FusionServer Pro 2288H V5 Server

Maintenance and Service Guide

Issue	35
Date	2024-07-03



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Security Declaration

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https://securitybulletin.huawei.com/enterprise/en/security-advisory

About This Document

Purpose

This document describes the 2288H V5 in terms of its appearance, physical structure, product specifications, and methods for removing and installing components.

Intended Audience

This document is intended for:

- Huawei technical support engineers
- Technical support engineers from channel partners
- Enterprise administrators

Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
DANGER	Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
WARNING	Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. **NOTICE** is used to address practices not related to personal injury.

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Symbol	Description
NOTE	Supplements the important information in the main text. **NOTE** is used to address information not related to personal injury, equipment damage, and environment deterioration.

Change History

Issue	Date	Description
35	2024-07-03	This issue is the thirty-fifth official release. Changed the output power from 550 W to 450 W when one or two 900 W AC Titanium PSUs are configured and the input voltage ranges from 100 V AC to 127 V AC in **2.8 PSUs**.
34	2024-05-15	This issue is the thirty-fourth official release. • Added the description of importing and replacing certificates in **8.5.62 Installing the Mainboard**. • Added the notice for turning off the circuit breaker before PSU replacement in **8.5.9 Removing a PSU** and **8.5.10 Installing a PSU**.
33	2024-04-01	This issue is the thirty-third official release. Modified **Figure 7-145**.
32	2024-01-12	This issue is the thirty-second official release. Modified **8.5.53 Removing a PCIe Card**, **8.5.54 Installing a PCIe Card**, and **10.2 Logging In to the iBMC WebUI**.
31	2023-10-11	This issue is the thirty-first official release. Modified **2.5.2 Drive Numbering**.
30	2023-07-25	This issue is the thirtieth official release. Modified **11.2 Product Information** and **11.4 Maintenance Tools**.
29	2023-01-13	This issue is the twenty-ninth official release. • Modified **8.5.27 Removing the TPM/TCM** and **8.5.28 Installing the TPM/TCM**. • Modified **3.1 Technical Specifications**.

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Issue	Date	Description
28	2022-11-30	This issue is the twenty-eighth official release. • Modified **10.3.2 Logging In to the Independent Remote Console**. • Added the method of viewing the health status of drives from the PCH in **2.5.1 Drive Configurations**.
27	2022-09-15	• Modified **3.3 Physical Specifications**. • Modified **11.2 Product Information**.
26	2022-08-19	• Modified **2.5.2 Drive Numbering**. • Modified internal cabling.
25	2022-06-30	• Modified internal cabling. • Updated the drive numbering. • Updated figures in the document. • Added the method of burning the original device serial number to the new mainboard.
24	2022-04-12	• Added the section "NC-SI Cabling". • Optimized the procedure for removing a PCIe riser module. • Added the methods of installing and removing cables for a 2000 W PSU.
23	2021-08-16	• Added the procedure for removing and installing the CacheCade key of the LSI 9361-8i RAID controller card. • Added sections about removing and installing the PCIe RAID controller card. • Added sections about removing and installing the supercapacitor (for servers configured with PCIe RAID controller cards). • Updated content in sections about the LOM port, rear panel, and replacement of NVMe SSDs. • Added the description of hot plug in the VMD configuration.
22	2021-07-14	Updated the iBMC version restrictions for specific front-drive backplanes.
21	2021-06-30	• Added the firmware upgrade procedure in sections about the PCIe card, RAID controller card, and FlexIO card installation. • Added 24 x 2.5" Drive Pass-through Configuration with 3 x PCIe RAID controller cards.

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Issue	Date	Description
20	2021-06-01	• Added the iBMC version restrictions for specific front-drive backplanes in section **8.5.32 Installing the Front-Drive Backplane**. • Added the iBMC version restrictions for the 4 x 2.5" rear-drive module in section **8.5.38.2 Installing a 4 x 2.5" Rear Drive Module**. • Updated the storage temperature and humidity.
19	2021-04-12	This issue is the nineteenth official release.
18	2021-03-09	This issue is the eighteenth official release.
17	2021-01-21	This issue is the seventeenth official release.
16	2020-11-07	This issue is the sixteenth official release.
15	2020-08-31	This issue is the fifteenth official release.
14	2020-08-04	This issue is the fourteenth official release.
13	2020-06-05	This issue is the thirteenth official release.
12	2020-04-20	This issue is the twelfth official release.
11	2020-03-18	This issue is the eleventh official release.
10	2020-03-05	This issue is the tenth official release.
09	2019-11-30	This issue is the ninth official release.
08	2019-10-15	This issue is the eighth official release.
07	2019-08-10	Added the support for the Cascade Lake processors.
06	2018-11-30	Refined the document for easy use.
05	2018-10-30	Refined the document for easy use.
04	2018-09-04	Added information about the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive configuration.
03	2018-04-18	• Added TPM specifications. • Added built-in drive specifications. • Modified operating temperature specifications.
02	2017-12-29	Added the NVMe drive configuration information.
01	2017-08-13	This issue is the first official release.

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1 Overview

1.1 Overview

1.2 Physical Structure

1.3 Logical Structure

1.1 Overview

Huawei FusionServer Pro 2288H V5 (2288H V5) is a next-generation 2U 2-socket rack server designed for Internet, Internet Data Center (IDC), cloud computing, enterprise, and telecom applications.

The 2288H V5 is ideal for IT core services, cloud computing, high-performance computing, distributed storage, big data processing, enterprise or telecom applications, and other complex workloads.

The reliable 2288H V5 features low power consumption, high scalability, easy deployment, and simplified management.

NOTE

For details about the 2288H V5 nameplate information, see **A.3 Nameplate** .

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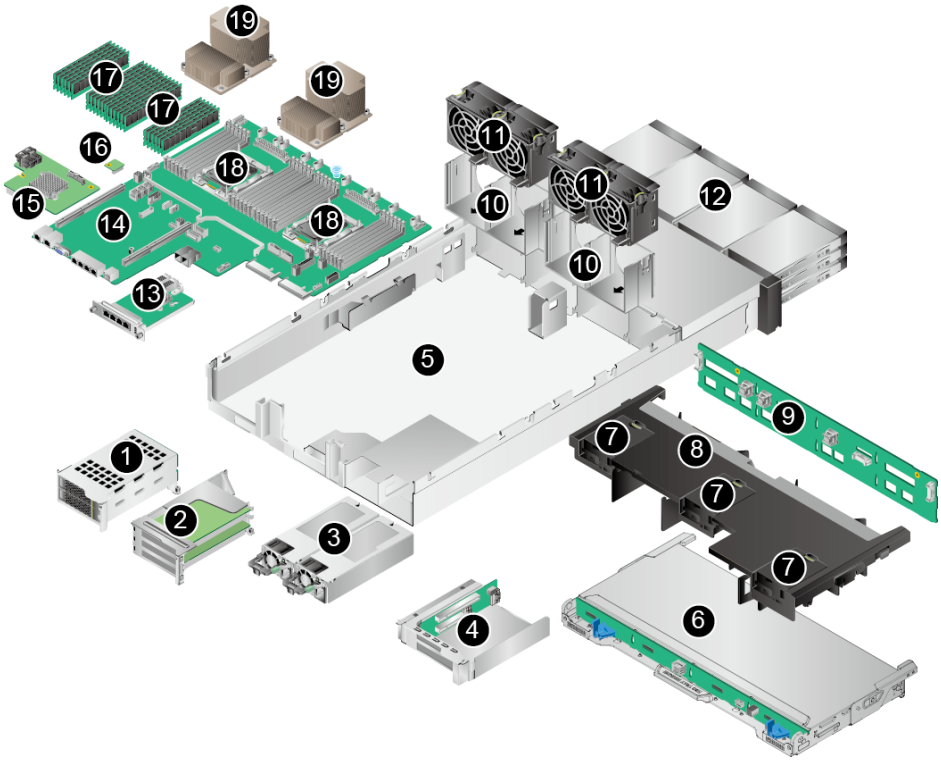
Figure 1-1 2288H V5 (with 12 drives)



1.2 Physical Structure

Figure 1-2 Physical structure of a 2288H V5 with 12 x 3.5" drives (example)



1	I/O module 1	2	I/O module 2
3	Power supply unit (PSU)	4	I/O module 3

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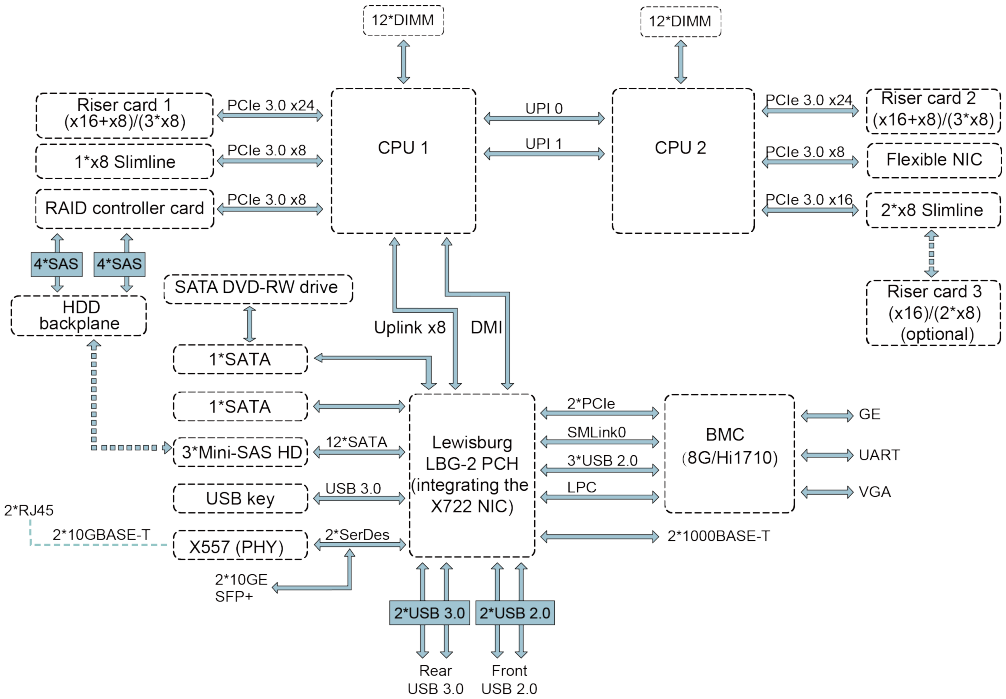
5	Chassis	6	(Optional) built-in drive module[a]
7	Supercapacitor holder	8	(Optional) air duct[a]
9	Front drive backplane	10	Fan module bracket
11	Fan modules	12	Front drive
13	FlexIO	14	Mainboard
15	RAID controller card	16	TPM/TCM
17	Memory	18	Processor
19	Heat sink	-	-
a: Install either the air duct or built-in drive module.			

1.3 Logical Structure

Figure 1-3 2288H V5 logical structure



- The server supports one or two Intel® Xeon® Scalable processors.
- The server supports up to 24 memory modules.
- The CPUs (processors) interconnect with each other through two UPI links at a speed of up to 10.4 GT/s.
- Three PCIe riser cards connect to the processors through PCIe buses to provide ease of expandability and connection.

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- The RAID controller card on the mainboard connects to CPU 1 through PCIe buses, and connects to the drive backplane through SAS signal cables. A variety of drive backplanes are provided to support different local storage configurations.
- The LBG-2 Platform Controller Hub (PCH) supports:
  - Two 10GE optical LOM ports or two 10GE electrical LOM ports
  - Two GE electrical LOM ports
- The server uses the Hi1710 management chip and supports a video graphic array (VGA) port, a management network port, and a debug serial port.

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2 Hardware Description

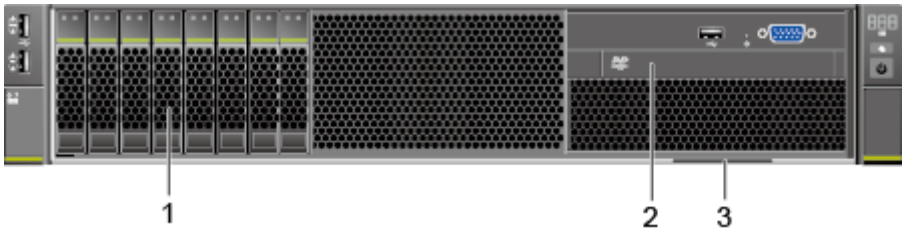
2.1 Front Panel
2.2 Rear Panel
2.3 Processor
2.4 Memory
2.5 Storage
2.6 Network
2.7 I/O Expansion
2.8 PSUs
2.9 Fans
2.10 Boards

2.1 Front Panel

2.1.1 Appearance

- 8 x 2.5" drive configuration

Figure 2-1 Front view



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1	Drives	2	(Optional) Built-in DVD drive
3	Slide-out label plate (with an SN label)	-	-

- 12 x 3.5" drive configuration

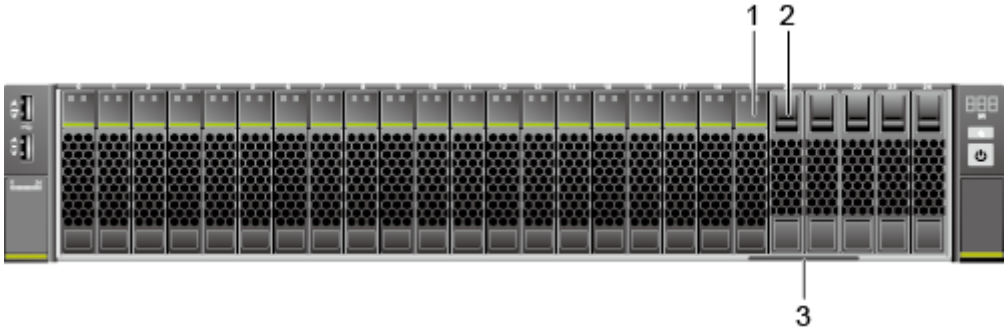
Figure 2-2 Front view



1	Drives	2	Slide-out label plate (with an SN label)

- 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive configuration

Figure 2-3 Front view



1	Drives	2	Filler module
3	Slide-out label plate (with an SN label)	-	-

- 24 x 2.5" drive configuration

Figure 2-4 Front view



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1	Drives	2	Slide-out label plate (with an SN label)

- 25 x 2.5" drive configuration

Figure 2-5 Front view



1	Drives	2	Slide-out label plate (with an SN label)

2.1.2 Indicators and Buttons

Positions

- 8 x 2.5" drive configuration

Figure 2-6 Indicators and buttons on the front panel



1	10GE LOM port 1 connection status indicator	2	10GE LOM port 2 connection status indicator
3	GE LOM port 1 connection status indicator	4	GE LOM port 2 connection status indicator
5	Non-Maskable Interrupt (NMI) button	6	Fault diagnosis LED
7	Health status indicator	8	UID button/indicator
9	Power button/indicator	-	-

- 12 x 3.5" drive configuration

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Figure 2-7 Indicators and buttons on the front panel



1	10GE LOM port 1 connection status indicator	2	10GE LOM port 2 connection status indicator
3	GE LOM port 1 connection status indicator	4	GE LOM port 2 connection status indicator
5	Fault diagnosis LED	6	Health status indicator
7	UID button/indicator	8	Power button/indicator

- 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive configuration

Figure 2-8 Indicators and buttons on the front panel



1	10GE LOM port 1 connection status indicator	2	10GE LOM port 2 connection status indicator
3	GE LOM port 1 connection status indicator	4	GE LOM port 2 connection status indicator
5	Fault diagnosis LED	6	Health status indicator
7	UID button/indicator	8	Power button/indicator

- 24 x 2.5" drive configuration

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Figure 2-9 Indicators and buttons on the front panel



1	10GE LOM port 1 connection status indicator	2	10GE LOM port 2 connection status indicator
3	GE LOM port 1 connection status indicator	4	GE LOM port 2 connection status indicator
5	Fault diagnosis LED	6	Health status indicator
7	UID button/indicator	8	Power button/indicator
9	NMI button	-	-

- 25 x 2.5" drive configuration

Figure 2-10 Indicators and buttons on the front panel



1	10GE LOM port 1 connection status indicator	2	10GE LOM port 2 connection status indicator
3	GE LOM port 1 connection status indicator	4	GE LOM port 2 connection status indicator
5	Fault diagnosis LED	6	Health status indicator
7	UID button/indicator	8	Power button/indicator

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Indicator and Button Description

Table 2-1 Indicators and buttons on the front panel

Silkscreen	Indicator/ Button	Description
	Fault diagnosis LED	• ---: The device is operating normally. • Fault code: A component is faulty. For details about error codes, see ***FusionServer Pro Rack Server iBMC Alarm Handling***.
	Power button/ indicator	Power indicator: • Off: The device is not powered on. • Steady green: The device is powered on. • Blinking yellow: The iBMC is starting. The power button is locked and cannot be pressed. The iBMC is started in about 1 minute, and then the power indicator is steady yellow. • Steady yellow: The device is standby. Power button: • When the device is powered on, you can press this button to gracefully shut down the OS. **NOTE** For different OSs, you may need to shut down the OS as prompted. • When the device is powered on, holding down this button for 6 seconds will forcibly power off the device. • When the power indicator is steady yellow, you can press this button to power on the device.

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Silkscreen	Indicator/ Button	Description
	UID button/ indicator	The UID button/indicator helps identify and locate a device. UID indicator: ● Off: The device is not being located. ● Blinking or steady blue: The device is being located. UID button: ● You can control the UID indicator status by pressing the UID button or using the iBMC. ● You can press this button to turn on or off the UID indicator. ● You can press and hold down this button for 4 to 6 seconds to reset the iBMC.
	Health status indicator	● Off: The device is powered off or is faulty. ● Blinking red at 1 Hz: A major alarm has been generated on the system. ● Blinking red at 5 Hz: A critical alarm has been generated on the system. ● Steady green: The device is operating properly.
○	NMI button	A non-maskable interrupt (NMI) is generally triggered to stop the OS for debugging. To trigger an NMI, press this button or click the button on the iBMC WebUI. **NOTICE** ● Press the NMI button only when the OS is abnormal. Do not press this button when the server is operating properly. An NMI does not gracefully shut down the OS and causes service interruption and data loss. ● Before pressing the NMI button, ensure that the OS has the NMI processing program. Otherwise, the OS may crash. Exercise caution when pressing this button.

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Silkscreen	Indicator/ Button	Description
	LOM port connection status indicator	Each indicator shows the connection status of an Ethernet LOM port. • Off: The network port is not in use or has failed. • Steady green: The network port is properly connected. **NOTE** • The indicators correspond to two 10GE and two GE network ports on the mainboard. • The LOM has a standby power supply and will not be powered off even if the service system is powered off. As long as the LOM ports are properly connected to other working network devices, the network ports will remain connected and the indicators are on.

2.1.3 Ports

Port Positions

- 8 x 2.5" drive configuration

Figure 2-11 Ports on the front panel



1	USB 2.0 ports	2	USB 3.0 port
3	VGA port	-	-

- 12 x 3.5" drive configuration

Figure 2-12 Ports on the front panel



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1	USB 2.0 ports	-	-

- 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive configuration

Figure 2-13 Ports on the front panel



1	USB 2.0 ports	-	-

- 24 x 2.5" drive configuration

Figure 2-14 Ports on the front panel



1	USB 2.0 ports	2	USB 3.0 port
3	VGA port	-	-

- 25 x 2.5" drive configuration

Figure 2-15 Ports on the front panel



1	USB 2.0 ports	-	-

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Port Description

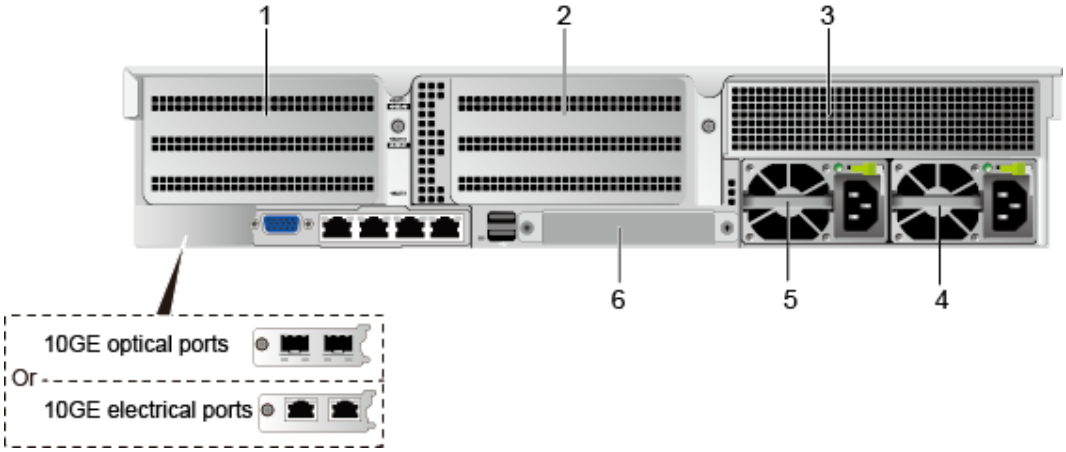
Table 2-2 Ports on the front panel

Port	Type	Quantity[Note]	Description
VGA port	DB15	1	Used to connect a display terminal, such as a monitor or KVM.
USB port	USB 2.0	2	Used to connect to a USB device. **NOTICE** Before connecting an external USB device, check that the USB device functions properly. The server may operate abnormally if an abnormal USB device is connected.
	USB 3.0	1	
Note: The number of ports varies depending on server configuration. This table lists the maximum number of ports in different configurations.			

2.2 Rear Panel

2.2.1 Appearance

Figure 2-16 Rear view



1	I/O module 1	2	I/O module 2
3	I/O module 3	4	PSU 2
5	PSU 1	6	(Optional) FlexIO card

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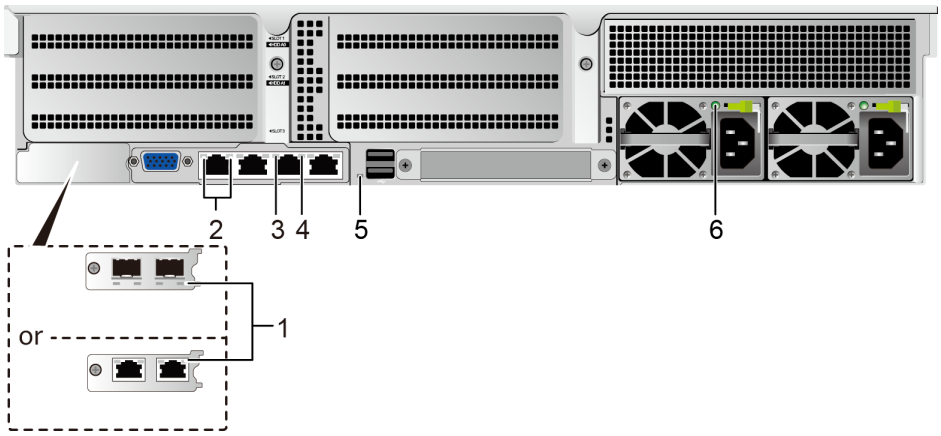
NOTE

- I/O modules 1, 2 and 3 can be configured with drive modules or PCIe riser modules.
- The preceding figure is for reference only.

2.2.2 Indicators

Indicator Positions

Figure 2-17 Indicators on the rear panel



1	LOM port indicator	2	LOM port indicator
3	Data transmission status indicator for the management network port	4	Connection status indicator for the management network port
5	UID indicator	6	PSU indicator

Indicator Description

Table 2-3 Indicators on the rear panel

Indicator	Description
LOM port indicator	For details, see 2.6.1 LOMs.

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Indicator	Description
PSU indicator	• Off: No power is supplied. • Blinking green at 1 Hz: – The input is normal, and the server is standby. – The input is overvoltage or undervoltage. – The PSU is in deep hibernation mode. • Blinking green at 4 Hz: The firmware is being upgraded online. • Steady green: The power input and output are normal. • Steady orange: The input is normal, but no power output is supplied. **NOTE** The possible causes of no power output are as follows: • Power supply overtemperature protection • Power output overcurrent or short-circuit • Output overvoltage • Short-circuit protection • Device failure (excluding failure of all devices)
UID indicator	The UID indicator helps identify and locate a device. • Off: The device is not being located. • Blinking or steady blue: The device is being located. **NOTE** You can turn on or off the UID indicator by pressing the UID button or remotely running a command on the iBMC CLI.
Data transmission status indicator for the management network port	• Off: No data is being transmitted. • Blinking yellow: Data is being transmitted.
Connection status indicator for the management network port	• Off: The network port is not connected. • Steady green: The network port is properly connected.

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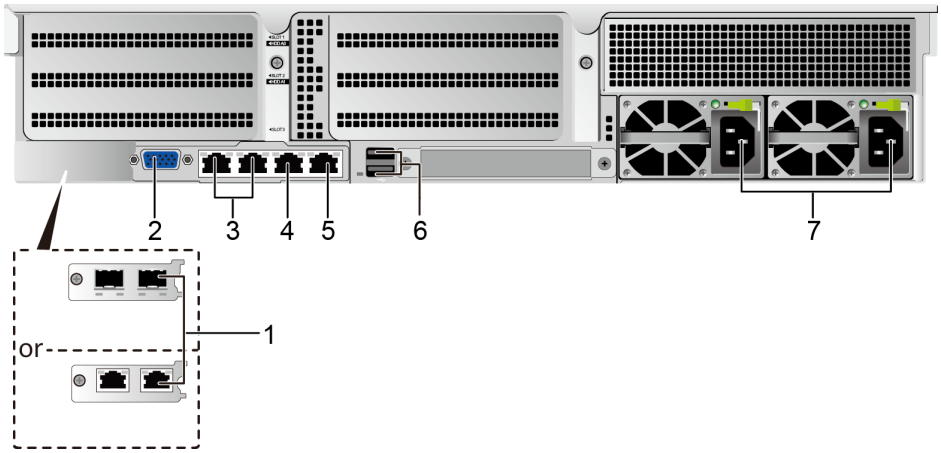
2.2.3 Ports

Port Positions

Figure 2-18 Ports on the rear panel



1	LOM port 1	2	VGA port
3	LOM port 2	4	Management network port
5	Serial port	6	USB 3.0 port
7	PSU socket	8	-

Port Description

Table 2-4 Description of ports on the rear panel

Port	Type	Quantity	Description
LOM port 1	10GE SFP+ or 10GE BASE-T	2	10GE LOM service ports (optical/electrical). Use the optical or electrical ports based on service requirements. For details, see **2.6.1 LOMs**.
LOM port 2	1000BASE-T	2	GE LOM service ports (electrical). LOM port 2
VGA port	DB15	1	Used to connect a display terminal, such as a monitor or KVM.

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Port	Type	Quantity	Description
Serial port	RJ45	1	Default operating system serial port used for debugging. You can also set it as the iBMC serial port by using the iBMC command. **NOTE** The port uses 3-wire serial communication interface, and the default baud rate is 115,200 bit/s.
Management network port	1000BASE-T	1	Used for server management. **NOTE** The management network port is a GE port that supports 100 Mbit/s and 1000 Mbit/s auto-negotiation.
USB port	USB 3.0	2	Used to connect to a USB device. **NOTICE** Before connecting an external USB device, check that the USB device functions properly. The server may operate abnormally if an abnormal USB device is connected.
PSU socket	-	2	Used to connect to the power distribution unit (PDU) in the cabinet. You can select the number of power supply units (PSUs) as required. **NOTE** • When determining the quantity of PSUs, ensure that the rated power of the PSUs is greater than that of the server. • If only one PSU is used, **Predicted PSU Status** cannot be set to **Active/Standby** on the iBMC WebUI.

2.3 Processor

- The server supports one or two processors.
- If only one processor is required, install it in socket **CPU1**.
- The same model of processors must be used in a server.
- Contact your local Huawei sales representative or use the **Computing Product Compatibility Checker** to determine the components to be used.

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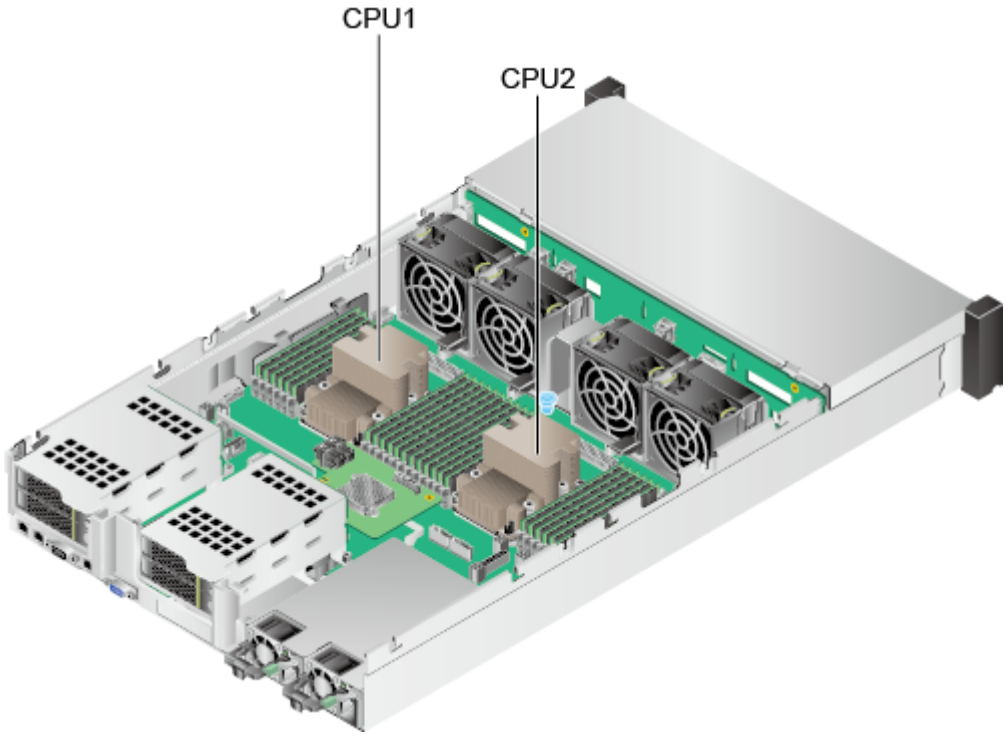
Figure 2-19 Processor positions



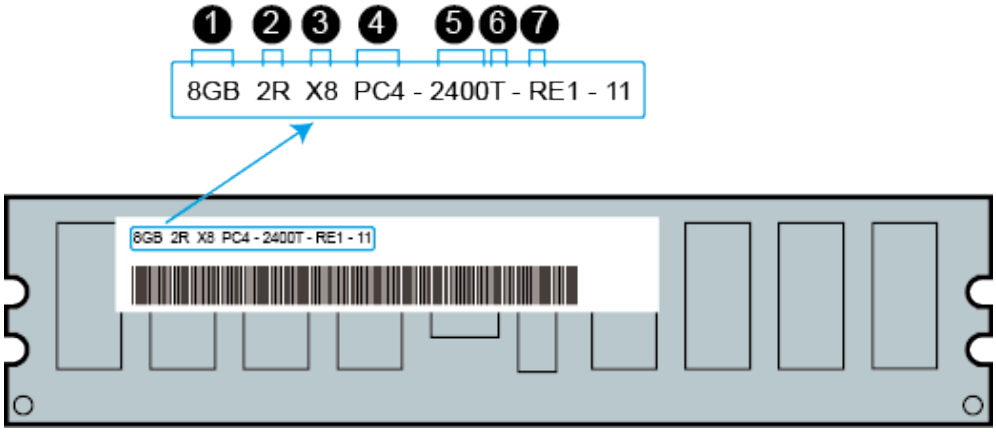
2.4 Memory

2.4.1 DDR4 Memory

2.4.1.1 Memory Identifier

You can determine the memory module properties based on the label attached to the memory module.

Figure 2-20 Memory identifier



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Callout	Description	Definition
1	Capacity of the memory module	• 8 GB • 16 GB • 32 GB • 64 GB • 128 GB
2	Number of ranks of the memory module	• 1R: single-rank • 2R: dual-rank • 4R: quad-rank • 8R: octal-rank
3	Data width on the DRAM	• X4: 4-bit • X8: 8-bit
4	Type of the memory interface	• PC3: DDR3 • PC4: DDR4
5	Maximum memory speed	• 2133 MT/S • 2400 MT/S • 2666 MT/S • 2933 MT/S
6	Column Access Strobe (CAS) latency	• P: 15 • T: 17
7	DIMM type	• R: RDIMM • L: LRDIMM

2.4.1.2 Memory Subsystem Architecture

The 2288H V5 provides 24 memory slots. Each processor integrates six memory channels.

Install the memory modules in the primary memory channels first. If the primary memory channel is not populated, the memory modules in secondary memory channels cannot be used.

Table 2-5 Memory channels

CPU	Memory Channel	Memory Slot
CPU 1	A (primary)	DIMM000(A)
	A	DIMM001(G)
	B (primary)	DIMM010(B)

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CPU	Memory Channel	Memory Slot
	B	DIMM011(H)
	C (primary)	DIMM020(C)
	C	DIMM021(I)
	D (primary)	DIMM030(D)
	D	DIMM031(J)
	E (primary)	DIMM040(E)
	E	DIMM041(K)
	F (primary)	DIMM050(F)
	F	DIMM051(L)
CPU 2	A (primary)	DIMM100(A)
	A	DIMM101(G)
	B (primary)	DIMM110(B)
	B	DIMM111(H)
	C (primary)	DIMM120(C)
	C	DIMM121(I)
	D (primary)	DIMM130(D)
	D	DIMM131(J)
	E (primary)	DIMM140(E)
	E	DIMM141(K)
	F (primary)	DIMM150(F)
	F	DIMM151(L)

2.4.1.3 Memory Compatibility

Observe the following rules when configuring DDR4 DIMMs:

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NOTICE

- A server must use the same model of DDR4 DIMMs, and all the DIMMs operate at the same speed, which is the smallest value of:
  - Memory speed supported by a processor
  - Maximum operating speed of a DIMM
- The DDR4 DIMMs of different types (RDIMM and LRDIMM) and specifications (capacity, bit width, rank, and height) cannot be used together.
- Contact your local Huawei sales representative or use the **Computing Product Compatibility Checker** to determine the components to be used.

- The memory can be used with Intel® Xeon® Scalable Skylake and Cascade Lake processors. The maximum memory capacity supported varies depending on the processor model.
  - Skylake processors
    - M processors: 1.5 TB/socket
    - Other processors: 768 GB/socket
  - Cascade Lake processors
    - L processors: 4.5 TB/socket
    - M processors: 2 TB/socket
    - Other processors: 1 TB/socket
- The total memory capacity is the sum of the capacity of all DDR4 memory modules.

NOTICE

- The total memory capacity cannot exceed the maximum memory capacity supported by the CPUs.
- The total memory capacity refers to the capacity when DDR4 memory modules are fully configured. For details about the memory capacity when DCPMMs are used together with DDR4 memory modules, see **2.4.2.3 Memory Compatibility**.

- Use the **Computing Product Compatibility Checker** to determine the capacity type of a single memory module.
- The maximum number of DIMMs supported by a server varies depending on the CPU type, memory type, rank quantity, and operating voltage.

NOTE

Each memory channel supports a maximum of 8 ranks. The number of DIMMs supported by each channel varies depending on the number of ranks supported by each channel:

Number of DIMMs supported by each channel ≤ Number of ranks supported by each memory channel/Number of ranks supported by each DIMM

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- A memory channel supports more than eight ranks for LRDIMMs.

  NOTE

  A quad-rank LRDIMM generates the same electrical load as a single-rank RDIMM on a memory bus.

Table 2-6 DDR4 memory specifications

Parameter		Specifications
Maximum capacity per DDR4 memory module (GB)		128
Rated speed (MT/s)		2933
Operating voltage (V)		1.2
Maximum number of DDR4 memory modules in a server[a]		24
Maximum DDR4 memory capacity of the server (GB)[b]		3072
Maximum operating speed (MT/s)	1 DPC[c]	2933[d]
	2 DPC	2666
• a: The maximum number of DDR4 memory modules is based on dual-processor configuration. The value is halved for a server with only one processor. • b: The maximum DDR4 memory capacity varies depending on the processor type. The value listed in this table is based on the assumption that DIMMs are fully configured. • c: DPC (DIMM per channel) indicates the number of DIMMs per channel. • d: If the Cascade Lake processor is used, the maximum operating speed of a DIMM can reach 2933 MT/s. If the Skylake processor is used, the maximum operating speed of a DIMM can reach 2666 MT/s only.		

2.4.1.4 DIMM Installation Rules

NOTE

This section applies to a server fully configured with DDR4 DIMMs. If DCPMMs are used together, see **2.4.2.4 DIMM Installation Rules**.

- Observe the following when configuring DDR4 memory modules:
  - Install memory modules only when corresponding processors are installed.
  - Do not install LRDIMMs and RDIMMs in the same server.
  - Install filler memory modules in vacant slots.
- Observe the following when configuring DDR4 memory modules in specific operating mode:
  - Memory sparing mode

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- Comply with the general installation guidelines.
- Each memory channel must have a valid online spare configuration.
- The channels can have different online spare configurations.
- Each populated channel must have a spare rank.

– Memory mirroring mode

- Comply with the general installation guidelines.
- Each processor supports two integrated memory controllers (IMCs). At least two channels of each IMC are used for installing memory modules (channels 1 and 2, or channels 1, 2, and 3). The installed memory modules must be identical in size and organization.
- For a multi-processor configuration, each processor must have a valid memory mirroring configuration.

– Memory scrubbing mode

- Comply with the general installation guidelines.

2.4.1.5 Memory Installation Positions

A 2288H V5 supports a maximum of 24 DDR4 DIMMs. Balanced memory configuration is recommended for optimal memory performance.

NOTICE

At least one DDR4 DIMM must be installed in the memory slots corresponding to CPU 1.

Figure 2-21 Memory slots

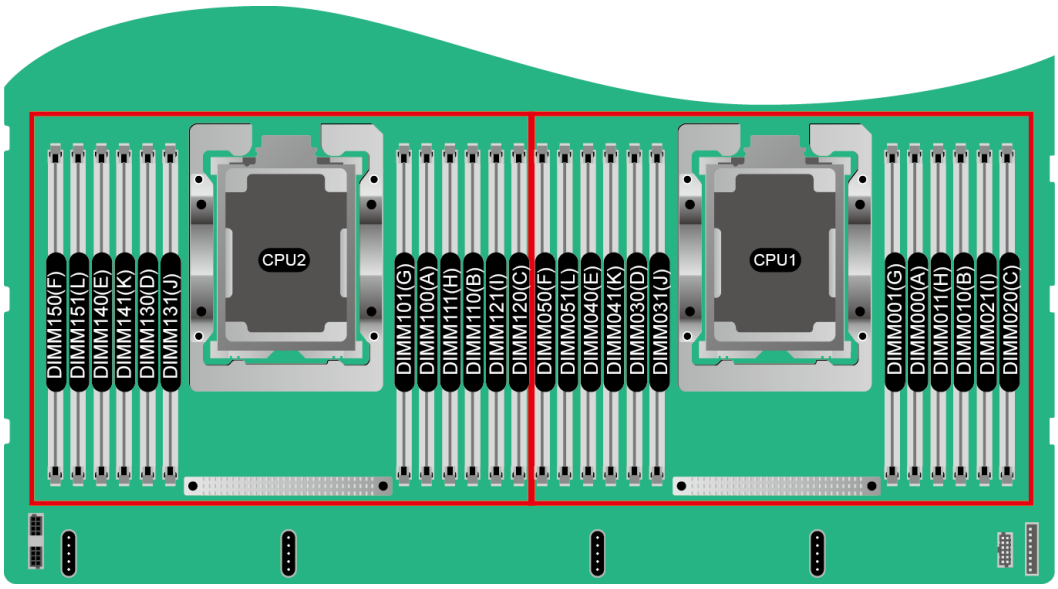

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Figure 2-22 DDR4 memory installation guidelines (1 processor)

CPU	Channel	DIMM Slot	Number of DIMMs (✓: recommended ○: not recommended)											
			✓	✓	✓	✓	○	✓	○	✓	○	○	○	✓
			1	2	3	4	5	6	7	8	9	10	11	12
CPU 1	A	DIMM000(A)	•	•	•	•	•	•	•	•	•	•	•	•
		DIMM001(G)							•	•	•	•	•	•
	B	DIMM010(B)		•	•	•	•	•	•	•	•	•	•	•
		DIMM011(H)								•	•	•	•	•
	C	DIMM020(C)			•		•	•	•		•	•	•	•
		DIMM021(I)									•		•	•
	D	DIMM030(D)				•	•	•	•	•	•	•	•	•
		DIMM031(J)								•		•	•	•
	E	DIMM040(E)				•	•	•	•	•	•	•	•	•
		DIMM041(K)								•		•	•	•
	F	DIMM050(F)						•	•		•	•	•	•
		DIMM051(L)												•

Figure 2-23 DDR4 memory installation guidelines (2 processors)

CPU	Channel	DIMM Slot	Number of DIMMs (✓: recommended ○: not recommended)																							
			○	✓	○	✓	○	✓	○	✓	○	○	○	✓	○	○	○	✓	○	○	○	○	○	○	○	✓
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
CPU1	A	DIMM000(A)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
		DIMM001(G)													•	•	•	•	•	•	•	•	•	•	•	•
	B	DIMM010(B)			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
		DIMM011(H)															•	•	•	•	•	•	•	•	•	•
	C	DIMM020(C)					•	•			•	•	•	•	•	•			•	•	•	•	•	•	•	•
		DIMM021(I)																	•	•			•	•	•	•
	D	DIMM030(D)							•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
		DIMM031(J)															•	•			•	•	•	•	•	•
	E	DIMM040(E)							•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
		DIMM041(K)															•	•			•	•	•	•	•	•
	F	DIMM050(F)											•	•	•	•			•	•	•	•	•	•	•	•
		DIMM051(L)																							•	•
CPU2	A	DIMM100(A)		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
		DIMM101(G)														•	•	•	•	•	•	•	•	•	•	•
	B	DIMM110(B)				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
		DIMM111(H)																•	•	•	•	•	•	•	•	•
	C	DIMM120(C)						•	•			•	•	•	•	•	•			•	•	•	•	•	•	•
		DIMM121(I)																		•	•			•	•	•
	D	DIMM130(D)								•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
		DIMM131(J)																•	•			•	•	•	•	•
	E	DIMM140(E)								•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
		DIMM141(K)																•	•			•	•	•	•	•
	F	DIMM150(F)												•	•	•	•			•	•	•	•	•	•	•
		DIMM151(L)																								•

2.4.1.6 Memory Protection Technologies

The following memory protection technologies are supported:

- ECC
- Full mirroring
- Address range mirroring
- SDDC
- SDDC+1
- Rank sparing mode
- Static virtual lockstep

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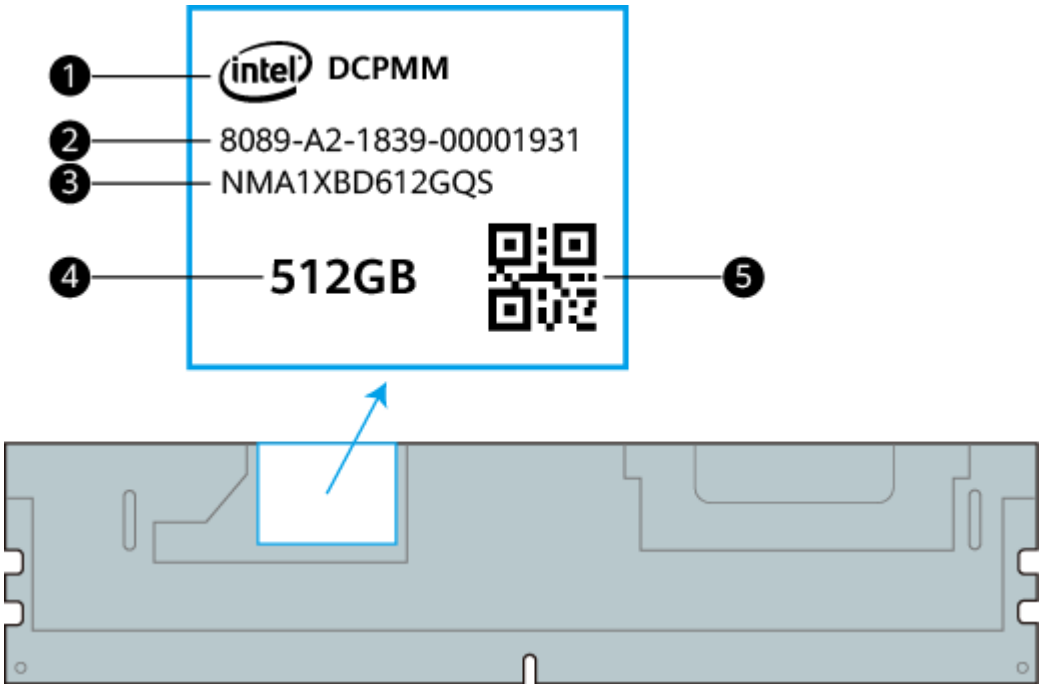
- Faulty DIMM isolation
- Memory thermal throttling
- Memory address parity protection
- Memory demand/patrol scrubbing
- Device tagging
- Data scrambling
- Adaptive double device data correction (ADDDC)
- ADDDC+1

2.4.2 DCPMM

2.4.2.1 Memory Identifier

Figure 2-24 Memory identifier



Callout	Description	Example
1	Component name	Intel® DCPMM
2	Serial number	8089-A2-1839-00001931
3	Model	NMA1XBD612GQS
4	Capacity	• 128 GB • 256 GB • 512 GB
5	SN QR code	8089-A2-1839-00001931

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2.4.2.2 Memory Subsystem Architecture

The 2288H V5 provides 24 memory slots. Each processor integrates six memory channels, and each memory channel supports up to one DCPMM.

DCPMMs must be used with DDR4 memory modules.

Table 2-7 Memory channels

CPU	Memory Channel	Memory Slot
CPU 1	A (primary)	DIMM000(A)
	A	DIMM001(G)
	B (primary)	DIMM010(B)
	B	DIMM011(H)
	C (primary)	DIMM020(C)
	C	DIMM021(I)
	D (primary)	DIMM030(D)
	D	DIMM031(J)
	E (primary)	DIMM040(E)
	E	DIMM041(K)
	F (primary)	DIMM050(F)
	F	DIMM051(L)
CPU 2	A (primary)	DIMM100(A)
	A	DIMM101(G)
	B (primary)	DIMM110(B)
	B	DIMM111(H)
	C (primary)	DIMM120(C)
	C	DIMM121(I)
	D (primary)	DIMM130(D)
	D	DIMM131(J)
	E (primary)	DIMM140(E)
	E	DIMM141(K)
	F (primary)	DIMM150(F)
	F	DIMM151(L)

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2.4.2.3 Memory Compatibility

Observe the following rules when configuring DC persistent memory modules (DCPMMs):

NOTICE

- The DCPMMs must be used with the DDR4 memory modules. For details, see **Huawei FusionServer Pro DCPMM User Guide**.
- Contact your local Huawei sales representative or use the **Computing Product Compatibility Checker** to determine the components to be used.

- The memory must be used with Intel® Xeon® Scalable Cascade Lake processors. The maximum memory capacity supported varies depending on the processor model.
  - L processors: 4.5 TB/socket
  - M processors: 2 TB/socket
  - Other processors: 1 TB/socket
- The DCPMM can work only in App Direct Mode (AD) and Memory Mode (MM). The total supported memory capacity is calculated as follows:
  - DCPMM in AD mode

    Total memory capacity = Total capacity of all DCPMMs + Total capacity of all DDR4 memory modules
  - DCPMM in MM mode

    Total memory capacity = Total capacity of all DCPMMs (The DDR4 memory modules are used as the cache and therefore are not calculated as memory capacity.)

  NOTICE

  - The total memory capacity cannot exceed the maximum memory capacity supported by the CPUs.
  - For details about the AD and MM modes, see "Operating Modes" in ***Huawei FusionServer Pro DCPMM User Guide***.
- Use the **Computing Product Compatibility Checker** to determine the capacity type of a single memory module.

Table 2-8 DCPMM specifications

Item	Specifications		
Capacity per DCPMM (GB)	128	256	512
Rated speed (MT/s)	2666	2666	2666

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Item	Specifications		
Operating voltage (V)	1.2	1.2	1.2
Maximum number of DCPMMs in a server[a]	12	12	12
Maximum capacity of the server (GB)[b]	2304	4608	7680
Maximum operating speed (MT/s)	2666	2666	2666

- a: The maximum number of DCPMMs is based on dual-processor configuration. The value is halved for a server with only one processor.
- b: The maximum memory capacity varies depending on the CPU type and DCPMM working mode. The value listed in this table is based on the assumption that 12 DCPMMs and 12 DDR4 memory modules are used with the L series CPUs and the DCPMMs work in AD mode.
- The information listed in this table is for reference only. For details, consult the local sales representative.

2.4.2.4 DIMM Installation Rules

- The following are general guidelines for DCPMM installation:
  - The DDR4 memory modules used with the DCPMMs include RDIMMs and LRDIMMs.
  - The DCPMMs used in a server must have the same part number (P/N code).
  - The DDR4 memory modules used with the DCPMMs in a server must have the same part number (P/N code).
- Observe the following when configuring DCPMMs in specific operating mode:

  MM mode:

  On the same server, it is recommended that the ratio of FM to NM be 2:1 to 16:1.

  NOTE

  - Near memory (NM): capacity of DDR4 DIMMs used as the cache.
  - Far memory (FM): capacity of the DCPMMs in MM.
- The mapping between the DCPMM and CPU is as follows:
  - DCPMMs require Cascade Lake Gold/Platinum/Silver (4215 model) CPUs.
  - **Table 2-9** lists the maximum memory capacity supported by different CPUs.

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Table 2-9 Maximum memory capacity supported by a CPU

CPU Type	Maximum Memory Capacity Supported by a CPU (DDR4 and DCPMM Capacities)
Full-series	1 TB
M series	2 TB
L series	4.5 TB

2.4.2.5 Memory Installation Positions

A 2288H V5 supports a maximum of 12 DCPMMs. The DCPMMs must be used with DDR4 DIMMs.

Figure 2-25 Memory slots

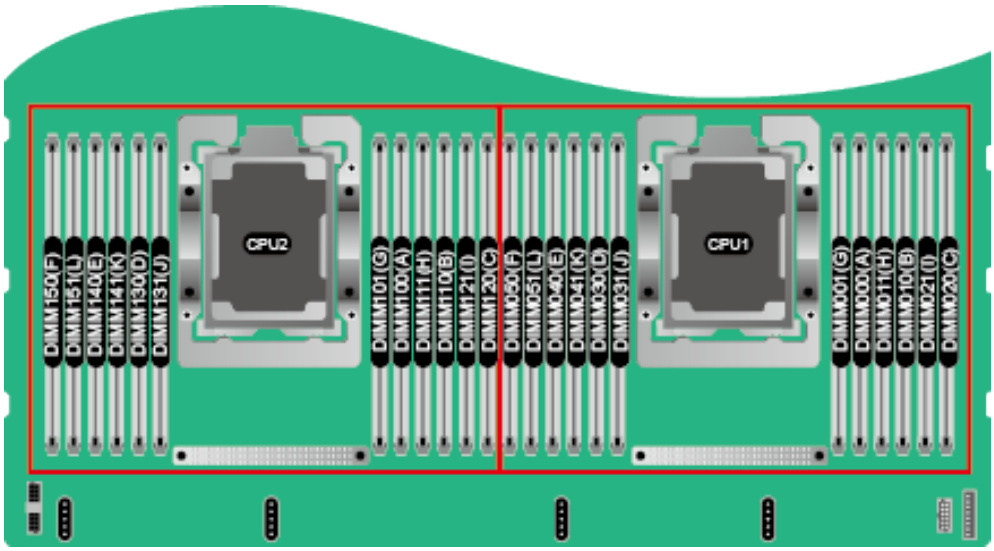

Figure 2-26 DCPMM and DDR4 memory configuration guidelines (1 processor)

CPU	Channel		DIMM Slot	Configurations in Different Modes (●: DDR4 DIMM ○: DCPMM)							
				AD	MM	AD	MM	AD	MM	AD	MM
				2-2-2		2-2-1		2-1-1		1-1-1	
CPU1	IMC0	A	DIMM000(A)	●		●		●		●	
			DIMM001(G)	○		○		○			
		B	DIMM010(B)	●		●		●		●	
			DIMM011(H)	○		○					
		C	DIMM020(C)	●		●		●		◇	
			DIMM021(I)	○							
	IMC1	D	DIMM030(D)	●		●		●		●	
			DIMM031(J)	○		○		○			
		E	DIMM040(E)	●		●		●		●	
			DIMM041(K)	○		○					
		F	DIMM050(F)	●		●		●		◇	
			DIMM051(L)	○							

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Figure 2-27 DCPMM and DDR4 memory configuration guidelines (2 processors)

CPU	Channel		DIMM Slot	Configurations in Different Modes (●: DDR4 DIMM ○: DCPMM)							
				AD	MM	AD	MM	AD	MM	AD	MM
				2-2-2		2-2-1		2-1-1		1-1-1	
CPU1	IMC0	A	DIMM000(A)	●		●		●		●	
			DIMM001(G)	○		○		○			
		B	DIMM010(B)	●		●		●		●	
			DIMM011(H)	○		○					
		C	DIMM020(C)	●		●		●		◇	
			DIMM021(I)	○							
	IMC1	D	DIMM030(D)	●		●		●		●	
			DIMM031(J)	○		○		○			
		E	DIMM040(E)	●		●		●		●	
			DIMM041(K)	○		○					
		F	DIMM050(F)	●		●		●		◇	
			DIMM051(L)	○							
CPU2	IMC0	A	DIMM100(A)	●		●		●		●	
			DIMM101(G)	○		○		○			
		B	DIMM110(B)	●		●		●		●	
			DIMM111(H)	○		○					
		C	DIMM120(C)	●		●		●		◇	
			DIMM121(I)	○							
	IMC1	D	DIMM130(D)	●		●		●		●	
			DIMM131(J)	○		○		○			
		E	DIMM140(E)	●		●		●		●	
			DIMM141(K)	○		○					
		F	DIMM150(F)	●		●		●		◇	
			DIMM151(L)	○							

Figure 2-28 DCPMM and DDR4 memory configuration guidelines

DCPMM and DDR4 Memory Configuration Guidelines					
Capacity per DCPMM	Single iMC Installation Method	Matchable Capacity per DDR4 Memory			
		16 GB	32 GB	64 GB	128 GB
128 GB	2-2-2	√	√	√	
	2-2-1	√	√		
	2-1-1	√			
	1-1-1	√	√		
256 GB	2-2-2	√	√	√	√
	2-2-1	√	√	√	
	2-1-1	√	√		
	1-1-1	√	√	√	
512 GB	2-2-2		√	√	√
	2-2-1		√	√	√
	2-1-1	√	√	√	
	1-1-1	√	√	√	√

2.4.2.6 Memory Protection Technologies

The following memory protection technologies are supported:

- DCPMM error detection and correction
- DCPMM persistent memory address range scrub (ARS)
- DCPMM data poison
- DCPMM DDR-T fault tolerance
- Faulty DCPMM isolation

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2.5 Storage

2.5.1 Drive Configurations

Table 2-10 Drive configurations

Configuration	Maximum Front Drives	Maximum Rear Drives	Maximum Built-in Drives	Drive Management Mode
8 x 2.5" drive passthrough configuration 1	• Front drives: 8 x 2.5" – Slots 0 to 7 support only SAS/ SATA drives.	• I/O module 3: 4 x 2.5" – Slots 44 to 47 support only NVMe drives.	-	1 x screw-in RAID controller card Screw-in RAID controller card: installed in the RAID controller card connector on the mainboard.
8 x 2.5" drive passthrough configuration 2	• Front drives: 8 x 2.5" – Slots 0 to 7 support only SAS/ SATA drives.	• I/O module 3: 4 x 2.5" – Slots 44 to 47 support only NVMe drives.	-	1 x PCIe RAID controller card PCIe RAID controller card: must be installed in slot 1 or 3.

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Configuration	Maximum Front Drives	Maximum Rear Drives	Maximum Built-in Drives	Drive Management Mode
12 x 3.5" drive EXP configuration 1	• Front drives: 12 x 3.5" – Slots 0 to 11 support only SAS/ SATA drives.	• I/O module 1: 2 x 2.5" or 2 x 3.5" – Slots 40 and 41 support only SAS/ SATA drives. • I/O module 2: 2 x 3.5" – Slots 42 and 43 support only SAS/ SATA drives. • I/O module 3: 4 x 2.5" – Slots 44 to 47 support SAS/ SATA/ NVMe drives[a].	• Built-in drives: 4 x 3.5" – Slots 36 to 39 support only SAS/ SATA drives[b].	1 x screw-in RAID controller card Screw-in RAID controller card: installed in the RAID controller card connector on the mainboard.

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Configuration	Maximum Front Drives	Maximum Rear Drives	Maximum Built-in Drives	Drive Management Mode
12 x 3.5" drive EXP configuration 2	• Front drives: 12 x 3.5" – Slots 0 to 11 support only SAS/ SATA drives.	• I/O module 1: 2 x 3.5" – Slots 40 and 41 support only SAS/ SATA drives. • I/O module 3: 4 x 2.5" – Slots 44 to 47 support only NVMe drives.	-	1 x screw-in RAID controller card + 1 x PCIe RAID controller card 1. Screw-in RAID controller card: installed in the RAID controller card connector on the mainboard. 2. PCIe RAID controller card: must be installed in slot 6.
12 x 3.5" drive EXP configuration 3	• Front drives: 12 x 3.5" – Slots 0 to 11 support only SAS/ SATA drives.	• I/O module 1: 2 x 3.5" – Slots 40 and 41 support only SAS/ SATA drives. • I/O module 3: 4 x 2.5" – Slots 44 to 47 support SAS/ SATA/ NVMe drives.	• Built-in drives: 4 x 3.5" – Slots 36 to 39 support only SAS/ SATA drives.	1 x PCIe RAID controller card[c] PCIe RAID controller card: must be installed in slot 6.

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Configuration	Maximum Front Drives	Maximum Rear Drives	Maximum Built-in Drives	Drive Management Mode
12 x 3.5" drive EXP configuration 4	• Front drives: 12 x 3.5" – Slots 0 to 11 support only SAS/ SATA drives.	• I/O module 1: 2 x 2.5" – Slots 40 and 41 support only SAS/ SATA drives. • I/O module 2: 2 x 3.5" – Slots 42 and 43 support only SAS/ SATA drives. • I/O module 3: 4 x 2.5" – Slots 44 to 47 support NVMe drives.	-	1 x PCIe RAID controller card PCIe RAID controller card: must be installed in slot 3.

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Configuration	Maximum Front Drives	Maximum Rear Drives	Maximum Built-in Drives	Drive Management Mode
12 x 3.5" drive passthrough configuration 1	• Front drives: 12 x 3.5" – Slots 0 to 11 support only SAS/ SATA drives.	• I/O module 1: 2 x 3.5" – Slots 40 and 41 support only SAS/ SATA drives. • I/O module 2: 2 x 3.5" – Slots 42 and 43 support only SAS/ SATA drives. • I/O module 3: 4 x 2.5" – Slots 44 to 47 support only NVMe drives.	-	1 x screw-in RAID controller card[d] Screw-in RAID controller card: installed in the RAID controller card connector on the mainboard.
12 x 3.5" drive passthrough configuration 2	• Front drives: 12 x 3.5" – Slots 0 to 11 support only SATA drives.	• I/O module 3: 4 x 2.5" – Slots 44 to 47 support only NVMe drives.	-	PCH pass-through

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Configuration	Maximum Front Drives	Maximum Rear Drives	Maximum Built-in Drives	Drive Management Mode
12 x 3.5" drive passthrough configuration 3	• Front drives: 12 x 3.5" – Slots 0 to 11 support only SAS/ SATA drives.	• I/O module 3: 4 x 2.5" – Slots 44 to 47 support SAS/ SATA/ NVMe drives.	• Built-in drives: 4 x 3.5" – Slots 36 to 39 support only SAS/ SATA drives.	1 x screw-in RAID controller card + 1 x PCIe RAID controller card 1. Screw-in RAID controller card: installed in the RAID controller card connector on the mainboard. 2. PCIe RAID controller card: must be installed in slot 6.

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Configuration	Maximum Front Drives	Maximum Rear Drives	Maximum Built-in Drives	Drive Management Mode
12 x 3.5" drive passthrough configuration 4	• Front drives: 12 x 3.5" – Slots 0 to 11 support only SAS/ SATA drives.	• I/O module 1: 2 x 3.5" – Slots 40 and 41 support only SAS/ SATA drives. • I/O module 3: 4 x 2.5" – Slots 44 to 47 support SAS/ SATA/ NVMe drives[e].	-	1 x screw-in RAID controller card + 1 x PCIe RAID controller card 1. Screw-in RAID controller card: installed in the RAID controller card connector on the mainboard. 2. PCIe RAID controller card: must be installed in slot 6.
20 x 2.5" drive configuration 1 (8 x SAS/ SATA + 12 x NVMe)	• Front drives: 20 x 2.5" – Slots 0 to 7 support only SAS/ SATA drives. – Slots 8 to 19 support only NVMe drives.	• I/O module 3: 4 x 2.5" – Slots 44 to 47 support only NVMe drives.	-	1 x screw-in RAID controller card Screw-in RAID controller card: installed in the RAID controller card connector on the mainboard.

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Configuration	Maximum Front Drives	Maximum Rear Drives	Maximum Built-in Drives	Drive Management Mode
20 x 2.5" drive configuration 2 (8 x SATA + 12 x NVMe)	• Front drives: 20 x 2.5" – Slots 0 to 7 support only SATA drives. – Slots 8 to 19 support only NVMe drives.	• I/O module 3: 4 x 2.5" – Slots 44 to 47 support only NVMe drives.	-	PCH pass-through
24 x 2.5" drive passthrough configuration 1	• Front drives: 24 x 2.5" – Slots 0 to 23 support only SAS/ SATA drives.	• I/O module 3: 4 x 2.5" – Slots 44 to 47 support only NVMe drives.	-	1 x screw-in RAID controller card + 2 x PCIe RAID controller cards[f] 1. Screw-in RAID controller card: installed in the RAID controller card connector on the mainboard. 2. PCIe RAID controller cards: must be installed in slots 3 and 6.

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Configuration	Maximum Front Drives	Maximum Rear Drives	Maximum Built-in Drives	Drive Management Mode
24 x 2.5" drive passthrough configuration 2	• Front drives: 24 x 2.5" – Slots 0 to 23 support only SAS/ SATA drives.	• I/O module 3: 4 x 2.5" – Slots 44 to 47 support only NVMe drives.	-	3 x PCIe RAID controller cards[f] PCIe RAID controller cards: must be installed in slot 1, slot 2, and slot 6.
24 x 2.5" drive NVMe configuration 1	• Front drives: 24 x 2.5" – Slots 0 to 3 support SAS/ SATA/ NVMe drives. – Slots 4 to 23 support only NVMe drives.	• I/O module 3: 4 x 2.5" – Slots 44 to 47 support only NVMe drives.	-	1 x screw-in RAID controller card Screw-in RAID controller card: installed in the RAID controller card connector on the mainboard.
24 x 2.5" drive NVMe configuration 2	• Front drives: 24 x 2.5" – Slots 0 to 3 support SAS/ SATA/ NVMe drives. – Slots 4 to 23 support only NVMe drives.	• I/O module 3: 4 x 2.5" – Slots 44 to 47 support only NVMe drives.	-	PCH passthrough

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Configuration	Maximum Front Drives	Maximum Rear Drives	Maximum Built-in Drives	Drive Management Mode
25 x 2.5" drive EXP configuration 1	• Front drives: 25 x 2.5" – Slots 0 to 24 support only SAS/ SATA drives.	• I/O module 1: 2 x 3.5" – Slots 40 and 41 support only SAS/ SATA drives. • I/O module 3: 4 x 2.5" – Slots 44 to 47 support NVMe drives.	-	1 x screw-in RAID controller card Screw-in RAID controller card: installed in the RAID controller card connector on the mainboard.
25 x 2.5" drive EXP configuration 2	• Front drives: 25 x 2.5" – Slots 0 to 24 support only SAS/ SATA drives.	• I/O module 1: 2 x 3.5" – Slots 40 and 41 support only SAS/ SATA drives. • I/O module 3: 4 x 2.5" – Slots 44 to 47 support only NVMe drives.	-	1 x screw-in RAID controller card + 1 x PCIe RAID controller card 1. Screw-in RAID controller card: installed in the RAID controller card connector on the mainboard. 2. PCIe RAID controller card: must be installed in slot 6.

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Configuration	Maximum Front Drives	Maximum Rear Drives	Maximum Built-in Drives	Drive Management Mode
25 x 2.5" drive EXP configuration 3	• Front drives: 25 x 2.5" – Slots 0 to 24 support only SAS/ SATA drives.	• I/O module 1: 2 x 2.5" – Slots 40 and 41 support only SAS/ SATA drives. • I/O module 3: 4 x 2.5" – Slots 44 to 47 support SAS/ SATA/ NVMe drives[g].	-	1 x PCIe RAID controller card PCIe RAID controller card: • When I/O module 1 is configured with the PCIe RAID controller card, the PCIe RAID controller card must be installed in slot 3. • When I/O module 2 is configured with the PCIe RAID controller card, the PCIe RAID controller card must be installed in slot 6.

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Configuration	Maximum Front Drives	Maximum Rear Drives	Maximum Built-in Drives	Drive Management Mode
• a: SAS/SATA drives can be installed in I/O module 3 only when an SR760-M (Broadcom SAS3416) or SR760IT-M (Broadcom SAS3416) screw-in RAID controller card is configured. • b: Built-in drives can be used only when an SR760-M (Broadcom SAS3416) or SR760IT-M (Broadcom SAS3416) screw-in RAID controller card is configured. • c: The drives can be managed only by the SP460C-M (Broadcom SAS3516) PCIe RAID controller card. • d: The drives can be managed only by the SR760-M (Broadcom SAS3416) or SR760IT-M (Broadcom SAS3416) screw-in RAID controller card. • e: NVMe drives can be installed in I/O module 3 only when an SR760-M (Broadcom SAS3416) or SR760IT-M (Broadcom SAS3416) screw-in RAID controller card is configured. • f: Every eight front drives require a RAID controller card. A maximum of three RAID controller cards are supported. • g: SAS/SATA drives can be installed in I/O module 3 only when an SP460C-M (Broadcom SAS3516) PCIe RAID controller card is configured. • For drives from PCH, use Smart Provisioning to check the health status. For details about how to use Smart Provisioning, see the ***Smart Provisioning User Guide***. • Contact your local Huawei sales representative or use the **Computing Product Compatibility Checker** to determine the components to be used.				

2.5.2 Drive Numbering

NOTE

When the common drive management mode is PCH, each SATA drive has a fixed ATA number. ATA numbers provided in this section are based on the assumption that the drive management mode is PCH. The following table lists the mapping between ATA numbers and physical drive numbers.

- 8 x 2.5" drive pass-through configuration 1 and 8 x 2.5" drive pass-through configuration 2

  For more details, see 8 x 2.5" drive pass-through configuration 1 and 8 x 2.5" drive pass-through configuration 2 in **2.5.1 Drive Configurations**.

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Figure 2-29 Drive numbering

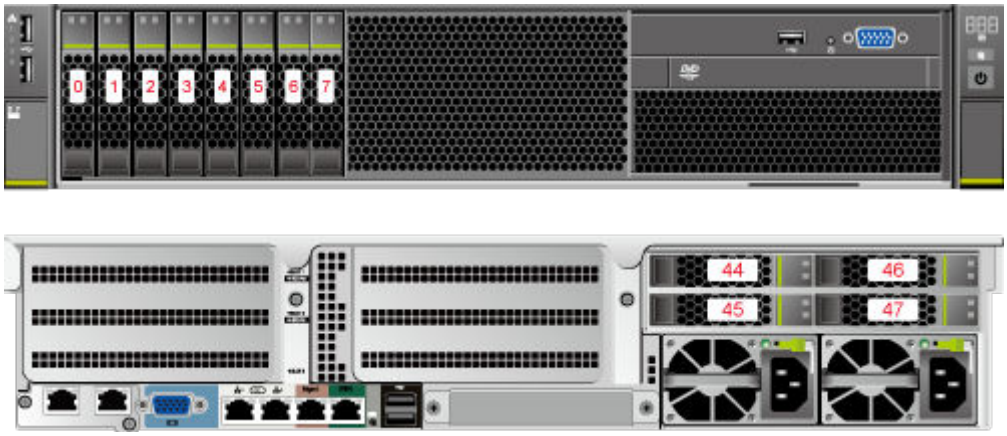

Table 2-11 Drive numbering

Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
44	44	-
45	45	-
46	46	-
47	47	-

- 12 x 3.5" drive EXP configuration 1

  For more details, see 12 x 3.5" drive EXP configuration 1 in **2.5.1 Drive Configurations**.

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Figure 2-30 Drive numbering



Table 2-12 Drive numbering

Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7

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Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
8	8	8
9	9	9
10	10	10
11	11	11
36	36	8
37	37	9
38	38	10
39	39	11
40	40	12
41	41	13
42	42	14
43	43	15
44	44	12Note
45	45	13Note
46	46	14Note
47	47	15Note
• Note: If the slot is configured with a SAS/SATA drive, the RAID controller card can manage the drive and allocate a number to the drive. • If duplicate drive slot numbers are displayed on a RAID controller card, you are advised to locate the drive based on the EID.		

- 12 x 3.5" drive EXP configuration 2

  For more details, see 12 x 3.5" drive EXP configuration 2 in **2.5.1 Drive Configurations**.

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Figure 2-31 Drive numbering

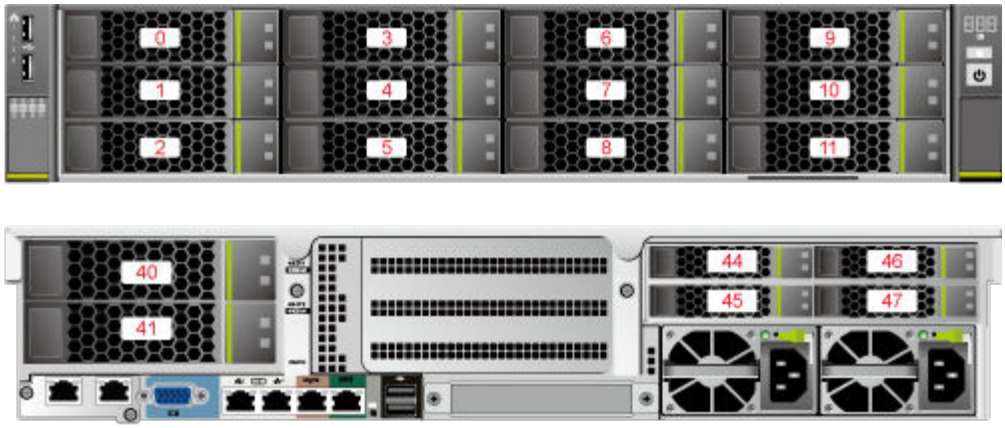

Table 2-13 Drive numbering

Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
40	40	0
41	41	1
44	44	-
45	45	-
46	46	-
47	47	-

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Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
Note: If duplicate drive slot numbers are displayed on a RAID controller card, you are advised to locate the drive based on the RAID controller card number.		

- 12 x 3.5" drive EXP configuration 3

  For more details, see 12 x 3.5" drive EXP configuration 3 in **2.5.1 Drive Configurations**.

Figure 2-32 Drive numbering



Table 2-14 Drive numbering

Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
0	0	0

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Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
36	36	8
37	37	9
38	38	10
39	39	11
40	40	12
41	41	13
44	44	12[Note]
45	45	13[Note]
46	46	14[Note]
47	47	15[Note]
• Note: If the slot is configured with a SAS/SATA drive, the RAID controller card can manage the drive and allocate a number to the drive. • If duplicate drive slot numbers are displayed on a RAID controller card, you are advised to locate the drive based on the EID.		

- 12 x 3.5" drive EXP configuration 4

  For more details, see 12 x 3.5" drive EXP configuration 4 in **2.5.1 Drive Configurations**.

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Figure 2-33 Drive numbering

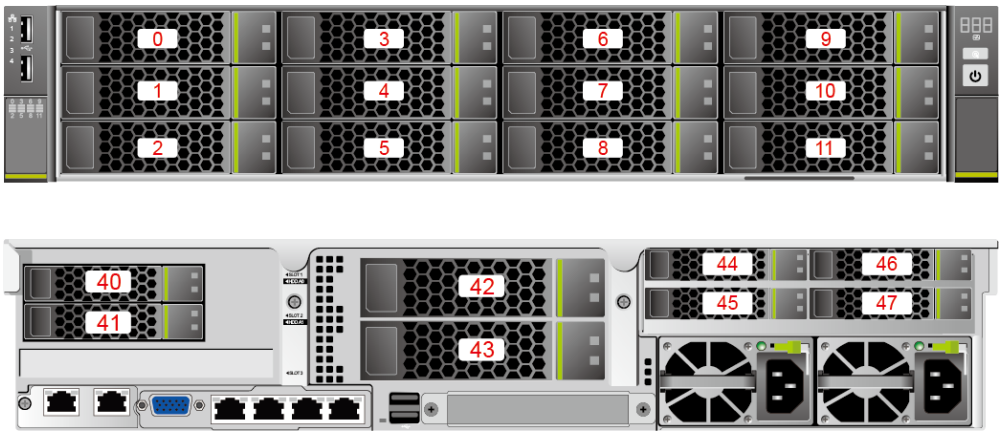

Table 2-15 Drive numbering

Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
40	40	12
41	41	13
42	42	14
43	43	15
44	44	-
45	45	-
46	46	-

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Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
47	47	-

- 12 x 3.5" drive pass-through configuration 1

  For more details, see 12 x 3.5" drive pass-through configuration 1 in **2.5.1 Drive Configurations**.

Figure 2-34 Drive numbering

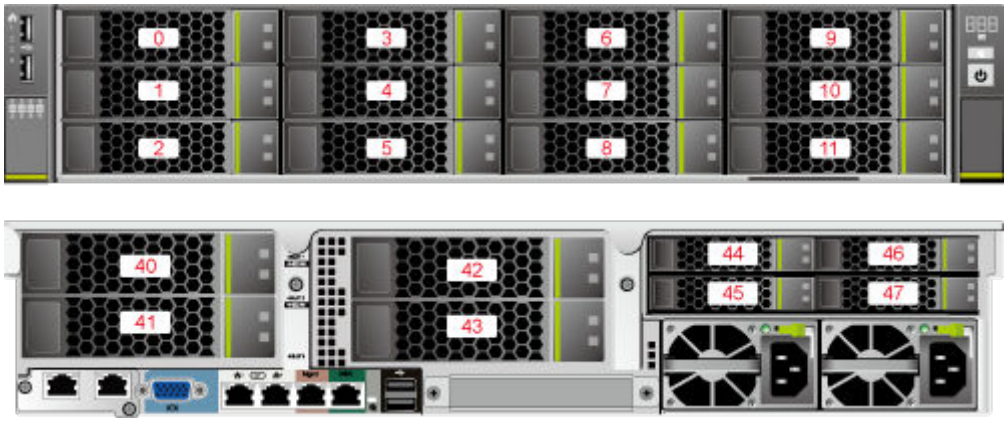

Table 2-16 Drive numbering

Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11

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Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
40	40	12
41	41	13
42	42	14
43	43	15
44	44	-
45	45	-
46	46	-
47	47	-

- 12 x 3.5" drive pass-through configuration 2

  For more details, see 12 x 3.5" drive pass-through configuration 2 in **2.5.1 Drive Configurations**.

Figure 2-35 Drive numbering

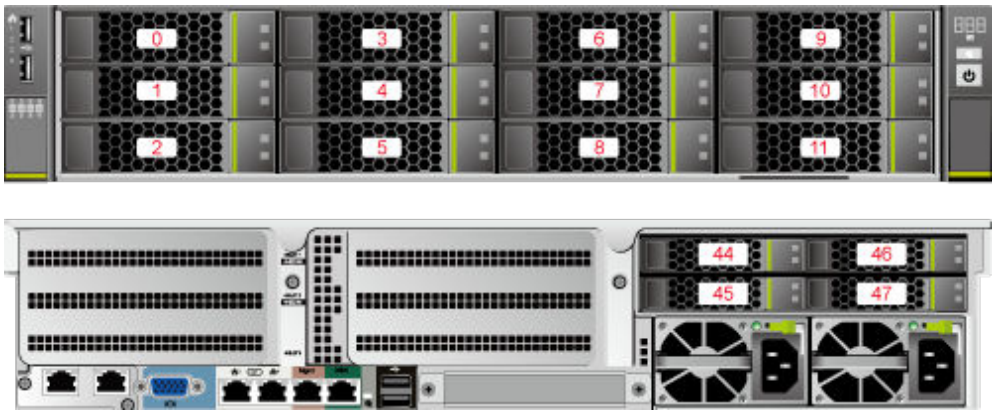

Table 2-17 SATA drive numbering

Drive No.	ATA No.
0	ATA3
1	ATA4
2	ATA5
3	ATA6
4	ATA7
5	ATA8
6	ATA9

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Drive No.	ATA No.
7	ATA10
8	ATA11
9	ATA12
10	ATA13
11	ATA14

Table 2-18 Drive numbering

Drive No.	Drive Number Identified by the iBMC
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
44	44
45	45
46	46
47	47

- 12 x 3.5" drive pass-through configuration 3

  For more details, see 12 x 3.5" drive pass-through configuration 3 in **2.5.1 Drive Configurations**.

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Figure 2-36 Drive numbering



Table 2-19 Drive numbering

Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7

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Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
8	8	8
9	9	9
10	10	10
11	11	11
36	36	12
37	37	13
38	38	14
39	39	15
44	44	0Note
45	45	1Note
46	46	2Note
47	47	3Note
• Note: If the slot is configured with a SAS/SATA drive, the RAID controller card can manage the drive and allocate a number to the drive. • If duplicate drive slot numbers are displayed on a RAID controller card, you are advised to locate the drive based on the RAID controller card number.		

- 12 x 3.5" drive pass-through configuration 4

  For more details, see 12 x 3.5" drive pass-through configuration 4 in **2.5.1 Drive Configurations**.

Figure 2-37 Drive numbering

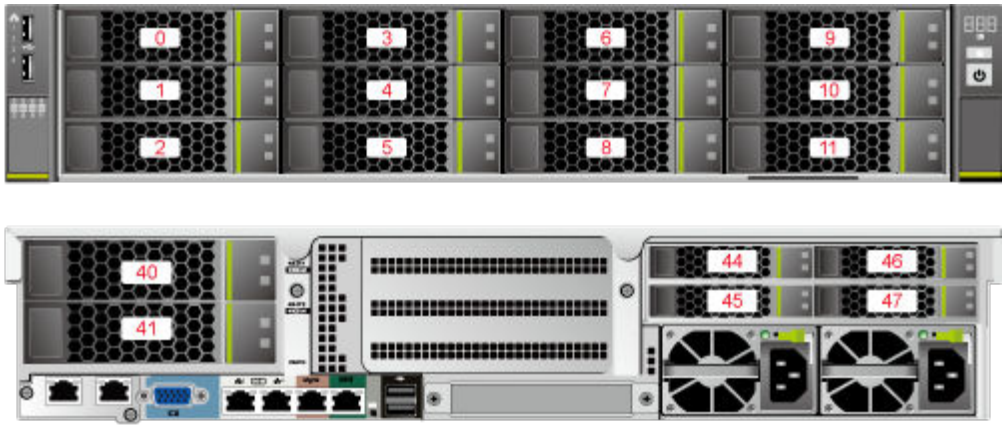

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Table 2-20 Drive numbering

Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
40	40	12
41	41	13
44	44	0Note
45	45	1Note
46	46	2Note
47	47	3Note
• Note: If the slot is configured with a SAS/SATA drive, the RAID controller card can manage the drive and allocate a number to the drive. • If duplicate drive slot numbers are displayed on a RAID controller card, you are advised to locate the drive based on the RAID controller card number.		

- 20 x 2.5" drive configuration 1 (8 x SAS/SATA + 12 x NVMe)

  For more details, see 20 x 2.5" drive configuration 1 (8 x SAS/SATA + 12 x NVMe) in **2.5.1 Drive Configurations**.

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Figure 2-38 Drive numbering

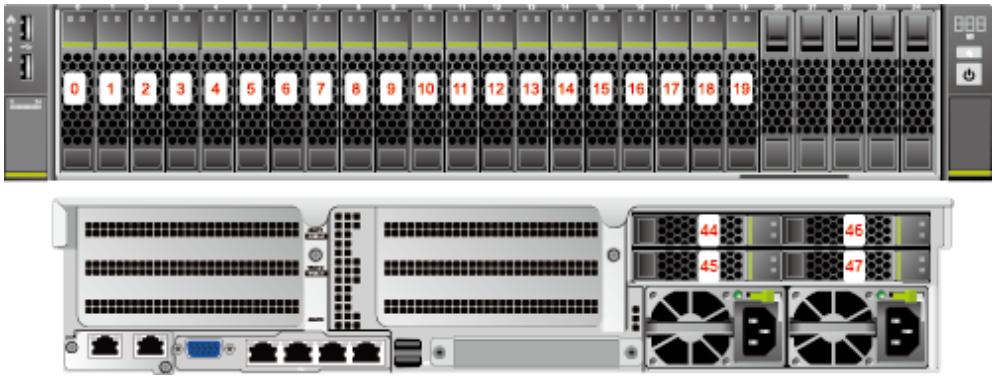

Table 2-21 SATA drive numbering

Drive No.	ATA No.
0	ATA3
1	ATA4
2	ATA5
3	ATA6
4	ATA7
5	ATA8
6	ATA9
7	ATA10

Table 2-22 Drive numbering

Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7

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Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
8	8	-
9	9	-
10	10	-
11	11	-
12	12	-
13	13	-
14	14	-
15	15	-
16	16	-
17	17	-
18	18	-
19	19	-
44	44	-
45	45	-
46	46	-
47	47	-

- 20 x 2.5" drive configuration 2 (8 x SATA + 12 x NVMe)
  For more details, see 20 x 2.5" drive configuration 2 (8 x SATA + 12 x NVMe) in **2.5.1 Drive Configurations**

Figure 2-39 Drive numbering

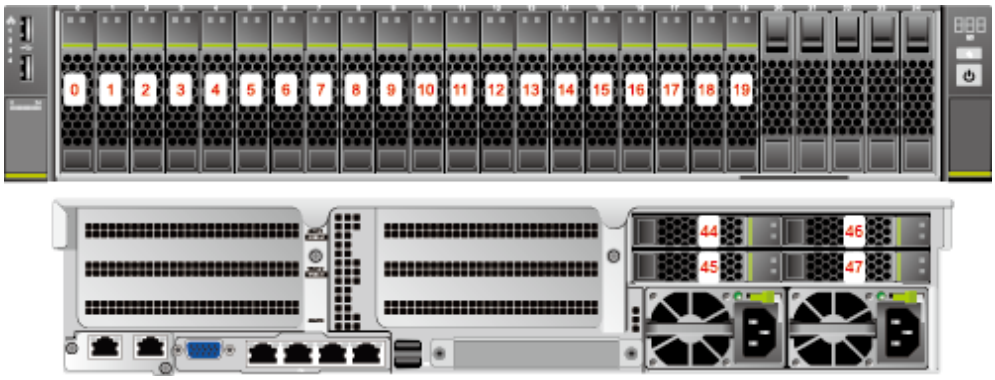

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Table 2-23 Drive numbering

Drive No.	Drive Number Identified by the iBMC
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
44	44
45	45
46	46
47	47

- 24 x 2.5" drive pass-through configuration 1 and 24 x 2.5" drive pass-through configuration 2

  For more details, see 24 x 2.5" drive pass-through configuration 1 and 24 x 2.5" drive pass-through configuration 2 in **2.5.1 Drive Configurations**.

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Figure 2-40 Drive numbering

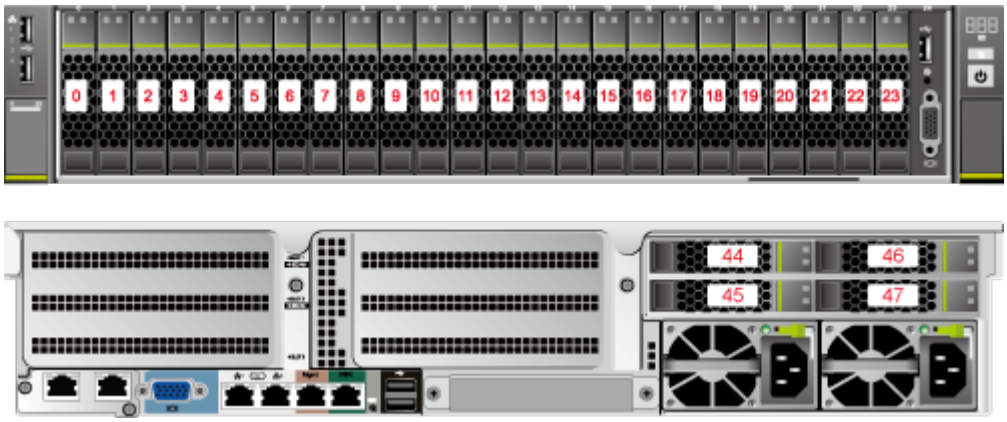

Table 2-24 SATA drive numbering

Drive No.	ATA No.
0	ATA3
1	ATA4
2	ATA5
3	ATA6

Table 2-25 Drive numbering

Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	0
9	9	1
10	10	2
11	11	3

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Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
12	12	4
13	13	5
14	14	6
15	15	7
16	16	0
17	17	1
18	18	2
19	19	3
20	20	4
21	21	5
22	22	6
23	23	7
44	44	-
45	45	-
46	46	-
47	47	-
Note: If duplicate drive slot numbers are displayed on a RAID controller card, you are advised to locate the drive based on the RAID controller card number.		

- 24 x 2.5" drive NVMe configuration 1

  For more details, see 24 x 2.5" drive NVMe configuration 1 in **2.5.1 Drive Configurations**.

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Figure 2-41 Drive numbering

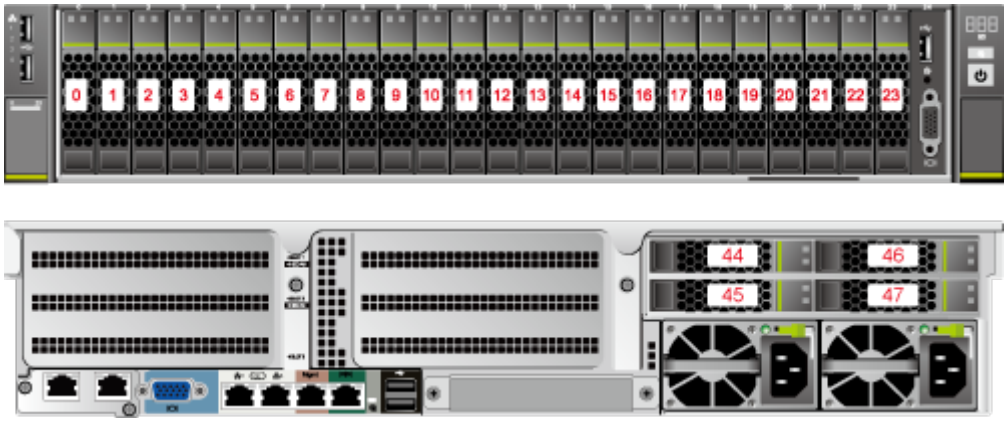

Table 2-26 SATA drive numbering

Drive No.	ATA No.
0	ATA3
1	ATA4
2	ATA5
3	ATA6

Table 2-27 Drive numbering

Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
0	0	0[Note]
1	1	1[Note]
2	2	2[Note]
3	3	3[Note]
4	4	-
5	5	-
6	6	-
7	7	-
8	8	-
9	9	-
10	10	-

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Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
11	11	-
12	12	-
13	13	-
14	14	-
15	15	-
16	16	-
17	17	-
18	18	-
19	19	-
20	20	-
21	21	-
22	22	-
23	23	-
44	44	-
45	45	-
46	46	-
47	47	-
Note: If the slot is configured with a SAS/SATA drive, the RAID controller card can manage the drive and allocate a number to the drive.		

- 24 x 2.5" drive NVMe configuration 2

  For more details, see 24 x 2.5" drive NVMe configuration 2 in **2.5.1 Drive Configurations**.

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Figure 2-42 Drive numbering

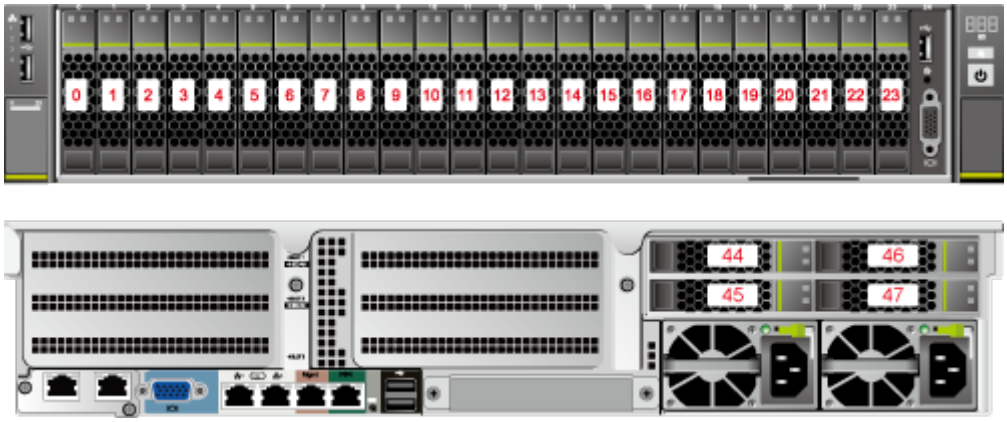

Table 2-28 SATA drive numbering

Drive No.	ATA No.
0	ATA3
1	ATA4
2	ATA5
3	ATA6

Table 2-29 Drive numbering

Drive No.	Drive Number Identified by the iBMC
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11

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Drive No.	Drive Number Identified by the iBMC
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
44	44
45	45
46	46
47	47

- 25 x 2.5" drive EXP configuration 1

  For more details, see 25 x 2.5" drive EXP configuration 1 in **2.5.1 Drive Configurations**.

Figure 2-43 Drive numbering

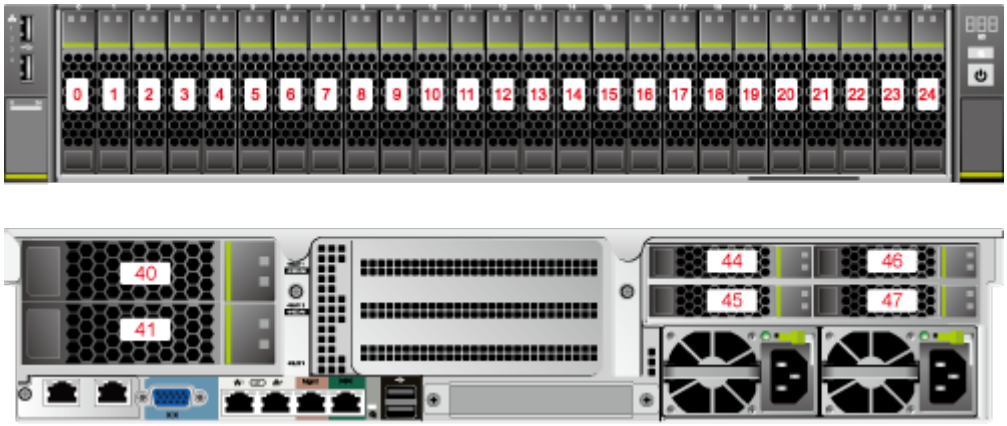

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Table 2-30 Drive numbering

Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16
17	17	17
18	18	18
19	19	19
20	20	20
21	21	21
22	22	22
23	23	23
24	24	24
40	40	25
41	41	26
44	44	-

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Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
45	45	-
46	46	-
47	47	-

- 25 x 2.5" drive EXP configuration 2

  For more details, see 25 x 2.5" drive EXP configuration 2 in **2.5.1 Drive Configurations**.

Figure 2-44 Drive numbering

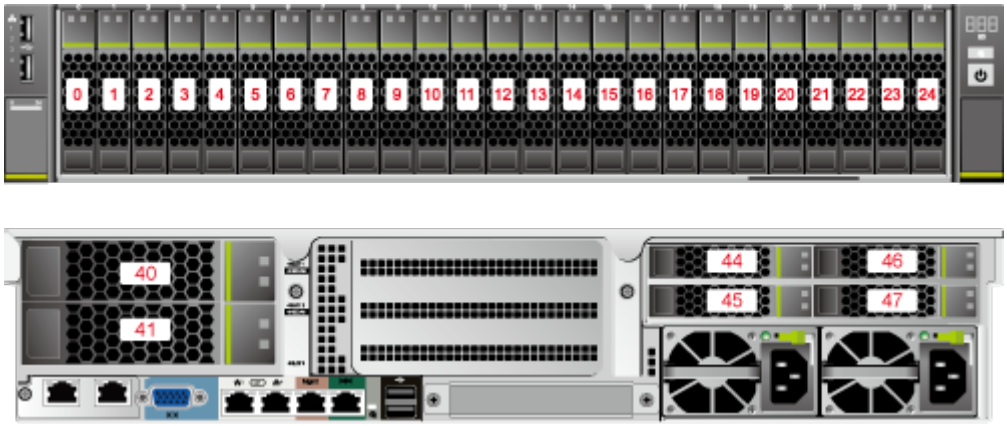

Table 2-31 Drive numbering

Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9

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Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16
17	17	17
18	18	18
19	19	19
20	20	20
21	21	21
22	22	22
23	23	23
24	24	24
40	40	0
41	41	1
44	44	-
45	45	-
46	46	-
47	47	-
Note: If duplicate drive slot numbers are displayed on a RAID controller card, you are advised to locate the drive based on the RAID controller card number.		

- 25 x 2.5" drive EXP configuration 3

  For more details, see 25 x 2.5" drive EXP configuration 3 in **2.5.1 Drive Configurations**.

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Figure 2-45 Drive numbering

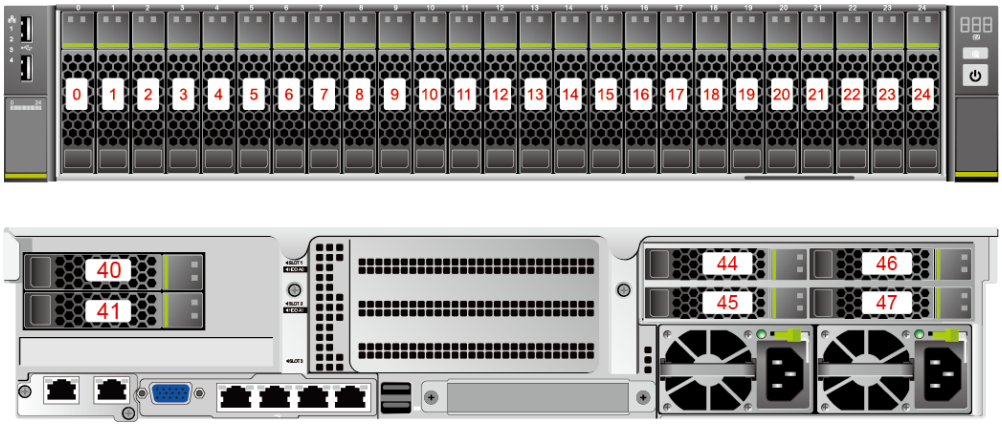

Table 2-32 Drive numbering

Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16
17	17	17
18	18	18

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Drive No.	Drive Number Identified by the iBMC	Drive Number Identified by the RAID Controller Card
19	19	19
20	20	20
21	21	21
22	22	22
23	23	23
24	24	24
40	40	25
41	41	26
44	44	8[Note]
45	45	9[Note]
46	46	10[Note]
47	47	11[Note]
• Note: If the slot is configured with a SAS/SATA drive, the RAID controller card can manage the drive and allocate a number to the drive. • If duplicate drive slot numbers are displayed on a RAID controller card, you are advised to locate the drive based on the EID.		

2.5.3 Drive Indicators

SAS/SATA Drive Indicators

Figure 2-46 SAS/SATA drive indicators

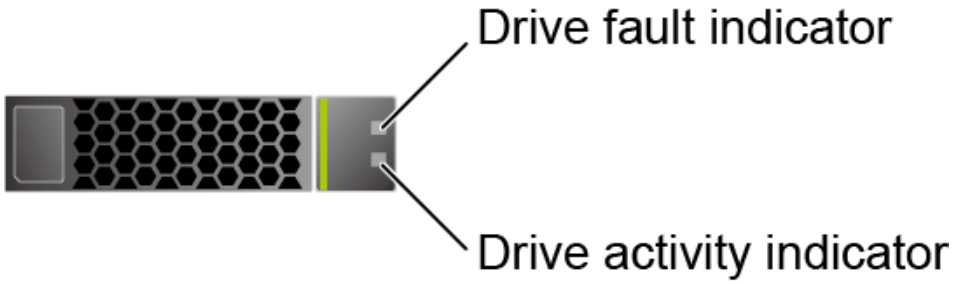

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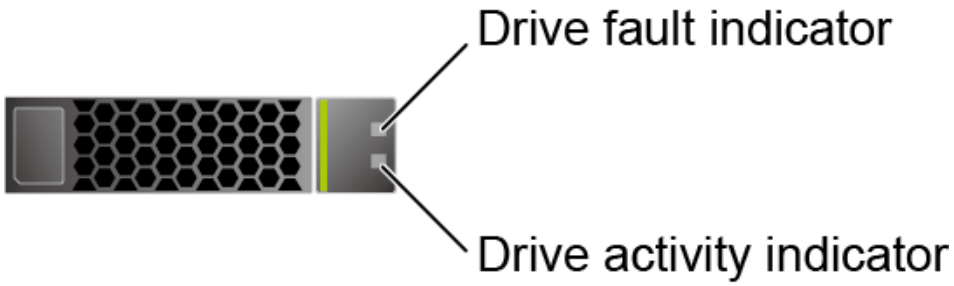
Table 2-33 Description of SAS/SATA drive indicators

Activity Indicator (Green)	Fault Indicator (Yellow)	Description
Steady on	Off	The drive is detected.
Blinking at 4 Hz	Off	Data is being read or written normally, or data on the primary drive is being rebuilt.
Steady on	Blinking at 1 Hz	The drive is being located.
Blinking at 1 Hz	Blinking at 1 Hz	Data on the secondary drive is being rebuilt.
Off	Steady on	A member drive in the RAID array is removed.
Steady on	Steady on	The drive is faulty.

NVMe Drive Indicators

Figure 2-47 NVMe drive indicators



- If the VMD function is enabled and the latest VMD driver is installed, the NVMe drives support surprise hot swap.

  Table 2-34 NVMe drive indicators (VMD enabled)

Activity Indicator (Green)	Fault Indicator (Yellow)	Description
Off	Off	The NVMe drive cannot be detected.
Steady on	Off	The NVMe drive is working properly.
Blinking at 2 Hz	Off	Data is being read from or written to the NVMe SSD.
Off	Blinking at 2 Hz	The NVMe drive is being located.
Steady on/Off	Steady on	The NVMe drive is faulty.

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- If the VMD function is disabled, NVMe drives support only orderly hot swap.

Table 2-35 NVMe drive indicators (VMD disabled)

Activity Indicator (Green)	Fault Indicator (Yellow)	Description
Off	Off	The NVMe drive cannot be detected.
Steady on	Off	The NVMe drive is working properly.
Blinking at 2 Hz	Off	Data is being read from or written to the NVMe drive.
Off	Blinking at 2 Hz	The NVMe drive is being located or hot-swapped.
Off	Blinking at 0.5 Hz	The hot removal process is complete, and the NVMe drive is removable.
Steady on/Off	Steady on	The NVMe drive is faulty.

2.5.4 RAID Controller Card

The RAID controller card supports RAID configuration, RAID level migration, and drive roaming.

- Contact your local Huawei sales representative or use the **Computing Product Compatibility Checker** to determine the components to be used.
- For details about the RAID controller card, see ***Huawei V5 Server RAID Controller Card User Guide***.

2.6 Network

2.6.1 LOMs

LOMs provide network expansion capabilities.

Table 2-36 LOM description

NIC Type	Chip Model	Port Type	Number of Ports	Rate Negotiation Mode	Supported Rates	Rates Not Supported
LOMs	X722	10GE optical port	2	Auto-negotiation 10,000 Mbit/s (full duplex)	10,000 Mbit/s	10/100/1000 Mbit/s

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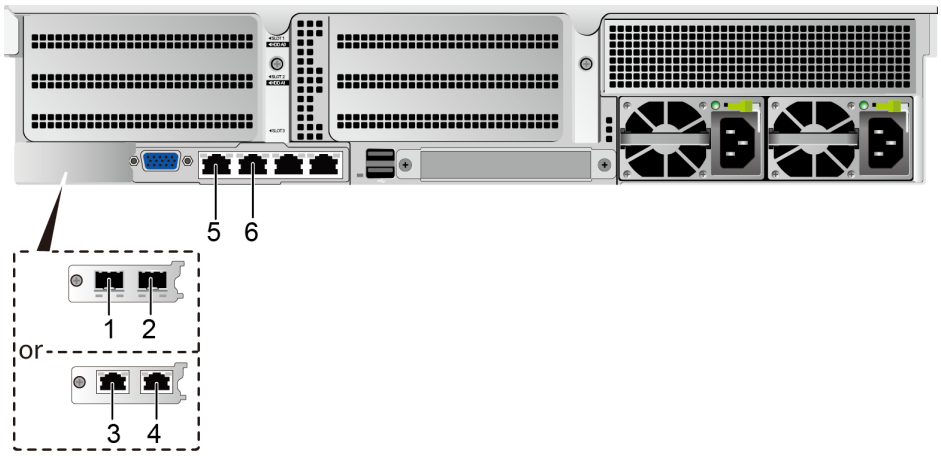
NIC Type	Chip Model	Port Type	Number of Ports	Rate Negotiation Mode	Supported Rates	Rates Not Supported
		10GE electrical port	2	Auto-negotiation 1000 Mbit/s (full duplex)	1000 Mbit/s	10/100 Mbit/s
				Auto-negotiation 10,000 Mbit/s (full duplex)	10,000 Mbit/s	10/100 Mbit/s
		GE electrical ports	2	Auto-negotiation 1000 Mbit/s (full duplex)	1000 Mbit/s	10/100 Mbit/s

- Use **Computing Product Compatibility Checker** to obtain information about the cables and optical modules supported by the LOM ports.
- The LOM ports support NC-SI, WOL, and PXE.
- The LOM ports do not support forced rates.
- The electrical LOM ports cannot be connected to power over Ethernet (PoE) devices (such as a switch with PoE enabled). Connecting a LOM port to a PoE device may cause link communication failure or even damage the NIC.
- The electrical LOM ports (GE electrical ports) do not support SR-IOV.
- Forcibly powering off a server will cause intermittent NC-SI disconnection and disable the Wake on LAN (WOL) function of the LOM ports. To restore the NC-SI connection, refresh the iBMC WebUI.

Figure 2-48 LOM ports



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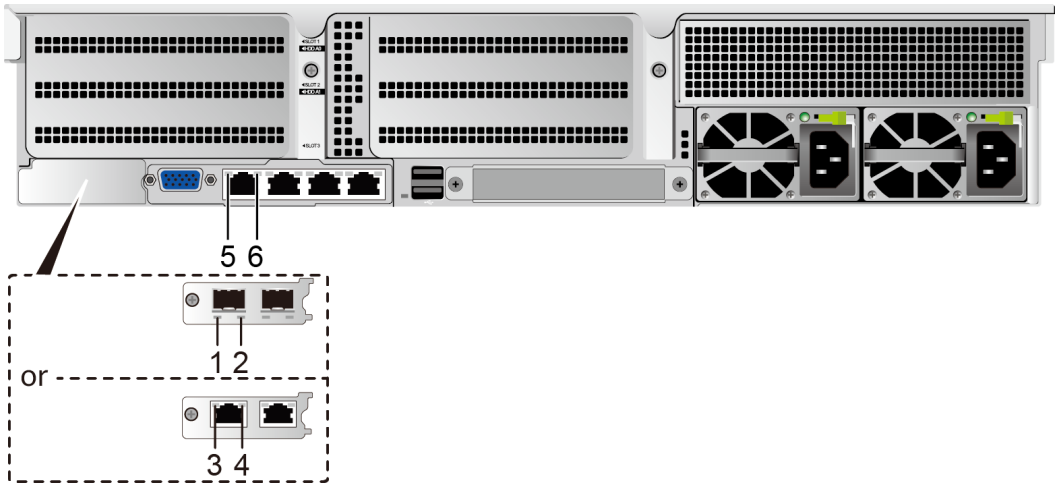
1	(Optional) 10GE optical port (LOM port 1)	2	(Optional) 10GE optical port (LOM port 2)
3	(Optional) 10GE electrical port (LOM port 1)	4	(Optional) 10GE electrical port (LOM port 2)
5	GE electrical port (LOM GE port 1)	6	GE electrical port (LOM GE port 2)

Indicator Positions

Figure 2-49 LOM indicators



1	Connection status indicator/Data transmission status indicator for a 10GE optical port	2	Data transmission rate indicator for a 10GE optical port
3	Data transmission rate indicator for a 10GE electrical port	4	Connection status indicator/Data transmission status indicator for a 10GE electric port
5	Data transmission status indicator of a GE electrical port	6	Connection status indicator of a GE electrical port

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Indicator Description

Table 2-37 LOM indicators

Indicator	Description
Connection status indicator/Data transmission status indicator for a 10GE optical port	• Off: The network port is not connected. • Blinking green: Data is being transmitted. • Steady green: The network port is properly connected.
Data transmission rate indicator for a 10GE optical port	• Off: The network port is not connected. • Steady green: The data transmission rate is 10 Gbit/s.
Data transmission rate indicator for a 10GE optical port	• Off: The network port is not connected. • Blinking green: Data is being transmitted. • Steady green: The network port is properly connected.
Data transmission rate indicator for a 10GE electrical port	• Off: The network port is not connected. • Steady green: The data transmission rate of the link is 10 Gbit/s. • Steady yellow: The data transmission rate of the link is 1 Gbit/s.
Connection status indicator of a GE electrical port	• Off: The network port is not connected. • Steady green: The network port is properly connected.
Data transmission status indicator of a GE electrical port	• Off: Inactive. • Steady yellow: Active, but no data is being transmitted. • Blinking yellow: Data is being transmitted.

2.6.2 FlexIO Cards

FlexIO cards provide network expansion capabilities.

- The FlexIO card (with electrical ports) cannot be connected to power over Ethernet (PoE) devices (such as a switch with PoE enabled). Otherwise, link communication failure or even damage to the FlexIO card may be caused.
- Contact your local Huawei sales representative or use the **Computing Product Compatibility Checker** to determine the components to be used.
- When IB cards are used to build an IB network, ensure that the IPoIB modes of the IB cards at both ends of the network are the same. For details, contact technical support.

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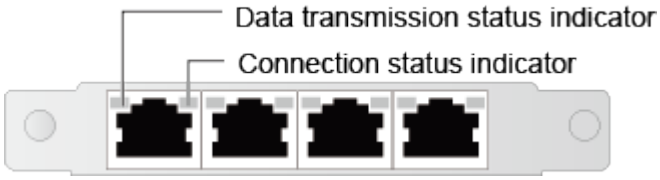
Table 2-38 FlexIO cards supported by the 2288H V5 (example)

NIC Model	Chip Model	Port Type	Number of Ports	Support NC-SI/WOL/PXE
SM210	5719	GE electrical port	4	√
SM211	i350	GE electrical port	2	√
SM212	i350	GE electrical port	4	√
SM233	X540	10GE electrical port	2	√
SM251	CX3	56G IB optical port	2	×
SM252	CX3	56G IB optical port	1	×
SM330	X710	10GE optical port	2	√
SM380	CX4	25GE optical port	2	√

Indicator Positions

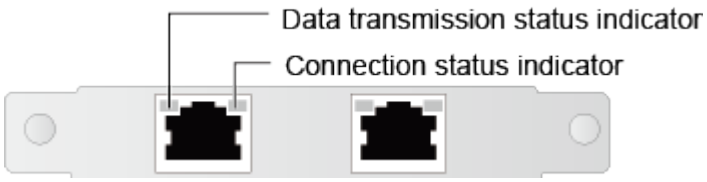
- SM210/SM212 with four GE electrical ports

  Figure 2-50 SM210/SM212 network port indicators

- SM211 with two GE electrical ports

  Figure 2-51 SM211 network port indicators

- SM233 with two 10GE electrical ports

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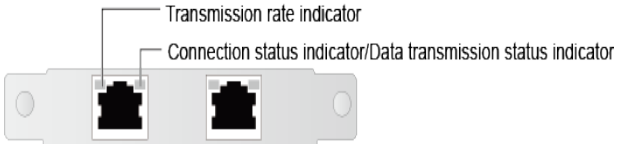
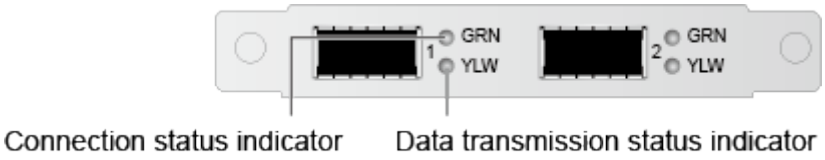
Figure 2-52 SM233 network port indicators



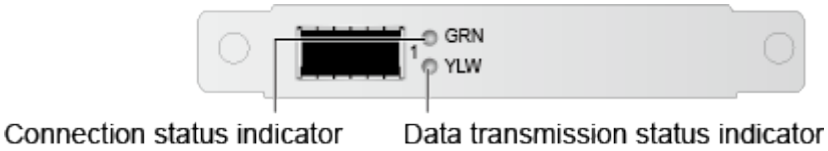
- SM251 with two 56G IB optical ports

Figure 2-53 SM251 network port indicators



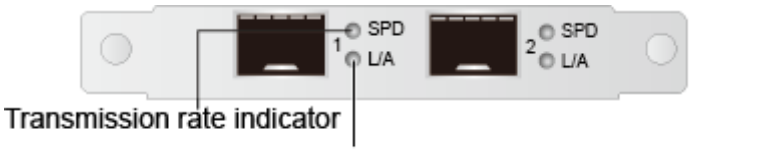
- SM252 with one 56G IB optical port

Figure 2-54 SM252 network port indicators



- SM330 with two 10GE optical ports/SM380 with two 25GE optical ports

Figure 2-55 SM330/SM380 network port indicators



Indicator Description

Table 2-39 Description of FlexIO card indicators

Port Type	Indicator	Description
GE electrical port	Data transmission status indicator	• Off: No data is being transmitted. • Blinking yellow: Data is being transmitted.
	Connection status indicator	• Off: The network port is not connected. • Steady green: The network port is properly connected.

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Port Type	Indicator	Description
10GE electrical port	Transmission rate indicator	• Off: The data transmission rate is 10/100 Mbit/s. • Steady green: The data transmission rate is 10 Gbit/s. • Steady yellow: The data transmission rate is 1 Gbit/s.
	Connection status indicator/Data transmission status indicator	• Off: No data is being transmitted or the network port is not connected. • Blinking green: Data is being transmitted. • Steady green: The network port is properly connected.
10GE optical port	Transmission rate indicator	• Off: The network port is not connected or the data transmission rate is 100 Mbit/s. • Steady green: The data transmission rate is 10 Gbit/s. • Steady yellow: The data transmission rate is 1 Gbit/s.
	Connection status indicator/Data transmission status indicator	• Off: The network port is not connected. • Blinking green: Data is being transmitted. • Steady green: The network port is connected properly.
25GE optical port	Transmission rate indicator	• Off: The network port is not connected. • Steady green: The data transmission rate is 25 Gbit/s. • Steady yellow: The data transmission rate is 10 Gbit/s.
	Connection status indicator/Data transmission status indicator	• Off: The network port is not connected. • Blinking green: Data is being transmitted. • Steady green: The network port is properly connected.
56G IB optical port	Connection status indicator	• Off: No physical link is set up. • Blinking green: The physical link is abnormal. • Steady green: The physical link is normal.

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Port Type	Indicator	Description
	Data transmission status indicator	• Off: No logical link is set up. • Blinking yellow: Data is being transmitted. • Steady yellow: The logical link is normal but no data is being transmitted.

2.7 I/O Expansion

2.7.1 PCIe Cards

PCIe cards provide ease of expandability and connection.

- The electrical ports provided by PCIe NICs cannot be connected to power over Ethernet (PoE) devices (such as a switch with PoE enabled). Connecting such an electrical port to a PoE device may cause link communication failure or even damage the NIC.
- Contact your local Huawei sales representative or use the **Computing Product Compatibility Checker** to determine the components to be used.
- When IB cards are used to build an IB network, ensure that the IPoIB modes of the IB cards at both ends of the network are the same. For details, contact technical support.

2.7.2 PCIe Slots

PCIe Slots

Figure 2-56 PCIe slots



- I/O module 1 provides slots 1 to 3. If a dual-slot PCIe riser module is used, slot 2 is unavailable.
- I/O module 2 provides slots 4 to 6. If a dual-slot PCIe riser module is used, slot 5 is unavailable.
- I/O module 3 provides slots 7 to 8. If a single-slot PCIe riser module is used, slot 8 is unavailable.

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NOTE

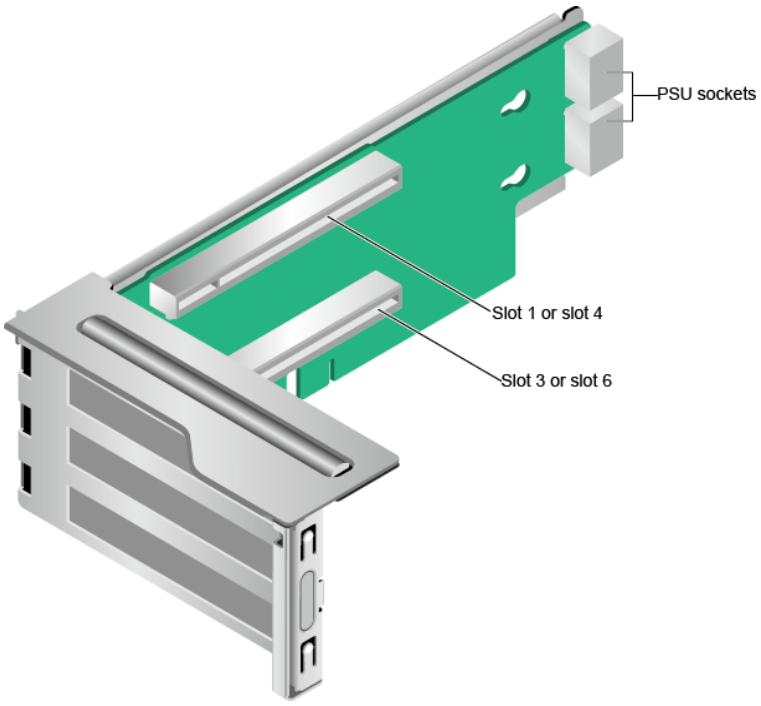
- Observe the following rules when configuring GPU PCIe cards:
  - A dual-slot PCIe riser module in I/O module 1 or 2 can house only one FHFL single-slot or dual-slot PCIe x16 GPU card in slot 1 or 4.
  - A three-slot PCIe riser module in I/O module 1 or 2 does not support dual-slot GPU card.
  - A single-slot PCIe riser module in I/O module 3 can house only one HHHL single-slot x16 GPU card.
  - I/O module 3 does not support GPU cards when it is installed with a dual-slot PCIe riser module.
  - The Tesla T4 or Tesla P4 HHHL GPU supports x16 and x8 configurations.

    If x16 is used, a maximum of three GPUs can be installed in slots 1, 4, and 7. If x8 is used, a maximum of seven GPUs can be installed in slots 1 to 7.
  - Dedicated PCIe riser module must be used with Tesla T4 and dual-slot GPU cards.
- Observe the following rules when configuring NVMe SSD adapters:
  - If 24 x 2.5" NVMe drives are configured, two NVMe SSD adapters must be installed in slots 1 and 4.

PCIe Riser Modules

- PCIe riser module 1 (universal)
  - Provides PCIe slots 1 and 3 when installed in I/O module 1.
  - Provides PCIe slots 4 and 6 when installed in I/O module 2.

Figure 2-57 PCIe riser module 1



- PCIe riser module 2 (universal)
  - Provides PCIe slots 1, 2, and 3 when installed in I/O module 1.
  - Provides PCIe slots 4, 5, and 6 when installed in I/O module 2.

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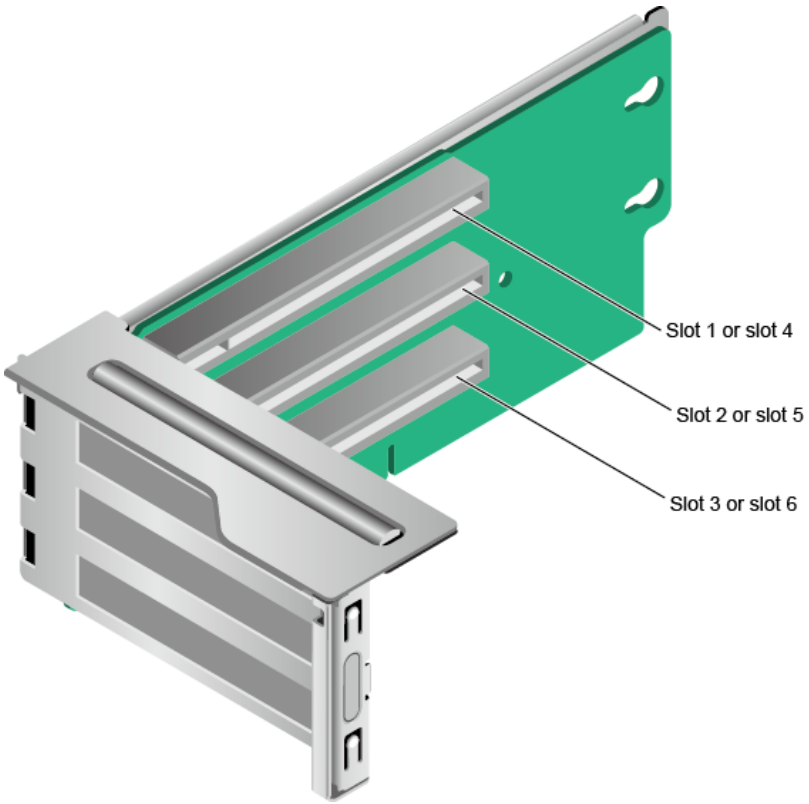
Figure 2-58 PCIe riser module 2



- PCIe riser module 3 (for ES3000 V3 SSD cards only)
  - Provides PCIe slots 1, 2, and 3 when installed in I/O module 1.
  - Provides PCIe slots 4, 5, and 6 when installed in I/O module 2.

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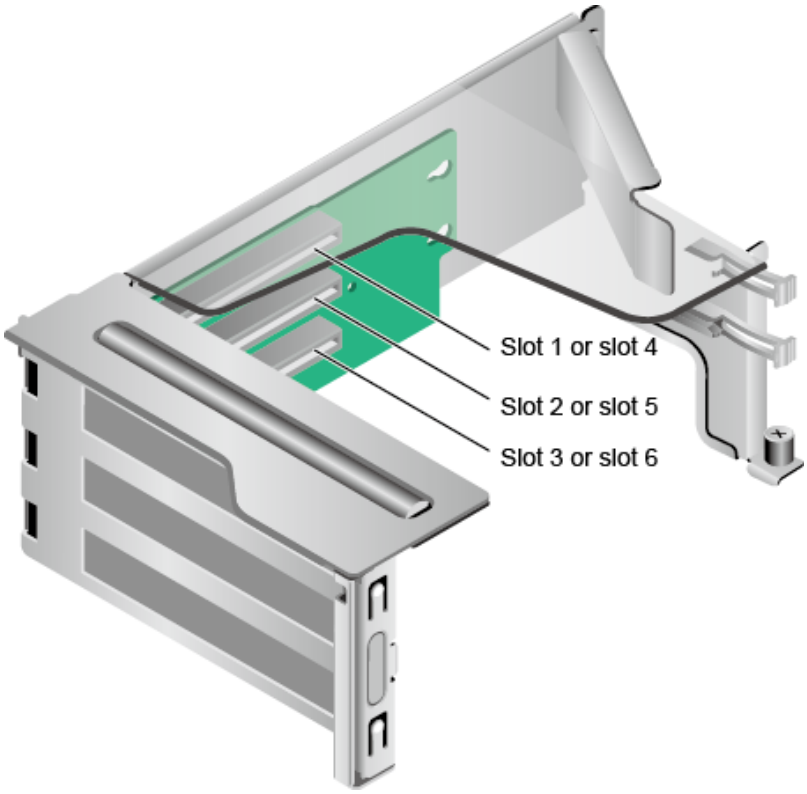
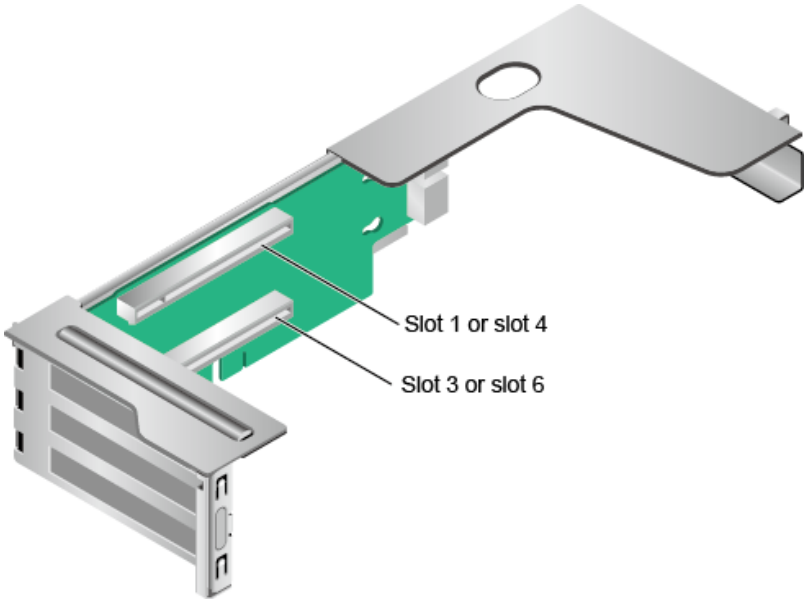
Figure 2-59 PCIe riser module 3



- PCIe riser module 4 (for GPUs only)
  - Provides PCIe slots 1 and 3 when installed in I/O module 1.
  - Provides PCIe slots 4 and 6 when installed in I/O module 2.

Figure 2-60 PCIe riser module 4



- PCIe riser module 5

  Provides PCIe slots 7 and 8 when installed in I/O module 3.

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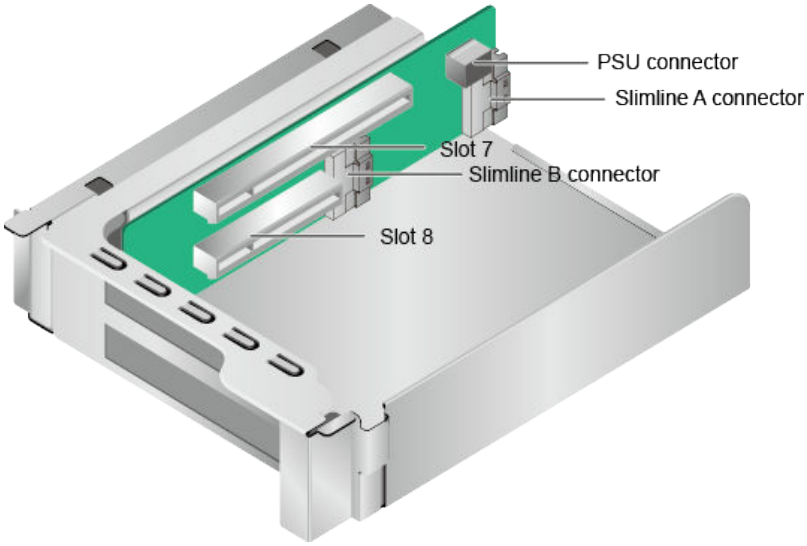
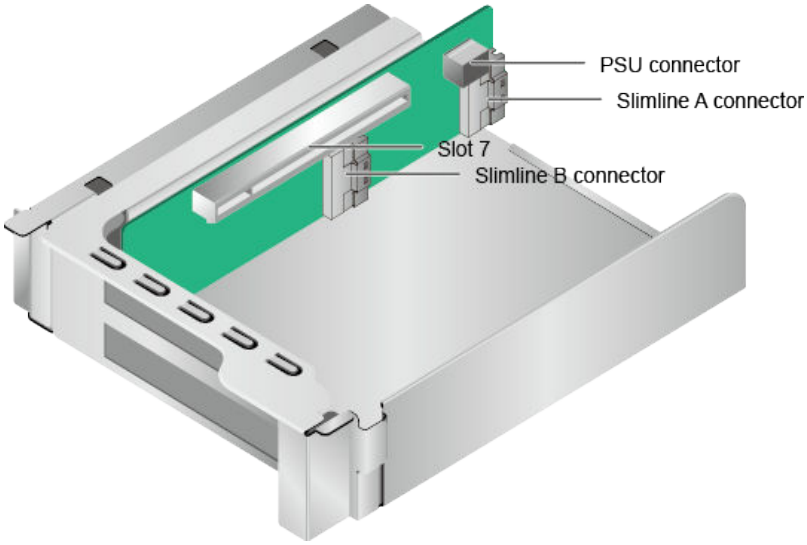
Figure 2-61 PCIe riser module 5



- PCIe riser module 6
  Provides PCIe slot 7 when installed in I/O module 3.

Figure 2-62 PCIe riser module 6



- PCIe riser module 7
  Provides PCIe slot 3 when installed in I/O module 1.

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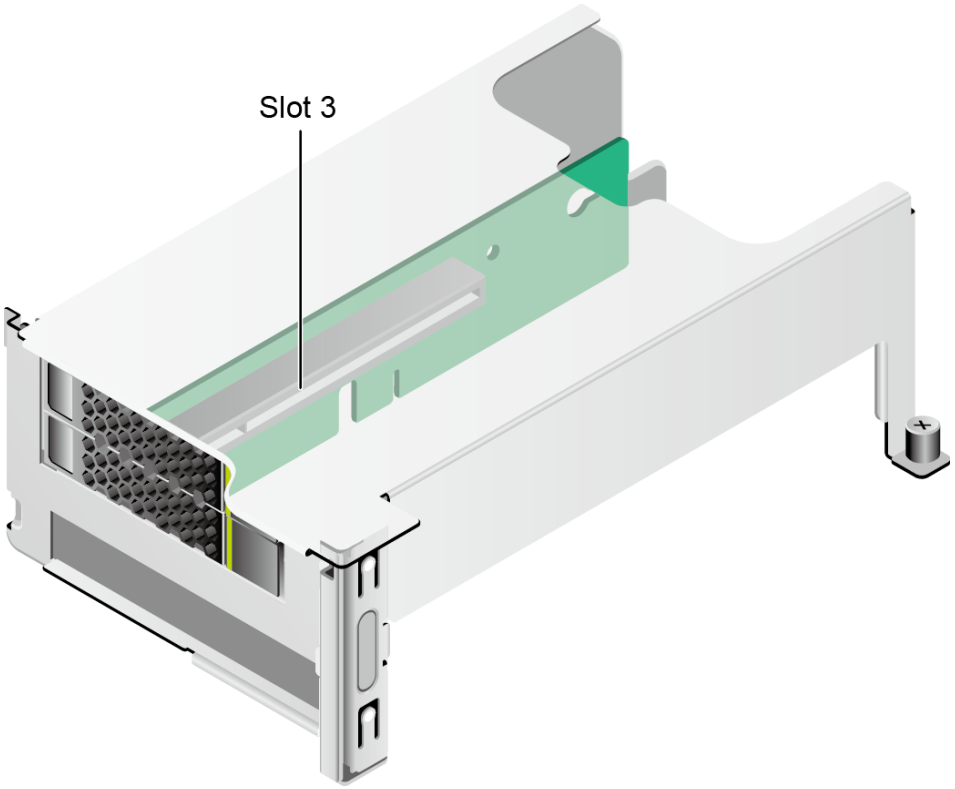
Figure 2-63 PCIe riser module 7



2.7.3 PCIe Slot Description

NOTE

If CPU 2 is not installed, its PCIe slots are unavailable.

Table 2-40 PCIe slot description

PCIe Slot	CPU	PCIe Standard	Connector Width	Bus Width	Port No.	Root Port (B/D/F)	Device (B/D/F)	Slot Size
Screw-in RAID controller card	CPU 1	PCIe 3.0	x8	x8	Port1C	17/02/0	1D/00/0	-
LOM	CPU 1	PCIe 3.0	x8	x8	Port1A	17/00/0	1A/00/0	-
FlexIO card	CPU 2	PCIe 3.0	x8	x8	Port2A	AE/00/0	AF/00/0	-

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PCIe Slot	CPU	PCIe Standard	Connector Width	Bus Width	Port No.	Root Port (B/D/F)	Device (B/D/F)	Slot Size
Slot 1	CPU 1	PCIe 3.0	x16	• 2-slot PCIe riser module (PRM): x16 • 3-slot PRM: x8	Port2A	3A/00/0	3B/00/0	FHFL
Slot 2	CPU 1	PCIe 3.0	x16	• 2-slot PRM: N/A • 3-slot PRM: x8	Port2C	3A/02/0	3E/00/0	FHFL
Slot 3	CPU 1	PCIe 3.0	x16	x8	Port3A	5D/00/0	5E/00/0	FHHL
Slot 4	CPU 2	PCIe 3.0	x16	• 2-slot PRM: x16 • 3-slot PRM: x8	Port1A	85/00/0	86/00/0	FHFL

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PCIe Slot	CPU	PCIe Standard	Connector Width	Bus Width	Port No.	Root Port (B/D/F)	Device (B/D/F)	Slot Size
Slot 5	CPU 2	PCIe 3.0	x16	• 2-slot PRM: N/A • 3-slot PRM: x8	Port1C	85/02/0	89/00/0	FHFL
Slot 6	CPU 2	PCIe 3.0	x16	x8	Port2C	AE/02/0	B0/00/0	FHHL
Slot 7	CPU 2	PCIe 3.0	x16	• 1-slot PRM: x16 • 2-slot PRM: x8	Port3A	D7/00/0	D8/00/0	HHHL
Slot 8	CPU 2	PCIe 3.0	x8	• 1-slot PRM: N/A • 2-slot PRM: x8	Port3C	D7/02/0	DB/00/0	HHHL

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PCIe Slot	CPU	PCIe Standard	Connector Width	Bus Width	Port No.	Root Port (B/D/F)	Device (B/D/F)	Slot Size
• The B/D/F (Bus/Device/Function Number) values are the default values when the server is fully configured with PCIe devices. The values may vary if the server is not fully configured with PCIe devices or if a PCIe card with a PCI bridge is configured. • Root Port (B/D/F) indicates the B/D/F of an internal PCIe root port of the processor. • Device (B/D/F) indicates the B/D/F (displayed on the OS) of an onboard or extended PCIe device. • The PCIe x16 slots are backward compatible with PCIe x8, PCIe x4, and PCIe x1 cards. The PCIe cards are not forward compatible. That is, the PCIe slot width cannot be smaller than the PCIe card link width. • Full-height full-length PCIe slots are backward compatible with full-height half-length and half-height half-length PCIe cards. Full-height half-length PCIe slots are backward compatible with half-height half-length PCIe cards. • All slots support PCIe cards of up to 75 W. The power of a PCIe card varies depending on its model. • The SP520, SP521, and SP522 do not support driveless server configuration. PXE boot is recommended for driveless servers.								

2.8 PSUs

- The server supports one or two PSUs.
- The server supports AC or DC PSUs.
- The PSUs are hot-swappable.
- The server supports two PSUs in 1+1 redundancy.
- The same model of PSUs must be used in a server.
- The PSUs are protected against short circuit. Double-pole fuse is provided for the PSUs with dual input live wires.
- Contact your local Huawei sales representative or use the **Computing Product Compatibility Checker** to determine the components to be used.

NOTE

- When 900 W AC Titanium PSUs are configured and the input voltage ranges from 100 V AC to 127 V AC, the output power decreases to 450 W.
- When 1500 W AC Platinum PSUs are configured:
  - When the input voltage ranges from 100 V AC to 127 V AC, the output power decreases to 1000 W.
  - Two 1500 W AC Platinum PSUs can serve as 1700 W PSUs.

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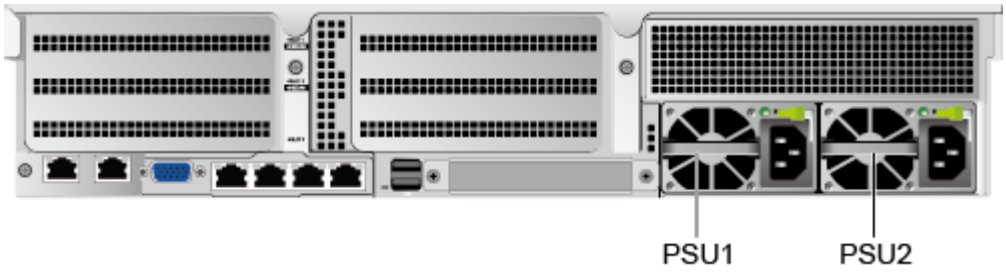
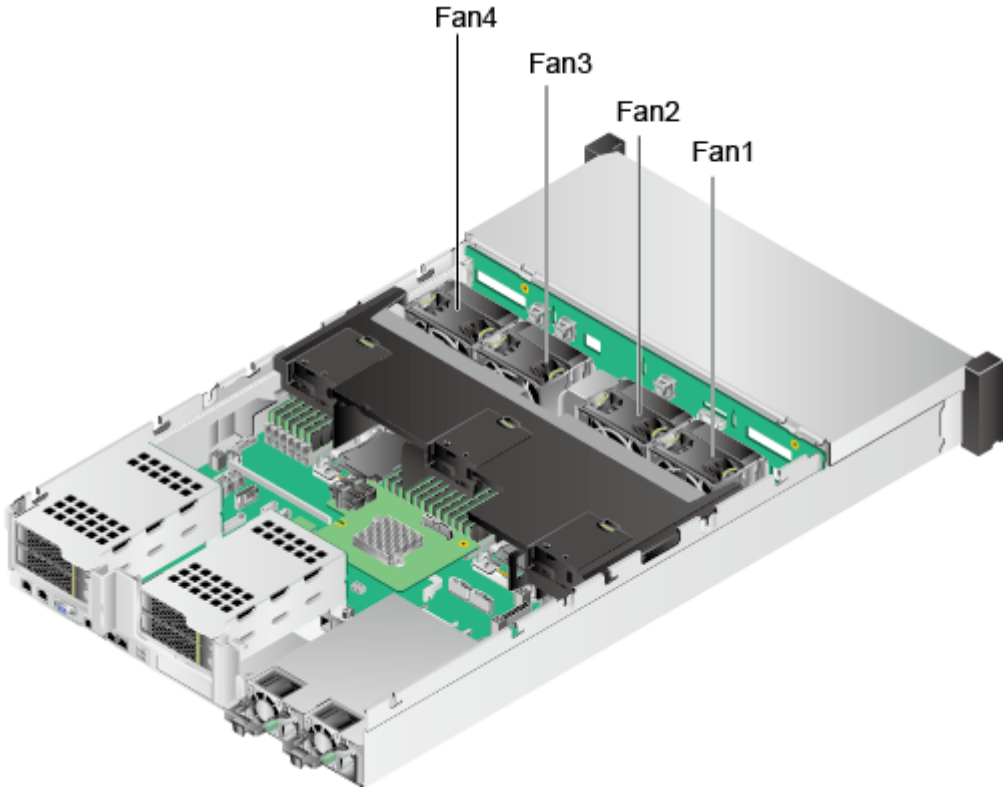
Figure 2-64 PSU positions



2.9 Fans

- The server supports four fan modules.
- The fan modules are hot-swappable.
- The server tolerates failure of a single fan.
- The fan speed can be adjusted.
- The same model of fan modules must be used in a server.

Figure 2-65 Fan module positions



2.10 Boards

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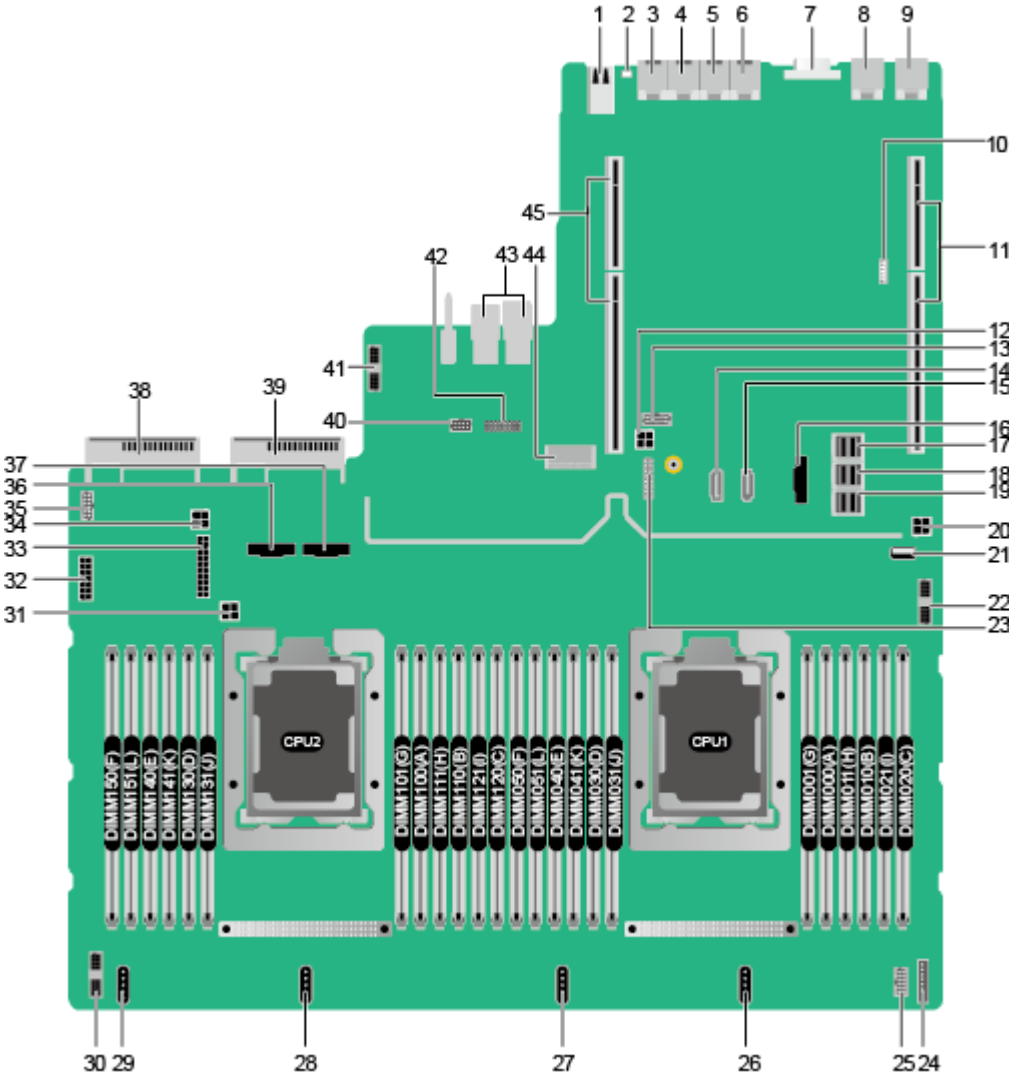
2.10.1 Mainboard

Figure 2-66 2288H V5 mainboard (BOM: 03024AFQ, 03026NEA, 03024CXS, and 03029JRP)



1	USB 3.0 port (USB 3.0 CONN/J169)	2	UID indicator (D6020)
3	Serial port	4	Management network port
5	GE electrical port	6	GE electrical port
7	VGA connector (VGA CONN/J112)	8	10GE optical port (10GE PORT2/J132) or 10GE electrical port (10GE PORT2/J101)[a]

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9	10GE optical port (10GE PORT1/J131) or 10GE electrical port (10GE PORT1/J100)[a]	10	VROC key port (J130)[b]
11	PCIe riser 1 slot (corresponding to CPU 1/J80/J108)	12	Rear-drive backplane power connector 2 (REAR BP PWR2/J126)
13	NC-SI connector (NCSI CONN/J99)	14	SATA signal connector 2 (SATA2/J71)
15	SATA signal connector 1 (SATA1/J67)	16	CPU 1 slimline connector (CPU1 SLIMELINE/J170)
17	mini-SAS HD connector C (MINIHD PORT C/J85)	18	mini-SAS HD connector B (MINIHD PORT B/J84)
19	mini-SAS HD connector A (MINIHD PORT A/J86)	20	Rear-drive backplane power connector 1 (REAR BP PWR1/J127)
21	USB 3.0 port (FRONT USB3.0/J173)[c]	22	Right mounting ear connector (RCIC/RCIF/ RCIG BOARD/J167)
23	TPM/TCM port (TPM CONN/J55)	24	LCD connector (LCD CONN/J87)
25	VGA connector (VGA BOARD/J160)	26	Fan 4 connector (2U FAN4/J148)
27	Fan 3 connector (2U FAN3/J145)	28	Fan 2 connector (2U FAN2/J146)
29	Fan 1 connector (1U/2U FAN1/J105)	30	Drive backplane connector (HDD BP CONN/J162)
31	Built-in drive power connector (INNER HDD PWR/J171)	32	Drive backplane power connector 1 (HDD BP PWR2/J128)
33	Drive backplane power connector 2 (HDD BP PWR2/J166)	34	Rear-drive backplane power connector 3 (REAR BP PWR3/J172)
35	Rear 4 x 2.5-inch drive backplane low-speed signal connector (REAR 4*2.5 HDD BP/J164)	36	CPU 2 slimline A connector (CPU2 SLIMLINE A/J140)
37	CPU 2 slimline B connector (CPU2 SLIMLINE B/J139)	38	PSU 2 connector (J157)

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39	PSU 1 connector (J156)	40	Built-in drive low-speed signal connector (INNER HDD BP/J122)
41	Left mounting ear connector (LCIA BOARD/J161)	42	Jumper (J176)[d]
43	I/O NIC connectors (IO BOARD/J159/J158)	44	RAID controller card connector (RAID CARD/J48)
45	PCIe riser 2 slot (corresponding to CPU 2/J155/J116)	-	-

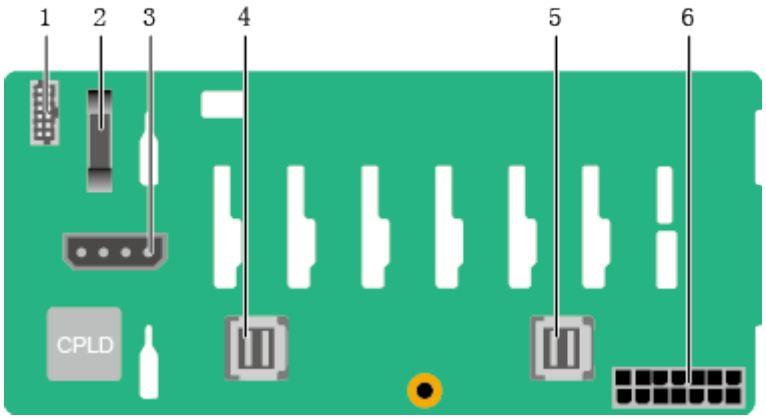
- a: "10GE optical port" corresponds to the mainboard (BOM: 03024AFQ and 03026NEA) integrated with two 10GE optical ports and two GE electrical ports. "10GE electrical port" corresponds to the mainboard (BOM: 03024CXS and 03029JRP) integrated with two 10GE and two GE electrical ports.
- b: Reserved.
- c: The built-in USB 3.0 port can be connected to the front USB 3.0 port through a USB cable. It cannot be used directly.
- d: COM_SW(ON) is used to change the connection direction of the physical serial port. BMC_RCV(ON) is used to restore the default iBMC configuration (for iBMC V350 and later versions, restoring the default iBMC configuration through a jumper is not supported).

2.10.2 Drive Backplane

Front-Drive Backplanes

- 8 x 2.5" drive backplane

Figure 2-67 8 x 2.5" drive backplane (BOM: 03022HXW and 03029JRY)



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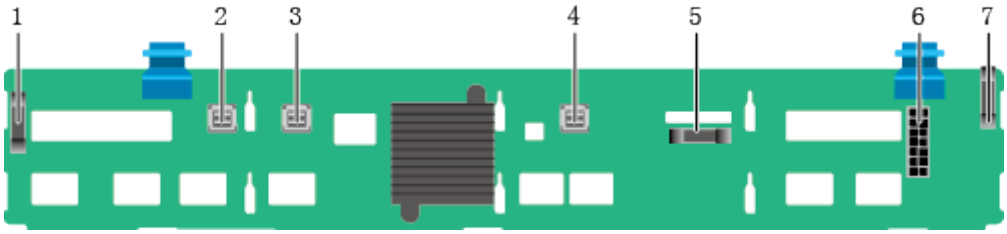
1	Front VGA connector (J26)	2	Backplane signal cable connector (J1)
3	DVD drive power connector (J11)	4	Mini-SAS HD connector (PORT B/J29)
5	Mini-SAS HD connector (PORT A/J28)	6	Power connector (J24)

- 12 x 3.5" drive EXP backplane

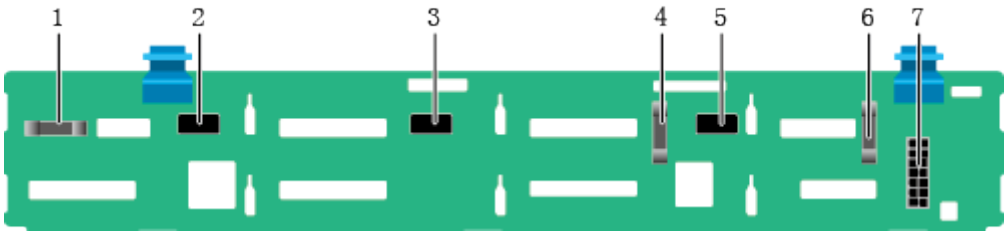
Figure 2-68 12 x 3.5" drive EXP backplane (BOM: 03024DDH, 03024MSG, and 03029JSA)



1	Indicator signal cable connector (J32)	2	Mini-SAS HD connector (PORT A/J28)
3	Mini-SAS HD connector (PORT B/J29)	4	Mini-SAS HD connector (REAR PORT/J31)
5	Backplane signal cable connector (J1)	6	Power connector (J24)
7	Indicator signal cable connector (J35)	-	-

- 12 x 3.5" drive pass-through backplane

Figure 2-69 12 x 3.5" drive pass-through backplane (BOM: 03024JMV and 03029TDH)



1	Indicator signal cable connector (J30)	2	Mini-SAS HD connector (PORT C/J36)

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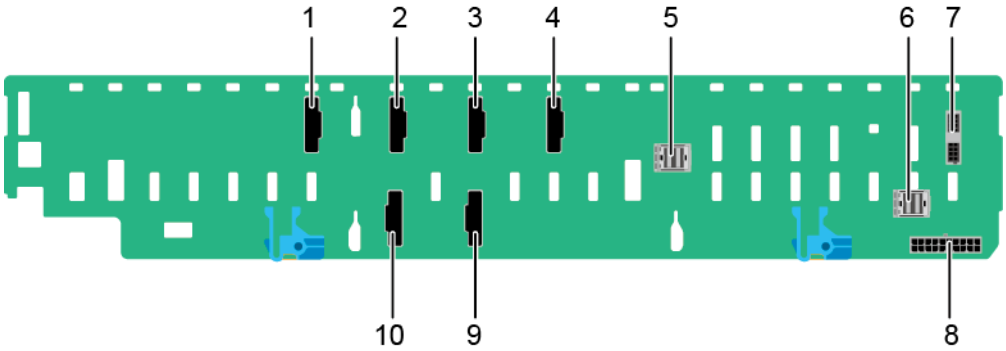
3	Mini-SAS HD connector (PORT B/J29)	4	Backplane signal cable connector (J1)
5	Mini-SAS HD connector (PORT A/J28)	6	Indicator signal cable connector (J31)
7	Power connector (J24)	-	-

- 20 x 2.5" drive backplane (8 x SAS/SATA + 12 x NVMe)

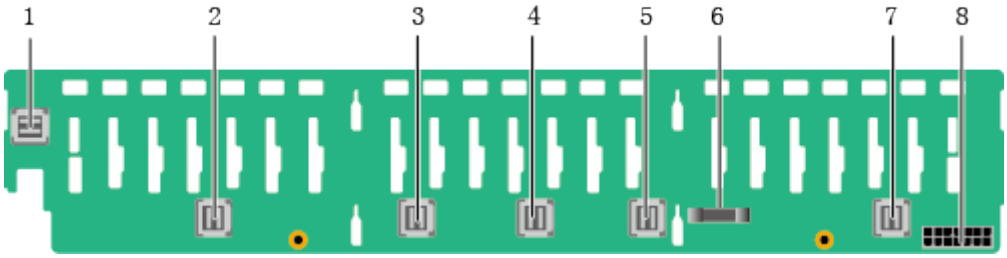
Figure 2-70 20 x 2.5" drive backplane (8 x SAS/SATA + 12 x NVMe) (BOM: 03025EUL and 03029TDE)



1	Slimline connector (PORT 2C/J31)	2	Slimline connector (PORT 1C/J19)
3	Slimline connector (PORT 1B/J18)	4	Slimline connector (PORT 1A/J17)
5	Mini-SAS HD connector (PORT B/J16)	6	Mini-SAS HD connector (PORT A/J15)
7	Backplane signal cable connector (J41)	8	Power connector (J37)
9	Slimline connector (PORT 2A/J21)	10	Slimline connector (PORT 2B/J32)

- 24 x 2.5" drive pass-through backplane

Figure 2-71 24 x 2.5" drive pass-through backplane (BOM: 03022JWW and 03029WFE)



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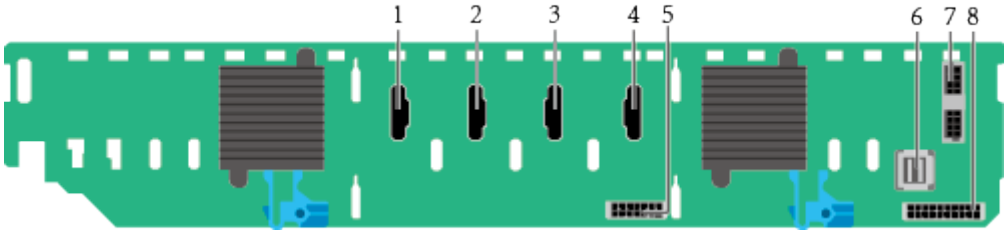
1	Mini-SAS HD connector (PORT 3B/J33)	2	Mini-SAS HD connector (PORT 3A/J39)
3	Mini-SAS HD connector (PORT 2B/J31)	4	Mini-SAS HD connector (PORT 2A/J30)
5	Mini-SAS HD connector (PORT 1B/J29)	6	Backplane signal cable connector (J1)
7	Mini-SAS HD connector (PORT 1A/J28)	8	Power connector (J24)

- 24 x 2.5" NVMe backplane

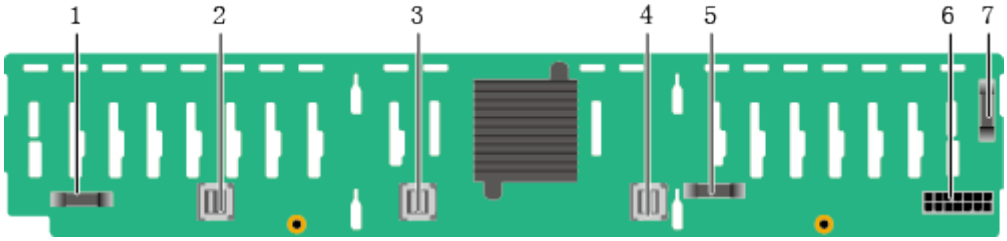
Figure 2-72 24 x 2.5" NVMe backplane (BOM: 03023WAD)



1	Slimline A connector (J6)	2	Slimline B connector (J5)
3	Slimline C connector (J7)	4	Slimline D connector (J8)
5	Power connector 2 (J34)	6	Mini-SAS HD connector (PORT A/J52)
7	Backplane signal cable connector (J3)	8	Power connector 1 (J2)

- 25 x 2.5" drive backplane

Figure 2-73 25 x 2.5" drive backplane (BOM: 03022HYB, 03024MSH, and 03029TDQ)



1	Indicator signal cable connector (J32)	2	Mini-SAS HD connector (PORT A/J28)
3	Mini-SAS HD connector (PORT B/J29)	4	Mini-SAS HD connector (REAR PORT/J31)

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5	Backplane signal cable connector (J1)	6	Power connector (J24)
7	Indicator signal cable connector (J35)	-	-

Built-in-Drive Backplane

- 4 x 3.5" built-in-drive backplane

Figure 2-74 4 x 3.5" built-in-drive backplane (BOM: 03024MBJ)

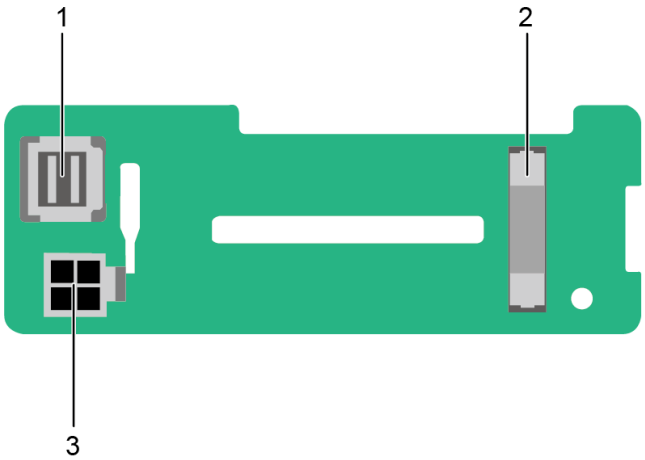


1	Mini-SAS HD connector (PORT A/J3)	2	Backplane signal cable connector (INNER HDD BP/J1)
3	Power connector (INNER HDD PWR/J2)	-	-

Rear-Drive Backplanes

- 2 x 2.5" drive backplane

Figure 2-75 2 x 2.5" drive backplane (BOM: 03022HYD)



1	Mini-SAS HD connector (REAR PORT/J3)	2	Indicator signal cable connector (REAR BP/J24)
3	Power connector (BP PWR/J1)	-	-

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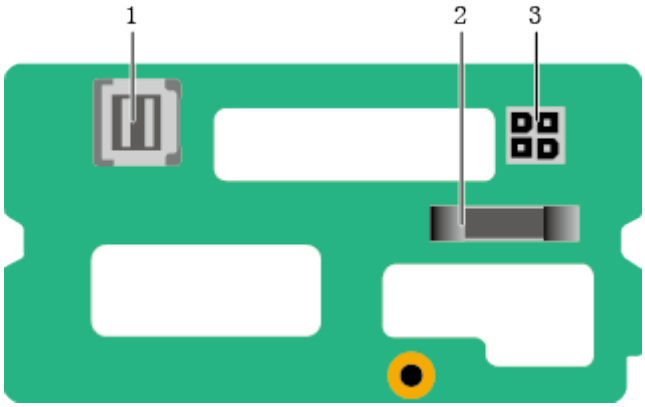
- 2 x 3.5" drive backplane

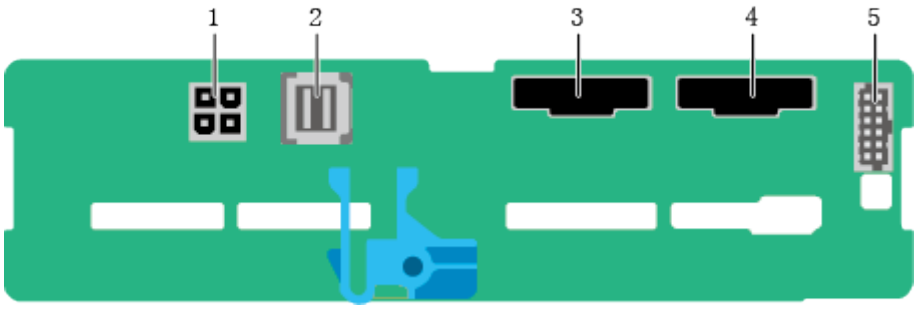
Figure 2-76 2 x 3.5" drive backplane (BOM: 03022HYE)



1	Mini-SAS HD connector (REAR PORT/J3)	2	Indicator signal cable connector (REAR BP/J24)
3	Power connector (BP PWR/J1)	-	-

- 4 x 2.5" drive backplane

Figure 2-77 4 x 2.5" drive backplane (BOM: 03024BPV and 03029TDR)



1	Power connector (REAR BP POWR3/J22)	2	Mini-SAS HD connector (Port A/J2)
3	Slimline A connector (SLIMLINE A/J8)	4	Slimline B connector (SLIMLINE B/J9)
5	Backplane signal cable connector (HDD BP/J23)	-	-

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3 Product Specifications

3.1 Technical Specifications
3.2 Environmental Specifications
3.3 Physical Specifications

3.1 Technical Specifications

Table 3-1 Technical specifications

Category	Specifications
Form factor	2U rack server
Chipset	Intel® C622
Processors	Supports one or two processors. • Intel® Xeon® Scalable (Skylake and Cascade Lake) processors • Built-in memory controller and six memory channels • Built-in PCIe controller, supporting PCIe 3.0 and 48 lanes per processor • Two UPI buses between processors, providing up to 10.4GT/s transmission per channel • Up to 28 cores per processor • Max. 3.8 GHz • Min. 1.375 MB L3 cache per core • Max. 205 W TDP **NOTE** The preceding information is for reference only. The actual configuration may vary. For details, check part compatibility using **Computing Product Compatibility Checker**.

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Category	Specifications
Memory	Supports 24 memory modules of the following types: • Up to 24 DDR4 memory modules – Max. 2933 MT/s memory speed – RDIMM and LRDIMM support – The DDR4 memory modules of different types (RDIMM and LRDIMM) and specifications (capacity, bit width, rank, and height) cannot be used together. • Up to 12 DCPMMs – The DCPMMs must be used with DDR4 memory modules together. – The DCPMMs support the AD or MM mode. – Max. 2666 MT/s memory speed – The DCPMMs of different specifications cannot be used together. – For details about the DCPMMs, see the ***Huawei FusionServer Pro DCPMM User Guide***. **NOTE** The preceding information is for reference only. The actual configuration may vary. For details, check part compatibility using **Computing Product Compatibility Checker**.

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Category	Specifications
Storage	Supports a variety of drive configurations. For details, see **2.5.1 Drive Configurations**. • Supports two M.2 SSDs. – M.2 SSDs are supported only when the server is configured with an Avago SAS3004iMR RAID controller card. – The drive letter of the M.2 SSDs managed by the Avago SAS3004iMR RAID controller card can be set to **sda** by modifying the GRUB parameters only when the RAID controller card is used with an SR130, SR760IT-M, SP150IT-M, or SmartRAID 3152-8i RAID controller card or a PCH. **NOTE** • The M.2 SSD module is used only as the boot device when the OS is installed. Small-capacity (32 GB or 64 GB) M.2 SSDs do not support logging due to poor endurance. If a small-capacity M.2 SSD is used as the boot device, a dedicated log drive or log server is required for logging. For example, you can dump VMware logs in either of the following ways: • Redirect **/scratch**. For details, see **https://kb.vmware.com/s/article/1033696**. • Configure syslog. For details, see **https://kb.vmware.com/s/article/2003322**. • The M.2 SSD cannot be used to store data due to poor endurance. In write-intensive applications, the M.2 SSD will wear out in a short time. Use enterprise-level high endurance (HE) SSDs or HDDs for data storage. • The M.2 SSD is not recommended for write-intensive service software due to poor endurance. • Do not use the M.2 SSD as the cache. • Supports hot swap of SAS/SATA/NVMe drives. **NOTE** The NVMe drives support: • Surprise hot swap if the VMD function is enabled and the latest Intel VMD driver is installed. • Orderly hot swap if the VMD function is disabled. • Supports a variety of RAID controller cards. Use the **Computing Product Compatibility Checker** to obtain information about the specific RAID controller cards supported. – The RAID controller card supports RAID configuration, RAID level migration, and drive roaming. – The RAID controller card does not occupy a standard PCIe slot.

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Category	Specifications
	For details about the RAID controller card, see ***Huawei V5 Server RAID Controller Card User Guide***. • Supports SAS HBA cards or SAS RAID controller card (with a 1 GB, 2 GB, or 4 GB cache) to improve storage performance and data security. **NOTE** If the BIOS is in legacy mode, the 4K drive cannot be used as the boot drive.
Network	Supports expansion capability of multiple types of networks. • LOM – Supports two 10GE optical ports and two GE electrical ports via the NIC chip integrated on the mainboard. – Supports two 10GE electrical ports and two GE electrical ports via the NIC chip integrated on the mainboard. – The LOM ports support NC-SI, WOL, and PXE. • FlexIO card – Supports on-demand configuration. – Supports a variety of FlexIO cards. Use the **Computing Product Compatibility Checker** to obtain information about the specific FlexIO cards supported. – When IB cards are used to build an IB network, ensure that the IPoIB modes of the IB cards at both ends of the network are the same. For details, contact technical support. **NOTE** • The electrical ports provided by LOMs, FlexIO cards, and PCIe NICs cannot be connected to PoE devices (such as a switch with PoE enabled). Connecting such an electrical port to a PoE device may cause link communication failure or even damage the NIC. • Forcibly powering off a server will cause intermittent NC-SI disconnection and disable the WOL function of the LOM ports. To restore the NC-SI connection, refresh the iBMC WebUI.

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Category	Specifications
I/O expansion	10 PCIe 3.0 slots: • One slot dedicated for a screw-in RAID controller card, one dedicated for a FlexIO card, and eight for standard PCIe cards. For details, see **2.7.2 PCIe Slots** and **2.7.3 PCIe Slot Description**. • Support Huawei proprietary PCIe SSD cards to bolster I/O performance for applications such as searching, caching, and download services. • Supports GPU cards. • When IB cards are used to build an IB network, ensure that the IPoIB modes of the IB cards at both ends of the network are the same. For details, contact technical support. **NOTE** The preceding information is for reference only. The actual configuration may vary. For details, check part compatibility using **Computing Product Compatibility Checker**.
Ports	Supports a variety of ports. • Ports on the front panel: – Two USB 2.0 ports – One USB 3.0 port – One DB15 VGA port **NOTE** For the server that uses 12 x 3.5", 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) or 25 x 2.5" drive configuration, the front panel provides only two USB 2.0 ports. • Ports on the rear panel: – Two USB 3.0 ports – One DB15 VGA port – One RJ45 serial port – One RJ45 system management port – Two GE electrical ports – Two 10GE electrical ports or 10GE optical ports • Built-in ports: – One USB 3.0 port – Two SATA ports **NOTE** In the 8 x 2.5" or 24 x 2.5" drive configuration, only two SATA built-in ports are provided. **NOTE** You are not advised to install the operating system on the USB storage media.

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Category	Specifications
Video card	An SM750 video chip with 32 MB display memory is integrated on the mainboard. The maximum display resolution is 1920 x 1200 at 60 Hz with 16 M colors. **NOTE** • SM750 is not supported by servers running the Windows Server 2019 or Windows Server 2019 Hyper-V operating systems that are in secure boot mode. • The integrated video card can provide the maximum display resolution (1920 x 1200) only after the video card driver matching the operating system version is installed. Otherwise, only the default resolution supported by the operating system is provided. • If the chassis provides the front and rear VGA ports but only one VGA port is connected to a monitor, the display effect may be affected.
System management	• UEFI • iBMC • NC-SI • Integration with third-party management systems
Security features	• Power-on password • Administrator password • TCM (only in China)/TPM • Secure boot • Front bezel (optional)

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3.2 Environmental Specifications

Table 3-2 Environmental specifications

Category	Specifications
Temperature	• Operating temperature: 5°C to 45°C (41°F to 113°F) (ASHRAE Classes A1 to A4 compliant) • Storage temperature (within three months): –30°C to +60°C (–22°F to +140°F) • Storage temperature (within six months): –15°C to +45°C (5°F to 113°F) • Storage temperature (within one year): –10°C to +35°C (14°F to 95°F) • Maximum rate of temperature change: 20°C (36°F) per hour, 5°C (9°F) per 15 minutes **NOTE** The highest operating temperature varies depending on the server configuration. For details, see **A.2 Operating Temperature Limitations**.
Relative humidity (RH, non-condensing)	• Operating humidity: 8% to 90% • Storage humidity (within three months): 8% to 85% • Storage humidity (within six months): 8% to 80% • Storage humidity (within one year): 20% to 75% • Maximum change rate: 20%/h
Air volume	≥ 204 cubic feet per minute (CFM)
Operating altitude	≤3050m • When the server configuration complies with ASHRAE Classes A1 and A2 and the altitude is above 900 m (2952.76 ft), the highest operating temperature decreases by 1°C (1.8°F) for every increase of 300 m (984.25 ft). • When the configuration complies with ASHRAE Class A3 standards and the altitude is above 900 m (2952.76 ft.), the highest operating temperature decreases by 1°C (1.8°F) for every increase of 175 m (574.14 ft.). • When the server configuration complies with ASHRAE Class A4 and the altitude is above 900 m (2952.76 ft), the highest operating temperature decreases by 1°C (1.8°F) for every increase of 125 m (410.1 ft). • HDDs cannot be used at an altitude of over 3050 m (10006.44 ft).

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Category	Specifications
Corrosive gaseous contaminant	Maximum corrosion product thickness growth rate: ● Copper corrosion rate test: 300 Å/month (meeting level G1 requirements of the ANSI/ISA-71.04-2013 standard on gaseous corrosion) ● Silver corrosion rate test: 200 Å/month
Particle contaminant	● The equipment room environment meets the requirements of ISO 14644-1 Class 8. ● There is no explosive, conductive, magnetic, or corrosive dust in the equipment room. **NOTE** It is recommended that the particulate pollution in the equipment room be monitored by a professional agency.
Acoustic noise	The declared A-weighted sound power levels (LWAd) and declared average bystander position A-weighted sound pressure levels (LpAm) listed are measured at 23°C (73.4°F) in accordance with ISO 7779 (ECMA 74) and reported in accordance with ISO 9296 (ECMA 109). ● Idle: – LWAd: 5.64 Bels – LpAm: 42.2 dBA ● Operating: – LWAd: 6.08 Bels – LpAm: 46.8 dBA **NOTE** The noise generated during operation varies depending on the server configuration, load, and ambient temperature.

NOTE

SSDs and HDDs (including NL-SAS, SAS, and SATA) cannot be preserved for a long time in the power-off state. Data may be lost or faults may occur if the preservation duration exceeds the specified maximum duration. When drives are preserved under the storage temperature and humidity specified in the preceding table, the following preservation time is recommended:

- Maximum preservation duration of SSDs:
  - 12 months in power-off state without data stored
  - 3 months in power-off state with data stored
- Maximum preservation duration of HDDs:
  - 6 months in unpacked/packed and powered-off state
- The maximum preservation duration is determined according to the preservation specifications provided by drive vendors. For details, see the manuals provided by drive vendors.

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3.3 Physical Specifications

Table 3-3 Physical specifications

Category	Description
Dimensions (H x W x D)	• Chassis with 3.5" drives: 86.1 mm x 447 mm x 748 mm (3.39 in. x 17.60 in. x 29.45 in.) • Chassis with 2.5" drives: 86.1 mm x 447 mm x 708 mm (3.39 in. x 17.60 in. x 27.87 in.)
Installation space	• Requirements for cabinet installation: Cabinet compliant with the International Electrotechnical Commission (IEC) 297 standard – Cabinet width: 482.6 mm (19.00 in.) – Cabinet depth ≥ 1000 mm (39.37 in.) • Requirements for guide rail installation: – L-shaped guide rails: apply only to Huawei cabinets. – Static rail kit: applies to cabinets with a distance of 543.5 mm to 848.5 mm (21.40 in. to 33.41 in.) between the front and rear mounting bars. – Ball bearing rail kit: – Chassis for 2.5" drives: with a distance of 610 mm to 914 mm (24.02 in. to 35.98 in.) between the front and rear mounting bars. – Chassis for 3.5" drives: with a distance of 640 mm to 914 mm (25.20 in. to 35.98 in.) between the front and rear mounting bars.
Weight in full configuration	• Maximum net weight: – Server with 8 x 2.5" front drives + 4 x 2.5" rear drives: 25.1 kg (55.35 lb) – Server with 12 x 3.5" front drives + 4 x 3.5" + 4 x 2.5" rear drives: 34.1 kg (75.19 lb) – Server with 24 x 2.5" front drives + 4 x 2.5" rear drives: 29.4 kg (64.83 lb) – Server with 25 x 2.5" front drives + 2 x 3.5" + 4 x 2.5" rear drives: 30.5 kg (67.25 lb) • Packaging materials: 5 kg (11.03 lb)

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4 Software and Hardware Compatibility

Use the **Computing Product Compatibility Checker** to obtain information about the operating systems and hardware supported.

NOTICE

- Do not use incompatible components. Otherwise, the server may fail to work properly. The technical support and warranty do not cover faults caused by incompatible components.
- The performance of servers is closely related to application software, basic middleware software, and hardware. The slight differences of the application software, middleware basic software, and hardware may cause performance inconsistency between the application layer and test software layer.
  - If the customer has requirements on the performance of specific application software, contact Huawei sales personnel to apply for POC tests in the pre-sales phase to determine detailed software and hardware configurations.
  - If the customer has requirements on hardware performance consistency, specify the specific configuration requirements (for example, specific drive models, RAID controller cards, or firmware versions) in the pre-sales phase.

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5 Safety Instructions

5.1 Safety Instructions
5.2 Maintenance and Warranty

5.1 Safety Instructions

General Statement

- Comply with local laws and regulations when installing devices. These Safety Instructions are only a supplement.
- The "DANGER", "WARNING", and "CAUTION" information in this document does not represent all the safety instructions, but supplements to the safety instructions.
- Observe all safety instructions provided on the device labels when installing hardware. Follow them in conjunction with these Safety Instructions.
- Only qualified personnel are allowed to perform special tasks, such as performing high-voltage operations and driving a forklift.
- This is a class A product, which may cause radio interference in a domestic environment. Take protective measures before operating this product in a residential area as it is likely to cause radio interference.

Human Safety

- Only personnel certified or authorized by Huawei are allowed to install devices.
- Discontinue any dangerous operations and take protective measures. Report anything that could cause personal injury or device damage to a project supervisor.
- Do not move devices or install racks and power cables in hazardous weather conditions.
- Do not carry the weight that is over the maximum load per person allowed by local laws or regulations. Before moving or installing equipment, check the maximum equipment weight and arrange required personnel.
- Wear clean protective gloves, ESD clothing, a protective hat, and protective shoes, as shown in **Figure 5-1**.

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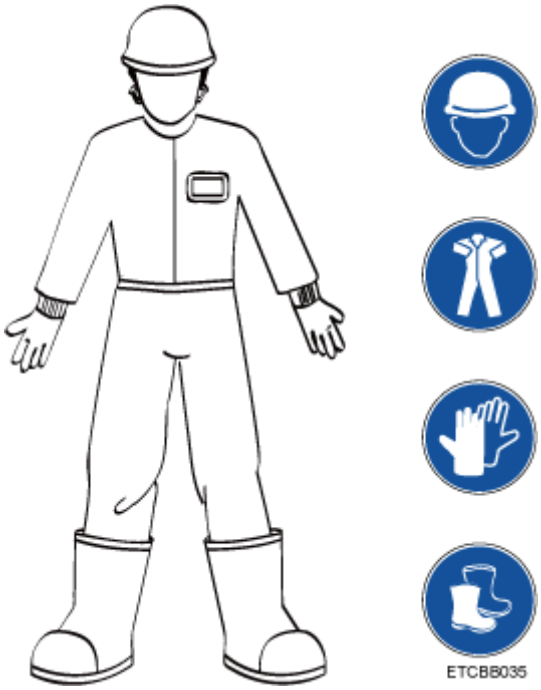
Figure 5-1 Safety work wear



- Before touching a device, wear ESD clothing and gloves (or wrist strap), and remove any conductive objects (such as watches and jewelry). **Figure 5-2** shows conductive objects that must be removed before you touch a device.

Figure 5-2 Removing conductive objects



Figure 5-3 shows how to wear an ESD wrist strap.

a. Put your hands into the ESD wrist strap.
b. Tighten the strap buckle and ensure that the ESD wrist strap is in contact with your skin.
c. Insert the ground terminal attached to the ESD wrist strap into the jack on the grounded rack or chassis.

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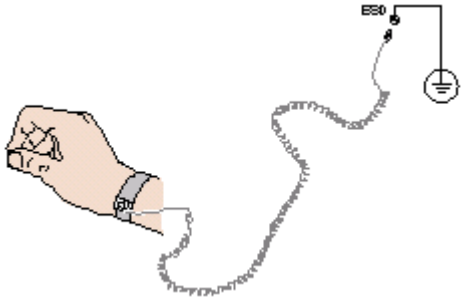
Figure 5-3 Wearing an ESD wrist strap



- Exercise caution when using tools.
- If the installation position of the device is higher than the shoulders of the installation personnel, use a vehicle such as a lift to facilitate installation. Prevent the equipment from falling down and causing personal injury or damage to the equipment.
- The equipment is powered by high-voltage power sources. Direct or indirect contact (especially through damp objects) with high-voltage power sources may result in serious injury or death.
- Ground the equipment before powering it on. Otherwise, personal injury may be caused by high electricity leakage.
- When a ladder is used, ensure that another person holds the ladder steady to prevent accidents.
- When connecting, testing, or replacing an optical cable, do not look into the optical port without eye protection.

Equipment Safety

- Use the recommended power cables at all times.
- Use power cables only for dedicated servers. Do not use them for other devices.
- Before operating equipment, wear ESD clothes and gloves to prevent electrostatic-sensitive devices from being damaged by ESD.
- When moving a device, hold the bottom of the device. Do not hold the handles of the installed modules, such as the PSUs, fan modules, drives, and the mainboard. Handle the equipment with care.
- Exercise caution when using tools that could cause personal injury.
- If the device is configured with active and standby PSUs, connect power cables of active and standby PSUs to different power distribution units (PDUs) to ensure reliable system operating.
- Ground the equipment before powering it on.

Transportation Precautions

Improper transportation may damage equipment. Contact the manufacturer for precautions before attempting transportation.

Transportation precautions include but are not limited to:

- The logistics company engaged to transport the device must be reliable and comply with international standards for transporting electronics. Ensure that

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the equipment being transported is always kept upright. Take necessary precautions to prevent collisions, corrosion, package damage, damp conditions and pollution.

- Transport the equipment in its original packaging.
- If the original packaging is unavailable, package heavy, bulky parts (such as chassis and blades) and fragile parts (such as PCIe GPUs and SSDs) separately.

  NOTE

  Use **Computing Product Compatibility Checker** to obtain information abut the components supported by a node or server.
- Power off all devices before transportation.

Maximum Weight Carried by a Person

CAUTION

To reduce the risk of personal injury, comply with local regulations with regard to the maximum weight one person is permitted to carry.

Table 5-1 lists the maximum weight one person is permitted to carry as stipulated by a number of organizations.

Table 5-1 Maximum weight carried per person

Organization	Weight (kg/lb)
European Committee for Standardization (CEN)	25/55.13
International Organization for Standardization (ISO)	25/55.13
National Institute for Occupational Safety and Health (NIOSH)	23/50.72
Health and Safety Executive (HSE)	25/55.13
General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China (AQSIQ)	• Male: 15/33.08 • Female: 10/22.05

For more information about safety instructions, see ***Huawei Server Safety Information***.

5.2 Maintenance and Warranty

For details about the maintenance policy, visit **Customer Support Service**.

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For details about the warranty policy, visit **Warranty Service**.

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6 ESD

6.1 ESD Prevention

6.2 Grounding Methods for ESD Prevention

6.1 ESD Prevention

The static electricity released by the human body or conductors may damage the mainboard or other electrostatic-sensitive devices. The damage caused by static electricity will shorten the service time of the devices.

To prevent electrostatic damage, observe the following:

- Use the ESD floor (or ESD mat) and ESD chairs in the equipment room. Use ESD materials for partition boards, screens, and curtains in the equipment room.
- All floor-standing electric devices, metal frames, and metal rack shells in the equipment room must be directly grounded. All electric meters or tools on a workbench must be connected to the common ground point of the workbench.
- Monitor the temperature and humidity in the equipment room. The heating system may reduce the humidity and increases static electricity indoors.
- Place the product in an ESD bag to avoid direct contact during transportation and storage.
- Before transporting electrostatic-sensitive components to a work area that is not affected by static electricity, store them in their original packages.
- Place the component on a grounded surface and then take it out of the package.
- Before installing or removing a server component, wear an ESD wrist strap that is properly grounded.
- During parts replacement, keep new components in ESD bags before installation, and place removed components on conductive mats for temporary storage.
- Do not touch pins, wires, or circuits.

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6.2 Grounding Methods for ESD Prevention

Use one or more of the following grounding methods when handling or installing electrostatic-sensitive devices:

- Use an ESD wrist strap that connects to a grounded work area or computer chassis through a ground cable. The wrist strap must be scalable, and the resistance of the ground cable must be at least 1 megohm (±10%). For grounding purposes, wear the wrist strap tightly against your skin.
- Use a heel-grounded, toe-grounded, or shoe-grounded ESD strap when working in a standing position. When standing on a conductive floor or electrostatic dissipative floor mat, tie a strap on your feet.
- Use conductive maintenance tools.
- Use a folding tool mat that dissipates static electricity and a portable field service kit.

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7 Internal Cabling

7.1 Server with 8 x 2.5" Drives (Pass-through) 1
7.2 Server with 8 x 2.5" Drives (Pass-through) 2
7.3 Server with 12 x 3.5" Drives (Expander) 1
7.4 Server with 12 x 3.5" Drives (Expander) 2
7.5 Server with 12 x 3.5" Drives (Expander) 3
7.6 Server with 12 x 3.5" Drives (Expander) 4
7.7 Server with 12 x 3.5" Drives (Pass-through) 1
7.8 Server with 12 x 3.5" Drives (Pass-through) 2
7.9 Server with 12 x 3.5" Drives (Pass-through) 3
7.10 12 x 3.5" Drive Pass-through Configuration 4
7.11 Server with 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) Drives 1
7.12 Server with 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) Drives 2
7.13 24 x 2.5" Drive Pass-through Configuration 1
7.14 24 x 2.5" Drive Pass-through Configuration 2
7.15 24 x 2.5" Drive NVMe Configuration 1
7.16 24 x 2.5" Drive NVMe Configuration 2
7.17 Server with 25 x 2.5" Drives (Expander) 1
7.18 Server with 25 x 2.5" Drives (Expander) 2
7.19 Server with 25 x 2.5" Drives (Expander) 3

7.1 Server with 8 x 2.5" Drives (Pass-through) 1

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7.1.1 DVD Drive

DVD Drive Cabling

Figure 7-1 DVD drive cabling

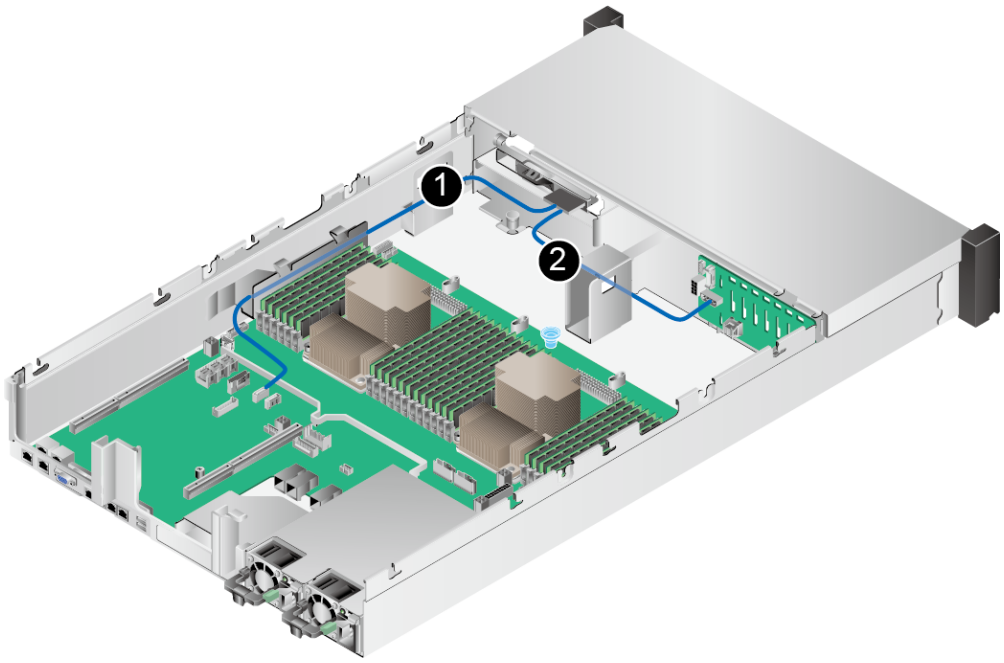

Table 7-1 DVD drive cabling

No.	P/N Code	Description
1	04050689	Signal cable for connecting the DVD drive to the mainboard (J67)
2	04050689	Power cable for connecting the DVD drive to the 8 x 2.5" drive pass-through backplane (J11)

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7.1.2 LCD Cabling

LCD Cabling

Figure 7-2 LCD cabling

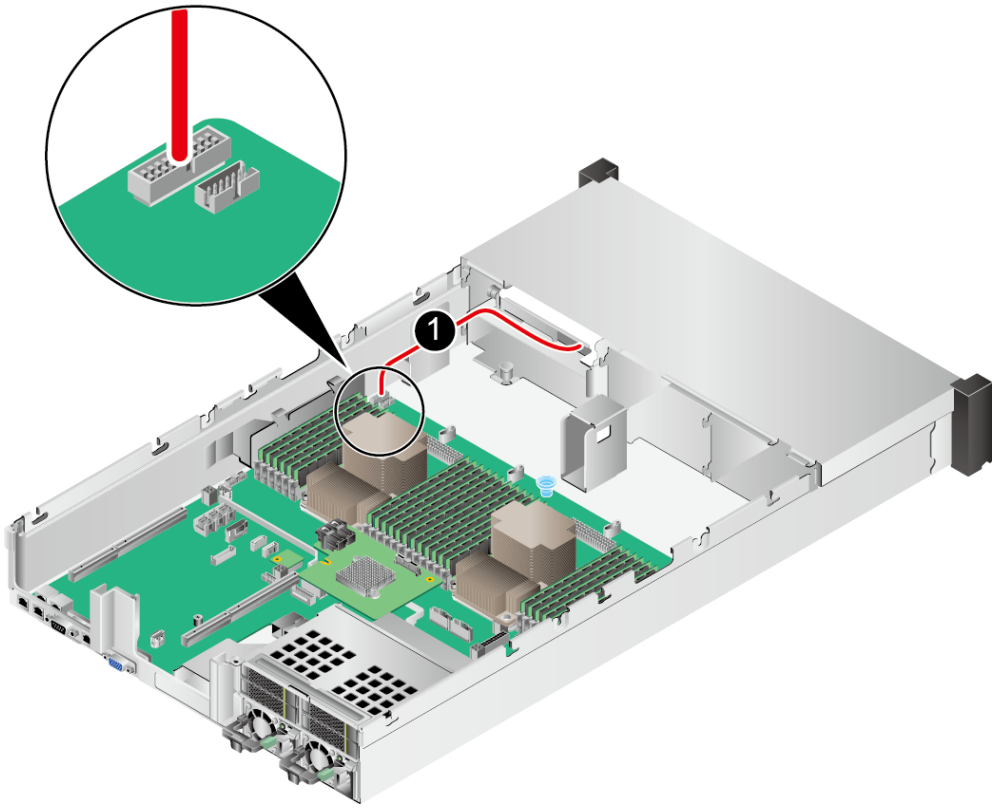

Table 7-2 LCD cabling

No.	Part No.	Description
1	-	Signal cable for connecting the LCD to the mainboard (J87)

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7.1.3 USB and VGA Board Signal Cables

USB and VGA Signal Cables

Figure 7-3 USB and VGA signal cabling

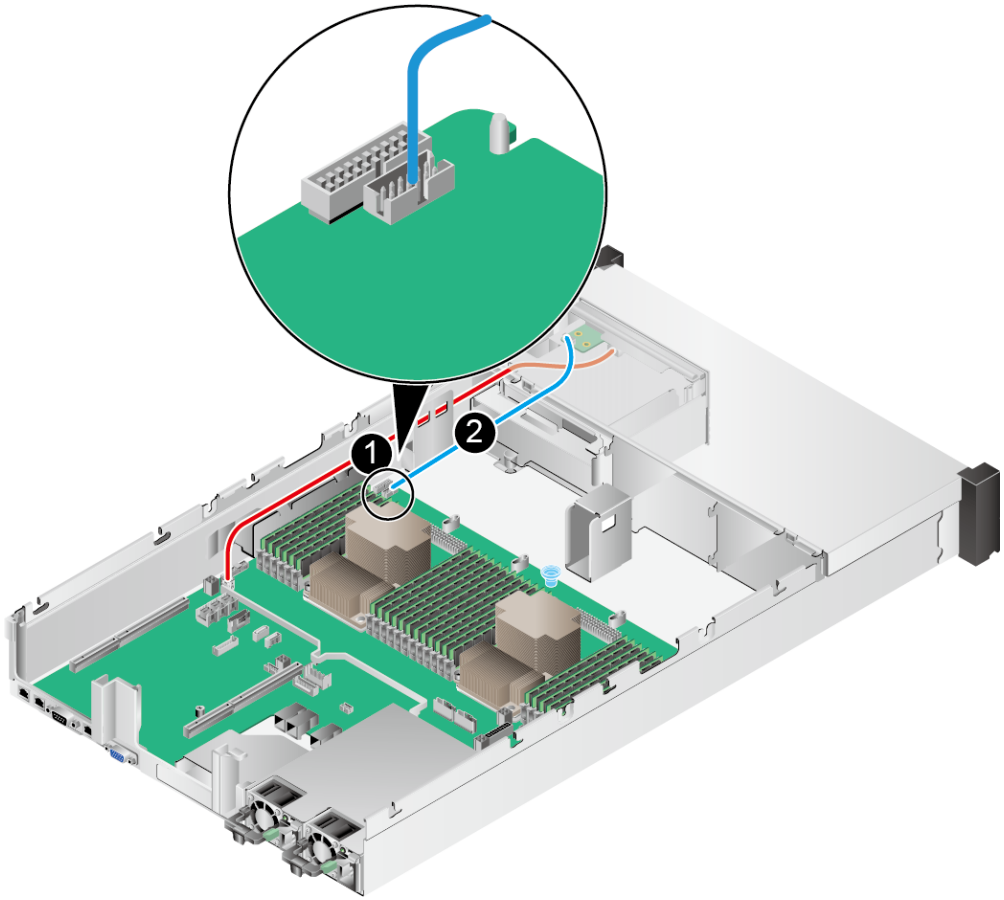

Table 7-3 USB and VGA signal cabling

No.	P/N Code	Description
1	04051947	Signal cable for connecting a front USB device to the mainboard (J173)
2	04051924	Signal cable for connecting the VGA board to the mainboard (J160)

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7.1.4 Left and Right Mounting Ears

Left and Right Mounting Ear Cabling

Figure 7-4 Left and right mounting ear cabling

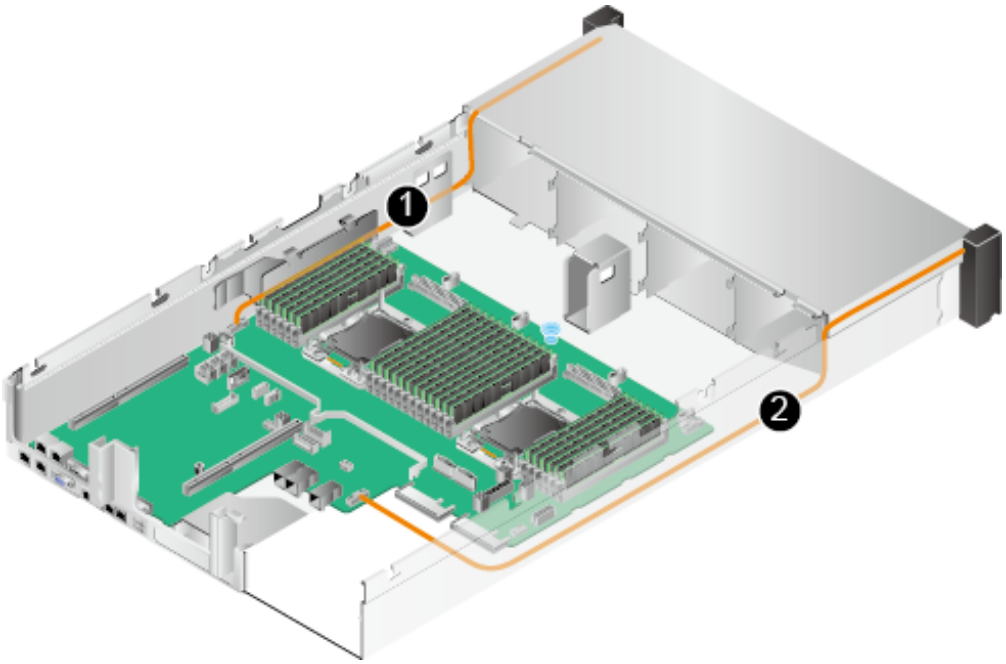

Table 7-4 Left and right mounting ear cabling

No.	P/N Code	Description
1	04051922	Signal cable for connecting the indicator board of the right mounting ear to the mainboard (J167)
2	04051921	Signal cable for connecting the USB board of the left mounting ear to the mainboard (J161)

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7.1.5 NC-SI Cabling

NC-SI Cabling

Figure 7-5 NC-SI cabling

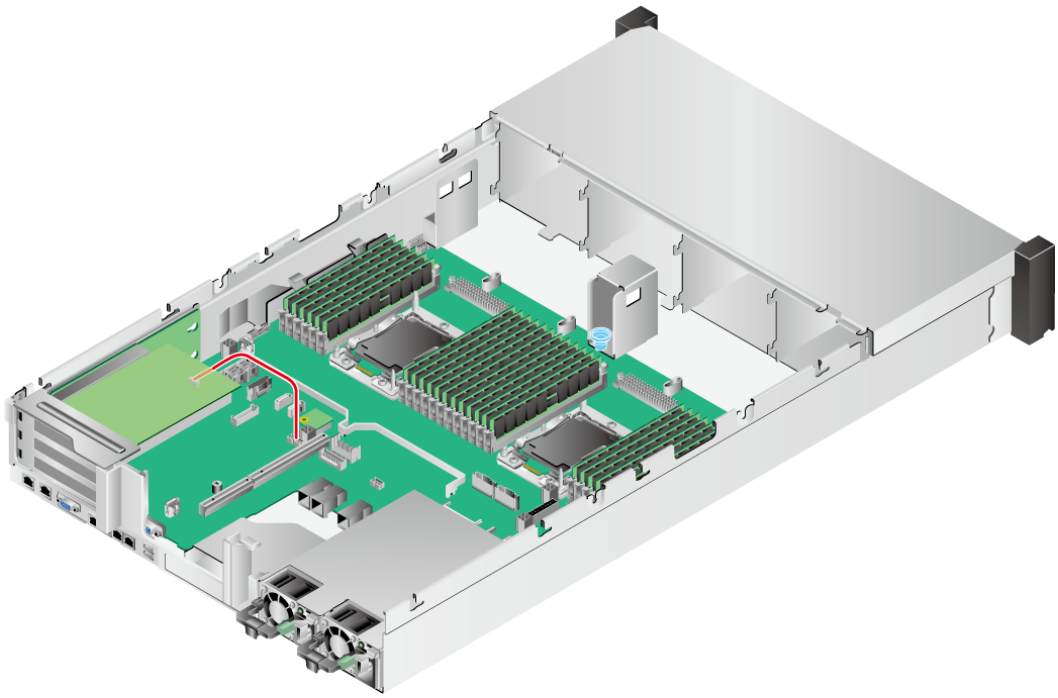

Table 7-5 NC-SI cabling

No.	Part No.	Description
1	04080606 or 04051036	NC-SI cable for connecting the PCIe NIC to the mainboard (J99)

NOTE

This cable is required only when the PCIe NIC supports NC-SI.

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7.1.6 8 x 2.5" Drive Pass-through Backplane Power and Indicator Signal Cables

8 x 2.5" Drive Pass-through Backplane Power and Indicator Signal Cabling

Figure 7-6 8 x 2.5" drive pass-through backplane power and indicator signal cabling

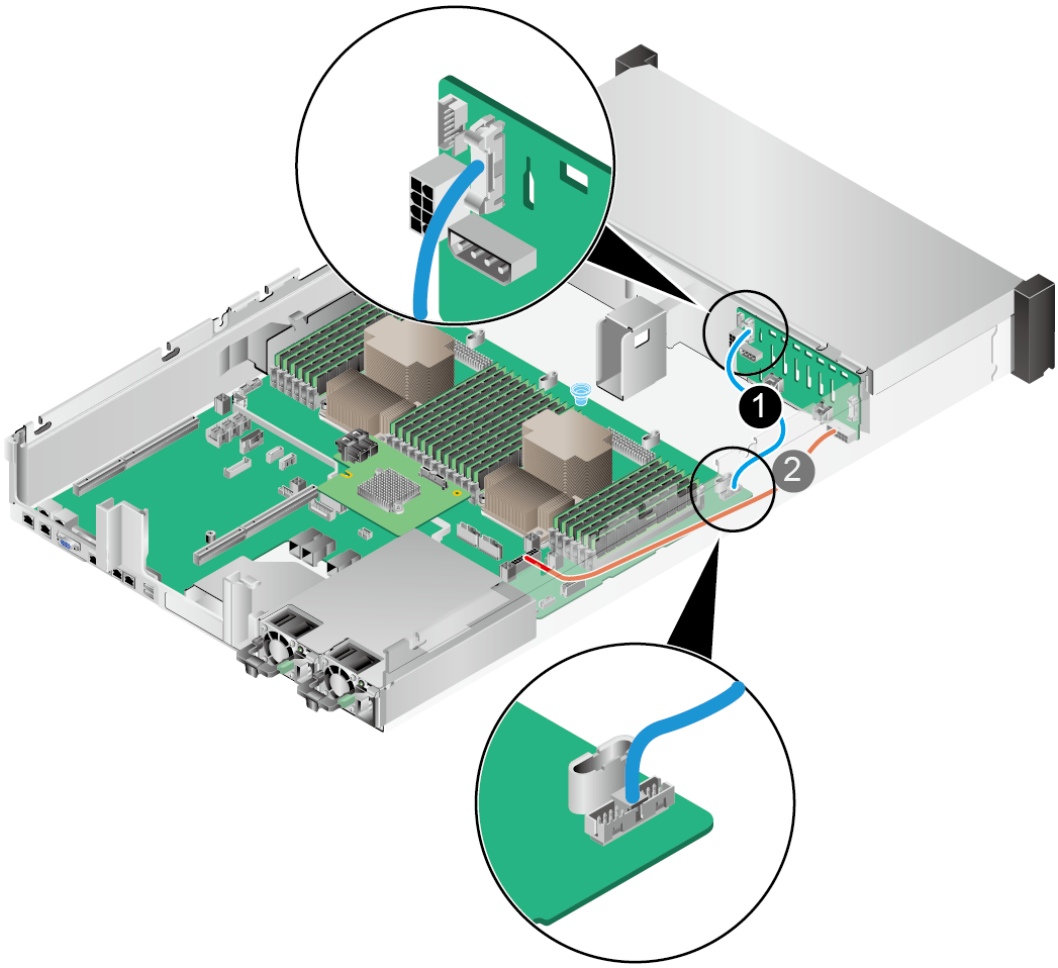

Table 7-6 8 x 2.5" drive pass-through backplane power and indicator signal cabling

No.	P/N Code	Description
1	04051923	Indicator signal cable for connecting the 8 x 2.5" drive pass-through backplane (J1) to the mainboard (J162)
2	04051989	Power cable for connecting the 8 x 2.5" drive pass-through backplane (J24) to the mainboard (J166)

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7.1.7 8 x 2.5" Drive Pass-through Backplane SAS Signal Cables (Server with a Screw-in RAID Controller Card)

8 x 2.5" Drive Pass-through Backplane SAS Signal Cabling

Figure 7-7 8 x 2.5" drive pass-through backplane SAS signal cabling

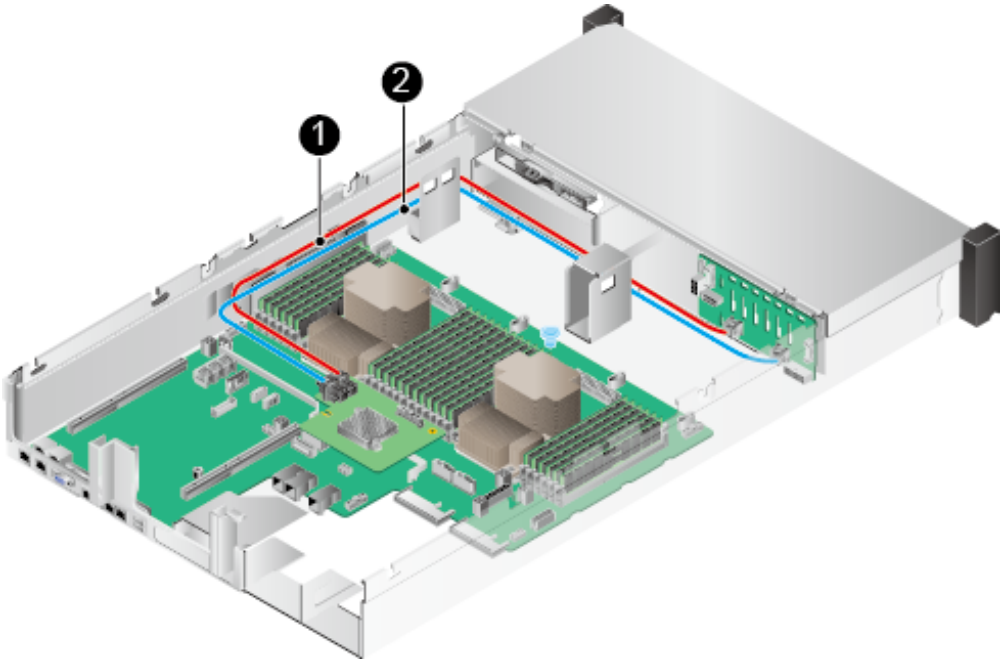

Table 7-7 8 x 2.5" drive pass-through backplane SAS signal cabling

No.	P/N Code	Description
1	04051021	SAS cable for connecting PORT B (J29) of the 8 x 2.5" drive pass-through backplane to PORT B of the screw-in RAID controller card
2	04051021	SAS cable for connecting PORT A (J28) of the 8 x 2.5" drive pass-through backplane to PORT A of the screw-in RAID controller card

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7.1.8 I/O Module 3 (PCIe Riser Card)

I/O Module 3 Cabling

Figure 7-8 I/O module 3 cabling

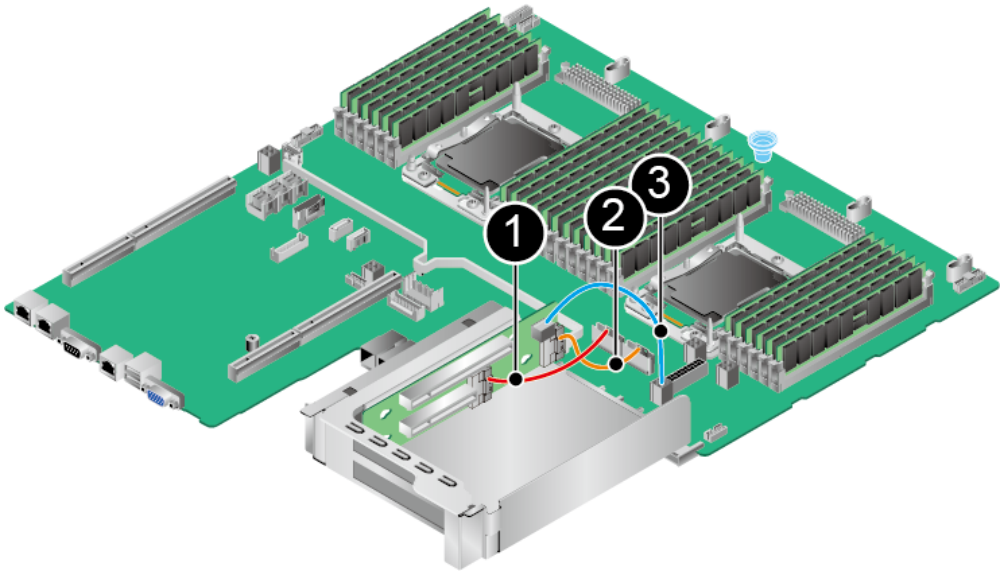

Table 7-8 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline B of the PCIe riser card to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline A of the PCIe riser card to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the PCIe riser card to the mainboard (J172)

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7.1.9 I/O Module 3 (4 x 2.5" NVMe Drives)

I/O Module 3 Cabling

Figure 7-9 I/O module 3 cabling

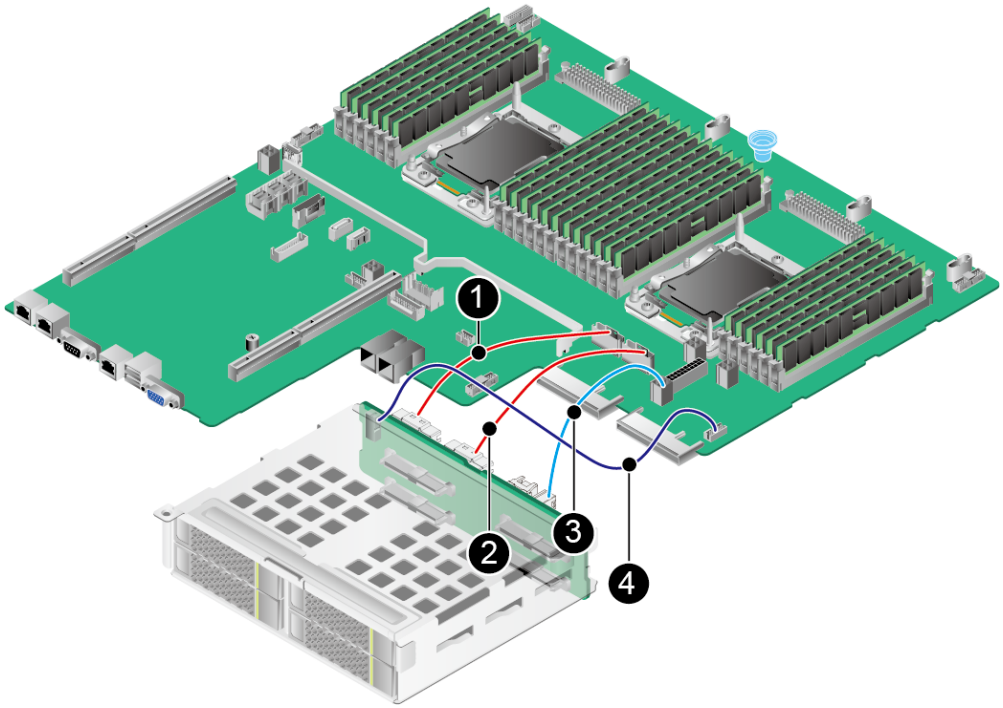

Table 7-9 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline B (J9) of the 4 x 2.5" drive backplane to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline A (J8) of the 4 x 2.5" drive backplane to Slimline A (J140) of the mainboard

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No.	P/N Code	Description
3	04150448-001	Power cable for connecting the 4 x 2.5" drive backplane (J22) to the mainboard (J172)
4	04080602	Low-speed signal cable for connecting the 4 x 2.5" drive backplane (J23) to the mainboard (J164)

7.2 Server with 8 x 2.5" Drives (Pass-through) 2

7.2.1 DVD Drive

DVD Drive Cabling

Figure 7-10 DVD drive cabling

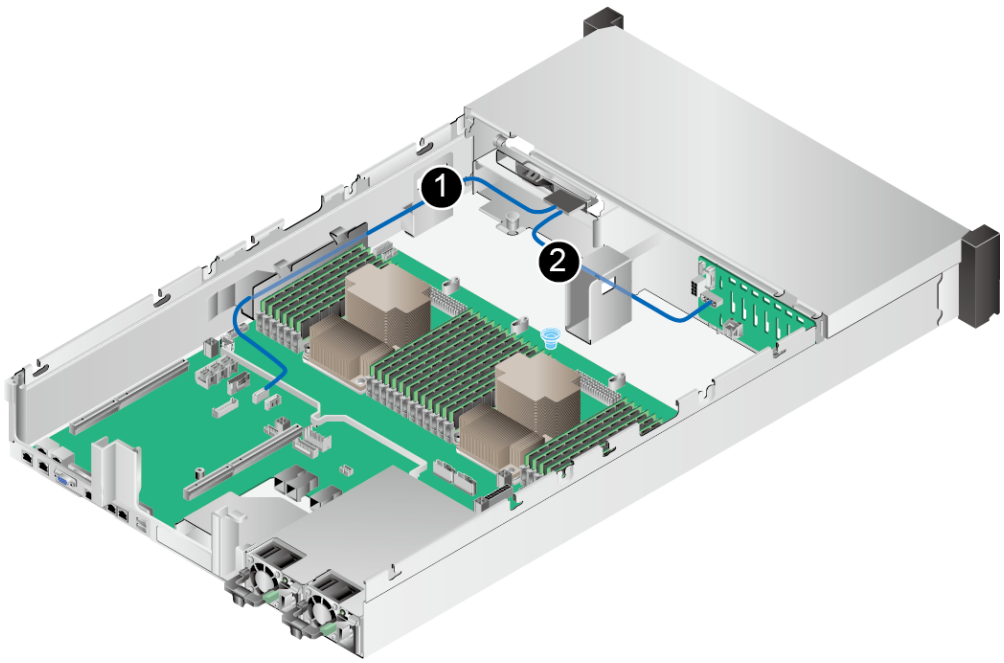

Table 7-10 DVD drive cabling

No.	P/N Code	Description
1	04050689	Signal cable for connecting the DVD drive to the mainboard (J67)
2	04050689	Power cable for connecting the DVD drive to the 8 x 2.5" drive pass-through backplane (J11)

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7.2.2 LCD Cabling

LCD Cabling

Figure 7-11 LCD cabling

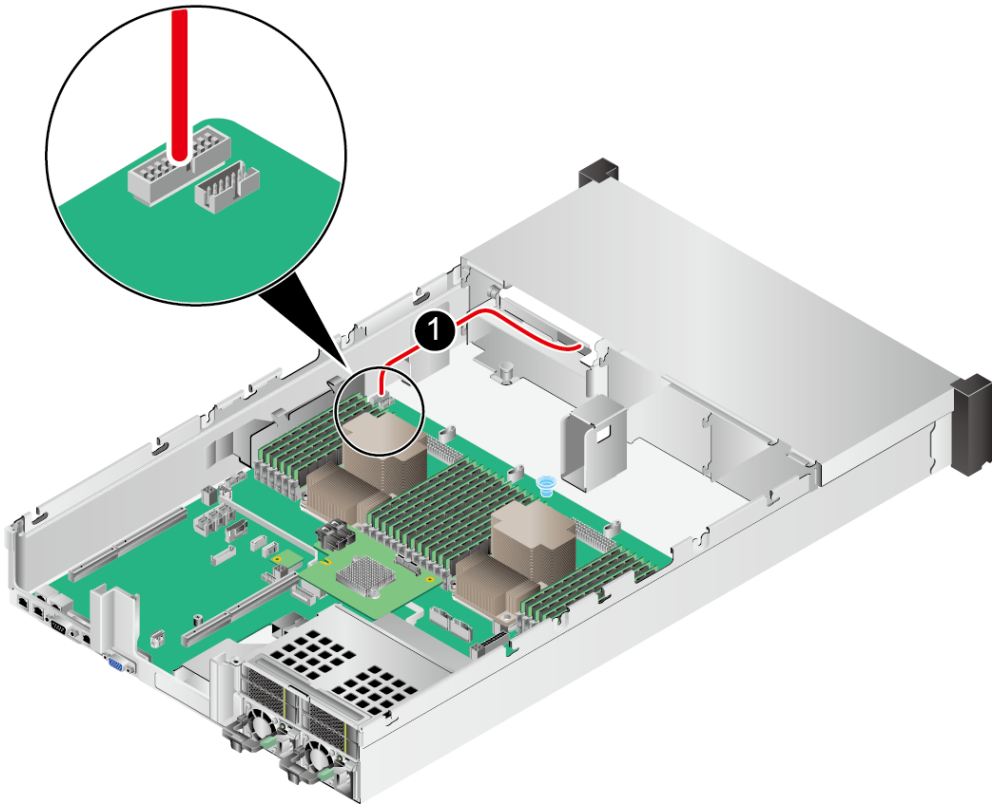

Table 7-11 LCD cabling

No.	Part No.	Description
1	-	Signal cable for connecting the LCD to the mainboard (J87)

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7.2.3 USB and VGA Signal Cables

USB and VGA Signal Cables

Figure 7-12 USB and VGA signal cabling

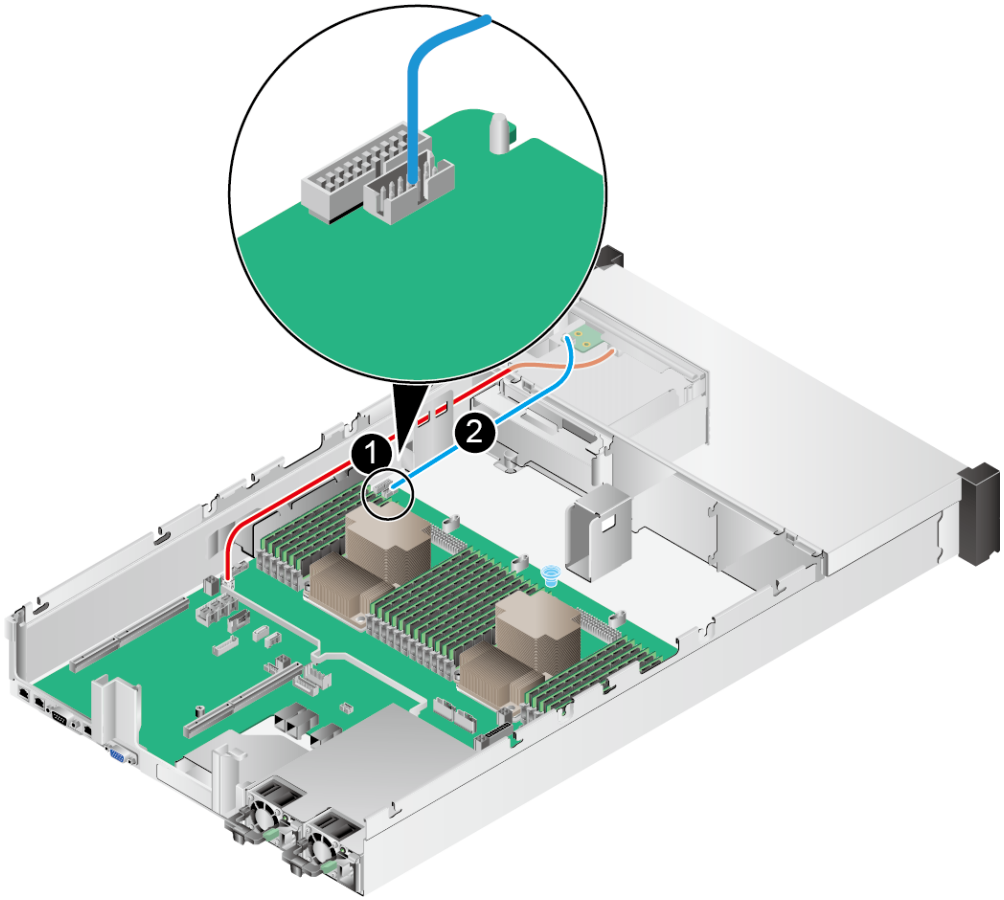

Table 7-12 USB and VGA signal cabling

No.	P/N Code	Description
1	04051947	Signal cable for connecting a front USB device to the mainboard (J173)
2	04051924	Signal cable for connecting the VGA board to the mainboard (J160)

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7.2.4 Left and Right Mounting Ears

Left and Right Mounting Ear Cabling

Figure 7-13 Left and right mounting ear cabling

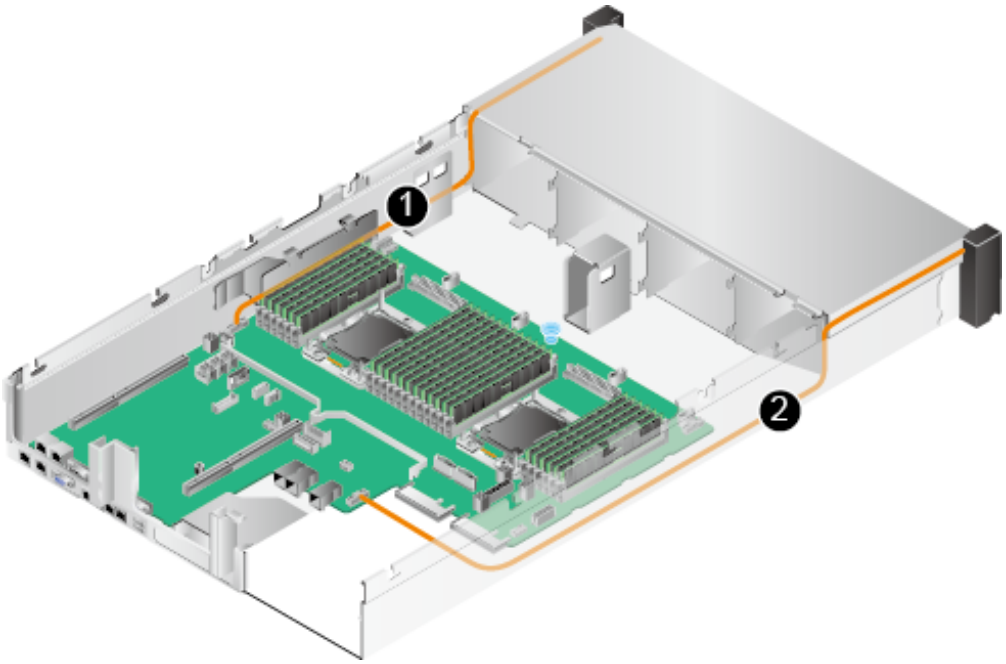

Table 7-13 Left and right mounting ear cabling

No.	P/N Code	Description
1	04051922	Signal cable for connecting the indicator board of the right mounting ear to the mainboard (J167)
2	04051921	Signal cable for connecting the USB board of the left mounting ear to the mainboard (J161)

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7.2.5 NC-SI Cabling

NC-SI Cabling

Figure 7-14 NC-SI cabling

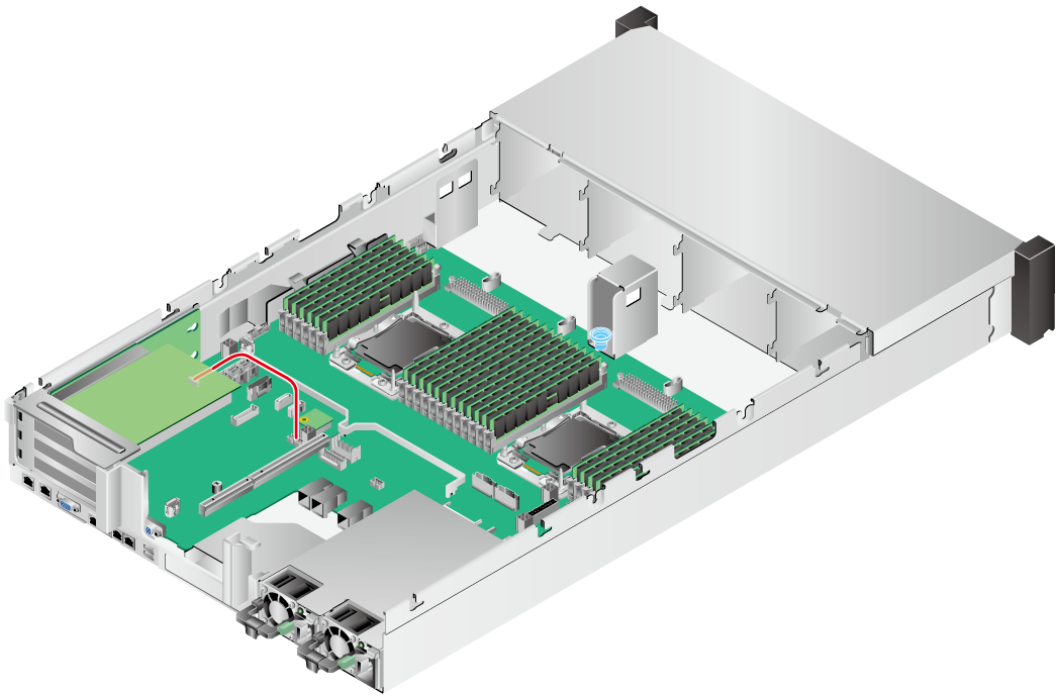

Table 7-14 NC-SI cabling

No.	Part No.	Description
1	04080606 or 04051036	NC-SI cable for connecting the PCIe NIC to the mainboard (J99)

NOTE

This cable is required only when the PCIe NIC supports NC-SI.

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7.2.6 8 x 2.5" Drive Pass-through Backplane Power and Indicator Signal Cables

8 x 2.5" Drive Pass-through Backplane Power and Indicator Signal Cabling

Figure 7-15 8 x 2.5" drive pass-through backplane power and indicator signal cabling

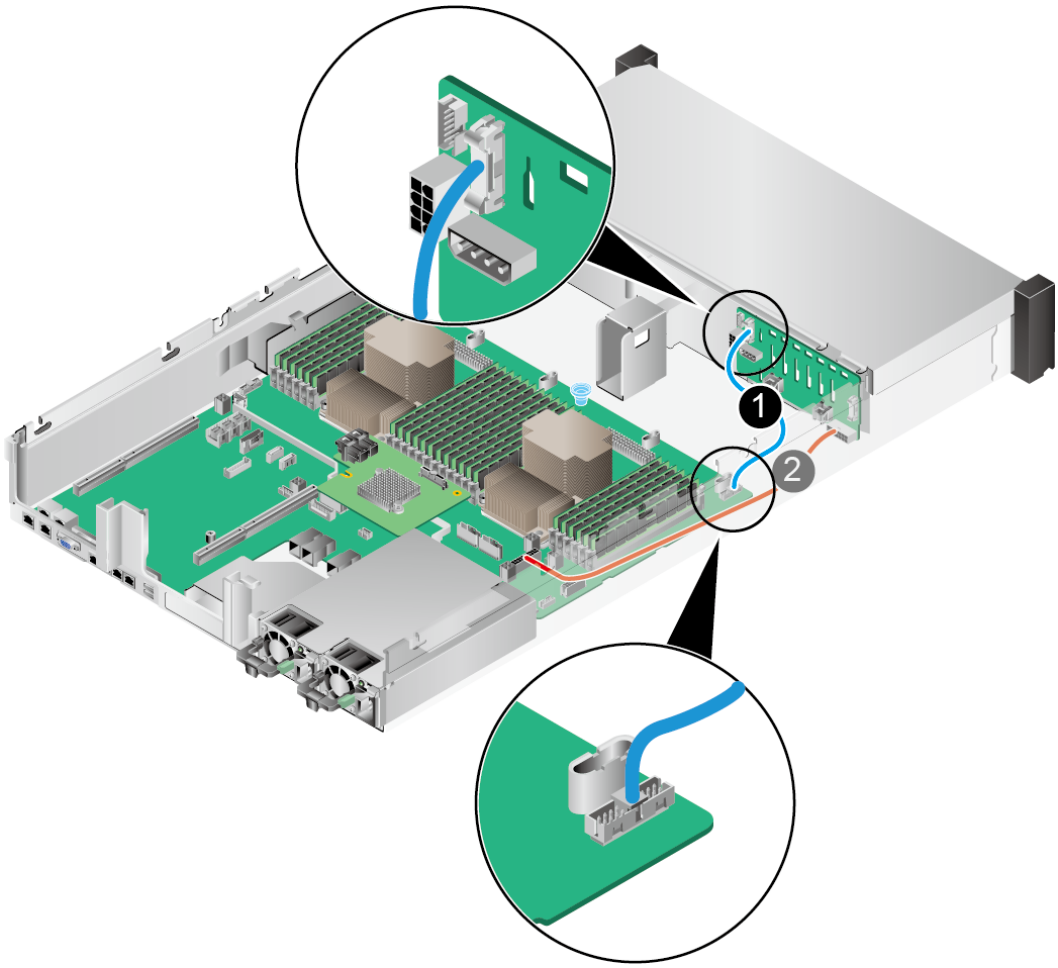

Table 7-15 8 x 2.5" drive pass-through backplane power and indicator signal cabling

No.	P/N Code	Description
1	04051923	Indicator signal cable for connecting the 8 x 2.5" drive pass-through backplane (J1) to the mainboard (J162)
2	04051989	Power cable for connecting the 8 x 2.5" drive pass-through backplane (J24) to the mainboard (J166)

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7.2.7 8 x 2.5" Drive Backplane SAS Signal Cables (Server with a PCIe RAID Controller Card)

8 x 2.5" Drive Pass-through Backplane SAS Signal Cabling

Figure 7-16 8 x 2.5" drive pass-through backplane SAS signal cabling

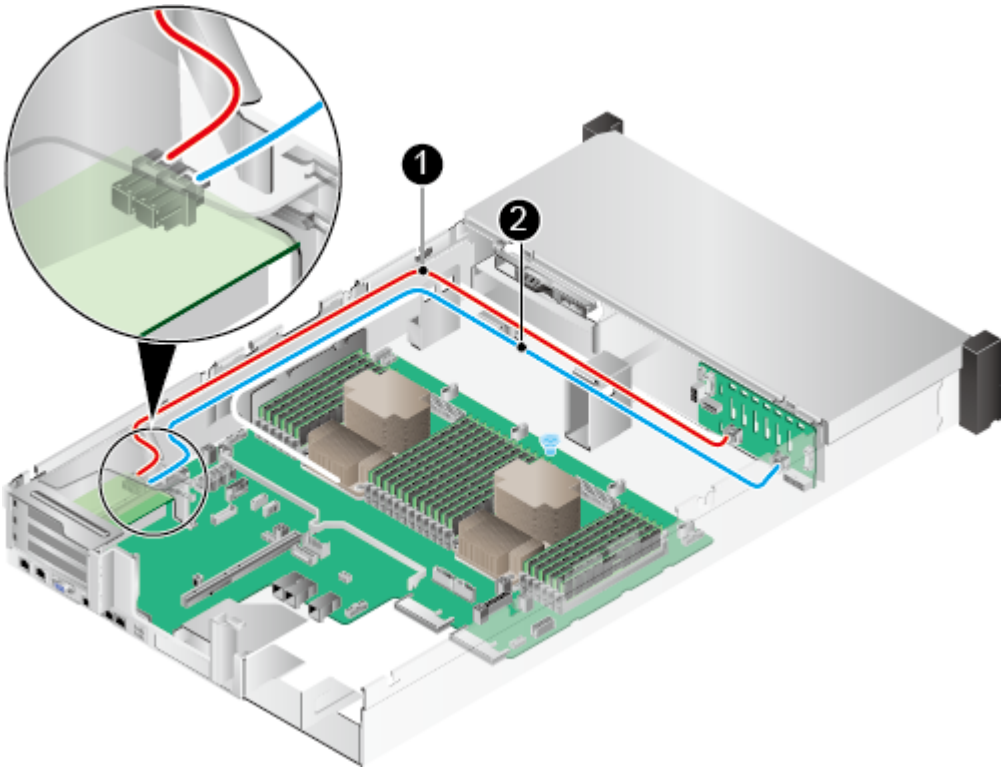

Table 7-16 8 x 2.5" drive pass-through backplane SAS signal cabling

No.	P/N Code	Description
1	04051021	SAS cable for connecting PORT B (J29) of the 8 x 2.5" drive pass-through backplane to C1 of the PCIe RAID controller card
2	04051021	SAS cable for connecting PORT A (J28) of the 8 x 2.5" drive pass-through backplane to C0 of the PCIe RAID controller card

NOTE

- The PCIe RAID controller card can be installed only in slot 1 or slot 3.
- The PMC 3152 RAID controller card can be installed only in slot 1.
- The port numbers vary with the PCIe RAID controller cards. The port number of the PCIe RAID controller card connected to front-drive backplane PORT A (J28) may be C0, PORT A, 0, or CN0, and the port number of the PCIe RAID controller card connected to front-drive backplane PORT B (J29) may be C1, PORT B, 1, or CN1.

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7.2.8 I/O Module 3 (PCIe Riser Card)

I/O Module 3 Cabling

Figure 7-17 I/O module 3 cabling

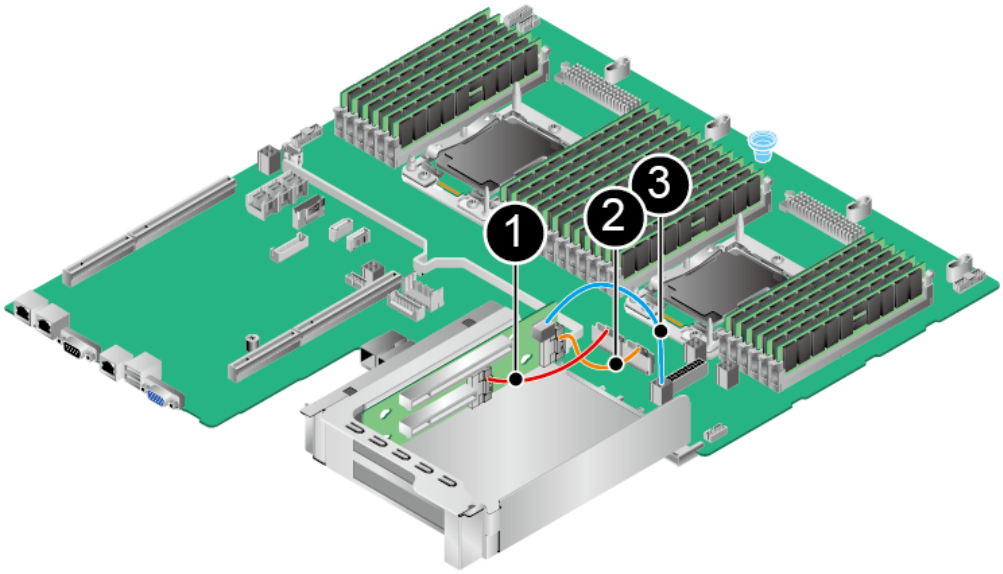

Table 7-17 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline B of the PCIe riser card to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline A of the PCIe riser card to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the PCIe riser card to the mainboard (J172)

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7.2.9 I/O Module 3 (4 x 2.5" NVMe Drives)

I/O Module 3 Cabling

Figure 7-18 I/O module 3 cabling

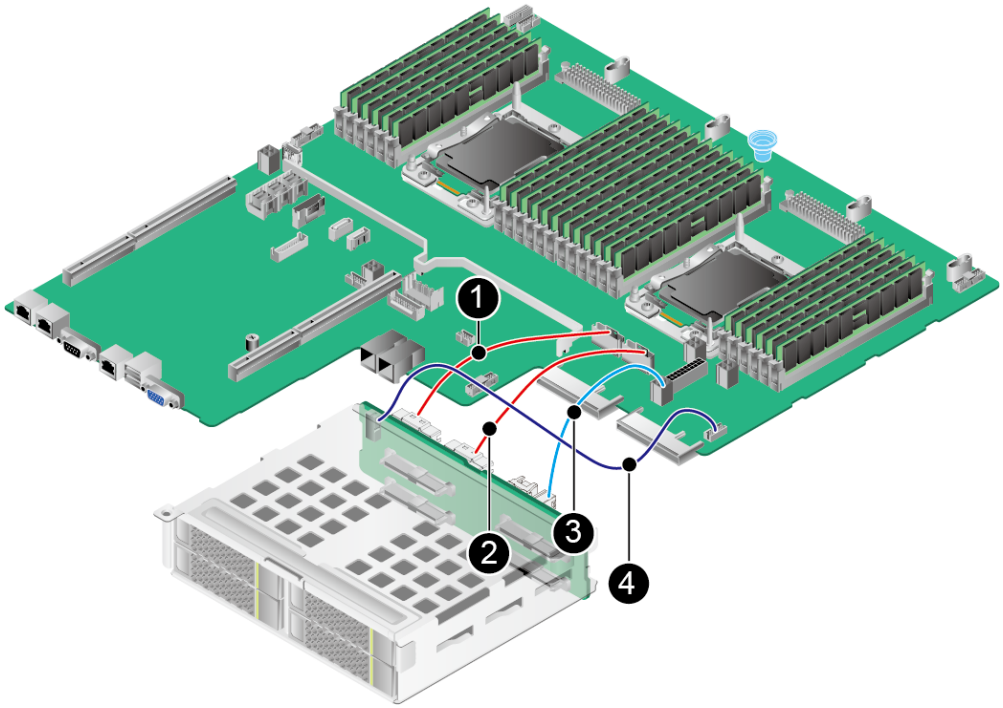

Table 7-18 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline B (J9) of the 4 x 2.5" drive backplane to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline A (J8) of the 4 x 2.5" drive backplane to Slimline A (J140) of the mainboard

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No.	P/N Code	Description
3	04150448-001	Power cable for connecting the 4 x 2.5" drive backplane (J22) to the mainboard (J172)
4	04080602	Low-speed signal cable for connecting the 4 x 2.5" drive backplane (J23) to the mainboard (J164)

7.3 Server with 12 x 3.5" Drives (Expander) 1

7.3.1 Left and Right Mounting Ears

Left and Right Mounting Ear Cabling

Figure 7-19 Left and right mounting ear cabling

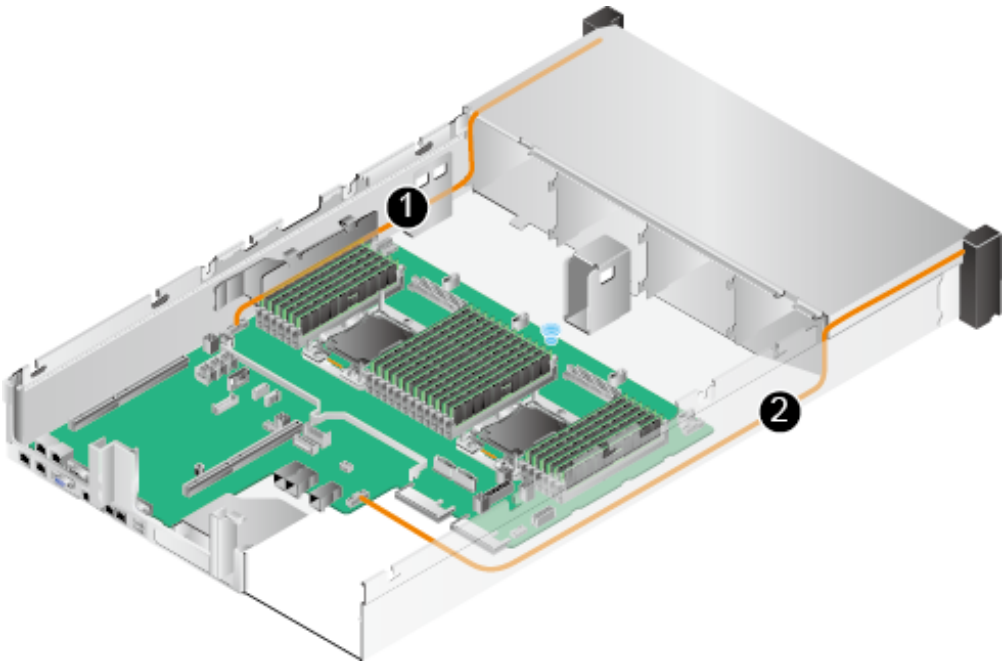

Table 7-19 Left and right mounting ear cabling

No.	P/N Code	Description
1	04051922	Signal cable for connecting the indicator board of the right mounting ear to the mainboard (J167)
2	04051921	Signal cable for connecting the USB board of the left mounting ear to the mainboard (J161)

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7.3.2 NC-SI Cabling

NC-SI Cabling

Figure 7-20 NC-SI cabling

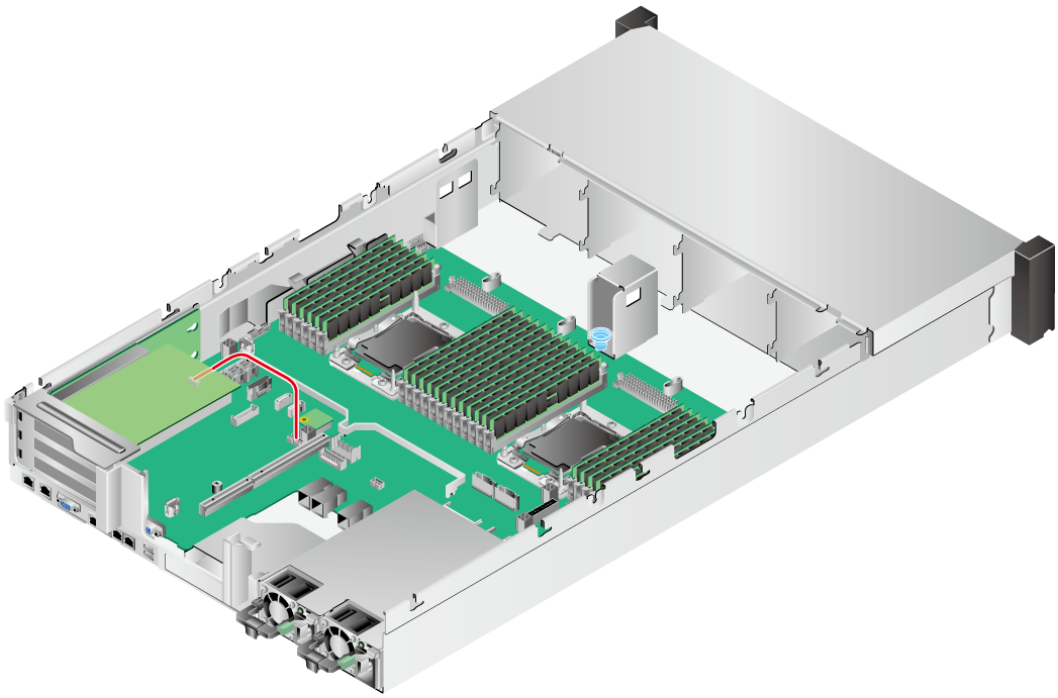

Table 7-20 NC-SI cabling

No.	Part No.	Description
1	04080606 or 04051036	NC-SI cable for connecting the PCIe NIC to the mainboard (J99)

NOTE

This cable is required only when the PCIe NIC supports NC-SI.

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7.3.3 12 x 3.5" Drive EXP Backplane Power and Indicator Signal Cables

12 x 3.5" Drive EXP Backplane Power and Indicator Signal Cabling

Figure 7-21 12 x 3.5" drive EXP backplane power and indicator signal cabling

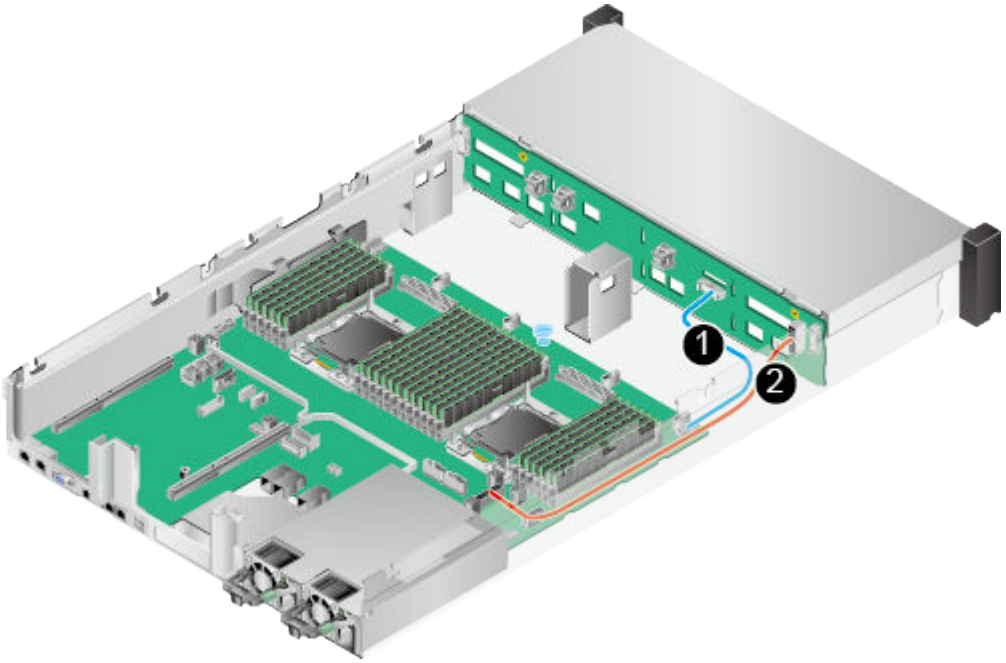

Table 7-21 12 x 3.5" drive EXP backplane power and indicator signal cabling

No.	P/N Code	Description
1	04051923	Indicator signal cable for connecting the 12 x 3.5" drive EXP backplane (J1) to the mainboard (J162)
2	04051989	Power cable for connecting the 12 x 3.5" drive EXP backplane (J24) to the mainboard (J166)

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7.3.4 12 x 3.5" Drive EXP Backplane SAS Signal Cables (Server with a Screw-in RAID Controller Card)

12 x 3.5" Drive EXP Backplane SAS Signal Cabling

Figure 7-22 12 x 3.5" drive EXP backplane SAS signal cabling

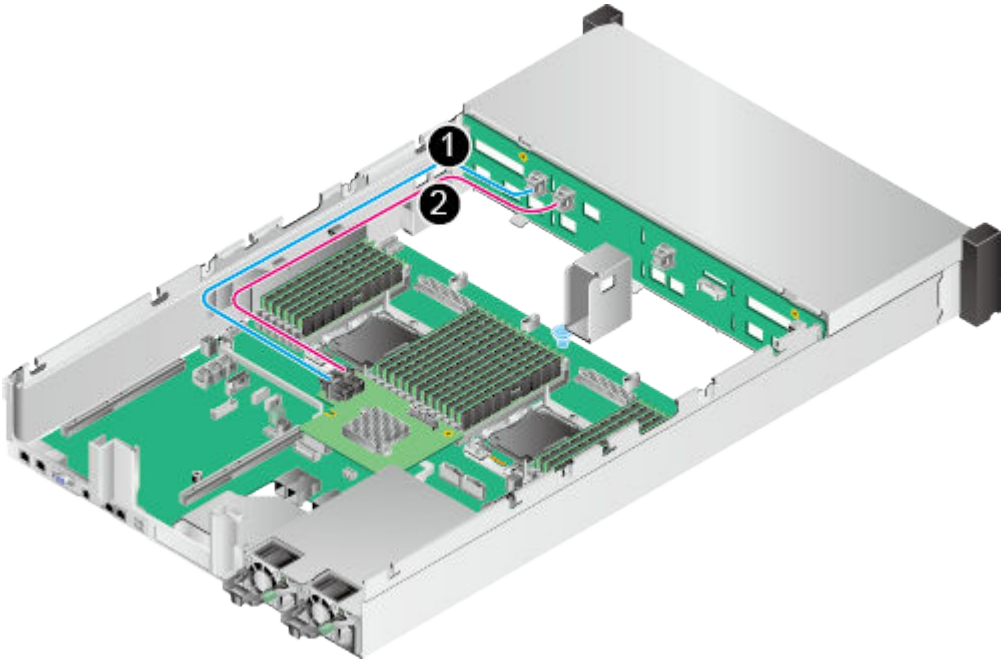

Table 7-22 12 x 3.5" drive EXP backplane SAS signal cabling

No.	P/N Code	Description
1	04051018	SAS cable for connecting PORT A (J28) of the 12 x 3.5" drive EXP backplane to PORT A of the screw-in RAID controller card
2	04051018	SAS cable for connecting PORT B (J29) of the 12 x 3.5" drive EXP backplane to PORT B of the screw-in RAID controller card

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7.3.5 4 x 3.5" Built-in-Drive Backplane Cabling (Server with a Screw-in RAID Controller Card)

4 x 3.5" Built-in-Drive Backplane Cabling

Figure 7-23 4 x 3.5" built-in-drive backplane cabling

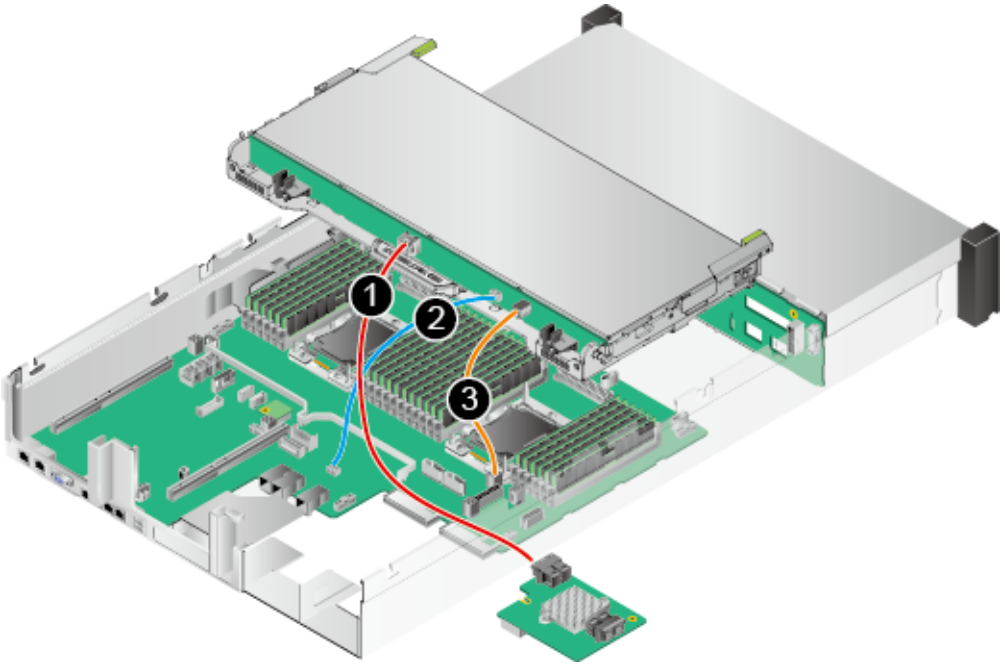

Table 7-23 4 x 3.5" built-in-drive backplane cabling

No.	P/N Code	Description
1	04051059	SAS cable for connecting the 4 x 3.5" built-in-drive backplane (J3) to PORT C of the screw-in RAID controller card
2	04051948 **NOTE** The cable is not an independent spare part. It is packed with the built-in-drive backplane as a spare part.	Indicator signal cable for connecting the 4 x 3.5" built-in-drive backplane (J1) to the mainboard (J122)
3	04150448-001	Power cable for connecting the 4 x 3.5" built-in-drive backplane (J2) to the mainboard (J171)

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7.3.6 I/O Module 1 (2 x 2.5" SAS/SATA Drives)

I/O Module 1 Cabling

Figure 7-24 I/O module 1 cabling

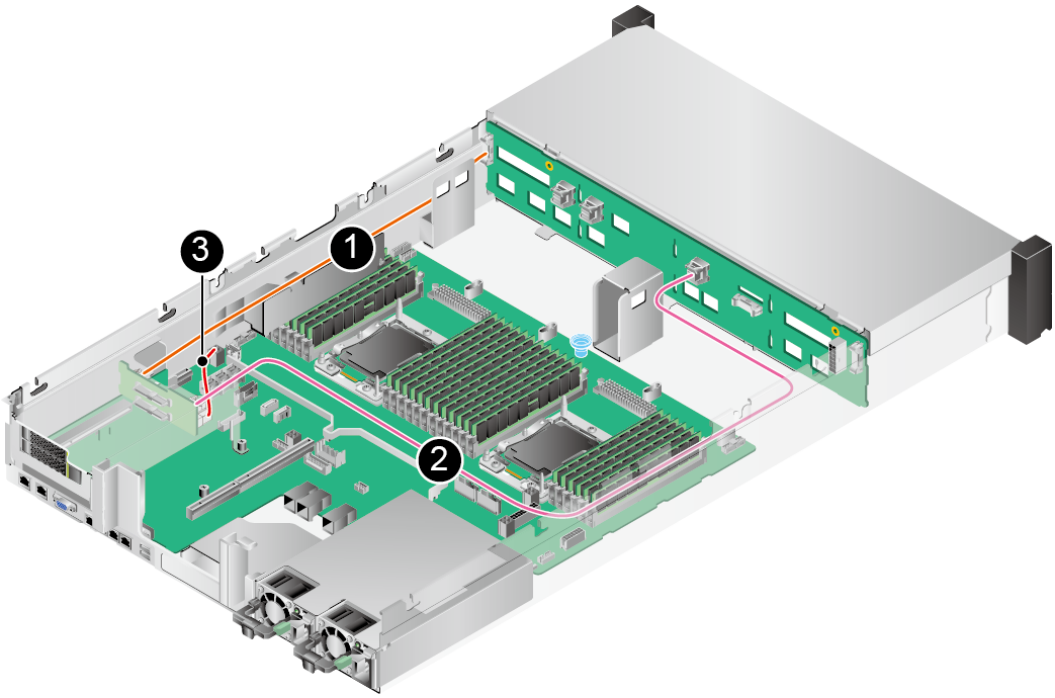

Table 7-24 I/O module 1 cabling

No.	P/N Code	Description
1	04051053	Indicator signal cable for connecting the 2 x 2.5" drive backplane (J24) to the 12 x 3.5" drive EXP backplane (J32)
2	04051060	SAS cable for connecting the 2 x 2.5" drive backplane (J3) to the 12 x 3.5" drive EXP backplane (J31) **NOTE** The Y-shaped end of the cable is connected to the 2 x 2.5" drive backplane. Connector HDD A corresponds to the backplane of I/O module 1 and connector HDD B corresponds to the backplane of I/O module 2. Use cable connectors based on actual situation.
3	04150448-001	Power cable for connecting the 2 x 2.5" drive backplane (J1) to the mainboard (J127)

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7.3.7 I/O Module 1 (2 x 2.5" SAS/SATA Drives) and I/O Module 2 (2 x 3.5" SAS/SATA Drives)

I/O Module 1 and I/O Module 2 Cabling

Figure 7-25 I/O modules 1 and 2 cabling

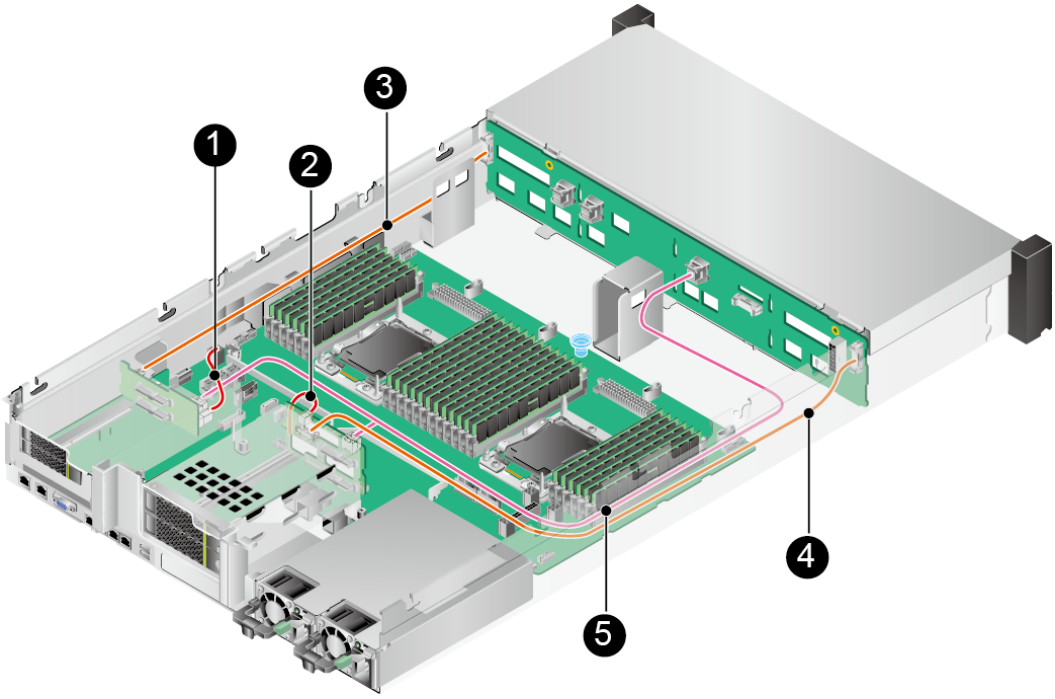

Table 7-25 I/O modules 1 and 2 cabling

No.	P/N Code	Description
1	04150448-001	Power cable for connecting the 2 x 2.5" drive backplane (J1) to the mainboard (J127)
2	04150448-001	Power cable for connecting the 2 x 3.5" drive backplane (J1) to the mainboard (J126)
3	04051053	Indicator signal cable for connecting the 2 x 2.5" drive backplane (J24) to the 12 x 3.5" drive EXP backplane (J32)
4	04051053	Indicator signal cable for connecting the 2 x 3.5" drive backplane (J24) to the 12 x 3.5" drive EXP backplane (J35)

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No.	P/N Code	Description
5	04051060	SAS cable for connecting the 2 x 2.5" drive backplane (J3) and 2 x 3.5" drive backplane (J3) to the 12 x 3.5" drive EXP backplane (J31) **NOTE** The Y-shaped end of the cable is connected to the 2 x 2.5" drive and 2 x 3.5" drive backplanes. Connector HDD A corresponds to the backplane of I/O module 1 and connector HDD B corresponds to the backplane of I/O module 2. Use cable connectors based on actual situation.

7.3.8 I/O Module 1 (2 x 3.5" SAS/SATA Drives)

I/O Module 1 Cabling

Figure 7-26 I/O module 1 cabling

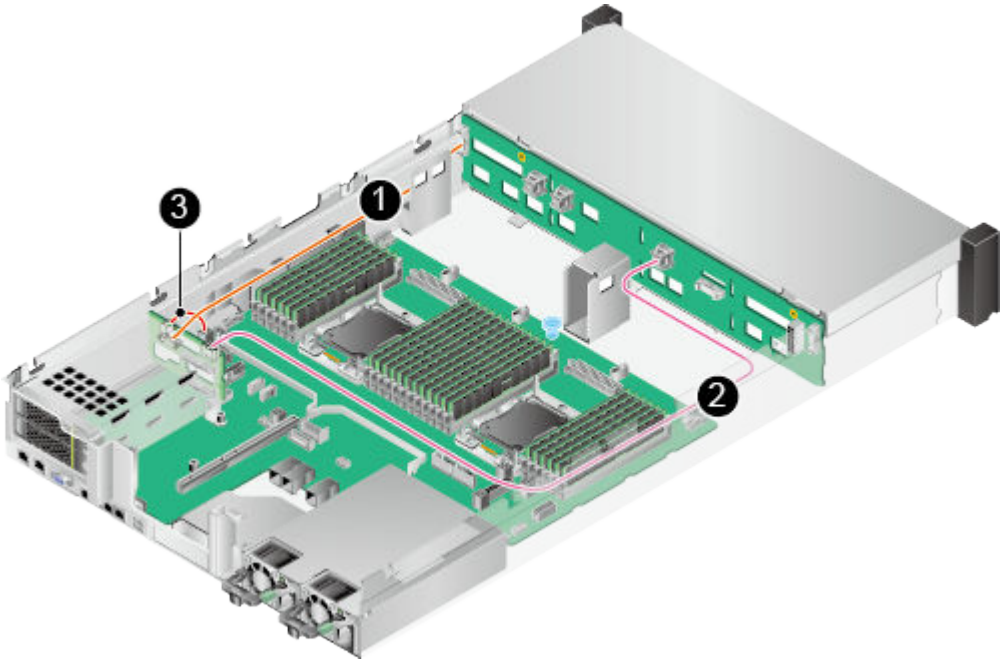

Table 7-26 I/O module 1 cabling

No.	P/N Code	Description
1	04051053	Indicator signal cable for connecting the 2 x 3.5" drive backplane (J24) to the 12 x 3.5" drive EXP backplane (J32)

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No.	P/N Code	Description
2	04051934 **NOTE** The cable is not an independent spare part. It is packed with the 2 x 3.5" drive backplane as a spare part.	SAS cable for connecting the 2 x 3.5" drive backplane (J3) to the 12 x 3.5" drive EXP backplane (J31) **NOTE** The Y-shaped end of the cable is connected to the 2 x 3.5" drive backplane. Connector HDD A corresponds to the backplane of I/O module 1 and connector HDD B corresponds to the backplane of I/O module 2. Use cable connectors based on actual situation.
3	04150448-001	Power cable for connecting the 2 x 3.5" drive backplane (J1) to the mainboard (J127)

7.3.9 I/O Module 1 (2 x 3.5" SAS/SATA Drives) and I/O Module 2 (2 x 3.5" SAS/SATA Drives)

I/O Module 1 and I/O Module 2 Cabling

Figure 7-27 I/O modules 1 and 2 cabling

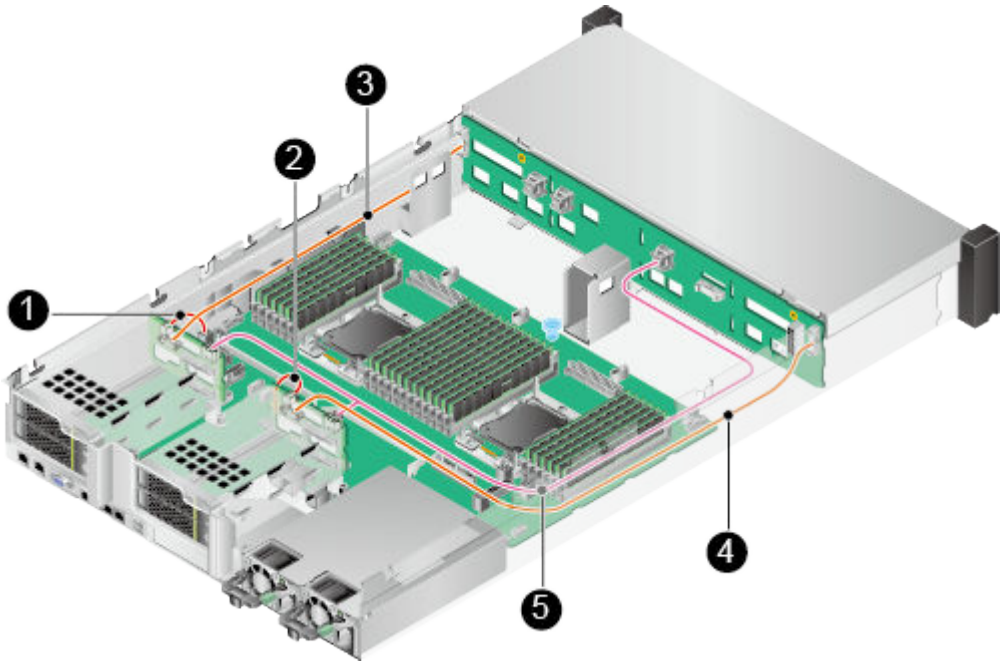

Table 7-27 I/O modules 1 and 2 cabling

No.	P/N Code	Description
1	04150448-001	Power cable for connecting the 2 x 3.5" drive backplane (J1) to the mainboard (J127)

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No.	P/N Code	Description
2	04150448-001	Power cable for connecting the 2 x 3.5" drive backplane (J1) to the mainboard (J126)
3	04051053	Indicator signal cable for connecting the 2 x 3.5" drive backplane (J24) to the 12 x 3.5" drive EXP backplane (J32)
4	04051053	Indicator signal cable for connecting the 2 x 3.5" drive backplane (J24) to the 12 x 3.5" drive EXP backplane (J35)
5	04051934 **NOTE** The cable is not an independent spare part. It is packed with the 2 x 3.5" drive backplane as a spare part.	SAS cable for connecting the 2 x 3.5" drive backplane (J3) to the 12 x 3.5" drive EXP backplane (J31) **NOTE** The Y-shaped end of the cable is connected to the 2 x 3.5" drive backplane. Connector HDD A corresponds to the backplane of I/O module 1 and connector HDD B corresponds to the backplane of I/O module 2. Use cable connectors based on actual situation.

7.3.10 I/O Module 3 (PCIe Riser Card)

I/O Module 3 Cabling

Figure 7-28 I/O module 3 cabling

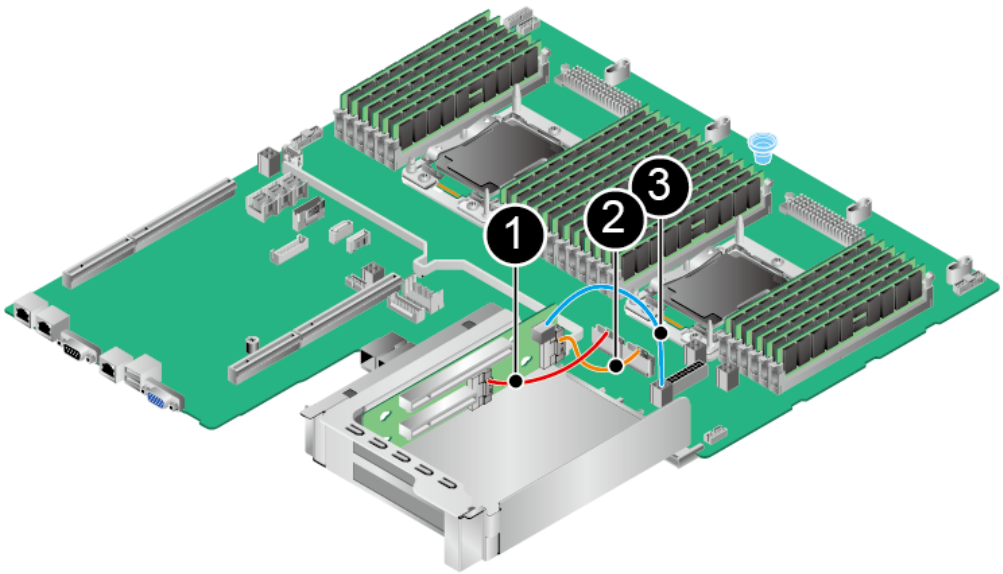

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Table 7-28 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline B of the PCIe riser card to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline A of the PCIe riser card to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the PCIe riser card to the mainboard (J172)

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7.3.11 I/O Module 3 (4 x 2.5" NVMe Drives)

I/O Module 3 Cabling

Figure 7-29 I/O module 3 cabling

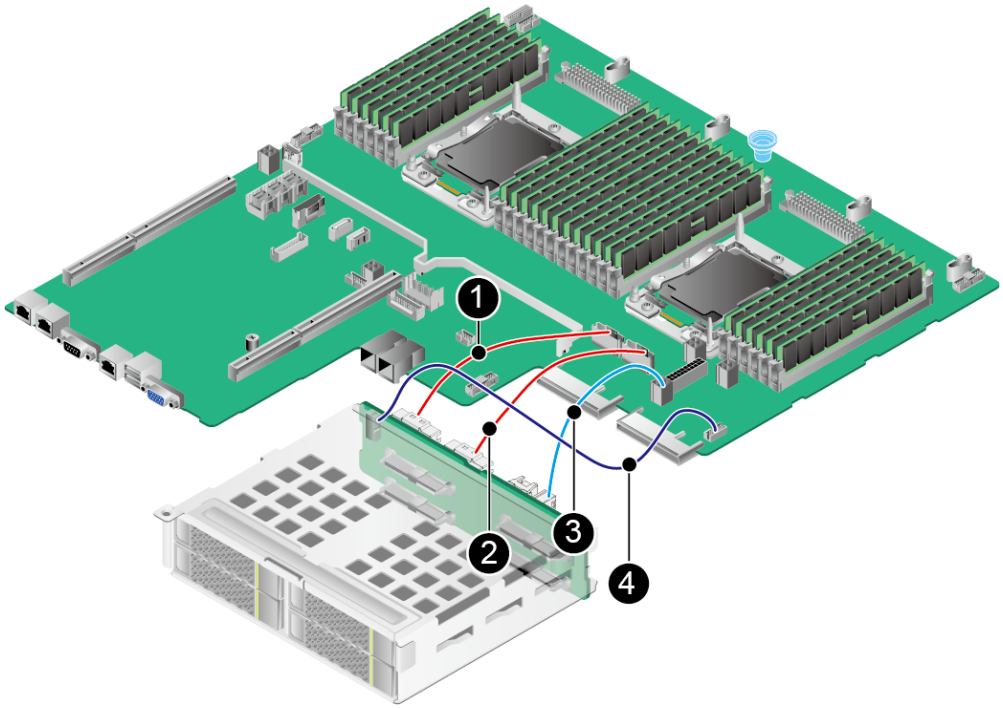

Table 7-29 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline B (J9) of the 4 x 2.5" drive backplane to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline A (J8) of the 4 x 2.5" drive backplane to Slimline A (J140) of the mainboard

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No.	P/N Code	Description
3	04150448-001	Power cable for connecting the 4 x 2.5" drive backplane (J22) to the mainboard (J172)
4	04080602	Low-speed signal cable for connecting the 4 x 2.5" drive backplane (J23) to the mainboard (J164)

7.3.12 I/O Module 3 (4 x 2.5" SAS/SATA Drives)

NOTE

SAS/SATA drives can be installed in I/O module 3 only when an SR760-M (Broadcom SAS3416) or SR760IT-M (Broadcom SAS3416) screw-in RAID controller card is configured.

I/O Module 3 Cabling

Figure 7-30 I/O module 3 cabling

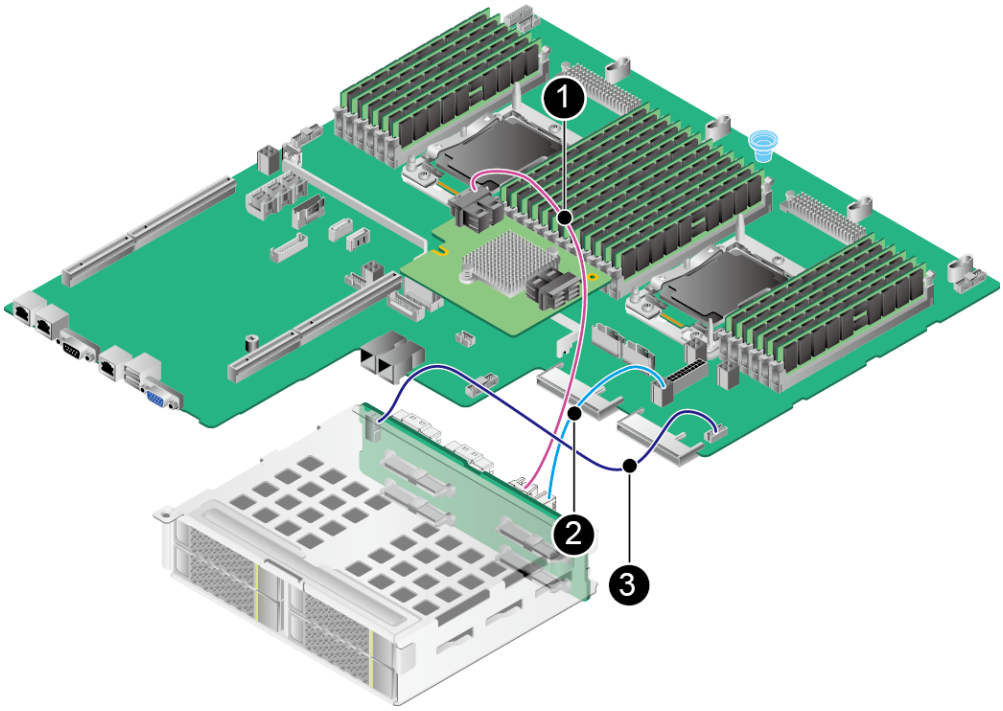

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Table 7-30 I/O module 3 cabling

No.	P/N Code	Description
1	04051059-002 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" drive backplane as a spare part.	SAS cable for connecting the 4 x 2.5" drive backplane (J2) to PORT D of the screw-in RAID controller card
2	04150448-001	Power cable for connecting the 4 x 2.5" drive backplane (J22) to the mainboard (J172)
3	04080602	Low-speed signal cable for connecting the 4 x 2.5" drive backplane (J23) to the mainboard (J164)

7.4 Server with 12 x 3.5" Drives (Expander) 2

7.4.1 Left and Right Mounting Ears

Left and Right Mounting Ear Cabling

Figure 7-31 Left and right mounting ear cabling

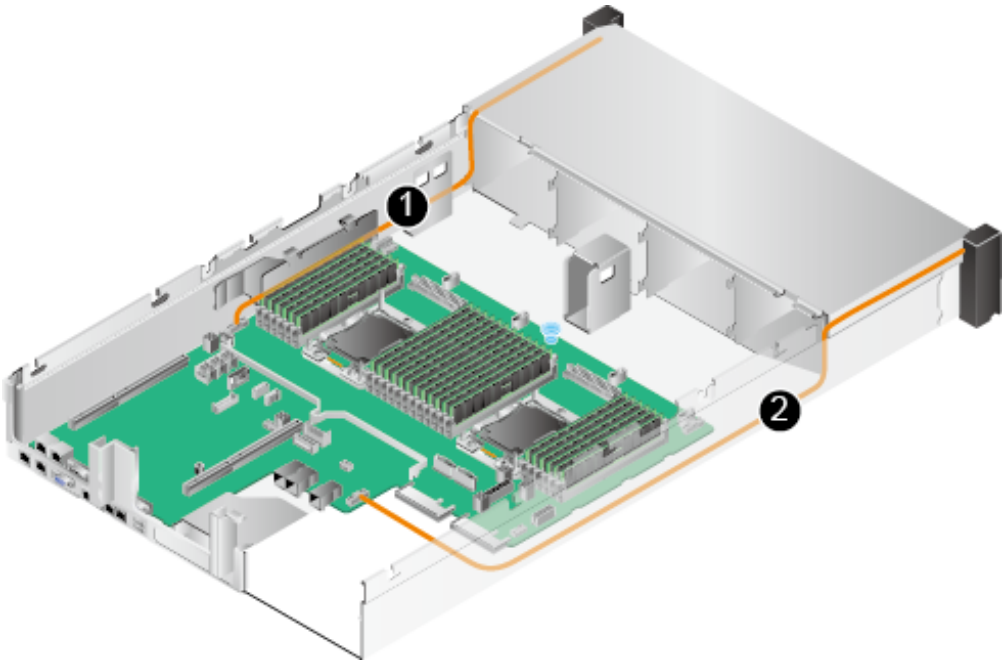

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Table 7-31 Left and right mounting ear cabling

No.	P/N Code	Description
1	04051922	Signal cable for connecting the indicator board of the right mounting ear to the mainboard (J167)
2	04051921	Signal cable for connecting the USB board of the left mounting ear to the mainboard (J161)

7.4.2 NC-SI Cabling

NC-SI Cabling

Figure 7-32 NC-SI cabling

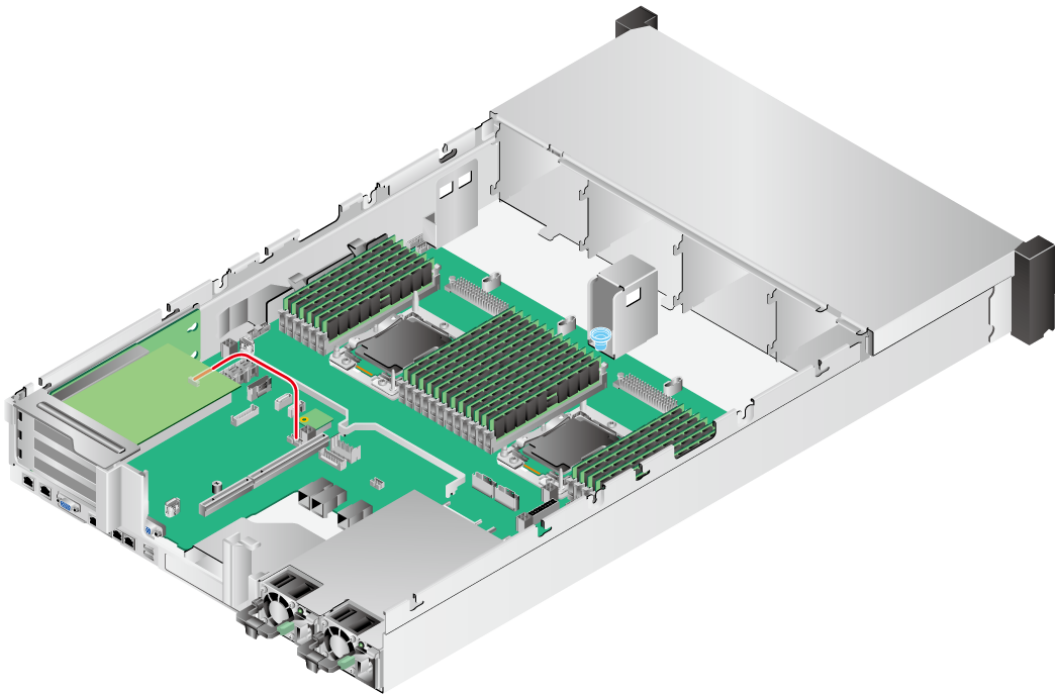

Table 7-32 NC-SI cabling

No.	Part No.	Description
1	04080606 or 04051036	NC-SI cable for connecting the PCIe NIC to the mainboard (J99)

NOTE

This cable is required only when the PCIe NIC supports NC-SI.

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7.4.3 12 x 3.5" Drive EXP Backplane Power and Indicator Signal Cables

12 x 3.5" Drive EXP Backplane Power and Indicator Signal Cabling

Figure 7-33 12 x 3.5" drive EXP backplane power and indicator signal cabling

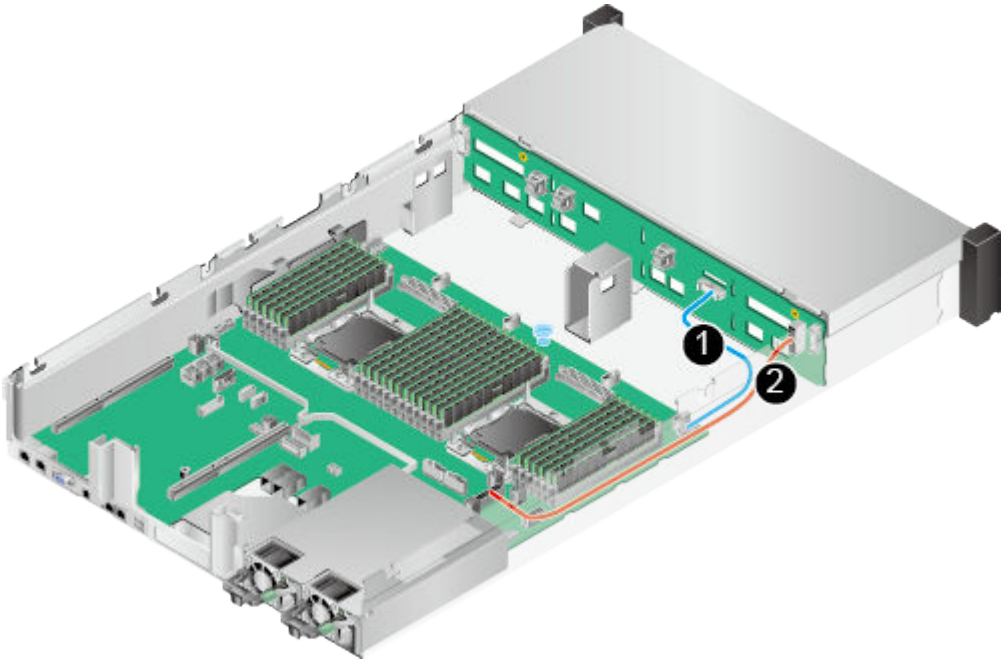

Table 7-33 12 x 3.5" drive EXP backplane power and indicator signal cabling

No.	P/N Code	Description
1	04051923	Indicator signal cable for connecting the 12 x 3.5" drive EXP backplane (J1) to the mainboard (J162)
2	04051989	Power cable for connecting the 12 x 3.5" drive EXP backplane (J24) to the mainboard (J166)

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7.4.4 12 x 3.5" Drive EXP Backplane SAS Signal Cables (Server with 1 x PCIe RAID Controller Card)

12 x 3.5" Drive EXP Backplane SAS Signal Cabling

Figure 7-34 12 x 3.5" drive EXP backplane SAS signal cabling

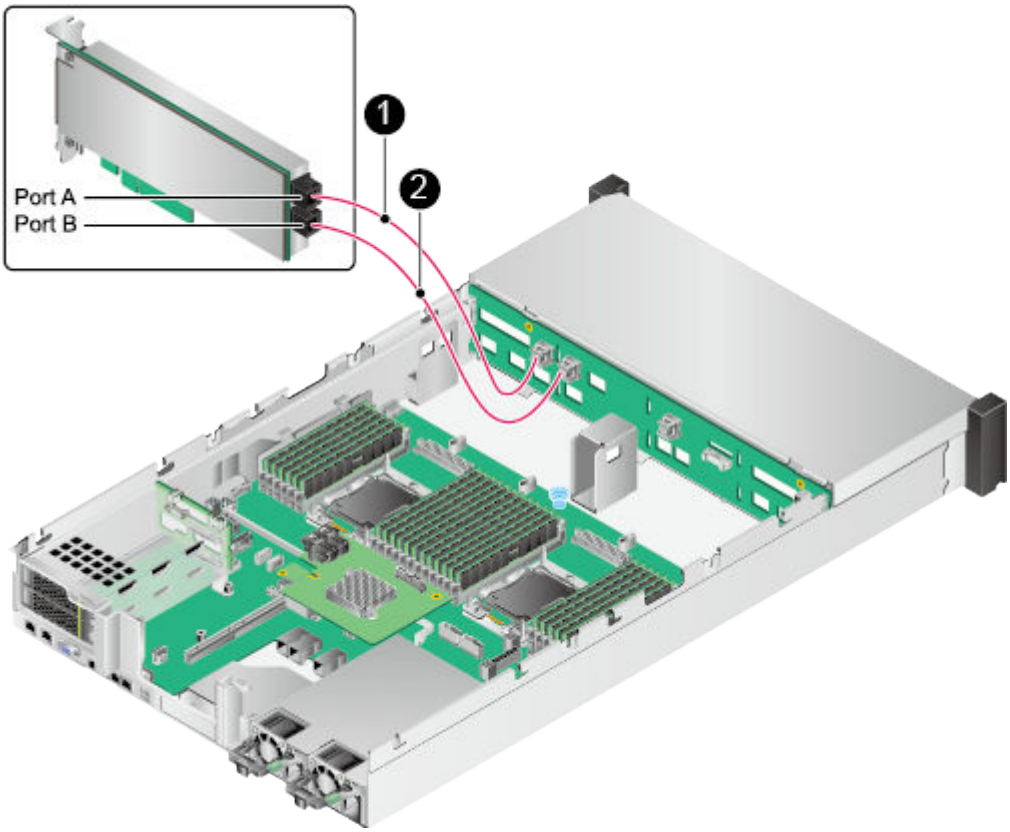

Table 7-34 12 x 3.5" drive EXP backplane SAS signal cabling

No.	P/N Code	Description
1	04051021	SAS cable for connecting PORT A (J28) of the 12 x 3.5" drive EXP backplane to PORT A of the PCIe RAID controller card
2	04051021	SAS cable for connecting PORT B (J29) of the 12 x 3.5" drive EXP backplane to PORT B of the PCIe RAID controller card

NOTE

The PCIe RAID controller card can be installed only in slot 6.

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7.4.5 I/O Module 1 (2 x 3.5" SAS/SATA Drives and 1 x Screw-in RAID Controller Card)

I/O Module 1 Cabling

Figure 7-35 I/O module 1 cabling

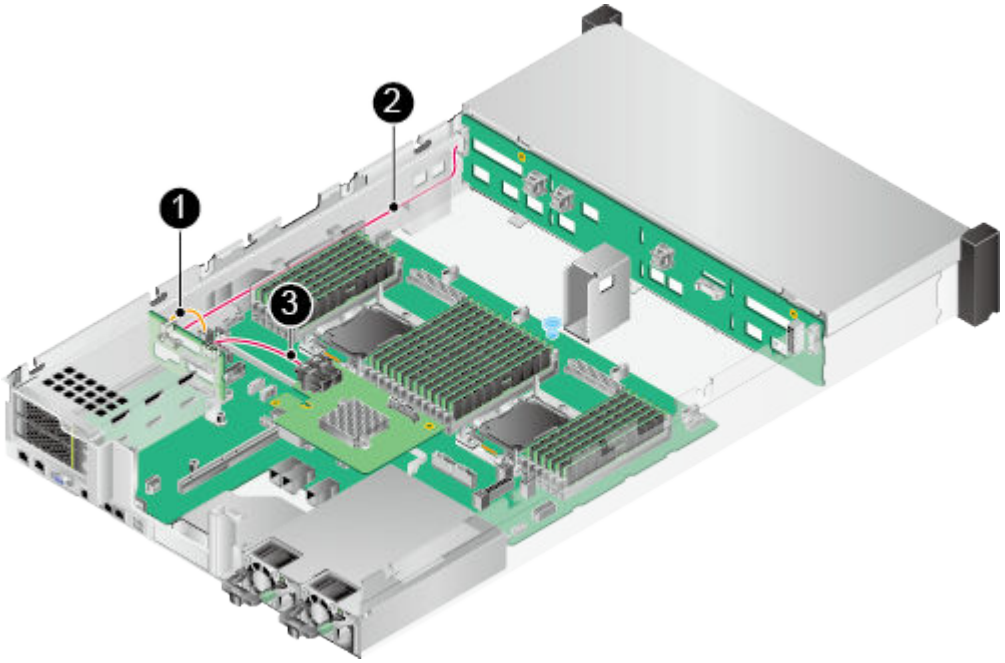

Table 7-35 I/O module 1 cabling

No.	P/N Code	Description
1	04150448-001	Power cable for connecting the 2 x 3.5" drive backplane (J1) to the mainboard (J127)
2	04051053	Indicator signal cable for connecting the 2 x 3.5" drive backplane (J24) to the 12 x 3.5" drive EXP backplane (J32)
3	04051059	SAS cable for connecting the 2 x 3.5" drive backplane (J3) to PORT A of the screw-in RAID controller card

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7.4.6 I/O Module 3 (PCIe Riser Card)

I/O Module 3 Cabling

Figure 7-36 I/O module 3 cabling

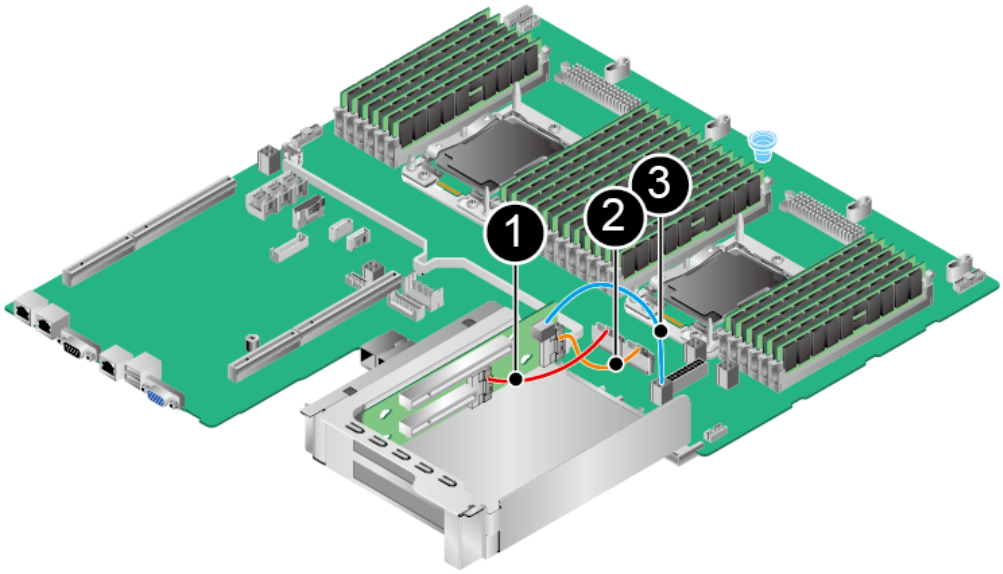

Table 7-36 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline B of the PCIe riser card to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline A of the PCIe riser card to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the PCIe riser card to the mainboard (J172)

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7.4.7 I/O Module 3 (4 x 2.5" NVMe Drives)

I/O Module 3 Cabling

Figure 7-37 I/O module 3 cabling

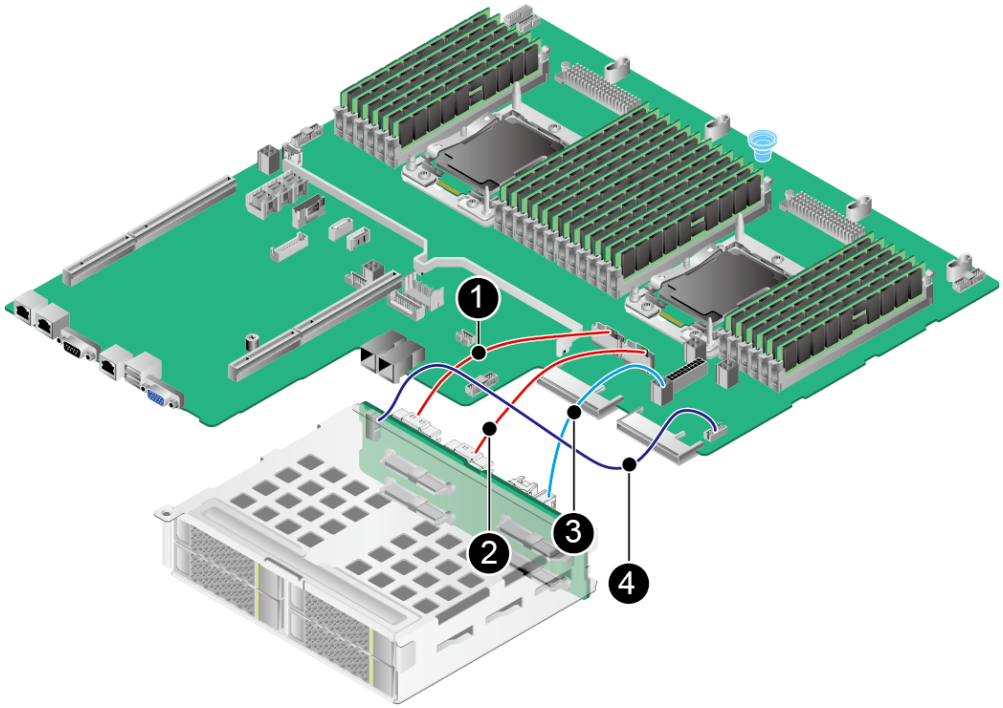

Table 7-37 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline B (J9) of the 4 x 2.5" drive backplane to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline A (J8) of the 4 x 2.5" drive backplane to Slimline A (J140) of the mainboard

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No.	P/N Code	Description
3	04150448-001	Power cable for connecting the 4 x 2.5" drive backplane (J22) to the mainboard (J172)
4	04080602	Low-speed signal cable for connecting the 4 x 2.5" drive backplane (J23) to the mainboard (J164)

7.5 Server with 12 x 3.5" Drives (Expander) 3

7.5.1 Left and Right Mounting Ears

Left and Right Mounting Ear Cabling

Figure 7-38 Left and right mounting ear cabling

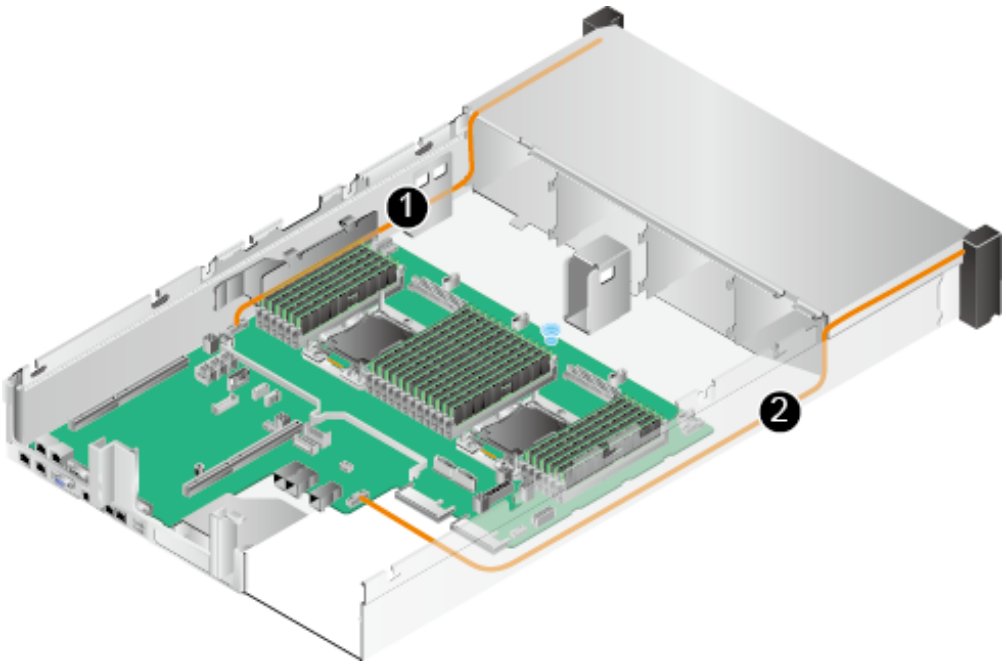

Table 7-38 Left and right mounting ear cabling

No.	P/N Code	Description
1	04051922	Signal cable for connecting the indicator board of the right mounting ear to the mainboard (J167)
2	04051921	Signal cable for connecting the USB board of the left mounting ear to the mainboard (J161)

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7.5.2 NC-SI Cabling

NC-SI Cabling

Figure 7-39 NC-SI cabling

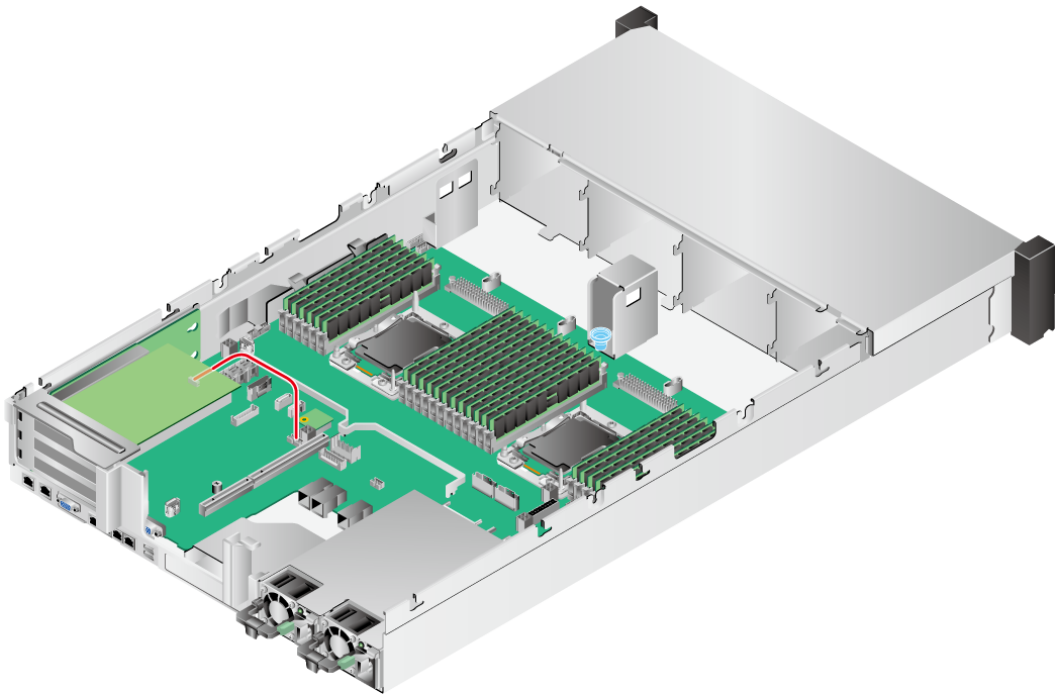

Table 7-39 NC-SI cabling

No.	Part No.	Description
1	04080606 or 04051036	NC-SI cable for connecting the PCIe NIC to the mainboard (J99)

NOTE

This cable is required only when the PCIe NIC supports NC-SI.

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7.5.3 12 x 3.5" Drive EXP Backplane Power and Indicator Signal Cables

12 x 3.5" Drive EXP Backplane Power and Indicator Signal Cabling

Figure 7-40 12 x 3.5" drive EXP backplane power and indicator signal cabling

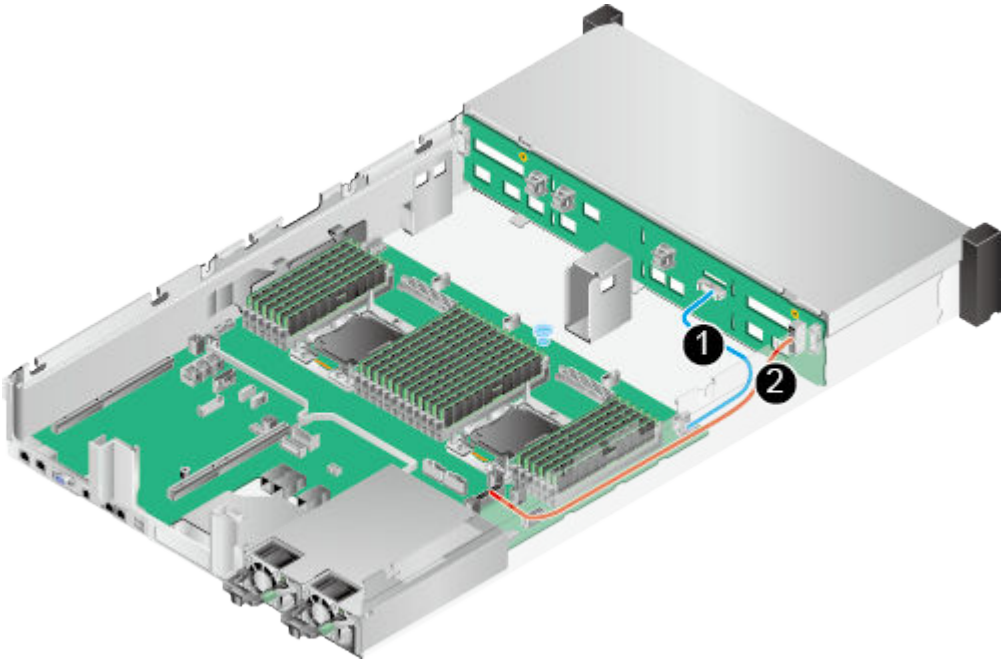

Table 7-40 12 x 3.5" drive EXP backplane power and indicator signal cabling

No.	P/N Code	Description
1	04051923	Indicator signal cable for connecting the 12 x 3.5" drive EXP backplane (J1) to the mainboard (J162)
2	04051989	Power cable for connecting the 12 x 3.5" drive EXP backplane (J24) to the mainboard (J166)

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7.5.4 12 x 3.5" Drive EXP Backplane SAS Signal Cables (Server with a PCIe RAID Controller Card)

12 x 3.5" Drive EXP Backplane SAS Signal Cabling

Figure 7-41 12 x 3.5" drive EXP backplane SAS signal cabling

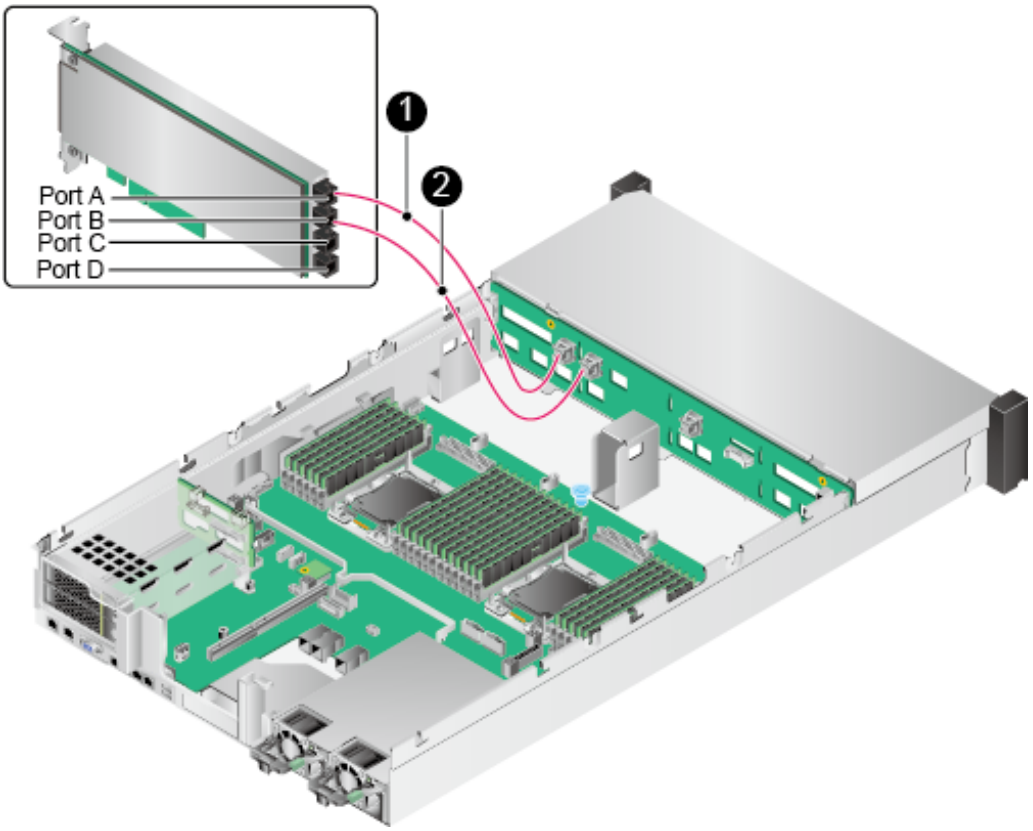

Table 7-41 12 x 3.5" drive EXP backplane SAS signal cabling

No.	P/N Code	Description
1	04051018	SAS cable for connecting PORT A (J28) of the 12 x 3.5" drive EXP backplane to PORT A of the PCIe RAID controller card
2	04051018	SAS cable for connecting PORT B (J29) of the 12 x 3.5" drive EXP backplane to PORT B of the PCIe RAID controller card

NOTE

The PCIe RAID controller card can be installed only in slot 6.

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7.5.5 4 x 3.5" Built-in-Drive Backplane Cabling (Server with a PCIe RAID Controller Card)

4 x 3.5" Built-in-Drive Backplane Cabling

Figure 7-42 Built-in-drive backplane cabling

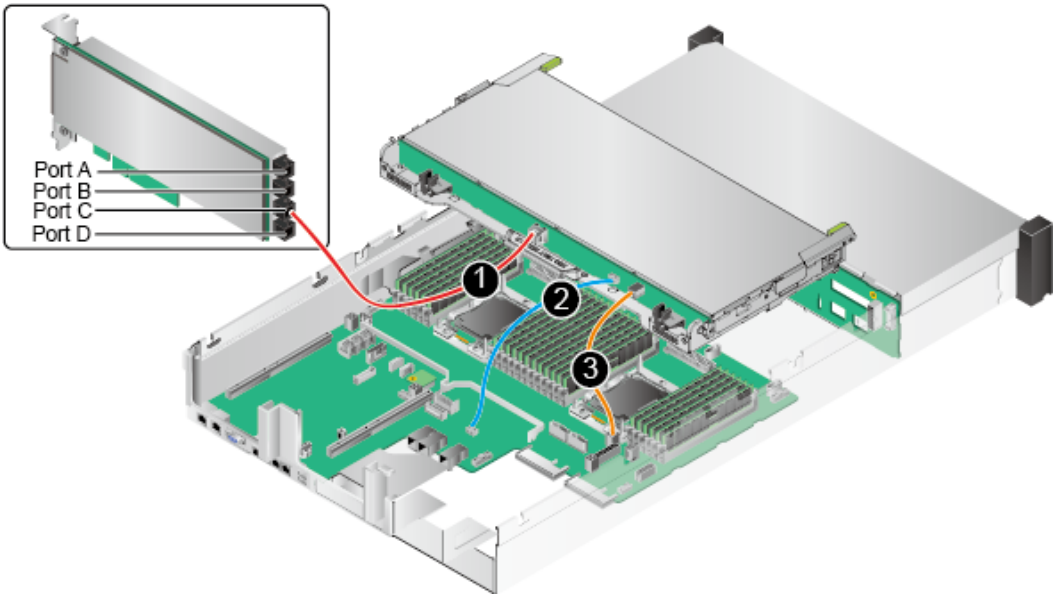

Table 7-42 4 x 3.5" built-in-drive backplane cabling

No.	P/N Code	Description
1	04051059	SAS cable for connecting the 4 x 3.5" built-in-drive backplane (J3) to PORT C of the PCIe RAID controller card
2	04051948 **NOTE** The cable is not an independent spare part. It is packed with the built-in-drive backplane as a spare part.	Indicator signal cable for connecting the 4 x 3.5" built-in-drive backplane (J1) to the mainboard (J122)
3	04150448-001	Power cable for connecting the 4 x 3.5" built-in-drive backplane (J2) to the mainboard (J171)

NOTE

The PCIe RAID controller card can be installed only in slot 6.

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7.5.6 I/O Module 1 (2 x 3.5" SAS/SATA Drives)

I/O Module 1 Cabling

Figure 7-43 I/O module 1 cabling

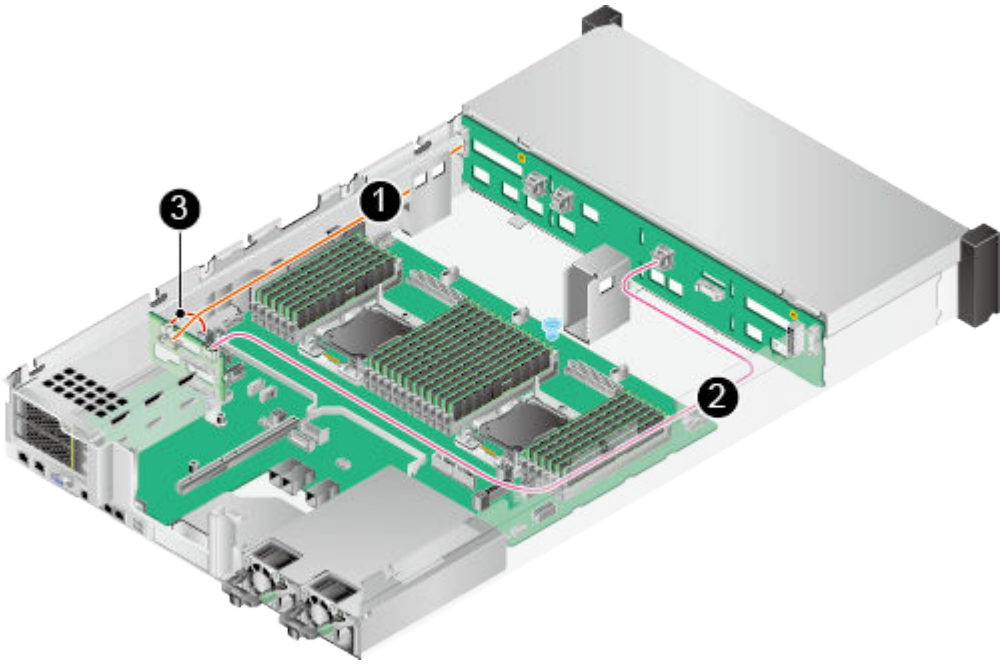

Table 7-43 I/O module 1 cabling

No.	P/N Code	Description
1	04051053	Indicator signal cable for connecting the 2 x 3.5" drive backplane (J24) to the 12 x 3.5" drive EXP backplane (J32)
2	04051934 **NOTE** The cable is not an independent spare part. It is packed with the 2 x 3.5" drive backplane as a spare part.	SAS cable for connecting the 2 x 3.5" drive backplane (J3) to the 12 x 3.5" drive EXP backplane (J31) **NOTE** The Y-shaped end of the cable is connected to the 2 x 3.5" drive backplane. Connector HDD A corresponds to the backplane of I/O module 1 and connector HDD B corresponds to the backplane of I/O module 2. Use cable connectors based on actual situation.
3	04150448-001	Power cable for connecting the 2 x 3.5" drive backplane (J1) to the mainboard (J127)

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7.5.7 I/O Module 3 (PCIe Riser Card)

I/O Module 3 Cabling

Figure 7-44 I/O module 3 cabling

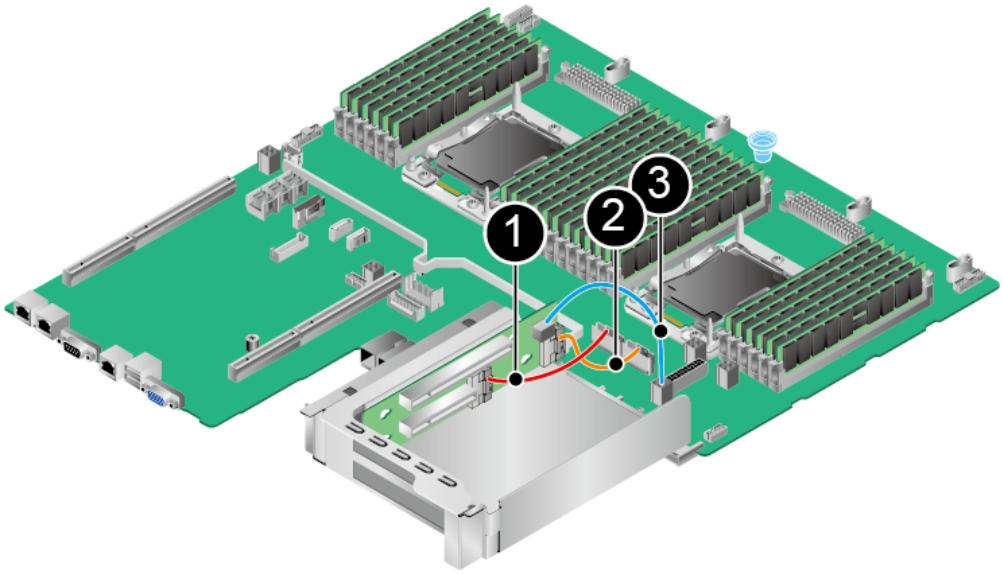

Table 7-44 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline B of the PCIe riser card to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline A of the PCIe riser card to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the PCIe riser card to the mainboard (J172)

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7.5.8 I/O Module 3 (4 x 2.5" NVMe Drives)

I/O Module 3 Cabling

Figure 7-45 I/O module 3 cabling

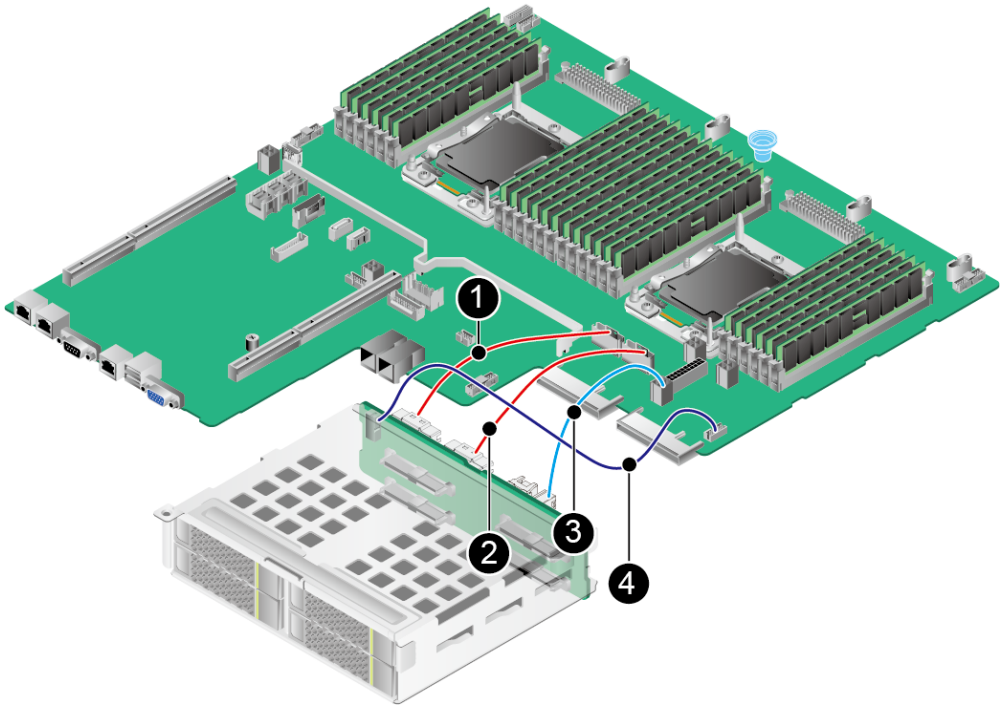

Table 7-45 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline B (J9) of the 4 x 2.5" drive backplane to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline A (J8) of the 4 x 2.5" drive backplane to Slimline A (J140) of the mainboard

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No.	P/N Code	Description
3	04150448-001	Power cable for connecting the 4 x 2.5" drive backplane (J22) to the mainboard (J172)
4	04080602	Low-speed signal cable for connecting the 4 x 2.5" drive backplane (J23) to the mainboard (J164)

7.5.9 I/O Module 3 (4 x 2.5" SAS/SATA Drives)

I/O Module 3 Cabling

Figure 7-46 I/O module 3 cabling

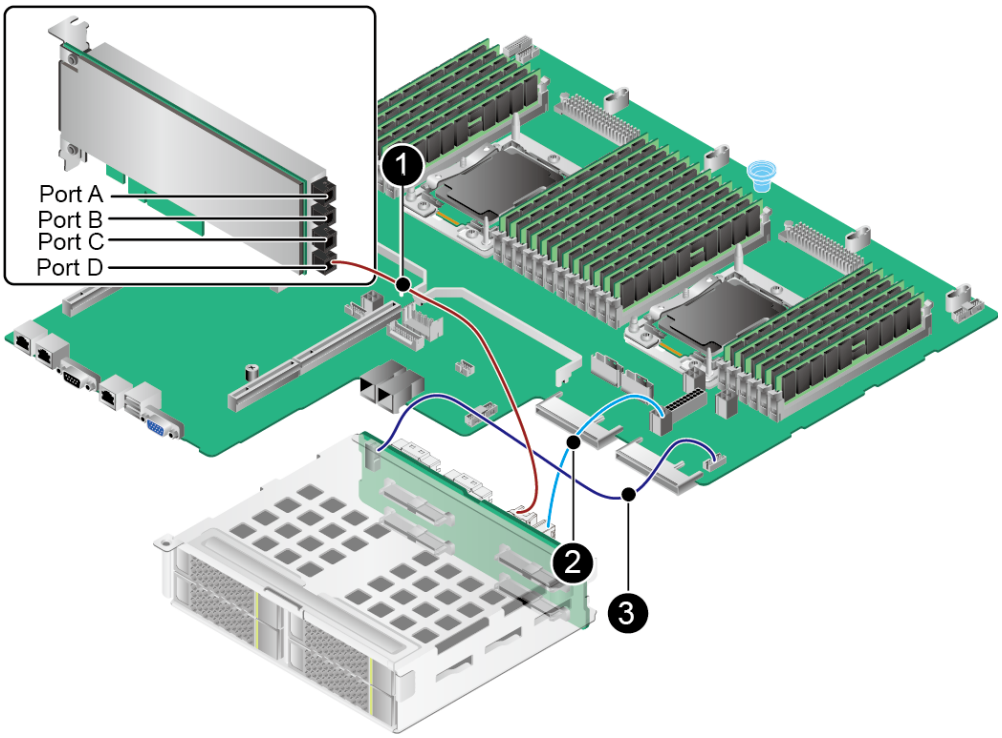

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Table 7-46 I/O module 3 cabling

No.	P/N Code	Description
1	04051059-002 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" drive backplane as a spare part.	SAS cable for connecting the 4 x 2.5" drive backplane (J2) to PORT D of the PCIe RAID controller card
2	04150448-001	Power cable for connecting the 4 x 2.5" drive backplane (J22) to the mainboard (J172)
3	04080602	Low-speed signal cable for connecting the 4 x 2.5" drive backplane (J23) to the mainboard (J164)

NOTE

The PCIe RAID controller card can be installed only in slot 6.

7.6 Server with 12 x 3.5" Drives (Expander) 4

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7.6.1 Left and Right Mounting Ears

Left and Right Mounting Ear Cabling

Figure 7-47 Left and right mounting ear cabling

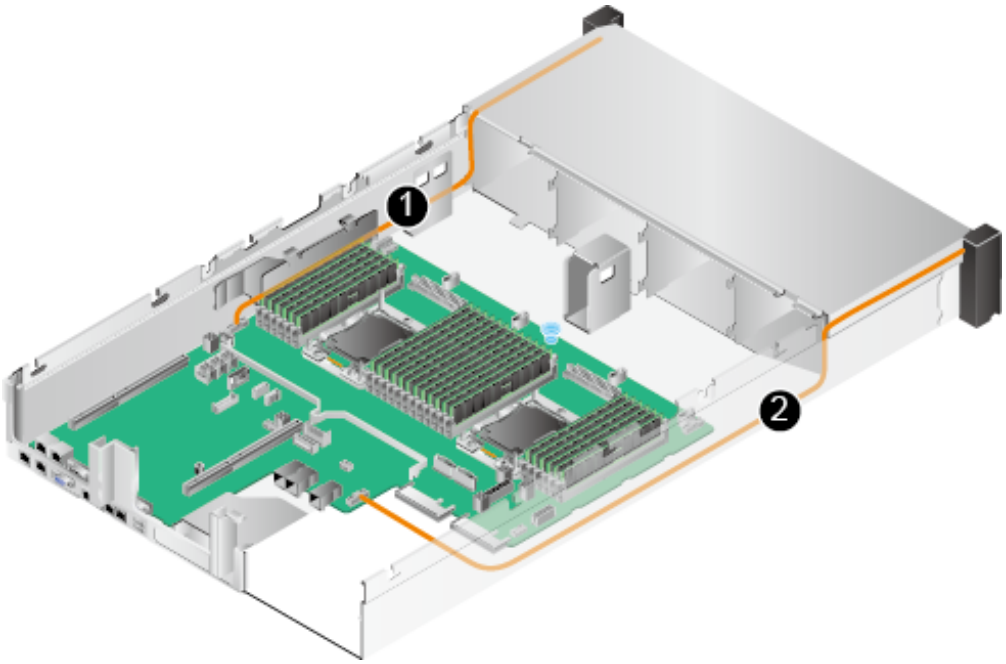

Table 7-47 Left and right mounting ear cabling

No.	P/N Code	Description
1	04051922	Signal cable for connecting the indicator board of the right mounting ear to the mainboard (J167)
2	04051921	Signal cable for connecting the USB board of the left mounting ear to the mainboard (J161)

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7.6.2 NC-SI Cabling

NC-SI Cabling

Figure 7-48 NC-SI cabling

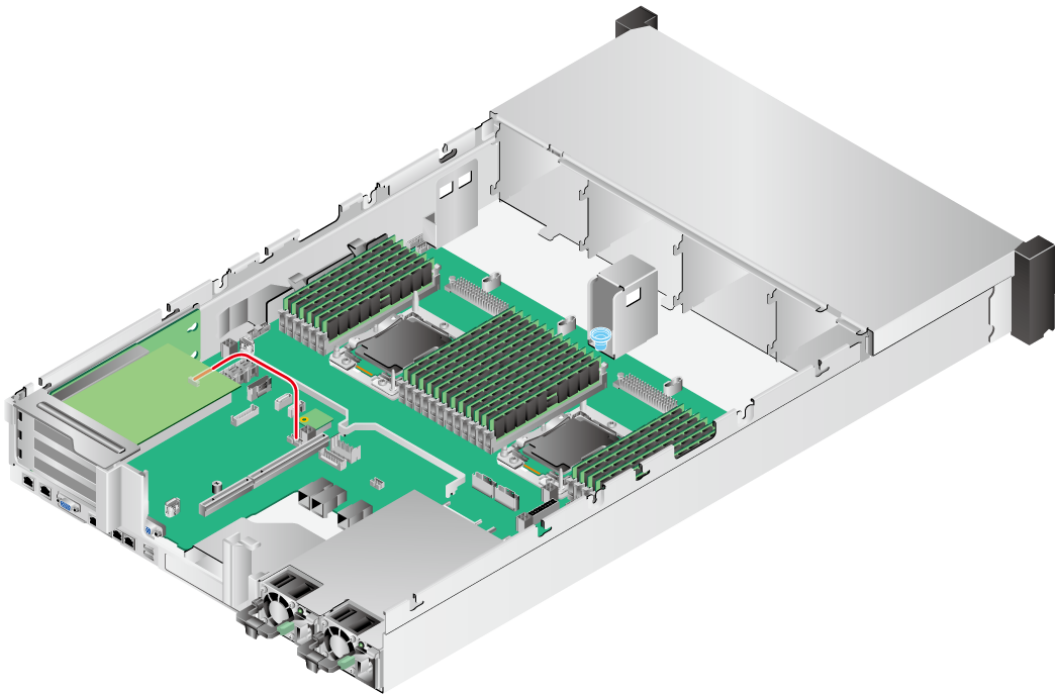

Table 7-48 NC-SI cabling

No.	Part No.	Description
1	04080606 or 04051036	NC-SI cable for connecting the PCIe NIC to the mainboard (J99)

NOTE

This cable is required only when the PCIe NIC supports NC-SI.

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7.6.3 12 x 3.5" Drive EXP Backplane Power and Indicator Signal Cables

12 x 3.5" Drive EXP Backplane Power and Indicator Signal Cabling

Figure 7-49 12 x 3.5" drive EXP backplane power and indicator signal cabling

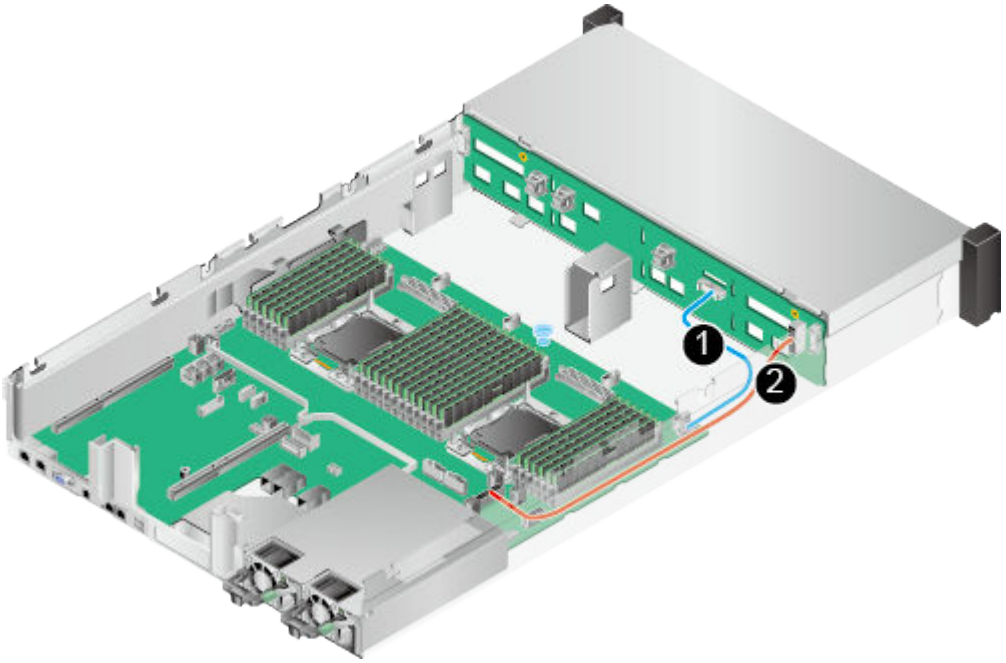

Table 7-49 12 x 3.5" drive EXP backplane power and indicator signal cabling

No.	P/N Code	Description
1	04051923	Indicator signal cable for connecting the 12 x 3.5" drive EXP backplane (J1) to the mainboard (J162)
2	04051989	Power cable for connecting the 12 x 3.5" drive EXP backplane (J24) to the mainboard (J166)

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7.6.4 12 x 3.5" Drive EXP Backplane SAS Signal Cables (Server with a PCIe RAID Controller Card)

12 x 3.5" Drive EXP Backplane SAS Signal Cabling

Figure 7-50 12 x 3.5" drive EXP backplane SAS signal cabling

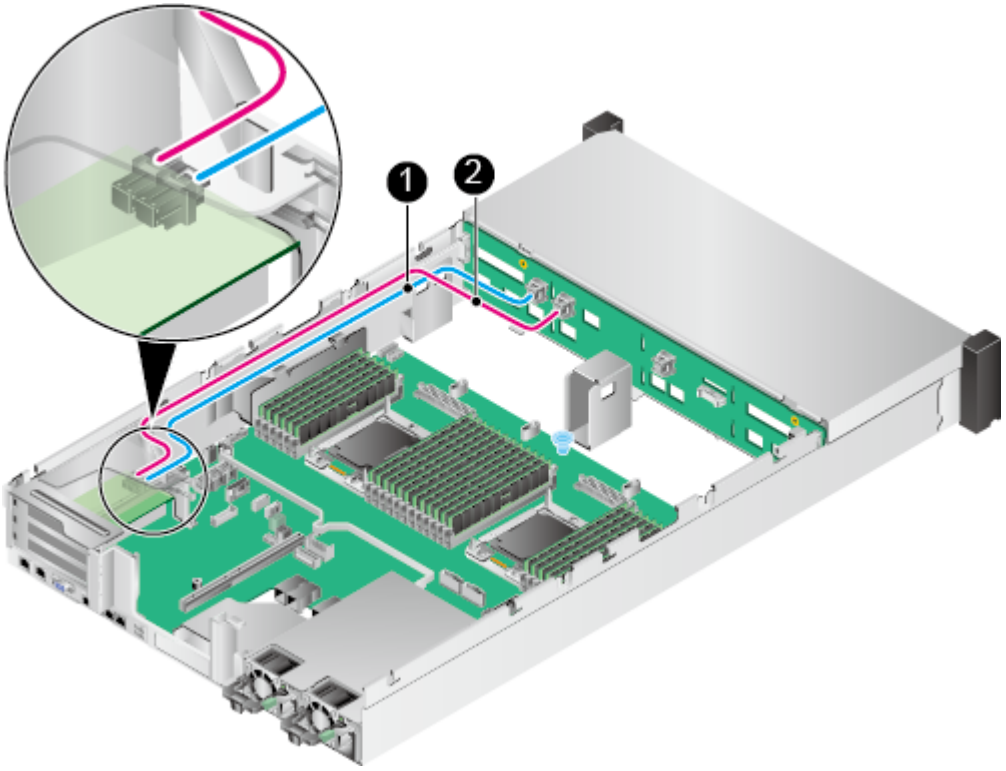

Table 7-50 12 x 3.5" drive EXP backplane SAS signal cabling

No.	P/N Code	Description
1	04051018	SAS cable for connecting PORT A (J28) of the 12 x 3.5" drive EXP backplane to C0 of the PCIe RAID controller card
2	04051018	SAS cable for connecting PORT B (J29) of the 12 x 3.5" drive EXP backplane to C1 of the PCIe RAID controller card

NOTE

- The PCIe RAID controller card can be installed only in slot 3.
- The port numbers vary with the PCIe RAID controller cards. The port number of the PCIe RAID controller card connected to front-drive backplane PORT A (J28) may be C0, PORT A, 0, or CN0, and the port number of the PCIe RAID controller card connected to front-drive backplane PORT B (J29) may be C1, PORT B, 1, or CN1.

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7.6.5 I/O Module 1 (2 x 2.5" SAS/SATA Drives)

I/O Module 1 Cabling

Figure 7-51 I/O module 1 cabling

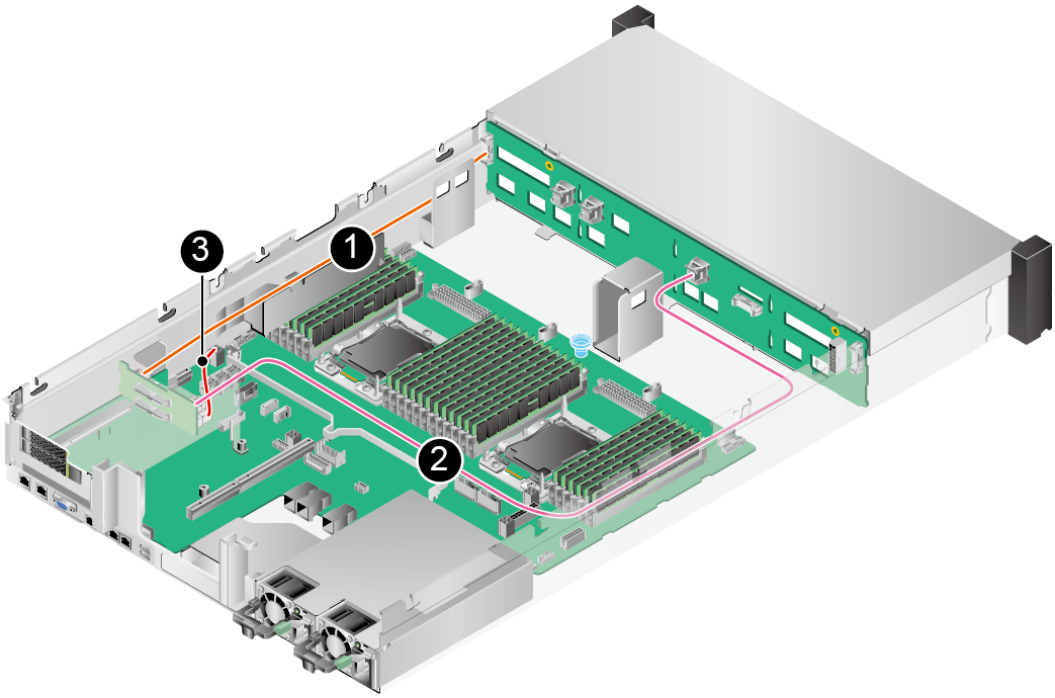

Table 7-51 I/O module 1 cabling

No.	P/N Code	Description
1	04051053	Indicator signal cable for connecting the 2 x 2.5" drive backplane (J24) to the 12 x 3.5" drive EXP backplane (J32)
2	04051060	SAS cable for connecting the 2 x 2.5" drive backplane (J3) to the 12 x 3.5" drive EXP backplane (J31) **NOTE** The Y-shaped end of the cable is connected to the 2 x 2.5" drive backplane. Connector HDD A corresponds to the backplane of I/O module 1 and connector HDD B corresponds to the backplane of I/O module 2. Use cable connectors based on actual situation.
3	04150448-001	Power cable for connecting the 2 x 2.5" drive backplane (J1) to the mainboard (J127)

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7.6.6 I/O Module 1 (2 x 2.5" SAS/SATA Drives) and I/O Module 2 (2 x 3.5" SAS/SATA Drives)

I/O Module 1 and I/O Module 2 Cabling

Figure 7-52 I/O modules 1 and 2 cabling

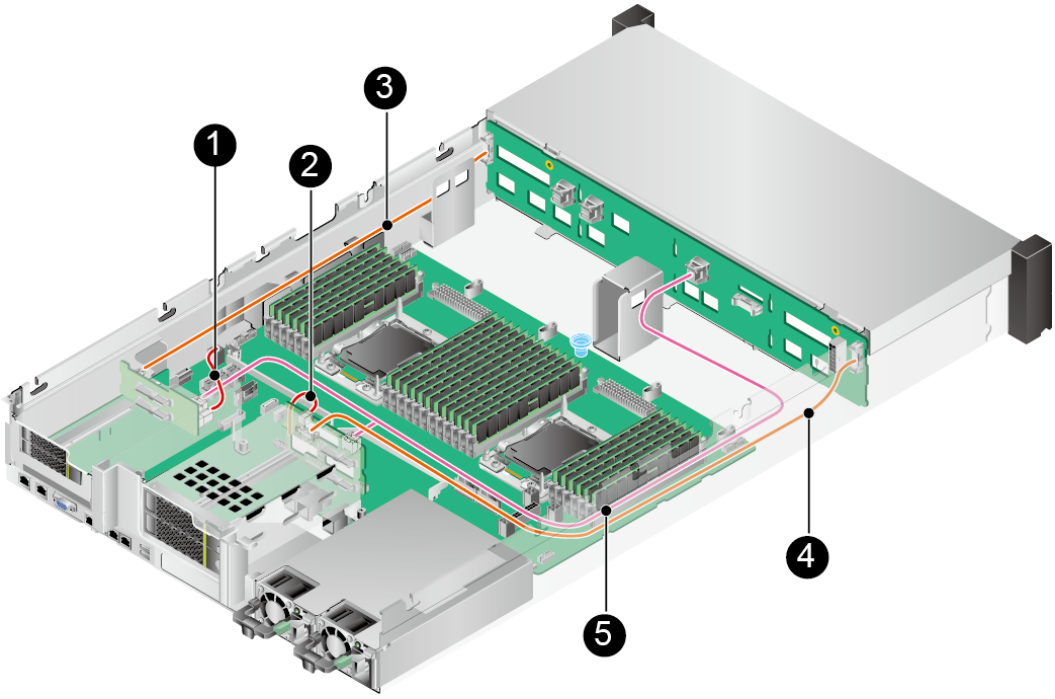

Table 7-52 I/O modules 1 and 2 cabling

No.	P/N Code	Description
1	04150448-001	Power cable for connecting the 2 x 2.5" drive backplane (J1) to the mainboard (J127)
2	04150448-001	Power cable for connecting the 2 x 3.5" drive backplane (J1) to the mainboard (J126)
3	04051053	Indicator signal cable for connecting the 2 x 2.5" drive backplane (J24) to the 12 x 3.5" drive EXP backplane (J32)
4	04051053	Indicator signal cable for connecting the 2 x 3.5" drive backplane (J24) to the 12 x 3.5" drive EXP backplane (J35)

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No.	P/N Code	Description
5	04051060	SAS cable for connecting the 2 x 2.5" drive backplane (J3) and 2 x 3.5" drive backplane (J3) to the 12 x 3.5" drive EXP backplane (J31) **NOTE** The Y-shaped end of the cable is connected to the 2 x 2.5" drive and 2 x 3.5" drive backplanes. Connector HDD A corresponds to the backplane of I/O module 1 and connector HDD B corresponds to the backplane of I/O module 2. Use cable connectors based on actual situation.

7.6.7 I/O Module 3 (PCIe Riser Card)

I/O Module 3 Cabling

Figure 7-53 I/O module 3 cabling

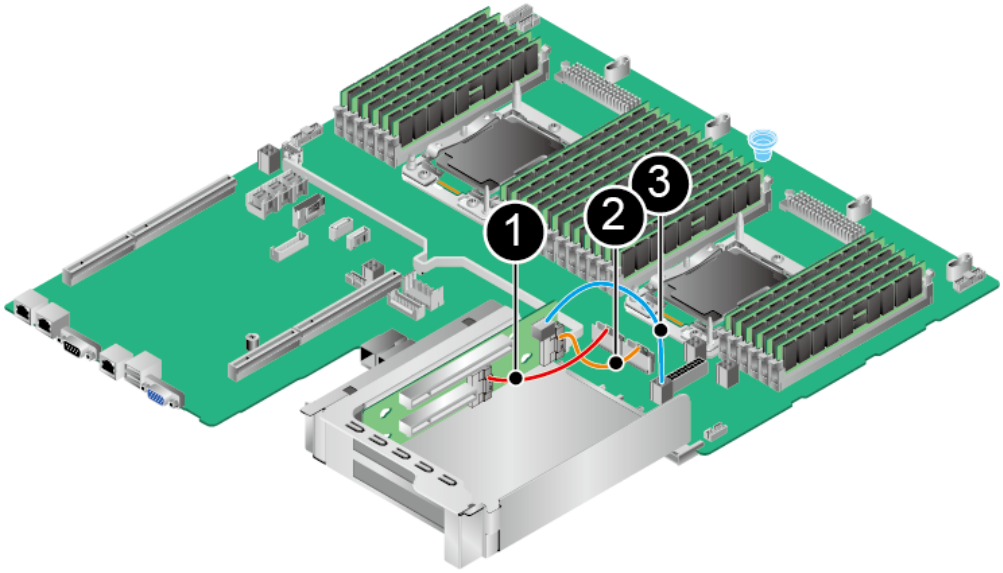

Table 7-53 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline B of the PCIe riser card to Slimline B (J139) of the mainboard

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No.	P/N Code	Description
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline A of the PCIe riser card to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the PCIe riser card to the mainboard (J172)

7.6.8 I/O Module 3 (4 x 2.5" NVMe Drives)

I/O Module 3 Cabling

Figure 7-54 I/O module 3 cabling

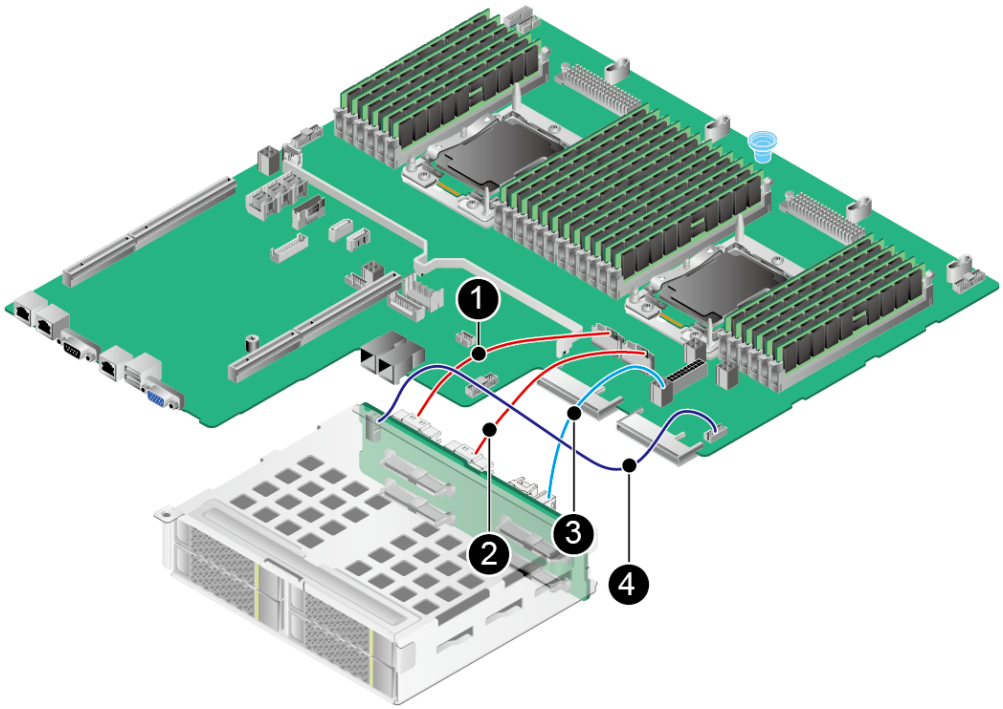

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Table 7-54 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline B (J9) of the 4 x 2.5" drive backplane to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline A (J8) of the 4 x 2.5" drive backplane to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the 4 x 2.5" drive backplane (J22) to the mainboard (J172)
4	04080602	Low-speed signal cable for connecting the 4 x 2.5" drive backplane (J23) to the mainboard (J164)

7.7 Server with 12 x 3.5" Drives (Pass-through) 1

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7.7.1 Left and Right Mounting Ears

Left and Right Mounting Ear Cabling

Figure 7-55 Left and right mounting ear cabling

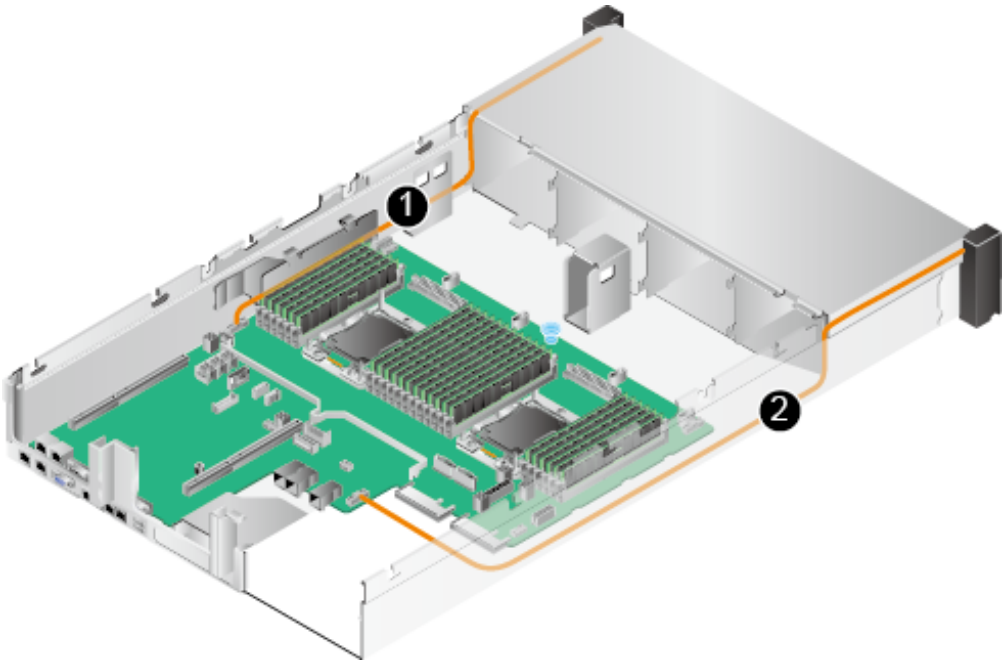

Table 7-55 Left and right mounting ear cabling

No.	P/N Code	Description
1	04051922	Signal cable for connecting the indicator board of the right mounting ear to the mainboard (J167)
2	04051921	Signal cable for connecting the USB board of the left mounting ear to the mainboard (J161)

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7.7.2 NC-SI Cabling

NC-SI Cabling

Figure 7-56 NC-SI cabling

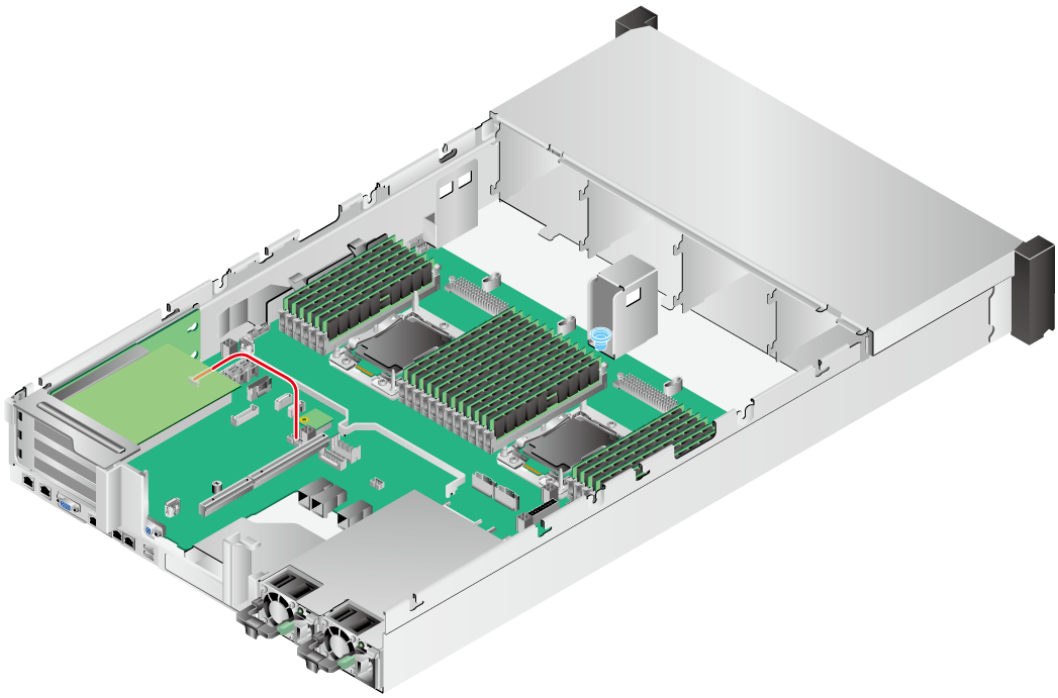

Table 7-56 NC-SI cabling

No.	Part No.	Description
1	04080606 or 04051036	NC-SI cable for connecting the PCIe NIC to the mainboard (J99)

NOTE

This cable is required only when the PCIe NIC supports NC-SI.

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7.7.3 12 x 3.5" Drive Pass-through Backplane Power and Indicator Signal Cables

12 x 3.5" Drive Pass-through Backplane Power and Indicator Signal Cabling

Figure 7-57 12 x 3.5" drive pass-through backplane power and indicator signal cabling

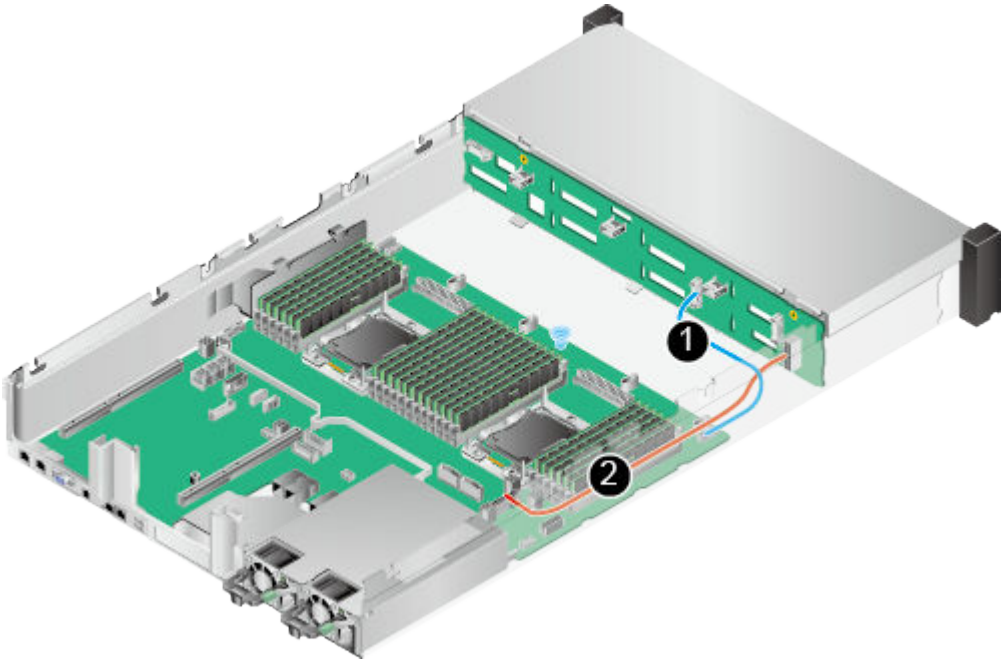

Table 7-57 12 x 3.5" drive pass-through backplane power and indicator signal cabling

No.	P/N Code	Description
1	04051923	Indicator signal cable for connecting the 12 x 3.5" drive pass-through backplane (J1) to the mainboard (J162)
2	04051989	Power cable for connecting the 12 x 3.5" drive pass-through backplane (J24) to the mainboard (J166)

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7.7.4 12 x 3.5" Drive Pass-through Backplane SAS Signal Cables (Server with a Screw-in RAID Controller Card)

12 x 3.5" Drive Pass-through Backplane SAS Signal Cabling

Figure 7-58 12 x 3.5" drive pass-through backplane SAS signal cabling

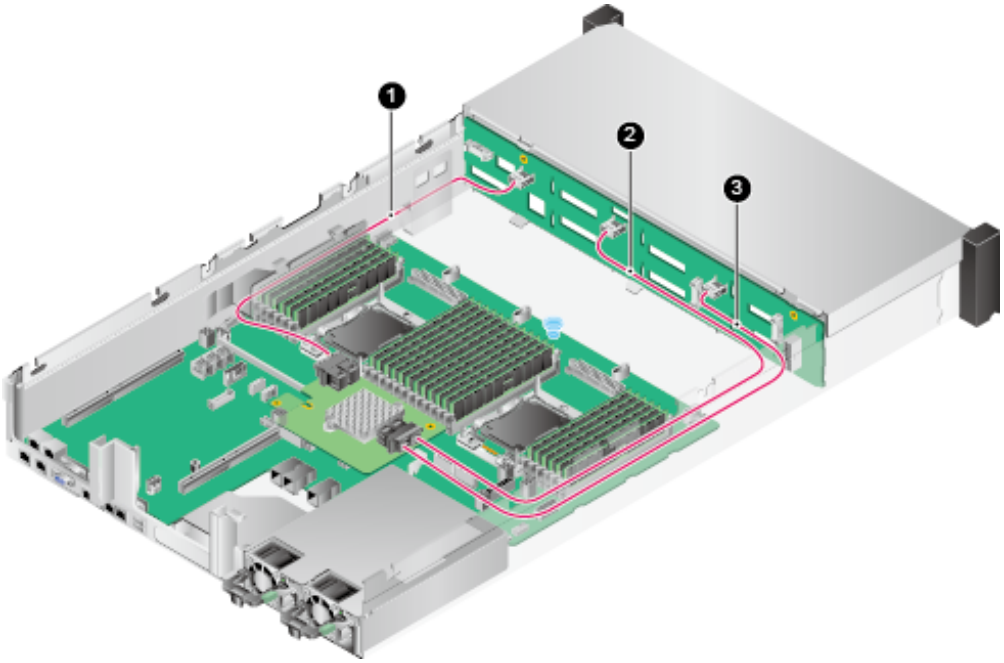

Table 7-58 12 x 3.5" drive pass-through backplane SAS signal cabling

No.	P/N Code	Description
1	04051078	SAS cable for connecting PORT C (J36) of the 12 x 3.5" drive pass-through backplane to PORT C of the screw-in RAID controller card
2	04051078	SAS cable for connecting PORT B (J29) of the 12 x 3.5" drive pass-through backplane to PORT B of the screw-in RAID controller card
3	04051078	SAS cable for connecting PORT A (J28) of the 12 x 3.5" drive pass-through backplane to PORT A of the screw-in RAID controller card

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7.7.5 I/O Module 1 (2 x 3.5" SAS/SATA Drives)

I/O Module 1 Cabling

Figure 7-59 I/O Module 1 Cabling

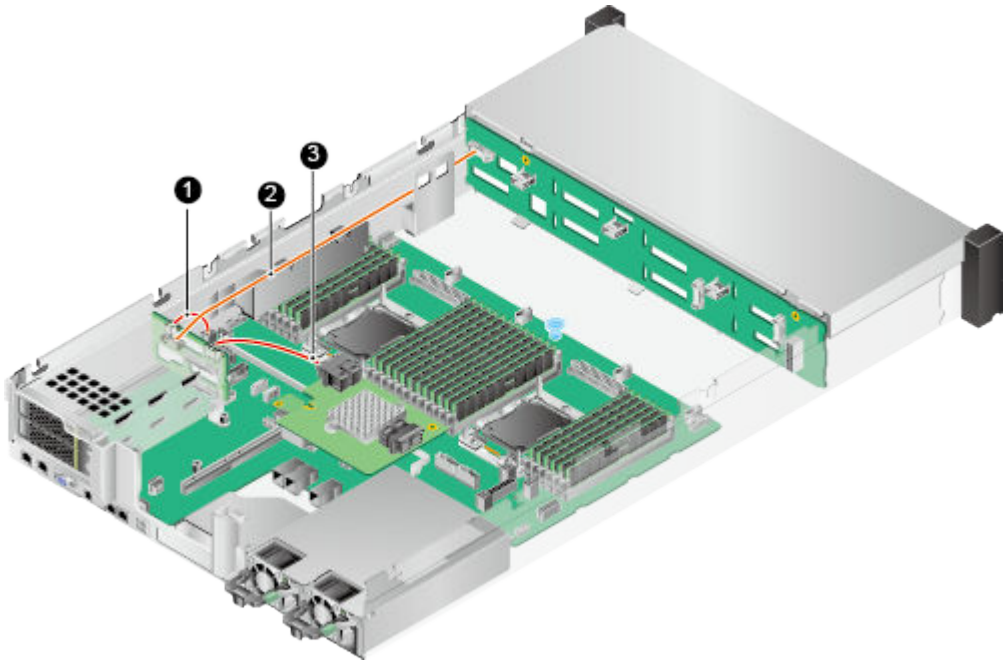

Table 7-59 I/O module 1 cabling

No.	P/N Code	Description
1	04150448-001	Power cable for connecting the 2 x 3.5" drive backplane (J1) to the mainboard (J127)
2	04051053	Indicator signal cable for connecting the 2 x 3.5" drive backplane (J24) to the 12 x 3.5" drive pass-through backplane (J30)
3	04051059	SAS cable for connecting the 2 x 3.5" drive backplane (J3) to PORT D of the screw-in RAID controller card

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7.7.6 I/O Module 1 (2 x 3.5" SAS/SATA Drives) and I/O Module 2 (2 x 3.5" SAS/SATA Drives)

I/O Module 1 and I/O Module 2 Cabling

Figure 7-60 I/O module 1 and I/O module 2 cabling

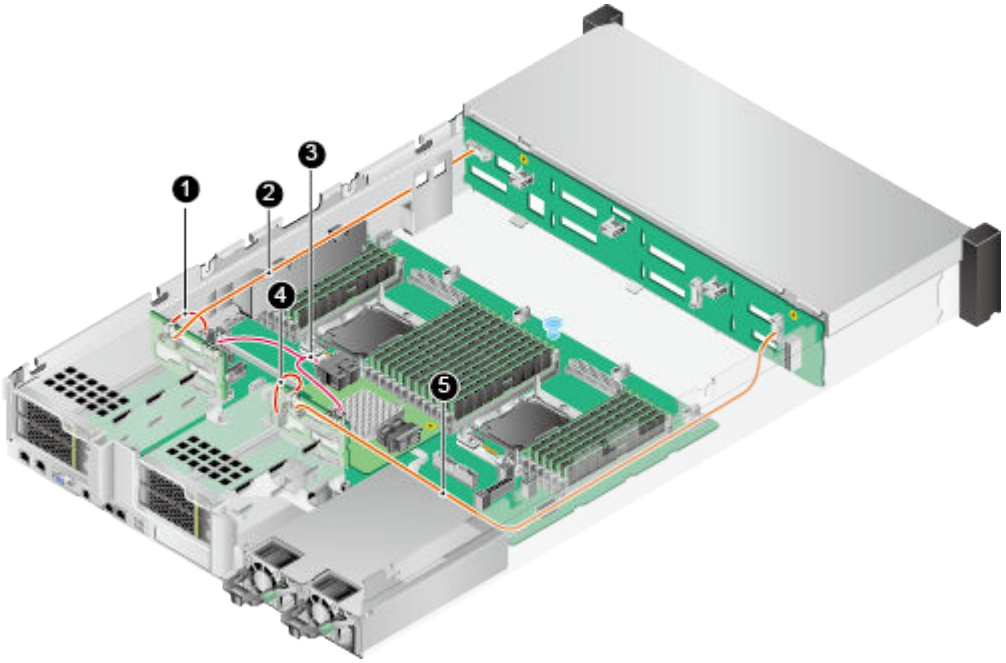

Table 7-60 I/O module 1 and I/O module 2 cabling

No.	P/N Code	Description
1	04150448-001	Power cable for connecting the 2 x 3.5" drive backplane (J1) to the mainboard (J127)
2	04051053	Indicator signal cable for connecting the 2 x 3.5" drive backplane (J24) to the 12 x 3.5" drive pass-through backplane (J30)
3	04051933	SAS cable for connecting the 2 x 3.5" drive backplane (J3) to PORT D of the screw-in RAID controller card **NOTE** The Y-shaped end of the cable is connected to the 2 x 3.5" drive backplane. Connector HDD A corresponds to the backplane of I/O module 1 and connector HDD B corresponds to the backplane of I/O module 2. Use cable connectors based on actual situation.
4	04150448-001	Power cable for connecting the 2 x 3.5" drive backplane (J1) to the mainboard

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No.	P/N Code	Description
5	04051053	Indicator signal cable for connecting the 2 x 3.5" drive backplane (J24) to the 12 x 3.5" drive pass-through backplane (J31)

7.7.7 I/O Module 3 (PCIe Riser Card)

I/O Module 3 Cabling

Figure 7-61 I/O module 3 cabling

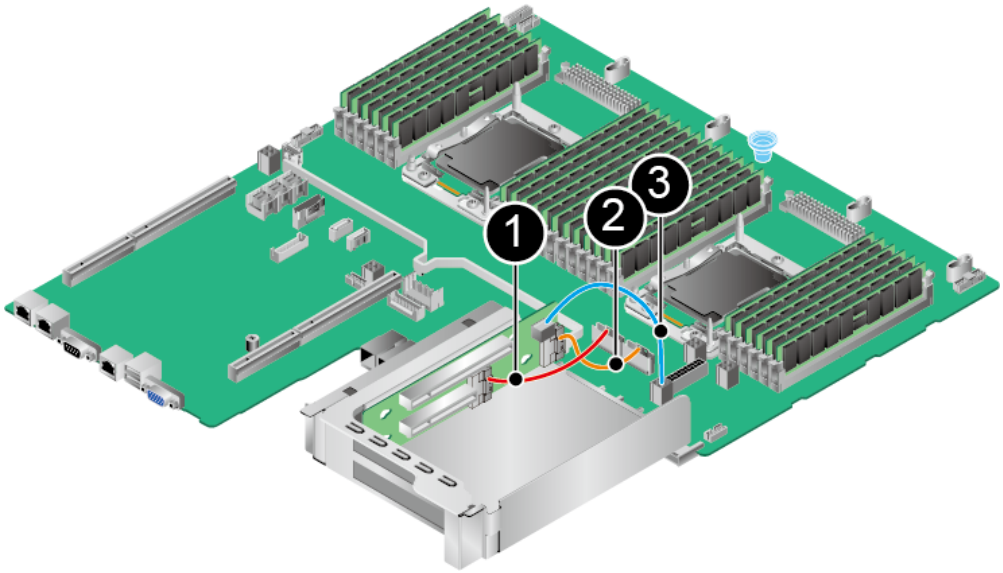

Table 7-61 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline B of the PCIe riser card to Slimline B (J139) of the mainboard

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No.	P/N Code	Description
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline A of the PCIe riser card to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the PCIe riser card to the mainboard (J172)

7.7.8 I/O Module 3 (4 x 2.5" NVMe Drives)

I/O Module 3 Cabling

Figure 7-62 I/O module 3 cabling

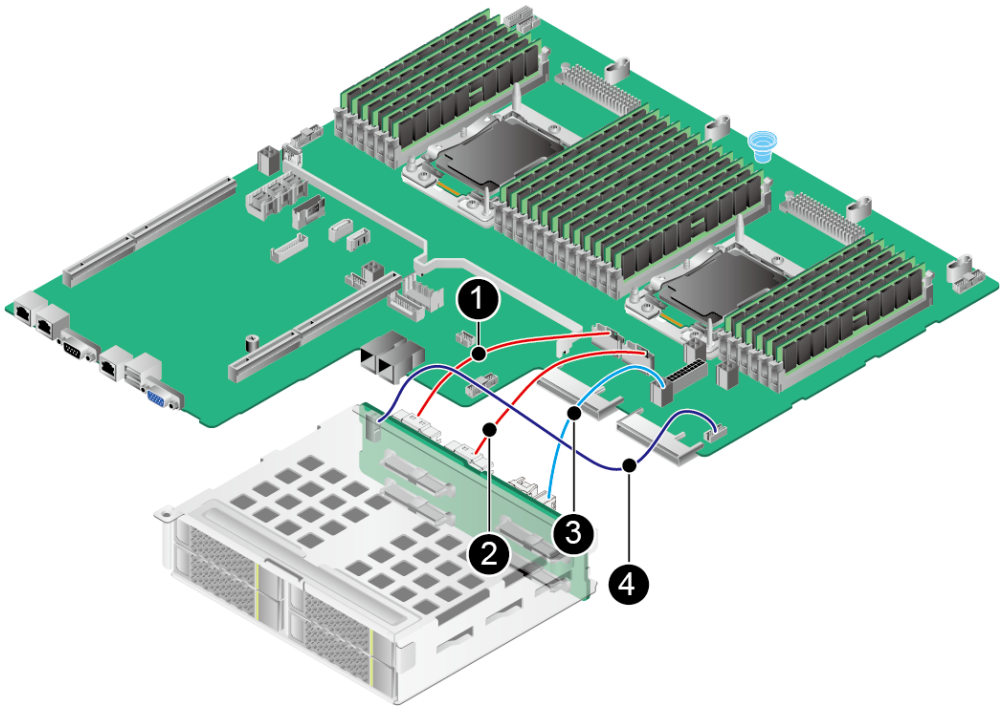

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Table 7-62 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline B (J9) of the 4 x 2.5" drive backplane to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline A (J8) of the 4 x 2.5" drive backplane to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the 4 x 2.5" drive backplane (J22) to the mainboard (J172)
4	04080602	Low-speed signal cable for connecting the 4 x 2.5" drive backplane (J23) to the mainboard (J164)

7.8 Server with 12 x 3.5" Drives (Pass-through) 2

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7.8.1 Left and Right Mounting Ears

Left and Right Mounting Ear Cabling

Figure 7-63 Left and right mounting ear cabling

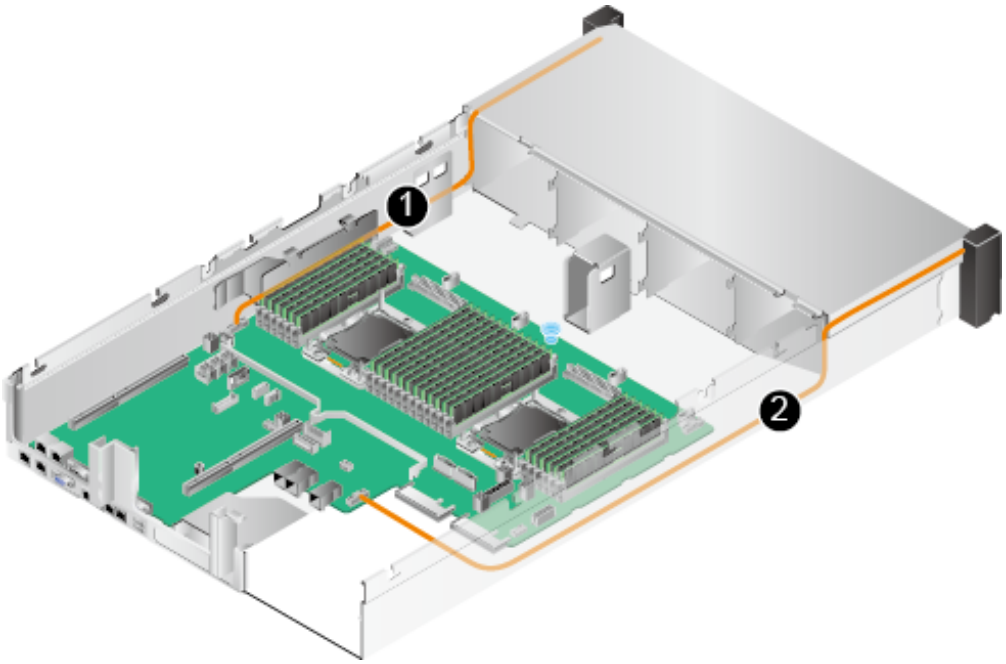

Table 7-63 Left and right mounting ear cabling

No.	P/N Code	Description
1	04051922	Signal cable for connecting the indicator board of the right mounting ear to the mainboard (J167)
2	04051921	Signal cable for connecting the USB board of the left mounting ear to the mainboard (J161)

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7.8.2 NC-SI Cabling

NC-SI Cabling

Figure 7-64 NC-SI cabling

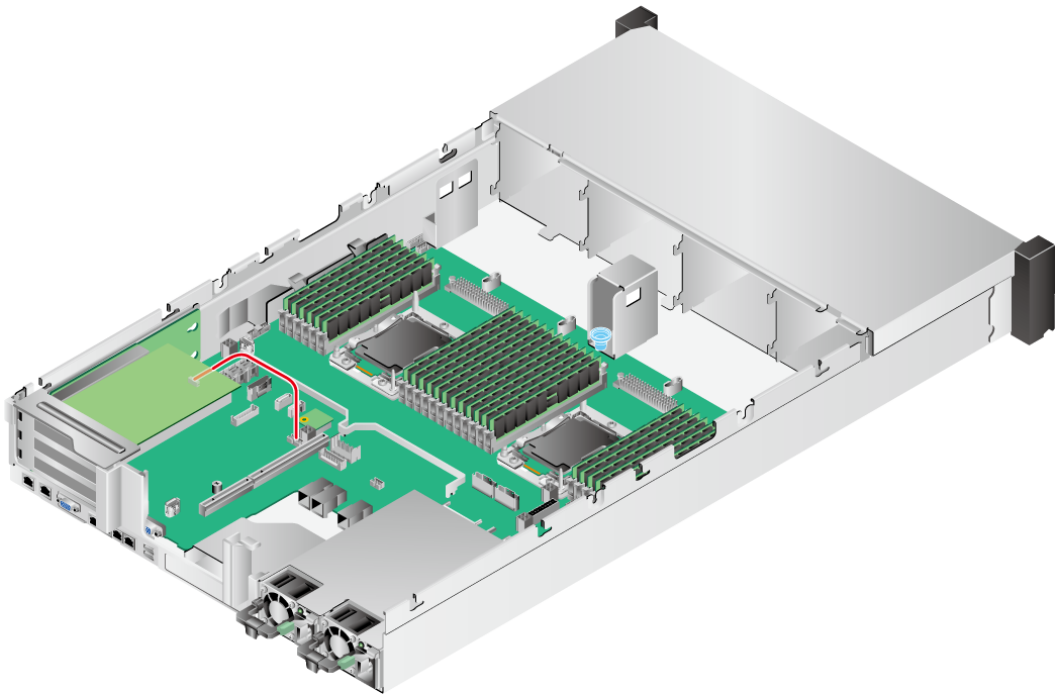

Table 7-64 NC-SI cabling

No.	Part No.	Description
1	04080606 or 04051036	NC-SI cable for connecting the PCIe NIC to the mainboard (J99)

NOTE

This cable is required only when the PCIe NIC supports NC-SI.

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7.8.3 12 x 3.5" Drive Pass-through Backplane Power and Indicator Signal Cables

12 x 3.5" Drive Pass-through Backplane Power and Indicator Signal Cabling

Figure 7-65 12 x 3.5" drive pass-through backplane power and indicator signal cabling

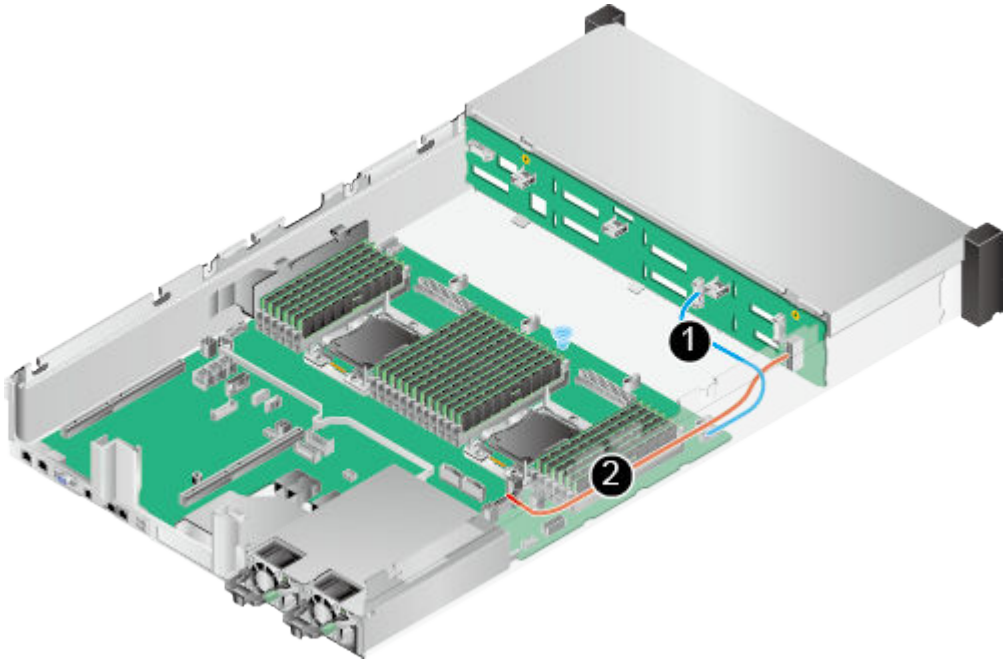

Table 7-65 12 x 3.5" drive pass-through backplane power and indicator signal cabling

No.	P/N Code	Description
1	04051923	Indicator signal cable for connecting the 12 x 3.5" drive pass-through backplane (J1) to the mainboard (J162)
2	04051989	Power cable for connecting the 12 x 3.5" drive pass-through backplane (J24) to the mainboard (J166)

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7.8.4 12 x 3.5" Drive Pass-through Backplane SAS Signal Cable (PCH Pass-through)

12 x 3.5" Drive Pass-through Backplane SAS Signal Cabling

Figure 7-66 12 x 3.5" drive pass-through backplane SAS signal cabling

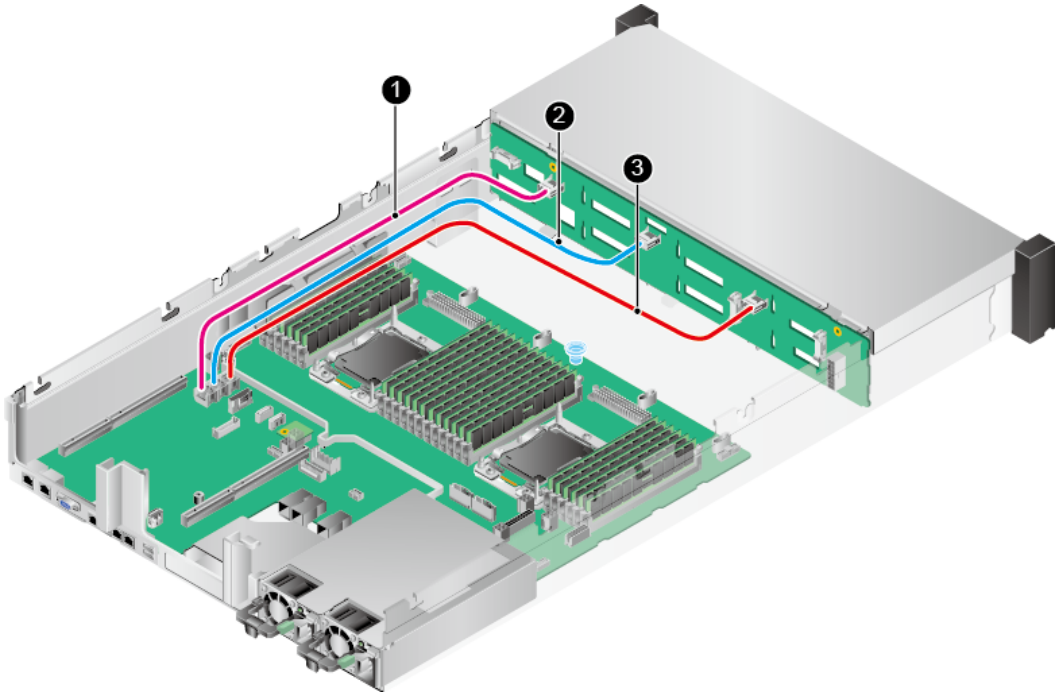

Table 7-66 12 x 3.5" drive pass-through backplane SAS signal cabling

No.	P/N Code	Description
1	04051928	SAS cable for connecting PORT C (J36) of the 12 x 3.5" drive pass-through backplane to the mainboard mini-SAS HD connector C (MINIHD PORT C/J85)
2	04051928	SAS cable for connecting PORT B (J29) of the 12 x 3.5" drive pass-through backplane to the mainboard mini-SAS HD connector B (MINIHD PORT B/J84)
3	04051928	SAS cable for connecting PORT A (J28) of the 12 x 3.5" drive pass-through backplane to the mainboard mini-SAS HD connector A (MINIHD PORT A/J86)

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7.8.5 I/O Module 3 (PCIe Riser Card)

I/O Module 3 Cabling

Figure 7-67 I/O module 3 cabling

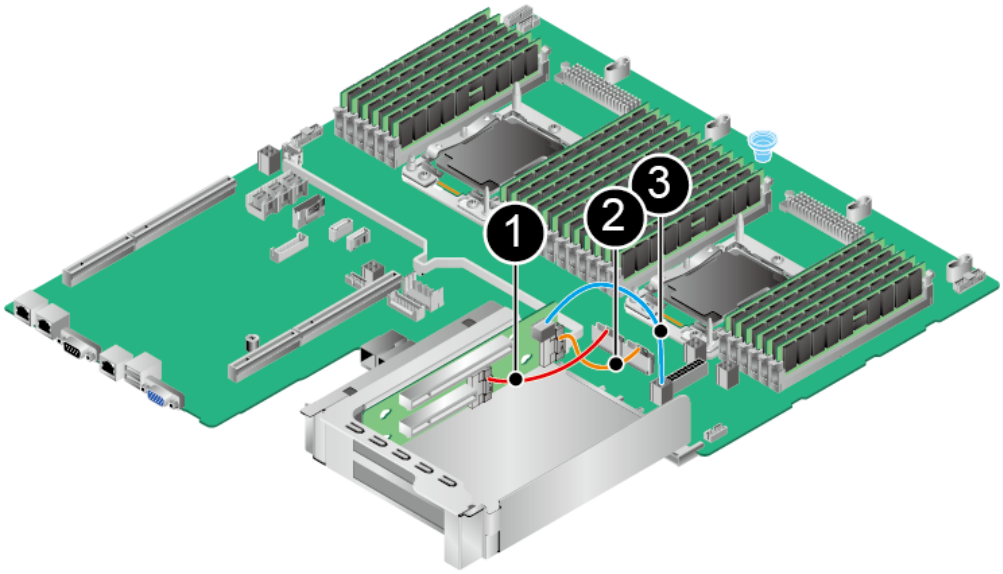

Table 7-67 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline B of the PCIe riser card to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline A of the PCIe riser card to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the PCIe riser card to the mainboard (J172)

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7.8.6 I/O Module 3 (4 x 2.5" NVMe Drives)

I/O Module 3 Cabling

Figure 7-68 I/O module 3 cabling

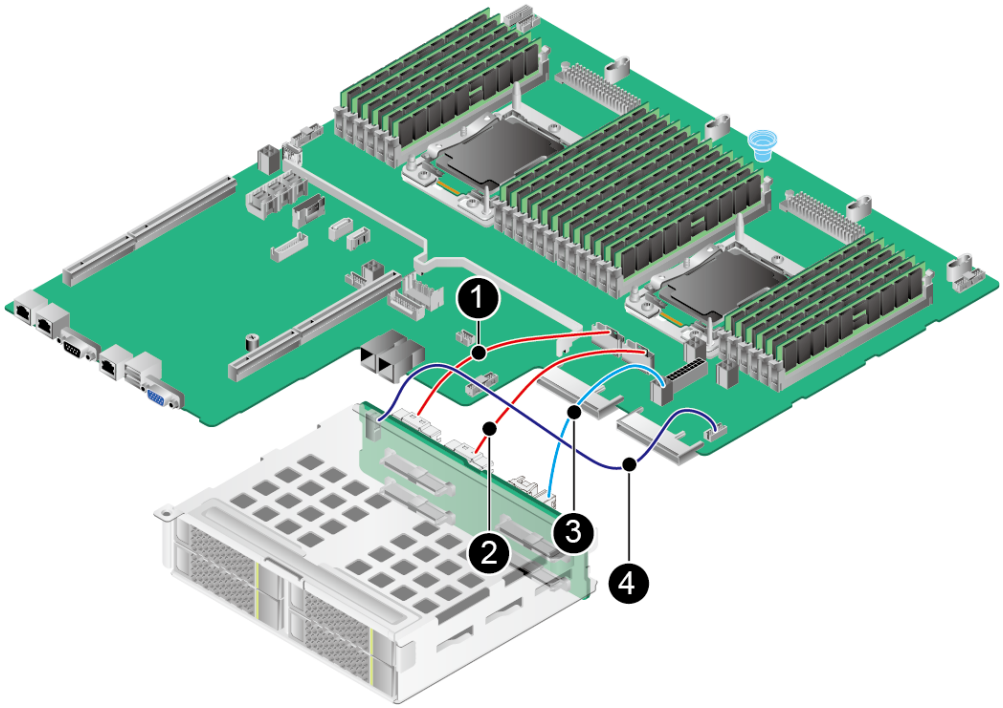

Table 7-68 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline B (J9) of the 4 x 2.5" drive backplane to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline A (J8) of the 4 x 2.5" drive backplane to Slimline A (J140) of the mainboard

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No.	P/N Code	Description
3	04150448-001	Power cable for connecting the 4 x 2.5" drive backplane (J22) to the mainboard (J172)
4	04080602	Low-speed signal cable for connecting the 4 x 2.5" drive backplane (J23) to the mainboard (J164)

7.9 Server with 12 x 3.5" Drives (Pass-through) 3

7.9.1 Left and Right Mounting Ears

Left and Right Mounting Ear Cabling

Figure 7-69 Left and right mounting ear cabling

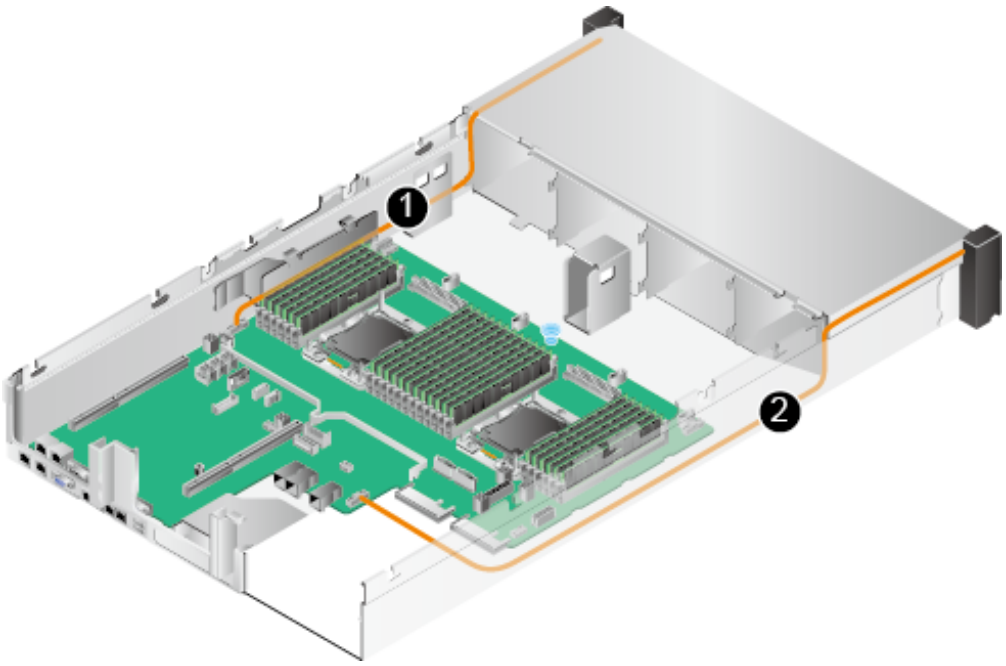

Table 7-69 Left and right mounting ear cabling

No.	P/N Code	Description
1	04051922	Signal cable for connecting the indicator board of the right mounting ear to the mainboard (J167)
2	04051921	Signal cable for connecting the USB board of the left mounting ear to the mainboard (J161)

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7.9.2 NC-SI Cabling

NC-SI Cabling

Figure 7-70 NC-SI cabling

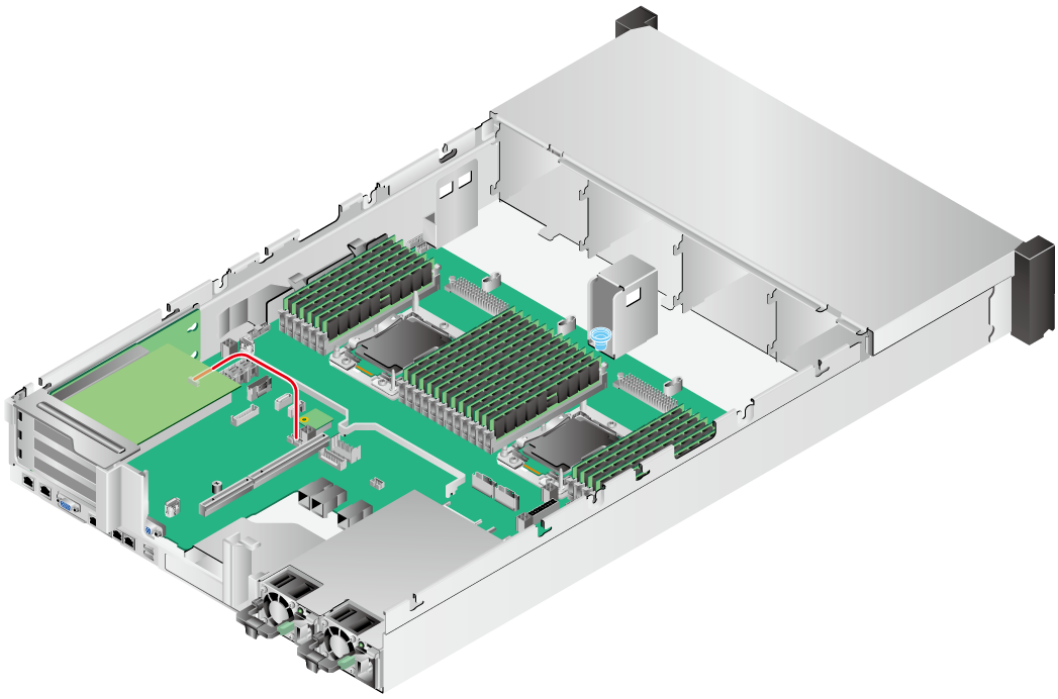

Table 7-70 NC-SI cabling

No.	Part No.	Description
1	04080606 or 04051036	NC-SI cable for connecting the PCIe NIC to the mainboard (J99)

NOTE

This cable is required only when the PCIe NIC supports NC-SI.

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7.9.3 12 x 3.5" Drive Pass-through Backplane Power and Indicator Signal Cables

12 x 3.5" Drive Pass-through Backplane Power and Indicator Signal Cabling

Figure 7-71 12 x 3.5" drive pass-through backplane power and indicator signal cabling

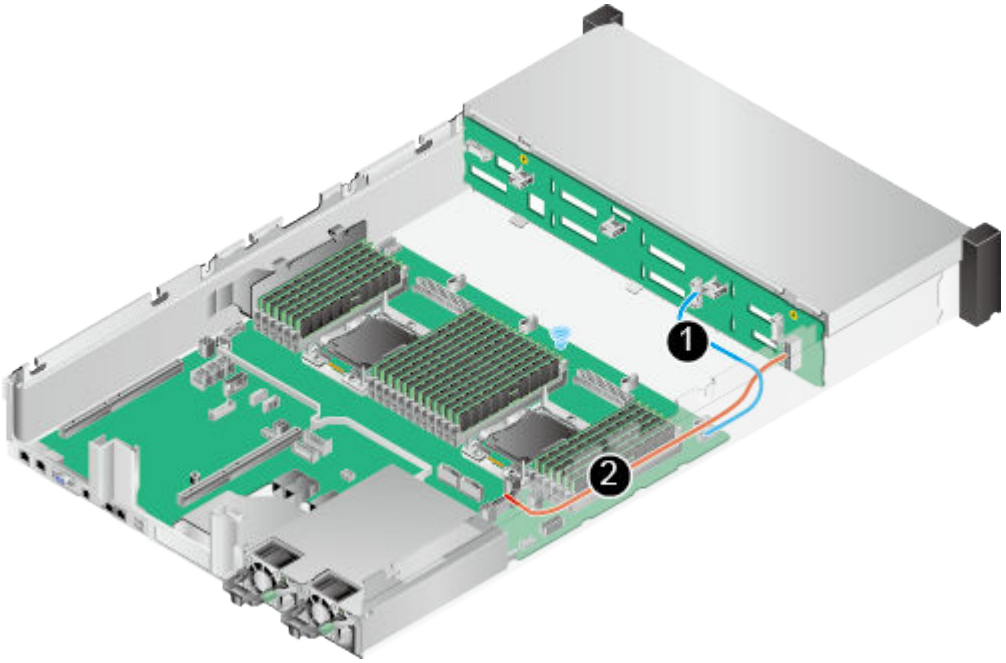

Table 7-71 12 x 3.5" drive pass-through backplane power and indicator signal cabling

No.	P/N Code	Description
1	04051923	Indicator signal cable for connecting the 12 x 3.5" drive pass-through backplane (J1) to the mainboard (J162)
2	04051989	Power cable for connecting the 12 x 3.5" drive pass-through backplane (J24) to the mainboard (J166)

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7.9.4 12 x 3.5" Drive Pass-through Backplane SAS Signal Cables (Server with 1 x Screw-in RAID Controller Card)

12 x 3.5" Drive Pass-through Backplane SAS Signal Cabling

Figure 7-72 12 x 3.5" drive pass-through backplane SAS signal cabling

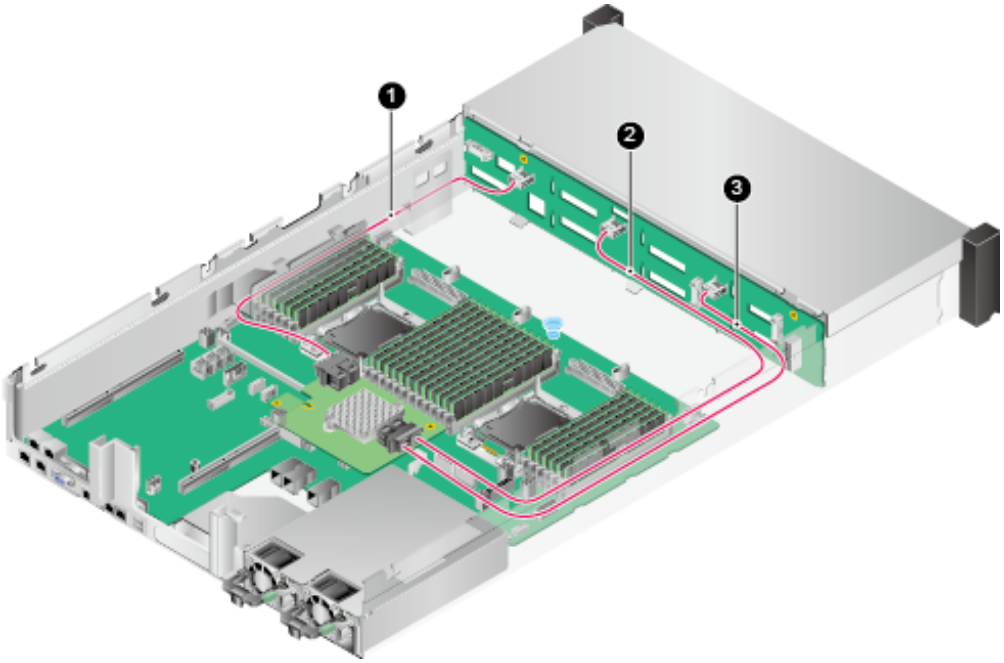

Table 7-72 12 x 3.5" drive pass-through backplane SAS signal cabling

No.	P/N Code	Description
1	04051078	SAS cable for connecting PORT C (J36) of the 12 x 3.5" drive pass-through backplane to PORT C of the screw-in RAID controller card
2	04051078	SAS cable for connecting PORT B (J29) of the 12 x 3.5" drive pass-through backplane to PORT B of the screw-in RAID controller card
3	04051078	SAS cable for connecting PORT A (J28) of the 12 x 3.5" drive pass-through backplane to PORT A of the screw-in RAID controller card

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7.9.5 4 x 3.5" Built-in-Drive Backplane Cabling (Server with 1 x Screw-in RAID Controller Card)

4 x 3.5" Built-in-Drive Backplane Cabling

Figure 7-73 4 x 3.5" built-in-drive backplane cabling

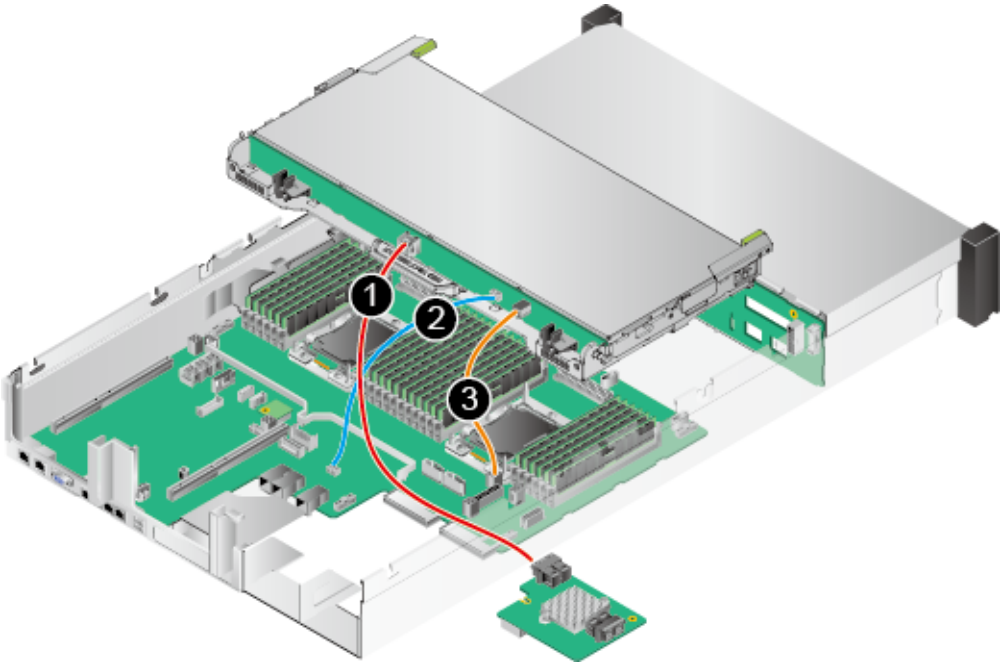

Table 7-73 4 x 3.5" built-in-drive backplane cabling

No.	P/N Code	Description
1	04051059	SAS cable for connecting the 4 x 3.5" built-in-drive backplane (J3) to PORT D of the screw-in RAID controller card
2	04051948 **NOTE** The cable is not an independent spare part. It is packed with the built-in-drive backplane as a spare part.	Indicator signal cable for connecting the 4 x 3.5" built-in-drive backplane (J1) to the mainboard (J122)
3	04150448-001	Power cable for connecting the 4 x 3.5" built-in-drive backplane (J2) to the mainboard (J171)

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7.9.6 I/O Module 3 (4 x 2.5" NVMe Drives)

I/O Module 3 Cabling

Figure 7-74 I/O module 3 cabling

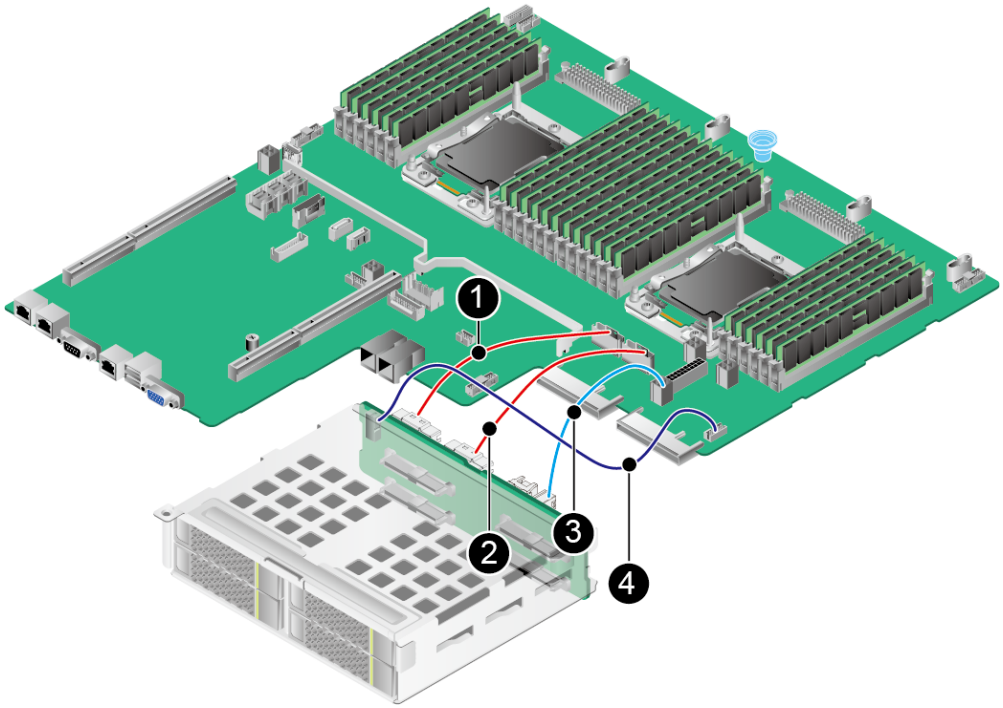

Table 7-74 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline B (J9) of the 4 x 2.5" drive backplane to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline A (J8) of the 4 x 2.5" drive backplane to Slimline A (J140) of the mainboard

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No.	P/N Code	Description
3	04150448-001	Power cable for connecting the 4 x 2.5" drive backplane (J22) to the mainboard (J172)
4	04080602	Low-speed signal cable for connecting the 4 x 2.5" drive backplane (J23) to the mainboard (J164)

7.9.7 I/O Module 3 (4 x 2.5" SAS/SATA Drives)

I/O Module 3 Cabling

Figure 7-75 I/O module 3 cabling

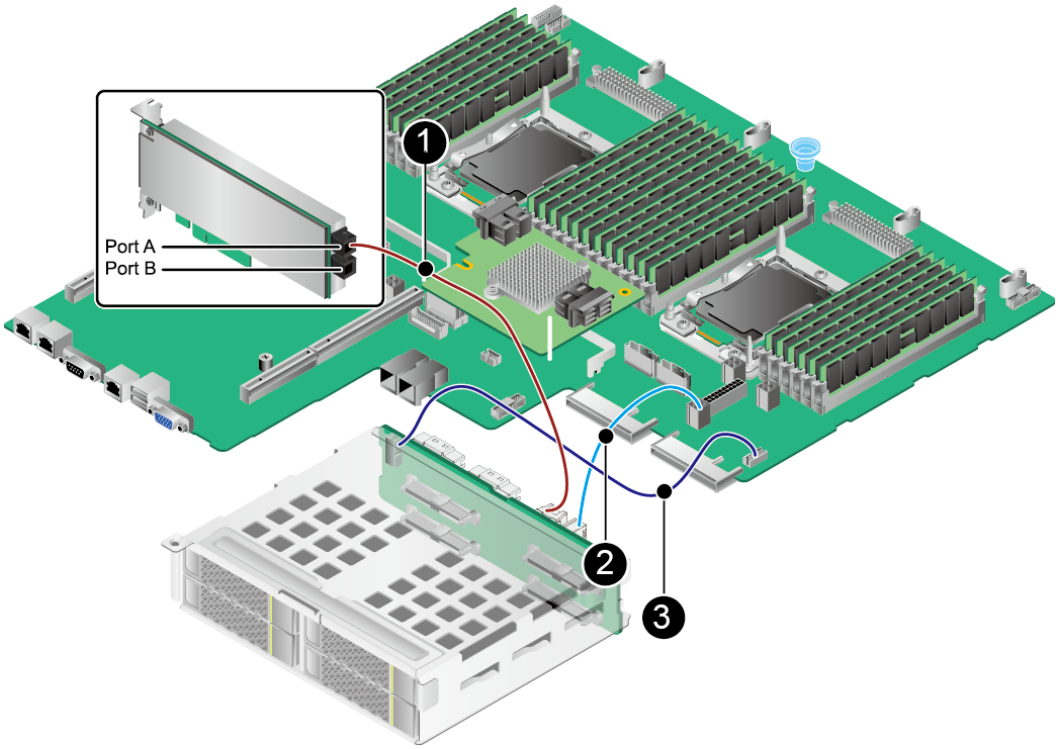

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Table 7-75 I/O module 3 cabling

No.	P/N Code	Description
1	04051059-002 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" drive backplane as a spare part.	SAS cable for connecting the 4 x 2.5" drive backplane (J2) to PORT A of the PCIe RAID controller card
2	04150448-001	Power cable for connecting the 4 x 2.5" drive backplane (J22) to the mainboard (J172)
3	04080602	Low-speed signal cable for connecting the 4 x 2.5" drive backplane (J23) to the mainboard (J164)

NOTE

The PCIe RAID controller card can be installed only in slot 6.

7.10 12 x 3.5" Drive Pass-through Configuration 4

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7.10.1 Left and Right Mounting Ears

Left and Right Mounting Ear Cabling

Figure 7-76 Left and right mounting ear cabling

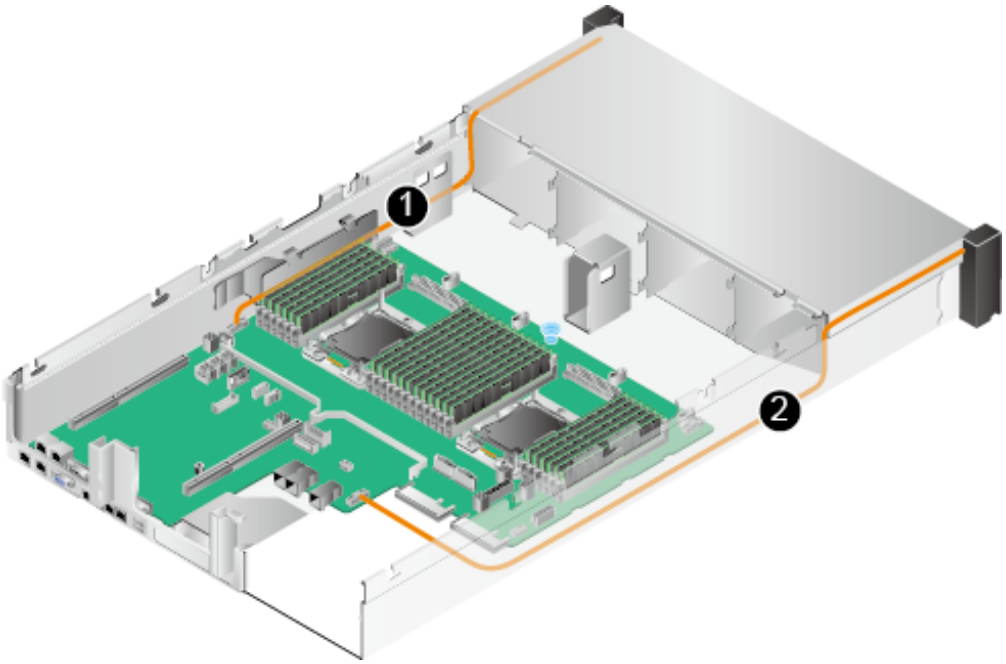

Table 7-76 Left and right mounting ear cabling

No.	P/N Code	Description
1	04051922	Signal cable for connecting the indicator board of the right mounting ear to the mainboard (J167)
2	04051921	Signal cable for connecting the USB board of the left mounting ear to the mainboard (J161)

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7.10.2 NC-SI Cabling

NC-SI Cabling

Figure 7-77 NC-SI cabling

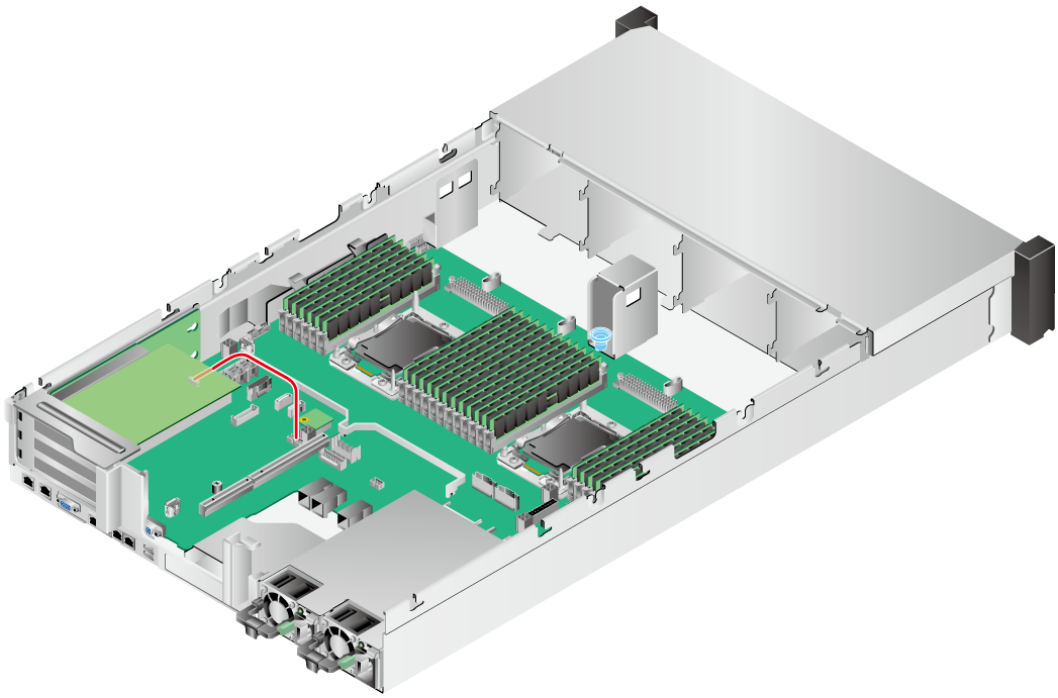

Table 7-77 NC-SI cabling

No.	Part No.	Description
1	04080606 or 04051036	NC-SI cable for connecting the PCIe NIC to the mainboard (J99)

NOTE

This cable is required only when the PCIe NIC supports NC-SI.

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7.10.3 12 x 3.5" Drive Pass-through Backplane Power and Indicator Signal Cables

12 x 3.5" Drive Pass-through Backplane Power and Indicator Signal Cabling

Figure 7-78 12 x 3.5" drive pass-through backplane power and indicator signal cabling

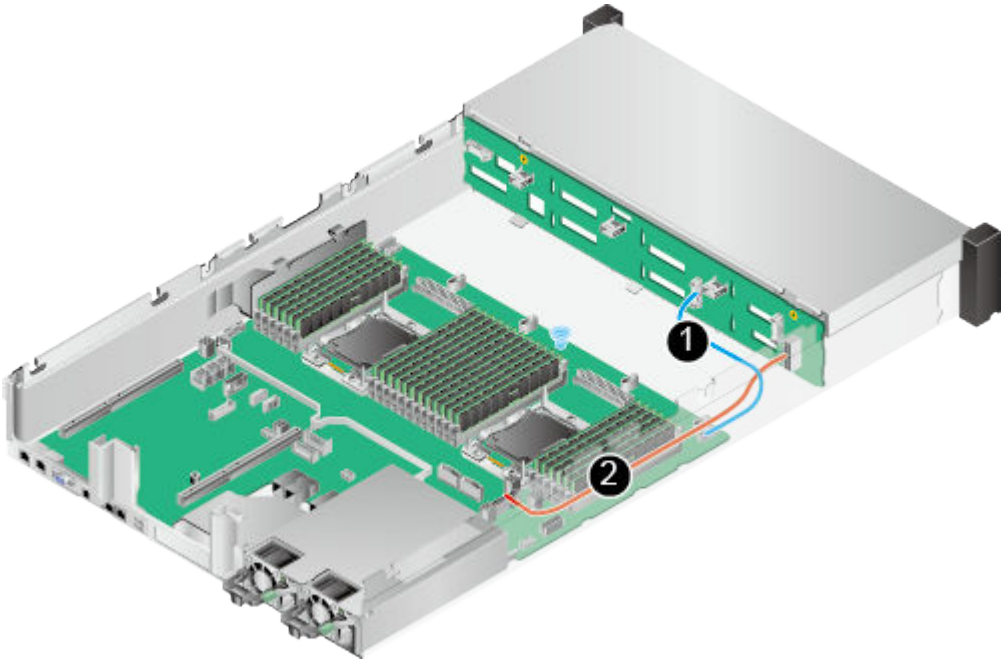

Table 7-78 12 x 3.5" drive pass-through backplane power and indicator signal cabling

No.	P/N Code	Description
1	04051923	Indicator signal cable for connecting the 12 x 3.5" drive pass-through backplane (J1) to the mainboard (J162)
2	04051989	Power cable for connecting the 12 x 3.5" drive pass-through backplane (J24) to the mainboard (J166)

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7.10.4 12 x 3.5" Drive Pass-through Backplane SAS Signal Cables (Server with 1 x Screw-in RAID Controller Card)

12 x 3.5" Drive Pass-through Backplane SAS Signal Cabling

Figure 7-79 12 x 3.5" drive pass-through backplane SAS signal cabling

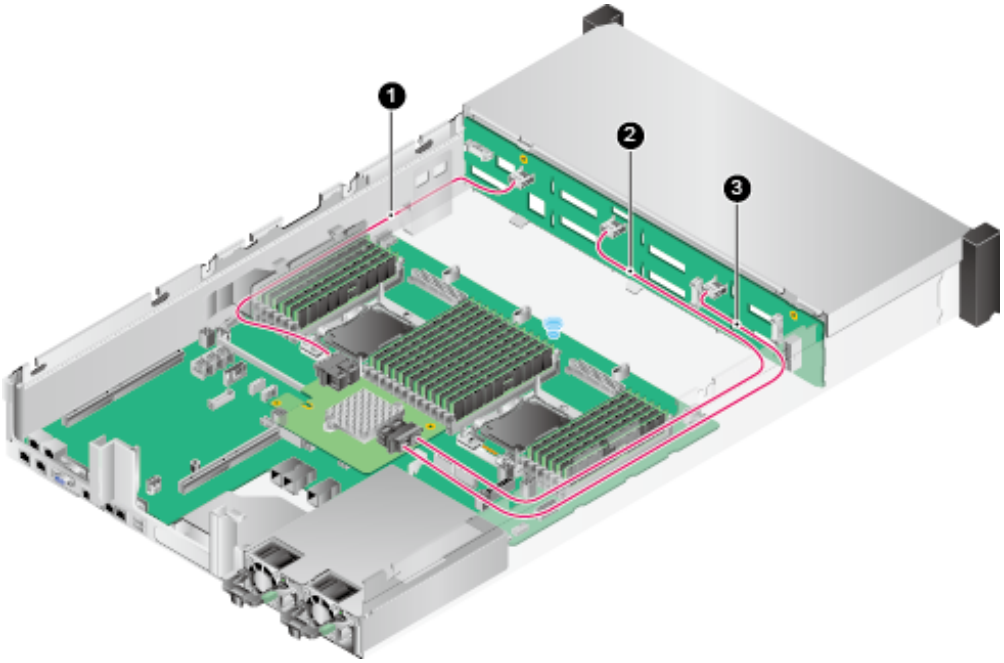

Table 7-79 12 x 3.5" drive pass-through backplane SAS signal cabling

No.	P/N Code	Description
1	04051078	SAS cable for connecting PORT C (J36) of the 12 x 3.5" drive pass-through backplane to PORT C of the screw-in RAID controller card
2	04051078	SAS cable for connecting PORT B (J29) of the 12 x 3.5" drive pass-through backplane to PORT B of the screw-in RAID controller card
3	04051078	SAS cable for connecting PORT A (J28) of the 12 x 3.5" drive pass-through backplane to PORT A of the screw-in RAID controller card

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7.10.5 I/O Module 1 (2 x 3.5" SAS/SATA Drives)

I/O Module 1 Cabling

Figure 7-80 I/O Module 1 Cabling

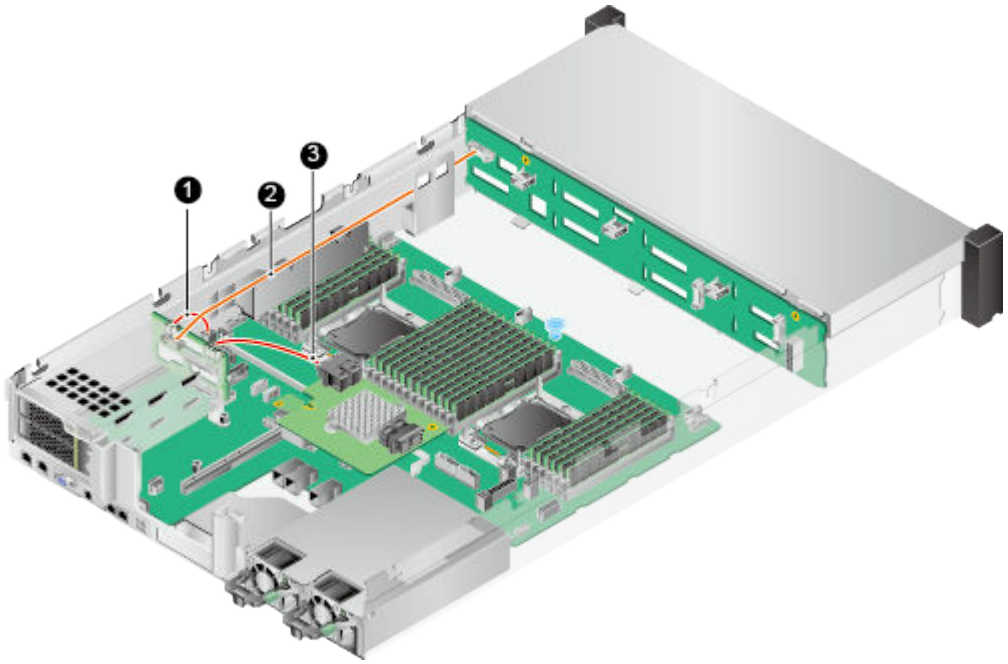

Table 7-80 I/O module 1 cabling

No.	P/N Code	Description
1	04150448-001	Power cable for connecting the 2 x 3.5" drive backplane (J1) to the mainboard (J127)
2	04051053	Indicator signal cable for connecting the 2 x 3.5" drive backplane (J24) to the 12 x 3.5" drive pass-through backplane (J30)
3	04051059	SAS cable for connecting the 2 x 3.5" drive backplane (J3) to PORT D of the screw-in RAID controller card

7.10.6 I/O Module 3 (PCIe Riser Module)

NOTE

The PCIe riser module can be installed in I/O module 3 only when an SR760-M (Broadcom SAS3416) or SR760IT-M (Broadcom SAS3416) screw-in RAID controller card is configured.

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I/O Module 3 Cabling

Figure 7-81 I/O module 3 cabling

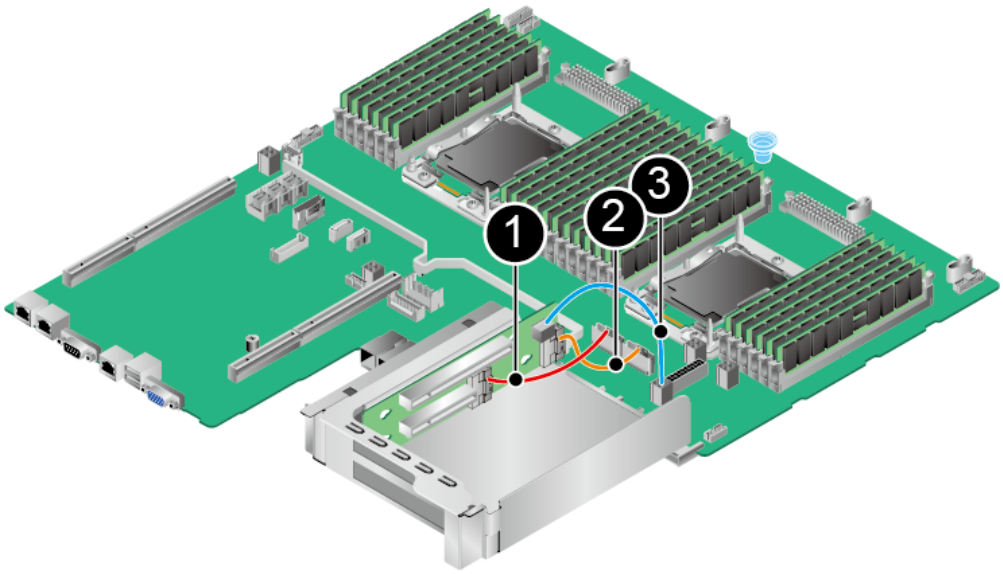

Table 7-81 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline B of the PCIe riser card to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline A of the PCIe riser card to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the PCIe riser card to the mainboard (J172)

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7.10.7 I/O Module 3 (4 x 2.5" NVMe Drives)

I/O Module 3 Cabling

Figure 7-82 I/O module 3 cabling

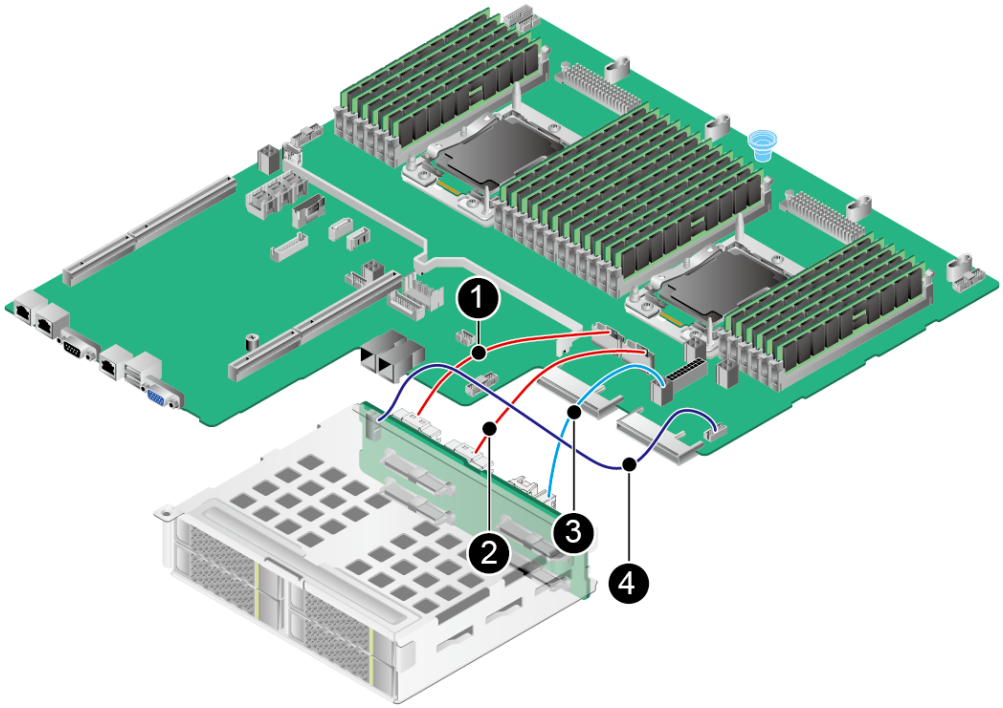

Table 7-82 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline B (J9) of the 4 x 2.5" drive backplane to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline A (J8) of the 4 x 2.5" drive backplane to Slimline A (J140) of the mainboard

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No.	P/N Code	Description
3	04150448-001	Power cable for connecting the 4 x 2.5" drive backplane (J22) to the mainboard (J172)
4	04080602	Low-speed signal cable for connecting the 4 x 2.5" drive backplane (J23) to the mainboard (J164)

7.10.8 I/O Module 3 (4 x 2.5" SAS/SATA Drives)

I/O Module 3 Cabling

Figure 7-83 I/O module 3 cabling

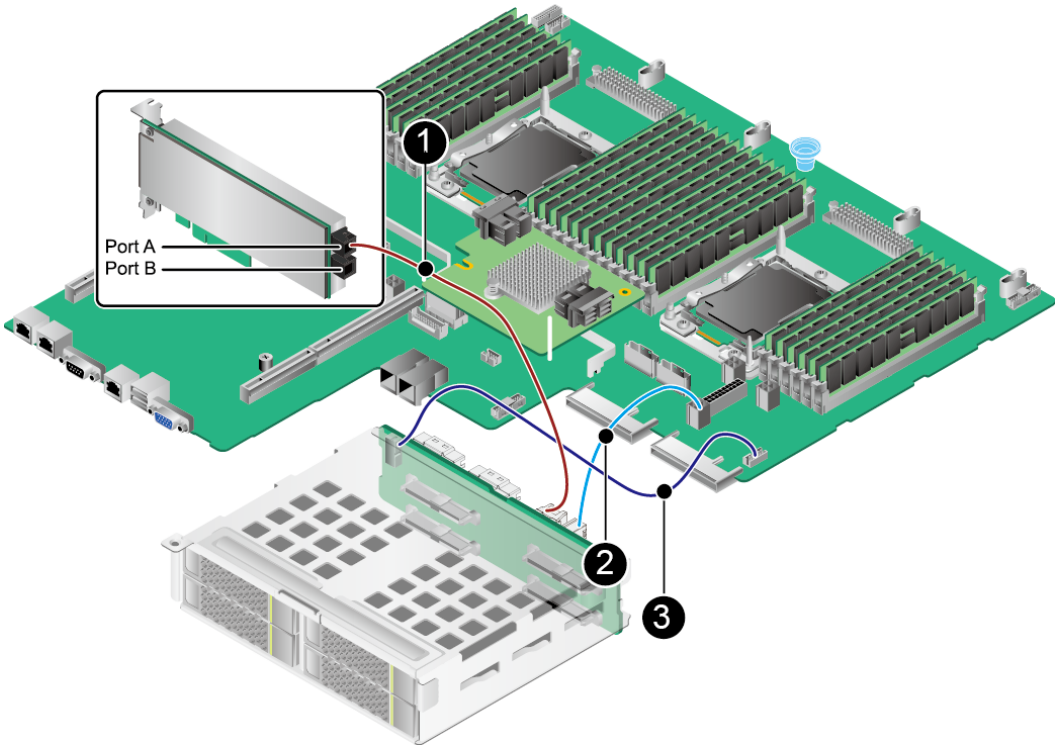

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Table 7-83 I/O module 3 cabling

No.	P/N Code	Description
1	04051059-002 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" drive backplane as a spare part.	SAS cable for connecting the 4 x 2.5" drive backplane (J2) to PORT A of the PCIe RAID controller card
2	04150448-001	Power cable for connecting the 4 x 2.5" drive backplane (J22) to the mainboard (J172)
3	04080602	Low-speed signal cable for connecting the 4 x 2.5" drive backplane (J23) to the mainboard (J164)

NOTE

The PCIe RAID controller card can be installed only in slot 6.

7.11 Server with 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) Drives 1

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7.11.1 Left and Right Mounting Ears

Left and Right Mounting Ear Cabling

Figure 7-84 Left and right mounting ear cabling

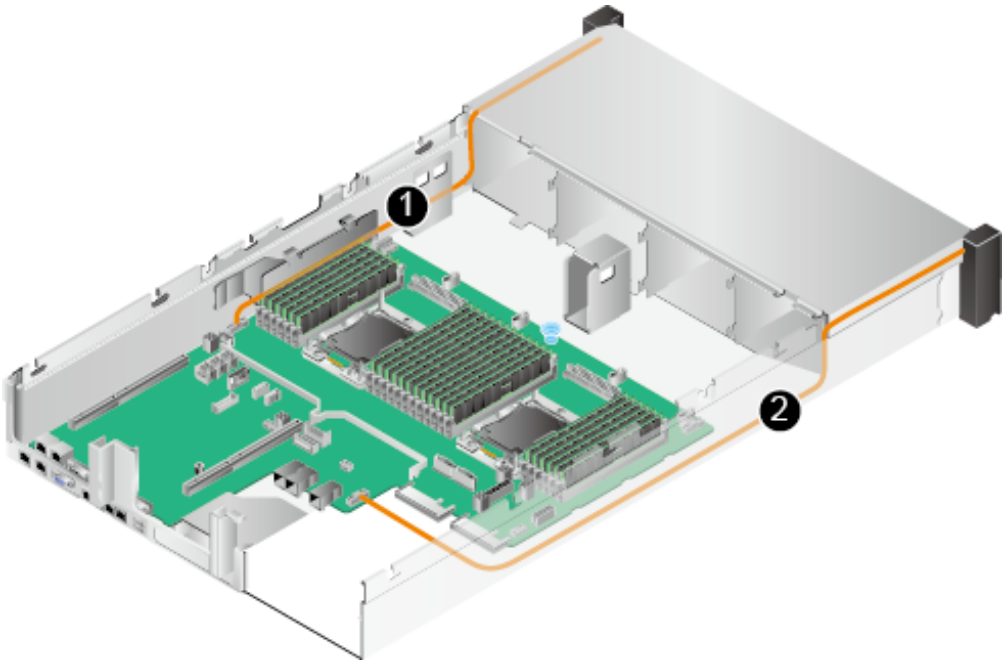

Table 7-84 Left and right mounting ear cabling

No.	P/N Code	Description
1	04051922	Signal cable for connecting the indicator board of the right mounting ear to the mainboard (J167)
2	04051921	Signal cable for connecting the USB board of the left mounting ear to the mainboard (J161)

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7.11.2 NC-SI Cabling

NC-SI Cabling

Figure 7-85 NC-SI cabling

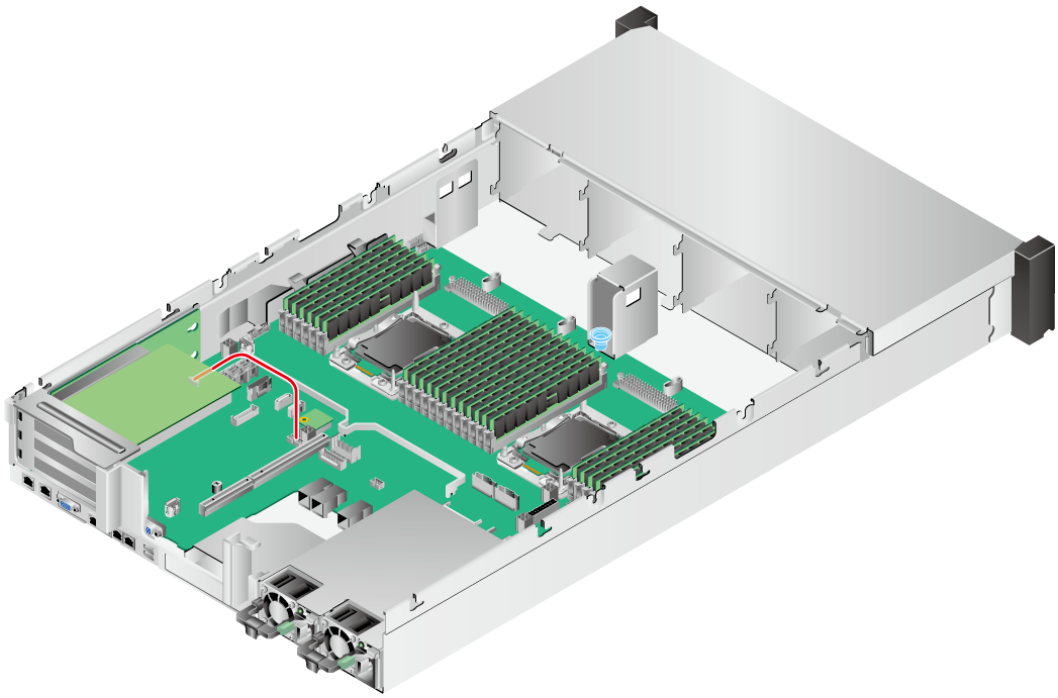

Table 7-85 NC-SI cabling

No.	Part No.	Description
1	04080606 or 04051036	NC-SI cable for connecting the PCIe NIC to the mainboard (J99)

NOTE

This cable is required only when the PCIe NIC supports NC-SI.

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7.11.3 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) Drive Backplane Power and Indicator Signal Cables

20 x 2.5" (8 x SAS/SATA + 12 x NVMe) Drive Backplane Power and Indicator Signal Cabling

Figure 7-86 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane power and indicator signal cabling

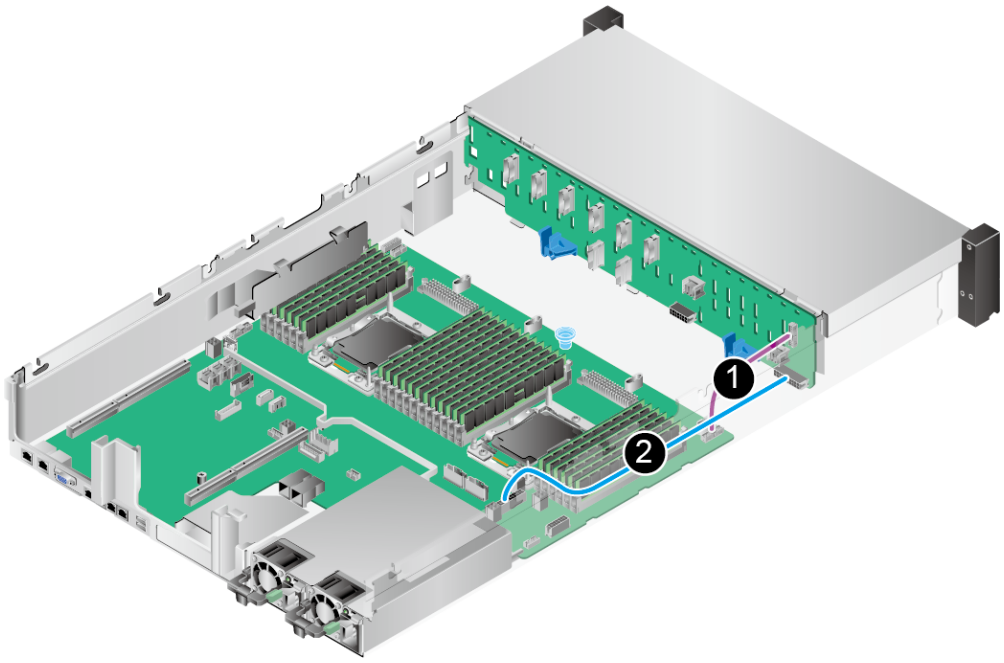

Table 7-86 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane power and indicator signal cabling

No.	P/N Code	Description
1	04080588	Indicator signal cable for connecting the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane (J41) to the mainboard (J162)
2	04152142	Power cable for connecting the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane (J37) to the mainboard (J166)

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7.11.4 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) Drive Backplane SAS Cables (Server with a Screw-in RAID Controller Card)

20 x 2.5" (8 x SAS/SATA + 12 x NVMe) Drive Backplane SAS Cabling (Server with a Screw-in RAID Controller Card)

Figure 7-87 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane SAS cabling

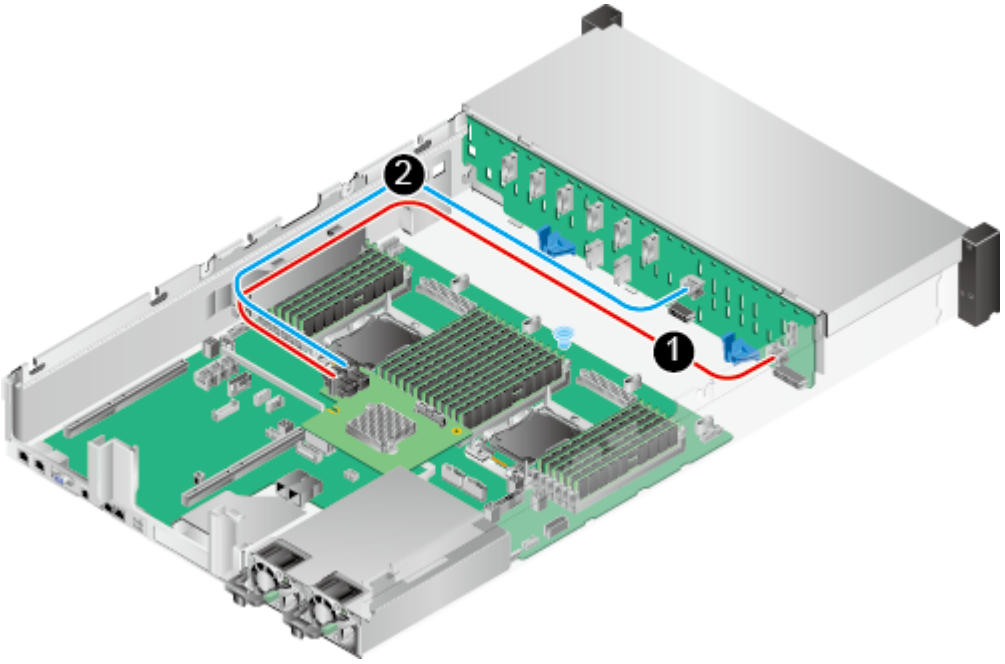

Table 7-87 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane SAS cabling

No.	P/N Code	Description
1	04051021	SAS cable for connecting PORT A (J15) of the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane to PORT A of the screw-in RAID controller card
2	04051021	SAS cable for connecting PORT B (J16) of the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane to PORT B of the screw-in RAID controller card

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7.11.5 Signal Cables for Connecting the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) Drive Backplane to the NVMe SSD Adapter

Signal Cabling for Connecting the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) Drive Backplane to the NVMe SSD Adapter

Figure 7-88 Signal cabling for connecting the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane to the NVMe SSD adapter

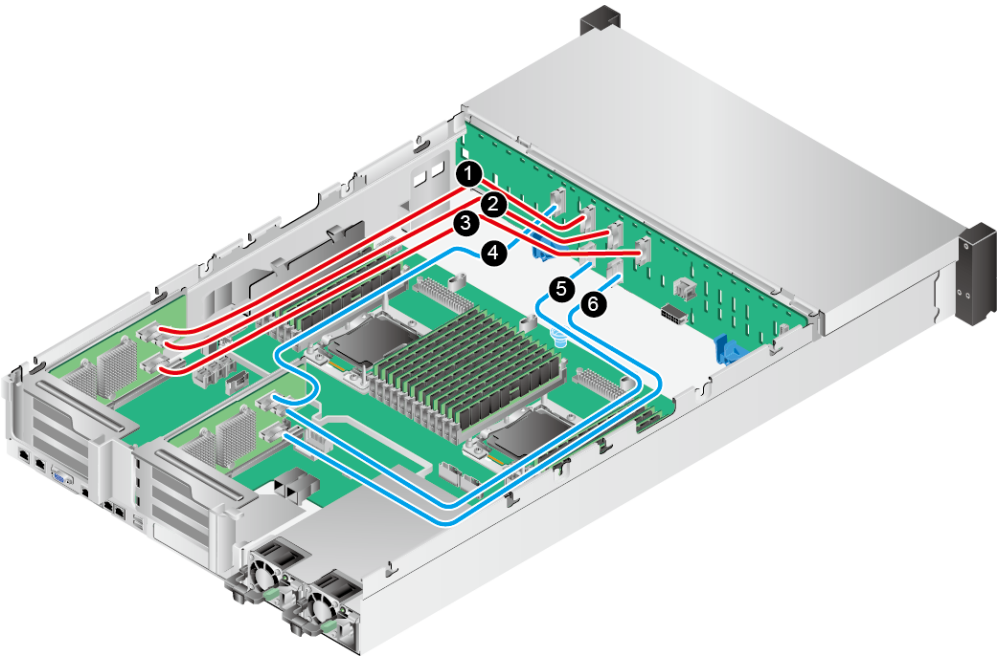

Table 7-88 Signal cabling for connecting the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane to the NVMe SSD adapter

No.	P/N Code	Description
1	04052103-001	Slimline cable for connecting PORT 1C (J19) of the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane to PORT C of NVMe SSD adapter 1
2	04052103-001	Slimline cable for connecting PORT 1B (J18) of the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane to PORT B of NVMe SSD adapter 1
3	04052103-001	Slimline cable for connecting PORT 1A (J17) of the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane to PORT A of NVMe SSD adapter 1
4	04052104-001	Slimline cable for connecting PORT 2C (J31) of the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane to PORT C of NVMe SSD adapter 2

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No.	P/N Code	Description
5	04052104-001	Slimline cable for connecting PORT 2B (J32) of the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane to PORT B of NVMe SSD adapter 2
6	04052104-001	Slimline cable for connecting PORT 2A (J21) of the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane to PORT A of NVMe SSD adapter 2

7.11.6 I/O Module 3 (PCIe Riser Card)

I/O Module 3 Cabling

Figure 7-89 I/O module 3 cabling

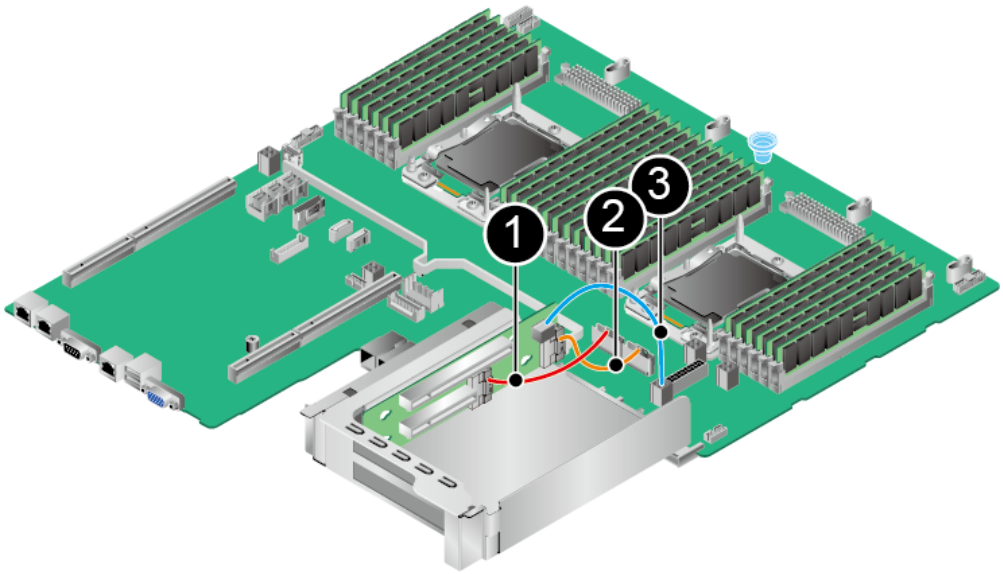

Table 7-89 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline B of the PCIe riser card to Slimline B (J139) of the mainboard

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No.	P/N Code	Description
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline A of the PCIe riser card to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the PCIe riser card to the mainboard (J172)

7.11.7 I/O Module 3 (4 x 2.5" NVMe Drives)

I/O Module 3 Cabling

Figure 7-90 I/O module 3 cabling

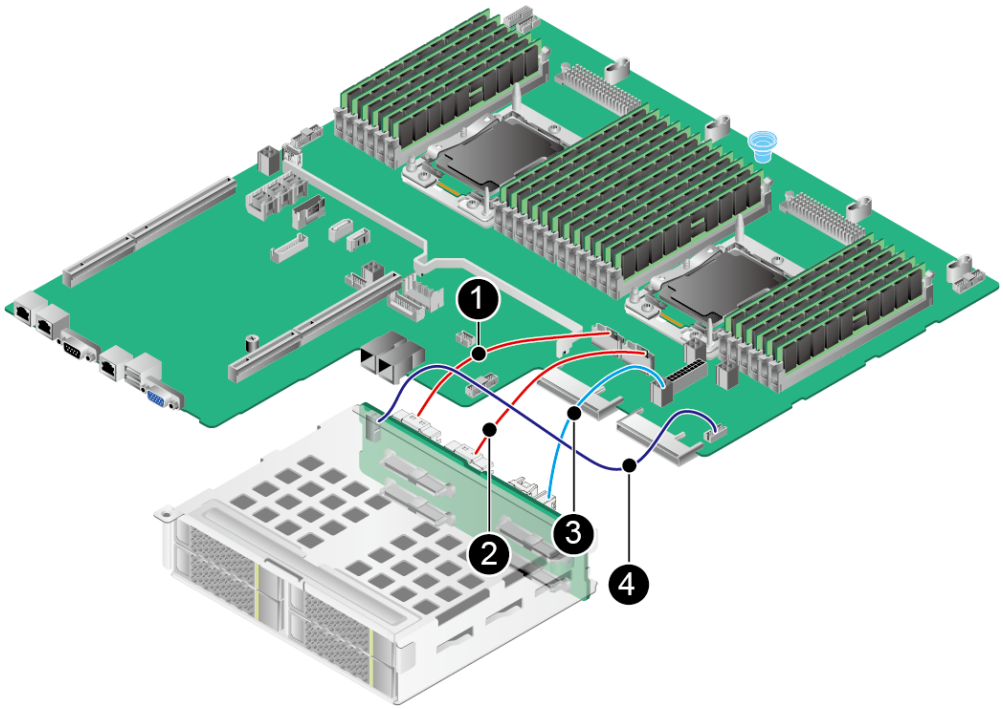

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Table 7-90 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline B (J9) of the 4 x 2.5" drive backplane to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline A (J8) of the 4 x 2.5" drive backplane to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the 4 x 2.5" drive backplane (J22) to the mainboard (J172)
4	04080602	Low-speed signal cable for connecting the 4 x 2.5" drive backplane (J23) to the mainboard (J164)

7.12 Server with 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) Drives 2

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7.12.1 Left and Right Mounting Ears

Left and Right Mounting Ear Cabling

Figure 7-91 Left and right mounting ear cabling

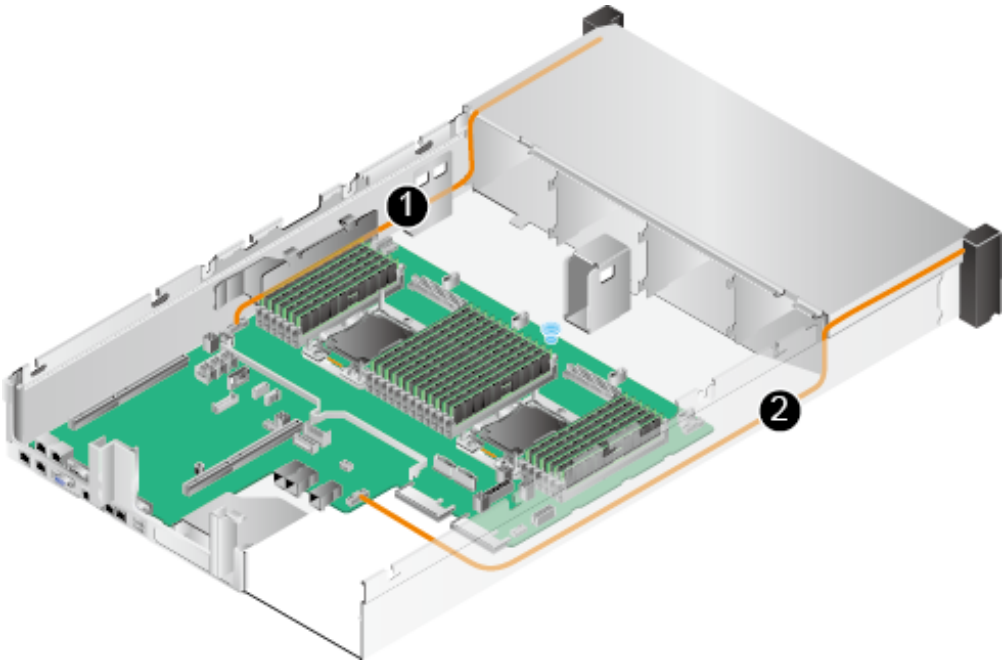

Table 7-91 Left and right mounting ear cabling

No.	P/N Code	Description
1	04051922	Signal cable for connecting the indicator board of the right mounting ear to the mainboard (J167)
2	04051921	Signal cable for connecting the USB board of the left mounting ear to the mainboard (J161)

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7.12.2 NC-SI Cabling

NC-SI Cabling

Figure 7-92 NC-SI cabling

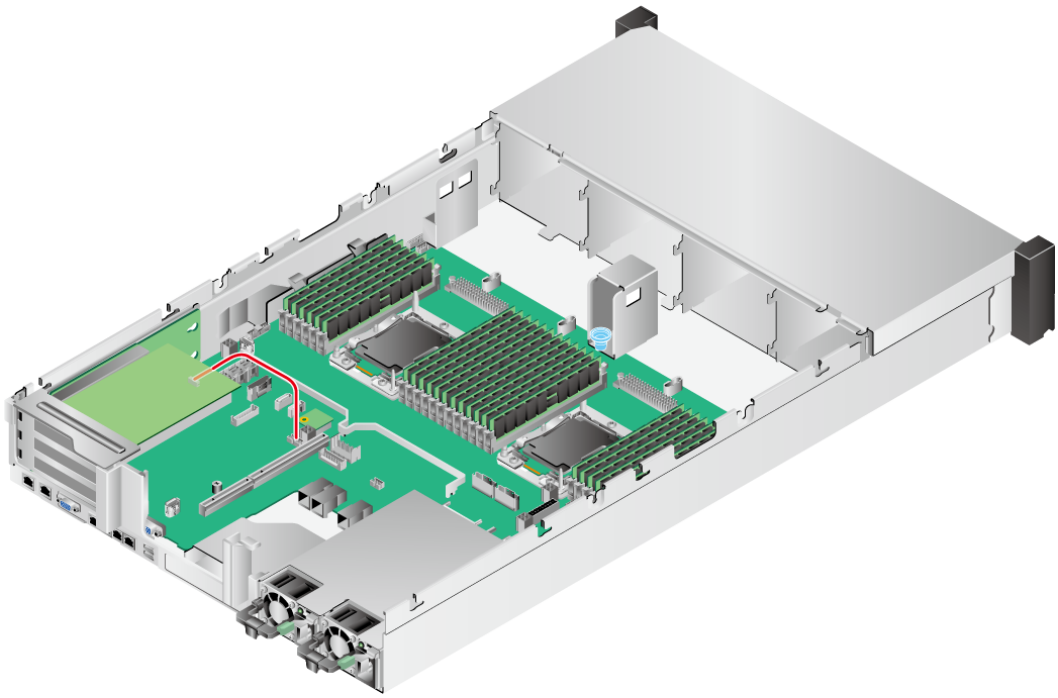

Table 7-92 NC-SI cabling

No.	Part No.	Description
1	04080606 or 04051036	NC-SI cable for connecting the PCIe NIC to the mainboard (J99)

NOTE

This cable is required only when the PCIe NIC supports NC-SI.

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7.12.3 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) Drive Backplane Power and Indicator Signal Cables

20 x 2.5" (8 x SAS/SATA + 12 x NVMe) Drive Backplane Power and Indicator Signal Cabling

Figure 7-93 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane power and indicator signal cabling

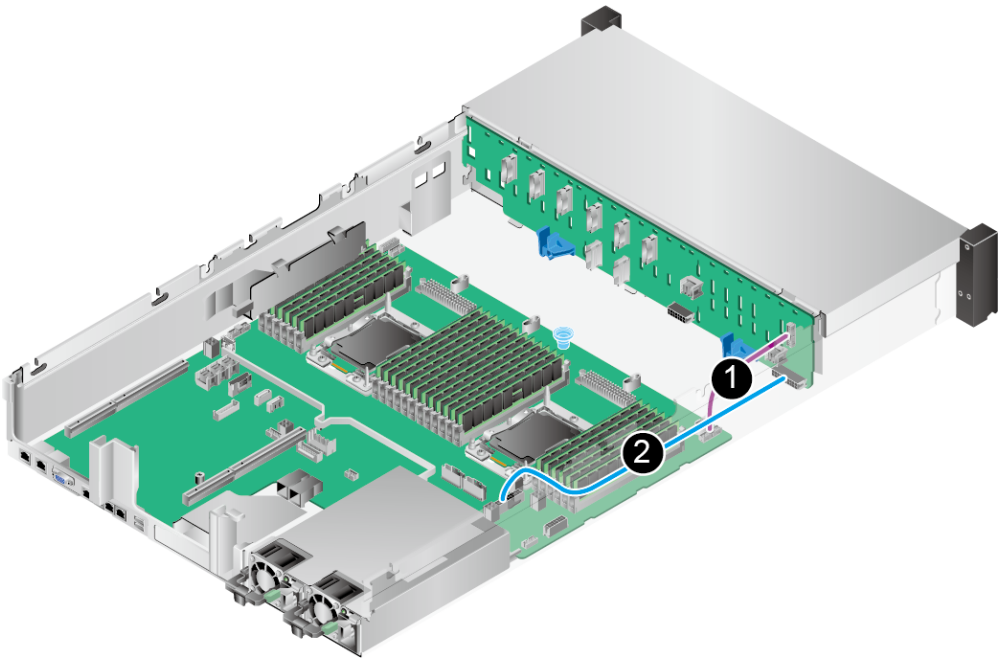

Table 7-93 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane power and indicator signal cabling

No.	P/N Code	Description
1	04080588	Indicator signal cable for connecting the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane (J41) to the mainboard (J162)
2	04152142	Power cable for connecting the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane (J37) to the mainboard (J166)

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7.12.4 20 x 2.5" (8 x SATA + 12 x NVMe) Drive Backplane SAS Signal Cables (PCH Pass-through)

20 x 2.5" (8 x SATA + 12 x NVMe) Drive Backplane SAS Signal Cabling (PCH Pass-through)

Figure 7-94 20 x 2.5" (8 x SATA + 12 x NVMe) drive backplane SAS cabling

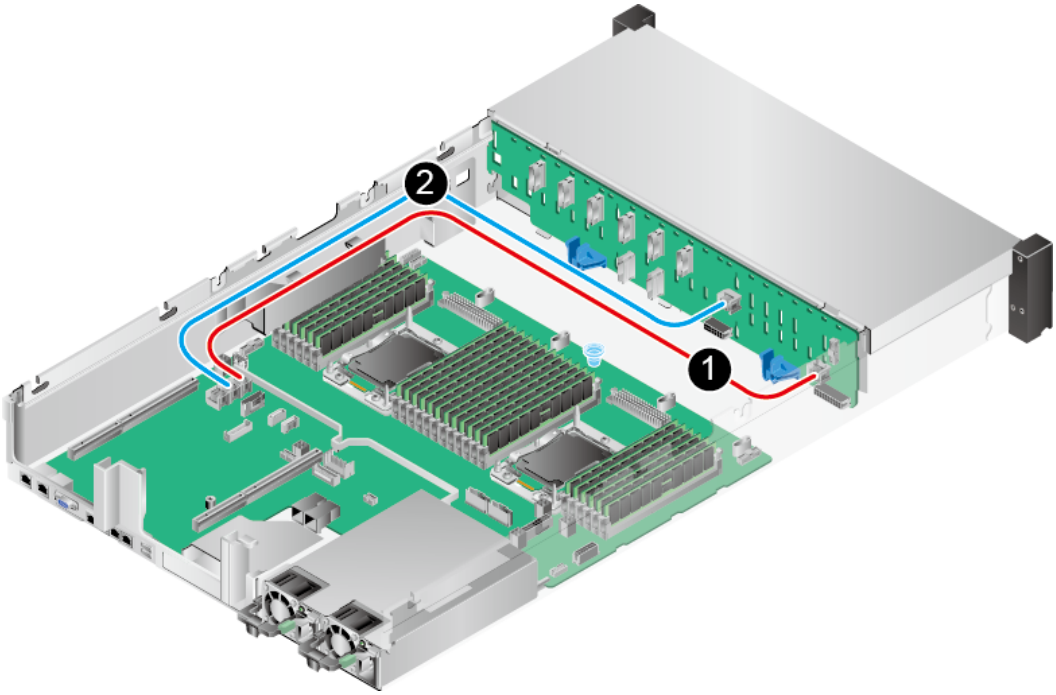

Table 7-94 20 x 2.5" (8 x SATA + 12 x NVMe) drive backplane SAS cabling

No.	P/N Code	Description
1	04051021	SAS cable for connecting PORT A (J15) of the 20 x 2.5" (8 x SATA + 12 x NVMe) drive backplane to the mainboard mini-SAS HD connector A (MINIHD PORT A/J86)
2	04051021	SAS cable for connecting PORT B (J16) of the 20 x 2.5" (8 x SATA + 12 x NVMe) drive backplane to the mainboard mini-SAS HD connector B (MINIHD PORT B/J84)

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7.12.5 Signal Cables for Connecting the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) Drive Backplane to the NVMe SSD Adapter

Signal Cabling for Connecting the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) Drive Backplane to the NVMe SSD Adapter

Figure 7-95 Signal cabling for connecting the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane to the NVMe SSD adapter

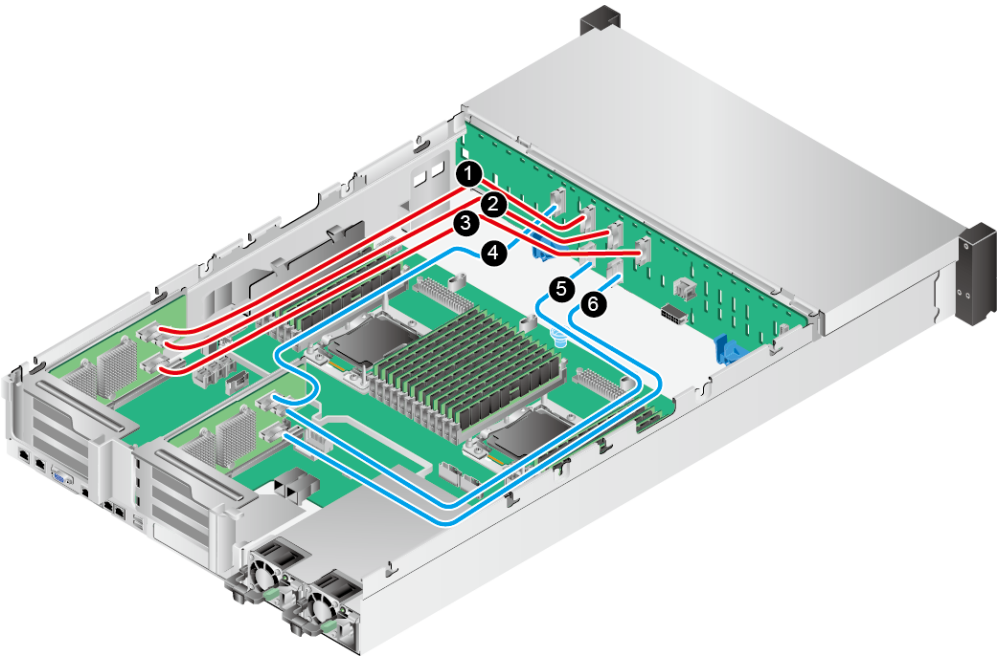

Table 7-95 Signal cabling for connecting the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane to the NVMe SSD adapter

No.	P/N Code	Description
1	04052103-001	Slimline cable for connecting PORT 1C (J19) of the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane to PORT C of NVMe SSD adapter 1
2	04052103-001	Slimline cable for connecting PORT 1B (J18) of the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane to PORT B of NVMe SSD adapter 1
3	04052103-001	Slimline cable for connecting PORT 1A (J17) of the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane to PORT A of NVMe SSD adapter 1
4	04052104-001	Slimline cable for connecting PORT 2C (J31) of the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane to PORT C of NVMe SSD adapter 2

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No.	P/N Code	Description
5	04052104-001	Slimline cable for connecting PORT 2B (J32) of the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane to PORT B of NVMe SSD adapter 2
6	04052104-001	Slimline cable for connecting PORT 2A (J21) of the 20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive backplane to PORT A of NVMe SSD adapter 2

7.12.6 I/O Module 3 (PCIe Riser Card)

I/O Module 3 Cabling

Figure 7-96 I/O module 3 cabling

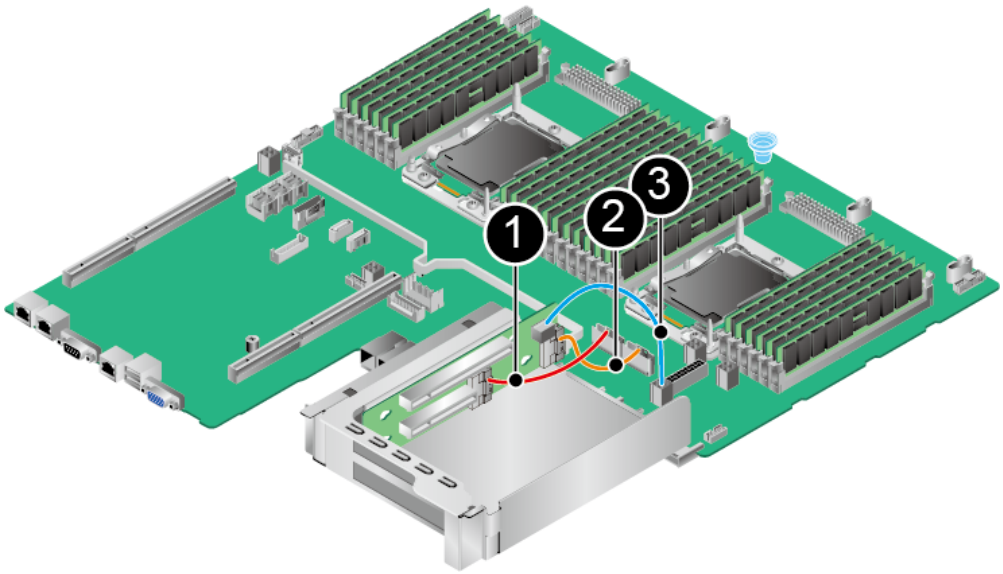

Table 7-96 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline B of the PCIe riser card to Slimline B (J139) of the mainboard

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No.	P/N Code	Description
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline A of the PCIe riser card to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the PCIe riser card to the mainboard (J172)

7.12.7 I/O Module 3 (4 x 2.5" NVMe Drives)

I/O Module 3 Cabling

Figure 7-97 I/O module 3 cabling

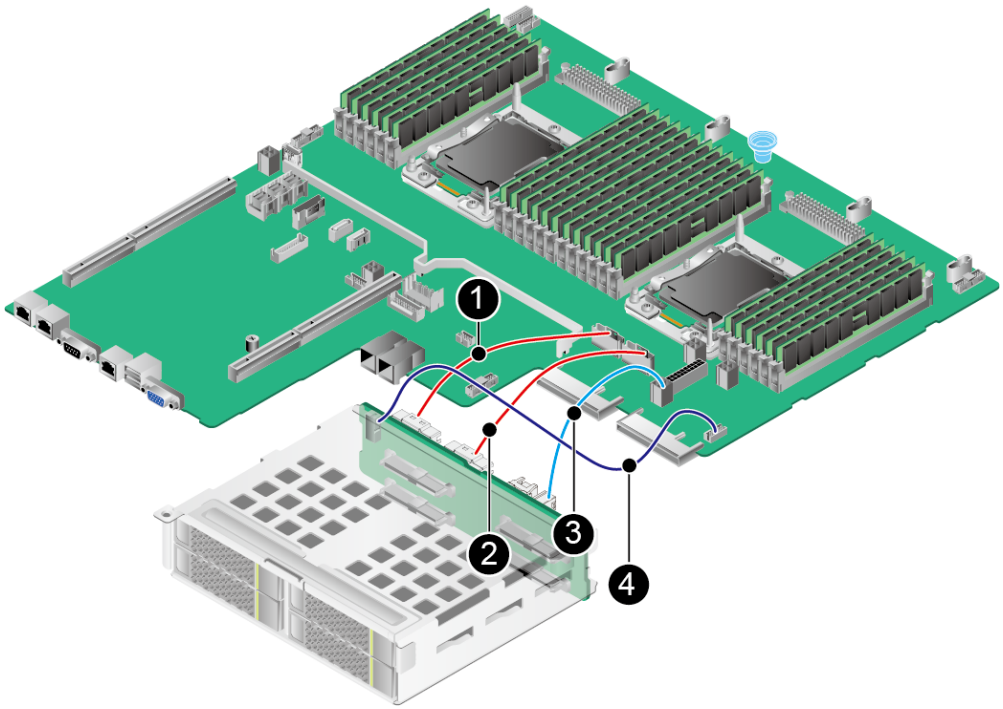

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Table 7-97 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline B (J9) of the 4 x 2.5" drive backplane to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline A (J8) of the 4 x 2.5" drive backplane to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the 4 x 2.5" drive backplane (J22) to the mainboard (J172)
4	04080602	Low-speed signal cable for connecting the 4 x 2.5" drive backplane (J23) to the mainboard (J164)

7.13 24 x 2.5" Drive Pass-through Configuration 1

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7.13.1 USB and VGA Signal Cables

USB and VGA Signal Cabling

Figure 7-98 USB and VGA signal cabling

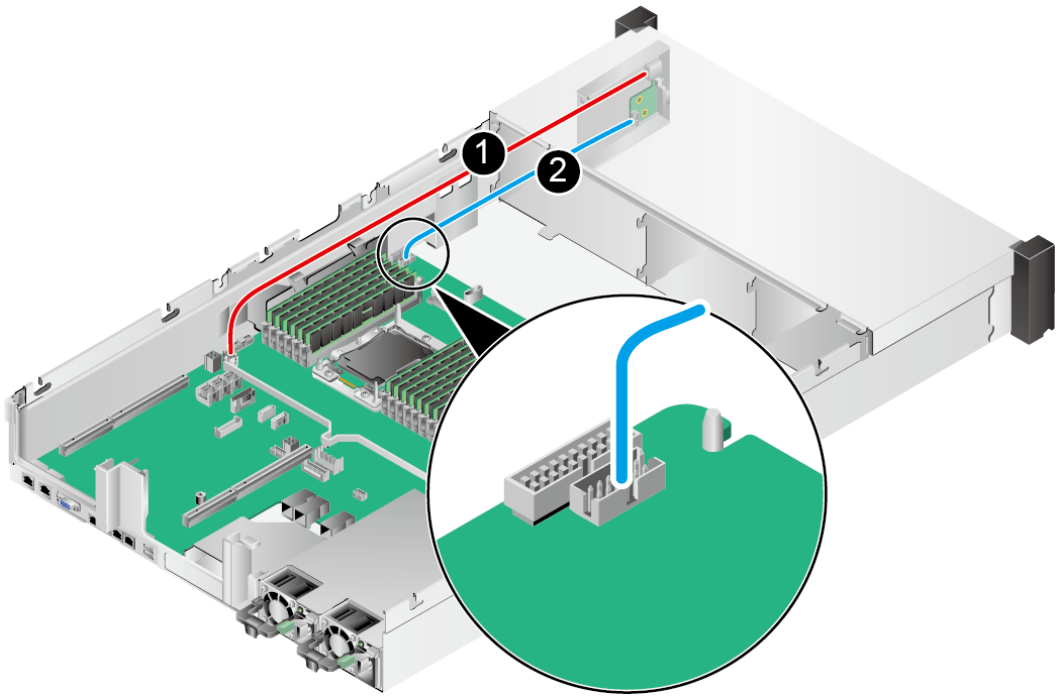

Table 7-98 USB and VGA signal cabling

No.	P/N Code	Description
1	04051947	Signal cable for connecting a front USB device to the mainboard (J173)
2	04051924	Signal cable for connecting the VGA board to the mainboard (J160)

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7.13.2 Left and Right Mounting Ears

Left and Right Mounting Ear Cabling

Figure 7-99 Left and right mounting ear cabling

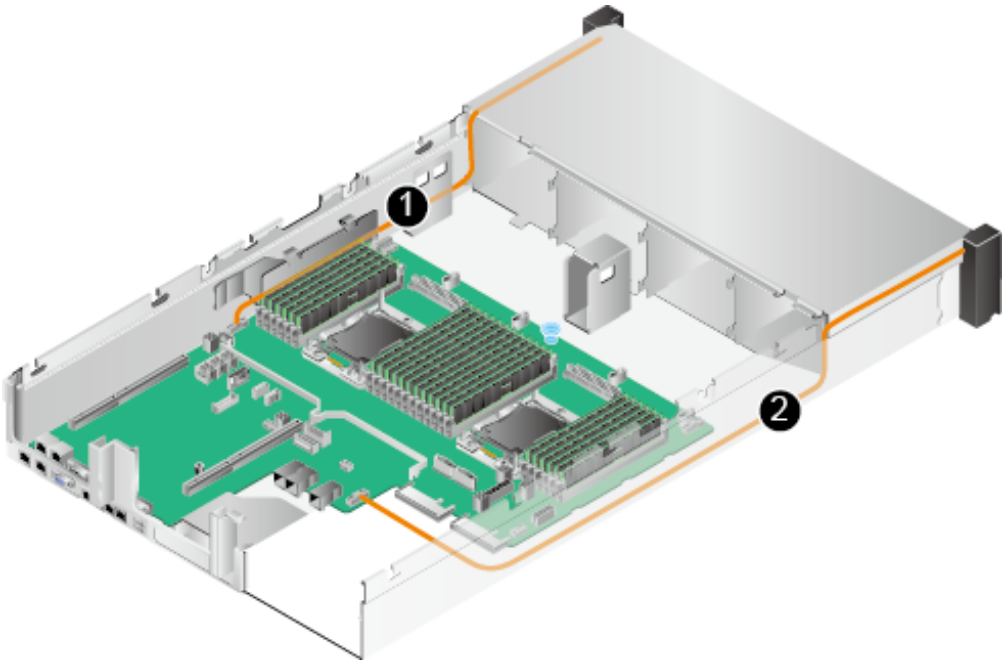

Table 7-99 Left and right mounting ear cabling

No.	P/N Code	Description
1	04051922	Signal cable for connecting the indicator board of the right mounting ear to the mainboard (J167)
2	04051921	Signal cable for connecting the USB board of the left mounting ear to the mainboard (J161)

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7.13.3 NC-SI Cabling

NC-SI Cabling

Figure 7-100 NC-SI cabling

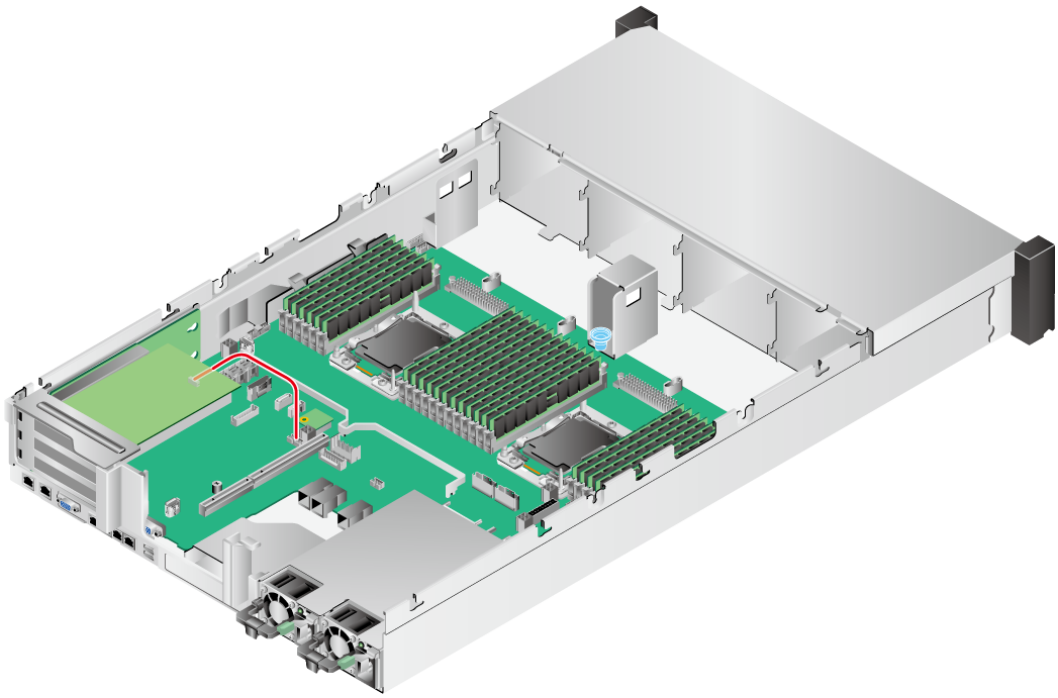

Table 7-100 NC-SI cabling

No.	Part No.	Description
1	04080606 or 04051036	NC-SI cable for connecting the PCIe NIC to the mainboard (J99)

NOTE

This cable is required only when the PCIe NIC supports NC-SI.

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7.13.4 24 x 2.5" Drive Pass-through Backplane Power and Indicator Signal Cables

24 x 2.5" Drive Pass-through Backplane Power and Indicator Signal Cabling

Figure 7-101 24 x 2.5" drive pass-through backplane power and indicator signal cabling

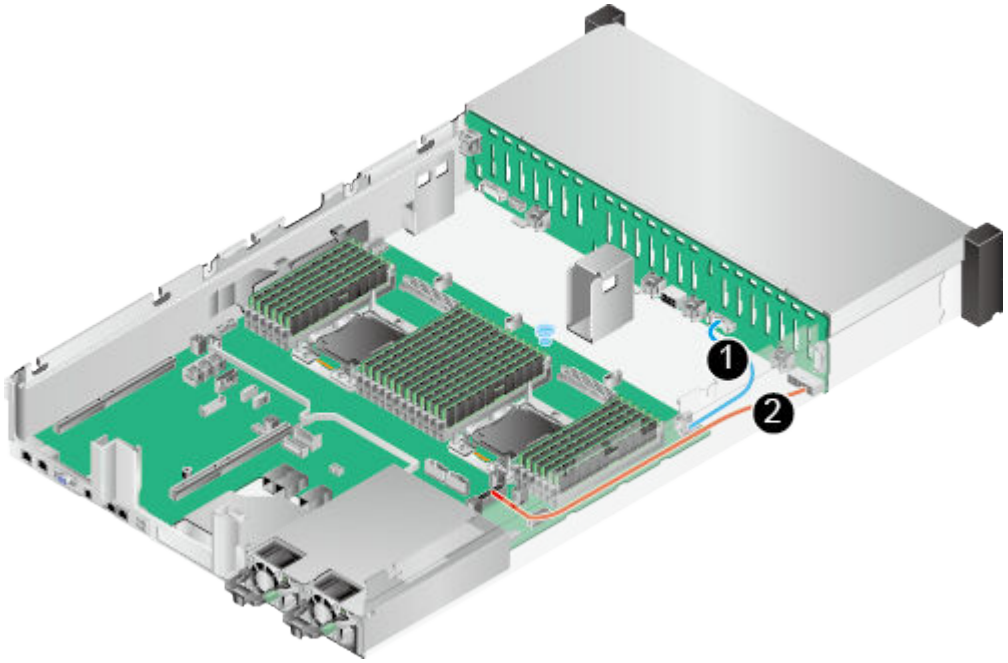

Table 7-101 24 x 2.5" drive pass-through backplane power and indicator signal cabling

No.	P/N Code	Description
1	04051923	Indicator signal cable for connecting the 24 x 2.5" drive pass-through backplane (J1) to the mainboard (J162)
2	04051989	Power cable for connecting the 24 x 2.5" drive pass-through backplane (J24) to the mainboard (J166)

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7.13.5 24 x 2.5" Drive Pass-through Backplane SAS Signal Cables (Server with 1 x Screw-in RAID Controller Card and 2 x PCIe RAID Controller Cards)

24 x 2.5" Drive Pass-through Backplane SAS Signal Cabling

Figure 7-102 24 x 2.5" drive pass-through backplane SAS signal cabling

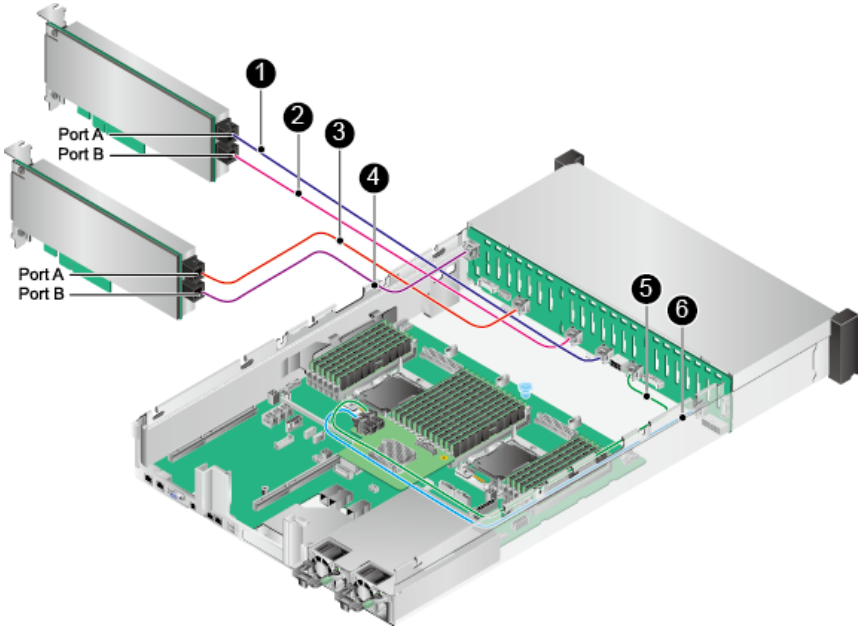

Table 7-102 24 x 2.5" drive pass-through backplane SAS signal cabling

No.	P/N Code	Description
1	04051020	SAS cable for connecting PORT 2A (J30) of the 24 x 2.5" drive pass-through backplane to PORT A of PCIe RAID controller card 1
2	04051020	SAS cable for connecting PORT 2B (J31) of the 24 x 2.5" drive pass-through backplane to PORT B of PCIe RAID controller card 1
3	04051020	SAS cable for connecting PORT 3A (J39) of the 24 x 2.5" drive pass-through backplane to PORT A of PCIe RAID controller card 2
4	04051020	SAS cable for connecting PORT 3B (J33) of the 24 x 2.5" drive pass-through backplane to PORT B of PCIe RAID controller card 2
5	04051021	SAS cable for connecting PORT 1B (J29) of the 24 x 2.5" drive pass-through backplane to PORT B of the screw-in RAID controller card

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No.	P/N Code	Description
6	04051021	SAS cable for connecting PORT 1A (J28) of the 24 x 2.5" drive pass-through backplane to PORT A of the screw-in RAID controller card

NOTE

PCIe RAID controller cards 1 and 2 can be installed only in slots 3 and 6.

7.13.6 I/O Module 3 (PCIe Riser Card)

I/O Module 3 Cabling

Figure 7-103 I/O module 3 cabling

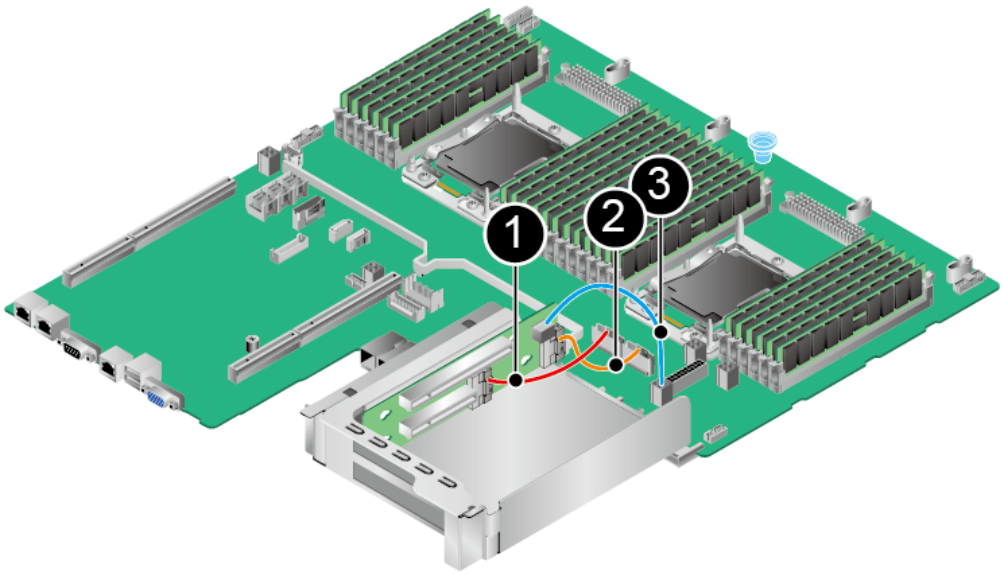

Table 7-103 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline B of the PCIe riser card to Slimline B (J139) of the mainboard

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No.	P/N Code	Description
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline A of the PCIe riser card to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the PCIe riser card to the mainboard (J172)

7.13.7 I/O Module 3 (4 x 2.5" NVMe Drives)

I/O Module 3 Cabling

Figure 7-104 I/O module 3 cabling

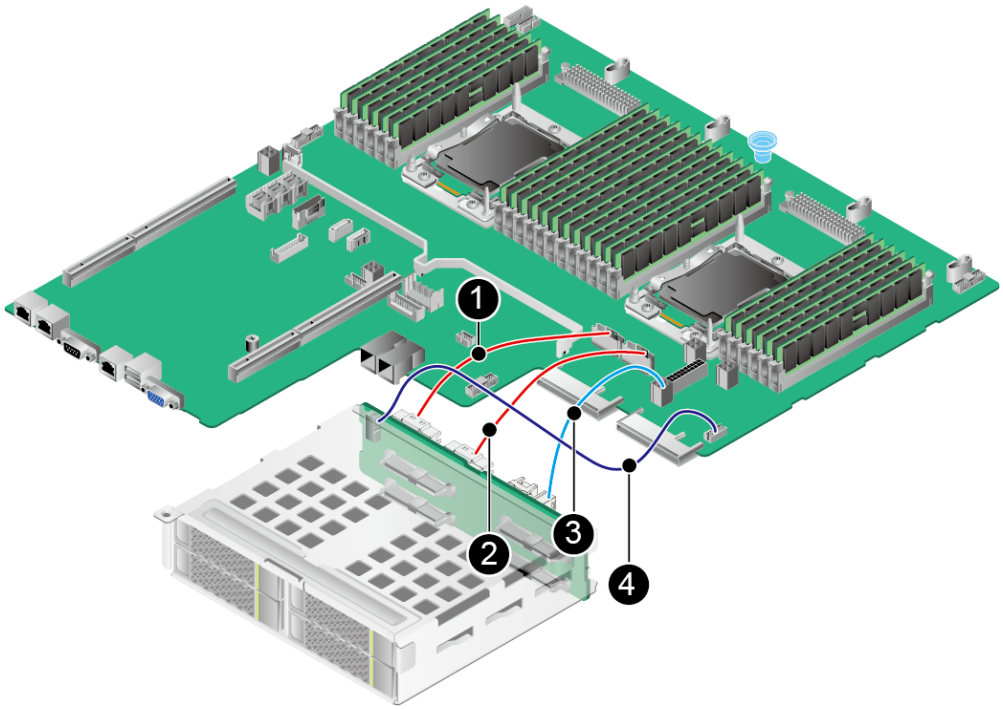

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Table 7-104 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline B (J9) of the 4 x 2.5" drive backplane to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline A (J8) of the 4 x 2.5" drive backplane to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the 4 x 2.5" drive backplane (J22) to the mainboard (J172)
4	04080602	Low-speed signal cable for connecting the 4 x 2.5" drive backplane (J23) to the mainboard (J164)

7.14 24 x 2.5" Drive Pass-through Configuration 2

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7.14.1 USB and VGA Signal Cables

USB and VGA Signal Cabling

Figure 7-105 USB and VGA signal cabling

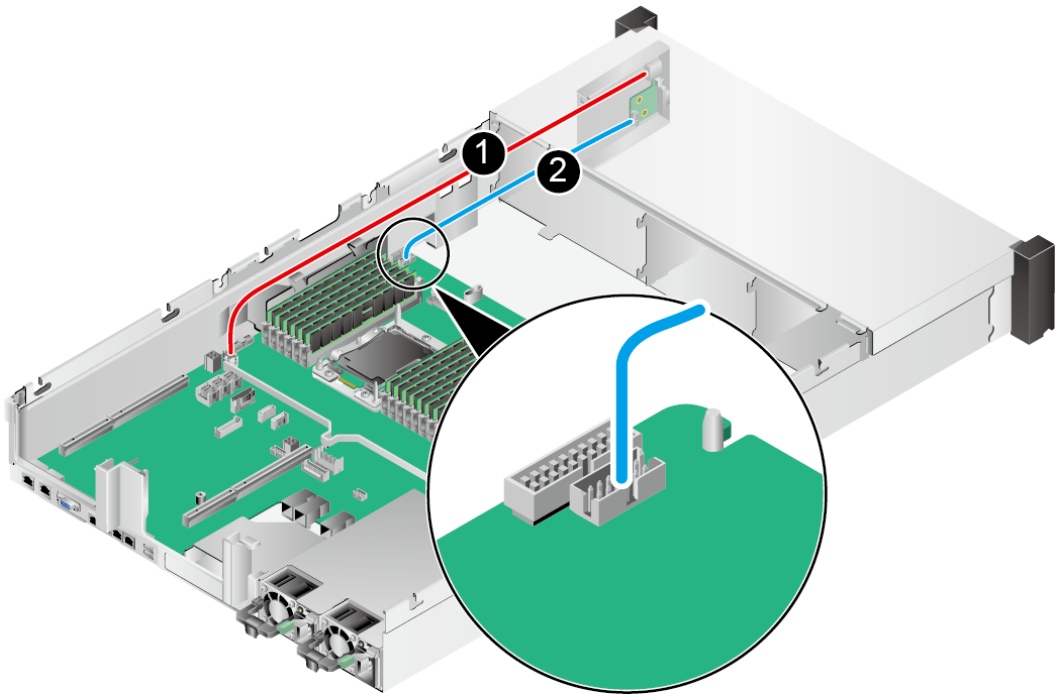

Table 7-105 USB and VGA signal cabling

No.	P/N Code	Description
1	04051947	Signal cable for connecting a front USB device to the mainboard (J173)
2	04051924	Signal cable for connecting the VGA board to the mainboard (J160)

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7.14.2 Left and Right Mounting Ears

Left and Right Mounting Ear Cabling

Figure 7-106 Left and right mounting ear cabling

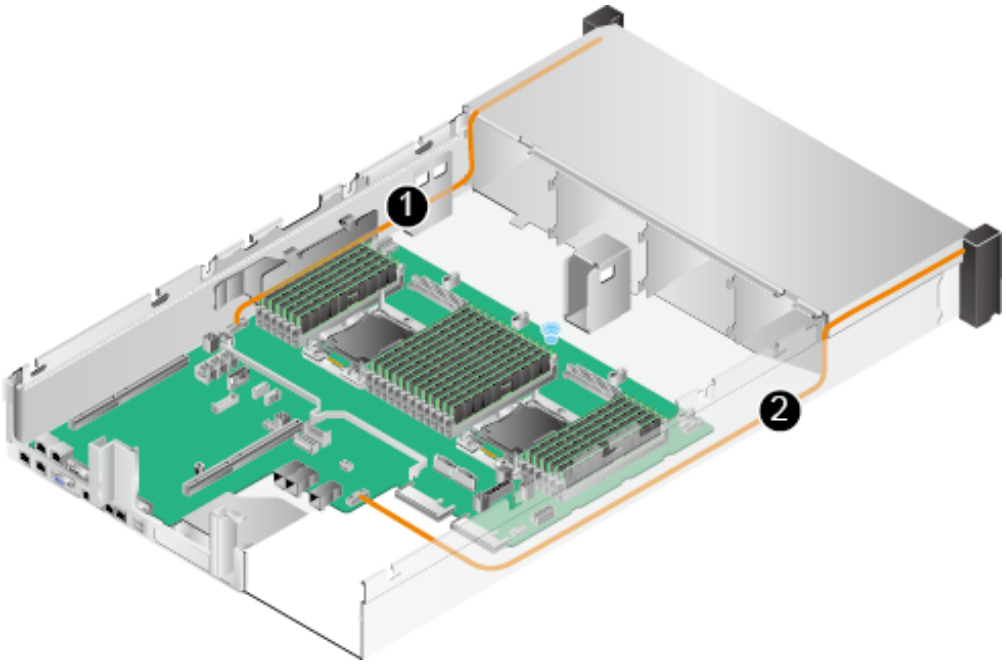

Table 7-106 Left and right mounting ear cabling

No.	P/N Code	Description
1	04051922	Signal cable for connecting the indicator board of the right mounting ear to the mainboard (J167)
2	04051921	Signal cable for connecting the USB board of the left mounting ear to the mainboard (J161)

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7.14.3 NC-SI Cabling

NC-SI Cabling

Figure 7-107 NC-SI cabling

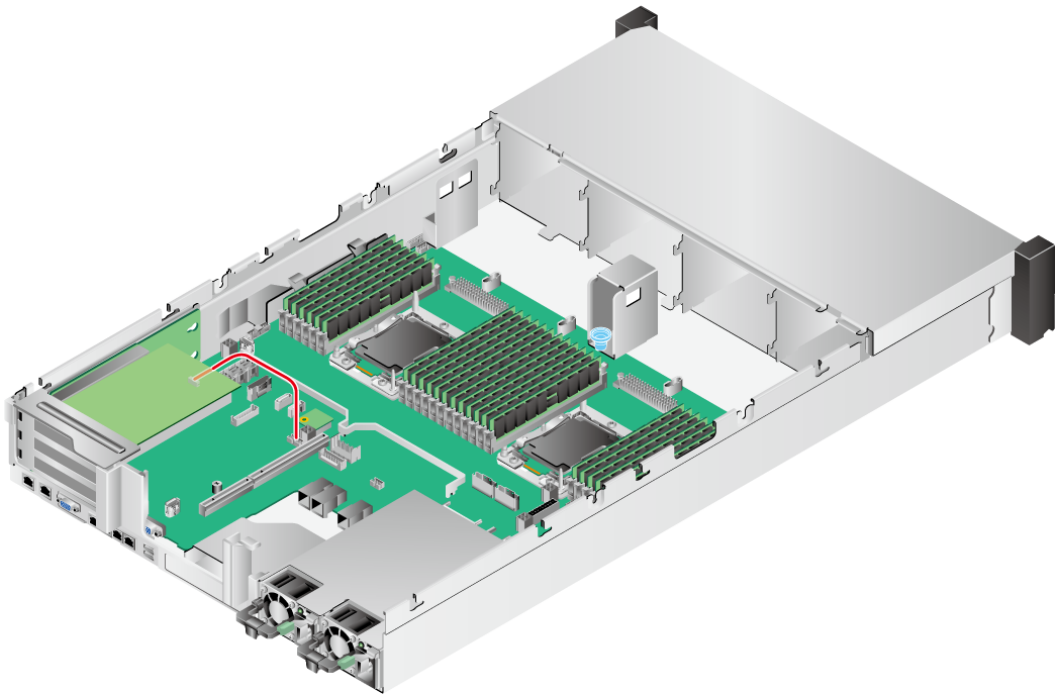

Table 7-107 NC-SI cabling

No.	Part No.	Description
1	04080606 or 04051036	NC-SI cable for connecting the PCIe NIC to the mainboard (J99)

NOTE

This cable is required only when the PCIe NIC supports NC-SI.

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7.14.4 24 x 2.5" Drive Pass-through Backplane Power and Indicator Signal Cables

24 x 2.5" drive pass-through backplane power and indicator signal cabling

Figure 7-108 24 x 2.5" drive pass-through backplane power and indicator signal cabling

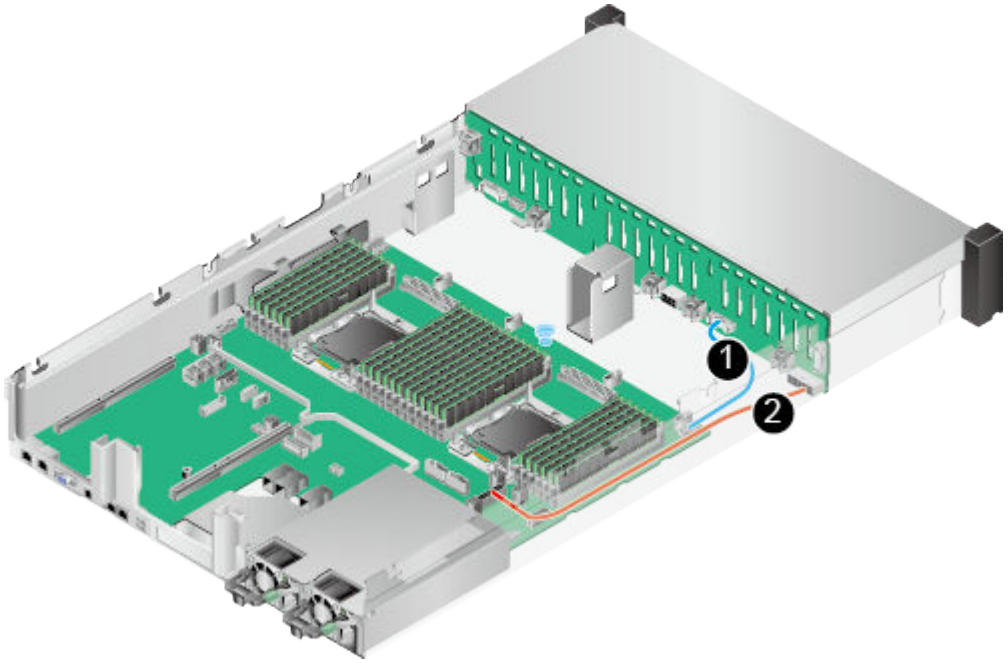

Table 7-108 24 x 2.5" drive pass-through backplane power and indicator signal cabling

No.	P/N Code	Description
1	04051923	Indicator signal cable for connecting the 24 x 2.5" drive pass-through backplane (J1) to the mainboard (J162)
2	04051989	Power cable for connecting the 24 x 2.5" drive pass-through backplane (J24) to the mainboard (J166)

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7.14.5 24 x 2.5" Drive Pass-through Backplane SAS Signal Cables (Server with 3 x Screw-in RAID Controller Cards)

24 x 2.5" Drive Pass-through Backplane SAS Signal Cabling

Figure 7-109 24 x 2.5" drive pass-through backplane SAS signal cabling

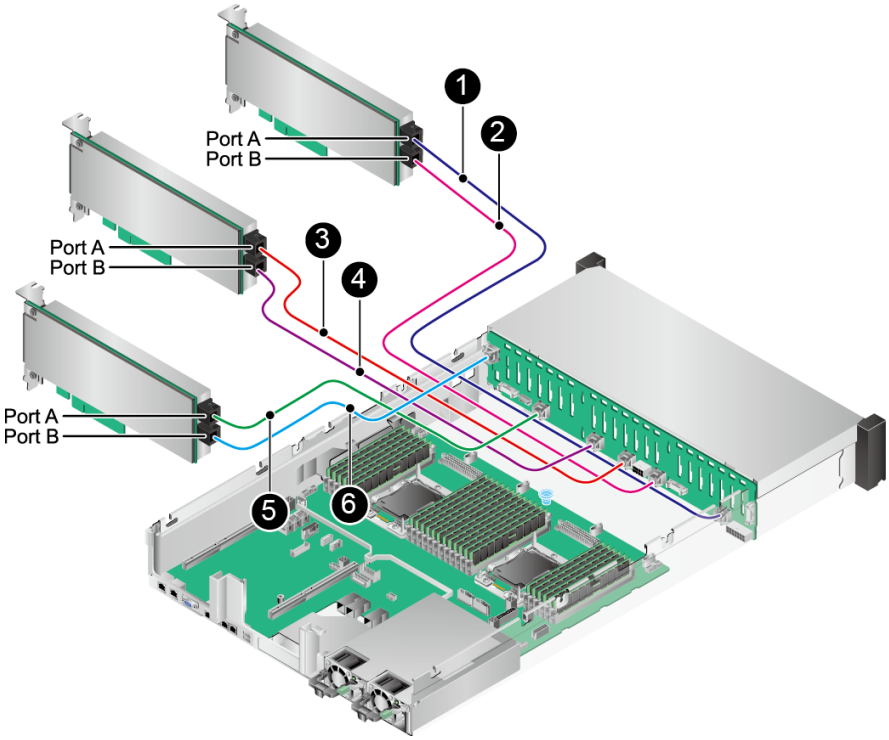

Table 7-109 24 x 2.5" drive pass-through backplane SAS signal cabling

No.	P/N Code	Description
1	04051916-015	SAS cable for connecting PORT 1A (J28) of the 24 x 2.5" drive pass-through backplane to PORT A of PCIe RAID controller card 1
2	04051916-015	SAS cable for connecting PORT 1B (J29) of the 24 x 2.5" drive pass-through backplane to PORT B of PCIe RAID controller card 1
3	04051020	SAS cable for connecting PORT 2A (J30) of the 24 x 2.5" drive pass-through backplane to PORT A of PCIe RAID controller card 2
4	04051020	SAS cable for connecting PORT 2B (J31) of the 24 x 2.5" drive pass-through backplane to PORT B of PCIe RAID controller card 2
5	04051020	SAS cable for connecting PORT 3A (J39) of the 24 x 2.5" drive pass-through backplane to PORT A of PCIe RAID controller card 3

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No.	P/N Code	Description
6	04051020	SAS cable for connecting PORT 3B (J33) of the 24 x 2.5" drive pass-through backplane to PORT B of PCIe RAID controller card 3
NOTE PCIe RAID controller cards 1, 2, and 3 are installed in slots 1, 2, and 6, respectively.		

7.14.6 I/O Module 3 (PCIe Riser Card)

I/O Module 3 Cabling

Figure 7-110 I/O module 3 cabling

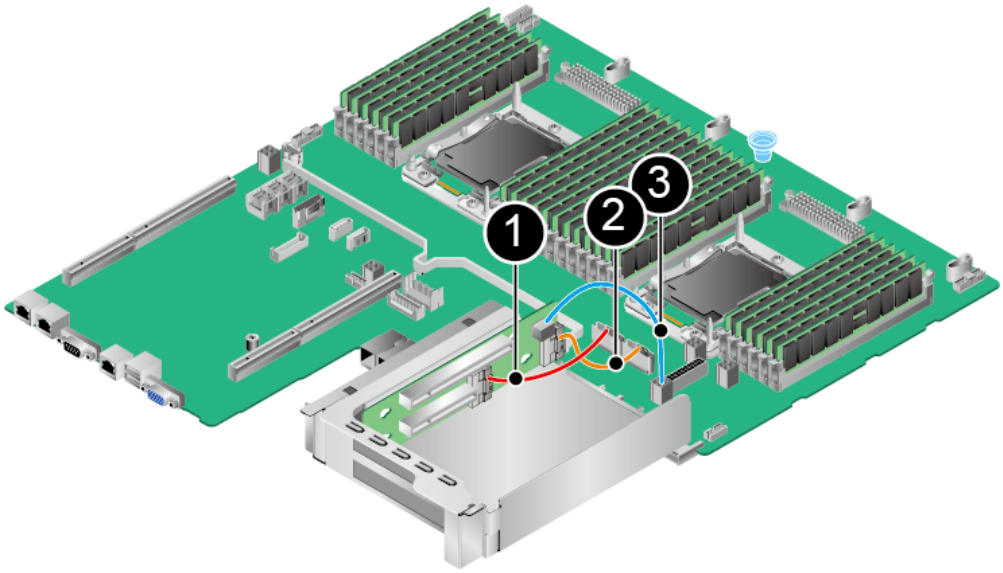

Table 7-110 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline B of the PCIe riser card to Slimline B (J139) of the mainboard

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No.	P/N Code	Description
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline A of the PCIe riser card to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the PCIe riser card to the mainboard (J172)

7.14.7 I/O Module 3 (Server with 4 x 2.5" NVMe Drives)

I/O Module 3 Cabling

Figure 7-111 I/O module 3 cabling

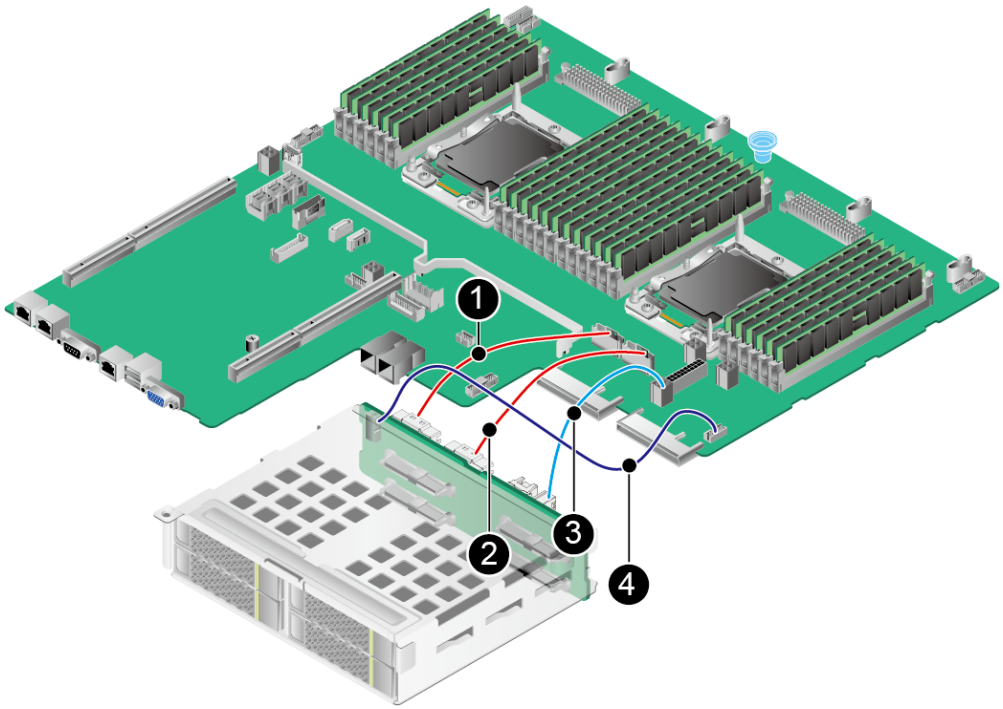

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Table 7-111 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline B (J9) of the 4 x 2.5" drive backplane to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline A (J8) of the 4 x 2.5" drive backplane to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the 4 x 2.5" drive backplane (J22) to the mainboard (J172)
4	04080602	Low-speed signal cable for connecting the 4 x 2.5" drive backplane (J23) to the mainboard (J164)

7.15 24 x 2.5" Drive NVMe Configuration 1

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7.15.1 USB and VGA Signal Cables

USB and VGA Signal Cabling

Figure 7-112 USB and VGA signal cabling

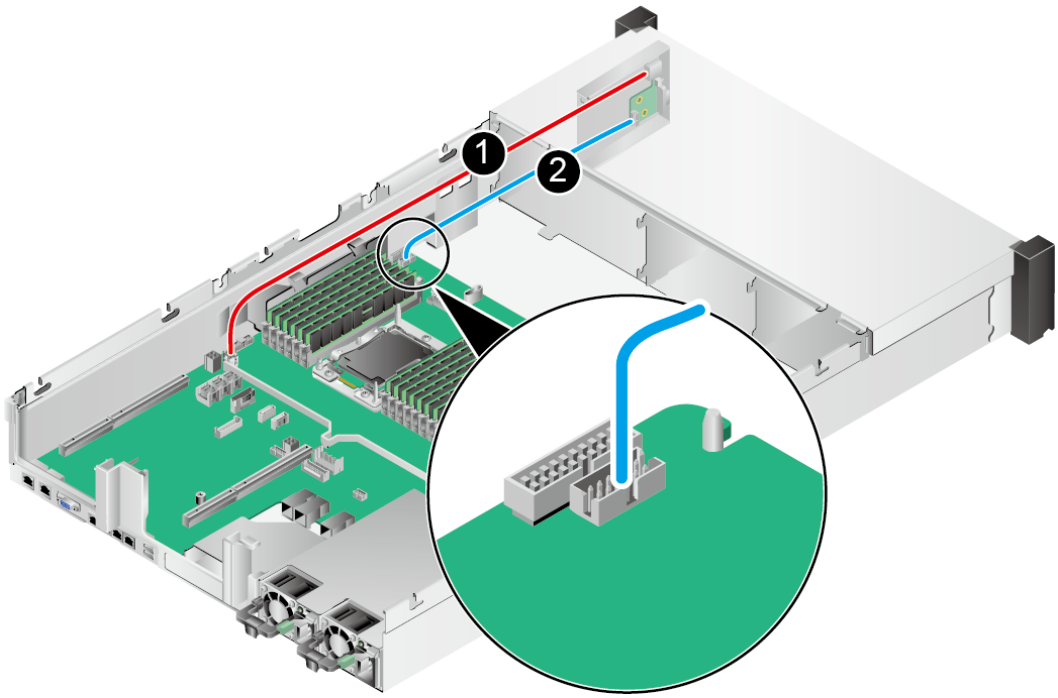

Table 7-112 USB and VGA signal cabling

No.	P/N Code	Description
1	04051947	Signal cable for connecting a front USB device to the mainboard (J173)
2	04051924	Signal cable for connecting the VGA board to the mainboard (J160)

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7.15.2 Left and Right Mounting Ears

Left and Right Mounting Ear Cabling

Figure 7-113 Left and right mounting ear cabling

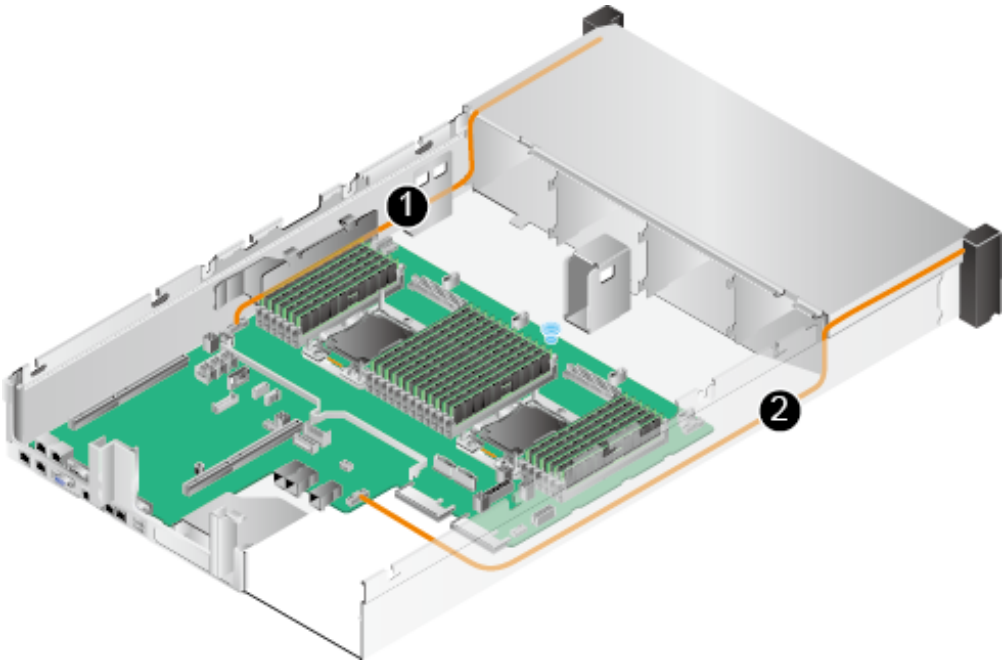

Table 7-113 Left and right mounting ear cabling

No.	P/N Code	Description
1	04051922	Signal cable for connecting the indicator board of the right mounting ear to the mainboard (J167)
2	04051921	Signal cable for connecting the USB board of the left mounting ear to the mainboard (J161)

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7.15.3 NC-SI Cabling

NC-SI Cabling

Figure 7-114 NC-SI cabling

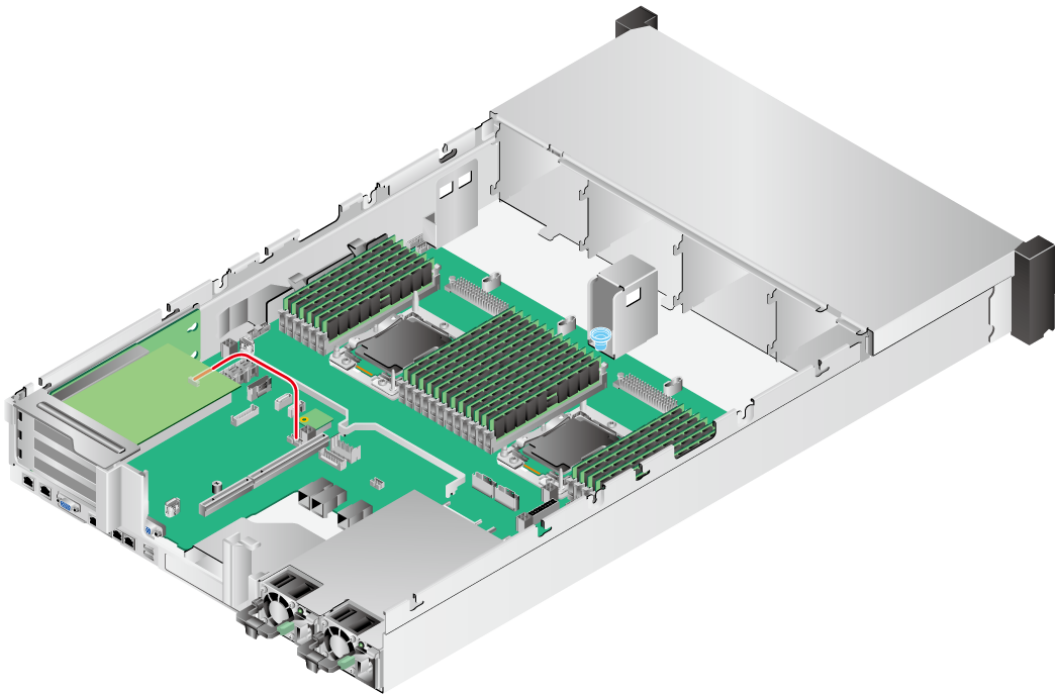

Table 7-114 NC-SI cabling

No.	Part No.	Description
1	04080606 or 04051036	NC-SI cable for connecting the PCIe NIC to the mainboard (J99)

NOTE

This cable is required only when the PCIe NIC supports NC-SI.

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7.15.4 24 x 2.5" Drive NVMe Backplane Power and Indicator Signal Cables

24 x 2.5" Drive NVMe Backplane Power and Indicator Signal Cabling

Figure 7-115 24 x 2.5" drive NVMe backplane power and indicator signal cabling

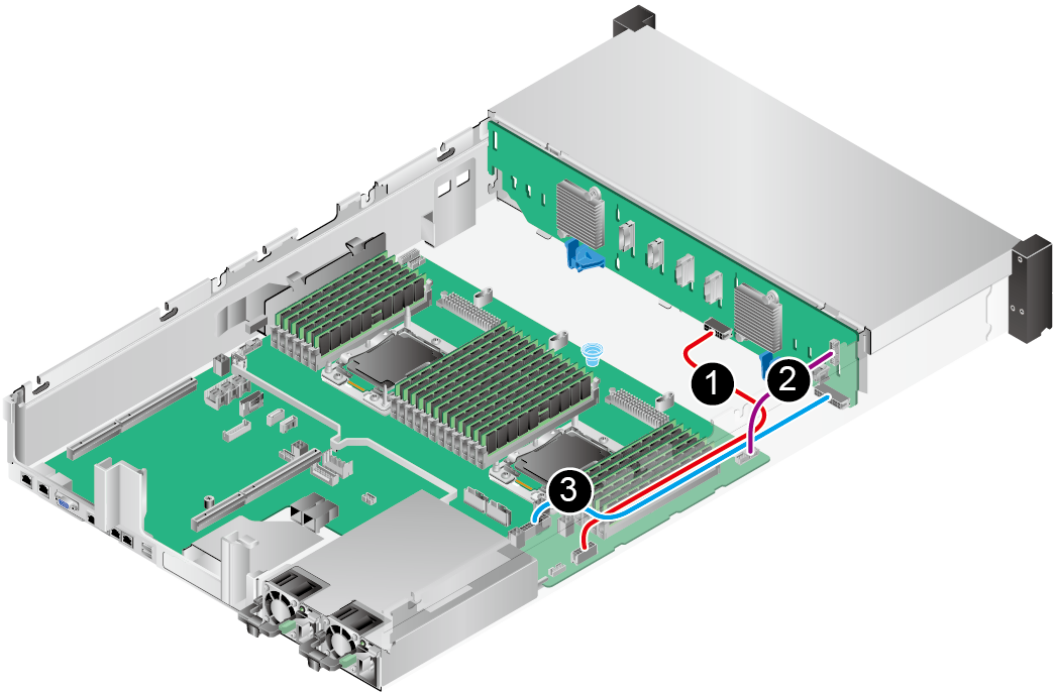

Table 7-115 24 x 2.5" drive NVMe backplane power and indicator signal cabling

No.	P/N Code	Description
1	04152145	Power cable for connecting the 24 x 2.5" drive NVMe backplane (J34) to the mainboard (J128)
2	04080550	Indicator signal cable for connecting the 24 x 2.5" drive NVMe backplane (J3) to the mainboard (J162)
3	04152142	Power cable for connecting the 24 x 2.5" drive NVMe backplane (J2) to the mainboard (J166)

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7.15.5 24 x 2.5" Drive NVMe Backplane SAS Signal Cables (Server with a Screw-in RAID Controller Card)

24 x 2.5" drive NVMe backplane SAS signal cabling

Figure 7-116 24 x 2.5" drive NVMe backplane SAS signal cabling

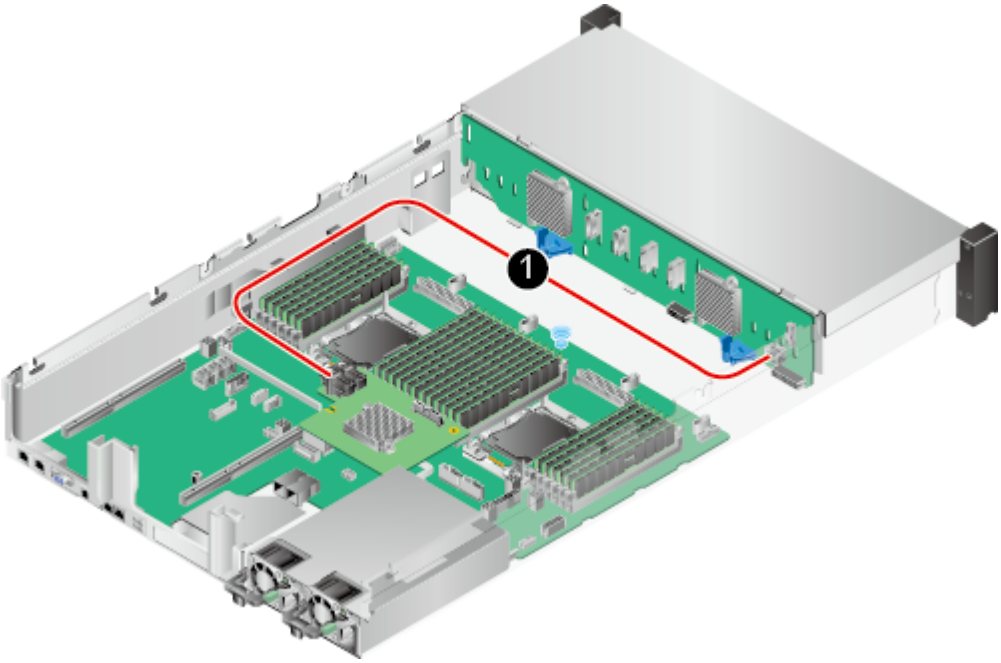

Table 7-116 24 x 2.5" drive NVMe backplane SAS signal cabling

No.	P/N Code	Description
1	04051021	SAS cable for connecting PORT A (J52) of the 24 x 2.5" drive NVMe backplane to PORT A of the screw-in RAID controller card

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7.15.6 Signal Cables for Connecting the 24 x 2.5" Drive NVMe Backplane to the NVMe SSD Adapter

Signal Cabling for Connecting the 24 x 2.5" Drive NVMe Backplane to the NVMe SSD Adapter

Figure 7-117 Signal cabling for connecting the 24 x 2.5" drive NVMe backplane to the NVMe SSD adapter

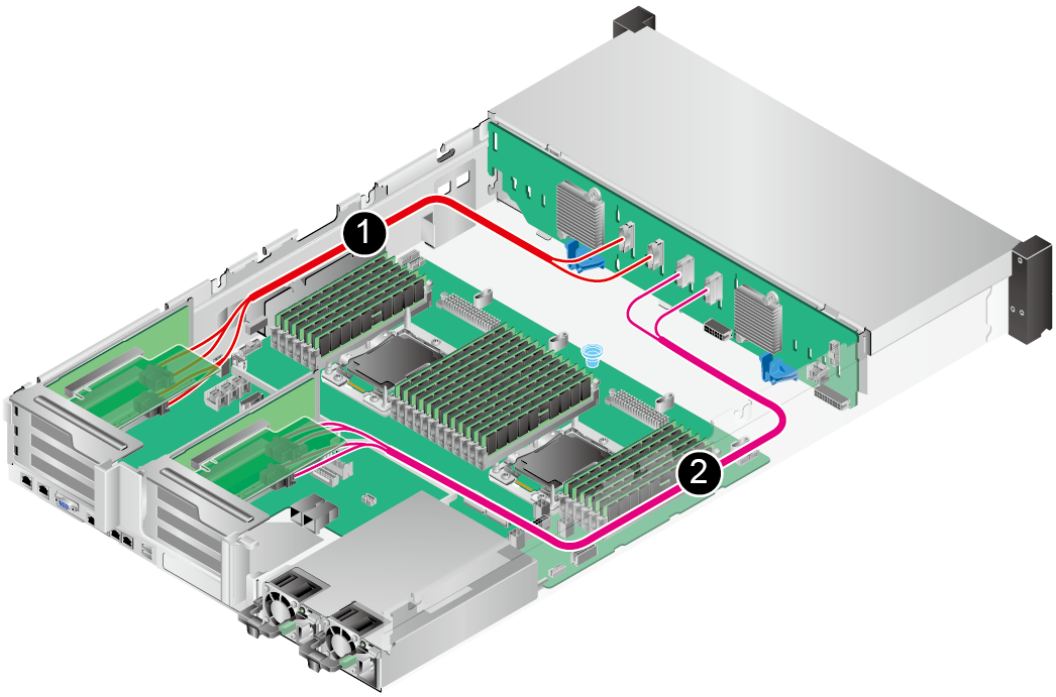

Table 7-117 Signal cabling for connecting the 24 x 2.5" drive NVMe backplane to the NVMe SSD adapter

No.	P/N Code	Description
1	04052105	Signal cable for connecting Slimline A/Slimline B (J6/J5) of the 24 x 2.5" drive NVMe backplane to NVMe SSD adapter 1
2	04052105-001	Signal cable for connecting Slimline C/Slimline D (J7/J8) of the 24 x 2.5" drive NVMe backplane to NVMe SSD adapter 2

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NOTE

- Connect cables according to port labels on cables and silk screens on the NVMe adapter or drive backplane. For example, connect the cable labeled PORT 0 to PORT 0 of the NVMe adapter, and connect the cable labeled PORT A to PORT A of the drive backplane.
- When connecting slimline cables, connect the shorter cables and then the longer ones.
- To facilitate operations, remove the backplane before removing the power cables.

7.15.7 I/O Module 3 (PCIe Riser Card)

I/O Module 3 Cabling

Figure 7-118 I/O module 3 cabling

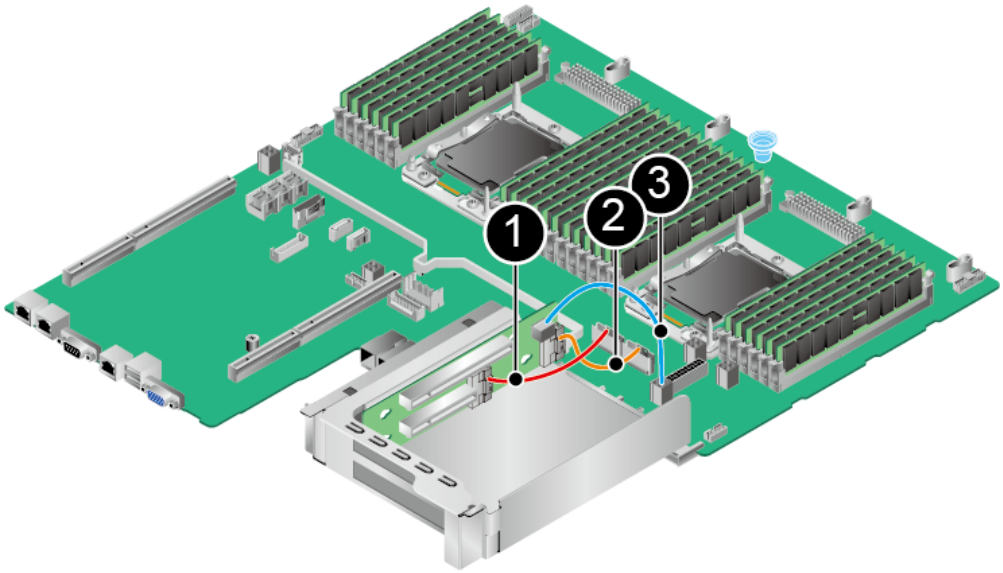

Table 7-118 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline B of the PCIe riser card to Slimline B (J139) of the mainboard

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No.	P/N Code	Description
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline A of the PCIe riser card to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the PCIe riser card to the mainboard (J172)

7.15.8 I/O Module 3 (4 x 2.5" NVMe Drives)

I/O Module 3 Cabling

Figure 7-119 I/O module 3 cabling

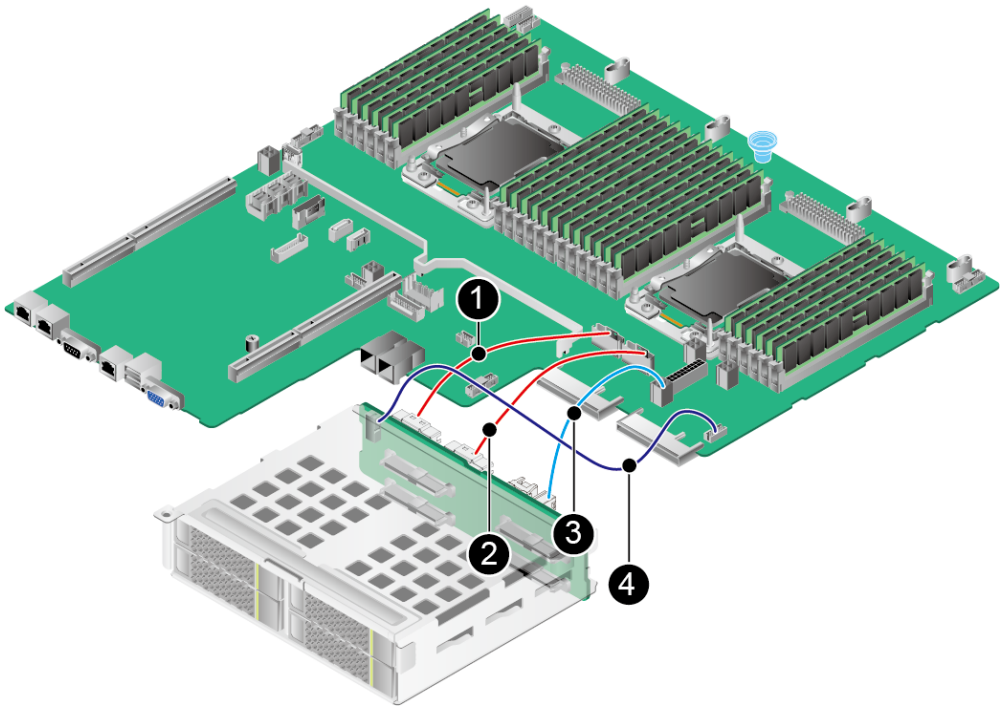

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Table 7-119 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline B (J9) of the 4 x 2.5" drive backplane to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline A (J8) of the 4 x 2.5" drive backplane to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the 4 x 2.5" drive backplane (J22) to the mainboard (J172)
4	04080602	Low-speed signal cable for connecting the 4 x 2.5" drive backplane (J23) to the mainboard (J164)

7.16 24 x 2.5" Drive NVMe Configuration 2

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7.16.1 USB and VGA Signal Cables

USB and VGA Signal Cabling

Figure 7-120 USB and VGA signal cabling

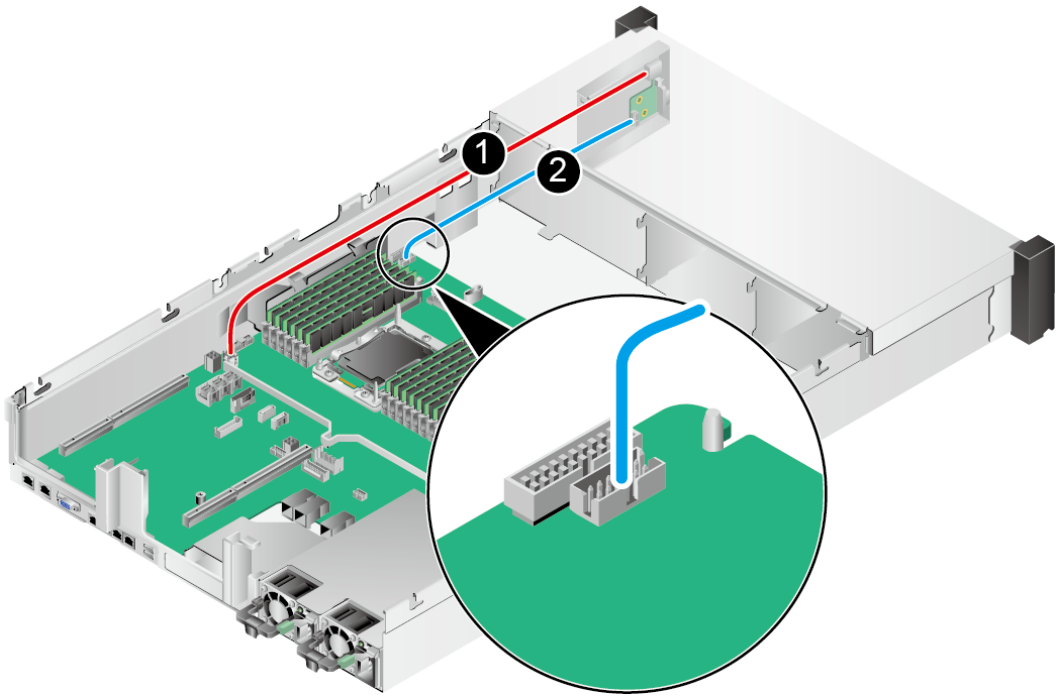

Table 7-120 USB and VGA signal cabling

No.	P/N Code	Description
1	04051947	Signal cable for connecting a front USB device to the mainboard (J173)
2	04051924	Signal cable for connecting the VGA board to the mainboard (J160)

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7.16.2 Left and Right Mounting Ears

Left and Right Mounting Ear Cabling

Figure 7-121 Left and right mounting ear cabling

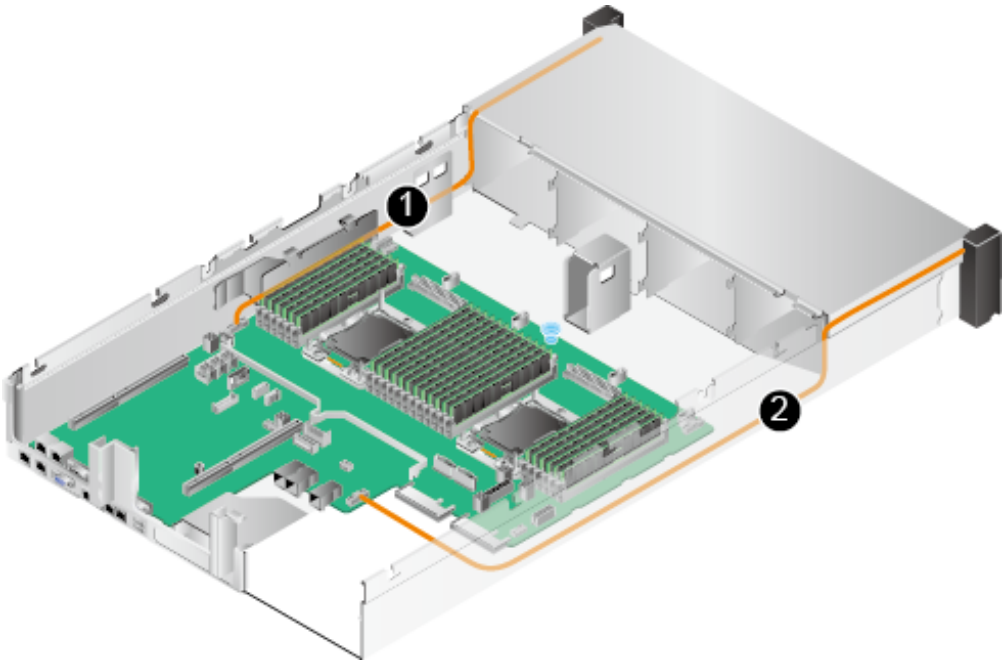

Table 7-121 Left and right mounting ear cabling

No.	P/N Code	Description
1	04051922	Signal cable for connecting the indicator board of the right mounting ear to the mainboard (J167)
2	04051921	Signal cable for connecting the USB board of the left mounting ear to the mainboard (J161)

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7.16.3 NC-SI Cabling

NC-SI Cabling

Figure 7-122 NC-SI cabling

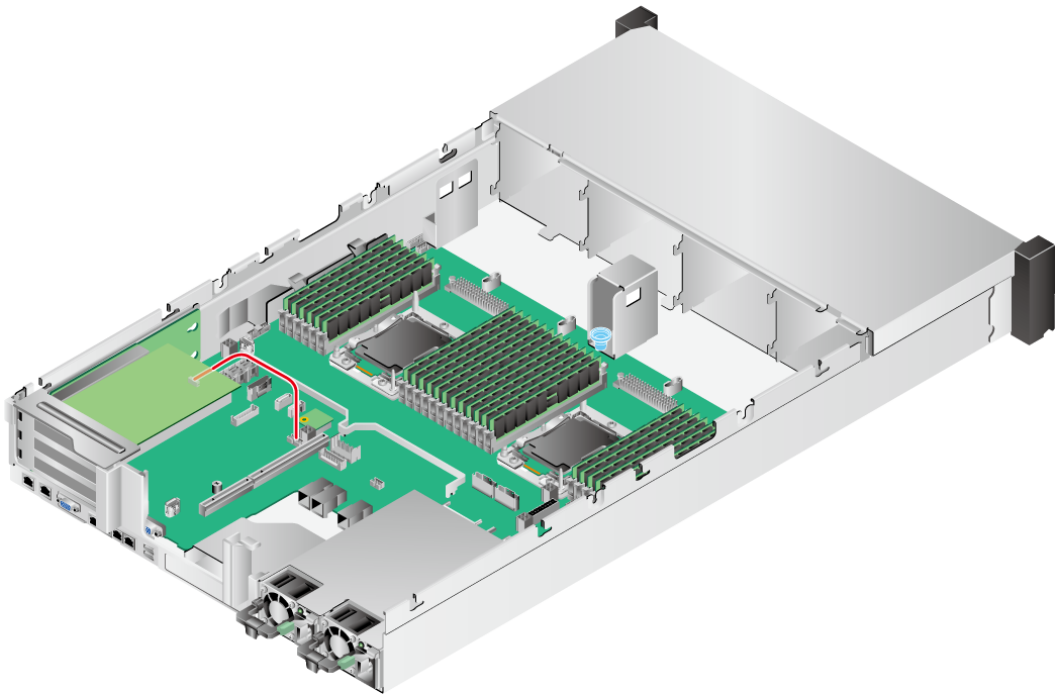

Table 7-122 NC-SI cabling

No.	Part No.	Description
1	04080606 or 04051036	NC-SI cable for connecting the PCIe NIC to the mainboard (J99)

NOTE

This cable is required only when the PCIe NIC supports NC-SI.

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7.16.4 24 x 2.5" Drive NVMe Backplane Power and Indicator Signal Cables

24 x 2.5" Drive NVMe Backplane Power and Indicator Signal Cabling

Figure 7-123 24 x 2.5" drive NVMe backplane power and indicator signal cabling

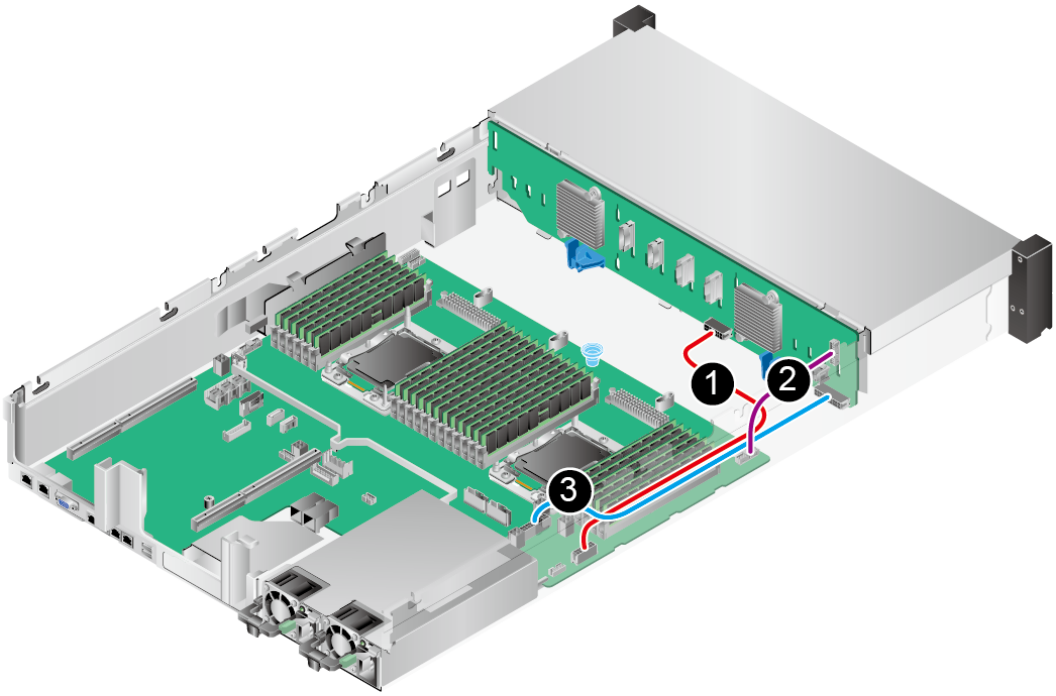

Table 7-123 24 x 2.5" drive NVMe backplane power and indicator signal cabling

No.	P/N Code	Description
1	04152145	Power cable for connecting the 24 x 2.5" drive NVMe backplane (J34) to the mainboard (J128)
2	04080550	Indicator signal cable for connecting the 24 x 2.5" drive NVMe backplane (J3) to the mainboard (J162)
3	04152142	Power cable for connecting the 24 x 2.5" drive NVMe backplane (J2) to the mainboard (J166)

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7.16.5 24 x 2.5" Drive NVMe Backplane SAS Signal Cabling (PCH Pass-through)

24 x 2.5" drive NVMe backplane SAS signal cabling

Figure 7-124 24 x 2.5" drive NVMe backplane SAS signal cabling

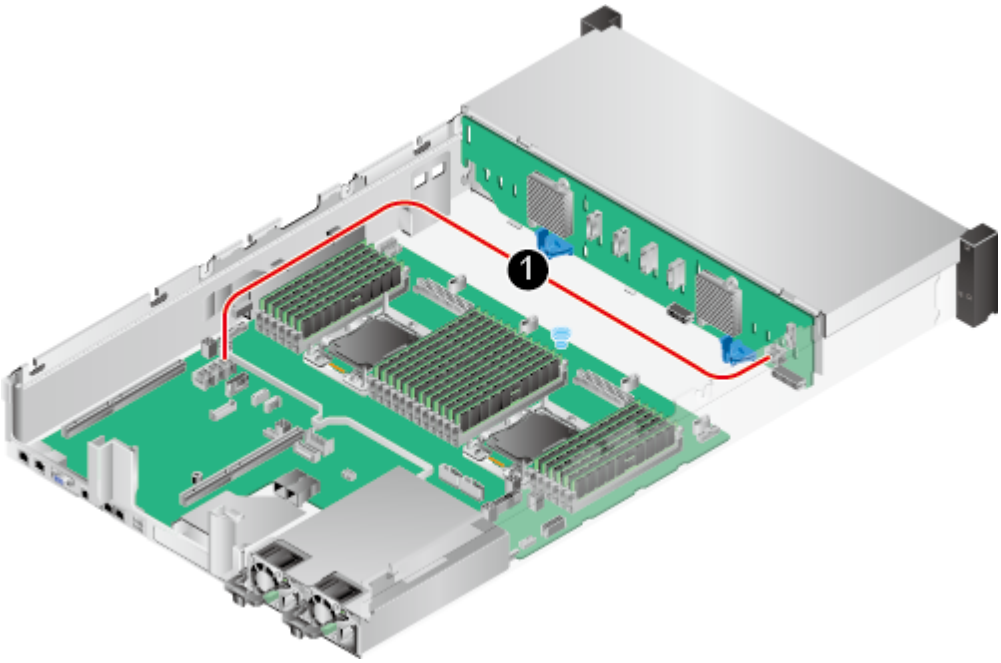

Table 7-124 24 x 2.5" drive NVMe backplane SAS signal cabling

No.	P/N Code	Description
1	04051021	SAS cable for connecting PORT A (J52) of the 24 x 2.5" drive backplane to mini-SAS HD connector A (MINIHD PORT A/J86) of the mainboard

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7.16.6 Signal Cables for Connecting the 24 x 2.5" Drive NVMe Backplane to the NVMe SSD Adapter

Signal Cabling for Connecting the 24 x 2.5" Drive NVMe Backplane to the NVMe SSD Adapter

Figure 7-125 Signal cabling for connecting the 24 x 2.5" drive NVMe backplane to the NVMe SSD adapter

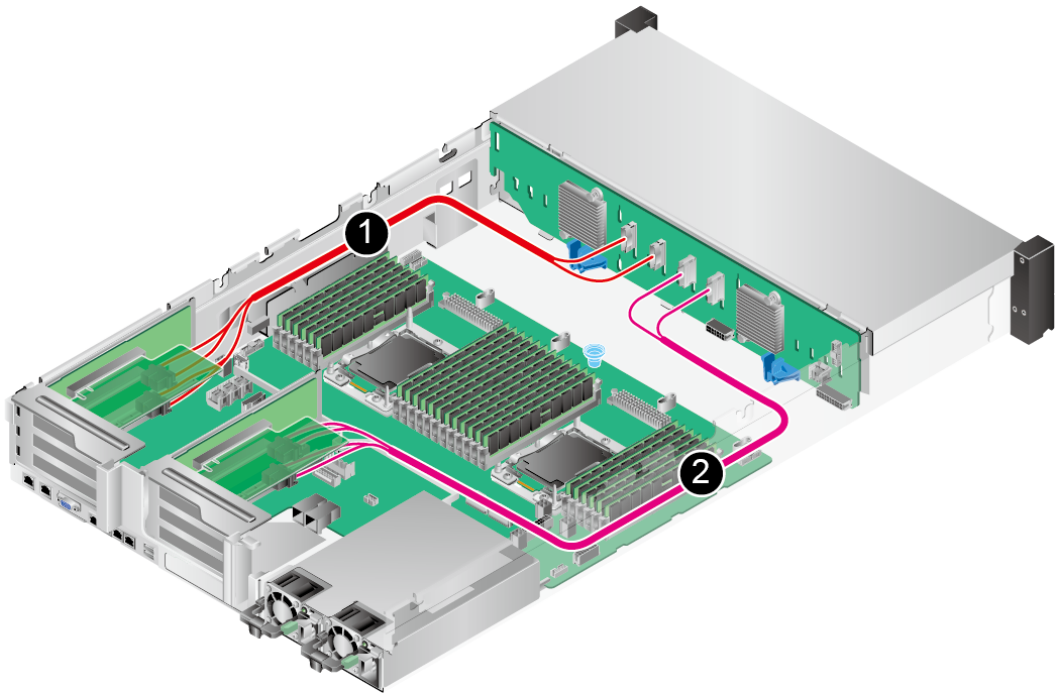

Table 7-125 Signal cabling for connecting the 24 x 2.5" drive NVMe backplane to the NVMe SSD adapter

No.	P/N Code	Description
1	04052105	Signal cable for connecting Slimline A/Slimline B (J6/J5) of the 24 x 2.5" drive NVMe backplane to NVMe SSD adapter 1
2	04052105-001	Signal cable for connecting Slimline C/Slimline D (J7/J8) of the 24 x 2.5" drive NVMe backplane to NVMe SSD adapter 2

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NOTE

- Connect cables according to port labels on cables and silk screens on the NVMe adapter or drive backplane. For example, connect the cable labeled PORT 0 to PORT 0 of the NVMe adapter, and connect the cable labeled PORT A to PORT A of the drive backplane.
- When connecting slimline cables, connect the shorter cables and then the longer ones.
- To facilitate operations, remove the backplane before removing the power cables.

7.16.7 I/O Module 3 (PCIe Riser Card)

I/O Module 3 Cabling

Figure 7-126 I/O module 3 cabling

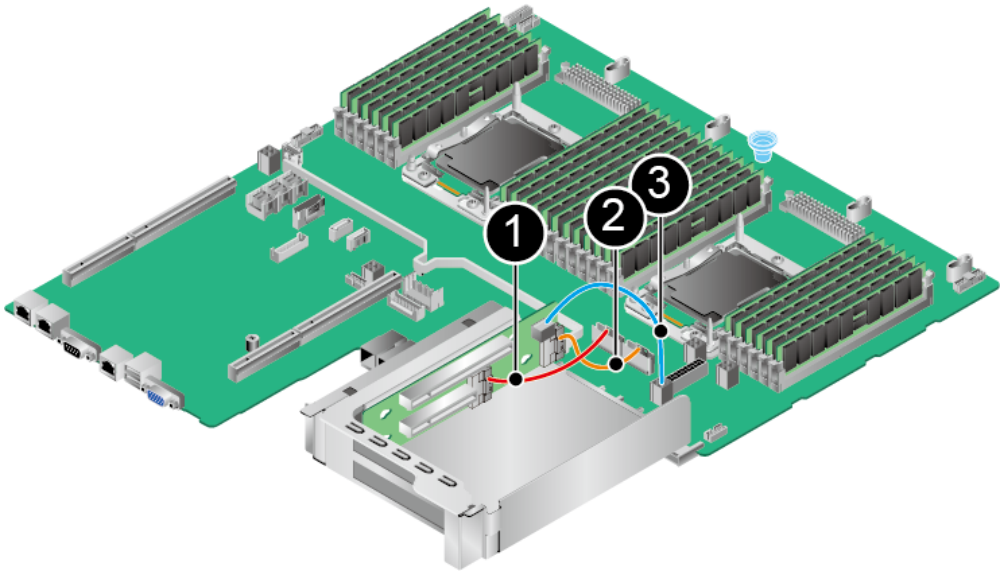

Table 7-126 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline B of the PCIe riser card to Slimline B (J139) of the mainboard

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No.	P/N Code	Description
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline A of the PCIe riser card to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the PCIe riser card to the mainboard (J172)

7.16.8 I/O Module 3 (4 x 2.5" NVMe Drives)

I/O Module 3 Cabling

Figure 7-127 I/O module 3 cabling

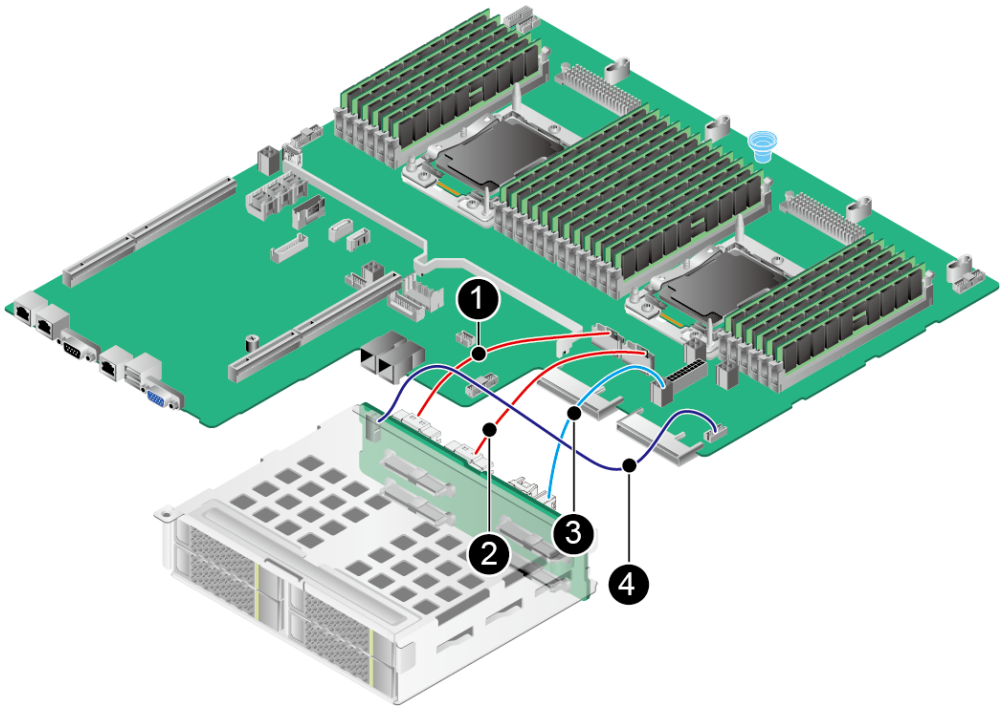

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Table 7-127 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline B (J9) of the 4 x 2.5" drive backplane to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline A (J8) of the 4 x 2.5" drive backplane to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the 4 x 2.5" drive backplane (J22) to the mainboard (J172)
4	04080602	Low-speed signal cable for connecting the 4 x 2.5" drive backplane (J23) to the mainboard (J164)

7.17 Server with 25 x 2.5" Drives (Expander) 1

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7.17.1 Left and Right Mounting Ears

Left and Right Mounting Ear Cabling

Figure 7-128 Left and right mounting ear cabling

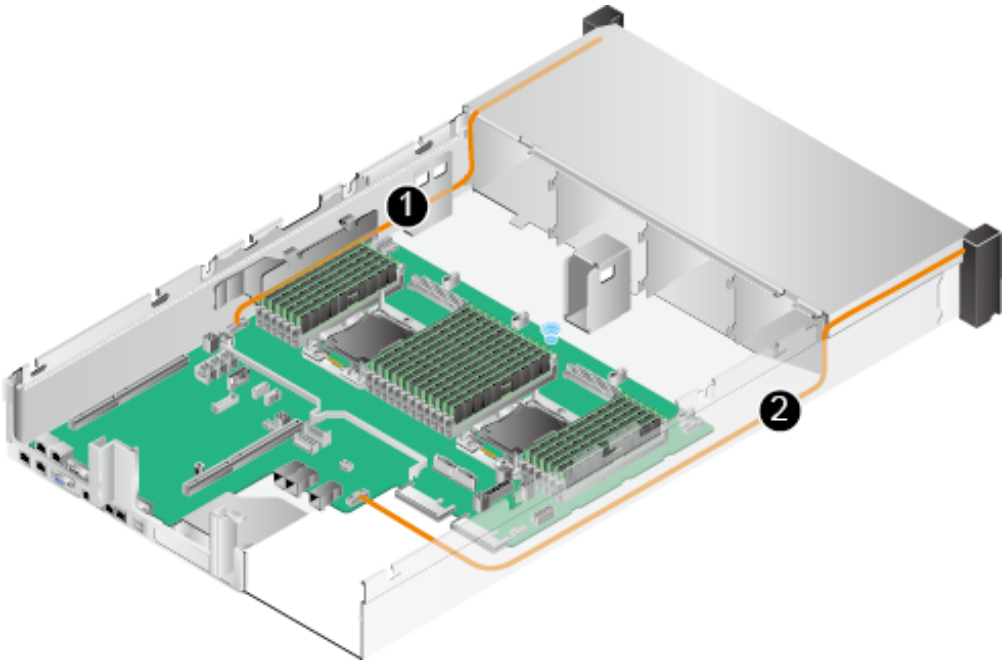

Table 7-128 Left and right mounting ear cabling

No.	P/N Code	Description
1	04051922	Signal cable for connecting the indicator board of the right mounting ear to the mainboard (J167)
2	04051921	Signal cable for connecting the USB board of the left mounting ear to the mainboard (J161)

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7.17.2 NC-SI Cabling

NC-SI Cabling

Figure 7-129 NC-SI cabling

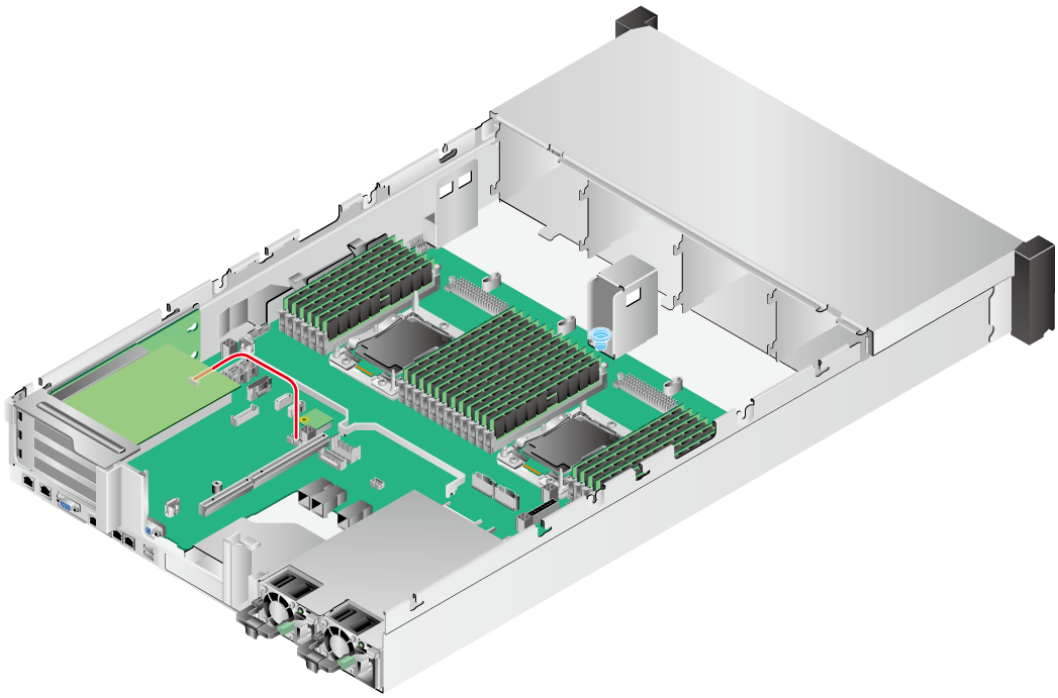

Table 7-129 NC-SI cabling

No.	Part No.	Description
1	04080606 or 04051036	NC-SI cable for connecting the PCIe NIC to the mainboard (J99)

NOTE

This cable is required only when the PCIe NIC supports NC-SI.

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7.17.3 25 x 2.5" Drive EXP Backplane Power and Indicator Signal Cables

25 x 2.5" Drive EXP Backplane Power and Indicator Signal Cabling

Figure 7-130 25 x 2.5" drive EXP backplane power and indicator signal cabling

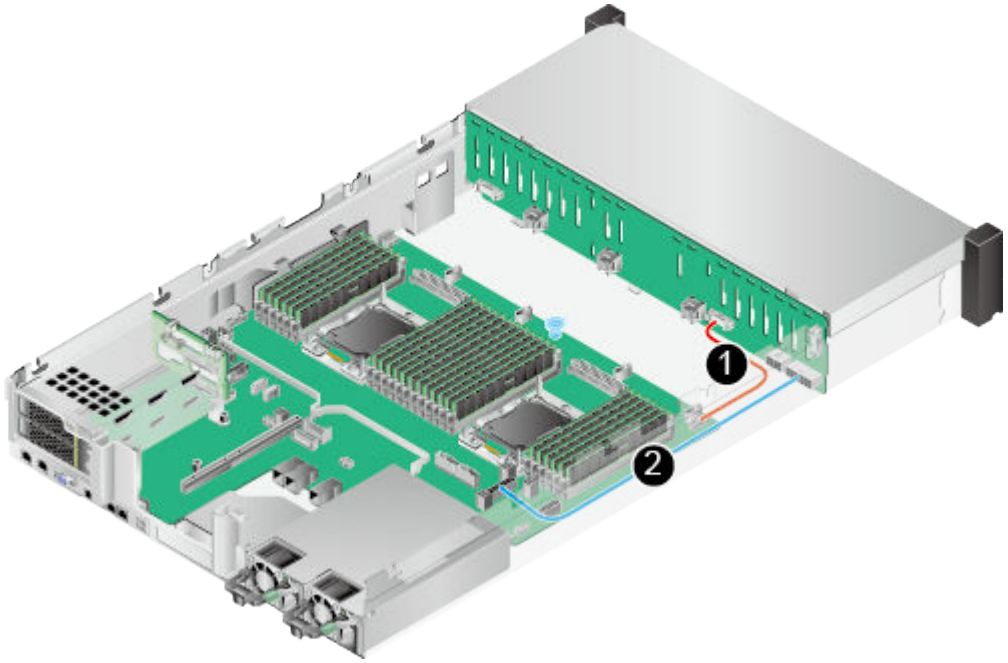

Table 7-130 25 x 2.5" drive EXP backplane power and indicator signal cabling

No.	P/N Code	Description
1	04051923	Indicator signal cable for connecting the 25 x 2.5" drive EXP backplane (J1) to the mainboard (J162)
2	04051989	Power cable for connecting the 25 x 2.5" drive EXP backplane (J24) to the mainboard (J166)

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7.17.4 25 x 2.5" Drive EXP Backplane SAS Signal Cables (Server with a Screw-in RAID Controller Card)

25 x 2.5" Drive EXP Backplane SAS Signal Cabling

Figure 7-131 25 x 2.5" drive EXP backplane SAS signal cabling

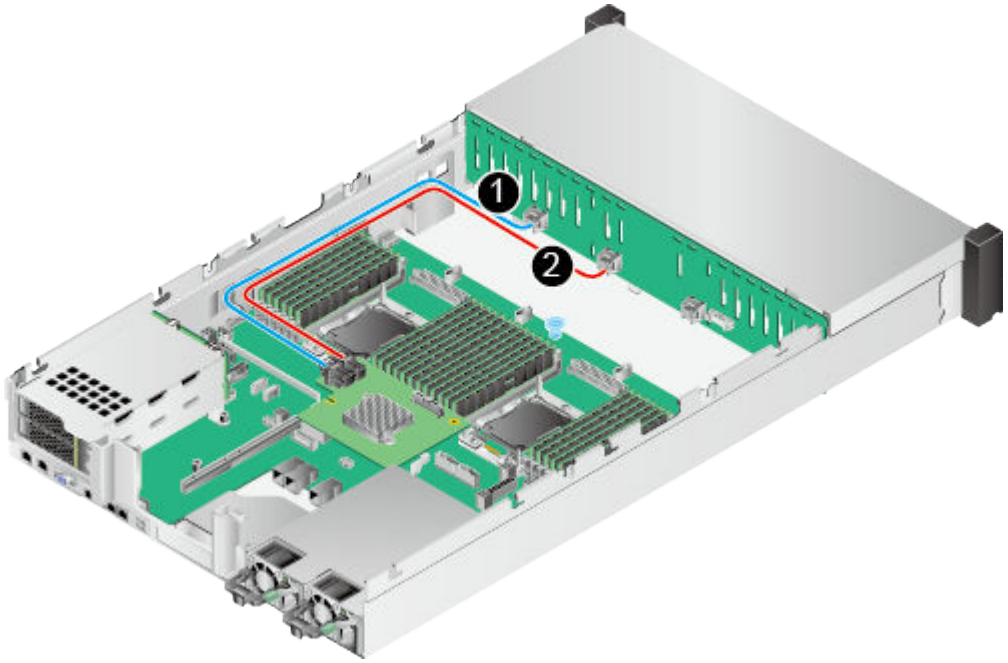

Table 7-131 25 x 2.5" drive EXP backplane SAS signal cabling

No.	P/N Code	Description
1	04051018	SAS cable for connecting PORT A (J28) of the 25 x 2.5" drive EXP backplane to PORT A of the screw-in RAID controller card
2	04051018	SAS cable for connecting PORT B (J29) of the 25 x 2.5" drive EXP backplane to PORT B of the screw-in RAID controller card

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7.17.5 I/O Module 1 (2 x 3.5" SAS/SATA Drives)

I/O Module 1 Cabling

Figure 7-132 I/O module 1 cabling

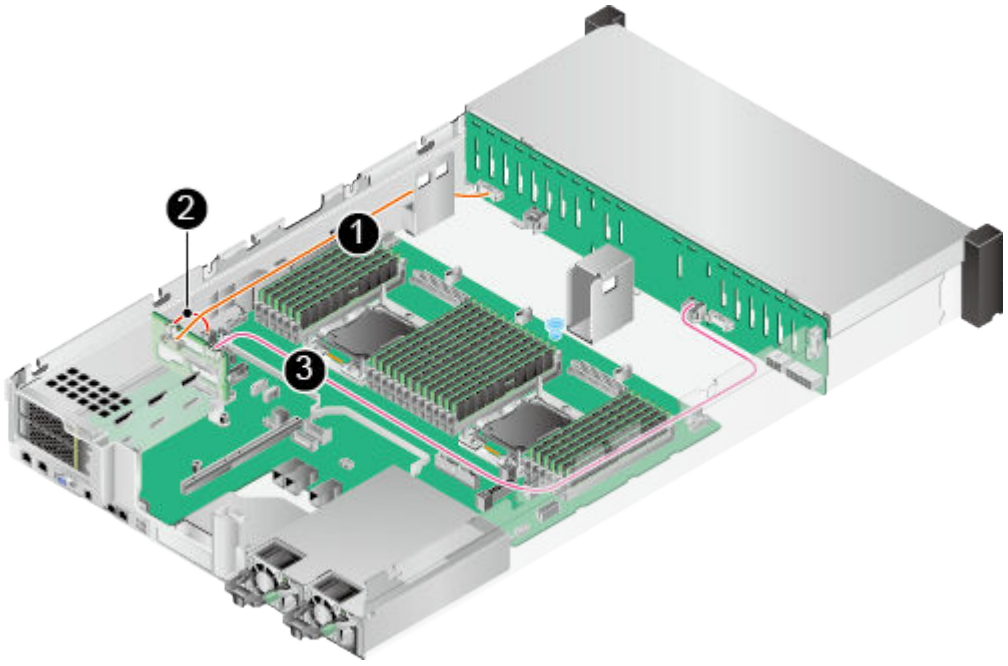

Table 7-132 I/O module 1 cabling

No.	P/N Code	Description
1	04051053	Indicator signal cable for connecting the 2 x 3.5" drive backplane (J24) to the 25 x 2.5" drive EXP backplane (J32)
2	04150448-001	Power cable for connecting the 2 x 3.5" drive backplane (J1) to the mainboard (J127)
3	04051934 **NOTE** The cable is not an independent spare part. It is packed with the 2 x 3.5" backplane as a spare part.	SAS cable for connecting the 2 x 3.5" drive backplane (J3) to the 25 x 2.5" drive EXP backplane (J31) **NOTE** The Y-shaped end of the cable is connected to the 2 x 3.5" drive backplane. Connector HDD A corresponds to the backplane of I/O module 1 and connector HDD B corresponds to the backplane of I/O module 2. Use cable connectors based on actual situation.

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7.17.6 I/O Module 3 (PCIe Riser Card)

I/O Module 3 Cabling

Figure 7-133 I/O module 3 cabling

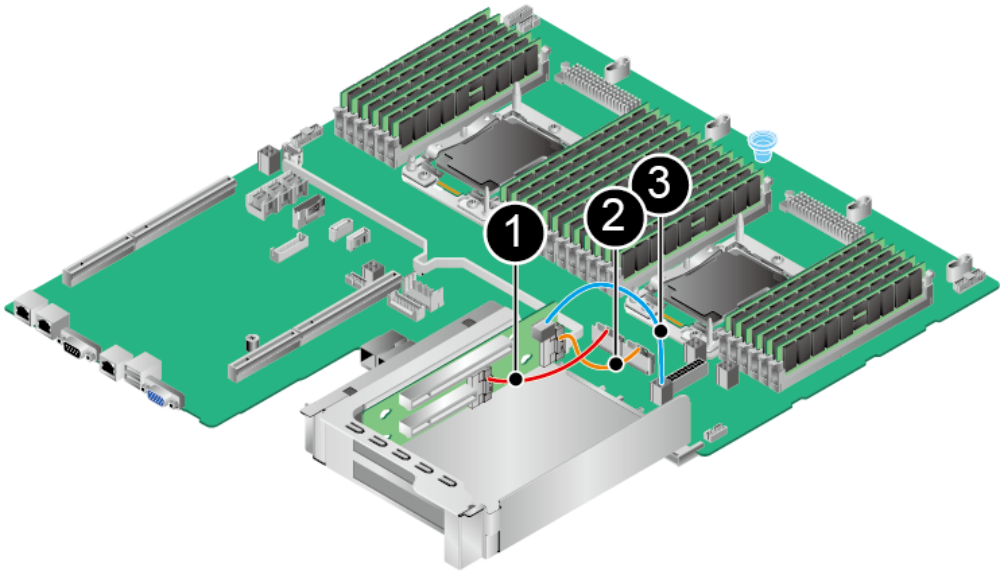

Table 7-133 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline B of the PCIe riser card to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline A of the PCIe riser card to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the PCIe riser card to the mainboard (J172)

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7.17.7 I/O Module 3 (4 x 2.5" NVMe Drives)

I/O Module 3 Cabling

Figure 7-134 I/O module 3 cabling

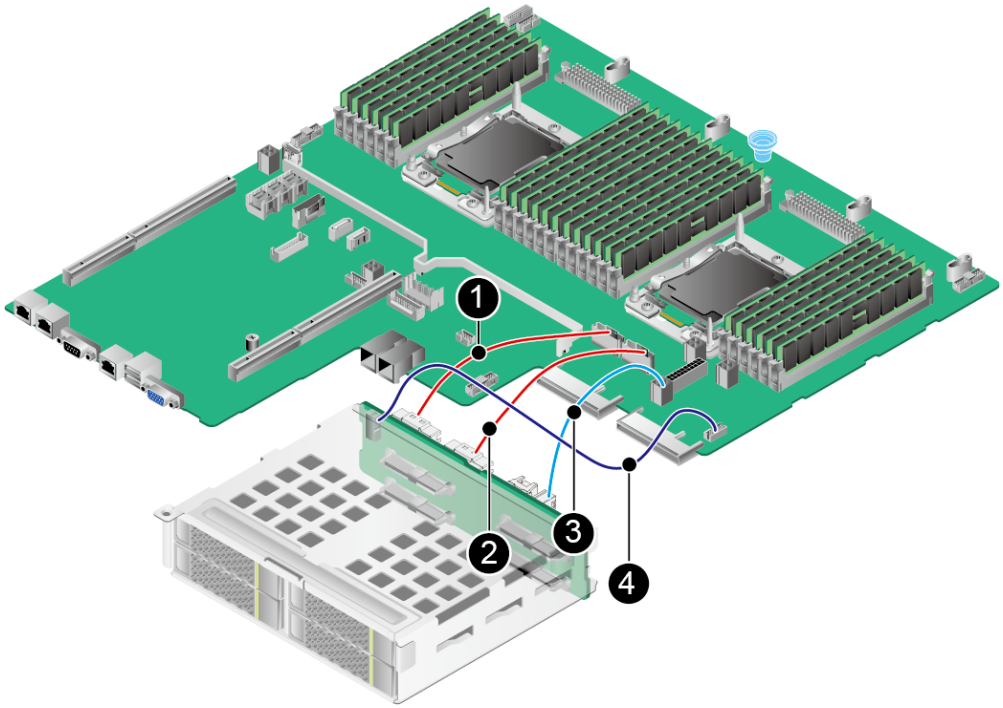

Table 7-134 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline B (J9) of the 4 x 2.5" drive backplane to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline A (J8) of the 4 x 2.5" drive backplane to Slimline A (J140) of the mainboard

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No.	P/N Code	Description
3	04150448-001	Power cable for connecting the 4 x 2.5" drive backplane (J22) to the mainboard (J172)
4	04080602	Low-speed signal cable for connecting the 4 x 2.5" drive backplane (J23) to the mainboard (J164)

7.18 Server with 25 x 2.5" Drives (Expander) 2

7.18.1 Left and Right Mounting Ears

Left and Right Mounting Ear Cabling

Figure 7-135 Left and right mounting ear cabling

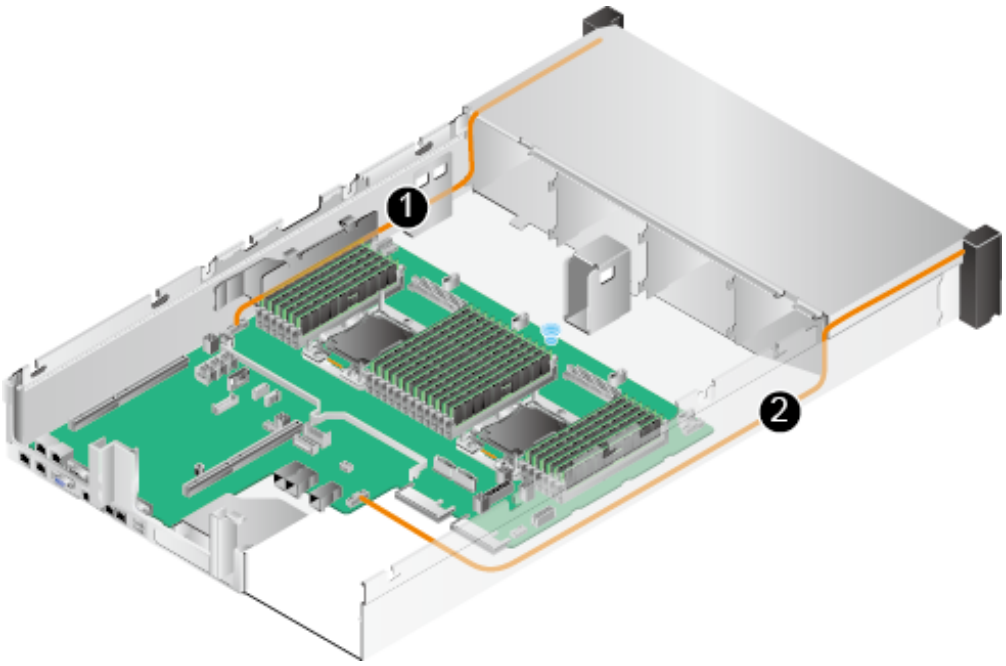

Table 7-135 Left and right mounting ear cabling

No.	P/N Code	Description
1	04051922	Signal cable for connecting the indicator board of the right mounting ear to the mainboard (J167)
2	04051921	Signal cable for connecting the USB board of the left mounting ear to the mainboard (J161)

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7.18.2 NC-SI Cabling

NC-SI Cabling

Figure 7-136 NC-SI cabling

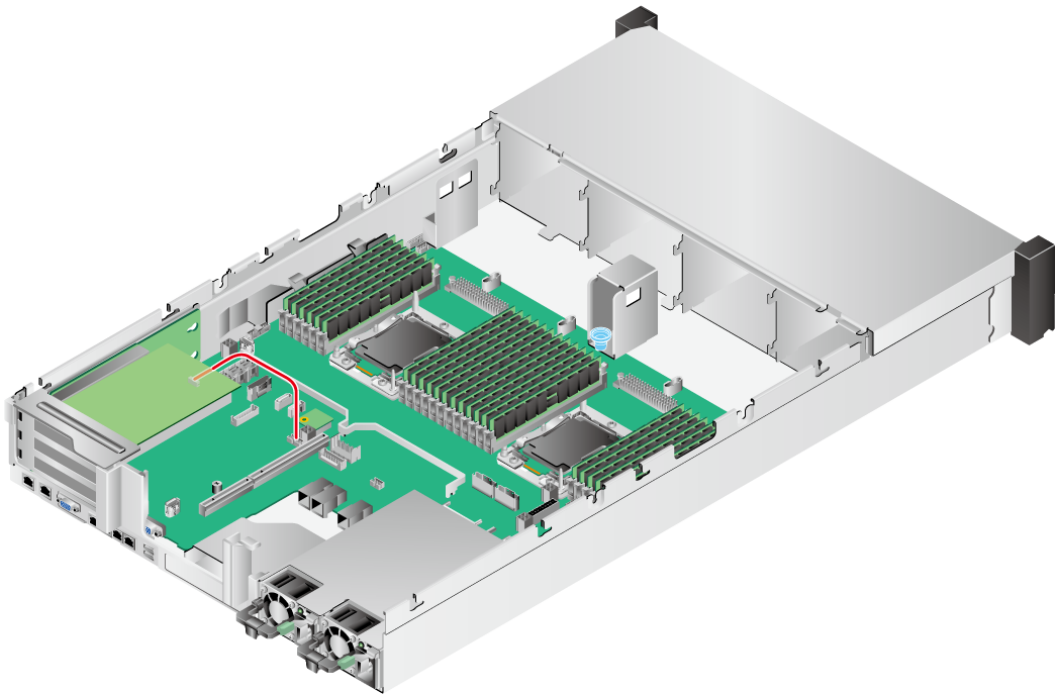

Table 7-136 NC-SI cabling

No.	Part No.	Description
1	04080606 or 04051036	NC-SI cable for connecting the PCIe NIC to the mainboard (J99)

NOTE

This cable is required only when the PCIe NIC supports NC-SI.

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7.18.3 25 x 2.5" Drive EXP Backplane Power and Indicator Signal Cables

25 x 2.5" Drive EXP Backplane Power and Indicator Signal Cabling

Figure 7-137 25 x 2.5" drive EXP backplane power and indicator signal cabling

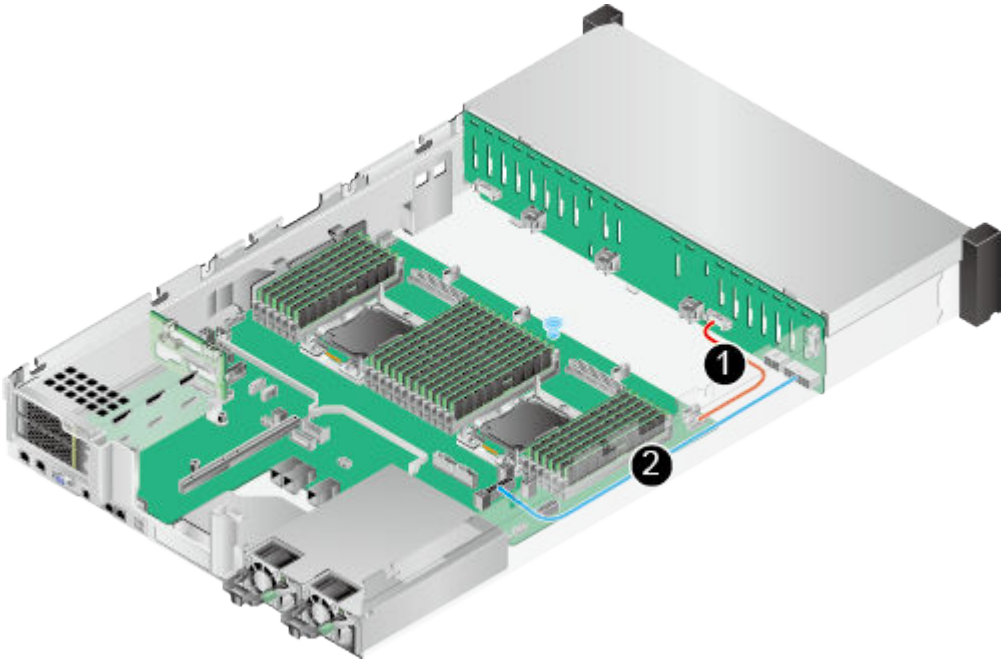

Table 7-137 25 x 2.5" drive EXP backplane power and indicator signal cabling

No.	P/N Code	Description
1	04051923	Indicator signal cable for connecting the 25 x 2.5" drive EXP backplane (J1) to the mainboard (J162)
2	04051989	Power cable for connecting the 25 x 2.5" drive EXP backplane (J24) to the mainboard (J166)

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7.18.4 25 x 2.5" Drive EXP Backplane SAS Signal Cables (Server with 1 x PCIe RAID Controller Card)

25 x 2.5" Drive EXP Backplane SAS Signal Cabling

Figure 7-138 25 x 2.5" drive EXP backplane SAS signal cabling

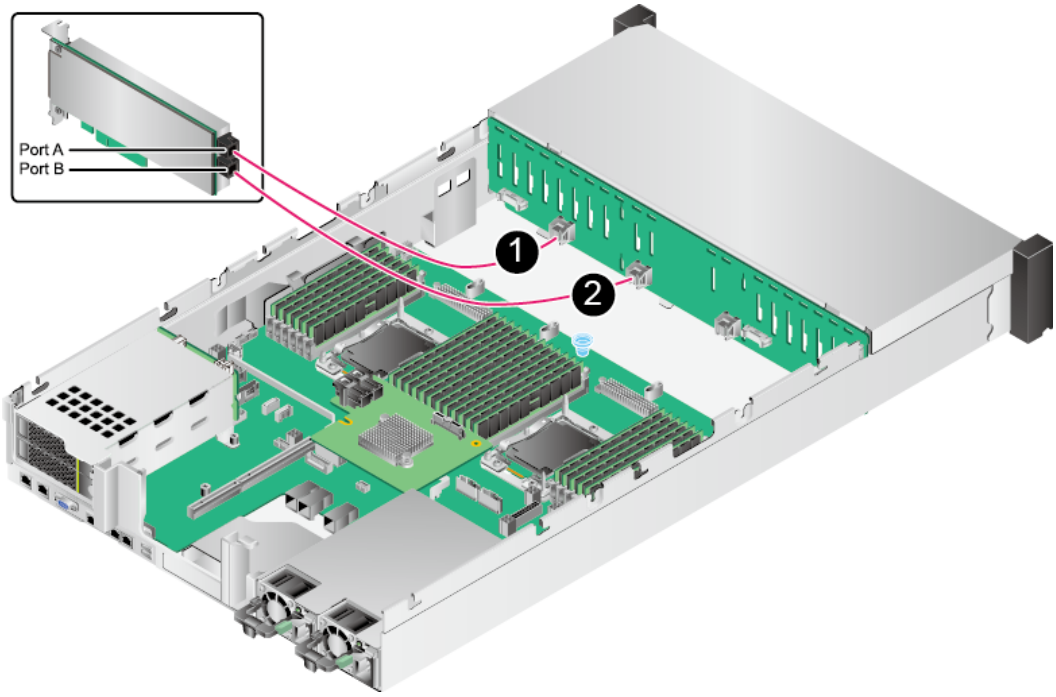

Table 7-138 25 x 2.5" drive EXP backplane SAS signal cabling

No.	P/N Code	Description
1	04051021	SAS cable for connecting PORT A (J28) of the 25 x 2.5" drive EXP backplane to PORT A of the PCIe RAID controller card
2	04051021	SAS cable for connecting PORT B (J29) of the 25 x 2.5" drive EXP backplane to PORT B of the PCIe RAID controller card

NOTE

The PCIe RAID controller card can be installed only in slot 6.

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7.18.5 I/O Module 1 (2 x 3.5" SAS/SATA Drives and 1 x Screw-in RAID Controller Card)

I/O Module 1 Cabling

Figure 7-139 I/O module 1 cabling

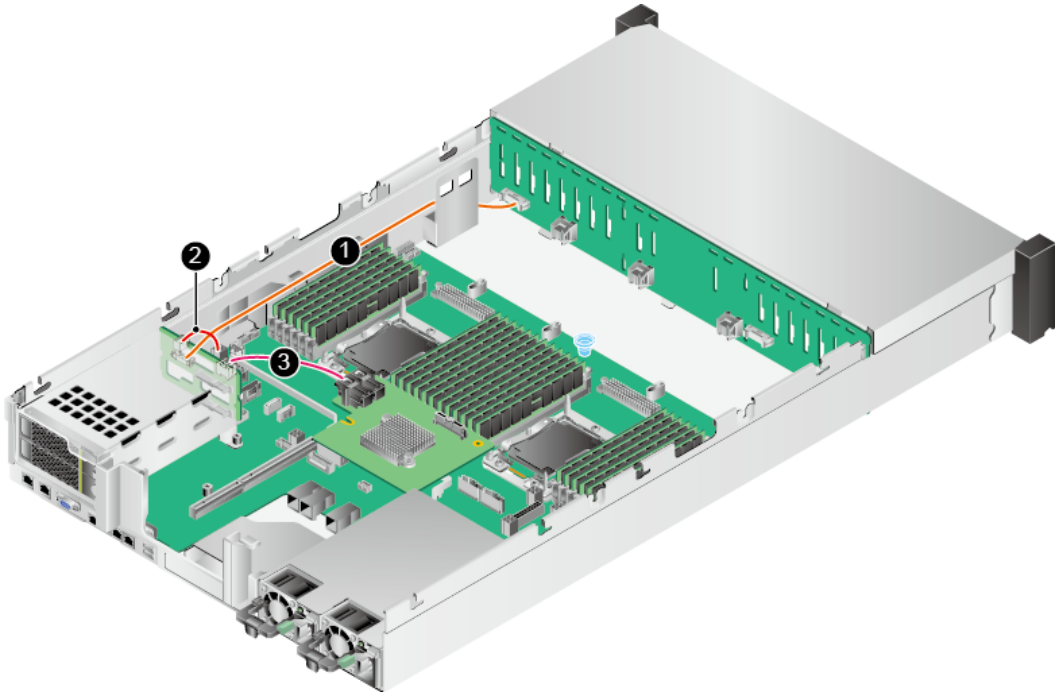

Table 7-139 I/O module 1 cabling

No.	P/N Code	Description
1	04051053	Indicator signal cable for connecting the 2 x 3.5" drive backplane (J24) to the 25 x 2.5" drive EXP backplane (J32)
2	04150448-001	Power cable for connecting the 2 x 3.5" drive backplane (J1) to the mainboard (J127)
3	04051059	SAS cable for connecting the 2 x 3.5" drive backplane (J3) to PORT A of the screw-in RAID controller card

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7.18.6 I/O Module 3 (PCIe Riser Card)

I/O Module 3 Cabling

Figure 7-140 I/O module 3 cabling

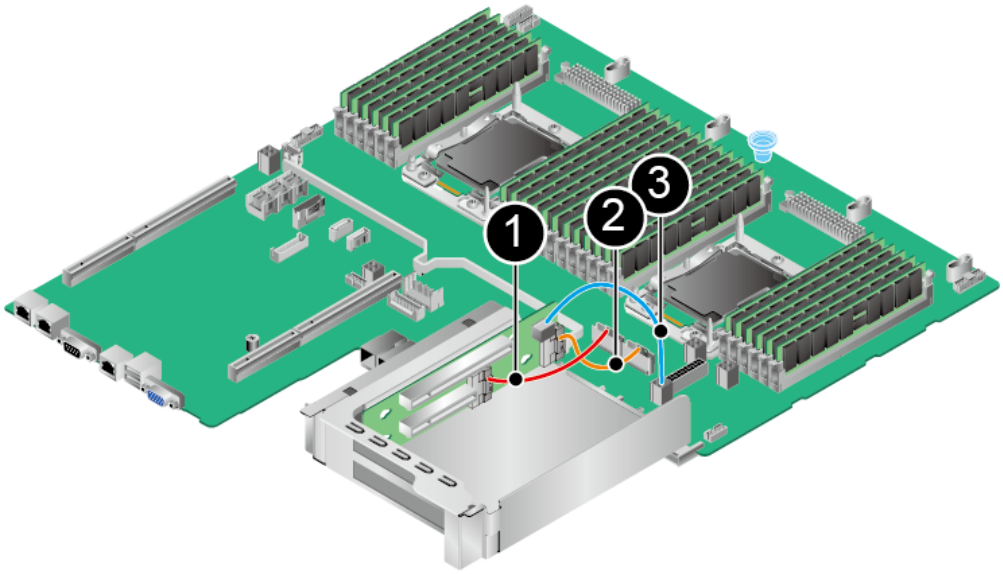

Table 7-140 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline B of the PCIe riser card to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline A of the PCIe riser card to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the PCIe riser card to the mainboard (J172)

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7.18.7 I/O Module 3 (4 x 2.5" NVMe Drives)

I/O Module 3 Cabling

Figure 7-141 I/O module 3 cabling

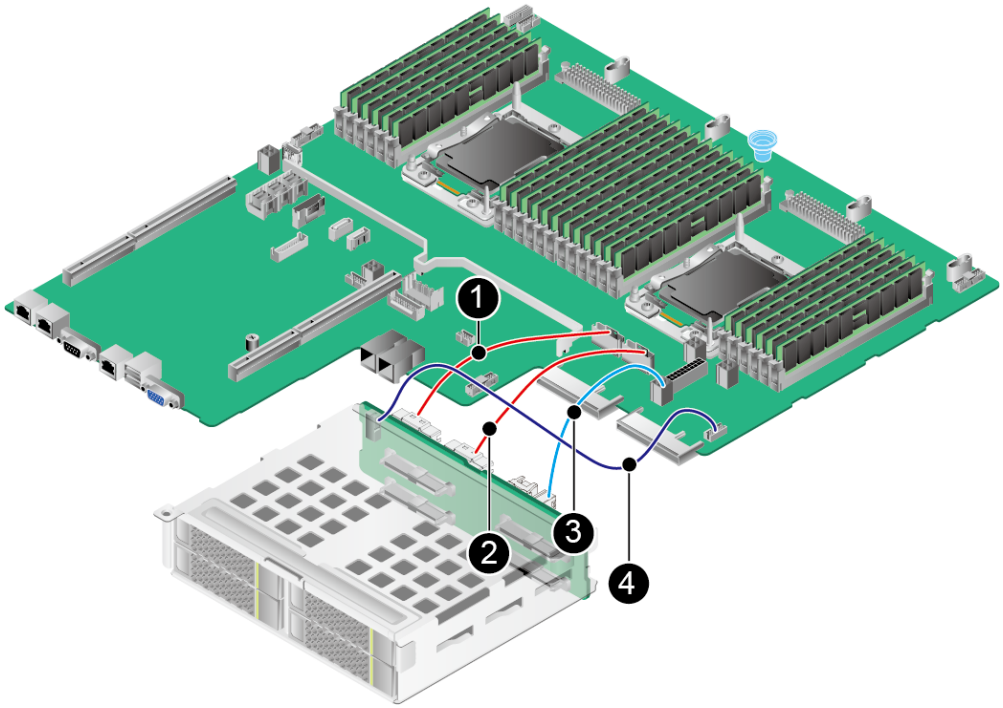

Table 7-141 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline B (J9) of the 4 x 2.5" drive backplane to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline A (J8) of the 4 x 2.5" drive backplane to Slimline A (J140) of the mainboard

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No.	P/N Code	Description
3	04150448-001	Power cable for connecting the 4 x 2.5" drive backplane (J22) to the mainboard (J172)
4	04080602	Low-speed signal cable for connecting the 4 x 2.5" drive backplane (J23) to the mainboard (J164)

7.19 Server with 25 x 2.5" Drives (Expander) 3

7.19.1 Left and Right Mounting Ears

Left and Right Mounting Ear Cabling

Figure 7-142 Left and right mounting ear cabling

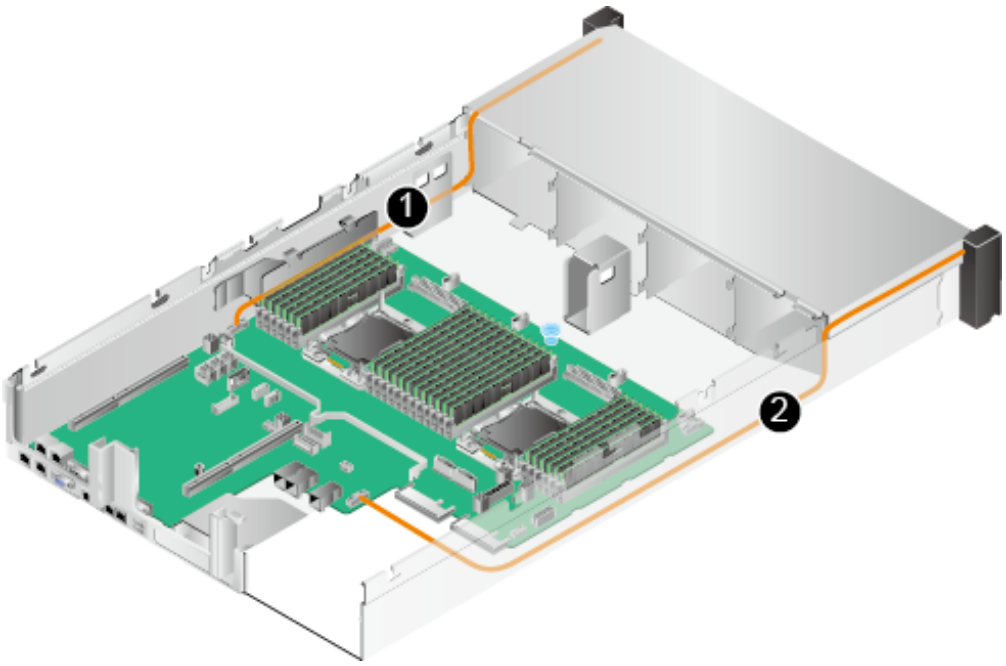

Table 7-142 Left and right mounting ear cabling

No.	P/N Code	Description
1	04051922	Signal cable for connecting the indicator board of the right mounting ear to the mainboard (J167)
2	04051921	Signal cable for connecting the USB board of the left mounting ear to the mainboard (J161)

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7.19.2 NC-SI Cabling

NC-SI Cabling

Figure 7-143 NC-SI cabling

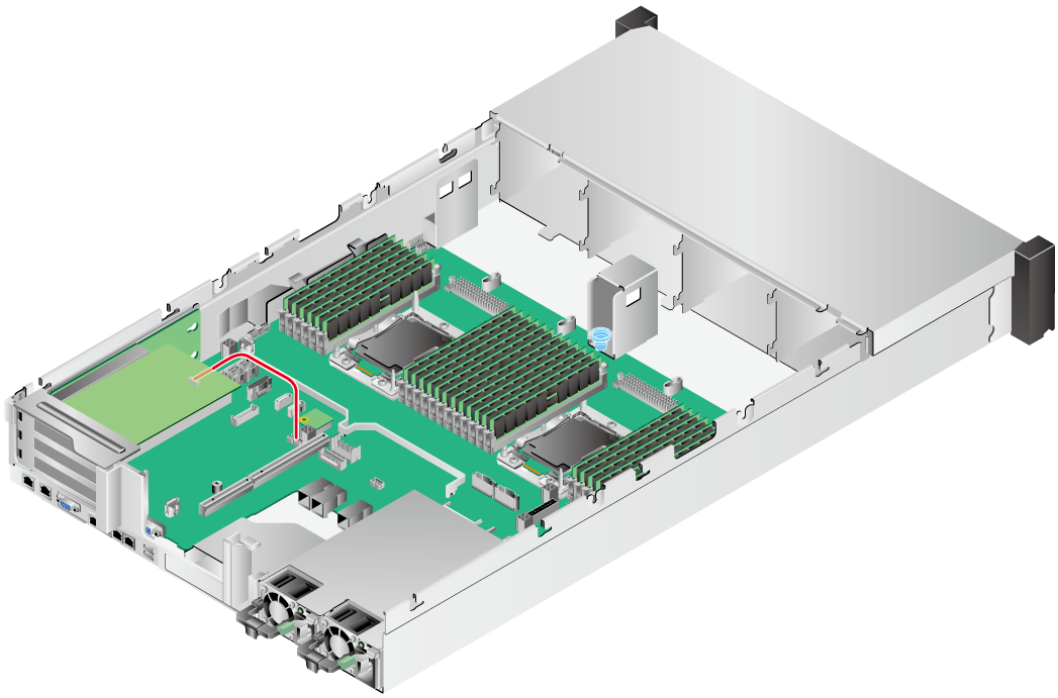

Table 7-143 NC-SI cabling

No.	Part No.	Description
1	04080606 or 04051036	NC-SI cable for connecting the PCIe NIC to the mainboard (J99)

NOTE

This cable is required only when the PCIe NIC supports NC-SI.

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7.19.3 25 x 2.5" Drive EXP Backplane Power and Indicator Signal Cables

25 x 2.5" Drive EXP Backplane Power and Indicator Signal Cabling

Figure 7-144 25 x 2.5" drive EXP backplane power and indicator signal cabling

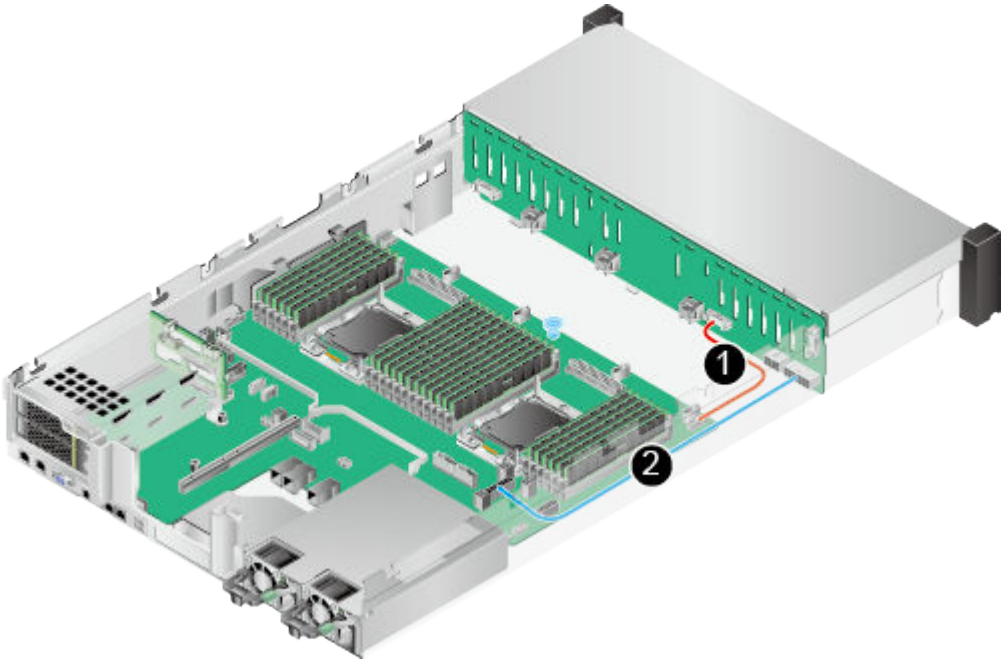

Table 7-144 25 x 2.5" drive EXP backplane power and indicator signal cabling

No.	P/N Code	Description
1	04051923	Indicator signal cable for connecting the 25 x 2.5" drive EXP backplane (J1) to the mainboard (J162)
2	04051989	Power cable for connecting the 25 x 2.5" drive EXP backplane (J24) to the mainboard (J166)

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7.19.4 25 x 2.5" Drive EXP Backplane SAS Signal Cables (Server with a PCIe RAID Controller Card in I/O Module 1)

25 x 2.5" Drive EXP Backplane SAS Signal Cabling

Figure 7-145 25 x 2.5" drive EXP backplane SAS signal cabling

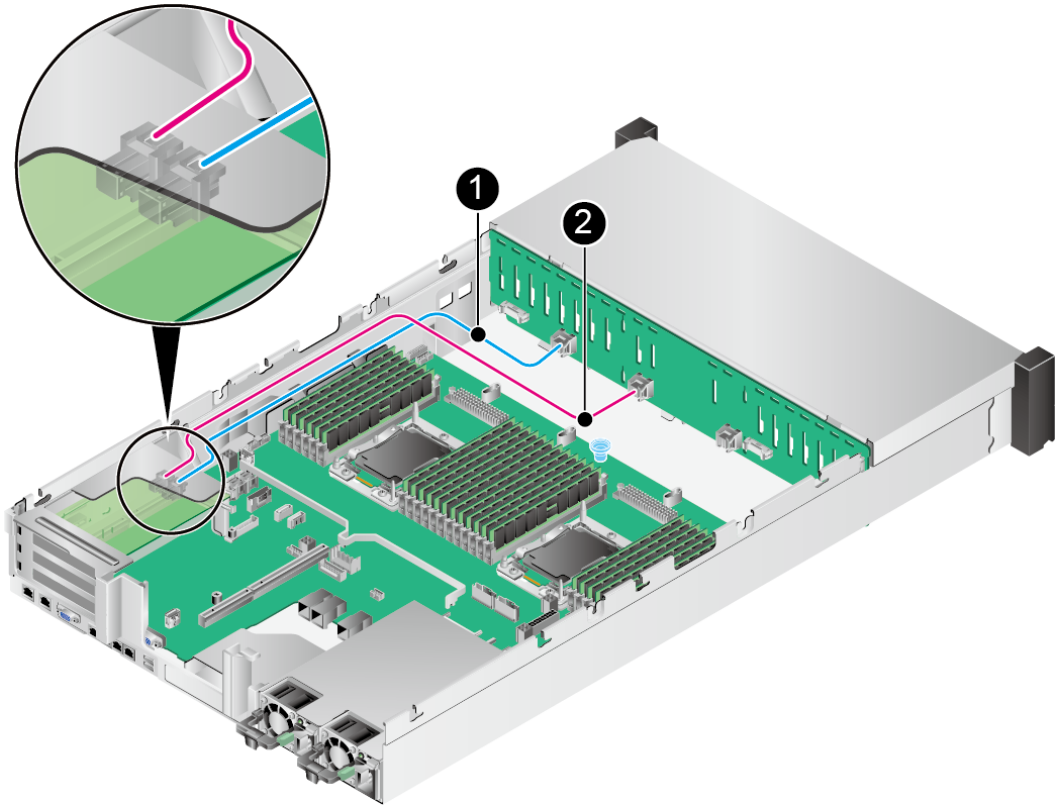

Table 7-145 25 x 2.5" drive EXP backplane SAS signal cabling

No.	P/N Code	Description
1	04051018	SAS cable for connecting PORT A (J28) of the 25 x 2.5" drive EXP backplane to C0 of the PCIe RAID controller card
2	04051018	SAS cable for connecting PORT B (J29) of the 25 x 2.5" drive EXP backplane to C1 of the PCIe RAID controller card

NOTE

- The PCIe RAID controller card can be installed only in slot 3.
- The port numbers vary with the PCIe RAID controller cards. The port number of the PCIe RAID controller card connected to front-drive backplane PORT A (J28) may be C0, PORT A, 0, or CN0, and the port number of the PCIe RAID controller card connected to front-drive backplane PORT B (J29) may be C1, PORT B, 1, or CN1.

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7.19.5 25 x 2.5" Drive EXP Backplane SAS Signal Cables (Server with a PCIe RAID Controller Card in I/O Module 2)

25 x 2.5" Drive EXP Backplane SAS Signal Cabling

Figure 7-146 25 x 2.5" drive EXP backplane SAS signal cabling

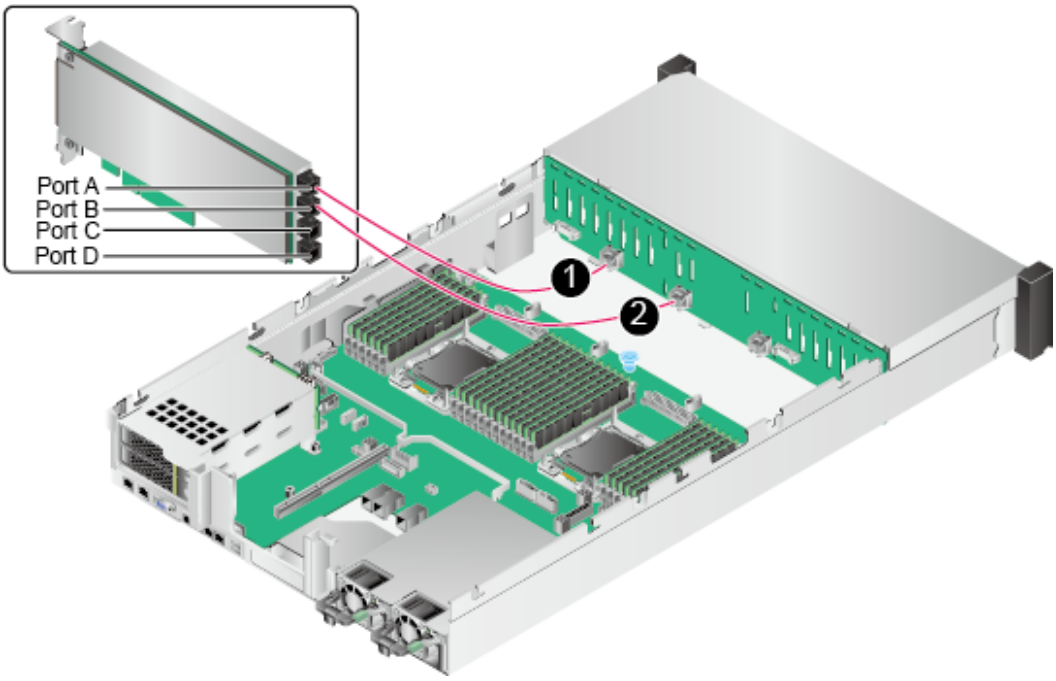

Table 7-146 25 x 2.5" drive EXP backplane SAS signal cabling

No.	P/N Code	Description
1	04051020	SAS cable for connecting PORT A (J28) of the 25 x 2.5" drive EXP backplane to PORT A of the PCIe RAID controller card
2	04051020	SAS cable for connecting PORT B (J29) of the 25 x 2.5" drive EXP backplane to PORT B of the PCIe RAID controller card

NOTE

- The PCIe RAID controller card must be installed in I/O module 2 only when an SP460C-M (Broadcom SAS3516) PCIe RAID controller card is configured.
- The PCIe RAID controller card can be installed only in slot 6.

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7.19.6 I/O Module 1 (2 x 2.5" SAS/SATA Drives)

I/O Module 1 Cabling

Figure 7-147 I/O module 1 cabling

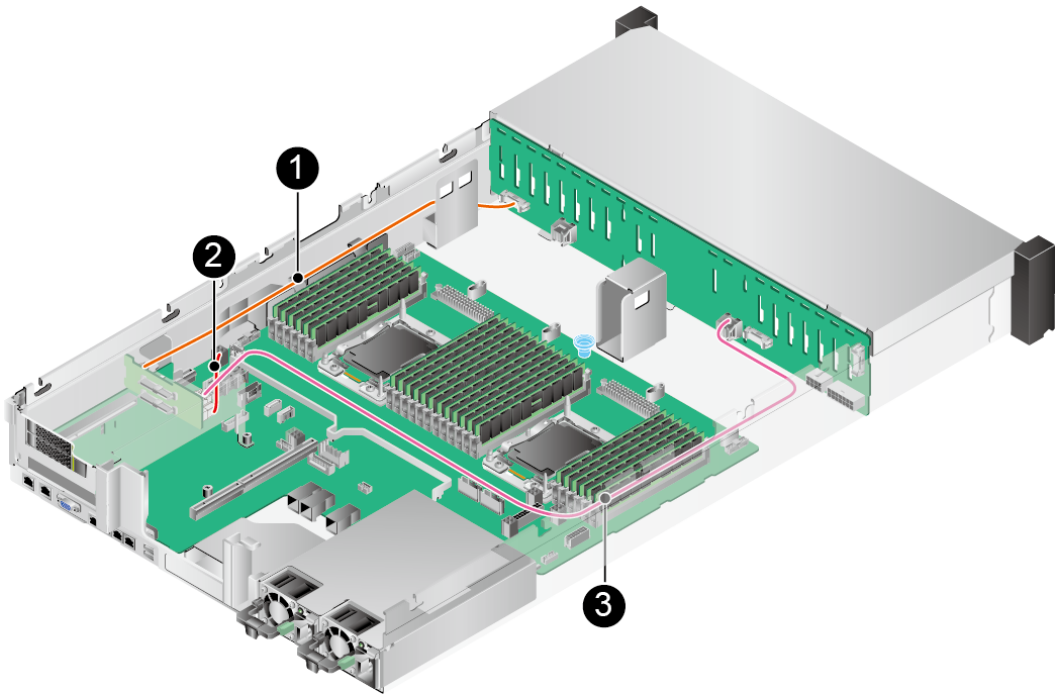

Table 7-147 I/O module 1 cabling

No.	P/N Code	Description
1	04051053	Indicator signal cable for connecting the 2 x 2.5" drive backplane (J24) to the 25 x 2.5" drive EXP backplane (J32)
2	04150448-001	Power cable for connecting the 2 x 2.5" drive backplane (J1) to the mainboard (J127)
3	04051060	SAS cable for connecting the 2 x 2.5" drive backplane (J3) to the 25 x 2.5" drive EXP backplane (J31) **NOTE** The Y-shaped end of the cable is connected to the 2 x 2.5" drive backplane. Connector HDD A corresponds to the backplane of I/O module 1 and connector HDD B corresponds to the backplane of I/O module 2. Use cable connectors based on actual situation.

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7.19.7 I/O Module 3 (PCIe Riser Card)

I/O Module 3 Cabling

Figure 7-148 I/O module 3 cabling

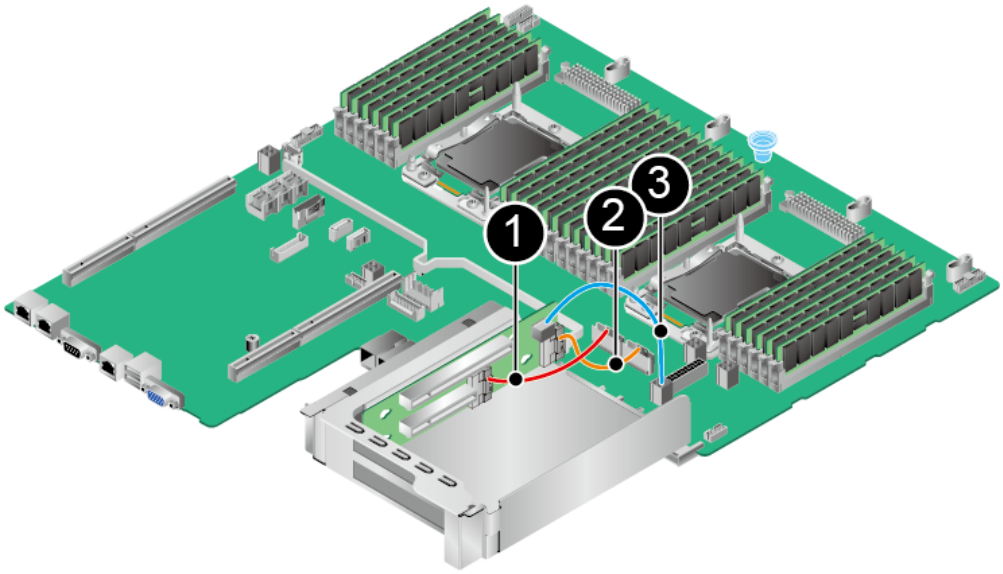

Table 7-148 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline B of the PCIe riser card to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the PCIe riser card as a spare part.	Signal cable for connecting Slimline A of the PCIe riser card to Slimline A (J140) of the mainboard
3	04150448-001	Power cable for connecting the PCIe riser card to the mainboard (J172)

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7.19.8 I/O Module 3 (4 x 2.5" NVMe Drives)

I/O Module 3 Cabling

Figure 7-149 I/O module 3 cabling

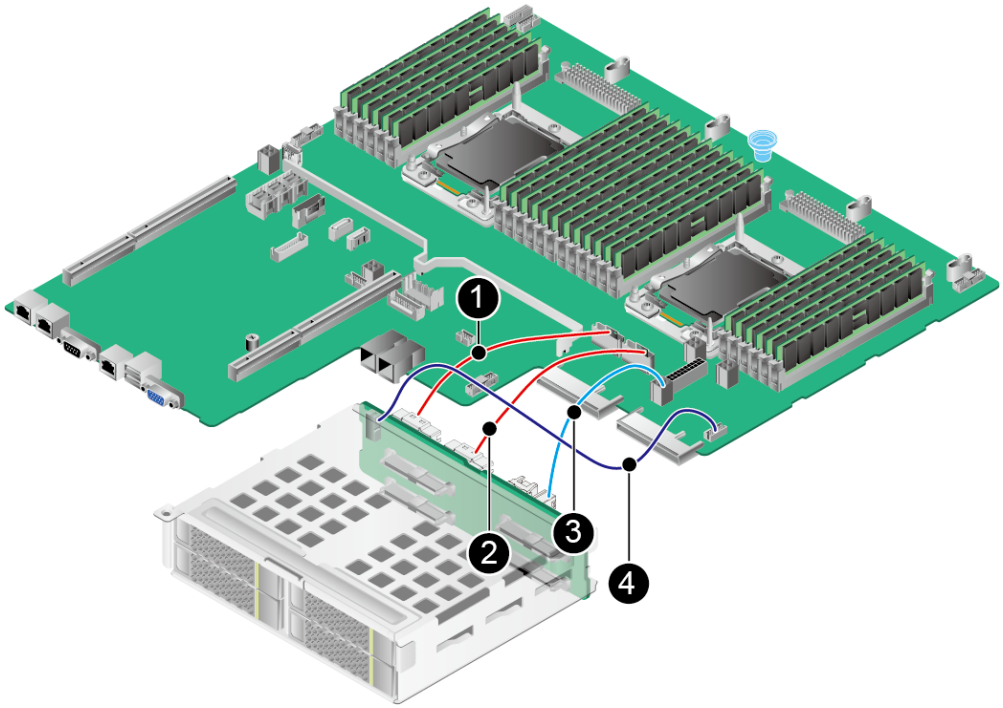

Table 7-149 I/O module 3 cabling

No.	P/N Code	Description
1	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline B (J9) of the 4 x 2.5" drive backplane to Slimline B (J139) of the mainboard
2	04051931 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" backplane as a spare part.	Signal cable for connecting Slimline A (J8) of the 4 x 2.5" drive backplane to Slimline A (J140) of the mainboard

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No.	P/N Code	Description
3	04150448-001	Power cable for connecting the 4 x 2.5" drive backplane (J22) to the mainboard (J172)
4	04080602	Low-speed signal cable for connecting the 4 x 2.5" drive backplane (J23) to the mainboard (J164)

7.19.9 I/O Module 3 (4 x 2.5" SAS/SATA Drives)

NOTE

SAS/SATA drives can be installed in I/O module 3 only when an SP460C-M (Broadcom SAS3516) PCIe RAID controller card is configured.

I/O Module 3 Cabling

Figure 7-150 I/O module 3 cabling

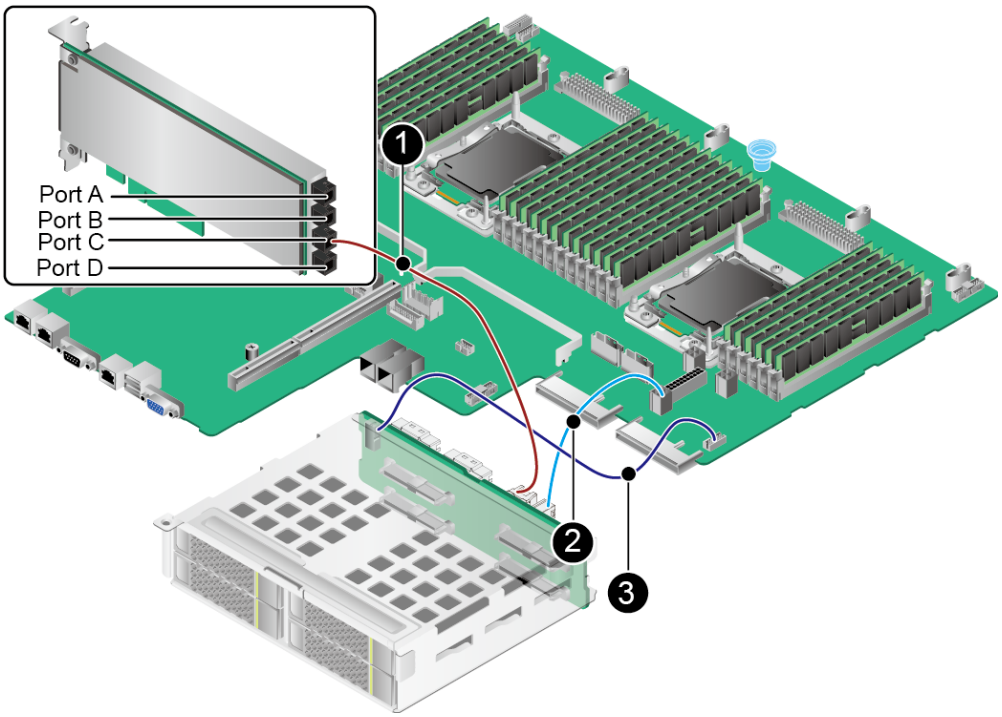

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Table 7-150 I/O module 3 cabling

No.	P/N Code	Description
1	04051059-002 **NOTE** The cable is not an independent spare part. It is packed with the 4 x 2.5" drive backplane as a spare part.	SAS cable for connecting the 4 x 2.5" drive backplane (J2) to PORT C of the PCIe RAID controller card
2	04150448-001	Power cable for connecting the 4 x 2.5" drive backplane (J22) to the mainboard (J172)
3	04080602	Low-speed signal cable for connecting the 4 x 2.5" drive backplane (J23) to the mainboard (J164)

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8 Parts Replacement

Before touching a device, wear an ESD wrist strap or ESD gloves. For more information, see **5 Safety Instructions**.

8.1 Spare Part Description

8.2 Tools

8.3 Symbols on Devices

8.4 Basic Operations

8.5 Field Replaceable Units

8.1 Spare Part Description

NOTICE

- A part number (P/N) uniquely identifies a server component. You can find the number on a component or component package.
- Before replacement, confirm the part number (P/N code) of the component to be replaced using **Computing Product Spare Parts Checker** and apply for a spare part.

Table 8-1 Spare parts description

Category	Description	Property	Application Scenarios
Regular Spare Part (RSP)	Regular spare part	Regular spare parts include boards and modules. Safety stock is recommended.	Stored in the warehouses near sites based on the contract service type, Service Level Agreement (SLA), and service sites.

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Category	Description	Property	Application Scenarios
Non-Regular Spare Part (NRSP)	Non-regular spare part	Mechanical parts, accessories, and cables. Generally, safety stock is not kept for NRSPs. NRSPs are provided on demand; however, the lead time is not committed.	Stored in a country's warehouses based on the contract service type.
Non-Spare Part (NSP)	NSPs are not spare parts and do not have replaceable units at lower levels.	NSPs are not spare parts and do not have replaceable units at lower levels.	Not supplied or stored.
RSP&SUB (Sub-Part)	Regular spare parts with replaceable units at lower levels.	It is classified as a type of RSP and has RSPs or NRSPs at lower levels.	Stored in the warehouses near sites based on the contract service type, SLA, and service sites. Lower-level parts vary with actual demands.
NRSP&SUB	Non-regular spare parts with replaceable units at lower levels.	It is classified as a type of NRSP and has RSPs or NRSPs at lower levels.	Stored in a country's warehouses based on the contract service type. Lower-level parts vary with actual demands.
NSP&SUB	Non-spare parts with spare parts at lower levels.	It is not a spare part, but has RSPs or NRSPs at lower levels.	This part is not stored. Lower-level parts vary with actual demands.

8.2 Tools

Ensure that the following tools are available:

- ESD wrist strap or ESD gloves
- Protective gloves

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- ESD bags
- Box cutter
- M3 Phillips screwdriver
- Flat-head screwdriver
- Die-casting pliers

  Used to remove LC optical fibers, pluggable optical modules, and unshielded network cables.

  Figure 8-1 Die-casting pliers

  

8.3 Symbols on Devices

Table 8-2 Safety symbols

Symbol	Name	Description
	Warning	Misoperations may cause personal injury or damage to the equipment.
	External grounding	External grounding of a device. Connect one end of the ground cable to the device, and the other end to a ground point. Ground the device through the ground point to ensure personal and device safety.
	Internal grounding	Internal grounding of a device. Connect the two ends of a ground cable to different components of the same device. Ground the device through the ground point to ensure personal and device safety.

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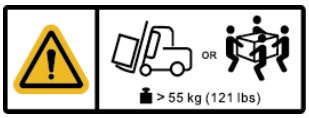
Symbol	Name	Description
	ESD	Electrostatic sensitive area. Do not touch a device in this area with bare hands. When handling a device in an ESD-sensitive area, take ESD measures, such as wearing an ESD wrist strap or ESD gloves.
	Altitude	The device operates properly at an altitude of 2000 m or lower. The symbol applies only to CCC.
	Tilt	The device may tilt. Do not push the device with force.
	High touch current	The device has high touch current. Ground it before connecting to power.
	Do not touch	Maintain a safe distance from the moving fan blades.
	Warning	At least two people are required for moving the device.
	Warning	At least three people are required for moving the device.
	Warning	A pallet truck or at least four people are required for moving the device.
	Do not stack	Do not stack after unpacking. This may cause damage to the device.
	Do not hold the handle	Do not carry the device by holding its handle. This may cause personal injury or damage to the device.
	Multiple power sources	The device is supplied by multiple sources of power. Disconnect all power cables before you power off the device.

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8.4 Basic Operations

8.4.1 Power-On Procedure

NOTICE

- Before powering on a server, ensure that the server is powered off, all cables are connected correctly, and the power supply voltage meets service requirements.
- During the power-on process, do not remove and insert drives or disconnect and connect network cables or Console port cables.
- If the power supply to a server is disconnected, wait for at least one minute before powering it on again.

The server can be powered on in any of the following ways:

- If PSUs are properly installed but are not yet powered on, power on the PSUs.

  The server will be powered on along with the PSUs.

  NOTE

  By default, **System State Upon Power Supply** is set to **Power On**, which allows the server to power on after the PSUs are applied with power. You can change the **System State Upon Power Supply** on the **Power** > **Power Control** page on the iBMC WebUI.
- If the PSUs are powered on and the server is in standby state (the power indicator is steady yellow), you can use any of the following methods to power on the server:
  - Press the power button on the front panel.

    For details, see **2.1.2 Indicators and Buttons**.
  - Use the iBMC WebUI.
    i. Log in to the iBMC WebUI.

       For details, see **10.2 Logging In to the iBMC WebUI**.
    ii. Choose **Power** > **Power Control**.

       The **Power Control** page is displayed.
    iii. Click **Power On**.

       A confirmation message is displayed.
    iv. Click **OK**.

       The server starts to be powered on.
  - Use the iBMC CLI.
    i. Log in to the iBMC CLI.

       For details, see **10.4 Logging In to the CLI**.
    ii. Run the following command:

       ipmcset -d powerstate -v 1

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iii. Type **y** or **Y** and press **Enter**.

– Use the Remote Virtual Console.

i. Log in to the Remote Virtual Console.

For details, see **10.3 Logging In to the Desktop of a Server**.

ii. On the KVM screen, click  or  on the toolbar.

iii. Select **Power On**.

A dialog box is displayed.

iv. Click **Yes**.

8.4.2 Power-Off Procedure

NOTE

- Powering off a server will interrupt all services and programs running on it. Therefore, before powering off a server, ensure that all services and programs have been stopped or migrated to other servers.
- The "power-off" mentioned here is an operation performed to change the server to the standby state (the power indicator is steady yellow).
- After a server is powered off forcibly, wait for more than 10 seconds for the server to power off completely. Do not power on the server again before it is completely powered off.
- Forced power-off may damage user programs or unsaved data. Exercise caution when performing this operation.

The server can be powered off in any of the following ways:

- Connect a keyboard, video, and mouse (KVM) to the server and shut down the operating system of the server using the KVM.
- When the server is in power-on state, pressing the power button on the server front panel can power off the server gracefully.

  NOTE

  If the server OS is running, shut down the OS according to the onscreen instructions.

  For details, see **2.1.2 Indicators and Buttons**.
- When the server is in power-on state, holding down the power button on the server front panel for six seconds can power off the server forcibly.

  For details, see **2.1.2 Indicators and Buttons**.
- Use the iBMC WebUI.

  a. Log in to the iBMC WebUI.

  For details, see **10.2 Logging In to the iBMC WebUI**.

  b. Choose **Power** > **Power Control**.

  The **Power Control** page is displayed.

  c. Click **Power Off** or **Forced Power Off**.

  A confirmation message is displayed.

  d. Click **OK**.

  The server starts to be powered off.

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- Use the iBMC CLI.
  a. Log in to the iBMC CLI.
     For details, see **10.4 Logging In to the CLI**.
  b. Run the following command:
     - To power off the server gracefully, run the **ipmcset -d powerstate -v 0** command.
     - To power off the server forcibly, run the **ipmcset -d powerstate -v 2** command.
  c. Type **y** or **Y** and press **Enter**.
- Use the Remote Virtual Console.
  a. Log in to the Remote Virtual Console.
     For details, see **10.3 Logging In to the Desktop of a Server**.
  b. On the KVM screen, click  or  on the toolbar.
  c. Choose **Power Off** or **Forced Power Off**.
     A dialog box is displayed.
  d. Click **Yes**.

8.4.3 Removing a 2288H V5

8.4.3.1 Removing the Server from L-Shaped Guide Rails or Static Rail Kit

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove external cables as required, such as network cables, VGA cables, and USB devices.

Step 4 Remove the server.

NOTICE

- When removing a device, wear protective gloves to avoid burns.
- At least two people are required to move the device. Otherwise, personal injury or device damage may occur.

1. Loosen the captive screws on the front panel. See (1) in **Figure 8-2**.
2. Slide out part of the server from the chassis. See (2) in **Figure 8-2**.
3. Remove the server from the chassis and place it on the ESD workstation. At least two people are required to handle the server.

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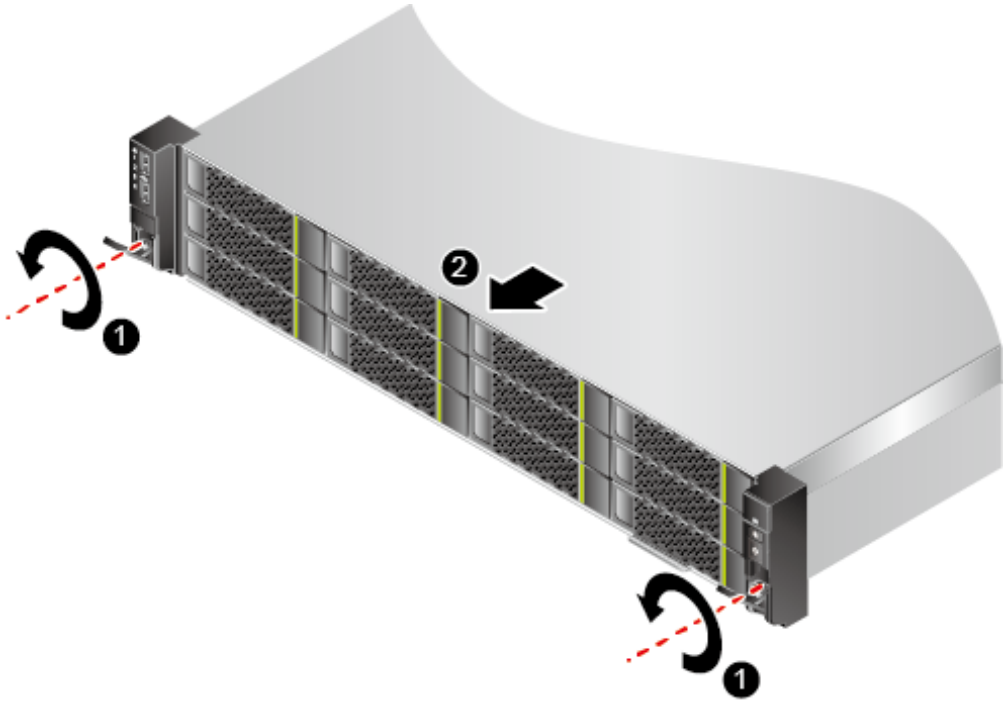
Figure 8-2 Removing the server



Step 5 Place the removed server in an ESD bag.

NOTICE

Place only one server in an ESD bag.

----End

8.4.3.2 Removing a Server from the Ball Bearing Rail Kit

8.4.3.2.1 Ball Bearing Rail Kit 1

This section applies to the ball bearing rail kit whose part number is 21241258 and the cable organizer whose part number is 21241259.

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove external cables as required, such as network cables, VGA cables, and USB devices.

Step 4 Remove the server.

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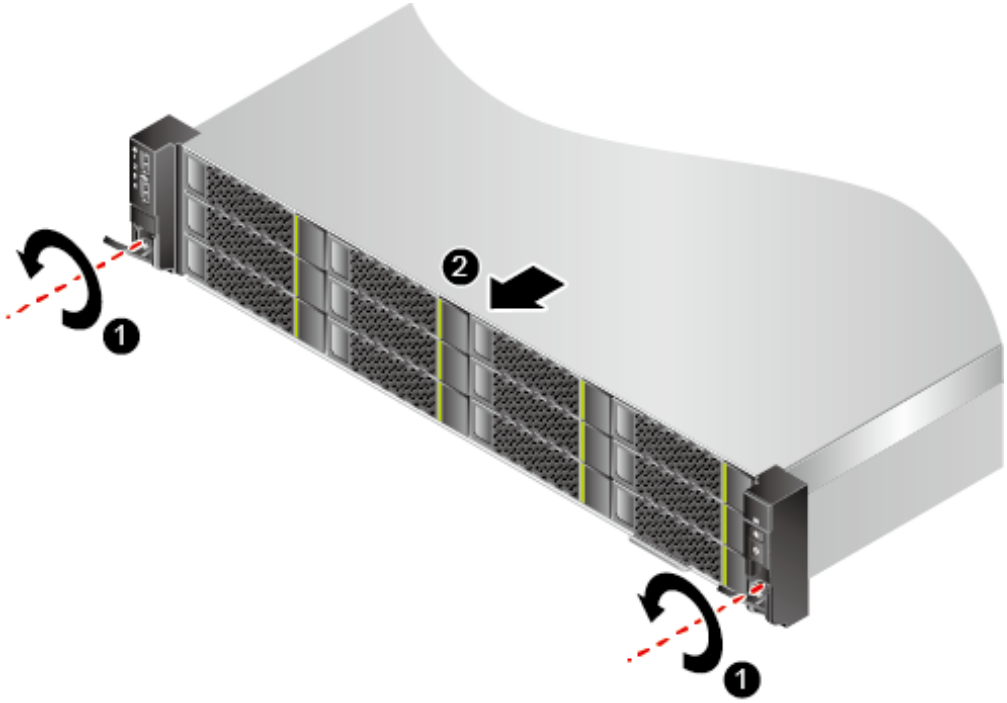
NOTICE

- When removing a device, wear protective gloves to avoid burns.
- At least two people are required to move the device. Otherwise, personal injury or device damage may occur.

1. Loosen the captive screws on the front panel. See (1) in **Figure 8-3**.
2. Slide out part of the server from the chassis. See (2) in **Figure 8-3**.

Figure 8-3 Removing the server



3. Unlock the release latches on both sides. See (1) in **Figure 8-4**.
4. Remove the server from the chassis and place it on the ESD workstation. At least two people are required to handle the server. See (2) in **Figure 8-4**.

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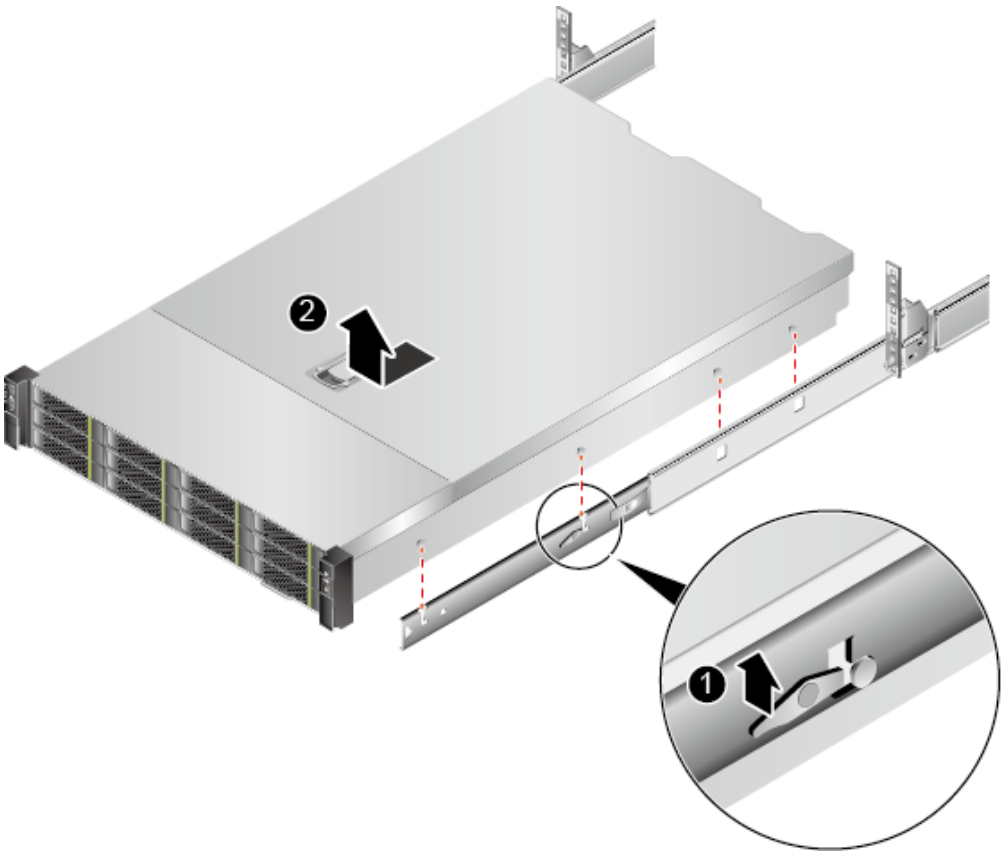
Figure 8-4 Removing the server from the ball bearing rail kit



Step 5 Place the removed server in an ESD bag.

NOTICE

Place only one server in an ESD bag.

----End

8.4.3.2.2 Ball Bearing Rail Kit 2

This section applies to the ball bearing rail kit whose part number is 21241258-002 and the cable organizer whose part number is 21241259-001.

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove external cables as required, such as network cables, VGA cables, and USB devices.

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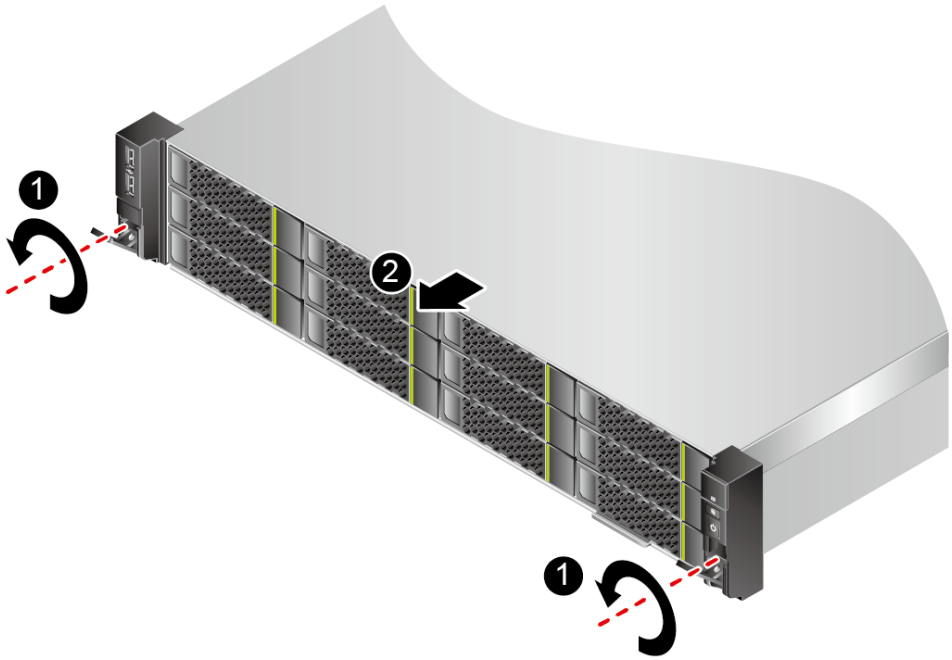
Step 4 Remove the server.

NOTICE

- When removing a device, wear protective gloves to avoid burns.
- At least two people are required to move the device. Otherwise, personal injury or device damage may occur.

1. Loosen the captive screws on the mounting ears. See (1) in **Figure 8-5**.
2. Pull out the server secured to the inner rails from the rail until the server cannot move. See (2) in **Figure 8-5**.

Figure 8-5 Removing the server



3. Press the buckles on both sides of the server and lift the front part of the server from both sides (two people are required) to separate the server from the six mounting screws on both sides of the inner rails. See (1) and (2) in **Figure 8-6**.

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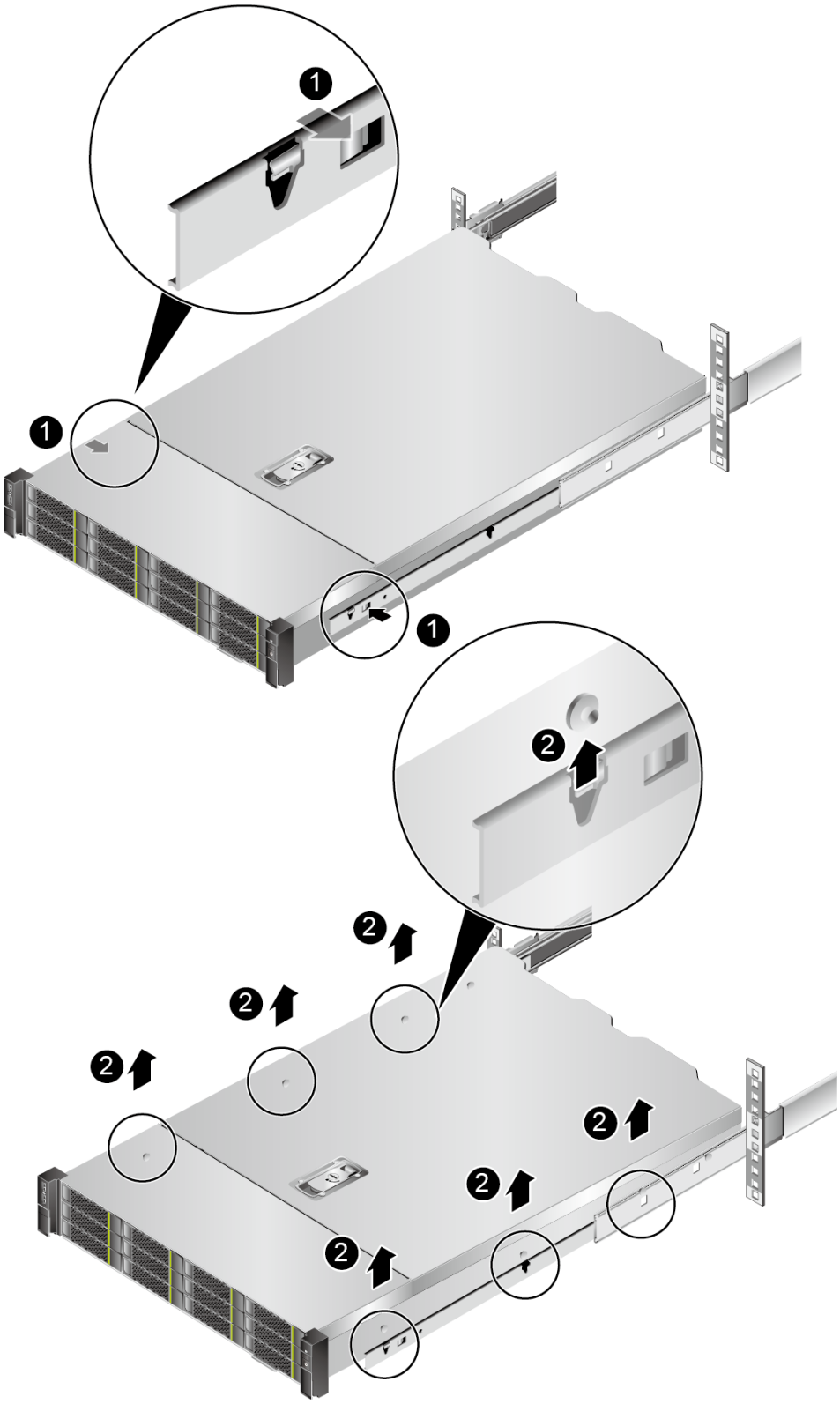
Figure 8-6 Removing the server from the ball bearing rail kit (1)



4. After lifting the front part of the server, pull the server towards the front panel, and then lift the server to remove it from the last two mounting screws on both sides of the inner rails. See (2) in **Figure 8-7**.

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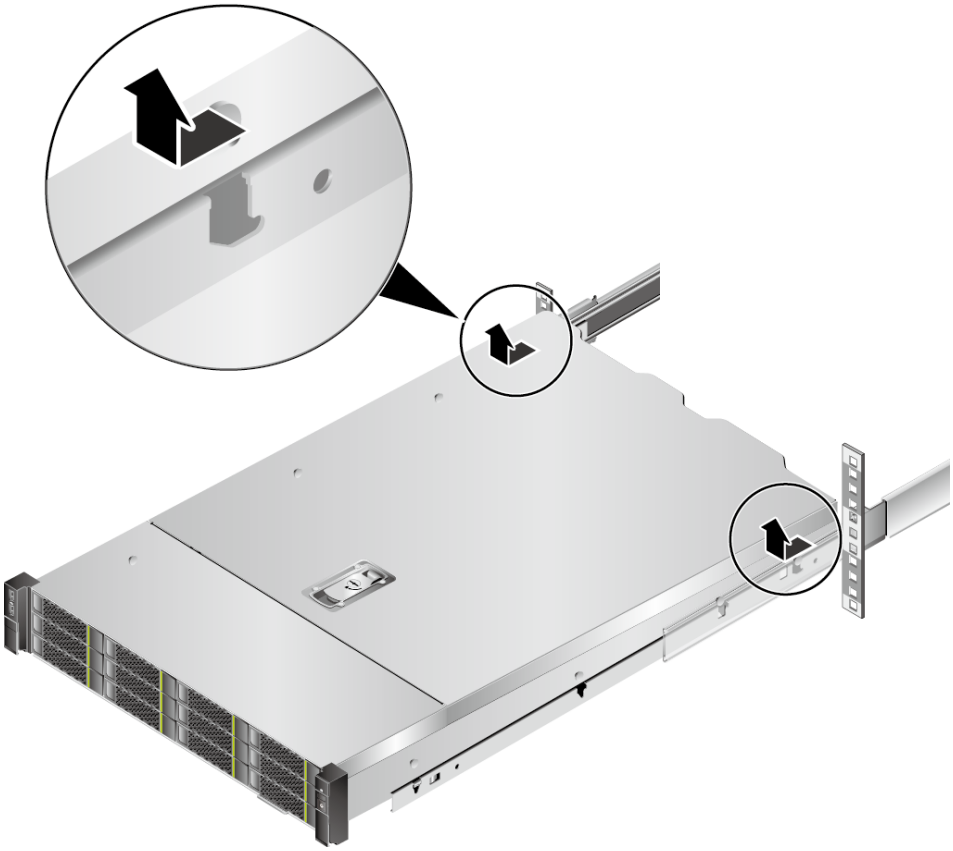
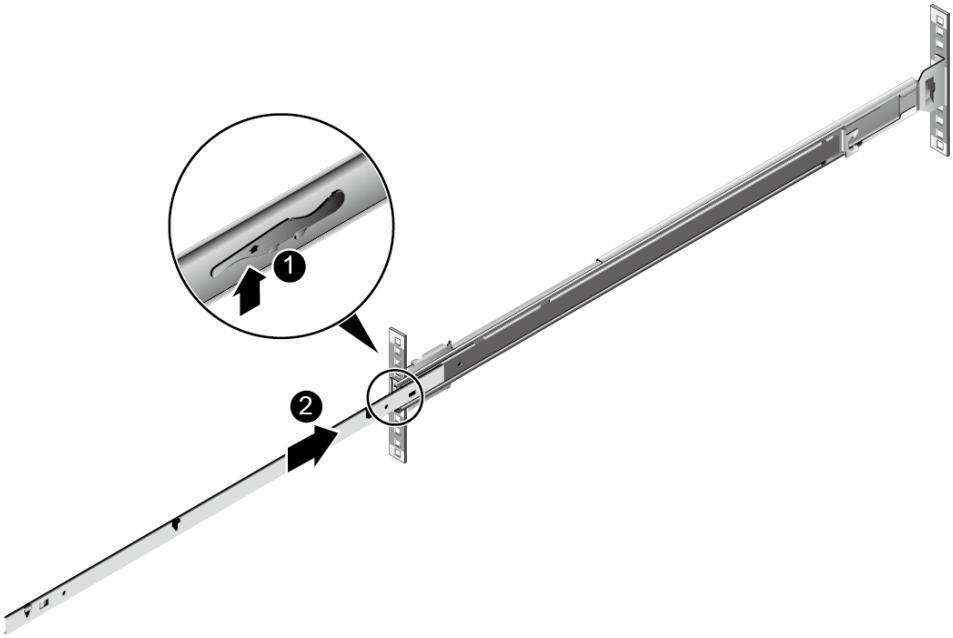
Figure 8-7 Removing the server from the ball bearing rail kit (2)



5. Place the server on the ESD workstation.
6. Unlock the release latches on both sides of the inner rails and push the inner rails until they are completely inserted in the rails. See (1) and (2) in **Figure 8-8**.

Figure 8-8 Pushing the inner rail



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Step 5 Place the removed server in an ESD bag.

NOTICE

Place only one server in an ESD bag.

----End

8.4.4 Installing a Server

8.4.4.1 Installing a Server on L-Shaped Guide Rails or Static Rail Kit

Before installing the server, properly install the L-shaped guide rails or static rail kit. For details, see **8.4.6.1 Installing L-Shaped Guide Rails** or **8.4.6.2 Installing the Static Rail Kit**.

The servers are stackable onto L-shaped guide rails or the static rail kit.

Procedure

Step 1 Install the server.

NOTICE

At least two people are required to move the device. Otherwise, personal injury or device damage may occur.

1. Lift the server, place it on guide rails, and slide it into the chassis. At least two people are required to move the server. See (1) in **Figure 8-9**.
2. Align the mounting ears on both sides of the server with the mounting bars and tighten the captive screws on the mounting ears. See (2) in **Figure 8-9**.

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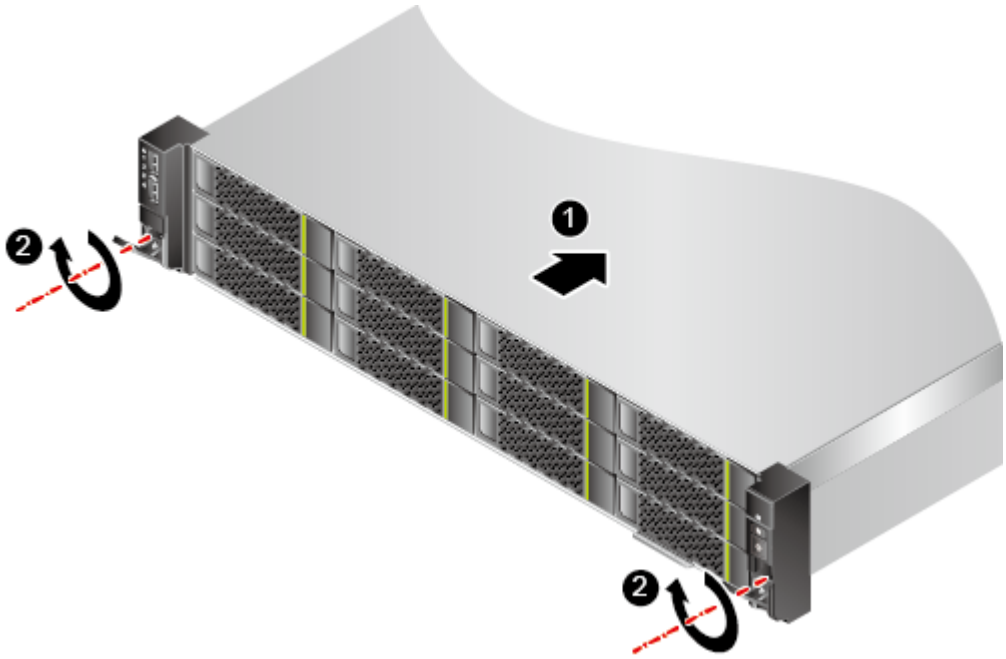
Figure 8-9 Installing a server



Step 2 Connect external cables as required, such as network cables, VGA cables, and USB devices.

Step 3 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 4 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 5 Check indicator status.

For details, see **2.1.2 Indicators and Buttons**.

----End

8.4.4.2 Installing the Server on the Ball Bearing Rail Kit

8.4.4.2.1 Ball Bearing Rail Kit 1

This section applies to the ball bearing rail kit whose part number is 21241258 and the cable organizer whose part number is 21241259.

Before installing the server, ensure that the ball bearing rail kit is properly installed. For details, see **8.4.6.3 Installing the Ball Bearing Rail Kit**.

The servers are stackable onto the ball bearing rail kit.

Procedure

Step 1 Install the server.

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NOTICE

At least two people are required to move the device. Otherwise, personal injury or device damage may occur.

1. Pull out the inner rails as far as they will go.

   Figure 8-10 Pulling out an inner rail

   

2. Lift the server (at least two people are required), align the positioning pins on the server with the holes on the inner guide rails, and push the server in the arrow direction until the locking pins engage. See (1) and (2) in **Figure 8-11**.

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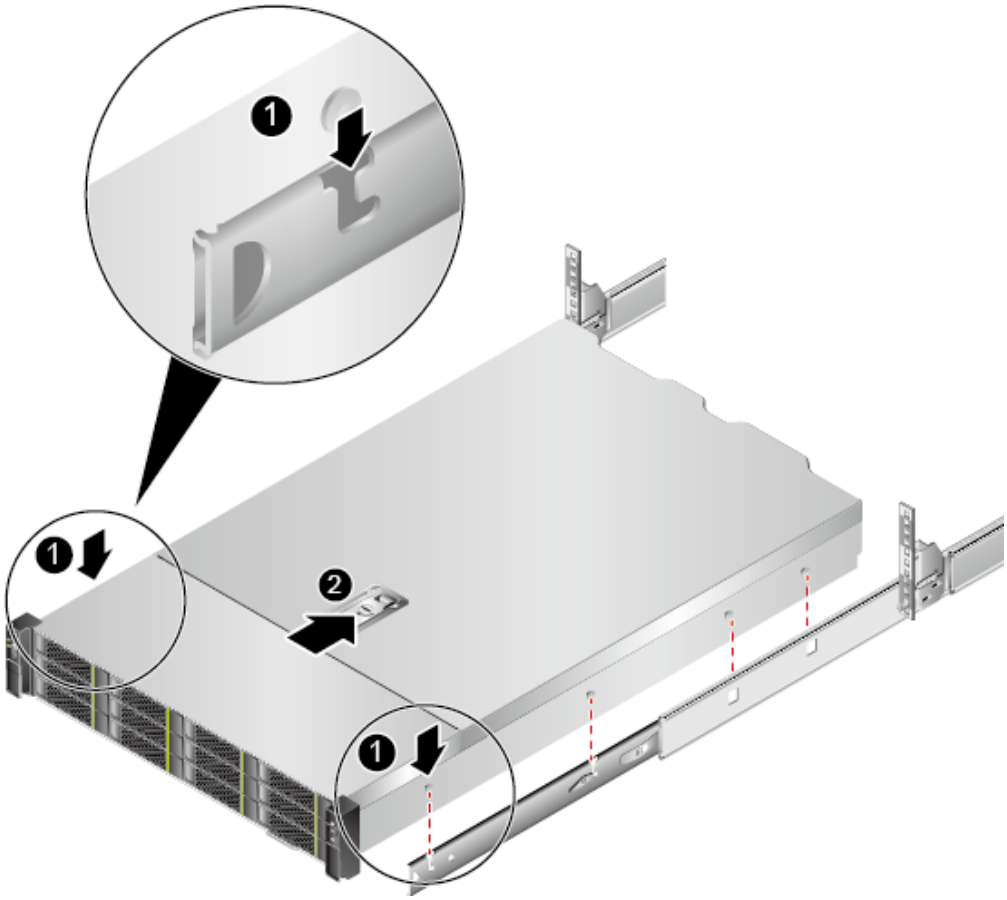
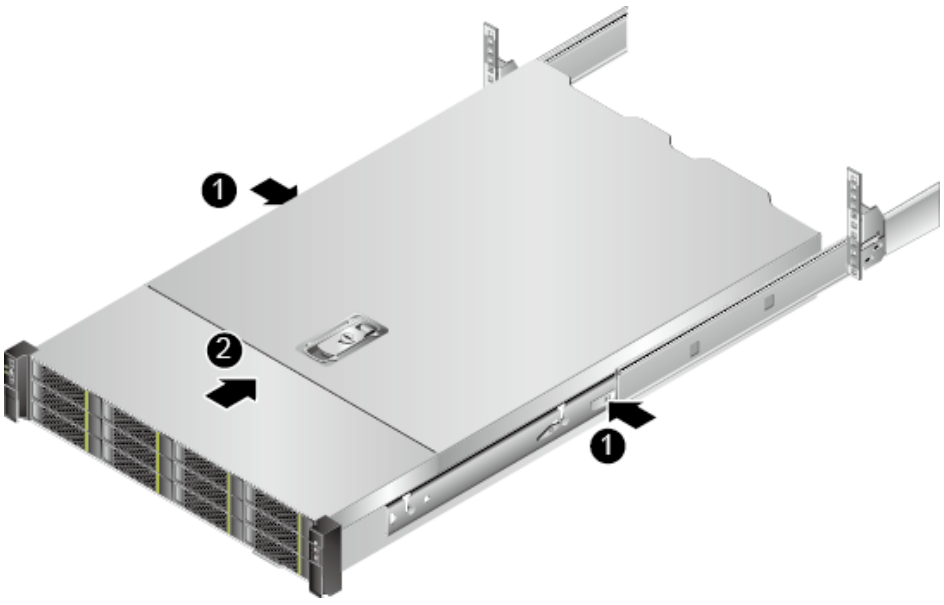
Figure 8-11 Installing inner rails



3. Press the release buttons on both sides and push the server into the rails. See (1) and (2) in **Figure 8-12**.

Figure 8-12 Installing a server



4. Tighten the captive screws on the mounting ears to secure the server.

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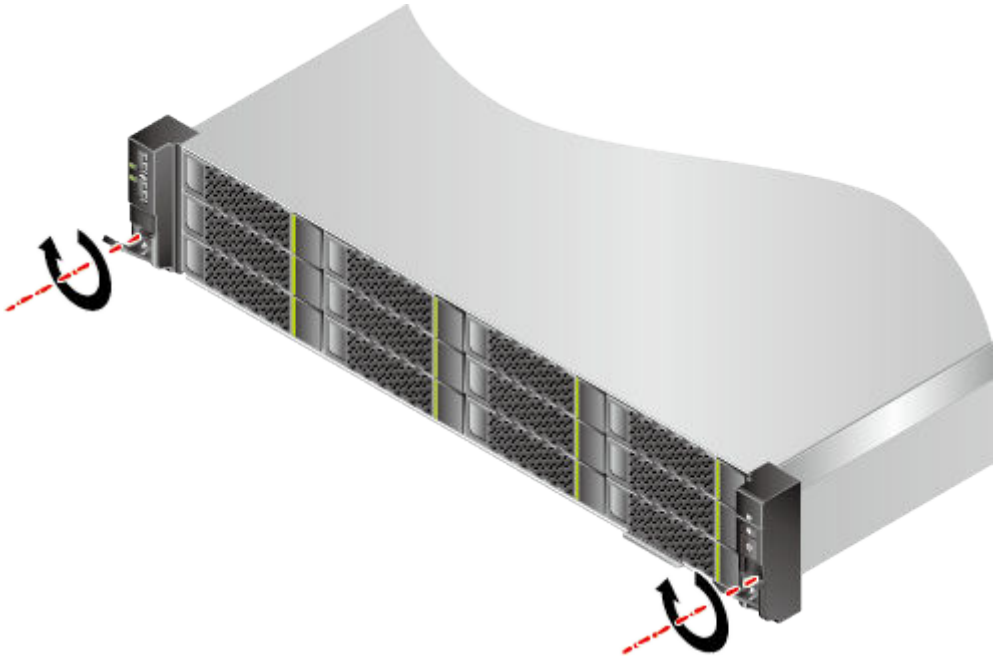
Figure 8-13 Securing a server



Step 2 Install a cable management arm (CMA).

1. Insert the support levers into the outer rails on both sides. See (1) in **Figure 8-14**.
2. Insert the nail heads on the outer left rail into the holes on the outer support lever of the CMA, and pull the CMA in the arrow direction. See (2) in **Figure 8-14**.
3. Insert the nail heads on the inner left rail into the holes on the inner support lever of the CMA, and pull the CMA in the arrow direction. See (3) in **Figure 8-14**.

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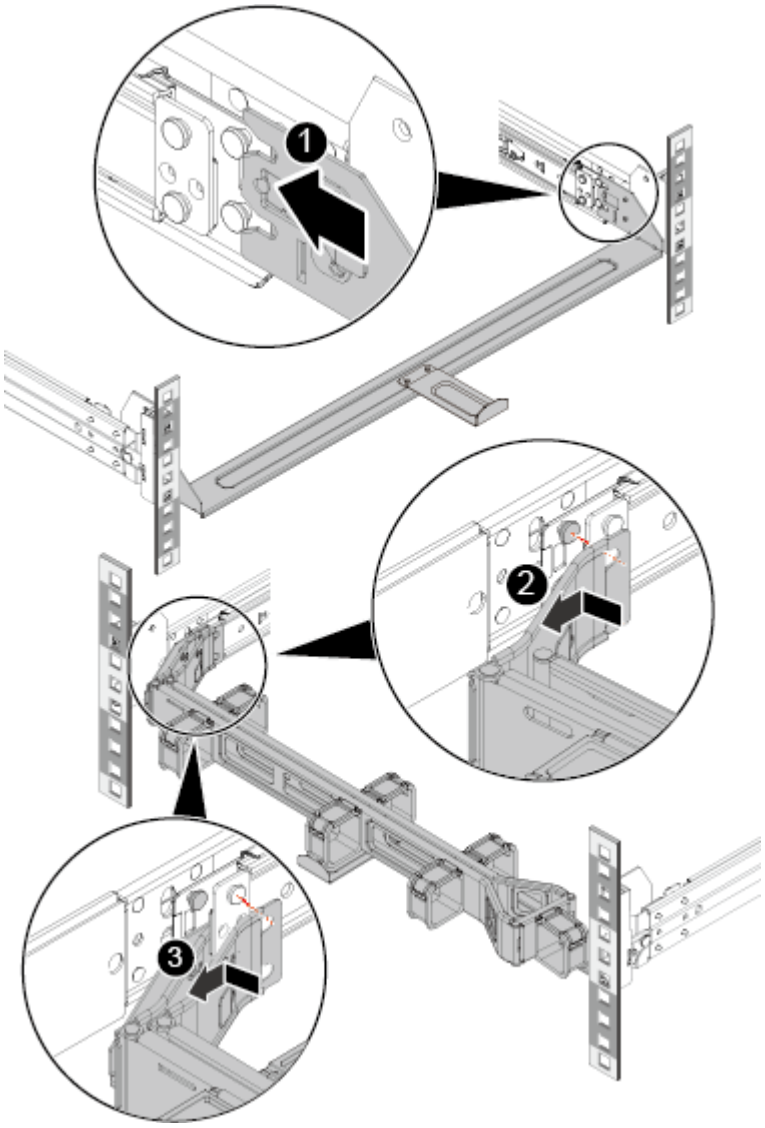
Figure 8-14 Installing the CMA



Step 3 Connect external cables as required, such as network cables, VGA cables, and USB devices.

Step 4 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 5 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 6 Check indicator status.

For details, see **2.1.2 Indicators and Buttons**.

----End

8.4.4.2.2 Ball Bearing Rail Kit 2

This section applies to the ball bearing rail kit whose part number is 21241258-002 and the cable organizer whose part number is 21241259-001.

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Before installing the server, ensure that the ball bearing rail kit is properly installed. For details, see **8.4.6.3 Installing the Ball Bearing Rail Kit**.

The servers are stackable onto the ball bearing rail kit.

Procedure

Step 1 Install the server.

NOTICE

At least two people are required to move the device. Otherwise, personal injury or device damage may occur.

1. Pull out the inner rails as far as they will go.

   Figure 8-15 Pulling out an inner rail



2. Lift the server (at least two people are required), align the two mounting screws on the rear part of the server with the holes on the inner rails, and push the server horizontally until the server cannot move. See **Figure 8-16**.

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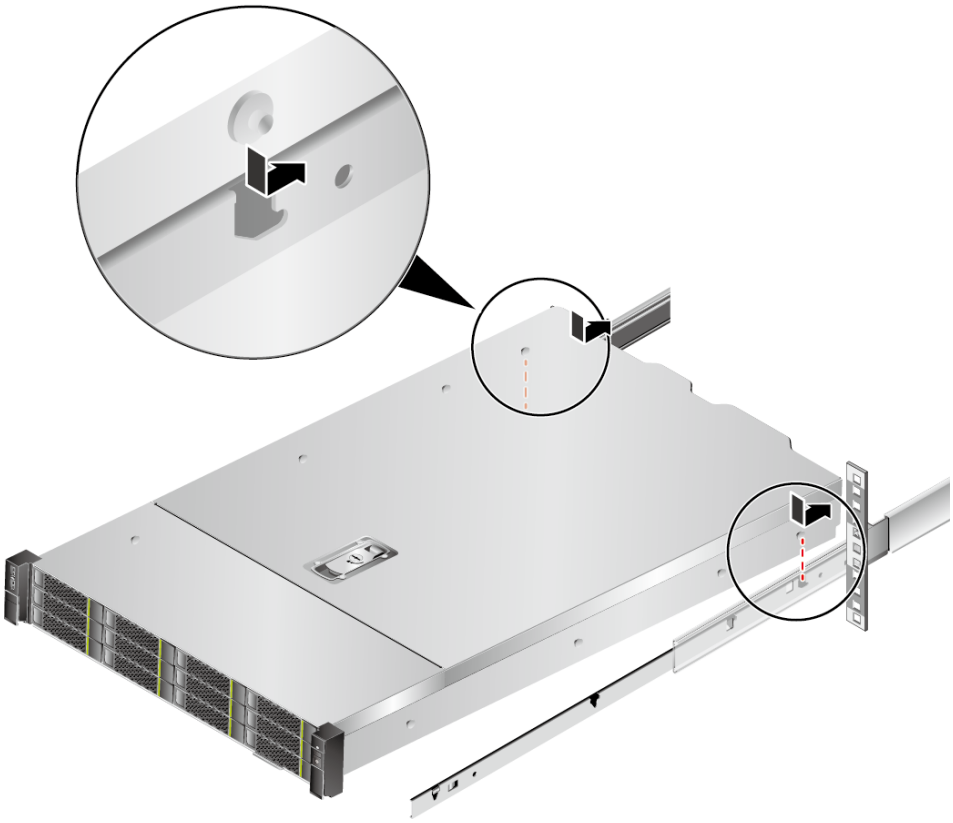
Figure 8-16 Securing a server to inner rails (1)



3. After securing the two mounting screws on the rear part of the server, slowly lower the front part of the server and secure the six mounting screws on the front part of the server to ensure that the server is completely secured on the inner rails. See **Figure 8-17**.

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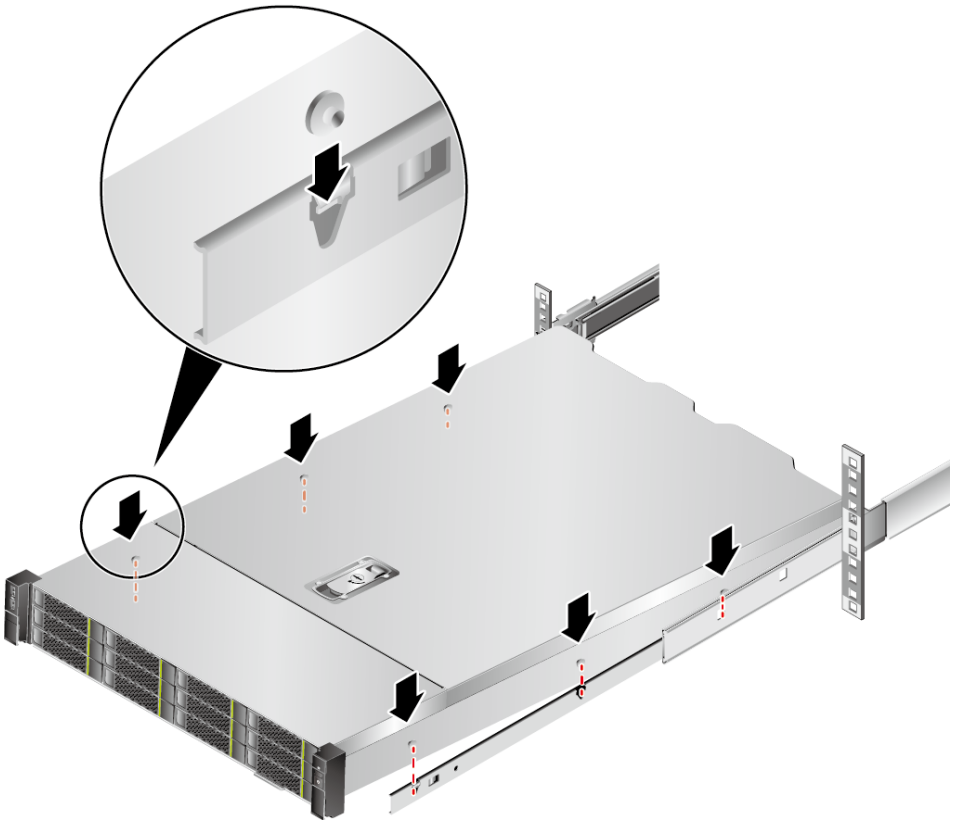
Figure 8-17 Securing a server to inner rails (2)



4. Unlock the release latches on both sides of the inner rails and push the server until the server cannot move. See (1) and (2) in **Figure 8-18**.

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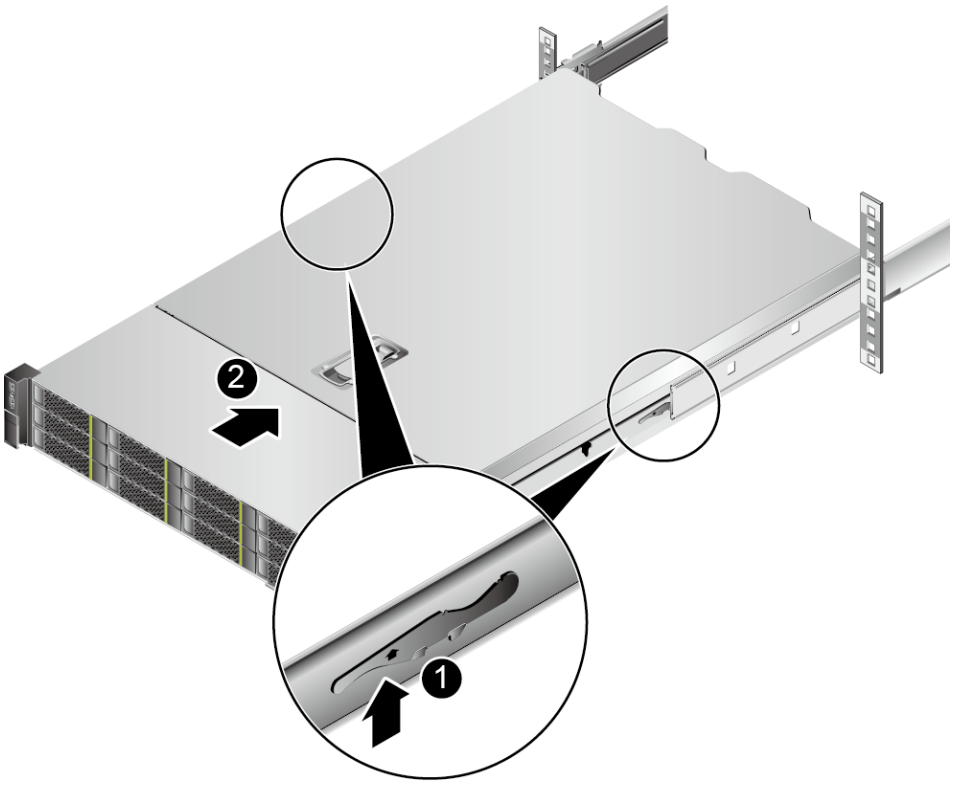
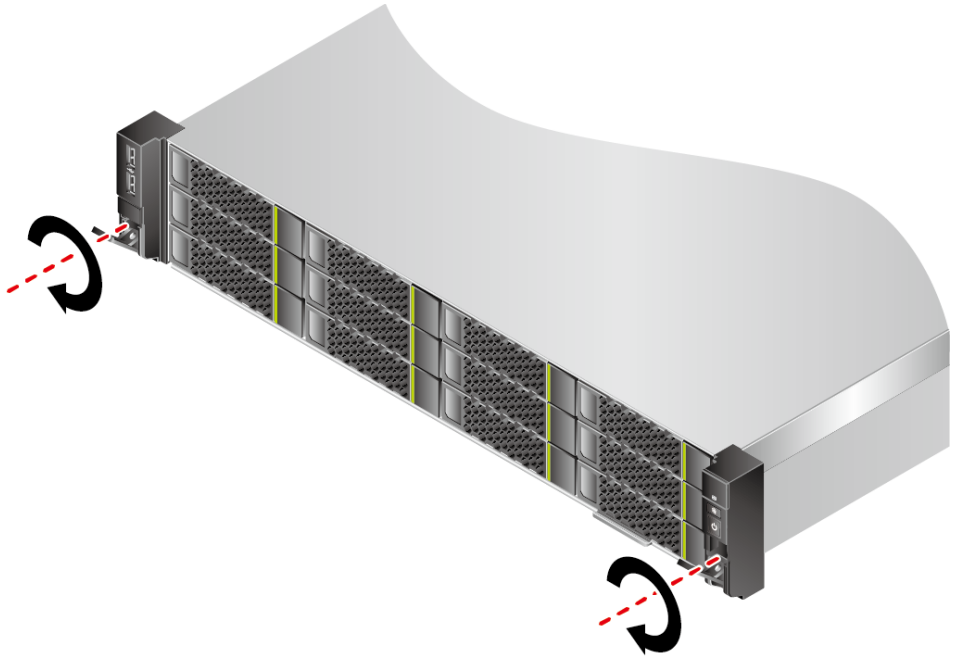
Figure 8-18 Pushing a server into the ball bearing rail kit



5. Tighten the captive screws on the mounting ears.

Figure 8-19 Securing a server



Step 2 Install a cable management arm (CMA).

1. Insert the bracket on the right of the CMA into the right guide rail. See (1) in **Figure 8-20**.

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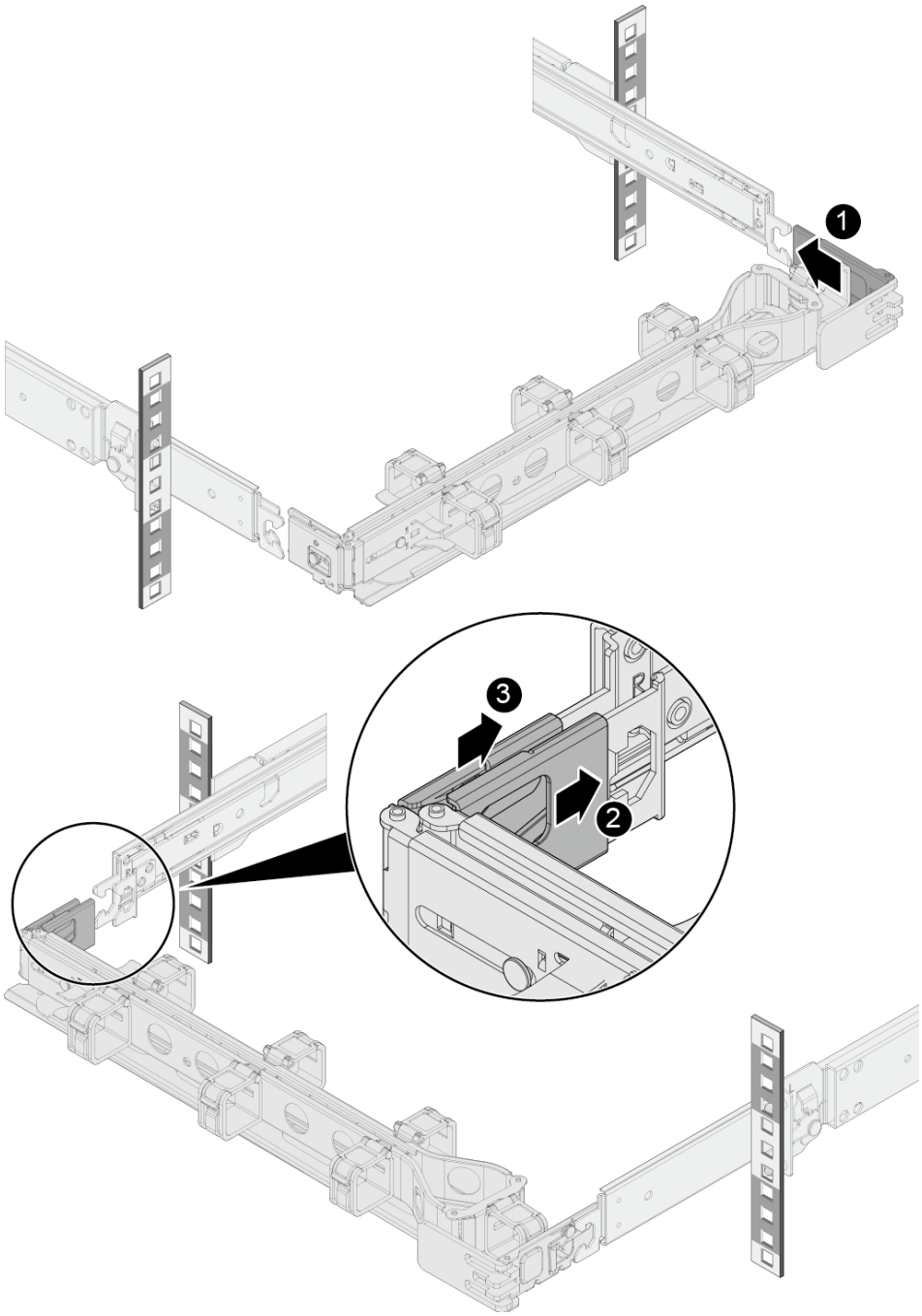
2. Insert the internal bracket on the left of the CMA into the left guide rail. See (2) in **Figure 8-20**.
3. Insert the external bracket on the left of the CMA into the left guide rail. See (3) in **Figure 8-20**.

Figure 8-20 Installing a CMA



Step 3 Connect external cables as required, such as network cables, VGA cables, and USB devices.

Step 4 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

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Step 5 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 6 Check indicator status.

For details, see **2.1.2 Indicators and Buttons**.

----End

8.4.5 Removing Server Guide Rails

8.4.5.1 Removing L-Shaped Guide Rails

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

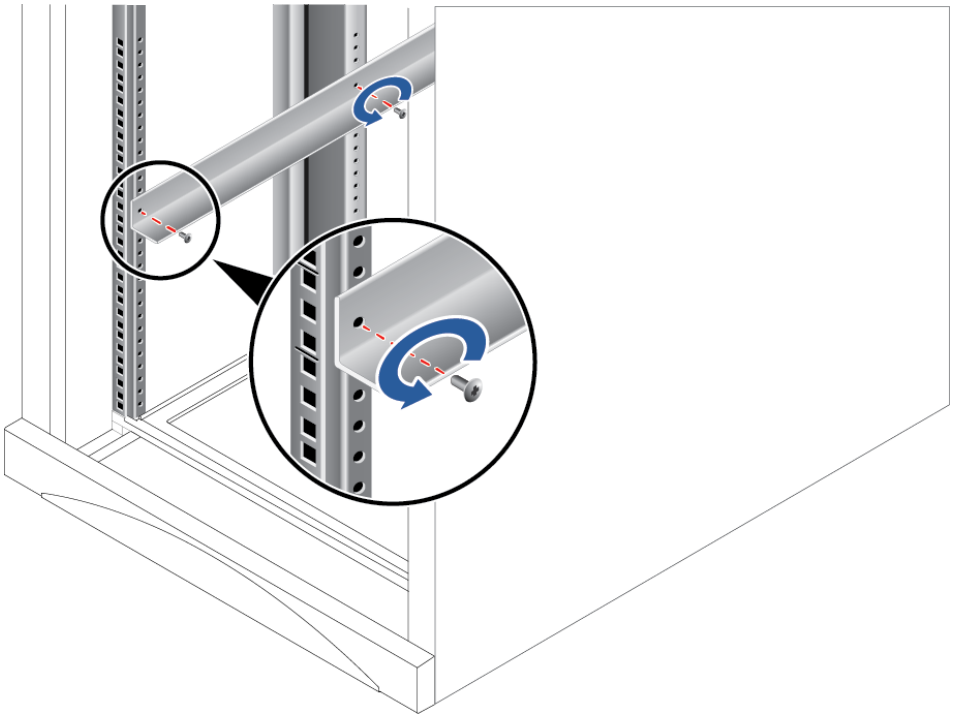
Step 3 Remove the server.

For details, see **8.4.3.1 Removing the Server from L-Shaped Guide Rails or Static Rail Kit**.

Step 4 Remove the L-shaped guide rails.

1. Loosen the screws on the guide rail.

Figure 8-21 Removing an L-shaped guide rail



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2. Remove the guide rail horizontally and place it on the ESD workstation.
3. Remove the other guide rail in the same way.

----End

8.4.5.2 Removing the Static Rail Kit

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3.1 Removing the Server from L-Shaped Guide Rails or Static Rail Kit**.

Step 4 Remove the static rail kit.

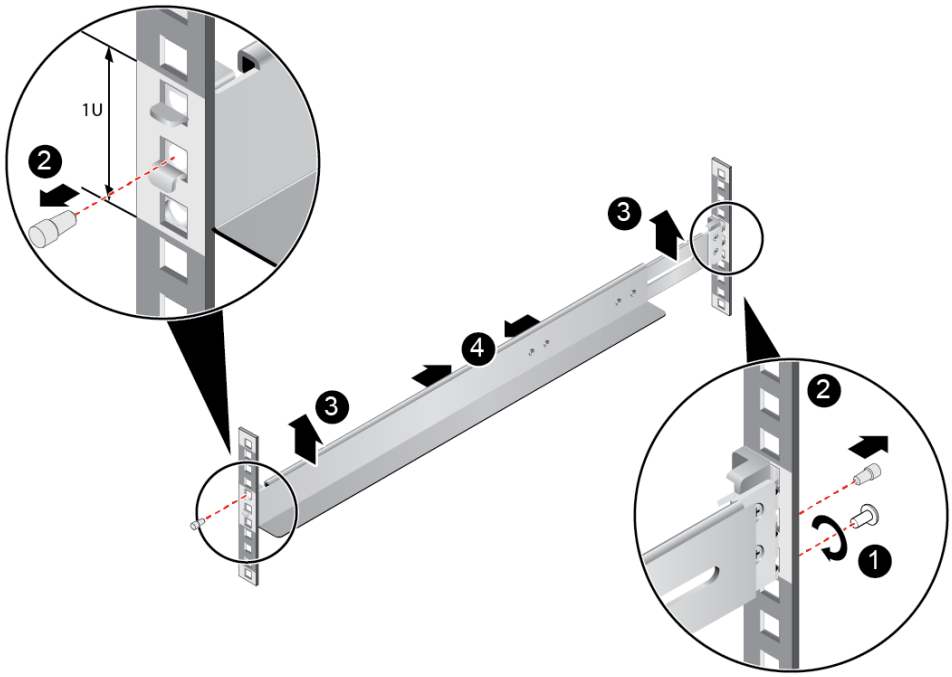
1. Loosen the M6 screw from the lowest square hole at the rear of the guide rail. See (1) in **Figure 8-22**.

   NOTE

   Perform this operation only when M6 screws are installed.

2. Remove the plugs from the two square holes. See (2) in **Figure 8-22**.
3. Lift the rail slightly to separate the hook from the square hole, and then shrink and remove the rail. See (3) and (4) in **Figure 8-22**.

Figure 8-22 Removing a static rail



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4. Remove the other rail in the same way.

----End

8.4.5.3 Removing the Ball Bearing Rail Kit

8.4.5.3.1 Ball Bearing Rail Kit 1

This section applies to the ball bearing rail kit whose part number is 21241258.

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3.2 Removing a Server from the Ball Bearing Rail Kit**.

Step 4 Remove the ball bearing rail kit.

1. Press the release latch at the front of the rail and stretch the hook horizontally as far as it will go. See (1) and (2) in **Figure 8-23**.
2. Push the front of the rail horizontally until it is removed from the mounting bar. See (3) in **Figure 8-23**.
3. Remove the front of the rail from the inner side of the mounting bar. See (4) in **Figure 8-23**.
4. Push the hook horizontally as far as it will go. See (5) in **Figure 8-23**.
5. Lift the positioning pin at the rear of the rail and stretch the rear of the rail horizontally as far as it will go. See (6) and (7) in **Figure 8-23**.

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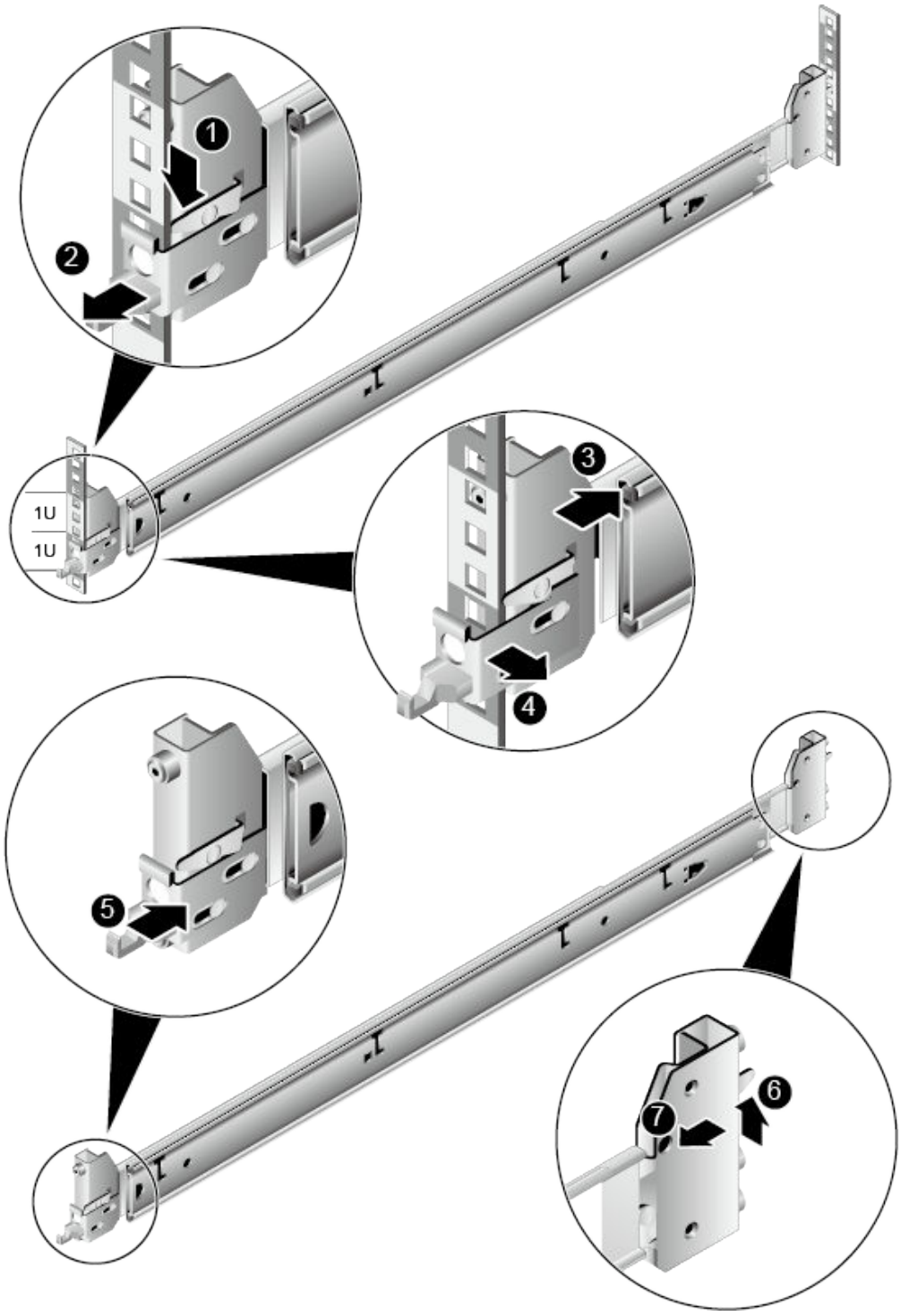
Figure 8-23 Removing the ball bearing rail kit



6. Remove the other rail in the same way.

----End

8.4.5.3.2 Ball Bearing Rail Kit 2

This section applies to the ball bearing rail kit whose part number is 21241258-002.

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Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3.2 Removing a Server from the Ball Bearing Rail Kit**.

Step 4 Remove the ball bearing rail kit.

1. Push the release latch on the front of the rail and pull out the hook. See (1) and (2) in **Figure 8-24**.
2. Keep the rail horizontal, and push the front of the rail until it is completely out of the hole on the front post of the cabinet. See (3) in **Figure 8-24**.
3. Hook the rail. See (4) in **Figure 8-24**.
4. Lift the positioning pin at the rear of the rail, and pull the rear of the rail until it is completely out of the hole on the rear post of the cabinet. See (5) and (6) in **Figure 8-24**.

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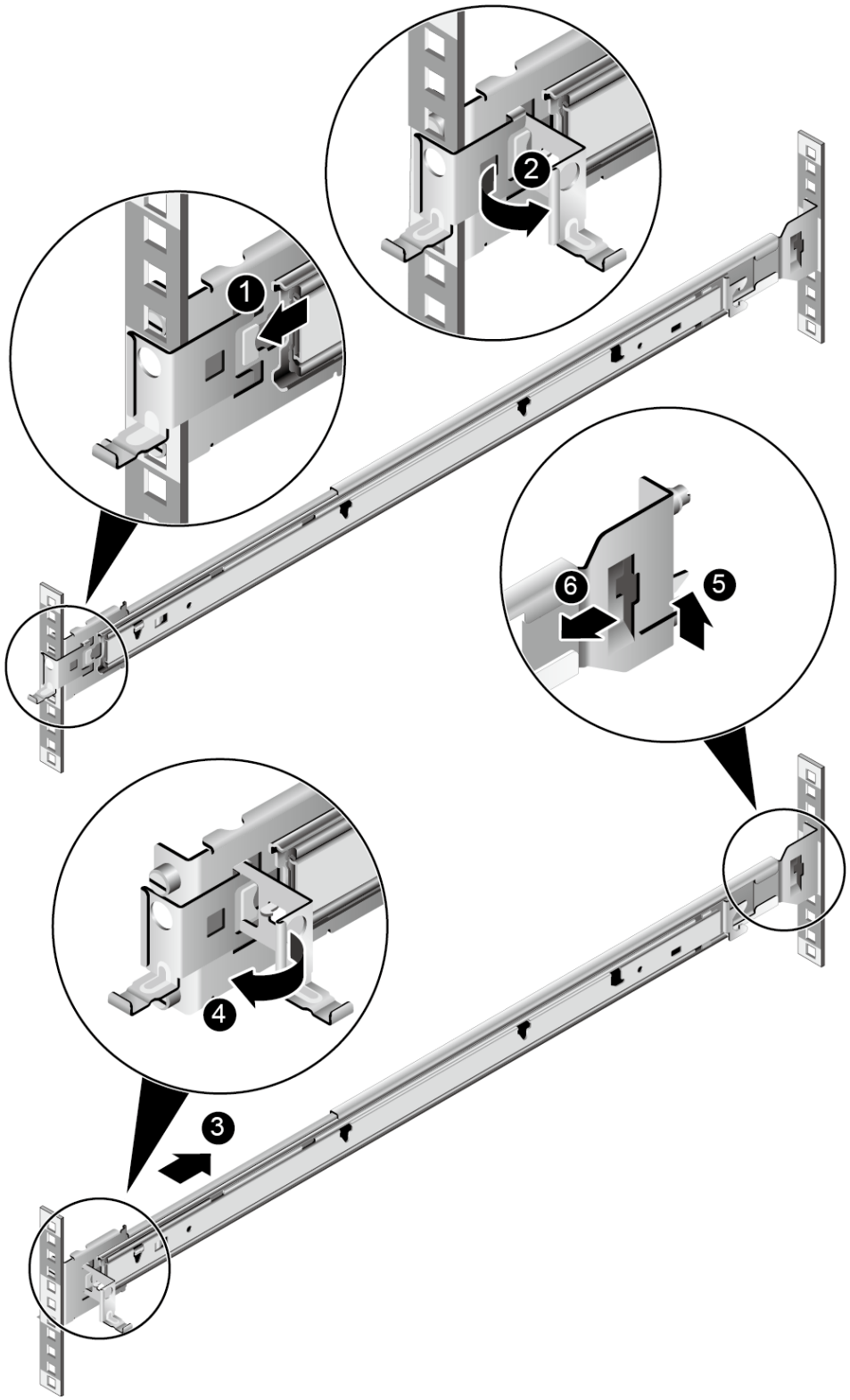
Figure 8-24 Removing the ball bearing rail kit



5. Push the front of the rail until the inner rail is completely inserted in the rail.
6. Remove the other rail in the same way.

----End

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8.4.6 Installing Server Guide Rails

8.4.6.1 Installing L-Shaped Guide Rails

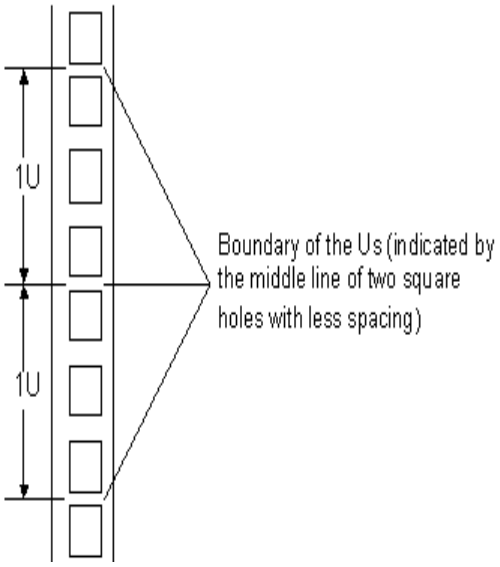
L-shaped guide rails are designed for Huawei cabinets only.

Procedure

Step 1 Install floating nuts.

1. Determine the installation positions of the floating nuts according to the cabinet device installation plan.

   Figure 8-25 Spacing of 1U on a mounting bar of a cabinet

   NOTE

   - Floating nuts are used to tighten screws.
   - The boundary between Us is used as the reference for calculating device installation space.

2. Fasten the lower end of a floating nut to the target square hole in a mounting bar at the front of the cabinet.
3. Use a floating nut hook to pull the upper end of the floating nut, and fasten it to the upper edge of the square hole.

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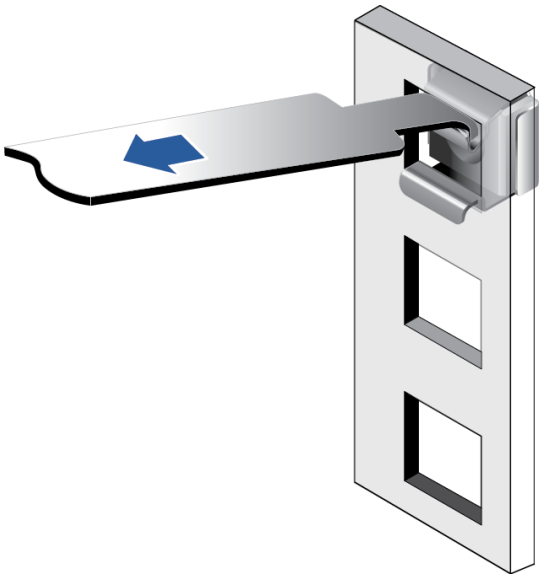
Figure 8-26 Installing a floating nut

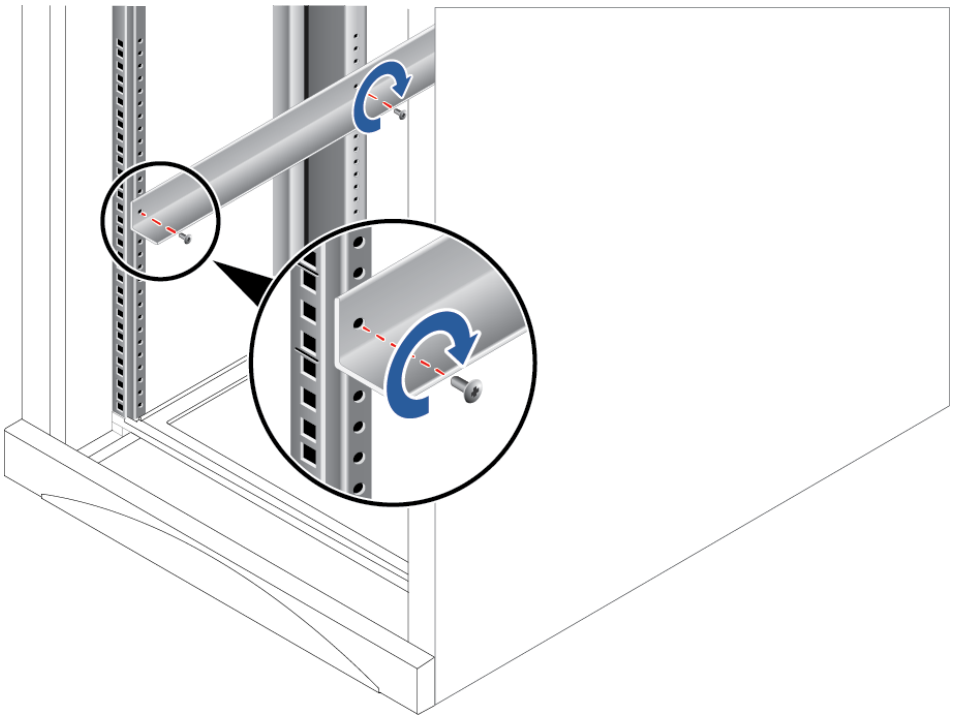


4. Install the other floating nut in the same way.

Step 2 Install the L-shaped guide rails.

1. Position a guide rail horizontally in contact with the mounting bars in the cabinet.
2. Tighten the screws to secure the guide rail.

Figure 8-27 Installing an L-shaped guide rail



3. Install the other guide rail in the same way.

----End

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8.4.6.2 Installing the Static Rail Kit

The static rail kit applies to cabinets with a distance of 543.5 mm to 848.5 mm (21.40 in. to 33.41 in.) between the front and rear mounting bars.

Procedure

Step 1 Place the rail horizontally in the planned position. Stretch the rail on both sides of the cabinet based on the cabinet length, keeping it in contact with the mounting bar in the cabinet, and hook the rail. See (1) in **Figure 8-28**.

NOTE

The distance between the three holes in each mounting bar for the guide rail must be within 1 U.

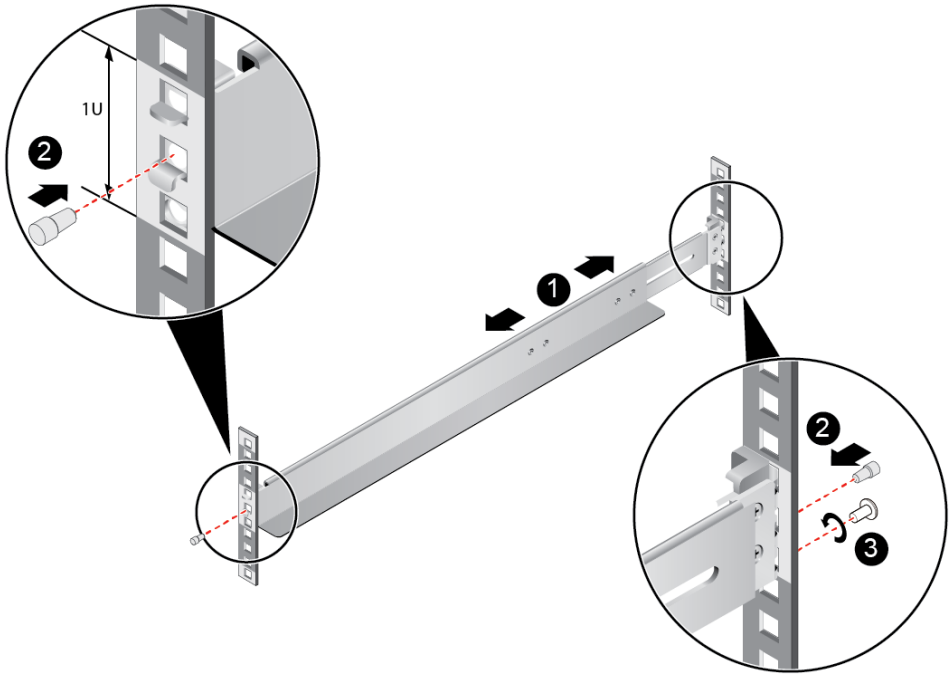
Step 2 Plug the second square holes at the front and rear of the rail. See (2) in **Figure 8-28**.

Step 3 On the first lower square hole at the rear of the rail, insert an M6 screw. See (3) in **Figure 8-28**.

NOTE

Although the static rail kit does not need screws for installation, you can perform this operation to improve the shockproof level and fastening degree of the server.

Figure 8-28 Installing a static rail



Step 4 Install the other rail in the same way.

----End

8.4.6.3 Installing the Ball Bearing Rail Kit

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8.4.6.3.1 Ball Bearing Rail Kit 1

This section applies to the ball bearing rail kit whose part number is 21241258.

Installation space for ball bearing rail kit:

- Chassis for 2.5" drives: with a distance of 610 mm to 914 mm (24.02 in. to 35.98 in.) between the front and rear mounting bars.
- Chassis for 3.5" drives: with a distance of 640 mm to 914 mm (25.20 in. to 35.98 in.) between the front and rear mounting bars.

Procedure

Step 1 Press the release latch at the front of the rail and stretch the hook horizontally as far as it will go. See (1) and (2) in **Figure 8-29**.

Step 2 Insert the positioning pin at the rear of the rail into the hole on the rear column of the cabinet. See (3) in **Figure 8-29**.

Step 3 Align the front end of the rail with the hole on the front column of the cabinet, push the rail horizontally, and insert the rail into the hole on the column from the side. See (4) in **Figure 8-29**.

Step 4 Push the hook horizontally until the release latch clicks into place. See (5) in **Figure 8-29**.

Step 5 On the third square hole at the rear of the rail, insert an M6 screw. See (6) in **Figure 8-29**.

NOTE

Although the ball bearing rail kit does not need screws for installation, we recommend you use M6 screws at the rear end to make the server more shockproof and secure.

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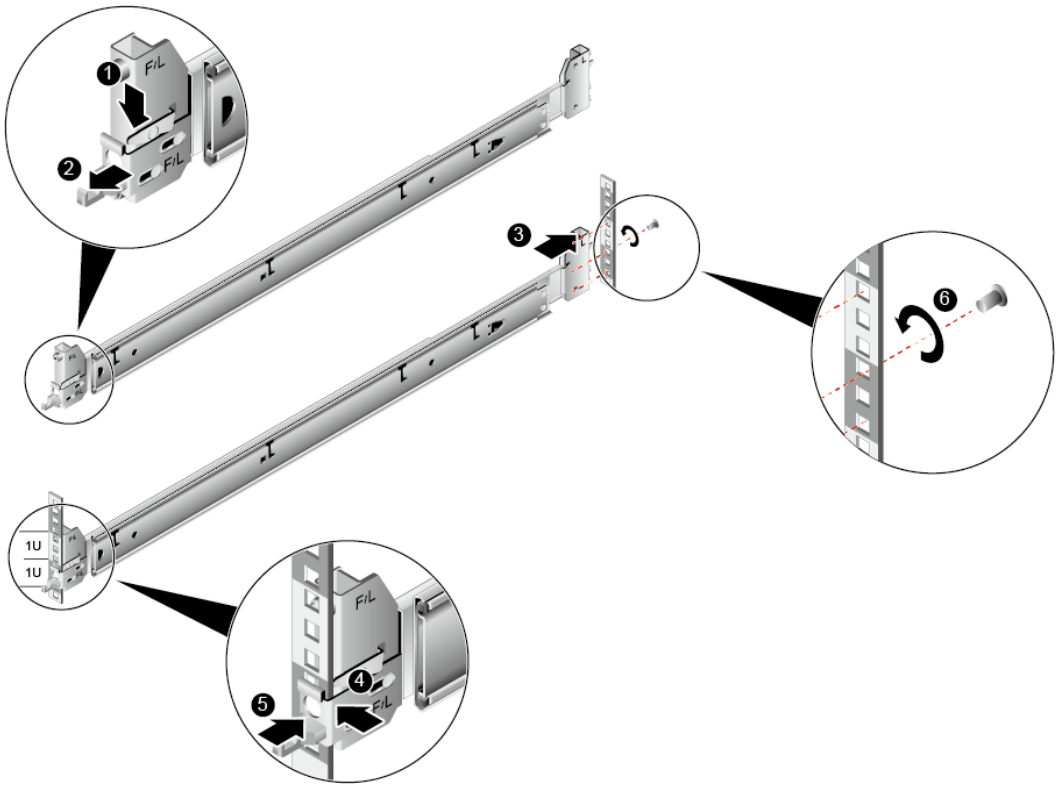
Figure 8-29 Installing the ball bearing rail kit



Step 6 Install the other rail in the same way.

----End

8.4.6.3.2 Ball Bearing Rail Kit 2

This section applies to the ball bearing rail kit whose part number is 21241258-002.

Installation space for ball bearing rail kit:

- Chassis for 2.5" drives: with a distance of 610 mm to 914 mm (24.02 in. to 35.98 in.) between the front and rear mounting bars.
- Chassis for 3.5" drives: with a distance of 640 mm to 914 mm (25.20 in. to 35.98 in.) between the front and rear mounting bars.

Procedure

Step 1 Push the release latch on the front of the rail and pull out the hook. See (1) and (2) in **Figure 8-30**.

Step 2 Insert the positioning pin at the rear of the rail into the hole on the rear post of the cabinet. See (3) in **Figure 8-30**.

Step 3 Keep the rail horizontal, and push the front end of the rail until it is inserted into the hole on the front post of the cabinet. See (4) in **Figure 8-30**.

Step 4 Hook the rail. See (5) in **Figure 8-30**.

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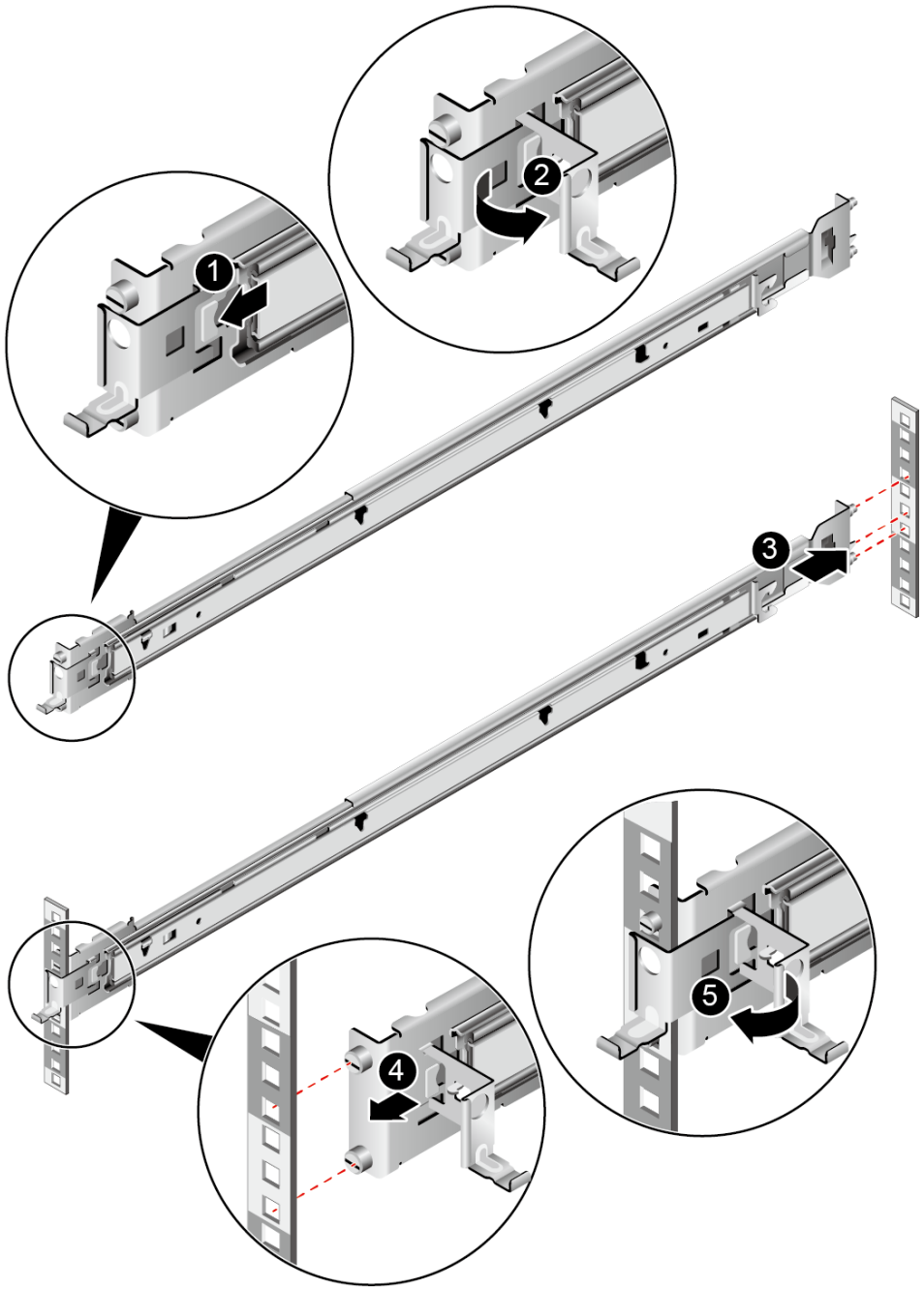
Figure 8-30 Installing the ball bearing rail kit



Step 5 Install the other rail in the same way.

----End

8.5 Field Replaceable Units

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8.5.1 Removing the Chassis Cover

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

1. Use a flat-head screwdriver to loosen the latch screw of the cover counterclockwise. See (1) in **Figure 8-31**.

   NOTICE

   - If no flat-head screwdriver is available onsite, you can use a Phillips screwdriver (PH2.0 is recommended).
   - Do not use an electric screwdriver. Otherwise, the lock slot of the chassis cover may be damaged due to high rotational speed.

2. Open the ejector lever on the cover and the cover moves backwards automatically. See (2) in **Figure 8-31**.
3. Lift the chassis cover. See (3) in **Figure 8-31**.

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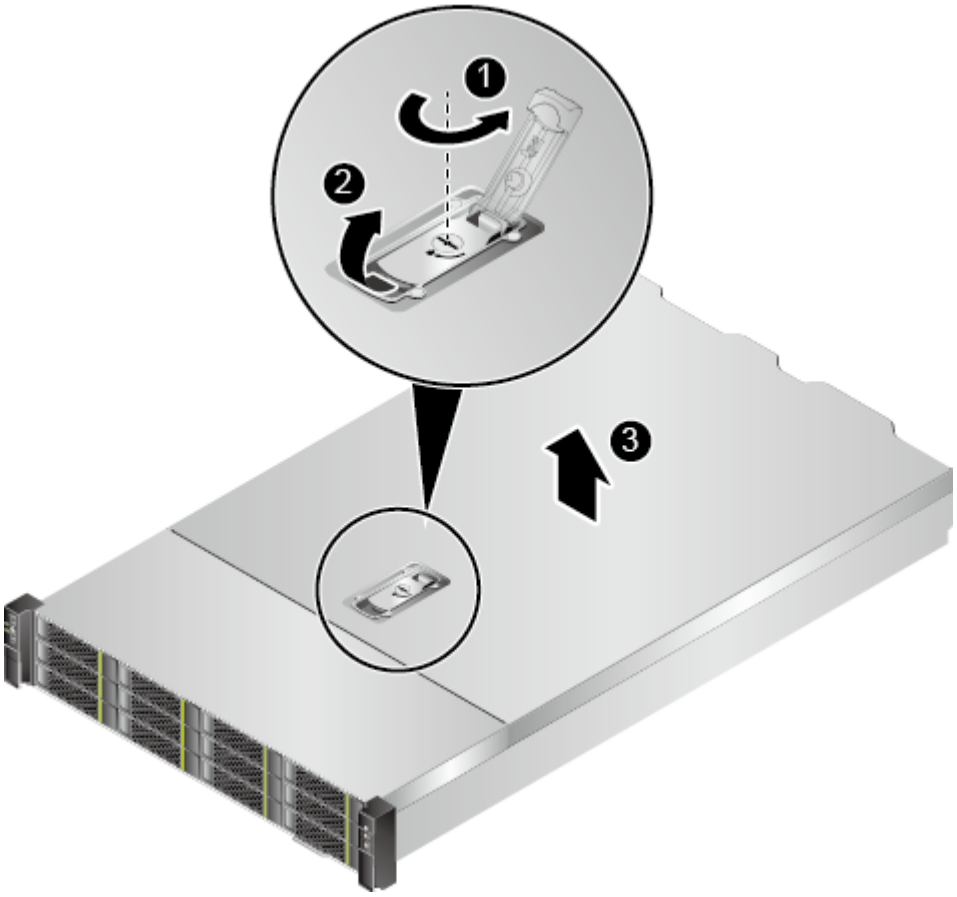
Figure 8-31 Removing the chassis cover



----End

8.5.2 Installing the Chassis Cover

Procedure

Step 1 Place the server on the ESD workstation.

Step 2 Take the component out of its ESD bag.

Step 3 Install the chassis cover.

1. Align the cover with the fixing slots on chassis walls and put down the cover. See (1) in **Figure 8-32**.
2. Close the latch handle. See (2) in **Figure 8-32**.
3. Use a flat-head screwdriver to fasten the latch screw of the cover clockwise. See (3) in **Figure 8-32**.

NOTICE

- If no flat-head screwdriver is available onsite, you can use a Phillips screwdriver (PH2.0 is recommended).
- Do not use an electric screwdriver. Otherwise, the lock slot of the chassis cover may be damaged due to high rotational speed.

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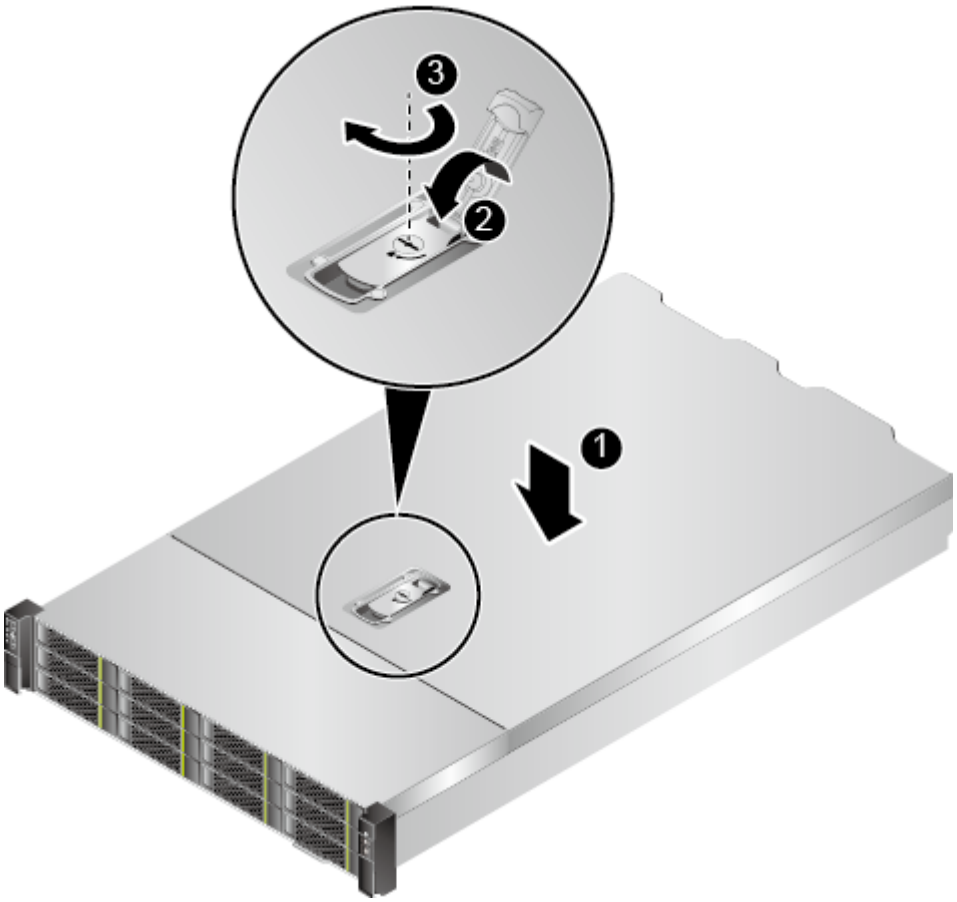
Figure 8-32 Installing the chassis cover



Step 4 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 5 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 6 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

----End

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8.5.3 Removing a SAS/SATA Drive

NOTE

- The SATA or SAS drives support hot swap.
  - If the drive to be removed has no operating system installed, you can remove it without powering off the server.
  - If the drive to be removed has the operating system installed and is in a RAID array with redundancy, and the removal does not cause a RAID array fault, you can remove it without powering off the server.
  - If the drive to be removed has the operating system installed but it is not in a RAID array or it is in a RAID array without redundancy (for example, RAID 0), power off the server before removing it.
- The SAS/SATA drives support RAID configuration.
  - If the drive to be removed is not in a RAID array or is in a RAID array without redundancy (for example, RAID 0), back up the data on the drive before removing it.
  - If the drive to be removed is in a RAID array with redundancy and the removal does not cause a RAID array fault, you do not need to back up data before removing it.
- Before removing a drive, you can use Smart Provisioning to delete data from the drive. For details, see "Erasing Drives" in ***Smart Provisioning User Guide***.

8.5.3.1 Removing a Front SAS/SATA Drive

Procedure

Step 1 Check whether a front bezel is installed.

- If yes, go to **Step 2**.
- If no, go to **Step 3**.

Step 2 Remove the front bezel.

For details, see **8.5.57 Removing the Front Bezel**.

Step 3 Determine the slot and position of the drive.

For details, see **2.5.1 Drive Configurations** and **2.5.2 Drive Numbering**.

Step 4 Check the running status of the drive by observing its indicators.

For details, see **SAS/SATA Drive Indicators**.

Step 5 Determine whether the drive needs to be removed.

- If yes, go to **Step 6**.
- If no, rectify the drive fault.

Step 6 Remove the drive.

1. Press the ejector release button on the drive panel to release the ejector lever. See (1) in **Figure 8-33**.
2. Open the drive ejector lever completely. See (2) in **Figure 8-33**.
3. Holding the ejector lever, remove the drive from the server. See (3) in **Figure 8-33**.

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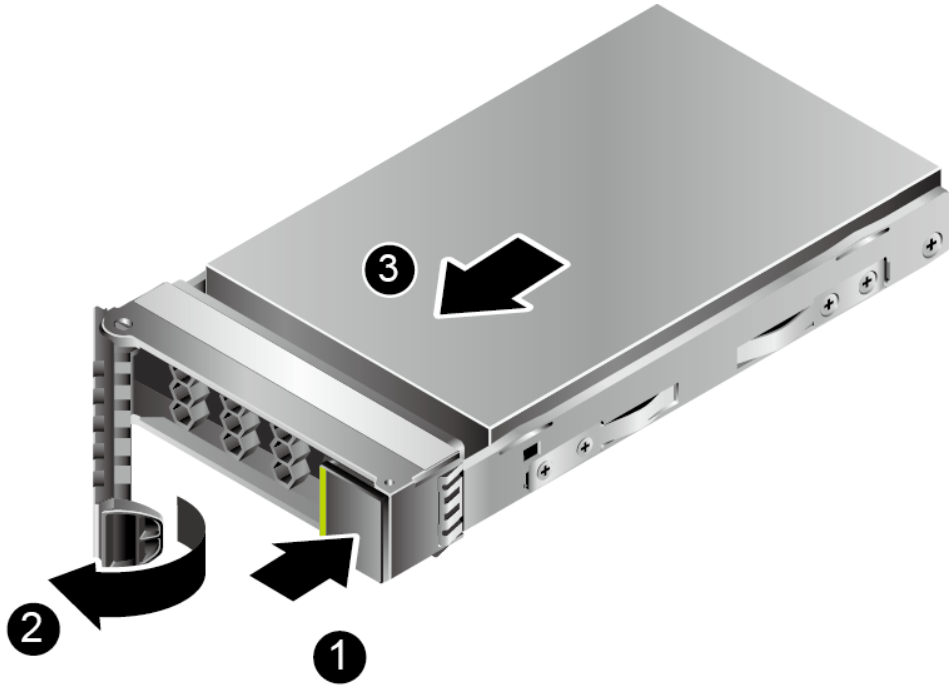
NOTICE

- Before removing an HDD, hold the ejector lever and pull out the drive for about 3 cm (1.18 in.). Wait for at least 30 seconds until the drive stops rotating, and then remove the drive from the server.
- Do not insert or remove drives frequently. If a drive is frequently removed and installed in an interval shorter than 30 seconds, there are risks that the drive cannot be identified.

Figure 8-33 Removing a drive



Step 7 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

Step 8 Install a drive filler.

NOTE

Perform this operation only when a drive is not installed immediately.

----End

8.5.3.2 Removing a Rear SAS/SATA Drive

Procedure

Step 1 Determine the slot and position of the drive.

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For details, see **2.5.1 Drive Configurations** and **2.5.2 Drive Numbering**.

Step 2 Check the running status of the drive by observing its indicators.

For details, see **SAS/SATA Drive Indicators**.

Step 3 Determine whether the drive needs to be removed.

- If yes, go to **Step 4**.
- If no, rectify the drive fault.

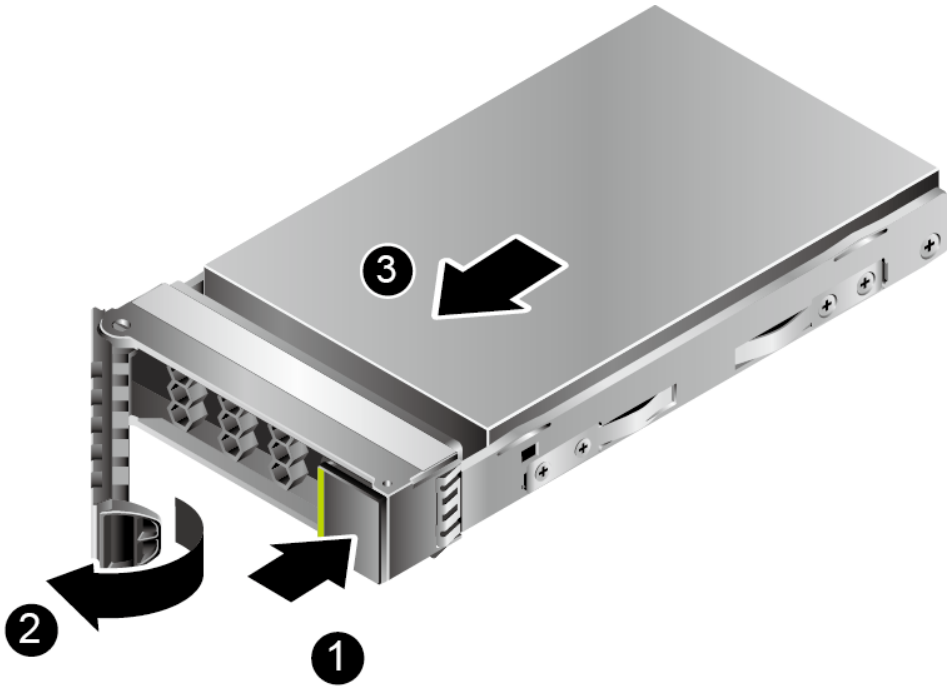
Step 4 Remove the drive.

1. Press the ejector release button on the drive panel to release the ejector lever. See (1) in **Figure 8-34**.
2. Open the drive ejector lever completely. See (2) in **Figure 8-34**.
3. Holding the ejector lever, remove the drive from the server. See (3) in **Figure 8-34**.

NOTICE

- Before removing an HDD, hold the ejector lever and pull out the drive for about 3 cm (1.18 in.). Wait for at least 30 seconds until the drive stops rotating, and then remove the drive from the server.
- Do not insert or remove drives frequently. If a drive is frequently removed and installed in an interval shorter than 30 seconds, there are risks that the drive cannot be identified.

Figure 8-34 Removing a drive



Step 5 Place the removed component in an ESD bag.

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NOTICE

Place only one component in an ESD bag.

Step 6 Install a drive filler.

NOTE

Perform this operation only when a drive is not installed immediately.

----End

8.5.3.3 Removing a Built-in SAS/SATA Drive

Procedure

Step 1 Determine the slot and position of the drive.

For details, see **2.5.1 Drive Configurations** and **2.5.2 Drive Numbering**.

Step 2 Check the running status of the drive by observing its indicators.

For details, see **SAS/SATA Drive Indicators**.

Step 3 Determine whether the drive needs to be removed.

- If yes, go to **Step 4**.
- If no, rectify the drive fault.

Step 4 Release the eject levers of the built-in drive module.

NOTICE

If the chassis cover is away for too long while the server is powered on, some components will become overheated. Install the chassis cover within 3 minutes.

1. Remove the chassis cover.
   For details, see **8.5.1 Removing the Chassis Cover**.
2. Release the eject levers of the built-in drive module until it cannot rotate.

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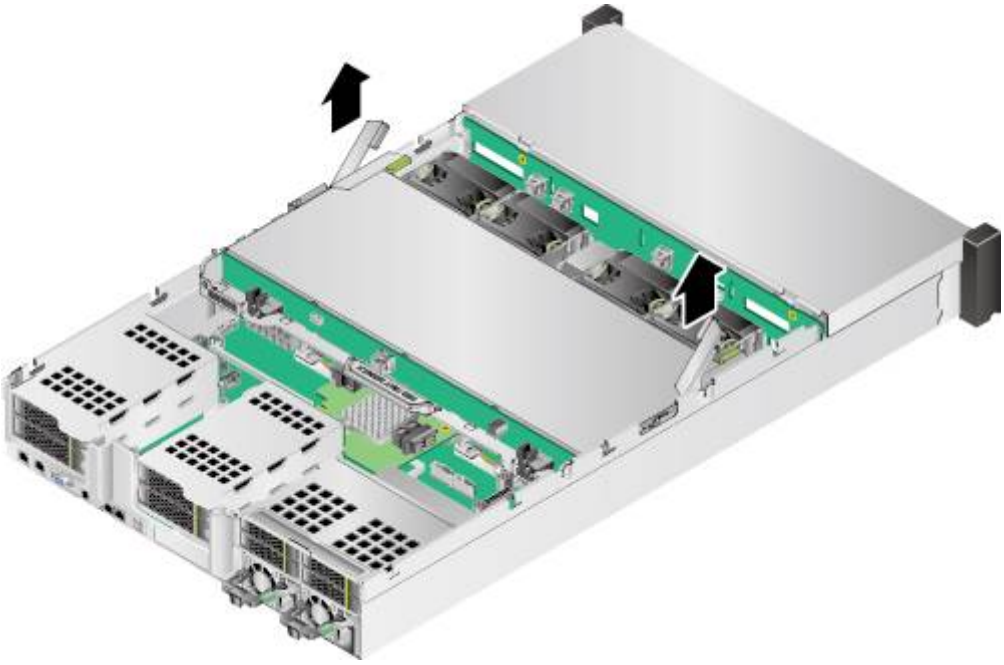
Figure 8-35 Releasing eject levers of the built-in drive module



Step 5 Remove the drive.

1. Press the ejector release button on the drive panel to release the ejector lever. See (1) in **Figure 8-36**.
2. Open the drive ejector lever completely. See (2) in **Figure 8-36**.
3. Holding the ejector lever, remove the drive from the server. See (3) in **Figure 8-36**.

NOTICE

- Before removing an HDD, hold the ejector lever and pull out the drive for about 3 cm (1.18 in.). Wait for at least 30 seconds until the drive stops rotating, and then remove the drive from the server.
- Do not insert or remove drives frequently. If a drive is frequently removed and installed in an interval shorter than 30 seconds, there are risks that the drive cannot be identified.

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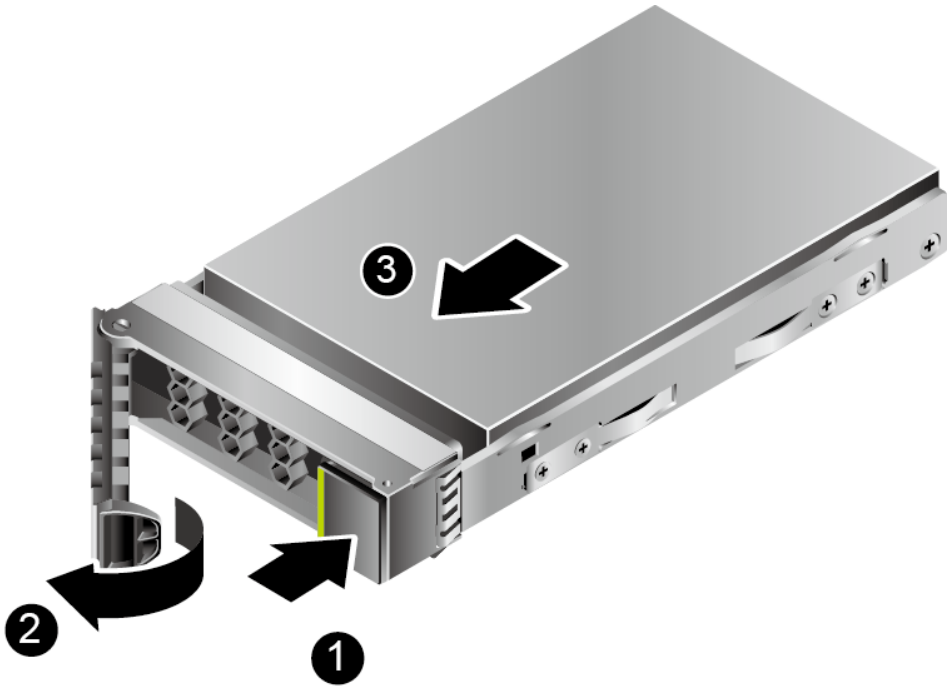
Figure 8-36 Removing a drive



Step 6 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

Step 7 Install a drive filler.

NOTE

Perform this operation only when a drive is not installed immediately.

----End

8.5.4 Installing a SAS/SATA Drive

NOTICE

- The SATA or SAS drives support hot swap. After a faulty drive is disconnected from its backplane, wait 30 seconds before removing it. If the drive alarm persists, you are advised to log in to the iBMC WebUI to view the alarm details. For details, see "Troubleshooting > Hard Drive Fault" of each RAID controller card in ***Huawei V5 Server RAID Controller Card User Guide***. Do not frequently hot-swap a drive to prevent new alarms.
- To prevent damage caused by insufficient heat dissipation and high temperature, install components or filler panels in all drive slots.

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8.5.4.1 Installing a Front SAS/SATA Drive

Procedure

Step 1 Check whether a front bezel is installed.

- If yes, go to **Step 2**.
- If no, go to **Step 3**.

Step 2 Remove the front bezel.

For details, see **8.5.57 Removing the Front Bezel**.

Step 3 Take the component out of its ESD bag.

Step 4 Determine the slot and position of the drive.

For details, see **2.5.1 Drive Configurations** and **2.5.2 Drive Numbering**.

Step 5 Remove the drive filler.

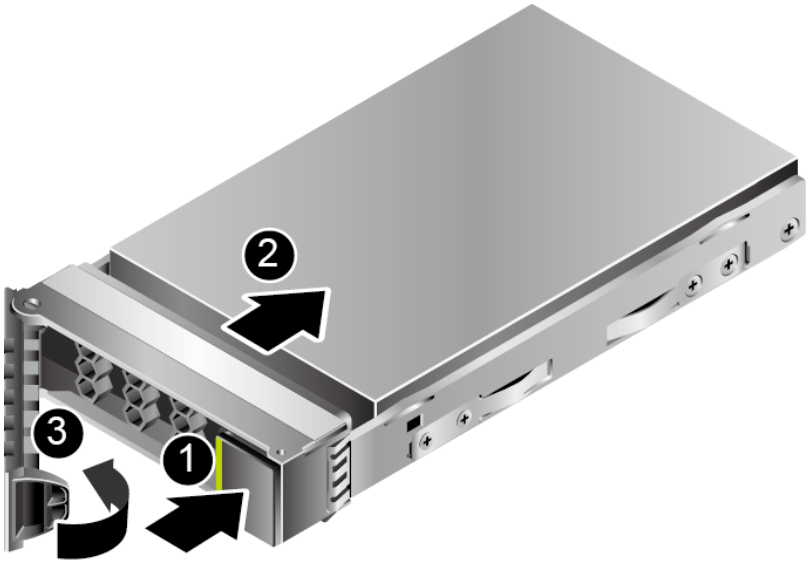
NOTE

Perform this operation only when a drive filler is installed.

Step 6 Install a drive.

1. Press the ejector release button on the drive panel to release the ejector lever. See (1) in **Figure 8-37**.
2. Push the drive into the chassis along the guide rails as far as it will go. See (2) in **Figure 8-37**.
3. Ensure that the ejector lever is fastened to the chassis beam, and then close it to completely insert the drive into the slot. See (3) in **Figure 8-37**.

Figure 8-37 Installing a drive



Step 7 Check the running status of the drive by observing its indicators.

For details, see **SAS/SATA Drive Indicators**.

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Step 8 Restore the drive data.

NOTE

Perform this operation only when you replace a drive.

For details, see "Troubleshooting > Hard Drive Fault" of each RAID controller card in ***Huawei V5 Server RAID Controller Card User Guide***.

Step 9 Check whether a front bezel is installed.

- If yes, go to **Step 10**.
- If no, no further action is required.

Step 10 Install the front bezel.

For details, see **8.5.58 Installing the Front Bezel**.

----End

8.5.4.2 Installing the Rear SAS/SATA Drive

Procedure

Step 1 Take the component out of its ESD bag.

Step 2 Determine the slot and position of the drive.

For details, see **2.5.1 Drive Configurations** and **2.5.2 Drive Numbering**.

Step 3 Remove the drive filler.

NOTE

Perform this operation only when a drive filler is installed.

Step 4 Install a drive.

1. Press the ejector release button on the drive panel to release the ejector lever. See (1) in **Figure 8-38**.
2. Push the drive into the chassis along the guide rails as far as it will go. See (2) in **Figure 8-38**.
3. Ensure that the ejector lever is fastened to the chassis beam, and then close it to completely insert the drive into the slot. See (3) in **Figure 8-38**.

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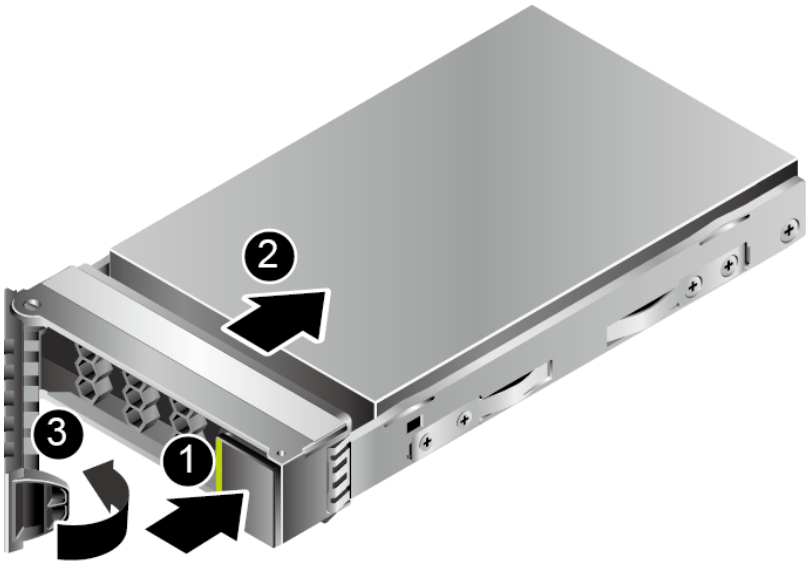
Figure 8-38 Installing a drive



Step 5 Check the running status of the drive by observing its indicators.

For details, see **SAS/SATA Drive Indicators**.

Step 6 Restore the drive data.

NOTE

Perform this operation only when you replace a drive.

For details, see "Troubleshooting > Hard Drive Fault" of each RAID controller card in ***Huawei V5 Server RAID Controller Card User Guide***.

----End

8.5.4.3 Installing a Built-in SAS/SATA Drive

Procedure

Step 1 Take the component out of its ESD bag.

Step 2 Determine the slot and position of the drive.

For details, see **2.5.1 Drive Configurations** and **2.5.2 Drive Numbering**.

Step 3 Release the eject levers of the built-in drive module.

NOTICE

If the chassis cover is away for too long while the server is powered on, some components will become overheated. Install the chassis cover within 3 minutes.

1. Remove the chassis cover.
   For details, see **8.5.1 Removing the Chassis Cover**.
2. Release the eject levers of the built-in drive module until it cannot rotate.

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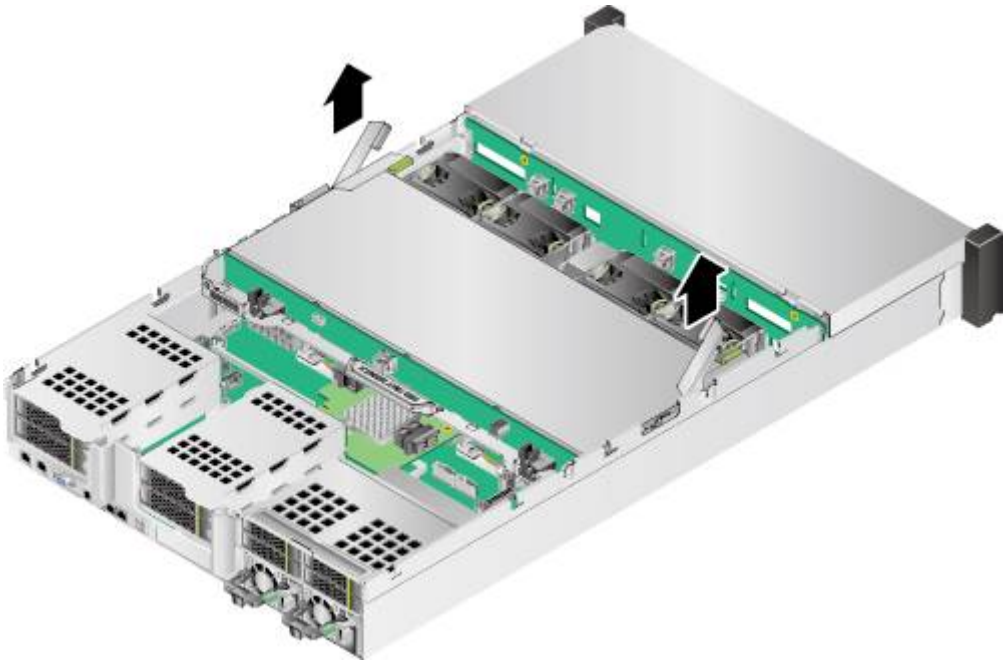
Figure 8-39 Releasing eject levers of the built-in drive assembly



Step 4 Remove the drive filler.

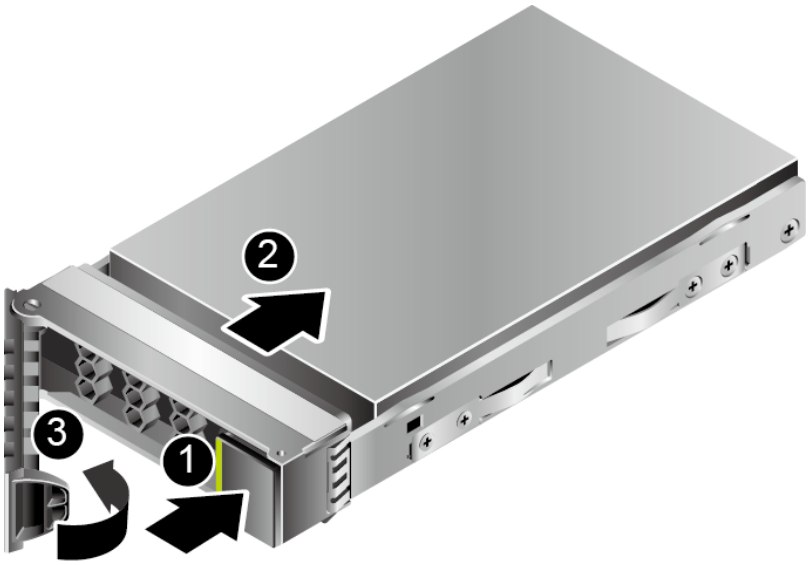
NOTE

Perform this operation only when a drive filler is installed.

Step 5 Install a drive.

1. Press the ejector release button on the drive panel to release the ejector lever. See (1) in **Figure 8-40**.
2. Push the drive into the chassis along the guide rails as far as it will go. See (2) in **Figure 8-40**.
3. Ensure that the ejector lever is fastened to the chassis beam, and then close it to completely insert the drive into the slot. See (3) in **Figure 8-40**.

Figure 8-40 Installing a drive



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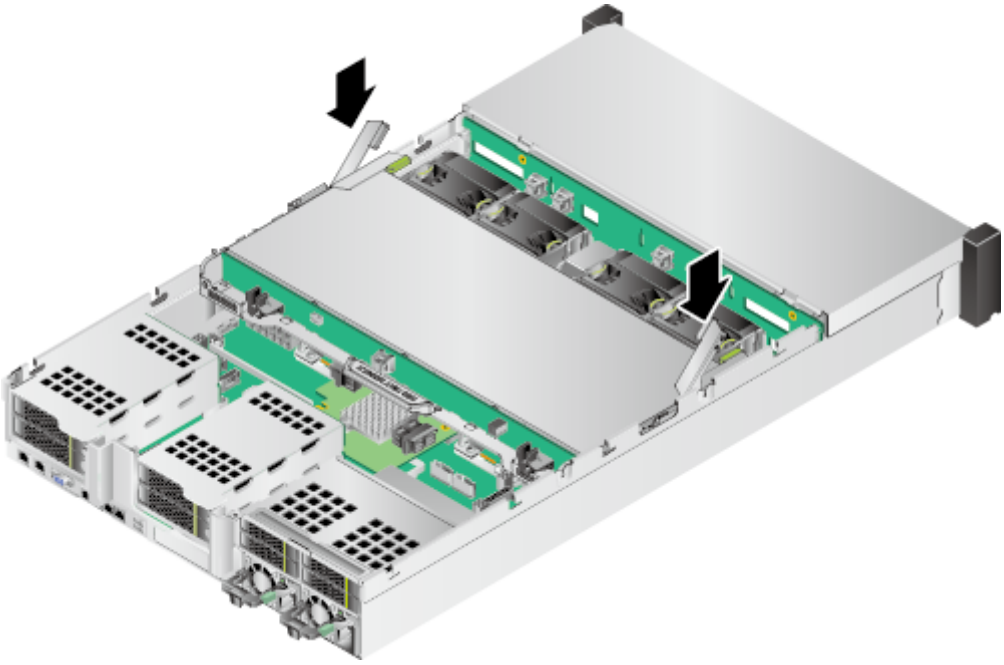
Step 6 Close the ejector levers of the built-in drive module.

1. Close the eject levers of the built-in drive module until it cannot move.

   Figure 8-41 Closing ejector levers of the built-in drive assembly



2. Install the chassis cover.

   For details, see **8.5.2 Installing the Chassis Cover**.

Step 7 Check the running status of the drive by observing its indicators.

For details, see **SAS/SATA Drive Indicators**.

Step 8 Restore the drive data.

NOTE

Perform this operation only when you replace a drive.

For details, see "Troubleshooting > Hard Drive Fault" of each RAID controller card in ***Huawei V5 Server RAID Controller Card User Guide***.

----End

8.5.5 Removing an NVMe Drive

- If the VMD function is enabled and the latest VMD driver is installed, the NVMe drives support surprise hot swap.
- If the VMD function is disabled, the NVMe drives support only orderly hot swap.

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NOTE

- For details about how to enable or disable the VMD function, see **10.5 Managing VMD**.
- Before using the VMD function, contact technical support engineers of the OS vendor to check whether the OS supports the VMD function. If yes, check whether the VMD driver needs to be manually installed and check the installation method.
- Before removing a drive, you can use Smart Provisioning to delete data from the drive. For details, see "Erasing Drives" in ***Smart Provisioning User Guide***.

8.5.5.1 Removing an NVMe Drive with VMD Enabled (Windows)

Procedure

NOTE

- The VMD can be used only with the following software versions:
  - BIOS 090 or later
  - iBMC 312 or later
  - Latest CPLD version of the drive backplane
- Before removing an NVMe drive:
  - Stop accessing the NVMe drive.
  - Back up date of the NVMe drive to prevent data loss.
- If multiple NVMe drives need to be replaced, remove them one by one. Do not remove multiple NVMe drives at the same time.
- For details about Windows OSs supported by the server configured with NVMe drives, search for compatible OSs on the **Computing Product Compatibility Checker**.

Step 1 Check whether the drive to be removed is a front drive and whether the server is configured with a front bezel.

- If yes, go to **Step 2**.
- If no, go to **Step 3**.

Step 2 Remove the front bezel.

For details, see **8.5.57 Removing the Front Bezel**.

Step 3 Determine the slot and position of the drive.

For details, see **2.5.1 Drive Configurations** and **2.5.2 Drive Numbering**.

Step 4 Check the running status of the drive by observing its indicators.

For details, see **NVMe Drive Indicators**.

Step 5 Determine whether the drive needs to be removed.

- If yes, go to **Step 6**.
- If no, rectify the drive fault.

Step 6 Remove the drive.

1. Press the ejector release button on the drive panel to release the ejector lever. See (1) in **Figure 8-42**.
2. Open the drive ejector lever completely. See (2) in **Figure 8-42**.
3. Holding the ejector lever, remove the drive from the server. See (3) in **Figure 8-42**.

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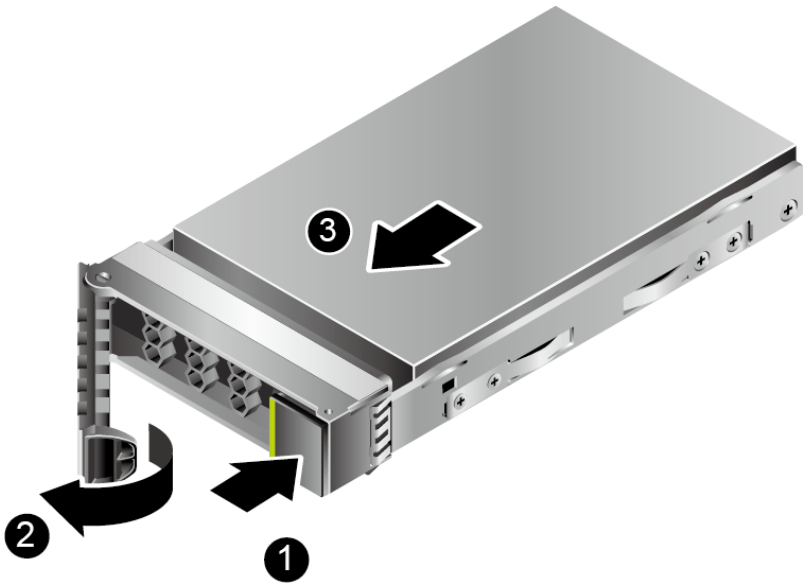
NOTICE

Do not insert or remove drives frequently. If a drive is frequently removed and installed in an interval shorter than 30 seconds, there are risks that the drive cannot be identified.

Figure 8-42 Removing a drive



Step 7 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

Step 8 Install a drive filler.

NOTE

Perform this operation only when a drive is not installed immediately.

----End

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8.5.5.2 Removing an NVMe Drive with VMD Enabled (Linux)

Procedure

NOTE

- The VMD can be used only with the following software versions:
  - BIOS 090 or later
  - iBMC 312 or later
  - Latest CPLD version of the drive backplane
- Before removing an NVMe drive:
  - Stop accessing the NVMe drive.
  - Back up date of the NVMe drive to prevent data loss.
- If multiple NVMe drives need to be replaced, remove them one by one. Do not remove multiple NVMe drives at the same time.
- If the OS is RHEL 7.3 and the VMD function is enabled, the OS kernel 3.10.0-514.el7.x86_64 must be used for surprise hot swap of NVMe drives. Otherwise, the operating system may restart.
- For details about the Linux OSs supported by the server configured with NVMe drives, search for compatible OSs on the **Computing Product Compatibility Checker**.

Step 1 Check whether the drive to be removed is a front drive and whether the server is configured with a front bezel.

- If yes, go to **Step 2**.
- If no, go to **Step 3**.

Step 2 Remove the front bezel.

For details, see **8.5.57 Removing the Front Bezel**.

Step 3 Determine the slot and position of the drive.

For details, see **2.5.1 Drive Configurations** and **2.5.2 Drive Numbering**.

Step 4 Check the running status of the drive by observing its indicators.

For details, see **NVMe Drive Indicators**.

Step 5 Determine whether the drive needs to be removed.

- If yes, go to **Step 6**.
- If no, rectify the drive fault.

Step 6 Remove the drive.

1. Press the ejector release button on the drive panel to release the ejector lever. See (1) in **Figure 8-43**.
2. Open the drive ejector lever completely. See (2) in **Figure 8-43**.
3. Holding the ejector lever, remove the drive from the server. See (3) in **Figure 8-43**.

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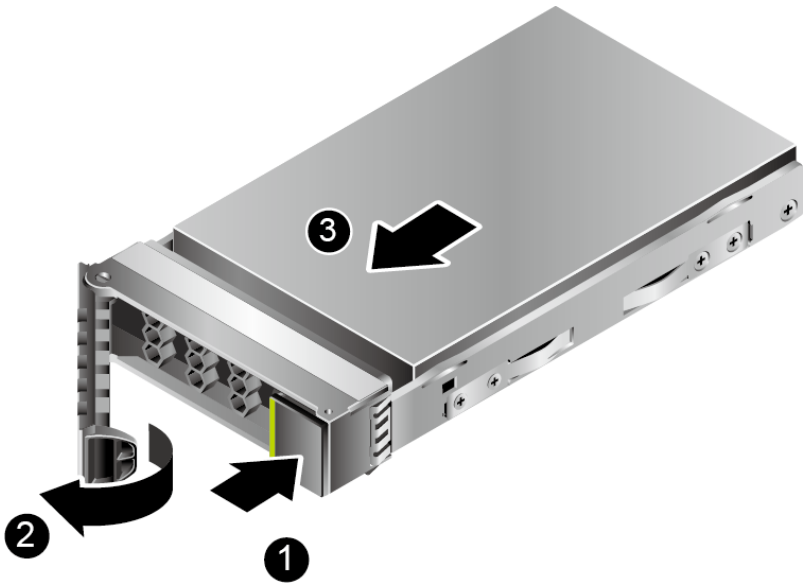
NOTICE

Do not insert or remove drives frequently. If a drive is frequently removed and installed in an interval shorter than 30 seconds, there are risks that the drive cannot be identified.

Figure 8-43 Removing a drive



Step 7 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

Step 8 Install a drive filler.

NOTE

Perform this operation only when a drive is not installed immediately.

----End

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8.5.5.3 Removing an NVMe Drive with VMD Disabled (Windows)

Procedure

NOTE

- Before removing an NVMe drive:
  - Stop accessing the NVMe drive.
  - Back up date of the NVMe drive to prevent data loss.
- If multiple NVMe drives need to be replaced, remove them one by one. Do not remove multiple NVMe drives at the same time.
- Run command to uninstall the drive driver.
- For details about Windows OSs supported by the server configured with NVMe drives, search for compatible OSs on the **Computing Product Compatibility Checker**.

Step 1 Check whether the drive to be removed is a front drive and whether the server is configured with a front bezel.

- If yes, go to **Step 2**.
- If no, go to **Step 3**.

Step 2 Remove the front bezel.

For details, see **8.5.57 Removing the Front Bezel**.

Step 3 Determine the slot and position of the drive.

For details, see **2.5.1 Drive Configurations** and **2.5.2 Drive Numbering**.

Step 4 Check the running status of the drive by observing its indicators.

For details, see **NVMe Drive Indicators**.

Step 5 Determine whether the drive needs to be removed.

- If yes, go to **Step 6**.
- If no, rectify the drive fault.

Step 6 Remove NVMe drives.

- Huawei NVMe drives
  a. Orderly hot swap the drive. For details, see "Hot Swap > Orderly Hot Swap > Orderly Hot Swap of a Drive in Windows" in ***ES3000 V5 NVMe PCIe SSD User Guide***.
  b. Observe the indicator status of the NVMe drive. If the green indicator is off and the yellow indicator blinks at 0.5 Hz, remove the NVMe drive slowly.

     For details, see **NVMe Drive Indicators**.
  c. Remove the drive.
     i. Press the ejector release button on the drive panel to release the ejector lever. See (1) in **Figure 8-44**.
     ii. Open the drive ejector lever completely. See (2) in **Figure 8-44**.
     iii. Holding the ejector lever, remove the drive from the server. See (3) in **Figure 8-44**.

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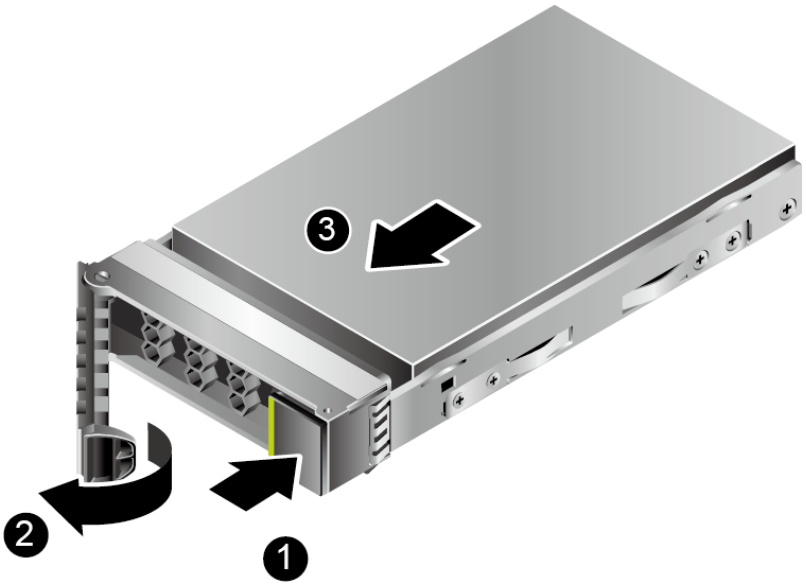
NOTICE

Do not insert or remove drives frequently. If a drive is frequently removed and installed in an interval shorter than 30 seconds, there are risks that the drive cannot be identified.

Figure 8-44 Removing a drive



- Non-Huawei NVMe drives
  a. Open Computer Management on the local PC.

     The **Computer Management** window is displayed.
  b. In the navigation pane on the left, choose **Device Manager**.

     The **Device Manager** window is displayed.
  c. Double-click **Storage controllers** to open the storage device list.
  d. Select the NVMe drive to be removed.
  e. Right-click and choose **Uninstall device**.

     The uninstalled NVMe drive is not displayed in **Storage controllers** after the removal.
  f. In the navigation pane on the left, choose **Storage** > **Disk Management**.

     Ensure that no removed NVMe drive is displayed in the **Disk Management** window.
  g. Observe the indicator status of the NVMe drive. If the green indicator is off and the yellow indicator blinks at 0.5 Hz, remove the NVMe drive slowly.

     For details, see **NVMe Drive Indicators**.
  h. Remove the drive.

     i. Press the ejector release button on the drive panel to release the ejector lever. See (1) in **Figure 8-45**.

     ii. Open the drive ejector lever completely. See (2) in **Figure 8-45**.

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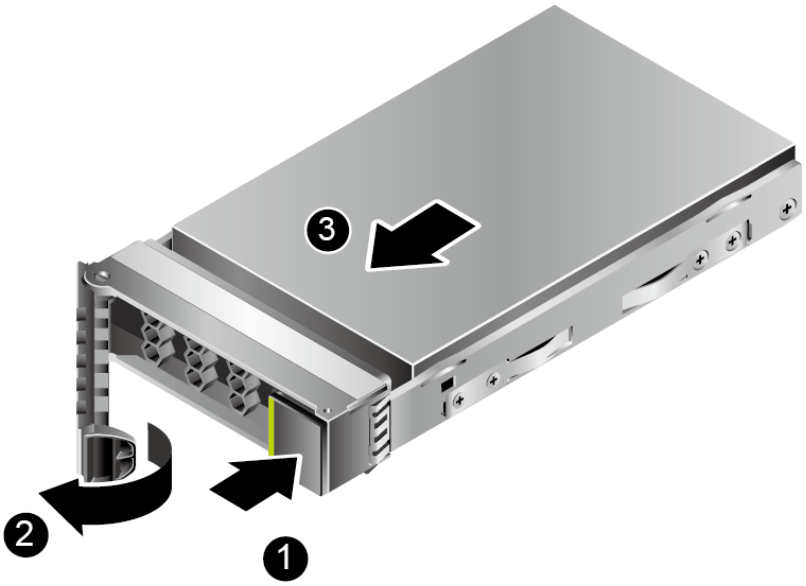
iii. Holding the ejector lever, remove the drive from the server. See (3) in **Figure 8-45**.

NOTICE

Do not insert or remove drives frequently. If a drive is frequently removed and installed in an interval shorter than 30 seconds, there are risks that the drive cannot be identified.

Figure 8-45 Removing a drive



Step 7 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

Step 8 Install a drive filler.

NOTE

Perform this operation only when a drive is not installed immediately.

----End

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8.5.5.4 Removing an NVMe Drive with VMD Disabled (Linux)

Procedure

NOTE

- Before removing an NVMe drive:
  - Stop accessing the NVMe drive.
  - Back up date of the NVMe drive to prevent data loss.
- If multiple NVMe drives need to be replaced, remove them one by one. Do not remove multiple NVMe drives at the same time.
- Run command to uninstall the drive driver.
- For details about the Linux OSs supported by the server configured with NVMe drives, search for compatible OSs on the **Computing Product Compatibility Checker**.
- If VMD is disabled, the kernel of RHEL 7.3 must be upgraded to **kernel-3.10.0-514.26.2.e17.x86_64** or later to support orderly hot swap of NVMe drives.
- The following uses RHEL 7.3 as an example.

Step 1 Check whether the drive to be removed is a front drive and whether the server is configured with a front bezel.

- If yes, go to **Step 2**.
- If no, go to **Step 3**.

Step 2 Remove the front bezel.

For details, see **8.5.57 Removing the Front Bezel**.

Step 3 Determine the slot and position of the drive.

For details, see **2.5.1 Drive Configurations** and **2.5.2 Drive Numbering**.

Step 4 Check the running status of the drive by observing its indicators.

For details, see **NVMe Drive Indicators**.

Step 5 Determine whether the drive needs to be removed.

- If yes, go to **Step 6**.
- If no, rectify the drive fault.

Step 6 If the operating system is RHEL 7.3, upgrade the kernel to **kernel-3.10.0-514.26.2.e17.x86_64** or later.

1. Log in to the server whose OS kernel is to be upgraded as user **root**.
2. Check the current kernel version.

   uname -a
3. Download the kernel upgrade package to the local PC.

   Log in to the **official Red Hat website** using a customer portal account and download the kernel upgrade package (**kernel-3.10.0-514.26.2.el7.x86_64.rpm** for example).

   Link: https://access.redhat.com/downloads/content/rhel---7/x86_64/2456/kernel/3.10.0-514.26.2.el7/x86_64/fd431d51/package
4. Use the KVM to mount the directory where the upgrade package is located.

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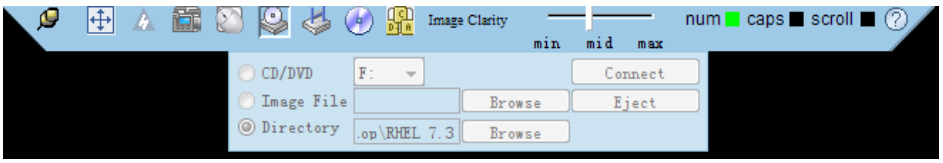
Figure 8-46 Mounting the directory



5. Mount the upgrade package to a directory on the OS, for example, **/home**.

   mount /dev/sr0 /home

6. Check the upgrade package in the **/home** directory.

   cd /home

   ls kernel*

7. Upgrade the system kernel.

   rpm -ivh kernel*.x86_64.rpm

8. Run the reboot command to restart the server and go to the new kernel.

   reboot

9. Verify the upgrade.

   uname -r

   The following information is displayed:

   ```
   kernel-3.10.0-514.26.2.el7.x86_64
   ```

Step 7 Configure kernel parameters.

1. Log in to the operating system and open the **/etc/default/grub** file.
2. Press **Insert**.
3. Locate "GRUB_CMDLINE_LINUX="crashkernel=auto rd.lvm.lv=rhel/root rd.lvm.lv=rhel/swap rhgb quiet" and add a space and then "pciehp.pciehp_force=1 pci=pcie_bus_perf".

   Do not add the content in a new line.

   Figure 8-47 Configuring kernel parameters

   ```
   [root@localhost ~]# cat /etc/default/grub
   GRUB_TIMEOUT=5
   GRUB_DISTRIBUTOR="$(sed 's, release .*$,,g' /etc/system-release)"
   GRUB_DEFAULT=saved
   GRUB_DISABLE_SUBMENU=true
   GRUB_TERMINAL_OUTPUT="console"
   GRUB_CMDLINE_LINUX="crashkernel=auto rd.lvm.lv=rhel/root rd.lvm.lv=rhel/swap rhgb quiet pciehp.pciehp_force=1 pci=pcie_bus_perf"
   GRUB_DISABLE_RECOVERY="true"
   [root@localhost ~]#
   ```

4. Press **Esc**.
5. Enter **:wq**.

   Save the modification and exit.

6. Run the following command for the modification to take effect:
   - Legacy mode: run **grub2-mkconfig -o /boot/grub2/grub.cfg**
   - UEFI mode: run **grub2-mkconfig -o /boot/efi/EFI/redhat/grub.cfg**
7. Restart the server.

Step 8 If the operating system is RHEL 7.3 or RHEL 7.4, change the value of the a8 register. Otherwise, the NVMe PCIe drives do not support orderly hot swap.

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NOTE

Skip this step if the server has 24 x 2.5" NVMe drives. You do not need to change the a8 register value for the server with 24 x 2.5" NVMe drives.

1. Run the following command to record the original a8 register value (the PCI data in column 9 of row a0): see **Figure 8-48**.

   lspci -s *<B/D/F>* **-xxx**

   <B/D/F>: indicates the root port (B/D/F) of the NVMe drive. **Table 8-3** lists the B/D/F information.

   Table 8-3 Drive B/D/F information

Configuration	Slot Number	Root Port (B/D/F)	Device (B/D/F)
8 x 2.5" drive configuration	44	d7:00.0	d8:00.0
	45	d7:01.0	d9:00.0
	46	d7:02.0	da:00.0
	47	d7:03.0	db:00.0
20 x 2.5" (8 x SAS/SATA + 12 x NVMe) driver configuration[a]	8	3A:00.0	3B:00.0
	9	3A:01.0	3C:00.0
	10	3A:02.0	3D:00.0
	11	3A:03.0	3E:00.0
	12	5D:00.0	5E:00.0
	13	5D:01.0	5F:00.0
	14	85:00.0	86:00.0
	15	85:01.0	87:00.0
	16	85:02.0	88:00.0
	17	85:03.0	89:00.0
	18	AE:02.0	AF:00.0
	19	AE:03.0	B0:00.0
– a: If no FlexIO card is configured, **Device (B/D/F)** is **AF:00.0** for drive 18 and **B0:00.0** for drive 19. If FlexIO cards are configured, **Device (B/D/F)** is **B1:00.0** for drive 18 and **B2:00.0** for drive 19. – The **Device (B/D/F)** values vary depending on the setting of the VMD function. The values in this table are based on the assumption that the VMD function is disabled.			

   For example, if the drive No. is 44, run the following command:

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lspci -s d7:00.0 -xxx

Figure 8-48 Querying the original register value

```
[root@localhost ~]# lspci -s d7:00.0 -xxx
d7:00.0 PCI bridge: Intel Corporation Sky Lake-E PCI Express Root Port A (rev 04
)
00: 86 80 30 20 47 05 10 00 04 00 04 06 10 00 01 00
10: 00 00 00 00 00 00 00 00 d7 d8 d8 00 c0 c0 00 20
20: b0 ee b0 ee 01 00 11 00 f0 03 00 00 f0 03 00 00
30: 00 00 00 00 40 00 00 00 00 00 00 00 ff 01 03 00
40: 0d 60 00 00 86 80 00 00 00 00 00 00 00 00 00 00
50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
60: 05 90 03 01 38 00 e0 fe 00 00 00 00 02 00 00 00
70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
80: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
90: 10 e0 42 01 21 80 00 00 27 01 00 00 43 30 7a 09
a0: 00 00 43 70 5b 00 e0 03 f1 11 40 00 1f 00 01 00
b0: 00 00 00 00 be 13 00 00 29 00 00 00 0e 00 00 00
c0: 03 00 1e 00 00 00 00 00 00 00 00 00 00 00 00 00
d0: 00 00 00 00 10 00 00 00 00 00 00 00 00 00 00 00
e0: 01 00 03 c8 08 00 00 00 00 00 00 00 00 00 00 00
f0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

NOTE

If the default value of the a8 register is not **f1**, contact technical support.

2. Change the value of the a8 register to **e1**.

   setpci -s *<B/D/F>* **a8.B=e1**

   <B/D/F>: indicates the root port (B/D/F) of the NVMe drive. **Table 8-3** lists the B/D/F information.

3. Run the following command to check the modification result:

   lspci -s *<B/D/F>* **-xxx**

   <B/D/F>: indicates the root port (B/D/F) of the NVMe drive. **Table 8-3** lists the B/D/F information.

Figure 8-49 Querying the new register value

```
[root@localhost ~]# setpci -s d7:00.0 a8.B=e1
[root@localhost ~]# lspci -s d7:00.0 -xxx
d7:00.0 PCI bridge: Intel Corporation Sky Lake-E PCI Express Root Port A (rev 04
)
00: 86 80 30 20 47 05 10 00 04 00 04 06 10 00 01 00
10: 00 00 00 00 00 00 00 00 d7 d8 d8 00 c0 c0 00 20
20: b0 ee b0 ee 01 00 11 00 f0 03 00 00 f0 03 00 00
30: 00 00 00 00 40 00 00 00 00 00 00 00 ff 01 03 00
40: 0d 60 00 00 86 80 00 00 00 00 00 00 00 00 00 00
50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
60: 05 90 03 01 38 00 e0 fe 00 00 00 00 02 00 00 00
70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
80: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
90: 10 e0 42 01 21 80 00 00 27 01 00 00 43 30 7a 09
a0: 00 00 43 70 5b 00 e0 03 e1 11 50 00 1f 00 01 00
b0: 00 00 00 00 be 13 00 00 29 00 00 00 0e 00 00 00
c0: 03 00 1e 00 00 00 00 00 00 00 00 00 00 00 00 00
d0: 00 00 00 00 10 00 00 00 00 00 00 00 00 00 00 00
e0: 01 00 03 c8 08 00 00 00 00 00 00 00 00 00 00 00
f0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

Step 9 Stop accessing the NVMe drive.

If a file system is mounted to the NVMe drive, run the following command to unmount the file system from it:

umount /dev/*NVMe drive letter*

Step 10 Obtain the mapping between the server drive IDs and the slot IDs on the operating system.

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NOTE

- For details about the drive numbers and positions, see **2.5.2 Drive Numbering**.
- The slot ID is the sum of the drive No. plus 80. For example, if the NVMe drive No. is 5, the slot ID is 85.

Table 8-4 Mapping

Configuration	Slot Number	Slot ID
8 x 2.5" drive configuration	44 to 47	124 to 127
20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive configuration	8 to 19	88 to 99
24 x 2.5" NVMe drive configuration	0 to 23	80 to 103

Step 11 Run the following command to safely remove the drive:

echo *n* **> /sys/bus/pci/slots/***Slot ID***/power**

Parameters

- In the command, the value of *n* can be **0** or **1**. The value **0** indicates unloading a drive, and the value **1** indicates loading a drive. You can load a drive only before the unloaded drive is removed.
- *Slot ID*: see **Table 8-4**.

For example, to orderly hot remove the NVMe drive in slot 44, run the following command:

echo 0 > /sys/bus/pci/slots/124/power

Step 12 If the OS uses the irqbalance service to balance CPU interrupts, restart the service after performing a hot swap.

systemctl restart irqbalance.service

NOTE

For details about configuration and management of the irqbalance service, see the related OS document.

Step 13 Observe the indicator status of the NVMe drive. If the green indicator is off and the yellow indicator blinks at 0.5 Hz, remove the NVMe drive slowly.

For details, see **NVMe Drive Indicators**.

Step 14 Remove the drive.

1. Press the ejector release button on the drive panel to release the ejector lever. See (1) in **Figure 8-50**.
2. Open the drive ejector lever completely. See (2) in **Figure 8-50**.

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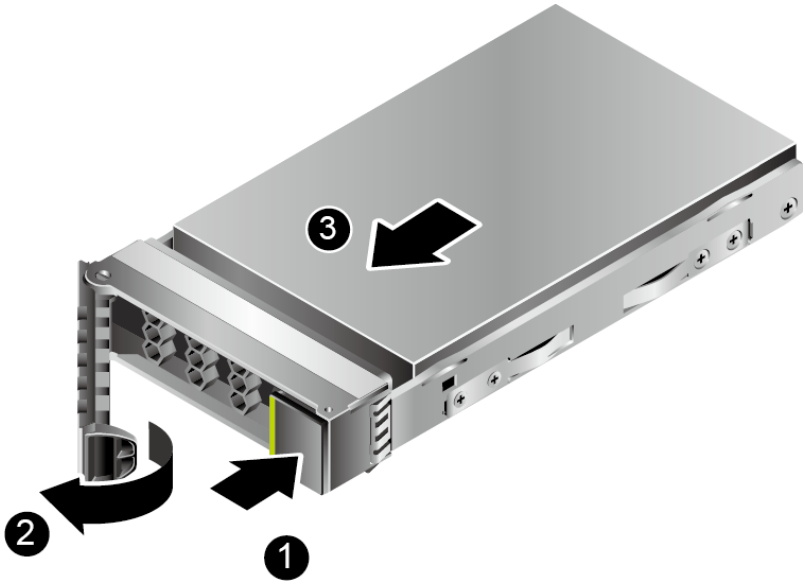
3. Holding the ejector lever, remove the drive from the server. See (3) in **Figure 8-50**.

NOTICE

Do not insert or remove drives frequently. If a drive is frequently removed and installed in an interval shorter than 30 seconds, there are risks that the drive cannot be identified.

Figure 8-50 Removing a drive



Step 15 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

Step 16 Run the following command to restore the value of the a8 register to the original value:

setpci -s *<B/D/F>* **a8.B=***Original a8 register value*

<B/D/F>: indicates the root port (B/D/F) of the NVMe drive. **Table 8-3** lists the B/D/F information.

NOTE

- Skip this step if the server has 24 x 2.5" NVMe drives. You do not need to change the a8 register value for the server with 24 x 2.5" NVMe drives.
- If the value of the register is not restored to the original one, the orderly hot insertion of the NVMe drives may be abnormal.

Step 17 Install a drive filler.

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NOTE

Perform this operation only when a drive is not installed immediately.

----End

8.5.6 Installing an NVMe Drive

- If the VMD function is enabled and the latest VMD driver is installed, the NVMe drives support surprise hot swap.
- If the VMD function is disabled, the NVMe drives support only orderly hot swap.

NOTE

- For details about how to enable or disable the VMD function, see **10.5 Managing VMD**.
- Before using the VMD function, contact technical support engineers of the OS vendor to check whether the OS supports the VMD function. If yes, check whether the VMD driver needs to be manually installed and check the installation method.
- Before installing a drive, you can use Smart Provisioning to delete data from the drive. For details, see "Erasing Drives" in ***Smart Provisioning User Guide***.

8.5.6.1 Installing an NVMe Drive with VMD Enabled (Windows)

Procedure

NOTE

- The VMD can be used only with the following software versions:
  - BIOS 090 or later
  - iBMC 312 or later
  - Latest CPLD version of the drive backplane
- If multiple NVMe drives need to be replaced, install them one by one. Do not install multiple NVMe drives at the same time.
- For details about Windows OSs supported by the server configured with NVMe drives, search for compatible OSs on the **Computing Product Compatibility Checker**.
- If the VMD function is enabled, the RHEL 7.3 graphical installation interface cannot be accessed. You can use a USB flash drive to access the RHEL 7.3 graphical installation interface.

Step 1 Check whether the drive to be removed is a front drive and whether the server is configured with a front bezel.

- If yes, go to **Step 2**.
- If no, go to **Step 3**.

Step 2 Remove the front bezel.

For details, see **8.5.57 Removing the Front Bezel**.

Step 3 Take the component out of its ESD bag.

Step 4 Determine the slot and position of the drive.

For details, see **2.5.1 Drive Configurations** and **2.5.2 Drive Numbering**.

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Step 5 Remove the drive filler.

NOTE

Perform this operation only when a drive filler is installed.

Step 6 Install the driver for NVMe drives.

- When Huawei series NVMe drives are used, you are advised to install the Huawei-developed NVMe driver to ensure the stable running of NVMe drives. For details, see ***ES3000 V5 NVMe PCIe SSD User Guide***.
- There is a possibility that the OS restarts when the NVMe open-source driver provided by the OS is used. For details, see **http://lists.infradead.org/pipermail/linux-nvme/2017-February/008580.html**.

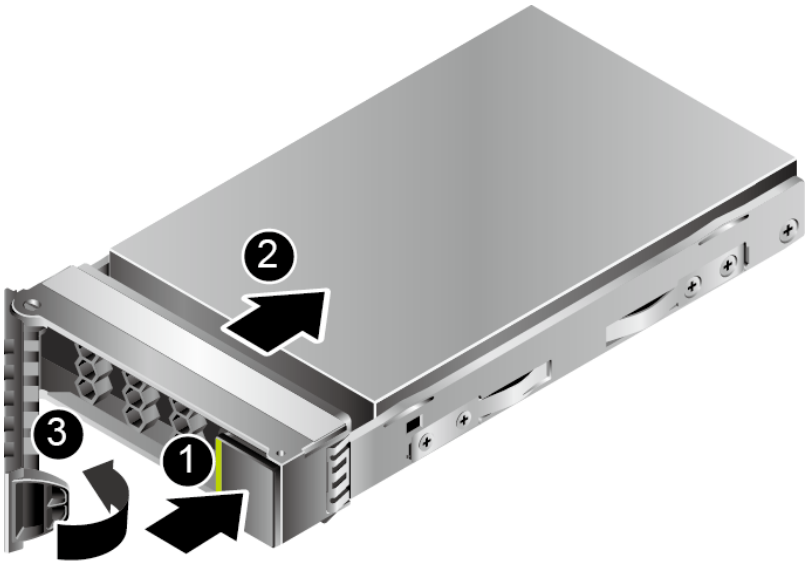
Step 7 Install NVMe drives.

NOTE

- When replacing an NVMe drive, install a new NVMe drive 30 seconds after the old one is removed.
- The NVMe drive power-on duration varies with the NVMe drives.
- For details about how to install an OS on an NVMe drive, see ***Huawei Server OS Installation Guide***.

1. Install a drive.
   a. Press the ejector release button on the drive panel to release the ejector lever. See (1) in **Figure 8-51**.
   b. Push the drive into the chassis along the guide rails as far as it will go. See (2) in **Figure 8-51**.
   c. Ensure that the ejector lever is fastened to the chassis beam, and then close it to completely insert the drive into the slot. See (3) in **Figure 8-51**.

   Figure 8-51 Installing a drive



2. Observe the drive indicators. If the green indicator is steady on and the yellow indicator is off, the NVMe drive is detected and working properly.

   For details, see **NVMe Drive Indicators**.

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3. Check the status of the newly installed NVMe drive in the system.
   - If the drive status is normal, no further action is required.
   - If the newly installed NVMe drive cannot be identified, perform **Step 7.4** to **Step 7.5**.
4. Go to Device Manager and scan for hardware changes.
5. Check the NVMe drive status on the OS.

Step 8 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

Step 9 Check whether a front bezel is installed.

- If yes, go to **Step 10**.
- If no, no further action is required.

Step 10 Install the front bezel.

For details, see **8.5.58 Installing the Front Bezel**.

----End

8.5.6.2 Installing an NVMe Drive with VMD Enabled (Linux)

Procedure

NOTE

- For details about the Linux OSs supported by the server configured with NVMe drives, search for compatible OSs on the **Computing Product Compatibility Checker**.
- The VMD can be used only with the following software versions:
  - BIOS 090 or later
  - iBMC 312 or later
  - Latest CPLD version of the drive backplane
- If multiple NVMe drives need to be replaced, install them one by one. Do not install multiple NVMe drives at the same time.
- If the OS is RHEL 7.3 and the VMD function is enabled, the OS kernel 3.10.0-514.el7.x86_64 must be used for surprise hot swap of NVMe drives. Otherwise, the operating system may restart.
- If the VMD function is enabled, the RHEL 7.3 graphical installation interface cannot be accessed. You can use a USB flash drive to access the RHEL 7.3 graphical installation interface.

Step 1 Check whether the drive to be removed is a front drive and whether the server is configured with a front bezel.

- If yes, go to **Step 2**.
- If no, go to **Step 3**.

Step 2 Remove the front bezel.

For details, see **8.5.57 Removing the Front Bezel**.

Step 3 Take the component out of its ESD bag.

Step 4 Determine the slot and position of the drive.

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For details, see **2.5.1 Drive Configurations** and **2.5.2 Drive Numbering**.

Step 5 Remove the drive filler.

NOTE

Perform this operation only when a drive filler is installed.

Step 6 Install the driver for NVMe drives.

- When Huawei series NVMe drives are used, you are advised to install the Huawei-developed NVMe driver to ensure the stable running of NVMe drives. For details, see ***ES3000 V5 NVMe PCIe SSD User Guide***.
- There is a possibility that the OS restarts when the NVMe open-source driver provided by the OS is used. For details, see **http://lists.infradead.org/pipermail/linux-nvme/2017-February/008580.html**.

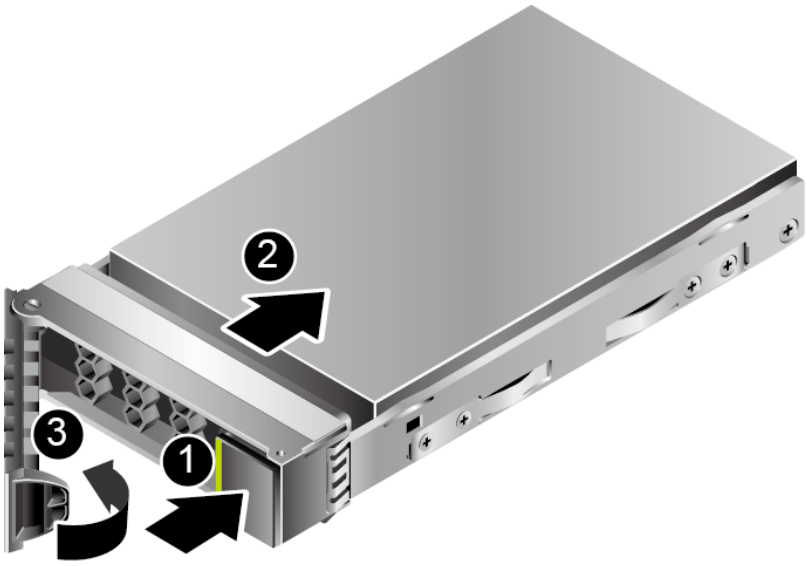
Step 7 Install NVMe drives.

NOTE

- When replacing an NVMe drive, install a new NVMe drive 30 seconds after the old one is removed.
- The NVMe drive power-on duration varies with the NVMe drives.
- For details about how to install an OS on an NVMe drive, see ***Huawei Server OS Installation Guide***.

1. Install a drive.
   a. Press the ejector release button on the drive panel to release the ejector lever. See (1) in **Figure 8-52**.
   b. Push the drive into the chassis along the guide rails as far as it will go. See (2) in **Figure 8-52**.
   c. Ensure that the ejector lever is fastened to the chassis beam, and then close it to completely insert the drive into the slot. See (3) in **Figure 8-52**.

Figure 8-52 Installing a drive



2. Observe the drive indicators. If the green indicator is steady on and the yellow indicator is off, the NVMe drive is detected and working properly.

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For details, see **NVMe Drive Indicators**.

3. Check the status of the newly installed NVMe drive in the system.

Step 8 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

Step 9 Check whether a front bezel is installed.

- If yes, go to **Step 10**.
- If no, no further action is required.

Step 10 Install the front bezel.

For details, see **8.5.58 Installing the Front Bezel**.

----End

8.5.6.3 Installing an NVMe Drive with VMD Disabled (Windows)

Procedure

NOTE

For details about Windows OSs supported by the server configured with NVMe drives, search for compatible OSs on the **Computing Product Compatibility Checker**.

Step 1 Check whether the drive to be removed is a front drive and whether the server is configured with a front bezel.

- If yes, go to **Step 2**.
- If no, go to **Step 3**.

Step 2 Remove the front bezel.

For details, see **8.5.57 Removing the Front Bezel**.

Step 3 Take the component out of its ESD bag.

Step 4 Determine the slot and position of the drive.

For details, see **2.5.1 Drive Configurations** and **2.5.2 Drive Numbering**.

Step 5 Remove the drive filler.

NOTE

Perform this operation only when a drive filler is installed.

Step 6 Install the driver for NVMe drives.

- When Huawei series NVMe drives are used, you are advised to install the Huawei-developed NVMe driver to ensure the stable running of NVMe drives. For details, see ***ES3000 V5 NVMe PCIe SSD User Guide***.
- There is a possibility that the OS restarts when the NVMe open-source driver provided by the OS is used. For details, see **http://lists.infradead.org/pipermail/linux-nvme/2017-February/008580.html**.

Step 7 Install NVMe drives.

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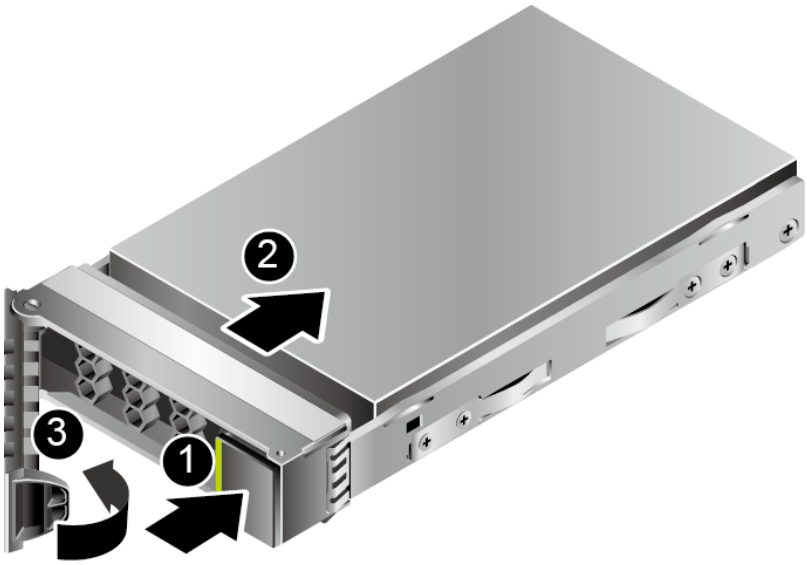
NOTE

- When replacing an NVMe drive, install a new NVMe drive 30 seconds after the old one is removed.
- The NVMe drive power-on duration varies with the NVMe drives.
- For details about how to install an OS on an NVMe drive, see ***Huawei Server OS Installation Guide***.

1. Install a drive.
   a. Press the ejector release button on the drive panel to release the ejector lever. See (1) in **Figure 8-53**.
   b. Push the drive into the chassis along the guide rails as far as it will go. See (2) in **Figure 8-53**.
   c. Ensure that the ejector lever is fastened to the chassis beam, and then close it to completely insert the drive into the slot. See (3) in **Figure 8-53**.

   Figure 8-53 Installing a drive



2. Observe the drive indicators. If the green indicator is steady on and the yellow indicator is off, the NVMe drive is detected and working properly.

   For details, see **NVMe Drive Indicators**.
3. Check the status of the newly installed NVMe drive in the system.
   - If the drive status is normal, no further action is required.
   - If the newly installed NVMe drive cannot be identified, perform **Step 7.4** and **Step 7.5**.
4. Go to Device Manager and scan for hardware changes.
5. Check the NVMe drive status on the OS.

Step 8 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

Step 9 Check whether a front bezel is installed.

- If yes, go to **Step 10**.

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- If no, no further action is required.

Step 10 Install the front bezel.

For details, see **8.5.58 Installing the Front Bezel**.

----End

8.5.6.4 Installing an NVMe Drive with VMD Disabled (Linux)

Procedure

NOTE

For details about the Linux OSs supported by the server configured with NVMe drives, search for compatible OSs on the **Computing Product Compatibility Checker**.

Step 1 Check whether the drive to be removed is a front drive and whether the server is configured with a front bezel.

- If yes, go to **Step 2**.
- If no, go to **Step 3**.

Step 2 Remove the front bezel.

For details, see **8.5.57 Removing the Front Bezel**.

Step 3 Take the component out of its ESD bag.

Step 4 Determine the slot and position of the drive.

For details, see **2.5.1 Drive Configurations** and **2.5.2 Drive Numbering**.

Step 5 Remove the drive filler.

NOTE

Perform this operation only when a drive filler is installed.

Step 6 Install the driver for NVMe drives.

- When Huawei series NVMe drives are used, you are advised to install the Huawei-developed NVMe driver to ensure the stable running of NVMe drives. For details, see ***ES3000 V5 NVMe PCIe SSD User Guide***.
- There is a possibility that the OS restarts when the NVMe open-source driver provided by the OS is used. For details, see **http://lists.infradead.org/pipermail/linux-nvme/2017-February/008580.html**.

Step 7 Install NVMe drives.

NOTE

- When replacing an NVMe drive, install a new NVMe drive 30 seconds after the old one is removed.
- The NVMe drive power-on duration varies with the NVMe drives.
- For details about how to install an OS on an NVMe drive, see ***Huawei Server OS Installation Guide***.

1. Configure kernel parameters.

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a. Log in to the operating system and open the **/etc/default/grub** file.

b. Press **Insert**.

c. Locate "GRUB_CMDLINE_LINUX="crashkernel=auto rd.lvm.lv=rhel/root rd.lvm.lv=rhel/swap rhgb quiet" and add a space and then "pciehp.pciehp_force=1 pci=pcie_bus_perf".

Do not add the content in a new line.

Figure 8-54 Configuring kernel parameters



d. Press **Esc**.

e. Enter **:wq**.

Save the modification and exit.

f. Run the following command for the modification to take effect:

- Legacy mode: run **grub2-mkconfig -o /boot/grub2/grub.cfg**
- UEFI mode: run **grub2-mkconfig -o /boot/efi/EFI/redhat/grub.cfg**

g. Restart the server.

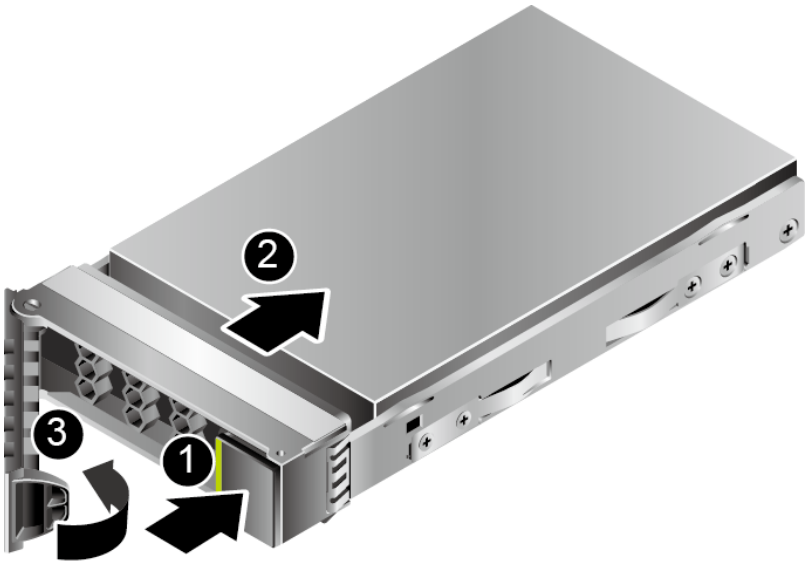
2. Install a drive.

a. Press the ejector release button on the drive panel to release the ejector lever. See (1) in **Figure 8-55**.

b. Push the drive into the chassis along the guide rails as far as it will go. See (2) in **Figure 8-55**.

c. Ensure that the ejector lever is fastened to the chassis beam, and then close it to completely insert the drive into the slot. See (3) in **Figure 8-55**.

Figure 8-55 Installing a drive



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3. Observe the drive indicators. If the green indicator is steady on and the yellow indicator is off, the NVMe drive is detected and working properly.

   For details, see **NVMe Drive Indicators**.

4. Check the status of the newly installed NVMe drive in the system.

Step 8 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

Step 9 Check whether a front bezel is installed.

- If yes, go to **Step 10**.
- If no, no further action is required.

Step 10 Install the front bezel.

For details, see **8.5.58 Installing the Front Bezel**.

----End

8.5.7 Removing PSU Cables

8.5.7.1 Removing the AC PSU Cable

Procedure

Step 1 Determine the number of PSUs configured for the server.

- If the server has only one PSU, go to **Step 2**.
- If the server has two PSUs, go to **Step 3**.

NOTE

If the server is fully configured with PSUs, you can remove PSUs and the power cables without powering off the server. However, before removing PSUs, ensure that the remaining PSUs are operating properly and the rated power is greater than or equal to the rated power of the server.

Step 2 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 3 Undo the velcro strap that secures the power cable.

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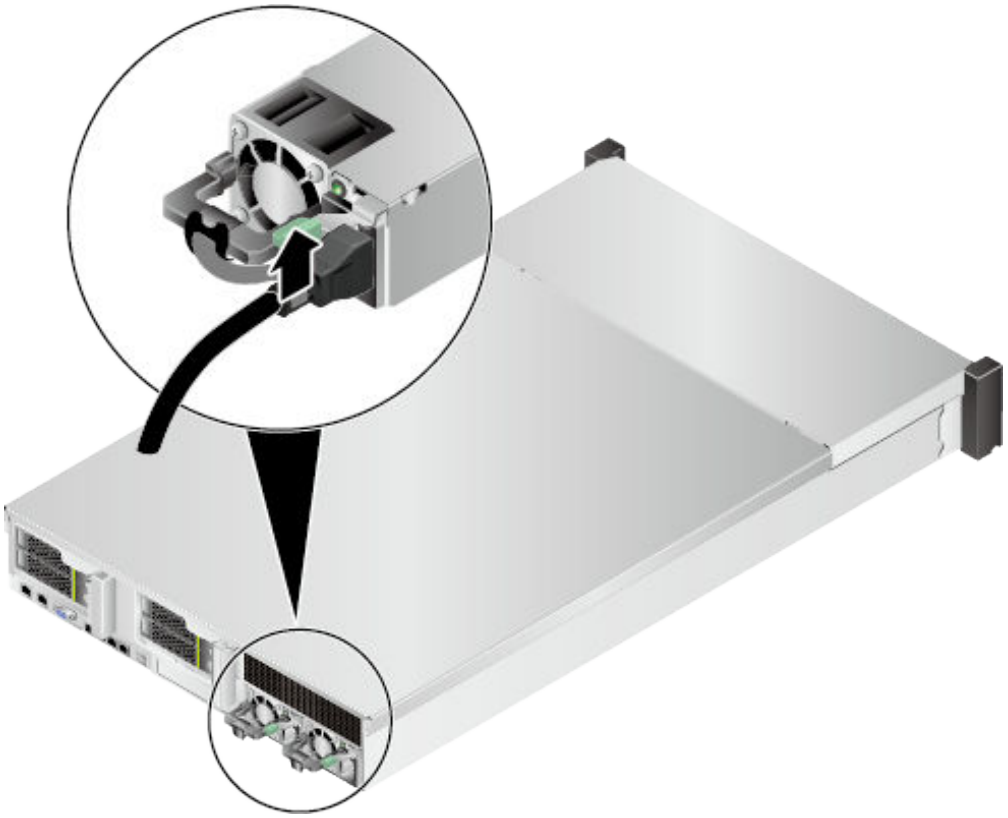
Figure 8-56 Removing the velcro strap



Step 4 Remove the power cable from the PSU.

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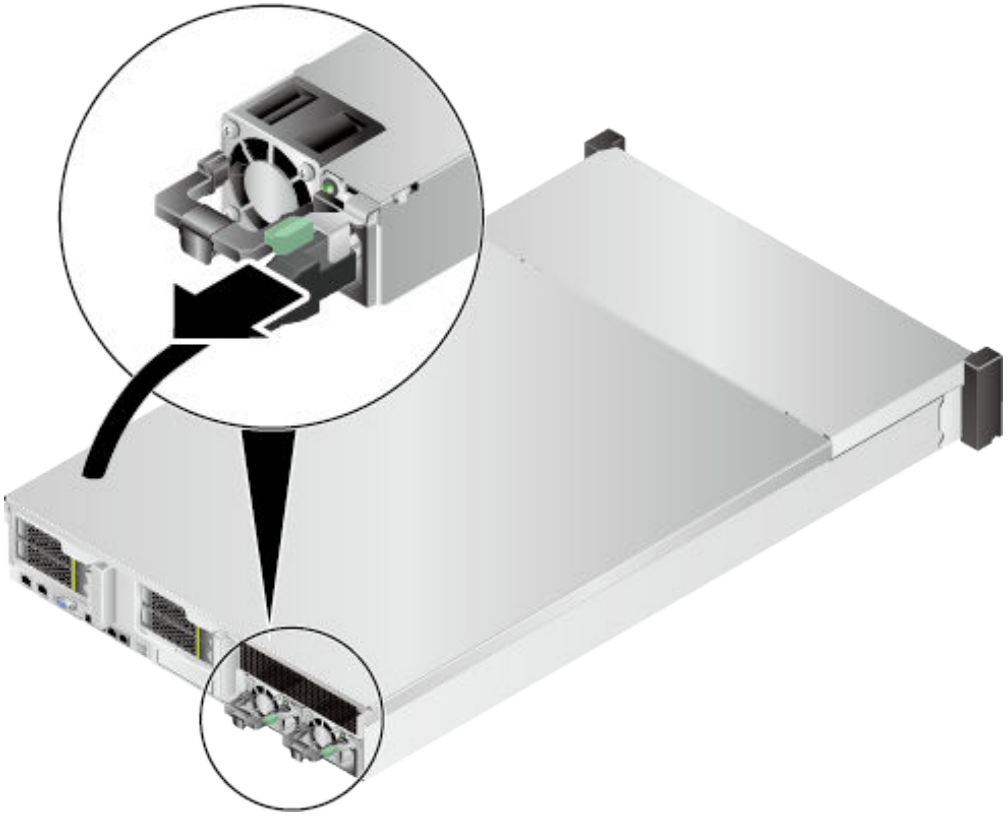
Figure 8-57 Removing the power cable from a PSU



Step 5 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

----End

8.5.7.2 Removing DC PSU Cables

Procedure

Step 1 Determine the number of PSUs configured for the server.

- If the server has only one PSU, go to **Step 2**.
- If the server has two PSUs, go to **Step 3**.

NOTE

If the server is fully configured with PSUs, you can remove PSUs and the power cables without powering off the server. However, before removing PSUs, ensure that the remaining PSUs are operating properly and the rated power is greater than or equal to the rated power of the server.

Step 2 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

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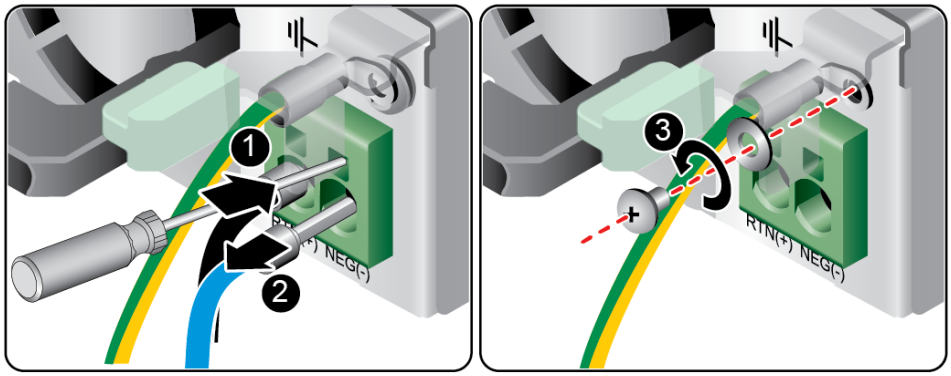
Step 3 Remove the PSU cables based on the specifications of the server PSU.

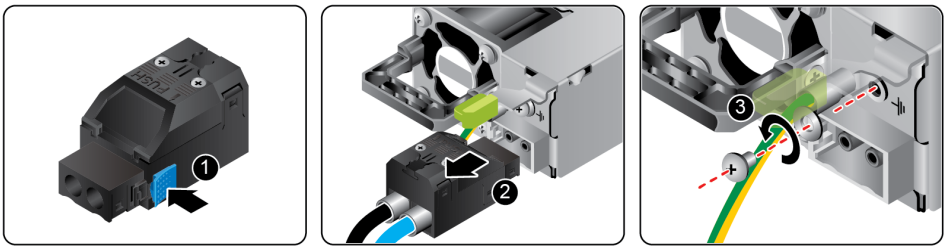
- Non-2000 W PSU
  a. Hold down the latches above the power cables to be removed using a flat-head screwdriver, and remove the power cables. See (1) and (2) in **Figure 8-58**.
  b. Loosen and remove the screw from the ground hole using a Phillips screwdriver, and remove the ground cable from the screw. See (3) in **Figure 8-58**.

Figure 8-58 Removing the cable (non-2000 W PSU)



- 2000 W PSU
  a. Hold down the latch on the quick connector, and remove the quick connector and the PSU cable. See (1) and (2) in **Figure 8-59**.

Figure 8-59 Removing the cable (2000 W PSU)



  b. Loosen and remove the screw from the ground hole using a Phillips screwdriver, and remove the ground cable from the screw. See (3) in **Figure 8-58**.
  c. If you need to replace the PSU cable or quick connector, use a screwdriver to remove the two screws from the quick connector and remove the PSU cable from the quick connector, as shown in **Figure 8-60**. Then install a new quick connector or PSU cable. For details about the installation method, see sections about installing power cables.

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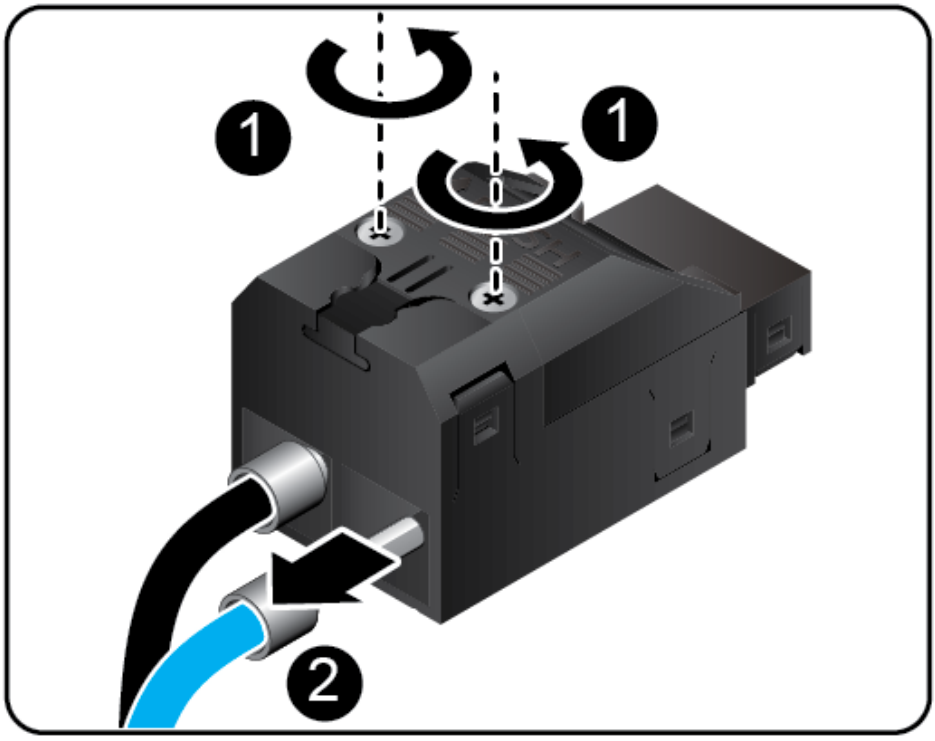
Figure 8-60 Removing the quick connector



Step 4 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

----End

8.5.8 Connecting PSU Cables

8.5.8.1 Connecting the AC PSU Cable

Before connecting power cables, ensure that the server has been correctly installed. For details, see **8.4.4 Installing a Server**.

NOTICE

- Use dedicated power cables to ensure equipment and personal safety.
- Use power cables only for dedicated servers. Do not use them for other devices.
- Connect the power cables of the active and standby PSUs to different power distribution units (PDUs) to ensure reliable system operation.
- Ground the equipment before powering it on.

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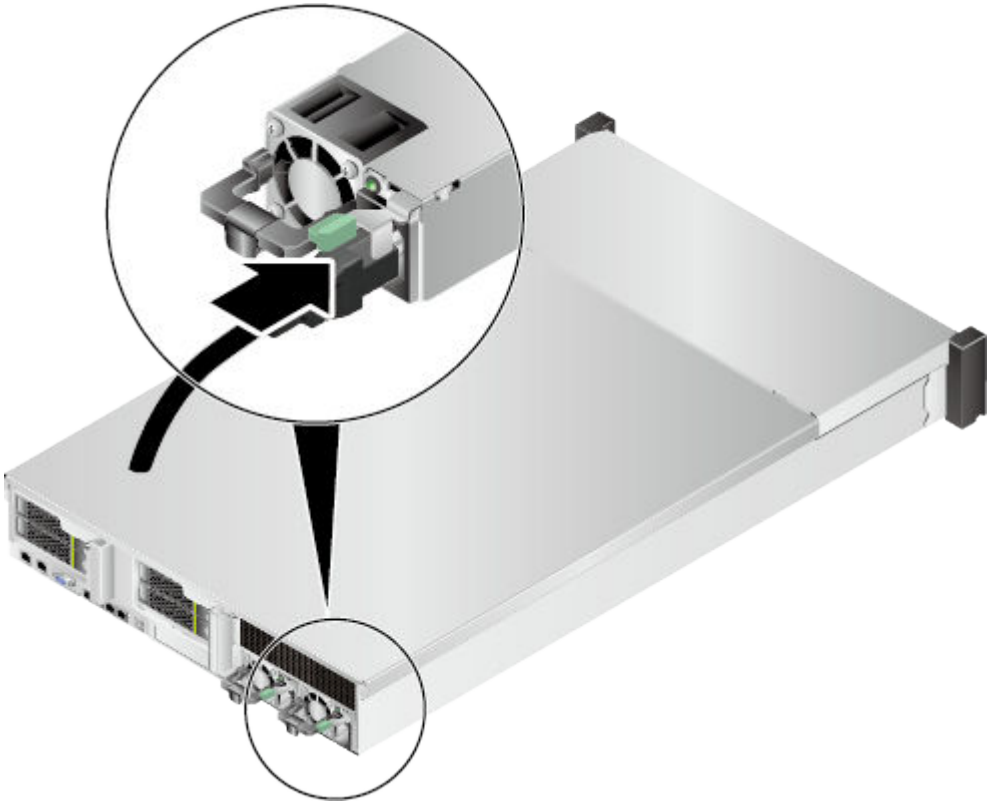
Procedure

Step 1 Take the component out of its ESD bag.

Step 2 Connect one end of the power cable to the power socket on the PSU of the server.

Figure 8-61 Connecting the cable



Step 3 Secure the power cable using a velcro strap.

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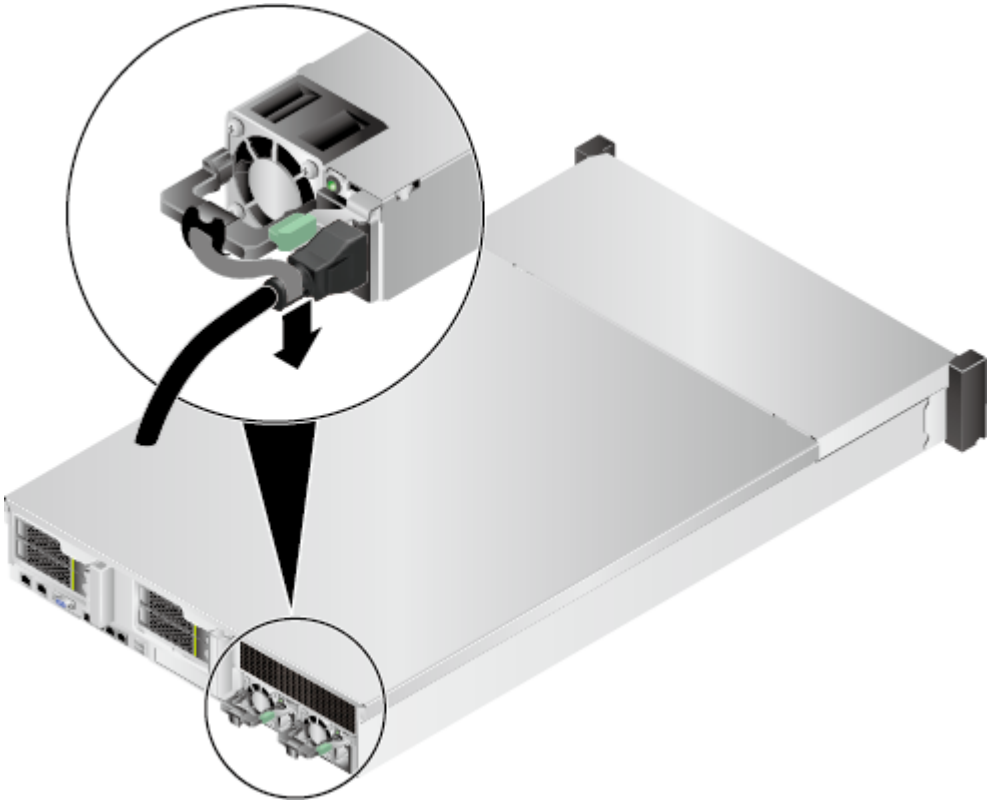
Figure 8-62 Securing the cable



Step 4 Connect the other end of the power cable to the AC PDU in the cabinet.

The AC PDU is fastened horizontally in the rear of the cabinet. Connect the power cable to the socket on the PDU according to the plan.

Step 5 Bundle the power cable to the cable guide using cable ties.

----End

8.5.8.2 Connecting DC PSU Cables

Before connecting power cables, ensure that the server has been correctly installed. For details, see **8.4.4 Installing a Server**.

NOTICE

- Use dedicated power cables to ensure equipment and personal safety.
- Use power cables only for dedicated servers. Do not use them for other devices.
- Connect the power cables of the active and standby PSUs to different power distribution units (PDUs) to ensure reliable system operation.
- Ground the equipment before powering it on.

Procedure

Step 1 Take the component out of its ESD bag.

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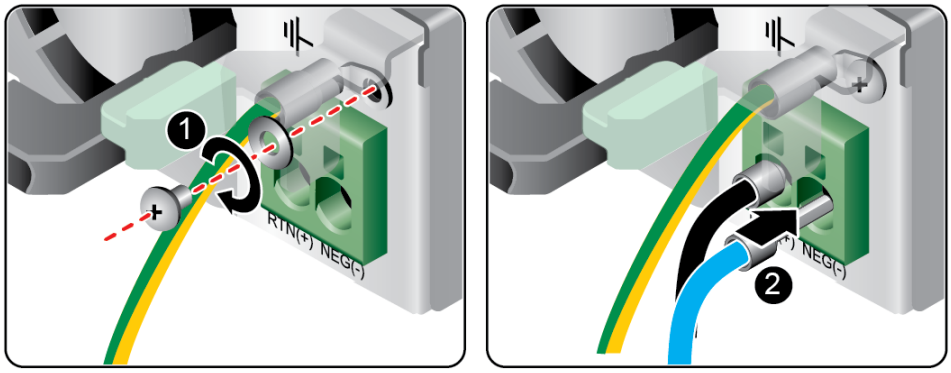
Step 2 Install the PSU cables based on the specifications of the server PSU.

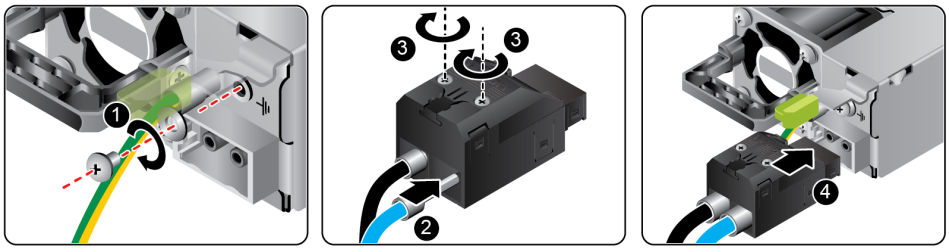
- Non-2000 W PSU
  a. Put the OT terminal (for the ground cable) on the screw removed from the ground hole, install the screw on the ground hole, and tighten the screw. See (1) in **Figure 8-63**.
  b. Insert the power cables to the wiring terminals on the PSU until the cables click into position. See (2) in **Figure 8-63**.
     - Connect the cord end terminal of the negative power cable (blue) to the NEG(-) wiring terminal on the PSU.
     - Connect the cord end terminal of the positive power cable (black) to the RTN(+) wiring terminal on the PSU.

Figure 8-63 Installing the cable (non-2000 W PSU)



- 2000 W PSU
  a. Put the OT terminal (for the ground cable) on the screw removed from the ground hole, install the screw on the ground hole, and tighten the screw. See (1) in **Figure 8-64**.
  b. Insert one end of the power cable into the quick connector, and use a screwdriver to tighten the two screws on the quick connector. See steps (2) and (3) in **Figure 8-64**.
  c. Insert the quick connector of the power cable into the wiring terminal of the PSU. See step (4) in **Figure 8-64**.

Figure 8-64 Installing the cable (2000 W PSU)



Step 3 Connect the other end of the power cable to the DC PDU in the cabinet.

The DC PDU is fastened horizontally in the rear of the cabinet. Connect the power cable to the socket on the PDU according to the plan.

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Step 4 Bundle the power cables to the cable guide using cable ties.

----End

8.5.9 Removing a PSU

NOTICE

Before replacing a PSU, turn off the circuit breaker corresponding to the PSU. After the replacement, turn on the circuit breaker.

8.5.9.1 Removing an AC PSU

The server supports two PSUs. The methods for removing the two PSUs are the same. This following describes how to remove one PSU as an example.

Procedure

Step 1 Determine the number of PSUs in the server.

- If the server has only one PSU, go to **Step 2**.
- If the server has two PSUs, go to **Step 3**.

NOTE

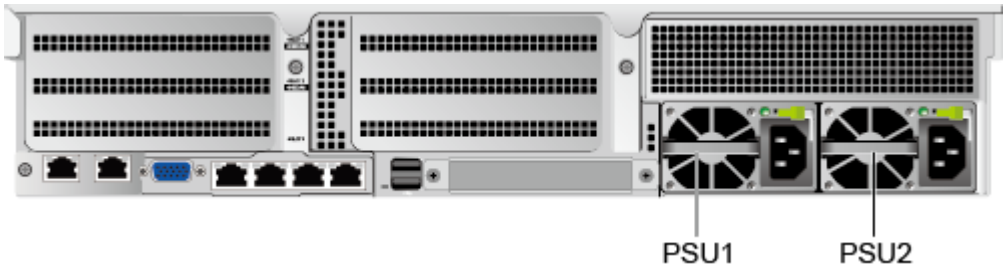
If the server is fully configured with PSUs, you can remove a PSU without powering off the server. Before the removal, ensure that the remaining PSUs are operating properly and the total rated power is greater than or equal to the rated power of the server.

Step 2 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 3 Determine the position of the PSU.

Figure 8-65 Positions of PSUs



Step 4 Remove the power cable from the PSU.

For details, see **8.5.7.1 Removing the AC PSU Cable**.

Step 5 Press and hold down the latch on the PSU, and pull the PSU out of the slot by holding its handle.

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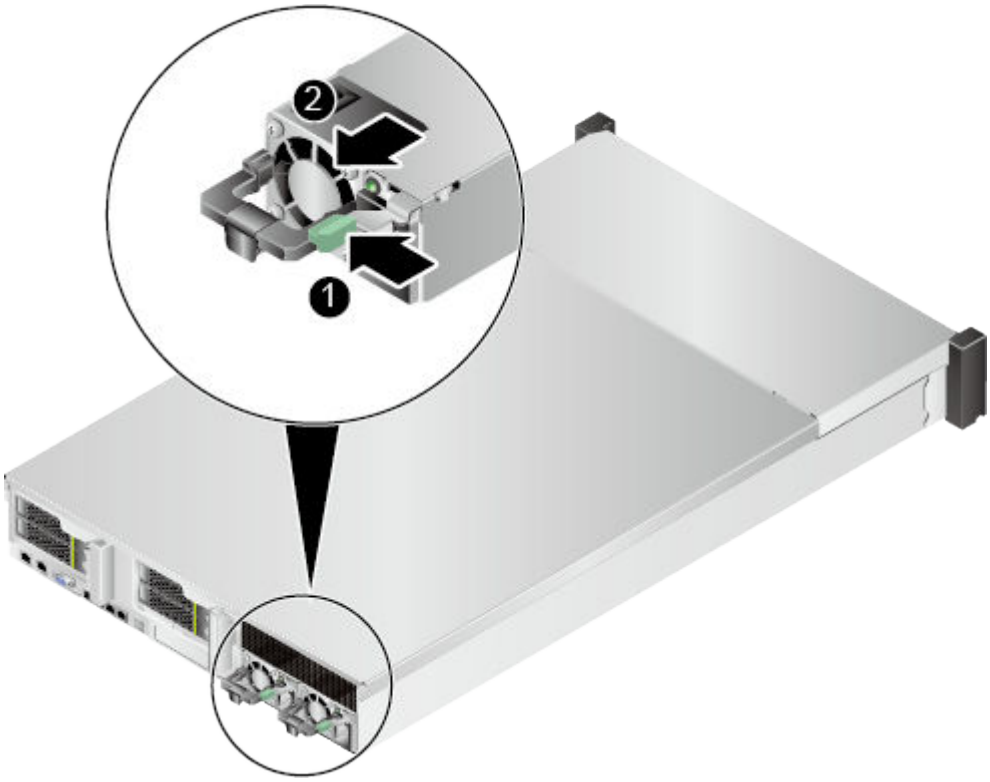
Figure 8-66 Removing a PSU



Step 6 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

Step 7 Install a PSU filler panel.

NOTE

Perform this operation only when a PSU is not installed immediately.

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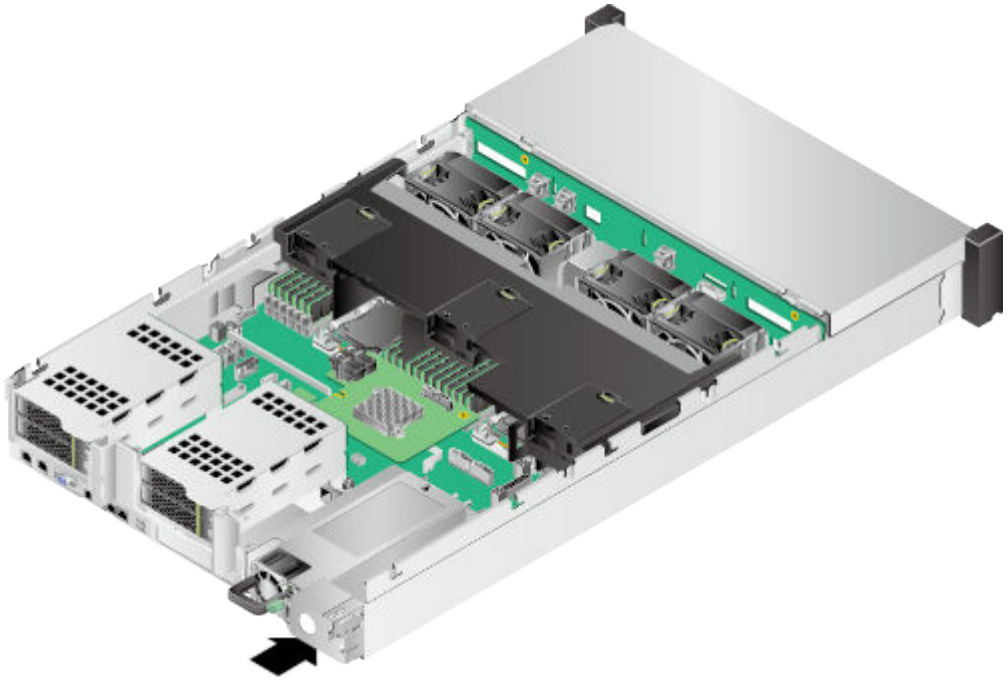
Figure 8-67 Installing a PSU filler panel



----End

8.5.9.2 Removing a DC PSU

The server supports two PSUs. The methods for removing the two PSUs are the same. This following describes how to remove one PSU as an example.

Procedure

Step 1 Determine the number of PSUs in the server.

- If the server has only one PSU, go to **Step 2**.
- If the server has two PSUs, go to **Step 3**.

NOTE

If the server is fully configured with PSUs, you can remove a PSU without powering off the server. Before the removal, ensure that the remaining PSUs are operating properly and the total rated power is greater than or equal to the rated power of the server.

Step 2 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 3 Determine the position of the PSU.

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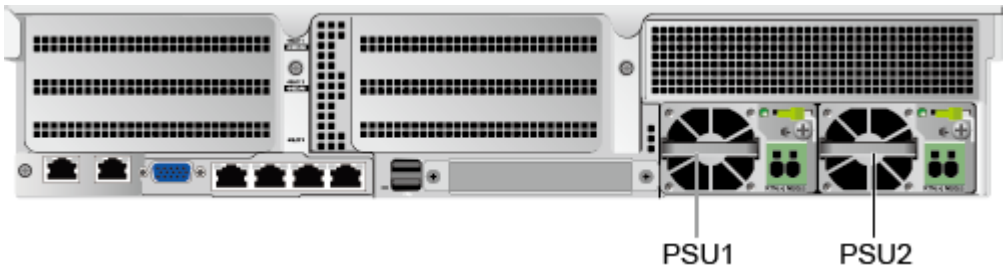
Figure 8-68 Positions of PSUs

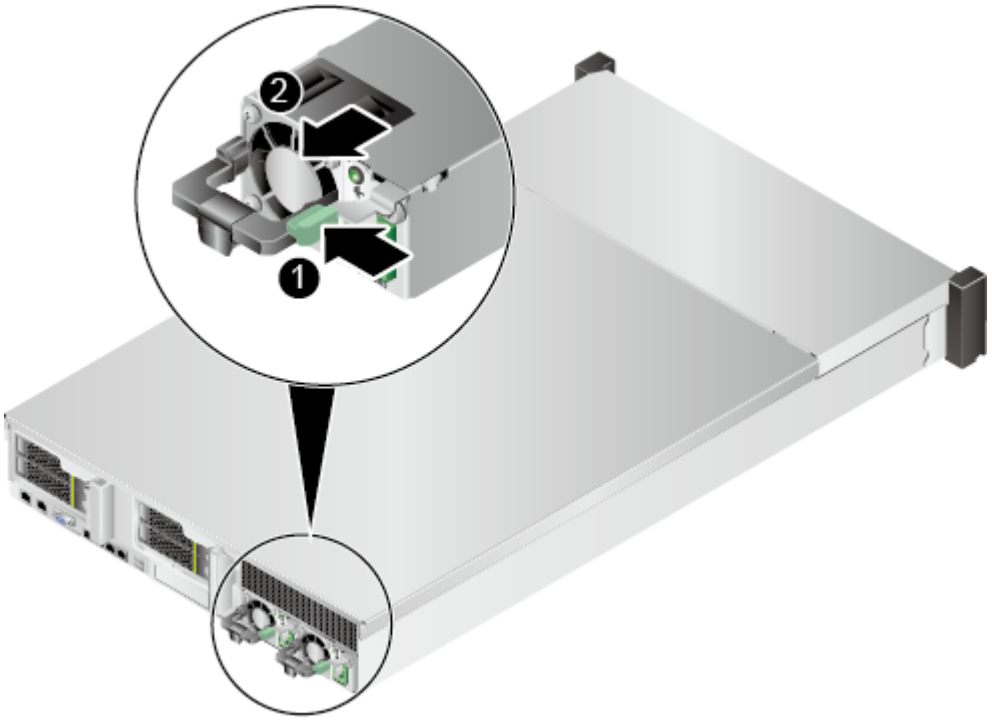


Step 4 Remove the power cable from the PSU.

For details, see **8.5.7.2 Removing DC PSU Cables**.

Step 5 Press and hold down the latch on the PSU, and pull the PSU out of the slot by holding its handle.

Figure 8-69 Removing a PSU



Step 6 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

Step 7 Install a PSU filler panel.

NOTE

Perform this operation only when a PSU is not installed immediately.

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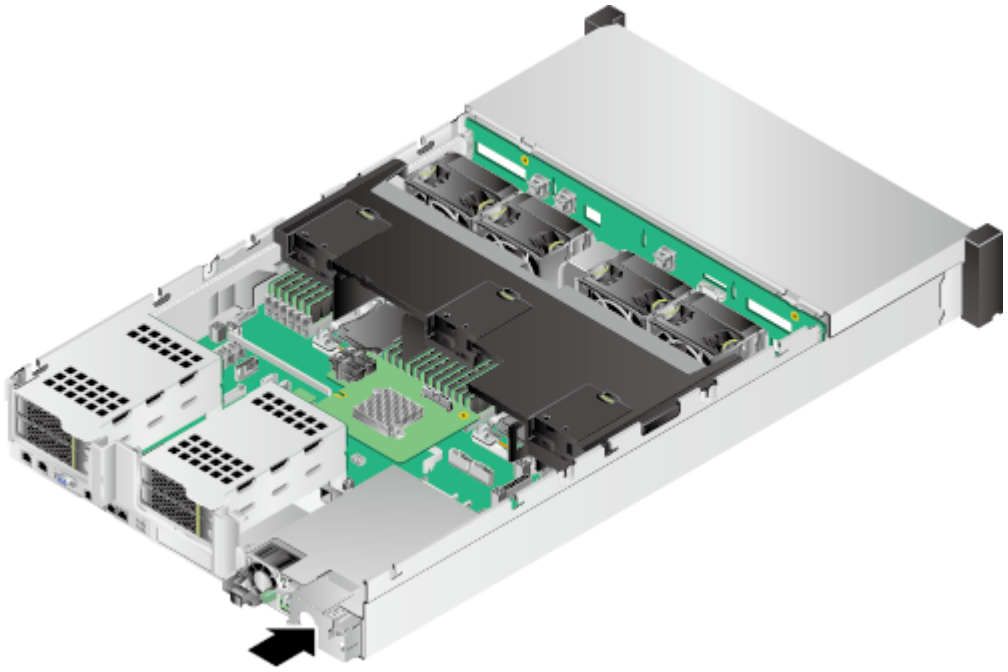
Figure 8-70 Installing a PSU filler panel



----End

8.5.10 Installing a PSU

NOTICE

Before replacing a PSU, turn off the circuit breaker corresponding to the PSU. After the replacement, turn on the circuit breaker.

8.5.10.1 Installing an AC PSU

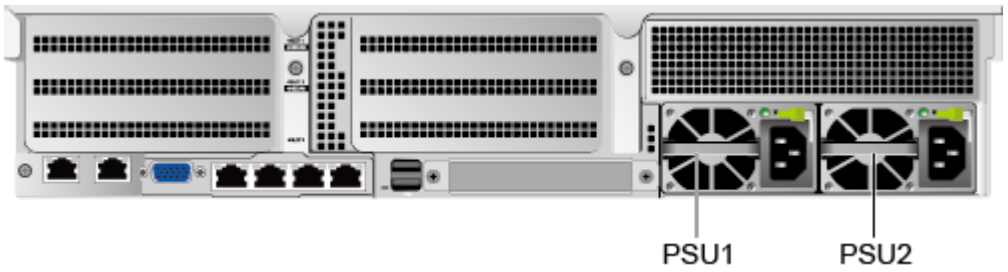
- The server supports two PSUs. The methods for installing the two PSUs are the same. This following describes how to install one PSU as an example.
- The same model of PSUs must be used in a server.

Procedure

Step 1 Take the component out of its ESD bag.

Step 2 Determine the position of the PSU.

Figure 8-71 Positions of PSUs



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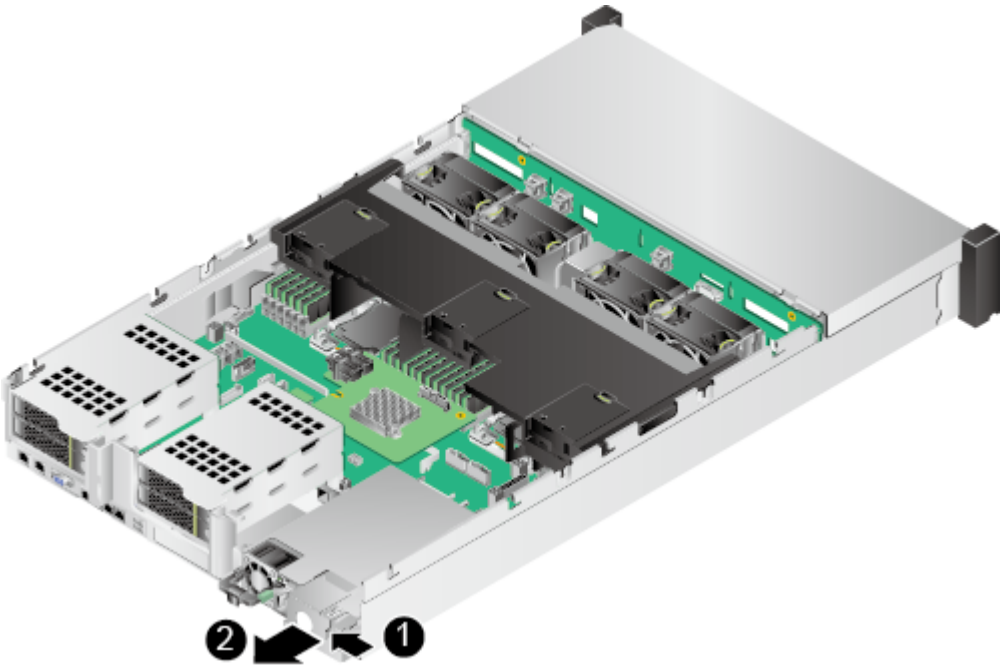
Step 3 Remove the PSU filler panel.

NOTE

Perform this operation only when a PSU filler panel is installed.

Figure 8-72 Removing a PSU filler panel



Step 4 Slide the PSU into the slot until it snaps into position.

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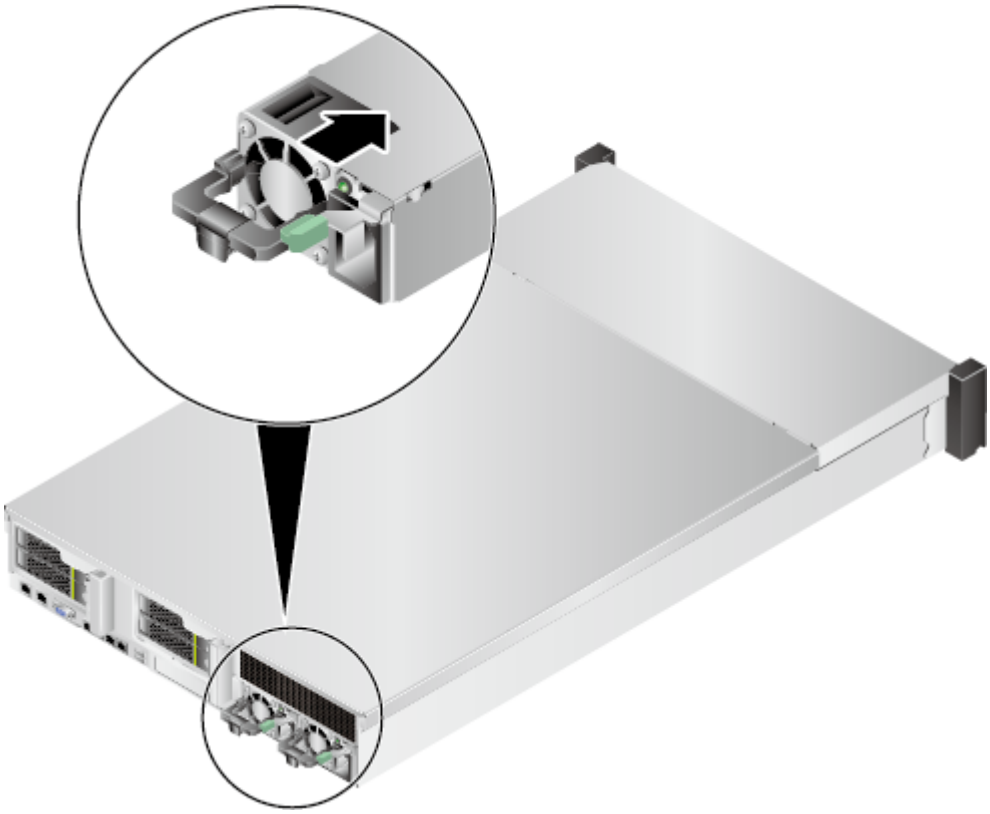
Figure 8-73 Installing a PSU



Step 5 Connect the power cable to the PSU.

For details, see **8.5.8.1 Connecting the AC PSU Cable**.

Step 6 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 7 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

----End

8.5.10.2 Installing a DC PSU

- The server supports two PSUs. The methods for installing the two PSUs are the same. This following describes how to install one PSU as an example.
- The same model of PSUs must be used in a server.

Procedure

Step 1 Take the component out of its ESD bag.

Step 2 Determine the position of the PSU.

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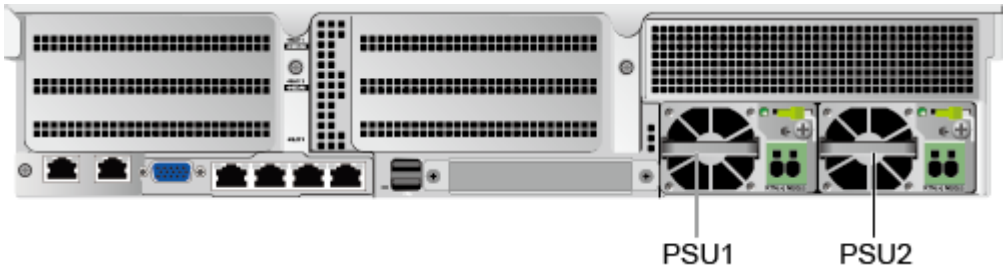
Figure 8-74 Positions of PSUs

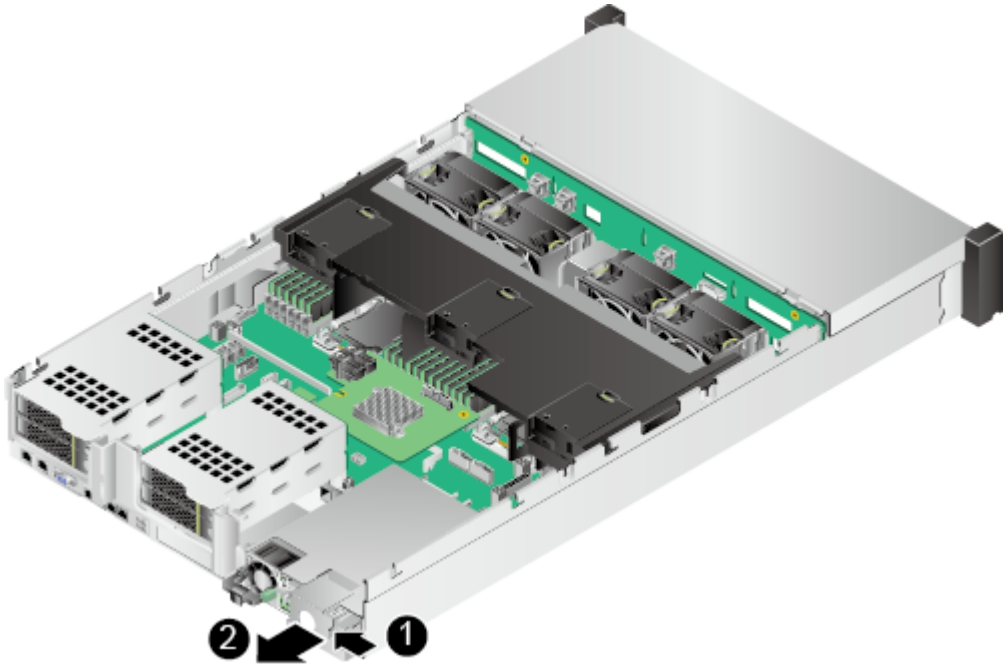


Step 3 Remove the PSU filler panel.

NOTE

Perform this operation only when a PSU filler panel is installed.

Figure 8-75 Removing a PSU filler panel



Step 4 Slide the PSU into the slot until it snaps into position.

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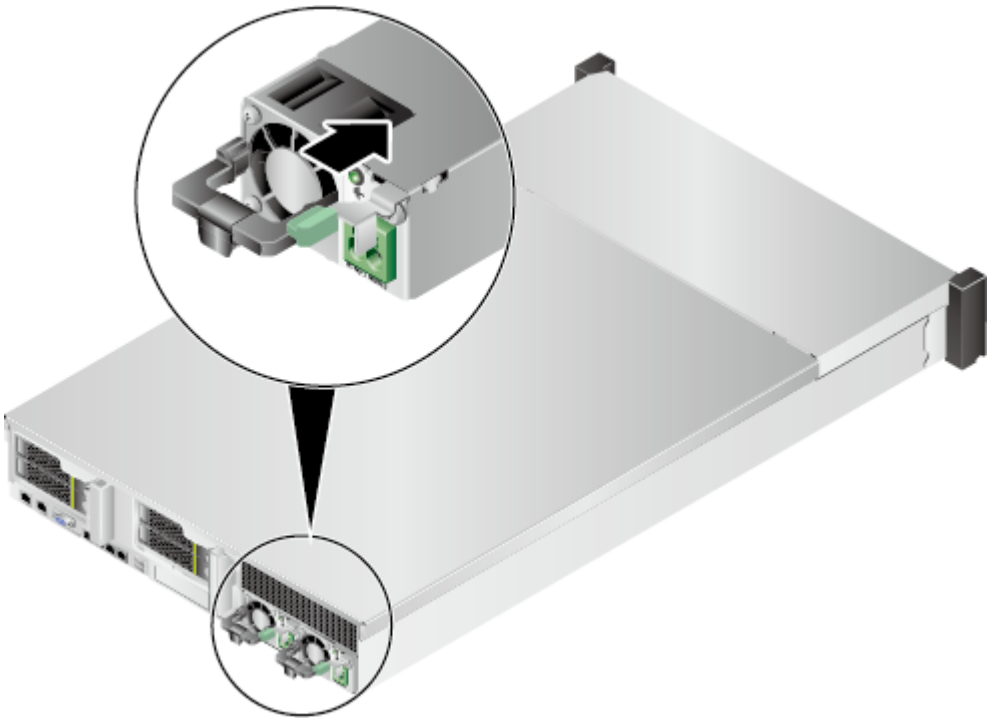
Figure 8-76 Installing a PSU



Step 5 Connect the power cable to the PSU.

For details, see **8.5.8.2 Connecting DC PSU Cables**.

Step 6 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 7 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

----End

8.5.11 Removing a Fan Module

- The fan modules support hot swap. If you can open the chassis cover without removing the server (for example, the server is not installed in a cabinet or the server is installed on a static rail kit or ball bearing rail kit), you do not need to perform **Step 1** to **Step 4**.
- To ensure adequate cooling effect during system operation, hot swap only one fan module at a time.

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

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Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

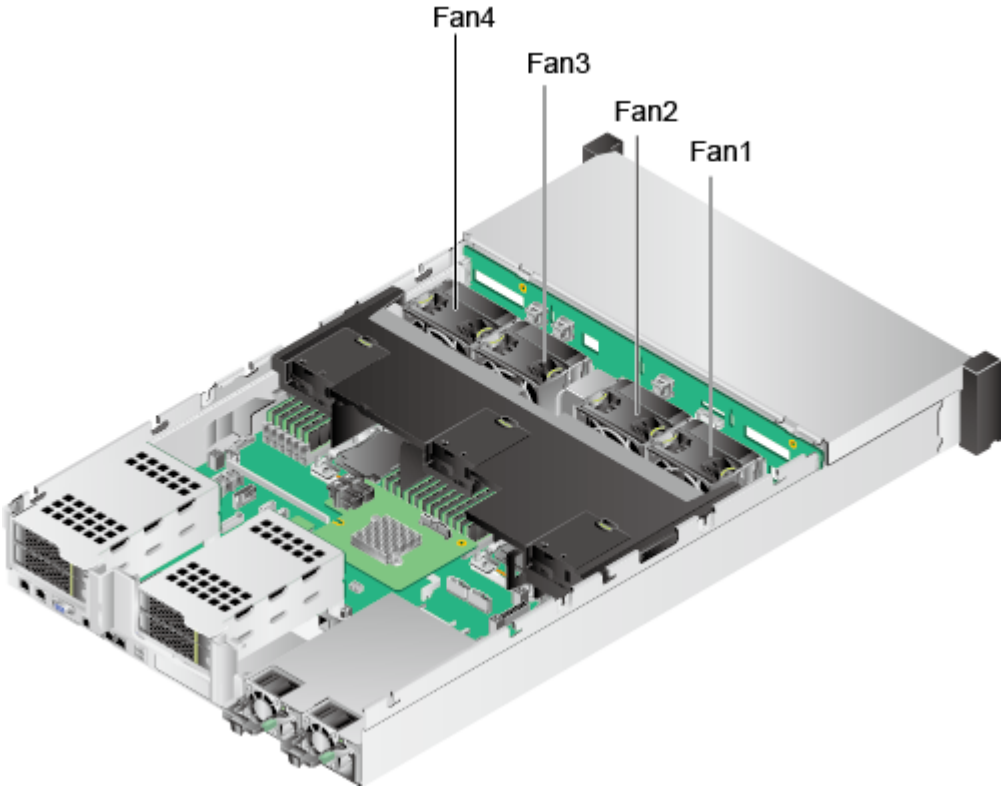
Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Determine the position of the fan module.

Figure 8-77 Positions of fan modules



Step 7 Remove the fan module.

1. Press the latches on both sides of the fan module to unlock it. See (1) in **Figure 8-78**.
2. Lift the fan module slowly until it is completely out of the slot. See (2) in **Figure 8-78**.

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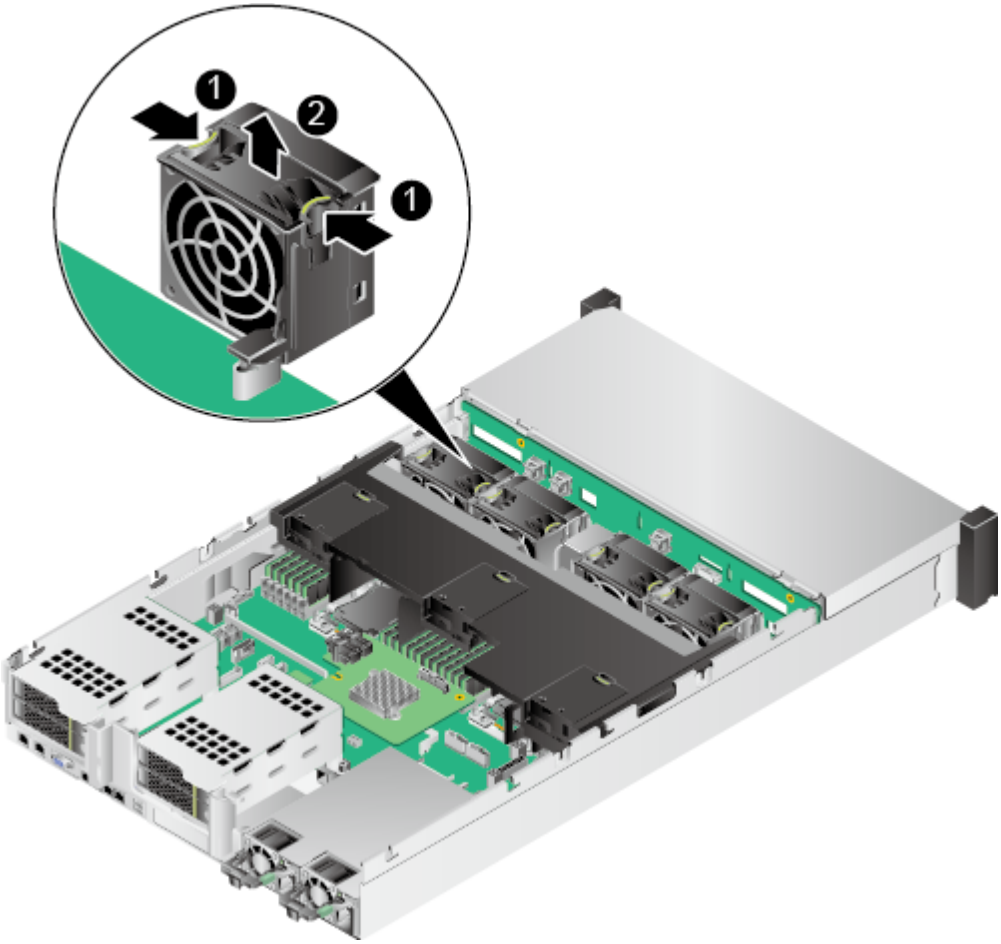
Figure 8-78 Removing a fan module



Step 8 Place the removed component in an ESD bag.

NOTICE

Place only one fan module in an ESD bag.

----End

8.5.12 Installing a Fan Module

The fan modules support hot swap. If you can open the chassis cover without removing the server (for example, the server is not installed in a cabinet or the server is installed on a static rail kit or ball bearing rail kit), you do not need to perform **Step 1** to **Step 4** and **Step 10** to **Step 12**.

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

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For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

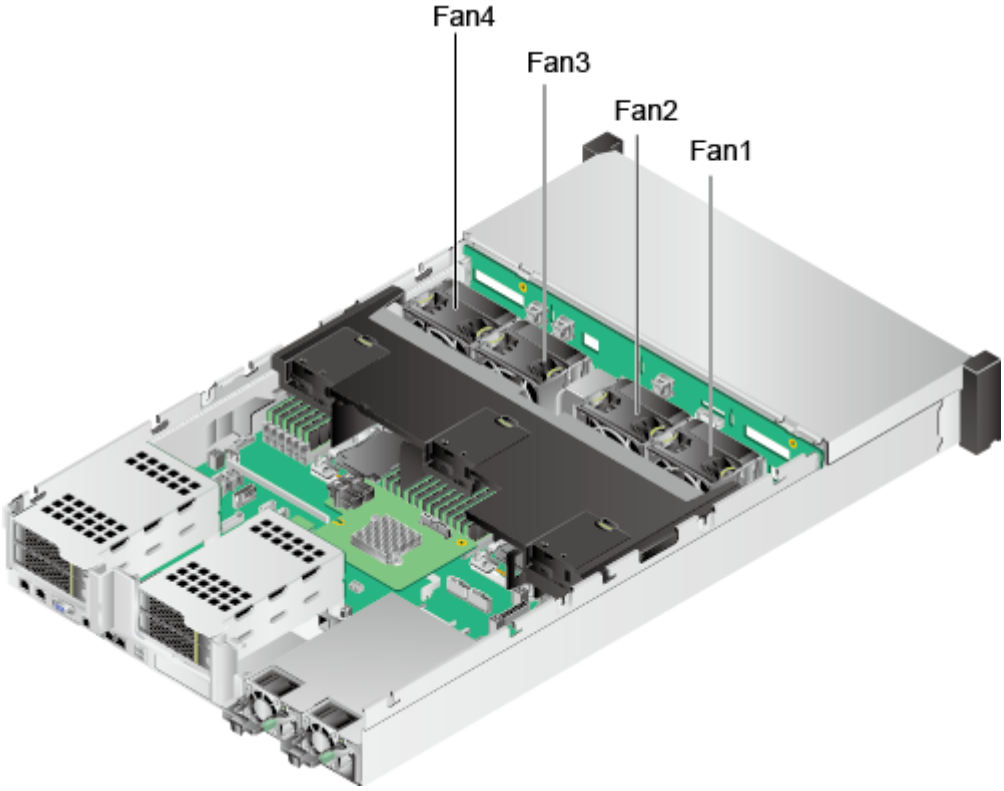
Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Take the component out of its ESD bag.

Step 7 Determine the position of the fan module.

Figure 8-79 Positions of fan modules



Step 8 Insert the fan module in the slot until it snaps into position.

NOTE

The same model of fan modules must be used in a server.

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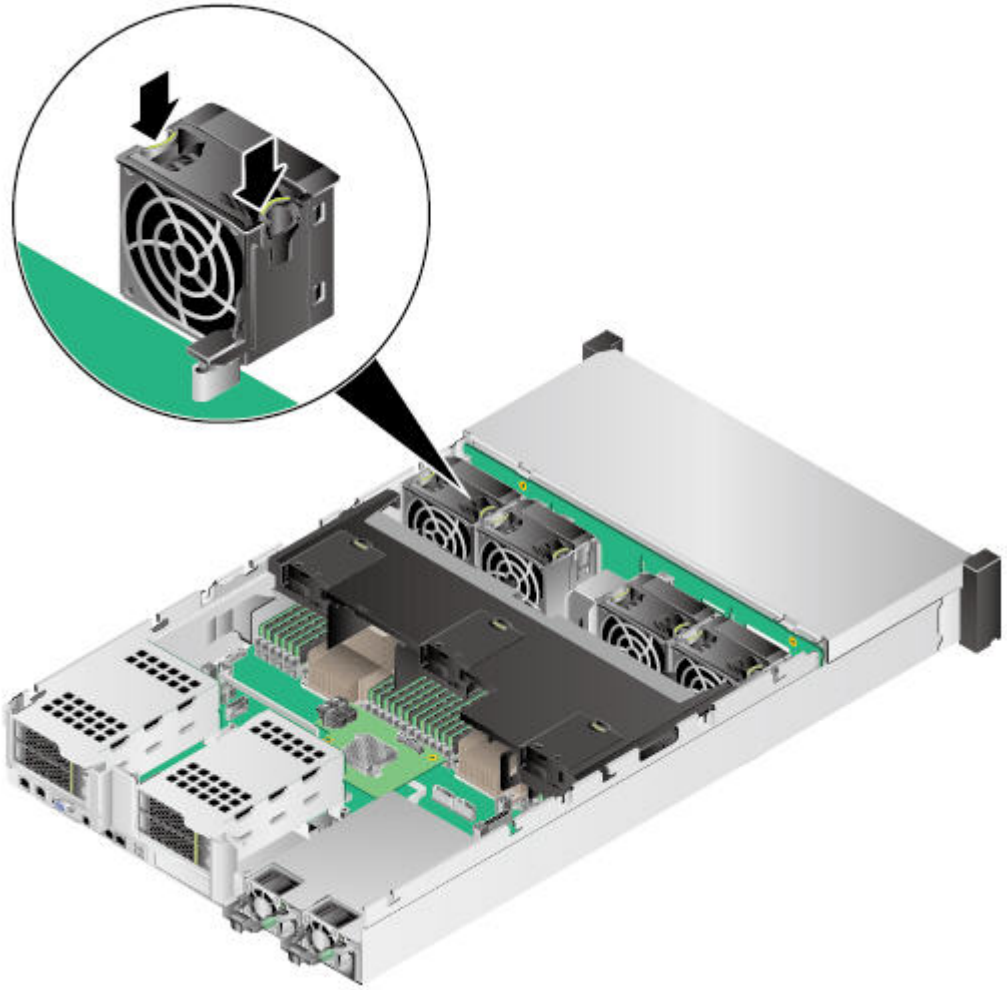
Figure 8-80 Installing a fan module



Step 9 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 10 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 11 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 12 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 13 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

----End

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8.5.13 Removing the DVD Drive

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Remove the air duct or built-in drive module.

For details, see **8.5.59 Removing the Air Duct** or **8.5.35 Removing the Built-in Drive Module**.

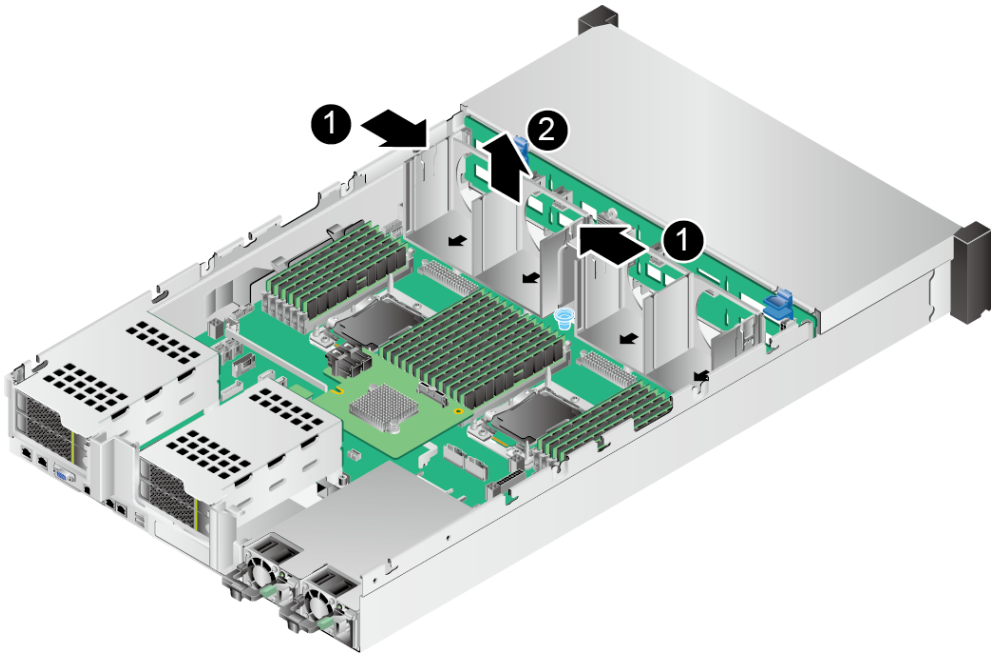
Step 7 Remove all fan modules.

For details, see **8.5.11 Removing a Fan Module**.

Step 8 Remove the fan module bracket.

1. Pressing the latches on both sides of the fan module bracket, lift the fan module bracket vertically. See (1) and (2) in **Figure 8-81**.
2. Remove the other fan module bracket in the same way.

Figure 8-81 Removing a fan module bracket



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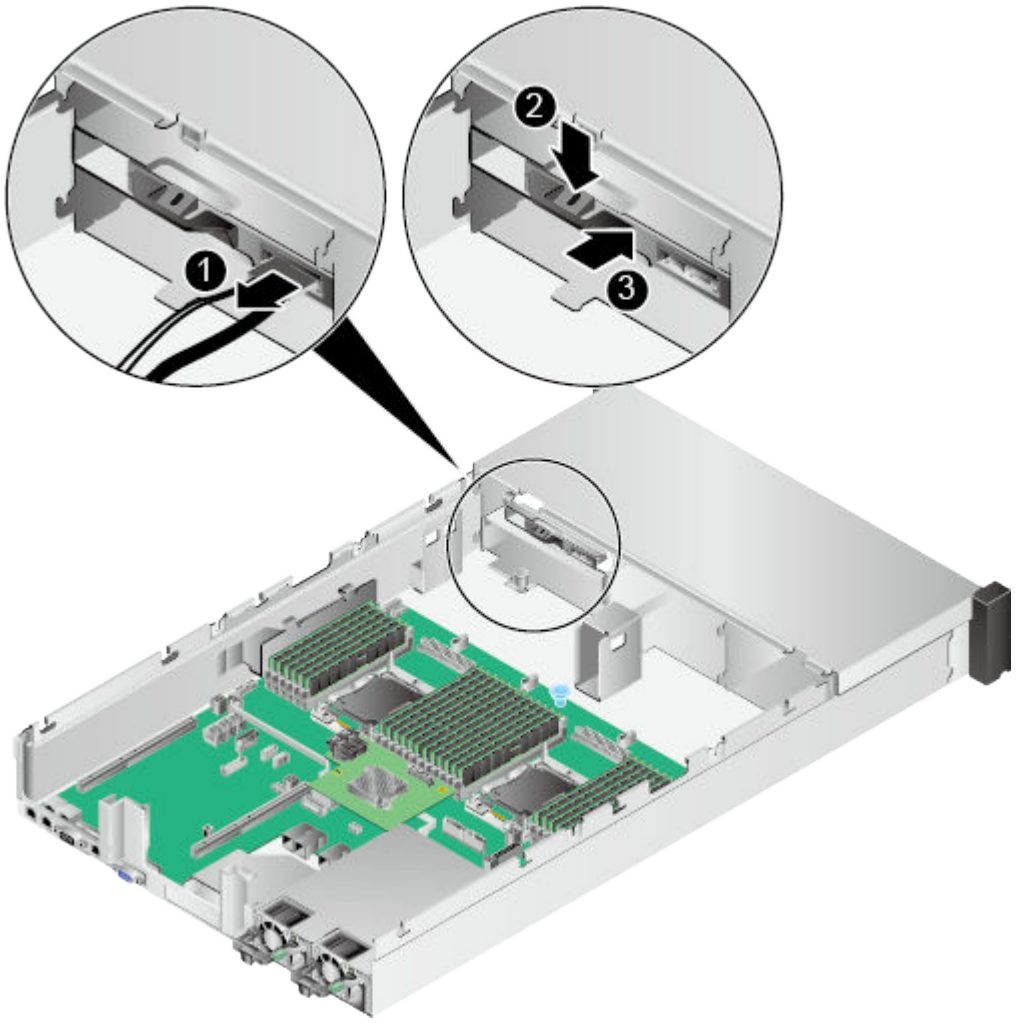
Step 9 Determine the position of the DVD drive.

Step 10 Remove the DVD drive.

1. Disconnect the cables from the DVD drive to the mainboard and the front-drive backplane. See (1) in **Figure 8-82**.

   For details, see **7.1 Server with 8 x 2.5" Drives (Pass-through) 1** or **7.2 Server with 8 x 2.5" Drives (Pass-through) 2**.
2. Pressing down the plastic handle, push the DVD drive outward. See (2) and (3) in **Figure 8-82**.

Figure 8-82 Removing the DVD drive



Step 11 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

----End

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8.5.14 Installing the DVD Drive

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Remove the air duct or built-in drive module.

For details, see **8.5.59 Removing the Air Duct** or **8.5.35 Removing the Built-in Drive Module**.

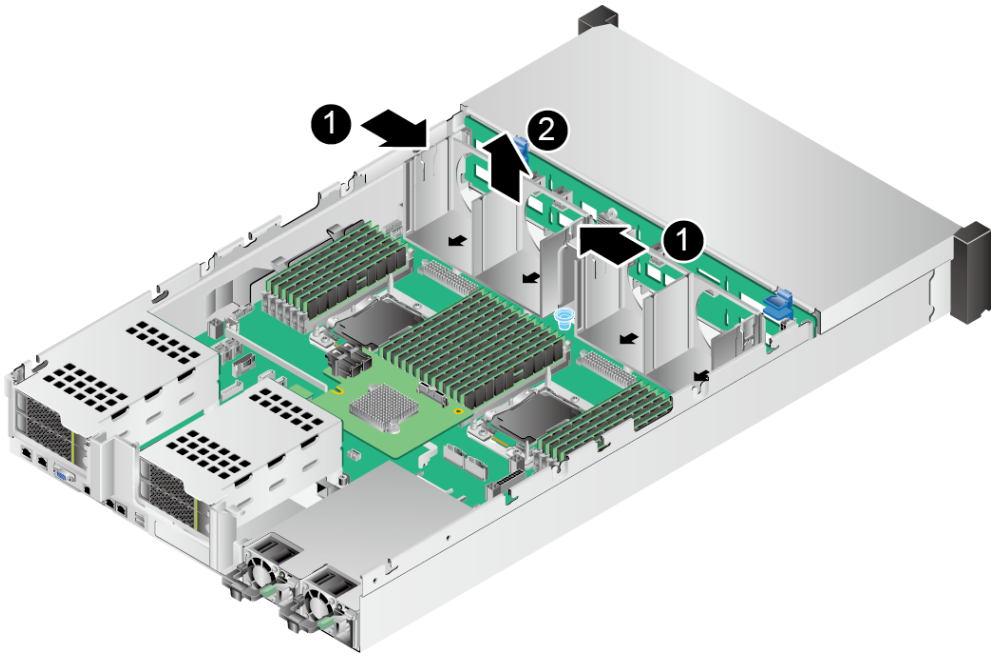
Step 7 Remove all fan modules.

For details, see **8.5.11 Removing a Fan Module**.

Step 8 Remove the fan module bracket.

1. Pressing the latches on both sides of the fan module bracket, lift the fan module bracket vertically. See (1) and (2) in **Figure 8-83**.
2. Remove the other fan module bracket in the same way.

Figure 8-83 Removing a fan module bracket



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Step 9 Take the component out of its ESD bag.

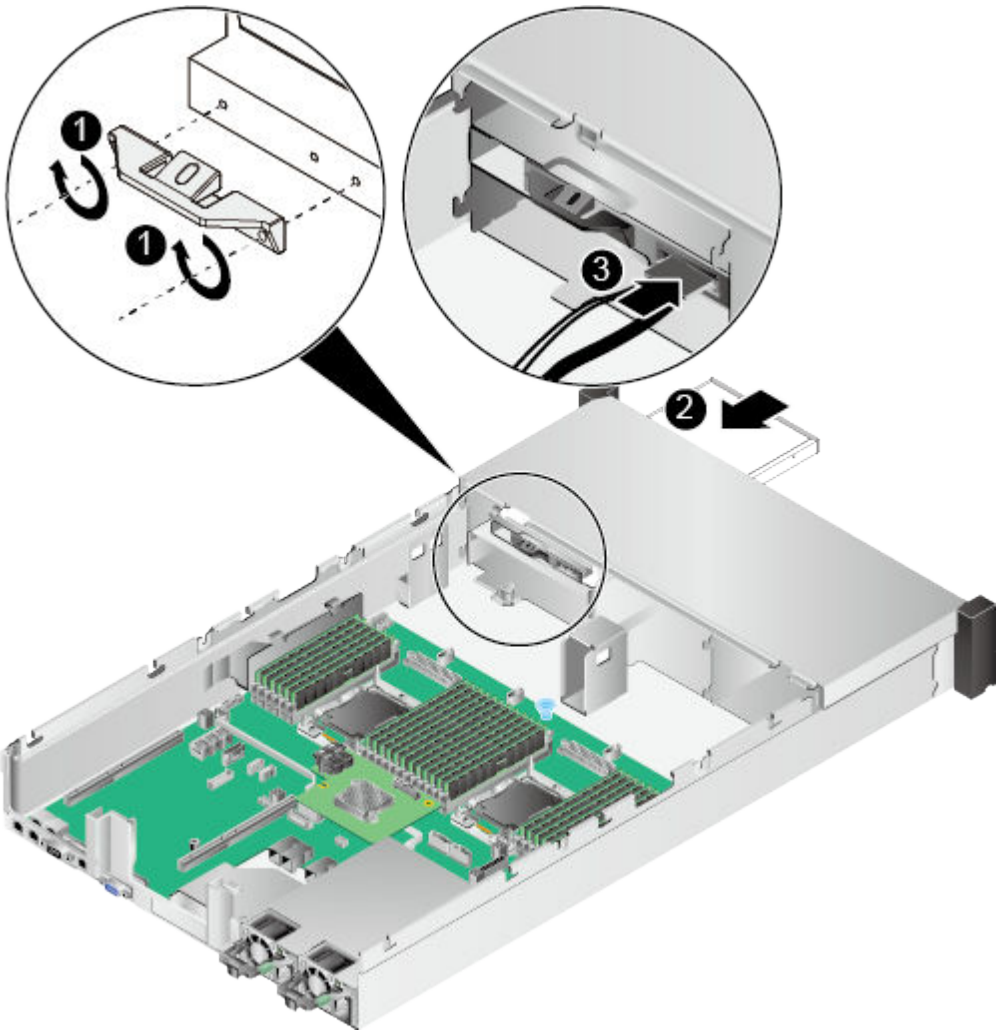
Step 10 Determine the position of the DVD drive.

Step 11 Install the DVD drive.

1. Use a Phillips screwdriver to tighten two M2 flat-head screws to secure the plastic handle to the DVD drive. See (1) in **Figure 8-84**.
2. Insert the DVD drive into the server. See (2) in **Figure 8-84**.
3. Connect the cables between the DVD drive and the mainboard and front-drive backplane. See (3) in **Figure 8-84**.

   For details, see **7.1 Server with 8 x 2.5" Drives (Pass-through) 1** or **7.2 Server with 8 x 2.5" Drives (Pass-through) 2**.

Figure 8-84 Installing the DVD drive



Step 12 Install all the fan module brackets.

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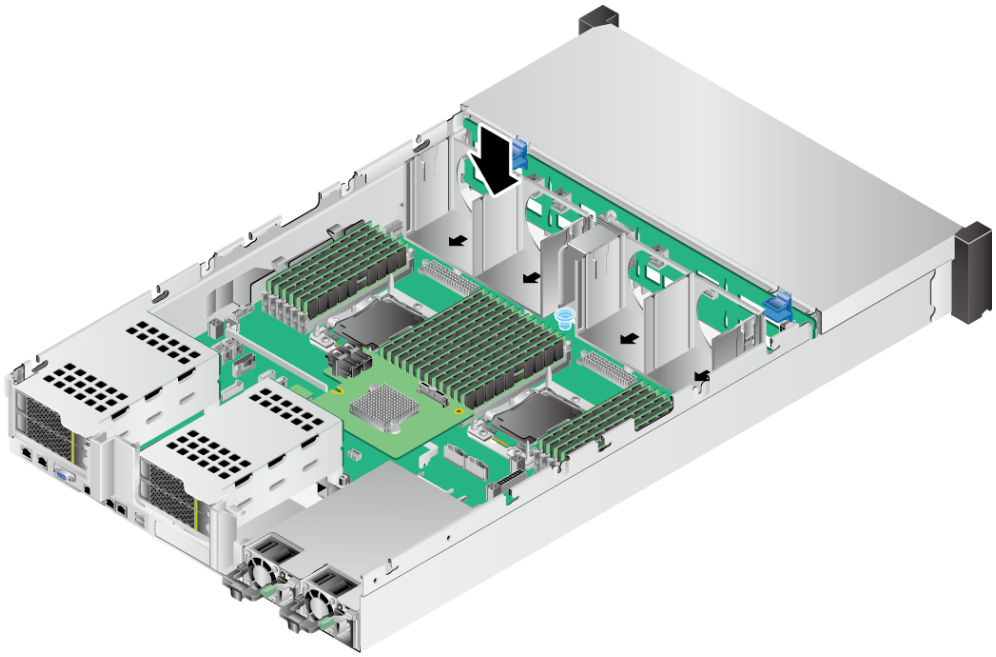
Figure 8-85 Installing a fan module bracket



Step 13 Install all fan modules.

For details, see **8.5.12 Installing a Fan Module**.

Step 14 Install the air duct or built-in drive module.

For details, see **8.5.60 Installing the Air Duct** or **8.5.36 Installing the Built-in Drive Module**.

Step 15 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 16 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 17 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 18 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

----End

8.5.15 Removing the RAID Controller Card

8.5.15.1 Removing the Screw-in RAID Controller Card

Procedure

Step 1 Power off the server.

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For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Check whether a built-in drive module is configured.

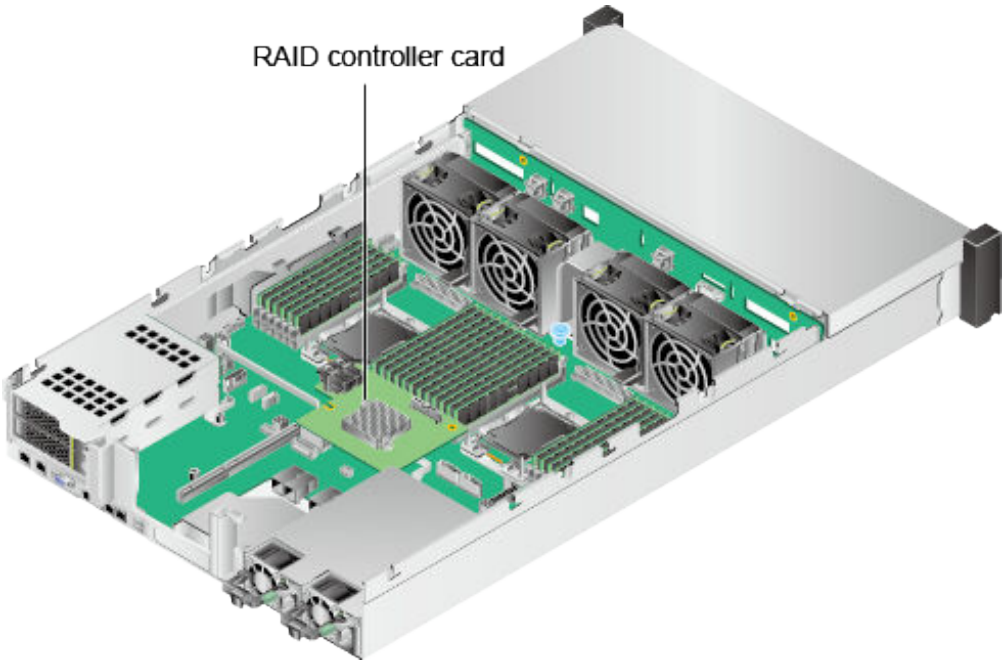
- If yes, go to **Step 7**.
- If no, go to **Step 8**.

Step 7 Remove the built-in drive module.

For details, see **8.5.35 Removing the Built-in Drive Module**.

Step 8 Determine the position of the screw-in RAID controller card.

Figure 8-86 Position of the screw-in RAID controller card



Step 9 Check whether I/O module 2 is configured with a full-height full-length PCIe riser module.

- If yes, go to **Step 10**.
- If no, go to **Step 11**.

Step 10 Remove the PCIe riser modules.

For details, see **8.5.55 Removing a PCIe Riser Module** .

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Step 11 Check whether a supercapacitor is configured.

- If yes, go to **Step 12**.
- If no, go to **Step 13**.

Step 12 Remove the supercapacitor.

For details, see **8.5.17.1 Removing a Supercapacitor (Server with a Screw-in RAID Controller Card)**.

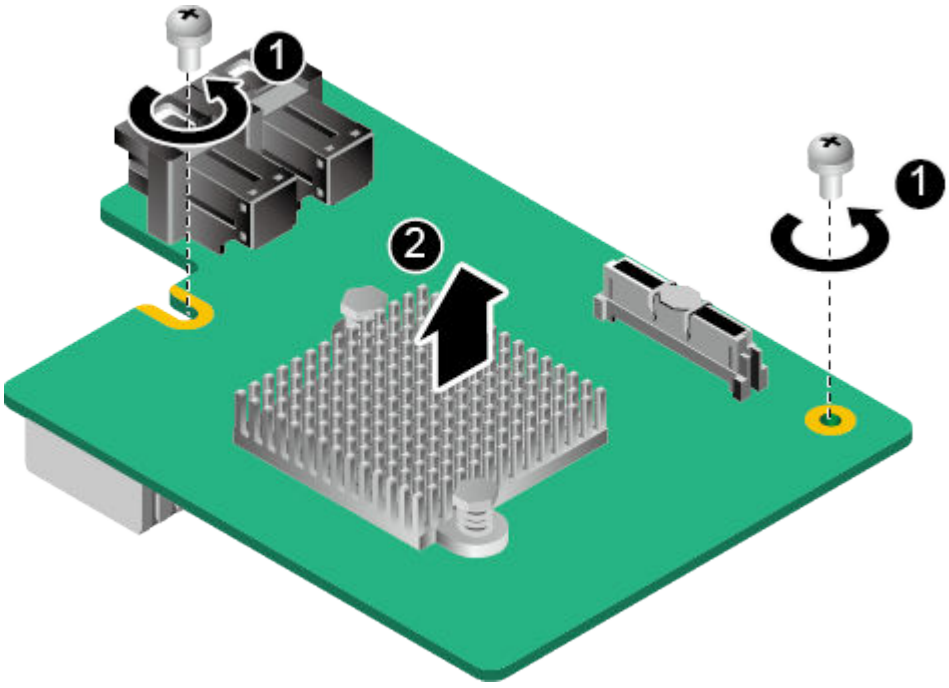
Step 13 Remove the cable from the RAID controller card.

For details, see **7 Internal Cabling**.

Step 14 Remove the RAID controller card.

1. Loosen the screws that secure the RAID controller card. See (1) in **Figure 8-87**.
2. Remove the RAID controller card from the connector on the mainboard. See (2) in **Figure 8-87**.

Figure 8-87 Removing a screw-in RAID controller card



Step 15 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

----End

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8.5.15.2 Removing the PCIe RAID Controller Card

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Determine the position of the PCIe RAID controller card.

NOTE

The slot of the RAID controller card varies depending on drive configuration. Determine the position of the RAID controller card based on drive configuration.

Step 7 Check whether a supercapacitor is configured.

- If yes, go to **Step 8**.
- If no, go to **Step 9**.

Step 8 Remove the supercapacitor.

For details, see **8.5.17.2 Removing the Supercapacitor (Server with a PCIe RAID Controller Card)**.

Step 9 Remove the cable from the RAID controller card.

For details, see **7 Internal Cabling**.

Step 10 Remove the PCIe riser modules.

For details, see **8.5.55 Removing a PCIe Riser Module** .

Step 11 Remove the RAID controller card.

1. Push the bucket outwards to release it. See (1) in **Figure 8-88**.
2. Remove the RAID controller card. See (2) in **Figure 8-88**.

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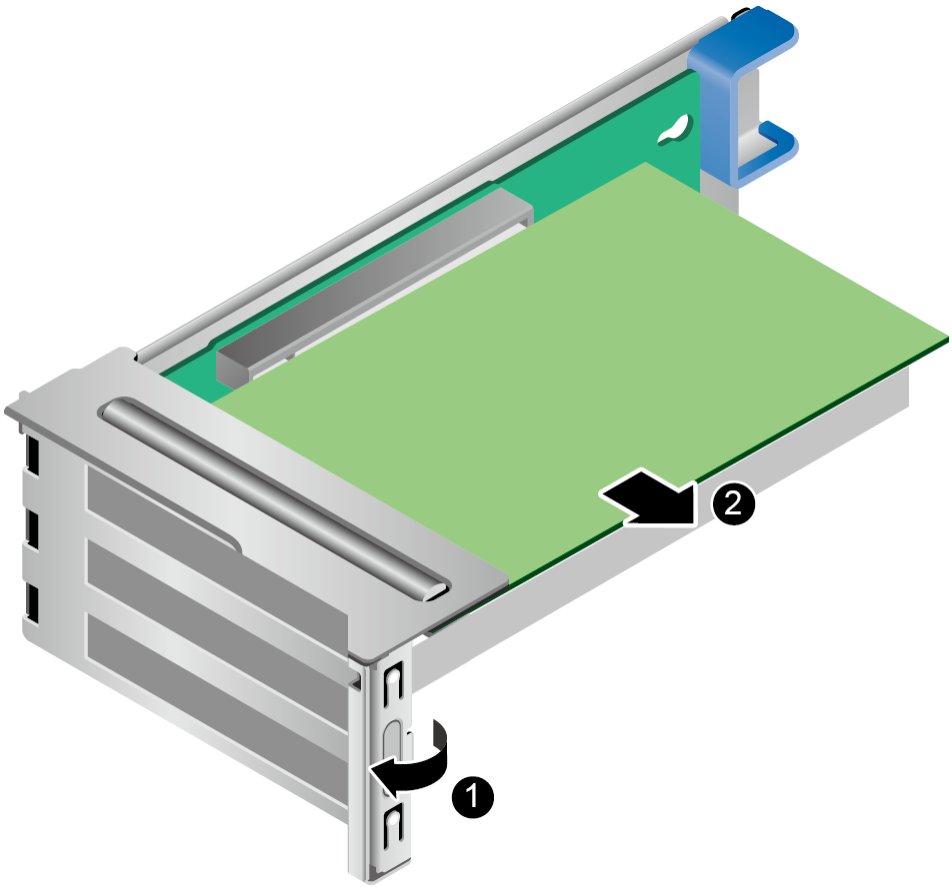
Figure 8-88 Removing a PCIe RAID controller card



Step 12 Check whether Part No. (P/N code) of the faulty PCIe RAID controller card is 02312FFX.

- If yes, go to **Step 13**.
- If no, go to **Step 14**.

NOTE

When replacing a PCIe RAID controller card whose part number (P/N code) is 02312FFX, you need to remove the CacheCade key of the faulty PCIe RAID controller card and install it in the spare PCIe RAID controller card.

Step 13 Lift the CacheCade key vertically upwards out of the PCIe RAID controller card.

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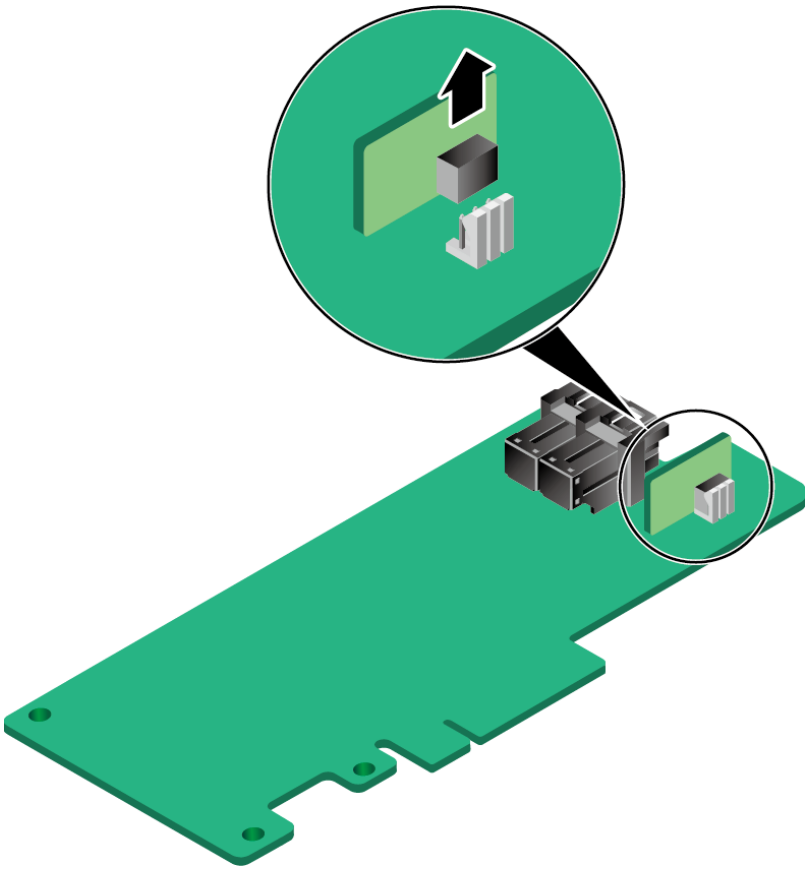
Figure 8-89 Removing a CacheCade key



Step 14 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

----End

8.5.16 Installing the RAID Controller Card

8.5.16.1 Installing the Screw-in RAID Controller Card

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

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Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Check whether a built-in drive module is configured.

- If yes, go to **Step 7**.
- If no, go to **Step 8**.

Step 7 Remove the built-in drive module.

For details, see **8.5.35 Removing the Built-in Drive Module**.

Step 8 Check whether I/O module 2 is configured with a full-height full-length PCIe riser module.

- If yes, go to **Step 9**.
- If no, go to **Step 10**.

Step 9 Remove the PCIe riser modules.

For details, see **8.5.55 Removing a PCIe Riser Module** .

Step 10 Take the component out of its ESD bag.

Step 11 Check whether a supercapacitor is configured.

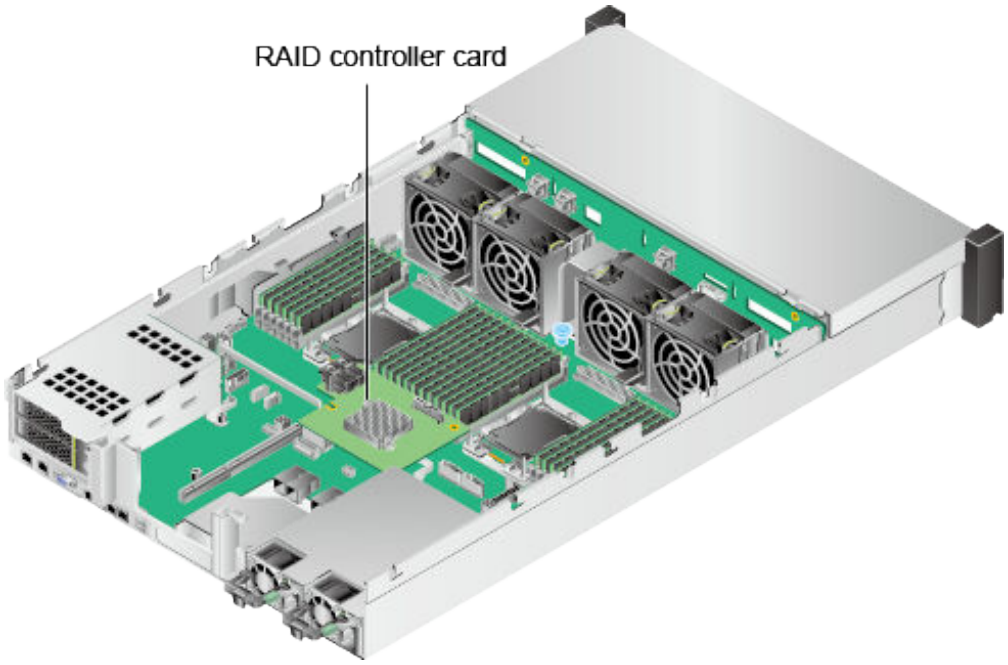
- If yes, go to **Step 12**.
- If no, go to **Step 13**.

Step 12 Install the supercapacitor.

For details, see **8.5.18.1 Installing a Supercapacitor (Server with a Screw-in RAID Controller Card)**.

Step 13 Determine the position of the screw-in RAID controller card.

Figure 8-90 Position of the screw-in RAID controller card



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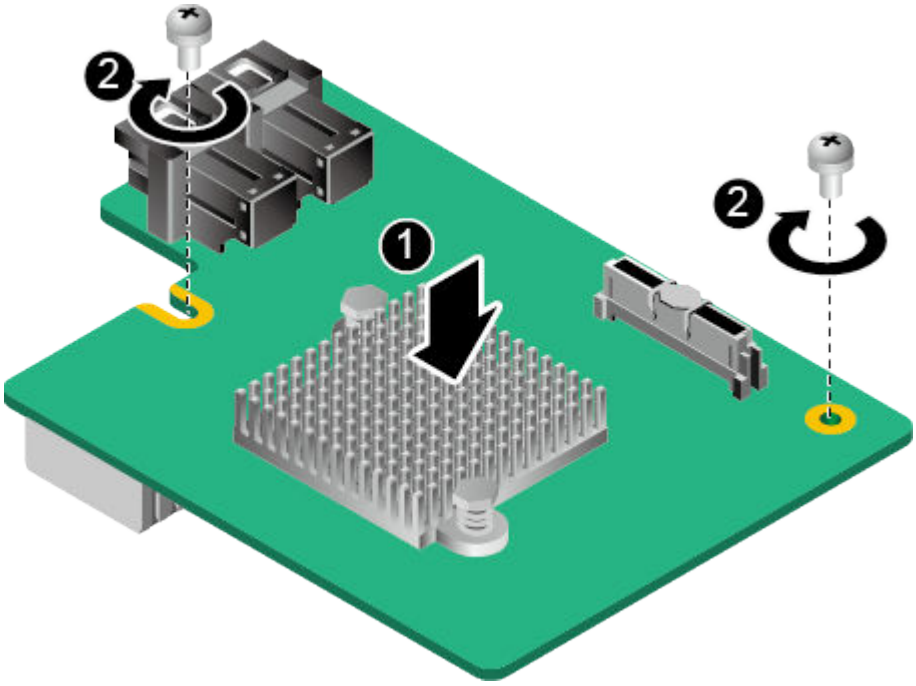
Step 14 Install the RAID controller card.

1. Insert the RAID controller card vertically into the connector on the mainboard. See (1) in **Figure 8-91**.
2. Tighten the screws to secure the RAID controller card. See (2) in **Figure 8-91**.

Figure 8-91 Installing a screw-in RAID controller card



Step 15 Connect the cable to the RAID controller card.

For details, see **7 Internal Cabling**.

Step 16 Check whether I/O module 2 is configured with a full-height full-length PCIe riser module.

- If yes, go to **Step 17**.
- If no, go to **Step 18**.

Step 17 Install the PCIe riser modules.

For details, see **8.5.56 Installing a PCIe Riser Module**.

Step 18 Check whether a built-in drive module is configured.

- If yes, go to **Step 19**.
- If no, go to **Step 20**.

Step 19 Install the built-in drive module.

For details, see **8.5.36 Installing the Built-in Drive Module**.

Step 20 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 21 Install the server.

For details, see **8.4.4 Installing a Server**.

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Step 22 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 23 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 24 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

Step 25 Configure the RAID controller card.

For details, see ***Huawei V5 Server RAID Controller Card User Guide***.

Step 26 Upgrade the firmware and driver to the target version.

For details, see ***FusionServer Pro Rack Server Upgrade Guide***.

----End

8.5.16.2 Installing the PCIe RAID Controller Card

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Take the component out of its ESD bag.

Step 7 Check whether a supercapacitor is configured.

- If yes, go to **Step 8**.
- If no, go to **Step 11**.

Step 8 Install the supercapacitor.

For details, see **8.5.18.2 Installing a Supercapacitor (Server with a PCIe RAID Controller Card)**.

Step 9 Check whether Part No. (P/N code) of the PCIe RAID controller card is 02312FFX.

- If yes, go to **Step 10**.
- If no, go to **Step 11**.

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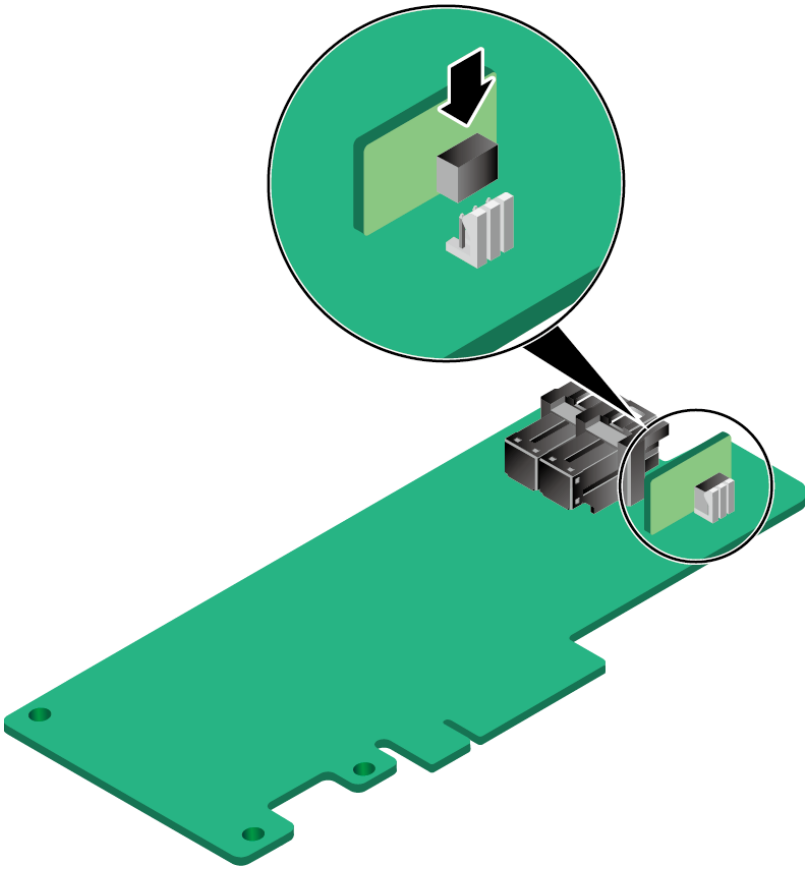
NOTE

When replacing a PCIe RAID controller card whose part number (P/N code) is 02312FFX, you need to remove the CacheCade key of the faulty PCIe RAID controller card and install it in the spare PCIe RAID controller card.

Step 10 Insert the CacheCade key vertically downwards on the PCIe RAID controller card.

Figure 8-92 Installing the CacheCade key



Step 11 Determine the position of the PCIe RAID controller card.

NOTE

The slot of the RAID controller card varies depending on drive configuration. Determine the position of the RAID controller card based on drive configuration.

Step 12 Remove the PCIe riser modules.

For details, see **8.5.55 Removing a PCIe Riser Module** .

Step 13 Install the RAID controller card.

1. Insert the RAID controller card into the slot. See (1) in **Figure 8-93**.
2. Close the buckle on the RAID controller card slot. See (2) in **Figure 8-93**.

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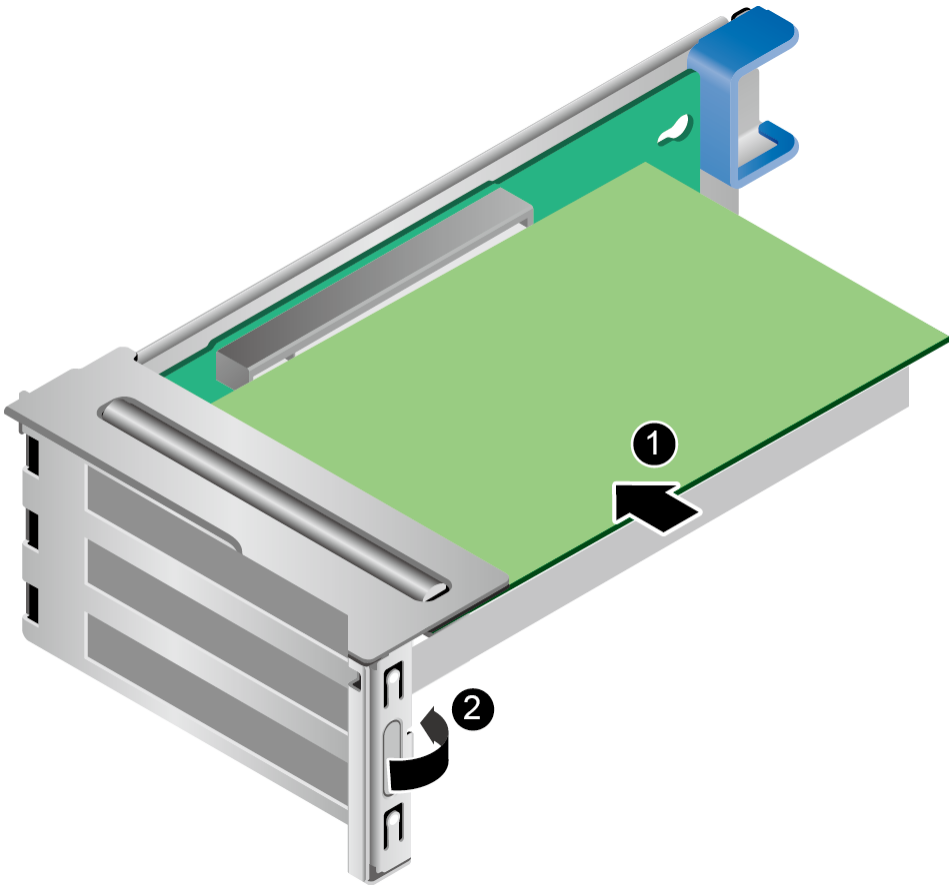
Figure 8-93 Installing a PCIe RAID controller card



Step 14 Install the PCIe riser modules.

For details, see **8.5.56 Installing a PCIe Riser Module**.

Step 15 Connect the cable to the RAID controller card.

For details, see **7 Internal Cabling**.

Step 16 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 17 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 18 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 19 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 20 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

Step 21 Configure the RAID controller card.

For details, see ***Huawei V5 Server RAID Controller Card User Guide***.

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Step 22 Upgrade the firmware and driver to the target version.

For details, see ***FusionServer Pro Rack Server Upgrade Guide***.

----End

8.5.17 Removing a Supercapacitor

8.5.17.1 Removing a Supercapacitor (Server with a Screw-in RAID Controller Card)

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Determine the position of the supercapacitor.

- If the server is configured with an air duct, the supercapacitor is installed on the air duct.
  - If one supercapacitor is configured, it must be installed in position (1) shown in the following figure.
  - If two supercapacitors are configured, they can be in positions (1) and (2) or (1) and (3) shown in the following figure.
  - If three supercapacitors are configured, they are in positions (1), (2), and (3) shown in the following figure.

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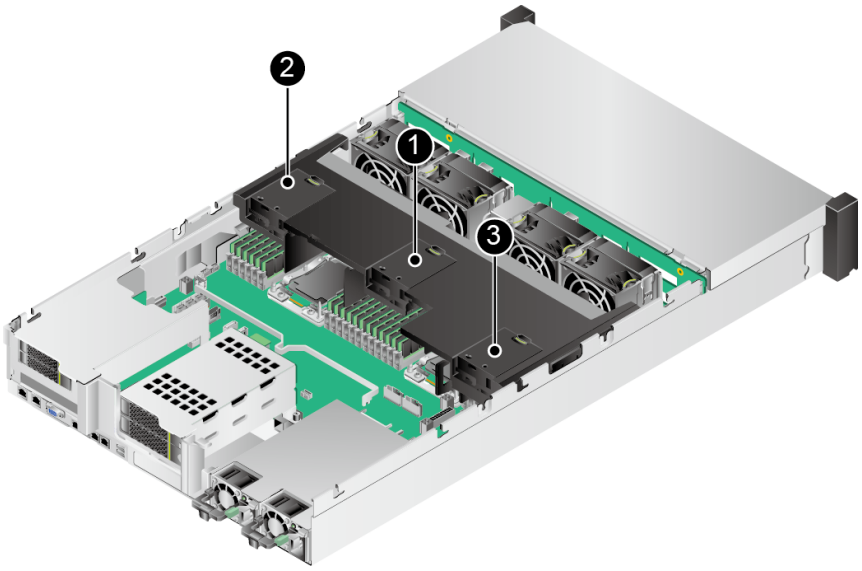
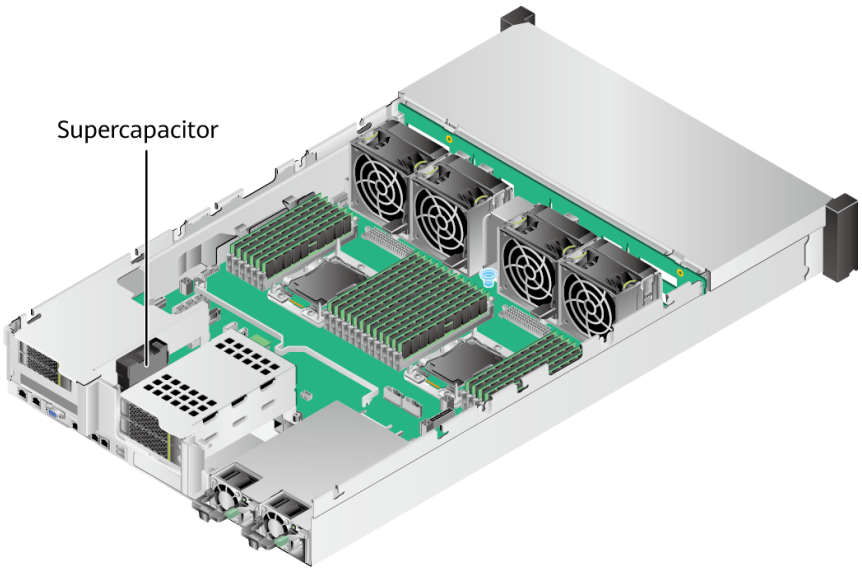
Figure 8-94 Positions of the supercapacitors on the air duct



- If the server is configured with a built-in drive module, the supercapacitor is installed on the side wall of I/O module 1.

  Figure 8-95 Position of the supercapacitor on the side wall of I/O module 1 (example)



Step 7 Check whether a full-height full-length PCIe riser module is configured.

- If yes, go to **Step 8**.
- If no, go to **Step 9**.

Step 8 Remove the full-height full-length PCIe riser module.

For details, see **8.5.55 Removing a PCIe Riser Module** .

Step 9 Check whether the supercapacitor is configured with a TFM.

- If yes, go to **Step 10**.
- If no, go to **Step 11**.

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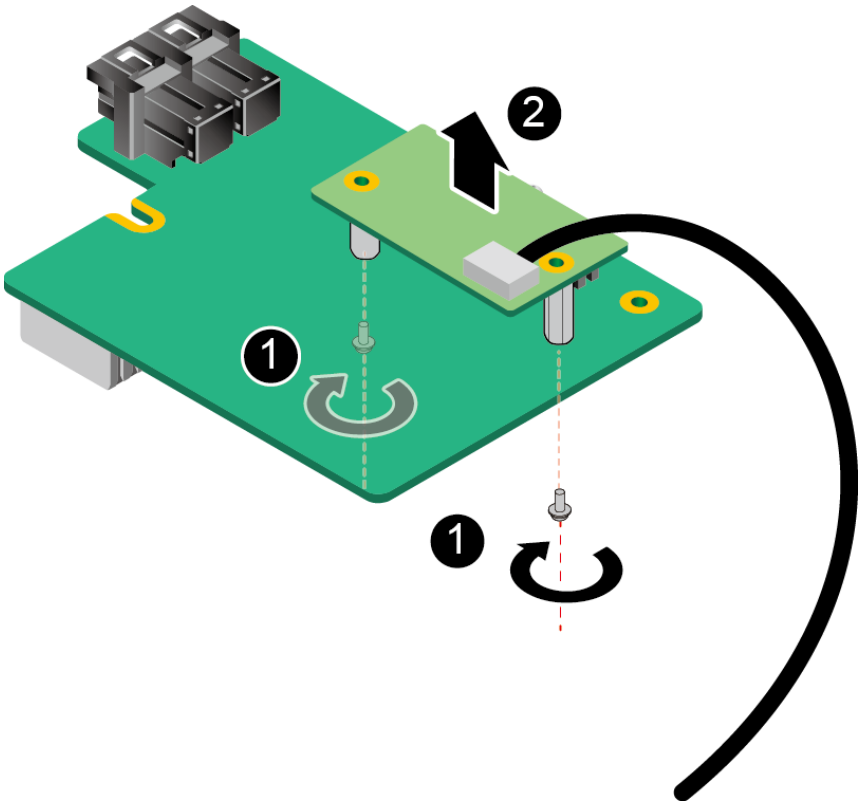
Step 10 Remove the TFM.

1. Remove the screw-in RAID controller card.

   For details, see **8.5.15.1 Removing the Screw-in RAID Controller Card**.
2. Unscrew the TFM on the screw-in RAID controller card. See (1) in **Figure 8-96**.
3. Remove the TFM from the RAID controller card. See (2) in **Figure 8-96**.

Figure 8-96 Removing a TFM



4. Go to **Step 12**.

Step 11 Remove the cable between the supercapacitor and the RAID controller card.

Step 12 Remove the supercapacitor and its holder.

- Remove the supercapacitor on the air duct
  a. Press the latch and remove the supercapacitor and its holder from the air duct.

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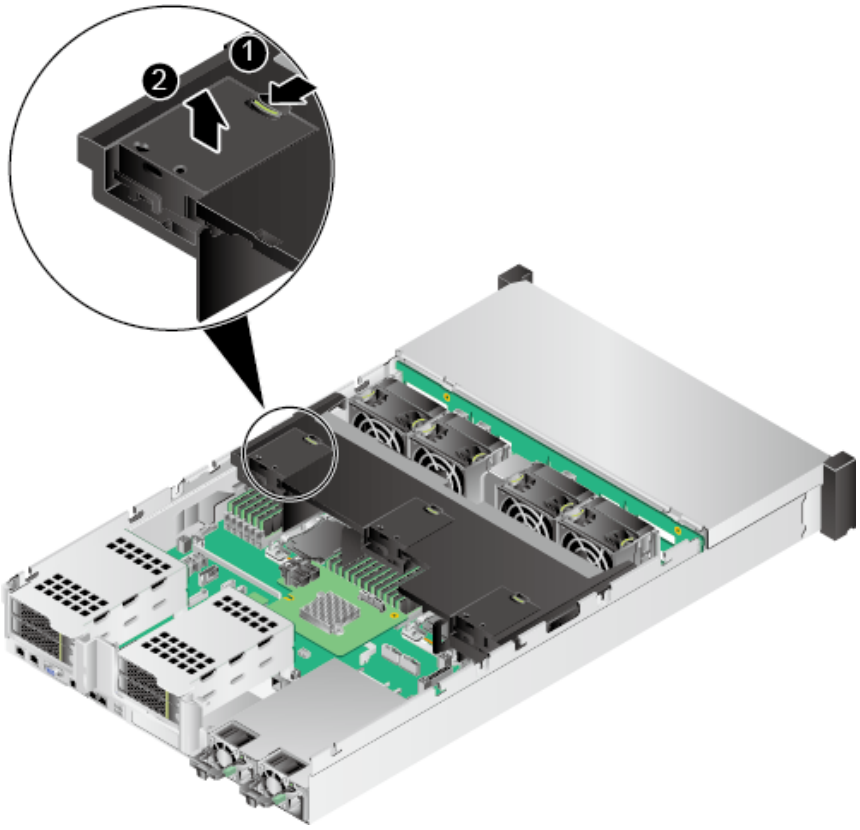
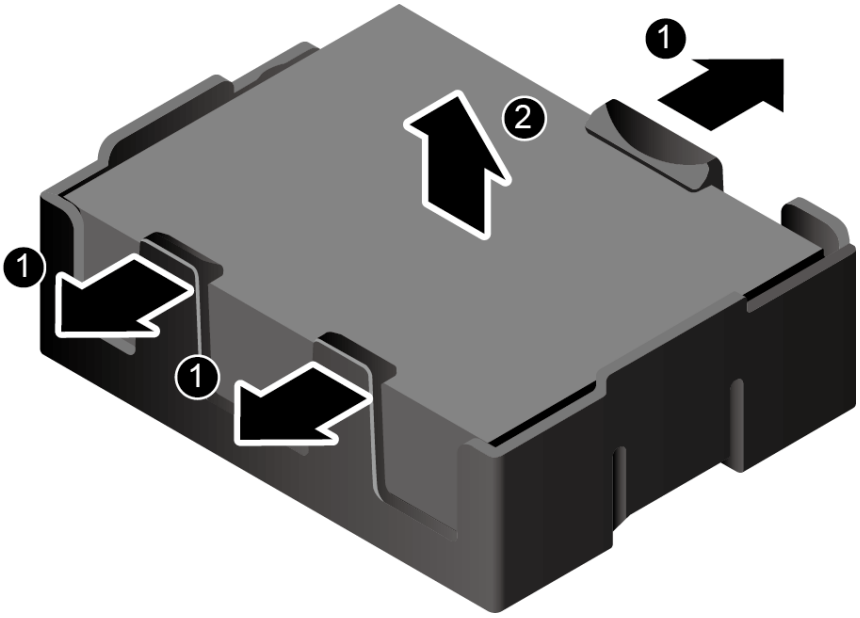
Figure 8-97 Removing a supercapacitor and its holder from the air duct



b. Open the plastic buckles that secure the supercapacitor. See (1) in **Figure 8-98**.

c. Exert even force to lift the supercapacitor out of the holder. See (2) in **Figure 8-98**.

Figure 8-98 Removing a supercapacitor



- Remove the supercapacitor on the side wall of I/O module 1

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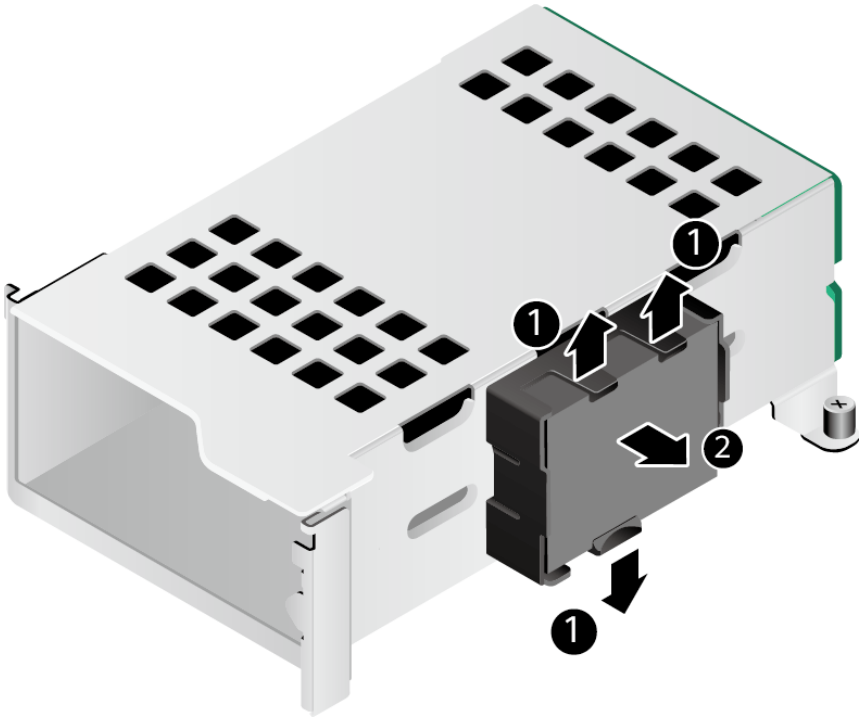
a. Remove I/O module 1.

   For details, see **8.5.37 Removing the Rear Drive Module** or **8.5.39 Removing the Module with Rear Drives and PCIe Card**.

b. Open the plastic buckles that secure the supercapacitor. See (1) in **Figure 8-99**.

c. Exert even force horizontally to remove the supercapacitor from the holder. See (2) in **Figure 8-99**.

Figure 8-99 Removing a supercapacitor from the side wall of I/O module 1



d. Loosen the screws that secure the supercapacitor holder on the side wall of I/O module 1.. See (1) in **Figure 8-100**.

e. Remove the supercapacitor holder from the side wall of I/O module 1.. See (2) in **Figure 8-100**.

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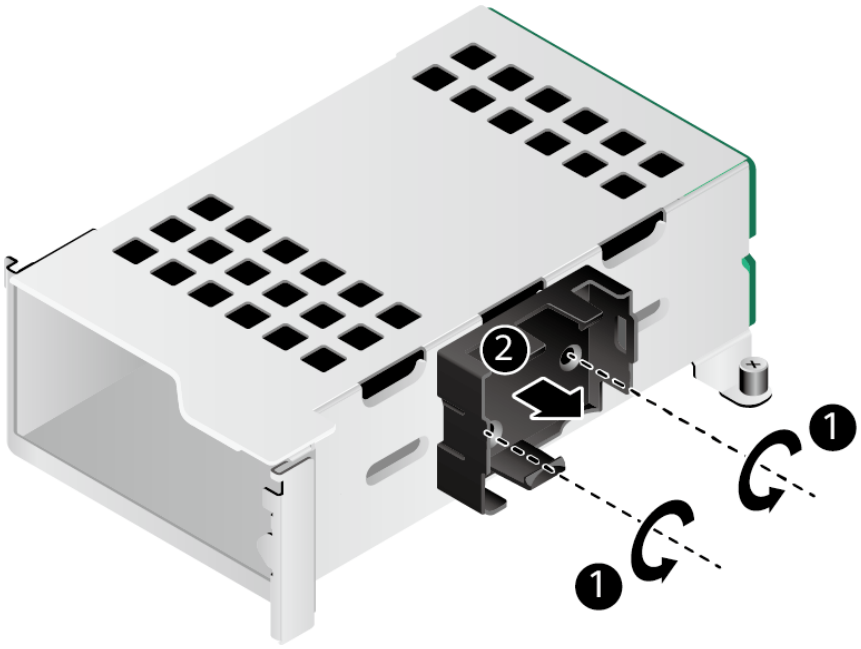
Figure 8-100 Removing a supercapacitor holder from the side wall of I/O module 1



f. Install I/O module 1.

For details, see **8.5.38 Installing the Rear Drive Module** or **8.5.40 Installing the Module with Rear Drives and PCIe Card**.

Step 13 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

----End

8.5.17.2 Removing the Supercapacitor (Server with a PCIe RAID Controller Card)

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

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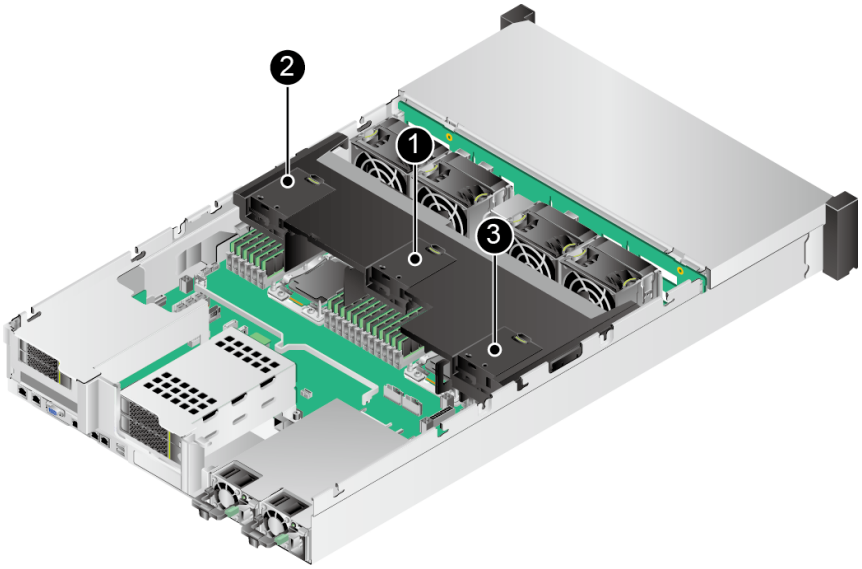
Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Determine the position of the supercapacitor.

- If the server is configured with an air duct, the supercapacitor is installed on the air duct.
  - If one supercapacitor is configured, it must be installed in position (1) shown in the following figure.
  - If two supercapacitors are configured, they can be in positions (1) and (2) or (1) and (3) shown in the following figure.
  - If three supercapacitors are configured, they are in positions (1), (2), and (3) shown in the following figure.

Figure 8-101 Positions of the supercapacitors on the air duct



- If the server is configured with a built-in drive module, the supercapacitor is installed on the side wall of I/O module 1.

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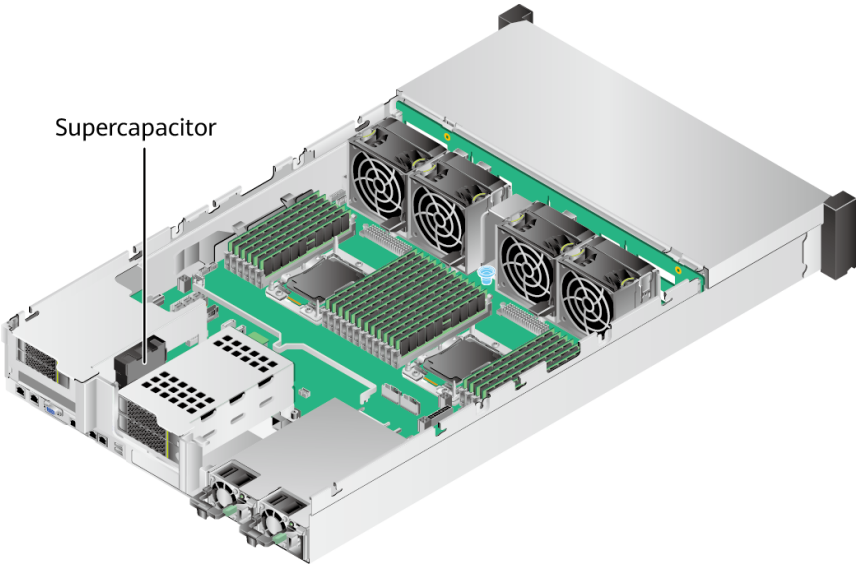
Figure 8-102 Position of the supercapacitor on the side wall of I/O module 1 (example)



Step 7 Remove the cable between the supercapacitor and the RAID controller card.

NOTE

If the gap is too small, remove the PCIe RAID controller card and then remove the cable. For details about how to remove a PCIe RAID controller card, see **8.5.15.2 Removing the PCIe RAID Controller Card**.

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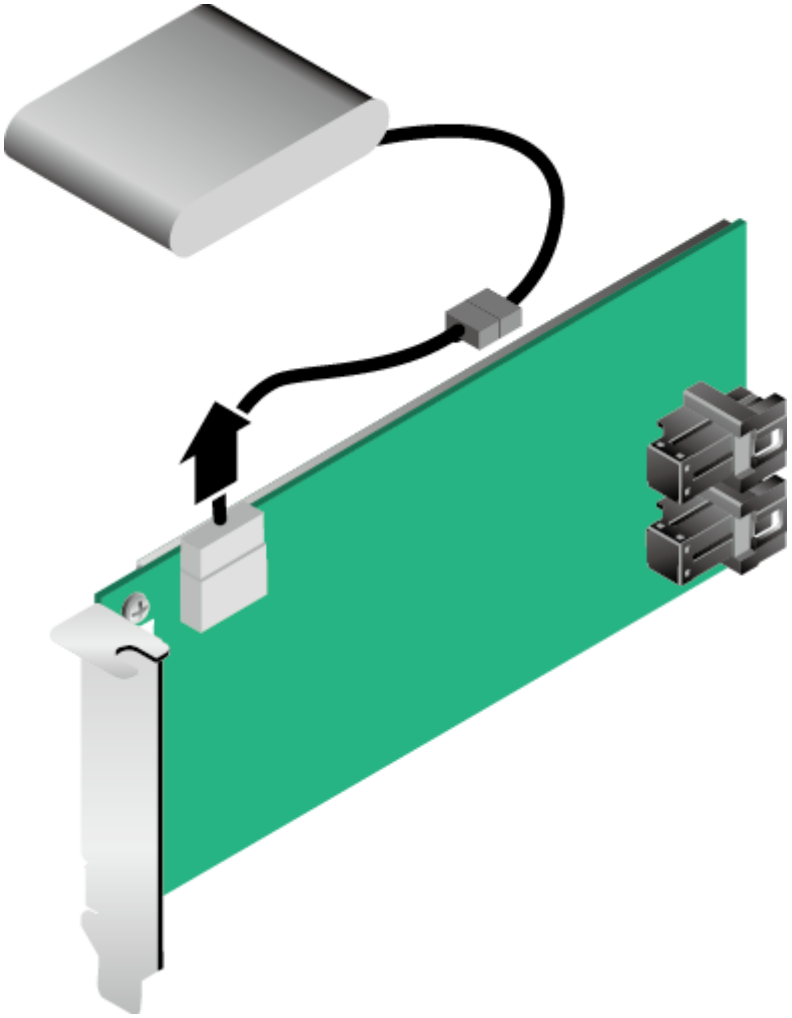
Figure 8-103 Removing a cable from the PCIe RAID controller card with two mini-SAS ports (example)



Step 8 Remove the supercapacitor and its holder.

- Remove the supercapacitor on the air duct
  a. Press the latch and remove the supercapacitor and its holder from the air duct.

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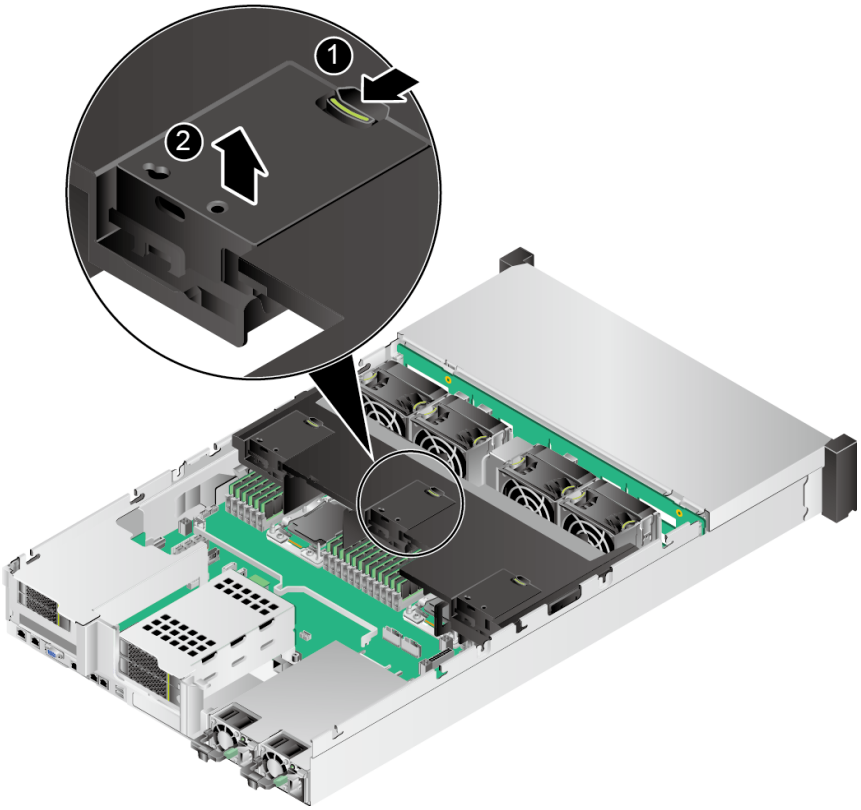
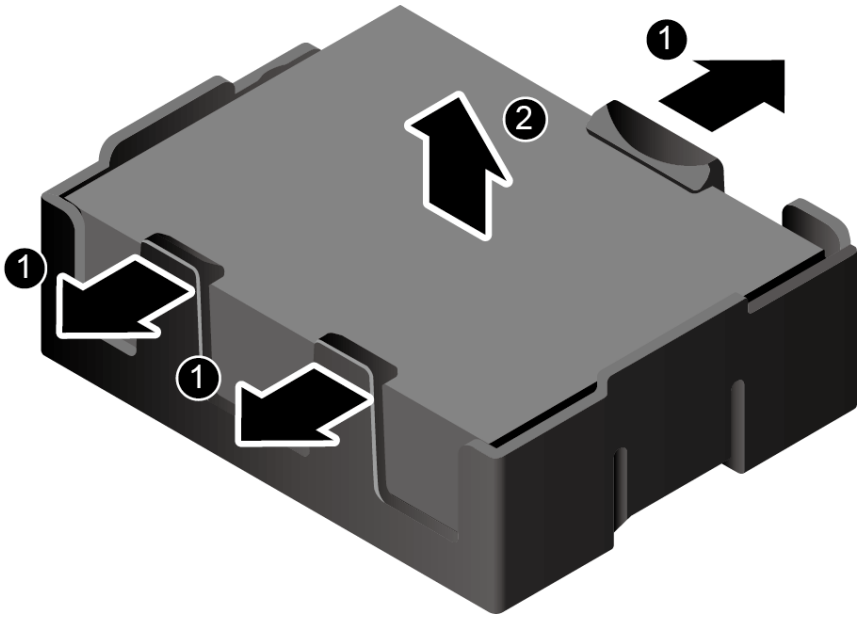
Figure 8-104 Removing a supercapacitor and its holder from the air duct



b. Open the plastic buckles that secure the supercapacitor. See (1) in **Figure 8-105**.

c. Exert even force to lift the supercapacitor out of the holder. See (2) in **Figure 8-105**.

Figure 8-105 Removing a supercapacitor



- Remove the supercapacitor on the side wall of I/O module 1

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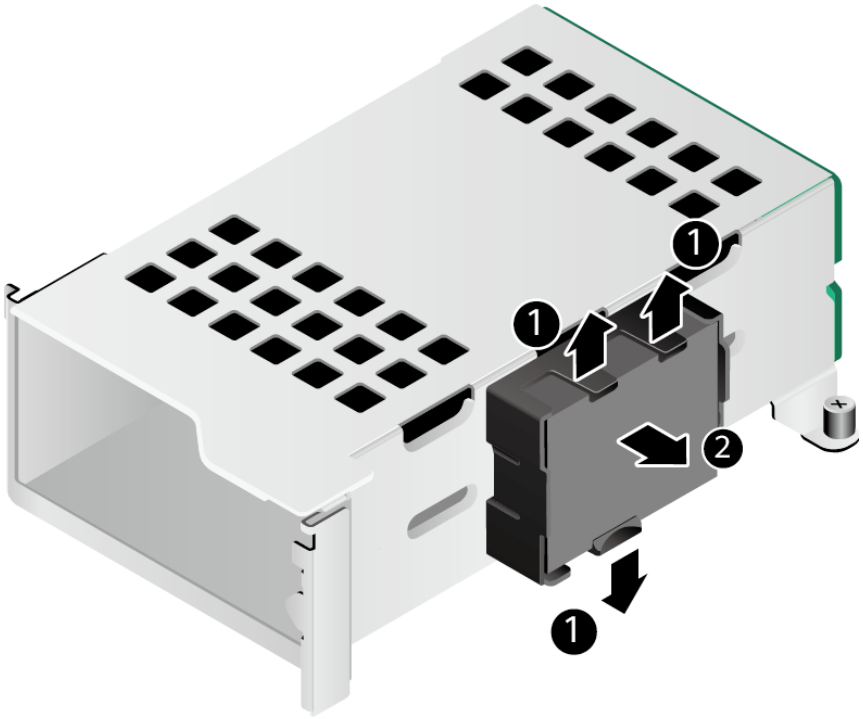
a. Remove I/O module 1.

   For details, see **8.5.37 Removing the Rear Drive Module** or **8.5.39 Removing the Module with Rear Drives and PCIe Card**.

b. Open the plastic buckles that secure the supercapacitor. See (1) in **Figure 8-106**.

c. Exert even force horizontally to remove the supercapacitor from the holder. See (2) in **Figure 8-106**.

Figure 8-106 Removing a supercapacitor from the side wall of I/O module 1



d. Loosen the screws that secure the supercapacitor holder on the side wall of I/O module 1.. See (1) in **Figure 8-107**.

e. Remove the supercapacitor holder from the side wall of I/O module 1.. See (2) in **Figure 8-107**.

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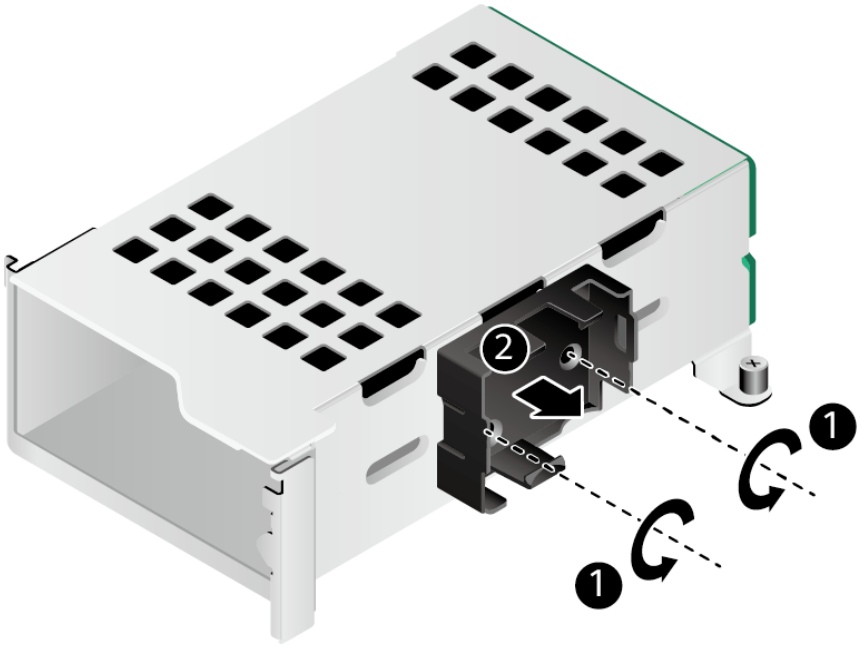
Figure 8-107 Removing a supercapacitor holder from the side wall of I/O module 1



f. Install I/O module 1.

For details, see **8.5.38 Installing the Rear Drive Module** or **8.5.40 Installing the Module with Rear Drives and PCIe Card**.

Step 9 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

----End

8.5.18 Installing a Supercapacitor

8.5.18.1 Installing a Supercapacitor (Server with a Screw-in RAID Controller Card)

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

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Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Check whether a full-height full-length PCIe riser module is configured.

- If yes, go to **Step 7**.
- If no, go to **Step 8**.

Step 7 Remove the full-height full-length PCIe riser module.

For details, see **8.5.55 Removing a PCIe Riser Module** .

Step 8 Take the component out of its ESD bag.

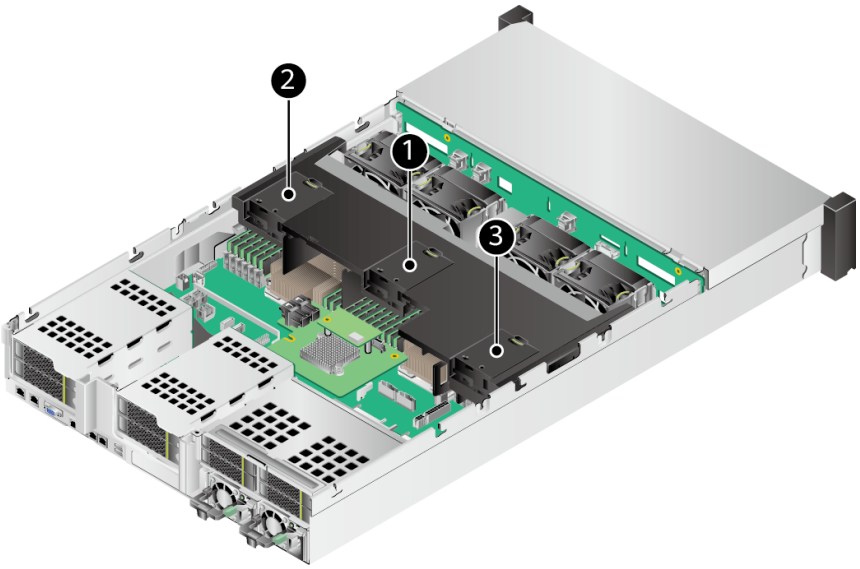
Step 9 Determine the position of the supercapacitor.

- If the server is configured with an air duct, the supercapacitor is installed on the air duct.
  - If one supercapacitor is configured, it must be installed in position (1) shown in the following figure.
  - If two supercapacitors are configured, they can be in positions (1) and (2) or (1) and (3) shown in the following figure.
  - If three supercapacitors are configured, they are in positions (1), (2), and (3) shown in the following figure.

  NOTE

  If two or three supercapacitors are configured, install them close to the RAID controller card to facilitate cable connection.

  Figure 8-108 Positions of the supercapacitors on the air duct

- If the server is configured with a built-in drive module, the supercapacitor is installed on the side wall of I/O module 1.

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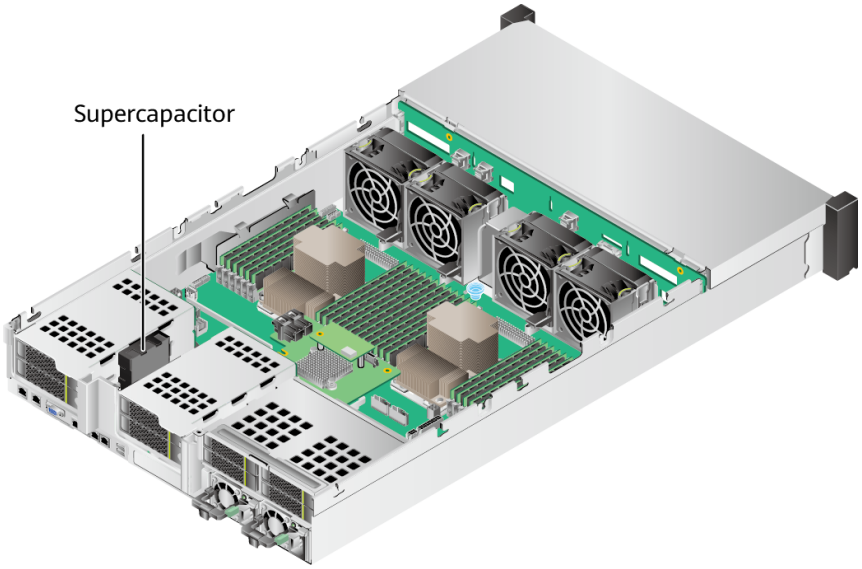
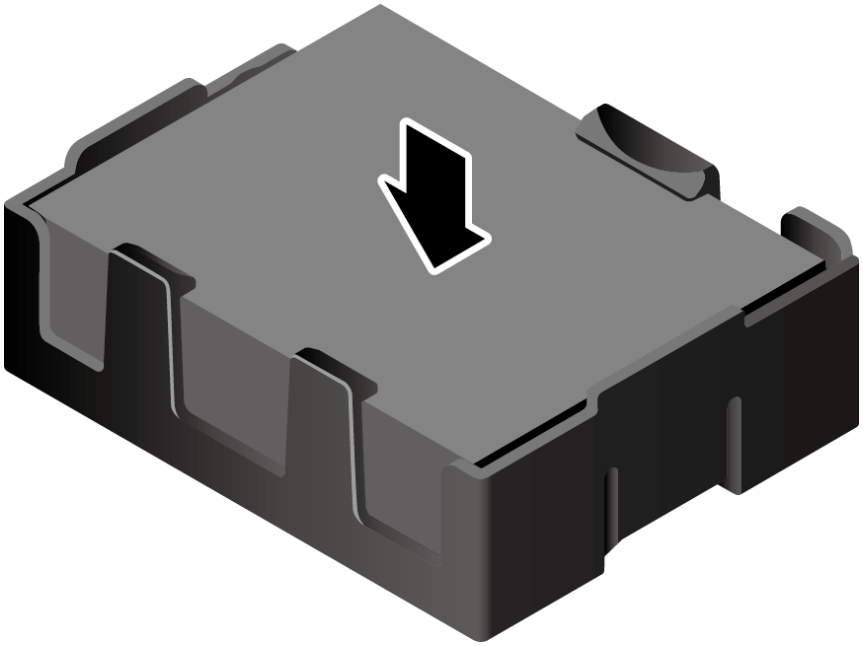
Figure 8-109 Position of the supercapacitor on the side wall of I/O module 1



Step 10 Install the supercapacitor and its holder.

- Supercapacitor on the air duct
  a. Insert the supercapacitor into the holder until the supercapacitor is locked.

  Figure 8-110 Installing a supercapacitor

  b. secure the supercapacitor and its holder to the air duct.

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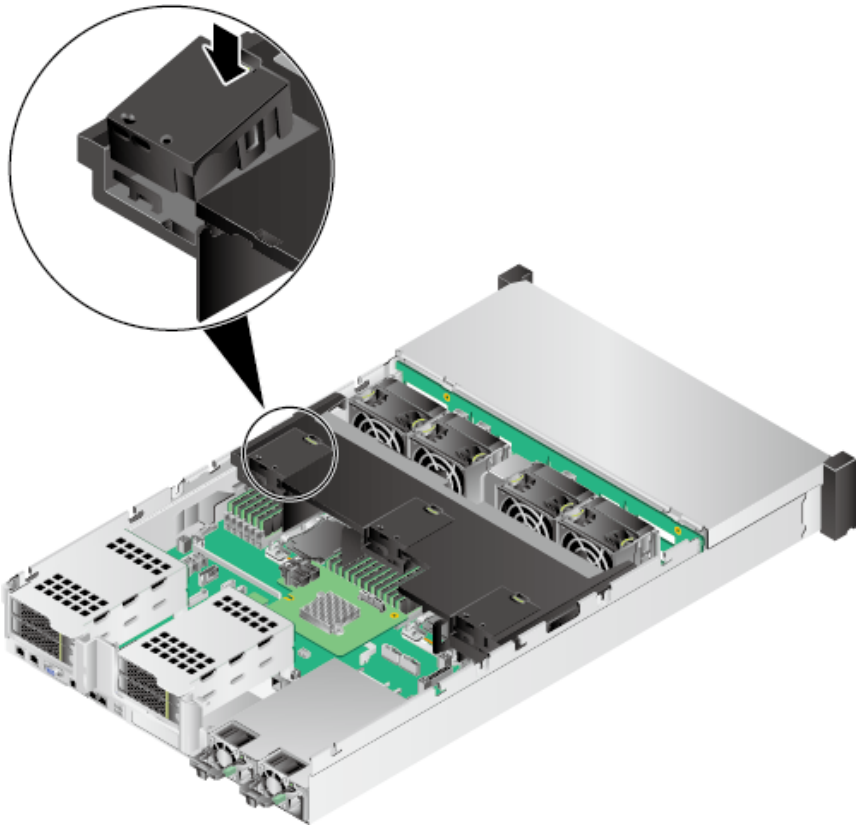
Figure 8-111 Installing a supercapacitor and its holder on the air duct



- Supercapacitor on the side wall of I/O module 1
  a. Remove I/O module 1.

     For details, see **8.5.37 Removing the Rear Drive Module** or **8.5.39 Removing the Module with Rear Drives and PCIe Card**.
  b. Place the supercapacitor holder on the side wall of I/O module 1. For details, see (1) in **Figure 8-112**.
  c. Align the screws of the supercapacitor holder with the screw holes on the side wall of I/O module 1, and tighten the screws. For details, see (2) in **Figure 8-112**.

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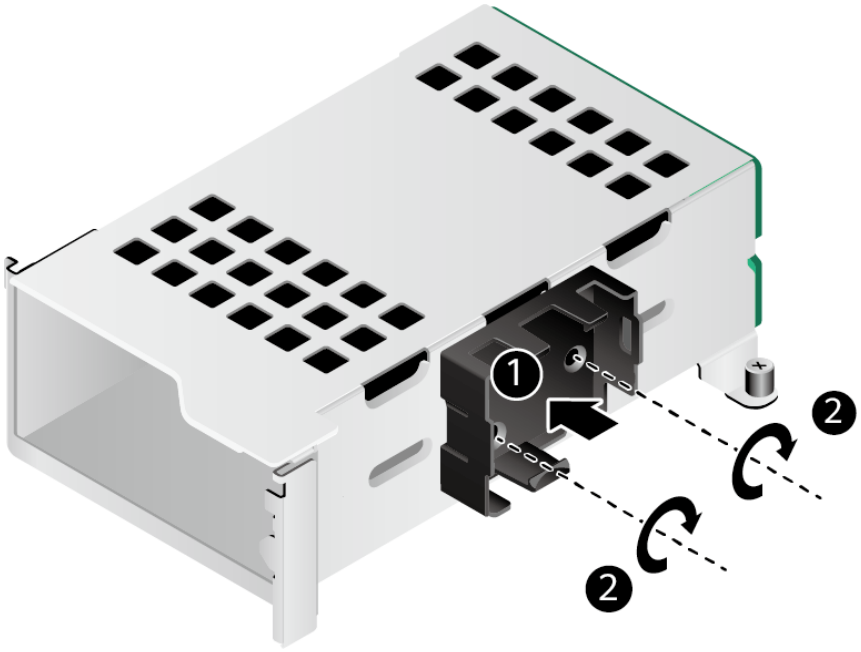
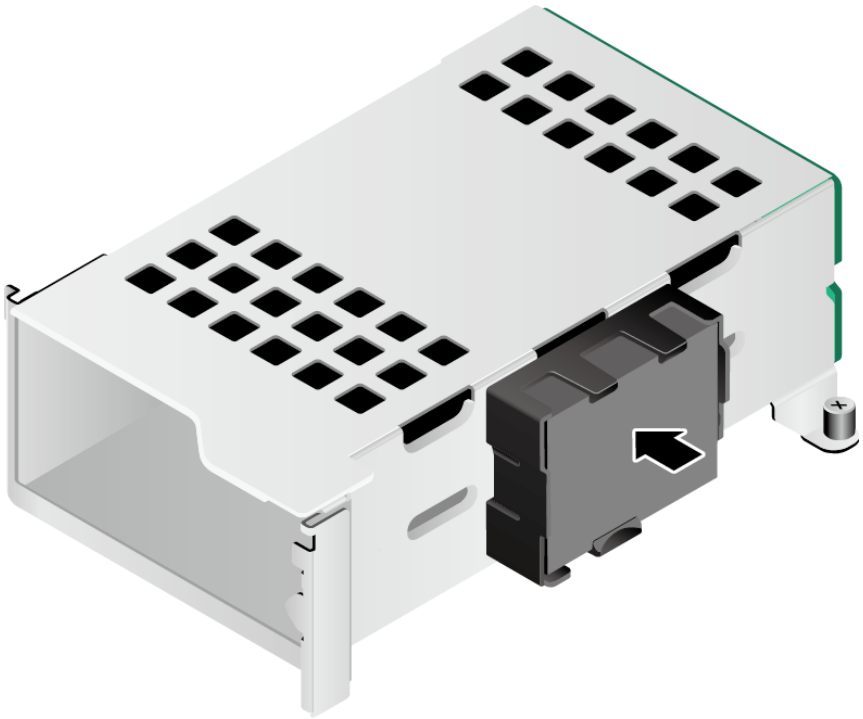
Figure 8-112 Installing a supercapacitor holder on the side wall of I/O module 1



d. Insert the supercapacitor into the holder until the supercapacitor is locked.

Figure 8-113 Installing a supercapacitor on the side wall of I/O module 1



e. Install I/O module 1.

For details, see **8.5.38 Installing the Rear Drive Module** or **8.5.40 Installing the Module with Rear Drives and PCIe Card**.

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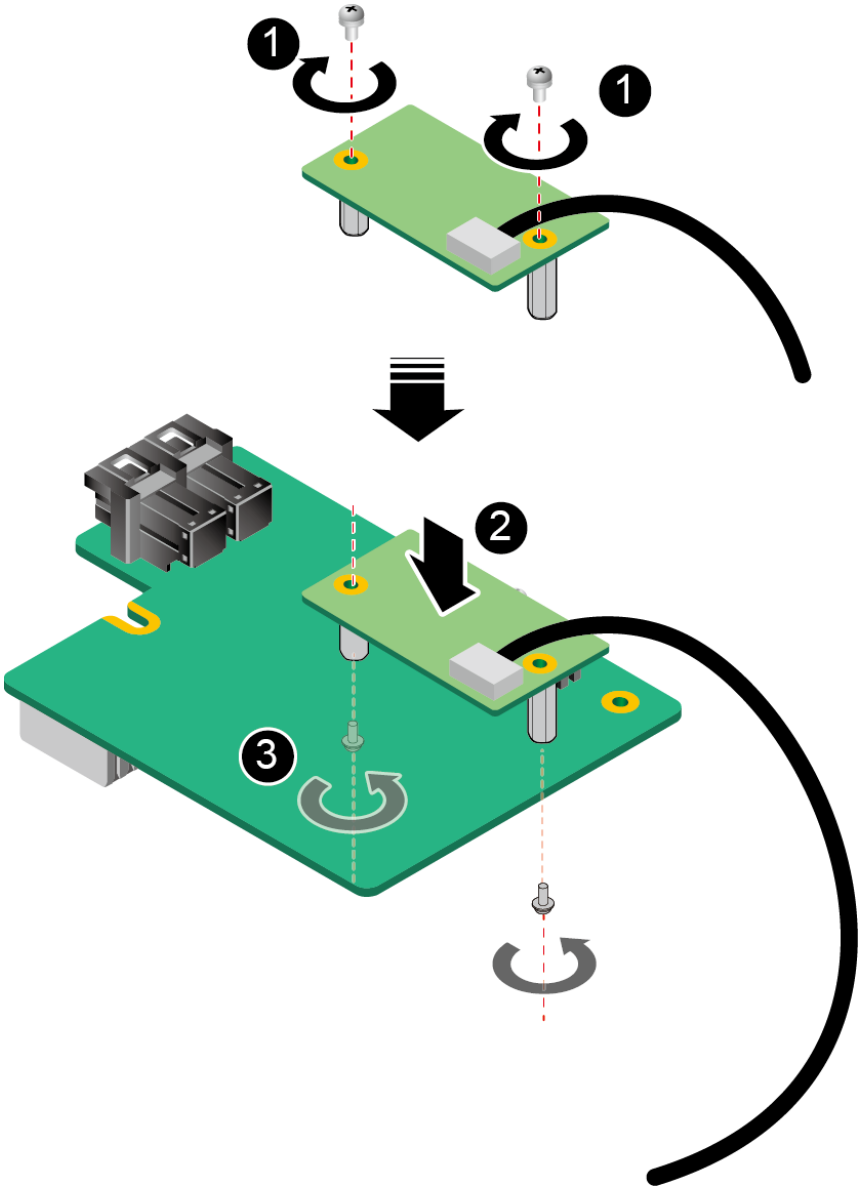
Step 11 Check whether the supercapacitor is configured with a TFM.

- If yes, go to **Step 12**.
- If no, go to **Step 13**.

Step 12 Install the TFM.

1. Remove the screw-in RAID controller card.
   For details, see **8.5.15.1 Removing the Screw-in RAID Controller Card**.
2. Install studs on the TFM. See (1) in **Figure 8-114**.
3. Insert the TFM into the screw-in RAID controller card. See (2) in **Figure 8-114**.
4. Tighten the screws to secure the TFM. See (3) in **Figure 8-114**.

Figure 8-114 Installing a TFM



5. Install the screw-in RAID controller card.
   For details, see **8.5.16.1 Installing the Screw-in RAID Controller Card**.

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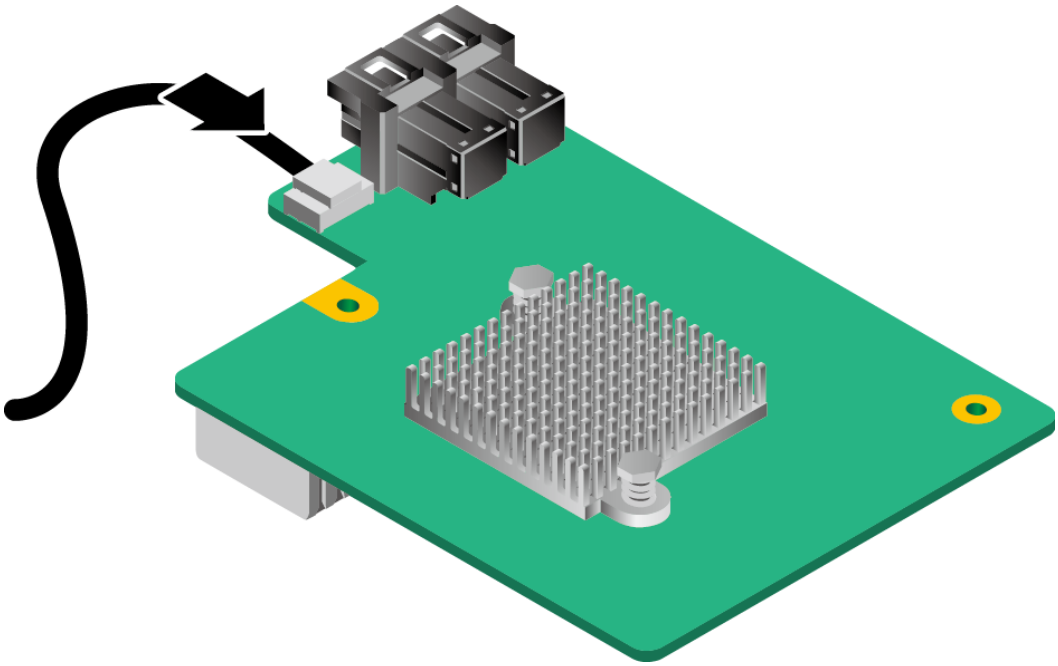
6. Go to **Step 14**.

Step 13 Connect the cable between the supercapacitor and the screw-in RAID controller card.

Figure 8-115 Connecting a cable to the screw-in RAID controller card with two Mini-SAS ports (example)



Step 14 Check whether a full-height full-length PCIe riser module is configured.

- If yes, go to **Step 15**.
- If no, go to **Step 16**.

Step 15 Install the full-height full-length PCIe riser module.

For details, see **8.5.56 Installing a PCIe Riser Module**.

Step 16 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 17 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 18 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 19 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 20 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

----End

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8.5.18.2 Installing a Supercapacitor (Server with a PCIe RAID Controller Card)

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Check whether a full-height full-length PCIe riser module is configured.

- If yes, go to **Step 7**.
- If no, go to **Step 8**.

Step 7 Remove the full-height full-length PCIe riser module.

For details, see **8.5.55 Removing a PCIe Riser Module** .

Step 8 Take the component out of its ESD bag.

Step 9 Determine the position of the supercapacitor.

- If the server is configured with an air duct, the supercapacitor is installed on the air duct.
  - If one supercapacitor is configured, it must be installed in position (1) shown in the following figure.
  - If two supercapacitors are configured, they can be in positions (1) and (2) or (1) and (3) shown in the following figure.
  - If three supercapacitors are configured, they are in positions (1), (2), and (3) shown in the following figure.

  NOTE

  If two or three supercapacitors are configured, install them close to the RAID controller card to facilitate cable connection.

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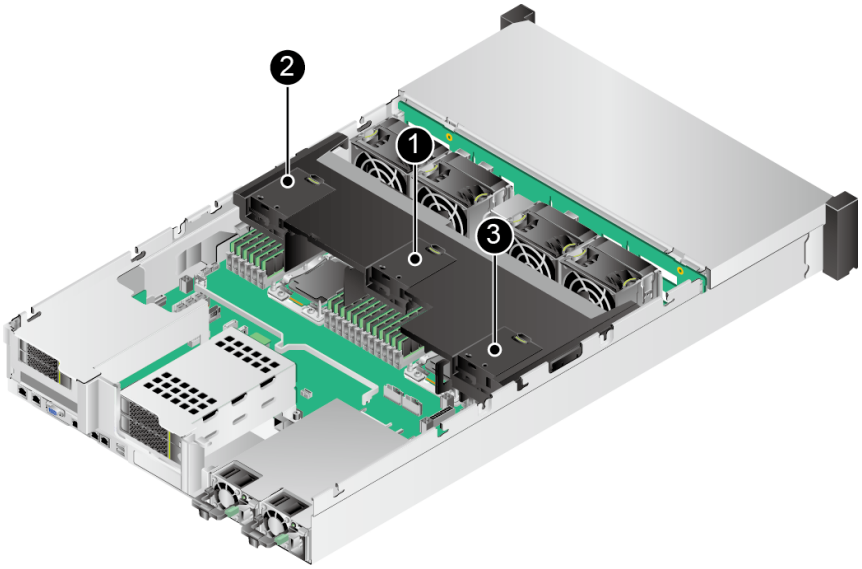
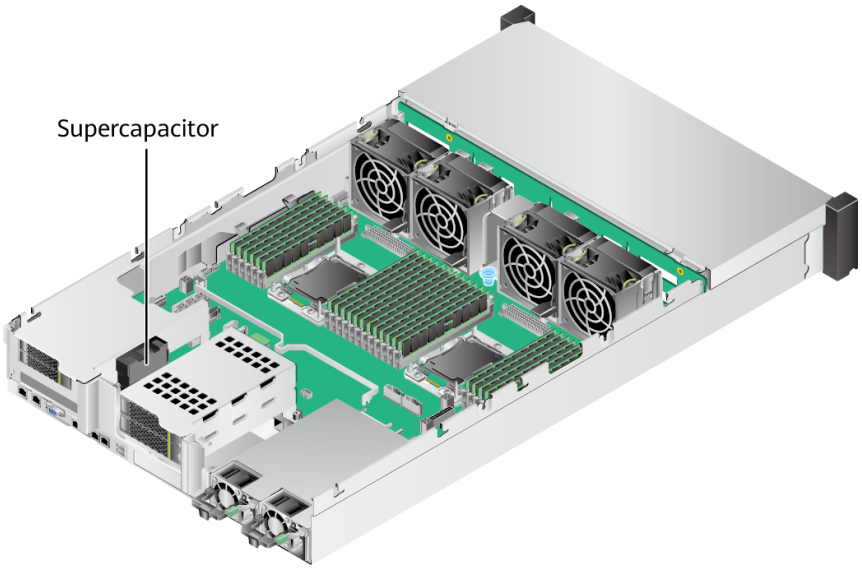
Figure 8-116 Positions of the supercapacitors on the air duct



- If the server is configured with a built-in drive module, the supercapacitor is installed on the side wall of I/O module 1.

  Figure 8-117 Position of the supercapacitor on the side wall of I/O module 1 (example)



Step 10 Install the supercapacitor and its holder.

- Supercapacitor on the air duct
  a. Insert the supercapacitor into the holder until the supercapacitor is locked.

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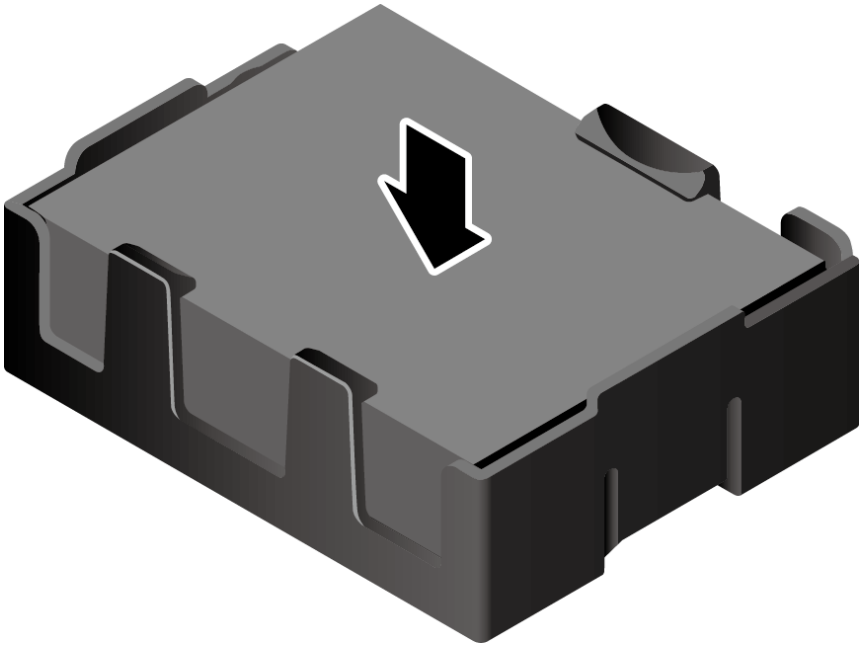
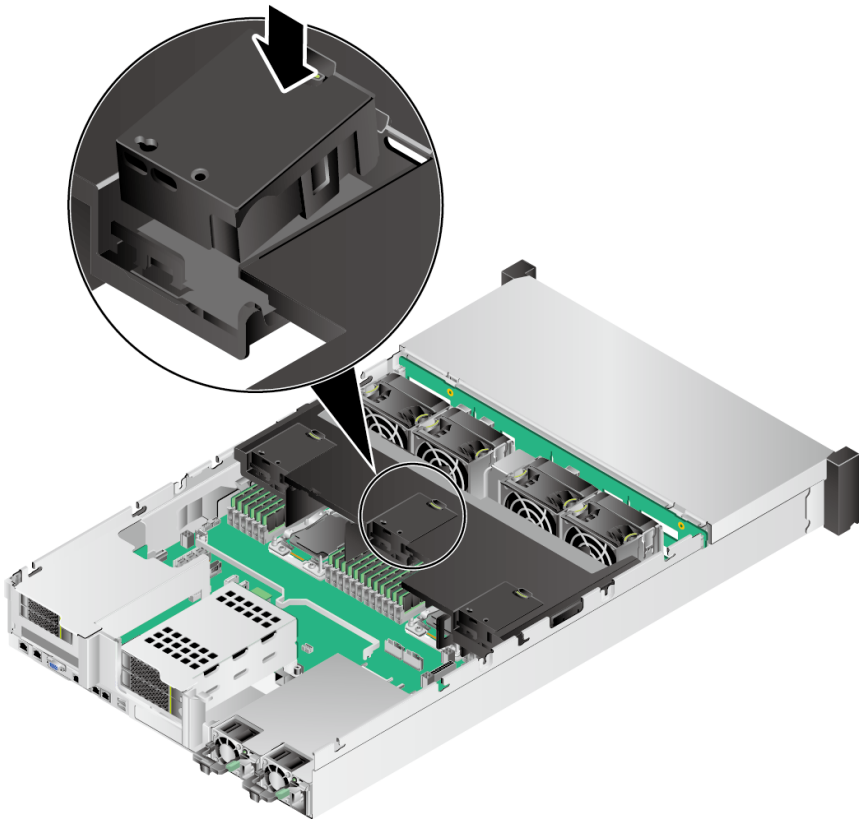
Figure 8-118 Installing a supercapacitor



b. secure the supercapacitor and its holder to the air duct.

Figure 8-119 Installing a supercapacitor and its holder on the air duct



- Supercapacitor on the side wall of I/O module 1
  a. Remove I/O module 1.

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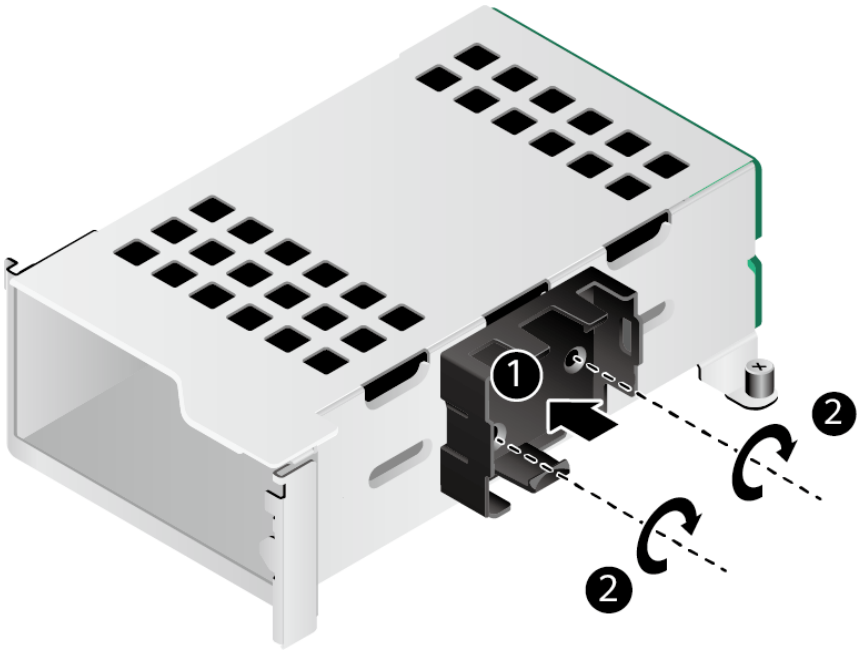
For details, see **8.5.37 Removing the Rear Drive Module** or **8.5.39 Removing the Module with Rear Drives and PCIe Card**.

b. Place the supercapacitor holder on the side wall of I/O module 1. For details, see (1) in **Figure 8-120**.

c. Align the screws of the supercapacitor holder with the screw holes on the side wall of I/O module 1, and tighten the screws. For details, see (2) in **Figure 8-120**.

Figure 8-120 Installing a supercapacitor holder on the side wall of I/O module 1



d. Insert the supercapacitor into the holder until the supercapacitor is locked.

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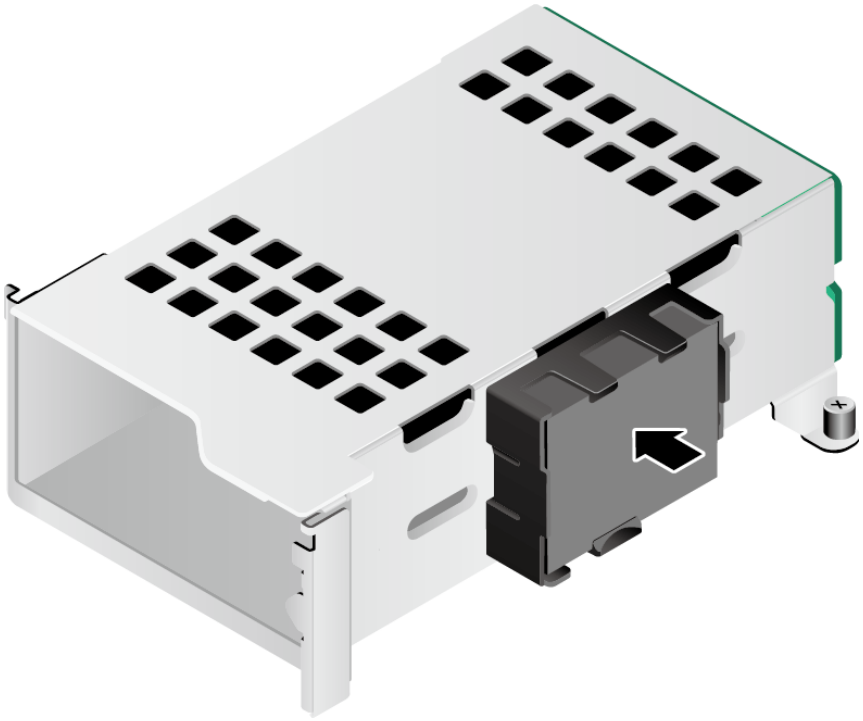
Figure 8-121 Installing a supercapacitor on the side wall of I/O module 1



e. Install I/O module 1.

   For details, see **8.5.38 Installing the Rear Drive Module** or **8.5.40 Installing the Module with Rear Drives and PCIe Card**.

Step 11 Connect the cable between the supercapacitor and the PCIe RAID controller card.

NOTE

If the gap is too small, remove the PCIe RAID controller card and then connect the cable. For details about how to remove and install a PCIe RAID controller card, see **8.5.15.2 Removing the PCIe RAID Controller Card** or **8.5.16.2 Installing the PCIe RAID Controller Card**.

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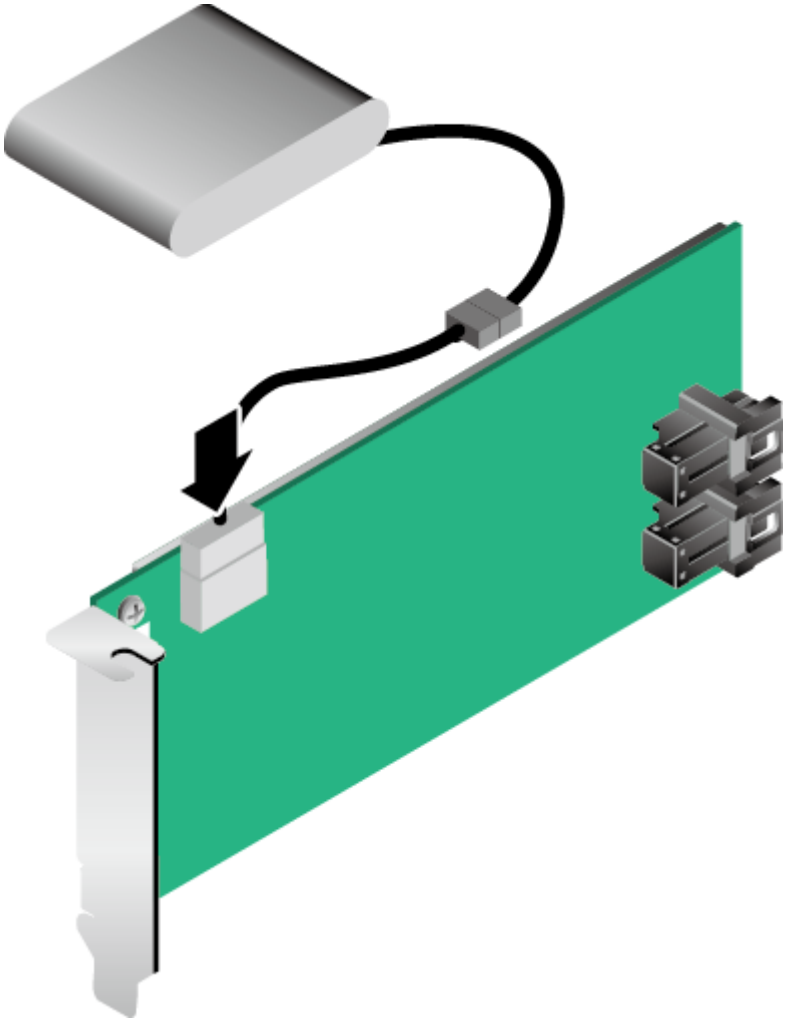
Figure 8-122 Connecting a cable to the PCIe RAID controller card with two mini-SAS ports (example)



Step 12 Check whether a full-height full-length PCIe riser module is configured.

- If yes, go to **Step 13**.
- If no, go to **Step 14**.

Step 13 Install the full-height full-length PCIe riser module.

For details, see **8.5.56 Installing a PCIe Riser Module**.

Step 14 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 15 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 16 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 17 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

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Step 18 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

----End

8.5.19 Removing the Avago SAS3004iMR PCIe RAID Controller Card

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Determine the position of the Avago SAS3004iMR RAID controller card.

Step 7 Remove the M.2 FRU from the Avago SAS3004iMR RAID controller card.

For details, see **8.5.21 Removing an M.2 FRU on the Avago SAS3004iMR PCIe RAID Controller Card**.

Step 8 Remove the PCIe riser module that holds the Avago SAS3004iMR RAID controller card.

For details, see **8.5.55 Removing a PCIe Riser Module** .

Step 9 Remove the Avago SAS3004iMR RAID controller card.

For details, see **8.5.53 Removing a PCIe Card**.

Step 10 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

----End

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8.5.20 Installing the Avago SAS3004iMR PCIe RAID Controller Card

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Take the component out of its ESD bag.

Step 7 Determine the position of the Avago SAS3004iMR RAID controller card.

Step 8 Remove the PCIe riser module that holds the Avago SAS3004iMR RAID controller card.

For details, see **8.5.55 Removing a PCIe Riser Module** .

Step 9 Install the Avago SAS3004iMR RAID controller card.

For details, see **8.5.54 Installing a PCIe Card**.

Step 10 Install the PCIe riser module that holds the Avago SAS3004iMR RAID controller card.

For details, see **8.5.56 Installing a PCIe Riser Module**.

Step 11 Install the M.2 FRU on the Avago SAS3004iMR RAID controller card.

For details, see **8.5.22 Installing an M.2 FRU on the Avago SAS3004iMR PCIe RAID Controller Card**.

Step 12 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 13 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 14 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 15 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

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Step 16 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

Step 17 Upgrade the firmware and driver to the target version.

For details, see ***FusionServer Pro Rack Server Upgrade Guide***.

----End

8.5.21 Removing an M.2 FRU on the Avago SAS3004iMR PCIe RAID Controller Card

The M.2 FRU on the Avago SAS3004iMR RAID controller card is hot swappable.

NOTE

- The M.2 FRU on the Avago SAS3004iMR RAID controller card is hot swappable:
  - If the drive to be removed has no operating system installed, you can remove it without powering off the server.
  - If the drive to be removed has the operating system installed and is in a RAID array with redundancy, and the removal does not cause a RAID array fault, you can remove it without powering off the server.
  - If the drive to be removed has the operating system installed but it is not in a RAID array or it is in a RAID array without redundancy (for example, RAID 0), power off the server before removing it.
- The M.2 FRU on the Avago SAS3004iMR RAID controller card supports RAID configuration:
  - If the drive to be removed is not in a RAID array or is in a RAID array without redundancy (for example, RAID 0), back up the data on the drive before removing it.
  - If the drive to be removed is in a RAID array with redundancy and the removal does not cause a RAID array fault, you do not need to back up data before removing it.

Procedure

Step 1 Determine the positions and slots of the M.2 FRUs on the Avago SAS3004iMR RAID controller card.

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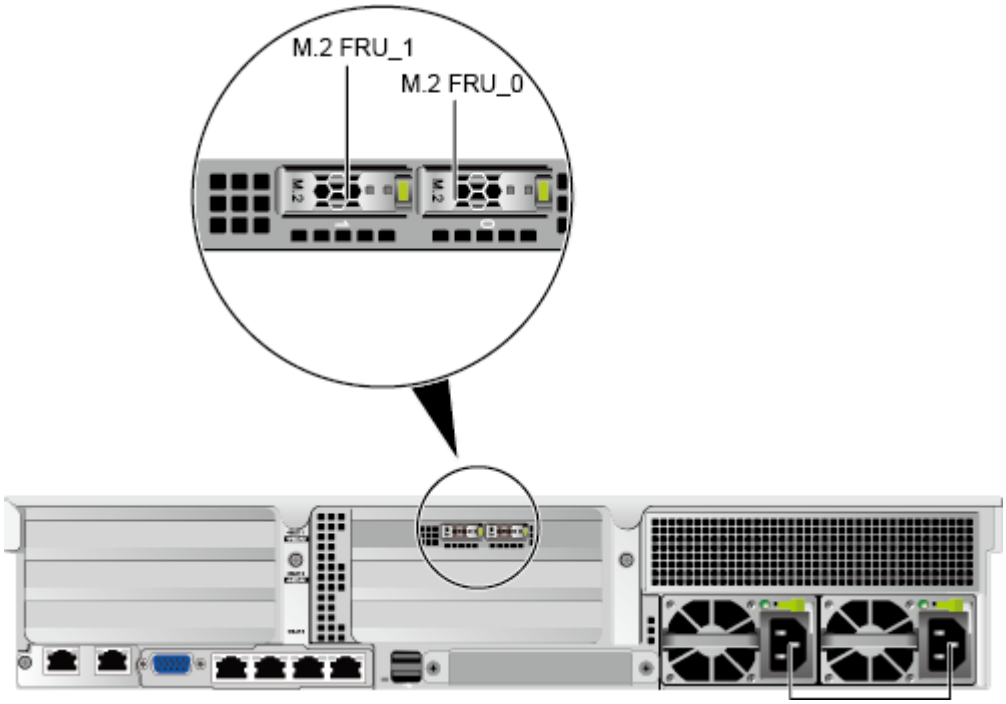
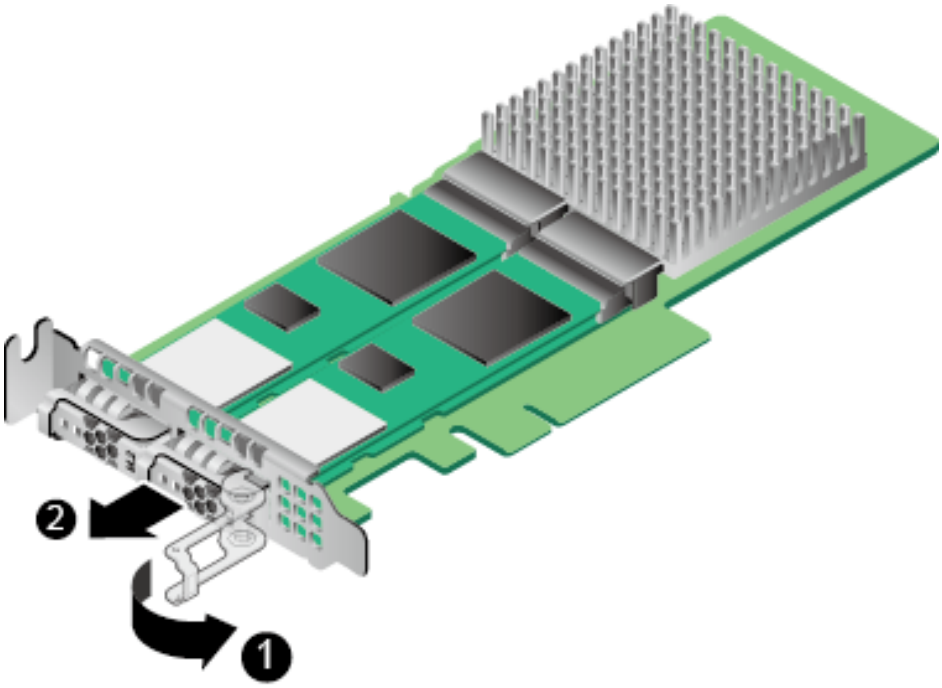
Figure 8-123 Positions and slots of the M.2 FRUs



Step 2 Remove the M.2 FRU from the Avago SAS3004iMR RAID controller card.

1. Open the handle of the M.2 FRU. See (1) in **Figure 8-124**.
2. Remove the M.2 FRU. See (2) in **Figure 8-124**.

Figure 8-124 Removing an M.2 FRU



Step 3 Place the removed component in an ESD bag.

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NOTICE

Place only one component in an ESD bag.

Step 4 Install an M.2 FRU filler module to shield the EMC.

NOTE

Perform this step only when an M.2 FRU is not installed immediately.

----End

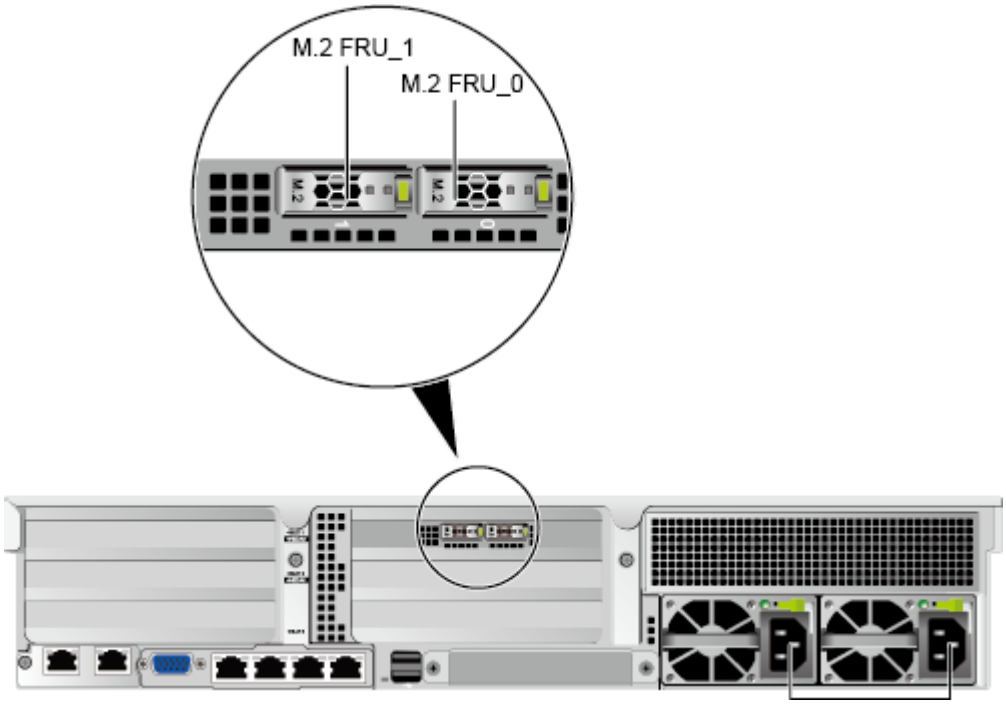
8.5.22 Installing an M.2 FRU on the Avago SAS3004iMR PCIe RAID Controller Card

The M.2 FRU on the Avago SAS3004iMR RAID controller card is hot swappable.

Procedure

Step 1 Determine the positions and slots of the M.2 FRUs on the Avago SAS3004iMR RAID controller card.

Figure 8-125 Positions and slots of the M.2 FRUs



Step 2 Remove the M.2 FRU filler module.

NOTE

Perform this step only when you configure an M.2 FRU filler module.

Step 3 Install an M.2 FRU on the Avago SAS3004iMR PCIe RAID controller card.

1. Take a spare M.2 FRU out of its ESD bag.

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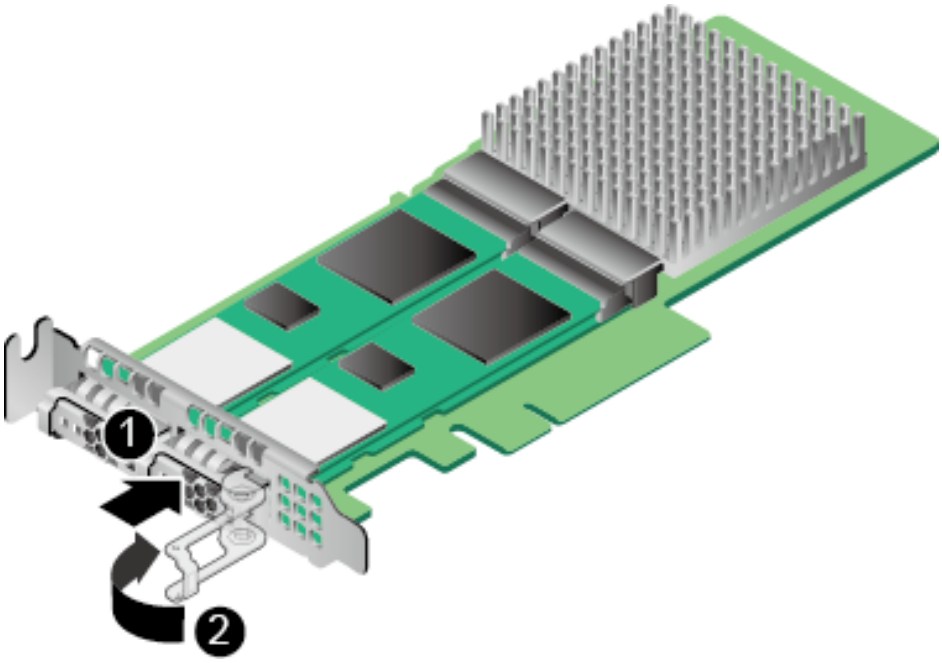
2. Open the handle of the M.2 FRU and push the M.2 FRU into the slot of the Avago SAS3004iMR RAID control card. See (1) in **Figure 8-126**.
3. Close the handle of the M.2 FRU. See (2) in **Figure 8-126**.

Figure 8-126 Installing an M.2 FRU



Step 4 Check the status of the M.2 FRU indicator on the Avago SAS3004iMR RAID controller card.

Figure 8-127 M.2 FRU indicators

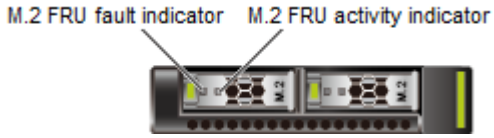


Table 8-5 Indicator status

Indicator	Description
M.2 FRU fault indicator	• Off: The M.2 FRU is running properly. • Blinking yellow: The M.2 FRU is being located, or RAID is being rebuilt. • Steady yellow: The M.2 FRU is faulty or not detected.
M.2 FRU activity indicator	• Off: The M.2 FRU is not in position or is faulty. • Blinking green: Data is being read, written, or synchronized. • Steady green: The M.2 FRU is inactive.

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Step 5 Restore the drive data.

NOTE

Perform this operation only after you replace a drive.

For details, see "Avago SAS3004iMR > Troubleshooting > Hard Drive Fault" in *Huawei V5 Server RAID Controller Card User Guide*.

----End

8.5.23 Removing a Processor

NOTICE

- Only Huawei technical support or personnel authorized by Huawei can remove the processors from Huawei servers.
- Do not wear ESD gloves during processor replacement. The gloves may catch on pins on the processor socket and damage it.

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Remove the air duct or built-in drive module.

For details, see **8.5.59 Removing the Air Duct** or **8.5.35 Removing the Built-in Drive Module**.

Step 7 Determine the position of the processor.

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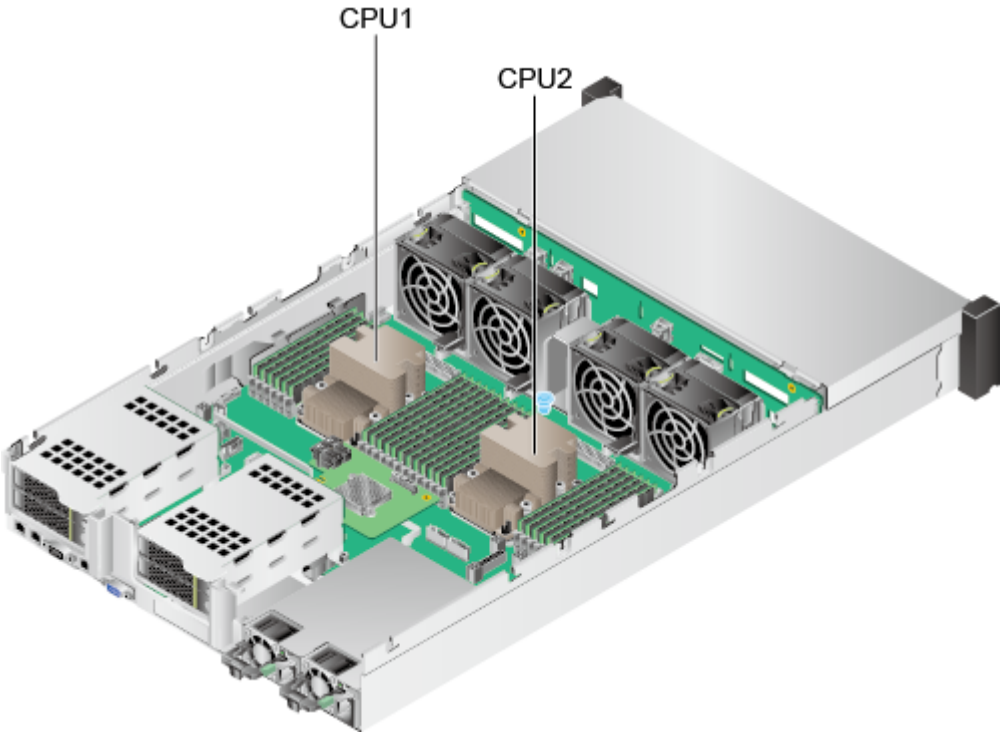
Figure 8-128 Positions of processors



Step 8 Remove the heat sink.

1. Use a Phillips screwdriver to loosen the four screws in the middle of the heat sink in a diagonal sequence.. See (1) in **Figure 8-129**.
2. Use a Phillips screwdriver to loosen the two diagonal screws on the heat sink.. See (2) in **Figure 8-129**.
3. Lift the heat sink and place it upside down on the ESD desk.

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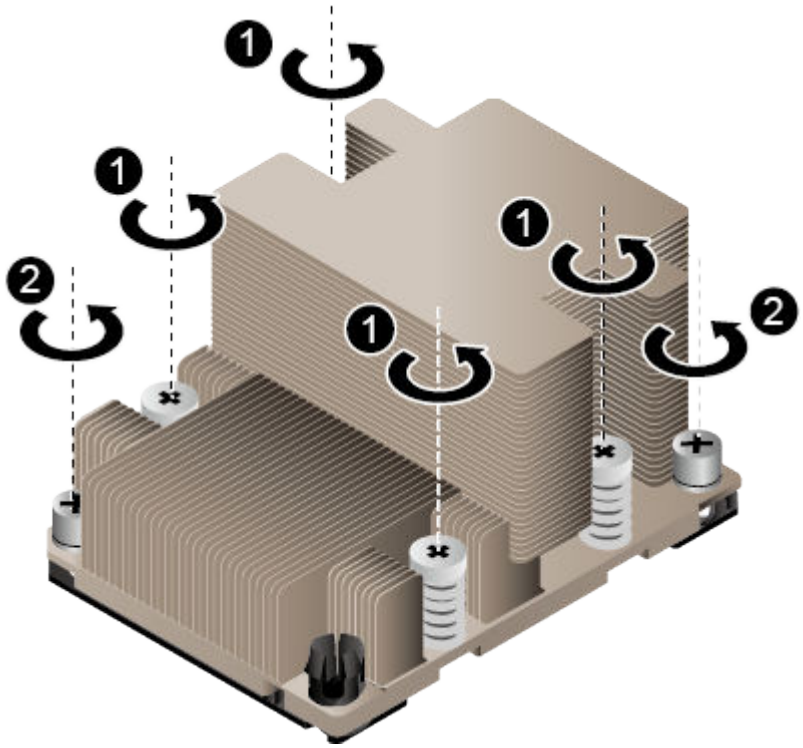
Figure 8-129 Removing the heat sink



Step 9 Remove the processor carrier and processor.

1. Insert a flat-head screwdriver into the groove of the processor carrier, and twist it to pry up one side of the carrier. See (1) in **Figure 8-130**.

   NOTE

   Insert only the tip of the flat-head screwdriver. Do not apply excessive force.

2. Holding the other end of the carrier, remove the carrier and processor in the arrow direction. See (2) and (3) in **Figure 8-130**.

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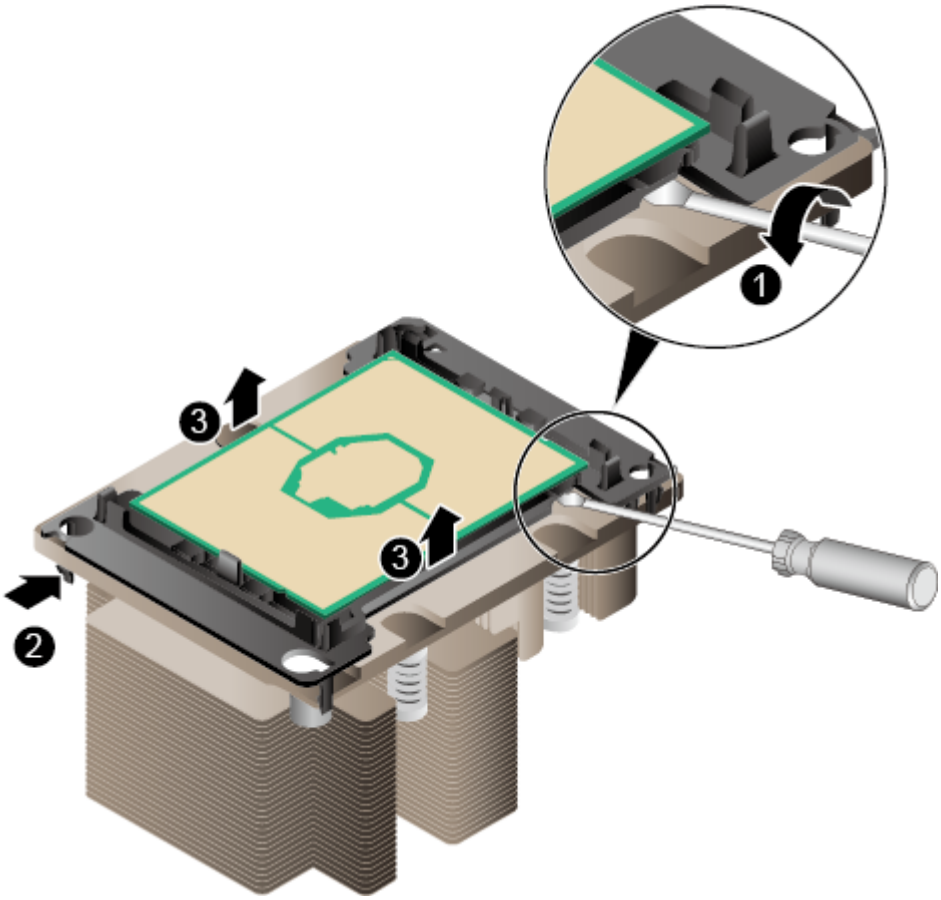
Figure 8-130 Removing the processor carrier and processor



Step 10 Remove the processor.

NOTE

- When removing a processor, hold the processor and its carrier to prevent the processor from falling off.
- To prevent damage to the pins and procesors, do not touch the pins of the processor socket or the corresponding area on the processor.
- Keep the processor away from the chassis to prevent thermal compound from falling off.

1. Bend the edge of the carrier with the triangular hole to release the processor from the carrier.

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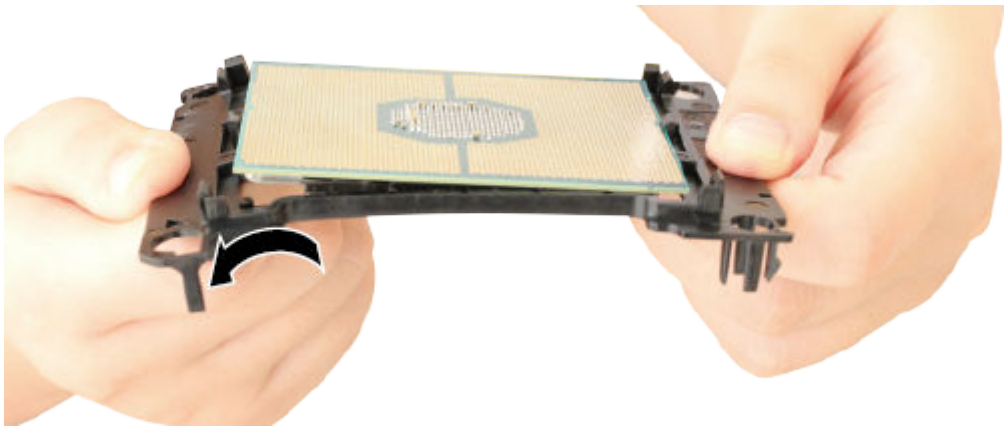
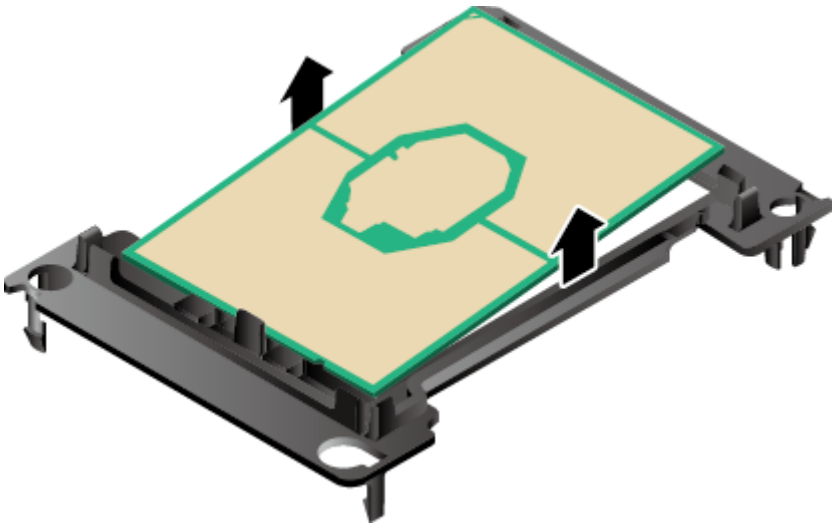
Figure 8-131 Removing a processor (1)



2. Hold the two sides of the processor and lift it.

Figure 8-132 Removing a processor (2)



Step 11 Place the removed component in an ESD bag.

NOTE

- Clean the thermal compound of the removed processor and put it into an ESD bag.
- Place only one component in an ESD bag.

Step 12 Install a processor socket cover.

NOTE

- Perform this operation only when a processor is not installed immediately.
- The processor socket cannot be exposed and must be covered by a processor or cover during transportation and storage.

1. Aligning the processor socket cover with the guide pin on the processor socket, place the cover on the processor socket. See (1) in **Figure 8-133**.
2. Press the positions shown by (2) in **Figure 8-133** until you hear a click.

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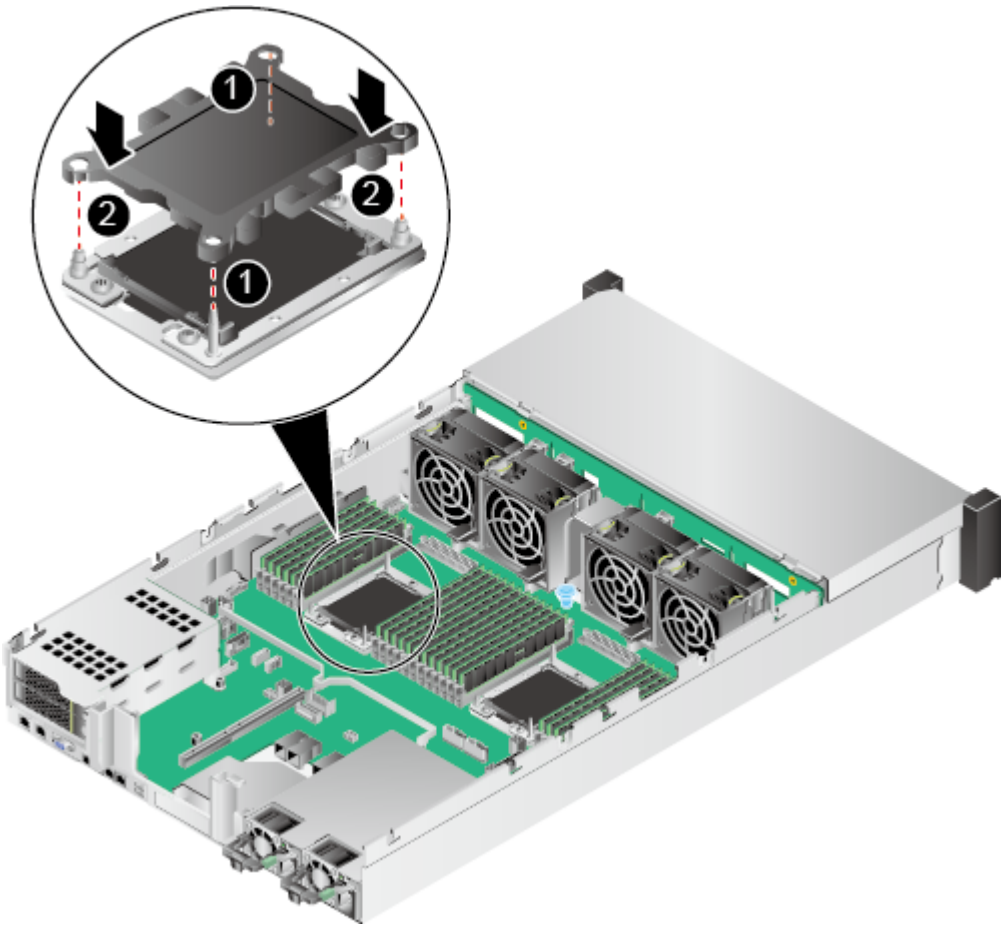
Figure 8-133 Installing a CPU socket cover



----End

8.5.24 Installing a Processor

NOTICE

- Only Huawei technical support or personnel authorized by Huawei can install the processors from Huawei servers.
- Do not wear ESD gloves during processor replacement. The gloves may catch on pins on the processor socket and damage it.
- The same model of processors must be used in a server.
- Before installing a processor, clean the surface of the processor, the heat sink, and the processor carrier. If there is residual thermal compound, clean it.

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

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For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

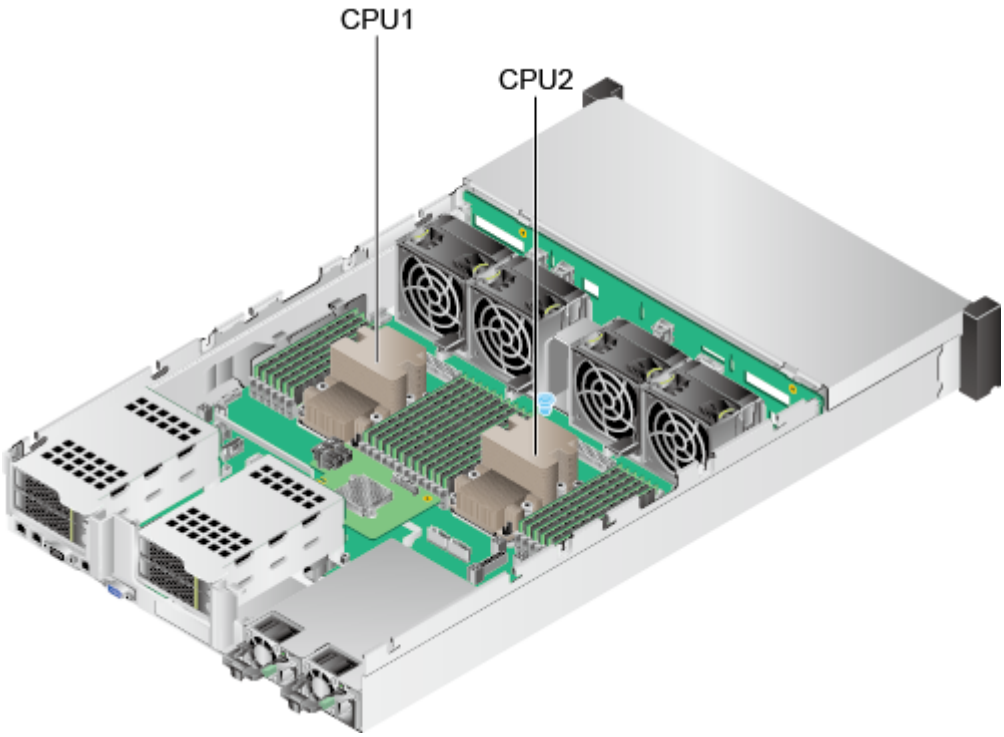
Step 6 Remove the air duct or built-in drive module.

For details, see **8.5.59 Removing the Air Duct** or **8.5.35 Removing the Built-in Drive Module**.

Step 7 Take the component out of its ESD bag.

Step 8 Determine the position of the processor.

Figure 8-134 Positions of processors



Step 9 Install the processor on the carrier.

1. Take a processor carrier out of an ESD bag.
2. Aligning the notch in one edge of the processor with the protrusion on the processor carrier, secure it.

   Ensure that the processor corner with a triangle mark is in the corner of the processor carrier with a notched triangle.

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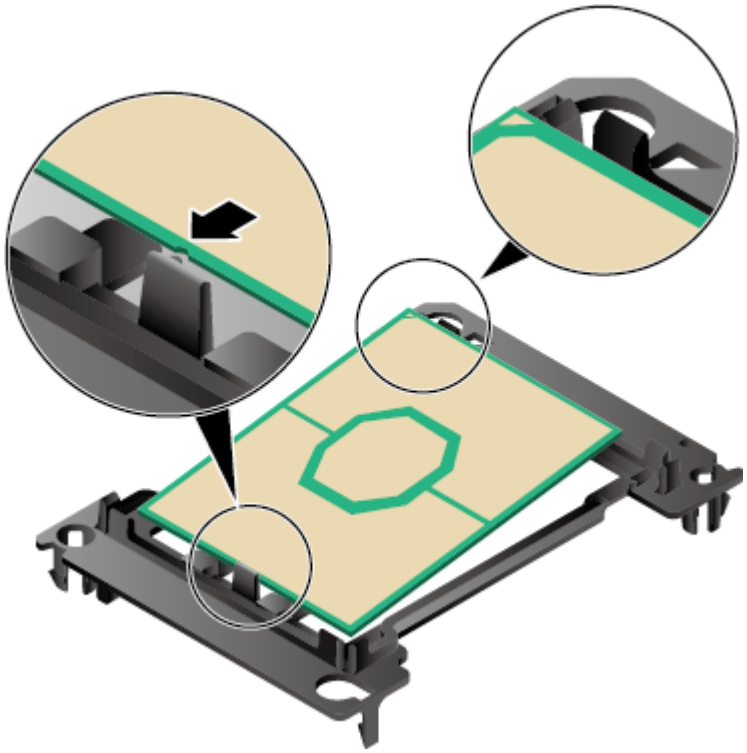
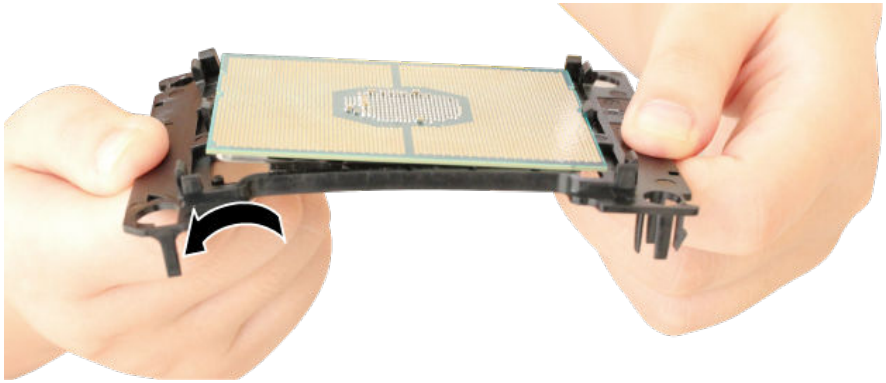
Figure 8-135 Installing one end of the processor



3. Bend the other edge of the processor carrier in the arrow direction.

Figure 8-136 Installing the other end of the processor



4. Release the processor carrier so that the other edge of the processor clips into place.
5. Check that the processor and the carrier are level and the processor is firmly secured. If the processor is tilted, gently press the tilted part to fasten it.

Step 10 Apply thermal compound.

1. Determine the area on the processor that will be in contact with the heat sink, and evenly apply 0.4 ml of thermal compound on the area.

   NOTE

   - When applying thermal compound, place the processor carrier on the desktop.
   - The thermal compound injector has volume marks.

   The two-line, five-dot, s-shape, and X-shape patterns are recommended.

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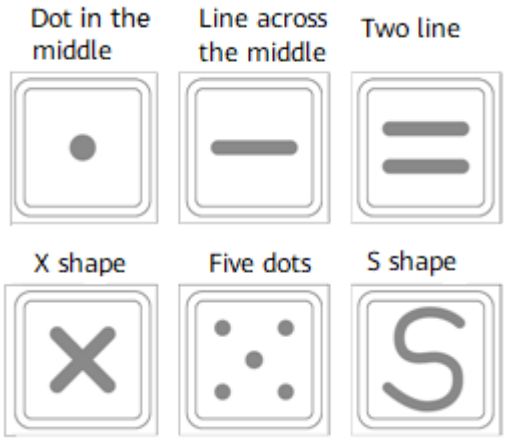
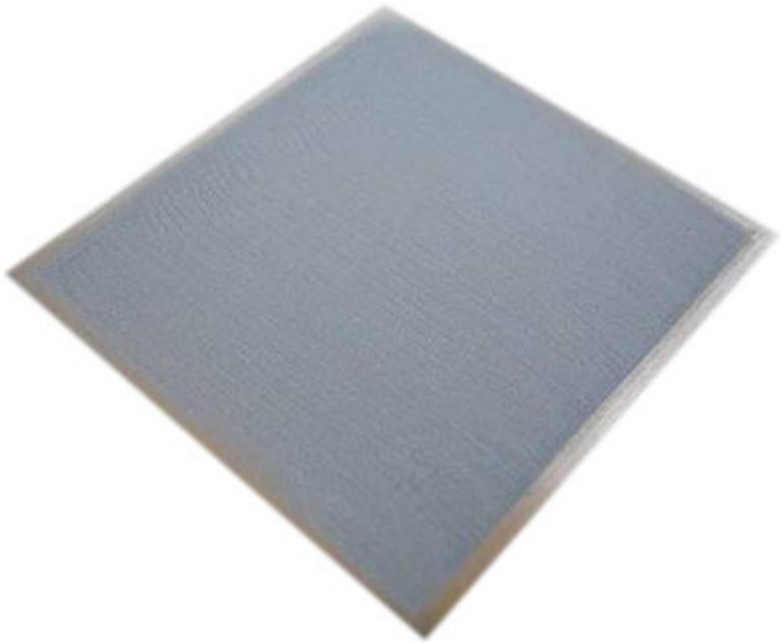
Figure 8-137 Pasting patterns



2. Use a clean card or blade to smear the thermal compound over the entire center of the CPU.

   The thickness of the thermal compound is about that of a piece of ordinary paper. Ensure that the thermal compound is evenly and fully coated.

Figure 8-138 Smeared thermal compound layer



Step 11 Install the processor carrier to the heat sink.

1. Aligning the processor corner with a triangle mark with the corner of the heat sink with a notched triangle, buckle the processor carrier on the heat sink.

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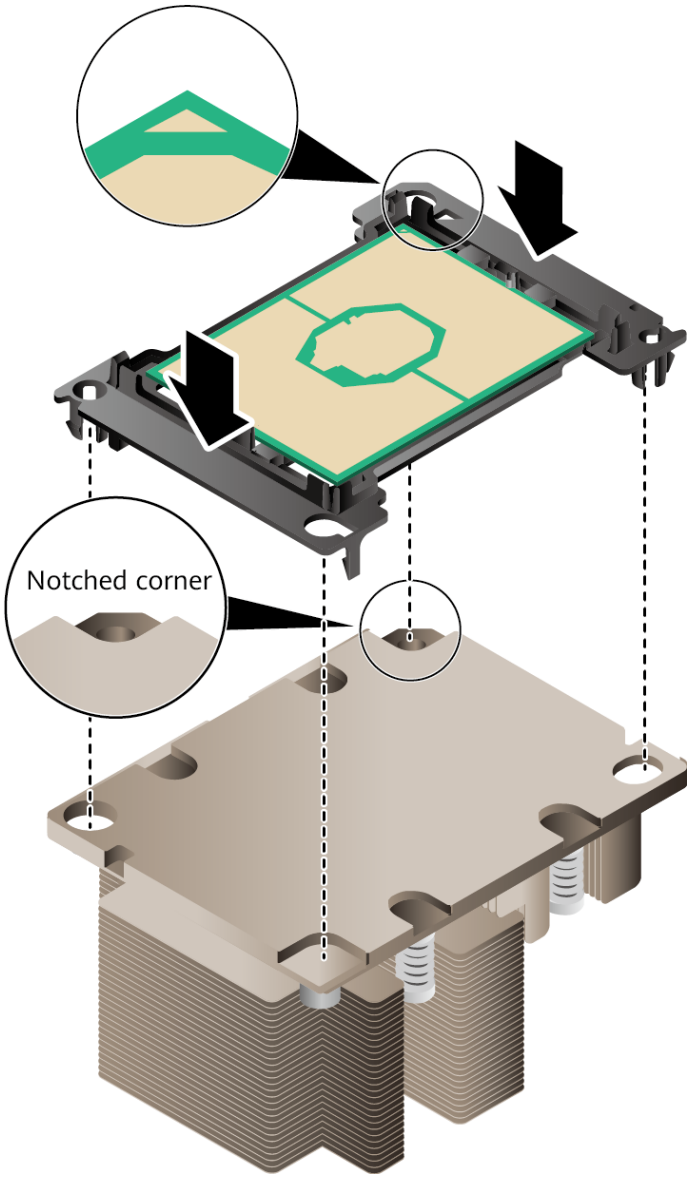
Figure 8-139 Installing the processor carrier



2. Place the assembled processor and heat sink upside down on the desk, and check that the processor carrier and the heat sink are firmly secured. If the processor carrier is not firmly buckled with the heat sink, gently press the processor carrier to secure it.

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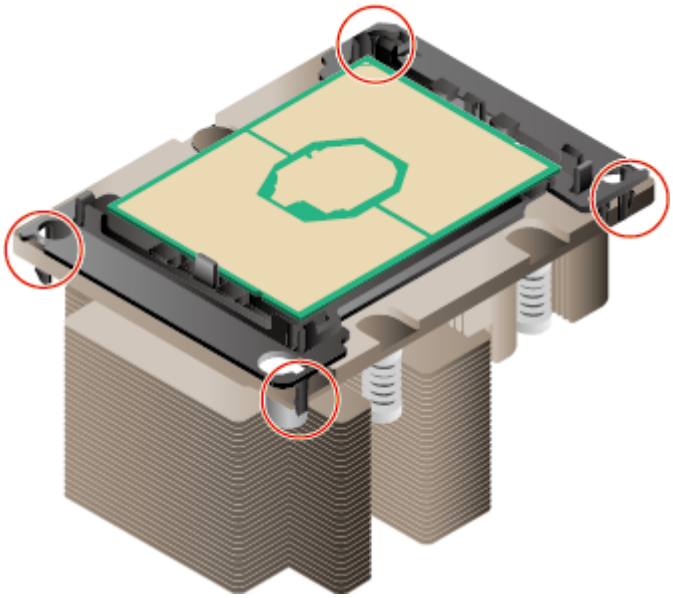
Figure 8-140 Checking the assembly



Step 12 Install the processor and heat sink.

1. Remove the processor socket cover.

NOTICE

When removing the protective cover, pull it out vertically to prevent damage to the pins on the processor socket.

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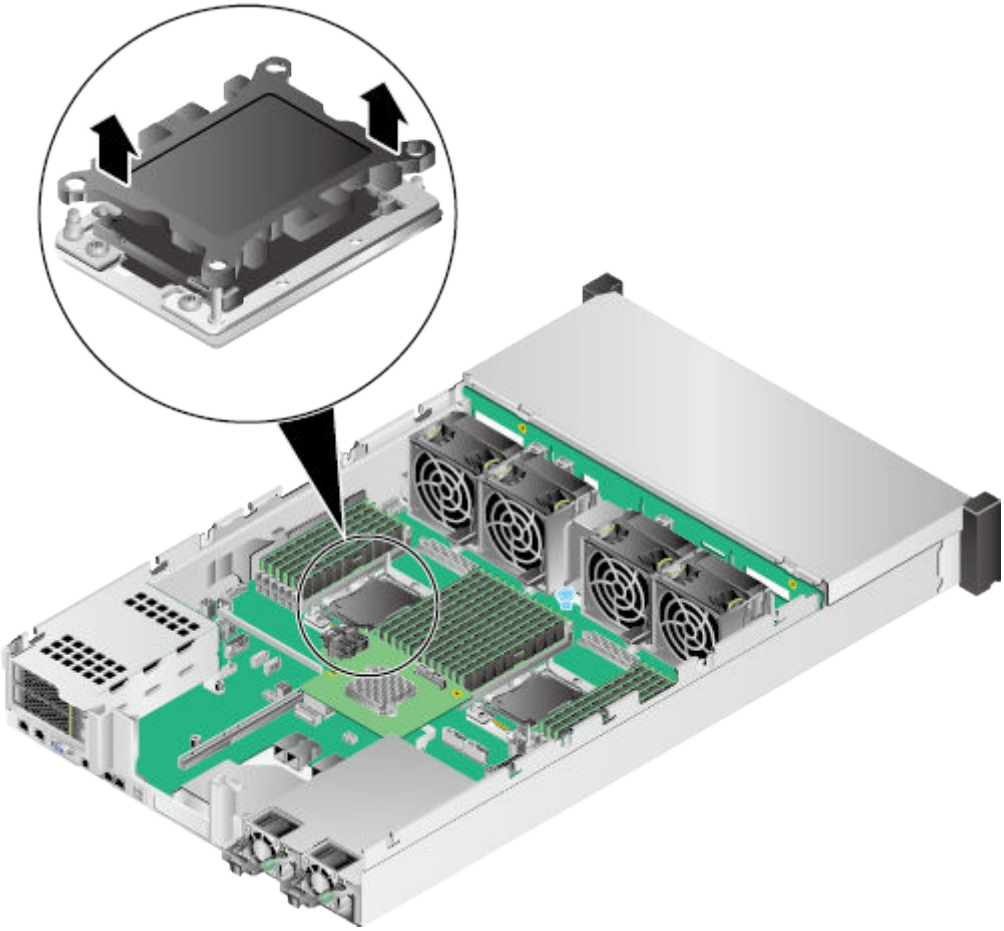
Figure 8-141 Removing the processor socket cover



2. Shine a light at various angles onto the processor socket to check for twisted pins, foreign matter, and pad damage.

NOTICE

If bent pins or foreign matters are found or the bonding pad is damaged, stop the operation and contact technical support.

3. Horizontally holding the processor and heat sink, align the notched corner on the heat sink with the notched corner on the processor socket, and place the processor and heat sink downwards on the socket along the guide sleeves.

NOTICE

Keep the processor and heat sink parallel with the mainboard to prevent damage to processor socket pins.

4. Use a Phillips screwdriver to tighten the two diagonal screws on the heat sink.. See (1) in **Figure 8-142**.
5. Use a Phillips screwdriver to tighten the four screws in the middle of the heat sink in a diagonal sequence.. See (2) in **Figure 8-142**.

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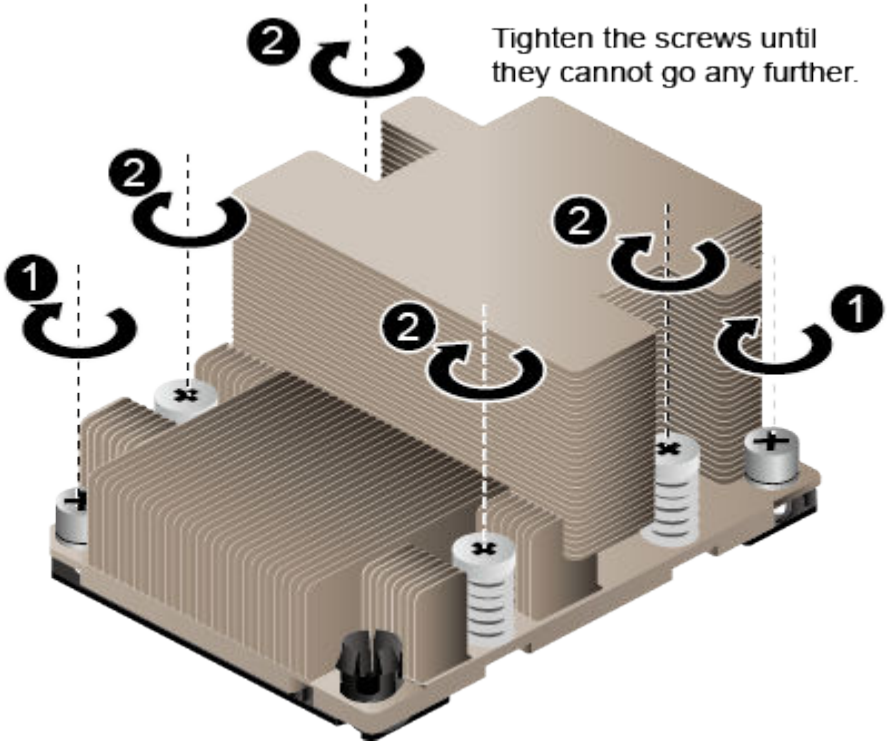
Figure 8-142 Installing the heat sink



Step 13 Install the air duct or built-in drive module.

For details, see **8.5.60 Installing the Air Duct** or **8.5.36 Installing the Built-in Drive Module**.

Step 14 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 15 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 16 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 17 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 18 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

----End

8.5.25 Removing a Memory Module

The procedures for removing the DCPMMs and DDR4 memory modules are the same. The following uses a DDR4 memory module as an example.

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Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

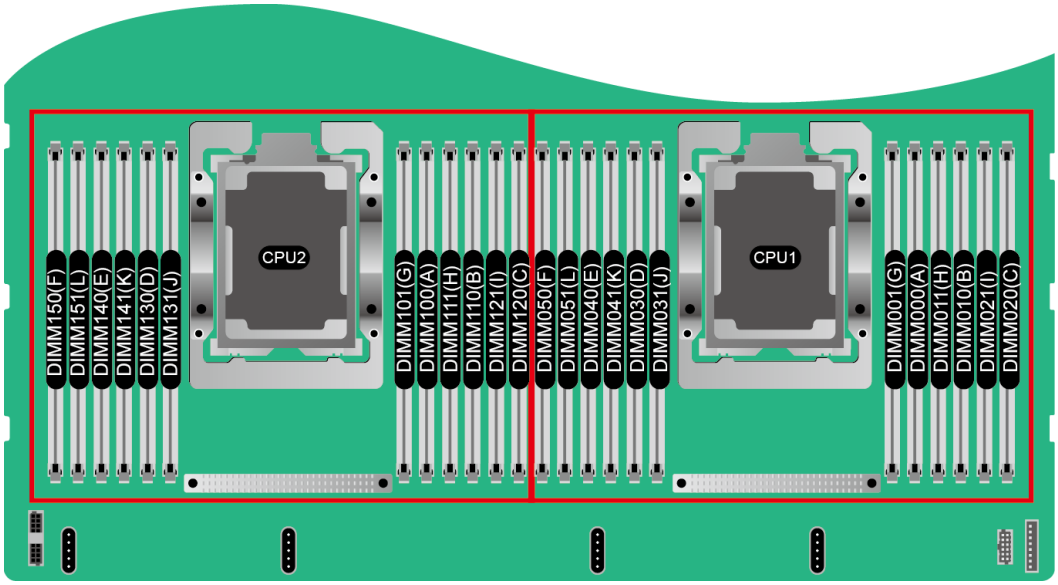
For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Remove the air duct or built-in drive module.

For details, see **8.5.59 Removing the Air Duct** or **8.5.35 Removing the Built-in Drive Module**.

Step 7 Determine the position of the memory module.

Figure 8-143 Memory slots



Step 8 Remove the memory module.

1. Open the memory module ejectors on the memory slot. See (1) in **Figure 8-144**.
2. Remove the memory module from the slot. See (2) in **Figure 8-144**.

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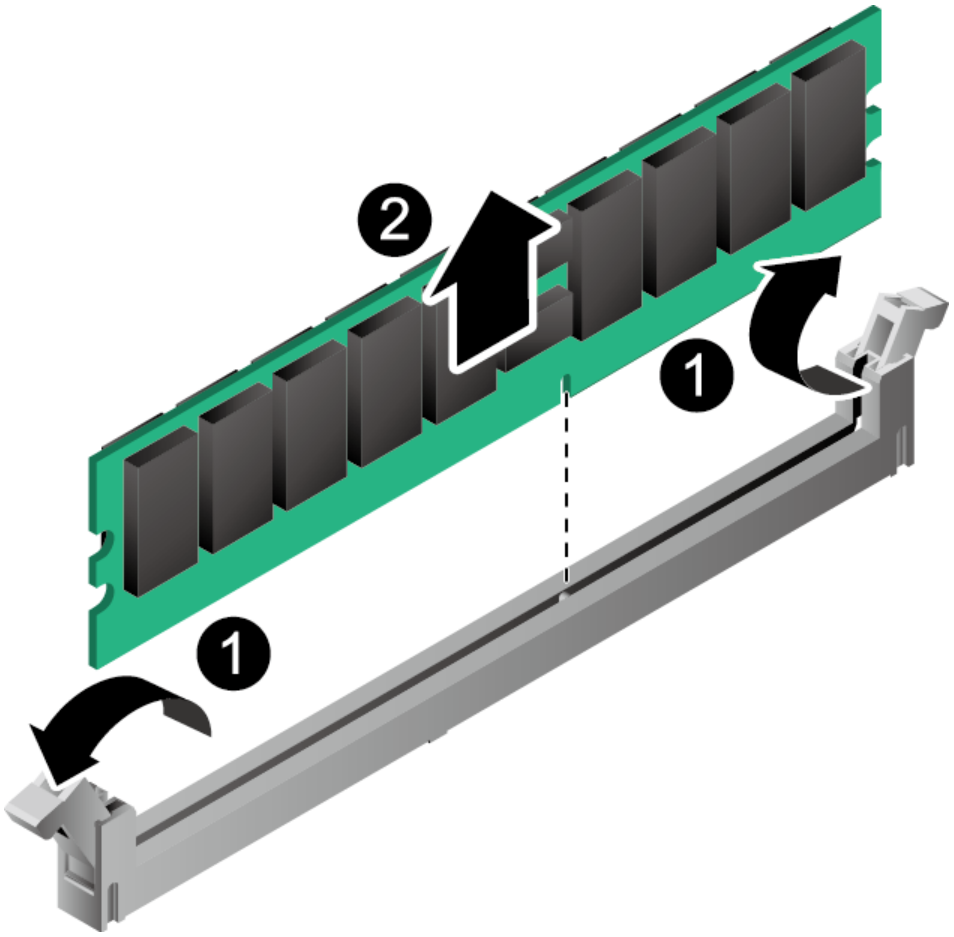
Figure 8-144 Removing a memory module



Step 9 Place the removed memory module in a memory box.

Step 10 Install memory modules.

NOTE

Perform this operation only when a memory module is not installed immediately.

----End

8.5.26 Installing a Memory Module

The procedures for installing the DCPMMs and DDR4 memory modules are the same. The following uses a DDR4 memory module as an example.

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

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For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Remove the air duct or built-in drive module.

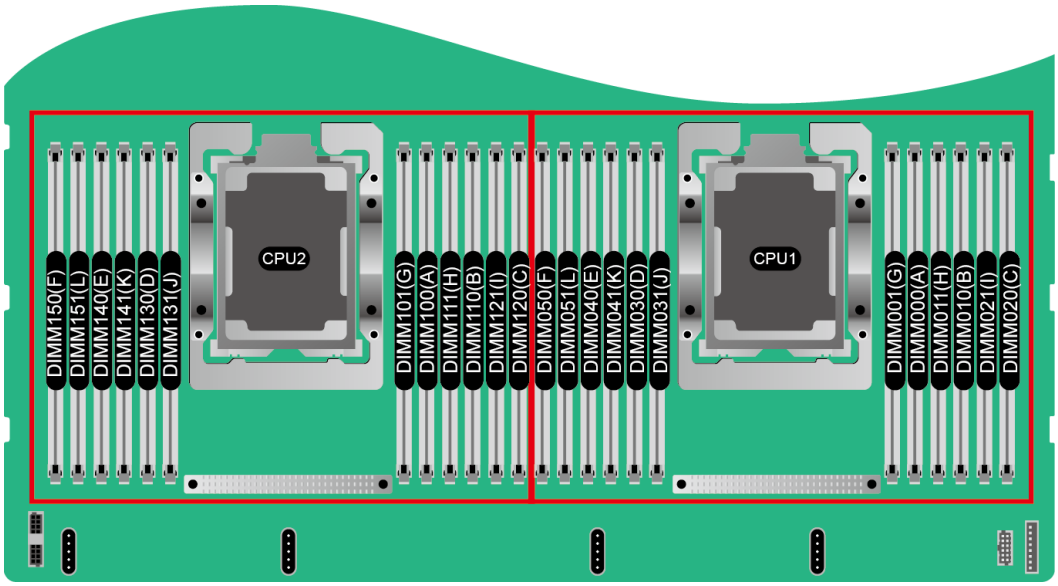
For details, see **8.5.59 Removing the Air Duct** or **8.5.35 Removing the Built-in Drive Module**.

Step 7 Take a spare memory module.

Step 8 Check the positions and installation guidelines of the memory modules.

For details, see **2.4.1.5 Memory Installation Positions**.

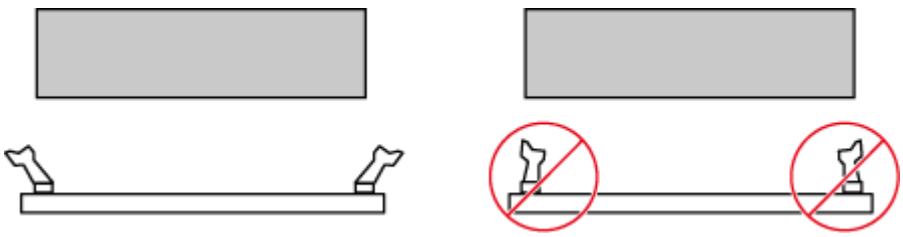
Figure 8-145 Memory slots



Step 9 Install the memory module.

1. Open the two memory module ejectors on the memory slot.

Figure 8-146 Opening the memory module ejectors



2. Align the edge connector of the memory module with the alignment key of the memory slot, and insert the memory module in the slot.

   The two memory ejectors are closed automatically after the memory module is firmly seated.

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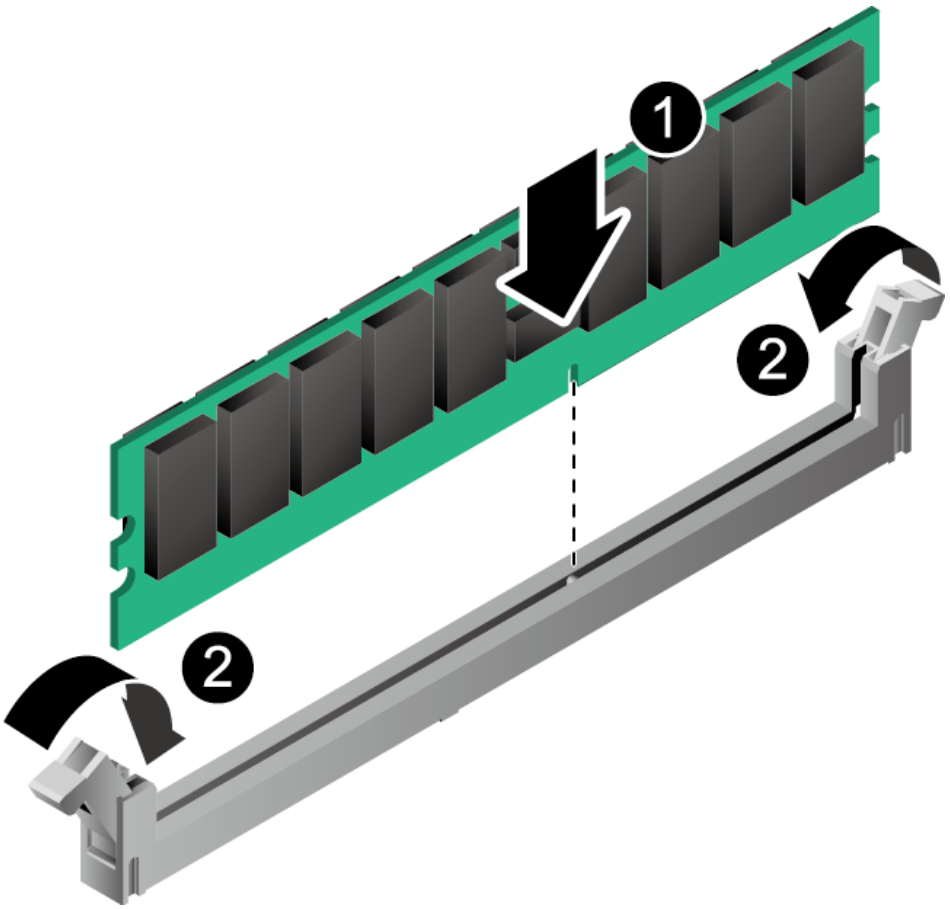
NOTE

Do not touch the edge connector on a memory module with bare hands. Before installing a memory module, ensure that the edge connector is not contaminated.

Figure 8-147 Installing a memory module



Step 10 Install the air duct or built-in drive module.

For details, see **8.5.60 Installing the Air Duct** or **8.5.36 Installing the Built-in Drive Module**.

Step 11 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 12 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 13 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 14 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 15 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

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NOTE

- If information about the new memory module is displayed, the replacement is successful.
- If information about the original memory module is displayed, access the BIOS and check memory information.

  For details, see ***Huawei Server Purley Platform BIOS Parameter Reference***.

----End

8.5.27 Removing the TPM/TCM

NOTICE

- If the private key of the TPM/TCM is used to encrypt data, back up the data before removing the TPM/TCM.

  If the data is not backed up, the encrypted data cannot be decrypted after the TPM/TCM is replaced.

  After data is backed up, you need to clear the TPM/TCM key. For details, see "Security" in ***Huawei Server Purley Platform BIOS Parameter Reference***.

  You need to back up and clear data only when the removed TPM/TCM is no longer used. If the removed TPM/TCM needs to be reinstalled in the original environment, you do not need to back up and clear data.
- If the TPM/TCM function has been set on the BIOS, record the settings before removing the TPM/TCM. After replacing the TPM/TCM, configure the related settings on the BIOS again.

  For details, see ***Huawei Server Purley Platform BIOS Parameter Reference***.
- If a broken or disfigured screw is found on a TPM/TCM, take appropriate measures to protect data.

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Check whether a built-in drive module is configured.

- If yes, go to **Step 7**.

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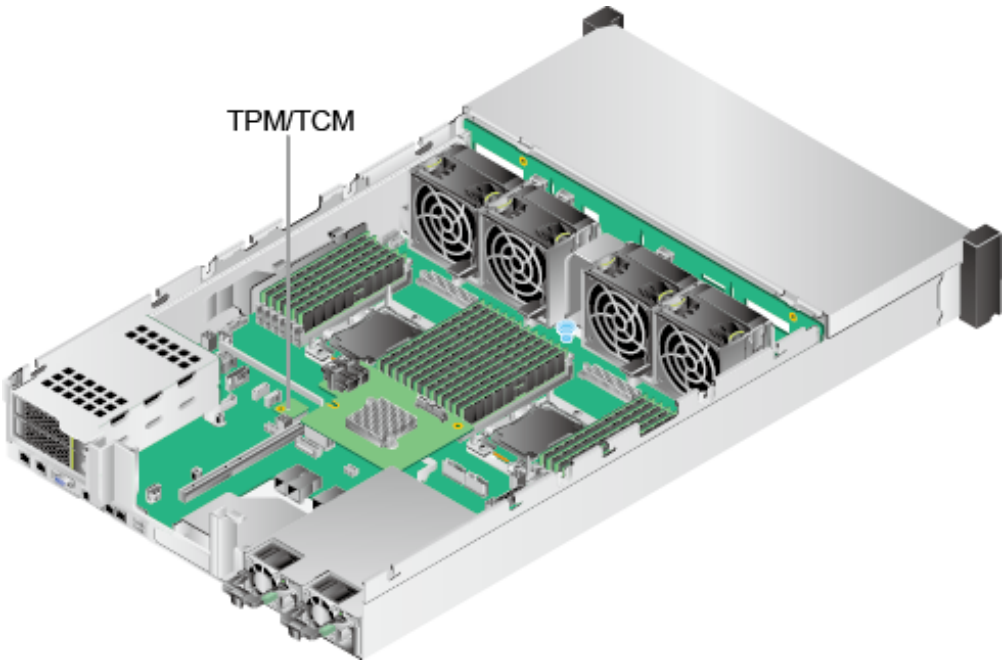
- If no, go to **Step 8**.

Step 7 Remove the built-in drive module.

For details, see **8.5.35 Removing the Built-in Drive Module**.

Step 8 Determine the position of the TPM/TCM.

Figure 8-148 Position of the TPM/TCM



Step 9 Remove the TPM/TCM.

1. Loosen the screw on the TPM/TCM. See (1) in **Figure 8-149**.
2. Remove the TPM/TCM from the mainboard. See (2) in **Figure 8-149**.

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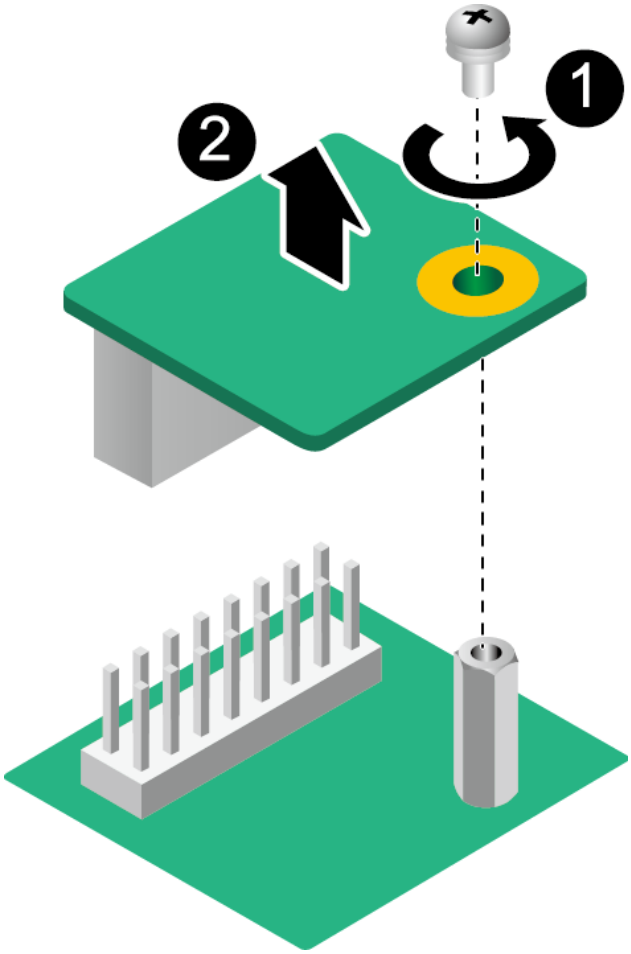
Figure 8-149 Removing the TPM/TCM



Step 10 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

----End

8.5.28 Installing the TPM/TCM

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

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Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Check whether a built-in drive module is configured.

- If yes, go to **Step 7**.
- If no, go to **Step 8**.

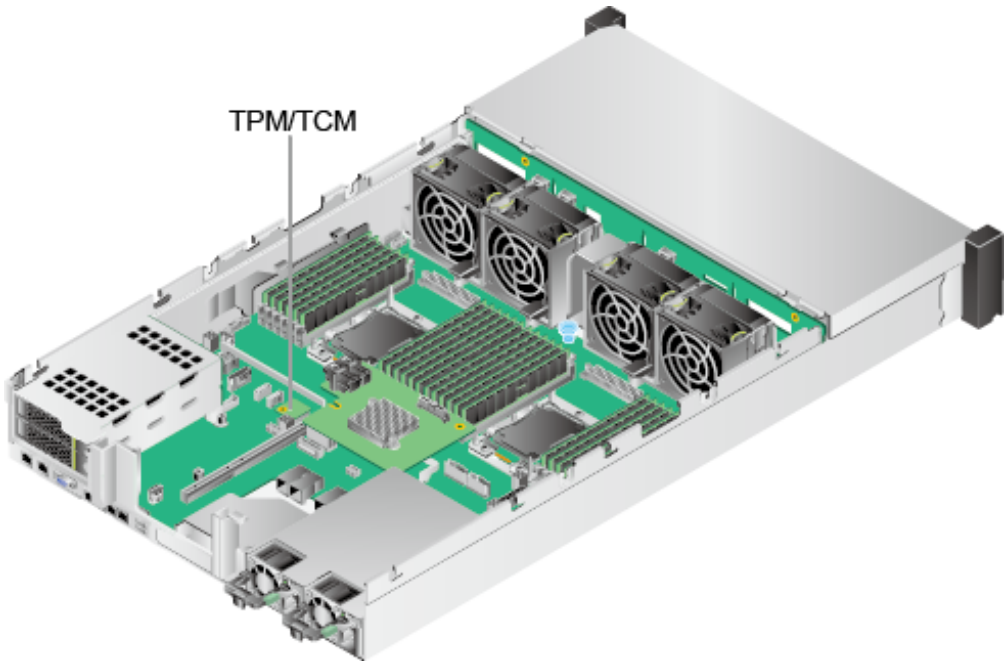
Step 7 Remove the built-in drive module.

For details, see **8.5.35 Removing the Built-in Drive Module**.

Step 8 Take the component out of its ESD bag.

Step 9 Determine the position of the TPM/TCM.

Figure 8-150 Position of the TPM/TCM



Step 10 Install the TPM/TCM.

1. Insert the TPM/TCM vertically into the connector on the mainboard. See (1) in **Figure 8-151**.
2. Tighten the screw to secure the TPM/TCM. See (2) in **Figure 8-151**.

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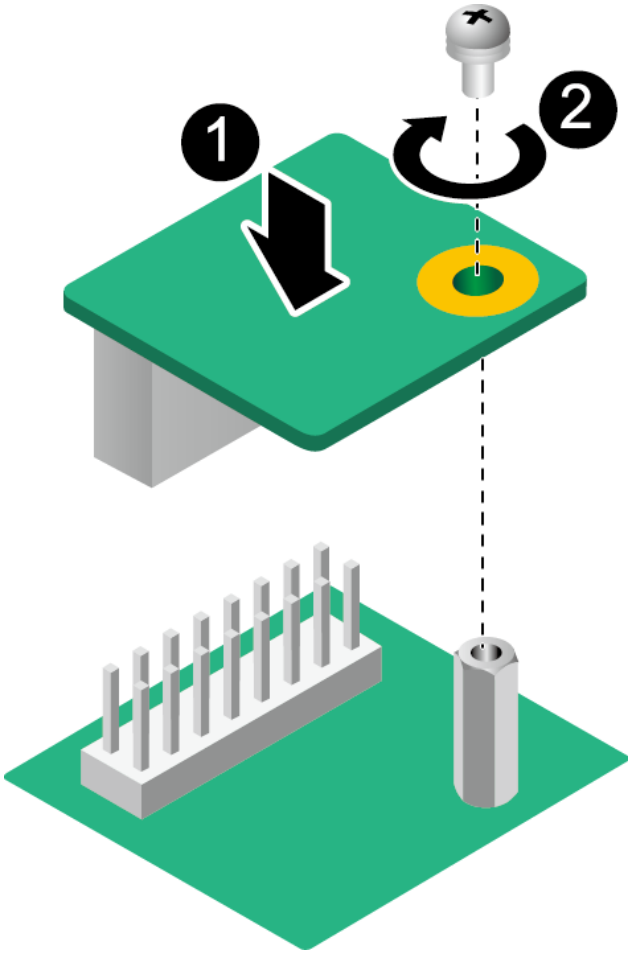
Figure 8-151 Installing the TPM/TCM



Step 11 Check whether a built-in drive module is configured.

- If yes, go to **Step 12**.
- If no, go to **Step 13**.

Step 12 Install the built-in drive module.

For details, see **8.5.36 Installing the Built-in Drive Module**.

Step 13 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 14 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 15 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 16 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 17 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

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Step 18 Configure the TPM/TCM.

NOTE

If the TPM 2.0 is installed and the TXT function is enabled, but the TPM 2.0 status on the BIOS is **unknown**, contact technical support.

- If a spare TPM/TCM is installed, perform the following operations:
  a. Set the TPM/TCM configuration items on the BIOS to ensure that the TPM/TCM settings are the same as the recorded TPM/TCM settings. For details, see ***Huawei Server Purley Platform BIOS Parameter Reference***.
  b. Restore the backup data on the spare TPM/TCM to overwrite its factory settings.
- If a removed TPM/TCM is reinstalled, perform the following operations:
  a. Check whether the BIOS version of the mainboard where the TPM/TCM is located is earlier than that before the removal.
     - If yes, upgrade the BIOS version to ensure that the BIOS version of the mainboard where the TPM/TCM is located is not earlier than that before the removal. For details, see ***FusionServer Pro Rack Server Upgrade Guide***.
     - If no, go to **Step 18.b**.
  b. Set the TPM/TCM configuration items on the BIOS to ensure that the TPM/TCM settings are the same as the recorded TPM/TCM settings. For details, see ***Huawei Server Purley Platform BIOS Parameter Reference***.

----End

8.5.29 Removing a FlexIO Card

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the network cable from the FlexIO card.

NOTE

Before removing the network cable from the FlexIO card, record the network cable and network port information of the FlexIO card.

Step 4 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 5 Place the server on the ESD workstation.

Step 6 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

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Step 7 Remove the drive module or PCIe riser module above the FlexIO card.

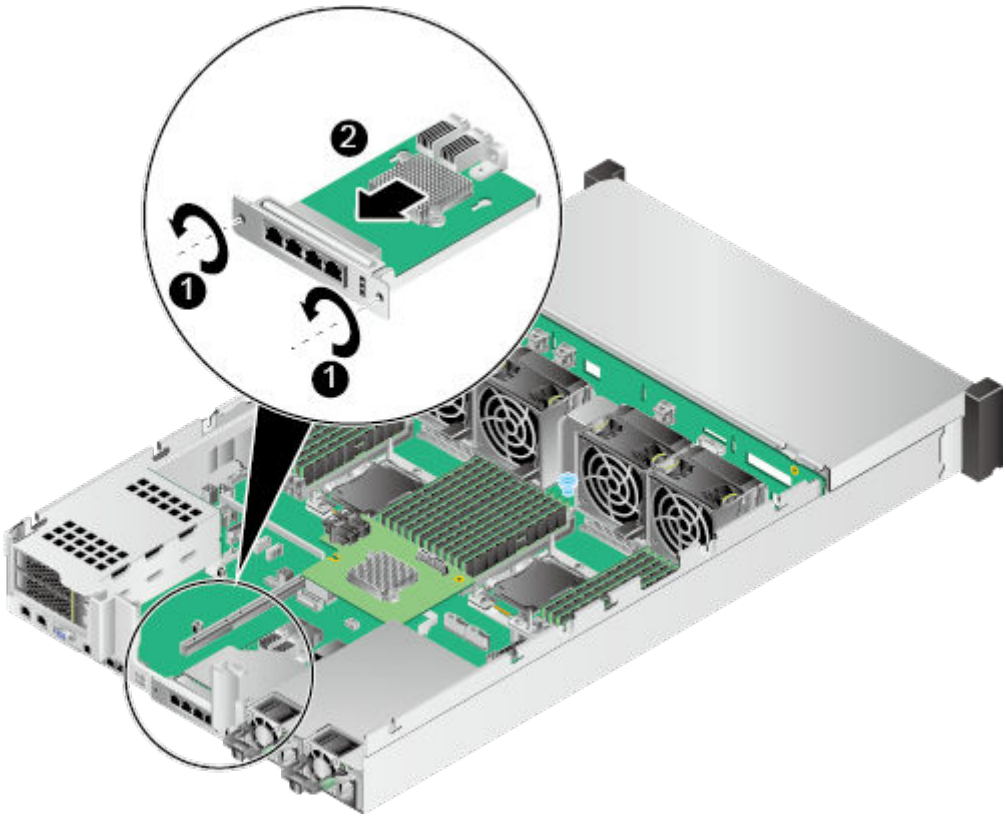
For details, see **8.5.37 Removing the Rear Drive Module** or **8.5.55 Removing a PCIe Riser Module** .

Step 8 Determine the position of the FlexIO card.

Step 9 Remove the FlexIO card.

1. Loosen the screws that secure the FlexIO card. See (1) in **Figure 8-152**.
2. Slowly pull out the FlexIO card. After the FlexIO card is disconnected from the connector on the mainboard, remove the FlexIO card. See (2) in **Figure 8-152**.

Figure 8-152 Removing a FlexIO card



Step 10 Remove the baffle plate from the FlexIO card.

NOTE

If no baffle plate is delivered with the spare FlexIO card, remove the baffle plate from the FlexIO card for future use.

NOTICE

When removing the baffle plate from the FlexIO card, do not pull out the FlexIO card horizontally. Otherwise, the pins of the network ports may be damaged.

1. Use a Phillips screwdriver to loosen the screws that secure the baffle plate with the FlexIO card. See (1) in **Figure 8-153**. The positions of the screws vary depending on the FlexIO card model.

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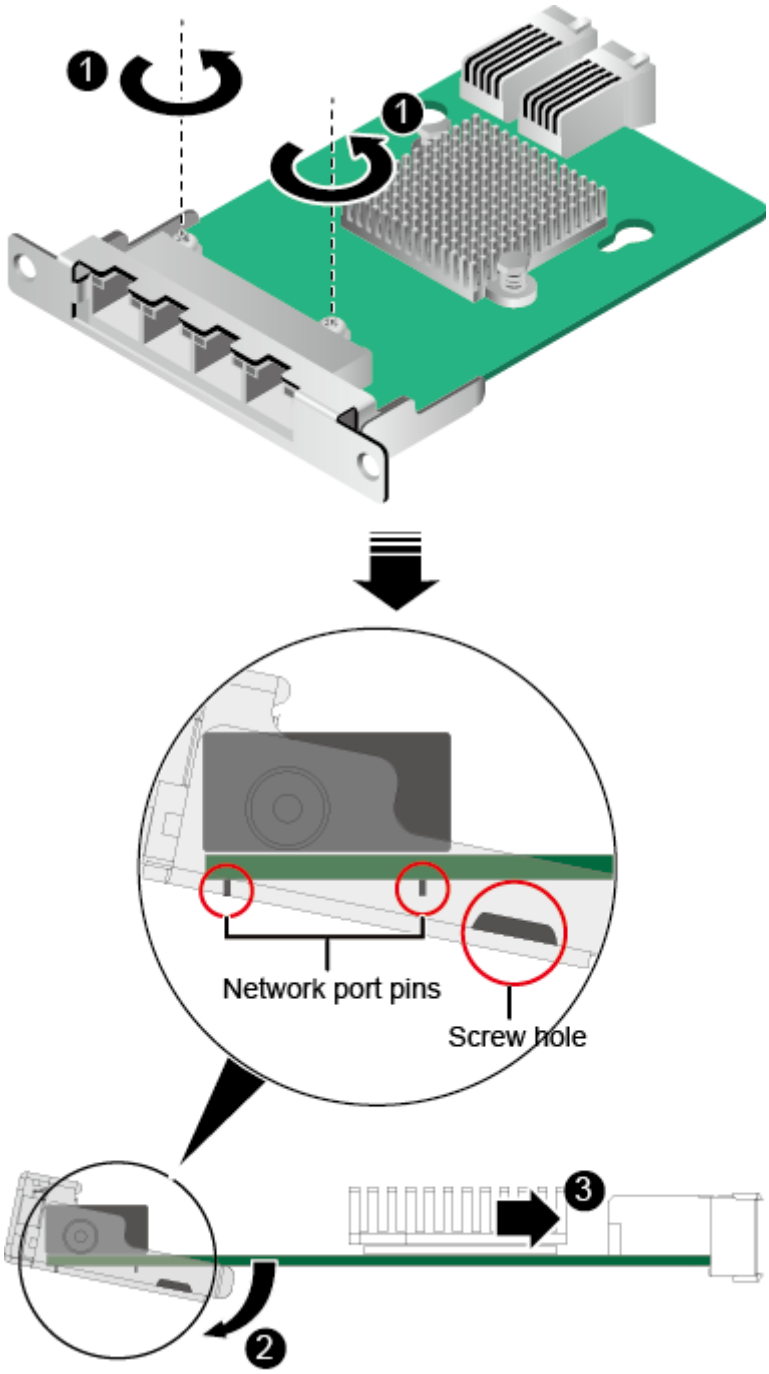
2. Keeping the FlexIO card horizontally level, hold the baffle plate with one hand and the two sides of the FlexIO card with the other hand. Pull apart the baffle plate in the direction shown by (2) in **Figure 8-153**. Check whether the screw holes on the other side of the plate are completely separated from the network port pins.
3. Ensure that the screw holes and the network port pins do not contact, and remove the FlexIO card horizontally. See (3) in **Figure 8-153**.

Figure 8-153 Removing the baffle plate from the FlexIO card



Step 11 Place the removed component in an ESD bag.

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NOTICE

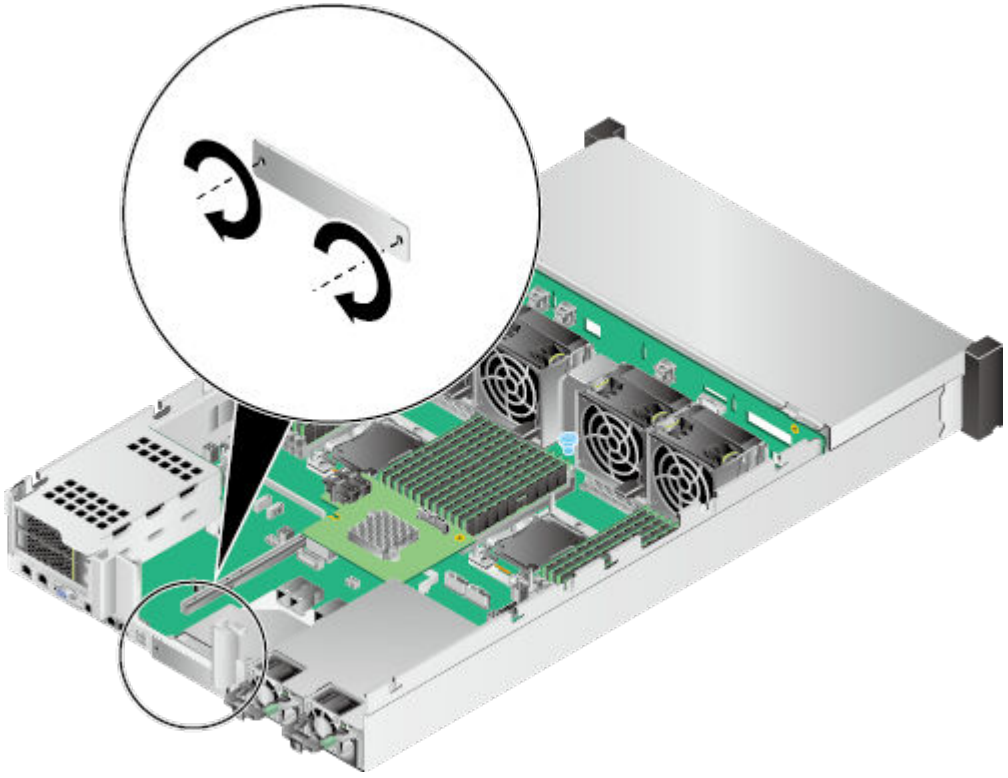
Place only one component in an ESD bag.

Step 12 Install a filler panel.

NOTE

Perform this operation only when a FlexIO card is not installed immediately.

Figure 8-154 Installing a filler panel



----End

8.5.30 Installing a FlexIO Card

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

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Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Remove the drive module or PCIe riser module above the FlexIO card.

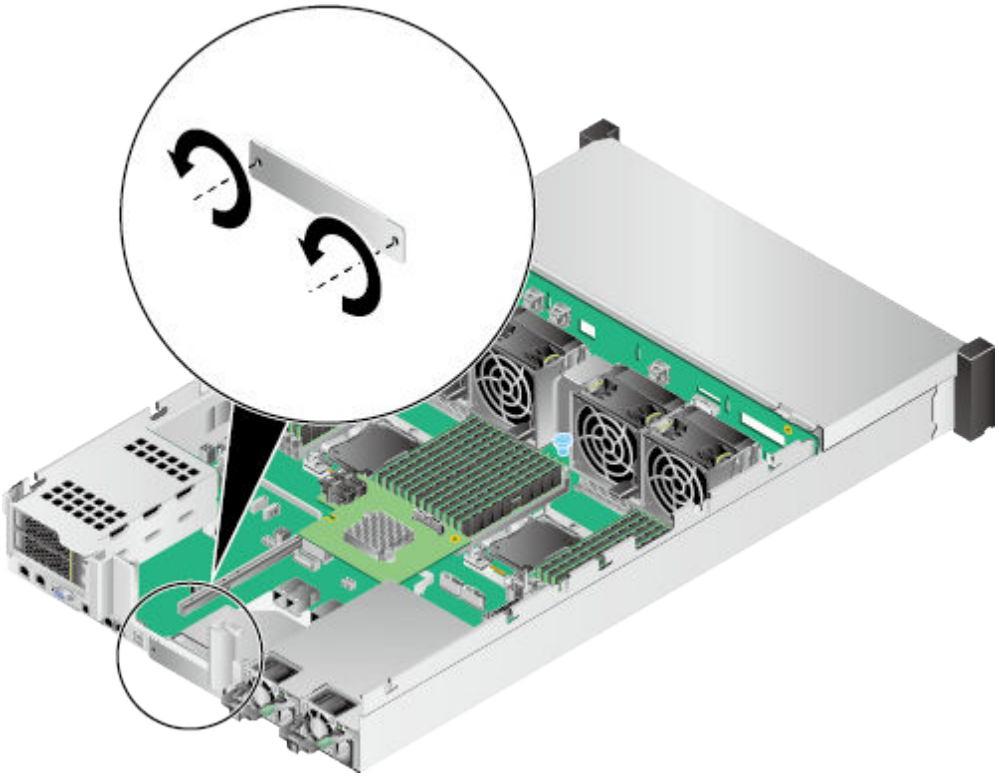
For details, see **8.5.37 Removing the Rear Drive Module** or **8.5.55 Removing a PCIe Riser Module** .

Step 7 Remove the filler panel.

NOTE

Perform this operation only when a filler panel is installed.

Figure 8-155 Removing a filler panel



Step 8 Take the component out of its ESD bag.

Step 9 Determine the position of the FlexIO card.

Step 10 Install the baffle plate of the FlexIO card.

NOTE

If no baffle plate is delivered with the spare FlexIO card, use the baffle plate removed from the original FlexIO card.

NOTICE

Do not insert the baffle plate onto the FlexIO card horizontally. Otherwise, the pins of the network ports may be damaged.

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1. Hold the baffle plate with one hand and the two sides of the FlexIO card with the other hand. Tilting the FlexIO card a little bit to prevent collision of the screw holes of the baffle plate and the network port pins, insert the FlexIO card into the baffle plate in the direction shown by (1) in **Figure 8-156**. Ensure that the pins at the rear of the FlexIO card are beyond the screw holes.
2. Close the baffle plate in the direction shown by (2) in **Figure 8-156**, and push the FlexIO card horizontally into the baffle plate as far as it will go.
3. Use a Phillips screwdriver to tighten the screws to secure the baffle plate with the FlexIO card. See (3) in **Figure 8-156**. The positions of the screws vary depending on the FlexIO card model.

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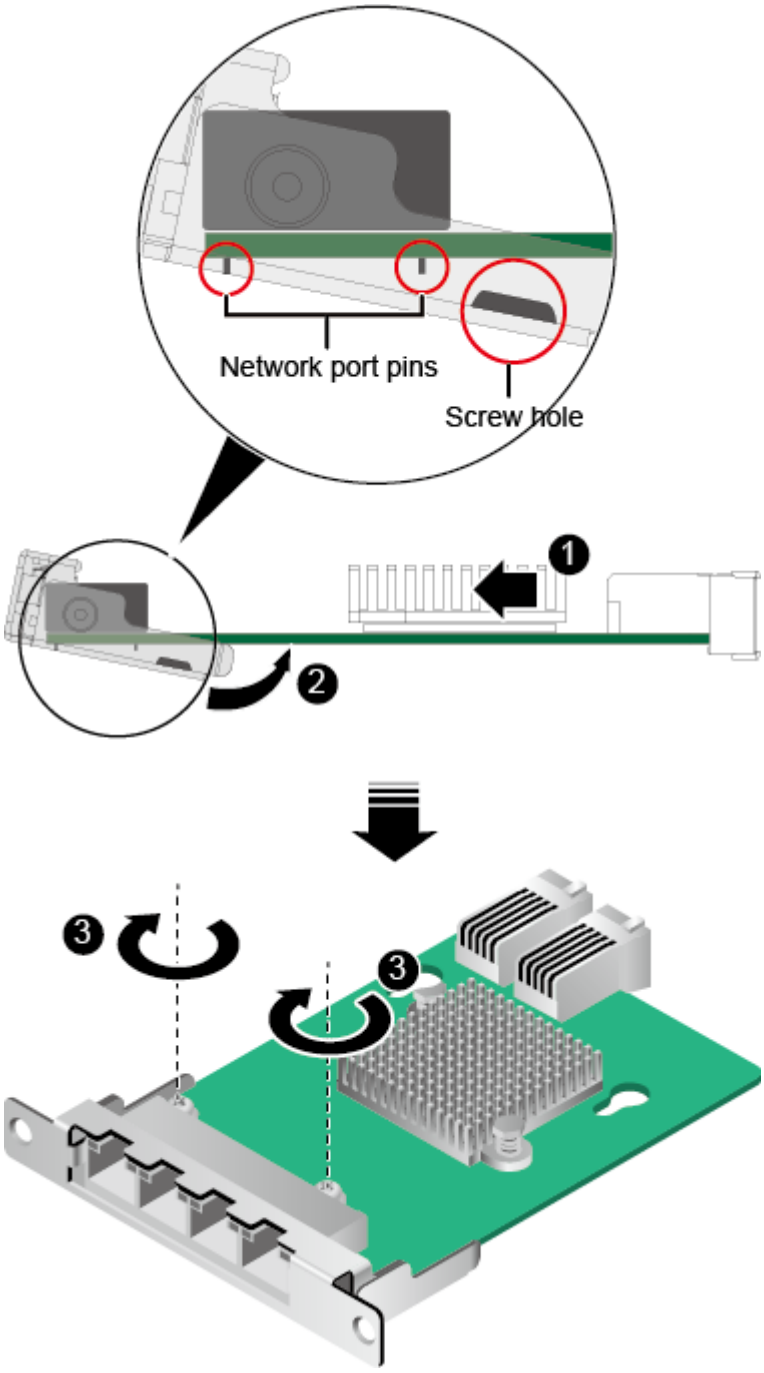
Figure 8-156 Installing the baffle plate of the FlexIO card



Step 11 Install the FlexIO card.

1. Aligning the FlexIO card with the guide pin on the mainboard, push the FlexIO card into the chassis until it is firmly seated with the connector on the mainboard. See (1) in **Figure 8-157**.
2. Tighten the screws to secure the FlexIO card. See (2) in **Figure 8-157**.

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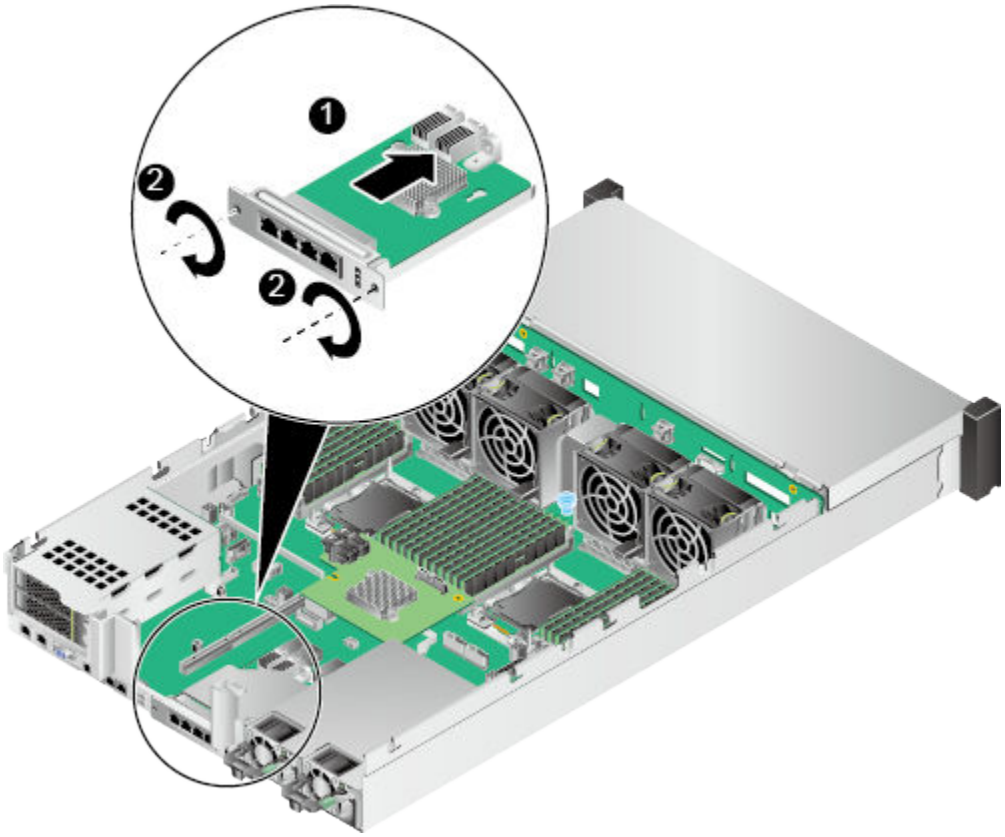
Figure 8-157 Installing a FlexIO card



Step 12 Install the drive module or PCIe riser module above the FlexIO card.

For details, see **8.5.38 Installing the Rear Drive Module** or **8.5.56 Installing a PCIe Riser Module**.

Step 13 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 14 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 15 Connect the network cable to the FlexIO card.

Step 16 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 17 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 18 After the FlexIO card is replaced, the MAC address of the original FlexIO card changes. If the FlexIO card is required on the service side, reconfigure the FlexIO card.

Step 19 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

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Step 20 Upgrade the firmware and driver to the target version.

For details, see ***FusionServer Pro Rack Server Upgrade Guide***.

----End

8.5.31 Removing the Front-Drive Backplane

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove front drives.

For details, see **8.5.3 Removing a SAS/SATA Drive** or **8.5.5 Removing an NVMe Drive**.

Step 6 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 7 Remove the air duct or built-in drive module.

For details, see **8.5.59 Removing the Air Duct** or **8.5.35 Removing the Built-in Drive Module**.

Step 8 Remove all fan modules.

For details, see **8.5.11 Removing a Fan Module**.

Step 9 Remove the fan module bracket.

1. Pressing the latches on both sides of the fan module bracket, lift the fan module bracket vertically. See (1) and (2) in **Figure 8-158**.
2. Remove the other fan module bracket in the same way.

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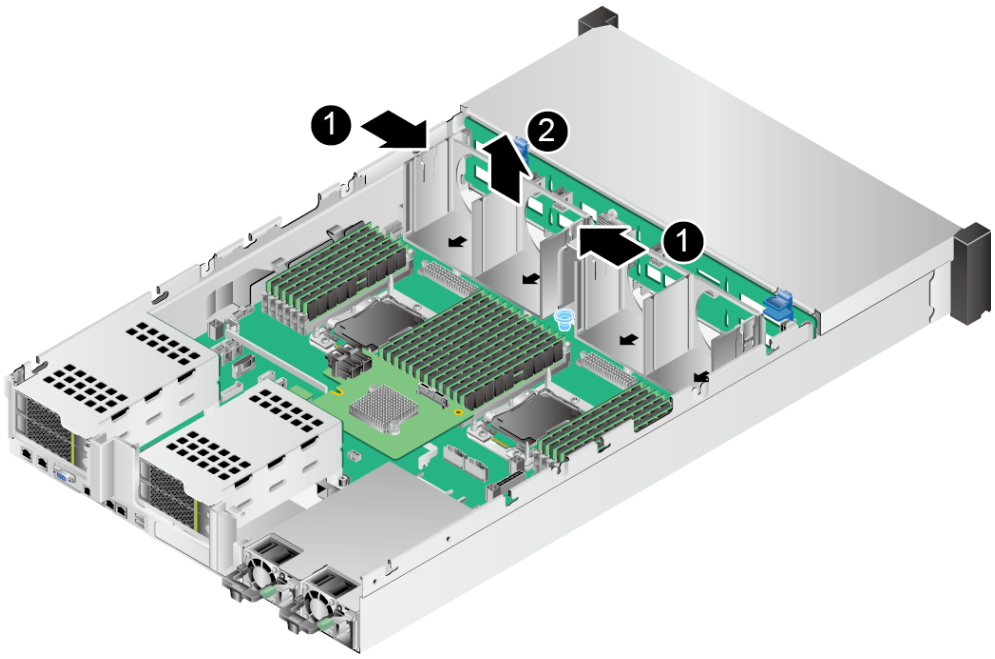
Figure 8-158 Removing a fan module bracket



Step 10 Determine the position of the front-drive backplane.

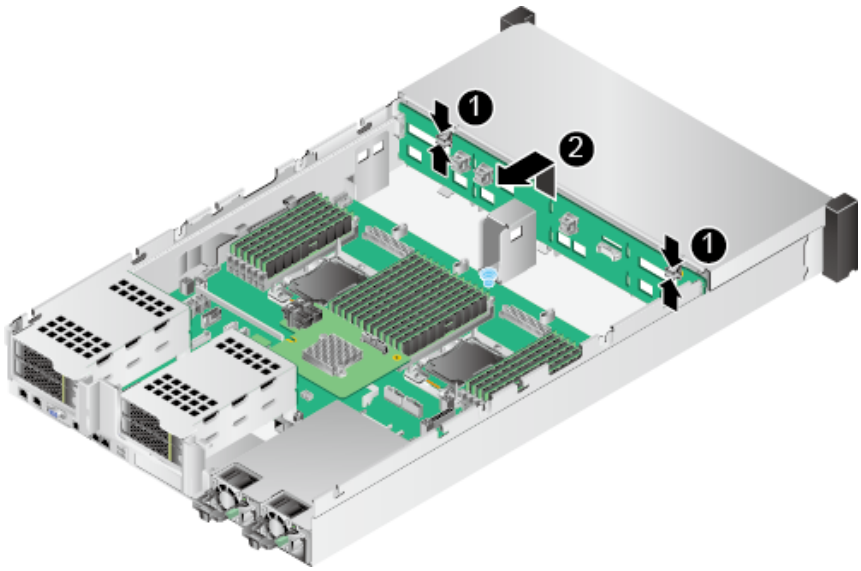
Step 11 Remove all cables from the front-drive backplane.

For details, see **7 Internal Cabling**.

Step 12 Remove the front-drive backplane.

1. Press the latch on the drive backplane and lift the backplane vertically as far as it will go. See (1) in **Figure 8-159**.
2. Remove the front-drive backplane horizontally. See (2) in **Figure 8-159**.

Figure 8-159 Removing the front-drive backplane



Step 13 Place the removed component in an ESD bag.

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NOTICE

Place only one component in an ESD bag.

----End

8.5.32 Installing the Front-Drive Backplane

NOTE

If the part number (P/N) of the new drive backplane is 03029JSA, 03029JRY, 03029TDQ, 03029TDH, 03029TDE, or 03029WFE, the mainboard iBMC version must be V520 or later. Otherwise, upgrade the iBMC first.

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove front drives.

For details, see **8.5.3 Removing a SAS/SATA Drive** or **8.5.5 Removing an NVMe Drive**.

Step 6 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 7 Remove the air duct or built-in drive module.

For details, see **8.5.59 Removing the Air Duct** or **8.5.35 Removing the Built-in Drive Module**.

Step 8 Remove all fan modules.

For details, see **8.5.11 Removing a Fan Module**.

Step 9 Remove the fan module bracket.

1. Pressing the latches on both sides of the fan module bracket, lift the fan module bracket vertically. See (1) and (2) in **Figure 8-160**.
2. Remove the other fan module bracket in the same way.

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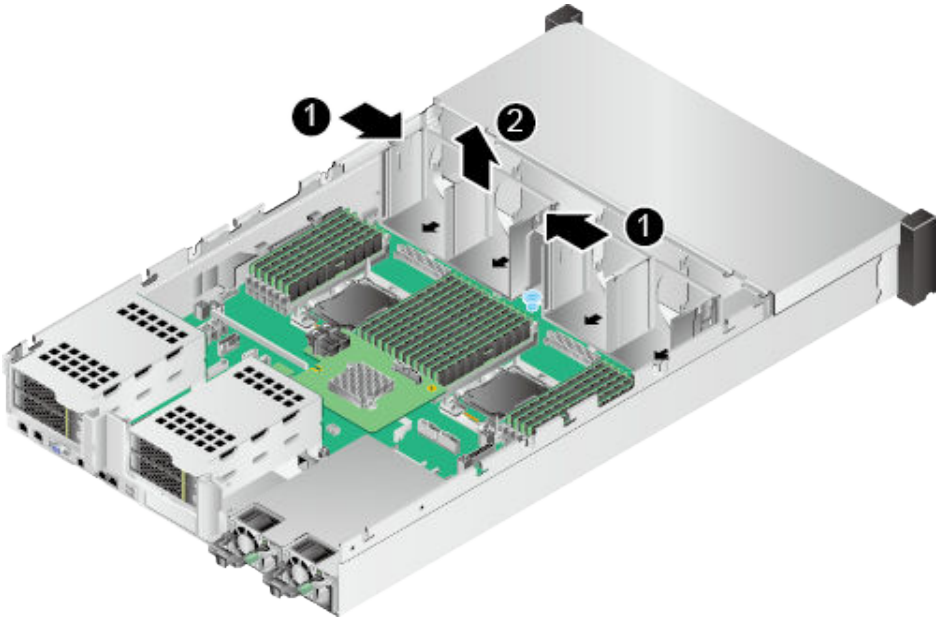
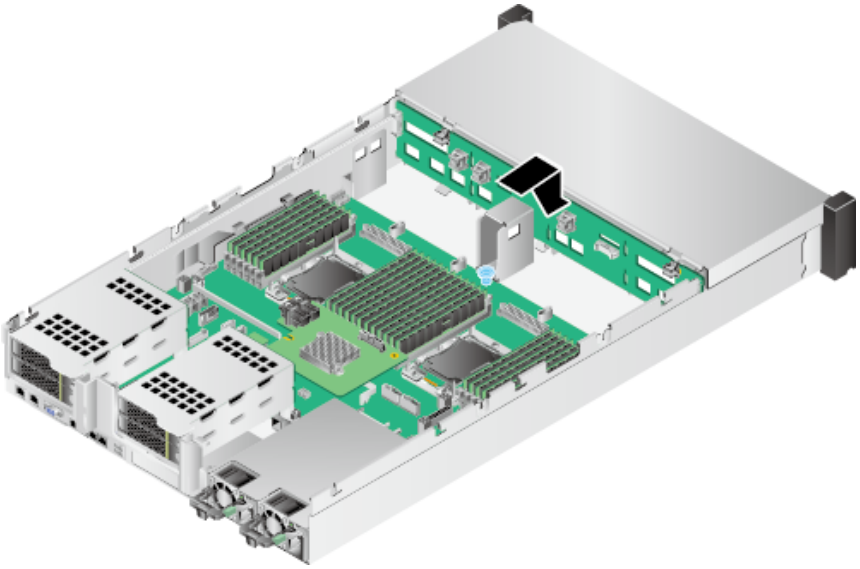
Figure 8-160 Removing a fan module bracket



Step 10 Install the front-drive backplane.

1. Take the component out of its ESD bag.
2. Determine the position of the front-drive backplane.
3. Hitch the front-drive backplane and move it downward until it is locked automatically.

Figure 8-161 Installing the front-drive backplane



Step 11 Connect the cables to the front-drive backplane.

For details, see **7 Internal Cabling**.

Step 12 Install front drives.

For details, see **8.5.4 Installing a SAS/SATA Drive** or **8.5.6 Installing an NVMe Drive**.

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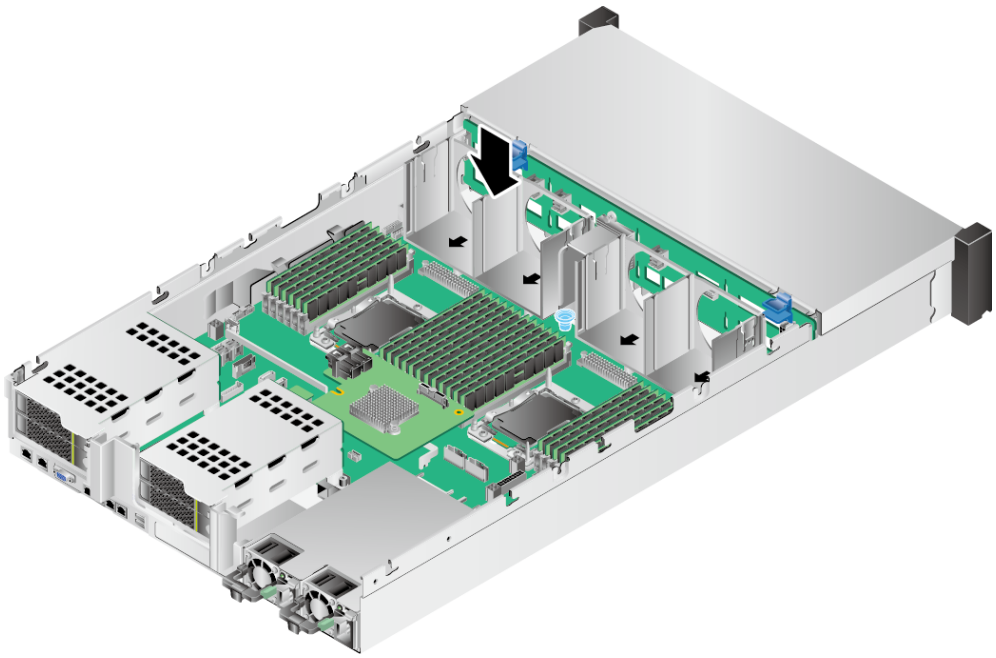
Step 13 Install all the fan module brackets.

Figure 8-162 Installing a fan module bracket



Step 14 Install all fan modules.

For details, see **8.5.12 Installing a Fan Module**.

Step 15 Install the air duct or built-in drive module.

For details, see **8.5.60 Installing the Air Duct** or **8.5.36 Installing the Built-in Drive Module**.

Step 16 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 17 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 18 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 19 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 20 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

----End

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8.5.33 Removing the Built-in Drive Backplane

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Remove built-in drives.

For details, see **8.5.3 Removing a SAS/SATA Drive**.

Step 7 Determine the position of the built-in drive backplane.

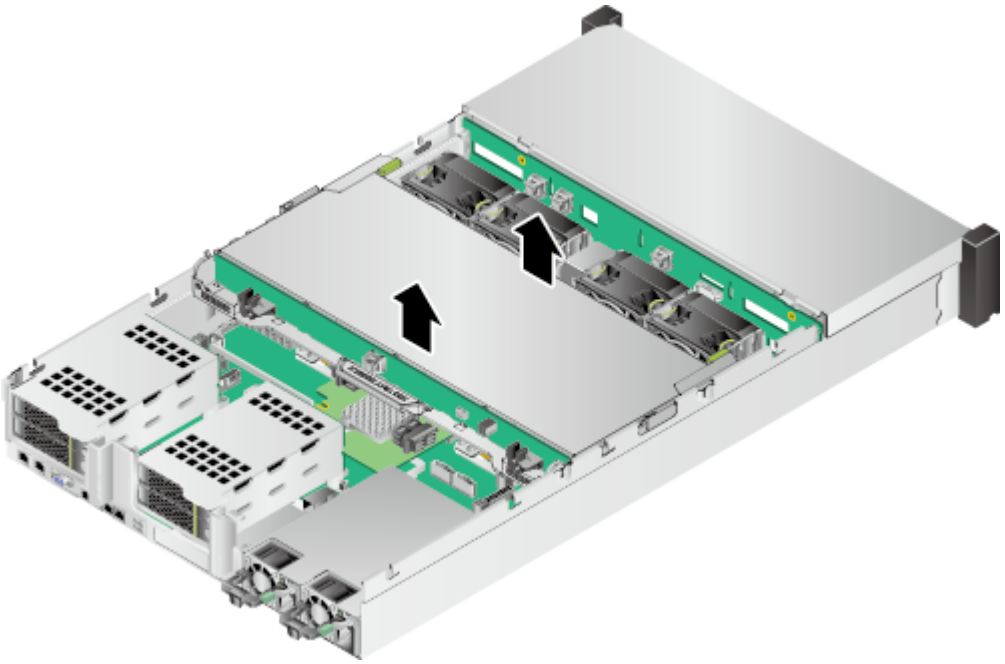
Step 8 Remove all cables from the built-in drive backplane.

The cable connection varies depending on the drive configuration. For details, see:

- **7.3 Server with 12 x 3.5" Drives (Expander) 1**
- **7.5 Server with 12 x 3.5" Drives (Expander) 3**
- **7.9 Server with 12 x 3.5" Drives (Pass-through) 3**

Step 9 Remove the built-in drive module vertically.

Figure 8-163 Removing the built-in drive module



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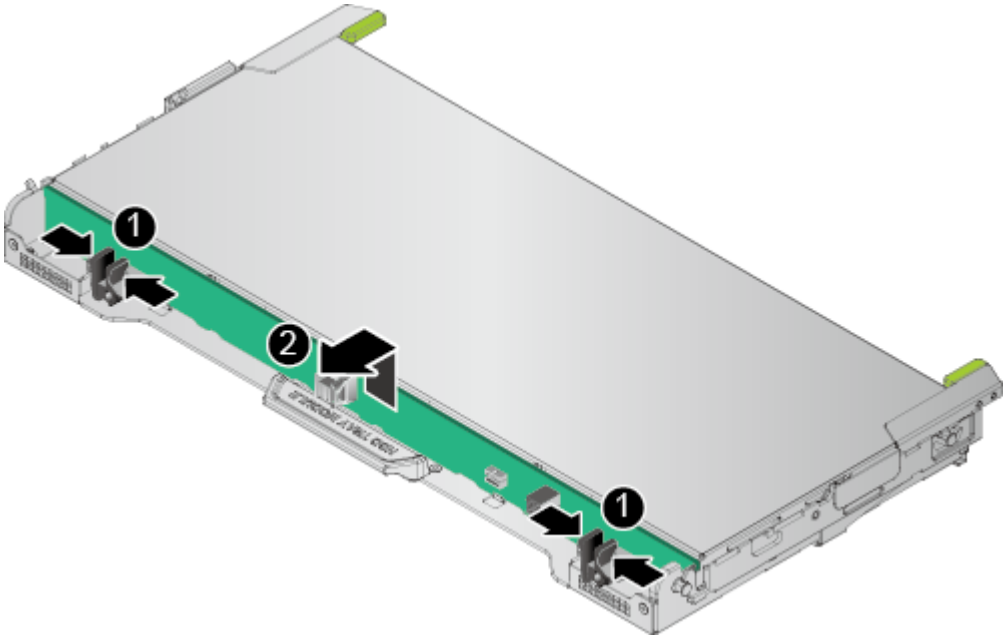
Step 10 Pinching open the latches on the drive backplane, lift the backplane as far as it will go and pull it out in the arrow direction.

Figure 8-164 Removing the built-in drive backplane



Step 11 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

----End

8.5.34 Installing the Built-in Drive Backplane

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

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Step 6 Remove built-in drives.

For details, see **8.5.3 Removing a SAS/SATA Drive**.

Step 7 Take the component out of its ESD bag.

Step 8 Determine the position of the built-in drive backplane.

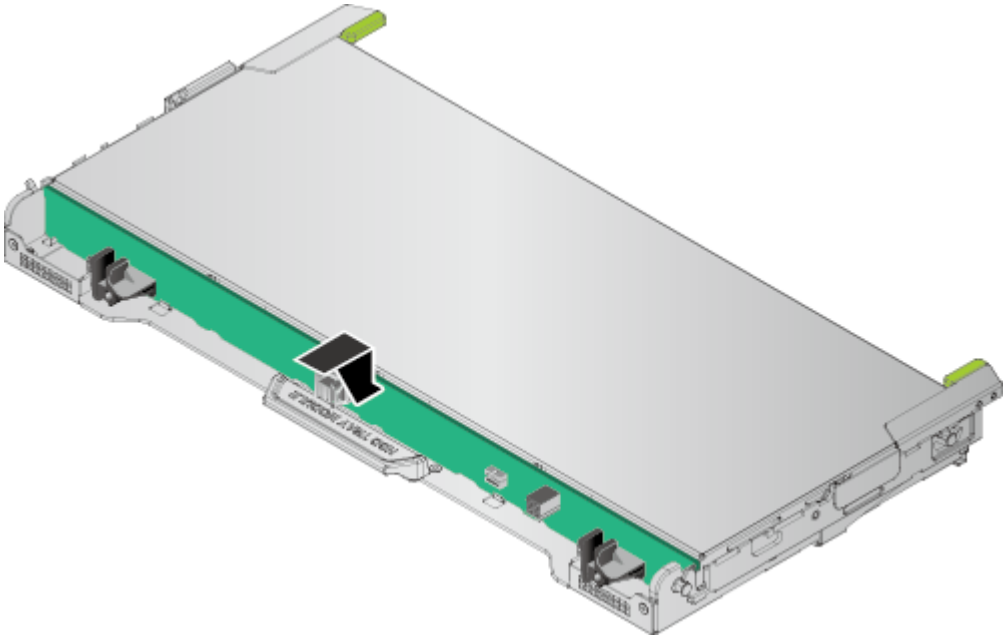
Step 9 Remove all cables from the built-in drive backplane.

The cable connection varies depending on the drive configuration. For details, see:

- **7.3 Server with 12 x 3.5" Drives (Expander) 1**
- **7.5 Server with 12 x 3.5" Drives (Expander) 3**
- **7.9 Server with 12 x 3.5" Drives (Pass-through) 3**

Step 10 Hitch the drive backplane and move it downward until it is locked automatically.

Figure 8-165 Installing the built-in drive backplane



Step 11 Push the plastic latch on each side of the chassis, and place the built-in drive module downward. See (1) and (2) in **Figure 8-166**.

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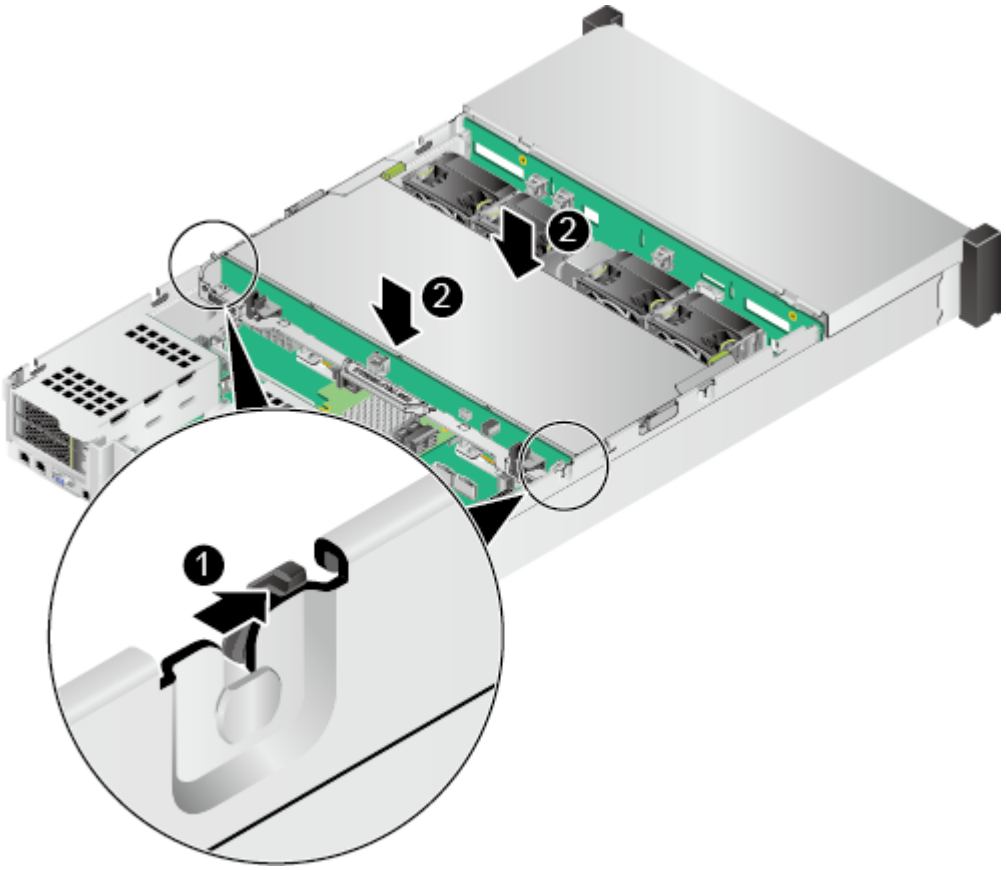
Figure 8-166 Installing the built-in drive module



Step 12 Connect cables to the built-in drive backplane.

The cable connection varies depending on the drive configuration. For details, see:

- **7.3 Server with 12 x 3.5" Drives (Expander) 1**
- **7.5 Server with 12 x 3.5" Drives (Expander) 3**
- **7.9 Server with 12 x 3.5" Drives (Pass-through) 3**

Step 13 Install built-in drives.

For details, see **8.5.4 Installing a SAS/SATA Drive**.

Step 14 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 15 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 16 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 17 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 18 Log in to the iBMC WebUI, and check whether the new component is normal.

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For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

----End

8.5.35 Removing the Built-in Drive Module

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Determine the position of the built-in drive module.

Step 7 Remove all drives from the drive module.

For details, see **8.5.3 Removing a SAS/SATA Drive**.

Step 8 Remove cables from the built-in drive module.

The cable connection varies depending on the drive configuration. For details, see:

- **7.3 Server with 12 x 3.5" Drives (Expander) 1**
- **7.5 Server with 12 x 3.5" Drives (Expander) 3**
- **7.9 Server with 12 x 3.5" Drives (Pass-through) 3**

Step 9 Lift the built-in drive module.

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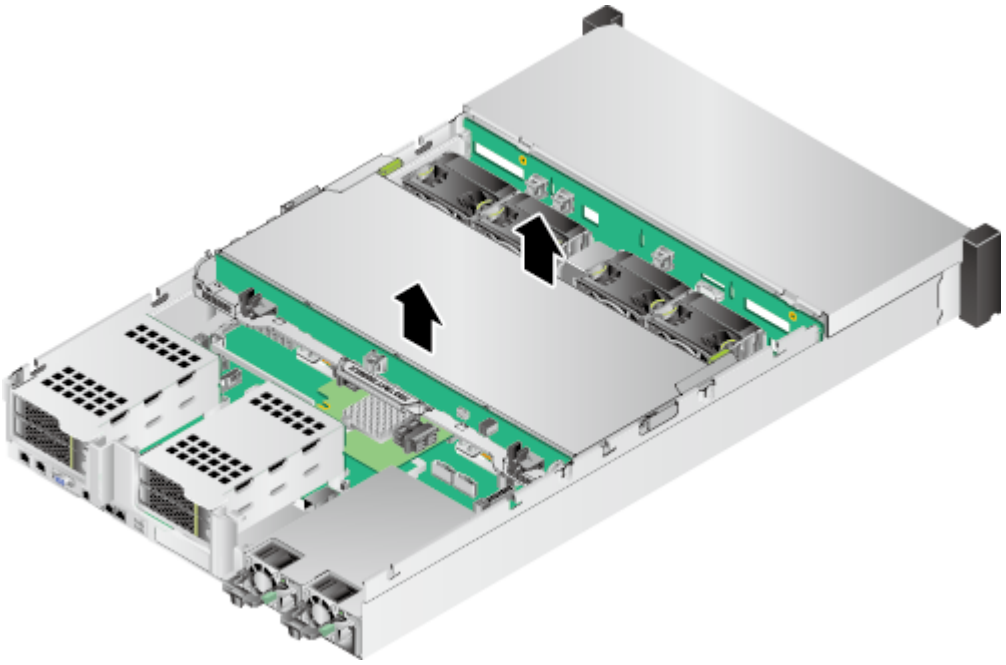
Figure 8-167 Removing the built-in drive module



Step 10 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

----End

8.5.36 Installing the Built-in Drive Module

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Take the component out of its ESD bag.

Step 7 Determine the position of the built-in drive module.

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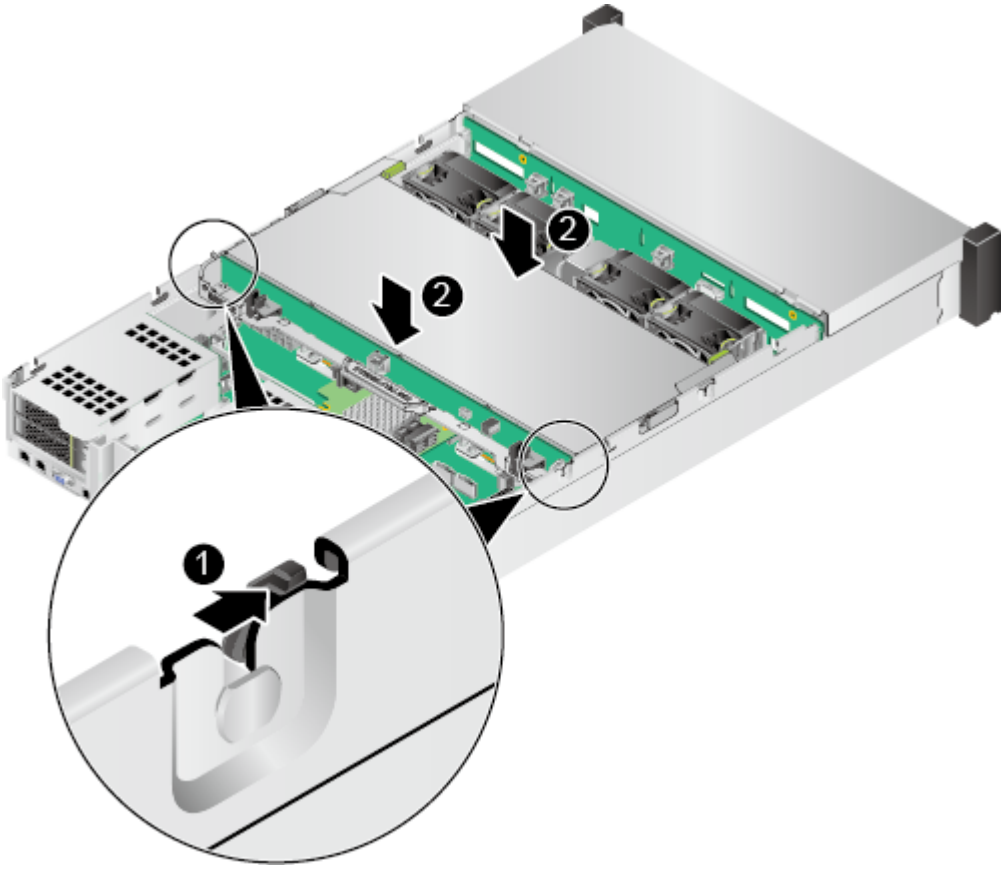
Step 8 Push the plastic latch in the arrow direction on each side of the chassis, and place the built-in drive module downwards. See (1) and (2) in **Figure 8-168**.

Figure 8-168 Installing the built-in drive module



Step 9 Install built-in drives.

For details, see **8.5.4 Installing a SAS/SATA Drive**.

Step 10 Connect cables to the built-in drive module.

The cable connection varies depending on the drive configuration. For details, see:

- **7.3 Server with 12 x 3.5" Drives (Expander) 1**
- **7.9 Server with 12 x 3.5" Drives (Pass-through) 3**

Step 11 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 12 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 13 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 14 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

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Step 15 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

----End

8.5.37 Removing the Rear Drive Module

8.5.37.1 Removing a 2 x 3.5" Rear Drive Module

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Determine the position of the rear drive module.

Step 7 Remove cables from the rear drive module.

For details, see **7 Internal Cabling**.

Step 8 Remove all drives from the rear drive module.

For details, see **8.5.3 Removing a SAS/SATA Drive**.

Step 9 Loosen the screws that secure the rear drive module, and lift the drive module. See (1), (2), and (3) in **Figure 8-169**.

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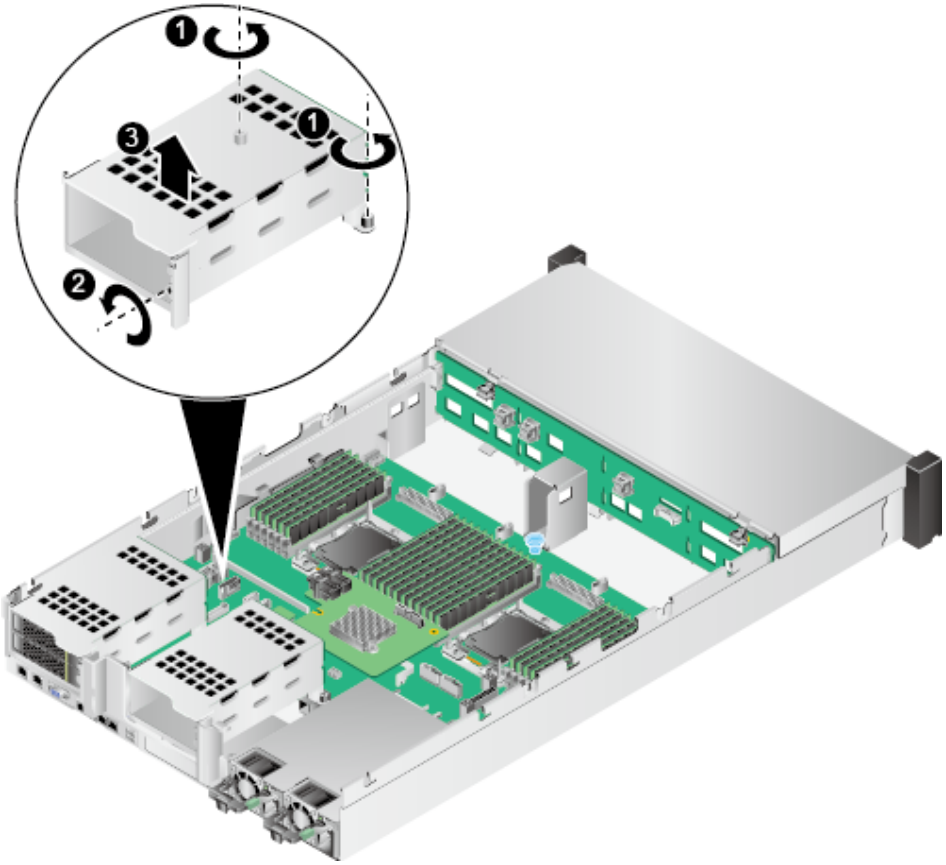
Figure 8-169 Removing the rear drive module



Step 10 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

----End

8.5.37.2 Removing a 4 x 2.5" Rear Drive Module

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

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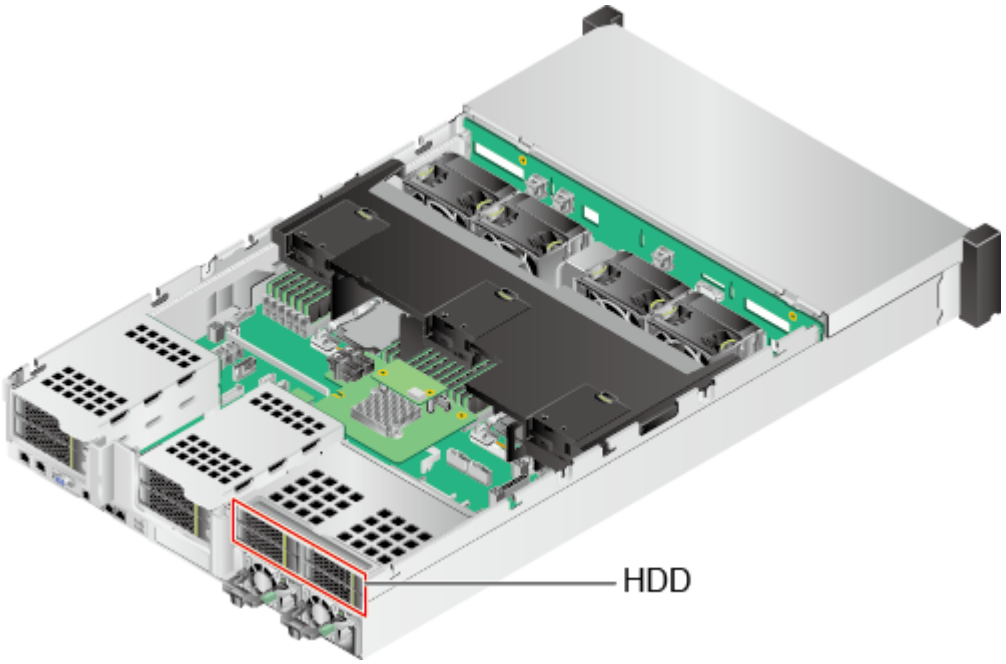
Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Determine the position of the rear drive module.

Figure 8-170 Position of the rear drive module



Step 7 Remove cables from the rear drive module.

For details, see **7 Internal Cabling**.

Step 8 Remove all drives from the rear drive module.

For details, see **8.5.3 Removing a SAS/SATA Drive** or **8.5.5 Removing an NVMe Drive**.

Step 9 Loosen the screws that secure the rear drive module, and lift the drive module. See (1) and (2) in **Figure 8-171**.

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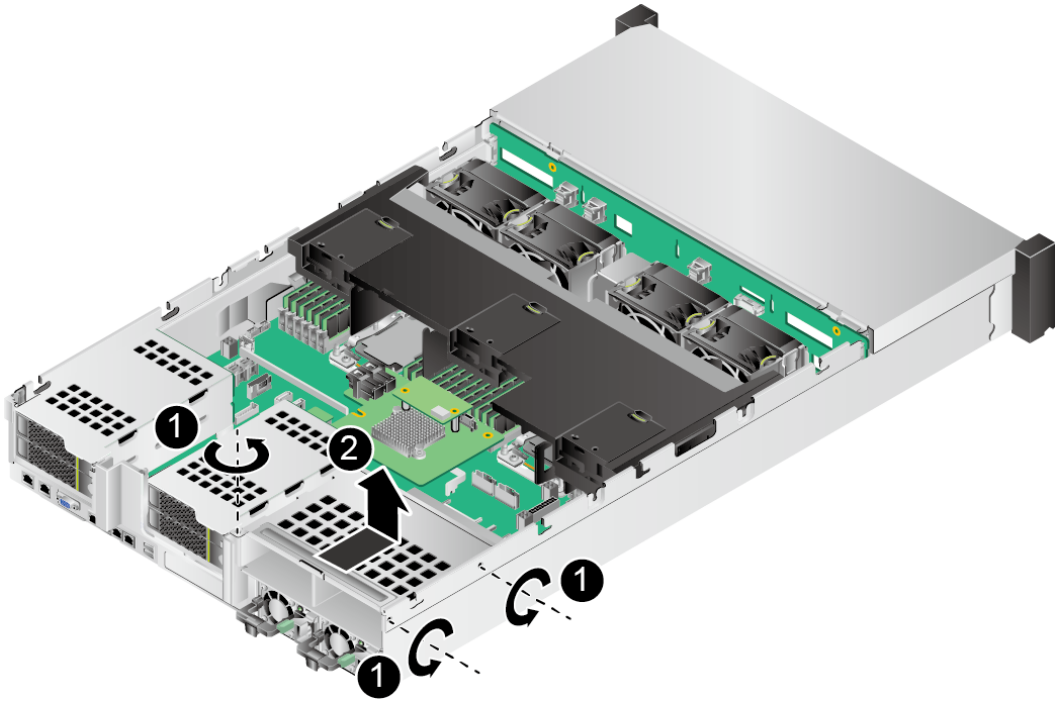
Figure 8-171 Removing the rear drive module



Step 10 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

----End

8.5.38 Installing the Rear Drive Module

8.5.38.1 Installing a 2 x 3.5" Rear Drive Module

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

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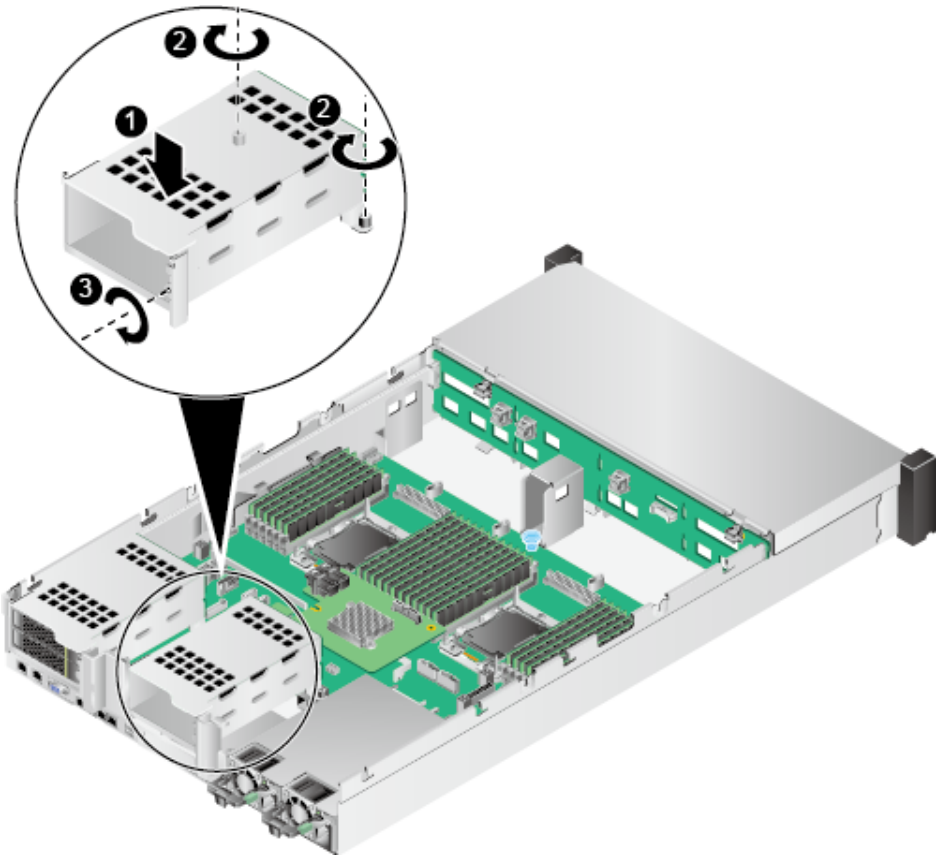
Step 6 Take the component out of its ESD bag.

Step 7 Determine the position of the rear drive module.

Step 8 Install the rear drive module in the chassis, and tighten the screws. See (1), (2), and (3) in **Figure 8-172**.

Figure 8-172 Installing the rear drive module



Step 9 Install drives in the rear drive module.

For details, see **8.5.4 Installing a SAS/SATA Drive**.

Step 10 Connect cables to the rear drive module.

For details, see **7 Internal Cabling**.

Step 11 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 12 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 13 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 14 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

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Step 15 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

----End

8.5.38.2 Installing a 4 x 2.5" Rear Drive Module

NOTE

If the part number (P/N) of the new drive module is 02311TWV or 02311XLA, the mainboard iBMC version must be V520 or later. Otherwise, upgrade the iBMC.

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Take the component out of its ESD bag.

Step 7 Determine the position of the rear drive module.

Step 8 Install the rear drive module in the chassis, and tighten the screws. See (1) and (2) in **Figure 8-173**.

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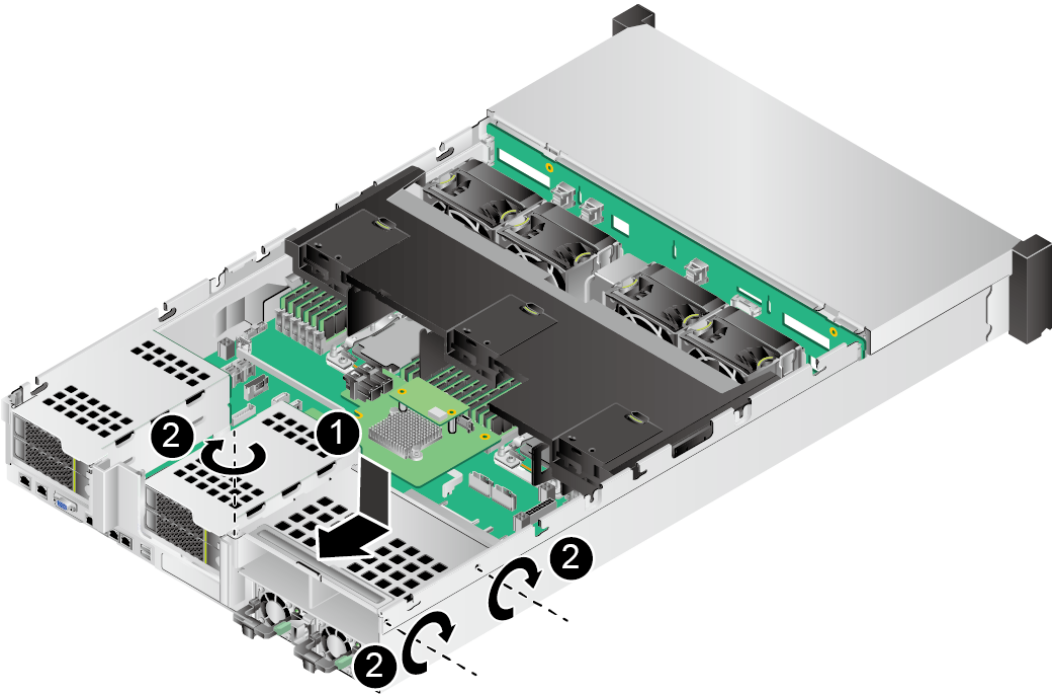
Figure 8-173 Installing the rear drive module



Step 9 Install drives in the rear drive module.

For details, see **8.5.4 Installing a SAS/SATA Drive** or **8.5.6 Installing an NVMe Drive**.

Step 10 Connect cables to the rear drive module.

For details, see **7 Internal Cabling**.

Step 11 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 12 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 13 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 14 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 15 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

----End

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8.5.39 Removing the Module with Rear Drives and PCIe Card

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Determine the position of the module with rear drives and PCIe card.

Step 7 Remove cables from the module with rear drives and PCIe card.

For details, see **7 Internal Cabling**.

Step 8 Remove all drives from the module with rear drives and PCIe card.

For details, see **8.5.3 Removing a SAS/SATA Drive**.

Step 9 Remove the module with rear drives and PCIe card.

1. Loosen the screws that secure the module with rear drives and PCIe card. See (1) and (2) in **Figure 8-174**.
2. Lift the module with rear drives and PCIe card. See (3) in **Figure 8-174**.

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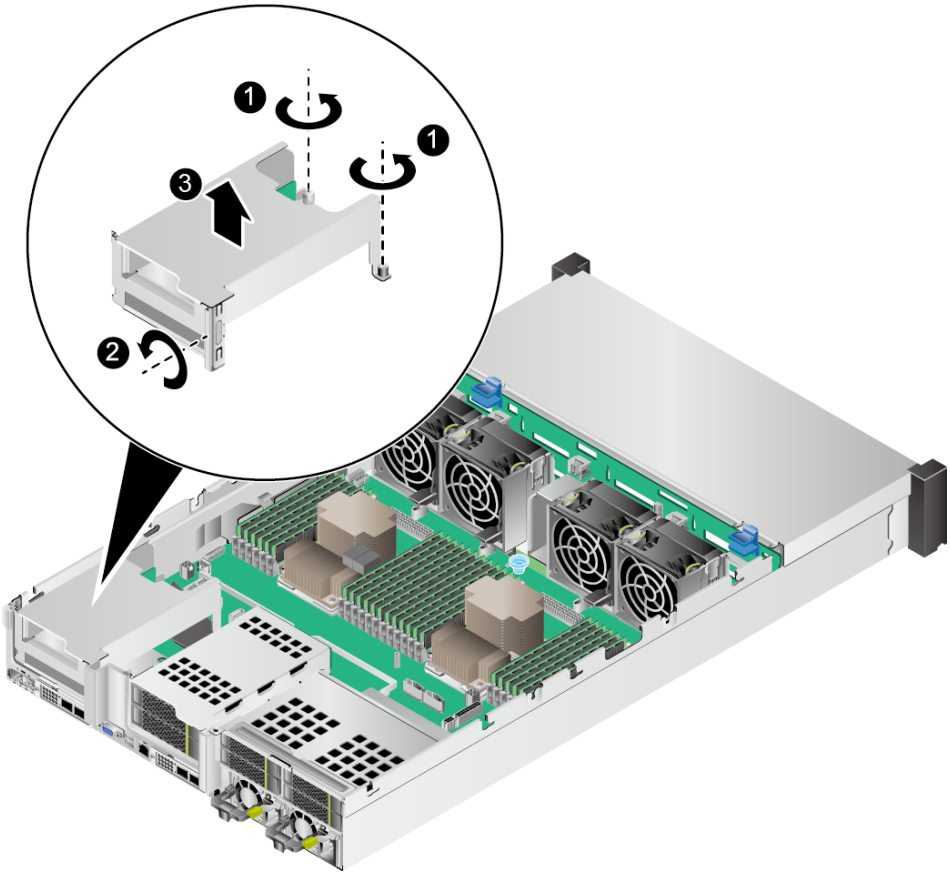
Figure 8-174 Removing the module with rear drives and PCIe card



Step 10 Remove the PCIe card from the module with rear drives and PCIe card.

For details, see **8.5.53 Removing a PCIe Card**.

Step 11 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

----End

8.5.40 Installing the Module with Rear Drives and PCIe Card

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

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For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Take the component out of its ESD bag.

Step 7 Install the PCIe card in the module with rear drives and PCIe card.

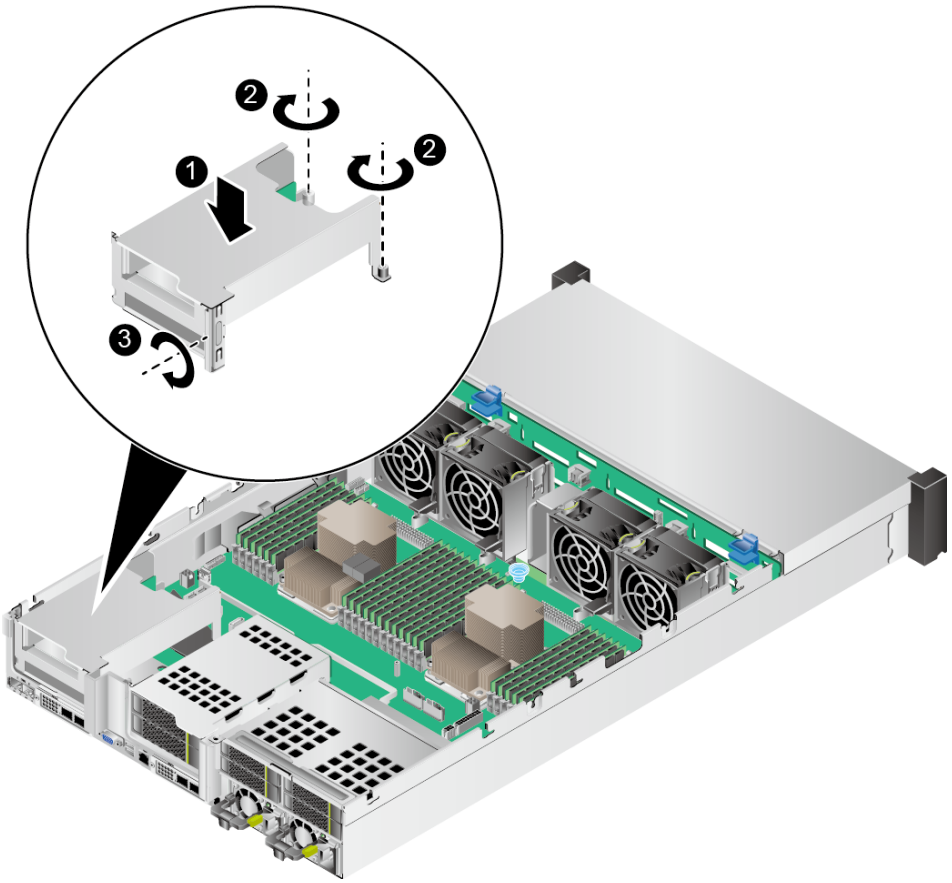
For details, see **8.5.54 Installing a PCIe Card**.

Step 8 Determine the position of the module with rear drives and PCIe card.

Step 9 Install the module with rear drives and PCIe card.

1. Install the module with rear drives and PCIe card in the chassis. See (1) in **Figure 8-175**.
2. Tighten the screws that secure the module with rear drives and PCIe card. See (2) and (3) in **Figure 8-175**.

Figure 8-175 Installing the module with rear drives and PCIe card



Step 10 Install drives in the module with rear drives and PCIe card.

For details, see **8.5.4 Installing a SAS/SATA Drive**.

Step 11 Connect cables to the module with rear drives and PCIe card.

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For details, see **7 Internal Cabling**.

Step 12 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 13 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 14 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 15 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 16 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

----End

8.5.41 Removing the LCD

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Remove the air duct or built-in drive module.

For details, see **8.5.59 Removing the Air Duct** or **8.5.35 Removing the Built-in Drive Module**.

Step 7 Remove all fan modules.

For details, see **8.5.11 Removing a Fan Module**.

Step 8 Remove the fan module bracket.

1. Pressing the latches on both sides of the fan module bracket, lift the fan module bracket vertically. See (1) and (2) in **Figure 8-176**.
2. Remove the other fan module bracket in the same way.

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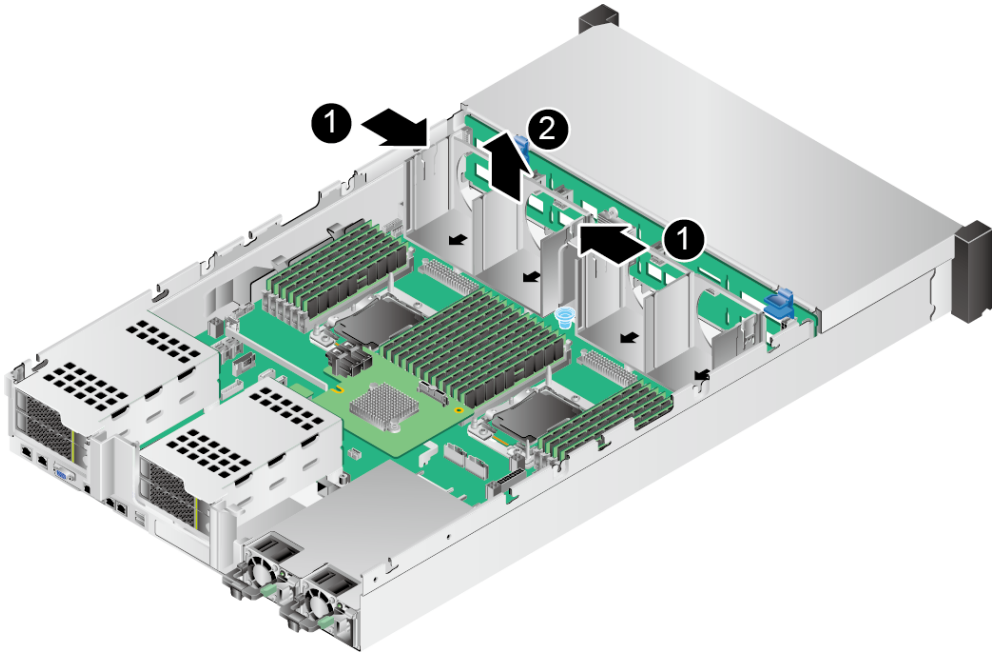
Figure 8-176 Removing a fan module bracket



Step 9 Determine the position of the LCD.

Step 10 Remove the cables from the LCD and VGA board.

For details, see **7.1 Server with 8 x 2.5" Drives (Pass-through) 1** or **7.2 Server with 8 x 2.5" Drives (Pass-through) 2**.

Step 11 Remove the LCD tray.

1. Remove the spring pin from the LCD tray. See (1) in **Figure 8-177**.
2. Push out the LCD tray. See (2) in **Figure 8-177**.

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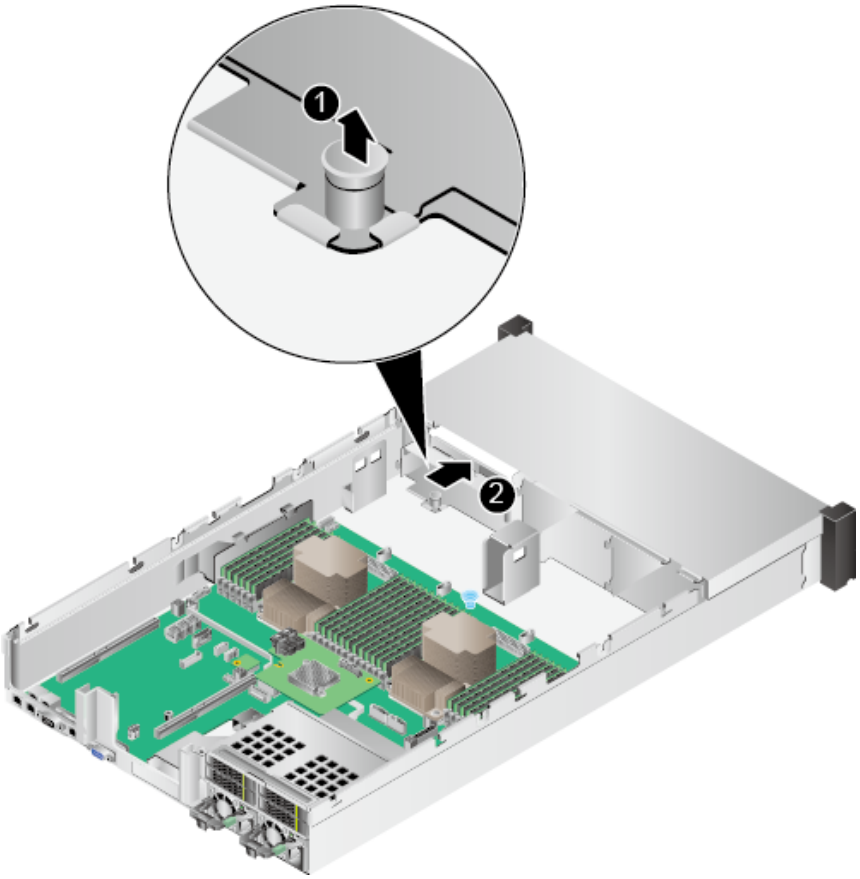
Figure 8-177 Removing the LCD tray



Step 12 Remove the LCD box.

1. Remove the bolt that secures the LCD box. See (1) in **Figure 8-178**.
2. Push out the LCD box. See (2) in **Figure 8-178**.

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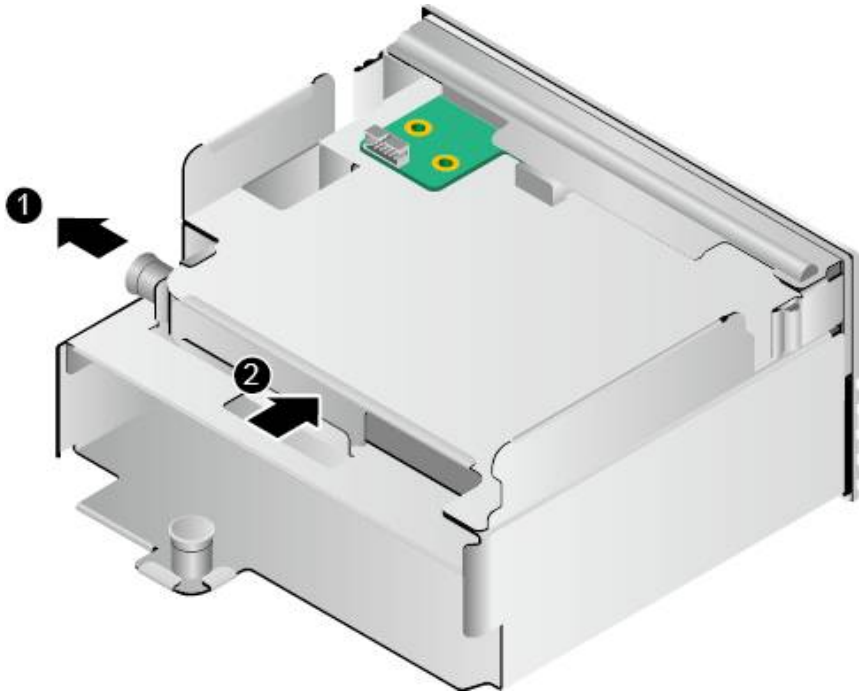
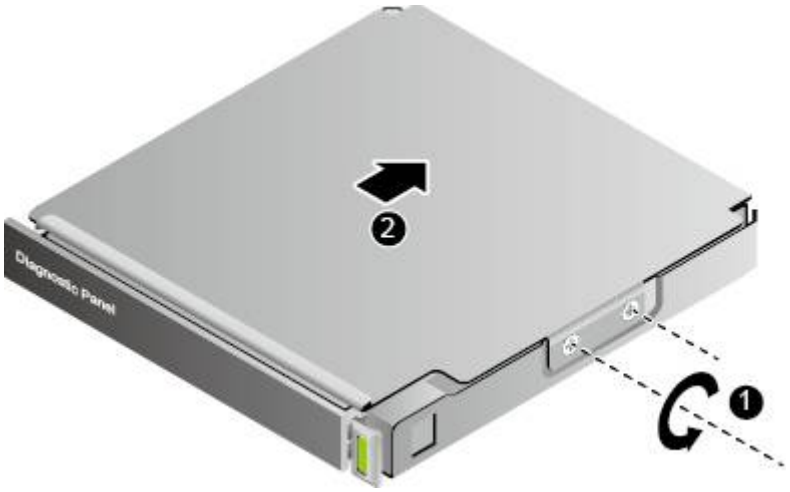
Figure 8-178 Removing the LCD box



Step 13 Remove the cover from the LCD box.

1. Loosen the screws that secure the cover. See (1) in **Figure 8-179**.
2. Push the cover from the LCD box. See (2) in **Figure 8-179**.

Figure 8-179 Removing the cover from the LCD box



Step 14 Remove the LCD.

1. Press the release button. See (1) in **Figure 8-180**.
2. Pull out the LCD. See (2) in **Figure 8-180**.

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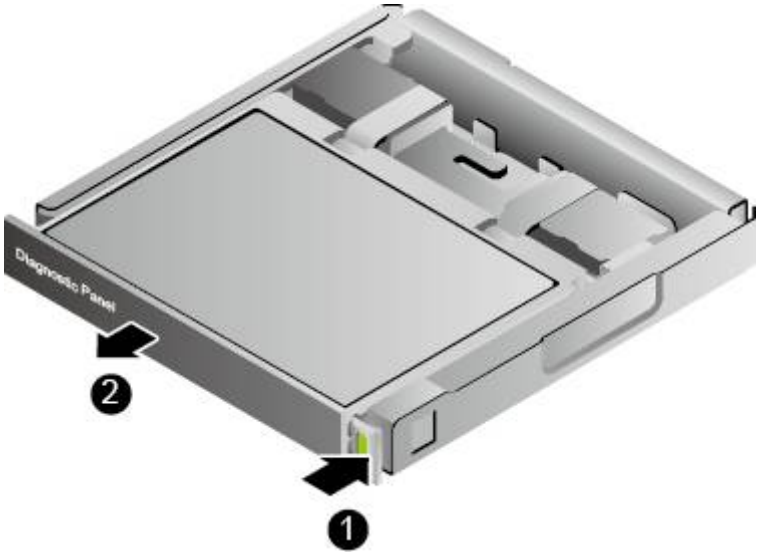
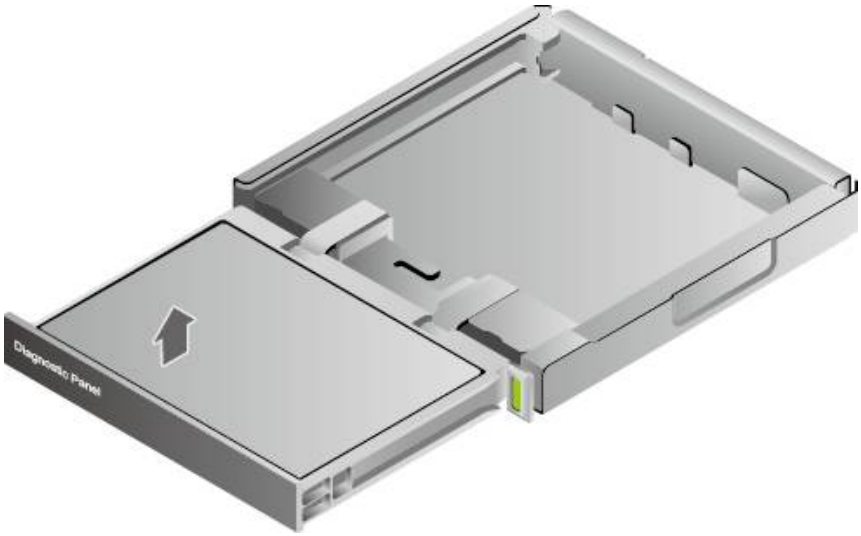
Figure 8-180 Removing the LCD



Step 15 Push the LCD upwards from the bottom and pull out the cable.

Figure 8-181 Removing the LCD



Step 16 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

----End

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8.5.42 Installing the LCD

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Remove the air duct or built-in drive module.

For details, see **8.5.59 Removing the Air Duct** or **8.5.35 Removing the Built-in Drive Module**.

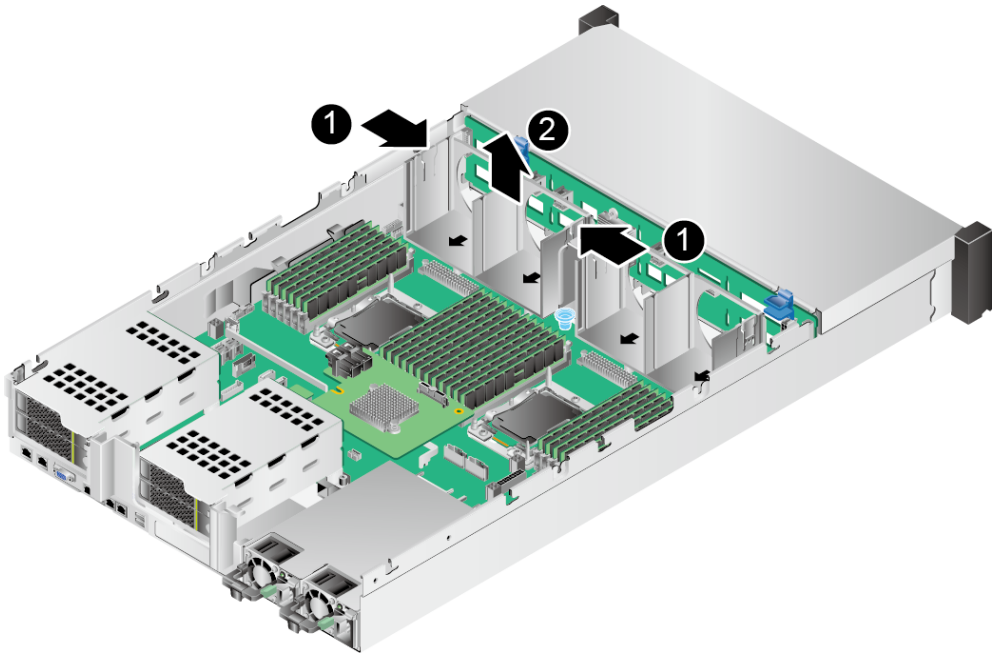
Step 7 Remove all fan modules.

For details, see **8.5.11 Removing a Fan Module**.

Step 8 Remove the fan module bracket.

1. Pressing the latches on both sides of the fan module bracket, lift the fan module bracket vertically. See (1) and (2) in **Figure 8-182**.
2. Remove the other fan module bracket in the same way.

Figure 8-182 Removing a fan module bracket



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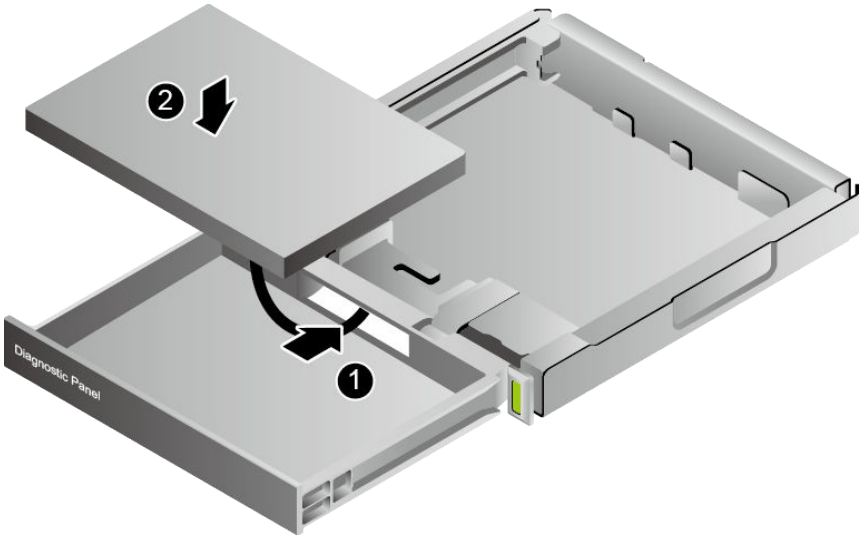
Step 9 Take the component out of its ESD bag.

Step 10 Determine the position of the LCD.

Step 11 Install the LCD.

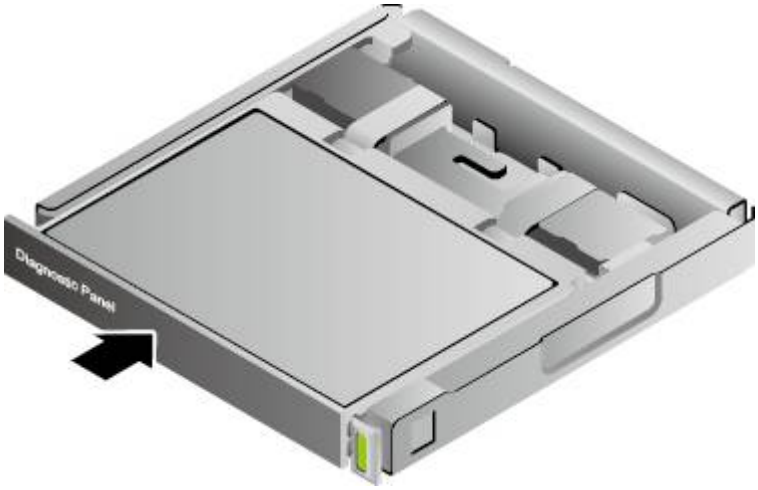
1. Route the LCD cable from the rear of the LCD box. See (1) in **Figure 8-183**.
2. Place the LCD in the tray. See (2) in **Figure 8-183**.

Figure 8-183 Installing the LCD



Step 12 Push the LCD into the LCD box.

Figure 8-184 Pushing the LCD into the LCD box



Step 13 Install the cover of the LCD box.

1. Close the cover of the LCD box. See (1) in **Figure 8-185**.
2. Tighten the screws to secure the cover. See (2) in **Figure 8-185**.

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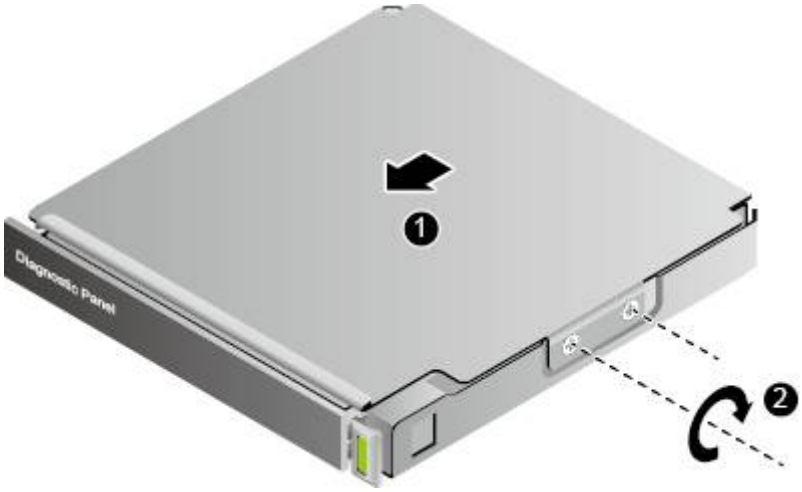
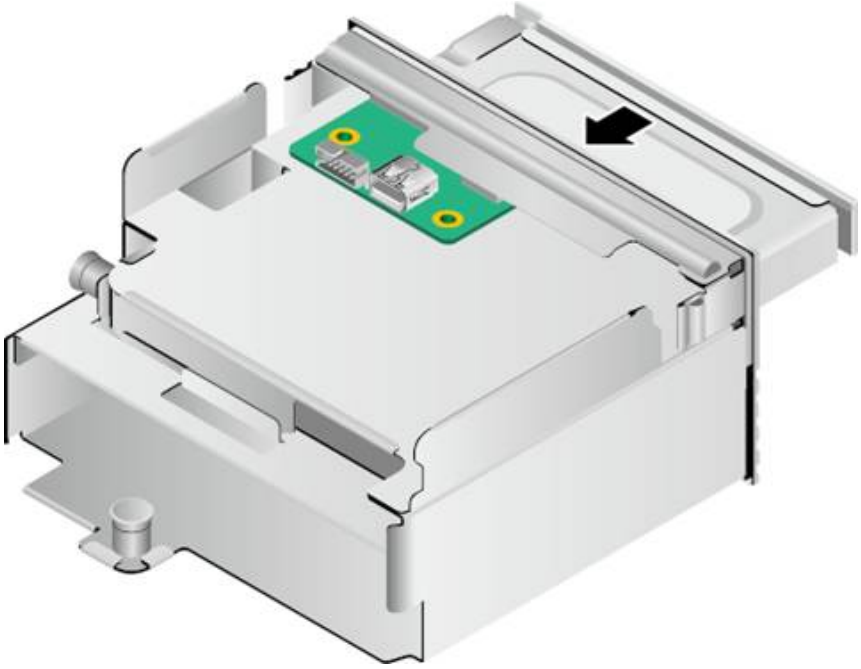
Figure 8-185 Installing the cover of the LCD box



Step 14 Push the LCD box into the LCD tray.

Figure 8-186 Pushing the LCD box in to the tray



Step 15 Push the LCD tray into the chassis.

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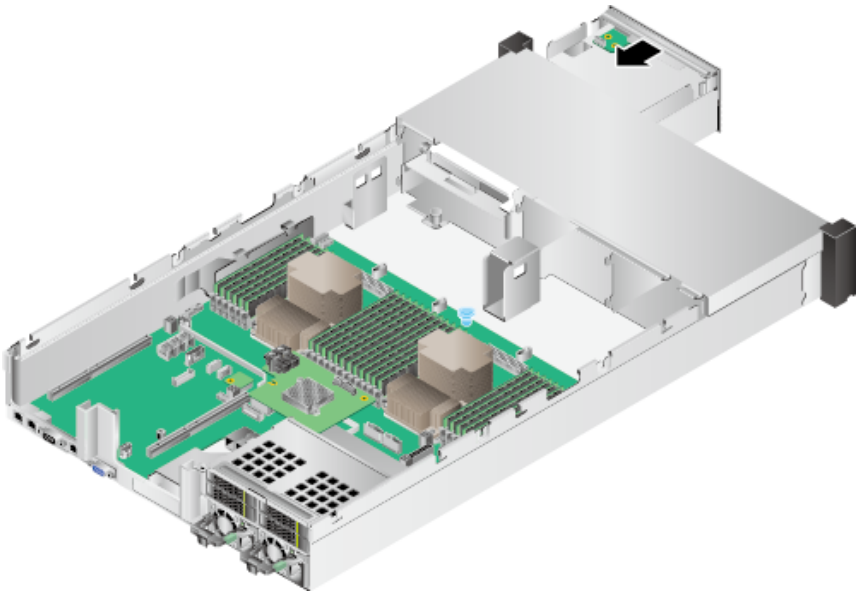
Figure 8-187 Installing the LCD tray

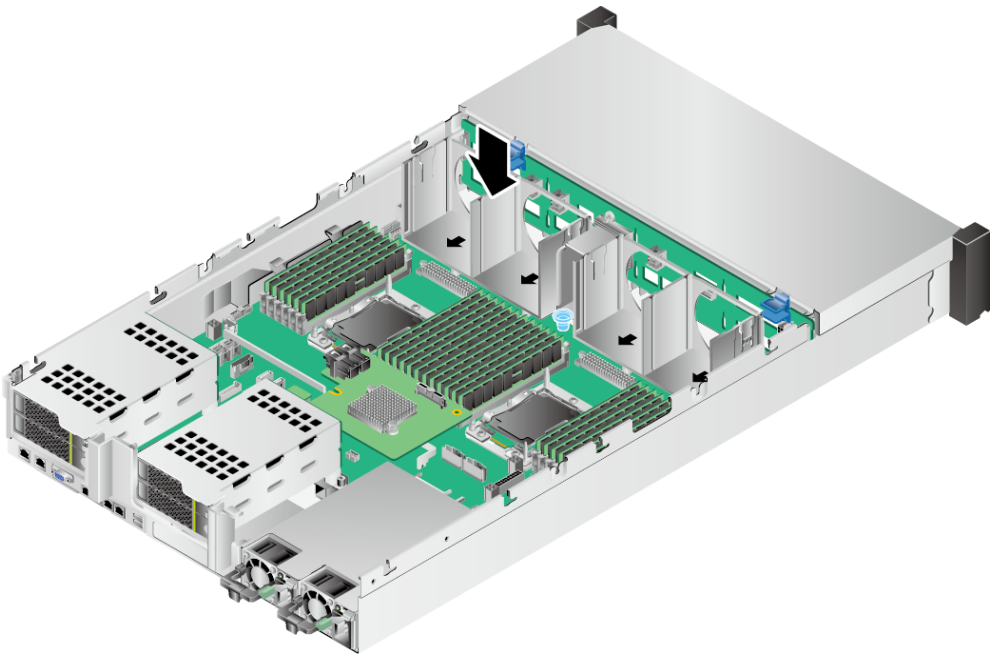


Step 16 Remove the cables from the LCD and VGA board.

For details, see **7.1 Server with 8 x 2.5" Drives (Pass-through) 1** or **7.2 Server with 8 x 2.5" Drives (Pass-through) 2**.

Step 17 Install all the fan module brackets.

Figure 8-188 Installing a fan module bracket



Step 18 Install all fan modules.

For details, see **8.5.12 Installing a Fan Module**.

Step 19 Install the air duct or built-in drive module.

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For details, see **8.5.60 Installing the Air Duct** or **8.5.36 Installing the Built-in Drive Module**.

Step 20 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 21 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 22 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 23 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 24 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

----End

8.5.43 Removing the VGA Board

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Remove the air duct or built-in drive module.

For details, see **8.5.59 Removing the Air Duct** or **8.5.35 Removing the Built-in Drive Module**.

Step 7 Remove all fan modules.

For details, see **8.5.11 Removing a Fan Module**.

Step 8 Remove the fan module bracket.

1. Pressing the latches on both sides of the fan module bracket, lift the fan module bracket vertically. See (1) and (2) in **Figure 8-189**.
2. Remove the other fan module bracket in the same way.

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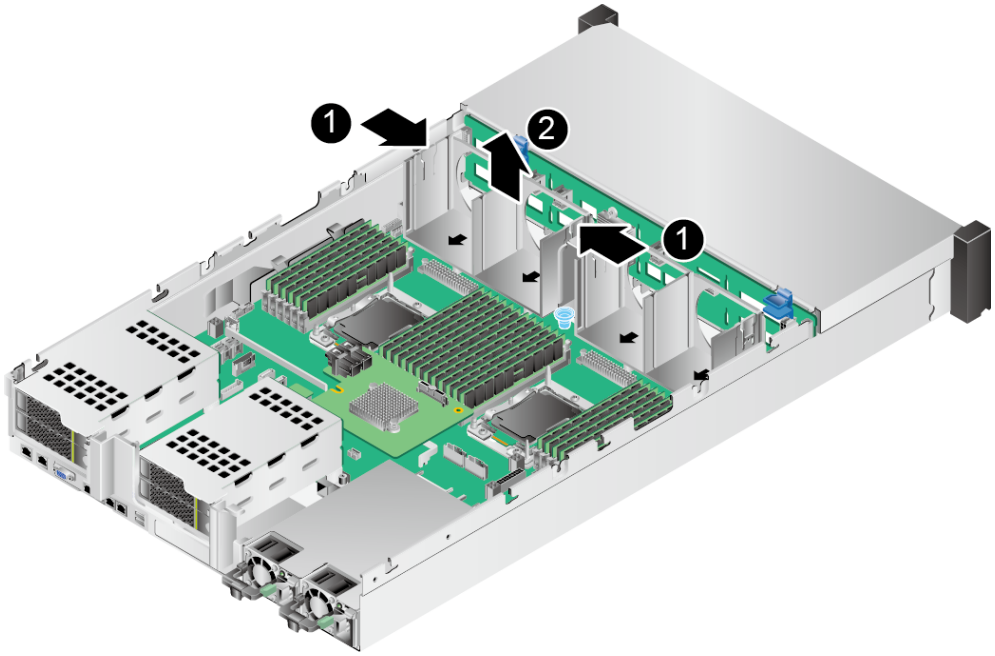
Figure 8-189 Removing a fan module bracket



Step 9 Remove the VGA and DVD drive cables from the mainboard and front-drive backplane.

For details, see **7 Internal Cabling**.

Step 10 Remove the bracket.

1. Pull the bolt that secures the bracket. See (1) in **Figure 8-190**.
2. Push out the bracket horizontally. See (2) in **Figure 8-190**.

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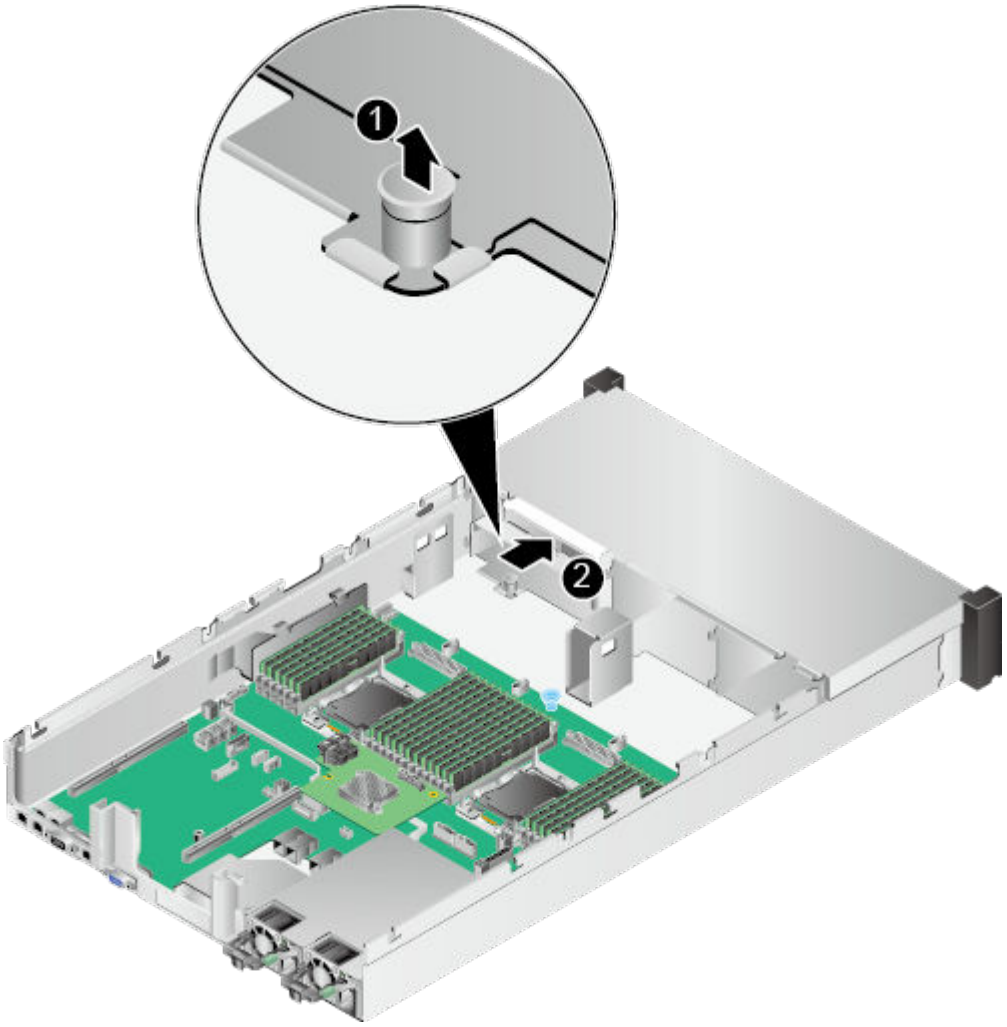
Figure 8-190 Removing the bracket



Step 11 Determine the position of the VGA board.

Step 12 Remove the VGA board.

1. Remove the cables from the VGA board.
2. Loosen the screws that secure the VGA board. See (1) in **Figure 8-191**.
3. Remove the VGA board horizontally. See (2) in **Figure 8-191**.

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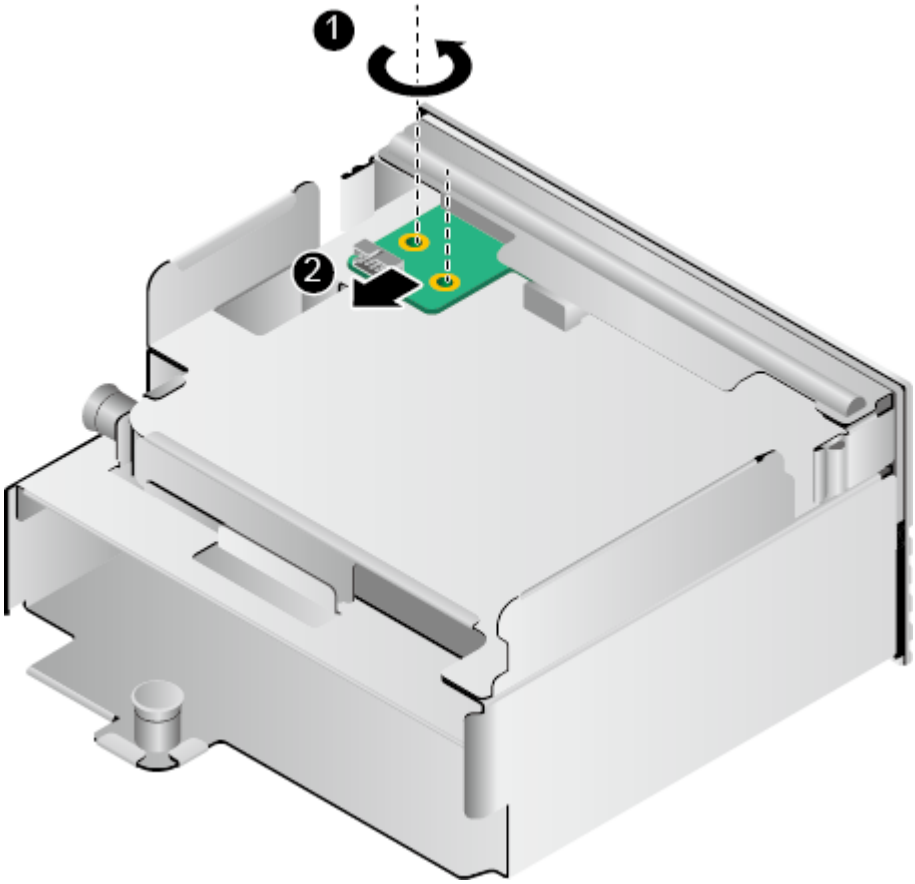
Figure 8-191 Removing the VGA board



Step 13 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

----End

8.5.44 Installing the VGA Board

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

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Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Remove the air duct or built-in drive module.

For details, see **8.5.59 Removing the Air Duct** or **8.5.35 Removing the Built-in Drive Module**.

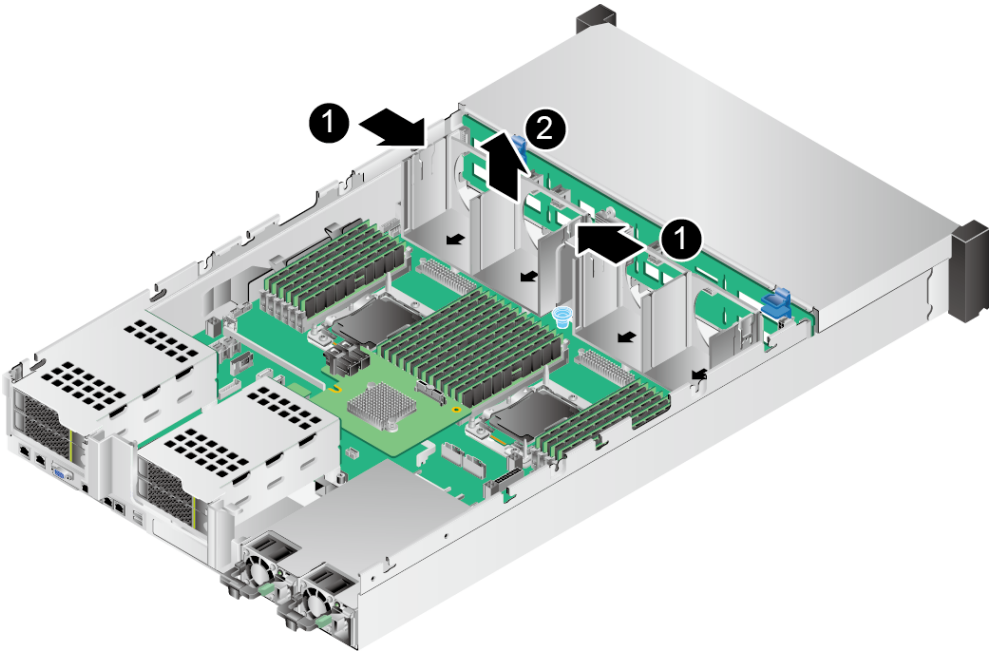
Step 7 Remove all fan modules.

For details, see **8.5.11 Removing a Fan Module**.

Step 8 Remove the fan module bracket.

1. Pressing the latches on both sides of the fan module bracket, lift the fan module bracket vertically. See (1) and (2) in **Figure 8-192**.
2. Remove the other fan module bracket in the same way.

Figure 8-192 Removing a fan module bracket



Step 9 Remove the VGA and DVD drive cables from the mainboard and front-drive backplane.

For details, see **7 Internal Cabling**.

Step 10 Remove the bracket.

1. Pull the bolt that secures the bracket. See (1) in **Figure 8-193**.
2. Push out the bracket horizontally. See (2) in **Figure 8-193**.

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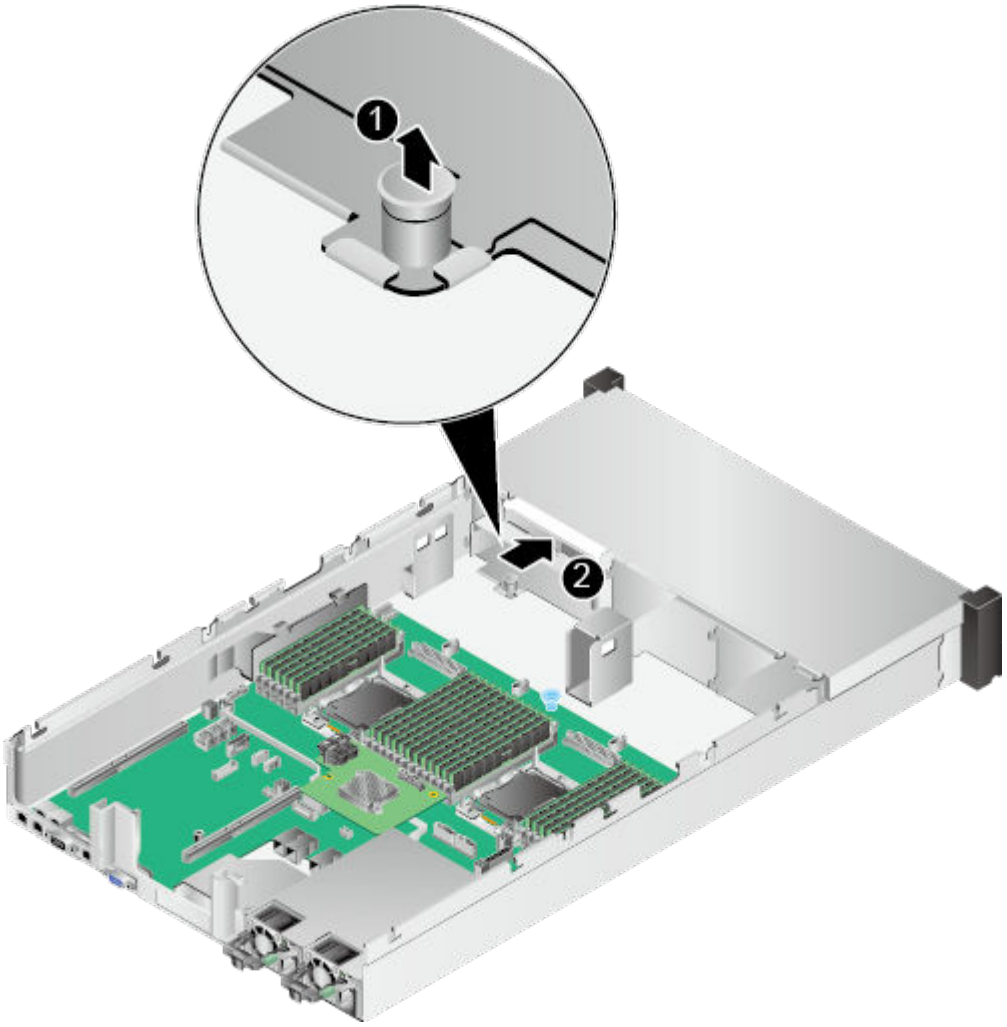
Figure 8-193 Removing the bracket



Step 11 Take the component out of its ESD bag.

Step 12 Determine the position of the VGA board.

Step 13 Install the VGA board.

1. Place the VGA board onto the bracket. See (1) in **Figure 8-194**.
2. Tighten the screws to secure the VGA board. See (2) in **Figure 8-194**.
3. Connect the signal cable to the VGA board.

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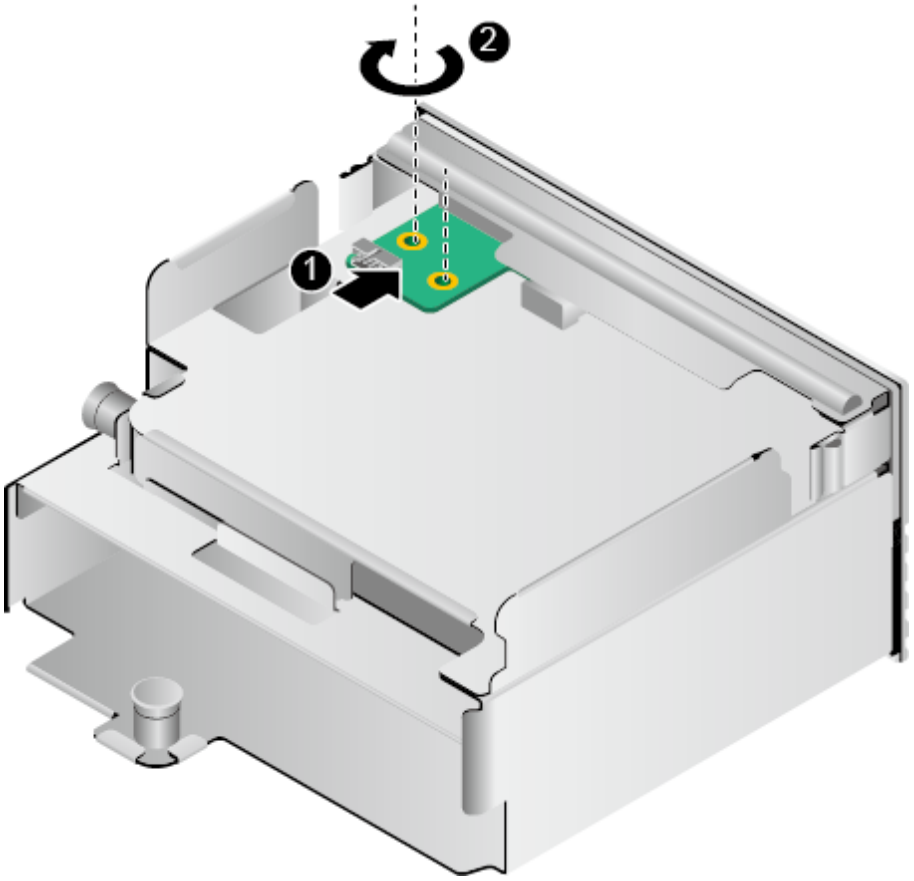
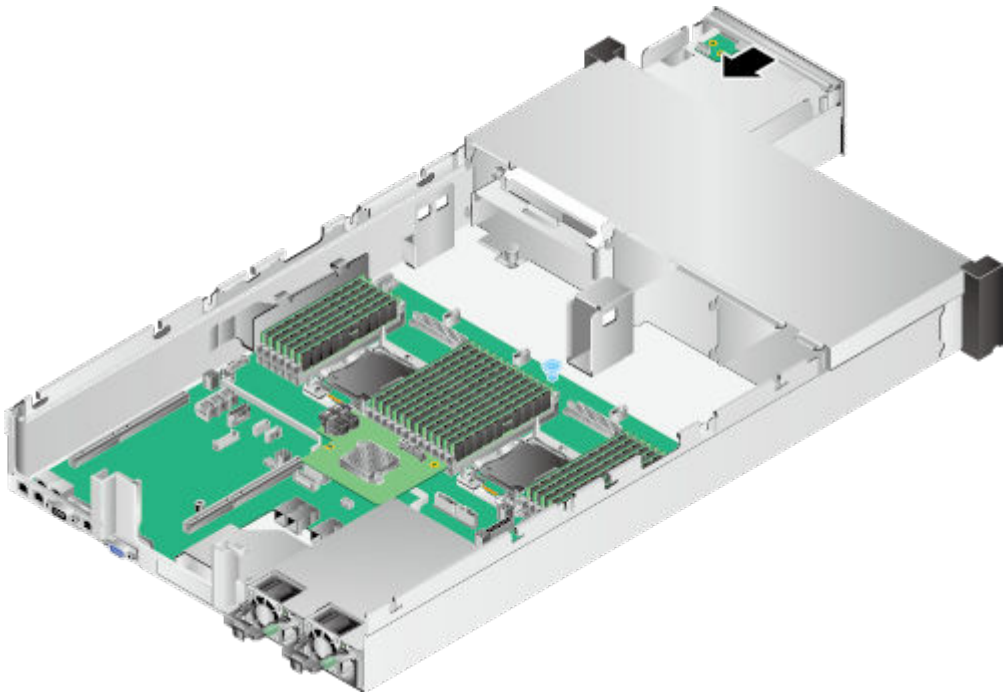
Figure 8-194 Installing the VGA board



Step 14 Push the bracket into the chassis.

Figure 8-195 Installing the bracket



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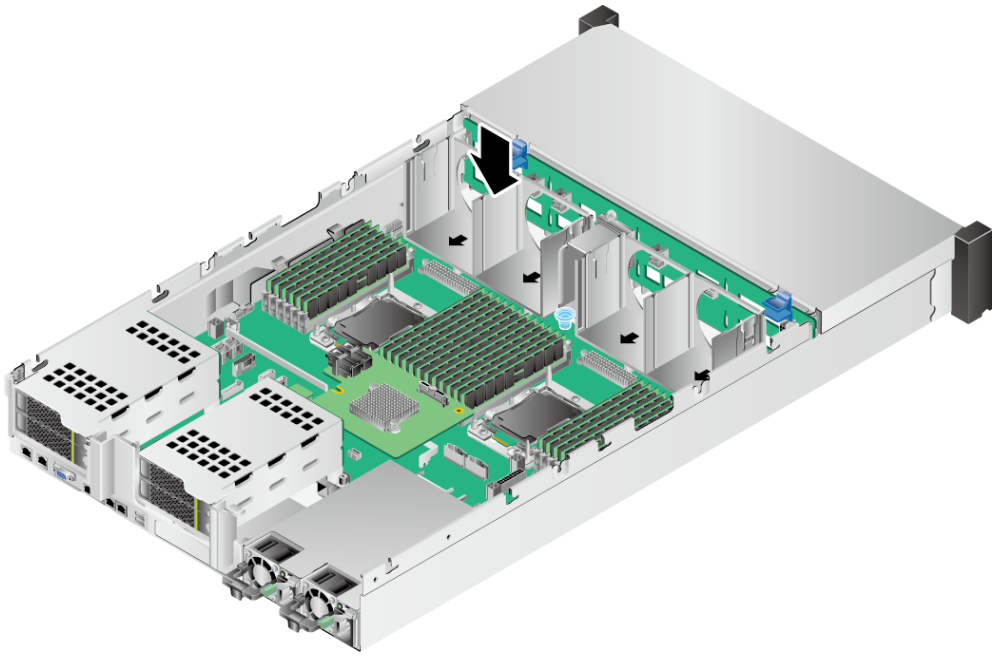
Step 15 Connect all the cables.

For details, see **7 Internal Cabling**.

Step 16 Install all the fan module brackets.

Figure 8-196 Installing a fan module bracket



Step 17 Install all fan modules.

For details, see **8.5.12 Installing a Fan Module**.

Step 18 Install the air duct or built-in drive module.

For details, see **8.5.60 Installing the Air Duct** or **8.5.36 Installing the Built-in Drive Module**.

Step 19 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 20 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 21 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 22 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

----End

8.5.45 Removing a USB Flash Drive

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8.5.45.1 Removing an External USB Flash Drive

Procedure

Step 1 Determine the position of the USB flash drive.

Step 2 Eject the USB flash drive.

- On the Linux OS, run the **umount** command.
- On the Windows OS, right-click the USB flash drive and choose **Eject** from the shortcut menu.

Step 3 Remove the USB flash drive from the USB port.

Figure 8-197 Removing a USB flash drive



Step 4 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

----End

8.5.45.2 Removing a Built-in USB Flash Drive

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

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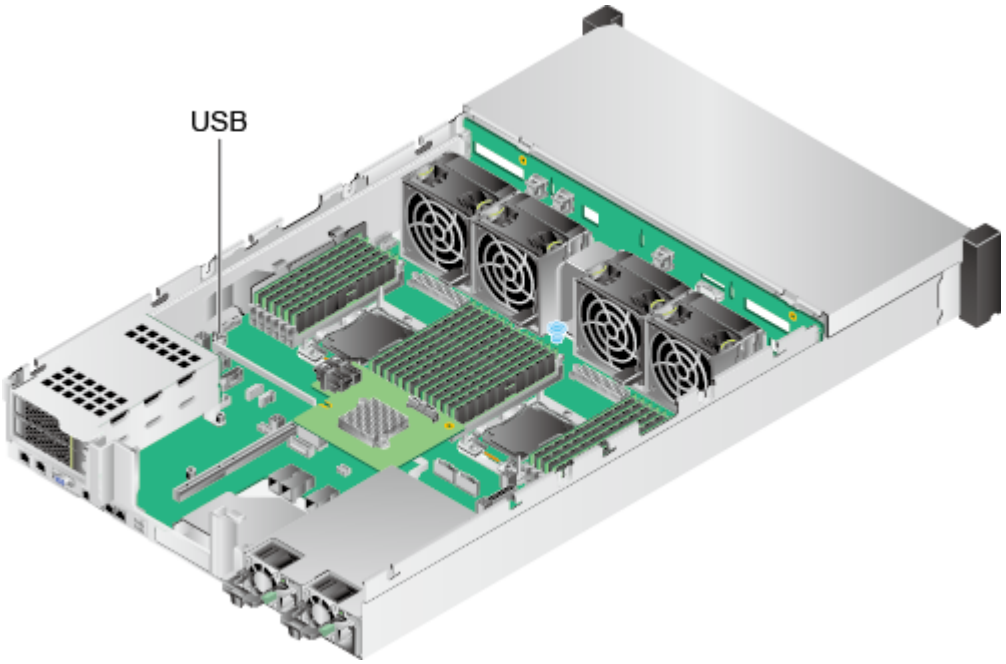
Step 6 Determine the position of the built-in USB flash drive.

Figure 8-198 Position of the built-in USB flash drive



Step 7 Remove the USB flash drive from the USB port.

Figure 8-199 Removing a USB flash drive



Step 8 Place the removed component in an ESD bag.

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NOTICE

Place only one component in an ESD bag.

----End

8.5.46 Installing a USB Flash Drive

8.5.46.1 Installing an External USB Flash Drive

Procedure

Step 1 Take the component out of its ESD bag.

Step 2 Determine the position of the USB flash drive.

Step 3 Insert the USB flash drive into the USB port.

Figure 8-200 Installing a USB flash drive



----End

8.5.46.2 Installing a Built-in USB Flash Drive

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

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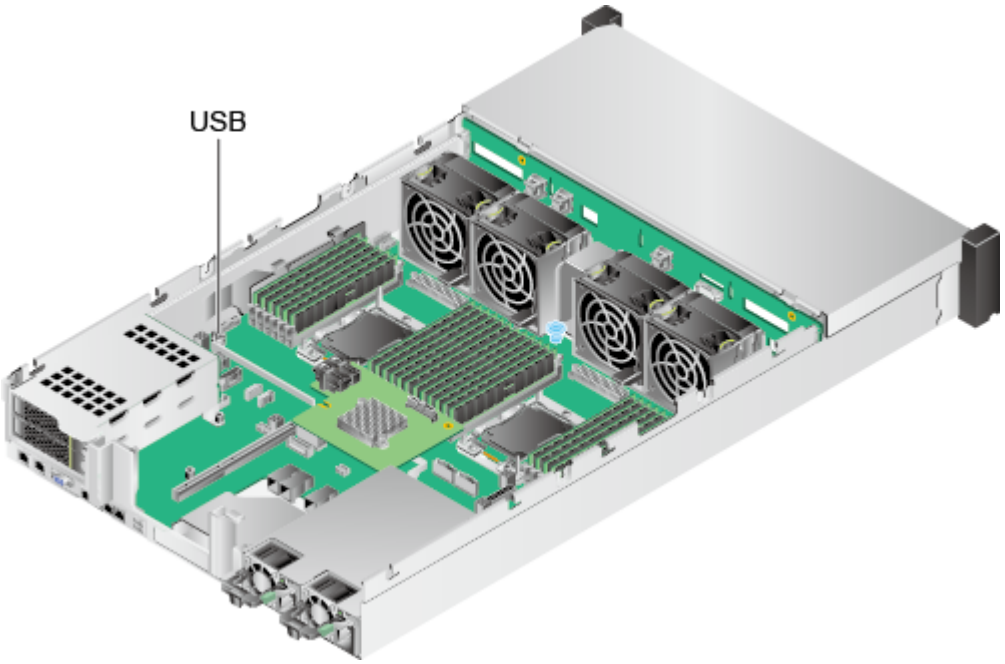
Step 6 Take the component out of its ESD bag.

Step 7 Determine the position of the built-in USB flash drive.

Figure 8-201 Position of the built-in USB flash drive



Step 8 Insert the USB flash drive into the USB port.

Figure 8-202 Installing a USB flash drive



Step 9 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 10 Install the server.

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For details, see **8.4.4 Installing a Server**.

Step 11 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 12 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

----End

8.5.47 Removing the Battery

Procedure

Step 1 Confirm the BIOS configuration.

CAUTION

After the battery is replaced, the original BIOS configuration will be lost. If the current BIOS parameters have been adjusted based on service scenarios, ensure that the parameter configuration is the same as that before the battery is replaced to ensure that services are not affected after the battery is replaced.

Step 2 Export the BIOS configuration file.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

NOTE

- The iBMC 2.32 and later versions support import and export of configuration files.
- The BIOS configuration file exported from the iBMC can be directly imported after the battery is replaced. If the exported configuration file contains ciphertext, change the ciphertext to plaintext and delete the comment tags from the line. For details about how to import and export configurations, see ***FusionServer Pro Rack Server iBMC User Guide***.
- The BIOS configuration file exported from the iBMC contains the configuration list. For details, see "Configuration File Description" in ***FusionServer Pro Rack Server iBMC User Guide***.
- If the iBMC cannot be logged in to or the BIOS configuration file is not exported before the battery is replaced, you need to manually reconfigure the BIOS after replacing the battery.

Step 3 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 4 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 5 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 6 Place the server on the ESD workstation.

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Step 7 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

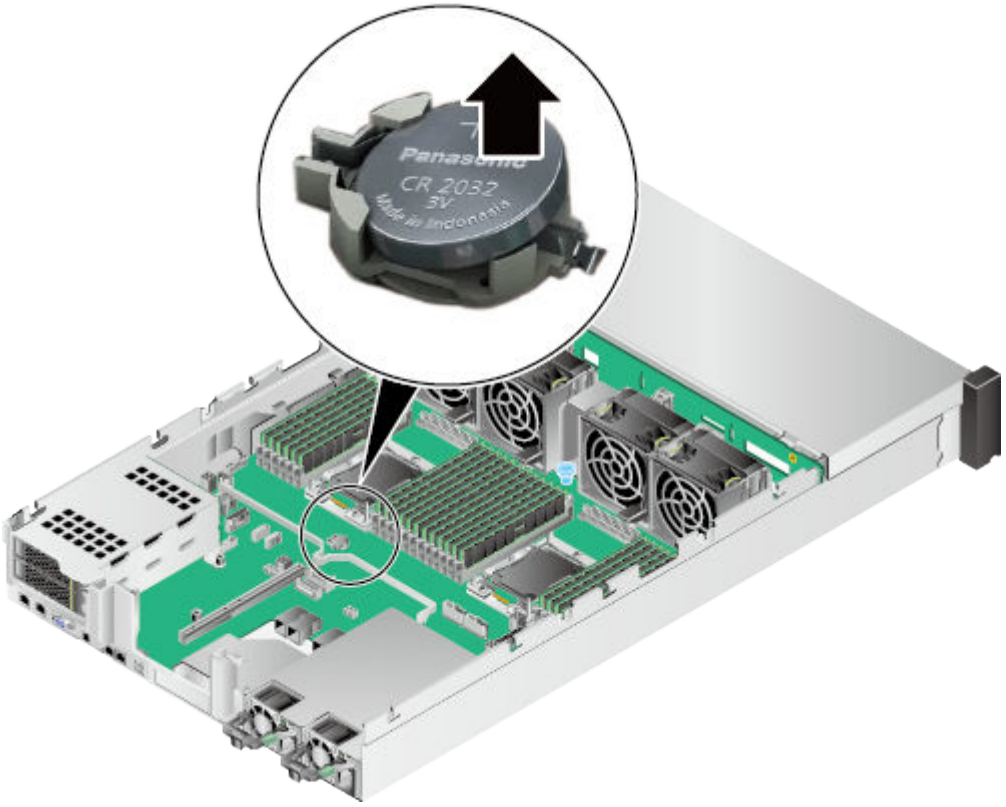
Step 8 Remove the screw-in RAID controller card.

For details, see **8.5.15.1 Removing the Screw-in RAID Controller Card**.

Step 9 Determine the position of the battery.

Step 10 Use a screwdriver to gently pry up the right end of the battery, and remove the entire battery.

Figure 8-203 Removing the battery



Step 11 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

----End

8.5.48 Installing the Battery

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

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Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Remove the screw-in RAID controller card.

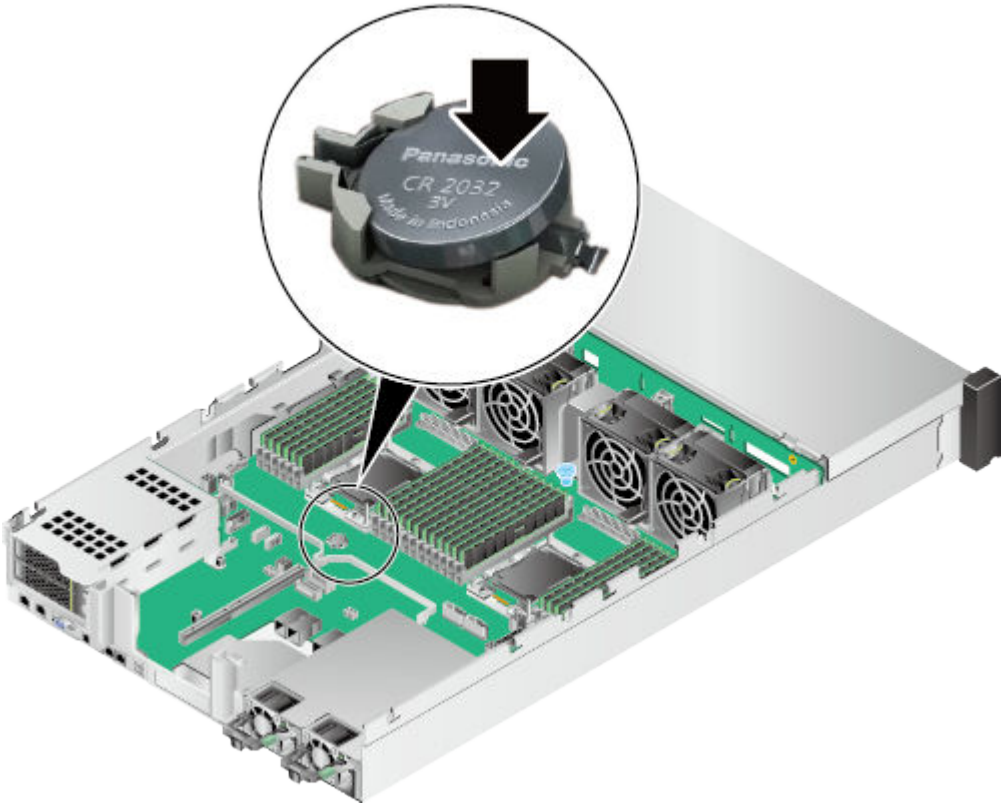
For details, see **8.5.15.1 Removing the Screw-in RAID Controller Card**.

Step 7 Take the component out of its ESD bag.

Step 8 Determine the position of the battery.

Step 9 Holding the battery with the text side facing upwards, insert the left end of the battery into the slot, and gently press down the whole battery into the slot.

Figure 8-204 Installing the battery



Step 10 Install the screw-in RAID controller card.

For details, see **8.5.16.1 Installing the Screw-in RAID Controller Card**.

Step 11 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

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Step 12 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 13 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 14 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 15 After the battery is replaced, the BIOS configuration is restored to the factory settings. You need to reconfigure the BIOS based on the site requirements.

NOTE

- The iBMC 2.32 and later versions support import and export of configuration files.
- The BIOS configuration file exported from the iBMC can be directly imported after the battery is replaced. If the exported configuration file contains ciphertext, change the ciphertext to plaintext and delete the comment tags from the line. For details about how to import and export configurations, see ***FusionServer Pro Rack Server iBMC User Guide***.
- The BIOS configuration file exported from the iBMC contains the configuration list. For details, see "Configuration File Description" in ***FusionServer Pro Rack Server iBMC User Guide***.
- If the iBMC cannot be logged in to or the BIOS configuration file is not exported before the battery is replaced, you need to manually reconfigure the BIOS after replacing the battery.

----End

8.5.49 Removing the Left Mounting Ear

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Remove the air duct or built-in drive module.

For details, see **8.5.59 Removing the Air Duct** or **8.5.35 Removing the Built-in Drive Module**.

Step 7 Determine the position of the left mounting ear.

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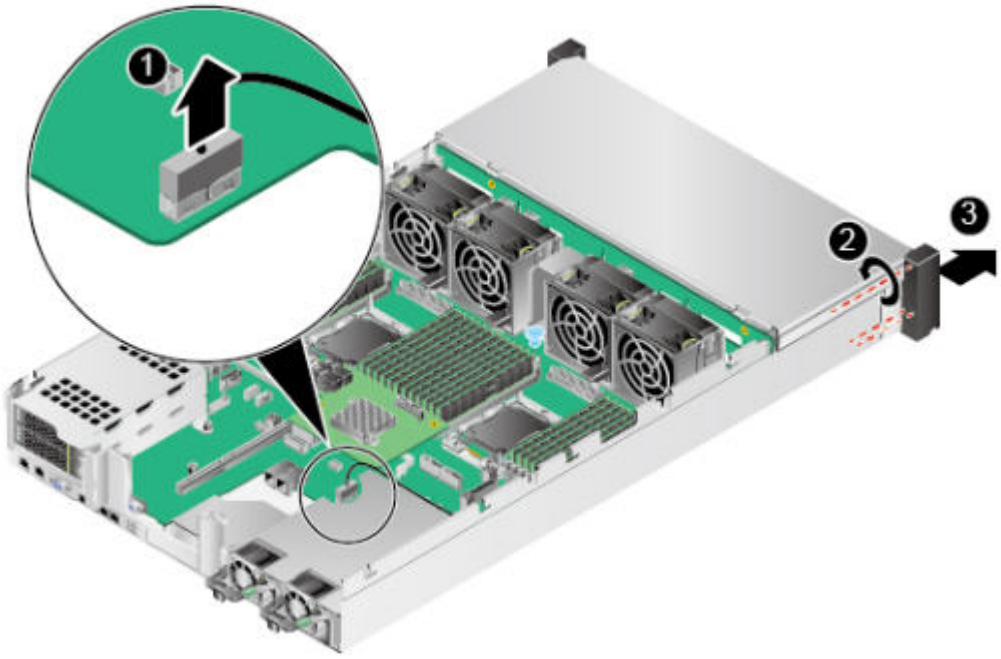
Step 8 Remove the left mounting ear.

1. Pressing the connector on the mounting ear signal cable, pull out the cable vertically. See (1) in **Figure 8-205**.
2. Loosen the screws that secure the mounting ear. See (2) in **Figure 8-205**.
3. Pull out the left mounting ear horizontally and slowly pull out its signal cable along the chassis wall. See (3) in **Figure 8-205**.

Figure 8-205 Removing the left mounting ear



Step 9 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

----End

8.5.50 Installing the Left Mounting Ear Board

Procedure

Step 1 Place the server on the ESD workstation.

Step 2 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 3 Remove the air duct or built-in drive module.

For details, see **8.5.59 Removing the Air Duct** or **8.5.35 Removing the Built-in Drive Module**.

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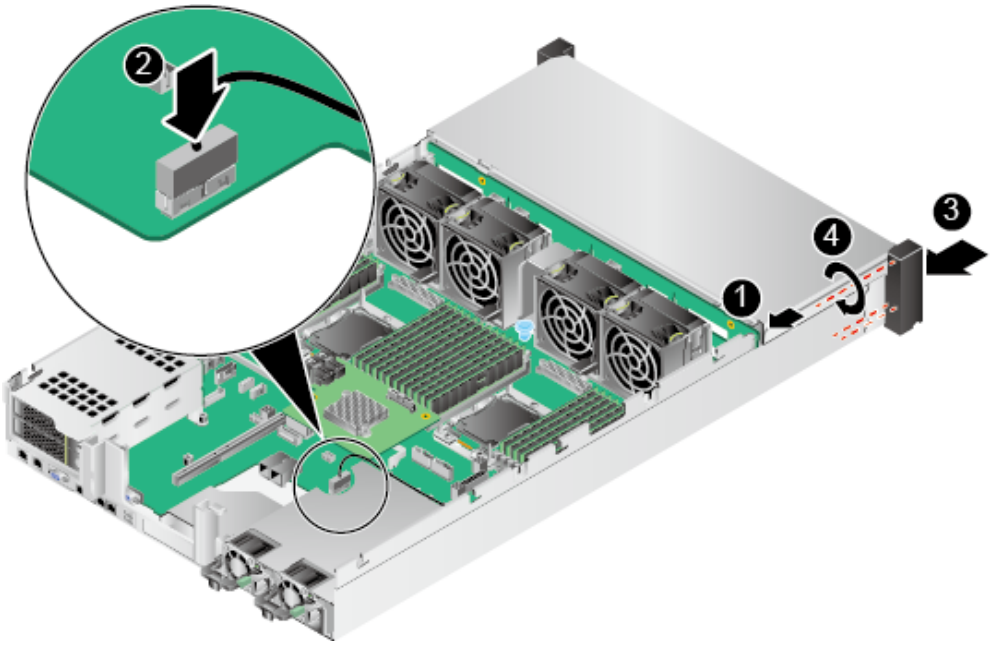
Step 4 Take the component out of its ESD bag.

Step 5 Determine the position of the left mounting ear.

Step 6 Install the left mounting ear.

1. Route the mounting ear signal cable through the chassis. See (1) in **Figure 8-206**.
2. Connect the signal cable to the connector of the left mounting ear on the mainboard. See (2) in **Figure 8-206**.
3. Install the left mounting ear. See (3) in **Figure 8-206**.
4. Tighten the screw to secure the mounting ear. See (4) in **Figure 8-206**.

Figure 8-206 Installing the left mounting ear



Step 7 Install the air duct or built-in drive module.

For details, see **8.5.60 Installing the Air Duct** or **8.5.36 Installing the Built-in Drive Module**.

Step 8 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 9 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 10 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 11 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 12 Check the indicators on the left mounting ear for fault.

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For details, see **2.1.2 Indicators and Buttons**.

----End

8.5.51 Removing the Right Mounting Ear

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Remove the air duct or built-in drive module.

For details, see **8.5.59 Removing the Air Duct** or **8.5.35 Removing the Built-in Drive Module**.

Step 7 Determine the position of the right mounting ear.

Step 8 Remove the right mounting ear.

1. Pressing the connector on the mounting ear signal cable, pull out the cable vertically. See (1) in **Figure 8-207**.
2. Loosen the screws that secure the mounting ear. See (2) in **Figure 8-207**.
3. Pull out the right mounting ear horizontally and slowly pull out its signal cable along the chassis wall. See (3) in **Figure 8-207**.

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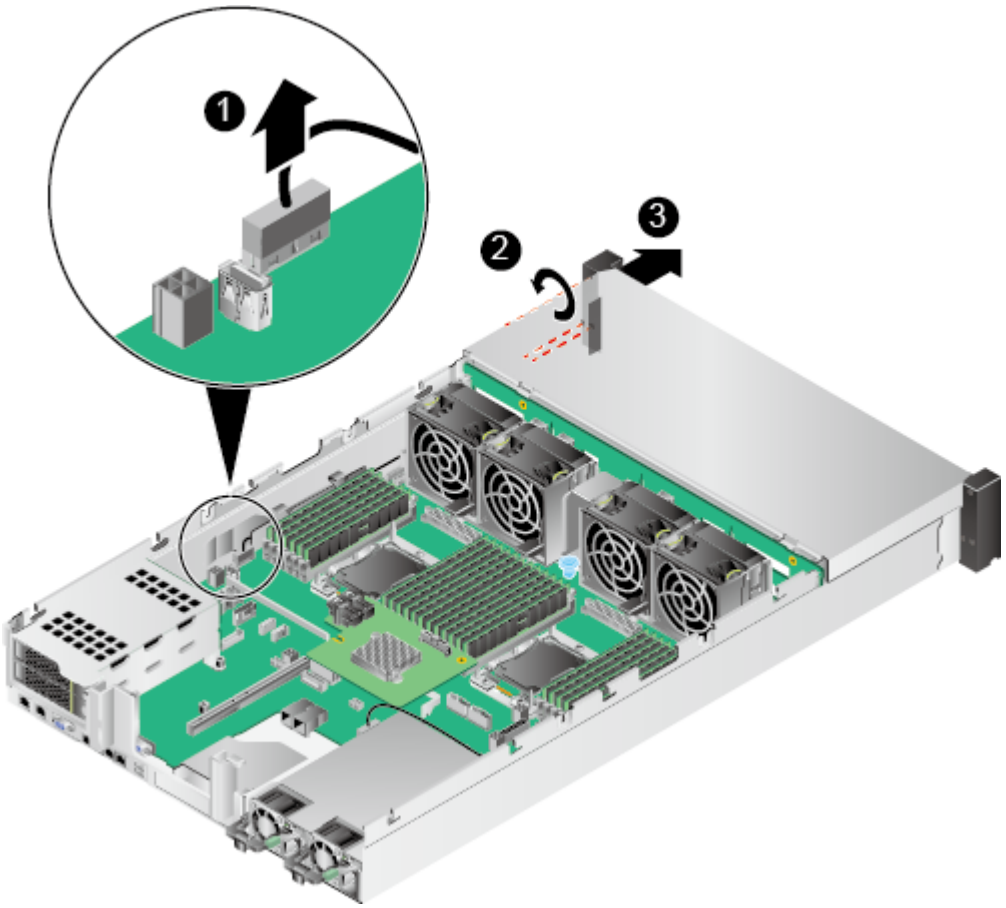
Figure 8-207 Removing the right mounting ear



Step 9 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

----End

8.5.52 Installing the Right Mounting Ear Board

Procedure

Step 1 Place the server on the ESD workstation.

Step 2 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 3 Remove the air duct or built-in drive module.

For details, see **8.5.59 Removing the Air Duct** or **8.5.35 Removing the Built-in Drive Module**.

Step 4 Take the component out of its ESD bag.

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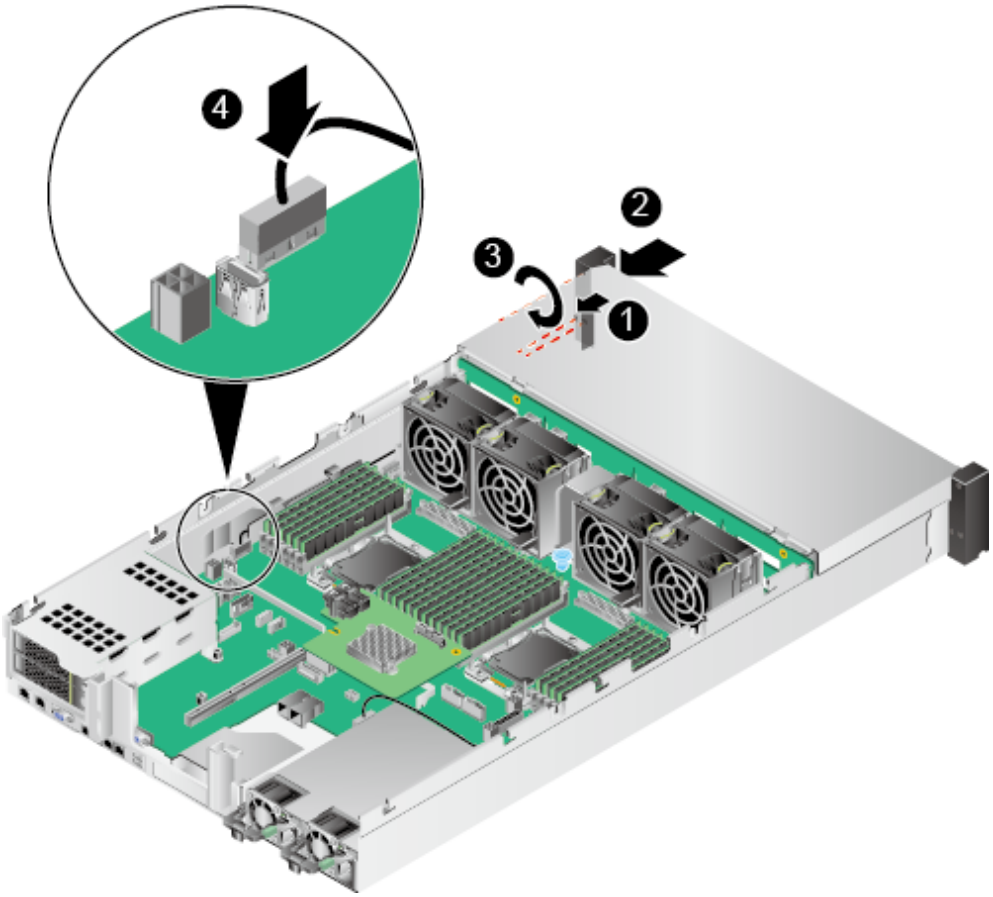
Step 5 Determine the position of the right mounting ear.

Step 6 Install the right mounting ear.

1. Route the mounting ear signal cable through the chassis. See (1) in **Figure 8-208**.
2. Install the right mounting ear. See (2) in **Figure 8-208**.
3. Tighten the screw to secure the mounting ear. See (3) in **Figure 8-208**.
4. Connect the signal cable to the connector of the right mounting ear on the mainboard. See (4) in **Figure 8-208**.

Figure 8-208 Installing the right mounting ear



Step 7 Install the air duct or built-in drive module.

For details, see **8.5.60 Installing the Air Duct** or **8.5.36 Installing the Built-in Drive Module**.

Step 8 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 9 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 10 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

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Step 11 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 12 Check the indicators on the right mounting ear for fault.

For details, see **2.1.2 Indicators and Buttons**.

----End

8.5.53 Removing a PCIe Card

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Determine the slot and position of the PCIe card.

For details, see **2.7.2 PCIe Slots**.

Step 7 Remove the PCIe riser modules.

For details, see **8.5.55 Removing a PCIe Riser Module** .

Step 8 Remove the power cable from the PCIe card.

NOTE

Certain models of PCIe CPU video cards must be connected with dedicated power cables. Before removing such a PCIe card, remove the power cable from the GPU.

Step 9 Remove the PCIe card.

- Remove a PCIe card from the PCIe riser module in I/O module 1 or 2.
  a. Push the bucket outwards to release it. See (1) in **Figure 8-209**.
  b. Rotate the PCIe card latch to open it. See (2) in **Figure 8-209**.
  c. Remove the PCIe card horizontally. See (3) in **Figure 8-209**.

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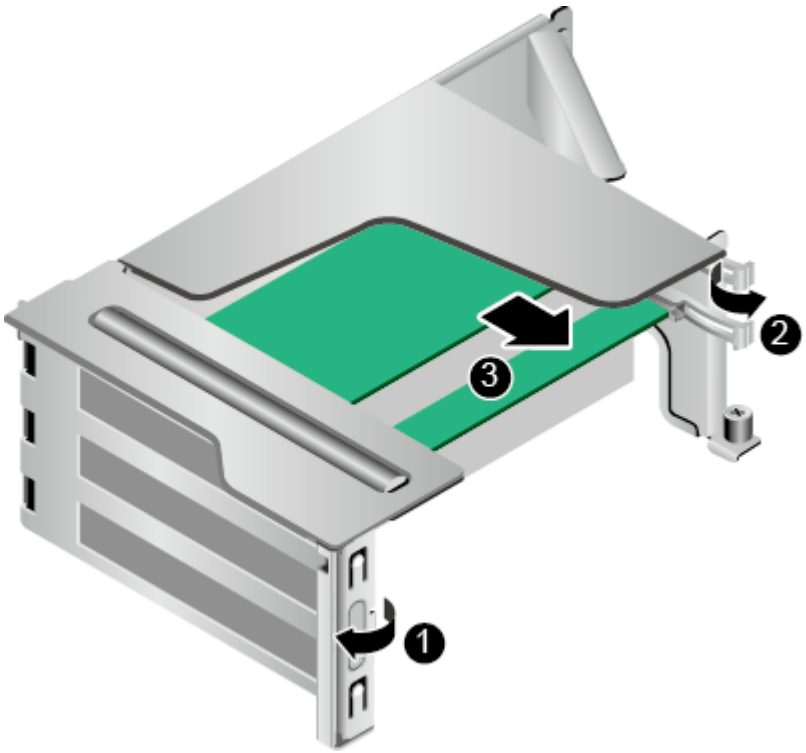
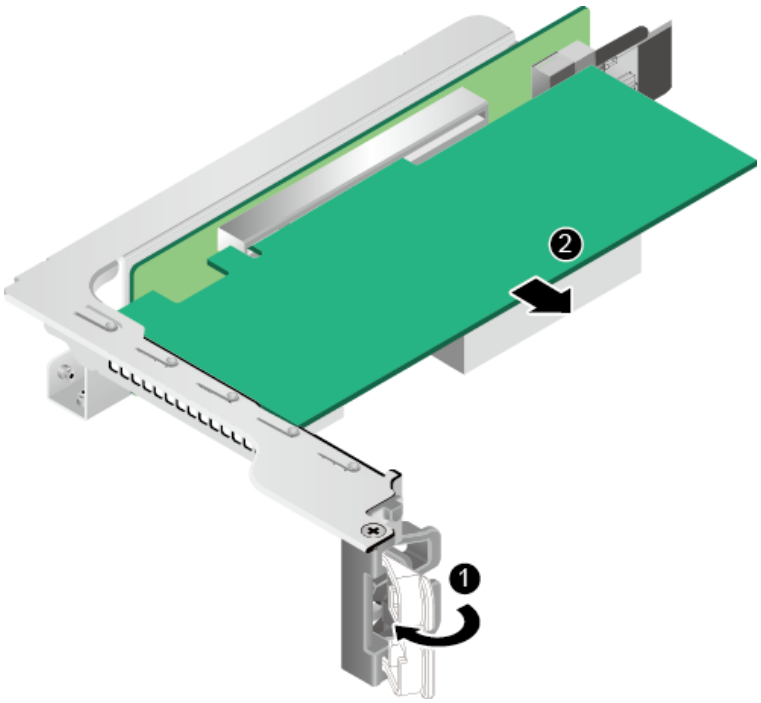
Figure 8-209 Removing a PCIe card from I/O module 2 (example)



- Remove a PCIe card from the PCIe riser module in I/O module 3.
  a. Push the buckle outwards to release it. See (1) in **Figure 8-210**.
  b. Remove the PCIe card horizontally. See (2) in **Figure 8-210**.

Figure 8-210 Removing a PCIe card



Step 10 Remove the front panel of a faulty PCIe card.

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NOTICE

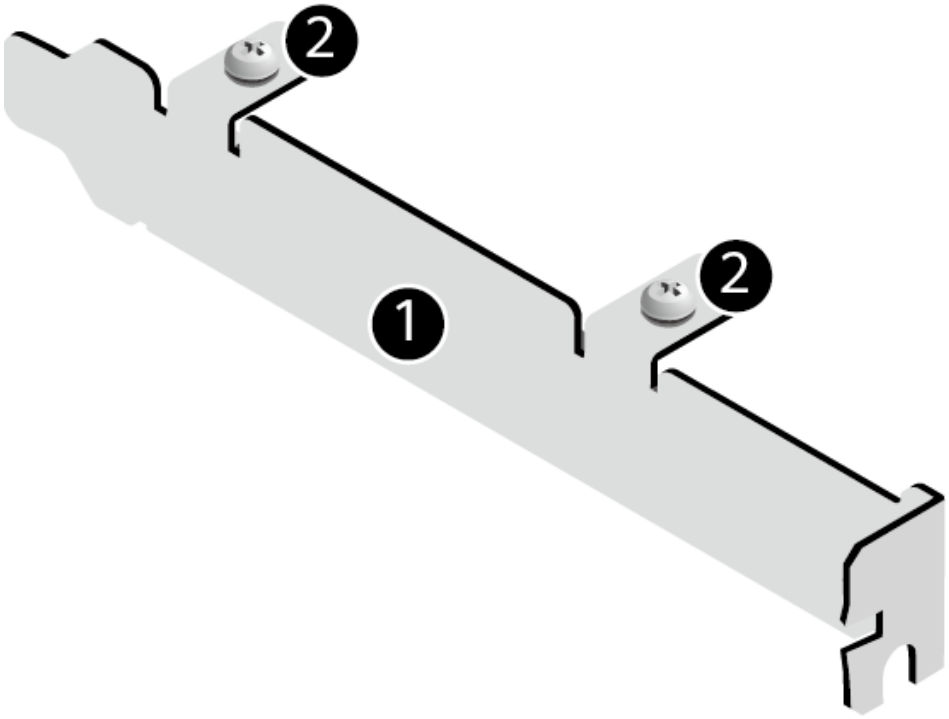
When returning the faulty PCIe card for repair, the customer must remove and retain the front panel and screws of the faulty PCIe card and return only the faulty card.

For details, see the following description:

- If the spare PCIe card does not have a front panel or the front panel of the spare PCIe card is inconsistent with that of the faulty PCIe card, use the front panel of the faulty PCIe card to replace that of the spare PCIe card and then install the spare PCIe card on the server.
- If the front panel of the spare PCIe card is the same as that of the faulty PCIe card, no replacement is required.
- The number and positions of screws vary depending on the PCIe card front panel model.

For details about the components that do not need to be returned, see **Figure 8-211**.

Figure 8-211 Parts that do not need to be returned (example)



Use a Phillips screwdriver to loosen the screws fastening the front panel and remove the front panel. See (1) and (2) in **Figure 8-212**.

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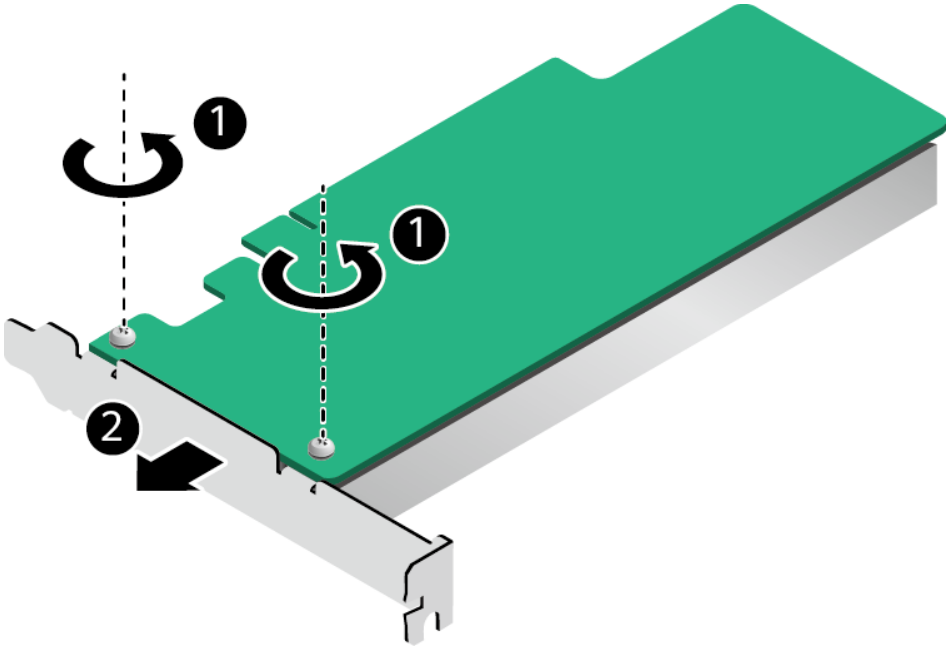
Figure 8-212 Removing the PCIe card front panel (example)



Step 11 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

Step 12 Install a filler panel.

NOTE

Perform this operation only when a PCIe card is not installed immediately.

Figure 8-213 Installing a filler panel in I/O module 2 (example)

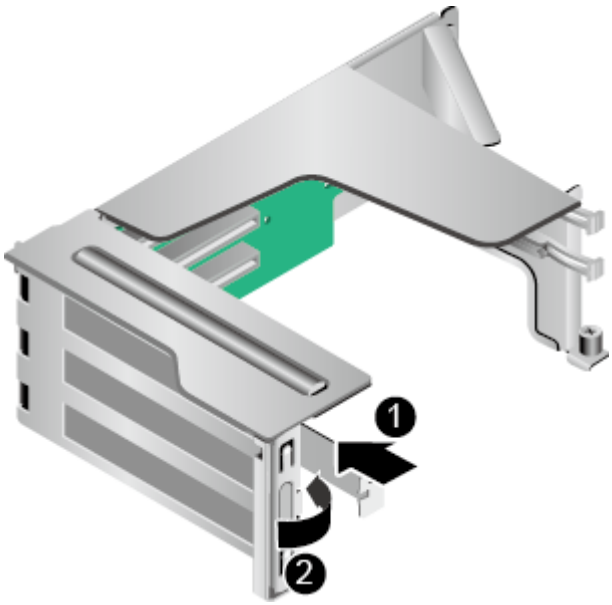


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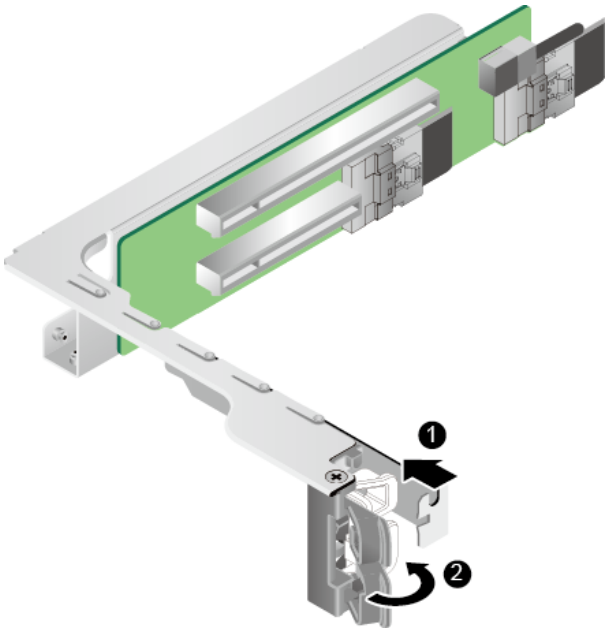
Figure 8-214 Installing a filler panel in I/O module 3 (example)



----End

8.5.54 Installing a PCIe Card

Use the **Computing Product Compatibility Checker** to obtain information about the precautions and accessories for installing the GPU card.

A PCIe riser module is required for installing GPU cards. If the PCIe riser module does not support GPU cards, contact your local Huawei sales representative.

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Determine the slot and position of the PCIe card.

For details, see **2.7.2 PCIe Slots**.

Step 7 Remove the PCIe riser modules.

For details, see **8.5.55 Removing a PCIe Riser Module** .

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Step 8 Remove the filler panel.

NOTE

Perform this operation only when a filler panel is installed.

Figure 8-215 Removing a filler panel from I/O module 2 (example)

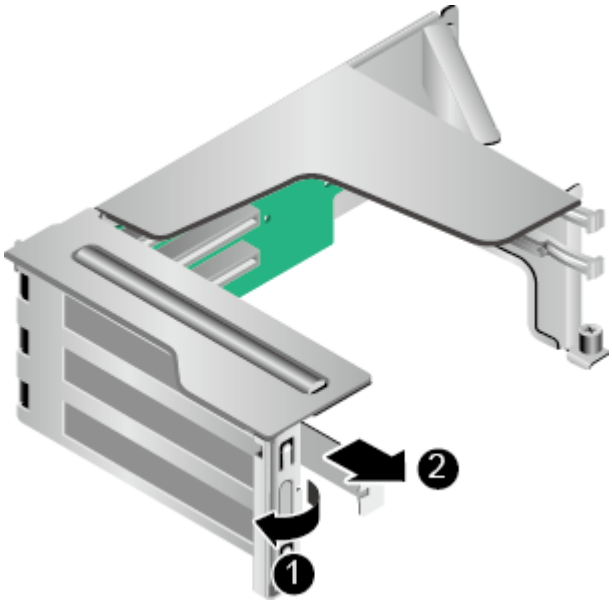
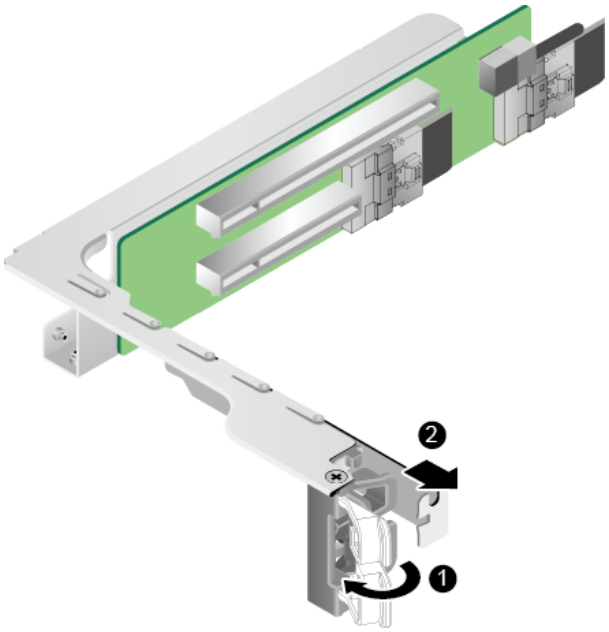


Figure 8-216 Removing a filler panel from I/O module 3 (example)



Step 9 Take the component out of its ESD bag.

Step 10 Replace the front panel of the spare PCIe card.

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NOTICE

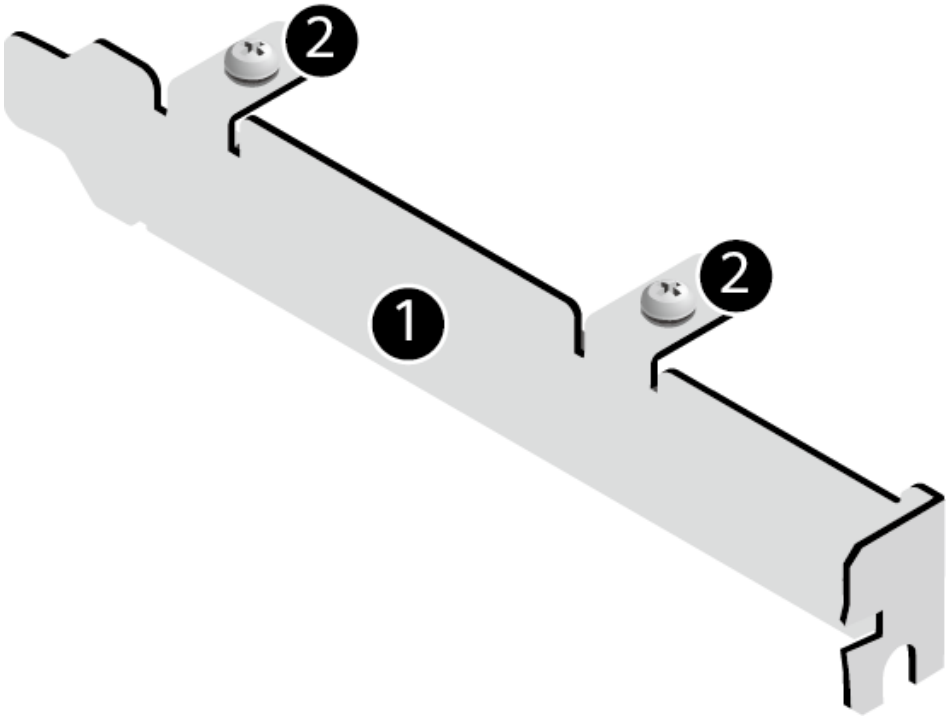
When returning the faulty PCIe card for repair, the customer must remove and retain the front panel and screws of the faulty PCIe card and return only the faulty card.

For details, see the following description:

- If the spare PCIe card does not have a front panel or the front panel of the spare PCIe card is inconsistent with that of the faulty PCIe card, use the front panel of the faulty PCIe card to replace that of the spare PCIe card and then install the spare PCIe card on the server.
- If the front panel of the spare PCIe card is the same as that of the faulty PCIe card, no replacement is required.
- The number and positions of screws vary depending on the PCIe card front panel model.

For details about the components that do not need to be returned, see **Figure 8-217**.

Figure 8-217 Parts that do not need to be returned (example)



1. Remove the front panel of the spare PCIe card.

   Use a Phillips screwdriver to loosen the screws fastening the front panel and remove the front panel. See (1) and (2) in **Figure 8-218**.

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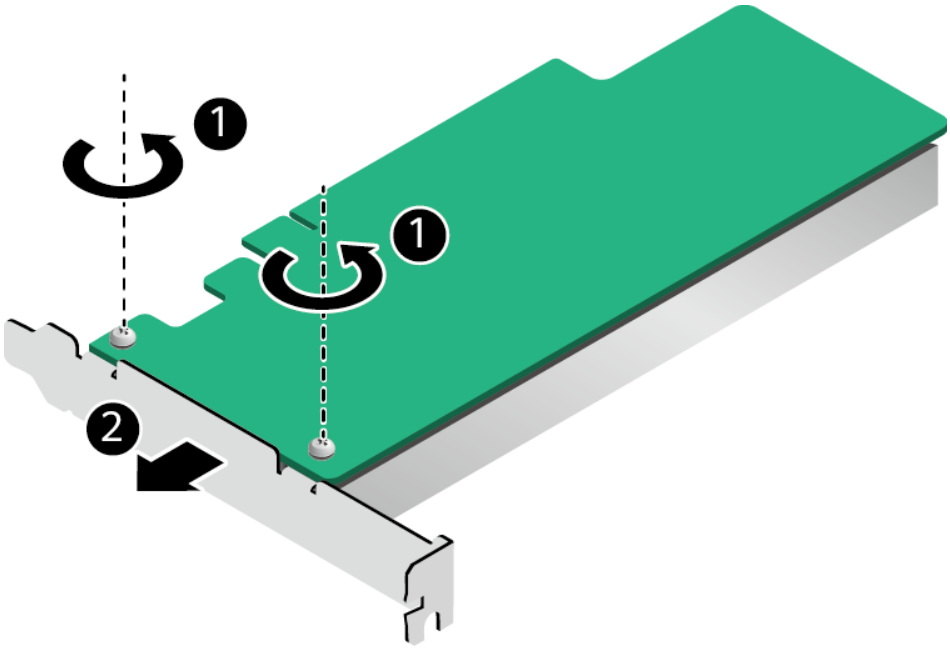
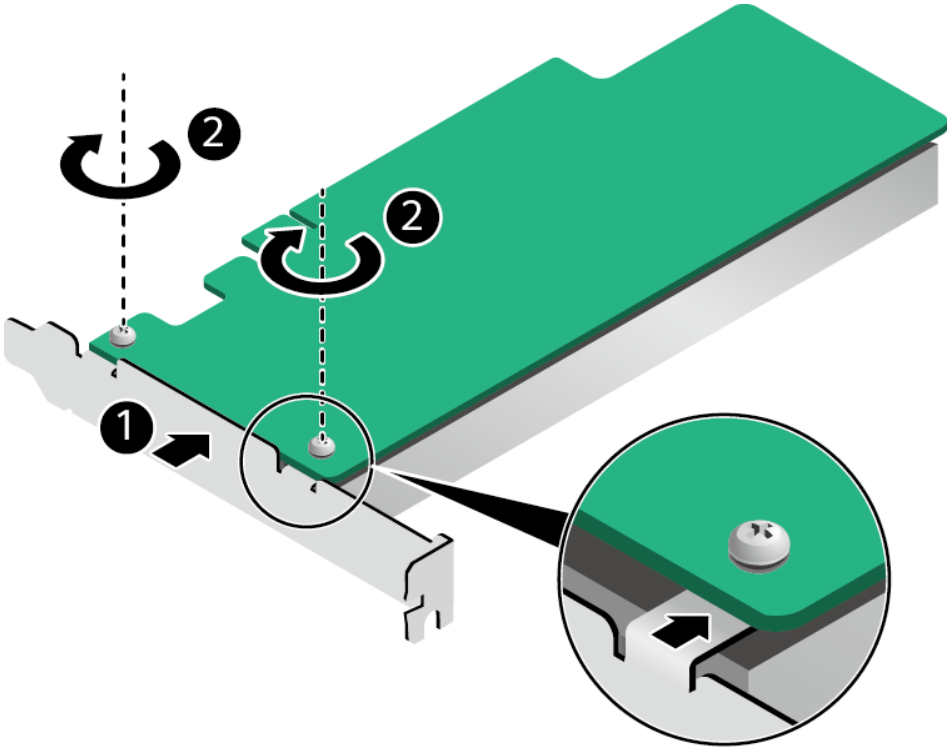
Figure 8-218 Removing the PCIe card front panel (example)



2. Install the front panel of a PCIe card.

   Insert the front panel into the PCIe card horizontally, align it with the screw holes on the PCIe card, and tighten the screws on the front panel using a Phillips screwdriver. See (1) and (2) in **Figure 8-219**.

Figure 8-219 Installing the PCIe card front panel (example)



Step 11 Install the PCIe card.

- Install the PCIe card on the PCIe riser module in I/O module 1 or 2.

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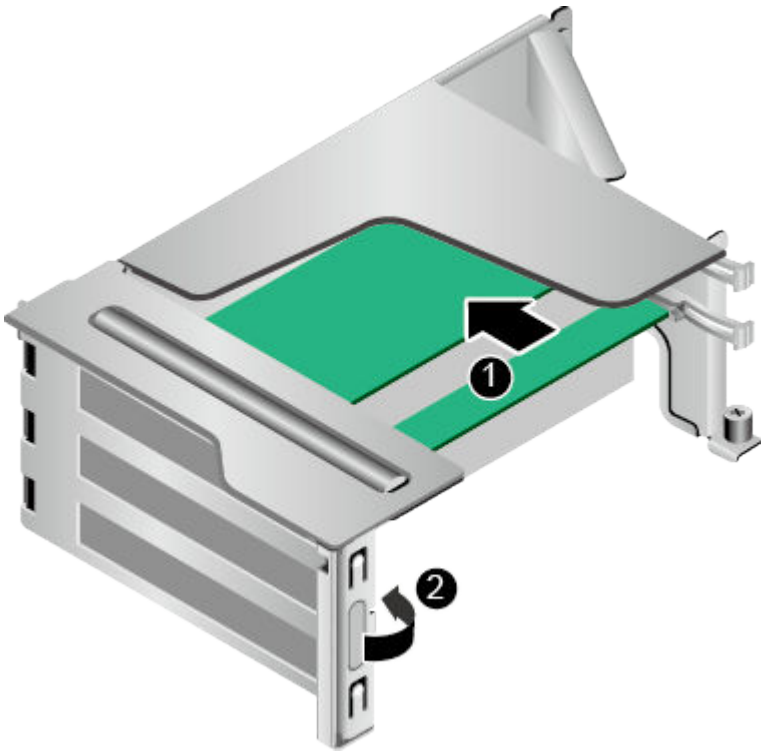
a. Insert the PCIe card in to the slot. See (1) in **Figure 8-220**.
b. Fasten the PCIe card latch. See (2) in **Figure 8-220**.

Figure 8-220 Installing a PCIe card in I/O module 2 (example)



- Install the PCIe card on the PCIe riser module in I/O module 3.
  a. Insert the PCIe card in to the slot. See (1) in **Figure 8-221**.
  b. Fasten the PCIe card latch. See (2) in **Figure 8-221**.

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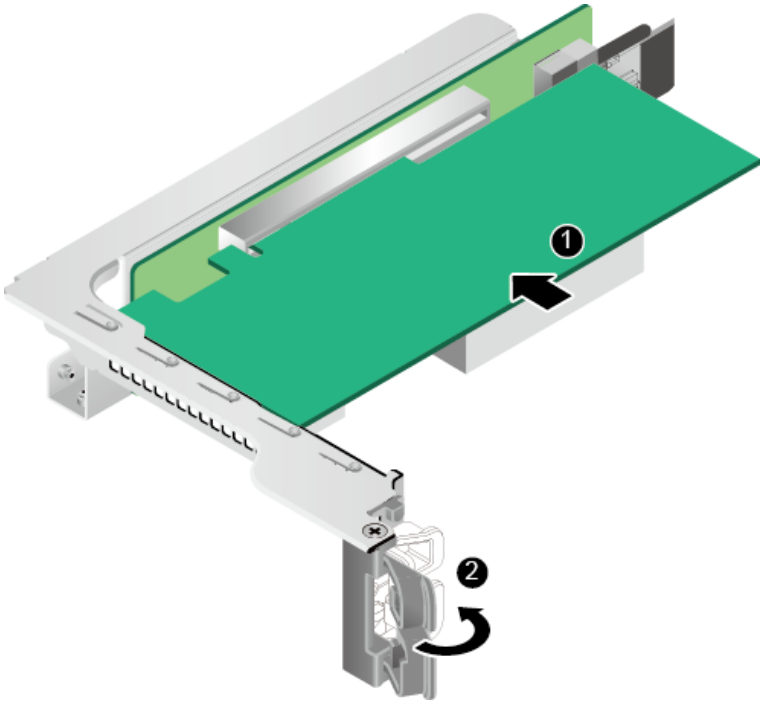
Figure 8-221 Installing a PCIe card



Step 12 Connect the power cable to the PCIe card.

NOTE

Certain models of PCIe CPU video cards must be connected with dedicated power cables. Connect the power cable to the GPU card correctly. The silkscreen of the two power connectors on the mainboard for connecting GPU cables is J2 and J5.

- No power cable is used.
- Using a 6-pin power cable

  Connect the 6-pin connector on the GPU to an 8-pin connector on the riser card.
- Using an 8-pin power cable

  Connect the 8-pin connector on the GPU to an 8-pin connector on the riser card.
- Using an 8-pin (one-to-two) power cable

  Connect the 8-pin connector on the GPU to an 8-pin connector on the riser card.

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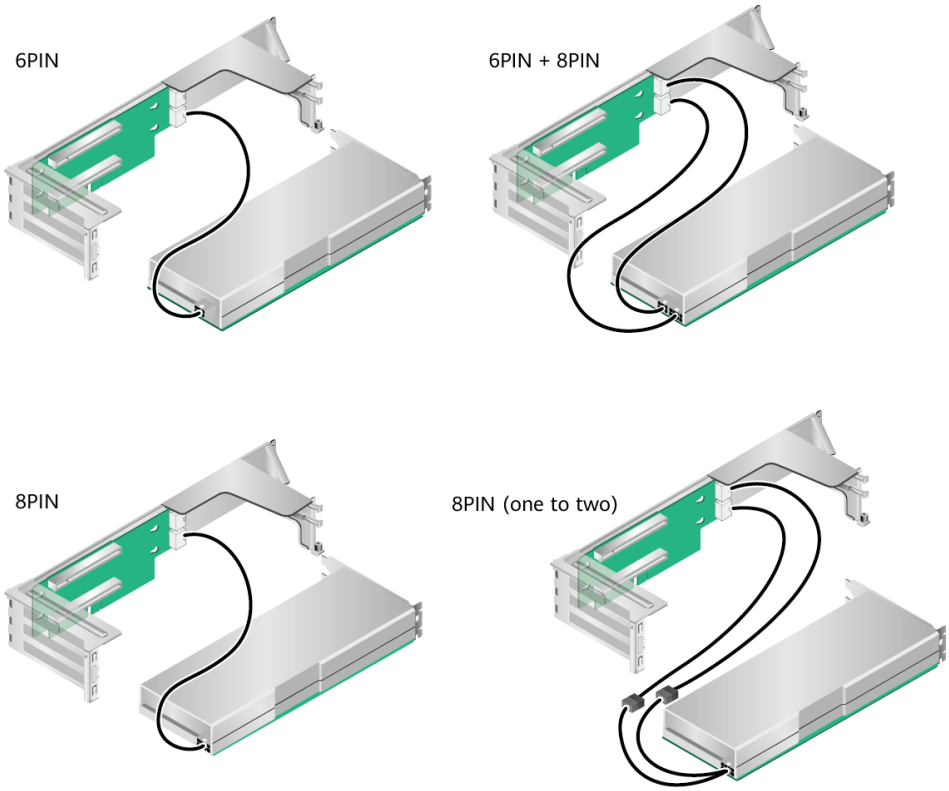
Figure 8-222 Connecting the power cable to a GPU card



Step 13 Install the PCIe riser modules.

For details, see **8.5.56 Installing a PCIe Riser Module**.

Step 14 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 15 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 16 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 17 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 18 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

Step 19 Install the driver for the PCIe card.

NOTE

If the new PCIe card model is different from the old PCIe card model, install the new PCIe card driver. If the PCIe card is a GPU, install the GPU driver. For details, see the ***NVIDIA GPU Card Driver Installation Guide***.

Step 20 Upgrade the firmware and driver to the target version.

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For details, see ***FusionServer Pro Rack Server Upgrade Guide***.

----End

8.5.55 Removing a PCIe Riser Module

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Determine the position of the PCIe riser module.

Step 7 Remove the PCIe riser module.

- Remove the PCIe riser module from I/O module 1 or 2.

  After removing the PCIe riser module, remove the PCIe card from the PCIe riser module.

  For details, see **8.5.53 Removing a PCIe Card**.

  NOTE

  The methods for removing the PCIe riser modules from I/O modules 1 and 2 are the same.

  – Remove the universal PCIe riser module.

    Lift the PCIe riser module.

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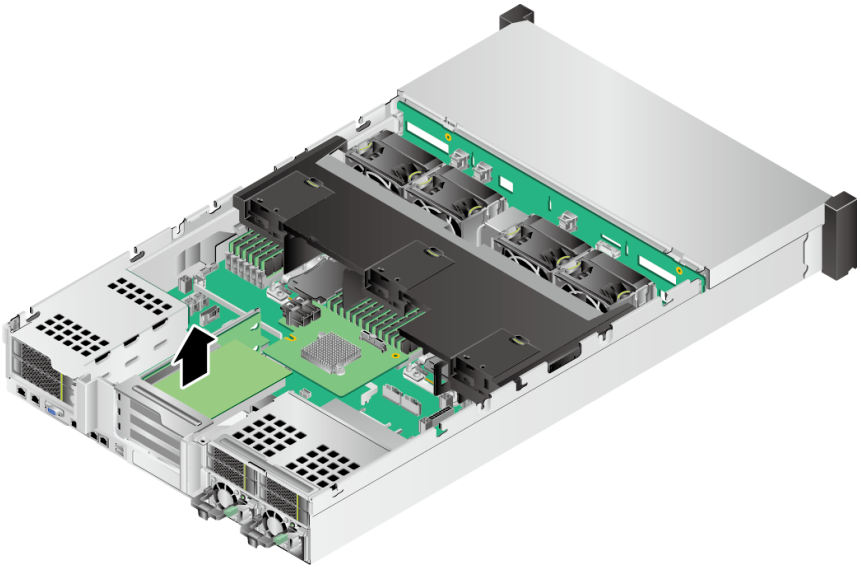
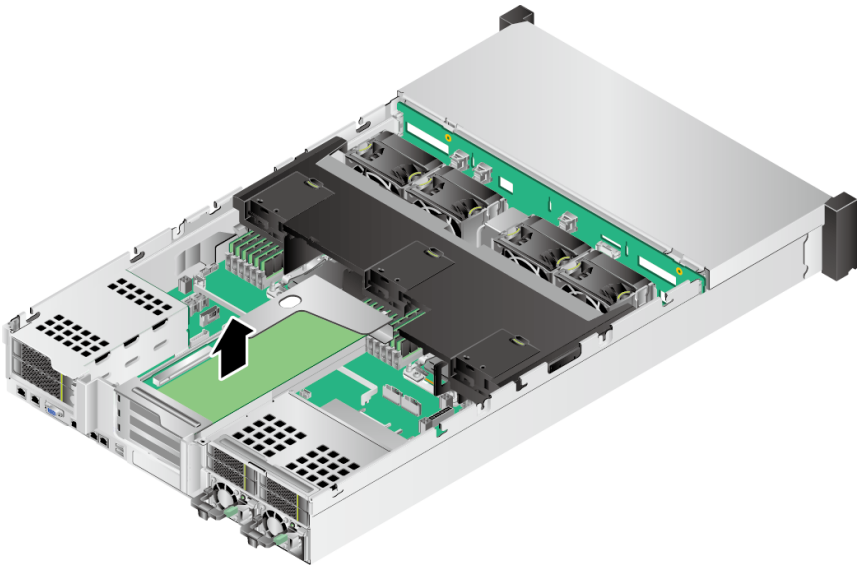
Figure 8-223 Removing the universal PCIe riser module



– Remove the PCIe riser module (for GPUs only).
  Lift the PCIe riser module.

Figure 8-224 Removing the PCIe riser module (for GPUs only)



– Remove the PCIe riser module (for ES3000 V3 SSD cards only).
  Loosen the screw on the PCIe riser module, and lift the PCIe riser module.

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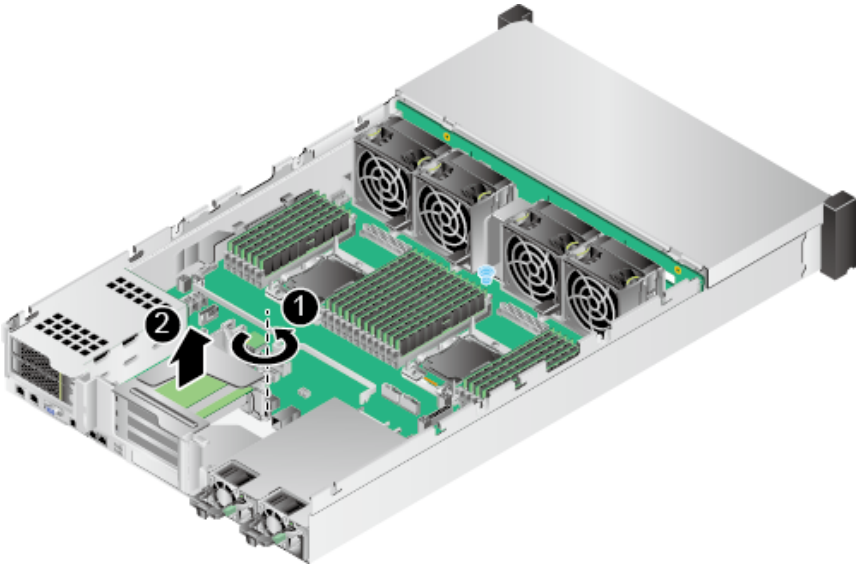
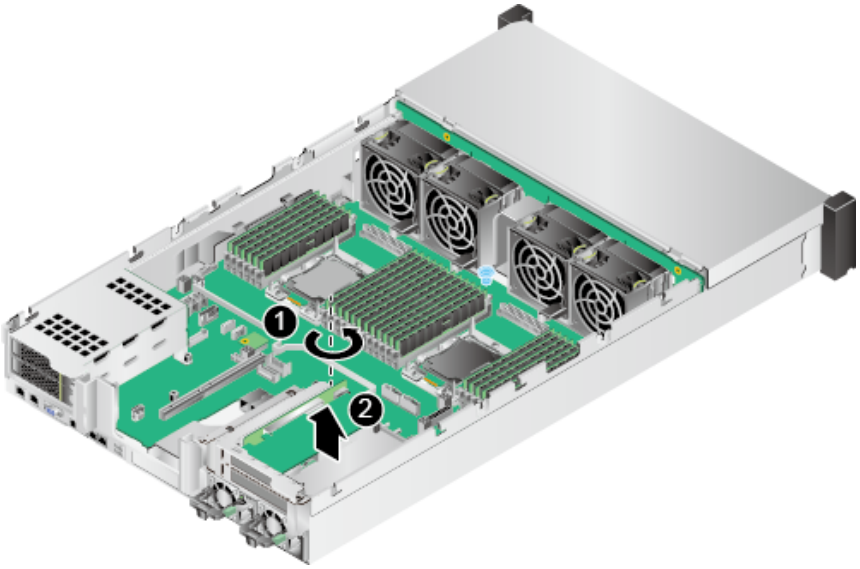
Figure 8-225 Removing the PCIe riser module from I/O module 2 (example)



- Remove the PCIe riser module from I/O module 3.
  a. Remove the signal cables and power cables from the mainboard.
  b. Loosen the screw on the PCIe riser module, and lift the PCIe riser module.

Figure 8-226 Removing the PCIe riser module



  c. Remove the PCIe card from the PCIe riser module.
     For details, see **8.5.53 Removing a PCIe Card**.
  d. Remove the signal cables and power cable from the riser card. See **Figure 8-227**.

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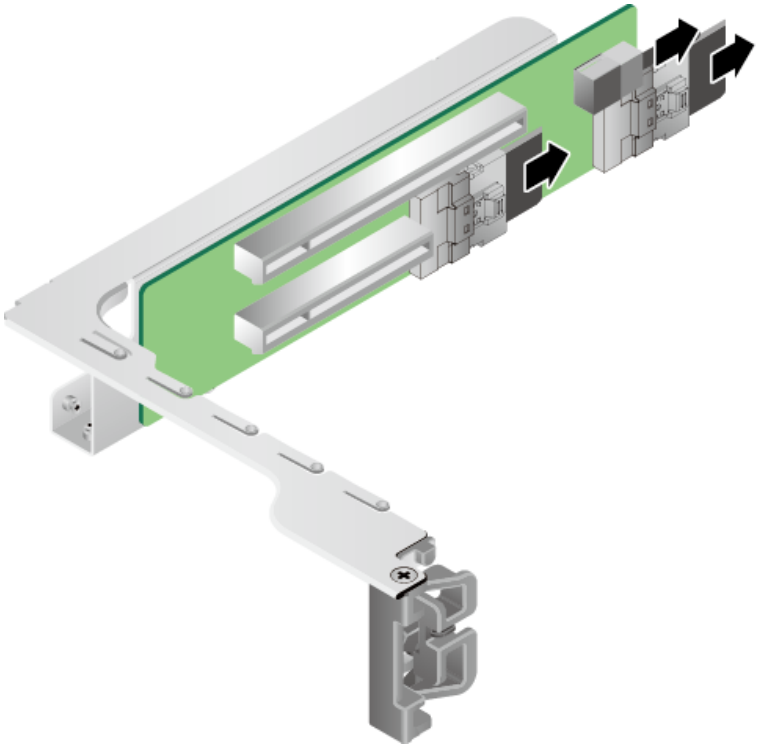
Figure 8-227 Removing the signal cables and power cables

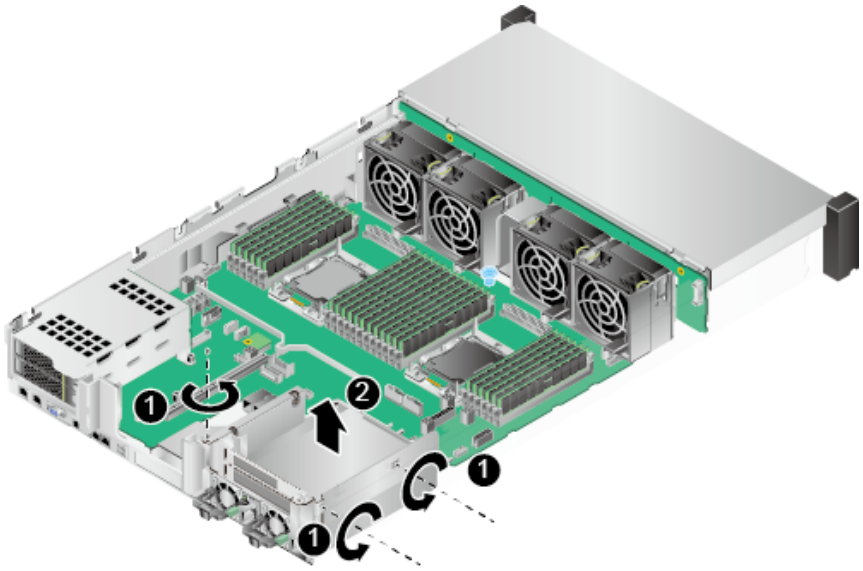


e. Remove the PCIe riser module base. See **Figure Removing the PCIe riser module base**.

NOTE

Perform this step only when you install a PCIe riser module in I/O module 3.

Figure 8-228 Removing the PCIe riser module base



Step 8 Place the removed component in an ESD bag.

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NOTICE

Place only one component in an ESD bag.

Step 9 Install a filler panel.

NOTE

Perform this operation only when a PCIe riser module is not installed immediately.

Figure 8-229 Installing a filler panel for I/O module 2 (example)

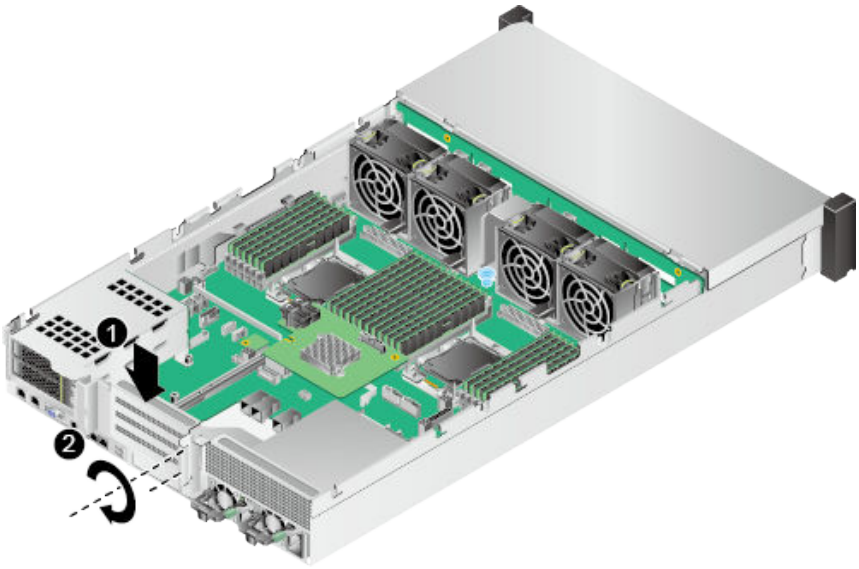
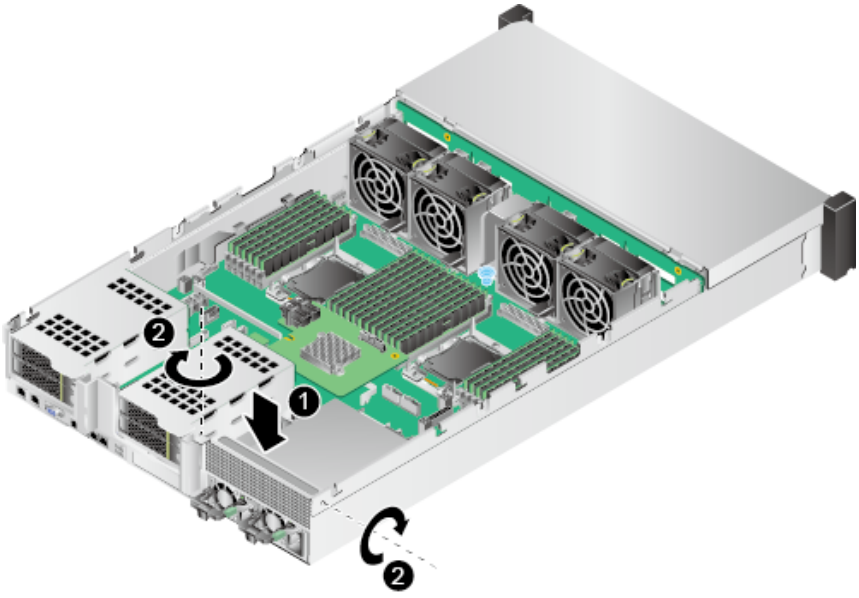


Figure 8-230 Installing a filler panel for I/O module 3 (example)



----End

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8.5.56 Installing a PCIe Riser Module

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Determine the position of the PCIe riser module.

Step 7 Remove the filler panel.

NOTE

- Perform this operation only when a filler panel is installed.
- Keep the removed filler panel properly.

Figure 8-231 Removing the filler panel from I/O module 2 (example)

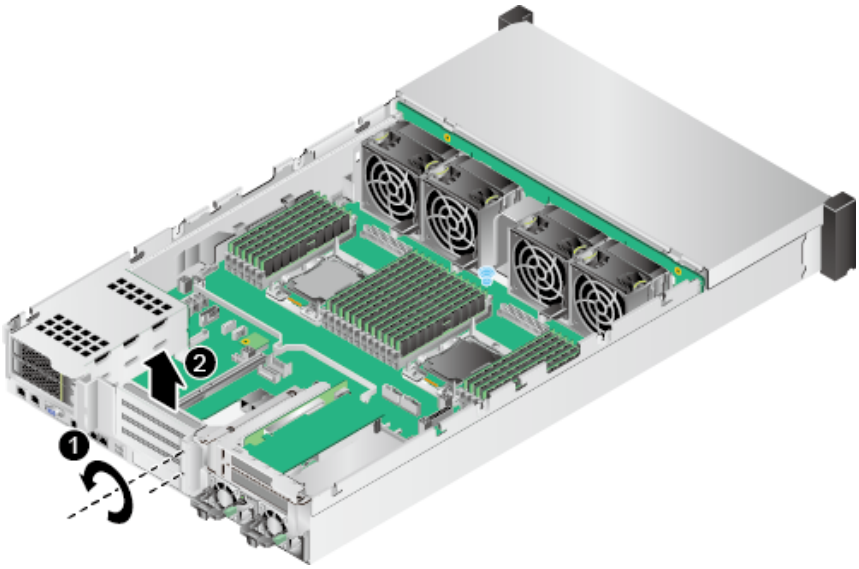

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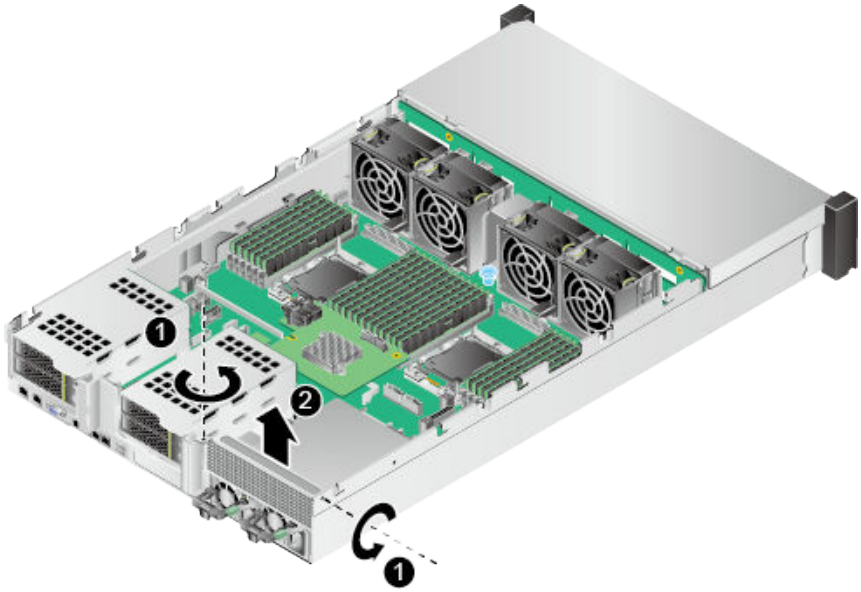
Figure 8-232 Removing the filler panel from I/O module 3 (example)



Step 8 Take the component out of its ESD bag.

Step 9 Install the PCIe riser module.

- Install the PCIe riser module in I/O module 1 or 2.

  Install the PCIe card on the PCIe riser module first.

  For details, see **8.5.54 Installing a PCIe Card**.

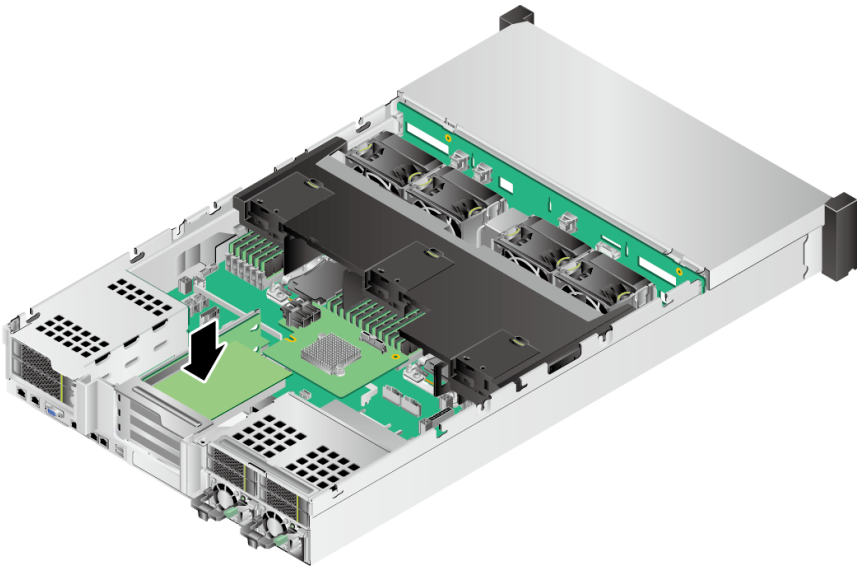
  NOTE

  The methods for installing the PCIe riser modules for I/O modules 1 and 2 are the same.

  – Universal PCIe riser module

    Place the PCIe riser module downwards in the slot.

    Figure 8-233 Installing the universal PCIe riser module



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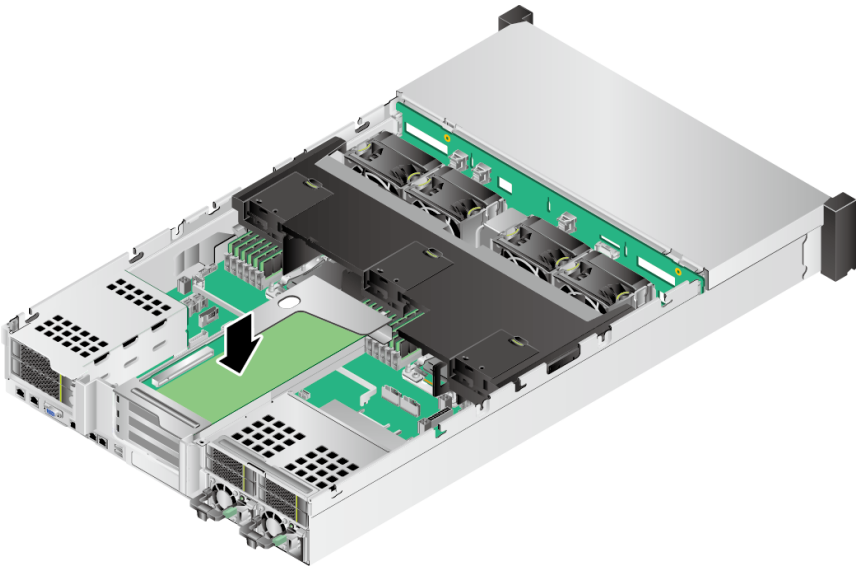
- PCIe riser module (for GPUs only)

  Place the PCIe riser module downwards in the slot.

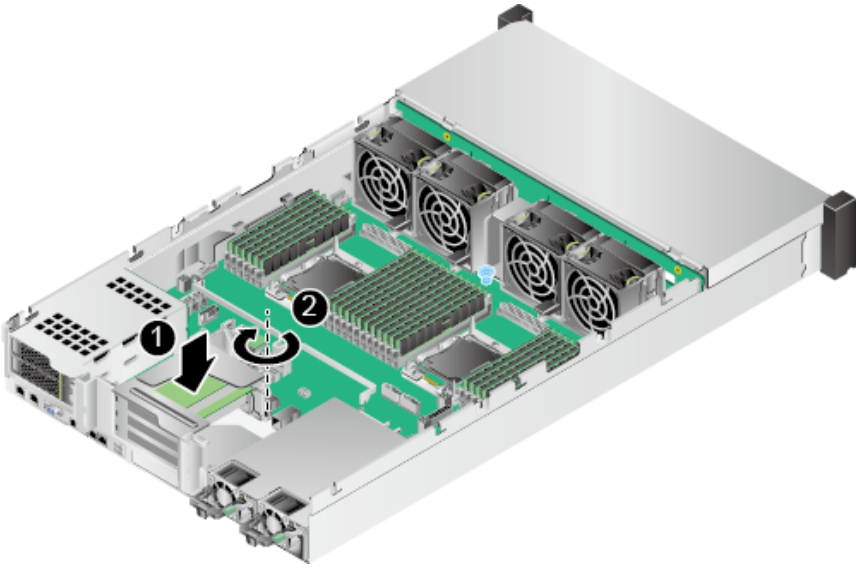
  Figure 8-234 Installing the PCIe riser module (for GPUs only)

- PCIe riser module (for ES3000 V3 SSD cards only)

  Place the PCIe riser module into the slot in the chassis, and tighten the screws.

  Figure 8-235 Installing the PCIe riser module in I/O module 2 (example)

- Install the PCIe riser module in I/O module 3

  a. Install the PCIe riser module base. See **Figure 8-236**.

  NOTE

  Perform this step only when you install a PCIe riser module in I/O module 3.

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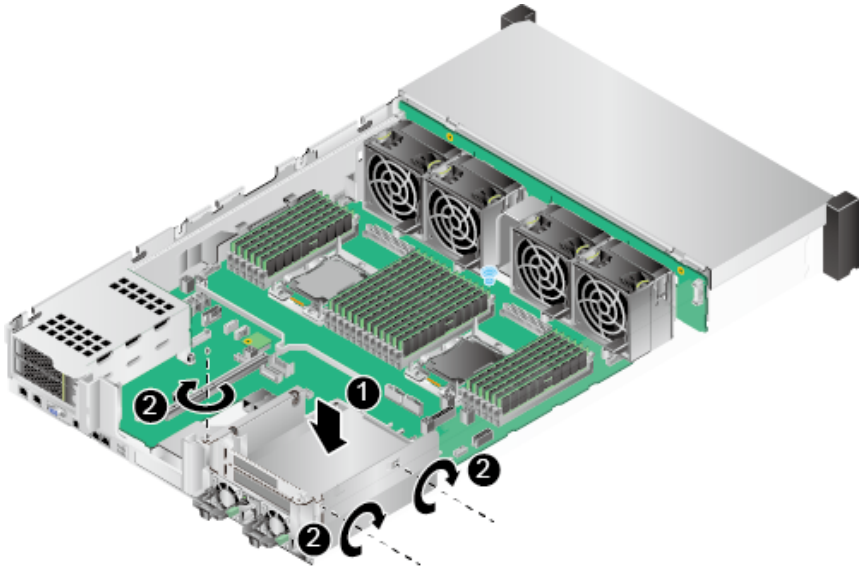
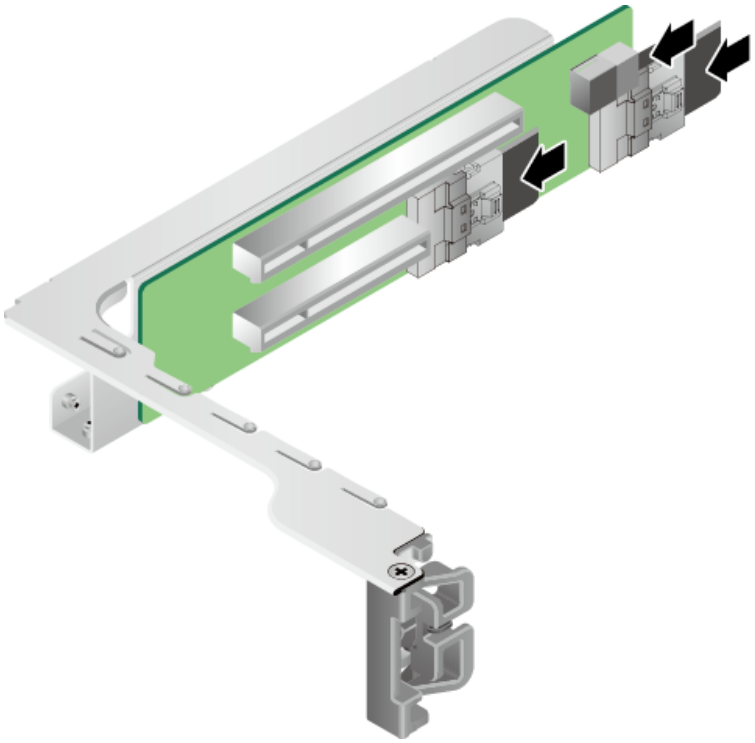
Figure 8-236 Installing a PCIe riser module base



b. Connect the signal cables and power cable to the riser card. See **Figure 8-237**.

Figure 8-237 Connecting the signal cables and power cable



c. Install PCIe card on the PCIe riser module.
   For details, see **8.5.54 Installing a PCIe Card**.
d. Install the PCIe riser module. See **Figure 8-238**.

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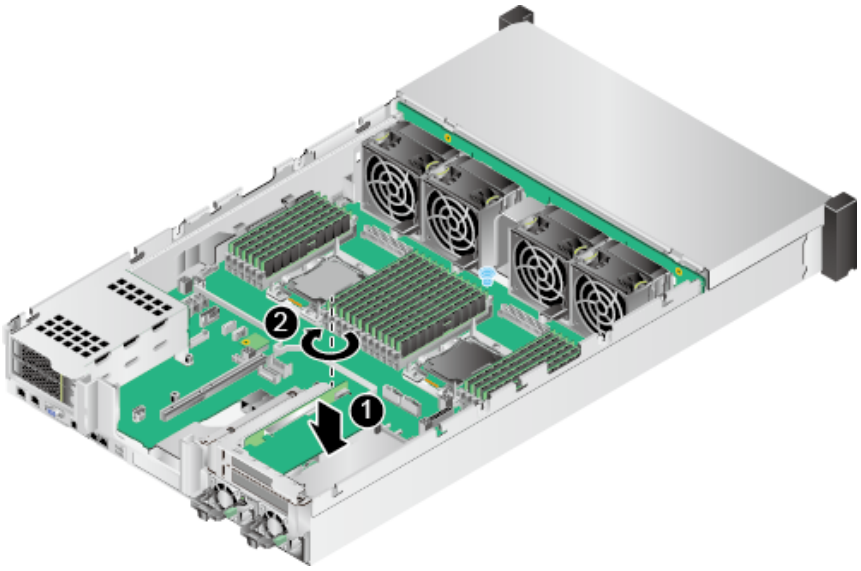
Figure 8-238 Installing the PCIe riser module



e. Connect the signal cables and power cable to the mainboard.

Step 10 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 11 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 12 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 13 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 14 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

----End

8.5.57 Removing the Front Bezel

The front bezel is installed on the front panel and comes with a lock to prevent unauthorized operations on drives and NMI button.

NOTE

- Only the 8 x 2.5" and 24 x 2.5" drive configurations support the NMI button.
- The front bezel is unlocked when delivered, and the key is in the inner side of the front bezel.

Procedure

Step 1 Determine the position of the front bezel.

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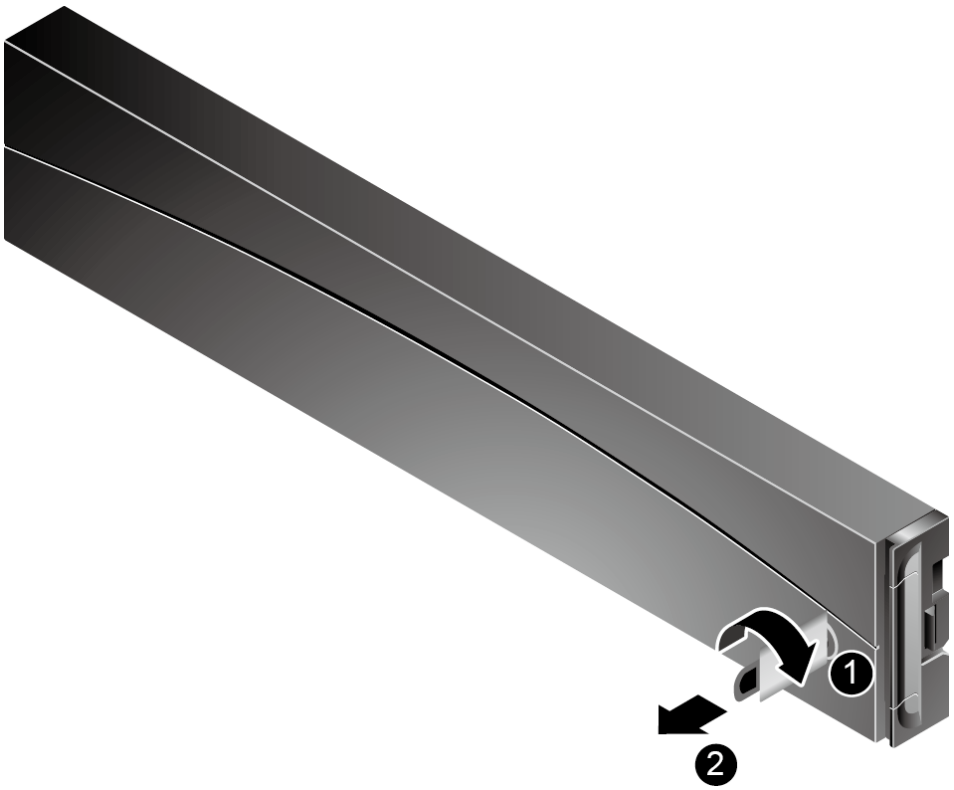
Step 2 Unlock the front bezel.

1. Insert the key into the keyway on the front bezel.
2. Unlock the front bezel. See (1) in **Figure 8-239**.
3. Remove the key. See (2) in **Figure 8-239**.

Figure 8-239 Unlocking the front bezel



Step 3 Remove the front bezel.

1. Press the release button on the front bezel. See (1) in **Figure 8-240**.
2. Remove the front bezel horizontally. See (2) in **Figure 8-240**.

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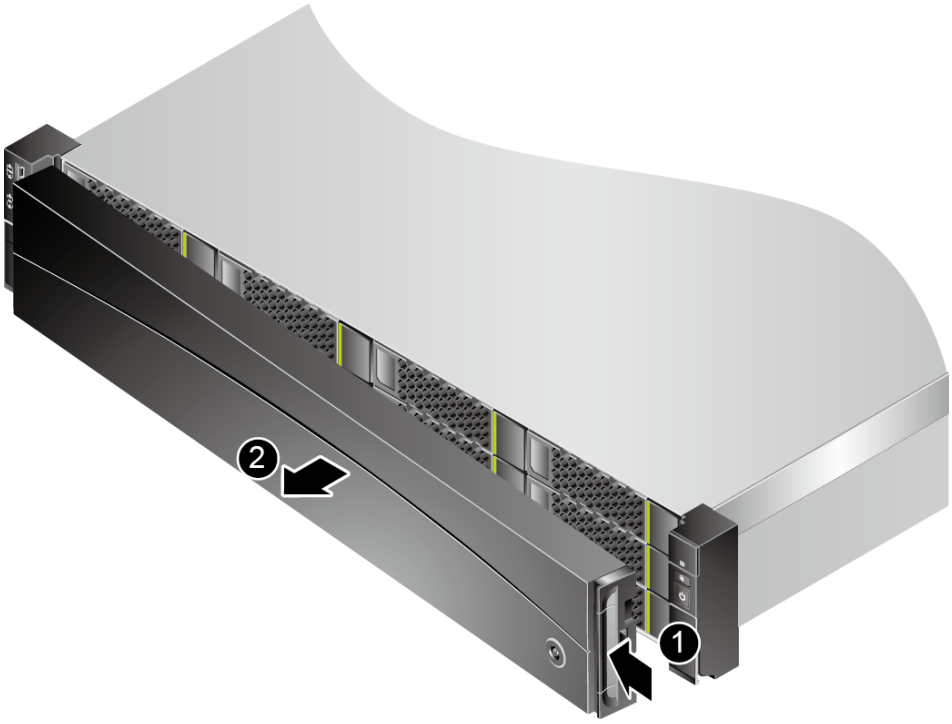
Figure 8-240 Removing the front bezel



Step 4 Place the removed component in an ESD bag.

NOTICE

- Keep the key properly.
- Place only one component in an ESD bag.

----End

8.5.58 Installing the Front Bezel

NOTE

The front bezel is optional and can be purchased as required.

Procedure

Step 1 Take the component out of its ESD bag.

Step 2 Determine the position of the front bezel.

Step 3 Install the front bezel.

1. Insert the front bezel to the side of the right mounting ear
2. Press the release button on the front bezel.
3. Push the front bezel close to the chassis.

Step 4 Lock the front bezel.

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1. Insert the key into the keyway on the front bezel.
2. Lock the front bezel. See (1) in **Figure 8-241**.
3. Remove the key. See (2) in **Figure 8-241**.

NOTICE

Keep the key properly.

Figure 8-241 Locking the front bezel



----End

8.5.59 Removing the Air Duct

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

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Step 6 Check whether a full-height full-length PCIe riser module is configured.

- If yes, go to **Step 7**.
- If no, go to **Step 8**.

Step 7 Remove the full-height full-length PCIe riser module.

For details, see **8.5.55 Removing a PCIe Riser Module** .

Step 8 Check whether a supercapacitor is configured.

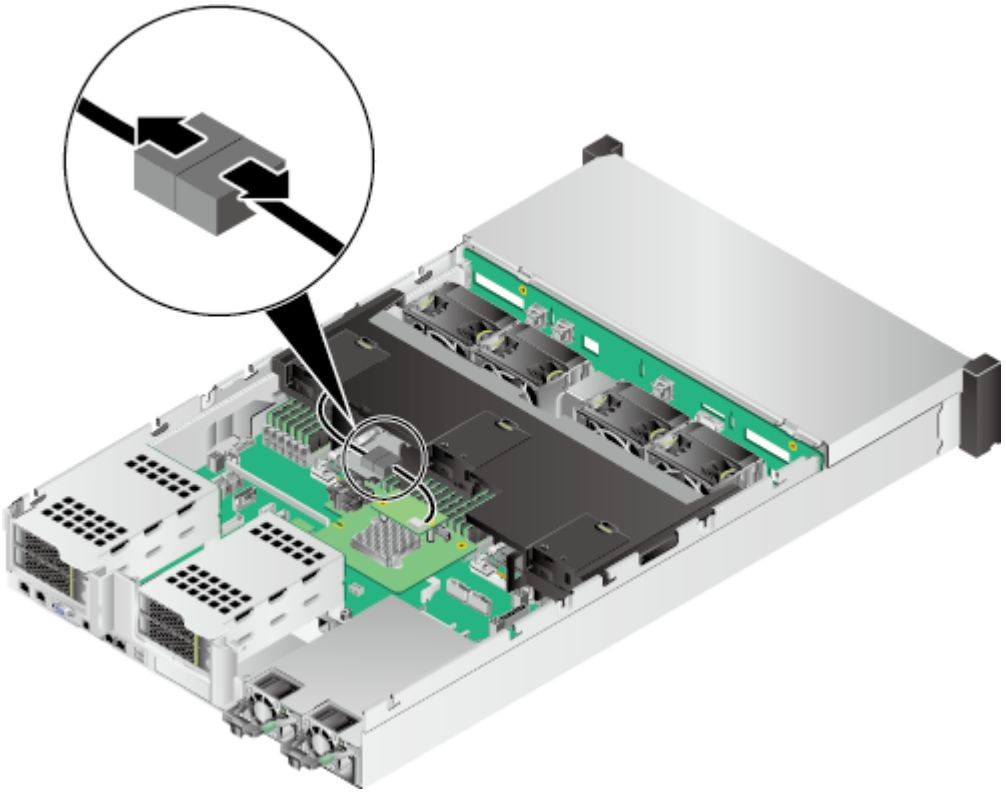
- If yes, go to **Step 9**.
- If no, go to **Step 11**.

Step 9 Disconnect the supercapacitor from the RAID controller card.

NOTE

If the LSI SAS3108 RAID controller card is used, disconnect the cable between the supercapacitor and the TFM card.

Figure 8-242 Removing the supercapacitor cable



Step 10 Determine the position of the air duct.

Step 11 Lift the air duct.

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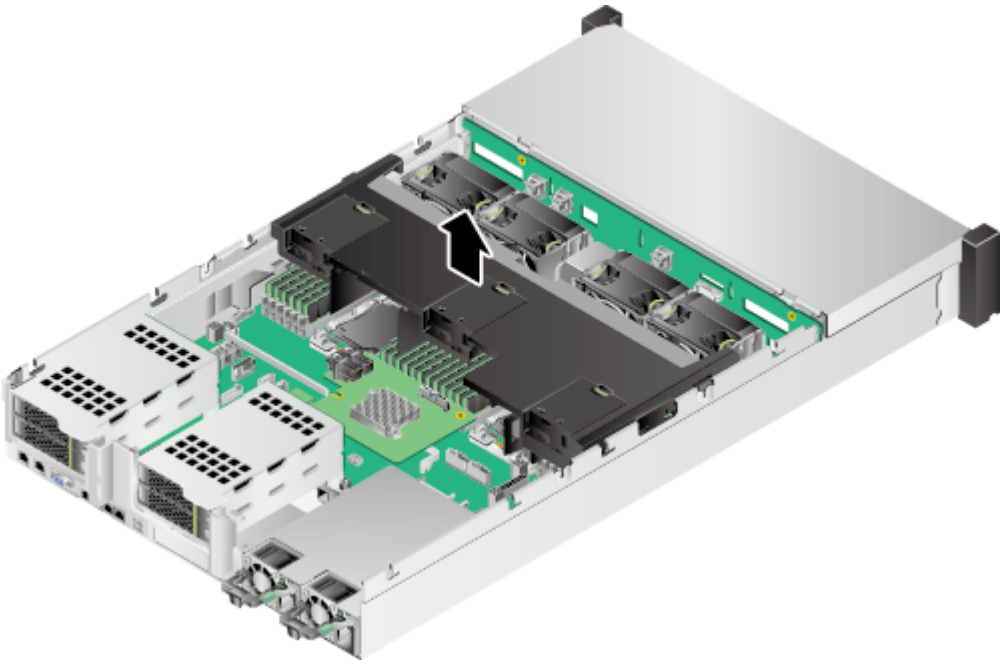
Figure 8-243 Removing the air duct



Step 12 Place the removed component in an ESD bag.

NOTICE

Place only one component in an ESD bag.

----End

8.5.60 Installing the Air Duct

Procedure

Step 1 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 2 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 3 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 4 Place the server on the ESD workstation.

Step 5 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 6 Check whether a full-height full-length PCIe riser module is configured.

- If yes, go to **Step 7**.

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- If no, go to **Step 8**.

Step 7 Remove the full-height full-length PCIe riser module.

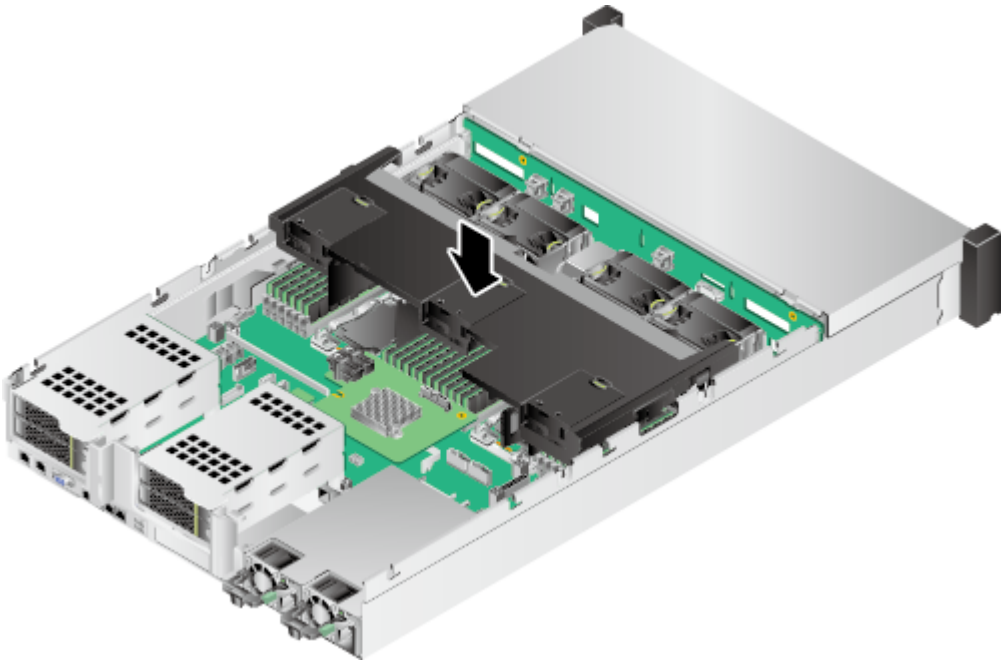
For details, see **8.5.55 Removing a PCIe Riser Module** .

Step 8 Take the component out of its ESD bag.

Step 9 Determine the position of the air duct.

Step 10 Align the positioning pins on the air duct with the fixing holes on the chassis according to the instructions on the air duct. Vertically place the air duct downwards.

Figure 8-244 Installing the air duct



Step 11 Check whether a supercapacitor is configured.

- If yes, go to **Step 12**.
- If no, go to **Step 13**.

Step 12 Connect the cable between the supercapacitor and the RAID controller card.

NOTE

If the LSI SAS3108 RAID controller card is used, connect the cable between the supercapacitor and the TFM card.

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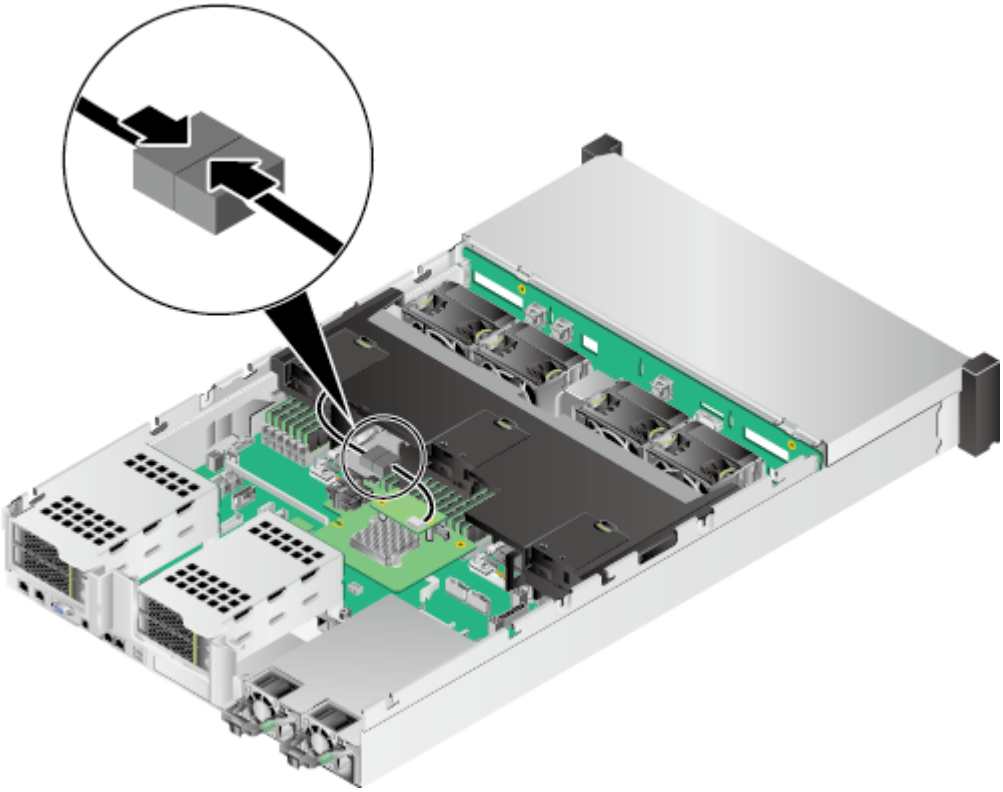
Figure 8-245 Connecting the supercapacitor cable



Step 13 Check whether a full-height full-length PCIe riser module is configured.

- If yes, go to **Step 14**.
- If no, go to **Step 15**.

Step 14 Install the full-height full-length PCIe riser module.

For details, see **8.5.56 Installing a PCIe Riser Module**.

Step 15 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 16 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 17 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 18 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 19 Log in to the iBMC WebUI, and check whether the new component is normal.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

----End

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8.5.61 Removing the Mainboard

If you cannot log in to the iBMC of the mainboard to be replaced, you do not need to perform **Step 1** to **Step 3**.

Procedure

Step 1 Record the firmware (iBMC, BIOS, and CPLD) versions of the mainboard to be replaced.

- On the iBMC WebUI, choose **Information** > **System Info** > **Product Info** to obtain the information.
- On the iBMC CLI, run the **ipmcget -d version** command to obtain the information.

Step 2 Check the iBMC and BIOS configurations.

CAUTION

After the mainboard is replaced, the original iBMC or BIOS configuration will be lost. If the current iBMC or BIOS parameters have been adjusted based on service scenarios, ensure that the parameter configuration is the same as that before the mainboard is replaced to ensure that services are not affected after the mainboard is replaced.

Step 3 Export the iBMC or BIOS configuration files.

For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

NOTE

- iBMC 2.32 and later versions support the import and export of configuration files.
- After replacing the mainboard, import the iBMC and BIOS configuration files that are exported from the iBMC. However, the exported configuration file does not contain password information. You need to manually configure the password for the iBMC user. For details about how to import and export the configuration file, see ***FusionServer Pro Rack Server iBMC User Guide***.
- The iBMC and BIOS configuration files exported from the iBMC contain the configuration list. For details, see "Configuration File Description" in ***FusionServer Pro Rack Server iBMC User Guide***.
- If the iBMC and BIOS configuration files are not exported before the mainboard is replaced, manually configure the iBMC and BIOS data after replacing the mainboard.

Step 4 Power off the server.

For details, see **8.4.2 Power-Off Procedure**.

Step 5 Remove the power cables from the PSUs.

For details, see **8.5.7 Removing PSU Cables**.

Step 6 Remove the server.

For details, see **8.4.3 Removing a 2288H V5**.

Step 7 Place the server on the ESD workstation.

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Step 8 Remove the chassis cover.

For details, see **8.5.1 Removing the Chassis Cover**.

Step 9 Determine the position of the mainboard.

Step 10 Remove PSUs.

For details, see **8.5.9 Removing a PSU**.

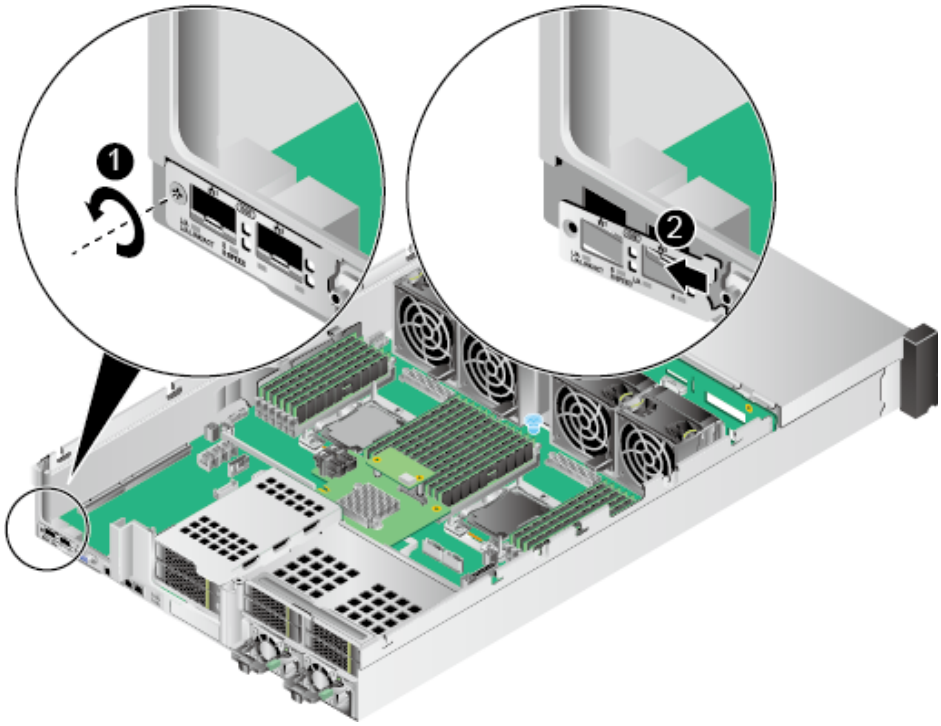
Step 11 Remove the PCIe riser modules.

For details, see **8.5.55 Removing a PCIe Riser Module** .

Step 12 Remove the baffle plate from the ports.

1. Loosen the screws that secure the baffle plate. See (1) in **Figure 8-246**.
2. Tilting the left side of the baffle plate, remove the baffle plate. See (2) in **Figure 8-246**.

Figure 8-246 Removing the baffle plate from the optical or electrical ports



Step 13 Remove the FlexIO card if there is any.

For details, see **8.5.29 Removing a FlexIO Card**.

Step 14 Remove the rear drive module.

For details, see **8.5.37 Removing the Rear Drive Module**.

Step 15 Remove the TPM or TCM.

For details, see **8.5.27 Removing the TPM/TCM**.

Step 16 Remove the built-in USB flash drive.

For details, see **8.5.45.2 Removing a Built-in USB Flash Drive**.

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Step 17 Remove the RAID controller card.

For details, see **8.5.15 Removing the RAID Controller Card**.

Step 18 Remove the supercapacitor if there is any.

For details, see **8.5.17 Removing a Supercapacitor**.

Step 19 Remove the air duct or built-in drive module.

For details, see **8.5.59 Removing the Air Duct** or **8.5.35 Removing the Built-in Drive Module**.

Step 20 Remove the battery.

For details, see **8.5.47 Removing the Battery**.

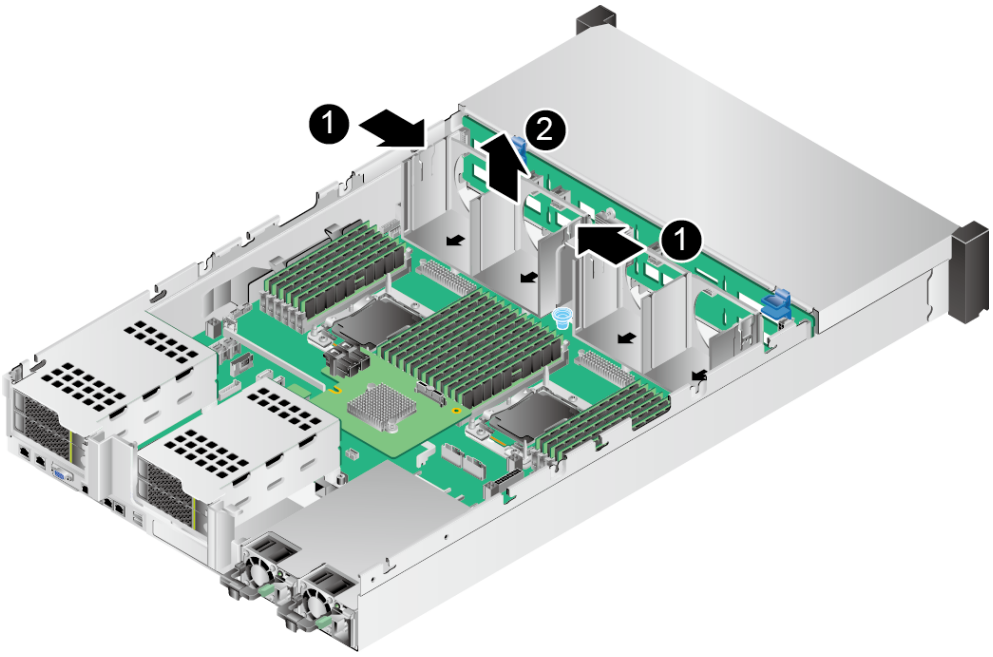
Step 21 Remove all fan modules.

For details, see **8.5.11 Removing a Fan Module**.

Step 22 Remove the fan module bracket.

1. Pressing the latches on both sides of the fan module bracket, lift the fan module bracket vertically. See (1) and (2) in **Figure 8-247**.
2. Remove the other fan module bracket in the same way.

Figure 8-247 Removing a fan module bracket



Step 23 Remove all cables from the mainboard.

For details, see **7 Internal Cabling**.

Step 24 Remove memory modules.

For details, see **8.5.25 Removing a Memory Module**.

Step 25 Remove processors.

For details, see **8.5.23 Removing a Processor**.

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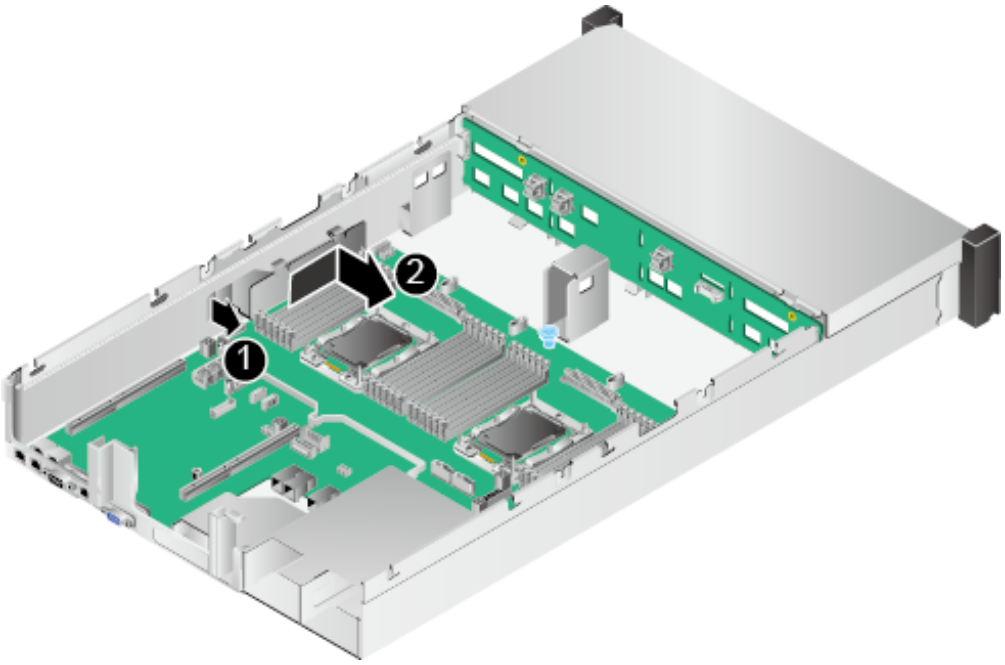
Step 26 Remove cable organizers.

Remove the cable organizers from the left and right sides of the chassis. When removing a cable organizer, hold the latch in arrow direction (1) and push the cable organizer in arrow direction (2).

Figure 8-248 Removing a cable organizer



Step 27 Remove the mainboard.

1. Loosen the screw that secures the mainboard. See (1) in **Figure 8-249**.
2. Holding the handles (shown in red circles), push the mainboard in the arrow direction as far as it will go. See (2) in **Figure 8-249**.

NOTICE

Do not lift the mainboard by holding any protruding part on the mainboard. Otherwise, the components on the mainboard may be damaged.

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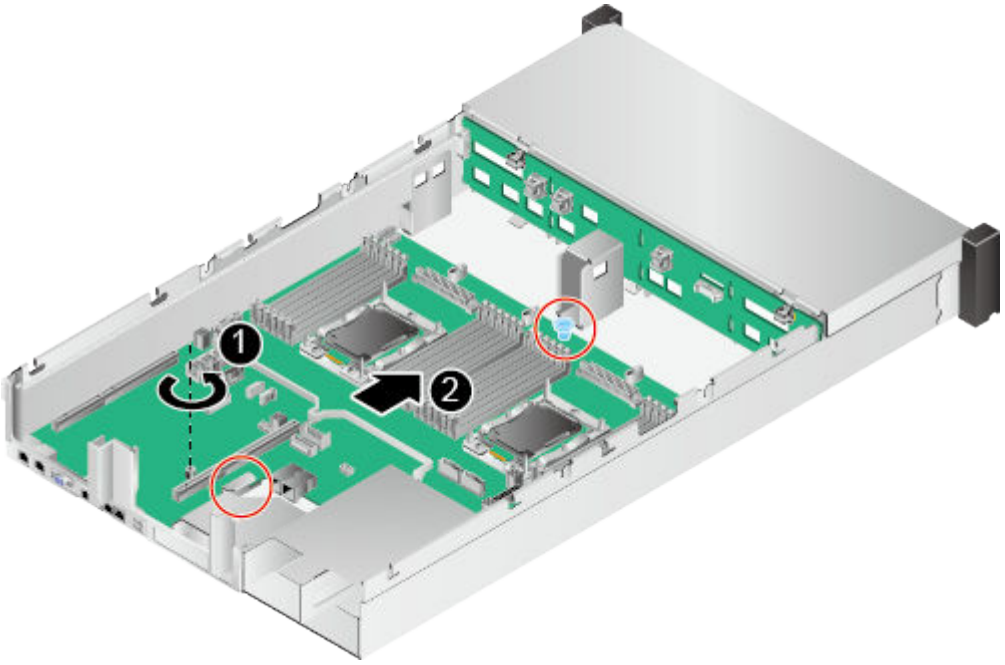
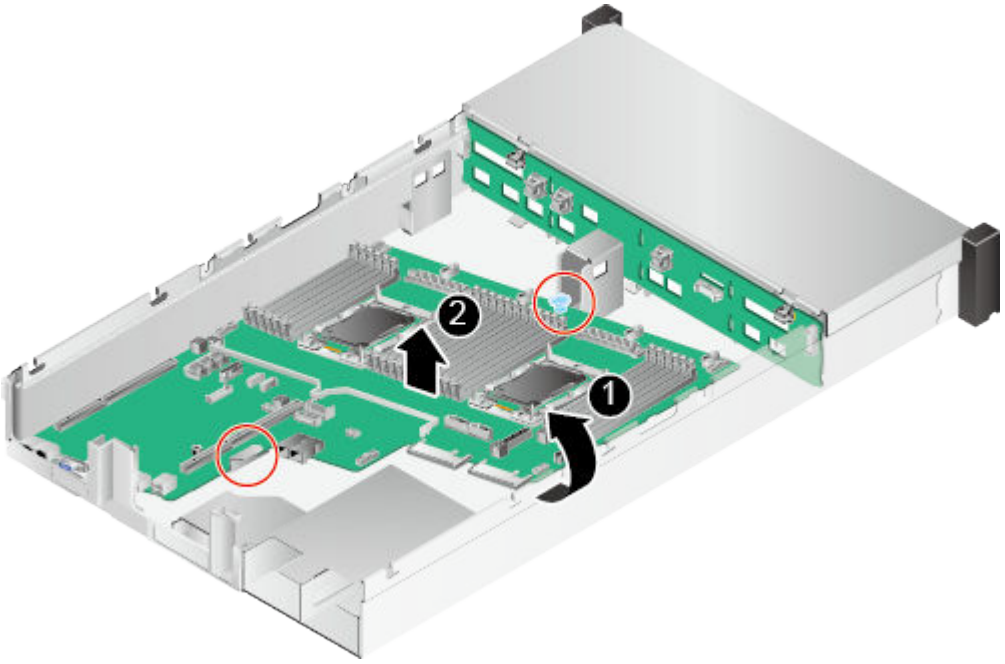
Figure 8-249 Removing the mainboard (1)



3. Tilt the mainboard 10° to 15° in the arrow direction. See (1) in **Figure 8-250**.
4. Lift the mainboard. See (2) in **Figure 8-250**.

Figure 8-250 Removing the mainboard (2)



Step 28 Place the removed mainboard and components on different ESD workstations.

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NOTE

- If the removed component is no longer used, pack it again using the original packaging materials and store it properly.
- Before placing the mainboard into an ESD bag, ensure that the processor sockets are installed with covers.
- Place only one component in an ESD bag.

----End

8.5.62 Installing the Mainboard

NOTE

- If the part number (P/N) of the hard disk backplane configured on the server is 03029JSA, 03029TDR, 03029TDQ, 03029TDH, 03029TDE, 03029JRY, or 03029WFE, ensure that the mainboard iBMC version is V520 or later. Otherwise, upgrade the iBMC first.
- If part number (P/N) of the new mainboard is 03026NEA or 03029JRP, the mainboard iBMC cannot be rolled back to a version before V520, the BIOS cannot be rolled back to a version before V793, and the mainboard CPLD cannot be rolled back to a version before V215.

Procedure

Step 1 Place the server on the ESD workstation.

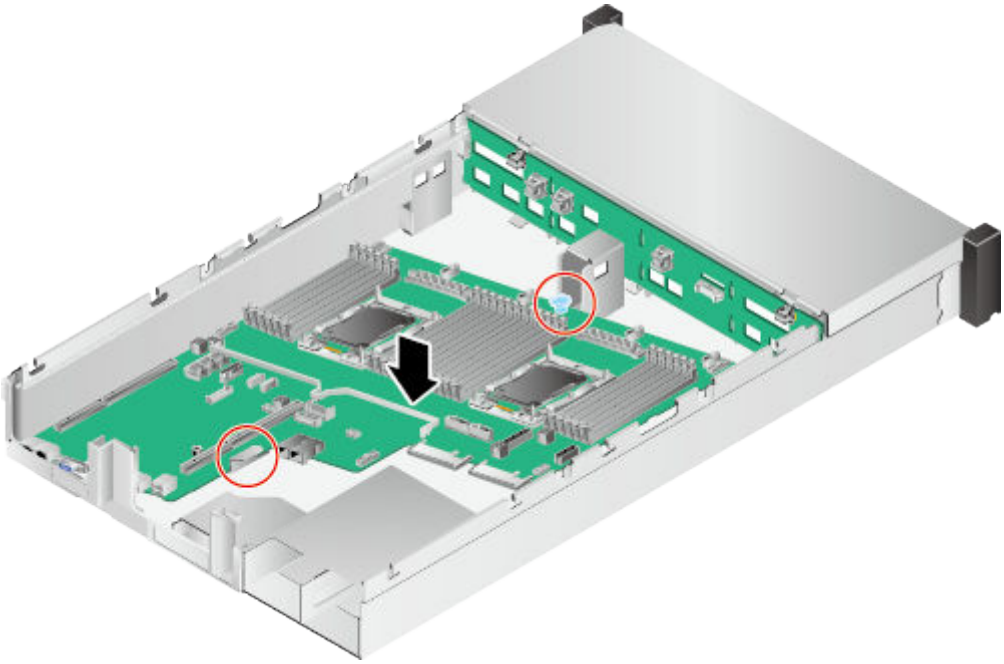
Step 2 Take the component out of its ESD bag.

Step 3 Determine the position of the mainboard.

Step 4 Install the mainboard.

1. Holding the handles (as red circled in the figure), tile the mainboard 10° to 15° in the arrow direction.

Figure 8-251 Installing the mainboard (1)



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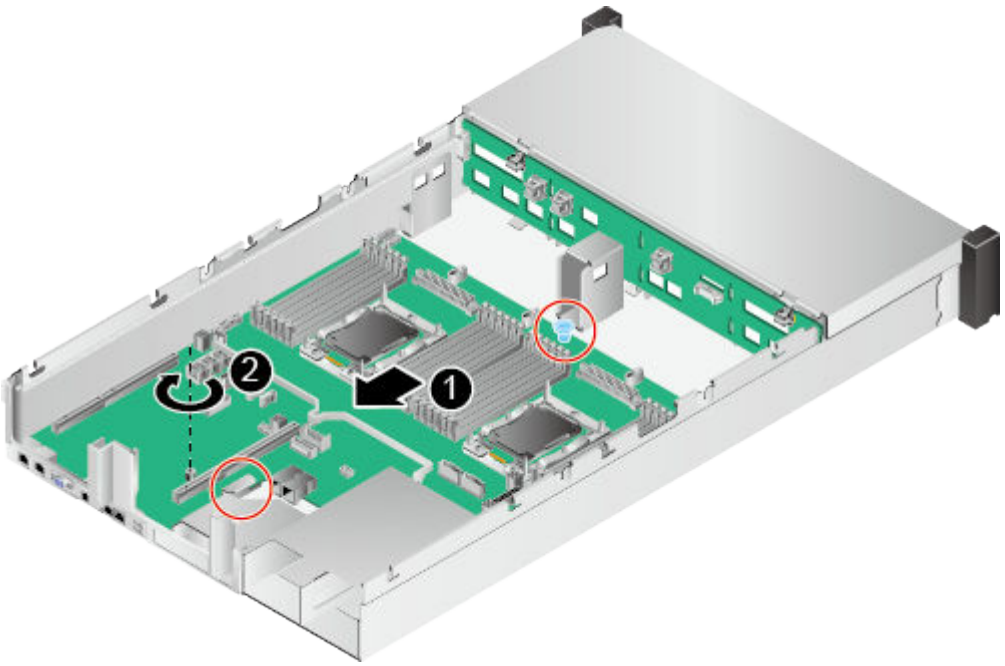
2. Aligning the rear ports of the mainboard with the reserved holes on the rear panel of the chassis, push the mainboard in the arrow direction as far as it will go. See (1) in **Figure 8-252**.
3. Tighten the screws to secure the mainboard. See (2) in **Figure 8-252**.

Figure 8-252 Installing the mainboard (2)



Step 5 Installing the baffle plate for ports.

1. Tilting the baffle plate, insert the baffle plate into the fixing holes and press it firmly. See (1) in **Figure 8-253**.

NOTICE

When pressing the baffle plate, hitch the baffle plate on the connector gently to avoid damage to the connector.

2. Tighten the screws to secure the baffle plate. See (2) in **Figure 8-253**.

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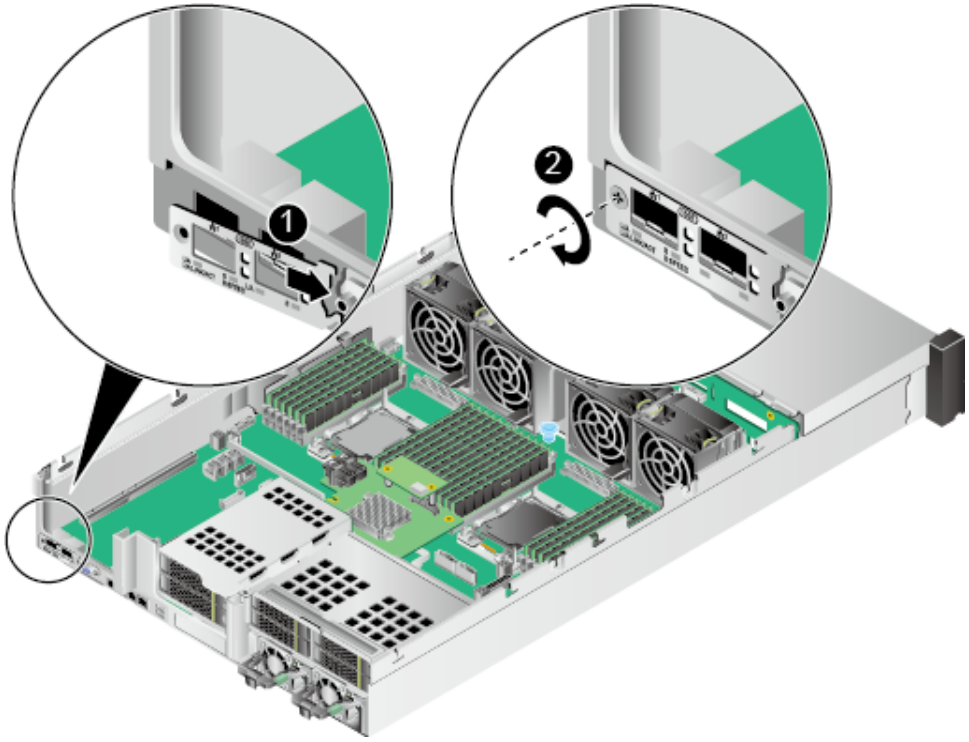
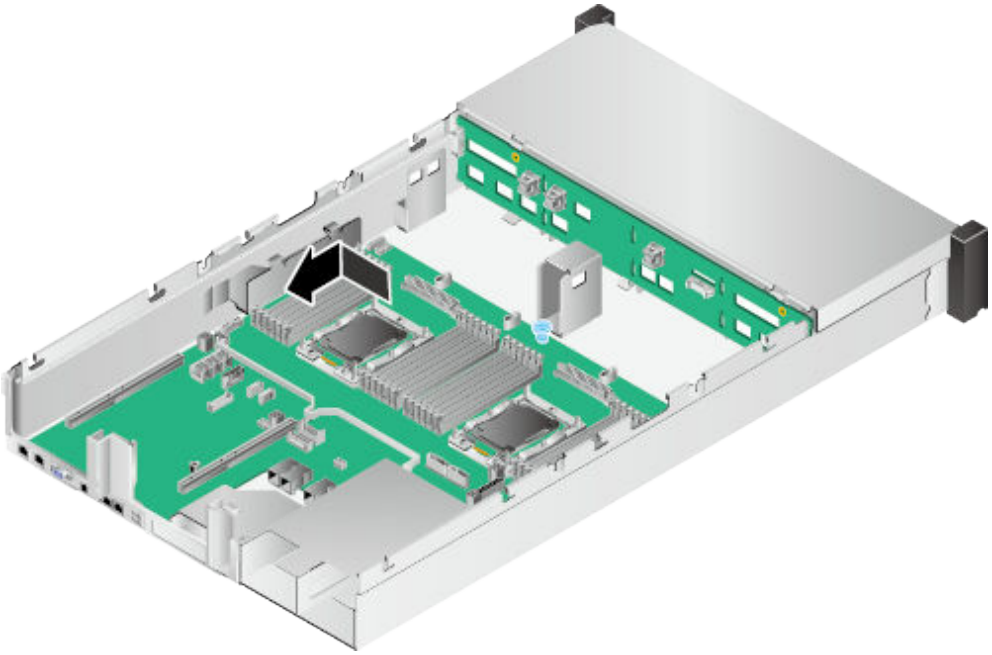
Figure 8-253 Installing the baffle plate for optical or electrical ports



Step 6 Install cable organizers.

Place the cable organizers along the chassis walls, align them with the mounting pegs on the side walls of the chassis, and push them in the arrow direction as far as they will go.

Figure 8-254 Installing a cable organizer



Step 7 Install all the fan module brackets.

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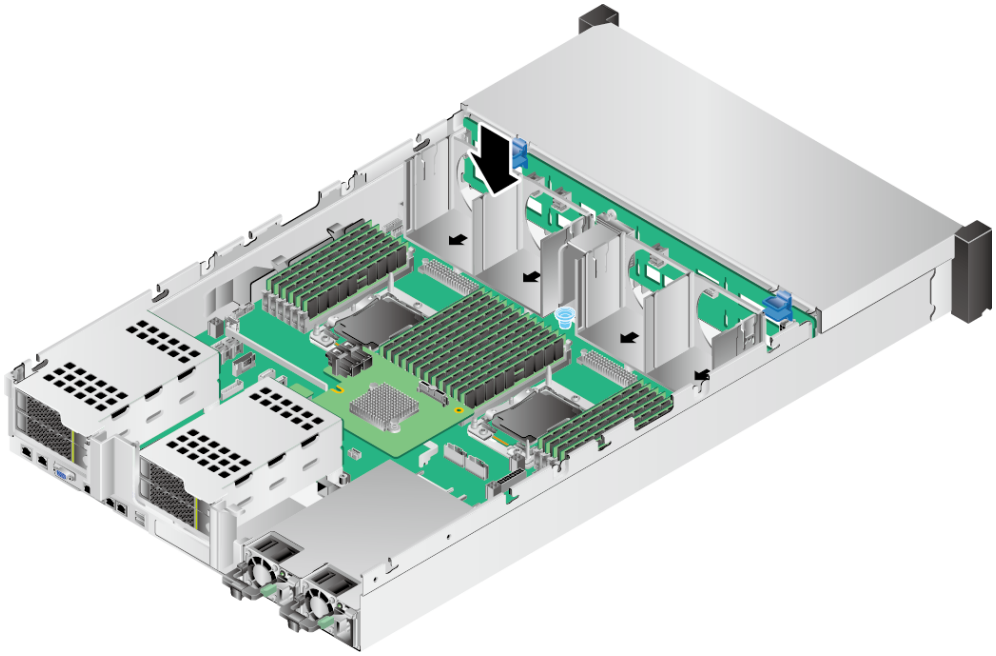
Figure 8-255 Installing a fan module bracket



Step 8 Install all fan modules.

For details, see **8.5.12 Installing a Fan Module**.

Step 9 Install processors.

For details, see **8.5.24 Installing a Processor**.

Step 10 Install memory modules.

For details, see **8.5.26 Installing a Memory Module**.

Step 11 Install the battery.

For details, see **8.5.48 Installing the Battery**.

Step 12 Install the RAID controller card.

For details, see **8.5.16 Installing the RAID Controller Card**.

Step 13 Install the TPM or TCM.

For details, see **8.5.28 Installing the TPM/TCM**.

Step 14 Install the built-in USB flash drive.

For details, see **8.5.46.2 Installing a Built-in USB Flash Drive**.

Step 15 Install PSUs.

For details, see **8.5.10 Installing a PSU**.

Step 16 Install the PCIe riser modules.

For details, see **8.5.56 Installing a PCIe Riser Module**.

Step 17 Install the rear drive module.

For details, see **8.5.38 Installing the Rear Drive Module**.

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Step 18 Install the FlexIO card if it is configured.

For details, see **8.5.30 Installing a FlexIO Card**.

Step 19 Connect all the cables to the mainboard.

For details, see **7 Internal Cabling**.

Step 20 Install the air duct or built-in drive module.

For details, see **8.5.60 Installing the Air Duct** or **8.5.36 Installing the Built-in Drive Module**.

Step 21 Install the supercapacitor if it is configured.

For details, see **8.5.18 Installing a Supercapacitor**.

Step 22 Install the chassis cover.

For details, see **8.5.2 Installing the Chassis Cover**.

Step 23 Install the server.

For details, see **8.4.4 Installing a Server**.

Step 24 Connect the power cables to the PSUs.

For details, see **8.5.8 Connecting PSU Cables**.

Step 25 Power on the server.

For details, see **8.4.1 Power-On Procedure**.

Step 26 Check the indicator status. If the health status indicator is steady green, the server is running properly.

For details, see **2.1.2 Indicators and Buttons**.

Step 27 Burn the original SN into the new mainboard after replacement. For details, see section "Modifying Electronic Labels" in the ***SmartKit User Guide (for Engineers)***.

NOTICE

- Only authorized engineers can download the ElabelTool plug-in package, import it to SmartKit, and modify electronic labels.
- If the original device SN is not burnt in the new mainboard, the iBMC and OS cannot obtain the device SN. This may affect the running of some services or the monitoring and management on the device.

Step 28 After the mainboard is replaced, the LOM is replaced and the MAC address of the LOM is changed. If the LOM is used for transferring data, you need to configure the LOM data.

Step 29 After the mainboard is replaced, the iBMC and BIOS settings are restored to the default settings of the new mainboard. Configure the iBMC and BIOS based on service requirements.

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NOTE

- If you have exported iBMC and BIOS configuration files on the iBMC before replacing the mainboard, you can import the configuration files after the replacement. However, the exported configuration files do not contain password information. You need to manually configure the password for the iBMC user. For details about how to import and export a configuration file, see the ***FusionServer Pro Rack Server iBMC User Guide***.
- The iBMC and BIOS configuration files exported from the iBMC contain parameter lists. For details, see "Configuration File Description" in the ***FusionServer Pro Rack Server iBMC User Guide***.
- iBMC 2.32 and later versions support the import and export of configuration files.
- If the iBMC and BIOS configuration files are not exported before you replace the mainboard, manually configure the iBMC and BIOS after the replacement.
- After the mainboard is replaced, the iBMC SSL certificate is restored to its initial status. If you have imported a requested SSL certificate before replacing the mainboard, import it again after replacing the mainboard.

Step 30 Upgrade the mainboard firmware (iBMC, BIOS, and CPLD) and Smart Provisioning to the latest version.

For details, see ***FusionServer Pro Rack Server Upgrade Guide***.

----End

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9 Troubleshooting Guide

For details about troubleshooting, see ***Huawei Servers Troubleshooting***.

- Troubleshooting process

  Troubleshooting is a process of using appropriate methods to find the cause of a fault and rectify the fault. The troubleshooting process is to narrow down the scope of possible causes for a fault to reduce troubleshooting complexity, identify the root cause, and rectify the fault.
- Fault information collection

  If a fault occurs on a server, collect logs for fault diagnosis.
- Fault diagnosis

  Fault diagnosis rules and tools help Huawei technical support engineers and maintenance engineers to analyze and rectify faults according to alarms and hardware fault symptoms.
- Software and firmware upgrade

  Software and firmware upgrade packages can be downloaded by server model and installed as needed.
- Preventive maintenance

  Preventive maintenance promptly detects, diagnoses, and rectifies server faults.

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10 Common Operations

10.1 Querying the iBMC IP Address
10.2 Logging In to the iBMC WebUI
10.3 Logging In to the Desktop of a Server
10.4 Logging In to the CLI
10.5 Managing VMD
10.6 Accessing the BIOS
10.7 Clearing Data from a Storage Device

10.1 Querying the iBMC IP Address

Scenarios

Query the IP address of the iBMC management network port. The following describes how to query the iBMC IP address on the BIOS.

You can use any of the following methods to query the IP address of the iBMC management network port:

- BIOS
- iBMC WebUI
  For details, see ***FusionServer Pro Rack Server iBMC User Guide***.
- iBMC CLI
  Run the **ipmcget -d ipinfo** command.
  For details, see ***FusionServer Pro Rack Server iBMC User Guide***.

Procedure

Step 1 Access the BIOS.

Step 2 Choose **Advanced** > **IPMI iBMC Configuration**, and press **Enter**.

The **IPMI iBMC Configuration** screen is displayed.

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Step 3 Select **iBMC Configuration** and press **Enter**.

The **iBMC Configuration** screen is displayed.

Step 4 Check the IP address of the iBMC management network port.

----End

10.2 Logging In to the iBMC WebUI

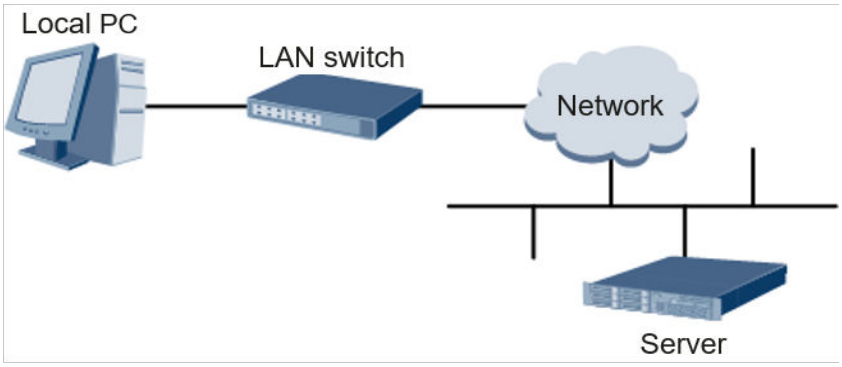
This section uses a PC running Windows 10 and Google Chrome as an example.

For details about the system configuration requirements of the local PC, refer to the ***FusionServer Pro Rack Server iBMC User Guide*** by choosing **Documentation** > **All Documents** > **User Guide**.

Step 1 Use a crossover cable or twisted pair cable to connect the local PC to the iBMC management network port of the server.

Figure 10-1 shows the network diagram.

Figure 10-1 Network diagram



Step 2 Open Google Chrome on the local PC.

Step 3 In the address box, enter the iBMC address in the format of **https://***IP_address_of_the server_iBMC_management_network_port* (for example, **https://192.168.2.100**).

Step 4 Press **Enter**.

The iBMC login page is displayed, as shown in **Figure 10-2**.

NOTE

- If Google Chrome displays a message indicating that your connection is not private, choose **Advanced** > **Proceed to**.
- The iBMC login page varies with the iBMC version.

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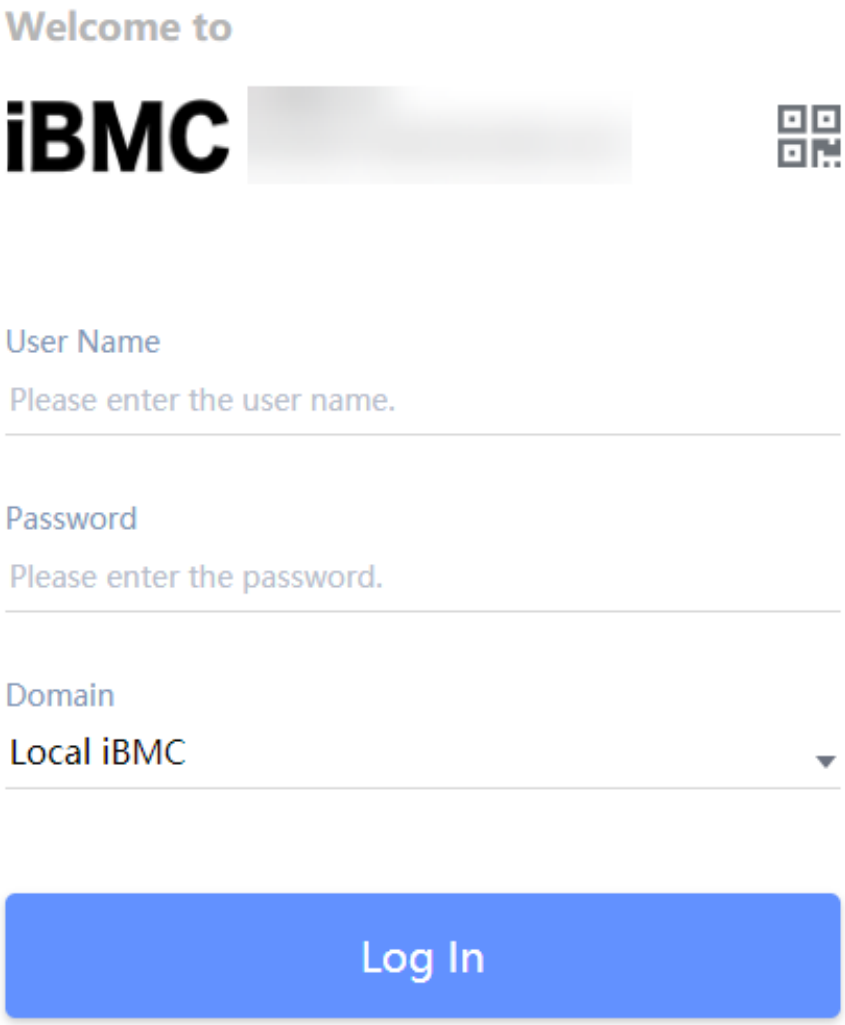
Figure 10-2 Logging in to the iBMC



Step 5 On the iBMC login page, enter your user name and password.

NOTE

- The default user name of the iBMC is **Administrator**, and the default password is **Admin@9000**.
- The user account will be locked if incorrect passwords are entered for five consecutive times. If your user account is locked, log in again 5 minutes later.

Step 6 In the **Domain** drop-down list, select **Local iBMC**.

Step 7 Click **Log In**.

If the login is successful, the **Home** page is displayed.

----End

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10.3 Logging In to the Desktop of a Server

10.3.1 Using the Remote Virtual Console

10.3.1.1 iBMC

10.3.1.1.1 Versions Earlier Than V561

Scenarios

Log in to the desktop of a server using the iBMC Remote Virtual Console.

Procedure

Step 1 Log in to the iBMC WebUI.

For details, see **10.2 Logging In to the iBMC WebUI**.

Step 2 On the menu bar, choose **Remote Console**. The **Remote Console** page is displayed.

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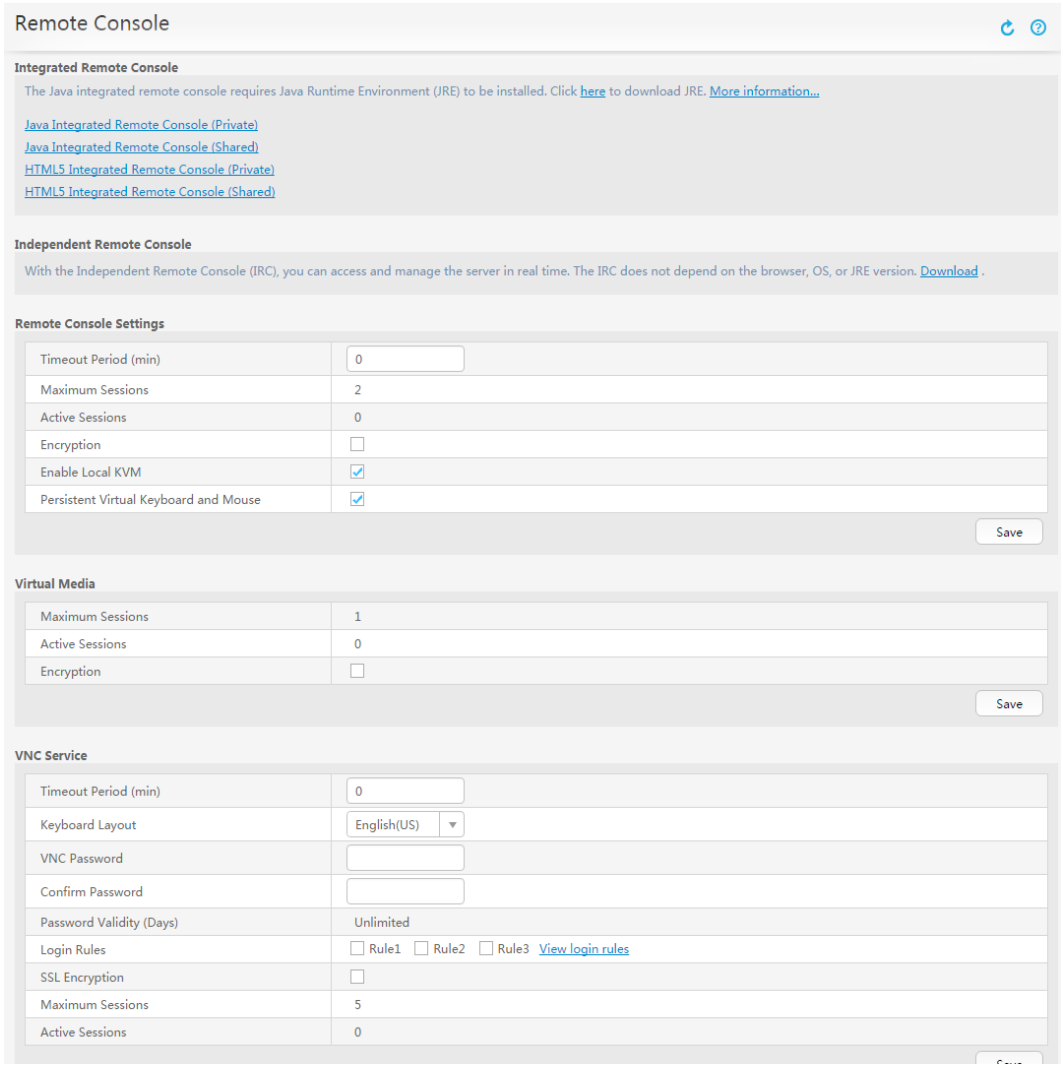
Figure 10-3 Remote Console page



Step 3 Click an Integrated Remote Console.

NOTE

- **Java Integrated Remote Console (Private)**: allows only one local user or VNC user to access and manage the server at a time.
- **Java Integrated Remote Console (Shared)**: allows two local users or five VNC users to access and manage the server at a time. Each user can view the operations performed by the other user.
- **HTML5 Integrated Remote Console (Private)**: allows only one local user or VNC user to access and manage the server at a time.
- **HTML5 Integrated Remote Console (Shared)**: allows two local users or five VNC users to access and manage the server at a time. Each user can view the operations performed by the other user.
- HTML5 supports only Internet Explorer 10.0 and later versions.

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Figure 10-4 Real-time operation console (Java)

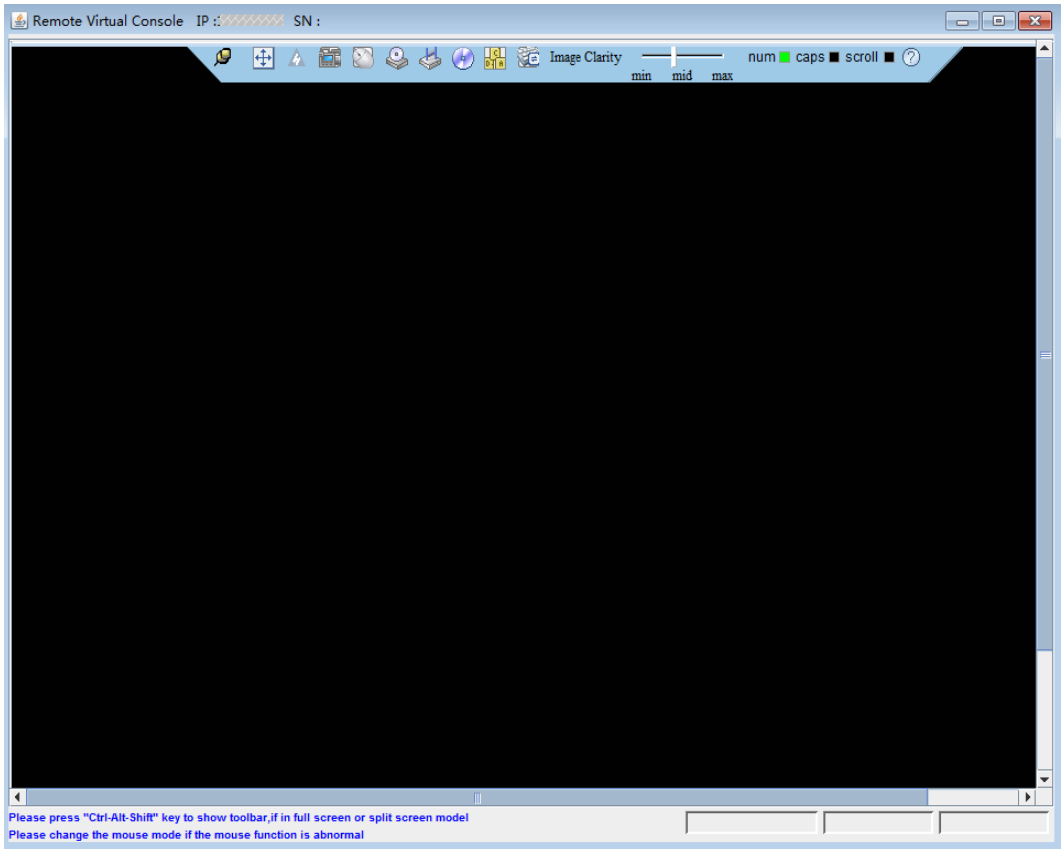

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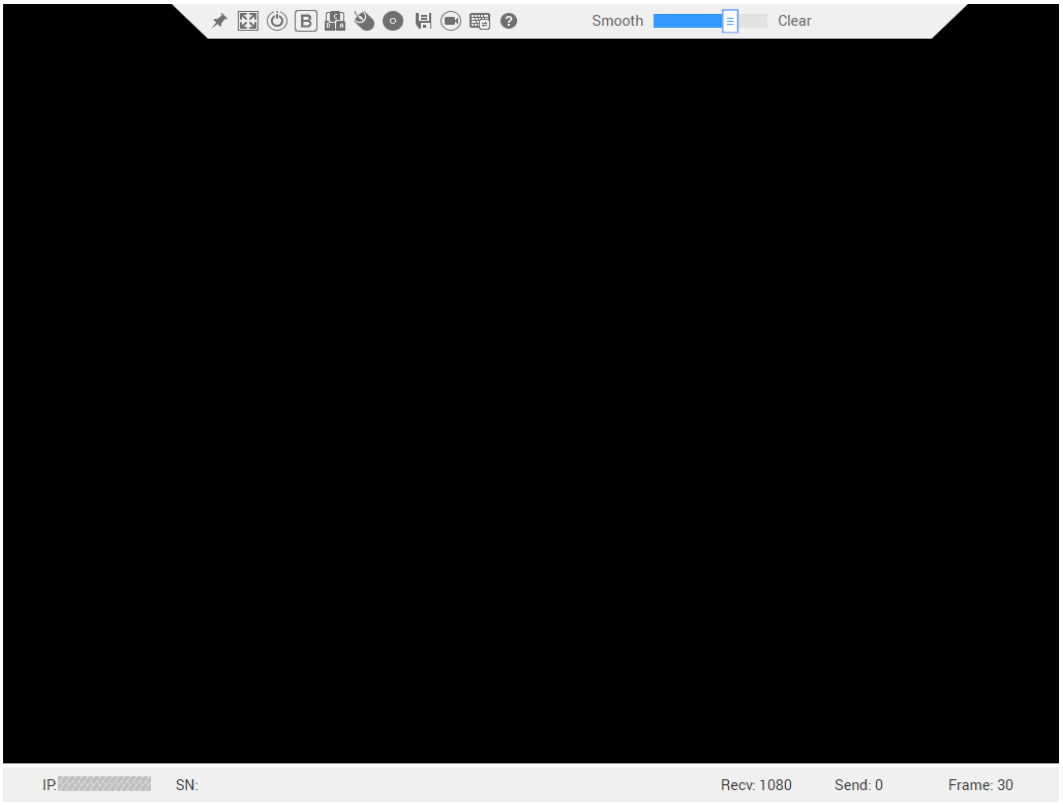
Figure 10-5 Real-time operation console (HTML5)



----End

10.3.1.1.2 V561 and Later Versions

Scenarios

Log in to the desktop of a server using the iBMC Remote Virtual Console.

Procedure

Step 1 Log in to the iBMC WebUI.

For details, see **10.2 Logging In to the iBMC WebUI**.

Step 2 Click **Start** in the **Virtual Console** area in the lower right corner of the **Home** page.

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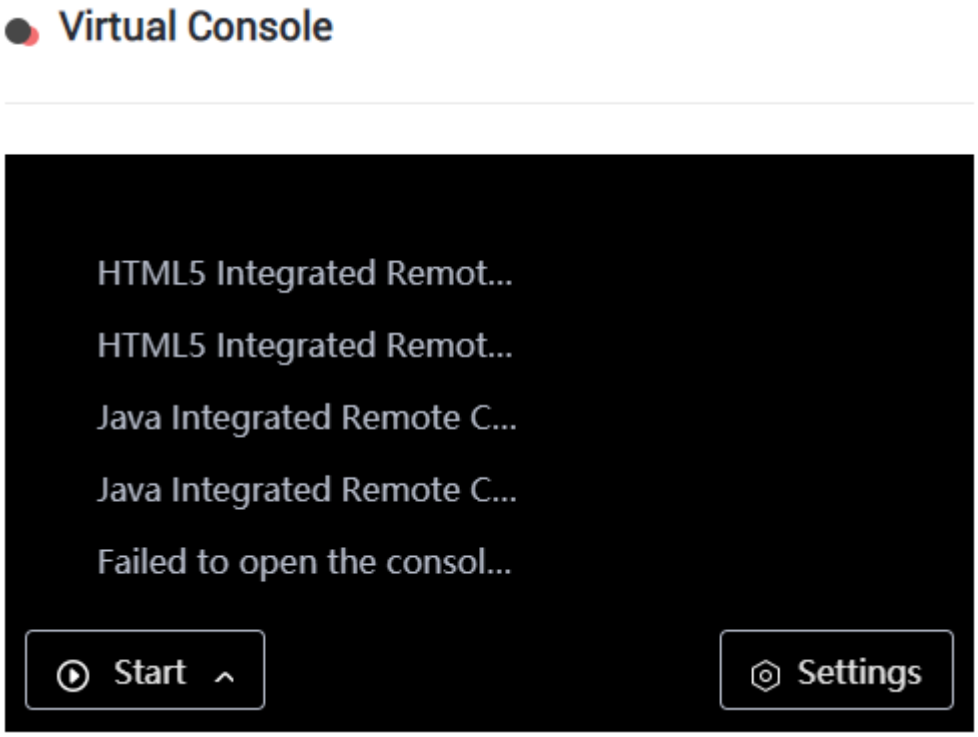
Figure 10-6 Virtual Console



Step 3 Click an Integrated Remote Console.

NOTE

- **Java Integrated Remote Console (Private)**: allows only one local user or VNC user to access and manage the server at a time.
- **Java Integrated Remote Console (Shared)**: allows two local users or five VNC users to access and manage the server at a time. Each user can view the operations performed by the other user.
- **HTML5 Integrated Remote Console (Private)**: allows only one local user or VNC user to access and manage the server at a time.
- **HTML5 Integrated Remote Console (Shared)**: allows two local users or five VNC users to access and manage the server at a time. Each user can view the operations performed by the other user.
- HTML5 supports only Internet Explorer 10.0 and later versions.

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Figure 10-7 Real-time operation console (Java)

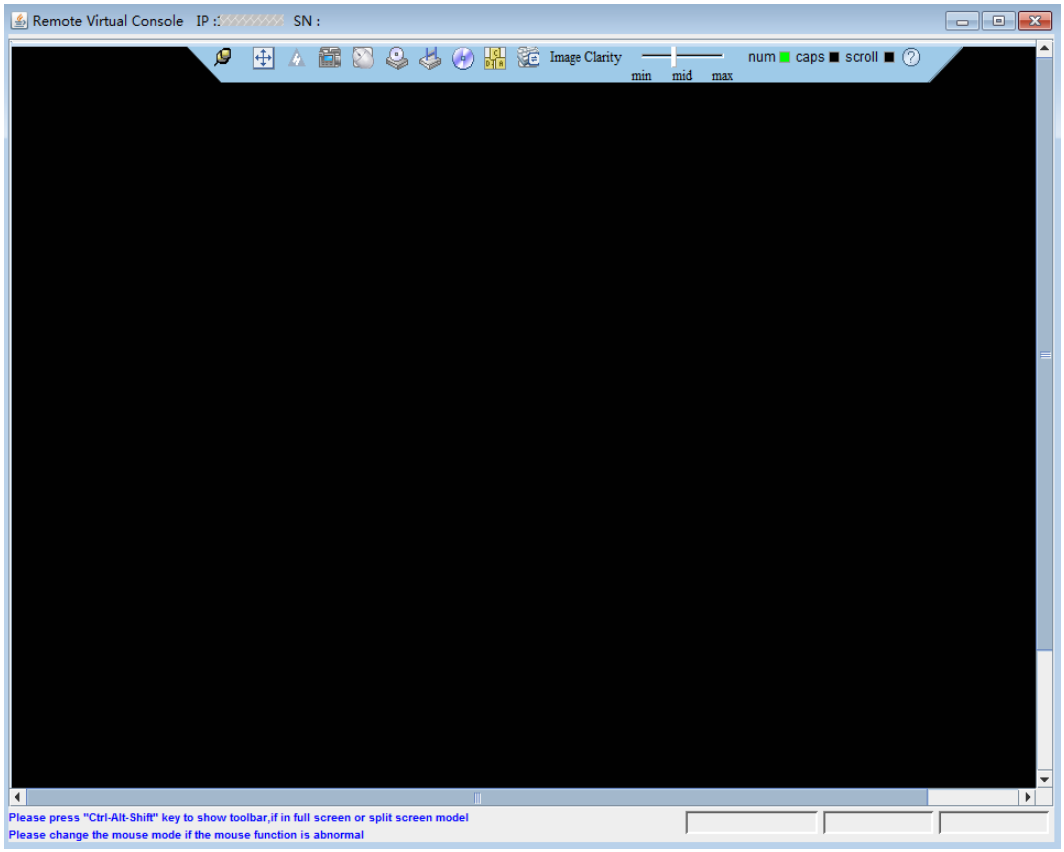

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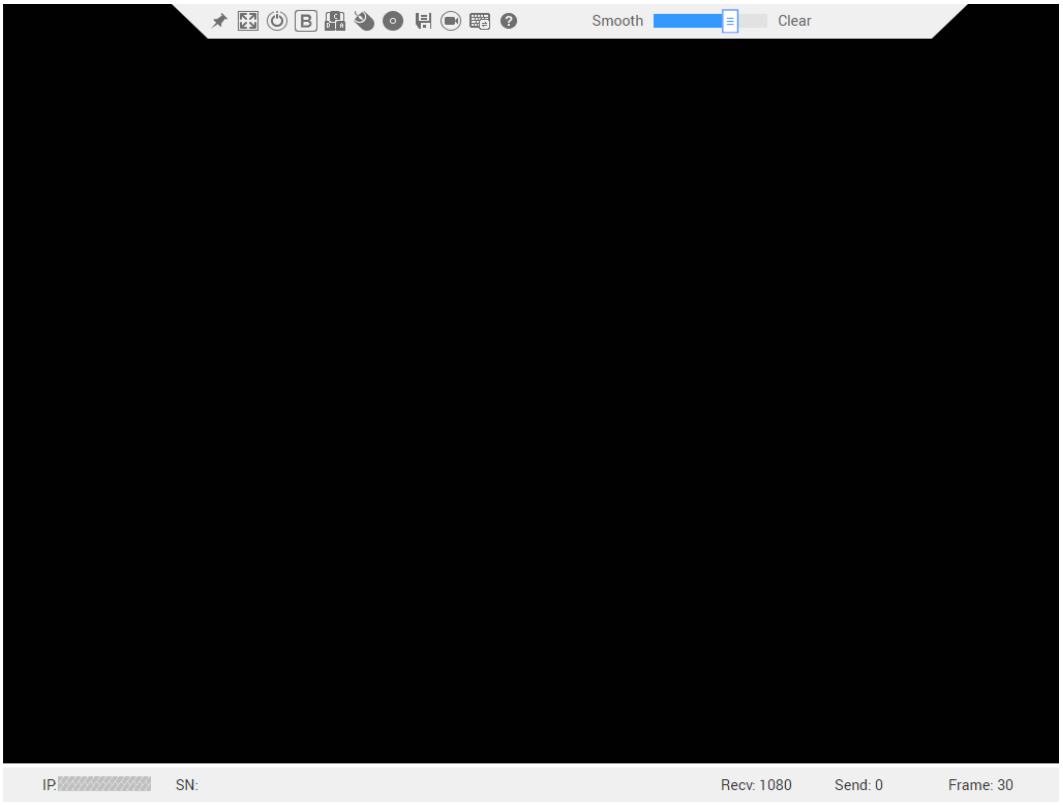
Figure 10-8 Real-time operation console (HTML5)



----End

10.3.2 Logging In to the Independent Remote Console

The independent remote console is a remote management tool developed based on the Huawei server management software iBMC and iMana 200. It plays the same functions as Remote Virtual Console provided by the iBMC WebUI and iMana 200 WebUI. This tool allows you to remotely access and manage a server, without worrying about the compatibility between the client's browser and the JRE.

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Table 10-1 Instructions for using the independent remote console

Software Package	How to Obtain	OS Type	Version	Operation Description
kvm_client_windows.zip	You can click **SmartKit Computing 23.1.0** to obtain it.	Windows	Windows 7 32-bit or 64-bit	For details about how to log in to the real-time desktop of a server using the independent remote console, see the ***SmartKit Computing V2R2 Independent Remote Console User Guide***.
			Windows 8 32-bit or 64-bit	
			Windows 10 32-bit or 64-bit	
			Windows Server 2008 R2 32-bit or 64-bit	
			Windows Server 2012 64-bit	
kvm_client_ubuntu.zip		Ubuntu	Ubuntu 14.04 LTS	
			Ubuntu 16.04 LTS	
kvm_client_mac.zip		Mac OS	Mac OS X El Capitan	
kvm_client_linux.zip		Red Hat	RHEL 6.9	
			RHEL 7.3	

10.4 Logging In to the CLI

10.4.1 Logging In to the CLI Using PuTTY over a Network Port

Scenarios

Use PuTTY to access a server over a local area network (LAN).

NOTE

- You can obtain the PuTTY software from the chiark home page.
- You are advised to use PuTTY of the latest version. PuTTY of an earlier version may cause login failures.

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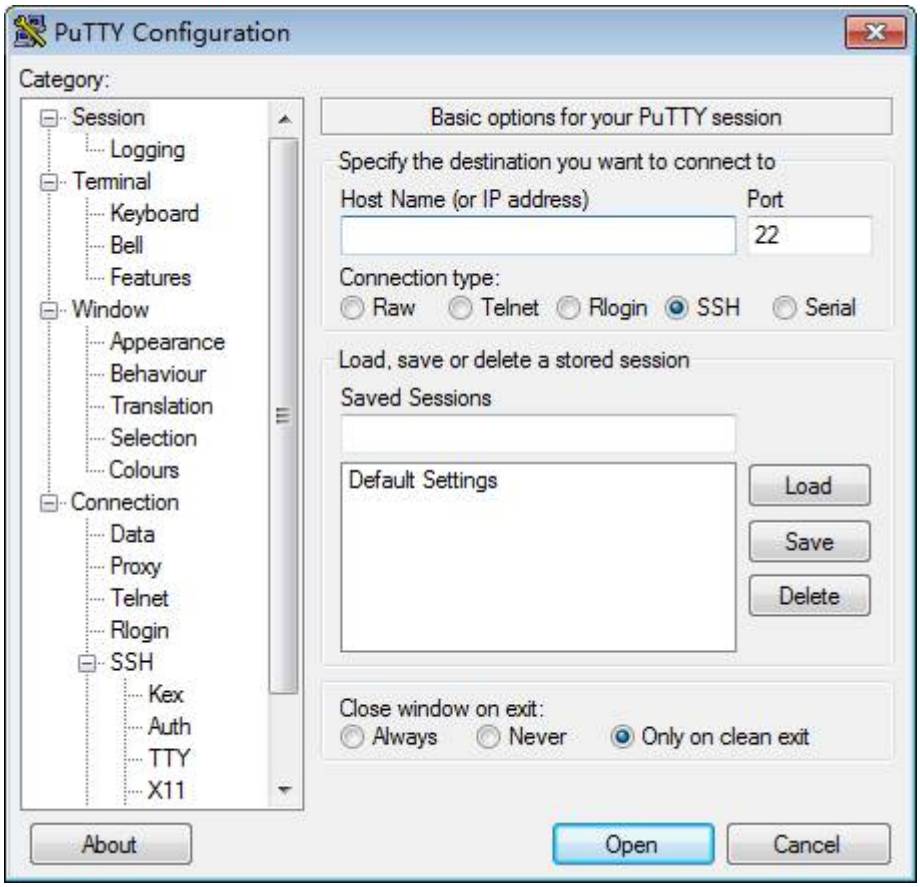
Procedure

Step 1 Set an IP address and subnet mask or add route information for the PC to communicate with the server.

Step 2 On the PC, double-click **PuTTY.exe**.

The **PuTTY Configuration** window is displayed.

Figure 10-9 PuTTY Configuration



Step 3 In the navigation tree, choose **Session**.

Step 4 Set the login parameters.

The parameters are described as follows:

- **Host Name (or IP address)**: Enter the IP address of the server to be accessed, for example, **191.100.34.32**.
- **Port**: Retain the default value **22**.
- **Connection type**: Retain the default value **SSH**.
- **Close window on exit**: Retain the default value **Only on clean exit**.

NOTE

Configure **Host Name** and **Saved Sessions**, and click **Save**. You can double-click the saved record in **Saved Sessions** to log in to the server next time.

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Step 5 Click **Open**.

The **PuTTY** screen is displayed. Then the message "login as:" is displayed, prompting you to enter a user name.

NOTE

- If this is your first login to the server, the **PuTTY Security Alert** dialog box is displayed. Click **Yes** to proceed.
- If an incorrect user name or password is entered, you must set up a new PuTTY session.

Step 6 Enter the user name and password.

If the login is successful, the user name is displayed on the left of the prompt.

----End

10.4.2 Logging In to the CLI Using PuTTY over a Serial Port

Scenarios

Use PuTTY to log in to a server over a serial port when:

- You want to perform initial configuration of the server.
- The server is inaccessible over a network port.

NOTE

- You can obtain the PuTTY software from the chiark home page.
- You are advised to use PuTTY of the latest version. PuTTY of an earlier version may cause login failures.

Procedure

Step 1 On the PC, double-click **PuTTY.exe**.

The **PuTTY Configuration** window is displayed.

Step 2 In the navigation tree, choose **Connection** > **Serial**.

Step 3 Set the login parameters.

The parameters are described as follows:

- Serial Line to connect to: COMn
- Speed (baud): 115200
- Data bits: 8
- Stop bits: 1
- Parity: None
- Flow control: None

NOTE

n in COM*n* indicates a serial port number, and its value is an integer.

Step 4 In the navigation tree, choose **Session**.

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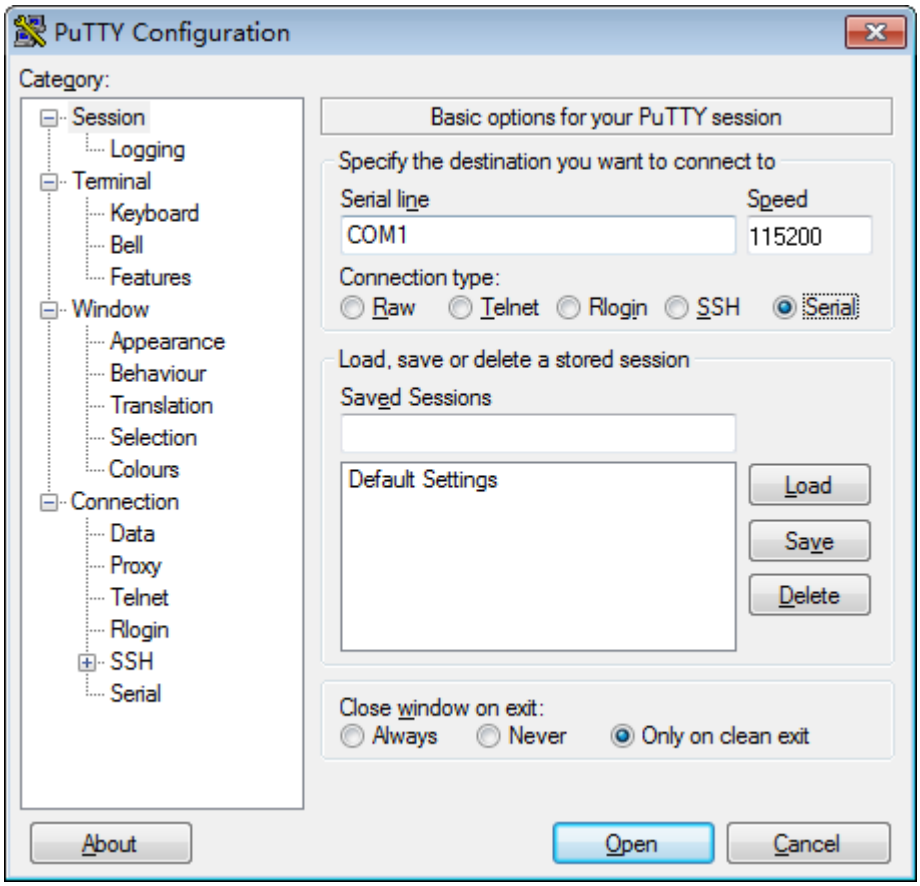
Step 5 Set **Connection type** to **Serial** and **Close window on exit** to **Only on clean exit**.

NOTE

Set **Saved Sessions** and click **Save**. You can double-click the saved record in **Saved Sessions** to log in to the server next time.

Figure 10-10 PuTTY Configuration



Step 6 Click **Open**.

The **PuTTY** screen is displayed. Then the message "login as:" is displayed, prompting you to enter a user name.

NOTE

If this is your first login to the server, the **PuTTY Security Alert** dialog box is displayed. Click **Yes** to proceed.

Step 7 Enter the user name and password.

If the login is successful, the user name is displayed on the left of the prompt.

----End

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10.5 Managing VMD

The Intel Volume Management Device (VMD) is a module integrated in the processor on the Purley platform. It is used for surprise hot plug, management, and error processing of SSDs.

- To use the VMD function, the iBMC version must be V304 or later. Otherwise, the iBMC WebUI may fail to display NVMe drive information and the fan speed cannot be adjusted based on the NVMe drive temperature, affecting the heat dissipation of NVMe drives.
- The VMD function must be enabled on the BIOS in UEFI mode only. The BIOS in legacy mode does not support this setting.
- When the VMD function is enabled and the latest VMD driver is installed, NVMe SSDs support surprise hot swap. When the VMD function is disabled, NVMe SSDs support orderly hot swap.

  NOTE

  If the BIOS version is V758 or later, select **Hot Plug** to enable the surprise hot swap function for NVMe drives in Legacy mode. This option must be used with the drive backplane CPLD or iBMC.

10.5.1 Enabling VMD

Procedure

Step 1 Access the BIOS.

Step 2 Choose **Advanced**.

Step 3 Select **Socket Configuration** and press **Enter**.

Step 4 Select **IIO Configuration** and press **Enter**.

Step 5 Select **Intel(R) VMD Technology** and press **Enter**.

Step 6 Select **Intel(R) VMD Config** and press **Enter**.

Step 7 Select **Auto** and press **Enter**.

Step 8 Press **F10**.

The **Save Changes&Exit** dialog box is displayed.

Step 9 Select **Yes** and press **Enter** to save the settings.

The server automatically restarts for the settings to take effect.

----End

10.5.2 Disabling VMD

Procedure

Step 1 Access the BIOS.

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Step 2 Choose **Advanced**.

Step 3 Select **Socket Configuration** and press **Enter**.

Step 4 Select **IIO Configuration** and press **Enter**.

Step 5 Select **Intel(R) VMD Technology** and press **Enter**.

Step 6 Select **Intel(R) VMD Config** and press **Enter**.

Step 7 Select **Disabled** and press **Enter**.

Step 8 Press **F10**.

The **Save Changes&Exit** dialog box is displayed.

Step 9 Select **Yes** and press **Enter** to save the settings.

The server automatically restarts for the settings to take effect.

----End

10.6 Accessing the BIOS

10.6.1 Accessing the BIOS (V3XX or Earlier)

Procedure

Step 1 Log in to the desktop of the server.

For details, see **10.3 Logging In to the Desktop of a Server**.

Step 2 On the Remote Virtual Console, click  on the menu bar.

Step 3 Choose **Forced System Reset** or **Forced Power Cycle**.

The **Select an Option** dialog box is displayed.

NOTICE

- A forced restart or power cycle may cause data loss or program damage.
- Before performing a forced restart or power cycle, ensure that no service interruption risk exists.

Step 4 Click **Yes**.

The server starts to be forcibly restarted or power cycled.

Step 5 During the restart, press **Delete** or **F4** when the information shown in **Figure 10-11** is displayed.

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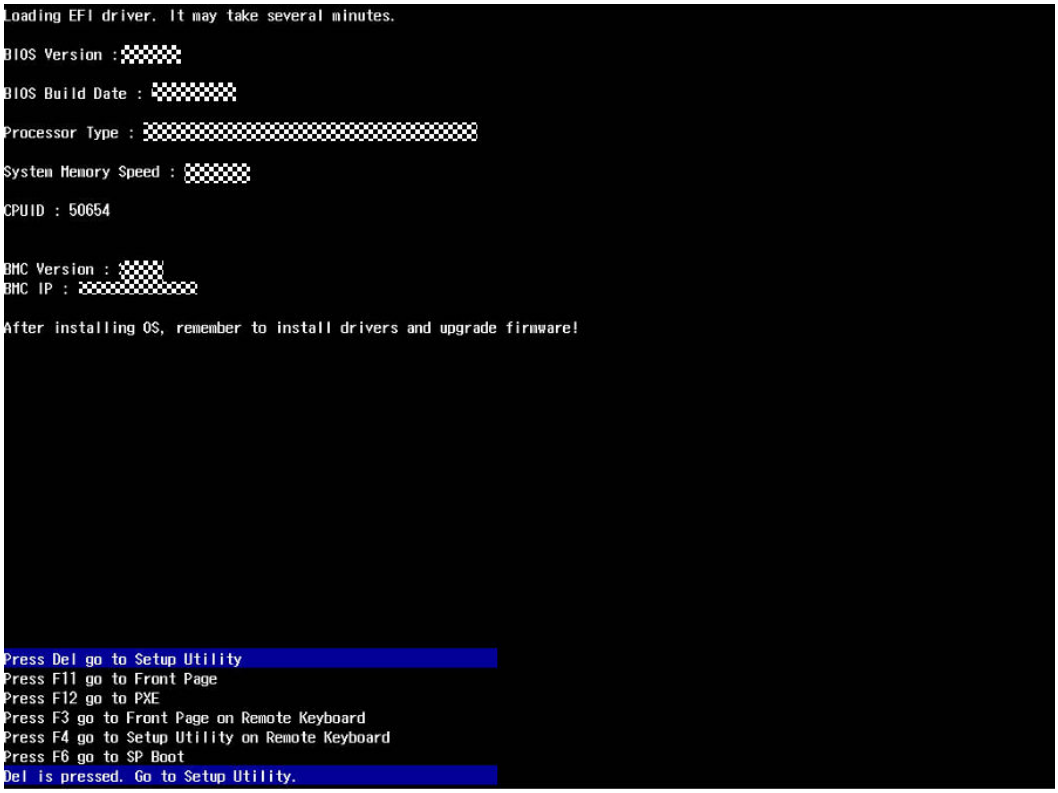
Figure 10-11 BIOS startup screen



NOTE

- To go to the BIOS front page, press **F11** or **F3**.
- To boot from the network, press **F12**. Enter the password in the displayed dialog box.
- To access the Smart Provisioning GUI, press **F6**.

The screen for entering the BIOS password is displayed.

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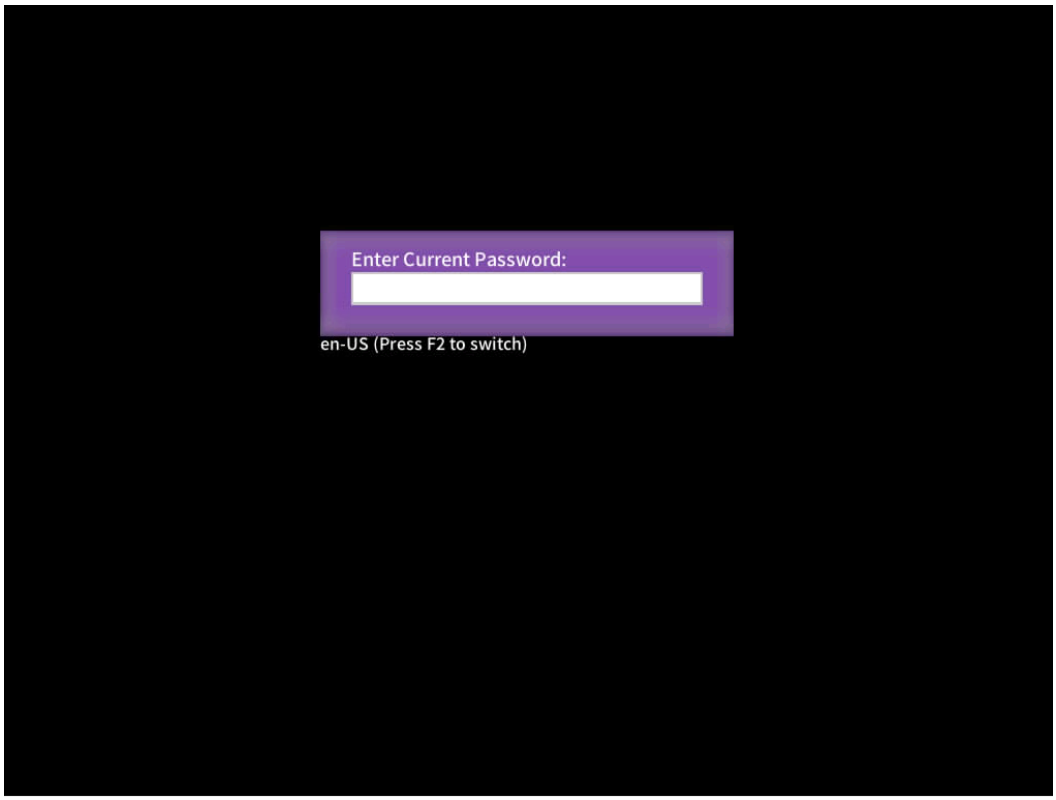
Figure 10-12 Entering the BIOS password



Step 6 Enter the BIOS password.

NOTE

- The default BIOS password is **Admin@9000**.
- Press **F2** to alternate between the English (US), French, and Japanese keyboards.
- For security purposes, change the administrator password periodically.
- The system will be locked if an incorrect password is entered three consecutive times. You can restart the server to unlock it.

The **Main** screen of the Setup Utility program is displayed.

----End

10.6.2 Accessing the BIOS (V6XX or Later)

Procedure

Step 1 Log in to the desktop of the server.

For details, see **10.3 Logging In to the Desktop of a Server**.

Step 2 On the Remote Virtual Console, click on the menu bar.

Step 3 Choose **Forced System Reset** or **Forced Power Cycle**.

The **Select an Option** dialog box is displayed.

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NOTICE

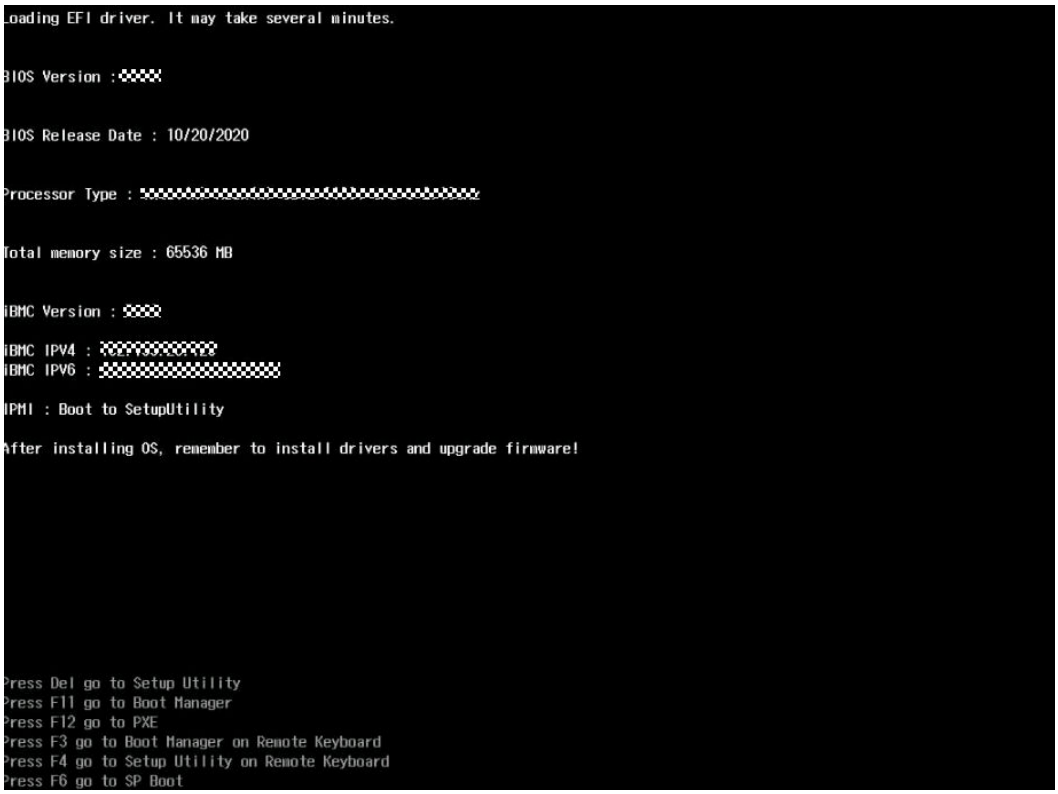
- A forced restart or power cycle may cause data loss or program damage.
- Before performing a forced restart or power cycle, ensure that no service interruption risk exists.

Step 4 Click **Yes**.

The server starts to be forcibly restarted or power cycled.

Step 5 During the restart, press **Delete** or **F4** when the information shown in **Figure 10-13** is displayed.

Figure 10-13 BIOS startup screen



NOTE

- To go to the **Boot Manager** screen, press **F11** or **F3**.
- To boot from the network, press **F12**. Enter the password in the displayed dialog box.
- To access the Smart Provisioning GUI, press **F6**.
- Common users cannot use shortcut keys to access configuration items except the front page during BIOS boot.

The screen for entering the BIOS password is displayed.

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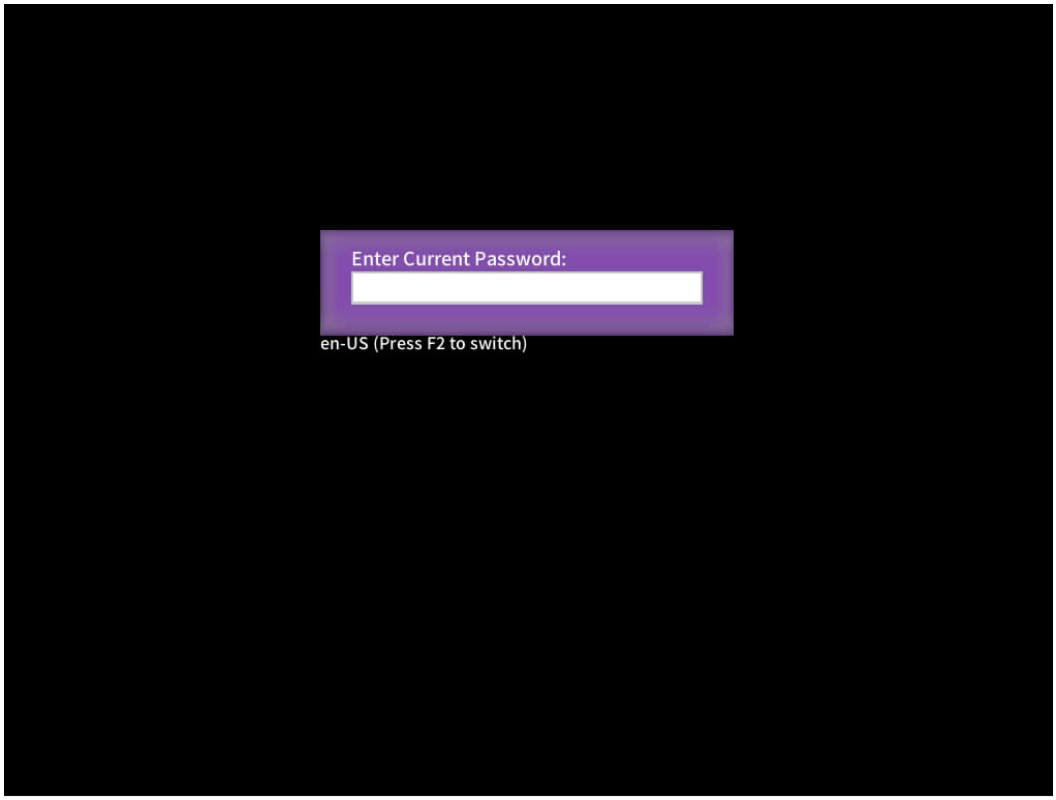
Figure 10-14 Entering the BIOS password



Step 6 Enter the BIOS password.

NOTE

- The default BIOS password is **Admin@9000**.
- Press **F2** to alternate between the English (US), French, and Japanese keyboards.
- Use the mouse to open the on-screen keyboard and enter the password.
- For security purposes, change the administrator password periodically.
- The system will be locked if an incorrect password is entered three consecutive times. You can restart the server to unlock it.

The **Front Page** screen is displayed.

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Figure 10-15 Using administrator password to log in to the Front Page



NOTE

- When you log in to the system using a common user password, only the **Continue** and **BIOS Configuration** menu options are displayed on the **Front Page** screen.
- On the **BIOS Configuration** screen, common users can only view menu options, set or change their own passwords, and save and exit. **Set User Password** in the **Security** screen and **Save Changes & Exit** in the **Exit** screen can be configured but other options are dimmed and cannot be edited. You can press **F10** to save and exit, but the function of **F9** (restoring default settings) is unavailable.

Step 7 Select **BIOS Configuration** by pressing arrow keys.

The **Main** screen is displayed.

----End

10.7 Clearing Data from a Storage Device

Scenarios

Use the Linux **badblocks** command to clear data on a storage device. Parameters are specified to overwrite data on the storage device.

The following describes how to clear the data on one HDD/SSD as an example. This operation is for reference only. You can also use other methods to clear data from storage media.

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NOTICE

The cleared data cannot be restored. Exercise caution when performing this operation.

Procedure

NOTE

Before performing this operation, check that:

- The storage device is not in a RAID array with redundancy, and the server operating system is running properly.
- You have obtained the server No. and the slot No. and location of the storage device to be cleared.

Step 1 You have accessed the desktop of the server where the target drive is located.

For details, see **10.3.1 Using the Remote Virtual Console**.

Step 2 Open the CLI.

Step 3 Query information about drive letters.

lsscsi

Figure 10-16 Querying drive letters

```
linux-hm54:~ # lsscsi
[0:0:0:0]    disk    SEAGATE  ST900MM0006      B001  /dev/sda
[0:0:1:0]    disk    SEAGATE  ST900MM0006      B001  /dev/sdb
```

Step 4 Query drive information.

fdisk -l

NOTE

- The drive with the * symbol in the **Boot** column is the system drive. As shown in **Figure 10-17**, **sda** is the system drive.
- Do not directly clear system drive data. Before clearing system drive data, clear data from other storage media.

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Figure 10-17 Querying drive information

```
linux-hm54:~ # fdisk -l

Disk /dev/sda: 900.2 GB, 900185481216 bytes
255 heads, 63 sectors/track, 109441 cylinders, total 1758174768 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x000181d2

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1               2048     8386559     4192256   82  Linux swap / Solaris
/dev/sda2   *     8386560  1758173183   874893312   83  Linux

Disk /dev/sdb: 900.2 GB, 900185481216 bytes
255 heads, 63 sectors/track, 109441 cylinders, total 1758174768 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000

Disk /dev/sdb doesn't contain a valid partition table
```

Step 5 Write all 0s to the drive to be cleared.

Command: **badblocks -swft 0** ***Drive letter***

Example: **badblocks -swft 0 /dev/sdb**

Figure 10-18 Clearing data (example)

```
linux-hm54:~ # badblocks -swft 0 /dev/sdb
Testing with pattern 0x00: 26.38% done, 19:40 elapsed
```

NOTE

- The drive letters vary with the storage media (HDD, SSD, and USB flash drive). Ensure that the drive letter that you entered is correct.
- This operation takes time.
- If the command fails to execute, contact technical support.

Step 6 Remove the drive.

NOTE

After the data is cleared, do not restart or reinstall the server. Otherwise, the system will reload data to the drives during the startup of the server.

----End

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11 More Information

11.1 Obtaining Technical Support

11.2 Product Information

11.3 Product Configuration Resources

11.4 Maintenance Tools

11.1 Obtaining Technical Support

Huawei provides timely and efficient technical support through local branch offices, secondary technical support system, telephone technical support, remote technical support and onsite technical support.

Technical Support Website

Refer to technical documents at either of the following technical support websites:

- **Huawei Enterprise Website**
- **Huawei Carrier Product and Service Website**

Self-Service Platform and Community

To learn more about servers and communicate with experts:

- Visit **HUAWEI Server Information Service Platform** for specific server product documentation.
- Visit **Huawei Enterprise WeiKnow** for quick learning about products.
- Visit **Huawei Enterprise Support Community (Servers)** for learning and discussion.

Notice

For notices about product life cycles, warnings, and updates, visit **Support > Bulletins > Product Bulletins**.

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Knowledge Base

To learn server applications, visit **Computing Product Case Library**.

Contact Huawei

If a fault cannot be located or rectified by referring to documents, contact technical support.

- Contact the Huawei customer service center.

  Enterprise customers in China:

  – Customer service hotline: 400-822-9999

  – Customer service hotline: **support_e@huawei.com**.

  Enterprise customers outside China: **Global Service Hotline**

  Telecom carriers in China can contact us by:

  – Customer service hotline: 400-830-2118

  – Customer service hotline: **support@huawei.com**.

  Telecom carriers outside China: **Global TAC Information**.
- Contact the technical support personnel at your local Huawei office.

11.2 Product Information

Table 11-1 provides common information about servers.

Table 11-1 Product information

Item	Description	How to Obtain
Server product documentation	Server user guide, which provides information about the structure, specifications, and installation of the server.	Visit **Support > Intelligent Servers**, select a product model, and view the **Documentation** tab page.
Computing Product Compatibility Checker	A tool used to query the OSs, parts, and peripherals compatible with a server.	**Computing Product Compatibility Checker**
Maintenance Information Inquiry System	A system used to query the service information about servers.	Visit **Maintenance Status**.
Computing Product Power Calculator	A tool used to calculate server power consumption based on the server configuration. The power consumption is for reference only.	**Computing Product Power Calculator**

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11.3 Product Configuration Resources

Table 11-2 describes the common product configuration resources of servers.

Table 11-2 Product configuration resources

Tool	Description	How to Obtain
Removal and installation videos	Tutorial videos about how to remove and install hardware.	**Multimedia Portal**
Computing Product Memory Configuration Assistant	The Computing Product Memory Configuration Assistant is an online application. It demonstrates DIMM installation sequence in a graphical manner after you specify the product name, CPU quantity, and DIMM quantity.	**Computing Product Memory Configuration Assistant**

11.4 Maintenance Tools

Table 11-3 lists the software tools required for routine maintenance of servers.

Table 11-3 Software tools for routine maintenance

Tool	Server Model and Software Version	Description
FusionServer Tools SmartKit	See **SmartKit Computing XXX User Guide**.	SmartKit contains tools used for batch deployment, maintenance, and upgrade of servers. Download link: • Enterprise users: **SmartKit Computing** • Carrier users: Contact the technical support personnel at your local Huawei office.

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Tool	Server Model and Software Version	Description
Smart Provisioning	See ***Smart Provisioning User Guide***.	Smart Provisioning is used to install OSs, configure RAID, and update firmware. Download link: • Enterprise users: **Smart Provisioning** • Carrier users: Contact the technical support personnel at your local Huawei office.
FusionDirector	See ***FusionDirector Specifications List***.	FusionDirector is the management software for intelligent O&M over the entire server lifecycle. It provides intelligent functions to manage deployment, assets, versions, faults, and energy efficiency. Download link: • Enterprise users: **FusionDirector** • Carrier users: Contact the technical support personnel at your local Huawei office.

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12 Software and Configuration Utilities

12.1 iBMC
12.2 BIOS

12.1 iBMC

Huawei intelligent Baseboard Management Controller (iBMC) is a Huawei proprietary intelligent system for remotely managing a server. The iBMC complies with IPMI 2.0 and SNMP standards and supports various functions, including KVM redirection, text console redirection, remote virtual media, and hardware monitoring and management.

The iBMC provides the following features:

- Multiple management interfaces for system integration

  The iBMC provides IPMI, command-line interface (CLI), Data Center Manageability Interface (DCMI), Redfish interfaces, Hypertext Transfer Protocol Secure (HTTPS), and SNMP.
- Fault detection and alarm management

  The iBMC implements fault detection and alarm management, ensuring stable, uninterrupted 24/7 system operation.
- Virtual KVM and virtual media

  The iBMC provides virtual KVM and virtual media, facilitating remote maintenance.
- Web-based user interface (WebUI)

  The iBMC provides a web-based UI for setting and querying device information.
- System breakdown screenshots and video playback

  The iBMC allows screenshots and videos to be created when the system breaks down. The screenshots and videos help to identify the cause of system breakdown.
- Screen snapshots and videos

  The iBMC offers screen snapshots and videos, which simplify routine preventive maintenance, recording, and auditing.

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- Support for DNS and LDAP

  The iBMC supports domain name system (DNS) and Lightweight Directory Application Protocol (LDAP) to implement domain management and directory service.
- Image backup

  The iBMC works in active/standby mode to ensure system reliability. If the active iBMC is faulty, the standby iBMC takes over services immediately.
- Intelligent power management

  The iBMC uses dynamic power saving to reduce operational expenditure (OPEX).

For details about the iBMC, see ***FusionServer Pro Rack Server iBMC User Guide***.

12.2 BIOS

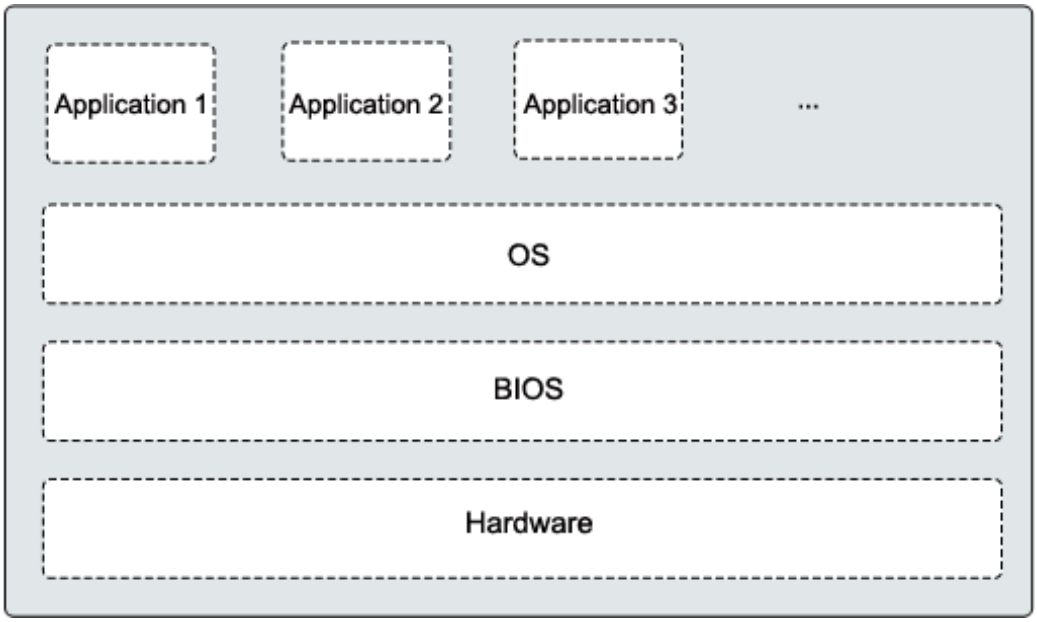
The basic input/output system (BIOS) is the most basic software loaded to a computer hardware system. The BIOS provides an abstraction layer for the operating system (OS) and the hardware to interact with the keyboard, display, and other input/output (I/O) devices.

The BIOS data is stored on the Serial Peripheral Interface (SPI) flash memory. The BIOS performs a power-on self-test (POST), initializes CPU and memory, checks the I/O and boot device, and finally boots the OS. The BIOS also provides the advanced configuration and power interface (ACPI) and hot swap.

The Huawei Purley-based server is developed based on Insyde code base and uses a proprietary BIOS. It provides a variety of in-band and out-of-band configuration functions as well as high scalability, and supports customization.

For details about the BIOS, see ***Huawei Server Purley Platform BIOS Parameter Reference***.

Figure 12-1 BIOS in the system



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A Appendix

A.1 Product SN

The serial number (SN) on the slide-out label plate uniquely identifies a device. The SN is required when you contact Huawei technical support.

Figure A-1 SN example

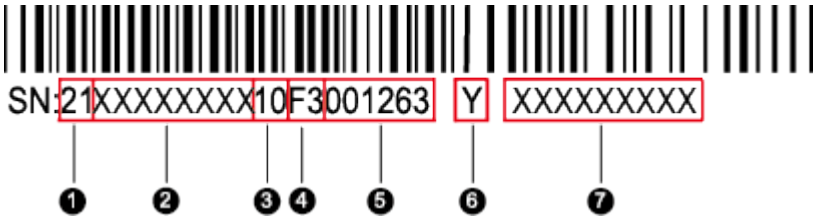

Table A-1 SN description

No.	Description
1	ESN ID (two characters), which can only be **21**.
2	Material ID (eight characters), that is, the processing code.
3	Vendor code (two characters). The value **10** indicates Huawei and other values indicate outsourcing vendors.

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No.	Description
4	Year and month (two characters). ● The first character indicates the year. – Digits 1 to 9 indicate years 2001 to 2009, respectively. – Letters A to H indicate years 2010 to 2017, respectively. – Letters J to N indicate years 2018 to 2022, respectively. – Letters P to Y indicate years 2023 to 2032, respectively. **NOTE** The years from 2010 are represented by upper-case letters excluding I, O, and Z because the three letters are similar to the digits 1, 0, and 2. ● The second character indicates the month. – Digits 1 to 9 indicate January to September, respectively. – Letters A to C indicate October to December, respectively.
5	Serial number (six digits).
6	RoHS compliance (one character). **Y** indicates RoHS compliant.
7	Internal model (product name) of the board.

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A.2 Operating Temperature Limitations

Table A-2 Operating temperature limitations

Configuration	Max. 30°C (86°F)	Max. 35°C (95°F)	Max. 40°C (104°F)	Max. 45°C (113°F)
8 x 2.5" drive configuration	• All options supported	Options not supported: • V100 GPU cards • T4 GPU cards	Options not supported: • PCIe SSD cards • Passive GPU cards	Options supported: • Platinum 8153, Gold 6152/6140 / 6126/5118 /5215, Silver 4216/4215 /4214, and other processors lower than 105 W Options not supported: • PCIe SSD cards • Passive GPU cards • Rear drives • IB and OPA cards
12 x 3.5" drive EXP configuration	• All options supported	Options not supported: • P100 GPU cards • M60 GPU cards • T4 GPU cards	Options not supported: • PCIe SSD cards • Passive GPU cards • Rear drives • Built-in drives	• Not supported

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Configuration	Max. 30°C (86°F)	Max. 35°C (95°F)	Max. 40°C (104°F)	Max. 45°C (113°F)
12 x 3.5" drive pass-through configuration	• All options supported	Options not supported: • P100 GPU cards • M60 GPU cards • T4 GPU cards	Options not supported: • PCIe SSD cards • Passive GPU cards • Rear drives • Built-in drives	• Not supported
20 x 2.5" (8 x SAS/SATA + 12 x NVMe) drive configuration	• All options supported	• T4 GPU cards not supported	• Not supported	• Not supported
24 x 2.5" drive pass-through configuration	• All options supported	Options not supported: • P100 GPU cards • M60 GPU cards • T4 GPU cards	Options not supported: • PCIe SSD cards • Passive GPU cards • Rear drives • Built-in drives	• Not supported
24 x 2.5" NVMe drive configuration	• All options supported	Options not supported: • P100 GPU cards • M60 GPU cards • Rear drives • T4 GPU cards	• Not supported	• Not supported
25 x 2.5" drive EXP configuration	• All options supported	Options not supported: • P100 GPU cards • M60 GPU cards • T4 GPU cards	Options not supported: • PCIe SSD cards • Passive GPU cards • Rear drives	• Not supported

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NOTE

- When a single fan is faulty:
  - The maximum operating temperature is 5°C (9°F) lower than the rated value.
  - System performance will be affected if GPU cards are configured.
- If P4 GPU cards are configured:
  - The server supports the maximum operating temperature of 35°C (95°F) when holding three or less GPU cards.
  - The server supports the maximum operating temperature of 30°C (86°F) when holding four or more GPU cards.
- If V100 GPU cards are configured:
  - Only the 8 x 2.5" drive configuration is supported.
  - The maximum operating temperature is 30°C (86°F).

A.3 Nameplate

Certified Model	Usage Restrictions
H22H-05	Global
H22H-05-I10	India only
H22H-05-I12	India only
H22H-05-I05	India only

A.4 RAS Features

The server supports a variety of Reliability, Availability, and Serviceability (RAS) features. You can configure these features for better performance.

For details about how to configure RAS features, see ***Huawei Server Purley Platform BIOS Parameter Reference***.

Table A-3 Supported RAS features

Module	Feature	Description
CPU	Corrected Machine Check Interrupt (CMCI)	Corrects error-triggered interrupts.
Memory	Failed DIMM Isolation	Identifies faulty DIMMs to facilitate isolation and replacement of the faulty DIMMs.
	Memory Thermal Throttling	Automatically adjusts the memory temperature to prevent the memory from being damaged due to overheat.

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Module	Feature	Description
	Rank Sparing	Uses some memory ranks for backup to prevent the system from breaking down due to uncorrectable errors.
	Memory Address Parity Protection	Detects memory command and address errors.
	Memory Demand and Patrol Scrubbing	Corrects correctable errors upon detection. If these errors are not corrected in a timely manner, uncorrectable errors may occur.
	Memory Mirroring	Provides high reliability for the system via mirroring.
	Single Device Data Correction (SDDC)	Corrects single-chip multi-bit errors to improve memory reliability.
	Device Tagging	Degrades and rectifies memory faults to improve memory availability.
	Data Scrambling	Optimizes data flow distribution to reduce the error probability and improve memory data flow reliability and address error detection.
PCIe	PCIe Advanced Error Reporting	Provides a PCIe advanced error reporting mechanism to improve server serviceability.
UPI	Intel UPI Link Level Retry	Provides a retry mechanism to improve the reliability of UPI links.
	Intel UPI Protocol Protection via CRC	Provides cyclic redundancy check (CRC) protection for UPI data packets to improve system reliability.
System	Core Disable For FRB (Fault Resilient Boot)	Isolates a faulty CPU core during startup to improve system reliability and availability.
	Corrupt Data Containment Mode	Marks the memory storage unit when a data error occurs to limit the impact on the running program and improve system reliability.
	Socket disable for FRB (Fault Resilient Boot)	Isolates a faulty socket during the BIOS startup process to improve system reliability.

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Module	Feature	Description
	Architected Error Records	With the features such as eMCA, the BIOS collects error information recorded in hardware registers in compliance with UEFI specifications, notifies the OS through the APEI interface of the ACPI, and locates the error unit, improving system availability.
	Error Injection Support	Implements fault injection to verify RAS features.
	Machine Check Architecture (MCA)	Provides a software repair function to rectify uncorrectable errors to improve system availability.
	Enhanced Machine Check Architecture (eMCA): Gen2	Improves system availability.
	OOB access to MCA registers	The out-of-band system can access MCA registers through the PECI. When a fatal error occurs in the system, the out-of-band system can collect onsite data to facilitate subsequent fault analysis and locating and improve system serviceability.
	BIOS Abstraction Layer for Error Handling	The BIOS processes errors and reports error information to the OS based on specifications, improving system serviceability.
	BIOS-based Predictive Failure Analysis (PFA)	The OS takes the lead. The BIOS provides information about physical memory error units. The OS tracks, predicts, and handles the errors.

A.5 Sensor List

Sensor	Description	Component
Inlet Temp	Air intake vent temperature	Left mounting ear
Outlet Temp	Air exhaust vent temperature	Mainboard
PCH Temp	PCH bridge temperature	Mainboard

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Sensor	Description	Component
CPU*N* Core Rem	CPU core temperature	CPU *N* *N* indicates the CPU number. The value is **1** or **2**.
CPU*N* DTS	CPU DTS value	CPU *N* *N* indicates the CPU number. The value is **1** or **2**.
CPU*N* Margin	CPU Margin	CPU *N* *N* indicates the CPU number. The value is **1** or **2**.
CPU*N* VDDQ Temp	CPU VDDQ temperature	Mainboard *N* indicates the CPU number. The value is **1** or **2**.
CPU*N* VRD Temp	CPU VRD temperature	Mainboard *N* indicates the CPU number. The value is **1** or **2**.
CPU*N* MEM Temp	CPU DIMM temperature	DIMMs of CPU *N* *N* indicates the CPU number. The value is **1** or **2**.
SYS 3.3V	Mainboard 3.3 V voltage	Mainboard
SYS 5V	Mainboard 5.0 V voltage	Mainboard
SYS 12V_1	Mainboard 12.0 V voltage	Mainboard
SYS 12V_2	Mainboard 12.0 V voltage	Mainboard
CPU*N* VCore	1.8 V CPU voltage	Mainboard *N* indicates the CPU number. The value is **1** or **2**.
CPU*N* DDR VDDQ	1.2 V DIMM voltage	Mainboard *N* indicates the CPU number. The value is **1** or **2**.

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Sensor	Description	Component
CPU*N* DDR VDDQ2	1.2 V DIMM voltage	Mainboard *N* indicates the CPU number. The value is **1** or **2**.
CPU*N* VSA	CPU VSA voltage	Mainboard *N* indicates the CPU number. The value is **1** or **2**.
CPU*N* VCCIO	CPU VCCIO voltage	Mainboard *N* indicates the CPU number. The value is **1** or **2**.
CPU*N* VMCP	CPU VMCP voltage	Mainboard *N* indicates the CPU number. The value is **1** or **2**.
PCH VPVNN	PCH VPVNN voltage	Mainboard
PCH PRIM 1V05	PCH PRIM voltage	Mainboard
CPU*N* VCCP	CPU VCCP voltage	Mainboard *N* indicates the CPU number. The value is **1** or **2**.
CPU*N* DDR VPP1	VPP_ABC voltage	Mainboard *N* indicates the CPU number. The value is **1** or **2**.
CPU*N* DDR VPP2	VPP_DEF voltage	Mainboard *N* indicates the CPU number. The value is **1** or **2**.
FAN*N* Speed	Fan speed	Fan module *N* *N* indicates the fan module number. The value ranges from **1** to **4**.
Power	Server input power	PSU
PS*N* VIN	PSU *N* input voltage	PSU *N* *N* indicates the PSU number. The value is **1** or **2**.

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Sensor	Description	Component
Disks Temp	Drive maximum temperature	Drive
Power*N*	PSU input power	PSU *N* *N* indicates the PSU number. The value is **1** or **2**.
PCH Status	PCH chip fault diagnosis health status	Mainboard
CPU*N* QPI Link	CPU QPI link fault diagnosis health status	Mainboard or CPU *N* *N* indicates the CPU number. The value is **1** or **2**.
CPU*N* Prochot	CPU Prochot	CPU *N* *N* indicates the CPU number. The value is **1** or **2**.
CPU*N* Status	CPU status	CPU *N* *N* indicates the CPU number. The value is **1** or **2**.
CPU*N* Memory	CPU memory status	DIMMs of CPU *N* *N* indicates the CPU number. The value is **1** or **2**.
FAN*N* Status	Fan status	Fan module *N* *N* indicates the fan module number. The value ranges from **1** to **4**.
DIMM*N*	DIMM status	DIMM *N* *N* indicates the DIMM slot number.
RTC Battery	RTC battery status. An alarm is generated when the voltage is lower than 1 V.	RTC battery on the mainboard
PCIE Status	PCIe status	PCIe card
Power Button	Power button pressed state	Mainboard and power button
Watchdog2	Watchdog	Mainboard

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Sensor	Description	Component
Mngmnt Health	Management subsystem health status	Management module
UID Button	UID button status	Mainboard
PwrOk Sig. Drop	Voltage dip status	Mainboard
PwrOn TimeOut	Power-on timeout	Mainboard
PwrCap Status	Power capping status	Mainboard
HDD Backplane	Entity presence	Drive backplane
HDD BP Status	Drive backplane health status	Drive backplane
Riser*N* Card	Entity presence	Riser card *N* *N* indicates the riser card slot number. The value ranges from **1** to **3**.
SAS Cable	Entity presence	SAS cable on the mainboard
FAN*N* R Presence	Fan presence	Fan module *N* *N* indicates the fan module number. The value ranges from **1** to **4**.
RAID Presence	RAID controller card presence	RAID controller card
LCD Status	LCD health status	LCD
LCD Presence	LCD presence	LCD
PS Redundancy	Redundancy failure due to PSU removal	PSU
NIC# Status	NIC fault diagnosis health status	LOM port
Port# Link Down	Network port link state	LOM port
PS*N* Status	PSU status	PSU *N* *N* indicates the PSU number. The value is **1** or **2**.
PS*N* Fan Status	PSU fan status	PSU *N* *N* indicates the PSU number. The value is **1** or **2**.

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Sensor	Description	Component
PS*N* Temp Status	PSU presence	PSU *N* *N* indicates the PSU number. The value is **1** or **2**.
DISK*N*	Drive status	Drive *N* *N* indicates the drive slot number. The value ranges from **0** to **24** or from **36** to **47**.
LOM P1 Link Down	LOM	LOM
LOM P2 Link Down	LOM	LOM
LOM P3 Link Down	LOM	LOM
LOM P4 Link Down	LOM	LOM
PCIe RAID$ Temp	PCIe RAID controller card temperature	PCIe RAID controller card
M2 Temp(PCIe$)	Maximum temperature of all M.2 drives of the RAID controller card	PCIe RAID controller card
RAID Temp	RAID controller card temperature	RAID controller card
RAID Status	RAID controller card health status	RAID controller card
RAID PCIE ERR	RAID controller card fault diagnosis health status	RAID controller card
IB$ TEMP	IB NIC temperature	IB card
PCIe$ OP Temp	PCIe card optical module temperature	PCIe card
PCIe NIC$ Temp	PCIe card chip temperature	PCIe card
PCIe FC$ Temp	PCIe card chip temperature	PCIe card
RAID Card BBU	RAID controller card BBU	BBU supercapacitor of RAID controller card
SM380 Temp	25GE NIC chip temperature	PCIe card
PCIe$ NIC Temp	PCIe card chip temperature	PCIe card

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Sensor	Description	Component
PS$ Inlet Temp	PSU air intake vent temperature	PSU
NIC$ Presence	LOM presence	FlexIO
CPU*N* AEP Temp	CPU DCPMM temperature	DCPMMs of CPU *N* *N* indicates the CPU number. The value is **1** or **2**.
FPGA# Temp	FPGA card temperature	PCIe card
FPGA# EnvTemp	FPGA card operating temperature	PCIe card
FPGA# DDR Temp	FPGA card memory temperature	PCIe card
FPGA# Power	FPGA card power	PCIe card
FPGA# OP Temp	FPGA card optical module temperature	PCIe card
GPU*N* Temp	GPU temperature	GPU cards *N* indicates the component number.

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B Glossary

B.1 A-E

B

baseboard management controller (BMC)	The BMC complies with the Intelligent Platform Management Interface (IPMI). It collects, processes, and stores sensor signals, and monitors the operating status of components. The BMC provides the hardware status and alarm information about the managed objects to the upper-level management system, so that the management system can manage the objects.

E

ejector lever	A part on the panel of a device used to facilitate installation or removal of the device.
Ethernet	A baseband local area network (LAN) architecture developed by Xerox Corporation by partnering with Intel and DEC. Ethernet uses the Carrier Sense Multiple Access/Collision Detection (CSMA/CD) access method and allows data transfer over various cables at 10 Mbit/s. The Ethernet specification is the basis for the IEEE 802.3 standard.

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B.2 F-J

G

Gigabit Ethernet (GE)	An extension and enhancement of traditional shared media Ethernet standards. It is compatible with 10M and 100M Ethernet and complies with IEEE 802.3z standards.

H

hot swap	Replacing or adding components without stopping or shutting down the system.

B.3 K-O

K

KVM	A hardware device that provides public keyboard, video and mouse (KVM).

B.4 P-T

P

panel	An external component (including but not limited to ejector levers, indicators, and ports) on the front or rear of the server. It seals the front and rear of the chassis to ensure optimal ventilation and electromagnetic compatibility (EMC).
Peripheral Component Interconnect Express (PCIe)	A computer bus PCI, which uses the existing PCI programming concepts and communication standards, but builds a faster serial communication system. Intel is the main sponsor for PCIe. PCIe is used only for internal interconnection. A PCI system can be transformed to a PCIe one by modifying the physical layer instead of software. PCIe delivers a faster speed and can replace almost all AGP and PCI buses.

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R

redundancy	A mechanism that allows a backup device to automatically take over services from a faulty device to ensure uninterrupted running of the system.
redundant array of independent disks (RAID)	A storage technology that combines multiple physical drives into a logical unit for the purposes of data redundancy and performance improvement.

S

server	A special computer that provides services for clients over a network.
system event log (SEL)	Event records stored in the system used for subsequent fault diagnosis and system recovery.

B.5 U-Z

U

U	A unit defined in International Electrotechnical Commission (IEC) 60297-1 to measure the height of a cabinet or chassis. 1 U = 44.45 mm
UltraPath Interconnect (UPI)	A point-to-point processor interconnect developed by Intel.

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C Acronyms and Abbreviations

C.1 A-E

A

AC	alternating current
AES	Advanced Encryption Standard New Instruction Set
ARP	Address Resolution Protocol
AVX	Advanced Vector Extensions

B

BBU	backup battery unit
BIOS	Basic Input/Output System
BMC	Baseboard Management Controller

C

CD	calendar day
CE	Conformite Europeenne
CIM	Common Information Model
CLI	command-line interface

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D

DC	direct current
DCPMM	DC persistent memory module
DDR3	Double Data Rate 3
DDR4	Double Data Rate 4
DDDC	double device data correction
DEMT	Dynamic Energy Management Technology
DIMM	dual in-line memory module
DRAM	dynamic random-access memory
DVD	digital video disc

E

ECC	error checking and correcting
ECMA	European Computer Manufacturer Association
EDB	Execute Disable Bit
EN	European Efficiency
ERP	enterprise resource planning
ETS	European Telecommunication Standards

C.2 F-J

F

FB-DIMM	Fully Buffered DIMM
FC	Fiber Channel
FCC	Federal Communications Commission
FCoE	Fibre Channel over Ethernet
FTP	File Transfer Protocol

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G

GE	Gigabit Ethernet
GPIO	General Purpose Input/Output
GPU	graphics processing unit

H

HA	high availability
HDD	hard disk drive
HPC	high-performance computing
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol Secure

I

iBMC	intelligent baseboard management controller
IC	Industry Canada
ICMP	Internet Control Message Protocol
IDC	Internet Data Center
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IGMP	Internet Group Message Protocol
IOPS	input/output operations per second
IP	Internet Protocol
IPC	intelligent power capability
IPMB	Intelligent Platform Management Bus
IPMI	Intelligent Platform Management Interface

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C.3 K-O

K

KVM	keyboard, video, and mouse

L

LC	Lucent connector
LRDIMM	load-reduced dual in-line memory module
LED	light emitting diode
LOM	LAN on motherboard

M

MAC	media access control
MMC	module management controller

N

NBD	next business day
NC-SI	Network Controller Sideband Interface

C.4 P-T

P

PCIe	Peripheral Component Interconnect Express
PDU	power distribution unit
PHY	physical layer
PMBUS	power management bus
POK	power OK
PWM	pulse-width modulation

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PXE	Preboot Execution Environment

Q

QPI	Quick Path Interconnect

R

RAID	redundant array of independent disks
RAS	reliability, availability and serviceability
RDIMM	registered dual in-line memory module
REACH	Registration Evaluation and Authorization of Chemicals
RJ45	registered jack 45
RoHS	Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment

S

SAS	Serial Attached Small Computer System Interface
SATA	Serial Advanced Technology Attachment
SCM	supply chain management
SDDC	single device data correction
SERDES	serializer/deserializer
SGMII	serial gigabit media independent interface
SMI	serial management interface
SMTP	Simple Mail Transfer Protocol
SNMP	Simple Network Management Protocol
SOL	serial over LAN
SONCAP	Standards Organization of Nigeria-Conformity Assessment Program
SSD	solid-state drive
SSE	Streaming SIMD Extensions

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T

TACH	tachometer signal
TBT	Turbo Boost Technology
TCG	Trusted Computing Group
TCM	trusted cryptography module
TCO	total cost of ownership
TDP	thermal design power
TELNET	Telecommunication Network Protocol
TET	Trusted Execution Technology
TFM	TransFlash module
TFTP	Trivial File Transfer Protocol
TOE	TCP offload engine
TPM	trusted platform module

C.5 U-Z

U

UDIMM	unbuffered dual in-line memory module
UEFI	Unified Extensible Firmware Interface
UID	unit identification light
UL	Underwriter Laboratories Inc.
USB	Universal Serial Bus

V

VCCI	Voluntary Control Council for Interference by Information Technology Equipment
VGA	Video Graphics Array
VLAN	virtual local area network
VRD	voltage regulator-down

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W

WEEE	waste electrical and electronic equipment
WSMAN	Web Service Management

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