



# **Install hardware (SG6000)**

## **StorageGRID**

NetApp  
May 03, 2022

# Table of Contents

- Install hardware (SG6000) ..... 1
  - Register hardware ..... 1
    - SG6060: Install 60-drive shelves into cabinet or rack ..... 1
    - SG6060: Install drives ..... 4
    - SGF6024: Install 24-drive shelves into cabinet or rack ..... 5
    - SG6000-CN: Install into cabinet or rack ..... 7
  - Cable appliance (SG6000) ..... 9
  - SG6060: Cabling optional expansion shelves ..... 12
  - Connect power cords and apply power (SG6000) ..... 14
  - View status indicators and buttons on SG6000-CN controller ..... 15
  - View boot-up status codes for SG6000 storage controllers ..... 16

# Install hardware (SG6000)

Hardware installation entails installing the SG6000-CN controller and the storage controller shelf into a cabinet or rack, connecting the cables, and applying power.

## Register hardware

Registering the appliance hardware provides support benefits.

### Steps

1. Locate the chassis serial number for the storage controller shelf.

You can find the number on the packing slip, in your confirmation email, or on the appliance after you unpack it.



There are several serial numbers on the storage appliance. The serial number on the storage controller shelf is the one that must be registered and used if you call for service or support on the appliance.

2. Go to the NetApp Support Site at [mysupport.netapp.com](https://mysupport.netapp.com).
3. Determine whether you need to register the hardware:

If you are a...	Follow these steps...
Existing NetApp customer	<div><div>a. Sign in with your username and password.</div><div>b. Select <b>Products &gt; My Products</b>.</div><div>c. Confirm that the new serial number is listed.</div><div>d. If it is not, follow the instructions for new NetApp customers.</div></div>
New NetApp customer	<div><div>a. Click <b>Register Now</b>, and create an account.</div><div>b. Select <b>Products &gt; Register Products</b>.</div><div>c. Enter the product serial number and requested details.</div></div> <div>After your registration is approved, you can download any required software. The approval process might take up to 24 hours.</div>

## SG6060: Install 60-drive shelves into cabinet or rack

You must install a set of rails for the E2860 controller shelf in your cabinet or rack, and then slide the controller shelf onto the rails. If you are installing 60-drive expansion

shelves, the same procedure applies.

### What you'll need

- You have reviewed the Safety Notices document included in the box, and understand the precautions for moving and installing hardware.
- You have the instructions packaged with the rail kit.



Each 60-drive shelf weighs approximately 132 lb (60 kg) without drives installed. Four people or a mechanized lift are required to safely move the shelf.



To avoid damaging the hardware, never move the shelf if drives are installed. You must remove all drives before moving the shelf.



When installing the E2860 controller shelf or optional expansion shelves, install hardware from the bottom to the top of the rack or cabinet to prevent the equipment from tipping over. To ensure that the heaviest equipment is at the bottom of the cabinet or rack, install the SG6000-CN controller above the E2860 controller shelf and expansion shelves.



Before committing to the installation, verify that the 0.5m optic cables shipped with the appliance, or cables that you supply, are long enough for the planned layout.

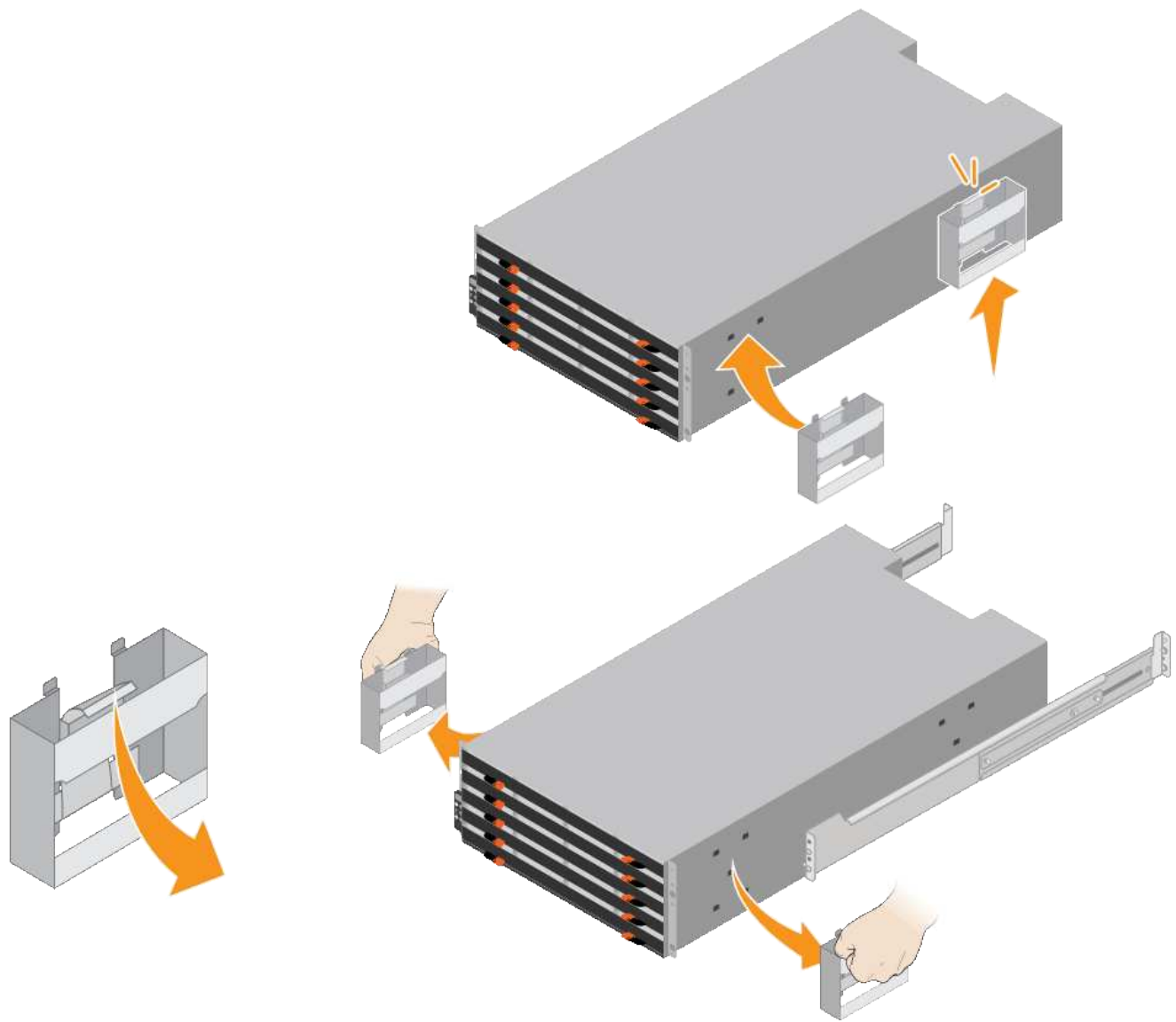
### Steps

1. Carefully follow the instructions for the rail kit to install the rails in your cabinet or rack.

For square hole cabinets, you must first install the provided cage nuts to secure the front and rear of the shelf with screws.

2. Remove the outer packing box for the appliance. Then, fold down the flaps on the inner box.
3. If you are lifting the appliance by hand, attach the four handles to the sides of the chassis.

Push up on each handle until it clicks into place.



4. Place the back of the shelf (the end with the connectors) on the rails.
5. Supporting the shelf from the bottom, slide it into the cabinet. If you are using the handles, use the thumb latches to detach one handle at a time as you slide the shelf in.

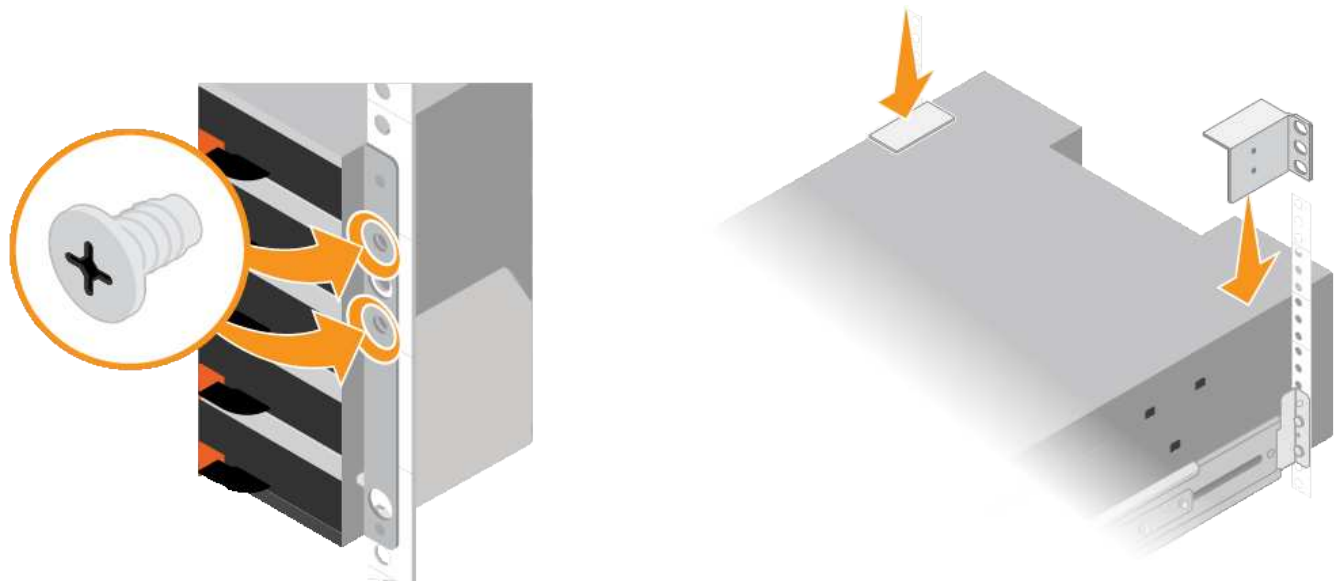
To remove the handles, pull back on the release latch, push down, then pull away from the shelf.

6. Secure the shelf to the front of the cabinet.

Insert screws into the first and third holes from the top of the shelf on both sides.

7. Secure the shelf to the rear of the cabinet.

Place two back brackets on each side of the upper rear section of the shelf. Insert screws into the first and third holes of each bracket.



8. Repeat these steps for any expansion shelves.

## SG6060: Install drives

After installing the 60-drive shelf into a cabinet or rack, you must install all 60 drives into the shelf. The shipment for the E2860 controller shelf includes two SSD drives, which you should install in the top drawer of the controller shelf. Each optional expansion shelf includes 60 HDD drives and no SSD drives.

### What you'll need

You have installed the E2860 controller shelf or optional expansion shelves (one or two) in the cabinet or rack.



To avoid damaging the hardware, never move the shelf if drives are installed. You must remove all drives before moving the shelf.

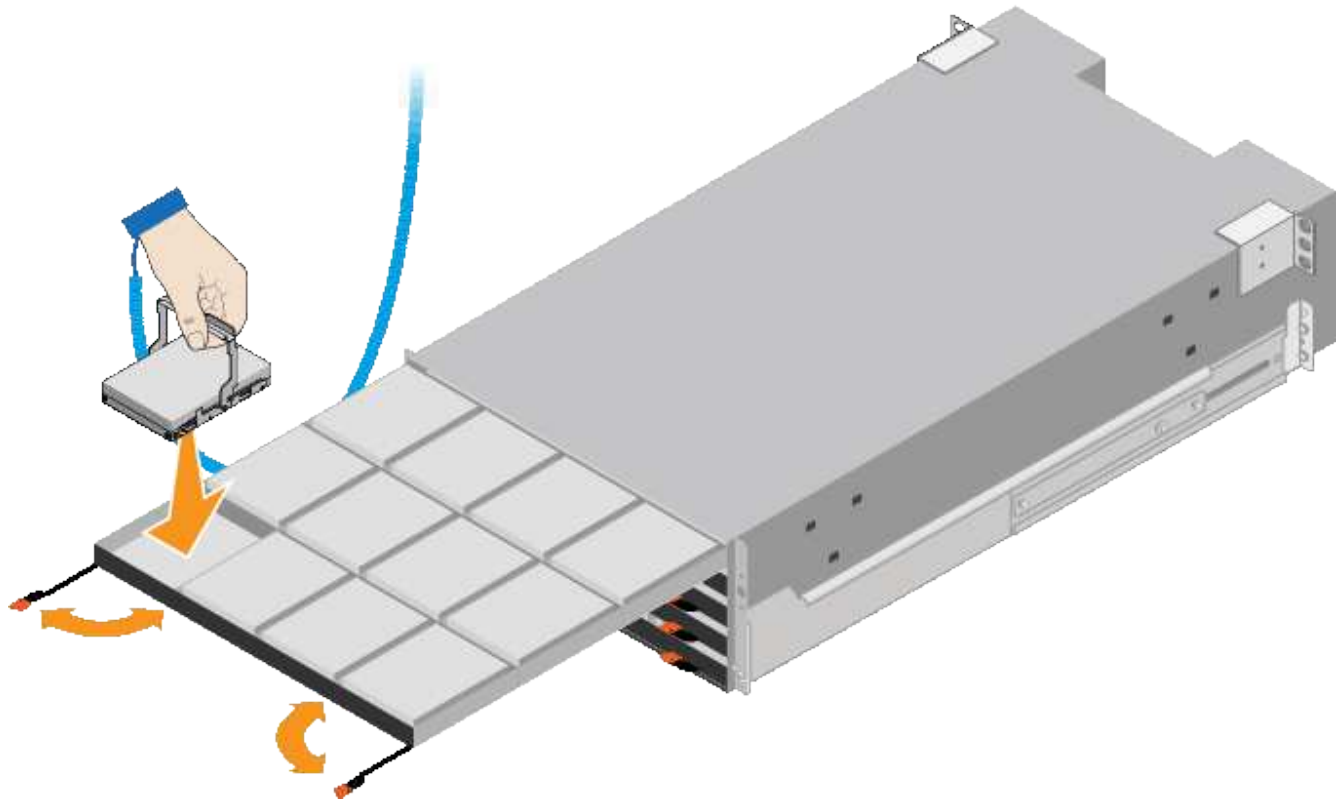
### Steps

1. Wrap the strap end of the ESD wristband around your wrist, and secure the clip end to a metal ground to prevent static discharge.
2. Remove the drives from their packaging.
3. Release the levers on the top drive drawer, and slide the drawer out using the levers.
4. Locate the two SSD drives.



Expansion shelves do not use SSD drives.

5. Raise each drive handle to a vertical position.
6. Install the two SSD drives in slots 0 and 1 (the first two slots along the lefthand side of the drawer).
7. Gently position each drive into its slot, and lower the raised drive handle until it clicks into place.



8. Install 10 HDD drives into the top drawer.

9. Slide the drawer back in by pushing on the center and closing both levers gently.



Stop pushing the drawer if you feel binding. Use the release levers at the front of the drawer to slide the drawer back out. Then, carefully reinsert the drawer into the slot.

10. Repeat these steps to install HDD drives into the other four drawers.



You must install all 60 drives to ensure correct operation.

11. Attach the front bezel to the shelf.

12. If you have expansion shelves, repeat these steps to install 12 HDD drives into each drawer of each expansion shelf.

13. Proceed to the instructions for installing the SG6000-CN into a cabinet or rack.

## SGF6024: Install 24-drive shelves into cabinet or rack

You must install a set of rails for the EF570 controller shelf in your cabinet or rack, and then slide the array onto the rails.

### What you'll need

- You have reviewed the Safety Notices document included in the box, and understand the precautions for moving and installing hardware.
- You have the instructions packaged with the rail kit.

### Steps

1. Carefully follow the instructions for the rail kit to install the rails in your cabinet or rack.

For square hole cabinets, you must first install the provided cage nuts to secure the front and rear of the shelf with screws.

2. Remove the outer packing box for the appliance. Then, fold down the flaps on the inner box.
3. Place the back of the shelf (the end with the connectors) on the rails.



A fully loaded shelf weighs approximately 52 lb (24 kg). Two persons are required to safely move the enclosure.

4. Carefully slide the enclosure all the way onto the rails.



You might need to adjust the rails to ensure that the enclosure slides all the way onto the rails.

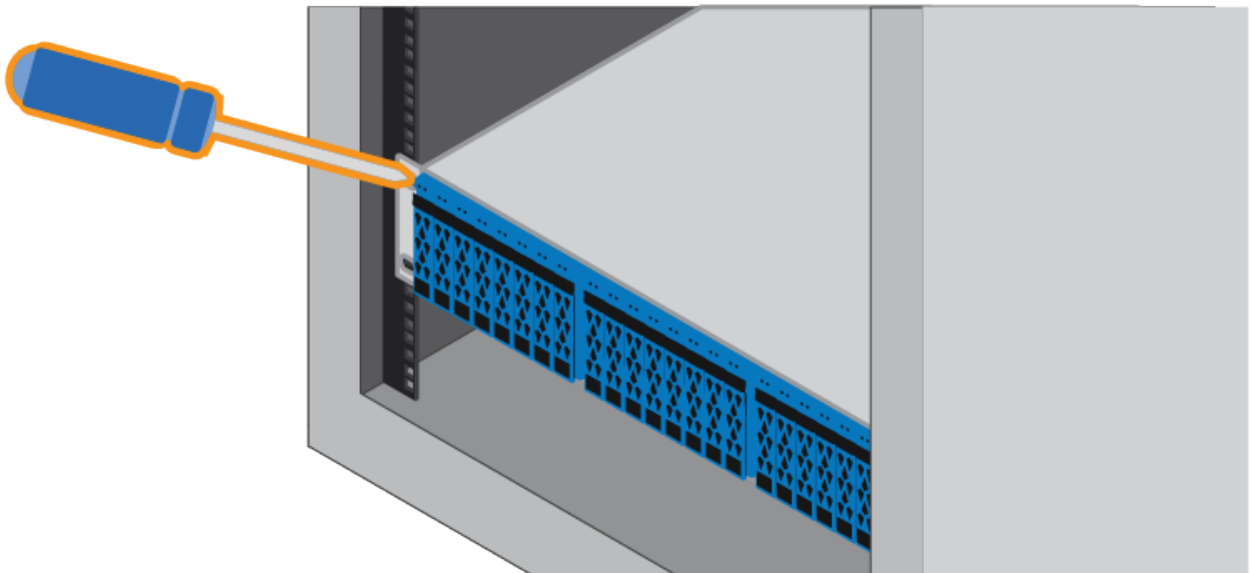


Do not place additional equipment on the rails after you finish installing the enclosure. The rails are not designed to bear additional weight.



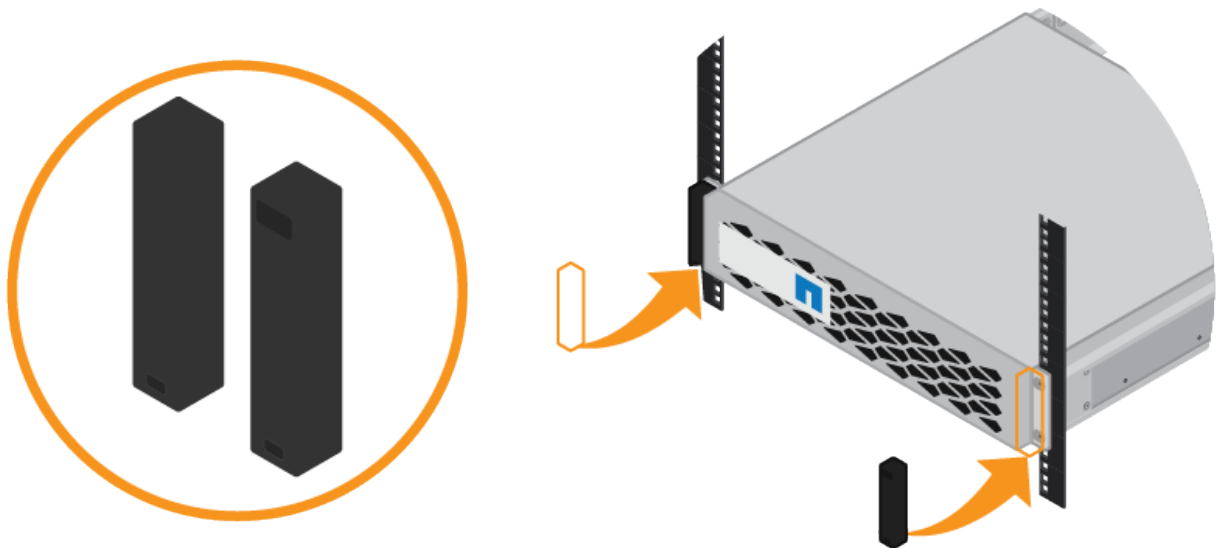
If applicable, you might need to remove the shelf end caps or the system bezel to secure the enclosure to the rack post; if so, you need to replace the end caps or bezel when you are done.

5. Secure the enclosure to the front of the cabinet or rack and rails by inserting two M5 screws through the mounting brackets (preinstalled on either side of the front of the enclosure), the holes on the rack or system cabinet, and the holes on the front of rails.



6. Secure the enclosure to the back of the rails by inserting two M5 screws through the brackets at the enclosure and the rail kit bracket.
7. If applicable, replace the shelf end caps or the system bezel.





## SG6000-CN: Install into cabinet or rack

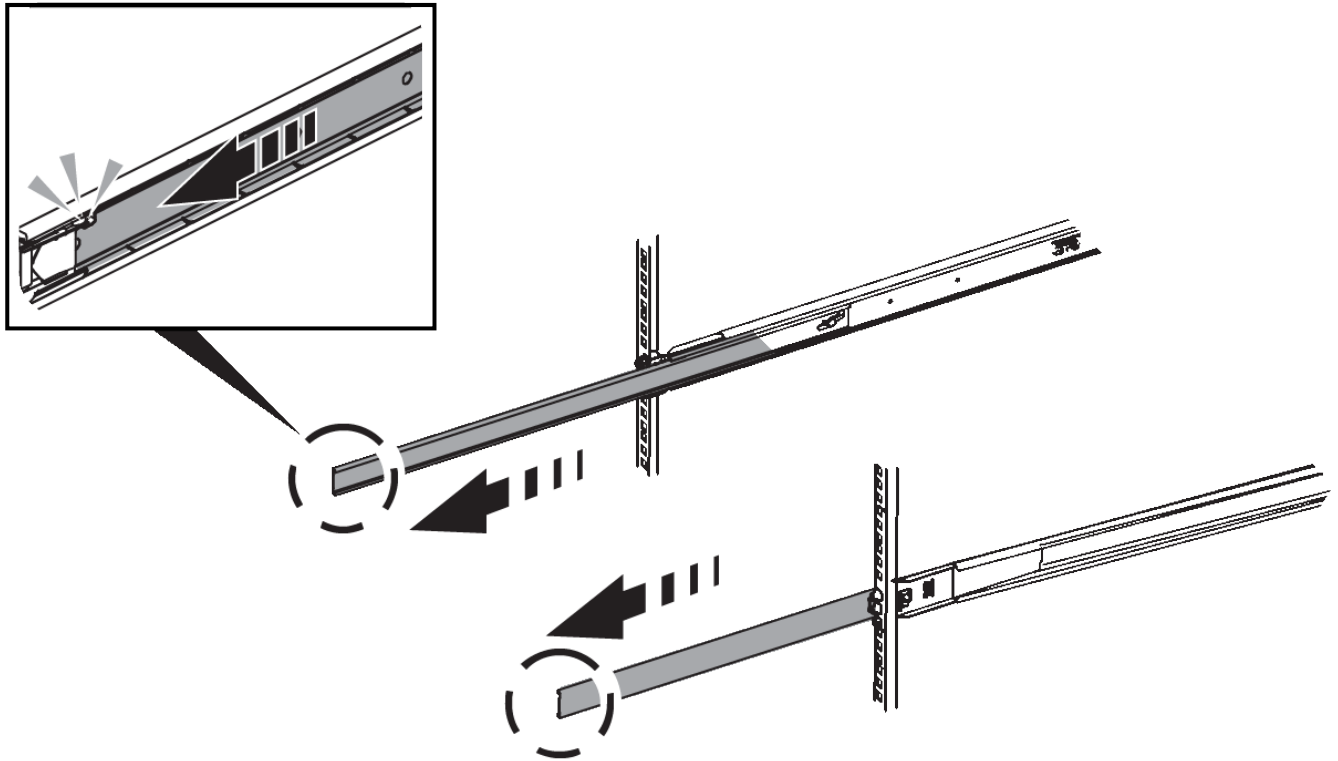
You must install a set of rails for the SG6000-CN controller in your cabinet or rack, and then slide the controller onto the rails.

### What you'll need

- You have reviewed the Safety Notices document included in the box, and understand the precautions for moving and installing hardware.
- You have the instructions packaged with the rail kit.
- You have installed the E2860 controller shelf and drives or the EF570 controller shelf.

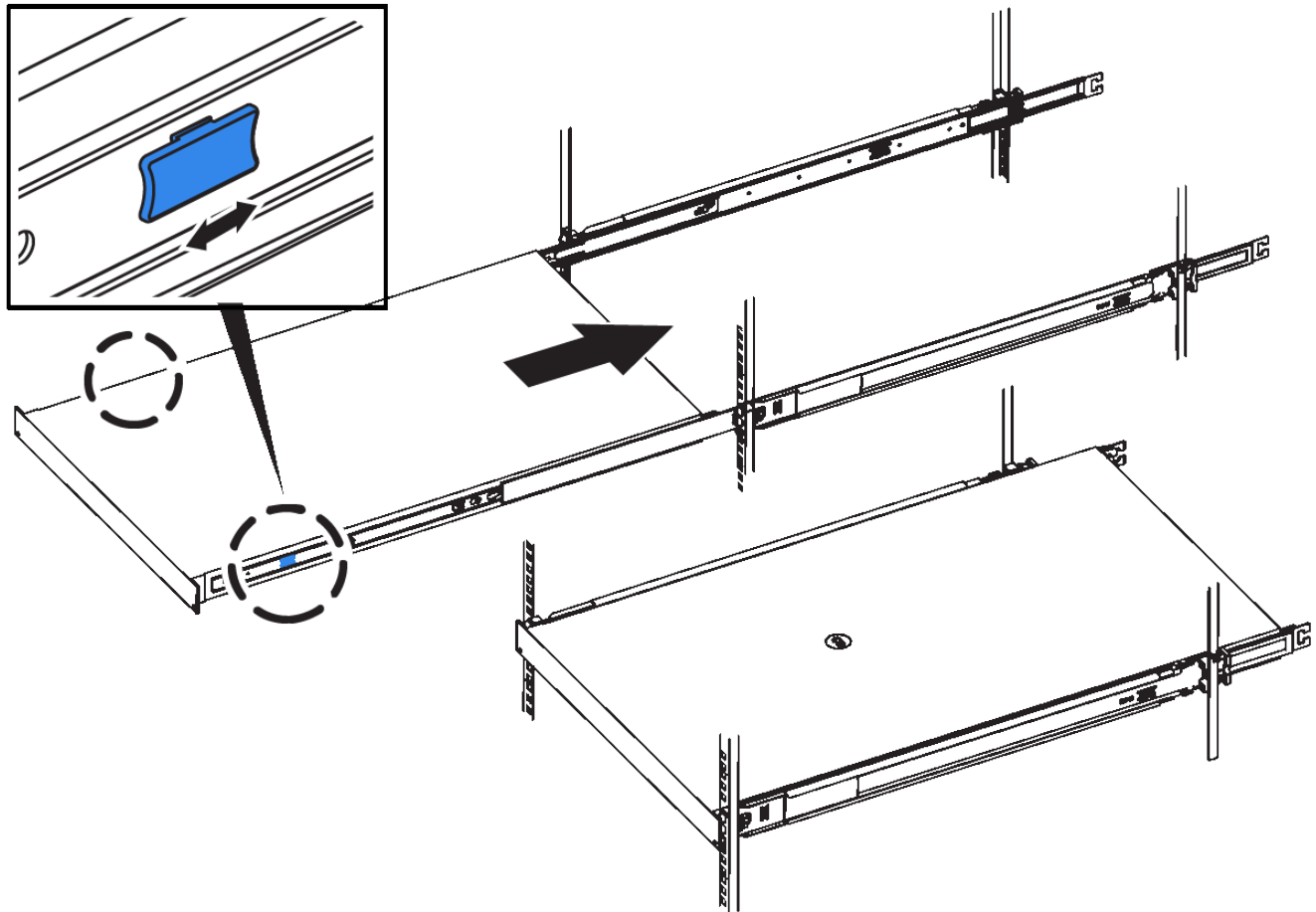
### Steps

1. Carefully follow the instructions for the rail kit to install the rails in your cabinet or rack.
2. On the two rails installed in the cabinet or rack, extend the movable parts of the rails until you hear a click.



3. Insert the SG6000-CN controller into the rails.
4. Slide the controller into the cabinet or rack.

When you cannot move the controller any further, pull the blue latches on both sides of the chassis to slide the controller all the way in.



Do not attach the front bezel until after you power on the controller.

5. Tighten the captive screws on the controller front panel to secure the controller in the rack.



## Cable appliance (SG6000)

You must connect the storage controllers to the SG6000-CN controller, connect the management ports on all three controllers, and connect the network ports on the SG6000-CN controller to the Grid Network and optional Client Network for StorageGRID.

### What you'll need

- You have the four optical cables provided with the appliance for connecting the two storage controllers to the SG6000-CN controller.
- You have RJ-45 Ethernet cables (four minimum) for connecting the management ports.
- You have one of the following options for the network ports. These items are not provided with the appliance.
  - One to four TwinAx cables for connecting the four network ports.

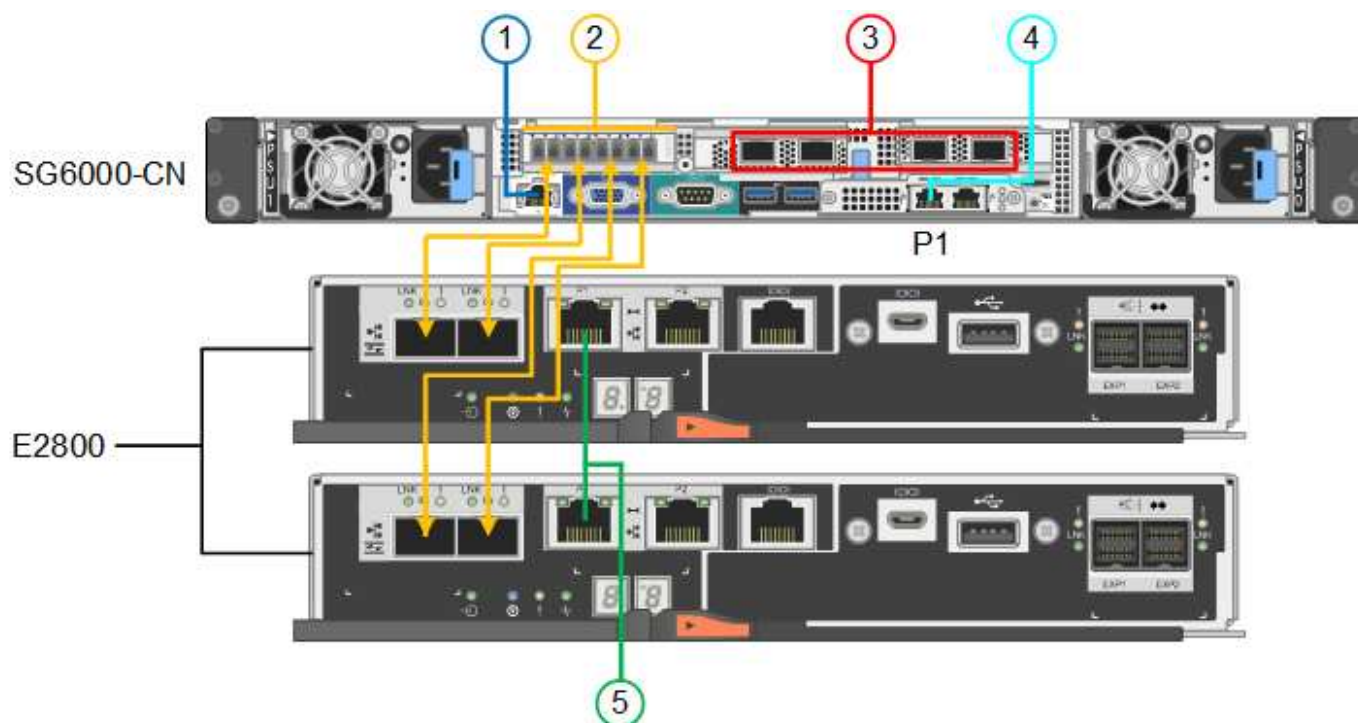
- One to four SFP+ or SFP28 transceivers if you plan to use optical cables for the ports.



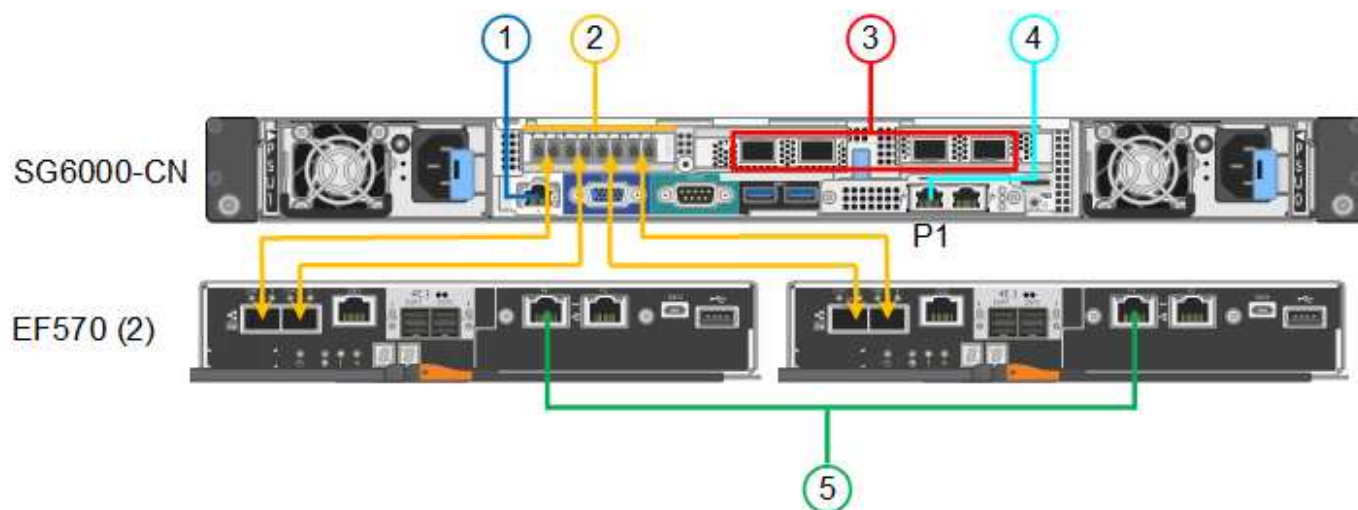
**Risk of exposure to laser radiation** — Do not disassemble or remove any part of an SFP transceiver. You might be exposed to laser radiation.

### About this task

The following figure shows the three controllers in the SG6060 appliance, with the SG6000-CN compute controller on the top and the two E2800 storage controllers on the bottom.



The following figure shows the three controllers in the SGF6024 appliance, with the SG6000-CN compute controller on the top and the two EF570 storage controllers side by side below the compute controller.



	Port	Type of port	Function
1	BMC management port on the SG6000-CN controller	1-GbE (RJ-45)	Connects to the network where you access the BMC interface.
2	FC connection ports: <ul style="list-style-type: none"> <li>• 4 on the SG6000-CN controller</li> <li>• 2 on each storage controller</li> </ul>	16-Gb/s FC optical SFP+	Connect each storage controller to the SG6000-CN controller.
3	Four network ports on the SG6000-CN controller	10/25-GbE	Connect to the Grid Network and the Client Network for StorageGRID.
4	Admin Network port on the SG6000-CN controller (labelled P1 in the figure)	1-GbE (RJ-45) <b>Important:</b> This port operates only at 1000 baseT/full and does not support 10- or 100-megabit speeds.	Connects the SG6000-CN controller to the Admin Network for StorageGRID.
	Rightmost RJ-45 port on the SG6000-CN controller	1-GbE (RJ-45) <b>Important:</b> This port operates only at 1000 baseT/full and does not support 10- or 100-megabit speeds.	<ul style="list-style-type: none"> <li>• Can be bonded with management port 1 if you want a redundant connection to the Admin Network.</li> <li>• Can be left unwired and available for temporary local access (IP 169.254.0.1).</li> <li>• During installation, can be used to connect the SG6000-CN controller to a service laptop if DHCP-assigned IP addresses are not available.</li> </ul>
5	Management port 1 on each storage controller	1-GbE (RJ-45)	Connects to the network where you access SANtricity System Manager.
	Management port 2 on each storage controller	1-GbE (RJ-45)	Reserved for technical support.

## Steps

1. Connect the BMC management port on the SG6000-CN controller to the management network, using an Ethernet cable.

Although this connection is optional, it is recommended to facilitate support.

2. Connect the two FC ports on each storage controller to the FC ports on the SG6000-CN controller, using four optical cables and four SFP+ transceivers for the storage controllers.

3. Connect the network ports on the SG6000-CN controller to the appropriate network switches, using TwinAx cables or optical cables and SFP+ or SFP28 transceivers.



The four network ports must use the same link speed. Install SFP+ transceivers if you plan to use 10-GbE link speeds. Install SFP28 transceivers if you plan to use 25-GbE link speeds.

- If you plan to use Fixed port bond mode (default), connect the ports to the StorageGRID Grid and Client Networks, as shown in the table.

Port	Connects to...
Port 1	Client Network (optional)
Port 2	Grid Network
Port 3	Client Network (optional)
Port 4	Grid Network

- If you plan to use the Aggregate port bond mode, connect one or more of the network ports to one or more switches. You should connect at least two of the four ports to avoid having a single point of failure. If you use more than one switch for a single LACP bond, the switches must support MLAG or equivalent.
4. If you plan to use the Admin Network for StorageGRID, connect the Admin Network port on the SG6000-CN controller to the Admin Network, using an Ethernet cable.
  5. If you plan to use the management network for SANtricity System Manager, connect management port 1 (P1) on each storage controller (the RJ-45 port on the left) to the management network for SANtricity System Manager, using an Ethernet cable.

Do not use management port 2 (P2) on the storage controllers (the RJ-45 port on the right). This port is reserved for technical support.

#### Related information

[Port bond modes for SG6000-CN controller](#)

[Reinstall SG6000-CN controller into cabinet or rack](#)

## SG6060: Cabling optional expansion shelves

If you are using expansion shelves, you must connect them to the E2860 controller shelf. You can have a maximum of two expansion shelves for each SG6060 appliance.

#### What you'll need

- You have the two SAS cables shipped with each expansion shelf.
- You have installed the expansion shelves in the cabinet or rack that contains the E2860 controller shelf.

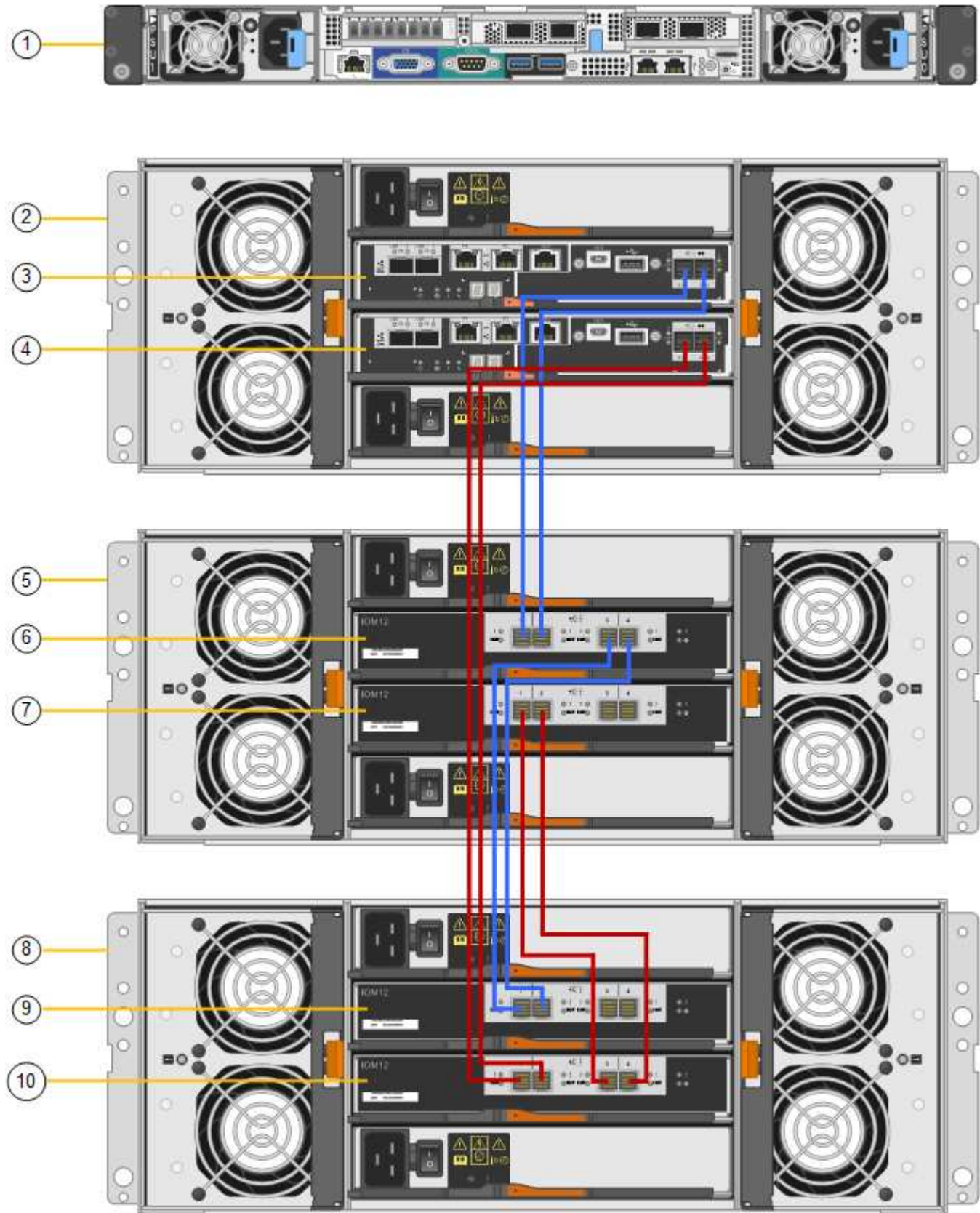
[SG6060: Install 60-drive shelves into cabinet or rack](#)



## Step

Connect each expansion shelf to the E2860 controller shelf as shown in the diagram.

This drawing shows two expansion shelves. If you have only one, connect IOM A to controller A and connect IOM B to controller B.



Callout	Description
1	SG6000-CN
2	E2860 controller shelf
3	Controller A
4	Controller B
5	Expansion shelf 1
6	IOM A for expansion shelf 1
7	IOM B for expansion shelf 1
8	Expansion shelf 2
9	IOM A for expansion shelf 2
10	IOM B for expansion shelf 2

## Connect power cords and apply power (SG6000)

After connecting the network cables, you are ready to apply power to the SG6000-CN controller and to the two storage controllers or optional expansion shelves.

### Steps

1. Confirm that both controllers in the storage controller shelf are off.



**Risk of electrical shock** — Before connecting the power cords, make sure that the power switches for each of the two storage controllers are off.

2. If you have expansion shelves, confirm that both of the IOM power switches are off.



**Risk of electrical shock** — Before connecting the power cords, make sure that the two power switches for each of the expansion shelves are off.

3. Connect a power cord to each of the two power supply units in the SG6000-CN controller.
4. Connect these two power cords to two different power distribution units (PDUs) in the cabinet or rack.
5. Connect a power cord to each of the two power supply units in the storage controller shelf.
6. If you have expansion shelves, connect a power cord to each of the two power supply units in each expansion shelf.
7. Connect the two power cords in each storage shelf (including the optional expansion shelves) to two different PDUs in the cabinet or rack.



8. If the power button on the front of the SG6000-CN controller is not currently illuminated blue, press the button to turn on power to the controller.

Do not press the power button again during the power-on process.

9. Turn on the two power switches on the back of the storage controller shelf. If you have expansion shelves, turn on the two power switches for each shelf.
  - Do not turn off the power switches during the power-on process.
  - The fans in the storage controller shelf and optional expansion shelves might be very loud when they first start up. The loud noise during start-up is normal.
10. After the components have booted up, check their status.
  - Check the seven-segment display on the back of each storage controller. Refer to the article about viewing boot-up status codes for more information.
  - Verify that the power button on the front of the SG6000-CN controller is lit.
11. If errors occur, correct any issues.
12. Attach the front bezel to the SG6000-CN controller if removed.

#### Related information

[View boot-up status codes for SG6000 storage controllers](#)

[View status indicators and buttons on SG6000-CN controller](#)

[Reinstall SG6000-CN controller into cabinet or rack](#)

## View status indicators and buttons on SG6000-CN controller

The SG6000-CN controller includes indicators that help you determine the status of the controller, including the following indicators and buttons.



	Display	Description
1	Power button	<ul style="list-style-type: none"><li>• Blue: The controller is powered on.</li><li>• Off: The controller is powered off.</li></ul>
2	Reset button	<i>No indicator</i>  Use this button to perform a hard reset of the controller.

	Display	Description
3	Identify button	<ul style="list-style-type: none"> <li>• Blinking or solid blue: Identifies the controller in the cabinet or rack.</li> <li>• Off: The controller is not visually identifiable in the cabinet or rack.</li> </ul> <p>This button can be set to Blink, On (Solid), or Off.</p>
4	Alarm LED	<ul style="list-style-type: none"> <li>• Amber: An error has occurred.</li> </ul> <p><b>Note:</b> To view the boot-up and error codes, you must access the BMC interface.</p> <ul style="list-style-type: none"> <li>• Off: No errors are present.</li> </ul>

## General boot-up codes

During boot-up or after a hard reset of the SG6000-CN controller, the following occurs:

1. The baseboard management controller (BMC) logs codes for the boot-up sequence, including any errors that occur.
2. The power button lights up.
3. If any errors occur during boot-up, the alarm LED lights up.

To view the boot-up and error codes, you must access the BMC interface.

### Related information

[Troubleshoot hardware installation \(SG6000\)](#)

[Configure BMC interface \(SG6000\)](#)

[Power on SG6000-CN controller and verify operation](#)

## View boot-up status codes for SG6000 storage controllers

Each storage controller has a seven-segment display that provides status codes as the controller powers up. The status codes are the same for both the E2800 controller and the EF570 controller.

### About this task

For descriptions of these codes, see the E-Series system monitoring information for your storage controller type.

### Steps

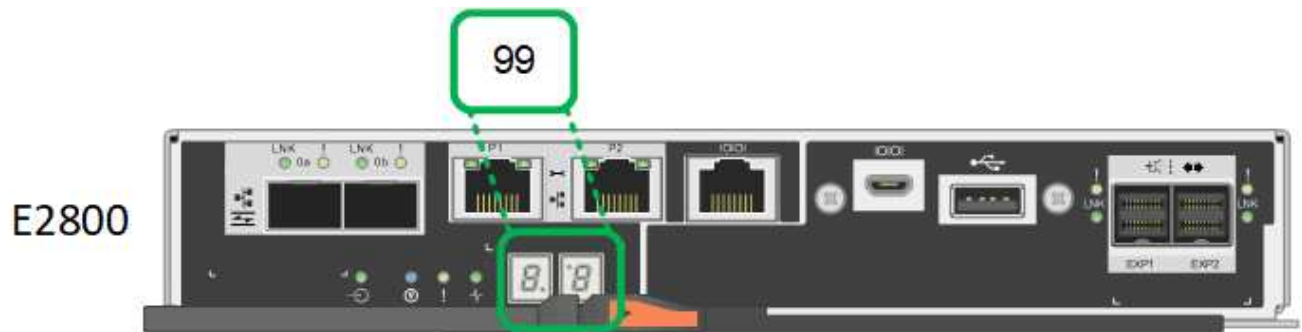
1. During boot-up, monitor progress by viewing the codes shown on the seven-segment display for each storage controller.

The seven-segment display on each storage controller shows the repeating sequence **OS**, **Sd**, **blank** to

indicate that the controller is performing start-of-day processing.

2. After the controllers have booted up, confirm that each storage controller shows 99, which is the default ID for an E-Series controller shelf.

Make sure this value is displayed on both storage controllers, as shown in this example E2800 controller.



3. If one or both controllers show other values, see [Troubleshoot hardware installation \(SG6000\)](#) and confirm you completed the installation steps correctly. If you are unable to resolve the problem, contact technical support.

#### Related information

[E5700 and E2800 System Monitoring Guide](#)

[NetApp Support](#)

[Power on SG6000-CN controller and verify operation](#)

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