This document describes how to replace a faulted 80-drive DAE disk drive in Unity All Flash and Unity Hybrid systems.

The disk drive slots on an 80-drive DAE are located inside the enclosure. To access the disk drives, release and pull the enclosure out of the cabinet. The enclosure slides out of the cabinet far enough for you to access its internal components, and then locks on the rails in the service position so that you cannot pull it out any farther.

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**Note**

You do not have to power down any components to add or replace a disk drive.

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**NOTICE**

When Data at Rest Encryption is enabled, only drives that meet at least one of these requirements can be used: factory new drives, securely erased/sanitized drives, or previously encrypted drives.

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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 instructions on how to identify failures, order new parts, and handle hardware components.

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.

ℹ️ **NOTICE**
Addresses practices not related to personal 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.
- 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.
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)

<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></td>
</tr>
<tr>
<td>Nominal 68-72°F (20-22°C)</td>
<td>Nominal 40-55% RH</td>
<td>Nominal 68-72°F (20-22°C) 40-55% RH</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>
<tr>
<td>Unknown</td>
<td></td>
<td>&lt;86°F (30°C)</td>
</tr>
</tbody>
</table>
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.
- 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.
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>
<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>
<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.
### Handling disks

Disks are extremely sensitive electronic components. Always handle a disk gently, and observe the following guidelines:

- Follow the instructions described in [Removing, installing, or storing replaceable units](#) on page 5.
- Do not stack disks upon one another, or place them on hard surfaces.
- Make sure that the replacement disk has the same part number or the part number of an approved replacement for the faulted disk. The part number (PN005xxxxxx) appears on the disk. A replacement disk should be the same type (example: SAS, FLASH) and have the same capacity (size and speed) as the disk it is replacing.
- When removing a spinning disk, pull the disk partially out of the slot, then wait 30 seconds for the drive to spin down before removing it.
- When installing multiple disks in a powered up system, wait at least 10 seconds before sliding the next disk into position.
- Place disks on a soft, antistatic surface, such as an industry-standard antistatic foam pad or the container used to ship the disk.

### Identifying and locating the faulted 80-drive DAE disk drive

Before you replace a faulted 80-drive DAE disk drive, you must locate its placement within the storage system by using Unisphere.

Using Unisphere, locate the faulted 80-drive DAE disk drive in the enclosure.

**Procedure**

1. In Unisphere, select **System View**.
2. Select the **Enclosures** page.
   - Select the 80-drive DAE housing the disk drive with the **Enclosure** dropdown menu and then select the **Top** view of the disk enclosure. Locate the disk drive shown in this enclosure view.
3. Locate the faulted 80-drive DAE disk drive marked orange and displayed in the **Enclosure** view shown.
Figure 1 Faulted 80-drive DAE disk A0, 2.5-inch drive- example location
Replacing the faulted 80-drive DAE disk drive

Take the following actions to remove the faulted 80-drive DAE disk drive and install the replacement 80-drive DAE disk drive into the system.

Opening the console

The console is a protruding plastic banner on the front of the cabinet with a stripe of blue or green light and the product badge.

If the console is covering the front of the to which you need access, open the console using the steps that follow. Refer to Figure 2 on page 9.

Procedure

1. Grasp the right side of the console.
2. Pull the console to swing it open.

Figure 2 Opening the console

Removing the front bezel

NOTICE

The bezel is required for EMI compliance when the enclosure is powered up. Remove it only to replace or add a part.

Refer to Figure 3 on page 10 as you perform the steps in this task.
Figure 3 Removing the front bezel

Procedure

1. If the bezel has a lock, insert the key that shipped with your enclosure into the lock, and turn the key to unlock the bezel.
2. Press the two latch buttons on the bezel surface to release the bezel from the cabinet.
3. Pull the bezel off the cabinet and put it on a clean, static-free surface.

Removing chassis securing screws

There are three sets of screws that may secure the chassis to the cabinet. The two black, knurled captive screws secure the chassis cover, and prevent the enclosure from coming out of the cabinet during service.

Note

The middle set, next to the black, knurled captive screws, are shipping screws and may have already been removed during a previous service event. These shipping screws are not reinstalled.

Procedure

1. Using a Philips screwdriver, remove the screws that secure the enclosure to the cabinet.
2. Retain the bottom two screws for reinstallation.
Pulling the enclosure chassis out

To access the internal components - disks and fans - you must release and pull the enclosure out of the cabinet. The enclosure slides out of the cabinet far enough for you to access its internal components and then locks on the rails in the service position so that you cannot pull it out any farther. Refer to Figure 5 on page 11 while you perform the steps in this task.

Procedure

1. Grasp the orange enclosure latch handles by the knurled edges and then pull them out to release the chassis from the inner rails.
2. Slowly pull the chassis out of the cabinet until it locks in the secure service position.

Figure 5 Pulling the enclosure out of the cabinet
Locating a faulted disk within a chassis

A faulted disk has an amber fault LED on its carrier. Generally, you should not remove a disk unless its amber fault LED is on. Do not replace a faulted disk until you have a replacement disk with the same part number available.
Disks are arranged in four rows of twenty modules each. The first (front) row is A, then B, C, and D. In each row, the disk are numbered 0-19, left to right.

Procedure

1. Using the grid identifiers on the chassis, locate the faulted disk.
Figure 6 Chassis grid identification markings

Locating a faulted disk within a chassis
2. Verify the display of the amber fault LED on that disk.

Figure 7 Location of amber fault LED on disk

Removing a disk

Before you begin

Wear ESD gloves or attach an ESD wristband to your wrist and the enclosure with the disks you are removing.

NOTICE

If a disk has been bound into a LUN, do not move it to another slot unless you do not care about the data on the LUN. Each disk contains LUN-identifying information written when its was bound. Moving it to another slot can make information on the original LUN inaccessible.

Refer to Figure 8 on page 15 when you perform the procedure that follows.

Procedure

1. Push the disk's orange release tab.
2. Lift the disk's latch and slowly pull the disk about 1 in (3 cm) from its slot.
3. Do one of the following:
   - If the disk’s fault LED is on steadily, pull the disk straight out about 2 inches (5 centimeters) from its slot, and wait 30 seconds for the disk to stop spinning before pulling the disk completely out of the slot.
   - If the disk’s fault LED is off or mostly off, pull the disk completely out of the slot.
4. Place the disk on a static-free surface.
Installing a disk

Before you begin
Wear ESD gloves or attach an ESD wristband to your wrist and the enclosure where you are installing the disks.

Refer to Figure 9 on page 15 while you perform the procedure that follows.

Procedure

1. With the disk carrier latch fully open, align the module with the guides and gently lower the disk into the slot.

   The latch begins to rotate downward when its tabs meet the enclosure.

2. Push the latch downward until it snaps past the orange latch tab.

3. When the latch is engaged, push firmly on the module to verify that the disk is properly seated.

   The disk's active blue light flashes to reflect the disk's spin-up sequence.

Inserting and securing the DAE chassis

Procedure

1. Using the orange enclosure latch handles, push the enclosure completely into the cabinet.

   Ensure that the self-locking latches are pushed in and fully engaged, and the enclosure cannot slide back out of the cabinet.

2. Secure the two knurled black captive screws to the NEMA channel and nut clips.
These screws secure the chassis cover and prevent the cover from coming out of the cabinet during service.

**Figure 10** Inserting the chassis into the cabinet and securing with captive screws

3. Insert chassis-securing screws:

These screws prevent removal of the DAE using the orange release handles. They also secure the DAE chassis to the cabinet rails in the event the cabinet needs to be moved. Ensure that these securing screws have been installed or re-installed after servicing the cabinet.

   a. Using a Philips screwdriver, insert a securing screw into the bottom hole on each side of the enclosure.

   The top set of screws are shipping screws, and are not installed.

**Figure 11** Installing the chassis-securing screws

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**Installing the front bezel**

**NOTICE**

The bezel is required for EMI compliance when the enclosure is powered up.
Refer to Figure 12 on page 17 as you perform the steps in this task.

Figure 12 Installing the front bezel

Procedure
1. Align the bezel with the enclosure.
2. Gently push the bezel into place on the cabinet until it latches.
3. If the bezel has a lock, insert the key that shipped with your enclosure into the lock, and turn the key to lock the bezel.

Closing the console

If you opened the console for access to the enclosure with the part you added or replaced, close the console using the procedure that follows.

Procedure
1. Grasp the free side of the console, and swing the console to the right to close it.
2. Gently push on the console until it is closed.

Verifying the new 80-drive DAE disk drive

Verify that the new 80-drive DAE disk drive 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 80-drive DAE disk drive 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 80-drive DAE housing the disk drive with the Enclosure dropdown menu and then select the Top view of the disk enclosure. Locate the disk drive shown in this enclosure view.
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.
Customer Upgrade Procedure