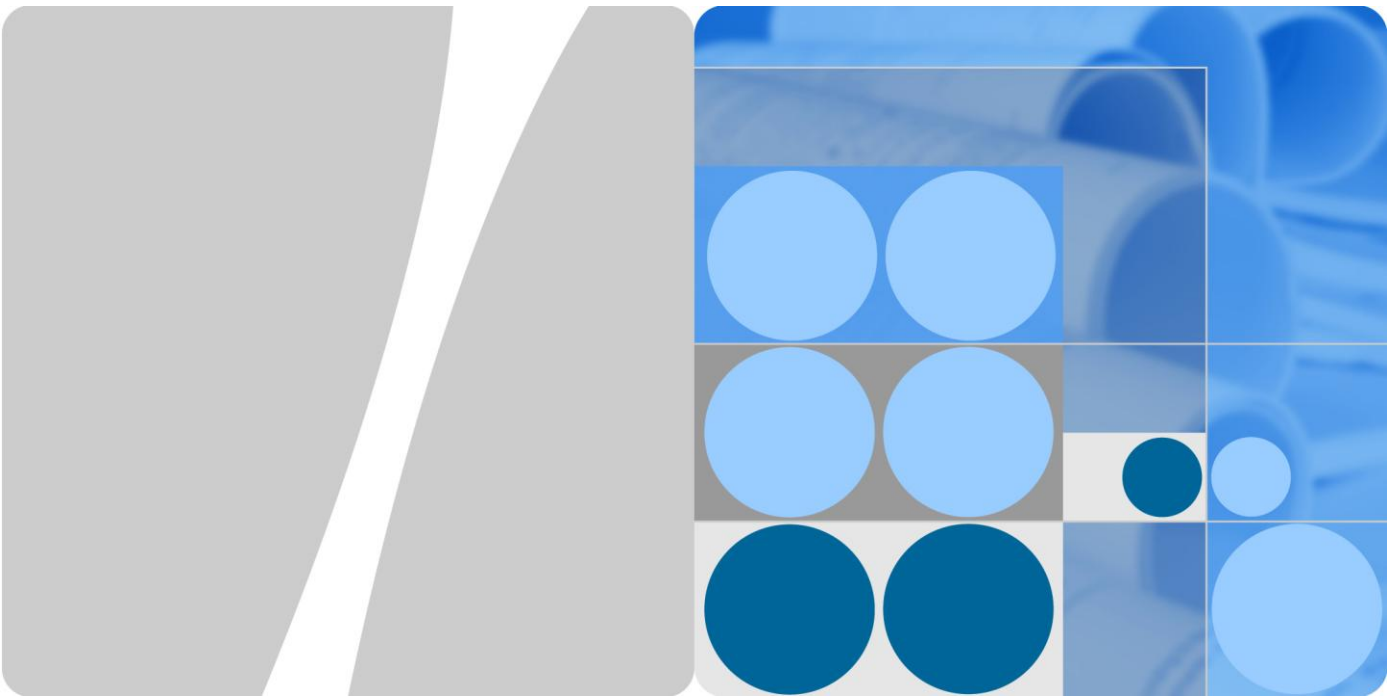

Huawei FusionServer RH5885 V3

Technical White Paper

Issue 03

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1 Overview

About This Chapter

1.1 Functions

As customer applications develop rapidly, customers have higher requirements for server reliability, performance, maintainability, and cost. Building on extensive experience in servers, Huawei has developed the FusionServer RH5885 V3, a high-performance, highly reliable 4U 4-socket rack server that uses the latest Intel processors.

The RH5885 V3 provides higher reliability, flexibility, scalability, and performance than Huawei's previous servers. To address applications such as databases, virtualization, and in-memory computing, the RH5885 V3 provides various processing capabilities, memory capacity, and I/O capabilities.

The RH5885 V3 supports three combinations of processor and DIMM configurations:

- E7 v2 + DDR3: E7-4800 v2 or E7-8800 v2 processors and DDR3 DIMMs
- E7 v3 + DDR3: E7-4800 v3 or E7-8800 v3 processors and DDR3 DIMMs
- E7 v3 + DDR4: E7-4800 v3 or E7-8800 v3 processors and DDR4 DIMMs

Table 1-1 lists the hardware configurations supported by the RH5885 V3.

Table 1-1 Hardware configurations supported by the RH5885 V3

Model	Processor	DIMM	RAID Controller Card	Hard Disk
E7 v2 + DDR3 + 8 disks	4 x E7 v2	48 x DDR3	1 x RAID controller card on the mainboard	8
E7 v2 + DDR3 + 23 disks	4 x E7 v2	48 x DDR3	1 x RAID controller card on the mainboard	23
E7 v3 + DDR3 + 8 disks	4 x E7 v3	48 x DDR3	1 x RAID controller card on the mainboard	8
E7 v3 + DDR3 + 23 disks	4 x E7 v3	48 x DDR3	1 x RAID controller card on the mainboard	23
E7 v3 + DDR3 + 23 directly connected disks	4 x E7 v3	48 x DDR3	1 x LSISAS2208 controller card on the mainboard + 2 x LSISAS2208 controller cards in standard PCIe slots	23
E7 v3 + DDR4 + 8 disks	4 x E7 v3	48 x DDR4	1 x RAID controller card on the mainboard	8
E7 v3 + DDR4 + 23 disks	4 x E7 v3	48 x DDR4	1 x RAID controller card on the mainboard	23
E7 v3 + DDR4 + 23 disks	4 x E7 v3	48 x DDR4	1 x LSISAS2208 controller card on the mainboard + 2 x LSISAS2208 controller cards in standard PCIe slots	23

1.2 Appearance

This topic describes the RH5885 V3 in terms of its appearance and panel.

Appearance

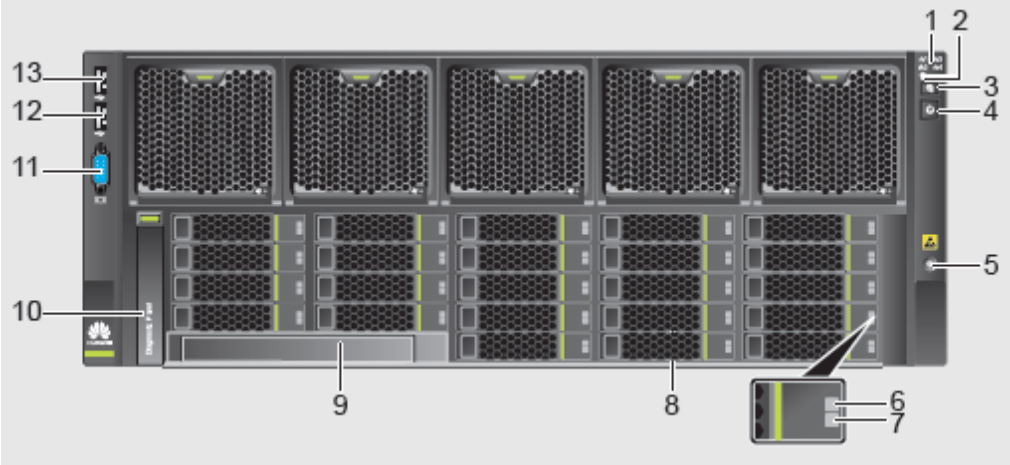
Figure 1-1 shows the appearance of the RH5885 V3.

Figure 1-1 RH5885 V3 appearance

Front panel

Figure 1-2 shows the RH5885 V3 front panel after the front bezel is removed.

Figure 1-2 RH5885 V3 front panel



1	Network port link status indicator	8	Hard disk
2	Health indicator	9	DVD-ROM drive

3	UID button/indicator	10	Indicator diagnosis panel
4	Power button/indicator	11	VGA port
5	ESD jack	12	USB port 2
6	Hard disk fault indicator	13	USB port 1
7	Hard disk operating indicator		

Table 1-2 Hard disk layout for the RH5885 V3 (8 hard disks)

HDD0	HDD4	-	-	-
HDD1	HDD5	-	-	-
HDD2	HDD6	-	-	-
HDD3	HDD7	-	-	-
-		-	-	-

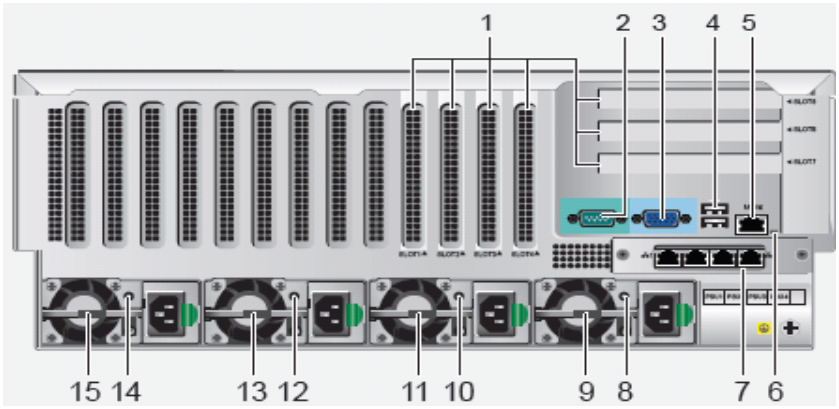
Table 1-3 Hard disk layout for the RH5885 V3 (23 hard disks)

HDD0	HDD4	HDD8	HDD13	HDD18
HDD1	HDD5	HDD9	HDD14	HDD19
HDD2	HDD6	HDD10	HDD15	HDD20
HDD3	HDD7	HDD11	HDD16	HDD21
-		HDD12	HDD17	HDD22

Rear panel

Figure 1-3 shows the RH5885 V3 rear panel.

Figure 1-3 RH5885 V3 rear panel



1	Standard Peripheral Component Interconnect Express (PCIe) card	6	UID indicator	11	PSU 3
2	Serial port	7	Onboard network interface card (NIC)	12	PSU 2 indicator
3	VGA port	8	Power supply unit (PSU) 4 indicator	13	PSU 2
4	USB port	9	PSU 4	14	PSU 1 indicator
5	Management network port	10	PSU 3 indicator	15	PSU 1

Figure 1-4 shows the PCIe slot layout of the RH5885 V3.

Figure 1-4 PCIe slot layout

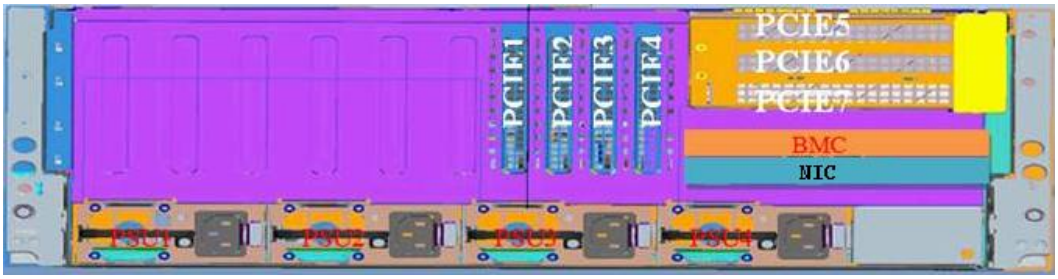


Table 1-4 describes the mapping between PCIe slots and processors and the compliant PCIe standards.

Table 1-4 PCIe slot description

No.	PCIe Slot	Processor	PCIe Standard	PCIe Card Size

No.	PCIe Slot	Processor	PCIe Standard	PCIe Card Size
1	PCIe 1	CPU2	PCIe 3.0 x 8	Full-height half-length
2	PCIe 2	CPU2	PCIe 3.0 x 8	Full-height half-length
3	PCIe 3	CPU2	PCIe 3.0 x 8	Full-height half-length
4	PCIe 4	PCH	PCIe 2.0 x 4	Full-height half-length
5	PCIe 5	CPU1	PCIe 3.0 x 16	On a riser card: full-height full-length
6	PCIe 6	CPU2	PCIe 3.0 x 4	On a riser card: full-height 3/4-length
7	PCIe 7	CPU2	PCIe 3.0 x 4	On a riser card: full-height half-length

1.3 Ports

This topic describes the ports on the RH5885 V3.

Table 1-5 and Table 1-6 describe the external ports on the RH5885 V3.

Table 1-5 Ports on the front panel

Port	Type	Quantity	Description
Video graphics array (VGA) port	DB15	1	The port is connected to a terminal, such as a monitor or keyboard, video, and mouse (KVM).
USB port	USB 2.0	2	The USB port is connected to a USB device.

Table 1-6 Ports on the rear panel

Port	Type	Quantity	Description
VGA port	DB15	1	The port is connected to a terminal, such as a monitor or KVM.
USB port	USB 2.0	2	The USB port is connected to a USB device.
BMC management network port	Ethernet port	1	The external Ethernet port is used to manage devices. **NOTE** The type of the baseboard management controller (BMC) management network port varies depending on the combination of

Port	Type	Quantity	Description
			processor and DIMM configurations: • E7 v2 or v3 processors and DDR3 DIMMs: 100 Mbit/s network port • E7 v3 processors and DDR4 DIMMs: 1000 Mbit/s network port
Serial port	DB9	1	The port is used as the system serial port by default. You can set it to the BMC serial port by using the command. The port is used for debugging.
Network Port	-	-	The port types and quantity vary according to the configured NIC.

1.4 Indicators and Buttons

This topic describes the indicators and buttons on the RH5885 V3.

You can observe the indicators to determine the status of the RH5885 V3.

Table 1-7 describes the indicators and buttons on the RH5885 V3 front panel.

Table 1-7 Indicators on the front panel

Indicator Symbol	Meaning	Color	State Description
	Power button/indicator	Yellow and green	• Off: The server is not powered on. • Blinking yellow: The management system is being started. • 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	Blue	• Off: The server is not being located. • On: The server is being located. **NOTE** You can hold down the UID button for 6 seconds to reset the BMC.
	Health indicator	Red and green	• Steady green: The server is operating properly. • Blinking red at 1 Hz: A major

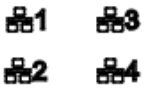
Indicator Symbol	Meaning	Color	State Description
			alarm is generated. • Blinking red at 2 Hz: A critical alarm is generated.
	Hard disk active indicator	Green	• Off: The hard disk is not detected or is faulty. • Blinking green: Data is being read from, written to the hard disk, or synchronized between hard disks. • Steady green: The hard disk is inactive. **NOTE** Only a SAS or SATA disk has this indicator.
	Hard disk fault indicator	Yellow	• Off: The hard disk is operating properly or hard disks cannot be detected in the RAID. • Blinking yellow: The hard disk is being located, or the RAID is being reconstructed. • Steady yellow: The hard disk is not detected or is faulty. **NOTE** Only a SAS or SATA disk has this indicator.
	Network port link status indicator (right mounting ear)	Green	The indicator shows the status of the 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, they correspond to network port indicators 1 and 2 on the front panel.

Table 1-8 describes the indicators and buttons on the RH5885 V3 rear panel.

Table 1-8 Indicators and buttons on the rear panel

Indicator Symbol	Meaning	Color	State Description
UID	Location indicator	Blue	• Off: The server is not being located. • On: The server is being located.

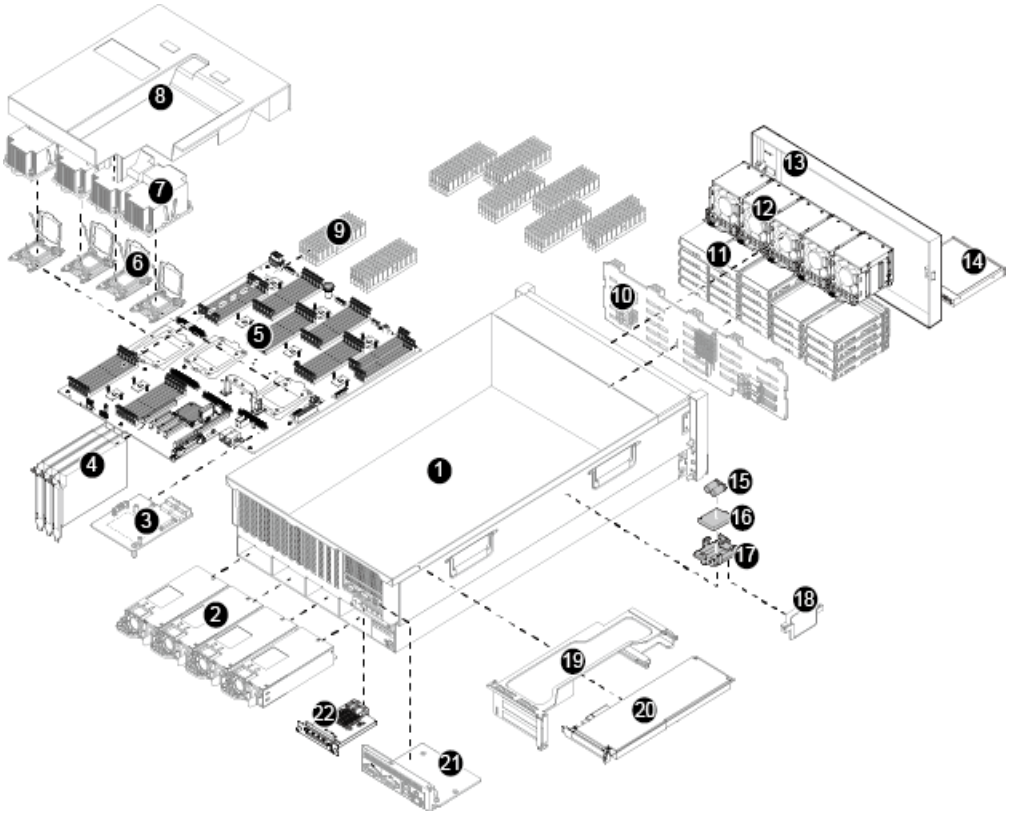
Indicator Symbol	Meaning	Color	State Description
-	Data transmission status indicator on the management port	Orange	• Off: No data is being transmitted. • Blinking: Data is being transmitted.
-	Connection status indicator on the management port	Green	• Steady on: The network connection is normal. • Off: The network port is not connected.
-	PSU indicator	Green	• Steady on: The power is supplied properly. • Off: No AC power is supplied.

1.5 Physical Structure

This topic describes the RH5585 V3 in terms of its components, mainboard layout, and connectors.

Figure 1-5 shows the components of the RH5885 V3-23S.

Figure 1-5 Components of the RH5885 V3



1	Chassis	2	PSU
3	RAID controller card	4	PCIe cards on the mainboard
5	Mainboard	6	Processor
7	Heat sink	8	Air duct
9	Dual in-line memory module (DIMM)	10	Hard disk backplane
11	Hard disk	12	Fan module
13	Front bezel	14	DVD-ROM drive
15	Supercapacitor (optional)	16	iBBU (optional)
17	Battery tray	18	Battery case
19	PCIe riser card	20	PCIe cards on a riser card
21	BMC card	18	NIC

Table 1-9 describes the components of the RH5885 V3.

Table 1-9 Component description

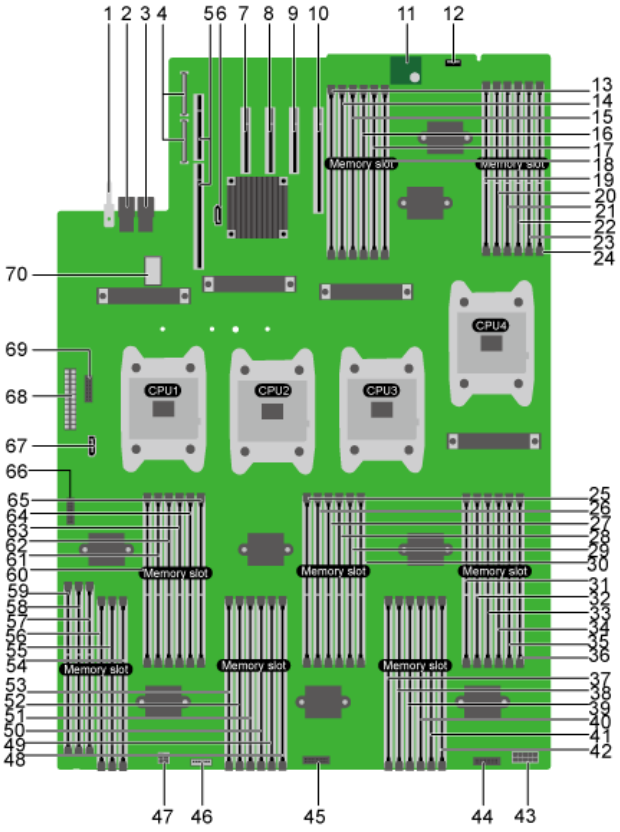
No.	Component	Description
1	Chassis	A chassis houses and protects all components.
2	PSU	The server provides four PSUs in 2+2 redundancy mode. You can use two types of PSUs based on the input power: • AC PSUs: convert AC power into 12 V DC power for the RH5885 V3. • DC PSUs: convert DC power into 12 V DC power for the RH5885 V3. **NOTE** The PSUs support double-pole/neutral fusing.
3	RAID controller card on the mainboard	The RH5885 V3 supports four types of RAID controller cards on the mainboard: • LSISAS2308 – Supports RAID 0, 1, 1E, and 10. – Does not provide cache data protection upon power failures. • LSISAS2208 – Supports RAID 0, 1, 10, 5, 50, 6, and 60. – Provides an iBBU or a supercapacitor to protect cache data from power failures. • LSISAS3008 – Supports RAID 0, 1, 1E, and 10. – Does not provide cache data protection upon power failures. • LSISAS3108 – 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 level migration, and RAID configuration memory.
4	PCIe cards on the mainboard	The RH5885 V3 supports four standard PCIe cards on the mainboard by providing three PCIe 3.0 x8 slots and one PCIe 2.0 x4 slot.
5	Mainboard	The mainboard integrates and interconnects components.
6	Processor	The RH5885 V3 supports Intel® Xeon® E7-4800 v2/v3 or E7-8800 v2/v3 series processors. Each processor connects to the other three processors through two-way 20-lane QuickPath Interconnects (QPIs).
7	Heat sink	A heat sink cools a processor and is designed with fool-proofing. Each processor is configured with one heat sink.
8	Air duct	An air duct supports the chassis cover and provides ventilation channels.

No.	Component	Description
9	DIMM	The RH5885 V3 supports a maximum of 48 DIMMs. • E7 v2 processors and DDR3 DIMMs, or E7 v3 processors and DDR3 DIMMs: – Maximum capacity per DIMM: 32 GB – Maximum capacity of the server: 1.5 TB – Memory bus speed: 1066 MT/s, 1333 MT/s, or 1600 MT/s • E7 v3 processors and DDR4 DIMMs: – Maximum capacity per DIMM: 32 GB – Maximum capacity of the server: 1.5 TB – Memory bus speed: 1333 MT/s, 1600 MT/s, 1866 MT/s
10	Hard disk backplane	The backplane provides power supply to hard disks and data transmission channels. The server supports three types of hard disk backplanes for connecting to 8 or 23 hard disks, or 23 directly connected hard disks, respectively.
11	Hard disk	Hard disks are hot-swappable and store data for the RH5885 V3.
12	Fan module	Fan modules dissipate heat for the RH5885 V3, and support hot swap. When one fan fails, the other fans run at full speed to ensure optimal heat dissipation.
13	Front bezel	The front bezel protects the server front panel.
14	DVD-ROM drive	A DVD-ROM drive is used to install operating systems (OSs).
15	Supercapacitor	A supercapacitor protects data in the RAID controller card cache from power failures. Both the LSISAS2208 and LSISAS3108 controller cards support a supercapacitor.
16	iBBU	An iBBU protects data in the RAID controller card cache from power failures. Only the LSISAS2208 controller card supports an iBBU. **NOTE** You can use either an iBBU or a supercapacitor to provide power-off protection for the data in the RAID controller card cache.
17	Battery tray	A battery tray supports an iBBU or a supercapacitor.
18	Battery case	A battery case fastens a battery tray to the chassis.
19	PCIe riser card	The RH5885 V3 comes with one standard PCIe riser card to provide one PCIe 3.0 x16 slot and two PCIe 3.0 x4 slots.
20	PCIe cards on a riser card	The RH5885 V3 supports three types of PCIe cards on a riser card: PCIe 3.0 x4, PCIe 3.0 x8, and PCIe 3.0 x16.
21	BMC card	The RH5885 V3 provides a BMC module for management.
22	NIC	The RH5885 V3 supports one GE NIC with two or four GE ports or supports one 10GE NIC with two 10GE ports. Both

No.	Component	Description
		NICs support Network Controller Sideband Interface (NC-SI).

Figure 1-6 shows the positions of connectors and other components on the RH5885 V3 mainboard.

Figure 1-6 Positions of the connectors and other components



1	NIC guide pin	2	NIC connector (J217)
3	NIC connector (J216)	4	BMC card connector (J214/J215)
5	Standard PCIe riser card connector (J204/J205)	6	-
7	Standard PCIe card connector (J185)	8	Standard PCIe card connector (J186)
9	Standard PCIe card connector (J187)	10	Standard PCIe card connector (J181)
11	TPM connector (J178)	12	USB connector (J167)
13	DIMM610 (J149)	14	DIMM611 (J150)
15	DIMM612 (J151)	16	DIMM600 (J146)

17	DIMM601 (J147)	18	DIMM602 (J148)
19	DIMM622 (J154)	20	DIMM621 (J153)
21	DIMM620 (J152)	22	DIMM632 (J157)
23	DIMM631 (J156)	24	DIMM630 (J155)
25	DIMM222 (J130)	26	DIMM221 (J129)
27	DIMM220 (J128)	28	DIMM232 (J133)
29	DIMM231 (J132)	30	DIMM230 (J131)
31	DIMM422 (J142)	32	DIMM421 (J141)
33	DIMM420 (J140)	34	DIMM432 (J145)
35	DIMM431 (J144)	36	DIMM430 (J143)
37	DIMM410 (J137)	38	DIMM411 (J138)
39	DIMM412 (J139)	40	DIMM400 (J134)
41	DIMM401 (J135)	42	DIMM402 (J136)
43	Power connector (J179)	44	Right mounting ear connector (J173)
45	Hard disk backplane connector (J172)	46	Indicator diagnosis panel connector (J164)
47	ODD power connector (J202)	48	DIMM202 (J124)
49	DIMM201 (J123)	50	DIMM200 (J122)
51	DIMM212 (J127)	52	DIMM211 (J126)
53	DIMM210 (J125)	54	DIMM002 (J112)
55	DIMM001 (J111)	56	DIMM000 (J110)
57	DIMM012 (J115)	58	DIMM011 (J114)
59	DIMM010 (J113)	60	DIMM022 (J118)
61	DIMM021 (J117)	62	DIMM020 (J116)
63	DIMM032 (J121)	64	DIMM031 (J120)
65	DIMM030 (J119)	66	Power backplane signal connector (J184)
67	SATA DOM/ODD connector (J169)	68	Power connector (J183)
69	Left mounting ear connector (J174)	70	RAID controller card connector (J203)

1.6 Logical Structure

This topic describes the RH5885 V3 logical structure.

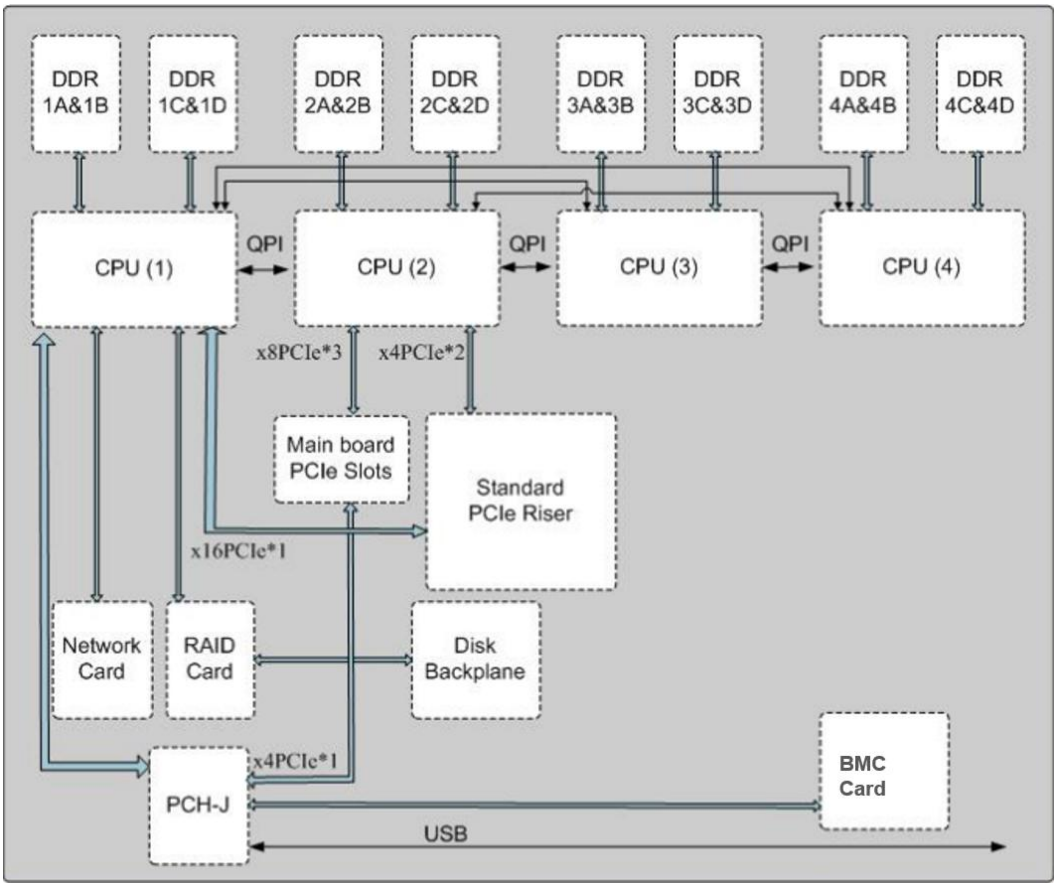
The RH5885 V3 is a high-performance rack server that uses new-generation Intel® Xeon® processors. It provides excellent performance and reliability by improving the number of processor cores, memory capacity, I/O expandability, and RAS features.

The RH5885 V3 provides the following features to offer customized configurations and maximize customers' return on investment (ROI):

- Supports various memory configurations with different capacity and bandwidth, and memory upgrades.
- Uses an onboard NIC in the plug-in card form factor, providing GE or 10GE ports to meet diversified configuration and upgrade requirements.
- Adopts an independent PCIe box design, meeting requirements on PCIe expansion and upgrades.

Figure 1-7 shows the RH5885 V3 logical structure.

Figure 1-7 RH5885 V3 logical structure



1.7 RAS Features

This topic describes the Reliability, Availability, and Serviceability (RAS) features supported by the RH5885 V3.

Table 1-10 describes the RAS features supported by the RH5885 V3. You can configure these features to improve server RAS.

NOTE
For details about how to configure the RAS features, see the *HUAWEI Server Brickland Platform BIOS Parameter Reference*.

Table 1-10 RAS features

No.	Module	Feature Name	Description
1	Processor	Corrected Machine Check Interrupt (CMCI)	This feature corrects error-triggered interrupts for Predictive Failure Analysis (PFA) and error log recording, facilitating further analysis.
2	Processor	Link level 8-bit, and rolling 16-bit CRC and retry	This feature provides cyclic redundancy check (CRC) protection and a retry mechanism upon errors to improve QPI link reliability.
3	Processor	Intel QPI error detection and logging	This feature detects errors on QPI links to improve QPI link reliability.
4	Processor	Dynamic link retraining and recovery on link failure	This feature improves QPI link reliability.
5	Processor	Intel QPI viral mode	This feature provides a QPI viral mode to prevent the spreading of error data and improve system security.
6	Processor	Intel QPI clock failover	This feature provides a QPI clock link self-recovery mechanism to improve system reliability.
7	Processor	Intel QPI data lane failover (self-healing)	This feature supports QPI data lane failover to improve QPI link reliability.
8	DIMM	Memory temperature adjustment	This feature automatically adjusts the DIMM temperature to avoid DIMM damage due to overheat.
9	DIMM	Memory ECC-DIMM	This feature provides memory error checking and correcting (ECC).
10	DIMM	Memory sparing (rank)	This feature uses some memory ranks as backup ranks to prevent the system from crashing due to uncorrectable errors.
11	DIMM	Memory address	This feature detects memory commands

No.	Module	Feature Name	Description
		parity protection	and address errors.
12	DIMM	Memory demand/patrol scrubbing	This feature provides the memory patrol function for promptly correcting correctable errors upon detection. If these errors are not corrected promptly, uncorrectable errors may occur.
13	DIMM	Memory mirroring: intra-socket, including mirroring for some addresses	This feature improves system reliability.
14	DIMM	SMI2-retry Intel SMI2 commands with parity errors and reads & writes with Intel SMI2 data bus errors	These features provide a System Management Interrupt (SMI) retry mechanism.
15	DIMM	DRAM Single Device Data Correction (SDDC) and SDDC+1	This feature enables the memory to correct 1-bit errors after one SDDC to improve memory reliability and availability.
16	DIMM	DRAM Double Device Data Correction (DDDC) and DDDC+1	This feature enables the memory to correct 1-bit errors after one DDDC to improve memory reliability and availability.
17	DIMM	Data scrambling	This feature optimizes data stream distribution and reduces the error possibility to improve the reliability of data streams in the memory and the capability to detect address errors.
18	DIMM	Device tagging	This feature degrades and rectifies DIMM device faults to improve DIMM availability.
19	I/O	PCIe advanced error reporting	This feature improves server serviceability.
20	System	Core disable for Fault Resilient Boot (FRB)	This feature isolates a faulty processor core during startup to improve system reliability and availability.
21	System	Socket disable for FRB	This feature isolates a faulty processor during startup to improve system reliability and availability.
22	System	Corrupt data containment mode (You can set this mode in the BIOS.)	This feature identifies the memory storage unit that contains corrupted data to minimize the impact on the running programs and improve system reliability.

No.	Module	Feature Name	Description
23	System	Architected error records	With the Enhanced Machine Check Architecture (eMCA) feature, the basic input/output system (BIOS) collects error information recorded in hardware registers in compliance with Unified Extensible Firmware Interface (UEFI) specifications, sends the error information to the operating system (OS) over the APEI of the Advanced Configuration and Power Interface (ACPI), and locates the error unit, which improves system availability.
24	System	Machine Check Architecture (MCA) recovery - Non-execution path	This feature provides the MAC error processing mechanism.
25	System	• E7 v2 processors: eMCA Gen1 • E7 v3 processors: eMCA Gen2	This feature triggers SMI before machine check exception (MCE), allowing software to process errors. This feature minimizes the impact of faults.
26	System	MCA recovery - IO	This feature reports I/O errors to the MCA.
27	System	Error injection support	This feature injects errors to verify various RAS features.
28	System	MCA recovery - execution path	This feature provides the error handling method for the BIOS or OS when MCE is caused by errors on the execution path, which protects the system from breakdown.
29	System	OOB access to MCA registers	This feature enables an out-of-band system to access an MCA register over the Platform Environment Control Interface (PECI).
30	Redundancy	PSUs in N+N hot backup	This feature supports hot backup for PSUs.
31	Redundancy	Fan modules in N+1 backup	This feature supports hot backup for fan modules.
32	Redundancy	Out-of-band management software with dual images	This feature provides dual images to improve system reliability.
33	Fault warning	Memory PFA	This feature provides precaution for memory faults.
34	Fault warning	Hard disk PFA	This feature provides precaution for hard disk faults.

No.	Module	Feature Name	Description
35	Fault warning	PCIe SSD fault warning	This feature provides precaution for PCIe solid-state drive (SSD) faults.
36	Fault diagnosis	Faulty processor location	This feature provides fault information in the power-on self-test (POST) phase.
37	Fault diagnosis	Faulty hard disk location	This feature provides location to a faulty hard disk by indicator observation and information displayed on the web page.
38	Fault diagnosis	Faulty PSU location	This feature uses a fault indicator to show PSU operating status and allows you to locate faulty PSUs by following the fault information on the iMana web page.
39	Fault diagnosis	Faulty fan module location	This feature enables you to check the fan module running status by using indicators on the fan modules.
40	Fault diagnosis	Faulty DIMM location	This feature enables faulty DIMM location after the server is powered off.
40	Fault diagnosis	Fault location with the black box function provided by the BMC	
41	Fault diagnosis	Last screen function provided by the BMC	
42	Fault diagnosis	Video recording provided by the BMC	
43	Device maintenance	Hard disk hot swap	
44	Device maintenance	PSU hot swap	
45	Device maintenance	Hot-swappable fan modules with maintenance without the need for opening the chassis cover	
46	Device maintenance	Indicators for onsite maintenance	
47	Device maintenance	Platform Controller Hub (PCH) faults reported by the BIOS to the BMC	
48	Device maintenance	Jordan Creek faults reported by the BIOS	

No.	Module	Feature Name	Description
		to the BMC	
49	Device maintenance	Holding rails	This feature facilitates device maintenance.
50	Device maintenance	Mail sending supported on the BMC	
51	Device maintenance	Electronic labels for key components	
52	Device maintenance	Power capping for the entire system	This feature reduces the power consumption density while increasing the device density in an equipment room.
53	Device maintenance	Intelligent fan speed adjustment and zone-based heat dissipation	

1.8 Technical Specifications

This topic describes the technical specifications for the RH5885 V3.

Table 1-11 describes the technical specifications for the RH5885 V3.

Table 1-11 Technical specifications

Category	Item	Specifications
Mechanical specifications	Chassis dimensions (H x W x D)	175 mm x 447 mm x 790 mm (6.89 in. x 17.60 in. x 31.10 in.)
	Weight	Net weight: 45 kg (99.21 lb)
		Packaging material: 3.6 kg (7.94 lb)
Environmental specifications	Temperature	• Operating temperature: 5 ℃ to 40 ℃ (41 ℉ to 104 ℉) • Storage temperature: -40 ℃ to +65 ℃ (-40 ℉ to +149 ℉) **NOTE** The RH5885 V3 supports the maximum operating temperature of 35 ℃ (95 ℉) when it is configured with standard PCIe SSD cards or 32 GB or larger-capacity DIMMs.
	Humidity	• Operating humidity: 8% RH to 80% RH (non-condensing) • Storage humidity: 5% RH to 95% RH

Category	Item	Specifications
		(non-condensing)
	Altitude	≤ 3000 m (9842.40 ft) The operating temperature decreases by 1 ℃ (1.8 ℉) as the altitude increases by 300 m (984.24 ft).
PSU input specifications	Input voltage	• DC PSU: -36 V DC to -75 V DC • AC PSU: AC: 90 V to 264 V High-voltage DC: 192 V DC to 288 V DC **NOTE** • The AC module LITEON 750 W-AC (PS-2751-7H) supports high-voltage 240 V DC with the voltage range of 192 V DC to 288 V DC. • The AC module LITEON 1200 W-AC (PS-2122-3H) supports high-voltage 240 V DC with the voltage range of 192 V DC to 288 V DC. • The DC module Emerson-800 W-DC (TPS800-12D) supports -48 V DC with the voltage range of -36 V DC to -75 V DC.
	Input current	10 A
PSU output specifications	Rated output voltage	12 V DC
	Rated output current	• 1200 W AC PSU: 96 A • 750 W AC PSU: 62.5 A • 800 W DC PSU: 66.7 A
Power specifications	PSU rated power	The RH5885 V3 supports four PSUs. The following lists the rated power for each type of PSU: • 1200 W AC PSU: – 800 W (input voltage: 100 V AC at 50 Hz to 60 Hz) – 900 W (input voltage: 100 V AC to 139 V AC at 50 Hz to 60 Hz) – 1200 W (input voltage: 180 V AC to 364 V AC at 50 Hz to 60 Hz) • 750 W AC PSU: 750 W (input voltage: 90 V AC to 264 V AC at 50 Hz to 60 Hz) • 800 W DC PSU: 800 W (input voltage: -36 V DC to -75 V DC)

1.9 Advantages

The RH5885 V3 provides the following advantages:

Leading Computing Performance

- The RH5885 V3 uses the latest Intel® Xeon® E7-4800 v2/v3 or E7-8800 v2/v3 processors. Each E7 v2 or v3 processor provides a maximum of 18 cores and 45 MB L3 cache, whereas each Westmere-EX (E7 v1) processor provides a maximum of 10 cores and 30 MB L3 cache.
- The RH5885 V3 supports a maximum of 48 DIMMs. Both the number of DIMMs and the memory capacity increase by 50% compared with the Westmere-EX processor, enabling the RH5885 V3 to support large databases and more VMs.
- Compared with an E7 v1 processor, an E7 v2 or v3 processor increases the overall performance by 200% and offers 340% higher performance for certain applications.

High RAS to Improve Stability and Enable Quick Recovery

- The RH5885 V3 transplants advanced RAS features from Intel Itanium (midrange computers) and implements 53 RAS features.
- The fan modules of the RH5885 V3 are hot-swappable and can be maintained without opening the chassis cover.
- The indicator diagnosis panel provides comprehensive and precise information to facilitate onsite fault rectification.
- The RH5885 V3 can operate stably at 40 ℃ (104 ℉) for a long term. When it is configured with high-power components such as PCIe SSD cards or 32 GB or larger-capacity DIMMs, the RH5885 V3 supports the maximum operating temperature of 35 ℃ (95 ℉).

2 Features

RAS Features

The RH5885 V3 provides the following RAS features to ensure stable system operation, simplify serviceability, and prolong the system operation time:

- The eMCA mechanism automatically rectifies correctable errors to ensure normal system operation. For uncorrectable errors, you can isolate or replace the faulty component online, and configure the new component without a system restart. The BIOS preferentially deals with correctable memory errors and locates the faulty DIMM.
- The RH5885 V3 provides chip-level fault tolerance (such as automatic recovery from processor, chip, and link hardware faults), minimizing system breakdown caused by hardware faults.
- The RH5885 V3 supports SDDC and DDDC to rectify memory soft errors.
- The RH5885 V3 provides memory mirroring and memory sparing functions to eliminate system downtime caused by uncorrectable memory hardware errors.
- The RH5885 V3 supports faulty DIMM indication on an offline memory riser by using indicators on the memory riser.
- The RH5885 V3 supports full redundancy and hot-swap maintenance without opening the chassis cover for key components, such as PSUs, fan modules, and hard disks. These features enable quick replacement of faulty components without interrupting normal system operation.
- The RH5885 V3 supports automatic disconnection from a faulty I/O device. When a fatal I/O device fault is detected, the system enters virus mode and disconnects the link to the faulty I/O device to prevent other devices from being affected.
- The RH5885 V3 supports hot-swappable drives to protect data and prolong normal system running time using RAID.
- The BMC monitors system operating, triggers alarms, and performs recovery actions. This helps minimize system downtime.
- Inband and out-of-band fault management software implements PFA and fault management. The software traces components, sends a precaution before a system breakdown caused by a faulty component, runs self-diagnosis, self-correction, self-recovery, and provides maintenance tips about faulty components for maintenance personnel, including offline and online operations and component replacement. PFA can be performed on components, such as processors, DIMMs, fan modules, PSUs, and hard disks.
- The RH5885 V3 provides an indicator diagnosis panel to facilitate fault location, which shortens the system recovery time.

- The optimized heat dissipation system supports long-term stable operation at an ambient temperature of 40 ℃ (104 ℉) in most cases, and at 35 ℃ (95 ℉) when standard PCIe SSD cards or 32 GB or larger-capacity DIMMs are configured.
- The advanced fault tolerance, fault recovery, and key component redundancy enable system availability of 99.999%.
- In regions in China, Huawei provides three-year customer replaceable unit and onsite limited warranty 9x5 next business day (NBD). Optional service upgrades are available.

Performance and Scalability

The RH5885 V3 supports the following features to ensure high performance and scalability while reducing the total cost of ownership (TCO):

- An Intel® Xeon® E7 v2 processor used by the RH5885 V3 supports a maximum of 15 cores, 37.5 MB L3 cache, and three QPI links. An Intel® Xeon® E7 v3 processor supports a maximum of 18 cores, 45 MB L3 cache, and three QPI links. These features provide outstanding system performance.
- The RH5885 V3 supports a maximum of four processors and 60 physical cores (E7 v2 processors) or 72 physical cores (E7 v3 processors), which maximizes concurrent execution of multithreaded applications.
- Intel® Turbo Boost Technology allows processor cores to run faster than the Thermal Design Power (TDP) configuration specified frequency if the processor cores 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 computation capability.
- The hardware-assisted Intel® Virtualization Technology (Intel® VT) allows OS vendors to better use hardware to address virtualization workloads.
- The RH5885 V3 can be configured with a maximum of 48 DIMMs.
- The RH5885 V3 provides seven standard PCIe slots and one plug-in NIC without occupying a standard PCIe slot, allowing flexible configurations of four GE ports or two 10GE ports.
- The RH5885 V3 supports PCIe 3.0, which increases the maximum I/O bandwidth by 60% (8 GT/s per link) compared with PCIe 2.0.

Availability and Serviceability

The RH5885 V3 provides the following features to improve availability and serviceability:

- The RH5885 V3 provides chip-level fault tolerance (such as automatic recovery from processor, chip, and link hardware faults), minimizing system breakdown caused by hardware faults.
- The RH5885 V3 supports SDDC and DDDC to rectify memory soft errors.
- The RH5885 V3 provides memory mirroring and memory sparing functions to eliminate system downtime caused by uncorrectable memory hardware errors.
- The RH5885 V3 supports full redundancy and hot-swap maintenance without opening the chassis cover for key components, such as PSUs, fan modules, and hard disks. These features enable quick replacement of faulty components without interrupting normal system operation.
- The RH5885 V3 supports hot-swappable drives to protect data and prolong normal system running time using RAID.

- The BMC monitors system operating, triggers alarms, and performs recovery actions. This helps minimize system downtime.
- The RH5885 V3 provides an indicator diagnosis panel to facilitate fault location, which shortens the system recovery time.
- In regions in China, Huawei provides three-year customer replaceable unit and onsite limited warranty 9x5 next business day (NBD). Optional service upgrades are available.

Manageability and Security

The RH5885 V3 provides the following features to simplify local and remote server management:

- The RH5885 V3 supports Intelligent Platform Management Interface (IPMI) 2.0. The integrated management module monitors server operating status and implements remote management.
- An integrated industry-standard Unified Extensible Firmware Interface (UEFI) increases setup, configuration, and update efficiency, and simplifies fault handling.
- The Intel Advanced Encryption Standard New Instructions (AES NI) implement faster and stronger encryption.
- The Intel Execute Disable Bit (EDB) function works with the supported OS to prevent certain types of malicious buffer overflow attacks.
- The Intel Trusted Execution technology provides enhanced security by using hardware-based defense against malicious software attacks, allowing an application to run in an isolated space from all other applications running on the OS.

Energy Efficiency

The RH5885 V3 provides the following features to reduce energy consumption and operating expense (OPEX) and increase energy efficiency:

- The latest Intel® Xeon® E7 v2/v3 series processors provide better performance than the previous-generation processors while fitting into the same TDP limits.
- The Intel Intelligent Power Capability enables processors to automatically adjust their operating voltage based on their loads.
- Low-voltage Intel® Xeon® E7 v2/v3 series processors consume less energy and apply to data centers and telecommunication environments that have power and thermal limitations.
- SSDs consume 80% less power than traditional 2.5-inch hard disk drives (HDDs).

3 Product Specifications

Table 3-1 describes the RH5885 V3 product specifications.

Table 3-1 RH5885 V3 product specifications

Item	Specifications
Form factor/height	4U rack server, supporting holding rails and cable management assemblies
Processor	• A maximum of four Intel® Xeon® E7-4800 v2 or E7-8800 v2 (Ivy Bridge-EX) processors, with up to 15 cores and 37.5 MB L3 cache per processor • A maximum of four Intel® Xeon® E7-4800 v3 or E7-8800 v3 (Haswell-EX) processors, with up to 18 cores and 45 MB L3 cache per processor
Chipset	Intel Patsburg PCH-J (Intel C602J)
DIMM slots	48 slots for installing DDR3 or DDR4 DIMMs
Maximum memory capacity	1.5 TB (32 GB DIMMs)
Number of hard disks	Eight or twenty-three 2.5-inch SAS HDDs, SATA HDDs, or SSDs. For details about the maximum local storage capacity, see the compatibility list at the following URL: http://e.huawei.com/en/marketing-material/download_success?MaterialID={0E522AAE-BEF9-41F4-9601-FA010A9C03E0}
RAID support	When the server is equipped with eight or twenty-three disks, it supports only one RAID controller card on the mainboard. The RAID controller card supports either of the following: • RAID 0, 1, 10, and 1E • RAID 0, 1, 10, 5, 50, 6, and 60, a 2 GB cache, and a supercapacitor for power-off protection When the server is equipped with twenty-three directly connected disks, it supports a maximum of one RAID

Item	Specifications
	controller card on the mainboard and two standard RAID controller cards in PCIe slots.
Network port	The LOM can be flexibly configured to provide the following ports: • Four GE 1000BASE-T ports • Two GE 1000BASE-T ports • Two 10GE optical ports • Two 10GE electrical ports
Expansion slot	The server provides eight standard PCIe slots: • One PCIe 3.0 x16 slot • Three PCIe 3.0 x8 slots • Two PCIe 3.0 x4 slots • One PCIe 2.0 x4 slot • One PCIe 3.0 x8 slot, dedicated for a RAID controller card
External port	• Front panel: two USB 2.0 ports, one power button, one UID button, one video graphics array (VGA) port, and one indicator panel • Rear panel: two USB 2.0 ports, one VGA port, one serial port, one management port, and one UID indicator
DVD-ROM drive (optional)	One
PSU	The PSUs can be configured as follows: • 1200 W AC PSUs in 1+1 or 2+2 redundancy mode (240 V HVDC) • 750 W AC PSUs in 1+1 or 2+2 redundancy mode (240 V HVDC) • 800 W DC PSUs in 1+1 or 2+2 redundancy mode
System management	IPMI 2.0
Security feature	Power-on password and administrator password. Support for a security panel.
Video card	• E7 v2/v3 processors and DDR3 DIMMs: uses an onboard display chip SM750. The display chip provides 16 MB display memory. The maximum resolution is 1024 x 768. • E7 v3 processors and DDR4 DIMMs: uses an onboard display chip that is integrated into the management chip Hi1710 and uses the IP core of the SM750. The display chip provides 32 MB display memory. The maximum resolution is 1280 x 1024.
OSs supported	Check the latest compatibility list.

Item	Specifications
Warranty	Three-year customer replaceable unit and onsite limited warranty, 9 x 5 NBD, and optional service upgrades.
Dimensions (H x W x D)	175 mm x 447 mm x 790 mm (6.89 in. x 17.60 in. x 31.10 in.)
Maximum weight	• Packaging materials: 7 kg (15.44 lb) • Server with 23 disks (excluding the package): 41 kg (90.41 lb) • Server with 8 disks (excluding the package): 37 kg (81.59 lb) **NOTE** When four processors are installed and DIMMs and hard disks are fully configured, the server is highest in weight. The weight of PCIe cards is not included and can be calculated as follows: • HHHL PCIe card: 0.3 kg (0.66 lb) • FHHL PCIe card: 0.4 kg (0.88 lb)
Physical environment	Operating environment • Ambient temperature: 5 ℃ to 40 ℃ (41 ℉ to 104 ℉) The operating temperature decreases by 1 ℃ (1.8 ℉) as the altitude increases by 300 m (984.25 ft). Maximum altitude: 3000 m (9842.52 ft) • Ambient humidity: 8% RH to 80% RH (twmax = 29 ℃) **NOTE** The RH5885 V3 supports the maximum operating temperature of 35 ℃ (95 ℉) when it is configured with standard PCIe SSD cards or 32 GB or larger-capacity DIMMs. Storage environment • Ambient temperature: -40 ℃ to +65 ℃ (-40 ℉ to +149 ℉) • Ambient humidity: 5% RH to 95% RH (twmax = 38 ℃)
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 ℃ (73.4 ℉) ambient environment. Noise emissions are measured in accordance with ISO 7999 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109). • Idle: – LWAd: 7.1 Bels – LpAm: 58.8 dBA • Operating: – LWAd: 7.1 Bels

Item	Specifications
	– LpAm: 58.8 dBA **NOTE** The actual sound levels generated during server operating vary depending on the server configuration, load, and ambient temperature.

4 Component Compatibility

About This Chapter

4.1 Processor

The RH5885 V3 supports Intel® Xeon® E7-4800 v2/v3 or E7-8800 v2/v3 series processors. Observe the following rules when configuring processors:

- The RH5885 V3 supports two or four processors. If only two processors are to be configured, install them in sockets CPU1 and CPU2.
- A server must use the same model of processors.

Table 4-1 lists the compatible processors.

Table 4-1 Compatible processors

Processor	Core	HT	GHz	Turbo Boost	L3 Cache (MB)	QPI	SMI2 (MT/s)
E7-8891 v2	10	Yes	3.2	Yes-3.7 GHz	37.5	8 GT/s	2667
E7-8893 v2	6	Yes	3.4	Yes-3.7 GHz	37.5	8 GT/s	2667
E7-8890 v2	15	Yes	2.8	Yes-3.4 GHz	37.5	8 GT/s	2667
E7-8880 v2	15	Yes	2.5	Yes-3.1 GHz	37.5	8 GT/s	2667
E7-8880L v2	15	Yes	2.2	Yes-2.8 GHz	37.5	8 GT/s	2667

Processor	Core	HT	GHz	Turbo Boost	L3 Cache (MB)	QPI	SMI2 (MT/s)
E7-8870 v2	15	Yes	2.3	Yes-2.9 GHz	30	8 GT/s	2667
E7-8857 v2	12	Yes	3.0	Yes-3.6 GHz	30	8 GT/s	2667
E7-8850 v2	12	Yes	2.3	Yes-2.8 GHz	24	7.2 GT/s	2132
E7-4890 v2	15	Yes	2.8	Yes-3.4 GHz	37.5	8 GT/s	2667
E7-4880 v2	15	Yes	2.5	Yes-3.1 GHz	37.5	8 GT/s	2667
E7-4870 v2	15	Yes	2.3	Yes-2.9 GHz	30	8 GT/s	2667
E7-4860 v2	12	Yes	2.6	Yes-3.2 GHz	30	8 GT/s	2667
E7-4850 v2	12	Yes	2.3	Yes-2.8 GHz	24	7.2 GT/s	2132
E7-4830 v2	10	Yes	2.2	Yes-2.7 GHz	20	7.2 GT/s	2132
E7-4820 v2	8	Yes	2.0	Yes-2.5 GHz	16	7.2 GT/s	2132
E7-4809 v2	6	Yes	1.9	No	12	6.4 GT/s	2132
E7-8890 v3	18	Yes	2.5	Yes-3.3 GHz	45	9.6 GT/s	3200
E7-8891 v3	10	Yes	2.8	Yes-3.5 GHz	45	9.6 GT/s	3200
E7-8893 v3	4	Yes	3.2	Yes-3.5 GHz	45	9.6 GT/s	3200
E7-8880 v3	18	Yes	2.3	Yes-3.1 GHz	45	9.6 GT/s	3200
E7-8870 v3	18	Yes	2.1	Yes-2.9 GHz	45	9.6 GT/s	3200
E7-8860 v3	16	Yes	2.2	Yes-3.2 GHz	40	9.6 GT/s	3200
E7-8880L v3	18	Yes	2.0	Yes-2.8 GHz	45	9.6 GT/s	2667
E7-8867v3	16	Yes	2.5	Yes-3.3 GHz	45	9.6 GT/s	3200
E7-4850 v3	14	Yes	2.2	Yes-2.8 GHz	35	8 GT/s	2667
E7-4830 v3	12	Yes	2.1	Yes-2.7 GHz	30	8 GT/s	2667
E7-4820 v3	10	Yes	1.9	No	25	6.4 GT/s	2667
E7-4809v3	8	Yes	2.0	No	25	6.4 GT/s	2667

For details about the processor models supported by the RH5885 V3, see the compatibility list at the following URL:

http://e.huawei.com/en/marketing-material/download_success?MaterialID={0E522AAE-BEF9-41F4-9601-FA010A9C03E0}

4.2 Memory

Memory Capacity Configuration Rules

The RH5885 V3 supports DDR3 and DDR4 DIMMs.

- When equipped with E7 v2 processors, the RH5885 V3 supports DDR3 DIMMs with up to 1600 MT/s operating speed. Each E7 v2 processor supports a maximum of 12 DDR3 DIMMs.
- When equipped with E7 v3 processors, the RH5885 V3 supports DDR3 DIMMs with up to 1600 MT/s operating speed or DDR4 DIMMs with up to 1866 MT/s operating speed. Each E7 v3 processor supports a maximum of 12 DDR3 or DDR4 DIMMs.

Table 4-2 lists the compatible DIMMs.

Table 4-2 Compatible DIMMs

BOM Number	Type	Description	Maximum Number of DIMMs
06200191	DDR3	Memory Module,DDR3 RDIMM,8GB,240PIN,1.25ns,1600000KHz,1.35V,ECC,2 Rank(512M*8bit),Height 30mm	48 (12 per processor)
06200169	DDR3	Memory Module,DDR3 RDIMM,8GB,240pin,1.1ns,1866000KHz,1.5V,ECC,2Rank(512M*8bit),Height 30mm	48 (12 per processor)
06200199	DDR3	Memory Module,DDR3 RDIMM,16GB,240PIN,1.5ns,1600000KHz,1.35V,ECC,for high end product only,2 Rank(1Gx4bit),Height 30mm, IT dedicated	48 (12 per processor)
06200137	DDR3	Memory Module,DDR3 LRDIMM,32GB,240pin,1.5ns,1333000KHz,1.35V,ECC,4Rank(1G*4bit),height 30mm, Server dedicated	48 (12 per processor)
06200178	DDR3	Memory Module,DDR3 LRDIMM,32GB,240pin,1.1ns,1866000KHz,1.5V,ECC,4Rank DDP(1G*4bit),IT dedicated	48 (12 per processor)
06200190	DDR4	Memory Module,DDR4 RDIMM,8GB,288pin,0.9ns,2133000KHz,1.2V,ECC,2Rank(512M*8bit)	48 (12 per processor)
06200176	DDR4	Memory Module,DDR4 RDIMM,16GB,288pin,0.9ns,2133000KHz,1.2V,ECC,2Rank(1G*4bit)	48 (12 per processor)
06200201	DDR4	Memory Module,DDR4 RDIMM,32GB,288pin,0.9ns,2133000KHz,1.2V,ECC,2Rank(2G*4bit)	48 (12 per processor)

Observe the following rules when configuring DIMMs:

1. The RH5885 V3 does not support mixed use of RDIMMs and LRDIMMs.
2. If the RH5885 V3 is equipped with RDIMMs, each memory channel supports up to six ranks. For details, see Table 4-2.
3. If the RH5885 V3 is equipped with LRDIMMs, each DDR3 memory channel supports up to 24 ranks.
4. The maximum memory operating speed depends on the memory configuration and maximum processor capability. Table 4-3, Table 4-4, and Table 4-5 list the maximum memory bandwidth without processor limitations.

   The RH5885 V3 does not support mixed use of DIMMs with different BOM numbers.

The maximum memory operating speed also depends on the memory operating mode. There are two memory operating modes:

- Performance mode (default): Each memory channel operates independently, and the speed of an SMI2 channel doubles the speed of a memory channel. The memory system in this mode delivers high performance.
- RAS (lockstep) mode: Two memory channels on the same SMI2 channel work synchronously, and an SMI2 channel operates at the same speed as a memory channel. The memory system in this mode delivers high reliability. In RAS mode, the number of DIMMs must be a multiple of 8.

Table 4-3 Maximum memory speed (E7 v2 + DDR3)

DIMM Properties			**Memory Operating Voltage/Speed**					
BOM Number	Key Parameters: DDRx-Type-Rated Speed (MT/s)-Rated Voltage (V)-Number of Ranks	Capacity (GB)	Performance Mode			RAS Mode		
			1 DPC	2 DPC	3 DPC	1 DPC	2 DPC	3 DPC
06200191	DDR3-RDIMM-1600-1.35V-2 Rank	8	1.35/1333	1.35/1333	1.35/1066	1.35/1333	1.35/1333	1.35/1066
06200169	DDR3-RDIMM-1866-1.5V-2 Rank	8	1.5/1333	1.5/1333	1.5/1333	1.5/1600	1.5/1600	1.5/1333
06200199	DDR3-RDIMM-1600-1.35V-2 Rank	16	1.35/1333	1.35/1333	1.35/1066	1.35/1333	1.35/1333	1.35/1066
06200137	DDR3-LRDIMM-1333-1.35V-4 Rank	32	1.35/1333	1.35/1333	1.35/1333	1.35/1333	1.35/1333	1.35/1333
06200178	DDR3-LRDIMM-1866-1.5V-4 Rank	32	1.5/1333	1.5/1333	1.5/1333	1.5/1600	1.5/1600	1.5/1333

NOTE

Table 4-3 lists the maximum memory operating speed without processor limitations. That is, this table assumes that the maximum operating speed of an SMI2 channel for an E7 v2 processor is 2667 MT/s.

Table 4-4 Maximum memory speed (E7 v3 + DDR3)

DIMM Properties			Memory Operating Voltage/Speed					
BOM Number	Key Parameters: DDRx-Type-Rated Speed (MT/s)-Rated Voltage (V)-Number of Ranks	Capacity (GB)	Performance Mode			RAS Mode		
			1 DPC	2 DPC	3 DPC	1 DPC	2 DPC	3 DPC
06200191	DDR3-RDIMM-1600-1.35V-2 Rank	8	1.35/1600	1.35/1333	1.5/1333	1.35/1600	1.35/1333	1.5/1333
06200169	DDR3-RDIMM-1866-1.5V-2 Rank	8	1.5/1600	1.5/1600	1.5/1333	1.5/1600	1.5/1600	1.5/1333
06200199	DDR3-RDIMM-1600-1.35V-2 Rank	16	1.35/1600	1.35/1333	1.5/1333	1.35/1600	1.35/1333	1.5/1333
06200196	DDR3-LRDIMM-1600-1.35V-4 Rank	32	1.35/1333	1.35/1333	1.5/1333	1.35/1333	1.35/1333	1.5/1333

NOTE

Table 4-4 lists the maximum memory operating speed without processor limitations. That is, this table assumes that the maximum operating speed of an SMI2 channel for an E7 v3 processor is 3200 MT/s.

Table 4-5 Maximum memory speed (E7 v3 + DDR4)

DIMM Properties			Memory Operating Voltage/Speed					
BOM Number	Key Parameters: DDRx-Type-Rated Speed (MT/s)-Rated Voltage (V)-Number of Ranks	Capacity (GB)	Performance Mode			RAS Mode		
			1 DPC	2 DPC	3 DPC	1 DPC	2 DPC	3 DPC
06200190	DDR4-RDIMM-2133-1.2V-2 Rank	8	1.2/1600	1.2/1600	1.2/1333	1.2/1866	1.2/1866	1.2/1333
06200176	DDR4-RDIMM-2133-1.2V-2 Rank	16	1.2/1600	1.2/1600	1.2/1333	1.2/1866	1.2/1866	1.2/1333
06200201	DDR4-RDIMM-2133-1.2V-2 Rank	32	1.2/1600	1.2/1600	1.2/1333	1.2/1866	1.2/1866	1.2/1333

NOTE

Table 4-5 lists the maximum memory operating speed without processor limitations. That is, this table assumes that the maximum operating speed of an SMI2 channel for an E7 v3 processor is 3200 MT/s.

DIMM Installation Rule

Figure 4-1 DIMM silk screen meaning

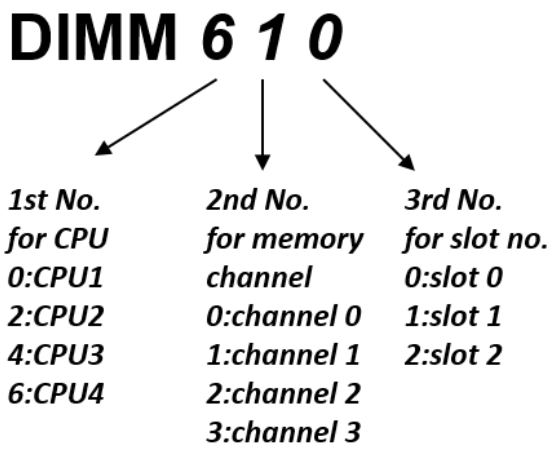


Figure 4-1 shows the DIMM silk screen meaning. The RH5885 V3 supports a maximum of 48 DIMMs. The DIMM installation rules are as follows:

- You are advised to install the same model of DIMMs in the same positions for each processor.
- The DIMM installation priorities for each processor are as follows:

  DIMMx00-->DIMMx10-->DIMMx20-->DIMMx30

  DIMMx01-->DIMMx11-->DIMMx21-->DIMMx31

  DIMMx02-->DIMMx12-->DIMMx22-->DIMMx32

Compatible DIMMs

For details about the DIMM models supported by the RH5885 V3, see the compatibility list at the following URL:

http://e.huawei.com/en/marketing-material/download_success?MaterialID={0E522AAE-BEF9-41F4-9601-FA010A9C03E0}

4.3 Storage

The RH5885 V3 supports three types of hard disks:

- Eight 2.5-inch SAS/SATA HDDs or SSDs, with one RAID controller card on the mainboard
- Twenty-three 2.5-inch SAS/SATA HDDs or SSDs, with one RAID controller card on the mainboard
- Twenty-three directly connected 2.5-inch SAS/SATA HDDs or SSDs, with up to one RAID controller card on the mainboard and two standard RAID controller cards in PCIe slots

For details about the hard disk models and RAID controller card models supported by the RH5885 V3, see the compatibility list at the following URL:

http://e.huawei.com/en/marketing-material/download_success?MaterialID={0E522AAE-BEF9-41F4-9601-FA010A9C03E0}

Table 4-6 lists the performance of different RAIDs, the minimum number of disks required, and disk utilization.

Table 4-6 RAID level comparison

RAID Level	Reliability	Read Performance	Write Performance	Minimum Number of Hard Disks	Hard Disk Utilization
RAID 0	Low	High	High	2	100%
RAID 1	High	Low	Low	2	1/*N*
RAID 5	Better than medium	High	Medium	3	(*N*-1)/*N*
RAID 6	Better than medium	High	Medium	4	(*N*-2)/*N*
RAID 1E	High	Medium	Medium	3	*M*/*N*
RAID 10	High	Medium	Medium	4	*M*/*N*
RAID 50	High	High	Better than medium	6	(*N* - M)/*N*
RAID 60	High	High	Better than medium	8	(*N* - M x 2)/*N*

NOTE
N indicates the number of member hard disks in a RAID. *M* indicates the number of subgroups of a RAID.

4.4 I/O Expansion

Standard PCIe Cards

Observe the following rules when configuring PCIe cards for the RH5885 V3:

- Configure a PCIe riser card if PCIe slots 5 to 7 are to be used.
- The RH5885 V3 does not support graphics processing units (GPUs).
- When standard PCIe SSD cards are configured, the RH5885 V3 supports the maximum operating temperature of 35 ℃ (95 ℉).

For details about the standard PCIe card models supported by the RH5885 V3, see the compatibility list at the following URL:

http://e.huawei.com/en/marketing-material/download_success?MaterialID={0E522AAE-BEF9-41F4-9601-FA010A9C03E0}

4.5 PSU

The PSU configuration rules are as follows:

- Input voltage range:
  - AC: 90 V AC to 264 V AC with an input frequency of 50 Hz or 60 Hz
  - DC: –48 V DC to –60 V DC or 192 V DC to 288 V DC
- A server must use PSUs of the same model.

For details about the PSU models supported by the RH5885 V3, see the compatibility list at the following URL:

http://e.huawei.com/en/marketing-material/download_success?MaterialID={0E522AAE-BEF9-41F4-9601-FA010A9C03E0}

4.6 OSs, Virtualization Software and Databases

For details about the OSs, virtualization software, and databases supported by the RH5885 V3, see the compatibility list at the following URL:

http://e.huawei.com/en/marketing-material/download_success?MaterialID={0E522AAE-BEF9-41F4-9601-FA010A9C03E0}

5 Management

About This Chapter

The management system used by the RH5885 V3 varies depending on the combination of processor and DIMM configurations:

- E7 v2 + DDR3: iMana 200
- E7 v3 + DDR3: iMana 200
- E7 v3 + DDR4: iBMC

5.1 iMana 200

The RH5885 V3 with E7 v2 or v3 processors and DDR3 DIMMs uses iMana 200 as its management system.

iMana 200 is a Huawei proprietary integrated management system for remote server management. iMana 200 complies with IPMI 2.0 specifications and provides reliable hardware monitoring and management. iMana 200 seamlessly communicates with management modules in a chassis and manages the compute nodes in the chassis through the management modules.

iMana 200 supports the following features:

- Keyboard, video, and mouse (KVM) and text console redirection
- Remote virtual media
- IPMI V2.0
- Simple Network Management Protocol Version 3 (SNMPv3)
- Common information model (CIM)
- Web-based logins

Table 5-1 describes iMana 200 specifications.

Table 5-1 iMana 200 specifications

Item	Specifications
Management interface	iMana 200 supports a variety of management interfaces to implement system integration. iMana 200 can integrate with any standard management system over the following interfaces: • IPMI V2.0 • CLI • HTTPS • SNMPv3
Fault detection	Detects faults and accurately locates hardware faults.
System watchdog	Supports BIOS power on self-test (POST), OS watchdog, and automatic system reset for timeout. You can enable or disable these functions on iMana 200.
Boot device configuration	Supports out-of-band configuration for boot devices.
Alarm management	Supports alarm management and reports alarms in various ways, such as the SNMP trap, Simple Mail Transfer Protocol (SMTP), and syslog service, to ensure uninterrupted system operation.
Integrated KVM	Provides remote maintenance measures, such as KVM and KVM over IP, for troubleshooting. Support a maximum resolution of 1280 x 1024.
Integrated virtual media	Virtualizes local media devices or images to the media devices for remote compute nodes, which simplifies OS installation. The virtual DVD-ROM drive supports a transmission rate of up to 8 MB/s.
Web-based user interface (UI)	Provides a visual WebUI for quick configuration and information queries. Supports the following web browsers: • Internet Explorer 7.0/8.0 • Firefox 9.0 • Chrome 13.0 • Safari
Fault reproduction	Reproduces faults to facilitate fault diagnosis.
Screenshots and videos	Allows you to view screenshots and videos without login, which facilitates preventive maintenance inspection (PMI).
DNS/LDAP	Supports domain management and directory services, which significantly simplifies network configuration and management.
Dual-image backup	Starts software from an image backup if the software fails.
Asset management	Provides intelligent asset management.

Item	Specifications
Intelligent power management	Uses the power capping technology to increase deployment density and the dynamic energy saving technology to lower the OPEX.
IPv6	Supports IPv6 to ensure sufficient IP addresses.
NC-SI	Supports NC-SI, which allows you to access iMana 200 over a service network port.

5.2 iBMC

The RH5885 V3 with E7 v3 processors and DDR4 DIMMs uses iBMC as its management system.

iBMC provides the following functions to improve management efficiency and reduce OPEX:

- Remote server management and carrier-class reliability

  As a Huawei home-grown intelligent management system, iBMC is advanced software for remotely managing servers. It supports KVM redirection, text console redirection, remote virtual media (mapping the CD-ROM drive, floppy disk drive (FDD), and hard disks from the terminal to the server), and IPMI 2.0-based hardware monitoring and management. iBMC is designed based on the carrier-class reliability requirements and supports dual-image backups for software.
- Various user interfaces

  iBMC provides various user interfaces, such as the CLI, web-based UI, IPMI management interface. All user interfaces adopt a highly secure encryption algorithm, ensuring access security.
- Comprehensive server monitoring

  iBMC not only monitors servers, but also provides diversified alarms and detailed logs. For example, logs record processor core temperatures, voltages, fan speed, PSU faults, and bus faults. In addition, iBMC allows you to query the information about processors, memory, and hard disks.
- Last-screen information recording and screenshot capturing

  When a server about to break down, iBMC saves the last information displayed on the screen for fault identification. iBMC allows you to configure regular or periodical tasks for capturing screenshots, which requires no manual intervention and saves maintenance time.

iBMC supports the following features and protocols:

- Management interfaces

  The server provides IPMI, call-level interface (CLI), Hypertext Transfer Protocol Secure (HTTPS), Simple Network Management Protocol (SNMP), and Web Service Management interfaces, meeting various system integration requirements.
- Compliance with IPMI 1.5 and IPMI 2.0

  iBMC provides standard management interfaces, which allow integration with standard management systems.

- Fault detection and alarm management

  iBMC supports fault detection and alarm management, ensuring stable uninterrupted system operation.
- Virtual KVM and virtual media

  iBMC provides virtual KVM and virtual media, facilitating remote maintenance.
- Web user interface (WebUI)

  iBMC provides the WebUI, helping users to rapidly set and query tasks.
- Breakdown screenshot and video

  iBMC creates screenshots and videos when the system collapses. The screenshots and videos provide clues to the cause of system breakdown.
- Screen snapshot and screen video

  iBMC offers screen snapshots and videos, which simplify routine inspections.
- Support for domain name system (DNS) and Lightweight Directory Application Protocol (LDAP)

  iBMC supports DNS and LDAP to implement domain management and directory service. This feature simplifies the server management network.
- Software dual-image backup

  iBMC provides software dual-image backup, which allows software to restart from the backup image when a failure occurs. This feature improves system security.
- Asset management

  iBMC implements asset management.
- Intelligent power management

  iBMC allows you to use power capping technology to improve deployment density and uses dynamic power saving technology to reduce OPEX.

Table 5-2 iBMC management product specifications

Item	Specifications
Core processor	Huawei Hi1710 management chip, dedicated for Huawei IT products
KVM	• Maximum resolution: 1280 x 1024 • Minimum resolution: 800 x 600
Management network port	GE management network port
Virtual media	• The virtual DVD-ROM drive supports a maximum transmission rate of 72 Mbit/s. • The virtual FDD supports a maximum transmission rate of 4 Mbit/s.
User interfaces	• HTTPS • IPMI LAN • SNMP • CLI
Security	• User management

Item	Specifications
	• Role authentication • Data encryption • Scenario-based login restriction • Account security
Intelligent power management	• Power statistics and power history line • Power capping
Fault diagnosis	• Component status monitoring and alarming • Screen snapshot and screen video • Black box • x86 system diagnosis log

6 Warranty

According to the *Huawei Warranty Policy for Servers & Storage Products*, the RH5885 V3 has a three-year warranty, the DVD-ROM drives and BBUs have a one-year warranty, and the software media has a three-month warranty. The *Warranty Policy* 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 *Warranty Policy* is country-specific. The service types, service levels, response time, and 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 representative office.

Table 6-1 describes the warranty services provided by Huawei.

Table 6-1 Warranty services

No.	Description
Help Desk	Huawei provides 24-hour after-sales technical support (such as handling requests for troubleshooting and hardware repair), receives and handles customer inquiries, complaints, and suggestions through a dedicated hotline.
Remote troubleshooting	After receiving a service request for rectifying a network or system fault, Huawei engineers will first analyze and handle the fault remotely and rectify it in the shortest possible time. There are two methods for remote troubleshooting: telephone support and remote access.
Online technical support	Huawei enterprise support website (http://enterprise.huawei.com) provides product and technical materials, such as product manuals, configuration guides, networking case study, and maintenance experience collections. Registered users can access the website and download required documents.
Licensing of software updates	To ensure that the devices operate stably, Huawei provides software patches whenever necessary.
Return for repair	Huawei provides repair or replacement services for customers within the promised time to meet customer needs

No.	Description
	for spare parts. You can return defective parts to the designated Huawei site after submitting a service request. Huawei provides a three-year warranty for parts replacement and onsite repair for the RH1288 V2 used in China. Huawei provides a 10-hour-a-day, 5-day-a-week support program. Service requests will be handled the next business day. Huawei provides a three-year warranty for parts replacement and repair for the RH1288 V2 used outside China. Huawei provides a 9-hour-a-day, 5-day-a-week support program. Service requests will be handled the next business day. Huawei delivers the repaired or new parts within 45 calendar days after receiving the defective parts.

Table 6-2 describes the warranty services provided by Huawei.

Table 6-2 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)	The response time starts from the time when Huawei technical support accepts a customer's service request to the time when the technical support contacts the customer the first time to provide remote troubleshooting services.
Online technical support			Huawei enterprise support website: available 24 hours a day, 7 days a week (00:00 to 24:00, Monday to Sunday)	None
Licensing of software updates			Huawei enterprise support website: available 24 hours a	None

Service	Response Time		Description	Remarks
			day, 7 days a week (00:00 to 24:00, Monday to Sunday)	
Return for repair	Outside China	9/5 hours, 45 calendar days shipment	Available 9 hours a day, 5 days a week (09:00 to 18:00, Monday to Friday), excluding official holidays	The repaired or replacement parts will be shipped within 45 calendar days after Huawei receives the defective parts.
	In China	10/5 hours, next business day	Available 10 hours a day, 5 days a week (08:00 to 18:00, Monday to Friday), excluding official holidays	Service requests submitted after 15:30 will be handled the next business day.

7 Certifications

Table 7-1 lists the certifications passed by the RH5885 V3 and the standards that the RH5885 V3 complies with.

Table 7-1 Certifications and standards

No.	Country/Region	Certification	Standard
1	China	RoHS	SJ/T-11363-2006 SJ/T-11364-2006 GB/T 26572-2011
2	China	China Environmental Labeling	GB/T24024:2001 idt ISO14024:1999 HJ 2507-2011
3	China	CCC	GB4943.1-2011;GB9254-2008(A);GB17625.1-2012
4	Europe	WEEE	2002/96/EC
5	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 V1.5.1:2010 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 RoHS

No.	Country/Region	Certification	Standard
			2002/95/EC REACH EC 1907/2006
6	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 EN 300 386 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
7	America	FCC	FCC CFR47 Part 15 Class A
8	Canada	IC	ICES-003 Class A
9	Australia	C-Tick	AS/NZS CISPR 22:2009+A1:2010
10	Japan	VCCI	VCCI V-3:2012
11	America	NRTL-UL	UL 60950-1,2nd Edition,2011-12-19 (Information Technology Equipment-Safety-Part 1:General Requirement) CSA C22.2 No.60950-1-07,2nd Edition,2011-12 (Information Technology Equipment-Safety-Part 1:General Requirement)
12	Canada	NRTL-UL	UL 60950-1,2nd Edition,2011-12-19 (Information Technology Equipment-Safety-Part 1:General Requirement) CSA C22.2 No.60950-1-07,2nd Edition,2011-12 (Information Technology Equipment-Safety-Part 1:General Requirement)