TaiShan 200 Server

White Paper (Model 2280E)

Issue	01
Date	2020-06-05

HUAWEI TECHNOLOGIES CO., LTD.

Trademarks and Permissions


and other Huawei trademarks are trademarks of Huawei Technologies Co., Ltd.
All other trademarks and trade names mentioned in this document are the property of their respective holders.

Notice

The purchased products, services and features are stipulated by the contract made between Huawei and the customer. All or part of the products, services and features described in this document may not be within the purchase scope or the usage scope. Unless otherwise specified in the contract, all statements, information, and recommendations in this document are provided "AS IS" without warranties, guarantees or representations of any kind, either express or implied.

The information in this document is subject to change without notice. Every effort has been made in the preparation of this document to ensure accuracy of the contents, but all statements, information, and recommendations in this document do not constitute a warranty of any kind, express or implied.

Huawei Technologies Co., Ltd.

Address: Huawei Industrial Base
Bantian, Longgang
Shenzhen 518129
People's Republic of China

Website: https://e.huawei.com

About This Document

Overview

This document describes the structure, components, specifications, and compatibility of a 2280E server.

Intended Audience

This document is intended for:

- Huawei presales engineers
- Channel partner presales engineers
- Enterprise presales engineers

Symbol Conventions

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

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

Change History

Issue	Release Date	Description
01	2020-06-05	This issue is the first official release.

Contents

1 Overview

The TaiShan 200 servers powered by Huawei Kunpeng 920 processors are optimal for data centers. The 2280E edge model (2280E for short) is a 2U 2-socket rack server. It features high-performance computing, large-capacity storage, low power consumption, easy management, and easy deployment and is ideal for Internet, distributed storage, cloud computing, big data, and enterprise services.

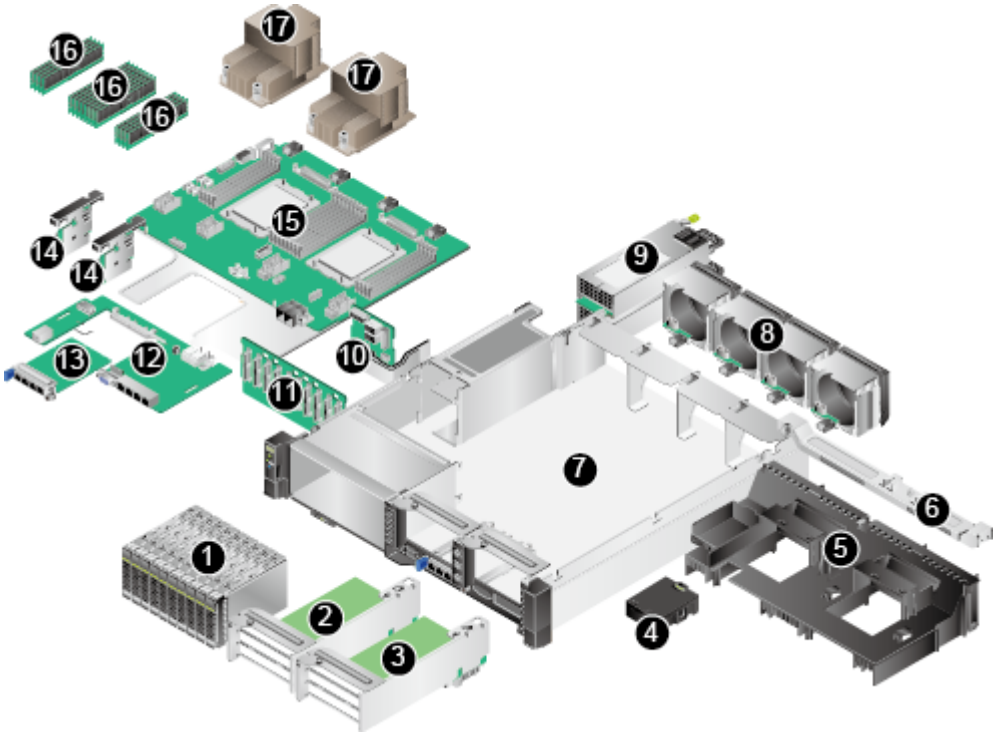
Figure 1-1 shows the appearance of a 2280E.

Figure 1-1 Appearance

1.1 Physical Structure

Figure 1-2 shows the components of a 2280E server.

Figure 1-2 Components



1	Front drives	2	I/O module 1 (CPU 2)
3	I/O module 2 (CPU 1)	4	Supercapacitor
5	Air duct	6	Support beam
7	Chassis	8	Fan module
9	Power supply unit (PSU)	10	Power backplane
11	Hard drive backplane	12	I/O expansion card
13	FlexIO card (CPU 1)	14	Cable transfer board
15	Mainboard	16	DIMM
17	Heat sinks	-	-

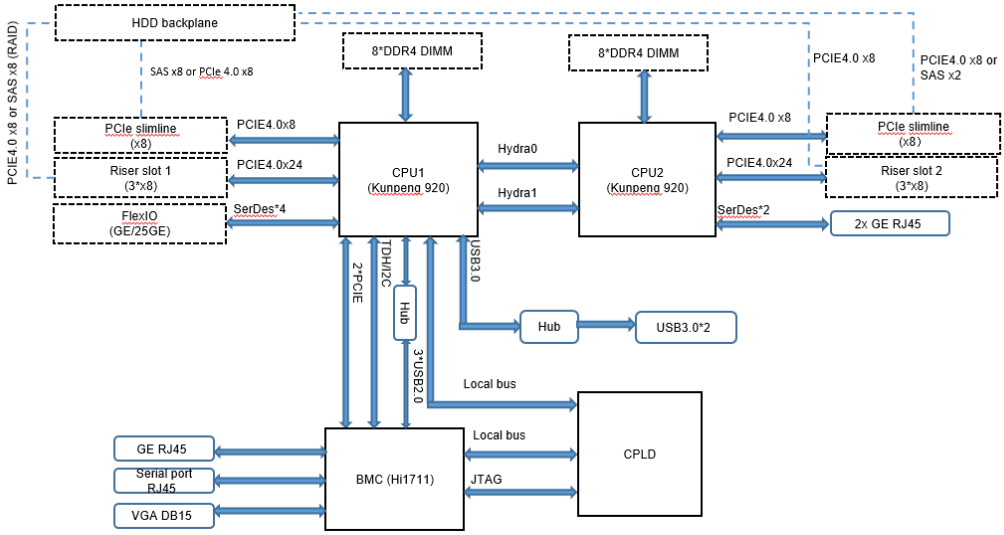
NOTE

- A riser card can be configured for I/O module 1 or 2. **Figure 1-2** is for reference only.
- The CPUs are integrated on the mainboard and cannot be replaced independently.

1.2 Logical Structure

Figure 1-3 shows the logical structure of the server.

Figure 1-3 Logical structure



- The server uses two Huawei Kunpeng 920 processors, and each processor supports 8 DDR4 DIMMs.
- The two CPUs are interconnected through two Hydra buses, which provide a maximum transmission rate of 30 Gbit/s.
- The Ethernet flexible cards can be cards with four GE or 25GE ports, and are connected to CPUs through high-speed SerDes interfaces.
- The RAID controller card connects to the drive backplane through SAS signal cables. A variety of drive backplanes are available to support flexible drive configurations.
- The BMC uses Huawei Hi1711 management chip and provides a video graphics array (VGA) port, management network port, and debugging serial port.

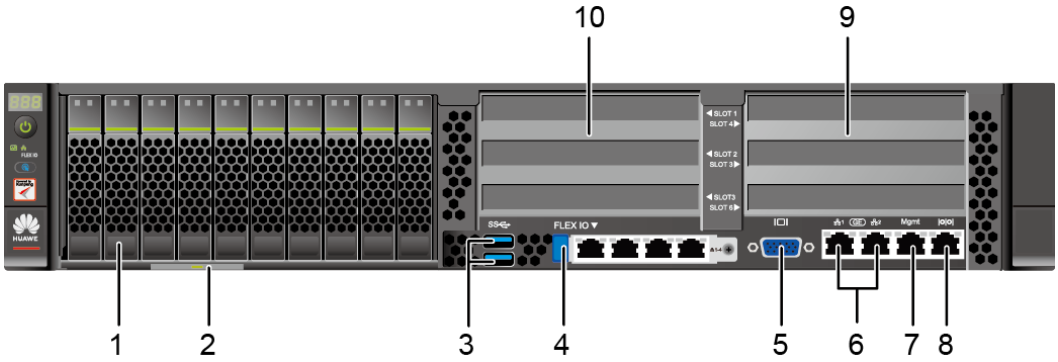
2 Components

2.1 Components on the Front Panel

Front Panel

Figure 2-1 shows the components on the 2280E front panel.

Figure 2-1 Components on the 2280E front panel



1	Drive	2	Label card (including an SN label)
3	USB 3.0 port (CPU 1)	4	FlexIO card (CPU 1)
5	VGA port (BMC)	6	LOM ports (LOM port 1 and LOM port 2 from left to right) (CPU 2)
7	Management network port (BMC)	8	Debugging serial port (supporting CPU 1 and BMC switchover)
9	I/O module 1 (CPU 2)	10	I/O module 2 (CPU 1)

Table 2-1 Ports on the front panel

Port	Type	Quantity	Description
USB port	USB 3.0	2	Connects USB devices to the server. **NOTE** • Before connecting a USB device, check that the USB device operates properly. The server may fail if it is connected to an abnormal USB device. • A maximum of 1 m extension cable is supported for a USB device.
VGA port	DB15	1	Used to connect to a monitor or a keyboard, video, and mouse (KVM). **NOTE** The VGA port on the front panel does not have cable screws. The VGA cable is easy to disconnect. You are advised to use the VGA port on the rear panel.
Management network port (Mgmt)	RJ45	1	A 1000 Mbit/s Ethernet port used for server management. It supports 10/100/1000 Mbit/s auto-negotiation. You can manage the server through this port.
Serial port	RJ45	1	System serial port by default. You can also set it as the iBMC serial port by using the iBMC CLI. This port is used for debugging.
GE electrical port	RJ45	4	Each FlexIO card provides four GE electrical ports. Two FlexIO cards provide a maximum of eight GE electrical ports and support 10/100/1000 Mbit/s auto-negotiation.

Port	Type	Quantity	Description
25GE optical port	SFP28	4	A FlexIO provides a maximum of four 25GE optical ports. **NOTE** The 25GE optical ports support autonegotiation to 10GE, if optical modules of 25GE and 10GE are used.
LOM port	RJ45	2	A 1000 Mbit/s Ethernet port used for server management. It supports 10/100/1000 Mbit/s auto-negotiation. You can manage the server OS through this port.

SN

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

Figure 2-2 shows an SN example.

Figure 2-2 SN example

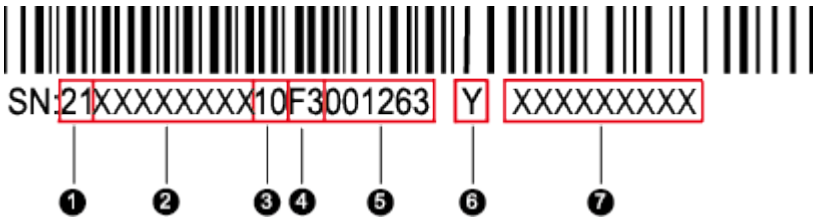


Table 2-2 SN description

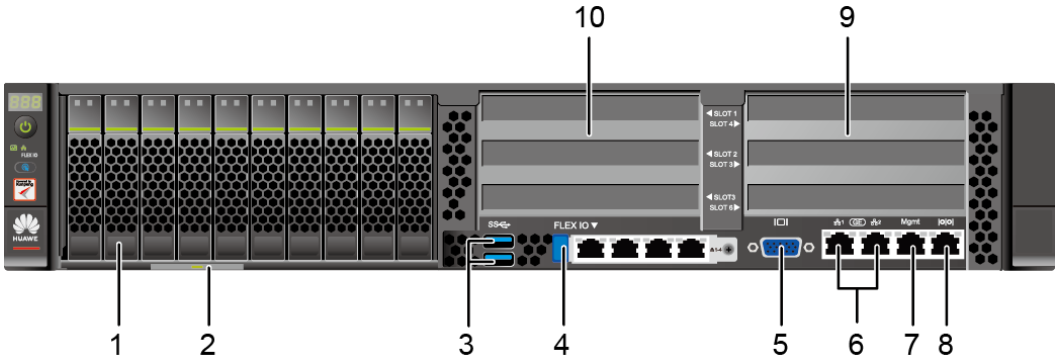
Callout	Description
1	SN ID (two characters), which is **21**.
2	Material identification code (8 characters), that is, the processing code.
3	Vendor code (two characters). The value **10** indicates Huawei.

Callout	Description
4	Year and month (two characters). • The first character indicates the year. The digits 1 to 9 indicate 2001 to 2009, the letters A to H indicate 2010 to 2017, the letters J to N indicate 2018 to 2022, and the letters P to Y indicate 2023 to 2032. **NOTE** The years from 2010 are represented by upper-case letters excluding I, O, and Z because the three letters are similar to the digits 1, 0, and 2. • The second character indicates the month. Digits 1 to 9 indicate January to September, and letters A to C indicate October to December.
5	Sequence number (six characters).
6	RoHS compliance (one character). **Y** indicates RoHS compliant.
7	Internal model, that is, product name.

2.2 Indicators and Buttons on the Front Panel

Figure 2-3 shows the indicators and buttons on the front panel of a 2280E server with hard drives.

Figure 2-3 Indicators and buttons



1	UID button/indicator	2	Health status indicator
3	Power button/indicator	4	Fault diagnosis LED
5	FlexIO indicator	6	Hard drive fault indicator
7	Hard drive active indicator	-	-

Table 2-3 Description of the indicators and buttons on the front panel

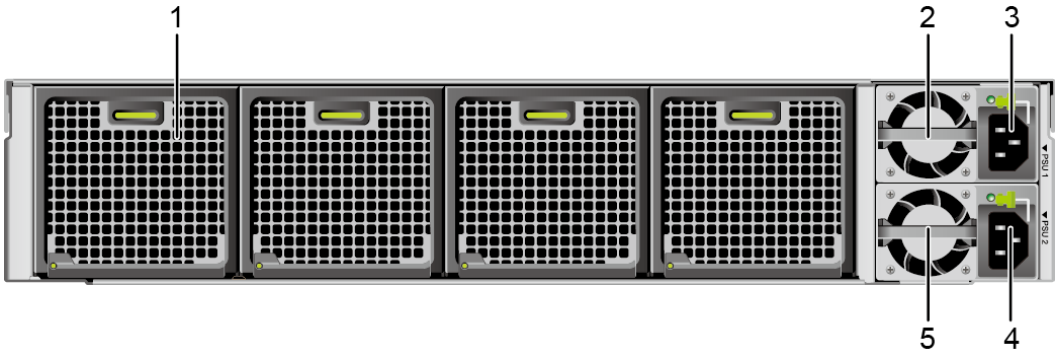
Silkscreen	Indicator and Button	Description
⊟⊟⊟	Fault diagnosis LED	• ---: The server is operating properly. • Error code: A server component is faulty. For details about error codes, see the ***TaiShan Rack Server iBMC Alarm Handling***.
	Power button/ indicator	Power indicator: • Steady yellow: The server is in standby state (ready to be powered on). • Steady green: The server is properly powered on. • Blinking yellow: The iBMC is starting. • Off: The server is not powered on. Power button: • When the server is powered on, you can press this button to shut down the operating system gracefully. • When the server is powered on, holding down this button for 6 seconds will power off the server forcibly. • When the server is in standby state (power indicator is steady yellow), you can press this button to power on the server.

Silkscreen	Indicator and Button	Description
	UID button/ indicator	The UID indicator helps identify and locate a server. UID indicator: • Off: The server is not being located. • Blinking blue (for 255 seconds): distinguishes the server from multiple servers that have also been located. • Steady blue: The server is being located. UID button: • You can set the UID indicator state 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. • Pressing and holding down this button for 5 seconds will reset the iBMC.
	Health status 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 indicator	• Steady green: The FlexIO card is installed and can be identified. • Off: The FlexIO card is not installed or faulty.

2.3 Components on the Rear Panel

Figure 1 shows components on the rear panel of a 2280E server.

Figure 2-4 Components on the rear panel



1	Fan module	2	PSU 1
3	PSU socket 1	4	PSU socket 2
5	PSU 2	-	-

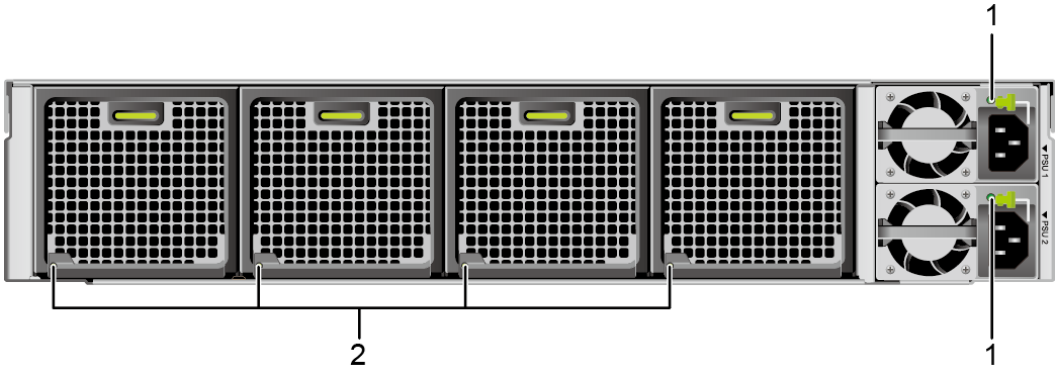
Table 2-4 Description of the port on the rear panel

Port	Type	Quantity	Description
PSU socket	-	1 or 2	The PSUs can be configured based on service requirements. However, the rated power of the PSUs must be greater than that of the server. Two PSUs are recommended for reliability purposes. If one PSU is used, **Work Mode** cannot be set to **Active/ Standby** on the iBMC WebUI. You can choose **System** > **Power** > **Power Supply Info** > **Power Supply Settings**.

2.4 Indicators on the Rear Panel

Figure 1 shows the indicators on the rear panel of a 2280E server.

Figure 2-5 Indicators on the rear panel



1	PSU indicator	2	Fan module indicator

Table 2-5 Description of indicators on the rear panel

Indicator	Description
PSU indicator	• 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: – The input is normal, and the server is in standby state. – The input is overvoltage or undervoltage. For details, see the ***TaiShan Rack Server iBMC Alarm Handling***. • Blinking green at 4 Hz: Online firmware upgrade is being performed. • Off: There is no power supply.
Fan module indicator	• If this indicator is steady green, the fan is working normally. • If this indicator is blinking red, the fan fails. • Off: There is no power supply.

2.5 FlexIO Cards

Use the **Intelligent Computing Compatibility Checker** to obtain information about the FlexIO cards supported by the server.

The following figures show the indicators on FlexIO cards.

Figure 2-6 TM210 (four GE electrical ports)

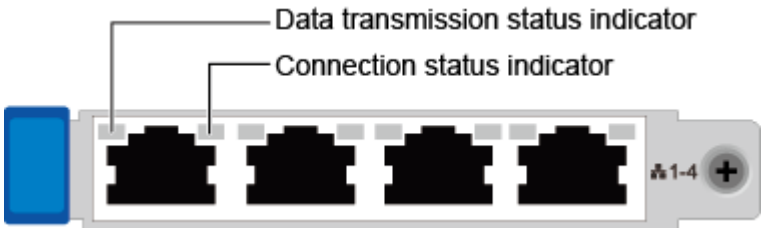


Figure 2-7 TM280 (four 25GE optical ports)

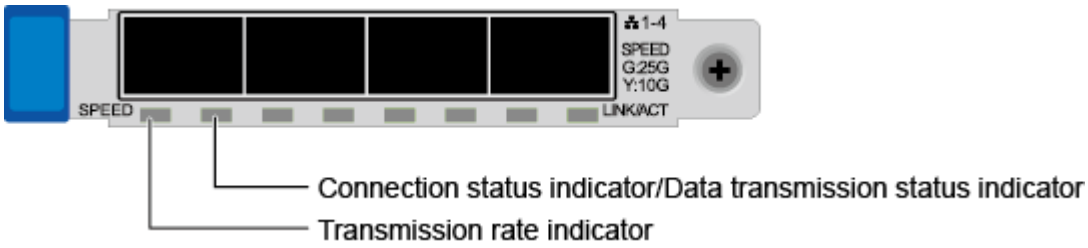


Table 2-6 Description of FlexIO card indicators

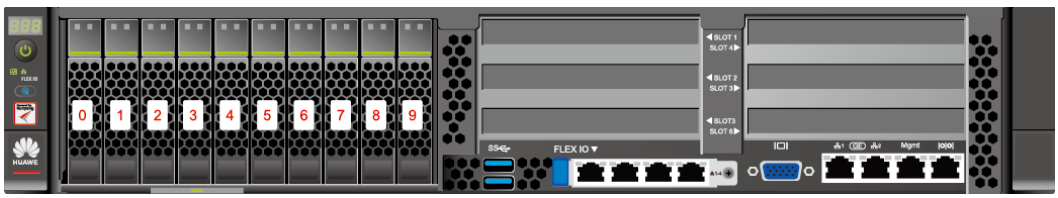
NIC Type	Indicator	Description
FlexIO card (four GE electrical ports)	Data transmission status indicator	Blinking yellow: Data is being transmitted. Off: No data is being transmitted.
	Connection status indicator	Steady green: The network connection is normal. Off: The network is disconnected.
FlexIO card (four 25GE optical ports)	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.
	Connection status indicator/Data transmission status indicator	Steady green: The network connection is normal. Blinking green: Data is being transmitted. Off: The network is disconnected.

2.6 Drives and Indicators

2.6.1 Drive Numbering

The 2280E hard drive slots are numbered from 0 to 9. **Figure 2-8** shows the slots.

Figure 2-8 Drive slots



The 2280E server supports SAS/SATA SSDs and HDDs, as well as NVMe SSDs. Table 2-7 shows hard drive configurations.

Table 2-7 Drive configurations

Configuration	Maximum Drives	Drive Management Mode
Server with 10 SAS/SATA drives (without a RAID controller card)	10	Connected to a CPU using SAS/SATA
Server with 10 SAS/SATA drives (with a RAID controller card)	10	• Slots 0 to 7: RAID controller card • Slots 8 and 9: connected to a CPU using SAS/SATA
Server with 8 NVMe and 2 SAS drives	10 • Slots 0 to 1 support only SAS drives. • Slots 2 to 9 support only NVMe drives.	Connected to a CPU using SAS and PCIe cards

2.6.2 SAS/SATA Drive Indicators

Figure 2-9 shows the indicators on an SAS or SATA drive.

Figure 2-9 SAS or SATA drive indicators

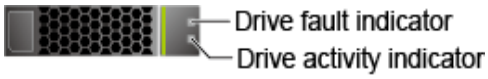


Table 2-8 Description of SAS or SATA drive indicators

Drive Activity Indicator (Green)	Drive Fault Indicator (Yellow)	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 RAID controller card.
Blinking at 1 Hz	Blinking at 1 Hz	The data on the secondary drive is being rebuilt.

Drive Activity Indicator (Green)	Drive Fault Indicator (Yellow)	Description
Off	Steady on	A drive in a RAID array is removed.
Steady on	Steady on	A drive in a RAID array is faulty.

2.6.3 NVMe Drive Indicators

Figure 2-10 shows the indicators on an NVMe drive.

Figure 2-10 NVMe drive indicators

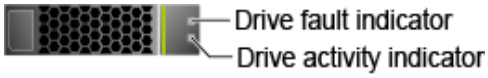


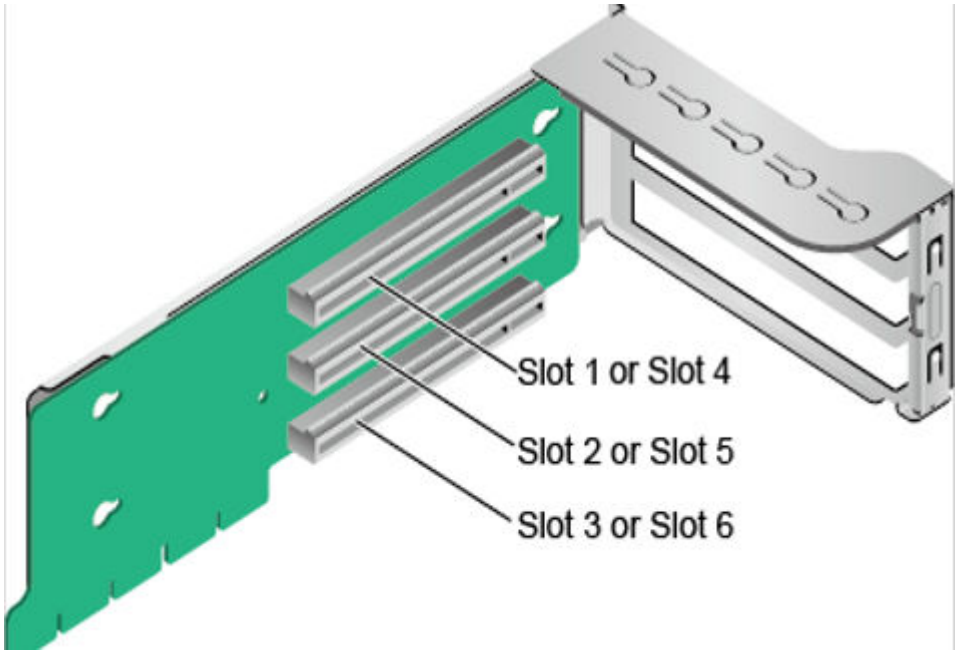
Table 2-9 Descriptions of NVMe drive indicators

Drive Activity Indicator (Green)	Drive Fault Indicator (Yellow)	Description
Off	Off	The NVMe drive cannot be detected or the PCIe link is down.
Steady green	Off	The NVMe drive is operating properly.
Blinking green at 2 Hz	Off	Data is being read from or written to the NVMe drive.
Off	Blinking yellow at 2 Hz	The NVMe drive is being located by the OS or hot-swapped.
Off	Blinking yellow at 0.5 Hz	The hot removal process is complete, and the NVMe drive is removable.
Steady green or off	Steady yellow	The NVMe drive is faulty.

2.7 Riser Cards and PCIe Slots

Figure 2-11 shows the riser cards supported by I/O modules 1 and 2. The riser card shown in Figure 2-11 can be installed in I/O module 1 or 2. If the riser card is installed in I/O module 1, the PCIe card is installed in slot 1, 2, or 3. If the riser card is installed in I/O module 2, the PCIe card is installed in slot 4, 5, or 6.

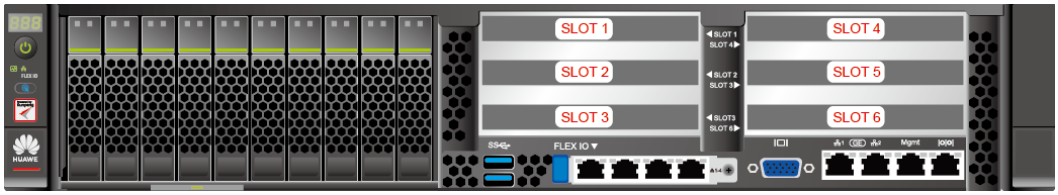
Figure 2-11 Riser card (three x8 slots)



For a server with two SAS drives and eight NVMe PCIe drives, if the riser card is installed in I/O module 1, only slots 2 and 3 are available; if the riser card is installed in I/O module 2, only slots 5 and 6 are available. Slots 1 and 4 do not support PCIe cards.

Figure 2-12 shows the PCIe slots of the 2280E server.

Figure 2-12 PCIe slots



I/O module 1 provides slots 1 and 3. I/O module 2 provides slots 4 and 6.

- If I/O module 1 uses two PCIe slots, slot 1 is unavailable.
- If I/O module 2 uses two PCIe slots, slot 4 is unavailable.

Table 2-10 lists the specifications of the PCIe slots.

Table 2-10 PCIe slot description

PCIe Slot	CPU Connected	PCIe Standards	Connector Width	Bus Width	Port No. on the BIOS	Root Port (B/D/F)	Device (B/D/F)	Slot Size
Slot 1	CPU 1	PCIe 4.0	x16	x8	Port 0	00/00/0	-	FHHL
Slot 2	CPU 1	PCIe 4.0	x16	x8	Port 12	00/0C/0	-	FHHL
Slot 3	CPU 1	PCIe 4.0	x16	x8	Port 8	00/08/0	-	FHHL
Slot4	CPU 2	PCIe 4.0	x16	x8	Port 20	80/00/0	-	FHHL
Slot5	CPU 2	PCIe 4.0	x16	x8	Port32	80/0C/0	-	FHHL
Slot6	CPU 2	PCIe 4.0	x16	x8	Port28	80/08/0	-	FHHL

NOTE

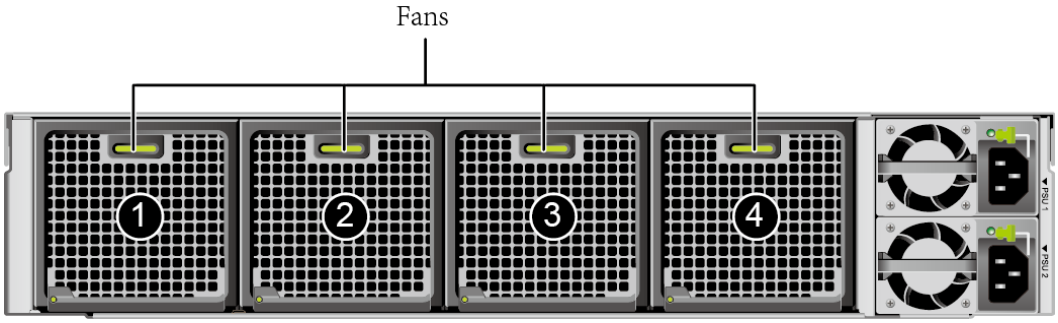
- Full-height half-length PCIe cards are supported.
- PCIe x8 slots are backward compatible with PCIe x4 and PCIe x2 cards.
- All slots support PCIe cards of up to 75 W. The power of a PCIe card varies depending on its model. Use the **Intelligent Computing Compatibility Checker** to obtain information about the PCIe cards supported by the server. For the PCIe cards not listed in the compatibility list, contact your local Huawei sales representative for a compatibility test.
- B/D/F indicates Bus/Device/Function Number.
- Root port (B/D/F) indicates the B/D/F of an internal PCIe root port of the CPU. Device (B/D/F) indicates the B/D/F (displayed on the OS) of an onboard or external PCIe port.
- The B/D/F values in this table are default. If a PCIe card is not fully configured, a PCIe card is fully configured but the model or slot is different, or a PCIe card with a PCI bridge is configured, the B/D/F values may change.
- A dedicated riser card is required when the Atlas 300 AI accelerator card (model 3000) is configured. For details, see the **Intelligent Computing Compatibility Checker**.

2.8 Fan Modules

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

Figure 2-13 shows the fans.

Figure 2-13 Fan module positions



3 Product Specifications

Use the **Intelligent Computing Compatibility Checker** to obtain information about the part No. and compatibility of the server.

3.1 Technical Specifications

Table 3-1 Technical specifications

Component	Specifications
Form factor	2 U rack server
Processors	• Supporting two Kunpeng 920 4processors with 32 or 48 cores at 2.6 GHz • Two Hydra buses between CPUs, each of which provides a maximum speed of 30 Gbit/s • An L3 cache of 45.5 MB to 46 MB **NOTE** Use the **Intelligent Computing Compatibility Checker** to obtain specific information.

Component	Specifications
Memory	• Up to 16 DDR4 RDIMMs • Maximum memory speed up to 2933 MHz/s • Protected with ECC, SEC/DED, SDDC, and patrol scrubbing • Supporting 16 GB, 32 GB, or 64 GB per DIMM **NOTE** • A server cannot be configured with DIMMs of different specifications (capacity, bit width, rank, and height). Use the DIMMs of the same part No. in the same server. • Use the **Intelligent Computing Compatibility Checker** to obtain specific information.
Storage	Drives: • The server supports a variety of drive configurations. For details, see **Table 2-7**. • The server supports hot-swap of a single drive. RAID controller cards: • Supports a variety of RAID controller cards. Use the **Intelligent Computing Compatibility Checker** to obtain specific information. • 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 RAID controller card, see the ***RAID Controller Card User Guide (Kunpeng Processors)***.
FlexIO card	Each board supports one FlexIO card. One FlexIO card provides the following network ports: • Four GE electrical ports, supporting PXE • Four 25GE or 10GE optical ports, supporting PXE **NOTE** Different optical modules can be used to implement autonegotiation between 25GE and 10GE.
PCIe	• A maximum of six standard PCIe slots are supported. The specifications of the PCIe 4.0 slots are as follows: • Six standard FHHL PCIe 4.0 x16 slots (width: PCIe 4.0 x8) • Two standard FHFL PCIe4.0 x16 slots and two standard FHHL PCIe4.0 x16 slots (width: PCIe 4.0 x8) • Supports Huawei PCIe SSD cards to improve I/O performance for search, cache, and download services. **NOTE** Use the **Intelligent Computing Compatibility Checker** to obtain specific information.
Port	The front panel provides two USB 3.0 ports, one VGA port, two LOM GE network ports (with the Realtek RTL8211FSI-VS-CG chip), one RJ45 system management network port, and one commissioning serial port.

Component	Specifications
Fan modules	Four hot-swappable 8038+ fan modules, allowing one-fan failure. **NOTE** Fan modules of the same part No. must be used in the same server.
System management	One 10/100/1000 Mbit/s RJ45 management network port. Huawei iBMC supports Intelligent Platform Management Interface (IPMI), Serial over LAN (SOL), KVM over IP, and virtual media.
Security	• Administrator password • Front bezel (optional) **NOTE** The front bezel is installed on the front panel and comes with a lock to prevent unauthorized operations on drives.
Video card	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. **NOTE** Only the maximum resolution supported by the built-in driver of the OS is supported.

3.2 Environmental Specifications

Table 3-2 Environmental specifications

Item	Specifications
Temperature	• Operating temperature (≤ 96 hours; total duration in a year ≤ 15 days): –5°C to +55°C (23°F to131°F) • Long-term operating temperature (> 96 hours): 0°C to 45°C (32°F to 113°F) (ASHRAE Class A2/A3) • 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 change rate: 20°C/h (36°F/h) **NOTE** The highest operating temperature varies depending on the server configuration. For details, see **Table 3-3**.

Item	Specifications
Relative humidity (RH, non-condensing)	• Operating humidity: 8% to 90% • Storage humidity (≤ 72 hours): 5% to 95% • Long-term storage humidity (> 72 hours): 30% to 69% • Maximum humidity change rate: 20%/h
Maximum altitude	3050 m (10006.56 ft) **NOTE** According to the ASHRAE 2015 standard: • When the server configuration complies with ASHRAE Classes A1 and A2 and the altitude is above 900 m (2952.76 ft), the highest operating temperature decreases by 1°C (1.8°F) for every increase of 300 m (984.25 ft). • When the server 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 server configuration complies with ASHRAE Class A4 and the altitude is above 900 m (2952.76 ft), the highest operating temperature decreases by 1°C (1.8°F) for every increase of 125 m (410.10 ft).
Corrosive Airborne Contaminants	Maximum corrosion product thickness growth rate: • Copper corrosion rate test: 300 Å/month (meeting level G1 requirements of the ANSI/ISA-71.04-2013 standard on gaseous corrosion) • Silver corrosion rate test: 200 Å/month
Particle contaminant	• The equipment room environment meets the requirements of ISO 14664-1 Class 8. • There is no explosive, conductive, magnetic, or corrosive dust in the equipment room. **NOTE** It is recommended that the particulate pollutants in the equipment room be monitored by a professional organization.
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: 5.72 Bels – LpAm: 41.9 dBA • Operating: – LWAd: 6.43 Bels – LpAm: 49.1 dBA **NOTE** The actual sound levels generated during server operating vary depending on the server configuration, load, and ambient temperature.

Table 3-3 Operating temperature limitations

Configuration	Maximum Operating Temperature: 35°C (95°F)	Maximum Operating Temperature: 40°C (104°F)	Maximum Operating Temperature: 45°C (113°F)	Maximum Operating Temperature: 55°C (131°F)
10 x SAS/SATA drives (without a RAID controller card)	All options supported	All options supported	All options supported	The SAS/SATA HDD and Atlas 300 AI accelerator card (model 3000) are not supported.
Server with 10 SAS/SATA drives (with a RAID controller card)				
Server with 8 NVMe and 2 SAS drives	All options supported	All options supported	All options supported	The NVMe PCIe SSD and Atlas 300 AI accelerator card (model 3000) are not supported.

NOTE

- When the operating temperature is less than or equal to 45°C and one fan fails, the maximum operating temperature is 5°C lower than the normal operating temperature.
- When the operating temperature is less than or equal to 45°C and one fan is removed for maintenance, the maximum operating temperature is 5°C (41°F) lower than the normal operating temperature (within 3 minutes).
- When the operating temperature is higher than 45°C and lower than or equal to 55°C, and one fan fails or is removed for maintenance, the system performance may be affected.
- When the operating temperature is higher than 45°C and lower than or equal to 55°C, PSUs work in 1+1 redundancy mode (to balance load).
- When the operating temperature is higher than 45°C and lower than or equal to 55°C, the iBMC event log may record a PSU temperature alarm.

3.3 Physical Specifications

Table 3-4 Physical specifications

Item	Description
Dimensions (H x W x D)	87.3 mm (2U) ×447mm×495 mm

Item	Description
Installation space	The server fits into a standard cabinet complying with the IEC 297 standard: • Cabinet width: 19 inches • Cabinet depth ≥ 600 mm (23.62 in.) Requirements for guide rail installation: • L-shaped guide rails: apply only to Huawei cabinets. • Adjustable guide rails: apply to a cabinet with a depth greater than 600 mm (23.62 in.). The distance between the front and rear mounting bars of the cabinet ranges from 543.5 mm to 848.5 mm (21.40 in. to 33.41 in.). For a 600 mm (23.62 in.) deep cabinet, the distance between the front and rear mounting rails ranges from 314.7 mm (12.39 in.) to 450.5 mm (17.74 in.).
Weight in full configuration	Maximum net weight: • Server with 10 SAS/SATA drives (with a RAID controller card and six standard FHHL cards): 25 kg (55.13 lb) • Server with 8 NVMe and 2 SAS drives (six FHHL standard cards): 24 kg (52.92 lb) Packing material weight: 5 kg (11.03 lb)
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.

3.4 Power Supply Specifications

- The PSUs are hot-swappable and work in 1+1 redundancy mode.
- Use the **Intelligent Computing Compatibility Checker** to obtain specific PSU specifications.
- The recommended current specifications of the circuit breakers connected to the server are as follows:
  - AC: 32 A
  - DC: 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.
- When the input voltage is 200 V AC to 220 V AC, the output power of the 2000 W AC platinum PSU decreases to 1800 W.
- The maximum output power of a 1200 W DC PSU varies depending on the operating temperature, as shown in **Table 3-5**.

Table 3-5 Maximum output power of a 1200 W DC PSU at different operating temperatures

Operating Temperature	Maximum Operating Temperature: 35°C (95°F)	Maximum Operating Temperature: 40°C (104°F)	Maximum Operating Temperature: 45°C (113°F)
Maximum output power	1200 W	1100 W	1050 W

4 Hardware and Software Compatibility

For details about the OS and hardware, use the **Intelligent Computing Compatibility Checker**.

NOTICE

If incompatible components are used, the device may be abnormal. This fault is beyond the scope of technical support and warranty.

5 System Management

The 2280E uses Huawei proprietary intelligent Baseboard Management Controller (iBMC) to implement remote server management. The iBMC complies with IPMI 2.0 and provides highly 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 5-1 describes the features of the iBMC.

Table 5-1 iBMC features

Item	Specifications
Management interface	Integrates with any standard management system through the following interfaces or protocols: • IPMI 2.0 • CLI • HTTPS • SNMP V3
Fault Detection	Detects and accurately locates faults in a field replaceable unit (FRU).
Alarm management	Supports alarm management and reports alarms using the SNMP trap, SMTP, and syslog service to ensure 24/7 operating.
Integrated virtual KVM	Provides remote maintenance measures for troubleshooting 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), simplifying user configuration and query operations.
Screen snapshots and videos	Allows users to view screen snapshots and videos without login, which facilitates preventive maintenance inspection (PMI).
Domain Name Service (DNS)/Active Directory (AD)	Supports domain management and directory services, which significantly simplify network and configuration management.
Dual-image backup	Allows a boot from the backup image when the active software crashes.
Asset management	Supports intelligent asset management.
IPv6	Supports IPv6 to ensure sufficient IP addresses.

6 Maintenance and Warranty

For details about the maintenance and warranty, see **Maintenance & Warranty**.

7 Certifications

No.	Country/ Region	Certification	Standard
1	China	CCC	GB4943.1-2011 GB/T9254-2008 (Class A) GB17625.1-2012
2	China	CQC	CQC3135-2011
3	China	Air transport verification	IATA DGR 61st, 2020

No.	Country/ Region	Certification	Standard
4	Europe	CE	Safety: EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013 EN 62368-1:2014+A11:2017 EMC: EN 55032:2012/AC:2013 CISPR 32:2012 EN 55032:2015/AC:2016 CISPR 32:2015 EN 55035:2017 CISPR 35:2016 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 61000-6-2:2005 EN 61000-6-4:2007+A1:2011 ERP: COMMISSION REGULATION (EU) 2019/424 of 15 March 2019 RoHS: EN 50581: 2012
5	America	FCC	FCC CFR47 Part 15 Subpart B:2018
6	America	NRTL	UL 60950-1:2007 Ed.2+R:14Oct2014 CSA C22.2#60950-1:2007 Ed.2 +A1;A2 UL 62368-1:2014 Ed.2 CSA C22.2#62368-1:2014 Ed.2]
7	Canada	IC	ICES-003 Issue 6: 2016 (updated April 2019) ICES Gen Issue 1:2018 ANSI C63.4:2014+A1:2017
8	Australia	RCM	EN 55032:2012/AC:2013 EN 55032:2015/AC:2016 AS/NZS CISPR 32:2015
9	Japan	VCCI	VCCI 32-1

No.	Country/ Region	Certification	Standard
10	-	Multi-country commodity inspection	See the product certification.
11	-	International CB	IEC 60950-1:2005, AMD1:2009, AMD2:2013 IEC 62368-1:2014 (Second Edition)
12	Europe	REACH	Regulation (EC) No 1907/2006 (EU REACH)
13	Europe	WEEE	2012/19/EU

A Appendix

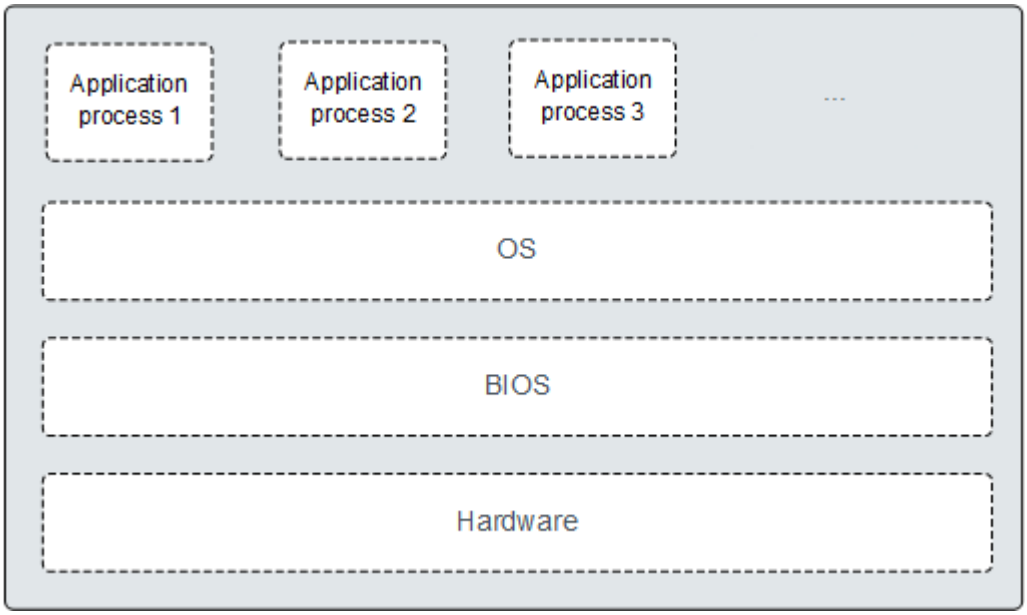
A.1 BIOS

The basic input/output system (BIOS) is the most basic software loaded to a computer hardware system. It provides an abstraction layer between the computer hardware and the OS. It is used to perform hardware initialization during the boot process and provide runtime services for the OS and programs. **Figure A-1** shows the BIOS position in the system.

The BIOS data is stored on the Serial Peripheral Interface (SPI) flash memory. The BIOS performs a power-on self-test (POST), initializes CPU and memory, checks the I/O and boot device, and finally boots the OS. The BIOS also supports the advanced configuration and power interface (ACPI) and hot swap setting.

The BIOS of the Huawei Kunpeng 920 platform server is a patented BIOS product with independent intellectual property rights. It supports customization and provides a variety of in-band and out-of-band configuration functions as well as high scalability.

Figure A-1 BIOS in the system



For details, see the ***BIOS Parameter Reference (Kunpeng 920 Processor)***.

A.2 iBMC

The iBMC is a Huawei proprietary intelligent management system that remotely manages servers.

The iBMC complies with Intelligent Platform Management Interface (IPMI) standards. It provides various functions, including keyboard, video, and mouse (KVM) redirection, text console redirection, remote virtual media, and reliable hardware monitoring and management.

The iBMC provides the following features:

- Multiple management interfaces for system integration

  The iBMC provides IPMI, CLI, Data Center Manageability Interface (DCMI), Redfish interfaces, Hypertext Transfer Protocol Secure (HTTPS), and SNMP.
- Fault detection and alarm management

  The iBMC implements fault detection and alarm management, ensuring stable, uninterrupted 24/7 system operation.
- Virtual KVM and virtual media

  The iBMC provides virtual KVM and virtual media, facilitating remote maintenance.
- WebUI

  The iBMC provides a web-based UI for setting and querying device information.
- System breakdown screenshots and video playback

  The iBMC allows screenshots and videos to be created when the system breaks down. The screenshots and videos help to identify the cause of system breakdown.

- Screen snapshots and videos

  The iBMC offers screen snapshots and videos, which simplify routine preventive maintenance, recording, and auditing.
- Support for DNS and LDAP

  The iBMC supports domain name system (DNS) and Lightweight Directory Application Protocol (LDAP) to implement domain management and directory service.
- Active/standby backup

  The iBMC works in active/standby mode to ensure system reliability. If the active iBMC is faulty, the standby iBMC takes over services immediately.

For more information about the iBMC, see the ***TaiShan Rack Server iBMC User Guide***.

A.3 Glossary

B

BMC	baseboard management controller The BMC complies with the Intelligent Platform Management Interface (IPMI) standard, responsible for collecting, processing, and storing sensor signals, and monitoring the operating status of each component. The BMC provides the hardware status and alarm information about the managed objects for the management module, so that the management module can manage the objects.

E

Ethernet	A baseband local area network (LAN) architecture developed by Xerox Corporation in cooperation with DEC and Intel. Ethernet uses Carrier Sense Multiple Access/Collision Detection (CSMA/CD) and supports a data transfer rate of 10 Mbps on multiple cables. The Ethernet specification is the basis for the IEEE 802.3 standard.

G

Generic Routing Encapsulation (GRE)	Generic Routing Encapsulation is an internet based term applied to the encapsulation of IP datagrams tunneled through the internet. Generic Routing Encapsulation (GRE) is a mechanism for encapsulating any network layer protocol over any other network. GRE serves as a Layer 3 tunneling protocol, and provides a tunnel for transparently transmitting data packets.

H

hot swap	In a running system, insertion or removal of a component does not affect normal running of the system.

K

KVM keyboard, video, and mouse

M

mezzanine card A card connected to the mainboard through the connector, level to the mainboard. It is used on a device which has high requirement for space usage.

P

panel The front-most or rear most element of a server, which serves to mount components, such as handles, indicators, and ports, and also seals the front of the chassis for airflow and electromagnetic compatibility (EMC).

PCIe A computer expansion bus standard based on the existing PCI programming and communication standards and a faster serial communication system. Intel is a major contributor to this standard. PCIe is used only for interconnection between applications. A PCI system can be turned into a PCIe one by modifying the physical layer instead of software. PCIe delivers a faster speed and can replace almost all existing bus standards including AGP and PCI.

R

RAID redundant array of independent disks

A storage technology that combines multiple drives into a logical unit in several ways called "RAID levels", providing redundancy and delivering higher storage performance than a single disk.

redundancy The ability of a system to keep functioning normally in the event of a device failure by having a backup device automatically replace the faulty one.

S

system event log (SEL) A non-volatile storage area and associated interfaces for storing system platform events for later retrieval.

server A special computer that provides various services for clients over a network.

U

U A unit defined in International Electrotechnical Commission (IEC) 60297-1 to measure the height of a cabinet, chassis, or subrack. 1 U = 44.45 mm = 1.75 in.

A.4 Acronyms and Abbreviations

A	
AC	alternating current
B	
BIOS	Basic Input/Output System
BMC	Baseboard Management Controller
C	
CLI	command-line interface
D	
DC	direct current
DDR4	Double Date Rate 4
DIMM	dual in-line memory module
E	
ECC	Error Checking and Correcting
F	
FC	Fibre Channel
FCC	Federal Communications Commission
G	
GE	Gigabit Ethernet
H	
HDD	hard disk drive
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol Secure
I	
iBMC	Intelligent Baseboard Management Controller
IEC	International Electrotechnical Commission
IP	Internet Protocol
IPMB	Intelligent Platform Management Bus

IPMI	Intelligent Platform Management Interface
K	
KVM	keyboard, video, and mouse
L	
LED	light emitting diode
LOM	LAN on motherboard
M	
MAC	Media Access Control
N	
NC-SI	Network Controller Sideband Interface
P	
PCIe	Peripheral Component Interconnect Express
PXE	Preboot Execution Environment
R	
RAID	redundant array of independent disks
RAS	Reliability, Availability and Serviceability
RDIMM	registered dual in-line memory module
RJ45	Registered Jack 45
RoHS	Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment
S	
SAS	Serial Attached Small Computer System Interface
SATA	Serial Advanced Technology Attachment
SNMP	Simple Network Management Protocol
SOL	Serial Over LAN
SSD	solid-state drive
T	
TDP	Thermal Design Power
U	

UEFI	Unified Extensible Firmware Interface
UID	unit identification light
USB	universal serial bus
V	
VGA	Video Graphics Array
VLAN	virtual local area network