Quantum®

Replacing a Drive in Base System

StorNext QD7000

Firmware 8.40.xx.xx

Replacing a Drive in Base System, 6-68669-01 Rev A, March 2018 Product of USA.

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Preface

> **Note:** The 8.40.xx.xx firmware (Madrid) is used in the QD7000 (E5600, Titan RAID controller, only). Refer to the NetApp to Quantum Naming Decoder section for additional information.

This section provides the following information:

- Audience
- Prerequisites
- NetApp to Quantum Naming Decoder
- Product Safety Statements
- Contacts
- Comments
- Quantum Global Services

Audience

This manual is intended for storage customers and technicians.

Prerequisites

Prerequisites for installing and using this product include knowledge of:

- Servers and computer networks
- Network administration
- Storage system installation and configuration
- Storage area network (SAN) management and direct attach storage (DAS)
- Fibre Channel (FC) and Ethernet protocols

NetApp to Quantum Naming Decoder

Use Table 1 to correlate the NetApp product nomenclature to the equivalent Quantum-storage naming conventions.

Table 1 Product Nomenclature

E-Series NetApp Product	Quantum-Storage	Description
Controller-Drive Tray	Base System	Quantum uses Base System when referring to a drive tray with the RAID controllers.
Drive Tray	Expansion Unit	Quantum uses Expansion Unit when referring to a drive tray with the environmental services modules (ESMs).
E5600 (Code Name: Titan)	RAID Controller	Four 16Gb/s FC SFP+ host ports
E5500 (Code Name: Soyuz)	RAID Controller	Four 16Gb/s FC SFP+ host ports
E5400 (Code Name: Pikes Peak)	RAID Controller	Four 8Gb/s FC SFP+ host ports
DE6600 (Code Name: Wembley)	4U 60-drive enclosure	Sixty 3.5 inch disk drives

E-Series NetApp Product	Quantum-Storage	Description
E5660 • DE6600 4U drive enclosure • With E5600 RAID controllers (Titan)	Quantum StorNext QD7000	
E5560 • DE6600 4U drive enclosure • With E5500 RAID controllers (Soyuz)	Quantum StorNext QD7000	
E5460 • DE6600 4U drive enclosure • With E5400 RAID controllers (Pikes Peak)	Quantum StorNext QD6000	

E-Series NetApp Product	Quantum-Storage	Description
E5424 • DE5600 24-drive 2U drive enclosure • Code Name: Camden • With E5400 RAID controllers (Pikes Peak)	Quantum StorNext QS2400	
E5412 • DE1600 12-drive 2U drive enclosure • Code Name: Ebbets • With E5400 RAID controllers (Pikes Peak)	Quantum StorNext QS1200	

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This unit is engineered and manufactured to meet all safety and regulatory requirements. Be aware that improper use may result in bodily injury, damage to the equipment, or interference with other equipment.

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AVERTISSEMENT　Avant d'utiliser ce produit, lisez la totalité des instructions et avertissements de ce document et du *Guide d'informations sur le système, la sécurité et la réglementation*.

HINWEIS　Lesen Sie vor der Verwendung dieses Produkts alle Anweisungen und Warnhinweise in diesem Dokument und im System, Safety, and Regulatory Information Guide (Info-Handbuch: System, Sicherheit und Richtlinien).

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VARNING	Läs alla anvisningar och varningar i detta dokument och i *System, säkerhet och krav från myndigheter - Informationshandbok* innan denna produkt tas i bruk.

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Replacing a Failed Drive in the E5660 Controller-Drive Tray

To access this product, go to the NetApp® Support Site at mysupport.netapp.com.

You can determine whether you have a failed drive in two ways:

1. The Recovery Guru directs you to replace a failed drive.
2. You locate the failed drive by checking the three amber Service Action Required LEDs in three locations: the drive tray, the drive drawer, and the drive itself.

Install only drives that are specifically designed for your controller-drive tray and that have been specifically tested, formatted, and qualified in the factory as replacement drives for your controller-drive tray.

ATTENTION Possible equipment damage – You must replace the drive within three minutes after removal to prevent the possibility of overheating the equipment.

ATTENTION Possible loss of data access – Never insert drives into the controller-drive tray without first confirming that the drive firmware level is compatible with the other drives. Inserting a drive with an incorrect firmware level can cause loss of data access. For information about the supported drive firmware levels, contact your Technical Support Representative.

ATTENTION Possible loss of data access – Magnetic fields can destroy all data on the drive and cause irreparable damage to the drive circuitry. To avoid the loss of data access and damage to the drives, always keep drives away from magnetic devices.

ATTENTION Possible hardware damage – To prevent electrostatic discharge damage to the tray, use proper antistatic protection when handling tray components.

Taking a Glance at the E5660 Controller-Drive Tray

Figure 1. LEDs on the Left End Cap of the E5660 Controller-Drive Tray – Front View


92034-09
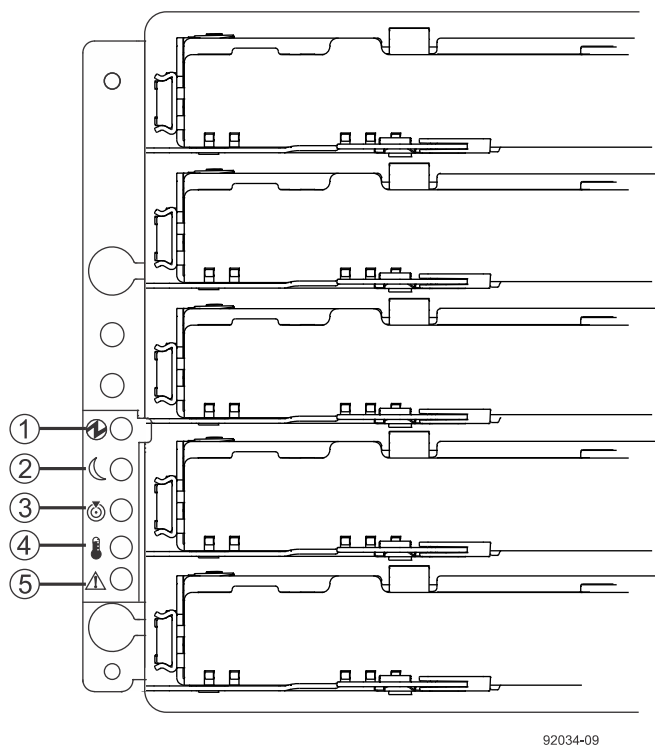
1. Power LED (Green)
2. Standby LED (Green)
3. Controller-Drive Tray Locate LED (White)
4. Controller-Drive Tray Over-Temperature LED (Amber)
5. Controller-Drive Tray Service Action Required LED (Amber)

Figure 2. LEDs on the Drive Drawer – Front View

92034-08
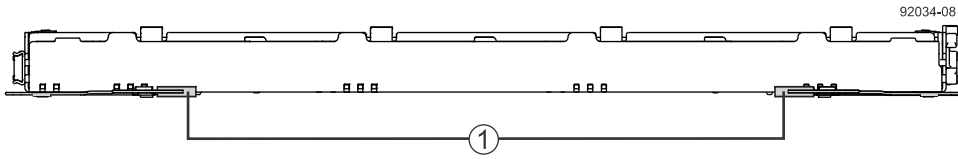
1. Drive Drawer Service Action Allowed LED (Blue)
2. Drive Drawer Service Action Required LED (Amber)
3. Drive 1 Activity LED (Green)
4. Drive 2 Activity LED (Green)
5. Drive 3 Activity LED (Green)
6. Drive 4 Activity LED (Green)
7. Drive 5 Activity LED (Green)
8. Drive 6 Activity LED (Green)
9. Drive 7 Activity LED (Green)
10. Drive 8 Activity LED (Green)
11. Drive 9 Activity LED (Green)
12. Drive 10 Activity LED (Green)
13. Drive 11 Activity LED (Green)
14. Drive 12 Activity LED (Green)

Figure 3. LEDs on the Drive – Top View

92008-01
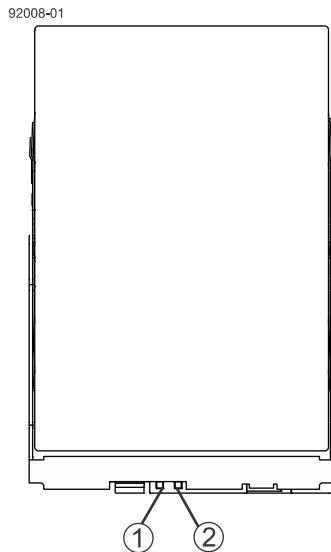
1. Drive Service Action Allowed LED (Blue)
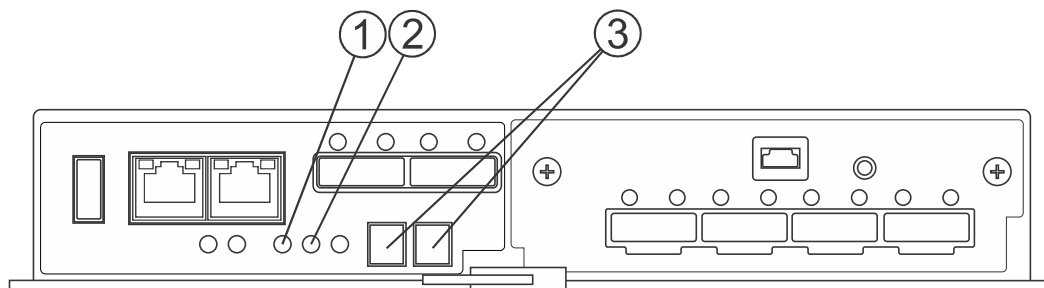2. Drive Service Action Required LED (Amber)

Replacing a Drive in the E5660 Controller-Drive Tray

1. Gather support data about your storage array by using one of these methods:

   - Use the storage management software to collect and save a support bundle of your storage array. From the Array Management Window toolbar, select **Monitor > Health > Collect Support Data Manually**. Then name and specify a location on your system where you want to store the support bundle.

   - Use the command line interface (CLI) to run the `save storageArray supportData` command to gather comprehensive support data about the storage array. For more information about this command, refer to *Command Line Interface and Script Commands Programming Guide*.

   Gathering support data can temporarily impact performance on your storage array.

2. Did the Recovery Guru direct you to replace a failed drive?

   - **Yes** – Go to step 3.

   - **No** – Run the Recovery Guru to identify the failed component, and then go to step 3.

3. Put on antistatic protection.

4. Unpack the drive.

   a. Set the new drive on a flat, static-free surface near the controller-drive tray.

   b. Save all packing materials in case you need to return the drive.

5. Remove the front bezel from the front of the controller-drive tray.

6. Locate the failed drive by checking the Drive Drawer Service Action Required LEDs (Figure 1 on the front of the controller-drive tray).

Figure 4. E5600 Controller Service Action LEDs

51001-16

   1. Controller Service Action Allowed LED (Blue)
   2. Controller Service Action Allowed LED (Amber)
   3. Seven-Segment Display

If a fault is detected, the amber Drive Drawer Service Action Required LED is on. If you can safely remove the drive, the blue Drive Drawer Service Action Allowed LED is on.


ATTENTION Possible loss of data access – After the blue Drive Drawer Action Allowed LED comes on, wait 30 seconds before you open the drive drawer. Waiting 30 seconds allows the drive to spin down, which prevents possible damage to the hardware. To prevent possible damage to the other spinning drives in the drive drawer, open the drive drawer slowly.

> **ATTENTION Potential damage to drives** – Bumping a drive against another surface can damage the drive mechanism or connectors.

7. Release the drive drawer levers on each side of the appropriate drive drawer by pulling both towards the center.

> **NOTE** If you are replacing multiple drives in separate drawers, only one drawer can be extended at a time.

Figure 5. Drive Drawer Levers
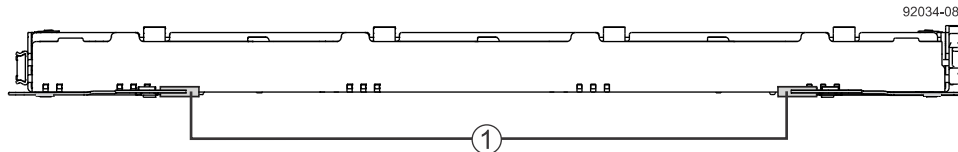
1. Drive Drawer Levers

8. Carefully pull on the extended drive drawer levers to pull out the drive drawer to its full extension without removing it from the controller-drive tray.

Figure 6. Fully Extended Drive Drawer
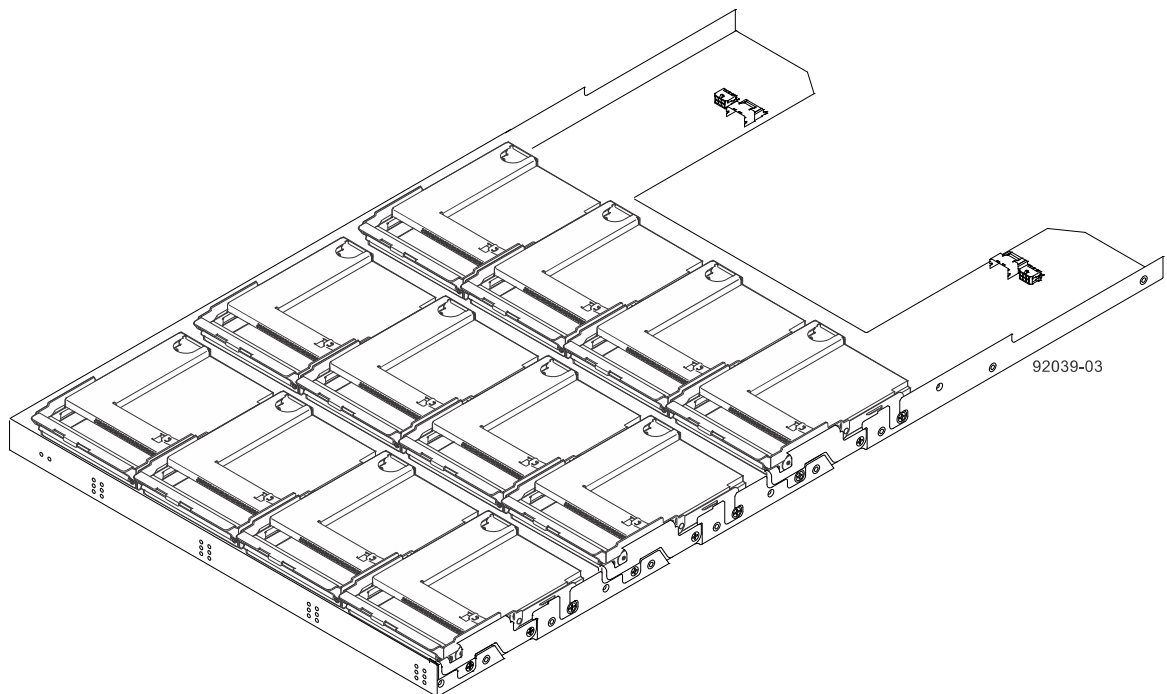
9. Remove the failed drive from the drive drawer by referring to "LEDs on the Drive -- Top View" (Figure 3) to determine which drive has failed. To remove a drive, perform these steps:

a. Locate the drive release lever that secures the drive handle in place. Disengage the drive release lever by carefully pulling it back to release the drive handle.

Figure 7. Drive Release Lever
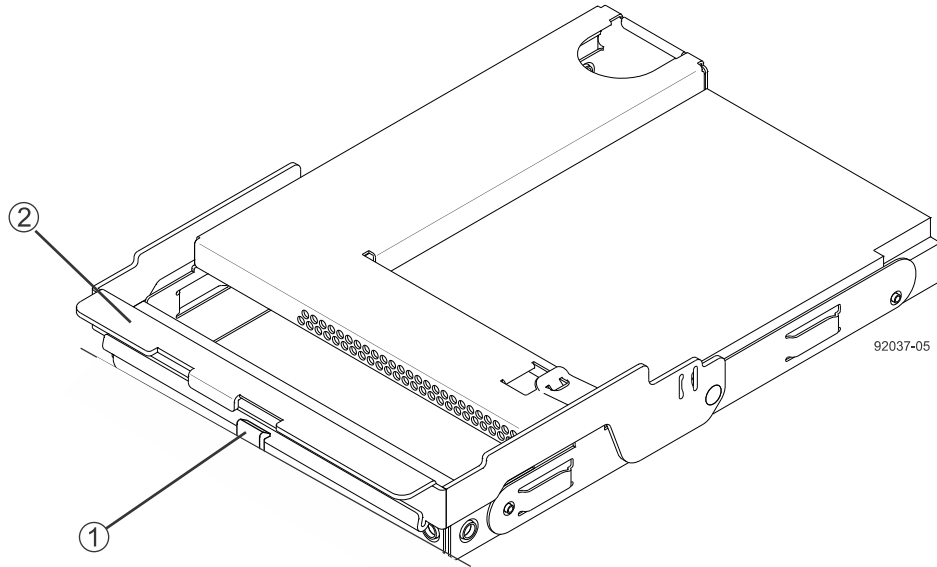
1. Drive Release Lever
2. Drive Handle

b. Raise the drive handle to the vertical position.

Figure 8. Raised Drive Handle

92037-03
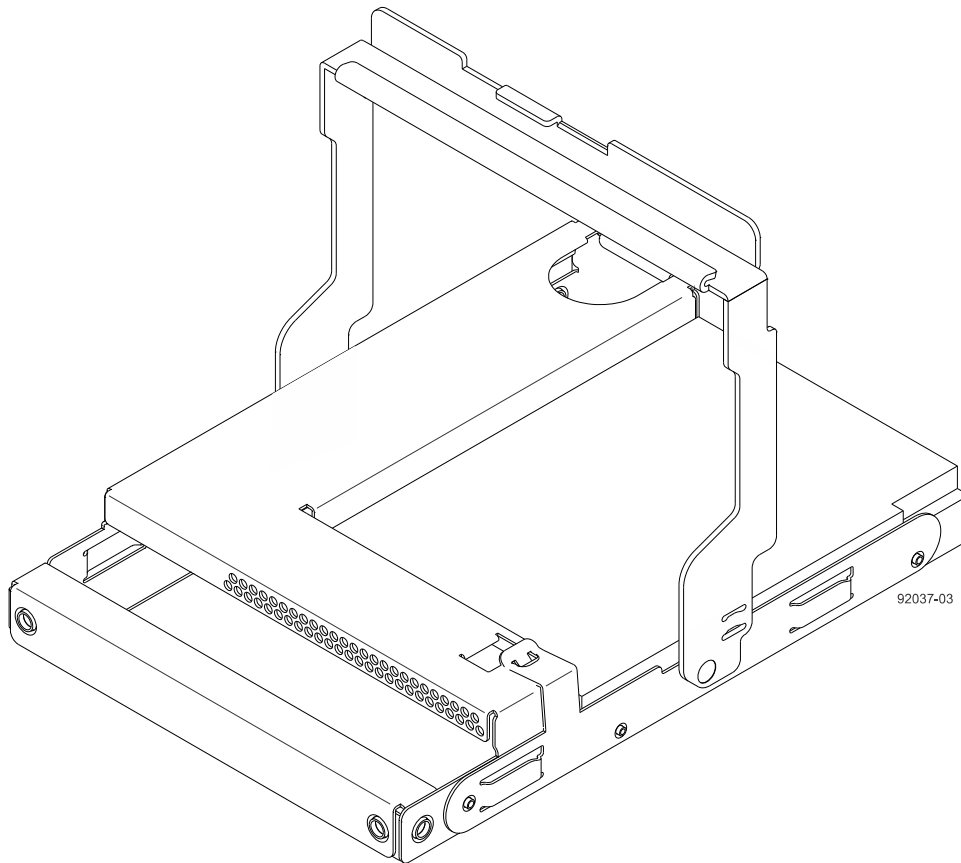
c. Lift the drive from the drive drawer by using the drive handle, and put the drive on a flat, static-free surface. If you are removing multiple drives, label each drive with the tray number, the drive drawer number, and the slot number. Then, if the fault is with the drive drawer and not the drive, the drive can be reused.

Installing a Drive in the E5660 Controller-Drive Tray

1. To install the new drive, raise the drive handle on the new drive to the vertical position.

2. Align the two raised buttons on each side over the matching gap in the drive channel on the drive drawer.

Figure 9. Raised Drive Handle Buttons (Side View)

92012-02
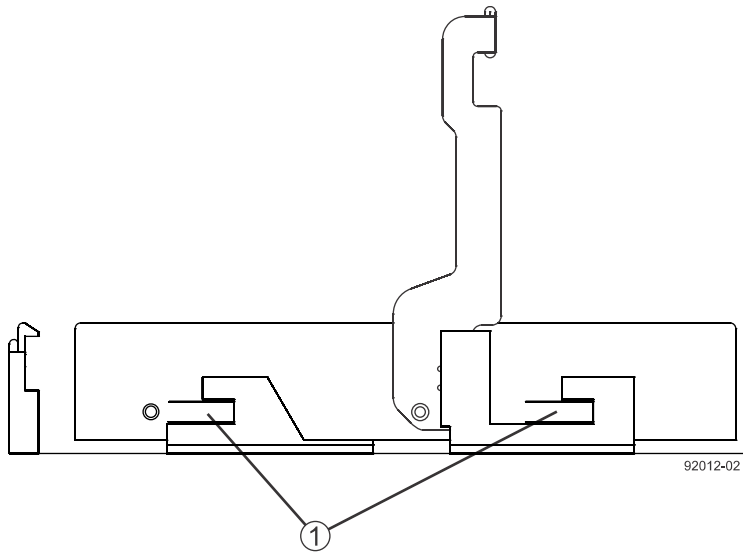
　1.　Raised Buttons

3. Lower the drive straight down, and then rotate the drive handle down until the drive snaps into place under the drive release lever.

Figure 10. Drive Release Lever Locked by the Drive Handle

92037-01
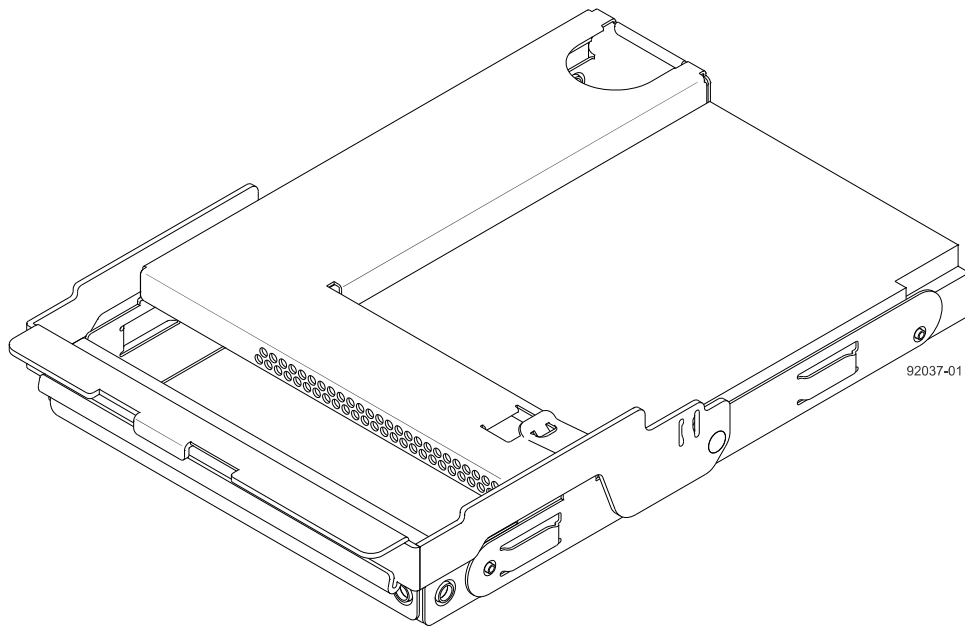
4. Push the drive drawer all the way back into the controller-drive tray, and close the drive drawer levers on each side of the drive drawer.

> **ATTENTION Possible hardware damage** – Make sure that you push both drive drawer levers to each side so that the drive drawer is completely closed. The drive drawer must be completely closed to allow proper airflow and prevent overheating.

> **NOTE** Depending on your configuration, the controller might automatically reconstruct data to the new drive. If the controller-drive tray uses hot spares, the controller might need to perform a complete reconstruction on the hot spare before the controller copies the data to the replaced drive. This reconstruction process increases the time that is required to complete this procedure.

5. Check the Drive Drawer Service Action Required LED (LEDs on the Drive Drawer -- Front View). Based upon the LED status, perform one of these actions:

   - **The Drive Drawer Service Action Required LED is off** – Go to step 7.

   - **The Drive Drawer Service Action Required LED is on** – The drive might not be installed correctly. Remove the drive, wait 30 seconds, and then reinstall it. Go to step 6.

6. Did this action correct the problem?

   - **Yes** – Go to step 7.

   - **No** – If the problem has not been resolved, contact your Technical Support Representative.

7. Install the front bezel on the front of the controller-drive tray.

8. Bring the new drive back online by using the storage management software:

   a. In the Array Management Window, highlight the affected volume group and then select the menu option **Replace Drives**.

   b. Select the replaced drive that corresponds to the to the slot location or select an appropriate replacement drive.

   c. Click the **Replace Drive** button. When the drive reconstruction completes, the volume group is in an Optimal state.

9. Using the LEDs and the storage management software, check the status of all of the trays in the storage array, and confirm the drive replacement.

10. Does any component have a Needs Attention status?

   - **Yes** – Click the **Recovery Guru** toolbar button in the Array Management Window, and complete the recovery procedure. If the problem has not been resolved, contact your Technical Support Representative.

   - **No** – Go to step 11.

11. Remove the antistatic protection.

12. Gather support data about your updated storage array by using one of these methods:

   - Use the storage management software to collect and save a support bundle of your storage array. From the Array Management Window toolbar, select **Monitor > Health > Collect Support Data Manually**. Then name and specify a location on your system where you want to store the support bundle.

   - Use the CLI to run the `save storageArray supportData` command to gather comprehensive support data about the storage array. For more information about this command, refer to *Command Line Interface and Script Commands Programming Guide*.

   Gathering support data can temporarily impact performance on your storage array.

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