

Sun Netra 6000 Modular System

Service Manual



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Using This Documentation

This service manual contains information and procedures for maintaining and upgrading Oracle's Sun Netra 6000 modular system. This document is written for technicians, system administrators, authorized service providers, and users who have advanced experience troubleshooting and replacing hardware. This document is available online in the Sun Netra 6000 Modular System Topic Set and as an individual PDF file.

Note – This guide provides instructions for the AC and DC models of the modular system. Most of the topics apply to both models unless otherwise noted. Illustrations show one model or the other, and might not match your equipment exactly.

- “Related Documentation” on page vii
- “Documentation, Support, and Training” on page viii

Related Documentation

The modular system documents listed as online are available at:

(<http://www.oracle.com/pls/topic/lookup?ctx=E19945-01&id=homepage>)

Activity	Title	Format	Location
Late-breaking information	<i>Sun Netra 6000 Modular System Product Notes</i>	PDF	Online
Installation	<i>Sun Netra 6000 AC Modular System Getting Started Guide</i>	Printed,	Shipping kit,
	<i>Sun Netra 6000 DC Modular System Getting Started Guide</i>	PDF	Online
	<i>Rack Alignment Template (AC)</i>	Printed,	Shipping kit
	<i>Rack Alignment Template (DC)</i>	PDF	Online

Activity	Title	Format	Location
	<i>Sun Netra 6000 Modular System Installation Guide</i>	Topic set, PDF	Online
Remote management (ILOM)	<i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Supplement for the Sun Netra 6000 Modular System</i>	Topic set, PDF	Online
Service	<i>Sun Netra 6000 Modular System Service Manual</i>	Topic set, PDF	Online
Safety	<i>Sun Netra 6000 Modular System Safety and Compliance Guide</i>	PDF	Online
	<i>Important Safety Information for Sun Hardware Systems</i>	Printed	Shipping kit

Additional Oracle Integrated Lights Out Manager (ILOM) documentation is available at:

(<http://www.oracle.com/pls/topic/lookup?ctx=E19860-01&id=homepage>)

	Title
General ILOM 3.0 information	<i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Getting Started Guide</i> <i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Concepts Guide</i> <i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Web Interface Procedures Guide</i> <i>Oracle Integrated Lights Out Manager (ILOM) 3.0 CLI Procedures Guide</i> <i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Feature Updates and Release Notes</i> <i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Management Protocols Reference Guide</i> <i>Oracle Integrated Lights Out Manager (ILOM) CMM Administration Guide for Sun Blade 6000 and Sun Blade 6048 Modular Systems</i>

Documentation, Support, and Training

These web sites provide additional resources:

- Documentation: (<http://www.oracle.com/technetwork/documentation/index.html>)
- Support: (<http://support.oracle.com>)

- Training: (<http://education.oracle.com>)

Monitoring Faults

These topics describe how to monitor system status and troubleshoot system faults.

- [“Understanding Fault Management” on page 1](#)
- [“Monitoring Faults \(LEDs\)” on page 3](#)
- [“Monitoring Faults \(Oracle ILOM\)” on page 9](#)

Related Information

- *Modular System Remote Management (ILOM)*, interpreting sensors
- [“Preparing for Service” on page 15](#)

Understanding Fault Management

These topics describe server module fault management.

- [“Fault Identification” on page 1](#)
- [“External and Internal Faults” on page 2](#)
- [“Fault Management Software” on page 2](#)

Related Information

- [“Power Supply and Front Fan Faults and Cautions \(Oracle ILOM\)” on page 11](#)
- [“Monitor Rear Fan Faults in Oracle ILOM” on page 12](#)
- [“Monitor Faults With the Oracle ILOM Event Log” on page 12](#)

Fault Identification

There are three ways to tell when a fault has occurred somewhere in the system:

- Verify if any amber Service Action Required LEDs are illuminated. See [“Chassis and CMM LEDs” on page 5](#).
- Use Oracle ILOM to check if a component is in a faulted state. See [“Monitoring Faults \(Oracle ILOM\)” on page 9](#).
- Check the Oracle ILOM system event log to see if a fault has been recorded in the system event log. See [“Monitor Faults With the Oracle ILOM Event Log” on page 12](#).

Related Information

- [“Monitor Power Supply and Front Fan Faults \(Oracle ILOM\)” on page 10](#)
- [“External and Internal Faults” on page 2](#)
- [“Fault Management Software” on page 2](#)

External and Internal Faults

When a system component experiences a hardware failure, it is called an internal fault. The fault is the result of a problem with the hardware of the modular system itself. Internal faults are cleared when a repair action takes place, most likely the replacement of the failed component.

With external faults, there is no failed system hardware. A condition that is outside the system is causing a potential problem. For example, if the ambient air temperature (external to the chassis) exceeds a certain threshold, it is a fault. The heat can adversely affect the system if the temperature is not reduced. External faults are autoclearing. They are cleared when the external condition no longer exists. Nonetheless, an external fault can cause components or the system as a whole to shut down if the problem is not resolved.

Related Information

- [“Monitor Power Supply and Front Fan Faults \(Oracle ILOM\)” on page 10](#)
- [“Fault Identification” on page 1](#)
- [“Fault Management Software” on page 2](#)

Fault Management Software

The fault management software monitors hardware health, and diagnoses and reports hardware failures on system components. Fault management also monitors environmental conditions and reports when the system’s environment is outside

acceptable parameters. Sensors on the system chassis and each power supply, server module, and fan are continuously monitored. When a sensor registers a problem, the fault management software, which runs on the CMM, is notified.

Fault management software then diagnoses the problem. If the software determines that a hardware or environmental failure has occurred, it lights the Service Action Required LED on the affected component. The Oracle ILOM management interfaces are updated to reflect the failure (the fault), and the failure is recorded as a fault in the event log.

Note – The modular system fault management software is not related to the Oracle Solaris Fault Management Architecture. Fault management is part of the modular system’s management software and does not interact with the server module hosts or their operating systems.

Related Information

- [“Fault Identification” on page 1](#)
- [“External and Internal Faults” on page 2](#)
- [“Monitoring Faults \(LEDs\)” on page 3](#)
- [“Monitor Power Supply and Front Fan Faults \(Oracle ILOM\)” on page 10](#)

Monitoring Faults (LEDs)

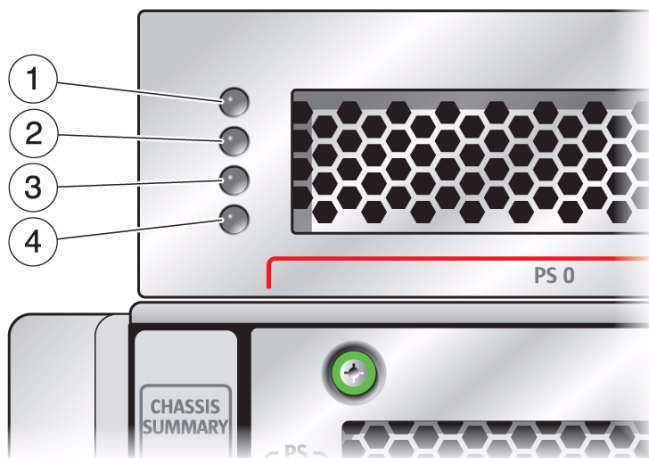
A fault is declared and the chassis Temperature Fail LEDs are illuminated when the external condition represents a potential hazard to the system. An external fault can force a shutdown of the entire system. The Chassis Service Action Required LED also lights when there is a fault on a chassis component.

- [“Alarm LEDs on the DC Input Unit” on page 4](#)
- [“Power Supply LEDs \(DC\)” on page 7](#)
- [“Power Supply LEDs \(AC\)” on page 8](#)
- [“Chassis and CMM LEDs” on page 5](#)
- [“Rear Fan LEDs” on page 9](#)

Related Information

- [“Monitoring Faults \(Oracle ILOM\)” on page 9](#)

Alarm LEDs on the DC Input Unit



You can change the LED states using CMM ILOM.

TABLE: DC Input Unit LED Functions

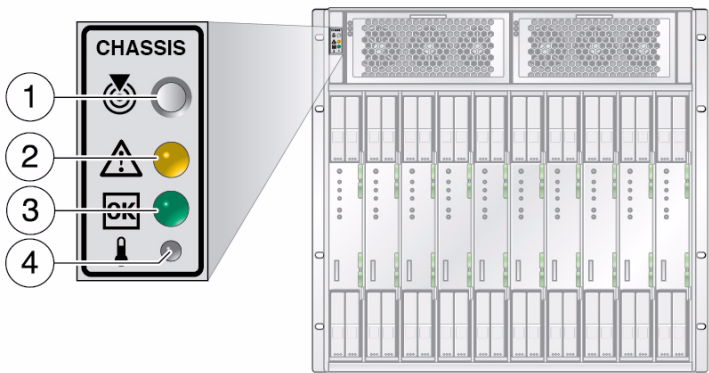
No.	LED Description	Color
1	CRIT (critical)	Red
2	MAJ (major)	Red
3	MIN (minor)	Yellow (Amber)
4	USER	Yellow (Amber)

Related Information

- [“Chassis and CMM LEDs” on page 5](#)
- [“Rear Fan LEDs” on page 9](#)

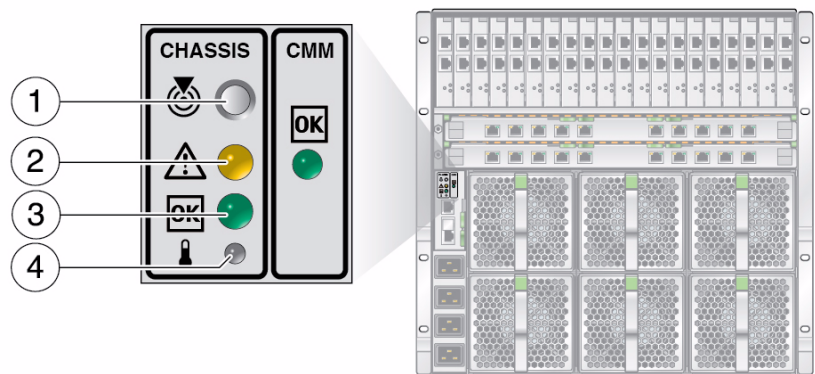
Chassis and CMM LEDs

FIGURE: LEDs on the Front Chassis FIM



No.	Description
1	Locate LED
2	Service Action Required LED
3	Power/OK LED
4	Temperature Fail LED

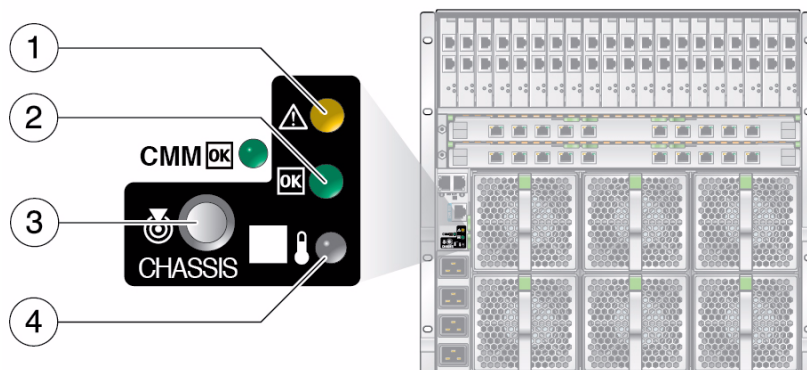
FIGURE: LEDs on the Rear Chassis CMM (A90-B Chassis)



No.	Description
1	Locate LED

No.	Description
2	Service Action Required LED
3	Power/OK LED
4	Temperature Fail LED

FIGURE: LEDs on the Rear Chassis CMM (A90-D Chassis)



No.	Description
1	Service Action Required LED
2	Power/OK LED
3	Locate LED
4	Temperature Fail LED

Related Information

- [“Power Supply LEDs \(DC\)” on page 7](#)
- [“Power Supply LEDs \(AC\)” on page 8](#)
- [“Rear Fan LEDs” on page 9](#)

Power Supply LEDs (DC)

The tables show the LED functions. The DC-B LED monitors the top input power connector in the back of the power supply. The DC-A LED monitors the bottom input power connector in the back of the power supply.

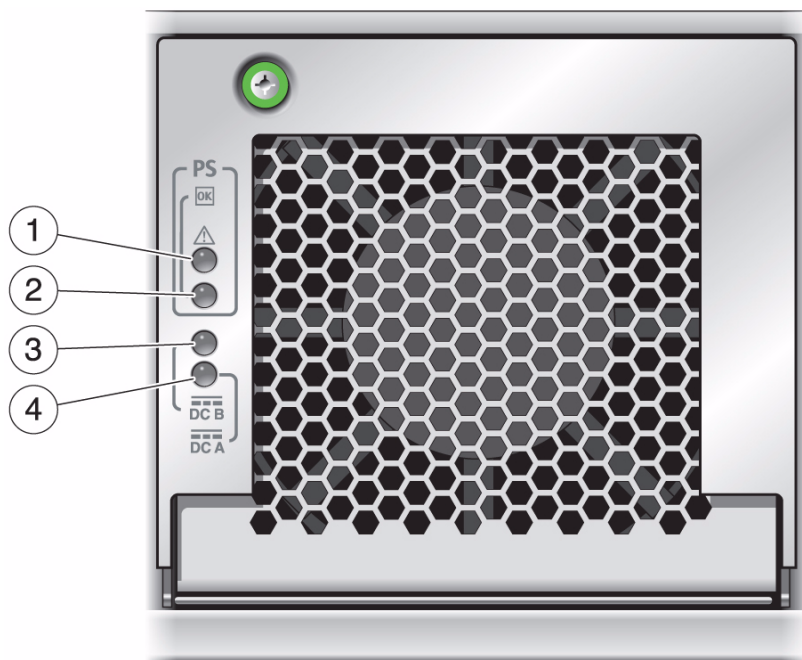


TABLE: Service Action Required and DC Output Power LED Functions

No.	LED Description	Normal	Fault	Standby Power Fault
1	Service Action Required (amber)	Off	On	Blinking if over or under 3.3VSB
2	DC output power (green)	On	On	N/A

TABLE: Input Power LED Functions for DC Power Supply

No.	LED Description	Power	No Power
3	DC-B (green)	On	Off
4	DC-A (green)	On	Off

Related Information

- “Chassis and CMM LEDs” on page 5
- “Rear Fan LEDs” on page 9

Power Supply LEDs (AC)

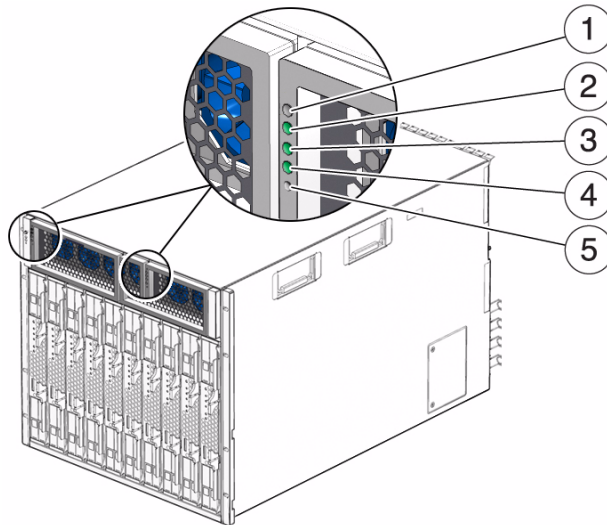


TABLE: AC Power Supply LED Functions

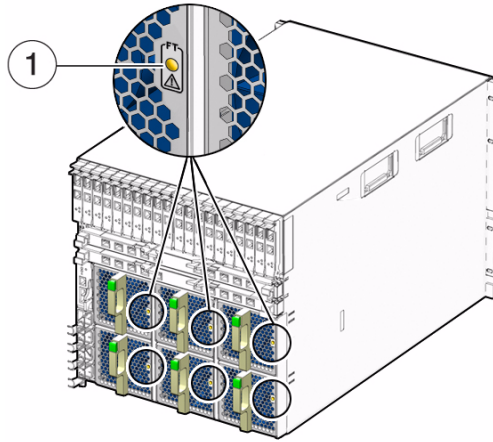
No.	LED Description	Normal	Overcurrent	AC 0 Failed	AC 1 Failed	Front Fan Failed
1	Service Action Required	Off	On	Off	Off	Off
2	DC (green)	On	Off	Off	Off	On
3	AC-1 (green)	On	On	On	Off	On
4	AC-0 (green)	On	On	Off	On	On
5	Fan Service (amber) (AC chassis only)	Off	Off	Off	Off	On

Related Information

- [“Chassis and CMM LEDs” on page 5](#)
- [“Rear Fan LEDs” on page 9](#)

Rear Fan LEDs

The chassis contains six rear fan modules. Each fan module has an LED. The rear fan fault LEDs indicate when a failure has occurred on a fan module. The source of the failure could be mechanical, electrical, or the result of a midplane controller failure.



No.	Description
1	Fan Service Action Required LED

Related Information

- [“Chassis and CMM LEDs” on page 5](#)
- [“Power Supply LEDs \(DC\)” on page 7](#)
- [“Power Supply LEDs \(AC\)” on page 8](#)
- [“Monitoring Faults \(Oracle ILOM\)” on page 9](#)

Monitoring Faults (Oracle ILOM)

You can monitor chassis and component faults from the Oracle ILOM CLI.

- [“Monitor Power Supply and Front Fan Faults \(Oracle ILOM\)” on page 10](#)
- [“Power Supply and Front Fan Faults and Cautions \(Oracle ILOM\)” on page 11](#)
- [“Monitor Rear Fan Faults in Oracle ILOM” on page 12](#)
- [“Monitor Faults With the Oracle ILOM Event Log” on page 12](#)

Related Information

- [“Understanding Fault Management” on page 1](#)
- [“Monitoring Faults \(LEDs\)” on page 3](#)

▼ Monitor Power Supply and Front Fan Faults (Oracle ILOM)

You can monitor chassis and component faults from the Oracle ILOM CLI.

1. **Open an Oracle ILOM CLI window.**
2. **Type the appropriate `show` command to display information about system components.**

For example, if the power supply AC-1 light is lit, you would type the following command:

```
> show /CH/PS0/S1/AC_FAIL
/CH/PS0/S1/AC_FAIL
Targets:

Properties:
type = Voltage
class = Discrete Sensor
value = Predictive Failure Asserted

Commands:
cd
show
```

In the example, `value = Predictive Failure Asserted` shows a faulted power supply. Since one of the power supplies in power supply 0 has failed, the you must replace the entire power supply.

Related Information

- [“Power Supply and Front Fan Faults and Cautions \(Oracle ILOM\)” on page 11](#)

Power Supply and Front Fan Faults and Cautions (Oracle ILOM)

The tables show the fault and caution types and where to find the sensor information in the Oracle ILOM CLI.

In the tables, the variable *n* represents one of the following values:

- Power supply 0 (PS0)
- Power supply 1 (PS1)
- 12V output 0 (S0)

■ 12V output 1 (S1)

For example, /CH/PS0/S1 represents 12 V output 1 located within power supply 0.

The sensors display the following value if a fault has occurred.

value = Predictive Failure Asserted

TABLE: Power Supply Cautions

Caution Type	Oracle ILOM CLI Path to Sensor
Power supply input lost or out of range. Possible values are: <ul style="list-style-type: none"> • Presence detected • Power supply failure detected • Predictive failure • Power supply input lost (AC/DC) • Power supply input lost or out-of-range • Power supply input out-of-range, but present 	/CH/PSn/STATUS
Sensor shows the ambient temperature of the power supply. The CMM LED illuminates when the ambient temperature reaches 40°C, and shuts down the chassis when the temperature reaches 45°C.	/CH/PSn/T_AMB
12V _n output current exceeds 240A for 100 msec.	/CH/PSn/Sn/I+12V_WARN
Ambient temperature reaches the range of 50° to 60°C.	/CH/PSn/T_AMB_WARN

TABLE: Power Supply and Front Fan Faults

Fault Type	Oracle ILOM CLI Path to Sensor
Power supply has failed.	/CH/PSn/Sn/ACFAIL
Ambient temperature reaches the following range: 65° to 75° C. This sensor causes the power supply to shut down.	/CH/PSn/T_AMB_FAULT
12V power output has exceeded 14V for more than 400 msec.	/CH/PSn/Sn/V+12V_FAULT
3V power output reaches the range: 3.7 to 4.3V.	/CH/PSn/V+3_3V_FAULT
12V _n output current exceeds 240 amps for more than 60 seconds or 12 V _n output current exceeds 275A for 20 msec.	/CH/PSn/Sn/I+12V_FAULT
3.3V output current exceeds 13A for more than 20 msec.	/CH/PSn/I+3_3V_Fault
Front fan has failed.	/CH/PSn/FAN_FAIL

Related Information

- [“Monitor Rear Fan Faults in Oracle ILOM” on page 12](#)

- “Power Supply and Front Fan Faults and Cautions (Oracle ILOM)” on page 11
- “Monitor Faults With the Oracle ILOM Event Log” on page 12

▼ Monitor Rear Fan Faults in Oracle ILOM

- Using the Oracle ILOM CLI, view the sensor for a rear fan fault:

```
show /CH/FMn/FAIL
```

The variable *n* represents the fan module number. For example, /CH/FM1/FAIL indicates a fan failure in fan module 1.

Related Information

- “Monitor Power Supply and Front Fan Faults (Oracle ILOM)” on page 10
- “Power Supply and Front Fan Faults and Cautions (Oracle ILOM)” on page 11
- “Monitor Faults With the Oracle ILOM Event Log” on page 12

▼ Monitor Faults With the Oracle ILOM Event Log

Faults are recorded in the system event log, which you can view from the Oracle ILOM CLI.

1. Open an Oracle ILOM CLI window.
2. View the event log:

```
show /CMM/logs/event list
```

You can scroll through the log output to review its contents. A fault entry displays something like the example below, which lists a fault that occurred on power supply 0, power supply side 0:

```
3642 Tue Jan 20 17:46:53 1970 IPMI Log critical
ID = 9 : pre-init timestamp : Voltage : ps0.ac0_fail :
Predictive
Failure Asserted
```

Related Information

- “Monitor Power Supply and Front Fan Faults (Oracle ILOM)” on page 10
- “Power Supply and Front Fan Faults and Cautions (Oracle ILOM)” on page 11

- “Monitor Rear Fan Faults in Oracle ILOM” on page 12

Preparing for Service

These topics describe how to prepare to service the modular system.

- [“Component Types and Service Classifications” on page 15](#)
- [“Differences Between Chassis Models and Their Replacement Components” on page 16](#)
- [“Determine if a Chassis Is A90-B or A90-D \(CLI\)” on page 18](#)
- [“Determine if a Chassis Is A90-B or A90-D \(Web Interface\)” on page 18](#)
- [“Gather Required Tools” on page 19](#)
- [“Prevent ESD Damage” on page 19](#)
- [“Power Off the Server Modules and Storage Modules” on page 20](#)
- [“Power Off Components in the Chassis” on page 21](#)
- [“Removing Power From the Chassis” on page 21](#)
- [“Removing the Chassis From the Rack” on page 24](#)

Related Information

- [“Replacing CRUs” on page 31](#)
- [“Replacing FRUs” on page 61](#)
- [“Returning the Modular System to Operation” on page 79](#)

Component Types and Service Classifications

All components in the modular system are removable and serviceable by a single person. There are two types of server module components:

- **CRU** - Any qualified service provider can remove and replace CRUs.
- **FRU** - Only Oracle service personnel are authorized to remove and install FRUs.

Components also have three service classifications:

- **Hot -pluggable** - Using the proper software commands, you can install or remove hot-pluggable components while the system is running.
- **Hot-swappable** - Hot-swappable components can be installed or removed while the system is running, without using any software commands.
- **Cold-swappable** - You must remove power from the system to service the components.

Component Name	Component Type	Service Classification
Power supply	CRU	Hot-swappable
Front fan module	CRU	Hot-swappable
Server module	CRU	Hot-pluggable
FIM	CRU	Hot-pluggable
CMM	CRU	Hot-swappable
NEM	CRU	Hot-swappable
PCI EM	CRU	Hot-swappable
Rear fan module	CRU	Hot-swappable
Fan board	CRU	Cold-swappable
Midplane	FRU	Cold-swappable
Internal power cables	FRU	Cold-swappable
DC input unit (DC model)	FRU	Cold-swappable
DC adapter tray (DC model)	FRU	Cold-swappable

Related Information

- [“Replacing CRUs” on page 31](#)
- [“Replacing FRUs” on page 61](#)

Differences Between Chassis Models and Their Replacement Components

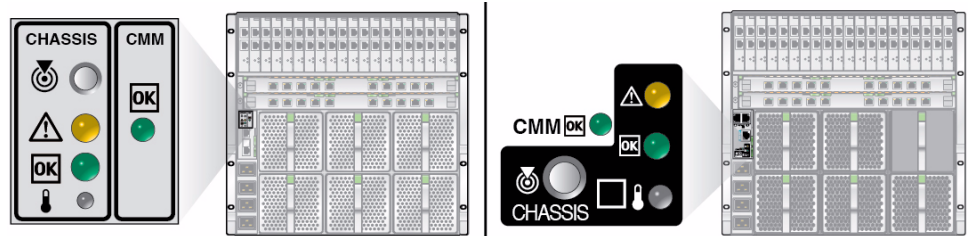
There are two chassis models of the modular system:

- A90-B

■ A90-D

Note – Both the A90-B and A90-D chassis exist for the AC model and DC model.

The most visible difference between the two chassis models is the CMM on the rear of the chassis.



- Left: CMM (501-7379) on the A90-B chassis
- Right: CMM (511-1531) on the A90-D chassis

You can also remotely identify which chassis you have by using Oracle ILOM. See [“Determine if a Chassis Is A90-B or A90-D \(CLI\)”](#) on page 18 or [“Determine if a Chassis Is A90-B or A90-D \(Web Interface\)”](#) on page 18.

Ensure that you know which chassis you have before removing and replacing components. Some replaceable components are not interchangeable between the two chassis models.

Component	A90-B	A90-D
AC power supply*	300-2190	300-2259
Rear fan	371-1450	371-4753
CMM	371-1447	541-4340
Midplane assembly	541-3789	541-4239

* The DC power supply is the same for the A90-B and A90-D chassis.

Note – The firmware for your CMM is specific to each chassis model (A90-B or A90-D). Make sure that you download the software release that is supported by your chassis model.

Related Information

- [“Determine if a Chassis Is A90-B or A90-D \(CLI\)”](#) on page 18

- [“Determine if a Chassis Is A90-B or A90-D \(Web Interface\)” on page 18](#)

▼ Determine if a Chassis Is A90-B or A90-D (CLI)

1. Log in to the Oracle ILOM CLI interface.
2. Type:

```
-> show /CH/CMM
```

3. In the properties section, locate the `fru_part_number` line.

- If you see `fru_part_number = 501-7379-xx`, you have the A90-B chassis.
- If you see `fru_part_number = 51101531-xx`, you have the A90-D chassis.

Related Information

- [“Differences Between Chassis Models and Their Replacement Components” on page 16](#)
- [“Determine if a Chassis Is A90-B or A90-D \(Web Interface\)” on page 18](#)

▼ Determine if a Chassis Is A90-B or A90-D (Web Interface)

1. Log in to the Oracle ILOM web interface.
The Chassis view page appears.
2. Select CMM in the left navigation panel.
3. Select the System Information -> Components tab.
4. Select `/CH/CMM` in the Component Name column.
The page displays CMM FRU part information.
5. In the displayed information, read the CMM FRU Part Number.
 - If the FRU Part Number value is `501-7379-xx`, you have the A90-B chassis.

- If the FRU Part Number value is 511-1531-xx, you have the A90-D chassis.

Related Information

- [“Differences Between Chassis Models and Their Replacement Components” on page 16](#)
- [“Determine if a Chassis Is A90-B or A90-D \(CLI\)” on page 18](#)

▼ Gather Required Tools

- **Gather the following tools and supplies to perform service on the modular system:**
 - No. 2 Phillips screwdriver
 - T-10 Torx driver
 - M6 hex nut driver for removing internal power cables
 - Antistatic wrist strap
 - Antistatic mat

Related Information

- [“Prevent ESD Damage” on page 19](#)
- [“Power Off the Server Modules and Storage Modules” on page 20](#)

▼ Prevent ESD Damage

Use the following procedure to prevent ESD damage when you access the server modules and server module options.



Caution – Printed circuit boards and disk drives contain electronic components that are extremely sensitive to static electricity. Ordinary amounts of static from your clothes or the work environment can destroy components. Do not touch the components themselves or any metal parts without taking proper antistatic precautions.

1. Use an antistatic mat or similar surface.

When installing an option, such as a DIMM or disk drive, place those static-sensitive parts on an antistatic surface. You can use the following items as an antistatic surface:

- Bag used to wrap a part
- Shipping container used to package a part
- Oracle ESD mat (part number 250-1088, available through your sales representative)
- Disposable ESD mat (shipped with some parts and options)

2. Attach one end of the wrist strap to the chassis sheet metal and the other end to your wrist.

Refer to the instructions that come with the strap.

Related Information

- [“Gather Required Tools” on page 19](#)
- [“Power Off Components in the Chassis” on page 21](#)

▼ Power Off the Server Modules and Storage Modules

- **Perform an orderly shutdown for the server modules and storage modules.**

See the documentation for the modules installed in your chassis.

Related Information

- Server module documentation at:
(<http://www.oracle.com/technetwork/documentation/netra-blade-servers-252766.html>)
- [“Power Off Components in the Chassis” on page 21](#)

▼ Power Off Components in the Chassis

Before you remove power from the chassis, you must place the CMM in standby mode. This action removes power from all the chassis components. You can still perform Oracle ILOM commands from the CMM.

You must remove power from the system to service the following components:

- Midplane
- Internal power cables
- DC input unit
- DC adapter tray

1. Log in to the Oracle ILOM CLI on the CMM.

2. Type:

stop /CH

This command powers off the chassis server without a graceful shutdown of the host operating systems.



Caution – Using the `-f` option could result in data loss unless the host operating systems have already been shut down at the server module level.

For instructions on powering on the system, see [“Returning the Modular System to Operation”](#) on page 79.

Related Information

- [“Removing Power From the Chassis”](#) on page 21
- [“Replacing CRUs”](#) on page 31
- [“Replacing FRUs”](#) on page 61

Removing Power From the Chassis

You must remove power from the modular system to service the following components:

- Midplane

- Internal power cables
- DC input unit
- DC adapter tray

Based on the model of your modular system, perform one of the following tasks:

- [“Remove Power From the AC Chassis” on page 22](#)
- [“Remove Power From the DC Chassis” on page 23](#)

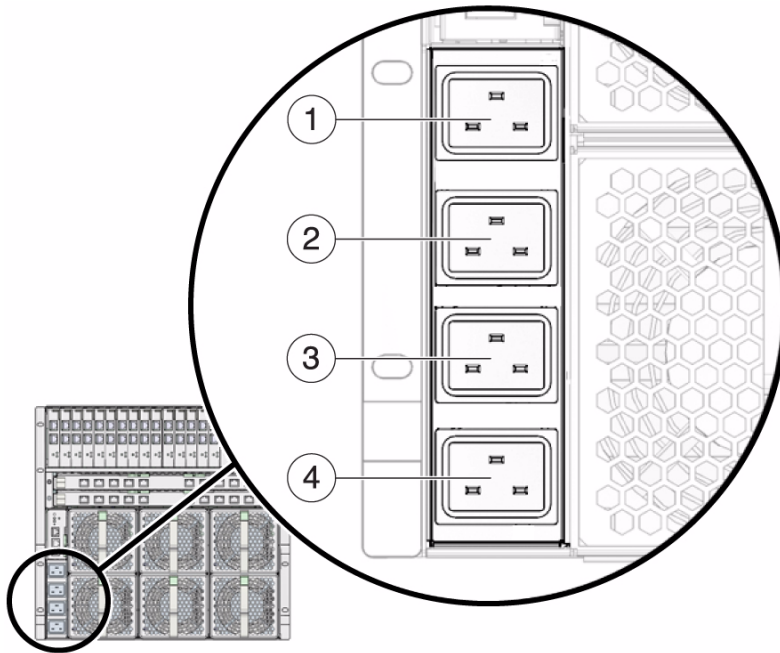
Related Information

- [“Removing the Chassis From the Rack” on page 24](#)

▼ Remove Power From the AC Chassis

You must remove power from the AC model to service the following components:

- Midplane
- Internal power cables
- **Disconnect all four power cords from the back of the chassis.**



Related Information

- [“Removing the Chassis From the Rack” on page 24](#)

▼ Remove Power From the DC Chassis

You must remove power from the DC model to service the following components:

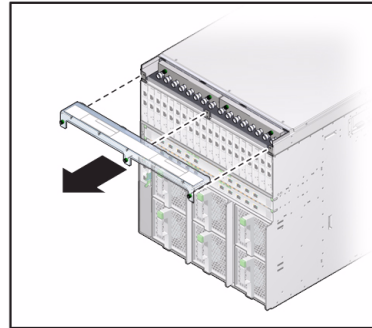
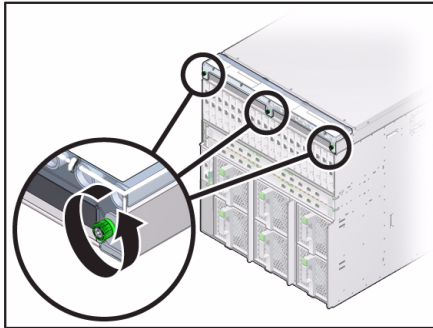
- Midplane
- DC input unit
- DC adapter tray

1. **Open the breakers or remove the fuses on your DC power source.**

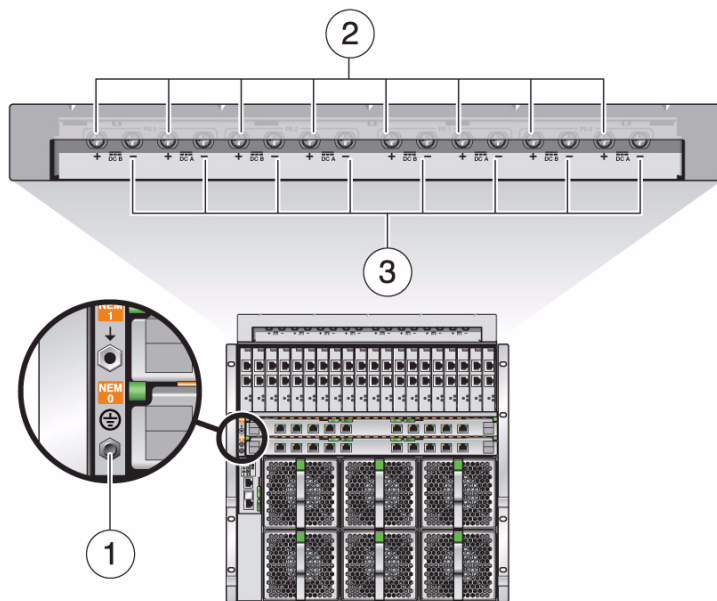


Caution – Verify that no voltage is applied to the chassis before you continue.

2. **Remove the DC input cover.**



3. **Disconnect the DC input ground, hot, and neutral wires from the chassis.**



No.	Description
1	DC input groupd
2	Neutral (white wires)
3	-48 VDC or -60 VDC hot (black wires)

Related Information

- [“Removing the Chassis From the Rack” on page 24](#)

Removing the Chassis From the Rack

You must remove the chassis from the rack to replace the DC input unit (on DC models only). You can also remove the chassis from the rack if you need to improve access when servicing other components.



Caution – The chassis is heavy. Use a mechanical lift, or depopulate the chassis and use four people to lift the chassis.

Select from the following topics to perform tasks that correspond your situation:

Description	Links
Remove the chassis using a mechanical lift.	“Prepare the Chassis for Removal” on page 25 “Remove the Chassis From the Rack” on page 27
Remove the chassis manually with four people.	“Prepare the Chassis for Removal” on page 25 “Depopulate the Chassis” on page 26 “Remove the Chassis From the Rack” on page 27

Related Information

- [“Gather Required Tools” on page 19](#)
- [“Prevent ESD Damage” on page 19](#)
- [“Power Off the Server Modules and Storage Modules” on page 20](#)

▼ Prepare the Chassis for Removal

1. **Label and record the locations of all the cables that are connected to the modular system.**

Performing this step ensures that each cable can be returned to its original location.

2. **Disconnect all data cables that are connected to components in the chassis.**

3. **Ensure that no power is applied to the chassis.**

See [“Removing Power From the Chassis” on page 21](#).



Caution – Verify that no voltage is applied to the chassis before you continue.

4. **Consider your next step.**

- If you are removing the chassis with a mechanical life, proceed to [“Remove the Chassis From the Rack” on page 27](#).
- If you are removing the chassis manually, proceed to [“Depopulate the Chassis” on page 26](#).

Related Information

- [“Depopulate the Chassis” on page 26](#)
- [“Remove the Chassis From the Rack” on page 27](#)

▼ Depopulate the Chassis

Follow these steps if you plan to remove the chassis from the rack without a mechanical lift.

If you plan to use a mechanical lift, go to [“Remove the Chassis From the Rack” on page 27](#).

Depopulating the chassis makes the chassis much lighter, but manual chassis removal requires four people.

1. (If necessary) Prepare the chassis for removal.

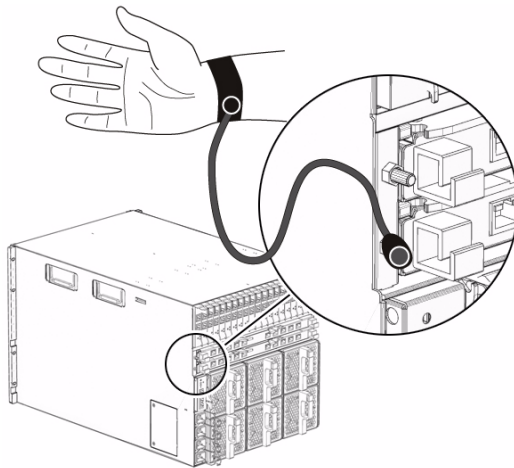
See [“Prepare the Chassis for Removal” on page 25](#).

2. Label and record the locations of the all components in the modular system.

Performing this step ensures that each component can be returned to its original location.

3. Use an antistatic wrist strap.

Attach this wrist strap to your wrist and ground the other end of strap to the system chassis.



4. Remove the following components from the chassis:

- **PSU** - See [“Remove a Power Supply \(DC\)” on page 32](#) and [“Remove a Power Supply \(AC\)” on page 34](#).
- **Server/storage module** - See [“Remove a Server or Storage Module” on page 40](#).
- **PCI EM** - See [“Remove a PCI EM” on page 48](#).
- **NEM** - See [“Remove a NEM” on page 50](#).
- **Rear fan module** - See [“Remove a Rear Fan Module” on page 53](#).

- CMM - See [“Remove the CMM”](#) on page 57.
 - Filler panel - See [“Remove a Server or Storage Module”](#) on page 40.
5. **Remove the chassis from the rack.**
See [“Remove the Chassis From the Rack”](#) on page 27.

Related Information

- [“Remove the Chassis From the Rack”](#) on page 27
- [“Repopulate the Chassis”](#) on page 83

▼ Remove the Chassis From the Rack

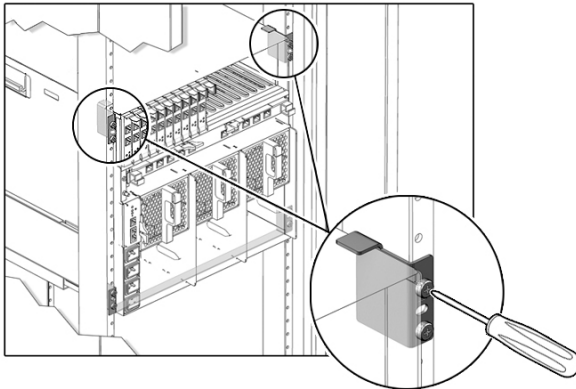


Caution – The chassis is heavy. Use a mechanical lift, or depopulate the chassis and use four people to lift the chassis.

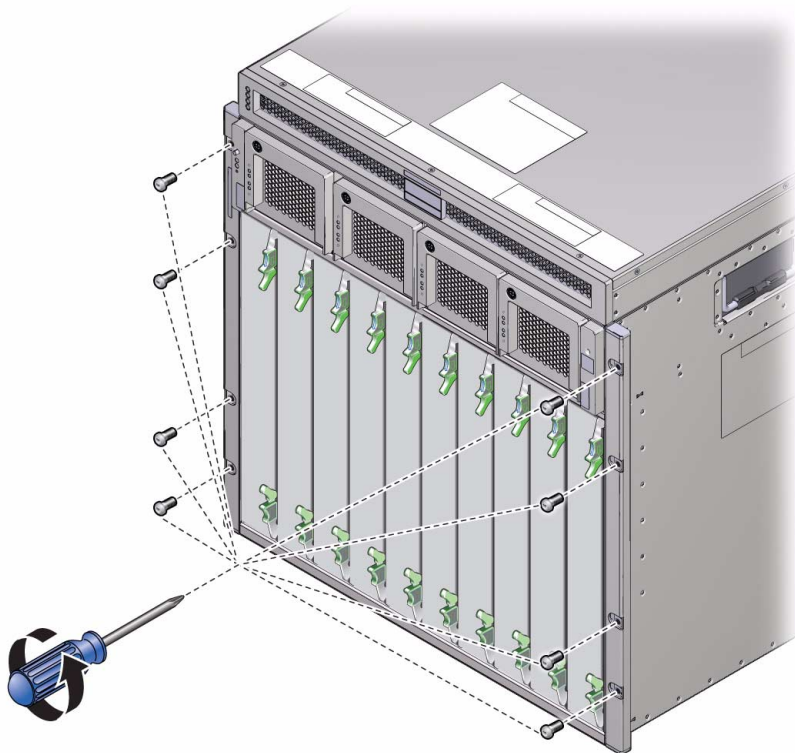
1. **Consider your first step.**

- If you are removing the chassis with a mechanical lift, prepare the chassis. See [“Prepare the Chassis for Removal”](#) on page 25.
- If you are removing the chassis manually, prepare and depopulate the chassis. See [“Prepare the Chassis for Removal”](#) on page 25 and [“Depopulate the Chassis”](#) on page 26.

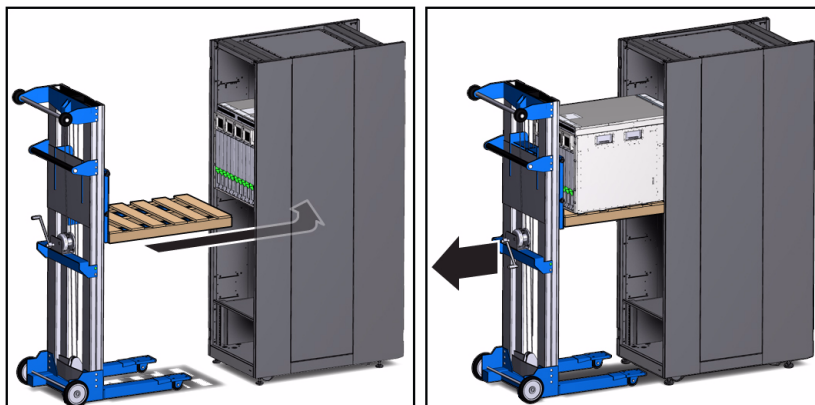
2. **Remove two upper rear brackets from the rack by removing four screws that secure the bracket.**



3. **Remove eight screws that secure the front of the chassis to the rack.**



4. From the front of the rack, slowly pull the chassis forward a few inches.
5. Remove the chassis the rest of the way using a mechanical lift, or manually, using four people.



6. Set the chassis on a sturdy surface.

Related Information

- [“Replacing CRUs” on page 31](#)
- [“Replacing FRUs” on page 61](#)
- [“Install the DC Input Unit” on page 72](#)
- [“Reinstalling the Chassis Into a Rack” on page 79](#)

Replacing CRUs

One person can remove and service all components in the modular system. For more information about component types, see [“Component Types and Service Classifications”](#) on page 15.

These topics describe how to remove and replace CRUs.

- [“Replacing a Power Supply”](#) on page 31
- [“Replacing a Front Fan Module \(AC\)”](#) on page 37
- [“Replacing a Server or Storage Module”](#) on page 40
- [“Replacing the FIM”](#) on page 44
- [“Replacing a PCI EM”](#) on page 46
- [“Replacing a NEM”](#) on page 50
- [“Replacing a Rear Fan Module”](#) on page 53
- [“Replacing the Fan Board”](#) on page 54
- [“Replacing the CMM”](#) on page 57

Related Information

- [“Replacing FRUs”](#) on page 61

Replacing a Power Supply

You can remove and replace a power supply from a powered-off system or from a powered-on system using a hot-swap procedure.



Caution – Do not leave a power supply slot empty. Power supplies have integrated fans that continue to supply cooling air even when the power supply is off.

Note – Ensure that you install the AC power supply supported for the modular system that you have. See [“Differences Between Chassis Models and Their Replacement Components”](#) on page 16 for more information.

- [“Remove a Power Supply \(DC\)”](#) on page 32
- [“Install a Power Supply \(DC\)”](#) on page 33
- [“Remove a Power Supply \(AC\)”](#) on page 34
- [“Install a Power Supply \(AC\)”](#) on page 36

Related Information

- [“Returning the Modular System to Operation”](#) on page 79
- [“Power Supply LEDs \(DC\)”](#) on page 7
- [“Power Supply and Front Fan Faults and Cautions \(Oracle ILOM\)”](#) on page 11

▼ Remove a Power Supply (DC)

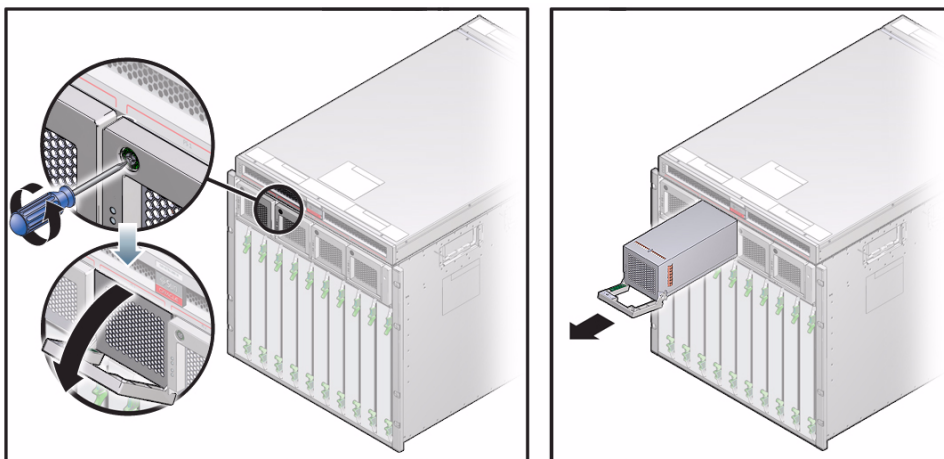


Caution – You must replace the power supply within one minute to ensure proper system cooling and operation, or you must power off the chassis.



Caution – You should keep three power supplies in the chassis at all times to supply adequate power.

1. Unscrew the green captive screw.



2. Lower the power supply handle.
3. Pull the power supply out and support the weight of the power supply with your other hand.
4. (If necessary) Install a new DC power supply.
See [“Install a Power Supply \(DC\)” on page 33](#).

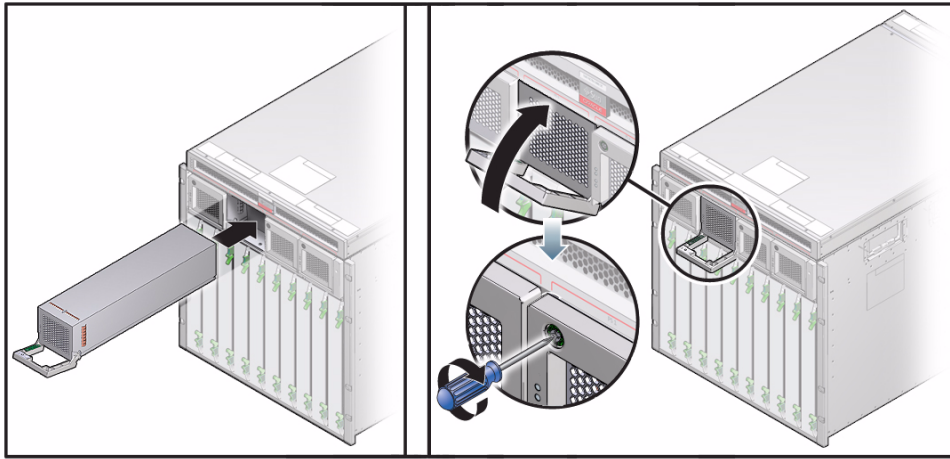
Related Information

- [“Install a Power Supply \(DC\)” on page 33](#)
- [“Remove a FIM” on page 44](#)

▼ Install a Power Supply (DC)

Note – Wait for all LED indicators on the power supply to be extinguished before reinstalling the power supply. If you do not follow this procedure, the system might log a false power supply fault condition.

1. (If necessary) Remove a DC power supply.
See [“Remove a Power Supply \(DC\)” on page 32](#).
2. Align the power supply so that the power supply LEDs are oriented to the left.
3. Pull the power supply handle out and away from the power supply.



4. Slide the power supply into the slot until the power supply engages with the internal connectors.
5. Push the handle back towards the power supply until the power supply is fully inserted.
6. Screw in the retention screw with a No. 2 Phillips screwdriver.

Tip – To verify that the power supply is functioning you can check Oracle ILOM. See [“Power Supply and Front Fan Faults and Cautions \(Oracle ILOM\)”](#) on page 11.

Related Information

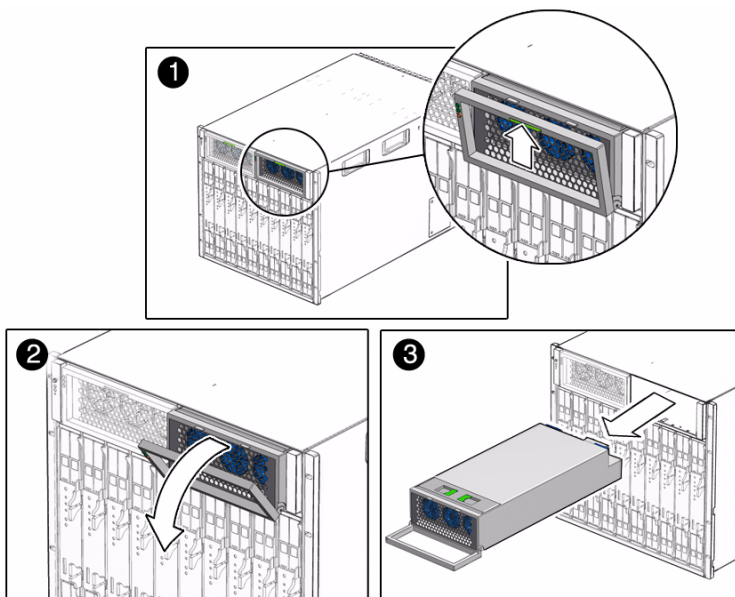
- [“Remove a Power Supply \(DC\)”](#) on page 32
- [“Returning the Modular System to Operation”](#) on page 79
- [“Power Supply LEDs \(DC\)”](#) on page 7
- [“Power Supply and Front Fan Faults and Cautions \(Oracle ILOM\)”](#) on page 11

▼ Remove a Power Supply (AC)



Caution – You must replace the power supply within one minute to ensure proper system cooling and operation, or you must power off the chassis.

1. Press and hold the green button on top of the power supply handle frame.



2. Rotate the power supply handle away from the power supply and down.
3. Pull the power supply out of the chassis approximately 10 cm (4 in.).
4. While supporting the bottom of the power supply with your both hands, pull the power supply all the way out of the chassis.



Caution – Remove only one power supply at a time. One power supply must be in the system at all times to supply power to the system.

5. (If necessary) Install a new AC power supply.

See [“Install a Power Supply \(AC\)” on page 36](#).

Related Information

- [“Install a Power Supply \(AC\)” on page 36](#)
- [“Remove a FIM” on page 44](#)

▼ Install a Power Supply (AC)

Note – Ensure that the power supply is facing up and the five LED holes appear on the left when installing the power supply.

Note – Wait for all LED indicators on the power supply to be extinguished before reinstalling the power supply. If you do not follow this procedure, the system might log a false power supply fault condition.

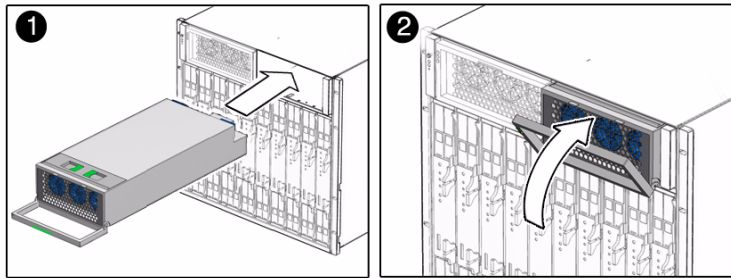
1. (If necessary) Remove an AC power supply.

See [“Remove a Power Supply \(AC\)”](#) on page 34.

2. Pull the power supply handle out and away from the power supply.

3. Slide the power supply into the power supply slot until the unit engages with the internal connectors.

4. Push the power supply handle back towards the power supply until it clicks into place.



Related Information

- [“Remove a Power Supply \(AC\)”](#) on page 34
- [“Returning the Modular System to Operation”](#) on page 79
- [“Power Supply LEDs \(AC\)”](#) on page 8
- [“Power Supply and Front Fan Faults and Cautions \(Oracle ILOM\)”](#) on page 11

Replacing a Front Fan Module (AC)

These topics describe how to remove and install a front fan module in the AC chassis.

- [“Remove a Front Fan Module \(AC\)”](#) on page 37
- [“Install a Front Fan Module \(AC\)”](#) on page 39

Related Information

- [“Monitor Power Supply and Front Fan Faults \(Oracle ILOM\)” on page 10](#)
- [“Power Supply and Front Fan Faults and Cautions \(Oracle ILOM\)” on page 11](#)
- [“Monitor Faults With the Oracle ILOM Event Log” on page 12](#)

▼ Remove a Front Fan Module (AC)

A front fan module is located inside each of the power supplies. You must remove the power supply to replace the fan module.

Do not leave a power supply slot vacant. Power supplies have integrated fans that continue to supply cooling air even when the power supply is off. You can remove and replace a power supply from a powered-off system or from a powered-on system using a hot-swap procedure.

Note – When removing a power supply from the system, wait for all LED indicators on the power supply to be extinguished before reinstalling the power supply. If you do not follow this procedure, the system might log a false power supply fault condition.



Caution – Replace the power supply within one minute in order to ensure proper system cooling and operation, or you must power off the chassis.

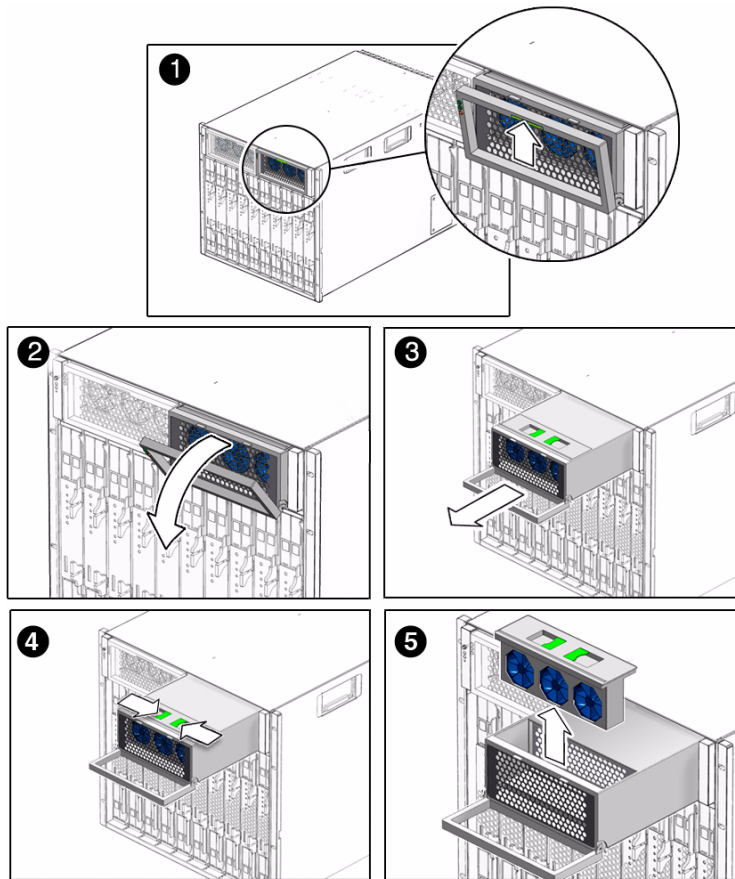
1. Remove the power supply.

Follow the instructions in [“Remove a Power Supply \(AC\)” on page 34](#).

Pull the power supply out of the system just far enough to access the fan. You do not need to remove the power supply completely from the system.



Caution – The fan continues spinning for a moment after the power supply is disconnected. Be careful not to insert a finger or other object into the fan while the fan is still spinning.



2. Press together the two latches on top of the fan module and pull the module upward and out of the power supply chassis.

3. (If necessary) Install a new front fan module.

See [“Install a Front Fan Module \(AC\)”](#) on page 39.

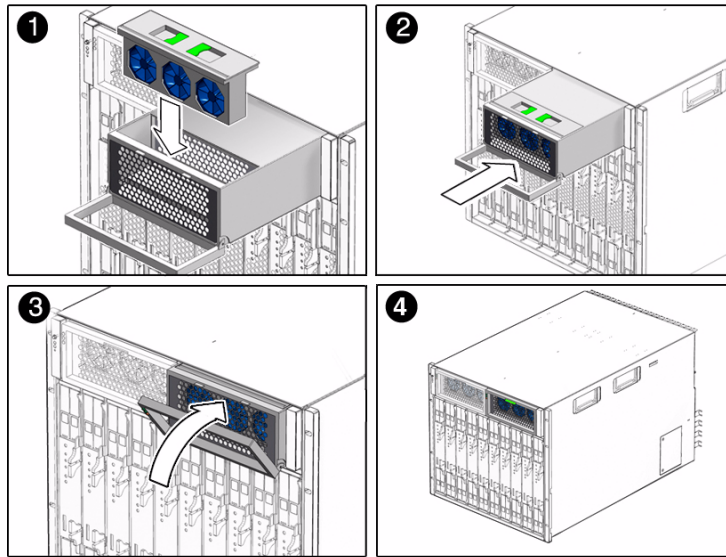
Related Information

- [“Install a Front Fan Module \(AC\)”](#) on page 39

▼ Install a Front Fan Module (AC)

Note – Wait for all LED indicators on the power supply to be extinguished before reinstalling the power supply. If you do not follow this procedure, the system might log a false power supply fault condition.

1. (If necessary) Remove a front fan module.
See [“Remove a Front Fan Module \(AC\)” on page 37](#).
2. Insert the new fan module into the front of the power supply.



3. Slide the power supply into the power supply slot until the unit engages with the internal connectors.
4. Push the power supply handle back towards the power supply until it clicks into place.

Related Information

- [“Remove a Front Fan Module \(AC\)” on page 37](#)
- [“Power Supply LEDs \(AC\)” on page 8](#)
- [“Monitor Power Supply and Front Fan Faults \(Oracle ILOM\)” on page 10](#)
- [“Returning the Modular System to Operation” on page 79](#)

Replacing a Server or Storage Module

You can remove and install a server module (blade) or a disk (storage) module from a powered-off system or from a powered-on system using hot-plug procedures.



Caution – Do not operate the modular system with empty slots. Always insert a filler panel into an empty slot to reduce the chances of overheating.

These topics describe how to remove and install a server or storage module.

- “Remove a Server or Storage Module” on page 40
- “Install a Server or Storage Module” on page 42

Related Information

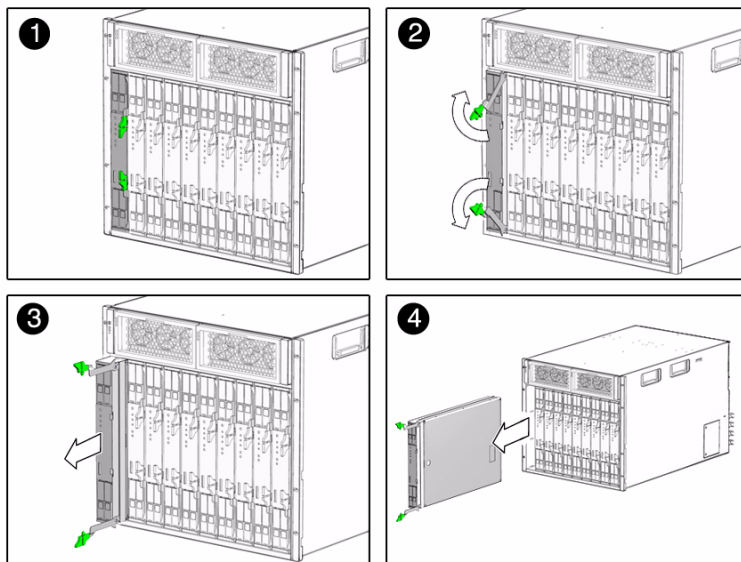
- Server module documentation at:
(<http://www.oracle.com/technetwork/documentation/netra-blade-servers-252766.html>)

▼ Remove a Server or Storage Module

1. **Initiate an orderly shutdown of the operating system.**

For instructions, refer to the documentation for your server module.

2. **Power down the server or storage module to standby power.**
3. **Press the latches on the ejectors at the top and bottom of the server or storage module.**



4. Swing out both ejector latches simultaneously (raise the top ejector and lower the bottom ejector).
5. Use the ejector latches to start pulling the server module out of its slot in the chassis.



Caution – Do not use the ejector latches to carry the server or storage module. The ejector latches should only be used to unseat the server or storage module from the chassis. The latches are not designed to support the weight of the server or storage module.

6. Finish pulling the server or storage module out of the chassis, supporting the weight of the server or storage module from the bottom.
7. Install a filler panel into the server or storage module slot if the server or storage module will be out of the chassis for longer than one minute.
8. (If necessary) Install a new server or storage module.
See [“Install a Server or Storage Module” on page 42.](#)

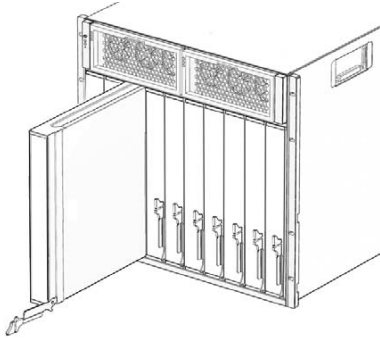
Related Information

- [“Install a Server or Storage Module” on page 42](#)

▼ Install a Server or Storage Module

1. Consider your first step:

- If a server or storage module is in the slot, remove the module. See [“Remove a Server or Storage Module”](#) on page 40.
- If a filler panel is in the slot, remove the filler panel.



2. Rotate the lower ejector lever on the filler panel downward, and pull the filler panel out of the chassis.

Note – Do not discard the filler panel. You must reinstall the filler panel if the server or storage module ever needs to be serviced or removed again.

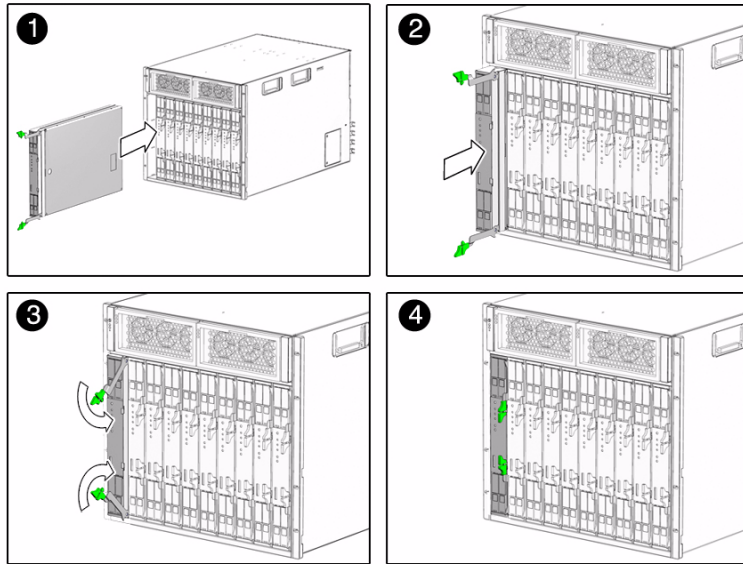
3. Align the server or storage module with the vacant slot.

4. Ensure the following:

- The server or storage module indicator lights on the front panel are facing toward you.
- The server or storage module ejector levers are fully opened.
- The server or storage module ejectors are on the right side of the module.

5. Slide the server or storage module into the vacant server module chassis slot.

As the ejectors make contact with the chassis, the bottom lever begins to rise, and the top lever begins to lower.



6. **Simultaneously close the ejector levers at the top and bottom of the server or storage module (lower the top ejector and raise the bottom ejector) until the levers clamp in place against the front of the server or storage module.**

As the ejector levers are closed, the server or storage module moves back to engage with the chassis.

7. **Verify that the server or storage module is powered on and operational.**

After you insert a server or storage module into a powered-on system, the internal SP is brought online automatically and the server or storage module is powered on by default.

Related Information

- [“Remove a Server or Storage Module” on page 40](#)
- Server module documentation at:
<http://www.oracle.com/technetwork/documentation/netra-blade-servers-252766.html>
- [“Monitoring Faults” on page 1](#)

Replacing the FIM

The front indicator module is located in the front of the chassis. You can remove and install a FIM from a powered-off system or from a powered-on system using hot-plug procedures.

- [“Remove a FIM” on page 44](#)
- [“Install a FIM” on page 45](#)

Related Information

- [“Monitoring Faults \(Oracle ILOM\)” on page 9](#)

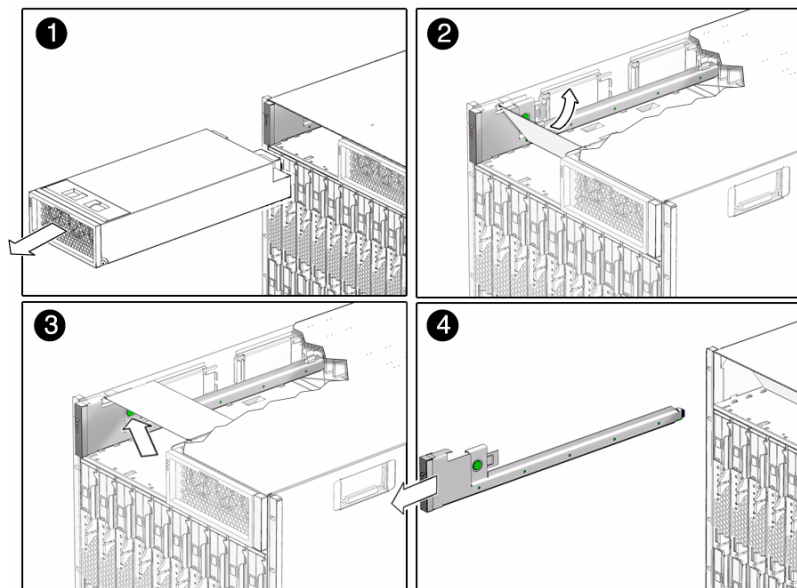
▼ Remove a FIM



Caution – You must replace the power supply within one minute to ensure proper system cooling and operation, or you must power off the chassis.

1. Remove power supply 0 from the chassis.

See [“Remove a Power Supply \(AC\)” on page 34](#) or [“Remove a Power Supply \(DC\)” on page 32](#).



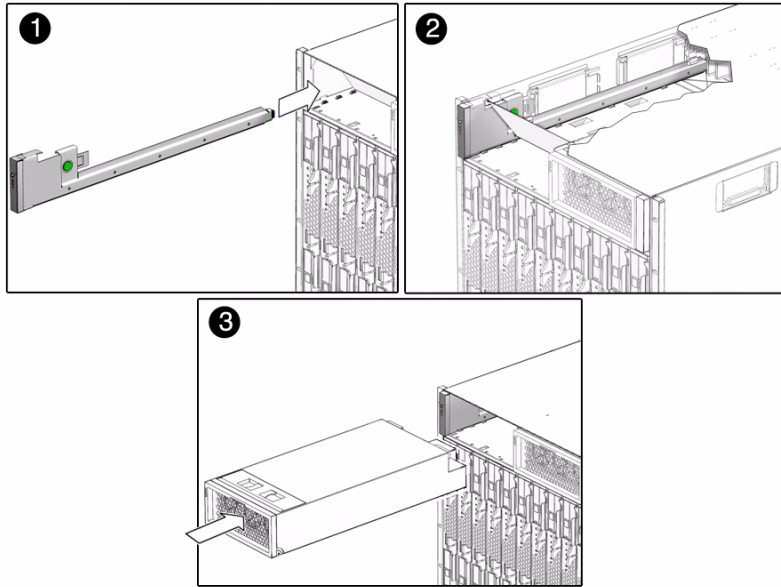
2. Push back the power supply air baffle.
3. Press the button on the right side of the FIM.
4. Remove the FIM from the chassis.
5. (If necessary) Install a new FIM.
See [“Install a FIM” on page 45](#).

Related Information

- [“Install a FIM” on page 45](#)

▼ Install a FIM

1. (If necessary) Remove a FIM.
See [“Remove a FIM” on page 44](#).
2. Align the FIM with the FIM slot.



3. Slide the FIM into the FIM slot.

4. Reinstall power supply 0 into the chassis.

See [“Install a Power Supply \(DC\)” on page 33](#) or [“Install a Power Supply \(AC\)” on page 36](#).

Related Information

- [“Remove a FIM” on page 44](#)
- [“Monitoring Faults” on page 1](#)

Replacing a PCI EM

These topics describe how to remove and install a PCI EM.

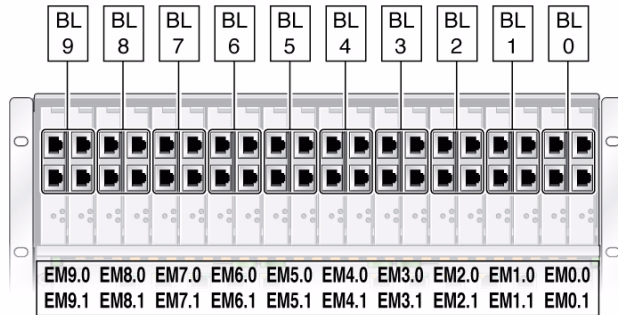
- [“PCI EM Service Overview” on page 47](#)
- [“Remove a PCI EM” on page 48](#)
- [“Install a PCI EM” on page 49](#)

Related Information

- [“Monitoring Faults \(Oracle ILOM\)” on page 9](#)

PCI EM Service Overview

A pair of PCI EMs is assigned to each server module in the chassis. All PCI EMs connect to a chassis midplane. The midplane provides an interconnect between the server modules and the PCI EMs installed in the chassis. The midplane connections between the server module and the PCI EM are logically defined by the midplane.



Caution – If you are not immediately replacing the PCI EM, install an PCI EM filler panel to ensure proper system operation.

If the amber Attention indicator on a PCI EM is lit, this indicates a problem with the PCI EM.

Related Information

- “Remove a PCI EM” on page 48
- “Install a PCI EM” on page 49
- “Monitoring Faults” on page 1
- Server module documentation at:
(<http://www.oracle.com/technetwork/documentation/netra-blade-servers-252766.html>)

▼ Remove a PCI EM

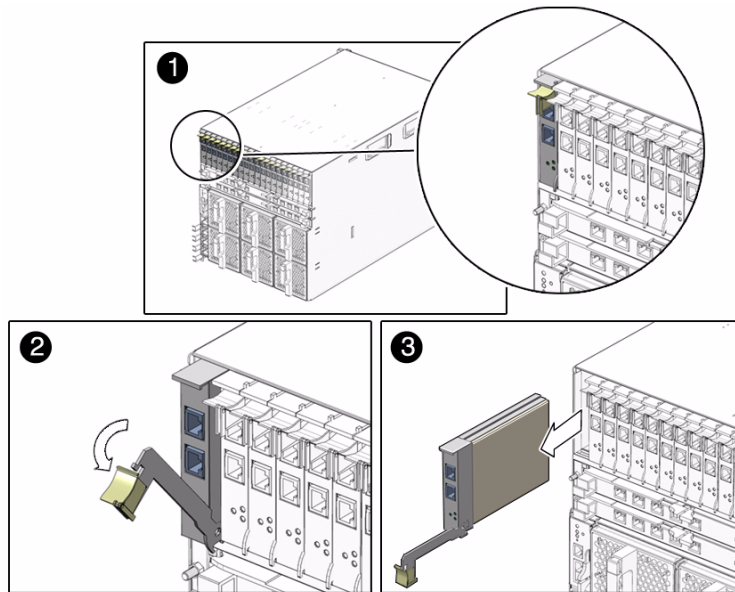
You need to prepare the PCI EM for removal through the associated server module operating system. If you are hot-plugging the PCI EM, press the Attention button to prepare the operating system.

1. Verify that the PCI EM power indicator is off.

If you have successfully prepared the PCI EM for a hot-remove, the Power indicator goes out.

2. Place one finger on top of the ejector lever handle.

3. Pull the ejector lever toward you to pull the PCI EM forward until you can pull the rest of the module out by hand.



4. (If necessary) Install a new PCI EM.

See [“Install a PCI EM” on page 49](#).

Related Information

- [“Install a PCI EM” on page 49](#)
- [“PCI EM Service Overview” on page 47](#)

▼ Install a PCI EM

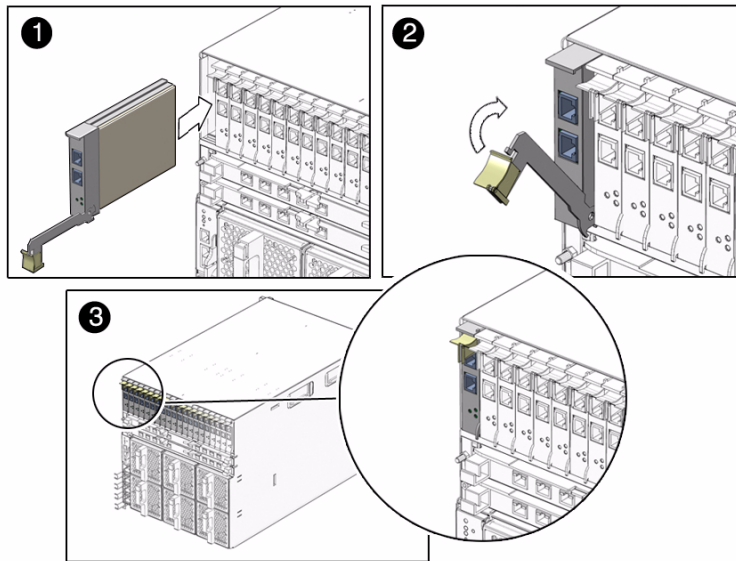
1. (If necessary) Remove a PCI EM.

See [“Remove a PCI EM” on page 48](#).

2. Complete one of the following procedures:

- If you are not installing a Gigabit Ethernet PCI EM, go to [Step 3](#).

- If you are installing a Gigabit Ethernet PCI EM, continue this step:
 - a. Press the Release button on the side of the GbE PCI EM to release its cover, then remove the cover.
 - b. Locate the PCI EM MAC address, which is visible in the PCI EM when the cover is removed.
 - c. Record the MAC address of the PCI EM and record the chassis slot number where you plan to install the GbE PCI EM. Keep the data for future reference.
 - d. Replace the GbE PCI EM cover by sliding the cover into place.



3. **Align the PCI EM with the vacant PCI EM slot.**
Ensure that the indicator lights on the front panel of the PCI EM are facing toward you and that the PCI EM ejector lever on the bottom is fully opened.
4. **Slide the PCI EM into the vacant PCI EM chassis slot.**
The ejector lever starts to pop up as the module engages with the system slot.
5. **Complete the installation by closing the ejector lever to secure the PCI EM in the chassis.**
6. **Notify the operating system that a new PCI EM is installed.**
See the server module documentation for more information.
7. **Verify that the PCI EM power indicator is on.**
If the hot-insert procedure was successful, the green power indicator illuminates.

Related Information

- [“Remove a PCI EM” on page 48](#)
- [“Monitoring Faults” on page 1](#)

Replacing a NEM

You can remove and replace a NEM from a powered-on system using a hot-swap operation, as well as from a powered-off system.

- [“Remove a NEM” on page 50](#)
- [“Install a NEM” on page 51](#)

Related Information

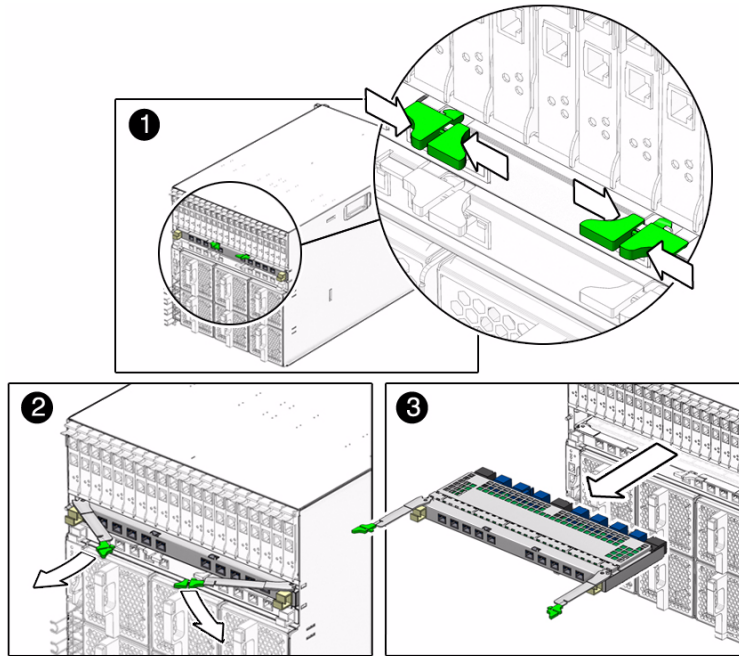
- [“Monitoring Faults” on page 1](#)

▼ Remove a NEM



Caution – If you are not immediately replacing the NEM, install a NEM filler panel to ensure proper system temperature and operation.

1. **Remove all cables from the NEM.**



2. Press together and hold the ejector buttons on both the right and left ejector levers.
3. To unlatch the NEM from the chassis, open the ejector levers by extending them outward.
4. Holding the opened ejector levers, pull the NEM toward you until you can pull the rest of the module out by hand.
5. Consider your next step:
 - If you are replacing a NEM, install a new NEM. See [“Install a NEM” on page 51](#).
 - If you are not immediately replacing the NEM, install a filler panel.

Related Information

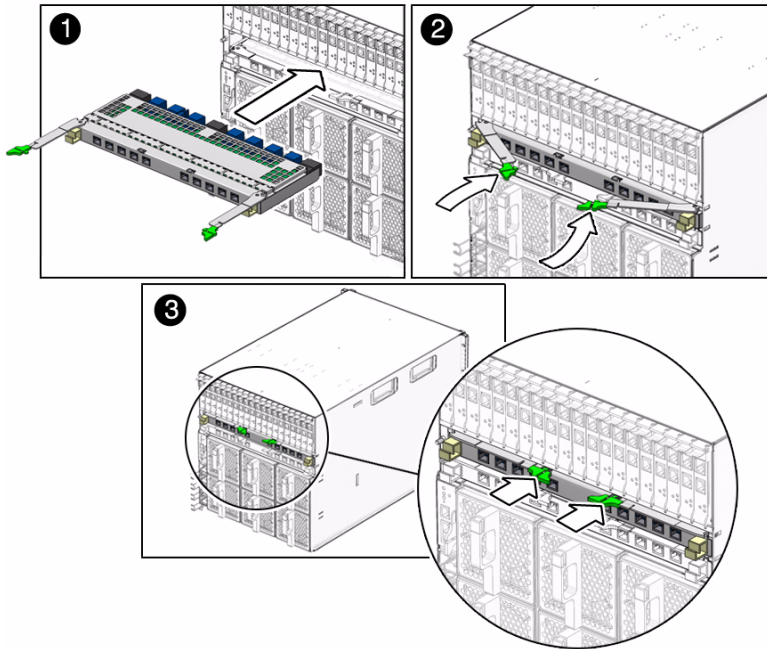
- [“Install a NEM” on page 51](#)

▼ Install a NEM

1. Consider your next step:
 - If a NEM is in the slot, remove the NEM. See [“Remove a NEM” on page 50](#).

- If a filler panel is in the slot, remove the filler panel.

2. Align the NEM with the vacant NEM slot.



3. Ensure that:

- The RJ-45 port connectors of the NEM are facing you.
- The NEM ejector levers are fully opened.
- The NEM ejector levers are on the top of the module.

4. Slide the NEM into the vacant NEM chassis slot until you feel it stop.

5. Close the ejector levers to secure the NEM in the chassis.

Related Information

- [“Remove a NEM” on page 50](#)
- [“Monitoring Faults” on page 1](#)

Replacing a Rear Fan Module

These topics describe how to remove and install a rear fan module.

Note – Ensure that you install the rear fan module supported for the modular system chassis that you have. See [“Differences Between Chassis Models and Their Replacement Components”](#) on page 16 for more information.

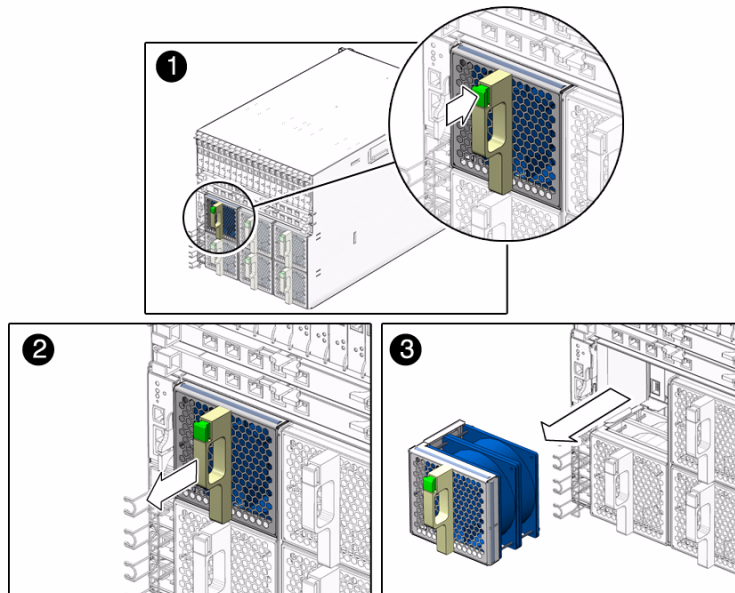
- [“Remove a Rear Fan Module”](#) on page 53
- [“Install a Rear Fan Module”](#) on page 54

Related Information

- [“Monitoring Faults”](#) on page 1

▼ Remove a Rear Fan Module

1. Press and hold the green button on the fan handle.



2. Pull out the rear fan module in a smooth motion until it is free from the chassis.
3. (If necessary) Install a new rear fan module.
See [“Install a Rear Fan Module”](#) on page 54.

Related Information

- [“Install a Rear Fan Module”](#) on page 54

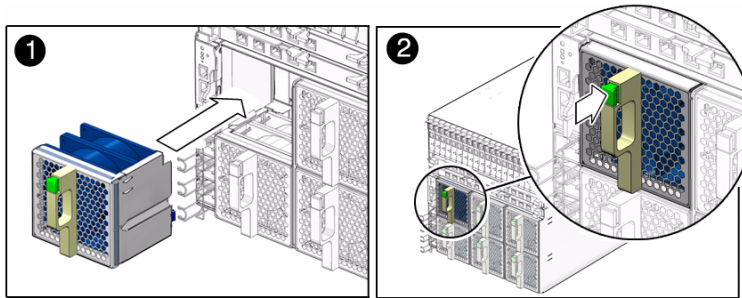
▼ Install a Rear Fan Module

1. (If necessary) Remove a rear fan module.

See [“Remove a Rear Fan Module” on page 53.](#)

2. Using both hands, align the fan module with the vacant fan module slot.

Ensure that the green button on the handle of the fan module is at the top of the fan.



3. Slide the fan module into the vacant slot until the front panel meets the chassis.

After you install the rear fan module, the CMM automatically detects the new module.

Related Information

- [“Monitoring Faults” on page 1](#)

Replacing the Fan Board

These topics describe how to remove and install a fan board.

- [“Remove the Fan Board” on page 55](#)
- [“Install the Fan Board” on page 56](#)

Related Information

- [“Monitoring Faults” on page 1](#)

▼ Remove the Fan Board

1. Power off the chassis.

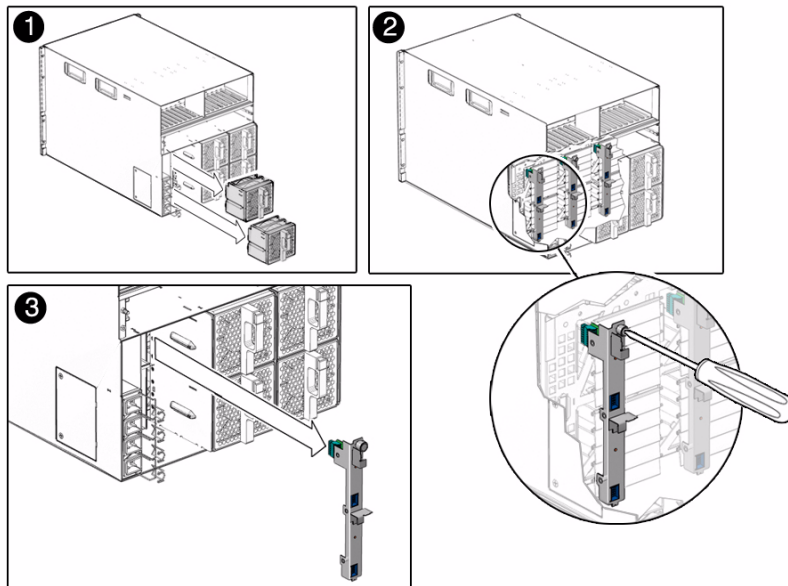
Refer to the server module documentation and see [“Power Off Components in the Chassis” on page 21.](#)

2. Remove the two rear fan modules that are in front of the fan board that you want to remove.

See [“Replacing a Rear Fan Module” on page 53.](#)

3. Loosen the captive screw on the fan board until you can pull the top of the board forward. Then lift the board up and off the chassis.

This screw needs to be fully unscrewed because the screw disengages the fan board connector from the midplane.



4. (If necessary) Install a new fan board.

See [“Install the Fan Board” on page 56.](#)

Related Information

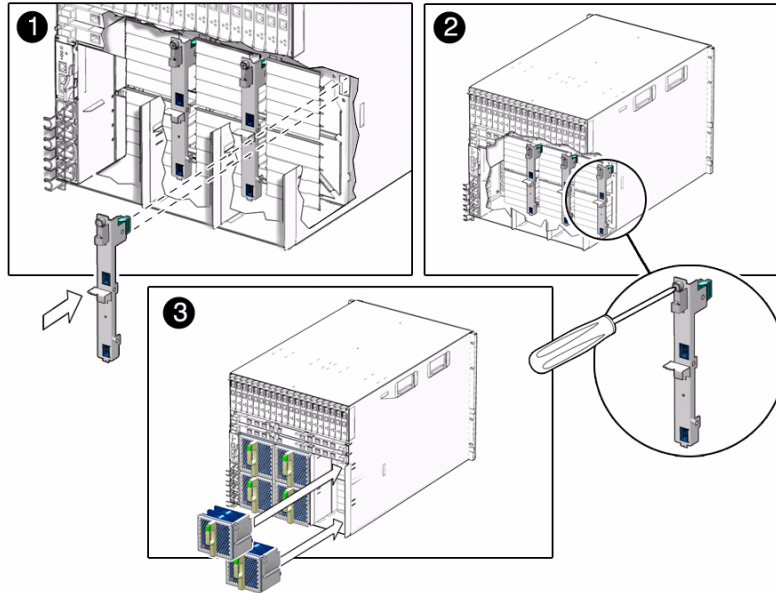
- [“Install the Fan Board” on page 56](#)

▼ Install the Fan Board

1. (If necessary) Remove the fan board.

See [“Remove the Fan Board” on page 55](#).

2. Place the bottom notch on the fan board into the hole in the chassis.



3. Push the top captive screw into place and tighten it.

4. Replace the two rear fan modules that you removed.

See [“Replacing a Rear Fan Module” on page 53](#).

5. Power on the chassis.

See [“Power-On Sequence” on page 87](#) and [“Start the CMM \(CLI\)” on page 92](#).

Related Information

- [“Monitoring Faults” on page 1](#)
- [“Remove the Fan Board” on page 55](#)

Replacing the CMM

You can remove and install a CMM from a powered-off system or from a powered-on system using a hot-swap procedure. The chassis cannot be managed while you replace the CMM hardware.

Note – Ensure that you install the CMM supported for the modular system chassis that you have. See [“Differences Between Chassis Models and Their Replacement Components” on page 16](#) for more information.

These topics describe how to remove and install the CMM.

- [“Remove the CMM” on page 57](#)
- [“Install the CMM” on page 58](#)
- [“CMM Reset Sequence” on page 59](#)

Related Information

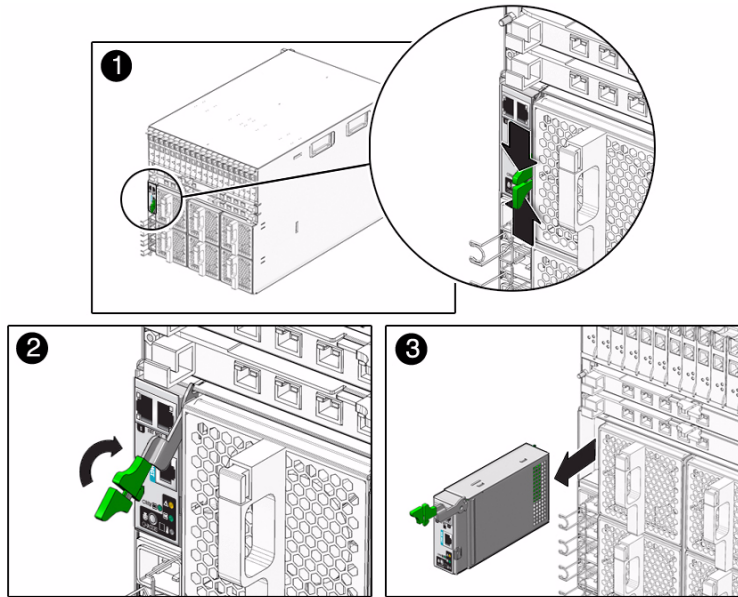
- [“Monitoring Faults” on page 1](#)

▼ Remove the CMM



Caution – You must replace the CMM within one minute to ensure proper system cooling and operation, or you must power off the chassis.

1. **Remove any cables connected to the CMM.**



2. Press together and hold the ejector button on the module ejector lever.
3. To unlatch the module from the chassis, pull the ejector lever away from the module and up.
4. Pull the ejector lever toward you until you are able to pull the rest of the module out by hand.
5. Consider your next step:
 - If you are replacing the CMM, immediately, install a new CMM. See [“Install the CMM” on page 58](#).
 - If you are not replacing the CMM immediately, power off the chassis.

Related Information

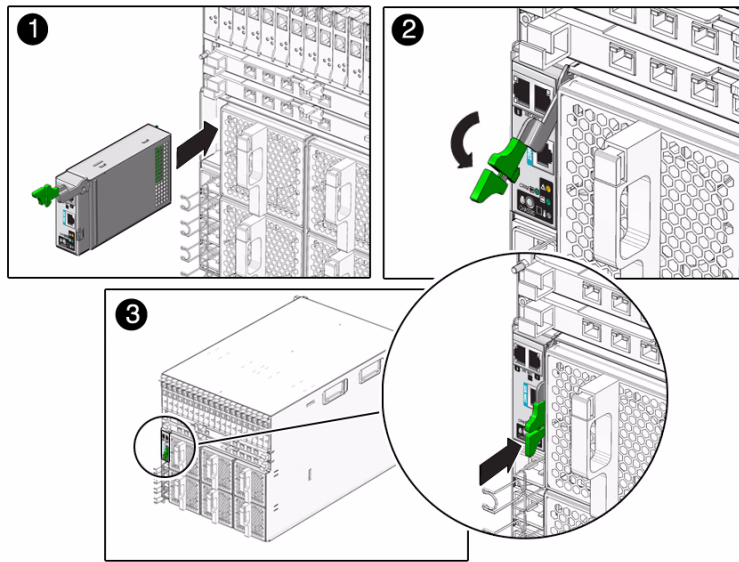
- [“Install the CMM” on page 58](#)

▼ Install the CMM

1. Consider your first step:
 - If you are replacing the CMM immediately, remove the CMM. See [“Remove the CMM” on page 57](#).
 - If you removed the CMM and powered off the chassis, power on the chassis. See [“Returning the Modular System to Operation” on page 79](#).

2. Align the CMM with the CMM slot.

Ensure that the CMM indicator lights of the CMM on the front panel are on the top of the module and facing you.



3. Slide the CMM into the vacant CMM chassis slot.

Ensure that the CMM engages with the system chassis guidance system.

4. Close the ejector lever to secure the CMM in the chassis.

After you install a CMM in a powered-on system, the CMM automatically begins to initialize. See [“CMM Reset Sequence” on page 59](#).

Related Information

- [“CMM Reset Sequence” on page 59](#)
- [“Remove the CMM” on page 57](#)

CMM Reset Sequence

If you have installed the CMM in a powered-off system, the CMM completes the following sequence of operations:

1. CMM receives 3-volt auxiliary standby power and comes out of reset.
2. While the CMM boots up, the green OK indicator on the CMM is set to the slow blink state.

3. When the CMM has booted, the CMM sets the green OK indicator on the FIM and CMM to the standby blink state, indicating that the chassis is now ready for full power-on.

Related Information

- [“Monitoring Faults” on page 1](#)

Replacing FRUs

These topics describe how to replace the FRUs.

- [“Replacing the Midplane” on page 61](#)
- [“Replacing an Internal Power Cable \(AC\)” on page 65](#)
- [“Replacing the DC Input Unit” on page 69](#)
- [“Replacing a DC Adapter Tray” on page 74](#)

Related Information

- [“Replacing CRUs” on page 31](#)

Replacing the Midplane

The midplane is not a hot-swappable or hot-pluggable component. You must power off the chassis before replacing this component.

Note – Ensure that you install the midplane supported for the modular system chassis that you have. See [“Differences Between Chassis Models and Their Replacement Components” on page 16](#) for more information.

- [“Remove the Midplane” on page 62](#)
- [“Install the Midplane” on page 63](#)

Related Information

- [“Monitor Faults With the Oracle ILOM Event Log” on page 12](#)

▼ Remove the Midplane

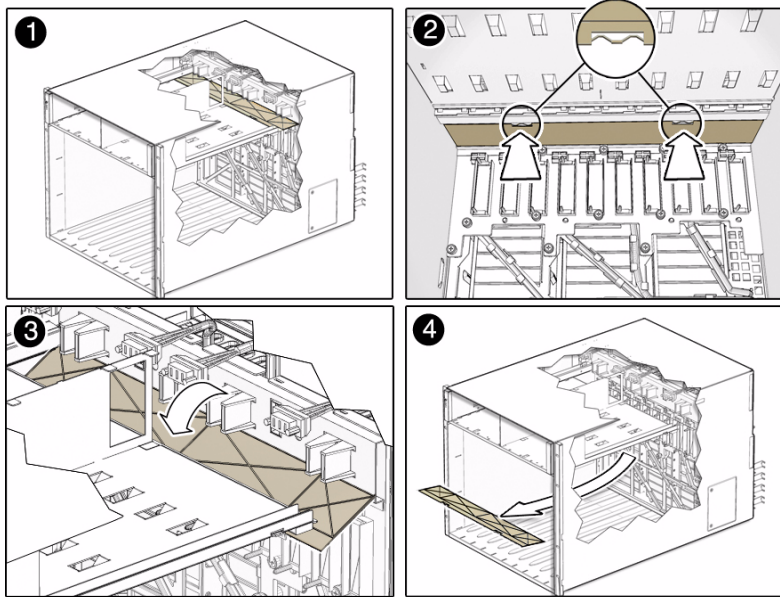
1. Power off the installed server modules and the chassis.

Refer to the documentation for the server modules. Also see [“Power Off Components in the Chassis” on page 21](#) and [“Removing Power From the Chassis” on page 21](#).

2. Remove all the modules and filler panels that are installed in the chassis.

See [“Remove a Server or Storage Module” on page 40](#).

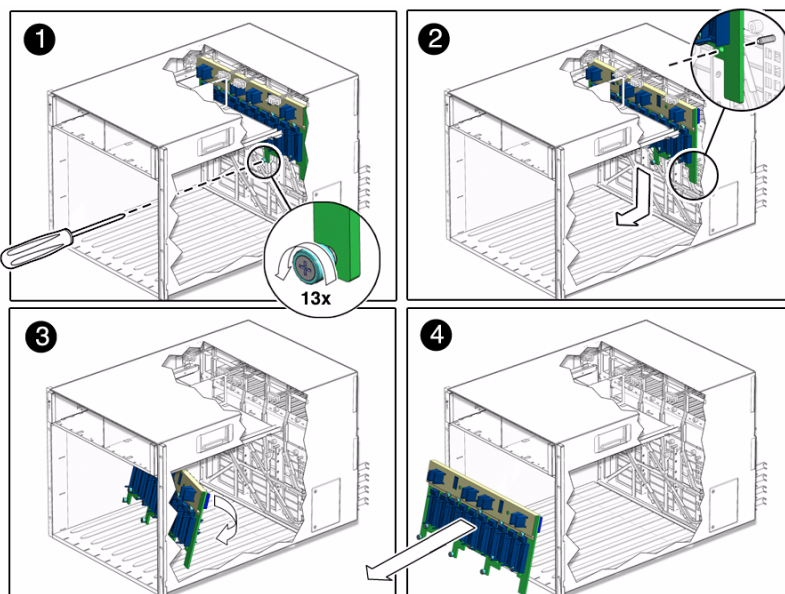
3. Remove the air duct by unfastening the snaps from underneath the power supply cage and tilting the front of the air duct downward to free it from the chassis.



4. Loosen the 13 captive screws attaching the midplane to the back of the chassis.



Caution – Do not touch the connectors on the midplane. You might damage or bend the connector pins.



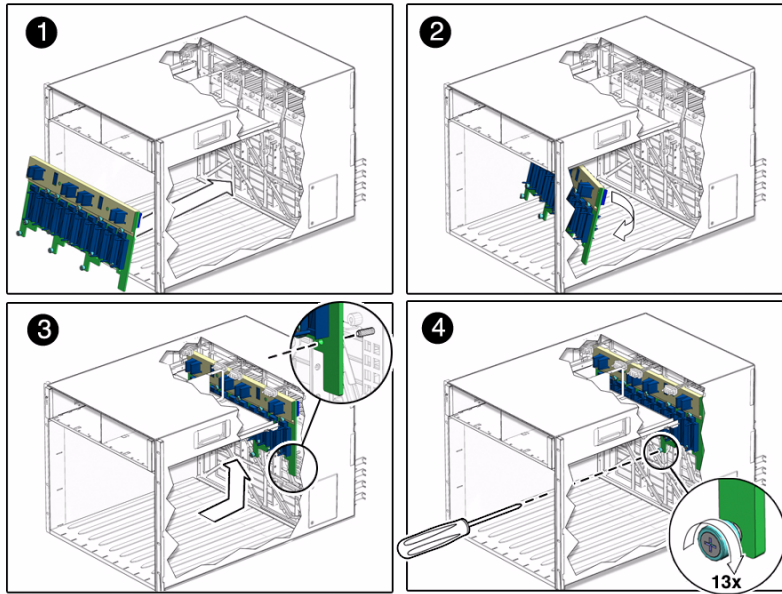
5. Pull the midplane away from the chassis guide pins, then down to clear the power supply cage.
6. Tilt the midplane slightly to the side to and remove it from the chassis.
7. (If necessary) Install a new midplane.
See [“Install the Midplane” on page 63](#).

Related Information

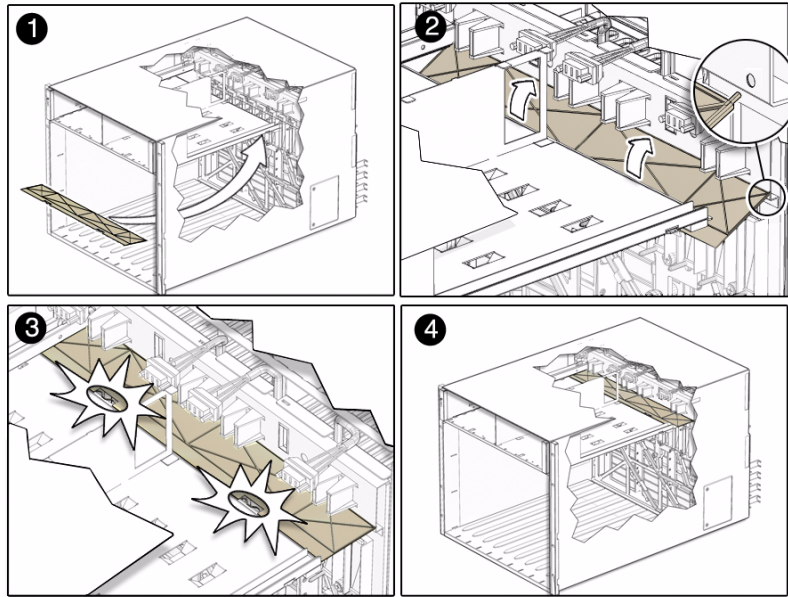
- [“Install the Midplane” on page 63](#)

▼ Install the Midplane

1. (If necessary) Remove the midplane.
See [“Remove the Midplane” on page 62](#).
2. Tilt the midplane to the side slightly to fit it into the chassis.



3. When you reach the back wall of the chassis, straighten the midplane so that it is flush with the back of the chassis, and lift the midplane so that the guidepin holes are aligned with the chassis guidepins.
4. Push the midplane backwards slightly to engage the chassis guidepins.
5. Fasten the 13 screws to secure the midplane to the chassis.
6. Replace the air duct:
 - a. Align the air duct so that the fastening snaps are facing away from the inside of the chassis.
 - b. Place the back edge of the air duct in the slot on the back of the chassis.
 - c. Rotate the air duct upward until the snaps fasten into place at the back of the power supply cage.



7. Replace all of the components that were removed from the chassis before installing the midplane.

See [“Replacing FRUs”](#) on page 61.

8. Power on the chassis.

See [“Returning the Modular System to Operation”](#) on page 79.

Related Information

- [“Remove the Midplane”](#) on page 62
- [“Verify Modular System Functionality”](#) on page 93

Replacing an Internal Power Cable (AC)

The power cables are not hot-swappable or hot-pluggable components. You must power off the chassis before replacing them.

- [“Remove an Internal Power Cable \(AC\)”](#) on page 66
- [“Install an Internal Power Cable \(AC\)”](#) on page 68

Related Information

- [“Monitor Faults With the Oracle ILOM Event Log”](#) on page 12

▼ Remove an Internal Power Cable (AC)

1. Power off the installed server modules and the chassis.

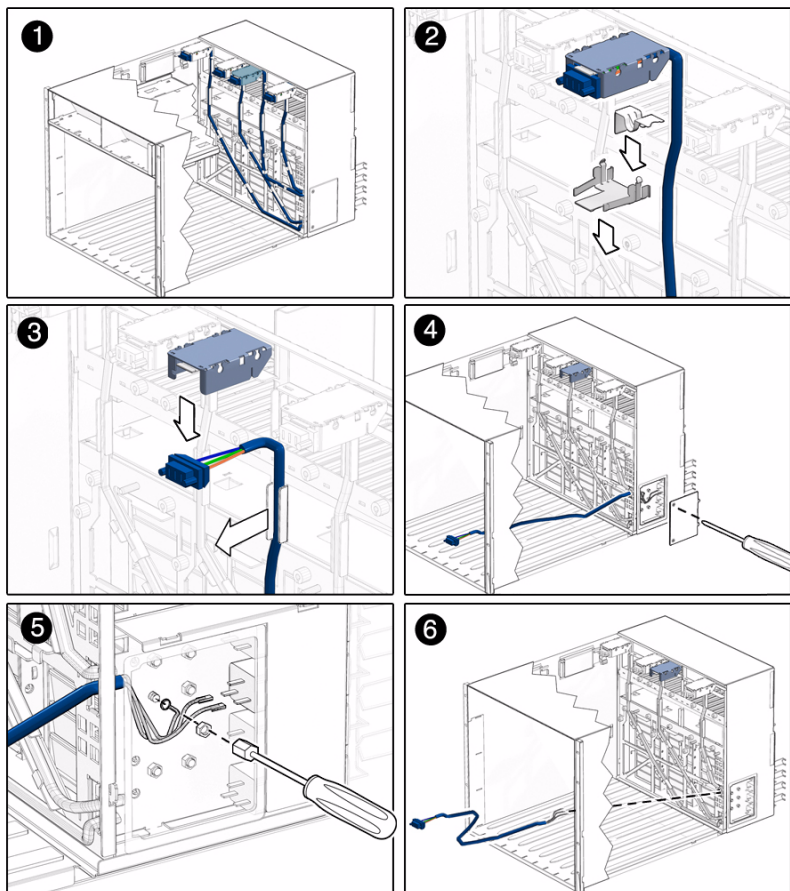
Refer to the documentation for the server modules. Also see [“Power Off Components in the Chassis”](#) on page 21 and [“Removing Power From the Chassis”](#) on page 21.

2. Remove all the modules or filler panels that are installed in the chassis.

See [“Replacing CRUs”](#) on page 31.

3. Remove the midplane from the chassis.

See [“Remove the Midplane”](#) on page 62.



4. Locate the power cable that you need to remove.
5. Remove the retention clip and grounding clip holding the cable in the chassis housing.
6. Pull the cable downward to release it from the chassis cable housing.
7. Unfasten the cable from the metal tabs that secure it to the chassis wall.
8. Unscrew the small panel on the right rear side of the chassis.
9. Remove the two terminal clips that correspond to the power cable that you are removing.
10. Using a nut driver, remove the chassis ground connectors that correspond to the power cable that you are removing.
11. Remove the cable from the chassis.

12. (If necessary) Install a new internal power cable.

See “Install an Internal Power Cable (AC)” on page 68.

Related Information

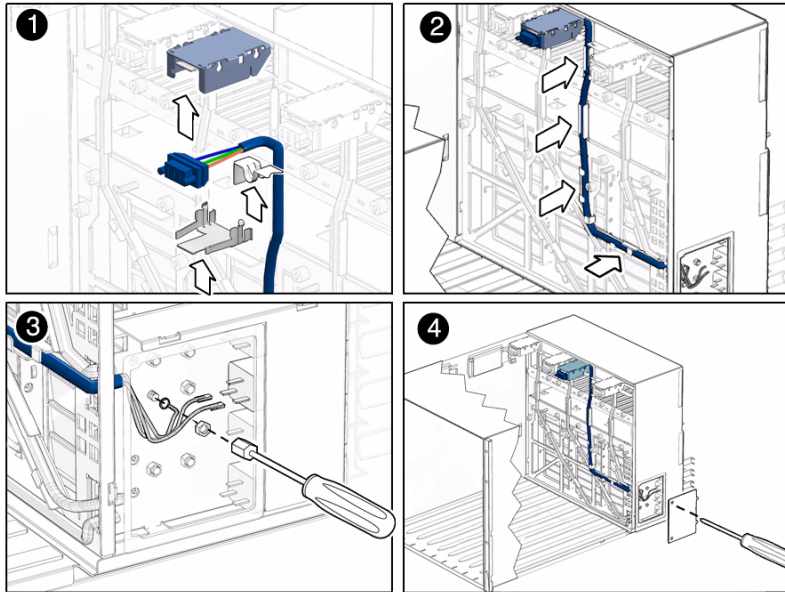
- “Install an Internal Power Cable (AC)” on page 68

▼ Install an Internal Power Cable (AC)

1. (If necessary) Remove an internal power cable.

See “Remove an Internal Power Cable (AC)” on page 66.

2. Replace the connector end of the cable in the chassis cable housing.



3. Replace the grounding clip and retention clip.

4. Route the cable through the tabs on the back wall of the chassis.

5. Route the end wires to the cable housing on the right rear of the chassis.

6. Connect the two terminal and two ground wires to the terminal and ground connectors.

7. Replace the side panel.

8. **Replace all of the components that you removed from the chassis.**

See [“Replacing CRUs” on page 31](#) and [“Replacing the Midplane” on page 61](#).

9. **Power on the chassis.**

See [“Returning the Modular System to Operation” on page 79](#).

Related Information

- [“Returning the Modular System to Operation” on page 79](#)
- [“Verify Modular System Functionality” on page 93](#)

Replacing the DC Input Unit

The DC input unit is a cold-swappable component. You must power off the chassis to remove and install the DC input unit.

- [“Remove the DC Input Unit” on page 69](#)
- [“Install the DC Input Unit” on page 72](#)

Related Information

- [“Removing Power From the Chassis” on page 21](#)
- [“Alarm LEDs on the DC Input Unit” on page 4](#)

▼ Remove the DC Input Unit

1. **Prepare the chassis for service.**

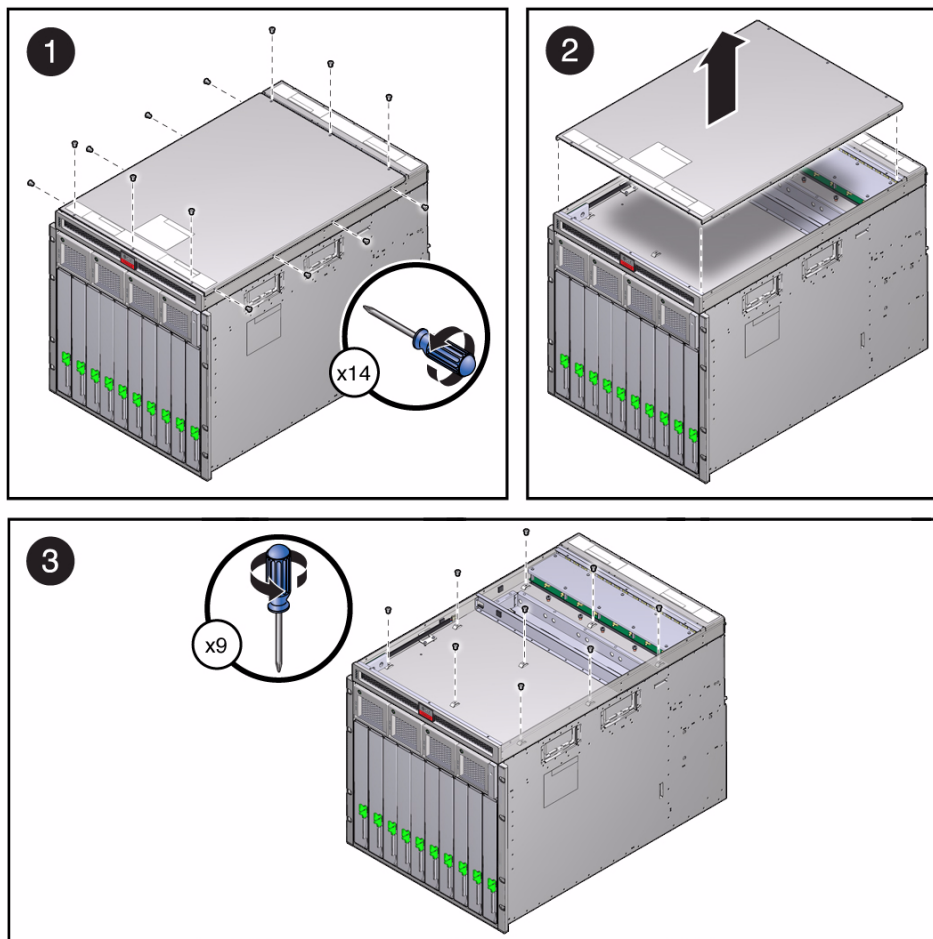
See these topics:

- [“Power Off the Server Modules and Storage Modules” on page 20](#)
- [“Power Off Components in the Chassis” on page 21](#)
- [“Remove Power From the DC Chassis” on page 23](#)
- [“Removing the Chassis From the Rack” on page 24](#)

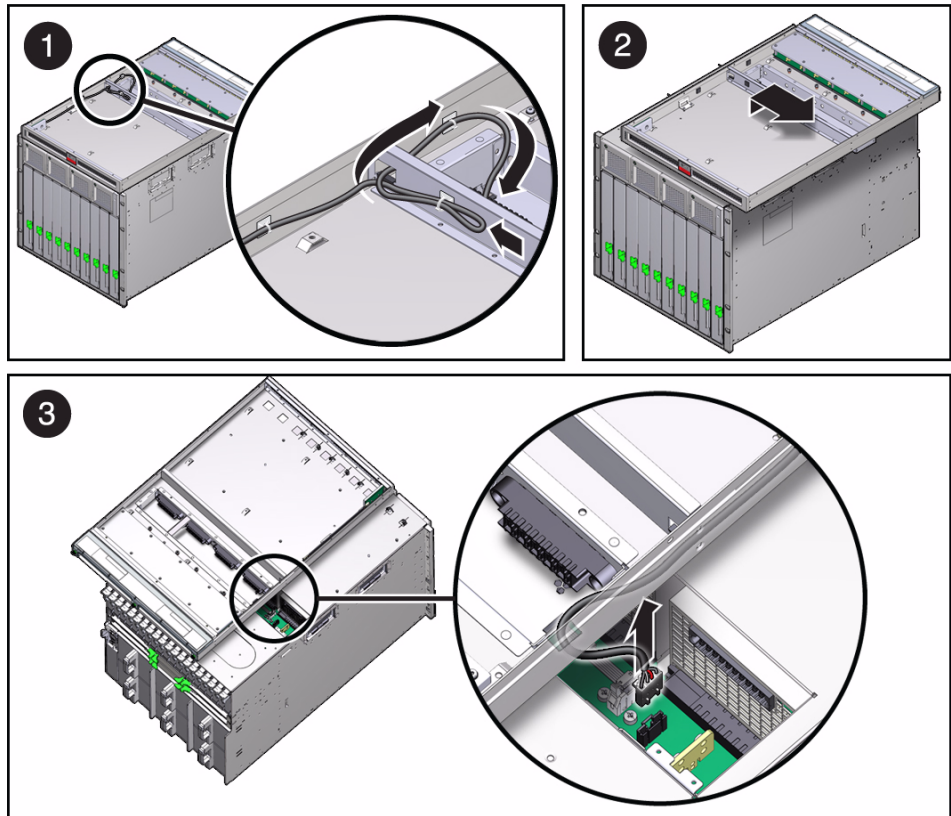


Caution – Remove DC power from all the DC power sources connected to the chassis.

2. **Remove the 14 T-10 Torx screws from the top cover of the DC input unit.**



3. Remove the cover of the DC input unit.
4. Remove the nine T-10 Torx screws that attach the DC input unit to the chassis.
5. Loosen the LED board signal cable from the tie wrap inside the DC Input unit.
6. Lift the DC input unit up and set it down on the chassis four to six inches to the right.



7. Reach through the chassis hole and disconnect the LED board signal cable from the DC adapter tray.
8. Lift the DC input unit off the top of the chassis.
9. (If necessary) Install a new DC input unit.
See [“Install the DC Input Unit”](#) on page 72.

Related Information

- [“Install the DC Input Unit”](#) on page 72
- [“Remove a DC Adapter Tray”](#) on page 74
- Server module documentation:
(<http://www.oracle.com/technetwork/documentation/netra-blade-servers-252766.html>)

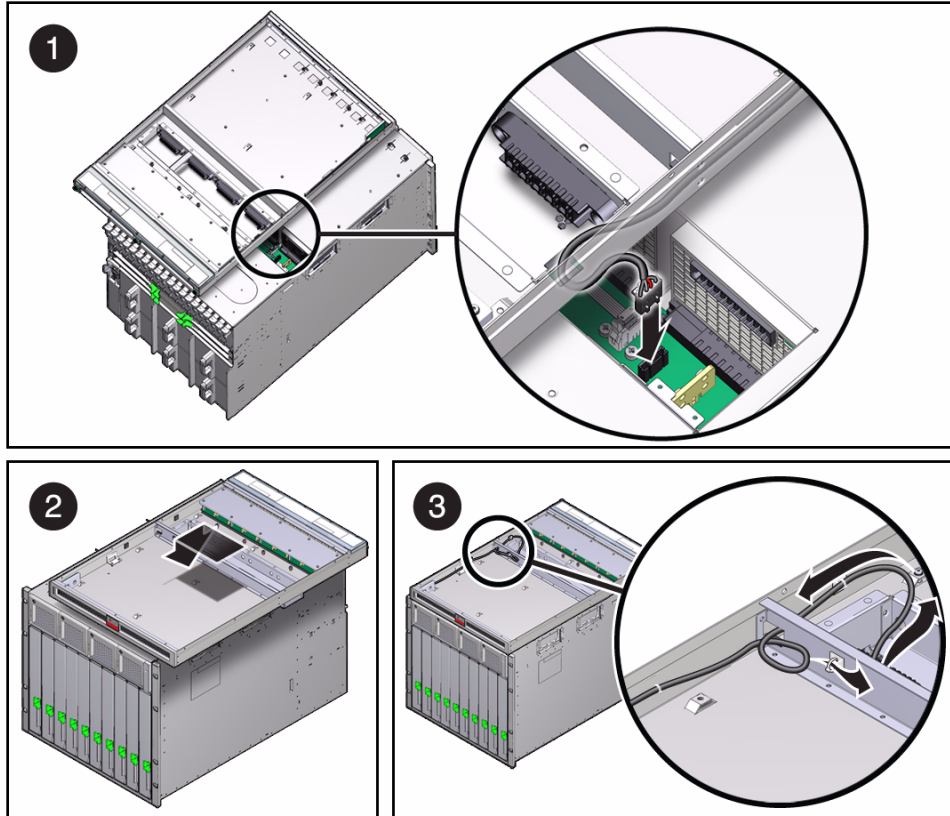
▼ Install the DC Input Unit

1. (If necessary) Remove the DC input unit.

See [“Remove the DC Input Unit” on page 69](#).

2. Place the DC input unit on top of the chassis.

Set the input unit to the side so that you can access the chassis opening and connect the LED cable to the adapter tray inside the chassis.

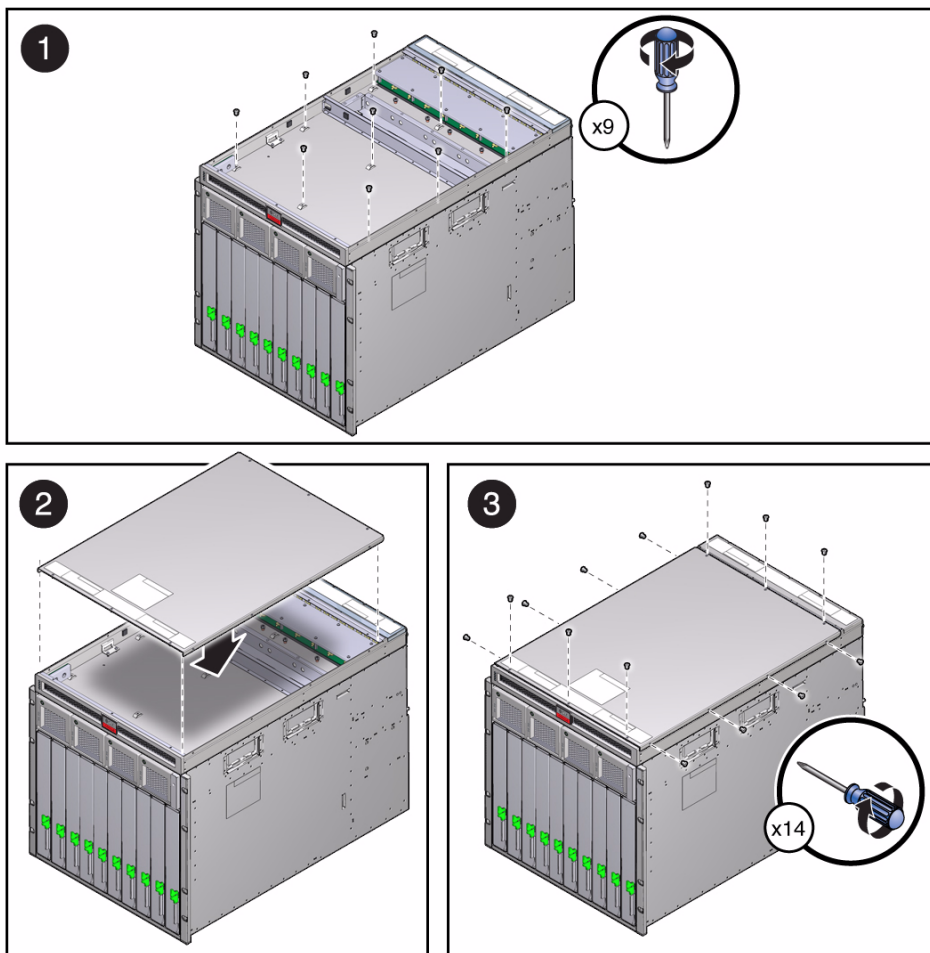


3. Connect the LED signal cable to the connector on the DC adapter tray.

Verify that the cable is properly connected.

4. Place the DC input unit on top of the chassis in the final position.

Use the alignment studs to ensure that the chassis is properly positioned.



5. Secure the loose cable in the tie-wrap on the wall of the DC input unit.
6. Screw in the nine Torx screws.
7. Replace the cover of the DC input unit.
8. Replace the 14 Torx screws on the cover of the DC input unit.
9. Connect all the cables in the back of the DC input unit.
Refer to *Modular System Installation*, installing DC power cables.
10. Install the chassis in the rack, apply system power, and verify system operation.
See [“Returning the Modular System to Operation”](#) on page 79.

Related Information

- [“Verify Modular System Functionality” on page 93](#)
- [“Remove the DC Input Unit” on page 69](#)

Replacing a DC Adapter Tray

The DC adapter tray is a cold-swappable component. You must power off the chassis to remove and install the DC adapter tray.

- [“Remove a DC Adapter Tray” on page 74](#)
- [“Install a DC Adapter Tray” on page 76](#)

Related Information

- [“Removing Power From the Chassis” on page 21](#)
- [“Remove the DC Input Unit” on page 69](#)

▼ Remove a DC Adapter Tray

You can remove a DC adapter tray without removing the DC input unit. However, removing the DC input tray as part of this process will help prevent damage to the LED signal cable and the ribbon signal cable.

1. Prepare the chassis for service.

See:

- [“Power Off the Server Modules and Storage Modules” on page 20](#)
- [“Power Off Components in the Chassis” on page 21](#)
- [“Remove Power From the DC Chassis” on page 23](#)
- [“Removing the Chassis From the Rack” on page 24](#)

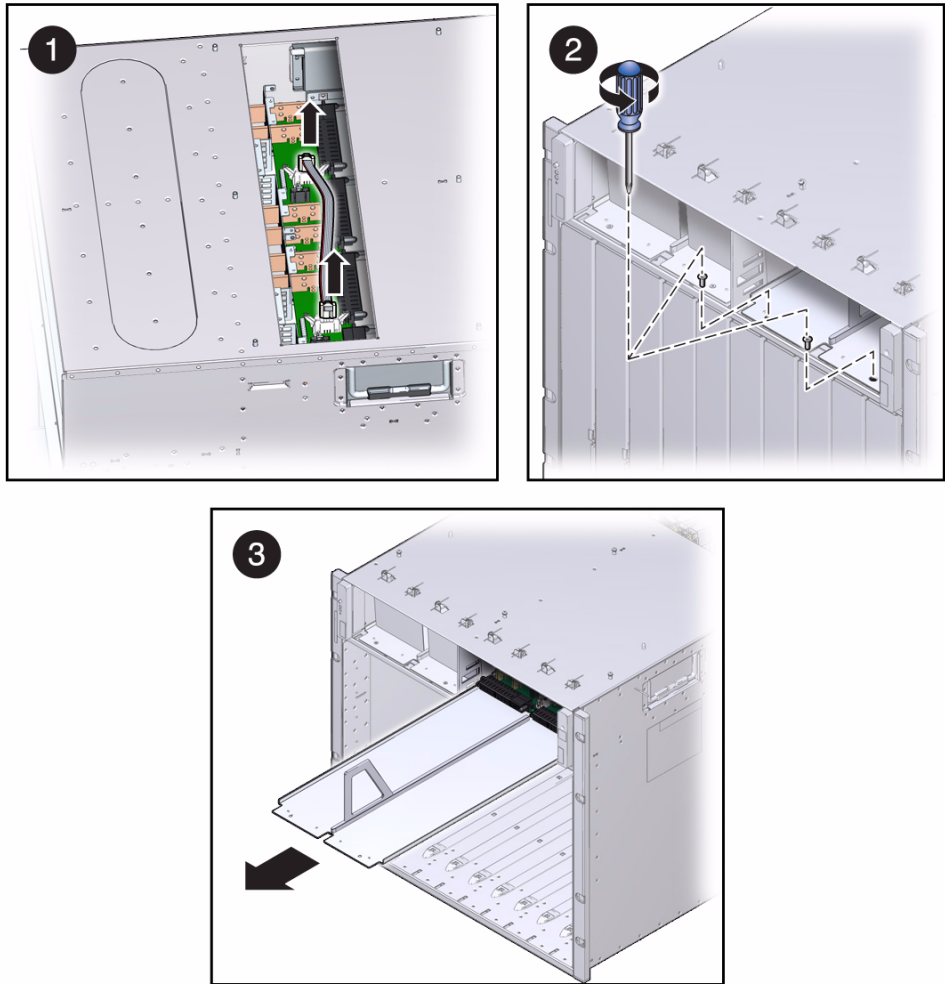
2. Lift up the DC input unit and place it on top the chassis so that you can reach through the access hole and disconnect the LED signal cable.

See [“Remove the DC Input Unit” on page 69](#).

3. Disconnect the signal cables by reaching through the access hole in the top of the chassis.

- a. (Left DC adapter tray only) Press the release tab on the LED signal cable and gently pull the cable from the connector.

b. Press the ejector levers down to release the ribbon signal cable.



4. Remove the two Torx screws at the front of the DC adapter tray.

Tip – A long-stem Torx driver can access these screws at a better angle.

5. Pull the DC adapter tray from the front of the chassis.

The adapter tray is securely connected and might require a strong pull to release.

6. (If necessary) Install a new DC adapter tray.

See [“Install a DC Adapter Tray”](#) on page 76.

Related Information

- [“Install a DC Adapter Tray” on page 76](#)

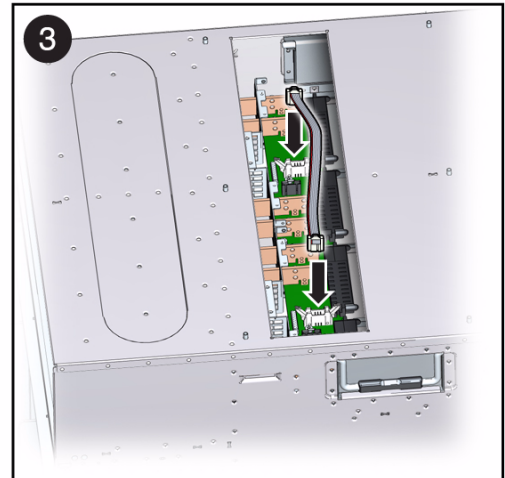
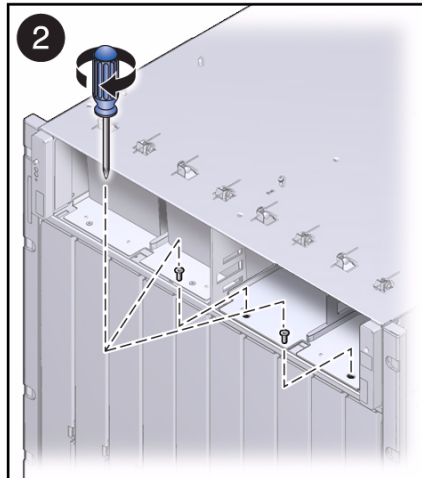
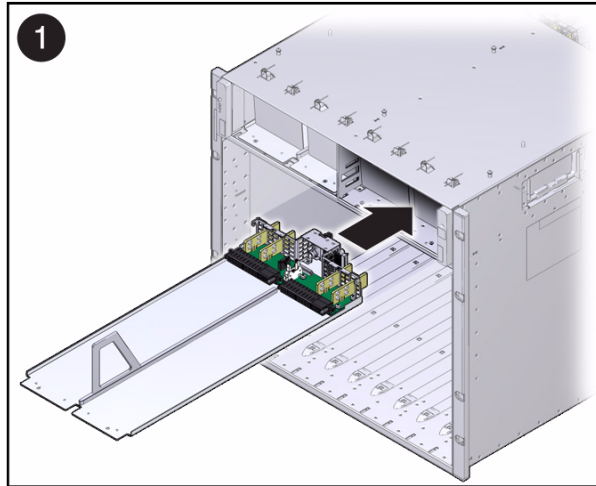
▼ Install a DC Adapter Tray

1. **(If necessary) Remove the DC adapter tray.**

See [“Remove a DC Adapter Tray” on page 74](#).

Note – Move the cables out of the way as you replace the DC adapter tray.

2. **Slide the DC adapter tray into the chassis until the connectors fit together and the front of the tray is even (flush) with the front of the chassis.**



3. Screw in the two Torx screws at the front of the DC adapter tray.
4. Connect the signal cables by reaching through the access hole in the top of the chassis and connect the cables.
 - a. (Left DC adapter tray only) Press the LED signal cable into the connector.
 - b. Press the ribbon signal cable connector into the connector until both levers rise and click.
 - c. Ensure that all cable connections are secure.
5. Replace the DC input unit.
See [“Install the DC Input Unit”](#) on page 72.

6. **Install the chassis in the rack, apply system power, and verify system operation.**
See [“Returning the Modular System to Operation”](#) on page 79.

Related Information

- [“Returning the Modular System to Operation”](#) on page 79

Returning the Modular System to Operation

These topics describe how to apply power to the modular system and verify correct operation.

- [“Reinstalling the Chassis Into a Rack” on page 79](#)
- [“Applying Power to the Chassis” on page 86](#)
- [“Power-On Sequence” on page 87](#)
- [“Start the CMM \(CLI\)” on page 92](#)
- [“Verify Modular System Functionality” on page 93](#)

Related Information

- [“Power Off Components in the Chassis” on page 21](#)

Reinstalling the Chassis Into a Rack

The following topics describe how to reinstall a chassis into a rack after servicing.



Caution – The chassis is heavy. Use a mechanical lift, or depopulate the chassis and use four people to lift the chassis.

Select from the following topics to perform tasks that correspond your situation:

Description	Links
Reinstall the chassis using a mechanical lift.	“Lift and Install the Chassis” on page 80 “Reinstall Cables on the Components” on page 85 “Apply Power to the Modular System (AC)” on page 87 “Reattach DC Power Cables and Apply Power to the Modular System (DC)” on page 89
Reinstall the chassis manually with four people.	“Lift and Install the Chassis” on page 80 “Repopulate the Chassis” on page 83 “Reinstall Cables on the Components” on page 85 “Apply Power to the Modular System (AC)” on page 87 “Reattach DC Power Cables and Apply Power to the Modular System (DC)” on page 89

Related Information

- [“Applying Power to the Chassis” on page 86](#)

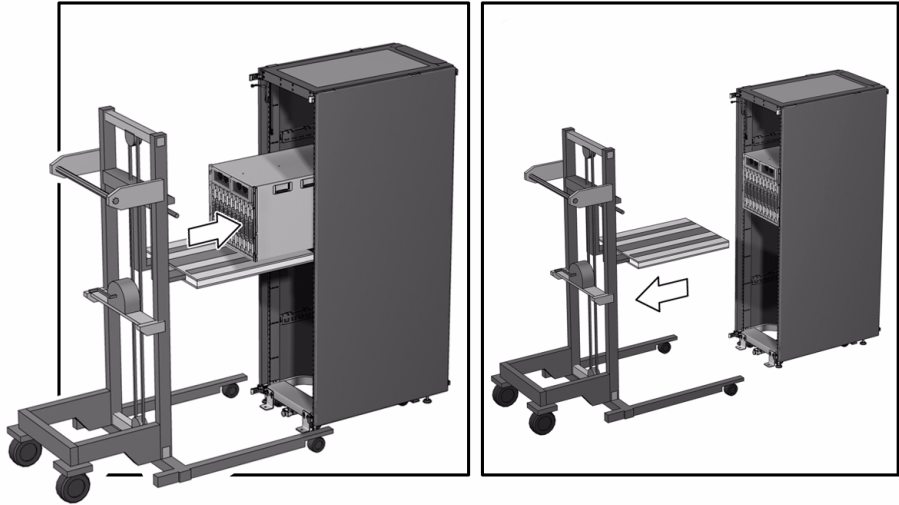
▼ Lift and Install the Chassis

Perform the following steps using a mechanical lift, or manually with four people. If you are manually installing the chassis, ensure that you depopulate the chassis first. See [“Depopulate the Chassis” on page 26](#).

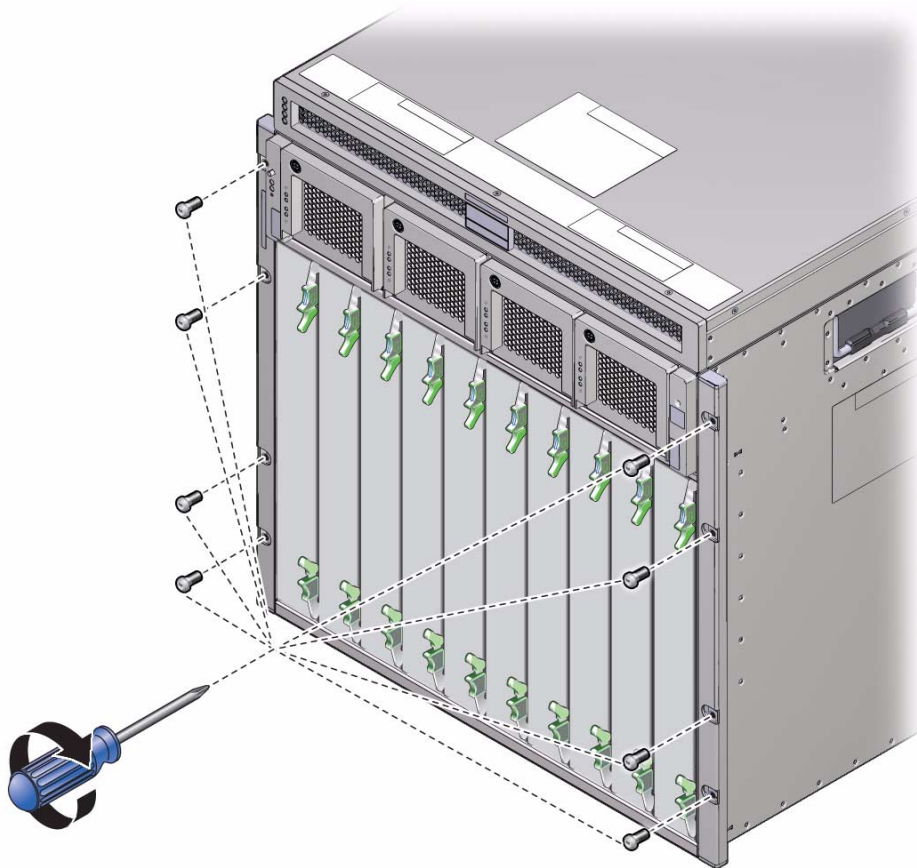


Caution – The chassis is heavy. Use a mechanical lift, or depopulate the chassis and use four people to lift the chassis.

1. Raise the chassis so that the bottom of the chassis is at the height of the rail shelf.
2. Slide the chassis into the rack until the chassis front mounting flanges contact the rack posts.



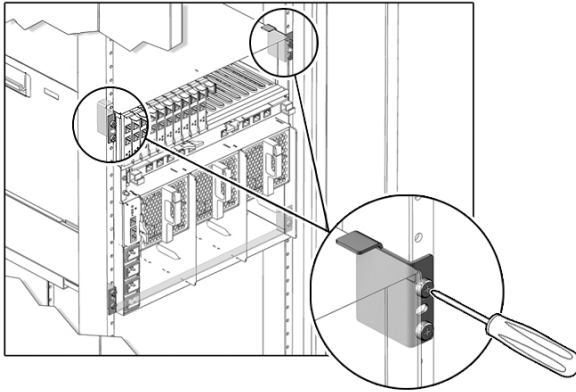
3. Install eight screws to secure the front of the chassis to the rack.



4. Fasten two upper rear brackets to the rack.

Place the screws in the two outside holes of the bracket and leave the middle hole empty.

Note – Permanent installation of these two brackets is required for seismic bracing.



5. Consider your next step:

- If you depopulated the chassis, repopulate the chassis. See [“Repopulate the Chassis” on page 83](#).
- If you did not depopulate the chassis and you are reinstalling it with a mechanical lift, see [“Reinstall Cables on the Components” on page 85](#).

Related Information

- [“Repopulate the Chassis” on page 83](#)
- [“Reinstall Cables on the Components” on page 85](#)

▼ Repopulate the Chassis

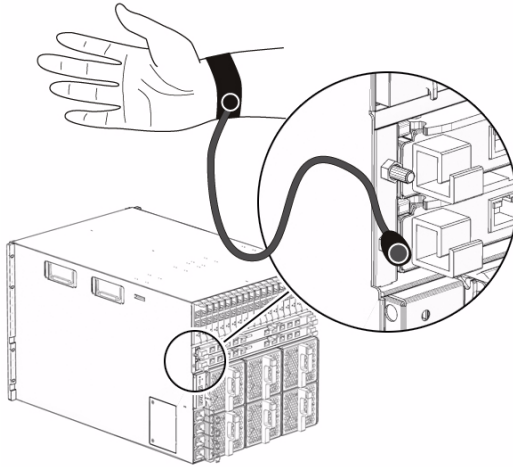
Follow these steps if you depopulated the chassis.

1. (If necessary) Install the chassis.

See [“Lift and Install the Chassis” on page 80](#).

2. Use an antistatic wrist strap.

Attach this wrist strap to your wrist and ground the other end of strap to the system chassis.



3. Install the following components.

Note – Ensure that you replace each component in the same slot that you removed the component from.

- **CMM** – See [“Install the CMM”](#) on page 58.
- **Rear fan modules** – See [“Install a Rear Fan Module”](#) on page 54.
- **NEMs** – See [“Install a NEM”](#) on page 51.
- **PCI EMs** – See [“Install a PCI EM”](#) on page 49.
- **Server and storage modules** – See [“Install a Server or Storage Module”](#) on page 42.
- **Power supplies** – See [“Install a Power Supply \(DC\)”](#) on page 33 and [“Install a Power Supply \(AC\)”](#) on page 36.
- **Filler Panels** – See [“Remove a Server or Storage Module”](#) on page 40.

4. Reinstall cables on the components.

See [“Reinstall Cables on the Components”](#) on page 85.

Related Information

- [“Reinstall Cables on the Components”](#) on page 85
- [“Depopulate the Chassis”](#) on page 26

▼ Reinstall Cables on the Components

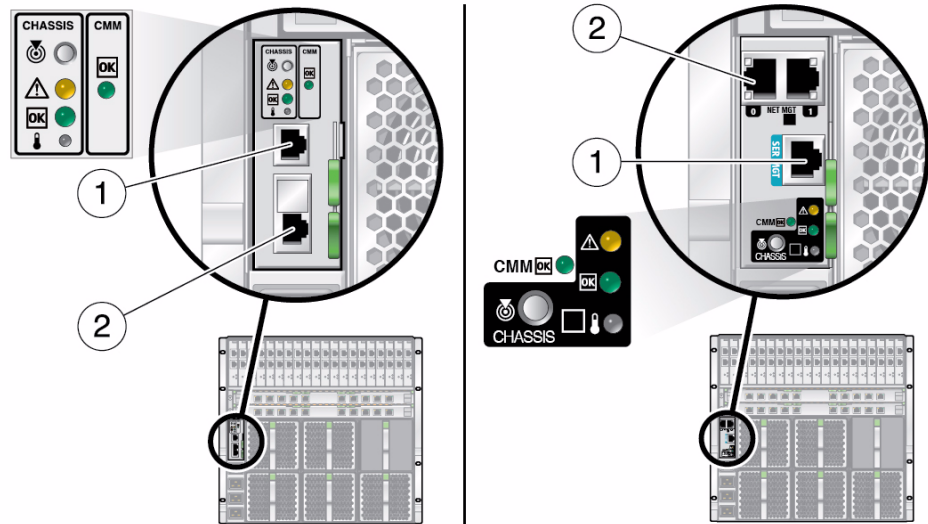
For this task, use the cable labels and records that you made in [“Prepare the Chassis for Removal” on page 25](#).

1. Consider your first step:

- If you are installing the chassis using a mechanical lift, install the chassis. See [“Lift and Install the Chassis” on page 80](#).
- If you are installing the chassis manually, install and repopulate the chassis. See [“Lift and Install the Chassis” on page 80](#) and [“Repopulate the Chassis” on page 83](#).

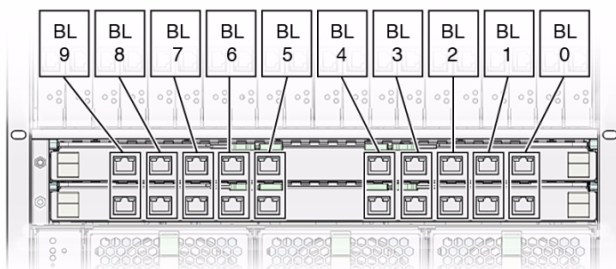
2. Reinstall cables on the following modular components:

- CMM connectors

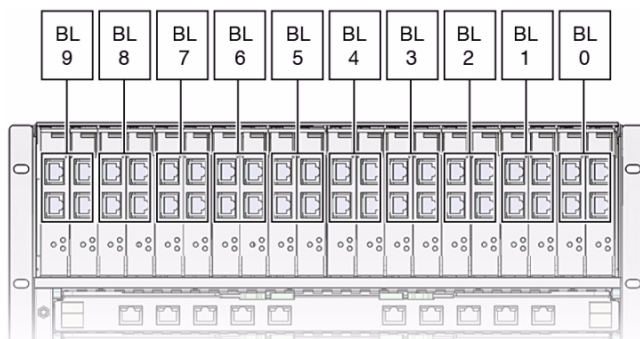


No.	Description
1	SER MGT – CMM serial management port (RS-232, RJ-45 serial port)
2	NET MGT – CMM network management port (Ethernet)

- NEM connectors



- PCI EM connectors



Related Information

- [“Applying Power to the Chassis” on page 86](#)

Applying Power to the Chassis

Select from the following topics to perform tasks that correspond your situation:

- [“Power-On Sequence” on page 87](#)
- [“Apply Power to the Modular System \(AC\)” on page 87](#)
- [“Reattach DC Power Cables and Apply Power to the Modular System \(DC\)” on page 89](#)
- [“Start the CMM \(CLI\)” on page 92](#)

Related Information

- [“Verify Modular System Functionality” on page 93](#)

Power-On Sequence

When the chassis is first connected to AC or DC power, the following sequence of events occurs:

1. The power supplies produce 3V auxiliary standby power.
2. The CMM receives 3V auxiliary standby power and comes out of reset.
3. The CMM starts to boot and sets the OK indicator on the CMM to a slow blink state.
4. When the CMM has booted, the CMM sets the OK indicators on the FIM and the CMM to the standby blink state, indicating that the chassis is now ready for full power-on.
5. The chassis automatically powers on.
6. When the chassis has been fully powered on, the OK indicator remains illuminated.

Related Information

- [“Verify Modular System Functionality” on page 93](#)
- [“Start the CMM \(CLI\)” on page 92](#)

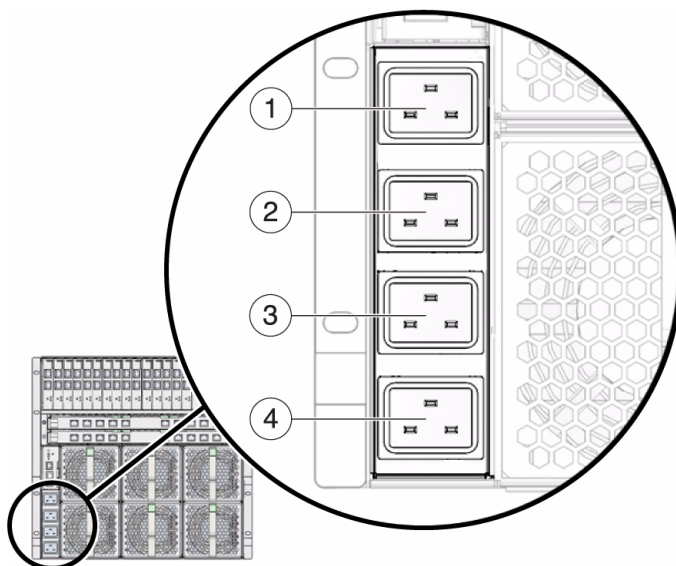
▼ Apply Power to the Modular System (AC)

By default, as soon as the chassis power supplies receive power, main power is automatically applied to all the modules. There is no main power on/off switch on the chassis. Plug in the power cords only when you are ready for the modular system to fully initialize.

Note – You can change the setting for the CMM ILOM `auto-power-on` parameter so that when power is applied, the CMM supplies only standby power to the modular system instead of main power. For details, refer to the Oracle ILOM documentation:

(<http://www.oracle.com/pls/topic/lookup?ctx=E19860-01&id=homepage>)

1. **On the rear of the chassis, open the metal retention clips for each power receptacle.**
2. **Plug the four power cords into the four receptacles.**



No.	Description
1	Power supply 1, AC1
2	Power supply 1, AC0
3	Power supply 0, AC1
4	Power supply 0, AC0

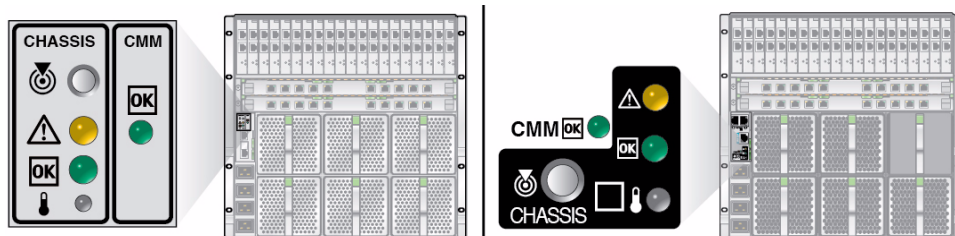
3. Secure each power cord by closing the metal retention clips.

4. Plug the other end of the power cords into your power source.

For power redundancy, plug the PS0 and PS1 cords into separate power circuits. Main power is automatically distributed to the modular system.

5. Verify the chassis initialization by viewing the front or rear status LEDs.

- **Green OK LEDs** – Illuminate a solid green light, indicating successful initialization.
- **Amber fault LED** – Illuminates if a fault is detected. If the amber fault LED is illuminated, check for other fault indicators on modular components, unplug the chassis, and take corrective actions. See [“Monitoring Faults” on page 1](#).



6. Start the CMM.

See “Start the CMM (CLI)” on page 92.

Related Information

- “Start the CMM (CLI)” on page 92

▼ Reattach DC Power Cables and Apply Power to the Modular System (DC)

By default, as soon as the chassis power supplies receive power, main power is applied to all installed components. There is no main power on/off switch on the chassis. Apply power only when you are ready for the modular system to fully initialize.



Caution – The DC power source must be located in the same premises as the DC modular system. The power source cannot be in one building with the modular system in another building. This restriction minimizes the possibility of transient energy appearing on the main DC input to the modular system.



Caution – A power disconnect device is not incorporated with the equipment. You must incorporate an external, readily accessible disconnect device to the equipment.



Caution – This product does not provide branch circuit overcurrent protection as defined by the US NEC (United States National Electrical Code), Article 100. Installations of this product in compliance with the US NEC must be on branch circuits with overcurrent protection as defined by Article 480.3 of the US NEC. Product power inputs with current ratings 16A or less must have a branch circuit or supplementary overcurrent protection device rated at no more than 20A. Product power inputs with current ratings of more than 16A must have a branch circuit or

supplementary overcurrent protection device rated at no more than 160% of the product input current rating. Other national and/or local electrical codes might apply to the installation of this product.

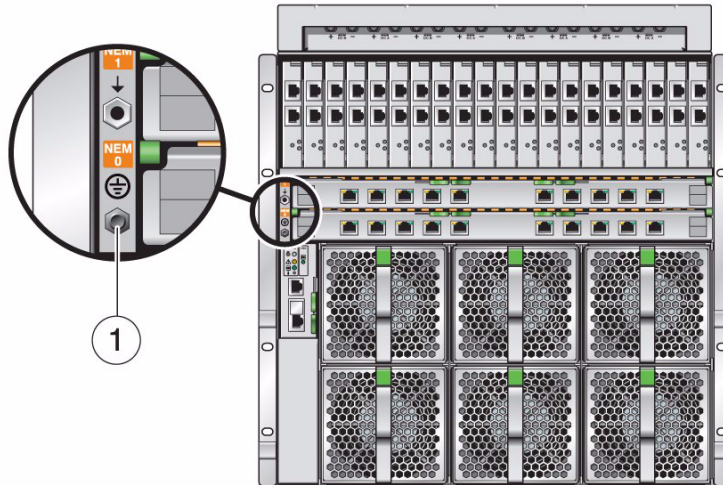
Note – You can change the setting for the CMM ILOM auto-power-on parameter so that when power is applied, the CMM supplies only standby power to the modular system instead of main power. For details, refer to *Modular System Remote Management (ILOM)*.

1. Ensure that the circuit breakers on your power source are open or that the fuses are removed.



Caution – To prevent electrical shock, ensure that no power is present on the circuits to which you are connecting.

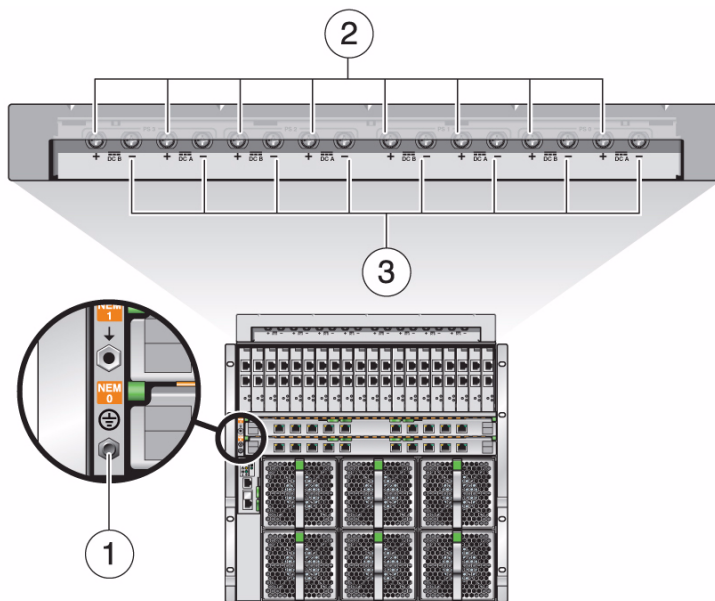
2. Use a nut and washer to fit the lug to the electrical grounding terminal on the rear of the system chassis.



No.	Description
1	Chassis DC grounding terminal

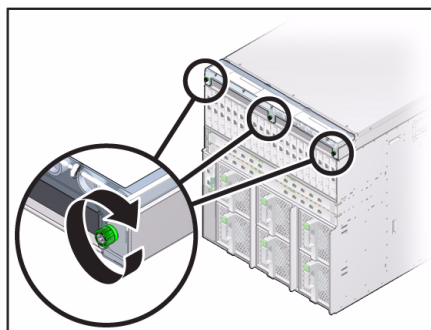
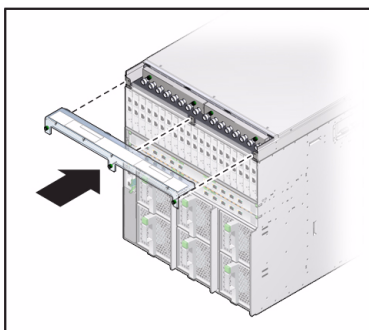
3. Use the nuts and washers to secure the lugs to the DC input unit terminals.

Attach the black wires to the positive terminals. Attach the white wires to the negative terminals. See *Modular System Installation*, DC power cable wiring..



No.	Description
1	Chassis ground terminal
2	Neutral terminals (white wires)
3	-48 or -60 VDC hot terminals (black wires)

4. Verify all DC connections before applying power.
5. Replace the safety cover on the rear of the DC input unit.
Tighten the green captive screws.

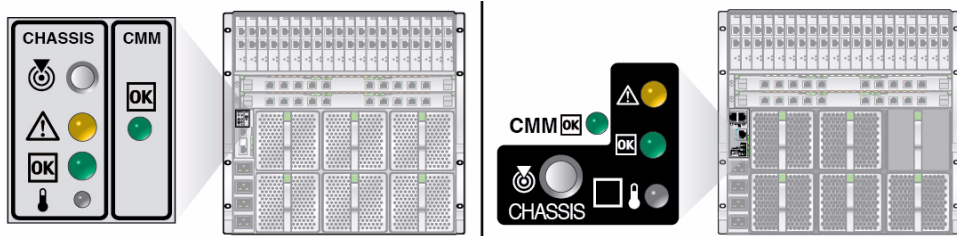


6. Apply power to the chassis by closing the circuit breakers or installing the fuses.

Main power is automatically distributed to the modular system.

7. Verify the chassis initialization by viewing the front or rear status LEDs.

- **Green OK LEDs** – Illuminate a solid green light, indicating successful initialization.
- **Amber fault LED** – Illuminates if a fault is detected. If the amber fault LED is illuminated, check for other fault indicators on modular components, unplug the chassis, and take corrective actions. See [“Monitoring Faults” on page 1](#).



8. Start the CMM

See [“Start the CMM \(CLI\)” on page 92](#).

Related Information

- [“Start the CMM \(CLI\)” on page 92](#)
- [“Verify Modular System Functionality” on page 93](#)

▼ Start the CMM (CLI)

The chassis is set by default to power on automatically when AC or DC power is connected to the chassis. However, if you have changed this default setting so that the chassis does not power on automatically, you can power on the system by issuing software commands through the CMM CLI.

1. Log in to the Oracle ILOM CLI on the CMM as administrator.
2. Type:

```
-> start /CH
```

3. Verify system functionality.

See [“Verify Modular System Functionality” on page 93](#).

Related Information

- [“Verify Modular System Functionality” on page 93](#)

▼ Verify Modular System Functionality

After servicing the modular system you should verify that Oracle’s Sun Netra 6000 modular system is functioning correctly.

1. Verify that the green OK indicator on the FIM or CMM is in the steady on state.

When the chassis has been fully powered on, the OK indicator remains illuminated. The steady on OK LED indicates that the power supplies are energized and the 12V power is supplied to the fan array, server modules, and the NEMs. See [“Chassis and CMM LEDs” on page 5](#) and [“Rear Fan LEDs” on page 9](#).

2. (Optional) Check the event logs.

See [“Monitor Faults With the Oracle ILOM Event Log” on page 12](#).

Related Information

- [“Monitor Faults With the Oracle ILOM Event Log” on page 12](#)

Glossary

A

ASF Alert standard format.

B

blade Generic term for server modules and storage modules.

blade server Server module.

C

chassis Modular system enclosure.

CMM Chassis monitoring module. Oracle ILOM runs on the CMM providing lights out management of the components in the chassis. See [Oracle ILOM](#).

CMM ILOM Oracle ILOM that runs on the CMM. See [Oracle ILOM](#).

CRU Customer-replaceable unit.

D

disk module or disk blade Interchangeable terms for storage module.

E

ESD Electrostatic discharge.

F

FEM Fabric expansion module. FEMs enable server modules to use the 10GbE connections provided by certain NEMs.

FRU Field-replaceable unit.

FIM Front indicator module.

H

HBA Host bus adapter.

I

ILOM See [Oracle ILOM](#).

Installation Title of the portion of the HTML topic set that corresponds to the PDF book *Sun Netra 6000 Modular System Installation Guide*.

IPMI Intelligent platform management interface.

K

KVM Keyboard, video, mouse. Refers to using a switch to enable sharing of one keyboard, one display, and one mouse with more than one computer.

L

L/R Ratio of inductance to resistance.

M

MAC or MAC address Media access controller address.

MPS Modular power system.

N

name space Top-level ILOM CMM targets.

NEM Network express module. NEMs provide 10/100/1000 Ethernet, SAS connectivity to storage modules, and 10GbE Ethernet ports.

NET MGT port Network management port. An Ethernet port on the CMM and on server module service processors.

NTP Network Time Protocol.

O

Oracle ILOM

Oracle Integrated Lights Out Manager (ILOM). Oracle ILOM firmware is preinstalled on a variety of Oracle systems. Oracle ILOM enables you to remotely manage your Oracle servers regardless of the state of the host system.

P

PCI EM

PCIe ExpressModule. Modular components that are based on the PCI Express industry-standard form factor and offer I/O features such as Gigabit Ethernet and Fibre Channel.

PET

Platform event trap.

PS

Power supply, as in device and sensor names, such as /CH/PS0/PRST.

power supply side

Each of the AC power supplies has an A side and a B side. The major 12V power paths of the two sides are independent. The two sides share a common 3.3V stand-by power output, a diagnostics and control section, and a fan module.

R

REM

RAID expansion module. Sometimes referred to as a host bus adapter (HBA). Supports the creation of RAID volumes on disk drives.

Remote Management (ILOM)

Title of the portion of the HTML topic set that corresponds to the PDF book *Oracle Integrated Lights Out Manager (ILOM) 3.0 Supplement for the Sun Netra 6000 Modular System*.

S

SER MGT port

Serial management port. A serial port on the CMM and on server modules service processors.

server module	Modular component that provides the main compute resources (CPU and memory). Server modules might also have onboard storage, and connectors that hold REMs and FEMs.
Service	Title of the portion of the HTML topic set that corresponds to the PDF book <i>Sun Netra 6000 Modular System Service Manual</i> .
SNMP	Simple Network Management Protocol.
SP	Service processor.
storage module	Modular component that provides compute storage to the server modules.

U

UCP	Universal connector port.
------------	---------------------------

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