

Dell EMC DSS 9000R

Notes, cautions, and warnings

 **NOTE:** A NOTE indicates important information that helps you make better use of your product.

 **CAUTION:** A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

 **WARNING:** A WARNING indicates a potential for property damage, personal injury, or death.

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Overview

The DSS 9000 rack enclosure is designed to hold and protect server, network, and data storage equipment.

NOTE: The product at time of delivery may differ from the following illustrations.

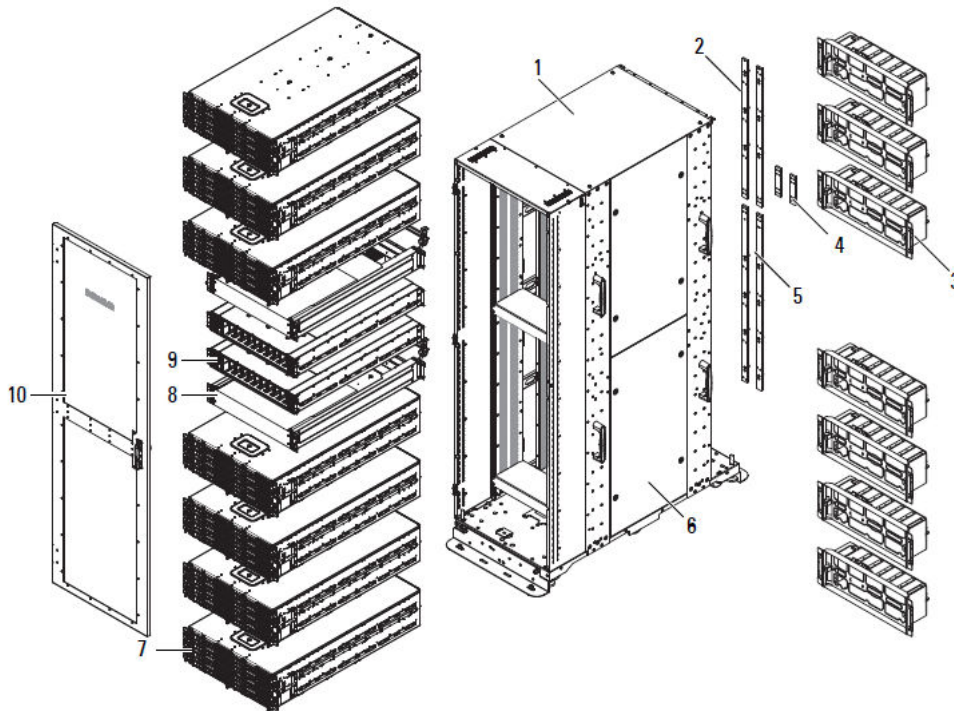


Figure 1. DSS 9000 system

Table 1. DSS 9000 features

No.	Feature	Description
1	Bare rack	Rack mounting enclosure for DSS 9000 system equipment.
2	Bus bar top	Bar strip located on top of the rack conducts electricity. Based on rack layout, two different types of top bus bars can be assembled. For more information about bus bars, see Bus bar top.
3	Rear cabinet	The rear cabinet houses twelve system fans, one block controller distribution board (BCDB), one block controller (BC), one fan cage, one fan power distribution board (FPDB), and one rear cabinet base.
4	Bus bar middle	Bridge bus bar located between top and bottom bus bars. For more information about bus bars, see Bus bar middle.
5	Bus bar bottom	Bar strip located on bottom of the rack conducts electricity. For more information about bus bars, see Bus bar bottom.
6	Side panel (optional)	Rack cabinet filler panel (optional).

No.	Feature	Description
7	Block chassis	Three types of block chassis (one third-width, half-width, and full-width).
8	OpenIT bay	Two switch devices are available to provide networking for the entire system.
9	Power Bay	Located on the front side of rack, provides allocated space for power supply units (PSUs).
10	Front door (optional)	Reversible front door can be configured to open from left or right, with lock.

Rack specifications

Table 2. Rack specifications

Item	Description
Height	Available rack options: <ul style="list-style-type: none"> • 29U: 1,466.4 mm (57.73 inch) • 42U: 1,970.4 mm (77.57 inch) • 44U: 2,071.2 mm (81.54 inch) • 48U: 2,272.8 mm (89.48 inch) • 50U: 2,373.6 mm (93.45 inch)
Width	600 mm (23.62 inch)
Depth	1,200 mm (47.24 inch)
Net weight	<ul style="list-style-type: none"> • 29U: 162.4 kg (358 lb) • 42U: 201.4 kg (444 lb) • 44U: 207.3 kg (457 lb) • 48U: 219.1 kg (483 lb) • 50U: 225.0 kg (496 lb)

Rack accessories overview

The DSS 9000 rack enclosure offers server and power supply blanks as well as shipping brackets, bus bar protectors and optional side panel accessories.

Topics:

- [Server blanks](#)
- [Power supply unit \(PSU\) blanks \(optional\)](#)
- [Side panels \(optional\)](#)
- [Shipping brackets](#)
- [PDU brackets](#)
- [Power bay protectors](#)
- [Bus bar protectors](#)
- [Rack blank fillers](#)
- [IM blank fillers](#)
- [Locating Service Tag of your system](#)

Server blanks

The following lists the available server blanks for the DSS 9000: full width, half width, and one third width blank chassis.

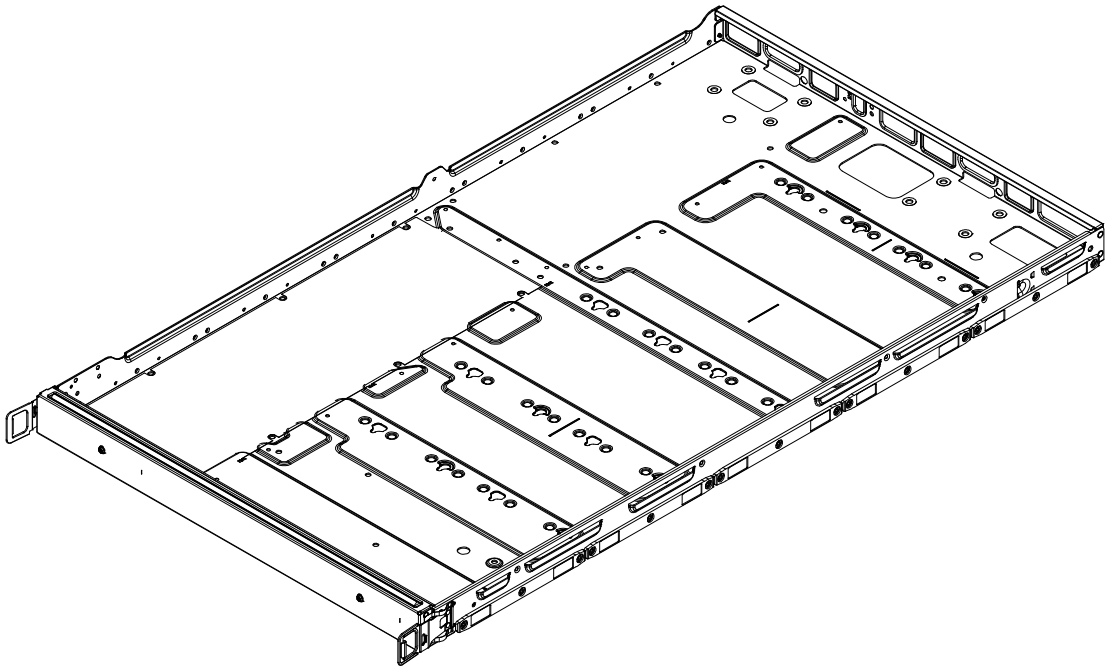


Figure 2. Full-width server blank

Table 3. Full-width server blank features

Item	Description
Dimensions (W x L x H)	527 mm x 930 mm x 47 mm (20.75 inch x 36.61 inch x 1.85 inch)

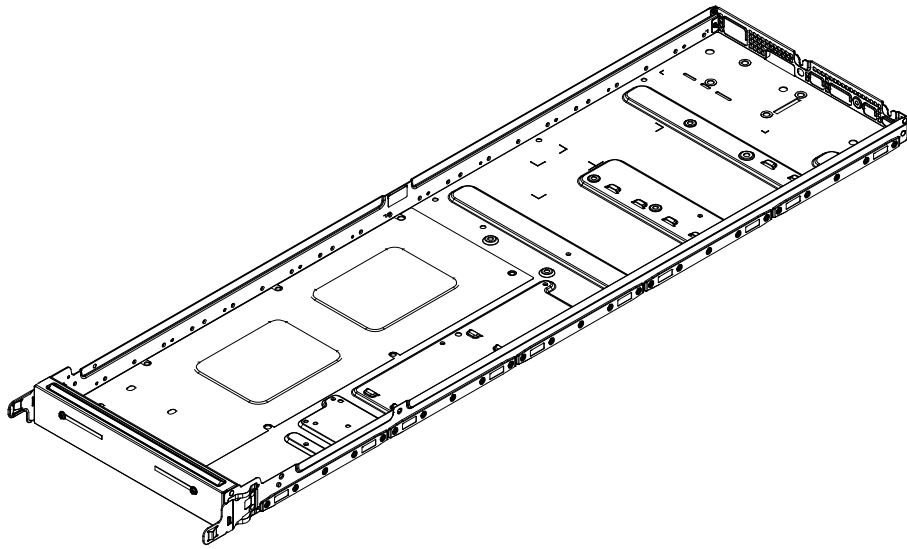


Figure 3. Half-width server blank

Table 4. Full-width server blank features

Item	Description
Dimensions (W x L x H)	262.2 mm x 930 mm x 47 mm (10.32 inch x 36.61 inch x 1.85 inch)

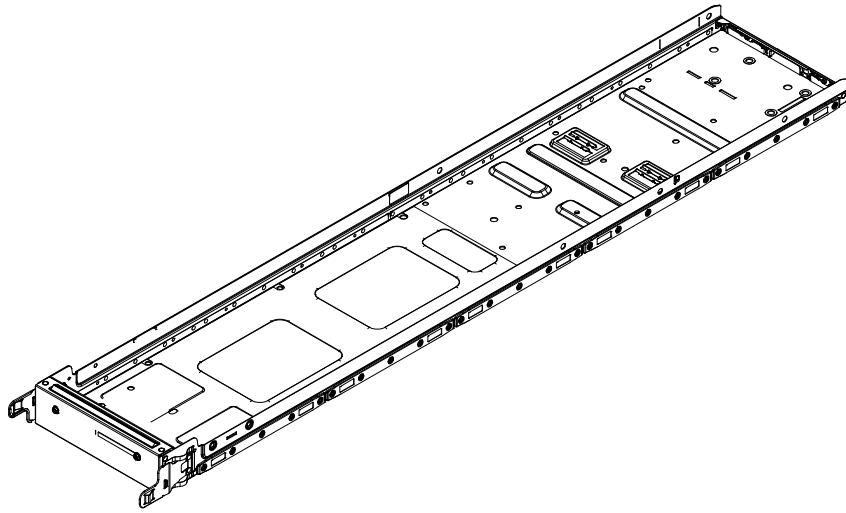


Figure 4. One third-width server blank

Table 5. Full-width server blank features

Item	Description
Dimensions (W x L x H)	174.3 mm x 930 mm x 47 mm (6.86 inch x 36.61 inch x 1.85 inch)

Power supply unit (PSU) blanks (optional)

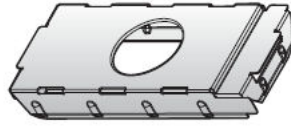


Figure 5. PSU blank

Side panels (optional)

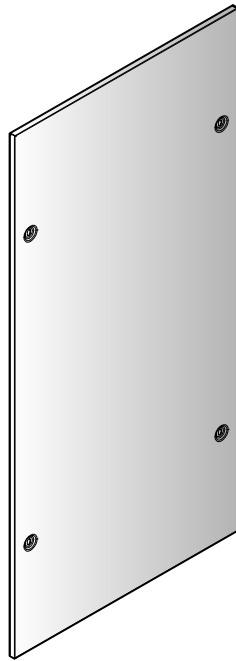


Figure 6. Filler panel

Shipping brackets

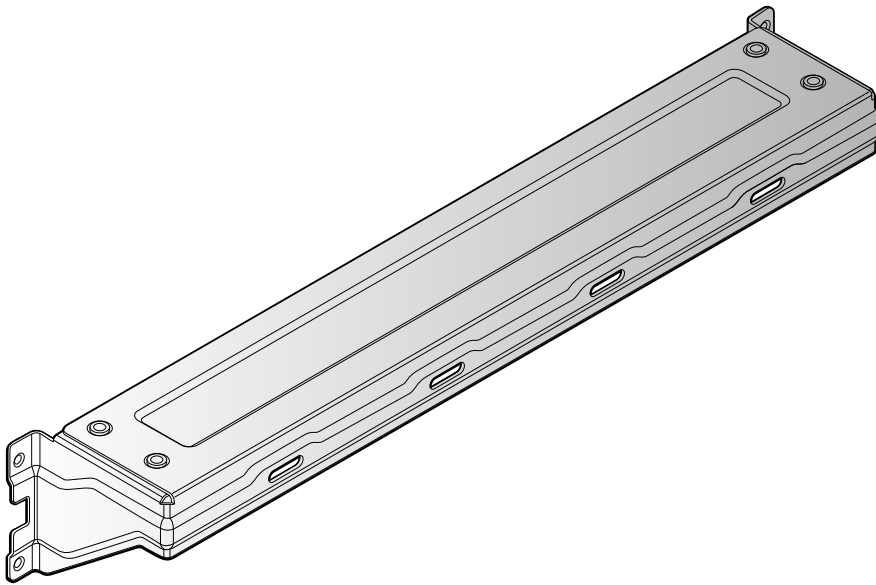


Figure 7. Shipping bracket

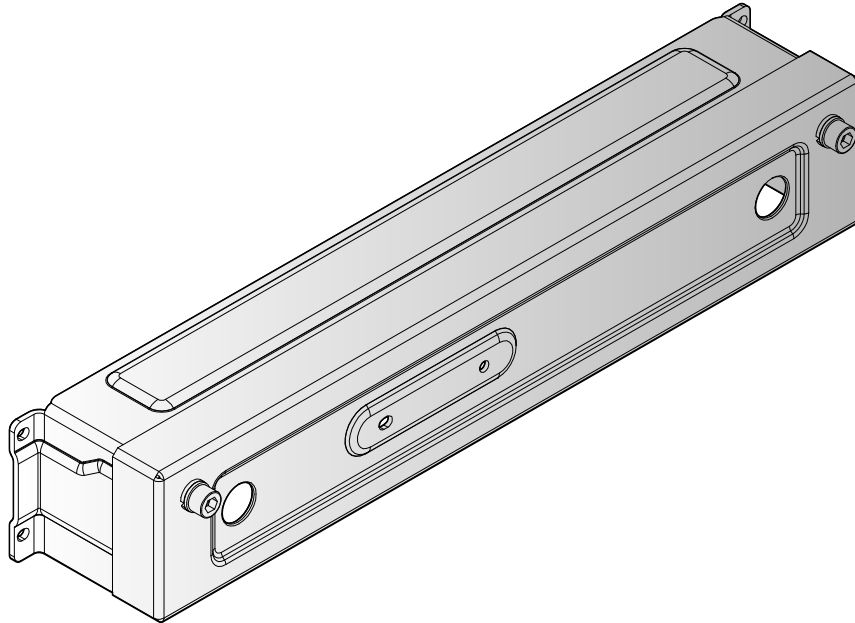
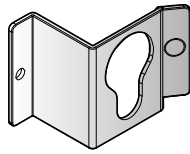


Figure 8. Shipping bracket

PDU brackets



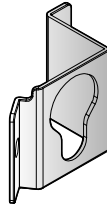


Figure 9. PDU bracket

Power bay protectors

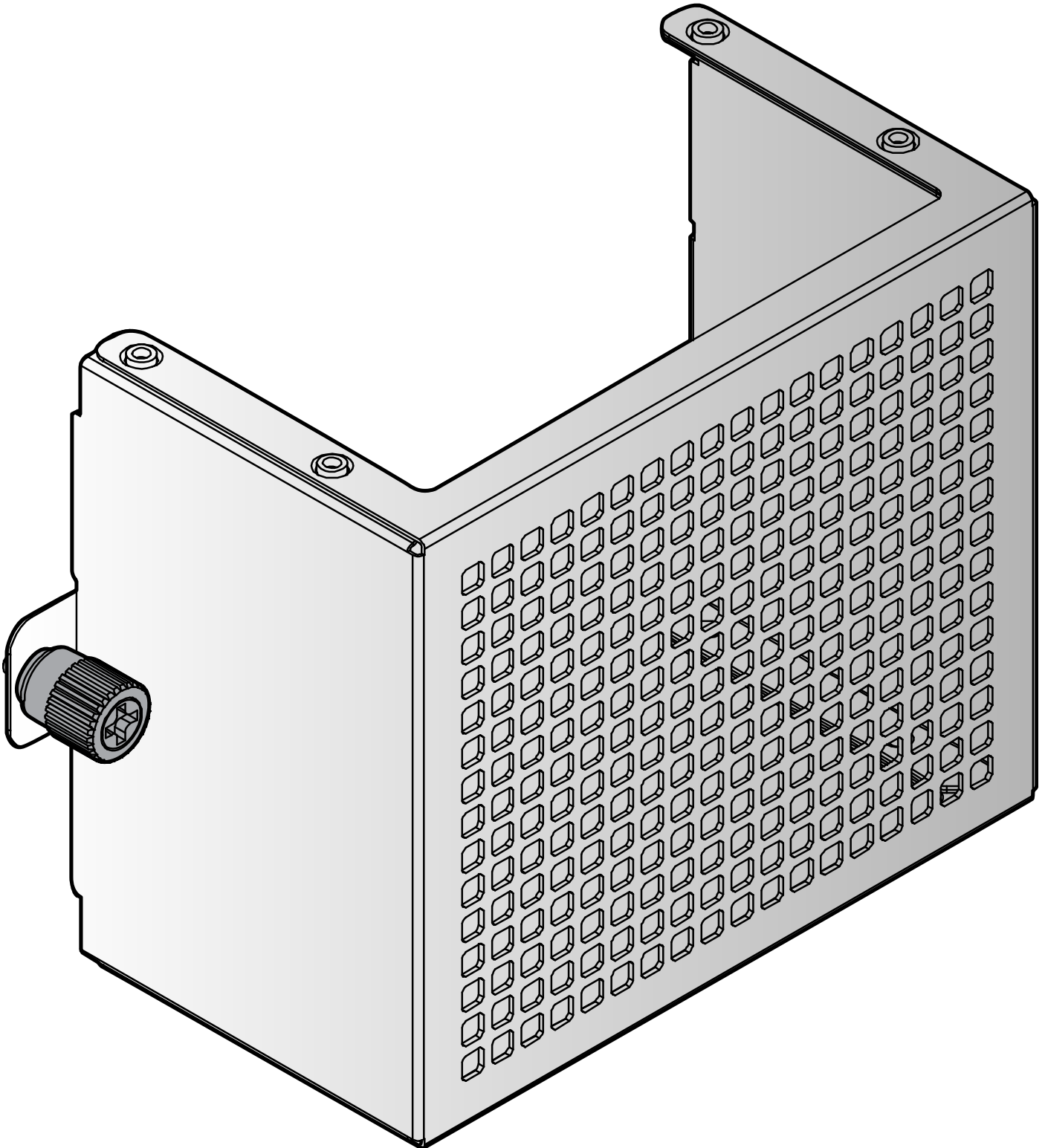


Figure 10. Power bay protector

Bus bar protectors

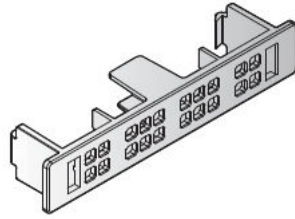
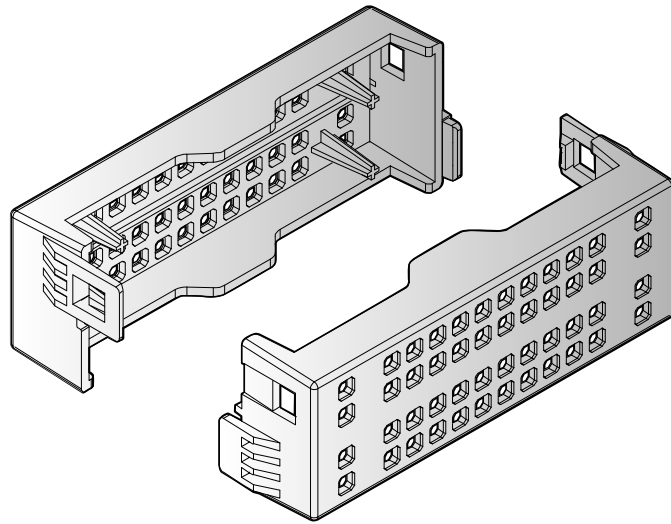


Figure 11. 0.5GU bus bar protector



86 **Figure 12.16** 16U bus bar protector
Rack accessories overview

Rack blank fillers

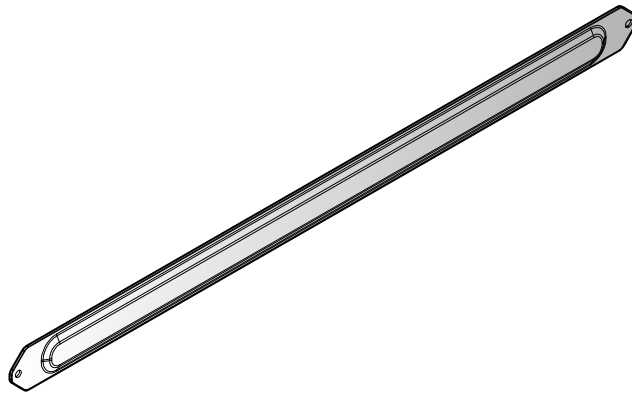
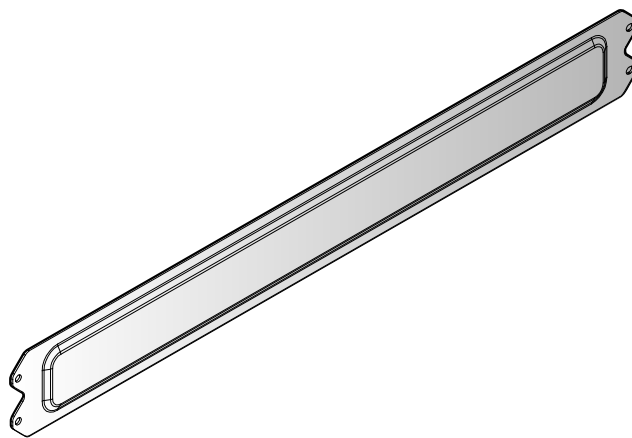


Figure 13. 1GU rack blank fillers



94 **Figure 14. 2GU rack blank fillers** Manual
Rack accessories overview

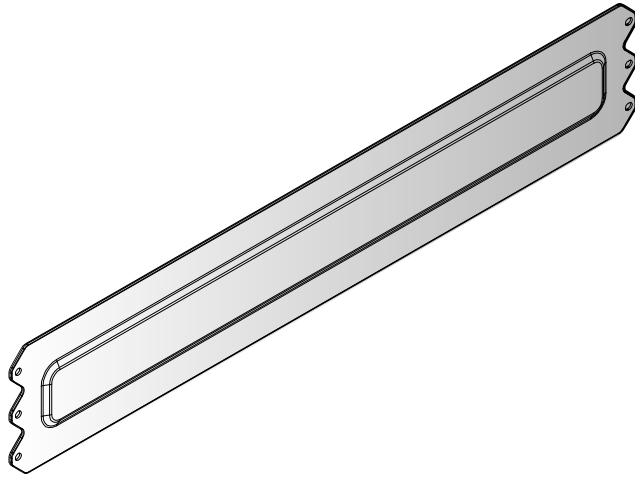
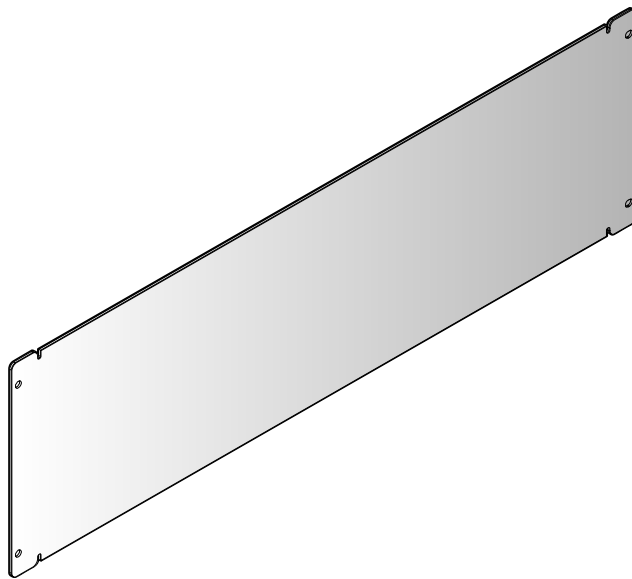


Figure 15. 3GU rack blank fillers



96 **Figure 16. 5GU rack blank fillers** Manual
Rack accessories overview

IM blank fillers

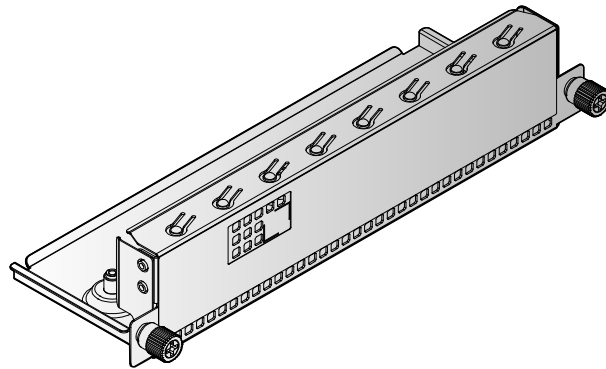


Figure 17. IM blank fillers

Locating Service Tag of your system

Your system is identified by a unique Express Service Code and Service Tag number. The information is on a sticker on the right-front of the system. This information is used by Dell to route support calls to the appropriate personnel.

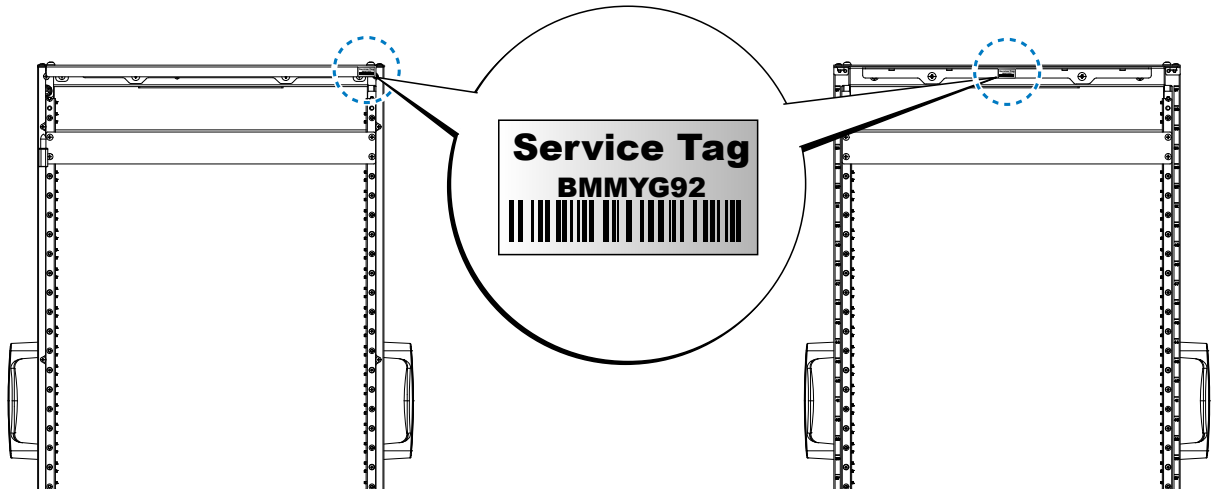


Figure 18. Service Tag location

Rear cabinet overview

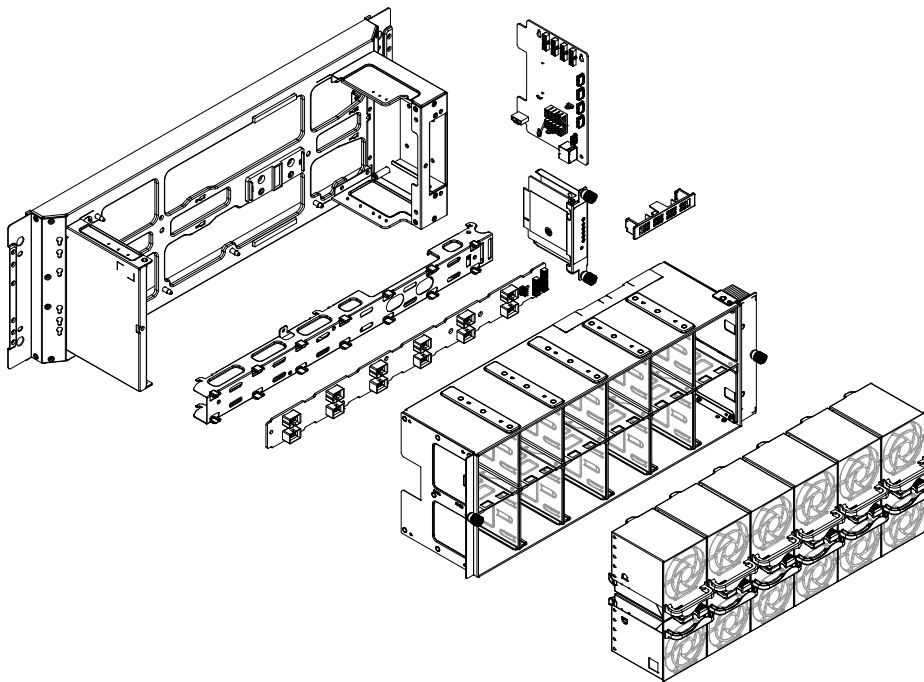


Table 6. Rear cabinet features

No.	Item	Description
1	BCDB (Block Controller Distribution Board)	<ul style="list-style-type: none"> • 1 x PCIe x8 connector • 4 x Fan zone connector • 4 x PIB connector • 1 x RJ45 • 1 x Temperature sensor connector
2	0.5U bus bar protector	Cover to prevent contact with the bus bar.
3	BC (Block Controller)	<p>Connectors</p> <ul style="list-style-type: none"> • 1 x PCIe x8 golden finger • 1 x RS232 • 1 x JTAG <p>LED</p> <ul style="list-style-type: none"> • 1 x power / status • 1 x ID • 4 x fan fail <p>Switch</p> <ul style="list-style-type: none"> • Reset switch (local)
4	Fan cage	<p>Supports up to twelve fan modules</p> <ul style="list-style-type: none"> • Width: 480 mm (18.89 inch) • Length: 114.5 mm (4.50 inch) • Height: 116.0 mm (4.56 inch)
5	Fan modules	Fan module includes twelve fans.
6	FPDB (Fan Power Distribution Board)	<ul style="list-style-type: none"> • 1 x 2x13 connector • 1 x 2x10 connector • 12 x 2x4 connectors
7	Rear cabinet base	Supports up to twelve fan modules

Topics:

- [Rear cabinet specifications](#)
- [Block control distribution board](#)
- [Block controller \(BC\) modules](#)
- [Fan power distribution boards \(FPDB\)](#)
- [Fan modules](#)

Rear cabinet specifications

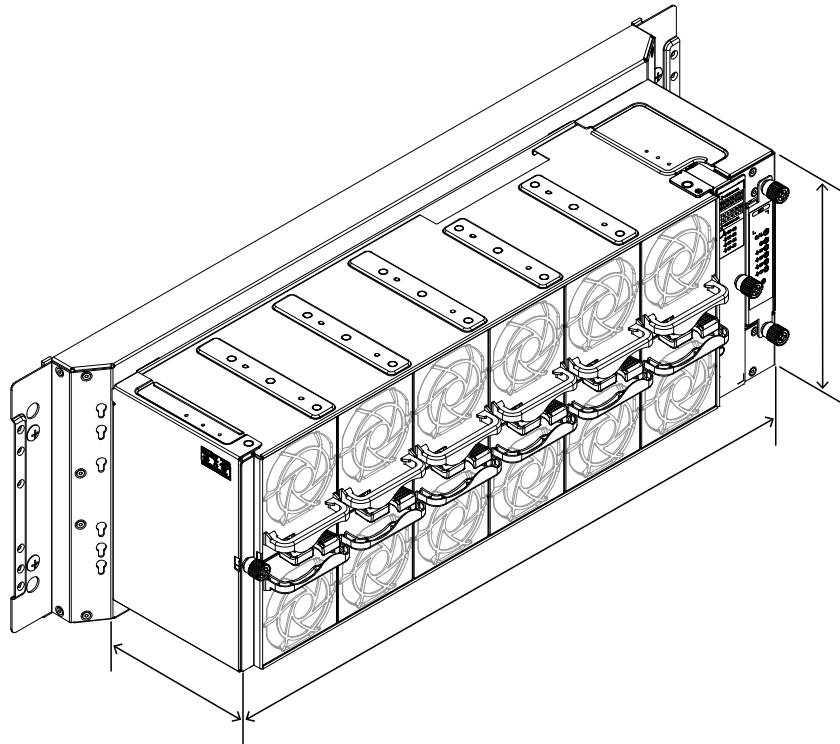


Figure 20. Rear cabinet

Table 7. Rear cabinet

Item	Description
Rear cabinet	Includes fan modules, fan cage, FPDB, BC, BCDB, and power strip brackets.
Dimensions (W x L x H)	480 mm x 114.5 mm x 167 mm (18.9 inch x 4.51 inch x 6.57 inch)

Block control distribution board

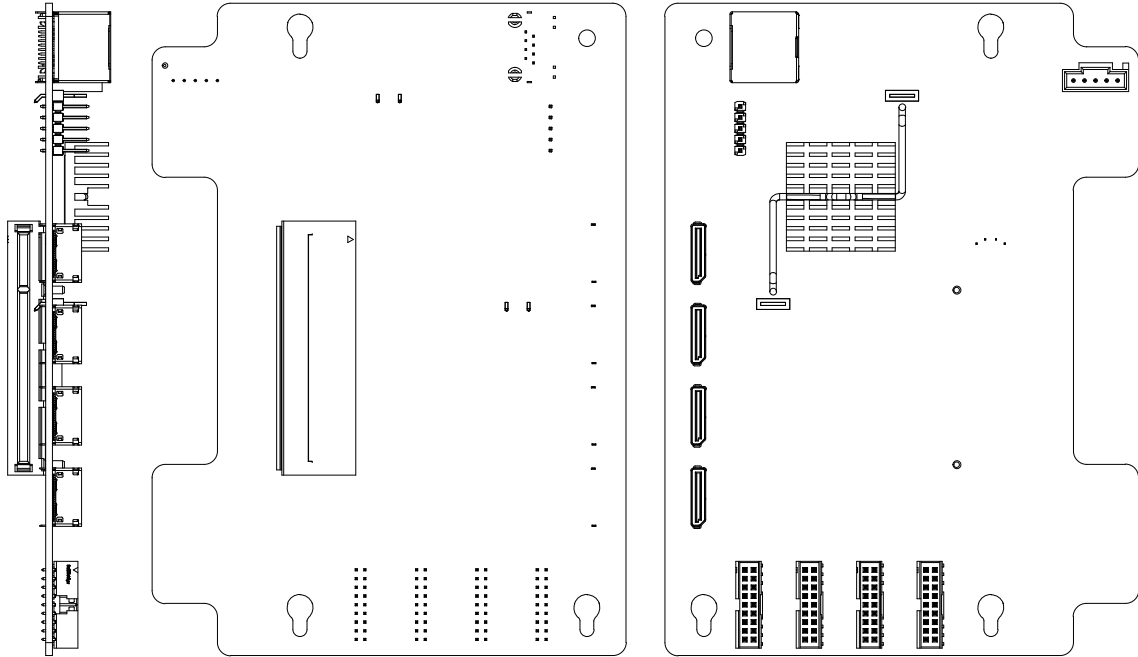


Figure 21. Block control distribution board

Table 8. Block control distribution board

Item	Description
Dimension (W x L x H)	150 mm x 109 mm x 1.5 mm (5.90 inch x 4.29 inch x 0.06 inch), 8 layers
Connector	<ul style="list-style-type: none"> · 4 x FAN Zone connector · 1 x RJ45 · 4 x NPIO connector · 1 x HTPB connector · 1 x BC connector · 1 x BCM UART connector
Net weight	78.6 g (2.77 ounce)
Operating voltage/current	12 V, current 0.2 A

LED definition

Table 9. LED

LED	Color	Status	Description
LED (Left)	Amber	Solid	Link speed: 100Mb
		Off	Disconnected
LED (Right)	Green	Blinking	LAN access

Block controller (BC) modules

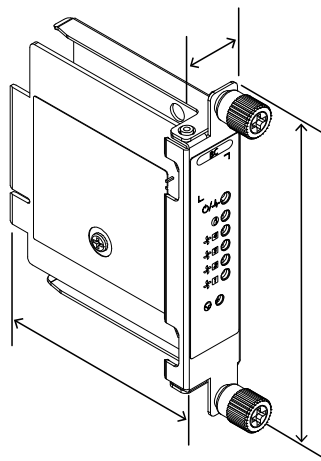


Figure 22. BC module

Table 10. BC module features

Item	Description
Dimension (W x L x H)	120 mm x 24 mm x 88 mm (4.72 inch x 0.94 inch x 3.46 inch)
Connector	<ul style="list-style-type: none"> · 1 x PCIe x8 golden finger · 1 x RS232 · 1 x JTAG
Switch	1 x Reset SW (Local)
Net weight	127.2 g (4.49 ounce)
Operating voltage/current	3.3 V, current 1 A

LED definition

Table 11. LED definition

LED	Color	Status	Description
Power/Status	Green	On	If there is no error
	Amber	On	If there is an error from anyone of these: (Mac address, Fan image, FPGA image, Mosfet, Ethernet link, I2C, FPGA configuration).
		Blinking	Infrastructure mismatch
UID	Blue	On/Off/Blinking	Identify BC board location
Fan zone 1~2	Amber	On	Fan fail
		Off	Normal work

Fan power distribution boards (FPDB)

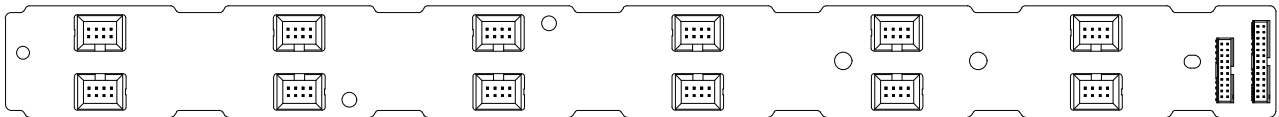
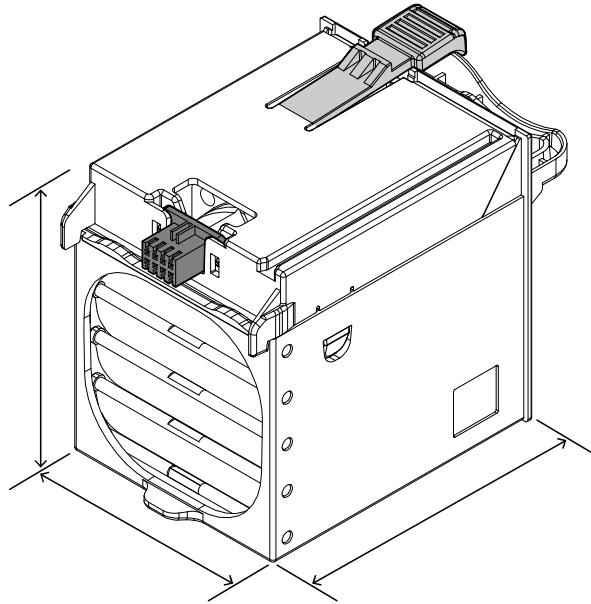


Figure 23. Fan power distribution board

Table 12. Fan power distribution board features

Item	Description
Board length	433 mm (17.05 inch)
Board width	38 mm (1.5 inch)
Connector	<ul style="list-style-type: none">· 1x (2x10) connector· 1x (2x13) connector· 12 x (2x4) connector
Net weight	129.2 g (4.56 ounce)
Operating voltage/current	12 V, current 32 A

Fan modules



Power bay overview

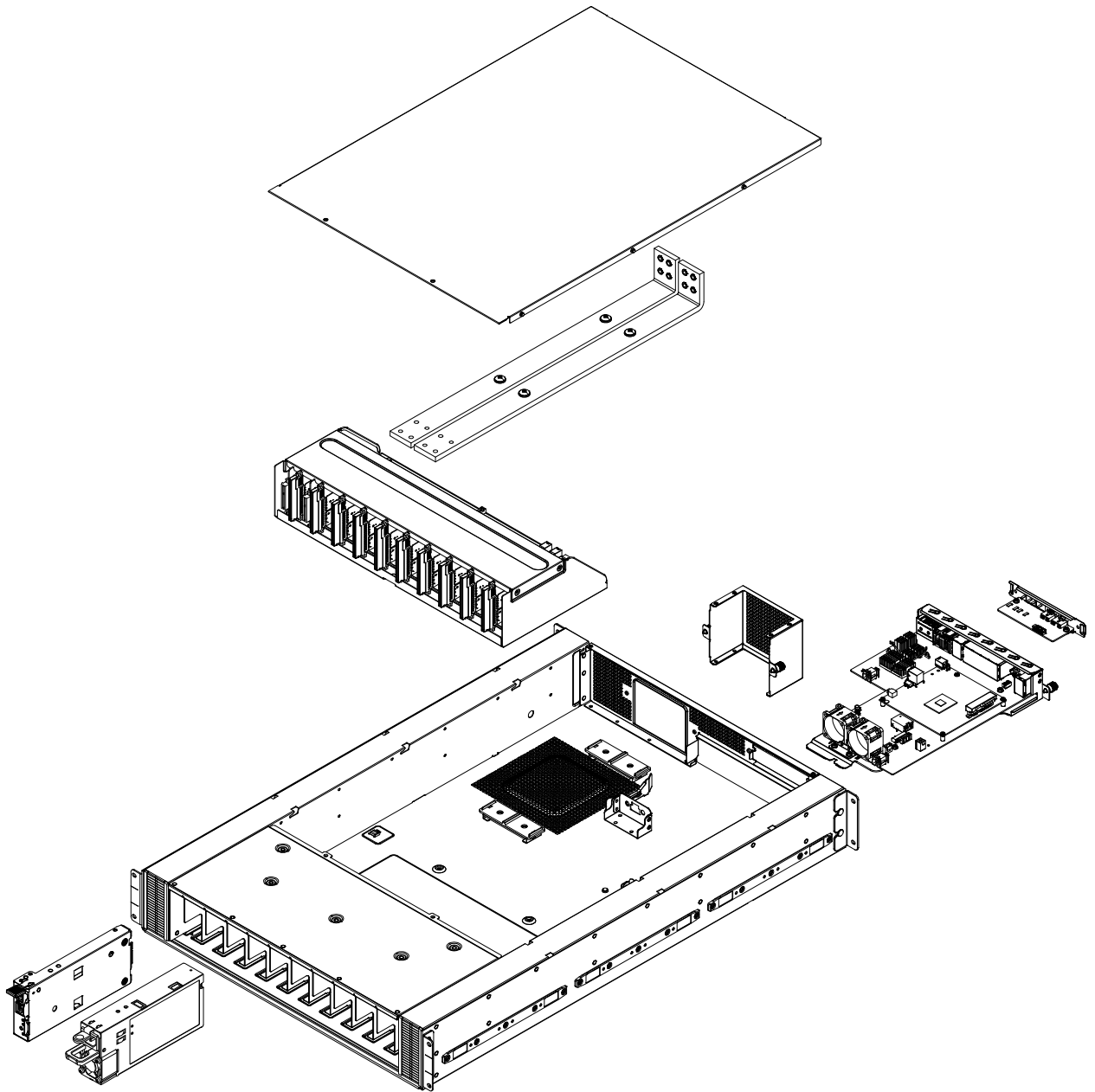


Table 13. Power bay features

No.	Item	Description
1	Top cover	Top cover for the power bay chassis.
2	Bus Bar PB	Bar strip to conduct electricity within the power bay.
3	PBPM	Power bay power module regulates power control for the PSU.
4	Rear IO module	Four RJ45 connectors, one 1x5 connector, one 1x6 connector and one 2x8 connector.
5	DSS 9000 rack manager module	Includes rack manager board (RMB) and infrastructure module (IM). MC and blocks of the IM are networked through a LAN.
6	Power supply unit (PSU)	Ten hot-swappable power supply units.
7	Management controller module	Monitoring through the on-board GbE to provide real-time two-way fan speed and power status and operational event information.

Topics:

- [Power bay specifications](#)
- [Power bay unit](#)

Power bay specifications

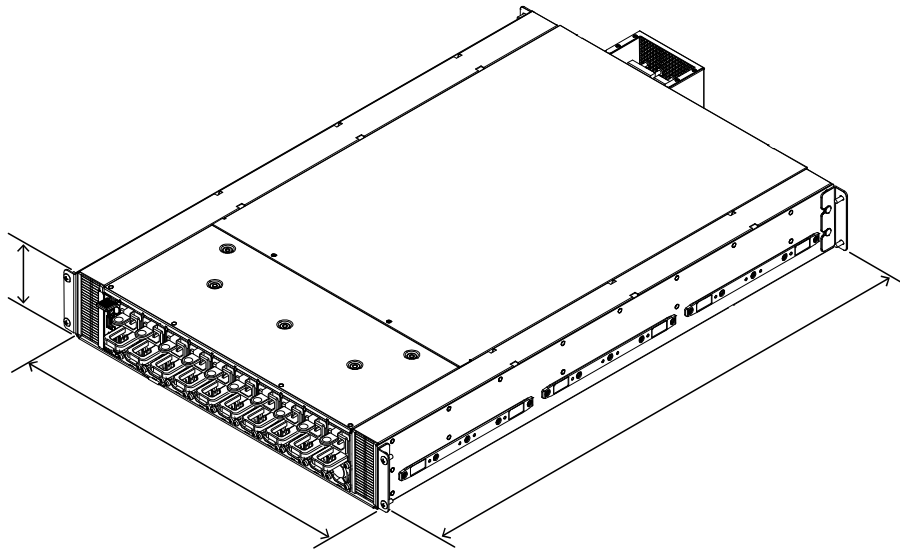


Figure 25. Power bay

Table 14. Power bay features

Item	Description
Dimensions (W x L x H)	537 mm x 800 mm x 98.6 mm (21.14 inch x 31.50 inch x 3.88 inch)
Output	<ul style="list-style-type: none"> • Ripple/CS accuracy same as specified in PSU specifications • Static regulation/dynamic regulation at bus bar as definition location in PBPM specifications. • On/Off capacity through PMBus control • Up to 10 kW (single PB with 5+5) • Up to 18 kW (single PB with 9+1)

Power bay unit

The DSS 9000 leverages a power bay which houses up to ten AC power supply units (PSUs) to fully support the operational requirements of the rack enclosure.

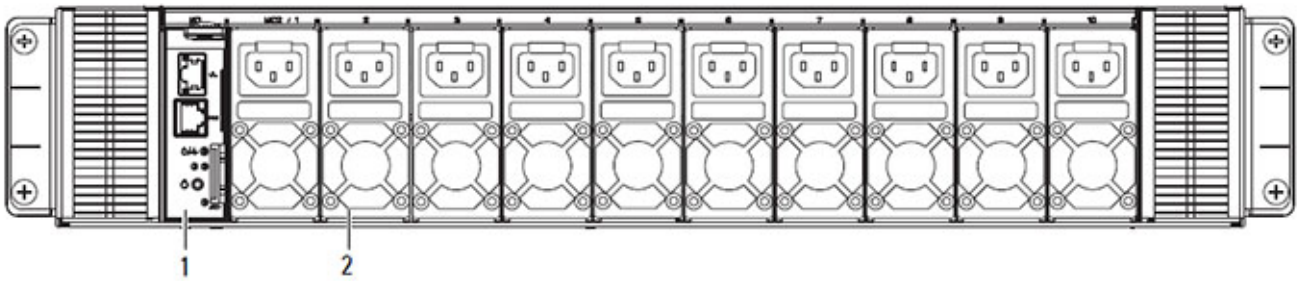


Figure 26. Power bay 1 MC + 10 PSU model (front view)

Table 15. Power bay 1 MC + 10 PSU model (front view)

No.	Item	Description
1	MC	One management controller module
2	Power supply unit	Ten hot-swappable power supply unit bays

Power bay allocation

When populating the PSU bays make sure to first populate bays 1 to 6 then 7 to 10 as required. A minimum of six power supply units are required to effectively sustain operations.

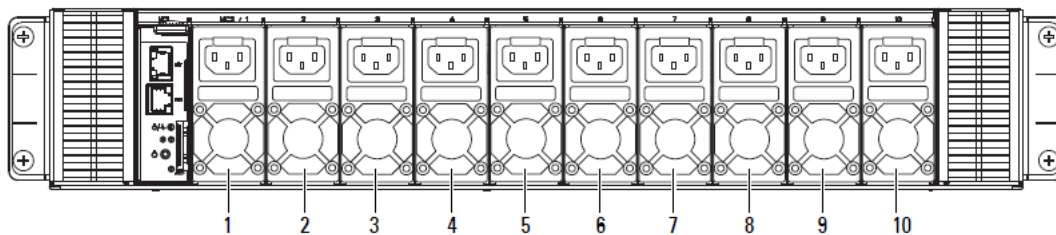


Figure 27. Power bay allocation

NOTE: To meet power requirements a minimum of six power supply units must be installed. Make sure to first populate power bays 1 to 6.

Rear view

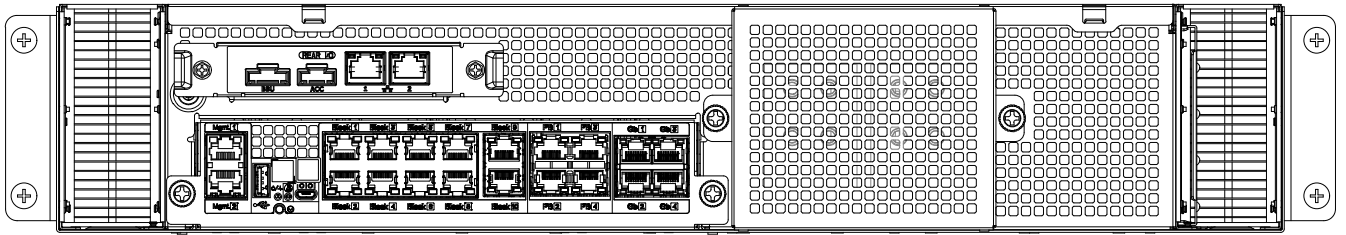


Table 16. Power bay overview (rear view)

No.	Item	Description
1	Rear IO	<ul style="list-style-type: none">• RJ45 connectors (x 4)• 1x5 connector (x 1)• 1x6 connector (x 1)• 2x8 connector (x 1)
2	Brush panel	Allows cabling to be fed to or from the rear of the cabinet and prevents dust ingress.
3	1U bus bar protector	Cover to prevent contact with the bus bar and an electrical short circuit.
4	Infrastructure module	<ul style="list-style-type: none">• Includes RJ45 ports• UID, power/status LEDs• Reset button• ICs: MCU, Ethernet switch, SPI ROM, EEPROM, TMP sensor, and RS232 driver/receiver

Power supply unit (PSU)

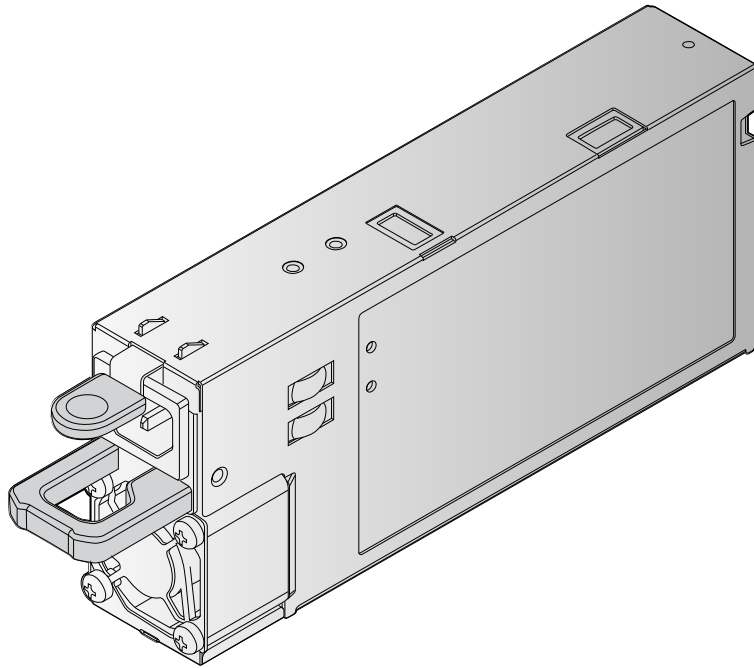


Table 17. Power supply unit (PSU)

Item	Description
Operating Temperature	10°C to 50°C (50°F to 122°F)

LED definition

Table 18. LED

LED	Color	Status	Description
PSU LED	Green	Solid	OK
	Amber	Blinking	Fault
		Off	Off

PSU specifications

Table 19. PSU specifications

PSU wattage	Class	Heat dissipation (maximum)	Frequency	Voltage	Maximum input current
2000 W AC	Platinum	675.37 BTU/hr	50/60 Hz	100–240 V AC, autoranging	11.5 A

① **NOTE:** Heat dissipation is calculated using the PSU wattage rating.

① **NOTE:** This system is also designed to connect to the IT power systems with a phase to phase voltage not exceeding 230 V.

Power bay power module (PBPM)

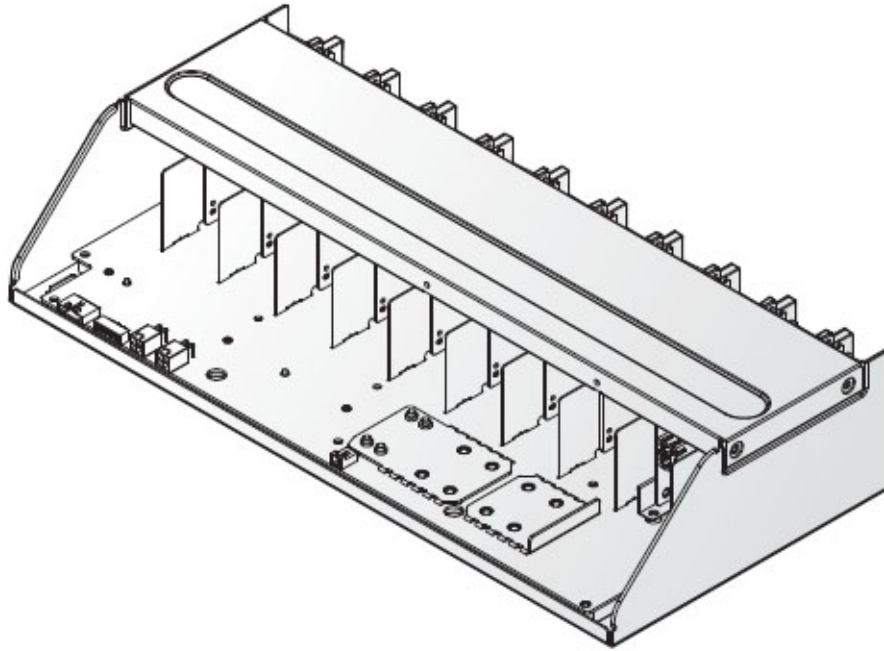


Figure 30. Power bay power module (PBPM)

Table 20. Power bay power module (PBPM)

Item	Description
	<ul style="list-style-type: none">• Supports multiple (max. 10) PSUs, each up to 2000 W PSU• Supports up to two management controller cartridges

Management controller (MC) module

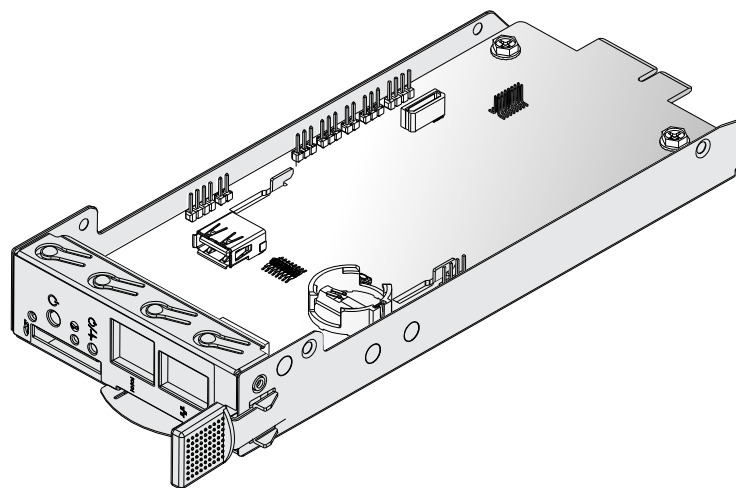


Table 21. Management controller

Item	Description
Board length	204.1 mm (8.03 inch)
Board width	82 mm (3.22 inch)
Net Weight	79 g (2.78 ounce.)
Connector	<ul style="list-style-type: none"> · 1 x PCIe x4 Gold-finger · 1 x RJ45 · 1 x Serial RJ45 · 1 x SD socket · 1 x USB · 1 x JTAG · 1 x Battery holder
Switch	1 x Power Button
Operating voltage/current	12 V, current 1.3 A

LED definition

Table 22. LED

LED	Color	Status	Description
LAN port			
Status	Green	On	1G LAN speed
	Amber	On	10M/100M LAN speed
Activity	Green	Blinking	Traffic access
Power/Status	Green	On	Power on
	Amber	On	Power on fail
UID	Blue	On/Off/Blinking	Identify MC board location
Error	Green	On	If there is no error
	Amber	Blinking	Infrastructure mismatch
		On	Link between MC and IM is Absent

Rear IO module

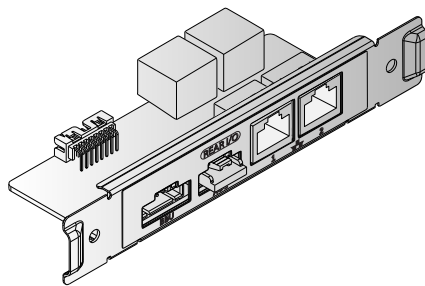


Table 23. Rear IO module

Item	Description
Board length	105 mm (4.13 inch)
Board width	40 mm (1.57 inch)
Net Weight	62.2 g (2.19 ounce)
Connector	<ul style="list-style-type: none"> · 4 x RJ45 connector · 1 x (1x5) connector · 1 x (1x6) connector · 1 x (2x8) connector

LED definition

Table 24. LED

LED	Color	Status	Description
LAN1 port			
Status	Green	On	1G LAN speed
	Amber	On	10M/100M LAN speed
Activity	Green	Blinking	Traffic access
LAN1 port			
Status	Green	On	10M/100M LAN speed
	Amber	On	1G LAN speed
Activity	Green	Blinking	Traffic access

DSS 9000 rack manager module

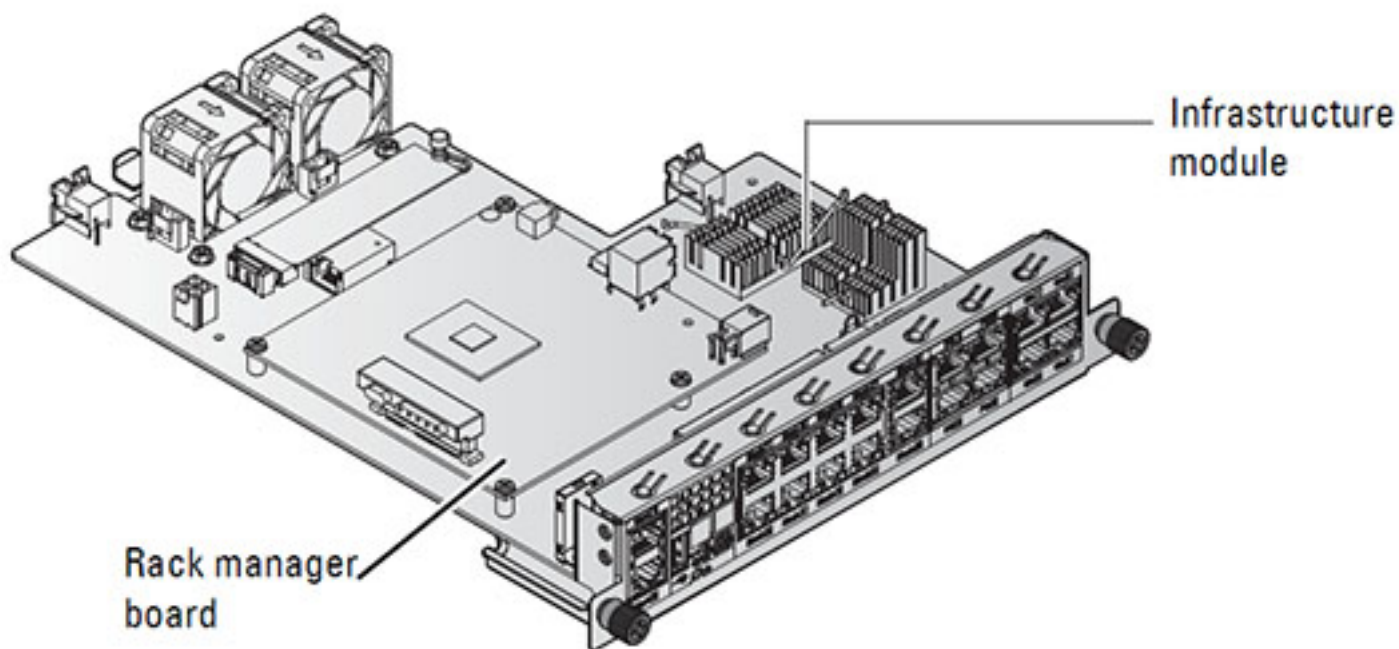


Figure 33. DSS 9000 rack manager module

Table 25. DSS 9000 rack manager module features

Item	Description
Board length	323.25 mm (12.73 inch)
Board width	242.3 mm (9.54 inch)
Net Weight	1,050 g (37.03 ounce)
Connector	<ul style="list-style-type: none"> · 2 x 8-port RJ45 · 1 x 2-port RJ45 · 1 x (2x2) Power connector · 1 x USB · 1 x (1x5) connector · 1 x Micro USB
Switch	1 x Reset Button
Operating voltage/current	12 V, current 2 A

Infrastructure module LED definition

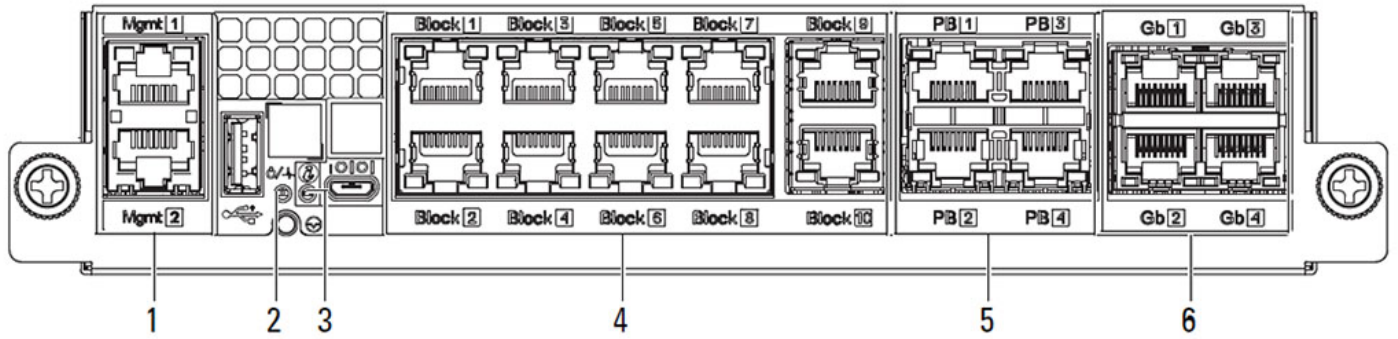


Figure 34. LED definition

Table 26. LED definition

Item	Port	LED	Color	Status	Description
1	Mgmt	Right LED	Green	Blinking	Active
		Left LED	Green	On	Link speed: 1Gb
			Yellow	On	Link speed: Others
			Off	No link	
2	Power/Status		Green	On	Fault not detected
			Amber	On	Fault detected: Mac address, I2C.
			Blinking	Infrastructure mismatch or fan fault	
3	UID		Blue	On/Off/Blinking	Identify IM board location
4	Block (1-10)	Right LED	Green	Blinking	Active
		Left LED	Green	On	Link speed: 1Gb
			Off	No link	
5	PB (1-4)	Right LED	Green	Blinking	Active
		Left LED	Yellow	On	Link speed: 100Mb
			Off	Link speed: 10Mb or no link	
6	Gb (1-4)	Right LED	Green	Blinking	Active
		Left LED	Green	On	Link speed: 1Gb
			Yellow	On	Link speed: Other
			Off	No link	

Bus bar overview

The DSS 9000 rack enclosure includes bus bar to the following areas:

- Rack level
- Block level
- Power bay level

Topics:

- [Rack level bus bar](#)
- [Block level bus bar](#)
- [Power bay level bus bars](#)

Rack level bus bar

Bus bar top

The top of the rack includes two bus bars, positive and negative. The bus bars are coupled to the middle bus bars for upward distribution of the system's power.

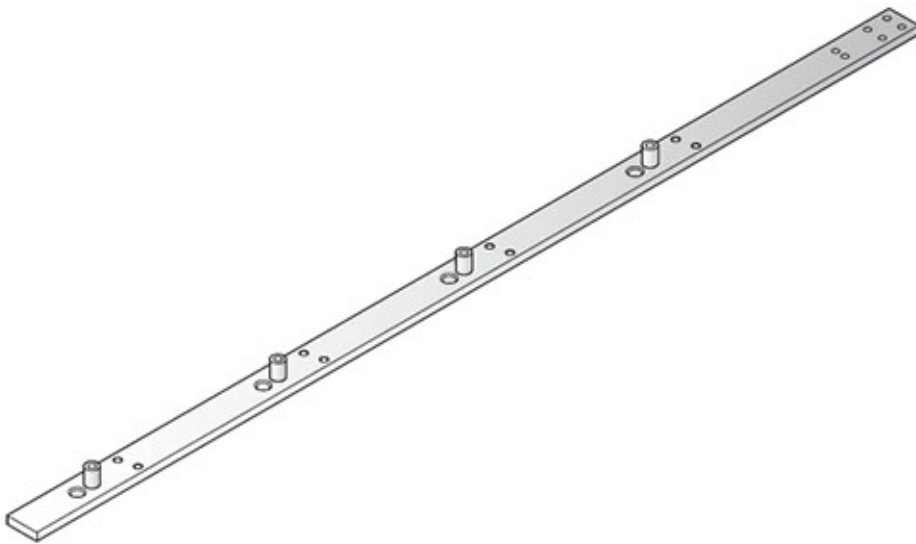


Figure 35. Bus bar top-P (positive, red)

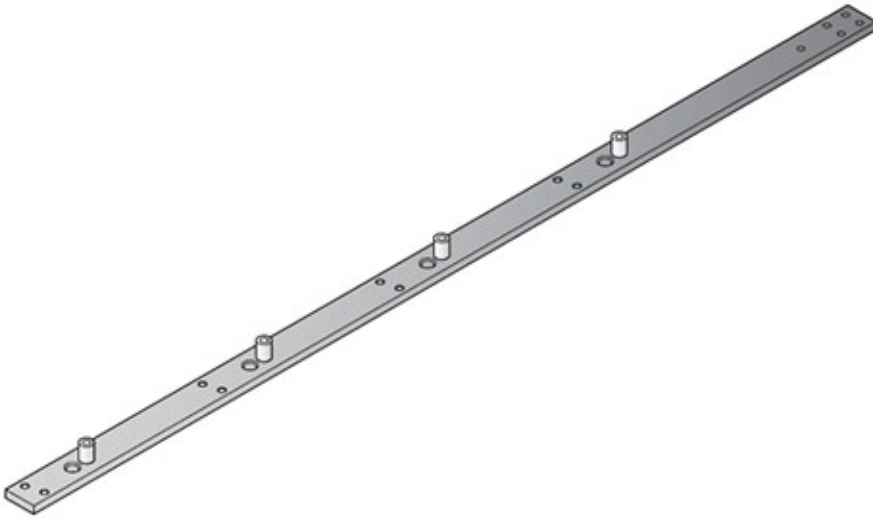
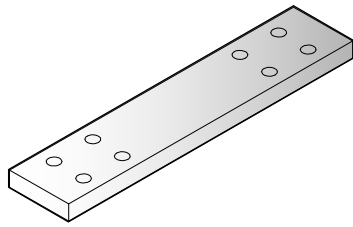


Figure 36. Bus bar top-N (negative, black)

Bus bar middle

The middle of the rack includes two bus bars, positive and negative. The bus bars couple the power block and the top bus bars for upward distribution of the system's power.



60
Figure 37. Bus bar middle-P (positive, red)
Bus bar overview

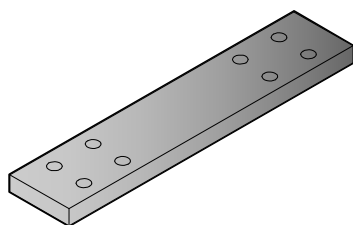


Figure 38. Bus bar middle-N (negative, black)

Bus bar bottom

The bottom of the rack includes two bus bars, positive and negative. The bus bars are coupled to the middle bus bars for downward distribution of the system's power.

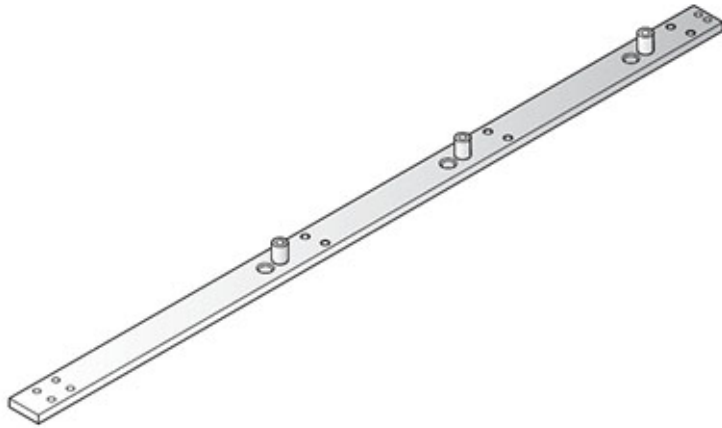


Figure 39. Bus bar bottom-P (positive, red)

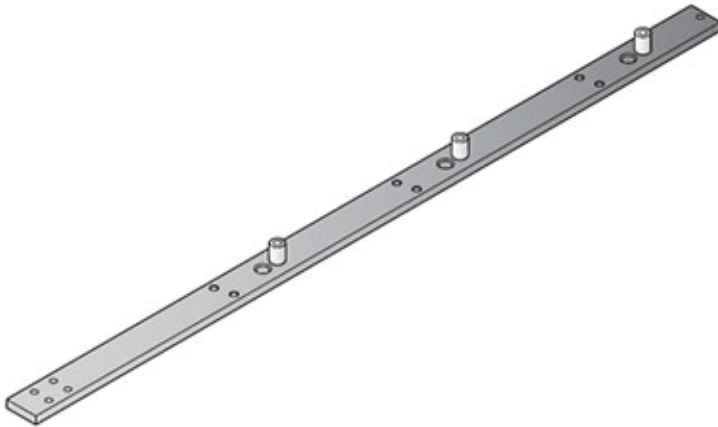


Figure 40. Bus bar bottom-N (negative, black)

Block level bus bar

The following cross bus bar types are specific for the 6GU block.

One third-width cross bus bar block

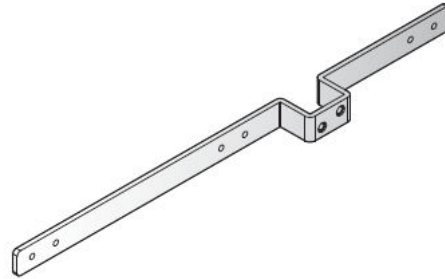


Figure 41. One third-width cross bus bar block-P (positive, red)

Table 27. Third width cross bus bar block-P (positive, red)

Item	Description
Length	334.4 mm (13.17 inch)
Width	20 mm (0.79 inch)
Height	34 mm (1.34 inch)
Thickness	4 mm (0.16 inch)

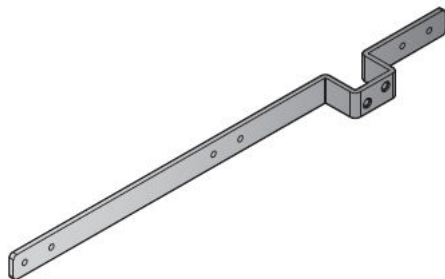


Figure 42. One third-width cross bus bar block-N (negative, black)

Table 28. One third-width cross bus bar block-N (negative, black)

Item	Description
Length	334.4 mm (13.17 inch)
Width	20 mm (0.79 inch)
Height	34 mm (1.34 inch)
Thickness	4 mm (0.16 inch)

Half-width/full-width cross bus bar block

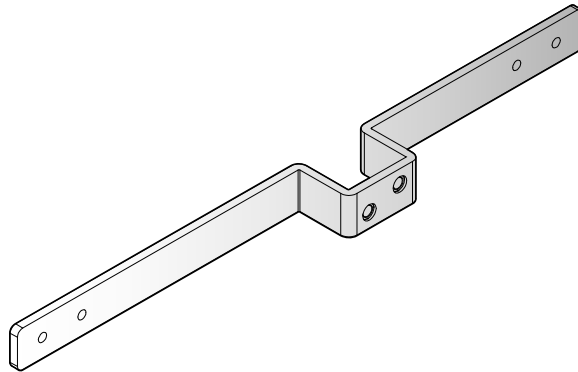
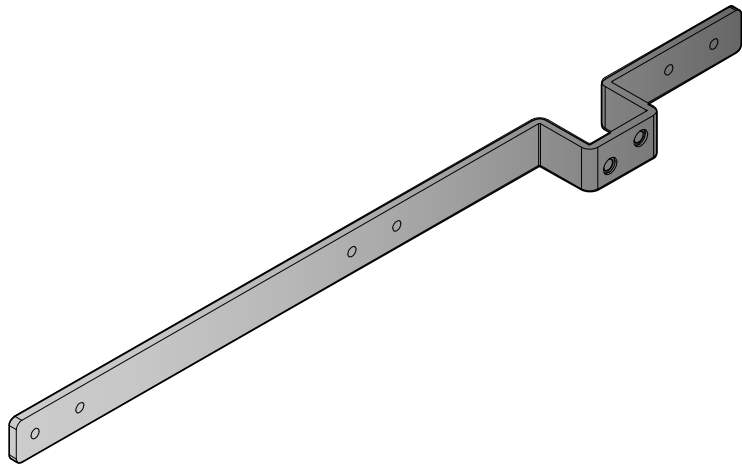


Table 29. Half-width/full-width cross bus bar block-P (positive, red)

Item	Description
Length	334.4 mm (13.17 inch)
Width	20 mm (0.79 inch)
Height	34 mm (1.34 inch)
Thickness	4 mm (0.16 inch)



66 Installation and Service Manual
Figure 44. Half-width/full-width cross bus bar block-N (negative, black)
Bus bar overview

Table 30. Half-width/full-width cross bus bar block-N (negative, black)

Item	Description
Length	334.4 mm (13.17 inch)
Width	20 mm (0.79 inch)
Height	34 mm (1.34 inch)
Thickness	4 mm (0.16 inch)

Power bay level bus bars

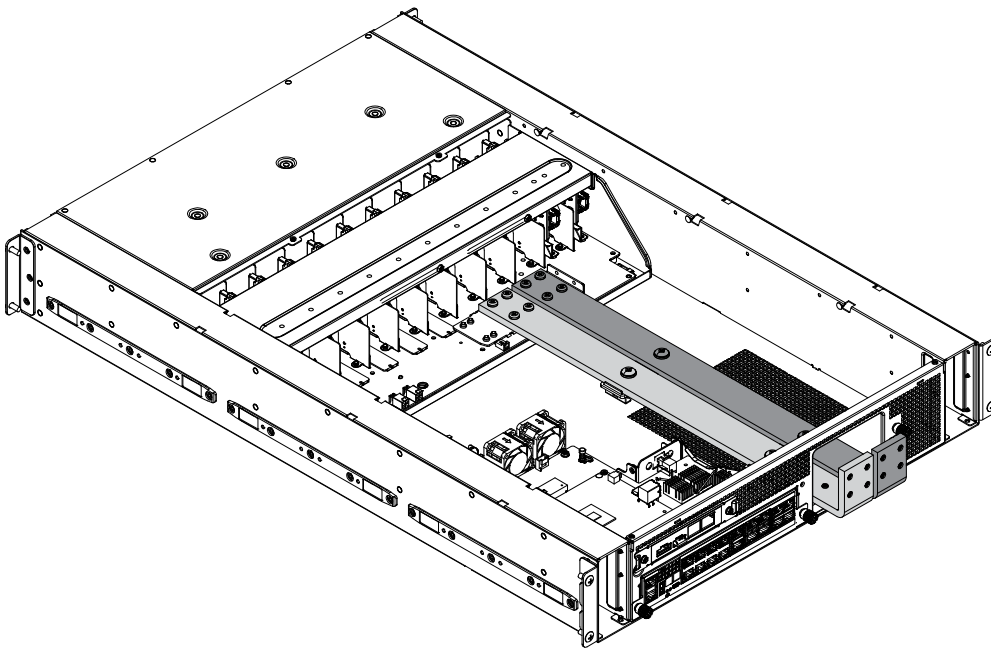


Figure 45. Power bay level bus bar

Bus bar-PB

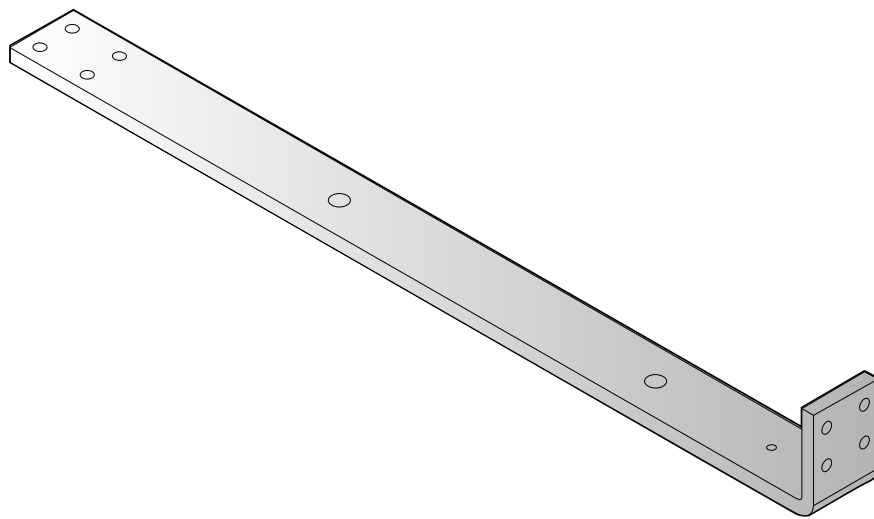


Table 31. Bus bar-PB-P (positive, red)

Item	Description
Length	507.7 mm (19.99 inch)
Width	40 mm (1.57 inch)
Height	58.8 mm (2.31 inch)
Thickness	8 mm (0.31 inch)

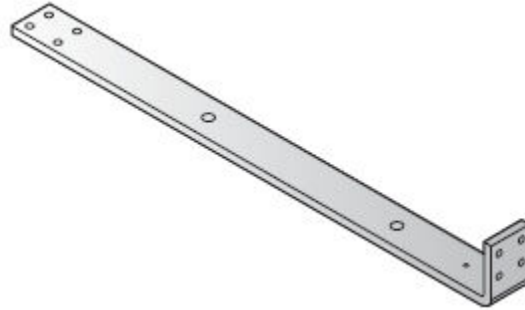


Figure 47. Bus bar-PB-N (negative, black)

Table 32. Bus bar-PB-N (negative, black)

Item	Description
Length	507.7 mm (19.99 inch)
Width	40 mm (1.57 inch)
Height	58.8 mm (2.31 inch)
Thickness	8 mm (0.31 inch)

Installing and removing system components

Topics:

- Safety instructions
- Recommended tools
- Service parts list
- Servers
- Hard disk drive (HDD) trays
- Power supply units (PSU)
- Fan modules
- Fan blocks
- Fan power distribution boards (FPDB)
- Block Controller Distribution Board (BCDB)
- Installing BCDB
- Block controllers (BC)
- Management controllers (MC)
- Rack manager board (RMB) and infrastructure module (IM)
- Rear IO modules
- Power interface board (PIB)

Safety instructions

⚠ CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized is not covered by warranty. Read and follow the safety instructions that are shipped with your product.

System components and electronic circuit boards can be damaged by discharges of static electricity. Working on systems that are still connected to a power supply can be extremely dangerous. To avoid injury to yourself or damage to system, follow these guidelines:

- Wear a grounded wrist strap when working inside the system chassis.
- Handle electronic circuit boards only by the edges, ensuring not to touch the components on the board. Do not flex or stress the circuit board.
- Store all components inside a static-proof packaging until you are ready to use the components for installation.

Recommended tools

- Phillips screwdriver #2

Service parts list

- DSS 9000 System
- Fan module
- Power

- PSU
- PBPM
- Mechanical
 - PSU blank
 - Third width server blank
 - Half width server blank
 - Full width server blank
- PCBA module
 - MC
 - MC cover
 - DSS 9000 rack manager module
 - Infrastructure module
 - Rear I/O
 - BC

Servers

Removing one third-width server

Prerequisite

- 1 Ensure that you read the Safety instructions.

Steps

- 1 Press the release latches on the side of the server.
- 2 Slide the server out of the block.

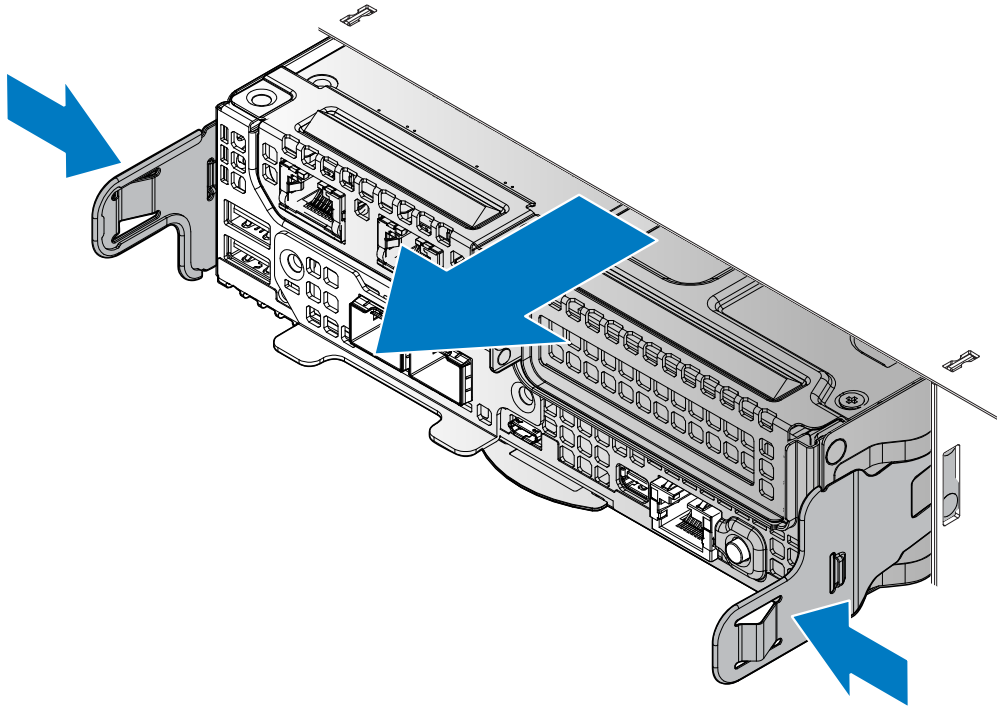


Figure 48. Removing the one third-width server

Installing one third-width server

- 1 Align the server with the bay, and insert the server into the block.
- 2 Slide the server in until it is fully seated in the block.
The server locks in place after it is properly seated.

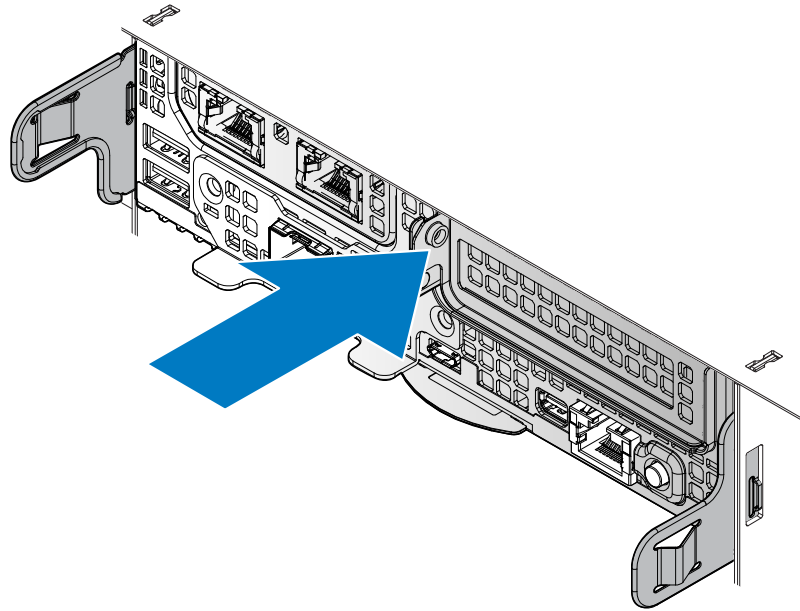


Figure 49. Installing the one third-width server

Removing half-width server

Prerequisite

- 1 Ensure that you read the Safety instructions.

Steps

- 1 Press the release latches on the side of the server.
- 2 Slide the server out of the block.

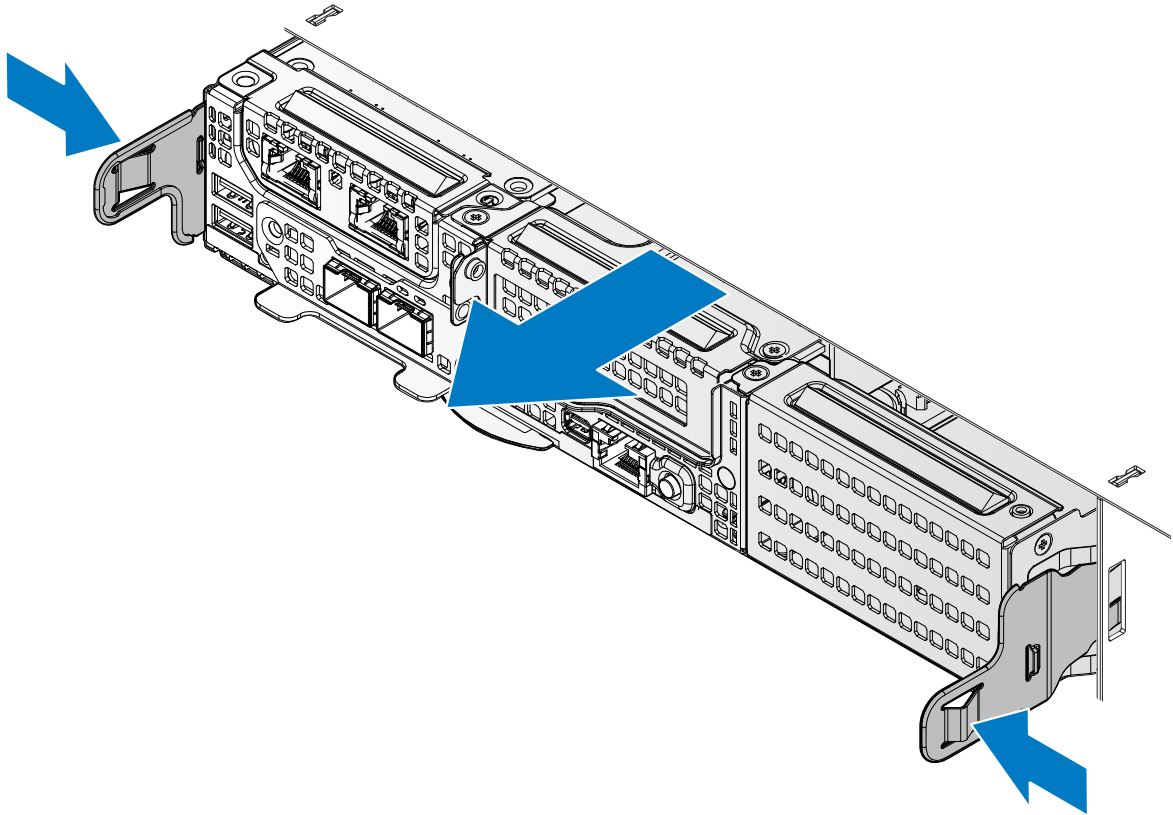


Figure 50. Removing the half-width server

Installing half-width server

- 1 Align the server with the bay, and insert the server into the block.
- 2 Slide the server in until it is fully seated in the block.
The server locks in place after it is properly seated.

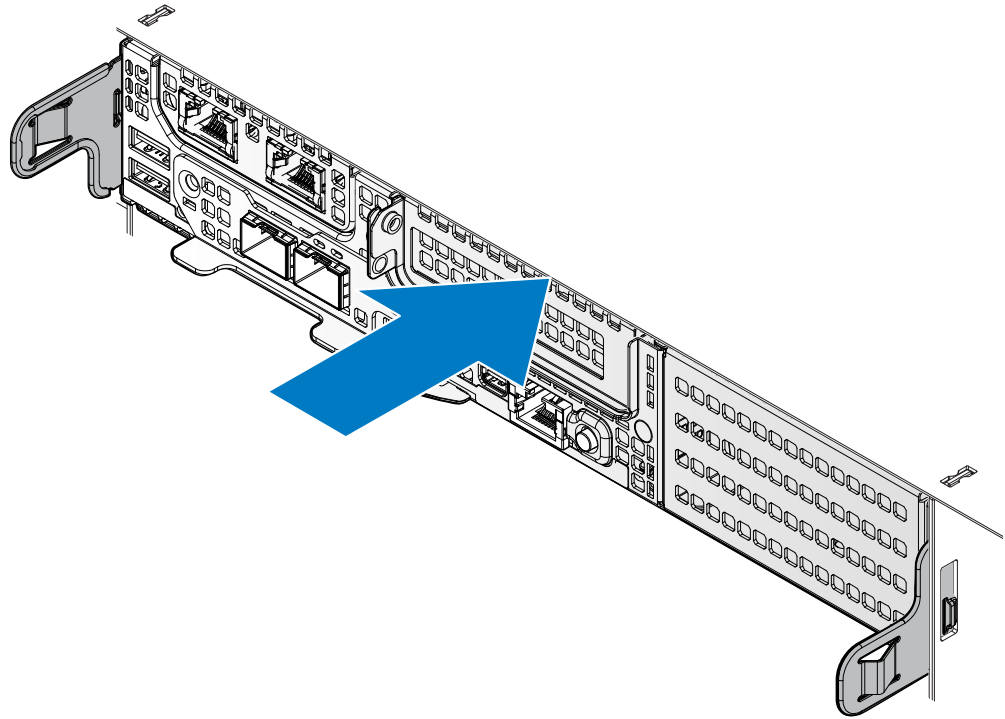


Figure 51. Installing the half-width server

Removing full-width server

Prerequisite

Ensure that you read the Safety instructions.

About this task

Enter the context of your task here (optional). This is where introductory content goes.

Steps

- 1 Press the release latches on the side of the server.
- 2 Slide the server out of the block.

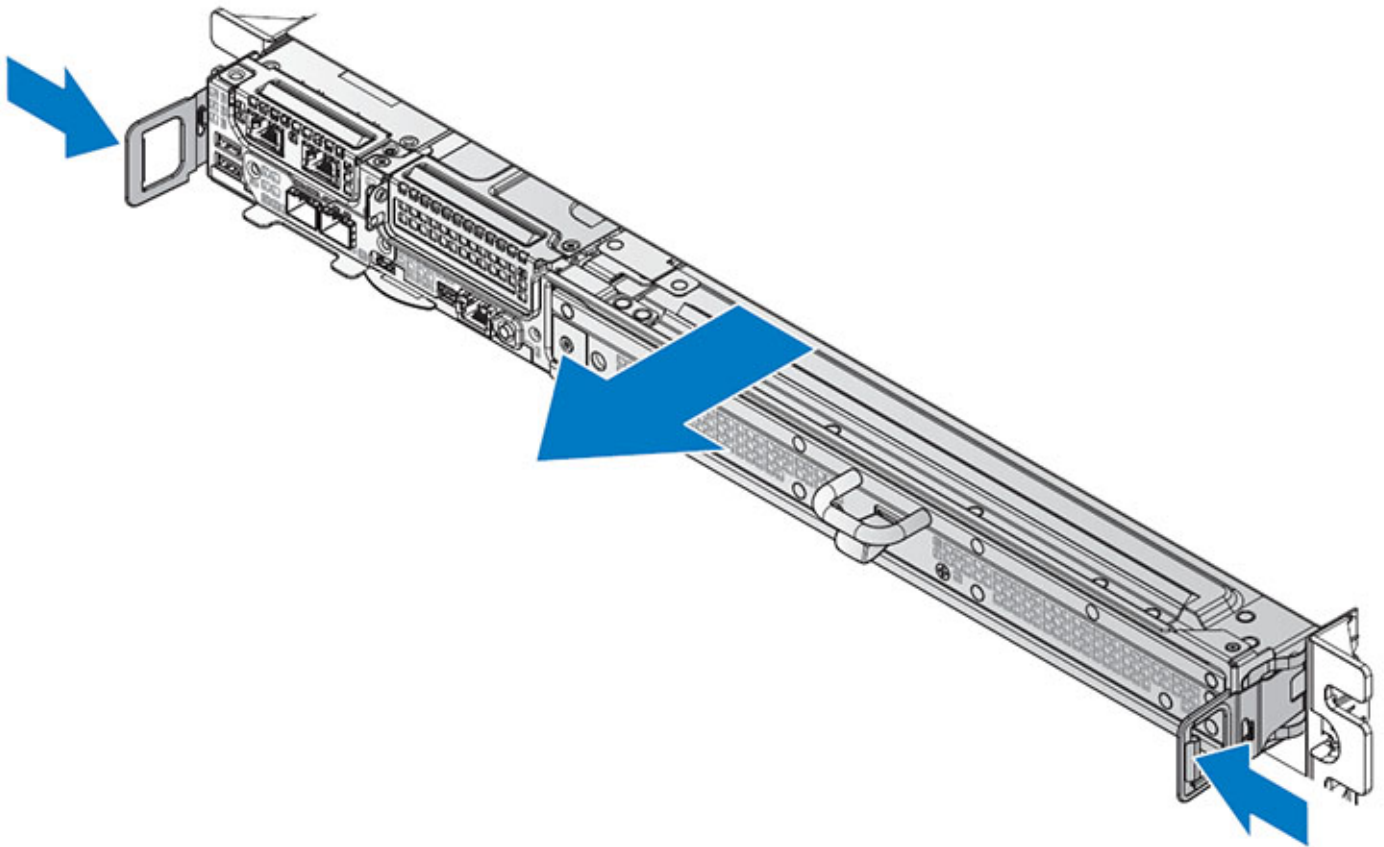


Figure 52. Removing full-width server

Installing full-width server

- 1 Align the server with the bay, and insert the server into the block.
- 2 Slide the server in until it is fully seated in the block.
The server locks in place after it is properly seated.

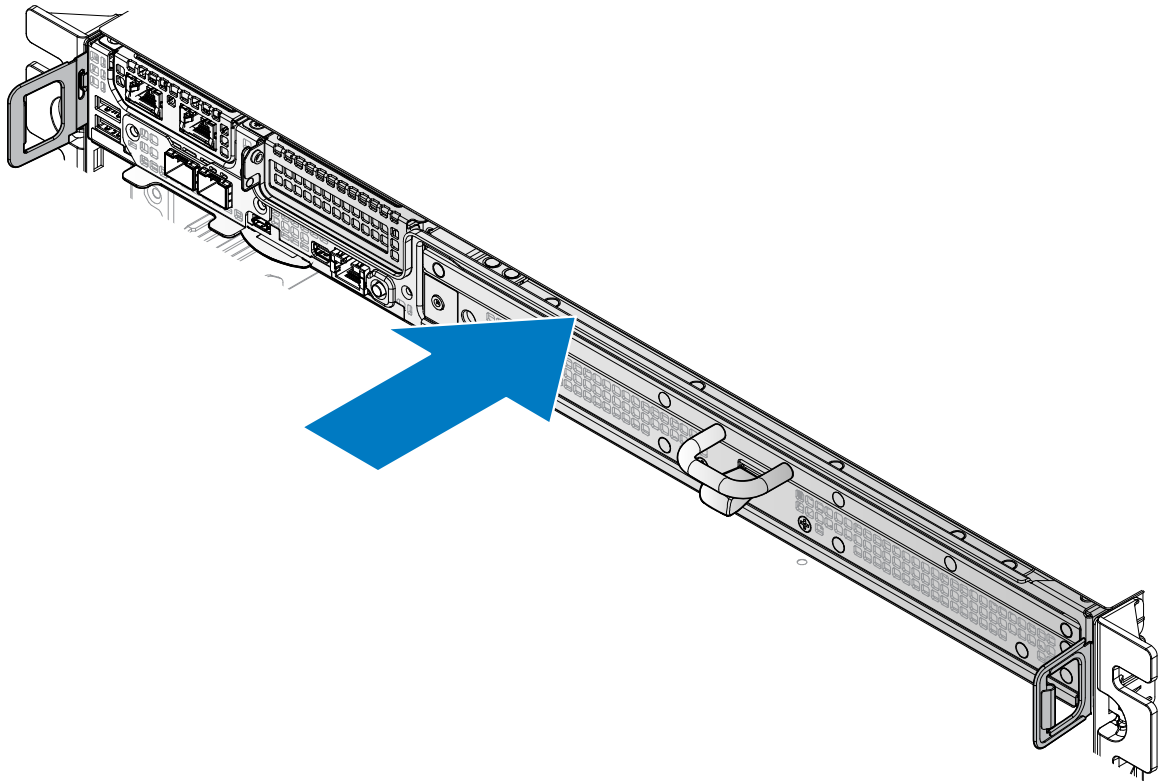


Figure 53. Installing the full-width server

Hard disk drive (HDD) trays

The HDD tray is only available for full width and JBOD servers.

Removing HDD tray

Prerequisite

- 1 Ensure that you read the Safety instructions.

Steps

- 1 Grasp the tray handle with one hand, and use your thumb to push the plunger up to release the HDD tray.
- 2 Continue to hold the plunger and use the tray handle to pull the tray out from the chassis.

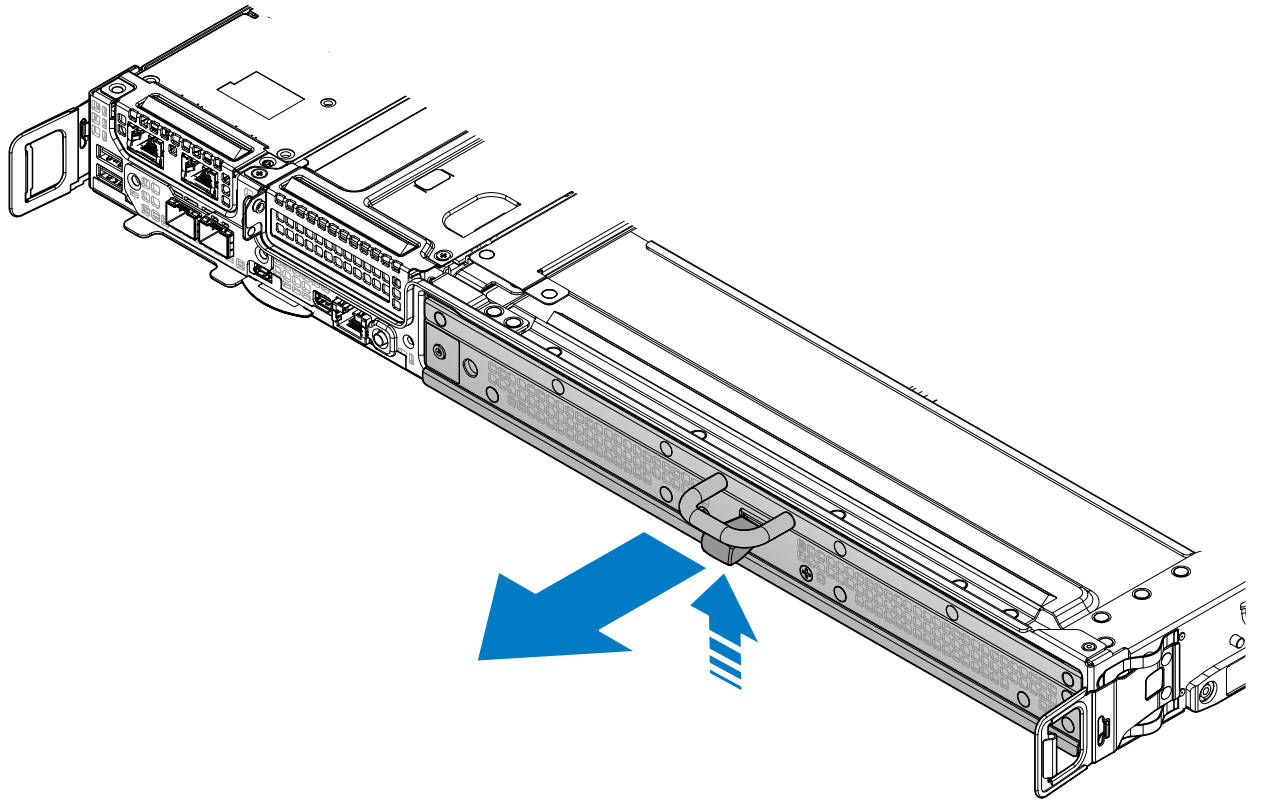


Figure 54. Releasing the HDD tray

- 3 Remove the HDD tray from the server.

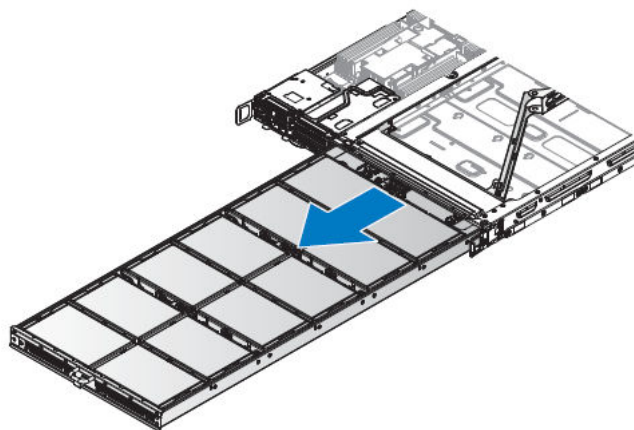


Figure 55. Removing the HDD tray

- 4 Remove all HDDs in the HDD tray.
- 5 Remove the screw and loosen the captive screw on the CMA.

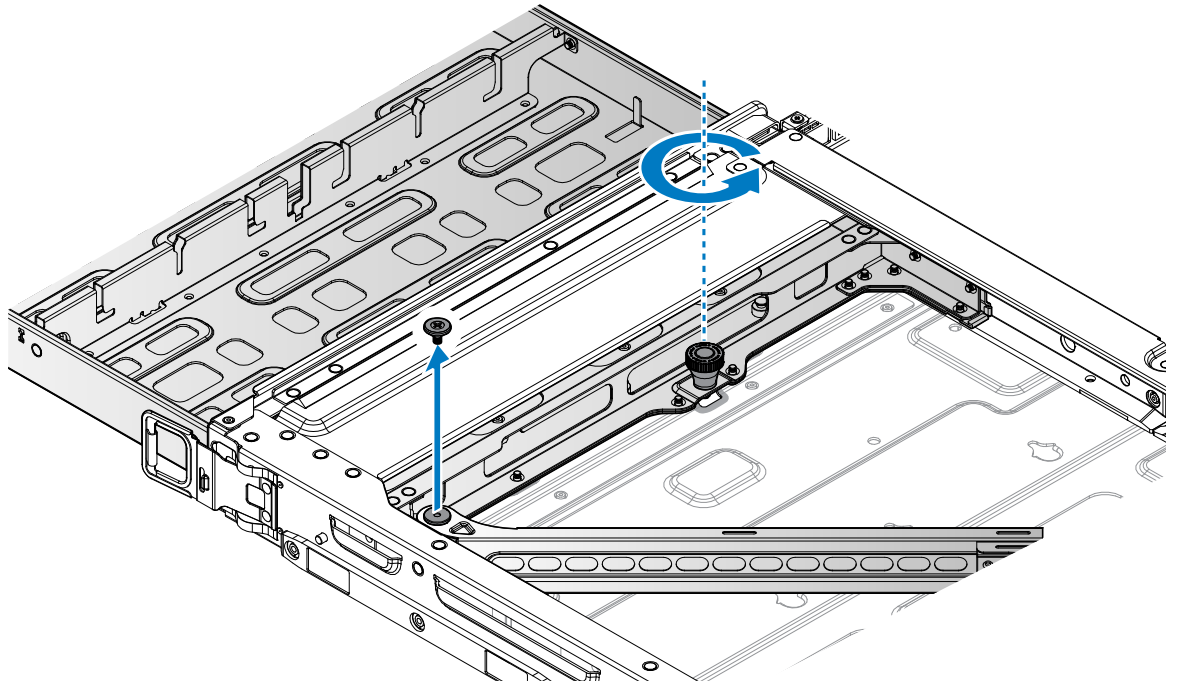


Figure 56. Unfastening the CMA

- 6 Continue to pull out the HDD tray and remove it completely from the chassis.

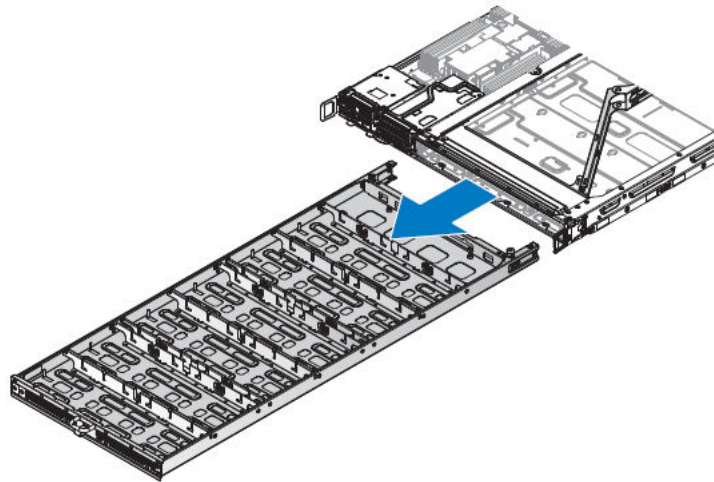


Figure 57. Removing the HDD tray from the server

Installing HDD tray

- 1 Insert the HDD tray into the server bay until the HDD tray clears the plunger.

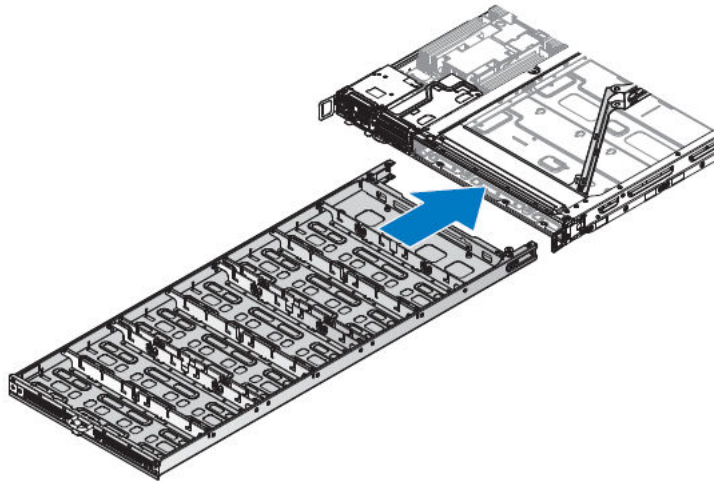


Figure 58. Installing the HDD tray

- 2 Align the CMA in the server making sure the screw wells on the CMA and server are aligned.
- 3 Insert a screw in the CMA and tighten it to secure it to the server.
- 4 Tighten the captive screw on the CMA.

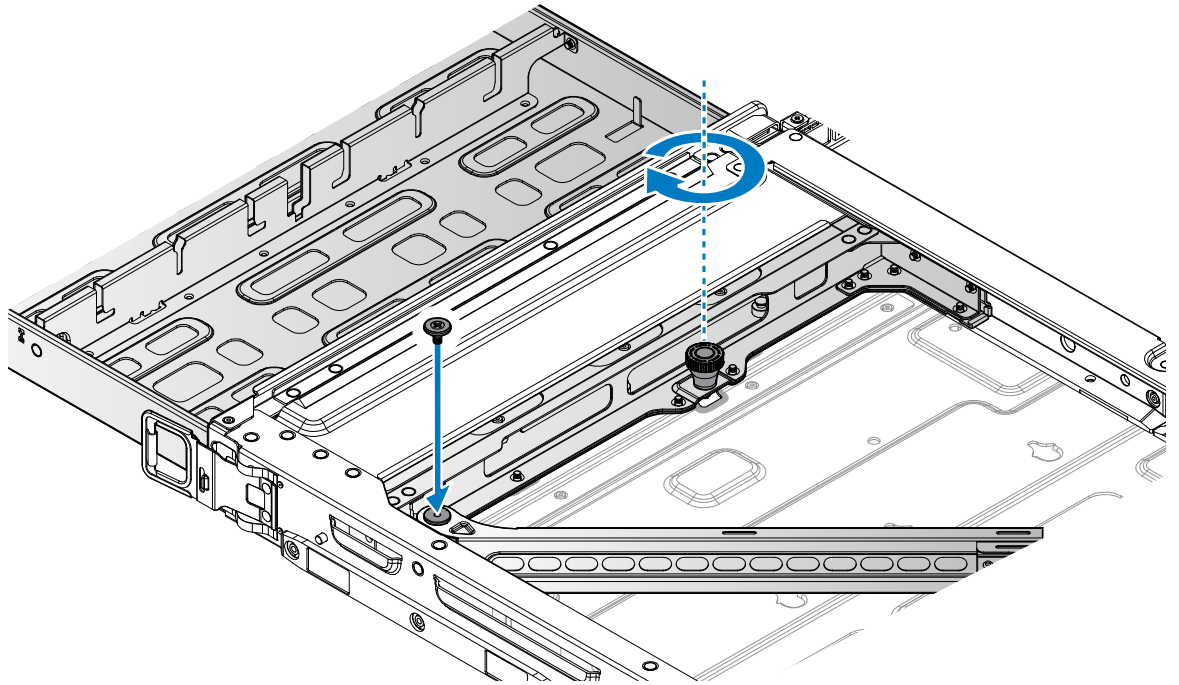


Figure 59. Securing the HDD tray and CMA

Table 33. Assembly material

Description	Quantity	Torque (lbs/inch)
#6-32 screw	1	8 ± 0.5

- 5 Install the HDDs on the HDD tray.
- 6 Push the HDD tray in until it is fully seated in the chassis.
The HDD tray locks in place after it is properly seated.

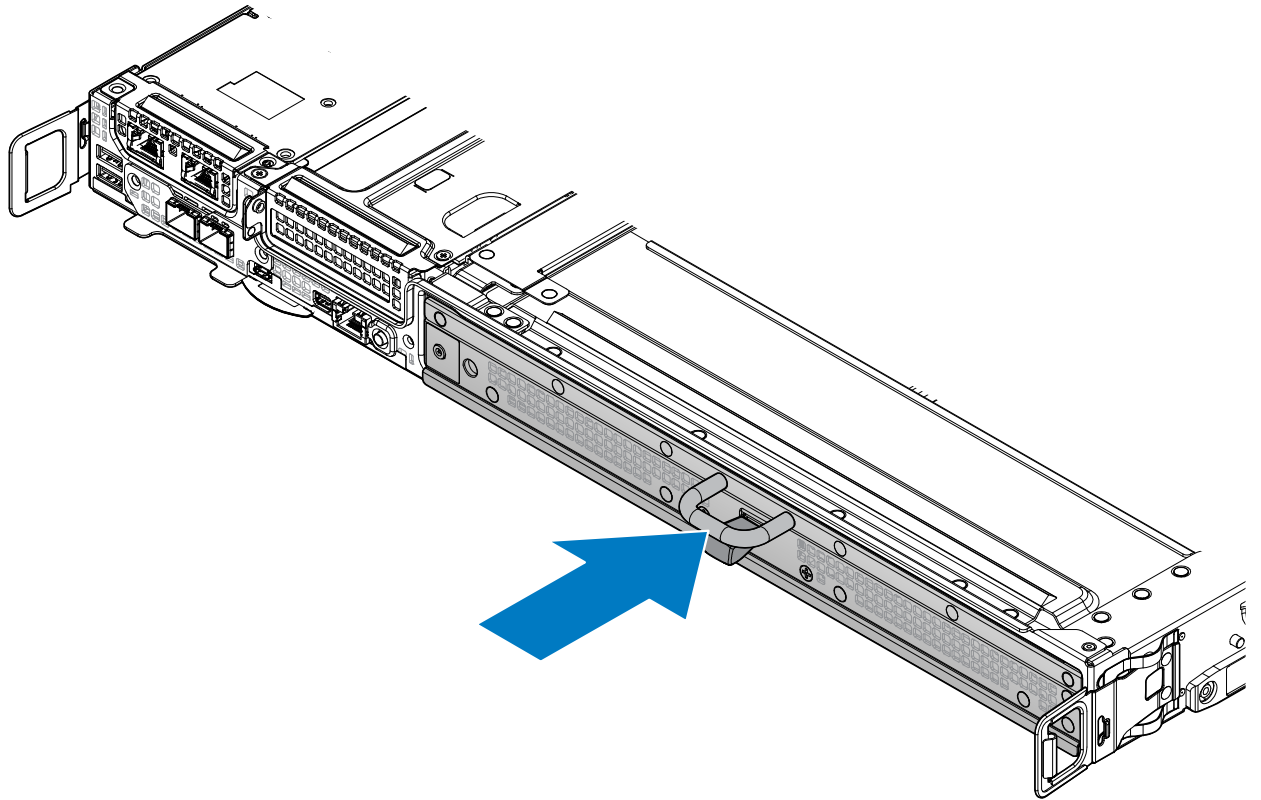
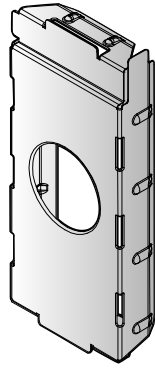


Figure 60. Installing the HDD tray

7 Install the full width server. For more details, see Installing full-width server.

Power supply units (PSU)



Removing PSU

Prerequisite

- 1 Ensure that you read the Safety instructions.

Steps

- 1 Press down the PSU release latch.
- 2 Remove the PSU from the power bay.

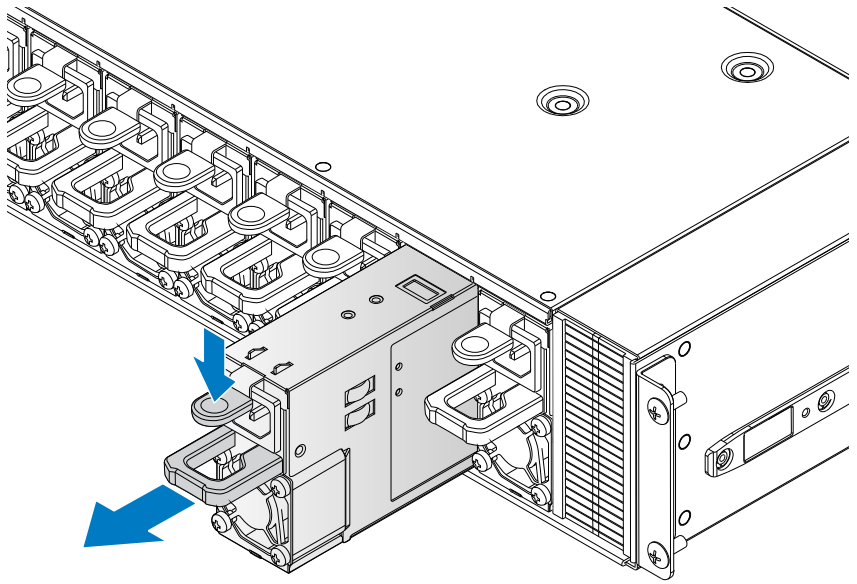


Figure 61. Removing the PSU

Installing PSU

- 1 Align the PSU with the bay. Make sure the connectors are positioned correctly before sliding the PSU into the bay.
- 2 Insert the PSU in the power bay and push it in until it is properly seated.
The PSU is secured when the release latch locks in place.

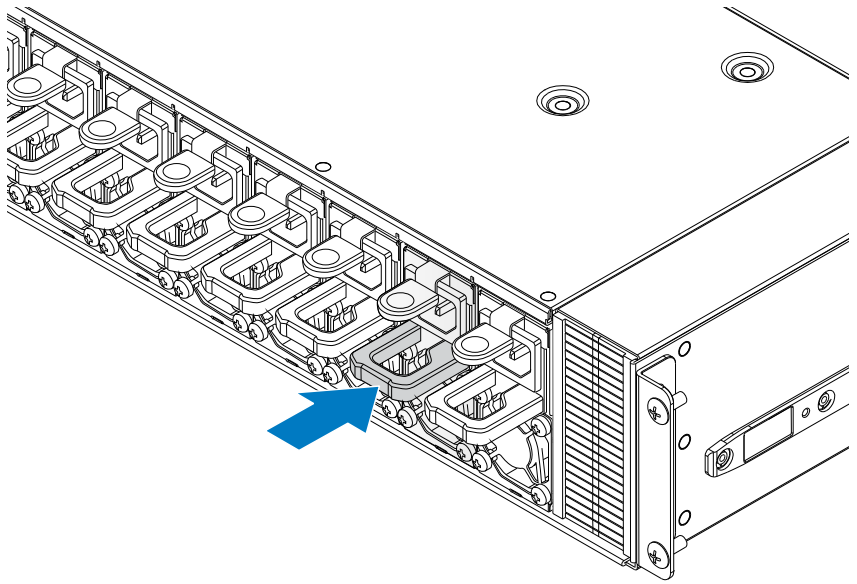
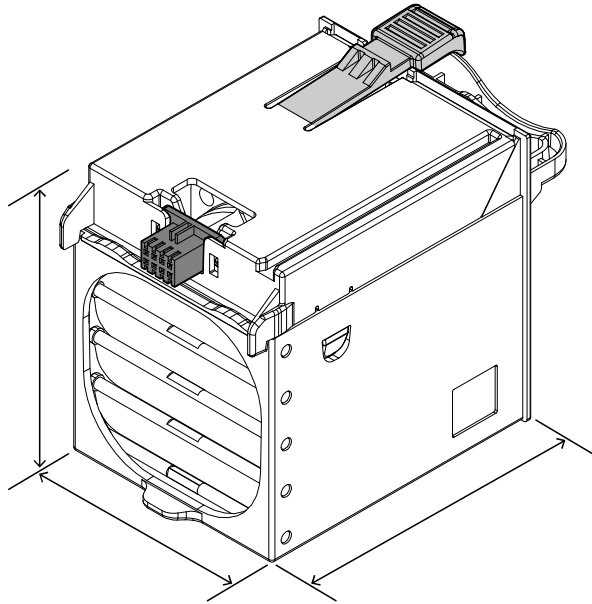


Figure 62. Installing the PSU

Fan modules



Removing fan module

Prerequisite

 **CAUTION:** To prevent damage to the system, remove only a single fan module at a time.

- 1 Ensure that you read the Safety instructions.

Steps

- 1 Press up and hold the fan module release latch.
- 2 Pull the fan module out.
- 3 Remove the fan module from the fan cage.

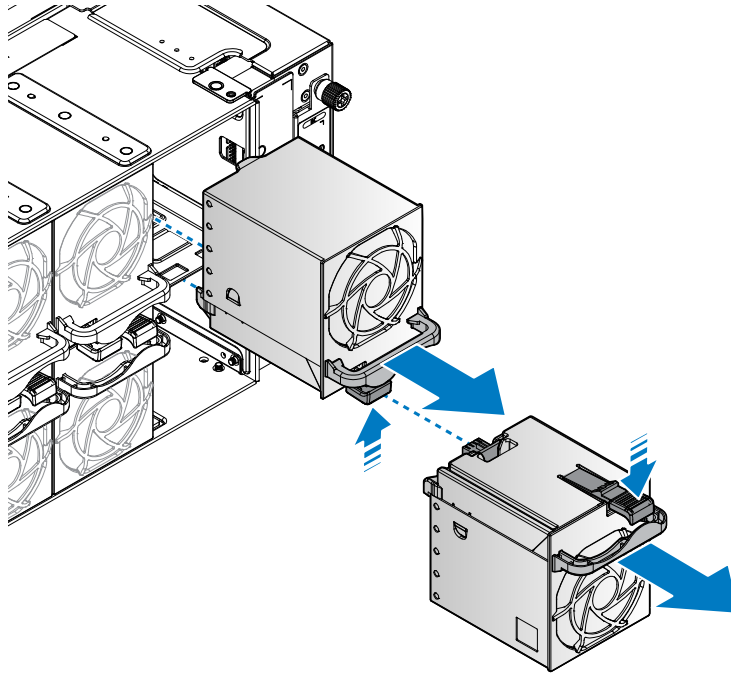


Figure 63. Removing the fan module

Installing fan module

- 1 Align the fan module with the fan cage, making sure the connectors are aligned.
- 2 Insert the fan module in the fan cage.
The fan module locks in the fan cage.

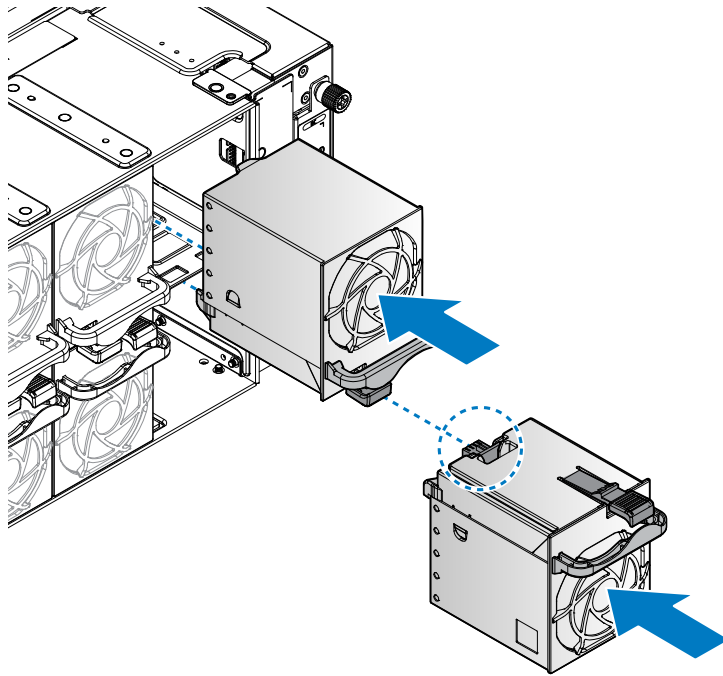


Figure 64. Installing the fan module

Fan blocks

Removing fan block

Prerequisite

- 1 Ensure that you read the Safety instructions.

Steps

- 1 Loosen the thumb screws.
- 2 Remove the fan block.

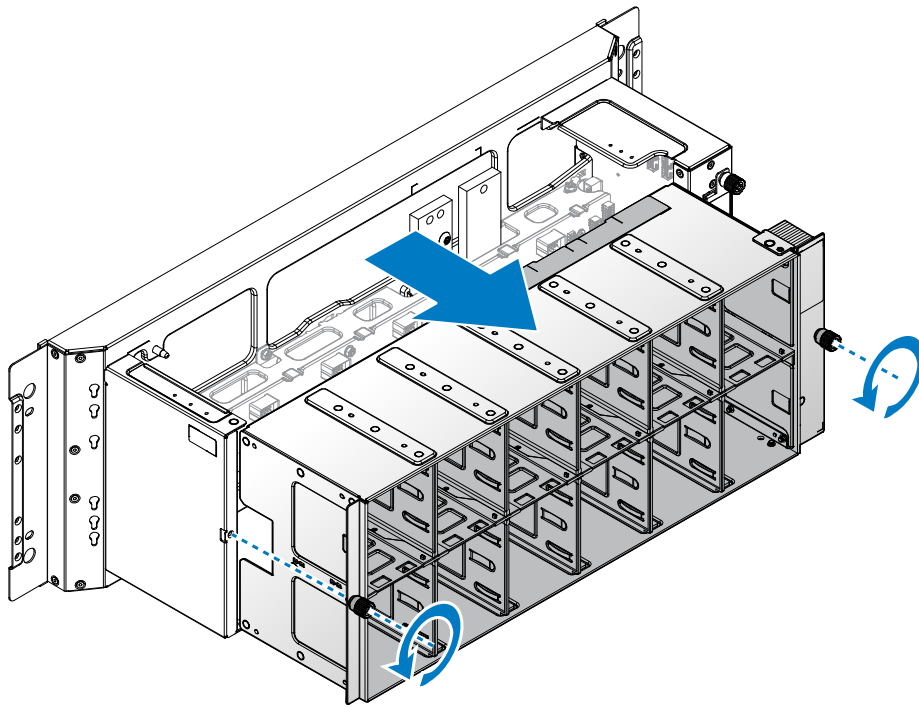


Figure 65. Removing the fan block

Installing fan block

- 1 Align the fan block with the FPDB.
- 2 Insert the fan block in the FPDB until the until slots are completely inserted into the connectors.
- 3 Tighten the thumb screws to secure the fan block.

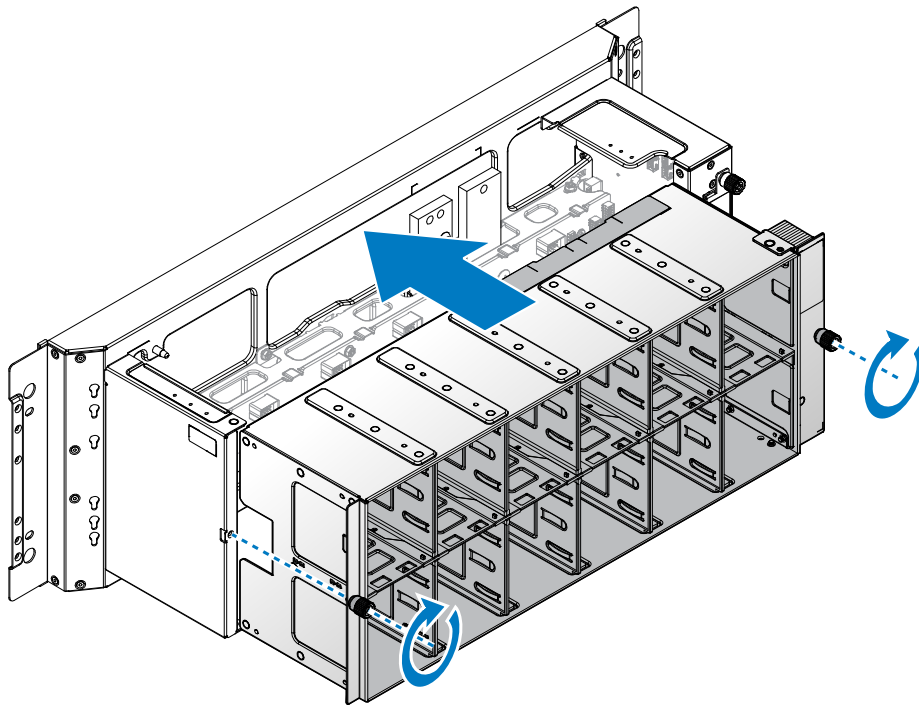


Figure 66. Installing the fan block

Fan power distribution boards (FPDB)

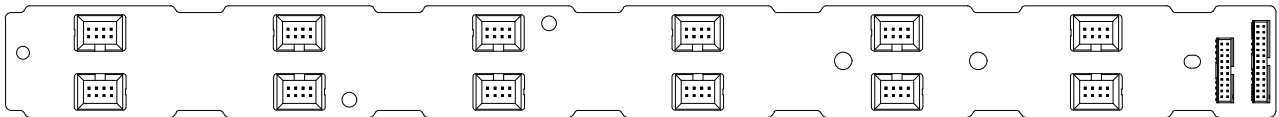


Figure 67. Fan power distribution board

Table 34. Fan power distribution board features

Item	Description
Board length	433 mm (17.05 inch)
Board width	38 mm (1.5 inch)
Connector	<ul style="list-style-type: none">· 1x (2x10) connector· 1x (2x13) connector· 12 x (2x4) connector
Net weight	129.2 g (4.56 ounce)
Operating voltage/current	12 V, current 32 A

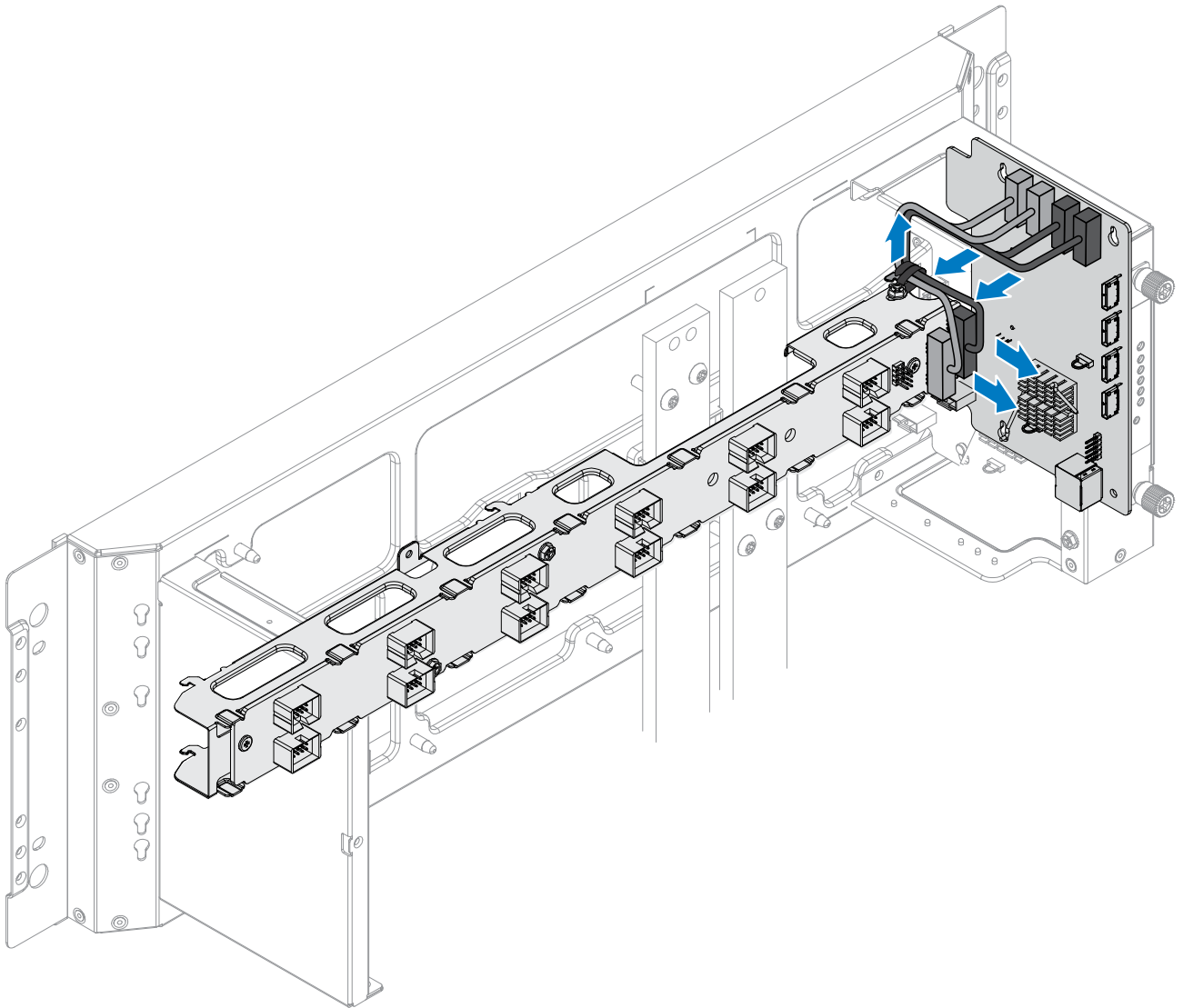
Removing FPDB

Prerequisites

- 1 Ensure that you read the Safety instructions.
- 2 Remove the fan block.

Steps

- 1 Disconnect the cables from the cable clip.
- 2 Disconnect the cables.



106 **Figure 68. Disconnecting the FPDB cables**
Installing and removing system components

- 3 Remove the screws securing the FPDB.
- 4 Remove the FPDB.

Figure 69. Removing the FPDB

Installing FPDB

- 1 Align the FPDB with the fan board bracket and install. Make sure the connectors are facing outward as seen in the following figure.
- 2 Secure the FPDB with screws.

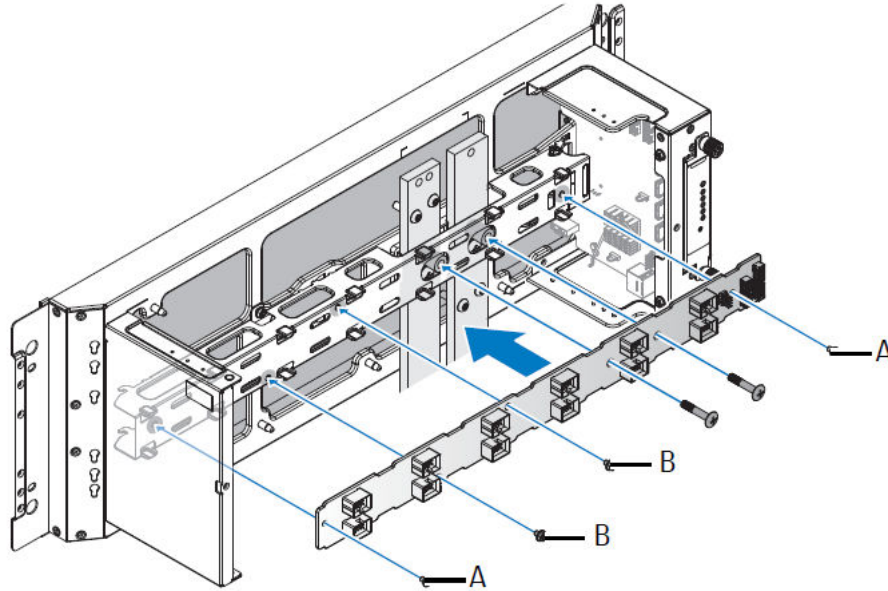
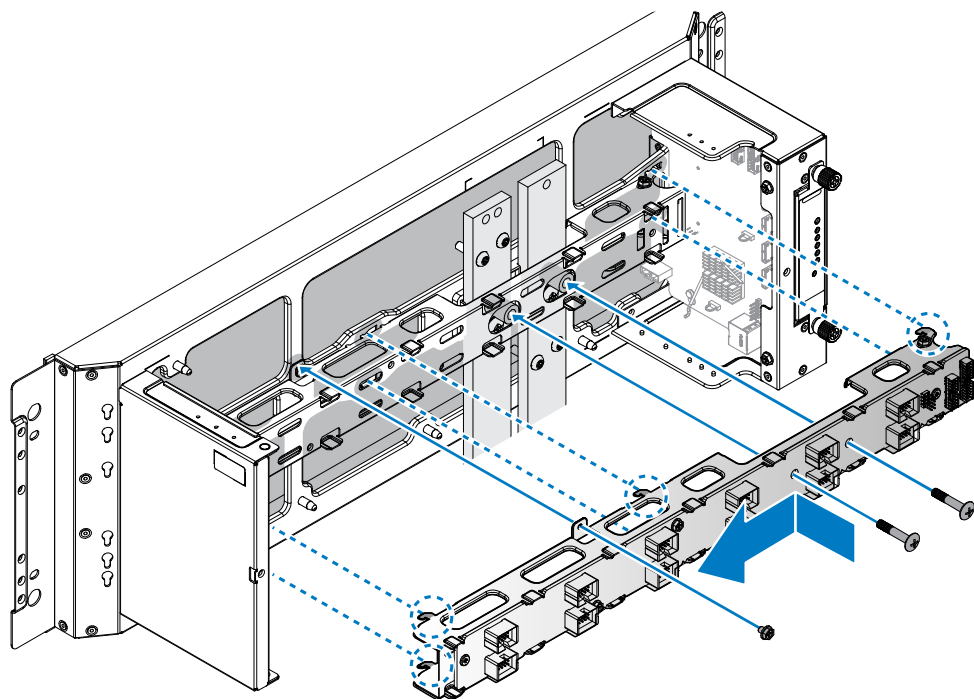


Figure 70. Installing the FPDB

Table 35. Assembly material

Description	Quantity	Torque (lbs/inch)
A: 6-32_STEP	2	8 ± 0.5
B: 6-32_4-5_SCREW	2	8 ± 0.5

- 3 Align the hooks on the FPDB assembly with the slots on the rear cabinet base.
- 4 Slide the FPDB assembly to install.
- 5 Secure the FPDB assembly with screws.

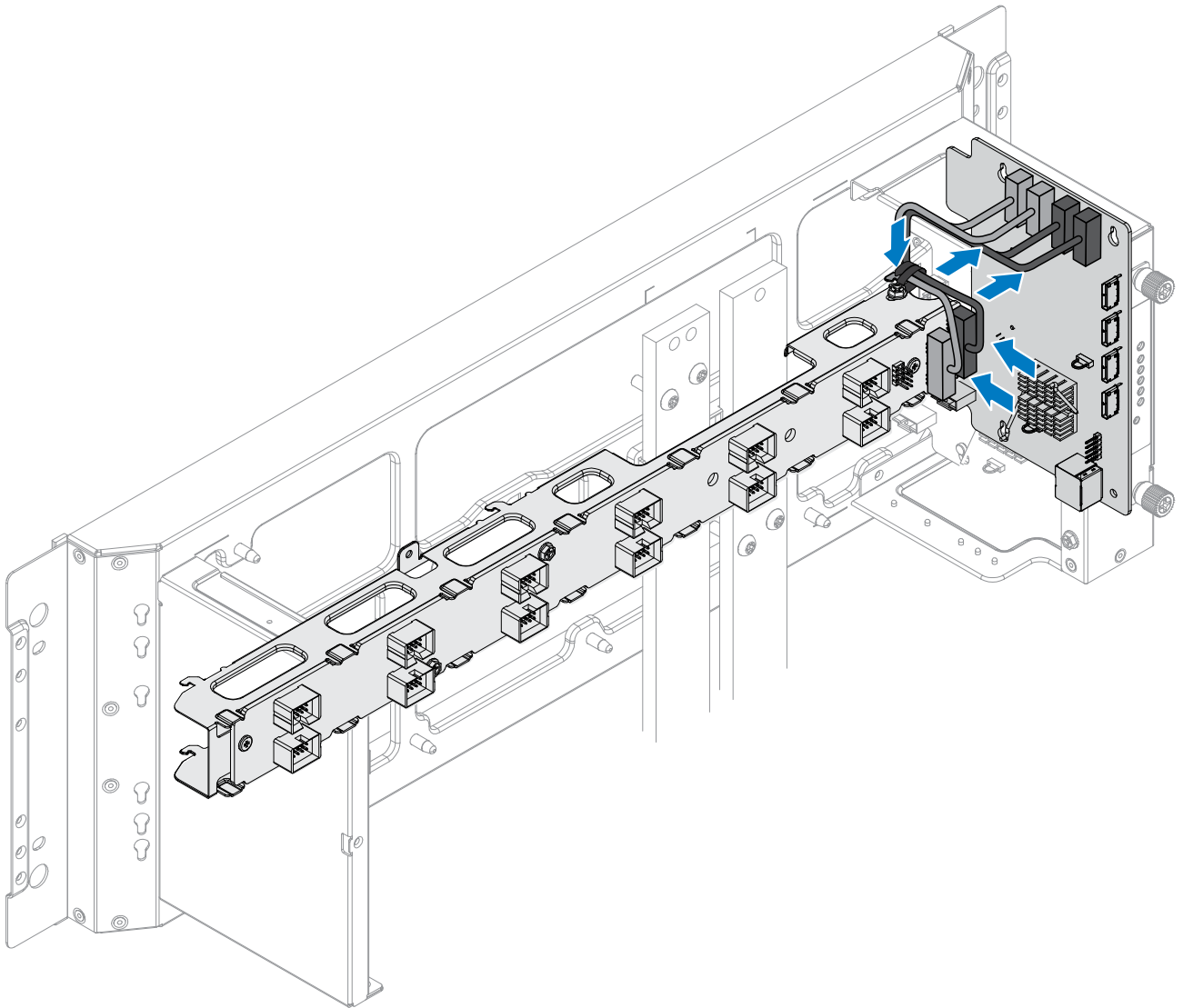


116 **Figure 71. Installing the FPDB assembly**
Installing and removing system components

Table 36. FPDB assembly

Item	Description
A	bracket hooks
B	Fan board to bus bar screws through copper standoffs.

- 6 Connect the cabling.
- 7 Secure the cabling with cable clip.



116 **Figure 72. Securing a cable with a cable clip**
Installing and removing system components

Block Controller Distribution Board (BCDB)

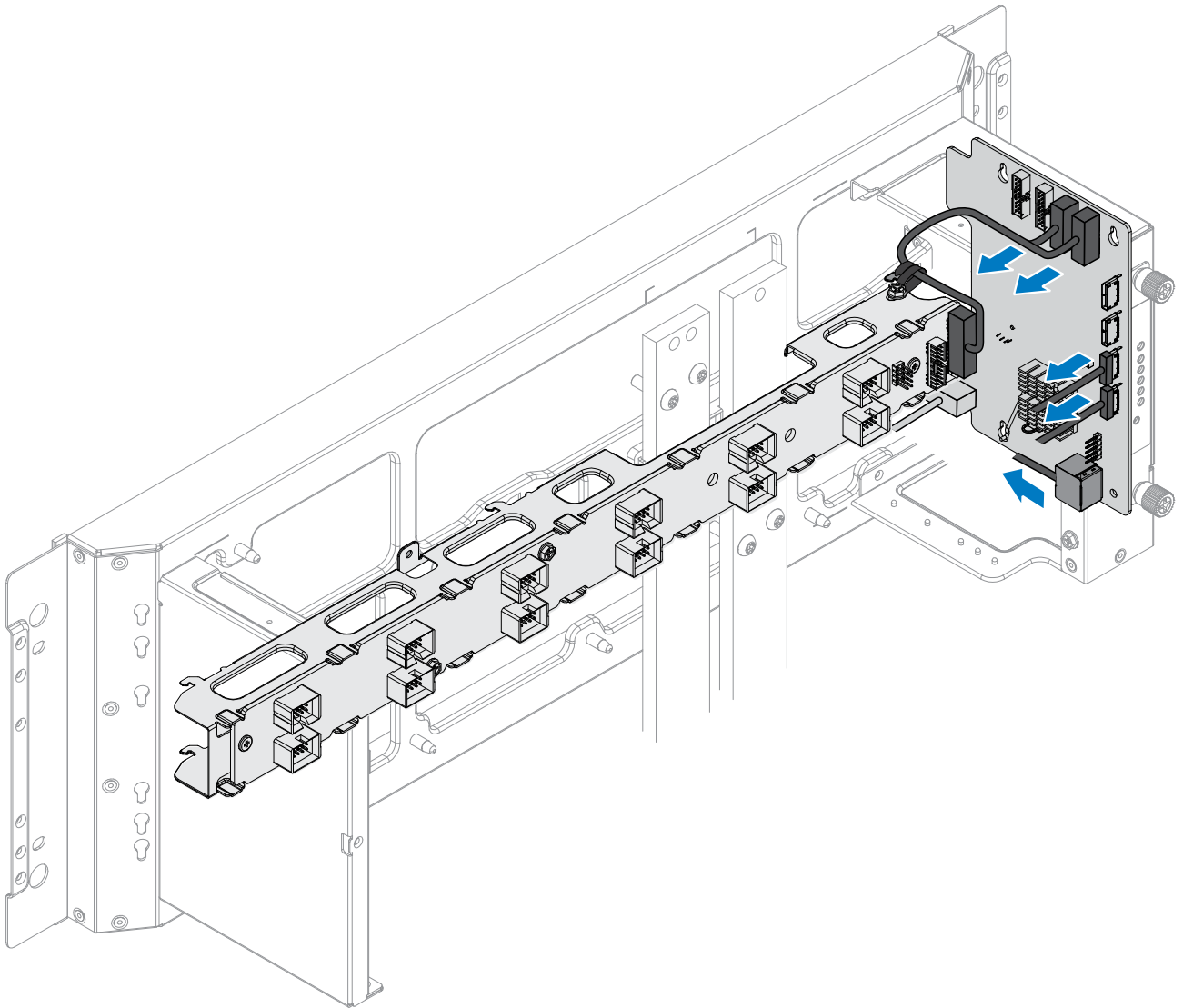
Removing BCDB

Prerequisites

- 1 Ensure that you read the Safety instructions.
- 2 Remove block controller (BC).
- 3 Remove the fan block.

Steps

- 1 Disconnect the cables from the BCDB. Do not disconnect the HTPB cable at this time.

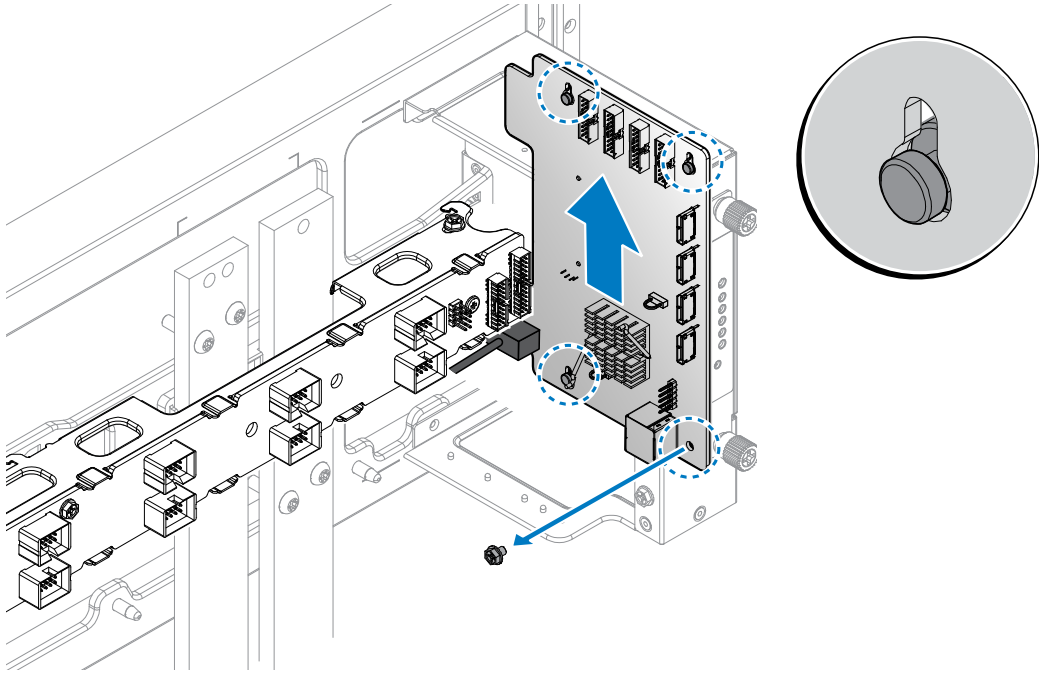


114 **Figure 73. Disconnecting cables from a BCDB**
Installing and removing system components

Table 37. BCDB connector

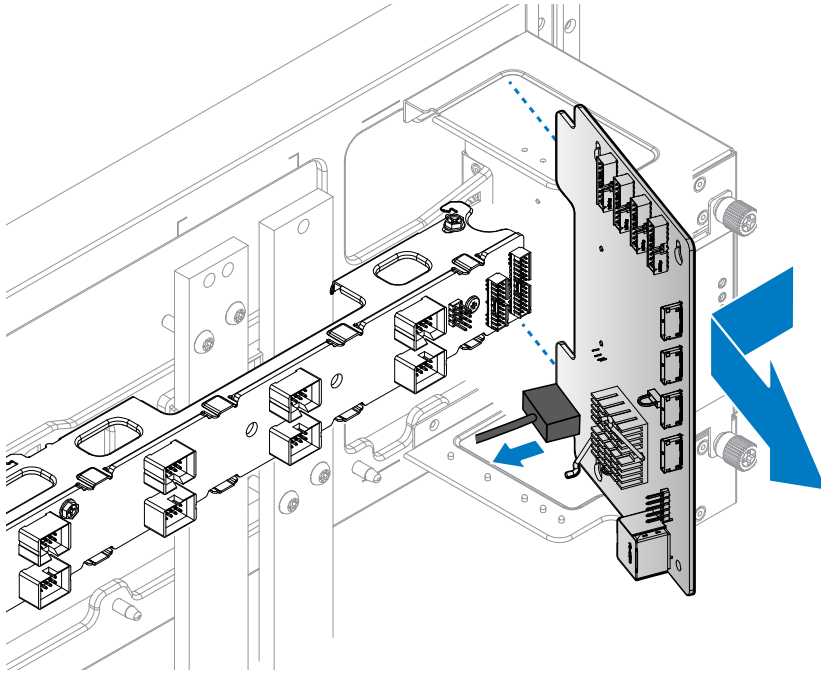
Item	Description
A	HTPB cable connector

- 2 Locate the screw securing the BCDB to the rear cabinet and remove it.
- 3 Slide the BCDB up to disengage from the posts on the rear cabinet.



116 **Figure 74. Disengaging the BCDB**
Installing and removing system components

- 4 Rotate the front of the BCDB until it clears the rear cabinet. Make sure the BCDB does not come in contact with the FPDB to prevent accidental damage to either component.
- 5 Once it is clear, slide the BCDB out until the HTPB cable is accessible. Do not remove the BCDB completely at this time.
- 6 Remove the BCDB from the rear cabinet cage.
- 7 Disconnect the HTPB cable from the BCDB.



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Figure 75. Disconnecting an HTPB cable and removing a BCDB
Installing and removing system components

Installing BCDB

- 1 Position the BCDB so that the cable connectors face the FPDB.
- 2 Locate the HTPB connector at the bottom left of the BCDB and connect the HTPB cable.
- 3 Angle the rear of the BCDB so that it can be inserted behind the FPDB until it is seated in the rear cabinet cage. During the course of the installation, make sure the BCDB does not come in contact with the FPDB assembly to prevent damage to either component.
- 4 Rotate the front of the BCDB towards the rear cabinet. Make sure the keyholes on the BCDB are aligned with the posts on the rear cabinet cage.

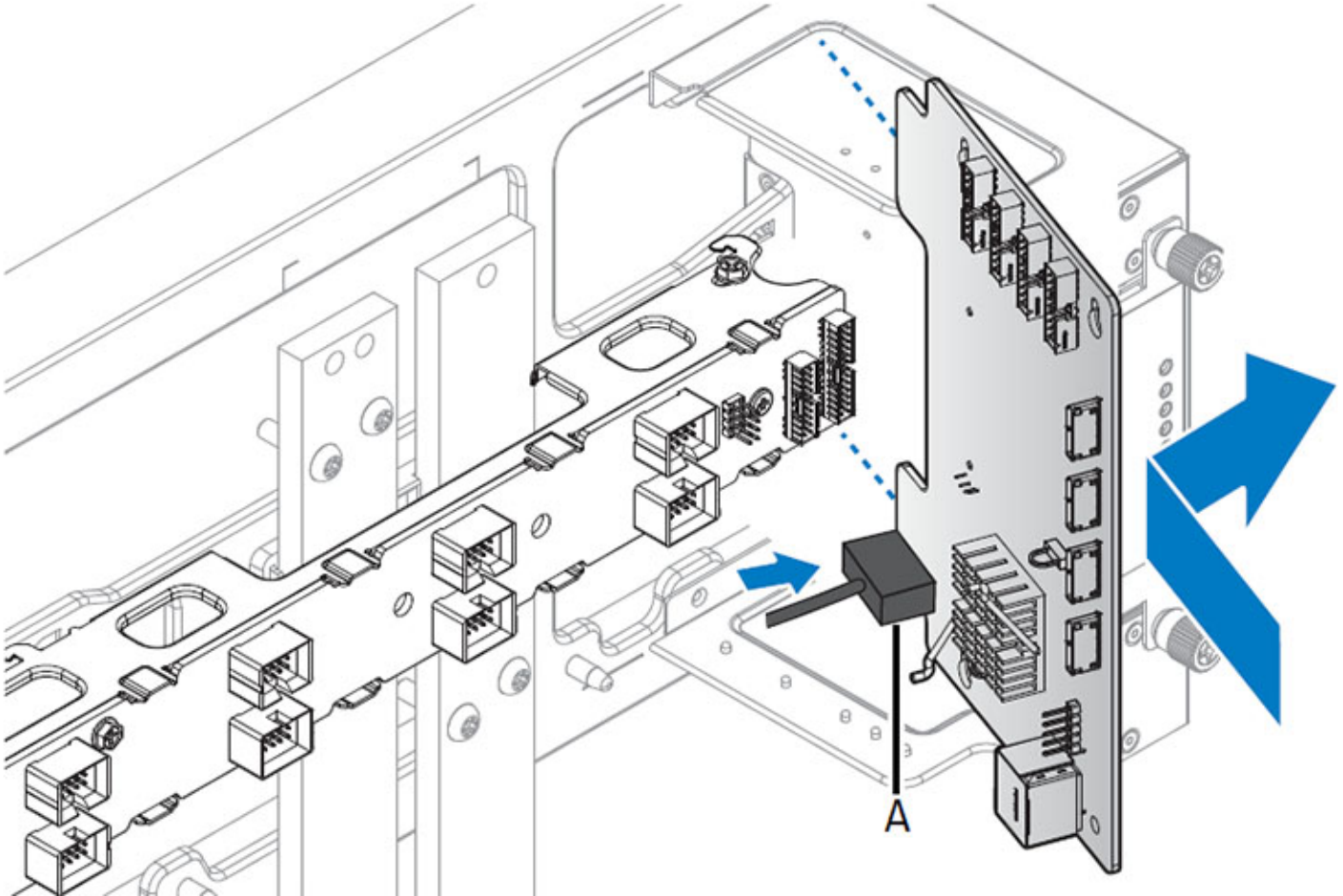


Figure 76. Connecting an HTPB cable and installing a BCDB

A HTPB cable connector

- 5 Once the BCDB is seated in the rear cabinet cage, slide it down to engage the posts through the keyholes. All three posts are must be visible through the keyholes to ensure the BCDB is properly seated.
- 6 Secure the BCDB with the screw.

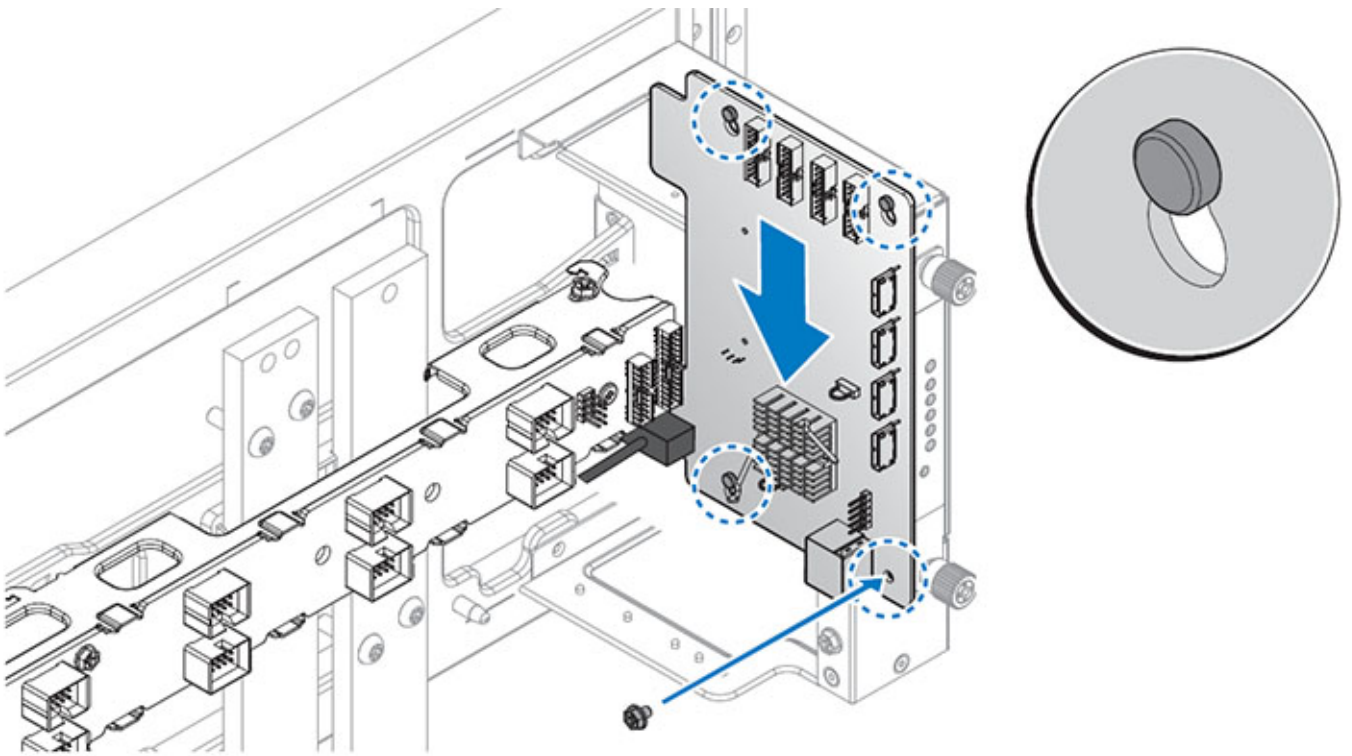


Figure 77. Engaging the BCDB in the rear cabinet cage

- 7 Connect the cables to the connectors on the BCDB.

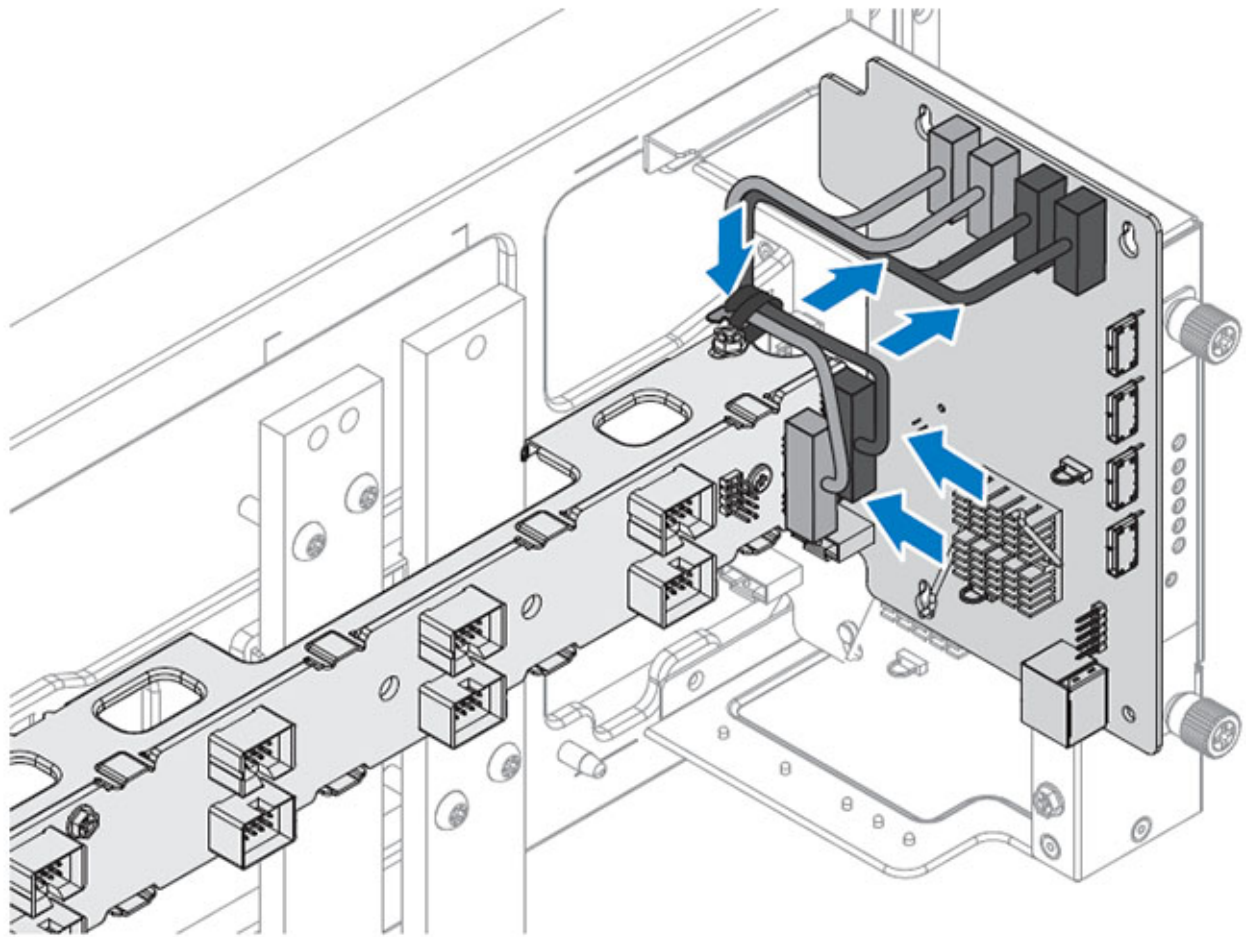


Figure 78. Connecting cables on the BCDB

Block controllers (BC)

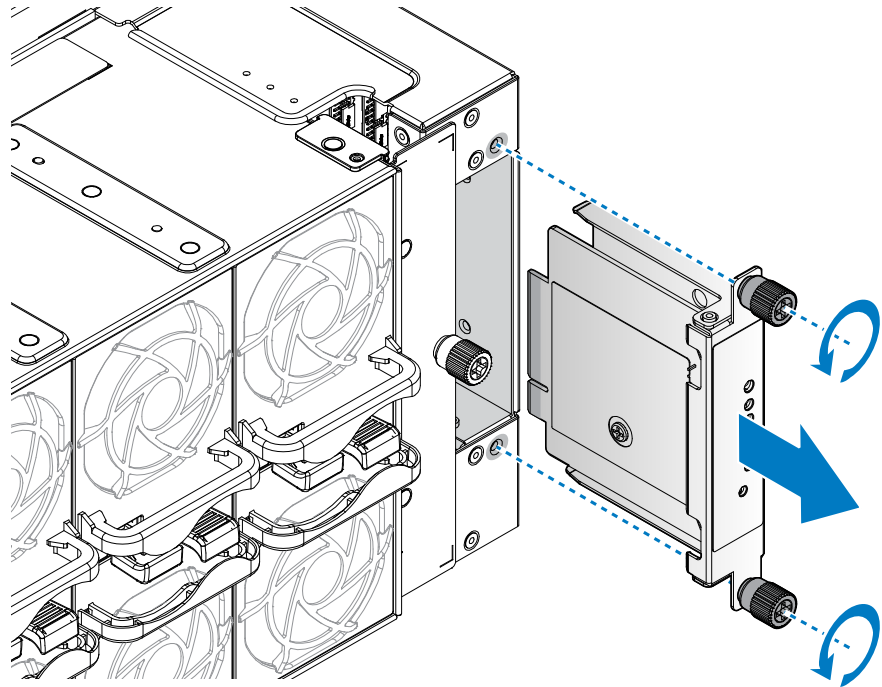
Removing BC

Prerequisite

- 1 Ensure that you read the Safety instructions.

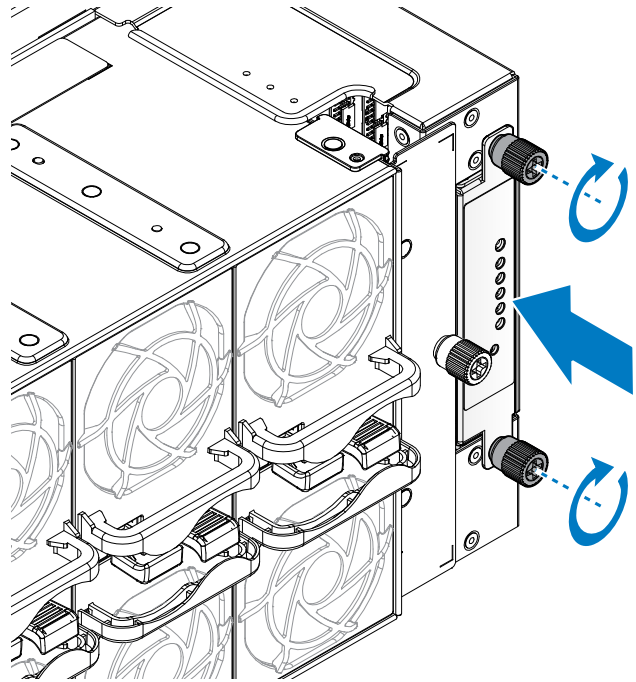
Steps

- 1 Loosen the captive screws on the BC.
- 2 Remove the BC from the cage.



Installing BC

- 1 Align the connector on the BC with the bay in the cage.
- 2 Slide the BC into the rear cabinet until it is flush with the cage.
- 3 Tighten the captive screws to secure the module to the rear cabinet.



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Installing and removing system components

Management controllers (MC)

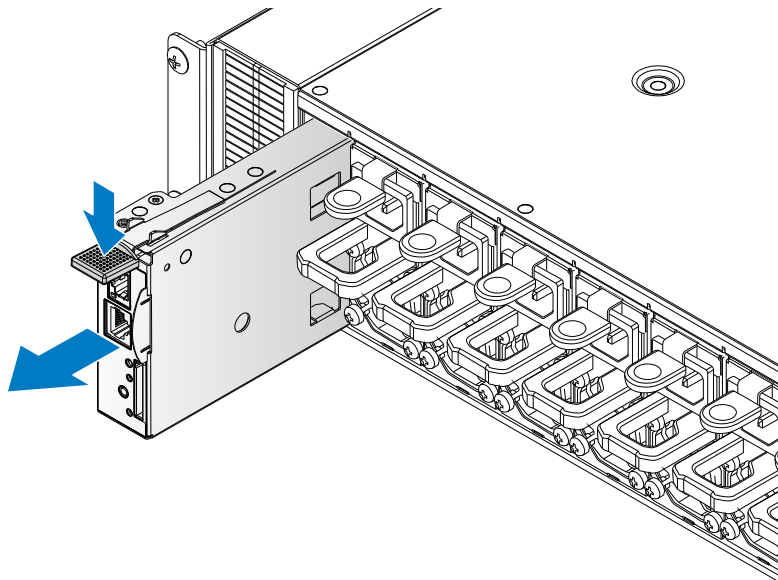
Removing MC

Prerequisite

- 1 Ensure that you read the Safety instructions.

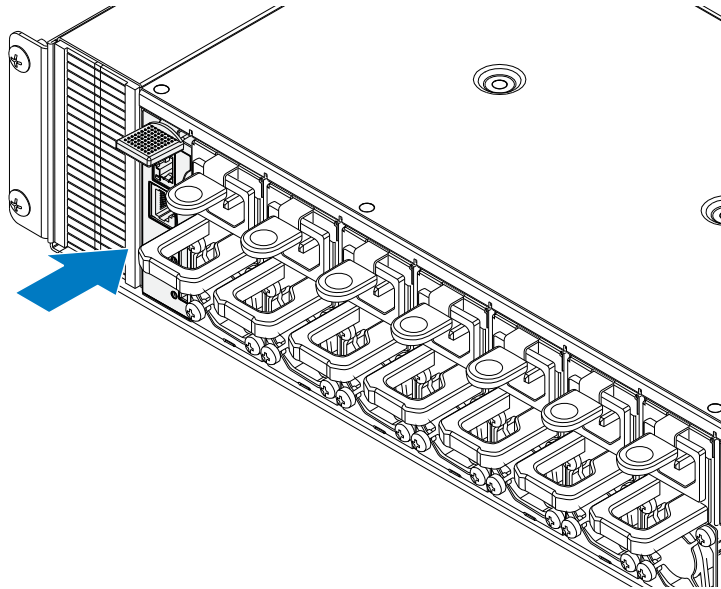
Steps

- 1 Press down on the MC release latch.
- 2 Remove the MC from the power bay.



Installing MC

- 1 Align the MC with the bay. Make sure the connector is positioned correctly before inserting into the bay.
- 2 Insert the MC in the bay and slide it in until it is flush with the bay.



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Figure 82. Installing the MC
Installing and removing system components

Rack manager board (RMB) and infrastructure module (IM)

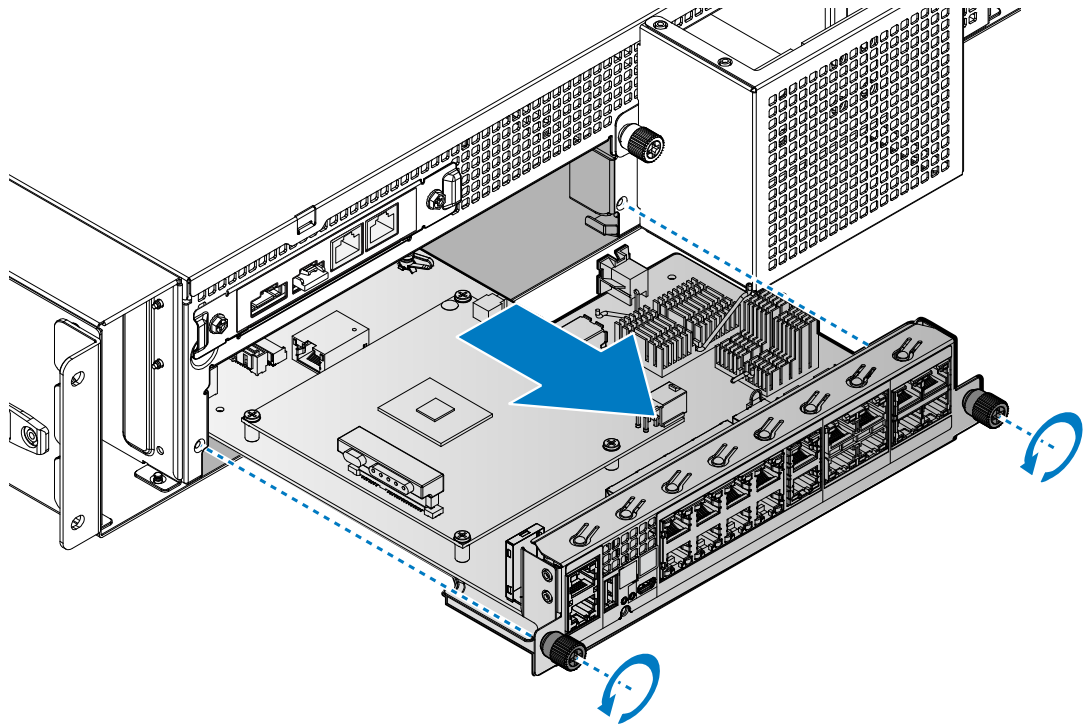
Removing DSS 9000 rack manager module

Prerequisite

- 1 Ensure that you read the Safety instructions.

Steps

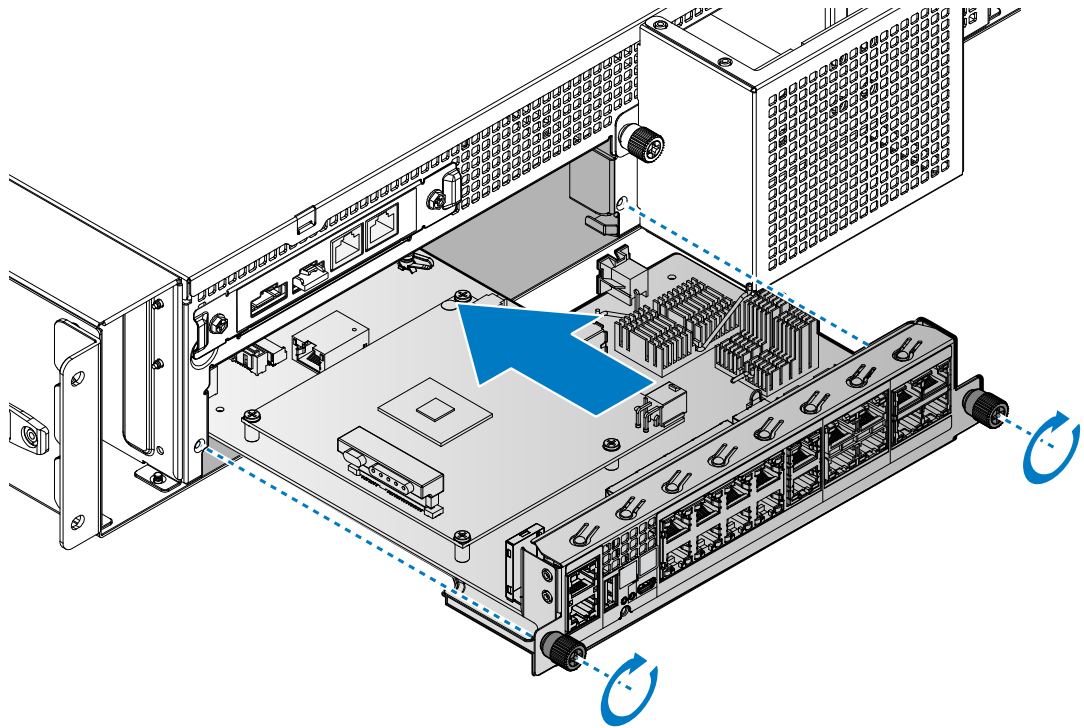
- 1 Loosen the captive screws securing the rack manager module to the power bay.
- 2 Grasp the rack manager module and slide it out of the power bay.



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Figure 83. Removing the DSS 9000 rack manager module
Installing and removing system components

Installing DSS 9000 rack manager module

- 1 Align the rack manager module with the power bay.
- 2 Slide the rack manager module into the bay until it is flush in the power bay.
- 3 Turn the captive screws to secure the rack manager module to the power bay.



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Figure 84. Installing the DSS 9000 rack manager module
Installing and removing system components

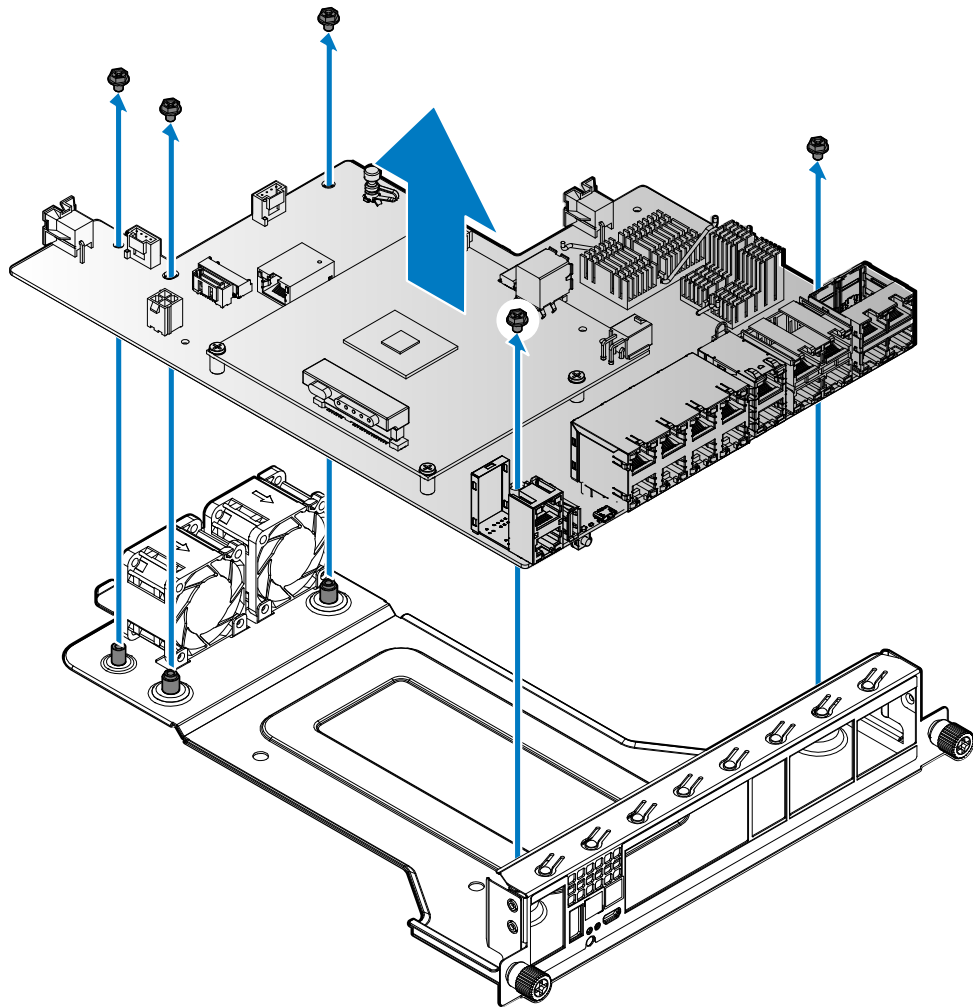
Removing IM

Prerequisites

- 1 Ensure that you read the Safety instructions.
- 2 Remove the rack manager module from the power bay, see Removing DSS 9000 rack manager module.

Steps

- 1 Remove the screws securing the IM to the bracket.
- 2 Hold the IM by the sides and lift it out to separate from the bracket.

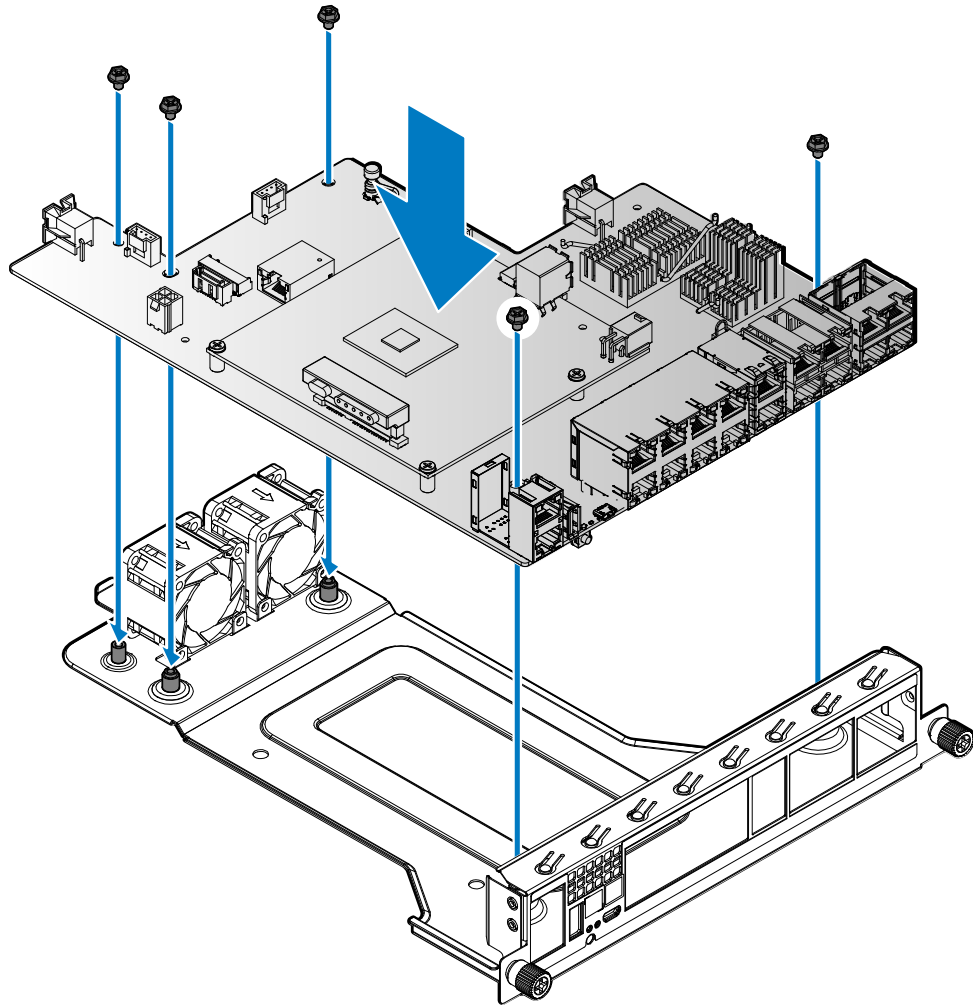


134 **Figure 85. Separating the IM from the bracket**
Installing and removing system components

Installing IM

Steps

- 1 Grasp the IM by the edges and align it in the bracket.
- 2 Lower it in place and make sure the screw holes on the bracket and IM are aligned.
- 3 Secure the IM to the bracket with the screws.



136 **Figure 36. Assembling the IM and bracket**
Installing and removing system components

Next step

- 1 Install the rack manager module.

Rear IO modules

Removing rear IO module

Prerequisite

Ensure that you read the Safety instructions.

Steps

- 1 Remove the screws from the rear IO.
- 2 Remove the rear IO from the power bay.

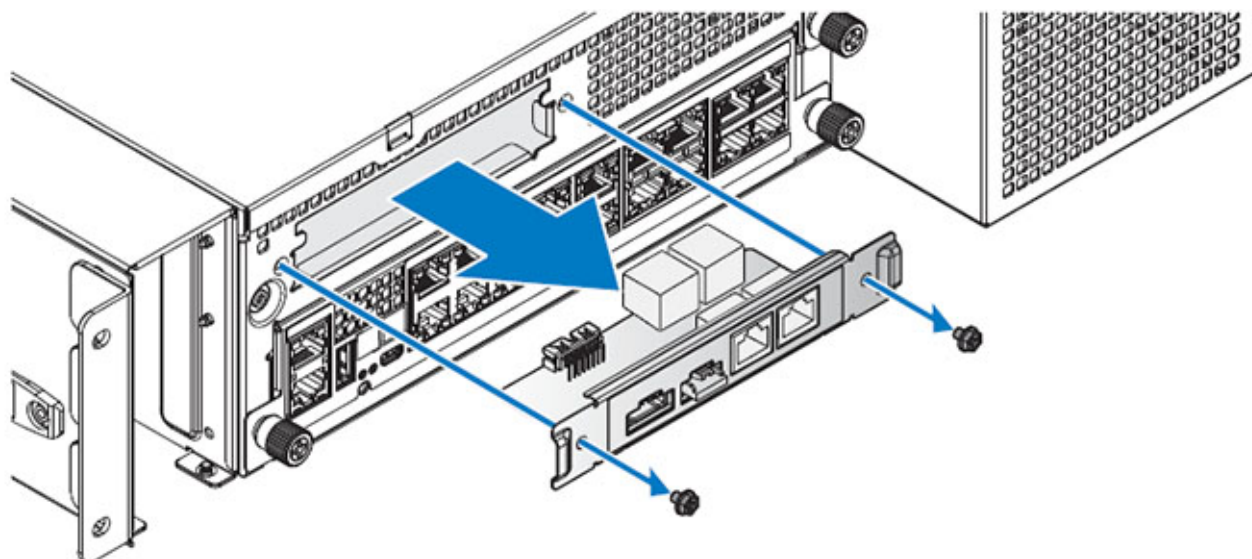
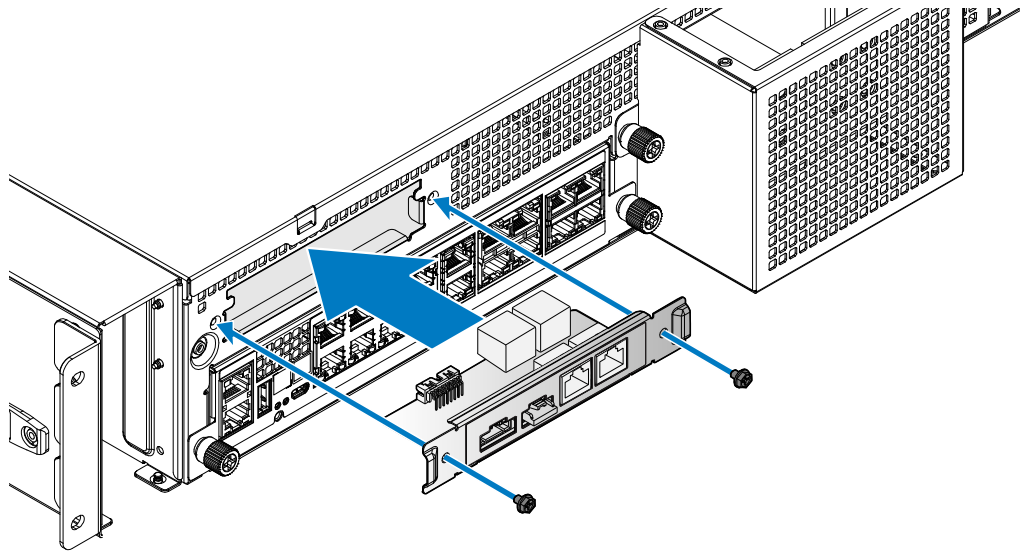


Figure 87. Removing the rear IO module

Installing rear IO module

- 1 Insert the rear I/O into the power bay.
- 2 Secure the rear I/O to the power bay with screws.



136 **Figure 88. Installing the rear IO module**
Installing and removing system components

Table 38. Assembly material

Description	Quantity	Torque (lbs/inch)
#6-32 screw	2	8 ± 0.5

Power interface board (PIB)

Removing PIB

Prerequisite

- 1 Ensure that you read the Safety instructions.

About this task

⚠ CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized is not covered by warranty. Read and follow the safety instructions that came with the product.

Before attempting to service any part of the Power Interface Board (PIB), make sure the power source and power cables are turned off and disconnected.

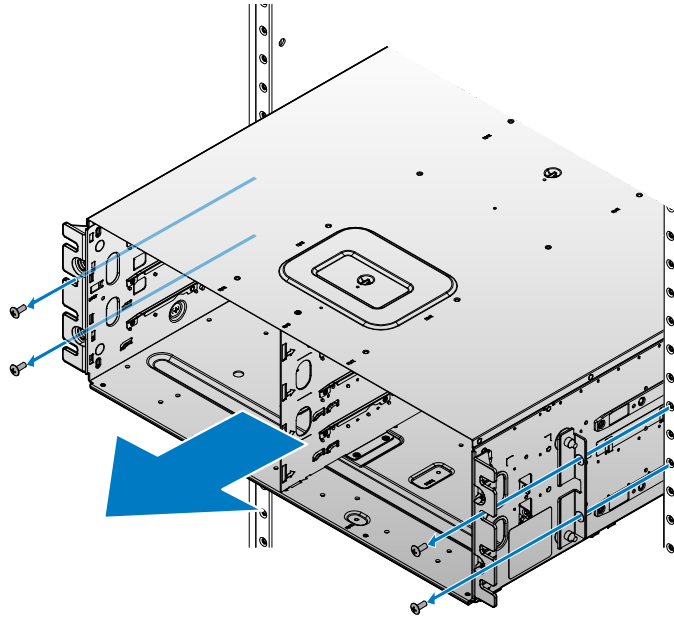
It is not necessary to remove the PIB cover. The following procedure is provided as reference information only.

Steps

- 1 Make sure the system is turned off. Log in to the interface. The command line interface (CLI) is displayed.
- 2 Change directory locations to the specified directory as shown in the following figure.
- 3 Type the command `Stop` to turn off the system. The turn-off process is fully completed in 2 minutes.

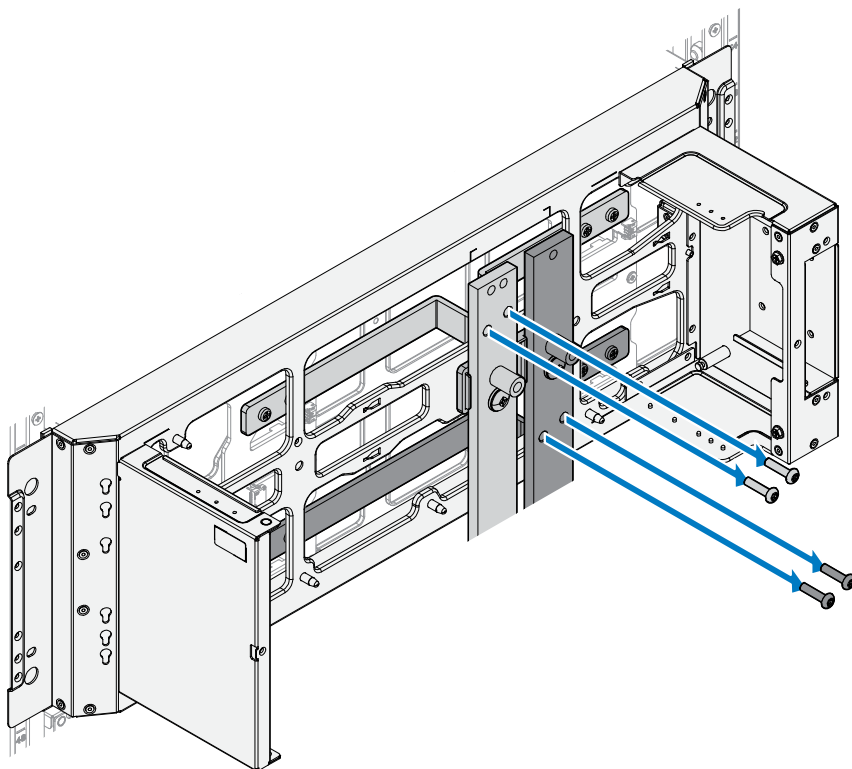
```
/DEVICEHANAGER/RACK1/BLOCK1/BC-> cd ..  
/DEVICEHANAGER/RACK1/BLOCK1-> cd ..  
/DEVICEHANAGER/RACK1/->  
/DEVICEHANAGER/RACK1/->  
/DEVICEHANAGER/RACK1/->  
/DEVICEHANAGER/RACK1/->  
/DEVICEHANAGER/RACK1/->  
/DEVICEHANAGER/RACK1/->  
/DEVICEHANAGER/RACK1/-> stop
```

- 4 After the system is fully turned off, disconnect the respective power cables from the electrical sockets before proceeding further.
- 5 Remove the server modules from the block chassis. For more details, see Servers.
- 6 Remove the securing screws attached to the chassis ears.
- 7 Remove the securing screws attached to the cross bus bars and main bus bars.



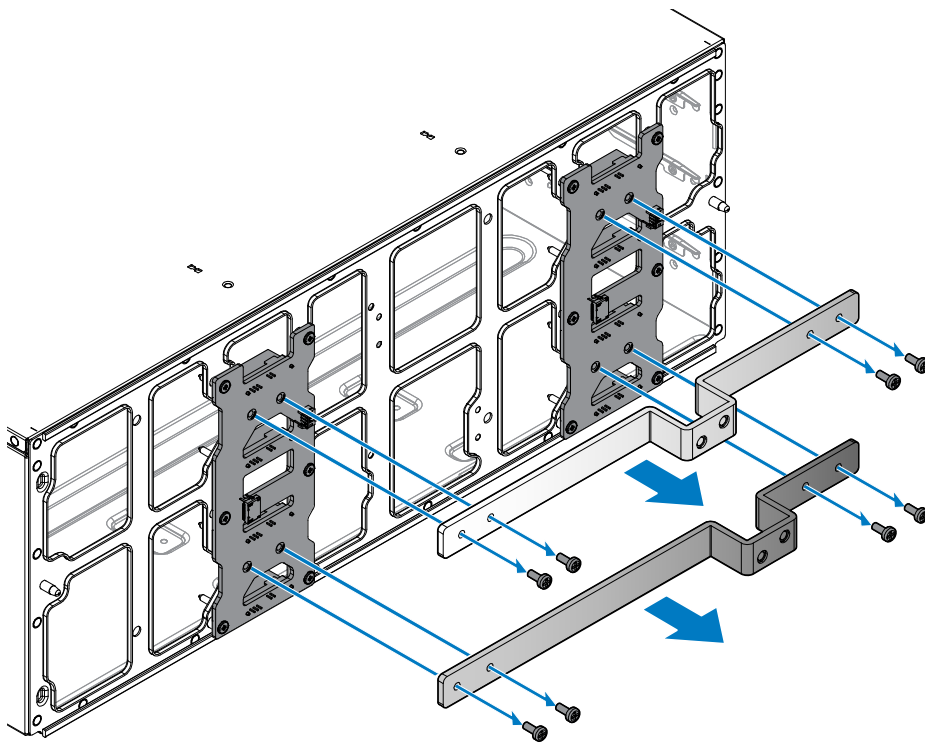
149 **Figure 90. Removing the bus bar screws**
Installing and removing system components

8 The block chassis is no longer secured to the rack cabinet.



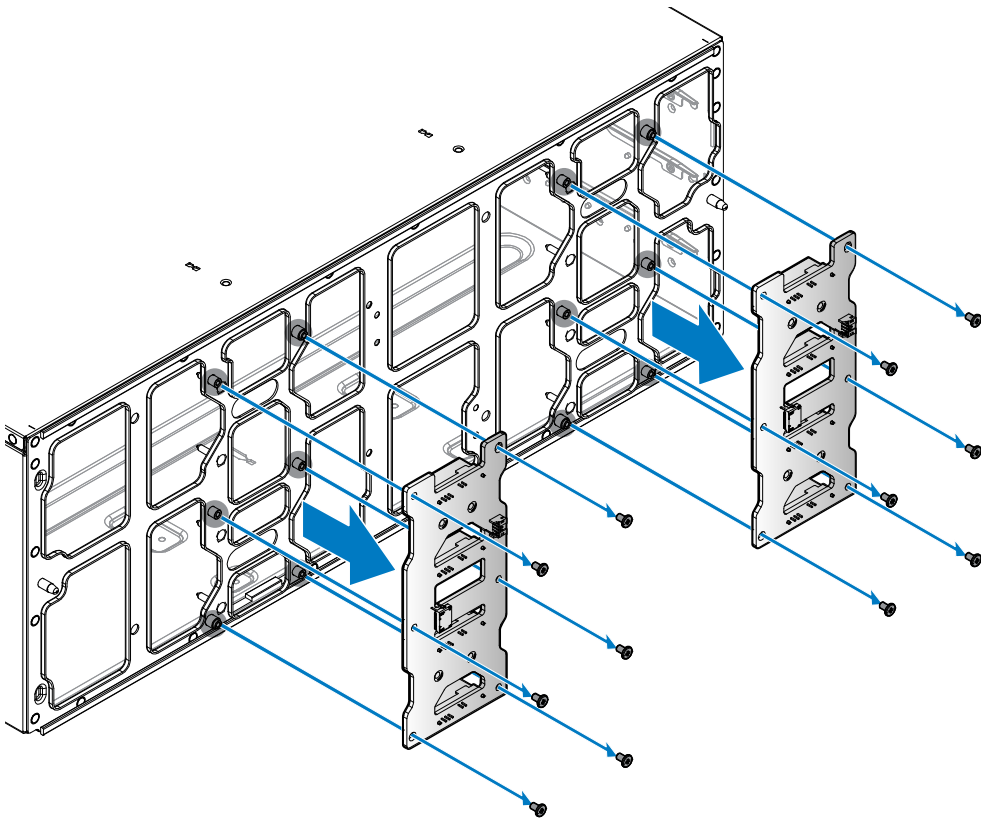
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Figure 91. Removing the block chassis from the rack cabinet
Installing and removing system components

- 9 Remove the block chassis from the rack cabinet and place it on a clean work surface.
- 10 Locate the rear of the block chassis. The cross bus bar (x2) and PIBs (x2) are visible from the rear view.
- 11 Remove the screws securing the cross bus bar to the chassis.
- 12 Remove the bus bars and place them on a clean surface.



146 **Figure 92. Removing the cross bus bars**
Installing and removing system components

- 13 Remove the screws securing the PIBs to the chassis.
- 14 Remove the PIBs and place them on a clean surface.



146 **Figure 93. Removing FIBs** Installation and Service Manual
Installing and removing system components

Installing PIB

About this task

⚠ CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized is not covered by warranty. Read and follow the safety instructions that came with the product.

Before attempting to service any part of the Power Interface Board (PIB), make sure the power source and power cables are turned off and disconnected.

The following procedure is provided as reference information only.

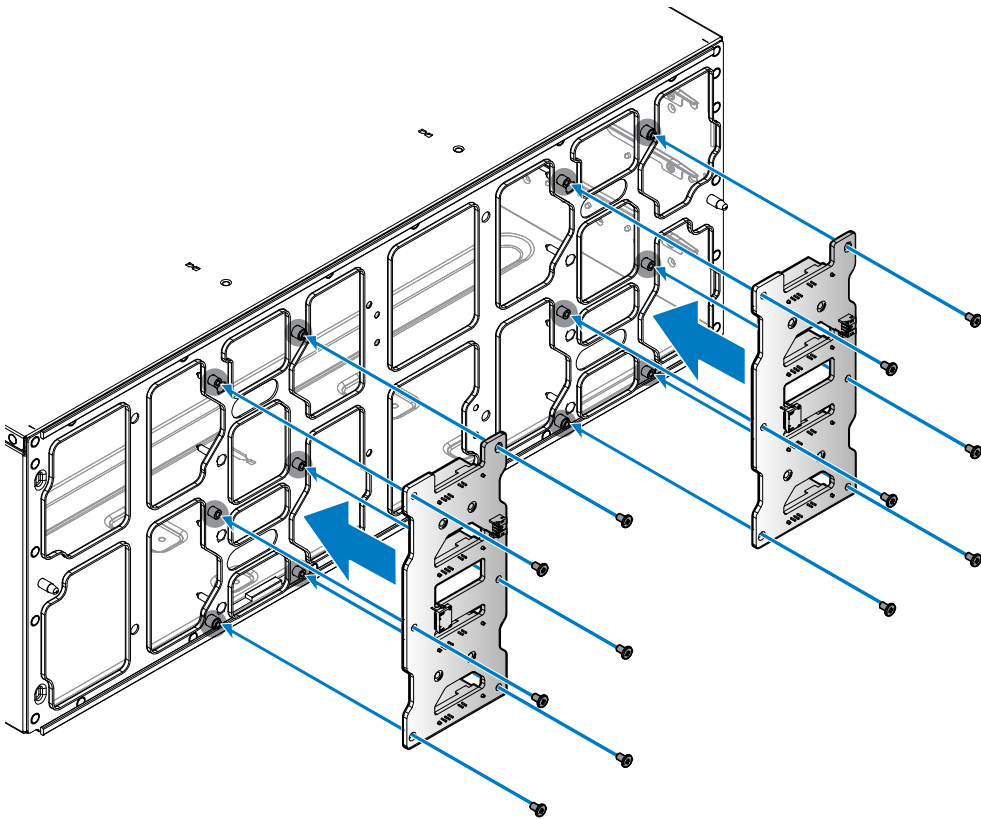
Steps

- 1 Make sure the system is turned off before proceeding.
If the system is not turned off, do the following:
 - a Log in to the interface. The CLI is displayed.
 - b Change directory locations to the specified directory as shown in the following figure.
 - c Type the command `stop` to turn off the system. The turn-off process is fully completed in 2 minutes.

```
/DEVICEHANAGER/RACK1/BLOCK1/BC-> cd ..  
/DEVICEHANAGER/RACK1/BLOCK1-> cd ..  
/DEVICEHANAGER/RACK1/->  
/DEVICEHANAGER/RACK1/->  
/DEVICEHANAGER/RACK1/->  
/DEVICEHANAGER/RACK1/->  
/DEVICEHANAGER/RACK1/->  
/DEVICEHANAGER/RACK1/->  
/DEVICEHANAGER/RACK1/-> stop
```

After the system is fully turned off, disconnect the respective power cables from the electrical sockets before proceeding further.

- 2 Locate the rear of the block chassis.
- 3 Remove the new PIBs from their packaging content and inspect for damage.
- 4 Align the PIBs on each respective location, see the following figure for further details, and place them on the block chassis.
- 5 Secure the PIBs to the chassis with the provided screws.

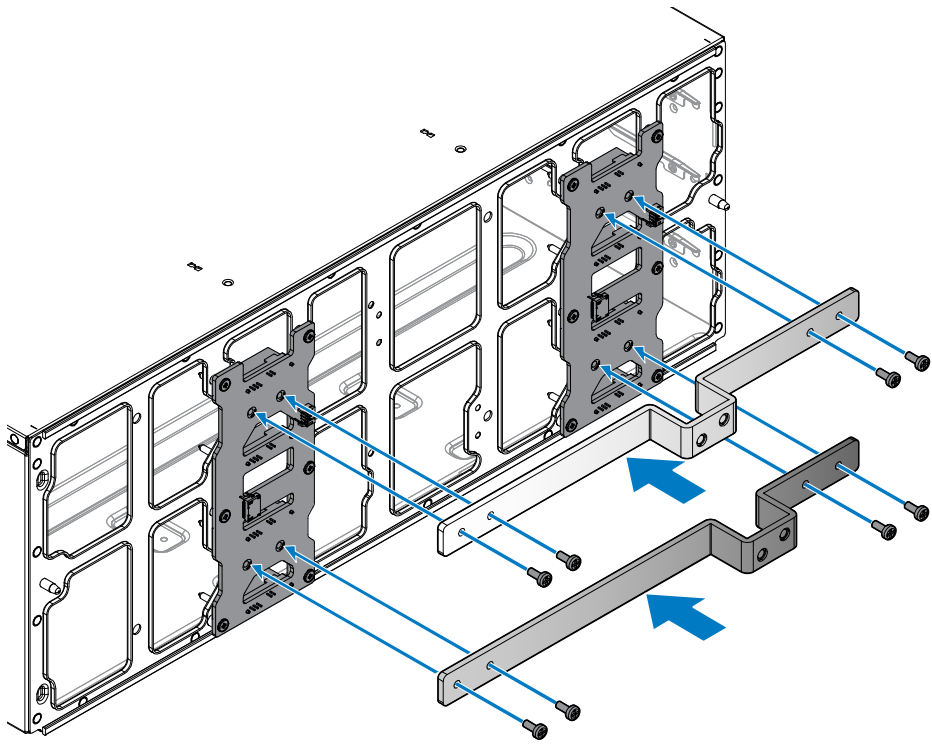


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Figure 95. Installing PIBs
Installing and removing system components

Table 39. Assembly material

Description	Quantity	Torque (lbs/inch)
#6-32 screw	12	8 ± 0.5

- 6 Align the top cross bus bar (positive, red) with the PIBs. Make sure the holes on the cross bus bar align with the holes on the PIBs.
- 7 Secure the cross bus bar and PIBS to the chassis with the provided screws.
- 8 Repeat for the bottom cross bus bar (negative, black).

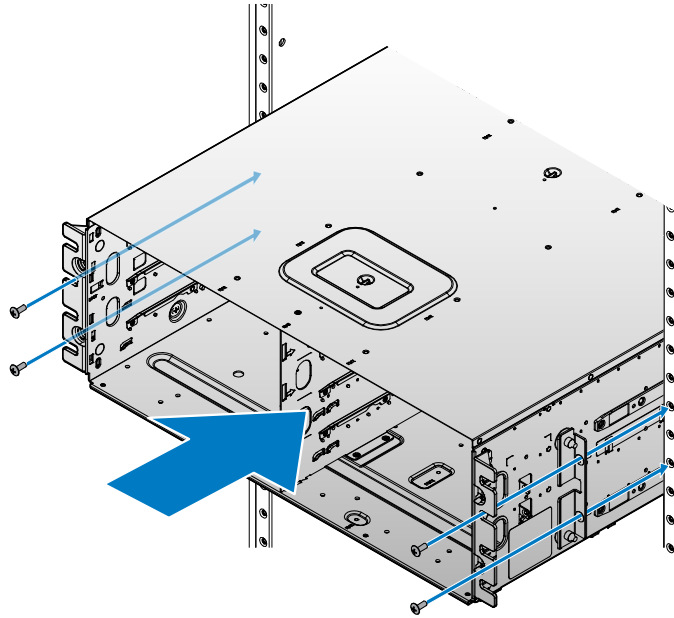


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Figure 96. Installing cross bus bars
Installing and removing system components

Table 40. Assembly material

Description	Quantity	Torque (lbs/inch)
M4 screw	8	8 ± 0.5

- 9 Align the block chassis with the rack cabinet and slide in place until the securing ears are flush with the rack posts.
- 10 Secure the block chassis to the posts with the provided screws.

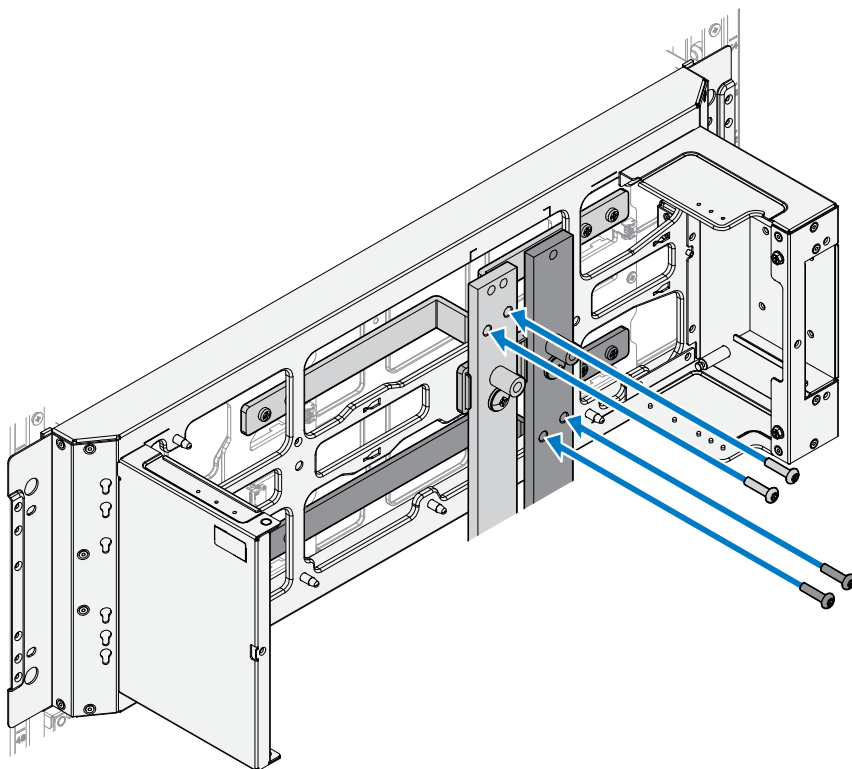


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Figure 97. Installing the block chassis on the rack cabinet
Installing and removing system components

Table 41. Assembly material

Description	Quantity	Torque (lbs/inch)
M5 screw	4	18 ± 1

- 11 Install the server modules on the block chassis. For more details, see Servers.
- 12 Secure the cross bus bars and main bus bars with the provided screws.



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Figure 98. Securing bus bars
Installing and removing system components

Table 42. Assembly material

Description	Quantity	Torque (lbs/inch)
M5 screw	4	16 ± 1

Troubleshooting list

Table 43. Troubleshooting list

Issue description	Trigger event for amber LED (MC/IM/BC)	Root cause	Troubleshooting step
Fan fail (keeps 100% duty)			<ol style="list-style-type: none"> 1 Check HTPB. 2 Check G5.5 FW version in IM/MC/BC. 3 Check "llcDebug" command.
BC Power LED amber	<ul style="list-style-type: none"> • For I2C communication and MOSFET failure, BC dumps EEPROM log. • For FPGA configuration failed, BC may rebooting again and again. 	<ol style="list-style-type: none"> 1 MAC address missed or incorrect. 2 Ethernet link is down. 3 Wrong fan table file. 4 FPGA image is wrong. 5 FPGA configuration failed. 6 Mosfet failed. 7 I2C communication failed. 	<ol style="list-style-type: none"> 1 Ensure fan table and FPGA image s correct. 2 LAN connection is fine. 3 Ensure MAC address is correct and present. 4 Ensure there is no HW damage.
Fan Zone 1 fail LED amber	<ul style="list-style-type: none"> • If 1 fan fails, BC will move to fan table C. • If 2 fan fails, BC will move to fan table D and fan will rotate on 100% PWM. 	1 or more than 1 fans become absent from left group of 6 fans (fan no: 1~6).	Ensure all fans insert in fan wall properly.
Fan Zone 2 fail LED amber	<ul style="list-style-type: none"> • If 1 fan fails, BC will move to fan table C. • If 2 fan fails, BC will move to fan table D and fan will rotate on 100% PWM. 	1 or more than 1 fans become absent from right group of 6 fans (fan no: 7~12).	Ensure all fans insert in fan wall properly.
IM status LED amber		<ol style="list-style-type: none"> 1 MAC address missed or incorrect. 2 I2C communication fail. 	<ol style="list-style-type: none"> 1 Set MAC address using llcDebug command if its incorrect or missed. 2 Ensure there is no HW damage.
BC status LED blinking amber	LED will blink on every 1s interval and 'LastUpgradeStatus' property on Bc target will show CFGERROR.	Different Infrastructure property between BC and MC (G5/G5.5).	Ensure both BC and MC have same Infrastructure property.
IM status LED blinking amber	LED will blink on every 1s interval and 'LastUpgradeStatus' property on IM target will show CFGERROR.	Different Infrastructure property between IM and MC (G5/G5.5).	Ensure both IM and MC have same Infrastructure property.
MC Error LED blinking amber	LED will blink on every 1s interval and 'LastUpgradeStatus' property on Rack target will show CFGERROR.	Different Infrastructure property between IM, MC and BC (G5/G5.5).	Ensure IM, MC and BC have same Infrastructure property.

Issue description	Trigger event for amber LED (MC/IM/BC)	Root cause	Troubleshooting step
MC Error LED amber	MC will dump log in llcEvent.log file.	Ethernet link to IM is down.	Ensure LAN connection is fine.
PSU status LED amber	MC will send PSU fault bitmap to iDRAC through BC and MC will display PSU Error status on MC CLI under PSU target.	PSU fail.	OCP, OVP, OTP.
G5.5 FW update fail	BC/IM will send fail status to MC and MC will dump the llcEvents log (BC/IM will not lit Amber LED).	Any image is wrong (header/checksum) or update G5 image on G5.5.	Call Dell help. Ask if the FW is official release.
Some server can not boot after rack power on			Reset server.

Getting help

Contacting Dell

Dell provides several online and telephone based support and service options. If you do not have an active internet connection, you can find contact information about your purchase invoice, packing slip, bill, or Dell product catalog. Availability varies by country and product, and some services may not be available in your area. To contact Dell for sales, technical assistance, or customer service issues:

- 1 Go to Dell.com/support/home
- 2 Select your country from the drop-down menu on the lower right corner of the page.
- 3 For customized support:
 - a Enter your system Service Tag in the **Enter your Service Tag** field.
 - b Click **Submit**.
The support page that lists the various support categories is displayed.
- 4 For general support:
 - a Select your product category.
 - b Select your product segment.
 - c Select your product.
The support page that lists the various support categories is displayed.
- 5 For contact details of Dell Global Technical Support:
 - a Click [Global Technical Support](#)
 - b The **Contact Technical Support** page is displayed with details to call, chat, or e-mail the Dell Global Technical Support team.

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