



NetApp®

Upgrading Host Interface Cards in the E2712 or the E2724 Controller-Drive Tray

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Planning the Host Interface Card Upgrade

Use these procedures to upgrade the host interface in a controller-drive tray. For duplex controller-drive trays, you replace both HICs. For simplex controller-drive trays, you replace the one HIC. In both cases, you must power off the controller-drive tray. As a result, you cannot access data on the storage array until you successfully complete the replacement.

If your storage array participates in remote volume mirroring, only iSCSI or Fibre Channel connections are supported between the primary site and the remote site. If your new HIC configuration does not include iSCSI or Fibre Channel connections, remote volume mirroring will not be supported.

To complete this procedure, you will need antistatic protection and two new HICs so you can upgrade controller A and controller B. Make sure before you begin that you have received the correct HICs. The following table summarizes requirements for cabling. Compare your current host cabling to the supported cabling for your new controllers to determine whether you can reuse cables from your old cabling configuration. The HBAs, HCAs, or Ethernet adapters, as well as switches in the network fabric used to connect your hosts to your storage array, must match the HICs in your controller canisters.

If you are changing your current configuration, you might need to replace these items in addition to the HICs:

- Host bus adapters or host channel adapters
- Cables - SAS uses optical or copper cable, fibre channel uses optical cable.
- The correct HIC subplate for the front of the controller

Table 1. Host Cabling Configurations

HIC		Cable		
Data Rate and Protocol	Number of Connectors	Connector	Type	Length
12 Gb/s SAS	4	MiniSAS-HD	passive copper	1-5m
		MiniSAS-HD	active copper	8-15m
		MiniSAS-HD	optical	5-100m
	2	MiniSAS-HD	passive copper	1-5m
		MiniSAS-HD	active copper	8-15m
		MiniSAS-HD	optical	5-100m
			Fan-out cable type #2	passive copper

HIC		Cable		
Data Rate and Protocol	Number of Connectors	Connector	Type	Length
		Fan-out cable type #3	passive copper	2m
16 Gb/s Fibre Channel	4	SFP+	OM2 SW optical	2,3,5,10,25m
		SFP+	OM3 SW optical	50-150m
		SFP+	OS2 LW optical	50-300m
	2	SFP+	OM2 SW optical	2,3,5,10,25m
		SFP+	OM3 SW optical	50-150m
		SFP+	OS2 LW optical	50-300m
10 Gb/s iSCSI	4	SFP+	OM2 optical	2,3,5,10,25m
		SFP+	OM3 optical	50-150m
		Twin-Ax	passive copper	2-7m
	2	SFP+	OM2 optical	2,3,5,10,25m
		SFP+	OM3 optical	50-150m
		Twin-Ax	passive copper	2-7m
		RJ-45	Cat6a passive copper	2-100m
1 Gb/s iSCSI	4	RJ-45	passive copper	2-70m
	2	RJ-45	Cat5 passive copper	2-70m
		RJ-45	Cat6a passive copper	2-100m

ATTENTION Possible Equipment Damage - Only a qualified service technician should perform this procedure, or equipment damage might result.

ATTENTION Potential loss of connectivity - If both controllers are powered up at the same time with different types of HICs, a mismatch results that causes both controllers to lock down (shut down and stop operating).

Preparing to Remove the Controller Canisters

- 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 the current version of the *Command Line Interface and Script Commands Programming Guide*.

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

- Halt all I/O operations between the storage array and all connected hosts.
- View the **Summary** tab of the **Array Management Window** (AMW) in SANtricity Storage Manager to make sure that there are no I/O operations in progress.

ATTENTION Possible data loss – If you continue with the steps to remove a controller while I/O operations are occurring between the storage array and attached hosts, you might lose data.

4. On each host that is connected to the storage array, unmount all file systems associated with volumes on the storage array.
5. Wait for five minutes.
6. In the **Hardware** tab of the **AMW**, select the graphic representation of the storage array and then select **Monitor > Reports > Operations in Progress** to make sure that there are no background operations in progress.
The **Operations in Progress** window shows the time remaining for any operations. Wait for those operations to complete before you continue with the next step.
7. Power off the controller-drive tray.
8. Wait for all of the LEDs on the controller-drive tray to go dark.
9. Power off each drive tray that is connected to the controller-drive tray.
10. Wait for two minutes for all of the drives to spin down.

Removing an E2712 Controller Canister or an E2724 Controller Canister

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

1. Put on antistatic protection.

ATTENTION Potential Degraded Performance – To prevent degraded performance, do not twist, fold, pinch, or step on the cables. Many cables have a minimum bending radius. Check the specifications for your cables, and do not bend any cable tighter than the minimum specified radius.

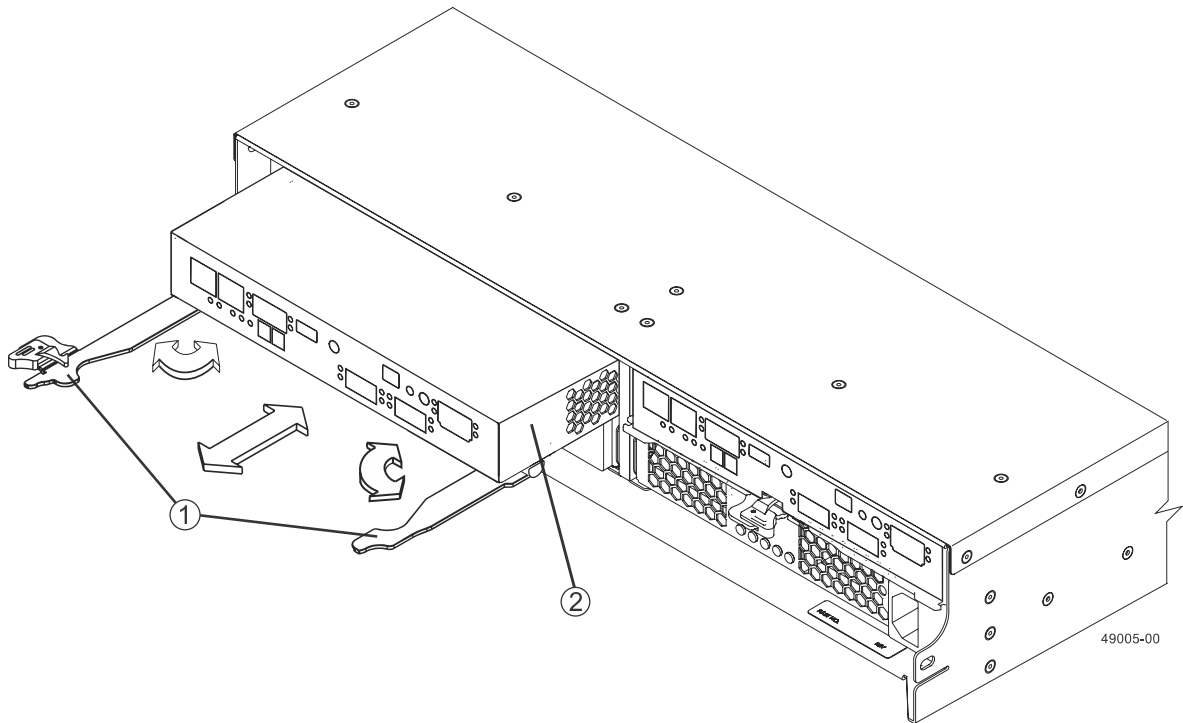
2. Use the Locate Canister Tray function in the storage management software to identify the controllers that have the HICs to be upgraded.
3. Label each of the cables attached to the controller canisters. Depending on your new HIC configuration, you might be able to reconnect some cables after you replace the controller canister.
4. Disconnect all cables from both controller canisters.
5. Remove controller A.

NOTE The following figures show the controller in the left-hand position within the controller-drive tray. However, you might be removing the controller from the right-hand position. The required actions are similar.

- a. Unlock and pull out the release levers to release the controller canister.

- b. Using the release levers, pull the controller canister out of the controller-drive tray.

Figure 1. Removing and Reinstalling the Controller Canister



1. Release Levers
2. Controller Canister

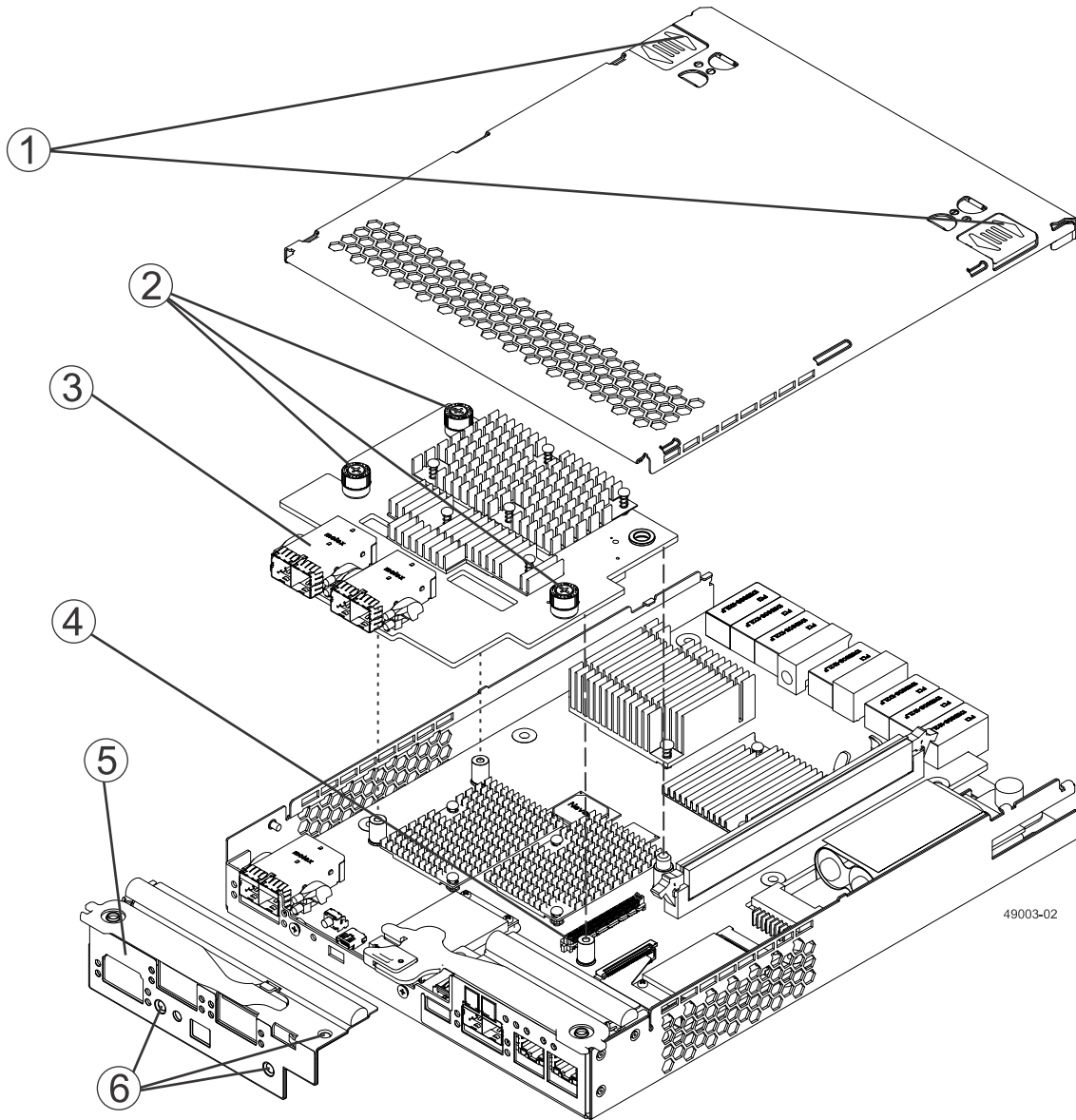
- c. Set the controller canister on a flat, static-free surface, and position it so that you can access the top cover.

Removing the Host Interface Card from the E2712 or the E2724 Controller-Drive Tray

1. Remove the top cover from controller A.

Press down on both of the top cover latch buttons, and slide the top cover to the rear.

Figure 2. Host Interface Card (HIC) Replacement



1. Top cover latch buttons
2. HIC Thumbscrews
3. Host Interface Card
4. HIC Interface Connector
5. Subplate
6. Subplate screws

2. Remove the subplate from the controller canister with a Phillips screwdriver.
3. Loosen the thumbscrews that secure the HIC to the controller card.
If the thumbscrews were overtightened, you can use a Phillips screwdriver to help loosen them.
4. Disengage the HIC from the controller card by lifting it up and gently sliding it back, making sure to clear the other components in the canister.

5. Place the HIC that you removed in an anti-static bag.
6. Repeat step [1](#) through step [5](#) for controller B.

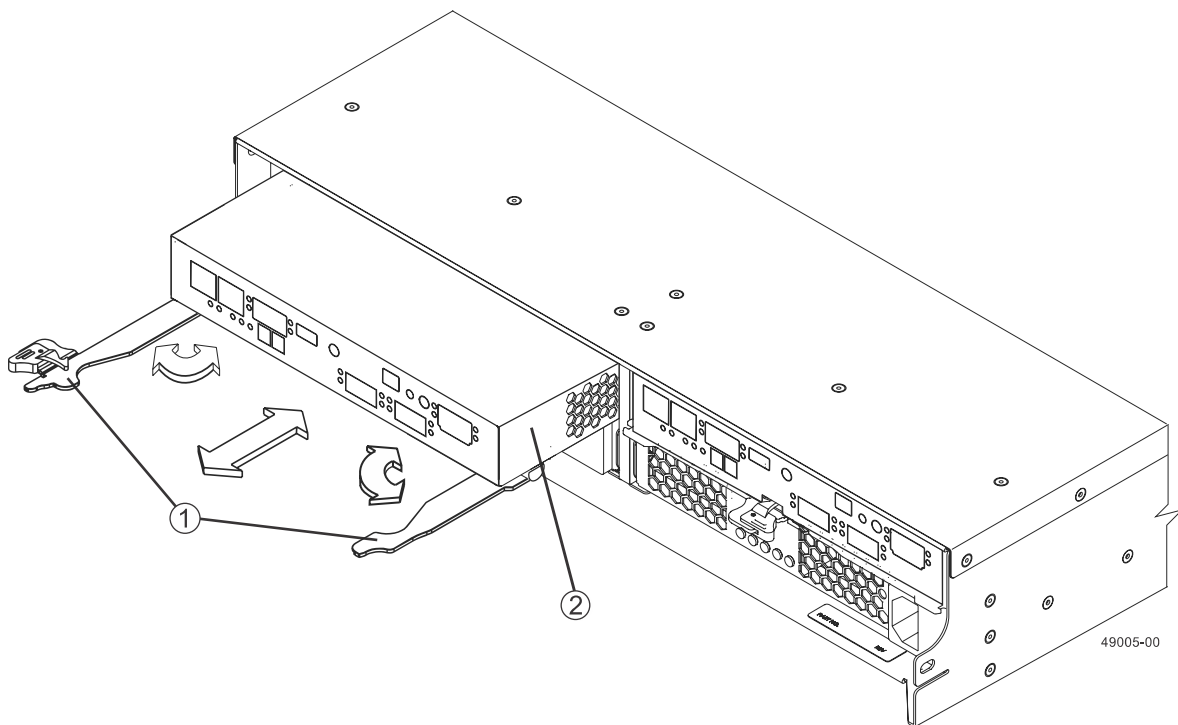
Installing the Host Interface Card

1. Unpack the new HIC.
2. Install the new HIC by gently connecting the HIC to the HIC interface connector and tightening the thumbscrews. Do not scratch or bump any of the components on the bottom of the HIC or the top of the controller card.
3. Tighten the HIC thumbscrews that secure the HIC to the controller card by hand only. A screwdriver can overtighten the screws.
4. Attach the subplate to the controller canister.
Insert the screws that hold the subplate to the controller canister using a Phillips screwdriver.
5. Repeat step [2](#) through step [4](#) for controller B.

Installing the Controller Canister

1. Reinstall the top cover on controller A by sliding it forward until the top cover latch buttons click.
2. Slide the controller canister all the way into the controller-drive tray.

Figure 3. Installing a Controller Canister



1. Release Levers
2. Controller Canister

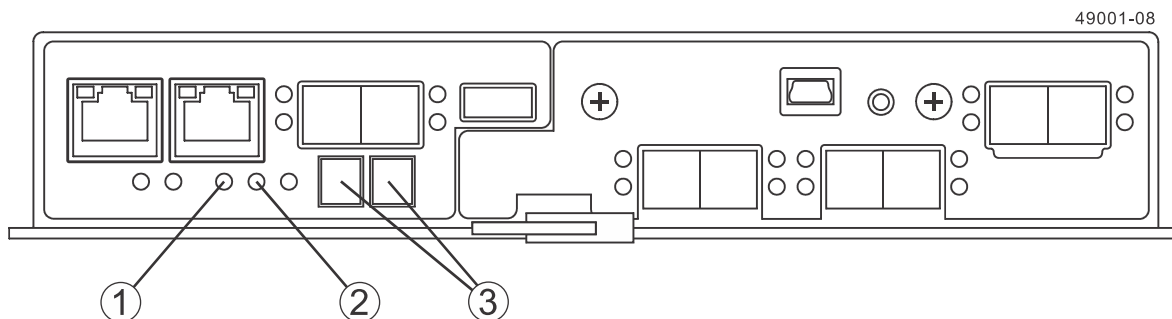
3. Rotate the release levers towards the center of the controller canister to lock it into place.
4. Connect all host and drive cables involved in your upgrade. You might be able to reuse cables that you disconnected at the beginning of the procedure. See [Table 1](#) for details about cabling requirements.
5. Repeat Step [1](#) through step [4](#) for controller B.

Bringing the Controller Canisters Back Online

ATTENTION Potential loss of connectivity – If both controllers in a duplex controller-drive tray are powered up at the same time with different types of HICs, a mismatch results that causes both controllers to lock down (shut down and stop operating).

1. Turn on both Power switches on the rear of each drive tray that is connected to the controller-drive tray.
2. Wait two minutes for the drives to spin up.
3. Turn on both Power switches on the rear of the controller-drive tray.
4. Wait three minutes for the power-up process to complete.
5. To enable write caching on all volumes, select **Storage > Volume > Change > Cache Settings**. Check the **Select all** option, check **Enable write caching**, and then click **OK**.
6. Use either the GUI (first bullet) or the CLI (second bullet) to bring controller A online.
 - From the Hardware pane in the Array Management Window, right-click the picture of the controller, and select **Advanced > Place > Online**.
 - Run the following command: `smCLI <DNS-network-name-or-IP-address> -c "set controller [(a | b)] availability=online";`
7. Look at the LEDs on the new controller canister to make sure that the new controller is booting correctly. The Host Link Service Action Required LEDs turn green during the reboot. The seven-segment display shows the sequence OS+ Sd+ blank- to indicate that the controller is performing Start-of-day (SOD) processing. After the controller successfully completes rebooting, the seven-segment display shows the tray ID matching the seven-segment display on the second controller. You can then discover the new controller canister by using the storage management software.

Figure 4. Controller LEDs



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

8. Look at the Controller Service Action Required LEDs. Based on the LED status, perform one of these actions:

- **All of the amber Service Action Required LEDs are off, and the Array Management Window indicates an Optimal status** – Go to step [10](#).
 - **Any of the controller-drive tray's Service Action Required LEDs are on, or the Controller Service Action Required LED is on** – Check that the controller canister has been installed correctly and that all of the cables are correctly seated. Reinstall the controller canister, if necessary. Go to step [9](#).
9. Did this action correct the problem?
- **Yes** – Go to step [10](#).
 - **No** – If the problem is not resolved, contact your Technical Support Representative.
10. Repeat step [5](#) through step [8](#) for controller B.
11. Using the LEDs and the storage management software, check the status of all of the trays in the storage array.
12. 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 is not resolved, contact your Technical Support Representative.
 - **No** – Go to step [13](#).
13. Remove the antistatic protection.
14. 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 the current version of the *Command Line Interface and Script Commands Programming Guide*.

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

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