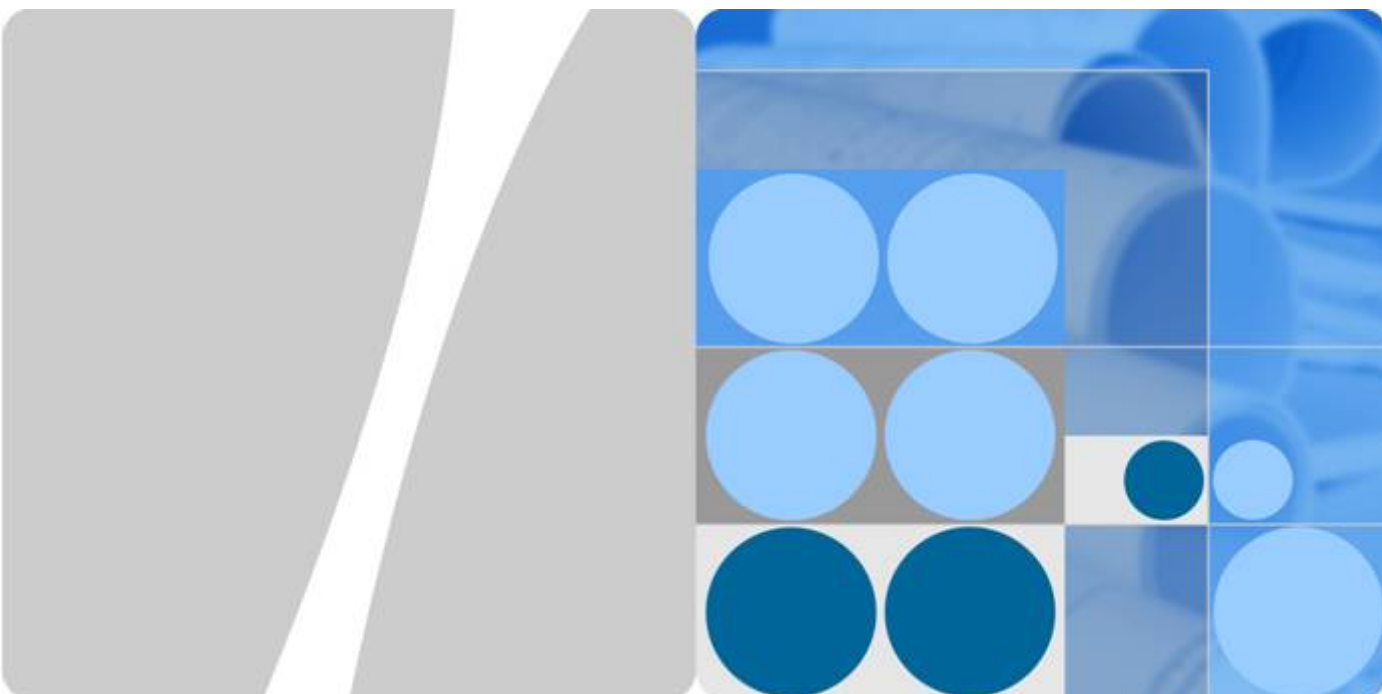




Huawei FusionServer RH1288 V3

White Paper

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1 Overview

The Huawei FusionServer RH1288 V3 is a general-purpose 1U 2-socket rack server launched to meet customer requirements for the Internet, Internet data center (IDC), cloud computing, enterprise, and telecom service applications.

The RH1288 V3 features high-performance computing (HPC), large storage capacity, low power consumption, and high scalability and reliability, and is easy to manage and deploy. It is suitable for various applications, including distributed storage, data mining, electronic album, video, basic enterprise applications, and telecom services.

The RH1288 V3 supports the following hard disk configurations:

- Eight hard disks
Up to eight front 2.5-inch SAS hard disk drives (HDDs), SATA HDDs, or solid-state drives (SSDs) (SAS refers to Serial Attached Small Computer System Interface, and SATA refers to Serial Advanced Technology Attachment.)
The hard disks on the server can be connected through the Intel chipset (PCH) or a SAS RAID controller card.
- Eight hard disks
Up to four front 2.5-inch SAS HDDs, SATA HDDs, or SSDs, and four NVMe PCIe SSDs
- Four hard disks
Up to four front 3.5-inch SAS or SATA disks
The hard disks on the server can be connected through the Intel chipset (PCH) or a SAS RAID controller card.

NOTE

- The server where hard disks are connected through the Intel chipset (PCH) supports SATA disks only, an optional SoftRAID license, and SoftRAID 0, 1, and 5. The server with SoftRAID configuration does not support installation of a virtualization OS. If you have any doubt about the hard disk configuration, contact your local Huawei sales representatives.
- The slots for NVMe PCIe SSDs also support 2.5-inch SAS HDDs, SATA HDDs, or SSDs.

Figure 1-1 RH1288 V3



2 Features

Performance and Scalability

The RH1288 V3 provides the following features to enhance performance and scalability:

- The Intel® Xeon® E5-2600 v3 series processor ensures high processing performance by providing up to:
 - 16 cores
 - 3.5 GHz frequency
 - 40 MB L3 cache
 - Two 9.6 GT/s QuickPath Interconnect (QPI) links between processors
- The Intel® Xeon® E5-2600 v4 series processor ensures high processing performance by providing up to:
 - 20 cores
 - 3.5 GHz frequency
 - 50 MB L3 cache
 - Two 9.6 GT/s QuickPath Interconnect (QPI) links between processors
- An RH1288 V3 supports two processors, 32 cores, and 64 threads, which maximizes the concurrent execution of multithreaded applications.
- The RH1288 V3 supports up to sixteen 2400 MT/s DDR4 registered DIMMs (RDIMMs) or load-reduced DIMMs (LRDIMMs) to provide a maximum memory capacity of 1024 GB. The maximum theoretical memory bandwidth is 136.5 GB/s, ensuring high speed. The DIMMs adopt error checking and correcting (ECC) technology, ensuring high availability.
- 1.2 V DDR4 DIMMs consume 20% less power than 1.5 V DDR3 DIMMs.
- Intel® Turbo Boost Technology 2.0 allows processor cores to run faster than the frequency specified in the Thermal Design Power (TDP) configuration if they are operating below power, current, and temperature specification limits.
- Intel Hyper-Threading technology enables each processor core to run up to two threads, improving parallel computing capacity.
- The hardware-assisted Intel® Virtualization Technology (Intel® VT) allows operating system (OS) vendors to better use hardware to address virtualized workloads.

- Integrated with the Intel® Advanced Vector Extensions 2.0 (AVX 2.0) instruction set, the RH1288 V3 improves floating-point computing performance for compute-intensive applications.
- The use of only SSDs provides higher I/O performance than the mixed use of HDDs and SSDs or use of only HDDs. An SSD supports up to 100 times more I/O operations per second (IOPS) than a typical HDD.
- The RH1288 V3 provides elastic, scalable storage capacity with various hard disk configurations to meet diverse storage and upgrade requirements.
- The RH1288 V3 supports onboard or plug-in NICs for providing a variety of network ports.
- The RH1288 V3 supports Peripheral Component Interconnect Express (PCIe) 3.0 to provide 60% higher I/O bandwidth (8 GT/s) than PCIe 2.0 (5 Gbit/s).
- The Intel® Xeon® E5 series processors incorporate the PCIe 3.0 controller using the Intel Integrated I/O technology to shorten I/O latency and enhance overall system performance.

Availability and Serviceability

The RH1288 V3 provides the following features to improve availability and serviceability:

- The RH1288 V3 uses carrier-class components and follows the engineering process to dramatically improve system reliability.
- The RH1288 V3 uses hot-swappable SATA HDDs, SAS HDDs, or SSDs. It supports RAID 0, 1, 1E, 10, 5, 50, 6, and 60, and offers a RAID cache. A supercapacitor is used to protect RAID cache data from power failures.
- The UID and HLY indicators on the front panel, fault diagnosis LED, and iBMC web user interface (WebUI) help technical support personnel promptly obtain the status of key components and locate failed or failing components. This simplifies maintenance, accelerates troubleshooting, and helps improve system availability.
- SSDs offer better reliability than HDDs, which helps maximize system uptime.
- 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.
- For RH1288 V3 servers used in China, Huawei provides a three-year warranty for parts replacement and limited onsite repair, as well as a 10-hour-a-day, 5-day-a-week Next Business Day (NBD) support program with optional service upgrades.
- For RH1288 V3 servers used outside China, Huawei provides a three-year warranty for parts replacement and repair, as well as a 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 RH1288 V3 provides the following features to ensure manageability and security:

- The built-in management module iBMC monitors server operating status and provides remote management.
- 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, maximizing

return on investment (ROI) for customers. NC-SI can be enabled or disabled using iBMC or the basic input/output system (BIOS). NC-SI is disabled by default.

- The integrated industry-standard Unified Extensible Firmware Interface (UEFI) increases efficiency of setup, configuration, and updates, and simplifies the fault handling process.
- The Trusted Platform Module (TPM) provides advanced encryption functions, including digital signatures and remote authentication.
- The server chassis panel can be locked to ensure security of local server data.
- The industry-standard Advanced Encryption Standard–New Instruction (AES NI) supports faster and stronger encryption.
- The Intel Execute Disable Bit 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 hardware-based defense against malicious software attacks, allowing an application to run in an isolated space.

 NOTE

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

- The service network port can be bound to a network port on a LAN on motherboard (LOM) of the server or a network port (host network port 1 by default) on the onboard card.
- The service network port allows you to enable, disable, and configure a virtual local area network (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 RH1288 V3 provides the following features to improve energy efficiency:

- The RH1288 V3 supports 80 Plus Platinum power supply units (PSUs) with different power levels. The PSUs provide 94% power efficiency at 50% load.
- The voltage regulator-down (VRD) PSUs reduce the energy loss in DC/DC power conversion.
- The RH1288 V3 supports area-based and Proportional-Integral-Derivative (PID) intelligent fan speed adjustment, and intelligent processor frequency adjustment, reducing power consumption.
- The improved thermal design with energy-efficient fans ensures optimal heat dissipation and reduces overall system power consumption.
- The RH1288 V3 provides power capping and power control functions.
- Hard disks can be powered on at different times to reduce startup power consumption.
- The Intel® Xeon® E5-2600 v3 series processors and the Intel® Xeon® E5-2600 v4 series processors provide better performance than the previous-generation Intel® Xeon® processors while fitting into the same TDP limits.
- 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 data center and telecommunication environments that have power and thermal limitations.
- 1.2 V DDR4 RDIMMs consume 20% less power than 1.5 V DDR3 RDIMMs.

- SSDs consume 80% less power than HDDs.

Support for Customization

- The RH1288 V3 is a Huawei proprietary server.
- Huawei also provides customized development services in a timely manner.

3 Logical Architecture

Figure 3-1 shows the logical architecture of the RH1288 V3.

The RH1288 V3 supports two Intel® Xeon® E5-2600 v3 (Haswell-EP) or E5-2600 v4 (Broadwell-EP) series processors and 16 DDR4 DIMMs. Processors are connected by using QPI buses at a maximum rate of 9.6 GT/s.

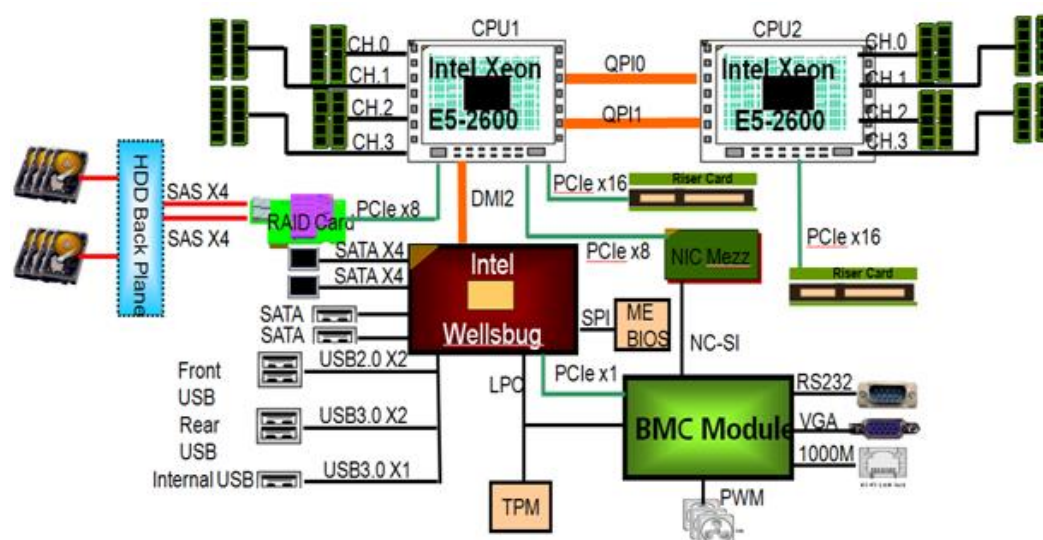
NOTE

The RH1288 V3 supports a maximum of two E5-2600 v3 series processors or two E5-2600 v4 series processors. For details about the processor installation positions, see "Installing a CPU" in the *RH1288 V3 Server V100R003 User Guide*.

Each processor connects to two PCIe riser cards for providing various PCIe slots.

The RAID controller card and the hard disk backplane form a hard disk interface module, which connects to the processors through PCIe connectors.

Figure 3-1 RH1288 V3 logical architecture



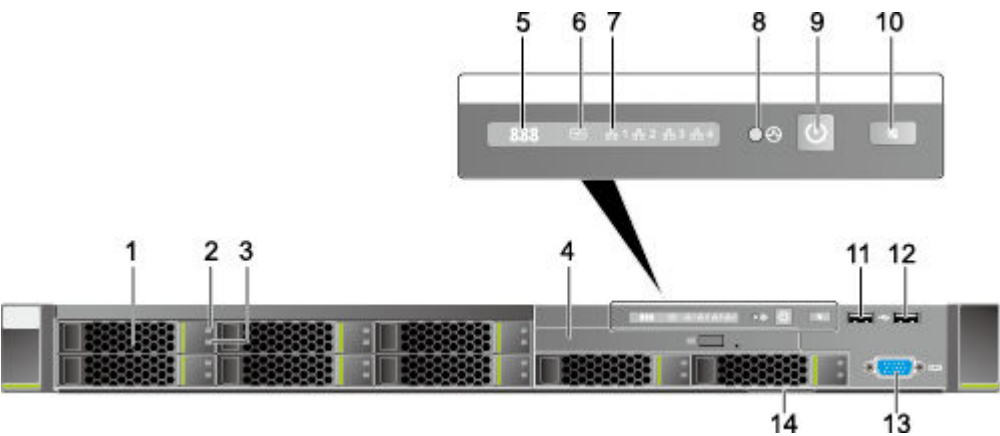
4 Hardware Description

4.1 Appearance

Front Panel

Figure 4-1 shows the RH1288 V3-8Bay front panel.

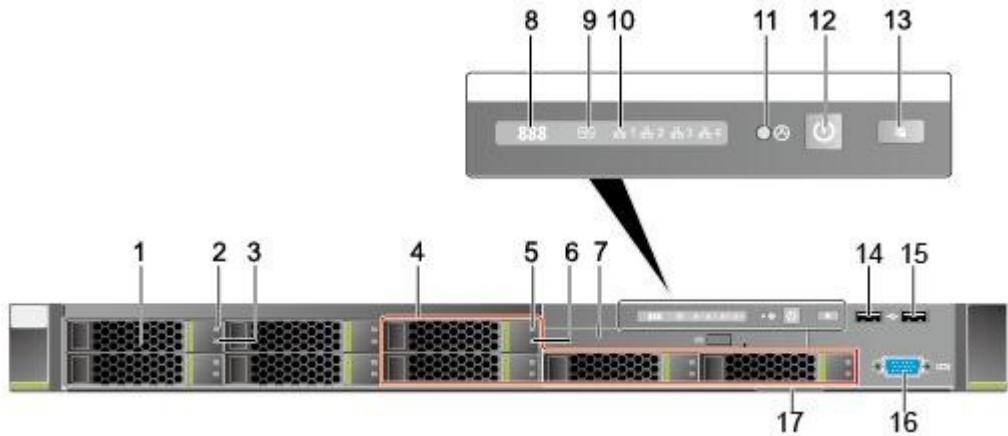
Figure 4-1 RH1288 V3-8Bay front panel



1	Hard disk	2	Hard disk fault indicator
3	Hard disk active indicator	4	Built-in DVD drive
5	Fault diagnosis LED	6	Health status indicator
7	Network port indicator	8	NMI button
9	Power button	10	UID button/indicator
11	USB 2.0 port	12	USB 2.0 port
13	VGA port	14	Label

Figure 4-2 shows the front panel of the RH1288 V3 with eight 2.5-inch hard disks, including four NVMe PCIe SSDs.

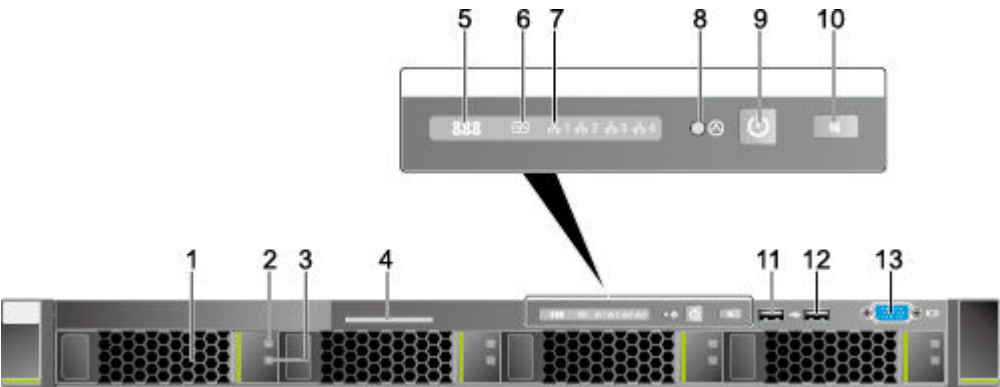
Figure 4-2 Front panel of the RH1288 V3 with eight 2.5-inch hard disks, including four NVMe PCIe SSDs



1	Hard disk	2	Hard disk fault indicator
3	Hard disk active indicator	4	NVMe PCIe SSD
5	NVMe PCIe SSD orange indicator	6	NVMe PCIe SSD green indicator
7	Built-in DVD drive	8	Fault diagnosis LED
9	Health indicator	10	Network port indicator
11	NMI button	12	Power button
13	UID button/indicator	14	USB 2.0 port
15	USB 2.0 port	16	VGA port
17	Label (including ESN label)	--	--

Figure 4-3 shows the RH1288 V3-4Bay front panel.

Figure 4-3 RH1288 V3-4Bay front panel

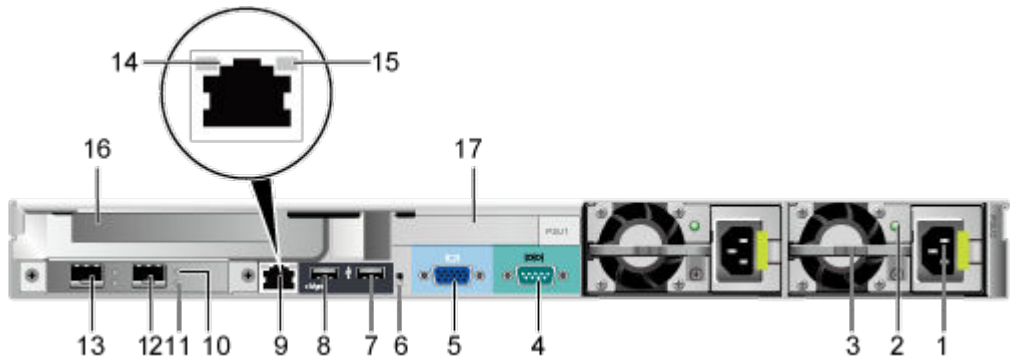


1	Hard disk	2	Hard disk fault indicator
3	Hard disk active indicator	4	Label
5	Fault diagnosis LED	6	Health status indicator
7	Network port indicator	8	NMI button
9	Power button/indicator	10	UID button/indicator
11	USB 2.0 port	12	USB 2.0 port
13	VGA port	-	-

Rear Panel

Figure 4-4 shows the rear panel of the RH1288 V3 with a 10GE NIC.

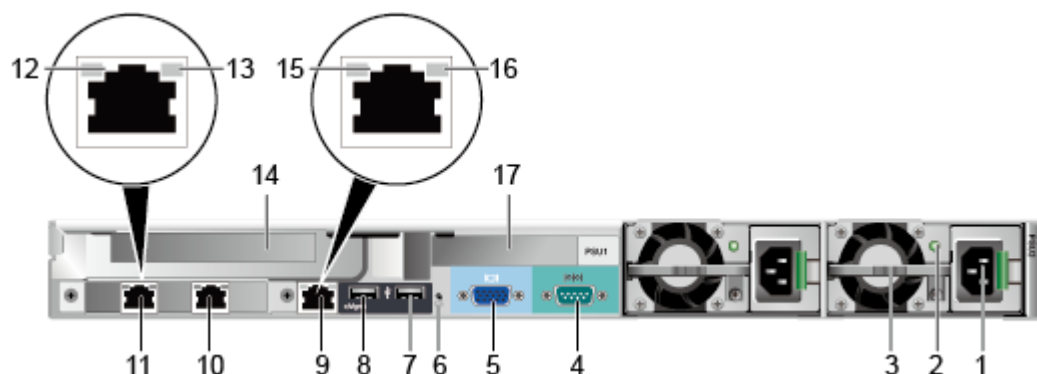
Figure 4-4 Rear panel of the RH1288 V3 with a 10GE NIC



1	Power socket of a PSU	2	PSU indicator
3	PSU	4	Serial port
5	VGA port	6	UID indicator
7	USB 3.0 port	8	USB 3.0 port
9	Management network port (Mgmt)	10	LINK indicator
11	ACT indicator	12	10GE port
13	10GE port	14	Data transmission status indicator
15	Connectivity status indicator	16	Full-height PCIe slot
17	Half-height PCIe slot		

#EN-US_TOPIC_0006629678/fig17789364165855 shows the rear panel of the RH1288 V3 with a 10GE network interface card (NIC) that has two 10GE electrical ports.

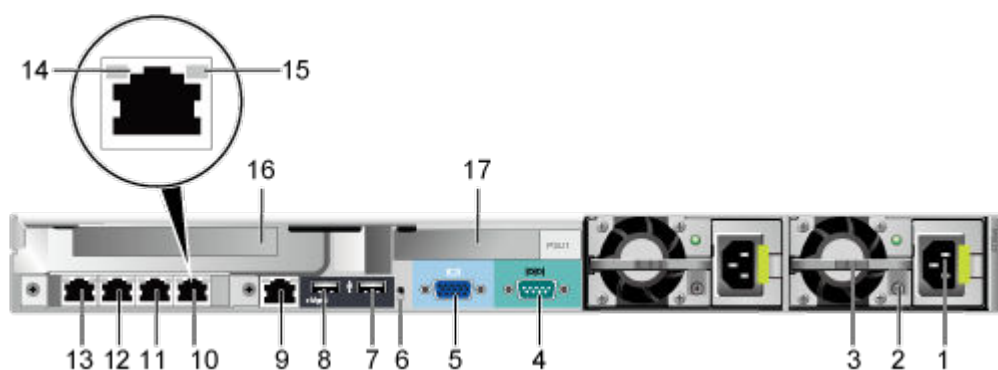
Figure 4-5 Rear panel of the RH1288 V3 with a 10GE NIC



1	Power socket for a power supply unit (PSU)	2	PSU indicator
3	PSU	4	Serial port
5	VGA port	6	UID indicator
7	USB 3.0 port	8	USB 3.0 port
9	Management network port (Mgmt)	10	Service network port
11	Service network port	12	Transmission rate indicator
13	Connection status indicator/ Data transmission status indicator	14	Full-height PCIe slot
15	Data transmission status indicator	16	Connection status indicator
17	Half-height PCIe slot		

Figure 4-6 shows the rear panel of the RH1288 V3 with a GE NIC.

Figure 4-6 Rear panel of the RH1288 V3 with a GE NIC

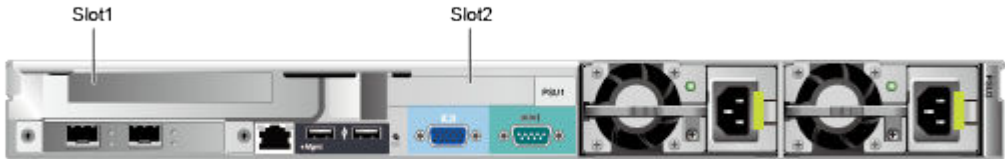


1	Power socket of a PSU	2	PSU indicator
3	PSU	4	Serial port
5	VGA port	6	UID indicator
7	USB 3.0 port	8	USB 3.0 port
9	Management network port (Mgmt)	10	GE port
11	GE port	12	GE port
13	GE port	14	Data transmission status indicator
15	Connectivity status indicator	16	Full-height PCIe slot
17	Half-height PCIe slot		

PCIe slot layout

Figure 4-7 shows the PCIe slot layout of the RH1288 V3.

Figure 4-7 PCIe slot layout



PCIe slots on PCIe riser module 1 and 2

PCIe riser module 1 provides slot 1, and PCIe riser module 2 provides slot 2.

Table 4-1 describes the mapping between PCIe slots and CPUs, and the PCIe specifications of the RH1288 V3.

NOTE

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

Table 4-1 PCIe slot description

PCIe Slot	CPU	PCIe Standard	Connector Bandwidth	Bus Width	Bus/ Device/ Function Number (B/D/F)	Slot Size
Slot1	CPU1	PCIe 3.0	x16	x16	00/03/0	full-height 3/4-length

PCIe Slot	CPU	PCIe Standard	Connector Bandwidth	Bus Width	Bus/Device/Function Number (B/D/F)	Slot Size
Slot2	CPU2	PCIe 3.0	x16	x16	80/02/0	Half-height half-length
Note 1: The PCIe slots that support full-height 3/4-length PCIe cards are backward compatible with full-height half-length or half-height half-length PCIe cards. Note 2: The PCIe slots with the bus width of PCIe x16 are backward 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, see Huawei Server Compatibility Checker. For PCIe cards out of the Huawei Server Compatibility Checker, contact your local Huawei sales personnel. Note 4: Table 4-1 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. Note 5: For a server with NVMe PCIe SSDs, slot 2 supports only an NVMe PCIe SSD adapter.						

PCIe GPU Configuration Rules

PCIe riser module 1 supports only one full-height 3/4-length, full-height half-length, or half-height half-length PCIe x16 single-slot GPU.

4.2 Ports

[Table 4-2](#) and [Table 4-3](#) describe the external ports on the RH1288 V3.

Table 4-2 Ports on the front panel

Port	Type	Quantity	Description
Video graphics array (VGA) port	DB15	1	This port is used to connect to a monitor or a keyboard, video, and mouse (KVM).
USB port	USB 2.0	2	The USB ports are used to connect to USB devices. NOTE Before connecting an external USB device, check that the USB device operates properly. A server may fail if it is connected to an abnormal USB device.

Table 4-3 Ports on the rear panel

Port	Type	Quantity	Description
VGA port	DB15	1	This port is used to connect to a monitor or a keyboard, video, and mouse (KVM).
USB port	USB 3.0	2	The USB ports are used to connect to USB devices. NOTE Before connecting an external USB device, check that the USB device operates properly. A server may fail if it is connected to an abnormal USB device. USB 3.0 is disabled by default. You can enable it in the BIOS. When using VMware, do not enable USB 3.0; otherwise, the mouse and keyboard are unavailable.
Management network port (Mgmt)	Ethernet port	1	This 1000 Mbit/s Ethernet port is used to manage the server.
Serial port	DB9	1	This port complies with RS232. The baud rate is 115200 bit/s. This port is used as the system serial port by default. You can set it as the iBMC serial port using the iBMC CLI. This port is used for debugging.
GE/10GE network port or 10GE optical port	-	-	The port types and quantity vary according to the configured I/O card type.

4.3 Indicators and Buttons

You can observe the indicators to determine the status of the RH1288 V3.

Table 4-4 describes the indicators and buttons on the RH1288 V3 front panel.

Table 4-4 Indicators and buttons on the front panel

Silk Screen	Meaning	State Description
	Fault diagnosis LED	● ---: The server is operating properly. ● Error code: A server component is faulty.

Silk Screen	Meaning	State Description
	Power button/indicator	● Off: The server is not powered on. ● Blinking yellow: iBMC is starting. ● Steady yellow: The server is to be powered on. ● Steady green: The server is properly powered on. NOTE You can hold down the power button for 6 seconds to power off the server.
	UID button/indicator	The UID button/indicator helps identify and locate a server in a rack. 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 located. ● Off: The server is not located. NOTE You can hold down the UID button for 6 seconds to reset iBMC.
	Health status indicator	● Steady green: The server is operating properly. ● Blinking red at 1 Hz: A major alarm is generated. ● Blinking red at 5 Hz: A critical alarm is generated.

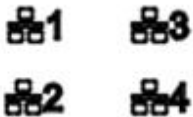
Silk Screen	Meaning	State Description
○	NMI button	This button triggers a server to generate a non-maskable interrupt. You can press the NMI button manually or remotely control the NMI button using the iBMC WebUI. NOTICE ● Use this button only when the OS is abnormal. Do not use this button when the server is operating properly. ● Use this button only for internal commissioning. Before using this button, ensure that the NMI processing program is running on the OS. Otherwise, the OS may crash. Exercise caution when using this button.
-	Hard disk active indicator	● Off: The hard disk cannot be detected or is faulty. ● Blinking green: Data is being read from, 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 properly or a hard disk in the RAID group cannot be detected. ● Blinking yellow: The hard disk is located, or RAID is being rebuilt. ● Steady yellow: The hard disk cannot be detected or is faulty.
	Network port link status indicator	This indicator shows the status of each Ethernet port on the NIC. ● Steady green: The port is properly connected. ● Off: The port is not in use. NOTE If the NIC provides only two network ports, indicators 1 and 2 are used.

Table 4-5 describes the NVMe PCIe SSD indicators on the RH1288 V3 front panel.

Table 4-5 NVMe PCIe SSD indicators

Green Indicator	Orange Indicator	State Description
Off	Off	The NVMe PCIe SSD cannot be detected.
Steady green	Off	The NVMe PCIe SSD is detected and working properly.
Blinking green at 2 Hz	Off	Data access to the NVMe PCIe SSD is in progress.
Off	Blinking orange at 2 Hz	The NVMe PCIe SSD is in the hot swap process.
Off	Blinking orange at 0.5 Hz	The NVMe PCIe SSD completes the hot removal process and is removable.
Steady green or off	Steady orange	The NVMe PCIe SSD is faulty.

Table 4-6 describes the indicators on the RH1288 V3 rear panel.

Table 4-6 Indicators on the rear panel

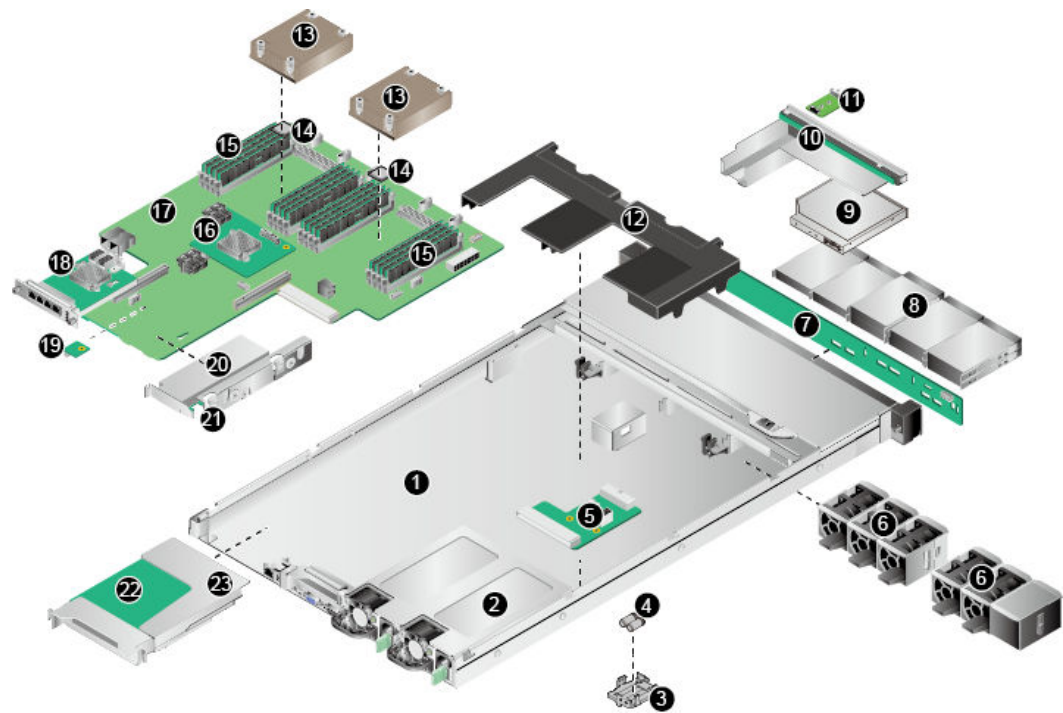
Indicator	State Description
Transmission rate indicator	● Steady green: The data transmission rate is 10 Gbit/s. ● Steady yellow: The data transmission rate is 1 Gbit/s. ● Off: The data transmission rate is 10 Mbit/s or 100 Mbit/s.
Connection status indicator/Data transmission status indicator	● Steady green: The port is properly connected. ● Blinking green: Data is being transmitted. ● Off: No data is being transmitted or the port is not connected.
Data transmission status indicator	● Off: No data is being transmitted. ● Blinking orange: Data is being transmitted.
Connectivity status indicator	● Steady green: The network is properly connected. ● Off: The network is not connected.

Indicator	State Description
UID indicator	The UID button/indicator helps identify and locate a server in a rack. 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 located. ● Off: The server is not located. NOTE You can hold down the UID button for 6 seconds to reset iBMC.
PSU indicator	● Steady green: The power input is normal. ● Off: No AC power is supplied or the system is in the standby state.
Hard disk active indicator	● Steady green: The hard disk is operating properly. ● Blinking green: Data is being read from or written to the hard disk. ● Off: The hard disk is not properly installed or not powered on, or no hard disk is installed.
Hard disk fault indicator	● Steady yellow: The hard disk is faulty. ● Blinking yellow: RAID is being rebuilt on the hard disk. ● Off: The hard disk is operating properly.

4.4 Physical Structure

Figure 4-8 shows the RH1288 V3 components.

Figure 4-8 RH1288 V3 components



1	Chassis	2	PSU
3	Supercapacitor tray	4	Supercapacitor
5	Power adapter board	6	Fan module
7	Hard disk backplane	8	Hard disk
9	Built-in DVD drive	10	Indicator board
11	VGA board	12	Air duct
13	Heat sink	14	Processor
15	DIMM	16	RAID controller card
17	Mainboard	18	NIC
19	Trusted platform module (TPM)	20	Half-height PCIe card
21	Half-height riser card tray	22	Full-height PCIe card
23	Full-height riser card tray		

Table 4-7 describes the RH1288 V3 components.

Table 4-7 RH1288 V3 components

No.	Name	Description
1	Chassis	A chassis houses all components.
2	PSU	The RH1288 V3 uses two hot-swappable PSUs in 1+1 redundancy mode. You can select DC or AC PSUs based on the input power: ● AC PSUs: 100 – 240 V AC ● DC PSUs: – 48 V to – 60 V DC ● 240 V high-voltage (HV) DC PSUs: 192 – 288 V DC ● 380 V HV DC PSUs: 260 – 400 V DC NOTE The PSUs support double-pole/neutral fusing.
3	Supercapacit or tray	This tray secures a supercapacitor for the RAID controller card.
4	Supercapacit or	A supercapacitor is required to protect RAID cache data from power failures when the RH1288 V3 uses the LSI SAS2208, LSI SAS3108 or SP435 (PM8060) controller card.
5	Power adapter board	This board connects PSUs to the mainboard.
6	Fan module	Fan modules dissipate heat for the RH1288 V3, and support hot swap. When one fan fails, the speed of other fans is adjusted based on areas to ensure optimal heat dissipation.
7	Hard disk backplane	The hard disk backplane supplies power to hard disks and provides data transmission channels. The RH1288 V3 supports two types of hard disk backplanes: ● Backplane for 2.5-inch hard disks ● Backplane for 2.5-inch hard disks (including four NVMe PCIe SSDs) ● Backplane for 3.5-inch hard disks
8	Hard disk	The RH1288 V3 uses hot-swappable hard disks to store data. It supports the following hard disk configurations: ● RH1288 V3-8Bay: supports eight front 2.5-inch SAS HDDs, SATA HDDs, or SSDs. ● RH1288 V3-8Bay: supports four front 2.5-inch SAS HDDs, SATA HDDs, or SSDs, and four NVMe PCIe SSDs. ● RH1288 V3-4Bay: supports four front 3.5-inch SAS or SATA HDDs.
9	Built-in DVD drive	The RH1288 V3 provides a DVD drive.
10	Indicator board	This board provides indicators for the server.

No.	Name	Description
11	VGA board	This board provides a VGA port.
12	Air duct	The air duct facilitates ventilation for the chassis.
13	Heat sink	A heat sink dissipates heat for a processor. Each processor is configured with one heat sink.
14	Processor	To provide powerful data processing functions, the RH1288 V3 has CPUs integrated with memory controllers and PCIe controllers. The server supports the following CPU configurations: ● Intel® Haswell-EP® E5-2600 v3 4-core, 6-core, 8-core, 10-core, 12-core, 14-core, and 16-core processors with a maximum Thermal Design Power (TDP) of 135 W ● Intel® Broadwell-EP® E5-2600 v4 4-core, 6-core, 8-core, 10-core, 12-core, 14-core, 16-core, 18-core, and 20-core processors with a maximum Thermal Design Power (TDP) of 135 W
15	DIMM	● Maximum number of DDR4 RDIMMs or LRDIMMs: 16 ● Maximum memory capacity: 1024 GB ● Capacity per DIMM: 8 GB, 16 GB, 32GB, and 64 GB ● Memory speed: DDR4 1867 MT/s 2133 MT/s, and 2400 MT/s

No.	Name	Description
16	RAID controller card	The RH1288 V3 supports RAID controller cards of the following models: ● SR320: - Uses the LSI SAS2208 chip. - Supports RAID 0, 1, 10, 5, 50, 6, and 60. - Provides a supercapacitor to protect cache data from power failures. ● SR120: - Uses the LSI SAS2308 chip. - Supports RAID 0, 1, 1E, and 10. - Does not provide cache data protection upon power failures. ● SR130: - Uses the LSI SAS3008 chip. - Supports RAID 0, 1, 1E, and 10. - Does not provide cache data protection upon power failures. ● SR430C: - Uses the LSI SAS3108 chip. - Provides a 1 GB or 2 GB cache. - Supports RAID 0, 1, 10, 5, 50, 6, and 60. - Provides a supercapacitor to protect cache data from power failures. - Supports a maximum of 32 hard disks. ● SR135: - Uses the PM8068 chip. - Supports RAID 0, 1, 10, and 5. - Does not protect cache data from power failures. These RAID controller cards support RAID state migration, RAID configuration memory, and web-based remote configuration. NOTE The preceding information is for reference only. For details, see the Huawei Server Compatibility Checker.
17	Mainboard	As the most important component of the server, the mainboard integrates basic components, including the BIOS chip, Platform Controller Hub (PCH) chip, and PCIe slots, and provides processor sockets, DIMM slots, and slots for installing other components.

No.	Name	Description
18	NIC	● The RH1288 V3 supports one GE NIC with two or four GE ports, or supports one 10GE NIC with two 10GE electrical or optical ports or with two GE electrical ports and two 10GE optical ports. Both NICs support the Network Controller Sideband Interface (NC-SI). ● The RH1288 V3 supports a 56GE NIC with one or two 56GE IB optical ports. The NIC does not support NC-SI.
19	TPM (optional)	The TPM complies with the Trusted Computing Group (TCG) standards and protects the platform from viruses or unauthorized operations.
20	Half-height PCIe card	The RH1288 V3 provides one PCIe 3.0 x16 slot for a half-height half-length standard PCIe card.
21	Half-height riser card tray	This riser card tray secures a PCIe riser card.
22	Full-height PCIe card	The RH1288 V3 provides one PCIe 3.0 x16 slot for a full-height half-length or full-height 3/4-length standard PCIe card.
23	Full-height riser card tray	This riser card tray secures a PCIe riser card.

5 Technical Specifications

Table 5-1 lists the RH1288 V3 technical specifications.

Table 5-1 Technical specifications

Item	Specifications
Form factor	1U rack server
Processor	Up to two Intel® Xeon® E5-2600 v3 series processors: ● Maximum thermal design power (TDP): 135 W ● Number of cores per processor: 16 cores (2.3 GHz), 14 cores (2.6 GHz), 12 cores (2.6 GHz), 10 cores (2.6 GHz), 8 cores (3.2 GHz), 6 cores (3.4 GHz), and 4 cores (3.5 GHz) ● Number of QPI links: 2 ● Maximum transmission speed per QPI link: 9.6 GT/s ● Maximum memory speed: 2133 MT/s ● Maximum L3 cache capacity: 35 MB Up to two Intel® Xeon® E5-2600 v4 series processors: ● Maximum thermal design power (TDP): 135 W ● Number of cores per processor: 20cores (2.2 GHz), 18 cores (2.3 GHz), 16 cores (2.6 GHz), 14 cores (2.6 GHz), 12 cores (2.2 GHz), 10 cores (2.4 GHz), 8 cores (3.2 GHz), 6 cores (3.4 GHz), and 4 cores (3.5 GHz) ● Number of QPI links: 2 ● Maximum transmission speed per QPI link: 9.6 GT/s ● Maximum memory speed: 2400 MT/s ● Maximum L3 cache capacity: 50 MB
Chipset	Intel C612

Item	Specifications
Memory	- Up to 16 DDR4 DIMM slots (8 DIMMs per processor) for installing either RDIMMs or LRDIMMs: 16 x 32 GB RDIMMs for two processors, with a maximum memory capacity of 512 GB 16 x 64 GB LRDIMMs for two processors, with a maximum memory capacity of 1024 GB - Maximum memory speed: 2400 MT/s - Memory data protection measures: ECC, memory mirroring, Single Device Data Correction (SDDC), memory sparing, and lockstep NOTE DIMMs of different types (RDIMMs and LRDIMMs) and specifications (such as the capacity, bit width, and rank) cannot be installed on one server.
Storage	- The RH1288 V3 supports the following hard disk configurations: - RH1288 V3 with 8 hard disks: supports a maximum of eight 2.5-inch SAS HDDs, SATA HDDs, or SSDs. - RH1288 V3 with eight hard disks (including four NVMe PCIe SSDs): supports a maximum of four 2.5-inch SAS HDDs, SATA HDDs, or SSDs, and four NVMe PCIe SSDs. - RH1288 V3 with 4 hard disks: supports a maximum of four 3.5-inch SAS or SATA HDDs. - Hard disks are hot-swappable. - The RH1288 V3 supports RAID 0, 1, 10, 1E, 5, 50, 6, and 60. It protects RAID cache data from power failures, and supports RAID state migration, RAID configuration memory, self-diagnosis, and web-based remote configuration. - The mainboard can be configured with a SAS card or SAS RAID controller card (with a maximum of 2 GB cache) to improve hard disk storage performance and ensure user data security. - The RAID controller card does not occupy a standard PCIe slot, improving system scalability. 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, consult the local Huawei sales representatives. - The hard disks on the server can be connected through the Intel chipset (PCH) or a SAS RAID controller card. The server where hard disks are connected through the Intel chipset (PCH) supports SATA disks only, an optional SoftRAID license, and SoftRAID 0, 1, and 5. The server with SoftRAID configuration does not support installation of a virtualization OS. For details about the hard disk configuration, contact your local Huawei sales representatives. - Only a server with an NVMe PCIe SSD adapter supports a maximum of four NVMe SSDs. For a server with a SAS card or SAS RAID controller card, SAS or SATA disks can also be installed in NVMe SSD slots.

Item	Specifications
Network port	The RH1288 V3 supports seven types of NICs, which provide the following network ports: ● Two GE electrical ports, supporting NC-SI, Wake on LAN (WOL), and Preboot Execution Environment (PXE) ● Four GE electrical ports, supporting NC-SI, WOL, and PXE ● Two 10GE optical ports, supporting NC-SI and PXE ● Two 10GE electrical ports, supporting NC-SI, WOL, and PXE ● Two GE electrical ports and two 10GE optical ports, supporting NC-SI, WOL, and PXE ● Two 56GE IB optical ports. The NIC does not support NC-SI, WOL, and PXE ● One 56GE IB optical ports. The NIC does not support NC-SI, WOL, and PXE

Item	Specifications
RAID support	The RH1288 V3 supports RAID controller cards of the following models: ● SR320: - Uses the LSI SAS2208 chip. - Supports RAID 0, 1, 10, 5, 50, 6, and 60. - Provides a supercapacitor to protect cache data from power failures. ● SR120: - Uses the LSI SAS2308 chip. - Supports RAID 0, 1, 1E, and 10. - Does not provide cache data protection upon power failures. ● SR130: - Uses the LSI SAS3008 chip. - Supports RAID 0, 1, 1E, and 10. - Does not provide cache data protection upon power failures. ● SR430C: - Uses the LSI SAS3108 chip. - Provides a 1 GB or 2 GB cache. - Supports RAID 0, 1, 10, 5, 50, 6, and 60. - Provides a supercapacitor to protect cache data from power failures. - Supports a maximum of 32 hard disks. ● SR135: - Uses the PM8068 chip. - Supports RAID 0, 1, 10, and 5. - Does not protect cache data from power failures. ● SP435: - Uses the PM8060 chip. - Supports RAID 0, 1, 10, 5, 50, 6, and 60. - Provides a supercapacitor to protect cache data from power failures. These RAID controller cards support RAID state migration, RAID configuration memory, and web-based remote configuration. NOTE The SP435 (PM8060) controller card is a standard PCIe card, which can be installed in a PCIe slot.

Item	Specifications
PCIe slot	- The RH1288 V3 provides one PCIe 3.0 x8 slot dedicated for a RAID controller card and two standard PCIe 3.0 x16 slots. The two standard PCIe 3.0 x16 slots are described as follows: - One full-height half-length or full-height 3/4-length standard PCIe card on riser card 1 (default configuration) Note: The server does not support a built-in RAID controller card when it is configured with a full-height 3/4-length standard PCIe card. - One half-height half-length standard PCIe card on riser card 2 - PCIe slots can house Huawei's proprietary PCIe SSDs to improve I/O performance for search, cache, and download services. - PCIe slots can house K2000 and NVS 315 graphics processing units (GPUs). NOTE - For details about the PCIe cards supported by the RH1288 V3, see the Huawei Server Compatibility Checker. If the PCIe cards that you use are not included in the Huawei Server Compatibility Checker, contact the local Huawei sales representatives or technical support. - For a server with NVMe PCIe SSDs, slot 2 supports only an NVMe PCIe SSD adapter.
Port	- Two USB 2.0 ports on the front panel - Two USB 3.0 ports, one DB15 VGA port, one DB9 serial port, and one RJ45 system management port on the rear panel - One internal USB 3.0 port, one internal dual-SD card port, and two internal miniSSDs (SATADOMs) for installing an OS or prebooting an installation program NOTE The internal USB port cannot be used for installing a Windows OS. The server with two internal miniSSDs (SATADOMs) and softRAID does not support the installation of a virtualization OS. For details about the types of OSs that can be installed, see Huawei Server Compatibility Checker.
Fan module	Five hot-swappable fan modules, tolerating the failure of a single fan Each fan module consists of two counter-rotating fans.
PSU	Two hot-swappable PSUs in redundancy mode: 460 W AC Platinum PSUs, supporting 240 V HV DC 750 W AC Platinum PSUs, supporting 240 V HV DC 750 W AC Titanium PSUs 1200 W 380 V HV DC PSUs 800 W -48 V DC PSUs NOTE For details about the PSUs supported by the RH1288 V3, see the Huawei Server Compatibility Checker.

Item	Specifications
System management	● UEFI ● Huawei iBMC - Supports Intelligent Platform Management Interface (IPMI), Serial over LAN (SOL), KVM over IP, and virtual media. - Provides one 10/100/1000M RJ45 management network port. ● NC-SI
Security	● Power-on password ● Administrator password ● Front bezel
Video card	The mainboard integrates the SM750 display chip and provides 32 MB display memory. The maximum resolution is 1920 pixels x 1200 pixels at 60 Hz with 16 M colors.
Supported OSs	● SUSE Linux Enterprise Server 11 SP3 ● Red Hat Enterprise Linux 6.5 ● Windows Server 2012 R2 ● Citrix 6.2 ● VMware 5.5 NOTE The preceding information is for reference only. For details, see the Huawei Server Compatibility Checker.
Dimensions (H x W x D)	● Chassis equipped with 3.5-inch hard disks: 43 mm (1U) x 436 mm x 748 mm (1.69 in. x 17.17 in. x 29.45 in.) ● Chassis equipped with 2.5-inch hard disks: 43 mm (1U) x 436 mm x 708 mm (1.69 in. x 17.17 in. x 27.87 in.)
Weight	Net weight: ● With eight 2.5-inch hard disks: 20 kg (44.10 lb) ● With four 3.5-inch hard disks: 19 kg (41.90 lb) Packing material weight: 5 kg (11.03 lb)

6 Component Compatibility

6.1 Processor

The RH1288 V3 supports up to two Intel® Xeon® E5-2600 v3 processors two Intel® Xeon® E5-2600 v4 processors. If only one processor is configured, this processor must be installed in socket CPU1.

Table 6-1 lists the processors supported by the RH1288 V3.

NOTE

- **Table 6-1** is for reference only. For details about the processors available, consult the local Huawei sales representatives.
- A server must use processors of the same model.

Table 6-1 Supported processors

Part Number	Model	Description
41020499	E5-2603 v3	X86 series- FCLGA2011-1600MHz-1.8V-64bit-85000mW-Haswell EP Xeon E5-2603 v3-6Core-IT Server Dedicated
41020491	E5-2609 v3	X86 series- FCLGA2011-1900MHz-1.8V-64bit-85000mW-Haswell EP Xeon E5-2609 v3-6Core-IT Server Dedicated
41020484	E5-2618L V3	X86 series- FCLGA2011-2300MHz-1.8V-64bit-75000mW-Haswell EP Xeon E5-2618L v3-8Core
41020498	E5-2620 v3	X86 series- FCLGA2011-2400MHz-1.8V-64bit-85000mW-Haswell EP Xeon E5-2620 v3-6Core-IT Server Dedicated
41020502	E5-2623 v3	X86 series- FCLGA2011-3000MHz-1.8V-64bit-105000mW-Haswell EP Xeon E5-2623 v3-4Core-IT Server Dedicated

Part Number	Model	Description
41020497	E5-2630 v3	X86 series- FCLGA2011-2400MHz-1.8V-64bit-85000mW-Haswell EP Xeon E5-2630 v3-8Core-IT Server Dedicated
41020503	E5-2630L v3	X86 series- FCLGA2011-1800MHz-1.8V-64bit-55000mW-Haswell EP Xeon E5-2630L v3-8Core-IT Product Dedicated
41020501	E5-2637 v3	X86 series- FCLGA2011-3500MHz-1.8V-64bit-135000mW-Haswell EP Xeon E5-2637 v3-4Core-IT Server Dedicated
41020496	E5-2640 v3	X86 series- FCLGA2011-2600MHz-1.8V-64bit-90000mW-Haswell EP Xeon E5-2640 v3-8Core-IT Server Dedicated
41020510	E5-2643 v3	X86 series- FCLGA2011-3400MHz-1.8V-64bit-135000mW-Haswell EP Xeon E5-2643 v3-6Core-IT Server Dedicated
41020490	E5-2650 v3	X86 series- FCLGA2011-2300MHz-1.8V-64bit-105000mW-Haswell EP Xeon E5-2650 v3-10Core-IT Server Dedicated
41020492	E5-2650L v3	X86 series- FCLGA2011-1800MHz-1.8V-64bit-65000mW-Haswell EP Xeon E5-2650L v3-12Core-IT Server Dedicated
41020483	E5-2658A v3	X86 series- FCLGA2011-2200MHz-1.8V-64bit-105000mW-Haswell EP Xeon E5-2658A v3-12Core
41020489	E5-2660 v3	X86 series- FCLGA2011-2600MHz-1.8V-64bit-105000mW-Haswell EP Xeon E5-2660 v3-10Core-IT Server Dedicated
41020500	E5-2667 v3	X86 series- FCLGA2011-3200MHz-1.8V-64bit-135000mW-Haswell EP Xeon E5-2667 v3-8Core-IT Server Dedicated
41020488	E5-2670 v3	X86 series- FCLGA2011-2300MHz-1.8V-64bit-120000mW-Haswell EP Xeon E5-2670 v3-12Core-IT Server Dedicated
41020487	E5-2680 v3	X86 series- FCLGA2011-2500MHz-1.8V-64bit-120000mW-Haswell EP Xeon E5-2680 v3-12Core-IT Server Dedicated
41020495	E5-2683 v3	X86 series- FCLGA2011-2000MHz-1.8V-64bit-120000mW-Haswell EP Xeon E5-2683 v3-14Core-IT Server Dedicated

Part Number	Model	Description
41020486	E5-2690 v3	X86 series-FCLGA2011-2600MHz-1.8V-64bit-135000mW-Haswell EP Xeon E5-2690 v3-12Core-IT Server Dedicated
41020509	E5-2695 v3	X86 series-FCLGA2011-2300MHz-1.8V-64bit-120000mW-Haswell EP Xeon E5-2695 v3-14Core-IT Server Dedicated
41020494	E5-2698 v3	X86 series-FCLGA2011-2300MHz-1.8V-64bit-135000mW-Haswell EP Xeon E5-2698 v3-16Core-IT Server Dedicated
41020561	E5-2698 v4	X86 series,FCLGA2011-3,2200MHz,1.8V,64bit,135000mW,Broadwell EP Xeon E5-2698 v4,20Core,IT Product Dedicated
41020574	E5-2603 v4	X86 series,FCLGA2011-3,1700MHz,1.8V,64bit,85000mW,Broadwell EP Xeon E5-2603 v4,6Core,IT Product Dedicated
41020573	E5-2609 v4	X86 series,FCLGA2011-3,1700MHz,1.8V,64bit,85000mW,Broadwell EP Xeon E5-2609 v4,8Core,IT Product Dedicated
41020572	E5-2620 v4	X86 series,FCLGA2011-3,2100MHz,1.8V,64bit,85000mW,Broadwell EP Xeon E5-2620 v4,8Core,IT Product Dedicated
41020581	E5-2623 v4	X86 series,FCLGA2011-3,2600MHz,1.8V,64bit,85000mW,Broadwell EP Xeon E5-2623 v4,4Core,IT Product Dedicated
41020571	E5-2630 v4	X86 series,FCLGA2011-3,2200MHz,1.8V,64bit,85000mW,Broadwell EP Xeon E5-2630 v4,10Core,IT Product Dedicated
41020576	E5-2630L v4	X86 series,FCLGA2011-3,1800MHz,1.8V,64bit,55000mW,Broadwell EP Xeon E5-2630L v4,10Core,IT Product Dedicated
41020580	E5-2637 v4	X86 series,FCLGA2011-3,3500MHz,1.8V,64bit,135000mW,Broadwell EP Xeon E5-2637 v4,4Core,IT Product Dedicated
41020570	E5-2640 v4	X86 series,FCLGA2011-3,2400MHz,1.8V,64bit,90000mW,Broadwell EP Xeon E5-2640 v4,10Core,IT Product Dedicated
41020568	E5-2660 v4	X86 series,LGA 2011-3,2000MHz,1.8V,64bit,105000mW,Broadwell EP Xeon E5-2660 V4,14Core,IT Product Dedicated

Part Number	Model	Description
41020579	E5-2643 v4	X86 series,FCLGA2011-3,3400MHz,1.8V,64bit,135000mW,Broadwell EP Xeon E5-2643 v4,6Core,IT Product Dedicated
41020569	E5-2650 v4	X86 series,FCLGA2011-3,2200MHz,1.8V,64bit,105000mW,Broadwell EP Xeon E5-2650 v4,12Core,IT Product Dedicated
41020578	E5-2667 v4	X86 series,FCLGA2011-3,3200MHz,1.8V,64bit,135000mW,Broadwell EP Xeon E5-2667 v4,8Core,IT Product Dedicated
41020567	E5-2680 v4	X86 series,FCLGA2011-3,2400MHz,1.8V,64bit,120000mW,Broadwell EP Xeon E5-2680 v4,14Core,IT Product Dedicated
41020566	E5-2683 v4	X86 series,FCLGA2011-3,2100MHz,1.8V,64bit,120000mW,Broadwell EP Xeon E5-2683 v4,16Core,IT Product Dedicated
41020559	E5-2690 v4	X86 series,FCLGA2011-3,2600MHz,1.8V,64bit,135000mW,Broadwell EP Xeon E5-2690 v4,14Core,IT Product Dedicated
41020565	E5-2695 v4	X86 series,FCLGA2011-3,2100MHz,1.8V,64bit,120000mW,Broadwell EP Xeon E5-2695 v4,18Core,IT Product Dedicated
41020575	E5-2650L v4	X86 series,FCLGA2011-3,1700MHz,1.8V,64bit,65000mW,Broadwell EP Xeon E5-2650L v4,14Core,IT Product Dedicated

 NOTE

The processors configured for one server must be of the same specifications.

6.2 Memory

Memory Capacity Configuration Rules

The RH1288 V3 supports a maximum of eight DIMMs when one processor is installed and a maximum of 16 DIMMs when two processors are installed. Each processor comes with four memory channels, and each memory channel supports two DIMMs.

Observe the following rules when configuring DIMMs:

1. The RH1288 V3 does not support mixed use of RDIMMs and LRDIMMs.
2. Each memory channel supports a maximum of eight ranks.

 NOTE

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

- The maximum number of DIMMs to be installed on the server varies depending on the processor type, DIMM type, number of ranks, and operating voltage. For details, see "Maximum number of DIMMs" in [Table 6-2](#) and [Table 6-4](#).

 NOTE

Note the following rule:

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

- All DIMMs on the server operate at the same speed, which is determined as the smaller value of:
 - Memory speed supported by a specified processor.
 - Lowest maximum operating speed for the selected memory configuration that depends on the rated speed, operating voltage, and number of DIMMs for each memory channel. For details, see "Maximum operating speed" in [Table 6-2](#) and [Table 6-4](#).

Table 6-2 RDIMM configuration rules(E5-2600 v3 processor)

Item		RDIMM
Rank		Dual-rank
Rated speed (MT/s)		2133
Rated voltage (V)		1.2
Operating voltage (V)		1.2
Maximum number of RDIMMs		16
Maximum capacity per RDIMM (GB)		32
Maximum memory capacity (GB)		512
Maximum memory capacity at the maximum operating speed (GB)		512
Maximum operating speed (MT/s)	One RDIMM per channel	2133
	Two RDIMMs per channel	2133
NOTE The maximum number of RDIMMs listed in Table 6-2 is based on 2-processor configuration. If the server has only one processor, the maximum number of RDIMMs is half the values in Table 6-2 .		

Table 6-3 RDIMM configuration rules(E5-2600 v4 processor)

Item		RDIMM
Rank		Dual-rank

Item		RDIMM
Rated speed (MT/s)		2400
Rated voltage (V)		1.2
Operating voltage (V)		1.2
Maximum number of RDIMMs		16
Maximum capacity per RDIMM (GB)		32
Maximum memory capacity (GB)		512
Maximum memory capacity at the maximum operating speed (GB)		512
Maximum operating speed (MT/s)	One RDIMM per channel	2400
	Two RDIMMs per channel	2400
NOTE The maximum number of RDIMMs listed in Table 6-3 is based on 2-processor configuration. If the server has only one processor, the maximum number of RDIMMs is half the values in Table 6-3 .		

Table 6-4 LRDIMM configuration rules(E5-2600 v3 processor)

Item		LRDIMM
Rank		Quad-rank
Rated speed (MT/s)		2133
Rated voltage (V)		1.2
Operating voltage (V)		1.2
Maximum number of RDIMMs		16
Maximum capacity per LRDIMM (GB)		64
Maximum memory capacity (GB)		1024
Maximum memory capacity at the maximum operating speed (GB)		1024
Maximum operating speed (MT/s)	One RDIMM per channel	2133
	Two RDIMMs per channel	2133
NOTE The maximum number of LRDIMMs listed in Table 6-4 is based on 2-processor configuration. If the server has only one processor, the maximum number of LRDIMMs is half the values in Table 6-4 .		

Table 6-5 LRDIMM configuration rules(E5-2600 v4 processor)

Item		LRDIMM
Rank		Quad-rank
Rated speed (MT/s)		2400
Rated voltage (V)		1.2
Operating voltage (V)		1.2
Maximum number of RDIMMs		16
Maximum capacity per LRDIMM (GB)		64
Maximum memory capacity (GB)		1024
Maximum memory capacity at the maximum operating speed (GB)		1024
Maximum operating speed (MT/s)	One RDIMM per channel	2400
	Two RDIMMs per channel	2400
NOTE The maximum number of LRDIMMs listed in Table 6-5 is based on 2-processor configuration. If the server has only one processor, the maximum number of LRDIMMs is half the values in Table 6-5 .		

Memory Slot Configuration Rules

- The RH1288 V3 supports DIMMs of 8 GB, 16 GB, 32GB, and 64 GB. When the RH1288 V3 is fully configured with DIMMs, the maximum memory capacity is 1024 GB.
- The RH1288 V3 provides 16 slots for installing DDR4 DIMMs. Each processor integrates four memory channels. Four memory channels for the processor in socket CPU1 are 1A, 1B, 1C, and 1D, and those for the processor in socket CPU2 are 2A, 2B, 2C, and 2D. [Table 6-6](#) describes the composition of each memory channel. [Figure 6-1](#) shows the DIMM installation positions.

Table 6-6 Memory channels

Processor Socket	Memory Channel	Composition
CPU1	1A	DIMM000(A)
		DIMM001(E)
	1B	DIMM010(B)
		DIMM011(F)
	1C	DIMM020(C)

Processo r Socket	Memory Channel	Composition
	1D	DIMM021(G)
		DIMM030(D)
		DIMM031(H)
CPU2	2A	DIMM100(A)
		DIMM101(E)
	2B	DIMM110(B)
		DIMM111(F)
	2C	DIMM120(C)
		DIMM121(G)
	2D	DIMM130(D)
		DIMM131(H)

Channels 000, 010, 020, 030, 100, 110, 120, and 130 are the primary memory channels for 1A, 1B, 1C, 1D, 2A, 2B, 2C, and 2D respectively.

Figure 6-1 DIMM installation positions

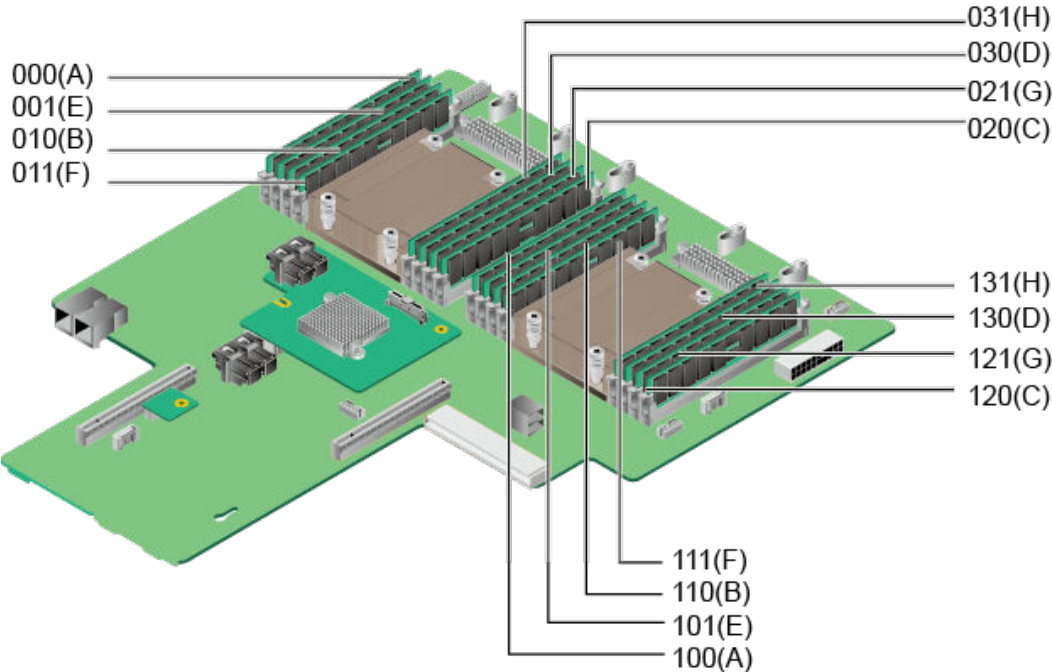


Table 6-7 describes the DIMM installation sequence.

Table 6-7 DIMM installation sequence

Processor Socket	DIMM Installation Sequence
CPU1	000(A), 010(B), 020(C), 030(D), 001(E), 011(F), 021(G), and then 031(H)
CPU1 and CPU2	000(A), 100(A), 010(B), 110(B), 020(C), 120(C), 030(D), 130(D), 001(E), 101(E), 011(F), 111(F), 021(G), 121(G), 031(H), and then 131(H)

Memory Data Protection Technologies

The RH1288 V3 uses the following memory data protection technologies:

- ECC
- Memory mirroring
- SDDC
- Memory sparing
- Lockstep

Supported DIMMs

The following tables list the DIMMs supported by the RH1288 V3.

NOTE

- The following tables are for reference only. For details about the DIMMs available, consult the local Huawei sales representatives.
- A server must use DIMMs of the same model.

Table 6-8 Supported DIMMs (E5-2600 V3 2-Socket Embedded)

Part Number	Capacity	Description
06200176	16GB	Memory Module,DDR4 RDIMM,16GB,288pin,0.9ns, 2133000KHz,1.2V,ECC,2Rank(1G*4bit)
06200190	8GB	Memory Module,DDR4 RDIMM,8GB,288pin,0.9ns, 2133000KHz,1.2V,ECC,2Rank(512M*8bit)

Table 6-9 Supported DIMMs (E5-2600 V3 2-Socket General-Purpose)

Part Number	Capacity	Description	Notes
06200176	16GB	Memory Module,DDR4 RDIMM,16GB, 288pin,0.9ns,2133000KHz,1.2V,ECC, 2Rank(1G*4bit)	

Part Number	Capacity	Description	Notes
06200201	32GB	Memory Module,DDR4 RDIMM,32GB,288pin,0.9ns,2133000KHz,1.2V,ECC,2Rank(2G*4bit)	
06200175	8GB	Memory Module,DDR4 RDIMM,8GB,288pin,0.9ns,2133000KHz,1.2V,ECC,1Rank(1Gb*4bit)	Note1;
06200190	8GB	Memory Module,DDR4 RDIMM,8GB,288pin,0.9ns,2133000KHz,1.2V,ECC,2Rank(512M*8bit)	
Notes; 1.EOM			

Table 6-10 Supported DIMMs (E5-2600 V4 2-Socket General-Purpose)

Part Number	Capacity	Description	Notes
06200176	16GB	Memory Module,DDR4 RDIMM,16GB,288pin,0.9ns,2133000KHz,1.2V,ECC,2Rank(1G*4bit)	
06200213	16GB	Memory Module,DDR4 RDIMM,16GB,288pin,0.83ns,2400000KHz,1.2V,ECC,Server Dedicated,2Rank(1G*8bit)	
06200201	32GB	Memory Module,DDR4 RDIMM,32GB,288pin,0.9ns,2133000KHz,1.2V,ECC,2Rank(2G*4bit)	
06200214	32GB	Memory Module,DDR4 RDIMM,32GB,288pin,0.83ns,2400000KHz,1.2V,ECC,2Rank(2G*4bit)	
06200190	8GB	Memory Module,DDR4 RDIMM,8GB,288pin,0.9ns,2133000KHz,1.2V,ECC,2Rank(512M*8bit)	
06200212	8GB	Memory Module,DDR4 RDIMM,8GB,288pin,0.8ns,2400000KHz,1.2V,ECC,2Rank(512M*8bit)	

 NOTE

The DIMMs configured for one server must be of the same specifications.

6.3 Storage

The RH1288 V3 supports the following hard disk configurations:

- RH1288 V3 with 8 hard disks: supports a maximum of eight front 2.5-inch SAS HDDs, SATA HDDs, or SSDs.

- RH1288 V3 with 8 hard disks: supports four front 2.5-inch SAS HDDs, SATA HDDs, or SSDs, and four NVMe PCIe SSDs.
- RH1288 V3 with 4 hard disks: supports a maximum of four front 3.5-inch SAS or SATA HDDs.

Table 6-11 and **Table 6-12** list the hard disks supported by the RH1288 V3.

 NOTE

Table 6-11 and **Table 6-12** are for reference only. For details about the hard disks available, consult the local Huawei sales representatives.

Table 6-11 Supported SAS&SATA Disks

Part Number	Capacity	Description	Notes
02311HAN	1200GB	10000 RPM - 2.5' SAS 12Gbps - 1200GB HDD	
02311FMR	1800GB	10000 RPM - 2.5' SAS 12Gbps - 1800GB HDD	
02311HAK	300GB	10000 RPM - 2.5' SAS 12Gbps - 300GB HDD	
02311HAS	300GB	10000 RPM - 2.5' SAS 12Gbps - 300GB HDD-3.5inch Handle	
02311HAP	600GB	10000 RPM - 2.5' SAS 12Gbps - 600GB HDD	
02311HAT	600GB	10000 RPM - 2.5' SAS 12Gbps - 600GB HDD-3.5inch Handle	
02311HAL	900GB	10000 RPM - 2.5' SAS 12Gbps - 900GB HDD	
02310YCU	1200GB	10000 RPM - 2.5' SAS 6Gbps - 1200GB HDD	Note8;
02310YCM	300GB	10000 RPM - 2.5' SAS 6Gbps - 300GB HDD	
02311EEJ	300GB	10000 RPM - 2.5' SAS 6Gbps - 300GB HDD - 3.5inch Handle	
02310YCR	600GB	10000 RPM - 2.5' SAS 6Gbps - 600GB HDD	
02311EEK	600GB	10000 RPM - 2.5' SAS 6Gbps - 600GB HDD - 3.5inch Handle	
02310YCT	900GB	10000 RPM - 2.5' SAS 6Gbps - 900GB HDD	
02311EXX	300GB	15000 RPM - 2.5' SAS 12Gbps - 300GB HDD	
02311EEL	300GB	15000 RPM - 2.5' SAS 12Gbps - 300GB HDD - 3.5inch Handle	
02311AYF	600GB	15000 RPM - 2.5' SAS 12Gbps - 600GB HDD	
02311EEM	600GB	15000 RPM - 2.5' SAS 12Gbps - 600GB HDD - 3.5inch Handle	
02310YCL	146GB	15000 RPM - 2.5' SAS 6Gbps - 146GB HDD	Note8;

Part Number	Capacity	Description	Notes
02310YCN	300GB	15000 RPM - 2.5' SAS 6Gbps - 300GB HDD	Note8;
02311JCY	1000GB	7200 RPM - 2.5' NL SAS 12Gbps - 1000GB HDD	
02311JDA	2000GB	7200 RPM - 2.5' NL SAS 12Gbps - 2000GB HDD	
02310YCV	1000GB	7200 RPM - 2.5' NL SAS 6Gbps - 1000GB HDD	Note8;
02310YCH	1000GB	7200 RPM - 2.5' SATA 6Gbps - 1000GB HDD	
02311HGX	2000GB	7200 RPM - 2.5' SATA 6Gbps - 2000GB HDD	
02310YCG	500GB	7200 RPM - 2.5' SATA 6Gbps - 500GB HDD	Note8;
02311FNH	6000GB	7200 RPM - 3.5' NL SAS 12Gbps - 6000GB HDD	
02311KAB	8000GB	7200 RPM - 3.5' NL SAS 12Gbps - 8000GB HDD	
02311AYJ	1000GB	7200 RPM - 3.5' NL SAS 6Gbps - 1000GB HDD	Note8;
02311AYM	2000GB	7200 RPM - 3.5' NL SAS 6Gbps - 2000GB HDD	
02311AYN	3000GB	7200 RPM - 3.5' NL SAS 6Gbps - 3000GB HDD	
02311AYP	4000GB	7200 RPM - 3.5' NL SAS 6Gbps - 4000GB HDD	
02311AYR	1000GB	7200 RPM - 3.5' SATA 6Gbps - 1000GB HDD	Note8;
02311AYT	2000GB	7200 RPM - 3.5' SATA 6Gbps - 2000GB HDD	
02311AYU	3000GB	7200 RPM - 3.5' SATA 6Gbps - 3000GB HDD	
02311AYV	4000GB	7200 RPM - 3.5' SATA 6Gbps - 4000GB HDD	
02311DYQ	6000GB	7200 RPM - 3.5' SATA 6Gbps - 6000GB HDD	
02311JRE	8000GB	7200 RPM - 3.5' SATA 6Gbps - 8000GB HDD	
02310YDA	480GB	LE2.5' SATA 6Gbps - 480GB SSD	Note1;
02311BAD	800GB	LE2.5' SATA 6Gbps - 800GB SSD	Note1;
02311EAN	960GB	LE2.5' SATA 6Gbps - 960GB SSD	Note1;
02311LQE	120GB	LE 2.5' SATA 6Gbps - 120GB SSD	Note1;
02311LQD	120GB	LE 2.5' SATA 6Gbps - 120GB SSD - 3.5inch Handle	Note1;
02310YCW	240GB	LE 2.5' SATA 6Gbps - 240GB SSD	Note1;
02311EEN	240GB	LE 2.5' SATA 6Gbps - 240GB SSD - 3.5inch Handle	Note1;
02311EEP	480GB	LE 2.5' SATA 6Gbps - 480GB SSD - 3.5inch Handle	Note1;

Part Number	Capacity	Description	Notes
02311JLV	960GB	LE 2.5' SATA 6Gbps - 960GB SSD - 3.5inch Handle	Note1; Note7;
02311JLV	960GB	LE 2.5' SATA 6Gbps - 960GB SSD - 3.5inch Handle	
02311HAJ	1600GB	ME2.5' SAS 12Gbps - 1600GB SSD	
02311HAH	400GB	ME2.5' SAS 12Gbps - 400GB SSD	
02311HAG	800GB	ME2.5' SAS 12Gbps - 800GB SSD	
02310YCY	200GB	ME 2.5' SATA 6Gbps - 200GB SSD	Note3;
02310YCX	400GB	ME 2.5' SATA 6Gbps - 400GB SSD	Note3;
02311BAE	800GB	ME 2.5' SATA 6Gbps - 800GB SSD	Note3;
02311LTP	480GB	VE 2.5' SATA 6Gbps - 480GB SSD	Note2;
02311LTN	480GB	VE 2.5' SATA 6Gbps - 480GB SSD - 3.5inch Handle	Note2;
Notes: 1.Endurance Rating: LE (Light Endurance), 0.3 DWPD(drive writes per day) level for 5 years, based on JESD218 standard and JESD219 workload. 2.Endurance Rating: VE (Value Endurance) , 3 DWPD(drive writes per day) level for 5 years, based on JESD218 standard and JESD219 workload. 3.Endurance Rating: ME (Mainstream Endurance), 10 DWPD(drive writes per day) level for 5 years, based on JESD218 standard and JESD219 workload. 7.3.5 inch handle with 2.5 inch disk. 8.EOM			

Table 6-12 Supported NVMe SSDs

Part Number	Type	Model	Device Form	Interface Type	Description	Manufacturer	Drivers	Manufacturer
02311JGS	Official	P3600-800G	2.5inch Disk	SFF-8639	VE 2.5' - 800GB - PCIE 3.0 X4 - NVMe SSD	Intel	Link	Note1;
02311LUA	Official	P3600-1600G	2.5inch Disk	SFF-8639	VE 2.5' - 1600GB - PCIE 3.0 X4 - NVMe SSD	Intel	Link	Note1;

Part Number	Type	Model	Device Form	Interface Type	Description	Manufacturer	Drivers	Manufacturer
Notes: 1.Support RHEL 7.0、 Windows 2012 R2								

Table 2 Supported RAID controller cards lists the RAID controller cards supported by the RH1288 V3.

 NOTE

Table 2 Supported RAID controller cards is for reference only. For details about the RAID controller cards available, consult the local Huawei sales representatives.

Table 6-13 Supported RAID controller cards

Part Number	Model	Description	Drivers	Manufacturer	Notes
02311JEB	LSI 2208	Function Module,SR320BC 1GB,BC1M52ESMQ,LSI2208 RAID card-Board ID 0X2b-RAID0,1,5,6,10,50,60-Support SuperCap +750mm MiniSAS Cable Moudle(1U 8HDD CHASSIS)	Link	LSI	Not e1; Not e2;
02311JEE	LSI 2208	Function Module,SR320BC 1GB,BC1M55ESMQ,LSI2208 RAID card-Board ID 0X2b-RAID0,1,5,6,10,50,60-Support SuperCap +800mm MiniSAS Cable Moudle(4HDD CHASSIS)	Link	LSI	Not e1; Not e2;
02311JDX	LSI 2308	Function Module,SR120,BC1M52ESMN,SR120 (LSI2308)-SAS/SATA RAID Card-RAID0,1,1E,10,+750mm MiniSAS Cable Moudle	Link	LSI	
02311JMN	LSI 2308	Function Module,SR120,BC1M54ESMN,SR120 (LSI2308)-SAS/SATA RAID Card-RAID0,1,1E,10,+800mm MiniSAS Cable Moudle	Link	LSI	

Part Number	Model	Description	Drivers	Manufacturer	Notes
02310YLX	LSI 3008	Function Module,SR130,BC1M02ESMN,SR130 (LSI3008)-SAS/SATA RAID Card-RAID0,1,1E,10,+750mm MiniSAS HD Cable Moudle	Link	LSI	
02311AGH	LSI 3008	Function Module,RH1288 V3,BC1M04ESMN,SR130 SAS/SATA RAID Card,RAID0,1,1E,10,0 Cache(LSI3008)+850mm 1MiniSAS HD To 4 SATA Cable Moudle	Link	LSI	
02310YMD	LSI 3108	Function Module,SR430C 1GB,BC1M02ESMQ,LSI 3108 RAID CARD-Board ID 0X24-RAID0,1,5,6,10,50,60-Support SuperCap +750mm MiniSAS HD Cable Moudle	Link	LSI	Not e3;
02310YMG	LSI 3108	Function Module,SR430C 2GB,BC1M06ESML,LSI 3108 RAID CARD-Board ID 0X2d-RAID0,1,5,6,10,50,60-Support SuperCap, +750mm MiniSAS HD Cable Moudle	Link	LSI	Not e4;
02311AGF	LSI 3108	Function Module,RH1288V3,BC1M04ESML,SR430C-Board ID 0X2d,RAID0,1,5,6,10,50,60,2GB Cache-Support SuperCap+850mm 1MiniSAS HD To 4 SATA Cable Moudle	Link	LSI	Not e4;
02311AGG	LSI 3108	Function Module,RH1288 V3,BC1M04ESMQ,SR430C-Board ID 0X24,RAID0,1,5,6,10,50,60,1GB Cache-Support SuperCap+850mm 1MiniSAS HD To 4 SATA Cable Moudle	Link	LSI	Not e3;
02311JFK	LSI 3108	Function Module,12G SAS RAID Card,BC1M023108,LSI 3108 RAID Card-PCIE 3.0 X8-4GB cache-RAID 1,5,6,10,50,60,+950mm MiniSAS HD Cable Moudle	Link	LSI	Not e15;

Part Number	Model	Description	Drivers	Manufacturer	Notes
05200449	Software RAID	Embedded OS, Embedded MegaRAID Software RAID for BIOS, Paper LABEL, Intel Grantley, Embedded RAID label option ROM, support RAID0/1/10	Link	LSI	Not e5; Not e7; Not e8; Not e17;
43020180	Software RAID	SAS Expander, PCBA Board, 3.3V, RAID5, Soft RAID Key, 631mW, 6,0.125MB/s	Link	LSI	Not e5;
Notes: 1. One 24020944 should be accompanied if Battery is required 2. One 06010220 should be accompanied if Super-Cap module is required 3. One 06010262 should be accompanied if Super-Cap module is required 4. One 06010278 should be accompanied if Super-Cap module is required 5. NOT support any Virtualization OS: Vmware, Windows Hyper-V, RHEL KVM, etc. 7. Need 43020180 if RAID5 is required 8. Support OS: Windows 2008 R2 SP1 Windows 2012 Windows 2012 R2 RHEL 6.5 RHEL 7.0 SLES 11.3 15. On RH1288 V3, 02311JFK does not support 4HDD Backplain 17. Software RAID on V3 OSCA blade only supports SATA DOM					

Table 3 RAID level comparison provides the comparison between RAID levels in performance, the minimum number of hard disks, and disk usage.

Table 6-14 RAID level comparison

RAID Level	Reliability	Read Performance	Write Performance	Minimum Number of Hard Disks	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 Level	Reliability	Read Performance	Write Performance	Minimum Number of Hard Disks	Disk Usage
RAID 6	Relatively high	High	Medium	4	$(N - 2)/N$
RAID 10	High	Medium	Medium	4	M/N
RAID 50	High	High	Relatively high	6	$(N - M)/N$
RAID 60	High	High	Relatively high	8	$(N - M \times 2)/N$
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 RH1288 V3 provides various PCIe cards. You can select the following PCIe cards based on the card type and transmission speed:

- Fibre Channel (FC) host bus adapter (HBA)
- Converged network adapter (CNA)
- InfiniBand (IB) card
- SAS HBA
- NIC
- SSD card
- GPU

[Table 1 Supported standard PCIe cards \(FC HBAs\)](#) to [Table 7 Supported NIC mezz cards](#) list the PCIe cards supported by the RH1288 V3.

NOTE

[Table 1 Supported standard PCIe cards \(FC HBAs\)](#) to [Table 7 Supported NIC mezz cards](#) are for reference only. For details about the PCIe cards available, consult the local Huawei sales representatives.

Table 6-15 Supported standard PCIe cards (FC HBAs)

Part Number	Type	Card Type	Model	Description	Port Type	Chip	Manufacturer	Driver	Notes
06030216	Official	FC Card	Lpe 12000	Single Port FC HBA Card,PCIE 2.0 X4 PCIE 1.0 X8-Vendor ID 10DF-Device ID F100-1,8Gbps,Fiber Channel Multimode LC Optic Interface,English Manual	SFP +	Lancer, LPe 12000	emulex	Link	Not e1; Not e15;
06030217	Official	FC Card	LPE 12002	DualPort FC HBA Card,PCIE 2.0 X4 PCIE 1.0 X8-Vendor ID 10DF-Device ID F100-2, 8Gbps,Fiber Channel Multimode LC Optic Interface,English Manual	SFP +	Lancer, LPE 12002	emulex	Link	Not e1; Not e15;
06030275	Official	FC Card	LPe 16000B	Other Cards,HBA Card LPe16000B-M6,FC Single Port-16Gb/s,PCIE 3.0 x8-Vendor ID 10df-Device ID e200-1,English doc,Multimode optical module,half width half length	SFP +	XE 201, LPe 16000B	emulex	Link	Not e1; Not e15;

Part Number	Type	Card Type	Model	Description	Port Type	Chip	Manufacturer	Driver	Notes
06030276	Official	FC Card	LPe16002B	Other Cards,HBA Card LPe16002B-M6,FC Double Ports-16Gb/s,PCIE 3.0 x8-Vendor ID 10df-Device ID e200-2,English doc,Multimode optical module,half width half length	SFP+	XE201, LPe16002B	emulex	Link	Not e1; Not e15;
06030220	Official	FC Card	QLE2562	Other Cards,DualPort FC HBA Card,PCIE 2.0 X4-1077-2532-2-8 Gbps,Fiber Channel Multimode LC Optic Interface,English doc	SFP+	EP2532, QLE2562	Qlogic	Link	Not e1; Not e15;
06030221	Official	FC Card	QLE2560	Single Port FC HBA Card,PCIE 2.0 X4-1077-2532-1-8 Gbps,Fiber Channel Multimode LC Optic Interface,English Manual	SFP+	EP2532, QLE2560	Qlogic	Link	Not e1; Not e15;

Part Number	Type	Card Type	Model	Description	Port Type	Chip	Manufacturer	Driver	Notes
06030278	Official	FC Card	QLE2672	Other Cards,HBA Card QLE2672-HUA-SP,FC Double Ports-16Gb/s,PCIE 3.0 x4-Vendor ID 1077-Device ID 2031-2,English Doc,Multimode optical module,half width half length	SFP+	ISP8324,QLE2672	Qlogic	Link	Not e1; Not e15;
06030277	Official	FC Card	QLE2670	Other Cards,HBA Card QLE2670-HUA-SP,FC Single Port-16Gb/s,PCIE 3.0 x4-Vendor ID 1077-Device ID 2031-1,English Doc,Multimode optical module,half width half length	SFP+	ISP8324,QLE2670	Qlogic	Link	Not e1; Not e15;
Notes: 1.Please download drivers from third-party official websites , and take the OS compatibility information released by third-party vendors as standard. 15.with SFP+ Optics itself									

Table 6-16 Supported standard PCIe cards (CNAs)

Part Number	Type	Card Type	Model	Description	Port Type	Chip	Manufacturer	Driver	Notes
06030223	Official	CNA	OCe1102-FM	Other Cards,FCoE-SFP+ Interface,2 ports,PCIE 2.0 X8-Vendor ID 19a2-Device ID 0710 0714-4,With SFP,Short,low-profile,English Doc	SFP+	be3	emulex	Link	Not e1; Not e15;
Notes: 1.Please download drivers from third-party official websites , and take the OS compatibility information released by third-party vendors as standard. 15.with SFP+ Optics itself									

Table 6-17 Standard PCIe cards (IB cards)

Part Number	Type	Card Type	Model	Description	Port Type	Chip	Manufacturer	Driver	Notes
06030284	Official	IB Card	MCX354A-FCBT	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	SFP+	CX3-PRO,MCX354A-FCBT	Mellanox	Link	Not e1; Not e16;

Part Number	Typ er	Card Type	Model	Description	Port Type	Chip	Manufacturer	Driver	Notes
06030285	Official	IB Card	MCX353A-FCBT	Other Cards, Infiniband MCX353A-FCBT, FDR Single port-56Gb/s PCIe 3.0 X8- Vendor ID 15b3-Device ID 1003-1, English Doc, half width half length	SFP+	CX3-PRO, MCX353A-FCBT, MCX354A-FCBT	Mellanox	Link	Not e1; Not e16;
Notes: 1. Please download drivers from third-party official websites, and take the OS compatibility information released by third-party vendors as standard. 16. Made in Israel, Can not be sold to LAS									

Table 6-18 Supported standard PCIe cards (NICs)

Part Number	Typ er	Card Type	Model	Description	Port Type	Chip	Manufacturer	Driver	Notes
03022 UTK	Official	NIC	SP212	Manufactured Board, X6000, CN21 ITGC, I350 4*GE PCIe Card, PCIe 2.0 X4- Vendor ID 8086-Device ID 1521-4, 1*2	RJ45 copper	i350	Huawei	Link Link	Not e1;

Part Number	Type	Card Type	Model	Description	Port Type	Chip	Manufacturer	Driver	Notes
02311 CWM	Official	NIC	SP212	Function Module, Server, CN21ITGC01, Intel I3504*GE Half-height Half-length, Full Handle bars, Ethernet Card, PCIE 2.0 X4-Vendor ID 8086-Device ID 1521-4	RJ45 copper	i350	Huawei	Link Link	Not e1; Not e19;
03030 WSQ	Official	NIC	SP310	Finished Board, X6000, CN21ITGAA13, Intel 82599 2*10GE SFP + Half-height Half-length X8 PCIE Ethernet Card NCSI Supported, PCIE 2.0 X8-Vendor ID 8086-Device ID 10FB-2	SFP +	82599	Huawei	Link Link	Not e1; Not e18;
	Temporary	NIC	MCX311A	Network Card, 10 Gigabit, 64bit, SFP+, 1 ports, PCIE 3.0 X4-15B3-1003-1, No Driver CD	SFP +	CX3	Mellanox	Link	Not e1; Not e15; Not e17;
	Temporary	NIC	MCX312B-XCCT	Dual Port 10 Gigabit Ethernet Server Adapter, LC Fiber Optic, PCIE 3.0 X8 -15b3-1007- Half-height half-length	SFP +	CX3	Mellanox	Link	Not e1; Not e15; Not e17;
06310 058	Official	NIC	I350F2G1P20914215	Network Card, Gigabit, LC Fiber Optic, 2 Ports, PCIE 2.0 X4-8086-1522-2, without Driver CD, With SFP, Short, low-profile	SFP +	i350	Intel	Link Link	Not e1; Not e15;

Part Number	Type	Card Type	Model	Description	Port Type	Chip	Manufacturer	Driver	Notes
06310025	Official	NIC	E1G44HT	NIC,Gigabit Ethernet Card,RJ45 Copper,Quad port ,PCIE 2.0 X4-8086-150E-4, Without Driver CD	RJ45 copper	82580	Intel	Link Link	Not e1;
06310040	Official	NIC	PE2G4I80L	Network Card,Gigabit,RJ45 Copper,4 ports,PCIE 2.0 X4-8086-150e-4,No Driver CD	RJ45 copper	82580	Silicom	Link Link	Not e1;
06310026	Official	NIC	E10G42BFSR	NIC,10 Gigabit Ethernet Server Adapter,LC Fiber Optic,Dual Port,PCIE 2.0 X8-8086-10FB-2, Without Driver CD	SFP+	82599	Intel	Link Link	Not e1; Not e15;
02310YHP	Official	NIC	SP310	Function Module,X6000,CN2 1ITGAA12,PCIE 2.0 X8-Vendor ID 8086-Device ID 10FB-2,NCSI Supported	SFP+	82599	Huawei	Link Link	Not e1; Not e19;
02311CVV	Official	NIC	SP210	Function Module,Server,CN2 1ITGB01,Intel I350 2*GE Half-height Half-length ,Full Handle bars,Ethernet Card,PCIE 2.0 X4-Vendor ID 8086-Device ID 1521-2	RJ45 copper	i350	Huawei	Link Link	Not e1; Not e19;
06310070	Official	NIC	I350T2G1P20914225	Network Card,Gigabit,RJ45 Copper,2 ports,PCIE 2.0 x4-8086-1521-2,without Driver CD	RJ45 copper	i350	Intel	Link Link	Not e1;

Part Number	Type	Card Type	Model	Description	Port Type	Chip	Manufacturer	Driver	Notes
06310080	Official	NIC	PE210G2140E-T-HU	Network Card, 10GE,RJ45,2 ports,PCIE 2.0 X8-8086-1528-2,without Driver CD22	RJ45 copper	X540	Silicom	Link	Not e1; Not e17;
06310081	Official	NIC	X540T2914248	Network Card, 10GE,RJ45,2 ports,PCIE 2.0 X8-8086-1528-2,without Driver CD	RJ45 copper	X540	Intel	Link Link	Not e1; Not e17;
03022TSC	Official	NIC	SP210	Manufactured Board,X6000,CN21 ITGB,I350 2*GE PCIE Card,PCIE 2.0 X4-Vendor ID 8086-Device ID 1521-2,1*2	RJ45 copper	i350	Huawei	Link	Not e1;
Notes: 1.Please download drivers from third-party official websites ,and take the OS compatibility information released by third-party vendors as standard. 15.with SFP+ Optics itself 17.Cannot get it from Unistar 18.The SPF+ Optical module part number:34060494;34060495;04050233;04050185 19.Only for Spares									

Table 6-19 Supported standard PCIe cards (PCIe SSDs)

Part Number	Type	Card Type	Model	Description	Port Type	Chip	Manufacturer	Driver	Notes
03022UUA	Official	SSD	ES3000 V2-600GB	Manufactured Board,ES3000 V2,CN21EEACJ,ES3000 V2-600-PCIE 2.0 X8-Vendor ID 19e5-Device ID 0009-1-SSD Card (600GB) Half-height half-length	PCI E2.0 X8	XC7K410T_2F_FG900I	Huawei	Link	
03022XWV	Official	SSD	ES3000 V2-800GB	Manufactured Board,ES3000 V2,CN21EEACQ,ES3000 V2-800-PCIE 2.0 X8-Vendor ID 19e5-Device ID 0009-1-SSD Card (800GB) Half-height half-length	PCI E2.0 X8	XC7K410T_2F_FG900I	Huawei	Link	
03022XVW	Official	SSD	ES3000 V2-1200GB	Manufactured Board,ES3000 V2,CN21EEACL,ES3000 V2-1200-PCIE 2.0 X8-Vendor ID 19e5-Device ID 0009-1-SSD Card (1200GB) Half-height half-length	PCI E2.0 X8	XC7K410T_2F_FG900I	Huawei	Link	
03022YJR	Official	SSD	ES3000 V2-1600GB	Manufactured Board,ES3000 V2,CN21EEACM,ES3000 V2-1600-PCIE 2.0 X8-Vendor ID 19e5-Device ID 0009-1-SSD Card (1600GB) Half-height half-length	PCI E2.0 X8	XC7K410T_2F_FG900I	Huawei	Link	

Part Number	Type	Card Type	Model	Description	Port Type	Chip	Manufacturer	Driver	Notes
03022PEL	Official	SSD	ES3000 V2-1200GB	Manufactured Board,ES3000 V2,CN21EEBCL,ES3000 V2-1200H-PCIE 2.0 X8-Vendor ID 19e5-Device ID 0009-1-SSD Card (1200GB) Full-height half-length	PCI E2.0 X8	XC7K410T_2F_FG900I	Huawei	Link	
03022PEK	Official	SSD	ES3000 V2-2400GB	Manufactured Board,ES3000 V2,CN21EEBCN,ES3000 V2-2400H-PCIE 2.0 X8-Vendor ID 19e5-Device ID 0009-1-SSD Card (2400GB) Full-height half-length	PCI E2.0 X8	XC7K410T_2F_FG900I	Huawei	Link	
03022MDC	Official	SSD	ES3000 V2-3200GB	Manufactured Board,ES3000 V2,CN21EEBCP,ES3000 V2-3200H-PCIE 2.0 X8-Vendor ID 19e5-Device ID 0009-1-SSD Card (3200GB) Full-height half-length	PCI E2.0 X8	XC7K410T_2F_FG900I	Huawei	Link	
03030TLH	Official	SSD	ES3000-400GB	Finished Board,Tecal ES2000,CN21EDB CF01,The 4th Generation-PCIE 2.0 X8-19e5-0007-1-SSD Card(400GB),ES2000-4-0.4	PCI E2.0 X8	XC7K325t	Huawei	Link	

Part Number	Type	Card Type	Model	Description	Port Type	Chip	Manufacturer	Driver	Notes
03030PXT	Official	SSD	ES3000-800GB	Finished Board,Tecal ES2000,CN21EDB CJ01,The 4th Generation-PCIe 2.0 X8-19e5-0007-1-SSD Card (800GB),ES2000-4-0.8	PCI E2.0 X8	XC7K325t	Huawei	Link	
03030PXS	Official	SSD	ES3000-1200GB	Finished Board,Tecal ES2000,CN21EDB CL01,The 4th Generation-PCIe 2.0 X8-19e5-0007-1-SSD Card (1200GB),ES2000-4-1.2	PCI E2.0 X8	XC7K325t	Huawei	Link	
03030PWG	Official	SSD	ES3000-2400GB	Finished Board,Tecal ES2000,CN21EDB CN01,The 4th Generation-PCIe 2.0 X8-19e5-0007-1-SSD Card (2400GB),ES2000-4-2.4	PCI E2.0 X8	XC7K325t	Huawei	Link	

Table 6-20 Supported standard PCIe cards (GPUs)

Part Number	Type	Card Type	Model	Description	Port Type	Chip	Manufacturer	Driver	Notes
06320062	Official	GPU	Quadro K2000	Video Card,GPU-Quadro K2000,2GB Memory/ 64GB/s Bandwidth / PCIE 2.0 X16-10DE-0FFE 0E1B-2,51.1W/ SingleSlot/ ActiveCooling,Chinese and English doc,Configuration sheet, Enterprise Computing Used	NA	GK107	NVIDIA	Link	Not e1; Not e2; Not e20; Not e24;
06320064	Official	GPU	NVS315	Video Card,GPU Card,NVS 315/ 1GB DDR3/ 14GB/s bandwidth -PCIE 2.0 X16-10DE-107C 0E08-2,19.5W- ActiveCooling,NUL L,with Config-Sheet	NA	GF119	NVIDIA	Link	Not e1; Not e2; Not e20;

Part Number	Type	Card Type	Model	Description	Port Type	Chip	Manufacturer	Driver	Notes
Notes: 1.Please download drivers from third-party official websites , and take the OS compatibility information released by third-party vendors as standard. 2.Single card supported only 20.Install Redhat system with basic driver video mode 24.Shipment with the server is not supported for this GPU.									

Table 6-21 Supported NIC mezzanine cards

Part Number	Type	Model	Description	Chip	Manufacturer	Driver	Notes
03021XTQ	Official	SM210-4*GE	Manufactured Board,Tecal RH2285H V2,BC11FGEA, 4*GE Interface Card--PCIE 1.0 X4-4-Board ID 0X14,Servers,4*1	5719	Huawei	Link	
03022CKQ	Official	SM211-2*GE	Manufactured Board,RH2288H V2,BC11FGEB, 2*GE Interface Card,PCIE 2.0 X4-2-Board ID 0X17,4*1	i350	Huawei	Link	
03021YTD	Official	SM231-2*10G	Manufactured Board,Tecal RH2285H V2,BC11FXEB, 2X10GE NetCard-PCIE 2.0 X8-2-Board ID 0X15,2*1	82599	Huawei	Link	Note 2;

Part Number	Type	Model	Description	Chip	Manufacturer	Driver	Notes
03022GEX	Official	SM233-2*10G	Manufactured Board, Tecal RH2288H V2, BC11FGED, 2*10G BASET Interface Card, PCIE 2.1 X8-Board ID 0X19,4*1	X540	Huawei	Link	
03022TQY	Official	SM212-4*GE	Manufactured Board, RH2288 V3, BC11FGEC, I350 4*GE Interface Card, PCIE 2.0 X4-4-Board ID 0X18,4*1	i350	Huawei	Link	
Notes: 2. The SPF+ Optical module part number: 34060494; 34060495; 04050233; 04050185							

6.5 PSU

Table 6-22 lists the PSUs supported by the RH1288 V3.

NOTE

- **Table 6-22** is for reference only. For details about the PSUs available, consult the local Huawei sales representatives.
- A server must use PSUs of the same model.

Table 6-22 Supported PSUs

Part Number	Power Rating	Power Input	Power Output	Energy Efficiency Grade	Altitude	Notes
02270146	1200W	260-400V/6A	+12V/100A 94.0% Platinum. 4094BTU/hr	Platinum	2000m	
02310QWX	750W	100-240V/ 9.0~4.5A OR 240V DC/5A	+12V/62.5A 94.0% Platinum. 2559BTU/hr	Platinum	2000m	

Part Number	Power Rating	Power Input	Power Output	Energy Efficiency Grade	Altitude	Notes
02131042	460W	100V-240V/6~3A	+12V/38A 92.0% Gold. 1570BTU/hr	Gold	2000m	
02130957	460W	100V-240V/6~3A OR 240V DC/5A	+12V/38A 94.0% Platinum. 1570BTU/hr	Platinum	2000m	
02131058	750W	100V-240V/9.0~4.5A OR 240V DC/5A	+12V/62.5A 94.0% Platinum. 2559BTU/hr	Platinum	2000m	
02131167	750W	200V-240V~4.1A	+12V/62.5A 96.0% Titanium. 2559BTU/hr	Titanium	5000m	
02270113	800W	-38V~-75V/26A	+12V/65A 93.5% Gold. 2811BTU/hr	Platinum	2000m	

6.6 OS and Software

Table 6-23 lists the OSs supported by the RH1288 V3.

NOTE

Table 6-23 is for reference only. For details about the OSs available, consult the local Huawei sales representatives.

Table 6-23 Supported OSs

OS	Description	Certification	Drivers	Notes
CentOS 6.5	CentOS Linux 6 Update 5 Server for Intel EM64T		Link	Note1 ; Note2 ; Note3 ; Note4 ; Note5 ;

OS	Description	Certification	Drivers	Notes
CentOS 6.6	CentOS Linux 6 Update 6 Server for Intel EM64T		Link	Note1 ; Note2 ; Note3 ; Note4 ; Note5 ;
CentOS 6.7	CentOS Linux 6 Update 7 Server for Intel EM64T		Link	Note2 ; Note3 ; Note4 ; Note5 ;
CentOS 7.0	CentOS Linux 7 Server for Intel EM64T		Link	Note2 ; Note3 ; Note4 ; Note5 ;
CentOS 7.1	CentOS Linux 7 Update 1 Server for Intel EM64T		Link	Note2 ; Note3 ; Note4 ; Note5 ;
Citrix XenServer 6.2	Citrix XenServer 6.2	Link	Link	Note2 ; Note3 ; Note5 ; Note6 ;
Citrix XenServer 6.5	Citrix XenServer 6.5	Link	Link	Note2 ; Note3 ; Note4 ; Note5 ;
Debian 7.0	Debian 7.0 for Intel EM64T		Link	Note2 ; Note3 ; Note5 ; Note6 ;
Debian 7.7	Debian 7.7 for Intel EM64T		Link	Note2 ; Note3 ; Note5 ; Note6 ;

OS	Description	Certification	Drivers	Notes
Debian 7.8	Debian 7.8 for Intel EM64T		Link	Note2; Note3; Note5; Note6;
FS5.0	FusionSphere 5.0		Link	Note2; Note3; Note4; Note5;
OpenStack 5.0	Red Hat Enterprise Linux OpenStack Platform 5.0	Link	Link	
OpenStack 6.0	Red Hat Enterprise Linux OpenStack Platform 6.0	Link	Link	
OpenStack 7.0	Red Hat Enterprise Linux OpenStack Platform 7.0	Link	Link	
Oracle Linux 6.5	Oracle Enterprise Linux 6 Update 5 Server for Intel EM64T	Link	Link	Note2; Note3; Note4; Note5;
Oracle Linux 6.6	Oracle Enterprise Linux 6 Update 6 Server for Intel EM64T	Link	Link	Note2; Note3; Note4; Note5;
Oracle Linux 6.7	Oracle Enterprise Linux 6 Update 7 Server for Intel EM64T	Link	Link	Note2; Note3; Note4; Note5; Note2; Note3; Note4; Note5;

OS	Description	Certification	Drivers	Notes
Oracle VM 3.3	Oracle VM 3.3	Link	Link	Note2; Note3; Note4; Note5;
RHEL 6.5	Red Hat Enterprise Linux 6 Update 5 Server for Intel EM64T	Link	Link	Note1; Note2; Note3; Note4; Note5; Note14;
RHEL 6.5 KVM	Red Hat Enterprise Linux 6 Update 5 Server for Intel EM64T	Link	Link	Note1;
RHEL 6.6	Red Hat Enterprise Linux 6 Update 6 Server for Intel EM64T		Link	Note1; Note2; Note3; Note4; Note5;
RHEL 6.7	Red Hat Enterprise Linux 6 Update 7 Server for Intel EM64T		Link	Note2; Note3; Note4; Note5;
RHEL 7.0	Red Hat Enterprise Linux 7 Server for Intel EM64T	Link	Link	Note2; Note3; Note4; Note5; Note14;
RHEL 7.0 KVM	Red Hat Enterprise Linux 7 Server for Intel EM64T	Link	Link	
RHEL 7.1	Red Hat Enterprise Linux 7 Update 1 Server for Intel EM64T		Link	Note2; Note3; Note4; Note5;

OS	Description	Certification	Drivers	Notes
SLES 11.3	SUSE Linux Enterprise Server 11 Service Pack 3 for Intel EM64T	Link	Link	Note1 ; Note2 ; Note3 ; Note4 ; Note5 ; Note14 ;
SLES 11.4	SUSE Linux Enterprise Server 11 Service Pack 4 for Intel EM64T	Link	Link	Note2 ; Note3 ; Note4 ; Note5 ;
SLES 12.0	SUSE Linux Enterprise Server 12 for AMD64 & Intel64	Link	Link	Note2 ; Note3 ; Note4 ; Note5 ;
Solaris 11.2	Oracle Solaris 11 update 2		Link	Note2 ; Note3 ; Note4 ; Note5 ;
Ubuntu 12.04	Ubuntu 12.04 LTS Server Edition for Intel EM64T		Link	Note2 ; Note3 ; Note5 ; Note6 ;
Ubuntu 14.04 LTS	Ubuntu 14.04 LTS Server Edition for Intel EM64T		Link	Note2 ; Note3 ; Note5 ; Note6 ;
Vmware ESXi 5.1.2	Vmware ESXi 5.1 update2	Link	Link	Note1 ; Note10 ; Note11 ; Note12 ; Note13 ;
Vmware ESXi 5.1.3	Vmware ESXi 5.1 update 3	Link	Link	Note1 ; Note10 ; Note11 ; Note12 ; Note13 ;

OS	Description	Certification	Drivers	Notes
Vmware ESXi 5.5.2	Vmware ESXi 5.5 update2	Link	Link	Note1 ; Note2 ; Note3 ; Note4 ; Note5 ;
Vmware ESXi 6.0	Vmware ESXi 6.0	Link	Link	Note1 ; Note2 ; Note3 ; Note4 ; Note5 ;
Windows 2008 R2 SP1	Microsoft Windows Server 2008 R2 SP1	Link	Link	Note1 ; Note6 ; Note7 ; Note8 ; Note9 ; Note14 ;
Windows 2008 R2 SP1 Hyper-v	Microsoft Windows Server 2008 R2 SP1 hyper-v	Link	Link	
Windows 2012	Microsoft Windows Server 2012	Link	Link	Note1 ; Note2 ; Note3 ; Note5 ; Note6 ; Note14 ;
Windows 2012 Hyper-v	Microsoft Windows Server 2012 hyper-v	Link	Link	
Windows 2012 R2	Microsoft Windows Server 2012 R2	Link	Link	Note1 ; Note2 ; Note3 ; Note4 ; Note5 ; Note14 ;

OS	Description	Certification	Drivers	Notes
Windows 2012 R2 Hyper-v	Microsoft Windows Server 2012 R2 hyper-v	Link	Link	
Notes: 1.Install an OS by using the ServiceCD2.0 2.Install an OS directly when config LSI2308 raid card 3.Install an OS directly when config LSI2208 raid card 4.Install an OS directly when config LSI3008 raid card 5.Install an OS directly when config LSI3108 raid card 6.Install an OS must to load LSI3008 driver when config LSI3008 raid card 7.Install an OS must to load LSI3108 driver when config LSI3108 raid card 8.Install an OS must to load LSI2208 driver when config LSI2208 raid card 9.Install an OS must to load LSI2308 driver when config LSI2308 raid card 10.Install an OS by making an installation source when config LSI2308 raid card 11.Install an OS by making an installation source when config LSI2208 raid card 12.Install an OS by making an installation source when config LSI3008 raid card 13.Install an OS by making an installation source when config LSI3108 raid card 14.Install an OS must to load megasr driver when config softraid				

7 System Management

The Huawei proprietary intelligent baseboard management system (iBMC) manages servers remotely. iBMC complies with IPMI V2.0 standards and provides reliable hardware monitoring and management.

iBMC has the following features:

- KVM and text console redirection
- Remote virtual media
- IPMI support
- Simple Network Management Protocol (SNMP) support
- Browser login

Table 7-1 describes the specifications of iBMC.

Table 7-1 Specifications of iBMC

Feature	Specifications
Management interface	Standard management systems are integrated through: ● IPMI ● CLI ● HTTPS ● SNMP
Fault detection	iBMC detects faults and accurately locates faults in hardware, for example, an FRU.
Alarm management	Alarm reporting uses: ● SNMP trap ● Simple Mail Transfer Protocol (SMTP) ● Syslog service
Virtual KVM integration	● Remote maintenance measures for system troubleshooting ● Maximum resolution: 1920 x 1200

Feature	Specifications
Virtual media integration	● Local media devices, images, USB keys, and folders virtualized into media devices on a remote server simplify OS installation. ● Maximum transmission rate of virtual DVD-ROM drive: 8 Mbyte/s
WebUI	● User-friendly GUI simplifies configuration and querying. ● Compatible OS, web browser, and JRE versions: - Windows XP (32-bit); Internet Explorer 8.0 or later, Mozilla Firefox 9.0, or Google Chrome 13.0; JRE 1.6.0 U25 or later - Windows 7 (32-bit); Internet Explorer 8.0 or later, Mozilla Firefox 9.0, or Google Chrome 13.0; JRE 1.6.0 U25 or later - Red Hat Enterprise Linux 4.3 (64-bit); Mozilla Firefox 9.0; JRE 1.6.0 U25 or later - Red Hat Enterprise Linux 6.0 (64-bit); Mozilla Firefox 9.0; JRE 1.6.0 U25 or later - Mac; Safari or Mozilla Firefox 9.0; JRE 1.6.0 U25 or later
Fault reproduction	Facilitates fault diagnosis.
Screenshots and videos	View screenshots and videos without login for easy routine preventive maintenance inspection (PMI).
DNS and directory service	Further simplifies network and configuration management.
Dual-image backup	Startup from a backup image if the software fails.
Asset management	iBMC provides intelligent asset management.
Intelligent power management	Power capping technology increases deployment density. Dynamic energy saving lowers operating expenses.
IPv6	Ensures sufficient IP addresses.
NC-SI	System management is accessible 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 servers, 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 service and/or parts may not be available in all countries. For more information about warranty services in your country, contact Huawei technical support or your local Huawei representative office.

9 Physical Specifications

Table 9-1 describes the physical specifications of the RH1288 V3.

Table 9-1 Physical specifications

Item	Specifications
Dimensions (H x W x D)	● Chassis equipped with 3.5-inch hard disks: 43 mm (1U) x 436 mm x 748 mm (1.69 in. x 17.17 in. x 29.45 in.) ● Chassis equipped with 2.5-inch hard disks: 43 mm (1U) x 436 mm x 708 mm (1.69 in. x 17.17 in. x 27.87 in.)
Installation dimensions	The RH1288 V3 fits into a common rack complying with the IEC 297 standard. ● Rack width: 19 inches ● Rack depth: > 1000 mm (39.37 in.)
Power rating of PSUs	The PSUs support the following power ratings: ● 460 W AC PSU: 460 W (input voltage range: 100 V to 240 V AC or 192 V to 288 V DC) ● 750 W AC PSU: 750 W (input voltage range: 100 V to 240 V AC or 192 V to 288 V DC) ● 800 W DC PSU: 800 W (input voltage range: 36 V to 75 V DC) ● 1200 W high-voltage direct current (HVDC) PSU: 1200 W (input voltage range: 260 V to 400 V DC) NOTE For more information, see the Huawei Server Compatibility Checker.
Weight in full configuration	Net weight: ● With eight 2.5-inch hard disks: 20 kg (44.10 lb) ● With four 3.5-inch hard disks: 19 kg (41.90 lb) Packing material weight: 5 kg (11.03 lb)

Item	Specifications
Input voltage	● 460 W or 750 W AC PSUs: 100 V to 240 V AC ● 460 W or 750 W AC PSUs (compatible with 240 V HVDC PSUs): 192 V DC to 288 V DC ● 800 W DC PSUs: -36 V to -75 V DC ● 1200 W high-voltage direct current (HVDC) PSUs: 260 V to 400 V DC NOTE The recommended current for the external power circuit breaker connected to the RH1288 V3 is 16 A or larger.
Temperature	● Operating temperature: 5°C to 45°C (41°F to 113°F) ● Storage temperature: - 40°C to +65°C (- 40°F to 149°F) ● Temperature change rate: < 20°C/h (36°F/h) NOTE ● When the RH1288 V3 operates at 40°C (104°F), the failure of one fan may cause the processor performance to deteriorate. ● When the RH1288 V3 operates at 35°C (95°F), the failure of one fan has no adverse impact on the processor performance. ● The RH1288 V3 can operate at the highest temperature of 35°C (95°F) when it is configured with Huawei PCIe SSDs. ● The RH1288 V3 can operate at the highest temperature of 40°C (104°F) when it is configured with E5-2698 v3, E5-2690 v3, E5-2667 v3, or E5-2643 v3 processors. Operating at a temperature of higher than 40°C (104°F) or the failure of a fan may cause the processor performance to deteriorate. ● The RH1288 V3 can operate at the highest temperature of 30°C (86°F) when it is configured with E5-2637 v3 processors. Operating at a temperature of higher than 30°C (86°F) or the failure of a fan may cause the processor performance to deteriorate.
Humidity	Operating humidity: 8% RH to 90% RH (non-condensing) Storage humidity: 5% RH to 95% RH (non-condensing) Humidity change rate: < 20% RH/hour
Altitude	≤ 3000 m (9842.40 ft) When the altitude is higher than 900 m (2952.72 ft), the operating temperature decreases by 1°C (1.8°F) per 300 m (984.24 ft).

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: 5.4 Bels - LpAm: 37.6 dBA ● Operating: - LWAd: 6.37 Bels - LpAm: 46.7 dBA NOTE The actual sound levels generated during server operating vary depending on the server configuration, load, and ambient temperature.

10 Certifications

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