This document describes how to add an optional I/O module in Dell EMC 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.

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**


**Troubleshooting**

For information about products, software updates, licensing, and service, go to Online Support (registration required) at: [https://Support.EMC.com](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](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.
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)

<table>
<thead>
<tr>
<th>If the last 24 hours of the TRANSIT/STORAGE environment was this:</th>
<th>...and the OPERATING environment is this:</th>
<th>...then let the system or component acclimate in the new environment this many hours:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>Humidity</td>
<td>Nominal 68-72°F (20-22°C)</td>
</tr>
<tr>
<td>Cold &lt;68°F (20°C)</td>
<td>Dry &lt;30% RH</td>
<td>&lt;86°F (30°C)</td>
</tr>
<tr>
<td>Cold &lt;68°F (20°C)</td>
<td>Damp ≥30% RH</td>
<td>&lt;86°F (30°C)</td>
</tr>
<tr>
<td>Hot &gt;72°F (22°C)</td>
<td>Dry &lt;30% RH</td>
<td>&lt;86°F (30°C)</td>
</tr>
<tr>
<td>Hot &gt;72°F (22°C)</td>
<td>Humid 30-45% RH</td>
<td>&lt;86°F (30°C)</td>
</tr>
<tr>
<td></td>
<td>Humid 45-60% RH</td>
<td>&lt;86°F (30°C)</td>
</tr>
<tr>
<td></td>
<td>Humid ≥60% RH</td>
<td>&lt;86°F (30°C)</td>
</tr>
</tbody>
</table>
Table 1 Hardware acclimation times (systems and components) (continued)

<table>
<thead>
<tr>
<th>If the last 24 hours of the TRANSIT/STORAGE environment was this:</th>
<th>...and the OPERATING environment is this:</th>
<th>...then let the system or component acclimate in the new environment this many hours:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown</td>
<td>&lt;86°F (30°C)</td>
<td>16 hours</td>
</tr>
</tbody>
</table>

**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.

Removing, installing, or storing replaceable units

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

**CAUTION**

**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.

- 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

<table>
<thead>
<tr>
<th>Touch point color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terra-cotta (orange)</td>
<td>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).</td>
</tr>
</tbody>
</table>
Table 2  Standard touch point colors (continued)

<table>
<thead>
<tr>
<th>Touch point color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue</td>
<td>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.</td>
</tr>
</tbody>
</table>

Note

Some tasks may require additional steps.

Summary of tasks for adding I/O modules

To add I/O modules you must complete the tasks below in the order listed. This document provides instructions for completing each task.

Note

Before beginning this task, it is recommended that you plan for possible downtime for hosts as this task requires both SPs to be rebooted. Some hosts may take time to re-establish the connection to the system after the SPs have been rebooted and return to normal mode.

1. Add one I/O module to SP A (the bottom SP in the 2U DPE):
   a. Locate the slot for the new I/O module.
   b. Remove the I/O filler module from the SP A assembly.
   c. Unpack the I/O module.
   d. Install the I/O module.
   e. Verify that the system recognizes the I/O module.

2. Add one I/O module to SP B (the top SP in the 2U DPE):
   a. Locate the slot for the new I/O module.
   b. Remove the I/O filler module from the SP B assembly.
   c. Unpack the I/O module.
   d. Install the I/O module.
   e. Verify that the system recognizes the I/O module.

3. Commit the I/O modules.

4. Verify that the new I/O module on each SP is recognized by your system, and operating correctly.
Adding the new I/O module

Take the following actions to install the new I/O module into the system.

Locating a slot for a new I/O module

Locate the slot with the I/O filler module that you want to replace with the new I/O module.

Removing an I/O filler module

Procedure
1. Pull the trigger mechanism on the I/O filler module handle to release it.
2. Gently pull the filler module from the CPU module.

Figure 1 Removing an I/O filler module

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.

Installing an 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 2 Installing an I/O module

3. Connect cables into the assigned I/O module ports.

Verifying that the new I/O ports are recognized

Verify that the new I/O ports are recognized by your system and is not faulted using the procedure that follows.

**NOTICE**

Do not attempt to commit the new I/O ports at this time. Wait until directed later in this procedure for the appropriate point to commit both new I/O ports.

**Procedure**

1. Open Unisphere™ and select System View.
2. Select the new I/O ports in the graphical view:
   - In the graphical view, the ports should be highlighted yellow.
   - If the system health monitor shows the ports as faulted, contact your service provider.

Adding the I/O module to SP B

You have completed the addition of the I/O module to SP A. Now you are ready to add the other I/O module to SP B by repeating the following tasks that you just performed for SP A:

**Note**

Ensure that you install the I/O module in the same slot on SP B that was used on SP A.

1. Locate the slot for the new I/O module.
2. Remove the I/O filler module from the SP B assembly.
3. Unpack the I/O module.
4. Install the I/O module.
5. Verify that the system recognizes the I/O module.

**Committing the new I/O ports**

You must commit the new I/O ports before they can be used.

**Procedure**

1. In Unisphere, select **System View**.
2. Select the DPE and select **Commit IO Ports**.

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**Note**

Committing I/O ports requires multiple reboots of the SPs and may take up to an hour to complete. You can find I/O ports commit and SP reboot status details on **Service > Logs**. During these reboots you will temporarily lose Unisphere connectivity.

After this process completes, the new I/O ports have been successfully committed into the system.

If the commit of the new I/O ports fails, please wait 15 minutes for the system to fully boot and then re-attempt the commit process.

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

If the system health monitor shows the part as faulted, contact your service provider.
Adding an optional I/O module

Verifying the new I/O module