SAS expansion cards

E-Series

NetApp
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Requirements for EF300 SAS expansion card replacement

If you plan to add a SAS expansion card to an EF300, review the following requirements.

- You must follow the Install and set up EF300 and EF600 storage systems to set up your controller.
- You must update your firmware to the latest version. To update your firmware, follow the instructions in the Upgrading SANtricity OS.
- You must schedule a downtime maintenance window for this procedure. You cannot access data on the storage array until you have successfully completed this procedure.
- You have an ESD wristband, or you have taken other antistatic precautions.
- You have a #1 Phillips screwdriver.
- You have labels to identify each cable that is connected to the controller canister.
- You have a management station with a browser that can access SANtricity System Manager for the controller. (To open the System Manager interface, point the browser to the controller's domain name or IP address.)
- EF300 controllers may have a SAS expansion card installed in port 1 to allow for drive tray expansion.
- To cable your SAS expansion, see Cabling E-Series hardware for instructions.

Add SAS expansion card to EF300

You can add a SAS expansion card to an EF300 controller to allow for drive tray expansion.

About this task
When you add a SAS expansion card, you must power off the storage array, install the new SAS expansion card, and reapply power.

Before you begin
- Review Requirements for EF300 SAS expansion card replacement.
- You must schedule a downtime maintenance window for this procedure. You cannot access data on the storage array until you have successfully completed this procedure.

What you'll need
- A SAS expansion card that is compatible with your controller.
- An ESD wristband, or you have taken other antistatic precautions.
- A flat, static free work area.
- A #1 Phillips screwdriver.
- Labels to identify each cable that is connected to the controller canister.
- A management station with a browser that can access SANtricity System Manager for the controller. (To open the System Manager interface, point the browser to the controller's domain name or IP address.)

Step 1: Place controller shelf offline

Place the controller shelf offline so you can safely add the SAS expansion card.

Steps

1. From the Home page of SANtricity System Manager, ensure that the storage array has Optimal status.

   If the status is not Optimal, use the Recovery Guru or contact technical support to resolve the problem. Do not continue with this procedure.

2. Back up the storage array's configuration database using SANtricity System Manager.

   If a problem occurs when you remove a controller, you can use the saved file to restore your configuration. The system will save the current state of the RAID configuration database, which includes all data for volume groups and disk pools on the controller.

   - From System Manager:

     a. Select **Support › Support Center › Diagnostics**.

     b. Select **Collect Configuration Data**.

     c. Click **Collect**.

        The file is saved in the Downloads folder for your browser with the name, **configurationData-<arrayName>-<dateTime>.7z**.

3. Ensure that no I/O operations are occurring between the storage array and all connected hosts. For example, you can perform these steps:

   - Stop all processes that involve the LUNs mapped from the storage to the hosts.

   - Ensure that no applications are writing data to any LUNs mapped from the storage to the hosts.

   - Unmount all file systems associated with volumes on the array.

     > (i) The exact steps to stop host I/O operations depend on the host operating system and the configuration, which are beyond the scope of these instructions. If you are not sure how to stop host I/O operations in your environment, consider shutting down the host.

     > (!) **Possible data loss** — If you continue this procedure while I/O operations are occurring, the host application might lose access to the data because the storage is not accessible.

4. Wait for any data in cache memory to be written to the drives.

   The green Cache Active LED on the back of each controller is on when cached data needs to be written to the drives. You must wait for this LED to turn off.

5. From the Home page of SANtricity System Manager, select **View Operations in Progress**. Wait for all operations to complete before continuing with the next step.

6. Power down the controller shelf.

   a. Label and then unplug both power cables from controller shelf.

   b. Wait for all LEDs on the controller shelf to turn off.

Step 2: Remove controller canister

Remove the controller canister so you can add the new SAS expansion card.

Steps

1. Put on an ESD wristband or take other antistatic precautions.

2. Label each cable that is attached to the controller canister.

3. Disconnect all the cables from the controller canister.

> ⚠️   To prevent degraded performance, do not twist, fold, pinch, or step on the cables.

4. Confirm that the Cache Active LED on the back of the controller is off.

5. Squeeze the handles on either side of the controller, and pull back until it releases from the shelf.

6. Using two hands and the handles, slide the controller canister out of the shelf. When the front of the controller is free of the enclosure, use two hands to pull it out completely.

> ⚠️   Always use two hands to support the weight of a controller canister.

7. Place the controller canister on a flat, static-free surface.

Step 3: Add the new SAS expansion card

Install the SAS expansion card to allow for drive tray expansion.

> ℹ️   On an EF300 controller shelf, a SAS expansion card may only be installed in port 1.

Steps

1. Remove the controller canister's cover by unscrewing the single thumbscrew and lifting the lid open.

2. Confirm that the green LED inside the controller is off.

   If this green LED is on, the controller is still using battery power. You must wait for this LED to go off before removing any components.

3. Using a #1 Phillips screwdriver, remove the two screws that attach the faceplate to the controller canister, and remove the faceplate.

4. Align the single thumbscrew on the SAS expansion card with the corresponding hole on the controller, and align the connector on the bottom of the expansion card with the expansion card interface connector on the controller card.

   Be careful not to scratch or bump the components on the bottom of the SAS expansion card or on the top of the controller card.

5. Carefully lower the SAS expansion card into place, and seat the expansion card connector by pressing gently on the expansion card.

6. Hand-tighten the SAS expansion card thumbscrew.

   Do not use a screwdriver, or you might over tighten the screws.

7. Using a #1 Phillips screwdriver, attach the faceplate you removed from the original controller canister to the new controller canister with the two screws.

Step 4: Reinstall the controller canister

After installing the new SAS expansion card, reinstall the controller canister into the controller shelf.

Steps

1. Lower the cover on the controller canister and secure the thumbscrew.

2. While squeezing the controller handles, gently slide the controller canister all the way into the controller shelf.

> ℹ️ The controller audibly clicks when correctly installed into the shelf.

Step 5: Complete SAS expansion card addition

Place the controller online, collect support data, and resume operations.

Steps

1. Plug in power cables to place the controller online.

2. As the controller boots, check the controller LEDs.

   ◦ The amber Attention LED remains on.

   ◦ The Host Link LEDs might be on, blinking, or off, depending on the host interface.

3. When the controller is back online, confirm that its status is Optimal and check the controller shelf's Attention LEDs.

   If the status is not Optimal or if any of the Attention LEDs are on, confirm that all cables are correctly seated and the controller canister is installed correctly. If necessary, remove and reinstall the controller

canister.

> ℹ️ If you cannot resolve the problem, contact technical support.

4. Click **Hardware › Support › Upgrade Center** to ensure that the latest version of SANtricity OS is installed.

   As needed, install the latest version.

5. Verify that all volumes have been returned to the preferred owner.

   a. Select **Storage › Volumes**. From the **All Volumes** page, verify that volumes are distributed to their preferred owners. Select **More › Change ownership** to view volume owners.

   b. If volumes are all owned by preferred owner continue to Step 6.

   c. If none of the volumes are returned, you must manually return the volumes. Go to **More › Redistribute volumes**.

   d. If only some of the volumes are returned to their preferred owners after auto-distribution or manual distribution you must check the Recovery Guru for host connectivity issues.

   e. If there is no Recovery Guru present or if following the recovery guru steps the volumes are still not returned to their preferred owners contact support.

6. Collect support data for your storage array using SANtricity System Manager.

   a. Select **Support › Support Center › Diagnostics**.

   b. Select **Collect Support Data**.

   c. Click **Collect**.

   The file is saved in the Downloads folder for your browser with the name, **support-data.7z**.

> ℹ️ To cable your SAS expansion, see Cabling E-Series hardware for instructions.

What's next?

The process of adding a SAS expansion card in your storage array is complete. You can resume normal operations.