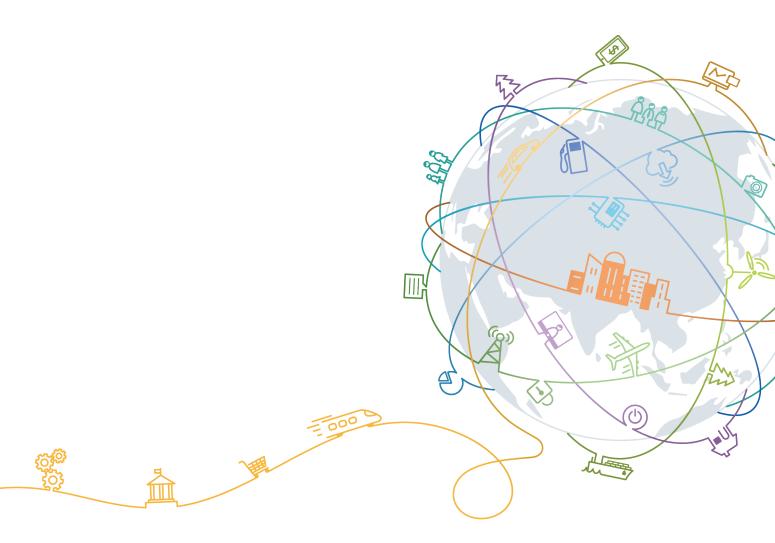
Huawei FusionServer 2288H V5

White Paper

lssue 06 Date 2018-05-14





Copyright © Huawei Technologies Co., Ltd. 2018. All rights reserved.

No part of this document may be reproduced or transmitted in any form or by any means without prior written consent of Huawei Technologies Co., Ltd.

Trademarks and Permissions

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: <u>http://e.huawei.com</u>

About This Document

Purpose

This document describes the 2288H V5 in terms of its appearance, performance parameters, and component compatibility to help users have a profound understanding of the 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
A DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	Indicates a potentially hazardous situation which, if not avoided, may 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.
	NOTICE is used to address practices not related to personal injury.

Symbol	Description
D NOTE	Calls attention to important information, best practices, and tips. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

Change History

Changes between document issues are cumulative. The latest document issue contains all the changes made in earlier issues.

Issue 06 (2018-05-14)

This issue is the sixth official release.

Mode	Change Description
Modified	Modified video card description. For details, see Table 5-1.

Issue 05 (2018-04-18)

This issue is the fifth official release.

Mode	Change Description						
New	 Added TPM specifications. For details, see 5.1 Technical Specifications. 						
	• Added internal disk specifications. For details, see 6.3 Storage .						
Modified	Modified operating temperature specifications.						

Issue 04 (2018-02-07)

This issue is the fourth official release.

Mode	Change Description
New	Added NVMe configurations.

Issue 03 (2017-11-30)

This issue is the third official release.

Mode	Change Description
New	Added the GPU card and Broadcom SAS3508 RAID controller card specifications.

Issue 02 (2017-08-18)

This issue is the second official release.

Mode	Change Description
New	Added the support for DIMMs with a maximum speed of 2666 MT/s.

Issue 01 (2017-08-07)

This issue is the first official release.

Contents

About This Document	ii
1 Overview	1
2 Features	2
3 Logical Structure	5
4 Hardware Description	7
4.1 Appearance	
4.2 Ports	
4.3 Indicators and Buttons	14
4.4 Riser Cards and PCIe Slots	
4.5 Physical Structure.	
5 Product Specifications	
5.1 Technical Specifications	
5.2 Physical and Environmental Specifications	
6 Component Compatibility	
6.1 CPU	
6.2 Memory	
6.3 Storage	
6.4 I/O Expansion	
6.5 PSU	
6.6 OS and Software Support	
7 System Management	52
8 Warranty	54
9 Certifications	
10 References	

1 Overview

Huawei FusionServer 2288H V5 is a 2U 2-socket rack server for Internet, Internet data center (IDC), cloud computing, enterprise, and telecom service applications.

Marked H22H-05 on the nameplate, the 2288H V5 is ideal for IT core services, cloud computing virtualization, high-performance computing, distributed storage, big data processing, enterprise or telecom service applications, and other complex workloads. It combines low power consumption with high scalability and reliability, and ease of deployment and management.

Figure 1-1 shows the appearance of the 2288H V5 server with 12 hard disks.



Figure 1-1 Appearance

2 Features

Performance and Scalability

The following features improve the performance and scalability of the 2288H V5:

- Intel[®] Xeon[®] Scalable processors ensure high processing performance by providing up to 28 cores, 3.6 GHz frequency, 38.5 MB L3 cache, and two 10.4 GT/s Ultra Path Interconnect (UPI) links between processors.
 - Each 2288H V5 supports two processors with 56 cores and 112 threads, maximizing concurrent execution of multithreaded applications.
 - Intel[®] Xeon[®] Scalable processors support L2 cache. Each core exclusively uses 1 MB L2 cache and a maximum of 1.375 MB L3 cache.
 - Intel[®] Turbo Boost Technology 2.0 enables processor cores to run at maximum speeds during peak hours by temporarily going beyond the processor thermal design power (TDP).
 - Intel[®] Hyper-Threading Technology enables each processor core to run up to two threads, improving parallel computation capability.
 - Intel[®] Virtualization Technology integrates hardware-level virtualization functions to allow OS vendors to better use hardware to address virtualization workloads.
- Twenty-four DDR4 error checking and correcting (ECC) RDIMMs or load-reduced DIMMs (LRDIMMs) provide a maximum memory speed of 2666 MT/s and a maximum memory capacity of 1,536 GB, featuring high speed and availability. The maximum memory bandwidth is 249.9375 GB/s in theory.
- The 2288H V5 supports flexible hard disk configurations and provides elastic and scalable memory capacities to satisfy storage capacity and upgrade requirements.
- Intel[®] Advanced Vector Extensions 2.0 (AVX-512) improves floating-point computing performance for computing-intensive applications.
- The I/O performance of pure SSDs is higher than that of mixed configuration of SSDs and HDDs and 100 times that of pure HDDs.
- The 2288H V5 supports various LANs on motherboard (LOMs) and flexible NICs to provide rich network ports.
- The 2288H V5 supports up to eight Peripheral Component Interconnect Express (PCIe) 3.0 slots.

• The Intel[®] Xeon[®] Scalable processors incorporate the PCIe 3.0 controller using the Intel Integrated I/O. This significantly reduces I/O latency and enhances overall system performance.

Availability and Serviceability

The 2288H V5 provides the following features to improve availability and serviceability:

- The 2288H V5 uses carrier-class components and follows the engineering process, which dramatically improves system reliability.
- The 2288H V5 uses hot-swappable SAS/SATA hard disks or NVMe SSDs. It supports redundant array of independent disks (RAID) 0, 1, 1E, 10, 5, 50, 6, and 60 and offers RAID cache. A supercapacitor is used to protect RAID cache data from power failures.
- SSDs offer better reliability than HDDs, prolonging system uptime.
- The web user interface (WebUI) of the Intelligent Baseboard Management Controller (iBMC), UID and HLY LEDs, and fault diagnosis LED on the front panel help technical support personnel promptly obtain the status of key components and locate failed (or failing) components. This simplifies servicing, accelerates troubleshooting, and improves system availability.
- The iBMC monitors system parameters in real time, triggers alarms, and performs recovery actions in case of failures, minimizing system downtime.
- Huawei provides a three-year warranty for parts replacement and limited onsite repair for the servers used in China, with the 10-hour-a-day, 5-day-a-week next business day (NBD) support program. Optional service upgrades are available.
- Huawei provides a three-year warranty for parts replacement and repair for the servers used outside China, with the 9-hour-a-day, 5-day-a-week NBD support program. Huawei delivers the repaired or new parts within 45 calendar days after receiving the defective parts.

Manageability and Security

The 2288H V5 provides the following features to enhance manageability and security:

- The built-in iBMC module monitors server operating status and provides remote management.
- The Network Controller Sideband Interface (NC-SI) feature enables a network port to function as a management network port and a service port, which maximizes the return on investment (ROI) for customers. NC-SI is disabled by default. You can enable it on the iBMC WebUI or in the BIOS.
- The integrated industry-standard Unified Extensible Firmware Interface (UEFI) increases setup, configuration, and update efficiency, and simplifies fault handling.
- The front bezel in the server chassis is locked to ensure local data security and reliability.
- The Intel[®] Advanced Encryption Standard–New Instructions (AES NI) support faster and stronger encryption.
- The Intel[®] Execute Disable Bit (EDB) function prevents certain types of malicious buffer overflow attacks when working with a supported OS.
- The Intel[®] Trusted Execution technology provides enhanced security by using hardwarebased defense against malicious software attacks, allowing an application to run in an isolated space from all other applications running on the OS.

The service network port supporting NC-SI has the following features:

- The service network port can be bound to a network port (host network port 1 by default) on a flexible or standard NIC.
- The service network port allows you to enable, disable, and configure a VLAN ID. A VLAN ID is disabled by default, and the default VLAN ID is 0.
- The service network port supports IPv4 and IPv6 addresses. You can set an IP address, subnet mask, default gateway, and IPv6 address prefix length for the service network port.

Energy Efficiency

The 2288H V5 offers the following features to save energy:

- The 2288H V5 supports 80 Plus Platinum power supply units (PSUs). The PSUs provide 94% power efficiency at 50% loads.
- The 2288H V5 supports active-standby power supplies and high-voltage DC (HVDC), improving power supply efficiency.
- Efficient VRD PSUs reduce the loss in DC/DC power conversion.
- The 2288H V5 supports area-based and intelligent fan speed adjustment, Proportional-Integral-Derivative (PID) speed adjustment, and intelligent processor frequency adjustment, reducing power consumption.
- The improved thermal design with energy-efficient fans ensures optimal heat dissipation and reduces system power consumption.
- The 2288H V5 supports power capping and power control.
- Hard disks are not powered on simultaneously, which reduces the server startup power consumption.
- The Intel[®] Intelligent Power Capability allows a single processor to be powered on or off based on site requirements.
- Low-voltage Intel[®] Xeon[®] Scalable processors consume less energy and apply to data centers and telecommunication environments that have power and thermal limitations.
- SSDs consume 80% less power than HDDs.

Support for Customization

The 2288H V5 is a Huawei proprietary server. Huawei also provides customized development in a timely manner.

3 Logical Structure

Figure 3-1 shows the logical structure of the 2288H V5.

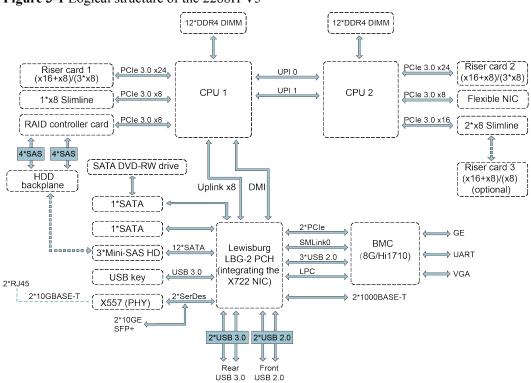


Figure 3-1 Logical structure of the 2288H V5

- The 2288H V5 supports two Intel[®] Xeon[®] Scalable CPUs and 24 DDR4 DIMMs. The CPUs interconnect with each other through two Ultra Path Interconnect (UPI) links at speeds of up to 10.4 GT/s.
- The CPUs connect to three PCIe riser cards through PCIe buses and the riser cards provide various PCIe slots.
- The RAID controller card on the mainboard connects to CPU 1 through PCIe buses, and to the hard disk backplanes through SAS signal cables. The hard disk backplanes support various local storage configurations.
- The LBG-2 bridge chip provides two GE electrical LOM ports, and two 10GE optical LOM ports or two 10GE electrical LOM ports (through the X557 PHY).

• The Huawei Hi1710 management chip provides a VGA port, management network port, and debugging serial port.

4 Hardware Description

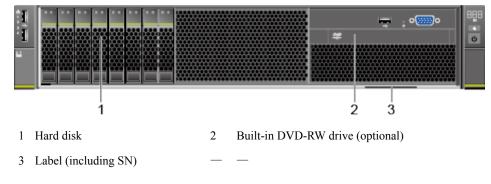
- 4.1 Appearance
- 4.2 Ports
- 4.3 Indicators and Buttons
- 4.4 Riser Cards and PCIe Slots
- 4.5 Physical Structure

4.1 Appearance

Front Panel

• Figure 4-1 shows the front panel of a server with eight 2.5-inch hard disks.

Figure 4-1 Front panel of a server with eight 2.5-inch hard disks



• Figure 4-2 shows the front panel of a server with twelve 3.5-inch hard disks.

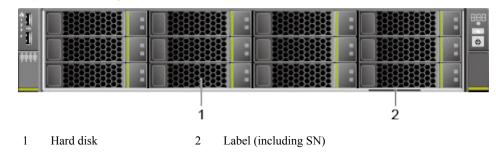
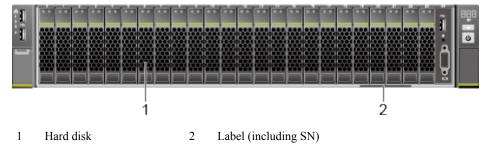


Figure 4-2 Front panel of a server with twelve 3.5-inch hard disks

• Figure 4-3 shows the front panel of a server with twenty-four 2.5-inch hard disks.

Figure 4-3 Front panel of a server with twenty-four 2.5-inch hard disks



• **Figure 4-4** shows the front panel of a server with twenty-five 2.5-inch hard disks.

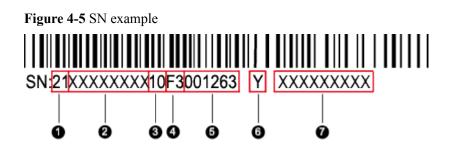
Figure 4-4 Front panel of a server with twenty-five 2.5-inch hard disks

11 11 11			1									2			0
1	Hard disk	2		2	La	abel (inclu	ıdin	g Sl	N)					

SN

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

Figure 4-5 shows the SN format.



N	Description
No.	Description
1	SN ID (two characters), which is permanently set to 21.
2	Material identification code (eight characters), that is, processing code.
3	Vendor code (two characters). 10 indicates Huawei and other values indicate outsourcing vendors.
4	Year and month (two characters).
	• The first character indicates the year. Digits 1 to 9 indicate 2001 to 2009, letters A to H indicate 2010 to 2017, letters J to N indicate 2018 to 2022, and letters P to Y indicate 2023 to 2032.
	NOTE The years from 2010 are represented by upper-case letters excluding I, O, and Z because the three letters are similar to digits 1, 0, and 2.
	• The second character indicates the month. Digits 1 to 9 indicate January to September, and letters A to C indicate October to December.
5	Serial number (six characters).
6	RoHS compliance (one character). Y indicates environmental protection processing.
7	Internal model, that is, product name.

Table 4-1 SN description

Rear Panel

Figure 4-6 shows the rear panel of a server.

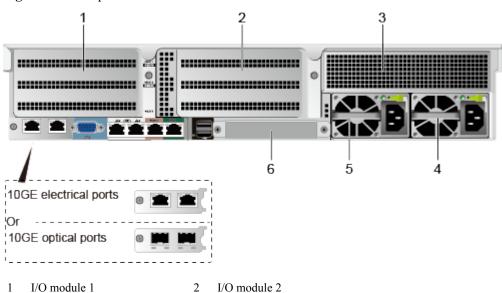


Figure 4-6 Rear panel

3	I/O module 3	4	Power supply unit (PSU) 2
5	PSU 1	6	Flexible NIC (optional)

ΠΝΟΤΕ

 $I\!/\!O$ modules 1, 2, and 3 can be hard disk modules or riser card modules. The preceding figure is for reference only.

4.2 Ports

Front Panel

• Figure 4-7 shows the ports on the front panel of a server with eight 2.5-inch hard disks.

Figure 4-7 Front panel of a server with eight 2.5-inch hard disks

1—[
1	USB 2.0 ports	2 USB	3.0 port	
3	VGA port			

• Figure 4-8 shows the ports on the front panel of a server with twelve 3.5-inch hard disks.

Figure 4-8 Front panel of a server with twelve 3.5-inch hard disks

1-1			868
++++			0

- 1 USB 2.0 ports
- Figure 4-9 shows the ports on the front panel of a server with twenty-four 2.5-inch hard disks.

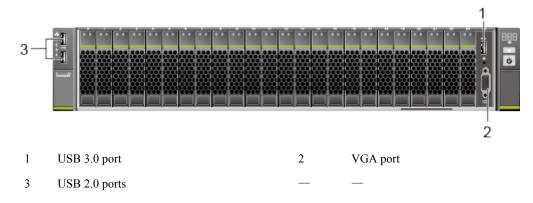


Figure 4-9 Front panel of a server with twenty-four 2.5-inch hard disks

• Figure 4-10 shows the ports on the front panel of a server with twenty-five 2.5-inch hard disks.

Figure 4-10 Front panel of a server with twenty-five 2.5-inch hard disks

1-[0
1	USB 2.0 ports	5						_		_	_	

 Table 4-2 describes the ports on the front panel.

Table 4-2 Description of ports on the front panel

Port	Туре	Description
VGA port	DB15	The VGA port is used to connect a terminal, such as a monitor or KVM.
USB port	USB 2.0 and USB 3.0	The USB ports allow USB devices to be connected to the server. NOTE Before connecting an external USB device, check that the USB device functions properly. The server may operate abnormally if an abnormal USB device is connected.

Rear Panel

Figure 4-11 shows the ports on the rear panel of a server.

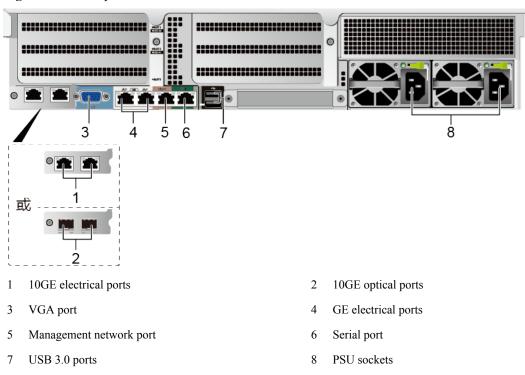


Figure 4-11 Rear panel

 Table 4-3 describes the ports on the rear panel.

Port	Туре	Qua ntit	Description
		У	

Table 4-3	Description	of ports on	the rear	panel

		ntit y	
10GE electrical port	10GBASE-T	2	The mainboard provides two 10GE electrical ports or two 10GE optical ports.
10GE optical port	10GE SFP+	2	
VGA port	DB15	1	The VGA port is used to connect a terminal, such as a monitor or KVM.
GE electrical port	1000BASE-T	2	Server service network port.
Serial port	RJ45	1	The serial port is used as the system serial port by default. You can set it as the iBMC serial port by using the iBMC command. This port is used for debugging.

Port	Туре	Qua ntit y	Description
Manageme nt network port	1000BASE-T	1	The 1000 Mbit/s Ethernet port is used for server management.
USB port	USB 3.0	2	The USB ports allow USB devices to be connected to the server. NOTICE Before connecting an external USB device, check that the USB device functions properly. The server may operate abnormally if an abnormal USB device is connected.
PSU socket		1 or 2	Determine the quantity of PSUs based on actual requirements, but ensure that the rated power of the PSUs is greater than that of the server. When one PSU is used, Predicted PSU Status cannot be set to Active/Standby .

Table 4-4 LOM port description

LOM Port	Chip Model	Rate Negotiation Mode	Supported Rate	Not Supported Rate
10GE optical port	X722	Auto- negotiation 10000 Mbit/s (full duplex)	10000 Mbit/s	10/100/1000 Mbit/s
10GE electrical port		Auto- negotiation 1000 Mbit/s (full duplex)	1000 Mbit/s	10/100 Mbit/s
		Auto- negotiation 10000 Mbit/s (full duplex)	10000 Mbit/s	10/100 Mbit/s
GE electrical port		Auto- negotiation 1000 Mbit/s (full duplex)	1000 Mbit/s	10/100 Mbit/s
NOTE • The LOM por	ts do not support forc	i ible rates	1	1

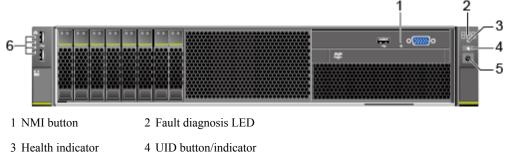
- The LOM ports do not support forcible rates.
- The GE LOM electrical port does not support SR-IOV.

4.3 Indicators and Buttons

Front Panel

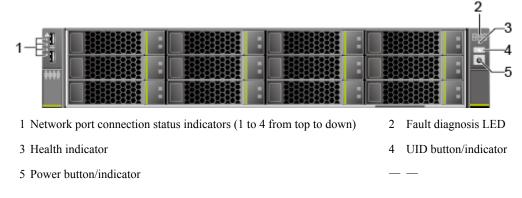
• Figure 4-12 shows the indicators and buttons on the front panel of a server with eight 2.5-inch hard disks.

Figure 4-12 Front panel of a server with eight 2.5-inch hard disks



- 5 Power button/indicator 6 Network port connection status indicators (1 to 4 from top to down)
- **Figure 4-13** shows the indicators and buttons on the front panel of a server with twelve 3.5-inch hard disks.

Figure 4-13 Front panel of a server with twelve 3.5-inch hard disks



• **Figure 4-14** shows the indicators and buttons on the front panel of a server with twenty-four 2.5-inch hard disks.

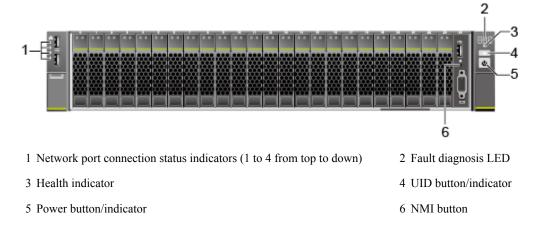


Figure 4-14 Front panel of a server with twenty-four 2.5-inch hard disks

• **Figure 4-15** shows the indicators and buttons on the front panel of a server with twenty-five 2.5-inch hard disks.

Figure 4-15 Front panel of a server with twenty-five 2.5-inch hard disks

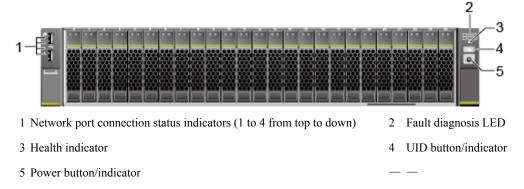


 Table 4-5 describes the indicators and buttons on the front panel of a server.

Table 4-5 Description of indicators and buttons on the front panel

Silk Scree n	Indicator and Button	State Description
888	Fault diagnosis LED	 : The server is operating normally. Error code: A server component is faulty. For error code details, see the <i>Huawei Rack Server iBMC</i> <i>Alarm Handling</i>.

Silk Scree n	Indicator and Button	State Description
Ċ	Power button/ indicator	 Power indicator: Steady yellow: The server is ready to power on. Steady green: The server is properly powered on. Blinking yellow: The iBMC is starting. Off: The server is not connected to a power source. Power button: When the server is powered on, you can press this button to shut down the OS. When the server is powered on, holding down this button for 6 seconds will power off the server. When the server is ready to be powered on, you can press this
(G)	UID button/ indicator	 button to start the server. The UID button/indicator helps identify and locate a server. You can turn on or off the UID indicator by pressing the UID button or remotely running a command on the iBMC CLI. UID indicator: Steady blue/Blinking blue: The server is being located. Off: The server is not being located. UID button: You can press this button to turn on or off the UID indicator. You can press and hold down this button for 4 to 6 seconds to reset the iBMC.
8	Health indicator	 Steady green: The server is operating properly. Blinking red at 1 Hz: A major alarm has been generated on the server. Blinking red at 5 Hz: A critical alarm has been generated on the server.
0	NMI button	 The NMI button triggers a server to generate a non-maskable interrupt. You can press this button or remotely control it through the iBMC WebUI. NOTICE Press the NMI button only when the OS is abnormal. Do not press this button when the server is operating properly. Press the NMI button only for internal commissioning. Before pressing this button, ensure that the OS has the handler for NMI interrupts. Otherwise, the OS may crash. Exercise caution when pressing this button.

Silk Scree n	Indicator and Button	State Description
8	Network port connection status indicator	 Each indicator shows the status of an Ethernet port on the LOM. Steady green: The network port is properly connected. Off: The network port is not in use or has failed. NOTE The indicators correspond to two 10GE and two GE network ports on the mainboard. The LOM has a standby power supply and is not powered off after the service system is powered off. If the network ports are properly connected to other working network devices, the network ports are still connected and the indicators are on.

Rear Panel

Figure 4-16 shows the indicators on the rear panel of a server.

Figure 4-16 Indicators on the rear panel

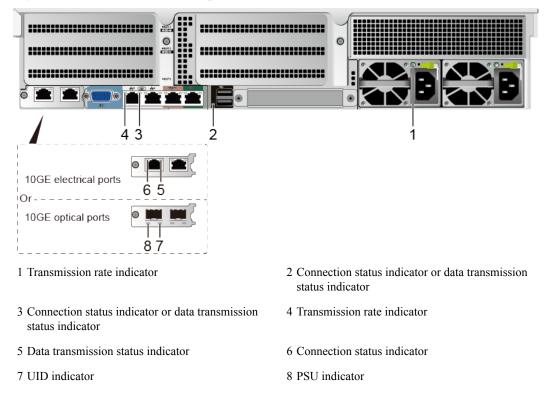


Table 4-6 describes the indicators on the rear panel of a server.

Indicator		State Description			
10GE electrical port	Transmission rate indicator	• Steady green: The data transmission rate is 10 Gbit/s.			
		• Steady yellow: The data transmission rate is 1 Gbit/s.			
		• Off: The network port is not connected.			
	Connection status indicator or data	• Steady green: The network port is properly connected.			
	transmission status indicator	• Blinking green: Data is being transmitted.			
	status indicator	• Off: The network port is not connected.			
10GE optical port	Connection status indicator or data	• Steady green: The network port is properly connected.			
	transmission status indicator	• Blinking green: Data is being transmitted.			
		• Off: The network port is not connected.			
	Transmission rate indicator	• Steady green: The data transmission rate is 10 Gbit/s.			
		• Steady yellow: The data transmission rate is lower than 10 Gbit/s.			
		• Off: The network port is not connected.			
GE electrical port	Connection status indicator	• Steady green: The network port is properly connected.			
		• Off: The network port is not connected.			
	Data transmission	• Blinking yellow: Data is being transmitted.			
	status indicator	• Off: No data is being transmitted.			
UID indicator		The UID indicator helps identify and locate a server. You can turn on or off the UID indicator by pressing the UID button or remotely running a command on the iBMC CLI.			
		• Steady blue/Blinking blue: The server is being located.			
		• Off: The server is not being located.			

 Table 4-6 Description of indicators on the rear panel

Indicator	State 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 4 Hz: under online upgrade.
	• Blinking green at 1 Hz:
	 The input is normal, the server is in the standby state, and the PSU is in MV6 mode. (The output voltage is 6.7 V.)
	- The input is overvoltage or undervoltage.
	- The PSU is in deep hibernation mode.
	• Off: No AC power is supplied.

SAS/SATA Hard Disk Indicators

Figure 4-17 shows the SAS/SATA hard disk indicators.

Figure 4-17 SAS/SATA hard disk indicators

Hard disk fault indicator Hard disk activity indicator

Table 4-7 describes the SAS/SATA hard disk indicators.

Indicator	State Description
Hard disk fault indicator	• Steady yellow: The hard disk is faulty or the status of a member disk in a RAID array is abnormal.
	• Blinking yellow: The server is locating the hard disk or rebuilding a RAID array.
	• Off: The hard disk is operating normally.
Hard disk activity	• Steady green: The hard disk is inactive.
indicator	• Blinking green: Data is being read from or written to the hard disk, or synchronized between hard disks.
	• Off: The hard disk is faulty or not detected.

NVMe SSD Indicators

Figure 4-18 shows the NVMe SSD indicators.

Figure 4-18 NVMe SSD indicators



Table 4-8 NVMe SSD indicators

Green Indicator	Yellow Indicator	State Description
Off	Off	The NVMe SSD cannot be detected.
Steady green	Off	The NVMe SSD is detected and working properly.
Blinking green (2 Hz)	Off	Data is being read from or written to the NVMe SSD.
Off	Blinking yellow (2 Hz)	The NVMe SSD is being located or hot-swapped.
Off	Blinking yellow (0.5 Hz)	The NVMe SSD completes the hot removal process and is removable.
Steady green or off	Steady yellow	The NVMe SSD is faulty.

Flexible NIC Indicators

Supported flexible NICs include:

- SM211 (chip: i350) with two GE electrical ports
- SM210 (chip: 5719)/SM212 (chip: i350) with four GE electrical ports
- SM233 (chip: X540) with two 10GE electrical ports
- SM252 (chip: CX3) with one 56G IB optical port
- SM251 (chip: CX3) with two 56G IB optical ports

Use the Huawei Server Compatibility Checker to obtain the details about the flexible NICs.

The following figures show the indicators on these flexible NICs.

Figure 4-19 SM211 with two GE electrical ports



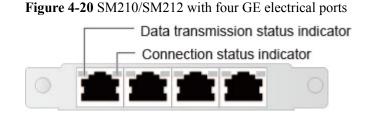


Figure 4-21 SM233 with two 10GE electrical ports

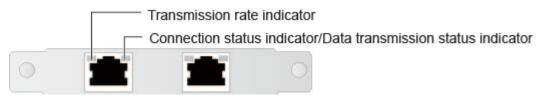


Figure 4-22 SM252 with one 56G IB optical port



Figure 4-23 SM251 with two 56G IB optical ports



Connection status indicator

Data transmission status indicator

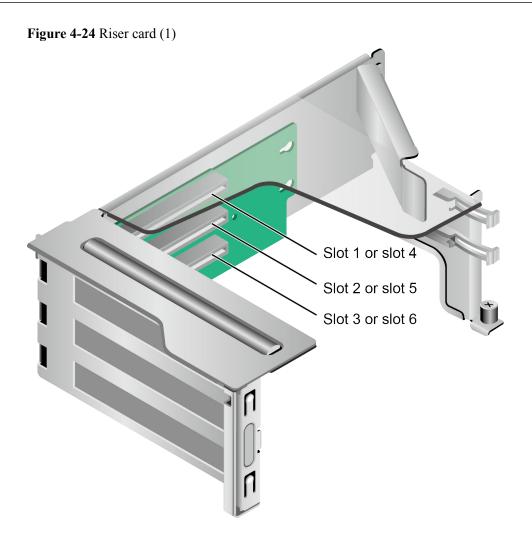
 Table 4-9 Description of flexible NIC indicators

NIC Type	Indicator	State Description
 Flexible NIC with two GE electrical ports Electrical control 	Data transmission status indicator	 Blinking yellow: Data is being transmitted. Off: No data is being transmitted.
• Flexible NIC with four GE electrical ports	Connection status indicator	 Steady green: The network port is properly connected. Off: The network port is not connected.
Flexible NIC with two 10GE electrical ports	Transmission rate indicator	 Steady green: The data transmission rate is 10 Gbit/s. Steady yellow: The data transmission rate is 1 Gbit/s. Off: The data transmission rate is 10/100 Mbit/s.

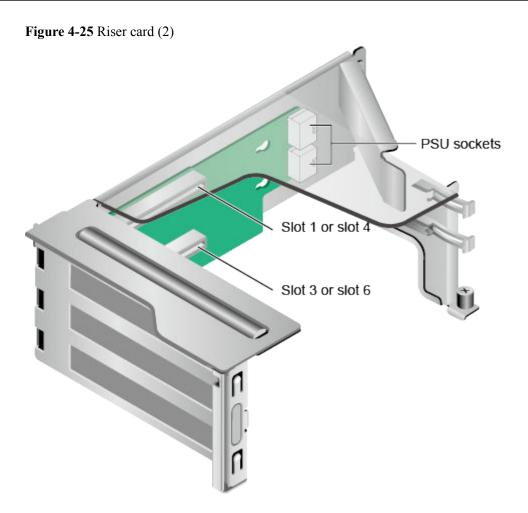
NIC Type	Indicator	State Description
	Connection status indicator or data transmission status indicator	 Steady green: The network port is properly connected. Blinking green: Data is being transmitted. Off: No data is being transmitted or the network port is not connected.
 Flexible NIC with one 56G IB optical port Flexible NIC with two 56G IB optical ports 	Connection status indicator	 Steady green: The physical link is normal. Blinking green: The physical link is abnormal. Off: No physical link is set up.
optical ports	Data transmission status indicator	 Steady yellow: The logical link is normal but no data is being transmitted. Blinking yellow: Data is being transmitted. Off: No logical link is set up.

4.4 Riser Cards and PCIe Slots

Figure 4-24, **Figure 4-25**, **Figure 4-26**, and **Figure 4-27** show the riser cards supported by the server.



When installed in I/O module 1, this riser card provides slots 1 to 3. When installed in I/O module 2, this riser card provides slots 4 to 6.



When installed in I/O module 1, this riser card provides slots 1 and 3. When installed in I/O module 2, this riser card provides slots 4 and 6.

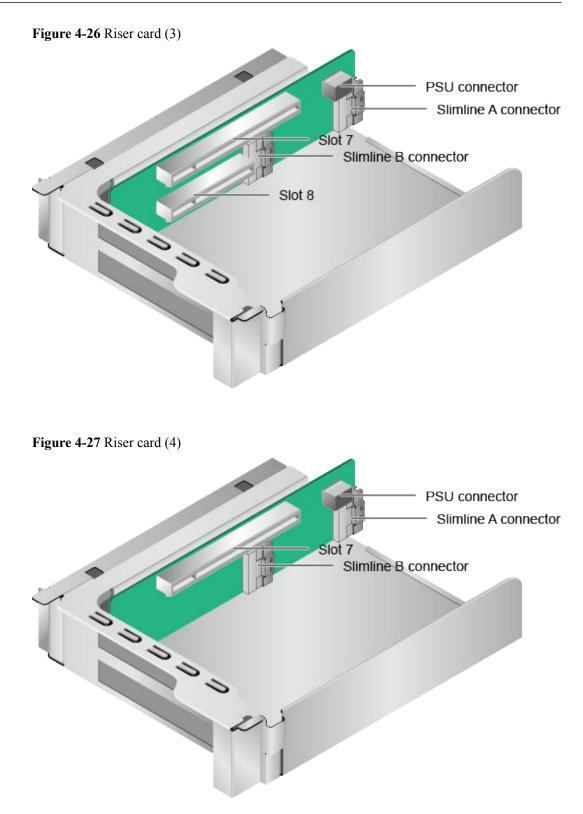


Figure 4-28 shows the PCIe slots on the rear panel.

Figure 4-28 PCIe slots



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

- If I/O module 1 uses a 2-slot PCIe riser module (PRM), slot 2 is unavailable.
- If I/O module 2 uses a 2-slot PRM, slot 5 is unavailable.
- If I/O module 3 uses a 1-slot PRM, slot 8 is unavailable.

Table 4-10 describes the PCIe slots.

If CPU 2 is not installed, the PCIe slots provided by I/O modules 2 and 3 and the flexible NIC are unavailable.

Table 4-10 PCIe slot description

PCI e De vic e	CP U	PCI e Sta nda rd	Co nne ctor Ban dwi dth	Bus Bandwidth	Port Numb er	ROOT PORT (B/D/F)	Device (B/D/F)	Slot Size
Slot 1	CP U 1	PCI e 3.0	x16	 2-slot PRM: x16 3-slot PRM: x8 	Port 2A	3A/ 00/0	3B/00/0	Full-height full-length
Slot 2	CP U 1	PCI e 3.0	x16	 2-slot PRM: N/A 3-slot PRM: x8 	Port2C	3A/ 02/0	3E/00/0	Full-height full-length
Slot 3	CP U 1	PCI e 3.0	x16	x8	Port 3A	5D/ 00/0	5E/00/0	Full-height half-length
Slot 4	CP U 2	PCI e 3.0	x16	 2-slot PRM: x16 3-slot PRM: x8 	Port 1A	85/00/0	86/00/0	Full-height full-length

PCI e De vic e	CP U	PCI e Sta nda rd	Co nne ctor Ban dwi dth	Bus Bandwidth	Port Numb er	ROOT PORT (B/D/F)	Device (B/D/F)	Slot Size
Slot 5	CP U 2	PCI e 3.0	x16	 2-slot PRM: N/A 3-slot PRM: x8 	Port1C	85/02/0	89/00/0	Full-height full-length
Slot 6	CP U 2	PCI e 3.0	x16	x8	Port 2C	AE/ 02/0	B0/00/0	Full-height half-length
Slot 7	CP U 2	PCI e 3.0	x16	 1-slot PRM: x16 2-slot PRM: x8 	Port 3A	D7/00/ 0	D8/00/ 0	Half-height half-length
Slot 8	CP U 2	PCI e 3.0	x8	 1-slot PRM: N/A 2-slot PRM: x8 	Port 3C	D7/02/ 0	DB/ 00/0	Half-height half-length
RAI D cont roll er card	CP U 1	PCI e 3.0	x8	x8	Port1C	17/02/0	1D00/0	
Flex ible NIC	CP U 2	PCI e 3.0	x8	x8	Port2A	AE/ 00/0	AF/ 00/0	

NOTE

- B/D/F stands for Bus/Device/Function Number.
- **ROOT PORT (B/D/F)** indicates the bus number of a CPU internal PCIe root port. **Device (B/D/F)** indicates the bus number (displayed on the OS) of an LOM or external PCIe port.
- The PCIe slots that support full-height full-length PCIe cards are backwards compatible with full-height half-length or half-height half-length PCIe cards.
- The PCIe slots that support PCIe x16 cards are backwards compatible with PCIe x8, PCIe x4, and PCIe x1 cards.
- Table 4-10 lists the default values of B/D/F. If CPUs are not in full configuration or a PCIe card with a PCI bridge is configured, the values of B/D/F may differ.

PCIe GPU Configuration Rules

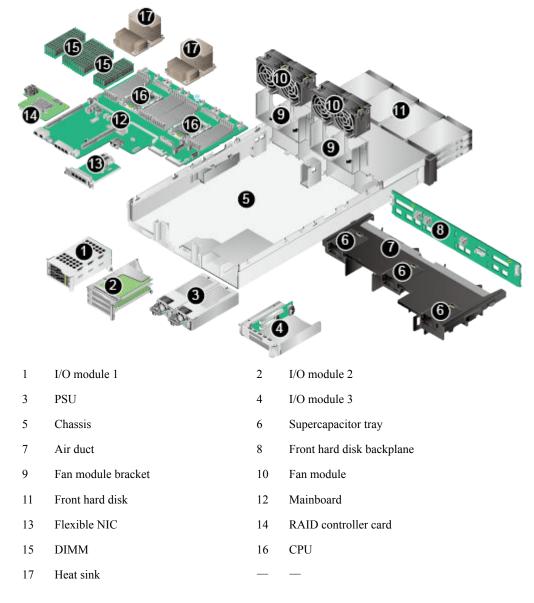
• A two-slot PRM in I/O module 1 or 2 can house a maximum of one single-slot or dualslot PCIe x16 GPU in slot 1 or 4.

- A one-slot PRM in I/O module 3 can house a maximum of one single-slot half-height half-length PCIe x16 GPU.
- A three-slot PRM in I/O module 1 or 2 does not support GPUs.
- A two-slot PRM in I/O module 3 does not support GPUs.
- The server supports a maximum of two dual-slot GPUs or three single-slot GPUs. All GPUs except half-height half-length P4 GPUs must be installed in dedicated riser cards.

4.5 Physical Structure

Figure 4-29 shows the components of a server.

Figure 4-29 2288H V5 components



5 Product Specifications

5.1 Technical Specifications

5.2 Physical and Environmental Specifications

5.1 Technical Specifications

Table 5-1 Technical sp	pecifications
------------------------	---------------

Item	Specifications
Form factor	2U rack server
CPU	One or two Intel [®] Xeon [®] Scalable 3100, 4100, 5100, 6100, and 8100 processors
	• A maximum of 28 cores (2.5 GHz)
	• Maximum frequency: 3.6 GHz (four cores)
	• Two UPI links: 10.4 GT/s
	• Maximum L3 cache capacity per core: 1.375 MB
	• Maximum thermal design power (TDP): 205 W
Chipset	Intel C622
Memory	• A maximum of 24 DDR4 RDIMMs or LRDIMMs
	 RDIMM: twenty-four 32 GB RDIMMs for two CPUs, with a maximum memory capacity of 768 GB
	• LRDIMM: twenty-four 64 GB LRDIMMs for two CPUs, with a maximum memory capacity of 1536 GB
	 Maximum memory speed: 2666 MT/s
	• Memory protection: Error Checking and Correcting (ECC), Mirrored Channel Mode, Single Device Data Correction (SDDC), Rank Sparing Mode, and Lockstep
	NOTE DIMMs on one server must be of the same model, type ((RDIMM or LRDIMM), and specifications (capacity, bit width, number of ranks, and height).

Item	Specifications
Storage	 Supports various hard disk configurations. For details, see Table 6-4. Supports two M.2 SSD modules. NOTE An M.2 SSD is designed only for installing a Linux OS and functions as a boot device. Small-capacity M.2 SDDs (such as 32 GB or 64 GB SSDs) have short endurance and do not support logging. If a small-capacity M.2 SSD is used as the boot device, a dedicated log hard disk or log server is
	required for logging. For example: You can dump VMware logs in either of the following ways: -Redirect /scratch. For details, visit https://kb.vmware.com/s/article/ 1033696.
	 -Configure syslog. For details, visit https://kb.vmware.com/s/article/2003322. M.2 SSDs have short endurance and cannot be used as data storage devices. M.2 SSDs have write-through risks in a short time, and cannot be used in frequent data erase operations. SSDs or HDDs with enterprise-level
	 high DWPD can be used for data storage. Installing write-intensive service software on M.2 SSDs will accelerate the write life consumption and result in perpetual damage of M.2 SSDs. Therefore, M.2 SSDs cannot be used for such services and cannot be used in cache scenarios.
	• Supports hard disk hot swap.
	• Supports RAID 0, 1, 10, 1E, 5, 50, 6, and 60, provides a supercapacitor to protect cache data from power failures, and supports RAID state migration, RAID configuration memory, self-diagnosis, and web-based configuration.
	• Allows a SAS card or SAS RAID controller card (with a maximum of 4 GB cache) to be configured on the mainboard to improve hard disk storage performance and ensure user data security.
	NOTE If the BIOS is in Legacy mode, the server does not support a 4K hard disk as the system boot disk.
Network port	• Two 10GE electrical or optical LOM ports (provided by the PCH), supporting NC-SI, WOL, and PXE
	• Two GE electrical LOM ports (provided by the PCH), supporting NC- SI, WOL, and PXE
	• Network ports provided by the flexible NIC:
	- Two GE electrical ports, supporting NC-SI, WOL, and PXE
	- Four GE electrical ports, supporting NC-SI, WOL, and PXE
	- Two 10GE electrical ports, supporting NC-SI, WOL, and PXE
	- One 56G IB optical port, not supporting NC-SI, WOL, or PXE
	- Two 56G IB optical ports, not supporting NC-SI, WOL, or PXE
	NOTE If a server is forcibly powered off, the NC-SI function of LOM ports will be unavailable and you need to refresh the iBMC WebUI to restore the function. The WOL function will also be unavailable.

Item	Specifications
RAID controller card	The RAID controller card does not occupy a standard PCIe slot, which improves system scalability.
	The RAID controller card supports RAID level migration and RAID configuration memory. The server supports the following RAID controller cards:
	• LSI SAS3008 (SR130): supports RAID 0, 1, 10, and 1E, and does not support out-of-band iBMC management.
	• LSI SAS3008 (SR130-M): supports the IT mode and iBMC out-of- band management, but does not support RAID arrays.
	• LSI SAS3108 (SR430C-M): supports RAID 0, 1, 10, 5, 50, 6, and 60, supports a supercapacitor for power-off protection, and support out-of-band iBMC management.
	• Broadcom SAS3508 (SR450C-M 2G/4G): supports RAID 0, 1, 10, 5, 50, 6, and 60, a supercapacitor for power-off protection, and out-of-band iBMC management.
	• Broadcom SAS3408 (SR150-M): supports RAID 0, 1, and 10, and out-of-band iBMC management, but does not support power-off protection.
	• Broadcom SAS3416 (SR760-M): supports RAID 0, 1, and 10, and out-of-band iBMC management, but does not support power-off protection.
	• Broadcom SAS3416 (SR760IT-M): supports the IT mode and iBMC out-of-band management, but does not support RAID arrays.
PCIe slot	• I/O modules 1 and 2 provide the following PCIe slots:
	 Two standard full-height full-length PCIe 3.0 x16 slots (bus bandwidth: PCIe 3.0 x8) and one standard full-height half-length PCIe 3.0 x16 slot (bus bandwidth: PCIe 3.0 x8)
	 One standard full-height full-length PCIe 3.0 x16 slot and one standard full-height half-length PCIe 3.0 x16 slot (bus bandwidth: PCIe 3.0 x8)
	• I/O module 3 provides the following PCIe slots:
	 One standard half-height half-length PCIe 3.0 x16 slot (bus bandwidth: PCIe 3.0 x8) and one standard half-height half-length PCIe 3.0 x8 slot
	- One standard half-height half-length PCIe 3.0 x16 slot
	• One Huawei SSD card, which greatly improves I/O performance for search, cache, and download services
	• P4, P100, and M10 GPUs
	NOTE
	Use the Huawei Server Compatibility Checker to check the PCIe cards supported by the server. For PCIe cards not listed in the Huawei Server Compatibility Checker , contact your local Huawei sales representative or Huawei technical support.

Item	Specifications
Port	 Two USB 2.0 ports, one USB 3.0 port, and one DB15 VGA port on the front panel NOTE Only servers with eight 2.5-inch hard disks and twenty-four 2.5-inch hard disks provide the VGA port and USB 3.0 port on the front panel. Two USB 3.0 ports, one DB15 VGA port, one RJ45 serial port, one system management port, two GE electrical ports, and two 10GE electrical ports or two 10GE optical ports on the rear panel One built-in USB 3.0 port and two built-in SATA ports NOTE The front USB 3.0 ports are connected to the built-in USB 3.0 port through a USB signal cable. The built-in USB port cannot be used for installing OSs.
Fan module	Four hot-swappable fan modules, allowing one-fan failures NOTE The fans on one server must be of the same model.
System management	 UEFI iBMC Uses an independent port. Supports SNMPv1/SNMPv2c/SNMPv3 and IMPI 2.0, and Redfish 1.0, and provides the GUI, virtual KVM, virtual media, Serial Over LAN (SOL), intelligent power supply, remote control, and hardware monitoring features. NC-SI Supports Huawei eSight management software and integration with third-party management systems, such as VMware vCenter, Microsoft SystemCenter, and Nagios.
Security	 Power-on password Administrator password TPM Front bezel (optional) The front bezel is installed on the front panel and comes with a security lock to prevent unauthorized operations on hard disks.
Video card	Integrates an SM750 graphics card chip to the mainboard to provide a memory capacity of 32 M and support a maximum resolution of 1920 x 1200 at 60 Hz with 16 M colors. NOTE The maximum resolution 1920 x 1200 is supported only when a compatible graphics card driver is installed. Otherwise, only the default resolution supported by the OS is available.

5.2 Physical and Environmental Specifications

Physical Specifications

Item	Specifications
Dimensions (H x W x D)	• Chassis with 3.5-inch hard disks: 86.1 mm x 447 mm x 748 mm (3.39 in. x 17.60 in. x 29.45 in.)
	 Chassis with 2.5-inch hard disks: 86.1 mm x 447 mm x 708 mm (3.39 in. x 17.60 in. x 27.87 in.)
Installation space	The server fits into a universal cabinet that complies with the IEC 297 standard.
	• Cabinet width: 19 in.
	• Cabinet depth: \geq 1000 mm (39.37 in.)
	Requirements for guide rail installation:
	• L-shaped guide rails: apply only to a Huawei cabinet.
	• Adjustable guide rails: apply to a cabinet with a distance of 543.5 mm to 848.5 mm (21.40 in. to 33.41 in.) between the front and rear mounting bars.
	• Holding rails: apply to a cabinet with a distance of 610 mm to 914 mm (24.02 in. to 35.98 in.) between the front and rear mounting bars.
Weight in full	Net weight:
configuration	• With eight 2.5-inch front hard disks and four 2.5-inch rear hard disks: 25.1 kg (55.35 lb)
	• With twelve 3.5-inch front hard disks, four 3.5-inch rear hard disks, and four 2.5-inch rear hard disks: 34.1 kg (75.19 lb)
	• With twenty-four 2.5-inch front hard disks and four 2.5-inch rear hard disks: 29.4 kg (64.83 lb)
	• With twenty-five 2.5-inch front hard disks, two 3.5-inch rear hard disks, and four 2.5-inch rear hard disks: 30.5 kg (67.25 lb)
	Packaging materials: 5 kg (11.03 lb)
Power consumption	The power consumption varies with the server configuration. Use the Huawei Server Power Calculator to calculate the power consumption.

Table 5-2 Physical specifications

Item	Specifications
Acoustic noise	The data listed in the following is the declared A-weighted sound power levels (LWAd) and declared average bystander position A-weighted sound pressure levels (LpAm) when the server is operating in a 23°C (73.4°F) ambient environment. Noise emissions are measured in accordance with ISO 7999 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).
	• Idle:
	- LWAd: 5.64 Bels
	- LpAm: 42.2 dBA
	• Operating:
	- LWAd: 6.08 Bels
	- LpAm: 46.8 dBA
	NOTE The actual sound levels generated when the server is operating vary depending on the server configuration, workload, and ambient temperature.

Environmental Specifications

- Temperature
 - Operating temperature: 5°C to 45°C (41°F to 113°F) (ASHRAE Class A3 and A4 compliant). For details, see Table 5-3.
 - Storage temperature: -40°C to +65°C (-40°F to +149°F).
 - Temperature change rate: < 20°C/h (36°F/h).

	able 5-3 Operating temperature specifications									
Model	Maximu m Operati ng Temper ature 30°C (86°F)	Maximu m Operatin g Tempera ture 35°C (95°F)	aximum perating emperature °C (104°F) .SHRAE Class 3 Compliant)	Maximum Operating Temperature 45°C (113°F) (ASHRAE Class A4 Compliant)						
Server with eight 2.5-inch front hard disks	Supports all configurations.		•	Does not support PCIe SSD cards. Does not support passive cooling GPUs.	 Does not support PCIe SSD cards. Does not support passive cooling GPUs. Supports only Intel[®] Xeon[®] Platinum 8153 and Gold 6152/6140/6126 /5118 CPUs, and CPUs with a maximum TDP of 105 W. Does not support rear hard disks. Does not support standard IB and OPA cards. 					
Server with twelve 3.5-inch front hard disks (expander) Server with twelve 3.5-inch front hard disks (pass- through)	Supports all configura tions.	Does not support P100 and M60 GPUs.	•	Does not support PCIe SSD cards. Does not support passive cooling GPUs. Does not support rear hard disks. Does not support internal hard disks.	N/A					

Model	Maximu m Operati ng Temper ature 30°C (86°F)	Maximu m Operatin g Tempera ture 35°C (95°F)	Maximum Operating Temperature 40°C (104°F) (ASHRAE Class A3 Compliant)	Maximum Operating Temperature 45°C (113°F) (ASHRAE Class A4 Compliant)
Server with twelve 3.5-inch front NVMe SSDs				
Server with twenty- four 2.5- inch front hard disks (pass- through)				
Server with twenty- four 2.5- inch front NVMe SSDs		Does not support P100 and M60 GPUs, and rear hard disks.	N/A	
Server with twenty- five 2.5- inch front hard disks (expander)		Does not support P100 and M60 GPUs.	 Does not support PCIe SSD cards. Does not support passive cooling GPUs. Does not support rear hard disks. 	

NOTE

- If one fan fails, the highest operating temperature of the server is 5°C (9°F) lower than that in normal cases.
- When GPUs are used, the failure of one fan may result in performance deterioration.
- If three or fewer P4 GPU cards are configured, the maximum operating temperature is 35°C (95°F). If four or more P4 GPU cards are configured, the maximum working temperature is 30°C (86°F).

• Humidity

- Operating humidity: 8% RH to 90% RH (non-condensing)
- Storage humidity: 5% to 95% RH (non-condensing)
- Humidity change rate: < 20% RH/h

• Altitude

- \leq 3048 m (9999.88 ft). For altitudes above 900 m (2952.72 ft), the operating temperature decreases by 1°C (1.8°F) for every increase of 300 m (984.24 ft).
- HDDs are not supported when the altitude is higher than 3000 m (9842.4 ft).

• Corrosive gaseous contaminant

- Copper corrosion rate test requirement: The corrosion product thickness growth rate is lower than 300 Å/month (meeting level G1 requirements of the ANSI/ ISA-71.04-2013 standard on gaseous corrosion).
- Silver corrosion rate test requirement: The corrosion product thickness growth rate is lower than 200 Å/month.

• Particle contaminant

- The equipment room environment meets the requirements of ISO 14664-1 Class 8.
 You are advised to hire a professional organization to monitor particle contaminants in the equipment room.
- The equipment room is free from explosive, conductive, magnetic conductive, and corrosive dust.

6 Component Compatibility

Use the **Huawei Server Compatibility Checker** to check the software and hardware supported by the server.

- 6.1 CPU
- 6.2 Memory
- 6.3 Storage
- 6.4 I/O Expansion
- 6.5 PSU
- 6.6 OS and Software Support

6.1 CPU

One or two Intel[®] Xeon[®] Scalable 3100, 4100, 5100, 6100, and 8100 processors

- A maximum of 28 cores (2.5 GHz)
- Maximum frequency: 3.6 GHz (four cores)
- Two UPI links: 10.4 GT/s
- Maximum L3 cache capacity per core: 1.375 MB
- Maximum thermal design power (TDP): 205 W

- For details about component options, consult the local Huawei sales representatives.
- CPUs on the same server must be of the same model.
- For details about CPUs, visit https://www.intel.com/content/www/us/en/homepage.html.

6.2 Memory

Memory Configuration Rules

A server provides 24 DDR4 DIMM slots. Each processor supports six memory channels and each memory channel supports two DDR4 DIMMs.

Observe the following rules when configuring DIMMs:

- 1. DIMMs of different types (RDIMMs and LRDIMMs) cannot be installed on one server.
- 2. Each channel supports a maximum of eight ranks.

A channel supports more than eight ranks for LRDIMMs, because a quad-rank LRDIMM generates the same electrical load as a single-rank RDIMM on a memory bus.

3. The maximum number of DIMMs to be installed on the server varies with the processor type, DIMM type, number of ranks, and operating voltage. For details, see **Maximum number of DIMMs** in the following tables.

ΠΝΟΤΕ

Restriction of the number of ranks supported by each channel on the maximum number of DIMMs supported by each channel:

Number of DIMMs supported by each channel \leq Number of ranks supported by each memory channel/Number of ranks supported by each DIMM

- 4. All DIMMs operate at the same speed, which is the smaller value of:
 - Memory speed supported by a CPU
 - Lowest maximum operating speed for the selected memory configuration. For details, see **Maximum operating speed** in the following tables.

Table 6-1 RDIMM configuration

Item		Specifications				
Rank		Dual-rank				
Rated speed (MT/s)		2666				
Operating voltage (V)		1.2				
Maximum number of DIM	lMs	24				
Maximum capacity per DI	MM (GB)	32				
Maximum total memory c	apacity (GB)	768				
Maximum total memory c operating speed (GB)	apacity at maximum	768				
Maximum operating speed (MT/s)	One DIMM per channel	2666				
	Two DIMMs per channel	2666				
		this table is based on dual-processor er with only one processor.				

Item		Specifications					
Rank		Quad-rank					
Rated speed (MT/s	3)	2666					
Operating voltage	(V)	1.2					
Maximum number	of DIMMs	24					
Maximum capacity per DIMM (GB)		64					
Maximum memory capacity (GB)		1536					
Maximum total me maximum operatin		1536					
Maximum One DIMM per operating speed channel		2666					
(MT/s)	Two DIMMs per channel	2666					
		listed in this table is based on dual-processor r a server with only one processor.					

Table 6-2 LRDIMM configuration

Memory Slot Configuration Rules

Figure 6-1 shows the DIMM slot numbers and positions.

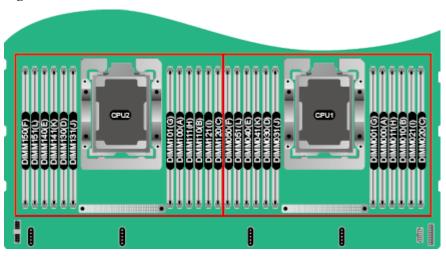


Figure 6-1 DIMM slots

- The server supports DIMMs of 8 GB, 16 GB, 32 GB, and 64 GB. A server fully configured with DIMMs provides up to 1536 GB memory.
- The server provides 24 DDR4 DIMM slots. Each CPU supports six channels. Table 6-3 lists channels for each CPU.

CPU	Channel	DIMM
CPU 1	А	DIMM000(A)
		DIMM001(G)
	В	DIMM010(B)
		DIMM011(H)
	С	DIMM020(C)
		DIMM021(I)
	D	DIMM030(D)
		DIMM031(J)
	Е	DIMM040(E)
		DIMM041(K)
	F	DIMM050(F)
		DIMM051(L)
CPU2	А	DIMM100(A)
		DIMM101(G)
	В	DIMM110(B)
		DIMM111(H)
	С	DIMM120(C)
		DIMM121(I)
	D	DIMM130(D)
		DIMM131(J)
	Е	DIMM140(E)
		DIMM141(K)
	F	DIMM150(F)
		DIMM151(L)

Table 6-3 Channels

DIMM Installation Rules



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

Balanced DIMM configuration can deliver the optimal memory performance. Unbalanced configuration reduces memory performance and is not recommended.

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

- Unbalanced DIMM configuration for channels: Five, seven, nine, ten, or eleven DIMMs for a processor.
- Unbalanced DIMM configuration for processors: Different number of DIMMs are configured for the processors.

CPU			Number of DIMMs											
	Channel	nal DIMM Slot	IMM Slot (√: recommended ○: not recommended)											
	Channel	DIMINI SIOU	1	1	1	\	0	1	0	1	0	0	0	1
			1	2	3	4	5	6	7	8	9	10	11	12
	А	DIMM000(A)	•	•	•	•	•	•	•	•	•	•	•	•
	A	DIMM001(G)							•	•	•	•	•	•
	В	DIMM010(B)		•	•	•	•	•	•	•	•	•	•	•
		DIMM011(H)								•	•	•	•	•
	С	DIMM020(C)			•		•	•	•		•	•	•	•
CPU1		DIMM021(I)									•		•	•
CFUI	D	DIMM030(D)				•	•	•	•	•	•	•	•	•
	D	DIMM031(J)								•		•	•	•
-	Е	DIMM040(E)				•	•	•	•	•	•	•	•	•
	E	DIMM041(K)								•		•	•	•
	F	DIMM050(F)						•	•		•	•	•	•
	Г	DIMM051(L)												•

Figure 6-2 DIMM installation rules (one CPU)

Figure 6-3	DIMM	installation	rules ((two CPUs)	
Figure 0-5	DIMINI	instantation	Tuics (

										(√:	rec	-		ber o ed (-	nend	ed)							
CPU	Channel	DIMM Slot	0	1	0	1	0	1	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	А	DIMM000(A)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	A	DIMM001(G)													•	•	•	•	•	•	•	•	•	•	•	•
	в	DIMM010(B)			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	В	DIMM011(H)															•	•	•	•	•	•	•	•	•	•
	с	DIMM020(C)					•	•			•	•	•	•	•	•			•	•	•	•	•	•	•	•
CPU1	Č	DIMM021(I)																	•	•			•	•	•	•
Crui	D	DIMM030(D)							•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
		DIMM031(J)															•	•			•	•	•	•	•	•
	Е	DIMM040(E)							•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
		DIMM041(K)															•	•			•	•	•	•	•	•
	F	DIMM050(F)											•	•	•	•			•	•	•	•	•	•	•	•
	-	DIMM051(L)																							•	•
	А	DIMM100(A)		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
		DIMM101(G)														•	•	•	•	•	•	•	•	•	•	•
	в	DIMM110(B)				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
		DIMM111(H)																•	•	•	•	•	•	•	•	•
	с	DIMM120(C)						•	•			•	•	•	•	•	•			•	•	•	•	•	•	•
CPU2		DIMM121(I)																		•	•			•	•	•
	D	DIMM130(D)								•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
		DIMM131(J)																•	•			•	•	•	•	•
	Е	DIMM140(E)								•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
		DIMM141(K)																•	•			•	•	•	•	•
	F	DIMM150(F)												•	•	•	•			•	•	•	•	•	•	•
		DIMM151(L)																								•

Memory Protection Technologies

The server supports the following memory protection technologies:

- ECC
- Mirrored Channel Mode
- SDDC
- Rank Sparing Mode
- Lockstep

Supported DIMMs

ΠΝΟΤΕ

- For details about component options, consult the local Huawei sales representatives.
- DIMMs on one server must be of the same model.

6.3 Storage

 Table 6-4 lists hard disk configurations supported by the server.

The following table is for reference only. For details about component options, consult the local Huawei sales representatives.

Table 6-4 Hard dia	sk configurations
--------------------	-------------------

Configuratio n	Maximum Front Hard Disks	Maximum Rear Hard Disks	Ma xim um Int ern al Har d Dis ks	Hard Disk Managemen t Mode
Server with eight 2.5-inch front hard disks ^[1]	8 (SAS/ SATA hard disk)	I/O module 3: 4 (NVMe SSD)	-	One RAID controller card
Server with twelve 3.5-inch front hard disks (expander) 1	12 (SAS/ SATA hard disk)	 I/O module 1: 2 (SAS/SATA hard disk) I/O module 2: 2 (SAS/SATA hard disk) I/O module 3: 4 (SAS/SATA hard disk or NVMe SSD)^[2] 	4 (SA S/ SAT A hard disk) ^[3]	One RAID controller card

Configuratio n	Maximum Front Hard Disks	Maximum Rear Hard Disks	Ma xim um Int ern al Har d Dis ks	Hard Disk Managemen t Mode
Server with twelve 3.5-inch front hard disks (expander) 2	12 (SAS/ SATA hard disk)	 I/O module 1: 2 (SAS/SATA hard disk) I/O module 3: 4 (NVMe SSD) 	-	Two RAID controller cards
Server with twelve 3.5-inch front NVMe SSDs	 12 Slots 0 to 3: 4 (SAS/SATA hard disk or NVMe SSD) Slots 4 to 11: 8 (NVMe SSD) 	I/O module 3: 4 (NVMe SSD)	-	One RAID controller card
Server with twelve 3.5-inch front hard disks (pass- through) ^[4]	12 (SAS/ SATA hard disk)	 I/O module 1: 2 (SAS/SATA hard disk) I/O module 2: 2 (SAS/SATA hard disk) I/O module 3: 4 (NVMe SSD) 	-	One RAID controller card
Server with twenty-four 2.5-inch front hard disks (pass-through) [1]	24 (SAS/ SATA hard disk)	I/O module 3: 4 (NVMe SSD)	-	Three RAID controller cards (one for eight hard disks)

Configuratio n	Maximum Front Hard Disks	Maximum Rear Hard Disks	Ma xim um Int ern al Har d Dis ks	Hard Disk Managemen t Mode
Server with twenty-four 2.5-inch front NVMe SSDs ^[1]	 24 Slots 0 to 3: 4 (SAS/SATA hard disk or NVMe SSD) Slots 4 to 23: 20 (NVMe SSD) 	I/O module 3: 4 (NVMe SSD)	-	One RAID controller card
Server with twenty-five 2.5-inch front hard disks (expander) ^[1]	25 (SAS/ SATA hard disk)	 I/O module 1: 2 (SAS/SATA hard disk) I/O module 3: 4 (NVMe SSD) 	-	One RAID controller card
Server with twenty-five 2.5-inch front hard disks (expander) ^[1]	25 (SATA or SAS hard disk)	 I/O module 1: 2 (SAS/SATA hard disk) I/O module 3: 4 (NVMe SSD) 	-	Two RAID controller cards

[1]: The front hard disks of an 8-disk, 24-disk, or 25-disk (expander) server and I/O module 3 can only be 2.5-inch. Hard disks of servers with other configurations and I/O modules can be 2.5-inch or 3.5-inch.

[2]: For a server with twelve 3.5-inch front hard disks (expander) 1, I/O module 3 supports SAS/SATA hard disks only when SR760-M (Broadcom SAS3416) or SR760IT-M (Broadcom SAS3416) RAID controller cards are configured.

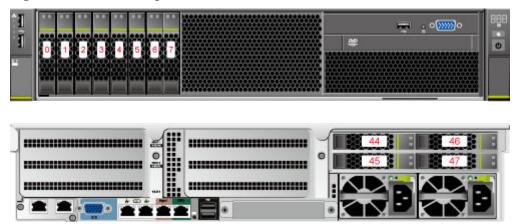
[3]: For a server with twelve 3.5-inch front hard disks (expander) 1, internal hard disks are supported only when SR760-M (Broadcom SAS3416) or SR760IT-M (Broadcom SAS3416) RAID controller cards are configured.

[4]: SR760-M (Broadcom SAS3416) or SR760IT-M (Broadcom SAS3416) RAID controller cards must be configured for a server with twelve 3.5-inch front hard disks (pass-through).

The following figures show the hard disk slot numbers for these configurations.

• Server with eight 2.5-inch front hard disks

Figure 6-4 Server with eight 2.5-inch front hard disks

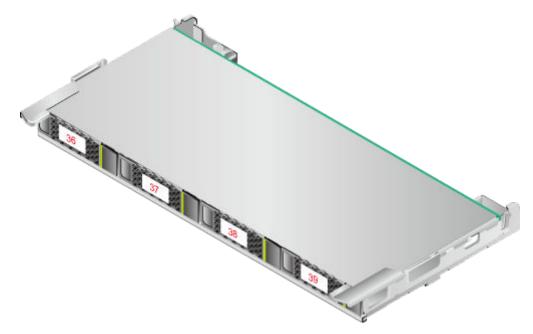


• Server with twelve 3.5-inch front hard disks (expander) 1

Figure 6-5 Server with twelve 3.5-inch front hard disks (expander) 1

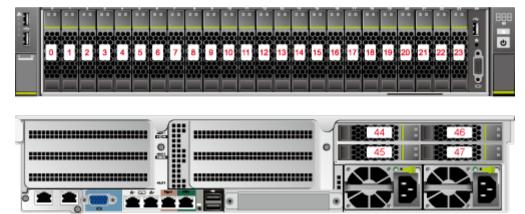
Î	0	-	3	6	H	9	666
1		-	4		E	10	Ċ
	2		5			11)	





• Server with twelve 3.5-inch front hard disks (expander) 2

Figure 6-6 Server with twelve 3.5-inch front hard disks (expander) 2



• Server with twelve 3.5-inch front NVMe SSDs

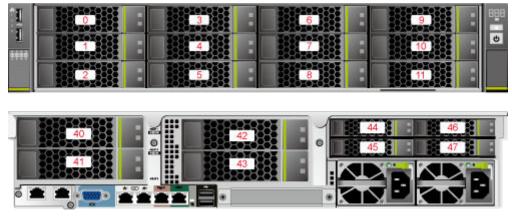
Figure 6-7 Server with twelve 3.5-inch front NVMe SSDs

1	0	3	6	9)	888
1		4		10	9
	2	5	8	11	



• Server with twelve 3.5-inch front hard disks (pass-through)

Figure 6-8 Server with twelve 3.5-inch front hard disks (pass-through)



• Server with twenty-four 2.5-inch front hard disks (pass-through)

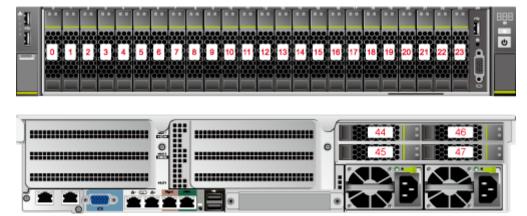


Figure 6-9 Server with twenty-four 2.5-inch front hard disks (pass-through)

• Server with twenty-four 2.5-inch front NVMe SSDs

Figure 6-10 Server with twenty-four 2.5-inch front NVMe SSDs

	10 11 12 13 14	15 16 17 18 19 2	
2	*	0	

• Server with twenty-five 2.5-inch front hard disks



Figure 6-11 Server with twenty-five 2.5-inch front hard disks

Table 6-5 lists the comparison between RAID levels in performance and disk usage.

RAID Level	Reliability	Read Performance	Write Performance	Hard Disk Usage
RAID 0	Low	High	High	100%
RAID 1	High	High	Low	50%
RAID 5	Relatively high	High	Medium	(N - 1)/N
RAID 6	Relatively high	High	Medium	(N - 2)/N
RAID 10	High	High	Medium	50%
RAID 1E	High	Medium	Medium	50%

Table 6-5 RAID level comparison

RAID Level	Reliability	Read Performance	Write Performance	Hard Disk Usage			
RAID 50	High	High	Relatively high	(N - M)/N			
RAID 60	High	High	Relatively high	(N - M x 2)/N			

Note: N indicates the number of member disks in a RAID array, and M indicates the number of spans in a RAID array.

6.4 I/O Expansion

The server supports a wide range of PCIe cards for you to choose based on the card type and transmission speed:

- Fiber Channel (FC) host bus adapter (HBA)
- Converged network adapter (CNA)
- Network expansion card
- SSD card

ΠΝΟΤΕ

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

6.5 PSU

Table 6-6 lists the PSUs supported by the server.

Table 6-6 Supported PSUs

PSU Model	Rated Power	Rated Input Voltage
550 W AC Platinum PSU	550 W	 AC: 100 V to 240 V HVDC: 192 V to 288 V
900 W AC Platinum PSU	900 W	 AC: 100 V to 240 V HVDC: 192 V to 288 V
1500 W AC Platinum PSU	1500 W	 AC: 100 V to 240 V HVDC: 192 V to 288 V

- The PSUs are hot-swappable and work in 1+1 redundancy mode.
- Table 6-6 is for reference only. For details about component options, see the Huawei Server Compatibility Checker.
- PSUs on one server must be of the same model.
- The PSUs provide short-circuit protection. The PSUs that support dual input live wires provide double-pole fuse.
- If the input voltage ranges from 100 V to 132 V AC, the output power of the 1500 W AC Platinum PSU decreases to 1000 W, and the 550 W AC Platinum PSU is not affected.
- The power of a 1500 W AC Platinum PSU can reach 1700 W. When two such PSUs are installed, they can be used as 1700 W PSUs.

6.6 OS and Software Support

For details about component options, see the Huawei Server Compatibility Checker.

7 System Management

The server uses Huawei's proprietary 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
- SNMP
- Redfish 1.0
- Login using a web browser

Table 7-1 describes the features of the iBMC.

Table 7-1 iBMC features

Feature	Description		
Management interface	Integrates with any standard management system through the following interfaces:		
	• IPMI		
	• CLI		
	• HTTPS		
	• SNMP		
	• Redfish		
Fault detection	Detects faults and accurately locates faults in hardware, for example, an FRU.		
Alarm management	Supports alarm management and reports alarms using the SNMP trap, Simple Mail Transfer Protocol (SMTP), and syslog service to ensure 24/7 operating.		
Integrated virtual KVM	Provides remote maintenance measures for troubleshooting.		

Feature	Description		
Integrated virtual media	Virtualizes local media devices, images, USB keys, and folders into media devices on a remote server, simplifying OS installation. (The virtual DVD-ROM drive supports a maximum transmission rate of 8 MB/s.)		
WebUI	Provides a user-friendly graphical user interface (GUI), which simplifies users' configuration and query operations.		
Fault reproduction	Reproduces faults to facilitate fault diagnosis.		
Screen snapshots and screen videos	Allows you to view screenshots and videos without login, which facilitates routine preventive maintenance inspection (PMI).		
Domain Name Service (DNS)/Active Directory (AD)	Supports the DNS and AD, significantly simplifying network and configuration management.		
Dual-image backup	Starts software from a backup image if the software fails.		
Asset management	Supports intelligent asset management.		
Intelligent power management	Uses the power capping technology to increase deployment density, and uses dynamic energy saving to lower operating expenses.		
IPv6	Supports IPv6 to ensure sufficient IP addresses.		
Network Controller Sideband Interface (NC- SI)	Supports NC-SI, which allows you to access the iBMC through the service network port.		

8 Warranty

According to the *Huawei Warranty Policy for Servers & Storage Products (Warranty Policy* for short), Huawei provides a three-year warranty for the server, a one-year warranty for DVD-RW drives and batteries, and a three-month warranty for software media.

The *Warranty Policy* stipulates warranty terms and conditions, including the available services, response time, terms of service, and disclaimer.

The warranty terms and conditions may vary by country, and some services and/or parts may not be available in all countries. For more information about warranty services in your country, contact Huawei technical support or the local Huawei representative office.

Table 8-1 describes the warranty service response time.

Service	Response Time	Description	Remarks
Help Desk	24/7	Available 24 hours a day, 7 days a week (00:00 to 24:00, Monday to Sunday)	None
Remote troubleshootin g	24/7	Available 24 hours a day, 7 days a week (00:00 to 24:00, Monday to Sunday)	The response time is the period between the end of a customer's service request and beginning of the response by the technical support to offer troubleshooting services.

 Table 8-1 Response time

Service	Response Tin	ne	Description	Remarks
Online technical support	24/7		Huawei enterprise support website (http:// e.huaw ei.com): available 24 hours a day, 7 days a week (00:00 to 24:00, Monday to Sunday)	None
Licensing of software updates	24/7		Available 9 hours a day, 5 days a week (09:00 to 18:00, Monday to Friday), excluding official holidays.	The repaired or replacement parts will be shipped within 45 calendar days after Huawei receives the defective parts.
Return for repair	Outside China	9/5 hours, shipment within 45 calendar days	Available 9 hours a day, 5 days a week (09:00 to 18:00, Monday to Friday), excluding official holidays.	The repaired or replacement parts will be shipped within 45 calendar days after Huawei receives the defective parts.
	In China	10/5 hours, next business day	Available 10 hours a day, 5 days a week (08:00 to 18:00, Monday to Friday), excluding official holidays. Arrival: NBD	 Service requests submitted after 15:30 will be handled the next business day. The response time starts when a remote decision is made to appoint an onsite engineer.

 Table 8-2 describes warranty services provided by Huawei.

Table 8-2 Warranty service	5
----------------------------	---

Service	Description	
Help Desk	Huawei provides 24-hour after-sales technical support (such as handling requests for troubleshooting and hardware repair), receives and handles customer inquiries, complaints, and suggestions through a dedicated hotline.	
Remote troubleshooting	After receiving a service request for rectifying a network or system fault, Huawei engineers will analyze and handle the fault remotely and proceed to rectify it in the shortest possible time. There are two methods for remote troubleshooting: telephone support and remote access.	
Online technical support	Huawei enterprise support website (http://e.huawei.com) provides product and technical materials, such as product manuals, configuration guides, networking case study, and maintenance experience collections. Registered users can access the website and download required documents.	
Licensing of software updates	To ensure that the devices operate stably, Huawei provides software patches whenever necessary.	
Return for repair	Huawei provides repair or replacement services for customers within the promised time to meet customer needs for spare parts. You can return defective parts to the designated Huawei site after submitting a service request. Huawei provides a three-year warranty for parts replacement and limited onsite repair for the servers used in China. Huawei provides a 10-hour-a-day, 5-day-a-week NBD support program. Huawei provides a three-year warranty for parts replacement and repair for the servers used outside China. Huawei provides a 9-hour-a-day, 5-day-a-week NBD support program. Service requests will be handled the next business day. Huawei delivers the repaired or new parts within 45 calendar days after receiving the defective parts.	

9 Certifications

Country/Region	Certificatio n	Standards
Europe	WEEE	2002/96/EC, 2012/19/EU
Europe	RoHS	2002/95/EC, 2011/65/EU, EN 50581:2012
Europe	REACH	EC No. 1907/2006
Europe	CE	Safety: EN 60950-1:2006+A11:2009+A1:2010+A12:2011 EMC: • EN 55022:2010 • CISPR 22:2008 • EN 55024:2010 • CISPR 24:2010 • ETSI EN 300 386 V1.6.1:2012 • ETSI ES 201 468 V1.3.1:2005
China	CCC	GB4943.1-2011 GB9254-2008 (Class A) GB17625.1-2012
China	RoHS	SJ/T-11363-20006 SJ/T-11364-20006 GB/T 26572-2011
Australia	C-tick	AS/NZS CISPR22:2009
America	FCC	FCC Part 15 (Class A)

Country/Region	Certificatio n	Standards
America	NTRL-UL	UL 60950-1, 2nd Edition, 2011-12-19 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No.60950-1-07, 2nd Edition, 2011-12 (Information Technology Equipment-Safety-Part 1: General Requirements)
Canada	IC	ICES-003 Class A
Canada	NRTL-UL	UL 60950-1, 2nd Edition, 2011-12-19 (Information Technology Equipment-Safety-Part 1: General Requirements)
Nigeria	SONCAP	IEC 60950-1: 2005 (2nd Edition) + A1:2009 EN 60950-1: 2006+A11:2009+A1:2010 + A12:2011
Kingdom of Saudi Arabia (KSA)	SASO	IEC 60950-1: 2005 (2nd Edition) + A1:2009 EN 60950-1: 2006+A11:2009+A1:2010 + A12:2011
Global	СВ	IEC 60950-1
Japan	VCCI	VCCI V-4:2012
Saudi, Nigeria, Tanzania, Uganda, Kuwait, Algeria, Botswana, Qatar, Egypt	Multi- country_certi ficate	IEC 60950-1: 2005 (2nd Edition) + A1:2009 EN 60950-1: 2006+A11:2009+A1:2010 + A12:2011

10_{References}

For more information about the product, see the following documents:

- Server Data Sheet
- Server Documentation
- Huawei Server Information Self-Service Platform