Overview

StorageGRID

NetApp
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SG6000 appliances: Overview

The StorageGRID SG6000 appliances are integrated storage and computing platforms that operate as Storage Nodes in a StorageGRID system. These appliances can be used in a hybrid grid environment that combines appliance Storage Nodes and virtual (software-based) Storage Nodes.

The SG6000 appliances provide the following features:

- Available in two models:
  - SG6060, which includes 60 drives and supports expansion shelves.
  - SGF6024, which offers 24 solid state drives (SSDs).
- Integrate the storage and computing elements for a StorageGRID Storage Node.
- Include the StorageGRID Appliance Installer to simplify Storage Node deployment and configuration.
- Include SANtricity System Manager for managing and monitoring the storage controllers and drives.
- Include a baseboard management controller (BMC) for monitoring and diagnosing the hardware in the compute controller.
- Support up to four 10-GbE or 25-GbE connections to the StorageGRID Grid Network and Client Network.
- Support Federal Information Processing Standard (FIPS) drives. When these drives are used with the Drive Security feature in SANtricity System Manager, unauthorized access to data is prevented.

SG6060 overview

The StorageGRID SG6060 appliance includes a compute controller and a storage controller shelf that contains two storage controllers and 60 drives. Optionally, 60-drive expansion shelves can be added to the appliance.

SG6060 components

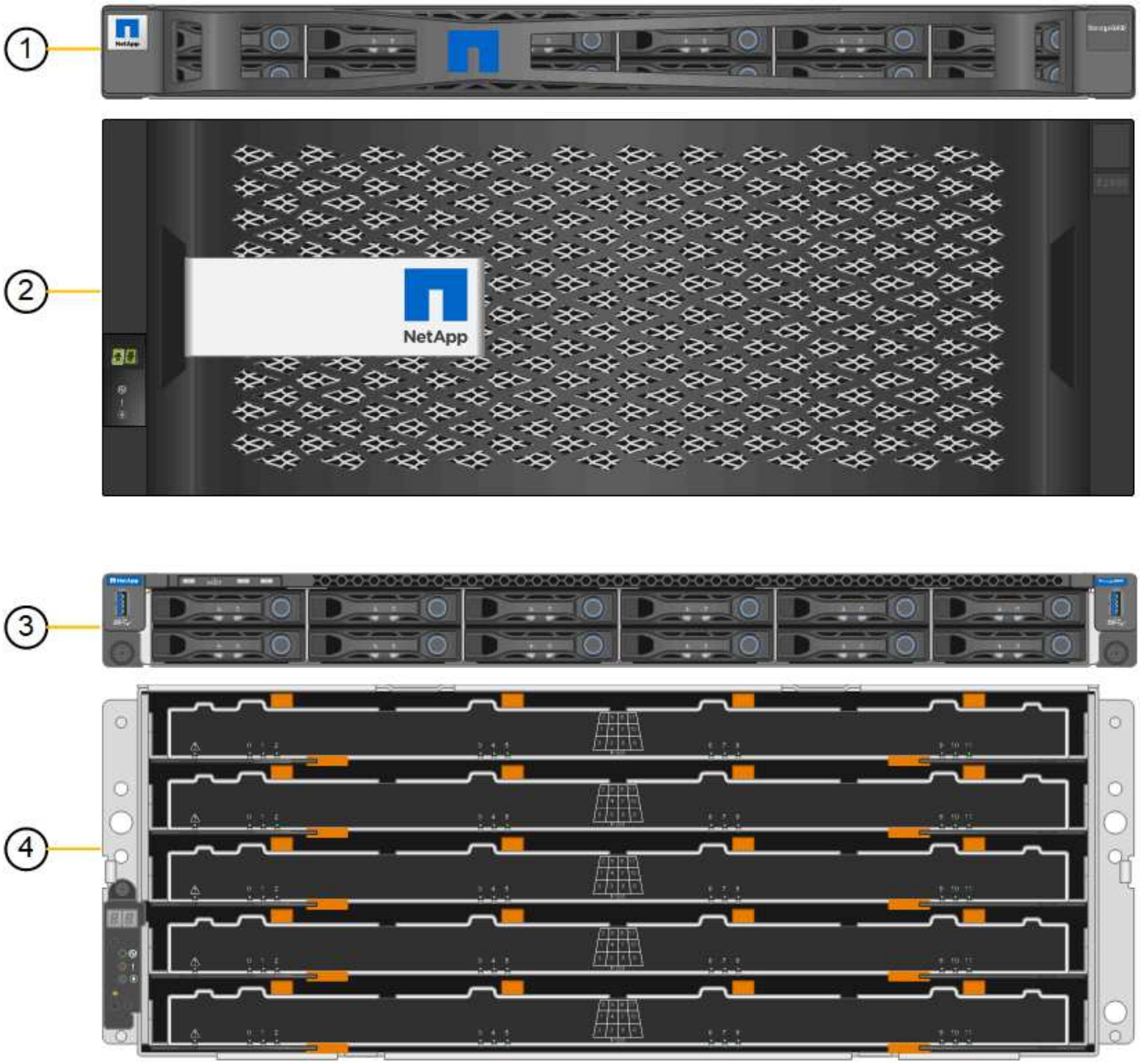
The SG6060 appliance includes the following components:

Component	Description
Compute controller	SG6000-CN controller, a one-rack unit (1U) server that includes: • 40 cores (80 threads) • 192 GB RAM • Up to 4 × 25 Gbps aggregate Ethernet bandwidth • 4 × 16 Gbps Fibre Channel (FC) interconnect • Baseboard management controller (BMC) that simplifies hardware management • Redundant power supplies

Component	Description
Storage controller shelf	E-Series E2860 controller shelf (storage array), a 4U shelf that includes: • Two E-Series E2800 controllers (duplex configuration) to provide storage controller failover support • Five-drawer drive shelf that holds sixty 3.5-inch drives (2 solid-state drives, or SSDs, and 58 NL-SAS drives) • Redundant power supplies and fans
Optional: Storage expansion shelves **Note:** Expansion shelves can be installed during initial deployment or added later.	E-Series DE460C enclosure, a 4U shelf that includes: • Two input/output modules (IOMs) • Five drawers, each holding 12 NL-SAS drives, for a total of 60 drives • Redundant power supplies and fans Each SG6060 appliance can have one or two expansion shelves for a total of 180 drives.

SG6060 diagrams

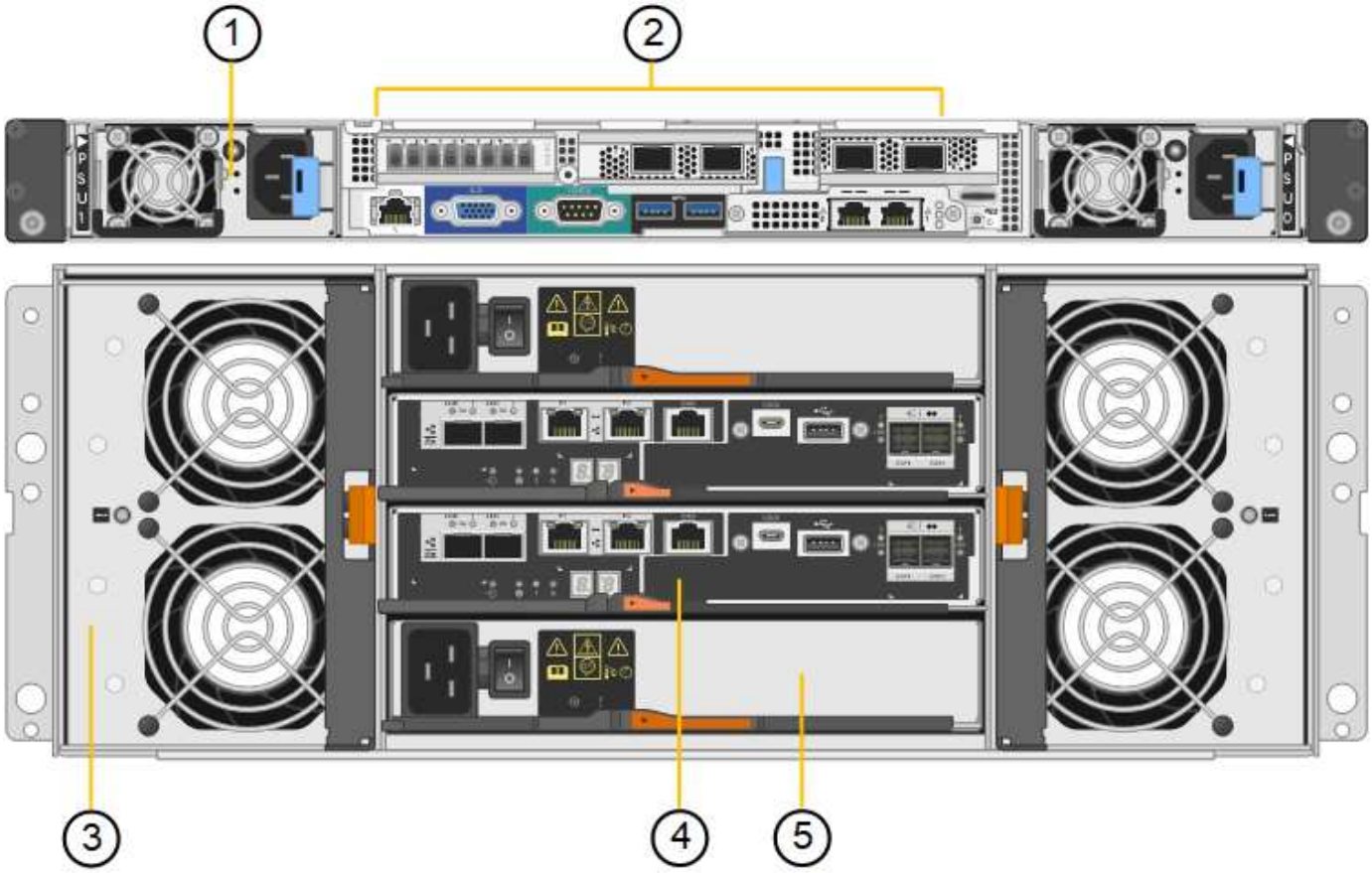
This figure shows the front of the SG6060, which includes a 1U compute controller and a 4U shelf containing two storage controllers and 60 drives in five drive drawers.



Callout	Description
1	SG6000-CN compute controller with front bezel
2	E2860 controller shelf with front bezel (optional expansion shelf appears identical)
3	SG6000-CN compute controller with front bezel removed
4	E2860 controller shelf with front bezel removed (optional expansion shelf appears identical)

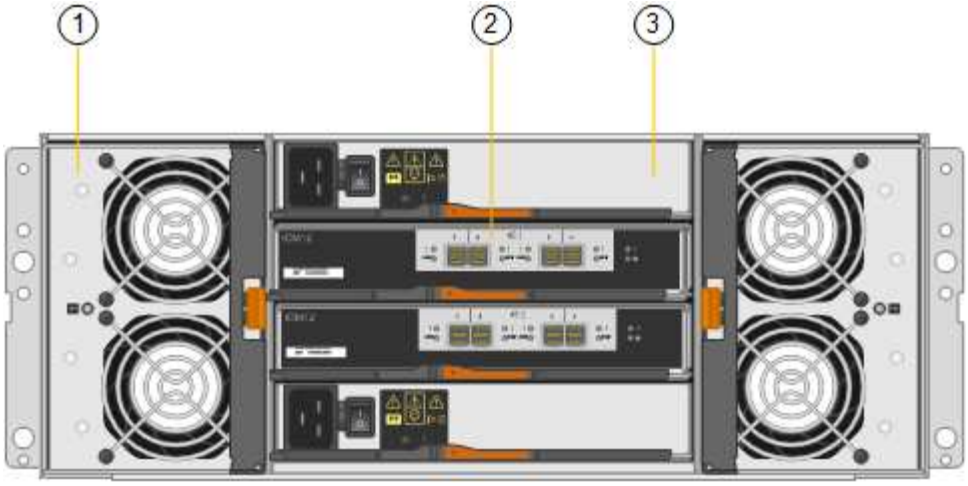
This figure shows the back of the SG6060, including the compute and storage controllers, fans, and power

supplies.



Callout	Description
1	Power supply (1 of 2) for SG6000-CN compute controller
2	Connectors for SG6000-CN compute controller
3	Fan (1 of 2) for E2860 controller shelf
4	E-Series E2800 storage controller (1 of 2) and connectors
5	Power supply (1 of 2) for E2860 controller shelf

This figure shows the back of the optional expansion shelf for the SG6060, including the input/output modules (IOMs), fans, and power supplies. Each SG6060 can be installed with one or two expansion shelves, which can be included in the initial installation or added later.



Callout	Description
1	Fan (1 of 2) for expansion shelf
2	IOM (1 of 2) for expansion shelf
3	Power supply (1 of 2) for expansion shelf

SGF6024 overview

The StorageGRIDSGF6024 includes a compute controller and a storage controller shelf that holds 24 solid state drives.

SGF6024 components

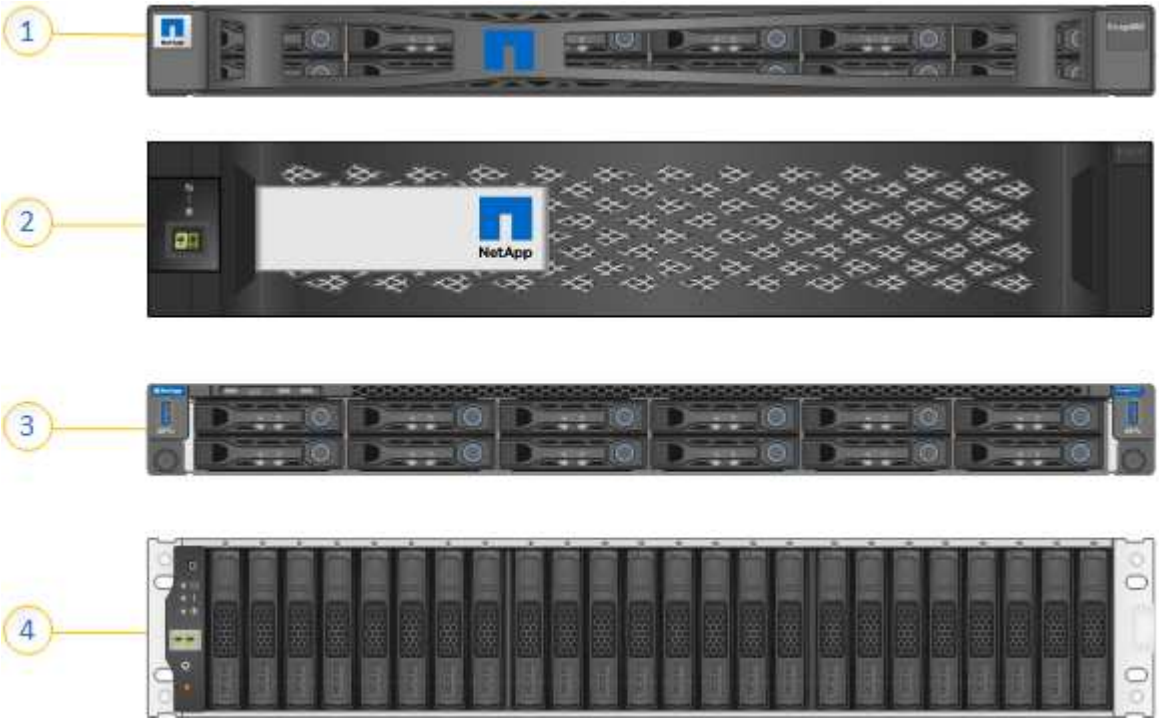
The SGF6024 appliance includes the following components:

Component	Description
Compute controller	SG6000-CN controller, a one-rack unit (1U) server that includes: • 40 cores (80 threads) • 192 GB RAM • Up to 4 × 25 Gbps aggregate Ethernet bandwidth • 4 × 16 Gbps Fibre Channel (FC) interconnect • Baseboard management controller (BMC) that simplifies hardware management • Redundant power supplies

Component	Description
Flash array (controller shelf)	E-Series EF570 flash array (also known as a controller shelf), a 2U shelf that includes: • Two E-Series EF570 controllers (duplex configuration) to provide storage controller failover support • 24 solid state drives (also known as SSDs or flash drives) • Redundant power supplies and fans

SGF6024 diagrams

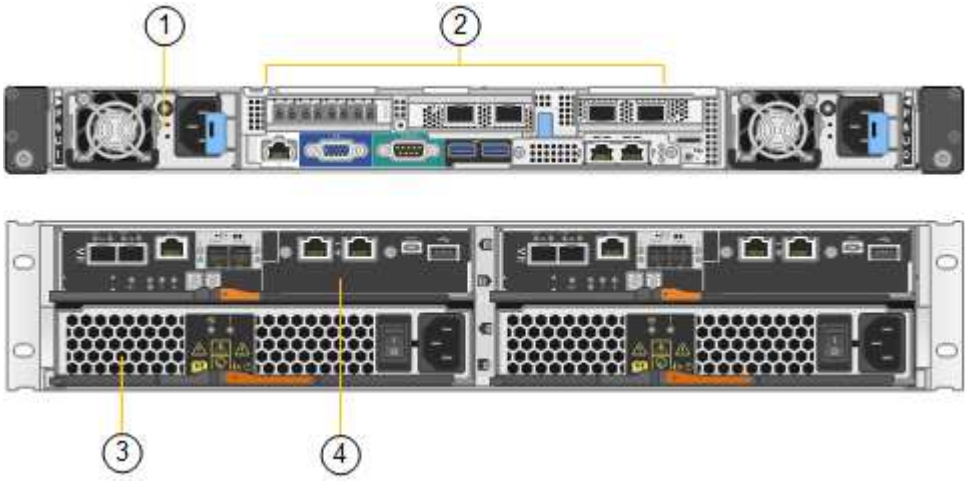
This figure shows the front of the SGF6024, which includes a 1U compute controller and a 2U enclosure containing two storage controllers and 24 flash drives.



Callout	Description
1	SG6000-CN compute controller with front bezel
2	EF570 flash array with front bezel
3	SG6000-CN compute controller with front bezel removed
4	EF570 flash array with front bezel removed

This figure shows the back of the SGF6024, including the compute and storage controllers, fans, and power

supplies.



Callout	Description
1	Power supply (1 of 2) for SG6000-CN compute controller
2	Connectors for SG6000-CN compute controller
3	Power supply (1 of 2) for EF570 flash array
4	E-Series EF570 storage controller (1 of 2) and connectors

Controllers in SG6000 appliances

Each model of the StorageGRID SG6000 appliance includes an SG6000-CN compute controller in a 1U enclosure and duplex E-Series storage controllers in a 2U or 4U enclosure, depending on the model. Review the diagrams to learn more about each type of controller.

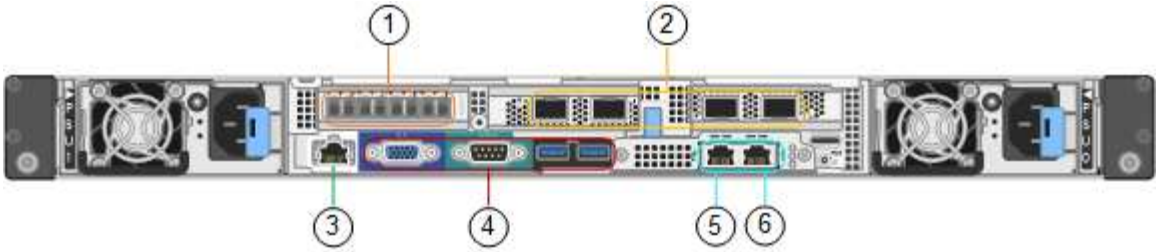
All appliances: SG6000-CN compute controller

- Provides compute resources for the appliance.
- Includes the StorageGRID Appliance Installer.

> StorageGRID software is not preinstalled on the appliance. This software is retrieved from the Admin Node when you deploy the appliance.

- Can connect to all three StorageGRID networks, including the Grid Network, the Admin Network, and the Client Network.
- Connects to the E-Series storage controllers and operates as the initiator.

This figure shows the connectors on the back of the SG6000-CN.



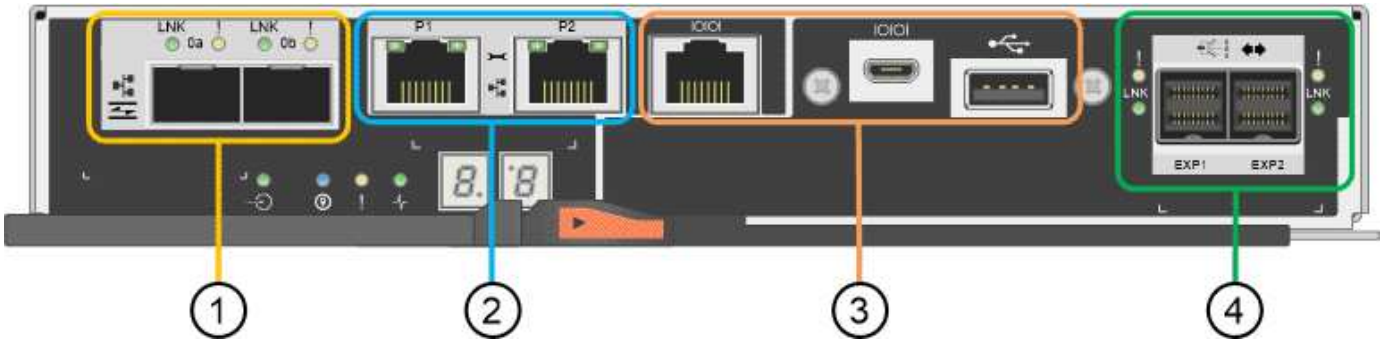
	Port	Type	Use
1	Interconnect ports 1-4	16-Gb/s Fibre Channel (FC), with integrated optics	Connect the SG6000-CN controller to the E2800 controllers (two connections to each E2800).
2	Network ports 1-4	10-GbE or 25-GbE, based on cable or SFP transceiver type, switch speed, and configured link speed	Connect to the Grid Network and the Client Network for StorageGRID.
3	BMC management port	1-GbE (RJ-45)	Connect to the SG6000-CN baseboard management controller.
4	Diagnostic and support ports	• VGA • Serial, 115200 8-N-1 • USB	Reserved for technical support use.
5	Admin Network port 1	1-GbE (RJ-45)	Connect the SG6000-CN to the Admin Network for StorageGRID.

	Port	Type	Use
6	Admin Network port 2	1-GbE (RJ-45)	Options: • Bond with management port 1 for a redundant connection to the Admin Network for StorageGRID. • Leave unwired and available for temporary local access (IP 169.254.0.1). • During installation, use port 2 for IP configuration if DHCP-assigned IP addresses are not available.

SG6060: E2800 storage controllers

- Two controllers for failover support.
- Manage the storage of data on the drives.
- Function as standard E-Series controllers in a duplex configuration.
- Include SANtricity OS Software (controller firmware).
- Include SANtricity System Manager for monitoring storage hardware and for managing alerts, the AutoSupport feature, and the Drive Security feature.
- Connect to the SG6000-CN controller and provide access to the storage.

This figure shows the connectors on the back of each of the E2800 controllers.



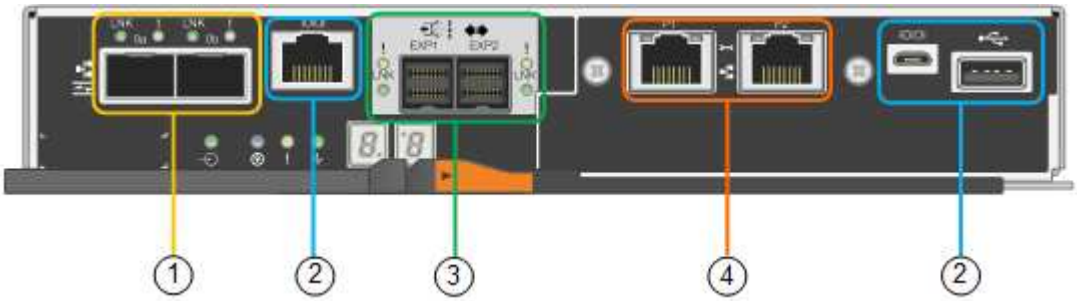
	Port	Type	Use
1	Interconnect ports 1 and 2	16-Gb/s FC optical SFPa	Connect each of the E2800 controllers to the SG6000-CN controller. There are four connections to the SG6000-CN controller (two from each E2800).
2	Management ports 1 and 2	1-Gb (RJ-45) Ethernet	• Port 1 Options: ◦ Connect to a management network to enable direct TCP/IP access to SANtricity System Manager ◦ Leave unwired to save a switch port and IP address. Access SANtricity System Manager using the Grid Manager or Storage Grid Appliance Installer UIs. **Note**: some optional SANtricity functionality, such as NTP sync for accurate log timestamps, is not available when you choose to leave Port 1 unwired. **Note**: StorageGRID 11.5 or greater, and SANtricity 11.70 or greater, are required when you leave Port 1 unwired. • Port 2 is reserved for technical support use.
3	Diagnostic and support ports	• RJ-45 serial port • Micro USB serial port • USB port	Reserved for technical support use.

	Port	Type	Use
4	Drive expansion ports 1 and 2	12Gb/s SAS	Connect the ports to the drive expansion ports on the IOMs in the expansion shelf.

SGF6024: EF570 storage controllers

- Two controllers for failover support.
- Manage the storage of data on the drives.
- Function as standard E-Series controllers in a duplex configuration.
- Include SANtricity OS Software (controller firmware).
- Include SANtricity System Manager for monitoring storage hardware and for managing alerts, the AutoSupport feature, and the Drive Security feature.
- Connect to the SG6000-CN controller and provide access to the flash storage.

This figure shows the connectors on the back of each of the EF570 controllers.

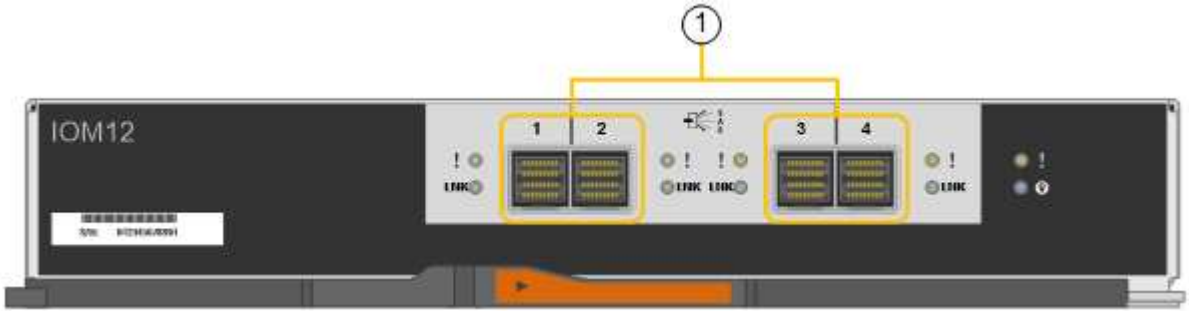


	Port	Type	Use
1	Interconnect ports 1 and 2	16-Gb/s FC optical SFPa	Connect each of the EF570 controllers to the SG6000-CN controller. There are four connections to the SG6000-CN controller (two from each EF570).
2	Diagnostic and support ports	• RJ-45 serial port • Micro USB serial port • USB port	Reserved for technical support use.
3	Drive expansion ports	12Gb/s SAS	Not used. The SGF6024 appliance does not support expansion drive shelves.

	Port	Type	Use
4	Management ports 1 and 2	1-Gb (RJ-45) Ethernet	• Port 1 connects to the network where you access SANtricity System Manager on a browser. • Port 2 is reserved for technical support use.

SG6060: Input/output modules for optional expansion shelves

The expansion shelf contains two input/output modules (IOMs) that connect to the storage controllers or to other expansion shelves.



	Port	Type	Use
1	Drive expansion ports 1-4	12Gb/s SAS	Connect each port to the storage controllers or additional expansion shelf (if any).

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