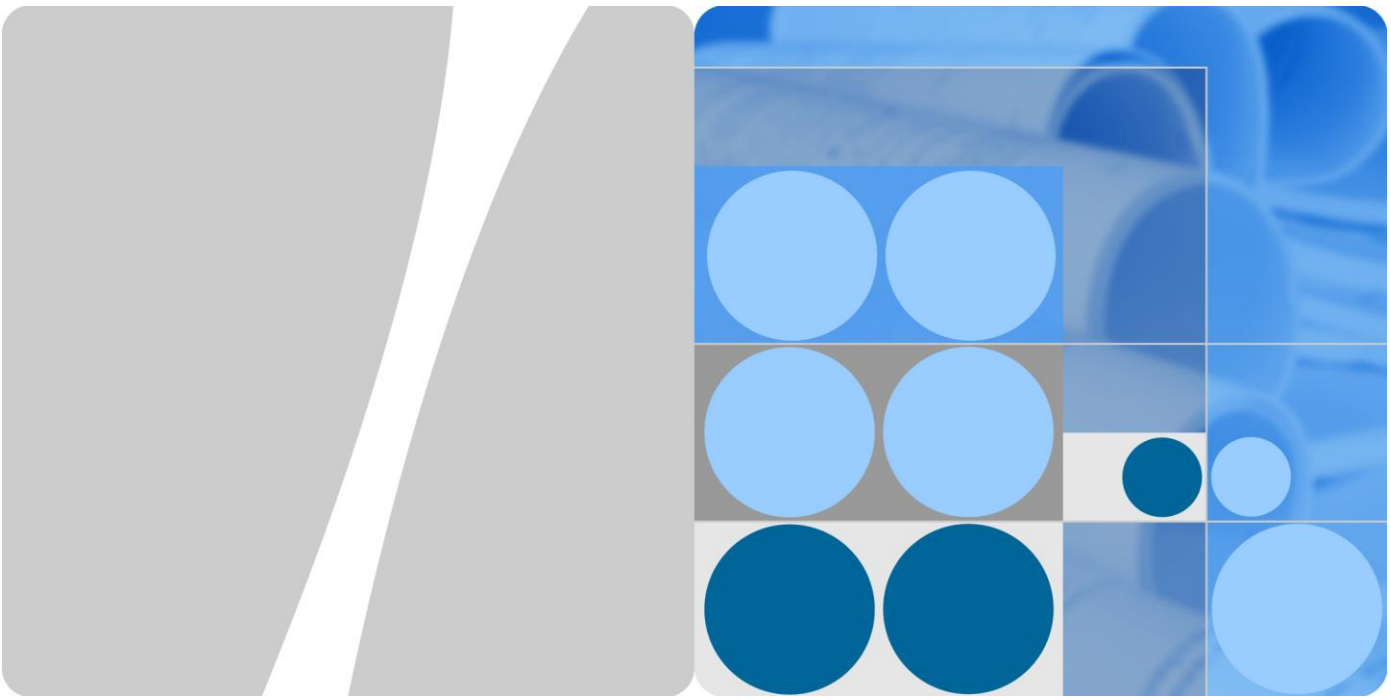

Tecal RH1288 V2 Server V100R002

White Paper

Issue 01

Date 2013-6-20

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Contents

1 About This Document

Purpose

This document describes the appearance, features, specifications, and configurations of the HUAWEI new-generation 1U rack server Tecal RH1288 V2(short for RH1288 V2). You can understand the server by reading this document.

Intended Audience

This document is intended for:

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

Symbol Conventions

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

Symbol	Description
DANGER	**DANGER** indicates a hazard with a high level or medium level of risk which, if not avoided, could result in death or serious injury.
WARNING	**WARNING** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
CAUTION	**CAUTION** indicates a potentially hazardous situation that, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results.
TIP	**TIP** indicates a tip that may help you solve a problem or save time.
NOTE	**NOTE** provides additional information to emphasize or supplement important points of the main text.

Change History

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

Issue 01 (2013-06-20)

This issue is the first official release.

2 Overview

About This Chapter

2.1 Introduction

This topic describes the RH1288 V2 in terms of its features and appearance.

The Tecal RH1288 V2 (RH1288 V2 for short) is a generic 1 U dual-socket rack server launched by Huawei to meet customer requirements for the Internet, Internet data center (IDC), cloud computing, enterprise market applications, and telecom service applications.

The RH1288 V2 supports high performance computing (HPC), databases, virtualization, basic enterprise applications, and telecommunication service applications thanks to its outstanding computing performance, large storage capacity, low energy consumption, high reliability, and ease of deployment and management.

The RH1288 V2 has two models:

- RH1288 V2-8S

  Figure 2-1 shows the RH1288 V2-8S that supports eight 2.5-inch SAS HDDs, SATA HDDs, or solid-state drives (SSDs).
- RH1288 V2-4L

  Figure 2-2 shows the RH1288 V2-4L that supports four 3.5-inch SAS or SATA HDDs.

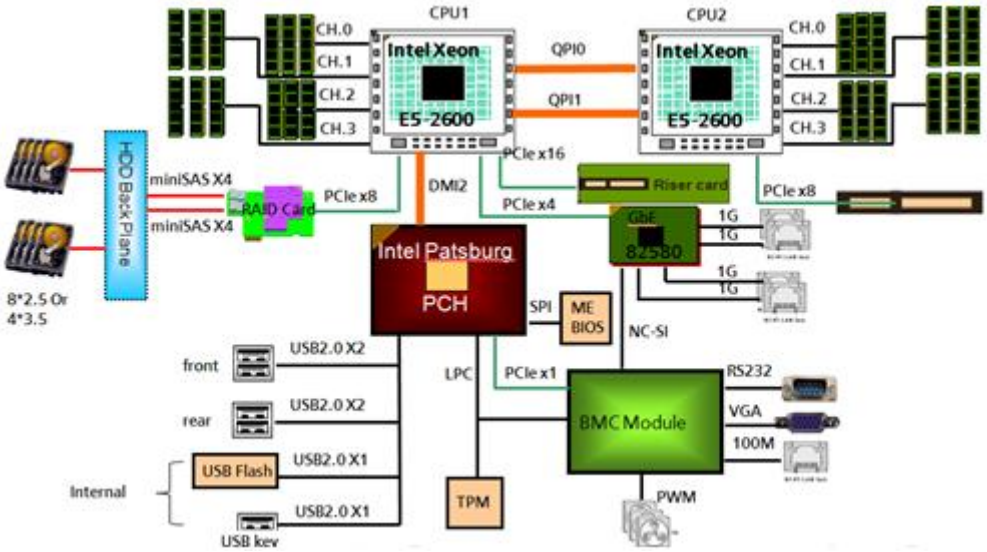
Figure 2-1 RH1288 V2-8S

Figure 2-2 RH1288 V2-4L

2.2 System Architecture

The RH1288 V2 is a high-performance rack server based on the latest Intel® Sandy Bridge-EP platform. The server supports Intel Xeon E5-2600 series CPUs and up to 24 double data rate 3 (DDR3) dual in-line memory modules (DIMMs).Figure 2-3 describes its system architecture.

Figure 2-3 System Architecture



3 Features

Performance and Scalability

- The Intel Xeon E5-2600 series CPUs each have up to eight cores and 20 MB of L3 cache at a frequency of 2.9 GHz, with double QuickPath Interconnect (QPI) links between CPUs, delivering up to 8 GT/s of bandwidth per link. This enables the server to have the highest processing performance.
- Each server supports two CPUs, 16 cores, and 32 threads, which maximizes the concurrent execution of multithreaded applications.
- Intelligent and adaptive system performance provided by Intel's Turbo Boost Technology 2.0 enables the CPU cores to run at maximum speeds during peak workloads by temporarily going beyond the CPU thermal design power (TDP).
- Intel's Hyper-Threading Technology boosts performance for multithreaded applications by enabling simultaneous multithreading within each processor core, up to two threads per core.
- Intel's Virtualization Technology integrates hardware-level virtualization functions that allow operating system (OS) vendors to better use hardware for addressing virtualization workloads.
- With Intel Advanced Vector Extensions (AVX), Xeon E5-2600 series CPUs improve floating-point performance for compute-intensive applications by 80% compared to Intel Xeon 5600 series CPUs.
- A total of 24 DDR3 error checking and correcting (ECC) load-reduced DIMMs (LRDIMMs) provide a high speed of up to 1600 MHz, high availability, and a memory capacity of up to 768 GB.
- The theoretical maximum memory bandwidth of Intel Xeon E5-2600 series CPUs is 51.6 Gbit/s, which is 60% higher than Xeon 5600 series CPUs.
- The use of solid-state drives (SSDs) instead of or along with hard disk drives (HDDs) significantly improves I/O performance. An SSD supports up to 100 times more I/O operations per second (IOPS) than a typical HDD.
- The server supports two flexible disk configurations and provides up to four 3.5-inch disks or eight 2.5-inch disks.
- The server provides four integrated GE ports and a variety of network ports.
- The server offers Peripheral Component Interconnect Express (PCIe) 3.0 I/O scalability that improves the maximum bandwidth by 60% (8 GT/s), compared with PCIe 2.0.
- With the Intel integrated I/O technology, the PCIe 3.0 controller is integrated into the Intel Xeon E5 series CPUs, which reduces I/O latency and increases overall system performance.

Availability and Serviceability

- The server boards use carrier-class components and follow the engineering process, which dramatically improves system reliability.
- The server provides hot-swappable Serial Advanced Technology Attachment (SATA) disks, Serial Attached SCSI (SAS) disks, and SSDs, supports RAID 0, 1, 1E, 10, 5, 50, 6, and 60, offers RAID cache, and uses backup battery units (BBUs) or supercapacitors for power-off protection.
- The UID and HLY indicators on the panel and the baseboard management controller (BMC) web user interface (WebUI) provide the status of key components to quickly lead the technical support personnel to failed (or failing) components, which simplifies servicing, accelerates troubleshooting, and helps improve system availability.
- SSDs offer better reliability than hard disk drives (HDDs) for longer system uptime.
- The built-in iMana continuously monitors system parameters, triggers alarms, and performs recovery actions in the case of failures to minimize system downtime.
- For the products with three-year warranty used in China, Huawei provides customer replaceable units and onsite limited warranty 9 x 5 next business day. Optional service upgrades are available.
- For the products with three-year warranty used outside China, Huawei responds to service requests 9 x 5 next business day and ships the repaired or replacement parts within 45 calendar days after receiving defective parts.

Manageability and Security

- The built-in iMana monitors server availability and performs remote management.
- An integrated industry-standard unified extensible firmware interface (UEFI) increases efficiency of setup, configuration, and updates, and simplifies error handling.
- The optional Trusted Platform Module (TPM) V1.2 enables the advanced cryptographic functions, such as digital signatures and remote attestation.
- 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 combined with a supporting OS.
- Intel Trusted Execution Technology provides enhanced security by using hardware-based resistance to malicious software attacks, allowing an application to run in its own isolated space that is protected from all other software running on a system.
- The Network Controller Sideband Interface (NC-SI) feature supports multiplexing of management ports and service ports, which maximizes return on investment (ROI) for customers.

Energy Efficiency

- The server uses 460 W 80 Plus Platinum power supply units (PSUs) that provide a maximum efficiency of 94% at 50% loads.
- The Intel Xeon E5-2600 series CPUs provide better performance over the previous generation while fitting into the same TDP limits.
- Intel Intelligent Power Capability powers on and off an individual processor element as needed, to reduce power consumption.
- Low-voltage Intel Xeon CPUs consume less energy to satisfy demands of power and thermally constrained data centers and telecommunication environments.

- Low-voltage 1.35 V DDR3 RDIMMs consume 15% less energy than 1.5 V DDR3 RDIMMs.
- SSDs consume 80% less power than HDDs.
- The improved thermal design with energy-efficient fans reduces power consumption.
- The efficient voltage regulator down (VRD) power supplies reduce the loss in DC/DC power conversion.
- The server supports partition-based and intelligent fan speed adjustment and intelligent CPU frequency adjustment, reducing power consumption.
- The server provides power capping and power control.
- Disks are not powered on at the same time, reducing the server startup power consumption.

Customization

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

4 Appearance

About This Chapter

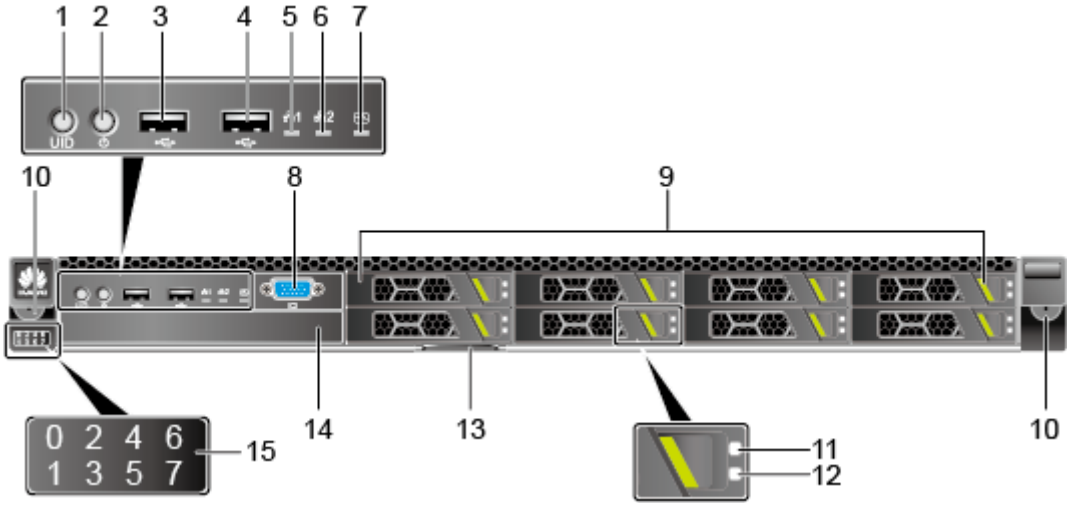
4.1 Front Panel

This topic describes the indicators, buttons, and ports on the RH1288 V2 front panel.

4.1.1 Front View

Figure 4-1 shows the components on the RH1288 V2 front panel.

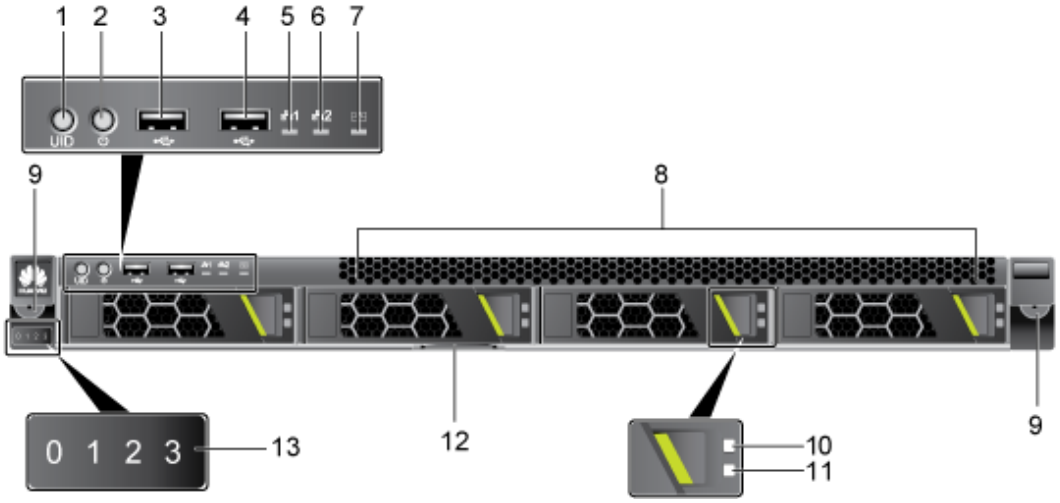
Figure 4-1 RH1288 V2-8S front view



1	UID button/indicator	2	Power button/indicator
3	USB port 1	4	USB port 2
5	Ethernet port indicator 1	6	Ethernet port indicator 2
7	HEALTHY indicator	8	VGA port
9	Disk	10	Captive screw
11	Hard disk fault indicator	12	Hard disk active indicator
13	Label (showing the RH1288 V2 hardware configurations)	14	(Optional) Built-in DVD-ROM driver (only for the RH1288 V2-8S)
15	Hard disk slot label	16	–

Figure 4-2 shows the components on the RH1288 V2-4L front panel.

Figure 4-2 RH1288 V2-4L front view



1	UID button/indicator	2	Power button/indicator
3	USB port 1	4	USB port 2
5	Ethernet port indicator 1	6	Ethernet port indicator 2
7	HEALTHY indicator	8	Disk
9	Captive screw	10	Hard disk fault indicator
11	Hard disk active indicator	12	Label (showing the RH1288 V2 hardware configurations)
13	Hard disk slot label	14	–

4.1.2 Indicators

Table 4-1 describes the indicators and buttons that on the front panel of the RH1288 V2.

Table 4-1 Indicators and buttons on the front panel

Indicator/Button	Color	State
UID button/indicator	Blue	• Steady on: The UID button is pressed down. • Off: The UID button is not pressed.
HEALTHY indicator	Red and green	• Steady green: The server is operating properly. • Blinking red: – 2 Hz: A major alarm is generated. – 4 Hz: A critical alarm is generated.
Ethernet port indicator 1	Green	The indicator corresponds to the GE port 1 on the rear panel. • Steady on: The network port is connected

Indicator/Button	Color	State
		properly. • Off: The port is not in use.
Ethernet port indicator 2	Green	The indicator corresponds to the GE port 2 on the rear panel. • Steady on: The network port is connected properly. • Off: The port is not in use.
Power button/indicator	Yellow and green	• Steady green: The system is properly powered on. • Blinking yellow at 1 Hz: The iMana is being started. • Steady yellow: The system is in the standby state. • Off: The server is not powered on.
Hard disk active indicator	Green	• Steady on: The hard disk is operating properly. • Blinking: The data on the hard disk is being accessed. • Off: The hard disk is not properly installed or is not powered on, or no hard disk is installed in the slot.
Hard disk fault indicator	Yellow	• Steady on: The hard disk fails. • Blinking: The RAID on the hard disk is being reconstructed. • Off: The hard disk is operating properly.

4.1.3 Ports

The RH1288 V2-8S provides two USB 2.0 ports and one DB15 video graphics array (VGA) port on the front panel. Table 4-2 describes the ports.

Table 4-2 Ports on the front panel

Port	Type	Description
USB port	USB 2.0	The port is connected to a USB device, such as, • USB flash drive • USB keyboard and mouse • USB CD-ROM drive for installing an operating system (OS)
VGA port (provided for the RH1288 V2-8S)	DB15	The port is connected to a terminal, such as, a monitor or keyboard, video, and mouse (KVM)

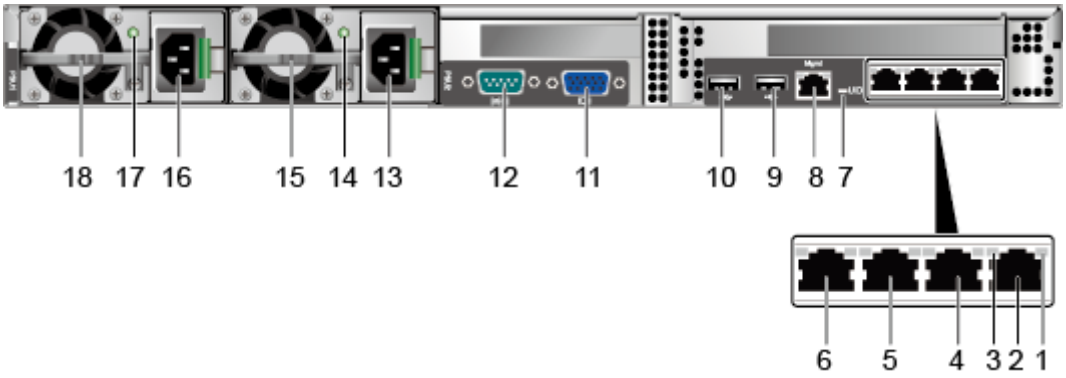
4.2 Rear Panel

This topic describes the indicators, buttons, and ports on the RH1288 V2 rear panel.

4.2.1 Rear View

Figure 4-3 shows the rear view of the RH1288 V2 with four GE ports.

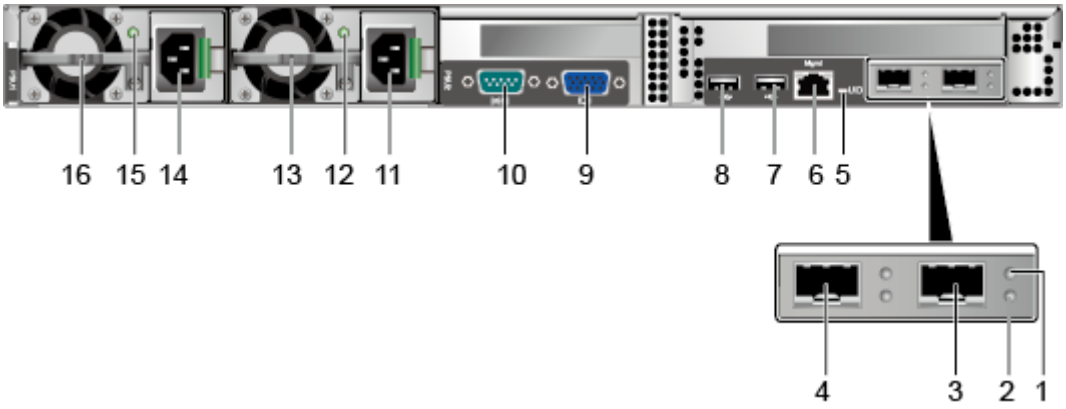
Figure 4-3 Rear view of the chassis



1	Connection status indicator	2	GE port 4
3	Data transmission status indicator	4	GE port 3
5	GE port 2	6	GE port 1
7	UID indicator	8	Management network port
9	USB port 2	10	USB port 1
11	VGA port	12	Serial port
13	Power socket of PSU 2	14	PSU 2 indicator
15	PSU 2	16	Power socket of PSU 1
17	PSU 1 indicator	18	PSU 1

Figure 4-4 shows the rear view of the RH1288 V2 with two 10GE ports.

Figure 4-4 Rear view of the chassis



1	Connection status indicator	2	Data transmission status indicator
3	10GE port 2	4	10GE port 1
5	UID indicator	6	Management network port
7	USB port 2	8	USB port 1
9	VGA port	10	Serial port
11	Power socket of PSU 2	12	PSU 2 indicator
13	PSU 2	14	Power socket of PSU 1
15	PSU 1 indicator	16	PSU 1

4.2.2 Indicators

Table 4-3 describes the indicators and buttons that on the rear panel of the RH1288 V2.

Table 4-3 Indicators

Indicator	Color	State
Data transmission status indicator	Orange	Blinking: Data is being transmitted. Off: No data is being transmitted.
Connection status indicator	Green	Steady on: The network port is connected properly. Off: The network port is not connected.
UID indicator	Blue	Steady on: The UID button is pressed down. Off: The UID button is not pressed.
Indicator for the PSU	Green	Steady on: The power input

Indicator	Color	State
		is normal. Off: No AC power is supplied.
Hard disk active indicator	Green	• Steady on: The hard disk is operating properly. • Blinking: The data on the hard disk is being accessed. • Off: The hard disk is not properly installed or is not powered on, or no hard disk is installed in the slot.
Hard disk fault indicator	Yellow	• Steady on: The hard disk fails. • Blinking: The RAID on the hard disk is being reconstructed. • Off: The hard disk is operating properly.

4.2.3 Ports

Table 4-4 describes the ports on the RH1288 V2 rear panel.

Table 4-4 Ports on the rear panel

Port	Type	Description
Serial port	DB9	The port is used as the system serial port by default. You can set it to the iMana serial port by using jumpers. The serial port is used for commissioning.
Video graphics array (VGA) port	DB15	The port is connected to a terminal, such as, a monitor or keyboard, video, and mouse (KVM)
Management network port	RJ45	The port is used to log in to the iMana for management.
GE port	RJ45	The port is connected to a network.
USB port	USB 2.0	The port is connected to a USB device, such as,

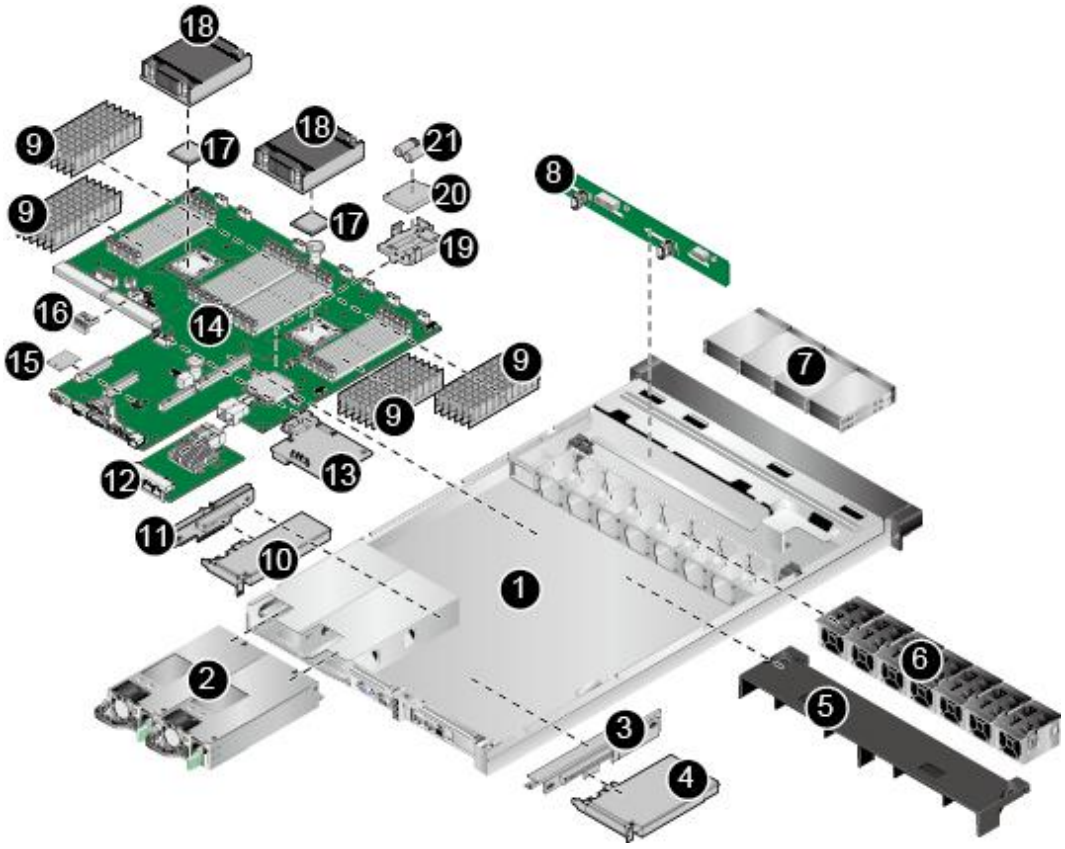
Port	Type	Description
		• USB flash drive • USB keyboard and mouse • USB CD-ROM drive for installing an operating system (OS)
Power socket	It is a standard three-phase power socket.	It is connected a power supply unit (PSU) to the AC input power.

4.3 Components

This topic describes the components of the RH1288 V2.

Figure 4-5 shows the components of the RH1288 V2 configured with eight hard disks.

Figure 4-5 Components of the RH1288 V2



describes the components of the RH1288 V2.

Table 4-5 Components of the RH1288 V2

No.	Name	Description
1	Chassis	A chassis provides space for installing all the components.
2	PSU	The server uses two PSUs working in 1+1 redundancy mode. You can use two types of PSUs based on the input power: • AC PSU: converts AC power into DC power for the RH1288 V2. • DC PSU: converts DC power into -12 V DC power for the RH1288 V2. **CAUTION** DOUBLE POLE / NEUTRAL FUSING.
3	Riser card	Provides one PCIe 3.0 x 16 slot for installing one PCIe card of full height and half length or of half height and half length.
4	PCIe card (install on the Riser card 3)	Two PCIe cards are supported: one of full height and full length, one of half height and half length. **NOTE** The GPU Quadro 2000 is supported.
5	Air duct	The air duct is a ventilation duct in a chassis.
6	Fan	The fans dissipate heat for the RH1288 V2 and allow one-fan failures. The fans support hot swap. If one fan fails, the other fans run at full speed to ensure heat dissipation.
7	Disk	Hard disks are hot-swappable and store data for the RH1288 V2. The RH1288 V2 supports the following hard disk configurations: • RH1288 V2-8S: supports eight 2.5-inch SAS HDDs, SATA HDDs, or SSDs. The three types of disks can be installed in one server. • RH1288 V2-4L: supports four 3.5-inch SAS HDDs or SATA HDDs. The two types of disks can be installed in one server.
8	Hard disk backplane	The backplane supplies power to HDDs and provides data transmission channels.
9	Memory	• Maximum number of DDR3 registered DIMMs (RDIMMs): 24 • Maximum memory capacity: 768 GB • Capacity of a single DIMM: 4 GB, 8 GB, 16 GB, or 32 GB • Memory speed: 800/1066/1333/1600 MHz
10	PCIe card (install on the mainboard)	Used for install one PCIe card of half height and half length.
11	Riser card	Provides one PCIe 3.0 x 8 slot for installing one PCIe card of half height and half length.
12	NIC	Three types of NICs are supported, providing the following network ports: • Two GE electrical ports, supporting Network Controller Sideband

No.	Name	Description
		Interface (NCSI). • Four GE electrical ports, supporting NCSI. • Two 10GE optical ports, supporting NCSI. • Two 10GE electrical ports, supporting NCSI.
13	Storage controller card	The server supports the SR120 (LSISAS2308), SR220 (LSISAS2208-8), SR320 (LSISAS2208-16), SR420 (LSISAS2208-32), SR520 (LSISAS2208-32), and SR620 (LSISAS2208-8) controller cards to configure RAID properties for its hard disks. The controller cards support RAID state migration, RAID configuration memory, self-diagnosis, and web-based remote configuration. • The SR220 controller card supports RAID 0, 1, 1E, and 10. Battery protection is not supported. • The SR220 and SR320 controller cards support RAID 0, 1, 10, 5, and 50. An iBBU or a supercapacitor is supported for power-off protection. • The SR420 and SR620 controller cards support RAID 0, 1, 10, 5, 50, 6, and 60. An iBBU or a supercapacitor is supported for power-off protection. • The SR520 supports RAID 0, 1, 10, 5, 50, 6, and 60, A supercapacitor is supported for power-off protection.
14	Mainboard	As a basic key component of a server, a mainboard integrates basic components such as the BIOS chip, PCH chip, and expansion slots and provides sockets for installing components such as CPUs and DIMMs.
15	Flash card	The flash card is optional. The server adopts a USB flash storage card, which provides a maximum capacity of 8 GB.
16	Trusted platform module (TPM)	The TPM is optional. It is a safety solution that complies with the trusted computing group (TCG) standards. It prevents viruses or unauthorized operations, enhancing platform security.
17	CPU	The RH1288 V2 uses Intel® new-generation high-performance Xeon® E5-2600 (Sandy Bridge-EP) series CPUs to provide a powerful data processing capability. A CPU integrates a memory controller and PCIe controller.
18	CPU heat sink	The heat sink cools the processors.
19	Battery tray	A battery tray supports and secures an iBBU.
20	iBBU	The iBBU is required to provide power-off protection when the RH1288 V2 uses the SR220, SR320, SR420, or SR620 controller card.
21	Supercapacitor	The supercapacitor is required to provide power-off protection when the RH1288 V2 uses the SR220, SR320, SR420, SR520, or SR620 controller card.

No.	Name	Description
		NOTE Either a **supercapacitor** or an **iBBU** is configured for providing the power-off protection for the preceding RAID controller card.

5 Technical Specifications

Table 5-1 describes the technical specifications of the RH1288 V2.

Table 5-1 Technical specifications

Feature	Specifications
CPU	• The server supports two Intel Xeon® E5-2600 (Sandy Bridge-EP) series CPUs. – One or two CPUs of quad-core, six-core, or eight-core – Highest CPU frequency: 3.3 GHz – Maximum power consumption of each CPU: 135 W – Maximum L3 cache of each CPU: 20 MB **NOTE** The performance of the 135 W CPU may deteriorate when one fan fails. • Two CPUs are connected through two QuickPath buses of full bandwidth. Each link provides a unidirectional transmission rate of up to 8.0 GT/s.
Memory	• Maximum number of double data rate 3 (DDR3) DIMMs: 24 • Maximum memory capacity: 768 GB • Capacity of a single DIMM: 4 GB, 8 GB, 16 GB, or 32 GB • Memory speed: DDR3 800/1066/1333/1600 MHz
Storage	• The server supports two types of hard disk configurations: – RH1288 V2-8S: supports eight 2.5-inch SAS HDDs, SATA HDDs, or SSDs at the front. – RH1288 V2-4L: supports four 3.5-inch SAS HDDs or SATA HDDs at the front. • The following information lists the total storage capacity of four 3.5-inch hard disks: – SAS HDD: 4 TB

Feature	Specifications
	– SATA HDD: 12 TB • Hard disks are hot-swappable. • SAS HDDs, SATA HDDs, and SSDs can be installed in one chassis. • The server supports RAID 0, 1, 10, 5, 50, 6, and 60. It supports iBBU battery protection, RAID state migration, RAID configuration memory, self-diagnosis, and web-based configuration. • The mainboard can be configured with an Serial Attached SCSI (SAS) card or an SAS RAID controller card (with the maximum 1 GB cache) for improving hard disk storage performance and protecting user data. • RAID controller cards do not occupy standard PCIe slots, which ensures high scalability for the system. **NOTE** The total storage capacity of the server is different along with the single hard disk most large-capacity.
Chipset	Intel® C602 chipset.
Network port	Three types of NICs are supported, providing the following network ports: • Two GE electrical ports, supporting Network Controller Sideband Interface (NCSI). • Four GE electrical ports, supporting NCSI. • Two 10GE optical ports, supporting NCSI.
I/O port	• One onboard DVD-ROM connector • Five USB 2.0 ports: two on the front panel, two on the rear panel, and one on the mainboard • One USB flash port on the mainboard • Four RJ45 ports or two optical ports on the rear panel • One VGA port on the front panel for the RH1288 V2-8S and none for the RH1288 V2-4L; one VGA port on the rear panel for either server • One RS232 port on the rear panel • One RJ45 management port on the rear panel
DVD-ROM drive	DVD-ROM drive, required when the server is RH1288 V2-8S.
Expansion slots	• A maximum of three PCIe cards are supported: one of full height and full length, one of half height and half length, and one non-standard for installing a RAID controller card. • The PCIe slots support the Huawei PCIe iNIC to improve the I/O bandwidth and throughput. • The PCIe slots support one Huawei PCIe SSDs for search, cache, and download services to greatly improve the I/O performance. • The PCIe expansion slots support the GPUs, such as Quadro 2000.

Feature	Specifications
	For details about the PCIe cards supported by the RH1288 V2, see the compatibility list.
Certification	Including CCC, CE, FCC, IC, VCCI, C-tick, and so on.

6 Component Selection

About This Chapter

NOTE
The components that list this topic are for reference only. For details about the components that can be purchased, consult Huawei sales representatives.

6.1 Processors

The RH1288 V2 supports a maximum of two Intel Xeon E5-2600 series CPUs and the CPU1 is mandatory. Table 6-1 lists the supported CPUs.

Table 6-1 Supported CPUs

No.	BOM	Description
1	41020278	Intel Xeon Processor E5-2603 SandyBridge-EP - 4 Core - 1.8GHz - QPI 6.4GT/s - L3 Cache 10M - 80W
2	41020279	Intel Xeon Processor E5-2609 SandyBridge-EP - 4 Core - 2.4GHz - QPI 6.4GT/s - L3 Cache 10M - 80W
3	41020222	Intel Xeon Processor E5-2620 SandyBridge-EP - 6 Core - 2.0GHz - QPI 7.2GT/s - L3 Cache 15M - 95W
4	41020274	Intel Xeon Processor E5-2630 SandyBridge-EP - 6 Core - 2.3GHz - QPI 7.2GT/s - L3 Cache 15M - 95W

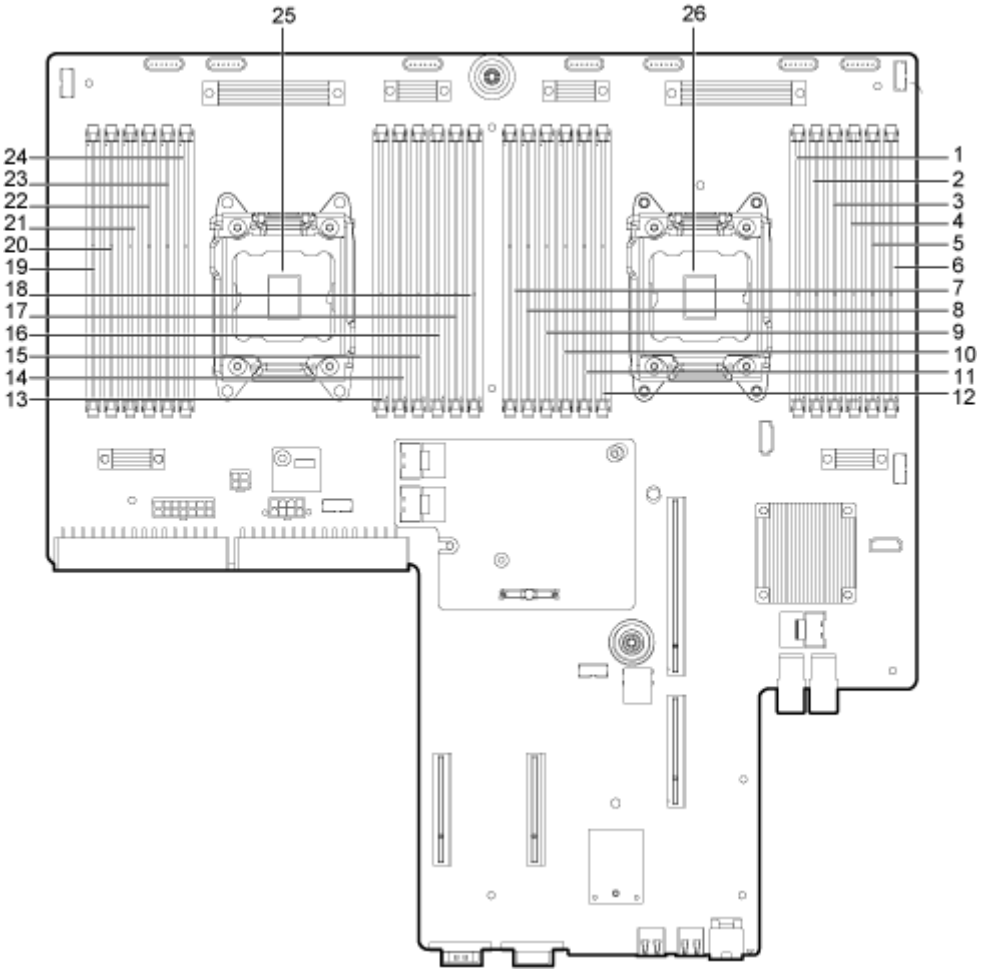
No.	BOM	Description
5	41020275	Intel Xeon Processor E5-2640 SandyBridge-EP - 6 Core - 2.5GHz - QPI 7.2GT/s - L3 Cache 15M - 95W
6	41020281	Intel Xeon Processor E5-2643 SandyBridge-EP - 4 Core - 3.3GHz - QPI 8.0GT/s - L3 Cache 10M - 130W
7	41020276	Intel Xeon Processor E5-2650 SandyBridge-EP - 8 Core - 2.0GHz - QPI 8.0GT/s - L3 Cache 20M - 95W
8	41020310	Intel Xeon Processor E5-2650L SandyBridge-EP - 8 Core - 1.8GHz - QPI 8.0GT/s - L3 Cache 20M - 70W
9	41020265	Intel Xeon Processor E5-2658 SandyBridge-EP - 8 Core - 2.1GHz - QPI 8.0GT/s - L3 Cache 20M - 95W
10	41020277	Intel Xeon Processor E5-2660 SandyBridge-EP - 8 Core - 2.2GHz - QPI 8.0GT/s - L3 Cache 20M - 95W
11	41020297	Intel Xeon Processor E5-2665 SandyBridge-EP - 8 Core - 2.4GHz - QPI 8.0GT/s - L3 Cache 20M - 115W
12	41020282	Intel Xeon Processor E5-2667 SandyBridge-EP - 6 Core - 2.9GHz - QPI 8.0GT/s - L3 Cache 15M - 130W
13	41020296	Intel Xeon Processor E5-2670 SandyBridge-EP - 8 Core - 2.6GHz - QPI 8.0GT/s - L3 Cache 20M - 115W
14	41020283	Intel Xeon Processor E5-2680 SandyBridge-EP - 8 Core - 2.7GHz - QPI 8.0GT/s - L3 Cache 20M - 130W
15	41020284	Intel Xeon Processor E5-2690 SandyBridge-EP - 8 Core - 2.9GHz - QPI 8.0GT/s - L3 Cache 20M - 135W

6.2 Memory

Memory Configuration Slots Rules

- The RH1288 V2 supports the DIMM with the capacity of 1 GB, 2 GB, 4 GB, 8 GB, 16 GB, or 32 GB. When the RH1288 V2 is fully configured with DIMMs, the maximum memory capacity reaches 768 GB.
- The RH1288 V2 provides 24 slots for installing double data rate 3 (DDR3) DIMMs, and each Sandy Bridge-EP CPU integrates eight memory channels: 1A, 1B, 1C, 1D, 2A, 2B, 2C, and 2D. Figure 6-1 shows the No. of each memory channel, Table 6-2 lists the composition of each memory channel.

Figure 6-1



1	J52 DIMM032(1D3)	2	J51 DIMM031(1D2)
3	J50 DIMM030(1D1)	4	J49 DIMM022(1C3)
5	J48 DIMM021(1C2)	6	J47 DIMM020(1C1)
7	J41 DIMM000(1A1)	8	J42 DIMM001(1A2)
9	J43 DIMM002(1A3)	10	J44 DIMM010(1B1)
11	J45 DIMM011(1B2)	12	J46 DIMM012(1B3)
13	J64 DIMM132(2D3)	14	J63 DIMM131(2D2)
15	J62 DIMM130(2D1)	16	J61 DIMM122(2C3)
17	J60 DIMM121(2C2)	18	J59 DIMM120(2C1)
19	J53 DIMM100(2A1)	20	J54 DIMM101(2A2)
21	J55 DIMM102(2A3)	22	J56 DIMM110(2B1)
23	J57 DIMM111(2B2)	24	J58 DIMM112(2B3)
25	CPU2	26	CPU1

Table 6-2 Composition of each memory channel

Memory Channel	Composition
1A	J41 DIMM000 (1A1)
	J42 DIMM001 (1A2)
	J43 DIMM002 (1A3)
1B	J44 DIMM010 (1B1)
	J45 DIMM011 (1B2)
	J46 DIMM012 (1B3)
1C	J47 DIMM020 (1C1)
	J48 DIMM021 (1C2)
	J49 DIMM022 (1C3)
1D	J50 DIMM030 (1D1)
	J51 DIMM031 (1D2)
	J52 DIMM032 (1D3)
2A	J53 DIMM100 (2A1)
	J55 DIMM101 (2A2)
	J55 DIMM102 (2A3)
2B	J56 DIMM110 (2B1)
	J57 DIMM111 (2B2)
	J58 DIMM112 (2B3)
2C	J59 DIMM120 (2C1)
	J60 DIMM121 (2C2)
	J61 DIMM122 (2C3)
2D	J62 DIMM130 (2D1)
	J63 DIMM131 (2D2)
	J64 DIMM132 (2D3)

The channels 1A1, 1B1, 1C1, 1D1, 2A1, 2B1, 2C1, and 2D1 are the primary channels for the 1A, 1B, 1C, 1D, 2A, 2B, 2C, and 2D respectively, as shown in Table 6-2.

- The DIMMs must be installed in the sequence specified in the following table.

Table 6-3 DIMM configuration principles

CPU	DIMM Installation Sequence
CPU 1	1A1, 1B1, 1C1, 1D1, 1A2, 1B2, 1C2, 1D2, 1A3, 1B3, 1C3, 1D3
CPU 1 and CPU 2	1A1, 2A1, 1B1, 2B1, 1C1, 2C1, 1D1, 2D1, 1A2, 2A2, 1B2, 2B2, 1C2, 2C2, 1D2, 2D2, 1A3, 2A3, 1B3, 2B3, 1C3, 2C3, 1D3, 2D3

Memory Configuration Rules

The RH1288 V2 supports a maximum of 24 DIMMs when two processors are installed, with 12 DIMMs for each processor. Each processor has four memory channels, and each channel supports three DIMMs.

Observe the following rules to configure DIMMs:

- A compute node is configured with only RDIMMs or LRDIMMs.
- You are advised not to use both 1.5 V and 1.35 V DIMMs for one server.
- Each channel supports a maximum of eight ranks.

NOTE
More than eight ranks are supported for LRDIMMs because one quad-rank LRDIMM provides the same electrical load on a memory bus as a single-rank RDIMM.

- The maximum number of DIMMs that can be installed in the server depends on the number of CPUs installed, DIMM type, number of ranks, and operating voltage. See the "Maximum number of DIMMs" in Table 6-4 and Table 6-5.

NOTE
Number of DIMMs supported by each channel ≤ Number of ranks supported by each channel / Number of ranks supported by each DIMM

- All DIMMs in the server operate at the same speed, whichever of the following is the lowest:
  - The memory speed that is supported by the specific CPU.
  - The lowest of the maximum operating speeds for the selected memory configuration that depends on the rated speed, operating voltage, and number of DIMMs for each channel. See the "Maximum operating speed" in Table 6-4 and Table 6-5.

Table 6-4 RDIMM configuration rules

Parameter	RDIMM							
Rank	Single rank			Dual rank			Quad rank	
Rated speed (MHz)	1333		1600	1333		1600	1066	
Rated voltage (V)	1.35		1.5	1.35		1.5	1.35	
Operating voltage (V)	1.35	1.5	1.5	1.35	1.5	1.5	1.35	1.5
Maximum number of	16	24	24	16	24	24	16	16

Parameter		RDIMM							
DIMMs									
Maximum DIMM capacity (GB)		4	4	4	16	16	8	8	8
Maximum memory capacity (GB)		64	96	96	256	384	192	128	128
Maximum memory capacity at the maximum operating speed (GB)		64	64	64	256	256	128	128	64
Maximum operating speed (MHz)	1 DIMM per channel	1333	1333	1600	1333	1333	1600	800	1066
	2 DIMMs per channel	1333	1333	1600	1333	1333	1600	800	800
	3 DIMMs per channel	Not supported	1066	1066	Not supported	1066	1066	Not supported	Not supported

NOTE

- The maximum number of DIMMs is shown for two CPUs installed. When one CPU is installed, the maximum number is a half of the number that is shown.
- Cells highlighted with a gray background indicate that all DIMM slots are installed with DIMMs.
- The operating voltage is 1.35 V for less than sixteen 1.35 V DIMMs, and is 1.5 V for more than sixteen 1.35 V DIMMs.

Table 6-5 Table 5-2 LRDIMM configuration rule

Parameter	LRDIMM	
Rank	Quad rank	
Rated speed (MHz)	1333	
Rated voltage (V)	1.35	
Operating voltage (V)	1.35	1.5

Parameter		LRDIMM	
Maximum number of DIMMs		24	24
Maximum DIMM capacity (GB)		32	32
Maximum memory capacity (GB)		768	768
Maximum memory capacity at the maximum operating speed (GB)		256	512
Maximum operating speed (MHz)	1 DIMM per channel	1333	1333
	2 DIMMs per channel	1066	1333
	3 DIMMs per channel	1066	1066

NOTE

- The maximum number of DIMMs is shown for two CPUs installed. When one CPU is installed, the maximum number is a half of the number that is shown.
- Cells highlighted with a gray background indicate that all DIMM slots are installed with DIMMs.

Memory Protection

RH1288 V2 supports the following memory protection technologies.

- Error checking and correcting (ECC)
- Memory sparing

  If memory sparing is used, the DIMMs must be installed in pairs (three DIMMs in a pair) and the DIMMs in a pair must be identical in type and size.

Supported DIMM Models

Table 6-6 describes its supported DIMM models.

Table 6-6 Supported DIMM Models

No.	BOM	Description
1	06200110	DDR3 RDIMM-4GB-2Rx8 2Gbit- LV 1.35V 1333-Height 30mm
2	06200111	DDR3 RDIMM-8GB-2Rx4 2Gbit- LV 1.35V 1333-Height 30mm
3	06200107	DDR3 RDIMM-16GB-2Rx4 4Gbit- LV 1.35V 1333-Height 30mm
4	06200121	DDR3 RDIMM-16GB-2Rx4 4Gbit- 1.5V 1600-Height 30mm
5	062001	DDR3 RDIMM-8GB-2Rx8 4Gbit- 1.35V 1600-Height 30mm (1600 not

No.	BOM	Description
	23	supported by CPU)
6	06200139	DDR3 RDIMM-8GB-2Rx8 4Gbit- 1.5V 1600-Height 30mm

6.3 Storage

HDD

RH1288 V2 supports two types of hard disk configurations:

- RH1288 V2–8L: supports eight 2.5-inch SAS HDDs, SATA HDDs, or SSDs.
- RH1288 V2–4S: supports four 3.5-inch SAS HDDs or SATA HDDs.

Table 6-7 lists the supported HDDs.

Table 6-7 Supported HDDs

No.	BOM	Description
1	02310KPR	10000 RPM - 2.5" SAS 6Gbps - 300GB HDD
2	02310KPU	10000 RPM - 2.5" SAS 6Gbps - 600GB HDD
3	02310LYS	10000 RPM - 2.5" SAS 6Gbps - 900GB HDD
4	02310LHE	15000 RPM - 2.5"SAS 6Gbps -146GB HDD
5	02310MMV	15000 RPM - 2.5" SAS 6Gbps -300GB HDD
6	02310LBB	7200 RPM - 2.5" SATA 6Gbps - 500GB HDD
7	02310LAY	7200 RPM - 2.5" SATA 6Gbps - 1000GB HDD
8	02310MLB	7200 RPM - 2.5" NL SAS 6Gbps - 1000GB HDD
9	02310KSX	MLC -2.5" SATA 3Gbps - 160GB SSD
10	02310LTB	MLC -2.5" SATA 3Gbps - 300GB SSD
11	02310MMS	MLC - 2.5" SATA 3Gbps -600GB SSD
12	02310LAV	15000 RPM - 3.5" SAS 6Gbps -300GB HDD
13	02310LAX	15000 RPM - 3.5" SAS 6Gbps - 600GB HDD
14	02310MKV	7200 RPM - 3.5" NL SAS 6Gbps - 1000GB HDD
15	02310MKX	7200 RPM - 3.5" NL SAS 6Gbps - 2000GB HDD
16	02310MLA	7200 RPM - 3.5" NL SAS 6Gbps - 3000GB HDD
17	02310LHB	7200 RPM - 3.5" SATA 6Gbps - 500GB HDD

No.	BOM	Description
18	02310LGW	7200 RPM - 3.5" SATA 3Gbps - 1000GB HDD (EOM)
19	02310LGY	7200 RPM - 3.5" SATA 6Gbps - 1000GB HDD
20	02310LGX	7200 RPM - 3.5" SATA 3Gbps - 2000GB HDD (EOM)
21	02310QKW	7200 RPM - 3.5" SATA 6Gbps - 2000GB HDD (Only for V2 sever)
20	02310MKT	7200 RPM - 3.5" SATA 6Gbps - 3000GB HDD
21	02310RFP	7200 RPM - 3.5" SATA 6Gb/s - 4000GB HDD
22	02310MMT	MLC -2.5" SATA 6Gb/s -240GB SSD
23	02310SLH	MLC 2.5" SATA 6Gb/s -480GB SSD
24	02310SLK	eMLC 2.5" SATA 6Gb/s -200GB SSD
25	02310SLL	eMLC 2.5" SATA 6Gb/s -400GB SSD
26	0235G7GH	eMLC 3.5" SAS 6Gb/s -200GB SSD
27	0235G7GJ	eMLC 3.5" SAS 6Gb/s -400GB SSD
28	02310SLN	MLC 2.5" SATA 6Gb/s -480GB SSD - 3.5inch Handle
29	02310RFP	7200 RPM - 3.5" SATA 6Gb/s - 4000GB HDD

Hard Disk Controller

Table 6-8 describes the supported RAID controller cards.

Table 6-8 Supported RAID controller cards

No.	BOM	Description
1	03021ENL	SR120 Server Raid Controller- SAS 6G/SATA 6G - RAID0 / RAID1 / RAID1E /RAID10
2	02310KTK	SR220 Server Raid Controller- SAS 6G/SATA 6G - Cache 512MB – 8 Disk-RAID0 / RAID1 / RAID10 /RAID5 / RAID50
3	02310KTM	SR620 Server Raid Controller- SAS 6G/SATA 6G - Cache 512MB -8 Disk - RAID0 / RAID1 / RAID10 /RAID5 / RAID6 /RAID50 /RAID60
4	02310KTL	SR320 Server Raid Controller- SAS 6G/SATA 6G - Cache 512MB -16 Disk - RAID0 / RAID1 / RAID10 /RAID5 / RAID50
5	02310MGE	SR320 Server Raid Controller- SAS 6G/SATA 6G - Cache 1GB -16 Disk- RAID0 / RAID1 / RAID10 /RAID5 / RAID50
6	02310MGD	SR220 Server Raid Controller- SAS 6G/SATA 6G - Cache 1G -8 Disk- RAID0 / RAID1 / RAID10 /RAID5 / RAID50

No.	BOM	Description
7	02310MGF	SR620 Server Raid Controller- SAS 6G/SATA 6G - Cache 1G -8 Disk- RAID0 / RAID1 / RAID10 /RAID5 / RAID6 /RAID50 /RAID60
8	02310MGS	SR320C Server Raid Controller- SAS 6G/SATA 6G - Cache 1G -16 Disk- RAID0 / RAID1 / RAID10 /RAID5 /RAID50 Only Support SuperCap
9	02310MXP	SR420 Server Raid Controller- SAS 6G/SATA 6G - Cache 512MB -32 Disk- RAID0 / RAID1 / RAID10 /RAID5 / RAID6 /RAID50 /RAID60
10	02310MGT	SR620C Server Raid Controller- SAS 6G/SATA 6G - Cache 1G -8 Disk- RAID0 / RAID1 / RAID10 /RAID5 / RAID6 /RAID50 /RAID60 - Only Support SuperCap
11	02310MXU	SR420C Server Raid Controller- SAS 6G/SATA 6G - Cache 1G -32 Disk- RAID0 / RAID1 / RAID10 /RAID5 / RAID6 /RAID50 /RAID60 - Only Support SuperCap
12	02310MXS	SR420 Server Raid Controller- SAS 6G/SATA 6G - Cache 1G -32 Disk- RAID0 / RAID1 / RAID10 /RAID5 / RAID6 /RAID50 /RAID60 - Only Support Battery
13	02310NKT	SR520C Server Raid Controller- SAS 6G/SATA 6G - Cache 1G -32 Disk- CacheCade2.0 -RAID0 / RAID1 / RAID10 /RAID5 / RAID6 /RAID50 /RAID60 - Only Support SuperCap
14	02310QNL	SR320BC Server Raid Controller- SAS 6G/SATA 6G - Cache 512MB-16 Disk-RAID0/1/10/5/50/6/60 - Support Battery and SuperCap
15	02310QNJ	SR320BC Server Raid Controller- SAS 6G/SATA 6G - Cache 1GB -16 Disk-RAID0/1/10/5/50/6/60 - Support Battery and SuperCap

6.4 I/O Expansion

RH1288 V2 supports many types of Peripheral Component Interconnect Express (PCIe) expansion cards. You can choose a card based on the I/O card type and rate requirements.

- GE expansion card
- 10GE expansion card
- FC expansion card
- SSD expansion card
- GPU expansion card

Table 6-9 describes its supported I/O expansion cards for the RH1288 V2.

Table 6-9 Supported I/O expansion cards

No.	BOM	Description
1	06030220	Dual Port 8Gbps Fibre Channel Host Bus Adapter Card -PCIe 3.0 x8 -multi-mode optic -DLC -Half-height half-length
2	06030221	Single Port 8Gbps Fibre Channel Host Bus Adapter Card -PCIe 3.0 x8 -multi-mode optic -DLC -Half-height half-length
3	06030217	Dual Port 8Gbps Fibre Channel Host Bus Adapter Card -PCIe 3.0 x8 -multi-mode optic -DLC -Half-height half-length
4	06030216	Single Port 8Gbps Fibre Channel Host Bus Adapter Card -PCIe 3.0 x8 -multi-mode optic -DLC -Half-height half-length
5	06030223	Dual Port 10Gbps FCoE Host Bus Adapter Card -PCIE 2.0 -multi-mode optic -Half-height half-length
6	06310023	Dual Port Gigabit Ethernet Server Adapter,RJ45 Copper, PCIE 2.0 X4 -Half-height half-length
7	06310025	Quad Port Gigabit Ethernet Card,RJ45 Copper,PCIE 2.0 X4 -Half-height half-length
8	06310024	Dual Port 10 Gigabit Ethernet Server Adapter,SFP+ Direct Attach Copper,PCIe 2.0 X8 -Half-height half-length
9	06310026	Dual Port 10 Gigabit Ethernet Server Adapter,LC Fiber Optic, PCIe 2.0 X8 -Half-height half-length
10	06310038	Dual Port Gigabit Ethernet Server Adapter,RJ45 Copper, PCIE 2.0 X4 -Half-height half-length
11	06310039	Dual Port 10 Gigabit Ethernet Server Adapter,SFP+ Direct Attach Copper,PCIe 2.0 X8 -Half-height half-length
12	06310040	Quad Port Gigabit Ethernet Card,RJ45 Copper,PCIe 2.0 X4 -Half-height half-length
13	06310041	Dual Port 10 Gigabit Ethernet Server Adapter,LC Fiber Optic, PCIe 2.0 X8 -Half-height half-length
14	06310042	Quad Port Gigabit Ethernet Card, LC Fiber Optic,PCIe1.0 X4 -Half-height half-length
15	03030PWD	Dual Port 10 Gigabit Ethernet Card, XFP/SFP+,PCIE 2.0 X8 -Half-height half-length
16	06320031	Video Card,GPU card,1GB memory,41.6 GB/s Bandwidth,x16-10DE -0DD8,PCIE 2.0 ,Active Cooling, 4.376(H) x 7.00 (L)

6.5 Power Supply

The RH1288 V2 uses two PSUs working in 1+1 redundancy mode. You can use two types of PSUs based on the input power:

- AC: 100 to 240 V AC
- DC: -48 V DC to -60 V DC

NOTE

- AC modules **LITEON 460W-AC(PS-2461-7H)** and **LITEON 750W-AC(PS-2751-2H)** support the high tension directing current. The input voltage is 180 V DC to 288 V DC.
- AC module **Emerson 800W-AC(EPW800W-AC)** and DC modules not support the high tension directing current.

Table 6-10 describes its supported PSUs for the RH1288 V2.

Table 6-10 Supported PSUs

No.	BOM	Description
1	98080310	AC/DC Power Module 750W 100V-240V /9.0~4.5A +12V/62.5A 92.0% Gold
2	02130950	AC/DC Power Module 824W 100V-240V/10A +12V/65A 94.0% Platinum
3	02130957	AC/DC Power Module 460W 90V-264V/6~3A +12V/38A 94.0% Platinum
	02270113	DC/DC Power Module 824W -38V- -75V/26A +12V/65A 93.5% Gold
	02131042	AC/DC Power Module 460W 90V-264V/6~3A +12V/38A 92.0% Gold

NOTE

- Select power cord based on local electrical standards and customer requirements.
- PSUs of different models must not be configured for one server.

6.6 Peripherals

The RH1288 V2 supports the peripherals such as USB DVD-ROM drive and KVM. Table 6-11 lists the supported peripherals.

Table 6-11 Supported Peripherals

No.	BOM	Description
1	06020088	DVDRW-CD 24X/DVD 8X,USB2.0,External,USB 2.0 5V power
2	06060114	USB,High Quality Keyboard & Mouse,Optional Accessory for

No.	BOM	Description
		ThinClient

6.7 OSs and Softwares

OSs

Table 6-12 list operating systems (OSs) supported by the RH1288 V2.

Table 6-12 Supported OSs

Number	Part Number	Description
1	Windows2008 SP2	Microsoft Windows Sever 2008 SP2 32bit Windows Certification URL:
2	Windows2008 R2 SP1	Microsoft Windows Sever 2008 R2 SP1 64bit Windows Certification URL:**http://www.windowsservercatalog.com/item.aspx?idItem=b9292d40-b427-c11e-285d-545aa3d2cd76&bCatID=1282**
3	Windows 2012	Microsoft Windows Sever 2012 64bit Windows Certification URL:
4	RHEL 6U1	Microsoft Windows Sever 2012 64bit Windows Certification URL:**https://hardware.redhat.com/show.cgi?id=907279**
5	SLES 11.1	Red Hat Enterprise Linux 6. Update 1 Server for x86/Intel EM64T Windows Certification URL:
6	SLES 11.2	SUSE Linux Enterprise Server 11 Service Pack 1 for x86/Intel EM64T Windows Certification URL:**https://www.suse.com/nbswebapp/yesBulletin.jsp?bulletinNumber=138880**, **https://www.suse.com/nbswebapp/yesBulletin.jsp?bulletinNumber=138881**
7	Oracle 6.1	Oracle Enterprise Linux 6.1 Server X86_64 Windows Certification URL:

virtualization softwares

Table 6-13 list virtualization softwares supported by the RH1288 V2.

Table 6-13 Supported Virtualization Softwares

Number	Part Number	Description
1	Windows 2012 Hyper-V	Windows 2012 Hyper-V
2	RHEL 6.1 KVM	Red Hat Enterprise Linux 6. Update 1 Server for x86/Intel EM64T
3	Oracle VM 3.0.2	Oracle Server VM 3.0.2
4	Citrix 6.0	Citrix XenServer 6.0.0
5	Vmware 4.1	Vmware ESX 4.1.0 update 2
6	Vmware 4.1	Vmware ESXi 4.1.0 update 2
7	Vmware 5.0	Vmware ESXi 5.0.0
8	Huawei FusionCompute	GalaX8800V1R2C01
9	Huawei FusionCompute	GalaxEngineV1R2C02
10	Huawei FusionCompute	FusionCompute V100R003C00
11	Huawei UVP	UVP Linux Enterprise Server V100R002C00

7 Management

Huawei iMana 200, a remote management system for servers, is integrated on the RH1288 V2. The iMana 200 complies with Intelligent Platform Management Interface (IPMI) V2.0 and provides reliable hardware monitoring and management functions.

The iMana 200 supports the following features:

- KVM and text console redirection
- Remote virtual media
- IPMI V2.0
- Simple Network Management Protocol (SNMP) V3
- Common information model (CIM)
- Web-based browser login

Table 7-1 describes the iMana 200 specifications.

Table 7-1 iMana 200 specifications

Item	Description
Management interface	The iMana 200 supports various management interfaces to implement system integration. The iMana 200 can integrate with any standard management systems over the following interfaces: • IPMI V2.0 • CLI • SM_CLP • HTTPS • SNMP V3 • WSMAN
System monitoring	The iMana 200 detects faults and accurately locates faults tin hardware such as CPUs, memory, and hard disks. The iMana 200 provide a failure detect agent running under the operating system, once the operating system is hung, the management module will restart the server and record an event log. Remote startup, shutdown, and restart are supported. The

Item	Description
	system status, such as the CPU temperature, temperature at the air intake vent, and fan rotation is monitored in real time.
Alarm management	The iMana 200 supports alarm management and reports alarms in various ways such as the SNMP trap, Simple Mail Transfer Protocol (SMTP), and syslog service to ensure that the server runs properly without interruption. An agent running on the OS is provided to start the BMC watchdog. The OS can be reset upon a failure, and logs and events are recorded.
Integrated virtual KVM	The iMana 200 Provides remote maintenance measures, such as KVM and KVM over IP, for troubleshooting. The maximum resolution is 1280 x 1024.
Integrated virtual media	The iMana 200 virtualizes local media devices or images to the media devices for remote compute nodes, which simplifies operating system (OS) installation. The virtual DVD-ROM drive supports a transmission rate of up to 8 MB/s.
WebUI	The iMana 200 provides visual WebUIs for quick configuration and information queries. The following web browsers are supported: • Internet Explorer 6.0 • Internet Explorer 8.0 • Firefox 9.0 • CHROME 13.0 • SAFARI
Fault reproduction	Faults can be reproduced to help diagnose the faults quickly.
Screenshots and videos	You can view screen snapshots and videos without login, which facilitates preventive maintenance inspection (PMI).
DNS/LDAP	The iMana 200 supports the domain name server (DNS) and directory service, which significantly simplifies management networks and configuration tasks.
Dual-image backup	If software fails, it can be started from an image backup.
Asset management	Intelligent asset management helps count assets easily.
Intelligent power management	Power capping increases deployment density, and dynamic energy saving lowers operating costs.
IPv6	The iMana 200 supports IPv6 to enable worry-free IP addresses.

8 Warranty

According to the *Huawei Warranty Policy for Servers & Storage Products*, the server has a three-year warranty, the DVD-ROM drives and BBUs have a one-year warranty, and the software media has a three-months warranty. The *Huawei Warranty Policy for Servers & Storage Products* is a series of warranty maintenance upgrades and post-warranty maintenance agreements with a well-defined scope of services, including service hours, response time, terms of service, and service agreement terms and conditions.

The *Huawei Warranty Policy for Servers & Storage Products* is country-specific. The service types, service levels, response time, and terms and conditions may vary with the countries where the product is used. Not all services described in the *Huawei Warranty Policy for Servers & Storage Products* are provided to users in all countries. For more information about warranty services in your country, contact Huawei technical support or local representative office.

Table 8-1 and Table 8-2 describes the response time and warranty services provided by Huawei.

Table 8-1 Response time

Service	Response Time	Description	Remarks
Help Desk	24×7	Available 24 hours a day, 7 days a week (00:00 to 24:00, Monday to Sunday)	None
Remote troubleshooting		Available 24 hours a day, 7 days a week (00:00 to 24:00, Monday to Sunday)	Response time starts from the moment the technical support accepts a customer's service request to the time technical support contacts the customer to provide remote troubleshooting service.
Online technical support		Huawei support website: available 24 hours a day, 7 days a week (00:00 to 24:00, Monday to	None

Service	Response Time		Description	Remarks
			Sunday)	
Licensing of software updates			Huawei support website: available 24 hours a day, 7 days a week (00:00 to 24:00, Monday to Sunday)	None
Return for repair	Outside China	45 CDS, 9 hours a day, 5 days a week	Available 9 hours a day, 5 days a week, excluding official holidays (09:00 to 18:00, Monday to Friday)	The repaired or replacement parts will be shipped within 45 calendar days after Huawei receives the defective parts.
	In China	10 x 5 x NBD, 9 hours a day, 5 days a week	Available 10 hours a day, 5 days a week, excluding official holidays (09:00 to 18:00, Monday to Friday)	Service requests submitted after 15:30 will be handled the next workday.

Table 8-2 Huawei warranty services

Service	Description
Help Desk	Huawei provides 24-hour after-sales technical support such as handling customers requests for troubleshooting or hardware replacement, responding to customer inquiries, handling customer complaints, and collecting suggestions using the dedicated hotline.
Remote troubleshooting	After receiving a service request for rectifying a network or system fault, Huawei technical support engineers first analyze and handle the fault remotely and then resolve the issue as soon as possible. There are two remote troubleshooting methods: telephone support and remote access.
Online technical support	The Huawei support website provides product technical materials, such as product manuals, configuration guides, networking case studies, and maintenance records. Authorized users can access the website, download documents, get up-to-date maintenance and skills development information, and learn about the latest products.

Service	Description
Licensing of software updates	Huawei provides patches whenever necessary to ensure stable and reliable equipment operation.
Return for repair	Huawei provides repair or replacement services for customers within the defined time period to meet customer needs for spare parts. You can return defective parts to the designated Huawei customer service center after submitting a service request. For the products with a three-year warranty used in China, Huawei provides the next business day (NBD) service, 9 hours a day, 5 days a week. For the products with a three-year warranty used outside China, Huawei provides calendar days shipment (CDS) service, 9 hours a day, 5 days a week.

9 Physical Specifications

Table 9-1 lists the physical specifications of RH1288 V2.

Table 9-1 Physical specifications

Item	Specifications
Dimensions (H x W x D)	43.6 mm (1 U) x 447 mm x 740 mm (1.72 in. x 17.60 in. x 29.92 in.)
Rated power	The rated power for compatible PSUs: • 460 W • 750 W • 800 W
Weight (in full configuration)	Net weight: • Eight 2.5-inch HDDs: 19.6 kg (43.22 lb) • Four 3.5-inch HDDs: 20 kg (44.10 lb) Packing material weight: 5.3 kg (11.68 lb)
Rated input voltage	• AC: 100 to 240 V AC • DC: -48 V DC to -60 V DC **NOTE** • AC modules **LITEON 460W-AC(PS-2461-7H)** and **LITEON 750W-AC(PS-2751-2H)** support the high tension directing current. The input voltage is 180 V DC to 288 V DC. • AC module **Emerson 800W-AC(EPW800W-AC)** and DC modules not support the high tension directing current.
Temperature	Operating temperature: 10 ℃ to 35 ℃ (50 ℉ to 95 ℉) Storage temperature: -40 ℃ to +65 ℃ (-40 ℉ to +149 ℉) The temperature change rate is smaller than 20 ℃ (36 ℉)/h.
Altitude	≤ 3000 m (9842 ft). When the altitude is higher than 900 m (2952.72 ft), the operating temperature decreases by 1 ℃ (1.8 ℉) per 300 m (984.24 ft).
Humidity	Operating humidity: 8% to 85% RH (non-condensing) Storage humidity: 5% to 95% RH (non-condensing)

Item	Specifications
	The humidity change rate is smaller than 20% RH/h.

10 Certifications

Table 10-1 lists the certifications and standards of RH1288 V2.

Table 10-1 Certifications

Number	Country/ Region	Certification	Standards
1	China	RoHS	• SJ/T-11363-20006 • SJ/T-11364-20006 • GB/T 26572-2011
2	China	CCC	• GB4943-2001 • GB9254-2008(Class A) • GB17625.1-2003
3	China	China Environmental Labeling	• GB/T24024:2001 idt ISO14024:1999 • HJ 2507-2011
4	China	Energy Conservation	• CQC3135-2011"Energy Conservation Certification • Criteria for Servers"
5	Europe	RoHS	2002/95/EC
6	Europe	REACH	EC NO. 1907/2006
7	Europe	WEEE	• 2002/96/EC • 2012/19/EU
8	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

Number	Country/ Region	Certification	Standards
			• CISPR 24:2010 • ETSI EN300386 V1.5.1:2010 • ETSI ES 201 468 V1.3.1:2005 • IEC61000-3-2:2005+A1:2008+A2:2009/ EN 61000-3-2:2006+A1:2009+A2:2009 • IEC 61000-3-3:2008/EN 61000-3-3:2008 RoHS: 2002/95/EC, 2011/65/EU, EN 50581: 2012
9	Russia	GOST	• GOST R IEC60950-1-2009 • GOST 26329-84 • GOST R 51318.22-2006 • GOST R 51318.24-99 • GOST R 51317.3.2-2006 • GOST R 51317.3.3-2008
10	Turkey	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 EN300386 V1.5.1:2010 • ETSI ES 201 468 V1.3.1:2005 • IEC61000-3-2:2005+A1:2008+A2:2009/ EN 61000-3-2:2006+A1:2009+A2:2009 • IEC 61000-3-3:2008/EN 61000-3-3:2008 RoHS: 2002/95/EC, 2011/65/EU, EN 50581: 2012
11	America	FCC	FCC CFR47 Part 15:2005 Class A
12	America	NTRL-UL	UL 60950-1, 2nd Edition, 2011-12-19 (Information Technology Equipment - Safety - Part 1: General Requirements)
13	America	ENERGY STAR	ENERGY STAR® Program Requirements for Computer Servers Eligibility Criteria V1.1
14	Canada	IC	ICES-003:2004 Class A
15	Canada	NTRL-UL	CSA C22.2 No. 60950-1-07, 2nd Edition, 2011-12 (Information Technology

Number	Country/ Region	Certification	Standards
			Equipment - Safety - Part 1: General Requirements)
16	Australia	C-tick	AS/NZS CISPR 22:2009
17	Japan	VCCI	VCCI V-3:2012
18	Kingdom of Saudi Arabia (KSA)	SASO	• IEC 60950-1: 2005 (2nd Edition) + A1:2009 • EN 60950-1:2006+A11:2009+A1:2010 + A12:2011
19	Nigeria	SONCAP	• IEC 60950-1: 2005 (2nd Edition) + A1:2009 • EN 60950-1:2006+A11:2009+A1:2010 + A12:2011
20	Global	CB	IEC 60950-1:2005 (2nd Edition); Am 1:2009

A Abbreviations

A

AC	Alternating Current
AES NI	Advanced Encryption Standard New Instruction Set
ARP	Address Resolution Protocol
AVX	Advanced Vector Extensions

B

BBU	Backup Battery Unit
BIOS	Basic Input Output System
BMC	Baseboard Management Controller

C

CD	Calendar Day
CE	Conformite Europende
CIM	Common Information Model
CLI	Command-line Interface

D

DC	Direct Current
DDR3	Duble Data Rate 3
DDDC	Double Device Data Correction
DEMT	Dynamic Energy Management Technology
DIMM	Dual In-line Memory Module
DRAM	Dynamic Random-Access Memory

DVD	Digital Video Disc

E

ECC	Error Checking and Correcting
ECMA	European Computer Manufacturers Association
EDB	Execute Disable Bit
EN	European Efficiency
ERP	Enterprise Resource Planning
ETS	European Telecommunication Standards

F

FB-DIMM	Fully Buffered DIMM
FC	Fiber Channel
FCC	Federal Communications Commission
FCoE	Fibre Channel Over Ethernet
FTP	File Transfer Protocol

G

GE	Gigabit Ethernet
GPIO	General Purpose Input/Output
GPU	Graphics Processing Unit

H

HA	High Availibility
HDD	Hard Disk Drive
HPC	Hgh-performance Cmputing
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol Secure

I

IC	Industry Canada
ICMP	Internet Control Message Protocol
IDC	Internet Data Center

IEC International Electrotechnical Commission

IEEE Institute of Electrical and Electronics Engineers

IGMP Internet Group Message Protocol

iMana Integrated Management

IOPS Input/Output Operations per Second

IP Internet Protocol

IPC Intelligent Power Capability

IPMB Intelligent Platform Management Bus

IPMI Intelligent Platform Management Interface

K

KVM Keyboard Video and Mouse

L

LC Lucent Connector

LDIMM Local Dual In-line Memory Module

LED Light Emitting Diode

LOM LAN on motherboard

M

MAC Media Access Control

N

NBD Next Business Day

NC-SI Network Controller Sideband Interface

MMC Module Management Controller

P

PCIe Peripheral Component Interconnect Express

PHY Physical Layer

PMBUS Power Management Bus

POK Power OK

PWM Pulse-width Modulation

PXE Preboot Execution Environment

Q

QPI QuickPath Interconnect

R

RAID Redundant Array of Independent Disks

RAS Reliability, Availability, and Serviceability

RDIMM Registered Dual In-line Memory Module

REACH Registration Evaluation and Authorization of Chemicals

RJ45 Registered Jack 45

RoHS Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment

S

SAS Serial Attached Small Computer System Interface

SATA Serial Advanced Technology Attachment

SCM Supply Chain Management

SDDC Single Device Data Correction

SERDES Serializer/Deserializer

SGMII Serial Gigabit Media Independent Interface

SMI Serial Management Interface

SMTP Simple Mail Transfer Protocol

SM_CLP Server Management Command Line Protocol

SNMP Simple Network Management Protocol

SOL Serial Over LAN

SONCAP Standards Organization of Nigeria—ConformityAssessmentProgram

SSD Solid-state Drive

SSE Streaming SIMD Extension

T

TACH Tachometer signal

TBT Turbo Boost Technology

TCG Trusted Computing Group

TCO Total Cost of Ownership

TDP Thermal Design Power

TELNET Telecommunication Network Protocol

TET Trusted Execution Technology

TFTP Trivial File Transfer Protocol

TOE TCP offload engine

TPM Trusted Platform Module

U

UDIMM Unbuffered Dual In-line Memory Module

UEFI Unified Extensible Firmware Interface

UID Unit Identification Light

UL Underwriter Laboratories Inc.

USB Universal Serial Bus

V

VCCI Voluntary Control Council for Interference by Information Technology Equipment

VGA Video Graphics Array

VLAN Virtual Local Area Network

VRD Voltage Regulator-Down

W

WEEE Waste Electrical and Electronic Equipment

WSMAN Web Service Management