

TaiShan 200 Server

# White Paper (Model 1280)

Issue 04  
Date 2020-06-16



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# About This Document

## Overview

This document describes the TaiShan 200 server 1280 high-density model (1280) in terms of its structure, components, specifications, and compatibility.






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

## Change History

Issue	Release Date	Description
04	2020-06-16	This issue is the fourth official release. Modified <a href="#">7 Certifications</a> .
03	2020-06-05	This issue is the third official release. <ul style="list-style-type: none"><li>• Added the label "Powered by Kunpeng" to all images related to the front panel.</li><li>• Modified <a href="#">7 Certifications</a>.</li></ul>
02	2020-05-14	This issue is the second official release. <ul style="list-style-type: none"><li>• Added the CPU that the USB port is subject to and modified the description of the seventh field in the SN description table in <a href="#">2.1 Front Panel</a>.</li><li>• Deleted the Maximum TDP in <a href="#">3.1 Technical Specifications</a>.</li></ul>
01	2019-11-30	This issue is the first official release.

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# 1 Overview

The TaiShan 200 servers powered by Huawei Kunpeng 920 processors are optimal for data centers. The 1280 high-density model is a 1U 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 1280.

**Figure 1-1** Appearance



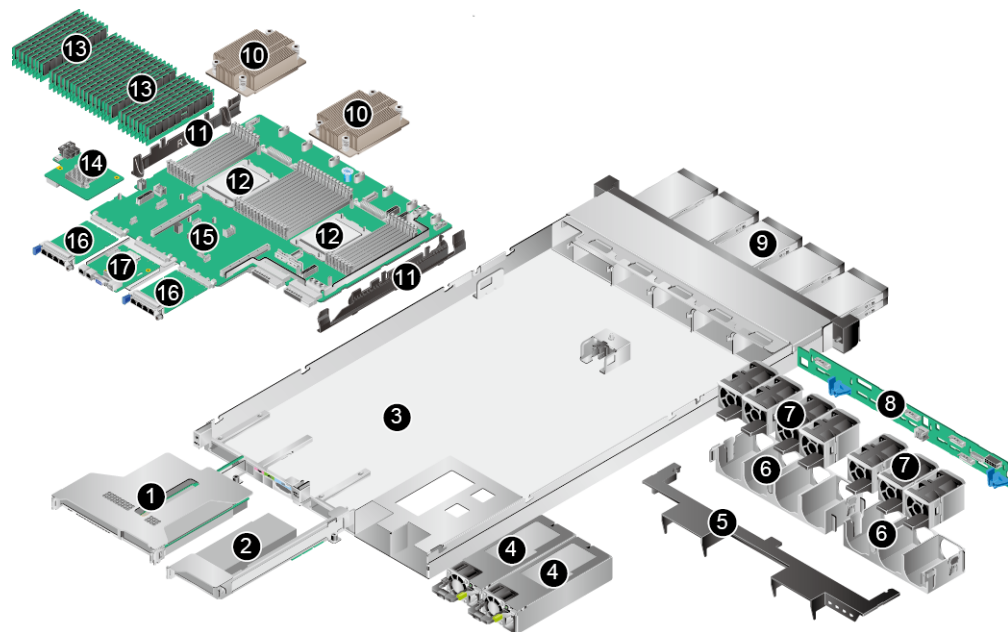
[1.1 Physical Structure](#)

[1.2 Logical Structure](#)

## 1.1 Physical Structure

[Figure 1-2](#) shows the components of a 1280 server.

Figure 1-2 Components



1	I/O module 1 (CPU 1)	2	I/O module 2 (CPU 2)
3	Chassis	4	Power supply units (PSUs)
5	Air duct	6	Fan module brackets
7	Fan modules	8	Front-drive backplane
9	Front drives	10	Heat sinks
11	Cable organizers	12	CPUs
13	DIMMs	14	RAID controller card (CPU 1)
15	Mainboard	16	FlexIO card (CPU 1 and CPU 2 from left to right)
17	iBMC card (CPU 1)	-	-



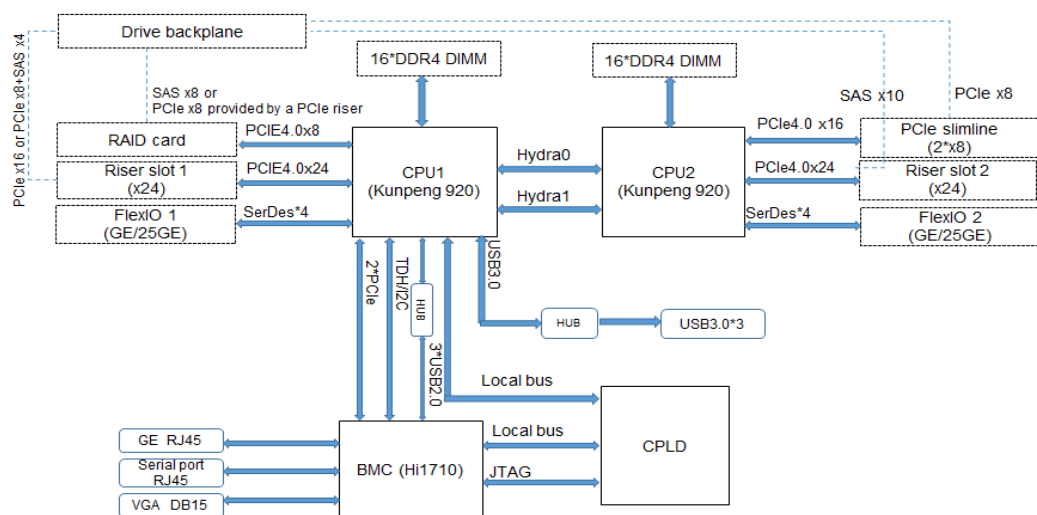
**NOTE**

- A riser module can be configured for I/O module 1 or 2. The preceding figure is for reference only.
- The CPUs are integrated on the mainboard and cannot be replaced independently.
- If the 1280 is configured with 64-core processors, VC heat sinks (Part No.: 21163234) and 4056 Plus fan modules (Part No.: 02312UKJ) are required.
- If the 1280 is configured with 48-core processors, common heat sinks (Part No.: 1162748-001) and 4056 fan modules (Part No.: 02312UKK) are required.
- Heat sinks and fans with different part numbers have similar appearances. This figure is for reference only. The actual configuration prevails.

## 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 16 DDR4 DIMMs.
- The two CPUs are interconnected through two Hydra buses, which provide a maximum transmission rate of 30 Gbit/s.
- The server supports two types of Ethernet FlexIO cards, which provide four GE ports and four 25GE ports. The CPUs connect to the FlexIO cards through the high-speed SerDes interface of the CPUs.
- The RAID controller card connects to CPU 1 through PCIe buses, and 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 Hi1710 management chip and provides a video graphics array (VGA) port, management network port, and debugging serial port.

# 2 Hardware

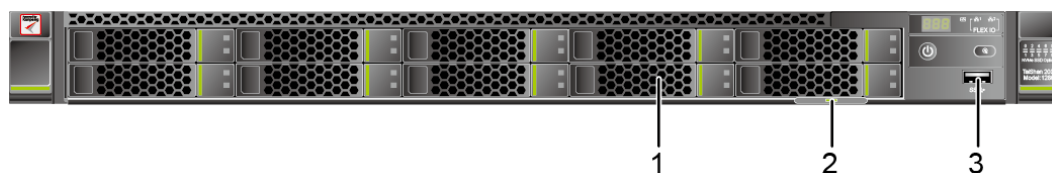
- [2.1 Front Panel](#)
- [2.2 Indicators and Buttons on the Front Panel](#)
- [2.3 Rear Panel](#)
- [2.4 Indicators on the Rear Panel](#)
- [2.5 FlexIO Cards](#)
- [2.6 Drives and Indicators](#)
- [2.7 Riser Cards and PCIe Slots](#)
- [2.8 Fan Modules](#)

## 2.1 Front Panel

### Front Panel

**Figure 2-1** shows the front panel of the 1280 server.

**Figure 2-1** Front panel



1	Drive	2	Slide-out label plate (with an SN label)
3	USB 3.0 port (CPU 1)	-	-

**Table 2-1** Ports on the front panel

Port	Type	Description
USB port	USB 3.0	Used to connect to a USB device. <b>NOTE</b> 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.

## 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 <b>21</b> .
2	Material identification code (8 characters), that is, the processing code.
3	Vendor code (two characters). The value <b>10</b> indicates Huawei.
4	Year and month (two characters). <ul style="list-style-type: none"> <li>The first character indicates the year: <ul style="list-style-type: none"> <li>Digits 1 to 9 indicate years 2001 to 2009, respectively.</li> <li>Letters A to H indicate years 2010 to 2017, respectively.</li> <li>Letters J to N indicate years 2018 to 2022, respectively.</li> <li>Letters P to Y indicate years 2023 to 2032, respectively.</li> </ul> </li> <li><b>NOTE</b> The years from 2010 are represented by uppercase letters excluding I, O, and Z because the three letters are similar to digits 1, 0, and 2.</li> <li>The second character indicates the month: <ul style="list-style-type: none"> <li>Digits 1 to 9 indicate January to September, respectively.</li> <li>Letters A to C indicate October to December, respectively.</li> </ul> </li> </ul>
5	Sequence number (six characters).

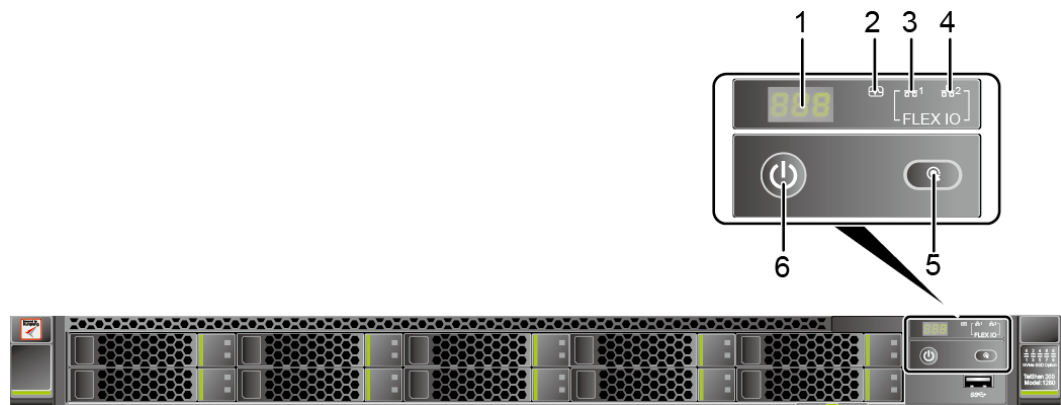
Callout	Description
6	RoHS compliance (one character). <b>Y</b> indicates RoHS compliant.
7	Internal model, that is, product name. The product name of 1280 is K12R-02-XXXXXX. The first four characters of XXXXXX indicate different configurations. <ul style="list-style-type: none"> <li>● <b>S64M</b> indicates the 6 x SAS RAID + 2 x SAS RAID/2 x NVMe + 2 x NVMe drive configuration.</li> <li>● <b>S64P</b> indicates the 6 x SAS pass-through + 4 x SAS pass-through/4 x NVMe drive configuration.</li> <li>● <b>S46M</b> indicates the 6 x NVMe+2 x NVMe/2 x SAS RAID+2 x SAS RAID configuration.</li> <li>● <b>S46P</b> indicates the 6 x NVMe + 2 x NVMe/2 x SAS pass-through + 2 x SAS pass-through configuration.</li> </ul>

## 2.2 Indicators and Buttons on the Front Panel

### Front Panel



Figure 2-3 shows the indicators and buttons on the front panel of the 1280 server.




Figure 2-3 Indicators and buttons on the front panel



1	Fault diagnosis LED	2	Health status indicator
3	FlexIO 1 indicator	4	FlexIO 2 indicator
5	UID button/indicator	6	Power button/indicator

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

Silkscreen	Indicator and Button	Description
	Fault diagnosis LED	<ul style="list-style-type: none"> <li>• ---: The server is operating properly.</li> <li>• Error code: A server component is faulty.</li> </ul> For details about error codes, see the <a href="#">TaiShan Rack Server iBMC Alarm Handling</a> .
	Power button/ indicator	Power indicator: <ul style="list-style-type: none"> <li>• Steady yellow: The server is in standby state (ready to be powered on).</li> <li>• Steady green: The server is properly powered on.</li> <li>• Blinking yellow: The iBMC is starting.</li> <li>• Off: The server is not powered on.</li> </ul> Power button: <ul style="list-style-type: none"> <li>• When the server is powered on, you can press this button to shut down the operating system gracefully.</li> <li>• When the server is powered on, holding down this button for 6 seconds will power off the server forcibly.</li> <li>• When the server is in standby state (power indicator is steady yellow), you can press this button to power on the server.</li> </ul>

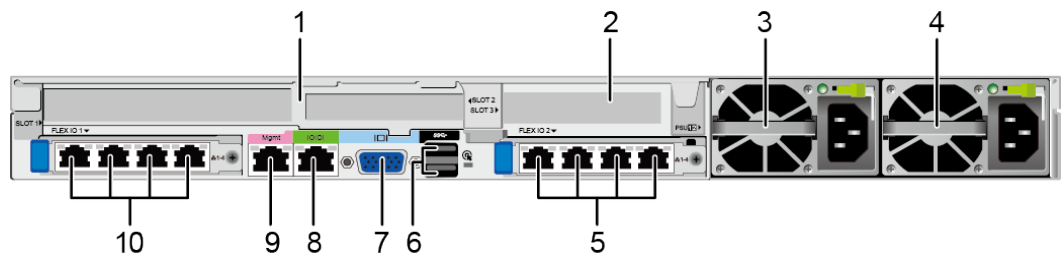
Silkscreen	Indicator and Button	Description
	UID button/ indicator	<p>The UID indicator helps identify and locate a server.</p> <p>UID indicator:</p> <ul style="list-style-type: none"> <li>• Off: The server is not being located.</li> <li>• Blinking blue (for 255 seconds): distinguishes the server from multiple servers that have also been located.</li> <li>• Steady blue: The server is being located.</li> </ul> <p>UID button:</p> <ul style="list-style-type: none"> <li>• You can set the UID indicator state by pressing the UID button on the panel or by using the iBMC CLI or WebUI.</li> <li>• You can press this button to turn on or off the UID indicator.</li> <li>• Pressing and holding down this button for 5 seconds will reset the iBMC.</li> </ul>
	Health status indicator	<ul style="list-style-type: none"> <li>• Steady green: The server is operating properly.</li> <li>• Blinking red at 1 Hz: A major alarm has been generated on the server.</li> <li>• Blinking red at 5 Hz: A critical alarm has been generated on the server.</li> </ul>
	FlexIO card indicators (1 and 2)	<ul style="list-style-type: none"> <li>• 1 indicates FlexIO card 1, and 2 indicates FlexIO card 2.</li> <li>• Steady green: The FlexIO card is installed and can be identified.</li> <li>• Off: The FlexIO card is not installed or faulty.</li> </ul>

## 2.3 Rear Panel

### Rear Panel

[Figure 2-4](#) shows the rear panel of the 1280 server.

Figure 2-4 Rear panel



1	I/O module 1 (CPU 1)	2	I/O module 2 (CPU 2)
3	PSU 1	4	PSU 2
5	FlexIO card 2 (CPU 2)	6	USB 3.0 port (CPU 1)
7	VGA port (BMC)	8	Debug serial port (supporting CPU1 and BMC switchover)
9	Management network port (BMC)	10	FlexIO card 1 (CPU 1)

**NOTE**

- A riser module can be configured for I/O module 1 or 2. The preceding figure is for reference only.
- A TM210 network interface card (NIC) can be configured for FlexIO card 1 or 2. Another TM280 NIC can be configured based on service requirements. The actual configuration may be different from that shown in the preceding figure.
- FlexIO cards 1 and 2 are not hot-swappable. Before replacing it, power off the server.

Table 2-4 Description of ports on the rear panel

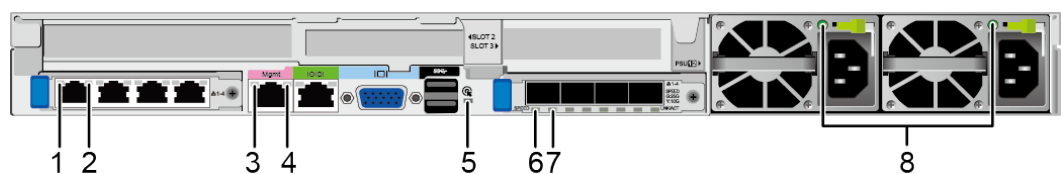
Port	Type	Quantity	Description
VGA port	DB15	1	Used to connect to a monitor or a keyboard, video, and mouse (KVM).
USB port	USB 3.0	2	Used to connect to a USB device. <b>NOTE</b> Before connecting a USB device, check that the USB device operates properly. The server may fail if it is connected to an abnormal USB device.
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.

Port	Type	Quantity	Description
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 or 8	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.
25GE optical port	SFP28	4	A FlexIO provides a maximum of four 25GE optical ports. <b>NOTE</b> The 25GE optical ports support autonegotiation to 10GE, if optical modules of 25GE and 10GE are used.
PSU socket	-	1/2	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, <b>Work Mode</b> cannot be set to <b>Active/Standby</b> on the iBMC WebUI, you can choose <b>System &gt; Power &gt; Power Supply Info &gt; Power Supply Settings</b> to change.

## 2.4 Indicators on the Rear Panel

Figure 2-5 shows the indicators on the rear panel of the 1280 server.

Figure 2-5 Indicators on the rear panel



1	Data transmission status indicator for a GE electrical port	2	Connection status indicator for a GE electrical port
3	Data transmission status indicator for the management network port	4	Connection status indicator for the management network port



5	UID indicator	6	Data transmission rate indicator for an optical port
7	Link status indicator/Data transmission status indicator for an optical port	8	PSU indicator

**Table 2-5** Description of indicators on the rear panel

Indicator		Description
GE electrical port/Management network port	Data transmission status indicator	<ul style="list-style-type: none"> <li>• Blinking yellow: Data is being transmitted.</li> <li>• Off: No data is being transmitted.</li> </ul>
	Connection status indicator	<ul style="list-style-type: none"> <li>• Steady green: The network connection is normal.</li> <li>• Off: The network is disconnected.</li> </ul>
UID indicator		<p>The UID indicator helps identify and locate a server.</p> <ul style="list-style-type: none"> <li>• Off: The server is not being located.</li> <li>• Blinking blue (for 255 seconds): distinguishes the server from multiple servers that have also been located.</li> <li>• Steady blue: The server is being located.</li> </ul> <p><b>NOTE</b> You can set the UID indicator state by pressing the UID button on the panel or by using the iBMC CLI.</p>
25GE optical port	Transmission rate indicator	<ul style="list-style-type: none"> <li>• Steady green: The data transmission rate is 25 Gbit/s.</li> <li>• Steady yellow: The data transmission rate is 10 Gbit/s.</li> <li>• Off: The network is disconnected.</li> </ul>
	Connection status indicator/Data transmission status indicator	<ul style="list-style-type: none"> <li>• Steady green: The network connection is normal.</li> <li>• Blinking green: Data is being transmitted.</li> <li>• Off: The network is disconnected.</li> </ul>

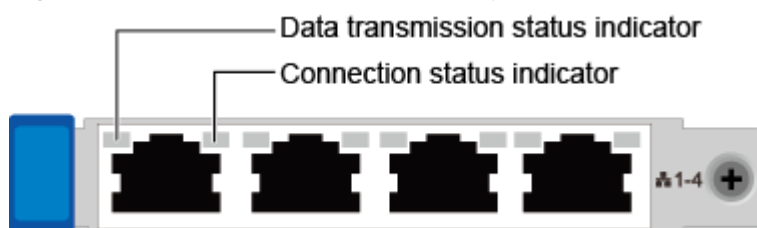
Indicator	Description
PSU indicator	<ul style="list-style-type: none"> <li>● Steady green: The power input and output are normal.</li> <li>● Steady orange: The input is normal, but no power output is supplied due to overheat protection, overcurrent protection, short circuit protection, output overvoltage protection, or some component failures.</li> <li>● Blinking green at 1 Hz: <ul style="list-style-type: none"> <li>– The input is normal, and the server is in standby state.</li> <li>– The input is overvoltage or undervoltage. For details, see the <a href="#">TaiShan Rack Server iBMC Alarm Handling</a>.</li> </ul> </li> <li>● Blinking green at 4 Hz: Online firmware upgrade is being performed.</li> <li>● Off: There is no power supply.</li> </ul>

## 2.5 FlexIO Cards

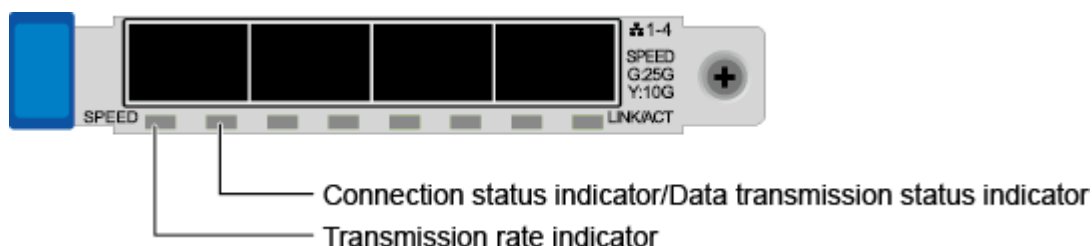
Use the [Intelligent Computing Compatibility Checker](#) to obtain information about the FlexIO cards supported by the server.

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

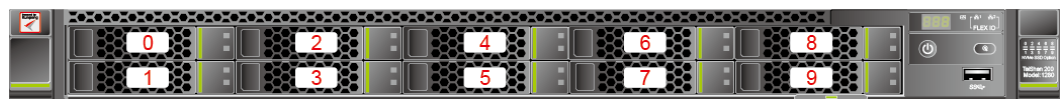
NIC Type	Indicator	Description
FlexIO card (four GE electrical ports)	Data transmission status indicator	Blinking yellow: Data is being transmitted. Off: No data is being transmitted.
	Connection status indicator	Steady green: The network connection is normal. Off: The network is disconnected.
FlexIO 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 drive slots of the 1280 server are numbered from 0 to 9, as shown in [Figure 2-8](#).

**Figure 2-8** Drive slots



The 1280 supports SAS/SATA solid-state drives (SSDs) and hard disk drives (HDDs) and NVMe SSDs. [Table 2-7](#) lists the drive configurations.

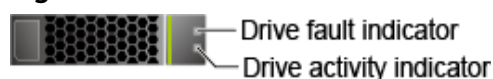
**Table 2-7** Drive configurations

Configuration	Maximum Front Drives	Drive Management Mode
6 x SAS RAID + 2 x SAS RAID/2 x NVMe + 2 x NVMe	10 <ul style="list-style-type: none"> <li>• Slots 0 to 5 support only SAS and SATA drives.</li> <li>• Slots 6 to 7 support SAS, SATA, and NVMe drives.</li> <li>• Slots 8 to 9 support only NVMe drives.</li> </ul>	1 RAID controller card
6 x SAS pass-through + 4 x SAS pass-through/4 x NVMe	10 <ul style="list-style-type: none"> <li>• Slots 0 to 5 support only SAS and SATA drives.</li> <li>• Slots 6 to 9 support SAS, SATA, and NVMe drives.</li> </ul>	CPU over SAS
6 x NVMe + 2 x NVMe/2 x SAS RAID + 2 x SAS RAID	10 <ul style="list-style-type: none"> <li>• Slots 0 to 1 support only SAS and SATA drives.</li> <li>• Slots 2 to 3 support SAS, SATA, and NVMe drives.</li> <li>• Slots 4 to 9 support only NVMe drives.</li> </ul>	1 RAID controller card
6 x NVMe + 2 x NVMe/2 x SAS pass-through + 2 x SAS pass-through	10 <ul style="list-style-type: none"> <li>• Slots 0 to 1 support only SAS and SATA drives.</li> <li>• Slots 2 to 3 support SAS, SATA, and NVMe drives.</li> <li>• Slots 4 to 9 support only NVMe drives.</li> </ul>	CPU over SAS

## 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



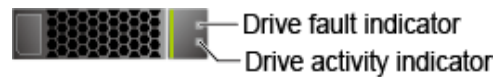
**Table 2-8** Description of SAS or SATA drive indicators

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.
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

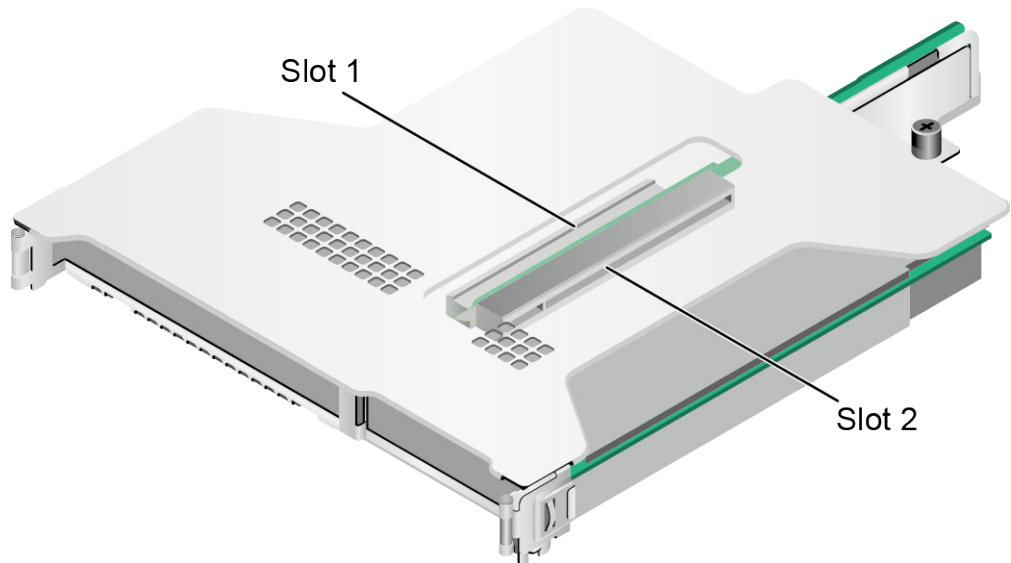
Drive Activity Indicator (Green)	Drive Fault Indicator (Yellow)	Description
Off	Off	The NVMe drive cannot be detected or the PCIe link is down.
Steady green	Off	The NVMe drive is operating properly.
Blinking green at 2 Hz	Off	Data is being read from or written to the NVMe drive.
Off	Blinking yellow at 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**, **Figure 2-12**, **Figure 2-13**, and **Figure 2-14** show the riser cards supported by I/O modules 1 and 2.

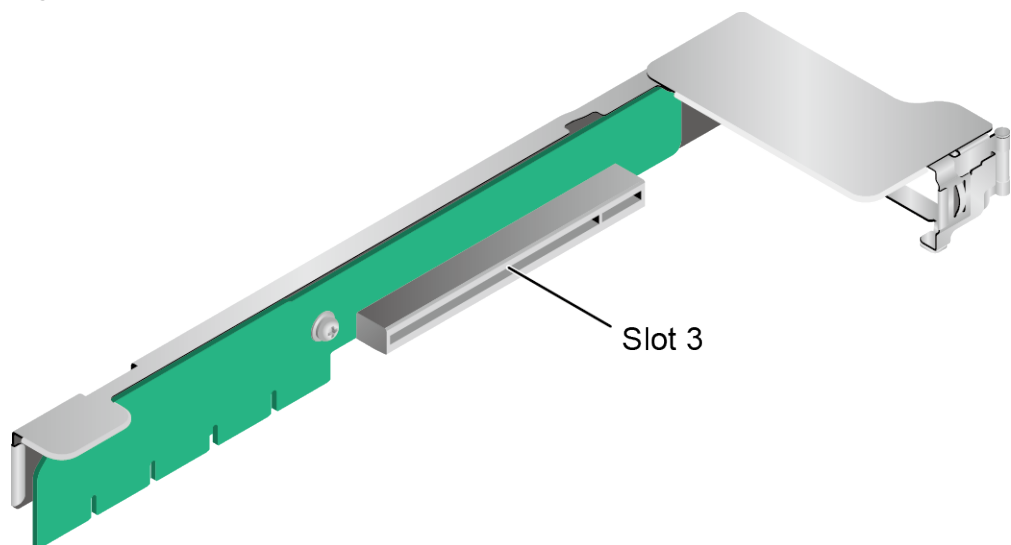
- The riser card shown in **Figure 2-11** can be installed in I/O module 1. It can house a full-height half-length (FHHL) x16 PCIe standard card in slot 1 and a half-height half-length (HHHL) x8 PCIe standard card in slot 2.

**Figure 2-11** Riser card 1 (slot 1 x16 + slot 2 x8)



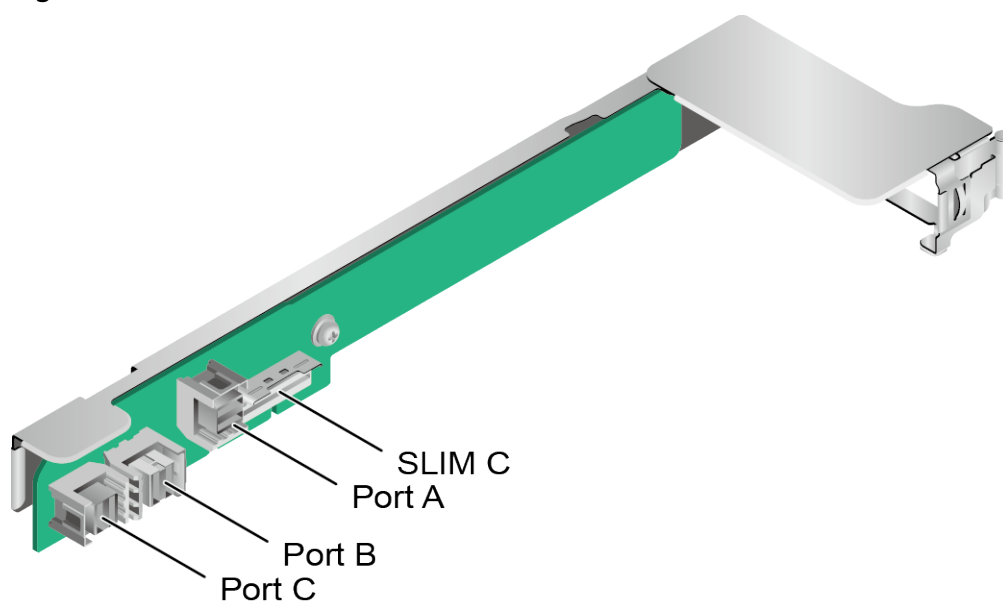
- The riser card shown in **Figure 2-12** can be installed in I/O module 2. It can house one HHHL x16 PCIe standard card in slot 3.

**Figure 2-12** Riser card 2 (slot 3 x16)



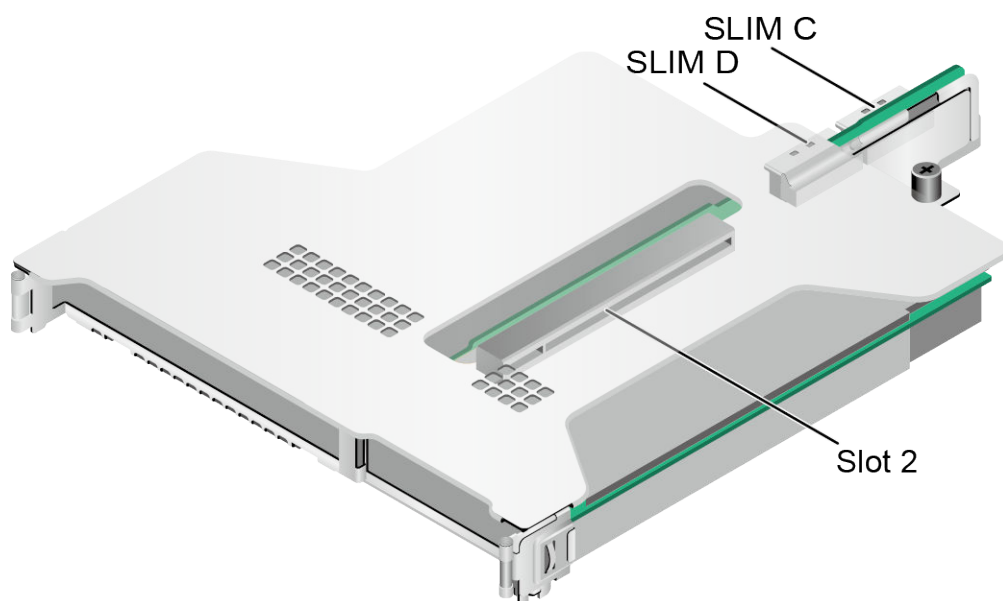
- The riser card shown in **Figure 2-13** can be installed in I/O module 2. The riser card has no PCIe slots. Ports A, B, and C are mini-SAS connectors, and SLIM C is a slimline cable connector.

Figure 2-13 Riser card 3



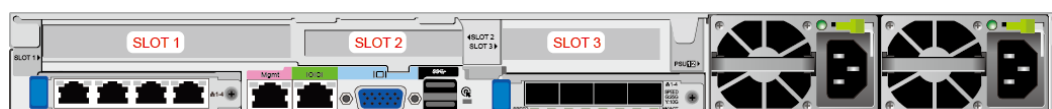
- The riser card shown in [Figure 2-14](#) can be installed in I/O module 1. It can house one HHL x8 PCIe card in slot 2. SLIM C and SLIM D are slimline cable connectors.

Figure 2-14 Riser card 4 (slot 2 x8)



[Figure 2-15](#) shows the PCIe slots on the rear panel of the server.

Figure 2-15 PCIe slots



I/O module 1 provides slots 1 and 2. I/O module 2 provides slot 3.

**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	<ul style="list-style-type: none"> <li>• 6 x SAS RAID + 2 x SAS RAID/2 x NVMe + 2 x NVMe drive configuration: x16/x16</li> <li>• 6 x SAS pass-through + 4 x SAS pass-through/4 x NVMe drive configuration: x16/x16</li> <li>• 6 x NVMe + 2 x NVMe/2 x SAS RAID + 2 x SAS RAID configuration: NA/NA</li> <li>• 6 x NVMe + 2 x NVMe/2 x SAS pass-through + 2 x SAS pass-through: NA/NA</li> </ul>	Port 0	00/00/0	-	FHHL
Slot 2	CPU 1	PCIe 4.0	x16/x8	Port 12	00/0C/0	-	HHHL



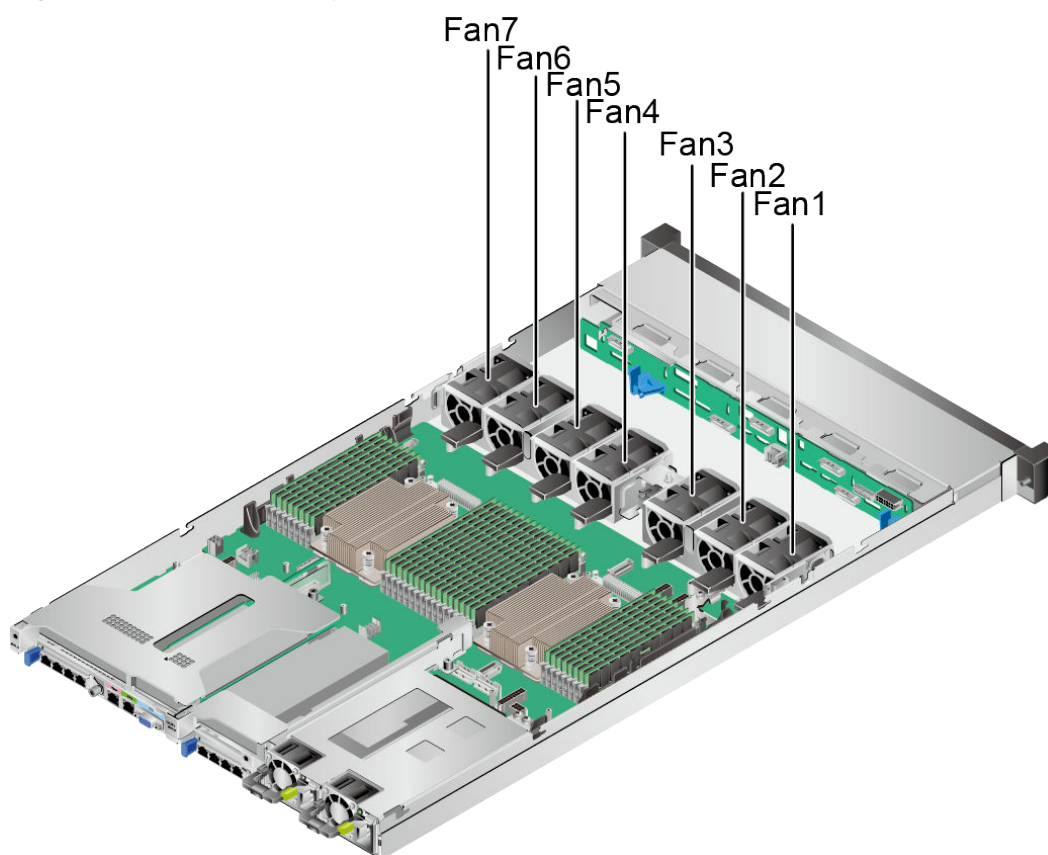
PCIe Slot	CPU Connected	PCIe Standards	Connector Width/Bus Width	Port No. on the BIOS	Root Port (B/D/F)	Device (B/D/F)	Slot Size
Slot 3	CPU 2	PCIe 4.0	<ul style="list-style-type: none"> <li>6 x SAS RAID + 2 x SAS RAID/2 x NVMe + 2 x NVMe drive configuration: x16/x16</li> <li>6 x SAS pass-through + 4 x SAS pass-through/4 x NVMe drive configuration: NA/NA</li> <li>6 x NVMe + 2 x NVMe/2 x SAS RAID + 2 x SAS RAID configuration: x16/x16</li> <li>6 x NVMe + 2 x NVMe/2 x SAS pass-through + 2 x SAS pass-through: x16/x16</li> </ul>	Port 20	00/14/0	-	HHHL
RAID controller card	CPU 1	PCIe 4.0	x8/x8	Port 8	00/08/0	-	-
<p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>The FHHL PCIe slots are backwards compatible with HHHL PCIe cards.</li> <li>The PCIe x16 slots are backwards compatible with PCIe x8, x4, and x1 cards. The PCIe x8 slots are backwards compatible with PCIe x4 and x1 cards.</li> <li>All slots support PCIe cards of up to 75 W. The power of a PCIe card varies depending on its model. Use the <a href="#">Intelligent Computing Compatibility Checker</a> 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.</li> <li>B/D/F indicates Bus/Device/Function Number.</li> <li>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.</li> <li>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.</li> </ul>							

## 2.8 Fan Modules

The 1280 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.

The model of the fan module is 4056. **Figure 2-16** shows the position of the fan modules.

**Figure 2-16** Fan module positions



### NOTE

Fan modules of the same part No. must be used in the same server.

- If the 1280 is configured with 64-core processors, 4056 Plus fan modules (Part No.: 02312UKJ) are required.
- If the 1280 is configured with 48-core processors, 4056 fan modules (Part No.: 02312UKK) are required.

# 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](#)

[3.2 Environmental Specifications](#)

[3.3 Physical Specifications](#)

[3.4 Power Supply Specifications](#)

## 3.1 Technical Specifications

**Table 3-1** Technical specifications

Component	Specifications
Form factor	1U rack server
Processors	<ul style="list-style-type: none"> <li>• Two Kunpeng 920 (64-core or 48-core) processors of 2.6 GHz                             <ul style="list-style-type: none"> <li>- If the 1280 is configured with 64-core processors, VC heat sinks (Part No.: 21163234) and 4056 Plus fan modules (Part No.: 02312UKJ) are required.</li> <li>- If the 1280 is configured with 48-core processors, common heat sinks (Part No.: 1162748-001) and 4056 fan modules (Part No.: 02312UJK) are required.</li> </ul> </li> <li>• Two Hydra buses between CPUs, each of which provides a maximum speed of 30 Gbit/s</li> <li>• An L3 cache of 45.5 MB to 46 MB</li> </ul> <p><b>NOTE</b> Use the <a href="#">Intelligent Computing Compatibility Checker</a> to obtain specific information.</p>

Component	Specifications
Memory	<ul style="list-style-type: none"> <li>• Up to 32 DDR4 RDIMMs</li> <li>• Maximum memory speed up to 2933 MHz/s</li> <li>• Protected with ECC, SEC/DED, SDDC, and patrol scrubbing</li> <li>• Supports 16 GB, 32 GB, 64 GB, or 128 GB per DIMM</li> </ul> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Use the <a href="#">Intelligent Computing Compatibility Checker</a> to obtain specific information.</li> </ul>
Storage	<p>Drives:</p> <ul style="list-style-type: none"> <li>• The server supports a variety of drive configurations. For details, see <a href="#">2.6.1 Drive Numbering</a>.</li> <li>• The server supports hot-swap of a single drive.</li> </ul> <p>RAID controller cards:</p> <ul style="list-style-type: none"> <li>• Supports a variety of RAID controller cards. Use the <a href="#">Intelligent Computing Compatibility Checker</a> to obtain specific information.</li> <li>• 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 <a href="#">RAID Controller Card User Guide (Kunpeng Processors)</a>.</li> </ul>
FlexIO	<p>Up to two FlexIO cards. One FlexIO card provides either of the following:</p> <ul style="list-style-type: none"> <li>• Four GE electrical ports, supporting PXE</li> <li>• Four 25GE or 10GE optical ports, supporting PXE</li> </ul> <p><b>NOTE</b> Different optical modules can be used to implement autonegotiation between 25GE and 10GE. Use the <a href="#">Intelligent Computing Compatibility Checker</a> to obtain specific information.</p>
PCIe	<ul style="list-style-type: none"> <li>• Up to four PCIe 4.0 PCIe slots: one dedicated for the RAID controller card and three for PCIe cards. The specifications of the standard PCIe 4.0 slots are as follows: <ul style="list-style-type: none"> <li>- I/O module 1: one standard FHHL PCIe 4.0 x16 slot (width: PCIe 4.0 x16) and one standard HHHL PCIe 4.0 x8 slot (width: PCIe 4.0 x8)</li> <li>- I/O module 2: one standard HHHL PCIe 4.0 x8 slot (width: PCIe 4.0 x8)</li> </ul> </li> <li>• Supports Huawei PCIe SSD cards to improve I/O performance for search, cache, and download services.</li> </ul> <p><b>NOTE</b> Use the <a href="#">Intelligent Computing Compatibility Checker</a> to obtain specific information.</p>

Component	Specifications
Port	<ul style="list-style-type: none"> <li>• Front panel: one USB 3.0 port</li> <li>• Rear panel: two USB 3.0 ports, one DB15 VGA port, one RJ45 serial port, and one RJ45 management network port</li> </ul>
Fans	<p>Seven hot-swappable fan modules, allowing one-fan failures</p> <p><b>NOTE</b> Fan modules of the same part No. must be used in the same server.</p> <ul style="list-style-type: none"> <li>• If the 1280 is configured with 64-core processors, 4056 Plus fan modules (Part No.: 02312UKJ) are required.</li> <li>• If the 1280 is configured with 48-core processors, 4056 fan modules (Part No.: 02312UKK) are required.</li> </ul>
System management	<p>One 10/100/1000 Mbit/s RJ45 management network port.</p> <p>Huawei iBMC supports Intelligent Platform Management Interface (IPMI), Serial over LAN (SOL), KVM over IP, and virtual media.</p>
Security	<ul style="list-style-type: none"> <li>• Administrator password</li> <li>• Front bezel (optional)</li> </ul> <p><b>NOTE</b> The front bezel is installed on the front panel and comes with a lock to prevent unauthorized operations on drives.</p>
Video 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><b>NOTE</b> Only the maximum resolution supported by the built-in driver of the OS is supported.</p>

## 3.2 Environmental Specifications

**Table 3-2** Environmental specifications

Item	Specifications
Temperature	<ul style="list-style-type: none"> <li>• Operating temperature: 5°C to 35°C (41°F to 95°F) (ASHRAE Classes A2 and A3 compliant)</li> <li>• Storage temperature (<math>\leq 72</math> hours): -40°C to +65°C (-40°F to +149°F)</li> <li>• Long-term storage temperature (<math>&gt; 72</math> hours): 21°C to 27°C (69.8°F to 80.6°F)</li> <li>• Maximum temperature change rate: 20°C/h (36°F/h)</li> </ul> <p><b>NOTE</b> The highest operating temperature varies depending on the server configuration. For details, see <a href="#">Table 3-3</a>.</p>

Item	Specifications
Relative humidity (RH, non-condensing)	<ul style="list-style-type: none"> <li>• Operating humidity: 8% to 90%</li> <li>• Storage humidity (<math>\leq 72</math> hours): 5% to 95%</li> <li>• Long-term storage humidity (<math>&gt; 72</math> hours): 30% to 69%</li> <li>• Maximum humidity change rate: 20%/h</li> </ul>
Air volume	$\geq 80$ cubic feet per minute (CFM)
Maximum altitude	<p>3050 m (10006.56 ft)</p> <p><b>NOTE</b> According to the ASHRAE 2015 standard:</p> <ul style="list-style-type: none"> <li>• 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).</li> <li>• 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).</li> <li>• 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).</li> </ul>
Corrosive Airborne Contaminants	<p>Maximum corrosion product thickness growth rate:</p> <ul style="list-style-type: none"> <li>• Copper corrosion rate test: 300 Å/month (meeting level G1 requirements of the ANSI/ISA-71.04-2013 standard on gaseous corrosion)</li> <li>• Silver corrosion rate test: 200 Å/month</li> </ul>
Particle contaminant	<ul style="list-style-type: none"> <li>• The equipment room environment meets the requirements of ISO 14664-1 Class 8.</li> <li>• There is no explosive, conductive, magnetic, or corrosive dust in the equipment room.</li> </ul> <p><b>NOTE</b> It is recommended that the particulate pollutants in the equipment room be monitored by a professional organization.</p>

Item	Specifications
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"> <li>• Idle: <ul style="list-style-type: none"> <li>- LWAd: 6.08 Bels</li> <li>- LpAm: 45.2 dBA</li> </ul> </li> <li>• Operating: <ul style="list-style-type: none"> <li>- LWAd: 7.0 Bels</li> <li>- LpAm: 53 dBA</li> </ul> </li> </ul> <p><b>NOTE</b> The actual sound levels generated during server operating vary depending on the server configuration, load, and ambient temperature.</p>

**Table 3-3** Operating temperature limitations

Configuration	Max. 30°C (86°F)	Max. 35°C (95°F) (ASHRAE Class A2 Compliant)
<ul style="list-style-type: none"> <li>• 6 x SAS RAID + 2 x SAS RAID/2 x NVMe + 2 x NVMe</li> <li>• 6 x SAS pass-through + 4 x SAS pass-through/4 x NVMe</li> <li>• 6 x NVMe + 2 x NVMe/2 x SAS RAID + 2 x SAS RAID</li> <li>• 6 x NVMe + 2 x NVMe/2 x SAS pass-through + 2 x SAS pass-through</li> </ul>	All options supported	All options supported
<p><b>NOTE</b> When a single fan fails, the highest operating temperature is 5°C (41°F) lower than the rated value.</p>		

## 3.3 Physical Specifications

**Table 3-4** Physical specifications

Item	Specifications
Dimensions (H x W x D)	Server with 10 x 2.5-inch drives: 43 mm (1U) x 435.6 mm x 790 mm (1.69 in. x 17.15 in. x 31.10 in.)
Installation space	<p>The server fits into a standard cabinet complying with the IEC 297 standard:</p> <ul style="list-style-type: none"> <li>• Cabinet width: 19 inches</li> <li>• Cabinet depth ≥ 1000 mm (39.37 in.)</li> </ul> <p>Requirements for guide rail installation:</p> <ul style="list-style-type: none"> <li>• L-shaped guide rails: apply only to Huawei cabinets.</li> <li>• Static rail kit: applies to cabinets with a distance of 543.5 mm to 848.5 mm (21.40 in. to 33.41 in.) between the front and rear mounting bars.</li> </ul> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>• The static rail kit is required if the servers need to be stacked.</li> <li>• The L-shaped guide rails equipped with the cabinet or provided by Huawei do not support stack of servers.</li> </ul>
Weight in full configuration	<p>Server with 10 x 2.5-inch front drives: 19.2 kg (42.34 lb)</p> <p>Packing material weight: 4.5 kg (9.92 lb)</p>
Power consumption	<p>The power consumption parameters vary according to configurations (including the ErP standard configuration of the European Union). Use the <a href="#">Intelligent Computing Product Power Calculator</a> to obtain the specific power consumption value.</p>

## 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.

# 4 Software and Hardware Compatibility

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

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## 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.

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# 5 System Management

The 1280 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: <ul style="list-style-type: none"> <li>• IPMI 2.0</li> <li>• CLI</li> <li>• HTTPS</li> <li>• SNMP V3</li> </ul>
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

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

# 7 Certifications

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

No.	Country/ Region	Certification	Standards
3	Europe	CE	<p>Safety: EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013 EN 62368-1:2014+A11:2017</p> <p>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</p> <p>ERP: Commission Regulation (EU) 2019/424</p> <p>RoHS: EN 50581: 2012</p>
4	America	FCC	FCC CFR47 Part 15 Subpart B:2018
5	America	NRTL	<p>CAN/CSA C22.2 No. 62368-1:2014;UL 62368-1:Ed.2, 2014</p> <p>CAN/CSA-C22.2 No. 60950-1:2007(R2016);UL 60950-1:Ed.2, 2014</p>
6	Canada	IC	<p>ICES-003 Issue 6: 2016 (updated April 2019)</p> <p>ICES Gen Issue 1:2018</p> <p>ANSI C63.4:2014+A1:2017</p>
7	Australia	RCM	<p>EN 55032:2012/AC:2013</p> <p>EN 55032:2015/AC:2016</p> <p>AS/NZS CISPR 32:2015</p>
8	Japan	VCCI	VCCI 32-1

No.	Country/ Region	Certification	Standards
9	-	Multi-country commodity inspection	See the product certification.
10	-	International CB	IEC 62368-1:2014 IEC 60950-1:2005+A1:2009+A2:2013
11	Europe	REACH	Regulation (EC) No 1907/2006 (EU REACH)
12	Europe	WEEE	2012/19/EU



# A Appendix

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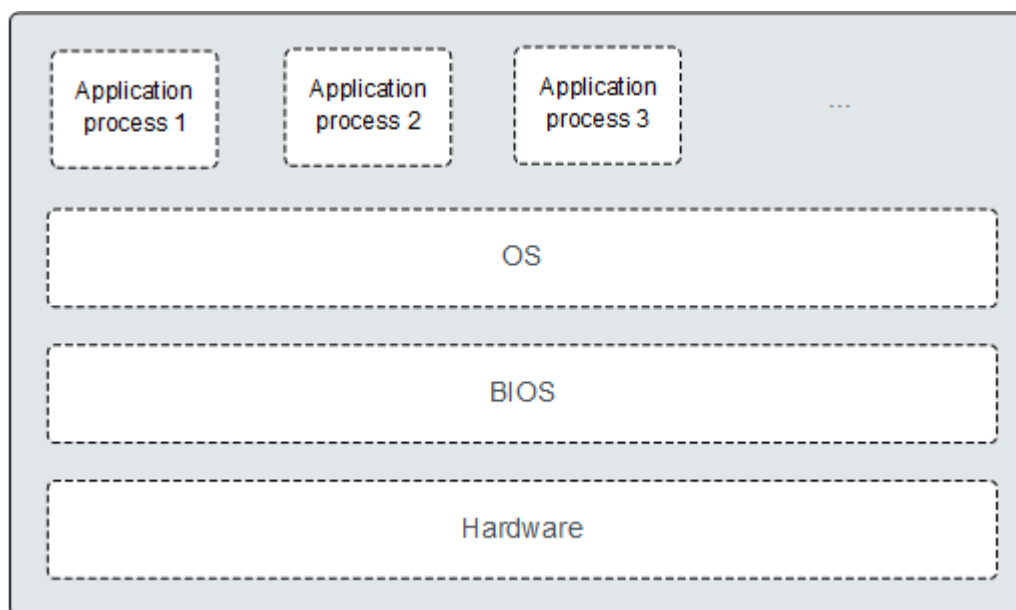
## A.1 BIOS

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

<b>KVM</b>	keyboard, video, and mouse
<b>M</b>	
<b>mezzanine card</b>	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.
<b>P</b>	
<b>panel</b>	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).
<b>PCIe</b>	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.
<b>R</b>	
<b>RAID</b>	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.
<b>redundancy</b>	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.
<b>S</b>	
<b>system event log (SEL)</b>	A non-volatile storage area and associated interfaces for storing system platform events for later retrieval.
<b>server</b>	A special computer that provides various services for clients over a network.
<b>U</b>	
<b>U</b>	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 Data 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

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

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