

HP Moonshot Switch User and Maintenance Guide

Abstract

This document is for the person who installs, administers, services, and troubleshoots switches. This guide provides identification, setup, installation, and removal procedures. HP assumes you are qualified in these areas.



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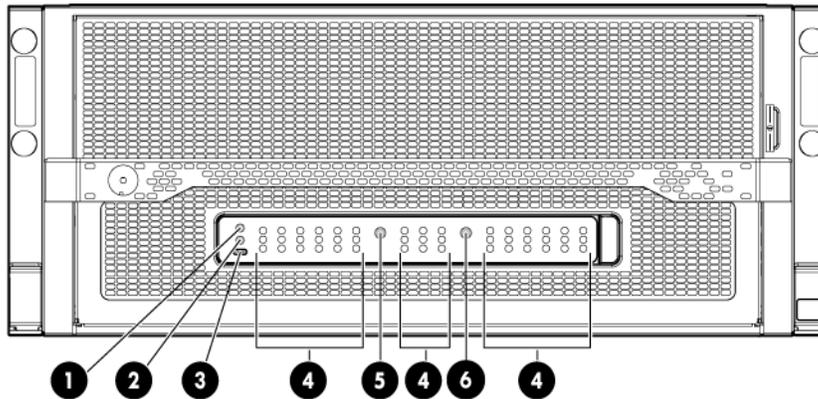
Contents

Component and LED identification	5
Chassis front panel LEDs and buttons	5
Moonshot-6SFP Uplink Module.....	6
Uplink module components	6
Uplink module buttons and LEDs	6
Moonshot-4QSFP+ Uplink Module	7
Uplink module components	7
Uplink module buttons and LEDs	8
Moonshot-45G Switch Module.....	9
Switch module button, sensor, and LEDs	9
Moonshot-180G Switch Module.....	10
Switch module button, sensor, and LEDs	10
iLO CM management port	11
Operations.....	12
Extend the chassis from the rack	12
Remove the access panel.....	13
Open the cable management arm	14
Remove the uplink module blank	14
Remove the switch module blank	15
Setup.....	16
Installation information and guidelines	16
Uplink module bays.....	17
Installing the uplink module.....	17
Installing the switch module	18
Configuration	21
Configuring the switch	21
Network mapping	22
Production network mapping.....	22
Management network mapping.....	23
Interfaces	23
Moonshot-6SFP uplink interfaces.....	23
Moonshot-4QSFP+ uplink interfaces.....	24
Moonshot-45G downlink interfaces.....	25
Moonshot-180G downlink interfaces.....	26
Command Line Interface.....	27
Connect to the switch console	27
Access the CLI locally.....	27
Obtaining the switch management IP address	28
Configure the Enable password.....	28
Interacting with the switch from the iLO CM firmware	28
Firmware.....	30
Update the switch firmware	30
Updating the switch firmware using the switch console	30
Troubleshooting	32

Troubleshooting resources	32
Illustrated parts catalog	33
Customer self repair.....	33
Parts only warranty service	33
Switch customer self repair components.....	34
Removal and replacement procedures	35
Removing the switch module	35
Removing the uplink module	35
Regulatory information	37
Safety and regulatory compliance	37
Turkey RoHS material content declaration.....	37
Ukraine RoHS material content declaration.....	37
Warranty information	37
Electrostatic discharge	38
Preventing electrostatic discharge	38
Grounding methods to prevent electrostatic discharge.....	38
Specifications	39
Chassis environmental specifications.....	39
Chassis specifications	39
Support and other resources	40
Before you contact HP.....	40
HP contact information.....	40
Acronyms and abbreviations.....	41
Documentation feedback	43
Index.....	44

Component and LED identification

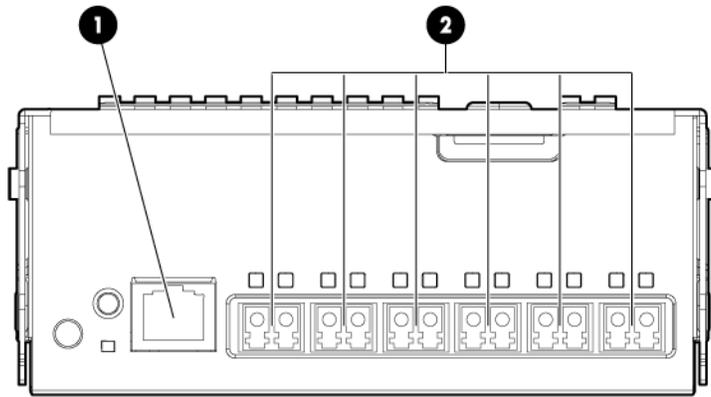
Chassis front panel LEDs and buttons



Item	Description	LED Status
1	Chassis power LED	Flashing Green = The chassis is waiting to power on. Green = Normal operation Amber = Standby operation Off = No power
2	Chassis health LED	Green = Normal operation Flashing Amber = Degraded condition Flashing Red = Critical condition Off = No power
3	Chassis UID LED/button	Blue = Chassis ID is selected. Flashing blue = System firmware update is in process. Off = Chassis ID is not selected.
4	Cartridge health LEDs	Green = Normal operation Amber = Standby mode Flashing Amber = Degraded condition Flashing Amber (All) = Moonshot 1500 CM module is not installed. Flashing Red = Critical condition Off = Cartridge is not installed or no power exists.
5	Switch module A health LED	Green = Normal operation Flashing Amber = Degraded condition Flashing Red = Critical condition Off = Switch module is not installed or no power exists.
6	Switch module B health LED	Green = Normal operation Flashing Amber = Degraded condition Flashing Red = Critical condition Off = Switch module is not installed or no power exists.

Moonshot-6SFP Uplink Module

Uplink module components



Item	Component	Description
1	Serial console port	For management
2	SFP+ ports X1–X6	1Gb or 10Gb Ethernet

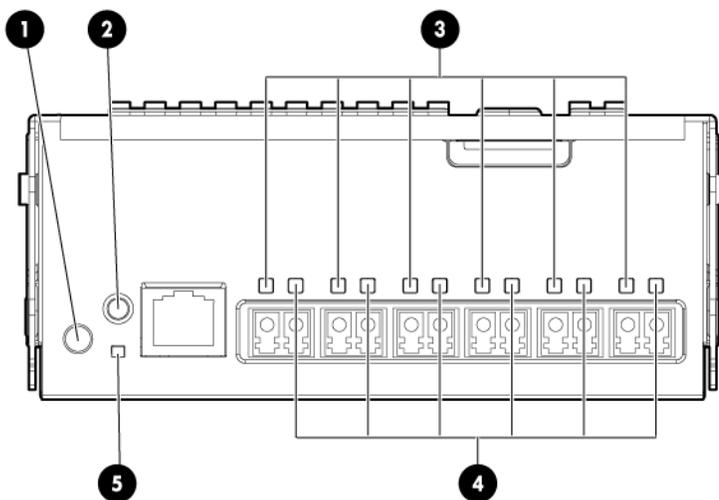
SFP+ ports X1 through X6 support Ethernet traffic only.

SFP+ ports support the following pluggable Ethernet transceiver modules:

- HP 1000BASE-T SFP
- HP 10GBASE-SR SFP+
- HP 10GBASE-DAC SFP+

Any available port can be used to connect to the data center. Ensure the port is populated with supported HP transceiver modules that are compatible with the data center port type.

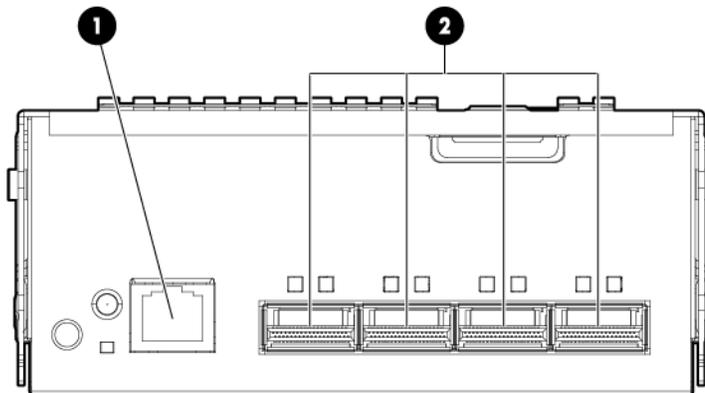
Uplink module buttons and LEDs



Item	Description	Status
1	Uplink module UID LED/button	Solid blue = Switch module ID is selected. Flashing blue = Switch module firmware update is in progress. Off = Switch module ID is not selected.
2	Uplink module health LED	Green = Normal operation Flashing amber = Degraded condition Flashing red = Critical condition Off = No power
3	Uplink module link LED	Solid green = Link Off = No link
4	Uplink module activity LED	Flashing green = Activity Off = No activity
5	Reset button	Resets the switch module

Moonshot-4QSFP+ Uplink Module

Uplink module components



Item	Component	Description
1	Serial console port	For management
2	QSFP+ ports Q1–Q4	40Gb Ethernet

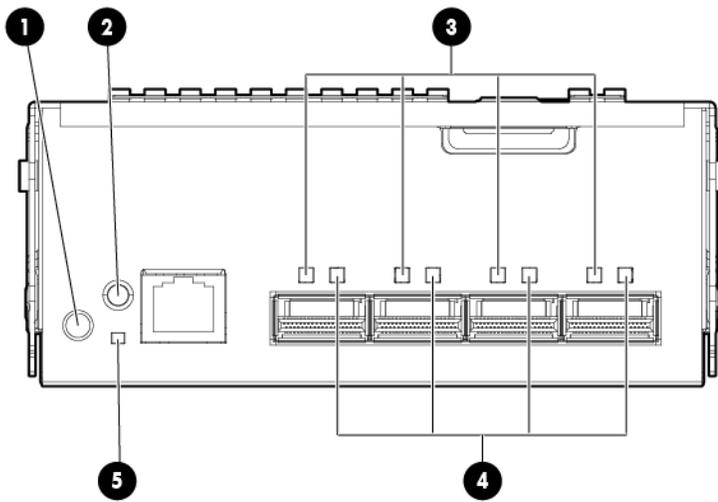
QSFP+ ports Q1 through Q4 support Ethernet traffic only.

QSFP+ ports support the following pluggable Ethernet transceiver modules:

- HP 40GBASE QSFP+
- HP 40GBASE QSFP+ SR4
- HP 40GBASE QSFP+ DAC
- HP 40GBASE QSFP+ to 4x10G SFP+

Any available port can be used to connect to the data center. Ensure the port is populated with supported HP transceiver modules that are compatible with the data center port type.

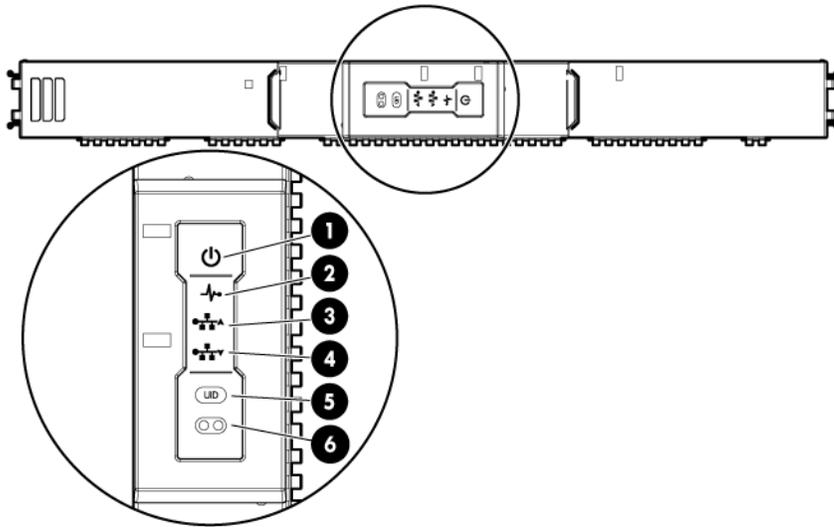
Uplink module buttons and LEDs



Item	Description	Status
1	Uplink module UID LED/button	Solid blue = Switch module ID is selected. Flashing blue = Switch module firmware update is in progress. Off = Switch module ID is not selected.
2	Uplink module health LED	Green = Normal operation Flashing amber = Degraded condition Flashing red = Critical condition Off = No power
3	Uplink module link LED	Solid green = Link Off = No link
4	Uplink module activity LED	Flashing green = Activity Off = No activity
5	Reset button	Resets the switch module

Moonshot-45G Switch Module

Switch module button, sensor, and LEDs

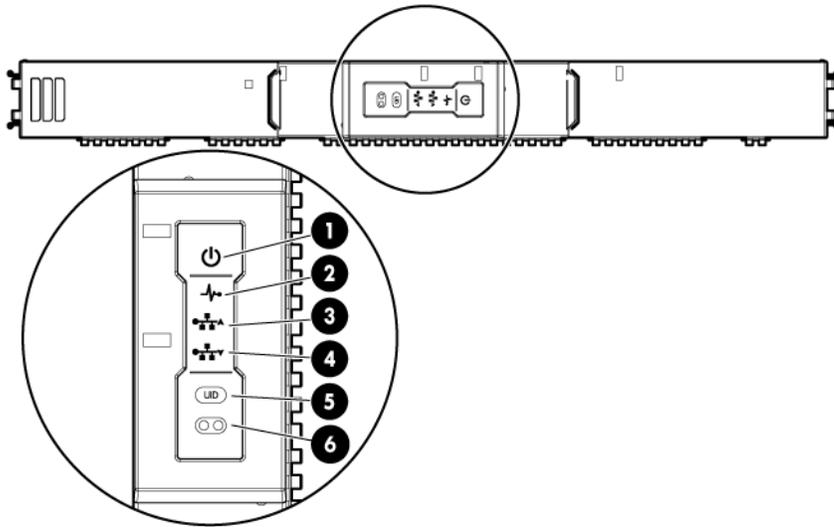


Item	Description	Status
1	Switch module power LED	Green = Normal operation Amber = Standby operation Off = No power
2	Switch module health LED	Green = Normal operation Flashing amber = Degraded condition Flashing red = Critical condition Off = No power
3	Switch module uplink activity LED	Green = Link Flashing green = Activity Off = No activity
4	Switch module downlink activity LED	Green = Link Flashing green = Activity Off = No activity
5	Switch module UID LED/button	Solid blue = Switch module ID is selected. Flashing blue = Switch module firmware update is in progress. Off = Switch module ID is not selected.
6	Access panel sensor	Detects the presence of the access panel*

*The fan speed adjusts automatically when the access panel is installed or removed.

Moonshot-180G Switch Module

Switch module button, sensor, and LEDs

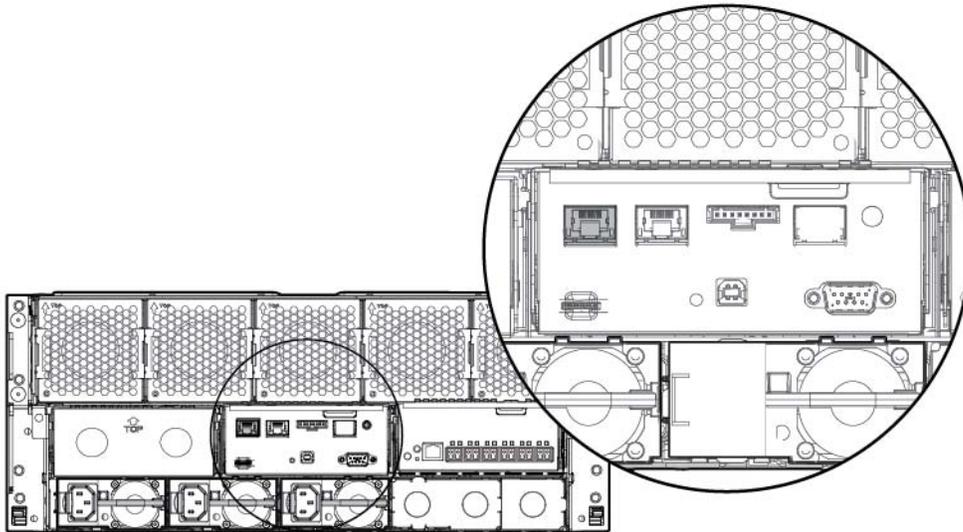


Item	Description	Status
1	Switch module power LED	Green = Normal operation Amber = Standby operation Off = No power
2	Switch module health LED	Green = Normal operation Flashing amber = Degraded condition Flashing red = Critical condition Off = No power
3	Switch module uplink activity LED	Green = Link Flashing green = Activity Off = No activity
4	Switch module downlink activity LED	Green = Link Flashing green = Activity Off = No activity
5	Switch module UID LED/button	Solid blue = Switch module ID is selected. Flashing blue = Switch module firmware update is in progress. Off = Switch module ID is not selected.
6	Access panel sensor	Detects the presence of the access panel*

*The fan speed adjusts automatically when the access panel is installed or removed.

iLO CM management port

The iLO CM management port provides communication with the switch service port interface and is used for remote sessions. All service port traffic is routed through the iLO/MGMT port, located on the iLO CM module:



The switch service port interface is enabled by default and can be used with the switch serial console port when making configuration changes.

The switch serial console port is on the uplink module. To identify the switch serial console port, see uplink module components (on page 7, on page 6).

To find the switch service port IP address for remote management, see "Obtaining the switch management IP address (on page 28)."

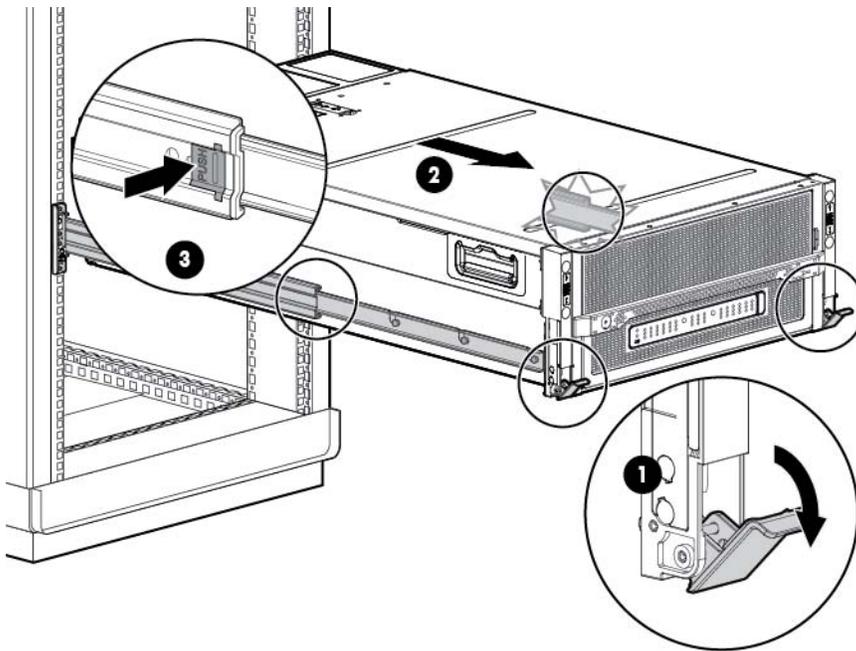
Operations

Extend the chassis from the rack

1. Pull down the quick release levers on each side of the chassis.
2. Extend the chassis from the rack until it locks once.
3. Press the push tab on the rail, and then fully extend the chassis.



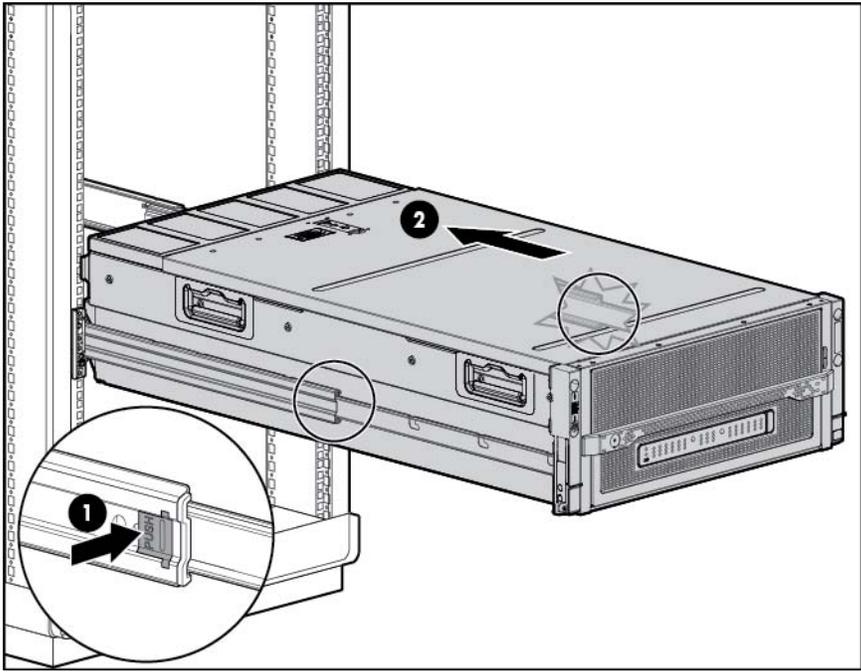
WARNING: To reduce the risk of personal injury or equipment damage, be sure that the rack is adequately stabilized before extending a component from the rack.



4. After performing the installation or maintenance procedure, slide the chassis back into the rack, and then press the chassis firmly into the rack to secure it in place.



WARNING: To reduce the risk of personal injury, be careful when pressing the server rail-release latches and sliding the server into the rack. The sliding rails could pinch your fingers.

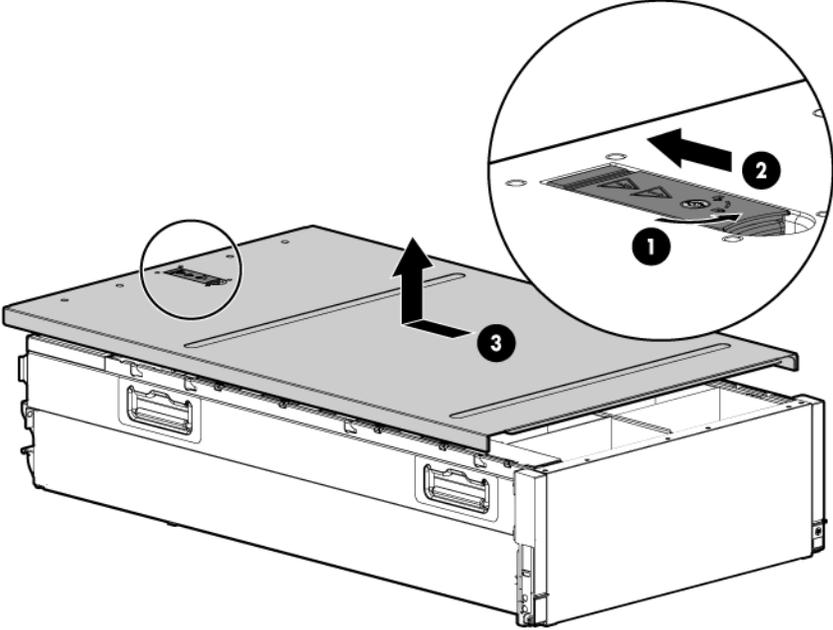


Remove the access panel



IMPORTANT: After performing a procedure inside the chassis, always install the access panel on the chassis when complete. Do not operate the chassis for long periods of time with the access panel removed.

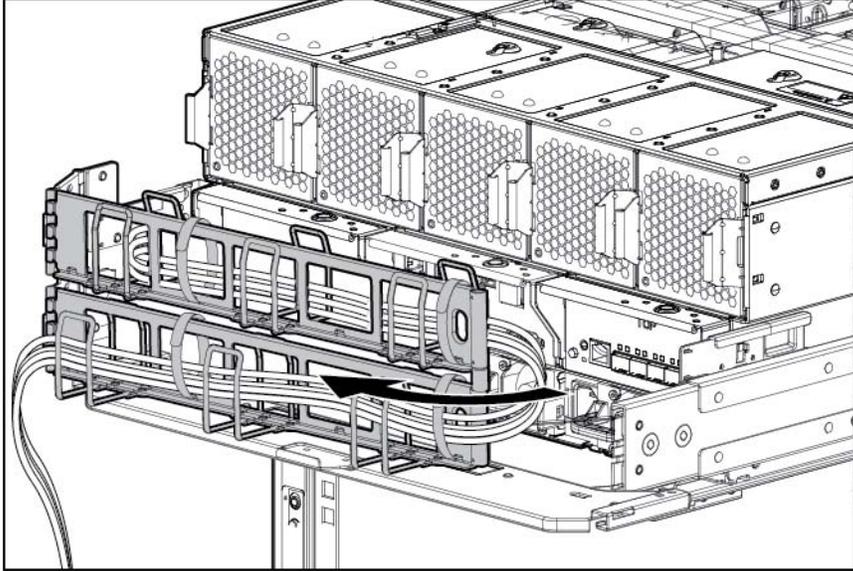
- 1. Release the access panel latch.
- 2. Slide the access panel back about 1.5 cm (0.5 in).
- 3. Lift and remove the access panel.



NOTE: Turn the access panel over to locate the hood labels. These labels provide information on installing various options, flexible memory configurations, LED status indicators, and switch settings.

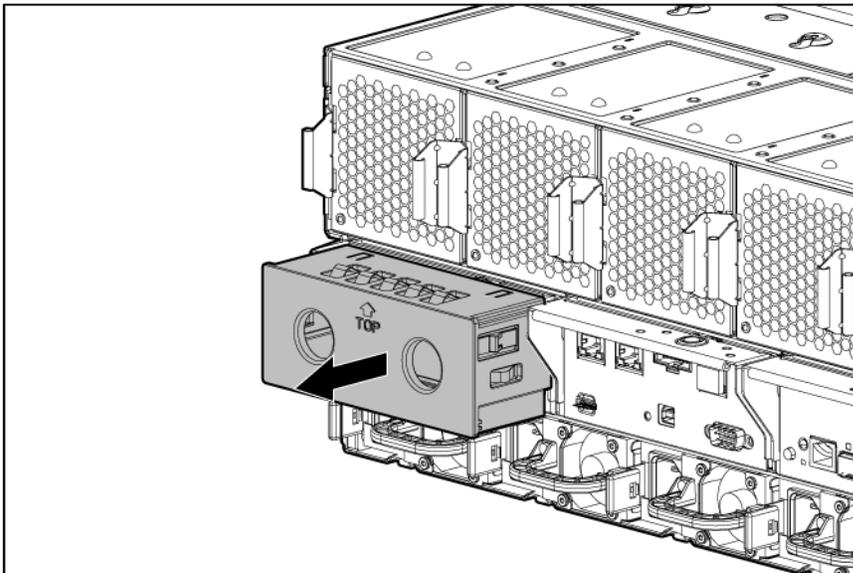
Open the cable management arm

To open, lift the cable management arm up as you swing it open.



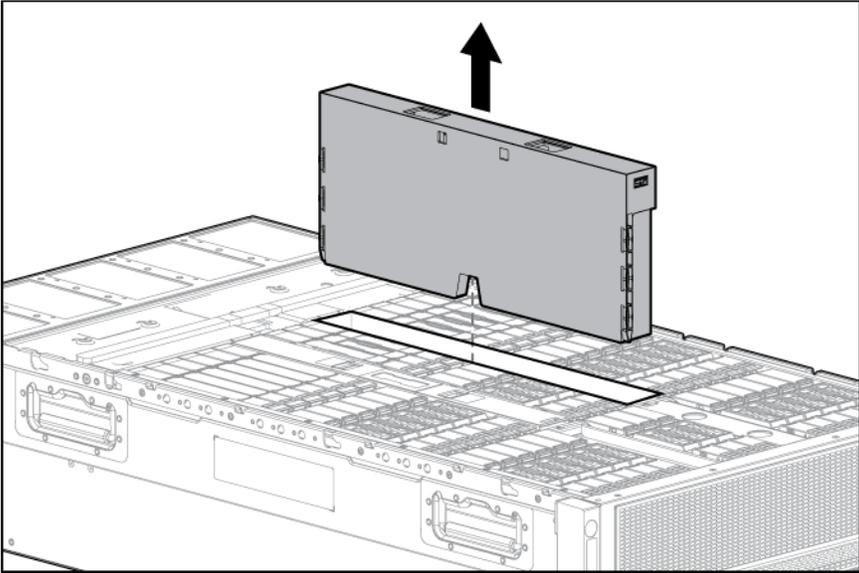
Remove the uplink module blank

Remove the component as indicated.



Remove the switch module blank

Remove the component as indicated.

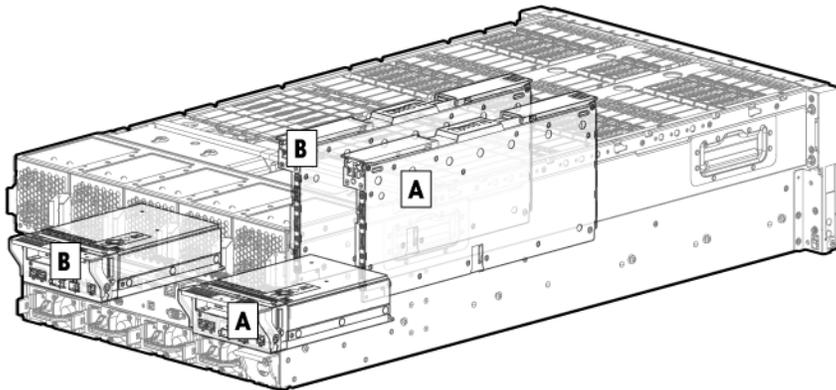


Setup

Installation information and guidelines

Before installing the module, review the following:

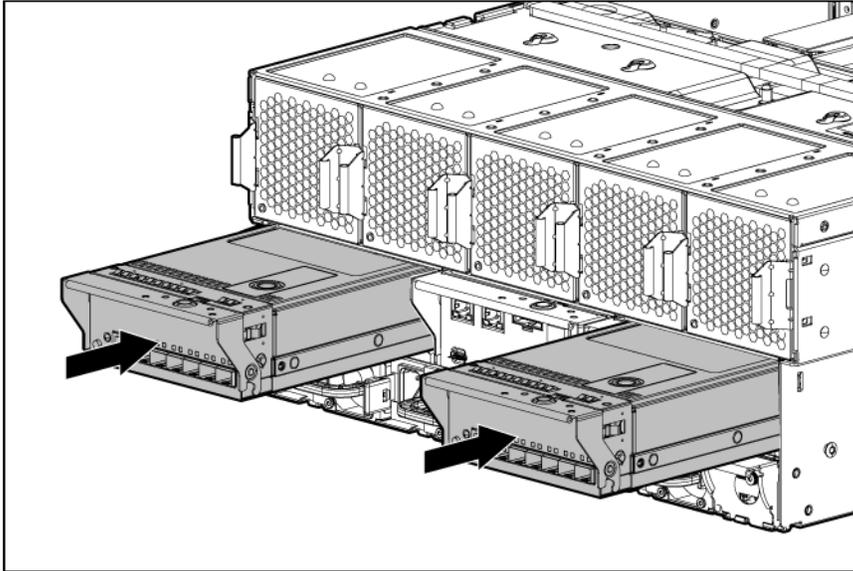
- Always install the switch module and the uplink module in corresponding bays. Both components must be installed for normal operation.



- The switch module and the uplink module can be installed in any order.
- The switch module and the uplink module power down when either module is removed from the chassis.
- The switch module and the uplink module power up after both modules are installed in the chassis.
- Removing any component from bay A or bay B does not disrupt traffic for the other switch.
- Always use the recommended firmware version. For current information on recommended firmware versions, see the HP website (<http://www.hp.com/go/moonshot/download>).
- For the most current product information, see the HP Moonshot Information Library (<http://www.hp.com/go/moonshot/docs>).

Uplink module bays

The uplink module can be installed in the uplink module bays located in the rear of the chassis.

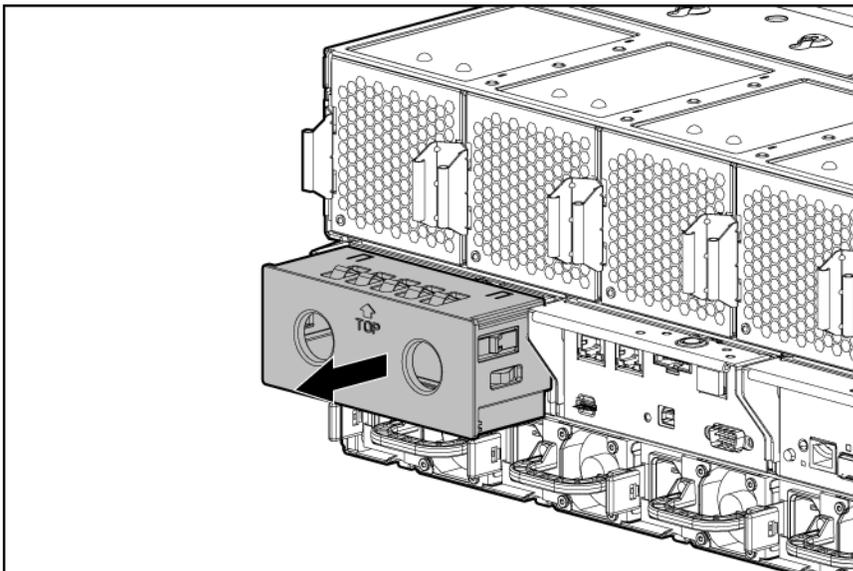


Installing the uplink module

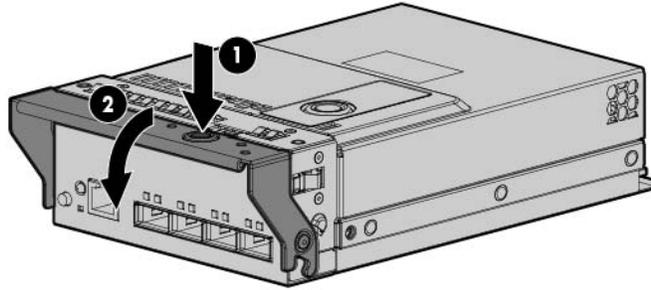


IMPORTANT: To avoid connectivity loss, do not remove any network cables or uplink modules already in operation.

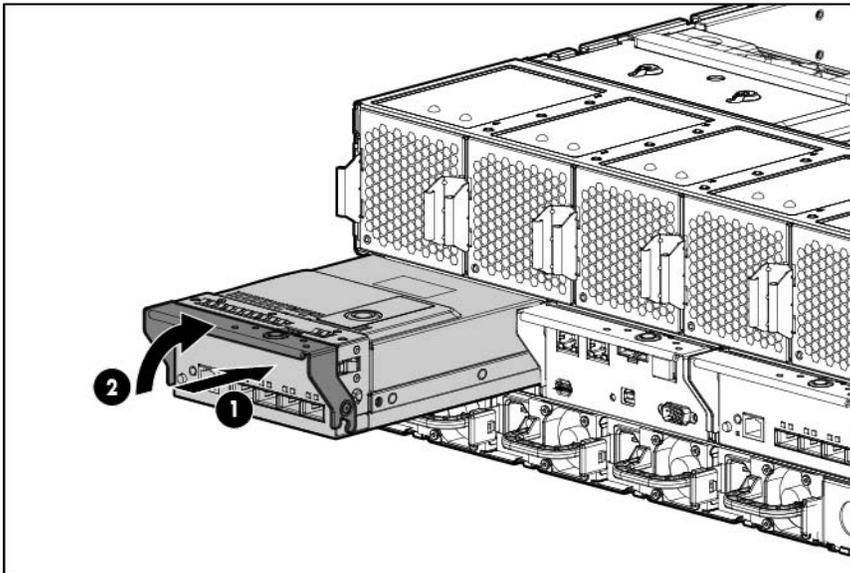
1. Remove the uplink module bay blank.



2. Prepare the uplink module for installation.



3. Install the uplink module.



4. Do one of the following:
 - If the switch module is already installed, verify the uplink module powers on and the health LED is green.
 - If the switch module is not installed, install the switch module before verifying LEDs.For more information, see the "Installation information and guidelines (on page 16)."
5. After both components have been installed, verify the switch firmware is at the recommended firmware version. For more information, see the HP website (<http://www.hp.com/go/moonshot/download>).

The installation is complete.

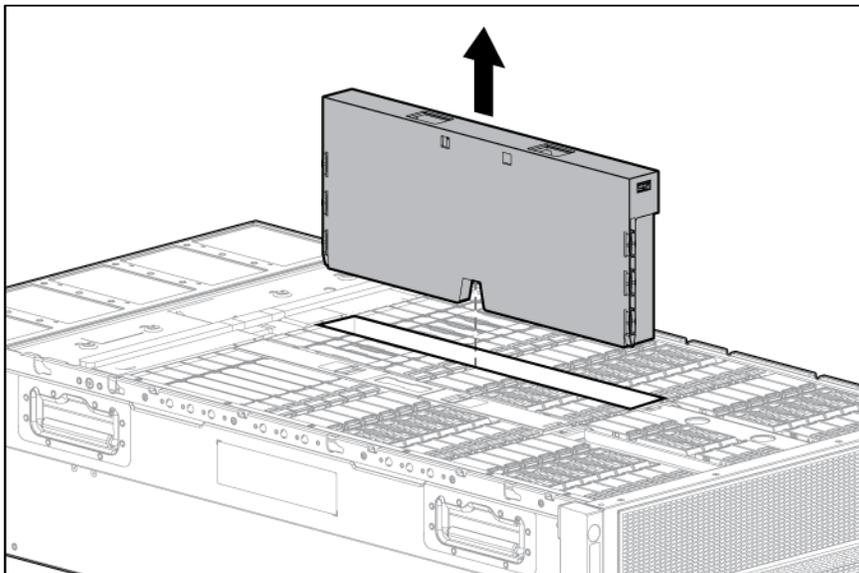
Installing the switch module

CAUTION: To avoid connectivity loss, do not remove switches already in operation.

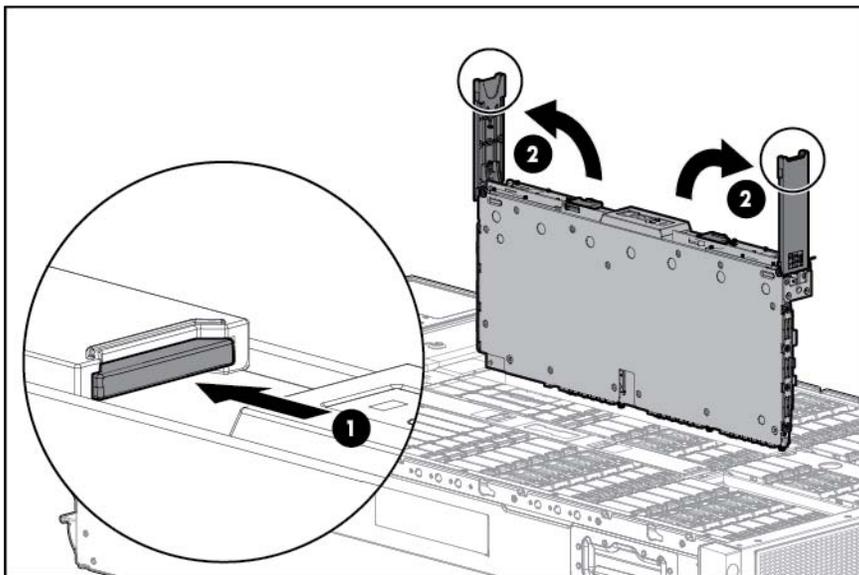
To install the switch module:

1. Extend the chassis from the rack (on page 12).
2. Remove the access panel (on page 13).

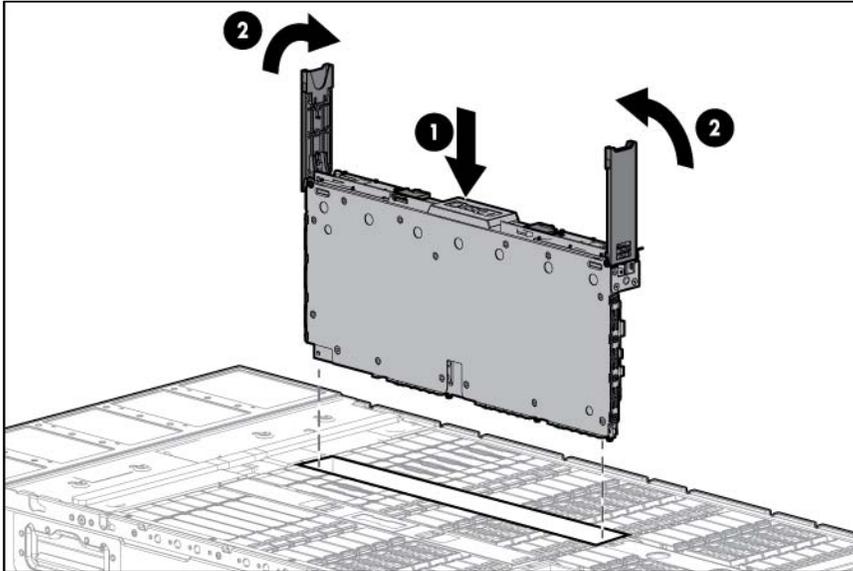
3. Locate the switch module slot and remove the blank.



4. Prepare the switch module for installation.



5. Align and install the switch module into the chassis.



6. Do one of the following:
 - o If the uplink module is already installed, verify the switch module powers on and the health LED is green.
 - o If the uplink module is not installed, install the uplink module before verifying LEDs.For more information, see "Installation information and guidelines (on page 16)."
7. Install the access panel.
8. Install the chassis in the rack.
9. After both components have been installed, verify the switch firmware is at the recommended firmware version. For more information, see the HP website (<http://www.hp.com/go/moonshot/download>).

The installation is complete.

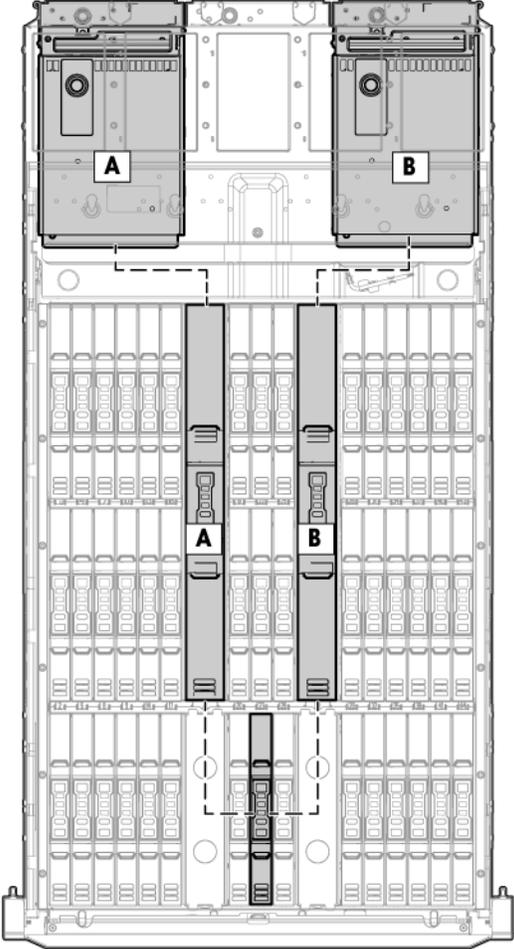
Configuration

Configuring the switch

To configure the switch, see the *Switch Administrator's Guide* and the *Switch CLI Command Reference* in the HP Moonshot Information Library (<http://www.hp.com/go/moonshot/docs>).

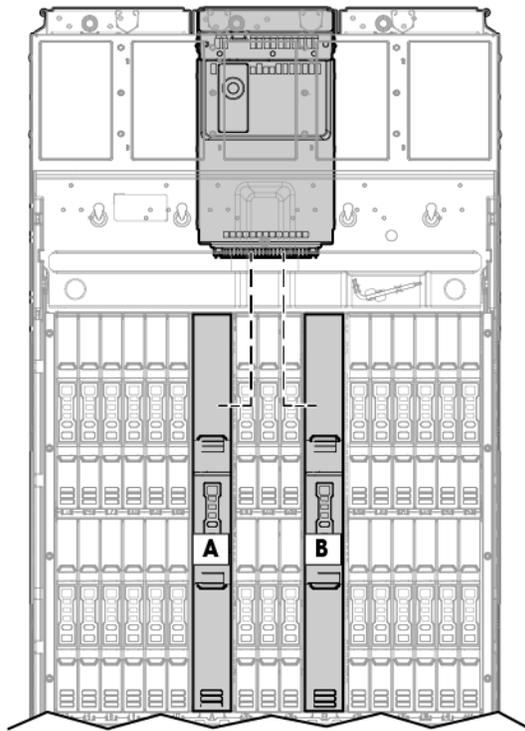
Network mapping

Production network mapping



The first network interface discovered by the operating system routes traffic through switch A. The second network interface discovered by the operating system routes traffic through switch B.

Management network mapping



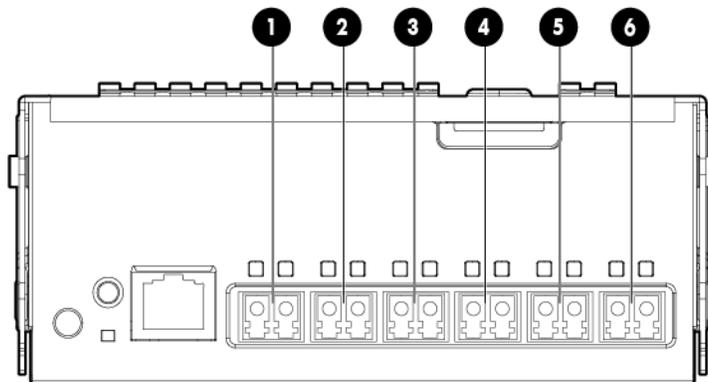
All traffic from the service port management interface is routed through the iLO CM management port (on page 11).

Interfaces

Interfaces are identified by the switch CLI using a unit/slot/port naming convention.

For more information on interface naming, see the *Switch Administrator's Guide* and the *Switch CLI Command Reference* in the HP Moonshot Information Library (<http://www.hp.com/go/moonshot/docs>).

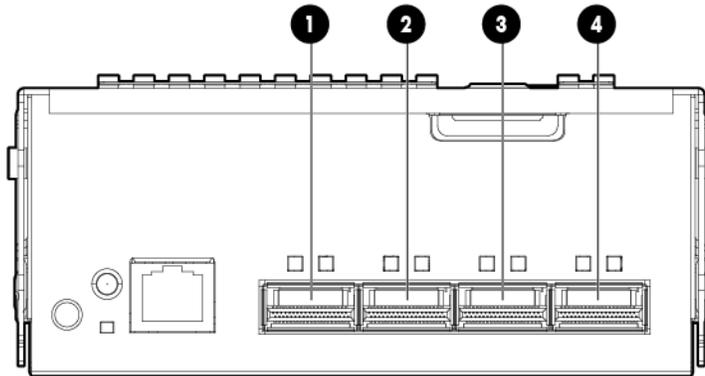
Moonshot-6SFP uplink interfaces



Item	Port	Interface
1	X1	1/1/1
2	X2	1/1/2
3	X3	1/1/3
4	X4	1/1/4
5	X5	1/1/5
6	X6	1/1/6

Interfaces 1/1/1–1/1/6 are the uplink ports that connect to the datacenter.

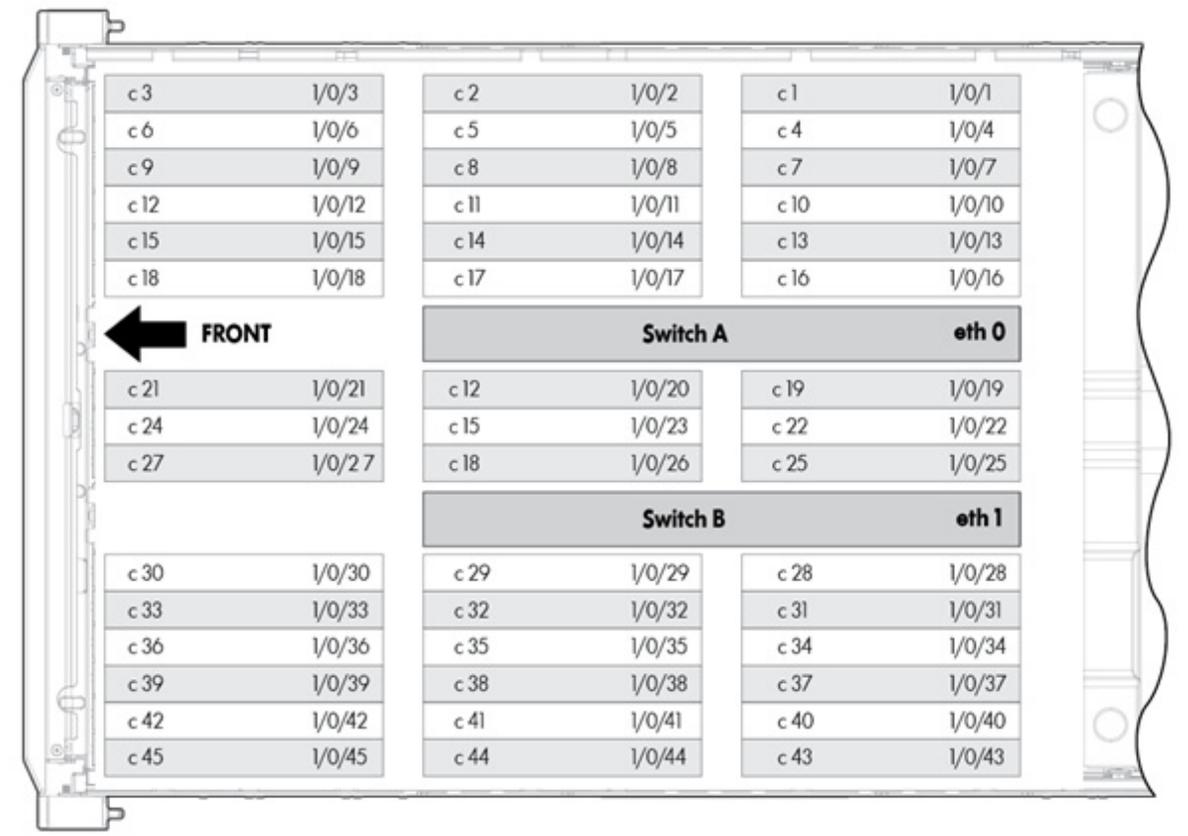
Moonshot-4QSFP+ uplink interfaces



Item	Port	Portmode	Interface
1	Q1	portmode 1x40G portmode 4x10G	1/1/1 1/1/2-5
2	Q2	portmode 1x40G portmode 4x10G	1/1/6 1/1/7-10
3	Q3	portmode 1x40G portmode 4x10G	1/1/11 1/1/12-15
4	Q4	portmode 1x40G portmode 4x10G	1/1/16 1/1/17-20

Interfaces 1/1/1–1/1/20 are the uplink ports that connect to the datacenter.

Moonshot-45G downlink interfaces

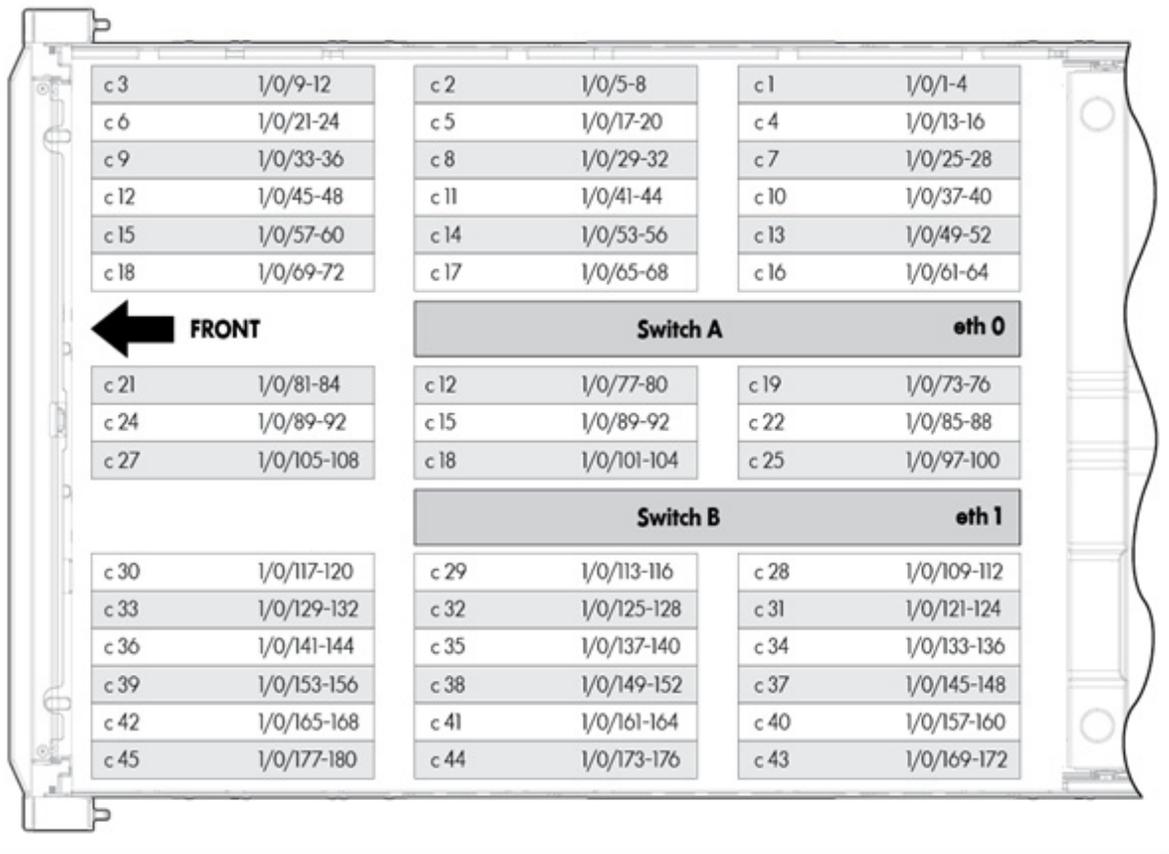


Interfaces 1/0/1–1/0/45 are the downlinks to the cartridge nodes.

Each SoC is identified as a cartridge node. The iLO CM firmware identifies each node as $c_{xn}y$, where c is the cartridge and n is the node.

Switch interfaces correspond to cartridge nodes, respectively. For example, $c_{28}n1$ corresponds to cartridge 28, node 1, and interface 1/0/28.

Moonshot-180G downlink interfaces



Interfaces 1/0/1–1/0/180 are the downlinks to the cartridge nodes.

Each SoC is identified as a cartridge node. The iLO CM firmware identifies each node as $c_{xn}y$, where c is the cartridge and n is the node.

Switch interfaces correspond to cartridge nodes, respectively. For example, $c_{22}n3$ corresponds to cartridge 22, node 3, and interface 1/0/87:

- Cartridge 22
 - Node 1 - 1/0/85
 - Node 2 - 1/0/86
 - Node 3 - 1/0/87
 - Node 4 - 1/0/88

Command Line Interface

Connect to the switch console

To manage the switch, use one of the following ports to connect to the switch console:

- Service port:
 - Out-of-band management
 - Over TCP/IP
 - Connect through the iLO CM management port ("[Obtaining the switch management IP address](#)" on page 28)
- Network port:
 - Inband management
 - Over TCP/IP
 - Connect through the network interface
- Serial console port:
 - Out-of-band management
 - Serial
 - Connect to the serial console port ("[Access the CLI locally](#)" on page 27)
- Virtual serial port:
 - Out-of-band management
 - iLO CM firmware
 - Connect to the virtual serial port from the iLO CM firmware CLI ("[Interacting with the switch from the iLO CM firmware](#)" on page 28)

Consider the following guidelines before managing the switch:

- A TCP/IP port and a serial port can be in use at the same time.
- Both TCP/IP ports cannot be in use at the same time.
- The serial console port and the virtual serial port cannot be in use at the same time.
- The switch requires a reboot before changing from one serial port to another.

Access the CLI locally

To access the CLI interface locally:

1. Use a console cable to connect a PC or terminal to the serial console port on the uplink module.
2. Configure the terminal with the following settings:
 - 115200 baud rate
 - 8 data bits
 - No parity
 - 1 stop bit

- No flow control
- 3. Start the terminal.
The switch login prompt appears.
- 4. Enter: `admin`
No password is set by default.

Obtaining the switch management IP address

To access the switch console remotely, be sure network connectivity is established with the iLO CM management port (on page 11).

If DHCP services are provided on the network, obtain the switch management IP address:

1. Access the switch CLI interface locally.
2. Enter privileged exec mode. At the switch prompt, enter:
`enable`
3. Show the switch management IP address. At the privileged exec prompt, enter:
`show serviceport`

If DHCP services are not available, configure the serviceport IP address.

Be sure to configure the enable password before managing the switch remotely.

To configure the switch, see the *Switch Administrator's Guide* and the *Switch CLI Command Reference* in the HP Moonshot Information Library (<http://www.hp.com/go/moonshot/docs>).

Configure the Enable password

The Enable password controls access to the privileged exec mode. The default authentication profile denies remote access to the privileged exec mode if the Enable password is not configured. Configure the Enable password before starting a remote session.

To configure the password:

1. Access the CLI locally (on page 27).
2. To access the privileged exec mode, enter the following command:
`enable`
No password prompt appears if a password is not configured.
3. To configure the Enable password, enter the following command:
`enable password {password}`

Interacting with the switch from the iLO CM firmware

Use the following iLO CM firmware commands to show switch information, set switch parameters, or connect to the switch console.

To show switch information:

- `show switch info`
- `show switch list`
- `show switch sn {sa|sb|sa-b}`
- `show switch pid {sa|sb|sa-b}`

- o show firmware revisions
- o show switch power
- o show switch temperature

To set switch power or switch UID LED:

- o set switch power {off|on} {sa|sb|sa-b}
- o set switch uid {off|on} {sa|sb|sa-b}

To connect to the switch console using the virtual serial port:

```
connect switch vsp {sa|sb}
```

If the virtual serial port is not configured, configure the virtual serial port before connecting to the switch console:

1. Enable VSP:
set switch vsp on {sa|sb}
 2. Reload the switch:
set switch power off {sa|sb}
- Traffic is halted on the associated switch.
- ```
set switch power on {sa|sb}
```

For more information on interacting with the switch from the iLO CM firmware, see the *HP Moonshot iLO Chassis Management CLI User Guide* in the HP Moonshot Information Library (<http://www.hp.com/go/moonshot/docs>).

# Firmware

## Update the switch firmware

Switch firmware can be updated using the following CLIs:

- The iLO CM firmware CLI
- The switch CLI

To perform updates from the iLO CM firmware CLI, see the *HP Moonshot iLO Chassis Management CLI User Guide* in the HP Moonshot Information Library (<http://www.hp.com/go/moonshot/docs>).

Switch updates are found on the HP Moonshot Component Pack download site (<http://www.hp.com/go/moonshot/download>).

## Updating the switch firmware using the switch console

Use TFTP, SFTP, or SCP to update the switch firmware using the switch console.

1. Connect to the switch console.
2. Log in to the switch.
3. Enter privileged exec mode:  
`enable`
4. Verify the version of the current switch image:  
`show bootvar`
5. Verify connectivity by pinging the file server:  
`ping x.x.x.x`
6. Copy the firmware image from the file server to the alternate firmware bank of the switch:  
`copy tftp://x.x.x.x/<path_to_file> alternate`  
If using SFTP or SCP:  
`copy {sftp|scp}://username@x.x.x.x/<path_to_file> alternate`
7. Verify the version of the new switch image:  
`show bootvar`
8. Configure the switch to boot from the alternate flash file system:  
`boot system alternate`
9. Reset the switch to boot from the new image:  
`reload`  
Traffic is halted on the associated switch. The switch boots from the alternate flash file system. The image is loaded and runs in the primary flash file system.
10. Verify the firmware update was successful:  
`show bootvar`
11. Update the boot loader on the switch:  
`update bootcode`
12. Update the CPLDs on the switch:



**NOTICE:** The CPLD update halts network traffic on the associated switch. Once initiated, do not interrupt the CPLD update. Permanent damage will occur to the switch. CPLD updates may last up to 10 minutes.

```
update cpld
```

The CPLD update reloads the switch and completes when the switch returns to an operational state. If no CPLD update is found, the update is not performed.

**13.** (Optional) Make a backup of the image:

```
copy primary alternate
```

This step overwrites the previous firmware version. Before committing, be sure no plans exist to downgrade switch firmware.

For more information on updating switch firmware, see the *Switch Module Administrator's Guide* and the *Switch Module CLI Command Reference* in the HP Moonshot Information Library (<http://www.hp.com/go/moonshot/docs>).

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# Troubleshooting

## Troubleshooting resources

The *HP Moonshot System Troubleshooting Guide* provides procedures for resolving common problems and comprehensive courses of action for fault isolation and identification, issue resolution, and software maintenance on the HP Moonshot System. The document is available in the HP Moonshot Information Library (<http://www.hp.com/go/moonshot/docs>).

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# Illustrated parts catalog

## Customer self repair

HP products are designed with many Customer Self Repair (CSR) parts to minimize repair time and allow for greater flexibility in performing defective parts replacement. If during the diagnosis period HP (or HP service providers or service partners) identifies that the repair can be accomplished by the use of a CSR part, HP will ship that part directly to you for replacement. There are two categories of CSR parts:

- **Mandatory**—Parts for which customer self repair is mandatory. If you request HP to replace these parts, you will be charged for the travel and labor costs of this service.
- **Optional**—Parts for which customer self repair is optional. These parts are also designed for customer self repair. If, however, you require that HP replace them for you, there may or may not be additional charges, depending on the type of warranty service designated for your product.

**NOTE:** Some HP parts are not designed for customer self repair. In order to satisfy the customer warranty, HP requires that an authorized service provider replace the part. These parts are identified as "No" in the Illustrated Parts Catalog.

Based on availability and where geography permits, CSR parts will be shipped for next business day delivery. Same day or four-hour delivery may be offered at an additional charge where geography permits. If assistance is required, you can call the HP Technical Support Center and a technician will help you over the telephone. HP specifies in the materials shipped with a replacement CSR part whether a defective part must be returned to HP. In cases where it is required to return the defective part to HP, you must ship the defective part back to HP within a defined period of time, normally five (5) business days. The defective part must be returned with the associated documentation in the provided shipping material. Failure to return the defective part may result in HP billing you for the replacement. With a customer self repair, HP will pay all shipping and part return costs and determine the courier/carrier to be used.

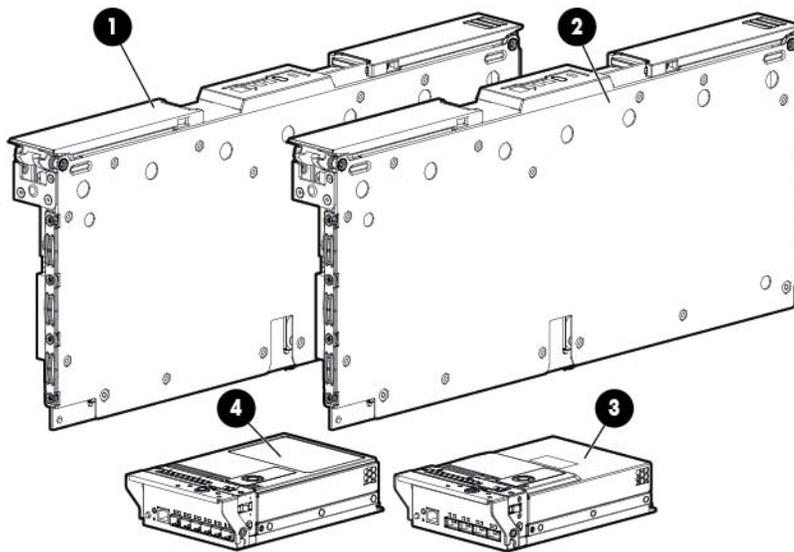
For more information about HP's Customer Self Repair program, contact your local service provider. For the North American program, refer to the HP website (<http://www.hp.com/go/selfrepair>).

## Parts only warranty service

Your HP Limited Warranty may include a parts only warranty service. Under the terms of parts only warranty service, HP will provide replacement parts free of charge.

For parts only warranty service, CSR part replacement is mandatory. If you request HP to replace these parts, you will be charged for the travel and labor costs of this service.

# Switch customer self repair components



| Item | Description                      | Spare part number | Customer self repair (on page 33) |
|------|----------------------------------|-------------------|-----------------------------------|
| 1    | HP Moonshot-45G Switch Module    | 712675-001        | Mandatory <sup>1</sup>            |
| 2    | HP Moonshot-180G Switch Module   | 712692-001        | Mandatory <sup>1</sup>            |
| 3    | HP Moonshot-4QSFP+ Uplink Module | 712694-001        | Mandatory <sup>1</sup>            |
| 4    | HP Moonshot-6SFP Uplink Module   | 712676-001        | Mandatory <sup>1</sup>            |
| 5    | Switch module bay blank*         | 726173-001        | Mandatory <sup>1</sup>            |
| 6    | Uplink module bay blank*         | 745288-001        | Mandatory <sup>1</sup>            |

\* Not shown

<sup>1</sup>Mandatory—Parts for which customer self repair is mandatory. If you request HP to replace these parts, you will be charged for the travel and labor costs of this service.

<sup>2</sup>Optional—Parts for which customer self repair is optional. These parts are also designed for customer self repair. If, however, you require that HP replace them for you, there may or may not be additional charges, depending on the type of warranty service designated for your product.

<sup>3</sup>No—Some HP parts are not designed for customer self repair. In order to satisfy the customer warranty, HP requires that an authorized service provider replace the part. These parts are identified as "No" in the Illustrated Parts Catalog.

---

# Removal and replacement procedures

## Removing the switch module

- 
- △ **CAUTION:** Be sure to save the running-configuration of the switch before removing any switch components.

---

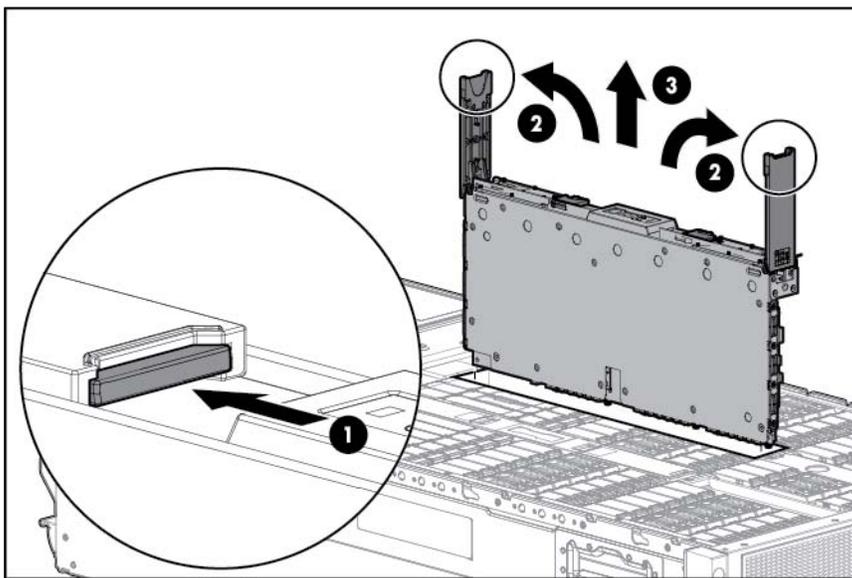
  - △ **CAUTION:** To avoid connectivity loss, do not remove switches already in operation.

---

  - △ **CAUTION:** For proper cooling, be sure every switch module bay and uplink module bay has either a blank or a module installed.
- 

To remove the switch module:

1. Extend the chassis from the rack (on page 12).
2. Remove the access panel (on page 13).
3. Locate and remove the switch module.



## Removing the uplink module

- 
- △ **CAUTION:** Be sure to save the running-configuration of the switch before removing any switch components.

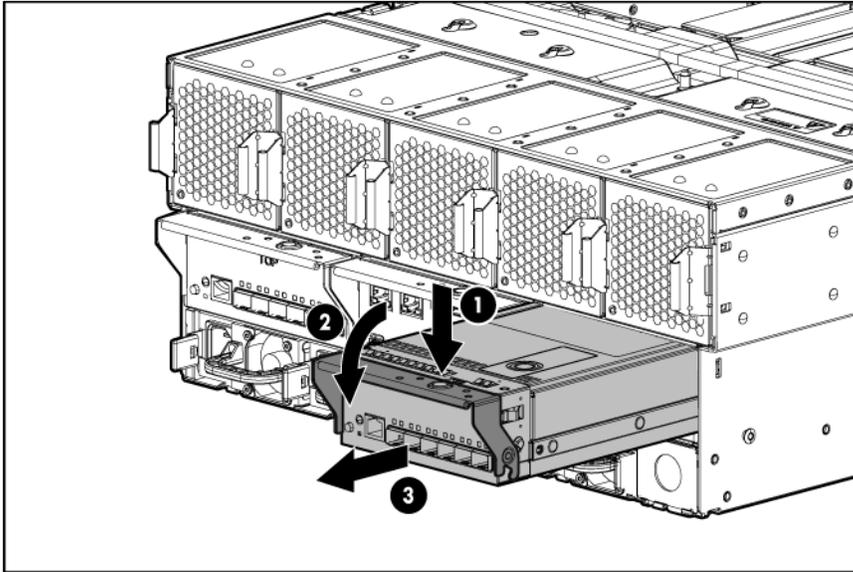
---

  - △ **CAUTION:** To avoid connectivity loss, do not remove switches already in operation.
-



**CAUTION:** For proper cooling, be sure every switch module bay and uplink module bay has either a blank or a module installed.

1. Open the cable management arm (on page 14).
2. Remove the component as indicated.



---

## Regulatory information

### Safety and regulatory compliance

For safety, environmental, and regulatory information, see *Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products*, available at the HP website (<http://www.hp.com/support/Safety-Compliance-EnterpriseProducts>).

### Turkey RoHS material content declaration

Türkiye Cumhuriyeti: EEE Yönetmeliğine Uygundur

### Ukraine RoHS material content declaration

Обладнання відповідає вимогам Технічного регламенту щодо обмеження використання деяких небезпечних речовин в електричному та електронному обладнанні, затвердженого постановою Кабінету Міністрів України від 3 грудня 2008 № 1057

### Warranty information

HP ProLiant and X86 Servers and Options (<http://www.hp.com/support/ProLiantServers-Warranties>)

HP Enterprise Servers (<http://www.hp.com/support/EnterpriseServers-Warranties>)

HP Storage Products (<http://www.hp.com/support/Storage-Warranties>)

HP Networking Products (<http://www.hp.com/support/Networking-Warranties>)

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# Electrostatic discharge

## Preventing electrostatic discharge

To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

## Grounding methods to prevent electrostatic discharge

Several methods are used for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm  $\pm 10$  percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have an authorized reseller install the part.

For more information on static electricity or assistance with product installation, contact an authorized reseller.

# Specifications

## Chassis environmental specifications

| Specification                              | Value                          |
|--------------------------------------------|--------------------------------|
| <b>Temperature range*</b>                  | —                              |
| Operating                                  | 10°C to 35°C (50°F to 95°F)    |
| Non-operating                              | -30°C to 60°C (-22°F to 140°F) |
| <b>Maximum Wet bulb temperature</b>        | —                              |
| Operating                                  | 28°C (82.4°F)                  |
| Non-operating                              | 38.7°C (101.7°F)               |
| <b>Relative humidity (noncondensing)**</b> | —                              |
| Operating                                  | 10% to 90%                     |
| Non-operating                              | 5% to 95%                      |

\* All temperature ratings shown are for sea level. An altitude derating of 1°C per 304.8 m (1.8°F per 1000 ft) to 3048 m (10,000 ft) is applicable. No direct sunlight allowed. Upper operating limit is 3,048 m (10,000 ft) or 70 kPa/10.1 psia. Upper non-operating limit is 9,144 m (30,000 ft).

\*\* Storage maximum humidity of 95% is based on a maximum temperature of 45°C (113°F). Altitude maximum for storage corresponds to a pressure minimum of 70 kPa (10.1 psia).

## Chassis specifications

| Specification        | Value                |
|----------------------|----------------------|
| Height               | 18.96 cm (7.46 in)   |
| Depth                | 84.91 cm (33.43 in)  |
| Width                | 44.33 cm (17.45 in)  |
| Weight, fully loaded | 81.65 kg (180.00 lb) |
| Weight, empty        | 43.09 kg (95.00 lb)  |

---

# Support and other resources

## Before you contact HP

Be sure to have the following information available before you call HP:

- Technical support registration number (if applicable)
- Product name
- Chassis serial number
- Product identification number
- Applicable error messages
- Operating system type and revision level

To obtain product information, log in to iLO CM firmware and use the `Show Chassis Info` command. For more information, see the *HP Moonshot iLO Chassis Management CLI User Guide* in the HP Moonshot Information Library (<http://www.hp.com/go/moonshot/docs>).

## HP contact information

For United States and worldwide contact information, see the Contact HP website (<http://www.hp.com/go/assistance>).

In the United States:

- To contact HP by phone, call 1-800-334-5144. For continuous quality improvement, calls may be recorded or monitored.
- If you have purchased a Care Pack (service upgrade), see the Support & Drivers website (<http://www8.hp.com/us/en/support-drivers.html>). If the problem cannot be resolved at the website, call 1-800-633-3600. For more information about Care Packs, see the HP website (<http://pro-aq-sama.houston.hp.com/services/cache/10950-0-0-225-121.html>).

---

# Acronyms and abbreviations

## CM

chassis management

## CMU

HP Insight Cluster Management Utility

## CPLD

complex programmable logic device

## CSR

Customer Self Repair

## DAC

direct attach cable

## DHCP

Dynamic Host Configuration Protocol

## ESD

electrostatic discharge

## ID

identification

## MAC

Media Access Control

## QSFP

quad small form-factor pluggable

## QSFP+

enhanced quad small form-factor pluggable

## SCP

Secure Copy Protocol

## SFP+

enhanced small form-factor pluggable

## SFTP

Secure File Transfer Protocol

## SoC

system on chip

## SR

short range

## SSH

Secure Shell

## TFTP

Trivial File Transfer Protocol

## UID

unit identification

## VSP

virtual serial port

---

# Documentation feedback

HP is committed to providing documentation that meets your needs. To help us improve the documentation, send any errors, suggestions, or comments to Documentation Feedback (<mailto:docsfeedback@hp.com>). Include the document title and part number, version number, or the URL when submitting your feedback.

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# Index

## A

access panel 13  
activity LED 5  
administration 21  
authorized reseller 40

## B

before you contact HP 40  
blank, removal 14, 15  
buttons 35

## C

cable management arm 14  
chassis, extend from rack 12  
CLI (Command Line Interface) 27  
CLI, accessing 27, 28  
compliance 37  
components 5, 33, 34  
components, identification 5, 33  
components, uplink module 6, 7  
configuration 21  
contact information 40  
contacting HP 40  
customer self repair (CSR) 33, 34, 40

## D

default interfaces 23, 24, 25, 26  
documentation feedback 43  
downloading files 30, 40

## E

electrostatic discharge 38  
extending chassis from rack 12

## F

firmware 30  
front panel components 5

## G

guidelines, installation 16  
guidelines, troubleshooting 32

## H

health LED 5, 9  
HP contact information 40  
HP technical support 40

## I

illustrated parts catalog 33  
installation 17, 18  
installing modules 17, 18  
interface 23, 24, 25, 26

## L

LED, health 5, 9  
LEDs 5, 6, 8, 9  
LEDs, front panel 5  
LEDs, unit identification (UID) 5, 9  
LEDs, uplink module 6, 8

## P

part numbers 33, 37  
port identification 23  
port mapping 22, 23  
port, management 11  
preparation procedures 12  
problem diagnosis 32

## R

regulatory compliance identification numbers 37  
regulatory compliance notices 37  
remote management 28  
replacing a module 35  
resources 32, 40

## S

serial console port 6, 7

- series number 37
- setup 16
- spare part numbers 33
- static electricity 38
- support and other resources 40
- switch firmware, updating 30
- switch health LEDs 5, 9
- switch module bay numbering 16, 17
- switch module, configuring 21
- switch module, installing 17, 18

## **T**

- technical support 40
- troubleshooting 32

## **U**

- updating firmware 28, 30
- uplink module 6, 8, 17
- uplink module bay identification 16, 17
- uplink module components 6, 7
- uplink module, configuring 21
- uplink module, installing 17
- uplink module, removing 35

## **W**

- warranty 33, 37
- website, HP 40