SPARC S7-2L Server Service Manual

Part No: E73201-05
February 2019

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Access to Oracle Support

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Référence: E73201-05

Accès aux services de support Oracle

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Contents

Using This Documentation

- **Overview** – Describes how to troubleshoot and maintain the server
- **Audience** – This guide is intended for trained technicians an authorized service personnel who have been instructed on the hazards within the equipment and qualified to remove and replace hardware
- **Required knowledge** – Advanced experience troubleshooting and replacing hardware

Product Documentation Library

Documentation and resources for this product and related products are available at http://www.oracle.com/goto/s7-2l/docs.

Feedback

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

Identifying Components

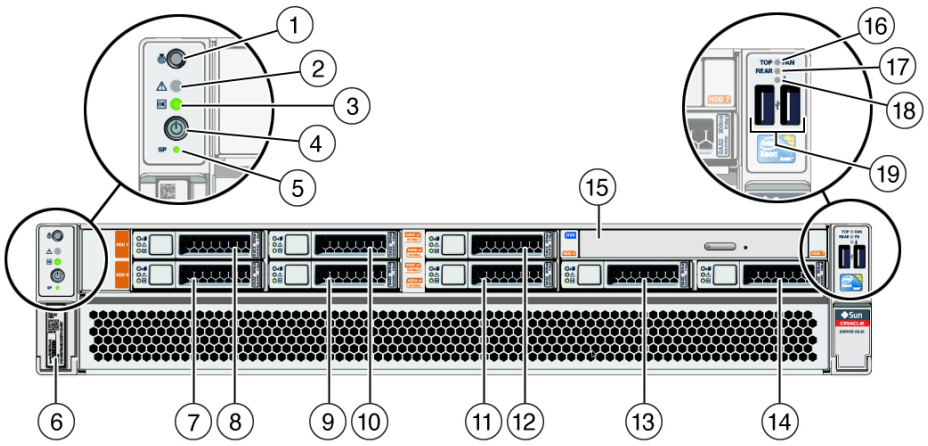
These topics identify key components of the server, including major boards and internal system cables, as well as front and rear panel features.

Related Information

Front Panel Components with Eight Drives

The following figure shows the layout of the server front panel, including the power and server locator buttons and the various status and fault LEDs.

Note - The front panel also provides access to internal drives, the removable media drive (if equipped), and the two front USB ports.



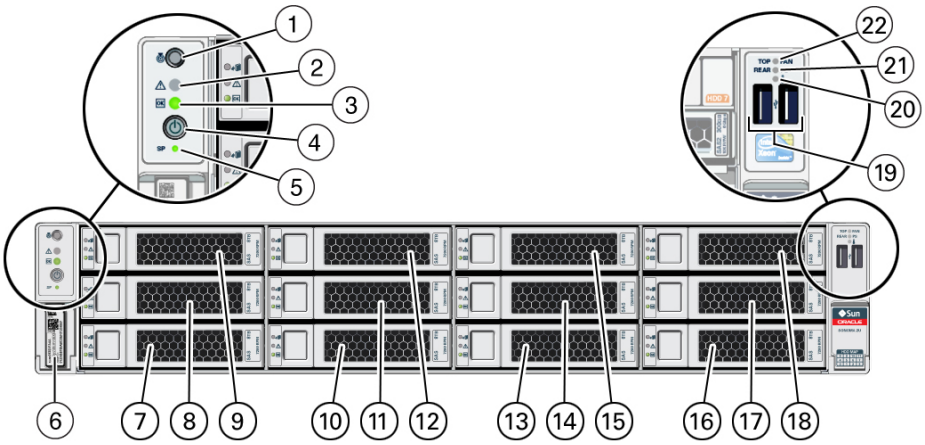
No.	Description	Links
1	Server Locator LED/Locator button (white)	“Front Panel Controls and LEDs” on page 34
2	Service Required LED (amber)	“Front Panel Controls and LEDs” on page 34
3	Power LED (green)	“Front Panel Controls and LEDs” on page 34
4	Server Power button	“Front Panel Controls and LEDs” on page 34
5	SP Fault LED (green or amber)	“Front Panel Controls and LEDs” on page 34
6	Serial number	“Find the Server Serial Number” on page 48
7	HDD 0	“Servicing Drives” on page 65
8	HDD 1	“Servicing Drives” on page 65
9	HDD 2 or NVMe 0	“Servicing Drives” on page 65
10	HDD 3 or NVMe 1	“Servicing Drives” on page 65
11	HDD 4 or NVMe 2	“Servicing Drives” on page 65
12	HDD 5 or NVMe 3	“Servicing Drives” on page 65
13	HDD 6	“Servicing Drives” on page 65
14	HDD 7	“Servicing Drives” on page 65
15	DVD drive (not available on this server)	
16	Fan Service LEDs (amber)	“Servicing Fan Modules” on page 77
17	Power Supply (PS) Service LED (amber)	“Servicing Power Supplies” on page 87

No.	Description	Links
18	Server Overtemp LED (amber)	“Front Panel Controls and LEDs” on page 34
19	USB 2.0 connectors (2)	“USB Ports” in *SPARC S7-2L Server Installation Guide*

Related Information

- “Rear Panel Components” on page 19
- “Internal Component Locations” on page 20
- “Device Paths” on page 23

Front Panel Components with Twelve-3.5-Inch-Drive Backplane



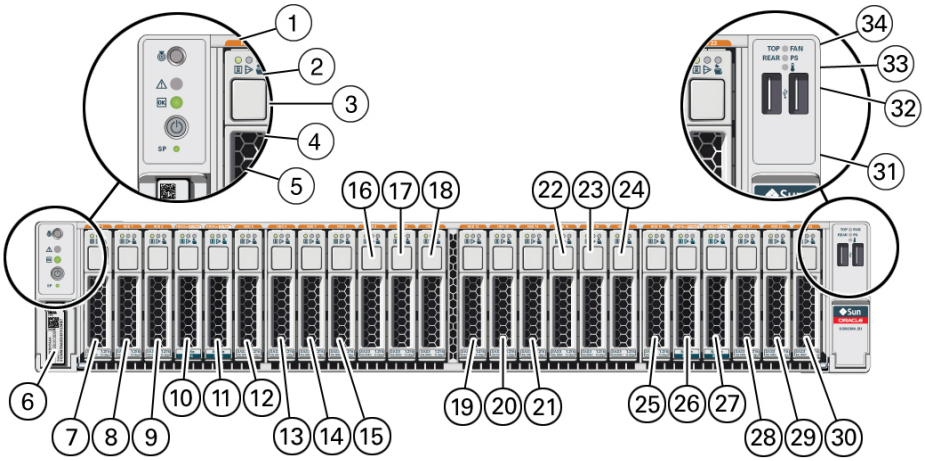
No.	Description	Links
1	Locator button / Locator LED (white)	“Front Panel Controls and LEDs” on page 34
2	Service Required LED (amber)	“Front Panel Controls and LEDs” on page 34

No.	Description	Links
3	Power LED (green)	“Front Panel Controls and LEDs” on page 34
4	Power button	“Front Panel Controls and LEDs” on page 34
5	SP Power OK button (green)	“Front Panel Controls and LEDs” on page 34
6	Server serial number	“Find the Server Serial Number” on page 48
7	Drive 0	“Servicing Drives” on page 65
8	Drive 4	“Servicing Drives” on page 65
9	Drive 8	“Servicing Drives” on page 65
10	Drive 1	“Servicing Drives” on page 65
11	Drive 5	“Servicing Drives” on page 65
12	Drive 9	“Servicing Drives” on page 65
13	Drive 2	“Servicing Drives” on page 65
14	Drive 6	“Servicing Drives” on page 65
15	Drive 10	“Servicing Drives” on page 65
16	Drive 3	“Servicing Drives” on page 65
17	Drive 7	“Servicing Drives” on page 65
18	Drive 11	“Servicing Drives” on page 65
19	USB 2.0 connectors (2)	“USB Ports” in *SPARC S7-2L Server Installation Guide*
20	Overtemperature LED (amber)	“Front Panel Controls and LEDs” on page 34
21	PS fault LED	“Servicing Power Supplies” on page 87
22	Fan fault LED (amber)	“Servicing Fan Modules” on page 77

Related Information

- “Rear Panel Components” on page 19
- “Internal Component Locations” on page 20
- “Device Paths” on page 23

Front Panel Components with Twenty-Four-Drive Backplane



No.	Description	Links
1	Locator button / Locator LED (white)	“Front Panel Controls and LEDs” on page 34
2	Service Required LED (amber)	“Front Panel Controls and LEDs” on page 34
3	Power LED (green)	“Front Panel Controls and LEDs” on page 34
4	Power button	“Front Panel Controls and LEDs” on page 34
5	SP Power OK button (green)	“Front Panel Controls and LEDs” on page 34
6	Server serial number	“Find the Server Serial Number” on page 48
7	Drive 0	“Servicing Drives” on page 65
8	Drive 1	“Servicing Drives” on page 65

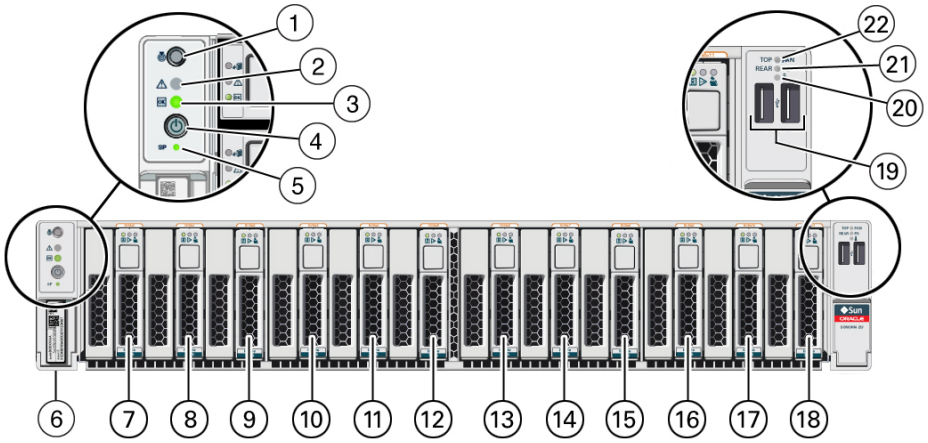
No.	Description	Links
9	Drive 2	“Servicing Drives” on page 65
10	Drive 3 (or NVMe drive 0)	“Servicing Drives” on page 65
11	Drive 4 (or NVMe drive 1)	“Servicing Drives” on page 65
12	Drive 5	“Servicing Drives” on page 65
13	Drive 6	“Servicing Drives” on page 65
14	Drive 7	“Servicing Drives” on page 65
15	Drive 8	“Servicing Drives” on page 65
16	Drive 9	“Servicing Drives” on page 65
17	Drive 10	“Servicing Drives” on page 65
18	Drive 11	“Servicing Drives” on page 65
19	Drive 12	“Servicing Drives” on page 65
20	Drive 13	“Servicing Drives” on page 65
21	Drive 14	“Servicing Drives” on page 65
22	Drive 15	“Servicing Drives” on page 65
23	Drive 16	“Servicing Drives” on page 65
24	Drive 17	“Servicing Drives” on page 65
25	Drive 18	“Servicing Drives” on page 65
26	Drive 19 (or NVMe drive 2)	“Servicing Drives” on page 65
27	Drive 20 (or NVMe drive 3)	“Servicing Drives” on page 65
28	Drive 21	“Servicing Drives” on page 65
29	Drive 22	“Servicing Drives” on page 65

No.	Description	Links
30	Drive 23	"Servicing Drives" on page 65
31	USB 2.0 connectors (2)	"USB Ports" in *SPARC S7-2L Server Installation Guide*
32	Overtemperature LED (amber)	"Front Panel Controls and LEDs" on page 34
33	PS fault LED (amber)	"Servicing Power Supplies" on page 87
34	Fan Fault LED (amber)	"Servicing Fan Modules" on page 77

Related Information

- "Rear Panel Components" on page 19
- "Internal Component Locations" on page 20
- "Device Paths" on page 23

Front Panel Components with Twelve NVMe Drive Backplane



No.	Description
1	Locator button / Locator LED (white)
2	Service Required LED (amber)
3	Power LED (green)
4	Power button
5	SP Power OK button (green)
6	Server serial number
7	NVMe drive 0
8	NVMe drive 1
9	NVMe drive 2
10	NVMe drive 3
11	NVMe drive 4
12	NVMe drive 5
13	NVMe drive 6
14	NVMe drive 7
15	NVMe drive 8
16	NVMe drive 9

No.	Description
17	NVMe drive 10
18	NVMe drive 11
19	USB 2.0 connectors (2)
20	Overtemperature LED (amber)
21	PS fault LED (amber)
22	Fan fault LED (amber)

Related Information

- “Rear Panel Components” on page 19
- “Internal Component Locations” on page 20
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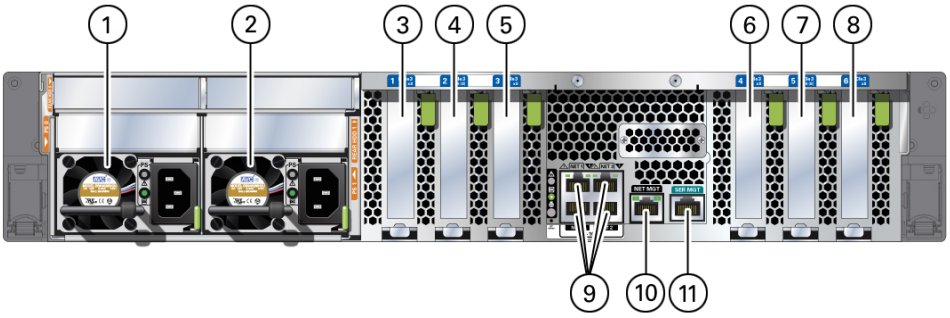
Rear Panel Components



No.	Description	Links
1	Power supply 0	“Servicing Power Supplies” on page 87
2	Power supply 1	“Servicing Power Supplies” on page 87
3	PCIe card slot 1	“Servicing PCIe Cards” on page 103
4	PCIe card slot 2	“Servicing PCIe Cards” on page 103
5	PCIe card slot 3	“Servicing PCIe Cards” on page 103

No.	Description	Links
6	PCIe card slot 4	“Servicing PCIe Cards” on page 103
7	PCIe card slot 5	“Servicing PCIe Cards” on page 103
8	PCIe card slot 6	“Servicing PCIe Cards” on page 103
9	10GbE ports (4), NET 0 to NET 3	
10	Network management (NET MGT) port	
11	Serial management (SER MGT) RJ-45 serial port	

Related Information

- “Front Panel Components with Eight Drives” on page 11
- “Internal Component Locations” on page 20
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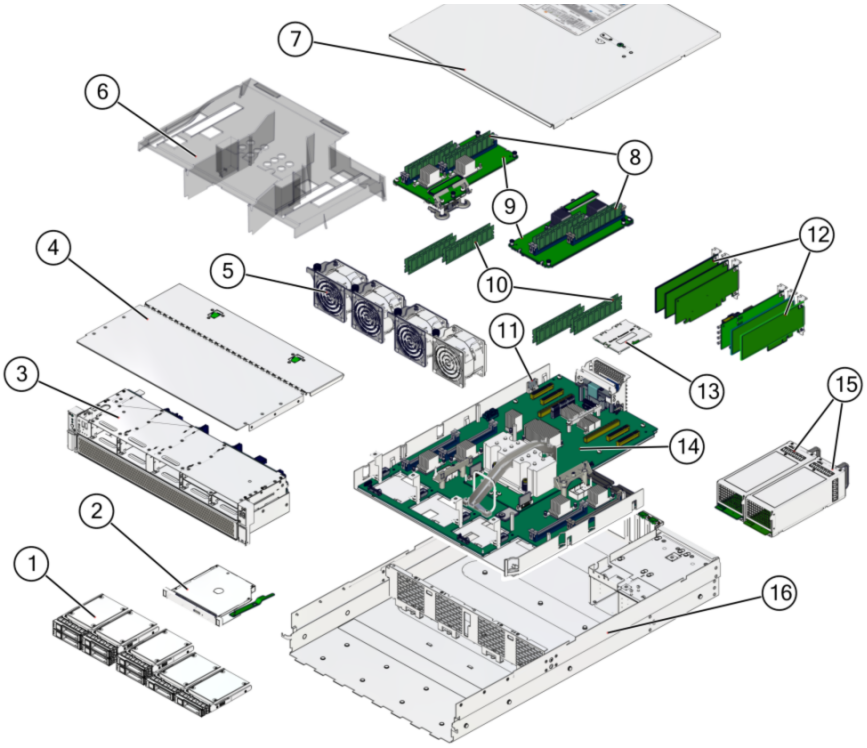
Internal Component Locations

The following figure identifies the replaceable component locations.



No.	Component	Oracle ILOM Target	Links

1	Drives (eight drive configuration in this example)	`/SYS/DBP/HDD0` (lower left)
		`/SYS/DBP/HDD1`
		`/SYS/DBP/HDD2` or `/SYS/DBP/NVME0`
		`/SYS/DBP/HDD3` or `/SYS/DBP/NVME1`
		`/SYS/DBP/HDD4` or `/SYS/DBP/NVME2`
		`/SYS/DBP/HDD5` or `/SYS/DBP/NVME3`
		`/SYS/DBP/HDD6`
		`/SYS/DBP/HDD7` (right)
			"Servicing Drives" on page 65

3	Drive backplane (on drive cage)	`/SYS/DBP`	"Servicing the Drive Backplane" on page 131
4	Fan module cover		"Remove the Fan Cover" on page 60 "Replace the Fan Cover" on page 149

No.	Component	Oracle ILOM Target	Links
5	Fan modules	As viewed from front of server:	"Servicing Fan Modules" on page 77
		/SYS/MB/FM0 (left)	
		/SYS/MB/FM1 (left center)	
		/SYS/MB/FM2 (right center)	
		/SYS/MB/FM3 (right)	
6	Air baffle		"Remove the Air Baffle" on page 60
			"Install the Air Baffle" on page 151
7	Top cover		"Remove the Top Cover" on page 59
			"Replace the Top Cover" on page 152
8	DIMMs	/SYS/MB/CMP[0-1]/MCU[0-1]/CH[0-1]/D[0-1]	"Servicing DIMMs" on page 93
11	Battery	/SYS/MB/BAT	"Servicing the Battery" on page 113
12	PCIe cards	/SYS/MB/PCIE1	"Servicing PCIe Cards" on page 103
		/SYS/MB/PCIE2	
		/SYS/MB/PCIE3	
		/SYS/MB/PCIE4	
		/SYS/MB/PCIE5	
		/SYS/MB/PCIE6	
		/SYS/MB/PCIE7 (internal PCIe card)	
14	Motherboard	/SYS/MB	"Servicing the Motherboard" on page 117
14	Processor chip (replaceable only by replacing the motherboard)	/SYS/MB/CMP[0-1]	"Servicing the Motherboard" on page 117
15	Power supplies	/SYS/PS0 (outer)	"Servicing Power Supplies" on page 87
		/SYS/PS1 (inner)	
16	Chassis		
	eUSB drive	/SYS/MB/EUSB_DISK	

Related Information

- "Component Names Displayed by Diagnostic Software" on page 31
- "Front Panel Components with Eight Drives" on page 11
- "Rear Panel Components" on page 19
- "Internal Component Locations" on page 20

- "Device Paths" on page 23

Device Paths

These tables include paths that identify components on the server. The device paths can help you determine the optimum locations for optional cards or other peripherals, based on your server's configuration and intended use.

This table identifies some key path names in this server.

Device NAC Name	Description	Device Path	PCIe Switch	Physical Port	Device Number	Owner	Width
/SYS/MB/PCIE1	PCIe slot 1	/pci@300/pci@1/pci@0/pci@11	PCIE SW 0	Port 4	pci@11	CPU 0	x8
/SYS/MB/PCIE2	PCIe slot 2	/pci@302/pci@1/pci@0/pci@12	PCIE SW 0	Port 6	pci@12	CPU 1	x8 (physical x16)
/SYS/MB/PCIE3	PCIe slot 3	/pci@302/pci@1/pci@0/pci@13	PCIE SW 0	Port 12	pci@13	CPU 1	x8
/SYS/MB/PCIE4	PCIe slot 4	/pci@300/pci@2/pci@0/pci@14	PCIE SW 1	Port 4	pci@14	CPU 0	x8
/SYS/MB/PCIE5	PCIe slot 5	/pci@300/pci@2/pci@0/pci@15	PCIE SW 1	Port 6	pci@15	CPU 0	x8 (physical x16)
/SYS/MB/PCIE6	PCIe slot 6	/pci@302/pci@2/pci@0/pci@16	PCIE SW 1	Port 12	pci@16	CPU 1	x8
/SYS/MB/PCIE7	PCIe slot 7 (internal only)	/pci@302/pci@2/pci@0/pci@17	PCIE SW 1	Port 14	pci@17	CPU 1	x8
/SYS/MB/NET0	NET 0 interface	/pci@300/pci@1/pci@0/pci@1/network@0	SW 0	Port 4	pci@1	CPU 0	x8
/SYS/MB/NET1	NET 1 interface	/pci@300/pci@1/pci@0/pci@1/network@0,1	SW 0	Port 4	pci@1	CPU 0	x8
/SYS/MB/NET2	NET 2 interface	/pci@300/pci@1/pci@0/pci@1/network@0,2	SW 0	Port 4	pci@1	CPU 0	x8
/SYS/MB/NET3	NET 3 interface	/pci@300/pci@1/pci@0/pci@1/network@0,3	SW 0	Port 4	pci@1	CPU 0	x8

This table identifies the paths for drives in the configuration with eight drives in front.

Device NAC Name	Description	Device Path	PCIe Switch	Physical Port	Device Number	Owner	Width
/SYS/DBP/HDD0	SAS drive in Slot 0	/pci@302/pci@2/pci@0/pci@17/LSI,sas@0/disk@p2	PCIE SW 1	Port 14	pci@17	CPU1	
/SYS/DBP/HDD1	SAS drive in Slot 1	/pci@302/pci@2/pci@0/pci@17/LSI,sas@0/disk@p3	PCIE SW 1	Port 14	pci@17	CPU1	
/SYS/DBP/HDD02	SAS drive in Slot 2	/pci@302/pci@2/pci@0/pci@17/LSI,sas@0/disk@p1	PCIE SW 1	Port 14	pci@17	CPU1	
/SYS/DBP/HDD3	SAS drive in Slot 3	/pci@302/pci@2/pci@0/pci@17/LSI,sas@0/disk@p0	PCIE SW 1	Port 14	pci@17	CPU1	
/SYS/DBP/HDD4	SAS drive in Slot 4	/pci@302/pci@2/pci@0/pci@17/LSI,sas@0/disk@p6	PCIE SW 1	Port 14	pci@17	CPU1	
/SYS/DBP/HDD5	SAS drive in Slot 5	/pci@302/pci@2/pci@0/pci@17/LSI,sas@0/disk@p7	PCIE SW 1	Port 14	pci@17	CPU1	
/SYS/DBP/HDD6	SAS drive in Slot 6	/pci@302/pci@2/pci@0/pci@17/LSI,sas@0/disk@p5	PCIE SW 1	Port 14	pci@17	CPU1	
/SYS/DBP/HDD7	SAS drive in Slot 7	/pci@302/pci@2/pci@0/pci@17/LSI,sas@0/disk@p4	PCIE SW 1	Port 14	pci@17	CPU1	
/SYS/DBP/NVME0	NVMe drive in Slot 2	/pci@302/pci@2/pci@0/pci@4	PCIE SW 1	Port 10	pci@4	CPU1	x4
/SYS/DBP/NVME1	NVMe drive in Slot 3	/pci@302/pci@2/pci@0/pci@5	PCIE SW 1	Port 11	pci@5	CPU1	x4
/SYS/DBP/NVME2	NVMe drive in Slot 4	/pci@302/pci@2/pci@0/pci@6	PCIE SW 1	Port 9	pci@6	CPU0	x4
/SYS/DBP/NVME3	NVMe drive in Slot 5	/pci@302/pci@2/pci@0/pci@7	PCIE SW 1	Port 8	pci@7	CPU0	x4

Related Information

- “Component Names Displayed by Diagnostic Software” on page 31
- “Front Panel Components with Eight Drives” on page 11
- “Rear Panel Components” on page 19

- “Internal Component Locations” on page 20
- “Device Paths” on page 23

Detecting and Managing Faults

When a SPARC S7-2L server encounters a fault, the fault is recorded in a common fault database. The fault is then reported by the server in one of several ways, depending on the type and severity of the fault.

These topics explain how to use various diagnostic tools to monitor server status and troubleshoot faults in the server.

Step	Description	Links
1.	Check the server for detected faults and for information about components that might require service.	"Checking for Faults" on page 27 "Interpreting LEDs" on page 33
2.	Perform additional troubleshooting if needed.	"Performing Advanced Troubleshooting" on page 36
3.	Manage faults following a service procedure.	"Clear a Fault Manually" on page 42
4.	Contact technical support if the problem persists.	`https://support.oracle.com`

Related Information

- "Identifying Components" on page 11
- "Preparing for Service" on page 45
- "Returning the Server to Operation" on page 149

Checking for Faults

Use these tools to identify components that require service.

Step	Description	Links
1.	Run the `fmadm faulty` command to display information about components that require service.	"Log In to Oracle ILOM (Service)" on page 28 "Identify Faulted Components" on page 28

Step	Description	Links
2.	Run the `show disabled` command to display information about components that have been disabled either intentionally or because of a failure. Plan to service any components that are degraded or might need service soon to minimize system downtime.	"Identify Disabled Components" on page 30
3.	Identify the names of components that require service as reported by diagnostic software.	"Component Names Displayed by Diagnostic Software" on page 31

Related Information

- "Interpreting LEDs" on page 33
- "Performing Advanced Troubleshooting" on page 36
- "Clear a Fault Manually" on page 42

▼ Log In to Oracle ILOM (Service)

- **At the terminal prompt, type:**

```
ssh root@SP-IP-address
Password: password
Oracle (R) Integrated Lights Out Manager
Version 3.2.x
Copyright (c) 2016, Oracle and/or its affiliates, Inc. All rights reserved.
->
```

Related Information

- "Identify Faulted Components" on page 28
- "Identify Disabled Components" on page 30
- "Component Names Displayed by Diagnostic Software" on page 31

▼ Identify Faulted Components

The `fmadm faulty` command displays the list of faults detected by PSH. You can run this command from the host or through the Oracle ILOM fault management shell.

1. **From the Oracle ILOM prompt, start the fault management shell and type `fmadm faulty`.**

   This example shows how to check for faults through the Oracle ILOM fault management shell. You can also check for faults by typing `show faulty` at the Oracle ILOM prompt.

```
-> start /SP/faultmgmt/shell
Are you sure you want to start /SP/faultmgmt/shell (y/n)? y

faultmgmtsp> fmadm faulty
------------------- ------------------------------------ -------------- -------
Time                UUID                                 msgid          Severity
------------------- ------------------------------------ -------------- -------
2016-01-16/17:55:26 f4ee56c-9fdd-ca19-efb5-ae39675dfee3  SPT-8000-PX    Major

Problem Status   : open
Diag Engine      : fdd 1.0
System
  Manufacturer   : Oracle Corporation
  Name           : SPARC S7-2L
  Part_Number    : 12345678+11+1
  Serial_Number  : 1238BDC0DF

----------------------------------------
Suspect 1 of 1
  Fault class  : fault.component.misconfigured
  Certainty    : 100%
  Affects      : /SYS/MB/CMP0/MCU1/CH0/D0
  Status       : faulted
  FRU
     Status      : faulty
     Location    : /SYS/MB/CMP0/MCU1/CH0/D0
     Manufacturer      : Hynix Semiconductor Inc.
     Name              : 8192MB DDR4 SDRAM DIMM
     Part_Number       : 70xx001,HMA4xxR7MFRxx-TFT7
     Revision          : 01
     Serial_Number     : 465769T+02xxx102WR
     Chassis
        Manufacturer   : Oracle Corporation
        Name           : SPARC S7-2L
        Part_Number    : 12345678+13+2
        Serial_Number  : 1248DC140

Description : A FRU has been inserted into a location where it is not
              supported.

Response    : The service required LED on the chassis may be illuminated.
```

```
Impact      : The FRU may not be usable in its current location.

Action      : Please refer to the associated reference document at
              http://support.oracle.com/msg/SPT-8000-PX for the latest
              service procedures and policies regarding this diagnosis.
faultmgmtsp>
```

In this example, a fault is displayed that includes these details:

- Date and time of the fault (`2016-01-16/17:55:26`).
- UUID (`f4ee56c-9fdd-ca19-efb5-ae39675dfee3`), which is unique to each fault.
- Message ID (`SPT-8000-PX`), which can be used to obtain additional fault information from Knowledge Base articles.

2. **Use the message ID to obtain more information about this type of fault.**

   a. **Obtain the message ID from console output (`SPT-8000-PX` in the example above).**

   b. **Go to `https://support.oracle.com`, and search on the message ID in the Knowledge tab, or type the URL from the Action field into a browser.**

3. **Follow the suggested actions to repair the fault.**

4. **If necessary, clear the fault manually.**

   See "Clear a Fault Manually" on page 42.

Related Information

- "Log In to Oracle ILOM (Service)" on page 28
- "Identify Disabled Components" on page 30
- "Component Names Displayed by Diagnostic Software" on page 31

▼ Identify Disabled Components

You can run the `show disabled` command from the Oracle ILOM prompt to identify components that have been disabled either intentionally, by a user, or automatically, because of a fault.

1. **At the Oracle ILOM prompt, type:**

```
-> show disabled
Target                              | Property       | Value
------------------------------------+----------------+--------------------
...
/SYS/MB/CMP0/MCU0/CH0/D0  | disable_reason | Configuration Rules
...
```

2. **For additional information about a disabled component, type the `show -t` command and the Oracle ILOM target.**

   See “Component Names Displayed by Diagnostic Software” on page 31.

   For example:

```
-> show -t /SYS/MB/CMP0/MCU0/CH0/D0
Target                              | Property               | Value
------------------------------------+------------------------+------------
...
/SYS/MB/CMP0/MCU0/CH0/D0            | type                   | DIMM
/SYS/MB/CMP0/MCU0/CH0/D0            | ipmi name              | P0/M3/B0/C1/D0
/SYS/MB/CMP0/MCU0/CH0/D0            | requested_config_state | Enabled
/SYS/MB/CMP0/MCU0/CH0/D0            | current_config_state   | Enabled
/SYS/MB/CMP0/MCU0/CH0/D0            | disable_reason         | Configuration Rules
/SYS/MB/CMP0/MCU0/CH0/D0            | fru_name               | 8192MB DDR4 SDRAM DIMM
...
```

Related Information

- “Log In to Oracle ILOM (Service)” on page 28
- “Identify Faulted Components” on page 28
- “Component Names Displayed by Diagnostic Software” on page 31

Component Names Displayed by Diagnostic Software

Use the information in this table to identify the name of a component that requires service.

Component	Oracle ILOM Target	Links
Battery	`/SYS/MB/BAT`	“Servicing the Battery” on page 113
DIMMs on motherboard	`/SYS/MB/CMP[0-1]/MCU[0-1]/CH[0-1]/D[0-1]`	“Servicing DIMMs” on page 93

Component	Oracle ILOM Target	Links
Drive backplane	/SYS/DBP	"Servicing the Drive Backplane" on page 131
Drives (example of eight drive model)	/SYS/DBP/HDD0 (upper left)	"Servicing Drives" on page 65
	/SYS/DBP/HDD1	
	/SYS/DBP/HDD2 or /SYS/DBP/NVME0	
	/SYS/DBP/HDD3 or /SYS/DBP/NVME1	
	/SYS/DBP/HDD4 or /SYS/DBP/NVME2	
	/SYS/DBP/HDD5 or /SYS/DBP/NVME3	
	/SYS/DBP/HDD6	
	/SYS/DBP/HDD7 (right)	
eUSB drive	/SYS/MB/EUSB_DISK	"Remove the eUSB Drive" on page 109
Fan modules	As viewed from front of server:	"Servicing Fan Modules" on page 77
	/SYS/MB/FM0 (left)	
	/SYS/MB/FM1	
	/SYS/MB/FM2	
	/SYS/MB/FM3 (right)	
Motherboard	/SYS/MB	"Servicing the Motherboard" on page 117
PCIe cards	/SYS/MB/PCIE1	"Servicing PCIe Cards" on page 103
	/SYS/MB/PCIE2	
	/SYS/MB/PCIE3	
	/SYS/MB/PCIE4	
	/SYS/MB/PCIE5	
	/SYS/MB/PCIE6	
	/SYS/MB/PCIE7 (internal PCIe slot)	
Power supplies	/SYS/PS0 (outer)	"Servicing Power Supplies" on page 87
	/SYS/PS1 (inner)	

Related Information

- "Log In to Oracle ILOM (Service)" on page 28

- “Identify Faulted Components” on page 28
- “Identify Disabled Components” on page 30

Interpreting LEDs

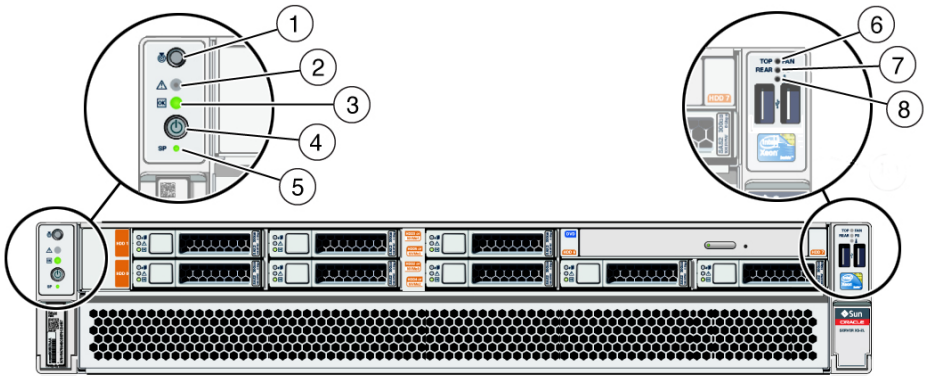
Use these steps to determine if an LED indicates that a component has failed.

Step	Description	Links
1.	Check the LEDs on the front and rear of the server.	■ “Front Panel Controls and LEDs” on page 34 ■ “Rear Panel Controls and LEDs” on page 35
2.	Check the LEDs on the individual components. Component LEDs might not be lit even though the component is faulty. Rely on software to determine if a component is faulty, see “Identify Faulted Components” on page 28.	■ “Servicing Drives” on page 65 ■ “Servicing Fan Modules” on page 77 ■ “Servicing Power Supplies” on page 87 ■ “Servicing DIMMs” on page 93 ■ “Servicing PCIe Cards” on page 103 ■ “Servicing the Motherboard” on page 117

Related Information

- “Checking for Faults” on page 27
- “Performing Advanced Troubleshooting” on page 36
- “Clear a Fault Manually” on page 42

Front Panel Controls and LEDs



No.	LED	Icon or Label	Description
1	System Server Locator LED and button (white)		You can turn on the Locator LED to identify a particular server. When lit, the LED blinks rapidly. The blinking will time out after 15 minutes. Turn on the Locator LED by pressing the Locator button, or see "Locate the Server" on page 49.
2	Service Required LED (amber)		The `fmadm faulty` command provides details about any faults that cause this indicator to light. See "Identify Faulted Components" on page 28. Under some fault conditions, individual component fault LEDs are lit in addition to the Service Required LED.
3	Power OK LED (green)	OK	Indicates these conditions: ■ **Off** – Server is not running in its normal state. Server power might be off. The SP might be running. ■ **Steady on** – Server is powered on and is running in its normal operating state. No service actions are required. ■ **Fast blink** – Server is running in standby mode and can be quickly returned to full function. ■ **Slow blink** – A normal but transitory activity is taking place. Slow blinking might indicate that server diagnostics are running or that the server is booting.
4			
5	SP OK LED	SP	Indicates these conditions: ■ **Off** – AC power might have been connected to the power supplies.

No.	LED	Icon or Label	Description
			■ **Steady on, green** – SP is running in its normal operating state. No service actions are required. ■ **Blink, green** – SP is initializing the Oracle ILOM firmware. ■ **Steady on, amber** – An SP error has occurred and service is required.
6	Fan Module Fault LED (amber)	FAN	Indicates these conditions: ■ **Off** – Steady state, no service action is required. ■ **Steady on** – A fan module failure event has been acknowledged and a service action is required on at least one of the fan modules.
7	Server Power Supply Fault LED (amber)	PS	Indicates these conditions: ■ **Off** – Steady state, no service action is required. ■ **Steady on** – A fault has been detected on one of the two power supplies.
8	Server Overtemp LED (amber)		Indicates these conditions: ■ **Off** – Steady state, no service action is required. ■ **Steady on** – A temperature failure event has been acknowledged. A temperature limit has been exceeded, and a service action is required.

Related Information

- “Rear Panel Controls and LEDs” on page 35
- “Checking for Faults” on page 27

Rear Panel Controls and LEDs

No.	LED	Icon or Label	Description
1	PS Fault LED (amber)		Indicates these conditions: ■ **Off** – Steady state, no service action is required. ■ **Steady on** – A fault has been detected on this power supply.
2	PS DC OK LED (green)		Indicates these conditions: ■ **Off** – 12V DC output from this power supply is disabled or not within specification. ■ **Steady on** – 12V DC output from this power supply is present and within specifications.
3	Locator LED and button (white)		Turn on the Locator LED by pressing the Locator button, or see “Locate the Server” on page 49. When lit, the LED blinks rapidly. The blinking will time out after 15 minutes.

No.	LED	Icon or Label	Description
4	Service Required LED (amber)		The `fmadm faulty` command provides details about any faults that cause this indicator to light. See “Identify Faulted Components” on page 28. Under some fault conditions, individual component fault LEDs are lit in addition to the Service Required LED.
5	Power OK LED (green)		Indicates these conditions: ■ **Off** – Server is not running in its normal state. Server power might be off. The SP might be running. ■ **Steady on** – Server is powered on and is running in its normal operating state. No service actions are required. ■ **Fast blink** – Server is running in standby mode and can be quickly returned to full function. ■ **Slow blink** – A normal but transitory activity is taking place. Slow blinking might indicate that system diagnostics are running or that the system is booting.
6	Host Ethernet Port Link/ Activity LED (green) From left to right, NET 1, NET 0, NET 3, and NET 2.		Indicates these conditions: ■ **Off** – No link is established. ■ **Steady On** – A link is established. ■ **Blinking** – A link is established, and there is activity on the port.
7	NET MGT Port Link and Activity LED (green on left) NET MGT Port Speed LED (green on right)	LINK/ACT SPD	Indicates these conditions: ■ **Off** – No link is established. ■ **Steady On** – A link is established. ■ **Blinking** – A link is established and there is activity on the port. Indicates these conditions: ■ **Off** – The link is operating as a 10 Mbps connection. ■ **Steady On** – The link is operating as a 100 Mbps connection.

Related Information

- “Front Panel Controls and LEDs” on page 34
- “Checking for Faults” on page 27

Performing Advanced Troubleshooting

If you are unable to diagnose faults using the methods provided in “Checking for Faults” on page 27, use any of the following methods to diagnose faults on the server.

Description	Links
Generate and examine diagnostic information.	“Check the Message Buffer” on page 37
Examine log files for additional information about the server.	“View Log Files (Oracle Solaris)” on page 37 “View Log Files (Oracle ILOM)” on page 38
Generate and examine low-level diagnostic information generated by POST.	“POST Overview” on page 39 “Configure POST” on page 39 “Oracle ILOM Properties That Affect POST Behavior” on page 41

Related Information

- “Checking for Faults” on page 27
- “Interpreting LEDs” on page 33
- “Clear a Fault Manually” on page 42

▼ Check the Message Buffer

The `dmesg` command checks the system buffer for recent diagnostic messages and displays the messages.

1. **Log in as superuser.**
2. **Type:**

```
# dmesg
```

Related Information

- “View Log Files (Oracle Solaris)” on page 37
- “View Log Files (Oracle ILOM)” on page 38
- “POST Overview” on page 39

▼ View Log Files (Oracle Solaris)

The error logging daemon, `syslogd`, automatically records various system warnings, errors, and faults in message files. These messages can alert you to system problems such as a device that is about to fail.

The `/var/adm` directory contains several message files. The most recent messages are in the `/var/adm/messages` file. After a period of time (usually every week), a new `messages` file is automatically created. The original contents of the `messages` file are rotated to a file named `messages.1`. Over a period of time, the messages are further rotated to `messages.2` and `messages.3`, and then deleted.

1. **Log in as superuser.**
2. **Type:**

```
# more /var/adm/messages
```

3. **To view all logged messages, type:**

```
# more /var/adm/messages*
```

Related Information

- “Check the Message Buffer” on page 37
- “View Log Files (Oracle Solaris)” on page 37
- “POST Overview” on page 39

▼ View Log Files (Oracle ILOM)

1. **View the event log.**

```
-> show /SP/logs/event/list
```

2. **View the audit log.**

```
-> show /SP/logs/audit/list
```

Related Information

- “Check the Message Buffer” on page 37
- “View Log Files (Oracle Solaris)” on page 37
- “POST Overview” on page 39

POST Overview

POST is a group of PROM-based tests that run when the server is powered on or reset. POST checks the basic integrity of the critical hardware components in the server.

You can also set other Oracle ILOM properties to control various other aspects of POST operations. For example, you can specify the events that cause POST to run, the level of testing POST performs, and the amount of diagnostic information POST displays. Refer to the section on setting the SPARC host keyswitch state in the *Oracle ILOM Administrator's Guide for Configuration and Maintenance Firmware Release 3.2.x* for a list of parameters and values.

If POST detects a faulty component, the component is disabled automatically. If the server is able to run without the disabled component, the server boots when POST completes its tests. For example, if POST detects a faulty processor core, the core is disabled, POST completes its test sequence, and the server boots using the remaining cores.

Related Information

- "Configure POST" on page 39
- "Oracle ILOM Properties That Affect POST Behavior" on page 41

▼ Configure POST

1. **Log in to Oracle ILOM.**
   See "Log In to Oracle ILOM (Service)" on page 28.

2. **Set the virtual keyswitch to the value that corresponds to the POST configuration you want to run.**
   This example sets the virtual keyswitch `default_level` to `min`, which configures POST to run according to other parameter values.

```
-> set /HOST default_level=min
Set default_level to min
```

   For possible values for the `default_level` parameter, type:

```
-> help /HOST diag

/HOST/diag : Manage Host Power On Self Test Diagnostics

Targets:
```

```
Properties:
default_level : Diag level in the default cause (no error or hw change)
default_level : Possible values = off, min, max
default_level : User role required for set = r

default_verbosity : Diag verbosity in the default cause (no error or hw
                            change)
default_verbosity : Possible values = none, min, normal, max
default_verbosity : User role required for set = r

error_level : Diag level when running after an error reset
error_level : Possible values = off, min, max
error_level : User role required for set = r

error_verbosity : Diag verbosity when running after an error reset
error_verbosity : Possible values = none, min, normal, max
error_verbosity : User role required for set = r

hw_change_level : Diag level when running after a hw change
hw_change_level : Possible values = off, min, max
hw_change_level : User role required for set = r

hw_change_verbosity : Diag verbosity when running after a hw change
hw_change_verbosity : Possible values = none, min, normal, max
hw_change_verbosity : User role required for set = r

->
```

Note - When the verbosity value is set to *none*, the console might not display any POST test status for extended periods of time on certain configurations.

3. (Optional) Set the virtual keyswitch to determine the diagnostic level after an error reset and after a hardware change.

To set `error_level`, to `max`, and to set `hw_change_level` to `max`, type:

```
-> set /HOST/diag error_level=max
-> set /HOST/diag hw_change_level=max
```

Refer to the section on setting the SPARC host keyswitch state in the *Oracle ILOM Administrator's Guide for Configuration and Maintenance Firmware Release 3.2.x* for a description of parameters and values.

4. View the current values for settings.

For example:

```
-> show /HOST/diag
```

```
/HOST/diag
   Targets:

   Properties:
        default_level = off
        default_verbosity = normal
        error_level = max
        error_verbosity = normal
        hw_change_level = max
        hw_change_verbosity = normal


   Commands:
        cd
        set
        show
->
```

Related Information

- “POST Overview” on page 39
- “Oracle ILOM Properties That Affect POST Behavior” on page 41

Oracle ILOM Properties That Affect POST Behavior

There are a number of Oracle ILOM commands that you can use to perform host diagnostic tests. For details about using these commands, refer to the chapter that describes configuring host server management actions in the *Oracle ILOM Administrator's Guide for Configuration and Maintenance Firmware Release 3.2.x.*

Related Information

- “POST Overview” on page 39
- “Configure POST” on page 39

Clear a Fault Manually

When the server detects faults, the faults are logged and displayed on the console. In most cases, after the fault is repaired the fault condition is repaired automatically. In cases where the fault condition is not automatically cleared, you must clear the fault manually.

1. **After replacing a faulty component, power on the server, and verify that the fault for that component has cleared.**

   Use the `fmadm faulty` command to confirm that the fault is clear.

2. **Determine your next step.**

   - **If no fault was detected, you do not need to do anything else. Do not perform the subsequent steps.**
   - **If a fault was detected, continue to the next step.**

3. **Clear the fault from all persistent fault records.**

   In some cases, even though the fault is cleared, some persistent fault information remains and results in erroneous fault messages at boot time. To ensure that these messages are not displayed, type:

   ```
   faultmgmtsp> fmadm replaced FRU
   ```

   Fault UUID numbers are displayed in `fmadm faulty` output.

4. **If required, reset the server.**

   In some cases, the output of the `fmadm faulty` command might include this message for the faulty component:

   `faulted and taken out of service.`

   If this message appears in the output, you must reset the server after you manually repair the fault.

   ```
   faultmgmtsp> exit
   -> reset /System
   Are you sure you want to reset /System? y
   Resetting /System ...
   ```

5. **Clear the fault in the Oracle Enterprise Manager Ops Center software, if applicable.**

Clearing a fault with the `fmadm aquit` command does not clear that fault in the Oracle Enterprise Manager Ops Center software. You must manually clear the fault or incident. For more information, refer to the section on marking an incident repaired in the *Oracle Enterprise Manager Ops Center Feature Reference Guide* at:

http://www.oracle.com/pls/topic/lookup?ctx=oc122

6. **If you are servicing a component, return to the procedure for that component.**

Related Information

- “Checking for Faults” on page 27
- “Interpreting LEDs” on page 33
- “Performing Advanced Troubleshooting” on page 36

Preparing for Service

These topics describe how to prepare the server for servicing.

Step	Description	Links
1.	Review safety and handling information.	“Safety Information” on page 45
2.	Gather the tools needed for service.	“Tools Needed For Service” on page 47
3.	Consider filler options.	“Fillers” on page 47
4.	Review component service categories.	“Component Service Categories” on page 49
5.	Find the server serial number.	“Find the Server Serial Number” on page 48
6.	Identify the server to be serviced.	“Locate the Server” on page 49
7.	For cold-service operations, shut down the OS and remove power from the server.	“Removing Power From the Server” on page 50
8.	Move the server out of the rack and remove covers as necessary to gain access to internal components.	“Accessing Server Components” on page 54
9.	Attach devices to the server to perform service procedures.	“Attachment of Devices During Service” on page 62

Related Information

- “Identifying Components” on page 11
- “Returning the Server to Operation” on page 149

Safety Information

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

- Follow all cautions and instructions marked on the equipment and described in the documentation shipped with your server.
- Follow all cautions and instructions marked on the equipment and described in the *SPARC S7-2L Safety and Compliance Guide*.

- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment's electrical rating label.
- Follow the ESD safety practices as described in this section.

Safety Symbols

Note the meanings of the following symbols that might appear in this document:

Caution - There is a risk of personal injury or equipment damage. To avoid personal injury and equipment damage, follow the instructions.

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

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

ESD Measures

ESD sensitive devices, such as the cards, drives, and DIMMS, require special handling.

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

Caution - You must disconnect all power supplies before servicing any of the components that are inside the chassis.

Antistatic Wrist Strap Use

Wear an antistatic wrist strap and use an antistatic mat when handling components such as drive assemblies, circuit boards, or PCIe cards. When servicing or removing server components, attach an antistatic strap to your wrist and then to a metal area on the chassis. Following this practice equalizes the electrical potentials between you and the server.

Note - An antistatic wrist strap is no longer included in the accessory kit for this server. However, antistatic wrist straps are still included with options.

Antistatic Mat

Place ESD-sensitive components such as motherboards, memory, and other PCBs on an antistatic mat.

Related Information

- “Prevent ESD Damage” on page 54
- “Tools Needed For Service” on page 47

Tools Needed For Service

You need the following tools for most service operations:

- Antistatic wrist strap
- Antistatic mat
- No. 2 Phillips screwdriver
- No. 1 flat-blade screwdriver (battery removal)
- T6 Torx screwdriver

Related Information

- “Safety Information” on page 45
- “Prevent ESD Damage” on page 54

Fillers

A filler is an empty metal or plastic enclosure that is installed at the factory or in the field into a server component slot that does not contain a functioning component. The fillers ensure proper airflow through the system. Depending on the component configuration, the server can include the following types of fillers:

- Drive filler
- PCIe filler (covering back panel, not inserted in the PCIe slot)

Caution - When you remove a server component while the server is connected to power, insert a new component or filler within 60 seconds to ensure proper system chassis cooling. After you complete cold-servicing, ensure that all fillers are in place before connecting the server to power.

Related Information

- “Servicing Drives” on page 65
- “Servicing PCIe Cards” on page 103
- “Returning the Server to Operation” on page 149

Find the Server Serial Number

You need the serial number of the server's chassis to obtain technical support for the system.

Note - When a drive backplane or motherboard is replaced, the chassis serial number and part number might need to be programmed into the new component. This must be done in a special service mode by trained service personnel.

- **Locate the serial number using one of the following methods:**
  - **Read the serial number from a sticker located on the front of the server or another sticker on the side of the server.**
  - **At the Oracle ILOM prompt, type.**

```
-> show /System

/System
   Targets:
. . .
```

In the output look for a line under Properties that identifies the product serial number. For example:

```
product_serial_number = BDL1026F8F
```

Related Information

- “Front Panel Components with Eight Drives” on page 11

▼ Locate the Server

You can use the Server Locator LEDs to identify one particular server from many other servers.

1. **At the Oracle ILOM prompt, type:**

```
-> set /System/locator_indicator=on
```

The white Server Locator LEDs (one on the front panel and one on the rear panel) blink for about 30 minutes before turning off.

2. **After locating the server with the blinking Locator LED, turn it off by pressing the Server Locator button.**

Alternatively, you can type an Oracle ILOM command to turn off the Locator LED.

```
-> set /System/locator_indicator=off
```

Related Information

- “Front Panel Components with Eight Drives” on page 11

Component Service Categories

The server components and assemblies that can be replaced in the field fall into three categories:

- Hot-service, replaceable by customer
- Cold-service, replaceable by customer
- Cold-service, replaceable by authorized service personnel

Cold-service procedures require that you shut the server down and unplug the power cables that connect the power supplies to the power source.

Although hot-service procedures can be performed while the server is running, you should usually bring it to standby mode as the first step in the replacement procedure. See “Power Off the Server (Server Power Button - Graceful)” on page 52 for instructions.

The following table identifies the components in each category.

Component service Category	Component	Service information	Notes
Hot-service, replaceable by customer	Drive	"Servicing Drives" on page 65	Drive must be offline.
	Drive filler	"Servicing Drives" on page 65	Needed to preserve proper interior air flow.
	Power supply	"Servicing Power Supplies" on page 87	Hot-service if two power supplies are in use. Otherwise, cold-service.
	Fan	"Servicing Fan Modules" on page 77	Removal of a fan requires replacement within 5 minutes to avoid overheating.
Cold-service, replaceable by customer	DIMMs	"Servicing DIMMs" on page 93	
	PCIe cards	"Servicing PCIe Cards" on page 103	
	Battery	"Servicing the Battery" on page 113	
	SC PROM	"Servicing the Motherboard" on page 117	
	eUSB Drive		
Cold-service, replaceable by authorized service personnel	Motherboard	"Servicing the Motherboard" on page 117	Transfer system configuration PROM to new motherboard.
	Drive backplane	"Servicing the Drive Backplane" on page 131	
	LED indicator modules (front left and front right)		

Related Information

- "Internal Component Locations" on page 20

Removing Power From the Server

These topics describe how to power off the server.

Step	Description	Links
1.	Prepare the server for powering off.	"Prepare to Power Off the Server" on page 51
2.	Power off the server by one of three methods.	"Power Off the Server (Oracle ILOM)" on page 52

Step	Description	Links
		"Power Off the Server (Server Power Button - Graceful)" on page 52 "Power Off the Server (Emergency Shutdown)" on page 53
3.	Disconnect the power cords from the server.	"Disconnect Power Cords" on page 53

Related Information

- "Front Panel Components with Eight Drives" on page 11

▼ Prepare to Power Off the Server

Perform this procedure before powering off the server.

1. **Log in as superuser or equivalent.**

   Depending on the type of problem, you might want to view server status or log files. You also might want to run diagnostics before you shut down the server.

2. **Notify affected users that the server will be shut down.**

   Refer to the Oracle Solaris system administration documentation for additional information.

3. **Save any open files and quit all running programs.**

   Refer to your application documentation for specific information on these processes.

4. **Shut down all LDoms.**

   Refer to Oracle Solaris system administration and Oracle VM Server for SPARC documentation for additional information.

5. **Shut down the Oracle Solaris OS.**

   Refer to the Oracle Solaris system administration documentation for additional information.

Related Information

- "Power Off the Server (Server Power Button - Graceful)" on page 52
- "Power Off the Server (Emergency Shutdown)" on page 53
- "Front Panel Components with Eight Drives" on page 11

Power Off the Server (Oracle ILOM)

You can use the SP to perform a graceful shutdown of the server, and to ensure that all of your data is saved and the server is ready for restart.

Note - Additional information about powering off the server is provided in the *SPARC S7-2 Series Servers Administration Guide*.

1. **Prepare to power off the server.**

   See “Prepare to Power Off the Server” on page 51.

2. **Switch from the system console to the Oracle ILOM prompt by typing the #. (Hash-Dot) key sequence.**

3. **Power off the server.**

```
-> stop /System
```

Note - You can also use the Server Power button on the front of the server to initiate a graceful server shutdown. (See “Power Off the Server (Server Power Button - Graceful)” on page 52.)

Related Information

- “Prepare to Power Off the Server” on page 51
- “Power Off the Server (Server Power Button - Graceful)” on page 52
- “Power Off the Server (Emergency Shutdown)” on page 53
- “Front Panel Components with Eight Drives” on page 11

Power Off the Server (Server Power Button - Graceful)

This procedure places the server in the power standby mode. In this mode, the Power OK LED blinks rapidly.

1. **Prepare to power off the server.**

   See “Prepare to Power Off the Server” on page 51.

2. **Press and release the Power button.**

   You might need to use a pointed object, such as a pen or pencil.

Related Information

- “Prepare to Power Off the Server” on page 51
- “Power Off the Server (Oracle ILOM)” on page 52
- “Power Off the Server (Emergency Shutdown)” on page 53
- “Front Panel Components with Eight Drives” on page 11

▼ Power Off the Server (Emergency Shutdown)

Caution - All applications and files will be closed abruptly without saving changes. File system corruption might occur.

1. **Prepare to power off the server.**

   See “Prepare to Power Off the Server” on page 51.

2. **Press and hold the Power button for five seconds.**

Related Information

- “Prepare to Power Off the Server” on page 51
- “Power Off the Server (Oracle ILOM)” on page 52
- “Power Off the Server (Server Power Button - Graceful)” on page 52
- “Front Panel Components with Eight Drives” on page 11

▼ Disconnect Power Cords

Remove the power cords from the server only after powering off the server.

- **Unplug all power cords from the server.**

Caution - Because 3.3V standby power is always present in the server, you must unplug the power cords before accessing any cold-serviceable components.

Related Information

- “Safety Information” on page 45
- “Power Off the Server (Oracle ILOM)” on page 52
- “Power Off the Server (Server Power Button - Graceful)” on page 52
- “Power Off the Server (Emergency Shutdown)” on page 53
- “Rear Panel Components” on page 19

Accessing Server Components

These topics explain how to access components on the outside and the inside of the server. Perform these tasks in this order, as needed.

- “Prevent ESD Damage” on page 54
- “Extend the Server to the Service Position” on page 55
- “Release the CMA” on page 56
- “Remove the Server From the Rack” on page 58
- “Remove the Top Cover” on page 59
- “Remove the Air Baffle” on page 60
- “Remove the Fan Cover” on page 60

Related Information

- “Safety Information” on page 45

▼ Prevent ESD Damage

Many components housed within the chassis can be damaged by ESD. To protect these components from damage, perform the following steps before opening the chassis for service.

1. **Prepare an antistatic surface to set parts on during the removal or installation process.**

   Place ESD-sensitive components such as the printed circuit boards on an antistatic mat. The following items can be used as an antistatic mat:

   - Antistatic bag used to wrap a replacement part

- ESD mat
- Disposable ESD mat (shipped with some replacement parts or optional components)

2. **Attach an antistatic wrist strap.**

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

   See "Safety Information" on page 45.

Related Information

- "Safety Information" on page 45

▼ Extend the Server to the Service Position

You can service the following components with the server in the service position:

- Drives or fillers
- Power supplies
- Fans
- DIMMs
- PCIe cards
- eUSB drive
- Battery

Note - You can replace the drives and rear power supplies without extending the server into the service position.

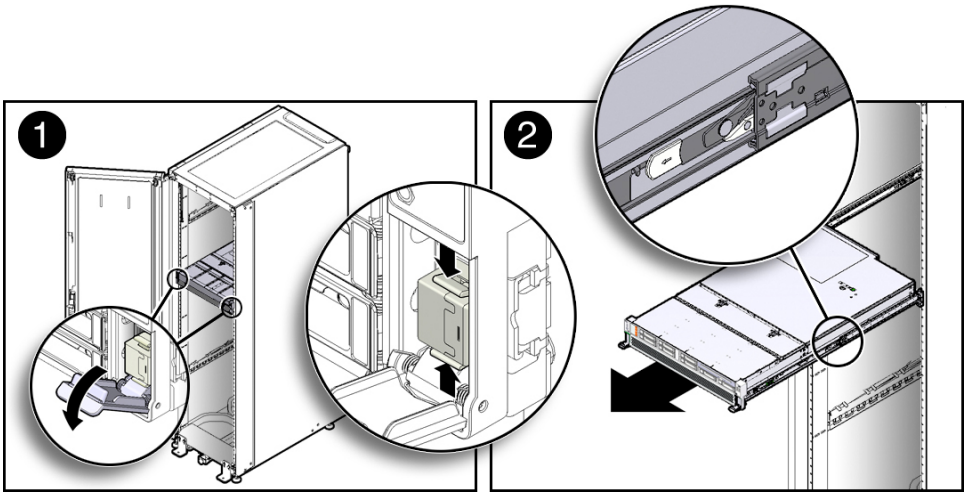
---

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

   Although the CMA that is supplied with the server is hinged to accommodate extending the server, you should ensure that all cables and cords are capable of extending.

2. **From the front of the server, release the two slide release latches.**

Squeeze the green slide release latches to release the slide rails.



3. **While squeezing the slide release latches, slowly pull the server forward until the slide rails latch.**

Related Information

- “Release the CMA” on page 56
- “Remove the Server From the Rack” on page 58

▼ Release the CMA

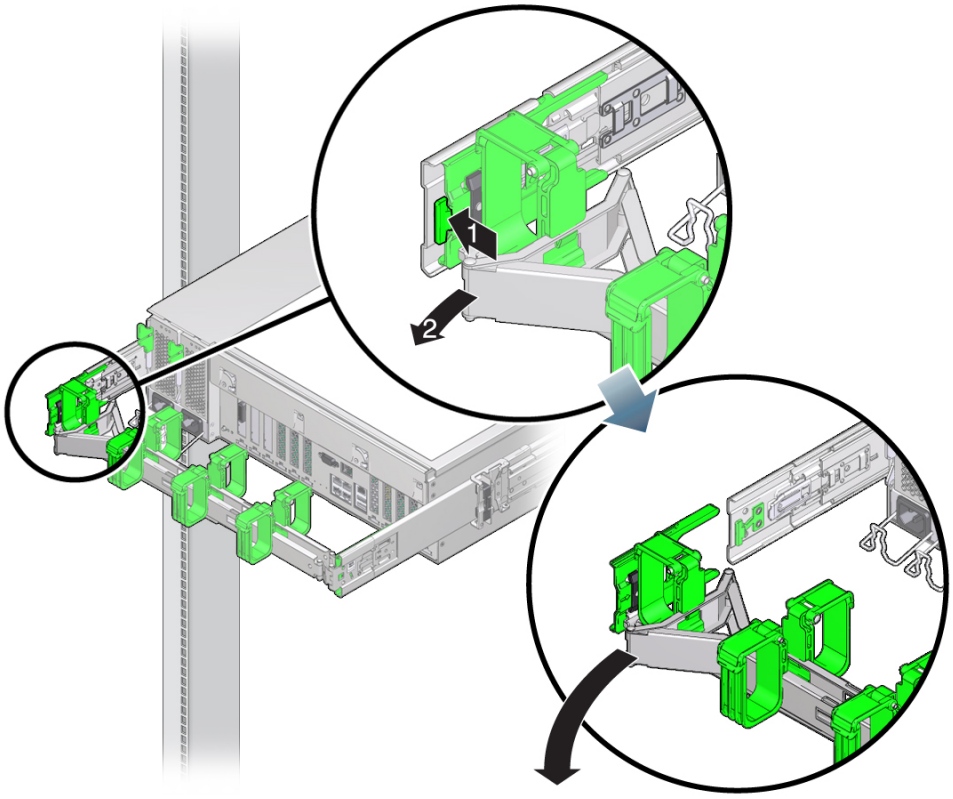
For some service procedures, such as replacing a power supply, if you are using a CMA, you might need to release the CMA to gain access to the rear of the chassis.

Note - For instructions on how to install the CMA for the first time, refer to the *SPARC S7-2 Series Servers Administration Guide*.

---

1. **Press and hold the tab.**

The tab is on the inside rear of the left side of the CMA.



2. **Swing the CMA out of the way.**
   Do not allow the CMA to hang unsupported while it is unattached.

3. **When you have finished the service steps that require the CMA to be out of the way, swing the CMA closed and latch it to the left rack rail.**
   Check that the CMA and the cables are functioning properly after completing service.

Related Information

- “Extend the Server to the Service Position” on page 55
- “Remove the Server From the Rack” on page 58
- “Returning the Server to Operation” on page 149

Remove the Server From the Rack

You must remove the server from the rack to remove or install these components:

- Motherboard
- Drive backplane

Caution - The server chassis is heavy. To avoid personal injury, use two people to remove the server from the rack.

1. **Shut down the host.**
2. **Remove power from the server.**

   See “Removing Power From the Server” on page 50.
3. **Disconnect all the cables and power cords from the server.**
4. **Extend the server to the maintenance position.**

   See “Extend the Server to the Service Position” on page 55.
5. **Release the optional CMA from the rail assembly.**

   The CMA is still attached to the cabinet, but the server chassis is now disconnected from the CMA. See “Release the CMA” on page 56.
6. **From the front of the server, pull the release tabs forward and pull the server forward until it is free of the rack rails.**

   A release tab is located on each rail.
7. **Set the server on a sturdy work surface.**

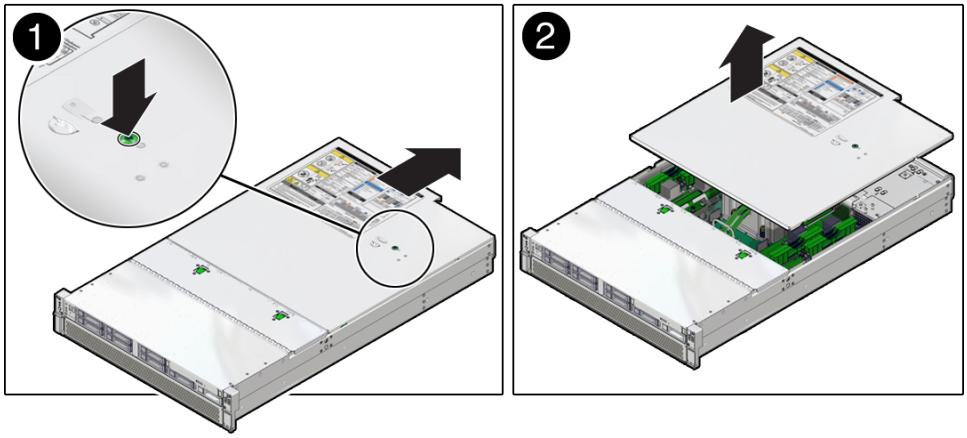
Related Information

- “Extend the Server to the Service Position” on page 55
- “Release the CMA” on page 56
- “Remove the Top Cover” on page 59

Remove the Top Cover

Caution - Removing the top cover without properly powering down the server and disconnecting the AC power cords from the power supplies results in a chassis intrusion switch failure. This failure causes the server to be immediately powered off. Any changes you make to the DIMM configurations will not be properly reflected in the service processor's inventory until you replace the top cover.

1. **Ensure that the AC power cords are disconnected from the server power supplies.**
2. **Press the green button to release the top cover (panel 1).**



3. **Slide the cover towards the rear of the server chassis about 0.5 inch (12 mm).**
4. **Lift up and remove the top cover (panel 2).**

Related Information

- “Replace the Top Cover” on page 152
- “Remove the Air Baffle” on page 60
- “Remove the Fan Cover” on page 60

Remove the Air Baffle

To access some components, you must remove the transparent air baffle.

- **Grip the middle ridge of the air baffle and lift it straight up.**

Related Information

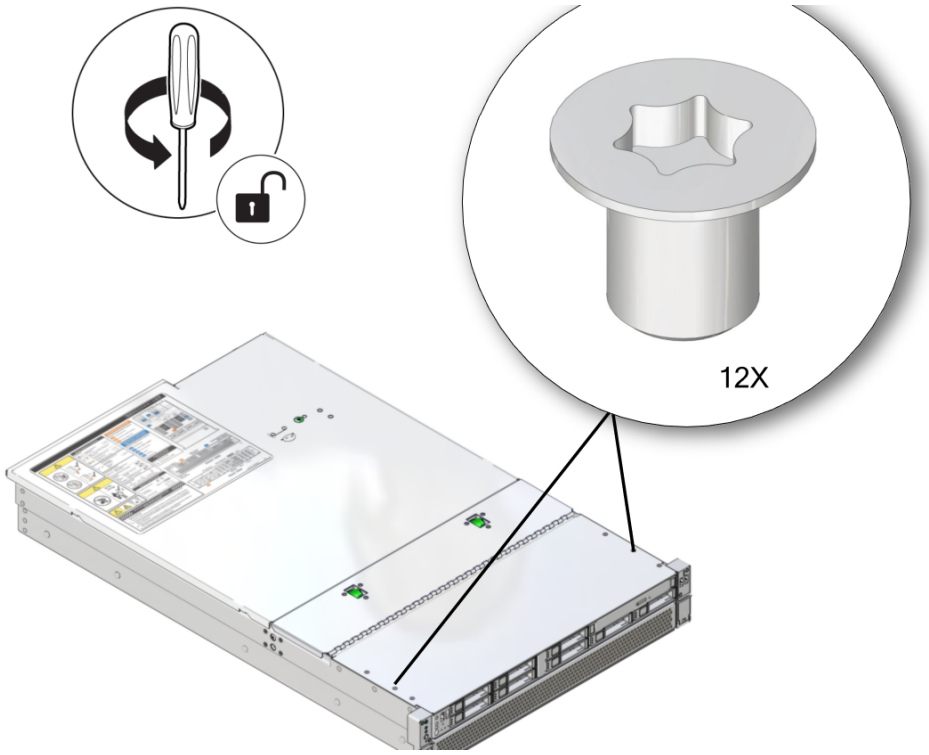
- “Install the Air Baffle” on page 151
- “Remove the Top Cover” on page 59
- “Remove the Fan Cover” on page 60

Remove the Fan Cover

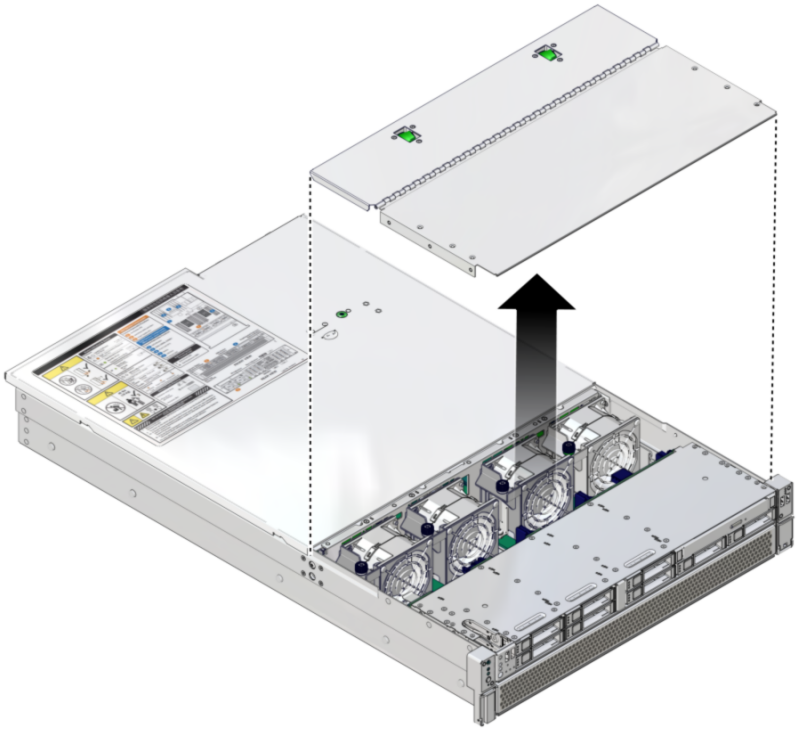
To access some components, you must remove the fan cover.

1. **Remove 12 screws on the top and side of the fan cover.**

Use a T6 Torx screwdriver.



2. **Lift the fan cover from the server.**



Related Information

- “Replace the Fan Cover” on page 149
- “Remove the Air Baffle” on page 60
- “Remove the Top Cover” on page 59

Attachment of Devices During Service

During service procedures, you might have to connect devices to the server.

- For OS support, connect an Ethernet cable to the one of the Ethernet connectors (NET 0, NET 1, NET 2, or NET 3).

- If you plan to interact with the system console directly, you can connect additional external devices, such as a mouse and keyboard, to the server's USB connectors.
- If you plan to connect to the Oracle ILOM software over the network, connect an Ethernet cable to the Ethernet port labeled NET MGT.

Note - The SP uses the NET MGT (out-of-band) port by default. You can configure the SP to share one of the server's four Ethernet ports instead. The SP uses only the configured Ethernet port.

- If you plan to access the Oracle ILOM CLI through the management port, connect a serial null modem cable to the RJ-45 serial port labeled SER MGT.
- The USB connectors on the front panel support USB 2.0.

Related Information

- “Front Panel Components with Eight Drives” on page 11
- “Rear Panel Components” on page 19
- “Detecting and Managing Faults” on page 27
- “Connecting Cables” in *SPARC S7-2L Server Installation Guide*

Servicing Drives

The server provides several configurations of available drives, depending on the drive backplane and supporting PCIe cards in that model.

Drives	Interface support	Links
Eight 2.5-inch drives in the front. Four can be NVMe drives.	SAS card in internal PCIe slot 7. NVMe drives supported by the motherboard interface.	
Twelve 3.5-inch SAS drives in the front. Two 2.5-inch SAS drives in the rear.	Backplane expander card.	
Twenty-four 2.5-inch drives in the front. Four can be NVMe drives. Two 2.5-inch SAS drives in the rear.	Backplane expander card. NVMe drives supported by the motherboard interface.	
Twelve 2.5-inch NVMe drives in the front.	Motherboard interface, and three NVMe switch cards in PCIe slots x,x,x.	

Drives can be removed and installed while the server is running. This feature, referred to as being *hot-serviceable*, depends on how the drives are configured.

Note - The server supports traditional, disk-based storage devices and Flash SSDs, which are diskless storage devices based on solid-state memory. The server also can support NVMe drives. Either type of drive can be a boot device. The term “drive” is used in a generic sense to refer to all three types of internal storage devices.

These topics explain how to service drives.

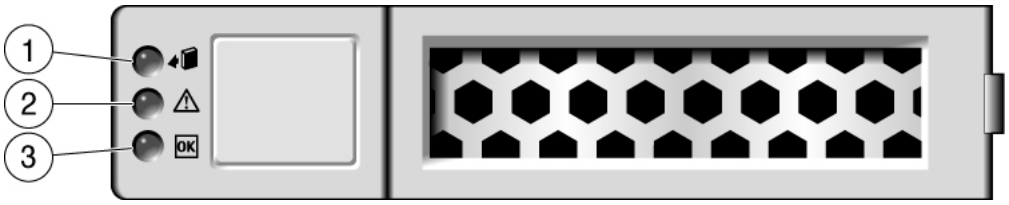
- “Drive LEDs” on page 66
- “Determine Which Drive Is Faulty” on page 67
- “Remove a Drive or Drive Filler” on page 68

- “Install a Drive or Drive Filler” on page 72
- “Verify a Drive” on page 73

Related Information

- “Component Service Categories” on page 49

Drive LEDs



The following table explains how to interpret the drive status LEDs.

	LED		Color	Description
1	Ready to Remove		Blue	Indicates that a drive can be removed during a hot-service operation.
2	Service Required		Amber	Indicates that the drive has experienced a fault condition.
3	OK/Activity (hard drives)		Green	Indicates the drive's availability for use. ■ **On –** Read or write activity is in progress. ■ **Off –** Drive is idle and available for use.
3	OK/Activity (SSDs)		Green	Indicates the drive's availability for use. ■ **On –** Read or write activity is in progress. ■ **Off –** Drive is idle and available for use. ■ **Flashes on and off –** This situation occurs during hot-service operations. You can ignore this situation.

Note - The front and rear panel Service Required LEDs are also lit when the server detects a drive fault. See “Front Panel Components with Eight Drives” on page 11 and “Rear Panel Components” on page 19.

Related Information

- “Front Panel Components with Eight Drives” on page 11
- “Rear Panel Components” on page 19
- “Remove a Drive or Drive Filler” on page 68
- “Install a Drive or Drive Filler” on page 72
- “Verify a Drive” on page 73

▼ Determine Which Drive Is Faulty

You must determine which drive is faulty before you replace it.

1. **Check to see if any System Service Required LEDs are lit or flashing.**

   See “Interpreting LEDs” on page 33.

2. **Visually inspect the drive to see if any of its status LEDs are lit or flashing.**

   See “Drive LEDs” on page 66.

   If the drive is faulty, replace it. See “Remove a Drive or Drive Filler” on page 68.

3. **If you are unable to identify the faulty drive, seek further information.**

   See “Detecting and Managing Faults” on page 27.

4. **Remove the faulty drive.**

   See “Remove a Drive or Drive Filler” on page 68.

Related Information

- “Drive LEDs” on page 66
- “Remove a Drive or Drive Filler” on page 68
- “Install a Drive or Drive Filler” on page 72
- “Verify a Drive” on page 73
- “Detecting and Managing Faults” on page 27

Remove a Drive or Drive Filler

You can perform this procedure while the server is running. See “Component Service Categories” on page 49 for more information about hot-service procedures.

To hot-service a drive, you must first take it offline. This action prevents applications from accessing the drive and removes software links to it.

1. **Determine which drive needs to be removed.**

   See “Determine Which Drive Is Faulty” on page 67.

2. **Determine if you need to shut down the OS to replace the drive, and perform one of the following actions:**

   - **If the drive contains the sole image of the OS or cannot be logically isolated from the server's online operations, shut down the OS as described in “Power Off the Server (Oracle ILOM)” on page 52. Then go to Step 5.**
   - **If the drive can be taken offline without shutting down the OS, go to the next step.**

3. **Take the drive offline.**

   - **For a standard drive:**

     a. **At the Oracle Solaris prompt, list all drives in the device tree, including drives that are not configured.**

     ```
     # cfgadm -al
     ```

     This command lists dynamically reconfigurable hardware resources and shows their operational status. In this case, look for the status of the drive you plan to remove. This information is listed in the `Occupant` column.

     ```
     Ap_id                  Type         Receptacle   Occupant       Condition
     c0                     scsi-bus     connected    configured     unknown
     c0::dsk/c1t0d0         disk         connected    configured     unknown
     c0::dsk/c1t0d0         disk         connected    configured     unknown
     usb0/1                 unknown      empty        unconfigured   ok
     usb0/2                 unknown      empty        unconfigured   ok
     ...
     ```

You must unconfigure any drive you plan to remove.

b. Unconfigure the drive using the `cfgadm -c unconfigure` command.

For example, type:

```
# cfgadm -c unconfigure c0::dsk/c1t1d0
```

Replace `c0:dsk/c1t1d0` with the drive name that applies to your situation.

c. Verify that the drive's blue Ready to Remove LED is lit.

- **For an NVMe Drive:**

a. Determine the name of the NVMe drive to be removed.

```
# hotplug list -lc
```

Locate the name of the drive, such as `/SYS/DBP/NVME0` in this example.

You can use this same command to check the state of the drive at other stages of the removal procedure.

b. Disable the NVMe drive.

```
# hotplug disable /SYS/DBP/NVME0
```

Check that the drive's state has changed from `enabled` to `powered`.

```
# hotplug list -lc
```

c. Power down the NVMe drive.

```
# hotplug poweroff /SYS/DBP/NVME0
```

Check that the drive's state has changed from `powered` to `present`.

```
# hotplug list -lc
```

In this state, the blue OK to Remove LED on the NVMe drive is lit.

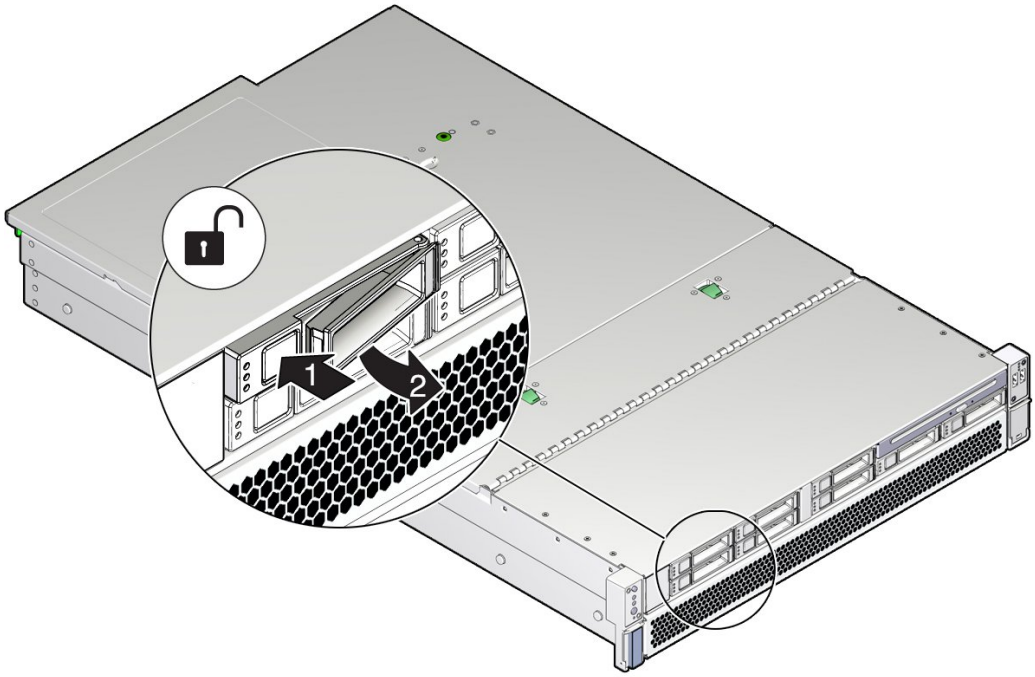
Note - Do not remove the drive unless the blue OK to Remove LED is lit.

4. **If you are hot-servicing the drive, locate the drive that displays the amber Fault LED and ensure that the blue Ready to Remove LED is lit.**

5. **If you are cold-servicing the drive, power off the server. Complete one of the procedures described in "Removing Power From the Server" on page 50.**

6. **Attach an antistatic wrist strap.**

7. **On the drive or drive filler you want to remove, complete the following tasks.**

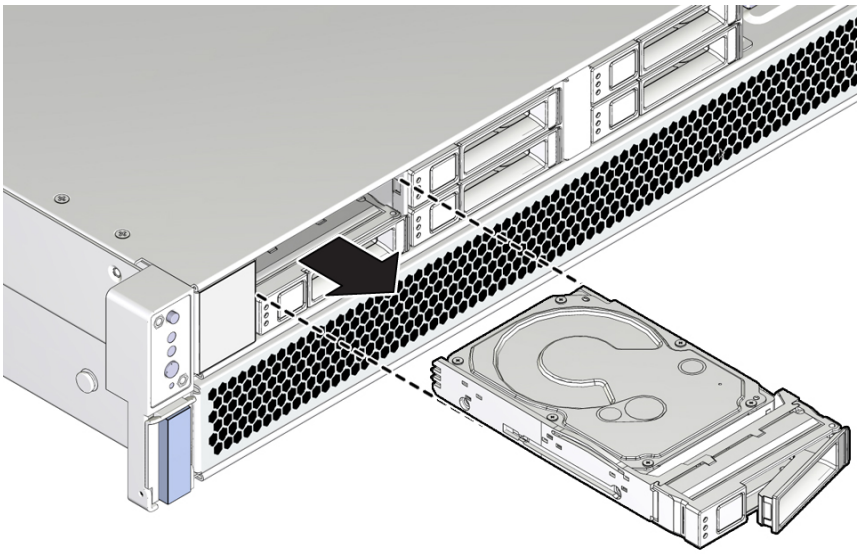


Caution - The latch is not an ejector. Do not bend it too far to the right. Doing so can damage the latch.

a. **Push the release button to open the latch.**

b. **Unlock the drive by moving the latch to the right.**

c. **Grasp the latch and pull the drive out of the slot.**



Caution - When you remove a drive, replace it with a drive filler or another drive. Otherwise, the server might overheat due to improper airflow.

8. **After you remove an NVMe drive, check that the drive slot's state has changed to empty.**

```
# hotplug list -lc
```

9. **Install a replacement drive or a drive filler.**

See “Install a Drive or Drive Filler” on page 72.

Related Information

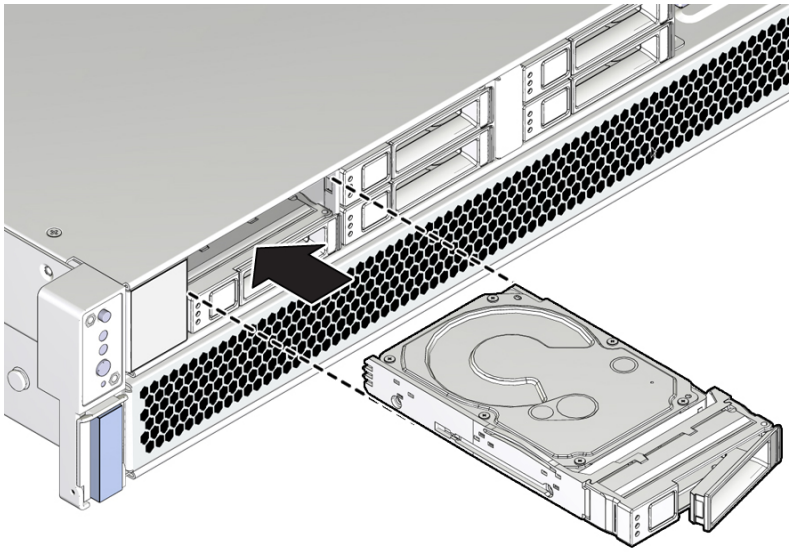
- “Determine Which Drive Is Faulty” on page 67
- “Install a Drive or Drive Filler” on page 72
- “Verify a Drive” on page 73

Install a Drive or Drive Filler

Installing a drive into a server is a two-step process. You must first install the drive into the drive slot and then configure that drive to the server.

Note - If you removed an existing drive from a slot in the server, you must install the replacement drive in the same slot as the drive that was removed. Drives are physically addressed according to the slot in which they are installed.

1. **Remove a drive or a drive filler.**
   See "Remove a Drive or Drive Filler" on page 68.
2. **Unpack the drive and place it on an antistatic mat.**
3. **Fully open the release lever on the drive.**
4. **Install the drive or drive filler by completing the following tasks.**



   a. **Slide the drive or drive filler into the drive slot until it is fully seated.**
   b. **Close the latch to lock the drive or drive filler in place.**

5. **Return the drive to operation by doing one of the following tasks:**

   - **If you cold-serviced the drive, restore power to the server. Complete the procedure described in "Power On the Server (Oracle ILOM)" on page 154 or "Power On the Server (System Power Button)" on page 155.**

   - **If you hot-serviced the drive, configure it.**

     For example, type:

     ```
     # cfgadm -c configure c0::dsk/c1t1d0
     ```

     Replace `c0:dsk/c1t1d0` with the drive name that applies to your situation.

   - **If you hot-serviced an NVMe drive, it should automatically power up and attach. If not, power up and attach the drive manually.**

     ```
     # hotplug enable /SYS/DBP/NVME0
     ```

     Check that the drive's state has changed to enabled.

     ```
     # hotplug list -lc
     ```

6. **Verify the drive functionality.**

   See "Verify a Drive" on page 73.

Related Information

- "Determine Which Drive Is Faulty" on page 67
- "Remove a Drive or Drive Filler" on page 68
- "Verify a Drive" on page 73

▼ Verify a Drive

Perform these steps after replacing a drive or installing a new drive.

1. **If the OS is shut down, and the drive you replaced was not the boot device, boot the OS.**

   Depending on the nature of the replaced drive, you might need to perform administrative tasks to reinstall software before the server can boot. Refer to the Oracle Solaris OS administration documentation for more information.

2. **At the Oracle Solaris prompt, list all drives in the device tree, including any drives that are not configured.**

```
# cfgadm -al
```

This command helps you identify the drive you installed.

```
Ap_id              Type         Receptacle   Occupant       Condition
c0                 scsi-bus     connected    configured     unknown
c0::dsk/c1t0d0     disk         connected    configured     unknown
c0::sd1            disk         connected    unconfigured   unknown
usb0/1             unknown      empty        unconfigured   ok
usb0/2             unknown      empty        unconfigured   ok
...
```

3. **Configure each drive that is not already configured.**

For example, to configure the second disk listed in the example above, type:

```
# cfgadm -c configure c0::sd1
```

Replace `c0::sd1` with the drive name for your configuration.

4. **Verify that the blue Ready to Remove LED is no longer lit on the drive that you installed.**

See "Determine Which Drive Is Faulty" on page 67.

5. **At the Oracle Solaris prompt, list all drives in the device tree, including any drives that are not configured.**

```
# cfgadm -al
```

The replacement drive is now listed as configured, as shown in the following example.

```
Ap_Id              Type         Receptacle   Occupant       Condition
c0                 scsi-bus     connected    configured     unknown
c0::dsk/c1t0d0     disk         connected    configured     unknown
c0::dsk/c1t1d0     disk         connected    configured     unknown
usb0/1             unknown      empty        unconfigured   ok
usb0/2             unknown      empty        unconfigured   ok
...
```

6. **Perform one of the following tasks based on your verification results:**

- **If the previous steps did not verify the drive, see "Detecting and Managing Faults" on page 27.**

- **If the previous steps indicate that the drive is functioning properly, perform the tasks required to configure the drive. These tasks are covered in the Oracle Solaris OS administration documentation.**

For additional drive verification, you can run Oracle VTS. Refer to the Oracle VTS documentation for details.

Related Information

- "Determine Which Drive Is Faulty" on page 67
- "Remove a Drive or Drive Filler" on page 68
- "Install a Drive or Drive Filler" on page 72

Servicing Fan Modules

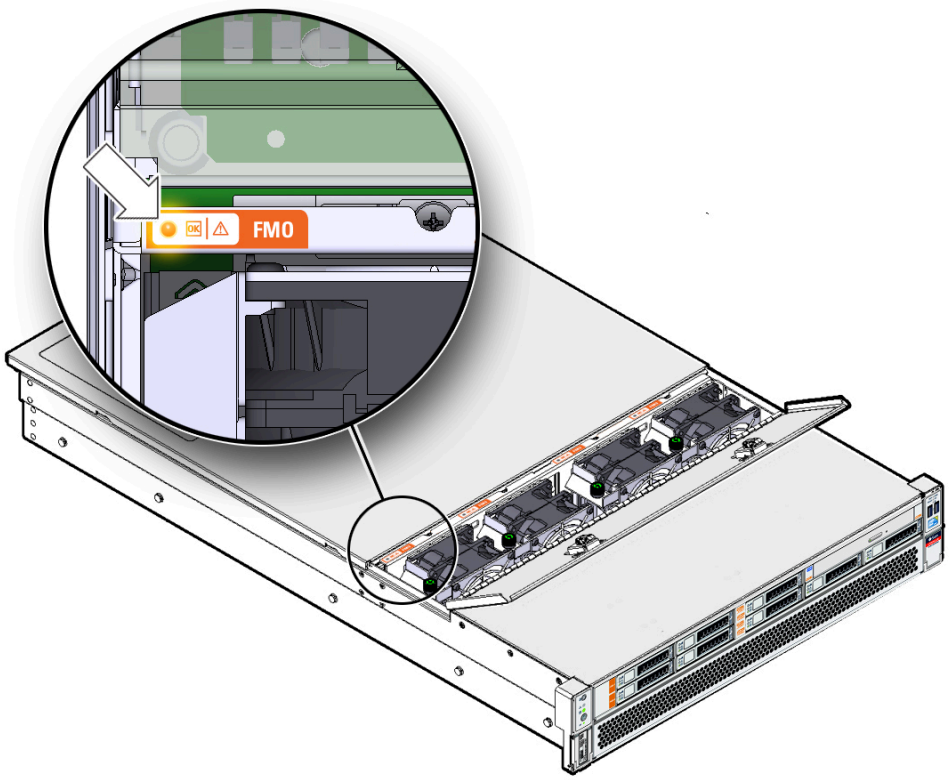
The four fan modules in the server are located at the front of the chassis. See “Identifying Components” on page 11. You can access the fan modules without removing the server cover. You might need to extend the server from the rack to access the fans. Each fan module contains two fans mounted in an integrated, hot-serviceable component.

These topics describe how to service faulty fan modules.

Related Information

- “Preparing for Service” on page 45

Fan Module LEDs



LED		Color	Status When Lit
Power OK	OK	Green	The server is powered on, and the fan module is functioning correctly.
Service Required	⚠	Amber	The fan module is faulty.

Related Information

- “Determine Which Fan Module Is Faulty” on page 79
- “Detecting and Managing Faults” on page 27

▼ Determine Which Fan Module Is Faulty

- **View the following LEDs, which are lit when a fan fault is detected.**
  - Fan (FAN) Fault LED on the front of the server. See “Front Panel Components with Eight Drives” on page 11.
  - Fan Fault LED on or adjacent to the faulty fan. See “Fan Module LEDs” on page 78. Each fan contains an LED. When the amber Service Required LED is lit, a fault has occurred on that fan module.

Note - The front and rear panel Service Required LEDs are also lit when the server detects a fan fault. The Server Overtemp LED might also light if a fan fault causes an increase in server operating temperature.

Related Information

- “Front Panel Components with Eight Drives” on page 11
- “Rear Panel Components” on page 19
- “Extend the Server to the Service Position” on page 55
- “Remove a Fan Module” on page 79
- “Detecting and Managing Faults” on page 27

▼ Remove a Fan Module

Caution - While the fans provide some cooling redundancy, if a fan module fails, replace it as soon as possible to maintain server availability. When you remove one of the fan modules, you must replace it within 30 seconds to prevent overheating of the server.

Caution - The fan module contains hazardous moving parts. Unless the power to the server is completely shut down, replacing the fan module is the only service permitted in the fan compartment.

You can perform this procedure while the server is running. See “Component Service Categories” on page 49 for more information about hot-service procedures.

1. **Prepare for servicing.**

   a. **Attach an antistatic wrist strap.**

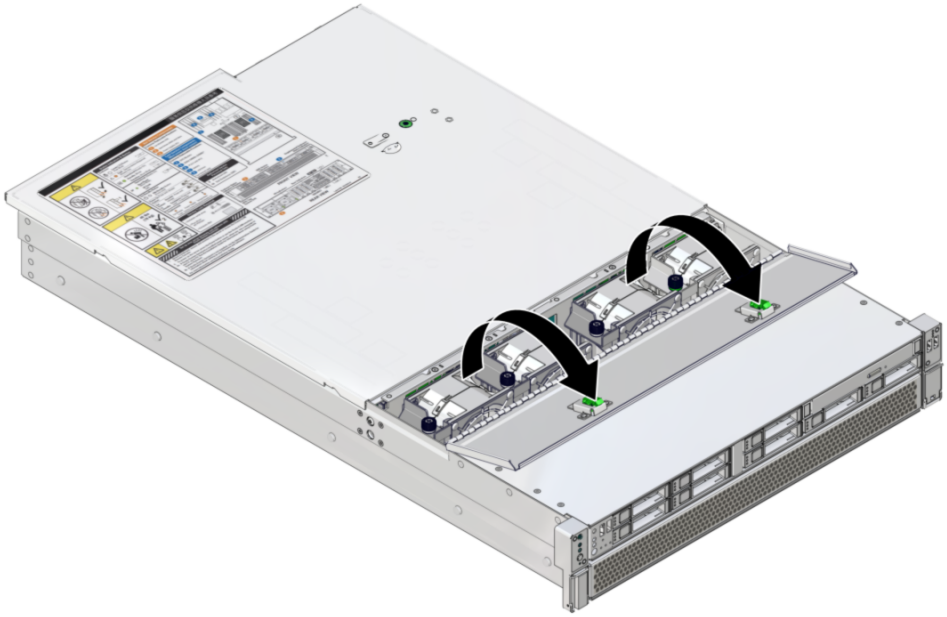
      See “Prevent ESD Damage” on page 54.

   b. **Extend the server to the maintenance position.**

      See “Extend the Server to the Service Position” on page 55.

2. **Open the fan door.**

   Slide the two green buttons to unlock the fan door, then swing it open.

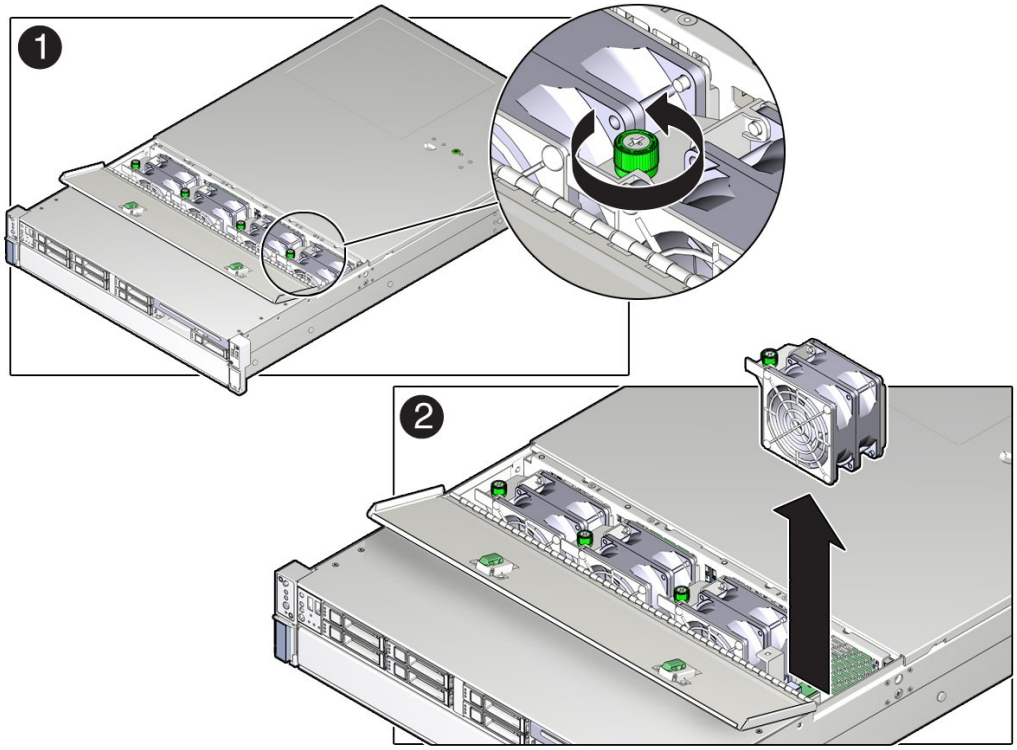


3. **Identify the faulty fan module with a corresponding Service Required LED.**

The Service Required LEDs are located near the fan modules as shown in “Determine Which Fan Module Is Faulty” on page 79.

4. **Loosen the screw on the fan module (panel 1).**

   The screws should only be finger tight. If you have difficulty loosening a screw by hand, use a No. 2 Phillips screwdriver.



5. **Grasp the fan module and lift it out of the server.**

Caution - When removing a fan module, do not rock it back and forth. Rocking fans can damage the fan module connectors.

Caution - When changing fan modules, note that only the fan modules can be removed or replaced. Do not service any other components in the fan compartment unless the server is shut down and the power cords are removed.

6. **Install a new fan module.**

   See “Install a Fan Module” on page 82.

Related Information

- “Determine Which Fan Module Is Faulty” on page 79
- “Extend the Server to the Service Position” on page 55
- “Install a Fan Module” on page 82

▼ Install a Fan Module

Caution - To ensure proper cooling, ensure that you install the replacement fan module in the same slot from which the faulty fan was removed.

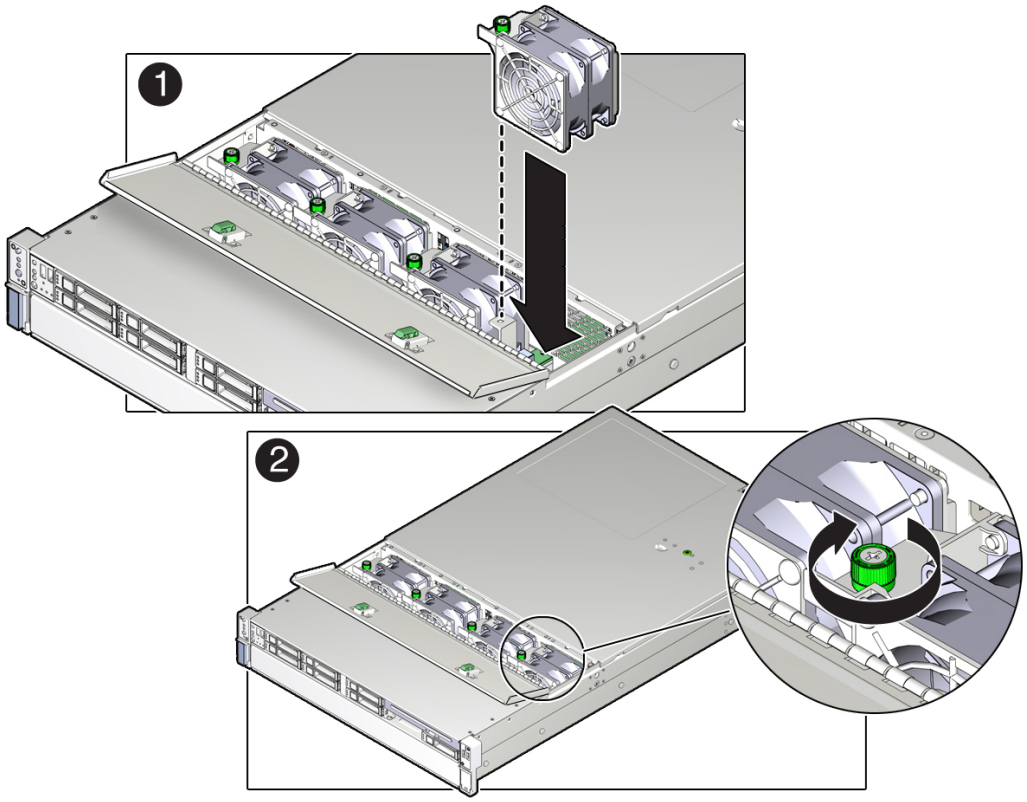
1. **Remove a fan module.**

   See “Remove a Fan Module” on page 79.

2. **Unpack the replacement fan module and place it on an antistatic mat.**

3. **Open the fan door.**

4. **Install the replacement fan module into the server by completing the following tasks.**



a. **Align the fan module and slide it into the fan slot (panel 1).**

Note - Fan modules are keyed to ensure that they are installed in the correct orientation.

Ensure that the cables threaded between the two middle fan modules are not caught.

b. **Apply firm pressure to fully seat the fan module.**

You will hear a click when the fan module is properly seated.

c. **Tighten the green screw to hold the fan module in place (panel 2).**

This screw should only be finger tight. Do not use a screwdriver to tighten it.

5. **If the server is powered during this procedure, verify the new fan module.**
   See “Verify a Fan Module” on page 85.

6. **Close the fan door.**
   Swing the fan door closed, then press down until the two green buttons snap into place.

7. **Return the server to the normal operating position.**
   See “Return the Server to the Normal Operating Position” on page 153.

8. **When the server is powered, verify the new fan module. See “Verify a Fan Module” on page 85.**

Related Information

- “Return the Server to the Normal Operating Position” on page 153.
- “Remove a Fan Module” on page 79
- “Verify a Fan Module” on page 85

▼ Verify a Fan Module

1. **Verify that the Service Required LED on the replaced fan module is not lit.**

   See “Fan Module LEDs” on page 78.

2. **Verify that the Top Fan LED and the Service Required LED on the front of the server are not lit.**

   See “Front Panel Controls and LEDs” on page 34.

Note - If you are replacing a fan module when the server is powered down, the LEDs might stay lit until power is restored to the server and the server can determine that the fan module is functioning properly.

---

3. **Use the Oracle ILOM `show faulty` command to verify that the fault has been cleared.**

   See “Identify Faulted Components” on page 28 for more information on using the `show faulty` command.

   Consider these two possibilities.

   - **If the previous steps did not clear the fault, see “Detecting and Managing Faults” on page 27 for information about the tools and methods you can use to diagnose component faults.**
   - **If the previous steps indicate that no faults have been detected, then the component has been replaced successfully. No further action is required.**

Related Information

- “Determine Which Fan Module Is Faulty” on page 79
- “Front Panel Components with Eight Drives” on page 11
- “Rear Panel Components” on page 19

Servicing Power Supplies

The server has redundant hot-serviceable power supplies. You can remove and replace a power supply without shutting the server down, provided that the other power supply is online and working.

For information about power configuration policies, refer to the Oracle ILOM documentation.

These topics describe how to service power supply modules.

Related Information

- "Rear Panel Components" on page 19

▼ Locate a Faulty Power Supply

- **View the following LEDs, which are lit when a power supply fault is detected.**
  - Rear PS Fault LED on the front bezel of the server. See "Front Panel Controls and LEDs" on page 34.
  - Service Required LED on the faulted power supply. See "Rear Panel Controls and LEDs" on page 35.

Note - The front and rear panel Service Required LEDs are also lit when the server detects a power supply fault. See "Front Panel Controls and LEDs" on page 34 and "Rear Panel Controls and LEDs" on page 35.

Related Information

- "Front Panel Components with Eight Drives" on page 11

- “Rear Panel Components” on page 19
- “Remove a Power Supply” on page 88

Remove a Power Supply

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

Caution - If a power supply fails and you do not have a replacement available, to ensure proper airflow, leave the failed power supply installed in the server until you replace it with a new power supply.

You can perform this procedure while the server is running. See “Component Service Categories” on page 49 for more information about hot service procedures.

1. **Prepare for servicing.**

   a. **Attach an antistatic wrist strap.**

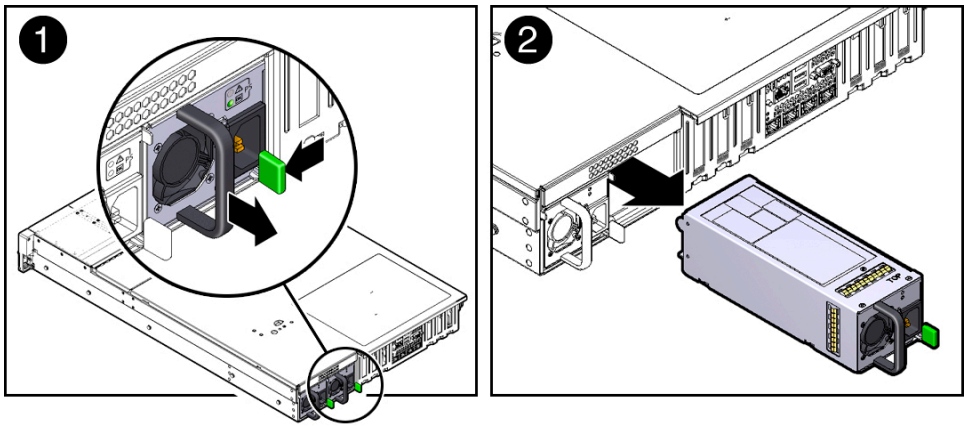
   b. **If necessary, release the CMA to access the power supplies.**

      See “Release the CMA” on page 56.

      Do not allow the CMA to hang unsupported while it is unattached.

2. **Disconnect the power cord from the power supply that displays a lit amber Service Required LED.**

3. **Press the release latch to the left to open the ejector arm (panel 1).**



4. **Slide the power supply out of the chassis (panel 2).**

Caution - There is no restraint mechanism on the power supply to prevent it from sliding completely out of the chassis. Use care when removing the power supply to prevent it from falling.

Caution - Whenever you remove a power supply, you should replace it with another power supply. Otherwise, the server might overheat due to improper airflow. If a new power supply is not available, leave the failed power supply installed until it can be replaced.

5. **Install a new power supply.**

See “Install a Power Supply” on page 89.

Related Information

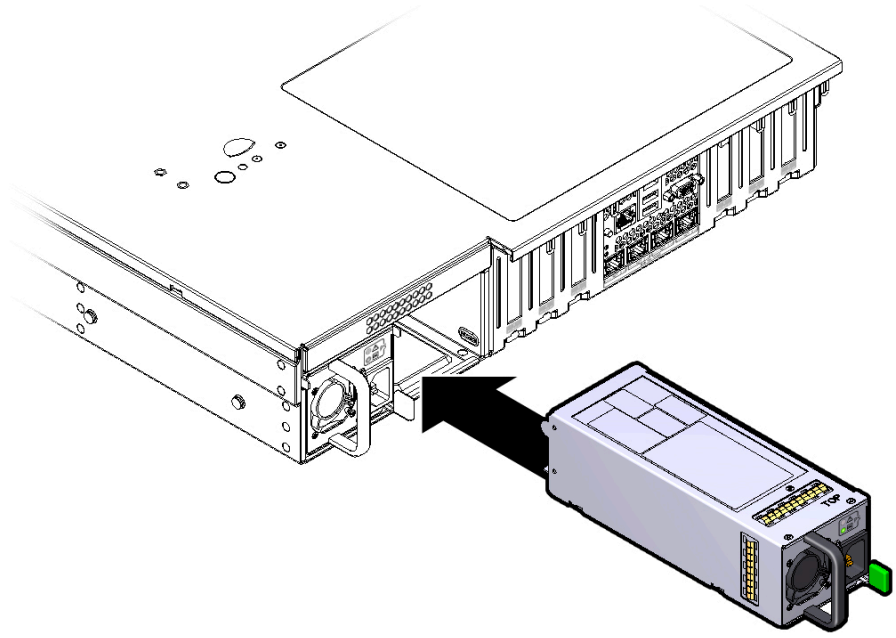
- “Locate a Faulty Power Supply” on page 87
- “Install a Power Supply” on page 89

▼ Install a Power Supply

1. **Remove a power supply.**

See “Remove a Power Supply” on page 88.

2. **If necessary, release the CMA to access the power supplies.**
   See “Release the CMA” on page 56.
   Do not allow the CMA to hang unsupported while it is unattached.
3. **Align the power supply with the empty power supply chassis bay.**
4. **Slide the power supply into the bay until it is fully seated.**
   You will hear an audible click when the power supply is fully seated.



5. **Reconnect the power cord to the power supply.**
6. **If you disconnected the two CMA left-side connectors, reconnect the CMA.**
   For instructions on reconnecting the CMA see “Attach the CMA to the Server” in *SPARC S7-2L Server Installation Guide*.
7. **Verify that the AC OK LED is lit.**

See “Locate a Faulty Power Supply” on page 87.

8. **Verify that the following LEDs are not lit:**

   - Service Required LED on the power supply
   - Front and rear Service Required LEDs
   - Rear PS Failure LED on the bezel of the server

   See “Interpreting LEDs” on page 33.

9. **Verify the power supply.**

   See “Verify a Power Supply” on page 91.

Related Information

- “Remove a Power Supply” on page 88
- “Verify a Power Supply” on page 91

▼ Verify a Power Supply

1. **Verify that the amber Service Required LED on the replaced power supply is not lit.**

2. **Verify that the PS Fault LED on the front of the server is not lit.**

3. **Use the Oracle ILOM `show faulty` command to verify that the fault has been cleared.**

   See “Identify Faulted Components” on page 28 for more information on using the `show faulty` command.

   Consider these possibilities.

   - If the previous steps did not clear the fault, see “Detecting and Managing Faults” on page 27 for information about the tools and methods you can use to diagnose component faults.
   - If the previous steps indicate that no faults have been detected, then the component has been replaced successfully. No further action is required.

Related Information

- “Locate a Faulty Power Supply” on page 87
- “Front Panel Components with Eight Drives” on page 11

- “Rear Panel Components” on page 19

Servicing DIMMs

These topics describe how to remove and install DIMMs in the server.

DIMM Configuration

The memory configuration rules for the server are as follows:

- The motherboard provides sixteen slots for DIMMs.
- Eight or sixteen slots on the motherboard must be filled with a DIMM.
- Every DIMM must be of the same size and type.
- Each DIMM is shipped with a label identifying its rank classification. The following rank classifications are supported.

Note - Single-rank DIMMs are not currently offered.

DIMM Capacity	DRAM Density	Rank Classification	Label
16 GB	4 GB	Dual-rank x4	2Rx4
32 GB	4 GB	Quad-rank x4	4Rx4
64 GB			

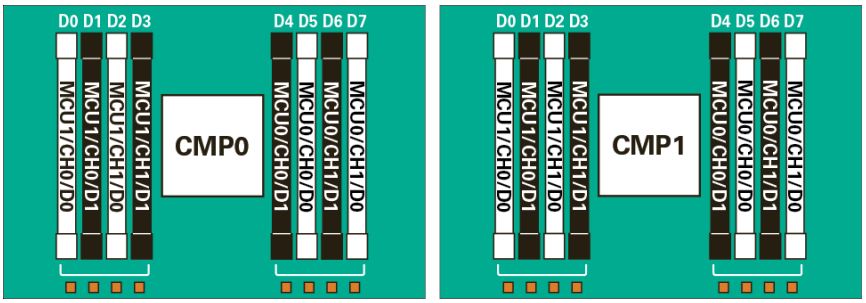
Related Information

- “DIMM FRU Names” on page 94
- “Locate a Failed DIMM (LEDs)” on page 95
- “Remove a DIMM” on page 97
- “Install a DIMM” on page 98

DIMM FRU Names

The server can contain 16 DIMMs. If only 8 DIMMs are installed (half populated) they must be in the DIMM slots with white handles.

Labels identify the names of DIMMs.



DIMM FRU names are based on the location of the DIMM on the motherboard. For example, the full FRU name for the DIMM slot on the motherboard farthest from the power supplies is `/SYS/MB/CMP1/MCU0/CH1/D0`.

Location from Left to Right (Seen From Rear)	DIMM Name	Ejector Color
1	`/SYS/MB/CMP0/MCU1/CH0/D0`	White
2	`/SYS/MB/CMP0/MCU1/CH0/D1`	Black
3	`/SYS/MB/CMP0/MCU1/CH1/D0`	White
4	`/SYS/MB/CMP0/MCU1/CH1/D1`	Black

Location from Left to Right (Seen From Rear)	DIMM Name	Ejector Color
5	/SYS/MB/CMP0/MCU0/CH0/D1	Black
6	/SYS/MB/CMP0/MCU0/CH0/D0	White
7	/SYS/MB/CMP0/MCU0/CH1/D1	Black
8	/SYS/MB/CMP0/MCU0/CH1/D0	White
9	/SYS/MB/CMP1/MCU1/CH0/D0	White
10	/SYS/MB/CMP1/MCU1/CH0/D1	Black
11	/SYS/MB/CMP1/MCU1/CH1/D0	White
12	/SYS/MB/CMP1/MCU1/CH1/D1	Black
13	/SYS/MB/CMP1/MCU0/CH0/D1	Black
14	/SYS/MB/CMP1/MCU0/CH0/D0	White
15	/SYS/MB/CMP1/MCU0/CH1/D1	Black
16	/SYS/MB/CMP1/MCU0/CH1/D0	White

Related Information

- “DIMM Configuration” on page 93
- “Locate a Failed DIMM (LEDs)” on page 95
- “Locate a Failed DIMM (Oracle ILOM)” on page 96
- “Enable and Verify a DIMM” on page 100

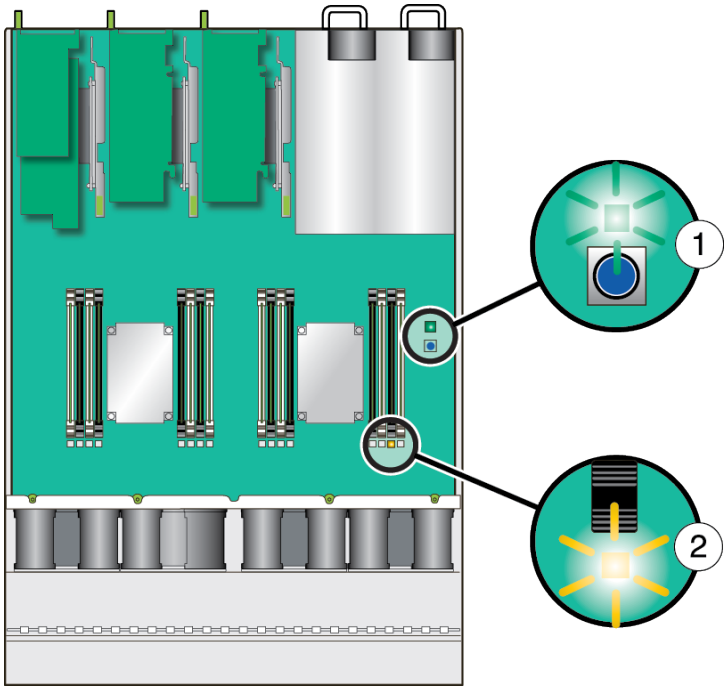
▼ Locate a Failed DIMM (LEDs)

This procedure describes how to identify a faulty DIMM using a button and LEDs on the motherboard.

- **Press a button on the motherboard to identify a faulty DIMM.**

Pressing this button activates the amber LED at the end of each DIMM slot that contains a faulty DIMM.

An LED next to the button lights when the button is pressed to show power is available to activate the LEDs. Press the button briefly to avoid using up the stored power.



Related Information

- “Locate a Failed DIMM (Oracle ILOM)” on page 96
- “Remove a DIMM” on page 97

▼ Locate a Failed DIMM (Oracle ILOM)

The Oracle ILOM `show faulty` command displays current faults, including DIMM failures.

1. **Type `show faulty` at the Oracle ILOM prompt.**

   The output will be similar to this example if a DIMM is faulty.

```
-> show faulty
Target              | Property          | Value
--------------------+-------------------+------------------
/SP/faultmgmt/0     | fru               | /SYS/MB/CMP0/MCU1/CH0/D0
/SP/faultmgmt/0     | timestamp         | Dec 21 16:40:56
/SP/faultmgmt/0/    | timestamp         | Dec 21 16:40:56 faults/0
/SP/faultmgmt/0/    | sp_detected_fault | /SYS/MB/CMP0/MCU1/CH0/D0
faults/0            |                   | Forced fail(POST)
```

2. **Locate the DIMM that corresponds to the listed name.**

   See “DIMM FRU Names” on page 94.

   In this example, `/SYS/MB/CMP0/MCU1/CH0/D0` indicates the DIMM slot on the mother board that is farthest from the power supplies.

Related Information

- “Locate a Failed DIMM (LEDs)” on page 95
- “DIMM FRU Names” on page 94
- “Remove a DIMM” on page 97

▼ Remove a DIMM

Caution - These procedures require that you handle components that are sensitive to ESD. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in “ESD Measures” on page 46.

You can perform this procedure. The system must be completely powered down before performing this procedure. See “Component Service Categories” on page 49 for more information about cold-service procedures.

Perform this procedure to remove a faulty DIMM from the motherboard.

1. **Locate the DIMM to be removed.**

   See “Locate a Failed DIMM (LEDs)” on page 95 and “Locate a Failed DIMM (Oracle ILOM)” on page 96.

2. **Remove the faulty DIMM.**

   a. **Press down both DIMM slot ejector tabs as far as they can go.**

b. **Carefully lift the DIMM straight up.**

Caution - Whenever you remove a DIMM, you should replace it with another DIMM before applying power to the server. Otherwise, the server might overheat due to improper airflow.

Related Information

- "Install a DIMM" on page 98

Install a DIMM

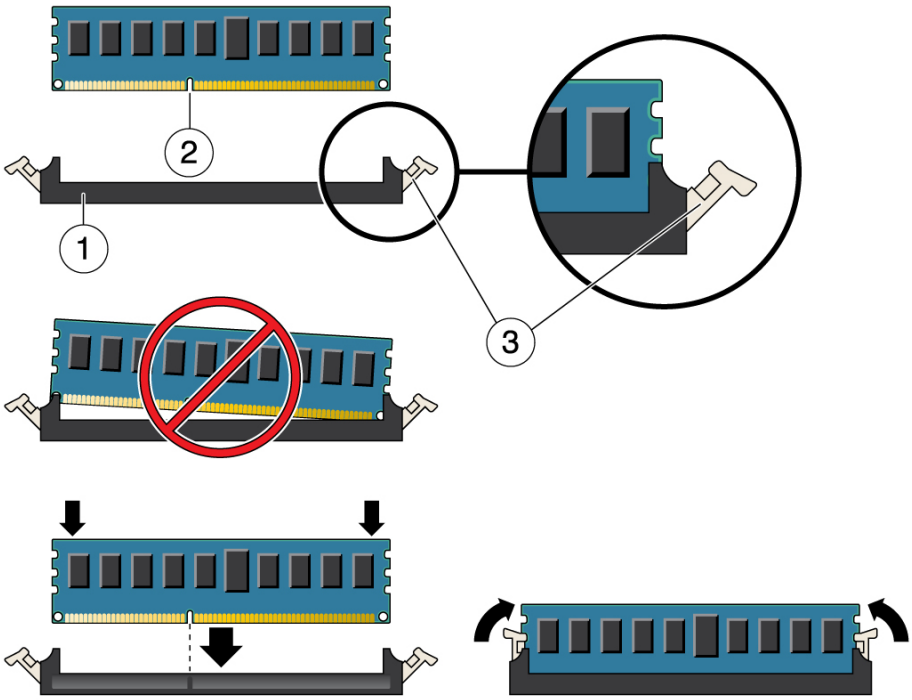
1. **Remove a DIMM from the motherboard.**

   See "Remove a DIMM" on page 97.

2. **Attach an antistatic wrist strap.**

   Then unpack the DIMMs and place them on an antistatic mat.

3. **Install a DIMM into the motherboard by performing the following steps.**



No.	Description
1	DIMM connector slot
2	DIMM connector key
3	DIMM ejector lever

a. **Ensure that the ejector levers at both ends of the DIMM slot are in a fully open position.**

b. **Align each DIMM with the empty connector slot, aligning the notch in the DIMM with the key in the connector.**

The notch ensures that the DIMM is oriented correctly.

c. **Gently press the DIMM into the slot until the ejector tabs lock the DIMM in place.**

Repeat these steps until each DIMM has been installed.

4. **Return the server to operation.**

   a. **Install the top cover.**
   See “Replace the Top Cover” on page 152.

   b. **Return the server to the normal operating position.**
   See “Return the Server to the Normal Operating Position” on page 153.

   c. **Reinstall the power cords to the power supplies and power on the server.**
   See “Returning the Server to Operation” on page 149.

Related Information

- “DIMM Configuration” on page 93
- “Remove a DIMM” on page 97
- “Enable and Verify a DIMM” on page 100

▼ Enable and Verify a DIMM

1. **Access the Oracle ILOM prompt.**

2. **Use the `show faulty` command to determine how to clear the fault.**

   - **If the output indicates a POST-detected fault, go to Step 4.**
   - **If the output displays a UUID, which indicates a host-detected fault, go to Step 5.**

3. **Use the `set` command to enable the DIMM that was disabled by POST.**
   In most cases, replacement of a faulty DIMM is detected when the service processor is power cycled. In those cases, the fault is automatically cleared from the server. If `show faulty` still displays the fault, the `set` command will clear it.

```
-> set /SYS/MB/CMP1/MCU0/CH1/D0 requested_config_state=Enabled
```

4. **For a host-detected fault, perform the following steps to verify the new DIMM.**

   a. **Set the virtual keyswitch to `diag` so that POST runs in Service mode.**

   ```
   -> set /HOST keyswitch_state=Diag
   Set 'keyswitch_state' to 'Diag'
   ```

   b. **Power cycle the server.**

   ```
   -> stop /System
   Are you sure you want to stop /System (y/n)? y
   Stopping /System
   -> start /System
   Are you sure you want to start /System (y/n)? y
   Starting /System
   ```

   c. **Check if the host has been powered off.**

   Allow approximately one minute before performing this step. Type the `show /HOST` command. When the host is powered off, the console displays `status=Powered Off`.

   d. **Switch to the system console to view POST output.**

   Watch the POST output for possible fault messages. The following output indicates that POST did not detect any faults:

   ```
   -> start /HOST/console
   ...
   0:0:0>INFO:
   0:0:0>    POST Passed all devices.
   0:0:0>POST:    Return to VBSC.
   0:0:0>Master set ACK for vbsc runpost command and spin...
   ```

Note - The server might boot automatically at this point. If so, go directly to Step 6. If the server remains at the OpenBoot prompt (`ok`) go to the next step.

   e. **If the server remains at the OpenBoot prompt, type `boot`.**

   f. **Return the virtual keyswitch to Normal mode.**

   ```
   -> set /HOST keyswitch_state=Normal
   Set 'keyswitch_state' to 'Normal'
   ```

   g. **Switch to the system console and type the Oracle Solaris `fmadm faulty` command.**

```
# fmadm faulty
```

If any faults are reported, refer to the diagnostics instructions described in “Identify Faulted Components” on page 28.

5. **Switch to the Oracle ILOM command shell.**

6. **Type:**

```
-> show faulty
Target              | Property               | Value
--------------------+------------------------+------------------------------
/SP/faultmgmt/0     | fru                    | /SYS/MB/CMP1/MCU0/CH1/D0
/SP/faultmgmt/0     | timestamp              | Dec 14 22:43:59
/SP/faultmgmt/0/    | sunw-msg-id            | SUN4V-8000-DX
faults/0            |                        |
/SP/faultmgmt/0/    | uuid                   | 3aa7c854-9667-e176-efe5-e487e520
faults/0            |                        | 7a8a
/SP/faultmgmt/0/    | timestamp              | Dec 14 22:43:59
faults/0            |                        |
```

If the output reports a fault with a UUID go to Step 7. If the output does *not* report a fault with a UUID, you are done with the verification process.

7. **Switch to the system console and type the `fmadm repair` command with the UUID.**

Use the same UUID that was displayed from the output of the Oracle ILOM `show faulty` command.

```
# fmadm repair 3aa7c854-9667-e176-efe5-e487e520
```

Related Information

- “DIMM Configuration” on page 93
- “DIMM FRU Names” on page 94
- “Locate a Failed DIMM (LEDs)” on page 95
- “Locate a Failed DIMM (Oracle ILOM)” on page 96

Servicing PCIe Cards

These topics describe how to service PCIe cards and PCIe fillers.

PCIe Card Configuration

Note - Before installing PCIe cards, refer to the *SPARC S7-2L Server Product Notes* and the documentation for each PCIe card for detailed information about known issues and configuration limitations.

This server has six PCIe 3.0 slots on the rear panel that accommodate low-profile PCIe cards. All slots support x8 PCIe cards and slots 2 and 5 can support x8 PCIe cards with physical x16 connectors. There is a seventh PCIe slot on the motherboard for an HBA or PCIe switch card.

To determine the slot in which to install a PCIe card, follow these guidelines:

1. Install cards that require a specific slot. Refer to the *SPARC S7-2 Series Servers Product Notes* and the documentation for each card to determine if there are slot requirements.

   For example, on the server supporting twelve NVMe drives, the three PCIe switch cards must be in slots 1, 3, and 7.
2. Cards with physical x16 connectors can only be in slots 2 and 5.

Related Information

- "Rear Panel Components" on page 19
- "Remove a PCIe Card or Filler" on page 104

- “Install a PCIe Card or Filler” on page 106

Remove a PCIe Card or Filler

Caution - This procedure requires that you handle components that are sensitive to ESD. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in “ESD Measures” on page 46.

You can perform this procedure. The server must be completely powered down before performing this procedure. See “Component Service Categories” on page 49 for more information about cold-service procedures.

1. **Prepare for servicing.**

   a. **Attach an antistatic wrist strap.**

   b. **Power off the server and disconnect all power cords from the server power supplies.**

      See “Removing Power From the Server” on page 50.

   c. **Extend the server to the maintenance position.**

      See “Extend the Server to the Service Position” on page 55.

   d. **Remove the top cover.**

      See “Remove the Top Cover” on page 59.

2. **Locate the PCIe card or filler that you want to remove.**

   See “Rear Panel Components” on page 19 for information about PCIe slots and their locations.

   If you are removing a PCIe filler, go to Step 6.

3. **Note the slot location for each PCIe card you plan to remove.**

4. **Unplug all data cables from the PCIe card.**

   Note the location of all cables for reinstallation later.

   If you are removing the on board SAS disk controller, installled in slot 7, follow these steps:

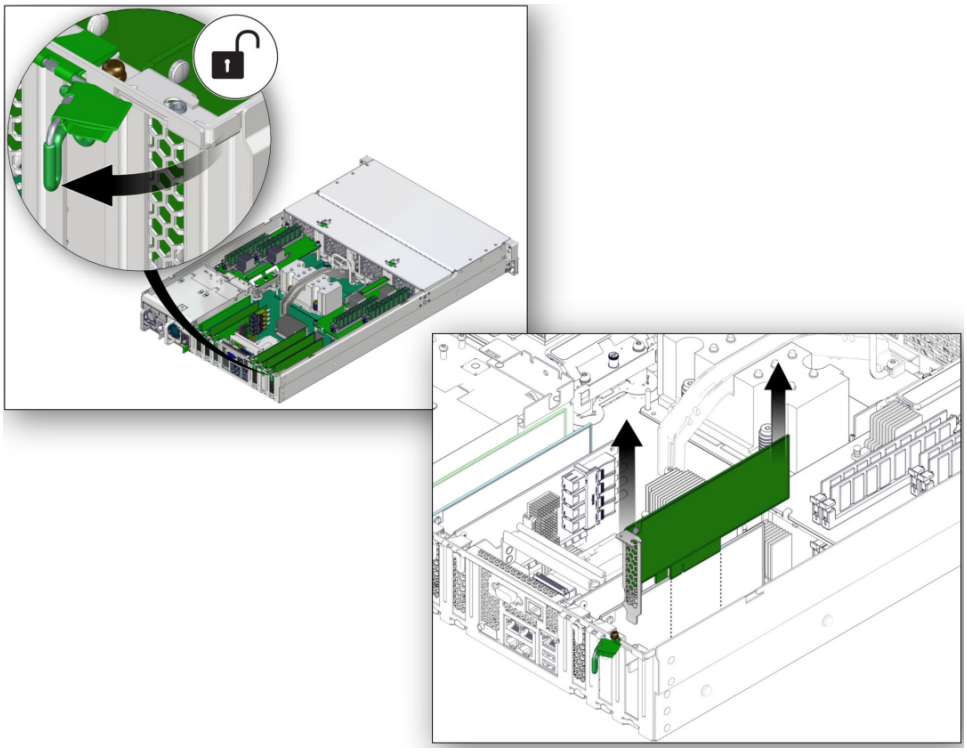
   a. **Remove the cable from rear of card.**

b. **Remove the screw from top of the standoff.**

c. **Lift the PCIe card off motherboard.**

5. **Remove any transceivers from the PCIe card before removing the card.**

6. **Remove the PCIe card by completing the following tasks.**



a. **Rotate the PCIe card locking mechanism (panel 1).**

b. **Carefully lift the PCIe card or filler from the card slot (panel 2).**

7. **Replace with another PCIe card or filler before the server is connected to power again.**

See “Install a PCIe Card or Filler” on page 106.

Related Information

- “Install a PCIe Card or Filler” on page 106

Install a PCIe Card or Filler

Caution - This procedure requires that you handle components that are sensitive to ESD. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in “ESD Measures” on page 46.

1. **Remove a PCIe card or filler.**

   See “Remove a PCIe Card or Filler” on page 104.

2. **Attach an antistatic wrist strap, unpack the PCIe card or PCIe filler, and place on an antistatic mat.**

3. **Remove any transceivers from the PCIe card before installing the card.**

4. **Ensure that the server is powered off and all power cords are disconnected from the server power supplies.**

   See “Removing Power From the Server” on page 50.

5. **Determine which slot to install the PCIe card in.**

   If you are not replacing an existing PCIe card and need information about deciding which slot to install the card in, see “PCIe Card Configuration” on page 103.

6. **Open the PCIe card locking mechanism for this PCIe card slot.**

   The locking mechanism might already be disengaged if you removed a PCIe card or filler from that slot.

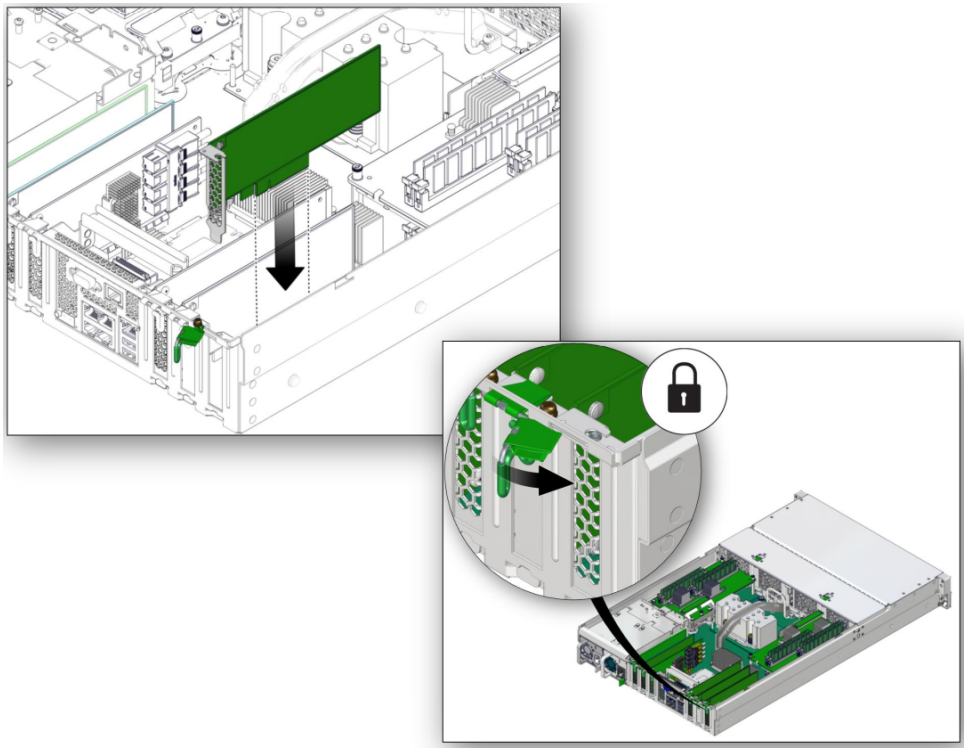
7. **If you are installing the on board SAS disk controller in slot 7, follow these steps:**

   a. **Install the cable to the rear of card.**

   b. **Insert the screw into the top of the standoff.**

   c. **Insert the PCIe card onto the motherboard.**

8. **Install the PCIe card or filler into the slot (panel 1) and rotate the PCIe locking mechanism to secure the PCIe card or filler in place (panel 2).**



9. **Return the server to operation.**

   a. **Install the top cover.**

      See “Replace the Top Cover” on page 152.

   b. **Return the server to the normal operating position.**

      See “Return the Server to the Normal Operating Position” on page 153.

   c. **Reconnect all power cords to the server power supplies.**

      See “Attach Power Cords” on page 154.

   d. **Power on the server.**

See “Power On the Server (Oracle ILOM)” on page 154 or “Power On the Server (System Power Button)” on page 155.

10. **Refer to the documentation shipped with the PCIe card for information about configuring the PCIe card, including installing required operating systems.**

Related Information

- “PCIe Card Configuration” on page 103
- “Remove a PCIe Card or Filler” on page 104

Servicing the eUSB Drive

The eUSB drive is mounted on the motherboard towards the front on the power supply side.

These topics describe how to service the eUSB drive.

- “Install the eUSB Drive” on page 111
- “Remove the eUSB Drive” on page 109

Related Information

- “Detecting and Managing Faults” on page 27

▼ Remove the eUSB Drive

You can perform this cold-service procedure. Power down the server completely before performing this procedure.

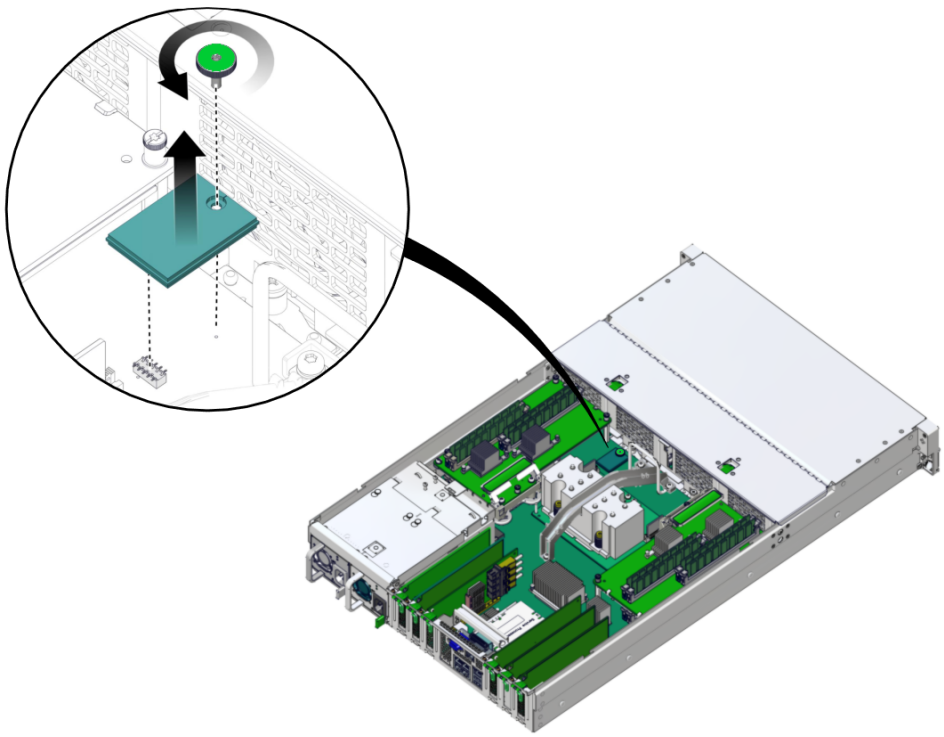
Caution - This procedure requires that you handle components that are sensitive to ESD. This sensitivity can cause the components to fail. To avoid damage, ensure that you follow antistatic practices as described in “Prevent ESD Damage” on page 54.

1. **Prepare the system for service.**

   See “Preparing for Service” on page 45.

2. **Remove the screw that attaches the eUSB drive to the motherboard.**

This screw is not a captive screw, so be careful not to drop it inside the server. Retain the screw to use with the new eUSB drive.



If the screw is too tight to remove by hand, use a Torx 10 driver to loosen it.

3. **Lift the eUSB drive up to disconnect it from the motherboard.**

4. **Install a new eUSB drive.**

   See “Install the eUSB Drive” on page 111.

Related Information

- “Install the eUSB Drive” on page 111

Install the eUSB Drive

You can perform this cold-service procedure. Power down the server completely before performing this procedure.

Caution - This procedure requires that you handle components that are sensitive to ESD. This sensitivity can cause the components to fail. To avoid damage, ensure that you follow antistatic practices as described in “Prevent ESD Damage” on page 54.

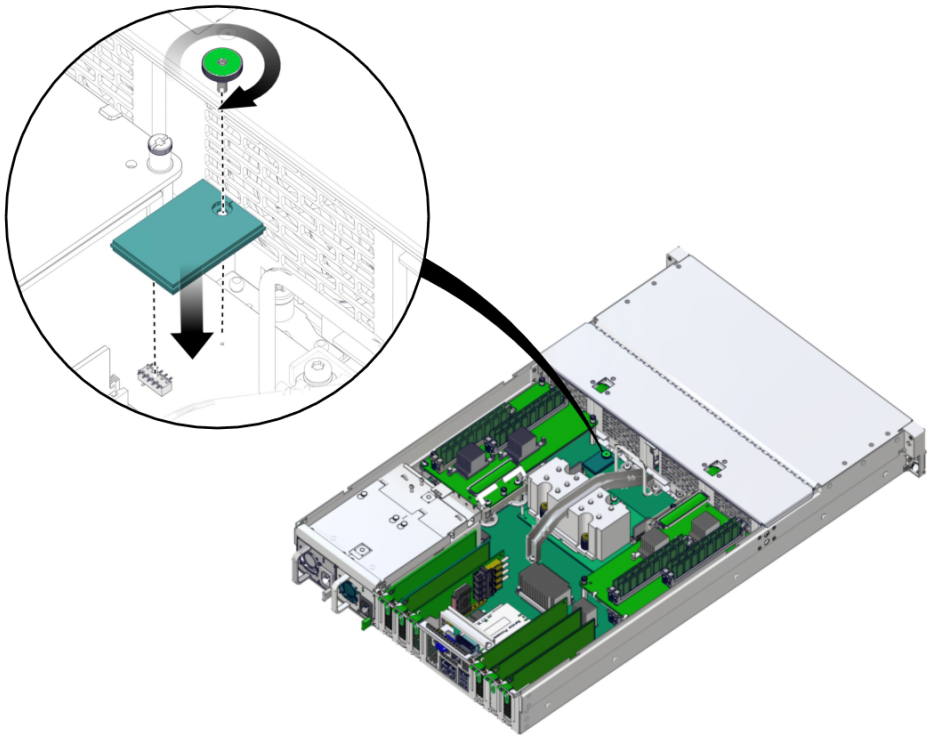
1. **Remove the eUSB drive.**

   See “Remove the eUSB Drive” on page 109.

2. **Ensure you are taking all ESD precautions before handling the eUSB drive.**

   See “Prevent ESD Damage” on page 54.

3. **Press the eUSB drive into the socket on the motherboard.**



4. **Hand tighten the screw to secure the drive to the motherboard.**

   Do not use a tool to tighten the screw further.

5. **Return the server to operation.**

   See “Returning the Server to Operation” on page 149.

Related Information

- “Remove the eUSB Drive” on page 109

Servicing the Battery

The battery is located inside the chassis. See “Internal Component Locations” on page 20. The battery maintains system time when the server is powered off and disconnected from AC power. If the log messages indicate a battery failure, replace the battery.

- “Replace the Battery” on page 113

Related Information

- “Detecting and Managing Faults” on page 27

▼ Replace the Battery

Caution - This procedure requires that you handle components that are sensitive to ESD. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in “ESD Measures” on page 46.

A customer can perform this procedure. The server must be completely powered down before performing this procedure. See “Component Service Categories” on page 49 for more information about cold-service procedures.

1. **Prepare the host for battery replacement.**

   To correctly reset the date and time after replacing a battery, you must prevent the host from automatically powering on, and also disable any NTP server connections. Before you remove power from the server, perform these steps.

   a. **Check the AUTO_HOST_POWER_ON state. At the Oracle ILOM prompt:**

```
-> show /SP/policy HOST_AUTO_POWER_ON

/SP/policy
  Properties:
```

```
    HOST_AUTO_POWER_ON = enabled
```

b. Set the property to disabled.

```
-> set /SP/policy HOST_AUTO_POWER_ON=disabled
```

c. Check the NTP server property for the `/SP/clock`.

```
-> show /SP/clock usentpserver

/SP/clock
  Properties:
     usentpserver = enabled
```

d. Set the property to disabled.

```
-> set /SP/clock usentpserver=disabled
```

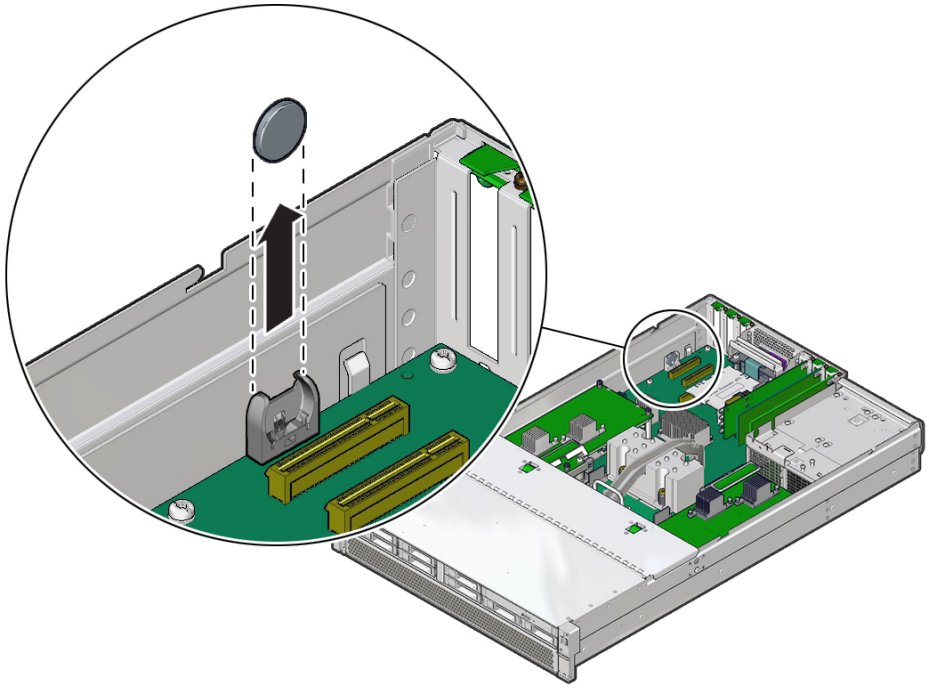
2. Replace the battery.

Replacing the battery is a cold-service procedure. The server must be completely powered down before performing this procedure.

a. Prepare the server for service.

See "Preparing for Service" on page 45.

b. **Gently push the battery toward the service processor to release it from the retention clip.**



c. **Unpack the replacement battery.**

d. **Press the new battery into the battery holder with the positive side (+) facing the side of the server.**

e. **Return the server to operation.**

See “Returning the Server to Operation” on page 149.

3. **Reset the system clock.**

a. **Use the Oracle ILOM clock command to set the day and time.**

The following example sets the date to August 22, 2016, and the timezone to EDT.

```
-> set /SP/clock datetime=0812213202016 timezone=EDT
Set 'datetime' to '0812213202016'
Set 'timezone' to 'PEDT'

-> show -d properties /SP/clock

/SP/clock
  Properties:
     datetime = Mon Aug 22 13:20:16 2016
     timezone = EDT (EST5EDT)
     uptime = 2 days, 19:56:49
     usentpserver = disabled
```

b. If the SP policy `HOST_AUTO_POWER_ON` was enabled before you replaced the battery, then it must be re-enabled.

```
-> set /SP/policy HOST_AUTO_POWER_ON=enabled
```

c. If the `/SP/clock usentpserver` property was enabled before you replaced the battery, you must re-enable it.

```
-> set /SP/clock usentpserver=enabled
```

4. Verify the battery.

Check the status of the system battery.

```
-> show /SYS/MB/BAT
```

Servicing the Motherboard

The motherboard includes two CMP modules, memory control subsystems, and all SP (Oracle ILOM) logic. The motherboard hosts a removable SC PROM, which contains MAC addresses and host ID.

These topics describe how to service the motherboard.

- "Remove the Motherboard" on page 117
- "Install the Motherboard" on page 123
- "Verify the Motherboard" on page 130

Related Information

- "Component Service Categories" on page 49
- "Remove the Motherboard" on page 117
- "Install the Motherboard" on page 123
- "Verify the Motherboard" on page 130

▼ Remove the Motherboard

Caution - Ensure that all power is removed from the server before removing or installing the motherboard assembly. You must disconnect the power cables from the server before performing these procedures.

Caution - These procedures require that you handle components that are sensitive to ESD. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in "ESD Measures" on page 46.

This is a cold-service procedure that must be performed by qualified service personnel. The server must be completely powered down before performing this procedure. See "Component Service Categories" on page 49 for more information about this category of service procedures.

Note - When replacing the motherboard, remove the SC PROM from the old motherboard and install that component on the new motherboard. The SC PROM contains the system host ID and MAC address. Transferring this component preserves system-specific information. The SP is built into the motherboard, not on a separate card as on some earlier servers.

1. **Prepare for servicing.**

   a. **Attach an antistatic wrist strap.**

   b. **Power off the server and unplug power cords from the power supplies.**

      See “Removing Power From the Server” on page 50.

   c. **Remove the server from the rack.**

      See “Remove the Server From the Rack” on page 58.

   d. **Remove the top cover.**

      See “Remove the Top Cover” on page 59.

2. **Remove the air baffle.**

   See “Remove the Air Baffle” on page 60.

3. **Remove all PCIe cards.**

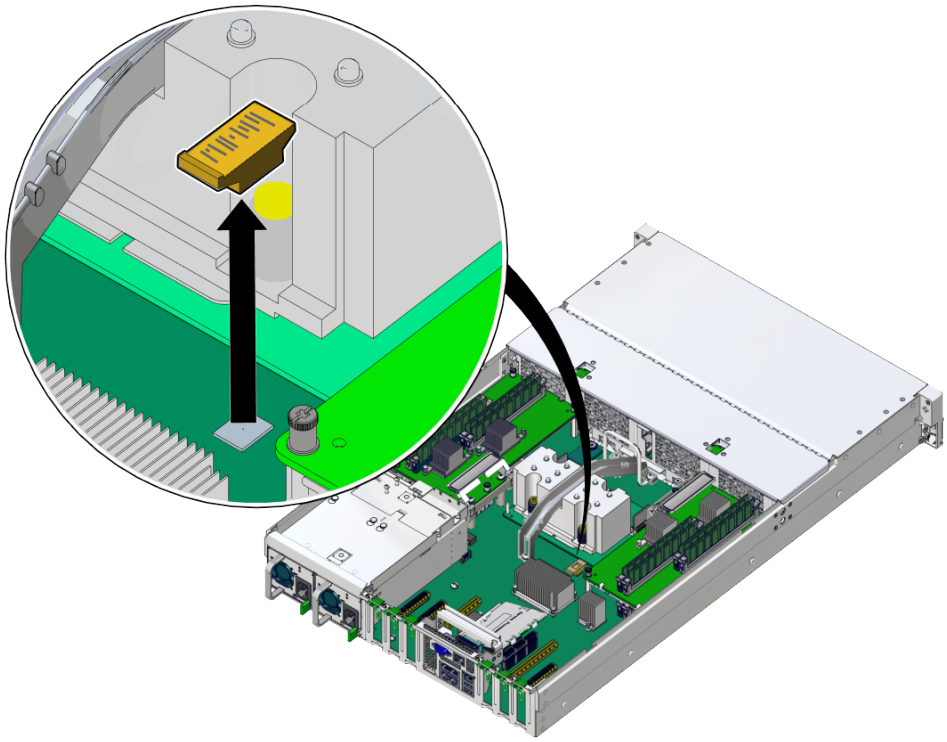
   See “Remove a PCIe Card or Filler” on page 104.

   Always remove transceivers from a PCIe card before removing the card from the server.

   Keep track of which slot each PCIe card was in so you can return them to their original positions.

4. **Remove the SC PROM from the motherboard.**

You will reinstall it on the new motherboard.



5. **Remove DIMMs from the motherboard.**

   See “Remove a DIMM” on page 97.

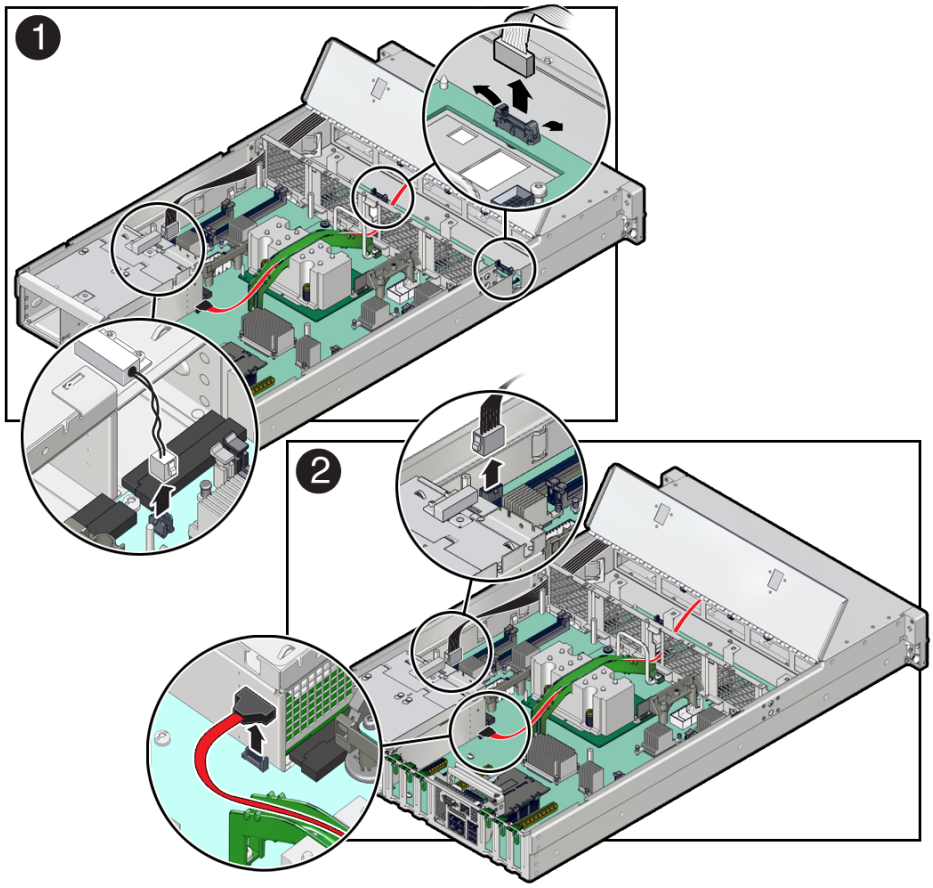
   You will reinstall the DIMMs on the new motherboard. Keep track of which slot each DIMM came from and return them to their original position.

6. **Open the fan cover and remove the fan modules.**

7. **Disconnect the ribbon cables from the motherboard that go to the left and right LED indicator modules (panel 1).**

   The right LED indicator module include the front USB 2.0 ports. The left and right LED indicator modules do not need to be removed to replace the motherboard.

8. **Disconnect the cable from the server intrusion switch (panel 1).**

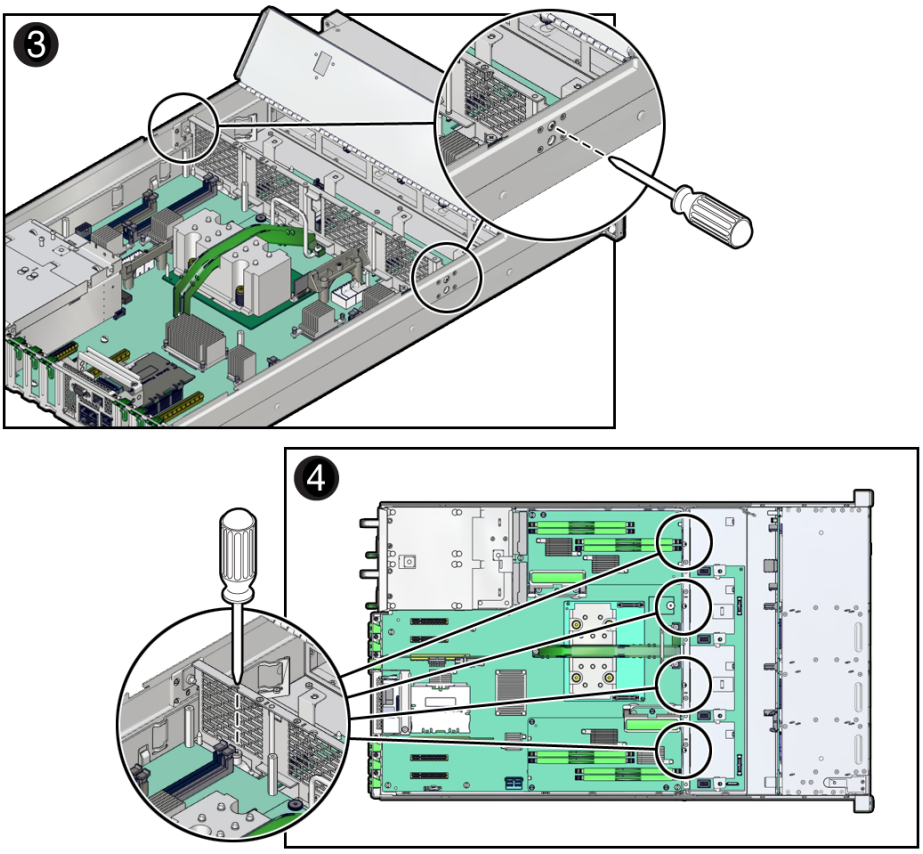


9. **Disconnect the signal cable and power cable from the motherboard to the drive backplane.**

   See “Remove the Eight-Drive Backplane” on page 131.

10. **Disconnect the mid-wall from the chassis.**

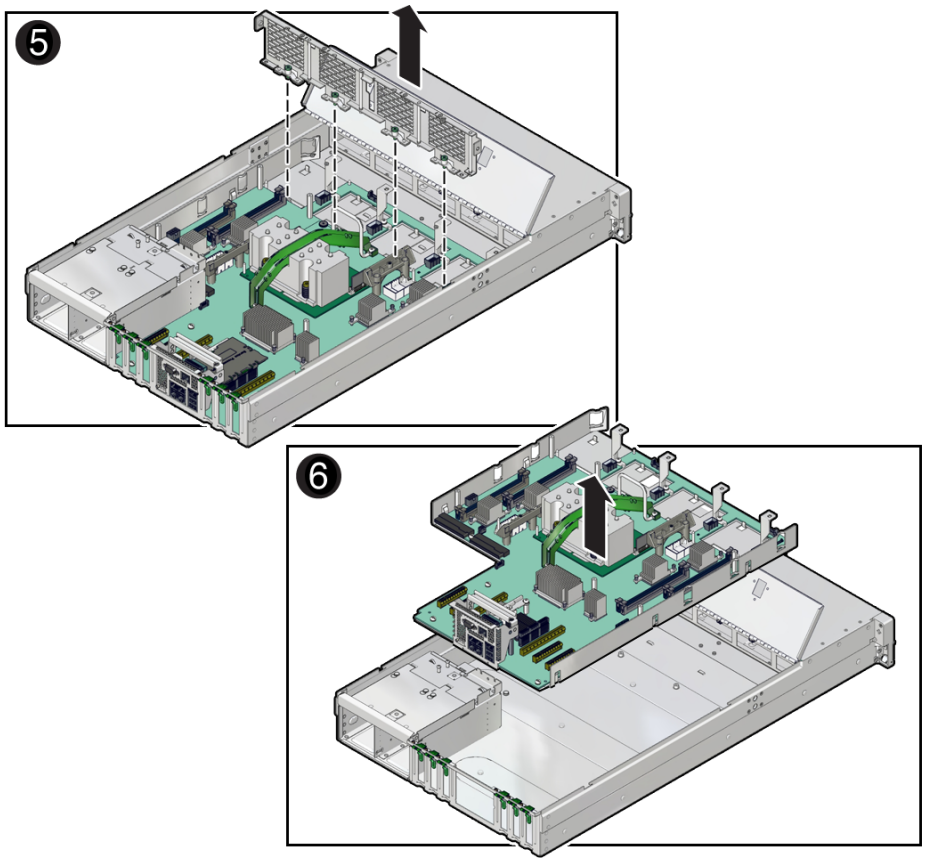
a. Remove the screw on each side of the chassis that secures the mid-wall to the chassis (panel 3).



b. Loosen the four green captive screws that secure the mid-wall to the bottom of the chassis (panel 4).

Use a No. 2 Phillips screwdriver to loosen the captive screws.

11. **Lift the mid-wall out of the chassis (panel 5)**



12. **Release the power supplies and pull them slightly out of the server.**
The power supplies do not need to be removed from the chassis to lift out the motherboard.

13. **Lift the motherboard out of the chassis.**
You can use the bar by the rear I/O panel and the metal handle in front of the cable channel as handles to lift the motherboard. Slide the motherboard slightly towards the front of the server and then lift it out of the chassis.

14. **Place the motherboard on an antistatic mat.**

15. **Install a new motherboard.**

See “Install the Motherboard” on page 123.

Related Information

- “Install the Motherboard” on page 123
- “Verify the Motherboard” on page 130

▼ Install the Motherboard

When replacing the motherboard, remove the SC PROM from the old motherboard and install this component on the new motherboard. The SPM contains the Oracle ILOM system configuration data, and the SC PROM contains the system host ID and MAC address. Transferring this component preserves system-specific information.

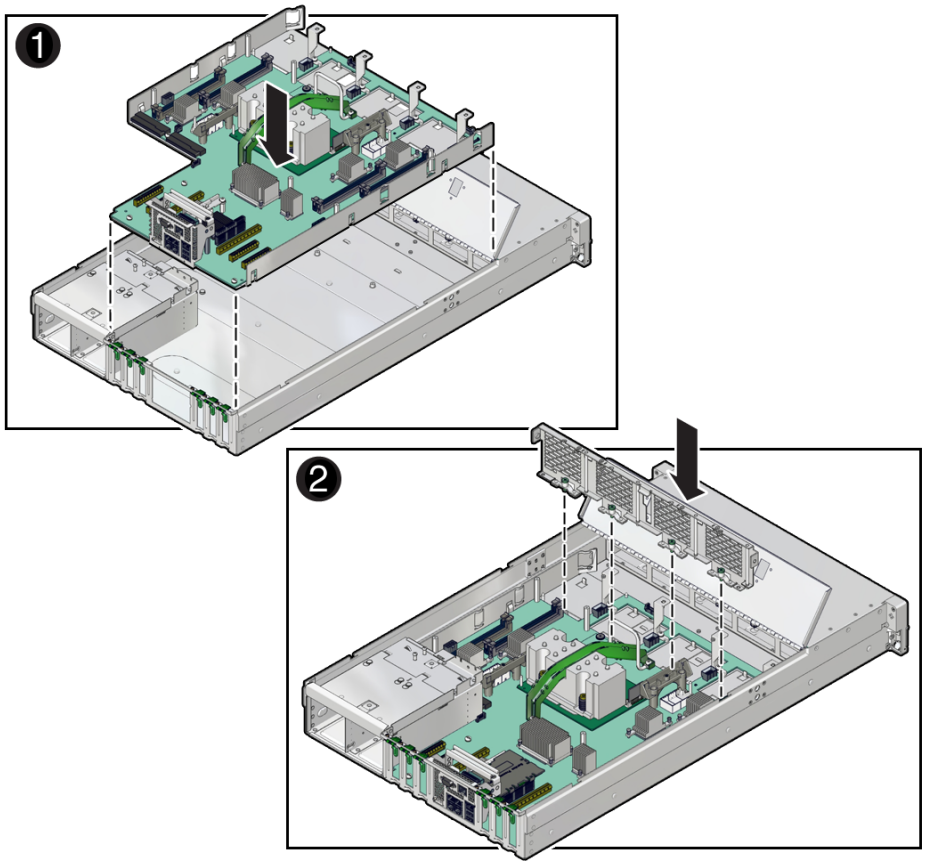
1. **Remove the old motherboard from the server.**

   See “Remove the Motherboard” on page 117.

   Keep track of the original locations of parts that will be installed on the new motherboard.

2. **Unpack the replacement motherboard and place it on an antistatic mat.**

3. **Grasp the motherboard by the handle and place it into the chassis (panel 1).**



You can use the metal handle in front of the cable channel and the bar by the rear I/O panel as handles to lift the motherboard.

Ensure that the remaining cables do not get caught on edges of the motherboard.

a. **Tilt the motherboard to the right side so it gets under the power supplies.**

   Be sure the power supplies are pulled out slightly from their slots when you insert the motherboard.

b. **Level the motherboard in the server chassis.**

c. **Slide the motherboard to the rear of the server to engage the raised standoffs.**

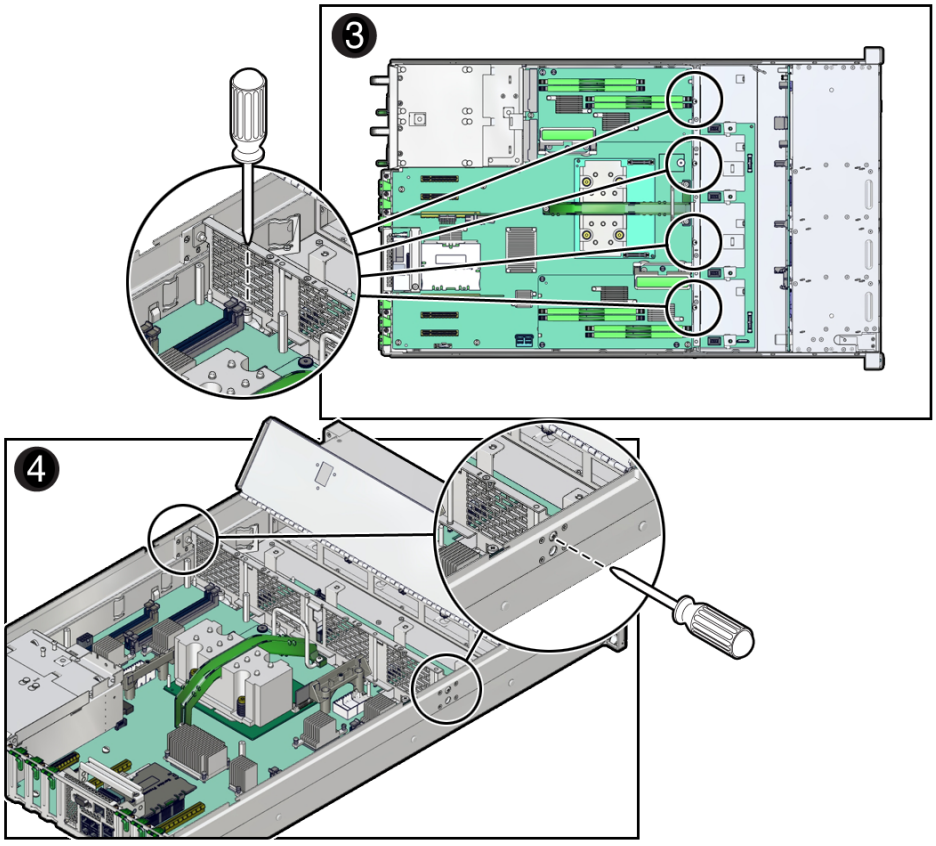
d. **Push the power supplies in to engage securely with the motherboard.**

4. **Insert the mid-wall into the chassis (panel 2).**

5. **Fasten the mid-wall to the chassis.**

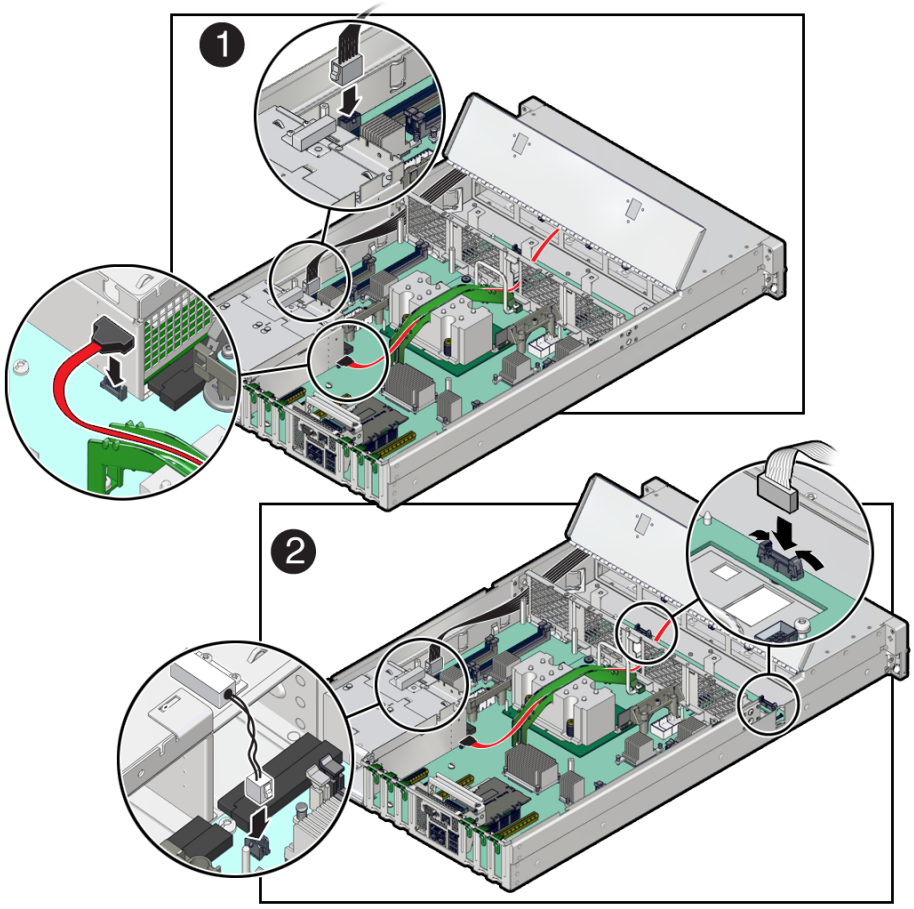
a. **Tighten the four green captive screws that secure the mid-wall to the bottom of the chassis (panel 3).**

Use a No. 2 Phillips screwdriver to tighten the captive screws.



b. Fasten a screw on each side of the chassis to secure the mid-wall to the chassis (panel 4).

6. **Reconnect the cable from the server intrusion switch (panel 1).**



7. **Reconnect the ribbon cables to the motherboard from the left and right LED indicator modules (panel 2).**

8. **Reconnect the signal cable and power cable from the motherboard to the drive backplane.**

   Also reconnect the NVMe cable from the motherboard to the drive backplane.

   See “Install the Eight-Drive Backplane” on page 134.

9. **Install the four fan modules.**

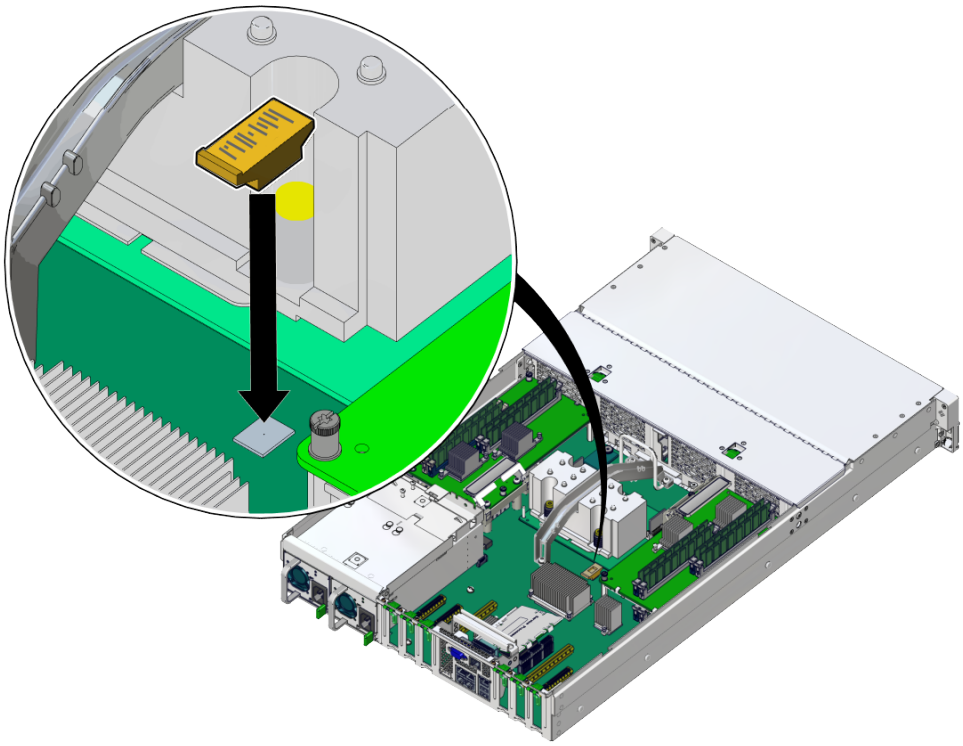
See “Install a Fan Module” on page 82.

10. **Install DIMMs on the motherboard.**

    Place each DIMM in the same motherboard slot where it had been before.

11. **Install the SC PROM on the motherboard.**

    Use the SC PROM you removed from a motherboard.



12. **Install all PCIe cards.**

    Place each PCIe card in the slot where it had been located.

    See “Install a PCIe Card or Filler” on page 106.

13. **Install the air baffle.**

    See “Install the Air Baffle” on page 151.

14. **Attach the top cover.**

    See “Replace the Top Cover” on page 152.

15. **Return the server to the normal operating position.**

    See “Return the Server to the Normal Operating Position” on page 153.

16. **Reconnect the power cords to the power supplies.**

    See “Attach Power Cords” on page 154.

17. **Prior to powering on the server, connect a terminal or a terminal emulator (PC or workstation) to the SP through the SER MGT port.**

    Refer to “Connect a Terminal or Emulator to the SER MGT Port” in *SPARC S7-2L Server Installation Guide*.

18. **Prepare to download the system firmware.**

    If necessary, configure the server's NET MGT port so that it can access the network. Log in to the SP through the NET MGT port.

    Refer to the Oracle ILOM documentation for network configuration instructions.

19. **Download the system firmware.**

    Follow the firmware download instructions in the Oracle ILOM documentation.

    Note - You can load any supported system firmware version, including the firmware version that was installed prior to replacing the motherboard.

20. **When you replace a motherboard that contains an SP, download the fallback miniroot image for your hardware and your Oracle Solaris version from My Oracle Support at: `https://support.oracle.com`.**

    Then follow the procedure Uploading a New Solaris Miniroot Package From SP to Hostin the *Oracle ILOM Administrator's Guide for Configuration and Maintenance*.

21. **Power on the server.**

    See “Power On the Server (Oracle ILOM)” on page 154 or “Power On the Server (System Power Button)” on page 155.

22. **(Optional) Transfer the serial number and product number to the FRUID of the new motherboard.**

    If the replacement motherboard must have the same serial number as the server prior to servicing, trained service personnel must take this action in a special service mode.

Related Information

- Oracle ILOM documentation
- “Remove the Motherboard” on page 117
- “Verify the Motherboard” on page 130

▼ Verify the Motherboard

1. **Use the Oracle ILOM `show faulty` command to verify that the fault has been cleared.**

   See “Identify Faulted Components” on page 28 for more information on using the `show faulty` command.

2. **Perform one of the following tasks based on your verification results:**

   - **If the previous steps did not clear the fault, see “Detecting and Managing Faults” on page 27 for information about the tools and methods you can use to diagnose component faults.**
   - **If the previous steps indicate that no faults have been detected, then the component has been replaced successfully. No further action is required.**

Related Information

- “Install the Motherboard” on page 123

Servicing the Drive Backplane

There are several different drive backplanes provided on models of this server with different drive configurations. Some models are equipped with an additional rear backplane that supports two 2.5-inch SAS3 drives.

Note - You cannot install a different style of drive backplane in a server than the one originally built into that server.

▼ Remove the Eight-Drive Backplane

1. **Prepare the server for service.**

   a. **Power off the server and disconnect the power cords from the power supplies.**

      See "Removing Power From the Server" on page 50.

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

      See "Prevent ESD Damage" on page 54.

c. **Extend the server into the service position.**

   See “Extend the Server to the Service Position” on page 55.

d. **Remove the fan cover.**

   Remove the 12 fan cover screws, then slide the cover forward and lift it off the server.

e. **If necessary, remove the fan modules from the server.**

   See “Remove a Fan Module” on page 79.

2. **Pull each drive out far enough to disengage it from the drive backplane.**

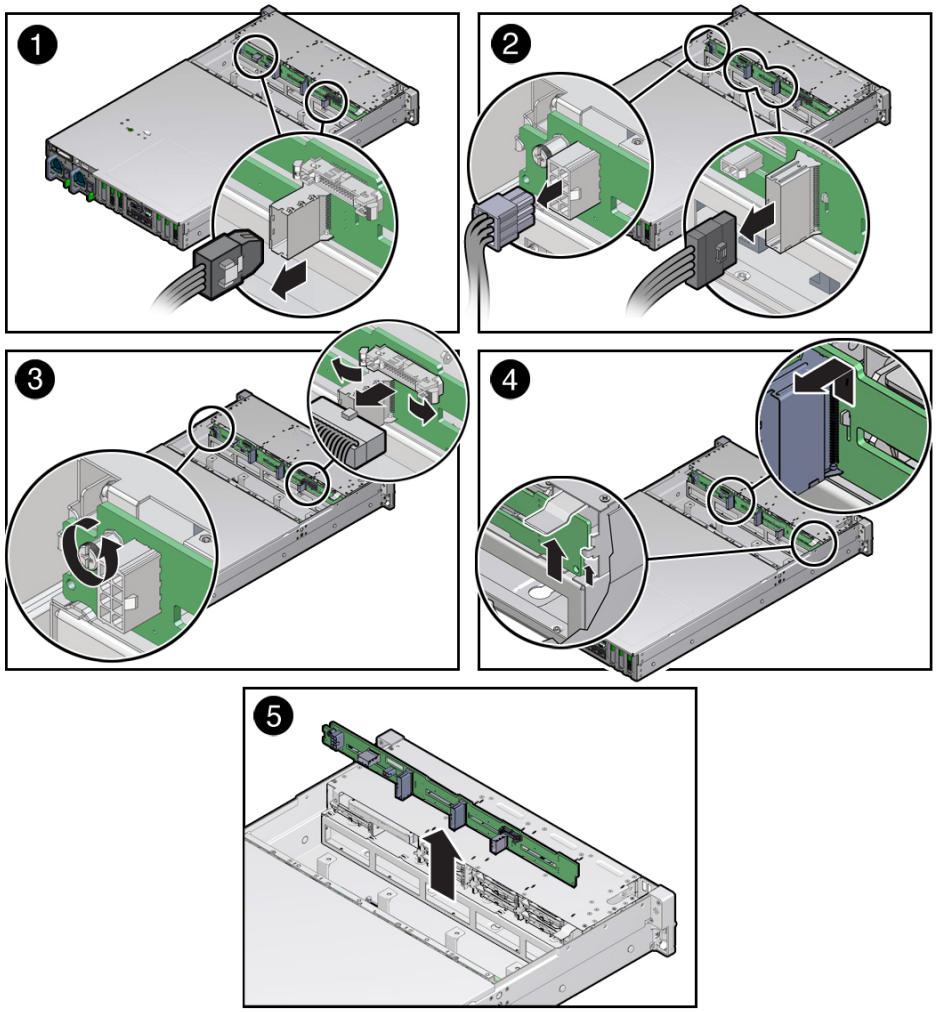
Note - You do not need to completely remove the storage drives from the server. Simply pull them out far enough to disengage them from the drive backplane. If you do remove the storage drives from the server, record their locations so that you can reinstall them in the same locations.

---

3. **Disconnect the cables from the drive backplane.**

   a. **Disconnect the two SAS cables from the drive backplane that go to the card in internal SAS slot 7 (panel 1).**

Note the cable connections in order to ease proper reconnection of the cables.



b. Disconnect the power cable and the auxiliary signal cable from the drive backplane (panel 2).

c. Disconnect the two NVMe cables from the drive backplane (panel 2).

Note the location of each cable so they can be reconnected to the same locations.

4. **Using a No. 2 Phillips screwdriver, loosen the right-side spring-mounted screw (on the power supply side of the server) that secures the drive backplane to the chassis (panel 4).**

5. **Lift up on the left-side spring tab, and then gently release the drive backplane from the standoff hooks and out from under the spring tab (panel 5).**

6. **Pull the drive backplane away from the standoff hooks and spring tab and out of the chassis (panel 6).**

7. **Place the drive backplane on an antistatic mat.**

Related Information

- “Internal Component Locations” on page 20
- “Install the Eight-Drive Backplane” on page 134

▼ Install the Eight-Drive Backplane

1. **Lower the drive backplane into the server, and then position it under the spring tab to engage the standoff hooks.**

   The standoff hooks fit into small openings in the drive backplane.

   Ensure that ribbon cables are clear of the drive backplane.

2. **Using a No. 2 Phillips screwdriver, install and tighten the spring-mounted screw (on the power supply side of the server) to secure the drive backplane to the chassis.**

3. **Reconnect the cables to the drive backplane.**

   a. **Reconnect the auxiliary signal cable to the drive backplane.**

   b. **Reconnect the power cable to the drive backplane.**

   c. **Reconnect the two NVMe cables to the drive backplane.**

      Attach connectors to the original locations on the drive backplane.

   d. **Reconnect the two SAS cables to the drive backplane.**

4. **Return the server to operation.**

a. **If removed, install the fan modules.**

   See “Install a Fan Module” on page 82.

b. **Install the fan cover, and close the fan door.**

   See “Replace the Fan Cover” on page 149.

c. **Fully install all storage drives you disengaged or removed.**

   See “Install a Drive or Drive Filler” on page 72.

d. **Return the server to the normal operating position.**

   See “Return the Server to the Normal Operating Position” on page 153.

e. **Reconnect the power cords to the power supplies, and power on the server.**

   See “Attach Power Cords” on page 154 and “Power On the Server (Oracle ILOM)” on page 154 or “Power On the Server (System Power Button)” on page 155. Verify that the power supply AC OK LED is lit.

Note - Authorized service personnel might need to reprogram the product serial number on the drive backplane. This number is used for service entitlement and warranty coverage. The correct product serial number is located on a label on the front of the chassis.

---

5. **Use the Oracle ILOM `show faulty` command to verify that the fault has been cleared.**

   See “Identify Faulted Components” on page 28 for more information on using the `show faulty` command.

Related Information

- “Internal Component Locations” on page 20
- “Remove the Eight-Drive Backplane” on page 131

▼ Remove the Twelve-Drive Backplane

1. **Prepare the server for service.**

   a. **Power off the server and disconnect the power cords from the power supplies.**

See “Removing Power From the Server” on page 50.

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

See “Prevent ESD Damage” on page 54.

c. **Extend the server into the service position.**

See “Extend the Server to the Service Position” on page 55.

d. **Remove the fan cover.**

Remove the three top screws and the two side screws, then remove the cover.

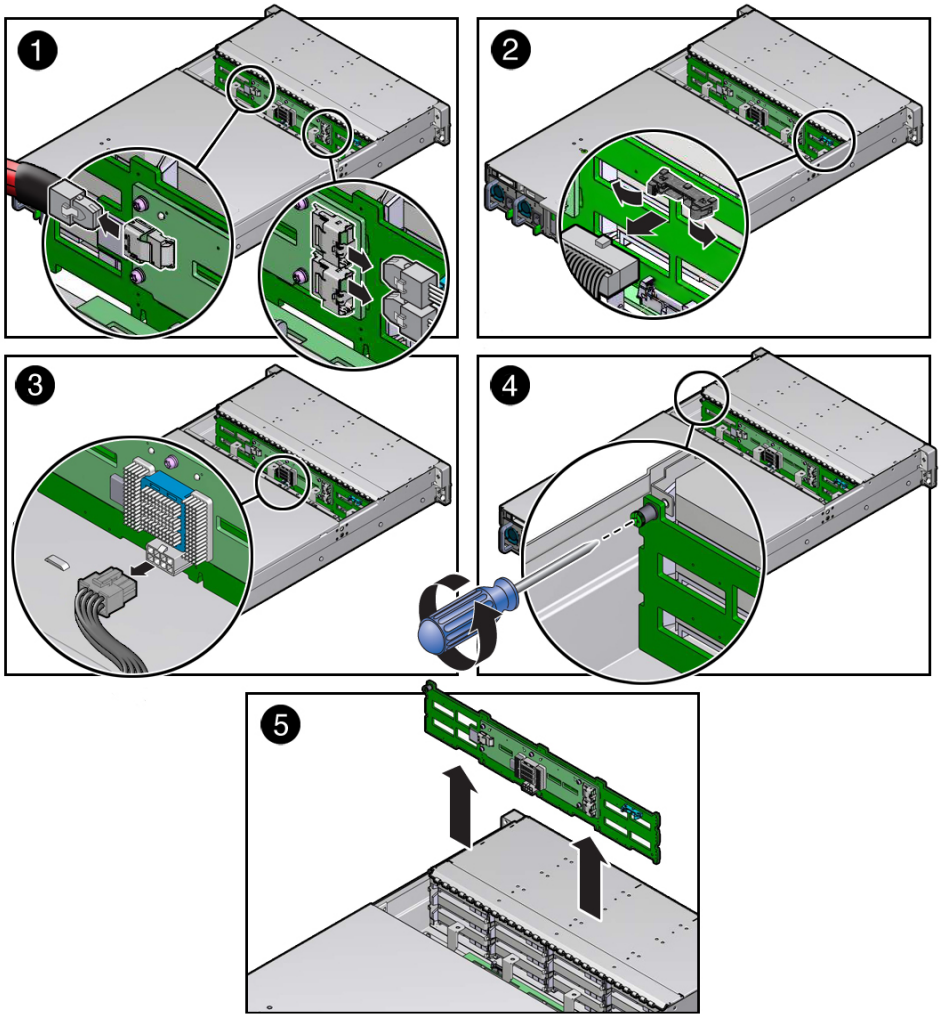
e. **If necessary, remove the fan modules from the server.**

See “Remove a Fan Module” on page 79.

2. **Pull each drive and filler out far enough to disengage it from the drive backplane.**

Note - You do not need to completely remove the storage drives from the server. Simply pull them out far enough to disengage them from the drive backplane. If you do remove the storage drives from the server, record their locations so that you can reinstall them in the same locations.

3. **Disconnect the cables from the SAS expander and drive backplane.**



a. **Disconnect the three SAS cables from the SAS expander (panel 1).**

b. **Disconnect the auxiliary signal cable from the drive backplane (panel 2).**

c. **Disconnect the power cable from the drive backplane (panel 3).**

4. **Using a No. 2 Phillips screwdriver, loosen the captive screw that secure the drive backplane to the disk cage.**

5. **Lift the drive backplane and attached SAS expander, over the nine hooks that secure it, then lift the assembly up and out of the chassis.**

6. **Place the drive backplane on an antistatic mat.**

▼ Install the Twelve-Drive Backplane

1. **Lower the drive backplane into the server, position it in front of the standoff hooks, then push the backplane into place.**

   The standoff hooks fit into small openings in the drive backplane. Ensure that all cables are out of the way.

2. **Using a No. 2 Phillips screwdriver, tighten the captive screw to secure the drive backplane to the disk cage.**

3. **Reconnect the cables to the drive backplane.**

   a. **Reconnect the auxiliary signal cable to the drive backplane.**

   b. **Reconnect the power cable to the drive backplane.**

   c. **Connect the three SAS cables to the SAS expander.**

      Attach cables to the similarly-labeled connectors.

4. **Return the server to operation.**

   a. **Install the fan modules.**

      See “Install a Fan Module” on page 82.

   b. **Install the fan cover, and close the fan door.**

      Replace the fan cover and secure it with the two side screws and three top screws.

   c. **Fully install all storage drives you disengaged or removed.**

      See “Install a Drive or Drive Filler” on page 72.

   d. **Return the server to the normal operating position.**

See “Return the Server to the Normal Operating Position” on page 153.

e. **Reconnect the power cords to the power supplies, and power on the server.**

See “Attach Power Cords” on page 154 and “Power On the Server (Oracle ILOM)” on page 154 or “Power On the Server (System Power Button)” on page 155. Verify that the power supply AC OK LED is lit.

Note - Authorized service personnel might need to reprogram the product serial number on the drive backplane. This number is used for service entitlement and warranty coverage. The correct product serial number is located on a label on the front of the chassis.

---

5. **Use the Oracle ILOM `show faulty` command to verify that the fault has been cleared.**

See “Identify Faulted Components” on page 28 for more information on using the `show faulty` command.

▼ Remove the Twelve-Drive NVMe Backplane

1. **Prepare the server for service.**

a. **Power off the server and disconnect the power cords from the power supplies.**

See “Removing Power From the Server” on page 50.

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

See “Prevent ESD Damage” on page 54.

c. **Extend the server into the service position.**

See “Extend the Server to the Service Position” on page 55.

d. **Remove the fan cover.**

Remove the two side screws that secure the fan cover, then remove the fan cover by pulling it towards the rear of the server.

e. **Remove the fan modules from the server.**

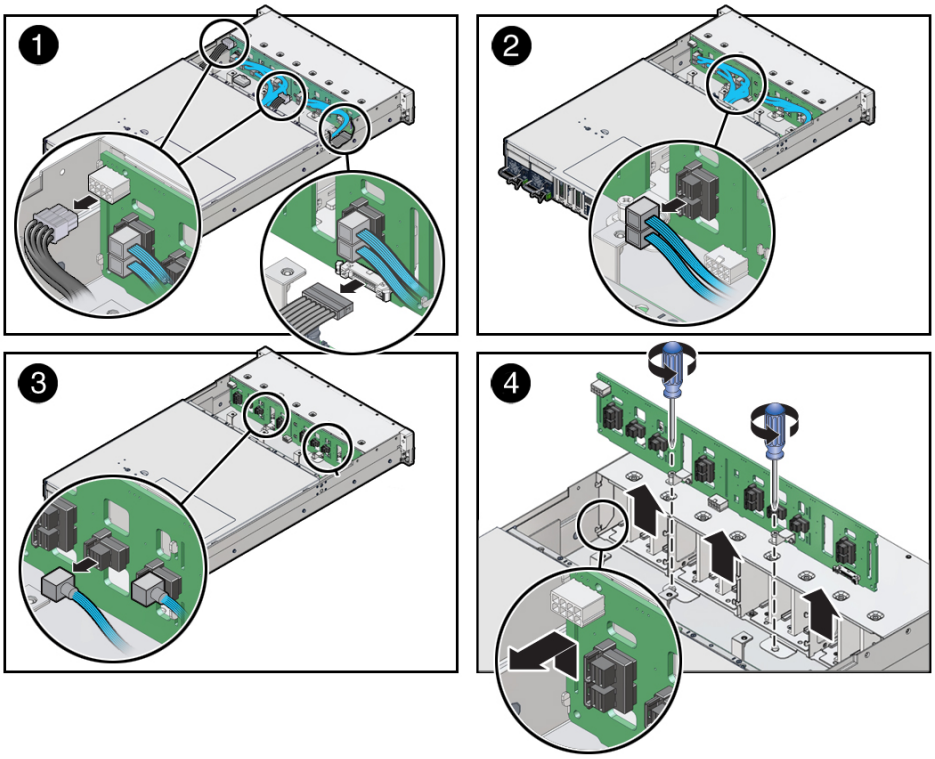
See “Remove a Fan Module” on page 79.

2. **Pull each drive and filler out far enough to disengage it from the drive backplane.**

Note - You do not need to completely remove the storage drives from the server. Simply pull them out far enough to disengage them from the drive backplane. If you do remove the storage drives from the server, record their locations so that you can reinstall them in the same locations.

---

3. **Disconnect the cables from the drive backplane.**



a. **Disconnect the two power cables from the drive backplane.**

b. **Disconnect the 12 NVMe cables from the drive backplane.**

c. **Disconnect the auxiliary signal cable from the drive backplane.**

4. **Using a No. 2 Phillips screwdriver, loosen the 2 green spring-mounted screws that secure the drive backplane to the chassis.**

5. **Pull the drive backplane towards the rear of the server, away from the standoff hooks, and then out of the chassis.**

6. **Place the drive backplane on an antistatic mat.**

Install the Twelve-Drive NVMe Backplane

1. **Lower the drive backplane into the server, position it in front of the eight stanoff hooks, then push the backplane down and into place.**
   The standoff hooks fit into small openings in the drive backplane. Align the center double hook first, and ensure that all cables are out of the way.

2. **Using a No. 2 Phillips screwdriver, tighten the two green spring-mounted screws to secure the drive backplane to the chassis.**

3. **Reconnect the cables to the drive backplane.**

   a. **Reconnect the auxiliary signal cable to the drive backplane.**

   b. **Reconnect the two power cables to the drive backplane.**

   c. **Connect the 12 NVMe cables to the drive backplane.**
      Attach cables to the similarly-labeled connectors.

4. **Return the server to operation.**

   a. **Install the fan modules.**
      See “Install a Fan Module” on page 82.

   b. **Install the fan cover, and close the fan door.**
      Replace the fan cover and secure it with two side screws.

   c. **Fully install all storage drives you disengaged or removed.**
      See “Install a Drive or Drive Filler” on page 72.

   d. **Return the server to the normal operating position.**
      See “Return the Server to the Normal Operating Position” on page 153.

e. **Reconnect the power cords to the power supplies, and power on the server.**

See “Attach Power Cords” on page 154 and “Power On the Server (Oracle ILOM)” on page 154 or “Power On the Server (System Power Button)” on page 155. Verify that the power supply AC OK LED is lit.

Note - Authorized service personnel might need to reprogram the product serial number on the drive backplane. This number is used for service entitlement and warranty coverage. The correct product serial number is located on a label on the front of the chassis.

---

5. **Use the Oracle ILOM `show faulty` command to verify that the fault has been cleared.**

See “Identify Faulted Components” on page 28 for more information on using the `show faulty` command.

▼ Remove the Twenty Four-Drive Backplane

1. **Prepare the server for service.**

a. **Power off the server and disconnect the power cords from the power supplies.**

See “Removing Power From the Server” on page 50.

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

See “Prevent ESD Damage” on page 54.

c. **Extend the server into the service position.**

See “Extend the Server to the Service Position” on page 55.

d. **Remove the fan cover.**

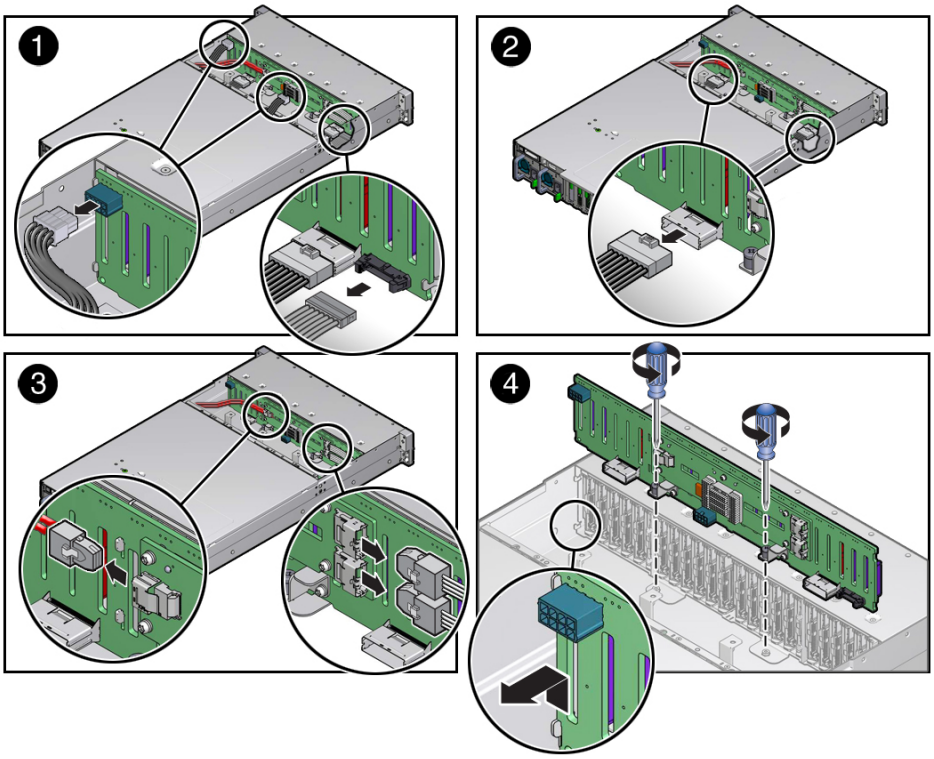
Remove the two side screws that secure the fan cover, then remove the fan cover by pulling it towards the rear of the server.

e. **If necessary, remove the fan modules from the server.**

See “Remove a Fan Module” on page 79.

2. **Pull each drive and filler half way out of the drive backplane.**

3. **Disconnect the cables from the drive backplane.**



   a. **Disconnect the two power cables and the auxiliary signal cable from the drive backplane (panel 1).**

   b. **Disconnect the two NVMe cables.**

   c. **Disconnect the three SAS cables from the SAS expander.**

4. **Using a No. 2 Phillips screwdriver, loosen the two green captive screws that secure the drive backplane to the chassis.**

5. **Lift the drive backplane and attached SAS expander, over the 12 hooks that secure it, then lift the assembly up and out of the chassis.**

6. **Place the drive backplane on an antistatic mat.**

7. **Install a drive backplane or continue the service procedure that required access.**

   See “Install the Eight-Drive Backplane” on page 134.

▼ Install the Twenty Four-Drive Backplane

1. **Lower the drive backplane into the server, position it in front of the standoff hooks, then push the backplane into place.**

   The standoff hooks fit into small openings in the drive backplane.

   Ensure that all cables are out of the way.

2. **Using a No. 2 Phillips screwdriver, tighten the 2 green captive screws to secure the drive backplane to the chassis.**

3. **Reconnect the cables to the drive backplane.**

   a. **Reconnect the auxiliary signal cable to the drive backplane.**

   b. **Reconnect the 2 power cables to the drive backplane.**

   c. **Reconnect the two NVMe cables.**

   d. **Connect the three SAS cables to the SAS expander.**

      Attach cables to the similarly-labeled connectors.

4. **Return the server to operation.**

   a. **If removed, install the fan modules.**

      See “Install a Fan Module” on page 82.

   b. **Install the fan cover, and close the fan door.**

      Replace the fan cover and secure it with two side screws.

   c. **Fully install all storage drives you disengaged or removed.**

      See “Install a Drive or Drive Filler” on page 72.

   d. **Return the server to the normal operating position.**

      See “Return the Server to the Normal Operating Position” on page 153.

e. **Reconnect the power cords to the power supplies, and power on the server.**

   See “Attach Power Cords” on page 154 and “Power On the Server (Oracle ILOM)” on page 154 or “Power On the Server (System Power Button)” on page 155. Verify that the power supply AC OK LED is lit.

Note - Authorized service personnel might need to reprogram the product serial number on the drive backplane. This number is used for service entitlement and warranty coverage. The correct product serial number is located on a label on the front of the chassis.

---

5. **Use the Oracle ILOM `show faulty` command to verify that the fault has been cleared.**

   See “Identify Faulted Components” on page 28 for more information on using the `show faulty` command.

▼ Remove the Rear Drive Backplane

1. **Prepare the server for service.**

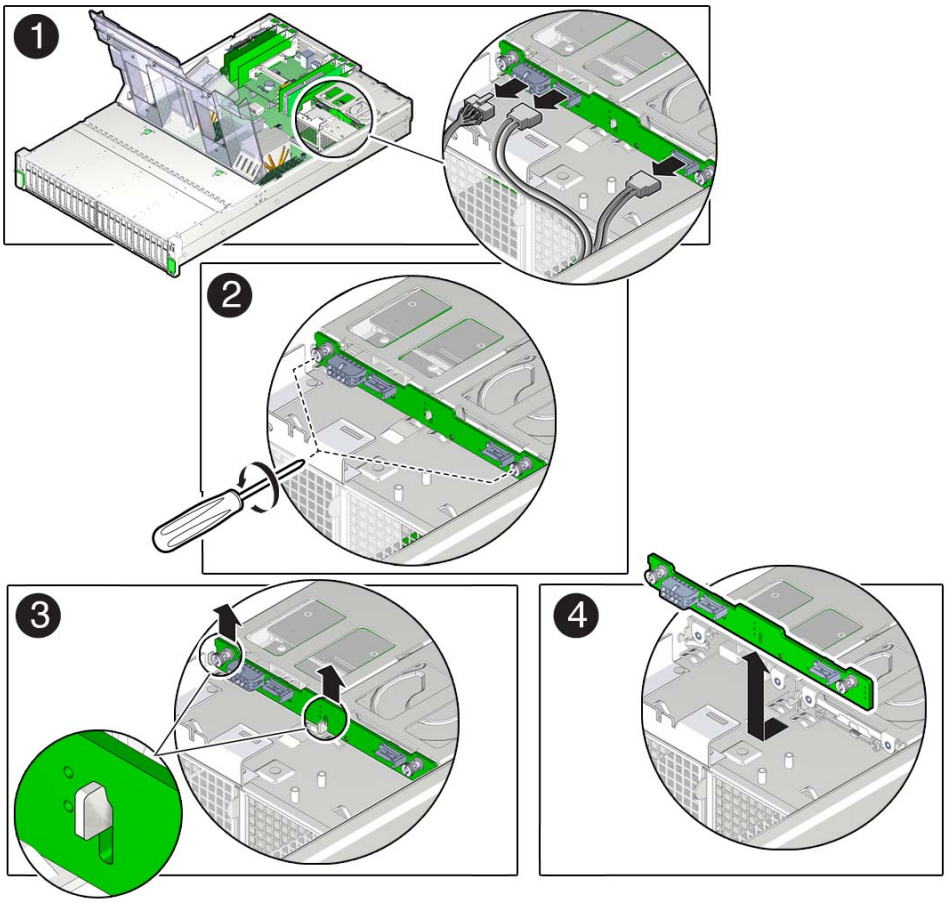
   See “Preparing for Service” on page 45.

2. **Pull each rear drive out far enough to disengage it from the rear drive backplane.**

3. **Disconnect the cables from the rear drive backplane (panel 1).**

   a. **Disconnect the two SAS cables from the rear drive backplane.**

b. **Disconnect the power cable from the rear drive backplane.**



4. **Use a No. 2 Phillips screwdriver to loosen the two screws that secure the rear drive backplane to the rear drive cage (panel 2).**

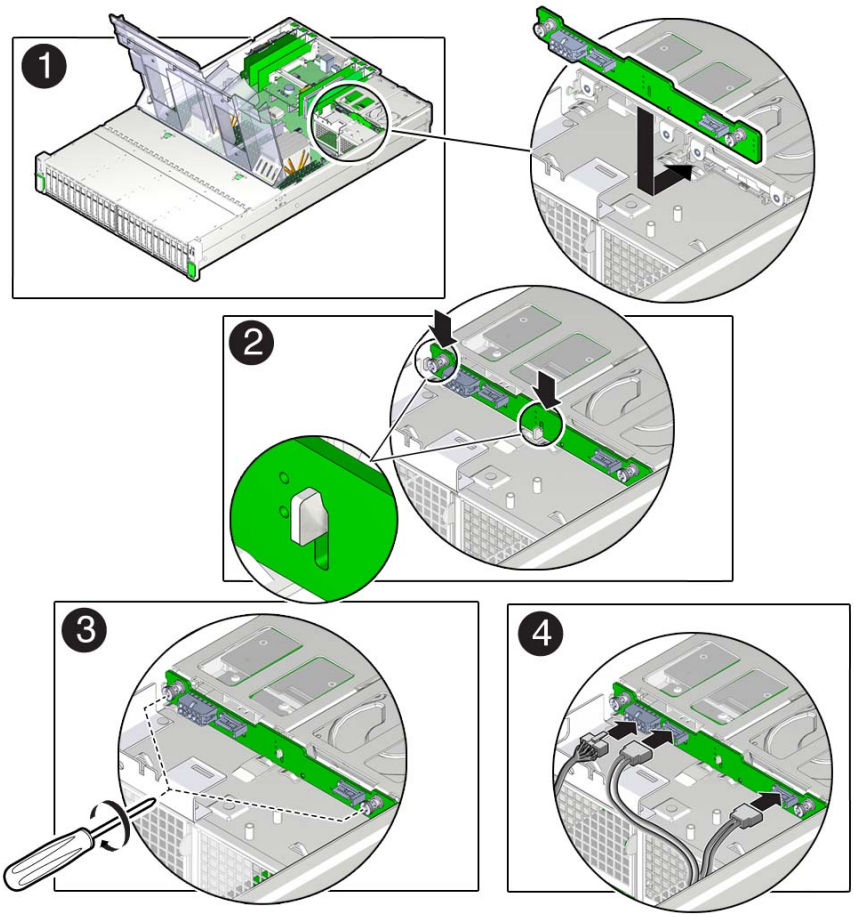
5. **Lift up the rear drive backplane to release it from the two standoff hooks (panel 3).**

6. **Pull the rear drive backplane away from the standoff hooks and remove it from the chassis (panel 4).**

7. **Place the rear drive backplane on antistatic mat.**

▼ Install the Rear Drive Backplane

1. **Orient the rear drive backplane in the server above the power supplies.**
   Position the rear drive backplane to engage the two standoff hooks (panels 1 and 2).



2. **Use a No. 2 Phillips screwdriver to tighten the two screws that secure the rear drive backplane to the rear drive cage (panel 3).**

3. **Reconnect the cables to the rear drive backplane (panel 4).**

    a. **Reconnect the power cable to the rear drive backplane.**

    b. **Reconnect the two SAS cables to the rear drive backplane.**

4. **Return the server to operation.**

    a. **Install the air baffle.**

    b. **Install the top cover.**

    c. **Fully insert all drives that you disengaged or removed.**

    d. **Return the server to normal operating position.**

    e. **Connect power cords to the power supplies and power on the server.**

5. **Check that the firmware in rear drive backplane is a minimum of FW 0408.**

    Use the `fwupdate` command from the Oracle Hardware Management Pack in Oracle Solaris 11.3 to check the firmware version for this component and to install a newer version of the firmware, if necessary.

Returning the Server to Operation

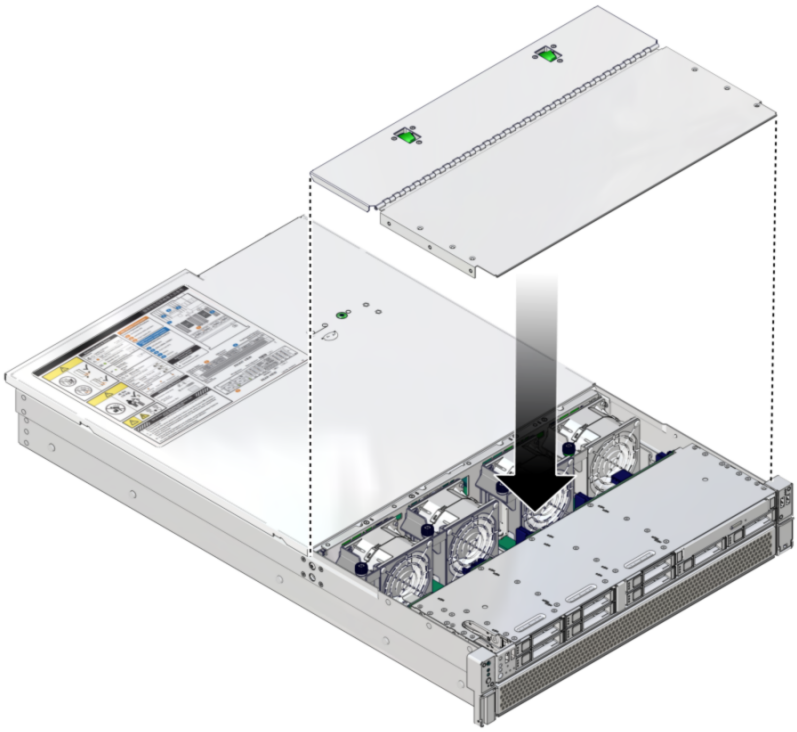
These topics describe how to return the server to operation.

Step	Description	Links
1.	Replace (as necessary) the fan cover, air baffle, and top cover and return the server to its normal operating position	“Replace the Fan Cover” on page 149 “Install the Air Baffle” on page 151 “Replace the Top Cover” on page 152 “Return the Server to the Normal Operating Position” on page 153
2.	Connect the power cords to the server.	“Attach Power Cords” on page 154
3.	Power on the server.	“Power On the Server (Oracle ILOM)” on page 154 “Power On the Server (System Power Button)” on page 155

▼ Replace the Fan Cover

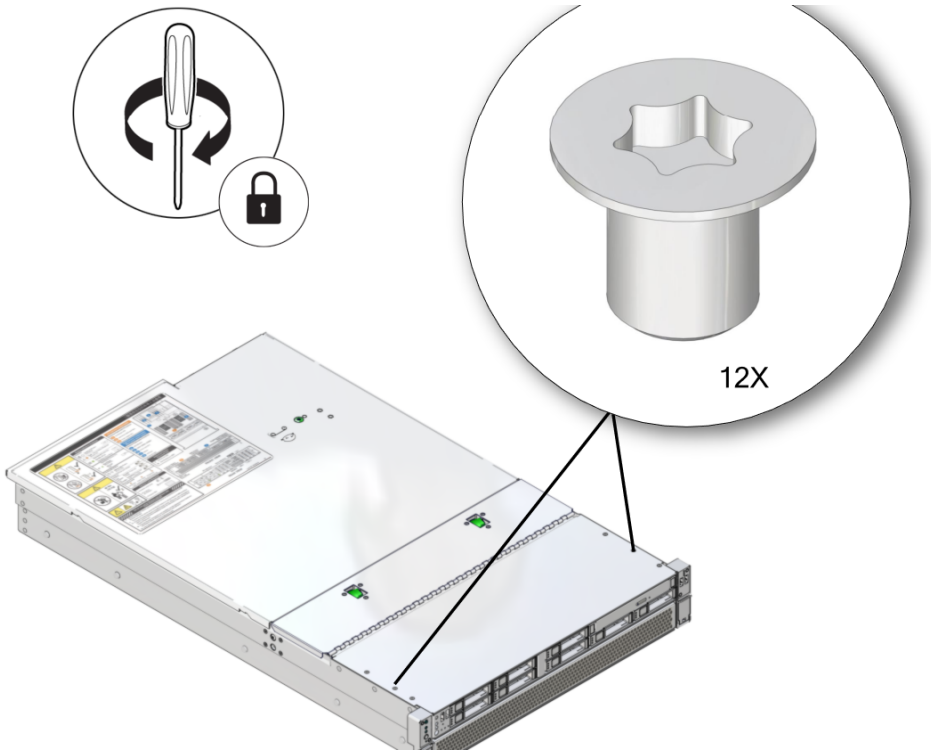
1. **Align the fan cover with the screw holes.**

There are 12 screws securing the fan cover.



2. **Fasten the 12 screws to the top and side.**

Use a T6 Torx screwdriver.



3. **Check that the two latches will engage when you close the fan cover.**

Related Information

- "Replace the Top Cover" on page 152

▼ Install the Air Baffle

Follow this procedure to install an air baffle.

1. **Orient the air baffle over the center of the server.**
   Hold the air baffle by the ridge in its center.

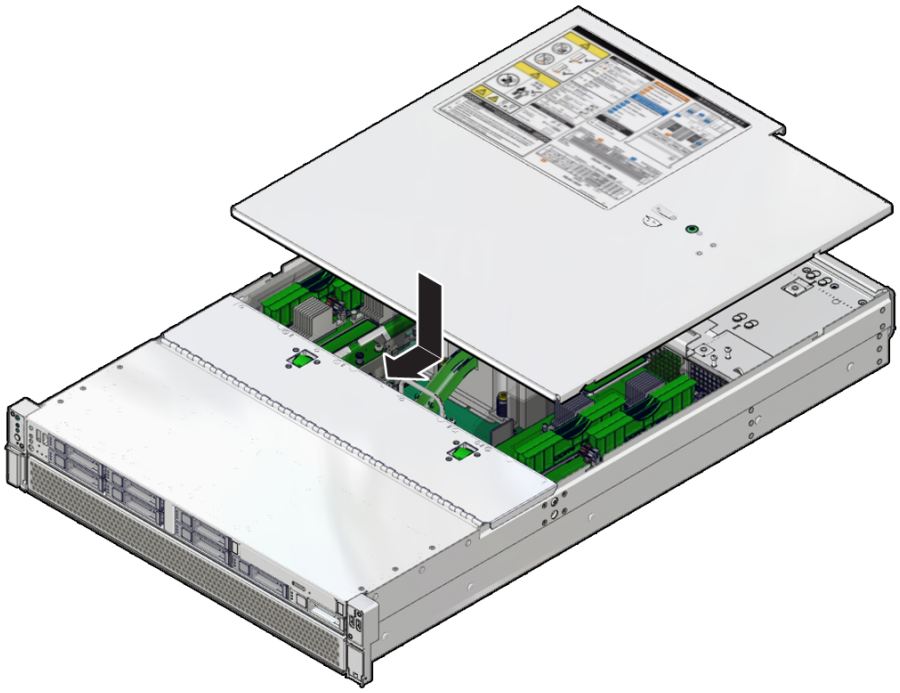
2. **Lower the air baffle until it seats in place.**

Related Information

- “Replace the Top Cover” on page 152

▼ Replace the Top Cover

1. **Place the top cover on the chassis.**



Set the cover down so that it is about 1 inch (2.5 cm) forward of the rear of the server.

2. **Slide the top cover toward the rear of the chassis until the rear cover lip engages with the rear of the chassis.**

When the top cover is seated, the green button clicks into place.

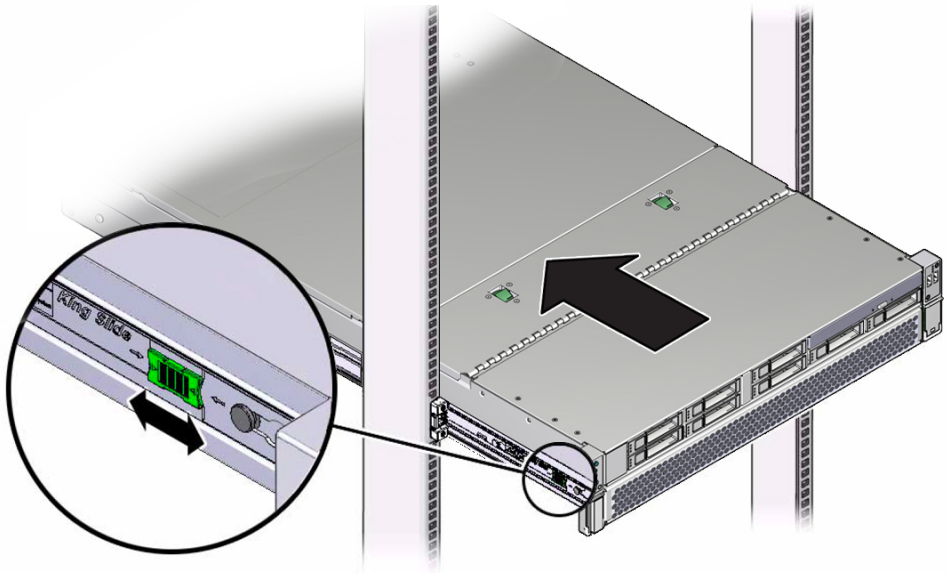
Related Information

- “Remove the Top Cover” on page 59
- “Return the Server to the Normal Operating Position” on page 153

Return the Server to the Normal Operating Position

Caution - The chassis is heavy. To avoid personal injury, use two people to lift the server and set it in the rack.

1. **Release the slide rails from the fully extended position by pushing the release tabs on the side of each rail.**



2. **While pushing on the release tabs, slowly push the server into the rack.**

   Ensure that the cables do not get in the way.

3. **Reconnect the cables to the rear of the server.**

If the CMA is in the way, disconnect the left CMA release and swing the CMA open. See “Release the CMA” on page 56.

4. **Reconnect the CMA.**
Swing the CMA closed and latch it to the left rack rail. Refer to “Attach the CMA to the Server” in *SPARC S7-2L Server Installation Guide*.

Related Information

- “Remove the Server From the Rack” on page 58
- “Attach Power Cords” on page 154

Attach Power Cords

1. **Attach both power cords to the power supplies.**

Note - As soon as the power cords are connected to a power source, standby power is applied in the server. Depending on how the firmware is configured, the server might boot at this time.

2. **Power on the server.**
See “Power On the Server (Oracle ILOM)” on page 154 or “Power On the Server (System Power Button)” on page 155.

Related Information

- “Power On the Server (Oracle ILOM)” on page 154
- “Power On the Server (System Power Button)” on page 155

Power On the Server (Oracle ILOM)

Note - If you are powering on the server following an emergency shutdown that was triggered by the top cover interlock switch, you must use the `poweron` command.

- **Type this command at the Oracle ILOM prompt.**

```
-> poweron
```

You will see an `alert` message on the system console. This message indicates that the server is reset. You will also see a message indicating that the VCORE has been margined up to the value specified in the default `.scr` file that was previously configured. For example:

```
-> start /System
```

Related Information

- “Power On the Server (System Power Button)” on page 155
- “Clear a Fault Manually” on page 42

Power On the Server (System Power Button)

Caution - Do not operate the server without all fans, component heat sinks, air baffles, fillers, and the cover installed. Severe damage to server components can occur if the server is operated without adequate cooling mechanisms.

1. **Verify that the power cords are connected and that standby power is on.**

   Shortly after power is applied to the server, the SP OK/Fault LED blinks as the SP boots. The SP OK/Fault LED is illuminated solid green when the SP has successfully booted. After the SP has booted, the Power OK/LED on the front panel begins flashing slowly, indicating that the host is in standby power mode.

2. **Press and release server power button on the server front panel.**

   You might need to use a pointed object, such as a pen or pencil.

   When main power is applied to the server, the main Power/OK LED begins to blink more quickly while the server boots and lights solidly once the operating system boots.

   Each time the server powers on, POST can take several minutes to complete tests.

Related Information

- “Power On the Server (Oracle ILOM)” on page 154
- “Clear a Fault Manually” on page 42

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