

**Huawei XH321 V5 Server Node  
V100R005**

# **Technical White Paper**

**Issue**                    04  
**Date**                     2018-09-28



**Copyright © Huawei Technologies Co., Ltd. 2018. All rights reserved.**

No part of this document may be reproduced or transmitted in any form or by any means without prior written consent of Huawei Technologies Co., Ltd.

## **Trademarks and Permissions**



HUAWEI and other Huawei trademarks are trademarks of Huawei Technologies Co., Ltd.

All other trademarks and trade names mentioned in this document are the property of their respective holders.

## **Notice**

The purchased products, services and features are stipulated by the contract made between Huawei and the customer. All or part of the products, services and features described in this document may not be within the purchase scope or the usage scope. Unless otherwise specified in the contract, all statements, information, and recommendations in this document are provided "AS IS" without warranties, guarantees or representations of any kind, either express or implied.

The information in this document is subject to change without notice. Every effort has been made in the preparation of this document to ensure accuracy of the contents, but all statements, information, and recommendations in this document do not constitute a warranty of any kind, express or implied.

## **Huawei Technologies Co., Ltd.**

Address: Huawei Industrial Base  
Bantian, Longgang  
Shenzhen 518129  
People's Republic of China

Website: <http://e.huawei.com>

# About This Document

## Purpose

This document describes the XH321 V5 in terms of its appearance, performance parameters, and component compatibility to help users has a profound understanding of the XH321 V5.





## Intended Audience


This document is intended for:

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

## Symbol Conventions

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

Symbol	Description
	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
	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
 <b>NOTE</b>	<p>Calls attention to important information, best practices and tips.</p> <p>NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.</p>

## Change History

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

### Issue 04 (2018-09-28)

1. Added description about the features of the SoftRAID in the PCH. For details, see [1 Functions](#).
2. Added description about the X722 NIC. For details, see [3 External Ports](#).
3. Adjusted the location of "Technical Specifications". For details, see [8.1 Technical Specifications](#).

### Issue 03 (2018-06-26)

Modified [7 Logical Structure](#).

### Issue 02 (2018-05-21)

The issue is the second official release.

### Issue 01 (2017-12-26)

This issue is the first official release.

---

# Contents

---

<b>About This Document.....</b>	<b>ii</b>
<b>1 Functions.....</b>	<b>1</b>
<b>2 Appearance.....</b>	<b>2</b>
<b>3 External Ports.....</b>	<b>4</b>
<b>4 Indicators.....</b>	<b>7</b>
<b>5 Physical Structure.....</b>	<b>10</b>
<b>6 Mainboard Layout.....</b>	<b>12</b>
<b>7 Logical Structure.....</b>	<b>14</b>
<b>8 Product Specifications.....</b>	<b>16</b>
8.1 Technical Specifications.....	16
8.2 Environmental Specifications.....	18
<b>9 Features.....</b>	<b>29</b>
<b>10 Components.....</b>	<b>32</b>
<b>11 System Management.....</b>	<b>37</b>
<b>12 Maintenance.....</b>	<b>39</b>
<b>13 Certifications.....</b>	<b>42</b>

# 1 Functions

---

The XH321 V5 is a 2-socket server node designed for Huawei X6000 V5 servers. An X6000 is a 2U chassis that can house a maximum of four server nodes. The XH321 V5 provides high performance computing to maximize efficiency within limited space, and is easy to manage and maintain.

The XH321 V5 supports six 2.5-inch SAS/SATA hard disks or NVMe SSDs, latest Intel® Xeon® Skylake-SP CPUs, up to 16 DDR4 dual in-line memory modules (DIMMs), and two PCIe cards. The XH321 V5 is ideal for data center, cloud computing, Big Data, and Internet applications thanks to its high computing power, large storage space, and flexible interfacing capability.

## NOTE

- OSs supported include Windows Server 2016, Windows Server 2012 R2, RHEL 6.9, RHEL 7.3, SLES 11 SP4, SLES 12 SP 2, VMware ESXi 6.0.3, and VMware ESXi 6.5.
- Intel SoftRAID is supported if the disks are connected to the server through the PCH rather than through RAID controller cards.
- Intel SoftRAID supports RHEL 7.3, RHEL 7.4, Windows Server 2012 R2, and Windows Server 2016.

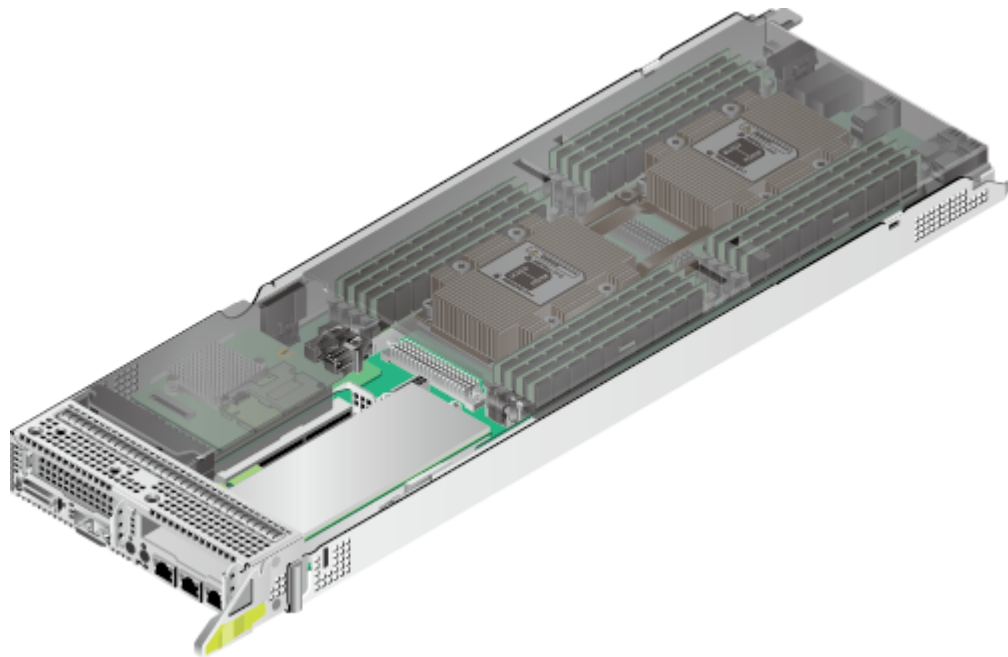
# 2 Appearance

---

## Appearance

**Figure 2-1** shows an XH321 V5.

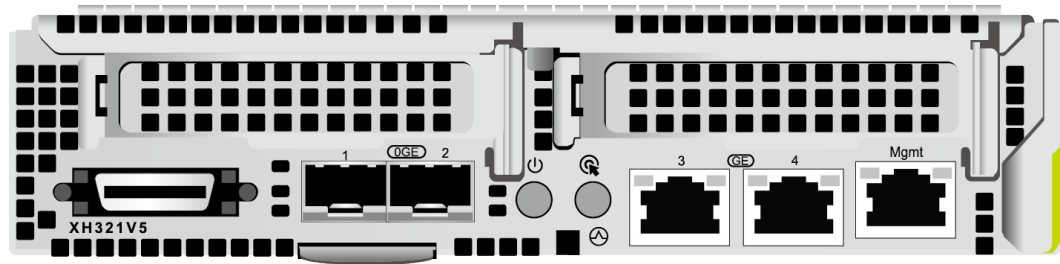
**Figure 2-1** Appearance



## Node Panel

**Figure 2-2** shows the front view of the XH321 V5.

Figure 2-2 Front view

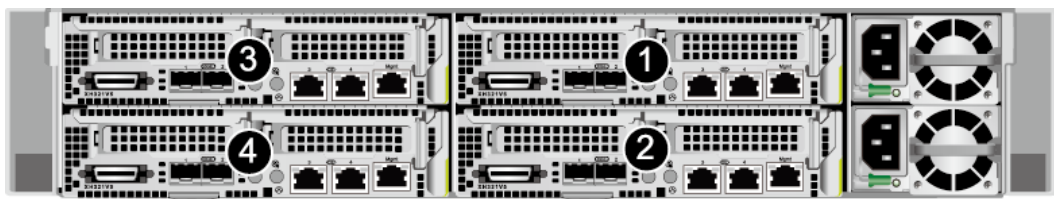


## Installation Positions

The XH321 V5 nodes are installed in the 2U,4 slots of an X6000 chassis. An X6000 chassis can house a maximum of four XH321 V5 nodes.

Figure 2-3 shows the installation positions and sequence of XH321 V5 nodes in an X6000 chassis.

Figure 2-3 Installation positions

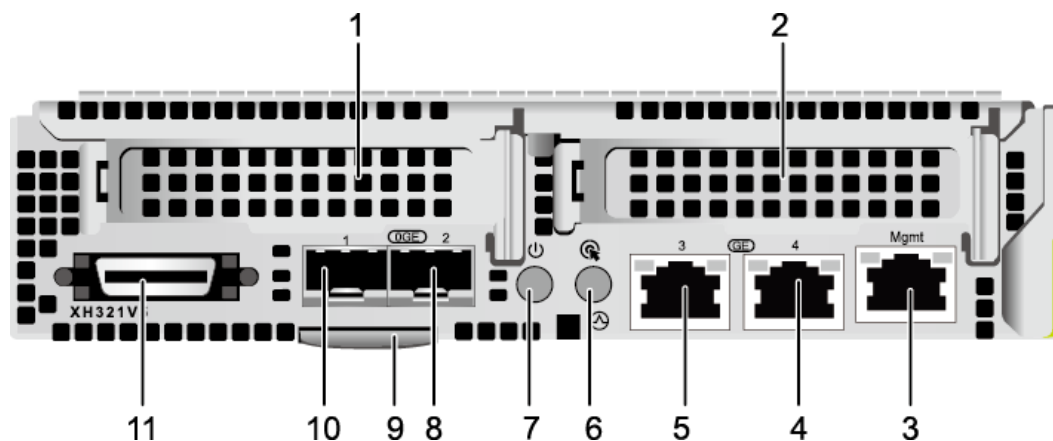




# 3 External Ports

Figure 3-1 shows the external ports of an XH321 V5.

Figure 3-1 External ports



No.	Component	No.	Component
1	(Optional) PCIe card (without RAID controller card)	2	(Optional) PCIe card/IB NIC
3	iBMC Management network port	4	LOM network port 4 (GE electrical port)
5	LOM network port 3 (GE electrical port)	6	UID indicator
7	Power button/indicator	8	10GE LOM network port 2 (optical)
9	SN	10	10GE LOM network port 1 (optical)
11	Universal connector port	-	-

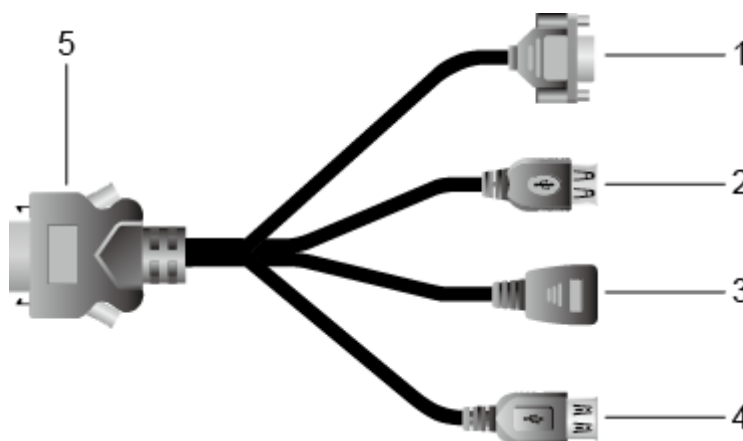
**NOTE**

- Components 1 and 2 are optional.
- The XH321 V5 supports an InfiniBand (IB) NIC that provides one or two 56G or 100G IB ports. The preceding information is for reference only. For details, use the [Huawei Server Compatibility Checker](#) to check the compatibility.
- If a server is forcibly powered off, the NC-SI function of LOM ports will be unavailable and you need to refresh the iBMC WebUI to restore the function. The WOL function will also be unavailable.

**Table 3-1** LOM port description

LOM Port	Chip Model	Rate Negotiation Mode	Supported Rate	Not Supported Rate
10GE optical port	X722	Auto-negotiation 10000 Mbit/s (full duplex)	1000/10000 Mbit/s	10/100 Mbit/s
GE electrical port		Auto-negotiation 1000 Mbit/s (full duplex)	1000 Mbit/s	10/100 Mbit/s
<p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>● The X722 NIC does not support interconnection with the PoE power supply device, for example, the PoE switch with the PoE function enabled. If the NIC is forcibly connected, the link communication may be abnormal or the NIC may be damaged.</li> <li>● To use NIC SR-IOV, enable SR-IOV on the BIOS. The GE electrical LOM ports do not support SR-IOV on Windows OSs.</li> </ul>				

**Figure 3-2** Multi-port cable



No.	Port	No.	Port
1	VGA port	2	Two USB ports
3	Serial port	4	One USB port

No.	Port	No.	Port
5	Multi-port connector	-	-

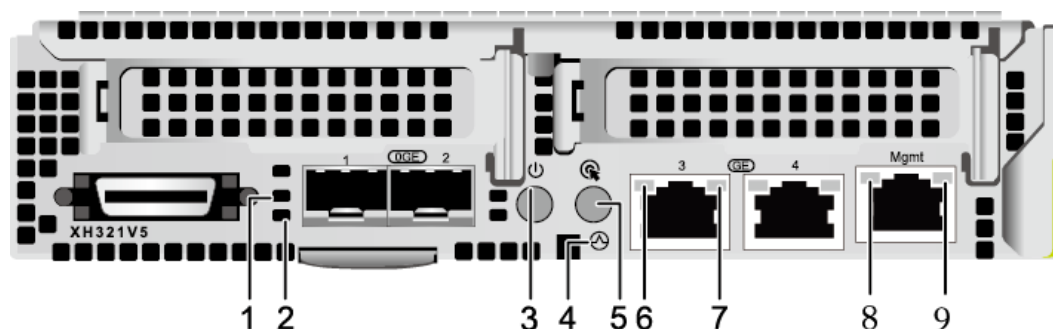
# 4 Indicators

The front panel indicators on the XH321 V5 display its working status.



## Indicators


Figure 4-1 shows the indicators on the XH321 V5 node panel.

Figure 4-1 Indicators



No.	Silk Screen	Indicator	State Description
1	-	Transmission rate indicator	<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>
2	-	Connection status indicator/Data transmission 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> <li>● Blinking green: Data is being transmitted.</li> </ul>

No.	Silk Screen	Indicator	State Description
3		Power button/ indicator	<ul style="list-style-type: none"> <li>● Steady yellow: The server node is ready to power on.</li> <li>● Steady green: The server is properly powered on.</li> <li>● Blinking yellow: The iBMC is starting.</li> <li>● Off: The server node is not connected to a power source.</li> </ul> <p>Power button</p> <ul style="list-style-type: none"> <li>● When the server node is powered on, you can press this button to shut down the OS.</li> <li>● When the server node is powered on, holding down this button for 6 seconds will power off the server node.</li> <li>● When the server node is ready to be powered on, you can press this button to start the server node.</li> </ul>
4		Health indicator	<ul style="list-style-type: none"> <li>● Off: There is no power supply, or the PSU is faulty.</li> <li>● Blinking red at 1 Hz: A major alarm is generated.</li> <li>● Blinking red at 5 Hz: A critical alarm is generated.</li> <li>● Steady green: The server is operating properly.</li> </ul>

No.	Silk Screen	Indicator	State Description
5		UID button/ indicator	<p>The UID button/indicator helps identify and locate a server node in a chassis. You can turn on or off the UID indicator by pressing the UID button or by using the iBMC CLI or WebUI.</p> <p>UID indicator</p> <ul style="list-style-type: none"> <li>● Off: The server node is not being located.</li> <li>● Steady blue: The server node has been located.</li> <li>● Blinking: distinguishes the server node from multiple server nodes that have also been located.</li> </ul> <p>UID button</p> <ul style="list-style-type: none"> <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>
6	-	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>
7	-	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>
8	-	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>
9	-	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>

# 5 Physical Structure

Figure 5-1 shows the components of an XH321 V5.

Figure 5-1 XH321 V5 components

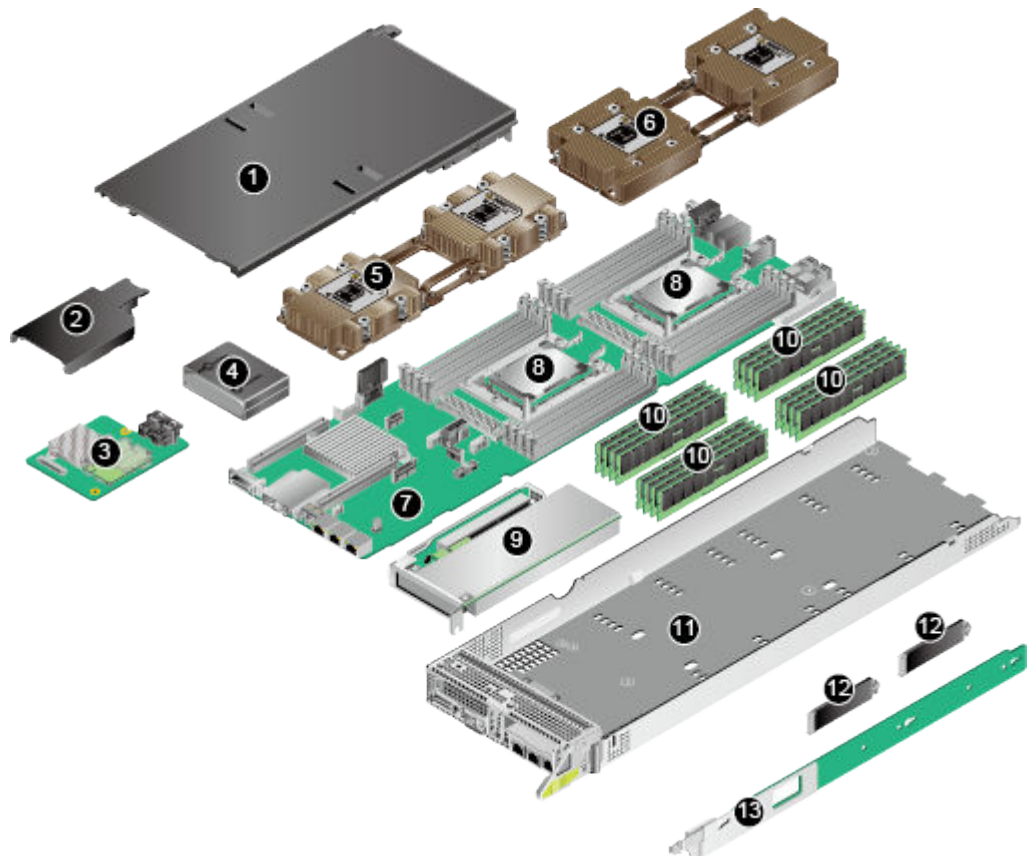


Table 5-1 Main components of the XH321 V5

No.	Component	No.	Component
1	Air duct	2	Supercapacitor air duct

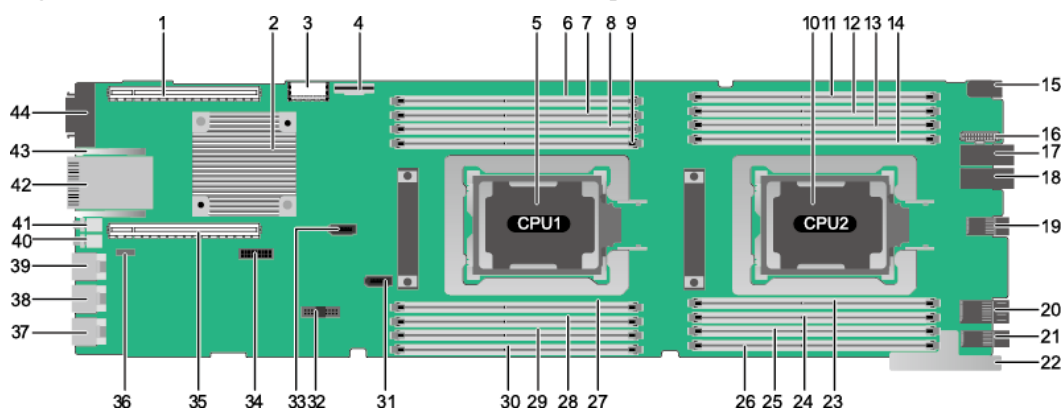
No.	Component	No.	Component
3	RAID controller card or PCIe card	4	Supercapacitor
5	Narrow conjoined heat sink	6	Broad conjoined heat sink
7	Mainboard	8	CPU
9	PCIe card or InfiniBand card	10	DIMM
11	Node panel	12	M.2 SATA SSD card
13	M.2 SSD card-TPM adapter	-	-



# 6 Mainboard Layout

Figure 6-1 shows the positions of connectors and other components on the mainboard of the XH321 V5.

Figure 6-1 Positions of the connectors and other components



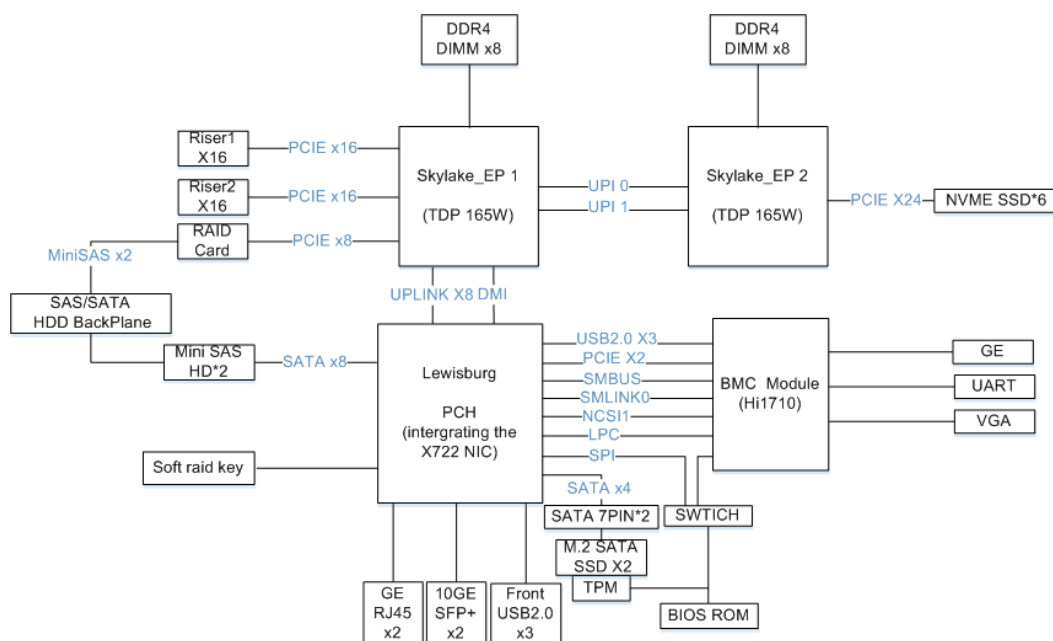
No.	Component	No.	Component
1	PCIe card slot 1	2	Southbridge
3	RAID controller card connector	4	Slimline connector
5	CPU 1	6	DIMM 050 connector
7	DIMM 040 connector	8	DIMM 030 connector
9	DIMM 031 connector	10	CPU 2
11	DIMM 150 connector	12	DIMM 140 connector
13	DIMM 130 connector	14	DIMM 131 connector
15	Left positioning pin	16	Slimline connector
17	Power connector	18	Power connector
19	Signal connector	20	Signal connector

No.	Component	No.	Component
21	Signal connector	22	Right positioning pin
23	DIMM 101 connector	24	DIMM 100 connector
25	DIMM 110 connector	26	DIMM 120 connector
27	DIMM 001 connector	28	DIMM 000 connector
29	DIMM 010 connector	30	DIMM 020 connector
31	M.2 SSD connector port 0	32	OPA signal connector
33	M.2 SSD connector port 1	34	TPM signal connector
35	PCIe card slot 2	36	Soft RAID key connector
37	iBMC management network port	38	GE LOM port 4
39	GE LOM port 3	40	UID indicator
41	Power button/indicator	42	Two 10GE ports
43	Network port indicator	44	Universal connector port

# 7 Logical Structure

Figure 7-1 shows the logical view of the XH321 V5.

Figure 7-1 Logical view of the XH321 V5



- The XH321 V5 supports Intel® Xeon® Scalable CPUs (3100, 4100, 5100, 6100, and 8100) and 16 DIMMs.
- The CPUs interconnect with each other through two Ultra Path Interconnect (UPI) buses at speeds of up to 10.4 GT/s.
- CPUs interconnect with standard cards through PCIe slots to provide service ports.
- The PCH is a next-generation Intel® southbridge chip used on server platforms and supports external I/O interface and bus expansion.
- The iBMC chipset interconnects with the PCH through PCIe slots and LPC buses to provide a management port.
- The RAID controller card connects to the mainboard using a SAS cable and connects to the system backplane through a connector.

- The iBMC integrates components such as video cards, video compression, and virtual media components to provide device management functions, including compute node power control, slot number obtaining, PSU detection, and KVM over IP.

# 8 Product Specifications

[8.1 Technical Specifications](#)

[8.2 Environmental Specifications](#)

## 8.1 Technical Specifications

**Table 8-1** Technical Specifications

Item	Specifications
Air duct	Provides ventilation channels.
Supercapacitor air duct	Provides ventilation channels for the supercapacitor.
RAID controller card	<p>The XH321 V5 supports the SR430C (LSI SAS3108, 1 GB or 2 GB cache), Avago SAS3004iMR, SR150-M (Avago SAS3408), and SR450C (Avago SAS3508, 2 GB or 4 GB cache) to enable RAID configuration. The controller cards support RAID state migration, RAID configuration memory, self-diagnosis, and web-based remote configuration.</p> <ul style="list-style-type: none"> <li>● SR150-M (Avago SAS3408) supports RAID 0, 1, and 10. It does not support power failure protection.</li> <li>● Avago SAS3004iMR supports RAID 0 and 1. It does not support power failure protection.</li> <li>● SR430C (LSI SAS3108, 1 GB or 2 GB cache) and SR450C (Avago SAS3508, 2 GB or 4 GB cache) support RAID 0, 1, 10, 5, 50, 6, and 60. They also support supercapacitors for power failure protection.</li> </ul> <p><b>NOTE</b>                      Use the <a href="#">Huawei Server Compatibility Checker</a> to check more RAID controller card models and PCIe card models supported.</p>
Supercapacitor	A supercapacitor is required to protect cache data from power failures for the LSI SAS3108 and Avago SAS3508.

Item	Specifications
Narrow conjoined heat sink	Dissipates heat from CPUs of 165 W or lower.
Broad conjoined heat sink	Dissipates heat from CPUs of over 165 W or under special conditions.
Mainboard	<p>As the most important component of a server, the mainboard integrates basic components such as the PCH chip, video chip, BIOS chip, and expansion slots, and provides CPU sockets and DIMM slots.</p> <ul style="list-style-type: none"> <li>● Integrates the Intel® C622 PCH chip.</li> <li>● Integrates the SM750 graphics card chip, providing a memory capacity of 32 MB and supporting a maximum resolution of 1920 x 1200 at 60 Hz with 16 million colors.</li> </ul> <p><b>NOTE</b>                      The maximum resolution 1920 x 1200 is supported only when a compatible graphics card driver is installed. Otherwise, only the default resolution supported by the OS is available.</p> <ul style="list-style-type: none"> <li>● Integrates two PCIe3.0 x16 slots.</li> <li>● Integrates the X722 LOM chip, providing two GE electrical ports and two 10GE optical ports.</li> </ul> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>● Two 10GE optical LOM ports (provided by the PCH), supporting NC-SI, WOL, and PXE.</li> <li>● Two GE electrical LOM ports (provided by the PCH), supporting NC-SI, WOL, and PXE.</li> </ul>
CPU	<p>Supports one or two Intel® Xeon® Scalable 3100, 4100, 5100, 6100, or 8100 series processors.</p> <ul style="list-style-type: none"> <li>● A maximum of 28 cores (2.5 GHz)</li> <li>● Maximum frequency: 3.6 GHz (four cores)</li> <li>● Two UPI links, with the maximum transmission speed of each link at 10.4 GT/s</li> <li>● Maximum L3 cache capacity per core: 1.375 MB</li> <li>● Maximum thermal design power (TDP): 205 W</li> </ul> <p><b>NOTE</b>                      NVMe SSDs are not supported if only one CPU is installed.</p>
PCIe card	<p>Two standard half-height half-length PCIe 3.0 x16 cards.</p> <p>PCIe card models supported: 2 x GE, 4 x GE, 2 x 10GE, and 2 x 10GBASE-T.</p> <p>IB card models supported: 56GE, 2 x 56GE, 100GE, and 2 x 100GE.</p> <p><b>NOTE</b>                      Use the <a href="#">Huawei Server Compatibility Checker</a> to check the card models supported.</p>

Item	Specifications
DIMM	<ul style="list-style-type: none"> <li>● Up to 16 DDR4 DIMM slots (8 DDR4 DIMM slots per CPU) for installing either RDIMMs or LRDIMMs (mixed use of them is not supported).</li> <li>● Maximum memory speed: 2666 MT/s</li> <li>● RDIMMs: 16 x 32 GB RDIMMs for two CPUs, with a maximum memory capacity of 512 GB</li> <li>● LRDIMMs: 16 x 64 GB LRDIMMs for two CPUs, with a maximum memory capacity of 1.0 TB</li> <li>● Memory protection technologies: error checking and correcting (ECC), memory mirroring, Single Device Data Correction (SDDC), and memory sparing</li> <li>● DDR4 speed: 1866 MT/s, 2133 MT/s, 2400 MT/s, and 2666 MT/s</li> </ul> <p><b>NOTE</b>                      Use the <a href="#">Huawei Server Compatibility Checker</a> to check more DIMM models supported.</p>
Node panel	The node panel is used to bear the mainboard and facilitate the removal of a server node.
M.2 SATA SSD card	Two models are supported: 2242 and 2280.
M.2 SSD card-TPM adapter	Installs the M.2 SATA SSD cards and TPM.

## 8.2 Environmental Specifications

**Table 8-2** Environmental specifications

Category	Item	Specifications
Physical specifications	Dimensions (H x W x D)	40.5 mm x 177.9 mm x 545.5 mm (1.59 in. x 7.00 in. x 21.48 in.)
	Weight	Product: 4.2 kg (9.26 lb)

Category	Item	Specifications
Environmental specifications	Temperature	Operating temperature: 5°C to 35°C (41°F to 95°F) Storage temperature: - 40°C to +65°C ( - 40°F to +149°F) <b>NOTE</b> <ul style="list-style-type: none"> <li>● If a single fan fails, the ambient temperature supported is 5°C (41°F) to 30°C (86°F).</li> <li>● If the server node is configured with processors of 125 W or above, the failure of a single fan may affect the server node performance or cause overheating alarms. You can resolve the issue by replacing the faulty fan.</li> <li>● For the maximum temperature supported by the server configured with a supercapacitor, optical modules, or 240G M.2 RAID controller card, see <a href="#">Table 8-3</a>, <a href="#">Table 8-4</a>, and <a href="#">Table 8-5</a>.</li> </ul>
	Maximum temperature change rate	20°C/h (36°F/h)
	Relative humidity (RH, non-condensing)	<ul style="list-style-type: none"> <li>● Operating: 8% to 90%</li> <li>● Storage: 5% to 95%</li> </ul>
	Altitude	<ul style="list-style-type: none"> <li>● Operating altitude: ≤ 3050 m (10006.44 ft)</li> </ul> <b>NOTE</b> For altitude above 900 m (2952.72 ft), the highest operating temperature decreases by 1°C (1.8°F) for every increase of 300 m (984.24 ft). <ul style="list-style-type: none"> <li>● HDDs cannot be used at an altitude of over 3050 m (10006.44 ft).</li> <li>● Titanium PSUs are required at an altitude of over 3050 m (10006.44 ft).</li> </ul>
	Vibration	One cyclical sweep in each axial direction at the rate of 0.1 oct/min, with a total of three axial directions 5 Hz to 10 Hz: 5 mm (0.20 in., peak-to-peak value) 10 Hz to 100 Hz: 1 m/s <sup>2</sup>
	Shock	Half sine wave, peak acceleration of 2 G, 11 ms, 3 times for each surface, and a total of three axial directions



Category	Item	Specifications
	Acoustic noise	<p>The following data is the declared A-weighted sound power levels (LWAd) and declared average bystander position A-weighted sound pressure levels (LpAm) when the server is operating at 23°C (73.4°F). Noise emissions are measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).</p> <p>Idle:</p> <ul style="list-style-type: none"> <li>● LWAd: 7.4 Bels</li> <li>● LpAm: 57 dBA</li> </ul> <p>Operating:</p> <ul style="list-style-type: none"> <li>● LWAd: 7.7 Bels</li> <li>● LpAm: 60 dBA</li> </ul> <p><b>NOTE</b>                      The actual sound levels generated when the server is operating vary depending on the server configuration, workload, and ambient temperature.</p>
	Corrosive gaseous contaminant	<ul style="list-style-type: none"> <li>● Copper corrosion rate test requirements: The corrosion product thickness growth rate is lower than 300 Å/month (meeting level G1 requirements of the ANSI/ISA-71.04-2013 standard on gaseous corrosion).</li> <li>● Silver corrosion rate test requirements: The corrosion product thickness growth rate is lower than 200 Å/month.</li> </ul>
	Particulate pollutant	<ul style="list-style-type: none"> <li>● The equipment room environment meets the requirements of ISO 14664-1 Class 8. You are advised to ask a professional organization to monitor particulate pollutants in the equipment room.</li> <li>● There is no explosive, conductive, magnetic, or corrosive dust in the equipment room.</li> </ul>
Input power specifications	Rated input voltage	12 V DC
Power consumption	-	The power consumption changes depending on the server configuration. Use the <a href="#">HuaweiServer Power Calculator</a> to calculate the actual consumption.
Reliability specifications	Mean time to repair (MTTR)	1 hour
	Mean time between failures (MTBF)	20.45 years

**Table 8-3** Maximum temperatures supported by the server configured with a RAID controller card supercapacitor

Hard Disk Backplane	Disk Quantity (Q)	CPU Power	Maximum Temperature
X6000 V5 C00 24*2.5-inch NVMe backplane	16 < Q ≤ 24	P ≤ 165 W	30°C (86°F)
	8 < Q ≤ 16	125 W ≤ P ≤ 165 W	30°C (86°F)
		P < 125 W	35°C (95°F)
X6000 V5 C00 24*2.5-inch SAS backplane	16 < Q ≤ 24	125 W ≤ P ≤ 165 W	32°C (89.6°F)
		P < 125 W	35°C (95°F)
	8 < Q ≤ 16	140 W ≤ P ≤ 165 W	32°C (89.6°F)
		P < 140 W	35°C (95°F)
	0 < Q ≤ 8	P ≤ 165 W	35°C (95°F)
	X6000 V5 C10 24*2.5-inch NVMe backplane	16 < Q ≤ 24	165 W < P ≤ 205 W: not supported
P ≤ 165 W			30°C (86°F)
8 < Q ≤ 16		165 W < P ≤ 205 W: not supported	N/A
		125 W ≤ P ≤ 165 W	30°C (86°F)
		P < 125 W	35°C (95°F)
0 < Q ≤ 8: The NVMe backplane is not supported.		N/A	N/A
X6000 V5 C10 24*2.5-inch SAS backplane	16 < Q ≤ 24	165 W < P ≤ 205 W: not supported	N/A
		125 W ≤ P ≤ 165 W	32°C (89.6°F)
		P < 125 W	35°C (95°F)
	8 < Q ≤ 16	165 W < P ≤ 205 W	30°C (86°F)
		140 W ≤ P ≤ 165 W	32°C (89.6°F)
		P < 140 W	35°C (95°F)
	0 < Q ≤ 8	165 W < P ≤ 205 W	32°C (89.6°F)
		P ≤ 165 W	35°C (95°F)

Hard Disk Backplane	Disk Quantity (Q)	CPU Power	Maximum Temperature
X6000 V5 C10 12*3.5-inch SAS backplane	$8 < Q \leq 12$	$165\text{ W} < P \leq 205\text{ W}$ : not supported	N/A
		$125\text{ W} \leq P \leq 165\text{ W}$	32°C (89.6°F)
		$P < 125\text{ W}$	35°C (95°F)
	$4 < Q \leq 8$	$165\text{ W} < P \leq 205\text{ W}$	30°C (86°F)
		$140\text{ W} \leq P \leq 165\text{ W}$	32°C (89.6°F)
		$P < 140\text{ W}$	35°C (95°F)
	$0 < Q \leq 4$	$165\text{ W} < P \leq 205\text{ W}$	32°C (89.6°F)
		$P \leq 165\text{ W}$	35°C (95°F)
	<b>NOTE</b> For configurations not listed in the table, the temperature range must be 5°C to 30°C (41°F to 86°F). If you need special configurations and temperature requirements, contact Huawei technical support.		

**Table 8-4** Maximum temperatures supported by the server configured with an onboard or PCIe optical module

Hard Disk Backplane	Disk Quantity (Q)	CPU Power	Maximum Temperature (With an Onboard Optical Module)	Maximum Temperature (With a PCIe Optical Module)
X6000 V5 C00 24*2.5-inch NVMe backplane	$16 < Q \leq 24$	$140\text{ W} < P \leq 165\text{ W}$	30°C (86°F)	30°C (86°F)
		$125\text{ W} < P \leq 140\text{ W}$	35°C (95°F)	30°C (86°F)
		$P \leq 125\text{ W}$	35°C (95°F)	35°C (95°F)
	$8 < Q \leq 16$	$140\text{ W} < P \leq 165\text{ W}$	30°C (86°F)	30°C (86°F)
		$125\text{ W} < P \leq 140\text{ W}$	35°C (95°F)	30°C (86°F)
		$P \leq 125\text{ W}$	35°C (95°F)	35°C (95°F)
	$0 < Q \leq 8$	$140\text{ W} < P \leq 165\text{ W}$	35°C (95°F)	30°C (86°F)
		$P \leq 140\text{ W}$	35°C (95°F)	35°C (95°F)

Hard Disk Backplane	Disk Quantity (Q)	CPU Power	Maximum Temperature (With an Onboard Optical Module)	Maximum Temperature (With a PCIe Optical Module)
X6000 V5 C00 24*2.5-inch SAS backplane	16 < Q ≤ 24	140 W < P ≤ 165 W	35°C (95°F)	30°C (86°F)
		P ≤ 140 W	35°C (95°F)	30°C (86°F) 10GE optical module: 35°C (95°F)
	8 < Q ≤ 16	140 W < P ≤ 165 W	35°C (95°F)	30°C (86°F)
		P ≤ 140 W	35°C (95°F)	35°C (95°F)
	0 < Q ≤ 8	P ≤ 165 W	35°C (95°F)	35°C (95°F)
X6000 V5 C10 24*2.5-inch NVMe backplane	16 < Q ≤ 24	165 W < P ≤ 205 W: not supported	N/A	N/A
		140 W < P ≤ 165 W	30°C (86°F)	30°C (86°F)
		125 W < P ≤ 140 W	35°C (95°F)	30°C (86°F)
		P ≤ 125 W	35°C (95°F)	35°C (95°F)
	8 < Q ≤ 16	165 W < P ≤ 205 W: not supported	N/A	N/A
		140 W < P ≤ 165 W	30°C (86°F)	30°C (86°F)
		125 W < P ≤ 140 W	35°C (95°F)	30°C (86°F)
		P ≤ 125 W	35°C (95°F)	35°C (95°F)
	0 < Q ≤ 8	165 W < P ≤ 205 W	30°C (86°F)	30°C (86°F)
		140 W < P ≤ 165 W	35°C (95°F)	30°C (86°F)
		P ≤ 140 W	35°C (95°F)	35°C (95°F)

Hard Disk Backplane	Disk Quantity (Q)	CPU Power	Maximum Temperature (With an Onboard Optical Module)	Maximum Temperature (With a PCIe Optical Module)	
X6000 V5 C10 24*2.5-inch SAS backplane	$16 < Q \leq 24$	$165 \text{ W} < P \leq 205 \text{ W}$ : not supported	N/A	N/A	
		$140 \text{ W} < P \leq 165 \text{ W}$	35°C (95°F)	30°C (86°F)	
		$P \leq 140 \text{ W}$	35°C (95°F)	30°C (86°F) For 10GE optical module: 35°C (95°F)	
	$8 < Q \leq 16$	$165 \text{ W} < P \leq 205 \text{ W}$	30°C (86°F)	30°C (86°F)	
		$140 \text{ W} < P \leq 165 \text{ W}$	35°C (95°F)	30°C (86°F)	
		$P \leq 140 \text{ W}$	35°C (95°F)	35°C (95°F)	
	$0 < Q \leq 8$	$165 \text{ W} < P \leq 205 \text{ W}$	35°C (95°F)	30°C (86°F)	
		$P \leq 165 \text{ W}$	35°C (95°F)	35°C (95°F)	
	X6000 V5 C10 12*3.5-inch SAS backplane	$8 < Q \leq 12$	$165 \text{ W} < P \leq 205 \text{ W}$ : not supported	N/A	N/A
			$140 \text{ W} < P \leq 165 \text{ W}$	35°C (95°F)	30°C (86°F)
$P \leq 140 \text{ W}$			35°C (95°F)	30°C (86°F) 10GE optical module: 35°C (95°F)	
$4 < Q \leq 8$		$165 \text{ W} < P \leq 205 \text{ W}$	30°C (86°F)	30°C (86°F)	
		$140 \text{ W} < P \leq 165 \text{ W}$	35°C (95°F)	30°C (86°F)	
		$P \leq 140 \text{ W}$	35°C (95°F)	35°C (95°F)	
$0 < Q \leq 4$		$165 \text{ W} < P \leq 205 \text{ W}$	35°C (95°F)	30°C (86°F)	

Hard Disk Backplane	Disk Quantity (Q)	CPU Power	Maximum Temperature (With an Onboard Optical Module)	Maximum Temperature (With a PCIe Optical Module)
		$P \leq 165 \text{ W}$	35°C (95°F)	35°C (95°F)
<b>NOTE</b> For configurations not listed in the table, the temperature range must be 5°C to 30°C (41°F to 86°F). If you need special configurations and temperature requirements, contact Huawei technical support.				

**Table 8-5** Maximum temperatures supported by the server configured with a 240G M.2 RAID controller card

Hard Disk Backplane	Disk Quantity (Q)	CPU Power	Maximum Temperature
X6000 V5 C00 24*2.5-inch NVMe backplane	$16 < Q \leq 24$	$140 \text{ W} < P \leq 165 \text{ W}$	28°C (82.4°F)
		$P \leq 140 \text{ W}$	32°C (89.6°F)
	$8 < Q \leq 16$	$140 \text{ W} < P \leq 165 \text{ W}$	30°C (86°F)
		$P \leq 140 \text{ W}$	35°C (95°F)
	$0 < Q \leq 8$	$140 \text{ W} < P \leq 165 \text{ W}$	35°C (95°F)
		$P \leq 140 \text{ W}$	35°C (95°F)
X6000 V5 C00 24*2.5-inch SAS backplane	$16 < Q \leq 24$	$140 \text{ W} < P \leq 165 \text{ W}$	30°C (86°F)
		$P \leq 140 \text{ W}$	35°C (95°F)
	$8 < Q \leq 16$	$140 \text{ W} < P \leq 165 \text{ W}$	32°C (89.6°F)
		$P \leq 140 \text{ W}$	35°C (95°F)
	$0 < Q \leq 8$	$P \leq 165 \text{ W}$	35°C (95°F)
X6000 V5 C10 24*2.5-inch NVMe backplane	$16 < Q \leq 24$	$165 \text{ W} < P \leq 205 \text{ W}$ : not supported	N/A
		$140 \text{ W} < P \leq 165 \text{ W}$	30°C (86°F)
		$P \leq 140 \text{ W}$	35°C (95°F)
	$8 < Q \leq 16$	$165 \text{ W} < P \leq 205 \text{ W}$ : not supported	N/A
		$140 \text{ W} < P \leq 165 \text{ W}$	32°C (89.6°F)
		$P \leq 140 \text{ W}$	35°C (95°F)

Hard Disk Backplane	Disk Quantity (Q)	CPU Power	Maximum Temperature
	$0 < Q \leq 8$	$165 \text{ W} < P \leq 205 \text{ W}$	28°C (82.4°F)
		$P \leq 165 \text{ W}$	35°C (95°F)
X6000 V5 C10 24*2.5-inch SAS backplane	$16 < Q \leq 24$	$165 \text{ W} < P \leq 205 \text{ W}$ : not supported	N/A
		$140 \text{ W} < P \leq 165 \text{ W}$	30°C (86°F)
		$P \leq 140 \text{ W}$	35°C (95°F)
	$8 < Q \leq 16$	$165 \text{ W} < P \leq 205 \text{ W}$	28°C (82.4°F)
		$P \leq 165 \text{ W}$	35°C (95°F)
	$0 < Q \leq 8$	$165 \text{ W} < P \leq 205 \text{ W}$	32°C (89.6°F)
$P \leq 165 \text{ W}$		35°C (95°F)	
X6000 V5 C10 12*3.5-inch SAS backplane	$8 < Q \leq 12$	$165 \text{ W} < P \leq 205 \text{ W}$ : not supported	N/A
		$140 \text{ W} < P \leq 165 \text{ W}$	30°C (86°F)
		$P \leq 140 \text{ W}$	35°C (95°F)
	$4 < Q \leq 8$	$165 \text{ W} < P \leq 205 \text{ W}$	30°C (86°F)
		$140 \text{ W} < P \leq 165 \text{ W}$	35°C (95°F)
	$0 < Q \leq 4$	$P \leq 205 \text{ W}$	35°C (95°F)
<b>NOTE</b> For configurations not listed in the table, the temperature range must be 5°C to 30°C (41°F to 86°F). If you need special configurations and temperature requirements, contact Huawei technical support.			

**Table 8-6** describes the heat dissipation requirements of XH321 V5 CPUs of different models.

**Table 8-6** Heat dissipation requirements of the server configured with CPUs of different models

Hard Disk Backplane	CPU Model	Heatsink	Disks and DIMMs	Maximum Inlet Temperature
X6000 V5 C00 24*2.5-inch SAS backplane	Intel® Xeon® 3100, 4100, 5100, 6100, and 8100 processors (165 W and lower)	Narrow heat sink	<ul style="list-style-type: none"> <li>● Disks ≤ 24</li> <li>● DIMMs ≤ 16</li> </ul>	35°C (95°F)
X6000 V5 C00 24*2.5-inch NVMe backplane	Intel® Xeon® 3100, 4100, 5100, 6100, and 8100 processors (165 W and lower)	Narrow heat sink	<ul style="list-style-type: none"> <li>● Disks ≤ 24</li> <li>● DIMMs ≤ 16</li> </ul>	35°C (95°F)
X6000 V5 C10 24*2.5-inch NVMe backplane	Intel® Xeon® 3100, 4100, 5100, 6100, and 8100 processors (205 W and lower)	Wide heat sink	<ul style="list-style-type: none"> <li>● 0 &lt; Disks ≤ 8</li> <li>● DIMMs ≤ 12</li> </ul>	30°C (86°F)
	Intel® Xeon® 3100, 4100, 5100, 6100, and 8100 processors (165 W and lower)	Narrow heat sink	<ul style="list-style-type: none"> <li>● Disks ≤ 24</li> <li>● DIMMs ≤ 16</li> </ul>	35°C (95°F)
X6000 V5 C10 24*2.5-inch SAS backplane	Intel® Xeon® 3100, 4100, 5100, 6100, and 8100 processors (205 W and lower)	Wide heat sink	<ul style="list-style-type: none"> <li>● 8 &lt; Disks ≤ 16</li> <li>● DIMMs ≤ 12</li> </ul>	30°C (86°F)
			<ul style="list-style-type: none"> <li>● 0 &lt; Disks ≤ 8</li> <li>● DIMMs ≤ 12</li> </ul>	35°C (95°F)
	Intel® Xeon® 3100, 4100, 5100, 6100, and 8100 processors (165 W and lower)	Narrow heat sink	<ul style="list-style-type: none"> <li>● Disks ≤ 24</li> <li>● DIMMs ≤ 16</li> </ul>	35°C (95°F)
X6000 V5 C10 12*3.5-inch SAS backplane	Intel® Xeon® 3100, 4100, 5100, 6100, and 8100 processors (205 W and lower)	Wide heat sink	<ul style="list-style-type: none"> <li>● 4 &lt; Disks ≤ 8</li> <li>● DIMMs ≤ 12</li> </ul>	30°C (86°F)
			<ul style="list-style-type: none"> <li>● 0 &lt; Disks ≤ 4</li> <li>● DIMMs ≤ 12</li> </ul>	35°C (95°F)



Hard Disk Backplane	CPU Model	Heatsink	Disks and DIMMs	Maximum Inlet Temperature
	Intel® Xeon® 3100, 4100, 5100, 6100, and 8100 processors (165 W and lower)	Narrow heat sink	<ul style="list-style-type: none"> <li>● Disks ≤ 12</li> <li>● DIMMs ≤ 16</li> </ul>	35°C (95°F)
<p><b>NOTE</b>                      Use <a href="#">Huawei Server Compatibility Checker</a> to check the CPU models supported.</p>				

# 9 Features

---

## Balanced Performance

The XH321 V5 provides the following performance features:

- Intel® Xeon® 3100, 4100, 5100, 6100, and 8100F series CPUs ensure high processing performance by providing:
  - Up to 28 cores
  - 3.6 GHz frequency
  - 38.5 MB L3 cache
  - Two 10.4 GT/s UPI links between CPUs
- Each XH321 V5 supports two CPUs, 56 cores, and 112 threads, which maximizes the concurrent execution of multithreaded applications.
- L2 cache is supported. Each core occupies 1 MB L2 cache space and up to 1.375 MB L3 cache space.
- 1.2 V DDR4 DIMMs consume 20% less power than 1.35 V DDR3L DIMMs supported by the previous-generation platform.
- Each XH321 V5 supports a total of 16 DDR4 error checking and correcting (ECC) load-reduced DIMMs (LRDIMMs) with the 2666 MHz frequency, which provides quick speed, high availability, and a maximum memory capacity of 1 TB. The maximum theoretical memory bandwidth is 249.9375 GB/s.
- Intel® Turbo Boost Technology 2.0 enables CPU cores to run at maximum speeds during peak hours by temporarily going beyond the CPU thermal design power (TDP).
- Intel® Hyper-Threading Technology enables each CPU core to run up to two threads, improving parallel computation capability.
- Intel® Virtualization Technology integrates hardware-level virtualization functions to allow OS vendors to better use hardware to address virtualization workloads.
- Intel® Advanced Vector Extensions 2.0 (AVX 2.0 and AVX-512) improves floating-point computing performance for compute-intensive applications.
- The Intel® Xeon® Scalable CPUs incorporate the PCIe 3.0 controller using Intel integrated I/O. This remarkably shortens I/O latency and enhances overall system performance.

- Six SATA/SAS HDDs or SSDs, or NVMe SDs are supported. SSDs can significantly improve I/O performance. The I/O operations per second (IOPS) of an SSD is over 100 times that of a typical HDD.
- Two half-height half-length ES3000 PCIe SSD cards can be configured to support high-bandwidth low-delay data access.

 **NOTE**

The DIMMs are for reference only. The specific DIMMs used depend on the compatibility list.

## Availability and Serviceability

The XH321 V5 provides the following features to improve availability and serviceability:

- The XH321 V5 uses carrier-class components and follows the engineering process, which dramatically improves system reliability.
- Each XH321 V5 provides six 2.5-inch or three 3.5-inch hot-swappable hard disks, and supports RAID 0, 1, 1E, 5, 6, 10, 50, and 60. The supported RAID level varies according to the RAID controller card. It offers a RAID cache and provides a supercapacitor for power-off protection.
- The UID and HLY indicators on the node panel and mounting ears, and the iBMC WebUI help technical support personnel determine the status of key components and promptly locate failed (or failing) components. This simplifies maintenance, accelerates troubleshooting, and improves system availability.
- SSDs offer better reliability than HDDs, which extends system uptime.
- The Huawei integrated iBMC module monitors system parameters in real time, triggers alarms, and performs recovery actions in case of failures. This helps minimize system downtime.
- For the products with three-year warranty used in China, Huawei provides customer replaceable units and onsite limited warranty 9 x 5 next business day. Optional service upgrades are available.
- Huawei provides a three-year warranty for parts replacement and repair for the XH321 V5 used outside China. Huawei provides a 9-hour-a-day, 5-day-a-week support program. Service requests will be handled the next business day. Huawei delivers the repaired or new parts within 45 calendar days after receiving the defective parts.

## Manageability and Security

The XH321 V5 provides the following features to enhance manageability and security:

- The built-in iBMC module monitors server operating status and provides remote management.
- The integrated industry-standard Unified Extensible Firmware Interface (UEFI) increases setup, configuration, and update efficiency, and simplifies fault handling.
- The optional trusted platform module (TPM) 2.0 provides advanced encryption functions, such as digital signatures and remote authentication.
- Intel® Advanced Encryption Standard–New Instructions (AES NI) supports faster and stronger encryption.
- Intel® Execute Disable Bit (EDB) prevents certain types of malicious buffer overflow attacks when working with a supported OS.

- The Network Controller Sideband Interface (NC-SI) feature allows a network port to provide functions of both a management network port and a service port, which maximizes return on investment (ROI) for customers.
- NC-SI can be enabled or disabled through the iBMC or the BIOS. NC-SI is disabled by default.

 **NOTE**

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

- The service network port can be bound to the network port (NIC Mezz) on the LOM NIC of the server. The network port on the LOM NIC is 1 by default.
- The service network port allows you to enable, disable, and configure a virtual local area network (VLAN) ID. A VLAN ID is disabled by default, and the default VLAN ID is 0.
- The service network port supports IPv4 and IPv6 addresses. You can set an IP address, subnet mask, default gateway, and IPv6 address prefix length for the service network port.

## Energy Efficiency

The XH321 V5 provides the following features to reduce energy consumption:

- The Intel® Xeon® 3100, 4100, 5100, 6100, and 8100 series CPUs provide higher performance than the previous-generation CPUs while supporting the same TDP.
- The efficient voltage regulator down (VRD) PSUs reduce the loss in DC/DC power conversion.
- The Intel® Intelligent Power Capability allows a single CPU to be powered on or off based on site requirements.
- Low-voltage Intel® Xeon® CPUs consume less energy and apply to the data center and telecommunication environments that have power and thermal limitations.
- Hard disks are not powered on simultaneously, which reduces the server startup power consumption.
- 1.2 V DDR4 RDIMMs consume 20% less energy than 1.5 V DDR3 RDIMMs.
- SSDs consume 80% less power than HDDs.
- The XH321 V5 supports intelligent CPU frequency adjustment for energy conservation and consumption reduction.
- The XH321 V5 panel has hexagonal ventilation holes to provide higher ventilation density than through round holes, remarkably increasing system cooling efficiency.

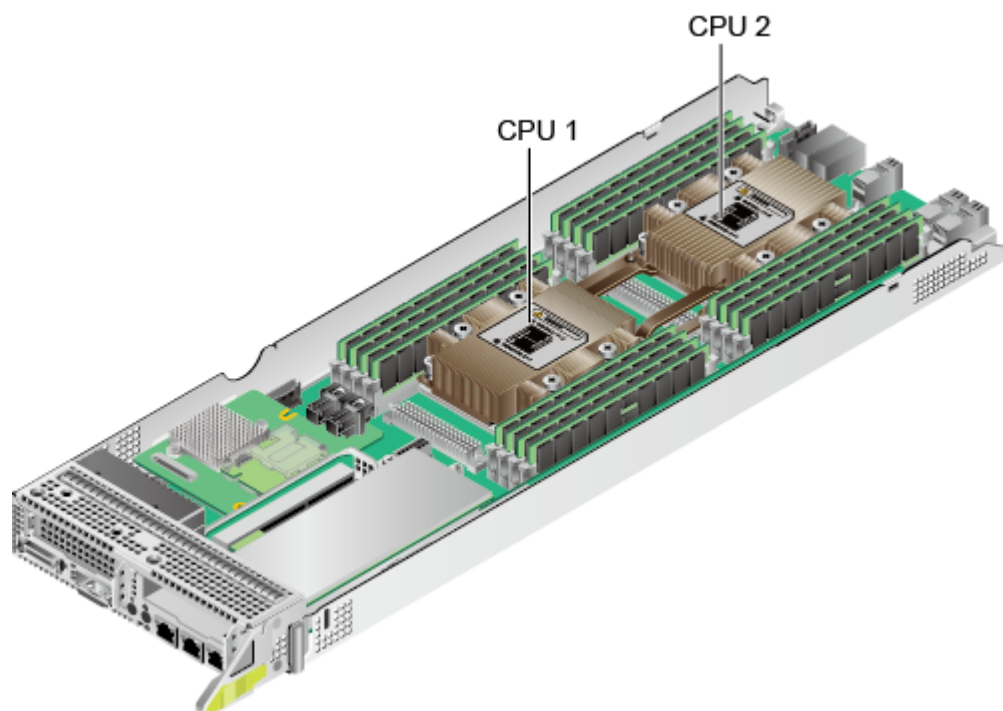
# 10 Components

## CPU

The XH321 V5 supports up to two Intel® Xeon® 3100, 4100, 5100, 6100, and 8100 series CPUs.

- If two CPUs are required, they must be of the same model.
- If only one CPU is required, install it in socket CPU 1, as shown in [Figure 10-1](#).

**Figure 10-1** CPU installation positions



## DIMM

### DIMM Configuration Rules

The XH321 V5 supports a maximum of eight DIMMs when one CPU is installed and a maximum of 16 DIMMs when two CPUs are installed. Each CPU has six memory channels.

Observe the following rules when configuring DIMMs:

1. The XH321 V5 does not support mixed use of different types of DIMMs. Use either RDIMMs or LRDIMMs.
2. Each channel supports a maximum of eight ranks.

 **NOTE**

A channel supports more than eight ranks for LRDIMMs. The number of ranks for LDIMMs must be calculated based on the number of ranks presented to external interfaces. All the DIMMs in the compatibility list support full memory channel configuration.

3. All DIMMs on a server operate at the same speed, whichever of the following is the lowest:
  - Memory speed supported by a specified CPU
  - Memory speed supported by a specified DIMM
  - Maximum operating speed of specific DIMMs. See the Maximum Operating Speed in [Table 10-1](#).

**Table 10-1** DIMM configurations and operating frequency mappings

Parameter	RDIMM		LRDIMM	
	1DPC	2DPC	1DPC	2DPC
Rank	1DPC	2DPC	1DPC	2DPC
Operating voltage (V)	1.2	1.2	1.2	1.2
Maximum operating speed (MT/s)	2666	2666	2666	2666

**DIMM Installation Rules**

- The XH321 V5 supports DIMMs of 8 GB, 16 GB, 32 GB, and 64 GB. When the XH321 V5 is fully configured with DIMMs, the maximum memory capacity is 1 TB.
- Each XH321 V5 provides 16 DDR4 DIMM slots and twelve memory channels. Each CPU integrates six memory channels. The six memory channels for CPU 1 are 1A, 1B, 1C, 1D, 1E, and 1F, and those for CPU 2 are 2A, 2B, 2C, 2D, 2E, and 2F. [Table 10-2](#) lists memory channels for each CPU. [Figure 10-2](#) shows the positions for installing DIMMs.

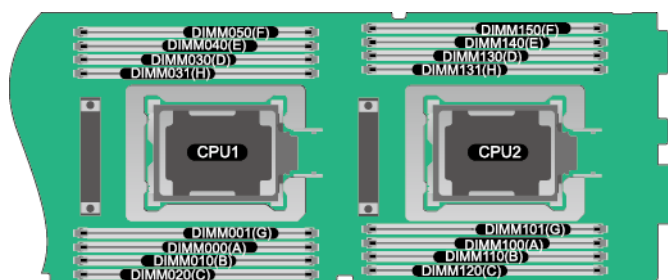
 **NOTE**

The DIMMs are for reference only. The specific DIMMs used depend on the compatibility list.

**Table 10-2** Memory channels for CPUs

CPU Socket	Channel	Channel Structure
CPU 1	1A	DIMM000(A)
		DIMM001(G)
	1B	DIMM010(B)
	1C	DIMM020(C)
	1D	DIMM030(D)
		DIMM031(H)
	1E	DIMM040(E)
1F	DIMM050(F)	
CPU 2	2A	DIMM100(A)
		DIMM101(G)
	2B	DIMM110(B)
	2C	DIMM120(C)
	2D	DIMM130(D)
		DIMM131(H)
	2E	DIMM140(E)
2F	DIMM150(F)	

**Figure 10-2** DIMM installation positions



DIMMs must be installed in the slots in sequence, as shown in the following table.

**Figure 10-3** DIMM installation sequence (one CPU)

CPU	Channel	DIMM Slot	Number of DIMMs (✓: recommended ○: not recommended)											
			✓	✓	○	✓	○	✓	○	✓				
			1	2	3	4	5	6	7	8				
CPU1	A	DIMM000(A)	•	•	•	•	•	•	•	•	•	•	•	•
		DIMM001(G)										•	•	•
	B	DIMM010(B)		•	•	•	•	•	•	•	•	•	•	•
		DIMM020(C)			•				•	•	•	•	•	•
	D	DIMM030(D)						•	•	•	•	•	•	•
		DIMM031(H)												•
E	DIMM040(E)						•	•	•	•	•	•	•	
	DIMM050(F)									•	•	•	•	

**Figure 10-4** DIMM installation sequence (two CPUs)

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	
CPU1	A	DIMM000(A)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
		DIMM001(G)													•	•	•	•	
	B	DIMM010(B)			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
		DIMM020(C)					•	•				•	•	•	•	•	•	•	
	D	DIMM030(D)								•	•	•	•	•	•	•	•	•	
		DIMM031(H)																•	
E	DIMM040(E)								•	•	•	•	•	•	•	•	•		
	DIMM050(F)													•	•	•	•		
CPU2	A	DIMM100(A)		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
		DIMM101(G)															•	•	
	B	DIMM110(B)				•	•	•	•	•	•	•	•	•	•	•	•	•	
		DIMM120(C)							•	•			•	•	•	•	•	•	
	D	DIMM130(D)									•	•	•	•	•	•	•	•	
		DIMM131(H)																•	
E	DIMM140(E)									•	•	•	•	•	•	•	•		
	DIMM150(F)														•	•	•		

**Memory Protection Technology**

The XH321 V5 employs the following memory protection technologies:

- ECC
- SDDC
- Mirror
- Sparing
- Lockstep
- Patrol Scrambling

**Storage**

The XH321 V5 supports a maximum of six 2.5-inch hot swappable SAS HDDs, SATA HDDs, and NVMe SSDs.

**Table 10-3** lists the performance of different RAID levels, the minimum number of disks required, and disk utilization.



 **NOTE**

- Install NVMe SSDs in compatible X6000 chassis.
- NVMe SSDs are not supported when only one CPU is configured.
- The maximum I/O bandwidth of hard disks managed through the southbridge is 1.9 GB/s due to the bandwidth limit of the SATA controller integrated in the southbridge.

**Table 10-3** RAID level comparison

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

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

**Table 10-4** Technical specifications of PCIe slots

Item	Specifications	Remarks
Dimensions (H x L)	68.90 mm x 167.65 mm (2.71 in. x 6.60 in.)	Install a half-height half-length PCIe card.
Maximum power consumption	25 W	Single slot

# 11 System Management

The iBMC is a Huawei's proprietary intelligent management system designed to remotely manage servers. It complies with the Intelligent Platform Management Interface (IPMI) V2.0 standards and provides reliable hardware monitoring and management functions.

The iBMC provides the following features:

- KVM and text console redirection
- Remote virtual media
- IPMI V2.0
- Simple Network Management Protocol Version 3 (SNMPv3)
- Common information model (CIM)
- Login using web browsers

Table 10-1 describes the iBMC features.

**Table 11-1** iBMC features

Features	Description
Management interfaces	Supports the following management interfaces integrated with any standard management system: <ul style="list-style-type: none"><li>● IPMI V2.0</li><li>● CLI</li><li>● SM_CLP</li><li>● HTTPS</li><li>● SNMPv3</li><li>● WSMAN</li></ul>
Fault detection	Detects faults and accurately locates faults in hardware, for example, field replaceable units (FRUs).
Alarm management	Manages alarms and reports alarms in various ways such as over the SNMP trap, Simple Mail Transfer Protocol (SMTP), and syslog service. Alarm management ensures that the server operates reliably 24/7.

Features	Description
Integrated virtual KVM	Provides remote maintenance measures for troubleshooting and supports a maximum resolution of 1920 x 1280.
Integrated virtual media	Virtualizes local media devices, images, USB keys, and folders into media devices on a remote server, which simplifies OS installation. The virtual DVD-ROM drive supports a maximum transmission rate of 8 MB/s.
Web-based user interface (UI)	<p>Provides a user-friendly graphical user interface (GUI), which simplifies configuration and query operations.</p> <p>The iBMC WebUI supports OSs, web browsers, and JRE of the following versions:</p> <ul style="list-style-type: none"> <li>● Windows XP (32-bit); Internet Explorer 8.0/9.0/10.0, Mozilla Firefox 9.0, or Google Chrome 13.0; JRE 1.6.0 U25 or later</li> <li>● Windows 7 (32-bit); Internet Explorer 8.0/9.0/10.0, Mozilla Firefox 9.0, or Google Chrome 13.0; JRE 1.6.0 U25 or later</li> <li>● Red Hat Enterprise Linux 4.3 (64-bit); Mozilla Firefox 9.0; JRE 1.6.0 U25 or later</li> <li>● Red Hat Enterprise Linux 6.0 (64-bit); Mozilla Firefox 9.0; JRE 1.6.0 U25 or later</li> <li>● Mac; Safari or Mozilla Firefox 9.0; JRE 1.6.0 U25 or later</li> </ul>
Fault reproduction	Reproduces faults to facilitate fault diagnosis.
Screen snapshot and screen video	Allows users to view screen snapshots and videos without login, which facilitates preventive maintenance inspection (PMI).
Domain name service (DNS) and directory service	Supports domain management and directory services, which significantly simplify network and configuration management.
Dual-image backup	Starts software from a backup image if the software fails.
Asset management	Provides intelligent asset management.
Intelligent power management	Uses the power capping technology to increase deployment density and the dynamic energy saving technology to lower the operation and maintenance cost.
IPv6	Supports IPv6 to ensure sufficient IP addresses.
NC-SI	Supports NC-SI, which allows users to access the iBMC over a service network port.

# 12 Maintenance

According to the *Huawei Warranty Policy for Servers & Storage Products* (Warranty Policy for short), the XH321 V5 has a 36-month warranty, the DVD-ROM drive and iBBU have a 12-month warranty, and the software media have a 3-month warranty.

The Warranty Policy stipulates warranty terms and conditions, including the available services, response time, terms of service, and disclaimer.

The warranty terms and conditions may vary by country, and some services and/or parts may not be available in all countries. For more information about warranty services in your country, contact Huawei technical support or the local Huawei office.

Table 11-1 describes the warranty service response time.

**Table 12-1** Response time

Service	Response Time	Description	Remarks
Help Desk	24/7	Available 24 hours a day, 7 days a week (00:00 to 24:00, Monday to Sunday)	None.
Remote troubleshooting	24/7	Available 24 hours a day, 7 days a week (00:00 to 24:00, Monday to Sunday)	The response time starts from the time when Huawei technical support accepts a customer's service request to the time when the technical support contacts the customer the first time to provide remote troubleshooting services.
Online technical support	24/7	You can obtain online support at Huawei's website. This service is available 24 hours a day (00:00 to 24:00), 7 days a week (Monday to Sunday).	None.

Service	Response Time		Description	Remarks
Software update authorization	24/7		You can obtain online support at Huawei's website. This service is available 24 hours a day (00:00 to 24:00), 7 days a week (Monday to Sunday).	None.
Return for repair	Outside China	9/5 hours, 45 calendar days shipment	Available 9 hours a day (09:00 to 18:00), 5 days a week (Monday to Friday), excluding official holidays.	The repaired or replacement parts will be shipped within 45 calendar days after Huawei receives the defective parts.
	In China	NBD, 9 hours a day, 5 days a week	Available 9 hours a day (09:00 to 18:00), 5 days a week (Monday to Friday), excluding official holidays.	Service requests submitted after 15:30 will be handled the next workday.

**Table 12-2** describes the warranty services provided by Huawei.

**Table 12-2** Warranty services

Service	Description
Help Desk	Huawei provides 24-hour after-sales technical support (such as handling requests for troubleshooting and hardware repair), receives and handles customer inquiries, complaints, and suggestions through a dedicated hotline.
Remote troubleshooting	After receiving a service request for rectifying a network or system fault, Huawei engineers will first analyze and handle the fault remotely and rectify it in the shortest possible time. There are two methods for remote troubleshooting: telephone support and remote access.
Online technical support	Huawei enterprise support website ( <a href="http://e.huawei.com">http://e.huawei.com</a> ) provides product and technical materials, such as product manuals, configuration guides, networking case study, and maintenance experience collections. Registered users can access the website and download required documents.
Software update authorization	To ensure that the devices operate stably, Huawei provides software patches whenever necessary.

Service	Description
Return for repair	<p>Huawei provides repair or replacement services for customers within the promised time to meet customer needs for spare parts. You can return defective parts to the designated Huawei site after submitting a service request.</p> <p>Huawei provides a three-year warranty for parts replacement and onsite repair for the server used in China. Huawei provides a 9-hour-a-day, 5-day-a-week support program. Service requests will be handled the next business day.</p> <p>Huawei provides a three-year warranty for parts replacement and repair for the server used outside China. Huawei provides a 9-hour-a-day, 5-day-a-week support program. Service requests will be handled the next business day. Huawei delivers the repaired or new parts within 45 calendar days after receiving the defective parts.</p>

# 13 Certifications

---

For details about the certifications that the XH321 V5 has passed and the standards that the XH321 V5 complies with, see the *Huawei FusionServer X6000 Technical White Paper*.