

TaiShan 200 Server

White Paper (Model 2480)

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1 Overview

TaiShan 200 servers are data center servers powered by Huawei Kunpeng 920 processors. The 2480 compute model (2480 for short) is a 2U 4-socket rack server. This server is designed for high-performance computing (HPC), databases, cloud computing, virtualization, and enterprise services. It provides supreme computing power and features high density, easy management, and easy deployment.

Figure 1-1 shows a 2480 server equipped with eight drives.

Figure 1-1 Appearance



2 Features

Performance and Scalability

The 2480 server offers the following features to boost performance and improve scalability:

- The server uses two Huawei server-oriented 64-bit high-performance multicore Kunpeng 920 processors, which integrate DDR4, PCIe 4.0, 25GE, 10GE, and GE ports and provide comprehensive system-on-chip (SOC) functions. Each processor provides the following features:
- The server supports a maximum of four processors and 256 cores, maximizing the concurrent execution of multithreaded applications.
- The supports up to 32 DDR4 ECC RDIMMs with a memory rate of up to 2933 MHz and a maximum memory capacity of 4096 GB.
- Flexible drive configurations meet a variety of business requirements and ensure high elasticity and scalability of storage resources.
- FlexIO cards provide multiple Ethernet ports to meet different networking requirements.
- The server supports a maximum of four standard PCIe 4.0 x8 slots and two standard PCIe 4.0 x16 slots.

Availability and Serviceability

The 2480 provides the following features to improve availability and serviceability:

- The 2480 uses carrier-class components and follows the engineering process to dramatically improve system reliability.
- The 2480 is equipped with SAS/SATA drives. SAS/SATA drives support RAID 0, 1, 10, 5, 50, 6, and 60, provides RAID cache, uses a supercapacitor for power-off data protection, and allows hot swap of data drives.
- The UID and HLY indicators on the panel and 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 Huawei iBMC monitors system parameters in real time, triggers alarms, and performs recovery actions in case of failures. This helps minimize system downtime.

Manageability and Security

The 2480 provides the following features to ensure 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.
- The front bezel in the server chassis is locked to ensure local data security and reliability.

Energy Efficiency

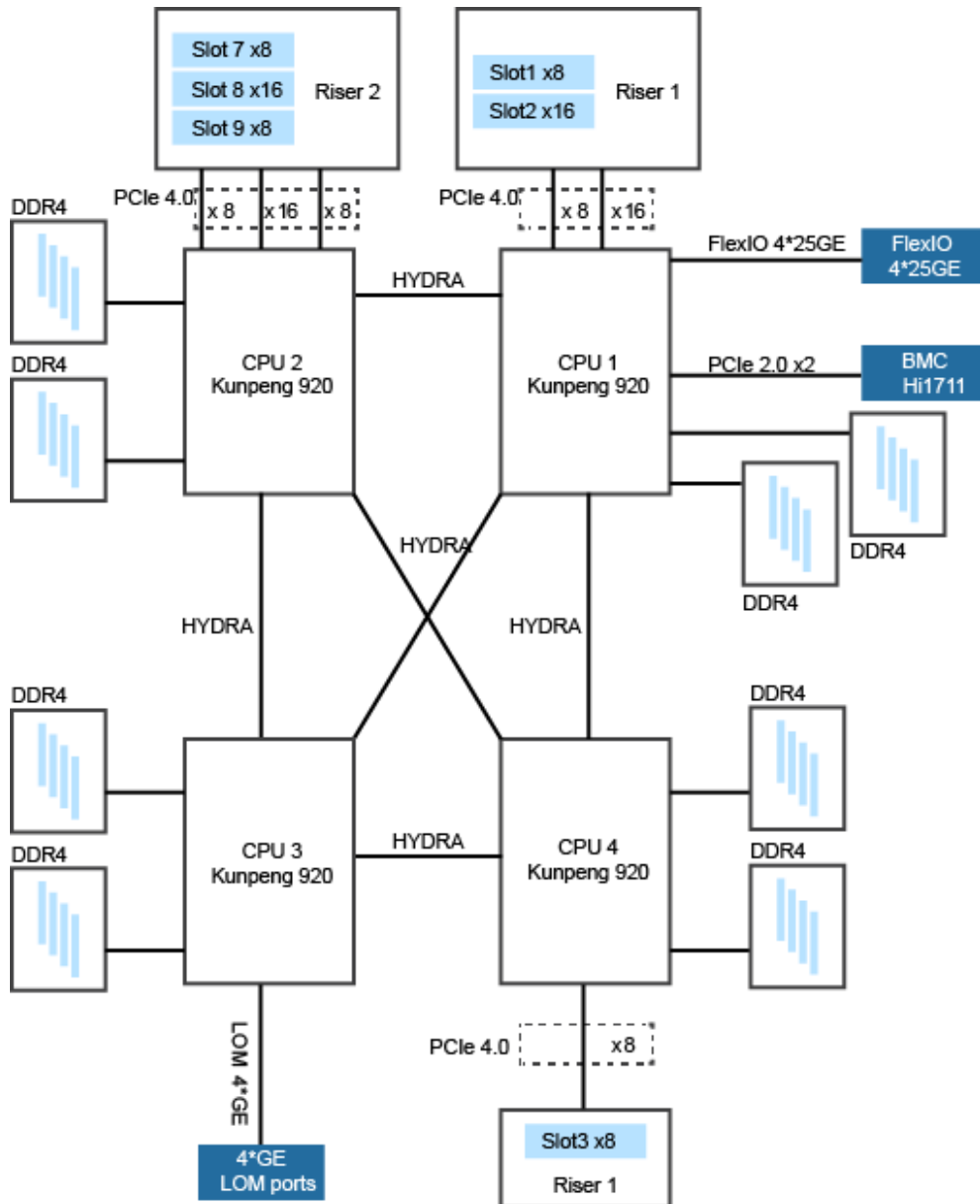
The 2480 provides the following features to improve energy efficiency:

- The 2480 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/standby power supplies.
- The 2480 supports Proportional-Integral-Derivative (PID) intelligent fan speed adjustment, reducing 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 2480 supports SSDs. SSDs consume 80% less power than HDDs.

3 Logical Structure

[Figure 3-1](#) shows the logical structure of the server.

Figure 3-1 Logical structure of the server



- The 2480 uses four HUAWEI Kunpeng 920 processors (CPUs), each of which supports eight DDR4 DIMMs.
- The four CPUs are interconnected in a full mesh topology through the Hydra interface.
- The FlexIO card provides four GE ports and is connected to the CPU through high-speed SerDes interface.
- The PCIe plug-in RAID controller card connects to CPU 1 through PCIe buses, and to the drive backplanes through SAS signal cables. The drive backplanes support various local storage configurations.
- The iBMC is based on the Huawei Hi1710 management chip and provides a VGA port, management network port, and debugging serial port.

4 Hardware Description

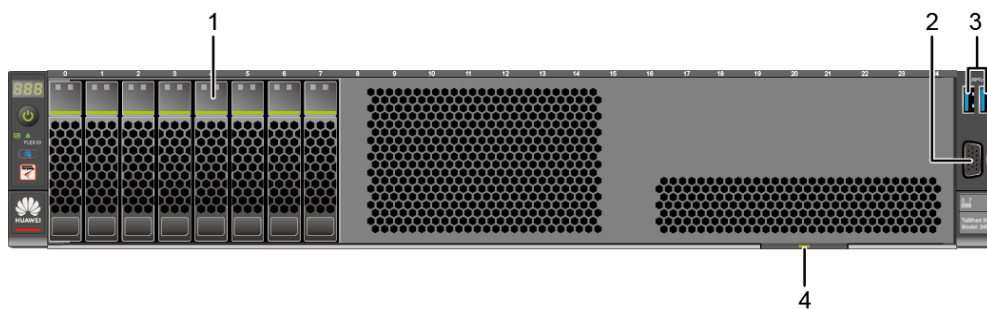
- 4.1 Appearance
- 4.2 Indicators and Buttons
- 4.3 Riser Cards and PCIe Slots
- 4.4 Physical Structure

4.1 Appearance

Front Panel

- **Figure 4-1** shows the components on the front panel of a server with 8 x 2.5-inch drives.

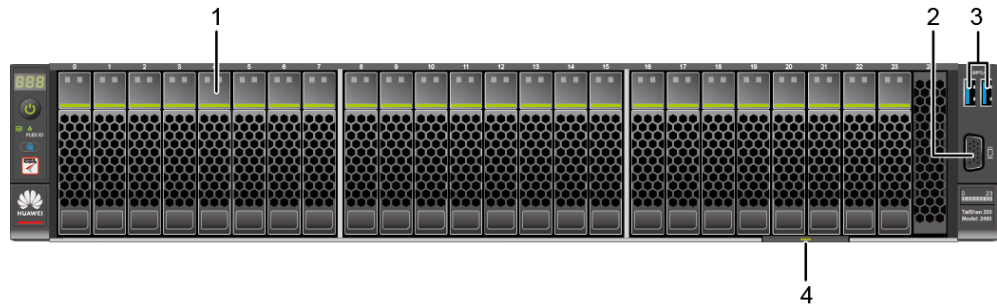
Figure 4-1 Components on the front panel of a server with 8 x 2.5-inch drives



- | | |
|----------------|--------------------------------|
| 1 Drive | 2 VGA port |
| 3 USB 3.0 port | 4 Label plate with an SN label |

- **Figure 4-2** shows the components on the front panel of a server with 24 x 2.5-inch drives.

Figure 4-2 Components on the front panel of a server with 24 x 2.5-inch drives



- 1 Drive
- 2 VGA port
- 3 USB 3.0 port
- 4 Label plate with an SN label

Table 4-1 Description of ports on the front panel

Port	Type	Description
USB port	USB 3.0	<p>The USB ports allow USB devices to be connected to the server.</p> <p>NOTE</p> <ul style="list-style-type: none"> • Before connecting an external USB device, check that the USB device functions properly. A server may operate abnormally if an abnormal USB device is connected. • If an external USB device is used, the maximum length of the extension cable is 1 m.
VGA port	DB15	<p>The VGA port is connected to a terminal, such as a monitor or physical KVM.</p> <p>NOTE</p> <ul style="list-style-type: none"> • The VGA port on the front panel does not have cable screws. The VGA cable is easy to fall off. You are advised to use the VGA port on the rear panel. • If the VGA ports on both the front and rear panels are connected, the VGA port on the front panel is used preferentially.

SN

The serial number (SN) on the label is a string that uniquely identifies a server. The SN is required when you contact Huawei technical support.

Figure 4-3 shows the SN format.

Figure 4-3 SN example



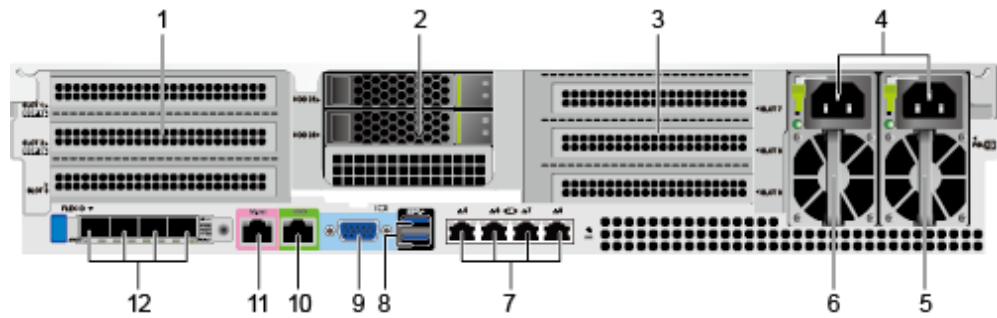
Table 4-2 SN description

No.	Description
1	SN ID (two characters), which is 21 .
2	Material identification code (eight characters), that is, processing code.
3	Code of a processing factory (two characters). The value 10 indicates Huawei.
4	Year and month (two characters). <ul style="list-style-type: none"> The first character indicates the year. Digits 1 to 9 indicate 2001 to 2009, letters A to H indicate 2010 to 2017, letters J to N indicate 2018 to 2022, and letters P to Y indicate 2023 to 2032. <p>NOTE The years from 2010 are represented by upper-case letters excluding I, O, and Z because the three letters are similar to digits 1, 0, and 2.</p> <ul style="list-style-type: none"> The second character indicates the month. Digits 1 to 9 indicate January to September, and letters A to C indicate October to December.
5	Serial number (six characters).
6	RoHS compliance (one character). Y indicates environment-friendly processing.
7	Board model, that is, product name.

Rear Panel

- **Figure 4-4** shows the components on the rear panel of a 2480 server configured with six standard PCIe cards.

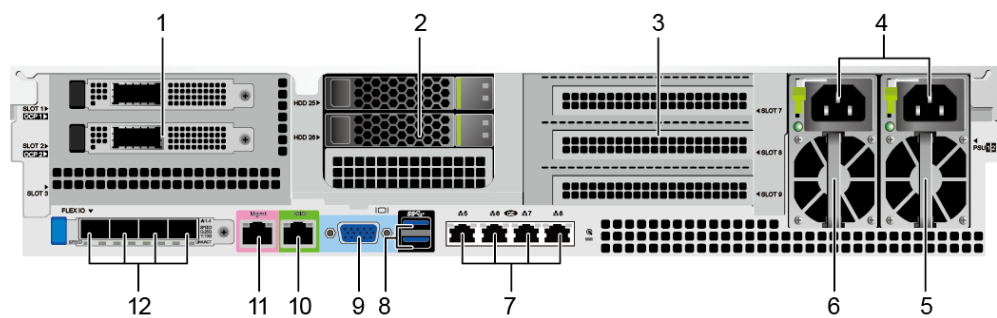
Figure 4-4 Rear panel components (6 PCIe Cards)



- | | |
|----------------------------------|-------------------------------------|
| 1 I/O module 1 | 2 I/O module 2 |
| 3 I/O module 3 | 4 PSU socket |
| 5 Power supply unit (PSU) 2 | 6 PSU 1 |
| 7 LOM ports (connected to CPU 3) | 8 USB 3.0 port |
| 9 VGA port | 10 Serial port |
| 11 Management network port | 12 FlexIO card (connected to CPU 1) |

- **Figure 4-5** shows the components on the rear panel of a 2480 server configured with OCP3.0 iNICs.

Figure 4-5 Rear panel components (OCP3.0 iNICs.)



- | | |
|----------------------------------|-------------------------------------|
| 1 I/O module 1 | 2 I/O module 2 |
| 3 I/O module 3 | 4 PSU socket |
| 5 Power supply unit (PSU) 2 | 6 PSU 1 |
| 7 LOM ports (connected to CPU 3) | 8 USB 3.0 port |
| 9 VGA port | 10 Serial port |
| 11 Management network port | 12 FlexIO card (connected to CPU 1) |

NOTICE

The FlexIO card does not support hot swap. Before replacing a FlexIO card, power off the server PSUs.

 **NOTE**

- I/O modules 1 and 3 can be configured with a riser module.
- I/O module 2 can be configured with two 2.5-inch SAS drive modules. SAS signals are directly output from the CPU, and RAID is not supported.
- The FlexIO card can be configured with a TM280 NIC.

Table 4-3 Ports on the rear panel

Port	Type	Quantity	Description
PSU socket	-	1/2	Determine the number of PSUs based on actual requirements, but 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 device operating. When one PSU is used, Predicted PSU Status cannot be set to Active/Standby on the iBMC WebUI.
LOM port	RJ45	4	LOM ports provide four GE electrical ports.
USB port	USB 3.0	2	The USB ports allow USB devices to be connected to the server. NOTE Before connecting an external USB device, check that the USB device functions properly. A server may operate abnormally if an abnormal USB device is connected.
VGA port	DB15	1	The VGA port is connected to a terminal, such as a monitor or physical KVM. NOTE If the VGA ports on both the front and rear panels are connected, the VGA port on the front panel is used preferentially.
Serial port	RJ45	1	The serial port is used as the system serial port by default. You can set it as the iBMC serial port by using the iBMC command. This port is used for debugging.
Management network port	RJ45	1	This 1000 Mbps Ethernet port is used for server management, and supports 10/100/1000 Mbps auto-negotiation.

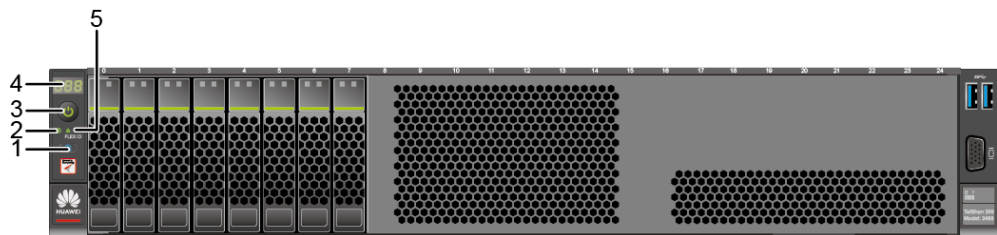
Port	Type	Quantity	Description
25GE optical port	SFP28	4	A FlexIO card can provide a maximum of four 25GE optical ports. NOTE The 25GE optical ports support rate adaptation to 10GE, and optical modules of different rates are required.

4.2 Indicators and Buttons

Front Panel

- **Figure 4-6** shows the indicators and buttons on the front panel of a server with 8 x 2.5-inch drives.

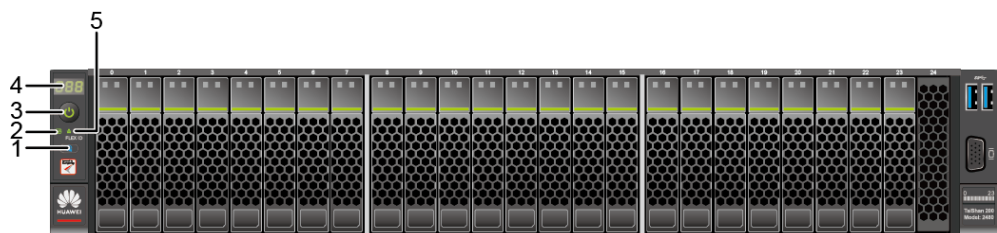
Figure 4-6 Indicators and buttons on the front panel of a server with 8 x 2.5-inch drives



1	UID button/indicator	2	Health indicator
3	Power button/indicator	4	Fault diagnostic LED
5	FlexIO card presence indicators	-	-




- **Figure 4-7** shows the indicators and buttons on the front panel of a server with 24 x 2.5-inch drives.



Figure 4-7 Indicators and buttons on the front panel of a server with 24 x 2.5-inch drives



1	UID button/indicator	2	Health indicator
3	Power button/indicator	4	Fault diagnostic LED
5	FlexIO card presence indicators	-	-

Table 4-4 Indicators and buttons on the front panel

Silkscreen	Indicator/ Button	State Description
	Fault diagnostic LED	<ul style="list-style-type: none"> ---: The server is operating normally. Error code: A server component is faulty. <p>For details about error code, see the TaiShan Rack Server iBMC Alarm Handling.</p>
	Power button/ indicator	<p>Power indicator</p> <ul style="list-style-type: none"> Steady yellow: The server is in the standby state. Steady green: The server is properly powered on. Blinking yellow: The iBMC is starting. Off: The server is not connected to a power source. <p>Power button</p> <ul style="list-style-type: none"> 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 this button for 6 seconds to force the server to power off. When the server is in the standby state, you can press this button to start the server.
	UID button/ indicator	<p>The UID button/indicator helps identify and locate a device.</p> <p>UID indicator:</p> <ul style="list-style-type: none"> Off: The device is not being located. Blinking blue (blinking 255 seconds): The device has been located and is differentiated from other devices that have also been located. Steady blue: The device is being located. <p>UID button:</p> <ul style="list-style-type: none"> You can turn on, turn off, or blink the UID indicator by pressing the UID button on the panel or by using the iBMC CLI or WebUI. You can press this button to turn on or off the UID indicator. You can press and hold down this button for about 5 seconds to reset the iBMC.

Silkscreen	Indicator/ Button	State Description
	Health indicator	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Steady green: The FlexIO card is installed and can be identified. Off: The FlexIO card is not installed or faulty.

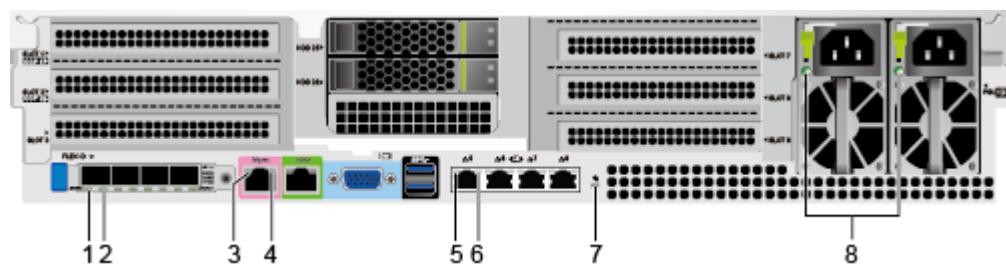
Rear Panel

Figure 4-8 shows the indicators on the rear panel of the server.

NOTE

The following uses the server configured with six PCIe cards as an example. The indicators on the rear panel are the same for the server with other configurations.

Figure 4-8 Rear panel indicators



1	Optical port transmission rate indicator	2	Optical port connection status indicator/data transmission status indicator
3	Management network port data transmission status indicator	4	Management network port connection status indicator
5	GE electrical port data transmission status indicator	6	GE electrical port connection status indicator
7	UID indicator	8	PSU indicator

Table 4-5 Indicators on the rear panel

Indicator		State Description
25 GE optical port	Transmission rate indicator	<ul style="list-style-type: none"> Steady green: The data transmission rate is 25 Gbit/s. Steady yellow: The data transmission rate is 10 Gbit/s. Off: The network port is not connected.
	Connection status indicator/Data transmission status indicator	<ul style="list-style-type: none"> Steady green: The network port is properly connected. Blinking green: Data is being transmitted. Off: The network port is not connected.
UID indicator		<p>The UID indicator helps identify and locate a device.</p> <ul style="list-style-type: none"> Off: The device is not being located. Blinking blue (blinking 255 seconds): The device has been located and is differentiated from other devices that have also been located. Steady blue: The device is being located. <p>NOTE You can turn on, turn off, or blink the UID indicator by pressing the UID button or remotely running a command on the iBMC CLI.</p>
PSU indicator		<ul style="list-style-type: none"> Steady green: The power input and output are normal. Steady orange: The input is normal, but no power output is supplied due to overheat protection, overcurrent protection, short circuit protection, output overvoltage protection, or some component failures. Blinking green at 1 Hz: <ul style="list-style-type: none"> The input is normal, the server is standby. The input is overvoltage or undervoltage. For details, see TaiShan Rack Server iBMC Alarm Handling. Blinking green at 4 Hz: under online PSU firmware upgrade. Off: No power is supplied.

SAS/SATA Drive Indicators

Figure 4-9 shows the SAS/SATA drive indicators.

Figure 4-9 SAS/SATA drive indicators

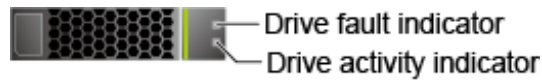


Table 4-6 Description of SAS/SATA drive indicators

Drive Activity Indicator (Green Indicator)	Drive Fault Indicator (Yellow Indicator)	Description
Steady on	Off	The drive is in position.
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 by the PCIe plug-in RAID controller card.
Blinking at 1 Hz	Blinking at 1 Hz	The data on the secondary drive is being rebuilt.
Off	Steady on	A member drive in the RAID array is removed.
Steady on	Steady on	A member drive in the RAID array is faulty.

FlexIO Cards

For details about FlexIO cards supported by the server, see the [Intelligent Computing Compatibility Checker](#).

The following figure shows the indicators on the FlexIO card.

Figure 4-10 TM280 with four 25GE optical ports

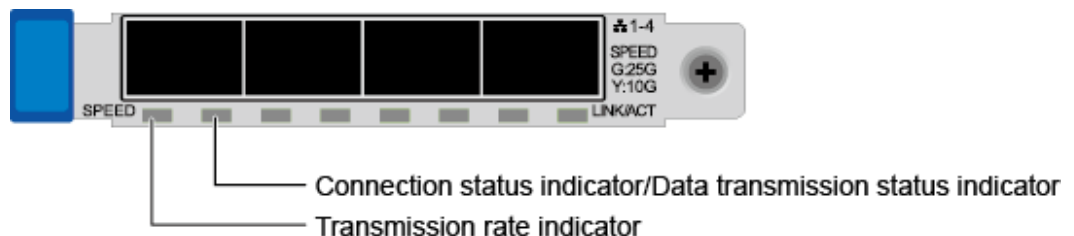


Table 4-7 FlexIO card indicators

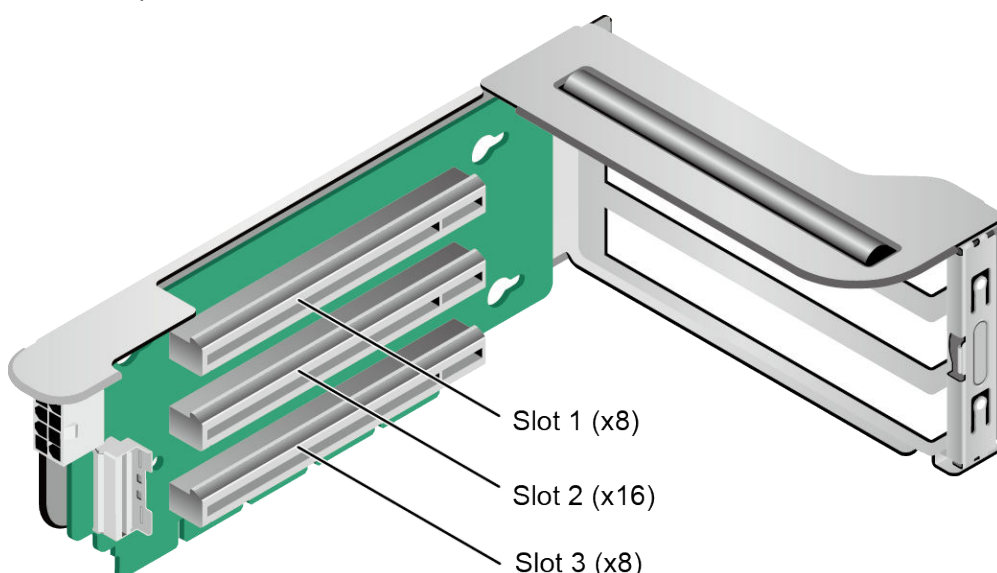
NIC Type	Indicator	State Description
FlexIO card with four 25GE optical ports	Transmission rate indicator	<ul style="list-style-type: none"> Steady green: The data transmission rate is 25 Gbit/s. Steady yellow: The data transmission rate is 10 Gbit/s. Off: The network port is not connected.
	Connection status indicator/Data transmission status indicator	<ul style="list-style-type: none"> Steady green: The network port is properly connected. Blinking green: Data is being transmitted. Off: The network port is not connected.

4.3 Riser Cards and PCIe Slots

Server with 8 x 2.5-inch Front Drives + 6 Standard PCIe Cards

- **Figure 4-11** shows the riser card supported by I/O module 1. The riser card provides PCIe slots 1 to 3, and the PCIe RAID controller card is installed in slot 1.

Figure 4-11 Riser card 1 (server with 8 x 2.5-inch front drives + 6 standard PCIe cards)



- **Figure 4-12** shows the riser card supported by I/O module 2. The riser card provides PCIe slots 7 to 9.

Figure 4-12 Riser card 2 (server with 8 x 2.5-inch front drives + 6 standard PCIe cards)

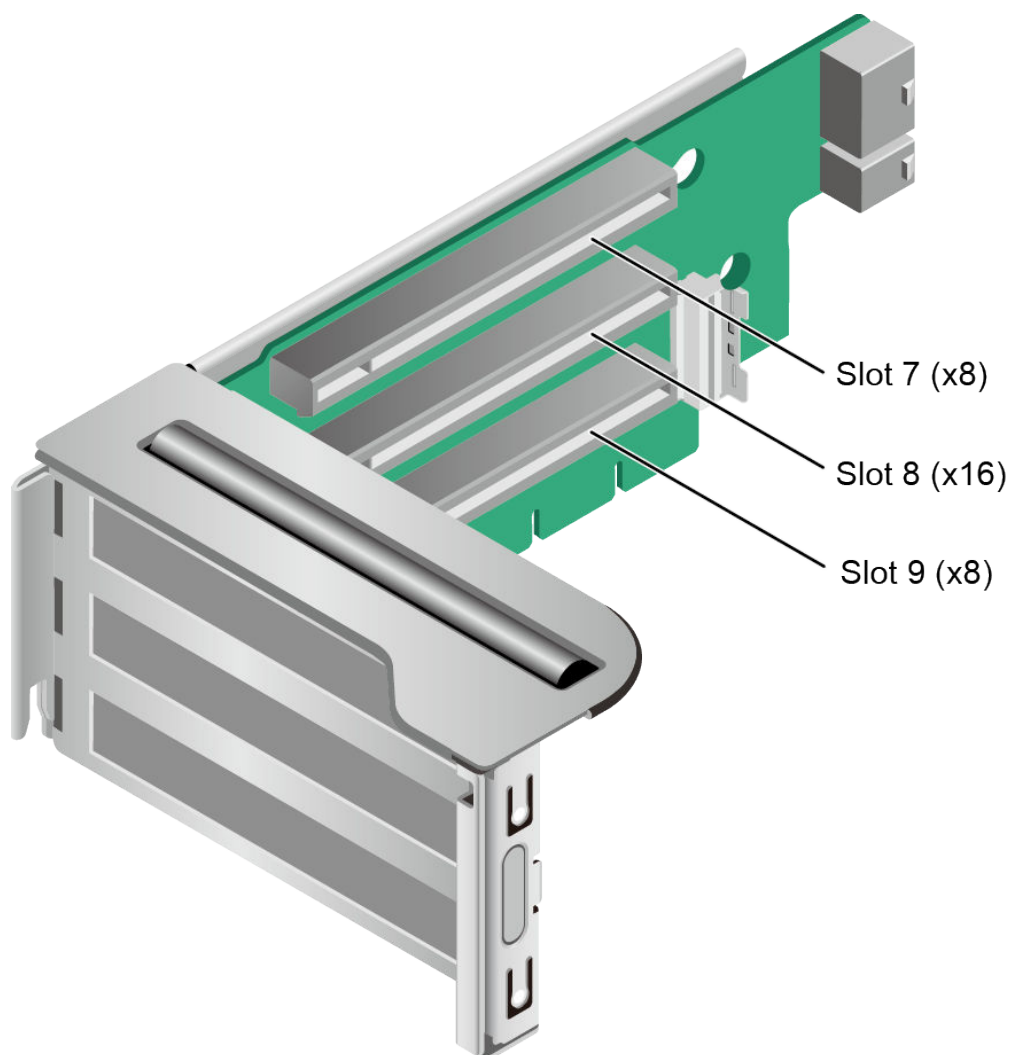
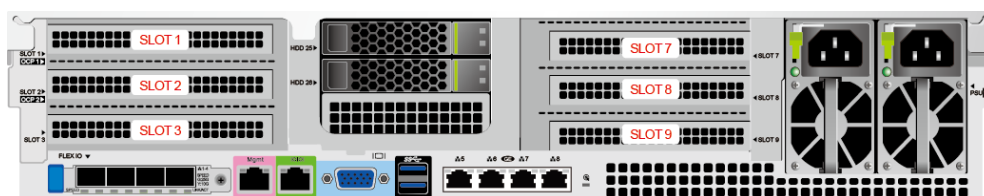


Figure 4-13 shows the PCIe slots on the rear panel of the server.

Figure 4-13 PCIe slots (server with 8 x 2.5-inch front drives + 6 standard PCIe cards)



I/O module 1 provides slots 1 and 3, and I/O module 3 provides slots 7 and 9.

Table 4-8 describes the PCIe slots.

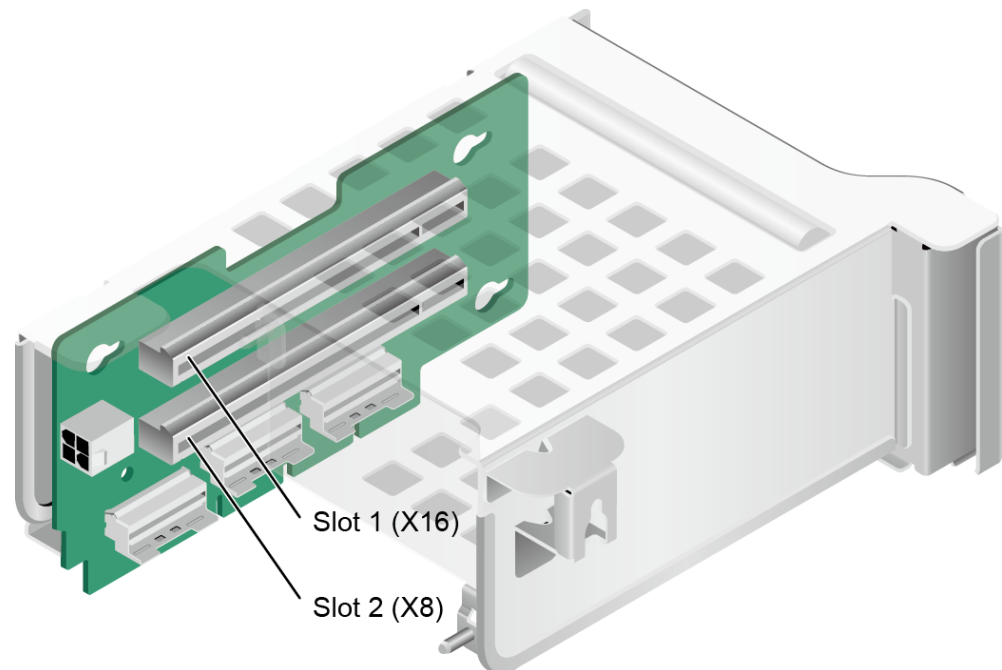
Table 4-8 PCIe slot description (server with 8 x 2.5-inch front drives + 6 standard PCIe cards)

PCIe Slot	CP U	PCIe Standards	Connector Width	Bus Width	Port Number in the BIOS	ROOT PORT (B/D/F)	Device (B/D/F)	Slot Size
Slot 1	CP U1	PCIe 4.0	x16	x8	CPU1 Port0	00/00/0	-	Full-height half-length (FHHL)
Slot 2	CP U1	PCIe 4.0	x16	x16	CPU1 Port8	00/08/0	-	Full-height full-length (FHFL)
Slot 3	CP U4	PCIe 4.0	x16	x8	CPU4 Port0	C0/00/0	-	FHHL
Slot 7	CP U2	PCIe 4.0	x16	x8	CPU2 Port0	41/00/0	-	FHHL
Slot 8	CP U2	PCIe 4.0	x16	x16	CPU2 Port8	47/00/0	-	FHHL
Slot 9	CP U2	PCIe 4.0	x16	x8	CPU2 Port16	4D/00/0	-	FHHL
<p>NOTE</p> <ul style="list-style-type: none"> • 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. • A PCIe slot that supports a PCIe x16 card is backward compatible with a PCIe x8, x4, or x2 card. A PCIe slot that supports a PCIe x8 card is backward compatible with a PCIe x4, or x2 card. • All slots support PCIe cards of up to 75 W. The power of a PCIe card varies depending on its model. For details about supported PCIe cards, use the Intelligent Computing Compatibility Checker. For PCIe cards not listed by the Intelligent Computing Compatibility Checker, contact the local Huawei sales personnel to submit a compatibility test requirement. • B/D/F indicates Bus/Device/Function Number. • ROOT PORT (B/D/F) indicates the B/D/F of a CPU internal PCIe root port. Device (B/D/F) indicates the B/D/F (displayed on the OS) of an onboard or external PCIe port. • This table lists the default B/D/F information. The values may be different if 1) The server is not fully configured with PCIe devices; 2) The PCIe cards in full configuration are of a different model or installed in different slots; 3) A PCIe card with a PCI bridge is configured. 								

Server with 24 x 2.5-inch Front Drives + OCP3.0 NICs

- **Figure 4-14** shows the riser card supported by I/O module 1. The riser card provides PCIe slots 1 to 2.

Figure 4-14 Riser card 1 (server with 24 x 2.5-inch front drives + OCP3.0 NICs)



- **Figure 4-15** shows the riser card supported by I/O module 2. The riser card provides PCIe slots 7 to 9.

Figure 4-15 Riser card 2 (server with 24 x 2.5-inch front drives + OCP3.0 NICs)

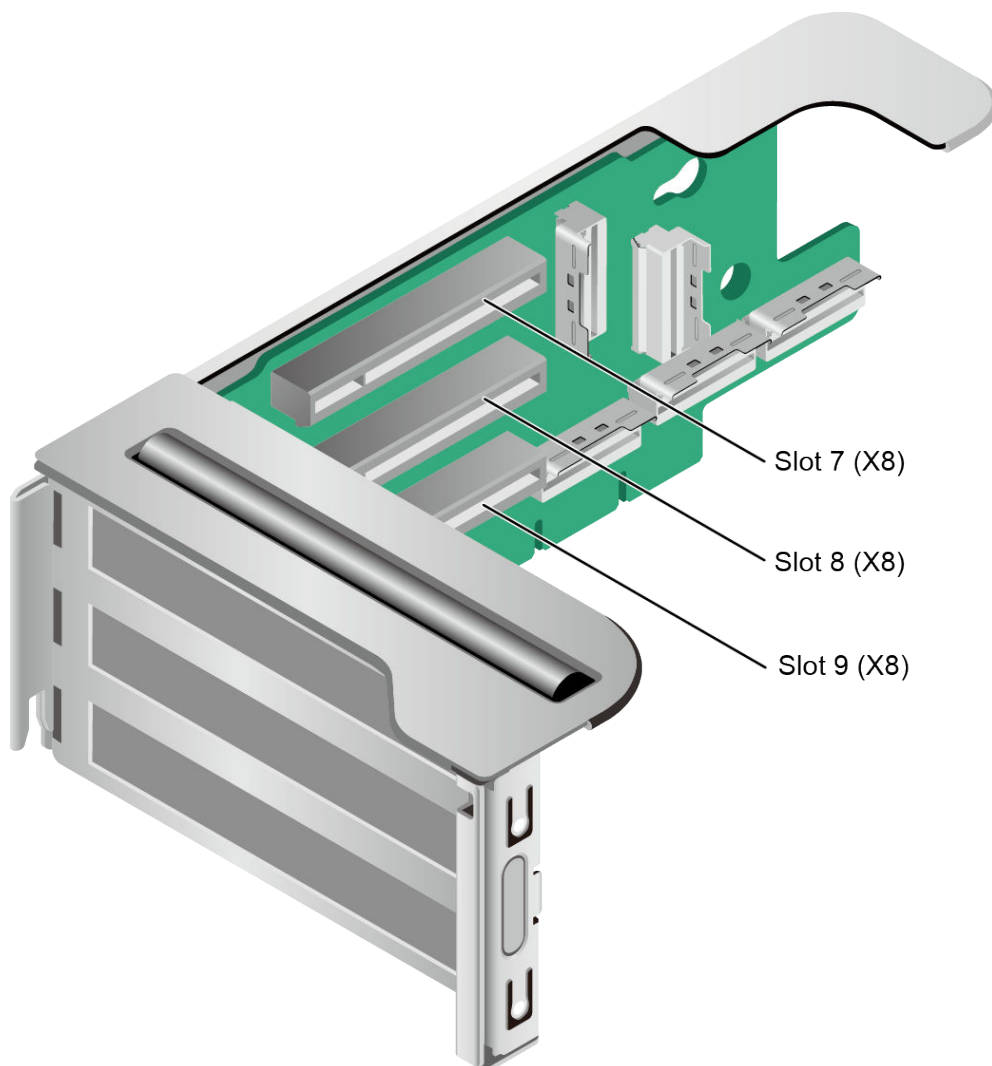
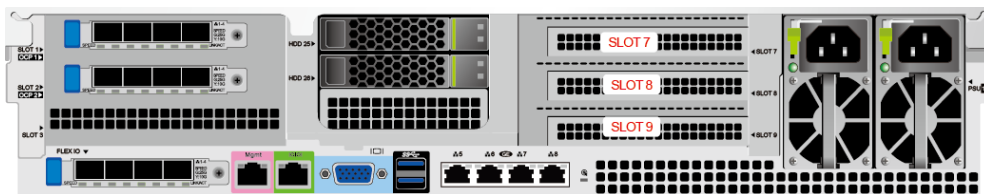


Figure 4-16 shows the PCIe slots on the rear panel of the server.

Figure 4-16 PCIe slots (server with 24 x 2.5-inch front drives + OCP3.0 NICs)



I/O module 1 does not support standard PCIe cards. It supports two OCP3.0 cards. I/O module 3 provides slots 7 to 9.

Table 4-9 describes the PCIe slots.

Table 4-9 PCIe slot description (server with 24 x 2.5-inch front drives + OCP3.0 NICs)

PCI Slot	CP U	PCI Standard	Connector Width	Bus Width	Port Number in the BIOS	ROOT PORT (B/D/F)	Device (B/D/F)	Slot Size
Slot 7	CP U2	PCI e 4.0	x16	x8	CP U2 Port0	41/0/0	-	FHHL
Slot 8	CP U2	PCI e 4.0	x16	x8	CP U2 Port8	47/0/0	-	FHHL
Slot 9	CP U2	PCI e 4.0	x16	x8	CP U2 Port16	4D/00/0	-	FHHL

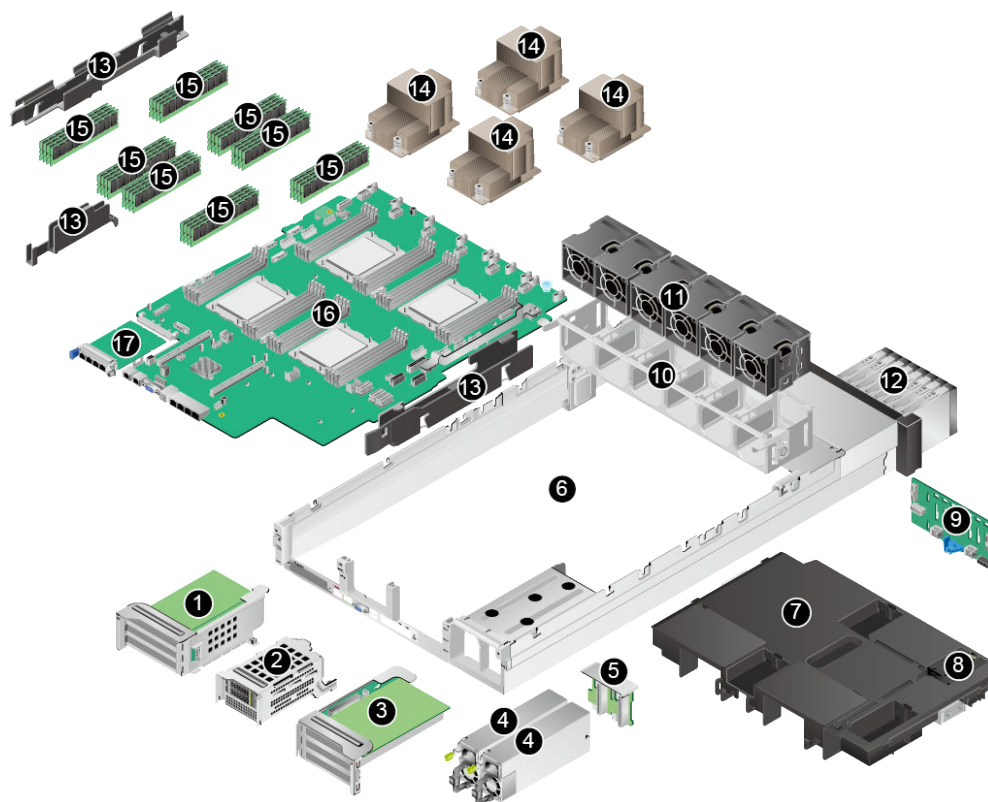
NOTE

- 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.
- A PCIe slot that supports a PCIe x16 card is backward compatible with a PCIe x8, x4, or x2 card. A PCIe slot that supports a PCIe x8 card is backward compatible with a PCIe x4, or x2 card.
- All slots support PCIe cards of up to 75 W. The power of a PCIe card varies depending on its model. For details about supported PCIe cards, use the [Intelligent Computing Compatibility Checker](#). For PCIe cards not listed by the Intelligent Computing Compatibility Checker, contact the local Huawei sales personnel to submit a compatibility test requirement.
- B/D/F indicates Bus/Device/Function Number.
- ROOT PORT (B/D/F) indicates the B/D/F of a CPU internal PCIe root port. Device (B/D/F) indicates the B/D/F (displayed on the OS) of an onboard or external PCIe port.
- This table lists the default B/D/F information. The values may be different if 1) The server is not fully configured with PCIe devices; 2) The PCIe cards in full configuration are of a different model or installed in different slots; 3) A PCIe card with a PCI bridge is configured.

4.4 Physical Structure

Figure 4-17 shows the components of a 2480 server configured with eight drives.

Figure 4-17 Components



- | | | | |
|----|----------------------------------|----|-----------------------|
| 1 | I/O module 1 | 2 | I/O module 2 |
| 3 | I/O module 3 | 4 | PSUs |
| 5 | PSU backplane | 6 | Chassis |
| 7 | Air duct and beam | 8 | Supercapacitor holder |
| 9 | Front-drive backplane | 10 | Fan module brackets |
| 11 | Fan modules | 12 | Front drives |
| 13 | Cable organizers | 14 | Heat sinks |
| 15 | DIMMs | 16 | Mainboard |
| 17 | FlexIO card (connected to CPU 1) | - | - |

NOTE

CPU are integrated on the mainboard and cannot be replaced independently.

5 Product Specifications

[5.1 Technical Specifications](#)

[5.2 Environmental Specifications](#)

[5.3 Physical Specifications](#)

5.1 Technical Specifications

For details about the part numbers and compatibility, use the [Intelligent Computing Compatibility Checker](#).

Table 5-1 Technical specifications

Item	Specifications
Form factor	2U rack server
Processor	<ul style="list-style-type: none"> • Four HUAWEI Kunpeng 920 processors at a frequency of 2.6 GHz. • The four CPUs are interconnected in a full mesh topology through the Hydra interface. • An L3 cache of up to 64 MB.
Memory	<ul style="list-style-type: none"> • Up to 32 DDR4 DIMM slots, supporting RDIMMs. • A maximum memory speed of 2933 MT/s. • Memory protection functions of ECC, SEC/DED, SDDC, Patrol scrubbing. • The capacity of a single DIMM can be 16 GB, 32 GB, and 64 GB. <p>NOTE DIMMs of different specifications (such as the capacity, bit width, rank, and height) cannot be installed on one server. That is, all DIMMs on one server must have the same Part No.</p>

Item	Specifications
Storage	<p>Drive:</p> <ul style="list-style-type: none"> • Various drive configurations. For details, see 6.3 Storage. • Hot-swappable drives. <p>PCIe plug-in RAID controller card:</p> <ul style="list-style-type: none"> • Supports a variety of PCIe plug-in RAID controller cards. Use the Intelligent Computing Compatibility Checker to obtain information about the specific PCIe plug-in RAID controller cards supported. • Provides a supercapacitor to protect cache data from power failures, and supports RAID level migration, drive roaming, self-diagnosis, and web-based configuration. For details about the PCIe plug-in RAID controller card, see TaiShan Server RAID Controller Card User Guide.
FlexIO card	<p>One FlexIO card that provides four 25GE or 10GE optical ports and supports PXE.</p> <p>NOTE Different optical modules can be used to support 25GE or 10GE optical port rate.</p>
PCIe slot	<ul style="list-style-type: none"> • Up to six PCIe 4.0 slots. Each of I/O modules 1 and 3 provides the following PCIe slots: <ul style="list-style-type: none"> – Two standard full-height full-length PCIe 4.0 x16 slots (width: PCIe 4.0 x8) – One standard full-height half-length PCIe 4.0 x16 slot (width: PCIe 4.0 x8) • The PCIe expansion slots fully support Huawei proprietary PCIe SSD cards, which bolster I/O performance for applications such as searching, caching, and download services. <p>NOTE For details about the PCIe card models supported by the 2480, use the Intelligent Computing Compatibility Checker.</p>
Port	<ul style="list-style-type: none"> • Two USB 3.0 ports and one DB15 VGA port on the front panel • Two USB 3.0 ports, one DB15 VGA port, one RJ45 serial port, and one RJ45 management network port on the rear panel
Fan module	<p>Six hot-swappable fan modules, providing protection against single-fan failure</p> <p>NOTE Fan modules on the same server must have the same Part No.</p>
System management	<p>Huawei iBMC supports Intelligent Platform Management Interface (IPMI), Serial over LAN (SOL), KVM over IP, and virtual media, and provides one 10/100/1000 Mbps RJ45 management network port.</p>

Item	Specifications
Security	<ul style="list-style-type: none"> Administrator password (Optional) Front bezel <p>NOTE The front bezel is installed on the front panel and comes with a security lock to prevent unauthorized operations on drives.</p>
Graphics card	<p>The video card chip SM750 is integrated in the iBMC management chip. It provides 32 MB video memory and supports the maximum display resolution of 1920 x 1080 at 60 Hz with 16 M colors.</p> <p>NOTE</p> <ul style="list-style-type: none"> Only the maximum resolution supported by the OS built-in driver is supported. If both the front and rear VGA ports are connected to monitors, only the monitor connected to the front VGA port is available.

5.2 Environmental Specifications

Table 5-2 Environmental specifications

Category	Specifications
Temperature	<ul style="list-style-type: none"> Operating temperature: 5°C to 40°C (41°F to 104°F) (ASHRAE Classes A2 and A3 compliant) Storage temperature (≤ 72 hours): -40°C to +65°C (-40°F to +149°F) Long-term storage temperature (> 72 hours): 21°C to 27°C (69.8°F to 80.6°F) Maximum temperature change rate: 20°C/h (36°F/h) <p>NOTE The highest operating temperature varies depending on the configuration. For details, see Table 5-3.</p>
Relative humidity (RH, non-condensing)	<ul style="list-style-type: none"> Operating humidity: 8% to 90% Storage humidity (≤ 72 hours): 5% to 95% Long-term storage humidity (> 72 hours): 30% to 69% Maximum change rate: 20%/h
Air volume	≥ 194 cubic feet per minute (CFM)

Category	Specifications
Altitude	<p>3050 m (10000 ft.)</p> <p>NOTE ASHRAE 2015 compliant:</p> <ul style="list-style-type: none"> • ASHRAE Class A1 and A2 compliant: For altitudes above 900 m (2952.72 ft.), the highest operating temperature decreases by 1°C (1.8°F) for every increase of 300 m (984.24 ft.) in altitude. • ASHRAE Class A3 compliant: For altitudes above 900 m (2952.72 ft.), the highest operating temperature decreases by 1°C (1.8°F) for every increase of 175 m (574.15 ft.) in altitude. • ASHRAE Class A4 compliant: For altitudes above 900 m (2952.72 ft.), the highest operating temperature decreases by 1°C (1.8°F) for every increase of 125 m (410.10 ft.) in altitude.
Corrosive gaseous contaminant	<p>Maximum corrosion product thickness growth rate:</p> <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • The equipment room environment meets the requirements of ISO 14664-1 Class 8. • There is no explosive, conductive, magnetic, or corrosive dust in the equipment room. <p>NOTE It is recommended that the particulate pollutants in the equipment room be monitored by a professional organization.</p>
Acoustic noise	<p>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).</p> <ul style="list-style-type: none"> • Idle: <ul style="list-style-type: none"> - LWAd: 6.40 Bels - LpAm: 46.3 dBA • Operating: <ul style="list-style-type: none"> - LWAd: 6.71 Bels - LpAm: 49.6 dBA <p>NOTE Actual sound levels generated during operation vary depending on server configuration, load, and ambient temperature.</p>

Table 5-3 Operating temperature limitations

Model	Max. 30°C (86°F)	Max. 35°C (95°F) (ASHRAE Class A2 Compliant)	Max. 40°C (104°F) (ASHRAE Class A3 Compliant)
8 x 2.5-inch drive configuration	All options supported	All options supported	All options supported
24 x 2.5-inch drive configuration	All options supported	All options supported	Not supported
NOTE If one fan fails, the highest operating temperature of the server is 5°C (9°F) lower than that in normal cases.			

5.3 Physical Specifications

Table 5-4 Physical specifications

Item	Description
Dimensions (H x W x D)	86.1 mm (2U) x 447 mm x 790 mm (3.39 in. x 17.60 in. x 31.10 in.)
Installation space	Requirements for cabinet installation (cabinet compliant with the International Electrotechnical Commission (IEC) 297 standard): <ul style="list-style-type: none"> • Cabinet width: 482.6 mm (19 in.) • Cabinet depth: ≥ 1000 mm (39.37 in.) Requirements for guide rail installation: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • Server with 8 x 2.5-inch front drives + 2 x 2.5-inch rear drives: 24.5 kg (54.01 lb) • Server with 8 x 2.5-inch front drives + OCP3.0 iNICs: 29.8 kg Packaging materials: 5 kg (11.03 lb)

Item	Description
Power consumption	The power consumption parameters vary according to configurations (including the ErP standard configuration of the European Union). Use the Intelligent Computing Product Power Calculator to obtain the specific power consumption value.

6 Software and Hardware Compatibility

Use the [Intelligent Computing Compatibility Checker](#) to obtain information about the operating systems and hardware supported by the server.

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.

[6.1 CPU](#)

[6.2 Memory](#)

[6.3 Storage](#)

[6.4 I/O Expansion](#)

[6.5 PSU](#)

6.1 CPU

Each Kunpeng 920 processor provides the following features:

- Supports a maximum of 64 cores and 2.6 GHz frequency, allowing flexible configurations of the core quantity and frequency.
- Compatible with the ARMv8-A architecture and supports ARMv8.1 and ARMv8.2 extensions.
- Uses Huawei 64-bit TaiShan cores.
- Each core integrates 64 KB L1 instruction cache, 64 KB L1 data cache, and 512 KB L2 cache.
- Supports an L3 cache of up to 45.5 MB to 46 MB.
- Supports superscalar, variable-length, and out-of-order pipelines.
- Supports one-bit ECC and two-bit error reporting.
- Uses the high-speed Hydra interface with a channel rate of up to 30 Gbit/s for inter-chip communication.

- Supports eight DDR controllers.
- Supports up to eight physical Ethernet ports.
- Supports three PCIe 4.0 (16 Gbit/s) controllers, which are also backwards compatible.
- Uses the IMU to collect CPU status information.

6.2 Memory

Memory Capacity Configuration Rules

The 2480 server supports a maximum of 32 DIMMs. Each processor supports eight memory channels, and each memory channel supports one DIMM.

Table 6-1 RDIMM configuration rules

Item		RDIMM
Rank		Dual rank
Rated speed (MT/s)		2933
Rated voltage (V)		1.2
Operating voltage (V)		1.2
Maximum number of DDR4 DIMMs in a server		32
Maximum capacity per DIMM (GB)		128
Maximum total memory capacity (GB)		4096
Maximum total memory capacity at maximum operating speed (GB)		2048
Maximum operating speed (MT/s)	One DIMM per channel	2933

Memory Slot Configuration Rules

- The 2480 supports a maximum of thirty-two 2933 MHz DDR4 ECC DIMMs. Each processor integrates eight memory channels. RDIMMs are supported.
- The 2480 supports DIMMs of 16 GB, 32 GB, 64 GB, and 128 GB. When the 2480 is fully configured with DIMMs, the maximum memory capacity is 4096 GB.
- In the 2480, each CPU has eight DDR4 DIMM slots, integrating eight memory channels. [Table 6-2](#) describes the composition of each channel. [Figure 6-1](#) shows the DIMM installation positions.
- DIMMs of different specifications (such as the capacity, bit width, rank, and height) cannot be mixed on one server. That is, a server must use DIMMs of the same Part No.

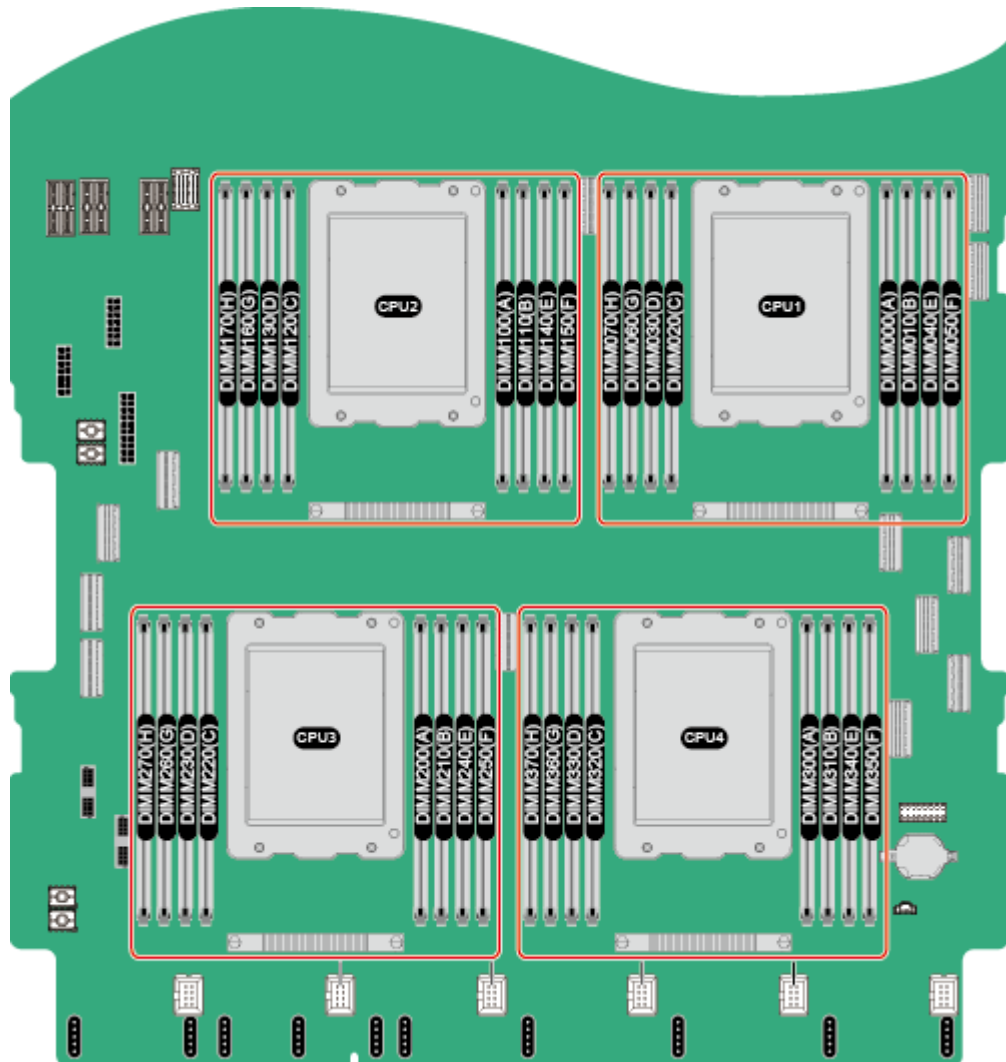
- DIMMs of different types (such as RDIMMs and LRDIMMs) cannot be installed in one server.

Table 6-2 Channels

CPU	Channel	DIMM
CPU1	TB_A	DIMM060(G)
	TB_B	DIMM020(C)
	TB_C	DIMM040(E)
	TB_D	DIMM000(A)
	TA_A	DIMM030(D)
	TA_B	DIMM070(H)
	TA_C	DIMM010(B)
	TA_D	DIMM050(F)
CPU2	TB_A	DIMM160(G)
	TB_B	DIMM120(C)
	TB_C	DIMM140(E)
	TB_D	DIMM100(A)
	TA_A	DIMM130(D)
	TA_B	DIMM170(H)
	TA_C	DIMM110(B)
	TA_D	DIMM150(F)
CPU3	TB_A	DIMM260(G)
	TB_B	DIMM220(C)
	TB_C	DIMM240(E)
	TB_D	DIMM200(A)
	TA_A	DIMM230(D)
	TA_B	DIMM270(H)
	TA_C	DIMM210(B)
	TA_D	DIMM250(F)
CPU4	TB_A	DIMM360(G)
	TB_B	DIMM320(C)
	TB_C	DIMM340(E)

CPU	Channel	DIMM
	TB_D	DIMM300(A)
	TA_A	DIMM330(D)
	TA_B	DIMM370(H)
	TA_C	DIMM310(B)
	TA_D	DIMM350(F)

Figure 6-1 DIMM installation positions



DIMM Installation Rules

NOTICE

At least one DIMM must be configured in slots supported by CPU 1.

Optimal memory performance can be achieved if the processors in a server are 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 and (or) processors.

- If a processor is configured with 5 or 7 DIMMs, 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 recommended DIMM quantity for a 4-socket server is 4, 8, 12, 16, 24, or 32.

Memory configuration must comply with the DIMM installation rules. For details, see the [Intelligent Computing Product Memory Configuration Assistant](#). Install dummy DIMMs in vacant DIMM slots.

Memory Protection

The server supports the following memory protection technologies:

- ECC
- SEC/DED
- SDDC
- Patrol scrubbing

Supported DIMMs

NOTE

- For details about component options, consult your local Huawei sales representative.
- DIMMs on one server must be of the same model, type (RDIMM or LRDIMM), and specifications (capacity, bit width, number of ranks, and height).

6.3 Storage

The 2480 server supports SAS/SATA SSDs and HDDs.

Table 6-3 Drive configurations

Configuration	Maximum Front Drives	Maximum Rear Drives	Drive Management Mode
Server with 8 x 2.5-inch drives in Expander mode	8 (SAS/SATA drives)	I/O module 2 ^[1] : 2 (SAS drives ^[2])	<ul style="list-style-type: none"> • Front drives: one PCIe plug-in RAID controller card • Rear drives: controller integrated in the CPU
Server with 24 x 2.5-inch drives in Expander mode	24 <ul style="list-style-type: none"> • Slots 0 to 3 support SAS/SATA/NVMe drives. • Slots 4 to 23 support only NVMe drives. 	I/O module 2 ^[1] : 2 (SAS drives)	Controller integrated in the CPU
[1]: I/O module 2 supports only 2.5-inch SAS drives. It does not support SATA drives. [2]: If the server comes with 8 x 2.5-inch drives, the two 2.5-inch SAS drives in I/O module 2 do not support RAID, and the signals are directly output from the CPU.			

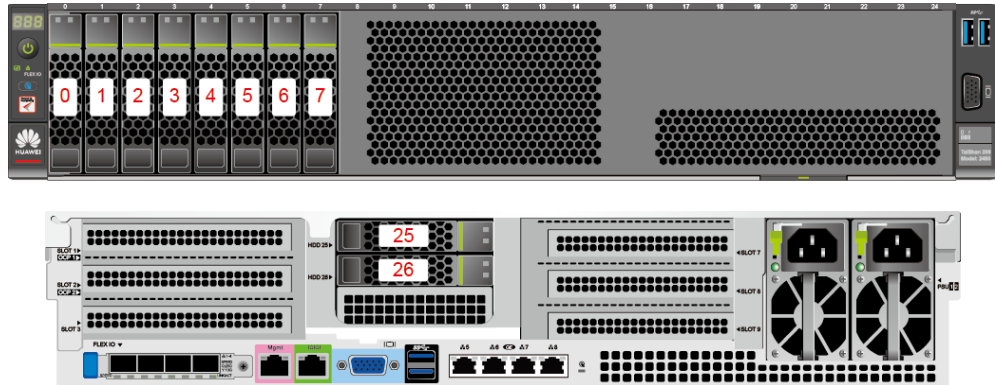
The following table describes the RAID levels.

Table 6-4 RAID level description

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

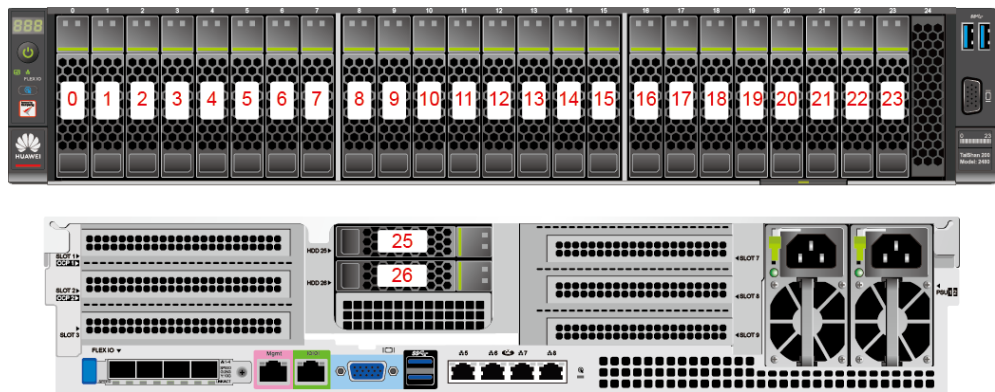
- **Figure 6-2** shows the drive slot numbers of a server with 8 x 2.5-inch drives.

Figure 6-2 Slot numbers (server with 8 x 2.5-inch drives)



- **Figure 6-3** shows the drive slot numbers of a server with 24 x 2.5-inch drives.

Figure 6-3 Server with 24 x 2.5-inch drives



6.4 I/O Expansion

The 2480 supports a wide variety of PCIe cards. You can select the following PCIe cards based on the card type and rate:

- Ethernet card
- Fiber Channel (FC) host bus adapter (HBA)
- InfiniBand (IB) expansion card
- SSD card

NOTE

For details about component options, consult your local Huawei sales representative.

6.5 PSU

Table 6-5 lists the PSUs supported by the 2480.

 **NOTE**

- **Table 6-5** is for reference only. For details about the PSUs available, contact local Huawei sales representatives.
- The recommended current specifications for the external power circuit breaker connected to the server are as follows:
 - AC power supply: 32 A
 - DC power supply: 63 A
- The PSUs are hot-swappable and work in 1+1 redundancy mode.
- 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 PSU decreases to 1800 W.

Table 6-5 Supported PSUs

PSU Model	Rated Power	Rated Input voltage
2000 W AC Platinum PSU	2000 W <ul style="list-style-type: none"> • 1800 W (input voltage: 200 V AC to 220 V AC) • 2000 W (input voltage: 220 V AC to 240 V AC) • 1800 W (input voltage: 180 V DC to 200 V DC) • 2000 W (input voltage: 200 V DC to 300 V DC) 	<ul style="list-style-type: none"> • AC voltage: 200 V to 240 V • HVDC voltage: 180 V to 300 V

7 System Management

The 2480 uses Huawei's proprietary intelligent baseboard management controller (iBMC) for remote server management. The iBMC complies with IPMI V2.0 standards and provides reliable hardware monitoring and management.

The iBMC supports the following features and protocols:

- KVM and text console redirection
- Remote virtual media
- IPMI
- Simple Network Management Protocol (SNMP)
- Login using a web browser

Table 7-1 describes the iBMC specifications.

Table 7-1 iBMC specifications

Item	Specifications
Management interface	Integrates with any standard management system through the following interfaces: <ul style="list-style-type: none"> • IPMIV2.0 • CLI • HTTPS • SNMPv3 • Redfish
Fault detection	Detects faults and accurately locates faults in hardware, for example, a field replaceable unit (FRU).
Alarm management	Supports alarm management and reports alarms using the SNMP trap, Simple Mail Transfer Protocol (SMTP), and syslog service to ensure 24/7 continuous operation.
Integrated virtual KVM	Provides remote maintenance measures for troubleshooting the system, and supports a maximum resolution of 1920 x 1200.

Item	Specifications
Integrated virtual media	Virtualizes local media devices, images, and folders into media devices on a remote server, simplifying OS installation. (The virtual DVD drive supports a maximum transmission rate of 8 MB/s.)
WebUI	Provides a user-friendly graphical user interface (GUI), which simplifies users' configuration and query operations.
Screen snapshots and videos	Allows you to view screen snapshots and videos without login, which facilitates preventive maintenance inspection.
Domain name service (DNS) and directory service	Supports the DNS and directory service, significantly simplifying network and configuration management.
Dual-image backup	Starts software from a backup image if the software fails.
Asset management	Provides intelligent asset management.
IPv6	Supports IPv6 to ensure sufficient IP addresses.

8 Maintenance and Warranty

For details, see [Maintenance & Warranty](#).

9 Certifications

No.	Country/ Region	Certification	Standard
1	China	CCC	GB4943.1-2011 GB9254-2008 (Class A) GB17625.1-2012