NETAŞ Server

NCS6722 N4 Server Product Description

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NCS6722A N4 Rack Server Product Description

Version	Date	Author	Reviewer	Notes
R1.0	2023/03/27	NETAŞ		Not opened to any 3rd party

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1 Overview

The NCS6722A N4 rack server is an enterprise-class general rack server developed by NETAŞ based on the EPYC 9004 series high-performance processors of AMD. It uses a secure and reliable software and hardware system, and features multiple cores, high throughput, strong single-thread capability, high integer computing performance, and

high access and I/O channel bandwidth. It is a high-performance server oriented to enterprise applications and data centers. NCS6722A N4 servers deliver outstanding total cost of ownership (TCO) for cloud computing, big data analytics, and software-defined data centers as a high-performance, secure, and reliable storage platform for low-latency, data-intensive workloads.

Figure 1- 1 NCS6722A N4 Front View

The NCS6722A N4 server displays its advanced technologies as follows:

- The product supports one or two AMD EPYC 9004 series processors, with a maximum of 128 cores and 256 threads on a single CPU. It has excellent level-2 and level-3 caches, provides stronger data processing throughput and virtualization capabilities, and provides higher performance for user applications.
- Each CPU is configured with twelve memory slots. A total of twenty-four memory slots are supported, supporting a maximum memory capacity of DDR5-4800. The maximum memory capacity can be expanded to 12TB, providing flexible and powerful memory configuration options.
- The intelligent chassis cooling system perfectly combines noise reduction and heat dissipation.
- The system supports a maximum of twelve PCIe slots to meet the network requirements of 1GB, 10GB, 25G, 40G, and 100G. It also supports GPU applications and various I/O interfaces to meet different service applications.
- The complete management system supports fault location, health monitoring, and rapid deployment.

- The system supports AC, high-voltage DC, low-voltage DC, and other power input systems.

2 Product Highlights

2.1 High Performance

- The product supports the latest EPYC 9004 series CPU.
- The product supports a maximum of 256 physical cores, maximizes the number of VM instances, and supports hyper-threading.
- The product supports up to twenty-four RDIMM/LRDIMM memory slots.
- The product supports memory frequencies up to 4,800MT/s.
- A single CPU supports a maximum of 6TB memory.
- A single CPU is integrated with up to 128 Lanes PCIe 5.0.
- The product supports twelve PCIe slots to meet the flexible expansion requirements for networks and storage control.

2.2 High Security and Reliability

- Key components such as hard disks and power supplies support hot swapping. Components can be replaced and maintained without power-off, improving the availability of the system.
- The product provides hardware HBA/RAID cards and supports RAID 0, 1, 5, 6, 10, and 50 to provide multiple data protection modes for users.
- The intelligent heat dissipation design improves system reliability, effectively extends the life of components, and supports N+1 redundancy.
- The product uses redundant power modules that support 1+1 redundancy.
- The product provides multiple hardware and data encryption, equipment fault alarms, and intrusion alarms.

2.3 Convenient Management and Easy Maintenance

- The system supports out-of-band centralized management in Web mode to manage and monitor CPUs, memories, hard disks, fans, power supplies, and networks.

- The system provides powerful iKVM functions. The administrator can redirect local virtual media to the remote server to upgrade software and install and maintain the operating system for the remote system in a timely manner.
- The system supports system management, log file viewing, and real-time monitoring of sensors on various modules of the system.
- Parameter. Alarms can be raised in accordance with the specified alarm mode.
- The system supports IPMI2.0, provides out-of-band management through the IPMI interface, provides the RMCP+SNMP interface, supports RedFish, can be integrated with third-party management systems, and provides local management tools, including:
  - ✓ Fault analysis and recovery
  - ✓ System diagnosis, system configuration, device management, and user management
  - ✓ Network management, firmware management, and security management
  - ✓ Power consumption and performance adjustment

2.4 Green, Energy Saving, Environment Protection

- High-performance quiet fan design, intelligent speed adjustment, low power consumption, and low noise
- The product uses platinum/titanium power modules. and power capping is supported.
- The intelligent CPU frequency conversion intelligently adjusts the operating frequency of CPUs in accordance with service pressure
- The product monitors the power consumption of the system in real time, so that the customer can configure the equipment room power according to the application situation.
- Lead-free deign and environment protection

3 Product Specifications

Specification	NCS6722A N4
Feature	
Form	2U

Processor	Supports 1/2 AMD EPCY 9004 processors, each of which supports a maximum of 128 cores and hyper-threading.
Memory slot	Twenty-four DDR5-4800 RDIMM and LRDIMM memory slots. The maximum memory capacity is 12TB.
Hard disk controller	Supports standard and self-developed HBAs, Raid cards, and SAS4.0/SAS3.0/SATA3.0/PCIe5.0/PCIe4.0.
Hard disk	Provides multiple front storage bays, hot swapping, HDDs, and SSDs: ● 8x2.5” slots, supporting SAS/SATA/U.2 ● 16x2.5” slots, supporting SAS/SATA/U.2 ● 24x2.5” slots, supporting SAS/SATA/U.2 ● 25x2.5” slots, supporting SAS/SATA, among which eight slots support U.2 ● 12x3.5” slots, supporting SAS/SATA/U.2 Provides multiple rear storage module configurations, provides the multiple option function, supports hot swapping, HDD, and SSD: ● 2x2.5” slots, supporting SAS/SATA/U.2, supporting at most four hard disks ● 2x3.5” slots, supporting SAS/SATA/U.2, supporting at most four hard disks
Display	Integrated display controller, supporting the optional configuration of PCIe standard display cards
I/O module	
PCIe slot	Can be expanded up to 12 PCIe slots (with two OCP slots)
External equipment interface	Front: One USB3.0, + one USB2.0 interface, and one VGA interface Rear: Two USB 3.0s, one VGA, one gigabit BMC management network interface (RJ45), and one serial interface (3.5 MM)
OS	
Compatible OS	Compatible with mainstream server operating systems: Microsoft Windows Sever，Red Hat Enterprise Linux，SUSE Enterprise Linux，Vmware ESXi，and Ubuntu
Physical features	

Power	Two CRPS standard power modules, supporting 1+1 redundancy and supporting multiple power supplies such as 550/800/1200/1600/2000W/2700W/3200W ● 100 – 240 V/50 Hz standard CRPS AC power supply ● 240/336V standard CRPS high-voltage DC power supply ● -48V standard low-voltage DC power supply
Environmental conditions **(Note 1)**	Operating temperature: +5 ºC to +40 ºC (depending on the configuration) Storage temperature: -40 ºC to +65 ºC Operating humidity: 8% – 90% RH, no condensation Transportation and storage humidity: 5% – 95% RH, no condensation Altitude: ≤ 3,000m. When the altitude is 900m higher, the operating temperature is reduced by 1° C for every 300m higher. If the altitude is more than 3,000m, you cannot configure mechanical hard disks.
System size	19-inch rack, chassis size: 432mm x 87.6mm x 780mm (W x H x D), excluding flanges and guide rails
Fan	Four pluggable redundant fans, supporting N+1 redundancy and dynamic intelligent speed adjustment
Weight	The equipment with the maximum configuration is about 40kg (excluding guide rails)
Certificate	CCC, CE…

Table 3- 1 Product Specification

Note: For the environment conditions, refer to the section of "physical Indexes and Specifications"

Operating this equipment in a residential environment may cause radio interference.

4 Product Architecture

4.1 Product Description

4.1.1 Appearance of the Server

The appearance of the NCS6722A N4 server is displayed as follows:

Figure 4- 1External View of the NCS6722A N4 Horizontal Hard Disk

Figure 4- 2External View of the NCS6722A N4 Vertical Hard Disk

The NCS6722A N4 has multiple front hard disk models such as 8/12/16/24/25, as shown in the following figure：

Figure 4- 3 View of Each Slot Model Panel of NCS6722A N4

The front panel in the front of NCS6722A N4 is shown in the following Diagram:

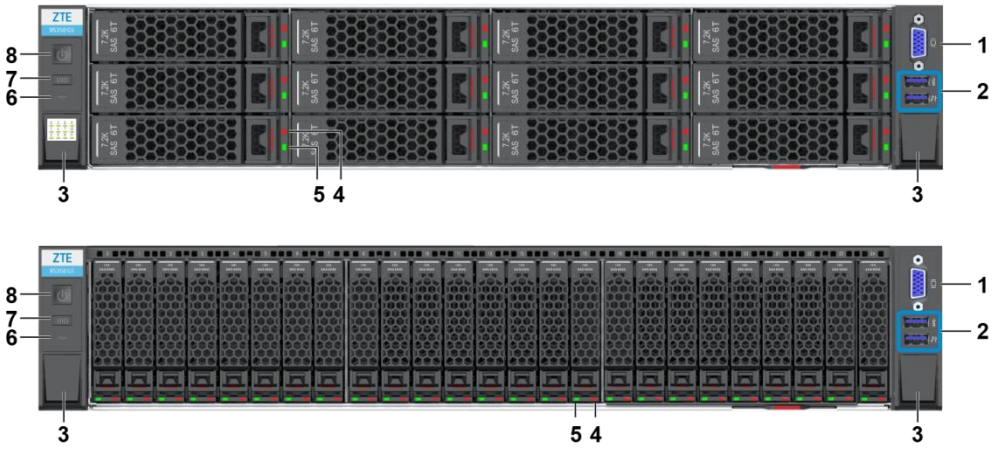


Figure 4- 4 Appearance View of NCS6722A N4 (in the front)

No	Name	No.	Name
1	Front VGA	5	Hard disk operation status indicator
2	USB interface	6	Status indicator
3	Rack installation hole	7	UID indicator/button
4	Hard disk operation status indicator	8	Power button

Table 4- 1 Description of the Front Interface of NCS6722A N4

The back Rear Panel of NCS6722A N4 is shown as follows:

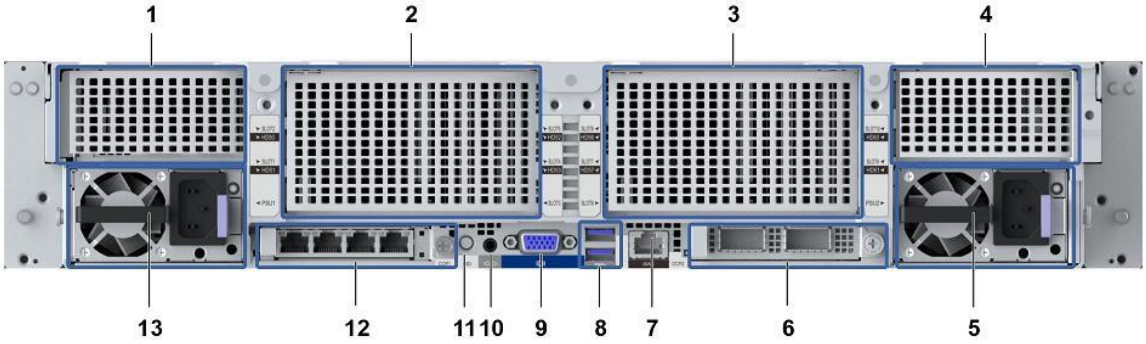


Figure 4- 5 Appearance View (Back Panel) of NCS6722A N4

No.	Name	No.	Name
1	IO module zone 1 (Supporting hard disk/PCI cards)	8	USB 3.0 interface
2	IO module zone 2 (Supporting hard disk/PCI cards)	9	VGA display interface
3	IO module zone 3 (Supporting hard disk/PCI cards)	10	Serial port

4	IO module zone 4 (Supporting hard disk/PCI cards)	11	UID button and indicator (Blue)
No.	**Name**	**No.**	**Name**
5	CRPS power 1	12	OCP card 1
6	OCP card 2	13	CRPSPower 2
7	RJ45 Gigabit IPMI management network port		

Table 4- 2 Description of the Rear Panel Interface of NCS6722A N4

4.1.2 System Structure

The NCS6722A N4 is a NETAŞ 2U general-purpose rack server that uses one or two AMD EPYC 9004 processors and different front high-performance hard disk backplanes and rear RISER expansion cards. It supports eight, twelve, sixteen, twenty-four, and twenty-five hard disks. It supports a maximum of thirty-three 2.5/3.5 SAS/SATA hot-swappable HDD/SSD hard disks, a maximum of thirty-two NVMe U.2 hard disks, and twenty-four DDR5 DIMM memory slots. CPUs are interconnected through four channels of xGMI3 fast channels at a transmission rate of up to 32Gbps, and supports a maximum of ten standard PCIe5.0 x8/x16 half-height/full-height standard slots. It also provides two PCIe 5.0 x16 OCP NIC slots, integrates one IPMI GE management electrical interface, supports four USB2.0/3.0 devices, supports 550W - 3200W redundant CRPS power supplies, and supports intelligent speed adjustment for high-performance fans.

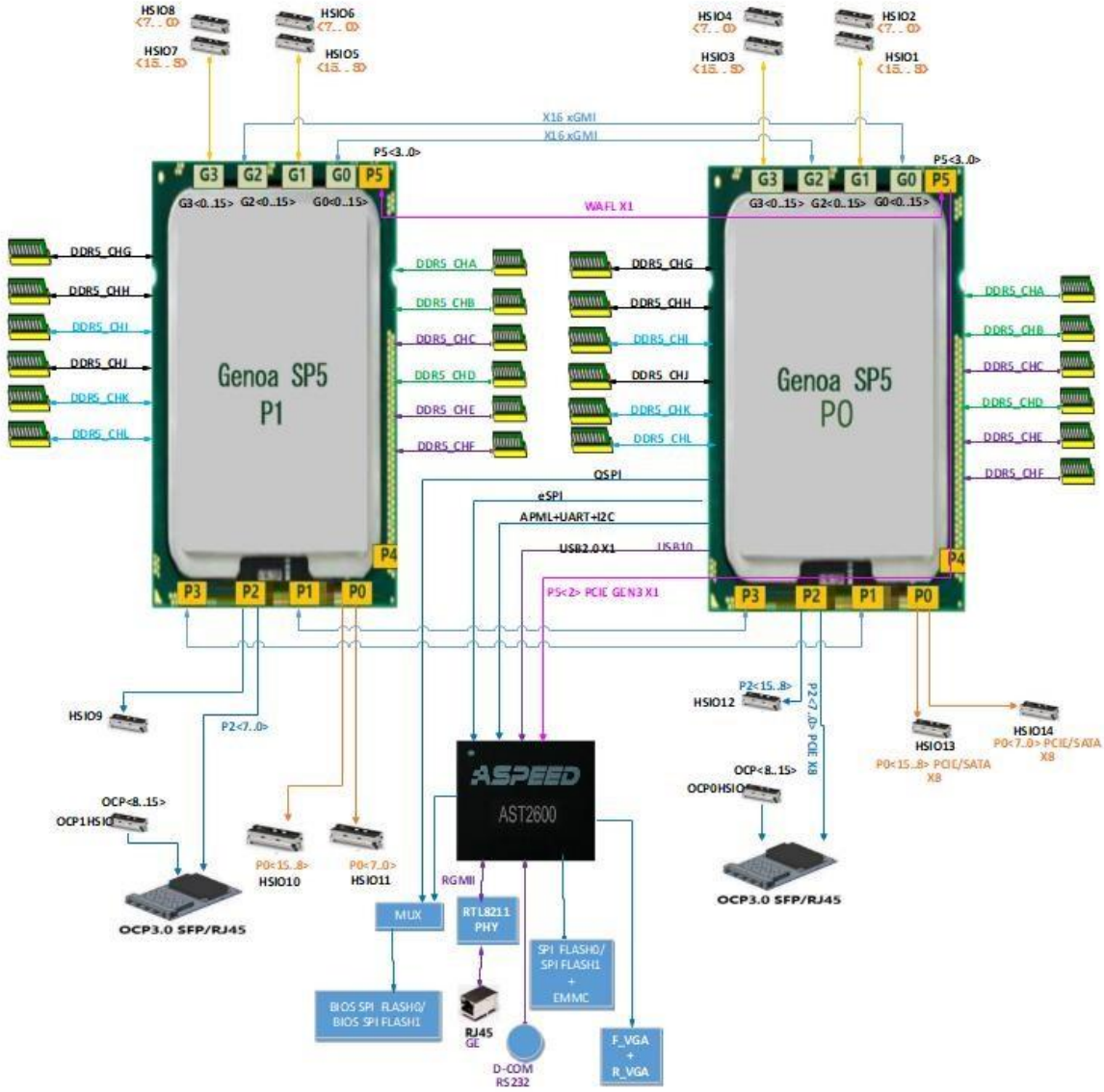


Figure 4- 6 Principle Shelf View

4.1.2.1 Management of Ethernet Plane

The customer can connect to the built-in management system of the server through the GE electrical interface on the rear of the shelf to manage and monitor the server. The management channel supports standard data center management protocol interfaces such as IPMI 2.0, SNMP V2/V3, and RedFish.

4.1.2.2 Description of Hard Disk Slots

The disk slots of the NCS6722A N4 are numbered by the front and rear partitions, as

shown in the following figure:

Figure 4- 7 12 Disk Model Hard Disk Slot View

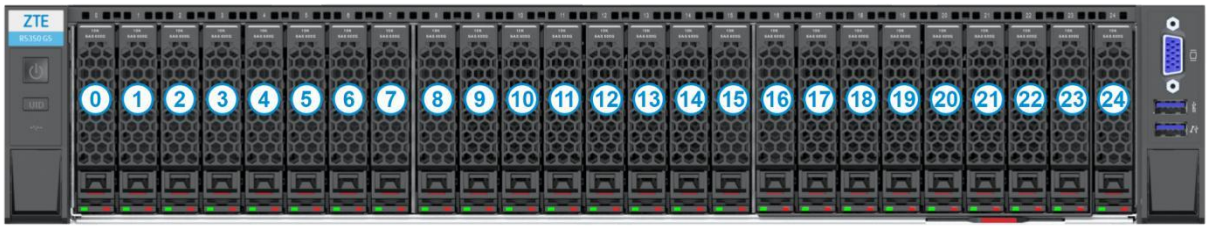


Figure 4- 8 8/16/24/25 Disk Model Hard Disk Slot View

Figure 4- 9 Rear Hard Disk Slot View

4.1.2.3 Description of Standard Slots of PCIe

The NCS6722A N4 supports up to ten rear half-height/full-height standard PCIe5.0 slots and can support the following types of interfaces/memory cards:

- Dual-port FC HBA optical interface card
- Dual-port/four-port GE electrical interface card
- Dual-port/four-port 10 GE optical interface card
- Dual-port 40GE optical interface card
- Dual-port 25 G optical interface card
- 8/16-port RAID card

- AIC NVMe SSD card
- Double-wide/single-wide GPU card or smart NIC
- Others

Figure 4- 10 View of PCIe Slots

4.1.2.4 OCP Interface Card Description

The NCS6722A N4 supports two OCP 3.0-compliant interface card slots and PCIe 5.0 x16 interfaces. After the OCPs are configured, the following optional interfaces are supported:

- Dual-port 10 GE NIC
- Four-port GE NIC
- Dual-port 25GE NIC
- Dual-port 100GE NIC
- Others

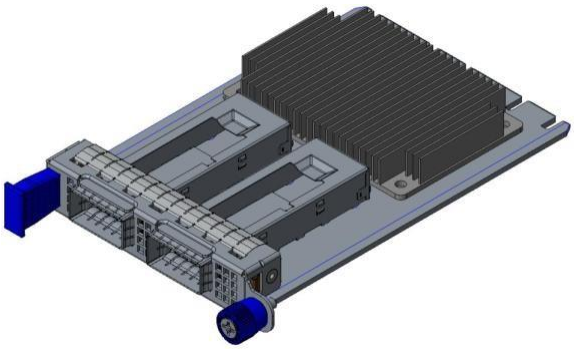


Figure 4- 11 OCP Interface Card View

4.1.2.5 Power Module

- The power input supports Platinum/Titanium certified CRPS power supplies such as

550 W/800 W/1200 W/1600 W/2000W/2700W/3200W, and supports 110 V/220 V AC,240 V/336 V high-voltage DC and -48V low-voltage DC.

- The power module supports current and voltage detection, provides the PM Bus interface, and is managed by the management module.
- The power module has fans. The system provides an independent air duct for heat dissipation.
- The power module is a standard 185-mm-length CRPS power module.
- The system can be configured with a maximum of two power modules, which support 1+1 redundancy and hot swapping.

There are green and amber indicators on the power panel. If the green indicator is on, the power output is normal. If the green indicator is flashing, the standby output is normal. If the amber indicator is on, the power supply breaks down.

Refer to the following table:

Running Indicator	Green	Red	Remarks
No AC input	Off	Off	No AC input, the light is OFF
AC input is normal, Standby output is normal, and 12V has no output.	1S shining	Off	Standby is normal. When 12V is not output, the green light shines for 1s.
12V output is normal, and Standby output is normal	On	Off	The outputs of two channels are normal, and the green light is on.
Module fault	Off	On	The amber indicator is on as long as there are input overvoltage/undervoltage alarms, output overvoltage, overcurrent, short circuit, and OTP faults in the two outputs.

Table 4- 3 Power Module Panel Indicator Definition

4.2 Product Composition

The product mainly consists of the chassis, server mainboard, RISER cards, power supply, fan, and hard disk backplane. Its core is the server mainboard.

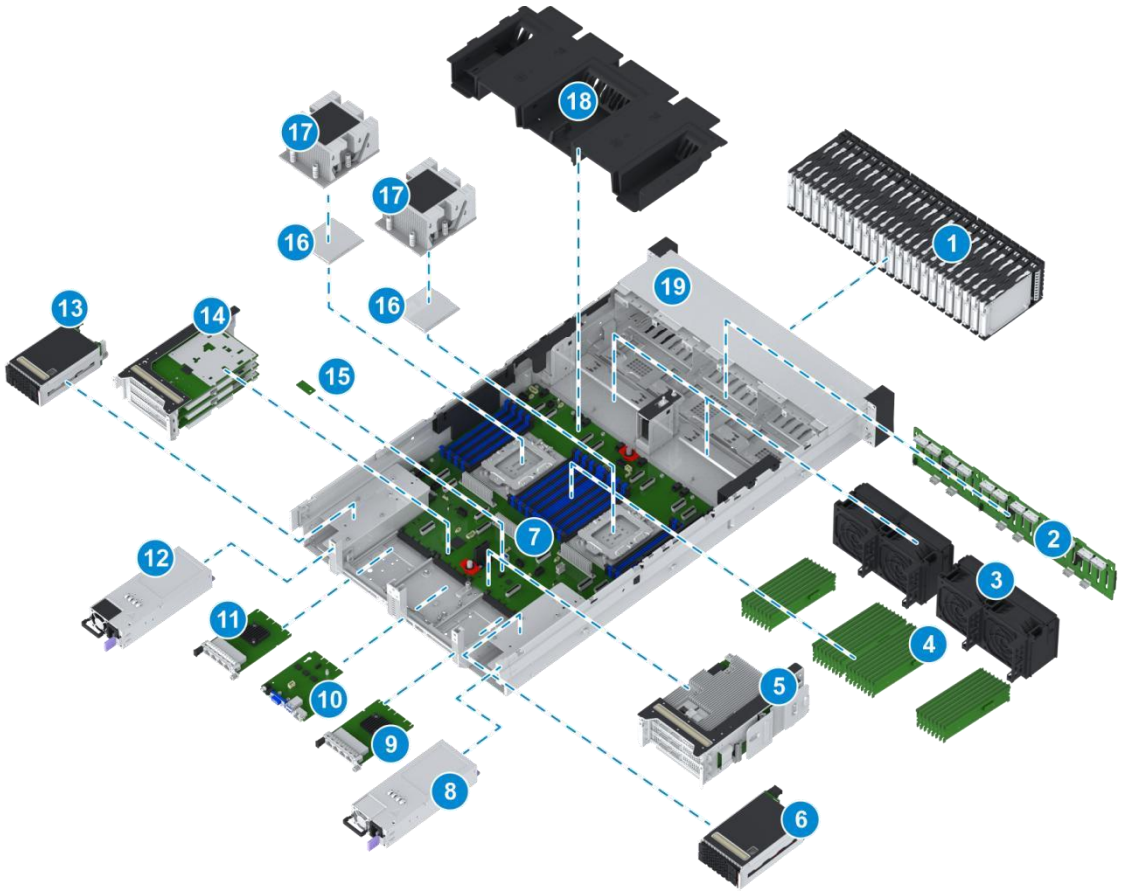


Figure 4- 13 NCS6722A N4 Product Composition

No.	Name	Description
1	Front hard disk	Provides a maximum of twenty-five 2.5-inch or twelve 3.5-inch SAS/SATA/NVME hard disks.
2	Front hard disk backboard	Supports 8/16/24/25 2.5-inch hard disk slots or 12 3.5-inch hard disk slots.

3	Fan component	Four high-performance fans, heat dissipation system that supports dynamic and intelligent fan speed adjustment, and N+1 redundancy

4	Memory module	Supports twenty-four DDR5 memory bars, and the maximum rate can reach 4,800MT/s.
5	IO module 3	IO module 3 supports the following configurations (Optional): ● Supports two full-height and full-length PCIe 3.0/4.0/5.0 ×16 standard cards. ● Supports one full-height full-length PCIe 3.0/4.0/5.0 ×16 standard card, one full-height full-length PCIe 3.0/4.0/5.0 ×8 standard card, and one full-height half-length PCIe 3.0/4.0/5.0 x8 standard card. ● Supports one dual-height full-length PCIe 3.0/4.0/5.0 ×16 GPU card and one full-height half-length PCIe 3.0/4.0/5.0 ×8 standard card. ● Supports two 2.5 "/3.5" SAS/SATA/U.2 hard disks.
6	IO module 4	The IO module 1/4 supports the following configurations (optional): ● Supports two half-height and half-length PCIe 3.0/4.0/5.0 ×8 standard cards. One slot supports PCIe3.0/4.0/5.0 ×16 signals. ● Supports two 2.5-inch SAS/SATA/U.2 hard disks. ● Supports two M.2 SATA hard disks.
7	Mainboard	Carries the core components of the server, and integrates multiple interface units. According to different functions, the boards are divided into enhanced boards and standard boards.
8	Module	Supports platinum/titanium-certified CRPS power supplies such as 550W/800W/1200W/1600W/2000W/2700W/3200W, 110V/220 V AC, and 240 V/336 V high-voltage DC. The power module supports 1+1 redundancy, fans, and hot swapping.
9	OCP	Various OCP3.0 standard interface NICs can be configured through OCPs. Multiple interfaces are supported, including GE/10GE/25GE/50GE/100GE.

10	IO card	Provides serial interfaces, USB interfaces, VGA interfaces, and gigabit management NICs.
11	OCP	Various OCP3.0 standard interface NICs can be configured through OCPs. Multiple interfaces are supported, for example, GE/10GE/25GE/50GE/100GE.
12	Power module	Supports platinum/titanium-certified CRPS power supplies (for example, 550W/800W/1200W/1600W/2000W/2700W/3200W), 110 V/220 V AC power supplies, and 240V/336V high-voltage DC power supplies. Power modules support 1+1 redundancy, fans, and hot swapping.
13	IO module 1	The IO module 1/4 supports the following configurations (optional): ● Supports two half-height and half-length PCIe 3.0/4.0/5.0×8 standard cards. One slot supports PCIe3.0/4.0/5.0 ×16 signals. ● Supports two 2.5-inch SAS/SATA/U.2 hard disks. ● Supports two M.2 SATA hard disks.
14	IO module 2	The IO module 3 supports the following configurations (optional): ● Supports two full-height and full-length PCIe 3.0/4.0/5.0 ×16 standard cards. ● Supports one full-height and full-length PCIe 3.0/4.0/5.0 ×16 standard card, one full-height and full-length PCIe 3.0/4.0/5.0 ×8 standard card, and one full-height and half-length PCIe 3.0/4.0/5.0 x8 standard card. ● Supports one double-height full-length PCIe 3.0/4.0/5.0 ×16 GPU card and one full-height half-length PCIe 3.0/4.0/5.0 ×8 standard card. ● Supports two 2.5-inch/3.5-inch SAS/SATA/U.2 hard disks.
15	TPM	A trusted security module can be installed to protect the server from illegal access.
16	CPU	Central processing unit, core chip of the server
17	Heat sink	The heat sink provides a good heat dissipation system for the CPU.

18	Ventilation cover	The ventilation cover is used to optimize the internal heat dissipation duct of the system, and can also be mounted to internal components.
19	Shelf	Shelf body for installing all the above components

Table 4- 4 Description of Product Compositions

4.3 Description of Buttons and Indicators

The fof 5350 N4acet has a wide range of interfaces, as shown in the following figure.

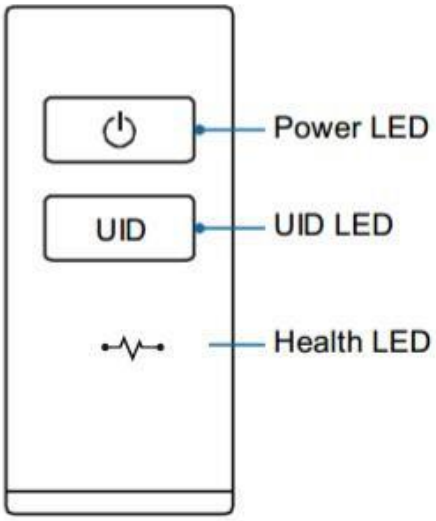


Figure 4- 14 Facet Indicator Button

Item	Symbol	Description
Power button/indicator	⏻	Short press of the power key: Power-on or power-off Press and hold the power key: The system is shut down forcibly.
UID button/indicator	UID	Yellow/green indicator combination: Indicates the operating Short press of the UID key: On/Off UID LED for server positioning and identification Press and hold the UID button: BMC reset button Indicator: Server location and identification

Health status indicator		Red/green indicator combination: Server health status

Table 4- 5 Definition of the Buttons of the Indicator

The hard disk indicator is shown in the following figure:

Figure 4- 15 Hard Disk Indicator

Indicator	Status Description
Activity Indicator	1. Off: The hard disk is not present or is faulty.
	2. Green (flashing): The hard disk is in read/write or synchronous status.
	3. Green (solid): The hard disk is present and inactive.
Status Indicator	1. Off: The hard disk runs normally.
	2. Blue (4Hz flashing): The hard disk is positioning.
	3. Blue (1Hz flashing): The RAID group member disk is reconstructed.
	4. Red (solid on): The hard disk is not detected, the hard disk is faulty, or the status of the RAID group that the hard disk belongs to is abnormal.

Table 4- 6 Definition of the Buttons of the Indicator

4.4 Software Functions

4.4.1 Server Software

The server software provides a basic platform for the services running on the product. The server software includes the BIOS, BMC, and device drivers.

The BIOS of the NCS6722A N4 server uses the UEFI BIOS to initialize hardware, load and bind device drivers, and boot devices or the system. In addition, the Runtime provides interfaces and services that can be invoked by OSs or third-party software.

The BIOS supports the following functions:

- Security
- BIOS Management
- ECC Memory
- Power ACPI Management
- Console Redirection
- Boot Mode Selection
- SMBUS
- Inventory Information Reporting
- Log recording function
- SMBIOS Information
- Black box
- Supports hot swapping

4.4.2 BMC Shelf Management Software

The BMC shelf management software uses the embedded Linux operating system and operates on the BMC module of the product to implement hardware system management in effective management mode.

The BMC provides the following functions:

- Inside the shelf: The BMC manages, traces, and controls the FRU modules in the shelf, and the common architecture of the shelf, especially the power supply and heat dissipation.
- Outside of the shelf: It provides external SNMP and Web interfaces to manage and monitor the boards and modules in the shelf.

Function	Description
Basic information	Board name, product name, manufacturer, and asset tag
	Production date, board serial number, product serial number
	UUID
	Power-on/off status and real-time power
	Boot mode
	Device alarm status
Real-time monitoring	Sensor information
	CPU use ratio
	Memory use ratio
	Hard disk use ratio
Component Information	Hard disk information, memory information, CPU information, network port information, and fan information
System configuration	BMC network configuration, DNS
	Time configuration
	Power, power control
	Power-on policy, delayed power-on
	UID light
	Boot mode
	Restore default
System management	Account, version, log management
	IPMI. SNMP configuration, ACL rule configuration, port configuration, and Redfish interface modes
	https certificate configuration

Button	Board power-on/power-off/restart button
Reliability	Supports VRRP
Virtual media	Virtual U disk (BMC local)
KVM	Supports KVM keyboard, mouse, display, and virtual media. Provides the external with HTML5 and java clients.
Alarm management	Alarm management
	Operation management (integrated to the system configuration)
Performance management	History power consumption statistics
Diagnosis and maintenance	Last screen, one-click data export, backup configuration, default factory configuration

Table 4- 7 List of BMC Chassis Management Software Functions

5 Physical Indexes and Specifications

5.1 Physical Indexes

Item	Description
Chassis size (H*W*D)	87.6 mm * 432 mm * 780 mm
Cabinet requirement	Standard IEC 297 19-inch general cabinet, whose depth ≥1,000mm
Weight	For full configuration, the maximum weight is 40kg (excluding the guide rail)
Power	Platinum/titanium power Provides multiple specifications such as 550W, 800W, 1,200W, 1,600W, 2,000W,2700W and 3200W. Supports 110v and 220v AC input. Supports 240v and 336v high-voltage DC input. Supports-48V low-voltage DC input. Power module 1+1 redundancy, hot swapping supported
Color	Silver chassis, black panel

Temperature	Operating temperature: 5℃ to 40℃(depending on the configuration) Storage temperature: -40°C to +65°C
Altitude	≤ 3,000m. When the altitude is higher than 900m, the operating temperature drops 1℃ per 300m above sea level. In 3000m or above, mechanical hard disks are not supported.
Relative humidity	Operating environment: 8% – 90% (non-condensing) Non-operating environment: 5% – 95%, no condensation

Table 5- 1 Physical Indexes

5.2 Interface Type

Interface	Type	Qty	Description
USB interface	USB 3.0/2.0	USB 3.0: 3 USB 2.0: 1	One front USB3.0, +1 USB2.0 interfaces, and two rear USB3.0 interfaces. Hot swapping is supported.
Management network port	1000BASE-T RJ45	1	Management network interface of the NCS6722A N4 server, supporting IPMI and SNMPs.
Hard disk interface	2.5/3.5-inch hard disk	Front: 2. 5-inch: at most 25 3. 5-inch: 12 Rear: 2. 5-inch: at most 8 3. 5-inch: at most 4	The 5350 N4 server supports the front 8/12/16/24/25 hard disk shelf and optional rear IO/storage shelf, and supports a maximum of thirty-three 2.5-inch pluggable hard disks or sixteen 3.5-inch hard disks and +4 2.5-inch hard disks.
Monitor	VGA DB15	2	The DB15 VGA plug is configured in the front or at the rear for connecting to display terminals, such as displays or KVMs.

PCIe standard interface	PCIe 5.0	10	Each NCS6722A N4 server can support up to ten PCIe standard half-height/full-height daughter cards, including: GE/10GE/25GE/40GE/100GE/FC/IB/GPU/AIC cards
OCP card	PCIe 5.0	2	Each NCS6722A N4 server can be configured with various OCPs through OCPs, supporting GE/10GE/25GE/100G
Power	CRPS power	2	Each 5350 N4 server can be configured with a maximum of two CRPS platinum power supplies to support 110V/220V AC, 240V/336V high-voltage DC, and -48V low-voltage DC input.

Table 5- 3Features of NCS6722A N4 Interfaces

5.3 Environment Requirements

5.4 Environment Requirements

- Requirements for the equipment room
  - The seismic resistance, lightning protection, and bearing capacity of the equipment room meet the construction requirements of the equipment room and long-term equipment safety.
  - The system must be equipped with corresponding anti-static measures, fire-fighting equipment, and labels. Different voltage sockets must meet the national level-2 fire protection standard
  - Biological conditions: No plants, microorganisms (mildew and mycosis), or animals are allowed in the equipment room.
  - Corrosive gas pollutants: The room meets the gas corrosion level defined in ANSI/ISA-71.04-2013 G2.
  - Requirement for the corrosion rate of the copper test piece: The thickness growth rate of the corrosion product shall be lower than 300Å/months.

- Requirement for the corrosion rate of the silver test piece: The thickness growth rate of the corrosion product shall be lower than 200 Å/months.
- Particulate pollutants: The room meets ISO14644-1 class 8 requirements. No explosive, electrically or magnetically conductive, or corrosive dust exists in the equipment room.

- Space requirements
  - The server must be installed in an access-restricted area.
  - The 800-mm space is required on both the front and rear doors of the cabinet for heat dissipation and maintenance.
- Cabinet requirements
  - Standard 19-inch universal cabinet, depth: ≥1,000 mm. The 800-mm space is required on both the front door and rear door of the cabinet for heat dissipation and maintenance.
- Floor bearing capacity

Considering different configurations and margins, the weight of a cabinet can be calculated according to the actual configuration, but the weight of a single 5350 N4 server is about 35kg. For example, if one standard cabinet is configured with twelve NCS6722A N4 devices, the bearing capacity should be above 600 kg/m² based on the comprehensive consideration of the margin.

5.5 Realiability Indexes

The system availability is greater than 99.999%, where MTTR is less than 60 min and MTBF is greater than 110,000 hours.

6 Installation Mode

6.1 Rack Installation

NCS6722A N4 supports IEC297 standard 19-inch cabinets with a depth of ≥1,000mm. The cabinet can be installed by using the built-in scalable guide rails or the brackets of the cabinet.

The 5350 N4 power cables and signal cables can all be led out from the rear of the chassis, and there are no cables on the front panel.

6.1.1 Installing Servers through the Built-in Scalable Guide Rail of the Equipment

This section lays emphasis on describing how to install the server into a cabinet by using the scalable guide rails of the NCS6722A N4.

Scalable rails include fixing brackets, outer rails, middle rails, and inner rails, see the following figure.

Figure 6-1 Structure View of Scalable Guide Rails

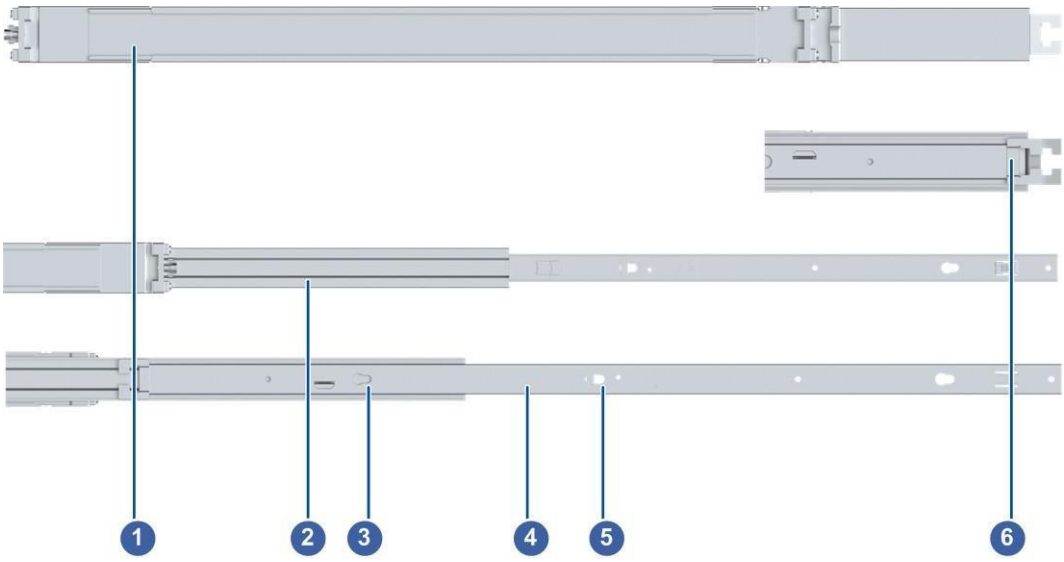


Figure 6-1 Structure View of Scalable Guide Rails

1. Outer Rail 2. Middle Rail 3. Spring 4. Inner Rail 5. Hole 6. Positioning End

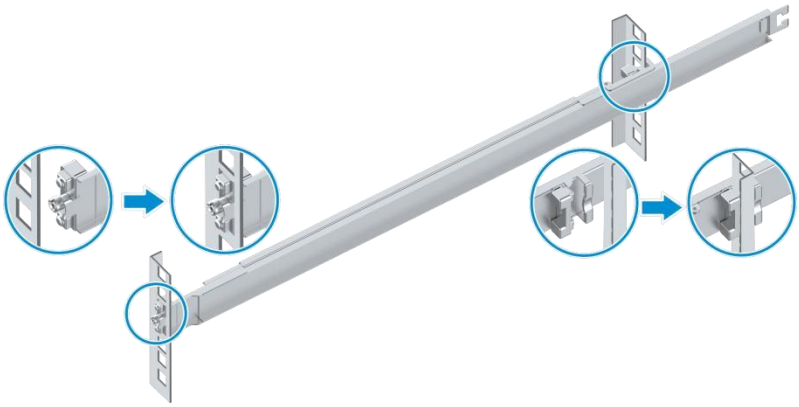
If more than one 5350 N4 devices are installed in a cabinet, it is recommended that you install them from the bottom of the cabinet upwards. It is recommended that the lowest layer of the server be at least 1U (1U = 44.45 mm, equal to the height of the three installation holes on the side of the cabinet) away from the cabinet bottom. The 2U space should be reserved under each server to install the FPQ cable tray.

- Wear anti-static gloves.
- Determine the installation position of the server in the cabinet in accordance with the design documents.
- Use a floating nut installation tool to install floating nuts on the cabinet bracket, as shown in the following figure.

Figure 6-2 Installing Floating Nuts

- Install the outer rails onto the brackets on both sides of the cabinet, as shown in the following figure. Install the front bracket before the rear bracket. After a guide rail is installed, the rear part of the guide rail is fixed by using the M5 screws that come with the guide rail. Do not install screws on the front part of the guide rail.

Figure 6-3 Installing the Outer Rails



- Pull the rails out of the maximum stroke, and pull up the inner rail latch to fetch the inner rails, as shown in the following figure.

Figure 6-4 Fetching the Inner Rails

- Install the inner rails on both sides of the server. Align the fixing holes (six in total) on the inner rails with the bolts on both sides of the server, and push the inner rails in the specified direction to tighten the inner rails and the server. Fix the inner rails by using the M4 ×4 screws, as shown in the following figure.

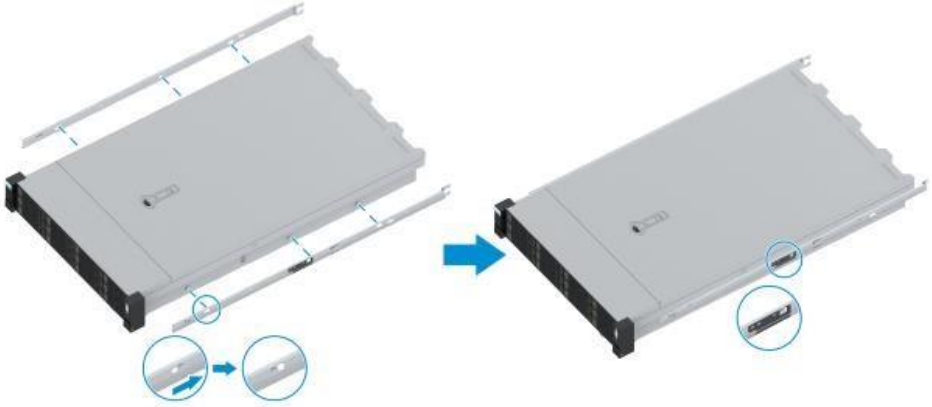


Figure 6-5 Installing the Inner Rails

- Pull the middle rail out to the front of the rail and check the rail installation to make sure the rail is installed securely.
- Clip the device with inner rails along the front end of the middle rails, and then push the device into the cabinet, as shown in the following figure.

Figure 6-5 Installing the Inner Rails

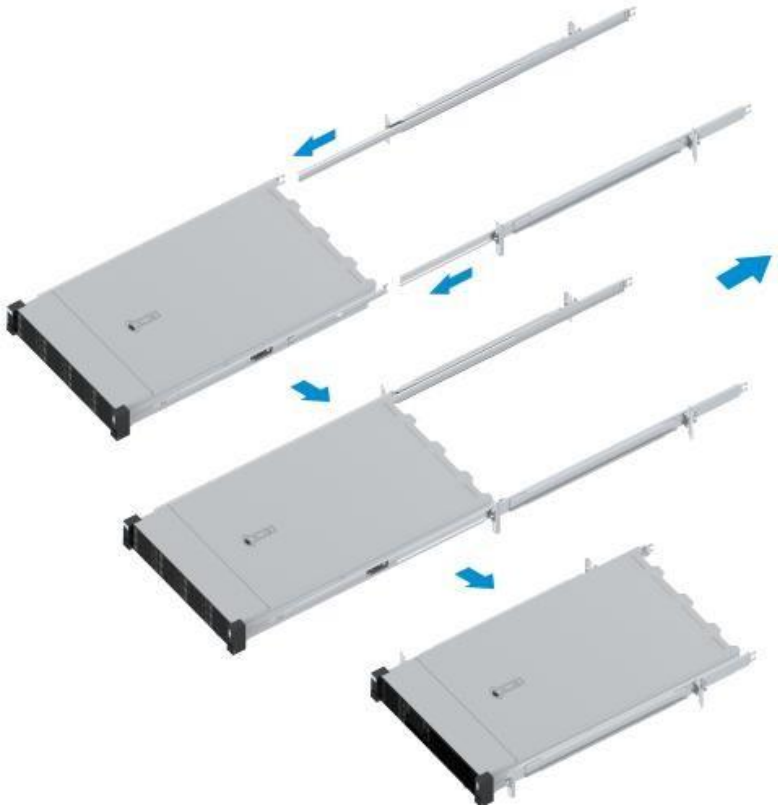


Figure 6- 6 Installing Servers

- Open the ejector levers on the left and right flanges of the chassis, and use a screwdriver to lock the two captive screws inside the flanges to the cabinet.

6.1.2 Installing Components inside the Cabinet by Using the Brackets Provided with the Cabinet

This section describes how to install the NCS6722A N4 into a cabinet through the brackets provided with the cabinet.

Prerequisites

- ESD gloves and a crosshead screwdriver are ready.
- The combination screw M6 ×20 and combination screw M5 ×10 is ready.
- The installation position of the shelf in the cabinet has been known.

Installation steps

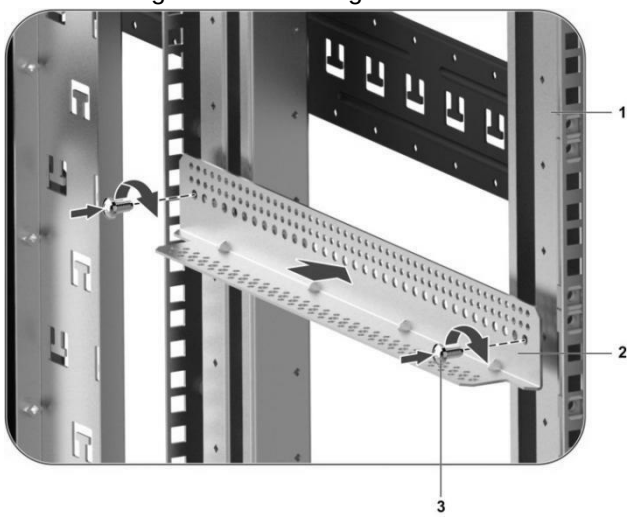
- Wear anti-static gloves.

- Determine the installation position of the shelf in the cabinet in accordance with the engineering design documents.

In a standard cabinet, 1U (1U = 44.45 mm) is equal to the height of the three installation holes on the side of the cabinet. It is recommended that the chassis be at least 1U away from the bottom of the cabinet.

- Install floating nuts, as shown in the above figure.
- The following figure shows how to install the bracket.

Figure 6-7 Installing the Bracket



1. Cabinet angle rail 2. bracket 3. Combination screw M5 ×10

- Lift the back of the NCS6722A N4 server against the shelf to a position slightly higher than the bracket in the cabinet, place the server on the bracket, push the server into the shelf, and secure the shelf. Note: The equipment shelf is heavy. To avoid personal safety and equipment fall-off during installation, at least two persons are required for installation.

Figure 6-8 Installing the Servers

- Open the installation screw covers on the lower sides of the front panel of the NCS6722A N4 shelf, and secure the shelf to the cabinet by tightening the screws.

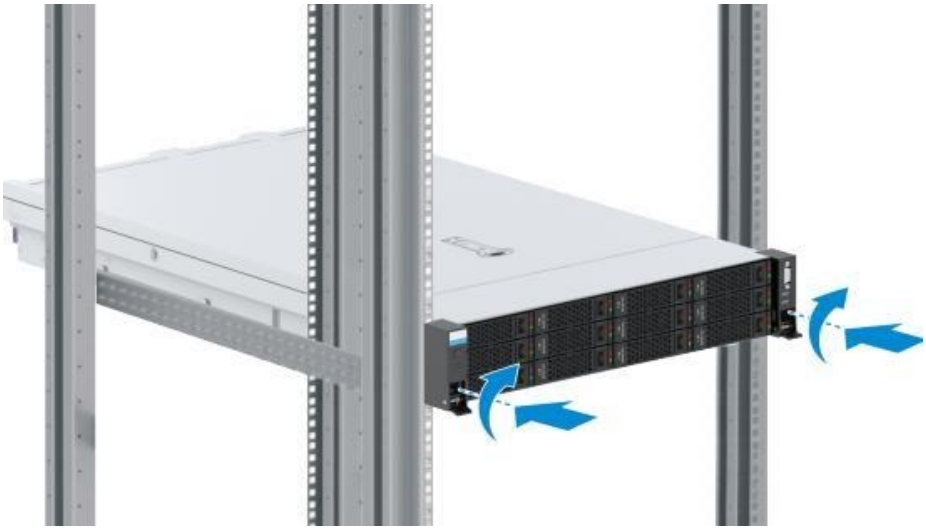


Figure 6- 9 Fixing Servers

- After the server is installed, install the hard disk box as required, and connect the network cable, VGA cable, and USB device for configuration after startup. Connect the power cable to the device through cabling. After verifying that the cables are connected properly, power on the device.

6.2 Cabling Mode

6.2.1 Cabling Mode of Power Cable and Grounding Cable

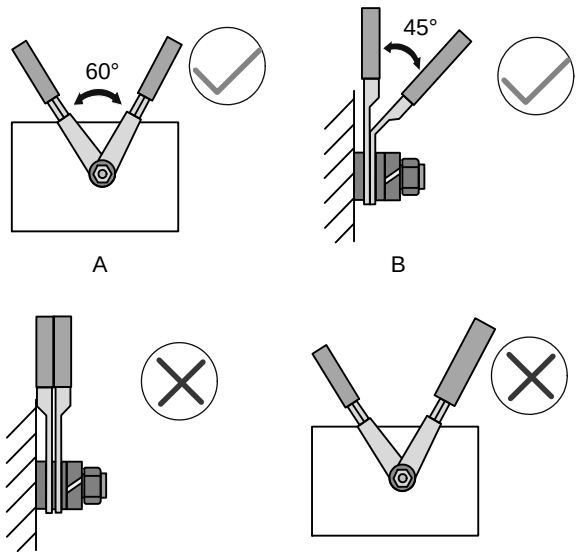
For the cabling mode of power cables and grounding cables, refer to the following table.

Table 6-10 Installation Specifications for Power Cables and Grounding Cables

Principle	Description
Laying principle	● Before installing a cable, you must perform a continuity test, and mark or paste engineering labels on both ends of the cable. ● The entire section of power cable and grounding cable should be used. There should be no joint or welding spot in the middle. ● The surplus parts of the power cable and grounding cable should be cut off instead of being coiled. ● If two OT terminals are installed, they should be cross-connected (see Area A in the following figure), or the O-type terminals are bent in 45° or 90° mode (see Area B in the following figure). ● OT terminals must not be installed on top of each other (see Area C in the following figure). Smaller OT terminals must not be installed on top of larger OT terminals (see Area D in the following figure). ● The power cable and grounding cable should be laid straightly and smoothly without crossing, wrapping, or twisting. ● The distance between the power cable, grounding cable, and other parallel cables should be greater than 300mm. ● The bending radius of the cable must be between 50mm 100mm.

Bundling principle	● The power cable and grounding cable should be bundled separately from other cables. ● Bind the power cable and grounding cable for 200mm. ● During cable installation and layout, do not squeeze or pull on the cable with rotating parts such as the door, and do not bind the cable ties, and the cable ties in the same direction at the bends (as marked with "A" in the following figure). After the binding, cut off the surplus part of the cable ties, and ensure that the cutting ends are aligned with each other.
Upward cabling principle	Power cables and grounding cables are routed from the top of the power distribution cabinet to the cable tray in the equipment room, and then to the top of each cabinet.
Downward	Power cables and grounding cables are led out from the bottom of
Principle	**Description**
cabling principle	the power distribution cabinet, and routed under the anti-static floor to the cabinet.

Table 6- 10 Description of Power Wire and Grounding Installation Specifications



C D

Figure 6-11 OT Terminal Installation Mode

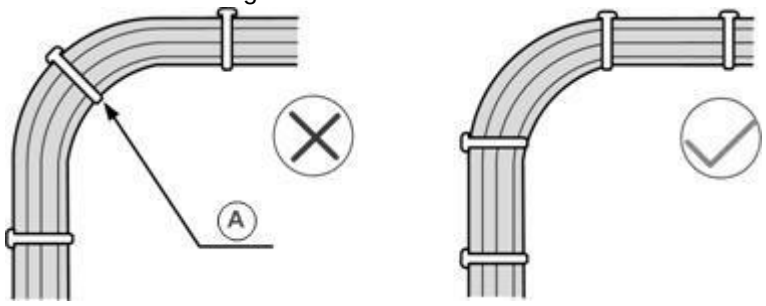


Figure 6- 12 Cable Bundling

6.2.2 Signal Cable Routing Mode

- The installation of signal cables includes internal signal cables and outgoing signal cables inside the cabinet.
- The signal cables inside the cabinet are used to connect cables inside the cabinet.
- The signal cables led out of a cabinet are used to connect the devices in multiple cabinets to external networking devices.
- For a description of the signal cable routing, refer to the following table.

Table 6-2 Specification of Installing Signal Cables

Principle	Description
Laying Principle	● Before a cable is installed, a continuity test must be performed for the cable, and both ends of the cable must be marked or labeled. ● The cable should not be damaged, broken, or connected in the middle.

	● The cable cannot be laid on the heat dissipation hole to avoid affecting the heat dissipation of the cabinet and the cable life.

Principle	Description
	● When the power cable and signal cable are laid out, at least a distance of 300mm should be guaranteed. Do not bundle them together. ● The cabling inside the cabinet should not affect the door installation. ● The cable should be horizontal and vertical, and should not be crossed or folded.
Bundling Principle	● Cables should be bundled evenly, neatly, and elegantly with proper tightness, and the cable ties should face the same direction. ● The surplus part of the cable clip shall be cut off from the root without any sharp edge. ● When the cable is fixed to an angled structural component, it is recommended that necessary protection measures be taken. ● The places where the fibers are bound should be protected with fiber ties.

Bending principle	● The cable bends should be even and smooth. ● The recommended minimum bending radius for network cables and MiniSAS cables is 8D (D is the outer diameter of the cable). ● When a single-core indoor optical fiber cable is laid fixedly, the recommended minimum bending radius cannot be less than ten times of the cable diameter, but cannot be less than 30mm. ● When the single-core indoor optical fiber cable is laid dynamically, the recommended minimum bending radius should not be less than 20x of the optical fiber diameter, but not less than 50 mm. ● Cable bends (marked with " A " in the following figure) cannot be bound with cable ties, and a proper margin should be reserved.
Upward cabling principle	Rodent-resistant panels are installed on both sides of the cabinet top. Cut rodent-resistant panels in accordance with the number of cables routed out of the cabinet. If the height difference
Principle	**Description**
	between the cable tray in the equipment room and the cabinet is greater than 800m, you should install the cable-down ladder to fix the cables, so that the cables will not be damaged due to high pulling force.
Downward cabling principle	Rodent-resistant screens are installed on both sides of the cabinet bottom. Cut rodent-resistant screens in accordance with the number of cables routed out of the cabinet. The highest superimposed height of cables under the floor should not exceed the 2/3 of the floor to avoid affecting ventilation and heat dissipation.

Table 6- 2 Description Table of Signal Cable Installation Specifications

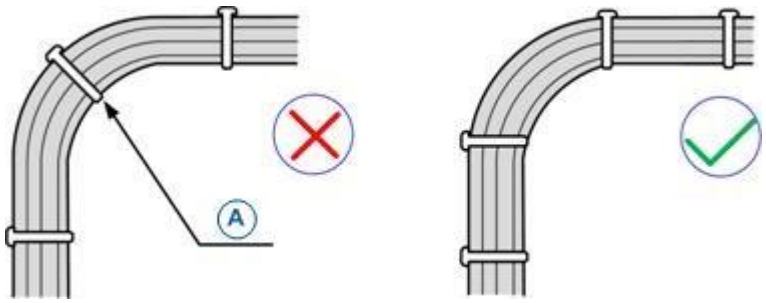


Figure 6- 12 Cable Binding

7 Abbreviation

Abbreviation	Full Spelling
BMC	Baseboard Management Controller
CDN	Contents Distribution Network
DDR5	Four generation Double Synchronous Dynamic Random Access Memory
DIMM	Dual In-line Memory Module
EATX	Extended ATX (Advanced Technology extended)
GE	Gigabit Ethernet
IPMI	Intelligent Platform Management Interface
MTBF	Mean Time Between Failure
MTTR	Mean Time to Restoration
RAID	Redundant Array of Independent Disks
SAS	Serial Attached SCSI
SATA	Serial Attached ATA
PCIe	Peripheral Component Interconnect Express

Table 7- 1 List of Abbreviations

8 Standards and Certificates

The following table lists the main standards that the NCS6722A N4 rack server complies with.

Table 8-1 Compliant Standards

Product Certificate	Compliant Standard
CCC	GB 4943.1-2011
	GB/T 9254.1-2021
	GB17625.1-2012
CE	EN 300 386 V1.6.1 EN 300 386 V2.1.1
	EN 62368-1
	IEC 62321 IEC 62474 EN IEC 63000
	(EU) No 617/2013 (EU) 2019/424 EN 303 470 V1.1.1
CB	IEC 62368-1
ETL	UL 62368-1
FCC	FCC 47 CFR Part15, Subpart B:
Energy Saving	CQC 3135-2011
CEC	HJ2507-2011

Table 8- 1Compliant Standards of NCS6722A N4