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SGI InfiniteStorage System

Quick Install Guide

*for the E5412
Controller-Drive Tray*

If you have any questions about the firmware or your configuration, contact your Customer and Technical Support representative.

Tools:

- An Internet connection
- A cart to hold the controller-drive tray and its components
- Labels for the cable connections
- A medium flat-blade screwdriver
- A No. 2 Phillips screwdriver
- Anti-static protection
- A flashlight

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1 | Before you begin

For warnings, refer to the printed *Safety Notices* document.

For detailed installation instructions, refer to *E5400 Controller-Drive Tray Installation Guide*, located on the SANtricity™ ES Storage Manager Installation DVD.

1.1 **What you need for assembly:**
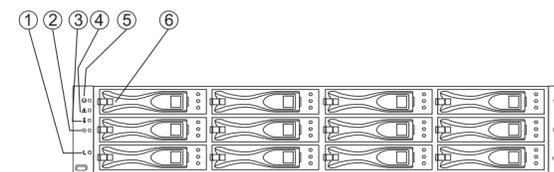
E5412 controller-drive tray:

- One two-unit (2U) -high E5412 controller-drive tray
- Two DVDs:
  - Firmware DVD
  - SANtricity ES Storage Manager Installation DVD, which contains all of the documents listed in this guide, except for the quick install guides
- Two power cords
- Small Form-factor Pluggable (SFP) transceivers, one for each of the host channel ports on the base controllers. Host Interface Cards require additional devices appropriate to the interface.
- One cabinet mounting hardware kit, including:
  - Two mounting rails (right and left assemblies)
  - Eight M5 x 8 mm screws – Use six screws to secure the mounting rails and two screws to secure the front of the controller-drive tray to the cabinet.
  - Two M4 x 8 mm screws – Use the screws to secure the rear of the controller-drive tray to the mounting rails.

Options:

- Drives (two minimum for each controller-drive tray)
- DC power cords for the optional –48 VDC power option
- Two SFP transceivers for each fiber-optic cable
- Two host bus adapters (HBAs) or two Infiniband adapters installed in each host
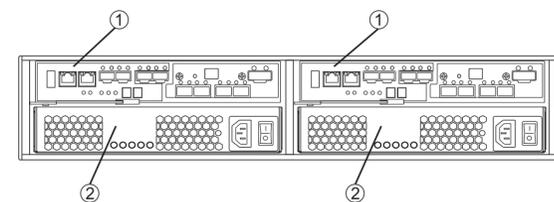- Two fiber-optic cables or two copper cables for each drive tray connection

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2 | Install the mounting rails

You can install the controller-drive tray into an industry-standard cabinet.

There must be a minimum depth of 76 cm (30 in.) between the front EIA support rails and the rear EIA support rails.

2.1 Position the mounting rails in the cabinet.

- If you are installing the mounting rails above an existing tray, position the mounting rails directly above the tray.
- If you are installing the mounting rails below an existing tray, allow 8.9-cm (3.5-in.) vertical clearance for the E5412 controller-drive tray.

2.2 Starting with the left mounting rail, use a flat-blade screwdriver to loosen the two flat-head rail adjustment screws. Hold the front of the left mounting rail against the inside of the front cabinet-mounting flange, and then extend the rear of the mounting rail until it makes contact with the rear cabinet-mounting flange. The alignment pins at the rear of the mounting rail should slide into the holes at the rear of the cabinet.
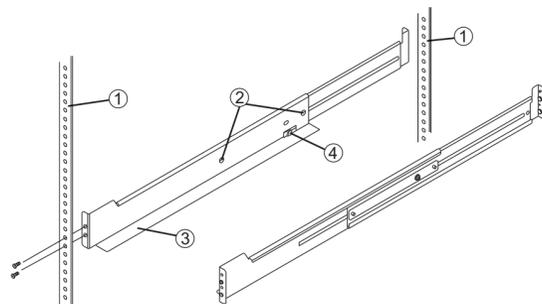
1 Mounting Holes on the Industry-Standard Cabinet
2 Adjustment Screws for Locking the Length of the Mounting Rail
3 Mounting Rail
4 Clip for Securing the Rear of the Controller-Drive Tray

2.3 From the front of the cabinet, with the front and rear cabinet-mounting flanges inside of the cabinet's mounting rail assemblies, use the Phillips screwdriver to loosely tighten only the lower screw.

2.4 From the rear of the cabinet, use the Phillips screwdriver to loosely tighten the two screws. Do not completely tighten the screws until you have installed the controller-drive tray in the cabinet.

2.5 Repeat step 2.1 through step 2.4 for the right mounting rail.

2.6 Tighten the flat-head rail adjustment screws on both mounting rails.

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3 | Install the controller-drive tray

WARNING (W08) Risk of bodily injury

>18 kg (39.7 lbs)

Two persons are required to safely lift the component.

3.1 With the help of one other person, remove the controller-drive tray from the shipping box.

E5412 Controller-Drive Tray – Front View

1 Standby Power LED
2 Power LED
3 Over-Temperature LED
4 Service Action Required LED
5 Locate LED
6 Drive Canister

E5412 Controller-Drive Tray – Rear View

1 Controller Canisters
2 Power-Fan Canisters

3.2 With the help of one other person, slide the rear of the controller-drive tray onto the mounting rails so that the mounting holes on the front flanges of the controller-drive tray align with the mounting holes on the front of the mounting rails.
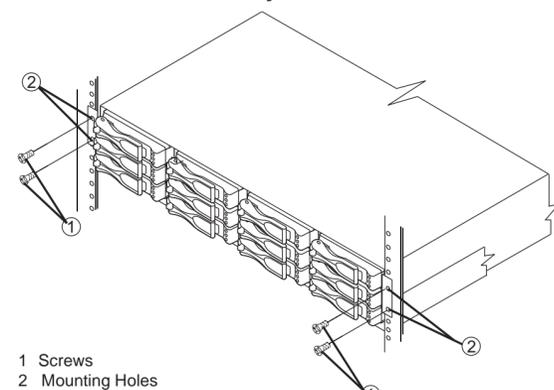
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4 | Secure the controller-drive tray

WARNING (W18) Risk of bodily injury – Do not use equipment in the cabinet as a shelf or workspace.

4.1 Secure the screws in the top mounting holes and the bottom mounting holes on each side of the controller-drive tray.

E5412 Controller-Drive Tray

1 Screws
2 Mounting Holes

4.2 Secure the rear of the controller-drive tray to the cabinet by using two screws to attach the flanges on each side at the rear of the controller-drive tray to the mounting rails.

4.3 Install the front end caps on the front of the controller-drive tray by pressing the front end caps into place on the left side and the right side.

NOTE You will install the DE1600 drive trays, the DE5600 drive trays, and the DE6600 drive trays below and above the controller-drive tray, keeping the weight in the lower portion of the cabinet.

You can install a maximum of 384 drives in a typical configuration. The total number of trays in the storage array, including the controller-drive tray and all of the attached drive trays, must not exceed 16. For information about High Performance Computing configurations and their capacity, refer to either the *E5400 Controller-Drive Tray Installation Guide* or the *Hardware Cabling Guide*.

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5 | Connect the cables

WARNING (W03) **Risk of exposure to laser radiation** – Do not disassemble or remove any part of a Small Form-factor Pluggable (SFP) transceiver because you might be exposed to laser radiation.

In this step, you will connect the E5412 controller-drive tray to the host or hosts, and then you will connect the DE1600 drive tray, the DE5600 drive tray, or the DE6600 drive tray to an E5412 controller-drive tray, or to another DE1600 drive tray, DE5600 drive tray or DE6600 drive tray in the storage array (step 5.5). For more information, refer to the *Hardware Cabling Guide*.

Host-to-Controller Cabling

5.1 Attach the appropriate cables and components for the relevant protocol (Fibre Channel or Infiniband).

5.2 Choose the host connection configuration (examples follow).

- **Direct topology** – Connect the cable from the host port on the controller to either an HBA port, a Fibre Channel port, or an Infiniband port on the host. The figure in step 5.4 shows the HBA port option on the host.
- **Switch or fabric topology** – Connect the cable from the host port on the controller to a port on the switch, and make sure that the HBA and the controller are in the same zone on the switch.
- **Mixed topology** – Use a combination of direct topology and fabric topology.

5.3 Repeat step 5.1 through step 5.2 once more for each controller and host channel that you intend to use.

5.4 When you are finished, label each end of the cable with information about its connection.

Direct Topology – Two Hosts and a Dual Controller-Drive Tray for Maximum Redundancy
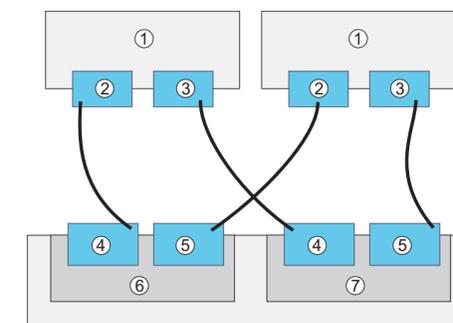
**Switch or Fabric Topology (Fibre Channel Ports Only) – Two Hosts and a Dual Controller-Drive Tray**
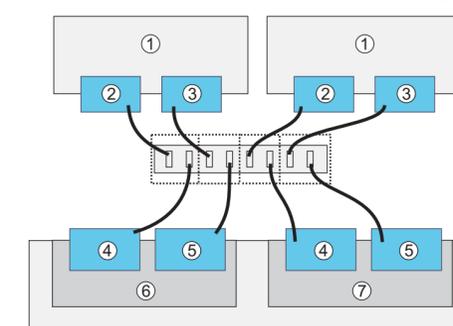
For examples of a mixed topology, refer to the *E5400 Controller-Drive Tray Installation Guide*.

5.5 Attach the cable to the drive trays as needed. For maximum redundancy and tray loss protection, see the figure on the following page. Refer to the *Hardware Cabling Guide* for detailed information.
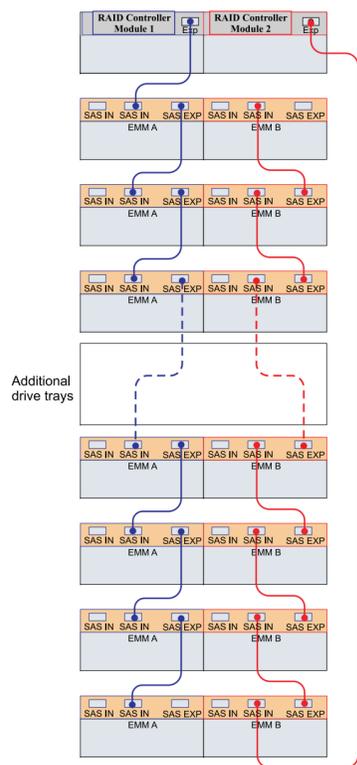
You can connect a combination of drive trays for a maximum of 384 drives, including the 12 drives in the E5412 controller-drive tray. You must also observe the 16-tray limit in all configurations.

Steps to connect Ethernet cables for out-of-band management only:

5.6 Connect one end of the Ethernet cable to the Ethernet port 1 connector on controller A.

5.7 Connect the other end of the Ethernet cable to the appropriate Ethernet network connection or directly to your Ethernet ports on your management station.

5.8 Repeat step 5.6 through step 5.7 for controller B.

6 Turn on the DC power

NOTE DC power is an option that is available for use with your E5412 controller-drive tray and drive trays. If you choose to have −48 VDC power available, you need a qualified service person to install the equipment that provides special DC power connectors to each power-fan canister in your storage array.

⚠ **WARNING (W14) Risk of bodily injury** – A qualified service person is required to make the DC power connection according to NEC and CEC guidelines.

⚠ **WARNING (W12) Risk of electrical shock** – This unit has more than one power source. To remove all power from the unit, all DC MAINS must be disconnected by removing all power connectors (see item 4 below) from the power supplies.
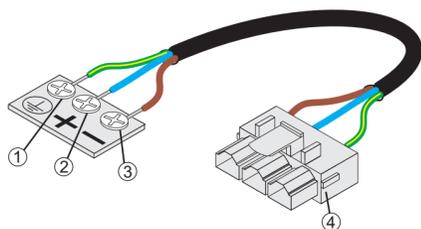
1 Ground, Green/Yellow Wire
2 Return (Positive), Blue Wire
3 Supply (Negative), Brown Wire, −48 VDC
4 DC Power Connector

⚠ ⚡ **WARNING (W16) Risk of bodily injury** – Each tray has more than one power cord. To remove all electrical current from the devices, make sure that all of the power cords are disconnected from the power source and that the two-pole 20-amp circuit breaker for the storage array has been disconnected.

You must follow the power sequence in the order shown. To establish power redundancy for trays with two power supplies, use a separate power source for each power-fan canister. For additional redundancy, you can connect each DC power connector on the same power-fan canister to a different power source.

NOTE You must turn on the power to all connected drive trays before you turn on the power to the E5412 controller-drive tray. Performing this action makes sure that the controllers recognize each attached drive tray.

6.1 Disconnect the two-pole 20-amp circuit breaker for the storage array.

6.2 Make sure that all of the DC Power switches on the DC-powered controller-drive tray and the DC-powered drive trays are turned off.

6.3 Connect the DC power connector cables to the DC power connectors on the rear of the controller-drive tray and the drive trays.

6.4 Have a qualified service person connect the other end of the DC power connector cables to the DC power plant equipment.

6.5 Turn on the DC Power switch on each power-fan canister in all of the drive trays.

6.6 Turn on the DC Power switch on each power-fan canister in the controller-drive trays.

NOTE When turning off the power to the storage array, perform the procedure in the reverse order. Turn off the power first to the controller-drive tray, and then turn off the power to the drive trays.

7 Turn on the AC power

You must follow the power sequence in the order shown for turning on AC power to controller-drive trays and drive trays that use AC power. To establish power redundancy for trays with two power supplies, use at least two different power distribution units (PDUs) in the cabinet. Split the power connections from each tray into the separate PDUs. Then connect the PDUs to external power receptacles that are on different circuits.

⚠ ⚡ **WARNING (W17) Risk of bodily injury** – Each tray has more than one power cord. To remove all electrical current from the devices, make sure that all of the power cords are disconnected from the power source.

NOTE You must turn on the power to all connected drive trays before you turn on the power to the E5412 controller-drive tray. Performing this action makes sure that the controllers recognize each attached drive tray.

7.1 Turn off all of the AC Power switches from the rear of the storage array, and make sure that all of the power cords are connected.

7.2 If the main AC circuit breaker switches in the cabinet are not already turned on, turn on the circuit breaker switches.

7.3 Turn on the AC Power switch on each power-fan canister or power canister in all of the installed drive trays.

7.4 Turn on both AC Power switches on each power-fan canister in the E5412 controller-drive tray.

NOTE When turning off the power to the storage array, perform the procedure in the reverse order. Turn off the power first to the controller-drive tray, and then turn off the power to the drive trays.

8 Determine the management method

Both management methods are specific to the installation steps in Section 9. This section and those that follow concern configuration of the entire storage array.

• **In-band management** – Managing a storage array by using a storage management station to send commands through the host input/output (I/O) connection to the controller.

• **Out-of-band management** – Managing a storage array by using a storage management station to send commands through the Ethernet connections on each controller.

For more information about in-band and out-of-band management methods, refer to the "Deciding on the Management Method" step in the *Initial Configuration and Software Installation Guide for SANtricity ES Storage Manager Guide.*

For Out-of-band management, use one of the methods below to configure the controllers for network connectivity:

Without a DHCP server

8.a1 Connect separate Ethernet cables to each controller.

8.a2 Manually configure the network settings on the controllers, using the guidelines and procedures from the "Manually Configuring the Controllers" step in the *Initial Configuration and Software Installation Guide for SANtricity ES Storage Manager Guide.*

With a DHCP server

8.b1 Connect separate Ethernet cables to each controller.

8.b2 Assign either static IP addresses or dynamic IP addresses to the controllers.

8.b3 Check your DHCP server for the IP addresses that are associated with the media access control (MAC) addresses of the controllers. The MAC address appears on a label on each controller.

NOTE This method applies only to IPv4 networks.

Stateless Address Autoconf guration

8.c1 Connect separate Ethernet cables to each controller.

8.c2 Connect at least one router for sending the IPv6 network address prefix in the form of router advertisements.

NOTE This method applies only to IPv6 networks and does not use a DHCP server.

9 Install the software

Two types of computers are associated with the storage array.

- *Hosts* send I/O to the storage array.

- *Management stations* manage the storage array.

The type of operating system that the management station runs is the directory that you need to locate on the DVD.

9.1 At this time, check the BIOS and device driver versions for your current Fibre Channel HBA or Infiniband HCA. If necessary, update them before proceeding. For HBAs, obtain the BIOS and device drivers directly from the vendor.

For Microsoft Windows installations,

- Install the StorPort device driver.

- Install the MPIO multi-path driver on the host.

9.2 On the SANtricity ES Storage Manager Installation DVD, locate the appropriate operating system (OS) directory.

- Review the appropriate operating system and device driver `readme` files included on the SANtricity ES Storage Manager Installation DVD for additional information.

9.3 Launch the SMIA executable file. Follow the instructions in the wizard, and select one of these installation methods:

- For the Management Station designated as a monitor (for monitoring and sending alert notifications), select **Management Station (full installation)**, and, when prompted, click **Automatically Start Monitor**.

- For the Management Station that you will use to manage the storage array, select **Management Station**, and, when prompted, select **Do Not Automatically Start the Monitor**.

- For all I/O hosts attached to the storage array, select **Host**, and, when prompted, select **Do Not Automatically Start the Monitor.**

10 Discover the storage array

Before performing this step, make sure that you have correctly configured the storage array IP addresses as described in the *Initial Configuration and Software Installation Guide for SANtricity ES Storage Manager.*

10.1 Start the SANtricity ES Storage Manager software from your management station either by typing `SMclient` and pressing **Enter** (UNIX OSs), or by navigating to the directory that contains the `SMclient.exe` file, typing `SMclient` and pressing **Enter** (Windows OSs). The client software starts and shows the Enterprise Management Window (EMW).

10.2 Select **Tools >> Automatic Discovery** from the EMW to discover the storage array.

10.3 In the configuration dialog, click **OK** to start the automatic discovery.

10.4 Click the **Devices** tab of the EMW to see the storage arrays.

10.5 Double-click the storage array that you want to manage. The associated Array Management Window (AMW) is launched.

NOTE To add storage from outside the local subnetwork, use the manual discovery method. From the EMW, click the **Add Storage Arrays** link, and follow the instructions.

11 Perform a basic setup

11.1 In the AMW, select the **Setup** tab, and select the **Rename Storage Array** link to name the storage array. You can use up to 30 alphanumeric characters, hyphens (-), pound signs (#), and underscores (_).

11.2 Also on the **Setup** tab, click the **Locate Storage Array** link to find the storage array in the cabinet. A white LED blinks on the front of the selected storage array. Physically label the storage array with its name.

11.3 Click the **Storage & Copy Services** tab to see the storage array's configuration.

If the storage array is not in the Optimal state, click the **Needs Attention** link. Follow the steps in the Recovery Guru.

11.4 Select the **Summary** tab, and select **Storage Array Prof le**.

By clicking the tabs, find the controller firmware, NVSRAM, ESM firmware, drive product ID, and firmware versions, and record them.

11.5 Close the storage array profile.

12 Conf gure the storage array

In the AMW, select the **Setup** tab. If the storage array is in the Optimal state, perform these tasks:

12.1 Configure the storage array.

12.2 Define the hosts.

12.3 Create new storage partitions.

12.4 Select the **Support** tab, and click the **Gather Support Information** link.

12.5 To set or change a password, in the AMW, select either the **Set a Storage Array Password** link under the **Setup** tab, or select **Storage Array >> Security >> Set Password**.

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