

# HP P2000 G3 MSA Systems Installation Instructions



## About this document

This document is for the person who installs, administers, and troubleshoots servers and storage systems. HP assumes that you are qualified in servicing and installing computer equipment, and are trained in recognizing hazards in products and hazardous energy levels. For complete installation and configuration information, see the user guide for your HP P2000 G3 MSA System. User documents are provided on the Software Support/Documentation DVD shipped with the product and on HP Manuals website: <http://www.hp.com/support/manuals>.

Installing an HP P2000 G3 MSA System includes the following steps:

- Step 1. Install equipment in the rack
- Step 2. Install hardware options
- Step 3. Connect drive enclosures to the P2000 G3 MSA array controller enclosure
- Step 4. Connect the P2000 G3 MSA System to data hosts
- Step 5. Connect the P2000 G3 MSA System to a remote management host
- Step 6. Connect two P2000 G3 MSA Systems to replicate volumes
- Step 7. Power on components
- Step 8. Update firmware
- Step 9. Configure the MSA

## Step 1. Install equipment in the rack

### Site requirements

Ensure that all environmental requirements are met. For more information about site requirements, see the racking instructions poster and user guide for the devices.

### Rack planning

HP Modular Smart Array (MSA) Systems are supported for installation in the HP 10000 series of racks. (Other racks might also be suitable, but have not been tested.) For information about setting up the rack, including the appropriate warnings and cautions, see the documentation that came with your rack. Download updated rack information at: <http://www.hp.com/products/racks>.

## Rack the devices

To install the equipment in the rack, use the racking instructions poster or other instructions provided with each device (P2000 G3 MSA array controller enclosures, supported drive enclosures, servers, and switches.)

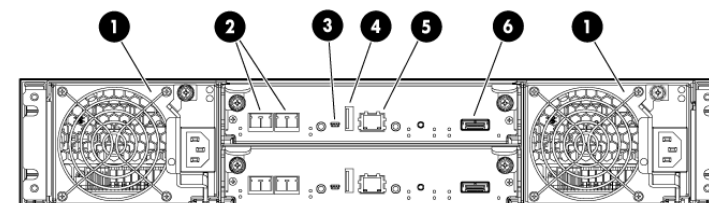
## Step 2. Install hardware options

For information about installing controllers, disk drives, and other options, see the installation instructions provided with the option. Installation instructions are also available on the Software Support/Documentation DVD.

Illustrations in this section describe the different P2000 G3 MSA array controller models.

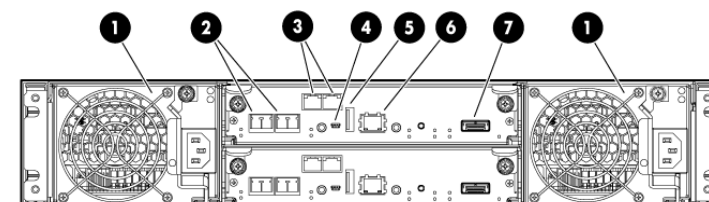
**IMPORTANT:** Do not install different types of controllers in the same enclosure chassis (for example, a P2000 G3 Fibre Channel MSA Controller and a P2000 G3 Combo FC/iSCSI MSA Controller). This is not supported.

### P2000 G3 Fibre Channel MSA



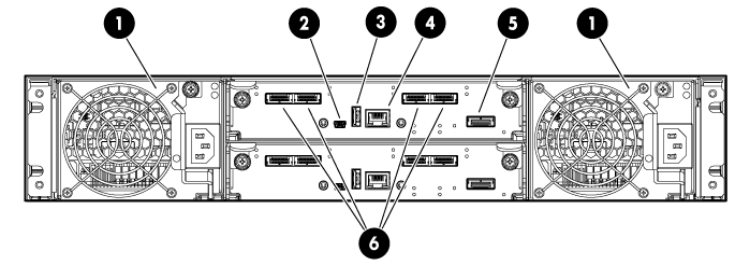
- 1. Power supplies
- 2. Fibre Channel host ports
- 3. CLI port (mini-USB)
- 4. Reserved for future use
- 5. Management Ethernet port
- 6. SAS expansion port

### P2000 G3 Combo Fibre Channel/iSCSI MSA



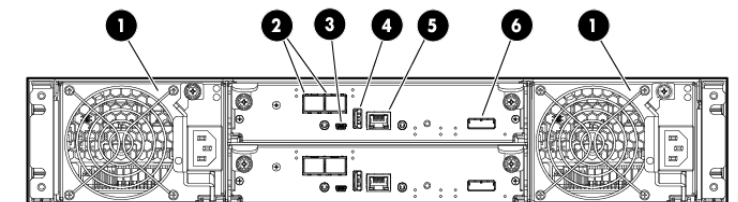
- 1. Power supplies
- 2. Fibre Channel host ports
- 3. iSCSI host ports
- 4. CLI port (mini-USB)
- 5. Reserved for future use
- 6. Management Ethernet port
- 7. SAS expansion port

### P2000 G3 SAS MSA



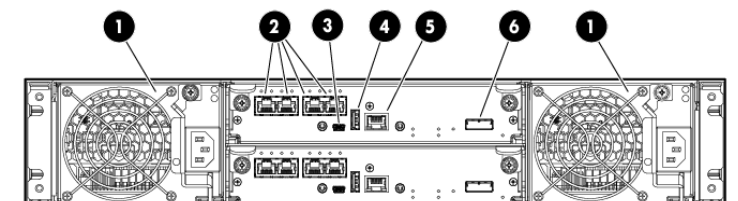
- 1. Power supplies
- 2. CLI port (mini-USB)
- 3. Reserved for future use
- 4. Management Ethernet port
- 5. SAS expansion port
- 6. SAS host ports

### P2000 G3 10GbE iSCSI MSA



- 1. Power supplies
- 2. 10GbE SFP+ iSCSI host ports
- 3. CLI port (mini-USB)
- 4. Reserved for future use
- 5. Management Ethernet port
- 6. SAS expansion port

### P2000 G3 1GbE iSCSI MSA



- 1. Power supplies
- 2. iSCSI host ports
- 3. CLI port (mini-USB)
- 4. Reserved for future use
- 5. Management Ethernet port
- 6. SAS expansion port



### Step 3. Connect drive enclosures to the P2000 G3 MSA array controller enclosure

If included in your environment, connect drive enclosures to the P2000 G3 MSA array controller enclosure.

**NOTE:** Drive enclosures can be hot-added to an operational P2000 G3 MSA array controller enclosure.

The following drive enclosure models are supported:

HP drive enclosure	Description
HP P2000	6Gb 3.5" 12-drive enclosure
HP D2700	6Gb 2.5" 25-drive enclosure
HP MSA2000	3Gb 3.5" 12-drive enclosure
HP MSA70	3Gb 2.5" 25-drive enclosure

#### Drive enclosure connection guidelines

**IMPORTANT:** Mixing 3Gb and 6Gb devices may result in data throughput at the lower 3Gb/s rate. For more information, see the *HP P2000 G3 MSA System Cable Configuration Guide*.

- Use only supported SAS 4x cables.
- Mini-SAS to mini-SAS 0.5 m cables are provided with the P2000, D2700, and MSA70 drive enclosures (one per I/O module).
- SAS to SAS 0.6 m cables are provided with the MSA2000 drive enclosure (one per I/O module).
- Longer cables than those supplied with the drive enclosure must be purchased separately. See the MSA Quick Specs for details.
- The maximum length cable supported for connecting drive enclosures to P2000 G3 MSA arrays or to cascaded drive enclosures is 2 m.
- Up to seven P2000 LFF 3.5-inch drive enclosures or up to five D2700 SFF drive enclosures can be attached to a P2000 G3 MSA controller. LFF and SFF drive enclosures may both be included in the solution, but the maximum number of drives cannot exceed 149.

#### SAS expansion cable requirements

The following table provides SAS expansion cable requirements for P2000 G3 MSA controllers and drive enclosures connection combinations.

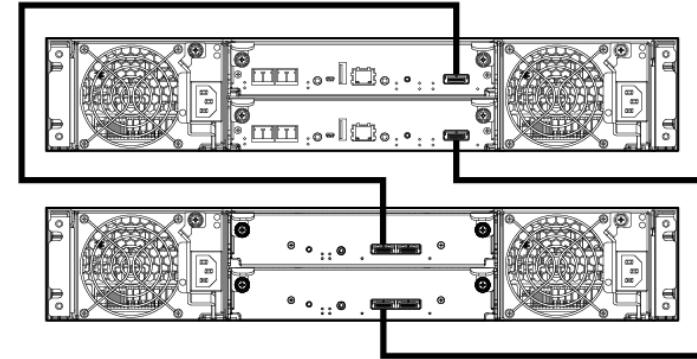
Component 1	Component 2	Type of cable needed
P2000 G3 MSA Controller	P2000 I/O module	Mini-SAS to Mini-SAS
P2000 G3 MSA Controller	D2700 I/O module	Mini-SAS to Mini-SAS
P2000 G3 MSA Controller	MSA2000 I/O module	SAS to Mini-SAS
P2000 G3 MSA Controller	MSA70 I/O module	Mini-SAS to Mini-SAS
P2000 I/O module	P2000 I/O module	Mini-SAS to Mini-SAS
P2000 I/O module	D2700 I/O module	Mini-SAS to Mini-SAS
D2700 I/O module	D2700 I/O module	Mini-SAS to Mini-SAS
MSA2000 I/O module	D2700 I/O module	SAS to Mini-SAS
MSA2000 I/O module	P2000 I/O module	SAS to Mini-SAS
MSA2000 I/O module	MSA2000 I/O module	SAS to SAS
MSA70 I/O module	P2000 I/O module	Mini-SAS to Mini-SAS
MSA70 I/O module	D2700 I/O module	Mini-SAS to Mini-SAS
MSA70 I/O module	MSA70 I/O module	Mini-SAS to Mini-SAS
MSA70 I/O module	MSA2000 I/O module	SAS to Mini-SAS

Consider the following about figures in this section:

- These figures illustrate connecting *one* drive enclosure to an array enclosure. For information on connecting multiple drive enclosures, see the *HP P2000 G3 MSA System Cable Configuration Guide*.
- These figures illustrate connecting a drive enclosure to a *Fibre Channel* P2000 G3 MSA array enclosure. Cabling requirements for connecting drive enclosures to array enclosures are identical, regardless of MSA controller model.

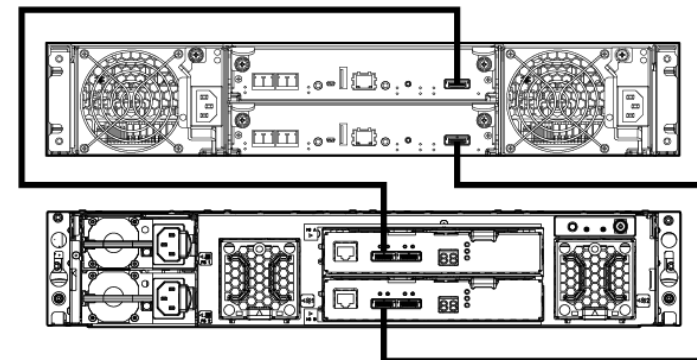
#### P2000 drive enclosure connections

Connecting a P2000 G3 dual-controller array enclosure to a P2000 drive enclosure with dual I/O modules requires two (2) mini-SAS to mini-SAS cables.



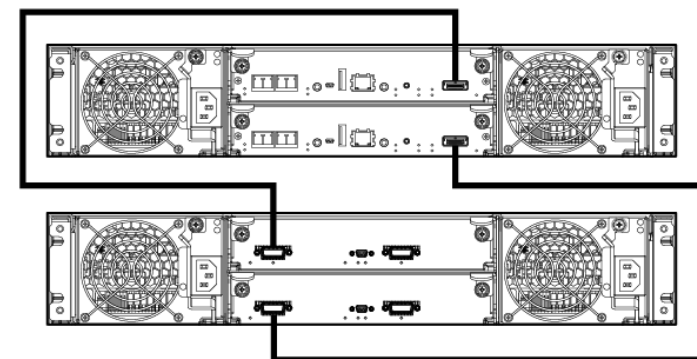
#### D2700 drive enclosure connections

Connecting a P2000 G3 dual-controller array enclosure to a D2700 drive enclosure requires two (2) mini-SAS to mini-SAS cables.



#### MSA2000 drive enclosure connections

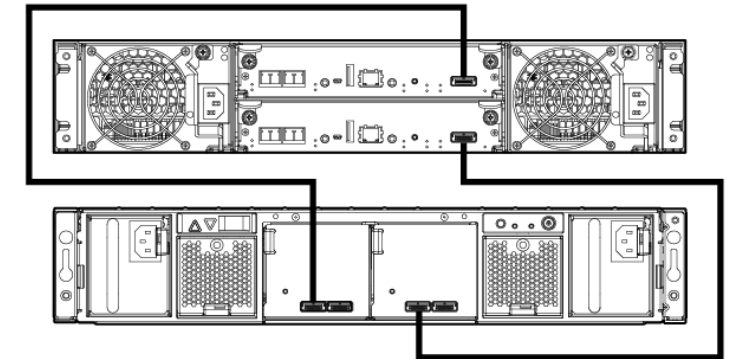
Connecting a P2000 G3 dual-controller array enclosure to an MSA2000 drive enclosure with dual I/O modules requires two (2) mini-SAS to SAS cables.



#### MSA70 drive enclosure connections

**IMPORTANT:** MSA70 firmware 2.28 or later is required when connecting an MSA70 to P2000 G3 MSA arrays.

Connecting a P2000 G3 dual-controller array enclosure to an MSA70 drive enclosure with dual I/O modules requires two (2) mini-SAS to mini-SAS cables.



### Step 4. Connect the P2000 G3 MSA System to data hosts

Direct-connect and switch-connect environments are supported.

The following table provides host port information for different P2000 G3 MSA controller models:

Controller model	Direct connect	Switch connect	Number of host ports
P2000 G3 FC MSA Controller	✓	✓	Single-controller: 2 FC Dual-controller: 4 FC
P2000 G3 Combo FC/iSCSI MSA Controller	✓	✓	Single-controller: 2 FC; 2 iSCSI Dual-controller: 4 FC; 4 iSCSI
P2000 G3 SAS MSA Controller	✓	✓	Single-controller: 4 SAS Dual-controller: 8 SAS
P2000 G3 10GbE iSCSI MSA Controller	✓	✓	Single-controller: 2 10GbE Dual-controller: 4 10GbE
P2000 G3 iSCSI MSA Controller	✓	✓	Single-controller: 4 iSCSI Dual-controller: 8 iSCSI



## Array enclosure connection guidelines

- P2000 G3 Combo FC/iSCSI MSA System LUNs may be presented through either the iSCSI or FC host ports; presenting the same LUN through both protocols is not supported.
- P2000 G3 MSA System Fibre Channel and iSCSI controller ports can both be used for connecting to hosts as well as for replication purposes.
- P2000 G3 10GbE iSCSI MSA Systems must connect to 10GbE-enabled devices (server, switch, or interconnect).
- Obtain host-connect cables for your P2000 G3 MSA Array controller model (FC, SAS, iSCSI, or 10GbE). For a list of available cables, see the P2000 G3 MSA Systems QuickSpecs.
- For single-domain environments, one cable is required; for dual-domain environments, two cables are required.
- The maximum length cable supported for connecting P2000 G3 SAS MSA array enclosures to a switch or host is 4 m.
- The maximum length cable supported for connecting drive enclosures to P2000 G3 MSA arrays or to cascaded drive enclosures is 2 m.

## Direct-connect configurations

For direct-connect configurations, connect cables from the P2000 G3 MSA controller to the host as shown in the following illustrations.

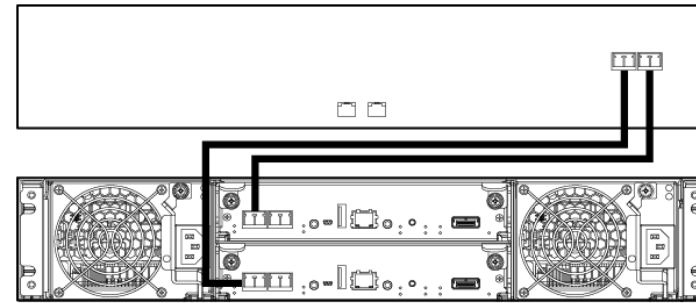
Any number or combination of LUNs can be shared among a maximum of 64 host ports, as long as the total adds up to no more than 512 LUNs per P2000 G3 MSA System.

Consider the following about figures in this section:

- These figures show examples of simple, common cabling configurations. Other cabling configurations exist.
- These figures show generic representations of servers.
- Simple, common cable configurations are included in this document. For additional supported cable/controller configurations, see the *HP P2000 G3 MSA System Cable Configuration Guide*, available at <http://www.hp.com/support/manuals>.

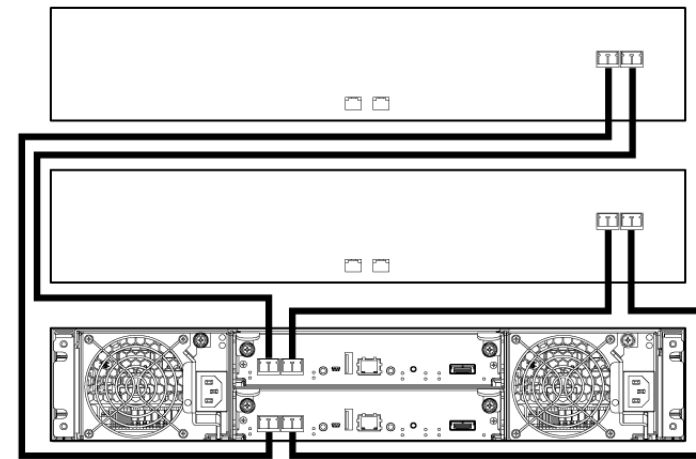
## P2000 G3 FC MSA connected to one server

Connecting a P2000 G3 FC MSA dual-controller array enclosure to one server in a dual-path configuration requires two (2) Fibre Channel cables.



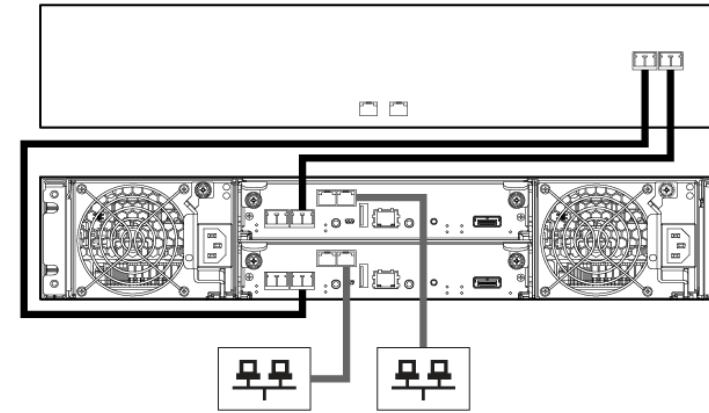
## P2000 G3 FC MSA connected to two servers

Connecting a P2000 G3 FC MSA dual-controller array enclosure to two servers in a dual-path configuration requires four (4) Fibre Channel cables.



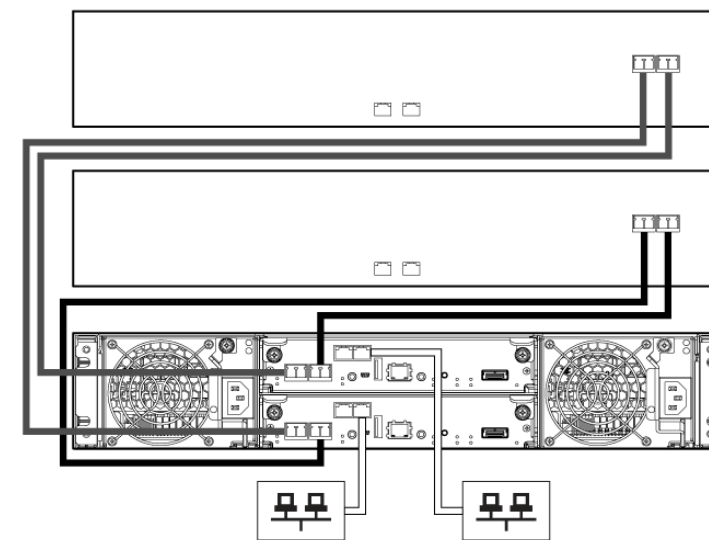
## P2000 G3 Combo FC/iSCSI MSA connected to one server

Connecting a P2000 G3 Combo FC/iSCSI MSA dual-controller array enclosure to one server in a dual-path configuration requires two (2) Fibre Channel cables connected to the server and two (2) Ethernet cables connected to the network for replication.



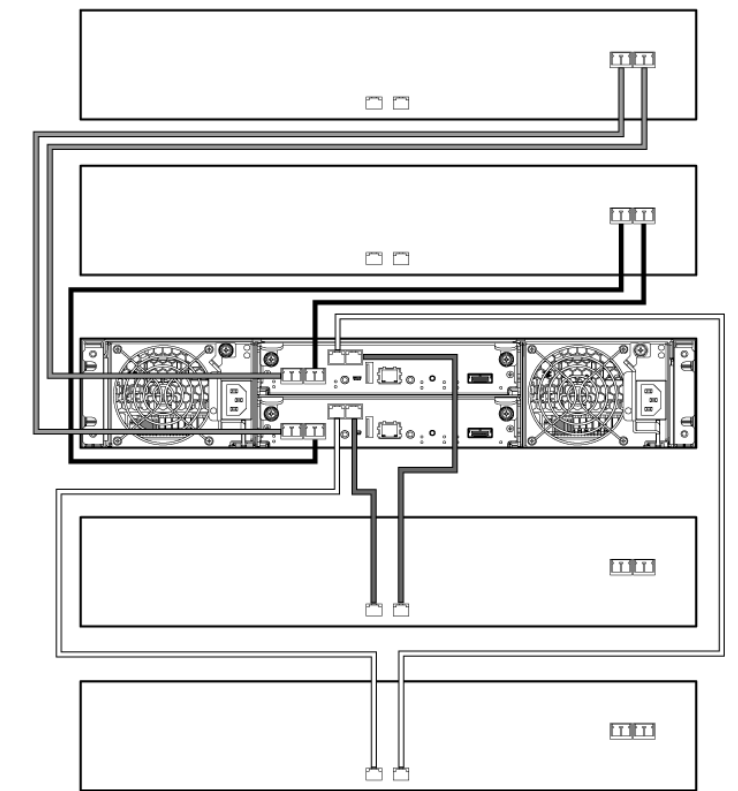
## P2000 G3 Combo FC/iSCSI MSA connected to two servers

Connecting a P2000 G3 Combo FC/iSCSI MSA dual-controller array enclosure to two servers in a dual-path configuration requires four (4) Fibre Channel cables connected to the servers and two (2) Ethernet cables connected to the network for replication.



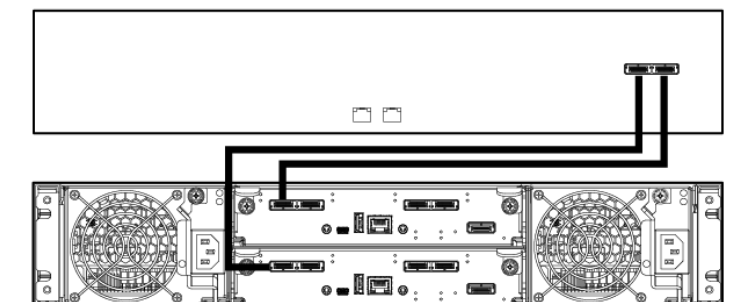
## P2000 G3 Combo FC/iSCSI MSA connected to four servers

Connecting a P2000 G3 Combo FC/iSCSI MSA dual-controller array enclosure to four servers in a dual-path configuration requires four (4) Fibre Channel cables connected to the servers and four (4) Ethernet cables connected to the network for replication.



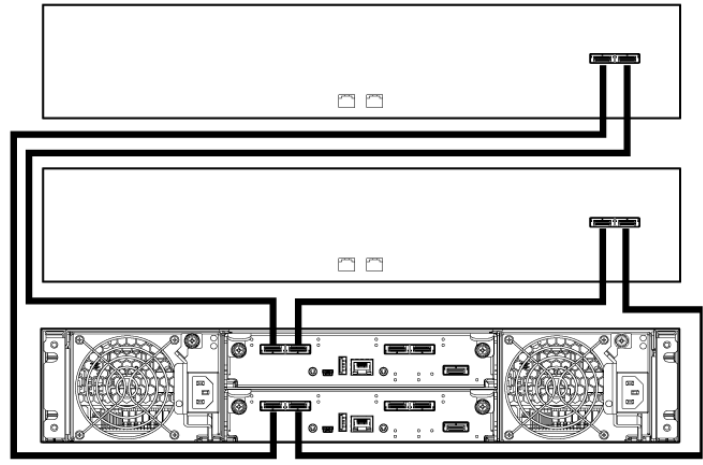
## P2000 G3 SAS MSA connected to one server

Connecting a P2000 G3 SAS MSA dual-controller array enclosure to one server in a dual-path configuration requires two (2) SAS cables.



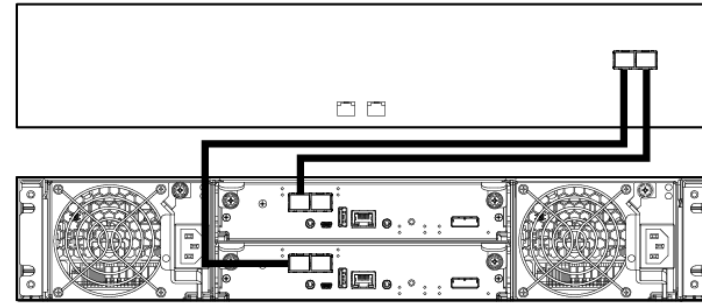
**P2000 G3 SAS MSA connected to two servers**

Connecting a P2000 G3 SAS MSA dual-controller array enclosure to two servers in a dual-path configuration requires four (4) SAS cables.



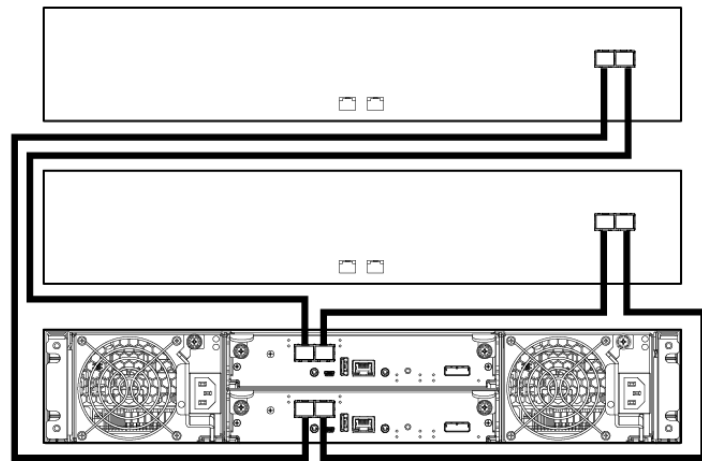
**P2000 G3 10GbE iSCSI MSA connected to one server**

Connecting a P2000 G3 10GbE iSCSI MSA dual-controller array enclosure to one server in a dual-path configuration requires two (2) cables (optical cables with SFP+ transceivers or SFP+ 10GbE copper cables).



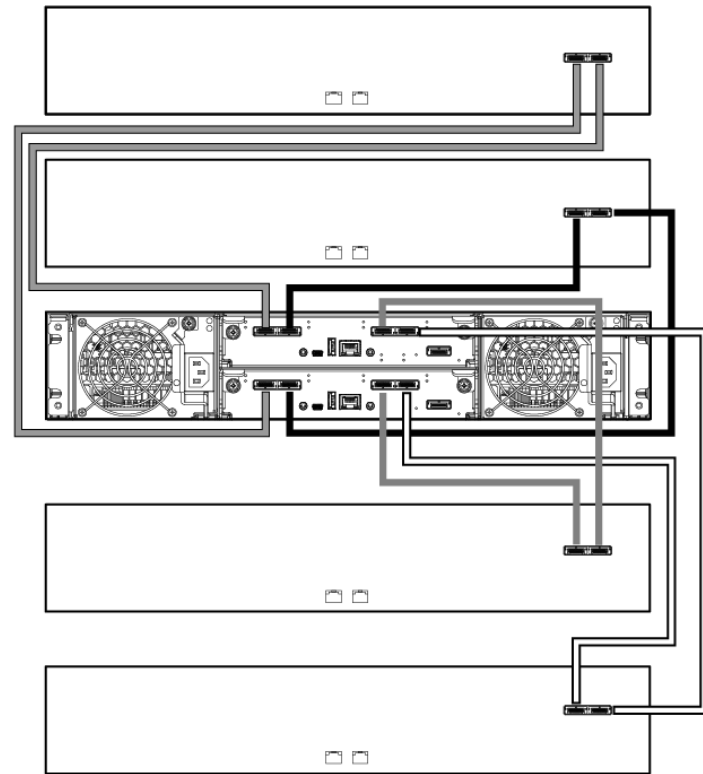
**P2000 G3 10GbE iSCSI MSA connected to two servers**

Connecting a P2000 G3 10GbE iSCSI MSA dual-controller array enclosure to two servers in a dual-path configuration requires four (4) cables (optical cables with SFP+ transceivers or SFP+ 10GbE copper cables).



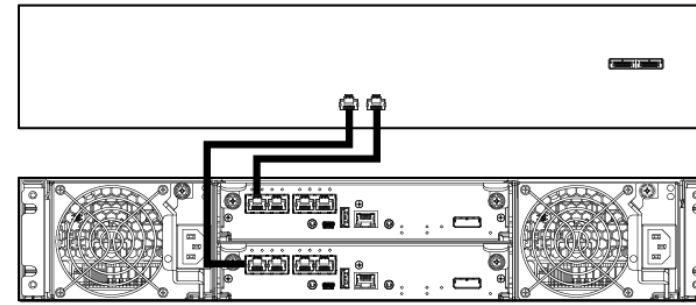
**P2000 G3 SAS MSA connected to four servers**

Connecting a P2000 G3 SAS MSA dual-controller array enclosure to four servers in a dual-path configuration requires eight (8) SAS cables.



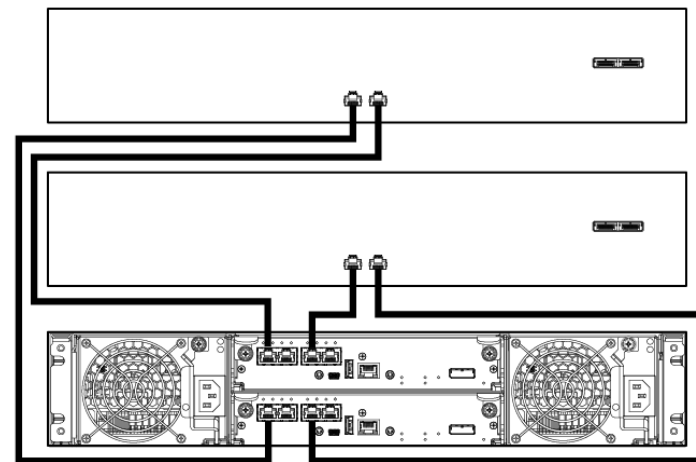
**P2000 G3 iSCSI MSA connected to one server**

Connecting a P2000 G3 iSCSI MSA dual-controller array enclosure to one server in a dual-path configuration requires two (2) Ethernet cables connected to the server.



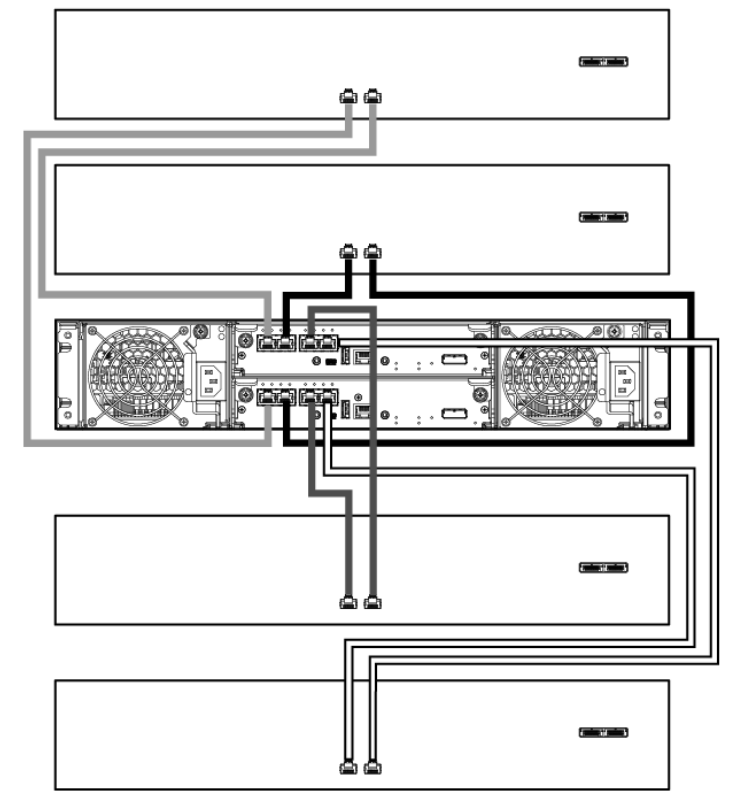
**P2000 G3 iSCSI MSA connected to two servers**

Connecting a P2000 G3 iSCSI MSA dual-controller array enclosure to two servers in a dual-path configuration requires four (4) Ethernet cables connected to the server.



**P2000 G3 iSCSI MSA connected to four servers**

Connecting a P2000 G3 iSCSI MSA dual-controller array enclosure to four servers in a dual-path configuration requires eight (8) Ethernet cables connected to the server.



### Switch-connect configurations

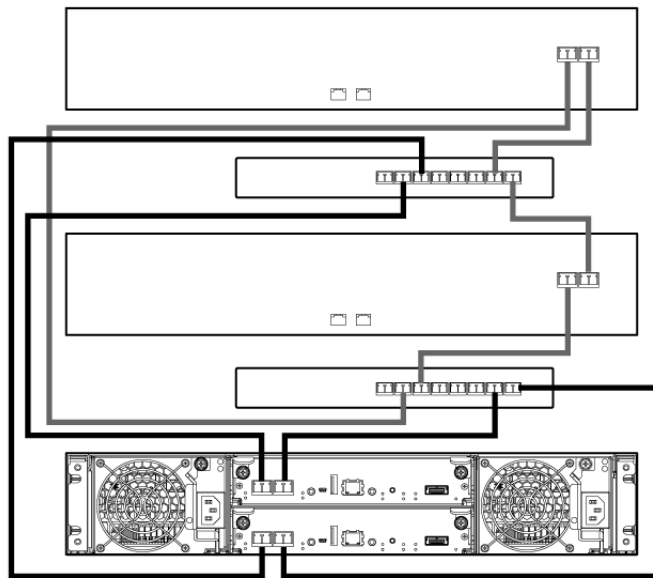
For switch-connect configurations, connect cables from the P2000 G3 MSA controller to the switch ports, and from switch ports to data hosts.

Consider the following about figures in this section:

- These figures show simple, common cabling configurations. Other cabling configurations exist.
- These figures show generic representations of servers and switches.
- Simple, common cable configurations are included in this document. For additional supported cable/controller configurations, see the *HP P2000 G3 MSA System Cable Configuration Guide*, available at <http://www.hp.com/support/manuals>.

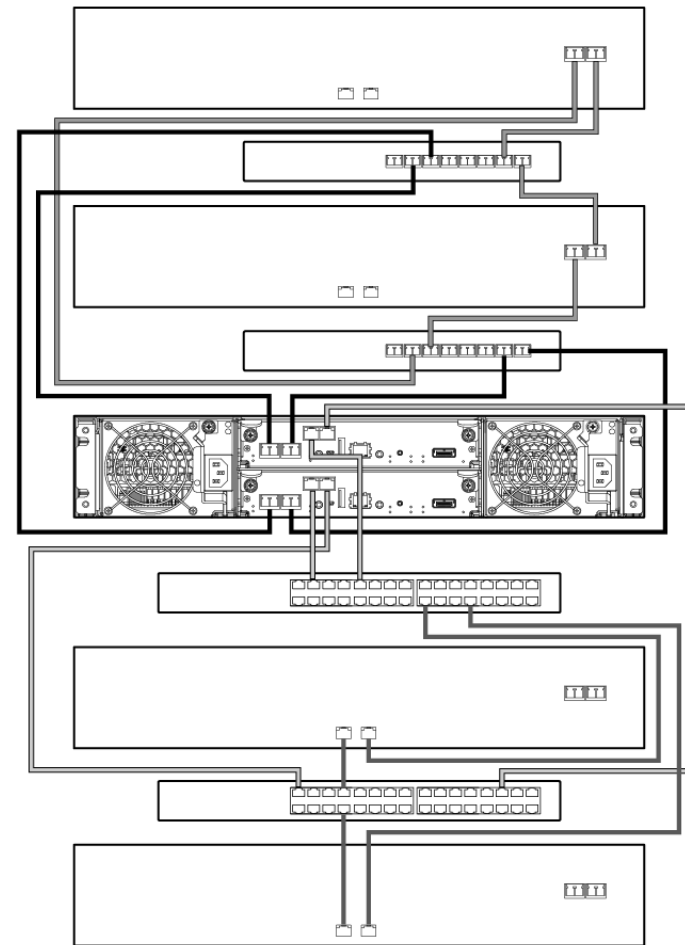
### P2000 G3 FC MSA connected to two switches/two servers

Connecting a P2000 G3 FC MSA dual-controller array enclosure to two switches/two servers in a dual-path configuration requires eight (8) Fibre Channel cables.



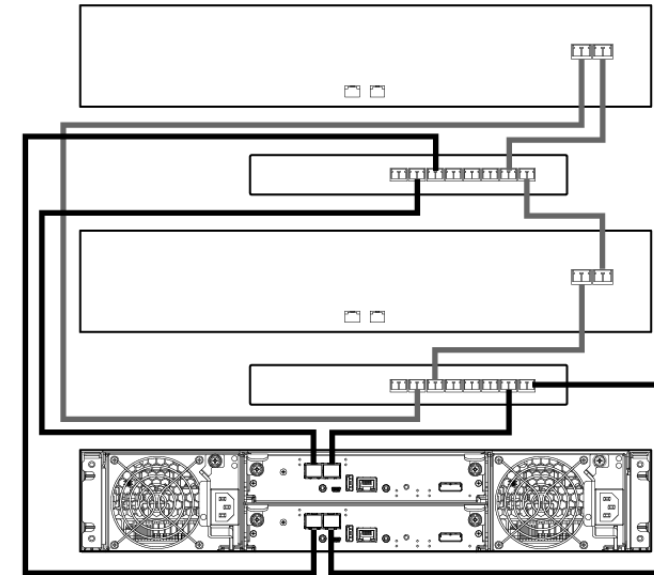
### P2000 G3 Combo FC/iSCSI MSA connected to four switches/four servers

Connecting a P2000 G3 Combo FC/iSCSI MSA dual-controller array enclosure to four switches/four servers in a dual-path configuration requires eight (8) Fibre Channel cables and eight (8) Ethernet cables.



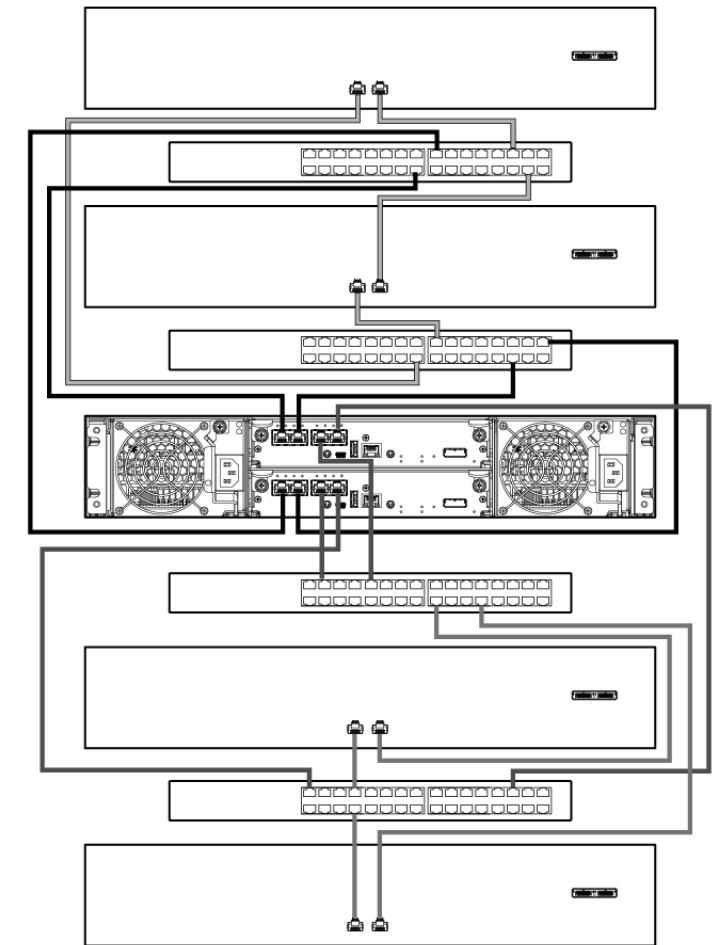
### P2000 G3 10GbE iSCSI MSA System connected to two switches/two servers

Connecting a P2000 G3 10GbE iSCSI MSA dual-controller array enclosure to two switches/two servers in a dual-path configuration requires four (4) cables from the MSA to the switch (optical cables with SFP+ transceivers or SFP+ 10GbE copper cables) and four (4) Ethernet cables from the switch to the host.



### P2000 G3 iSCSI MSA connected to four switches/four servers

Connecting a P2000 G3 iSCSI MSA dual-controller array enclosure to four switches/four servers in a dual-path configuration requires sixteen (16) Ethernet cables.



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## Step 5. Connect the P2000 G3 MSA System to a remote management host

The remote management host directly manages systems out-of-band over an Ethernet network. If included in your environment, do the following to connect the P2000 G3 MSA System to a remote management host:

1. Connect an RJ-45 Ethernet cable to the Ethernet network management port on each P2000 G3 MSA System controller.
2. Connect the other end of each Ethernet cable to a network that your management host can access (preferably on the same subnet).

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## Step 6. Connect two P2000 G3 FC MSA, FC/iSCSI Combo MSA, or iSCSI MSA to replicate volumes

If included in your environment, Remote Snap replication is a licensed disaster-recovery feature that performs asynchronous (batch) replication of block-level data from a volume on a primary P2000 G3 MSA System to a secondary volume on the same system or on a separate, independent P2000 G3 MSA System. Two associated master volumes form a replication set, with only the primary volume (source of data) mapped for access by a server. Both systems must be licensed to use replication and must be connected through switches to the same fabric or network (direct attach is not supported).

Cabling configuration possibilities are many, including:

- Single-controller—Multiple servers/single network/two switches
- Dual-controller—Multiple servers/different networks/multiple switches
- Dual-controller—Multiple servers/single network/single switch

For more information about Remote Snap and Remote Snap cabling requirements and examples, see “Connecting two storage systems to replicate volumes” in the *HP P2000 G3 MSA System User Guide* for your MSA model.

After the P2000 G3 MSA Systems are physically cabled, see the *HP P2000 G3 MSA System SMU Reference Guide* or online help for information about configuring, provisioning, and using this optional Remote Snap feature.

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## Step 7. Power on components

- ⓘ **IMPORTANT:** Important safety information about power cords can be found on the Software Support/Documentation DVD provided with your MSA chassis. To locate this information look for the Safety and Disposal guide located on the Documents tab.

Apply power to the enclosures and associated server(s) in the following order:

1. Connect the power cords from the rack to separate external power sources.
2. Plug in each power supply module in attached, cascaded drive enclosures to a power source in the rack. If the drive enclosures have a power button, apply power using the power switch on the rear of the units. Wait one minute to ensure that all drives are recognized by the array controller.
3. Plug in each power supply module in the P2000 G3 MSA array controller enclosure to a power source in the rack. If the array controller enclosure has a power button, apply power by using the power switch on the rear of the unit.
4. Power on servers (if they are powered down for maintenance purposes).

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## Step 8. Update firmware

After installing hardware and powering on components for the first time, be sure to verify that the controller modules, drive modules, and disk drives are running the latest available firmware.

Using the Storage Management Utility (SMU), right-click the system in the **Configuration View** panel and select **Tools > Update Firmware**. This panel shows the currently installed firmware versions and enables you to update them.

To find and download the latest software and firmware update for your product, go to the HP Downloads website at <http://www.hp.com/support/downloads>.

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## Step 9. Configure the MSA

See the *HP P2000 G3 MSA System User Guide*, *HP P2000 G3 MSA System Reference Guide*, and *HP P2000 G3 MSA System Cable Configuration Guide* for configuration and setup information.

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## Additional resources

Product manuals: <http://www.hp.com/support/manuals>

P2000 G3 MSA products: <http://www.hp.com/go/p2000>

Storage products: <http://www.hp.com/storage>

Servers: <http://www.hp.com/go/servers>

SAN infrastructure (switches and HBAs):

<http://www.hp.com/go/san>

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## Warranty statement

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