Oracle® MiniCluster S7-2 Service Manual

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Contents

Using This Documentation

- **Overview** – Describes how to service Oracle's MiniCluster S7-2 hardware
- **Audience** – System administrators and authorized service providers
- **Required knowledge** – Advanced experience installing enterprise servers

Product Documentation Library

Documentation and resources for this product and related products are available at https://docs.oracle.com/en/engineered-systems/minicluster-s7-2/.

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

Overview of System Status Indicators and LEDs

This chapter describes system status indicators and LEDs.

Compute Node Status Indicators

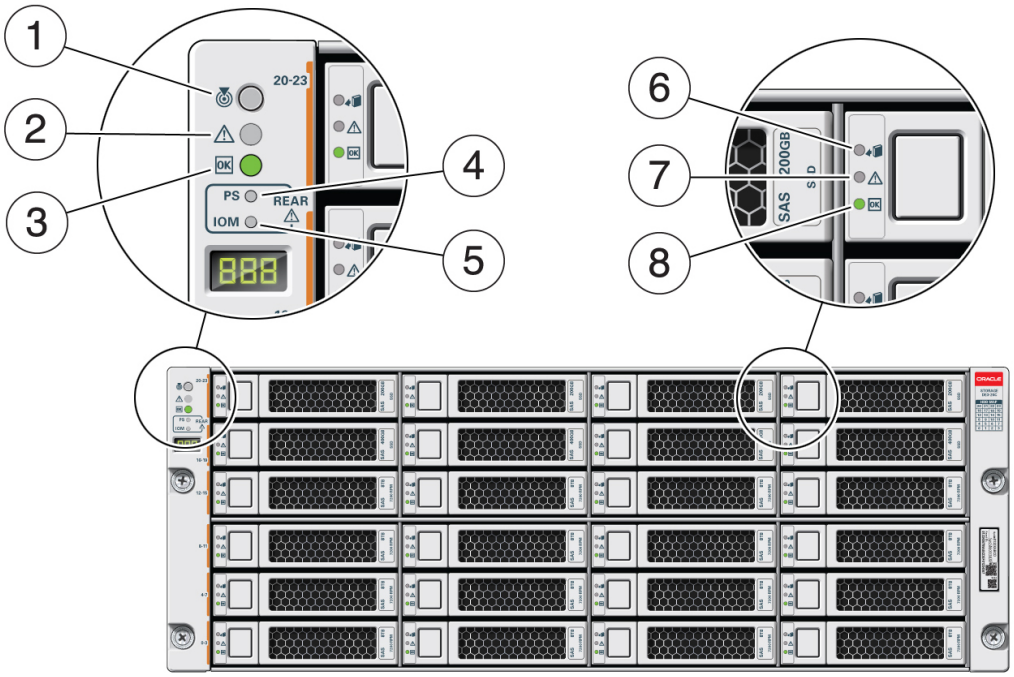
These topics describe MiniCluster compute node status indicators (LEDs).

Note - The links below take you to topics *outside* of the MiniCluster library to the Oracle SPARC S7-2 documentation library. Use your browser's Back button to return to the MiniCluster library.

- "Front Panel Components" in *SPARC S7-2 Server Service Manual*
- "Rear Panel Components" in *SPARC S7-2 Server Service Manual*

Storage Array Front Panel and Drive Indicators

The following figure shows the controls and indicators on the storage array front panel and drives.

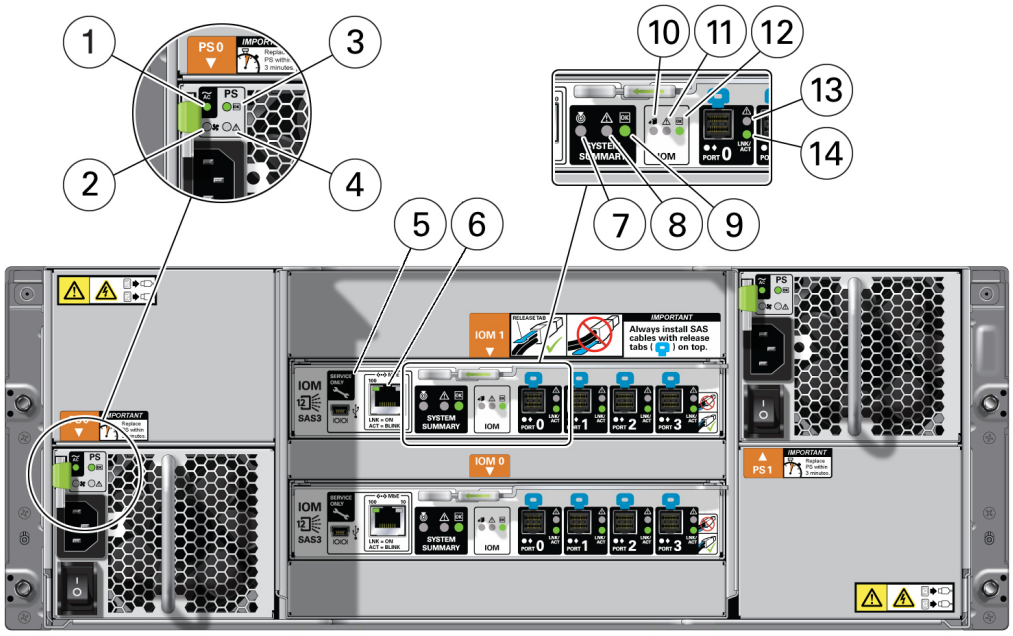


Callout	Indicator/LED: Color	State Meaning
1	Locate: white	■ Off – Normal operation. ■ Fast blink – This LED blinks to help locate the system. Operators can turn this indicator on and off remotely using Oracle ILOM. ■ Pressing this button toggles the fast blink on or off.
2	Service Required: amber	■ Off – Normal operation. ■ Steady on – A fault is present in the storage array.
3	OK: green	■ On – The storage array is powered on and operating normally. ■ Off – The storage array is unplugged or turned off.
4	Power Supply fault indicator: amber	■ On – Indicates a fault with a power supply. View the LEDs at the back of the storage array to determine which power supply has the fault. ■ Off – Normal operation.
5	SAS I/O Module fault indicator: amber	Service Required – Lights amber to indicate a fault with an I/O module. View the LEDs at the back of the storage array to determine which module has the fault.
6	Ready-to-Remove: blue	■ On – The storage drive can be safely removed during a hot-plug operation. ■ Off – The storage drive has not been prepared for removal.
7	Drive Service Required: amber	■ Off – Normal operation.

Callout	Indicator/LED: Color	State Meaning
8	Power/Activity: green	■ Steady on – A fault is present in the disk drive. ■ On – The drive is installed and recognized by the system but there is no drive activity. ■ Blink – The LED blinks randomly in response to data being written to or read from the drive. ■ Off – The drive is powered off or the installed drive is not recognized by the system.

Storage Array Back Panel Indicators

The following figure shows the controls and indicators on the storage array back panel and drives.



Callout	Indicator/LED: Color	State Meaning
1	AC power fault indicator: amber	■ On – Indicates an AC power fault. ■ Off – Normal operation.

Callout	Indicator/LED: Color	State Meaning
2	Fan fail indicator: amber	■ On – The fan is faulty. ■ Off – Normal operation.
3	Power supply status indicator: green	■ On – The power supply is operating normally. ■ Off – The power supply is unplugged or turned off.
4	DC power fail indicator: amber	■ On – The power supply is faulty. ■ Off – Normal operation.
5	Reserved	This port is reserved for Oracle Service.
6	Network port (reserved)	This port is reserved for Oracle Service.
7	Locate: white	■ Off – Normal operation. ■ Fast blink – This LED blinks to help locate the system. Operators can turn this indicator on and off remotely using Oracle ILOM. ■ Pressing this button toggles the fast blink on or off.
8	Service Required: amber	■ Off – Normal operation. ■ Steady on – A fault is present in the storage array.
9	OK: green	■ On – The storage array is powered on and operating normally. ■ Off – The storage array is unplugged or turned off.
10	SAS I/O Module Ready-to-Remove: blue	■ On – The I/O module can be safely removed during a hot-plug operation. ■ Off – The I/O module has not been prepared for removal.
11	SAS I/O Module fault indicator: amber	Service Required – Lights amber to indicate a fault with an I/O module.
12	SAS I/O Module OK: green	■ On – The I/O module is powered on and operating normally. ■ Off – The I/O module is unplugged or turned off.
13	Host SAS port fault indicator: amber	Service Required – Lights amber to indicate a fault with the port or connection.
14	Host SAS port activity indicator: green	Lights green to indicate host SAS link activity.

Preparing MiniCluster for Service

This chapter describes how to prepare MiniCluster for servicing.

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 "Preparing MiniCluster For Service" on page 15 for instructions.

This table identifies the components in each category.

Component Service Category	Component	Service Information
Hot-service, replaceable by customer	Drives, compute node	"Servicing Drives" in *SPARC S7-2 Server Service Manual*
	Fan modules, compute node	"Servicing Fan Modules" in *SPARC S7-2 Server Service Manual*
	Power supplies, compute node	"Servicing Power Supplies" in *SPARC S7-2 Server Service Manual*

Component Service Category	Component	Service Information
	HDD or SSD, storage array	“Replace a Storage Array HDD or SSD (CRU)” on page 18
	Power supplies, storage array	“Replace a Storage Array Power Supply (CRU)” on page 24
	I/O module, storage array	“Replace a Storage Array I/O Module (CRU)” on page 28
Cold-service, replaceable by customer	DIMMs, compute node	“Servicing DIMMs” in *SPARC S7-2 Server Service Manual*
	Battery, compute node	“Servicing the Battery” in *SPARC S7-2 Server Service Manual*
	PCIe cards, compute node	“Servicing PCIe Cards” in *SPARC S7-2 Server Service Manual*
	Front indicator module, compute node	“Servicing the Front Indicator Module” in *SPARC S7-2 Server Service Manual*
	eUSB drive, compute node	“Servicing the eUSB Drive” in *SPARC S7-2 Server Service Manual*
Cold-service, replaceable by authorized service personnel	Cables, compute node	“Servicing Cables” in *SPARC S7-2 Server Service Manual*
	Drive backplane, compute node	“Servicing the Drive Backplane” in *SPARC S7-2 Server Service Manual*
	Motherboard, compute node	“Servicing the Motherboard” in *SPARC S7-2 Server Service Manual*

Detecting and Managing Faults

Note - The links in this list take you to instructions that are in other documents. Open the links in a new tab or use your browser's Back button to return to this document.

- “Checking for Faults” in *SPARC S7-2 Server Service Manual*
- “Log In to Oracle ILOM (Service)” in *SPARC S7-2 Server Service Manual*
- “Identify Faulted Components” in *SPARC S7-2 Server Service Manual*
- “Performing Advanced Troubleshooting” in *SPARC S7-2 Server Service Manual*
- “Check the Message Buffer” in *SPARC S7-2 Server Service Manual*
- “View Log Files (Oracle Solaris)” in *SPARC S7-2 Server Service Manual*
- “View Log Files (Oracle ILOM)” in *SPARC S7-2 Server Service Manual*
- “POST Overview” in *SPARC S7-2 Server Service Manual*
- “Configure POST” in *SPARC S7-2 Server Service Manual*
- “Oracle ILOM Properties That Affect POST Behavior” in *SPARC S7-2 Server Service Manual*
- “Clear a Fault Manually” in *SPARC S7-2 Server Service Manual*

Preparing MiniCluster For Service

Most service procedures are performed on a single appliance component. Service procedures that require a single compute node to be powered off can be performed without shutting down the entire MiniCluster.

Note - The links in this table take you to instructions that are in other documents. Open the links in a new tab or use your browser's Back button to return to this document.

Task	For More Information
Review safety information.	Safety Information in the *SPARC S7-2 Server Service Manual*
Gather required tools.	Service Tools in the *SPARC S7-2 Server Service Manual*
Find the server serial number.	Find the Server Serial Number in the *SPARC S7-2 Server Service Manual*
Locate the server in the data center.	Locate the Server in the *SPARC S7-2 Server Service Manual*
Shut the compute nodes down gracefully.	Shut Down, Reset, or Power Cycle the System in the *MiniCluster S7-2 Administration Guide*.
Power off the compute nodes. *Caution* – Shut both compute nodes down gracefully before powering off the server.	Power Off the Server in the *SPARC S7-2 Server Service Manual*
Power off the storage array. *Caution* – Power off both compute nodes before powering off the storage array.	1. Place the storage array power supply on/off switches to the "0" off position. Note – There are two power supplies for each array. Power off all power supplies. 2. Disconnect both power cords from the power source. Note – All power cords must be disconnected to completely remove power from the storage array.
Label cables then disconnect the cables.	Disconnect Cables From the Server in the *SPARC S7-2 Server Service Manual*
Prevent ESD damage.	Prevent ESD Damage in the *SPARC S7-2 Server Service Manual*
Extend the server to the service position.	Extend the Server to the Service Position in the *SPARC S7-2 Server Service Manual*
Remove the server from the rack.	Remove the Server From the Rack in the *SPARC S7-2 Server Service Manual*
Open the server fan door.	Open the Server Fan Door in the *SPARC S7-2 Server Service Manual*
Remove the server top cover.	Remove the Top Cover in the *SPARC S7-2 Server Service Manual*

Servicing CRUs That Do Not Require System Power Off

This chapter describes how to remove and replace the hot-swappable components in MiniCluster. Hot-swappable means that these components can be replaced with the system powered on.

Note - Hot-swappable components can also be replaced with the system powered off. If you choose this method, first power off the system as described in “Preparing MiniCluster for Service” on page 13.

The following topics are covered:

Compute Node Hot-Swappable Components

This section describes replacing hot-swappable components for the compute node.

Hot-swappable components are those that can be removed and installed while the system and the compute nodes are running without requiring any administrative tasks. These are designated as Customer Replaceable Units (CRUs).

Refer to the following table for hot-swap component instructions for your appliance.

Note - The links in the following table take you to instructions *outside* of the MiniCluster library to the SPARC S7-2 documentation library. Use your browser's Back button to return to the MiniCluster library.

- “Servicing Drives” in *SPARC S7-2 Server Service Manual*

- "Servicing Fan Modules" in *SPARC S7-2 Server Service Manual*
- "Servicing Power Supplies" in *SPARC S7-2 Server Service Manual*

Storage Array Hot-Swappable Components

This section describes replacing hot-swappable components for the storage array.

Hot-swappable components are those that can be removed and installed while the system and the compute nodes are running without requiring any administrative tasks. These are designated as Customer Replaceable Units (CRUs).

Caution - Data loss. Do not remove power from both power supplies of the storage array or storage expansion shelf (if equipped) while the database is running. If you must power off the storage array or expansion storage array, stop the database first.

Note - After a physical insertion or removal action of a storage array component (such as a disk or SAS cable), you should wait before performing the next action to allow the system software to fully process the event. This could take up to 3 minutes to complete.

Replacement Procedures

These storage array components can be replaced while the storage array is powered-on and running:

- "Replace a Storage Array HDD or SSD (CRU)" on page 18
- "Replace a Storage Array Power Supply (CRU)" on page 24
- "Replace a Storage Array I/O Module (CRU)" on page 28

Replace a Storage Array HDD or SSD (CRU)

Use these procedures to replace a storage array HDD or SSD.

- "Remove a Storage Array HDD or SSD (CRU)" on page 19
- "Install a Storage Array HDD or SSD (CRU)" on page 22

▼ Remove a Storage Array HDD or SSD (CRU)

1. Enter the appropriate commands through the CLI to prepare the drive for removal from the storage array.

Use this procedure to logically remove a storage array drive from the system before you physically remove the drive.

The length of time that it takes to complete this procedure before you can physically remove the drive depends on the type of drive you are removing:

- **SSD** – The detach operation completes quickly and the drive can be removed immediately.
- **HDD** – The detach operation takes several minutes to complete. Do not remove the drive before the detach operation competes.

a. Log into the `mcmu` CLI as a primary admin such as mcinstall.

```
% ssh mcinstall@minicluster_node_name_or_IPaddress
```

where *minicluster_node_name_or_IPaddress* is the name of the first node on MiniCluster, or the IP address of the first node.

For example:

```
% ssh mcinstall@mc4-n1
```

b. When prompted, enter the password.

For more information about running `mcmu` CLI commands, refer to the *Oracle MiniCluster S7-2 Installation Guide* or the *Oracle MiniCluster S7-2 Administration Guide*.

c. Identify the drive name.

You might be able to get the drive name from the error message or log file that led to the plan to replace the drive.

You can use a command such as `diskinfo`. Make note of the long drive name (such as `c0t5000CCA23B0BF34Cd0`) for use with this procedure. Also make note of the shorter name (such as `HDD8`) for use with the followup task when you reattach the replaced drive.

Also note that the storage array drives are identified by a `JBODARRAY` string.

For example:

```
 % diskinfo
D:devchassis-path                  c:occupant-compdev
---------------------------------  --------------------
/dev/chassis/SYS/HDD0/disk         c0t5000CCA02D1EE2A8d0
/dev/chassis/SYS/HDD1/disk         c0t5000CCA02D1E7AACd0
```

```
/dev/chassis/SYS/HDD2/disk          c0t5000CCA02D1EDCECd0
/dev/chassis/SYS/HDD3/disk          c0t5000CCA02D1ED360d0
/dev/chassis/SYS/HDD4/disk          c0t5000CCA02D1EE6D8d0
/dev/chassis/SYS/HDD5/disk          c0t5000CCA02D1EE6CCd0
/dev/chassis/SYS/HDD6               -
/dev/chassis/SYS/HDD7               -
/dev/chassis/SYS/MB/EUSB-DISK/disk  c1t0d0
/dev/chassis/JBODARRAY1/HDD0/disk   c0t5000CCA25497267Cd0
/dev/chassis/JBODARRAY1/HDD1/disk   c0t5000CCA2549732B8d0
/dev/chassis/JBODARRAY1/HDD2/disk   c0t5000CCA254974F28d0
/dev/chassis/JBODARRAY1/HDD3/disk   c0t5000CCA254965A78d0
/dev/chassis/JBODARRAY1/HDD4/disk   c0t5000CCA254978510d0
/dev/chassis/JBODARRAY1/HDD5/disk   c0t5000CCA254964E3Cd0
/dev/chassis/JBODARRAY1/HDD6/disk   c0t5000CCA0536CA5E4d0
/dev/chassis/JBODARRAY1/HDD7/disk   c0t5000CCA0536CA7B0d0
/dev/chassis/JBODARRAY1/HDD8/disk   c0t5000CCA23B0BF34Cd0
/dev/chassis/JBODARRAY1/HDD9/disk   c0t5000CCA0536CB828d0
/dev/chassis/JBODARRAY1/HDD10/disk  c0t5000CCA0536CB308d0
/dev/chassis/JBODARRAY1/HDD11/disk  c0t5000CCA0536CAF2Cd0
/dev/chassis/JBODARRAY1/HDD12/disk  c0t5000CCA0536CABE4d0
/dev/chassis/JBODARRAY1/HDD13/disk  c0t5000CCA0536CB684d0
/dev/chassis/JBODARRAY1/HDD14/disk  c0t5000CCA0536CA870d0
/dev/chassis/JBODARRAY1/HDD15/disk  c0t5000CCA0536CAB88d0
/dev/chassis/JBODARRAY1/HDD16/disk  c0t5000CCA0536CA754d0
/dev/chassis/JBODARRAY1/HDD17/disk  c0t5000CCA0536CAD10d0
/dev/chassis/JBODARRAY1/HDD18/disk  c0t5000CCA0536CAEF8d0
/dev/chassis/JBODARRAY1/HDD19/disk  c0t5000CCA0536CA83Cd0
/dev/chassis/JBODARRAY1/HDD20/disk  c0t5000CCA04EB272E8d0
/dev/chassis/JBODARRAY1/HDD21/disk  c0t5000CCA04EB27234d0
/dev/chassis/JBODARRAY1/HDD22/disk  c0t5000CCA04EB27428d0
/dev/chassis/JBODARRAY1/HDD23/disk  c0t5000CCA04EB272A0d0
```

d. Use this syntax to detach the disk prior to removing the disk:

```
% mcmu diskutil -D diskname
```

where *diskname* is the disk identifier of the drive you plan to remove.

For example:

```
% mcmu diskutil -D c0t5000CCA23B0BF34Cd0
.
<output omitted>
.
INFO:MCMU.controllers.common.pexpect_util:su to user oracle successfully.
[INFO    ] logged into the zone f18-vm1-mc5qt-n1 as oracle
[INFO    ] disk alias found to be RECO_0003
[INFO    ] dropping disk c0t5000CCA23B0BF34Cd0s1
```

```
[INFO    ] ['', 'Diskgroup altered.', '']
[INFO    ] ASM rebalance complete in diskgroup RECO in zonegroup f18
[INFO    ] disk alias found to be DATA_0003
[INFO    ] dropping disk c0t5000CCA23B0BF34Cd0s4
[INFO    ] ['', 'Diskgroup altered.', '']
[INFO    ] ASM still initializing, please retry in a few minutes to check the
 progress by running
'mcmu diskutil -p'

[INFO    ] Disk should NOT be detached until rebalance is complete.

[INFO    ] disk alias found to be SYSTEM_0003
[INFO    ] dropping disk c0t5000CCA23B0BF34Cd0s5
[INFO    ] ['', 'Diskgroup altered.', '']
[INFO    ] ASM rebalance in progress in the zonegroup f18.
Estimated time of completion is 61.

[INFO    ] Disk should NOT be detached until rebalance is complete.
[INFO    ] exiting surplus
[INFO    ] Partitions to be dropped: [1]
[INFO    ] Removing disk from zones...
[INFO    ] Modifying zones: [u'f18-vm1-mc5qt-n1'] on node: mc5qt-n1
.
<output omitted>
.
[INFO    ] Running.. exit
[INFO    ] Disk {disk} being detached from Minicluster.
```

e. Check the status of the detach operation.

If you want to check the status, but the detach operation is still running, login to the `mcmu` CLI in another window.

Type:

```
% mcmu diskutil -p

[INFO    ] Checking asm rebalance progress
.
<output omitted>
.
[INFO    ] ASM Rebalance successfully complete. Attempting to remove disk from
 zones.
.
<output omitted>
.
[INFO    ] Disk successfully removed from Minicluster.
```

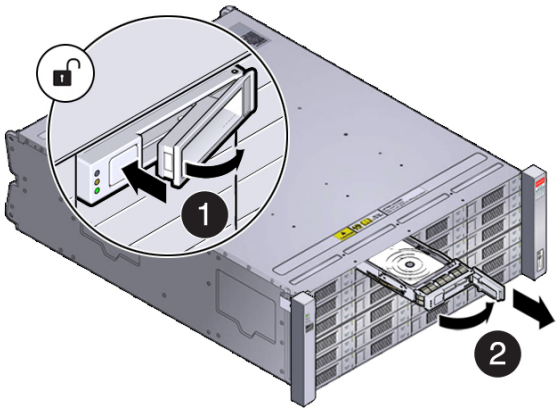
f. **When the ASM rebalance is complete, you can remove the drive.**

2. **Locate the failed drive on the front of the chassis.**

Caution - Equipment damage. Do not remove a drive unless you have an immediate replacement.

3. **Remove the drive.**

Press the button to release the drive lever [1], rotate the lever open and, grasping the drive body, slide the drive out of the chassis [2].



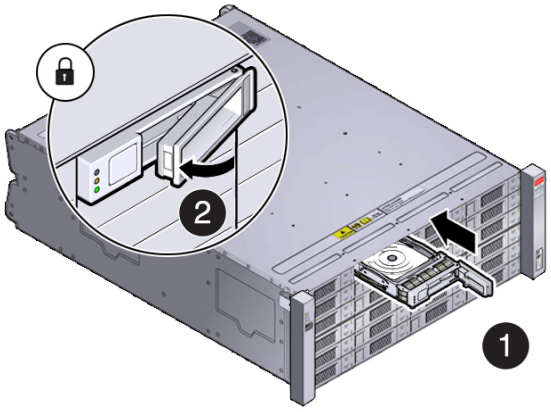
4. **Install a replacement drive, if necessary.**

See “Install a Storage Array HDD or SSD (CRU)” on page 22.

Install a Storage Array HDD or SSD (CRU)

1. **Install the replacement drive.**

Open the drive lever on the replacement drive and slide the replacement drive as far into the drive slot as possible and then close the lever to lock it into place. Check that the drive is locked in place and flush with the other drives.



2. **Log into the `mcmu` CLI as a primary admin such as mcinstall.**

   See Step 1a and Step 1b in "Remove a Storage Array HDD or SSD (CRU)" on page 19 for those instructions.

3. **Identify the full disk name of the replaced drive.**

   You can use a command such as `diskinfo`.

   In this example, `HDD8` was replaced, and `diskinfo` shows that the full drive name for `HDD8` is `c0t5000CCA0536CA710d0`.

   Also note that the storage array drives are identified by a `JBODARRAY` string.

```
 % diskinfo
D:devchassis-path                  c:occupant-compdev
---------------------------------  --------------------
/dev/chassis/SYS/HDD0/disk         c0t5000CCA02D1EE2A8d0
/dev/chassis/SYS/HDD1/disk         c0t5000CCA02D1E7AACd0
/dev/chassis/SYS/HDD2/disk         c0t5000CCA02D1EDCECd0
/dev/chassis/SYS/HDD3/disk         c0t5000CCA02D1ED360d0
/dev/chassis/SYS/HDD4/disk         c0t5000CCA02D1EE6D8d0
/dev/chassis/SYS/HDD5/disk         c0t5000CCA02D1EE6CCd0
/dev/chassis/SYS/HDD6              -
/dev/chassis/SYS/HDD7              -
/dev/chassis/SYS/MB/EUSB-DISK/disk c1t0d0
```

```
/dev/chassis/JBODARRAY1/HDD0/disk   c0t5000CCA25497267Cd0
/dev/chassis/JBODARRAY1/HDD1/disk   c0t5000CCA2549732B8d0
/dev/chassis/JBODARRAY1/HDD2/disk   c0t5000CCA254974F28d0
/dev/chassis/JBODARRAY1/HDD3/disk   c0t5000CCA254965A78d0
/dev/chassis/JBODARRAY1/HDD4/disk   c0t5000CCA254978510d0
/dev/chassis/JBODARRAY1/HDD5/disk   c0t5000CCA254964E3Cd0
/dev/chassis/JBODARRAY1/HDD6/disk   c0t5000CCA0536CA5E4d0
/dev/chassis/JBODARRAY1/HDD7/disk   c0t5000CCA0536CA7B0d0
/dev/chassis/JBODARRAY1/HDD8/disk   c0t5000CCA0536CA710d0
/dev/chassis/JBODARRAY1/HDD9/disk   c0t5000CCA0536CB828d0
/dev/chassis/JBODARRAY1/HDD10/disk  c0t5000CCA0536CB308d0
/dev/chassis/JBODARRAY1/HDD11/disk  c0t5000CCA0536CAF2Cd0
/dev/chassis/JBODARRAY1/HDD12/disk  c0t5000CCA0536CABE4d0
/dev/chassis/JBODARRAY1/HDD13/disk  c0t5000CCA0536CB684d0
/dev/chassis/JBODARRAY1/HDD14/disk  c0t5000CCA0536CA870d0
/dev/chassis/JBODARRAY1/HDD15/disk  c0t5000CCA0536CAB88d0
/dev/chassis/JBODARRAY1/HDD16/disk  c0t5000CCA0536CA754d0
/dev/chassis/JBODARRAY1/HDD17/disk  c0t5000CCA0536CAD10d0
/dev/chassis/JBODARRAY1/HDD18/disk  c0t5000CCA0536CAEF8d0
/dev/chassis/JBODARRAY1/HDD19/disk  c0t5000CCA0536CA83Cd0
/dev/chassis/JBODARRAY1/HDD20/disk  c0t5000CCA04EB272E8d0
/dev/chassis/JBODARRAY1/HDD21/disk  c0t5000CCA04EB27234d0
/dev/chassis/JBODARRAY1/HDD22/disk  c0t5000CCA04EB27428d0
/dev/chassis/JBODARRAY1/HDD23/disk  c0t5000CCA04EB272A0d0
```

4. **Use this syntax to attach a disk:**

```
% mcmu diskutil -a diskname
```

where *diskname* is the name of the disk that you want to attach.

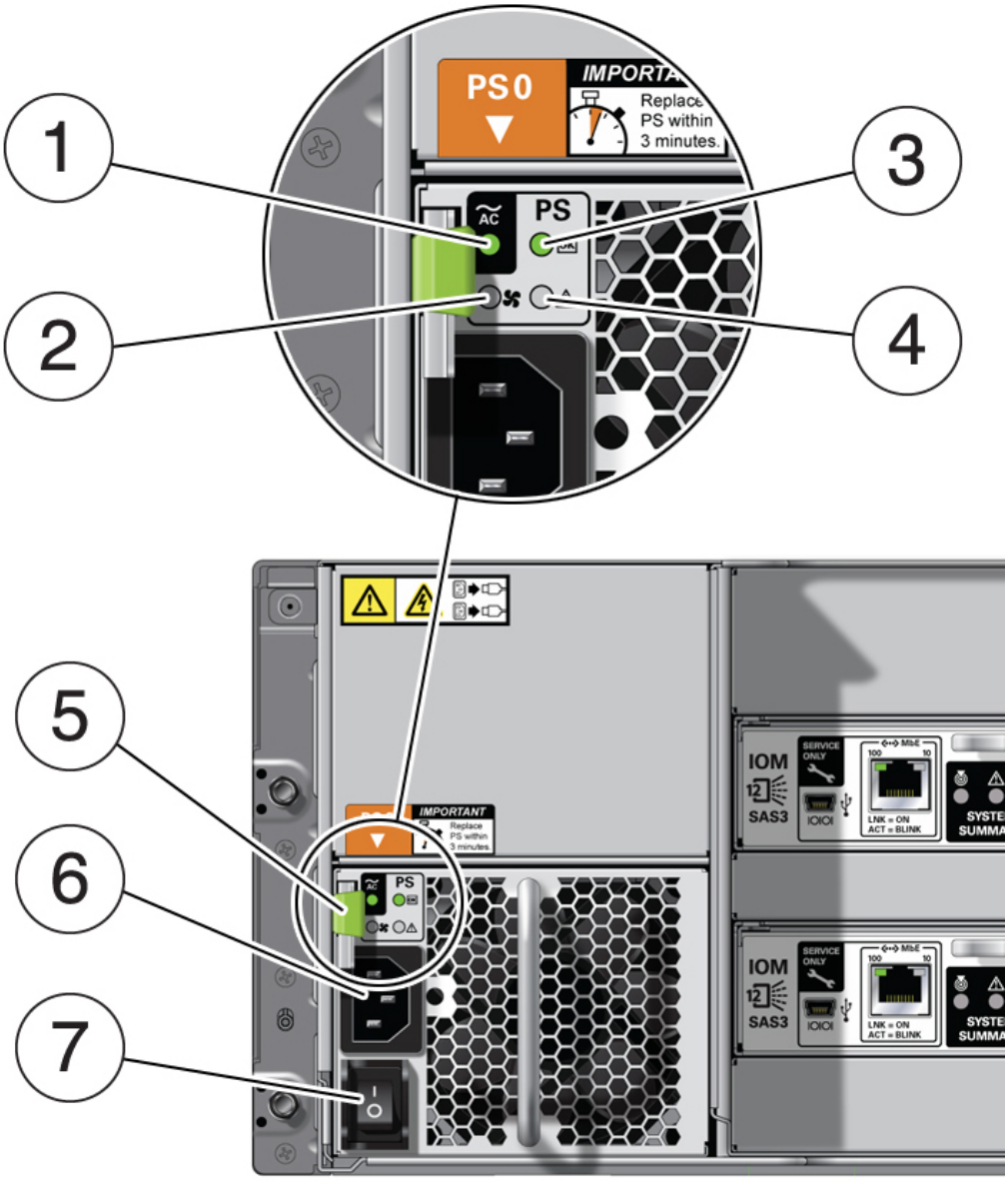
For example:

```
% mcmu diskutil -a c0t5000CCA0536CA710d0
```

▼ Replace a Storage Array Power Supply (CRU)

The storage array and the storage expansion shelf each have two power supplies. Indicators (LEDs) on the power supplies indicate their operation state.

The power supplies are redundant and one can be replaced while the appliance is running.

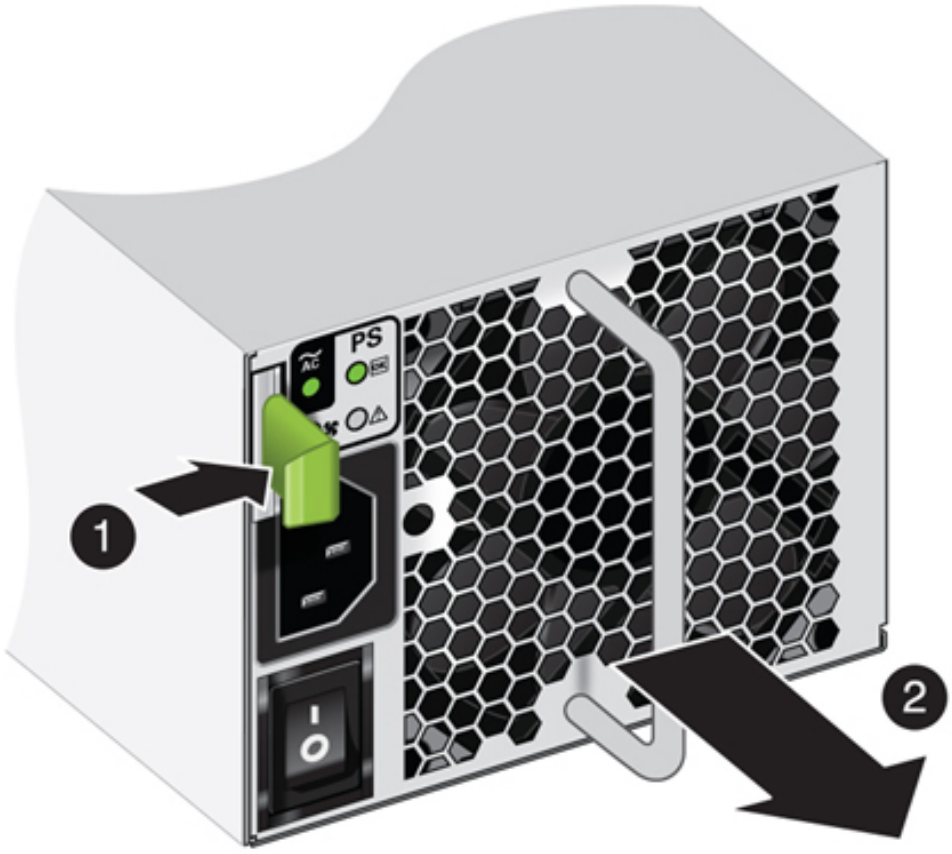

1
2
3
4
5
6
7
PS0
IMPORTA
Replace
PS within
3 minutes.
AC
PS
IMPORTANT
IOM
12
SAS3
SERVICE ONLY
LNK = ON
ACT = BLINK

Callout	Description
1	AC power fail indicator
2	Fan fail indicator
3	Power supply status indicator
4	DC power fail indicator
5	Release lever
6	AC connector
7	On/Off switch

If any of the indicators are amber, or if the power supply status indicator does not light, replace the power supply.

1. **Ensure the power supply on/off switch is in the "O" off position.**
2. **Disconnect the power cord tie strap from the power cord, and unplug the power cord from the power supply.**
3. **Remove the power supply unit.**

Grasp the power supply handle, push the release button [1], and slide the power supply out of the chassis [2].



4. **Open the lever/ejection arms on the replacement power supply.**

5. **Slide the replacement power supply module into the chassis.**

   Be careful to not bend the pins.

6. **Close the lever/ejection arms.**

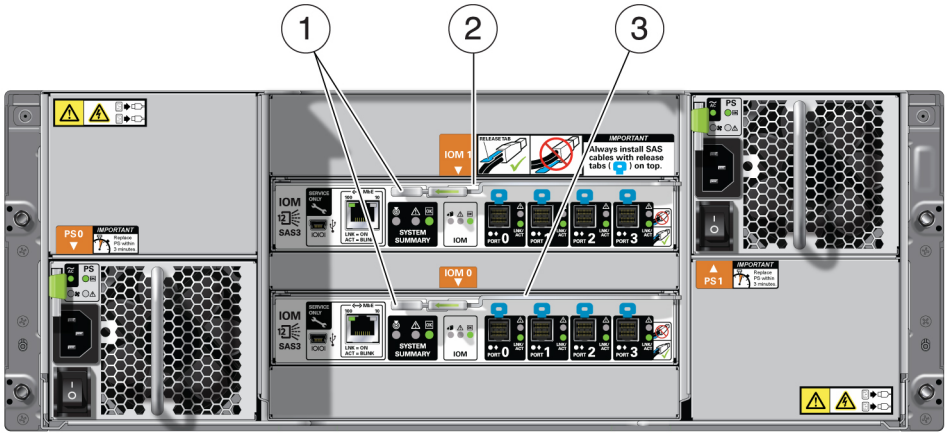
   Push the lever fully closed until you hear or feel a click.

▼ Replace a Storage Array I/O Module (CRU)

Storage array SAS I/O modules are fully redundant and can be replaced while the appliance is running.

1. **Disconnect the cables from the I/O module.**

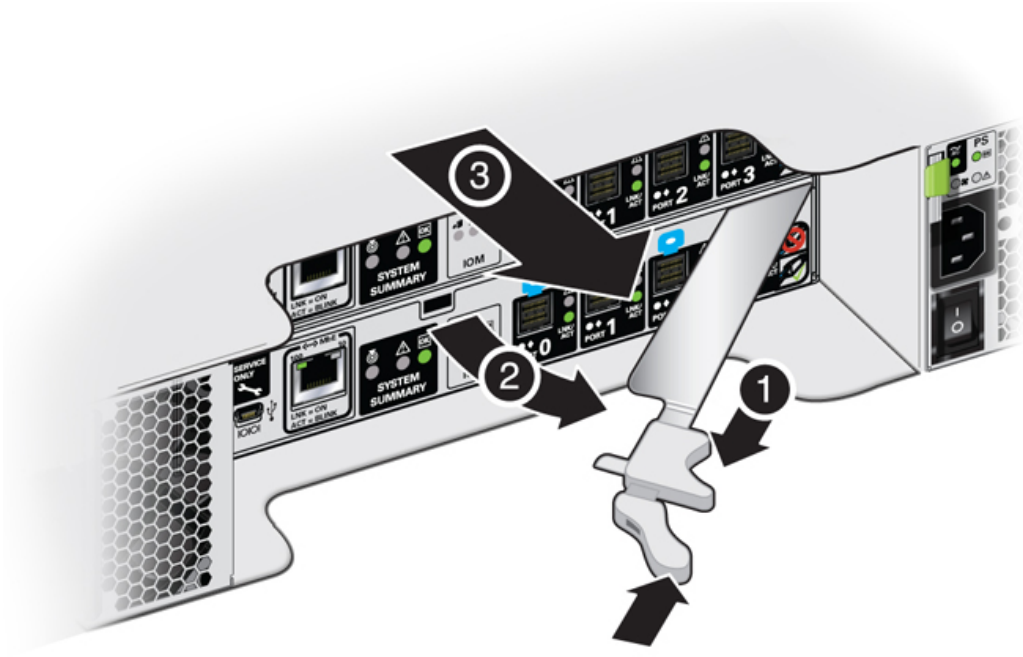
   Be sure to mark the cables so you can return them to their proper connectors.



Callout	Description
1	I/O module locking levers
2	I/O module 1 (top)
3	I/O module 0 (bottom)

2. **Remove the I/O module.**

Using your thumb and forefinger, pinch the release buttons [1] together to release the locking lever [2]. Grasp the lever and remove the I/O module from the chassis [3] .



Caution - Equipment damage. Be careful not to damage the connector pins at the back of the I/O module.

3. **Open the lever in the new I/O module if it is not already open.**
4. **Slide the new I/O module into the disk shelf and close the locking lever.**
5. **Reconnect the cables.**
6. **Verify that the new I/O module is working correctly.**
   - After approximately 60 seconds, the power LED should be solid green and the Fault/Locate LED should be off.
   - For each port that has a cable connected, all four activity LEDs should be solid green.

Servicing CRUs That Require Compute Node Power Off

These sections describe how to service customer-replaceable units (CRUs) for MiniCluster that require you to power off the compute node. All of these CRUs are located on the compute nodes.

Note - The servicing of hot-swap components such as the HDDs, SSDs, power supplies, and fans is described in “Servicing CRUs That Do Not Require System Power Off” on page 17.

Servicing Compute Node CRUs

This section describes how to service customer-replaceable units (CRUs) for the compute nodes that require you to power off the server.

Note - All of the CRUs on the storage array and the storage expansion shelf can be replaced while the power is on. See “Storage Array Hot-Swappable Components” on page 18 for storage array component replacement procedures.

Note - The links in the following list take you to instructions *outside* of the MiniCluster library to the SPARC S7-2 documentation library. Use your browser's Back button to return to the MiniCluster library.

- “Servicing DIMMs” in *SPARC S7-2 Server Service Manual*
- “Servicing the Battery” in *SPARC S7-2 Server Service Manual*
- “Servicing PCIe Cards” in *SPARC S7-2 Server Service Manual*
- “Servicing the Front Indicator Module” in *SPARC S7-2 Server Service Manual*
- “Servicing the eUSB Drive” in *SPARC S7-2 Server Service Manual*

Servicing FRUs

The following topics describe how to service field-replaceable units (FRUs) for MiniCluster. You must power down the system and disconnect the AC power cords from the server before servicing any of these components.

Only Oracle authorized service personnel should service FRU components.

Servicing Compute Node FRUs

This section describes how to service compute node FRUs. Only Oracle authorized service personnel should service FRU components.

Note - Most of the links in the following table take you to instructions *outside* of the MiniCluster library to the SPARC S7-2 documentation library. Use your browser's Back button to return to the MiniCluster library.

- "Servicing Cables" in *SPARC S7-2 Server Service Manual*
- "Servicing the Drive Backplane" in *SPARC S7-2 Server Service Manual*
- "Servicing the Motherboard" in *SPARC S7-2 Server Service Manual*

Returning MiniCluster to Operation

This chapter describes how to return MiniCluster to operation after you have performed service procedures. It includes:

Returning the System to Operation

This section describes returning the system to operation after servicing.

Note - Some links in this table take you to instructions that are in other documents. Open the links in a new tab or use your browser's Back button to return to this document.

Task	For More Information
Replace the top cover.	Replace the Top Cover in the *SPARC S7-2 Server Service Manual*
Return the server to the normal operating position.	Return the Server to the Normal Operating Position in the *SPARC S7-2 Server Service Manual*
Reconnect cables.	Connecting Cables in the *MiniCluster S7-2 Installation Guide*
Apply power to the storage array. **Apply power to the compute nodes.**	"Power On Procedure" on page 35 in this manual. **Note -** Do not power on the compute nodes until the disks on the storage array and storage expansion shelf have initialized.
Start the system.	Start the System in the *MiniCluster S7-2 Administration Guide*.

▼ Power On Procedure

Perform the following procedure to power on the MiniCluster.

When powering on the system, each compute node is powered on separately.

1. **If you powered off and disconnected the power cords from a storage array (and storage expansion shelf if one is present), reconnect the power cords now.**

2. **Power on the storage array (and storage expansion shelf if one is present) by switching the power supply On/Off button on each power supply to the On position.**

   The disks begin to initialize and the power supply LEDs light green. This can take several minutes.

   Note - Do not power on the compute nodes until the disks on the storage array and storage expansion shelf have initialized.

3. **If you powered off a compute node, reconnect any unplugged power cords now.**

4. **Power on a compute node on using one of the following methods:**

   - Press the recessed Power button on the compute node front panel.
   - Log in to the Oracle ILOM web interface, click Host Management > Power Control, and select **Power On** from the Select Action list box.
   - Log in to the Oracle ILOM command-line interface (CLI), and type the following command at the Oracle ILOM CLI prompt.

     ```
     -> start /SYS
     ```

   When the server is powered on and the power-on self-test (POST) tests have completed, the green Power/OK status indicator on the compute node front panel lights and remains lit.

   Note - If you powered off both compute nodes prior to servicing, repeat steps 3 and 4 to power on the second compute node.

5. **Refer to the *Oracle MiniCluster S7-2 Installation Guide* and *Oracle MiniCluster S7-2 Administration Guide* for any instructions or commands required to return the appliance to service.**

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