

# FusionServer Pro 1288H V5 Server V100R005

## User Guide

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# About This Document

## Purpose

This document describes the 1288H V5 in terms of its appearance, functions, structure, installation and removal procedures, basic configuration, OS installation methods, parts replacement, and troubleshooting.





## Intended Audience


This document is intended for:

- Enterprise administrators
- Enterprise end users

## Symbol Conventions

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

Symbol	Description
 <b>DANGER</b>	Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
 <b>WARNING</b>	Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
 <b>CAUTION</b>	Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
 <b>NOTICE</b>	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.

Symbol	Description
 NOTE	Supplements the important information in the main text. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

## Change History

Issue	Date	Description
13	2020-06-05	<ul style="list-style-type: none"> <li>This issue is the thirteenth official release.</li> </ul>
12	2020-04-20	<ul style="list-style-type: none"> <li>This issue is the twelfth official release.</li> </ul>
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10	2020-03-05	<ul style="list-style-type: none"> <li>This issue is the tenth official release.</li> </ul>
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02	2017-12-29	<ul style="list-style-type: none"> <li>Added information about the NVMe drive configuration.</li> </ul>
01	2017-08-13	<ul style="list-style-type: none"> <li>This issue is the first official release.</li> </ul>

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# Contents

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<b>About This Document.....</b>	<b>ii</b>
<b>1 Overview.....</b>	<b>1</b>
1.1 Overview.....	1
1.2 Physical Structure.....	2
1.3 Logical Structure.....	3
<b>2 Hardware Description.....</b>	<b>5</b>
2.1 Front Panel.....	5
2.1.1 Appearance.....	5
2.1.2 Indicators and Buttons.....	6
2.1.3 Ports.....	10
2.2 Rear Panel.....	11
2.2.1 Appearance.....	12
2.2.2 Indicators.....	12
2.2.3 Ports.....	14
2.3 Processor.....	17
2.4 Memory.....	18
2.4.1 Memory Identifier.....	18
2.4.2 Memory Subsystem Architecture.....	19
2.4.3 Memory Compatibility.....	20
2.4.4 Memory Installation Guidelines.....	22
2.4.5 Memory Installation Positions.....	23
2.4.6 Memory Protection Technologies.....	24
2.5 Storage.....	25
2.5.1 Drive Configurations.....	25
2.5.2 Drive Numbering.....	26
2.5.3 Drive Indicators.....	26
2.5.4 RAID Controller Card.....	28
2.6 Network.....	28
2.6.1 FlexIO Cards.....	28
2.7 I/O Expansion.....	31
2.7.1 PCIe Cards.....	32
2.7.2 PCIe Slots.....	32

2.7.3 PCIe Slot Description.....	33
2.8 PSUs.....	34
2.9 Fans.....	35
2.10 Boards.....	36
2.10.1 Mainboard.....	37
2.10.2 Drive Backplane.....	39
<b>3 Product Specifications.....</b>	<b>41</b>
3.1 Technical Specifications.....	41
3.2 Environmental Specifications.....	46
3.3 Physical Specifications.....	47
<b>4 Software and Hardware Compatibility.....</b>	<b>49</b>
<b>5 Safety Instructions.....</b>	<b>50</b>
5.1 Safety Instructions.....	50
5.2 Maintenance and Warranty.....	53
<b>6 ESD.....</b>	<b>54</b>
6.1 ESD Prevention.....	54
6.2 Grounding Methods for ESD Prevention.....	55
<b>7 Installation and Configuration.....</b>	<b>56</b>
7.1 Installation Environment Requirements.....	56
7.1.1 Space and Airflow Requirements.....	56
7.1.2 Temperature and Humidity Requirements.....	57
7.1.3 Cabinet Requirements.....	57
7.2 Hardware Installation.....	58
7.2.1 Installation Overview.....	58
7.2.2 Unpacking the Server.....	59
7.2.3 Installing Optional Parts.....	59
7.2.4 Installing Server Guide Rails.....	59
7.2.4.1 Installing L-Shaped Guide Rails.....	60
7.2.4.2 Installing the Static Rail Kit.....	62
7.2.4.3 Installing the Ball Bearing Rail Kit.....	62
7.2.5 Installing a 1288H V5.....	63
7.2.5.1 Installing the Server on L-Shaped Guide Rails or Static Rail Kit.....	63
7.2.5.2 Installing the Server on the Ball Bearing Rail Kit.....	65
7.2.6 Connecting External Cables.....	69
7.2.6.1 Cabling Guidelines.....	69
7.2.6.2 Connecting Mouse, Keyboard and VGA Cables.....	70
7.2.6.3 Connecting Network Cables.....	70
7.2.6.4 Connecting a Cable to an Optical Port.....	72
7.2.6.5 Connecting an IB Cable.....	75
7.2.6.6 Connecting a USB Device.....	78

7.2.6.7 Connecting a Serial Cable.....	78
7.2.6.8 Connecting PSU Cables.....	79
7.2.6.8.1 Connecting the AC PSU Cable.....	79
7.2.6.8.2 Connecting DC PSU Cables.....	81
7.2.6.9 Checking Cable Connections.....	82
7.3 Power-On and Power-Off.....	82
7.3.1 Power-On Procedure.....	83
7.3.2 Power-Off Procedure.....	84
7.4 Initial Configuration.....	85
7.4.1 Default Information.....	85
7.4.2 Configuration Overview.....	86
7.4.3 Changing Initial Passwords.....	87
7.4.3.1 Changing the Initial Password of the Default iBMC User.....	87
7.4.3.2 Changing the Initial U-Boot Password.....	89
7.4.4 Checking the Server.....	90
7.4.5 Setting the iBMC IP Address.....	92
7.4.6 Configuring RAID.....	93
7.4.7 Configuring the BIOS.....	93
7.4.7.1 Accessing the BIOS.....	94
7.4.7.2 Setting the System Boot Sequence.....	94
7.4.7.3 Setting PXE for a NIC.....	95
7.4.7.4 Setting the BIOS Password.....	96
7.4.7.5 Selecting a Language.....	97
7.4.7.6 Restarting the Server.....	97
7.4.8 Installing an OS.....	98
7.4.9 Upgrading the System.....	98
<b>8 Troubleshooting.....</b>	<b>100</b>
<b>9 Common Operations.....</b>	<b>101</b>
9.1 Querying the iBMC IP Address.....	101
9.2 Logging In to the iBMC WebUI.....	102
9.3 Logging In to the Desktop of a Server.....	106
9.3.1 Using the Remote Virtual Console.....	106
9.3.1.1 iBMC.....	106
9.3.2 Using the Independent Remote Console.....	109
9.3.2.1 Windows.....	109
9.3.2.2 Ubuntu.....	111
9.3.2.3 macOS.....	113
9.4 Logging In to the CLI.....	115
9.4.1 Logging In to the CLI Using PuTTY over a Network Port.....	116
9.4.2 Logging In to the CLI Using PuTTY over a Serial Port.....	118
9.5 Managing VMD.....	120
9.5.1 Enabling VMD.....	120

9.5.2 Disabling VMD.....	120
9.6 Accessing the BIOS.....	121
9.6.1 Accessing the BIOS (V3XX or Earlier).....	121
9.6.2 Accessing the BIOS (V6XX or Later).....	123
9.7 Clearing Data from a Storage Device.....	125
<b>10 More Information.....</b>	<b>128</b>
10.1 Technical Support.....	128
10.2 Product Information.....	129
10.3 Product Configuration Resources.....	130
10.4 Maintenance Tools.....	130
<b>11 Software and Configuration Utilities.....</b>	<b>132</b>
11.1 iBMC.....	132
11.2 BIOS.....	133
<b>A Appendix.....</b>	<b>134</b>
A.1 Product SN.....	134
A.2 Operating Temperature Limitations.....	135
A.3 Nameplate.....	136
A.4 RAS Features.....	137
A.5 Sensor List.....	139
<b>B Glossary.....</b>	<b>144</b>
B.1 A-E.....	144
B.2 F-J.....	145
B.3 K-O.....	145
B.4 P-T.....	145
B.5 U-Z.....	146
<b>C Acronyms and Abbreviations.....</b>	<b>147</b>
C.1 A-E.....	147
C.2 F-J.....	148
C.3 K-O.....	149
C.4 P-T.....	150
C.5 U-Z.....	152



# 1 Overview

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- [1.1 Overview](#)
- [1.2 Physical Structure](#)
- [1.3 Logical Structure](#)

## 1.1 Overview

Huawei FusionServer Pro 1288H V5 (1288H V5) is a new-generation 1U 2-socket rack server designed for Internet, Internet Data Center (IDC), cloud computing, enterprise, and telecom applications.

The 1288H V5 is ideal for IT core services, cloud computing, high-performance computing, distributed storage, big data processing, enterprise or telecom applications, and other complex workloads.

The compact and reliable 1288H V5 features low power consumption, high scalability, easy deployment, and simplified management.

### NOTE

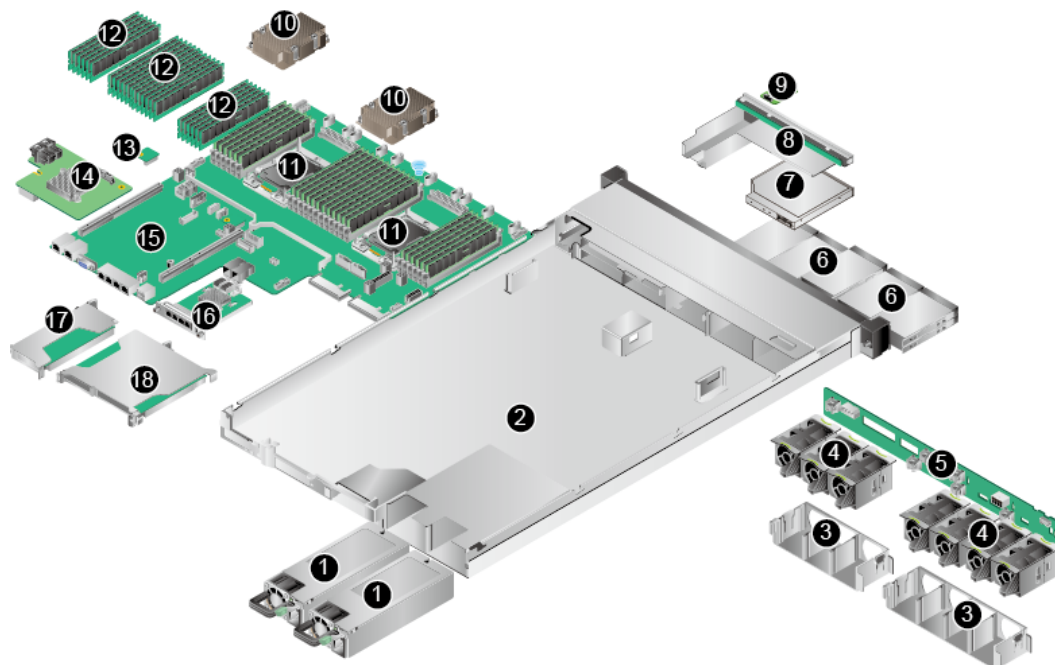
For details about the 1288H V5 nameplate information, see [A.3 Nameplate](#).

Figure 1-1 1288H V5 (with 8 drives)



## 1.2 Physical Structure

Figure 1-2 Physical structure of a 1288H V5 with 8 x 2.5" drives (example)

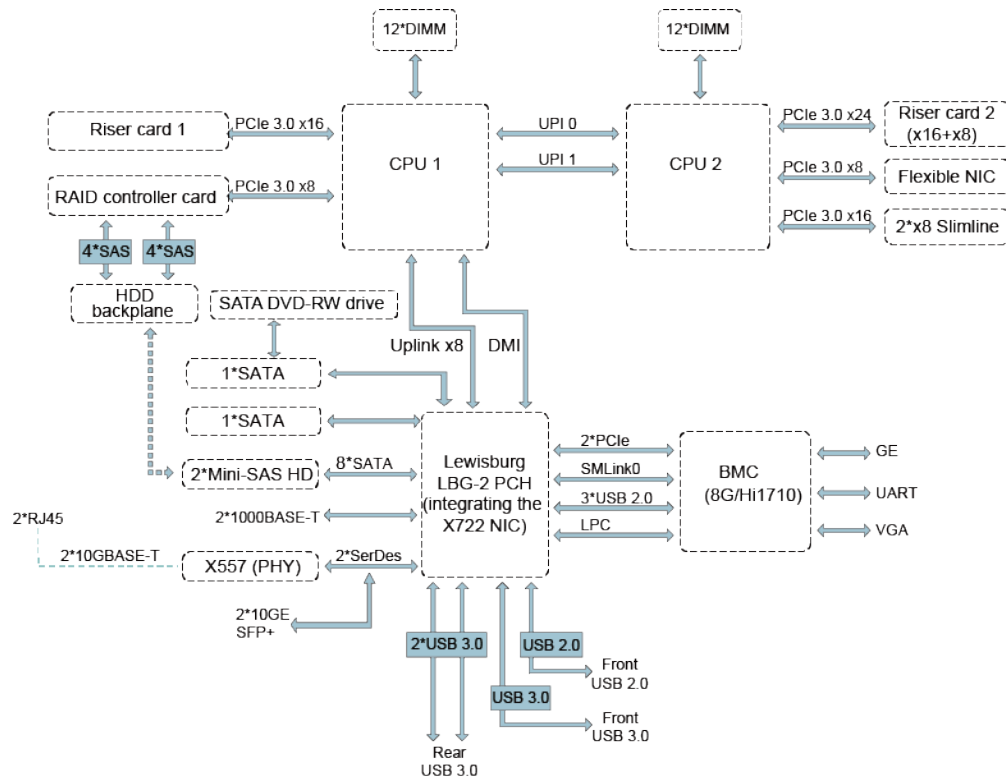


1	PSUs	2	Chassis
3	Fan module brackets	4	Fan modules
5	Front-drive backplane	6	Drives

7	DVD drive	8	Indicator board
9	VGA board	10	Heat sinks
11	Processors	12	Memory modules
13	TPM/TCM	14	Screw-in RAID controller card
15	Mainboard	16	FlexIO card
17	PCIe riser module 1	18	PCIe riser module 2

### 1.3 Logical Structure

Figure 1-3 1288H V5 logical structure



- The server supports one or two Intel® Xeon® Scalable processors.
- The server supports up to 24 memory modules.
- The CPUs (processors) interconnect with each other through two UPI links at a speed of up to 10.4 GT/s.
- Two PCIe riser cards connect to the processors through PCIe buses to provide ease of expandability and connection.
- The RAID controller card on the mainboard connects to CPU 1 through PCIe buses, and connects to the drive backplane through SAS signal cables. A variety of drive backplanes are provided to support different local storage configurations.

- The LBG-2 Platform Controller Hub (PCH) supports:
  - Two 10GE optical LOM ports or two 10GE electrical LOM ports
  - Two GE electrical LOM ports
- The server uses Hi1710 management chip and supports a video graphic array (VGA) port, a management network port, and a debug serial port.

# 2 Hardware Description

- [2.1 Front Panel](#)
- [2.2 Rear Panel](#)
- [2.3 Processor](#)
- [2.4 Memory](#)
- [2.5 Storage](#)
- [2.6 Network](#)
- [2.7 I/O Expansion](#)
- [2.8 PSUs](#)
- [2.9 Fans](#)
- [2.10 Boards](#)

## 2.1 Front Panel

### 2.1.1 Appearance

- 4 x 3.5" drive configuration

**Figure 2-1** Front view



1	Drives	2	Slide-out label plate (with an SN label)
---	--------	---	---

- 8 x 2.5" drive configuration

**Figure 2-2** Front view



1	Drives	2	(Optional) Built-in DVD drive
3	Slide-out label plate (with an SN label)	-	-

- 10 x 2.5" drive configuration

**Figure 2-3** Front view



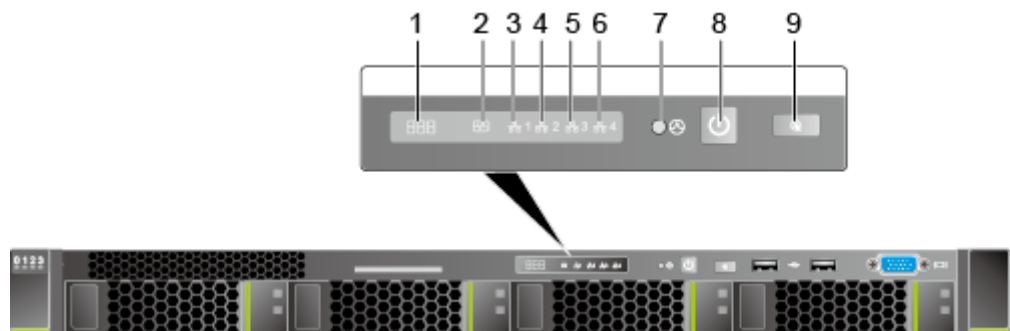
1	Drives	2	Slide-out label plate (with an SN label)
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## 2.1.2 Indicators and Buttons

### Positions

- 4 x 3.5" drive configuration

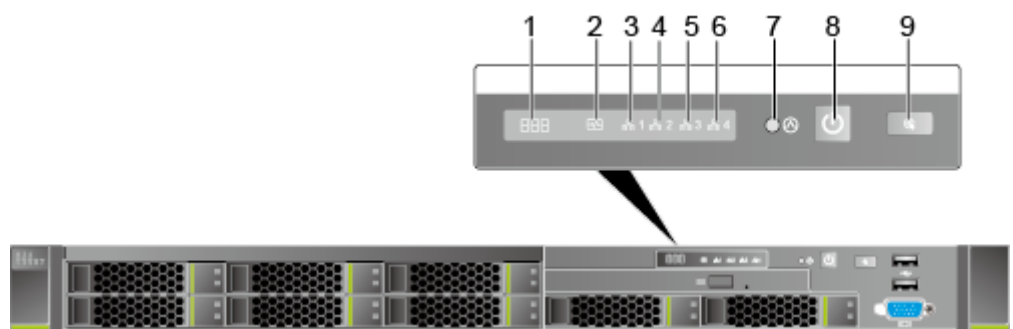
**Figure 2-4** Indicators and buttons on the front panel



1	Fault diagnosis LED	2	Health status indicator
3	LOM port 1 connection status indicator	4	LOM port 2 connection status indicator
5	LOM port 3 connection status indicator	6	LOM port 4 connection status indicator
7	Non-Maskable Interrupt (NMI) button	8	Power button/indicator
9	UID button/indicator	-	-

- 8 x 2.5" drive configuration

**Figure 2-5** Indicators and buttons on the front panel



1	Fault diagnosis LED	2	Health status indicator
3	LOM port 1 connection status indicator	4	LOM port 2 connection status indicator
5	LOM port 3 connection status indicator	6	LOM port 4 connection status indicator
7	NMI button	8	Power button/indicator
9	UID button/indicator	-	-

- 10 x 2.5" drive configuration

**Figure 2-6** Indicators and buttons on the front panel





1	Power button/indicator	2	Fault diagnosis LED
---	------------------------	---	---------------------




3	Health status indicator	4	LOM port connection status indicator
5	UID button/indicator	-	-


## Indicator and Button Description

**Table 2-1** Indicators and buttons on the front panel

Silkscreen	Indicator/ Button	Description
	Fault diagnosis LED	<ul style="list-style-type: none"> <li>• ---: The device is operating normally.</li> <li>• Fault code: A component is faulty. For details about error codes, see <a href="#">FusionServer Pro Rack Server iBMC Alarm Handling</a>.</li> </ul>
	Power button/ indicator	<p>Power indicator:</p> <ul style="list-style-type: none"> <li>• Off: The device is not powered on.</li> <li>• Steady green: The device is powered on.</li> <li>• Blinking yellow: The power button is locked. The power button is locked when the iBMC is starting.</li> <li>• Steady yellow: The device is ready to power on.</li> </ul> <p>Power button:</p> <ul style="list-style-type: none"> <li>• When the device is powered on, you can press this button to gracefully shut down the OS.</li> <li>• When the device is powered on, holding down this button for 6 seconds will forcibly power off the device.</li> <li>• When the power indicator is steady green, you can press this button to power on the device.</li> </ul>



Silkscreen	Indicator/ Button	Description
	UID button/ indicator	<p>The UID button/indicator helps identify and locate a device.</p> <p>UID indicator:</p> <ul style="list-style-type: none"> <li>• Off: The device is not being located.</li> <li>• Blinking blue: The device has been located and is distinguished from other devices that have also been located.</li> <li>• Steady blue: The device is being located.</li> </ul> <p>UID button:</p> <ul style="list-style-type: none"> <li>• You can turn on or off the UID indicator by pressing the UID button on the panel or by using the iBMC CLI or WebUI.</li> <li>• You can press this button to turn on or off the UID indicator.</li> <li>• You can press and hold down this button for 4 to 6 seconds to reset the iBMC.</li> </ul>
	Health status indicator	<ul style="list-style-type: none"> <li>• Off: The device is powered off or is faulty.</li> <li>• Blinking red at 1 Hz: A major alarm has been generated on the system.</li> <li>• Blinking red at 5 Hz: A critical alarm has been generated on the system.</li> <li>• Steady green: The device is operating properly.</li> </ul>
	NMI button	<p>A non-maskable interrupt (NMI) is generally triggered to stop the OS for debugging. To trigger an NMI, press this button or click the button on the iBMC WebUI.</p> <p><b>NOTICE</b></p> <ul style="list-style-type: none"> <li>• Press the NMI button only when the OS is abnormal. Do not press this button when the server is operating properly. An NMI does not gracefully shut down the OS and causes service interruption and data loss.</li> <li>• Before pressing the NMI button, ensure that the OS has the NMI processing program. Otherwise, the OS may crash. Exercise caution when pressing this button.</li> </ul>

Silkscreen	Indicator/ Button	Description
	LOM port connection status indicator	<p>Each indicator shows the connection status of an Ethernet LOM port.</p> <ul style="list-style-type: none"> <li>Off: The network port is not in use or has failed.</li> <li>Steady green: The network port is properly connected.</li> </ul> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>The indicators correspond to two 10GE and two GE network ports on the mainboard.</li> <li>The LOM has a standby power supply and will not be powered off even if the service system is powered off. As long as the LOM ports are properly connected to other working network devices, the network ports will remain connected and the indicators are on.</li> </ul>

## 2.1.3 Ports

### Port Positions

- 4 x 3.5" drive configuration

Figure 2-7 Ports on the front panel



1	USB 2.0 port	2	USB 3.0 port
3	VGA port	-	-

- 8 x 2.5" drive configuration

Figure 2-8 Ports on the front panel



1	USB 2.0 port	2	USB 3.0 port
3	VGA port	-	-

- 10 x 2.5" drive configuration

**Figure 2-9** Ports on the front panel



1	USB 3.0 port	-	-
---	--------------	---	---

## Port Description

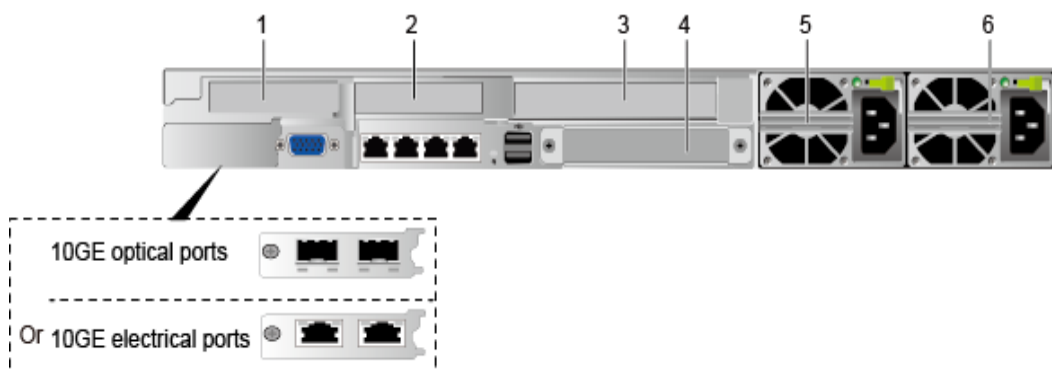
**Table 2-2** Ports on the front panel

Port	Type	Quantity <sup>Note</sup>	Description
VGA port	DB15	1	Used to connect a display terminal, such as a monitor or KVM.
USB port	USB 2.0	1	Used to connect to a USB device. <b>NOTICE</b> Before connecting an external USB device, check that the USB device functions properly. The server may operate abnormally if an abnormal USB device is connected.
	USB 3.0	1	
Note: The number of ports varies depending on server configuration. This table lists the maximum number of ports in different configurations.			

## 2.2 Rear Panel

## 2.2.1 Appearance

Figure 2-10 Rear view

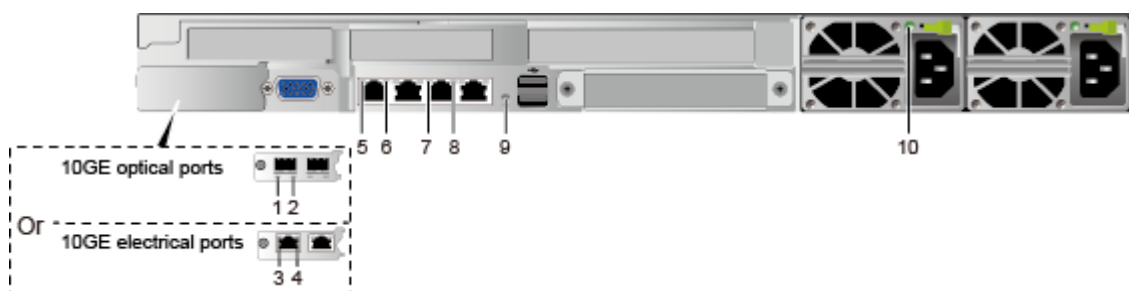


1	PCIe slot 1	2	PCIe slot 2
3	PCIe slot 3	4	(Optional) FlexIO card
5	PSU 1	6	PSU 2

## 2.2.2 Indicators

### Indicator Positions

Figure 2-11 Indicators on the rear panel



1	Connection status indicator/Data transmission status indicator for a 10GE optical port	2	Data transmission rate indicator for a 10GE optical port
3	Data transmission rate indicator for a 10GE electrical port	4	Connection status indicator/Data transmission status indicator for a 10GE electrical port

5	Data transmission status indicator for a GE electrical port	6	Connection status indicator for a GE electrical port
7	Data transmission status indicator for the management network port	8	Connection status indicator for the management network port
9	UID indicator	10	PSU indicator

## Indicator Description

**Table 2-3** Indicators on the rear panel

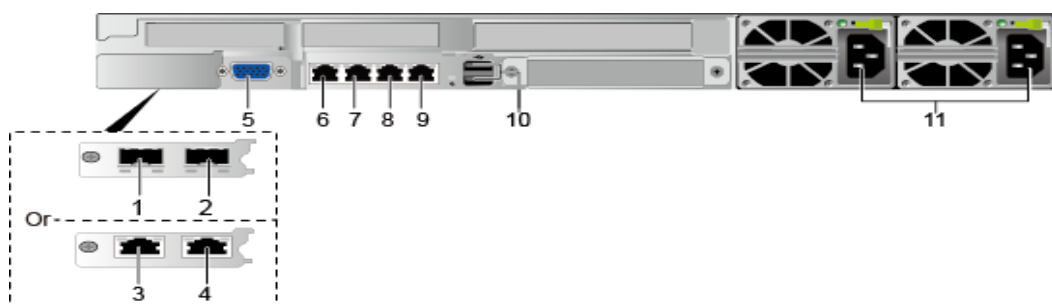
Indicator	Description
PSU indicator	<ul style="list-style-type: none"> <li>● Off: No power is supplied.</li> <li>● Blinking green at 1 Hz:                             <ul style="list-style-type: none"> <li>- The input is normal, the server is in standby state, and the PSU is in MV6 mode (output voltage is 6.7 V).</li> <li>- The input is overvoltage or undervoltage.</li> <li>- The PSU is in deep hibernation mode.</li> </ul> </li> <li>● Blinking green at 4 Hz: The firmware is being upgraded online.</li> <li>● Steady green: The power input and output are normal.</li> <li>● Steady orange: The input is normal, but no power output is supplied.</li> </ul> <p><b>NOTE</b> The possible causes of no power output are as follows:</p> <ul style="list-style-type: none"> <li>● Power supply overtemperature protection</li> <li>● Power output overcurrent or short-circuit</li> <li>● Output overvoltage</li> <li>● Short-circuit protection</li> <li>● Device failure (excluding failure of all devices)</li> </ul>
UID indicator	<p>The UID indicator helps identify and locate a device.</p> <ul style="list-style-type: none"> <li>● Off: The device is not being located.</li> <li>● Blinking blue: The device has been located and is differentiated from other devices that have also been located.</li> <li>● Steady blue: The device is being located.</li> </ul> <p><b>NOTE</b> You can turn on or off the UID indicator by pressing the UID button or remotely running a command on the iBMC CLI.</p>

Indicator	Description
Connection status indicator for a GE electrical port	<ul style="list-style-type: none"> <li>Off: The network port is not connected.</li> <li>Steady green: The network port is properly connected.</li> </ul>
Data transmission status indicator for a GE electrical port	<ul style="list-style-type: none"> <li>Off: No data is being transmitted on the port.</li> <li>Steady yellow: The network port is in active status.</li> <li>Blinking yellow: Data is being transmitted.</li> </ul>
Connection status indicator/Data transmission status indicator for a 10GE electrical port	<ul style="list-style-type: none"> <li>Off: The network port is not connected.</li> <li>Blinking green: Data is being transmitted.</li> <li>Steady green: The network port is properly connected.</li> </ul>
Data transmission rate indicator for a 10GE electrical port	<ul style="list-style-type: none"> <li>Off: The network port is not connected.</li> <li>Steady green: The data transmission rate is 10 Gbit/s.</li> <li>Steady yellow: The data transmission rate is 1 Gbit/s.</li> </ul>
Connection status indicator/Data transmission status indicator for a 10GE optical port	<ul style="list-style-type: none"> <li>Off: The network port is not connected.</li> <li>Blinking green: Data is being transmitted.</li> <li>Steady green: The network port is properly connected.</li> </ul>
Data transmission rate indicator for a 10GE optical port	<ul style="list-style-type: none"> <li>Off: The network port is not connected.</li> <li>Steady green: The data transmission rate is 10 Gbit/s.</li> <li>Steady yellow: The data transmission rate is lower than 10 Gbit/s.</li> </ul>

## 2.2.3 Ports

### Port Positions

Figure 2-12 Ports on the rear panel



1	(Optional) 10GE optical port (LOM port 1)	2	(Optional) 10GE optical port (LOM port 2)
3	(Optional) 10GE electrical port (LOM port 1)	4	(Optional) 10GE electrical port (LOM port 2)
5	VGA port	6	GE electrical port (LOM GE port 3)
7	GE electrical port (LOM GE port 4)	8	Management network port
9	Serial port	10	USB 3.0 ports
11	PSU sockets	-	-

## Port Description

**Table 2-4** Ports on the rear panel

Port	Type	Quantity	Description
(Optional) 10GE optical port	10GE SFP+	2	10GE LOM service ports (optical). Use the optical or electrical ports based on service requirements.
(Optional) 10GE electrical port	10GE BASE-T	2	10GE LOM service ports (electrical). Use the optical or electrical ports based on service requirements.
GE electrical port	1000BASE-T	2	GE LOM service ports (electrical).
VGA port	DB15	1	Used to connect a display terminal, such as a monitor or KVM.
Serial port	RJ45	1	Default operating system serial port used for debugging. You can also set it as the iBMC serial port by using the iBMC command.  <b>NOTE</b> The port uses 3-wire serial communication interface, and the default baud rate is 115,200 bit/s.

Port	Type	Quantity	Description
Management network port	1000BASE-T	1	Used for server management. <b>NOTE</b> The management network port is a GE port that supports 100 Mbit/s and 1000 Mbit/s auto-negotiation.
USB port	USB 3.0	2	Used to connect to a USB device. <b>NOTICE</b> Before connecting an external USB device, check that the USB device functions properly. The server may operate abnormally if an abnormal USB device is connected.
PSU socket	-	2	Used to connect to the power distribution unit (PDU) in the cabinet. You can select the number of power supply units (PSUs) as required. <b>NOTE</b> <ul style="list-style-type: none"> <li>When determining the quantity of PSUs, ensure that the rated power of the PSUs is greater than that of the server.</li> <li>If only one PSU is used, <b>Predicted PSU Status</b> cannot be set to <b>Active/Standby</b> on the iBMC WebUI.</li> </ul>

**Table 2-5** LOM port description

Chip Model	Port Type	Rate Negotiation Mode	Supported Rate	Rates Not Supported
X722	10GE optical port	Auto-negotiation 10000 Mbit/s (full duplex)	10000M	10/100/1000 M
	10GE electrical port	Auto-negotiation 1000 Mbit/s (full duplex)	1000M	10/100M



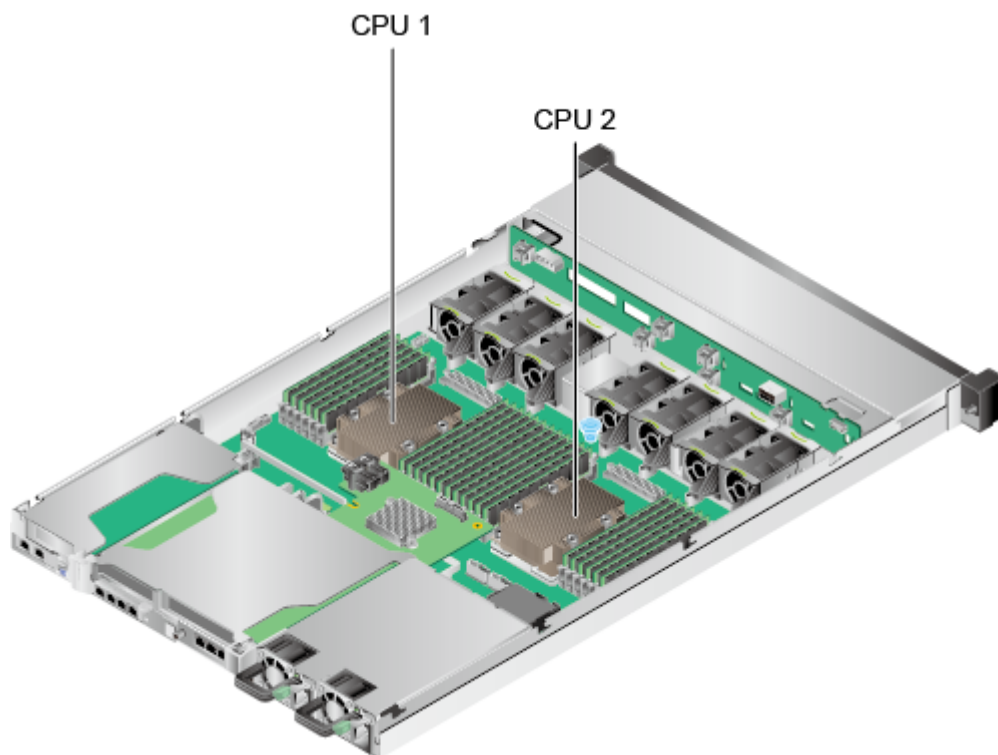
Chip Model	Port Type	Rate Negotiation Mode	Supported Rate	Rates Not Supported
		Auto-negotiation 10000 Mbit/s (full duplex)	10000M	10/100M
	GE electrical port	Auto-negotiation 1000 Mbit/s (full duplex)	1000M	10/100M

- Use [Intelligent Computing Compatibility Checker](#) to obtain information about the cables and optical modules supported by the LOM ports.
- The LOM ports support NC-SI, WOL, and PXE.
- The LOM ports do not support forced rates.
- The electrical LOM ports cannot be connected to power over Ethernet (PoE) devices (such as a switch with PoE enabled). Connecting a LOM port to a PoE device may cause link communication failure or even damage the NIC.
- The electrical LOM ports do not support SR-IOV.
- Forcibly powering off a server will cause intermittent NC-SI disconnection and disable the Wake on LAN (WOL) function of the LOM ports. To restore the NC-SI connection, refresh the iBMC WebUI.

## 2.3 Processor

- The server supports one or two processors.
- If only one processor is required, install it in socket **CPU1**.
- The same model of processors must be used in a server.
- Contact your local Huawei sales representative or use the [Intelligent Computing Compatibility Checker](#) to determine the components to be used.

**Figure 2-13** Processor positions

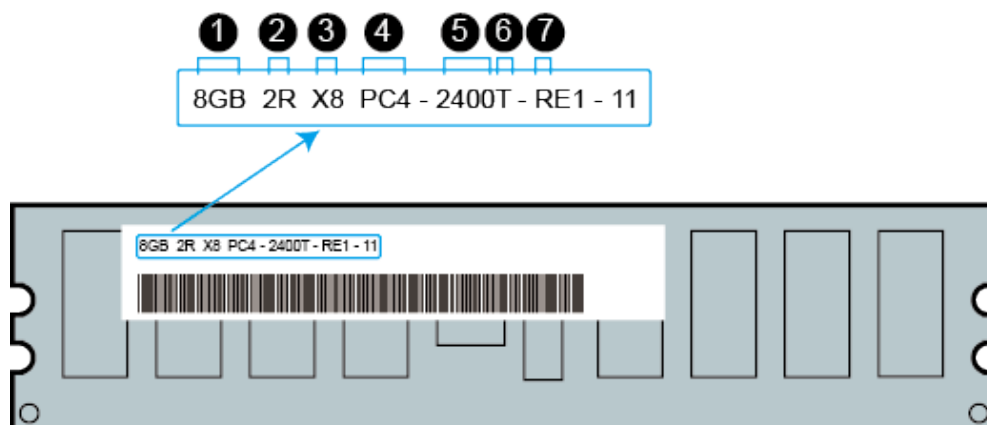


## 2.4 Memory

### 2.4.1 Memory Identifier

You can determine the memory module properties based on the label attached to the memory module.

**Figure 2-14** Memory identifier



callout	Description	Definition
1	Capacity of the memory module	<ul style="list-style-type: none"> <li>• 8 GB</li> <li>• 16 GB</li> <li>• 32 GB</li> <li>• 64 GB</li> <li>• 128 GB</li> </ul>
2	Number of ranks of the memory module	<ul style="list-style-type: none"> <li>• 1R: single-rank</li> <li>• 2R: dual-rank</li> <li>• 4R: quad-rank</li> <li>• 8R: octal-rank</li> </ul>
3	Data width on the DRAM	<ul style="list-style-type: none"> <li>• X4: 4-bit</li> <li>• X8: 8-bit</li> </ul>
4	Type of the memory interface	<ul style="list-style-type: none"> <li>• PC3: DDR3</li> <li>• PC4: DDR4</li> </ul>
5	Maximum memory speed	<ul style="list-style-type: none"> <li>• 2133 MT/S</li> <li>• 2400 MT/S</li> <li>• 2666 MT/S</li> <li>• 2933 MT/S</li> </ul>
6	Column Access Strobe (CAS) latency	<ul style="list-style-type: none"> <li>• P: 15</li> <li>• T: 17</li> </ul>
7	DIMM type	<ul style="list-style-type: none"> <li>• R: RDIMM</li> <li>• L: LRDIMM</li> </ul>

## 2.4.2 Memory Subsystem Architecture

The 1288H V5 provides 24 memory slots. Each processor integrates six memory channels.

Install DIMMs in primary memory channels first. If the primary memory channel is not populated, the DIMMs in secondary memory channels cannot be used.

**Table 2-6** Memory channels

CPU	Memory Channel	Memory Slot
CPU 1	A (primary)	DIMM000(A)
	A	DIMM001(G)
	B (primary)	DIMM010(B)
	B	DIMM011(H)

CPU	Memory Channel	Memory Slot
	C (primary)	DIMM020(C)
	C	DIMM021(I)
	D (primary)	DIMM030(D)
	D	DIMM031(J)
	E (primary)	DIMM040(E)
	E	DIMM041(K)
	F (primary)	DIMM050(F)
	F	DIMM051(L)
CPU 2	A (primary)	DIMM100(A)
	A	DIMM101(G)
	B (primary)	DIMM110(B)
	B	DIMM111(H)
	C (primary)	DIMM120(C)
	C	DIMM121(I)
	D (primary)	DIMM130(D)
	D	DIMM131(J)
	E (primary)	DIMM140(E)
	E	DIMM141(K)
	F (primary)	DIMM150(F)
	F	DIMM151(L)

## 2.4.3 Memory Compatibility

Observe the following rules when configuring DDR4 DIMMs:

---

**NOTICE**

- A server must use the same model of DDR4 DIMMs, and all the DIMMs operate at the same speed, which is the smallest value of:
    - Memory speed supported by a processor
    - Maximum operating speed of a DIMM
  - The DDR4 DIMMs of different types (RDIMM and LRDIMM) and specifications (capacity, bit width, rank, and height) cannot be used together.
  - Contact your local Huawei sales representative or use the [Intelligent Computing Compatibility Checker](#) to determine the components to be used.
- 
- The memory can be used with Intel® Xeon® Scalable Skylake and Cascade Lake processors. The maximum memory capacity supported varies depending on the processor model.
    - Skylake processors
      - M processors: 1.5 TB/socket
      - Other processors: 768 GB/socket
    - Cascade Lake processors
      - L processors: 4.5 TB/socket
      - M processors: 2 TB/socket
      - Other processors: 1 TB/socket
  - The total memory capacity is the sum of the capacity of all DDR4 DIMMs.

---

**NOTICE**

The total memory capacity cannot exceed the maximum memory capacity supported by the CPUs.

- 
- Use the [Intelligent Computing Compatibility Checker](#) to determine the capacity type of a single DIMM.
  - The maximum number of DIMMs supported by a server varies depending on the CPU type, memory type, rank quantity, and operating voltage.

** NOTE**

Each memory channel supports a maximum of 8 ranks. The number of DIMMs supported by each channel varies depending on the number of ranks supported by each channel:

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

- A memory channel supports more than eight ranks for LRDIMMs.

** NOTE**

A quad-rank LRDIMM generates the same electrical load as a single-rank RDIMM on a memory bus.

**Table 2-7** DDR4 memory specifications

Parameter		Specifications
Maximum capacity per DDR4 DIMM (GB)		128
Rated speed (MT/s)		2933
Operating voltage (V)		1.2
Maximum number of DDR4 DIMMs in a server <sup>a</sup>		24
Maximum DDR4 memory capacity of the server (GB) <sup>b</sup>		3072
Maximum operating speed (MT/s)	1DPC <sup>c</sup>	2933 <sup>d</sup>
	2DPC	2666
<ul style="list-style-type: none"> <li>• a: The maximum number of DDR4 DIMMs is based on dual-processor configuration. The value is halved for a server with only one processor.</li> <li>• b: The maximum DDR4 memory capacity varies depending on the processor type. The value listed in this table is based on the assumption that DIMMs are fully configured.</li> <li>• c: DPC (DIMM per channel) indicates the number of DIMMs per channel.</li> <li>• d: If the Cascade Lake processor is used, the maximum operating speed of a DIMM can reach 2933 MT/s. If the Skylake processor is used, the maximum operating speed of a DIMM can reach 2666 MT/s only.</li> </ul>		

## 2.4.4 Memory Installation Guidelines

- Observe the following when configuring DDR4 DIMMs:
  - Install DIMMs only when corresponding processors are installed.
  - Do not install LRDIMMs and RDIMMs in the same server.
  - Install filler DIMMs in vacant slots.
- Observe the following when configuring DDR4 DIMMs in specific operating mode:
  - Memory sparing mode
    - Comply with the general installation guidelines.
    - Each memory channel must have a valid online spare configuration.
    - The channels can have different online spare configurations.
    - Each populated channel must have a spare rank.
  - Memory mirroring mode
    - Comply with the general installation guidelines.
    - Each processor supports two integrated memory controllers (IMCs). At least two channels of each IMC are used for installing DIMMs

(channels 1 and 2, or channels 1, 2, and 3). The DIMMs installed must be identical in size and organization.

- For a multi-processor configuration, each processor must have a valid memory mirroring configuration.
- Memory scrubbing mode
  - Comply with the general installation guidelines.

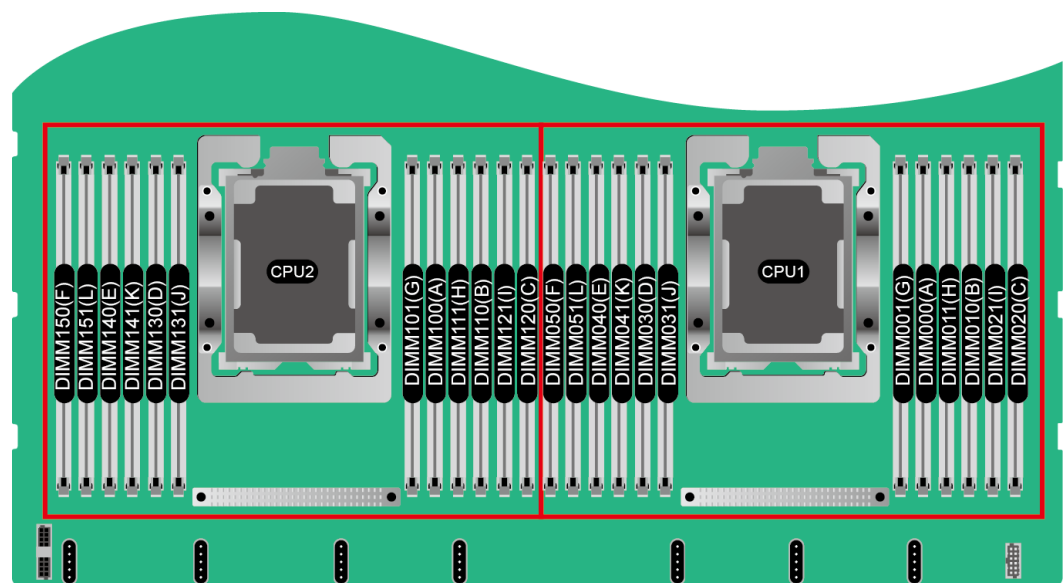
## 2.4.5 Memory Installation Positions

A 1288H V5 supports a maximum of 24 DDR4 DIMMs. To maximize the performance, balance the total memory capacity between the installed processors and load the channels similarly whenever possible.

### NOTICE

At least one DDR4 DIMM must be installed in the memory slots corresponding to CPU 1.

Figure 2-15 Memory slots



**Figure 2-16** DDR4 memory installation guidelines (1 processor)

CPU	Channel	DIMM Slot	Number of DIMMs												
			(✓: recommended ○: not recommended)												
			✓	✓	✓	✓	○	✓	○	✓	○	○	○	✓	
			1	2	3	4	5	6	7	8	9	10	11	12	
CPU 1	A	DIMM000(A)	•	•	•	•	•	•	•	•	•	•	•	•	•
		DIMM001(G)									•	•	•	•	•
	B	DIMM010(B)		•	•	•	•	•	•	•	•	•	•	•	•
		DIMM011(H)									•	•	•	•	•
	C	DIMM020(C)			•		•	•	•			•	•	•	•
		DIMM021(I)										•		•	•
	D	DIMM030(D)					•	•	•	•	•	•	•	•	•
		DIMM031(J)										•		•	•
	E	DIMM040(E)					•	•	•	•	•	•	•	•	•
		DIMM041(K)										•		•	•
	F	DIMM050(F)							•	•		•	•	•	•
		DIMM051(L)													•

**Figure 2-17** DDR4 memory installation guidelines (2 processors)

CPU	Channel	DIMM Slot	Number of DIMMs																								
			(✓: recommended ○: not recommended)																								
			○	✓	○	✓	○	✓	○	✓	○	✓	○	✓	○	✓	○	✓	○	✓	○	✓	○	✓	○	✓	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
CPU1	A	DIMM000(A)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
		DIMM001(G)																									
	B	DIMM010(B)			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
		DIMM011(H)																									
	C	DIMM020(C)					•	•																			
		DIMM021(I)																									
	D	DIMM030(D)							•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
		DIMM031(J)																									
	E	DIMM040(E)							•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
		DIMM041(K)																									
	F	DIMM050(F)																									
		DIMM051(L)																									
CPU2	A	DIMM100(A)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
		DIMM101(G)																									
	B	DIMM110(B)					•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
		DIMM111(H)																									
	C	DIMM120(C)							•	•																	
		DIMM121(I)																									
	D	DIMM130(D)									•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
		DIMM131(J)																									
	E	DIMM140(E)									•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
		DIMM141(K)																									
	F	DIMM150(F)																									
		DIMM151(L)																									

## 2.4.6 Memory Protection Technologies

The following memory protection technologies are supported:

- ECC
- Full mirroring
- Address range mirroring
- SDDC
- SDDC+1
- Rank sparing mode
- Static virtual lockstep



- Faulty DIMM isolation
- Memory thermal throttling
- Memory address parity protection
- Memory demand/patrol scrubbing
- Device tagging
- Data scrambling
- Adaptive double device data correction (ADDDC)
- ADDDC+1

## 2.5 Storage

### 2.5.1 Drive Configurations

**Table 2-8** Drive configurations

Configuration	Maximum Front Drives	Drive Management Mode
4 x 3.5" drive configuration	4 <ul style="list-style-type: none"> <li>• Slots 0 to 3 support only SAS/SATA drives.</li> </ul>	1 x RAID controller card/PCH <sup>a</sup>
8 x 2.5" drive configuration	8 <ul style="list-style-type: none"> <li>• Slots 0 to 7 support only SAS/SATA drives.</li> </ul>	1 x RAID controller card/PCH <sup>a</sup>
10 x 2.5" drive configuration 1	10 <ul style="list-style-type: none"> <li>• Slots 0 and 1 support only SAS/SATA drives.</li> <li>• Slots 2 and 3 support SAS/SATA/NVMe drives.</li> <li>• Slots 4 to 9 support only NVMe drives.</li> </ul>	1 x RAID controller card/PCH <sup>a</sup>
10 x 2.5" drive configuration 2	10 <ul style="list-style-type: none"> <li>• Slots 0 to 9 support only SAS/SATA drives.</li> </ul>	1 x RAID controller card <sup>b</sup>
10 x 2.5" drive configuration 3	10 <ul style="list-style-type: none"> <li>• Slots 0 to 5 support only SAS/SATA drives.</li> <li>• Slots 6 and 7 support SAS/SATA/NVMe drives.</li> <li>• Slots 8 and 9 support only NVMe drives.</li> </ul>	1 x RAID controller card/PCH <sup>a</sup>

Configuration	Maximum Front Drives	Drive Management Mode
<ul style="list-style-type: none"> <li>• a: A RAID controller card or PCH can be used to manage common drives. The PCH supports only SATA drives.</li> <li>• b: The drives can be managed only by the SP460C-M (Broadcom SAS3516) RAID controller card.</li> <li>• Contact your local Huawei sales representative or use the <a href="#">Intelligent Computing Compatibility Checker</a> to determine the components to be used.</li> </ul>		

## 2.5.2 Drive Numbering

- 4 x 3.5" drive configuration

Figure 2-18 Drive numbering



- 8 x 2.5" drive configuration

Figure 2-19 Drive numbering



- 10 x 2.5" drive configuration

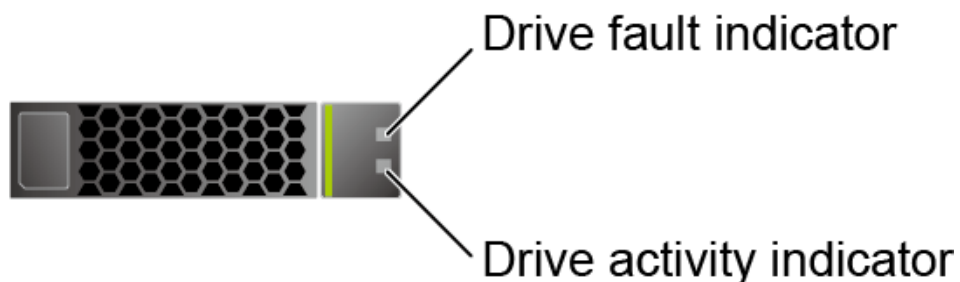
Figure 2-20 Drive numbering



## 2.5.3 Drive Indicators

### SAS/SATA Drive Indicators

Figure 2-21 SAS/SATA drive indicators

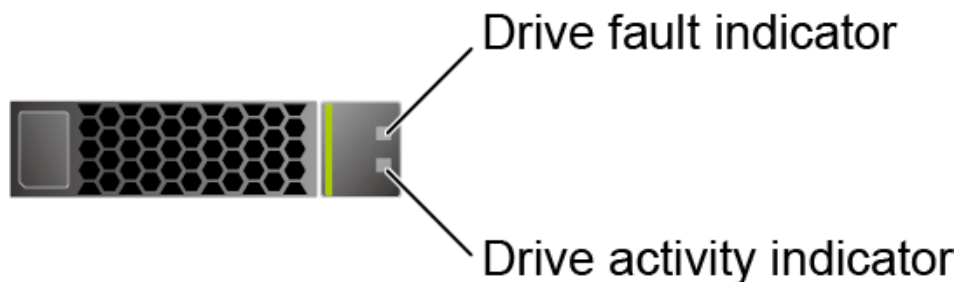


**Table 2-9** Description of SAS/SATA drive indicators

Activity Indicator (Green)	Fault Indicator (Yellow)	Description
Steady on	Off	The drive is in position.
Blinking at 4 Hz	Off	Data is being read or written normally, or data on the primary drive is being rebuilt.
Steady on	Blinking at 1 Hz	The drive is being located.
Blinking at 1 Hz	Blinking at 1 Hz	The data on the secondary drive is being rebuilt.
Off	Steady on	A member drive in the RAID array is removed.
Steady on	Steady on	The drive is faulty.

## NVMe Drive Indicators

**Figure 2-22** NVMe drive indicators



- If the VMD function is enabled and the latest VMD driver is installed, the NVMe drives support surprise hot swap.

**Table 2-10** Description of NVMe drive indicators (VMD enabled)

Activity Indicator (Green)	Fault Indicator (Yellow)	Description
Off	Off	The NVMe drive cannot be detected.
Steady on	Off	The NVMe drive is working properly.
Blinking at 2 Hz	Off	Data is being read from or written to the NVMe SSD.
Off	Blinking at 2 Hz	The NVMe drive is being located.

Activity Indicator (Green)	Fault Indicator (Yellow)	Description
Off	Blinking at 8 Hz	The data on the secondary NVMe drive is being rebuilt.
Steady on/Off	Steady on	The NVMe drive is faulty.

- If the VMD function is disabled, NVMe drives support only orderly hot swap.

**Table 2-11** NVMe drive indicators (VMD disabled)

Activity Indicator (Green)	Fault Indicator (Yellow)	Description
Off	Off	The NVMe drive cannot be detected.
Steady on	Off	The NVMe drive is working properly.
Blinking at 2 Hz	Off	Data is being read from or written to the NVMe drive.
Off	Blinking at 2 Hz	The NVMe drive is being located or hot-swapped.
Off	Blinking at 0.5 Hz	The hot removal process is complete, and the NVMe drive is removable.
Steady on/Off	Steady on	The NVMe drive is faulty.

## 2.5.4 RAID Controller Card

The RAID controller card supports RAID configuration, RAID level migration, and drive roaming.

- Contact your local Huawei sales representative or use the [Intelligent Computing Compatibility Checker](#) to determine the components to be used.
- For details about the RAID controller card, see [Huawei V5 Server RAID Controller Card User Guide](#).

## 2.6 Network

### 2.6.1 FlexIO Cards

FlexIO cards provide network expansion capabilities.

- The FlexIO card (with electrical ports) cannot be connected to power over Ethernet (PoE) devices (such as a switch with PoE enabled). Otherwise, link communication failure or even damage to the FlexIO card may be caused.

- Contact your local Huawei sales representative or use the [Intelligent Computing Compatibility Checker](#) to determine the components to be used.

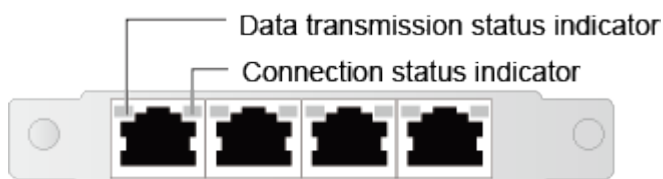
**Table 2-12** FlexIO cards supported by the 1288H V5 (example)

NIC Model	Chip Model	Port Type	Number of Ports	Support NC-SI/WOL/PXE
SM210	5719	GE electrical port	4	√
SM211	i350	GE electrical port	2	√
SM212	i350	GE electrical port	4	√
SM233	X540	10GE electrical port	2	√
SM251	CX3	56G IB optical port	2	×
SM252	CX3	56G IB optical port	1	×
SM380	CX4	25GE optical port	2	√

## Indicator Positions

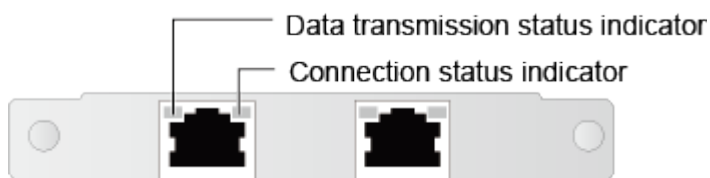
- SM210/SM212 with four GE electrical ports

**Figure 2-23** SM210/SM212 network port indicators



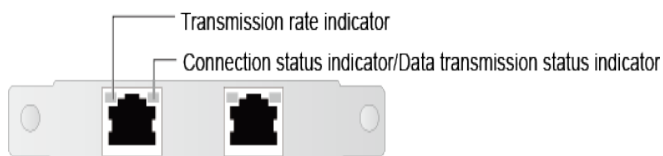
- SM211 with two GE electrical ports

**Figure 2-24** SM211 network port indicators



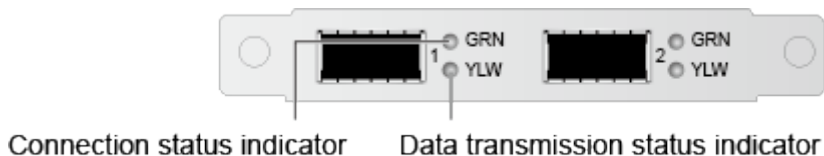
- SM233 with two 10GE electrical ports

**Figure 2-25** SM233 network port indicators



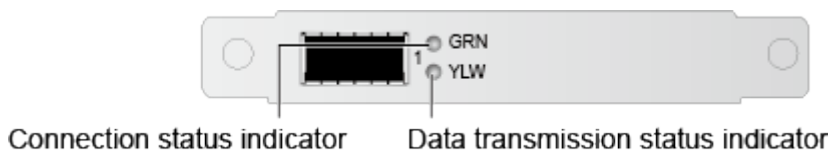
- SM251 with two 56G IB optical ports

**Figure 2-26** SM251 network port indicators



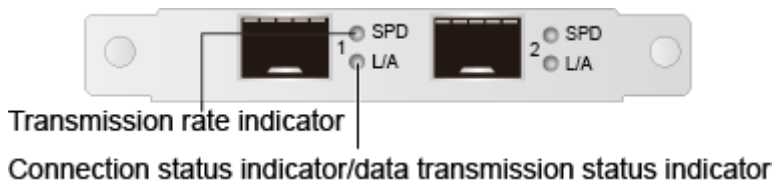
- SM252 with one 56G IB optical port

**Figure 2-27** SM252 network port indicators



- SM380 with two 25GE optical ports

**Figure 2-28** SM380 network port indicators



## Indicator Description

**Table 2-13** Description of FlexIO card indicators

Port Type	Indicator	Description
GE electrical port	Data transmission status indicator	<ul style="list-style-type: none"> <li>• Off: No data is being transmitted.</li> <li>• Blinking yellow: Data is being transmitted.</li> </ul>
	Connection status indicator	<ul style="list-style-type: none"> <li>• Off: The network port is not connected.</li> <li>• Steady green: The network port is properly connected.</li> </ul>

Port Type	Indicator	Description
10GE electrical port	Transmission rate indicator	<ul style="list-style-type: none"><li>● Off: The data transmission rate is 10/100 Mbit/s.</li><li>● Steady green: The data transmission rate is 10 Gbit/s.</li><li>● Steady yellow: The data transmission rate is 1 Gbit/s.</li></ul>
	Connection status indicator/Data transmission status indicator	<ul style="list-style-type: none"><li>● Off: No data is being transmitted or the network port is not connected.</li><li>● Blinking green: Data is being transmitted.</li><li>● Steady green: The network port is properly connected.</li></ul>
25GE optical port	Data transmission rate indicator for an optical port	<ul style="list-style-type: none"><li>● Off: The network port is not connected.</li><li>● Steady green: The data transmission rate is 25 Gbit/s.</li><li>● Steady yellow: The data transmission rate is 10 Gbit/s.</li></ul>
	Connection status indicator/Data transmission status indicator	<ul style="list-style-type: none"><li>● Off: The network port is not connected.</li><li>● Blinking green: Data is being transmitted.</li><li>● Steady green: The network port is properly connected.</li></ul>
56G IB optical port	Connection status indicator	<ul style="list-style-type: none"><li>● Off: No physical link is set up.</li><li>● Blinking green: The physical link is abnormal.</li><li>● Steady green: The physical link is normal.</li></ul>
	Data transmission status indicator	<ul style="list-style-type: none"><li>● Off: No logical link is set up.</li><li>● Blinking yellow: Data is being transmitted.</li><li>● Steady yellow: The logical link is normal but no data is being transmitted.</li></ul>

## 2.7 I/O Expansion

## 2.7.1 PCIe Cards

PCIe cards provide ease of expandability and connection.

- Contact your local Huawei sales representative or use the [Intelligent Computing Compatibility Checker](#) to determine the components to be used.

## 2.7.2 PCIe Slots

### PCIe Slots

Figure 2-29 PCIe slots



- PCIe riser module 1 provides slot 1.
- PCIe riser module 2 provides slots 2 and 3.

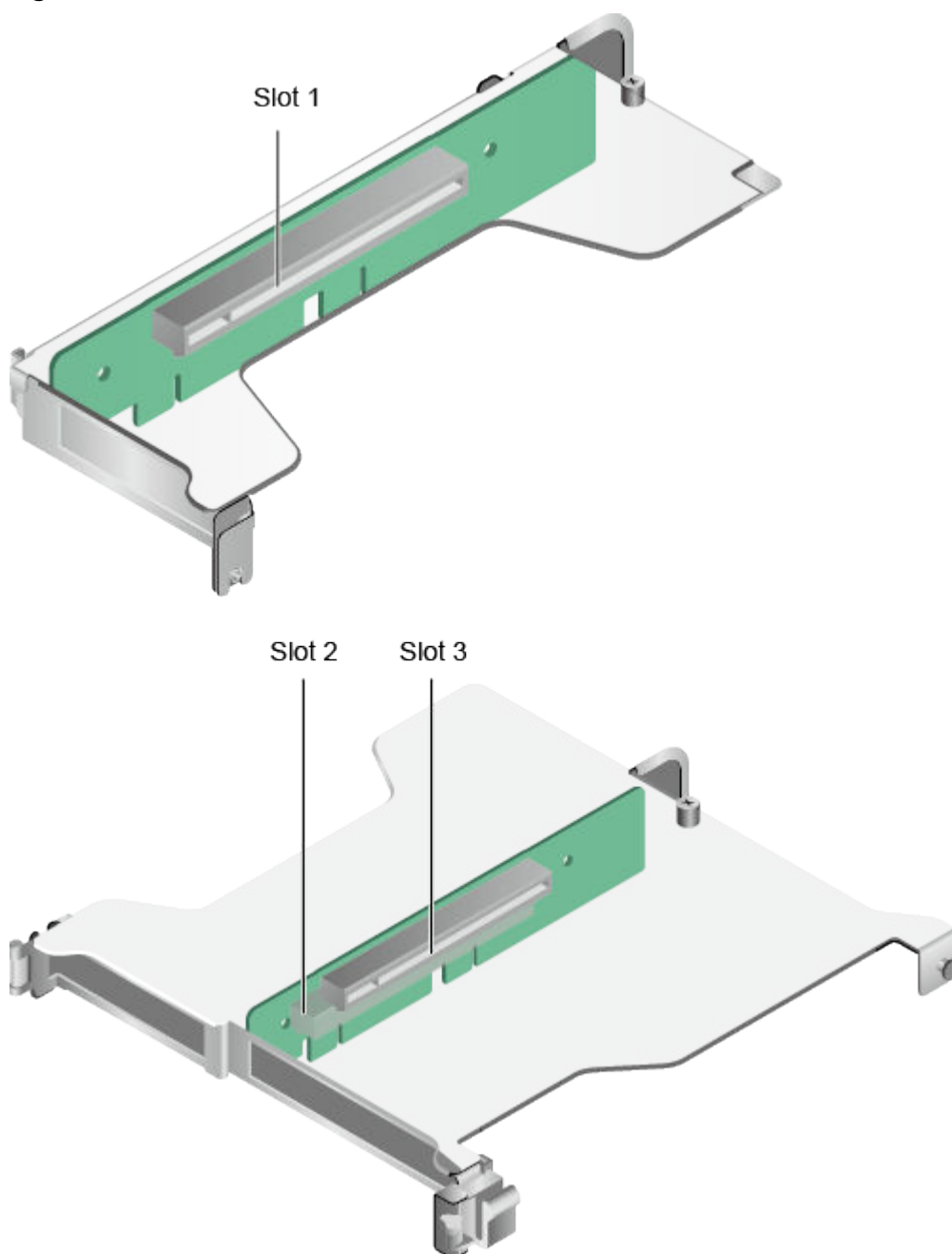
#### NOTE

- If NVMe drives are configured, slot 1 can be installed with an NVMe adapter only. No PCIe card can be installed in slot 1.
- If GPU PCIe cards are used, up to 2 HHHH single-slot GPU x16 cards can be installed in slots 1 and 2.



## PCIe Riser Modules

Figure 2-30 PCIe riser modules



### 2.7.3 PCIe Slot Description

**NOTE**

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

**Table 2-14** PCIe slot description

PCIe Slot	CPU	PCIe Standards	Connector Width	Bus Width	Port No.	Root Port (B/D/F)	Device (B/D/F)	Slot Size
RAID controller card	CPU 1	PCIe 3.0	x8	x8	Port1C	17/02/0	1D/00/0	-
LOM	CPU 1	PCIe 3.0	x8	x8	Port1A	17/00/0	1A/00/0	-
FlexIO card	CPU 2	PCIe 3.0	x8	x8	Port2A	AE/00/0	AF/00/0	-
Slot 1	CPU 1	PCIe 3.0	x16	x16	Port2A	3A/00/0	3B/00/0	HHHL
Slot 2	CPU 2	PCIe 3.0	x16	x16	Port1A	85/00/0	86/00/0	HHHL
Slot 3	CPU 2	PCIe 3.0	x16	x8	Port2C	AE/02/0	B2/00/0	FHHL

- The B/D/F (Bus/Device/Function Number) values are the default values when the server is fully configured with PCIe devices. The values may vary if the server is not fully configured with PCIe devices or if a PCIe card with a PCI bridge is configured.
- Root Port (B/D/F) indicates the B/D/F of an internal PCIe root port of the processor.
- Device (B/D/F) indicates the B/D/F (displayed on the OS) of an onboard or extended PCIe device.
- The PCIe x16 slots are backward compatible with PCIe x8, PCIe x4, and PCIe x1 cards. The PCIe cards are not forward compatible. That is, the PCIe slot width cannot be smaller than the PCIe card link width.
- The full-height half-length (FHHL) PCIe slots are backward compatible with half-height half-length (HHHL) PCIe cards.
- All slots support PCIe cards of up to 75 W. The power of a PCIe card varies depending on its model.
- The SP520, SP521, and SP522 do not support driveless server configuration. PXE boot is recommended for driveless servers.

## 2.8 PSUs

- The server supports one or two PSUs.
- The server supports AC or DC PSUs.
- The PSUs are hot-swappable.

- The server supports two PSUs in 1+1 redundancy.
- The same model of PSUs must be used in a server.
- The PSUs are protected against short circuit. Double-pole fuse is provided for the PSUs with dual input live wires.
- Contact your local Huawei sales representative or use the [Intelligent Computing Compatibility Checker](#) to determine the components to be used.

 **NOTE**

For a server configured with one or two 1500 W Platinum AC PSUs:

- When the input voltage is from 100 V AC to 132 V AC, the output power drops to 1000 W.
- Two 1500 W AC Platinum PSUs can serve as 1700 W PSUs.

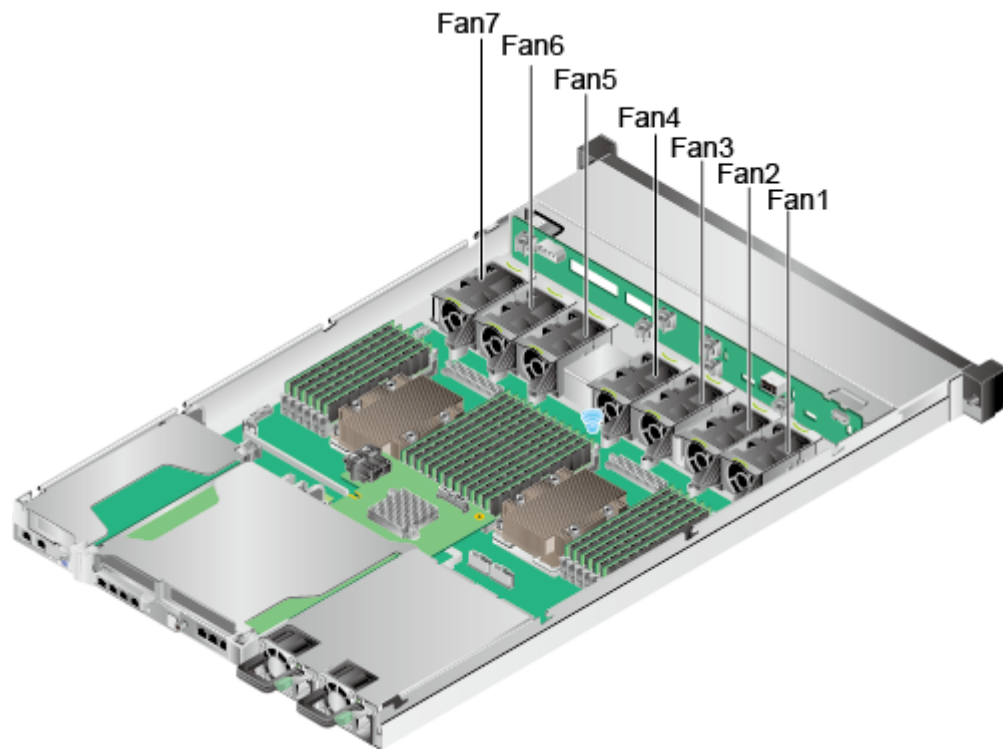
**Figure 2-31** PSU positions



## 2.9 Fans

- The server supports seven fan modules.
- The fan modules are hot-swappable.
- The server tolerates failure of a single fan.
- The fan speed can be adjusted.
- The same model of fan modules must be used in a server.

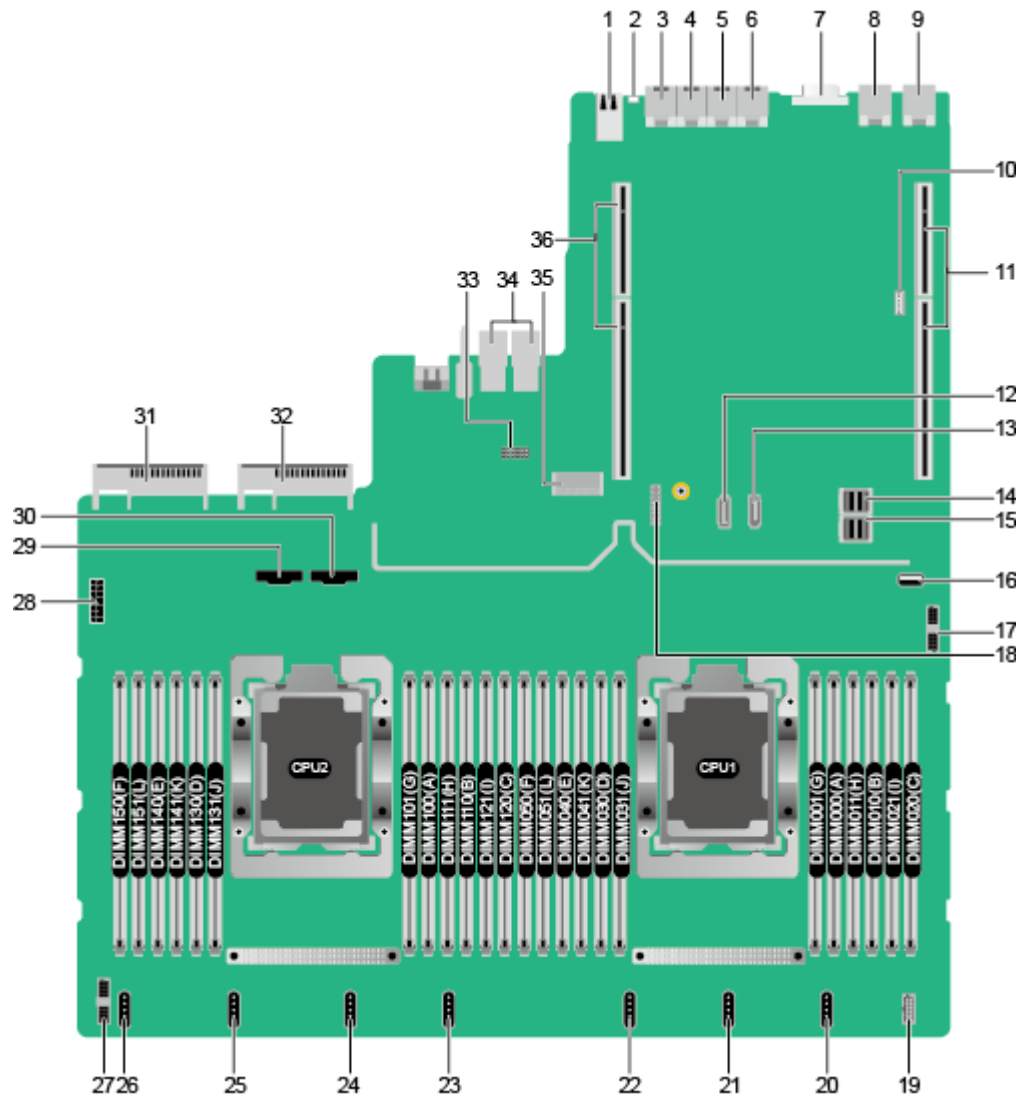
**Figure 2-32** Fan module positions



## 2.10 Boards

## 2.10.1 Mainboard

Figure 2-33 1288H V5 mainboard



1	USB 3.0 port (USB 3.0 CONN/J169)	2	UID indicator (D6020)
3	Serial port	4	Management network port
5	GE electrical port	6	GE electrical port
7	VGA connector (VGA CONN/J112)	8	10GE optical port (10GE PORT2/J132) or 10GE electrical port (10GE PORT2/J101) <sup>a</sup>

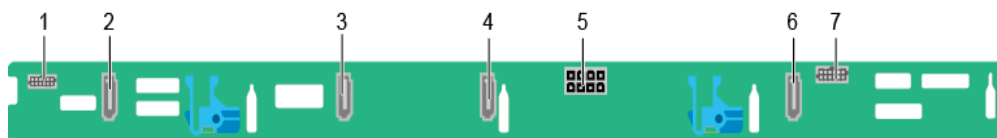
9	10GE optical port (10GE PORT1/J131) or 10GE electrical port (10GE PORT1/J100) <sup>a</sup>	10	VROC key port (J130) <sup>b</sup>
11	PCIe riser 1 slots (corresponding to CPU 1/ J108)	12	SATA signal connector 2 (SATA2/J71)
13	SATA signal connector 1 (SATA1/J67)	14	mini-SAS HD connector B (MINIHD PORT B/J84)
15	mini-SAS HD connector A (MINIHD PORT A/J86)	16	USB 3.0 port (FRONT USB3.0/J173) <sup>c</sup>
17	Front panel connector (RCIC/RCIF/RCIG BOARD/ J167)	18	TPM/TCM port (TPM CONN/J55)
19	VGA connector (VGA BOARD/J160)	20	Fan 7 connector (1U FAN7/J144)
21	Fan 6 connector (1U FAN6/J142)	22	Fan 5 connector (1U FAN5/J143)
23	Fan 4 connector (1U FAN4/J102)	24	Fan 3 connector (1U FAN3/J103)
25	Fan 2 connector (1U FAN2/J104)	26	Fan 1 connector (1U/2U FAN1/J105)
27	Drive backplane connector (HDD BP CONN/J162)	28	Drive backplane power connector 1 (HDD BP PWR1/J128)
29	CPU 2 slimline A connector (CPU2 SLIMLINE A/J140)	30	CPU 2 slimline B connector (CPU2 SLIMLINE B/J139)
31	PSU 2 connector (J157)	32	PSU 1 connector (J156)
33	Jumper (J176) <sup>d</sup>	34	I/O NIC connectors (IO BOARD/J159/J158)
35	RAID controller card connector (RAID CARD/ J48)	36	PCIe riser 2 slots (corresponding to CPU 2 / J155)

- a: "10GE optical port" corresponds to the mainboard integrated with two 10GE optical ports and two GE electrical ports. "10GE electrical port" corresponds to the mainboard integrated with two 10GE and two GE electrical ports.
- b: The port is reserved.
- c: The built-in USB 3.0 port cannot be used directly. If you want to use it, use a USB cable to connect it to the front USB 3.0 port.
- d: COM\_SW(ON) is used for changing the connection direction of the physical serial port. BMC\_RCV(ON) is used for restoring default iBMC settings.

## 2.10.2 Drive Backplane

- 4 x 3.5" drive backplane

**Figure 2-34** 4 x 3.5" drive backplane (BOM 03024NKB)



1	Backplane indicator signal cable connector (J6)	2	SATA signal connector (PORT3/J5)
3	SATA signal connector (PORT2/J4)	4	SATA signal connector (PORT1/J3)
5	Power connector (HDD POWER/J24)	6	SATA signal connector (PORT0/J2)
7	Backplane signal cable connector (HDD_BP/J1)	-	-

- 8 x 2.5" drive backplane

**Figure 2-35** 8 x 2.5" drive backplane (BOM 03024NKF)

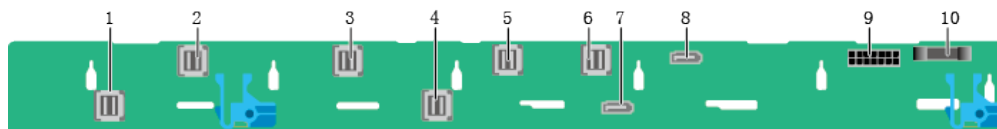


1	DVD drive connector (DVD_POWER/J11)	2	mini-SAS HD connector (PORT B/J29)
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3	Power connector (HDD POWER/J24)	4	mini-SAS HD connector (PORT A/J28)
5	Backplane signal cable connector (HDD_BP/J1)	-	-

- 10 x 2.5" drive backplane 1

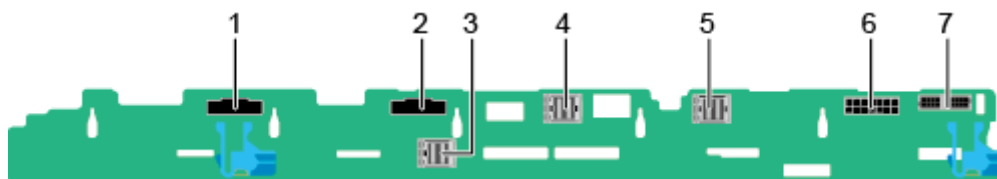
**Figure 2-36** 10 x 2.5" drive backplane 1 (BOM 03024KYL)



1	mini-SAS HD connector (PORT 3/J7)	2	mini-SAS HD connector (PORT 2/J6)
3	mini-SAS HD connector (PORT 0/J4)	4	mini-SAS HD connector (PORT 1/J5)
5	mini-SAS HD connector (PORT B/J3)	6	mini-SAS HD connector (PORT A/J2)
7	Slimline A connector (SLIM A/J8)	8	Slimline B connector (SLIM B/J9)
9	Power connector (HDD POWER/J1)	10	Backplane signal cable connector (HDD BP/J22)

- 10 x 2.5" drive backplane 2

**Figure 2-37** 10 x 2.5" drive backplane 2 (BOM 03025CYT)



1	Slimline B connector (SLIM B/J29)	2	Slimline A connector (SLIM A/J28)
3	mini-SAS HD connector (PORT C/J23)	4	mini-SAS HD connector (PORT B/J3)
5	mini-SAS HD connector (PORT A/J2)	6	Power connector (HDD POWER/J1)
7	Backplane signal cable connector (HDD BP/J22)	-	-



# 3 Product Specifications

[3.1 Technical Specifications](#)

[3.2 Environmental Specifications](#)

[3.3 Physical Specifications](#)

## 3.1 Technical Specifications

**Table 3-1** Technical specifications

Category	Specifications
Form factor	1U rack server
Chipset	Intel® C621/Intel® C622
Processors	<p>Supports one or two processors.</p> <ul style="list-style-type: none"><li>• Intel® Xeon® Scalable (Skylake and Cascade Lake) processors</li><li>• Built-in memory controller and six memory channels</li><li>• Built-in PCIe controller, supporting PCIe 3.0 and 48 lanes per processor</li><li>• Two UPI buses between processors, providing up to 10.4GT/s transmission per channel</li><li>• Up to 28 cores (2.7 GHz)</li><li>• Max. 3.8 GHz (four cores)</li><li>• Min. 1.375 MB L3 cache per core</li><li>• Max. 205 W TDP</li></ul> <p><b>NOTE</b> The preceding information is for reference only. Use the <a href="#">Intelligent Computing Compatibility Checker</a> to obtain specific information.</p>

Category	Specifications
Memory	<p>Supports 24 memory modules of the following types:</p> <ul style="list-style-type: none"><li>• Up to 24 DDR4 memory modules</li><li>• Max. 2933 MT/s memory speed</li><li>• RDIMM and LRDIMM support</li><li>• The DDR4 memory modules of different types (RDIMM and LRDIMM) and specifications (capacity, bit width, rank, and height) cannot be used together.</li></ul> <p><b>NOTE</b> The preceding information is for reference only. Use the <a href="#">Intelligent Computing Compatibility Checker</a> to obtain specific information.</p>

Category	Specifications
Storage	<p>Supports a variety of drive configurations. For details, see <a href="#">2.5.1 Drive Configurations</a>.</p> <ul style="list-style-type: none"> <li>● Supports two M.2 SSDs. <ul style="list-style-type: none"> <li>- M.2 SSDs are supported only when the server is configured with an Avago SAS3004iMR RAID controller card.</li> <li>- The drive letter of the M.2 SSDs managed by the Avago SAS3004iMR RAID controller card can be set to <b>sda</b> by modifying the GRUB parameters only when the RAID controller card is used with an SR130, SR760IT-M, SmartRAID 3152-8i, or SmartHBA 2100-8i RAID controller card or a PCH.</li> </ul> </li> </ul> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>● The M.2 SSD module is used only as the boot device when the OS is installed. Small-capacity (32 GB or 64 GB) M.2 SSDs do not support logging due to poor endurance. If a small-capacity M.2 SSD is used as the boot device, a dedicated log drive or log server is required for logging. For example, you can dump VMware logs in either of the following ways: <ul style="list-style-type: none"> <li>● Redirect <b>/scratch</b>. For details, see <a href="https://kb.vmware.com/s/article/1033696">https://kb.vmware.com/s/article/1033696</a>.</li> <li>● Configure syslog. For details, see <a href="https://kb.vmware.com/s/article/2003322">https://kb.vmware.com/s/article/2003322</a>.</li> </ul> </li> <li>● The M.2 SSD cannot be used to store data due to poor endurance. In write-intensive applications, the M.2 SSD will wear out in a short time. Use enterprise-level high endurance (HE) SSDs or HDDs for data storage.</li> <li>● The M.2 SSD is not recommended for write-intensive service software due to poor endurance.</li> <li>● Do not use the M.2 SSD as the cache.</li> </ul> <ul style="list-style-type: none"> <li>● Supports hot swap of SAS/SATA/NVMe drives. <p><b>NOTE</b> The NVMe drives support:</p> <ul style="list-style-type: none"> <li>● Surprise hot swap if the VMD function is enabled and the latest Intel VMD driver is installed.</li> <li>● Orderly hot swap if the VMD function is disabled.</li> </ul> </li> <li>● Supports a variety of RAID controller cards. Use the <a href="#">Intelligent Computing Compatibility Checker</a> to obtain information about the specific RAID controller cards supported. <ul style="list-style-type: none"> <li>- The RAID controller card supports RAID configuration, RAID level migration, and drive roaming.</li> <li>- The RAID controller card does not occupy a standard PCIe slot.</li> </ul> </li> </ul>

Category	Specifications
	<p>For details about the RAID controller card, see <a href="#">Huawei V5 Server RAID Controller Card User Guide</a>.</p> <p><b>NOTE</b> If the BIOS is in legacy mode, the 4K drive cannot be used as the boot drive.</p>
Network	<p>Supports expansion capability of multiple types of networks.</p> <ul style="list-style-type: none"> <li>● LOM <ul style="list-style-type: none"> <li>- Supports two 10GE optical ports and two GE electrical ports via the NIC chip integrated on the mainboard.</li> <li>- Supports two 10GE electrical ports and two GE electrical ports via the NIC chip integrated on the mainboard.</li> <li>- The LOM ports support NC-SI, WOL, and PXE.</li> </ul> </li> <li>● FlexIO card <ul style="list-style-type: none"> <li>- Supports on-demand configuration.</li> <li>- Supports a variety of FlexIO cards. Use the <a href="#">Intelligent Computing Compatibility Checker</a> to obtain information about the specific FlexIO cards supported.</li> </ul> </li> </ul> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>● The electrical ports provided by NICs and FlexIO cards cannot be connected to PoE devices (such as a switch with PoE enabled). Connecting such a port to a PoE device may cause link communication failure or even damage the NIC.</li> <li>● Forcibly powering off a server will cause intermittent NC-SI disconnection and disable the WOL function of the LOM ports. To restore the NC-SI connection, refresh the iBMC WebUI.</li> </ul>
I/O expansion	<p>5 PCIe 3.0 slots:</p> <ul style="list-style-type: none"> <li>● One slot dedicated for a RAID controller card, one dedicated for a FlexIO card, and three for standard PCIe cards. For details, see <a href="#">2.7.2 PCIe Slots</a> and <a href="#">2.7.3 PCIe Slot Description</a>.</li> <li>● Support Huawei proprietary PCIe SSD cards to bolster I/O performance for applications such as searching, caching, and download services.</li> <li>● Supports GPU cards.</li> </ul> <p><b>NOTE</b> The preceding information is for reference only. Use the <a href="#">Intelligent Computing Compatibility Checker</a> to obtain specific information.</p>

Category	Specifications
Ports	<p>Supports a variety of ports.</p> <ul style="list-style-type: none"> <li>● Ports on the front panel: <ul style="list-style-type: none"> <li>- One USB 2.0 port</li> <li>- One USB 3.0 port</li> <li>- One DB15 VGA port</li> </ul> </li> </ul> <p><b>NOTE</b> For the server that uses 10 x 2.5" drive configuration, the front panel provides only one USB 3.0 port.</p> <ul style="list-style-type: none"> <li>● Ports on the rear panel: <ul style="list-style-type: none"> <li>- Two USB 3.0 ports</li> <li>- One DB15 VGA port</li> <li>- One RJ45 serial port</li> <li>- One RJ45 system management port</li> <li>- Two GE electrical ports</li> <li>- Two 10GE electrical ports or 10GE optical ports</li> </ul> </li> <li>● Built-in ports: <ul style="list-style-type: none"> <li>- Two SATA ports</li> </ul> </li> </ul> <p><b>NOTE</b> You are not advised to install the operating system on a USB flash drive.</p>
Video card	<p>An SM750 video chip with 32 MB display memory is integrated on the mainboard. The maximum display resolution is 1920 x 1200 at 60 Hz with 16 M colors.</p> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>● The integrated video card can provide the maximum display resolution (1920 x 1200) only after the video card driver matching the operating system version is installed. Otherwise, only the default resolution supported by the operating system is provided.</li> <li>● If the chassis provides the front and rear VGA ports but only one VGA port is connected to a monitor, the display effect may be affected.</li> </ul>
System management	<ul style="list-style-type: none"> <li>● UEFI</li> <li>● iBMC</li> <li>● NC-SI</li> <li>● Integration with third-party management systems</li> </ul>
Security features	<ul style="list-style-type: none"> <li>● Power-on password</li> <li>● Administrator password</li> <li>● TCM (only in China)/TPM</li> <li>● Secure boot</li> <li>● Front bezel (optional)</li> </ul>

## 3.2 Environmental Specifications

**Table 3-2** Environmental specifications

Category	Specifications
Temperature	<ul style="list-style-type: none"> <li>Operating temperature: 5°C to 45°C (41°F to 113°F) (ASHRAE Classes A2 to A4 compliant)</li> <li>Storage temperature (≤ 72 hours): -40°C to +65°C (-40°F to +149°F)</li> <li>Long-term storage temperature (&gt; 72 hours): 21°C to 27°C (69.8°F to 80.6°F)</li> <li>Maximum temperature change rate: 20°C/h (36°F/h)</li> </ul> <p><b>NOTE</b> The highest operating temperature varies depending on the server configuration. For details, see <a href="#">A.2 Operating Temperature Limitations</a>.</p>
Relative humidity (RH, non-condensing)	<ul style="list-style-type: none"> <li>Operating humidity: 8% to 90%</li> <li>Storage humidity (≤ 72 hours): 5% to 95%</li> <li>Long-term storage humidity (&gt; 72 hours): 30% to 69%</li> <li>Maximum change rate: 20%/h</li> </ul>
Air volume	≥ 96 cubic feet per minute (CFM)
Altitude	<ul style="list-style-type: none"> <li>Operating altitude ≤ 3050 m (10006.44 ft) <ul style="list-style-type: none"> <li>If the server complies with ASHRAE Class A2, the maximum operating temperature decreases by 1°C (1.8°F) for every increase of 300 m (984.25 ft) in altitude above 900 m (2952.76 ft).</li> <li>If the server complies with ASHRAE Class A3, the maximum operating temperature decreases by 1°C (1.8°F) for every increase of 175 m (574.15 ft) in altitude above 900 m (2952.76 ft).</li> <li>If the server complies with ASHRAE Class A4, the maximum operating temperature decreases by 1°C (1.8°F) for every increase of 125 m (410.10 ft) in altitude above 900 m (2952.76 ft).</li> </ul> </li> <li>HDDs cannot be used at an altitude of over 3000 m (9842.4 ft).</li> </ul>
Corrosive gaseous contaminant	<p>Maximum corrosion product thickness growth rate:</p> <ul style="list-style-type: none"> <li>Copper corrosion rate test: 300 Å/month (meeting level G1 requirements of the ANSI/ISA-71.04-2013 standard on gaseous corrosion)</li> <li>Silver corrosion rate test: 200 Å/month</li> </ul>

Category	Specifications
Particle contaminant	<ul style="list-style-type: none"> <li>The equipment room environment meets the requirements of ISO 14664-1 Class 8.</li> <li>There is no explosive, conductive, magnetic, or corrosive dust in the equipment room.</li> </ul> <p><b>NOTE</b> It is recommended that the particulate pollution in the equipment room be monitored by a professional agency.</p>
Acoustic noise	<p>The declared A-weighted sound power levels (LWAd) and declared average bystander position A-weighted sound pressure levels (LpAm) listed are measured at 23°C (73.4°F) in accordance with ISO 7779 (ECMA 74) and reported in accordance with ISO 9296 (ECMA 109).</p> <ul style="list-style-type: none"> <li>Idle: <ul style="list-style-type: none"> <li>LWAd: 5.92 Bels</li> <li>LpAm: 42.3 dBA</li> </ul> </li> <li>Operating: <ul style="list-style-type: none"> <li>LWAd: 6.14 Bels</li> <li>LpAm: 46.3 dBA</li> </ul> </li> </ul> <p><b>NOTE</b> The noise generated during operation varies depending on the server configuration, load, and ambient temperature.</p>

### 3.3 Physical Specifications

Table 3-3 Physical specifications

Category	Description
Dimensions (H x W x D)	<ul style="list-style-type: none"> <li>Chassis with 3.5" drives: 43 mm x 436 mm x 748 mm (1.69 in. x 17.17 in. x 29.45 in.)</li> <li>Chassis with 2.5" drives: 43 mm x 436 mm x 708 mm (1.69 in. x 17.17 in. x 27.87 in.)</li> </ul>

Category	Description
Installation space	<ul style="list-style-type: none"> <li>● Requirements for cabinet installation: Cabinet compliant with the International Electrotechnical Commission (IEC) 297 standard                             <ul style="list-style-type: none"> <li>- Cabinet width: 482.6 mm (19 in.)</li> <li>- Cabinet depth ≥ 1000 mm (39.37 in.)</li> </ul> </li> <li>● Requirements for guide rail installation:                             <ul style="list-style-type: none"> <li>- L-shaped guide rails: apply only to Huawei cabinets.</li> <li>- Static rail kit: applies to cabinets with a distance of 543.5 mm to 848.5 mm (21.40 in. to 33.41 in.) between the front and rear mounting bars.</li> <li>- Ball bearing rail kit: applies to cabinets with a distance of 610 mm to 914 mm (24.02 in. to 35.98 in.) between the front and rear mounting bars.</li> </ul> </li> </ul>
Weight in full configuration	<ul style="list-style-type: none"> <li>● Maximum net weight:                             <ul style="list-style-type: none"> <li>- Server with 8 x 2.5" drives: 17.3 kg (38.15 lb)</li> <li>- Server with 4 x 3.5" drives: 18.4 kg (40.57 lb)</li> <li>- Server with 10 x 2.5" drives: 17.8 kg (39.25 lb)</li> </ul> </li> <li>● Packaging materials: 5 kg (11.03 lb)</li> </ul>
Power consumption	<p>The power consumption parameters vary with hardware configurations (including the configurations complying with EU ErP). Use the <a href="#">Intelligent Computing Product Power Calculator</a> to obtain specific information.</p>



# 4 Software and Hardware Compatibility

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Use the [Intelligent Computing Compatibility Checker](#) to obtain information about the operating systems and hardware supported.

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## NOTICE

Do not use incompatible components. Otherwise, the server may fail to work properly. The technical support and warranty do not cover faults caused by incompatible components.

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# 5 Safety Instructions

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[5.1 Safety Instructions](#)

[5.2 Maintenance and Warranty](#)

## 5.1 Safety Instructions

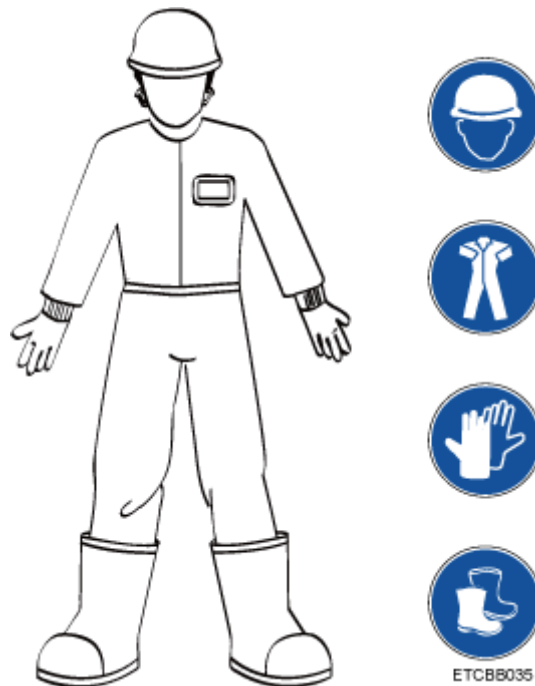
### General Instructions

- Comply with all local laws and regulations when installing the hardware. The safety instructions in this document are only supplemental to local laws and regulations.
- The "DANGER", "WARNING", and "CAUTION" information in this document does not represent all the safety instructions, but supplements to the safety instructions.
- To ensure safety when installing hardware, follow all safety instructions provided on the device labels and in this document.
- Only qualified personnel are allowed to perform special tasks, such as performing high-voltage operations and driving a forklift.
- Take protective measures if a Class A product is used in residential areas as it is likely to cause radio interference.

### Personal Safety

- Only personnel certified or authorized by Huawei are allowed to install the hardware.
- Stop any operation that may cause personal injury or equipment damage, report the problem to a project supervisor immediately, and take protective measures.
- Do not operate the product or handle cables during thunderstorms.
- Before carrying devices, note the following points:
  - Do not carry more weight than is permitted by local laws or regulations.
  - Ensure that there are enough people to carry the devices.
- Wear clean protective gloves, ESD clothing, a protective hat, and protective shoes, as shown in [Figure 5-1](#).

**Figure 5-1** Protective clothing



- Before touching a device, ensure that you are wearing ESD clothing and ESD gloves (or wrist strap), and remove any conductive objects (such as watches and jewelry). **Figure 5-2** shows conductive objects that must be removed before you touch a device.

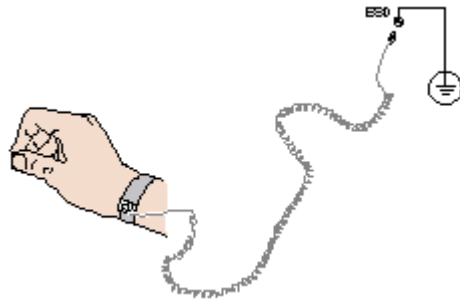
**Figure 5-2** Conductive objects to be removed



**Figure 5-3** shows how to wear an ESD wrist strap.

- Secure the ESD wrist strap around your wrist.
- Fasten the strap buckle and ensure that the ESD wrist strap is in contact with your skin.
- Insert the ground terminal attached to the ESD wrist strap into the jack on the grounded rack or chassis.

**Figure 5-3** Wearing an ESD wrist strap



- Exercise caution when using tools that could cause personal injury.
- If the installation position of the device is above shoulder height, use a stacker to lift it. This will prevent it from falling.
- To prevent electric shock, do not touch high-voltage cables directly or indirectly. A high-voltage power supply may be powering the device.
- Properly ground a device before powering it on.
- Do not use a ladder alone. Have someone else hold the ladder steady to prevent accidents.
- To avoid damaging your eyes when installing, testing, or replacing optical cables, do not look into optical ports without eye protection.

## Equipment Safety

- Use the recommended power cables at all times.
- Always use the power cables delivered with the devices.
- Wear ESD clothing and gloves before handling a device. This prevents electrostatic damage.
- When moving a device, hold the bottom of the device. Do not hold the handles of the installed modules, such as the PSUs, fan modules, drives, and the mainboard. Handle the equipment with care.
- Exercise caution when using tools that could cause personal injury.
- If the device is configured with active and standby PSUs, connect power cables of active and standby PSUs to different power distribution units (PDUs) to ensure reliable system operating.
- Properly ground a device before powering it on.

## Transportation Precautions

Improper transportation may damage equipment. Contact the manufacturer for precautions before attempting transportation.

Exercise caution when transporting equipment.

- The logistics company engaged to transport the equipment must be reliable and comply with international standards for transporting electronics. Ensure that the equipment being transported is always upright. Take necessary precautions to prevent collisions, corrosion, package damage, damp conditions and pollution.
- Transport the equipment in its original packaging.

- If the original packaging is unavailable, package heavy, bulky parts (such as chassis and blades) and fragile parts (such as PCIe GPUs and SSDs) separately.

 **NOTE**

Use [Intelligent Computing Compatibility Checker](#) to obtain information about the components supported by a node or server.

- Ensure that all devices are powered off before transportation.

## Limits for the Maximum Weight Carried Per Person

 **CAUTION**

To reduce the risk of personal injury, comply with local regulations with regard to the maximum weight one person is permitted to carry.

**Table 5-1** lists the maximum weight one person is permitted to carry as stipulated by a number of organizations.

**Table 5-1** Maximum weight one person is permitted to carry

Organization	Weight (kg/lb)
European Committee for Standardization (CEN)	25/55.13
International Organization for Standardization (ISO)	25/55.13
National Institute for Occupational Safety and Health (NIOSH)	23/50.72
Health and Safety Executive (HSE)	25/55.13
General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China (AQSIQ)	<ul style="list-style-type: none"> <li>• Men: 15/33.08</li> <li>• Women: 10/22.05</li> </ul>

For more information about security instructions, see the [Huawei Server Safety Information](#).

## 5.2 Maintenance and Warranty

For details about the maintenance and warranty, see [Maintenance & Warranty](#).

# 6 ESD

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## [6.1 ESD Prevention](#)

### [6.2 Grounding Methods for ESD Prevention](#)

## 6.1 ESD Prevention

The static electricity released by the human body or conductors may damage the mainboard or other electrostatic-sensitive devices. The damage caused by static electricity will shorten the service time of the devices.

To prevent electrostatic damage, observe the following:

- Use the ESD floor (or ESD mat) and ESD chairs in the equipment room. Use ESD materials for partition boards, screens, and curtains in the equipment room.
- All floor-standing electric devices, metal frames, and metal rack shells in the equipment room must be directly grounded. All electric meters or tools on a workbench must be connected to the common ground point of the workbench.
- Monitor the temperature and humidity in the equipment room. The heating system may reduce the humidity and increases static electricity indoors.
- Place the product in an ESD bag to avoid direct contact during transportation and storage.
- Before transporting electrostatic-sensitive components to a work area that is not affected by static electricity, store them in their original packages.
- Place the component on a grounded surface and then take it out of the package.
- Before installing or removing a server component, wear an ESD wrist strap that is properly grounded.
- During parts replacement, keep new components in ESD bags before installation, and place removed components on conductive mats for temporary storage.
- Do not touch pins, wires, or circuits.

## 6.2 Grounding Methods for ESD Prevention

Use one or more of the following grounding methods when handling or installing electrostatic-sensitive devices:

- Use an ESD wrist strap that connects to a grounded work area or computer chassis through a ground cable. The wrist strap must be scalable, and the resistance of the ground cable must be at least 1 megohm ( $\pm 10\%$ ). For grounding purposes, wear the wrist strap tightly against your skin.
- Use a heel-grounded, toe-grounded, or shoe-grounded ESD strap when working in a standing position. When standing on a conductive floor or electrostatic dissipative floor mat, tie a strap on your feet.
- Use conductive maintenance tools.
- Use a folding tool mat that dissipates static electricity and a portable field service kit.

# 7 Installation and Configuration

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[7.1 Installation Environment Requirements](#)

[7.2 Hardware Installation](#)

[7.3 Power-On and Power-Off](#)

[7.4 Initial Configuration](#)

## 7.1 Installation Environment Requirements

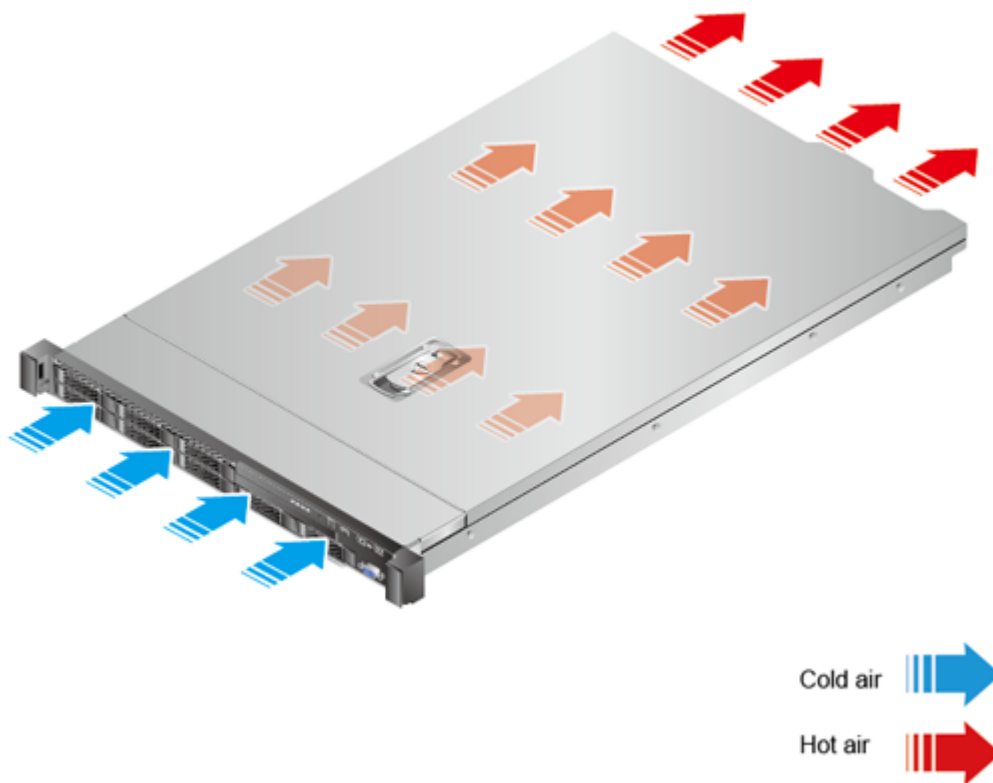
### 7.1.1 Space and Airflow Requirements

To allow for servicing and adequate airflow, observe the following space and airflow requirements:

- Install the server in an access-restricted area.
- Keep the area in which the server is located clean and tidy.
- To facilitate heat dissipation and maintenance, keep a clearance of 800 mm (31.50 in.) between walls and the front and rear doors of the cabinet.
- Do not block the air intake vents. Otherwise, air intaking and heat dissipation will be affected.
- The air conditioning system in the equipment room provides enough wind to ensure proper heat dissipation of all components.



**Figure 7-1** Direction of heat dissipation



## 7.1.2 Temperature and Humidity Requirements

To ensure continued safe and reliable equipment operation, install or position the system in a well-ventilated, climate-controlled environment.

- Use temperature control devices all year long in any climates.
- In dry and humid areas, maintain ambient humidity within range with humidifiers and dehumidifiers respectively.

**Table 7-1** Temperature and humidity requirements in the equipment room

Item	Description
Temperature	5°C to 35°C (41°F to 95°F)
Humidity	8% RH to 90% RH (non-condensing)

## 7.1.3 Cabinet Requirements

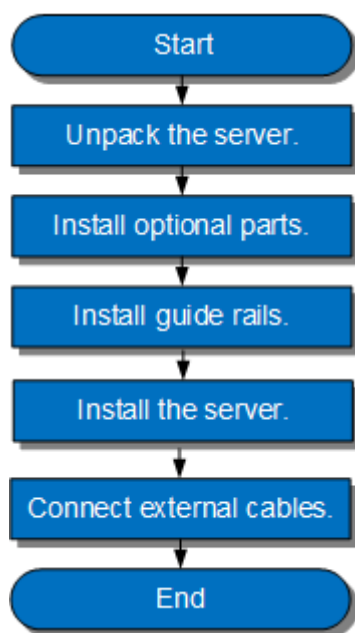
- A general 19-inch cabinet with a depth of more than 1000 mm (39.37 in.) which complies with the International Electrotechnical Commission 297 (IEC 297) standard.
- Air filters installed on cabinet doors.

## 7.2 Hardware Installation

### 7.2.1 Installation Overview

#### Installation Process

Figure 7-2 Installation process



#### Precautions

- Properly ground the server before installation to avoid damage to electronic components from electrostatic discharge. Improper grounding may cause electrostatic discharge.  
For details about how to prevent electrostatic discharge, see [6.1 ESD Prevention](#).
- Before installing multiple components, read the installation instructions for all the components and identify similar actions to simplify the installation process.  
Use the [Intelligent Computing Compatibility Checker](#) to obtain information about the components supported.

---

**⚠ CAUTION**

Wait until overheating devices have cooled down before touching them to avoid injury.

---

## 7.2.2 Unpacking the Server

### Procedure

**Step 1** Check whether the packing case and seals are in good conditions.

 **NOTE**

If the packing case is soaked or deformed, or the seals or pressure-sensitive adhesive tapes are not intact, fill in the Cargo Problem Feedback Form.

**Step 2** Use a box cutter to open the packing case.

 **CAUTION**

Exercise caution with the box cutter to avoid injury to your hands or damage to devices.

**Step 3** Unpack the packing case.

**Step 4** Ensure that the components are complete and in good condition without defects such as oxidation, chemical corrosion, missing components, or other damage incurred during transport.

**Table 7-2** Packing list

No.	Description
1	(Optional) Documentation bag containing a warranty card and quick start guide
2	Server guide rails
3	One rack server

----End

## 7.2.3 Installing Optional Parts

Before installing and configuring a server, you need to install all optional parts required, such as extra CPUs, drives, and PCIe cards.

### Procedure

**Step 1** Install the optional parts for the 1288H V5.

For details, see [FusionServer Pro 1288H V5 Server V100R005 Maintenance and Service Guide](#).

----End

## 7.2.4 Installing Server Guide Rails

### 7.2.4.1 Installing L-Shaped Guide Rails

L-shaped guide rails are designed for Huawei cabinets only.

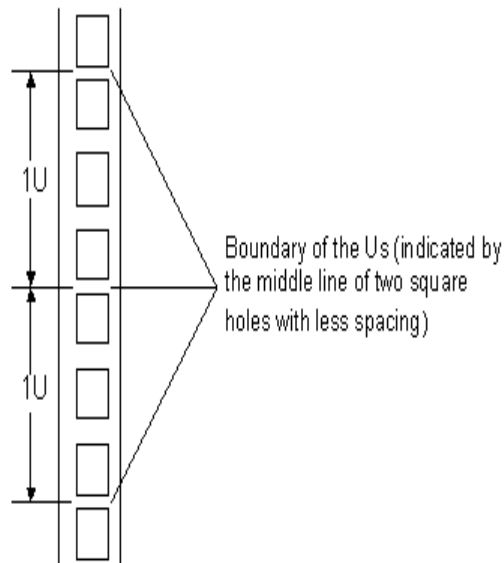
The 1288H V5 servers are not stackable onto L-shaped guide rails.

#### Procedure

##### Step 1 Install floating nuts.

1. Determine the installation positions of the floating nuts according to the cabinet device installation plan.

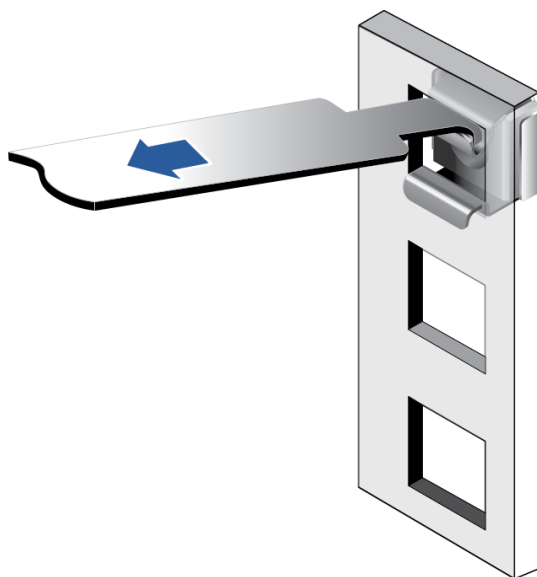
**Figure 7-3** Spacing of 1U on a mounting bar of a cabinet



#### NOTE

- Floating nuts are used to tighten screws.
  - The boundary between Us is used as the reference for calculating device installation space.
2. Fasten the lower end of a floating nut to the target square hole in a mounting bar at the front of the cabinet.
  3. Use a floating nut hook to pull the upper end of the floating nut, and fasten it to the upper edge of the square hole.

**Figure 7-4** Installing a floating nut

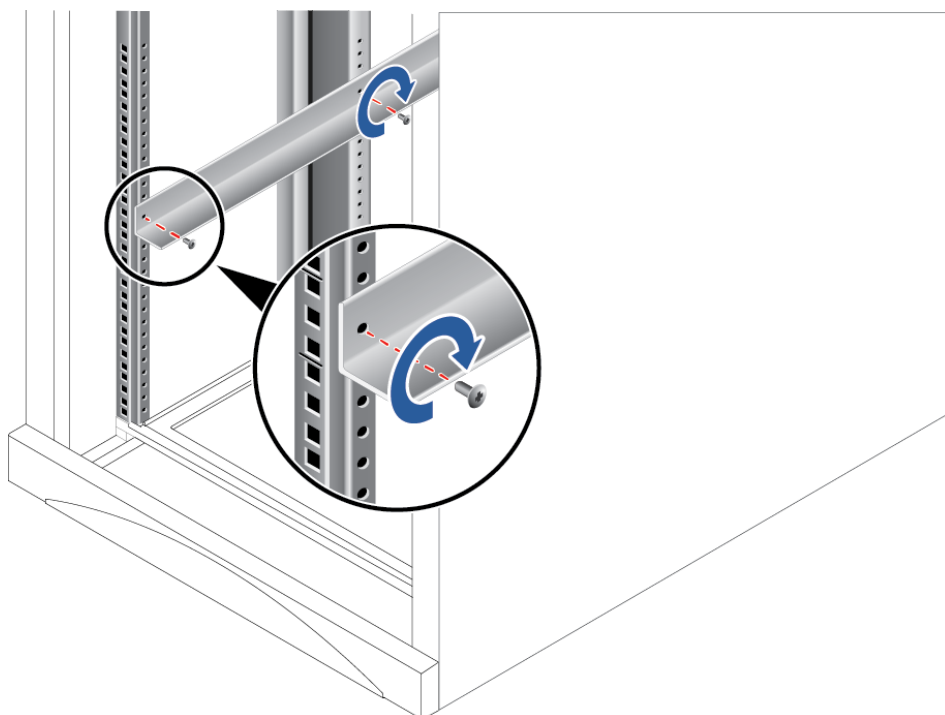


4. Install the other floating nut in the same way.

**Step 2** Install the L-shaped guide rails.

1. Position a guide rail horizontally in contact with the mounting bars in the cabinet.
2. Tighten the screws to secure the guide rail.

**Figure 7-5** Installing an L-shaped guide rail



3. Install the other guide rail in the same way.

----End

### 7.2.4.2 Installing the Static Rail Kit

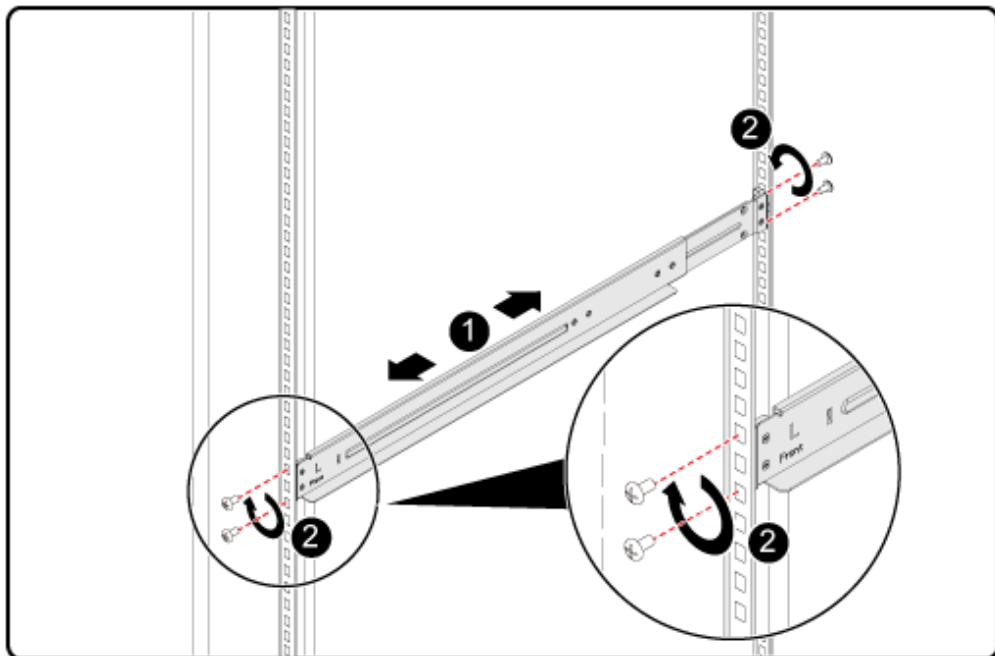
The static rail kit applies to cabinets with a distance of 543.5 mm to 848.5 mm (21.40 in. to 33.41 in.) between the front and rear mounting bars.

The 1288H V5 servers are not stackable onto the static rail kit.

#### Procedure

- Step 1** Place the rail horizontally in the planned position. Stretch the rail on both sides of the cabinet based on the cabinet length, keeping it in contact with the mounting bar in the cabinet. See (1) in [Figure 7-6](#).
- Step 2** Tighten the four screws at the front and rear of the rail. See (2) in [Figure 7-6](#).

**Figure 7-6** Installing a static rail



- Step 3** Install the other rail in the same way.

----End

### 7.2.4.3 Installing the Ball Bearing Rail Kit

The ball bearing rail kit applies to cabinets with a distance of 610 mm to 914 mm (24.02 in. to 35.98 in.) between the front and rear mounting bars.

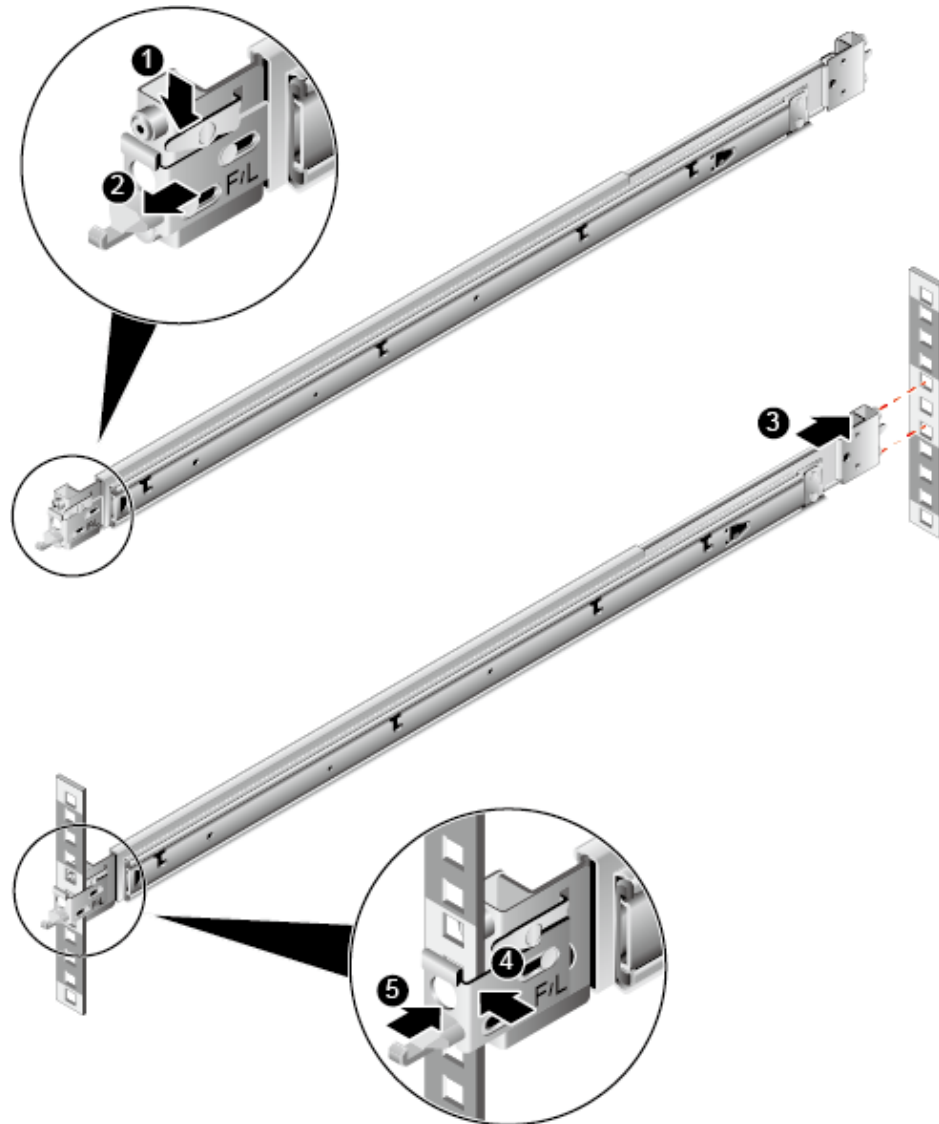
The 1288H V5 servers are stackable onto the ball bearing rail kit.

#### Procedure

- Step 1** Press the release latch at the front of the rail and stretch the hook horizontally as far as it will go. See (1) and (2) in [Figure 7-7](#).
- Step 2** Insert the positioning pin at the rear of the rail into the hole on the rear column of the cabinet. See (3) in [Figure 7-7](#).

- Step 3** Align the front end of the rail with the hole on the front column of the cabinet, push the rail horizontally, and insert the rail into the hole on the column from the side. See (4) in [Figure 7-7](#).
- Step 4** Push the hook horizontally until the release latch clicks into place. See (5) in [Figure 7-7](#).

**Figure 7-7** Installing the ball bearing rail kit



- Step 5** Install the other rail in the same way.

----End

## 7.2.5 Installing a 1288H V5

### 7.2.5.1 Installing the Server on L-Shaped Guide Rails or Static Rail Kit

Before installing the server, properly install the L-shaped guide rails or static rail kit. For details, see [7.2.4.1 Installing L-Shaped Guide Rails](#) or [7.2.4.2 Installing the Static Rail Kit](#).

## Procedure

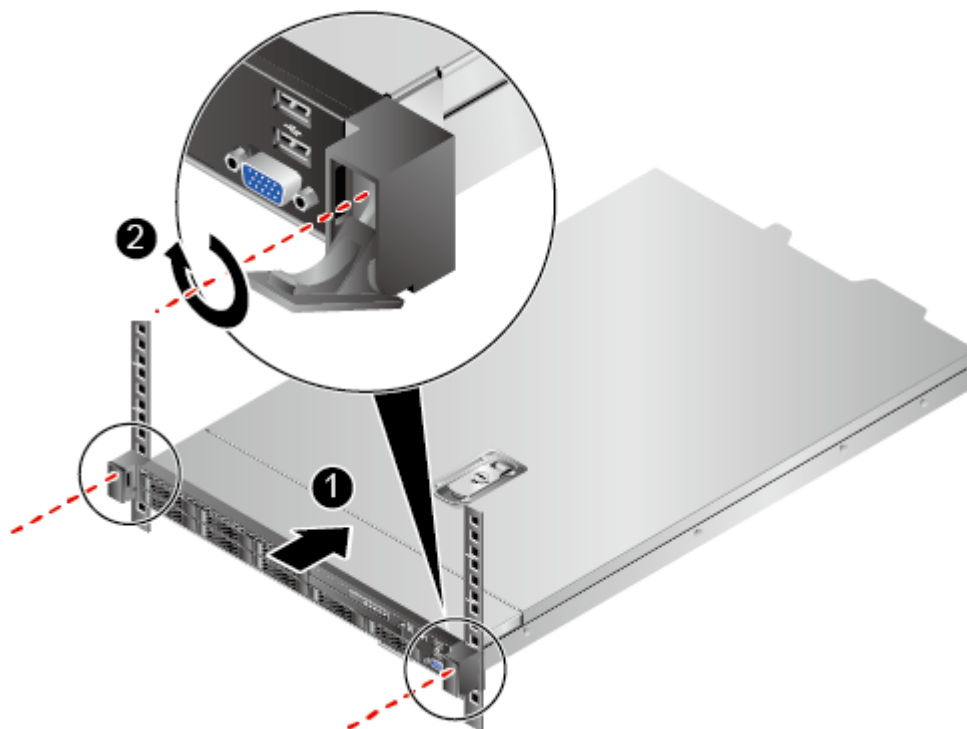
**Step 1** Install the server.

### NOTICE

At least two people are required to move the device. Otherwise, personal injury or device damage may occur.

1. Lift the server, place it on guide rails, and slide it into the chassis. At least two people are required to move the server. See (1) in [Figure 7-8](#).
2. Align the mounting ears on both sides of the server with the mounting bars and tighten the captive screws on the mounting ears. See (2) in [Figure 7-8](#).

**Figure 7-8** Installing the server



**Step 2** Connect the power cables to the PSUs.

For details, see [7.2.6.8 Connecting PSU Cables](#).

**Step 3** Connect a network cable, a VGA cable, and USB devices as required.

**Step 4** Power on the server.

For details, see [7.3.1 Power-On Procedure](#).

**Step 5** Check indicator status.

For details, see [2.1.2 Indicators and Buttons](#).

----End



## 7.2.5.2 Installing the Server on the Ball Bearing Rail Kit

Before installing the server, ensure that the ball bearing rail kit is properly installed. For details, see [7.2.4.3 Installing the Ball Bearing Rail Kit](#).

### Procedure

**Step 1** Install the server.

#### NOTICE

At least two people are required to move the device. Otherwise, personal injury or device damage may occur.

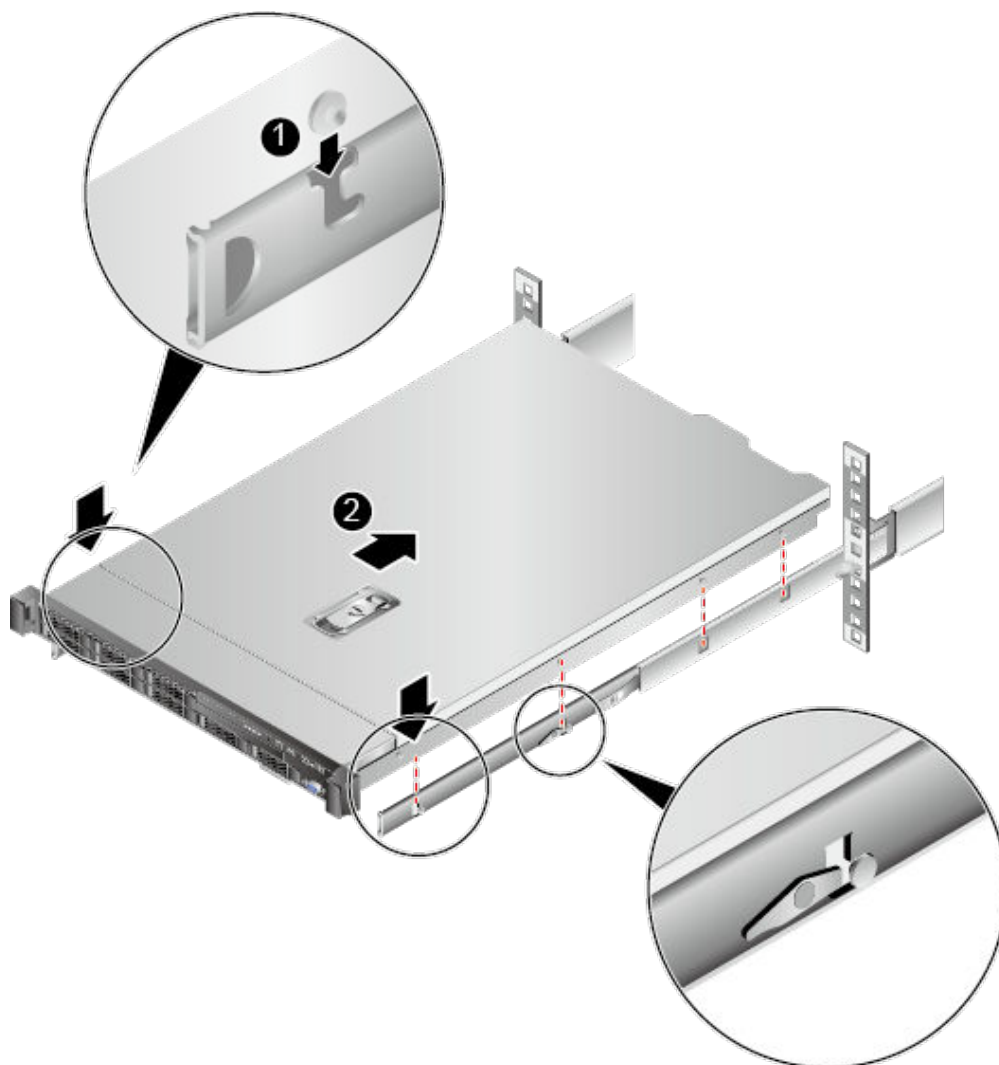
1. Pull out the inner rails as far as they will go.

**Figure 7-9** Pulling out inner rails



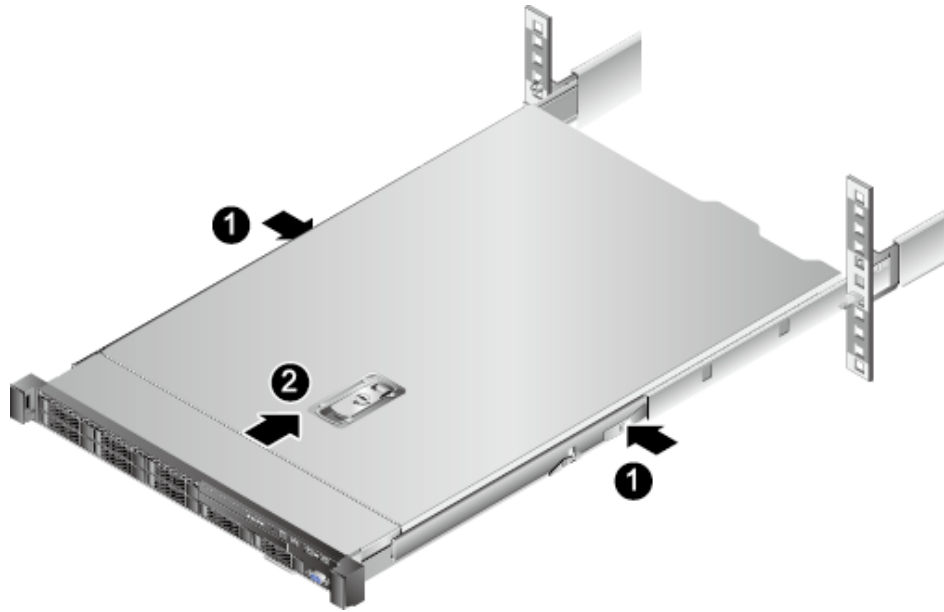
2. Lift the server (at least two people are required), align the positioning pins on the server with the holes on the inner guide rails, and push the server in the arrow direction until the locking pins engage. See (1) and (2) in [Figure 7-10](#).

**Figure 7-10** Installing the server on inner rails



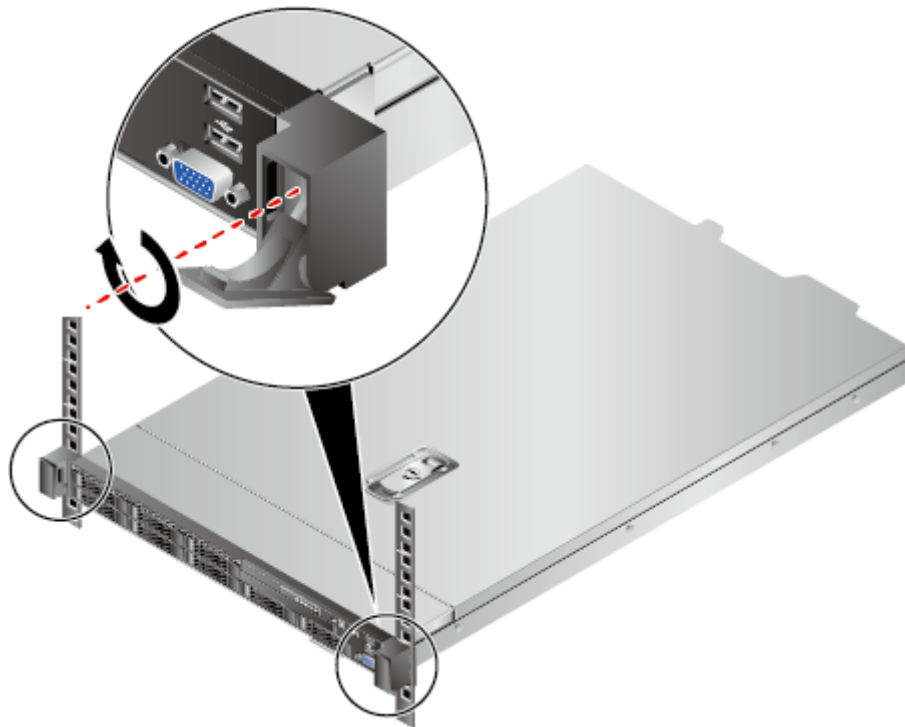
3. Press the release buttons on both sides and push the server into the rails. See (1) and (2) in [Figure 7-11](#).

**Figure 7-11** Installing the server



4. Tighten the captive screws on the mounting ears to secure the server.

**Figure 7-12** Securing the server

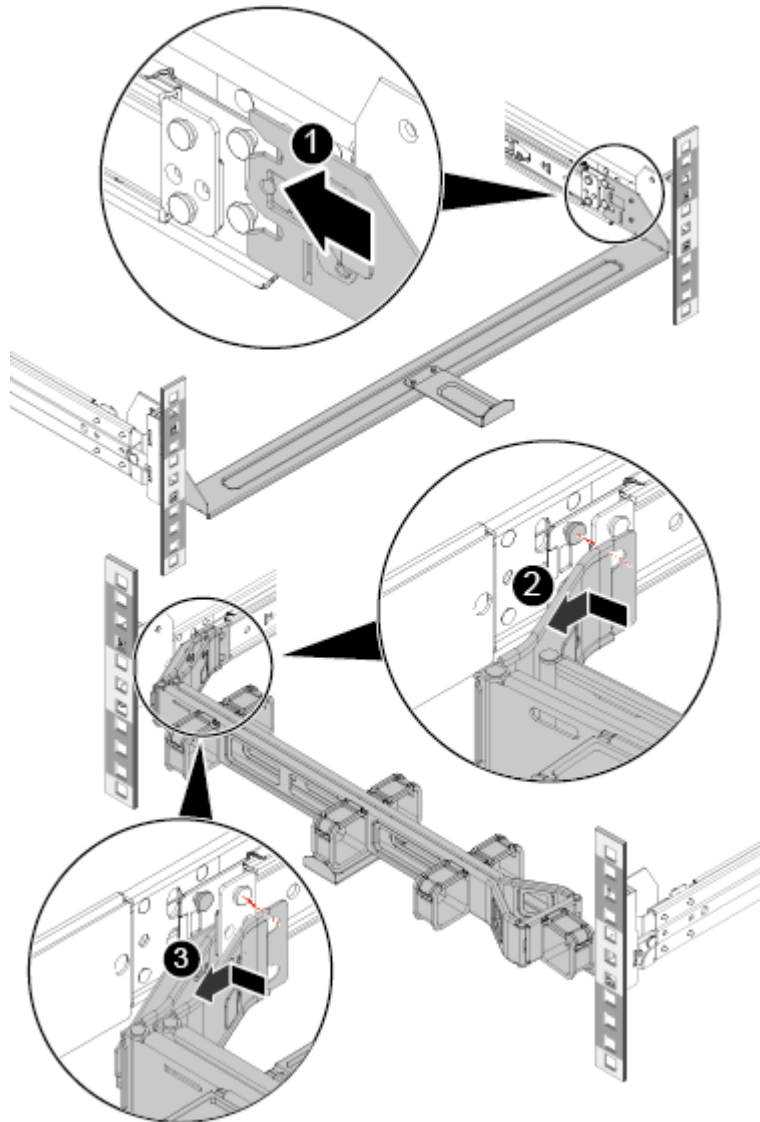


**Step 2** Install a cable management arm (CMA).

1. Insert the support levers into the outer rails on both sides. See (1) in [Figure 7-13](#).
2. Insert the nail heads on the outer left rail into the holes on the outer support lever of the CMA, and pull the CMA in the arrow direction. See (2) in [Figure 7-13](#).

3. Insert the nail heads on the inner left rail into the holes on the inner support lever of the CMA, and pull the CMA in the arrow direction. See (3) in [Figure 7-13](#).

**Figure 7-13** Installing the CMA



**Step 3** Connect the power cables to the PSUs.

For details, see [7.2.6.8 Connecting PSU Cables](#).

**Step 4** Connect a network cable, a VGA cable, and USB devices as required.

**Step 5** Power on the server.

For details, see [7.3.1 Power-On Procedure](#).

**Step 6** Check indicator status.

For details, see [2.1.2 Indicators and Buttons](#).

----End

## 7.2.6 Connecting External Cables

### 7.2.6.1 Cabling Guidelines

#### Basic Guidelines

---

**NOTICE**

Do not block the air exhaust vents of power supply units (PSUs) when you lay out cables. Otherwise, heat dissipation of the server may be affected.

---

- Lay out and bind cables of different types (such as power and signal cables) separately. Cables of the same type must be in the same direction.
  - Cables at a small distance can be laid out in crossover mode.
  - When laying out cables in parallel, the distance between power cables and signal cables must be longer than or equal to 30 mm (1.18 in.).
- If you cannot identify cables according to the cable labels, attach an engineering label to each cable.
- Cables must be protected from burrs, heat sinks, and active accessories, which may damage the insulation layers of the cables.
- Ensure that the length of cable ties for binding cables is appropriate. Do not connect two or more cable ties together for binding cables. After binding cables properly, trim the excess lengths of the cable ties and ensure that the cuts are neat and smooth.
- Ensure that cables are properly laid out, supported, or fixed within the cable troughs inside the cabinet to prevent loose connections and cable damage.
- Surplus cable lengths must be coiled and bound to a proper position inside the cabinet.
- Cables must be laid out straightly and bound neatly. The bending radius of a cable varies depending on the position where the cable is bent.
  - If you need to bend a cable in its middle, the bending radius must be at least twice the diameter of the cable.
  - If you need to bend a cable at the output terminal of a connector, the bending radius must be at least five times the diameter of the cable, and the cable must be bound before it is bent.
- Do not use cable ties at a place where the cables are bent. Otherwise, the cables may break.

#### Common Methods

The methods of laying out cables inside a cabinet are described as follows:

- Choose overhead or underfloor cabling for power cables based on equipment room conditions (such as the AC power distribution frame, surge protector, and terminal blocks).
- Choose overhead or underfloor cabling for service data cables (for example, signal cables) based on equipment room conditions.

- Place the connectors of all service data cables at the bottom of the cabinet so that the connectors are difficult to reach.

### 7.2.6.2 Connecting Mouse, Keyboard and VGA Cables

The front and rear panels of the server provide DB15 VGA ports but no standard PS/2 port for a keyboard or mouse.

You can connect a keyboard and mouse to the USB port on the front or rear panel based on site installation conditions. There are two connection methods:

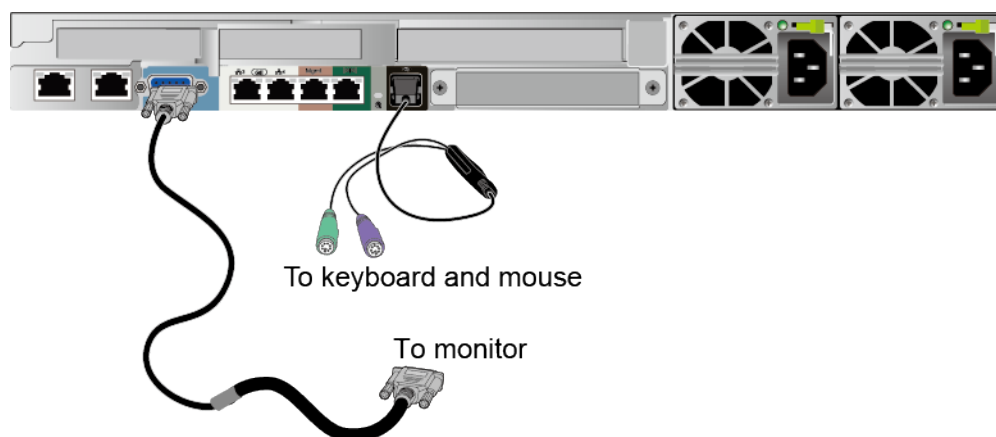
- Connect the keyboard and mouse to the USB ports.
- Connect the keyboard and mouse using a USB-to-PS/2 cable.

This section describes how to connect a keyboard and mouse using a USB-to-PS/2 cable and connect a monitor using a VGA cable.

#### Procedure

- Step 1** Connect the USB connector of the USB-to-PS/2 cable to a USB port on the front or rear panel of the server.
- Step 2** Connect the PS/2 connectors of the USB-to-PS/2 cable to the keyboard and mouse.
- Step 3** Connect the DB15 connector of the VGA cable to the VGA port on the front or rear panel of the server and tighten the two screws.
- Step 4** Connect the other connector of the VGA cable to the VGA port on the monitor and tighten the two screws.

**Figure 7-14** Connecting a USB-to-PS/2 cable and VGA cable



----End

### 7.2.6.3 Connecting Network Cables

Before connecting or replacing a network cable, use a network cable tester to ensure that the new network cable is functional.

## Procedure

**Step 1** Determine the model of the new network cable.

- Shielded cables are recommended.

### NOTE

According to the result of the EMC test, if a non-shielded cable is used, the system cannot respond to the ESD. As a result, the system is suspended and restarts.

- The new and old cables must be of the same model or be compatible.

**Step 2** Number the new network cable.

- The number of the new network cable must be the same as that of the old one.
- Use the same type of labels for the network cable.
  - Record the name and number of the local device to be connected on one side of the label, and those of the peer device on the other side.
  - Attach the label 2 cm (0.79 in.) away from the end of the network cable.

**Step 3** Lay out the new network cable.

- Lay out the new cable in the same way as the old one. Underfloor cabling is recommended because it is tidy and easy.
- Lay out network cables in the cabinet based on installation requirements. You are advised to arrange cables in the same way as existing cables. Ensure that cables are routed neatly and undamaged.
- Separate network cables from power cables and signal cables when laying out the cables.
- The minimum bend radius of a network cable is 4 cm (1.57 in.). Ensure that the cable insulation layer is intact.
- Ensure that cables are laid out for easy maintenance and capacity expansion.
- Network cables must be bound using cable ties. Ensure that network cables are bound closely, neatly, and straight, and cable ties are in even distance and fastened properly.

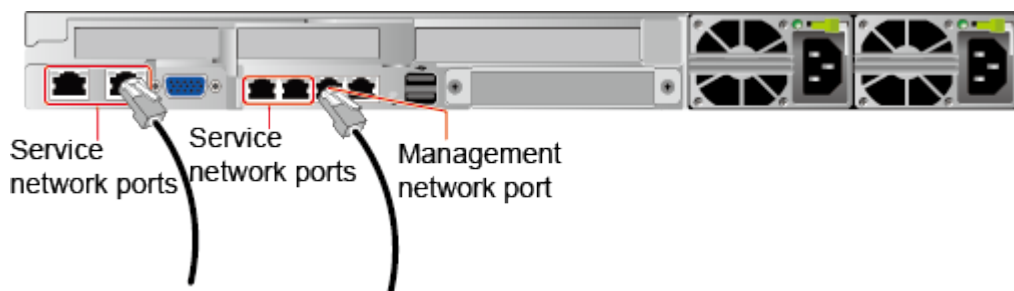
**Step 4** Remove the network cable to be replaced.

Remove the network cable from the network interface card (NIC) or board in the cabinet.

**Step 5** Connect the new network cable to the NIC or board.

- Connect the new network cable to the same network port as the removed one.
- Before installing a network cable to a network port, ensure that the network cable connector is intact and the pins have no sundries or deformation.
- Connect the network cable to the network port securely.

**Figure 7-15** Connecting a network cable



**Step 6** Connect the new network cable to the peer network port.

- Connect the other cable connector to the peer device based on the network plan.
- Connect the new network cable to the same port as the removed one.
- Connect the network cable to the network port securely.

**Step 7** Check whether the new network cable is functioning properly.

Power on the device. Check whether the communication with the peer device is normal by running the **ping** command.

- If yes, bind the new network cable with other cables.  
Bind the new network cable in the same way as the existing network cables. You can also remove all existing cable ties and bind all network cables again if necessary.
- If no, check whether the network cable is damaged or whether the connector of the network cable is not securely inserted.

----End

## 7.2.6.4 Connecting a Cable to an Optical Port

### Procedure

**Step 1** Determine the model of the new cable.

You can use an optical cable or an SFP+ cable to connect to the optical port.

**Step 2** Number the new cable.

- The number of the new cable must be the same as that of the old one.
- Use the same type of labels for the optical cable.
  - Record the name and number of the local device to be connected on one side of the label, and those of the peer device on the other side.
  - Attach the label 2 cm (0.79 in.) away from the end of the optical cable.

**Step 3** Lay out the new cable.

- Lay out the new cable in the same way as the old one.  
For example, if the old cable is laid out in underfloor cabling mode, so is the new cable.
- Lay out optical cables or SFP+ cables in the cabinet based on installation requirements.



You are advised to arrange cables in the same way as existing cables. Ensure that cables are routed neatly and undamaged.

- Separate optical cables or SFP+ cables from power cables and signal cables when laying out the cables.
- The minimum bend radius of an optical cable or SFP+ cables is 4 cm (1.57 in.).
- Ensure that optical cables or SFP+ cables are laid out for easy maintenance and capacity expansion.
- Optical cables must be bound using cable ties. Ensure that:
  - Optical cables are bound closely, neatly, and straight.
  - Cable ties are in even distance and fastened properly.

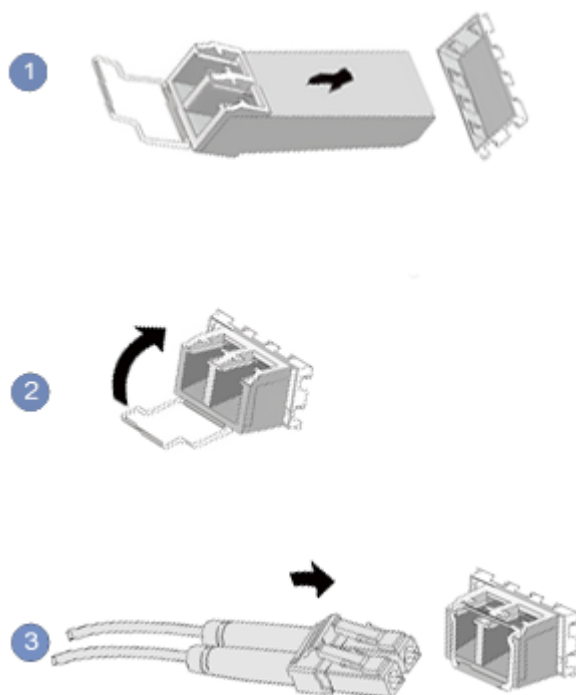
**Step 4** Connect the cable to an optical port.

- When you use an optical cable:
  - a. Remove the optical cable to be replaced.
  - b. Connect the new optical cable.

 **NOTE**

- Connect the new optical cable to the same port as the removed one.
- Connect the optical cable to the optical module securely.
- i. Insert the optical module into the optical port. See (1) in [Figure 7-16](#).
- ii. Close the latch on the optical module to secure it. See (2) in [Figure 7-16](#).
- iii. Insert the optical cable into the optical module. See (3) in [Figure 7-16](#).

**Figure 7-16** Connecting an optical cable



- When you use an SFP+ cable:
  1. Remove the SFP+ cable to be replaced.  
Gently push the power connector inwards and pull the latch out to remove the SFP+ cable.

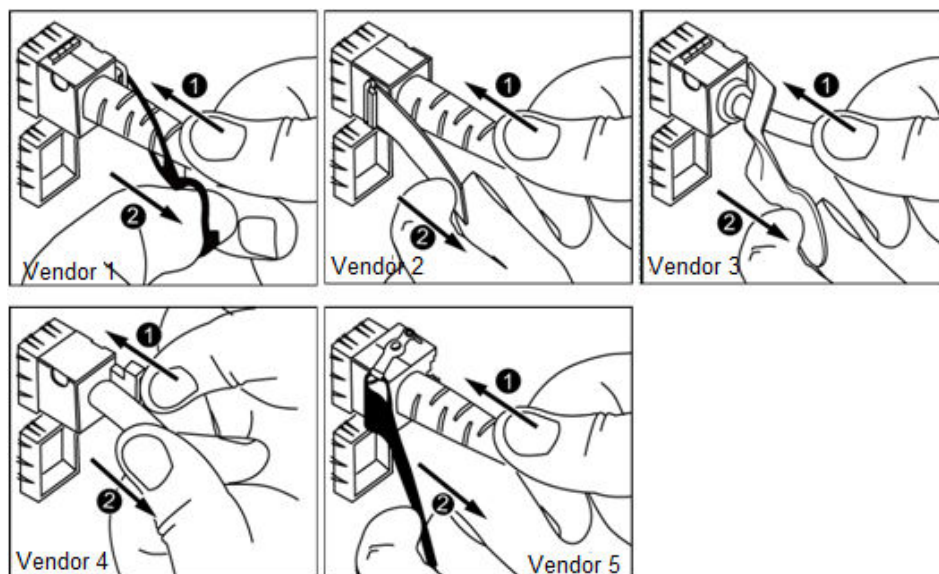
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**NOTICE**

Do not directly pull out the latch.

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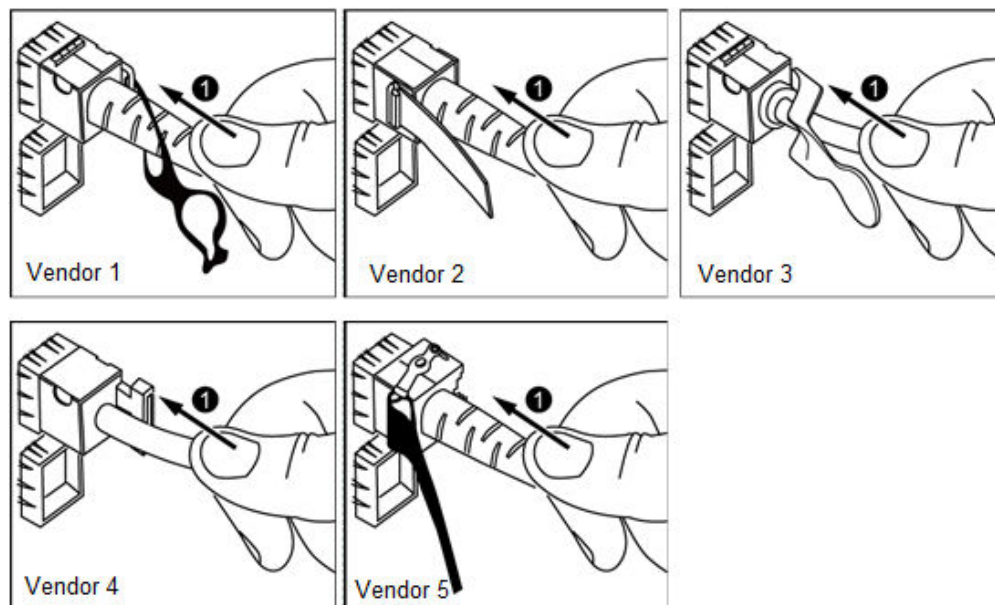
**Figure 7-17** Removing an SFP+ cable



2. Connect the new SFP+ cable.

Remove the dust-proof cap on the port, and insert the cable connector into the port. When you hear a "click" and the cable cannot be pulled out, the connector is secured.

**Figure 7-18** Connecting an SFP+ cable



**Step 5** Check whether the new cable is properly connected.

Power on the device. Check whether the communication with the peer device is normal by running the **ping** command.

- If yes, go to [Step 7](#).
- If no, go to [Step 6](#).

**Step 6** If the peer device cannot be pinged, check whether the cable is intact or the connector is securely connected.

- If yes, contact Huawei technical support.
- If no, replace the cable or insert the connector securely, and go to [Step 5](#).

**Step 7** Bind the new optical cable.

Bind the new optical cable in the same way as the existing optical cables. You can also remove all existing cable ties and bind all optical cables again if necessary.

----End

## 7.2.6.5 Connecting an IB Cable

### Procedure

**Step 1** Determine the model of the new cable.

You can use an optical cable or a QSFP+ cable.

**Step 2** Number the new cable.

- The number of the new cable must be the same as that of the old one.
- Use the same type of labels for the optical cable.
  - Record the name and number of the local device to be connected on one side of the label, and those of the peer device on the other side.
  - Attach the label 2 cm (0.79 in.) away from the end of the optical cable.

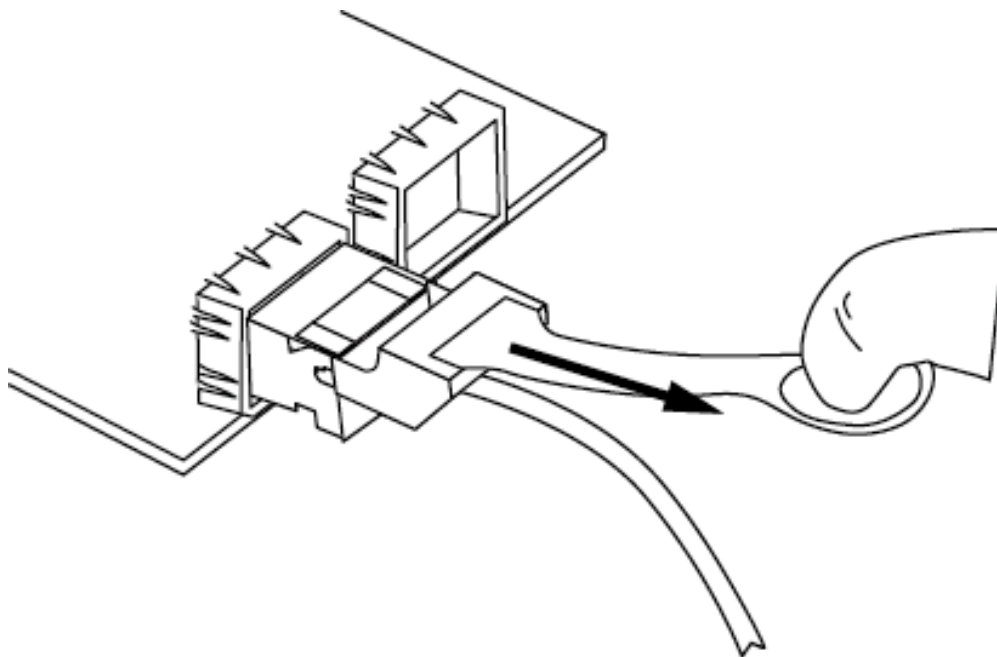
**Step 3** Lay out the new cable.

- Lay out the new cable in the same way as the old one.  
For example, if the old cable is laid out in underfloor cabling mode, so is the new cable.
- Lay out optical cables or QSFP+ cables in the cabinet based on installation requirements.  
You are advised to arrange cables in the same way as existing cables. Ensure that cables are routed neatly and undamaged.
- Separate optical cables or QSFP+ cables from power cables and signal cables when laying out the cables.
- The minimum bend radius of an optical cable or QSFP+ cables is 4 cm (1.57 in.).
- Ensure that optical cables or QSFP+ cables are laid out for easy maintenance and capacity expansion.
- Optical cables must be bound using cable ties. Ensure that:
  - Optical cables are bound closely, neatly, and straight.
  - Cable ties are in even distance and fastened properly.

**Step 4** Replace the cable.

1. Remove the cable to be replaced.  
Release the latch and remove the cable.

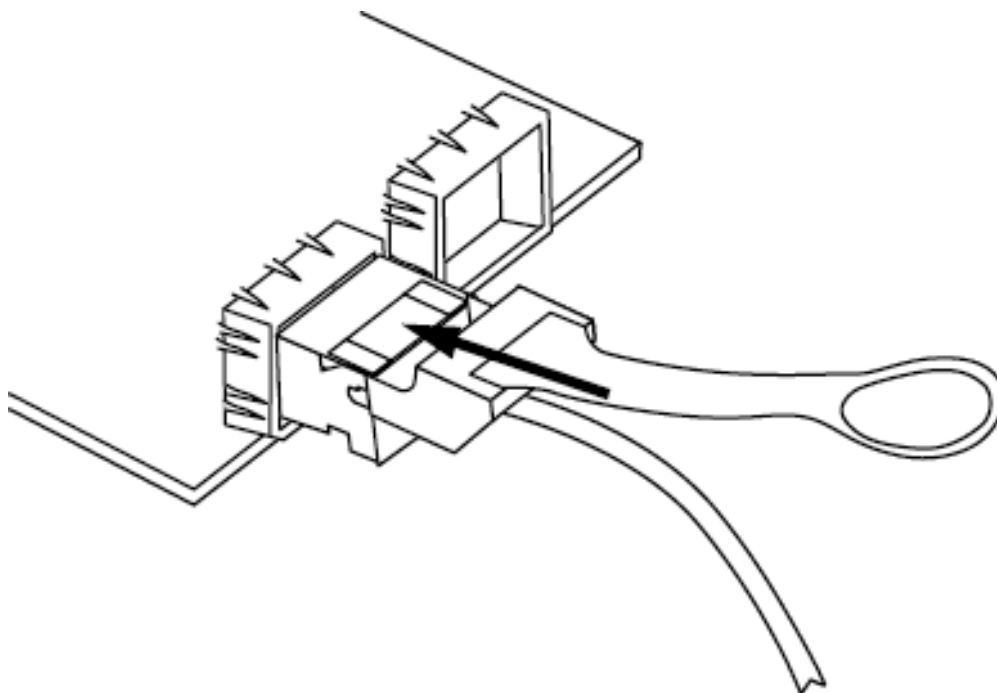
**Figure 7-19** Removing a cable (for an IB NIC with two 56 Gbit/s ports as an example)



2. Connect the new cable.

Remove the dust-proof cap on the port, and insert the cable connector into the port. When you hear a "click" and the cable cannot be pulled out, the connector is secured.

**Figure 7-20** Connecting a cable (for an IB NIC with two 56 Gbit/s ports as an example)



**Step 5** Check whether the new cable is properly connected.

Power on the device. If the LOM indicator is green, the cable is properly connected.

**Step 6** Bind the new optical cable.

Bind the new optical cable in the same way as the existing optical cables. You can also remove all existing cable ties and bind all optical cables again if necessary.

----End

### 7.2.6.6 Connecting a USB Device

#### Procedure

**Step 1** Connect the USB device to a USB port of the server.

**Figure 7-21** Connecting a USB device



----End

### 7.2.6.7 Connecting a Serial Cable

The rear panel of the server provides a standard RJ45 serial port (3-wire), which works as the system serial port by default. You can set it as the iBMC serial port by using the iBMC CLI.

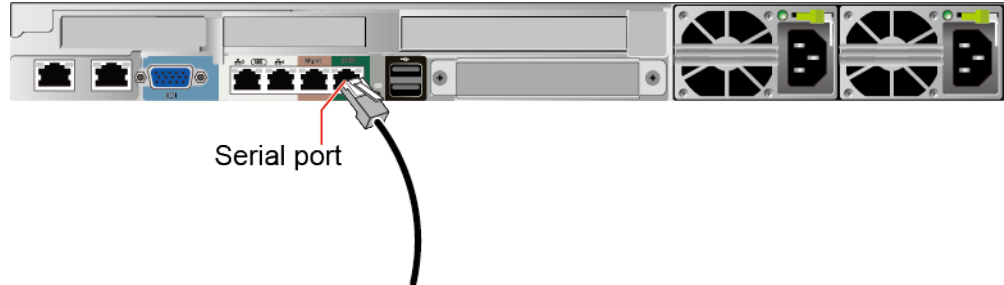
The serial port can be used as:

- System serial port to monitor the OS status
- iBMC serial port for debugging and fault locating

## Procedure

**Step 1** Connect the serial cable.

**Figure 7-22** Connecting a serial cable



----End

## 7.2.6.8 Connecting PSU Cables

### 7.2.6.8.1 Connecting the AC PSU Cable

Before connecting power cables, ensure that the server has been correctly installed. For details, see [7.2.5 Installing a 1288H V5](#).

---

#### NOTICE

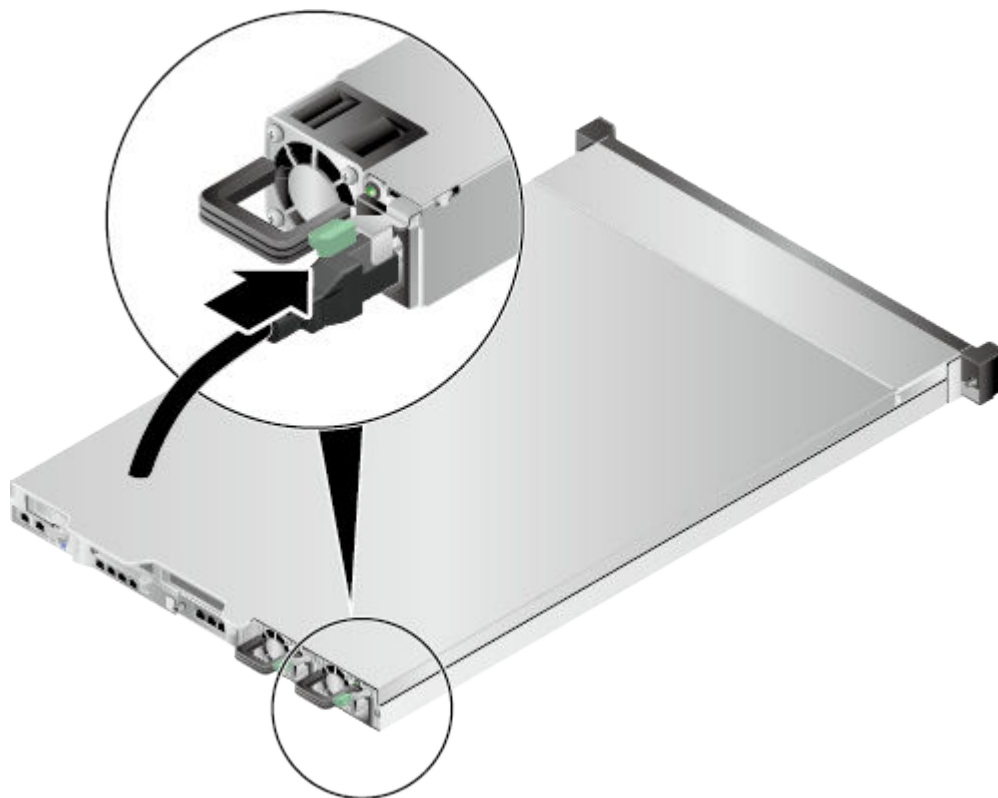
- Use dedicated power cables to ensure equipment and personal safety.
  - Use power cables only for dedicated servers. Do not use them for other devices.
  - Connect the power cables of the active and standby PSUs to different power distribution units (PDUs) to ensure reliable system operation.
  - Ground the equipment before powering it on.
- 

## Procedure

**Step 1** Take the spare part out of its ESD bag.

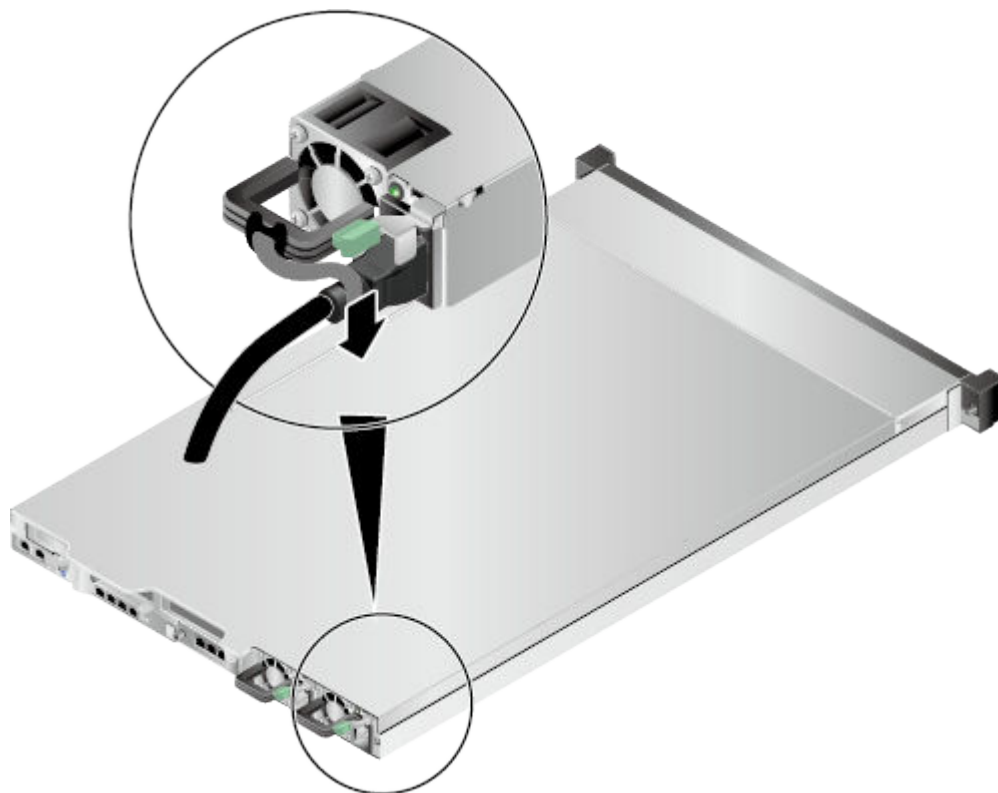
**Step 2** Connect one end of the power cable to the power socket on the PSU of the server.

**Figure 7-23** Connecting the cable



**Step 3** Secure the power cable using a velcro strap.

**Figure 7-24** Securing the cable





**Step 4** Connect the other end of the power cable to the AC PDU in the cabinet.

The AC PDU is fastened horizontally in the rear of the cabinet. Connect the power cable to the socket on the PDU according to the plan.

**Step 5** Bundle the power cable to the cable guide using cable ties.

----End

### 7.2.6.8.2 Connecting DC PSU Cables

Before connecting power cables, ensure that the server has been correctly installed. For details, see [7.2.5 Installing a 1288H V5](#).

#### NOTICE

- Use dedicated power cables to ensure equipment and personal safety.
- Use power cables only for dedicated servers. Do not use them for other devices.
- Connect the power cables of the active and standby PSUs to different power distribution units (PDUs) to ensure reliable system operation.
- Ground the equipment before powering it on.

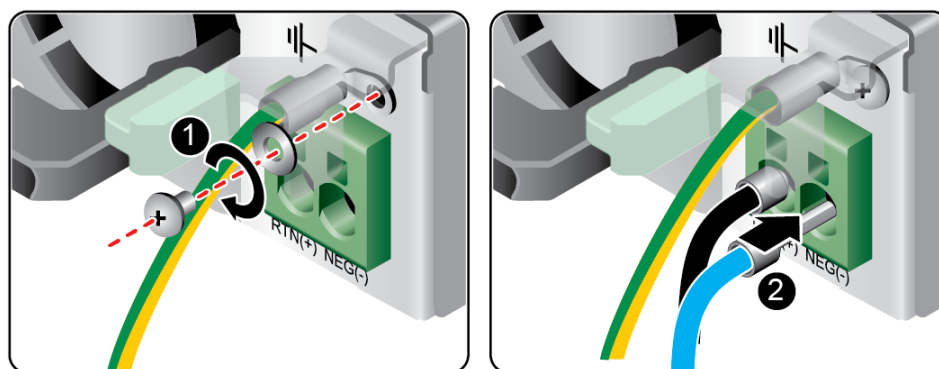
### Procedure

**Step 1** Take the spare part out of its ESD bag.

**Step 2** Connect the cables to the PSUs.

1. Put the OT terminal (for the ground cable) on the screw removed from the ground hole, install the screw on the ground hole, and tighten the screw. See (1) in [Figure 7-25](#).
2. Insert the power cables to the wiring terminals on the PSU until the cables click into position. See (2) in [Figure 7-25](#).
  - Connect the cord end terminal of the negative power cable (blue) to the NEG(-) wiring terminal on the PSU.
  - Connect the cord end terminal of the positive power cable (black) to the RTN(+) wiring terminal on the PSU.

**Figure 7-25** Connecting cables



**Step 3** Connect the other end of the power cable to the DC PDU in the cabinet.

The DC PDU is fastened horizontally in the rear of the cabinet. Connect the power cable to the socket on the PDU according to the plan.

**Step 4** Bundle the power cables to the cable guide using cable ties.

----End

### 7.2.6.9 Checking Cable Connections

#### CAUTION

Before checking cable connections, ensure that the power is cut off. Otherwise, any incorrect connection or loose connection may cause human injury or device damage.

**Table 7-3** Cable connection checklist

Item	Description
Power cable	Power cables are correctly connected to the rear of the chassis.
Network cable	Network cables are connected correctly to the management port or service ports on the rear panel of the chassis.
Ground cable	The server does not provide a separate ground port. <ul style="list-style-type: none"><li>• In AC or HVDC environment, the power cables of AC PSUs are grounded. Ensure that the power cables are in good contact.</li><li>• In DC environment, the ground terminals of DC PSUs are grounded. Ensure that the ground cables are in good contact.</li></ul>

## 7.3 Power-On and Power-Off

## 7.3.1 Power-On Procedure

### NOTICE

- Before powering on a server, ensure that the PSUs are switched off, all cables are connected correctly, and the power supply voltage meets service requirements.
- During the power-on process, do not remove and insert drives or disconnect and connect network cables or Console port cables.
- If a server is powered off, wait for at least one minute before powering it on again.



The server can be powered on in any of the following ways:

- If PSUs are properly installed but are not yet powered on, power on the PSUs. The server will be powered on along with the PSUs.

### NOTE

By default, **System State Upon Power Supply** is set to **Power On**, which allows the server to power on after the PSUs are applied with power. You can change the **System State Upon Power Supply** on the **Power > Power Control** page on the iBMC WebUI.

- If the PSUs are powered on and the server is in standby state (the power indicator is steady yellow), you can use any of the following methods to power on the server:
  - Press the power button on the front panel.  
For details, see [2.1.2 Indicators and Buttons](#).
  - Use the iBMC WebUI.
    - i. Log in to the iBMC WebUI.  
For details, see [9.2 Logging In to the iBMC WebUI](#).
    - ii. Choose **Power > Power Control**.  
The **Power Control** page is displayed.
    - iii. Click **Power On**.  
A confirmation message is displayed.
    - iv. Click **Yes**.
  - Use the iBMC CLI.
    - i. Log in to the iBMC CLI.  
For details, see [9.4 Logging In to the CLI](#).
    - ii. Run the following command:  
**ipmcset -d powerstate -v 1**
    - iii. Type **y** or **Y** and press **Enter**.
  - Use the Remote Virtual Console.
    - i. Log in to the Remote Virtual Console.  
For details, see [9.3 Logging In to the Desktop of a Server](#).

- ii. On the KVM screen, click  or  on the toolbar.
- iii. Select **Power On**.  
A dialog box is displayed.
- iv. Click **Yes**.

## 7.3.2 Power-Off Procedure

### NOTE

- Powering off a server will interrupt all services and programs running on it. Therefore, before powering off a server, ensure that all services and programs have been stopped or migrated to other servers.
- The "power-off" mentioned here is an operation performed to change the server to the standby state (the power indicator is steady yellow).
- After a server is powered off forcibly, wait for more than 10 seconds for the server to power off completely. Do not power on the server again before it is completely powered off.
- Forced power-off may damage user programs or unsaved data. Exercise caution when performing this operation.

The server can be powered off in any of the following ways:

- Connect a keyboard, video, and mouse (KVM) to the server and shut down the operating system of the server using the KVM.
- When the server is in power-on state, pressing the power button on the server front panel can power off the server gracefully.

### NOTE



If the server OS is running, shut down the OS according to the onscreen instructions.

For details, see [2.1.2 Indicators and Buttons](#).

- When the server is in power-on state, holding down the power button on the server front panel for six seconds can power off the server forcibly.

For details, see [2.1.2 Indicators and Buttons](#).

- Use the iBMC WebUI.
  - a. Log in to the iBMC WebUI.  
For details, see [9.2 Logging In to the iBMC WebUI](#).
  - b. Choose **Power > Power Control**.  
The **Power Control** page is displayed.
  - c. Click **Power Off** or **Forced Power Off**.  
A confirmation message is displayed.
  - d. Click **Yes**.
- Use the iBMC CLI.
  - a. Log in to the iBMC CLI.  
For details, see [9.4 Logging In to the CLI](#).
  - b. Run the following command:
    - To power off the server gracefully, run the **ipmcset -d powerstate -v 0** command.

- To power off the server forcibly, run the **ipmcset -d powerstate -v 2** command.
  - c. Type **y** or **Y** and press **Enter**.
- Use the Remote Virtual Console.
  - a. Log in to the Remote Virtual Console.  
For details, see [9.3 Logging In to the Desktop of a Server](#).
  - b. On the KVM screen, click  or  on the toolbar.
  - c. Choose **Power Off** or **Forced Power Off**.  
A dialog box is displayed.
  - d. Click **Yes**.

## 7.4 Initial Configuration

### 7.4.1 Default Information

Table 7-4 Default information

Category	Item	Default Value
iBMC management network port data	IP address and subnet mask of the management network port	<ul style="list-style-type: none"><li>• Default IP address: <b>192.168.2.100</b></li><li>• Default subnet mask: <b>255.255.255.0</b></li></ul>
iBMC login data	User name and password	<ul style="list-style-type: none"><li>• Default user name: <b>Administrator</b></li><li>• Default password: <b>Admin@9000</b></li></ul>
BIOS data	Password	<ul style="list-style-type: none"><li>• Default password: <b>Admin@9000</b></li></ul>
iBMC U-Boot data	Password	<ul style="list-style-type: none"><li>• Default password: <b>Admin@9000</b></li></ul>

## 7.4.2 Configuration Overview

### Configuration Process

Figure 7-26 Initial configuration process

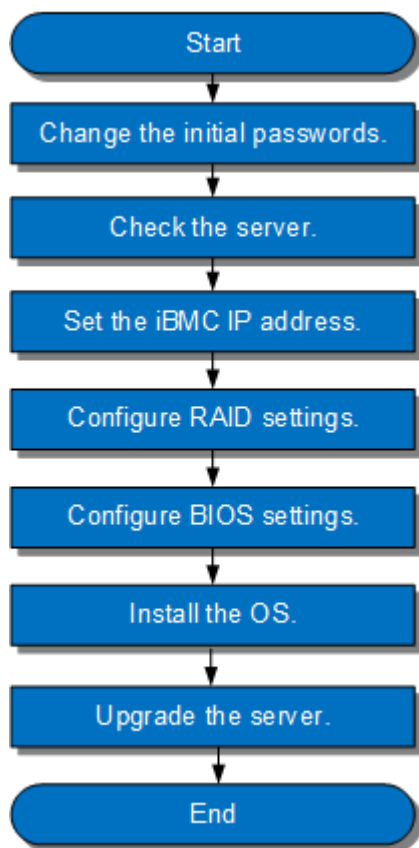


Table 7-5 Process description

Step	Description
Change the initial passwords.	<ul style="list-style-type: none"> <li>Initial password of the default iBMC user</li> <li>Initial iBMC U-Boot password</li> </ul>
Check the server.	<ul style="list-style-type: none"> <li>Ensure that the server version meets site requirements.</li> <li>Ensure that no alarm is generated for the server.</li> </ul>
Set the iBMC IP address.	Set an iBMC IP address for the server.
Configure RAID settings.	Configure the RAID array based on service requirements.
Configure BIOS settings.	Configure the BIOS settings of the server, including the boot mode, NIC PXE function, and BIOS password.
Install the OS.	Install an OS for the server.

Step	Description
Upgrade the system.	Upgrade software or firmware, and install or update drivers to the latest versions.

## Documents

- Configure the iBMC. The configuration method varies depending on the iBMC version. For details, see [FusionServer Pro Rack Server iBMC User Guide](#).
- Configure RAID settings. For details, see [Huawei V5 Server RAID Controller Card User Guide](#).
- Configure BIOS settings. For details, see [Huawei Server Purley Platform BIOS Parameter Reference](#).
- Install the operating system. For details, see [Huawei Server OS Installation Guide](#).
- Handle alarms. For details, see [FusionServer Pro Rack Server iBMC Alarm Handling](#).
- Rectify faults. For details, see [Huawei Servers Troubleshooting](#).

## 7.4.3 Changing Initial Passwords

### 7.4.3.1 Changing the Initial Password of the Default iBMC User

#### Scenarios

This section describes how to change the initial password of the default iBMC user on the iBMC WebUI.

You can change the initial password of the default iBMC user on:

- iBMC WebUI  
For details, see [FusionServer Pro Rack Server iBMC User Guide](#).
- iBMC CLI  
For details, see [FusionServer Pro Rack Server iBMC User Guide](#).

#### NOTE

- The default user name of the iBMC is **Administrator**, and the default password is **Admin@9000**.
- For security purposes, change the initial password upon the first login and change the password periodically.
- You are advised to use a password that meets complexity requirements or to enable the password complexity check function.
- The password complexity check function is enabled by default.

#### Procedure

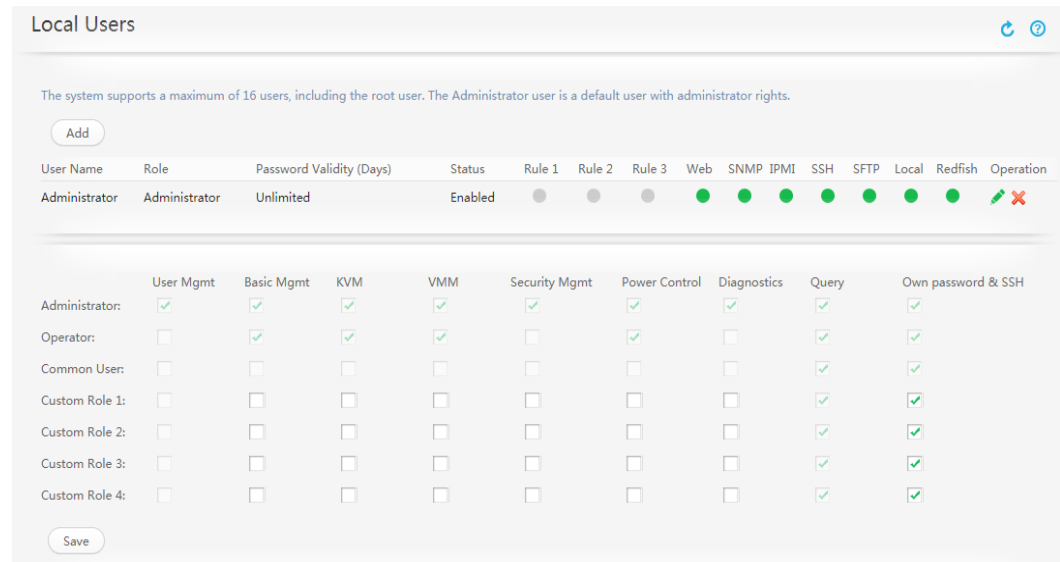
**Step 1** Log in to the iBMC WebUI.


For details, see [9.2 Logging In to the iBMC WebUI](#).

**Step 2** On the iBMC WebUI, choose **Configuration > Local Users**.

The **Local Users** page is displayed.

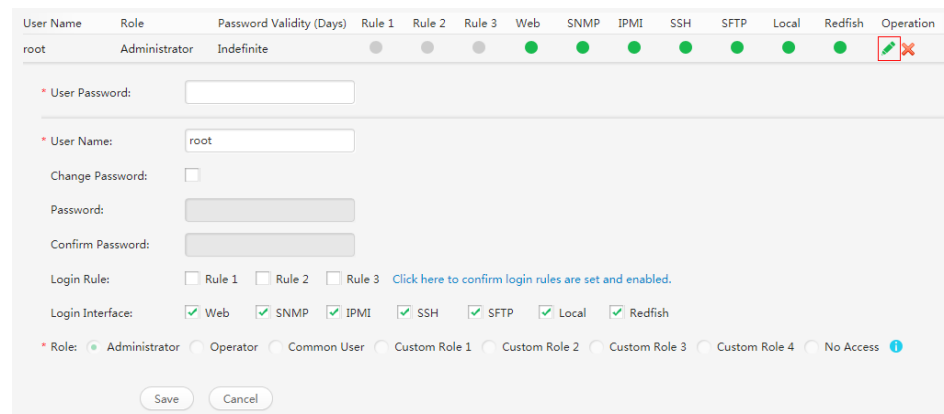
**Figure 7-27** Local Users page



**Step 3** Click  on the right of the user whose password is to be changed.

The page for changing the password is displayed.

**Figure 7-28** Changing password



**Step 4** Enter the current password in **Current User Password**.

**Step 5** Select **Change Password**.

**Step 6** Enter a new password in **New Password** and **Confirm Password**.



**NOTE**

The password must meet the following requirements:

- Contain 8 to 20 characters.
- Contain at least one space or one of the following special characters:  
`~!@#\$%^&\*()-\_+=\|[]{};:","<.>/?
- Contain at least two types of the following characters:  
Lowercase letters a to z  
Uppercase letters A to Z  
Digits 0 to 9
- Cannot be the same as the user name or the user name in reverse order.
- Contain at least two new characters when compared with the old password.

**Step 7** Click **Save**.

The initial password of the iBMC is changed.

----End

### 7.4.3.2 Changing the Initial U-Boot Password

**NOTE**

- U-Boot is a kind of underlying software used to configure basic settings, for example, initialize hardware devices and set up memory space mapping, to prepare for commissioning the OS.
- For security purposes, change the initial password upon the first login and periodically change the password.
- You are advised to use a password that meets complexity requirements or to enable the password complexity check function.
- The password complexity check function is enabled by default.

#### Procedure

**Step 1** Log in to the iBMC CLI.

For details, see [9.4 Logging In to the CLI](#).

**Step 2** Restart the iBMC.

```
ipmcset -d reset
```

The command output is as follows:

```
This operation will reboot IPMC system. Continue? [Y/N]:
```

**Step 3** Enter **y**.

The system restarts.

**Step 4** Press **Ctrl+B** immediately when the following information is displayed:

```
Hit 'ctrl + b' to stop autoboot: 1
```

**Step 5** Enter the default password (**Admin@9000**).

The U-Boot interface is displayed.

```
u-boot>
```

**Step 6** Switch to the interface for changing the U-Boot password.

**passwd**

The command output is as follows:

```
Enter old password:
```

**Step 7** Enter the old password.

The command output is as follows:

```
Enter new password:
```

**Step 8** Enter a new password.

The command output is as follows:

```
Enter the new password again:
```

**Step 9** Enter the new password again.

If the command output is as follows, the password has been changed:

```
. done
Un-Protected 1 sectors
Erasing Flash...
. done
Erased 1 sectors
Writing to Flash... done
. done
Protected 1 sectors

password be changed successfully.
```

**Step 10** Exit the U-Boot interface.

**boot**

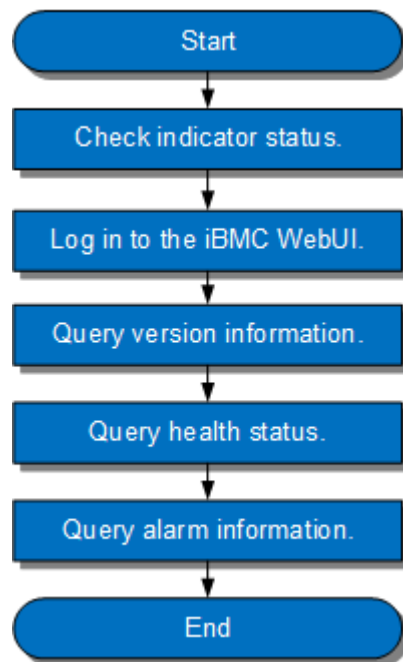
----End

## 7.4.4 Checking the Server

### Process

Check the server by performing the following operations:

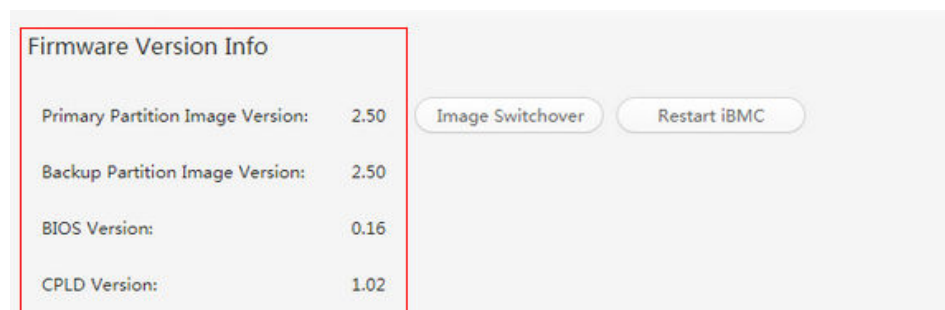
**Figure 7-29** Check process



## Procedure

- Step 1** Determine the hardware status by observing the indicators on the front panel.  
For details, see [2.1.2 Indicators and Buttons](#).
- Step 2** Log in to the iBMC WebUI.  
For details, see [9.2 Logging In to the iBMC WebUI](#).
- Step 3** Query version information.
1. On the menu bar, choose **System**.
  2. In the navigation tree, choose **Firmware Upgrade** to query the version information of the server.

**Figure 7-30** Querying version information



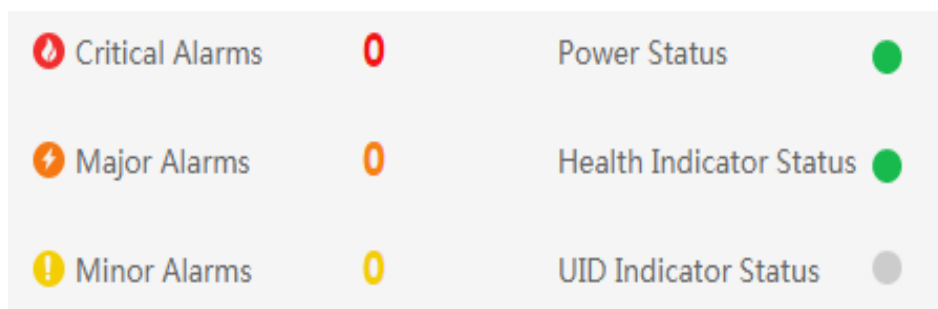
3. Check whether the versions meet site requirements.
  - If yes, go to [Step 4](#).
  - If no, go to [Step 3.4](#).
4. Upgrade the iBMC, BIOS, or CPLD.

For details, see [FusionServer Pro Rack Server Upgrade Guide](#).

**Step 4** Query health status.

1. On the menu bar, choose **Information**.
2. In the navigation tree, choose **Overview** to query the health status.

**Figure 7-31** Querying health status



**Step 5** Query alarm information.

Check whether any alarm is generated.

- If yes, handle the alarms.  
For details, see [FusionServer Pro Rack Server iBMC Alarm Handling](#).
- If no, no further action is required.

----End

## 7.4.5 Setting the iBMC IP Address

### Scenarios

This section describes how to set the iBMC IP address on the BIOS.

You can set the iBMC IP address on:

- BIOS
- iBMC WebUI  
For details, see [FusionServer Pro Rack Server iBMC User Guide](#).

- iBMC CLI

Run the following command: `ipmcset -d ipaddr`

For details, see [FusionServer Pro Rack Server iBMC User Guide](#).

### Default IP Address

Default IP Address	Default Subnet Mask
192.168.2.100	255.255.255.0

## Procedure (on the BIOS)

**Step 1** Restart the server, and enter the BIOS.

For details, see [9.6 Accessing the BIOS](#).

**Step 2** Choose **Advanced > IPMI iBMC Configuration** and press **Enter**.

The **IPMI iBMC Configuration** screen is displayed.

**Step 3** Select **iBMC Configuration** and press **Enter**.

The **iBMC Configuration** screen is displayed, showing the iBMC IP address.

**Step 4** Select **IPv4 IP Address** and press **Enter**.

The **IPv4 IP Address** dialog box is displayed.

**Step 5** Change the IPv4 address of the iBMC management network port.

**Step 6** Press **F10**.

Save the settings and exit.

----End

## 7.4.6 Configuring RAID

The 1288H V5 supports multiple types of RAID controller cards.

- Use [Intelligent Computing Compatibility Checker](#) to obtain information about the compatible RAID controller cards.
- The configuration method varies depending on the RAID controller card model. For details, see [Huawei V5 Server RAID Controller Card User Guide](#).

## 7.4.7 Configuring the BIOS

### Scenarios

This section describes how to configure the BIOS of the server.

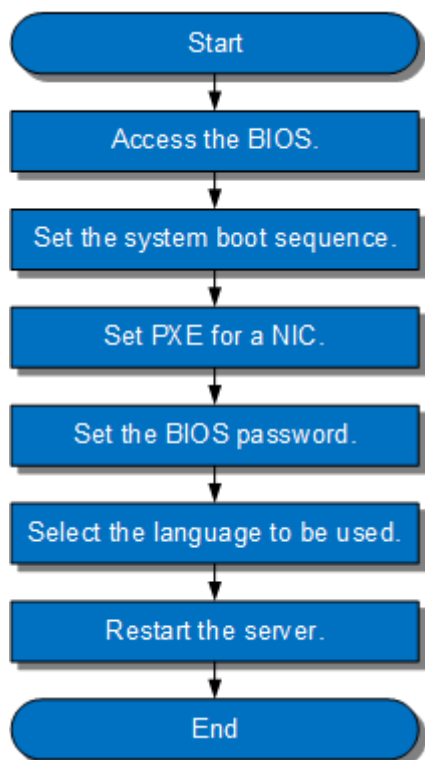
To configure the BIOS, perform the following operations:

- Set the system boot sequence
- Set PXE for a NIC
- Set the BIOS password
- Select a language

For details about other configurations, see [Huawei Server Purley Platform BIOS Parameter Reference](#).

## Process

**Figure 7-32** Process for configuring the BIOS



### 7.4.7.1 Accessing the BIOS

#### Procedure

**Step 1** Restart the server, and enter the BIOS.

For details, see [9.6 Accessing the BIOS](#).

----End

### 7.4.7.2 Setting the System Boot Sequence

If multiple boot devices are configured for the server, you can set the system boot sequence on the BIOS.

#### Procedure

**Step 1** On the BIOS main screen, choose **Boot**.

The **Boot** screen is displayed.

**Step 2** Select **Boot Type** and press **Enter**.

The **Boot Type** dialog box is displayed.

**Step 3** Select **Legacy Boot** or **UEFI Boot**, and then press **Enter**.

 **NOTE**

- The default boot mode is UEFI.
- For some OSs, if the capacity of the drive or RAID array for installing the OS is greater than 2 TB, use the UEFI boot mode. For details, see the release notes of the OS.
- If the OS is installed on an NVMe drive, the boot mode must be the UEFI boot.
- The UEFI boot mode supports more boot devices than the legacy boot mode. The UEFI boot mode is recommended if a server is configured with multiple boot devices. If the legacy mode is set, some devices may fail to boot. If the legacy mode has to be set, disable serial port redirection or NIC PXE based on service requirements so that the OS can start. For details, see sections "Setting PXE for a NIC" and "Setting Serial Port Redirection" in [Huawei Server Purley Platform BIOS Parameter Reference](#).

**Step 4** Select **Boot Sequence** and press **Enter**.

The **Boot Sequence** screen is displayed.

 **NOTE**

The default boot sequence is **Hard Disk Drive > DVD-ROM Drive > PXE > Others**.

**Step 5** Select the target boot device and press **F5** or **F6** to change the boot order.

- Press **F5** to move a boot option down.
- Press **F6** to move a boot option up.

 **NOTE**

The server boots in the order specified on this screen.

----End

### 7.4.7.3 Setting PXE for a NIC

If a server is configured with multiple NICs, you can set the PXE function for the NICs on the BIOS.

 **NOTE**

If multiple boot devices of the same type are configured for a server, you can set the system boot sequence on the BIOS. For details about how to set the boot device, see [Huawei Server Purley Platform BIOS Parameter Reference](#).

## Procedure

**Step 1** On the BIOS main screen, choose **Advanced**.

The **Advanced** screen is displayed.

**Step 2** Select **PXE Configuration** and press **Enter**.

The **PXE Configuration** screen is displayed.

 **NOTE**

- Four on-board network ports can be displayed on the PXE screen. The default value is **Enabled** for PXE1 and PXE3 and **Disabled** for other network ports.
- The I/O NIC ports are also displayed on the **PXE Configuration** screen.

**Step 3** Select the network port to be configured and press **Enter**.

The dialog box for setting the network port is displayed.

**Step 4** Select **Enabled** and press **Enter**.

 **NOTE**

To disable PXE for a network port, select **Disabled** and press **Enter**.

----End

#### 7.4.7.4 Setting the BIOS Password

For security purposes, change the administrator password upon the first login.

 **NOTE**

- The password complexity check function is enabled by default.
- You are advised to use a password that meets complexity requirements or to enable the password complexity check function.
- For security purposes, change the administrator password periodically.

#### Procedure

**Step 1** On the BIOS main screen, choose **Security**.

The **Security** screen is displayed.

**Step 2** Select **Manage Supervisor Password** and press **Enter**.

The **Manage Supervisor Password** screen is displayed.

**Step 3** Change the BIOS password.

 **NOTE**

- The current password of the system administrator is required before you change the password. The system will be locked if an incorrect password is entered three consecutive times. You can unlock the system by restarting it.
- The default BIOS password is **Admin@9000**.
- The requirements for setting the administrator password are as follows:
  - The password must be a string of 8 to 16 characters and contain special characters (including spaces) and at least two types of uppercase letters, lowercase letters, and digits.
  - The previous five passwords cannot be reused as a new password.
  - After the administrator password is set, the **Delete Supervisor Password** parameter is displayed, which can be used to clear the administrator password.
  - If **Simple Password** is set to **Enabled**, the system does not verify the password complexity, but the password length must be 8 to 16 digits.

----End



### 7.4.7.5 Selecting a Language

#### Procedure

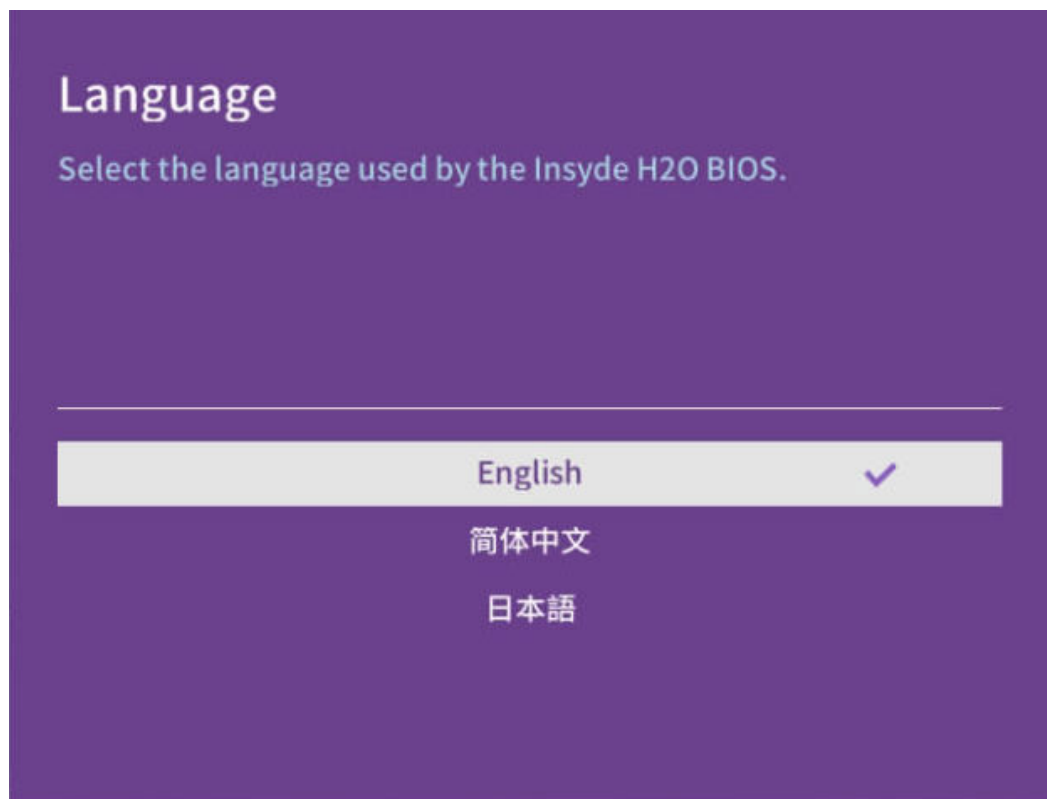
**Step 1** On the BIOS main screen, choose **Main**.

The **Main** screen is displayed.

**Step 2** Select **Language** and press **Enter**.

The **Language** screen is displayed.

**Figure 7-33** Selecting a language



**Step 3** Select the language to be used and press **Enter**.

The target language is set for the GUI.

----End

### 7.4.7.6 Restarting the Server

After the settings, you need to restart the server for the settings to take effect.

#### Procedure

**Step 1** On the BIOS, press **F10**.

The **Save Changes&Exit** dialog box is displayed.

**Step 2** Select **Yes** and press **Enter**.

Settings are saved and the BIOS is exited. The server automatically restarts for the settings to take effect.

----End

## 7.4.8 Installing an OS

The 1288H V5 supports multiple types of OSs.

- Use [Intelligent Computing Compatibility Checker](#) to obtain information about the compatible operating systems.
- The installation method varies with the operating system. For details, see [Huawei Server OS Installation Guide](#).

## 7.4.9 Upgrading the System

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### NOTICE

Unless the software or components to be installed require an earlier version, keep the system in the latest state before using the server for the first time.

---

### Obtaining Documents

- [Release Notes](#)
- [Huawei Server OS Installation Guide](#)
- [FusionServer Pro Rack Server Upgrade Guide](#)
- [FusionServer iDriver List](#)

### Upgrading Software or Firmware

- Upgrade the iBMC, BIOS, CPLD, or other firmware. For details, see [FusionServer Pro Rack Server Upgrade Guide](#).

### Installing or Updating the Driver

If the existing driver versions on a server are inconsistent with the driver version mapping, install the drivers of the required versions. Otherwise, the server may operate abnormally.

- Obtain the driver installation package. For details, see [Intelligent Computing Compatibility Checker](#).

For example, the Windows V304 driver package is **FusionServer iDriver-Windows-Driver-V304.zip**.

- Install or update the driver. For details, see [Huawei Server OS Installation Guide](#).

---

### NOTICE

Make sure to back up the original drivers before installing or upgrading drivers.

---

The driver installation package and procedure vary depending on the operating system.

# 8 Troubleshooting

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For details about troubleshooting, see [Huawei Servers Troubleshooting](#).

- **Troubleshooting process**  
Troubleshooting is a process of using appropriate methods to find the cause of a fault and rectify the fault. The troubleshooting process is to narrow down the scope of possible causes for a fault to reduce troubleshooting complexity, identify the root cause, and rectify the fault.
- **Fault information collection**  
If a fault occurs on a server, collect logs for fault diagnosis.
- **Fault diagnosis**  
Fault diagnosis rules and tools help Huawei technical support engineers and maintenance engineers to analyze and rectify faults according to alarms and hardware fault symptoms.
- **Software and firmware upgrade**  
Software and firmware upgrade packages can be downloaded by server model and installed as needed.
- **Preventive maintenance**  
Preventive maintenance promptly detects, diagnoses, and rectifies server faults.

# 9 Common Operations

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- [9.1 Querying the iBMC IP Address](#)
- [9.2 Logging In to the iBMC WebUI](#)
- [9.3 Logging In to the Desktop of a Server](#)
- [9.4 Logging In to the CLI](#)
- [9.5 Managing VMD](#)
- [9.6 Accessing the BIOS](#)
- [9.7 Clearing Data from a Storage Device](#)

## 9.1 Querying the iBMC IP Address

### Scenarios

Query the IP address of the iBMC management network port. The following describes how to query the iBMC IP address on the BIOS.

You can use any of the following methods to query the IP address of the iBMC management network port:

- BIOS
- iBMC WebUI  
For details, see [FusionServer Pro Rack Server iBMC User Guide](#).
- iBMC CLI  
Run the `ipmcget -d ipinfo` command.  
For details, see [FusionServer Pro Rack Server iBMC User Guide](#).

### Procedure

**Step 1** Access the BIOS interface.

**Step 2** Choose **Advanced > IPMI iBMC Configuration**, and press **Enter**.

The **IPMI iBMC Configuration** screen is displayed.

**Step 3** Select **iBMC Configuration** and press **Enter**.

The **iBMC Configuration** screen is displayed.

**Step 4** Check the IP address of the iBMC management network port.

----End

## 9.2 Logging In to the iBMC WebUI

### Scenarios

Log in to the iBMC WebUI. The following uses Internet Explorer 11.0 as an example.

#### NOTE

- A maximum of four users can log in to the iBMC WebUI at the same time.
- By default, the system timeout period is 5 minutes. If no operation is performed on the WebUI within 5 minutes, the user will be automatically logged out of the WebUI.
- The system locks a user account if the user enters incorrect passwords for consecutive five times. The user account is automatically unlocked five minutes later. The system administrator can also unlock a user account using the command line.
- For security purposes, change the initial password after the first login and change your password periodically.

### Procedure

**Step 1** Check that the client (for example, a local PC) used to access the iBMC meets the running environment requirements.

If you want to use the remote control function, ensure that the Java Runtime Environment (JRE) meets requirements.

**Table 9-1** Running environment

OS	Browser	JRE
Windows 7 32-bit Windows 7 64-bit	Internet Explorer 9.0 to 11.0	JRE 1.7 U45 JRE 1.8 U45
	Mozilla Firefox 39.0 to 54.0	JRE 1.8 U144
	Google Chrome 21.0 to 44.0	
Windows 8 32-bit Windows 8 64-bit	Internet Explorer 10.0/11.0	JRE 1.7 U45 JRE 1.8 U45
	Mozilla Firefox 39.0 to 54.0	JRE 1.8 U144
	Google Chrome 21.0 to 44.0	

OS	Browser	JRE
Windows 10 64-bit	Internet Explorer 11.0	JRE 1.8 U45
	Mozilla Firefox 39.0 to 54.0	JRE 1.8 U144
Windows Server 2012 R2 64-bit	Internet Explorer 11.0	JRE 1.8 U45
	Mozilla Firefox 39.0 to 54.0	JRE 1.8 U144
Windows Server 2016 64-bit	Internet Explorer 11.0	JRE 1.8 U45
	Mozilla Firefox 39.0 to 54.0	JRE 1.8 U144
Windows Server 2008 R2 64-bit	Internet Explorer 9.0 to 11.0	JRE 1.7 U45
	Mozilla Firefox 39.0 to 54.0	JRE 1.8 U45
	Google Chrome 21.0 to 44.0	JRE 1.8 U144
Windows Server 2012 64-bit	Internet Explorer 10.0/11.0	JRE 1.7 U45
	Mozilla Firefox 39.0 to 54.0	JRE 1.8 U45
	Google Chrome 21.0 to 44.0	JRE 1.8 U144
RHEL 6.0 64-bit	Mozilla Firefox 39.0 to 54.0	JRE 1.7 U45 JRE 1.8 U45 JRE 1.8 U144
MAC X v10.7	Safari 8.0	JRE 1.7 U45
	Mozilla Firefox 39.0 to 54.0	JRE 1.8 U45 JRE 1.8 U144

**Step 2** Connect the PC to the iBMC management network port using a network cable.

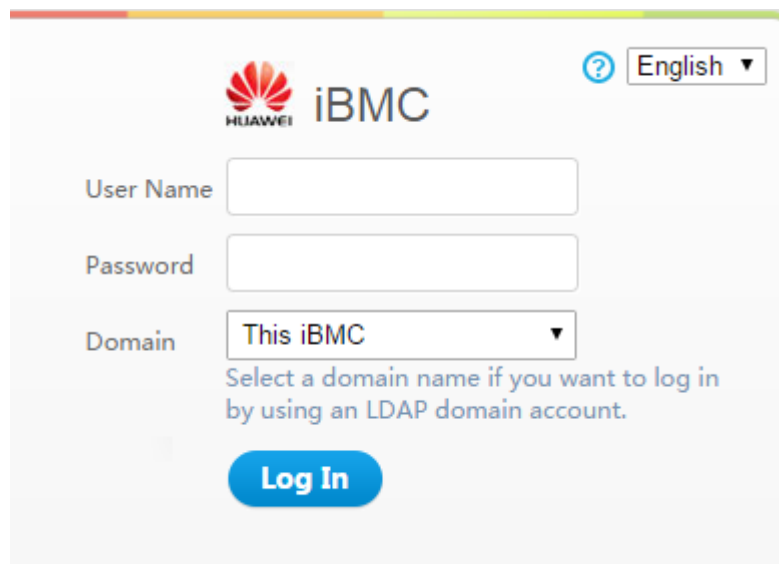
**Step 3** Set an IP address and subnet mask or route information for the local PC to enable the PC to communicate with the iBMC.

**Step 4** Open Internet Explorer, enter `https://IP address of the iBMC management network port` in the address box, and press **Enter**.

The iBMC login page is displayed.

**NOTE**

- If the language of the browser you use to log in to the iBMC WebUI is not Chinese, English, or Japanese, upgrade the iBMC to V260 or later. Otherwise, the login page may fail to display.
- If the message "There is a problem with this website's security certificate" is displayed, click **Continue to this website (not recommended)**.
- If a security alert is displayed, you can ignore this message or perform any of the following to shield this alert:
  - Import a trust certificate and a root certificate to the iBMC.  
For details, see "Importing the iBMC Trust Certificate and Root Certificate" in the [iBMC User Guide](#).
  - If no trust certificate is available and can ensure network security, add the iBMC to the **Exception Site List** on Java Control Panel or reduce the Java security level.  
This operation, however, poses security risks. Exercise caution when performing this operation.

**Figure 9-1** iBMC UI for login**Step 5** Log in to the iBMC WebUI.

- Log in as a local user.
  - a. Select the language to be used.
  - b. Enter the user name and password.

**NOTE**

- The system provides a default user of the administrator group. The default user name is **Administrator**, and the default password is **Admin@9000**.
  - If **Domain** is **This iBMC**, the maximum length of the user name is 20 characters.
  - If **Domain** is not **This iBMC**, the maximum length of the user name is 255 characters.
- c. Select **This iBMC** or **Automatic matching** from the **Domain** drop-down list.



d. Click **Log In**.

After the login is successful, the **Information** page is displayed. The user name is displayed in the upper right corner.

 **NOTE**

- The system may display a message indicating incorrect username or password when you attempt to log in using Internet Explorer after the system is upgraded. If this occurs, press **Ctrl+Shift+DEL** and click **Delete** to clear the browser cache. Then, attempt to log in again.
  - If the login still fails, choose **Tools > Internet Options > Advanced** in the menu bar and click **Reset** to restore default settings of Internet Explorer. Then attempt to log in again.
- Log in as a Lightweight Directory Access Protocol (LDAP) user.

**NOTICE**

Before login, ensure that the following settings meet the requirements:

- A domain controller exists on the network, and a user domain and Lightweight Directory Access Protocol (LDAP) users have been created on the domain controller.
- On the iBMC WebUI, the LDAP function has been enabled, and a user domain and LDAP users have been created. For details, see the **LDAP** page.

For details about how to create a domain controller, a user domain, and LDAP users, see domain controller documents. The iBMC provides only the access function for LDAP users.

- a. Select the language to be used.
- b. Enter the LDAP user name and password.

 **NOTE**

- If an LDAP user name is entered in **User Name**, **Domain** can be **Automatic matching** or a specified domain.
  - If *LDAP user name@Domain name* is entered, **Domain** must be **Automatic matching**.
  - In versions earlier than iBMC V294, the maximum password length for an LDAP user is 20 characters. In iBMC V294 and later versions, the maximum password length for an LDAP user is 255 characters.
- c. Select the LDAP user domain from the **Domain** drop-down list.

 **NOTE**

- Configured domain server: Select a domain server to log in as an LDAP user. The iBMC locates the user from the domain server.
- **Automatic matching:** If this option is selected, the iBMC searches for the user from the local user list first. If no match is found, the iBMC searches from the domain servers in the sequence displayed in the **Domain** drop-down list.

- d. Click **Log In**.

After the login is successful, the **Information** page is displayed. The user name is displayed in the upper right corner.

----End

## 9.3 Logging In to the Desktop of a Server

### 9.3.1 Using the Remote Virtual Console

#### 9.3.1.1 iBMC

##### Scenarios

Log in to the desktop of a server using the iBMC Remote Virtual Console.

##### Procedure

**Step 1** Log in to the iBMC WebUI.

For details, see [9.2 Logging In to the iBMC WebUI](#).

**Step 2** On the menu bar, choose **Remote Console**.

Figure 9-2 Remote Console page

**Remote Console**

**Integrated Remote Console**

The Java Integrated Remote Console requires Java Runtime Environment (JRE) to be installed. Click [here](#) to download JRE. [More information...](#)

[Java Integrated Remote Console \(Private\)](#)  
[Java Integrated Remote Console \(Shared\)](#)  
[HTML5 Integrated Remote Console \(Private\)](#)  
[HTML5 Integrated Remote Console \(Shared\)](#)

**Independent Remote Console**

With the Independent Remote Console (IRC), you can access and manage the server in real time. The IRC does not depend on the browser, OS, or JRE version. [Download](#).

**Remote Console Settings**

Timeout Period (min)	<input type="text" value="0"/>
Maximum Sessions	<input type="text" value="2"/>
Active Sessions	<input type="text" value="0"/>
Encryption	<input type="checkbox"/>
Enable Local KVM	<input type="checkbox"/>
Persistent Virtual Keyboard and Mouse	<input checked="" type="checkbox"/>

**Virtual Media**

Maximum Sessions	<input type="text" value="1"/>
Active Sessions	<input type="text" value="0"/>
Encryption	<input type="checkbox"/>

**VNC Service**

Timeout Period (min)	<input type="text" value="0"/>
Keyboard Layout	<input type="text" value="Japanese"/>
VNC Password	<input type="text"/>
Confirm Password	<input type="text"/>
Password Validity (Days)	<input type="text" value="Unlimited"/>
Login Rules	<input type="checkbox"/> Rule1 <input type="checkbox"/> Rule2 <input type="checkbox"/> Rule3 <a href="#">View login rules</a>
SSL Encryption	<input checked="" type="checkbox"/>
Maximum Sessions	<input type="text" value="5"/>
Active Sessions	<input type="text" value="0"/>

**Step 3** Click an Integrated Remote Console.**NOTE**

- **Java Integrated Remote Console (Private):** allows only one local user or VNC user to access and perform operations on the server through the iBMC.
- **Java Integrated Remote Console (Shared):** allows two local users or up to five VNC users to simultaneously access and perform operations on the server through the iBMC. Each user can view the operations performed by the other user.
- **HTML5 Integrated Remote Console (Private):** allows only one local user or VNC user to access and perform operations on the server through the iBMC.
- **HTML5 Integrated Remote Console (Shared):** allows two local users or up to five VNC users to simultaneously access and perform operations on the server through the iBMC. Each user can view the operations performed by the other user.
- HTML5 supports only Internet Explorer 10.0 and later versions.

**Figure 9-3** Remote console (Java)

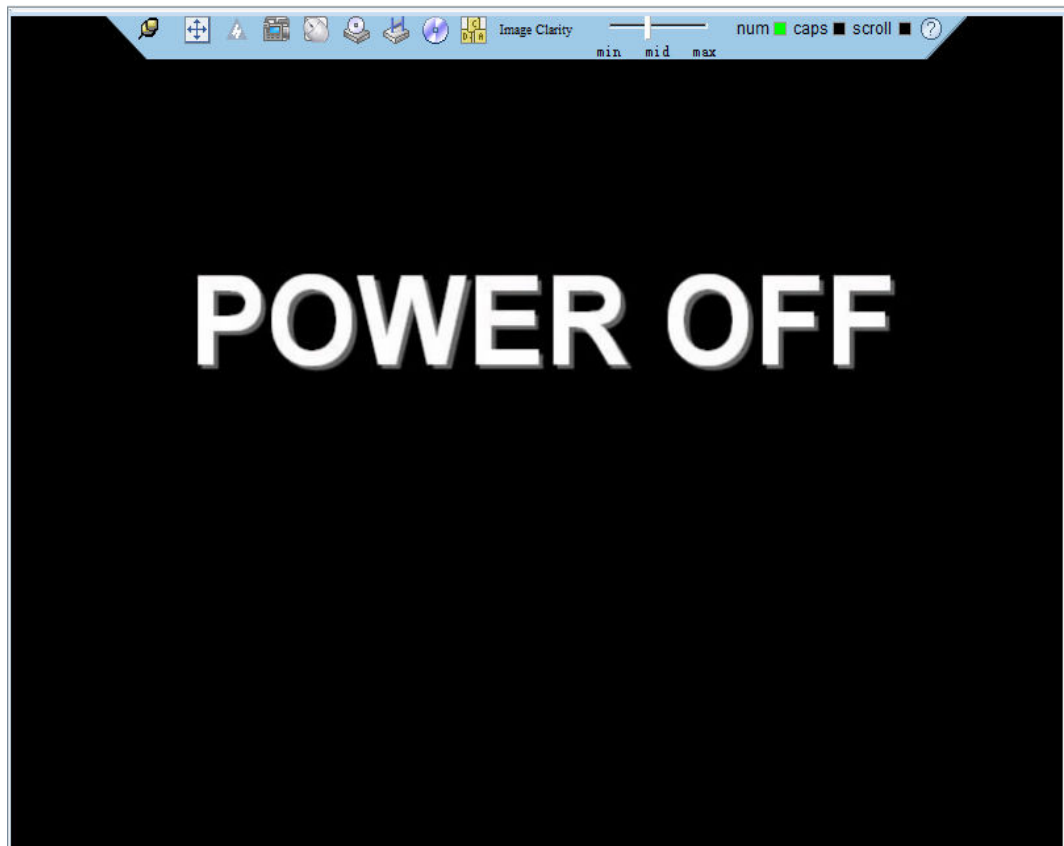
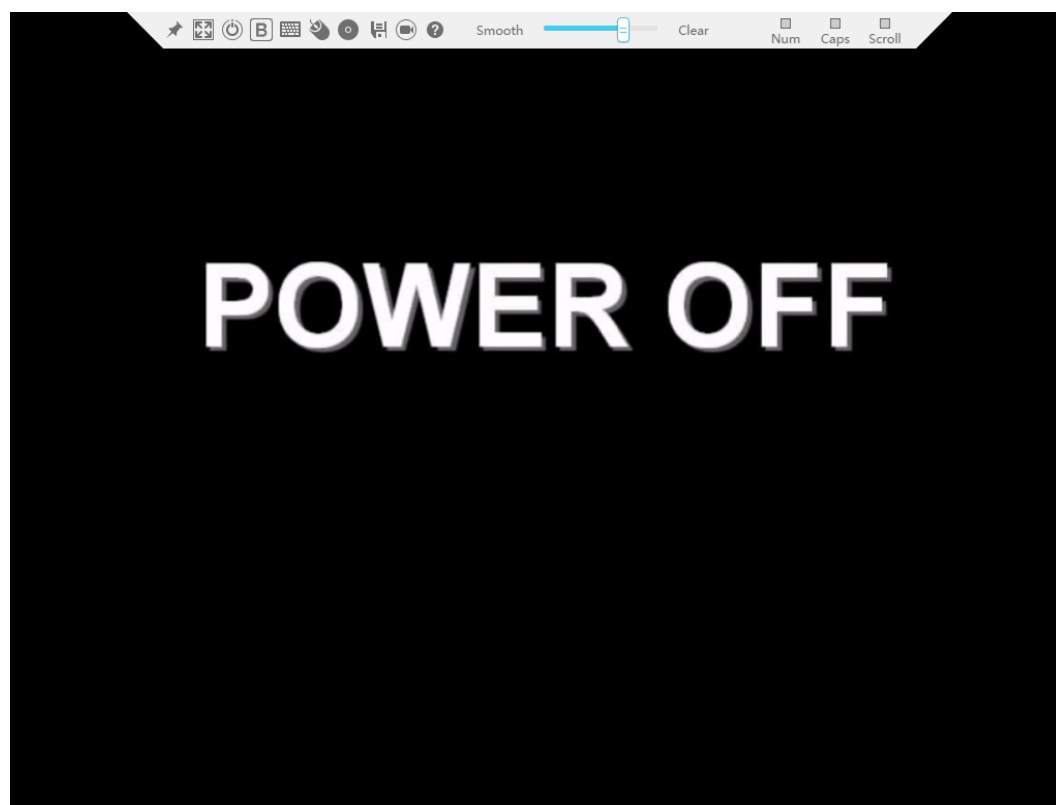


Figure 9-4 Remote console (HTML5)



----End

## 9.3.2 Using the Independent Remote Console

### Scenarios

Log in to the desktop of a server using the Independent Remote Console.

#### NOTE

When the client OS and iBMC versions are compatible with the Independent Remote Console, the Independent Remote Console provides easier operations than the Remote Virtual Console. You can download the Independent Remote Console (IRC) at [Independent Remote Console](#).

### 9.3.2.1 Windows

The following Windows versions are supported:

- Windows 7 32-bit or 64-bit
- Windows 8 32-bit or 64-bit
- Windows 10 32-bit or 64-bit
- Windows Server 2008 R2 32-bit or 64-bit
- Windows Server 2012 64-bit

## Procedure

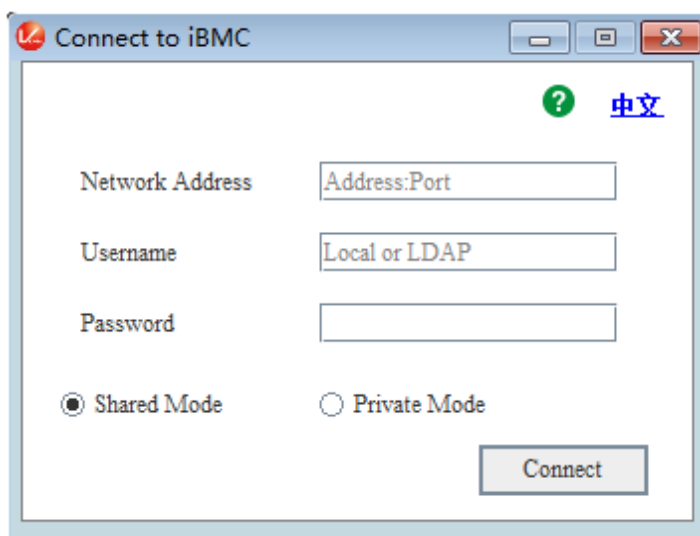
**Step 1** Configure an IP address for the client (PC) to enable communication between the client and the iBMC.

The IP address configured and the iBMC management network port IP address must be on the same network segment.

**Step 2** Double-click **KVM.exe**.

The **Connect to iBMC** dialog box is displayed.

**Figure 9-5** Connect to iBMC



**Step 3** Enter the network address, user name, and password.

### NOTE

- The network address can be in any of the following formats:
  - iBMC management network port IP address (IPv4 or IPv6 address):Port number  
Enter an IPv6 address in brackets or an IPv4 address directly, for example, **[2001::64]:444** or **192.168.100.1:444**.
  - iBMC domain name address:Port number
- When the port number is the default port number **443**, the port number can be left blank.

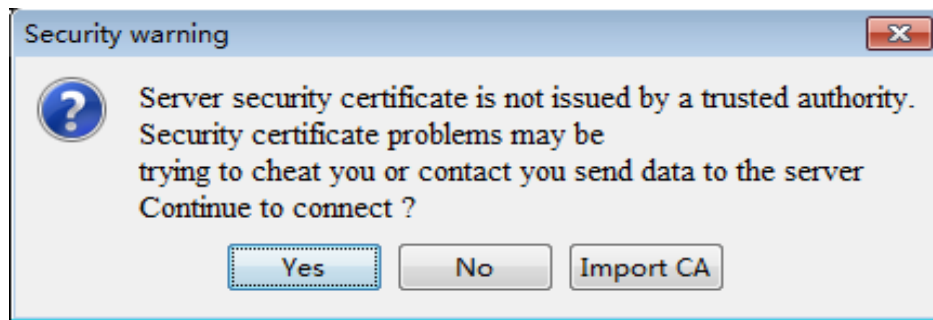
**Step 4** Select a login mode.

- **Shared Mode:** allows two users to access and manage a server at the same time. Each user can view the operations performed by the other user.
- **Private Mode:** allows only one user to access and manage a server at a time.

**Step 5** Click **Connect**.

A security warning is displayed.

**Figure 9-6** Security warning



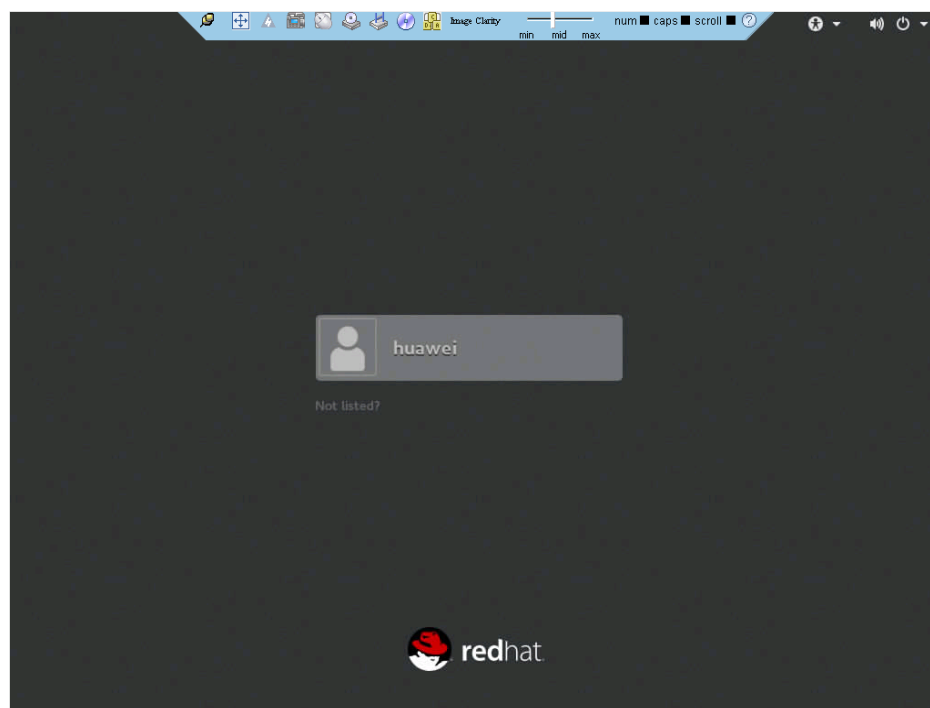
**Step 6** Click **Yes**.

**NOTE**

- Click **No** to return to the login interface.
- Click **Import CA** to import the CA certificate (\*.cer, \*.crt, or \*.pem). After the CA certificate is imported, the security risk dialog box will no longer be displayed.

The server desktop is displayed.

**Figure 9-7** Server desktop



----End

### 9.3.2.2 Ubuntu

The following Ubuntu versions are supported:

- Ubuntu 14.04 LTS
- Ubuntu 16.04 LTS

## Procedure

**Step 1** Configure an IP address for the client (PC) to enable communication between the client and the iBMC.

The IP address configured and the iBMC management network port IP address must be on the same network segment.

**Step 2** Open the console and set the folder where the IRC is stored as the working folder.

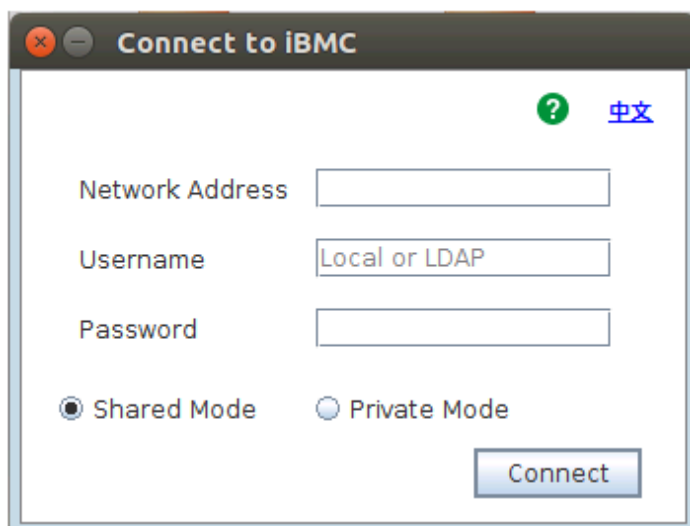
**Step 3** Run the **chmod 777 KVM.sh** command to set the permission for the Independent Remote Console.

**Step 4** Open the Independent Remote Console.

```
./KVM.sh
```

The **Connect to iBMC** dialog box is displayed.

**Figure 9-8** Connect to iBMC



**Step 5** Enter the network address, user name, and password.

### NOTE

- The network address can be in any of the following formats:
  - iBMC management network port IP address (IPv4 or IPv6 address):Port number  
Enter an IPv6 address in brackets or an IPv4 address directly, for example, **[2001::64]:444** or **192.168.100.1:444**.
  - iBMC domain name address:Port number
- When the port number is the default port number **443**, the port number can be left blank.

**Step 6** Select a login mode.

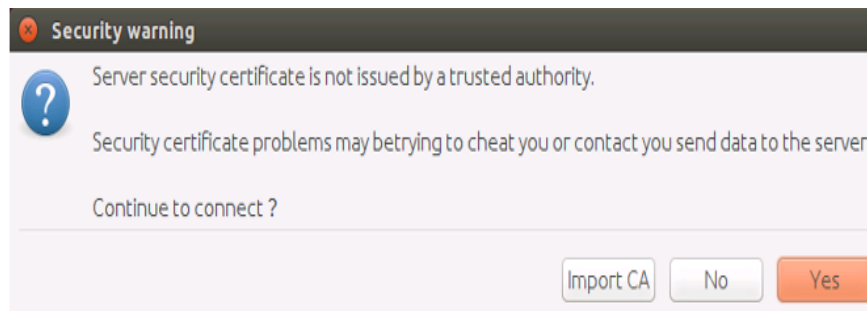
- **Shared Mode:** allows two users to access and manage a server at the same time. Each user can view the operations performed by the other user.
- **Private Mode:** allows only one user to access and manage a server at a time.

**Step 7** Click **Connect**.

A security warning is displayed.



**Figure 9-9** Security warning



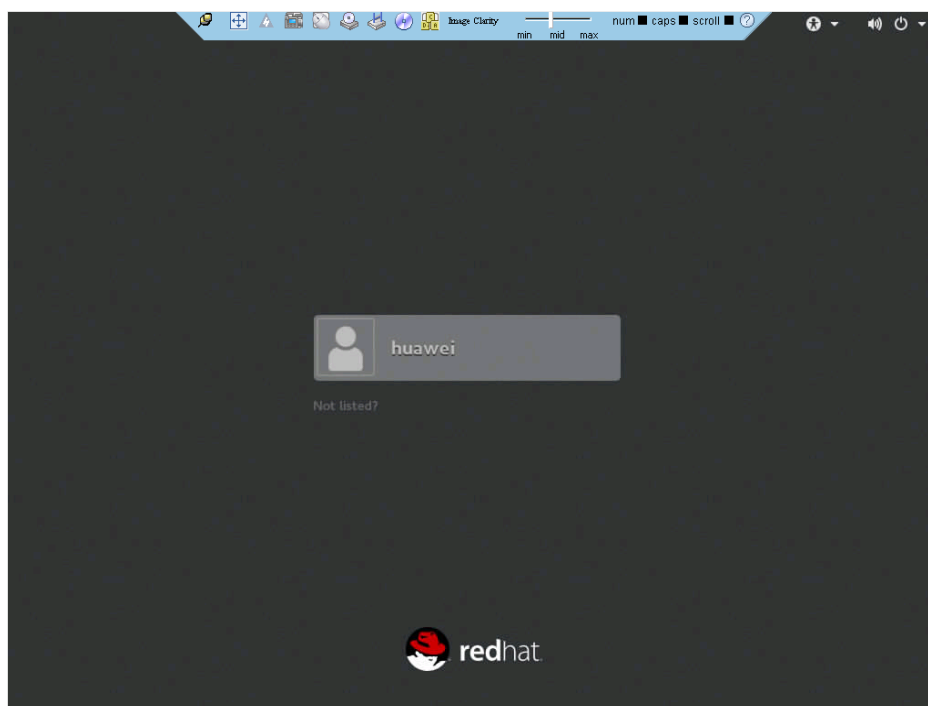
**Step 8** Click **Yes**.

**NOTE**

- Click **No** to return to the login interface.
- Click **Import CA** to import the CA certificate (\*.cer, \*.crt, or \*.pem). After the CA certificate is imported, the security risk dialog box will no longer be displayed.

The server desktop is displayed.

**Figure 9-10** Server desktop



----End

### 9.3.2.3 macOS

The following macOS version is supported:

- Mac OS X El Capitan

## Procedure

**Step 1** Configure an IP address for the client (PC) to enable communication between the client and the iBMC.

The IP address configured and the iBMC management network port IP address must be on the same network segment.

**Step 2** Open the console and set the folder where the IRC is stored as the working folder.

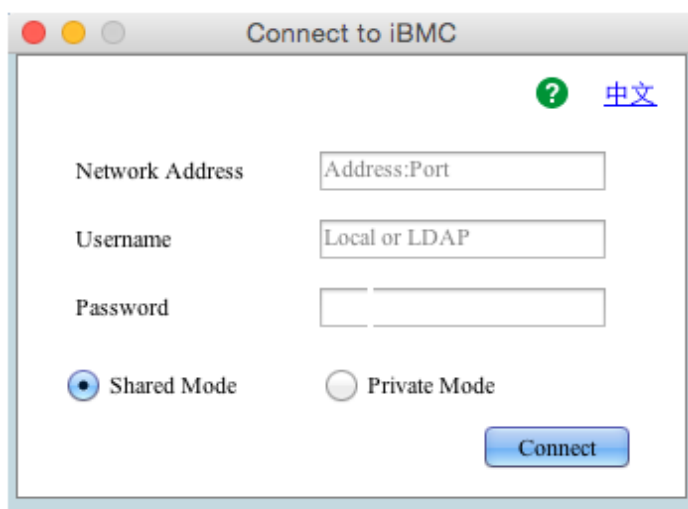
**Step 3** Run the **chmod 777 KVM.sh** command to set the permission for the Independent Remote Console.

**Step 4** Open the Independent Remote Console.

**./KVM.sh**

The **Connect to iBMC** dialog box is displayed.

**Figure 9-11** Connect to iBMC



**Step 5** Enter the network address, user name, and password.

### NOTE

- The network address can be in any of the following formats:
  - iBMC management network port IP address (IPv4 or IPv6 address):Port number  
Enter an IPv6 address in brackets or an IPv4 address directly, for example, **[2001::64]:444** or **192.168.100.1:444**.
  - iBMC domain name address:Port number
- When the port number is the default port number **443**, the port number can be left blank.

**Step 6** Select a login mode.

- **Shared Mode:** allows two users to access and manage a server at the same time. Each user can view the operations performed by the other user.
- **Private Mode:** allows only one user to access and manage a server at a time.

**Step 7** Click **Connect**.

A security warning is displayed.

**Figure 9-12** Security warning



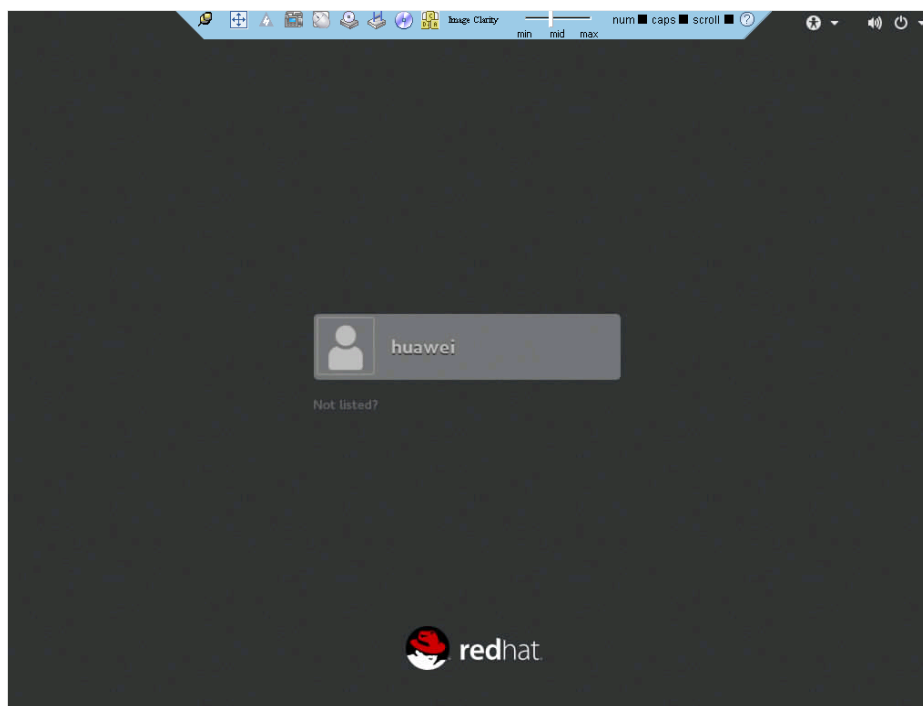
**Step 8** Click **Yes**.

**NOTE**

- Click **No** to return to the login interface.
- Click **Import CA** to import the CA certificate (\*.cer, \*.crt, or \*.pem). After the CA certificate is imported, the security risk dialog box will no longer be displayed.

The server desktop is displayed.

**Figure 9-13** Server desktop



----End

## 9.4 Logging In to the CLI

## 9.4.1 Logging In to the CLI Using PuTTY over a Network Port

### Scenarios

Use PuTTY to access a server over a local area network (LAN).

#### NOTE

- You can obtain the PuTTY software from the [chiark home page](#).
- You are advised to use PuTTY of the latest version. PuTTY of an earlier version may cause login failures.

### Procedure

**Step 1** Set an IP address and subnet mask or add route information for the PC to communicate with the server.

**Step 2** On the PC, double-click **PuTTY.exe**.

The **PuTTY Configuration** window is displayed.

**Step 3** In the navigation tree, choose **Connection > SSH**.

**Step 4** Set the login parameters.

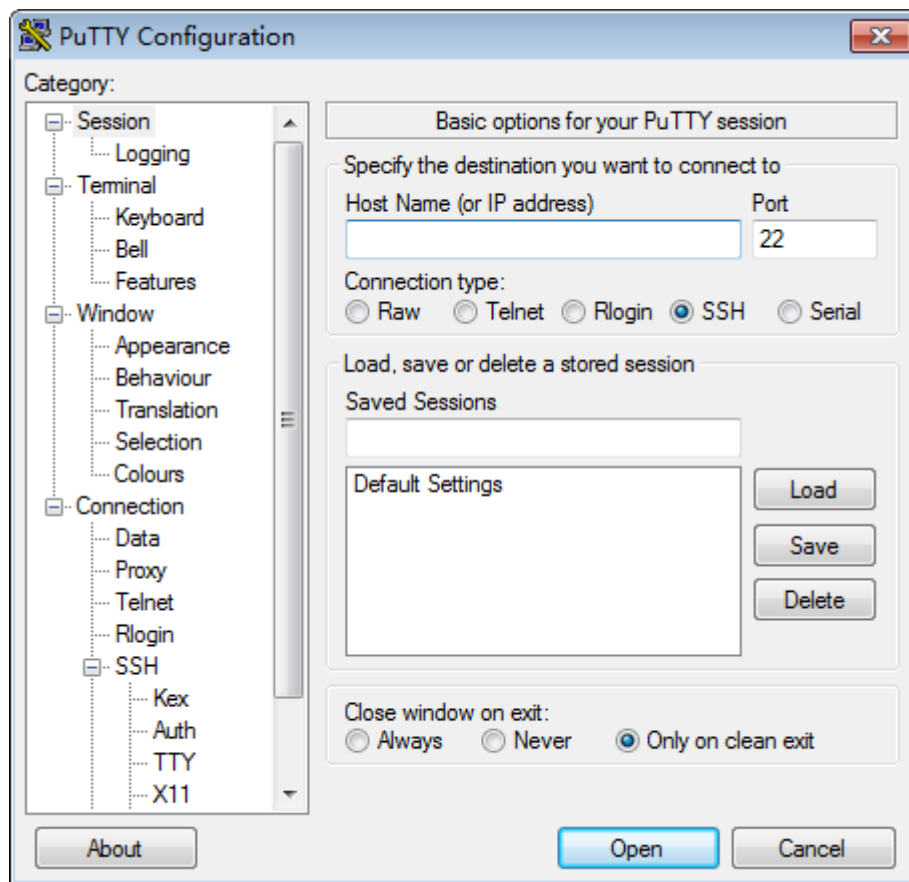
The parameters are described as follows:

- **Host Name (or IP address)**: Enter the IP address of the server to be accessed, for example, **191.100.34.32**.
- **Port**: Retain the default value **22**.
- **Connection type**: Retain the default value **SSH**.

**Step 5** In the navigation tree, choose **Session**.

**Step 6** Select **SSH** under **Connection type**.

**Figure 9-14** PuTTY Configuration



**Step 7** Set **Close window on exit** to **Only on clean exit**.

**NOTE**

Set **Saved Sessions** and click **Save**. You can double-click the saved record in **Saved Sessions** to log in to the server next time.

**Step 8** Click **Open**.

The **PuTTY** screen is displayed. Then the message "login as:" is displayed, prompting you to enter a user name.

**NOTE**

- If this is your first login to the server, the **PuTTY Security Alert** dialog box is displayed. Click **Yes** to proceed.
- If an incorrect user name or password is entered, you must set up a new PuTTY session.

**Step 9** Enter the user name and password.

If the login is successful, the server host name is displayed on the left of the prompt.

----End

## 9.4.2 Logging In to the CLI Using PuTTY over a Serial Port

### Scenarios

Use PuTTY to log in to a server over a serial port when:

- You want to perform initial configuration of the server.
- The server is inaccessible over a network port.

#### NOTE

- You can obtain the PuTTY software from the chiark home page.
- You are advised to use PuTTY of the latest version. PuTTY of an earlier version may cause login failures.

### Procedure

**Step 1** On the PC, double-click **PuTTY.exe**.

The **PuTTY Configuration** window is displayed.

**Step 2** In the navigation tree, choose **Connection > Serial**.

**Step 3** Set the login parameters.

The parameters are described as follows:

- Serial Line to connect to: COM $n$
- Speed (baud): 115200
- Data bits: 8
- Stop bits: 1
- Parity: None
- Flow control: None

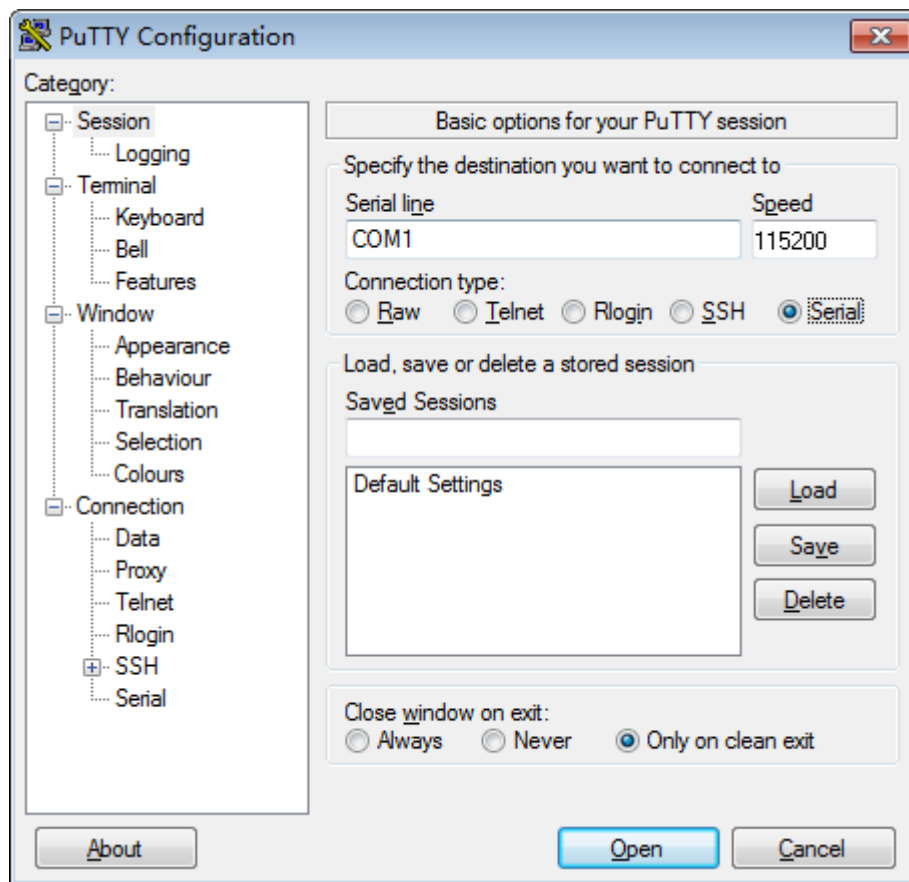
#### NOTE

$n$  in COM $n$  indicates a serial port number, and its value is an integer.

**Step 4** In the navigation tree, choose **Session**.

**Step 5** Select **Serial** under **Connection type**.

**Figure 9-15** PuTTY Configuration



**Step 6** Set **Close window on exit** to **Only on clean exit**.

**NOTE**

Set **Saved Sessions** and click **Save**. You can double-click the saved record in **Saved Sessions** to log in to the server next time.

**Step 7** Click **Open**.

The **PuTTY** screen is displayed. Then the message "login as:" is displayed, prompting you to enter a user name.

**NOTE**

If this is your first login to the server, the **PuTTY Security Alert** dialog box is displayed. Click **Yes** to proceed.

**Step 8** Enter the user name and password.

If the login is successful, the server host name is displayed on the left of the prompt.

----End

## 9.5 Managing VMD

The Intel Volume Management Device (VMD) is a module integrated in the processor on the Purley platform. It is used for surprise hot plug, management, and error processing of SSDs.

- To use the VMD function, the iBMC version must be V304 or later. Otherwise, the iBMC WebUI may fail to display NVMe drive information and the fan speed cannot be adjusted based on the NVMe drive temperature, affecting the heat dissipation of NVMe drives.
- The VMD function must be enabled on the BIOS in UEFI mode only. The BIOS in legacy mode does not support this setting.
- Use [Intelligent Computing Compatibility Checker](#) to obtain information about the operating systems supported by the VMD function.
- If the VMD function is enabled and the latest VMD driver is installed, the NVMe drives support surprise hot swap. If the VMD function is disabled, NVMe drives support orderly hot swap.

### 9.5.1 Enabling VMD

#### Procedure

**Step 1** Access the BIOS interface.

**Step 2** Choose **Advanced**.

**Step 3** Select **Socket Configuration** and press **Enter**.

**Step 4** Select **IIO Configuration** and press **Enter**.

**Step 5** Select **Intel(R) VMD Technology** and press **Enter**.

**Step 6** Select **Intel(R) VMD Config** and press **Enter**.

**Step 7** Select **Auto** and press **Enter**.

**Step 8** Press **F10**.

The **Save Changes&Exit** dialog box is displayed.

**Step 9** Select **Yes** and press **Enter**.

The server automatically restarts for the settings to take effect.

----End

### 9.5.2 Disabling VMD

#### Procedure

**Step 1** Access the BIOS interface.

**Step 2** Choose **Advanced**.



**Step 3** Select **Socket Configuration** and press **Enter**.

**Step 4** Select **IIO Configuration** and press **Enter**.

**Step 5** Select **Intel(R) VMD Technology** and press **Enter**.

**Step 6** Select **Intel(R) VMD Config** and press **Enter**.

**Step 7** Select **Disabled** and press **Enter**.

**Step 8** Press **F10**.

The **Save Changes&Exit** dialog box is displayed.

**Step 9** Select **Yes** and press **Enter**.

The server automatically restarts for the settings to take effect.

----End

## 9.6 Accessing the BIOS

### 9.6.1 Accessing the BIOS (V3XX or Earlier)

#### Procedure

**Step 1** Log in to the desktop of the server.

For details, see [9.3 Logging In to the Desktop of a Server](#).

**Step 2** On the Remote Virtual Console, click  on the menu bar.

**Step 3** Select **Reset** or **Forced System Reset**.

"Are you sure to perform this operation?" is displayed.

**Step 4** Click **Yes**.

The server is restarted.

**Step 5** During the restart, press **Delete** or **F4** when the information shown in [Figure 9-16](#) is displayed.

**Figure 9-16** BIOS startup screen

```
Loading EFI driver. It may take several minutes.

BIOS Version : 0.68
BIOS Build Date : 05/03/2018
Processor Type : Intel(R) Xeon(R) Gold 5117 CPU @ 2.00GHz
System Memory Speed : 2400 MHz
CPUID : 50654

BMC Version : 2.76
BMC IP : 192.168.2.100

After installing OS, remember to install drivers and upgrade firmware!

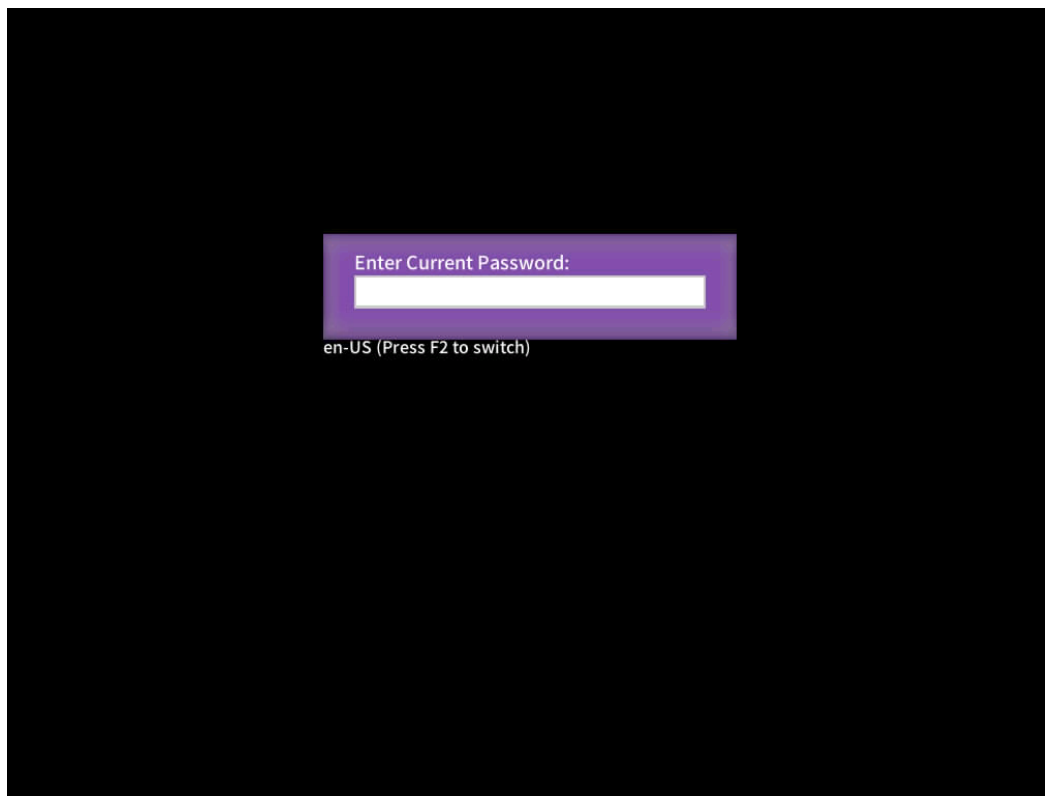
Press Del go to Setup Utility
Press F11 go to Front Page
Press F12 go to PXE
Press F3 go to Front Page on Remote Keyboard
Press F4 go to Setup Utility on Remote Keyboard
Press F6 go to SP Boot
Del is pressed. Go to Setup Utility.
```

 **NOTE**

- To go to the BIOS front page, press **F11** or **F3**.
- To boot from the network, press **F12**. Enter the password in the displayed dialog box.
- To access the Smart Provisioning GUI, press **F6**.

The screen for entering the BIOS password is displayed.

**Figure 9-17** Entering the BIOS password



**Step 6** Enter the BIOS password.

**NOTE**

- The default BIOS password is **Admin@9000**.
- Press **F2** to alternate between the English (US), French, and Japanese keyboards.
- For security purposes, change the administrator password periodically.
- The system will be locked if an incorrect password is entered three consecutive times. You can restart the server to unlock it.

The **Main** screen of the Setup Utility program is displayed.

----End

## 9.6.2 Accessing the BIOS (V6XX or Later)

### Procedure

**Step 1** Log in to the desktop of the server.

For details, see [9.3 Logging In to the Desktop of a Server](#).

**Step 2** On the Remote Virtual Console, click  on the menu bar.

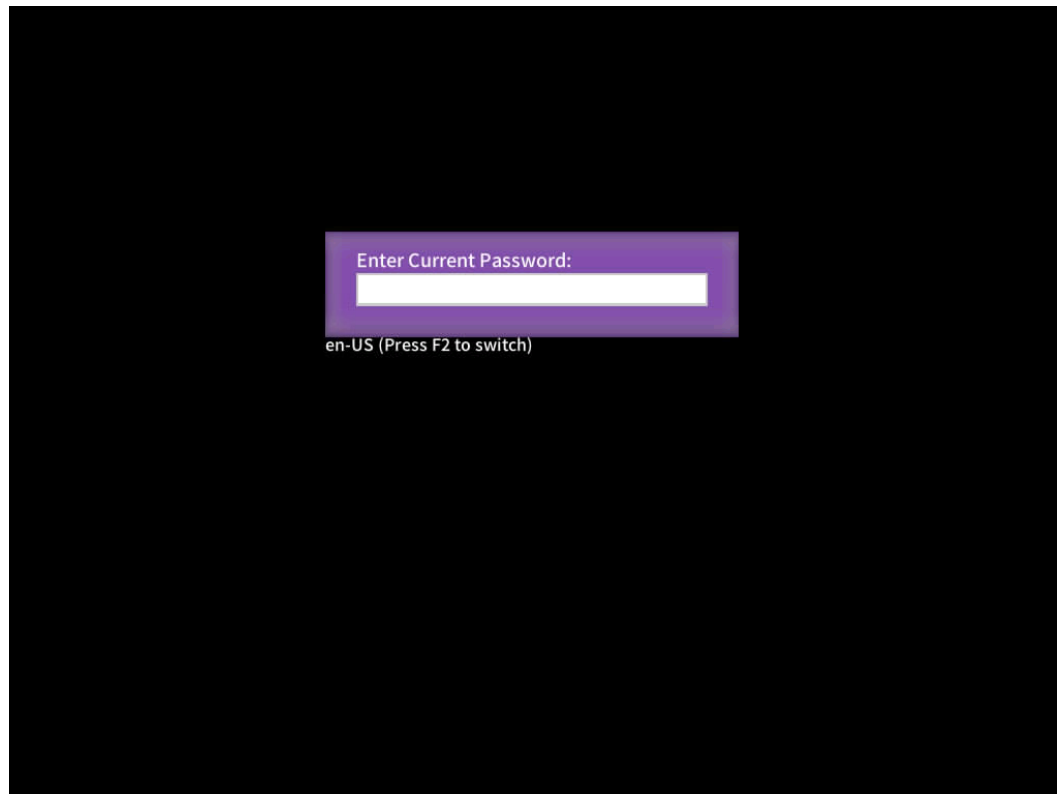
**Step 3** Select **Reset** or **Forced System Reset**.

"Are you sure to perform this operation?" is displayed.

**Step 4** Click **Yes**.



**Figure 9-19** Entering the BIOS password



**Step 6** Enter the BIOS password.

**NOTE**

- The default BIOS password is **Admin@9000**.
- Press **F2** to alternate between the English (US), French, and Japanese keyboards.
- Use the mouse to open the on-screen keyboard and enter the password.
- For security purposes, change the administrator password periodically.
- The system will be locked if an incorrect password is entered three consecutive times. You can restart the server to unlock it.

The **Front Page** screen is displayed.

**Step 7** Select **BIOS Configuration** by pressing arrow keys.

The **Main** screen is displayed.

----End

## 9.7 Clearing Data from a Storage Device

### Scenarios

Use the Linux **badblocks** command to clear data on a storage device. Parameters are specified to overwrite data on the storage device.

The following describes how to clear the data on one HDD/SSD as an example. This operation is for reference only. You can also use other methods to clear data from storage media.

**NOTICE**

The cleared data cannot be restored. Exercise caution when performing this operation.

## Procedure

 **NOTE**

Before performing this operation, check that:

- The storage device is not in a RAID array with redundancy, and the server operating system is running properly.
- You have obtained the server No. and the slot No. and location of the storage device to be cleared.

**Step 1** You have accessed the desktop of the server where the target drive is located.

For details, see [9.3.1 Using the Remote Virtual Console](#).

**Step 2** Open the CLI.

**Step 3** Query information about drive letters.

**lsscsi**

**Figure 9-20** Querying drive letters

```
Linux-hm54:~ # lsscsi
[0:0:0:0]    disk    SEAGATE  ST900MM0006    B001  /dev/sda
[0:0:1:0]    disk    SEAGATE  ST900MM0006    B001  /dev/sdb
```

**Step 4** Query drive information.

**fdisk -l**

 **NOTE**

- The drive with the \* symbol in the **Boot** column is the system drive. As shown in [Figure 9-21](#), **sda** is the system drive.
- Do not directly clear system drive data. Before clearing system drive data, clear data from other storage media.

**Figure 9-21** Querying drive information

```
Linux-hm54:~ # fdisk -l
Disk /dev/sda: 900.2 GB, 900185481216 bytes
255 heads, 63 sectors/track, 109441 cylinders, total 1758174768 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x000181d2

   Device | Boot | Start      | End          | Blocks    | Id  | System
---+---+---+---+---+---+---
  /dev/sda1 | *   |      2048   |      8386559 |    4192256 | 82  | Linux swap / Solaris
  /dev/sda2 |     |  8386560   | 1758173183   | 874893312 | 83  | Linux

Disk /dev/sdb: 900.2 GB, 900185481216 bytes
255 heads, 63 sectors/track, 109441 cylinders, total 1758174768 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000

Disk /dev/sdb doesn't contain a valid partition table
```

**Step 5** Write all 0s to the drive to be cleared.

Command: **badblocks -swft 0 Drive letter**

Example: **badblocks -swft 0 /dev/sdb**

**Figure 9-22** Clearing data (example)

```
Linux-hm54:~ # badblocks -swft 0 /dev/sdb
Testing with pattern 0x00: █26.38% done, 19:40 elapsed
```

**NOTE**

- The drive letters vary with the storage media (HDD, SSD, and USB flash drive). Ensure that the drive letter that you entered is correct.
- This operation takes time.
- If the command fails to execute, contact technical support.

**Step 6** Remove the drive.

**NOTE**

After the data is cleared, do not restart or reinstall the server. Otherwise, the system will reload data to the drives during the startup of the server.

----End

# 10 More Information

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- [10.1 Technical Support](#)
- [10.2 Product Information](#)
- [10.3 Product Configuration Resources](#)
- [10.4 Maintenance Tools](#)

## 10.1 Technical Support

Huawei provides timely and efficient technical support through:

- Local branch offices
- Secondary technical support system
- Telephone technical support
- Remote technical support
- Onsite technical support

### Technical Support Website

Technical documents are available at:

- [Huawei enterprise website](#)
- [Huawei Carrier Product and Service website](#)

### Self-Service Platform and Community

Learn more about servers and communicate with experts at:

- [Computing Product Information Service Platform](#) for specific server product documentation.
- [Huawei Enterprise iKnow](#) for Q&A about products.
- [Huawei Enterprise Support Community \(Servers\)](#) for learning and discussion.



## News

For notices about product life cycles, warnings, and rectifications, visit [Support > Bulletins > Product Bulletins](#).

## Cases

To learn server applications, visit [Intelligent Computing Case Library](#).

## Contact Huawei

Huawei provides comprehensive technical support and services. To obtain assistance, contact Huawei technical support as follows:

- Contact Huawei customer service center.  
**Enterprise customers in China:**
  - Call 400-822-9999
  - Send emails to [support\\_e@huawei.com](mailto:support_e@huawei.com).  
Enterprise customers outside China: visit [Global Service Hotline](#).**Telecom carriers in China:**
  - Call 400-830-2118
  - Send emails to [support@huawei.com](mailto:support@huawei.com).  
Telecom carriers outside China: visit [Global TAC Information](#).
- Contact the technical support personnel of your local Huawei office.

## 10.2 Product Information

[Table 10-1](#) provides common information about Huawei servers.

**Table 10-1** Product information

Item	Description	How to Obtain
Server product documentation	Server user guide, which provides information about the structure, specifications, and installation of the server.	Visit <a href="#">Support &gt; Intelligent Servers</a> , select a product model, and view the <b>Documentation</b> tab page.
Intelligent Computing Compatibility Checker	A tool used to query the OSs, parts, and peripherals compatible with a server.	<a href="#">Intelligent Computing Compatibility Checker</a>
Maintenance Information Inquiry System	A system used to query the service information about servers.	Visit <a href="#">Maintenance Information Inquiry</a> .

Item	Description	How to Obtain
Intelligent Computing Product Power Calculator	A tool used to calculate server power consumption based on the server configuration.	<a href="#">Intelligent Computing Product Power Calculator</a>

## 10.3 Product Configuration Resources

**Table 10-2** describes the common product configuration resources of Huawei servers.

**Table 10-2** Product configuration resources

Resource	Description	How to Obtain
Removal and installation videos	The videos show you how to remove and install hardware.	<a href="#">Intelligent Computing Product Hardware Installation Multimedia</a>
Intelligent Computing Product Memory Configuration Assistant	An online application that helps you configure memory modules for an intelligent computing product. The DIMM installation sequence in a graphical manner will be displayed after the product name, CPU quantity, and DIMM quantity are specified.	<a href="#">Intelligent Computing Product Memory Configuration Assistant</a>

## 10.4 Maintenance Tools

**Table 10-3** lists the software tools required for routine maintenance of Huawei servers.

**Table 10-3** Software tools for routine maintenance

Tool	Server Model and Software Version	Description
FusionServer Tools SmartKit	For details, see <a href="#">FusionServer Tools 2.0 SmartKit User Guide</a> .	SmartKit contains tools used for batch deployment, maintenance, and upgrade of servers.  Download link: <a href="#">FusionServer Tools</a>

Tool	Server Model and Software Version	Description
Smart Provisioning	For details, see <a href="#">Smart Provisioning User Guide</a> .	Smart Provisioning installs OSs, configures RAID, and upgrades firmware. Download link: <a href="#">Smart Provisioning</a>

# 11 Software and Configuration Utilities

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## 11.1 iBMC

### 11.2 BIOS

## 11.1 iBMC

Huawei intelligent Baseboard Management Controller (iBMC) is a Huawei proprietary intelligent system for remotely managing a server. The iBMC complies with IPMI 2.0 and SNMP standards and supports various functions, including KVM redirection, text console redirection, remote virtual media, and hardware monitoring and management.

The iBMC provides the following features:

- Multiple management interfaces for system integration  
The iBMC provides IPMI, command-line interface (CLI), Data Center Manageability Interface (DCMI), Redfish interfaces, Hypertext Transfer Protocol Secure (HTTPS), and SNMP.
- Fault detection and alarm management  
The iBMC implements fault detection and alarm management, ensuring stable, uninterrupted 24/7 system operation.
- Virtual KVM and virtual media  
The iBMC provides virtual KVM and virtual media, facilitating remote maintenance.
- Web-based user interface (WebUI)  
The iBMC provides a web-based UI for setting and querying device information.
- System breakdown screenshots and video playback  
The iBMC allows screenshots and videos to be created when the system breaks down. The screenshots and videos help to identify the cause of system breakdown.
- Screen snapshots and videos  
The iBMC offers screen snapshots and videos, which simplify routine preventive maintenance, recording, and auditing.

- Support for DNS and LDAP  
The iBMC supports domain name system (DNS) and Lightweight Directory Application Protocol (LDAP) to implement domain management and directory service.
- Image backup  
The iBMC works in active/standby mode to ensure system reliability. If the active iBMC is faulty, the standby iBMC takes over services immediately.
- Intelligent power management  
The iBMC uses dynamic power saving to reduce operational expenditure (OPEX).

For details about the iBMC, see [FusionServer Pro Rack Server iBMC User Guide](#).

## 11.2 BIOS

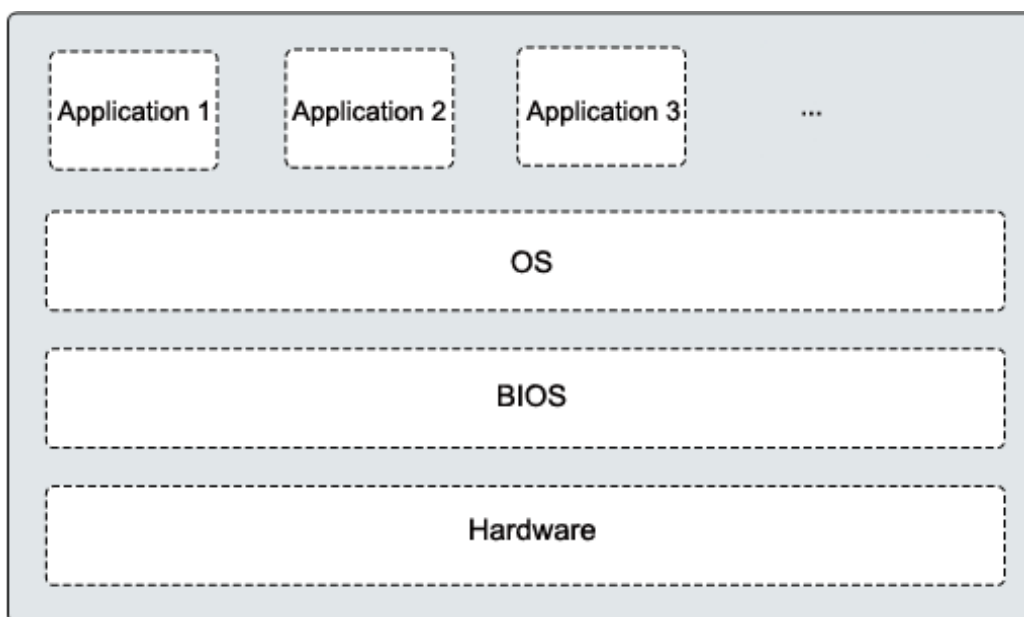
The basic input/output system (BIOS) is the most basic software loaded to a computer hardware system. The BIOS provides an abstraction layer for the operating system (OS) and the hardware to interact with the keyboard, display, and other input/output (I/O) devices.

The BIOS data is stored on the Serial Peripheral Interface (SPI) flash memory. The BIOS performs a power-on self-test (POST), initializes CPU and memory, checks the I/O and boot device, and finally boots the OS. The BIOS also provides the advanced configuration and power interface (ACPI) and hot swap.

The Huawei Purley-based server is developed based on Insyde code base and uses a proprietary BIOS. It provides a variety of in-band and out-of-band configuration functions as well as high scalability, and supports customization.

For details about the BIOS, see [Huawei Server Purley Platform BIOS Parameter Reference](#).

**Figure 11-1** BIOS in the system



# A Appendix

## A.1 Product SN

The serial number (SN) on the slide-out label plate uniquely identifies a device. The SN is required when you contact Huawei technical support.

Figure A-1 SN example



Table A-1 SN description

Callout No.	Description
1	SN ID (two characters), which is <b>21</b> .
2	Material identification code (8 characters), that is, the processing code.
3	Vendor code (two characters). <b>10</b> indicates Huawei, and other values indicate outsourcing vendors.

Callout No.	Description
4	<p>Year and month (two characters).</p> <ul style="list-style-type: none"> <li>The first character indicates the year. <ul style="list-style-type: none"> <li>Digits 1 to 9 indicate years 2001 to 2009, respectively.</li> <li>Letters A to H indicate years 2010 to 2017, respectively.</li> <li>Letters J to N indicate years 2018 to 2022, respectively.</li> <li>Letters P to Y indicate years 2023 to 2032, respectively.</li> </ul> </li> </ul> <p><b>NOTE</b> The years from 2010 are represented by uppercase letters excluding I, O, and Z because the three letters are similar to digits 1, 0, and 2.</p> <ul style="list-style-type: none"> <li>The second character indicates the month. <ul style="list-style-type: none"> <li>Digits 1 to 9 indicate January to September, respectively.</li> <li>Letters A to C indicate October to December, respectively.</li> </ul> </li> </ul>
5	Sequence number (six characters).
6	RoHS compliance (one character). Y indicates RoHS compliant.
7	Internal model, that is, product name.

## A.2 Operating Temperature Limitations

Table A-2 Operating temperature limitations

Configuration	Max. 35°C (95°F)	Max. 40°C (104°F)	Max. 45°C (113°F)
4 x 3.5" drive configuration	<ul style="list-style-type: none"> <li>All options supported</li> </ul>	<p>Options not supported:</p> <ul style="list-style-type: none"> <li>Platinum 8180/8168/8280/8280L/8280M/8268 and Gold 6154/6254 processors</li> <li>PCIe SSD cards</li> <li>NVMe drives</li> <li>Passive GPU cards</li> </ul>	<p>Options supported:</p> <ul style="list-style-type: none"> <li>Platinum 8153, Gold 6152/6140/6126/5118/5215, Silver 4216/4215/4214, and other processors lower than 105 W</li> </ul> <p>Options not supported:</p> <ul style="list-style-type: none"> <li>PCIe SSD cards</li> <li>NVMe drives</li> <li>Passive GPU cards</li> <li>IB and OPA cards</li> </ul>

Configuration	Max. 35°C (95°F)	Max. 40°C (104°F)	Max. 45°C (113°F)
8 x 2.5" drive configuration	<ul style="list-style-type: none"> <li>All options supported</li> </ul>	Options not supported: <ul style="list-style-type: none"> <li>Platinum 8180/8168/8280/8280L/8280M/8268 and Gold 6154/6254 processors</li> <li>PCIe SSD cards</li> <li>NVMe drives</li> <li>Passive GPU cards</li> </ul>	Options supported: <ul style="list-style-type: none"> <li>Platinum 8153, Gold 6152/6140/6126/5118/5215, Silver 4216/4215/4214, and other processors lower than 105 W</li> </ul> Options not supported: <ul style="list-style-type: none"> <li>PCIe SSD cards</li> <li>NVMe drives</li> <li>Passive GPU cards</li> <li>IB and OPA cards</li> </ul>
10 x 2.5" drive configuration	<ul style="list-style-type: none"> <li>SP351-BC51IBMB-IB cards supported</li> </ul>	<ul style="list-style-type: none"> <li>Not supported</li> </ul>	<ul style="list-style-type: none"> <li>Not supported</li> </ul>

 **NOTE**

- When a single fan is faulty:
  - The maximum operating temperature is 5°C (41°F) lower than the rated value.
  - System performance will be affected if GPU cards are configured.
- If the server is configured with ten 2.5-inch drives and SP351-BC51IBMB-IB cards, the maximum operating temperature supported is 30°C (86°F).

### A.3 Nameplate

Certified Model	Usage Restrictions
H12H-05	Global
H12H-05-I10	India only
H12H-05-I12	India only



## A.4 RAS Features

The server supports a variety of Reliability, Availability, and Serviceability (RAS) features. You can configure these features for better RAS.

For details about how to configure RAS features, see [Huawei Server Purley Platform BIOS Parameter Reference](#).

**Table A-3** RAS features

Module	Feature	Description
CPU	Corrected Machine Check Interrupt	Corrects error-triggered interruption.
DIMM	Failed DIMM Isolation	Identifies a faulty DIMM and isolates it from others before it is replaced.
	Memory Thermal Throttling	Automatically adjusts DIMM temperatures to avoid damage due to overheating.
	Rank Sparing	Allocates some memory ranks as backup ranks to prevent the system from crashing due to uncorrectable errors.
	Memory Address Parity Protection	Detects memory command and address errors.
	Memory Demand and Patrol Scrubbing	Corrects errors upon detection. If these errors are not corrected promptly, uncorrectable errors may occur.
	Memory Mirroring	Improves system reliability.
	Single Device Data Correction	Provides a single-device multi-bit error correction capability to improve memory reliability.
	Device Tagging	Degrades and rectifies DIMM device faults to improve DIMM availability.
	Data Scrambling	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.
PCIe	PCIe Advanced Error Reporting	Improves server serviceability.
UPI	Intel UPI Link Level Retry	Provides a retry mechanism upon errors to improve UPI reliability.

Module	Feature	Description
	Intel UPI Protocol Protection via CRC	Provides cyclic redundancy check (CRC) protection for UPI packets to improve system reliability.
System	Core Disable for Fault Resilient Boot (FRB)	Isolates a faulty CPU core during startup to improve system reliability and availability.
	Corrupt Data Containment Mode	Identifies the memory storage unit that contains corrupted data to minimize the impact on the running programs and improve system reliability.
	Socket disable for Fault Resilient Boot (FRB)	Isolates a faulty socket during the BIOS startup process to improve system reliability.
	Architected Error Records	With the enhanced machine check architecture (eMCA) feature, the BIOS collects error information from hardware registers in compliance with UEFI specifications, sends the error information to the OS over the APEI of the Advanced Configuration and Power Interface (ACPI), and locates the error unit, improving system availability.
	Error Injection Support	Injects errors to verify various RAS features.
	Machine Check Architecture	Provides software recovery for uncorrectable errors to improve system availability.
	eMCA: Gen2	Improves system availability.
	OOB access to MCA registers	The OBB system accesses MCA registers by using the Platform Environment Control Interface (PECI). If a fatal error occurs in the system, the out-of-band system collects onsite data to facilitate fault analysis and locating and improve system serviceability.
	BIOS Abstraction Layer for Error Handling	The BIOS processes errors and reports the error information to the OS and the server in compliance with specifications to improve system serviceability.

Module	Feature	Description
	BIOS-based Predictive Failure Analysis (PFA)	The BIOS provides physical unit information for DIMM errors, and the OS traces and predicts errors, and isolates error memory pages.

## A.5 Sensor List

Sensor	Description	Component
Inlet Temp	Air inlet temperature	Left mounting ear
Outlet Temp	Air outlet temperature	Mainboard
PCH Temp	PCH bridge temperature	Mainboard
CPU $N$ Core Rem	CPU core temperature	CPU $N$ $N$ indicates the CPU number. The value is <b>1</b> or <b>2</b> .
CPU $N$ DTS	CPU DTS value	CPU $N$ $N$ indicates the CPU number. The value is <b>1</b> or <b>2</b> .
CPU $N$ Margin	CPU Margin	CPU $N$ $N$ indicates the CPU number. The value is <b>1</b> or <b>2</b> .
CPU $N$ VDDQ Temp	CPU VDDQ temperature	Mainboard $N$ indicates the CPU number. The value is <b>1</b> or <b>2</b> .
CPU $N$ VRD Temp	CPU VRD temperature	Mainboard $N$ indicates the CPU number. The value is <b>1</b> or <b>2</b> .
CPU $N$ MEM Temp	CPU DIMM temperature	DIMMs of CPU $N$ $N$ indicates the CPU number. The value is <b>1</b> or <b>2</b> .
SYS 3.3V	Mainboard 3.3 V voltage	Mainboard
SYS 5V	Mainboard 5.0 V voltage	Mainboard

Sensor	Description	Component
SYS 12V_1	Mainboard 12.0 V voltage	Mainboard
SYS 12V_2	Mainboard 12.0 V voltage	Mainboard
CPU $N$ VCore	1.8 V CPU voltage	Mainboard $N$ indicates the CPU number. The value is <b>1</b> or <b>2</b> .
CPU $N$ DDR VDDQ	1.2 V DIMM voltage	Mainboard $N$ indicates the CPU number. The value is <b>1</b> or <b>2</b> .
CPU $N$ DDR VDDQ2	1.2 V DIMM voltage	Mainboard $N$ indicates the CPU number. The value is <b>1</b> or <b>2</b> .
CPU $N$ VSA	CPU VSA voltage	Mainboard $N$ indicates the CPU number. The value is <b>1</b> or <b>2</b> .
CPU $N$ VCCIO	CPU VCCIO voltage	Mainboard $N$ indicates the CPU number. The value is <b>1</b> or <b>2</b> .
CPU $N$ VMCP	CPU VMCP voltage	Mainboard $N$ indicates the CPU number. The value is <b>1</b> or <b>2</b> .
PCH VPVNN	PCH VPVNN voltage	Mainboard
PCH PRIM 1V05	PCH PRIM voltage	Mainboard
CPU $N$ VCCP	CPU VCCP voltage	Mainboard $N$ indicates the CPU number. The value is <b>1</b> or <b>2</b> .
CPU $N$ DDR VPP1	VPP_ABC voltage	Mainboard $N$ indicates the CPU number. The value is <b>1</b> or <b>2</b> .

Sensor	Description	Component
CPU/ <i>N</i> DDR VPP2	VPP_DEF voltage	Mainboard <i>N</i> indicates the CPU number. The value is <b>1</b> or <b>2</b> .
FAN/ <i>N</i> F Speed	Fan speed	Fan module <i>N</i> <i>N</i> indicates the fan module number. The value ranges from <b>1</b> to <b>7</b> .
FAN/ <i>N</i> R Speed		
Power	Server input power	PSU
PS/ <i>N</i> VIN	Input voltage	PSU/ <i>N</i> <i>N</i> indicates the PSU number. The value is <b>1</b> or <b>2</b> .
Disks Temp	Drive maximum temperature	Drive
RAID Temp	RAID controller card temperature	RAID controller card
Power/ <i>N</i>	PSU input power	PSU/ <i>N</i> <i>N</i> indicates the PSU number. The value is <b>1</b> or <b>2</b> .
PCH Status	PCH chip fault diagnosis health status	Mainboard
CPU/ <i>N</i> QPI Link	CPU QPI link fault diagnosis health status	Mainboard or CPU/ <i>N</i> <i>N</i> indicates the CPU number. The value is <b>1</b> or <b>2</b> .
CPU/ <i>N</i> Prochot	CPU Prochot	CPU/ <i>N</i> <i>N</i> indicates the CPU number. The value is <b>1</b> or <b>2</b> .
CPU/ <i>N</i> Status	CPU status	CPU/ <i>N</i> <i>N</i> indicates the CPU number. The value is <b>1</b> or <b>2</b> .
CPU/ <i>N</i> Memory	DIMM status	DIMMs of CPU <i>N</i> <i>N</i> indicates the CPU number. The value is <b>1</b> or <b>2</b> .
FAN/ <i>N</i> F Status	Fan status	Fan module <i>N</i>

Sensor	Description	Component
FAN/N R Status	Fan status	N indicates the fan module number. The value ranges from <b>1</b> to <b>7</b> .
DIMM/N	DIMM status	DIMM/N N indicates the DIMM slot number.
RTC Battery	RTC battery status. An alarm is generated when the voltage is lower than 1 V.	RTC battery
PCIE Status	PCle status	PCle card
Power Button	Power button pressed state	Mainboard and power button
Watchdog2	Watchdog	Mainboard
Mngmnt Health	Management subsystem health status	Management module
UID Button	UID button status	Mainboard
PwrOk Sig. Drop	Voltage drop status	Mainboard
PwrOn TimeOut	Power-on timeout	Mainboard
PwrCap Status	Power capping status	Mainboard
HDD Backplane	Entity presence	Drive backplane
HDD BP Status	Drive backplane health status	Drive backplane
Riser/N Card	Entity presence	Riser card N N indicates the riser card number. The value is <b>1</b> or <b>2</b> .
FAN/N F Presence	Fan presence	Fan module N N indicates the fan module number. The value ranges from <b>1</b> to <b>7</b> .
FAN/N R Presence	Fan presence	
RAID Presence	RAID controller card presence	RAID controller card
PS Redundancy	Redundancy failure due to PSU removal	PSU
RAID Status	RAID controller card health status	RAID controller card

Sensor	Description	Component
RAID PCIE ERR	RAID controller card fault diagnosis health status	RAID controller card
RAID Card BBU	LSI SAS3106 RAID controller card BBU	BBU supercapacitor of RAID controller card
NIC# Status	NIC fault diagnosis health status	LOM port
Port# Link Down	Network port link state	LOM port
PS $N$ Status	PSU status	PSU $N$ $N$ indicates the PSU number. The value is <b>1</b> or <b>2</b> .
PS $N$ Fan Status	PSU fan status	
PS $N$ Temp Status	PSU presence	
DISK $N$	Drive status	Drive $N$ $N$ indicates the drive slot number. The value ranges from <b>0</b> to <b>9</b> .
LOM P1 Link Down	LOM	LOM
LOM P2 Link Down	LOM	LOM
LOM P3 Link Down	LOM	LOM
LOM P4 Link Down	LOM	LOM
PCle RAID\$ Temp	PCle RAID controller card temperature	PCle RAID controller card
M2 Temp(PCle\$)	Maximum temperature of all M.2 drives of the RAID controller card	PCle RAID controller card
PCle\$ OP Temp	PCle card optical module temperature	PCle card
PCle NIC\$ Temp	PCle card chip temperature	PCle card
PCle FC\$ Temp	PCle card chip temperature	PCle card
SM380 Temp	25GENIC chip temperature	PCle card
PS\$ Inlet Temp	PSU air inlet temperature	PSU
NIC\$ Presence	LOM presence	FlexIO

# B Glossary

## B.1 A-E

### B

<b>baseboard management controller (BMC)</b>	The BMC complies with the Intelligent Platform Management Interface (IPMI). It collects, processes, and stores sensor signals, and monitors the operating status of components. The BMC provides the hardware status and alarm information about the managed objects to the upper-level management system, so that the management system can manage the objects.
--	--

### E

<b>ejector lever</b>	A part on the panel of a device used to facilitate installation or removal of the device.
<b>Ethernet</b>	A baseband local area network (LAN) architecture developed by Xerox Corporation by partnering with Intel and DEC. Ethernet uses the Carrier Sense Multiple Access/Collision Detection (CSMA/CD) access method and allows data transfer over various cables at 10 Mbit/s. The Ethernet specification is the basis for the IEEE 802.3 standard.



## B.2 F-J

### G

<b>Gigabit Ethernet (GE)</b>	An extension and enhancement of traditional shared media Ethernet standards. It is compatible with 10M and 100M Ethernet and complies with IEEE 802.3z standards.
------------------------------	---

### H

<b>hot swap</b>	Replacing or adding components without stopping or shutting down the system.
-----------------	--

## B.3 K-O

### K

<b>KVM</b>	A hardware device that provides public keyboard, video and mouse (KVM).
------------	---

## B.4 P-T

### P

<b>panel</b>	An external component (including but not limited to ejector levers, indicators, and ports) on the front or rear of the server. It seals the front and rear of the chassis to ensure optimal ventilation and electromagnetic compatibility (EMC).
<b>Peripheral Component Interconnect Express (PCIe)</b>	A computer bus PCI, which uses the existing PCI programming concepts and communication standards, but builds a faster serial communication system. Intel is the main sponsor for PCIe. PCIe is used only for internal interconnection. A PCI system can be transformed to a PCIe one by modifying the physical layer instead of software. PCIe delivers a faster speed and can replace almost all AGP and PCI buses.

## R

<b>redundancy</b>	A mechanism that allows a backup device to automatically take over services from a faulty device to ensure uninterrupted running of the system.
<b>redundant array of independent disks (RAID)</b>	A storage technology that combines multiple physical drives into a logical unit for the purposes of data redundancy and performance improvement.

## S

<b>server</b>	A special computer that provides services for clients over a network.
<b>system event log (SEL)</b>	A non-volatile area and interfaces used to store system events for later fault diagnosis and system recovery.

## B.5 U-Z

### U

<b>U</b>	A unit defined in International Electrotechnical Commission (IEC) 60297-1 to measure the height of a cabinet or chassis. 1 U = 44.45 mm
<b>UltraPath Interconnect (UPI)</b>	A point-to-point processor interconnect developed by Intel.

# C Acronyms and Abbreviations

---

## C.1 A-E

### A

<b>AC</b>	alternating current
<b>AES</b>	Advanced Encryption Standard New Instruction Set
<b>ARP</b>	Address Resolution Protocol
<b>AVX</b>	Advanced Vector Extensions

### B

<b>BBU</b>	backup battery unit
<b>BIOS</b>	Basic Input/Output System
<b>BMC</b>	baseboard management controller

### C

<b>CD</b>	calendar day
<b>CE</b>	Conformite Europeenne
<b>CIM</b>	Common Information Model
<b>CLI</b>	command-line interface

**D**

<b>DC</b>	direct current
<b>DDR3</b>	Double Data Rate 3
<b>DDR4</b>	Double Data Rate 4
<b>DDDC</b>	double device data correction
<b>DEMT</b>	Dynamic Energy Management Technology
<b>DIMM</b>	dual in-line memory module
<b>DRAM</b>	dynamic random-access memory
<b>DVD</b>	digital video disc

**E**

<b>ECC</b>	error checking and correcting
<b>ECMA</b>	European Computer Manufacturer Association
<b>EDB</b>	Execute Disable Bit
<b>EN</b>	European Efficiency
<b>ERP</b>	enterprise resource planning
<b>ETS</b>	European Telecommunication Standards

**C.2 F-J****F**

<b>FB-DIMM</b>	Fully Buffered DIMM
<b>FC</b>	Fiber Channel
<b>FCC</b>	Federal Communications Commission
<b>FCoE</b>	Fibre Channel over Ethernet
<b>FTP</b>	File Transfer Protocol

**G**

<b>GE</b>	Gigabit Ethernet
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<b>GPIO</b>	General Purpose Input/Output
<b>GPU</b>	graphics processing unit

## H

<b>HA</b>	high availability
<b>HDD</b>	hard disk drive
<b>HPC</b>	high-performance computing
<b>HTTP</b>	Hypertext Transfer Protocol
<b>HTTPS</b>	Hypertext Transfer Protocol Secure

## I

<b>iBMC</b>	intelligent baseboard management controller
<b>IC</b>	Industry Canada
<b>ICMP</b>	Internet Control Message Protocol
<b>IDC</b>	Internet Data Center
<b>IEC</b>	International Electrotechnical Commission
<b>IEEE</b>	Institute of Electrical and Electronics Engineers
<b>IGMP</b>	Internet Group Message Protocol
<b>IOPS</b>	input/output operations per second
<b>IP</b>	Internet Protocol
<b>IPC</b>	intelligent power capability
<b>IPMB</b>	Intelligent Platform Management Bus
<b>IPMI</b>	Intelligent Platform Management Interface

## C.3 K-O

### K

<b>KVM</b>	keyboard, video, and mouse
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**L**

<b>LC</b>	Lucent connector
<b>LRDIMM</b>	load-reduced dual in-line memory module
<b>LED</b>	light emitting diode
<b>LOM</b>	LAN on motherboard

**M**

<b>MAC</b>	media access control
<b>MMC</b>	module management controller

**N**

<b>NBD</b>	next business day
<b>NC-SI</b>	Network Controller Sideband Interface

**C.4 P-T****P**

<b>PCIe</b>	Peripheral Component Interconnect Express
<b>PDU</b>	power distribution unit
<b>PHY</b>	physical layer
<b>PMBUS</b>	power management bus
<b>POK</b>	power OK
<b>PWM</b>	pulse-width modulation
<b>PXE</b>	Preboot Execution Environment

**Q**

<b>QPI</b>	Quick Path Interconnect
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**R**

<b>RAID</b>	redundant array of independent disks
<b>RAS</b>	reliability, availability and serviceability
<b>RDIMM</b>	registered dual in-line memory module
<b>REACH</b>	Registration Evaluation and Authorization of Chemicals
<b>RJ45</b>	registered jack 45
<b>RoHS</b>	Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment

**S**

<b>SAS</b>	Serial Attached Small Computer System Interface
<b>SATA</b>	Serial Advanced Technology Attachment
<b>SCM</b>	supply chain management
<b>SDDC</b>	single device data correction
<b>SERDES</b>	serializer/deserializer
<b>SGMII</b>	serial gigabit media independent interface
<b>SMI</b>	serial management interface
<b>SMTP</b>	Simple Mail Transfer Protocol
<b>SNMP</b>	Simple Network Management Protocol
<b>SOL</b>	serial over LAN
<b>SONCAP</b>	Standards Organization of Nigeria-Conformity Assessment Program
<b>SSD</b>	solid-state drive
<b>SSE</b>	Streaming SIMD Extensions

**T**

<b>TACH</b>	tachometer signal
<b>TBT</b>	Turbo Boost Technology
<b>TCG</b>	Trusted Computing Group
<b>TCM</b>	trusted cryptography module
<b>TCO</b>	total cost of ownership

<b>TDP</b>	thermal design power
<b>TELNET</b>	Telecommunication Network Protocol
<b>TET</b>	Trusted Execution Technology
<b>TFM</b>	TransFlash module
<b>TFTP</b>	Trivial File Transfer Protocol
<b>TOE</b>	TCP offload engine
<b>TPM</b>	trusted platform module

## C.5 U-Z

### U

<b>UDIMM</b>	unbuffered dual in-line memory module
<b>UEFI</b>	Unified Extensible Firmware Interface
<b>UID</b>	unit identification light
<b>UL</b>	Underwriter Laboratories Inc.
<b>USB</b>	Universal Serial Bus

### V

<b>VCCI</b>	Voluntary Control Council for Interference by Information Technology Equipment
<b>VGA</b>	Video Graphics Array
<b>VLAN</b>	virtual local area network
<b>VRD</b>	voltage regulator-down

### W

<b>WEEE</b>	waste electrical and electronic equipment
<b>WSMAN</b>	Web Service Management