Customer Replacement Procedure

# Dell EMC Unity™ Family

# Dell EMC Unity All Flash and Unity Hybrid

## Replacing a faulted memory module

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This document describes how to replace a faulted memory module in Unity All Flash and Unity Hybrid systems.

Memory modules are located on the CPU board within each storage processor (SP) assembly in the disk processor enclosure (DPE). You remove the SP assembly from the rear of the DPE.

***NOTICE***

This procedure involves storage processor (SP) reboots coordinated to ensure that at least one SP is running at all times. During an SP reboot, data will be unavailable to front- or back-end connections that are not duplicated on the peer SP.


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# Before you start

Before you begin this procedure, ensure that you have received the new part and have correctly identified its intended location in the system. Refer to your Unisphere **Service** section for instruction on how to identify failures, order new parts and handle hardware components.

**NOTICE**

This procedure involves storage processor (SP) reboots coordinated to ensure that at least one SP is running at all times. During an SP reboot, data will be unavailable to front- or back-end connections that are not duplicated on the peer SP.

## Verifying replacement memory modules

Ensure that your replacement memory module is the same capacity as the faulted memory module. If you received multiple replacement memory modules of a different capacity than the faulted memory module, replace all memory modules in the storage processor at the same time.

View the installed memory modules configuration using: `svc_check_hw_config -d`. For more information about using this and other service commands, refer to *Unity Family Service Commands*.

## Additional resources

As part of an improvement effort, revisions of the software and hardware are periodically released. Therefore, some functions described in this document might not be supported by all versions of the software or hardware currently in use. The product release notes provide the most up-to-date information on product features. Contact your technical support professional if a product does not function properly or does not function as described in this document.

**Where to get help**
Support, product, and licensing information can be obtained as follows:

**Product information**
For product and feature documentation or release notes, go to Unity Technical Documentation at: www.emc.com/en-us/documentation/unity-family.htm.

**Troubleshooting**
For information about products, software updates, licensing, and service, go to Online Support (registration required) at: https://Support.EMC.com. After logging in, locate the appropriate **Support by Product** page.

**Technical support**
For technical support and service requests, go to Online Support at: https://Support.EMC.com. After logging in, locate **Create a service request**. To open a service request, you must have a valid support agreement. Contact your Sales Representative for details about obtaining a valid support agreement or to answer any questions about your account.

**Special notice conventions used in this document**

**DANGER**

**Indicates a hazardous situation which, if not avoided, will result in death or serious injury.**

**WARNING**

**Indicates a hazardous situation which, if not avoided, could result in death or serious injury.**

**CAUTION**

**Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.**

*NOTICE*

Addresses practices not related to personal injury.

**Note**

Presents information that is important, but not hazard-related.

## Handling replaceable units

This section describes the precautions that you must take and the general procedures that you must follow when removing, installing, and storing any replaceable unit.

### Avoiding electrostatic discharge (ESD) damage

When replacing or installing hardware units, you can inadvertently damage the sensitive electronic circuits in the equipment by simply touching them. Electrostatic charge that has accumulated on your body discharges through the circuits. If the air in the work area is very dry, running a humidifier in the work area will help decrease the risk of ESD damage. Follow the procedures below to prevent damage to the equipment.

Be aware of the following requirements:

- Provide enough room to work on the equipment.
- Clear the work site of any unnecessary materials or materials that naturally build up electrostatic charge, such as foam packaging, foam cups, cellophane wrappers, and similar items.
- Do not remove replacement or upgrade units from their antistatic packaging until you are ready to install them.
- Before you begin service, gather together the ESD kit and all other materials you will need.
- Once servicing begins, avoid moving away from the work site; otherwise, you may build up an electrostatic charge.
- Use ESD anti-static gloves or an ESD wristband (with strap).
  If using an ESD wristband with a strap:

- Attach the clip of the ESD wristband to the ESD bracket or bare metal on a cabinet/rack or enclosure.
- Wrap the ESD wristband around your wrist with the metal button against your skin.
- If a tester is available, test the wristband.

- If an emergency arises and the ESD kit is not available, follow the procedures in Emergency Procedures (without an ESD kit).

## Emergency procedures (without an ESD kit)

In an emergency when an ESD kit is not available, use the following precautions to reduce the possibility of an electrostatic discharge by ensuring that your body and the subassembly are at the same electrostatic potential.

**NOTICE**

These precautions are not a substitute for the use of an ESD kit. Follow them only in the event of an emergency.

- Before touching any unit, touch a bare (unpainted) metal surface of the cabinet/rack or enclosure.
- Before removing any unit from its antistatic bag, place one hand firmly on a bare metal surface of the cabinet/rack or enclosure, and at the same time, pick up the unit while it is still sealed in the antistatic bag. Once you have done this, do not move around the room or touch other furnishings, personnel, or surfaces until you have installed the unit.
- When you remove a unit from the antistatic bag, avoid touching any electronic components and circuits on it.
- If you must move around the room or touch other surfaces before installing a unit, first place the unit back in the antistatic bag. When you are ready again to install the unit, repeat these procedures.

## Hardware acclimation times

Systems and components must acclimate to the operating environment before applying power. This requires the unpackaged system or component to reside in the operating environment for up to 16 hours in order to thermally stabilize and prevent condensation.

Refer to the table, Table 1 on page 4, to determine the precise amount of stabilization time required.

**Table 1** Hardware acclimation times (systems and components)

| **If the last 24 hours of the TRANSIT/STORAGE environment was this:** | | **...and the OPERATING environment is this:** | **...then let the system or component acclimate in the new environment this many hours:** |
|---|---|---|---|
| Temperature | Humidity | | |
| Nominal 68-72°F (20-22°C) | Nominal 40-55% RH | Nominal 68-72°F (20-22°C) 40-55% RH | 0-1 hour |

**Table 1** Hardware acclimation times (systems and components) (continued)

| **If the last 24 hours of the TRANSIT/STORAGE environment was this:** | | **...and the OPERATING environment is this:** | **...then let the system or component acclimate in the new environment this many hours:** |
|---|---|---|---|
| Cold<br><68°F (20°C) | Dry<br><30% RH | <86°F (30°C) | 4 hours |
| Cold<br><68°F (20°C) | Damp<br>≥30% RH | <86°F (30°C) | 4 hours |
| Hot<br>>72°F (22°C) | Dry<br><30% RH | <86°F (30°C) | 4 hours |
| Hot<br>>72°F (22°C) | Humid<br>30-45% RH | <86°F (30°C) | 4 hours |
| | Humid<br>45-60% RH | <86°F (30°C) | 8 hours |
| | Humid<br>≥60% RH | <86°F (30°C) | 16 hours |
| Unknown | | <86°F (30°C) | 16 hours |

***NOTICE***

- If there are signs of condensation after the recommended acclimation time has passed, allow an additional eight (8) hours to stabilize.
- Systems and components must not experience changes in temperature and humidity that are likely to cause condensation to form on or in that system or component. Do not exceed the shipping and storage temperature gradient of 45°F/hr (25°C/hr).
- Do NOT apply power to the system for at least the number of hours specified in the table, Table 1 on page 4. If the last 24 hours of the transit/storage environment is unknown, then you must allow the system or component 16 hours to stabilize in the new environment.

## Removing, installing, or storing replaceable units

Use the following precautions when removing, handling, or storing replaceable units:

**⚠ CAUTION**

**Some replaceable units have the majority of their weight in the rear of the component. Ensure that the back end of the replaceable unit is supported while installing or removing it. Dropping a replaceable unit could result in personal injury or damage to the equipment.**

**NOTICE**

- For a module that must be installed into a slot in an enclosure, examine the rear connectors on the module for any damage before attempting its installation.
- A sudden jar, drop, or even a moderate vibration can permanently damage some sensitive replaceable units.

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- Do not remove a faulted replaceable unit until you have the replacement available.
- When handling replaceable units, avoid electrostatic discharge (ESD) by wearing ESD anti-static gloves or an ESD wristband with a strap. For additional information, refer to Avoiding electrostatic discharge (ESD) damage on page 3.
- Avoid touching any exposed electronic components and circuits on the replaceable unit.
- Never use excessive force to remove or install a replaceable unit. Take time to read the instructions carefully.
- Store a replaceable unit in the antistatic bag and the specially designed shipping container in which you received it. Use the antistatic bag and special shipping container when you need to return the replaceable unit.
- Replaceable units must acclimate to the operating environment before applying power. This requires the unpackaged component to reside in the operating environment for up to 16 hours in order to thermally stabilize and prevent condensation. Refer to Hardware acclimation times on page 4 to ensure the replaceable unit has thermally stabilized to the operating environment.

**NOTICE**

Your storage system is designed to be powered on continuously. Most components are hot swappable; that is, you can replace or install these components while the storage system is running. However, the system requires that:

- Front bezels should always be attached to ensure EMI compliance. Make sure you reattach the bezel after replacing a component.
- Each slot should contain a component or filler panel to ensure proper air flow throughout the system.

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### Unpacking a part

**Procedure**

1. Wear ESD gloves or attach an ESD wristband to your wrist and the enclosure in which you are installing the part.
2. Unpack the part and place it on a static-free surface.
3. If the part is a replacement for a faulted part, save the packing material to return the faulted part.

## Standard touch point colors

Touch points are component locations where you can:

- Grip the hardware to remove or install a component.
- Open or close a latch.

- Turn a knob to open, close, or adjust a component.

Standard touch point colors are terra-cotta (orange) or blue.

**Note**

Within this documentation, the color orange is used instead of terra-cotta for simplicity.

**Table 2** Standard touch point colors

| Touch point color | Description |
|---|---|
| Terra-cotta (orange) | This color indicates that you can perform the task, such as remove a component with a terra-cotta (orange) lever, while the system remains powered (up/on).<br>**Note**<br>Some tasks may require additional steps. |
| Blue | This color indicates that a shutdown of the system or component is required before you can perform the task, such as removing a component with a blue lever. |

# Summary of tasks for replacing a DIMM

To replace a DIMM, you must complete the tasks below in the order in which they appear. This document provides instructions for completing each task.

1. Identify the faulted DIMM.
2. Shutdown the SP assembly that contains the faulty DIMM.
3. Remove the SP assembly from the enclosure.
4. Remove the top cover from the SP assembly.
5. Remove the air flow baffle from the SP assembly.
6. Remove the faulted DIMM.
7. Unpack the replacement DIMM.
8. Install the replacement DIMM.
9. Install the air flow baffle in the SP assembly.
10. install the top cover on SP assembly.
11. Install the SP assembly in the enclosure.
12. Verify operation of the replacement DIMM.

# Identifying and locating the faulted memory module

Before you replace a faulted memory module, you must locate its placement within the storage system by using Unisphere.

Using Unisphere, locate the faulted memory module in the enclosure.

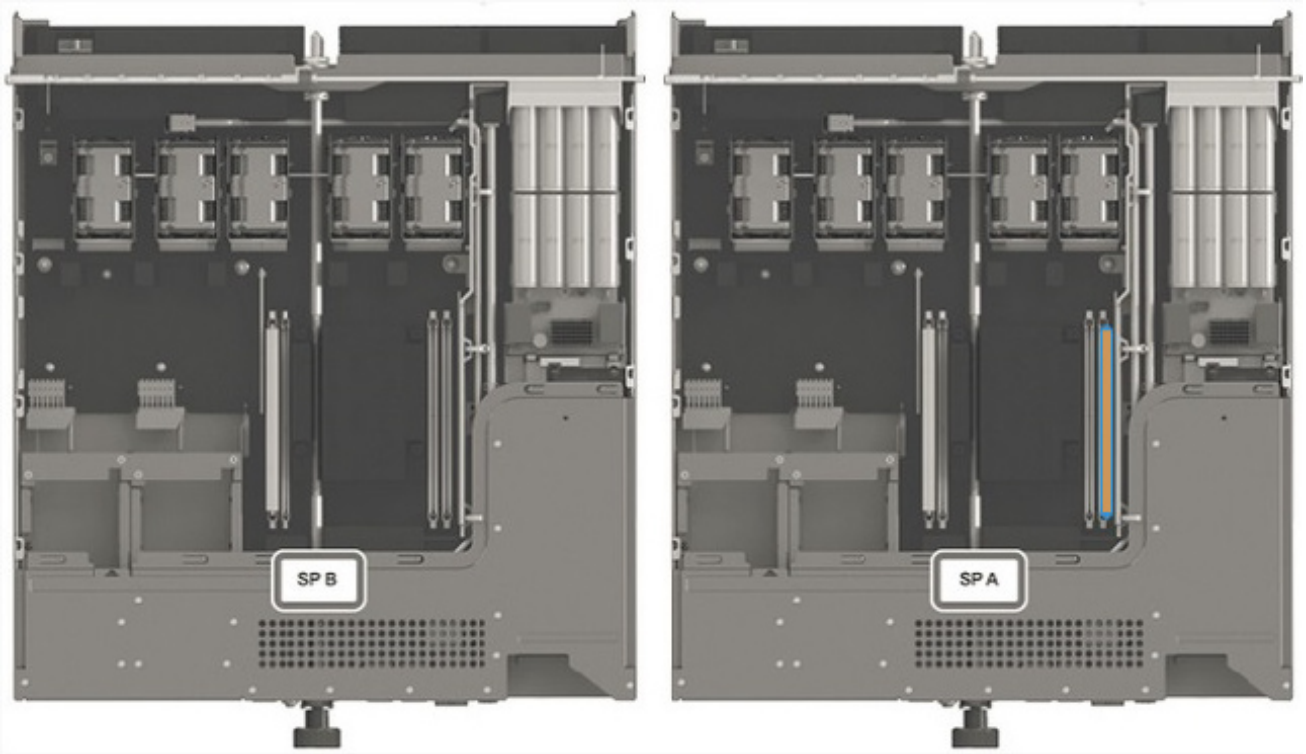
**Procedure**

1. In Unisphere, select **System View**.
2. Select the **Enclosures** page.

   Select the DPE in the **Enclosure** dropdown menu and select the **Top** view of the enclosure. Locate the new memory module shown in this enclosure view.

3. Locate the faulted memory module marked orange and displayed in the **Enclosure** view shown.

   **Figure 1** Faulted SP A memory module in slot 0 - example location




# Preparing the storage processor (SP) for service

To protect your system from accidental data loss during this maintenance activity, you must prepare the SP for service. You prepare an SP for service by putting it in Service Mode.
Entering Service Mode stops I/O on the SP so that service tasks can be safely performed.

**Note**

Both SPs must NOT be in Service mode at the same time.

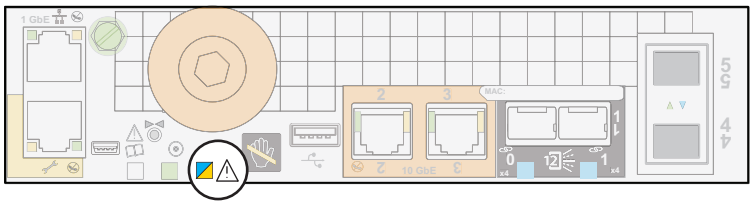
### Procedure

1. Open Unisphere and select **Service**, then **Service Tasks**.
2. Under the name of the storage processor where you will install the new memory module, select **Enter Service Mode** and then click **Execute**.
3. When prompted, enter the Service Password to put the SP into Service Mode.
4. (Optional) Either refresh your browser or follow the on-screen instructions to restore full-functionality to Unisphere.

   When placing the primary storage processor into Service Mode, Unisphere will become momentarily unresponsive (about one minute) as the management services transfer over to the other SP.
5. Return to cabinet with the system and locate the SP in the DPE from the back of the cabinet.
6. Wait until the SP fault LED is flashing alternating amber and blue before continuing to the next task.

   The SP fault LED will flash alternating amber and blue while the SP remains in Service mode and is receiving active power.

**Figure 2** SP fault LED



# Replacing the faulted memory module

Take the following actions to remove the faulted memory module and install the replacement memory module into the system.

## Removing an SP assembly

This procedure describes how to remove an SP assembly from the enclosure. There are two SP assemblies. The top SP assembly is considered to be "upside-down" and will mirror the bottom SP assembly. The illustration shows removal of the top SP assembly. The procedure for removing the bottom SP assembly is the same.

**Before you begin**

Locate the faulted SP assembly with the amber Fault LED.

***NOTICE***

DO NOT REMOVE an SP assembly while the "Unsafe to remove SP" LED shown below is lit.

**Procedure**

1. Rotate the power cord bail to the right (left for bottom power supply). Disconnect the AC power cord from the power supply.

   **Note**

   If the I/O module and network cables are not already labeled, label them clearly for reconnecting them later.

2. Disconnect the network and all other cables from the back of the I/O modules and network ports on the SP assembly.

   ***NOTICE***

   Do not remove any cables from the other SP assembly.

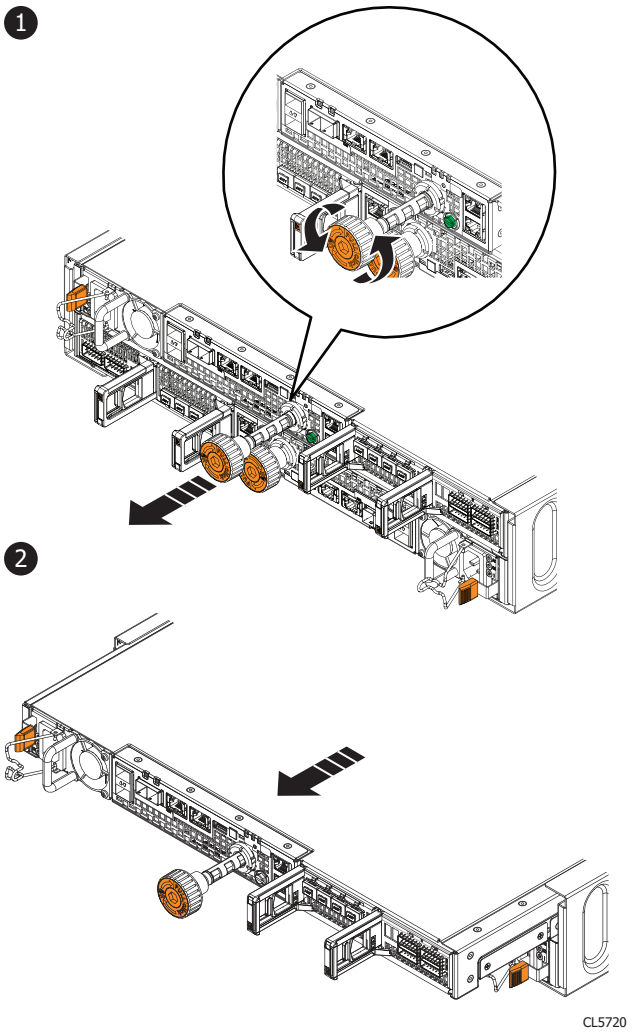
3. Pull the torque limit screw handle out of the SP assembly (1).
4. Turn the handle counterclockwise to release the SP assembly from the enclosure (1).

   As the handle is turned, the SP assembly extracts out of the enclosure. When outward movement stops, the SP assembly is ready for removal.

   **⚠ CAUTION**

   **The SP assembly comes completely out of the enclosure. Be prepared to support the SP assembly to avoid dropping it.**

**Figure 3** Remove an SP assembly




5. Use the handle to pull the SP assembly outward enough to grasp the sides with both hands (2). Then with both hands supporting the SP assembly, pull the SP assembly fully out of the enclosure.
6. Place the SP assembly, with topside upward, on a clean, flat static-free work surface.
7. Verify that all SP assembly LEDs are off to ensure that the SP has completed its power off after the removal from the DPE.

   It takes about three minutes for the SP assembly to deplete internal power once removed from the power source.

   **⚠ CAUTION**

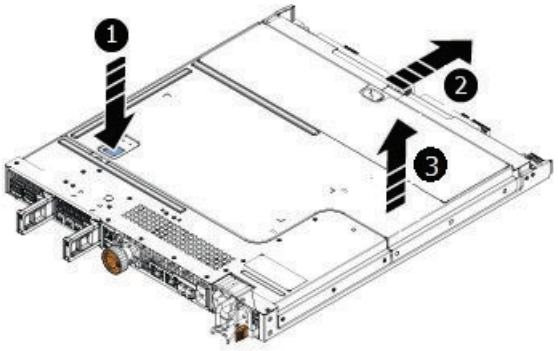
   **Do not remove the SP top cover until the automatic vaulting process has completed and all SP LEDs are off. If the top cover is opened while the vaulting process is occurring, it triggers a power down of the SP and its components, interrupting the vaulting process.**

## Removing the top cover from the SP assembly

### Procedure

1. While pushing down the blue release button (1), slide the top cover rearward approximately ½ inch until it stops (2).
2. Lift the top cover upward and remove it from the SP assembly (3).

**Figure 4** Removing top cover from SP assembly




## Removing the air flow baffle

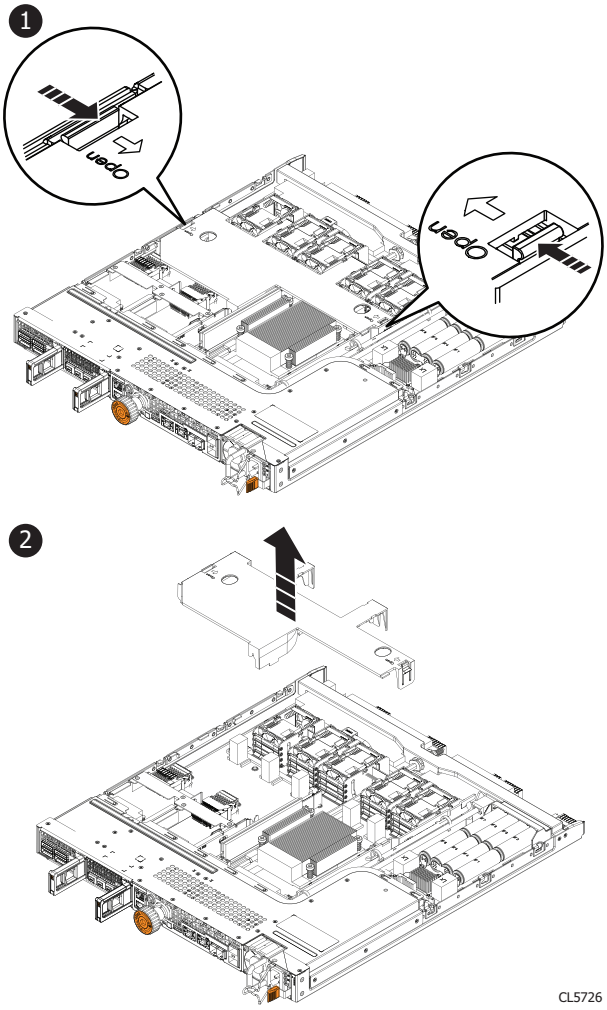
### Before you begin

Ensure that the SP assembly has exhausted all internal power before removing the top air baffle.

### Procedure

1. Press in on the tabs on both sides of the air flow baffle (1).
2. Lift the air flow baffle upward and remove it from the SP assembly (2).

**Figure 5** Removing the air baffle



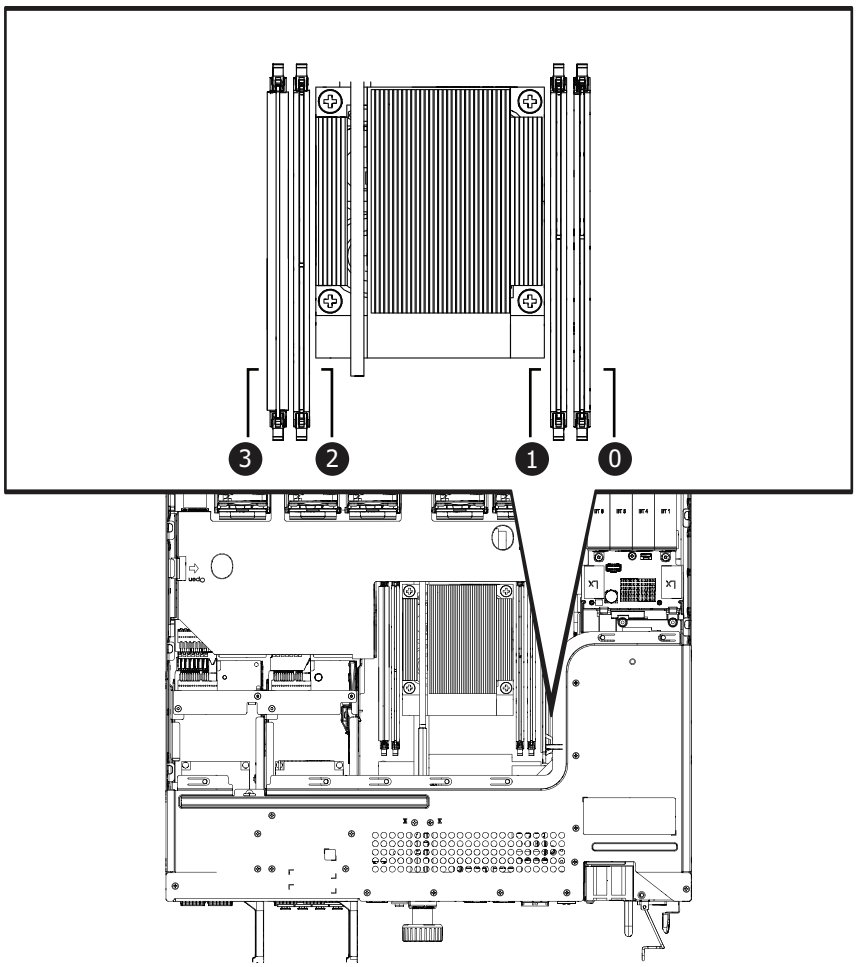

## Removing a DIMM (Memory Module)

There are four slots for DIMM. The procedure for removing any of the DIMMs is the same.

### Procedure

1. Attach an ESD wristband to your wrist and the enclosure.
2. Locate the DIMM slot containing the faulted module.

**Figure 6** Memory module slot locations

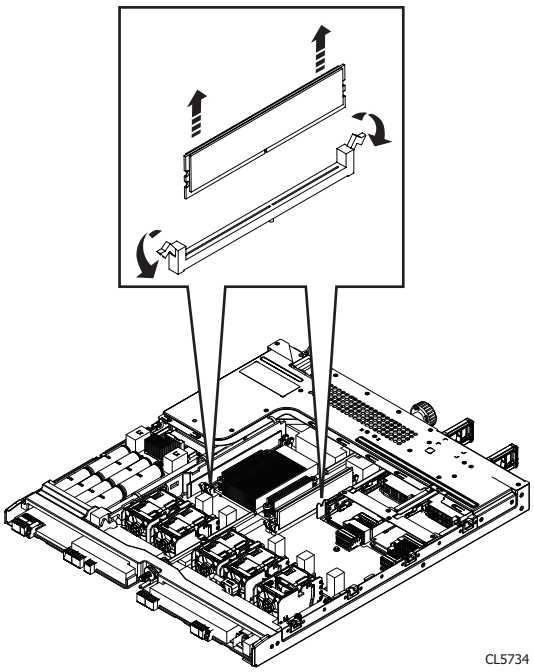



| Location | Unity 300/300F memory layout [a] | Unity 400/400F and Unity 350F memory layout | Unity 500/500F and Unity 450F memory layout | Unity 600/600F and Unity 550F memory layout | Unity 650F memory layout |
|---|---|---|---|---|---|
| Slot 0 | 8GB / 16GB | 16GB | 16GB | 32GB | 64GB |
| Slot 1 | 8GB / 16GB | 16GB | 16GB | 32GB | 64GB |
| Slot 2 | Empty | Empty | 16GB | 32GB | 64GB |
| Slot 3 | 8GB / 16GB | 16GB | 16GB | 32GB | 64GB |

a. Ensure each storage processor is populated with uniform capacity memory modules. Do not mix different capacity memory modules within the storage processor.

3. Depress the two retaining tabs downward to free the DIMM module from its slot.
4. Remove the DIMM module from the slot. Repeat for any other DIMM modules as required.

**Figure 7** Removing a DIMM

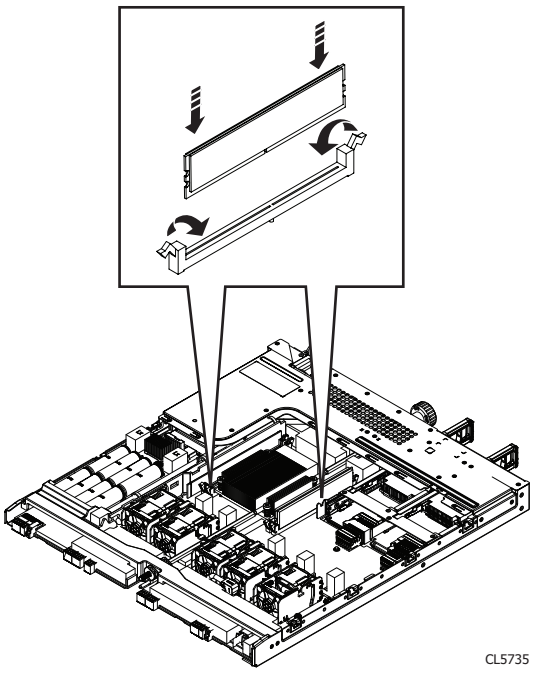



## Installing a DIMM (Memory Module)

### Procedure

1. Attach an ESD wristband to your wrist and the enclosure.
2. Touching only the DIMM's outside edges, align the module with the connector.
3. Firmly push the DIMM straight down into the connector. When the DIMM is fully seated you will hear a snap and feel the connector latches click into place.

**Figure 8** Installing a DIMM



4. Repeat this procedure for other DIMMs as required.

## Installing the air flow baffle

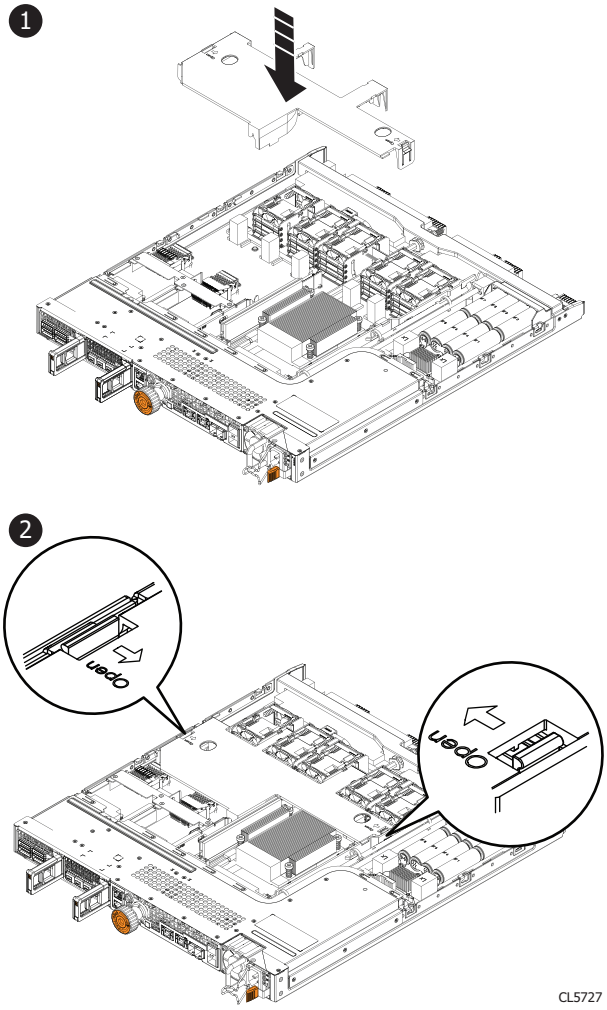
**Note**

The left side of the air baffle mounts over the coin cell battery.

### Procedure

1. Align the two retaining clips on the air flow baffle with the slots on sides of the SP assembly (1).
2. Push downward on the air flow baffle to secure it to the SP assembly (2).

**Figure 9** Installing the air baffle

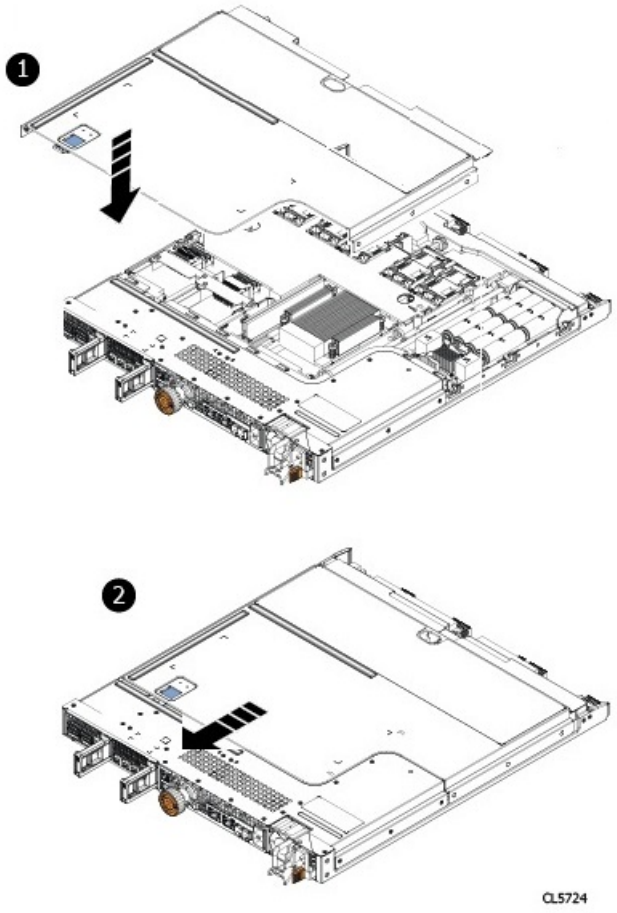



## Installing the top cover on the SP assembly

### Procedure

1. Position the top cover over the SP assembly and align it with the slots in the sides at rear of the assembly (1).
2. Pull the top cover forward approximately ½ inch to secure it in place (2).

**Figure 10** Installing the top cover



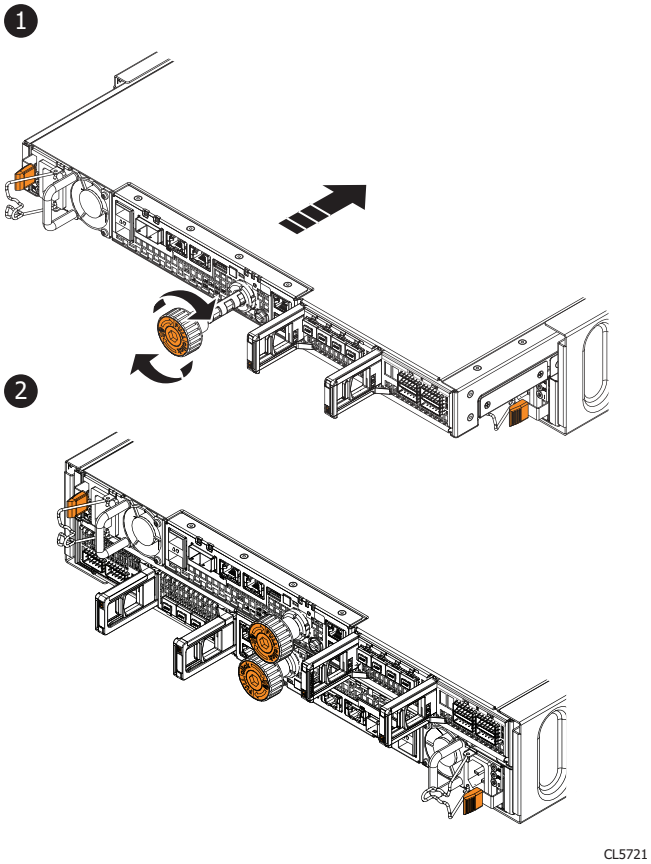

## Installing an SP assembly

This procedure describes how to install an SP assembly in the enclosure.

**Procedure**

1. Align the SP assembly with the enclosure slot and slide it into the slot until it stops (1).
2. Turn the orange torque limit screw handle clockwise until you hear a click sound from the handle (1). The click sound indicates the torque limit is reached and the SP assembly is seated in the enclosure.
3. Push the orange torque limit screw handle into the SP assembly until you hear a click sound from the handle (2). The click sound indicates screw handle is secured in the assembly.

**Figure 11** Installing the SP assembly




4. Connect each I/O module cable and network cable into the same port from which it was removed.
5. Connect the AC power cord to the power supply and secure the cord with the retention bail at the connector.

   The power supply fault LED turns off after about 2 seconds.

# Rebooting an SP into Normal Mode

### Before you begin

Wait about 10-15 minutes after reinserting the SP into the system to allow the fully reboot into Service Mode and the SP fault LED is flashing alternating amber and blue (1 hz) before continuing.

**Note**

If you attempt this task before the SP has completed its automatic reboot into Service Mode the attempt to reboot into Normal mode will fail.

Reboot the recently serviced SP into Normal Mode using the procedure that follows:

### Procedure

1. Open Unisphere and select **Service**, then **Service Tasks**.
2. Under the name of the storage processor where you installed the new memory module, select **Reboot** and the click **Execute**.

3. When prompted, enter the Service Password to put the SP into Normal Mode.

   It may take up to 15 minutes for the system to complete its reboot to return to normal mode.

# Verifying the new memory module

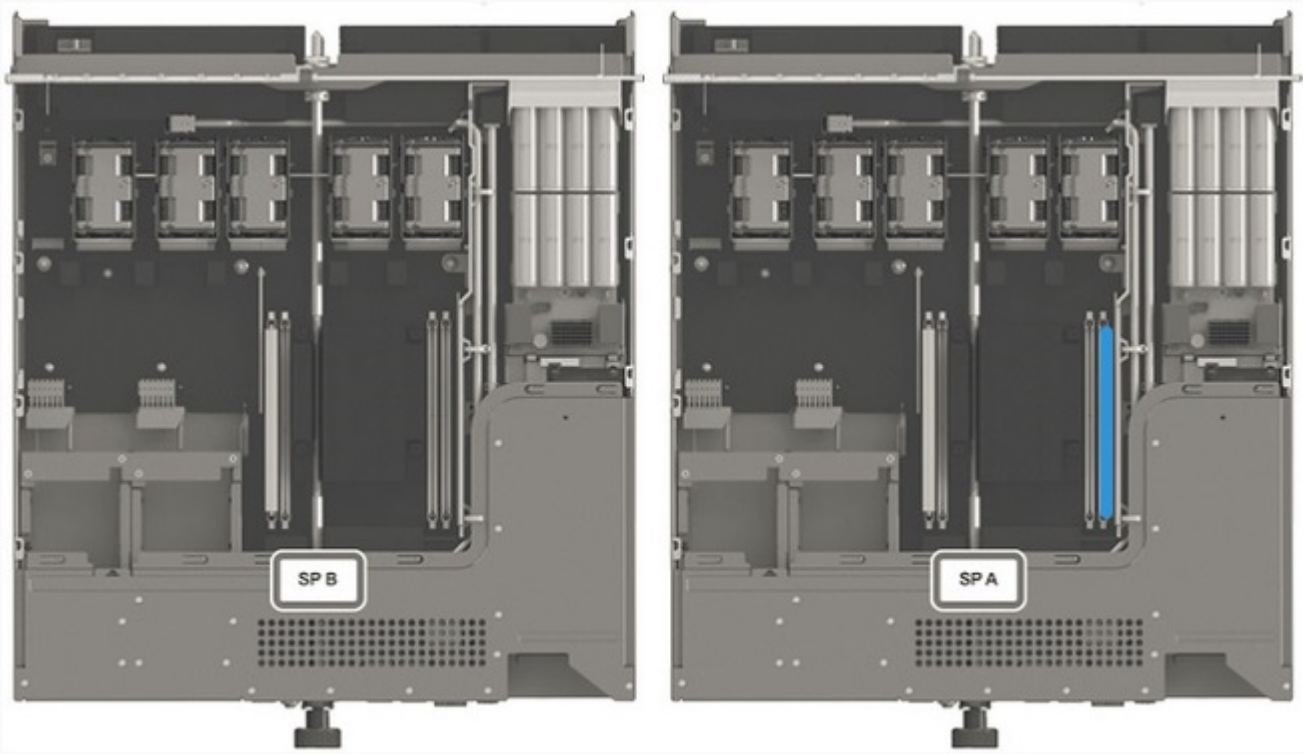
Verify that the new memory module is recognized by your system, and operating correctly using the procedure that follows.

**Procedure**

1. In Unisphere, select **System View**.
2. On the Summary page, confirm that the system status is OK.
3. Select the **Enclosures** page.
4. Verify that the memory module appears with OK status in the enclosure view.

   You may need to refresh Unisphere by clicking on the refresh icon next to the **Enclosures** view.
   Select the DPE in the **Enclosure** dropdown menu and select the **Top** view of the enclosure. Locate the new memory module shown in this enclosure view.

   **Figure 12** Healthy SP A memory module in slot 0 - example location




   If the system health monitor shows the part as faulted, contact your service provider.

## Troubleshooting notes

This section describes troubleshooting steps to follow in the event that you are having problems verifying the functionality of the memory module.

| Problem | Cause | Solution | Example |
|---|---|---|---|
| System remains in Service Mode and Memory Fault LED indicator is lit. | The memory configuration is invalid.<br>• A memory module is installed in the incorrect slot<br>• The memory modules are not all the same size | The system checks the storage processor memory configuration at boot time. View the installed memory modules configuration using: `svc_check_hw_config -d`. For more information about using this and other service commands, refer to *Unity Family Service Commands*. Replace the invalid memory module in the storage processor with the correct memory module. | Example of invalid memory configuration:<br>`17:31:50 root@spa spa:~> svc_check_hw_config -d`<br>`Error: Invalid Memory Config Found:`<br>`DIMM 0 : 16GB`<br>`DIMM 1 : EMPTY`<br>`DIMM 2 : 16GB`<br>`DIMM 3 : 16GB`<br>`Expected:`<br>`DIMM 0 : 16GB`<br>`DIMM 1 : 16GB`<br>`DIMM 2 : 16GB`<br>`DIMM 3 : 16GB` |

# Returning a faulted part

We appreciate the return of defective material within 5 business days (for US returns). For International customers, please return defective material within 5-10 business days. All instructions and material required to return your defective part were supplied with your good part shipment.

**Procedure**

1. Package the faulted part in the shipping box that contained the replacement part, and seal the box.
2. Ship the failed part to your service provider as described in the instructions that were included with the replacement part.
3. (Optional) For more information about returning customer-replaceable parts, from Unisphere, click **Support** > **Replace Disk Drives, Power Supplies, and Other Parts** > **Return a Part** to display the part return instructions.

   If your screen does not show the **Return a Part** option, contact your service provider for instructions on what to do next.

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