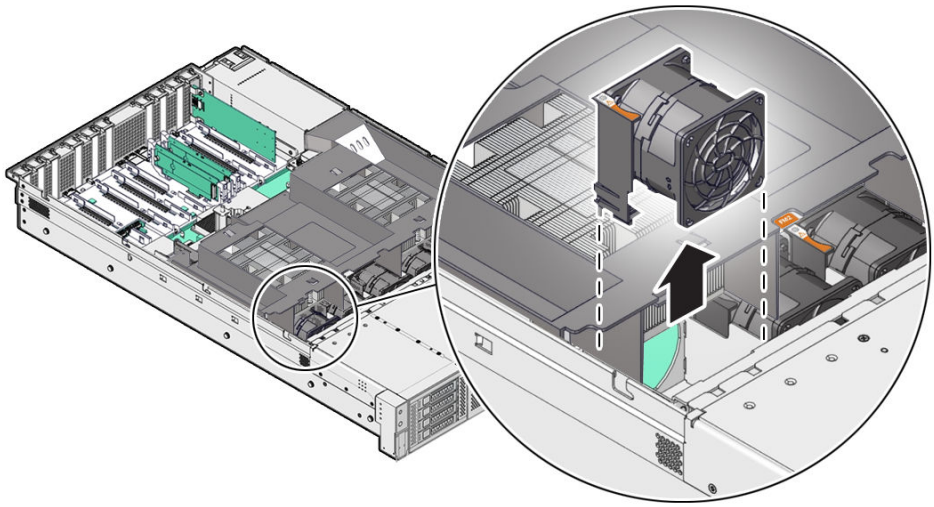
2. To access the fan modules, remove the server top cover.

   See Remove the Server Top Cover.

3. Identify the faulty fan module.
   Each fan module has a fan service action required status indicator (LED) that is located next to the module. If the LED is amber, the fan has failed. The location of the fan status LED is shown in the following figure.

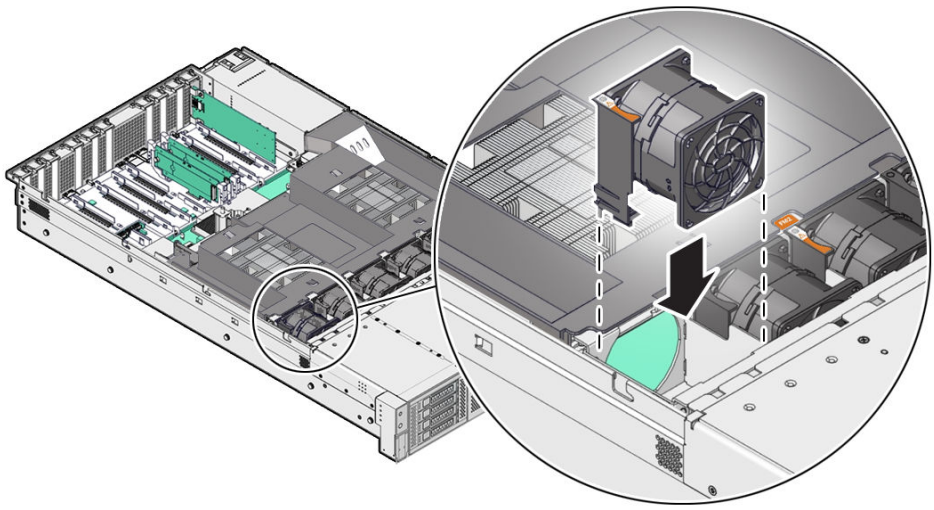


4. Using your forefinger and thumb, lift the fan module straight up and out of the chassis and set it aside on an antistatic mat.



Install a Fan Module

1. Remove the replacement fan module from its packaging, and place it on an antistatic mat.
2. With the server top cover removed, install the replacement fan module into the server. The fan modules are keyed to ensure that they are installed in the correct orientation.



3. Press down on the fan module to fully seat the fan module.
4. Verify that the fan module status indicator (LED) for the replacement fan module is not illuminated.
5. Install the server top cover.

   See Install the Server Top Cover.
6. Verify that the Top Fan Fault LED on the front of the server and the Fault-Service Required LEDs on the front and back of the server are not illuminated.
7. Return the server to operation.

   See Returning the Server to Operation.

Replacing the Battery

The system battery is a replaceable component that requires you to power off the server before servicing.

The real-time clock (RTC) battery maintains system time when the server is powered off and a time server is unavailable. If the server does not maintain the correct time when the system is powered off and not connected to a network, replace the battery.

⚠ Caution

These procedures require that you handle components that are sensitive to electrostatic discharge. This sensitivity can cause the components to fail. To avoid damage, ensure that you follow antistatic practices, as described in Electrostatic Discharge Safety under "Safety Precautions".

⚠ Caution

Ensure that all power is removed from the server before removing or installing the battery. You must disconnect the power cables from the system before performing these procedures.

Remove the Battery

1. Power off the server.

   See Powering Down the Server.

2. Disconnect the power cords from the power supplies.

   See Disconnect Cables From the Server.

3. Extend the server into the maintenance position.

   See Extend the Server to the Maintenance Position.

4. Attach an antistatic wrist strap to your wrist, and then to a metal area on the chassis.

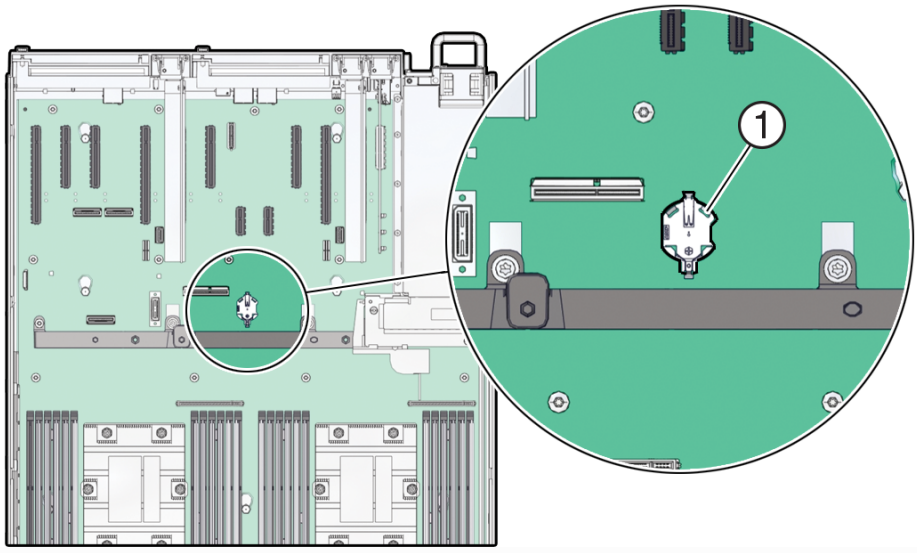
   See Take Antistatic Measures.

5. Remove the server top cover.

   See Remove the Server Top Cover.

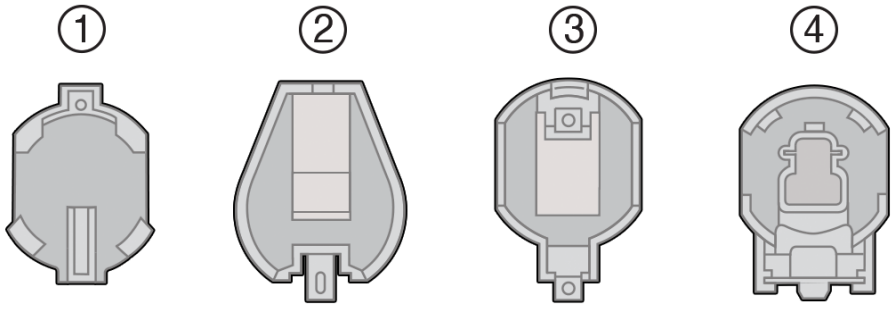
6. Locate the battery and RTC battery retainer on the server motherboard.

> **Note**
>
> Coin battery retainer types that are mounted in the RTC battery motherboard location may be different.



7. Remove the battery from the battery holder.

   Review the following battery holder (Part number: 8210501) options.



Callout	Description
1	796136-1 Top-Load Battery Connector (TE)
2	1093TR Top-Load Battery Connector
3	1070TR Top-Load Battery Connector
4	S8421 Top-Load Battery Connector

Select the detailed instructions below for the specific type of RTC battery retainer on the server motherboard.

- **[Type 1]** Remove the battery from the TE Top-Load Battery Connector as follows.

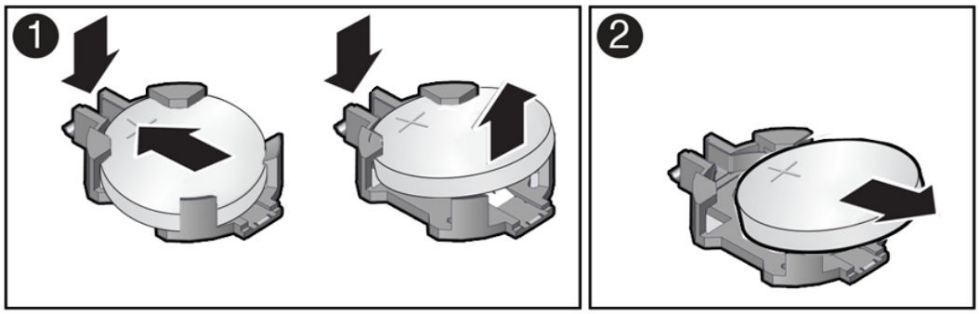
  Each connector consists of a housing with a positive contact and a negative contact. The floor of the housing is embossed with a `+' to designate the positive contact. The connector features four lips for positive retention of the battery.

  a. Grasp connector. Support the connector by grasping the "positive" end of the connector.

  > ⚠ **Caution**
  >
  > The connector must be supported, otherwise damage to the soldered contacts could occur.

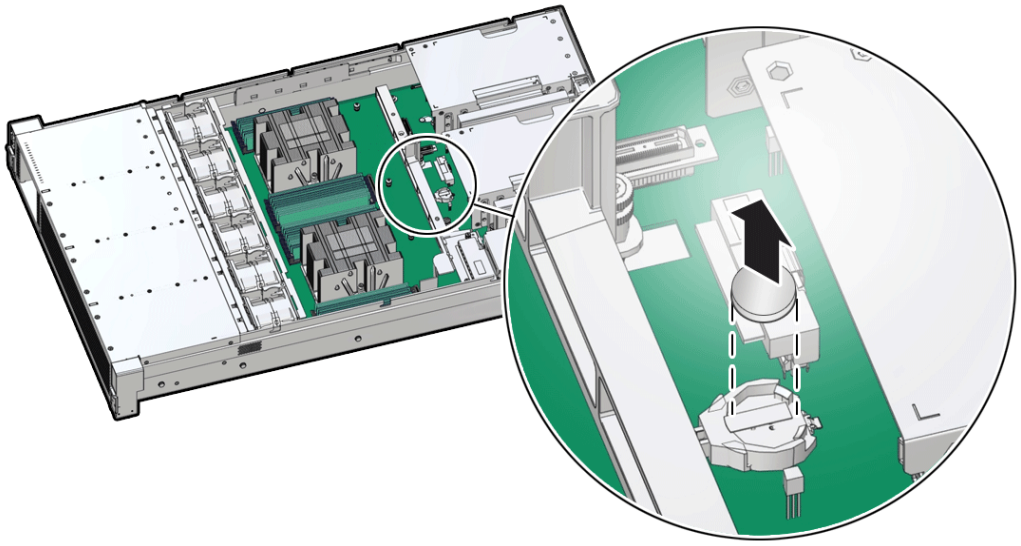
  b. Slide battery under lips at positive end of connector. While supporting the connector, simultaneously push the battery toward the positive end of the connector, and slightly move the lips at the negative end of the connector away from the battery. Hold in this position, and lift the battery.

  c. Pull the battery from the connector.

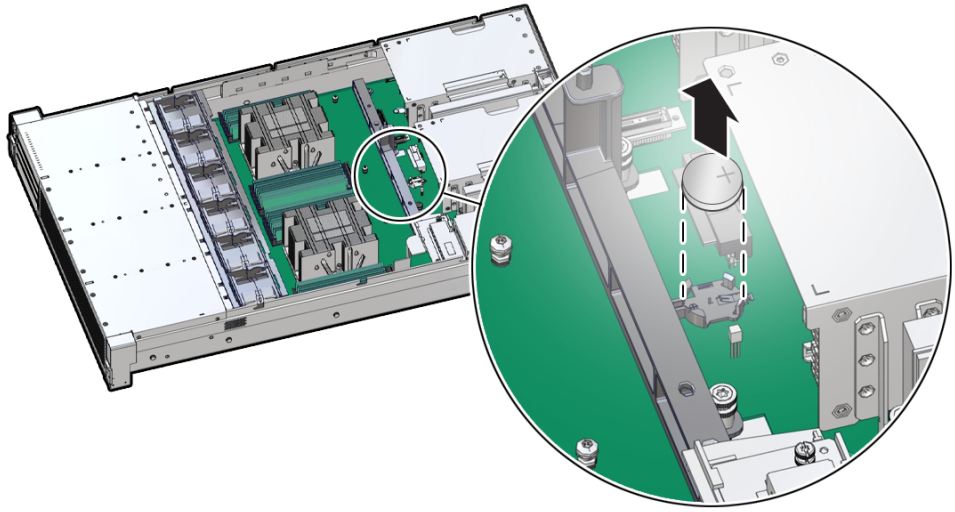
  

- **[Type 2]** Remove the battery from the 1093TR battery connector as follows.

Push the coin battery towards the negative spring and then lift up the coin battery to dislodge it from its holder.



- **[Type 3 and 4]** Remove the battery from other Top-Load Battery Connectors as follows.
  a. To dislodge the battery from the retainer, place your finger under the side of the battery nearest the rear of the server [1].
  b. Gently lift the battery up and out of the retainer [2].



Install the Battery

1. Unpack the replacement RTC battery.
2. Press the new battery into the battery retainer.

   Install the battery into the Top-Load Battery Connector as follows:

   - Each connector consists of a housing with a positive contact and a negative contact. The floor of the housing is embossed with a "+" to designate the positive contact. The connector features four lips for positive retention of the battery.

a. Grasp connector. Support the connector by grasping the positive end of the connector.

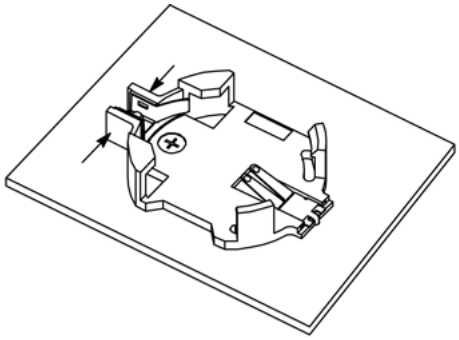
> **⚠ Caution**
>
> The connector must be supported, otherwise damage to the soldered contacts could occur.

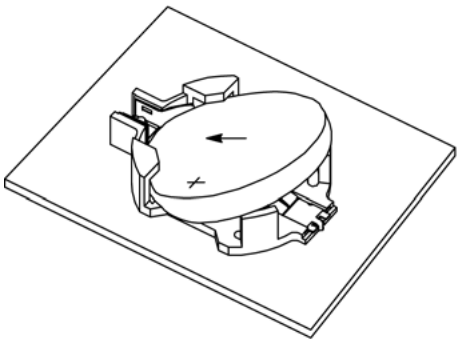
b. Slide battery under lips at positive end of connector. While supporting the connector, hold the battery at an angle with the positive side facing up, and slide the battery under the lips at the positive end of the connector.

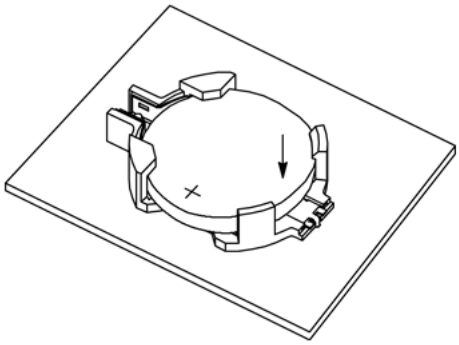
> **ⓘ Note**
>
> Positive side of battery is marked with a "+".

c. Fully seat battery onto housing floor. Gently push the battery onto the floor of the housing until the battery is fully seated. There should be an audible "snap".

> **ⓘ Note**
>
> Insert the battery so that the positive (+) side is facing up.







- Press the new battery into the battery retainer with the positive side (+) facing up.

3. Install the server top cover.

   See Install the Server Top Cover.

4. Return the server to the normal rack position.

   See Return the Server to the Normal Rack Position.

5. Reconnect the power cords to the server power supplies, and power on the server.

   See Reconnect Power and Data Cables and Power On the Server.

6. Verify that the System OK LED indicator is lit.

> **Note**
>
> If the service processor is configured to synchronize with a network time server using the Network Time Protocol (NTP), the Oracle ILOM SP clock is reset as soon as the server is powered on and connected to the network. Otherwise, proceed to the next step.

7. If the service processor is not configured to use NTP, you must reset the Oracle ILOM clock using Oracle ILOM CLI or web interface. Refer to Oracle ILOM Documentation.

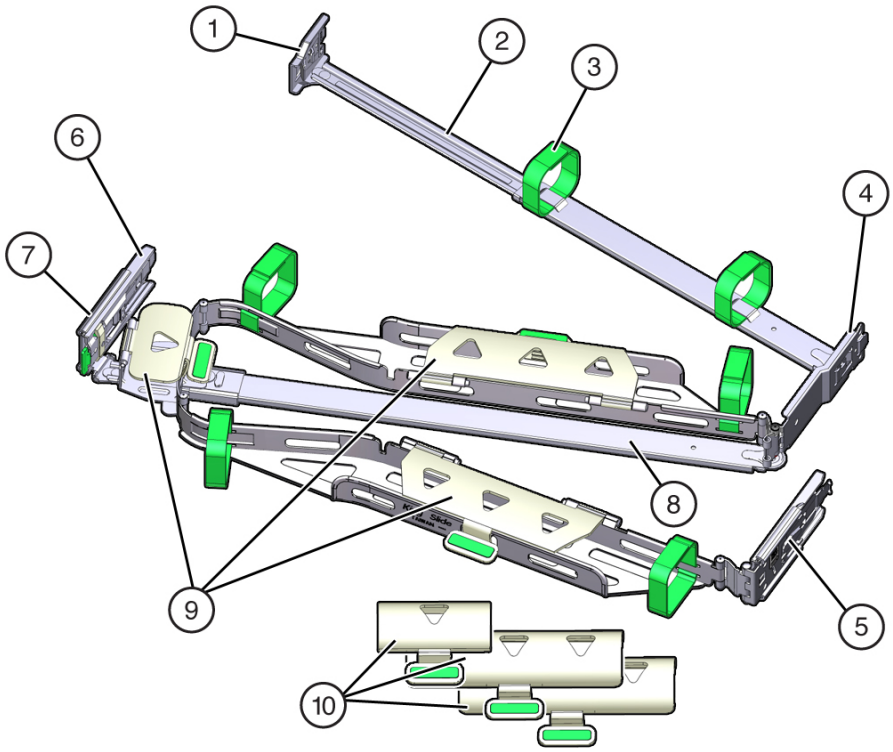
Replacing the Cable Management Arm

The cable management arm (CMA) is a replaceable component that requires you to power off the server before servicing. Before starting operations on the CMA, refer to the illustration below to identify the CMA connectors A, B, C, and D. The CMA connectors must be disconnected in the reverse order – that is, disconnect connector D first, followed by C, B, and A.

> **Warning**
>
> To reduce the risk of personal injury, stabilize the rack cabinet and extend the anti-tilt bar before extending the server from the rack.

> **Caution**
>
> While any of the four CMA connectors are disconnected, do not allow the CMA to hang under its own weight.

> **Note**
>
> References to “left” or “right” in this procedure assume that you are facing the back of the equipment rack.



Call Out	Description
1	Connector A
2	Front slide bar
3	Velcro straps (6)
4	Connector B
5	Connector C
6	Connector D
7	Slide-rail latching bracket (used with connector D)
8	Back slide bar
9	Server flat cable covers
10	Server round cable covers (optional)

Remove the Cable Management Arm

> **⚠ Caution**
>
> Throughout this procedure, after you disconnect any of the CMA four connectors, do not allow the CMA to hang under its own weight.

1. To make it easier to remove the CMA, extend the server approximately 13 cm (5 inches) out of the front of the rack.
2. To remove the cables from the CMA:

a. Disconnect all cables from the back of the server.

b. If applicable, remove any additional Velcro straps that were installed to bundle the cables.

c. Unwrap the six Velcro straps that are securing the cables.

d. Open the three cable covers to the fully opened position.

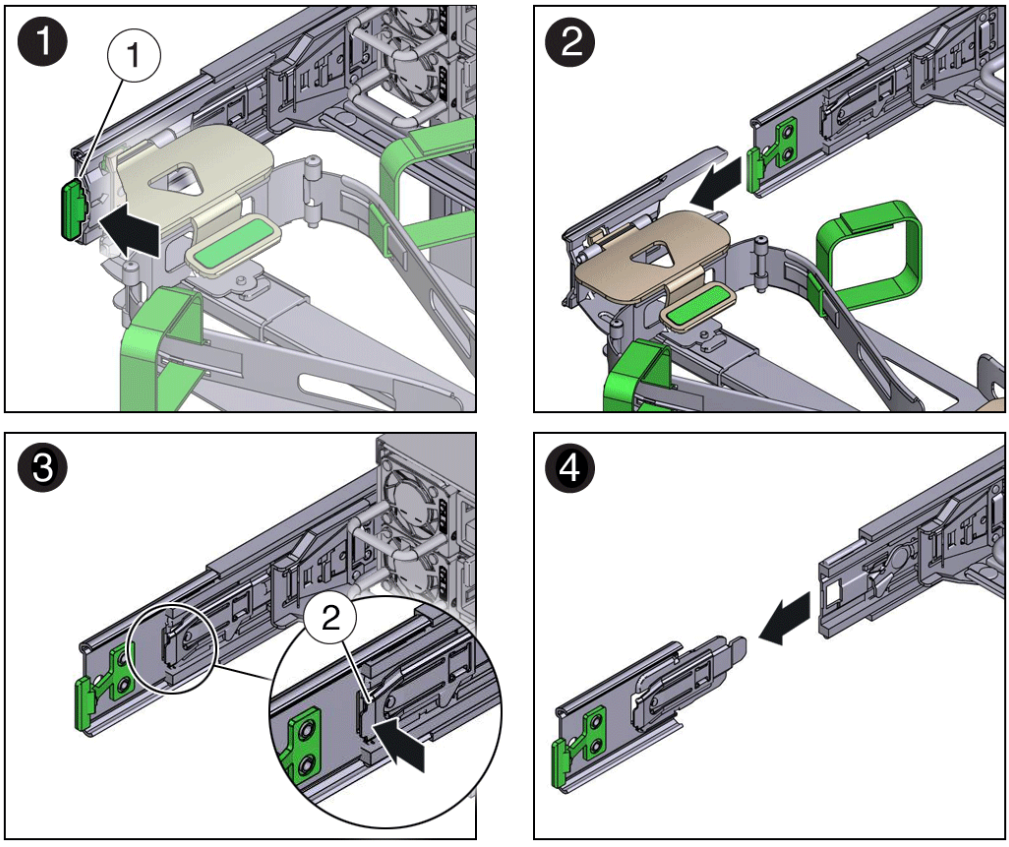
e. Remove the cables from the CMA and set them aside.

3. To disconnect connector D:

a. Press the green release tab (callout 1) on the slide rail latching bracket toward the left and slide the connector D out of the left slide rail [1 and 2].

When you slide connector D out of the left slide rail, the slide rail latching bracket portion of the connector remains in place. You disconnect connector D in the next step.

> **Note**
>
> After you disconnect connector D, do not allow the CMA to hang under its own weight. Throughout the remainder of this procedure, the CMA must be supported until all the remaining connectors are disconnected and the CMA can be placed on a flat surface.



Call Out	Description
1	Connector D release tab (green)

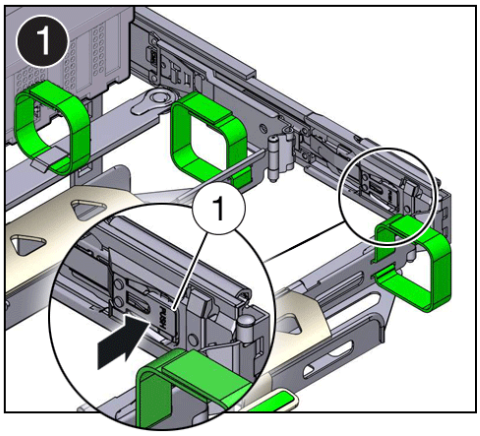
Call Out	Description
2	Slide rail latching bracket release tab (labeled PUSH)

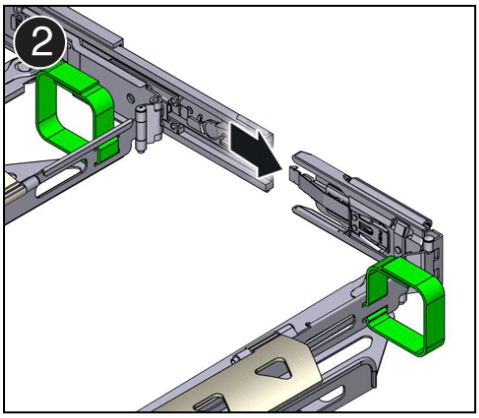
b. Use your right hand to support the CMA and use your left thumb to push in (toward the left) on the slide rail latching bracket release tab labeled PUSH (callout 2), and pull the latching bracket out of the left slide rail and put it aside [3 and 4].

4. To disconnect connector C:

a. Place your left arm under the CMA to support it.

b. Use your right thumb to push in (toward the right) on the connector C release tab labeled PUSH (callout 1), and pull connector C out of the right slide rail [1 and 2].



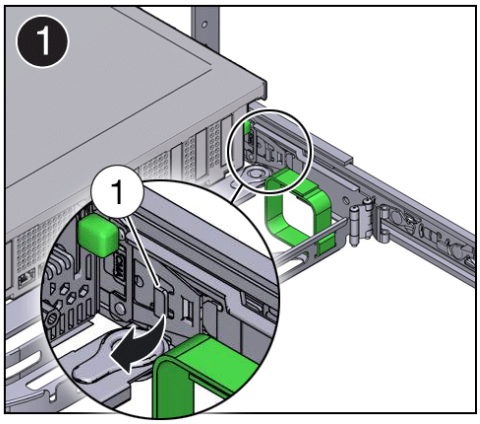


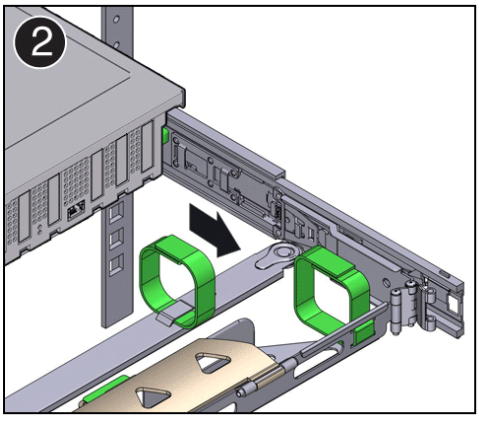
Call Out	Description
1	Connector C release tab (labeled PUSH)

5. To disconnect connector B:

a. Place your right arm under the CMA to support it and grasp the back end of connector B with your right hand.

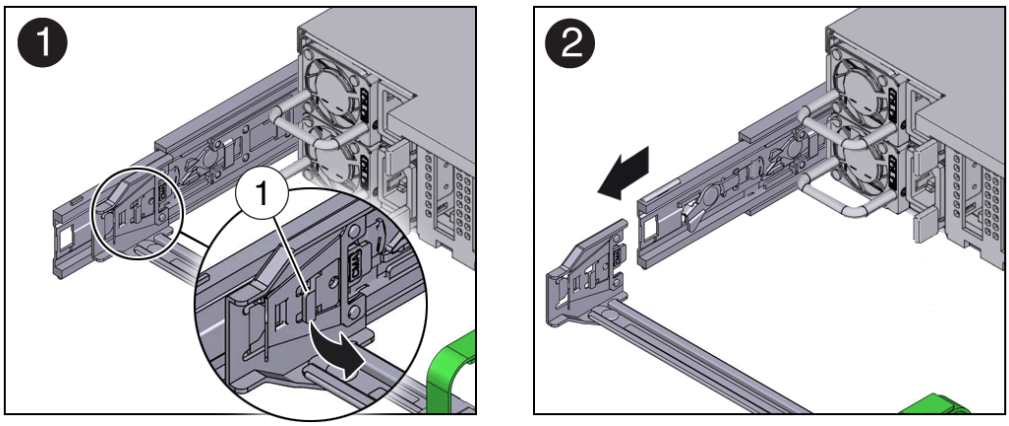
b. Use your left thumb to pull the connector B release lever to the left, away from the right slide rail (callout 1), and use your right hand to pull the connector out of the slide rail [1 and 2].





Call Out	Description
1	Connector B release lever

6. To disconnect connector A:
   a. Place your left arm under the CMA to support it and grasp the back end of connector A with your left hand.
   b. Use your right thumb to pull the connector A release lever to the right, away from the left slide rail (callout 1), and use your left hand to pull the connector out of the slide rail [1 and 2].



Call Out	Description
1	Connector A release lever

7. Remove the CMA from the rack and place it on a flat surface.
8. Go to the front of the server and push it back into the rack.

Install the Cable Management Arm

1. Prepare the CMA for installation.
   a. Ensure that the flat cable covers are installed on the CMA.
   b. Ensure that the six Velcro straps are threaded into the CMA.

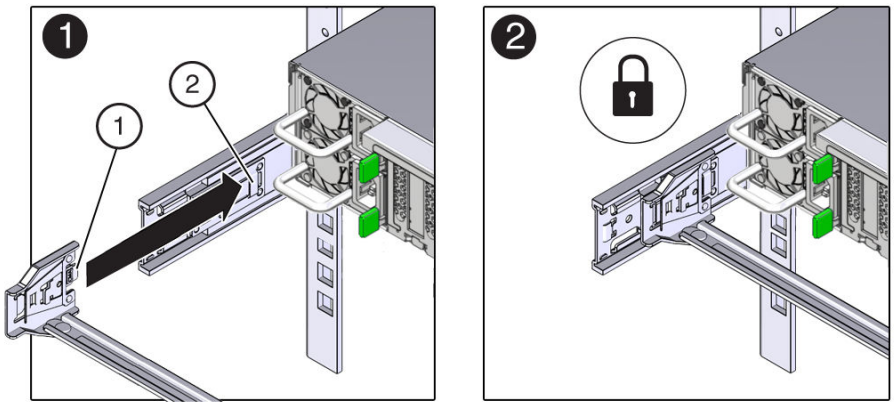
> **Note**
>
> Ensure that the two Velcro straps located on the front slide bar are threaded through the opening in the top of the slide bar. This prevents the Velcro straps from interfering with the expansion and contraction of the slide bar when the server is extended out of the rack and returned to the rack.

   c. To make it easier to install the CMA, extend the server approximately 13 cm (5 inches) out of the front of the rack.
   d. Take the CMA to the back of the equipment rack, and ensure that you have adequate room to work at the back of the server.

> **Note**
>
> References to "left" or "right" in this procedure assume that you are facing the back of the equipment rack.
>
> Throughout this installation procedure, support the CMA and do not allow it to hang under its own weight until it is secured at all four attachment points.

2. To install CMA connector A into the left slide rail:
   a. Insert CMA connector A into the front slot on the left slide rail until it locks into place with an audible click [1 and 2].

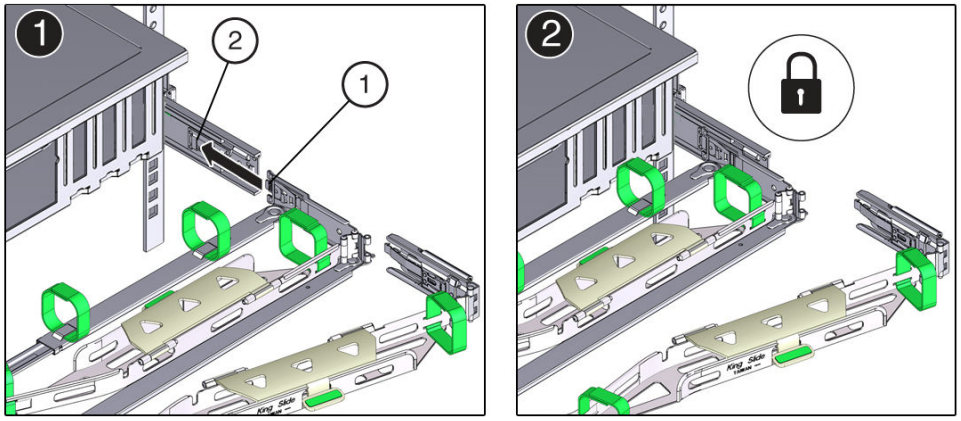
      The connector A tab (callout 1) goes into the slide rail front slot (callout 2).
   b. Gently tug on the left side of the front slide bar to verify that connector A is properly seated.



Call Out	Description
1	Connector A tab
2	Left slide rail front slot

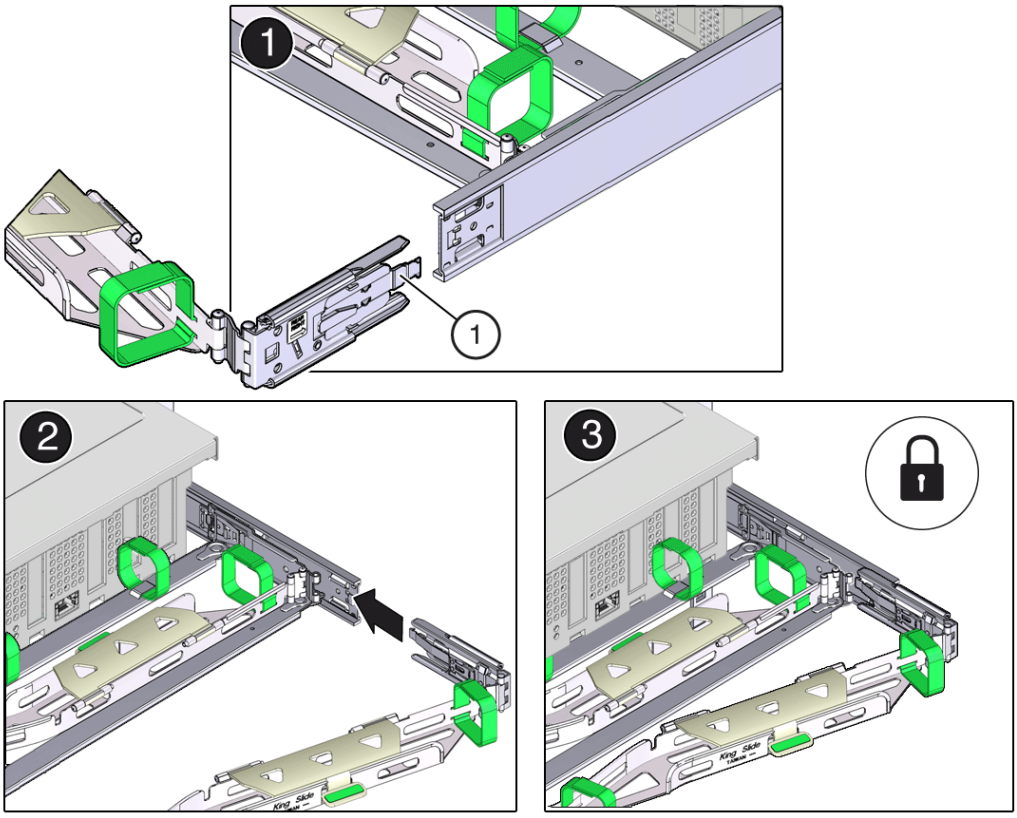
3. To install CMA connector B into the right slide rail:
   a. Insert CMA connector B into the front slot on the right slide rail until it locks into place with an audible click [1 and 2].

      The connector B tab (callout 1) goes into the slide rail front slot (callout 2).
   b. Gently tug on the right side of the front slide bar to verify that connector B is properly seated.



Call Out	Description
1	Connector B tab
2	Right slide rail front slot

4. To install CMA connector C into the right slide rail:
   a. Align connector C with the slide rail so that the locking spring (callout 1) is positioned inside (server side) of the right slide rail [1].



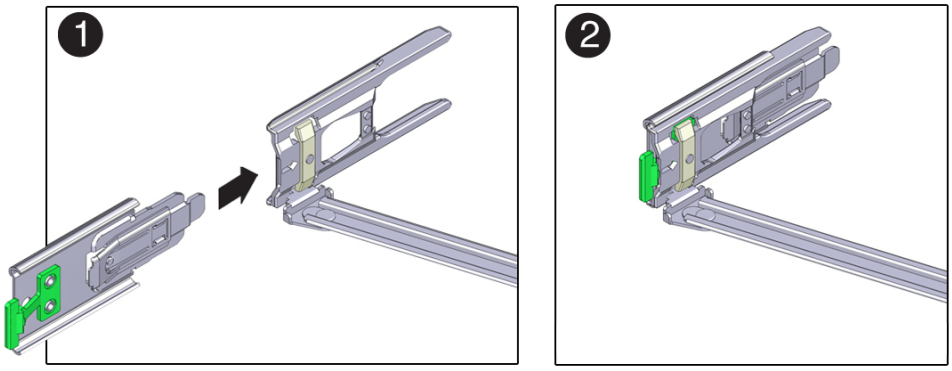
Call Out	Description
1	Connector C locking spring

b. Insert connector C into the right slide rail until it locks into place with an audible click [2 and 3].

c. Gently tug on the right side of the CMA back slide bar to verify that connector C is properly seated.

5. To prepare CMA connector D for installation, remove the tape that secures the slide rail latching bracket to connector D, and ensure that the latching bracket is properly aligned with connector D [1 and 2].

> **Note**
>
> The CMA is shipped with the slide rail latching bracket taped to connector D. You must remove the tape before you install this connector.



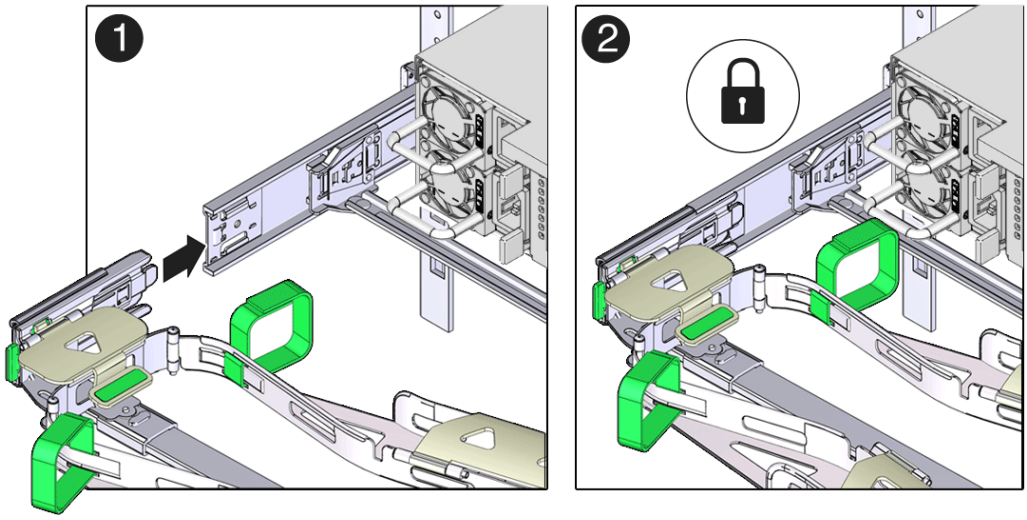
6. To install CMA connector D into the left slide rail:

a. While holding the slide rail latching bracket in place, insert connector D and its associated slide rail latching bracket into the left slide rail until connector D locks into place with an audible click [1 and 2].

> **Note**
>
> When inserting connector D into the slide rail, the preferred and easier method is to install connector D and the latching bracket as one assembly into the slide rail.

b. Gently tug on the left side of the CMA back slide bar to verify that connector D is properly seated.

> **Note**
>
> The slide rail latching bracket has a green release tab. Use the tab to release and remove the latching bracket so that you can remove connector D.

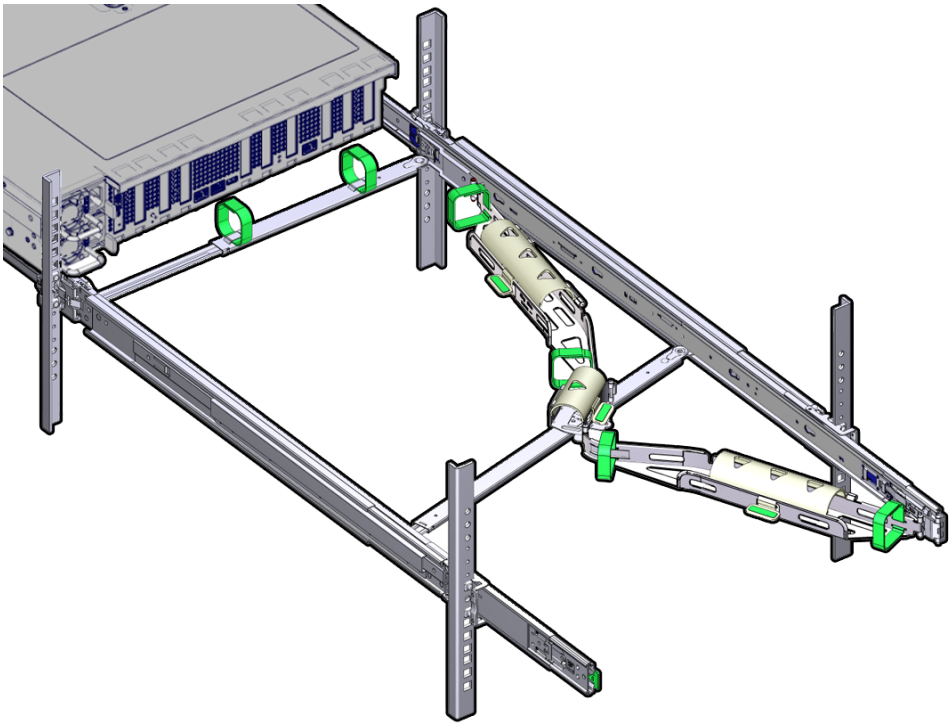


7. Gently tug on the four CMA connection points to ensure that the CMA connectors are fully seated before you allow the CMA to hang by its own weight.
8. To verify that the slide rails and the CMA are operating properly before routing cables through the CMA:
   a. Ensure that the rack anti-tilt bar is extended to prevent the rack from tipping forward when the server is extended.

> ⚠ **Caution**
>
> To reduce the risk of personal injury, stabilize the rack cabinet and extend the anti-tilt bar before extending the server from the rack.

   b. Slowly pull the server out of the rack until the slide rails reach their stops.
   c. Inspect the attached cables for any binding or kinks.

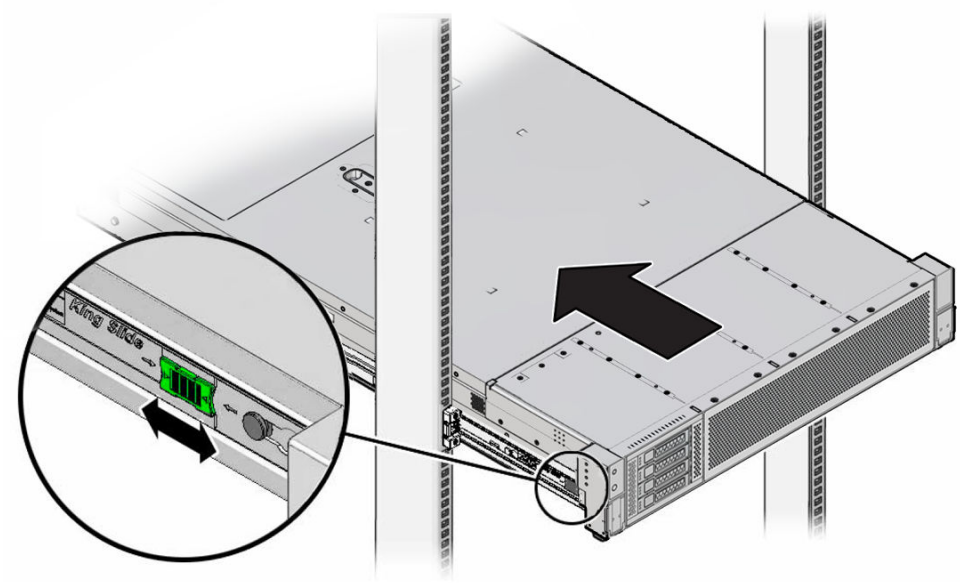
d. Verify that the CMA extends fully with the slide rails.



9. To return the server to the rack:

   a. Simultaneously pull and hold the two green release tabs (one on each side of the server) toward the front of the server while you push the server into the rack. As you push the server into the rack, verify that the CMA retracts without binding.

   b. To pull the green release tabs, place your finger in the center of each tab, not on the end, and apply pressure as you pull the tab toward the front of the server.



   c. Continue pushing the server into the rack until the slide rail locks (on the front of the server) engage the slide rail assemblies.

You hear a click when the server is in the normal rack position.

10. Connect cables to the server, as required.

    See Reconnect Power and Data Cables.

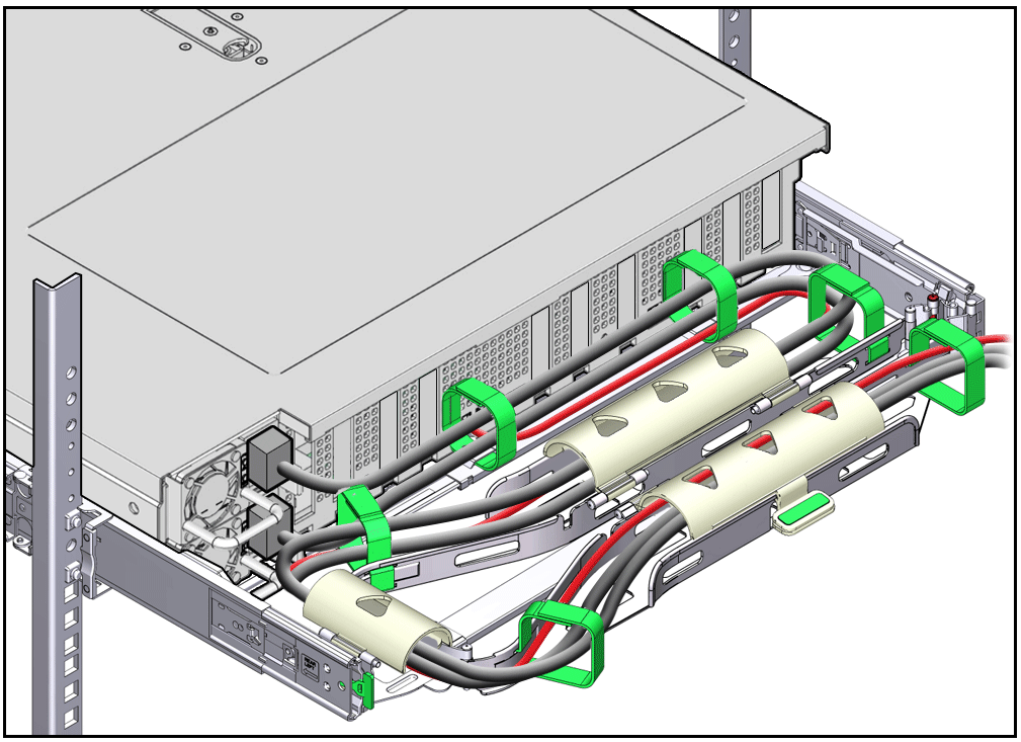
11. Open the CMA cable covers, route the server cables through the CMA cable troughs (in the order specified in the following steps), close the cable covers, and secure the cables with the six Velcro straps.

    a. First through the front-most cable trough.

    b. Then through the small cable trough.

    c. Then through the back-most cable trough.

> ⚠ **Caution**
>
> When securing the cables with the Velcro straps located on the front slide bar, ensure that the Velcro straps do not wrap around the bottom of the slide bar. Otherwise, expansion and contraction of the slide bar might be hindered when the server is extended from the rack and returned to the rack.



12. Ensure that the secured cables do not extend above the top or below the bottom of the server to which they are attached.

    Otherwise, the cables might snag on other equipment installed in the rack when the server is extended from the rack or returned to the rack.

13. If necessary, bundle the cables with additional Velcro straps to ensure that they stay clear of other equipment.

> **Note**
>
> If you need to install additional Velcro straps, wrap the straps around the cables only, not around any of the CMA components. Otherwise, expansion and contraction of the CMA slide bars might be hindered when the server is extended from the rack and returned to the rack.

Returning the Server to Operation

This section describes safety considerations and provides procedures and information after replacing components in the server.

After replacing components inside of the server, perform the procedures in the following sections. For more information, see the component replacement procedures in this guide.

Install the Server Top Cover

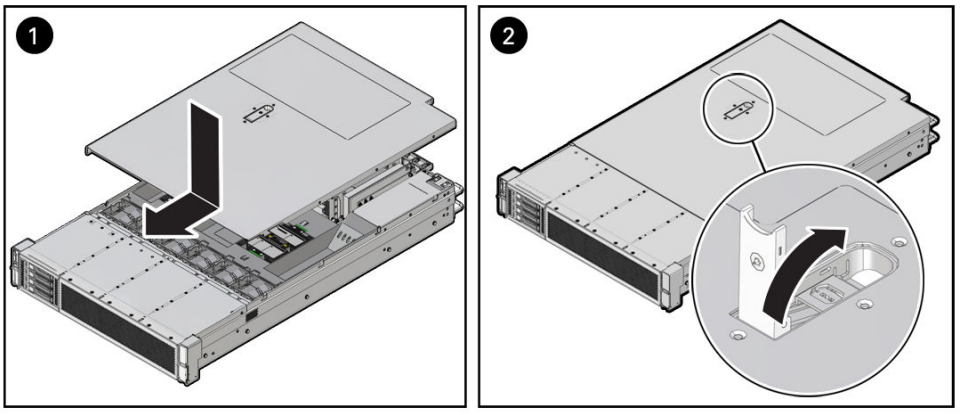
1. Place the top cover on the chassis [1].

   Set the cover down so that it hangs over the back of the server by about 1 inch (25 mm) and the side latches align with the cutouts in the chassis.

2. Check both sides of the chassis to ensure that the top cover is fully down and flush with the chassis.

   If the cover is not fully down and flush with the chassis, slide the cover towards the back of the chassis to position the cover in the correct position.

3. Gently slide the cover toward the front of the chassis until it latches into place with an audible click [2].
   As you slide the cover toward the front of the server, the release button on the top of the server automatically rotates downward to the closed position. Latch the top cover by pushing down on the button until it is flush with the cover and you hear an audible click. An audible click indicates that the cover is latched.



4. Use a Torx T15 screwdriver to turn the release button latch counterclockwise to the locked position.

5. If you are done replacing server components, remove any antistatic straps or conductors from the server chassis.

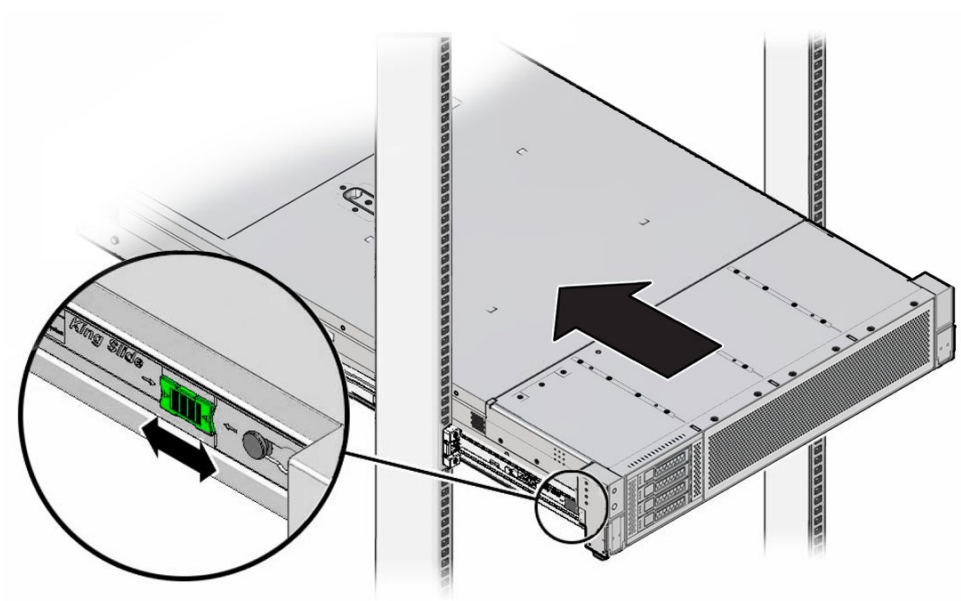
Return the Server to the Normal Rack Position

If the server is in the extended maintenance position, use this procedure to return the server to the normal rack position.

1. Push the server back into the rack, as described in the following steps.
   a. Simultaneously pull and hold the two green release tabs (one on each side of the slide rails on the server) toward the front of the server, while you push the server into the rack.

      Verify that the cable management arm (CMA) retracts without binding.

      > **Note**
      >
      > To pull the green release tab, place your finger in the center of the tab, not on the end, and apply pressure as you pull the tab toward the front of the server.



   b. Continue pushing the server into the rack until the slide rail locks (on the front of the server) engage the slide rail assemblies.

      You hear an audible click when the server is in the normal rack position.

2.
3. If the CMA is not installed, because you removed the server completely out of the rack, install the CMA.

   For installation instructions for the CMA, see Install the Cable Management Arm.
4. If the cables are disconnected from the back of the server, because you extended the server out of the rack, reconnect the cables. For instructions to reconnect cables to the back of the server, see Reconnect Power and Data Cables.

Reconnect Power and Data Cables

1. Reconnect the data cables to the back of the server, as appropriate.

   > **Note**
   >
   > If the cable management arm (CMA) is in the way, extend the server approximately 13 cm (5 inches) out of the front of the rack.

2. Reconnect the power cables to the power supplies.
3. Reinstall the cables into the cable management arm and secure them with Velcro straps.

Power On the Server

As soon as the power cords are connected, Standby power is applied. In Standby power mode:

- The System OK LED on the server front panel blinks slowly.
- The SP OK LED indicator is steady on.
- The AC power supply LED indicator lights are steady on.

Power on the server to Main power mode by performing the following procedure:

1. From the Service Enclave, issue the Start command.

   See Hardware Administration in the Oracle Private Cloud Appliance Administrator Guide.

   - Service Web UI: In the Rack Units table, click the action menu (three vertical dots) and select Start.
   - Service CLI: Enter the command start ComputeNode id=<***node-id***>.

2. If the Start command from the Service Enclave does not cause the node to boot as expected, try these alternatives:

   - Log in to the Oracle Integrated Lights Out Manager (ILOM).
     - ILOM UI: In the left pane, click Host Management, select Power Control, and click Power On from the Select Action list.
     - ILOM CLI: At the prompt, enter the command start /System.
   - Press the On/Standby button on the front bezel.

When the server is powered on to Main power mode and the power-on self-test (POST) code checkpoint tests are complete, the green System OK LED status indicator on the front panel of the server lights and remains lit.

5

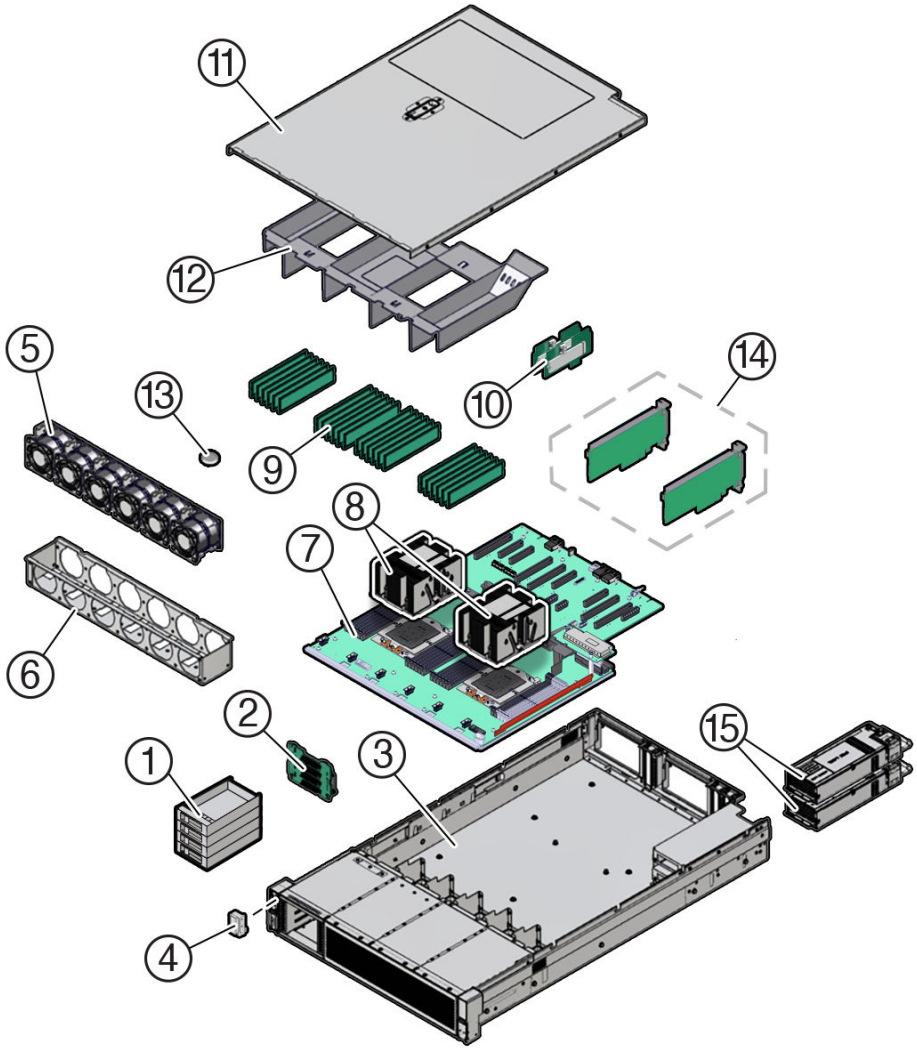
Replacing Oracle Server X11 Components

Compute nodes model Oracle Server X11 may be installed in your Oracle Private Cloud Appliance rack. Certain server components can be replaced by a data center administrator or technician in case of hardware failure. Please follow the step-by-step instructions provided in this guide.

> **Warning**
>
> If a replacement procedure is not listed in this guide, you must contact Oracle to have the malfunctioning component serviced.

Illustrated Parts Breakdown

The following figure identifies the major components of the Oracle Server X11.



Callout	Description
1	Storage drive filler panels
2	4-Drive backplane (DBP)
3	System chassis
4	Front LED indicator module (FIM)
5	Six fan modules (FM0-5)
6	Fan tray
7	Motherboard assembly (MB)
8	Processors (P0, P1) and heatsinks
9	24 DIMMs
10	Internal M.2 SSD memory with two internal M.2 Risers
11	Top cover
12	Air baffle
13	System RTC battery
14	CX5 PCIe cards – only slots 1 and 5 are populated in Private Cloud Appliance
15	Two power supplies (PS0, PS1)

Prepare to Service

Before replacing server components, perform the procedures in the following sections.

Safety Precautions

For your protection, observe the following safety precautions when setting up your equipment:

- Follow all standard cautions, warnings, and instructions marked on the equipment and described in the "Oracle Server Safety and Compliance Guide" and "Important Safety Information for Oracle's Hardware Systems".
- Ensure that the voltage and frequency of your power source match the voltage and frequency that appear on the equipment electrical rating label.
- Follow the electrostatic discharge safety practices.
- Disconnect both power supply cords (if necessary) before servicing components.

> **Note**
>
> Power cords must be disconnected when servicing components that require cold service.

Safety Symbols

The following symbols might appear in this document. Note their meanings.

> **Caution**
>
> **Risk of personal injury or equipment damage.** To avoid personal injury or equipment damage, follow the instructions.

> **Caution**
>
> **Hot surface.** Avoid contact. Surfaces are hot and might cause personal injury if touched.

> **Caution**
>
> **Hazardous voltages are present.** To reduce the risk of electric shock and danger to personal health, follow the instructions.

Electrostatic Discharge Safety

Devices that are sensitive to electrostatic discharge (ESD), such as the motherboard, PCIe cards, drives, processors, and memory DIMMs require special handling.

> **⚠ Caution**
>
> The boards and drives contain electronic components that are extremely sensitive to static electricity. Ordinary amounts of static electricity from clothing or the work environment can destroy components. Do not touch the components along their connector edges.

Do the following when handling ESD-sensitive components:

- Use an antistatic wrist strap.

  Wear an antistatic wrist strap when handling components such as drive assemblies, boards, or cards. When servicing or removing server components, disconnect the power cords from the server. Attach an antistatic strap to your wrist and to a metal area on the chassis. Following this practice equalizes the electrical potentials between you and the server.

  > **ⓘ Note**
  >
  > An antistatic wrist strap is not included in the Accessory Kit for the server. However, antistatic wrist straps are included with optional components.

- Use an antistatic mat.

  Place ESD-sensitive components such as the motherboard, DIMMS (memory modules), and other printed circuit board (PCB) cards on an antistatic mat. The following items can be used as an antistatic mat:

  – Antistatic bag used to wrap an Oracle replacement part
  – Oracle ESD mat (orderable item)
  – Disposable ESD mat (shipped with some replacement parts or optional system components)

FRU Key Identity Properties (KIP) Automated Update

Oracle ILOM includes a key identity properties (KIP) auto-update feature that ensures product information that is used for service entitlement and warranty coverage is accurately maintained by the server at all times, including during hardware replacement activities

The KIP includes the server product name, product part number (PPN), and product serial number (PSN). The KIP is stored in the FRUID (field-replaceable unit identifiers) container of the three server FRUs that are designated quorum members.

The quorum members include:

- Disk backplane (DBP), designated as a primary quorum member.
- Motherboard (MB), designated as a backup quorum member.
- Power supply (PS), designated as a backup quorum member.

When a server FRU that contains the KIP is removed and a replacement component is installed, the KIP of the replacement component is programmed by Oracle ILOM to contain the same KIP as the other two components.

> **Note**
>
> Only one of the quorum members can be replaced at a time. Automated updates can be completed only when two of the three quorum members contain matching key identity properties.

Required Service Tools

The server can be serviced with the following tools:

- Antistatic wrist strap
- Antistatic mat(s)
- No. 2 Phillips screwdriver
- Torx (6 lobe) T10, T15, T25, and T30 drivers

Powering Down the Server

Gracefully shut down the server host to prevent data from being corrupted. Performing a graceful shutdown ensures that the system is ready for restart. If the server is not responding, or you must shut down the server quickly, perform an immediate shutdown.

> **Note**
>
> Components that are hot-pluggable do not require the server to be powered down. For more information, see the component replacement procedures in this guide.

Before Powering Down a Node

Servers in a Private Cloud Appliance rack are integrated components of a multinode environment. Unless a server experiences a sudden failure or must be shut down in an emergency situation, powering down server nodes in the appliance should be planned and performed carefully to minimize impact on the performance and availability of the appliance services and resources.

When planning to power down server nodes, take these points into account:

System load
Powering down servers means system capacity is temporarily reduced. It makes sense to plan maintenance operations at a time when system load is typically at its lowest; for example during the night, over the weekend, and so on.

Instance availability
Many workloads need to remain available while a server is offline for maintenance. You can live-migrate compute instances to other compute nodes in the same fault domain, or restart them in another fault domain. The available compute capacity in the three fault domains determines whether all workloads can remain operational or if some need to be scaled down or even interrupted temporarily.

Maintenance mode
Before you can safely take a server offline, it must be placed in maintenance mode. In a Private Cloud Appliance environment this means that a compute node must not host any

running compute instances, that it is under maintenance lock, and that provisioning has been disabled. An appliance administrator must perform these tasks from the Service Enclave.

For more information about locking nodes for maintenance, migrating compute instances, and configuring high availability in the Compute service, refer to the chapter Hardware Administration in the Oracle Private Cloud Appliance Administrator Guide.

Power Down a Node from the Service Enclave

> **Note**
>
> Always perform a graceful shutdown. It ensures that all data is saved and the system is ready for restart.

1. Ensure that no compute instances are running on this node, and that the maintenance and provisioning locks are active.
2. From the Service Enclave, issue the Stop command.

   See Hardware Administration in the Oracle Private Cloud Appliance Administrator Guide.

   - Service Web UI: In the Rack Units table, click the action menu (three vertical dots) and select Stop.
   - Service CLI: Enter the command `stop ComputeNode id=<node-id>`.

Alternative Ways to Power Down a Node

If the Stop command from the Service Enclave does not cause the node to power down as expected, try these alternatives:

- Use the Oracle Integrated Lights Out Manager (ILOM)
  1. Log in to the ILOM UI or CLI using an Administrator account.
  2. Perform a graceful shutdown.
     - ILOM UI: In the left pane, click Host Management, select Power Control, and click Graceful Shutdown and Power Off from the Select Action list. Click Save, and then click OK.
     - ILOM CLI: At the prompt, enter the command `stop /System`.
     - ILOM CLI: To force the shutdown, at the prompt, enter the command `stop -f /System`.
- Use the On/Standby Button

  Press and quickly release the On/Standby button on the front panel.

  This action causes ACPI-enabled operating systems to perform an orderly shutdown of the operating system.

The host server performs an orderly power shutdown to Standby power mode, and the System OK LED on the front panel begins blinking. Next, you can disconnect the cables from the server.

Disconnect Cables From the Server

> **⚠ Caution**
>
> The system supplies Standby power to the circuit boards even when the system is powered off.

1. Ensure all cables connected to the server are labeled.
2. Power down the server.

   See Powering Down the Server.
3. Disconnect the power cords from the rear of the server.
4. Disconnect all data cables from the rear of the server.
5. Remove the cables from the cable management arm (CMA).

Replacing a Fan Module

Fan modules are replaceable components that do not require you to power off the server before servicing.

Fan modules are located in the front of the server.

> **ⓘ Note**
>
> If the system detects a fan module fault, the front and back panel Fault-Service Required LEDs are lit, as is the front Top Fan LED.

> **⚠ Caution**
>
> When removing and replacing a fan module in the Oracle Server X11, you must complete the entire procedure within 60 seconds to maintain adequate cooling in the system. Remove and replace only one fan module at a time. Ensure that you have obtained the replacement fan module and that it is ready for installation before starting the replacement procedure.
>
> Each fan module contains one fan, with two fan motors per fan. The two fan motors provide separate tachometer signals so that the fan module reports two tach signals to Oracle ILOM. Even if only one fan motor is faulted within the fan module, the Oracle ILOM service processor detects that two fan motors have failed to spin while the fan module is removed. If the fan module is not replaced within 60 seconds of removal, Oracle ILOM will take the protective action to shut down the system to prevent thermal damage to the system.
>
> If the cover is not installed within 60 seconds, the system may shutdown due to over-temperature or a PCIe card may overheat, potentially damaging it.

Remove a Fan Module

You do not have to power off the server to replace fan modules.

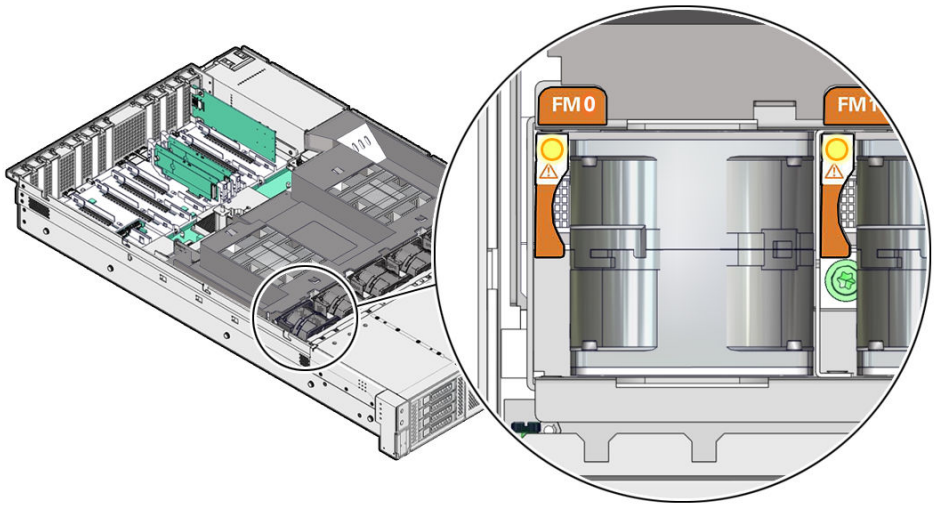
1. Extend the server to the maintenance position.

   See Extend the Server to the Maintenance Position.

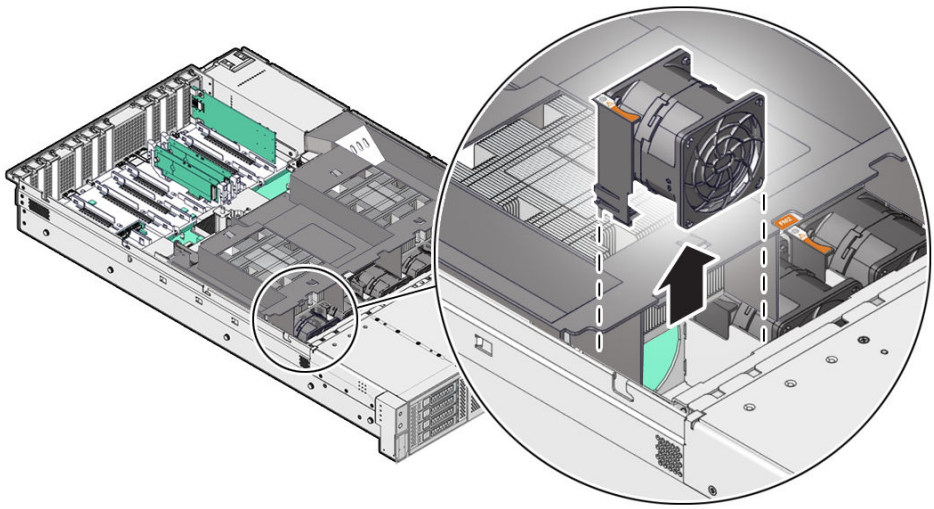
2. To access the fan modules, remove the server top cover.

   See Remove the Server Top Cover.

3. Identify the faulty fan module.
   Each fan module has a fan service action required status indicator (LED) that is located next to the module. If the LED is amber, the fan has failed. The location of the fan status LED is shown in the following figure.

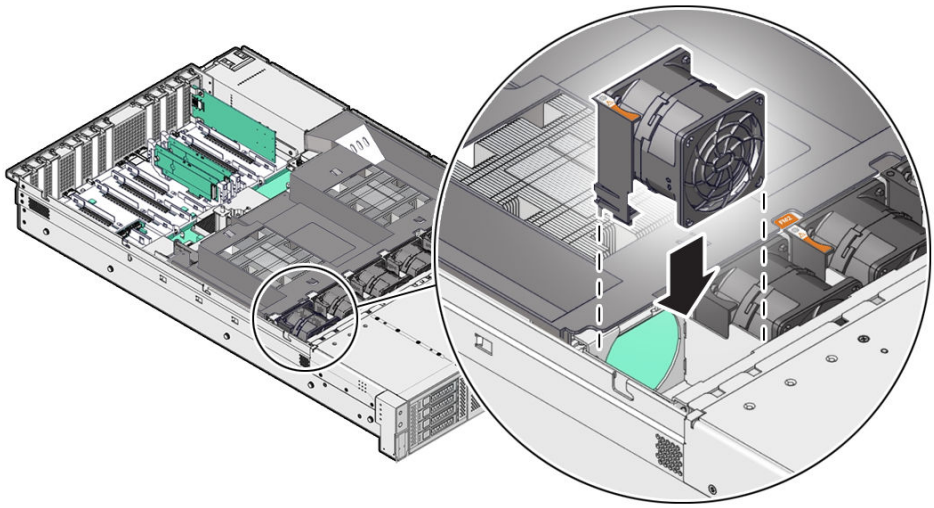


4. Using your forefinger and thumb, lift the fan module straight up and out of the chassis and set it aside on an antistatic mat.



Install a Fan Module

1. Remove the replacement fan module from its packaging, and place it on an antistatic mat.
2. With the server top cover removed, install the replacement fan module into the server. The fan modules are keyed to ensure that they are installed in the correct orientation.



3. Press down on the fan module to fully seat the fan module.
4. Verify that the fan module status indicator (LED) for the replacement fan module is not illuminated.
5. Install the server top cover.

   See Install the Server Top Cover.
6. Verify that the Top Fan Fault LED on the front of the server and the Fault-Service Required LEDs on the front and back of the server are not illuminated.
7. Return the server to operation.

   See Returning the Server to Operation.

Replacing the Battery

The system battery is a replaceable component that requires you to power off the server before servicing.

The real-time clock (RTC) battery maintains system time when the server is powered off and a time server is unavailable. If the server does not maintain the correct time when the system is powered off and not connected to a network, replace the battery.

> ⚠ **Caution**
>
> These procedures require that you handle components that are sensitive to electrostatic discharge. This sensitivity can cause the components to fail. To avoid damage, ensure that you follow antistatic practices, as described in Electrostatic Discharge Safety under "Safety Precautions".

> **⚠ Caution**
>
> Ensure that all power is removed from the server before removing or installing the battery. You must disconnect the power cables from the system before performing these procedures.

Remove the Battery

1. Power off the server.

   See Powering Down the Server.
2. Disconnect the power cords from the power supplies.

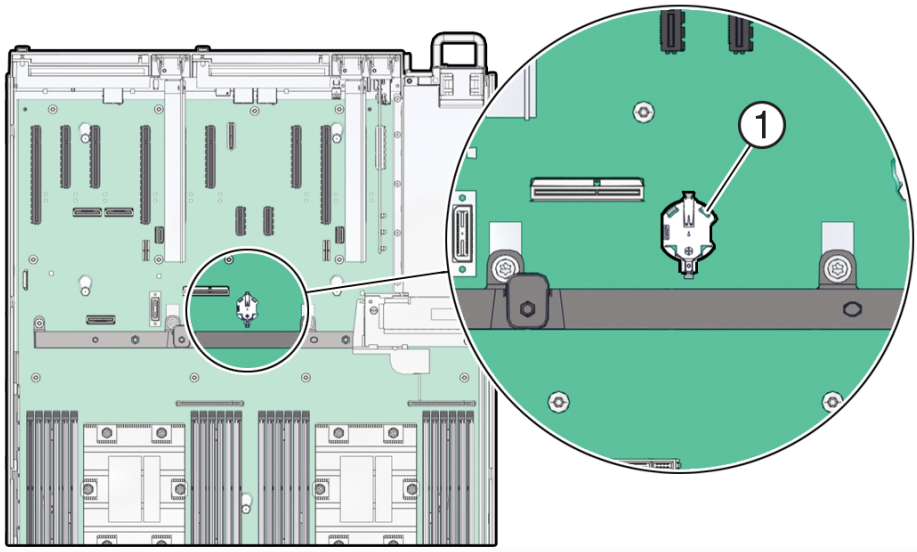
   See Disconnect Cables From the Server.
3. Extend the server into the maintenance position.

   See Extend the Server to the Maintenance Position.
4. Attach an antistatic wrist strap to your wrist, and then to a metal area on the chassis.

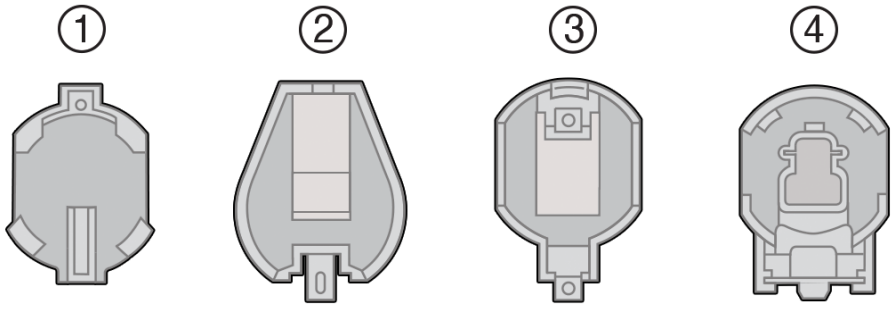
   See Take Antistatic Measures.
5. Remove the server top cover.

   See Remove the Server Top Cover.
6. Locate the battery and RTC battery retainer on the server motherboard.

> **ⓘ Note**
>
> Coin battery retainer types that are mounted in the RTC battery motherboard location may be different.



7. Remove the battery from the battery holder.
   Review the following battery holder (Part number: 8210501) options.



Callout	Description
1	796136-1 Top-Load Battery Connector (TE)
2	1093TR Top-Load Battery Connector
3	1070TR Top-Load Battery Connector
4	S8421 Top-Load Battery Connector

Select the detailed instructions below for the specific type of RTC battery retainer on the server motherboard.

- **[Type 1]** Remove the battery from the TE Top-Load Battery Connector as follows.

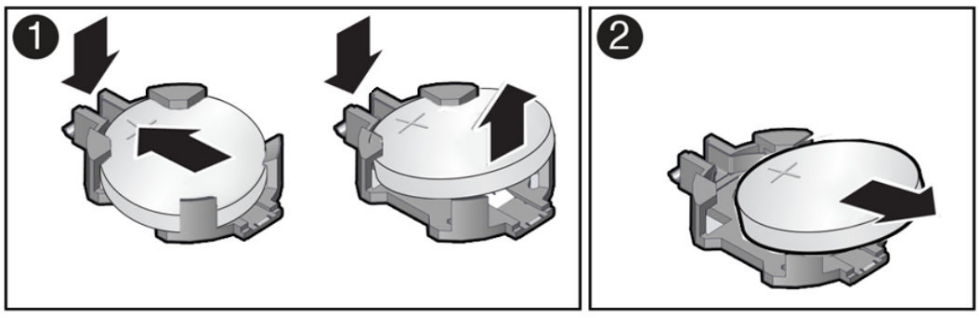
  Each connector consists of a housing with a positive contact and a negative contact. The floor of the housing is embossed with a `+' to designate the positive contact. The connector features four lips for positive retention of the battery.

  a. Grasp connector. Support the connector by grasping the "positive" end of the connector.

  > ⚠ **Caution**
  >
  > The connector must be supported, otherwise damage to the soldered contacts could occur.

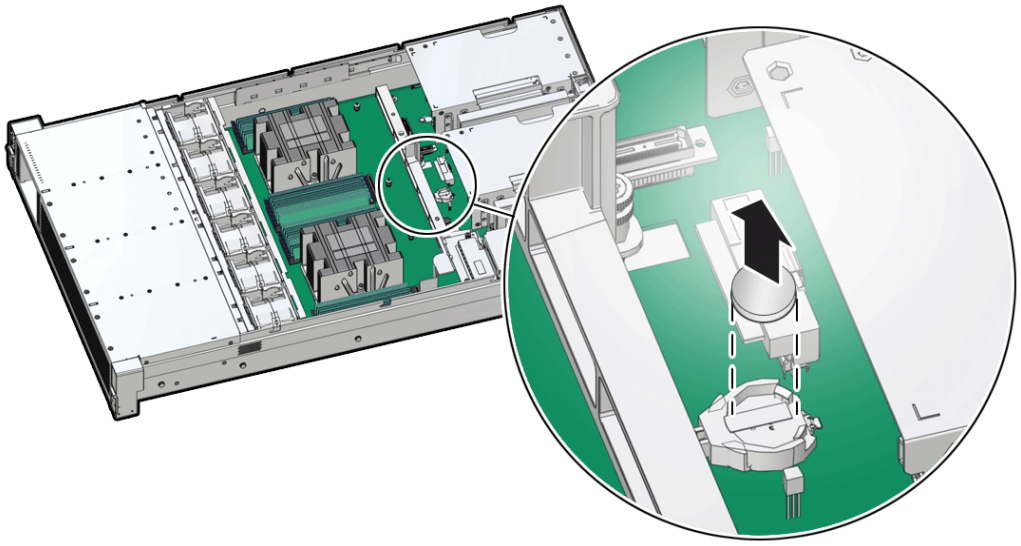
  b. Slide battery under lips at positive end of connector. While supporting the connector, simultaneously push the battery toward the positive end of the connector, and slightly move the lips at the negative end of the connector away from the battery. Hold in this position, and lift the battery.

  c. Pull the battery from the connector.

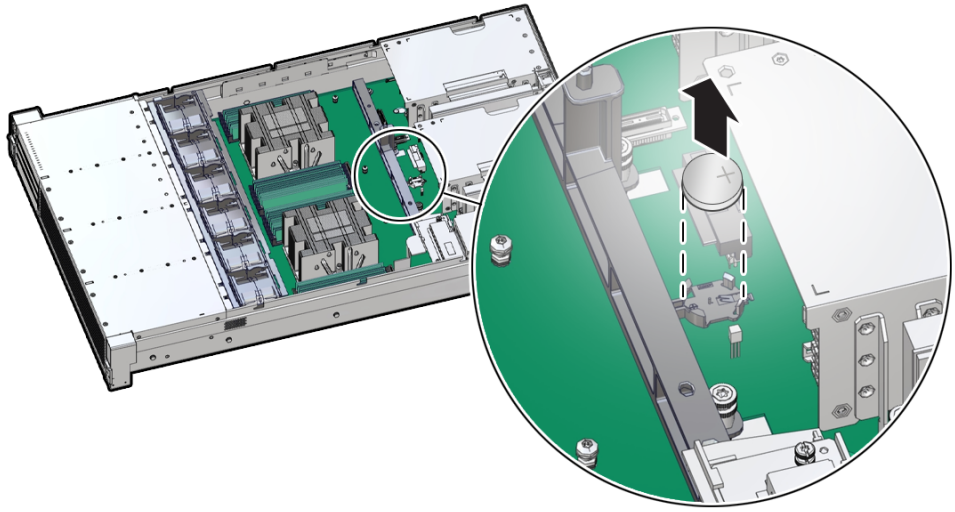


- **[Type 2]** Remove the battery from the 1093TR battery connector as follows.

Push the coin battery towards the negative spring and then lift up the coin battery to dislodge it from its holder.



- **[Type 3 and 4]** Remove the battery from other Top-Load Battery Connectors as follows.
  a. To dislodge the battery from the retainer, place your finger under the side of the battery nearest the rear of the server [1].
  b. Gently lift the battery up and out of the retainer [2].



Install the Battery

1. Unpack the replacement RTC battery.
2. Press the new battery into the battery retainer.

   Install the battery into the Top-Load Battery Connector as follows:

   - Each connector consists of a housing with a positive contact and a negative contact. The floor of the housing is embossed with a "+" to designate the positive contact. The connector features four lips for positive retention of the battery.

a. Grasp connector. Support the connector by grasping the positive end of the connector.

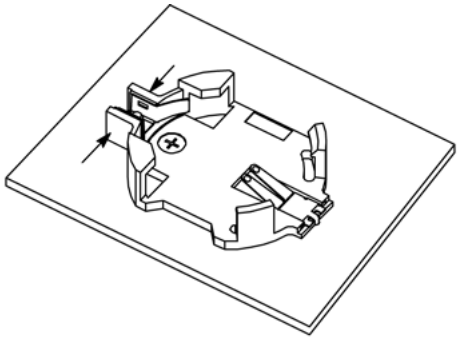
> **⚠ Caution**
>
> The connector must be supported, otherwise damage to the soldered contacts could occur.

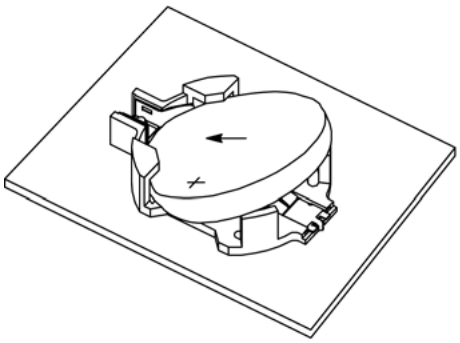
b. Slide battery under lips at positive end of connector. While supporting the connector, hold the battery at an angle with the positive side facing up, and slide the battery under the lips at the positive end of the connector.

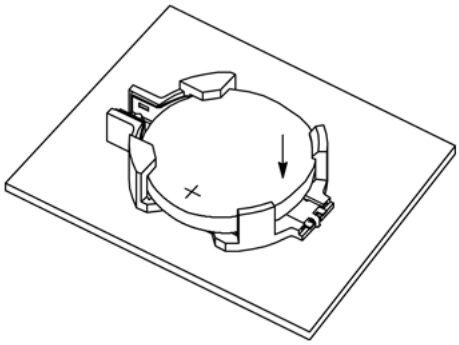
> **ⓘ Note**
>
> Positive side of battery is marked with a "+".

c. Fully seat battery onto housing floor. Gently push the battery onto the floor of the housing until the battery is fully seated. There should be an audible "snap".

> **ⓘ Note**
>
> Insert the battery so that the positive (+) side is facing up.







- Press the new battery into the battery retainer with the positive side (+) facing up.

3. Install the server top cover.

   See Install the Server Top Cover.

4. Return the server to the normal rack position.

   See Return the Server to the Normal Rack Position.

5. Reconnect the power cords to the server power supplies, and power on the server.

   See Reconnect Power and Data Cables and Power On the Server.

6. Verify that the System OK LED indicator is lit.

> **Note**
>
> If the service processor is configured to synchronize with a network time server using the Network Time Protocol (NTP), the Oracle ILOM SP clock is reset as soon as the server is powered on and connected to the network. Otherwise, proceed to the next step.

7. If the service processor is not configured to use NTP, you must reset the Oracle ILOM clock using Oracle ILOM CLI or web interface. Refer to Oracle ILOM Documentation.

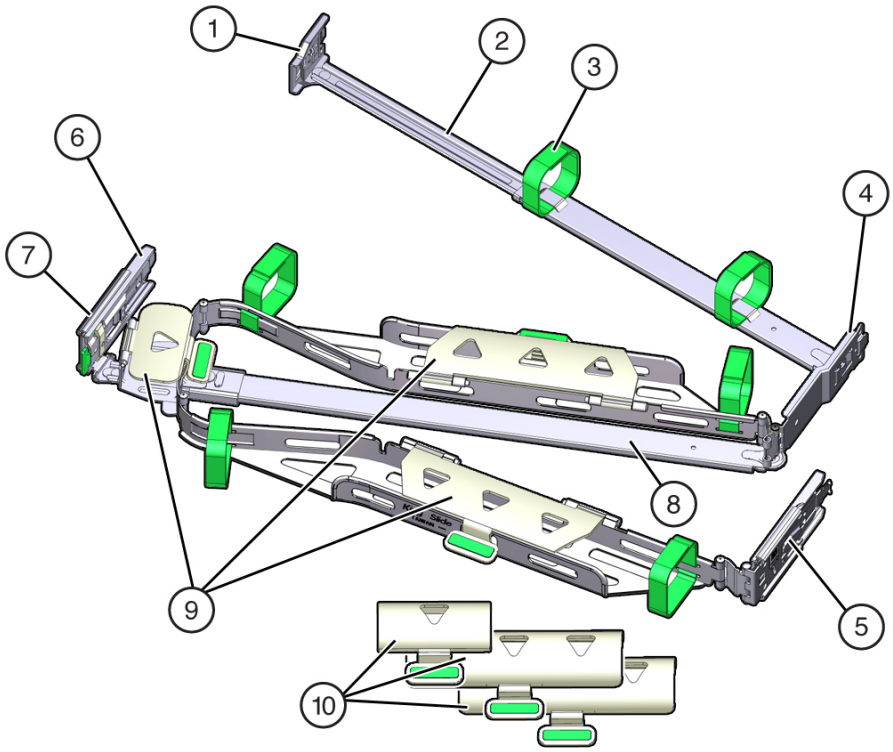
Replacing the Cable Management Arm

The cable management arm (CMA) is a replaceable component that requires you to power off the server before servicing. Before starting operations on the CMA, refer to the illustration below to identify the CMA connectors A, B, C, and D. The CMA connectors must be disconnected in the reverse order – that is, disconnect connector D first, followed by C, B, and A.

> **Warning**
>
> To reduce the risk of personal injury, stabilize the rack cabinet and extend the anti-tilt bar before extending the server from the rack.

> **Caution**
>
> While any of the four CMA connectors are disconnected, do not allow the CMA to hang under its own weight.

> **Note**
>
> References to “left” or “right” in this procedure assume that you are facing the back of the equipment rack.



Call Out	Description
1	Connector A
2	Front slide bar
3	Velcro straps (6)
4	Connector B
5	Connector C
6	Connector D
7	Slide-rail latching bracket (used with connector D)
8	Back slide bar
9	Server flat cable covers
10	Server round cable covers (optional)

Remove the Cable Management Arm

> **⚠ Caution**
>
> Throughout this procedure, after you disconnect any of the CMA four connectors, do not allow the CMA to hang under its own weight.

1. To make it easier to remove the CMA, extend the server approximately 13 cm (5 inches) out of the front of the rack.
2. To remove the cables from the CMA:

a. Disconnect all cables from the back of the server.

b. If applicable, remove any additional Velcro straps that were installed to bundle the cables.

c. Unwrap the six Velcro straps that are securing the cables.

d. Open the three cable covers to the fully opened position.

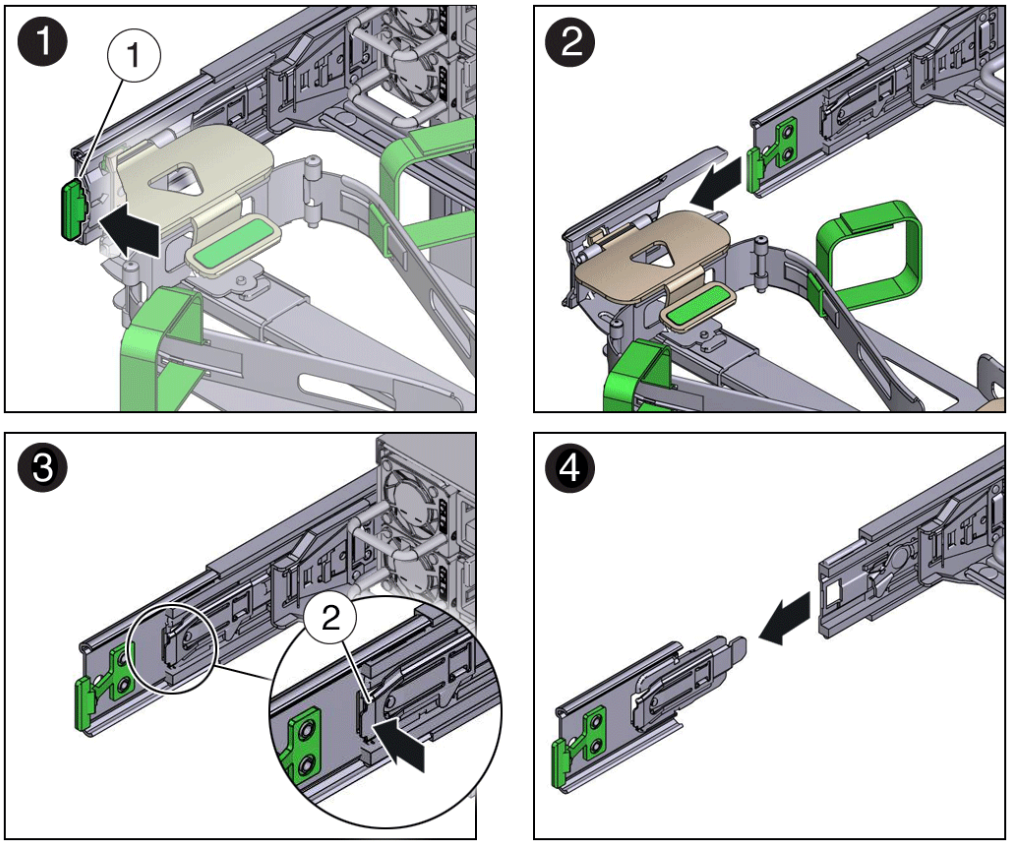
e. Remove the cables from the CMA and set them aside.

3. To disconnect connector D:

a. Press the green release tab (callout 1) on the slide rail latching bracket toward the left and slide the connector D out of the left slide rail [1 and 2].

When you slide connector D out of the left slide rail, the slide rail latching bracket portion of the connector remains in place. You disconnect connector D in the next step.

> **Note**
>
> After you disconnect connector D, do not allow the CMA to hang under its own weight. Throughout the remainder of this procedure, the CMA must be supported until all the remaining connectors are disconnected and the CMA can be placed on a flat surface.



Call Out	Description
1	Connector D release tab (green)

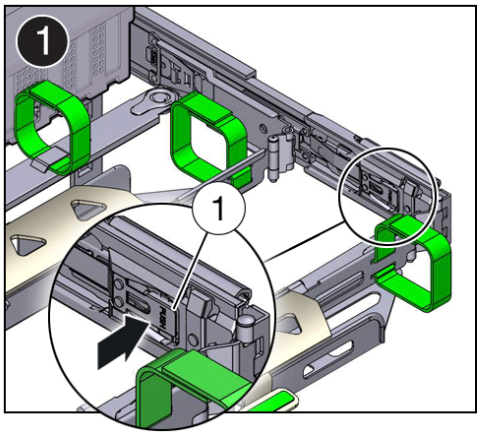
Call Out	Description
2	Slide rail latching bracket release tab (labeled PUSH)

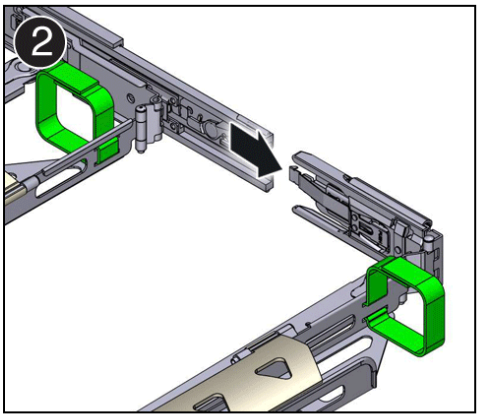
b. Use your right hand to support the CMA and use your left thumb to push in (toward the left) on the slide rail latching bracket release tab labeled PUSH (callout 2), and pull the latching bracket out of the left slide rail and put it aside [3 and 4].

4. To disconnect connector C:

a. Place your left arm under the CMA to support it.

b. Use your right thumb to push in (toward the right) on the connector C release tab labeled PUSH (callout 1), and pull connector C out of the right slide rail [1 and 2].



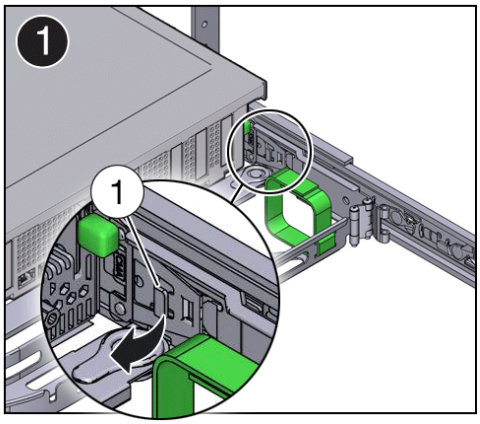


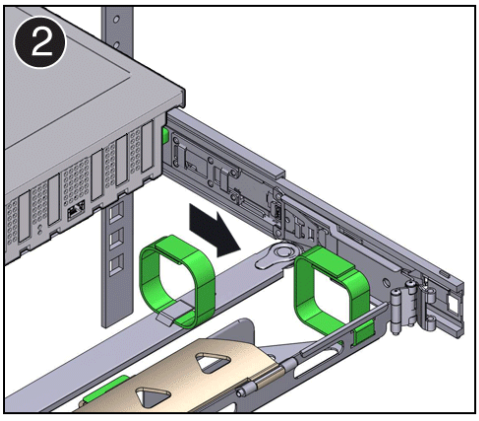
Call Out	Description
1	Connector C release tab (labeled PUSH)

5. To disconnect connector B:

a. Place your right arm under the CMA to support it and grasp the back end of connector B with your right hand.

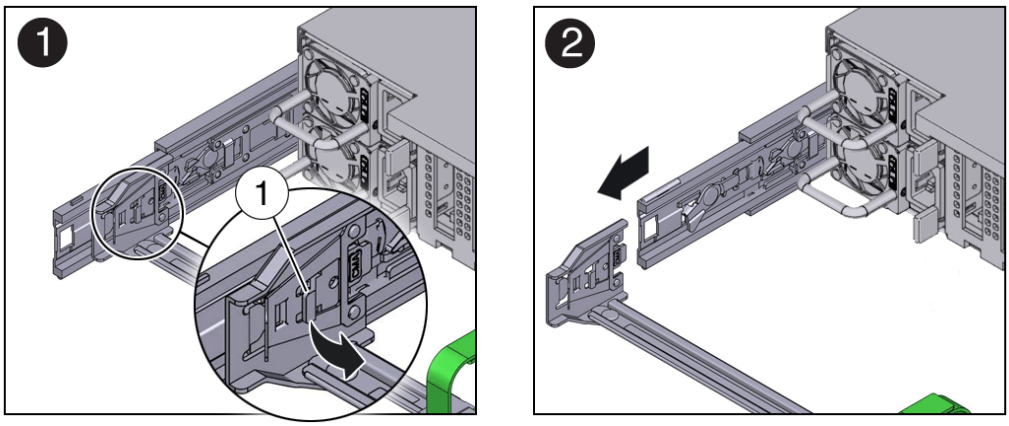
b. Use your left thumb to pull the connector B release lever to the left, away from the right slide rail (callout 1), and use your right hand to pull the connector out of the slide rail [1 and 2].





Call Out	Description
1	Connector B release lever

6. To disconnect connector A:
   a. Place your left arm under the CMA to support it and grasp the back end of connector A with your left hand.
   b. Use your right thumb to pull the connector A release lever to the right, away from the left slide rail (callout 1), and use your left hand to pull the connector out of the slide rail [1 and 2].



Call Out	Description
1	Connector A release lever

7. Remove the CMA from the rack and place it on a flat surface.
8. Go to the front of the server and push it back into the rack.

Install the Cable Management Arm

1. Prepare the CMA for installation.
   a. Ensure that the flat cable covers are installed on the CMA.
   b. Ensure that the six Velcro straps are threaded into the CMA.

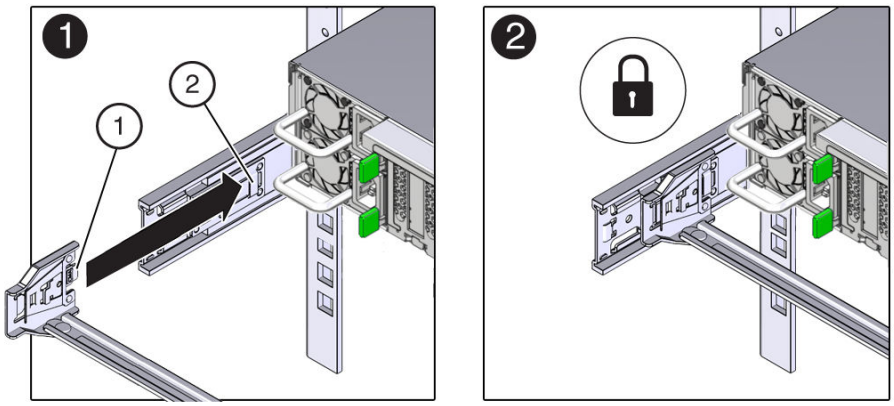
> **Note**
>
> Ensure that the two Velcro straps located on the front slide bar are threaded through the opening in the top of the slide bar. This prevents the Velcro straps from interfering with the expansion and contraction of the slide bar when the server is extended out of the rack and returned to the rack.

   c. To make it easier to install the CMA, extend the server approximately 13 cm (5 inches) out of the front of the rack.
   d. Take the CMA to the back of the equipment rack, and ensure that you have adequate room to work at the back of the server.

> **Note**
>
> References to "left" or "right" in this procedure assume that you are facing the back of the equipment rack.
>
> Throughout this installation procedure, support the CMA and do not allow it to hang under its own weight until it is secured at all four attachment points.

2. To install CMA connector A into the left slide rail:
   a. Insert CMA connector A into the front slot on the left slide rail until it locks into place with an audible click [1 and 2].

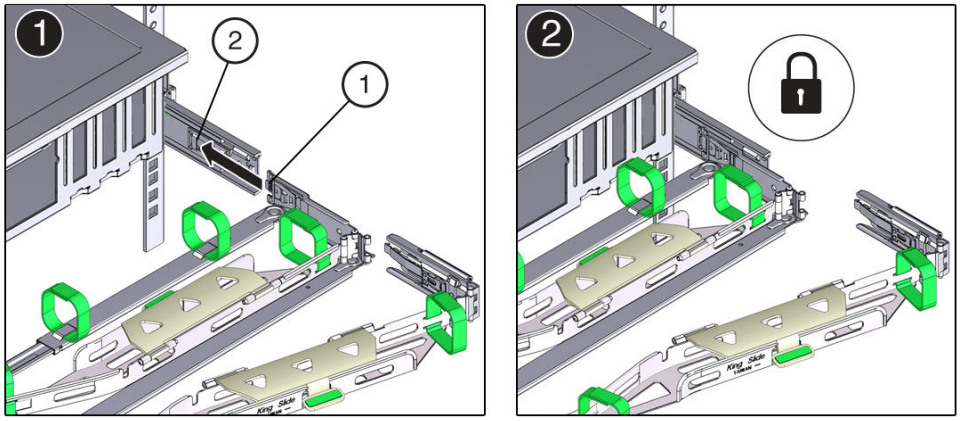
      The connector A tab (callout 1) goes into the slide rail front slot (callout 2).
   b. Gently tug on the left side of the front slide bar to verify that connector A is properly seated.



Call Out	Description
1	Connector A tab
2	Left slide rail front slot

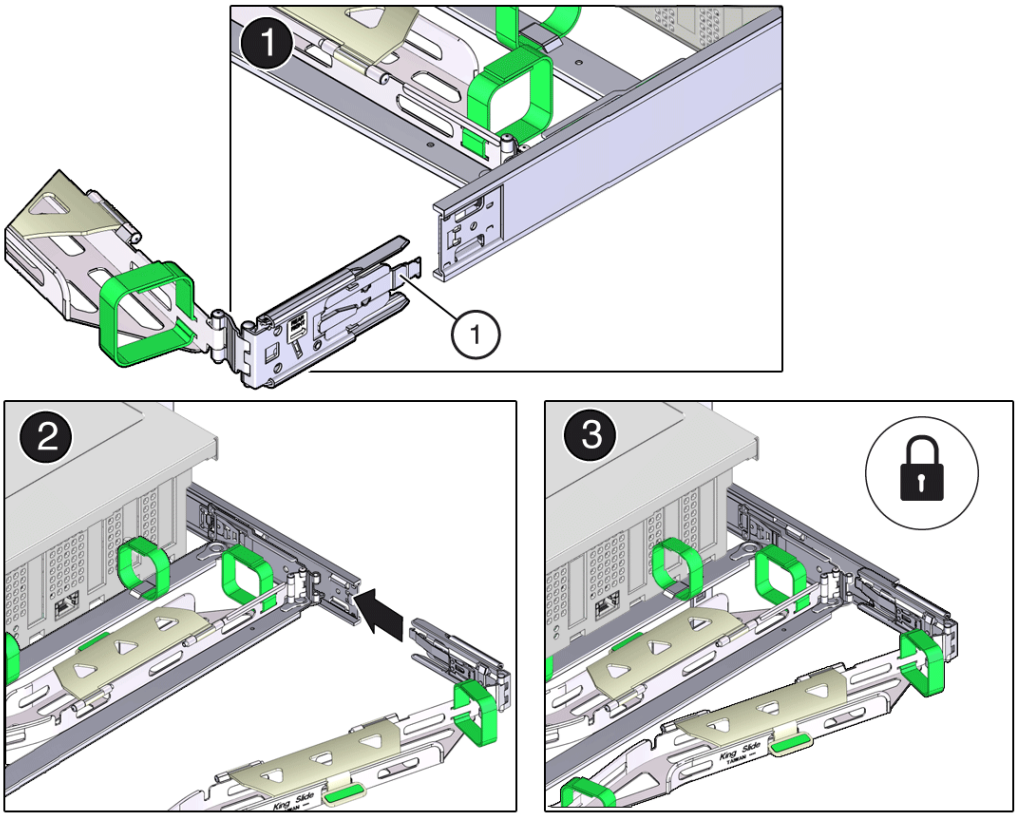
3. To install CMA connector B into the right slide rail:
   a. Insert CMA connector B into the front slot on the right slide rail until it locks into place with an audible click [1 and 2].

      The connector B tab (callout 1) goes into the slide rail front slot (callout 2).
   b. Gently tug on the right side of the front slide bar to verify that connector B is properly seated.



Call Out	Description
1	Connector B tab
2	Right slide rail front slot

4. To install CMA connector C into the right slide rail:
   a. Align connector C with the slide rail so that the locking spring (callout 1) is positioned inside (server side) of the right slide rail [1].



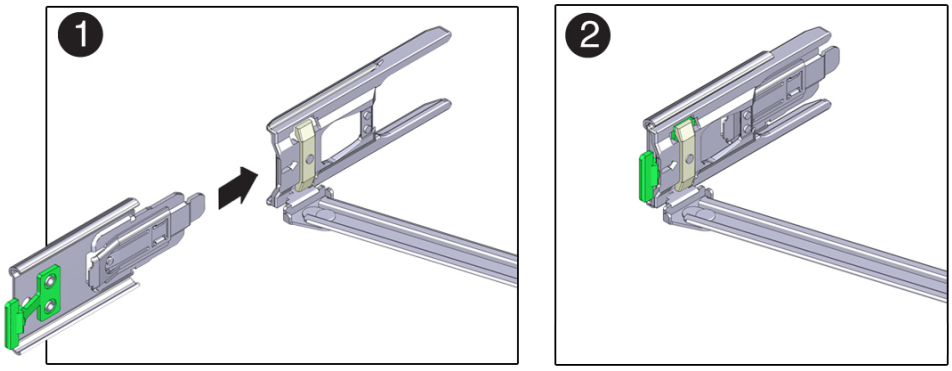
Call Out	Description
1	Connector C locking spring

b. Insert connector C into the right slide rail until it locks into place with an audible click [2 and 3].

c. Gently tug on the right side of the CMA back slide bar to verify that connector C is properly seated.

5. To prepare CMA connector D for installation, remove the tape that secures the slide rail latching bracket to connector D, and ensure that the latching bracket is properly aligned with connector D [1 and 2].

> **Note**
>
> The CMA is shipped with the slide rail latching bracket taped to connector D. You must remove the tape before you install this connector.



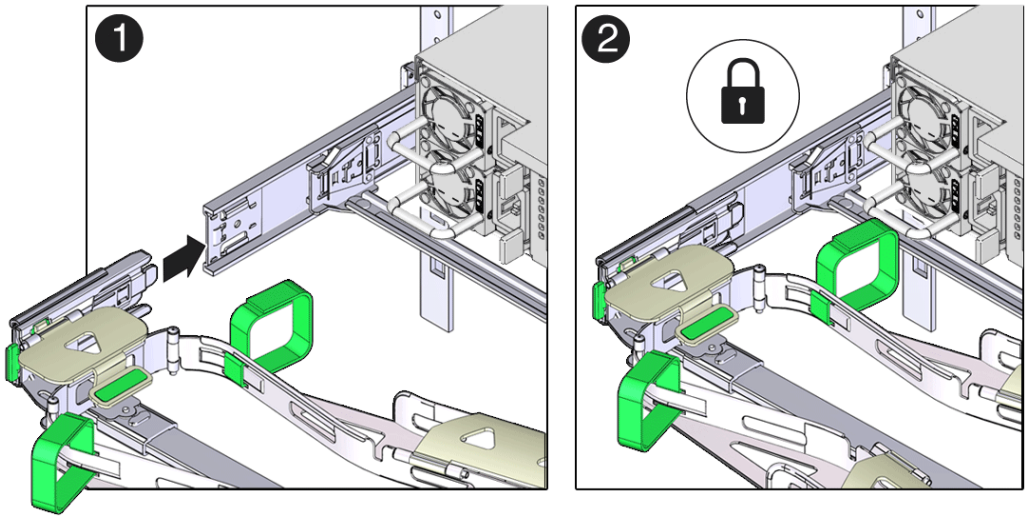
6. To install CMA connector D into the left slide rail:

a. While holding the slide rail latching bracket in place, insert connector D and its associated slide rail latching bracket into the left slide rail until connector D locks into place with an audible click [1 and 2].

> **Note**
>
> When inserting connector D into the slide rail, the preferred and easier method is to install connector D and the latching bracket as one assembly into the slide rail.

b. Gently tug on the left side of the CMA back slide bar to verify that connector D is properly seated.

> **Note**
>
> The slide rail latching bracket has a green release tab. Use the tab to release and remove the latching bracket so that you can remove connector D.

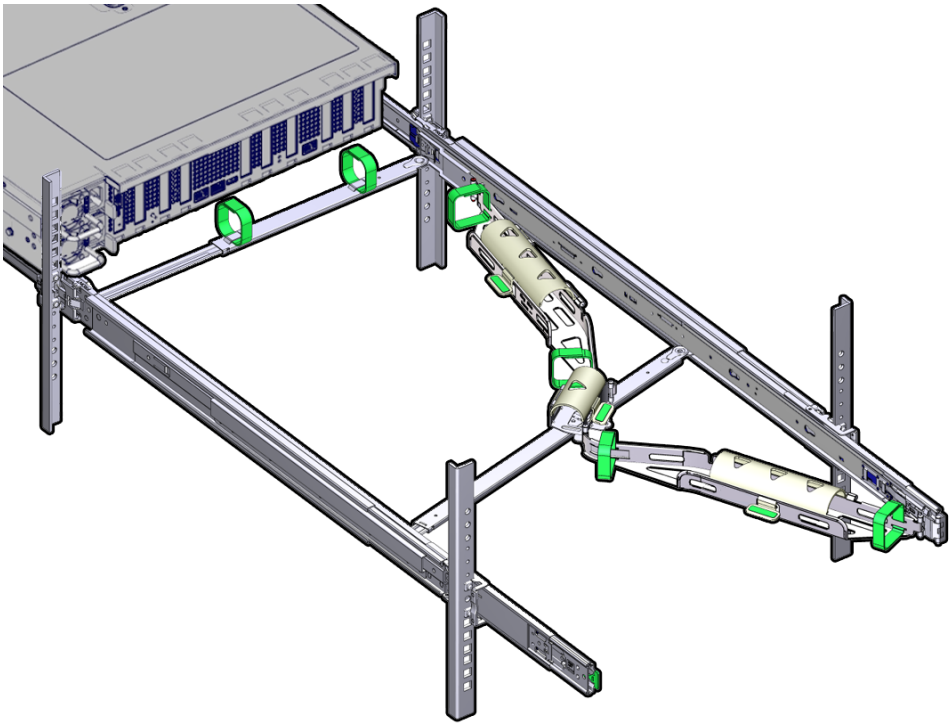


7. Gently tug on the four CMA connection points to ensure that the CMA connectors are fully seated before you allow the CMA to hang by its own weight.
8. To verify that the slide rails and the CMA are operating properly before routing cables through the CMA:
   a. Ensure that the rack anti-tilt bar is extended to prevent the rack from tipping forward when the server is extended.

> ⚠ **Caution**
>
> To reduce the risk of personal injury, stabilize the rack cabinet and extend the anti-tilt bar before extending the server from the rack.

   b. Slowly pull the server out of the rack until the slide rails reach their stops.
   c. Inspect the attached cables for any binding or kinks.

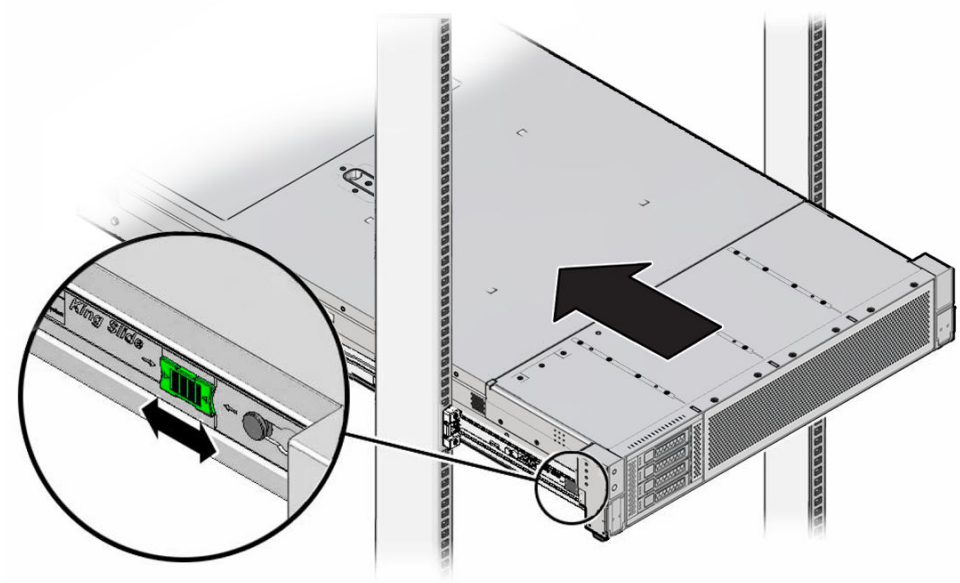
d. Verify that the CMA extends fully with the slide rails.



9. To return the server to the rack:

   a. Simultaneously pull and hold the two green release tabs (one on each side of the server) toward the front of the server while you push the server into the rack. As you push the server into the rack, verify that the CMA retracts without binding.

   b. To pull the green release tabs, place your finger in the center of each tab, not on the end, and apply pressure as you pull the tab toward the front of the server.



   c. Continue pushing the server into the rack until the slide rail locks (on the front of the server) engage the slide rail assemblies.

You hear a click when the server is in the normal rack position.

10. Connect cables to the server, as required.

    See Reconnect Power and Data Cables.

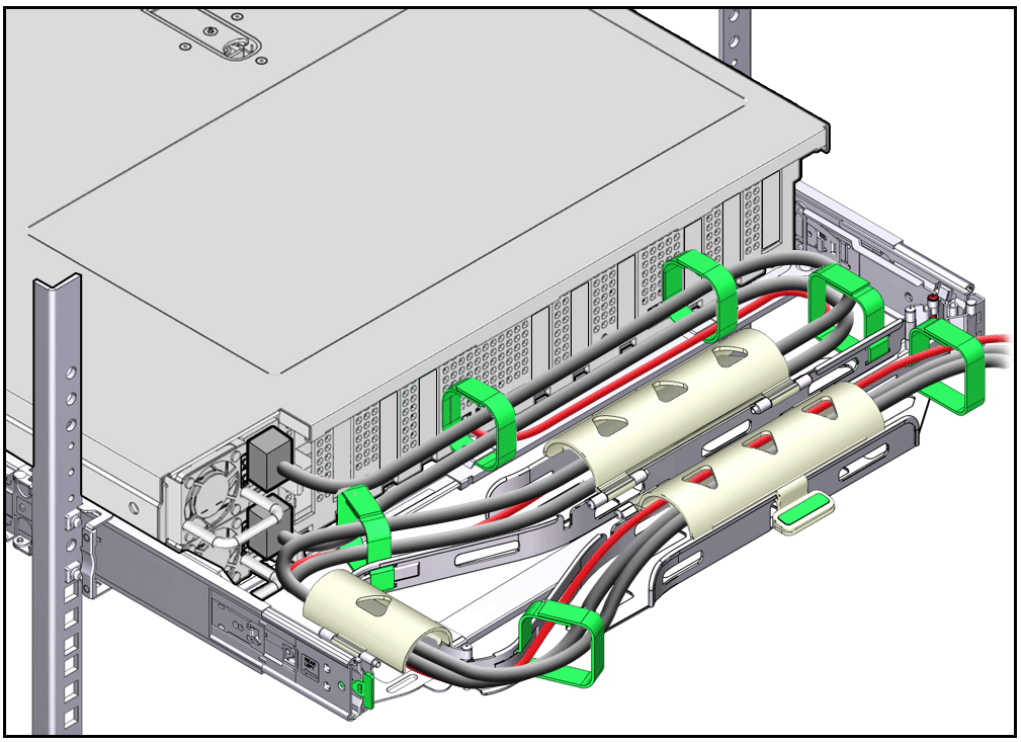
11. Open the CMA cable covers, route the server cables through the CMA cable troughs (in the order specified in the following steps), close the cable covers, and secure the cables with the six Velcro straps.

    a. First through the front-most cable trough.

    b. Then through the small cable trough.

    c. Then through the back-most cable trough.

> ⚠ **Caution**
>
> When securing the cables with the Velcro straps located on the front slide bar, ensure that the Velcro straps do not wrap around the bottom of the slide bar. Otherwise, expansion and contraction of the slide bar might be hindered when the server is extended from the rack and returned to the rack.



12. Ensure that the secured cables do not extend above the top or below the bottom of the server to which they are attached.

    Otherwise, the cables might snag on other equipment installed in the rack when the server is extended from the rack or returned to the rack.

13. If necessary, bundle the cables with additional Velcro straps to ensure that they stay clear of other equipment.

> **Note**
>
> If you need to install additional Velcro straps, wrap the straps around the cables only, not around any of the CMA components. Otherwise, expansion and contraction of the CMA slide bars might be hindered when the server is extended from the rack and returned to the rack.

Returning the Server to Operation

This section describes safety considerations and provides procedures and information after replacing components in the server.

After replacing components inside of the server, perform the procedures in the following sections. For more information, see the component replacement procedures in this guide.

Install the Server Top Cover

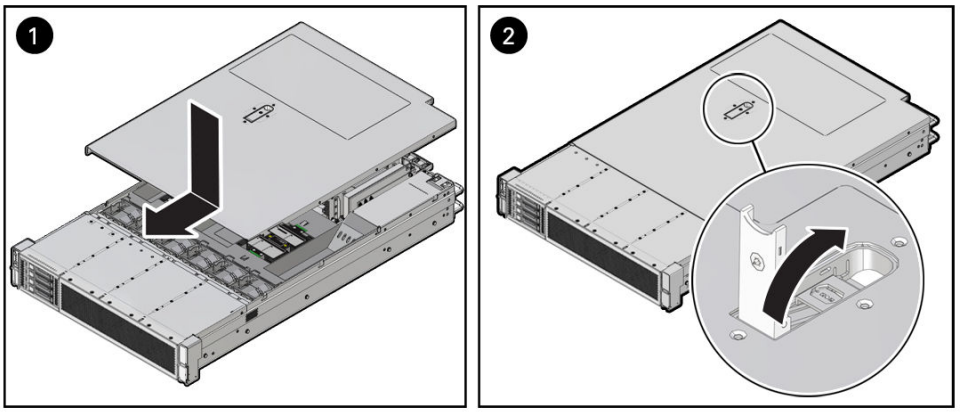
1. Place the top cover on the chassis [1].

   Set the cover down so that it hangs over the back of the server by about 1 inch (25 mm) and the side latches align with the cutouts in the chassis.

2. Check both sides of the chassis to ensure that the top cover is fully down and flush with the chassis.

   If the cover is not fully down and flush with the chassis, slide the cover towards the back of the chassis to position the cover in the correct position.

3. Gently slide the cover toward the front of the chassis until it latches into place with an audible click [2].
   As you slide the cover toward the front of the server, the release button on the top of the server automatically rotates downward to the closed position. Latch the top cover by pushing down on the button until it is flush with the cover and you hear an audible click. An audible click indicates that the cover is latched.



4. Use a Torx T15 screwdriver to turn the release button latch counterclockwise to the locked position.

5. If you are done replacing server components, remove any antistatic straps or conductors from the server chassis.

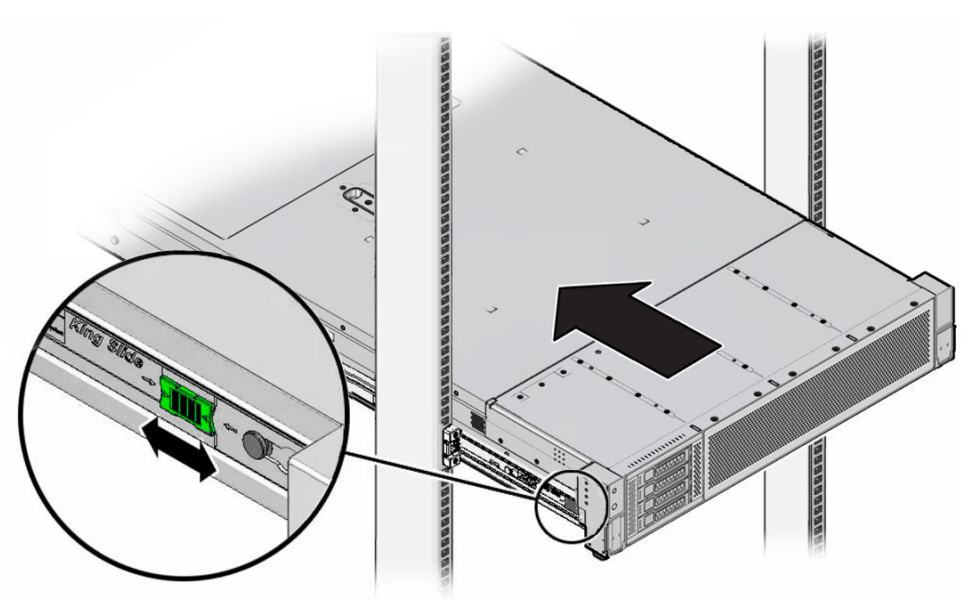
Return the Server to the Normal Rack Position

If the server is in the extended maintenance position, use this procedure to return the server to the normal rack position.

1. Push the server back into the rack, as described in the following steps.
   a. Simultaneously pull and hold the two green release tabs (one on each side of the slide rails on the server) toward the front of the server, while you push the server into the rack.

      Verify that the cable management arm (CMA) retracts without binding.

      > **Note**
      >
      > To pull the green release tab, place your finger in the center of the tab, not on the end, and apply pressure as you pull the tab toward the front of the server.



   b. Continue pushing the server into the rack until the slide rail locks (on the front of the server) engage the slide rail assemblies.

      You hear an audible click when the server is in the normal rack position.
2. If the CMA is not installed, because you removed the server completely out of the rack, install the CMA.

   For installation instructions for the CMA, see Install the Cable Management Arm.
3. If the cables are disconnected from the back of the server, because you extended the server out of the rack, reconnect the cables. For instructions to reconnect cables to the back of the server, see Reconnect Power and Data Cables.

Reconnect Power and Data Cables

1. Reconnect the data cables to the back of the server, as appropriate.

   > **Note**
   >
   > If the cable management arm (CMA) is in the way, extend the server approximately 13 cm (5 inches) out of the front of the rack.

2. Reconnect the power cables to the power supplies.
3. Reinstall the cables into the cable management arm and secure them with Velcro straps.

Power On the Server

As soon as the power cords are connected, Standby power is applied. In Standby power mode:

- The System OK LED on the server front panel blinks slowly.
- The SP OK LED indicator is steady on.
- The AC power supply LED indicator lights are steady on.

Power on the server to Main power mode by performing the following procedure:

1. From the Service Enclave, issue the Start command.

   See Hardware Administration in the Oracle Private Cloud Appliance Administrator Guide.

   - Service Web UI: In the Rack Units table, click the action menu (three vertical dots) and select Start.
   - Service CLI: Enter the command start ComputeNode id=<***node-id***>.

2. If the Start command from the Service Enclave does not cause the node to boot as expected, try these alternatives:

   - Log in to the Oracle Integrated Lights Out Manager (ILOM).
     - ILOM UI: In the left pane, click Host Management, select Power Control, and click Power On from the Select Action list.
     - ILOM CLI: At the prompt, enter the command start /System.
   - Press the On/Standby button on the front bezel.

When the server is powered on to Main power mode and the power-on self-test (POST) code checkpoint tests are complete, the green System OK LED status indicator on the front panel of the server lights and remains lit.

6

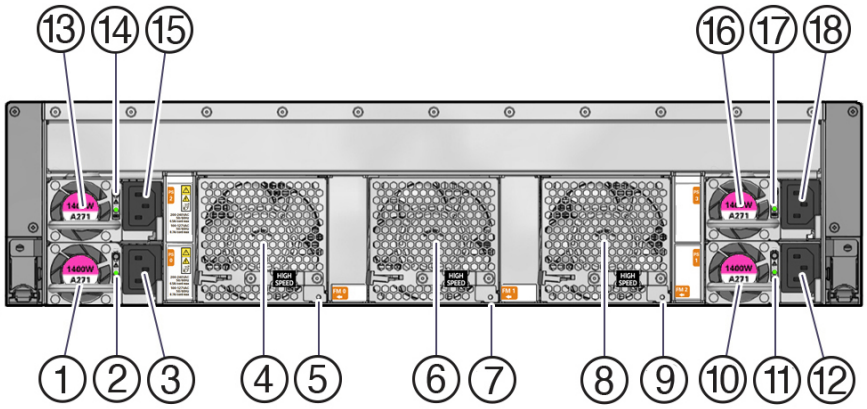
Replacing X10-2c GPU L40S Compute Server Components

Model X10-2c GPU L40S Compute Server nodes may be installed in a GPU expansion rack connected to your Oracle Private Cloud Appliance base rack. Certain server components can be replaced by a data center administrator or technician in case of hardware failure. Please follow the step-by-step instructions provided in this guide.

> **Warning**
>
> If a replacement procedure is not listed in this guide, you must contact Oracle to have the malfunctioning component serviced.

Illustrated Back Panel Components Breakdown

In Oracle Private Cloud Appliance, only components accessible from the rear of the 3U server chassis may be replaced. The following figure identifies the back panel components of the X10-2c GPU L40S Compute Server.



Callout	Description
1	Power supply (PS 0)
2	PS 0 status LEDs: • AC OK LED: green • Fault-Service Required LED: amber
3	AC power input connector (PS 0)
4	High speed fan module 0 (FM 0)
5	FM 0 bi-color status LED: • Fan OK: green • Fan-Service Required: amber • System Locate: all fan modules blink green to locate the system

Callout	Description
6	High speed fan module 1 (FM 1)
7	FM 1 bi-color status LED: • Fan OK: green • Fan-Service Required: amber • System Locate: all fan modules blink green to locate the system
8	High speed fan module 2 (FM 2)
9	FM 2 bi-color status LED: • Fan OK: green • Fan-Service Required: amber • System Locate: all fan modules blink green to locate the system
10	Power supply (PS 1)
11	PS 1 status LEDs: • AC OK LED: green • Fault-Service Required LED: amber
12	AC power input connector (PS 1)
13	Power supply (PS 2)
14	PS 2 status LEDs: • AC OK LED: green • Fault-Service Required LED: amber
15	AC power input connector (PS 2)
16	Power supply (PS 3)
17	PS 3 status LEDs: • AC OK LED: green • Fault-Service Required LED: amber
18	AC power input connector (PS 3)

Preparing the Server for Component Replacement

This section describes safety considerations and provides prerequisite procedures and information about replacing components in the server.

Before you can remove and install components that are inside the server, you must perform the procedures in some or all of the following sections. For more information, see the component replacement procedures in this guide.

Safety Precautions

For your protection, observe the following safety precautions when setting up your equipment:

- Follow all standard cautions, warnings, and instructions marked on the equipment and described in the "Oracle Server Safety and Compliance Guide" and "Important Safety Information for Oracle's Hardware Systems".
- Ensure that the voltage and frequency of your power source match the voltage and frequency that appear on the equipment electrical rating label.
- Follow the electrostatic discharge safety practices.
- Disconnect both power supply cords (if necessary) before servicing components.

> **Note**
>
> Power cords must be disconnected when servicing components that require cold service.

Safety Symbols

The following symbols might appear in this document. Note their meanings.

> **Caution**
>
> **Risk of personal injury or equipment damage.** To avoid personal injury or equipment damage, follow the instructions.

> **Caution**
>
> **Hot surface.** Avoid contact. Surfaces are hot and might cause personal injury if touched.

> **Caution**
>
> **Hazardous voltages are present.** To reduce the risk of electric shock and danger to personal health, follow the instructions.

Electrostatic Discharge Safety

Devices that are sensitive to electrostatic discharge (ESD), such as the motherboard, PCIe cards, drives, processors, and memory DIMMs require special handling.

> **Caution**
>
> The boards and drives contain electronic components that are extremely sensitive to static electricity. Ordinary amounts of static electricity from clothing or the work environment can destroy components. Do not touch the components along their connector edges.

Do the following when handling ESD-sensitive components:

- Use an antistatic wrist strap.

  Wear an antistatic wrist strap when handling components such as drive assemblies, boards, or cards. When servicing or removing server components, disconnect the power cords from the server. Attach an antistatic strap to your wrist and to a metal area on the chassis. Following this practice equalizes the electrical potentials between you and the server.

> **Note**
>
> Antistatic wrist straps might be included with options and components.

- Use an antistatic mat.

  Place ESD-sensitive components such as the motherboard, DIMMS (memory modules), and other printed circuit board (PCB) cards on an antistatic mat. You can use the following items as an antistatic mat:

  – An antistatic bag used to wrap an Oracle replacement part
  – An Oracle ESD mat (orderable item)
  – A disposable ESD mat (shipped with some replacement parts or optional system components)

Powering Down the Server

Gracefully shut down the server host to prevent data from being corrupted. Performing a graceful shutdown ensures that the system is ready for restart. If the server is not responding, or you must shut down the server quickly, perform an immediate shutdown.

> **Note**
>
> Components that are hot-pluggable do not require the server to be powered down. For more information, see the component replacement procedures in this guide.

Before Powering Down a Node

Servers in a Private Cloud Appliance rack are integrated components of a multinode environment. Unless a server experiences a sudden failure or must be shut down in an emergency situation, powering down server nodes in the appliance should be planned and performed carefully to minimize impact on the performance and availability of the appliance services and resources.

When planning to power down server nodes, take these points into account:

System load
Powering down servers means system capacity is temporarily reduced. It makes sense to plan maintenance operations at a time when system load is typically at its lowest; for example during the night, over the weekend, and so on.

Instance availability
Many workloads need to remain available while a server is offline for maintenance. You can live-migrate compute instances to other compute nodes in the same fault domain, or restart them in another fault domain. The available compute capacity in the three fault domains determines whether all workloads can remain operational or if some need to be scaled down or even interrupted temporarily.

Maintenance mode
Before you can safely take a server offline, it must be placed in maintenance mode. In a Private Cloud Appliance environment this means that a compute node must not host any running compute instances, that it is under maintenance lock, and that provisioning has been disabled. An appliance administrator must perform these tasks from the Service Enclave.

For more information about locking nodes for maintenance, migrating compute instances, and configuring high availability in the Compute service, refer to the chapter Hardware Administration in the Oracle Private Cloud Appliance Administrator Guide.

Power Down a Node from the Service Enclave

> **Note**
>
> Always perform a graceful shutdown. It ensures that all data is saved and the system is ready for restart.

1. Ensure that no compute instances are running on this node, and that the maintenance and provisioning locks are active.
2. From the Service Enclave, issue the Stop command.

   See Hardware Administration in the Oracle Private Cloud Appliance Administrator Guide.

   - Service Web UI: In the Rack Units table, click the action menu (three vertical dots) and select Stop.
   - Service CLI: Enter the command `stop ComputeNode id=<node-id>`.

Alternative Ways to Power Down a Node

If the Stop command from the Service Enclave does not cause the node to power down as expected, try these alternatives:

Use the Oracle Integrated Lights Out Manager (ILOM)

1. Log in to the ILOM UI or CLI using an Administrator account.
2. Perform a graceful shutdown.
   - ILOM UI: In the left pane, click Host Management, select Power Control, and click Graceful Shutdown and Power Off from the Select Action list. Click Save, and then click OK.
   - ILOM CLI: At the prompt, enter the command `stop /System`.

Use the On/Standby Button

1. By default, the front panel On/Standby button is disabled. Log in to the ILOM, go under `SP/policy` and enter the command: `set EXTERNAL_POWER_BUTTON_OVERRIDE=disabled`.
2. Perform a graceful shutdown.

   Press and quickly release the On/Standby button on the front panel.

   This action causes ACPI-enabled operating systems to perform an orderly shutdown of the operating system.

The host server performs an orderly power shutdown to Standby power mode, and the System OK LED on the front panel begins blinking. Next, you can disconnect the cables from the server.

Disconnect Cables From the Server

The server has cable connections in both the front and back. Disconnect only the cables required for your service action.

1. Ensure all cables connected to the server are labeled, to ensure they are reconnected to the same connector.
2. Shut down the server host.

   See Powering Down the Server.
3. If required, disconnect the power cords from the back of the server.

> **Note**
>
> Data cables are connected to the front of the server. These must not be disconnected.

4.

Replacing a Fan Module

Fan modules are located at the back of the server and are replaceable components that do not require you to power off the server for service.

When facing the rear of the system, fan module 0 (FM0) is on the left, fan module 1 (FM1) is in the center, and fan module 2 (FM2) is on the right.

Remove and replace only one fan module at a time. Ensure that you have obtained the replacement fan module and that it is ready for installation before starting the replacement procedure.

> **Caution**
>
> When removing and replacing a fan module in the X10-2c GPU L40S Compute Server, you must complete the entire procedure within 25 seconds to maintain adequate cooling in the system, and prevent the possible shutdown of the server.

Remove a Fan Module

You do not have to power off the server to service fan modules.

1. Remove and replace only one fan module at a time.

   When facing the rear of the system, fan module 0 (FM0) is on the left, fan module 1 (FM1) is in the center, and fan module 2 (FM2) is on the right.
2. Identify which fan module requires replacement.

> **Note**
>
> For accurate component identification, see Illustrated Back Panel Components Breakdown.

Each fan module has one bi-color status indicator (LED) located at the back of the system chassis. If the fan is operating normally, the indicator is lit green. If the fan is faulty, the indicator is lit amber.

Alternatively, to list all known faults in the server, log in to the ILOM service processor from the ILOM Fault Management Shell and issue the `fmadm faulty` command. For more information, refer to "Oracle ILOM User's Guide for System Monitoring and Diagnostics" in the Oracle Integrated Lights Out Manager (ILOM) Documentation.

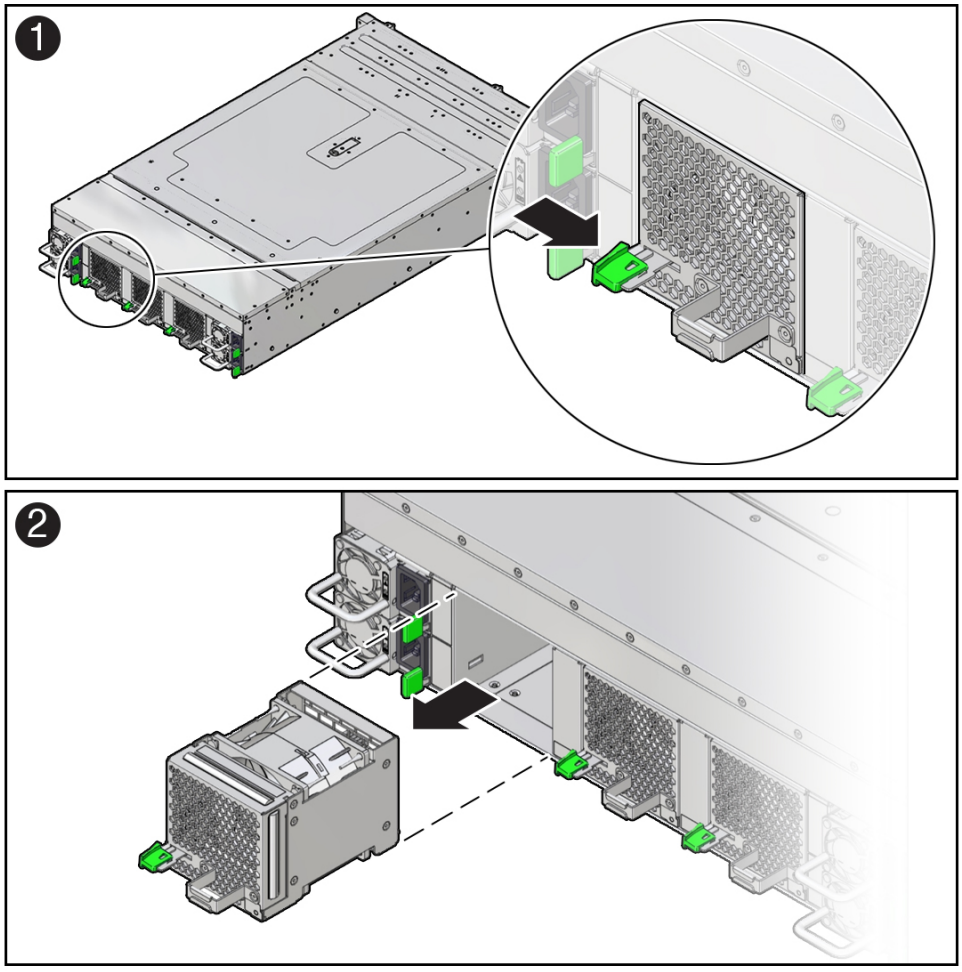
3. Prepare the system for fan module removal.

   See Electrostatic Discharge Safety.

4. Gain access to the rear of the server where the faulty fan module is located.

5. Grasp the fan module handle and use your thumb to push the release latch inwards, toward the handle [1]. Then pull the fan module straight out of the chassis [2].

> **Note**
>
> If the release lever becomes stuck (it won't move all the way right to the released position), push the lever down as you slide it in toward the module handle. This will help prevent the lever from binding in its slot in the fan module sheet metal.



6. Set the fan module on an antistatic mat.

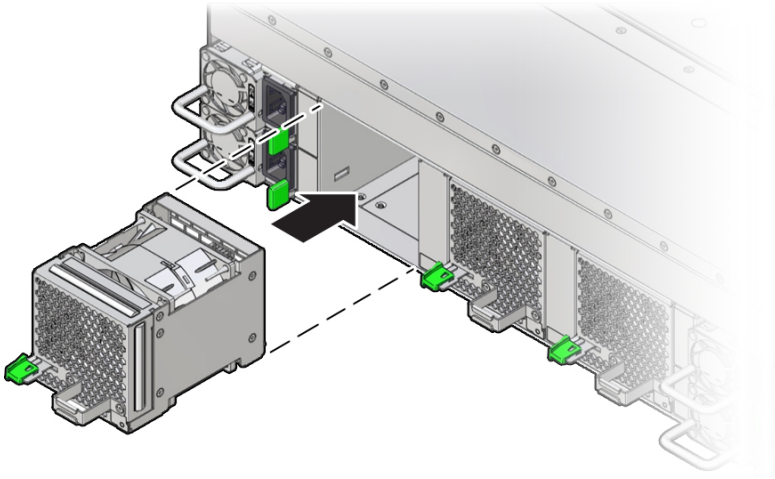
Install a Fan Module

1. Remove the replacement fan module from its packaging, and place it on an antistatic mat.
2. Grasp the replacement fan module by the handle and align it with the empty chassis fan module slot.

   The fan modules are keyed to ensure that they are installed in the correct orientation.
3. Slide the fan module into the chassis and apply firm pressure to fully seat the fan module.

   You will hear an audible click when the fan module latches.

> **Note**
>
> If the lever doesn't fully latch closed, pull the lever slightly toward you while pushing the lever up and to the left in order for it to completely latch. This will help keep the lever from binding in its slot in the module sheet metal.



4. Verify that the fan module status indicator (LED) on the replacement fan module is lit green.

Replacing Power Supplies

Power supplies are located at the back of the server and are replaceable components that do not require you to power off the server for service.

The server redundant power supplies support concurrent maintenance, which allows you to remove and replace a power supply without shutting down the server, provided that the other power supply is online and working.

The server supports the A271/A271A 1400W power supply. The power supply unit (PSU) provides conversion from the AC lines to the system, accepting ranges from 200-240 volts AC (VAC). In a system with multiple PSUs, the load is evenly spread out between PSUs. The PSUs are designed to be hot-pluggable, and in most cases, provide fully redundant "N+N" power, allowing the system to suffer the loss of a PSU or an AC feed with no loss to system availability.

In maximally configured systems, it is possible that the worst-case power consumption of the system could exceed the capacity of a single PSU. The PSUs provide an oversubscription mode, which allows the system to operate with fault-tolerance even with modest excursions beyond the rated capacity of a single PSU. This oversubscription support is accomplished using hardware signaling between the PSU and motherboard circuitry, which can force the system to throttle processor (CPU) and memory power in the event that a PSU is lost. The resulting power savings is enough to allow the system to continue to run (in a lower-performance state) until the power problem is resolved.

If a power supply fails and you do not have a replacement available, leave the failed power supply installed to ensure proper airflow in the server.

Remove a Power Supply

1. Identify which power supply requires replacement.

   > **Note**
   >
   > For accurate component identification, see Illustrated Back Panel Components Breakdown.

   A lit amber Fault-Service Required LED on a power supply indicates that a failure was detected.

   Alternatively, to list all known faults in the server, log in to the ILOM service processor from the ILOM Fault Management Shell and issue the `fmadm faulty` command. For more information, refer to "Oracle ILOM User's Guide for System Monitoring and Diagnostics" in the Oracle Integrated Lights Out Manager (ILOM) Documentation.

2. Prepare the system for fan module removal.

   See Electrostatic Discharge Safety.

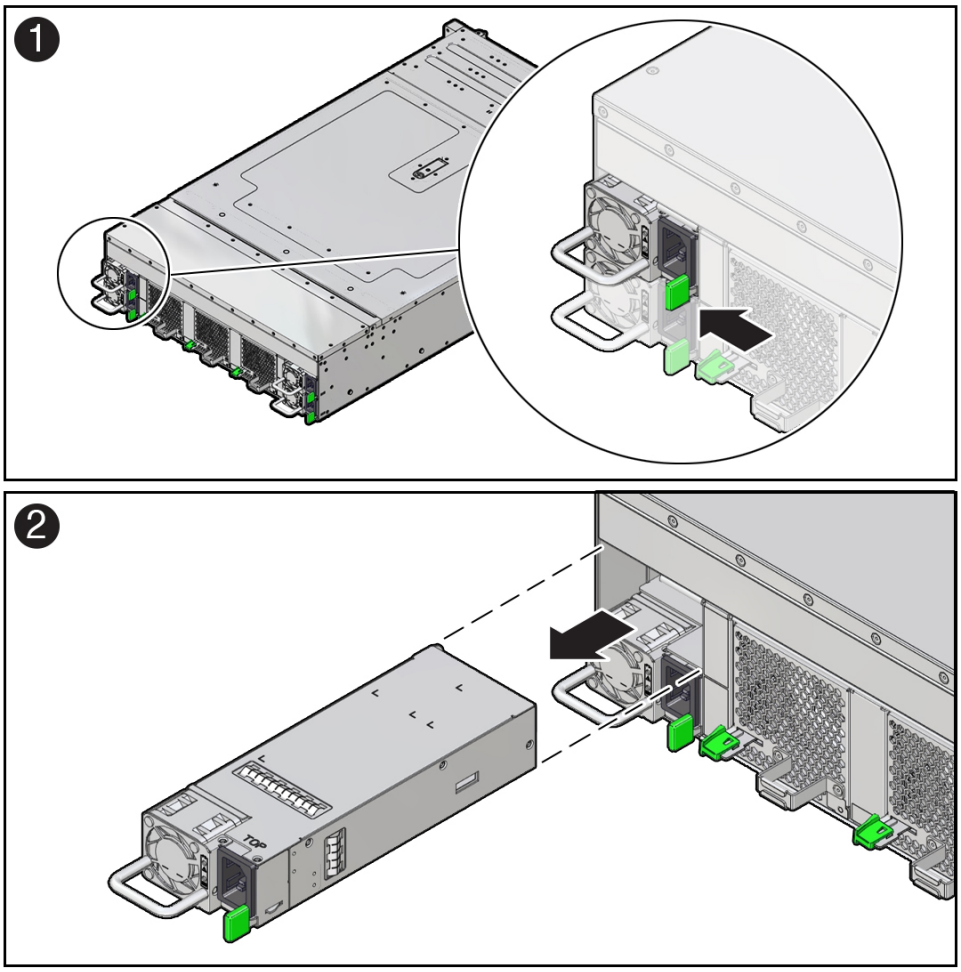
3. Gain access to the rear of the server where the power supplies are located.

4. Disconnect the power cord from the faulty power supply.

   > **Note**
   >
   > The fans of a failed power supply might still be spinning when the system is powered on. The fans stop spinning when you disconnect the power cords.

5. Grasp the power supply handle and use your thumb to push the green power supply release latch inwards, toward the handle [1]. Then pull the power supply out of the chassis [2].

   > **Caution**
   >
   > When you remove a power supply, replace it with another power supply; otherwise, the server might overheat due to improper airflow.



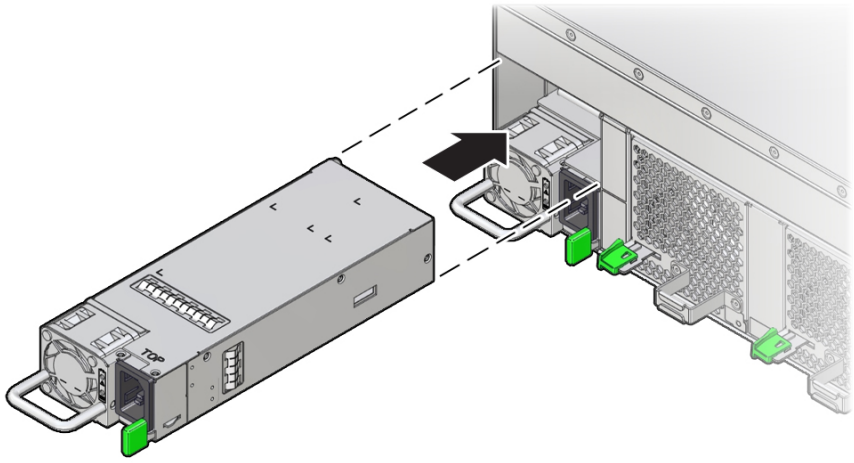
6. Set the power supply on an antistatic mat.

Install a Power Supply

Always replace the failed power supply with the same model of power supply. For this product, both the A271 and A271A power supplies are supported and are interchangeable in the system.

1. Remove the replacement power supply from its packaging, and place it on an antistatic mat.
2. Align the replacement power supply with the empty power supply slot.
3. Slide the power supply into the slot until it is fully seated.

   You hear an audible click when the power supply fully seats.



4. Reconnect the power cord to the power supply.

> **Warning**
>
> For accurate component identification, see Illustrated Back Panel Components Breakdown.
>
> When replacing a power supply, pay special attention to the **cable routing** of PS 0 and PS 2. These are on the left side when facing the rear of the system. Cables must be routed and **secured away from the power supply fans** to avoid interference with the airflow. The slightest obstruction will result in overheating warnings.

5. Verify that the amber Fault-Service Required LED on the replaced power supply is not lit.

Returning the Server to Operation

This section describes safety considerations and provides procedures and information after replacing components in the server.

After replacing components inside of the server, perform the procedures in the following sections. For more information, see the component replacement procedures in this guide.

Reconnect Cables

Reconnect the power cables to the power supplies at the back of the server, and secure them from accidental disconnection with the securing straps.

> **Warning**
>
> For accurate component identification, see Illustrated Back Panel Components Breakdown.
>
> Pay special attention to the **cable routing** of PS 0 and PS 2. These are on the left side when facing the rear of the system. Cables must be routed and **secured away from the power supply fans** to avoid interference with the airflow. The slightest obstruction will result in overheating warnings.

Power On the Server

1. As soon as you connect the power cords, the server enters Standby power mode and service processor (SP) starts. Check the following:
   - The AC Power Supply indicator lights are steady on.
   - The main System OK LED remains off until the SP completes its boot process This can take a few minutes.
   - Once the SP has successfully completed its boot process, the main System OK LED slowly flashes the standby blink pattern (0.1 seconds on, 2.9 seconds off), indicating that the SP is ready for use.

   The server is now In Standby power mode. The server host is off.

   > **Note**
   >
   > Depending on the firmware configuration, the system might automatically boot the server host at this point. If it does not, proceed to the next step.

2. From the Service Enclave, issue the Start command.

   See Hardware Administration in the Oracle Private Cloud Appliance Administrator Guide.
   - Service Web UI: In the Rack Units table, click the action menu (three vertical dots) and select Start.
   - Service CLI: Enter the command start ComputeNode id=<***node-id***>.
3. If the Start command from the Service Enclave does not cause the node to boot as expected, try these alternatives:
   - Press the On/Standby button on the front bezel.

     By default, the front panel On/Standby button is disabled. Log in to the ILOM, go under SP/policy and enter the command: set EXTERNAL_POWER_BUTTON_OVERRIDE=disabled.
   - Log in to the ILOM CLI, and enter the command start /System.

When the server is powered on to Main power mode and the power-on self-test (POST) code checkpoint tests are complete, the green System OK LED on the front panel lights and remains lit to indicate that the system is ready.