

# Customer Replacement Procedure

## Dell EMC Unity™ Family

## Dell EMC Unity All Flash and Unity Hybrid

### Replacing a faulted I/O module

302-002-590

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

Two I/O module slots per storage processor (SP) are located at the back of the disk processor enclosure (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.

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## 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](http://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.

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#### WARNING

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

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**⚠ CAUTION**

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

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**NOTICE**

Addresses practices not related to personal injury.

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**Note**

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

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## 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.

### 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.

Table 1 on page 4 helps you 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
Cold <68°F (20°C)	Dry <30% RH	<86°F (30°C)	4 hours
Cold <68°F (20°C)	Damp ≥30% RH	<86°F (30°C)	4 hours
Hot >72°F (22°C)	Dry <30% RH	<86°F (30°C)	4 hours
Hot >72°F (22°C)	Humid 30-45% RH	<86°F (30°C)	4 hours
	Humid 45-60% RH	<86°F (30°C)	8 hours
	Humid ≥60% RH	<86°F (30°C)	16 hours

**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:
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 [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.

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## 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.

## 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).

**Table 2** Standard touch point colors (continued)

Touch point color	Description
	<p><b>Note</b></p> <p>Some tasks may require additional steps.</p>
<p>Blue</p> 	<p>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.</p>

## Identifying and locating the faulted I/O module

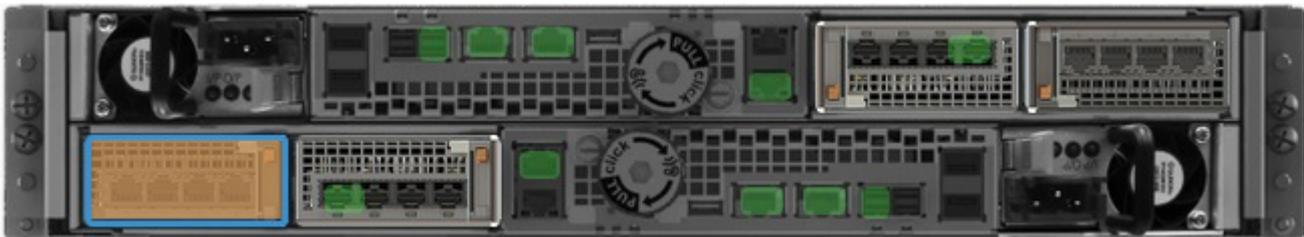
Before you replace a faulted I/O module, you must locate its placement within the storage system by using Unisphere.

Using Unisphere, locate the faulted I/O 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 **Rear** view of the enclosure. Select the new I/O module shown in this enclosure view.
3. Locate the faulted I/O module marked orange and displayed in the **Enclosure** view shown.

**Figure 1** Faulted SP A I/O module 0 - example location



## Preparing the storage processor (SP) for service

Hold in reset is a special state, during which power is maintained to the SP and I/O modules can be safely removed. This state has fewer management capabilities than Service Mode, but allows for easier I/O module replacement.

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**Note**

Both SPs must NOT be in hold in reset simultaneously. The system should be up for at least 40 minutes since its last reboot before being placed into hold in reset.

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**Procedure**

1. Open Unisphere and select **Service**, then **Service Tasks**.
  2. Under the name of the storage processor where you will install the new I/O module, select **Reset and Hold** and then click **Execute**.
- 

**Note**

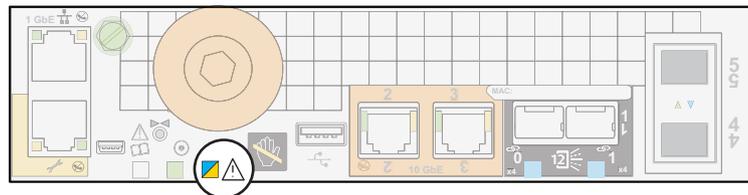
If the **Reset and Hold** option is missing from the GUI, follow the steps in [Appendix - Replacing an IO module without placing the SP in hold in reset](#) on page 12.

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3. When prompted, type the Service Password to put the SP into hold in reset.
4. (Optional) Either refresh the browser or follow the onscreen instructions to restore full-functionality to Unisphere.

When placing the primary storage processor into hold in reset, Unisphere becomes momentarily unresponsive as the management services transfer over to the other SP. After about 10 minutes, the SP's status will change to Degraded, and indicate that the SP has been placed in held in reset. The SP's status can be confirmed by checking the log entries in Unisphere under **Events > Alerts**.

5. Return to cabinet with the system and locate the I/O module to be replaced in the SP in the DPE from the back of the cabinet.
6. Wait until the SP fault LED and power indicator LED are lit solid amber and green, respectively, and the peer SP's Unsafe to Remove LED is lit before moving to the next task. The SFPs in the CNA ports and I/O modules (if present) will be blinking blue.

**Figure 2** SP fault LED

## Replacing the faulted I/O module

Take the following actions to remove the faulted I/O module and install the replacement I/O module into the system.

### Removing an I/O module

This procedure describes how to remove an IO module from a storage processor assembly that has been placed in hold in reset.

#### Before you begin

Ensure that you have placed the SP assembly with the faulted I/O module into hold in reset.

#### NOTICE

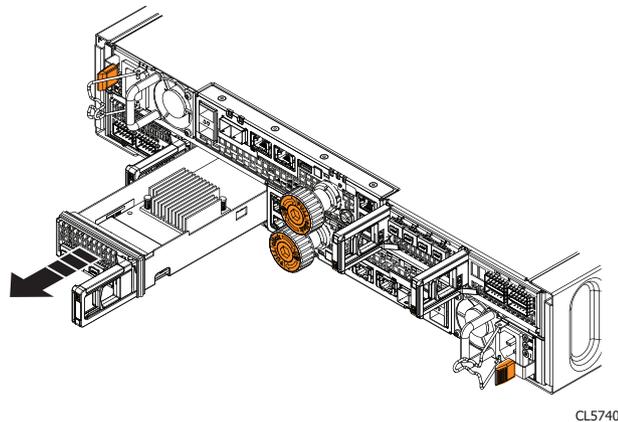
DO NOT REMOVE an SP assembly while the "Unsafe to remove SP" LED shown below is lit.



#### Procedure

1. Locate the faulted I/O module in the held in reset SP assembly, and then label and disconnect its cables.  
Use a cable retainer if available.
2. Pull the trigger mechanism on the I/O module handle to release it.
3. Gently pull the module from the slot.

**Figure 3** Removing an I/O module



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### Installing the replacement I/O module

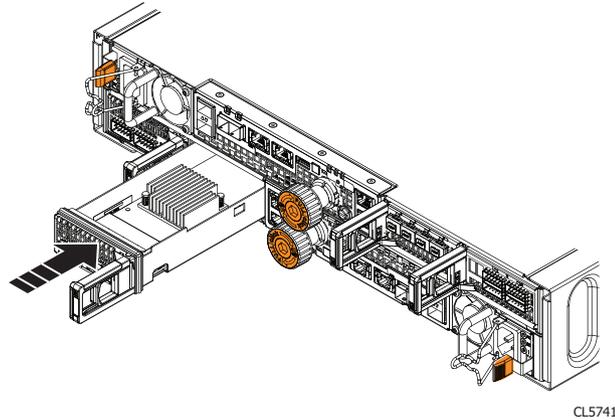
To install the replacement I/O module:

#### Procedure

1. Align the module with the empty slot and carefully push the module into the slot.

2. When the I/O module appears seated, push and release the small button on the handle.
  - If the button remains in, the module is fully seated.
  - If the button springs back, gently push the module further into the chassis, then push it again.
  - If the button still does not rest flush with its handle, remove the module and repeat steps 1 and 2.

**Figure 4** Installing an I/O module



3. Connect each cable into the same port from which it was removed.

## Rebooting an SP into Normal Mode

### Before you begin

Ensure that the replacement I/O module has been correctly installed using Unisphere. The replaced I/O module's status will indicate that the module is powered off and will power on during the next system reboot.

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 I/O module, select **Reboot** and click **Execute**.
3. When prompted, type 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.

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### Note

It is recommended that you plan downtime for hosts when you are replacing faulted I/O module. The host connections can take time to re-establish after the SPs have rebooted and returned to normal mode.

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## Verifying the new I/O module

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

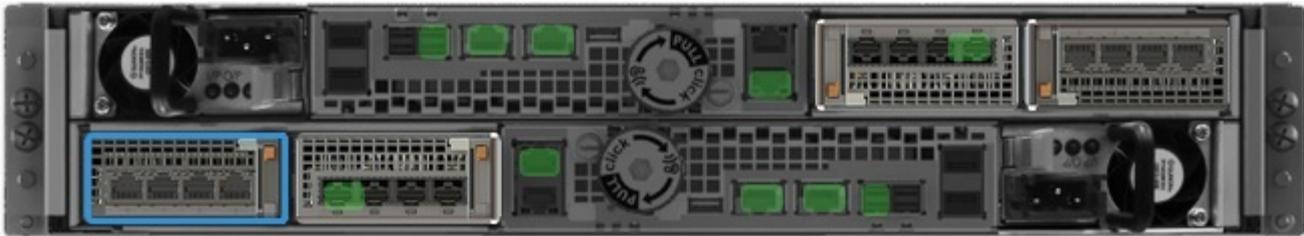
### Procedure

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 I/O 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 **Rear** view of the enclosure. Select the new I/O module shown in this enclosure view.

**Figure 5** Healthy SP A I/O module 0 - example location



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

## 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.

## Appendix - Replacing an IO module without placing the SP in hold in reset

This appendix explains how to replace an IO module without placing the SP in hold in reset. Follow this alternate procedure if you do not have the option in Unisphere to place the SP in hold in reset.

### 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.

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#### Note

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

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#### Procedure

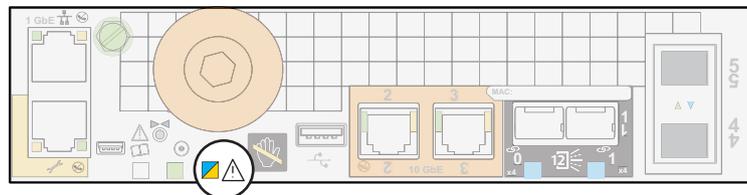
1. Open Unisphere and select **Service**, then **Service Tasks**.
2. Under the name of the storage processor where you will install the new I/O module, select **Enter Service Mode** and then click **Execute**.
3. When prompted, enter the Service Password to put the SP into Service Mode.
4. (Optional) 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 6** SP fault LED



## Replacing the faulted I/O module

Take the following actions to remove the faulted I/O module and install the replacement I/O module into the system.

### Removing an I/O module

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

Ensure that you have placed the SP assembly with the faulted I/O module into Service mode.

#### NOTICE

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




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#### Procedure

1. Pull the torque limit screw handle out of the SP assembly (1).
2. 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 until the SP assembly is released from the enclosure.

3. Partially slide the SP assembly from the enclosure to ensure it is uncoupled from the internal power source. (2)

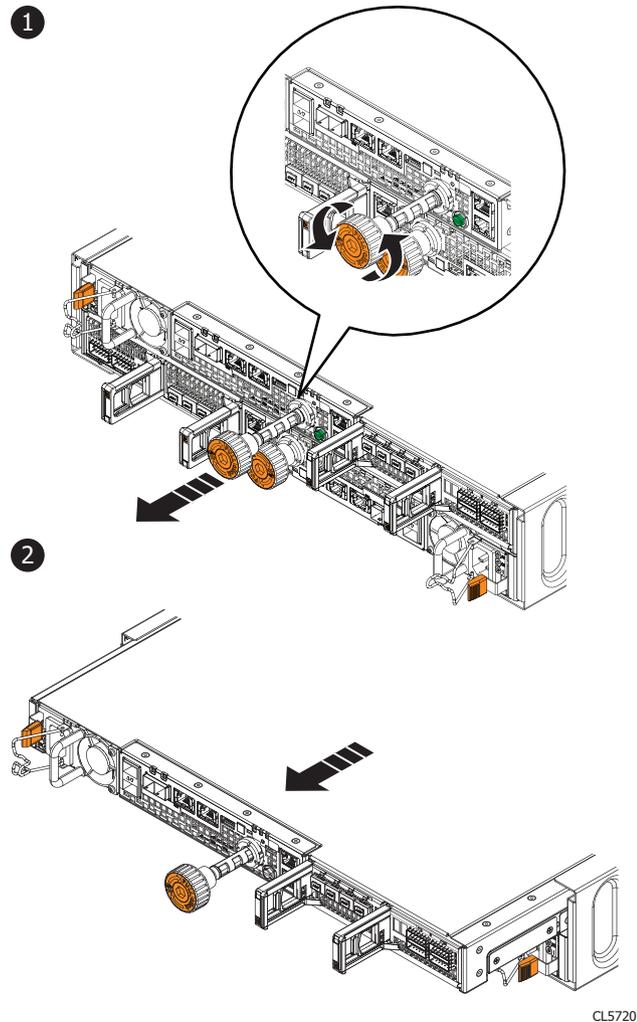
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#### Note

You do not need to fully remove the SP assembly from the enclosure to replace the I/O module.

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**Figure 7** Remove an SP assembly



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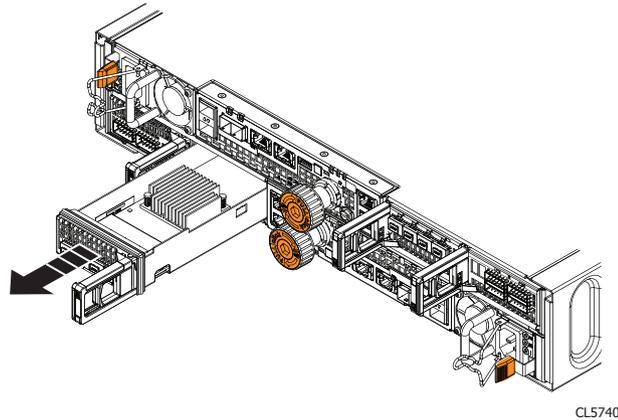
4. Verify that all SP assembly LEDs are off to ensure that the SP has completed its power off after the removal from the DPE.

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.**

5. Locate the faulted I/O module in the partially removed SP assembly and then label and disconnect its cables.
6. Pull the trigger mechanism on the I/O module handle to release it.
7. Gently pull the module from the slot.

**Figure 8** Removing an I/O module

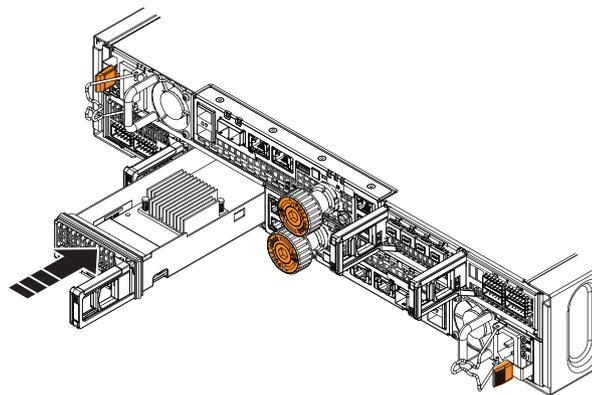
CL5740

## Installing the replacement I/O module

To install the replacement I/O module:

### Procedure

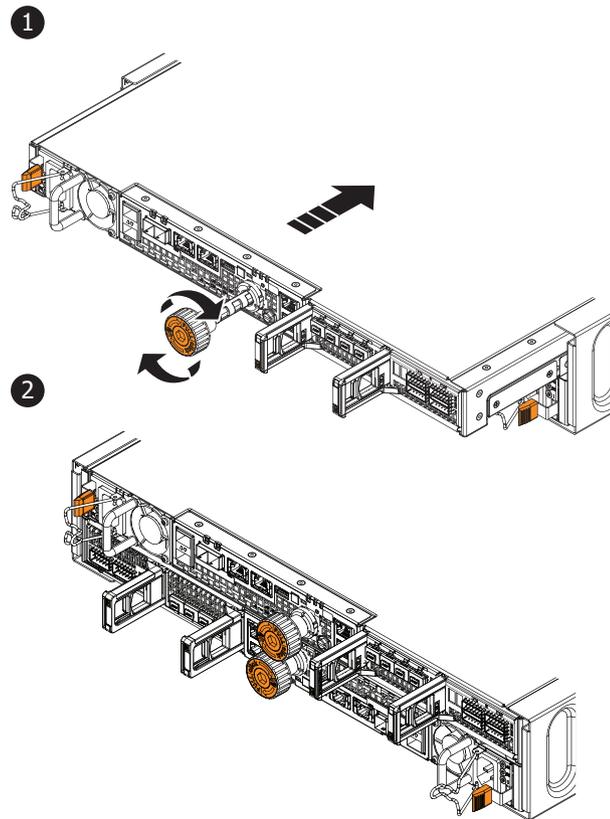
1. Align the module with the empty slot and carefully push the module into the slot.
2. When the I/O module appears seated, push and release the small button on the handle.
  - If the button remains in, the module is fully seated.
  - If the button springs back, gently push the module further into the chassis, then push it again.
  - If the button still does not rest flush with its handle, remove the module and repeat steps 1 and 2.

**Figure 9** Installing an I/O module

CL5741

3. Slide the SP assembly into the slot until it stops (1)
4. 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.
5. 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 10** Installing the SP assembly



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6. Connect each I/O module cable and network cable into the same port from which it was removed.

## 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.

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### 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.

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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 I/O 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 I/O module

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

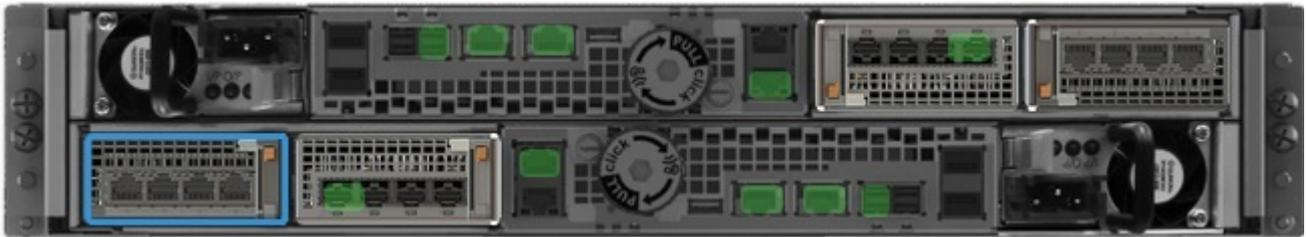
### Procedure

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 I/O 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 **Rear** view of the enclosure. Select the new I/O module shown in this enclosure view.

**Figure 11** Healthy SP A I/O module 0 - example location



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

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