NETAŞ NCS6782G N4

Rack Server

Product Description (Including Liquid Cooling)

Version: R1.6

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Revision History

Revision No.	Revision Date	Revision Reason
R1.6	2025-12-11	Updated "3.2 Logical Structure".
R1.5	2025-07-31	Updated "5.3 Environmental Specifications".
R1.4	2025-03-07	● Updated "2.2 Rear Panel". ● Updated "6 Compliant Standards".
R1.3	2024-11-15	Added "1.3 Product Features".
R1.2	2024-10-12	Updated "2 External Views".

Revision No.	Revision Date	Revision Reason
R1.1	2024-07-29	Updated "5.3 Environmental Specifications".
R1.0	2024-07-12	First edition.

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About This Manual

Purpose

This manual describes the NCS6782GN4 rack server, including its role, characteristics, structure, software functions, product specifications, environmental requirements, and compliant standards, helping you to fully learn about the NCS6782GN4 server.

Intended Audience

This manual is intended for:

- Network planning engineers
- Installation engineers
- Maintenance engineers

What Is in This Manual

This manual contains the following chapters.

Chapter 1, Product Overview	Describes the product role, characteristics and features of the NCS6782GN4 server.
Chapter 2, External Views	Describes the front panel and rear panel of the NCS6782GN4 server, including the indicators, buttons, and physical interfaces on the front and rear panels.
Chapter 3, Product Structure	Describes the physical structure and logical structure of the NCS6782GN4 server.
Chapter 4, Software Functions	Describes the software functions of the NCS6782GN4 server.
Chapter 5, Product Specifications	Describes the product specifications of the NCS6782GN4 server, including the physical, technical, environmental and reliability specifications.
Chapter 6, Compliant Standards	Describes the standards that the design of the NCS6782GN4 server complies with.
Chapter 7, Product Recycling	Describes how to contact technical support for the recycling of the NCS6782GN4 server.

Conventions

This manual uses the following conventions.

	Danger: indicates an imminently hazardous situation. Failure to comply will result in death or serious personal injury. Warning: indicates a potentially hazardous situation. Failure to comply can result in death or serious personal injury. Caution: indicates a potentially hazardous situation. Failure to comply can result in moderate or minor personal injury.
	Notice: indicates equipment or environment safety information. Failure to comply can result in equipment damage, data loss, equipment performance degradation, environmental contamination, or other unpredictable results. Failure to comply will not result in personal injury.
	Note: provides additional information about a topic.

Chapter 1
Product Overview

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1.1 Product Role

The NCS6782GN4 server is a GPU server intended for large-scale model training. It supports Intel® Xeon® Scalable processors, provides large-capacity memory and ultra-high-speed I/O interfaces, and supports 8 NVIDIA H20 NVLink GPUs.

The NCS6782GN4 server can be applied in the fields of large-scale model training of natural languages, AI, high-performance computing, financial modeling, and communication. With the ultra-powerful computing capability and high-speed interconnection bandwidth, it is a high-performance and highly stable supercomputing product.

Figure 1-1 shows an external view of the NCS6782GN4 server.

Figure 1-1 External View of the NCS6782GN4 Server

CAUTION

In a real-world environment, the operation of this device may cause radio jamming.

1.2 Product Characteristics

High Density and High Performance

- Two Intel® Xeon® (Sapphire Rapids/Emerald Rapids) Scalable processors are supported, each of which has a maximum of 64 cores.
- Thirty-two DDR5 DIMM slots are provided. The maximum rate of a memory module can reach 5600 MT/s.
- High-speed I/O interfaces and high-performance NVMe SSDs are supported.
- The I/O bandwidth reaches up to that supported by PCIe 5.0, which doubles its predecessor's bandwidth.

High Expandability and High Bandwidth

- Eight NVIDIA H20 NVLink GPUs are supported.
- A maximum of 16 standard PCIe 5.0 slots and 1 OCP slot are supported.
- A maximum of twenty-eight 2.5-inch hard disks are provided to meet the requirements for large-capacity storage.
- Hardware RAID and RAID levels such as 0, 1, 5, 6, 10, and 50 are supported, providing multiple data protection options for users.

High Availability and High Reliability

- Key components such as hard disks and PSUs support hot swapping, so they can be replaced and maintained without power-off, improving system availability.
- Intelligent heat dissipation design increases system reliability and effectively extends component life and reducing costs.
- Power modules support N+N redundancy, improving system reliability.
- The TPM is supported.

Convenient Management and Easy Maintenance

- The CPU and memory operating status is monitored in real time. In addition, power supply management and heat dissipation management are supported and can be quickly configured.
- The KVM function allows the administrator to redirect local virtual media to a remote server to upgrade software for the remote system or install and maintain an operating system.

- The server supports Web-based system management, including viewing log files, monitoring the sensor parameters of various modules of the system in real time. It can also raise alarms in the preset alarm modes.
- The server supports IPMI 2.0 for out-of-band management. In addition, the server provides the RMCP and SNMP interfaces, which can be used to integrate with a third-party management system to provide local management tools, including:
  - ➔ Fault analysis and recovery
  - ➔ System diagnosis, system configuration, device management, and user management
  - ➔ Network management and firmware management
  - ➔ Power consumption monitoring

Energy Saving and Environmentally Friendly

- Both air cooling and liquid cooling are supported.
- The server uses high-performance, low-power-consumption and low-noise fans whose rotational speed can be adjusted intelligently.
- The system power consumption is monitored in real time so that users can optimize the power for the equipment room.
- The server uses the intelligent CPU frequency conversion technology to optimize the CPU frequency based on the service load.
- Lead-free design is used, helping protect the environment.

1.3 Product Features

The NCS6782GN4 supports active shutdown in response to high temperatures. When enabled, this function automatically shuts down the server if the ambient temperature in the equipment room exceeds a predefined high-temperature threshold. To ensure service continuity, this function is disabled by default in all BMC V4 versions.

Chapter 2
External Views

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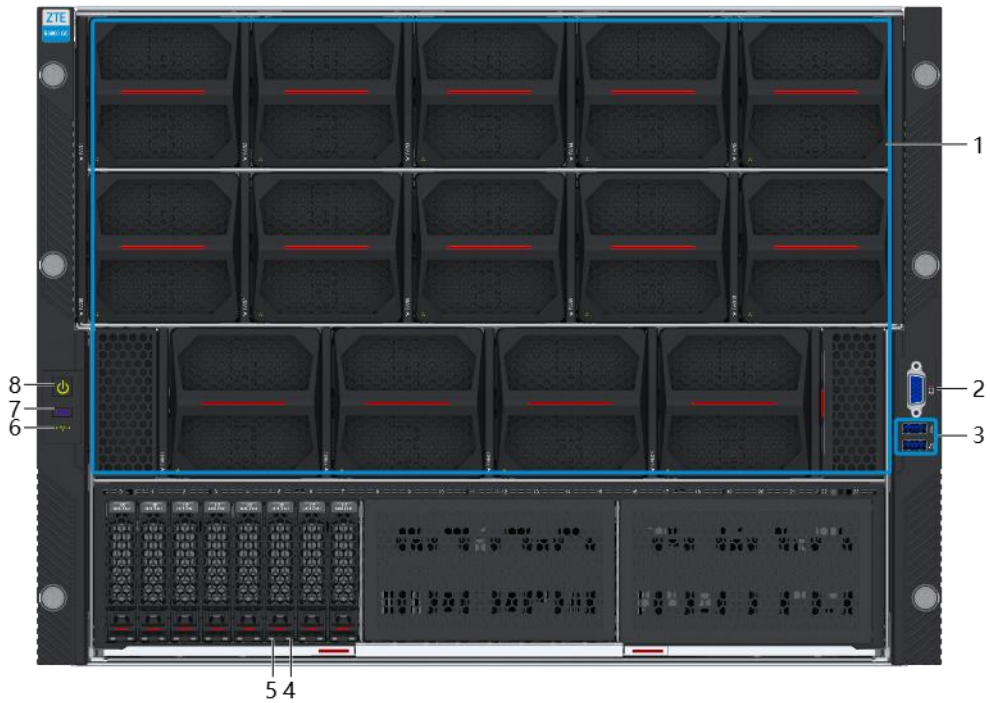
2.1 Front Panel

The front panel of the NCS6782GN4 server can be configured as follows:

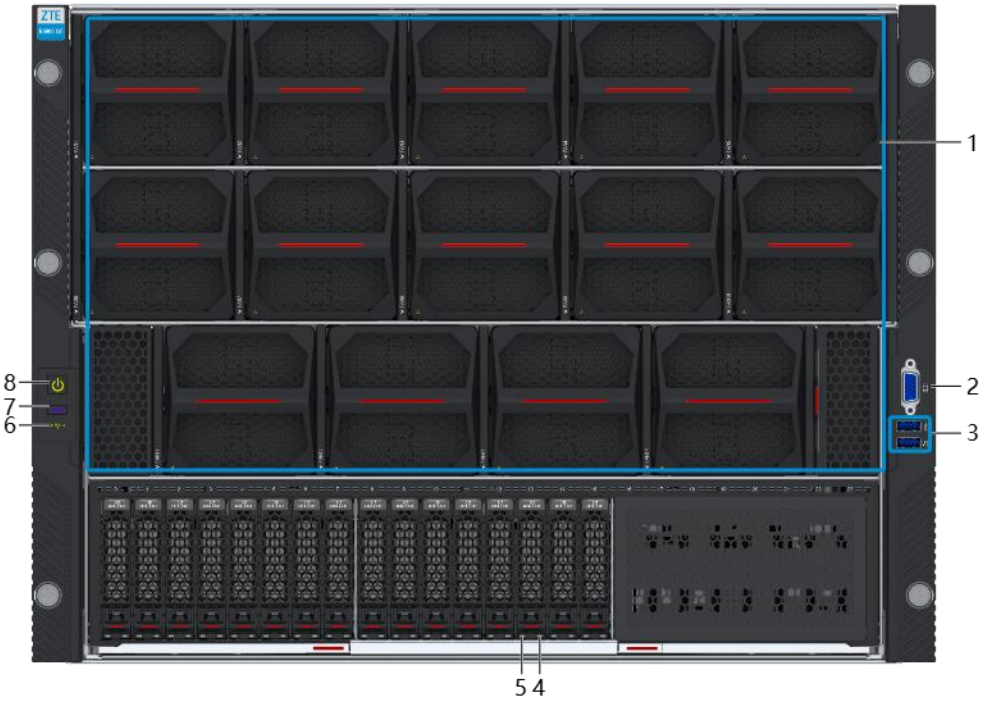
- Eight 2.5-inch hard disks, which support both SAS/SATA SSDs and NVMe SSDs. Figure 2-1 shows an external view of the front panel in this configuration mode.

Figure 2-1 Front Panel with 8 Disk Slots



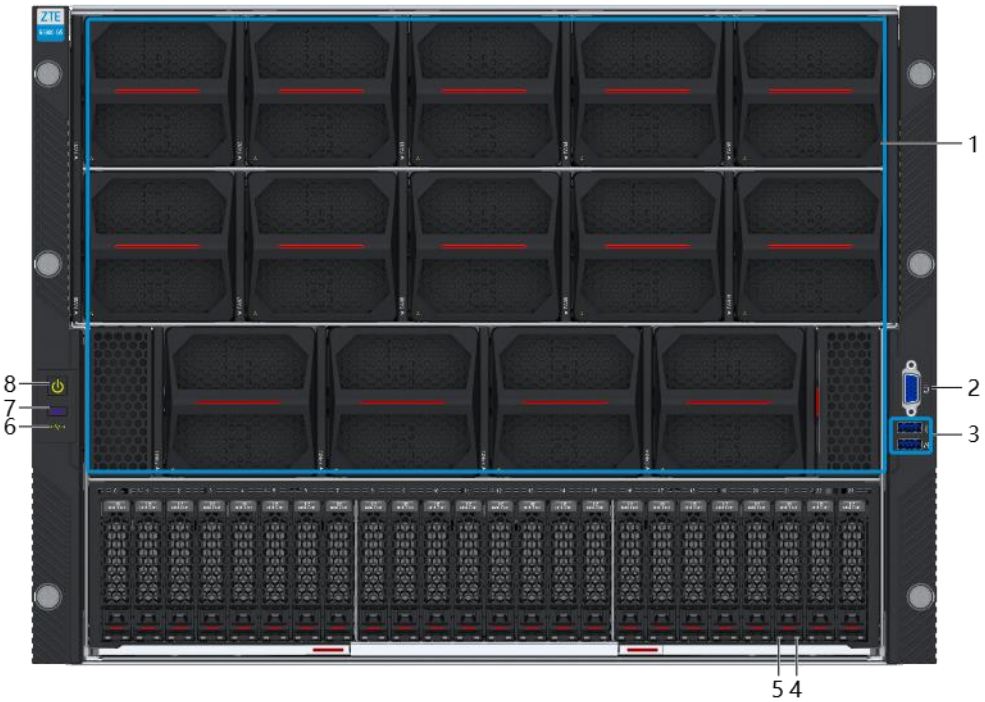
- Sixteen 2.5-inch hard disks, which support both SAS/SATA SSDs and NVMe SSDs. Figure 2-2 shows an external view of the front panel in this configuration mode.

Figure 2-2 Front Panel with 16 Disk Slots



- Twenty-four 2.5-inch hard disks, which support both SAS/SATA SSDs and NVMe SSDs. Figure 2-3 shows an external view of the front panel in this configuration mode.

Figure 2-3 Front Panel with 24 Disk Slots



For a description of the interfaces and indicators on the front panel of the NCS6782GN4 server, refer to Table 2-1.

Table 2-1 Front Panel Descriptions

No.	Name	Description
1	Fan	Used to cool the server.
2	VGA interface	Used to connect to a display.
3	USB interface	● The upper interface is a USB 3.0 interface, which is connected to a USB 3.0 device, for example, a system boot USB flash drive. ● The lower interface is a USB 2.0 interface, which is connected to a USB mouse or keyboard to facilitate lightweight maintenance of the server and rapid fault location and analysis.
4	Hard disk status indicator	This indicator can be in the following status: ● Off: The hard disk is operating properly. ● Flashing blue at 1 Hz: A RAID group member disk is being rebuilt. ● Flashing blue at 4 Hz: The hard disk is being positioned. ● Steady red: The hard disk is faulty.
5	Hard disk activity indicator	This indicator can be in the following status: ● Off: The hard disk is not present or is faulty. ● Flashing green: Data is being read from or written to the hard disk, or synchronized between hard disks. (The green indicator of the SAS/SATA disk flashes at 4 Hz, and the green indicator of the NVMe SSD flashes at an undefined frequency). ● Steady green: The hard disk is present but inactive.
6	Health status indicator	This indicator can be in the following status: ● Steady green: The server is operating properly. ● Flashing red at 1 Hz: The server has a minor alarm. ● Flashing red at 4 Hz: The server has a critical alarm. ● Off: The server is not operating properly.
7	UID button/indicator	The button is also used as an indicator. This indicator can be in the following status: ● Steady on: The server is being located. ● Flashing at 1 Hz: The server is being remotely maintained or the firmware is being upgraded through a PC. ● Flashing at 4 Hz: The server is in debugging mode. The serial port on the panel serves as the BMC debugging serial port. ● Off: No positioning operation is triggered on the server. The UID button supports the following operations: ● Press and hold the button for less than 4 seconds: Perform server positioning or cancel the current function (cancel positioning or the BMC debugging status of the serial port). ● Press and hold the button for 4 (inclusive) to 10 seconds: Switch the serial port on the panel to BMC debugging status. ● Press and hold the button for at least 10 seconds: Reset the BMC.

No.	Name	Description
		● Press and hold the button for 4 (inclusive) to 10 seconds, release it, and then press and hold it for at least 10 seconds: Reset the BMC and keep the serial port on the panel in BMC debugging status.
8	Power button/indicator	The button is also used as an indicator. This indicator can be in the following status: ● Steady yellow: The server is powered on in standby mode (the host is not powered on). ● Steady green: The server is powered on in payload mode (the host is powered on). ● Off: The server is not powered on or the power module is not operating properly. Press the power button to power on the server. The power button supports the following operations: ● Press and hold for less than 4 seconds: Power on the server. ● Press and hold for 4 through 10 seconds: Shut down the server forcibly.

Note

To ensure drive availability, the storage duration of a hard disk drive cannot exceed six months before use.

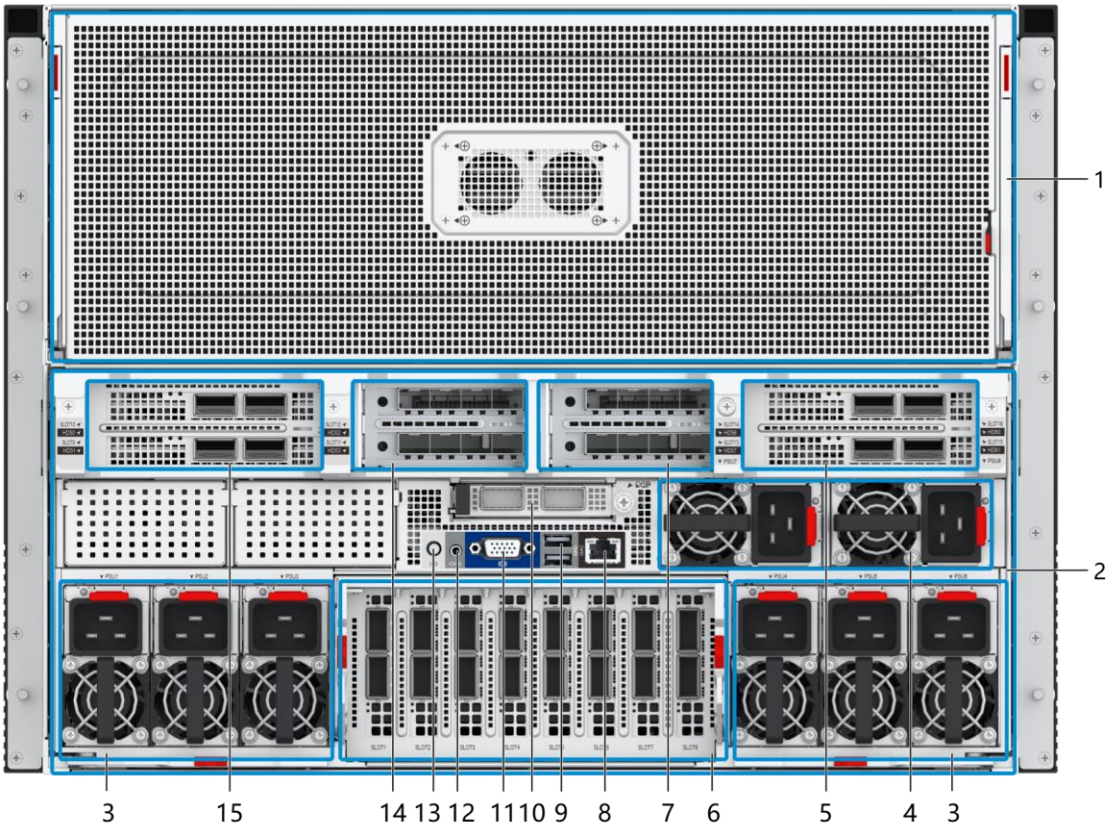
2.2 Rear Panel

2.2.1 Air Cooling–Based Rear Panel

When the NCS6782GN4 server uses air cooling, the rear panel can be configured as follows:

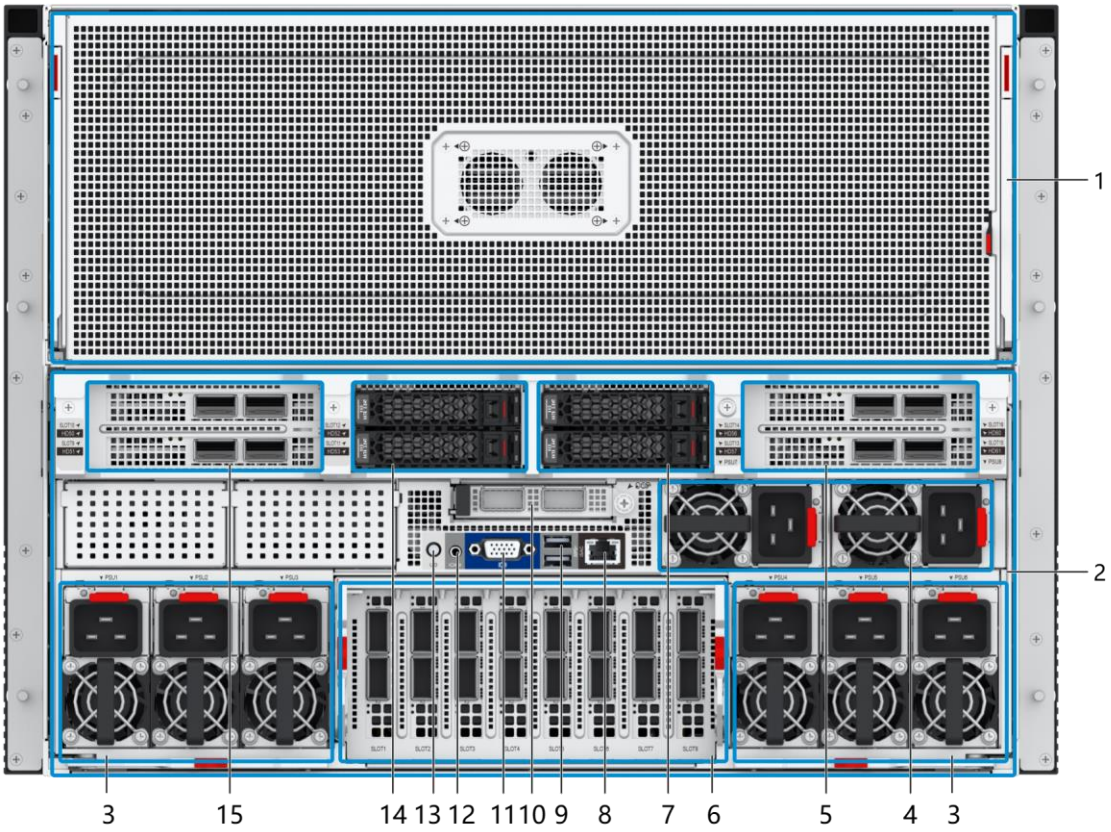
- Sixteen expansion slots for standard PCIe 5.0 cards, as shown in Figure 2-4.

Figure 2-4 Rear Panel with 16 Expansion Slots for Standard PCIe 5.0 Cards



- Twelve expansion slots for standard PCIe 5.0 cards and four slots for 2.5-inch hard disks, as shown in Figure 2-5.

Figure 2-5 Rear Panel with 12 Expansion Slots for Standard PCIe 5.0 Cards and 4 Slots for 2.5-Inch Hard Disks



For a description of the components on the rear panel of the NCS6782GN4 server, refer to Table 2-2.

Table 2-2 Descriptions of the Components on the Air Cooling–Based Rear Panel

No.	Name	Description
1	GPU module	Powerful GPU computing is provided.
2	CPU module	Powerful computing and processing capacities are provided and Intel's compute modules are supported.
3	54 V PSU	● Six 54 V PSUs are supported. ● 220 V AC input or 240 V DC input is supported. ● 3200 W power supply is supported. ● "N+N" redundancy is supported. ● Hot swapping is supported.
4	12 V PSU	● Two 12 V PSUs are supported. ● 220 V AC input or 240 V DC input is supported. ● 2700 W power supply is supported. ● "1+1" redundancy is supported. ● Hot swapping is supported.

No.	Name	Description
5	I/O module 4	One full-height double-width PCIe 5.0 x16 standard card or two full-height single-width PCIe 5.0 x16 standard cards are supported.
6	NIC module	Eight single-width PCIe 5.0 x16 standard cards and one half-height single-width NIC adapter module are supported.
7	I/O module 3	Two half-height single-width PCIe 5.0 x16 standard cards or two 2.5-inch SAS/SATA/NVMe SSDs are supported.
8	iSAC network interface	The network cable is used to interconnect the iSAC network interface with a debugging PC so you can log in to the Web portal of the iSAC network interface through a browser on the debugging PC.
9	USB 3.0 interface	Used to connect to a USB mouse, a USB keyboard, or a peripheral storage device (for example, a USB flash drive for booting the system).
10	OCP card	Various standard OCP NIC 3.0 cards are supported through OCP slots, and provide GE, 10 GE, 25 GE, and 100 GE interfaces.
11	VGA interface	Used to connect to a display.
12	Serial port	The 3.5 mm audio serial cable is used to connect the serial port to the debugging PC. The server can be configured on the HyperTerminal of the debugging PC.
13	UID button/indicator	The button is also used as an indicator. This indicator can be in the following status: ● Steady on: The server is being located. ● Flashing at 1 Hz: The server is being remotely maintained or the firmware is being upgraded through a PC. ● Flashing at 4 Hz: The server is in debugging mode. The serial port on the panel serves as the BMC debugging serial port. ● Off: No positioning operation is triggered on the server. The UID button supports the following operations: ● Press and hold the button for less than 4 seconds: Perform server positioning or cancel the current function (cancel positioning or the BMC debugging status of the serial port). ● Press and hold the button for 4 (inclusive) to 10 seconds: Switch the serial port on the panel to BMC debugging status. ● Press and hold the button for at least 10 seconds: Reset the BMC. ● Press and hold the button for 4 (inclusive) to 10 seconds, release it, and then press and hold it for at least 10 seconds: Reset the BMC and keep the serial port on the panel in BMC debugging status.
14	I/O module 2	Two half-height single-width PCIe 5.0 x16 standard cards or two 2.5-inch SAS/SATA/NVMe SSDs are supported.

No.	Name	Description
15	I/O module 1	One full-height double-width PCIe 5.0 x16 standard card or two full-height single-width PCIe 5.0 x16 standard cards are supported.

Note

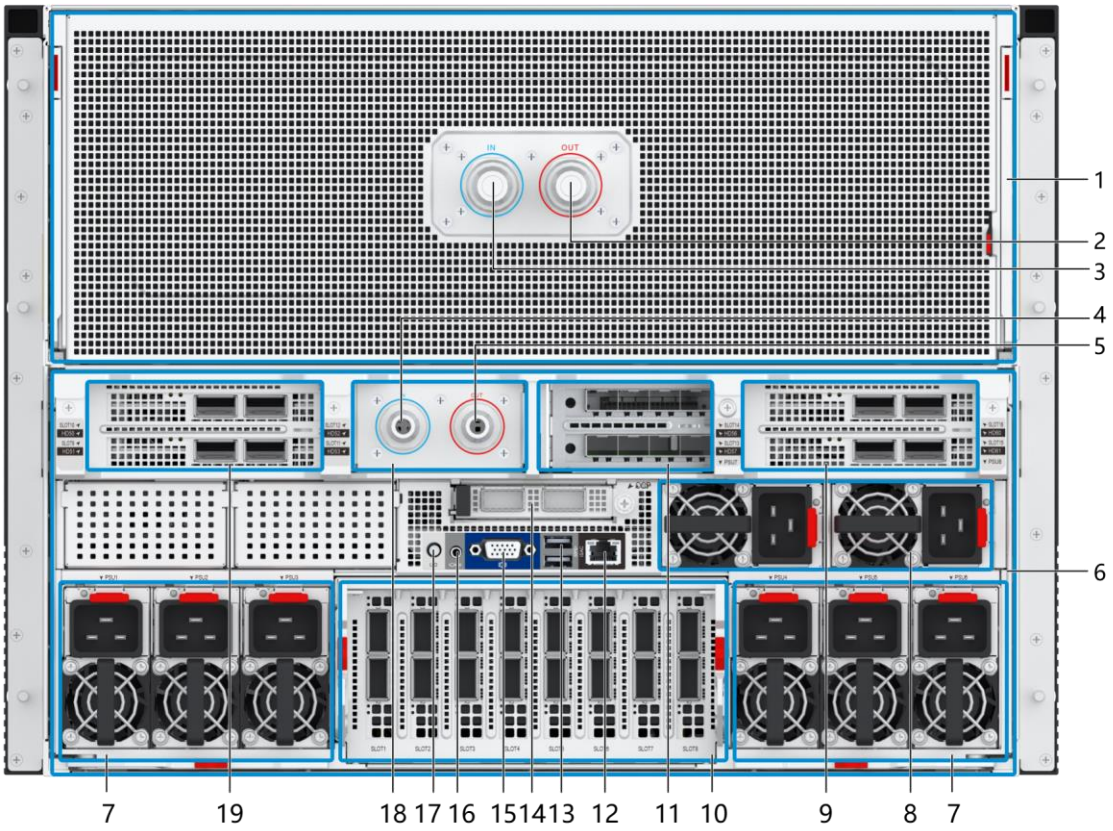
To ensure drive availability, the storage duration of a hard disk drive cannot exceed six months before use.

2.2.2 Liquid Cooling–Based Rear Panel

When the NCS6782GN4 server uses liquid cooling, the rear panel can be configured as follows:

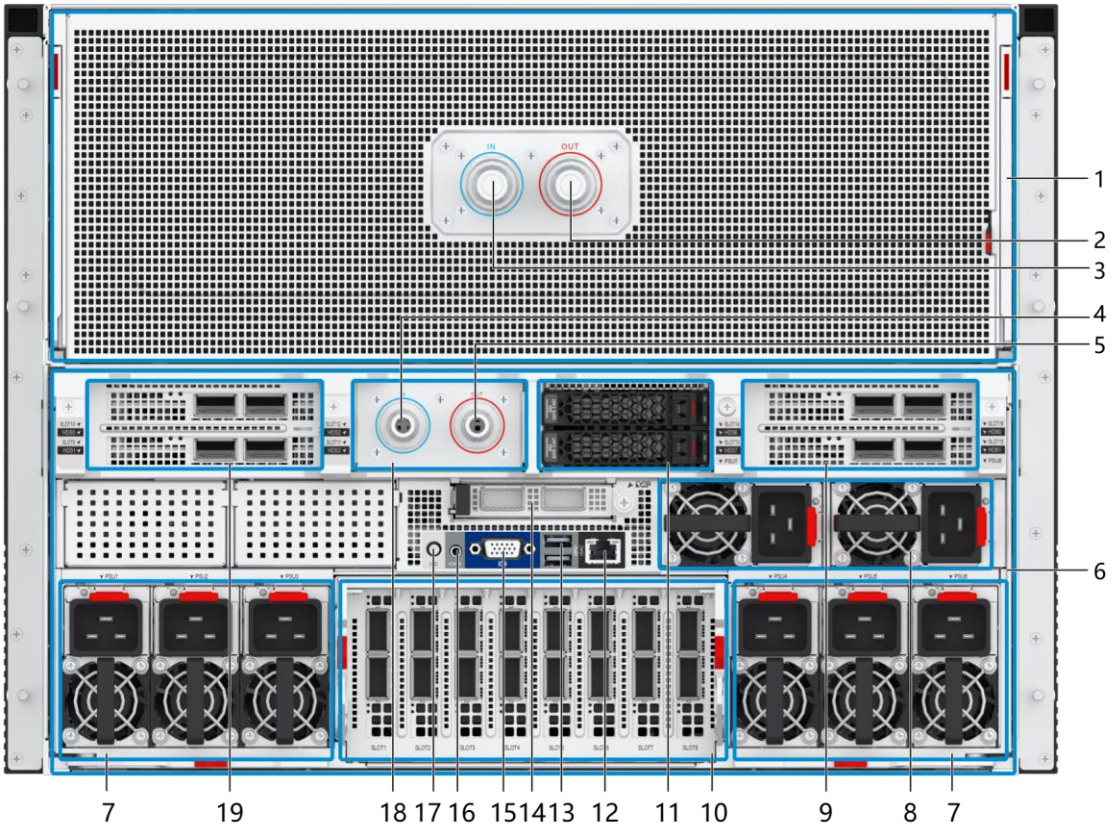
- Fourteen expansion slots for standard PCIe 5.0 cards, as shown in Figure 2-6.

Figure 2-6 Rear Panel with 14 Expansion Slots for Standard PCIe 5.0 Cards



- Twelve expansion slots for standard PCIe 5.0 cards and two slots for 2.5-inch hard disks, as shown in Figure 2-7.

Figure 2-7 Rear Panel with 12 Expansion Slots for Standard PCIe 5.0 Cards and 2 Slots for 2.5-Inch Hard Disks



For a description of the components on the rear panel of the NCS6782GN4 server, refer to Table 2-3.

Table 2-3 Descriptions of the Components on the Liquid Cooling–Based Rear Panel

No.	Item	Description
1	GPU module	Powerful GPU computing is provided.
2	Liquid cooling connector	Fluid connector at the outlet of the GPU module (UQD06).
3	Liquid cooling connector	Fluid connector at the inlet of the GPU module (UQD06).
4	Liquid cooling connector	Fluid connector at the inlet of the CPU module (UQD04).
5	Liquid cooling connector	Fluid connector at the outlet of the CPU module (UQD04).
6	CPU module	Powerful computing and processing capacities are provided and Intel compute modules are supported.
7	54 V PSU	• Six 54 V PSUs are supported. • 220 V AC input or 240 V DC input is supported.

No.	Item	Description
		● A 3200 W power supply is supported. ● "N+N" redundancy is supported. ● Hot swapping is supported.
8	12 V PSU	● Two 12 V PSUs are supported. ● 220 V AC input or 240 V DC input is supported. ● A 2700 W power supply is supported. ● "1+1" redundancy is supported. ● Hot swapping is supported.
9	I/O module 4	One full-height double-width PCIe 5.0 x16 standard card or two full-height single-width PCIe 5.0 x16 standard cards are supported.
10	NIC module	Eight single-width PCIe 5.0 x16 standard cards and one half-height single-width NIC adapter module are supported.
11	I/O module 3	Two half-height single-width PCIe 5.0 x16 standard cards or two 2.5-inch SAS/SATA/NVMe SSDs are supported.
12	iSAC network interface	The network cable is used to interconnect the iSAC network interface with a debugging PC so you can log in to the Web portal of the iSAC network interface through a browser on the debugging PC.
13	USB 3.0 interface	Used to connect to a USB mouse, a USB keyboard, or a peripheral storage device (for example, a USB flash drive for booting the system).
14	OCP card	Various standard OCP NIC 3.0 cards are supported through OCP slots, and provide GE, 10 GE, 25 GE, and 100 GE interfaces.
15	VGA interface	Used to connect to a display.
16	Serial port	The 3.5 mm audio serial cable is used to connect the serial port to the debugging PC. The server can be configured on the HyperTerminal of the debugging PC.
17	UID button/indicator	The button is also used as an indicator. This indicator can be in the following status: ● Steady on: The server is being located. ● Flashing at 1 Hz: The server is being remotely maintained or the firmware is being upgraded through a PC. ● Flashing at 4 Hz: The server is in debugging mode. The serial port on the panel serves as the BMC debugging serial port. ● Off: No positioning operation is triggered on the server. The UID button supports the following operations: ● Press and hold the button for less than 4 seconds: Perform server positioning or cancel the current function (cancel positioning or the BMC debugging status of the serial port).

No.	Item	Description
		● Press and hold the button for 4 (inclusive) to 10 seconds: Switch the serial port on the panel to BMC debugging status. ● Press and hold the button for at least 10 seconds: Reset the BMC. ● Press and hold the button for 4 (inclusive) to 10 seconds, release it, and then press and hold it for at least 10 seconds: Reset the BMC and keep the serial port on the panel in BMC debugging status.
18	I/O module 2	This area is configured with the fluid cooling connectors for the CPU module.
19	I/O module 1	One full-height double-width PCIe 5.0 x16 standard card or two full-height single-width PCIe 5.0 x16 standard cards are supported.

Note

To ensure drive availability, the storage duration of a hard disk drive cannot exceed six months before use.

Chapter 3
Product Structure

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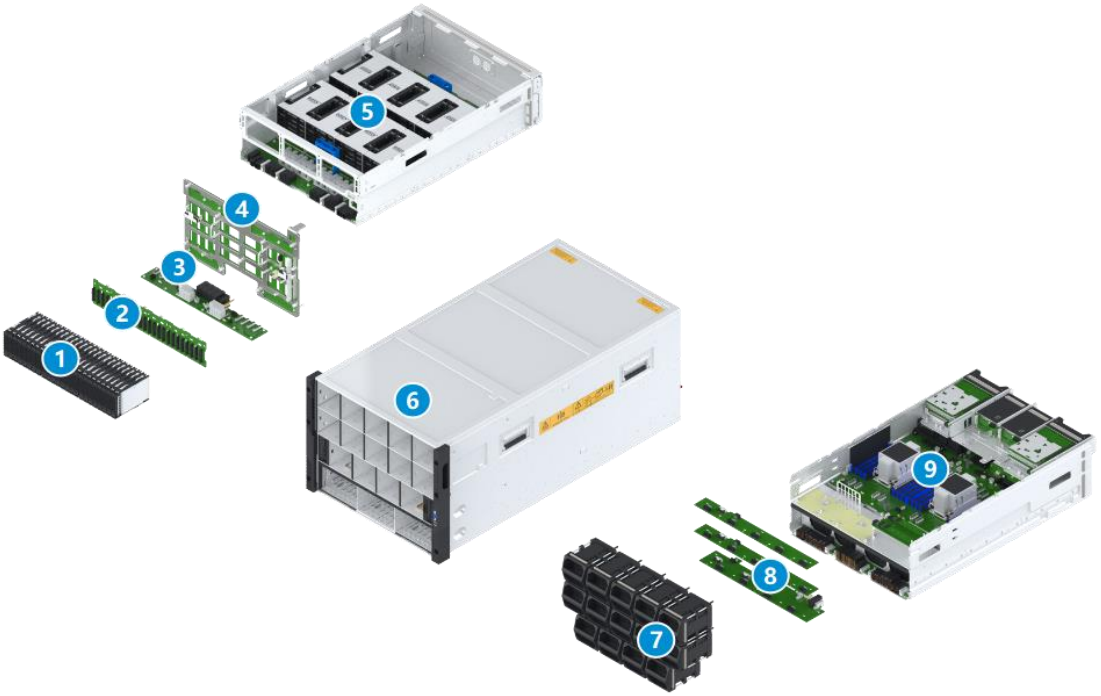
3.1 Physical Structure

3.1.1 Air Cooling–Based Physical Structure

Figure 3-1 shows the internal components of the air-cooled NCS6782GN4 server.

Figure 3-1 Internal Structure (in Air Cooling Mode)



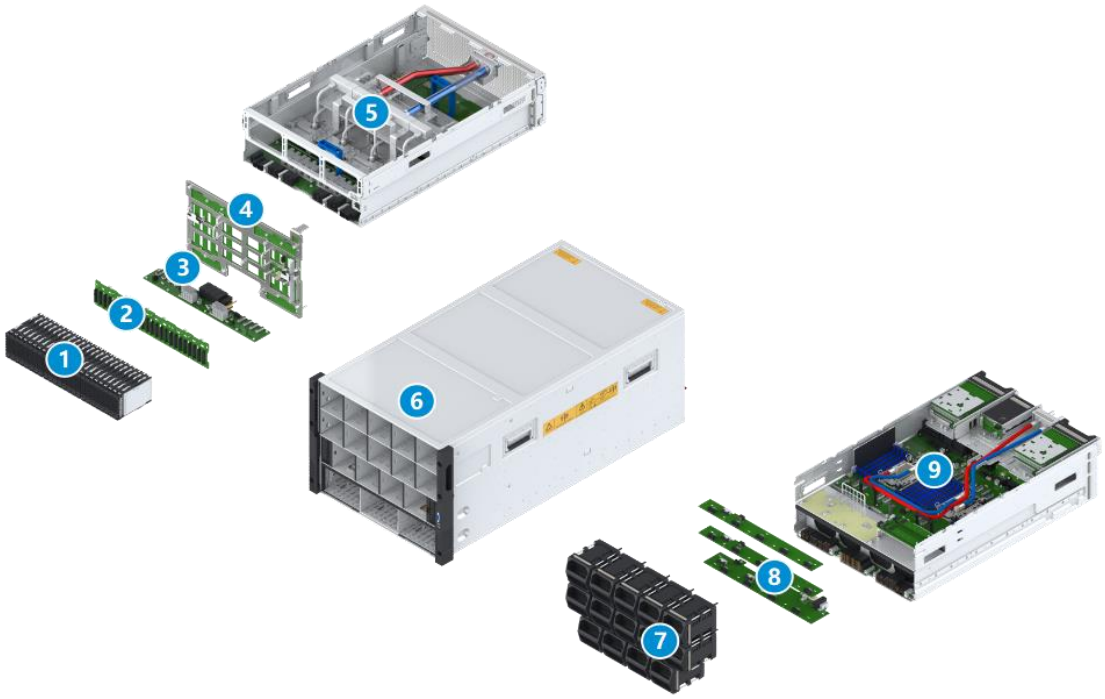
No.	Component	No.	Component
1	Front hard disk	2	Front hard disk backplane
3	Disk backplane adapter	4	Middle backplane
5	GPU module	6	Chassis

No.	Component	No.	Component
7	Fan unit	8	Fan backplane
9	CPU module	-	-

3.1.2 Liquid Cooling–Based Physical Structure

Figure 3-2 shows the internal components of the liquid-cooled NCS6782GN4 server.

Figure 3-2 Internal Structure (in Liquid Cooling Mode)



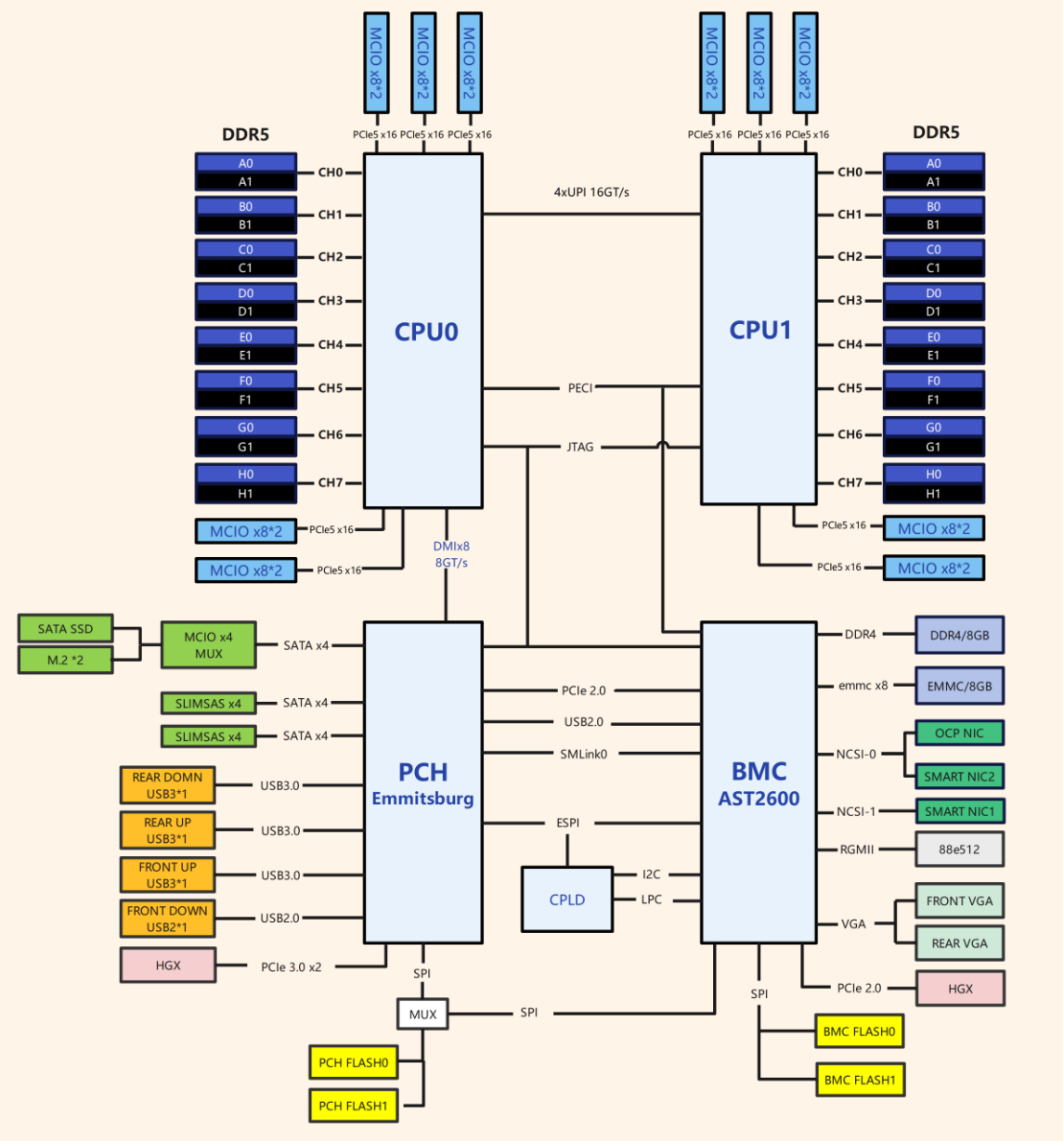
No.	Component	No.	Component
1	Front hard disk	2	Front hard disk backplane
3	Disk backplane adapter	4	Middle backplane
5	GPU module (liquid-cooled)	6	Chassis
7	Fan unit	8	Fan backplane
9	CPU module (liquid-cooled)	-	-

3.2 Logical Structure

3.2.1 Mainboard

Figure 3-3 shows the logical structure of the NCS6782GN4 server mainboard.

Figure 3-3 Logic Structure of the Mainboard



For a description of the modules of the NCS6782GN4 server mainboard, refer to Table 3-1.

Table 3-1 Module Descriptions

Module	Description
CPU	As the computing and control core of the server, the CPU is used for processing information and running programs. The NCS6782GN4 supports a maximum of two CPUs, which are interconnected through four UPI links, with a maximum transmission rate of 16 GT/s.
BMC	Used for upgrading server firmware and viewing device information when the server is not powered on.

Module	Description
PCH	Southbridge chipset on the mainboard of the server, on which SATA, PCIe, and USB interfaces can be integrated. The NCS6782GN4 uses the Emmitsburg chipset.
DDR5	Used for storing computational data in the CPUs and the data exchanged with external storage devices such as hard disks. The NCS6782GN4 provides thirty-two DDR5 memory slots.
USB	Exchanges data between the server and external devices. The NCS6782GN4 server provides one USB 2.0 interface and three USB 3.0 interfaces.
SATA	Hard disk interface. The NCS6782GN4 provides three SATA 3.0 interfaces.
MCIO	High-speed signal connector, which connects to the hard disk backplane and switch board.
CPLD	Used for server power management, system reset and initialization, and hardware logic control.
OCP	Used to install OCP 3.0 NICs and provides GE, 10 GE, 25 GE, and 100 GE interfaces.
VGA	Used to connect a display. The NCS6782GN4 provides two VGA interfaces.

3.2.2 Switch Board

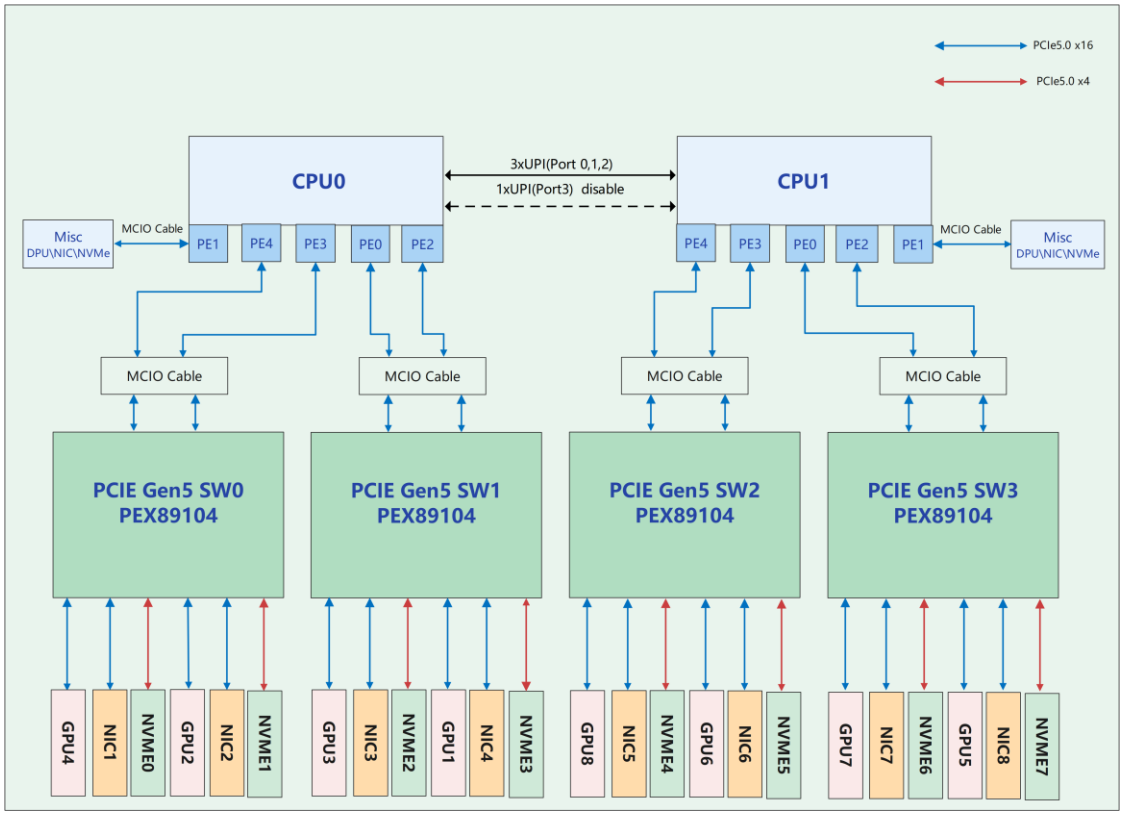
With a PCIe switch board, the NCS6782GN4 server can provide a certain number of standard PCIe card slots to expand system functions.

The switch boards of the NCS6782GN4 server include the following:

- Dual-uplink switch board

  Figure 3-4 shows the logical structure of a dual-uplink switch board.

Figure 3-4 Logical Architecture of the Dual-Uplink Switch Board



For the relationships between the PCIe devices that can be connected to the dual-uplink switch board and the connectors, refer to Table 3-2.

Table 3-2 Relationships Between PCIe Devices and Connectors—Dual-Uplink Switch Board

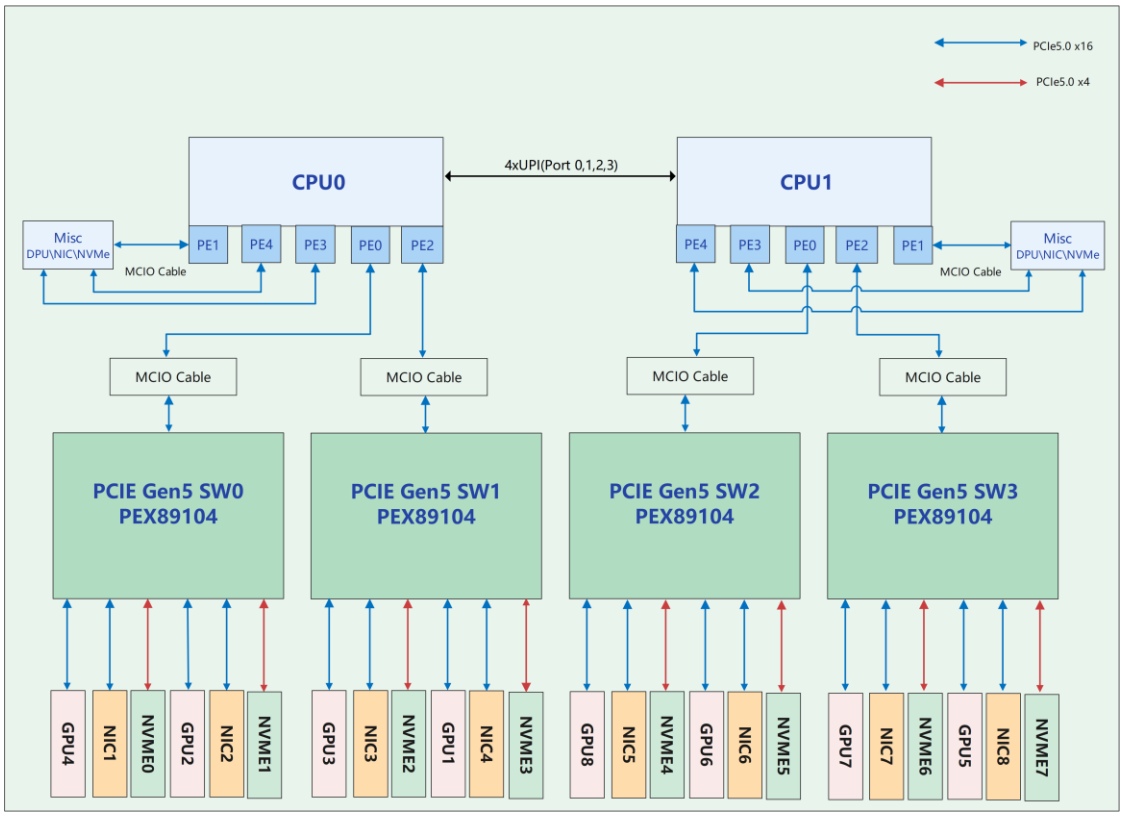
PCIe Device	Connector Position ID on the Switch Board	Connector Position ID on the Mainboard
Switch1: ➔ GPU1, GPU3 ➔ NIC3, NIC4 ➔ NVME2, NVME3	X56	X56
	X36	X36
	X41	X41
	X44	X44
Switch0: ➔ GPU2, GPU4 ➔ NIC1, NIC2 ➔ NVME0, NVME1	X14	X14
	X48	X48
	X47	X47
	X8	X8
Switch3: ➔ GPU5, GPU7	X58	X58
	X28	X28

PCIe Device	Connector Position ID on the Switch Board	Connector Position ID on the Mainboard
➔ NIC7, NIC8 ➔ NVME6, NVME7	X53	X53
	X54	X54
Switch2: ➔ GPU6, GPU8 ➔ NIC5, NIC6 ➔ NVME4, NVME5	X50	X50
	X49	X49
	X13	X13
	X18	X18

- Single-uplink switch board

  Figure 3-5 shows the logical structure of a single-uplink switch board.

Figure 3-5 Logical Architecture of a Single-Uplink Switch Board



For the relationships between the PCIe devices that can be connected to a single uplink switch board and the connectors, refer to Table 3-3.

Table 3-3 Correspondence Between PCIe Devices and Connectors—Single-Uplink Switch Board

PCIe Device	Connector Position ID on the Switch Board	Connector Position ID on the Mainboard
Switch3: ➔ GPU5, GPU7 ➔ NIC7, NIC8 ➔ NVME6, NVME7	X53	X53
	X54	X54
Switch0: ➔ GPU2, GPU4 ➔ NIC1, NIC2 ➔ NVME0, NVME1	X14	X56
	X48	X36
Switch2: ➔ GPU6, GPU8 ➔ NIC5, NIC6 ➔ NVME4, NVME5	X50	X58
	X49	X28
Switc12: ➔ GPU3, GPU1 ➔ NIC3, NIC4 ➔ NVME2, NVME3	X41	X41
	X44	X44

Chapter 4
Software Functions

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4.1 BMC Software

The CPUs, bridge chips, EPLD, sensors and other components on the mainboard of the NCS6782GN4 server are connected to the BMC through different channels to implement out-of-band management of the mainboard. Based on the hardware platform using the ARM AST2600 processor and the embedded Linux system, the BMC implements IPMI 2.0 server management, KVM, and virtual media functions with the support of the Tulip platform, and provides external user interfaces.

The BMC chassis management software provides the following functions:

- Internally, the chassis management software manages, tracks, and controls the FRU modules in the chassis, and the public structures of the chassis, especially power supplies and heat dissipation devices.
- Externally, the chassis management software provides external IPMI, Redfish and SNMP interfaces and the web portal to manage and monitor the boards and modules.

For a description of the BMC chassis management software functions, refer to Table 4-1.

Table 4-1 Descriptions of the Chassis Management Software Functions

Function	Description
Basic information viewing function	This function allows you to view the following information: ● Board name, product name, manufacturer, and asset label ● Production date, board serial number, and product serial number ● GUID ● Power-on/off status, and real-time power ● Boot mode ● Alarm status of the system
Real time monitoring function	This function monitors the following information in real time: ● Sensor information ● CPU usage

Function	Description
	● Memory usage ● Disk usage
Component information viewing function	This function allows you to view the following information: ● Hard disk information ● Memory information ● CPU Information ● Network interface information ● Fan information
System configuration function	This function allows you to perform the following operations: ● BMC network configuration ● DNS configuration ● Time configuration ● Power and power supply control ● Power-on strategy and power-on delay parameters ● UID indicator ● Boot mode ● Resetting defaults
System management function	This function allows you to manage the following information: ● Account, version and logs ● IPMI, SNMP, Redfish, ACL rules, and ports ● Https certificate
Button functions	The following buttons are available: ● Board power-on ● Board power-off ● Restart
Reliability function	This function enables the BMC firmware redundancy and backup.
KVM function	This function enables the support for KVM. This function provides HTML5 clients and Java clients.
Alarm management function	This function manages alarms.
Performance management function	This function provides statistics on historical power consumption.
Diagnosis and maintenance functions	The following functions are supported: the last screen function, the one-click data export function, the configuration backup function, and the factory default configuration restoration function.

4.2 BIOS Software

Complying with the modern UEFI BIOS standard, the BIOS of the NCS6782GN4 server is responsible for initializing hardware, loading device drivers and leading the booting of bootable devices or systems.

The functions of the BIOS software include:

- Basic functions:
  - ➔ UEFI and legacy boot modes
  - ➔ Multi-device boot modes, including HDD, PXE, CD, USB, and BIOS
  - ➔ ACPI, SMBIOS, and IPMI
  - ➔ Port 80 code (namely, POST code)
  - ➔ OEM logo customization
  - ➔ Multi-language BIOS setup
  - ➔ Console redirection
  - ➔ Power management
  - ➔ Secure boot
  - ➔ TPM/TCM
  - ➔ Device asset information reporting
- Advanced functions:
  - ➔ Black box
  - ➔ Fault diagnosis and alarm
  - ➔ BIOS menu configuration import and export, and post-upgrade configuration inheritance
  - ➔ Power management policy and dynamic energy saving

Chapter 5
Product Specifications

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5.1 Physical Specifications

For the physical specifications of the NCS6782GN4 server, refer to Table 5-1.

Table 5-1 Physical Specifications

Item	Description
Dimensions (Width x Height x Depth)	● 447 mm x 352.8 mm x 890 mm (lugs excluded) ● 482.6 mm x 352.8 mm x 900 mm (lugs included)
Weight	The net weight is 130 kg in full configuration without the heavy-duty rail kit, accessories, and packaging, and the gross weight is 150 kg in full configuration with the heavy-duty rail kit, accessories, and packaging.
Color	● Silver chassis ● Black panels
Installation requirements	● The server can be installed in a general-purpose cabinet meeting the IEC 297 standard and with a depth equal to or greater than 1200 mm. ● Servers can be stacked at intervals and secured through strengthened supporting rails. The clearance between the PDU and the front post of the cabinet shall not be less than 920 mm, and the clearance between the front post of the cabinet and the outside of the front door shall be 75 mm–200 mm.
Energy consumption	≤ 12 kW

5.2 Technical Specifications

For the technical specifications of the NCS6782GN4 server, refer to Table 5-2.

Table 5-2 Technical Specifications

Item	Description
Height and type	8 U
Chipset	Emmitsburg C741
CPU	The server supports a maximum of two Intel® Xeon® Scalable processors (Sapphire Rapids/Emerald Rapids), each of which has a maximum of 64 cores.
Memory	The server supports a maximum of 32 DDR5 DIMMs, with the rate of up to 5600 MT/s per module.
Interconnection bus	● The CPUs are interconnected with each other through four UPI links. The maximum rate of a UPI link can reach 16 GT/s. ● CPU1 is connected to the PCH through DMI ×8.
Storage controller	Supports standard PCIe RAID controller cards, various RAID levels such as 0, 1, 5, 6, 10, 50, and 60, and protection against a power supply failure.
Storage	● Front hard disks: Twenty-four 2.5-inch hard disk slots, supporting both SAS/SATA SSDs and NVMe SSDs as well as hot swapping ● Rear hard disks (optional): ➔ I/O module 2 provides two 2.5-inch hard disk slots, supporting both SAS/ SATA SSDs and NVMe SSDs as well as hot swapping. ➔ I/O module 3 provides two 2.5-inch hard disk slots, supporting both SAS/ SATA SSDs and NVMe SSDs as well as hot swapping
Network	● Supports one IPMI GE interface. ● Supports a maximum of 16 standard PCIe NICs and 1 OCP NIC (including smart NICs).
I/O expansion	Supports a maximum of 16 standard PCIe 5.0 expansion slots and 1 OCP 3.0 slot.
Interface	The server provides multiple interfaces: ● Interfaces on the front panel: ➔ One USB 2.0 interface ➔ One USB 3.0 interface ➔ One VGA interface ● Interfaces on the rear panel: ➔ Two USB 3.0 interface ➔ One iSAC management interface ➔ One VGA interface ➔ One OCP card interface ➔ One 3.5 mm audio serial interface
PSU	● Supports six 54 V PSUs, which operate in "N+N" redundancy mode. ● Supports two 12 V PSUs, which operate in "1+1" redundancy mode.

Item	Description
Heat dissipation	● Air cooling: fourteen 80 mm x 80 mm fans and four 80 mm x 38 mm fans. ● Liquid cooling: For the related technical specifications, refer to Table 5-3.
Video card	The server has an integrated graphics card and supports PCIe standard graphics cards.
Supported operating systems	The server is compatible with mainstream server operating systems, including but not limited to Microsoft Windows Sever, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, CentOS, and VMware ESXi.

Table 5-3 Technical Specifications on Liquid Cooling

Item	Description
Inlet temperature	Up to 40 ºC.
Universal Quick Disconnect (UQD)	● The liquid-cooled CPU module supports UQD04. In this specification, the equivalent flow diameter is 5 mm. ● The liquid-cooled GPU module supports UQD06. In this specification, the equivalent flow diameter is 7 mm.
Coolant	● Deionized water/pure water ● 25% ethylene glycol water solution ● 25% propylene glycol water solution
Tubing design	Hoses are used, which provide a high flexibility and reduces costs: ● The primary tube for liquid cooling of GPUs is an EPDM rubber tube, which has lower flow resistance and better wear resistance. ● For other tubes, PTFE tubing is used. A PTFE tube is connected to a pagoda connector and fastened with quick-connect nuts. In this way, the pressure bearing capability is higher and the connection is more reliable.
Leak detection	Intelligent monitoring covers all links, and an alarm is raised in seconds when a fluid leak is found during leak detection. The leaked fluid is isolated and collected to avoid spreading and mitigate O&M risks.
Cold plate soldering	The brazing process (silver solder) is used, resulting in stronger joints.
Cold plate material	T2 copper is used, and it consists of more than 99.9% copper. The surface finishing process is nickel plating.
Cold plate base	6063 aluminum alloys are used, and the surface finishing process is anodizing.
Thermal resistance	● CPU cold plate: (0.04 ± 0.002) °C/W@1.0 L/min ● GPU cold plate: (0.05 ± 0.002) °C/W@10.8 L/min
Cold plate flow and resistance	A low-flow and low-resistance design is used, so that the cooling efficiency is higher and the PUE can be further reduced.

Item	Description
	● CPU (liquid cooled): The flow is 1 L per minute, meeting the cooling requirements of 2 x 350W Intel EGS CPUs. The resistance is 20 KPa@25% ethylene glycol water solution. ● GPU (liquid cooled): The flow is 10.8 L per minute, meeting the cooling requirements of 8 x 700W H800 GPUs and (2 x 134W + 2 x 156W) NVSwitch chips. The resistance is 50 KPa@25% ethylene glycol water solution.

5.3 Environmental Specifications

For the environmental specifications of the NCS6782GN4 server, refer to Table 5-4.

Table 5-4 Environmental Specifications

Item	Description
Temperature	● Operating temperature: 5°C through 35°C (Meets the ASHRAE Class A2 requirements) ● Storage temperature: –40°C through +65°C ● Maximum temperature change rate: 20°C/h
Relative humidity	● Operating environment: 8% through 90%, non-condensing (Meets the ASHRAE Class A2/A3/A4 requirements) ● Non-operating environment: 5% through 95%, non-condensing
Altitude	≤ 3000 m. The operating temperature decreases by 1 °C per 300 m when the altitude is above 900 m, and hard disk drive configuration is not supported when the altitude is above 3000 m.
Corrosive gas contaminants	Meets the requirements of the airborne corrosion level G1 defined in ANSI/ISA-71.04-2013. The maximum thickness growth rate of corrosive airborne contaminants should be as follows: ● Copper coupon: 300 Å/month ● Silver coupon: 200 Å/month
Particulate pollutants	● Meets the requirements of the data center cleaning standard ISO 14644-1 Class 8. ● There must be no explosive, electrically or magnetically conducive, or corrosive dust in the equipment room.

Note

To ensure drive availability, the storage duration of a hard disk drive cannot exceed six months before use.

5.4 Reliability Specifications

For the reliability specification descriptions of the NCS6782GN4 server, refer to Table 5-5.

Table 5-5 Reliability Specifications

Item	Specification
System availability	> 99.999%
MTTR	≤ 60 min
MTBF	> 100000 h

Chapter 6
Compliant Standards

For the standards that the NCS6782GN4 rack server complies with, refer to Table 6-1.

Table 6-1 Compliant Standards

Standard Name	Standard Number
CE Certification	EN 62368-1:2014+A11:2017
	EN 300 386 V1.6.1
	EN 300 386 V2.2.1
	EN IEC 63000:2018
	(EU) 2019/424
	EN 303 470 V1.1.1
CB Certification	IEC 62368-1
ETL Certification	UL 62368-1

Chapter 7
Product Recycling

To better care for and protect the earth, if this product is no longer needed or has reached the end of its service life, please dispose it in compliance with national or local laws and regulations related to the recycling and disposal of electronic waste, and deliver it to a manufacturer with recycling and disposal qualification to ensure proper treatment.

In accordance with relevant laws and regulations, we can recycle the electronic information products that it has produced and sold. If necessary, contact the local technical support office for product recycling.

- Contact information: +86-755-26771900
- Address: NETAŞ Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, P.R.China

Glossary

AC

- Alternating Current

ACL

- Access Control List

ACPI

- Advanced Configuration and Power Interface

AI

- Artificial Intelligence

ARM

- Advanced RISC Machines

BIOS

- Basic Input/Output System

BMC

- Baseboard Management Controller

CB

- Certification Bodies' Scheme

CD

- Compact Disk

CE

- CONFORMITE EUROPENDE

CPLD

- Complex Programmable Logic Device

CPU

- Central Processing Unit

DC

- Direct Current

DDR

- Double Data Rate

DIMM

- Dual Inline Memory Module

DMI

- Direct Media Interface

DNS

- Domain Name System

EPLD

- Erasable Programmable Logic Device

ETL

- Electrical Testing Laboratories

FRU

- Field Replaceable Unit

GPU

- Graphics Processing Unit

GUID

- Globally Unique Identifier

HDD

- Hard Disk Drive

HTML

- HyperText Markup Language

I/O

- Input/Output

IEC

- International Electrotechnical Commission

IPMI

- Intelligent Platform Management Interface

iSAC

- Integrated Server Administrator Controller

KVM

- Keyboard, Video and Mouse

MTBF

- Mean Time Between Failures

MTTR

- Mean Time To Recovery

NIC

- Network Interface Card

NVMe

- Non-Volatile Memory Express

O&M

- Operation & Maintenance

OCP

- Open Computer Project

OEM

- Original Equipment Manufacturer

PC

- Personal Computer

PCH

- Platform Controller Hub

PCIe

- Peripheral Component Interconnect Express

PDU

- Power Distribution Unit

PSU

- Power Supply Unit

PUE

- Power Usage Effectiveness

PXE

- Preboot eXecution Environment

RAID

- Redundant Array of Independent Disks

RMCP

- Remote Management Control Protocol

SAS

- Serial Attached SCSI

SATA

- Serial ATA

SMBIOS

- System Management Basic Input/Output System

SNMP

- Simple Network Management Protocol

SSD

- Solid State Drive

TCM

- Trusted Cryptography Module

TPM

- Trusted Platform Module

UEFI

- Unified Extensible Firmware Interface

UID

- Unit Identification Light

UPI

- Ultra Path Interconnect

USB

- Universal Serial Bus

VGA

- Video Graphic Adapter