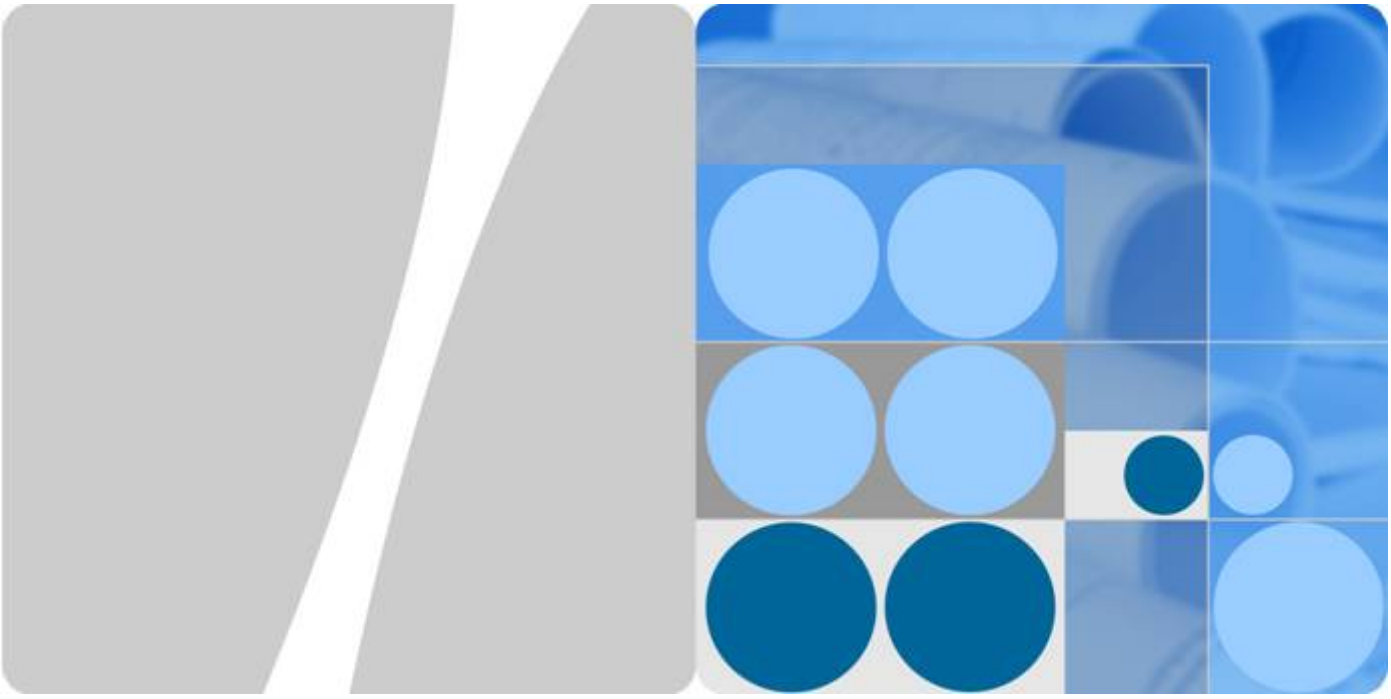

Huawei FusionServer 2488 V5

White Paper

Issue 01

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1 Overview

The Huawei 2488 V5 is a 2U 4-socket rack server developed for Internet data center (IDC), cloud computing, enterprise, and telecom service applications.

The 2488 V5 combines high-performance computing (HPC) with large storage capacity, low power consumption, high scalability and reliability, and is easy to deploy and manage. It is ideal for various application scenarios, such as database, cloud computing, virtualization, and memory computing application scenarios.

The 2488 V5 supports the following configurations:

- 8 SAS/SATA hard disks

  The server supports a maximum of eight 2.5-inch front SAS/SATA hard disks. One standard PCIe RAID controller card is required.

  In this configuration, the server supports a DVD-ROM drive or an LCD on the front panel. By default, the server provides a video graphics array (VGA) port and a USB 3.0 port on the front panel.
- 25 SAS/SATA hard disks

  The server supports a maximum of twenty-five 2.5-inch front SAS/SATA hard disks. One standard PCIe RAID controller card is required.

Figure 1-1 Appearance of the 2488 V5

2 Features

Performance and Scalability

The 2488 V5 offers the following features to boost performance and improve scalability:

- Intel® Xeon® Scalable Platinum 8100, Gold 6100, or Gold 5100 processors ensure high processing performance by providing up to 28 cores, 3.6 GHz frequency, 38.5 MB L3 cache, and three 10.4 GT/s Ultra Path Interconnect (UPI) links between processors. The UPI links enables 4-socket CPU full-mesh topology interconnection, delivering highest processing performance.
  - A 2488 V5 supports four processors, 112 cores, and 224 threads, which maximizes the concurrent execution of multithreaded applications.
  - Intel® Xeon® Scalable processors support L2 cache. Each core can exclusively use a maximum of 1 MB L2 cache or 1.35 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.
- Up to thirty-two 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 4096 GB, featuring high speed and availability. The maximum memory bandwidth is 499.9 GB/s in theory. The following memory operating modes are available and failed DIMMs can be isolated, improving memory subsystem reliability.
  - Independent Channel Mode
  - Rank Sparing Mode
  - Mirrored Channel Mode
  - Lockstep Channel Mode
- Intel® Advanced Vector Extensions 512 (AVX-512) uses up to two 512-bit fused multiply add (FMA) units to allow an application to pack 32 double and 64 single-precision floating-point operations, and eight 64-bit and sixteen 32-bit integers in a clock cycle of a 512-bit vector. Compared with Intel® AVX 2.0, AVX-512 doubles the register width, number of registers, and FMA unit width.

- 12 Gbit/s internal SCSI (SAS) storage connection doubles the data transmission rate compared with the 6 Gbit/s SAS storage connection, maximizing the performance of I/O-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 2488 V5 supports flexible hard disk configurations and provides elastic and scalable memory capacities to satisfy storage capacity and upgrade requirements.
- The Intel® Xeon® Scalable series processors incorporate the PCIe 3.0 controller using the Intel Integrated I/O. This remarkably shortens I/O latency and enhances overall system performance.
- The 2488 V5 supports up to nine PCIe 3.0 slots.

Availability and Serviceability

The 2488 V5 provides the following features to improve availability and serviceability:

- The 2488 V5 uses carrier-class components and follows the engineering process, which dramatically improves system reliability.
- The 2488 V5 uses hot-swappable SATA and SAS hard disks. 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.
- The UID and health indicators, fault diagnosis LED, and touchable LCD diagnosis panel on the panel and the key component status displayed on the iBMC WebUI help technical support personnel quickly locate faulty components or fault risks. This simplifies maintenance, shortens troubleshooting time, and improves system availability.
- SSDs offer better reliability than HDDs, which extends the Mean Time Between Failures (MTBF).
- The Huawei integrated management module (iBMC) monitors system parameters in real time, triggers alarms, and performs recovery actions in case of failures. This helps minimize system downtime.
- Huawei provides a three-year warranty for parts replacement and onsite repair for the servers used in China. Huawei provides a 10-hour-a-day, 5-day-a-week support program. Service requests will be handled the next business day. Optional service upgrades are available.
- 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 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.

Manageability and Security

The 2488 V5 provides the following features to enhance manageability and security:

- The built-in iBMC module monitors server operating status and provides remote management.
- The 2488 V5 supports a power-on password to ensure system startup and management security.
- The Network Controller Sideband Interface (NC-SI) feature allows a network port to provide functions of both a management network port and a service port. This feature is disabled by default and can be enabled on the iBMC or BIOS.

- The integrated industry-standard Unified Extensible Firmware Interface (UEFI) increases configuration and update efficiency, and simplifies fault handling.
- The trusted platform module (TPM) provides advanced encryption functions, such as digital signatures and remote authentication.
- The front bezel in the server chassis is locked to ensure local data security and reliability.
- The Intel Execute Disable Bit (EDB) function prevents malicious buffer overflow attacks when working with a supported OS.
- The Intel® Trusted Execution technology provides enhanced security by using hardware-based defense against malicious software attacks, allowing an application to run in an isolated space from all other applications running on the OS.

NOTE

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

- The service network port can be bound to any network port (host network port 1 by default) on the LAN on motherboard (LOM) of the server.
- The service network port allows you to enable, disable, and configure a virtual local area network (VLAN) ID. The 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 2488 V5 offers the following features to save energy:

- The 1288H V5 supports 80 Plus Platinum power supply units (PSUs). The PSUs provide 94% power efficiency at 50% loads.
- The voltage regulator-down (VRD) PSUs reduce the energy loss in DC/DC power conversion.
- The 2488 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 2488 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® processors consume less energy and apply to the data center and telecommunication environments that have power and thermal limitations.
- SSDs consume 80% less power than HDDs.

Support for Customization

- Huawei designs the product and owns the intellectual property.
- Huawei provides quick customized development and delivery.

3 Logical Structure

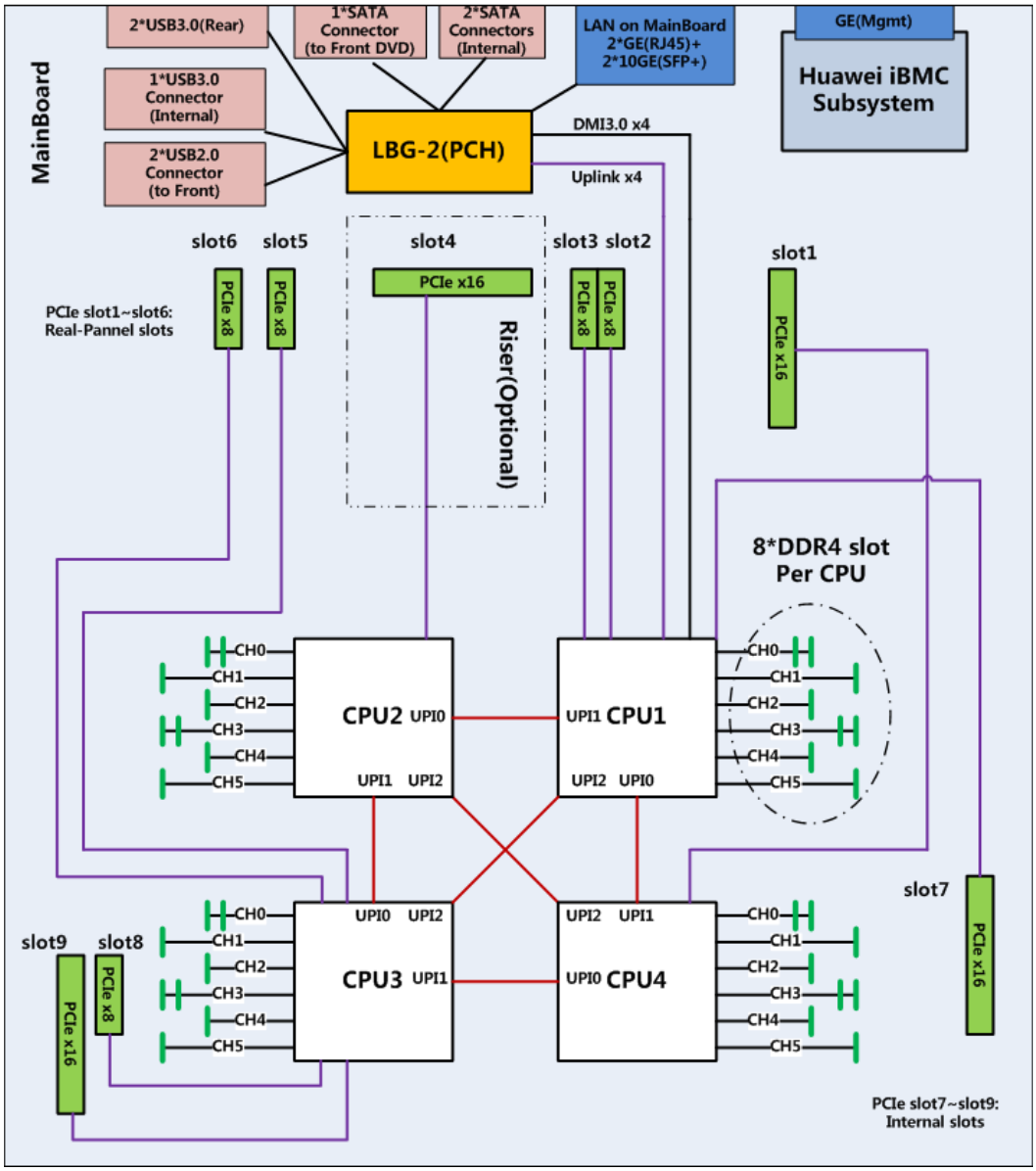
Figure 3-1 shows the logical structure of the 2488 V5.

The 2488 V5 supports up to four Intel® Xeon® Scalable CPUs and also supports two-CPU configuration. Each CPU supports eight DIMMs by two channels. The server supports a maximum of 32 DDR4 DIMMs. The CPUs interconnect with each other through Ultra Path Interconnect (UPI) buses at speeds of up to 10.4 GT/s.

The 2488 V5 provides up to nine standard PCIe 3.0 slots (including three internal slots: slot 7 to slot 9) of various specifications, and provides low-speed I/O ports, such as the VGA port, USB 3.0 ports, and serial port (RJ45) to meet the requirements in various application scenarios.

The 2488 V5 provides two 10GE optical LOM ports and two GE electrical ports to meet basic I/O requirements of users without connecting external PCIe cards.

Figure 3-1 Logical structure of the 2488 V5



4 Hardware Description

About This Chapter

4.1 Appearance

Front Panel Components

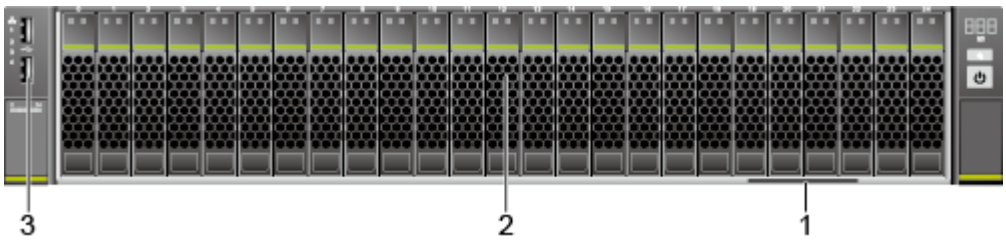
Figure 4-1 shows the components on the front panel with 8 SAS/SATA hard disks.

Figure 4-1 Components on the front panel with 8 SAS/SATA hard disks

1	USB 3.0 port	2	VGA port
3	Label (including ESN)	4	Built-in DVD-ROM drive or touchable LCD module
5	Hard disks	6	USB 2.0 ports on the mounting ear

Figure 4-2 shows the components on the front panel with 25 SAS/SATA hard disks.

Figure 4-2 Components on the front panel with 25 SAS/SATA hard disks



1	Label (including ESN)	2	Hard disks
3	USB 2.0 ports on the mounting ear	-	-

Indicators and Buttons on the Front Panel

Figure 4-3 shows the indicators and buttons on the front panel of a server with eight SAS/SATA hard disks.

Figure 4-3 Indicators and buttons on the front panel of a server with eight SAS/SATA hard disks

1	Network port connection status indicators (1 to 4 from top to down)	2	NMI button
3	Fault diagnosis LED	4	Health indicator
5	UID button/indicator	6	Power button/indicator

Figure 4-4 shows the indicators and buttons on the front panel of a server with 25 SAS/SATA hard disks.

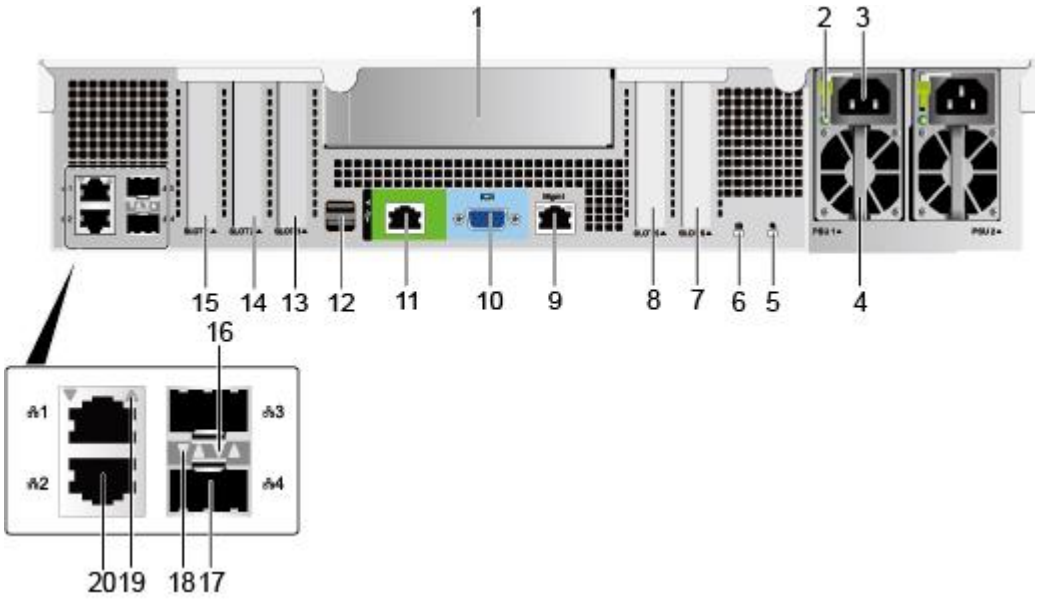
Figure 4-4 Indicators and buttons on the front panel of a server with 25 SAS/SATA hard disks

1	Network port connection status indicators (1 to 4 from top to down)	2	Fault diagnosis LED
3	Health indicator	4	UID button/indicator
5	Power button/indicator	6	

Rear Panel Components

Figure 4-5 shows the rear view of a 2488 V5.

Figure 4-5 Rear panel of a 2488 V5



1	PCIe slot 4	2	Power indicator
3	AC PSU socket	4	PSUs
5	UID indicator	6	Health indicator
7	PCIe slot 6	8	PCIe slot 5
9	Management network port	10	VGA port
11	System serial port	12	USB 3.0 ports
13	PCIe slot 3	14	PCIe slot 2
15	PCIe slot 1	16	Data transmission indicator for the 10GE port
17	10GE optical port	18	Connection status indicator for the 10GE port
19	GE port connection status indicator	20	GE port

Table 4-1 Ports on the rear panel

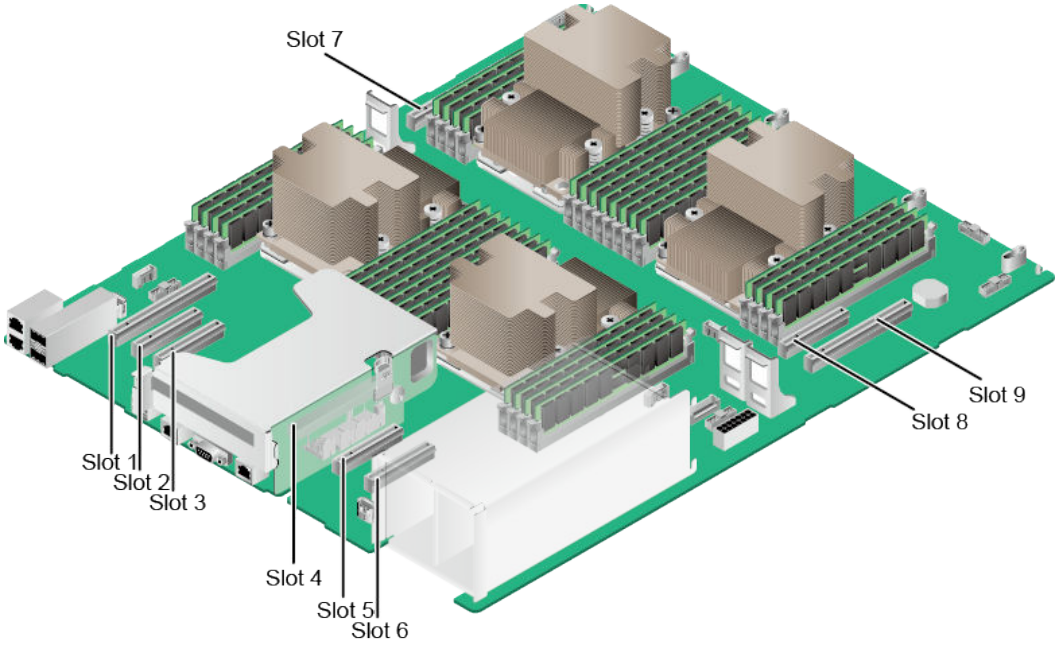
Name	Type	Quantity	Description
GE electrical port	Electrical port	2	The mainboard provides two GE electrical LOM ports and two 10GE optical LOM ports. **NOTE** The GE ports support only 1000 Mbit/s, but do not support 10 Mbit/s or 100 Mbit/s.
10GE optical port	Optical port	2	

Name	Type	Quantity	Description
VGA port	DB15	1	The VGA port is used to connect a terminal, such as a monitor or KVM.
System serial port	RJ45	1	The serial port is used as the system serial port by default. You can set it as the iBMC serial port by using the iBMC command. This port is used for debugging.
Management network port	Ethernet port	1	The 1000 Mbit/s Ethernet port is used to manage the server.
USB port	USB 3.0	2	The USB ports allow USB devices to be connected to the server.
PSU socket	-	1 or 2	-

PCIe Slot Layout

Figure 4-6 shows the PCIe slots on the 2488 V5.

Figure 4-6 PCIe slot layout



PCIe slots on I/O modules 1 and 2

The riser card 1 provides slot 4, and the mainboard provides slots 1 to 3 and slots 5 to 9. Slots 7 to 9 are internal slots.

The following table describes the mapping between PCIe slots and CPU sockets, and the PCIe specifications.

NOTE

The PCIe slots mapping to a vacant processor socket are unavailable.

Table 4-2 PCIe slot description

PCIe Slot	CPU	PCIe Standard	Connector Bandwidth	Bus Bandwidth	Port Number	Slot Size
Slot 1	CPU 4	PCIe 3.0	x16	x16	Port2A	Half-height half-length
Slot 2	CPU 1	PCIe 3.0	x8	x8	Port1A	Half-height half-length
Slot 3	CPU 1	PCIe 3.0	x8	x8	Port1C	Half-height half-length
Slot 4	CPU 2	PCIe 3.0	x16	x16	Port2A	Full-height half-length
Slot 5	CPU 3	PCIe 3.0	x8	x8	Port2C	Half-height half-length
Slot 6	CPU 3	PCIe 3.0	x8	x8	Port2A	Half-height half-length
Slot 7	CPU 1	PCIe 3.0	x16	x16	Port2A	Half-height half-length
Slot 8	CPU 3	PCIe 3.0	x8	x8	Port3C	Half-height half-length
Slot 9	CPU 3	PCIe 3.0	x16	x16	Port1A	Half-height half-length

Note 1: 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.

Note 2: The PCIe slots that support PCIe x16 cards are backwards compatible with PCIe x8, PCIe x4, and PCIe x1 cards.

Note 3: The power supply capabilities of all slots support PCIe cards of 75 W. The power of a PCIe card depends on its model. For details about the supported PCIe cards, visit **http://support.huawei.com/onlinetoolsweb/ftca/en**. Contact the local Huawei sales representatives or technical support if the PCIe cards you use are not included in the compatibility list.

4.2 Ports

Table 4-3 and **Table 4-4** describes the ports on the 2488 V5.

Table 4-3 Ports on the front panel

Name	Type	Quantity	Description
VGA port	DB15	1	The VGA port is used to connect a terminal, such as a monitor or KVM. (25-SAS disk configuration does not provide this port.)
Front USB port	USB 3.0	2	The USB ports allow USB devices to be connected to the server. (25-SAS disk configuration does not provide these ports.) **NOTE** Before connecting an external USB device, check that the USB device functions properly. A server may operate abnormally if an abnormal USB device is connected. The USB ports allow USB devices to be connected to the server. **NOTE** Before connecting an external USB device, check that the USB device functions properly. A server may operate abnormally if an abnormal USB device is connected.
Rear USB port	USB 2.0	2	

Table 4-4 Ports on the rear panel

Name	Type	Quantity	Description
VGA port	DB15	1	The VGA port is used to connect a terminal, such as a monitor or KVM.
USB port	USB 3.0	2	The USB ports allow USB devices to be connected to the server. **NOTE** Before connecting an external USB device, check that the USB device functions properly. A server may operate abnormally if an abnormal USB device is connected.
Management network port (Mgmt)	RJ45	1	The GE port is used to manage the server.
Serial port	RJ45	1	It is an RJ45 interface complying with the RS232 standard and with the baud rate of 115200 bit/s. The port is used as the system serial port by default. You can set it as the iBMC serial port by using a command. This port is used for debugging.

Name	Type	Quantity	Description
GE electrical port	RJ45	2	The two GE electrical ports are used for server data services.
10GE optical port	SFP+	2	The two 10GE optical ports are used for server data services.

4.3 Indicators and Buttons

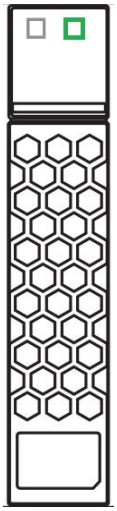
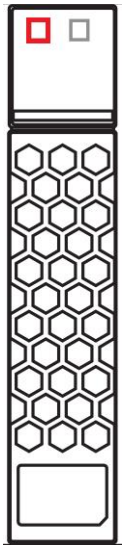
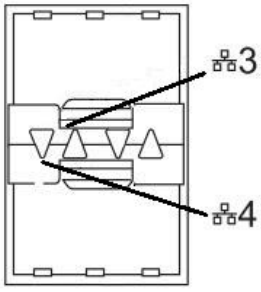
You can observe the indicators on the 2488 V5 to determine its status.

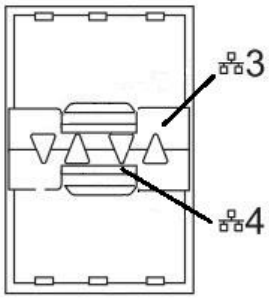
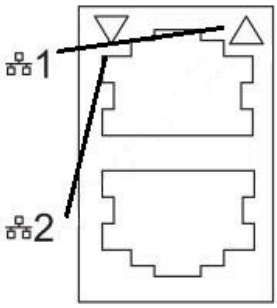
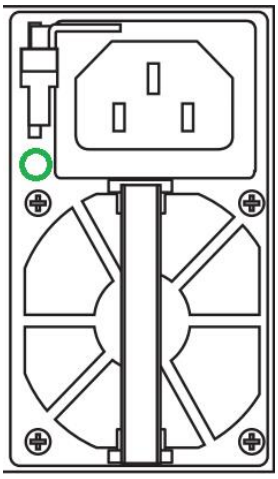
Table 4-5 describes the indicators and buttons on the 2488 V5 front panel.

Table 4-5 Indicators and buttons on the front panel

Silk Screen	Description	State Description
888	Fault diagnosis LED	● ---: The server is operating normally. ● Fault code: A server component is faulty.
	Power button/indicator	● Off: The server is not connected to a power source. ● Blinking yellow: The iBMC is starting. ● Steady yellow: The server is ready to power on. ● Steady green: The server is properly powered on. **NOTE** Holding down the power button for 6 seconds will forcibly power off the server.

Silk Screen	Description	State Description
	UID button/indicator	The UID button/indicator helps identify and locate a server in a cabinet. You can turn on or off the UID indicator by manually pressing the UID button or remotely running a command on the iBMC CLI. ● Steady blue: The server is being located. ● Off: The server is not being located. You can hold down the UID button for 4 to 6 seconds to reset the iBMC.
	Health indicator	● Steady green: The server is operating properly. ● Blinking red at 1 Hz: A major alarm has been generated on the server. ● Blinking red at 5 Hz: A critical alarm has been generated on the server.
	NMI button	The NMI button triggers a server to generate a non-maskable interrupt. You can press this button or control it remotely through the iBMC WebUI. **NOTE** ● Press the NMI button only when the OS is abnormal. Do not press this button when the server is operating properly. ● Before using this button, ensure that the NMI processing program is running on the OS. Otherwise, the OS may crash.

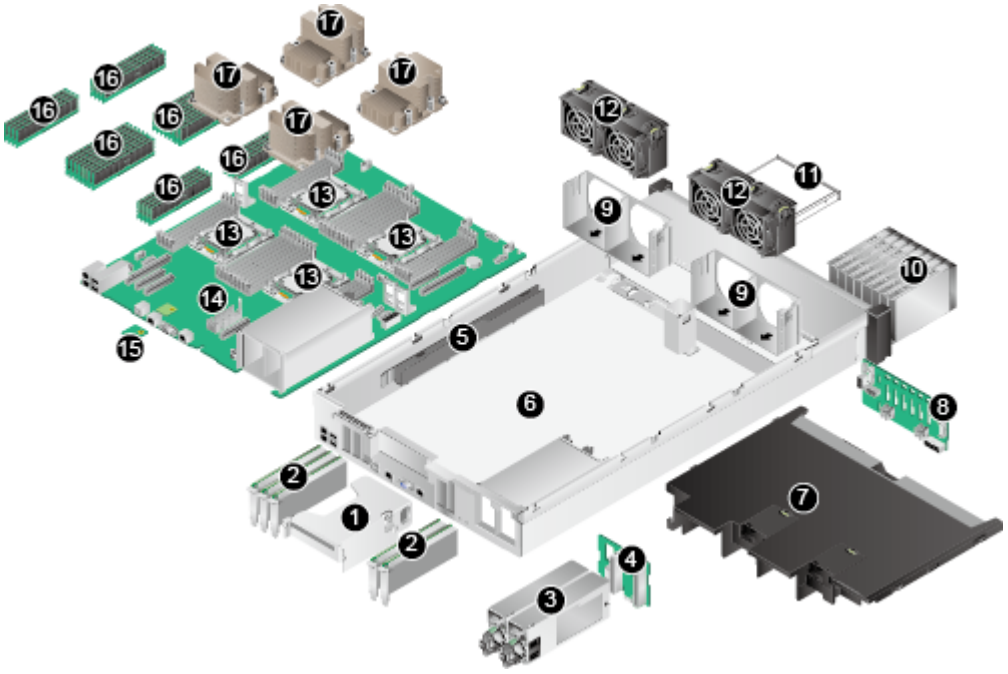
Silk Screen	Description	State Description
	Hard disk activity indicator	● Off: The hard disk is faulty or not detected. ● Blinking green: Data is being read from or written to the hard disk, or synchronized between hard disks. ● Steady green: The hard disk is inactive.
	Hard disk fault indicator	● Off: The hard disk is operating normally or is not detected in the RAID array. ● Blinking yellow: The server is locating the hard disk or rebuilding RAID. ● Steady yellow: The hard disk is not detected, the hard disk is faulty, or the RAID array status of the hard disk is abnormal. **NOTE** If the fault indicator is steady yellow, run the **Show** command to check the RAID status to determine whether the RAID array status is abnormal or whether the hard disk is faulty. For details about command description, see the **Huawei Server RAID Controller Card User Guide**.
	Data transmission indicator for the 10GE port	● Steady green: The network port is properly connected. ● Blinking green: Data is being transmitted. ● Off: The network port is not connected.

Silk Screen	Description	State Description
	Connection status indicator for the 10GE port	● Steady green: The data transmission rate is 10 Gbit/s or 1 Gbit/s. ● Off: The network port is not connected.
	GE port connection status indicator	● Steady green: The network port is properly connected. ● Blinking green: Data is being transmitted. ● Off: The network port is not connected.
	PSU status indicator	● Steady green: The power input and output are normal. ● Blinking green at 1 Hz: The power input is normal, but the power output is stopped due to power-on or installation detection. An input overvoltage or undervoltage fault occurs. The PSU enters the hibernation mode. ● Blinking green at 4 Hz: Online upgrade is being performed. ● 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. ● Off: No AC power is supplied.

4.4 Physical Structure

8-Disk Configuration

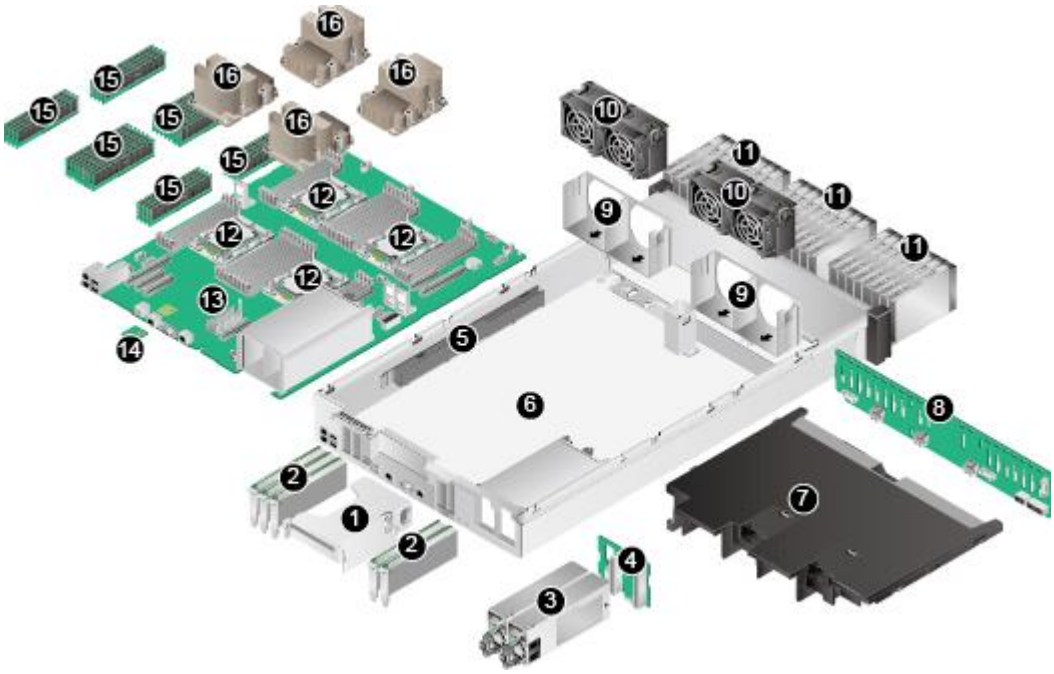
Components of a 2488 V5 with 8 SAS/SATA hard disks



1	Riser card	2	PCIe cards
3	PSUs	4	PSU backplane
5	Cable tray	6	Chassis
7	Air duct	8	Hard disk backplane
9	Fan module brackets	10	Hard disks
11	DVD-ROM drive (or LCD)	12	Fan modules
13	CPUs	14	Mainboard
15	TPM	16	DIMMs
17	Heat sinks	-	-

25-Disk Configuration

Components of a 2488 V5 with 25 SAS/SATA hard disks



1	Riser card	2	PCIe cards
3	PSUs	4	PSU backplane
5	Cable tray	6	Chassis
7	Air duct	8	Hard disk backplane
9	Fan module brackets	10	Fan modules
11	Hard disks	12	CPUs
13	Mainboard	14	TPM
15	DIMMs	16	Heat sinks

5 Product Specifications

About This Chapter

5.1 Technical Specifications

Table 5-1 lists the 2488 V5 technical specifications.

Table 5-1 Technical specifications

Item	Specifications
Form factor	2U rack server
CPU	Up to four Intel® Xeon® Scalable Platinum 8100, Gold 6100, or Gold 5100 processors, supporting three 10.4 GT/s UPI links, a maximum memory capacity of 4 TB, a maximum memory speed of 2666 MT/s, and up to 48 PCIe 3.0 links. **NOTE** When Intel® Xeon® Scalable Platinum/Gold processors are used, you are advised to upgrade the iBMC and BIOS to the latest versions.
Chipset	Intel C622
Memory	● Up to 32 DDR4 DIMM slots (eight DDR4 DIMM slots per CPU) for installing either RDIMMs or LRDIMMs. ● Maximum memory speed: 2666 MT/s ● 32 x 32 GB RDIMMs, with a maximum memory capacity of 1 TB ● 32 x 64 GB RDIMMs, with a maximum memory capacity of 2 TB ● 32 x 64 GB LRDIMMs, with a maximum memory capacity of 2 TB ● 32 x 128 GB LRDIMMs, with a maximum memory capacity of 4 TB ● Data protection measures: ECC, memory mirroring, single device data correction (SDDC), adaptive double device data correction (ADDDC), and lockstep **NOTE** DIMMs of different types (RDIMMs and LRDIMMs) and specifications (such as the capacity, bit width, rank, and height) cannot be installed on one server. The DIMMs on one server must have the same BOM number. For details about BOM numbers, use the **Huawei Server Compatibility Checker**.

Item	Specifications
Storage	● The 2488 V5 supports the following hard disk configurations: – 8 SAS/SATA hard disks: eight 2.5-inch front SAS/SATA hard disks with one SAS RAID controller card – 25 SAS/SATA hard disks: twenty-five 2.5-inch front SAS/SATA hard disks with one SAS RAID controller card ● Supports hard disk hot swap. ● Supports RAID 0, 1, 10, 1E, 5, 50, 6, and 60, provides an iBBU or 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 RAID controller card (with 2, 4, or 8 GB cache) to be configured on the mainboard to improve hard disk storage performance and supports a supercapacitor for power failure protection to ensure user data security. **NOTE** ● The maximum storage capacity of the server varies depending on the maximum capacity of a single hard disk. For details about the maximum storage capacity of the server, contact your local Huawei sales representatives.
Network port	Two RJ45 GE LOM ports and two 10GE SFP+ network ports
RAID support	Supports Broadcom MegaRAID 9361-8i standard RAID controller cards that provide functions such as RAID array creation, RAID state migration, RAID configuration memory. ● Broadcom MegaRAID 9361-8i: supports RAID 0, 1, 5, 6, 10, 50, and 60, and 1 GB cache, and a supercapacitor for power-off protection. **NOTE** Broadcom MegaRAID 9361-8i is a standard PCIe card and needs to be installed in the specified internal slot.
PCIe slot	● Supports a maximum of nine PCIe 3.0 expansion slots, among which three are internal card slots and six are external card slots. See **Table 4-2**. – Slots 1, 7, and 9 are x16 half-height half-length PCIe slots and slot 4 is an x16 full-height full-length PCIe slot. – Slots 2, 3, 5, 6, and 8 are x8 half-height half-length PCIe slots. ● Supports Huawei-developed NVMe SSD cards, which greatly improves I/O performance for search, cache, and download services. **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. ● For details about the PCIe slot configuration, contact your local Huawei sales representative.

Item	Specifications
Port	● Two USB 2.0 ports, one USB 3.0 port, and one DB15 VGA port on the front panel (2488 V5 with eight 2.5-inch or twenty-four 2.5-inch hard disks) ● Two USB 2.0 ports on the front panel (2488 V5 with twenty-five 2.5-inch hard disks) ● Two USB 3.0 ports, one DB15 VGA port, one RJ45 serial port, and one RJ45 management network port on the rear panel
Fan module	Four hot-swappable 8038+ fan modules, allowing one-fan failures
PSU	The power ratings of PSUs are as follows: ● 1500 W AC PSU – 1000 W (input voltage range: 100 V to 127 V AC) – 1500 W (input voltage range: 200 V to 240 V AC) – 1500 W (input voltage range: 190 V to 300 V DC) **NOTE** 1000 W (input voltage range: 100 V to 127 V AC) PSUs do not support 1+1 redundancy. For more information about PSUs, use the **Huawei Server Compatibility Checker**.
System management	● UEFI ● Huawei iBMC Uses an independent port. Supports Simple Network Management Protocol (SNMP) and Intelligent Platform Management Interface (IPMI). 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 ● Secure boot ● Front bezel
Video card	The mainboard integrates an SM750 graphics card chip, providing a memory capacity of 32 MB and supporting a maximum resolution of 1600 x 1200 at 60 Hz with 16 M colors. **NOTE** If a resolution higher than 1280 x 1024 is required, you need to install a dedicated graphics card driver.

Item	Specifications
Operating system	● SUSE Linux Enterprise Server 12 SP2 ● Red Hat Enterprise Linux 7.3 ● Windows Server 2012 R2 ● Windows Server 2016 ● Citrix 6.2 ● CentOS 6.9 ● CentOS 7.3 ● Ubuntu 14.04.5 ● Ubuntu 16.04.2 **NOTE** The preceding information is for reference only. To check the supported OS versions, use the **Huawei Server Compatibility Checker**.

5.2 Physical Specifications

Table 5-2 lists the 2488 V5 physical specifications.

Table 5-2 Physical specifications

Item	Specifications
Dimensions (H x W x D)	86.1 mm (2U) x 447 mm x 748 mm (3.39 in. x 17.60 in. x 29.45 in.)
Installation space	The server fits into a universal cabinet that complies with the IEC 297 standard. ● Cabinet width: 19 in. ● Minimum cabinet depth: 900 mm (35.43 in.)
Weight in full configuration	● With eight 2.5-inch hard disks: 27 kg (59.53 lb) ● With twenty-five 2.5-inch hard disks: 30 kg (66.15 lb) Packaging materials: 5 kg (11.03 lb)

Item	Specifications
Temperature	Operating temperature: 5°C to 45°C (41°F to 113°F) (meeting the ASHRAE CLASS A3 and A4 standards) Storage temperature: -40°C to +65℃ (-104°F to +149°F) Temperature change rate: < 20°C/h (36°F/h) Long-term storage temperature: 21℃ to 27℃ (69.8℉ to 80.6℉) **NOTE** ● When 8180/8168/6154 processors are installed, the maximum operating temperature is 35°C (95°F). When 5122/5120/5118 processors are installed, the maximum operating temperature is 45°C (113°F). When other models of processors are installed, the maximum operating temperature is 40°C (104°F). ● The maximum operating temperature supported by a server with 8 NVMe SSDs and 16 SAS/SATA hard disks, or with 24 NVMe SSDs is 35°C (95°F); the maximum operating temperature supported by a server with 25 SAS/SATA hard disks is 40°C (104°F); the maximum operating temperature supported by a server with 8 SAS/SATA hard disks or 8 NVMe SSDs is 45°C (113°F). ● The ambient temperature cannot be higher than the smaller value of the maximum operating temperatures supported by CPUs and hard disks. ● When a fan fails, the maximum operating temperature is 5°C (41°F) lower than the maximum operating temperature when all fans are running properly.
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	Maximum altitude: 3000 m (9842.4 ft). At altitudes higher than 900 m (2952.72 ft), the operating temperature decreases by 1ºC (1.8°F) with each 300 m (984.24 ft) increase in altitude.
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: 5.1 Bels – LpAm: 38.5 dBA ● Operating: – LWAd: 6.1 Bels – LpAm: 45.2 dBA **NOTE** The actual sound levels generated when the server is operating vary depending on the server configuration, workload, and ambient temperature.

6 Component Compatibility

About This Chapter

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

6.1 CPU

The 2488 V5 supports two or four Intel® Xeon® Scalable series processors (Platinum 8100, Gold 6100, or Gold 5100). If only two processors are configured, install them in the CPU 1 and CPU 2 sockets.

The following table lists the CPUs supported by the 2488 V5.

NOTE

- 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?_ga=2.177735788.892605408.1505119021-2038087524.1485138084**.

Table 6-1 Supported CPUs

BOM Number	Description
02311XQR	Function Module,Server,BC6M16CPU,Intel Xeon Gold 5122(3.6GHz/4-core/16.5MB/105W) Processor (with heatsink)
02311XQX	Function Module,Server,BC6M20CPU,Intel Xeon Gold 6128(3.4GHz/6-core/19.25MB/115W) Processor (with heatsink)
02311XQM	Function Module,Server,BC6M12CPU,Intel Xeon Gold 6134(3.2GHz/8-core/24.75MB/130W) Processor (with heatsink)
02311XQU	Function Module,Server,BC6M18CPU,X86 series-FCLGA3647-3600MHz-1.6V/1.83V-64bit-105000mW-Skylake-SP Xeon Platinum 8156-4Core,with heatsink
02311XQS	Function Module,Server,BC6M24CPU,Intel Xeon Gold 5118(2.3GHz/12-core/16.5MB/105W) Processor (with heatsink)
02311XQG	Function Module,Server,BC6M07CPU,Intel Xeon Gold 6126(2.6GHz/12-core/19.25MB/125W) Processor (with heatsink)
02311XRA	Function Module,Server,BC6M22CPU,Intel Xeon Gold 6136(3.0GHz/12-core/24.75MB/150W) Processor (with heatsink)
02311XUQ	Function Module,Server,BC6M26CPU,Intel Xeon Gold 5120(2.2GHz/14-core/19.25MB/105W) Processor (with heatsink)
02311XQY	Function Module,Server,BC6M21CPU,Intel Xeon Gold 6132(2.6GHz/14-core/19.25MB/140W) Processor (with heatsink)
02311XQJ	Function Module,Server,BC6M09CPU,Intel Xeon Gold 6130(2.1GHz/16-core/22MB/125W) Processor (with heatsink)
02311XUS	Function Module,Server,BC6M28CPU,Intel Xeon Gold 6130T(2.1GHz/16-core/22MB/125W) Processor (with heatsink)
02311XQH	Function Module,Server,BC6M08CPU,Intel Xeon Gold 6142(2.6GHz/16-core/22MB/150W) Processor (with heatsink)

BOM Number	Description
02311XQL	Function Module,Server,BC6M11CPU,Intel Xeon Gold 6140(2.3GHz/18-core/24.75MB/140W) Processor (with heatsink)
02311XQQ	Function Module,Server,BC6M15CPU,Intel Xeon Gold 6150(2.7GHz/18-core/24.75MB/165W) Processor (with heatsink)
02311XRB	Function Module,Server,BC6M23CPU,Intel Xeon Gold 6154(3.0GHz/18-core/24.75MB/200W) Processor (with heatsink)
02311XQK	Function Module,Server,BC6M10CPU,Intel Xeon Gold 6138(2.0GHz/20-core/27.5MB/125W) Processor (with heatsink)
02311XQP	Function Module,Server,BC6M14CPU,Intel Xeon Gold 6148(2.4GHz/20-core/27.5MB/150W) Processor (with heatsink)
02311XQN	Function Module,Server,BC6M13CPU,Intel Xeon Gold 6152(2.1GHz/22-core/30.25MB/140W) Processor (with heatsink)
02311XQV	Function Module,Server,BC6M18CPU,Intel Xeon Platinum 8156(3.6GHz/4-core/16.5MB/105W) Processor (with heatsink)
02311XQT	Function Module,Server,BC6M17CPU,Intel Xeon Platinum 8158(3.0GHz/12-core/24.75MB/150W) Processor (with heatsink)
02311XQW	Function Module,Server,BC6M19CPU,Intel Xeon Platinum 8153(2.0GHz/16-core/22MB/125W) Processor (with heatsink)
02311XQB	Function Module,Server,BC6M02CPU,Intel Xeon Platinum 8160(2.1GHz/24-core/33MB/150W) Processor (with heatsink)
02311XQF	Function Module,Server,BC6M06CPU,Intel Xeon Platinum 8168(2.7GHz/24-core/33MB/205W) Processor(with heatsink)
02311XQC	Function Module,Server,BC6M03CPU,Intel Xeon Platinum 8164(2.0GHz/26-core/35.75MB/150W) Processor (with heatsink)
02311XQD	Function Module,Server,BC6M04CPU,Intel Xeon Platinum 8170(2.1GHz/26-core/35.75MB/165W) Processor (with heatsink)
02311XQE	Function Module,Server,BC6M05CPU,Intel Xeon Platinum 8176(2.1GHz/28-core/38.5MB/165W) Processor (with heatsink)
02311XQA	Function Module,Server,BC6M01CPU,Intel Xeon Platinum8180(2.5GHz/28-Core/39MB/205W)Processor (with heatsink)

6.2 Memory

Memory Configuration Rules

The 2488 V5 supports up to 16 DIMMs when equipped with two processors and supports up to 32 DIMMs when equipped with four processors.

Observe the following rules when configuring DIMMs:

1. At least one DIMM must be configured.
2. DIMMs of different types (RDIMMs and LRDIMMs) cannot be installed on one server.
3. Each channel supports a maximum of eight ranks.

   NOTE

   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.

4. 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.

   NOTE

   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 ≤ Number of ranks supported by each memory channel/Number of ranks supported by each DIMM

5. 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. This speed varies with the rated speed, operating voltage, and number of DIMMs for each memory channel. For details, see **Maximum operating speed** in the following tables.

Table 6-2 RDIMM configuration

Parameter	RDIMM
Rank	Single Rank, dual rank, and quad rank
Rated speed (MT/s)	2666
Operating voltage (V)	1.2
Maximum number of DIMMs	32
Maximum capacity per DIMM (GB)	64
Maximum memory capacity (GB)	2048
Maximum operating speed (MT/s)	2666
Note: The maximum number of DIMMs listed in this table is based on four processors. These values are halved for a server with only two processors.	

Table 6-3 LRDIMM configuration

Parameter	LRDIMM
Rank	Single Rank, dual rank, and quad rank
Rated speed (MT/s)	2666

Parameter	LRDIMM
Operating voltage (V)	1.2
Maximum number of DIMMs	32
Maximum capacity per DIMM (GB)	64
Maximum memory capacity (GB)	2048
Maximum operating speed (MT/s)	2666
Note: The maximum number of DIMMs listed in this table is based on four processors. These values are halved for a server with only two processors.	

Memory Slot Configuration Rules

- The server supports DIMMs of 8 GB, 16 GB, 32 GB, and 64 GB. A server fully configured with DIMMs has up to 2048 GB of memory.
- The server provides up to 32 DDR4 DIMM slots. Each processor supports six memory channels. Channels 0 and 3 each support two DIMMs, and other channels each support only one DIMM.

  The following figure shows the DIMM slots and their numbers.

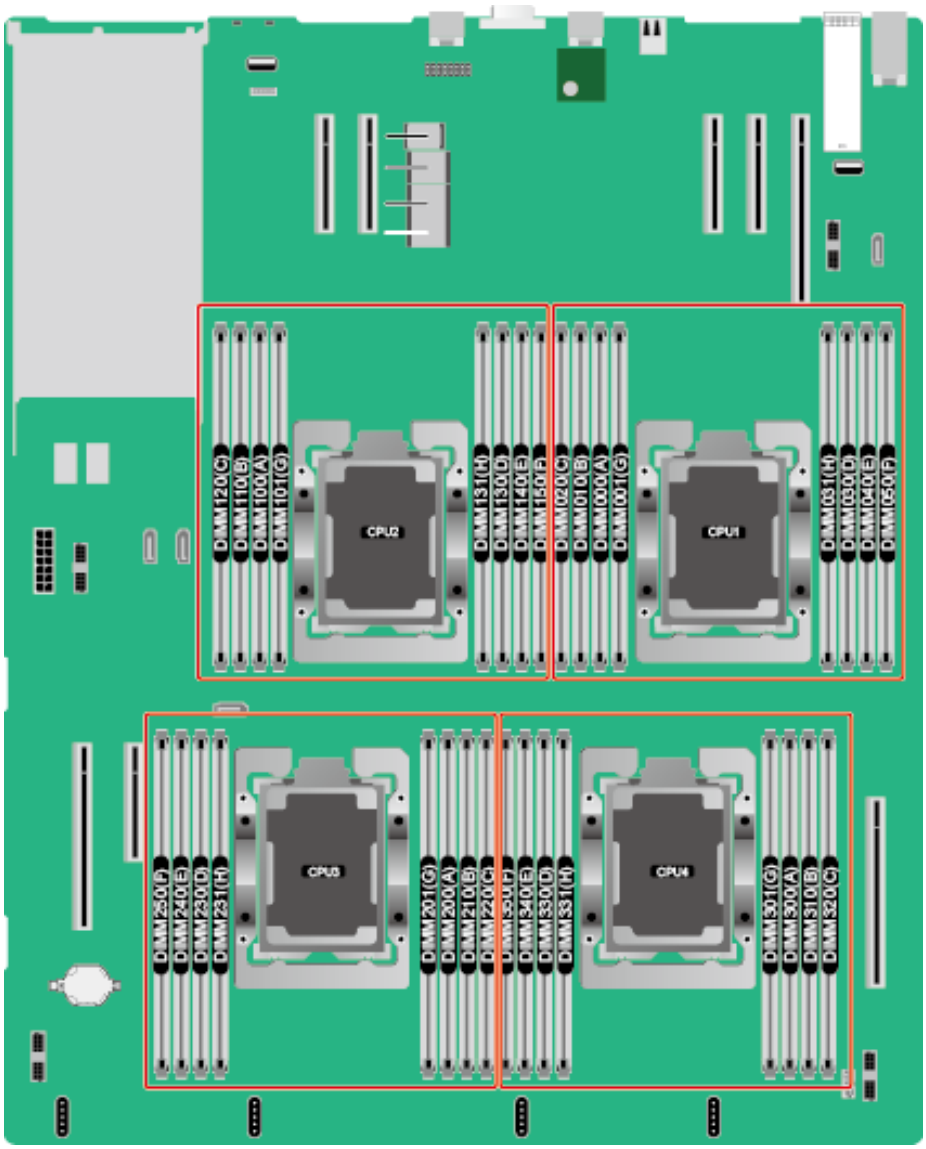


Table 6-4 lists the channels for each CPU.

Table 6-4 Channels

CPU Socket	Channel	DIMM
CPU 1	A	DIMM000(A)
		DIMM001(G)
	B	DIMM010(B)
	C	DIMM020(C)
	D	DIMM030(D)
		DIMM031(H)
	E	DIMM040(E)

CPU Socket	Channel	DIMM
	F	DIMM050(F)
CPU 2	A	DIMM100(A)
		DIMM101(G)
	B	DIMM110(B)
	C	DIMM120(C)
	D	DIMM130(D)
		DIMM131(H)
	E	DIMM140(E)
	F	DIMM150(F)
CPU 3	A	DIMM200(A)
		DIMM201(G)
	B	DIMM210(B)
	C	DIMM220(C)
	D	DIMM230(D)
		DIMM231(H)
	E	DIMM240(E)
	F	DIMM250(F)
CPU 4	A	DIMM300(A)
		DIMM301(G)
	B	DIMM310(B)
	C	DIMM320(C)
	D	DIMM330(D)
		DIMM331(H)
	E	DIMM340(E)
	F	DIMM350(F)

Table 6-5 lists the order in which the DIMMs are installed.

Table 6-5 Installation order

CPU	DIMM Installation Order
CPU 1 and CPU 2	000(A), 100(A), 010(B), 110(B), 020(C), 120(C), 030(D), 130(D), 040(E), 140(E), 050(F), 150(F), 001(G), 101(G), 031(H), 131(H)
CPU1, CPU2, CPU3, and CPU4	000(A), 100(A), 200(A), 300(A), 010(B), 110(B), 210(B), 310(B), 020(C), 120(C), 220(C), 320(C), 030(D), 130(D), 230(D), 330(D), 040(E), 140(E), 240(E), 340(E), 050(F), 150(F), 250(F), 350(F), 001(G), 101(G), 201(G), 301(G), 031(H), 131(H), 231(H), 331(H)

Memory Protection Technologies

The server supports the following memory protection technologies:

- Advanced ECC
- Memory mirroring
- SDDC
- ADDDC
- Rank sparing
- Lockstep

Supported DIMMs

The following table lists the DIMMs supported by the 2488 V5.

NOTE

- The following table is for reference only. For details about component options, consult the local Huawei sales representatives.
- DIMMs on the same server must be of the same model.

Table 6-6 Supported DIMMs

BOM Number	Capacity	Description
06200212	8 GB	Memory Module,DDR4 RDIMM,8GB,288pin,0.8ns, 2400000KHz,1.2V,ECC,2Rank(512M*8bit)
06200225	16 GB	Memory Module,DDR4 RDIMM,16GB,288pin,0.83ns, 2400000KHz,1.2V,ECC,2Rank(1G*8bit)
06200224	32 GB	Memory Module,DDR4 RDIMM,32GB,288pin,0.83ns, 2400000KHz,1.2V,ECC,2Rank(2G*4bit)
06200219	64 GB	Memory Module,DDR4 LRDIMM,64GB,288pin,0.8ns, 2400000KHz,1.2V,ECC,4Rank(2G*4bit)

BOM Number	Capacity	Description
06200244	8 GB	Memory Module,DDR4 RDIMM,8GB,288pin,0.75ns, 2666000KHz,1.2V,ECC,1Rank(1G*8bit),IT Dedicated
06200240	16 GB	Memory Module,DDR4 RDIMM,16GB,288pin,0.75ns, 2666000KHz,1.2V,ECC,2Rank(1G*8bit)
06200241	32 GB	Memory Module,DDR4 RDIMM,32GB,288pin,7.5ns, 2666000KHz,1.2V,ECC,2Rank(2G*4bit)
06200242	64 GB	Memory Module,DDR4 LRDIMM,64GB,288pin,0.75ns, 2666000KHz,1.2V,ECC,4Rank(2G*4bit)

6.3 Storage

The 2488 V5 supports the following types of hard disk configurations:

- 8 SAS/SATA hard disks

  The server supports a maximum of eight 2.5-inch front SAS/SATA hard disks. One standard RAID controller card is required.

- 25 SAS/SATA hard disks

  The server supports a maximum of twenty-five 2.5-inch front SAS/SATA hard disks. One standard RAID controller card is required.

The following tables list the supported hard disks.

NOTE

The following table lists some typical options which are for reference only. For details about component options, consult the local Huawei sales representatives.

Table 6-7 Supported SAS/SATA hard disks

BOM Number	Capacity	Description
02311HAN	300 GB	300GB-SAS 12Gb/s-10K rpm-2.5inch-128MB
02311EXX	300 GB	300GB-SAS 12Gb/s-15K rpm-2.5inch-128MB
02310YCH	1 TB	1000GB-SATA-7200rpm-2.5"-64M

Table 6-8 Supports NVMe SSDs

BOM Number	Capacity	Description
02311PNQ	1.8 TB	Function Module,Servers,ES3500P V3 SSD, 1800GB,NVMe PCIe,Read Intensive,1 DWPD, 2.5inch(2.5inch Drive Bay),LE Series,Tencent

BOM Number	Capacity	Description
02311MSC	2 TB	Function Module,Servers,ES3500P V3 SSD, 2000GB,NVMe PCIe,Read Intensive,1 DWPD, 2.5inch(2.5inch Drive Bay)
02311MSE	3.2 TB	Function Module,Servers,ES3500P V3 SSD, 3200GB,NVMe PCIe,Read Intensive,1 DWPD, 2.5inch(2.5inch Drive Bay)

The following table lists the supported standard PCIe RAID controller cards.

NOTE

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

Table 6-9 Supported standard PCIe RAID controller cards

BOM Number	Chip	Description	Vendor	Remarks
02311WMX	LSI SAS3108	Function Module,2488 V5,BC6M02RAID,AVAGO9361 PCIe RAID Controller,RAID0, 1, 5, 6, 10, 50, 60,1GB cache,PCIe 3.0 X8,used for 8HDD	Broadcom	Note1
02311WMY	LSI SAS3108	Function Module,2488 V5,BC6M01RAID,AVAGO9361 PCIe RAID Controller,RAID0,1,5,6,10,50,60,1GB cache,PCIe 3.0 X8,used for 25HDD	Broadcom	Note1
02311XJF	LSI SAS3108	Function Module,2488 V5,BC6M03RAID,AVAGO9361 PCIe RAID Controller,RAID0, 1, 5, 6, 10, 50, 60,1GB cache,PCIe 3.0 X8,used for 8NVME+16HDD	Broadcom	Note1
02311YFU		Function Module,Server,BC1M01TFM,LSI Flash Card-4GB,TFM, Supercapacitor and 620mm Cable Module	Broadcom	Provides a supercapacitor to protect data in the case of power failures.

BOM Number	Chip	Description	Vendor	Remarks
Note: If a supercapacitor for power-off protection is required, select 02311YFU.				

The following table describes the comparison between RAID levels in the performance, minimum number of hard disks, and disk usage.

Table 6-10 RAID level comparison

RAID Level	Reliability	Read Performance	Write Performance	Minimum Number of Hard Disks	Hard Disk Usage
RAID 0	Low	High	High	2	100%
RAID 1	High	Low	Low	2	50%
RAID 5	Relatively high	High	Medium	3	(N – 1)/N
RAID 6	Relatively high	High	Medium	4	(N – 2)/N
RAID 10	High	Medium	Medium	4	50%
RAID 50	High	High	Relatively high	6	(N – M)/N
RAID 60	High	High	Relatively high	8	(N - M x 2)/N
Note: N indicates the number of member disks in a RAID group, and M indicates the number of subgroups in a RAID group.					

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)
- InfiniBand (IB) expansion card
- SAS HBA
- Network expansion card
- SSD card

The following tables list the PCIe cards supported by the server.

NOTE

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

Table 6-11 Supported standard PCIe cards (FC HBAs)

BOM Number	Model	Description	API Type	Vendor	Remarks
06030382	QLE2692	Other Cards,HBA Card QLE2692-HUA-SP,FC Double Ports-16Gb/s,PCIE 3.0 x8-Vendor ID 1077-Device ID 2261-2,Multimode optical module,half width half length	SFP+	QLogic	Note 1
06030381	QLE2690	Other Cards,HBA Card QLE2690-HUA-SP,FC Single Port-16Gb/s,PCIE 3.0 x8-Vendor ID 1077-Device ID 2261-1,Without Doc,Multimode optical module,half width half length	SFP+	QLogic	Note 1
Note: 1. The compatibility information released by third-party vendors prevails. To download drivers, visit third-party websites. 2. The server provides SFP+ Optics.					

Table 6-12 Supported standard PCIe cards (IB expansion cards)

BOM Number	Model	Description	API Type	Vendor	Remarks
06030284	MCX354A	Other Cards,Infiniband MCX354A-FCBT,FDR Dual port-56Gb/s,PCIE 3.0 X8-Vendor ID 15b3-Device ID 1003-1,English doc,half width half length	QSFP	QLogic	Note 1

BOM Number	Model	Description	API Type	Vendor	Remarks
Note: 1. The compatibility information released by third-party vendors prevails. To download drivers, visit third-party websites.					

Table 6-13 Supported standard PCIe cards (NICs)

BOM Number	Model	Description	API Type	Vendor	Remarks
02311CWM	I350	Function Module,Server,CN21ITGC01,Intel I350 4*GE Half-height Half-length ,Full Handle bars,Ethernet Card,PCIE 2.0 X4-Vendor ID 8086-Device ID 1521-4	RJ45	Intel	Note 1
02311MSP	X540	Function Module,Rack Server,CN2M01ITGD,Ethernet Adapter, 10Gb Electrical Interface(Intel X540),2-Port,RJ45,PCIe 2.0 x8	SFP+	Intel	Note 1
02311PXA	X550	Function Module,Rack Server,CN2M01ITGE,Ethernet Adapter, 10Gb Electrical Interface(Intel X550),2-Port,RJ45,PCIe 2.0 x8	SFP+	Intel	Note 1

BOM Number	Model	Description	API Type	Vendor	Remarks
02311RMW	X710	Function Module,Rack Server,CN2M01ITGG,Ethernet Adapter, 10Gb Optical Interface(Intel X710),2-Port,SFP+ (without Optical Transceiver),PCIe 3.0 x8	SFP+	Intel	Note 1
02311RMY	XL710	Function Module,Rack Server,CN2M02ITGH,Ethernet Adapter, 10Gb Optical Interface(Intel XL710),4-Port,SFP +(without Optical Transceiver),PCIe 3.0 x8	SFP+	Intel	Note 1
Note: 1. The compatibility information released by third-party vendors prevails. To download drivers, visit third-party websites.					

Table 6-14 Supported standard PCIe cards (PCIe SSDs)

BOM Number	Model	Description	API Type	Vendor
02311SHA	ES3600C	Function Module,ES3000 V3,HWE36P43008M000N,ES3600C-800GB-3 DWPD-PCIE 3.0 X4-Vendor ID 19e5-Device ID 0123-1,Model number HWE36P43008M000N,HH/HL Card,NVMe SSD	PCIe 3.0	Huawei

BOM Number	Model	Description	API Type	Vendor
02311PBJ	ES3600C	Function Module,ES3000 V3,CN2M10FACP,ES3600C-3200GB-3 DWPD-PCIE 3.0 X4-Vendor ID 19e5-Device ID 0123-1,Model number HWE36P43032M000N,HH/HL Card,NVMe SSD	PCIe 3.0	Huawei

6.5 PSU

Table 6-15 lists the PSU supported by the server.

NOTE

- Table 6-15 is for reference only. For details about component options, consult the local Huawei sales representatives.
- A server must use PSUs of the same model.

Table 6-15 Supported PSUs

BOM Number	Rated Power	Power Input	Power Output	Energy Efficiency Grade	Altitude
02131336	1500 W	200 V-240 V/6.8 A	+12 V/125 A 94.0%	Platinum	2000 m

6.6 OS and Software Support

Table 6-16 lists the OSs supported by the 2488 V5.

NOTE

Table 6-16 is for reference only. For details about component options, consult the local Huawei sales representatives.

Table 6-16 Supported OSs

OS	Description
SLES 12 SP2	SUSE Linux Enterprise Server 12 Service Pack 2 for Intel EM64T
CentOS 7.3	CentOS Linux 7 Update 3 Server for Intel EM64T
Citrix XenServer 6.2	Citrix XenServer 6.2
Citrix XenServer 6.5	Citrix XenServer 6.5
RHEL 7.3	Red Hat Enterprise Linux 7 Update 3 Server for Intel EM64T
Ubuntu 12.04	Ubuntu 12.04 LTS Server Edition for Intel EM64T
VMware ESXi 6.5	VMware ESXi 6.5
Windows 2012 R2	Microsoft Windows Server 2012 R2
Windows 2016	Microsoft Windows Server 2016

7 System Management

The server uses Huawei's proprietary Intelligent Baseboard Management Controller (iBMC) to implement remote server management. The iBMC complies with Intelligent Platform Management Interface (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
- Redfish

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
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 continuous operation.
Integrated virtual KVM	Provides remote maintenance measures and the VNC service for troubleshooting, and supports a maximum resolution of 1920 x 1200.

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. The iBMC WebUI supports OSs, web browsers, and JRE of the following versions: ● Windows 7 (32-bit); Internet Explorer 9/10/11, Mozilla Firefox 26/34, or Google Chrome 21/39; JRE 1.6.0 U25/1.7.0 U40/1.8.0 U45 or later ● Windows 8 (32-bit/64-bit); Internet Explorer 9/10/11, Mozilla Firefox 26/34, or Google Chrome 21/39; JRE 1.6.0 U25/1.7.0 U40/1.8.0 U45 or later ● Windows Server 2008 R2 (32-bit/64-bit); Internet Explorer 9/10/11, Mozilla Firefox 26/34, or Google Chrome 21/39; JRE 1.6.0 U25/1.7.0 U40/1.8.0 U45 or later ● Windows Server 2012 R2 (32-bit/64-bit); Internet Explorer 9/10/11, Mozilla Firefox 26/34, or Google Chrome 21/39; JRE 1.6.0 U25/1.7.0 U40/1.8.0 U45 or later ● Red Hat Enterprise Linux 6.0 (64-bit); Mozilla Firefox 26/34; Google Chrome 21/39; JRE 1.6.0 U25/1.7.0 U40/1.8.0 U45 or later ● Mac; Safari 5.1; Mozilla Firefox 26/34; JRE 1.6.0 U25/1.7.0 U40/1.8.0 U45 or later
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 to manage and check assets being used in a unified manner.
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 help build an all-IPv6 environment.

Feature	Description
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-ROM drives and iBBUs, 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.

9 Certifications

No.	Country/ Region	Certification	Standards
1	China	RoHS	SJ/T 11363—2006 SJ/T 11364—2006 GB/T 26572—2011
2	China	CCC	GB4943.1-2011 GB9254-2008(Class A) GB17625.1-2012

No.	Country/ Region	Certification	Standards
6	Europe	CE	Safety: IEC 60950-1:2005(2nd Edition)+A1:2009 and/or 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 IEC 61000-3-2:2005+A1:2008+A2:2009/EN 61000-3-2:2006+A1:2009+A2:2009 IEC 61000-3-3:2008/EN 61000-3-3:2008 IEC 61000-6-2:2005/EN 61000-6-2:2005 IEC 61000-6-4:2006+A1:2010/EN 61000-6-4:2007+A1:2011 RoHS: 2002/95/EC, 2011/65/EU, EN 50581: 2012 REACH: EC NO. 1907/2006 WEEE: 2002/96/EC, 2012/19/EU
7	America	FCC	FCC CFR47 Part 15:2005 Class A
9	America	Energy Star	ENERGY STAR® Program Requirements for Computer Servers
10	Canada	IC	ICES-003:2004 Class A
11	Australia	C-tick	AS/NZS CISPR 22:2009
12	Japan	VCCI	VCCI V-3:2012
13	Saudi	SASO	IEC 60950-1: 2005 (2nd Edition) + A1:2009 EN 60950-1:2006+A11:2009+A1:2010 + A12:2011
14	Nigeria	SONCAP	IEC 60950-1: 2005 (2nd Edition) + A1:2009 EN 60950-1:2006+A11:2009+A1:2010 + A12:2011

No.	Country/ Region	Certification	Standards
15	Kuwait	Kucas	IEC 60950-1: 2005 (2nd Edition) + A1:2009 EN 60950-1:2006+A11:2009+A1:2010 + A12:2011