TaiShan 200 Server (Model 2280 V2)

Technical White Paper

Issue 04

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About This Document

Purpose

This document describes the appearance, performance parameters, and component compatibility of the TaiShan 200 server (model 2280 V2).

Intended Audience

The document is intended for:

- Huawei presales engineers
- Channel partners' presales engineers
- Enterprise presales engineers

Symbol Conventions

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.
NOTE	Supplements 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
04	2026-05-28	Changed the number of cores per processor to 24 or more. For details, see 2 Features and 6.1 Technical Specifications.
03	2026-01-16	• Added the 16 x 2.5-inch NVMe (compatible with 8 x 2.5-inch SAS/SATA) drive configuration. For details, see 5.1 Front Panel, 5.6.1 Drive Configurations, 5.6.2 Drive Numbers, 5.7 Storage Extension Components, 6.2 Environmental Specifications, and 6.3 Physical Specifications. • Added descriptions about M.2. For details, see 5.6.5 M.2 Drive Module and 5.7 Storage Extension Components. • Added the riser card with one x8, one x16, and one x8 slots. For details, see 5.8 I/O Extension Components.
02	2025-12-02	Added the DC power supply. For details, see 6.4 PSU Specifications. Added notice for single PSU risks. For details, see 6.4 PSU Specifications.
01	2025-07-11	This issue is the first official release.

Contents

1 Introduction

The TaiShan 200 servers powered by the Tianchi architecture and Huawei Kunpeng 920 processors are dedicated for data centers. The TaiShan 200 2280 V2 balanced model (marked as **K22R-02** on the nameplate) is a 2U 2-socket rack server.

It features high-performance computing, large-capacity storage, low power consumption, simple management, and easy deployment, and is ideal for Internet, distributed storage, cloud computing, big data, and enterprise services.

Figure 1-1 shows the appearance of a server with 8 x 2.5-inch drives.

Figure 1-1 Appearance

2 Features

Performance and Scalability

- This product supports Huawei-developed server-oriented 64-bit Kunpeng 920 multicore processors, which integrate DDR, PCIe, 25GE, 10GE, and GE ports to provide comprehensive system-on-chip (SoC) functions.
- Each server supports two processors (≥ 24 cores per processor), maximizing the concurrent execution of multithreaded applications.
- Flexible drive configurations satisfy a variety of business requirements and ensure high elasticity and scalability of storage resources.
- FlexIO cards provide multiple Ethernet ports.
- Up to 8 standard PCIe slots are allowed. 72 lanes (CPU 1) and 80 lanes (CPU 2) are available.

NOTE

The actual configurations may vary depending on the configuration manual.

Availability and Serviceability

- This server supports SAS/SATA/NVMe drives. SAS/SATA drives can provide RAID cache, and RAID levels of SAS/SATA drives can be set based on the RAID controller card type. For details, see RAID Controller Card User Guide (Arm). It supports a supercapacitor for power failure protection and hot swap of non-system drives.
- The UID and HLY indicators on the panel and the Intelligent Baseboard Management Controller (iBMC) WebUI help technical support personnel promptly obtain the status of key components and locate failed or failing components. This simplifies maintenance, accelerates troubleshooting, and improves system availability.
- The intelligent baseboard management controller (iBMC) monitors system parameters in real time and triggers alarms to minimize system downtime.

Manageability and Security

- The iBMC monitors server operating status and provides remote management.
- The integrated industry-standard Unified Extensible Firmware Interface (UEFI) increases efficiency of setup, configuration, and update, and simplifies fault handling.

Energy Efficiency

- The server supports Platinum power supply units (PSUs), which provide 94% power efficiency at 50% load.
- The voltage regulator-down (VRD) PSUs reduce the energy loss in DC-DC power conversion.
- The server supports active and standby PSUs.
- The server supports Proportional-Integral-Derivative (PID) intelligent fan speed adjustment, which reduces power consumption.
- The improved thermal design with energy-efficient fan modules ensures optimal heat dissipation and reduces overall system power consumption.
- Drives can be powered on at different times to reduce startup power consumption.
- The server supports SSDs. SSDs consume 80% less power than HDDs.

3 Physical Structure

The server provides 32 DIMM slots. This section takes a server with 8 x 2.5-inch SAS/SATA drives (compatible with 4 x 2.5-inch NVMe drives) as an example to describe the physical server structure. Figure 3-1 shows the components.

NOTE

Servers come in various configurations. This figure is for reference only, showing the relative positions and names of components. Actual server configurations may vary.

Figure 3-1 Components

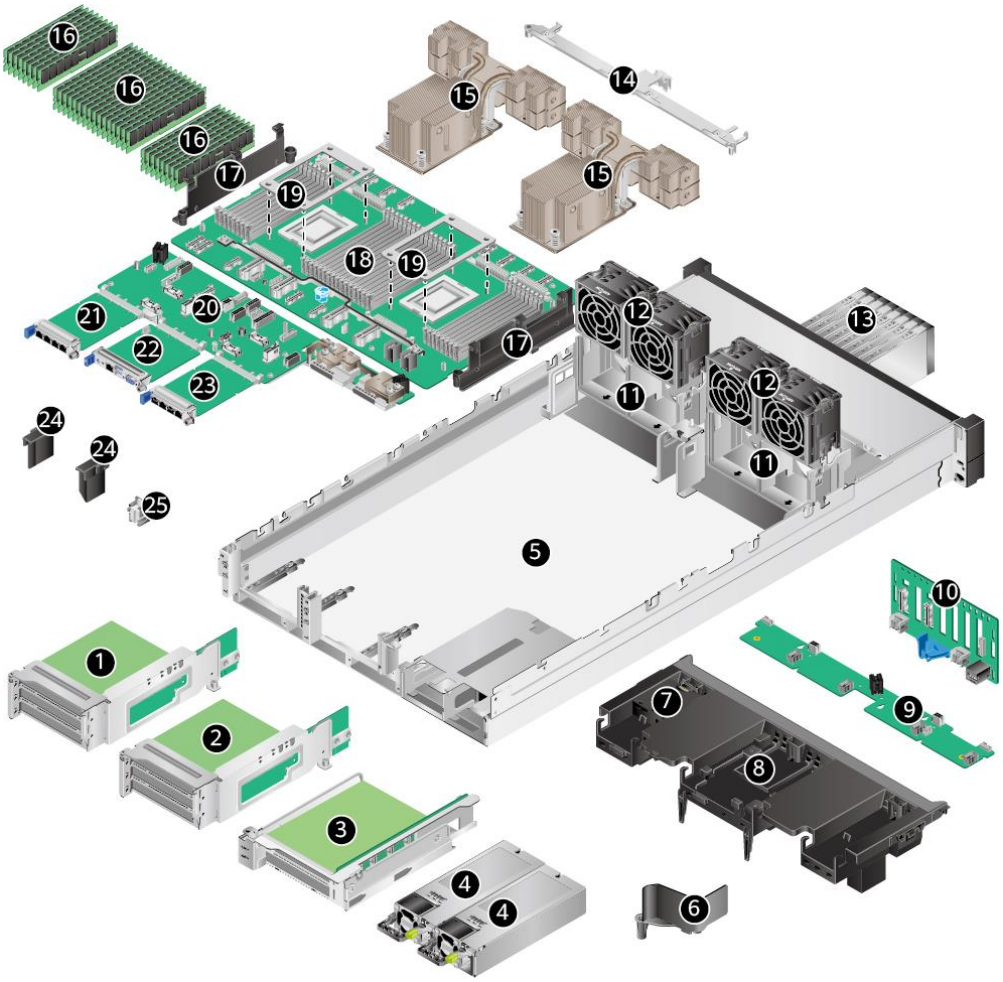


Table 3-1 Components

No.	Component	No.	Component
1	I/O module 1	2	I/O module 2
3	I/O module 3	4	Power supply unit (PSU)
5	Chassis	6	PSU air duct
7	Supercapacitor	8	Air duct
9	Fan board	10	Front drive backplane
11	Fan module bracket	12	Fan modules (numbered 4, 3, 2, and 1 from upper left to lower right in the figure)
13	Front drive	14	Remote support for the heat sink

No.	Component	No.	Component
15	Heat sink	16	DIMM
17	Cable organizer	18	Basic board
19	CPU tray	20	Extension board
21	FlexIO card 1 (connected to CPU 1)	22	BMC card
23	FlexIO card 2 (connected to CPU 2)	24	Cable tie
25	Intrusion sensor	-	-

NOTE

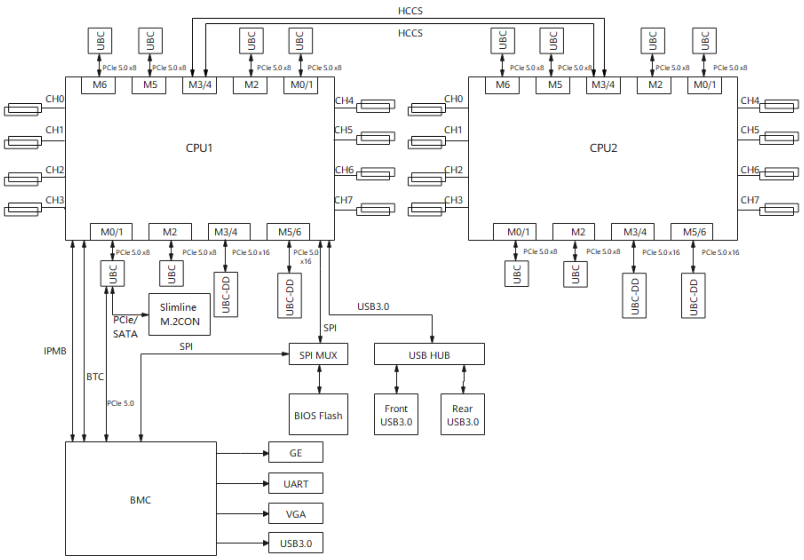
- The figure in this section is for reference only.
- CPUs are integrated on the basic board and cannot be replaced separately.
- For details about spare parts, see Spare Parts Query.
- The actual configurations may vary depending on the configuration manual.

4 Logical Structure

This product supports the Hi1711 BMC card and provides VGA, management, serial, and USB ports.

Figure 4-1 shows the logical server architecture.

Figure 4-1 Logical structure



- The server uses two Huawei Kunpeng 920 processors, each supporting 16 DDR DIMMs.
- The two processors interconnect with each other over two HCCS buses, with a maximum rate of 30 Gbit/s and a total rate of 480 Gbit/s.
- The PCIe resources of the processors are connected to the PCIe riser card through the PCB or cables.
- A riser card supports PCIe slots of different specifications. CPU 1 and CPU 2 each support one FlexIO NIC, which supports four GE ports and two 25GE/10GE ports.

- The independent baseboard management controller (BMC) chip supports external video graphics adapter (VGA), management, and serial ports.
- Different riser cards correspond to different PCIe protocol versions. For details, contact Huawei technical support.

5 Hardware

5.1 Front Panel

NOTE

The actual configurations may vary depending on the configuration manual.

- Figure 5-1 shows the components on the front panel with 8 x 2.5-inch SAS/SATA drives (compatible with 4 x 2.5-inch NVMe drives).

Figure 5-1 Front panel with 8 x 2.5-inch SAS/SATA drives (compatible with 4 x 2.5-inch NVMe drives)

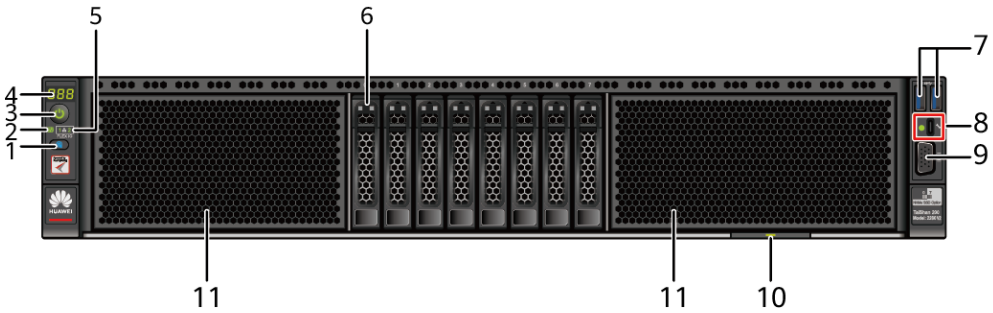


Table 5-1 Components on the front panel

No.	Component	No.	Component
1	UID button/indicator	2	Health indicator
3	Power button/indicator	4	Fault diagnosis LED
5	FlexIO card presence indicators (1 and 2)	6	Drive/indicator
7	USB port	8	USB Type-C port/indicator
9	VGA port	10	Label with SN
11	Filler panel	-	-

- Figure 5-2 shows the front panel with 12 x 3.5-inch SAS/SATA drives (RAID pass-through).

  Figure 5-2 Front panel with 12 x 3.5-inch SAS/SATA drives

- Figure 5-3 shows the front panel with 16 x 2.5-inch NVMe drives (compatible with 8 SAS/SATA drives).

Figure 5-3 Front panel with 16 x 2.5-inch NVMe drives (compatible with 8 SAS/SATA drives)

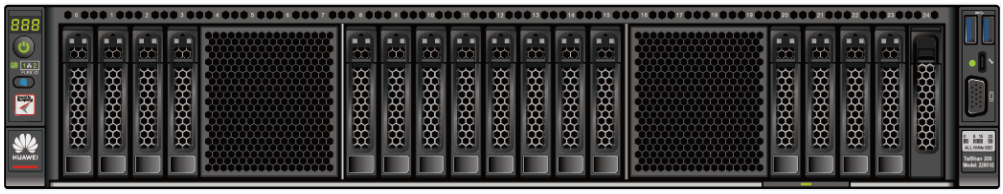


Table 5-2 Front panel description

Item	Type	Description
USB 3.0 port	USB 3.0	Connected to a USB device. **NOTE** • Before connecting a USB device, check that the USB device functions properly. The server may operate improperly if an abnormal USB device is connected. • A maximum of 1 m extension cable can be used for a USB device. • If USB devices, including USB flash drives and portable drives, are not detected, contact Huawei technical support.
VGA port	DB15	Connected to a terminal, such as a monitor or physical keyboard, video, or mouse (KVM). **NOTE** • The VGA port on the front panel does not have cable screws, meaning the VGA cable may disconnect easily. You are advised to use the VGA port on the rear panel. • The VGA port on the front panel cannot be used together with the USB Type-C port.
USB Type-C port/indicator	Type-C	Local maintenance and management port of the BMC. **NOTE** The USB Type-C port cannot be used together with the VGA port on the front panel.
Fault diagnosis LED	-	• ---: The server is operating properly. • Error code: A server component is faulty. For details about error codes, see iBMC Alarm Handling.
Power button/indicator	-	Power indicator description: • Steady yellow: The server is in the standby state. • Steady green: The server is powered on. • Blinking yellow: The iBMC is being started. • Off: The server is not powered on. Power button description: • When the server is powered on, you can press this button to shut down the OS. • When the server is powered on, you can hold down

Item	Type	Description
		this button for 6 seconds to force the server to power off. • When the server is in standby state, you can press this button to power on the server.
UID button/indicator	-	The UID button/indicator helps locate a server. UID indicator description: • Off: The server is not being located. • Blinking blue (for 255 seconds): The server is being located and is differentiated from other servers that are also being located. • Steady blue: The server is being located. **NOTE** • After the iBMC is initialized, the UID indicator restores to the default off state. You can press the UID button to relocate the server. • The blinking continues for 255 seconds for each setting on the iBMC. After 255 seconds, the indicator is off. UID button description: • You can turn on, turn off, or blink the UID indicator by pressing the UID button or by using the iBMC CLI or WebUI. • You can press this button to turn on or off the UID indicator. • You can hold down this button for 5 seconds to reset the iBMC.
Health indicator	-	• Steady green: The server is operating properly. • Blinking red at 1 Hz: A major alarm has been generated on the server. • Blinking red at 5 Hz: A critical alarm has been generated on the server.
FlexIO card presence indicators (1 and 2)	-	• 1 and 2: 1 indicates FlexIO card 1, and 2 indicates FlexIO card 2. • Steady green: The FlexIO card is installed and identified. • Off: The FlexIO card is not installed or is faulty.
Drive/indicator	-	For details, see 5.6.3 Drive Indicators.

5.2 Rear Panel

NOTE

The actual configurations may vary depending on the configuration manual.

Figure 5-4 shows the rear panel of a server.

Figure 5-4 Rear panel

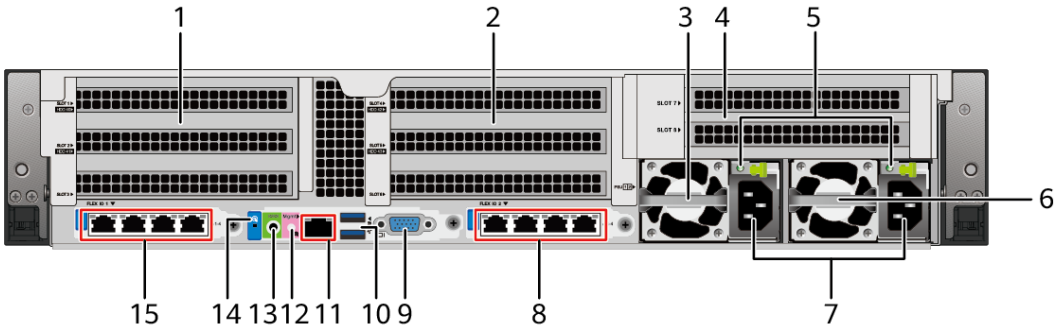


Table 5-3 Components on the rear panel

No.	Component	No.	Component
1	I/O module 1	2	I/O module 2
3	PSU 1	4	I/O module 3
5	PSU indicator	6	PSU 2
7	PSU socket	8	FlexIO card 2 and its indicators (connected to CPU 2)
9	VGA port	10	USB 3.0 port
11	Management network port and indicator	12	UID button
13	Serial port	14	UID indicator
15	FlexIO card 1 and its indicators (connected to CPU 1)	-	-

NOTE

- The ports or indicators numbered 9 to 14 are on the BMC card.
- FlexIO cards 1 and 2 and the BMC card are not hot-swappable. If you need to replace them, power off the server first.

Table 5-4 Rear panel description

Item	Type	Quantity	Description

Item	Type	Quantity	Description
I/O module	-	-	I/O modules 1, 2, and 3 support riser or drive modules. • For details about the supported riser modules, see 5.8 I/O Extension Components. • For details about the supported drive modules, see 5.6.4 Rear Drive Modules.
VGA port	DB15	1	Connected to a terminal, such as a monitor or physical KVM.
USB 3.0 port	USB 3.0	2	Connected to a USB device. **NOTE** • Before connecting a USB device, check that the USB device functions properly. The server may operate improperly if an abnormal USB device is connected. • A maximum of 1 m extension cable can be used for a USB device. • If USB devices, including USB flash drives and portable drives, are not detected, contact Huawei technical support.
Management network port/indicators	RJ45	1	Management network port description: Provides 1000 Mbit/s Ethernet port that supports 10/100/1000 Mbit/s auto-negotiation. You can manage the server through this port. Management indicator description: • Data transmission status indicator (in the upper left corner) – Blinking yellow: Data is being transmitted. – Off: No data is being transmitted. • Connection status indicator (in the upper right corner) – Steady green: The network connection is normal. – Off: The network is disconnected.
Serial port	3.5 mm	1	Used as the system serial port by default. You can set it as the iBMC serial port or another using CLI commands. It is used mainly for debugging.
FlexIO card/indicators	• SF221Q NIC: RJ45 • SF223D-H NIC: SFP28	2	Both FlexIO cards 1 and 2 can be configured with the SF221Q or SF223D-H NIC. This figure is for reference only. For details about FlexIO cards, see 5.9 FlexIO Cards.

Item	Type	Quantity	Description
PSU socket/indicator	-	1/2	PSU socket description: • Determine the number of PSUs based on actual requirements, and ensure that the rated power of the PSUs is greater than that of the server. • You are advised to configure two PSUs to ensure reliable server operating. When only one PSU is used, do not set **Predicted PSU Status** or **Power Supply Settings** to **Active/Standby** on the iBMC WebUI. PSU indicator description: • Steady green: The power input and output are normal. • Steady orange: The power input is normal, but the power output fails due to overheat/overcurrent/overvoltage protection, short circuit protection, or a component failure. • Blinking green at 1 Hz: – The power input is normal and the server is in the standby state. – The input is overvoltage or undervoltage. For details, see TaiShan Servers Troubleshooting. • Blinking green at 4 Hz: The PSU firmware is being upgraded online. • Off: There is no power input.
UID indicator/button	-	-	The UID indicator/button on the rear panel has the same function as that on the front panel. For details, see 5.1 Front Panel.
Drive and indicator	-	-	For details, see 5.6.3 Drive Indicators.

5.3 Basic Computing Unit

NOTE

In the Tianchi architecture, the basic computing unit is the basic board.

5.3.1 Connectors

Figure 5-5 shows connectors on the basic board.

Figure 5-5 Connectors on the basic board

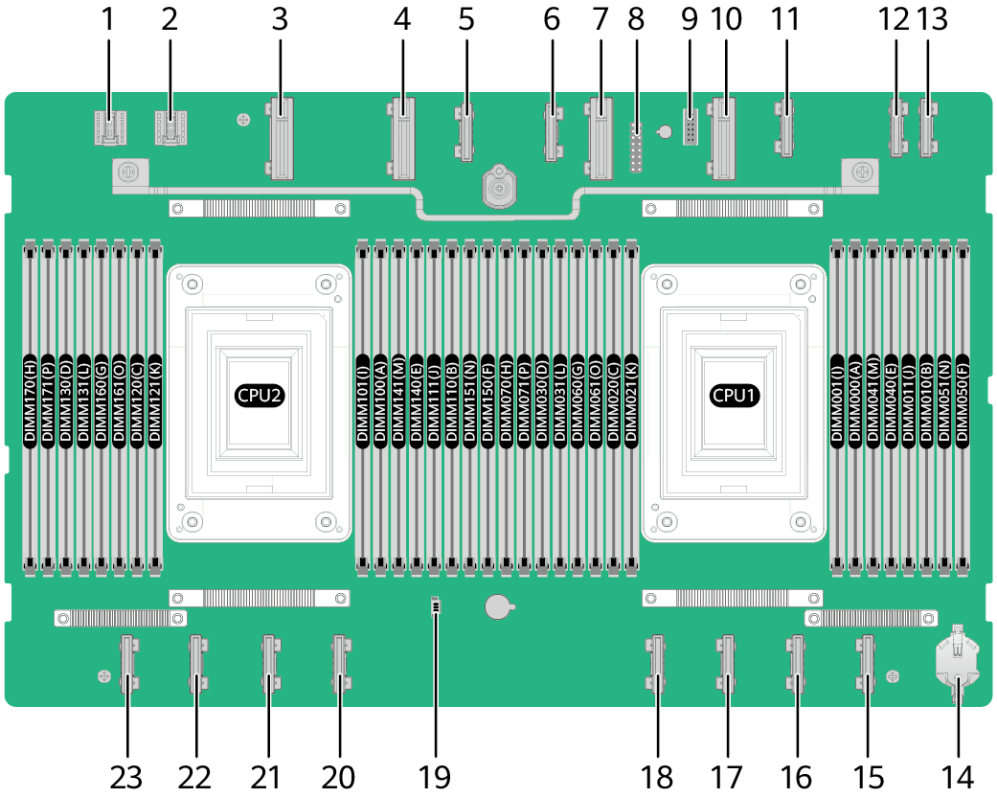


Table 5-5 Connector description

No.	Connector	No.	Connector
1	Power input connector (PWR2/J6073)	2	Power input connector (PWR1/J6074)
3	Northbound UBCDD high-speed connector (CPU2 UBCDD2/J6054)	4	Northbound UBCDD high-speed connector (CPU2 UBCDD1/J6053)
5	Northbound UBC high-speed connector (CPU2 UBC2/J132)	6	Northbound UBC high-speed connector (CPU2 UBC1/J133)
7	Northbound UBCDD high-speed connector (CPU1 UBCDD2/J6052)	8	TPM connector (J50)
9	NC-SI connector (NCSI CONN/J6124)	10	Northbound UBCDD high-speed connector (CPU1 UBCDD1/J6051)
11	Northbound UBC high-speed connector (CPU1 UBC2/J6075)	12	Northbound UBC high-speed connector (CPU1 UBC1/J6076)
13	Sub-5G low-speed UBC connector (MB CONN1/J6077) for interconnection between the basic board and the extension board	14	RTC battery holder (U53)

No.	Connector	No.	Connector
15	Southbound UBC high-speed connector (CPU1 UBC3/J138)	16	Southbound UBC high-speed connector (CPU1 UBC4/J137)
17	Southbound UBC high-speed connector (CPU1 UBC5/J6057)	18	Southbound UBC high-speed connector (CPU1 UBC6/J6056)
19	Intrusion sensor connector (INTRUDER CONN1/S1)	20	Southbound UBC high-speed connector (CPU2 UBC3/J136)
21	Southbound UBC high-speed connector (CPU2 UBC4/J135)	22	Southbound UBC high-speed connector (CPU2 UBC5/J140)
23	Southbound UBC high-speed connector (CPU2 UBC6/J139)	-	-
Note: The actual connectors may vary.			

NOTE

CPUs are integrated on the basic board and cannot be replaced separately.

5.3.2 DIMMs

5.3.2.1 DIMM Slot Numbers

A server provides a maximum of 32 DIMM slots. Each processor supports eight memory channels and each memory channel supports two DIMMs.

Figure 5-6 DIMM slot numbers

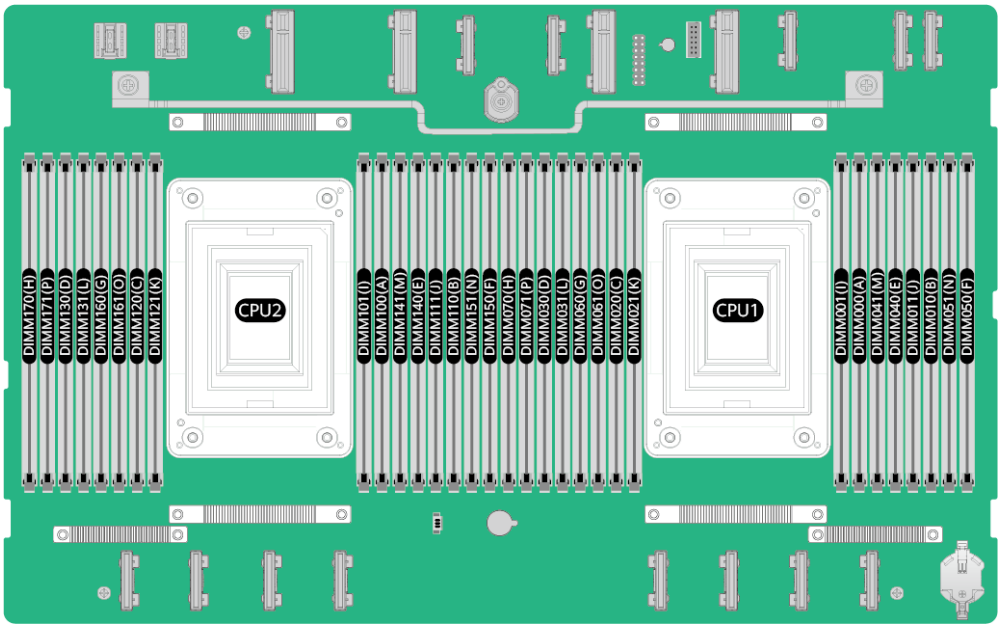


Table 5-6 Composition of channels

CPU	Channel	DIMM
CPU 1	TB_A	DIMM020(C)
		DIMM021(K)
	TB_C	DIMM060(G)
		DIMM061(O)
	TB_D	DIMM000(A)
		DIMM001(I)
	TB_F	DIMM040(E)
		DIMM041(M)
	TA_A	DIMM070(H)
		DIMM071(P)
	TA_C	DIMM030(D)
		DIMM031(L)
	TA_D	DIMM050(F)
		DIMM051(N)
	TA_F	DIMM010(B)
		DIMM011(J)
CPU 2	TB_A	DIMM120(C)
		DIMM121(K)
	TB_C	DIMM160(G)
		DIMM161(O)
	TB_D	DIMM100(A)
		DIMM101(I)
	TB_F	DIMM140(E)
		DIMM141(M)
	TA_A	DIMM170(H)
		DIMM171(P)
	TA_C	DIMM130(D)
		DIMM131(L)
	TA_D	DIMM150(F)
		DIMM151(N)

CPU	Channel	DIMM
	TA_F	DIMM110(B)
		DIMM111(J)

5.3.2.2 DIMM Installation Rules

NOTICE

- At least one DIMM must be configured in slots supported by CPU 1.
- All the DIMMs on a server must have the same specifications (such as the capacity, bit width, rank, height, and vendor). That is, they have the same part number (P/N code).

Optimal memory performance can be achieved if each processor in a server is configured with the same number of DIMMs and the DIMMs are evenly distributed among the memory channels. Unbalanced configuration reduces memory performance and is not recommended.

In unbalanced DIMM configuration, DIMMs are not evenly configured for memory channels or processors.

- If a processor is configured with an odd number of DIMMs (such as 3, 5, or 7), the DIMMs are not evenly configured for memory channels.
- If the processors in a server are configured with different number of DIMMs, the DIMMs are not evenly configured for processors.

The DIMM configuration must comply with the DIMM installation rules. For details, see Memory Configuration or Figure 5-7. Install dummy DIMM fillers in vacant DIMM slots.

Figure 5-7 DIMM installation rules

CPU	Channel	DIMM Slot	Number of DIMMs (√: Recommended O: Not recommended Y: Actual slot)																													
			x	x	x	x	x	x	x	√	x	x	x	x	x	x	x	√	x	x	x	x	x	x	x	x	x	x	x	x	x	√
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
CPU 1	TB DDRC	DIMM060(G)													Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	TB DDRC	DIMM061(O)																													Y	Y	Y	Y
	TB DDRA	DIMM020(C)					Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	TB DDRA	DIMM021(K)																					Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	TB DDRF	DIMM040(E)									Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	TB DDRF	DIMM041(M)																									Y	Y	Y	Y	Y	Y	Y	Y
	TB DDRD	DIMM000(A)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	TB DDRD	DIMM001(I)																Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	TA DDRC	DIMM030(D)							Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	TA DDRC	DIMM031(L)																							Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	TA DDRA	DIMM070(H)															Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	TA DDRA	DIMM071(P)																															Y	Y
	TA DDRF	DIMM010(B)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	TA DDRF	DIMM011(J)																			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	TA DDRD	DIMM050(F)											Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	TA DDRD	DIMM051(N)																											Y	Y	Y	Y	Y	Y
CPU 2	TB DDRC	DIMM160(G)														Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	TB DDRC	DIMM161(O)																													Y	Y	Y	Y
	TB DDRA	DIMM120(C)						Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	TB DDRA	DIMM121(K)																					Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	TB DDRF	DIMM140(E)										Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	TB DDRF	DIMM141(M)																										Y	Y	Y	Y	Y	Y	Y
	TB DDRD	DIMM100(A)		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	TB DDRD	DIMM101(I)																	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	TA DDRC	DIMM130(D)								Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	TA DDRC	DIMM131(L)																								Y	Y	Y	Y	Y	Y	Y	Y	Y
	TA DDRA	DIMM170(H)																Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	TA DDRA	DIMM171(P)																																Y
	TA DDRF	DIMM110(B)				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	TA DDRF	DIMM111(J)																				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	TA DDRD	DIMM150(F)												Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	TA DDRD	DIMM151(N)																												Y	Y	Y	Y	Y

5.3.2.3 DIMM Specifications

32 GB or 64 GB capacity per DIMM

Table 5-7 DDR DIMM specifications

Item		Specification
Rated speed (MT/s)		4800
Operating voltage (V)		12
Maximum number of DDR DIMMs		32
Maximum capacity per DDR DIMM (GB)		64
Maximum total DDR memory capacity of the server (GB)[a]		2048
Maximum operating speed (MT/s)	1 DPC[b]	4800
	2 DPC	4400

- a: The maximum total DDR memory capacity is the value for a server fully configured with DIMMs.
- b: DPC = DIMMs per channel

5.3.2.4 Memory Protection

The server supports the following memory protection technologies:

- Single Device Data Correction (SDDC)
- Memory Demand and Patrol Scrubbing
- Memory Address Parity Protection
- Memory Thermal Throttling
- Data Scrambling
- Error Checking and Correcting (ECC)
- Single-Bit Error Correction, Double-Bit Error Detection (SEC/DED)

5.4 System Extension Component

NOTE

In the Tianchi architecture, the system extension component is an extension board.

Figure 5-8 Extension board

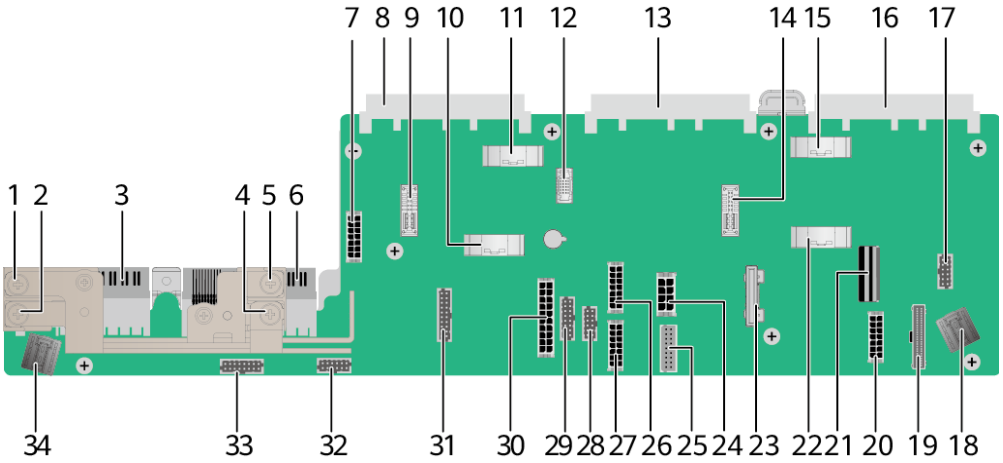


Table 5-8 Connector description

No.	Connector	No.	Connector
1	Basic board power GND	2	Basic board power 12 V
3	PSU 2 connector (PSU2 CONN/J33)	4	Basic board power GND
5	Basic board power 12 V	6	PSU 1 connector (PSU1 CONN/J34)
7	12 V power connector (12V PWR4/J12)	8	FlexIO card 2 connector (FLEX IO2 CONN/J27)
9	Riser module 2 power connector	10	FlexIO card 2 UBC2 connector (FLEX

No.	Connector	No.	Connector
	(RISER2 PWR/J21)		IO2 UBC2/J40)
11	FlexIO card 2 UBC1 connector (FLEX IO2 UBC1/J4)	12	SDI connector (SDI/DPU CONN/J18)
13	BMC card connector (BMC CONN/J43)	14	Riser module 1 power connector (RISER1 PWR/J17)
15	FlexIO card 1 UBC1 connector (FLEX IO1 UBC1/J41)	16	FlexIO card 1 connector (FLEX IO1 CONN/J28)
17	Low-speed fan board connector (FAN CONN/J5)	18	Fan board power connector (FAN PWR/J6)
19	Right mounting ear connector (RCI CONN/J26)	20	12 V power connector (12V PWR1/J13)
21	M.2/BBU high-speed signal connector (M.2 PCIE/SATA/J8)	22	High-speed connector (MB CONN2/J42) for interconnection between the extension board and the basic board
23	Low-speed connector (MB CONN1/J3) for interconnection between the extension board and the basic board	24	DPU auxiliary power connector (STBY PWR/J19)
25	Low-speed M.2 connector (M.2 CONN/J11)	26	12 V power connector (12V PWR2/J15)
27	12 V power connector (12V PWR3/J14)	28	NC-SI connector (NCSI CONN/J31)
29	BBU/Built-in drive backplane low-speed connector (INNER HDD BP/J22)	30	BBU power connector (BBU PWR/J10)
31	Left mounting ear connector (LCI CONN/J25)	32	Rear drive backplane low-speed connector (REAR HDD BP/J23)
33	Front drive backplane low-speed connector (J7)	34	Front drive backplane power connector (HDD BP PWR/J9)
Note: The actual connectors may vary.			

5.5 Heat Dissipation Components

NOTE

Heat dissipation components in the Tianchi architecture include a fan board and fans.

5.5.1 Fan Board

Figure 5-9 Ports on the fan board

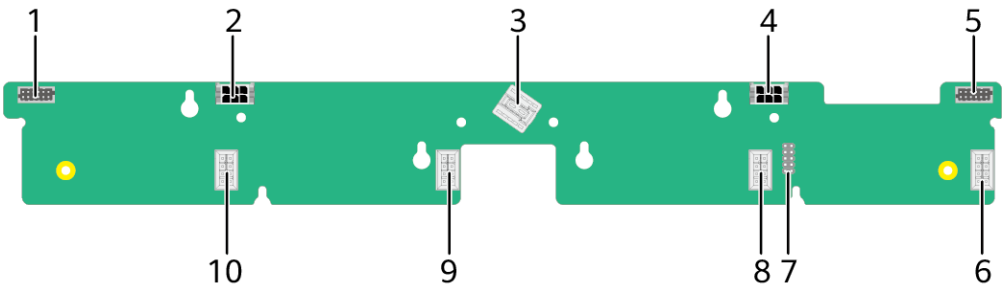


Table 5-9 Ports

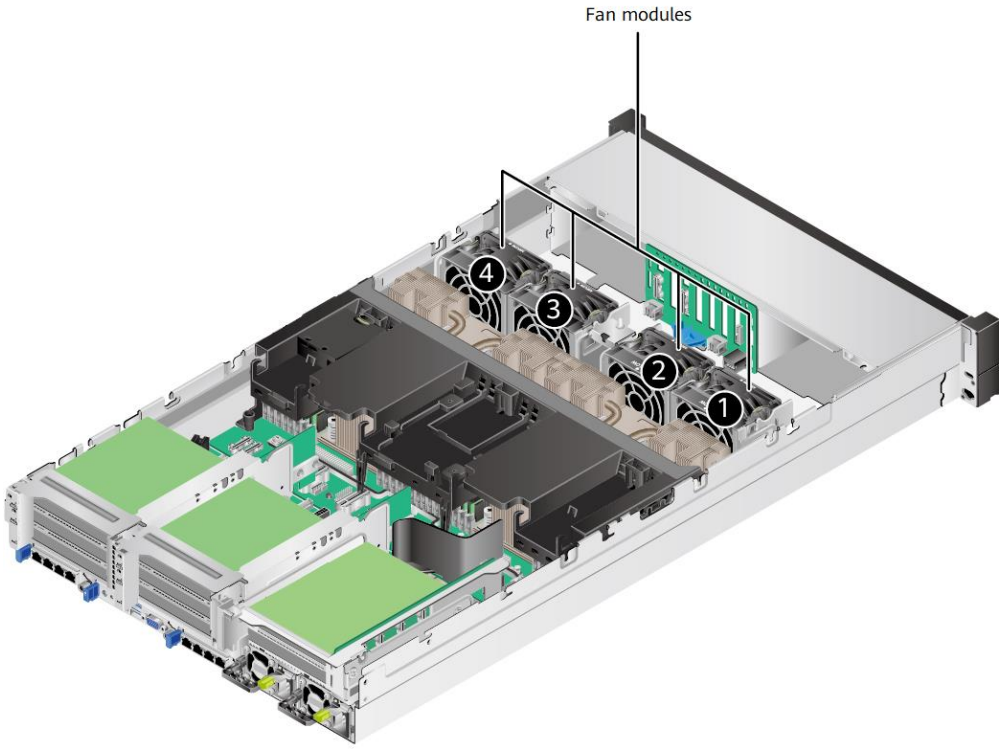
No.	Port	No.	Port
1	Fan board management port connector (FAN CONN/J3)	2	LAAC2 pump connector (reserved, J8)
3	Fan board power connector (FAN PWR/J1)	4	LAAC1 pump connector (reserved, J9)
5	LAAC fan board management connector (reserved, J2)	6	Fan connector 1 (FAN1/J7)
7	JTAG connector (reserved, J602)	8	Fan connector 2 (FAN2/J6)
9	Fan connector 3 (FAN3/J5)	10	Fan connector 4 (FAN4/J4)
Note: The actual connectors prevail.			

5.5.2 Fan Modules

The server uses fan modules that support intelligent speed adjustment. In normal cases, the fans run at a low speed. If the server temperature or the air inlet temperature increases, the fans will run faster to enhance heat dissipation.

Figure 5-10 shows the positions of fan modules.

Figure 5-10 Fan modules



5.6 Storage Components

NOTE

In the Tianchi architecture, storage components are drives.

5.6.1 Drive Configurations

NOTE

The actual configurations may vary depending on the configuration manual.

Table 5-10 Drive configurations

Configuration	Maximum Front Drives	Maximum Rear Drives	Front Drive Management Mode	Rear Drive Management Mode	M.2 Drive Modules	M.2 Drive Module Management Mode
8 x 2.5-inch SAS/SATA drives (compatible with 4 x 2.5-inch NVMe drives)	8 SAS/SATA drives Slots 0 to 3 support only SAS or SATA drives, and slots 4 to 7 support mixed configuration of SAS, SATA, and NVMe drives.	I/O module 3: • 2 x 2.5-inch SAS/SATA drives[b] • 4 x 2.5-inch NVMe drives[c]	• One RAID controller card[a] • CPU	One RAID controller card[a]	-	-
12 x 3.5-inch SAS/SATA drives (RAID pass-through)[d]	12 SAS/SATA drives	I/O module 2: • 2 x 2.5-inch SAS/SATA drives • 2 x 3.5-inch SAS/SATA drives I/O module 3: • 2 x 2.5-inch SAS/SATA drives[b] • 4 x 2.5-inch NVMe drives[c]	One RAID controller card[a]	One RAID controller card[a]	-	-
16 x 2.5-inch NVMe drives (compatible with 8 x 2.5-inch SAS/SATA drives)[i]	16 NVMe drives Slots 8 to 11 and slots 20 to 23 support only NVMe drives, and slots 0 to 3	I/O module 3: • 2 x 2.5-inch SAS/SATA drives[b] • 4 x 2.5-inch NVMe drives[c]	• One RAID controller card[a] • CPU	One RAID controller card[a]	-	-

Configuration	Maximum Front Drives	Maximum Rear Drives	Front Drive Management Mode	Rear Drive Management Mode	M.2 Drive Modules	M.2 Drive Module Management Mode
	and slots 12 to 15 support mixed configuration of SAS, SATA, and NVMe drives.					
a: A PCIe plug-in RAID controller card is installed in slot 3 by default. b: If I/O module 3 is configured with 2 x 2.5-inch drives, SAS/SATA drives can be installed only in the slots for drive numbers 46 and 47. For details about drive numbers, see 5.6.2 Drive Numbers. c: I/O module 3 is configured with 4 x 2.5-inch drives. For details about drive numbers, see 5.6.2 Drive Numbers. d: If I/O module 2 is configured with drive modules, I/O module 3 does not support drive modules. If I/O module 3 is configured with drive modules, I/O module 2 does not support drive modules.						

5.6.2 Drive Numbers

Drive numbers include physical drive numbers, drive numbers displayed on the iBMC WebUI, and drive numbers identified by the RAID controller card. A drive number is used to identify the physical location of a drive.

NOTE

The actual configurations may vary depending on the configuration manual.

- Figure 5-11 shows the drive numbers of a server with 8 x 2.5-inch SAS/SATA drives (compatible with 4 x 2.5-inch NVMe drives).

Figure 5-11 Drive numbers of a server with 8 x 2.5-inch SAS/SATA drives (compatible with 4 x 2.5-inch NVMe drives)

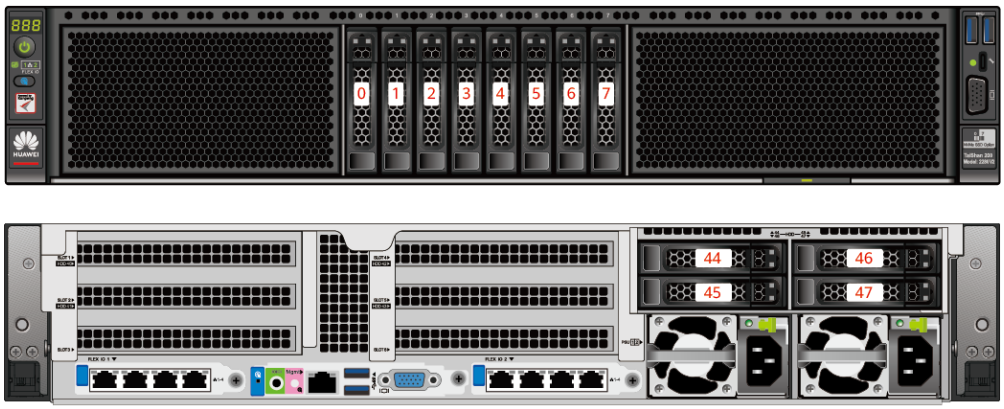


Table 5-11 Drive numbers of a server with 8 x 2.5-inch SAS/SATA drives (compatible with 4 x 2.5-inch NVMe drives)

Physical Drive Number	Drive Number Displayed on the iBMC WebUI	Drive Number Identified by the RAID Controller Card
0	Disk0	0
1	Disk1	1
2	Disk2	2
3	Disk3	3
4	Disk4	4[a]
5	Disk5	5[a]
6	Disk6	6[a]
7	Disk7	7[a]
44	Disk44	-
45	Disk45	-
46	Disk46	12[b]
47	Disk47	13[b]
[a]: When SAS/SATA drives are configured, the RAID controller card displays the drive numbers. [b]: When 2 x 2.5-inch (SAS/SATA drive) modules are configured, see Figure 5-20. The RAID controller card displays the drive numbers.		

- Figure 5-12 shows the drive numbers of a server with 12 x 3.5-inch SAS/SATA drives (RAID pass-through).

- 12 x 3.5-inch SAS/SATA drives (RAID pass-through, I/O module 2 configured with drive modules)

Figure 5-12 Drive numbers of a server with 12 x 3.5-inch SAS/SATA drives (RAID pass-through)

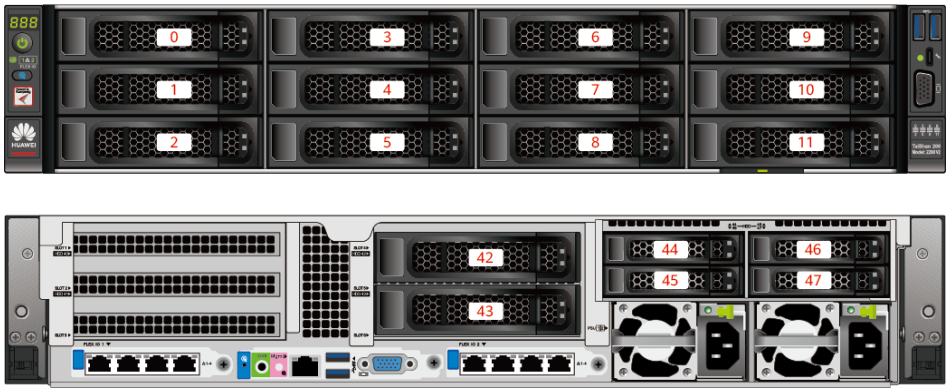


Table 5-12 Drive numbers of a server with 12 x 3.5-inch SAS/SATA drives (RAID pass-through)

Physical Drive Number	Drive Number Displayed on the iBMC WebUI	Drive Number Identified by the RAID Controller Card
0	Disk0	0
1	Disk1	1
2	Disk2	2
3	Disk3	3
4	Disk4	4
5	Disk5	5
6	Disk6	6
7	Disk7	7
8	Disk8	8
9	Disk9	9
10	Disk10	10
11	Disk11	11
42	Disk42	12
43	Disk43	13
44	Disk44	-
45	Disk45	-
46	Disk46	-

Physical Drive Number	Drive Number Displayed on the iBMC WebUI	Drive Number Identified by the RAID Controller Card
47	Disk47	-

- 12 x 3.5-inch SAS/SATA drives (RAID pass-through, I/O module 3 configured with drive modules)

Figure 5-13 Drive numbers of a server with 12 x 3.5-inch SAS/SATA drives (RAID pass-through)

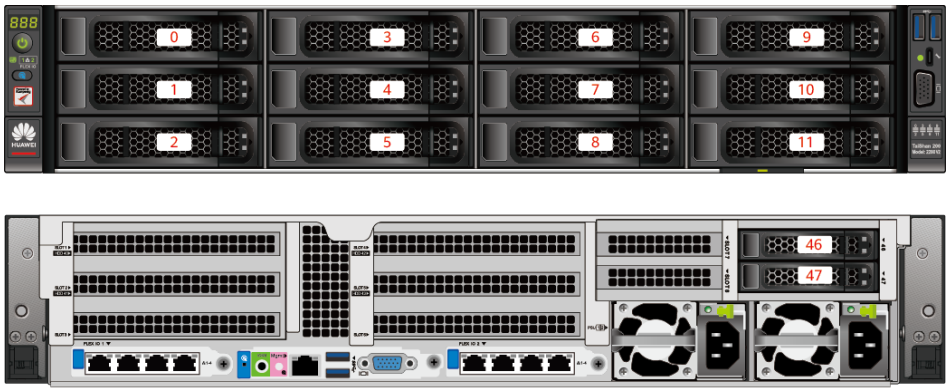


Table 5-13 Drive numbers of a server with 12 x 3.5-inch SAS/SATA drives (RAID pass-through)

Physical Drive Number	Drive Number Displayed on the iBMC WebUI	Drive Number Identified by the RAID Controller Card
0	Disk0	0
1	Disk1	1
2	Disk2	2
3	Disk3	3
4	Disk4	4
5	Disk5	5
6	Disk6	6
7	Disk7	7
8	Disk8	8
9	Disk9	9
10	Disk10	10
11	Disk11	11

Physical Drive Number	Drive Number Displayed on the iBMC WebUI	Drive Number Identified by the RAID Controller Card
46	Disk42	12
47	Disk43	13

- Figure 5-14 shows the drive numbers of a server with 16 x 2.5-inch NVMe drives (compatible with 8 SAS/SATA drives).

  Figure 5-14 Drive numbers (16 x 2.5-inch NVMe drives, compatible with 8 SAS/SATA drives)

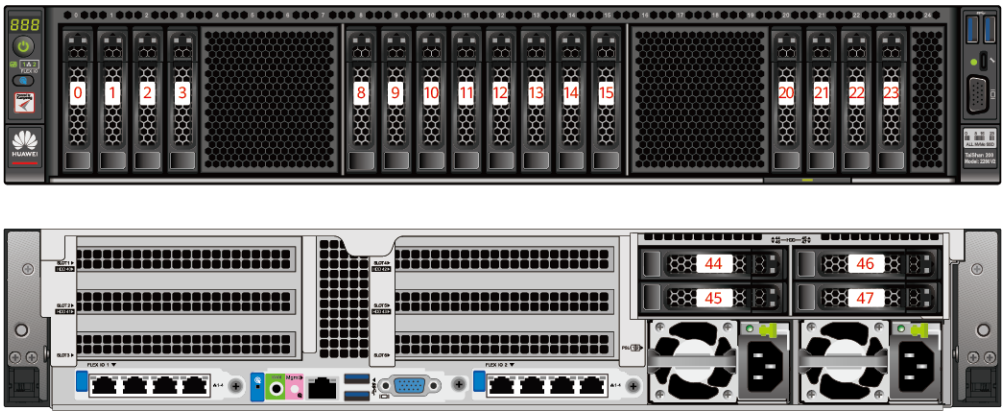


Table 5-14 Drive numbers (16 x 2.5-inch NVMe drives, compatible with 8 SAS/SATA drives)

Physical Drive Number	Drive Number Displayed on the iBMC WebUI	Drive Number Identified by the RAID Controller Card
0	Disk0	0[2]
1	Disk1	1[2]
2	Disk2	2[2]
3	Disk3	3[2]
8	Disk8	-
9	Disk9	-
10	Disk10	-
11	Disk11	-
12	Disk12	4[2]
13	Disk13	5[2]
14	Disk14	6[2]

Physical Drive Number	Drive Number Displayed on the iBMC WebUI	Drive Number Identified by the RAID Controller Card
15	Disk15	7[2]
20	Disk20	-
21	Disk21	-
22	Disk22	-
23	Disk23	-
44	Disk44	-
45	Disk45	-
46	Disk46	8[2]
47	Disk47	9[2]
50[1]	Disk50	-
51[1]	Disk51	-
[1]: Physical drive numbers 50 and 51 correspond to M.2 drives. [2]: When SAS/SATA drives are configured, the RAID controller card displays the drive numbers.		

5.6.3 Drive Indicators

SAS/SATA Drive Indicators

Figure 5-15 SAS/SATA drive indicators

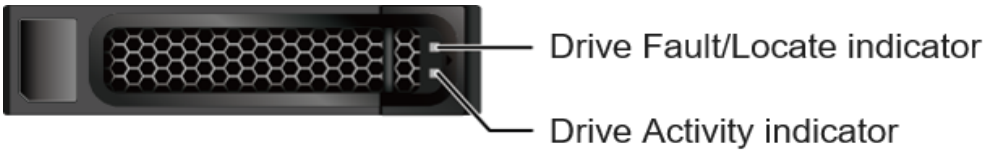


Table 5-15 Drive indicators (SAS/SATA drives)

Drive Activity Indicator (Green)	Drive Fault Indicator (Red)	Drive Locate Indicator (Blue)	Status Description
Off	Off	Off	The drive is not detected.
Steady on	Off	Off	The drive is detected and is working properly.

Drive Activity Indicator (Green)	Drive Fault Indicator (Red)	Drive Locate Indicator (Blue)	Status Description
Blinking at 4 Hz	Off	Off	Data is being read or written properly.
Blinking at 1 Hz	Blinking at 1 Hz	Off	The drive data is being rebuilt.
Steady on	Steady on	Off	The drive is faulty.
Off	Steady on	Off	The drive is removed.
Steady on	Off	Blinking at 1 Hz	The drive is being located.

NVMe Drive Indicators

Figure 5-16 NVMe drive indicators

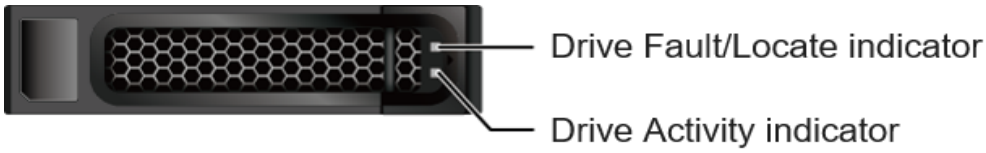


Table 5-16 Drive indicators (NVMe drives)

Drive Activity Indicator (Green)	Drive Fault Indicator (Red)	Drive Locate Indicator (Blue)	Status Description
Off	Off	Off	The drive is not detected or the PCIe link is down.
Steady on	Off	Off	The drive is detected and is working properly.
Blinking at 2 Hz	Off	Off	Data is being read from or written to the drive.
-	Off	Blinking at 1 Hz	The drive is being located.
Steady on/Off	Blinking at 2 Hz	Off	The drive is being hot-swapped.
Off	Blinking at 0.5 Hz	Off	The hot swap process is complete and the drive is

Drive Activity Indicator (Green)	Drive Fault Indicator (Red)	Drive Locate Indicator (Blue)	Status Description
			removable.
Blinking at 1 Hz	Blinking at 1 Hz	Off	The drive data is being rebuilt.
Steady on/Off	Steady on	Off	The drive is faulty.

5.6.4 Rear Drive Modules

NOTE

The actual configurations may vary depending on the configuration manual.

- Figure 5-17 and Figure 5-18 show the drive modules supported by I/O modules 1 and 2. For details, see 5.6.1 Drive Configurations.

Figure 5-17 2 x 3.5-inch rear drive module

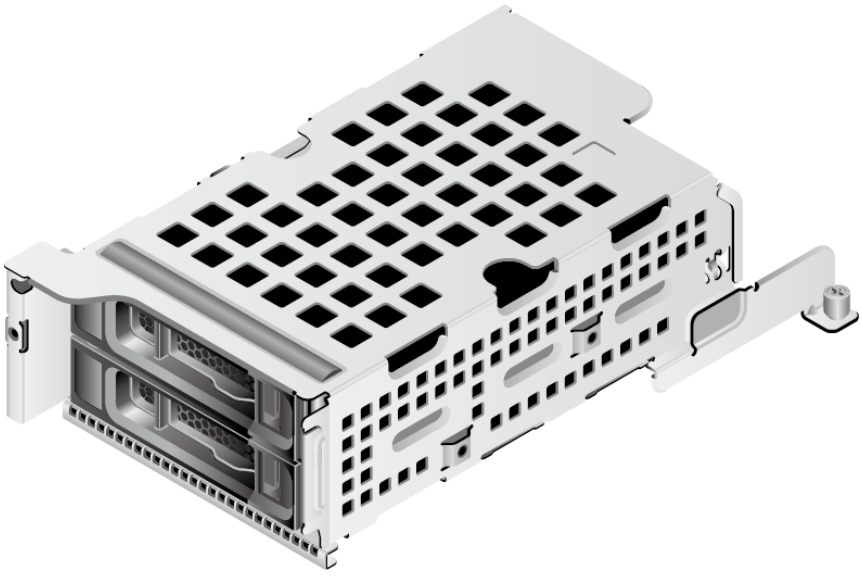
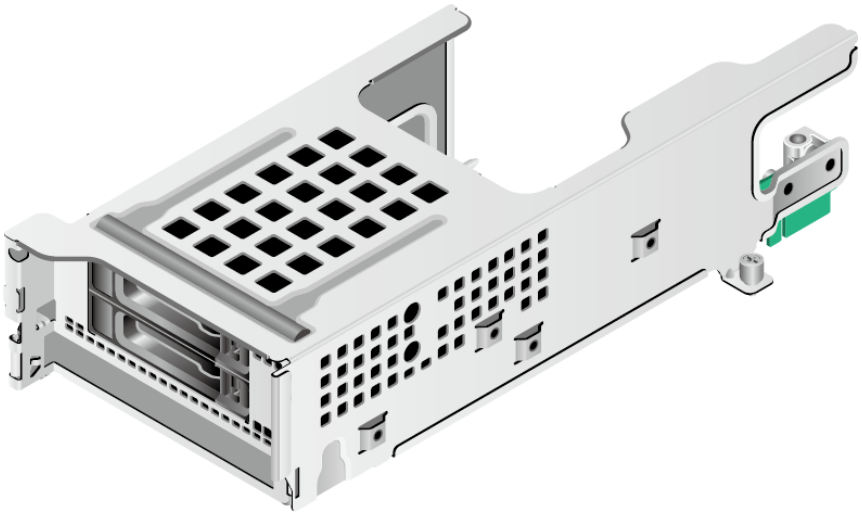


Figure 5-18 2 x 2.5-inch rear drive module



- Figure 5-19 or Figure 5-20 shows the drive module supported by I/O module 3. For details, see 5.6.1 Drive Configurations.

Figure 5-19 4 x 2.5-inch rear drive module

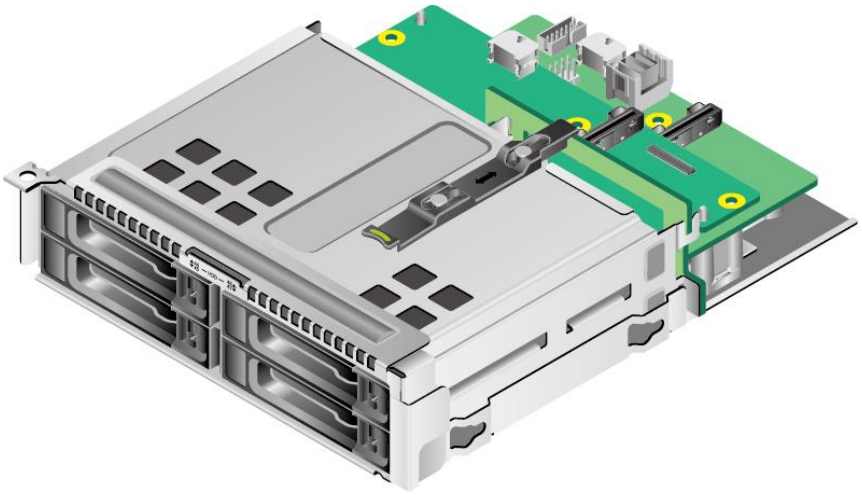
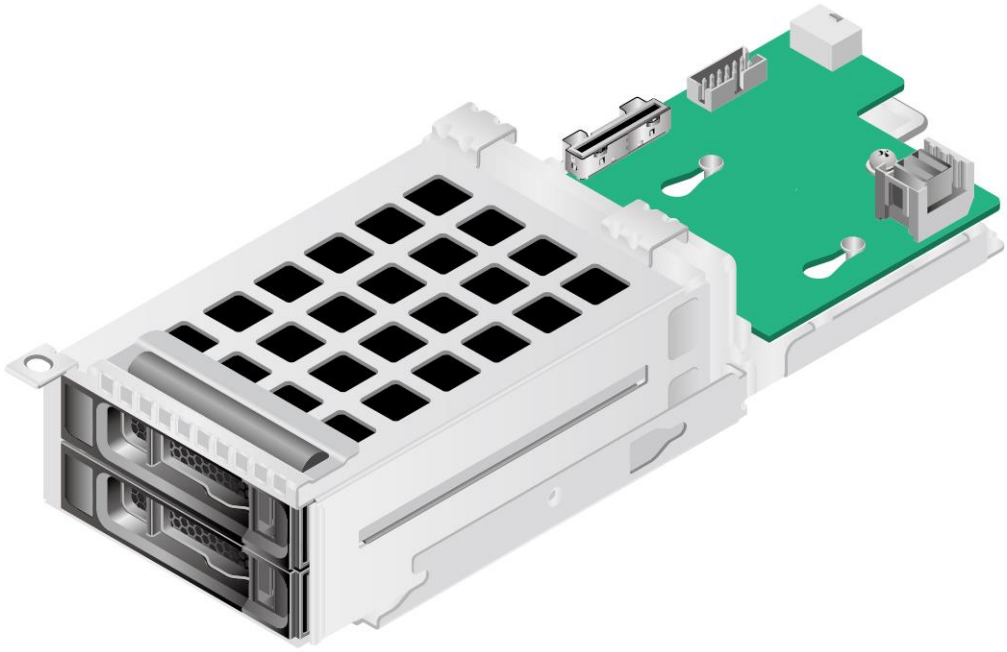


Figure 5-20 2 x 2.5-inch rear drive module



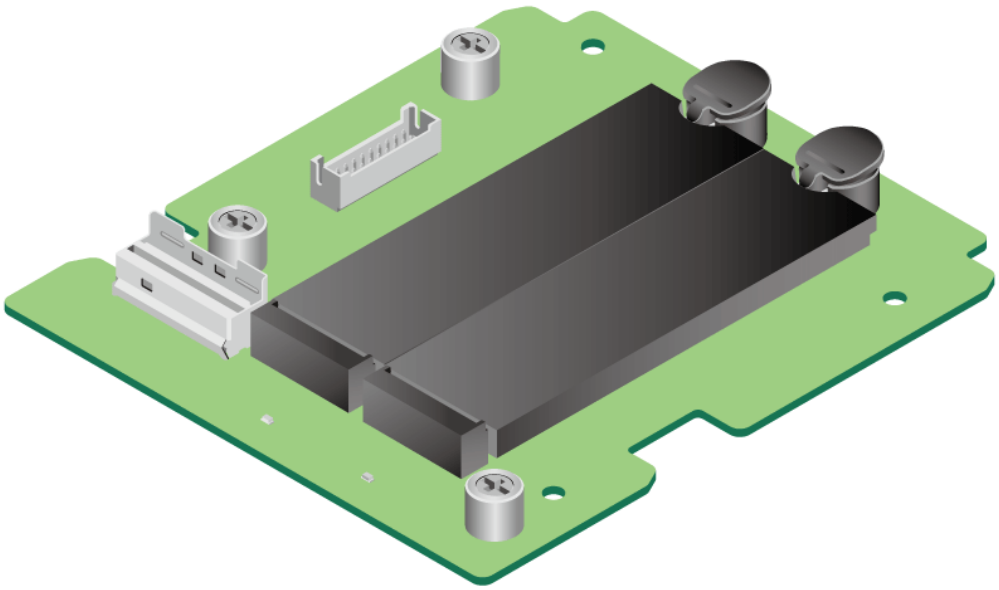
5.6.5 M.2 Drive Module

Figure 5-21 shows a built-in M.2 drive module. For details, see 5.6.1 Drive Configurations.

NOTE

The actual configurations may vary depending on the configuration manual.

Figure 5-21 Built-in M.2 drive module



5.6.6 RAID Levels

Table 5-17 lists the performance and drive utilization of different RAID levels.

Table 5-17 RAID levels

RAID Level	Reliability	Read Performance	Write Performance	Drive Utilization
RAID 0	Low	High	High	100%
RAID 1	High	High	Moderate	50%
RAID 5	Relatively high	High	Moderate	(N – 1)/N
RAID 6	Relatively high	High	Moderate	(N – 2)/N
RAID 10	High	High	Moderate	50%
RAID 50	High	High	Relatively high	(N – M)/N
RAID 60	High	High	Relatively high	(N – M x 2)/N
Note: N indicates the number of member drives in the RAID array, and M indicates the number of spans in the RAID array.				

5.7 Storage Extension Components

NOTE

Storage extension components in the Tianchi architecture are drive backplanes. The actual configurations may vary depending on the configuration manual.

- Figure 5-22 shows connectors on a backplane of 8 x 2.5-inch SAS/SATA drives (compatible with 4 x 2.5-inch NVMe drives).

Figure 5-22 8 x 2.5-inch SAS/SATA (compatible with 4 x 2.5-inch NVMe) drive backplane

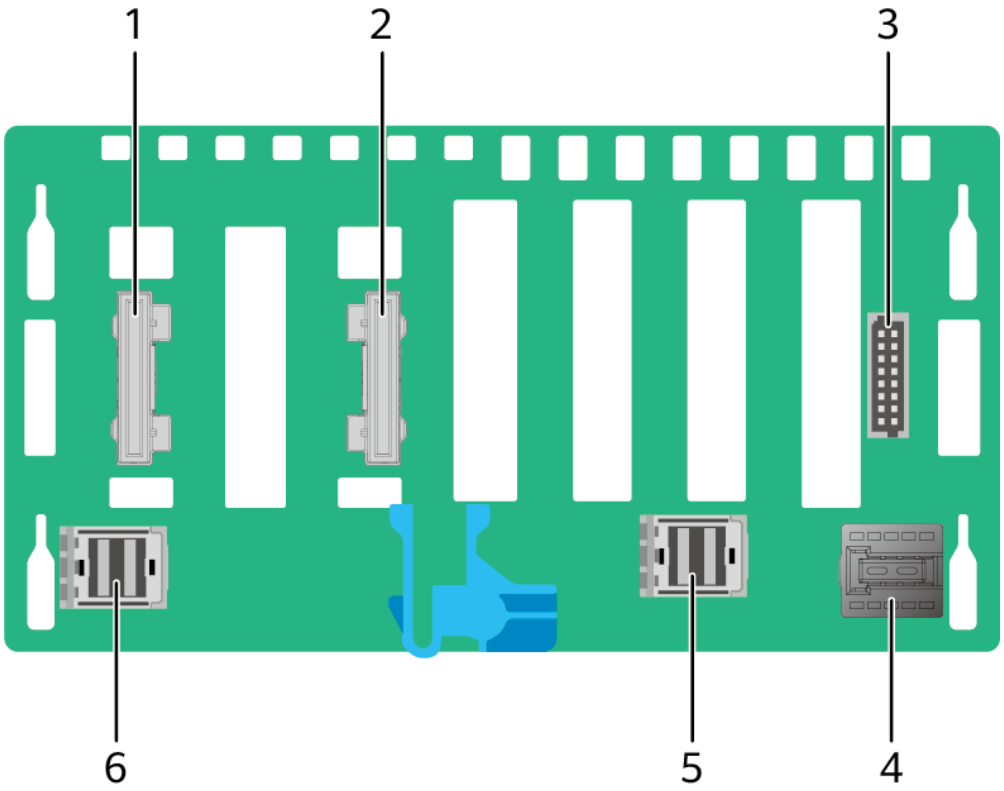


Table 5-18 Connector description

No.	Connector	No.	Connector
1	UBC connector (UBC2/J2)	2	UBC connector (UBC1/J1)
3	Low-speed signal cable connector (HDD BP/J19)	4	Power connector (PWR CONN/J21)
5	Mini-SAS HD connector (PORT A/J28)	6	Mini-SAS HD connector (PORT B/J601)

- Figure 5-23 shows connectors on a backplane of 12 x 3.5-inch drives.

Figure 5-23 12 x 3.5-inch drive backplane

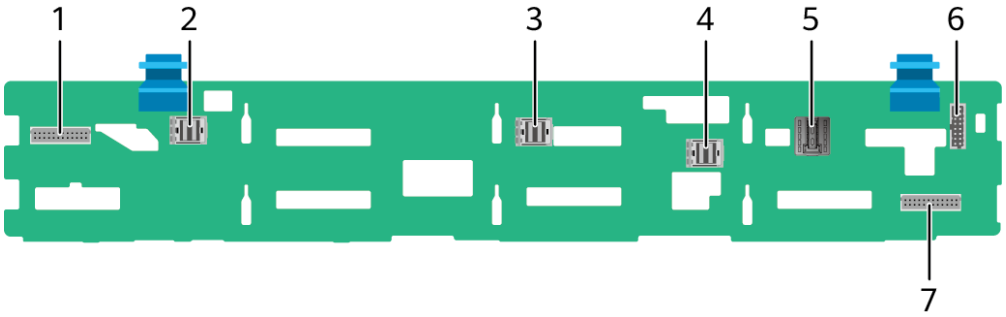
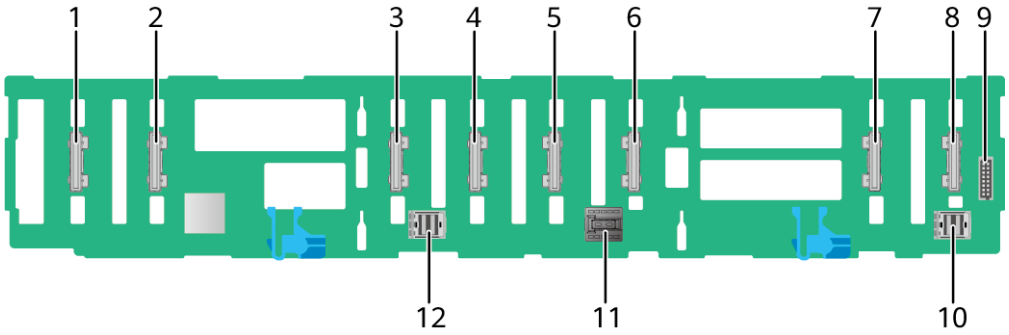


Table 5-19 Connector description

No.	Connector	No.	Connector
1	Low-speed signal cable connector (REAR_BP0/J17)	2	Mini-SAS HD connector (PORT C/J4)
3	Mini-SAS HD connector (PORT B/J3)	4	Mini-SAS HD connector (PORT A/J28)
5	Power connector (PWR CONN/J21)	6	Low-speed signal cable connector (HDD BP/J19)
7	Low-speed signal cable connector (REAR_BP1/J18)	-	-

- Figure 5-24 shows connectors on a backplane of 16 x 2.5-inch NVMe drives (compatible with 8 SAS/SATA drives).

Figure 5-24 16 x 2.5-inch NVMe drive backplane (compatible with 8 SAS/SATA drives)



No.	Connector	No.	Connector
1	UBC connector (UBC8/J8)	2	UBC connector (UBC7/J7)
3	UBC connector (UBC6/J6)	4	UBC connector (UBC5/J5)

No.	Connector	No.	Connector
5	UBC connector (UBC4/J4)	6	UBC connector (UBC3/J3)
7	UBC connector (UBC2/J2)	8	UBC connector (UBC1/J1)
9	Low-speed signal cable connector (HDD BP/J28)	10	Mini-SAS HD connector (PORT A/J9)
11	Power connector (PWR CONN/J29)	12	Mini-SAS HD connector (PORT B/J10)

- Figure 5-25 shows connectors on a 2 x 2.5-inch SATA/SAS pass-through drive backplane (horizontal). It must be used together with Figure 5-26.

Figure 5-25 Pass-through drive backplane (horizontal)

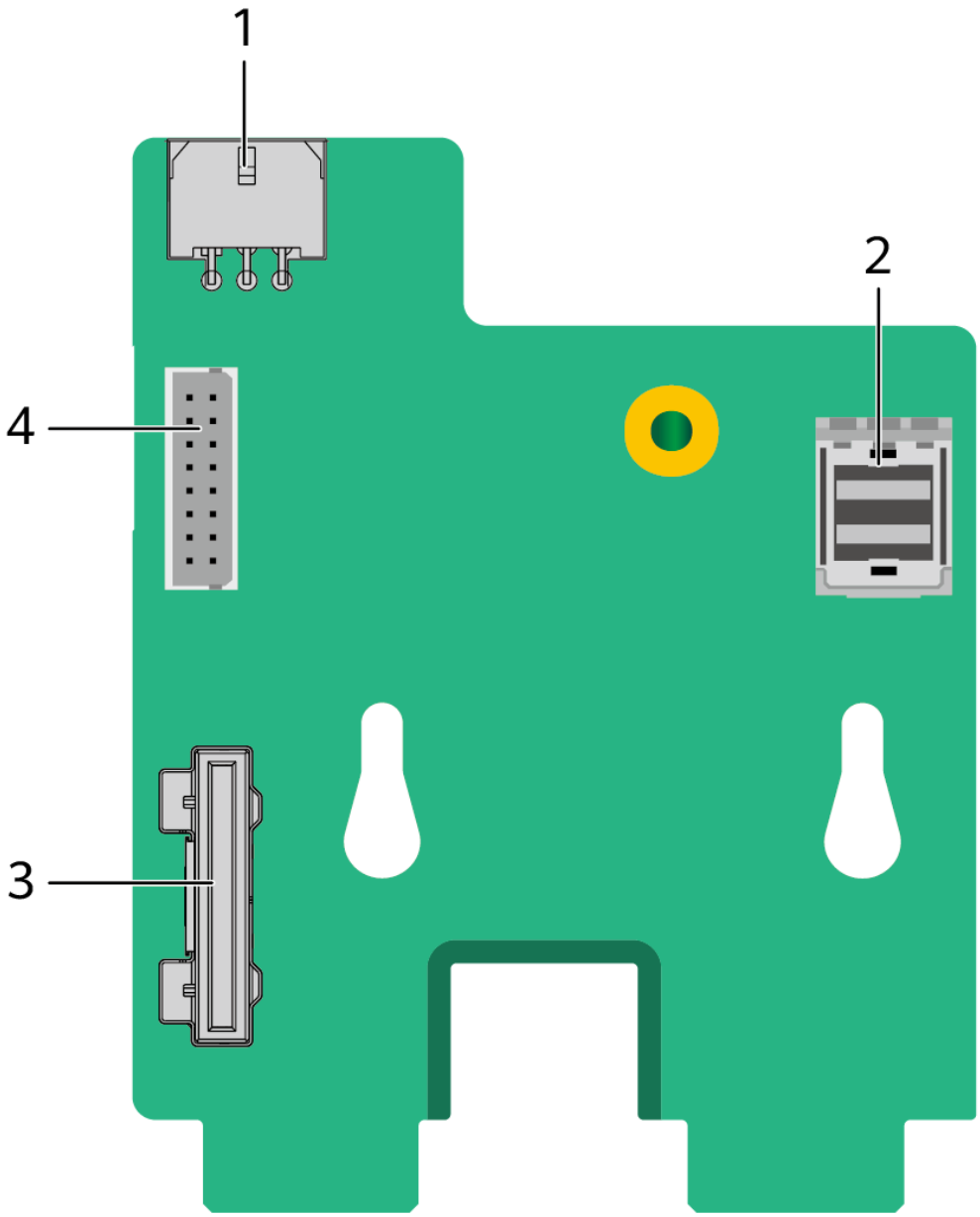
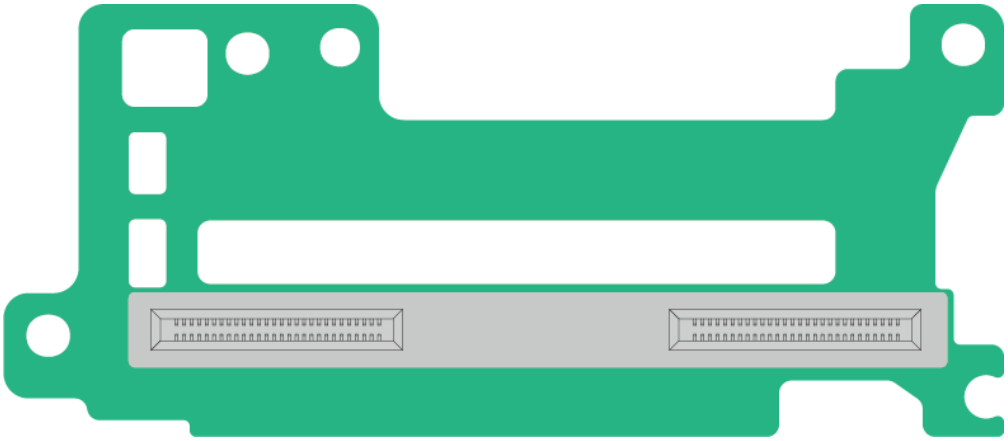


Table 5-20 Connector description

No.	Connector	No.	Connector
1	Power connector (J1101)	2	Mini-SAS connector (J402)
3	UBC connector (J3)	4	Low-speed signal cable connector (J701)

- Figure 5-26 shows connectors on a 2 x 2.5-inch SATA/SAS pass-through drive backplane (vertical). It must be used together with Figure 5-25.

Figure 5-26 Pass-through drive backplane (vertical)



- Figure 5-27 shows connectors on a backplane of 2 x 3.5-inch rear drives.

Figure 5-27 Backplane of 2 x 3.5-inch rear drives

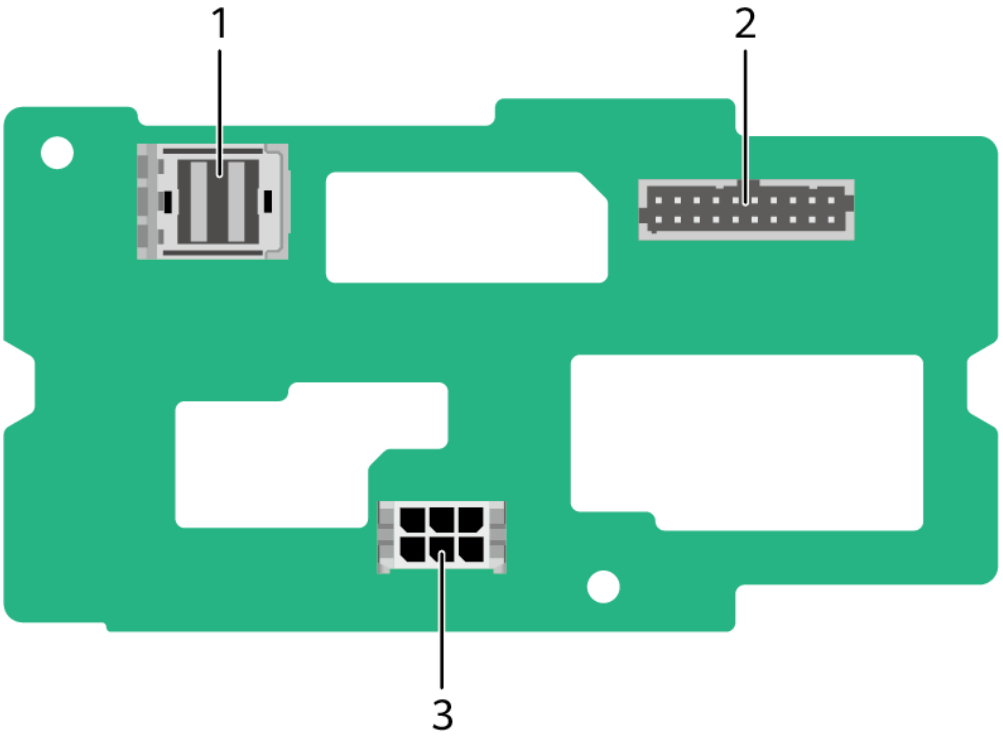


Table 5-21 Connector description

No.	Connector	No.	Connector
1	Mini-SAS connector (PORT A/J28)	2	Low-speed signal cable connector (HDD BP/J17)
3	Power connector (PWR CONN/J21)	-	-

- Figure 5-28 shows connectors on a backplane of 2 x 2.5-inch rear drives.

Figure 5-28 Backplane of 2 x 2.5-inch rear drives

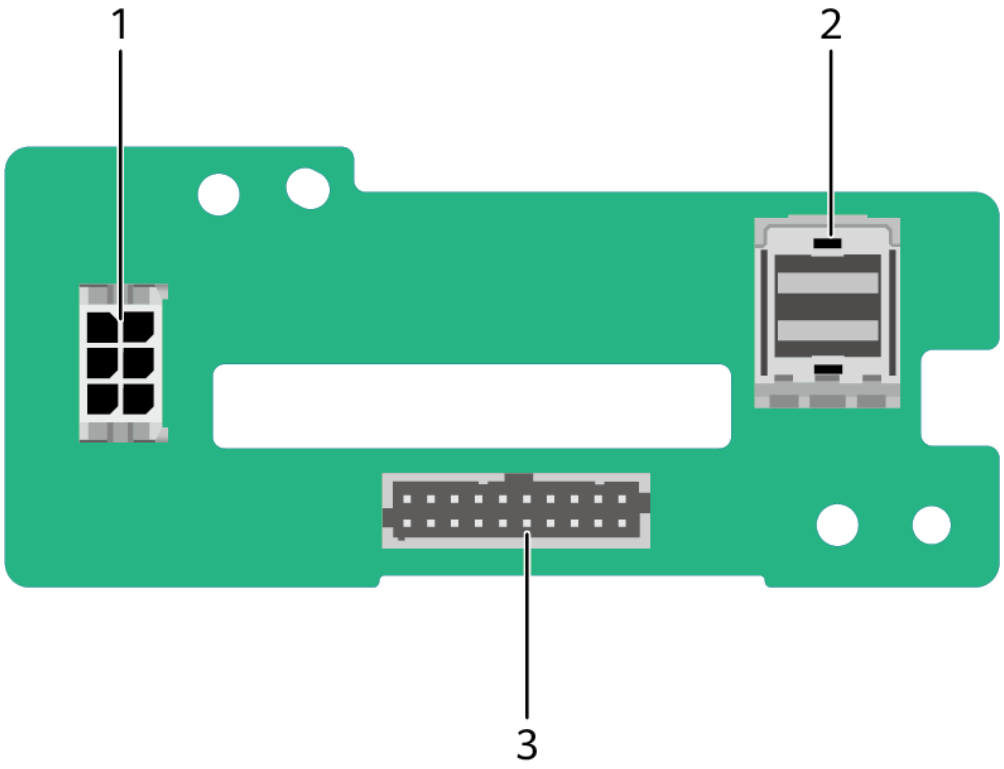


Table 5-22 Connector description

No.	Connector	No.	Connector
1	Power connector (PWR CONN/J21)	2	Mini-SAS connector (PORT A/J28)
3	Low-speed signal cable connector (HDD BP/J17)	-	-

- Figure 5-29 shows connectors on a horizontal drive backplane for I/O module 3 (upper board).

Figure 5-29 Horizontal drive backplane for I/O module 3 (upper board)

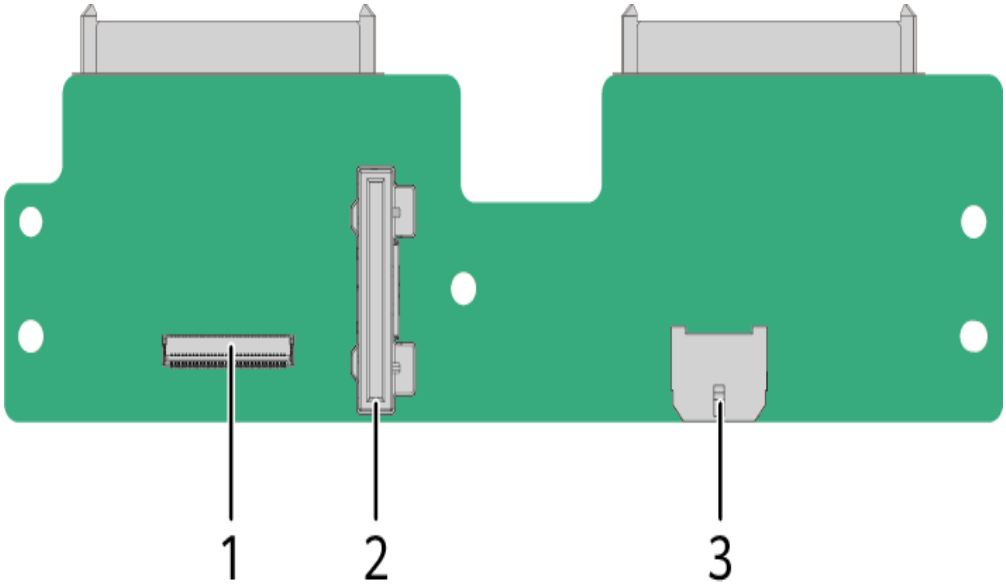


Table 5-23 Connector description

No.	Connector	No.	Connector
1	FPC connector (FPC/J702)	2	UBC connector (UBC2/J1)
3	Power connector (PWR CONN/J1101)	-	-

- Figure 5-30 shows connectors on a horizontal drive backplane for I/O module 3 (lower board).

Figure 5-30 Horizontal drive backplane for I/O module 3 (lower board)

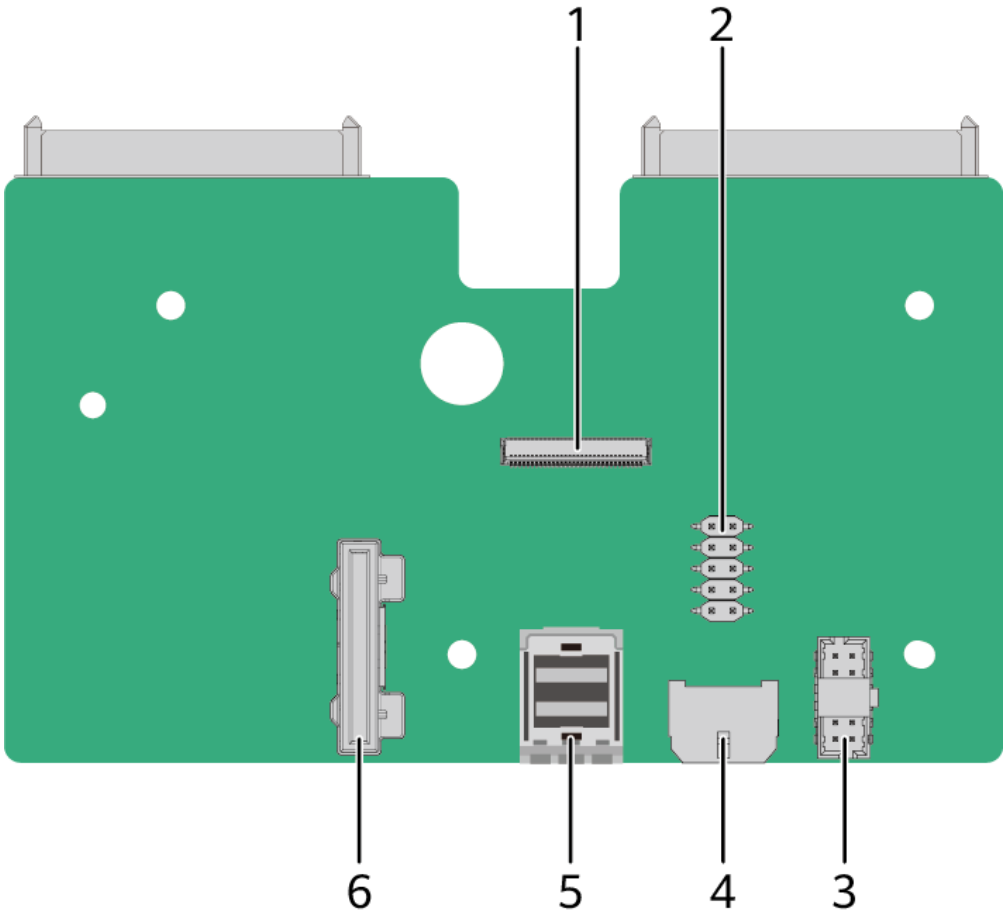


Table 5-24 Connector description

No.	Connector	No.	Connector
1	FPC connector (FPC/J702)	2	JTAG connector (J601)
3	Low-speed signal cable connector (HDD BP/J701)	4	Power connector (PWR CONN/J1101)
5	Mini-SAS connector (PORT A/J402)	6	UBC connector (UBC1/J1)

- Figure 5-31 shows connectors on an M.2 adapter board.

Figure 5-31 M.2 adapter board

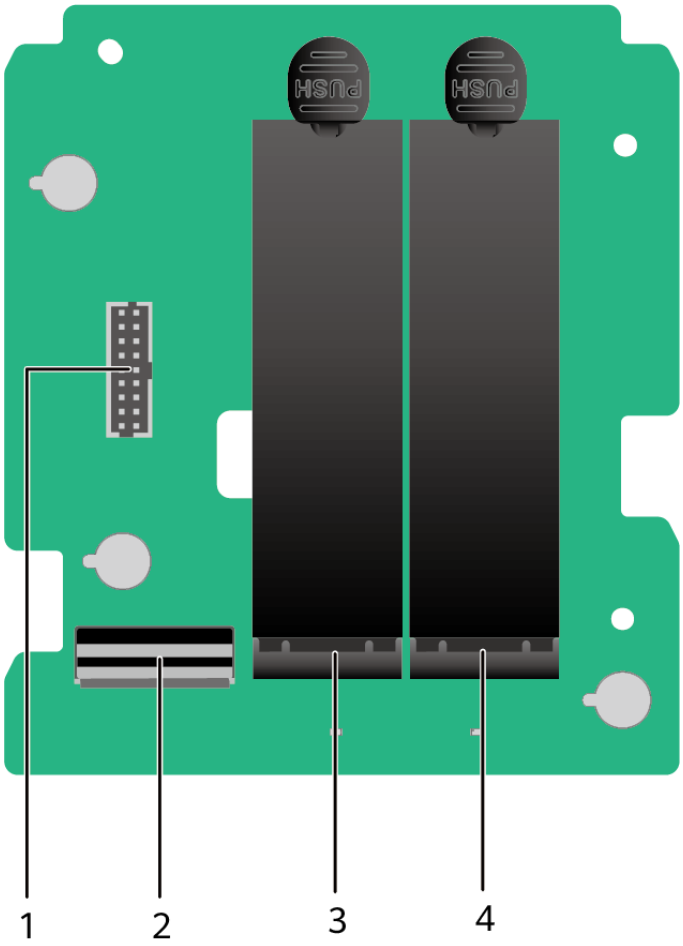


Table 5-25 Connector

No.	Connector
1	Low-speed connector (M.2 PWR/J1)
2	High-speed connector (M.2 PCIE/SATA/J2)
3	M.2 drive connector (M.2 CONN1/J3)
4	M.2 drive connector (M.2 CONN2/J4)

5.8 I/O Extension Components

NOTE

I/O extension components in the Tianchi architecture are riser modules. The actual configurations may vary depending on the configuration manual.

Riser Modules Supported By the Server

- Rear riser module with one CEM, one x8, and one x8 slots. See Figure 5-32. It can be installed in I/O module 1 or 2. When installed in I/O module 1, it provides PCIe slots 1 to 3. When installed in I/O module 2, it provides PCIe slots 4 to 6. The installation depends on the product.

Figure 5-32 Front view of the riser module with one CEM, one x8, and one x8 slots

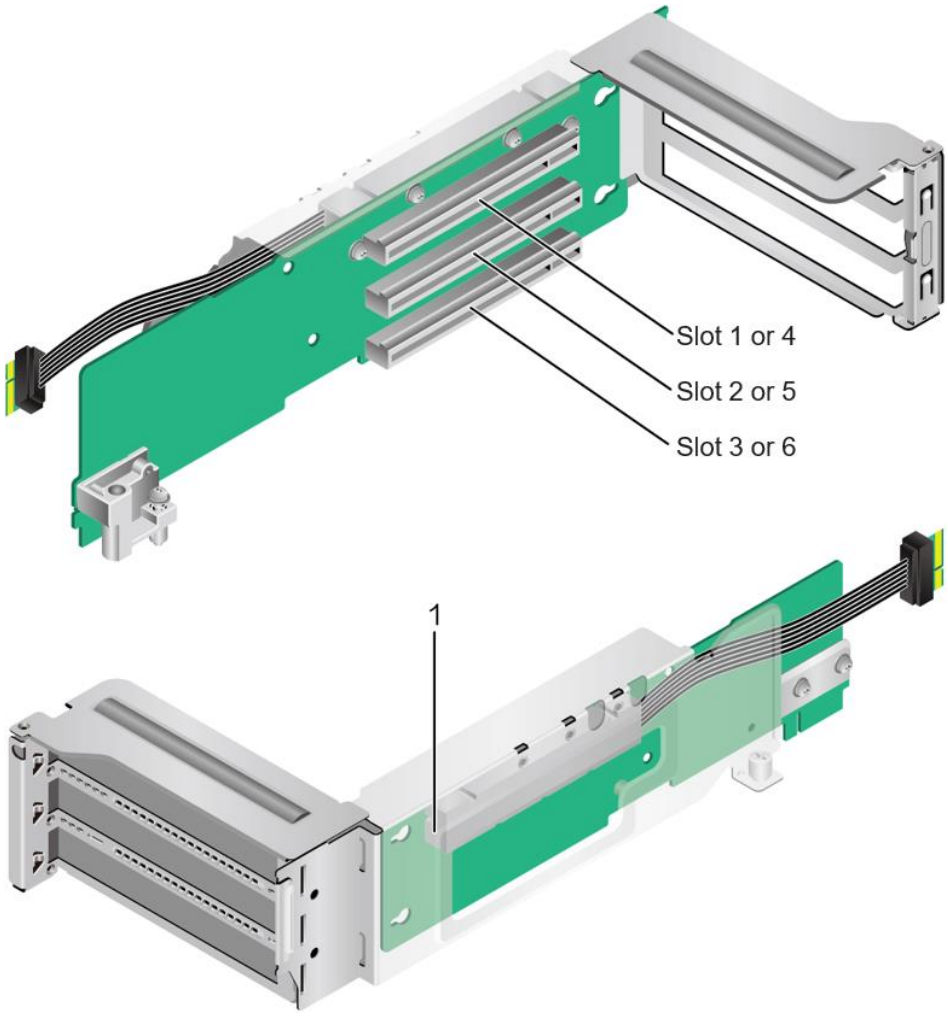


Table 5-26 Connector description

No.	Connector
1	CEM cable connector (PCIE SLOT1 X16 5.0 (FH/HL)/J501)

- Rear riser module with three CEM slots. See Figure 5-33 and Figure 5-34. It can be installed in I/O module 1 or 2. 5.2 Rear Panel shows the positions of I/O modules 1 and 2. When installed in I/O module 1, it provides PCIe slots 1 to 3. When installed in I/O module 2, it provides PCIe slots 4 to 6. The installation depends on the product.

Figure 5-33 Riser module with three CEM slots (1)

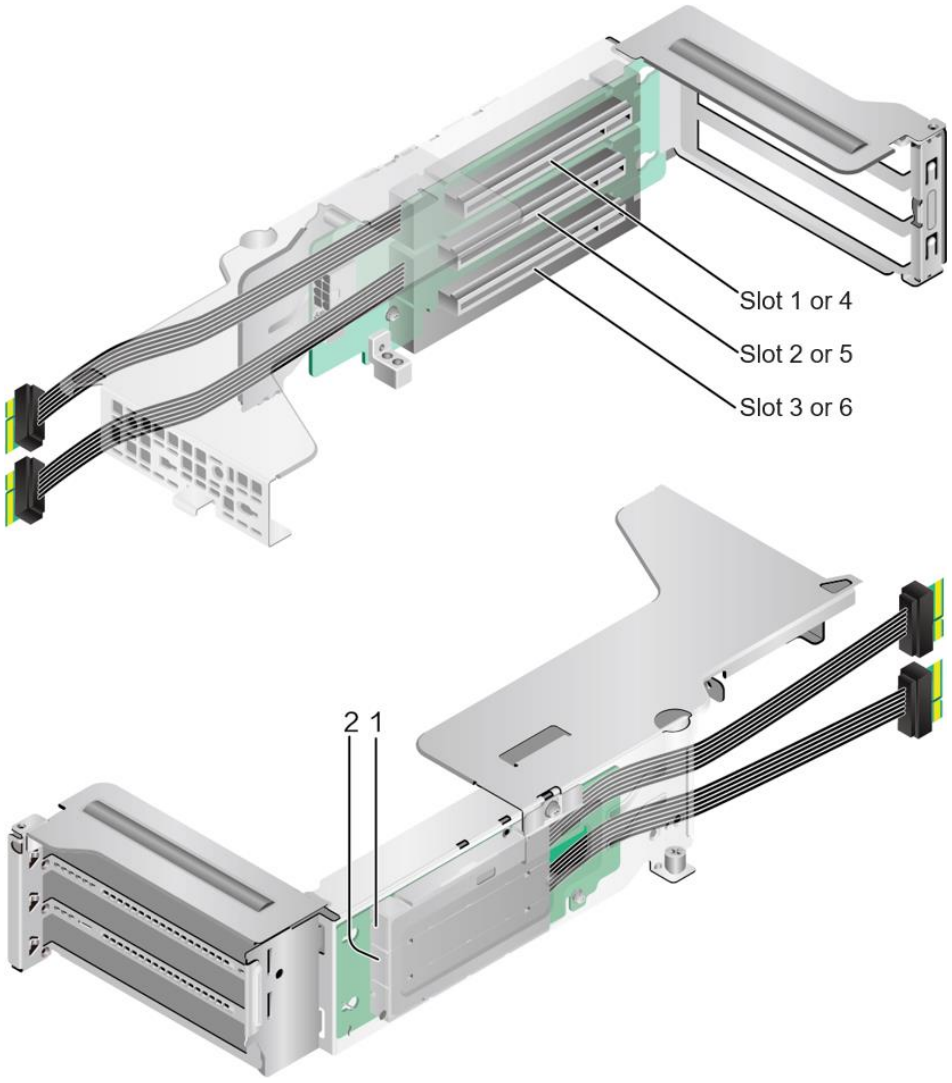


Table 5-27 Connector description

No.	Connector	No.	Connector
1	CEM cable connector (PCIE SLOT1 X16 5.0 (FH/FL)/J401)	2	CEM cable connector (PCIE SLOT2 X16 5.0 (FH/FL)/J501)

Figure 5-34 Riser module with three CEM slots (2)

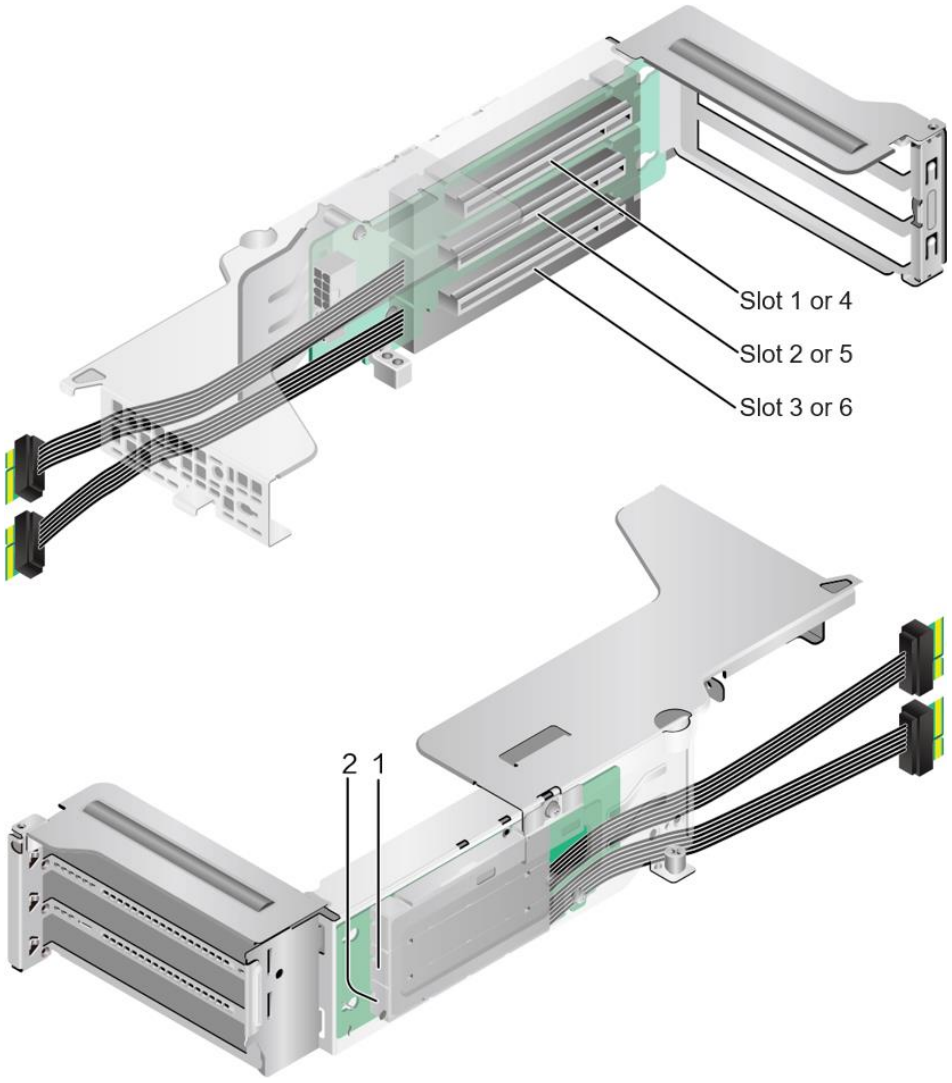
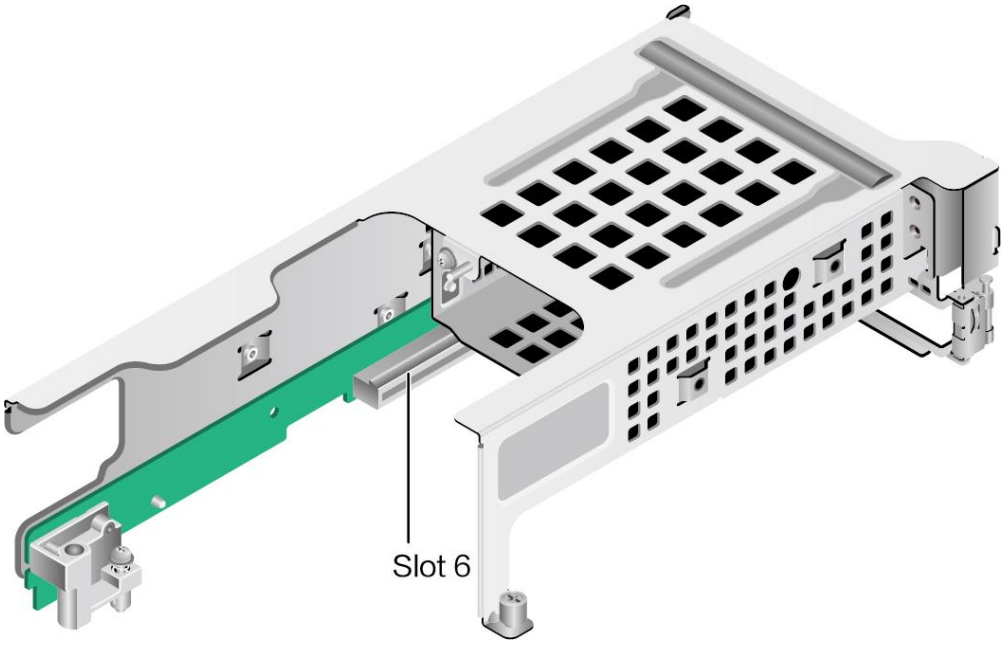


Table 5-28 Connector description

No.	Connector	No.	Connector
1	CEM cable connector (PCIE SLOT2 X16 5.0 (FH/FL)/J501)	2	CEM cable connector (PCIE SLOT3 X16 5.0 (FH/HL)/J601)

- Rear riser module with one x16 slot. See Figure 5-35. It can be installed in I/O module 2. When installed in I/O module 2, it provides PCIe slot 6. This module can be configured with 2 x 2.5-inch drives.

Figure 5-35 Riser module with one x16 slot



NOTE

If the server is equipped with an SP686C RAID controller card, the card cannot be installed in slot 6 of the 2 x 2.5-inch rear drive module.

- Rear riser module with one x16 slot. See Figure 5-36 and Figure 5-37. It can be installed in I/O module 3 to provide PCIe slot 8.

Figure 5-36 Front view of the riser module with one x16 slot

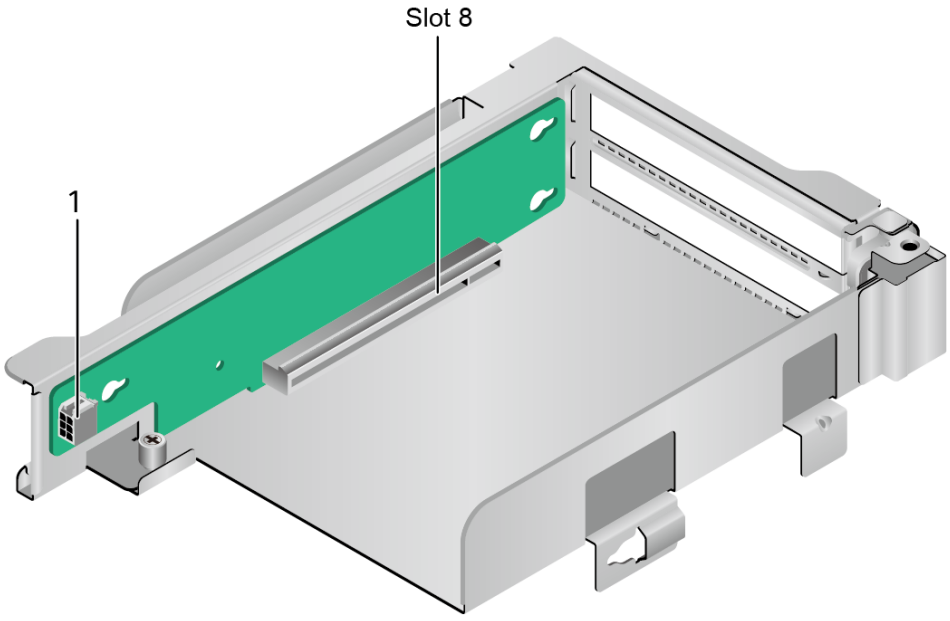


Table 5-29 Connector description

No.	Connector
1	Power connector (PWR CONN/J5)

Figure 5-37 Rear view of the riser module with one x16 slot

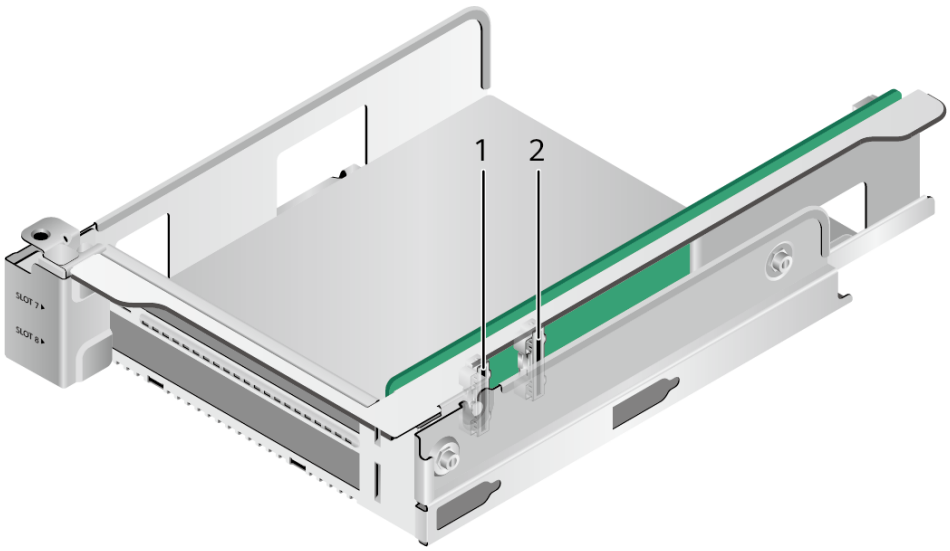


Table 5-30 Connector description

No.	Connector	No.	Connector
1	UBC connector (UBC1/J6)	2	UBC connector (UBC2/J7)

- Rear riser module with two x16 slots. See Figure 5-38 and Figure 5-39. It can be installed in I/O module 3 to provide PCIe slots 7 and 8.

Figure 5-38 Front view of the riser module with two x16 slots

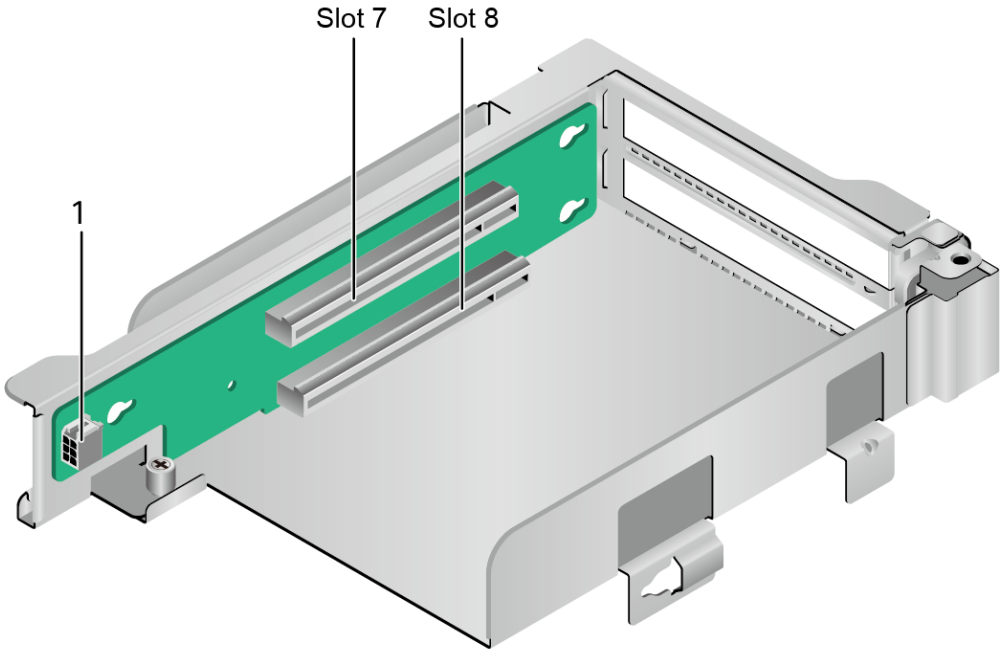


Table 5-31 Connector description

No.	Connector
1	Power connector (PWR CONN/J5)

Figure 5-39 Rear view of the riser module with two x16 slots

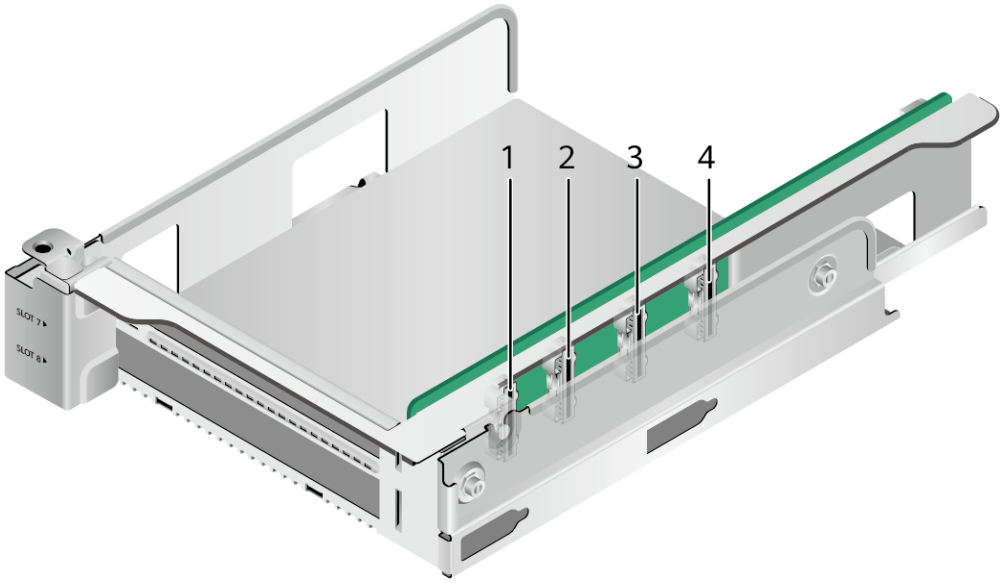


Table 5-32 Connector description

No.	Connector	No.	Connector
1	UBC connector (UBC1/J6)	2	UBC connector (UBC2/J7)
3	UBC connector (UBC3/J1)	4	UBC connector (UBC4/J3)

- Rear riser module with two x8 slots. See Figure 5-40 and Figure 5-41. It can be installed in I/O module 3 to provide PCIe slots 7 and 8.

Figure 5-40 Front view of the riser module with two x8 slots

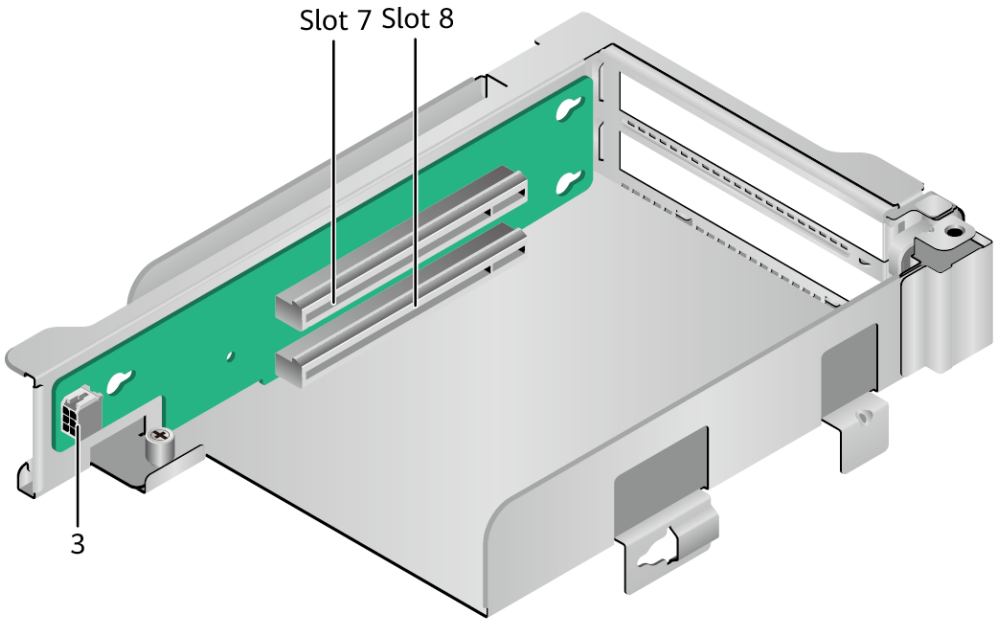


Figure 5-41 Rear view of the riser module with two x8 slots

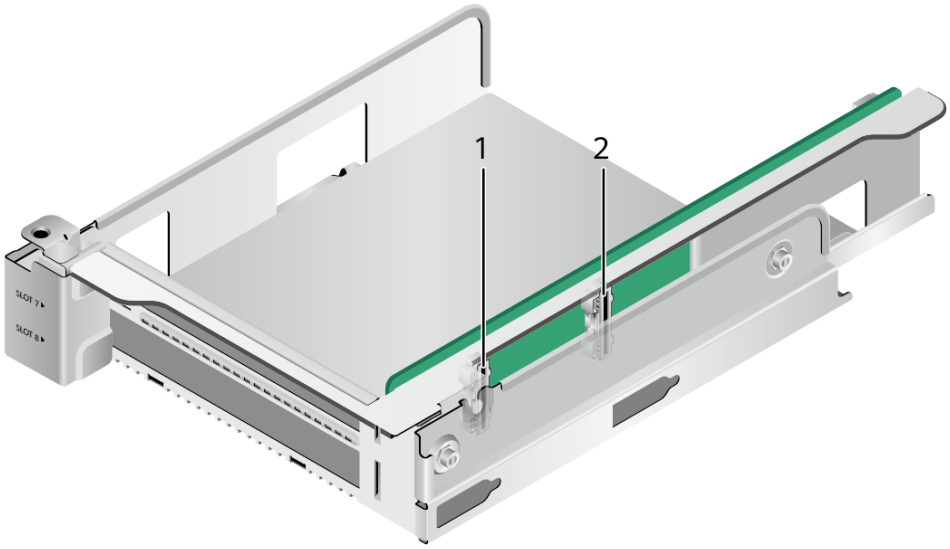


Table 5-33 Connector description

No.	Connector	No.	Connector
1	UBC connector (UBC1/J6)	2	UBC connector (UBC3/J1)
3	Power connector (PWR CONN/J5)	-	-

- Rear riser module with one x8, one x16, and one x8 slots. See Figure 5-42. It can be installed in I/O module 1 or 2. When installed in I/O module 1, it provides PCIe slots 1 to 3. When installed in I/O module 2, it provides PCIe slots 4 to 6. The installation depends on the product.

NOTE

- Slots 1 and 4 of this riser module are currently unavailable.
- If the high-speed link insertion loss of the PCIe card is less than or equal to 6 dB (16 GHz), PCIe 5.0 is supported. Otherwise, PCIe cards are not supported (the insertion loss of PCIe 5.0 may exceed the threshold).

Figure 5-42 Rear riser module with one x8, one x16, and one x8 slots

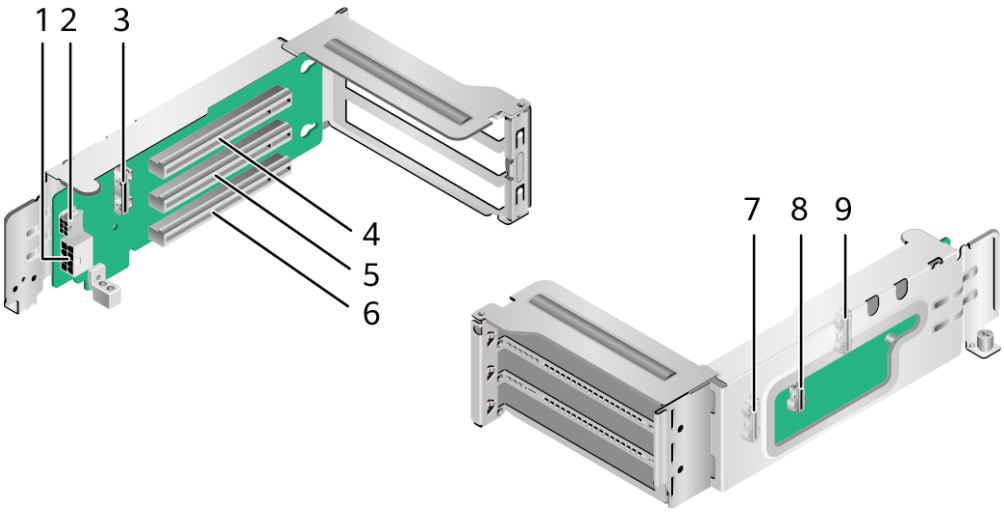


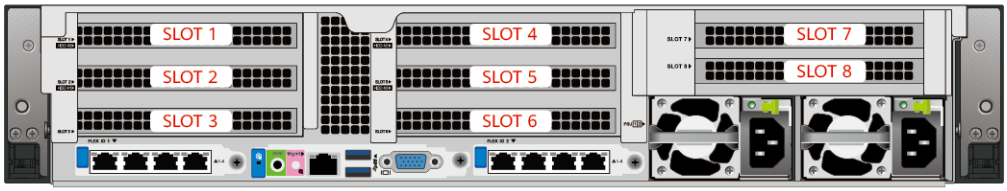
Table 5-34 Connector description

No.	Connector	No.	Connector
1	Power connector (PWR CONN1/J9)	2	Power connector (PWR CONN2/J10)
3	UBC connector (UBC3/J2)	4	Slot 1 or slot 4
5	Slot 2 or 5	6	Slot 3 or 6
7	UBC connector (UBC4/J3)	8	UBC connector (UBC2/J1)
9	UBC connector (UBC1/J4)	-	-

Layout of Rear PCIe Slots

Figure 5-43 shows the layout of 8 PCIe slots.

Figure 5-43 8 PCIe slots



I/O module 1 provides slots 1 to 3, I/O module 2 provides slots 4 to 6, and I/O module 3 provides slots 7 to 8.

Slots 1, 2, 4, 5, 7, and 8 support full-height full-length PCIe cards. Slots 3 and 6 support full-height half-length PCIe cards.

NOTE

- When supporting full-height full-length PCIe cards, the slots also support full-height half-length and half-height half-length PCIe cards.
- When supporting full-height half-length PCIe cards, the slots also support half-height half-length PCIe cards.
- The slot size varies with the riser module model.

PCIe Slot Description

Table 5-35 PCIe slot description

PCIe Riser Module	Position of the PCIe Riser Module	PCIe Slot	PCIe Standard	PCIe Slot Width/Bus Width	Port Number in the BIOS	Root Port (B/D/F)	Device (B/D/F)	CPU Socket	Slot Size
Rear riser module with one CEM, one x8, and one x8 slots	I/O module 1	Slot 1	PCIe 5.0	x16/x16	12	40/00/00	41/00/00	CPU 1	Full-height half-length
		Slot 2	PCIe 4.0	x16/x8	10	16/04/00	18/00/00		Full-height half-length
		Slot 3	PCIe 4.0	x16/x8	8	16/00/00	17/00/00		Full-height half-length
	I/O module 2	Slot 4	PCIe 5.0	x16/x16	52	aa/00/00	ab/00/00	CPU 2	Full-height half-length
		Slot 5	PCIe 4.0	x16/x8	48	95/00/00	96/00/00		Full-height half-length
		Slot 6	PCIe 4.0	x16/x8	50	95/04/00	97/00/00		Full-height half-length
Rear riser module with three	I/O module 1	Slot 1	PCIe 5.0	Configuration 1: x16/x16	12	40/00/00	41/00/00	CPU 1	Full-height full-length
				Configurat	-	-	-		

PCIe Riser Module	Position of the PCIe Riser Module	PCIe Slot	PCIe Standard	PCIe Slot Width/Bus Width	Port Number in the BIOS	Root Port (B/D/F)	Device (B/D/F)	CPU Socket	Slot Size
CEM slots				ion 2: N/A					
		Slot 2	PCIe 5.0	Configuration 1: x16/x16	8	16/00/00	17/00/00		Full-height full-length
				Configuration 2: x16/x16	8	16/00/00	17/00/00		
		Slot 3	PCIe 5.0	Configuration 1: N/A	-	-	-		Full-height half-length
				Configuration 2: x16/x16	12	40/00/00	41/00/00		
	I/O module 2	Slot 4	PCIe 5.0	Configuration 1: x16/x16	52	aa/00/00	ab/00/00	CPU 2	Full-height full-length
				Configuration 2: N/A	-	-	-		
		Slot 5	PCIe 5.0	Configuration 1: x16/x16	48	95/00/00	96/00/00		Full-height full-length
				Configuration 2: x16/x16	48	95/00/00	96/00/00		
		Slot 6	PCIe 5.0	Configuration 1: N/A	-	-	-		Full-height half-length
				Configuration 2: x16/x16	52	aa/00/00	ab/00/00		
Rear riser module with one x16 slot	I/O module 2	Slot 6	PCIe 4.0	x16/x16	48	95/00/00	96/00/00	CPU 2	Full-height half-length
Rear riser module	I/O module 3	Slot 8	PCIe 5.0	x16/x16	60	c0/00/00	c1/00/00	CPU 2	Full-height half-l

PCIe Riser Module	Position of the PCIe Riser Module	PCIe Slot	PCIe Standard	PCIe Slot Width/Bus Width	Port Number in the BIOS	Root Port (B/D/F)	Device (B/D/F)	CPU Socket	Slot Size
with one x16 slot									ength
Rear riser module with two x16 slots	I/O module 3	Slot 7	PCIe 5.0	x16/x16	72	d5/00/00	d6/00/00	CPU 2	Full-height full-length
		Slot 8	PCIe 5.0	x16/x16	60	c0/00/00	c1/00/00	CPU 2	Full-height full-length
Riser module with two rear x8 slots	I/O module 3	Slot 7	PCIe 5.0	x16/x8	64	c0/04/00	c2/00/00	CPU 2	Full-height full-length
		Slot 8	PCIe 5.0	x16/x8	60	c0/00/00	c1/00/00	CPU 2	Full-height full-length
Rear riser module with one x8, one x16, and one x8 slots	I/O module 1	Slot 1	-	-	-	-	-	-	-
		Slot 2	PCIe 5.0	x16/x16	8	16/00/00	17/00/00	CPU 1	Full-height full-length
		Slot 3	PCIe 5.0	x16/x8	4	01/04/00	06/00/00	CPU 1	Full-height half-length
	I/O module 2	Slot 4	-	-	-	-	-	-	-
		Slot 5	PCIe 5.0	x16/x16	48	95/00/00	96/00/00	CPU 2	Full-height full-length
		Slot 6	PCIe 5.0	x16/x8	40	80/00/00	81/00/00	CPU 2	Full-height half-length
FlexIO	-	-	-	x8/x8	4	01/	06/	CPU 1	-

PCIe Riser Module	Position of the PCIe Riser Module	PCIe Slot	PCIe Standard	PCIe Slot Width/Bus Width	Port Number in the BIOS	Root Port (B/D/F)	Device (B/D/F)	CPU Socket	Slot Size
card 1						04/00	00/00		
FlexIO card 2	-	-	-	x8/x8	44	80/04/00	82/00/00	CPU 2	-

Note 1: A PCIe slot that supports a full-height full-length PCIe card is backward compatible with a full-height half-length or half-height half-length PCIe card. A PCIe slot that supports a full-height half-length PCIe card is backward compatible with a half-height half-length PCIe card.

Note 2: A PCIe slot that supports a PCIe x16 card is backwards compatible with a PCIe x8, x4, or x2 card. A PCIe slot that supports a PCIe x8 card is backwards compatible with a PCIe x4 or x2 card.

Note 3: The power supply capability of each slot supports a PCIe card of up to 75 W. The power of a PCIe card depends on its model. For details about supported PCIe cards, see Compatibility Query. For PCIe cards not listed in the compatibility list, contact your local Huawei sales representative for a compatibility test.

Note 4: The FlexIO card information in this table applies to PCIe devices (only OCP cards). If NICs are used, refer to the actual bus information.

5.9 FlexIO Cards

For details about the FlexIO cards supported by the server, see Compatibility Query. For details about FlexIO specifications and features, see the user guide of the FlexIO card you use.

Figure 5-44 SF221Q (4 x GE electrical ports)

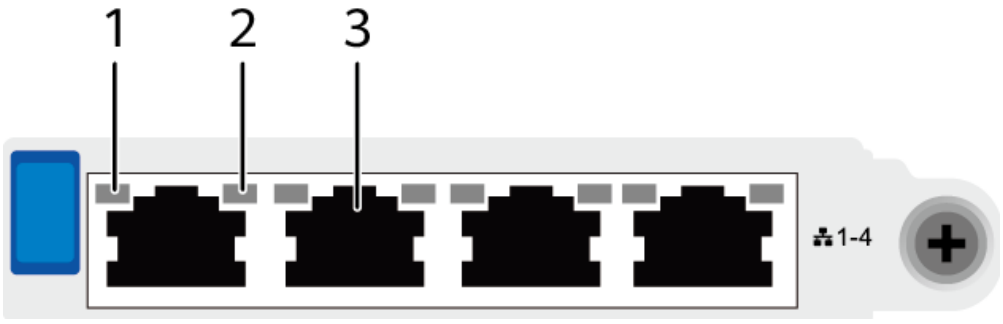


Table 5-36 Ports and indicators on the SF221Q

No.	Port/Indicator	Description
1	Data transmission status indicator	• Steady yellow: The network port is in active status. • Blinking yellow: Data is being transmitted. • Off: No data is being transmitted.
2	Connection status indicator	• Steady green: The network connection is normal. • Off: The network is disconnected.
3	GE electrical port	One card provides four GE electrical ports, each functioning as an outbound 1000 Mbit/s Ethernet port that supports 10/100/1000 Mbit/s auto-negotiation.

Figure 5-45 SF223D-H (2 x 25GE optical ports)

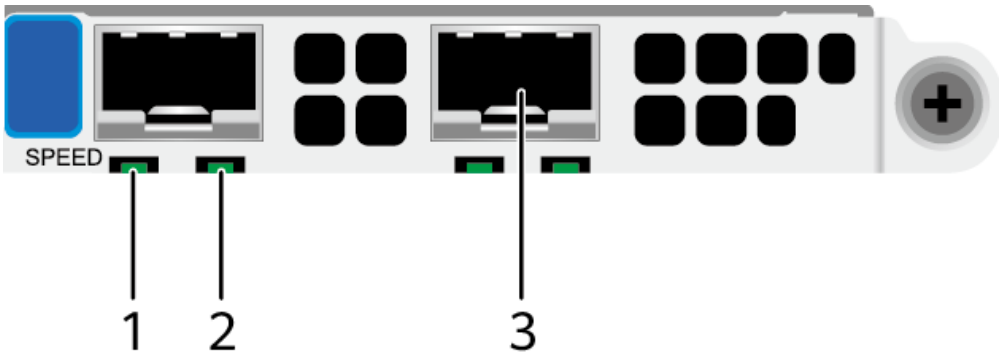


Table 5-37 Ports and indicators on the SF223D-H

No.	Port/Indicator	Description
1	Optical port transmission rate indicator	• Steady green: The data transmission rate is 25 Gbit/s. • Steady yellow: The data transmission rate is 10 Gbit/s. • Off: The network is disconnected.
2	Connection status indicator/Data transmission status indicator for the optical port	• Steady green: The network connection is normal. • Blinking green: Data is being

No.	Port/Indicator	Description
		transmitted. • Off: The network is disconnected.
3	25GE optical port	One card provides two 25GE optical ports that support auto-negotiation to 10GE through optical modules of different rates.

5.10 BMC Card

The product supports the BMC card, which provides VGA, management network, USB, and serial ports. For details, see the VGA, management network, USB, and serial ports in 5.2 Rear Panel.

Figure 5-46 shows ports on the BMC card.

Figure 5-46 BMC card

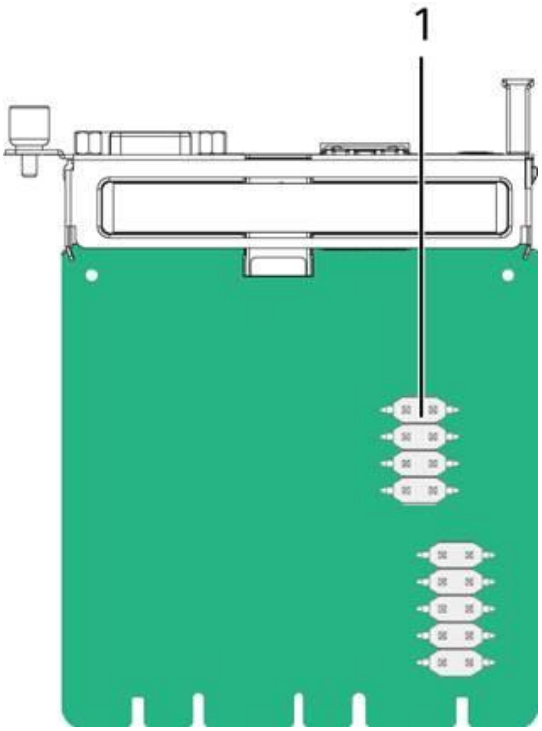


Table 5-38 Port description

No.	Description
1	Jumper

No.	Description
Note 1: You can use a jumper cap to short-circuit the COM_SW pin to change the connection direction of the physical serial port. When the pin is short-circuited, the serial port on the panel is forcibly switched to the BMC serial port. When the pin is open, the source of the serial port is controlled by BMC software and the serial port is automatically switched to the OS serial port after the system is powered on. Note 2: The actual connectors may vary.	

6 Product Specifications

For details about component specifications, see Compatibility Query.

6.1 Technical Specifications

NOTE

The actual configurations may vary depending on the configuration manual.

Table 6-1 Technical specifications

Item	Specifications
Form factor	2U rack server
Processor	Kunpeng 920: 2 x 24 cores or more.
Memory	• Up to 32 DDR DIMM slots, supporting RDIMMs • Memory rate at 4800 MT/s • 32 GB or 64 GB capacity per DIMM
Storage	SAS, SATA, and NVMe drives: • For details, see 5.6.1 Drive Configurations. • Drives are hot-swappable. RAID controller cards: • For details about supported RAID controller cards, see Compatibility Query. • The server supports supercapacitors to protect cache data from power failures, and supports RAID level migration, drive roaming, self-diagnosis, and web-based configuration. For details about the RAID controller cards, see RAID Controller Card User Guide (Arm).

Item	Specifications
FlexIO card	Up to two FlexIO cards per board. A FlexIO card provides the following network ports: • Four GE electrical ports, with PXE support • Two 25GE/10GE optical ports, with PXE support **NOTE** Different optical modules can be used for auto-negotiation between 25GE and 10GE.
PCIe slot	Up to 8 PCIe slots. All PCIe slots are standard PCIe slots. The specifications are as follows: • I/O module 1 provides the following PCIe slots: – One standard full-height half-length PCIe 5.0 x16 slot (width: PCIe 5.0 x16) and two standard full-height half-length PCIe 4.0 x16 slots (width: PCIe 4.0 x8) – Two standard full-height full-length PCIe 5.0 x16 slots (width: PCIe 5.0 x16) or one standard full-height full-length PCIe 5.0 x16 slot (width: PCIe 5.0 x16) and one standard full-height half-length PCIe 5.0 x16 slot (width: PCIe 5.0 x16) – One standard full-height full-length PCIe 5.0 x16 slot (width: PCIe 5.0 x16) and one standard full-height half-length PCIe 5.0 x16 slot (width: PCIe 5.0 x8) • I/O module 2 provides the following PCIe slots: – One standard full-height half-length PCIe 5.0 x16 slot (width: PCIe 5.0 x16) and two standard full-height half-length PCIe 4.0 x16 slots (width: PCIe 4.0 x8) – Two standard full-height full-length PCIe 5.0 x16 slots (width: PCIe 5.0 x16) or one standard full-height full-length PCIe 5.0 x16 slot (width: PCIe 5.0 x16) and one standard full-height half-length PCIe 5.0 x16 slot (width: PCIe 5.0 x16) – One standard full-height half-length PCIe 5.0 x16 slot (width: PCIe 5.0 x16) – One standard full-height full-length PCIe 5.0 x16 slot (width: PCIe 5.0 x16) and one standard full-height half-length PCIe 5.0 x16 slot (width: PCIe 5.0 x8) • I/O module 3 provides the following PCIe slots: – One standard full-height half-length PCIe 5.0 x16 slot (width: PCIe 5.0 x16) – Two standard full-height full-length PCIe 5.0 x16 slots (width: PCIe 5.0 x16) – Two standard full-height full-length PCIe 5.0 x16 slots (width: PCIe 5.0 x8)
Port	• Front panel: two USB 3.0 ports, one DB15 VGA port, and one USB Type-C port • Rear panel: two USB 3.0 ports, one DB15 VGA port, one 3.5 mm serial port, and one RJ45 management network port
Fan module	Four hot-swappable fan modules in N+1 (rotor) redundancy

Item	Specifications
	NOTE The fan modules in a server must have the same part number (P/N code).
System management	The iBMC supports Intelligent Platform Management Interface (IPMI), Serial over LAN (SOL), KVM over IP, and virtual media, and provides one 10/100/1000 Mbit/s RJ45 management network port.
Security feature	Administrator password
Video card	A video chip with 32 MB video RAM is integrated on the BMC card. The maximum display resolution is 1920 x 1200 at 60 Hz with 16M colors. **NOTE** • The integrated video card can provide the maximum display resolution (1920 x 1200) only after the video card driver matching the OS version is installed. Otherwise, only the default resolution supported by the OS is provided. • If both the front and rear VGA ports of a device are connected to a monitor, the front VGA port is used by default.

6.2 Environmental Specifications

NOTE

The actual configurations may vary depending on the configuration manual.

Table 6-2 Environmental specifications

Item	Specifications
Temperature	• Operating temperature: 5°C to 35°C (41°F to 95°F) (ASHRAE Class A1/A2 compliant) • Storage temperature (≤ 24 hours): –40°C to +65°C (–40°F to +149°F) • Storage temperature (≤ 3 months): –30°C to +60°C (–22°F to +140°F) • Storage temperature (≤ 6 months): –15°C to +45°C (5°F to 113°F) • Storage temperature (≤ 1 year): –10°C to +35°C (14°F to 95°F) • Maximum change rate: 20°C (36°F) per hour, 5°C (9°F) per 15 minutes **NOTE** The operating temperature range varies depending on the server configuration. For details, see Table 6-3.
Relative humidity (RH, non-condensing)	• Operating humidity: 8% to 90% • Storage humidity (≤ 96 hours): 8% to 95% (40°C) • Storage humidity (≤ 3 months): 8% to 85% • Storage humidity (≤ 6 months): 8% to 80% • Storage humidity (≤ 1 year): 20% to 75% • Maximum change rate: 20%/h

Item	Specifications
Air volume	≥ 204 CFM
Altitude	≤ 3,050 m (10006.56 ft.) **NOTE** • When the 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 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 (574.15 ft). • When the 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 (410.10 ft).
Corrosive airborne contaminant	Maximum growth rate of the corrosion product thickness: • 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
Particulate matter	• 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 matter 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 declared in accordance with ISO 9296 (ECMA 109). • Idle: – LWAd: 5.64 Bels – LpAm: 41 dBA • Operating: – LWAd: 6.24 Bels – LpAm: 46.6 dBA **NOTE** Actual sound levels generated during operation vary depending on server configuration, load, and ambient temperature.

Table 6-3 Operating temperature limitations

Model	Max. 30°C (86°F)	Max. 35°C (95°F) (ASHRAE Class A2 Compliant)
8 x 2.5-inch SAS/SATA drives (compatible with 4 x 2.5-inch	Rear GPUs are not supported.	Rear GPUs are not supported.

Model	Max. 30°C (86°F)	Max. 35°C (95°F) (ASHRAE Class A2 Compliant)
NVMe drives) **NOTE** The CPU power consumption cannot be greater than 340 W.		
12 x 3.5-inch SAS/SATA drives (RAID pass-through) **NOTE** The CPU power consumption cannot be greater than 340 W.	Rear GPUs are not supported.	Rear GPUs are not supported.
16 x 2.5-inch NVMe drives (compatible with 8 x 2.5-inch SAS drives) **NOTE** The CPU power consumption cannot be greater than 340 W.	Rear GPUs are not supported.	Rear GPUs are not supported.
Note 1: When a single fan (rotor) fails, unless otherwise specified, the maximum operating temperature is 5°C (9°F) lower than the normal operating temperature. For details about operating temperature restrictions of some configurations, see Compatibility Query. Note 2: The actual configurations may vary depending on the configuration manual.		

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 time exceeds the specified maximum time. When drives are preserved under the specified storage temperature and humidity, the following preservation time is recommended:

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

6.3 Physical Specifications

NOTE

The actual configurations may vary depending on the configuration manual.

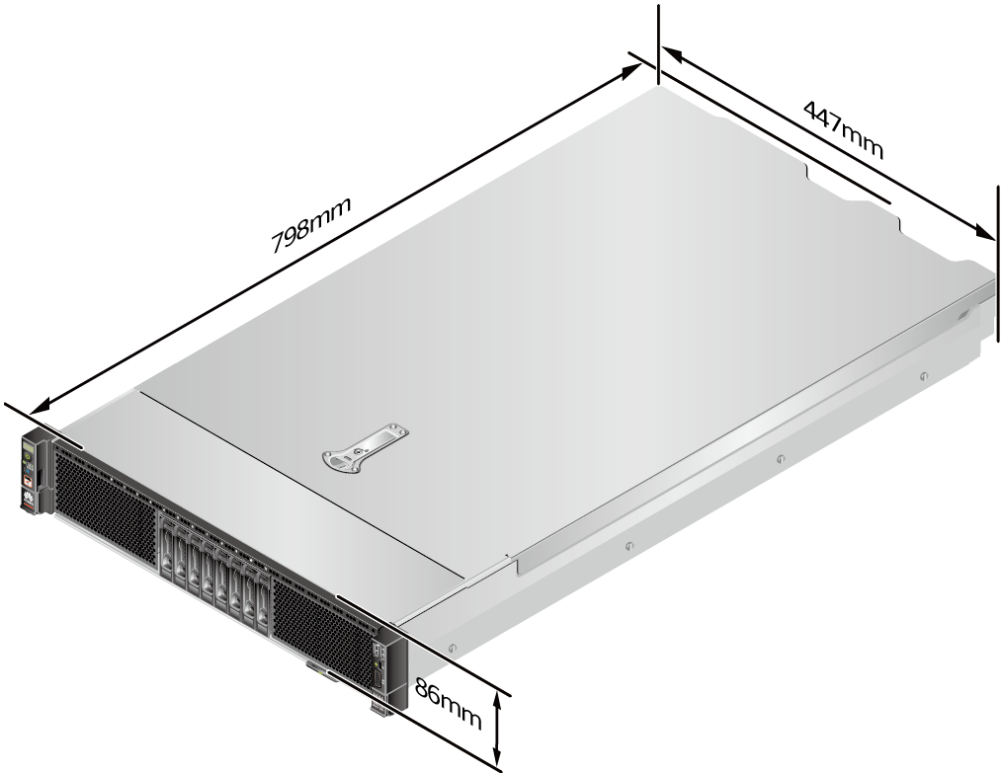
Table 6-4 Physical specifications

Item	Specifications
Dimensions (H x W x D)	Chassis with 2.5-inch drives (2U): 86 mm x 447 mm x 798 mm (3.39 in. x 17.60 in. x 31.42 in.)

Item	Specifications
	Chassis with 3.5-inch drives (2U): 86 mm x 447 mm x 798 mm (3.39 in. x 17.60 in. x 31.42 in.)
Installation space	The server fits into a common cabinet that complies with the IEC 297 standard: • Cabinet width: 482.6 mm (19.00 in.) • Cabinet depth: ≥ 1,000 mm (39.37 in.) Requirements for guide rail installation: • L-shaped guide rails apply only to Huawei cabinets. • Adjustable guide rails apply to a cabinet 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. • Holding rails apply to a cabinet with a distance of 610 mm to 914 mm (24.02 in. to 35.98 in.) between the front and rear mounting bars.
Weight in full configuration	Net weight: • Server with 8 x 2.5-inch SAS/SATA drives (compatible with 4 x 2.5-inch NVMe drives): 21 kg (46.30 lb) • Server with 12 x 3.5-inch SAS/SATA drives (RAID pass-through): 26 kg (57.32 lb) • Server with 16 x 2.5-inch NVMe drives (compatible with 8 x 2.5-inch SAS drives): 23 kg (50.71 lb) Packaging materials: 5 kg (11.02 lb)
Power consumption	Power consumption specifications vary according to server configurations (including the ErP standard configuration of the European Union). For details, use the Power Calculator.

The following figure shows the chassis of a server with 8 x 2.5-inch drives.

Figure 6-1 Physical dimensions



6.4 PSU Specifications

- The PSUs are hot-swappable and work in 1+1 redundancy.

NOTICE

Using a single PSU is not recommended, as it offers no power redundancy.

- For details about supported PSU specifications, use the Compatibility Query.
- The recommended current specifications for an external power circuit breaker connected to the server are as follows:

  AC power supply: 32 A

  DC power supply: 63 A
- A server must use PSUs of the same model.
- The PSUs provide short-circuit protection. The PSUs that support dual input live wires provide double-pole fuse.
- If the input voltage ranges from 200 V to 220 V AC, the output power of the 2000 W AC Platinum PSUs decreases to 1800 W.

7 Compatibility

7.1 Hardware and Software Compatibility

For details about compatible OSs and hardware, use the Compatibility Query.

NOTICE

The faults caused by use of incompatible components are beyond the scope of technical support and warranty.

7.2 I/O Extension

The server supports a wide variety of PCIe cards. You can select the following PCIe cards based on the card type and rate:

- Ethernet cards
- FC host bus adapters (HBAs)
- InfiniBand cards
- RAID/HBA cards

NOTE

For details about component options, consult the local Huawei sales representatives.

8 System Management

The iBMC provides rich management functions and features.

- Various management interfaces

  The iBMC provides the following standard interfaces to meet various system integration requirements:

  - Data Center Manageability Interface (DCMI) 1.5
  - Intelligent Platform Management Interface (IPMI) 1.5/2.0
  - Command line interface (CLI)
  - Redfish interface
  - Hypertext Transfer Protocol Secure (HTTPS)
  - Simple Network Management Protocol (SNMP)
- Fault monitoring and diagnosis

  Faults can be detected and rectified in advance to ensure 24/7 stable running of the device.

  - The iBMC allows screenshots and videos to be generated when the system breaks down, facilitating cause analysis of the system breakdown.
  - The iBMC offers screen snapshots and videos, simplifying routine preventive maintenance, recording, and auditing.
  - The iBMC supports the reporting of alarms through syslog packets, trap packets, and emails, helping the upper-layer NMS to collect the fault information about the server.
  - Fault Diagnose Management (FDM) provides precise fault diagnosis based on components, facilitating identification and replacement of faulty parts.
- Security management
  - Software image backup improves system security. Even if the running software breaks down, the system can be started from the backup image.
  - Diversified user security control interfaces are provided to ensure user login security.
  - Multiple types of certificates can be imported and replaced to ensure data transmission security.
- System maintenance interfaces
  - The iBMC supports KVM and virtual media to facilitate remote maintenance.

  - The iBMC supports RAID out-of-band monitoring and configuration, improving RAID configuration efficiency and management.
  - The Smart Provisioning implements OS installation, RAID configuration, and upgrades without a DVD, simplifying server installation and configuration.
- Various network protocols
  - The Network Time Protocol (NTP) synchronizes network time to optimize time configuration.
  - The iBMC supports domain name system (DNS) and Lightweight Directory Application Protocol (LDAP) to implement domain management and directory service.
- Intelligent power management
  - The power capping technology helps you easily improve deployment density.
  - The iBMC uses dynamic power saving to reduce operational expenditure (OPEX).
- License management

  License management allows advanced features to be used by authorized users. The iBMC advanced edition provides the following features:
  - Deploy an OS through the Redfish interface.
  - Enable the Kunpeng Accelerator Engine, which includes the Hardware Security Engine (SEC), High Performance RSA Engine (HPRE), RAID DIF Engine (RDE), and ZIP engine.

9 Certifications

No.	Country/Region	Certification	Standard
1	China	CCC	GB 4943.1-2022 GB/T 9254.1-2021(Class A) GB 17625.1-2022
2	China	CQC	CQC31-452425-2025 GB 43630-2023
3	China	Air Transport of Goods	IATA DGR:66th, 2025
4	Europe	CE&UKCA	Safety: EN 62368-1:2014+A11:2017 EMC: EN 55032:2015 EN 55032:2015/A11:2020 EN 55035:2017 EN 55035:2017/A11:2020 EN 55024:2010 EN 55024:2010+A1:2015 ETSI EN 300 386 V1.6.1:2012 ETSI EN 300 386 V2.1.1:2016 EN 61000-3-2:2014 EN 61000-3-3:2013 EN 61000-3-3:2013/A1:2019 EN 61000-6-2:2005 EN 61000-6-4:2007+A1:2011 EN IEC 61000-3-2:2019 EN IEC 61000-3-2:2019/A1:2021 RoHS: EN IEC 63000:2018

No.	Country/Region	Certification	Standard
			ErP: Commission Regulation (EU) 2019/424 ETSI EN 303 470 V1.1.1 (2019-03) Generalized Test Protocol for Calculating the Energy Efficiency of Internal Ac-Dc and Dc-Dc Power Supplies Revision 6.7.2
5	North America	NRTL	UL 62368-1:2019 Ed.3 CSA C22.2#62368-1:2019 Ed.3
6	Canada	IC	ICES-003
7	Australia	RCM	EN 55032:2015 EN 55032:2015 / A11:2020 AS/NZS CISPR 32:2015 AS/NZS CISPR 32:2016 AS/NZS CISPR 32:2015/AMD:2019
8	Japan	VCCI	VCCI 32-1
9	-	Commodity inspection	See the product certification.
10	-	CB	IEC 62368-1:2014

