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Inspur Server NF5468A5
White Paper

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Preface

Abstract

This white paper describes the NF5468A5 server's appearance, features, performance parameters, and software and hardware compatibility, providing in-depth information of NF5468A5.

Intended Audience

This white paper is intended for:

- Inspur pre-sales engineers

- Pre-sales engineers of channel partners

- Enterprise pre-sales engineers

Symbol Conventions

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

Symbol	Description
⚠ DANGER	A potential for serious injury, or even death if not properly handled
⚠ WARNING	A potential for minor or moderate injury if not properly handled
⚠ CAUTION	A potential loss of data or damage to equipment if not properly handled
ⓘ IMPORTANT	Operations or information that requires special attention to ensure successful installation or configuration
🗎 NOTE	Supplementary description of manual information

Revision History

Version	Date	Description of Changes
V1.0	2022/09/07	Initial release

Version	Date	Description of Changes
V1.1	2022/10/10	• Updated name of Table 7-11 from GPU and Graphics Card Specifications to GPU Specifications • Added a note under Figure 5-4

Table of Contents

1 Product Overview

The Inspur NF5468A5 is a heterogeneous computing platform built on AMD EPYC Rome and Milan CPUs with up to 8 PCIe 4.0 AI accelerator cards. Thanks to its superior PCIe device compatibility, it can host accelerator cards from NVIDIA and other manufacturers to meet diversified needs in AI training, AI inference, and video encoding & decoding, making it our most versatile and best-selling AI server.

With supremely optimized links, the NF5468A5 boasts excellent GPU/accelerator expansion capabilities. Direct CPU-GPU connection maximizes the CPU-to-GPU bandwidth and reduces communication latency for optimal performance, providing customers with a platform that features supreme computing power. The system supports twenty-four 2.5-inch drives or twelve 3.5-inch drives, offering large-capacity local storage solutions.

Figure 1-1 24 × 2.5-inch Drive Configuration
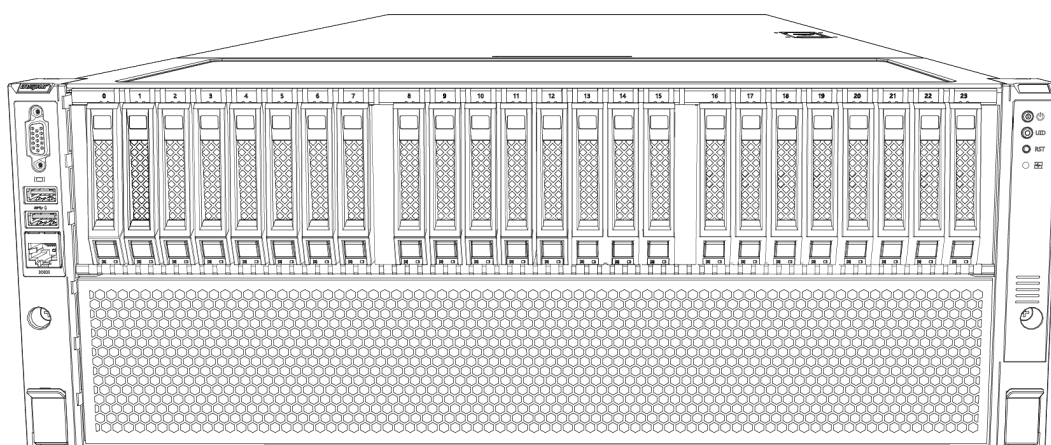
Figure 1-2 12 × 3.5-inch Drive Configuration
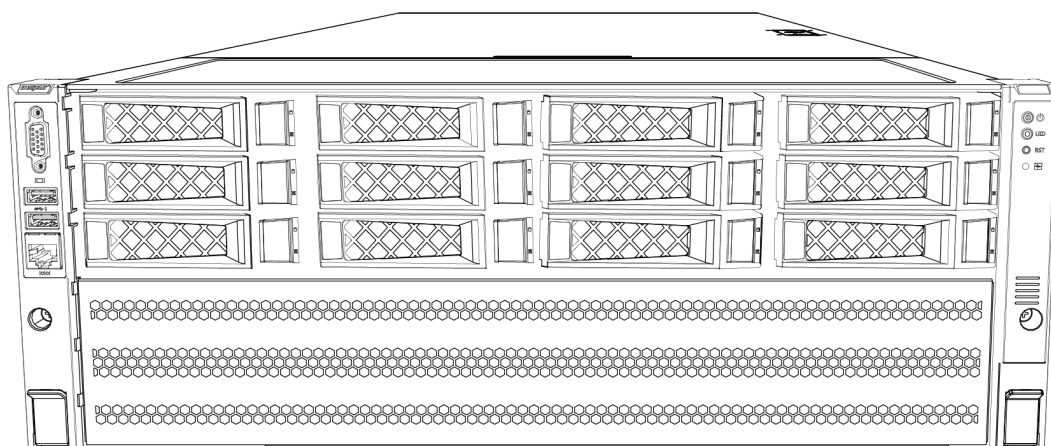
2 Features

2.1 Scalability and Performance

- Features AMD EPYC Rome or Milan processors, with up to 64 cores and 128 threads per processor, TDP up to 280 W, a max base frequency of 3.1 GHz and up to 3 xGMI links at up to 18 GT/s, providing powerful processing capabilities.

- CPUs are directly connected to GPUs, demonstrating AMD's topology advantage in PCIe expansion. A single CPU supports up to 80 PCIe 4.0 lanes, effectively reducing costs and improving energy efficiency.

- Up to 32 DDR4 ECC DIMMs (RDIMM/LRDIMM, 4 TB max., up to 128 GB per DIMM), delivering superior speeds and high availability.

- Up to 8 hot-swap NVMe SSDs with IOPS ten times that of high-end enterprise-class SATA SSDs, bringing a giant leap in storage I/O performance.

- Up to 12 × 3.5-inch drive or 24 × 2.5-inch drive at the front.

- An optional OCP 3.0 module with multiple network port options (1G/10G/25G/40G/100G), delivering a more flexible network architecture for different applications.

- Up to 10 PCIe 4.0 expansion cards, including up to 8 FHFL GPU cards with a max. total graphics card power of 350 W, further enhancing I/O performance.

(i) IMPORTANT

A technical review is required for the 8-NVMe drive configuration.

2.2 Availability and Serviceability

- Based on humanization design, the server allows tool-less maintenance. The modular structural parts enable quick removal/installation, greatly reducing O&M time.

- Inspur's unique intelligent control technology combined with the cutting-edge air-cooling technology creates an optimum operating environment to ensure stable running of the server.

- The server supports up to 12 × 3.5-inch or 24 × 2.5-inch hot-swap storage drives and RAID controller cards with RAID levels 0/1/1E/10/5/50/6/60, RAID

cache and data protection enabled by the super-capacitor in case of power failures.

- With the latest BMC technology, technicians can quickly identify the faulty system via the BMC Web GUI, locate the faulty system via the UID LED on the front panel, and then identify the components that have failed (or are failing) via LEDs for fault diagnosis, enabling simple, quick, and efficient O&M.

- The BMC can monitor system parameters and send alerts in advance to enable technicians to take appropriate actions, minimizing system downtime and ensuring stable running of the system.

For information about warranty policies, refer to Chapter 9 Inspur Limited Warranty in *Inspur Server NF5468A5 User Manual*.

For other product resources (such as product marketing materials, user manuals, drivers, firmware, and product certifications), visit https://en.inspur.com.

2.3 Manageability and Security

- The motherboard and backplane feature overcurrent and overvoltage protection functions, and the onboard connectors and cables are designed to be foolproof, thus preventing potential circuit hazards.

- A hood latch is added to the top cover and an intrusion switch connector is integrated on the motherboard to monitor chassis-opening activities, preventing unauthorized operations.

- BIOS image files are signed using secure encryption algorithms before release, and the signature must be validated before firmware update, thus ensuring the integrity and legitimacy of the firmware.

- The BMC intelligent management system provides various security features such as identification and authentication, authorization and access control, web security configuration, and log audit, offering industry-leading security capability.

- All physical I/O ports are clearly defined.

- Optional Trusted Platform Module (TPM) 2.0 is provided for data security, enabling secure boot of servers.

2.4 Energy Efficiency

- Equipped with 80 PLUS Platinum PSUs (1,600 W – 3,000 W) with power efficiency up to 94% at a load of 50%.

- Features efficient voltage regulator down (VRD) solutions, reducing DC-DC conversion loss.

- Supports intelligent fan speed control to conserve energy.

3 System Parts Breakdown

Figure 3-1 NF5468A5 Parts Breakdown (Demonstrated with 24 × 2.5-inch Drive Configuration)
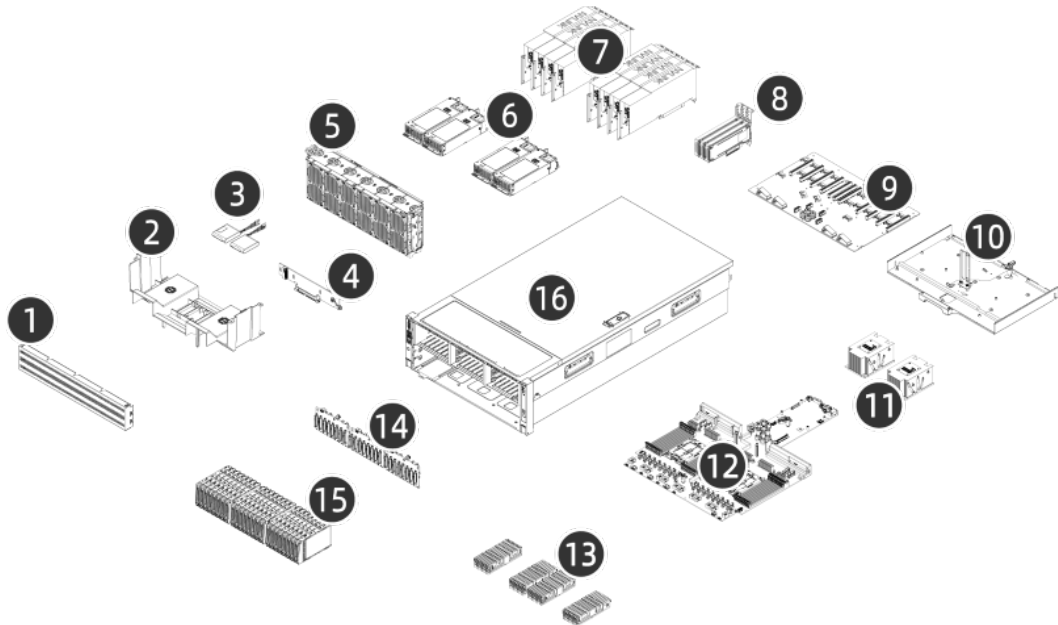
Item	Feature	Item	Feature
1	Lower 2U Air Vent Bezel	2	Air Duct
3	Super-Capacitor	4	Internal M.2 SSD Module
5	Fan Modules	6	PSUs
7	GPUs	8	PCIe Add-in Cards
9	GPU Board	10	GPU Tray
11	Processor Heatsinks	12	Motherboard
13	DIMMs	14	Drive Backplane
15	Front Drives	16	Chassis

4 System Logical Diagram

Figure 4-1 NF5468A5 System Logical Diagram
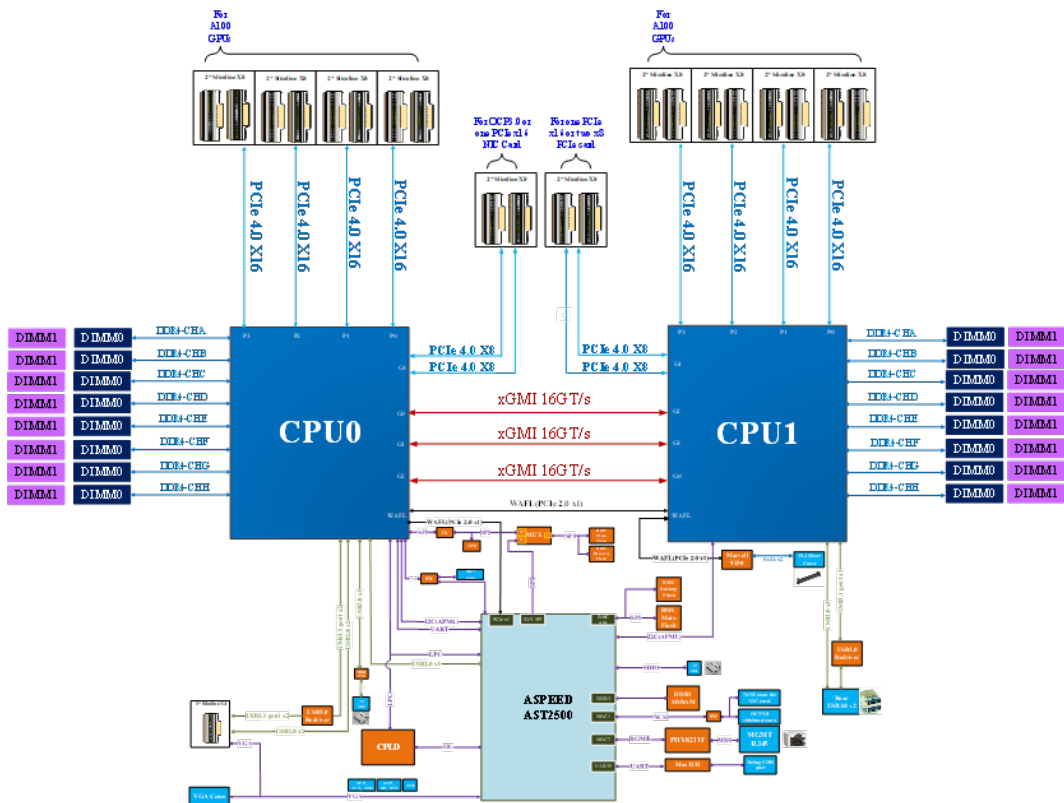
- Supports 2 AMD Rome or Milan CPUs.

- Supports 32 DIMMs.

- The 2 processors are interconnected through 3 xGMI links.

- Supports three 8 × 2.5-inch drive backplanes or one 12 × 3.5-inch drive backplane on the front panel.

- Supports up to 8 GPUs.

- Supports up to 2 x16 NICs or 1 x16 NIC + 2 x8 NICs.

5 Hardware Description

5.1 Front Panel

5.1.1 Appearance

- 24 × 2.5-inch Drive Configuration

Figure 5-1 Front View
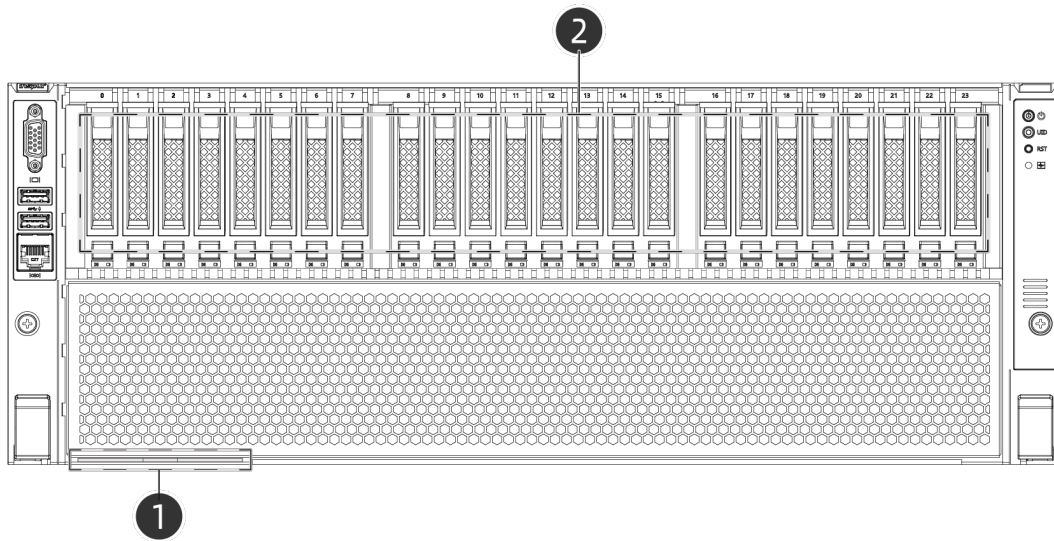
Item	Feature	Item	Feature
1	Service Tag (including SN label and drive numbers)	2	Drive Bay × 24

- 12 × 3.5-inch Drive Configuration

Figure 5-2 Front View
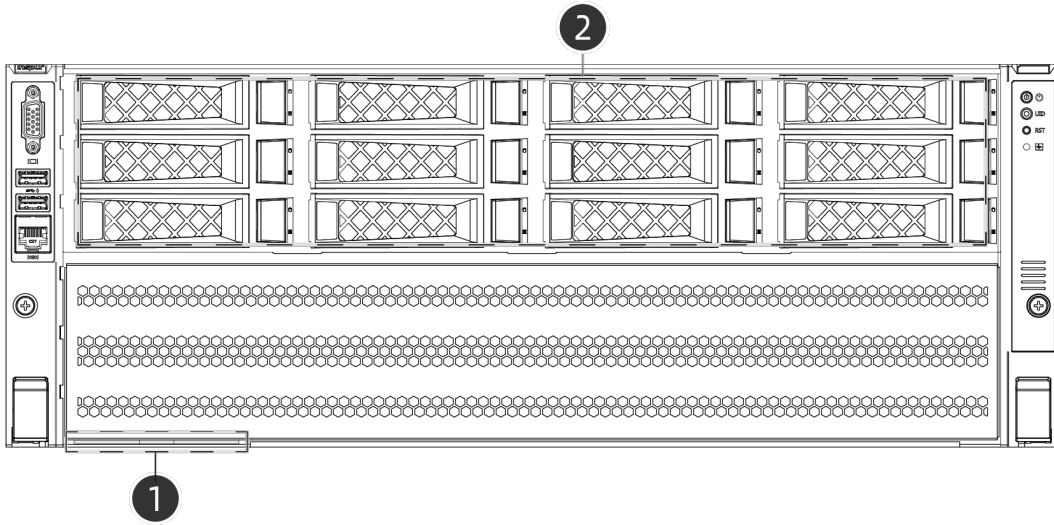
Item	Feature	Item	Feature
1	Service Tag (including SN label and drive numbers)	2	Drive Bay × 12

5.1.2 LEDs & Buttons

1. LED and Button Location
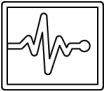
Figure 5-3 Front Panel LEDs and Buttons
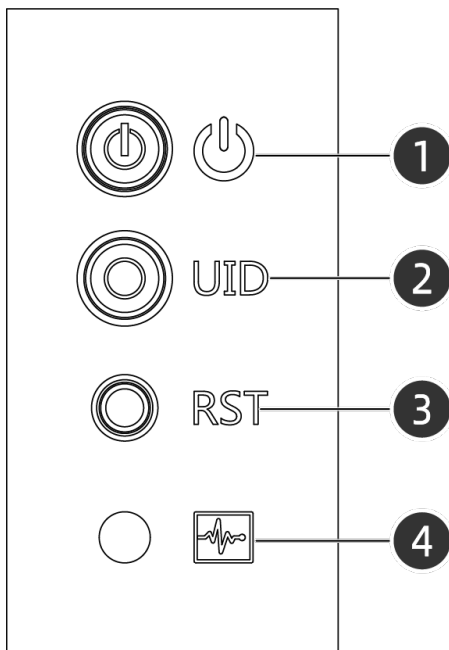
Item	Feature	Item	Feature
1	Power Button and LED	2	UID Button and LED
3	System Reset Button	4	System Health LED

2. LED and Button Description

Table 5-1 Front Panel LED and Button Description

Icon	LED & Button	Description
⏻	Power Button and LED	Power LED: • Off = No power • Solid green = Power-on state • Solid orange = Standby state Power button: • Long press 4 seconds to force a shutdown from the power-on state. 🗒 NOTE Follow the prompt under the OS to shut it down. Short press the power button to power on the system in standby state.
UID	UID Button and LED	The UID LED is used to identify the device to be operated • Off = System unit not identified • Solid blue = System unit identified • Flashing blue = System unit being operated remotely 🗒 NOTE The UID LED turns on or off when activated by the UID button or via ISBMC remotely. Long press the UID button for over 6 seconds to reset the BMC.
RST	System Reset Button	Press the button to reset the system
〰	System Health LED	• Off = Normal • Red = System error

5.1.3 Ports

1. Port Location

Figure 5-4 Front Panel Ports (Demonstrated with 24 × 2.5-inch Drive Configuration)
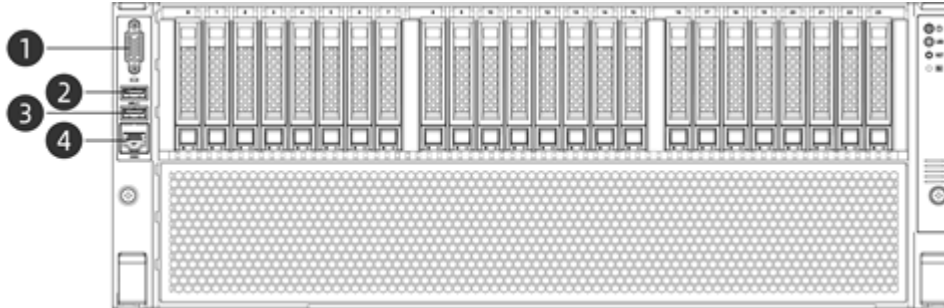
Item	Feature	Item	Feature
1	VGA Port	2	USB 3.0 Port
3	USB 3.0 Port	4	System Serial Port

☐NOTE

The ports are identical for the 24 × 2.5-inch drive configuration and 12 × 3.5-inch drive configuration.

2. Port Description

Table 5-2 Front Panel Port Description

Port	Type	Quantity	Description
VGA Port	DB15	1	Enables you to connect a display terminal, for example, a monitor or KVM, to the system
USB 3.0 Port	USB 3.0	2	Enables you to connect a USB 3.0 device to the system ⓘIMPORTANT Make sure the USB device is in good condition or it may cause the server to work abnormally.
System Serial Port	RJ45	1	Captures BMC logs and provides the BMC debugging function

5.2 Rear Panel

5.2.1 Appearance

Figure 5-5 Rear View
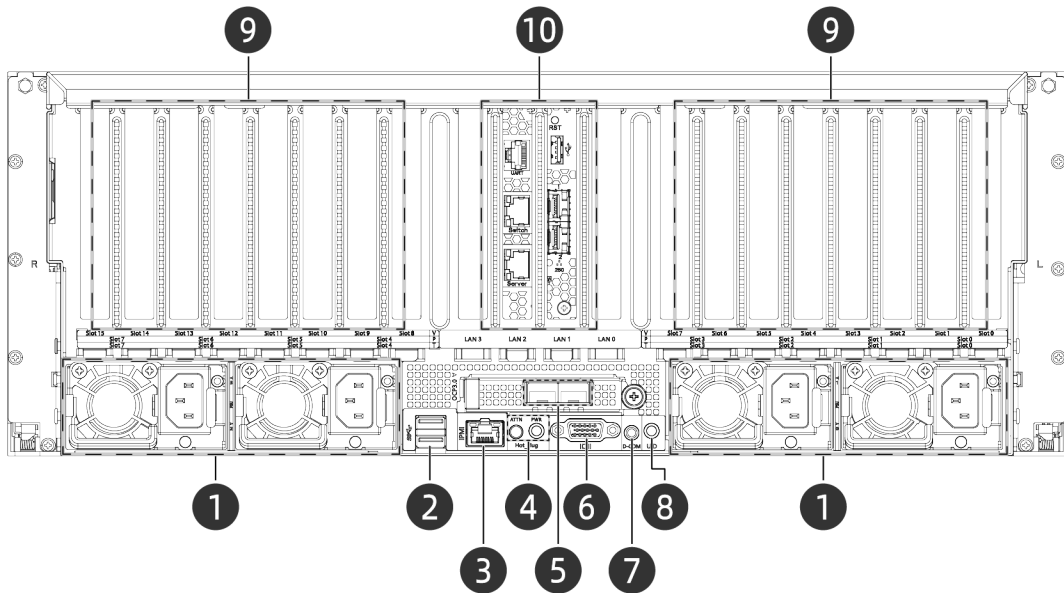
Item	Feature	Item	Feature
1	PSU × 4	2	USB 3.0 Port × 2
3	BMC Management Network Port	4	OCP 3.0 Card Hot-Plug Button and LED
5	OCP 3.0 Card	6	VGA Port
7	BMC Serial Communication Port	8	UID Button and LED
9	GPU Slots	10	Add-in Card Slots

5.2.2 LEDs and Buttons

Figure 5-6 Rear Panel LEDs and Buttons
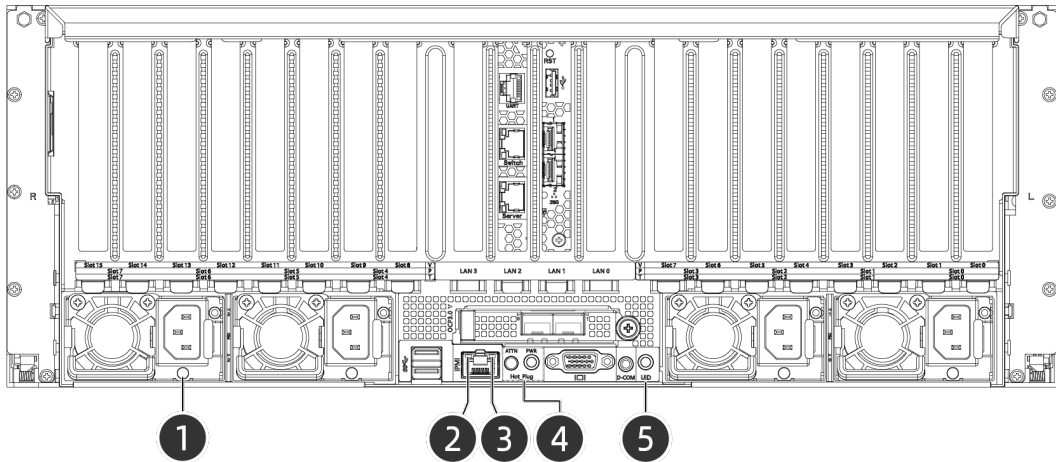
Item	Feature	Item	Feature
1	PSU LED × 4	2	Data Transmit Rate LED of BMC Management Network Port
3	Connection Status LED of BMC Management Network Port	4	OCP 3.0 Card Hot-Plug Button and LED
5	UID Button and LED		

1. LED and Button Description

Table 5-3 Rear Panel LED and Button Description

Icon	LED	Description
UID	UID Button and LED	The UID LED is used to identify the device to be operated • Off = System unit not identified • Solid blue = System unit identified • Flashing blue = System unit being operated remotely NOTE The UID LED turns on when activated by the UID button or via ISBMC remotely. Long press the UID button for over 6 seconds to reset the BMC.

Icon	LED	Description
Hot_Plug	OCP 3.0 Card Hot-Plug Button and LED	• Button: - Enables the hot-swap function of the OCP 3.0 Card • LED: - Solid blue = OCP card is powered on - Flashing blue = OCP card power being removed or connected - Off = OCP NIC is not powered on
N/A	Data Transmit Rate LED of BMC Management Network Port	• Off = No network connection • Solid green = Normal network connection (1000 Mbps) • Solid orange = Normal network connection (100 Mbps/10 Mbps)
N/A	Connection Status LED of BMC Management Network Port	• Off = No network connection • Solid green = Normal network connection • Flashing green = Data transmission in progress
N/A	PSU LED	• Off = No AC power to PSU • Flashing green (1 Hz) = PSU operating in standby state with normal AC input. • Solid green = Normal input and output • Flashing amber (1 Hz) = PSU warning event where the PSU continues to operate (possible causes: PSU overtemperature, PSU output overcurrent, excessively high or low fan speed) • Solid amber = PSU critical event causing a shutdown (possible causes: PSU overtemperature protection, PSU output overcurrent or short circuit, output overvoltage, short circuit protection, component (not all components) failure)

5.2.3 Ports

1. Port Location

Figure 5-7 Rear Panel Ports
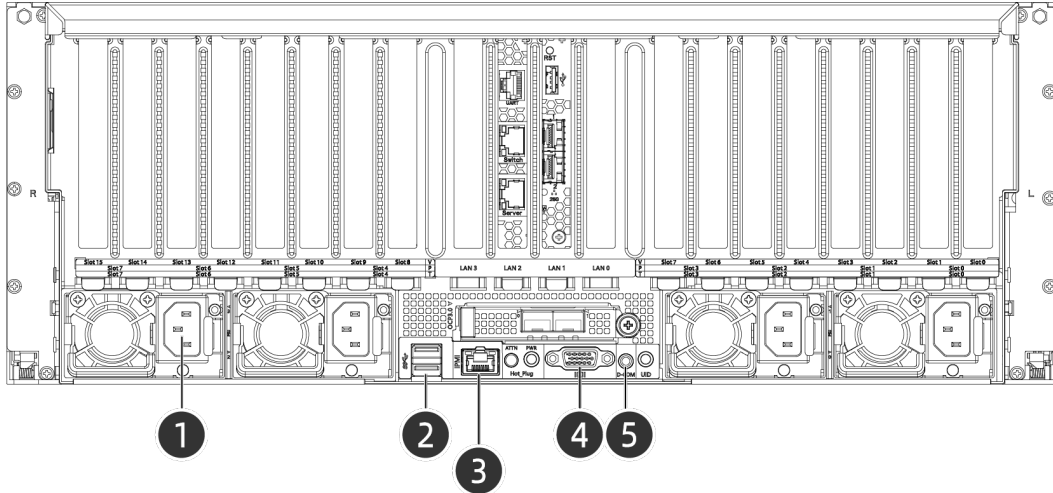
Item	Feature	Item	Feature
1	PSU Socket × 4	2	USB 3.0 Port × 2
3	BMC Management Network Port	4	VGA Port
5	BMC Serial Communication Port		

2. Port Description

Table 5-4 Rear Panel Port Description

Port	Type	Quantity	Description
BMC Serial Communication Port	3.5 mm jack	1	Enables you to capture BMC logs and debug the BMC 📄 NOTE The serial port uses a standard 3.5 mm Jack with a default baud rate of 115,200 bit/s.
USB Port	USB 3.0	2	Enables you to connect a USB 3.0 device to the system ⓘ IMPORTANT The maximum current supported by the USB port is 0.9 A. Make sure the USB device is in good condition or it may cause the server to work abnormally.
BMC Management Network Port	RJ45	1	ISBMC management network port to manage the server 📄 NOTE It is a Gigabit Ethernet port of 100/1000 Mbps (auto-negotiation).

Port	Type	Quantity	Description
VGA Port	DB15	1	Enables you to connect a display terminal, for example, a monitor or KVM, to the system
PSU Socket	N/A	4	Connected with a power cord. User can select the PSUs as needed NOTE Make sure that the total rated power of the PSUs is greater than that of the server.

5.3 Processors

- Supports 2 processors.

- The processors configured in the same server must be of the same model.

- Supports up to 64 cores (with a max base frequency of 3.1 GHz).

- 3 xGMI links at up to 18 GT/s.

- Up to 256 MB of L3 cache (64 cores).

- TDP up to 280 W.

- For specific system processor options, consult Inspur sales representative or refer to 7.2 Hardware Compatibility.

Figure 5-8 Processor Location
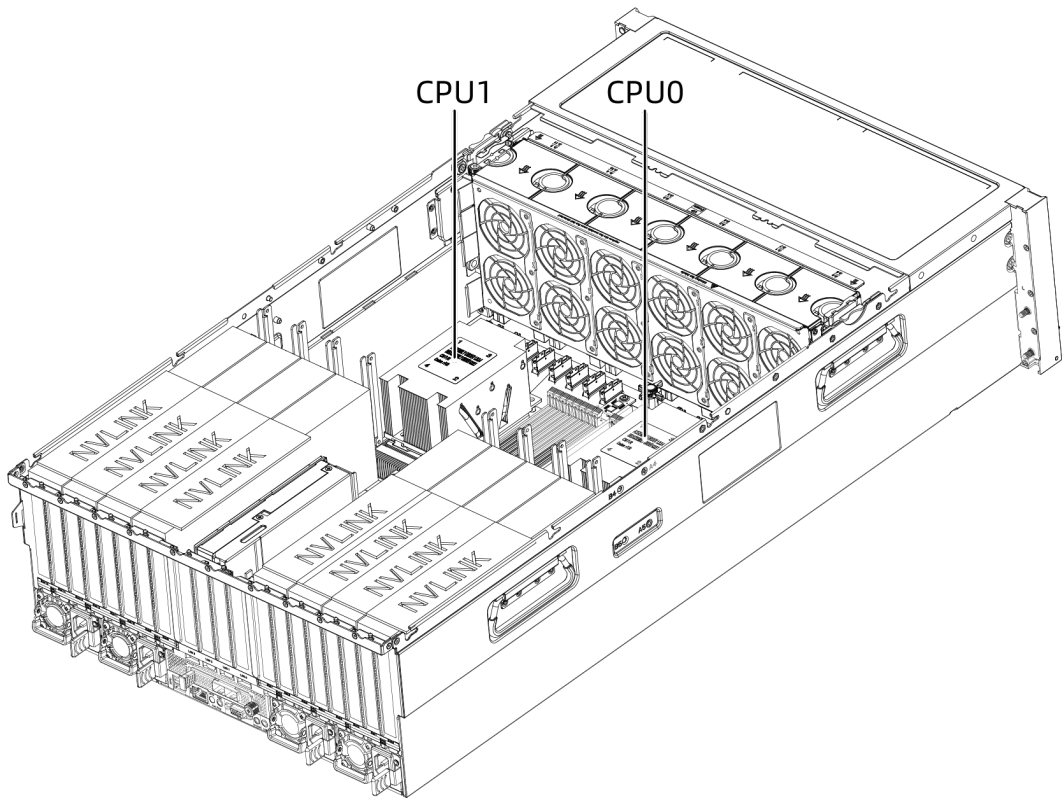
5.4 Memory

5.4.1 DDR4 DIMM

1. Identification

To determine the DIMM characteristics, refer to the label attached to the DIMM and the following figure and table.

Figure 5-9 Memory Identification
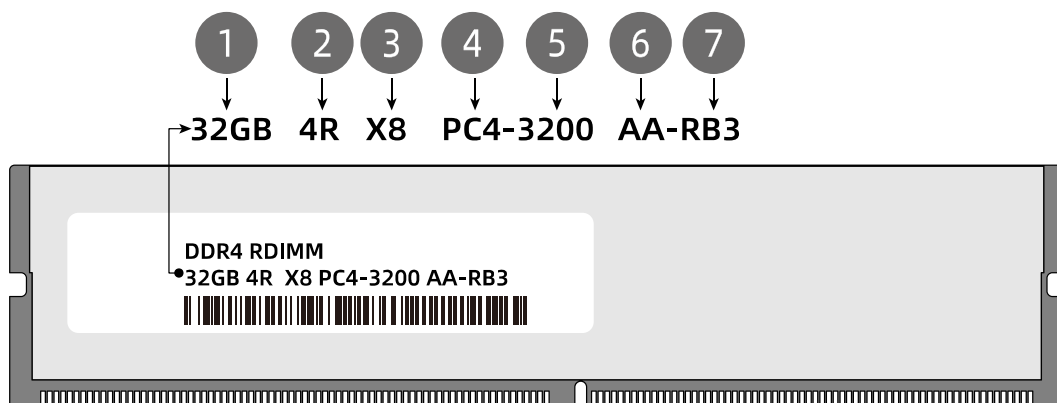
Item	Description	Example
1	Capacity	• 32 GB • 64 GB • 128 GB
2	Rank(s)	• 1R = Single rank • 2R = Dual rank • 2S2R = Two ranks of two high stacked 3DS DRAM • 4DR = Four ranks of dual die packaged DRAM • 4R = Quad rank
3	Data width on the DRAM	• x4 = 4 bits • x8 = 8 bits
4	DIMM slot type	PC4 = DDR4
5	Maximum memory speed	3200 MT/s
6	CAS latency	SDP-chip-based • V = CAS-19-19-19 • Y = CAS-21-21-21 • AA = CAS-22-22-22 3DS-chip-based • V = CAS-22-19-19 • Y = CAS-24-21-21 • AA = CAS-26-22-22
7	DIMM type	• R = RDIMM • L = LRDIMM • RBx = Gerber Revision

2. Memory Subsystem Architecture

The NF5468A5 supports 32 DIMM slots and 8 channels per CPU with 2 DIMM slots per channel. Within a channel, populate the DIMM slot with its silk screen ending with D0 first and second the DIMM slot with its silk screen ending with D1. For instance, within CPU0 Channel A, populate CPU0_CAD0 first and second CPU0_CAD1.

Table 5-5 DIMM Slot List

CPU	Channel ID	Silk Screen
CPU0	Channel A	CPU0_CAD0
		CPU0_CAD1
	Channel B	CPU0_CBD0
		CPU0_CBD1
	Channel C	CPU0_CCD0
		CPU0_CCD1
	Channel D	CPU0_CDD0
		CPU0_CDD1
	Channel E	CPU0_CED0
		CPU0_CED1
	Channel F	CPU0_CFD0
		CPU0_CFD1
	Channel G	CPU0_CGD0
		CPU0_CGD1
	Channel H	CPU0_CHD0
		CPU0_CHD1
CPU1	Channel A	CPU1_CAD0
		CPU1_CAD1
	Channel B	CPU1_CBD0
		CPU1_CBD1
	Channel C	CPU1_CCD0
		CPU1_CCD1
	Channel D	CPU1_CDD0
		CPU1_CDD1
	Channel E	CPU1_CED0
		CPU1_CED1
	Channel F	CPU1_CFD0
		CPU1_CFD1
	Channel G	CPU1_CGD0
		CPU1_CGD1
	Channel H	CPU1_CHD0
		CPU1_CHD1

3. Compatibility

Refer to the following rules to select the DDR4 DIMMs:

ⓘ IMPORTANT

- A server must use DDR4 DIMMs with the same part number (P/N code). All DDR4 DIMMs operate at the same speed, which is the lowest of:
  - Memory speed supported by a specific CPU
  - Maximum operating speed of a memory configuration
- Mixing DDR4 DIMM types (RDIMM, LRDIMM) or mixing DDR4 DIMM specifications (capacity, bit width, rank, height, etc.) is not supported.
- For specific system memory options, consult your local Inspur sales representative or refer to 7.2 Hardware Compatibility.

ⓘ IMPORTANT

- An RDIMM supports up to 4 ranks and an LRDIMM supports up to 8 ranks.
- Maximum number of DIMMs supported per channel ≤ Maximum number of ranks supported per channel/Number of ranks per DIMM.

🗒 NOTE

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

Table 5-6 DDR4 DIMM Specifications

Item	Value		
Capacity per DDR4 DIMM (GB)	32	64	128
Type	RDIMM/LRDIMM	RDIMM/LRDIMM	RDIMM/LRDIMM
Rated speed (MT/s)	3200	3200	3200
Operating voltage (V)	1.2	1.2	1.2
Maximum number of DDR4 DIMMs supported in the server[a]	32	32	32
Maximum capacity of DDR4 DIMMs supported in the server (GB)[b]	1024	2048	4096

Item		Value		
Actual speed (MT/s)	1DPC[c]	3200	3200	2933
	2DPC	3200	3200	2666

- a: The maximum number of DDR4 DIMMs supported is based on the 2-processor configuration. For the 1-processor configuration, the number should be halved.

- b: It indicates the maximum DDR4 memory capacity supported when all DDR4 DIMMs are populated. The maximum DDR4 capacity varies with the CPU type.

- c: DIMM Per Channel (DPC) is the number of DIMMs per memory channel.

The above information is for reference only, please consult your local Inspur sales representative for details.

4. Population Rules

General population rules for DDR4 DIMMs:

- Install DIMMs only when the corresponding processor is installed.

- Mixing LRDIMMs and RDIMMs is not allowed.

- Install dummies in the DIMM slots where no DIMMs are installed.

Population rules for DDR4 DIMMs in specific modes:

- Memory sparing

    - Follow the general population rules.

    - Each channel must have a valid online spare configuration.

    - Each channel can have a different valid online spare configuration.

    - Each channel with a DIMM installed must have a spare rank.

- Memory mirroring

    - Follow the general population rules.

    - Each processor supports 4 channels via 2 integrated memory controllers (IMCs). DIMMs installed must be of the same size and specifications.

    - In a multi-processor configuration, each processor must have a valid memory mirroring configuration.

5. DIMM Slot Layout

Up to 32 DDR4 DIMMs can be installed in the server. Balance the total memory capacity between the installed processors for optimal memory performance. DIMM configuration must be compliant with the DIMM population rules.

ⓘ IMPORTANT

At least one DDR4 DIMM must be installed in the DIMM slot(s) corresponding to each CPU.

Figure 5-10 DIMM Slot Layout
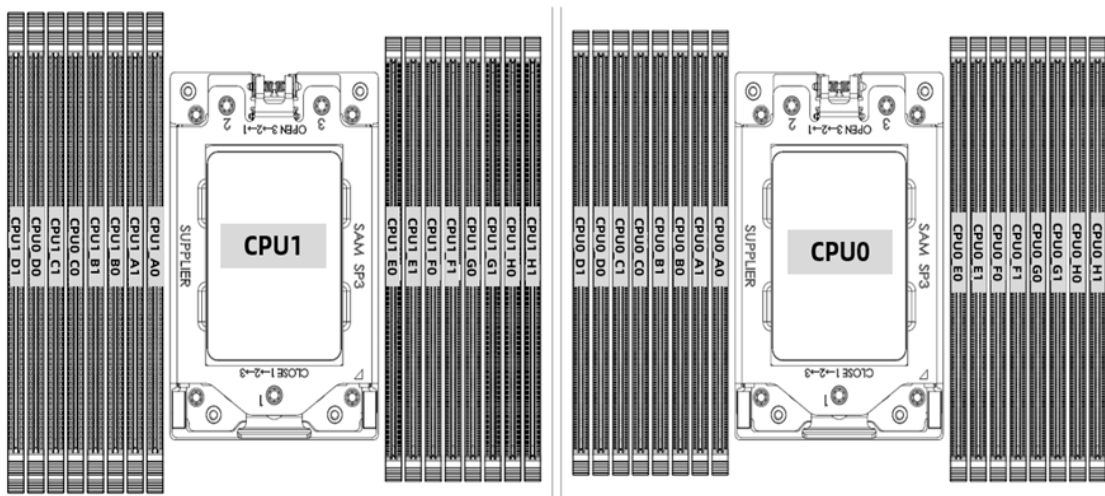
Table 5-7 DDR4 DIMM Population Rules (2-Processor Configuration)

DIMM Qty	CPU1																CPU0															
	CD		CC		CB		CA		CE		CF		CG		CH		CD		CC		CB		CA		CE		CF		CG		CH	
	D1	D0	D1	D0	D1	D0	D1	D0	D0	D1	D0	D1	D0	D1	D0	D1	D1	D0	D1	D0	D1	D0	D1	D0	D0	D1	D0	D1	D0	D1	D0	D1
2			V																V													
4	V		V														V		V													
6	V		V										V				V		V										V			
8	V		V										V		V		V		V										V		V	
10	V		V		V								V		V		V		V		V								V		V	
12	V		V		V		V						V		V		V		V		V		V						V		V	
14	V		V		V		V				V		V		V		V		V		V		V				V		V		V	
16	V		V		V		V		V		V		V		V		V		V		V		V		V		V		V		V	
24	V	V	V	V	V	V	V	V	V		V		V		V		V	V	V	V	V	V	V	V	V		V		V		V	
32	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V

5.5 Storage

5.5.1 Drives

> **NOTE**
>
> The NF5468A5 supports not only front drives, but also 2 internal M.2 SSDs, with the capacity of up to 960 GB per M.2.

Table 5-8 Drives

Form Factor	Quantity	Configuration		Slot		Drive Management Mode
		NVMe	SAS/SATA	NVMe	SAS/SATA	
2.5	4	4	/	0 - 3	/	Directly connected to CPU1
	8	/	8	/	0 - 7	1 × 8i RAID controller card (standard)
	12	4	8	0 - 3	8 - 15	SAS/SATA drive: 1 × 8i RAID controller card (standard) NVMe drive: Directly connected to CPU1
	16	/	16	/	0 - 15	2 × 8i RAID controller card (standard) or 1 × 16i RAID controller card (standard)
	18	2	16	0 - 1	8 - 23	SAS/SATA drive: 1 × 16i RAID controller card (standard) or 2 × 8i RAID controller card (standard) NVMe drive: Directly connected to CPU1
	20	4	16	0 - 3	8 - 23	SAS/SATA drive: 1 × 16i RAID controller card (standard) NVMe drive: Directly connected to CPU1
	24	/	24	/	0 - 23	1 × 8i RAID controller card (standard) + 1 × 16i RAID controller

Form Factor	Quantity	Configuration NVMe	Configuration SAS/SATA	Slot NVMe	Slot SAS/SATA	Drive Management Mode
						card (standard, RAID controller cards of the same manufacturer and series are recommended)
3.5	4	4	/	0 - 3	/	Directly connected to CPU1
	8	/	8	/	0 - 7	1 × 8i RAID controller card (standard)
	12	/	12	/	0 - 11	2 × 8i RAID controller card or 1 × 16i RAID controller card (standard)
	12	4	8	0 - 3	4 - 11	SAS/SATA drive: 1 × 8i RAID controller card (standard) NVMe drive: Directly connected to CPU1

▤ NOTE

- If 2 NVMe drives are configured, CPU1_SLOT_6 on the GPU board is not available.
- If 4 NVMe drives are configured, CPU1_SLOT_6 and CPU1_SLOT_7 on the GPU board are not available.

5.5.2 Drive Numbering

- 24 × 2.5-inch Drive Pass-Through Configuration (24 × SAS/SATA Drive)

Figure 5-11 Drive Numbering

Physical Drive No.	Drive No. Identified by the ISBMC	Drive No. Identified by the Standard 8i + 16i RAID Controller Card
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	0
9	9	1
10	10	2
11	11	3
12	12	4
13	13	5
14	14	6
15	15	7
16	16	8
17	17	9
18	18	10
19	19	11
20	20	12
21	21	13
22	22	14

Physical Drive No.	Drive No. Identified by the ISBMC	Drive No. Identified by the Standard 8i + 16i RAID Controller Card
23	23	15

- 12 × 3.5-inch Drive Pass-Through Configuration (12 × SAS/SATA Drive)

Figure 5-12 Drive Numbering
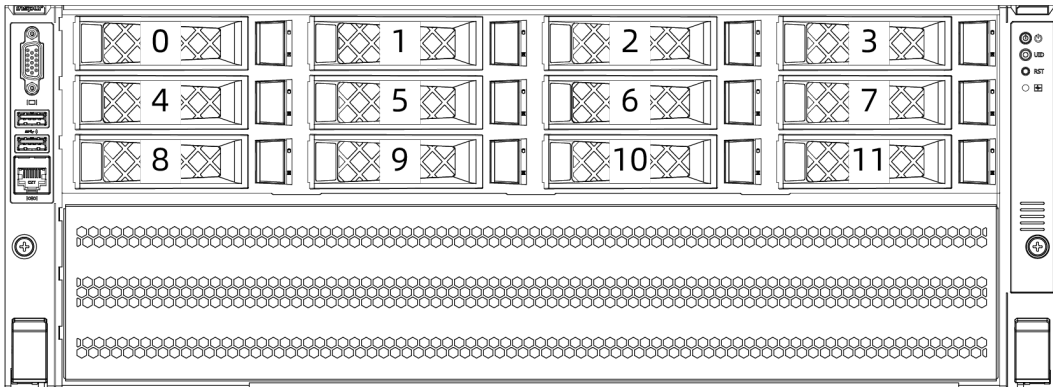
Physical Drive No.	Drive No. Identified by the ISBMC	Drive No. Identified by the Standard 8i RAID Controller Card
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	0
9	9	1
10	10	2
11	11	3

5.5.3 Drive LEDs

Figure 5-13 SAS/SATA Drive LEDs
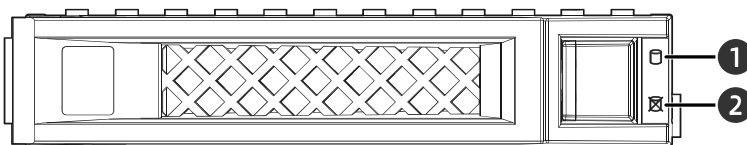
Item	Feature	Description
1	Activity LED	• Solid green = Drive is present but not in use • Flashing green = Drive is present and in use
2	Error LED	• Solid red = Drive error or failure • Solid blue = Drive is being located • Solid pink = RAID rebuilding

5.5.4 RAID Controller Card

The RAID controller card provides functions such as RAID configuration, RAID level migration, and disk roaming. For specific RAID controller card options, consult your local Inspur sales representative or refer to 7.2 Hardware Compatibility.

5.6 Network

The OCP 3.0 card allows for network expansion capabilities.

● The FLEX I/O card slot supports the OCP 3.0 card, which can be selected as required.

● For specific OCP 3.0 card options, consult your local Inspur sales representative or refer to 7.2 Hardware Compatibility.

● For details on the OCP 3.0 card, see the documentation of each OCP 3.0 card.

NOTE

If an OCP NIC card is selected, CPU0_SLOT_5 on the motherboard is not available.

5.7 I/O Expansion

5.7.1 PCIe Cards

The PCIe cards provide system expansion capabilities.

● Supports up to 2 PCIe 4.0 x16 expansion slots or 2 PCIe 4.0 x8 expansion slots + 1 PCIe 4.0 x16 expansion slot (including 1 dedicated slot for an OCP 3.0 card).

- For specific PCIe card options, consult your local Inspur sales representative or refer to [7.2 Hardware Compatibility](#).

5.7.2 PCIe Slots

1. PCIe Slot Layout

Figure 5-14 PCIe Slots - Standard Configuration
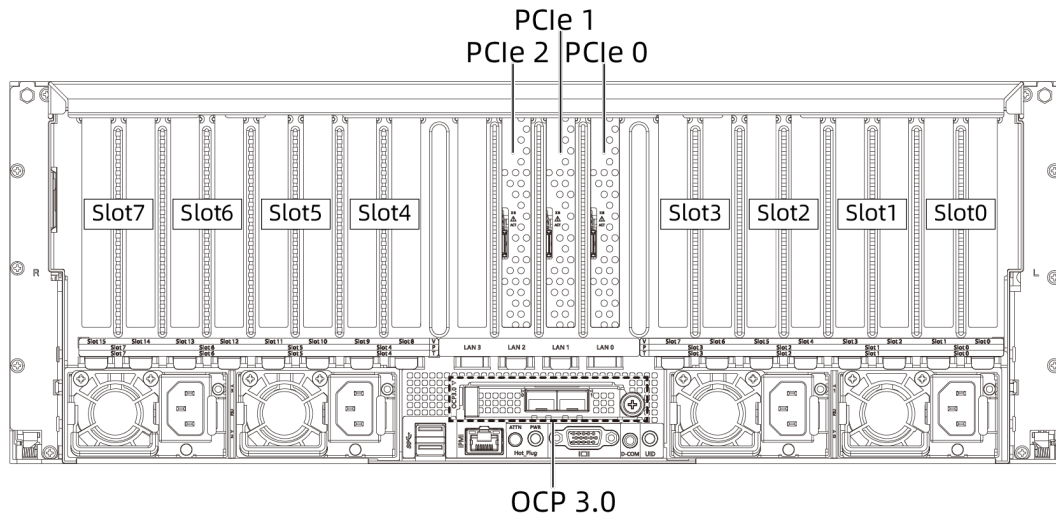
- GPU slots: Slot0, Slot1, Slot2, Slot3, Slot4, Slot5, Slot6, and Slot7.

- Standard add-in card slots: PCIe0, PCIe1, and PCIe2.

Table 5-9 PCIe Slots

PCIe Slot	Corresponding CPU	PCIe Standard	Connector Bandwidth	Bus Bandwidth	Port No.	Root Port (B/D/F)	Slot Size
Slot 0	CPU0	PCIe 4.0	x16	x16	1	60:3:1	FHFL
Slot 1	CPU0	PCIe 4.0	x16	x16	2	40:1:1	FHFL
Slot 2	CPU0	PCIe 4.0	x16	x16	3	00:1:1	FHFL
Slot 3	CPU0	PCIe 4.0	x16	x16	4	20:3:1	FHFL
Slot 4	CPU1	PCIe 4.0	x16	x16	8	E0:3:1	FHFL
Slot 5	CPU1	PCIe 4.0	x16	x16	9	C0:1:1	FHFL

PCIe Slot	Corresponding CPU	PCIe Standard	Connector Bandwidth	Bus Bandwidth	Port No.	Root Port (B/D/F)	Slot Size
Slot 6	CPU1	PCIe 4.0	x16	x16	A	80:1:1	FHFL
Slot 7	CPU1	PCIe 4.0	x16	x16	B	A0:3:1	FHFL
PCIe 0	CPU0	PCIe 4.0	x16	• x16 if no OCP 3.0 card is installed • This slot is not available if an OCP 3.0 card is installed	5	20:1:1	FHHL
PCIe 1	CPU1	PCIe 4.0	x16	• x16 if PCIe2 slot is empty • x8 if PCIe2 slot is populated with a card	6	C0:3:2	FHHL
PCIe 2	CPU1	PCIe 4.0	x16	x8	7	C0:3:1	FHHL
OCP 3.0 Slot	CPU0	PCIe 3.0	x16	x16	5	20:1:1	Standard OCP 3.0

5.8 PSUs

- Supports up to 4 PSUs.
- Supports AC PSUs.
- The PSUs are hot-swappable.
- Supports 4 PSUs in 2+2 redundancy.
- PSUs in a server must have the same Part No. (P/N code).

Figure 5-15 PSU Layout

PSU3   PSU2   PSU1   PSU0
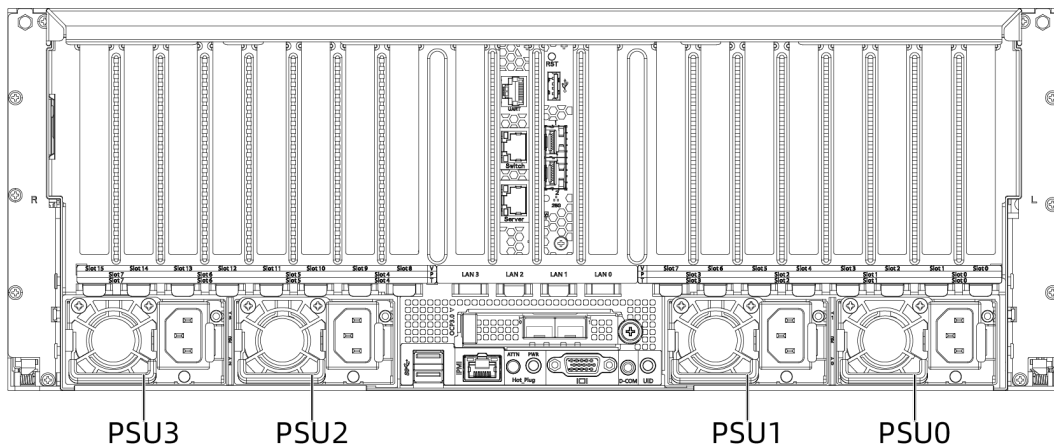
5.9 Fan Modules

- Supports twelve 6056 fan modules.
- The fan modules are hot-swappable.
- Supports N+1 rotor redundancy, which means that the server can operate properly when a single fan module fails.
- Supports intelligent fan speed control.
- Fan modules in a server must have the same Part No. (P/N code).

Figure 5-16 Fan Module Layout
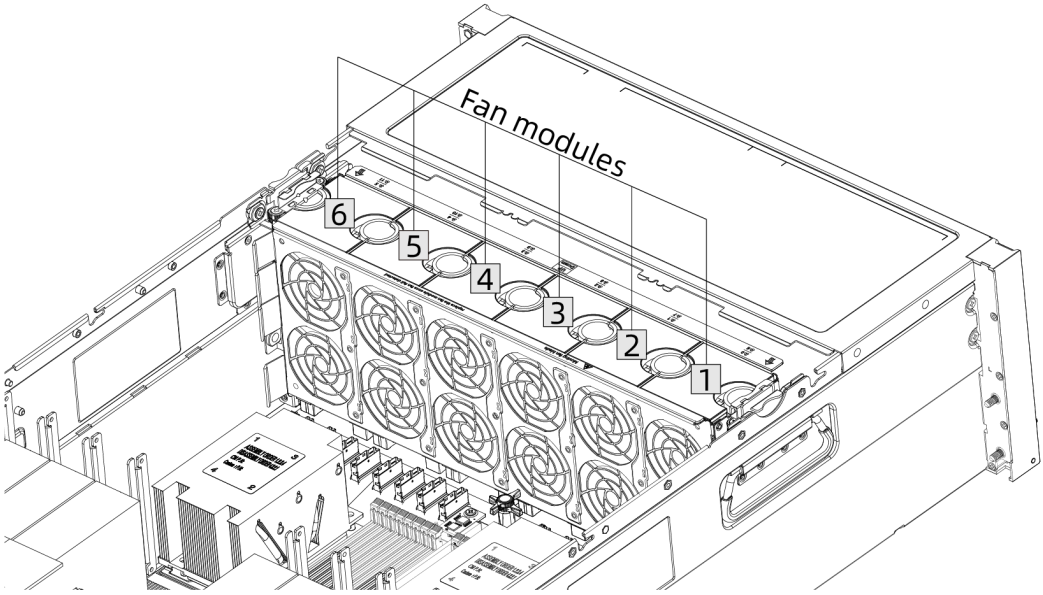
5.10 Boards

5.10.1 Motherboard

Figure 5-17 NF5468A5 Motherboard
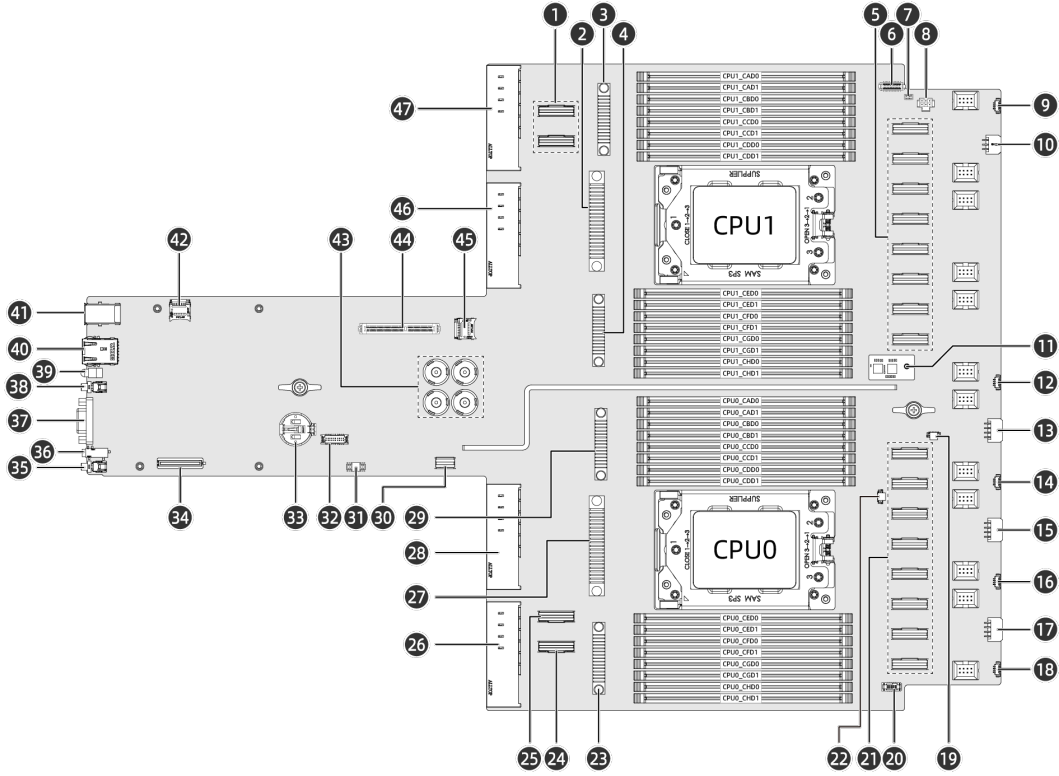
Item	Feature	Item	Feature
1	Slimline Connector × 2	2	CPU1 VR Heatsink
3	Memory VR Heatsink	4	Memory VR Heatsink
5	Slimline Connector × 8	6	Front Control Panel Connector
7	Intrusion Switch Connector	8	Smart NIC Power Connector
9	Chassis Temperature Detector Connector	10	RAID Controller Card Power Connector
11	TPM Connector	12	Backplane I^{2}C Connector
13	Backplane Power Connector	14	Backplane I^{2}C Connector
15	Backplane Power Connector	16	Backplane I^{2}C Connector
17	Backplane Power Connector	18	Backplane I^{2}C Connector
19	Clock Connector	20	VPP Connector
21	Slimline Connector × 8	22	Clock Connector
23	Memory VR Heatsink	24	Slimline Connector
25	Slimline Connector	26	PSU0 Connector
27	CPU0 VR Heatsink	28	PSU1 Connector
29	Memory VR Heatsink	30	Front Control Panel Connector
31	CPU HDT Header	32	NIC NC-SI Connector
33	Battery Socket	34	OCP Interposer Card Connector
35	UID Button and LED	36	Serial Communication Port
37	VGA Port	38	OCP 3.0 Card Hot-Plug Button
39	OCP 3.0 Card Hot-Plug Attention LED	40	BMC Management Network Port
41	USB 3.0 Port	42	TF Card Connector (for BMC)
43	Radsok Connector	44	M.2 Backplane Connector
45	TF Card Connector (for CPU)	46	PSU2 Connector
47	PSU3 Connector		

5.10.2 Drive Backplane

1. Front Drive Backplane

- 8 × 2.5-inch Drive (8 × SAS/SATA/NVMe Drive) Pass-Through Backplane

Figure 5-18 8 × 2.5-inch Drive (8 × SAS/SATA/NVMe Drive) Pass-Through Backplane
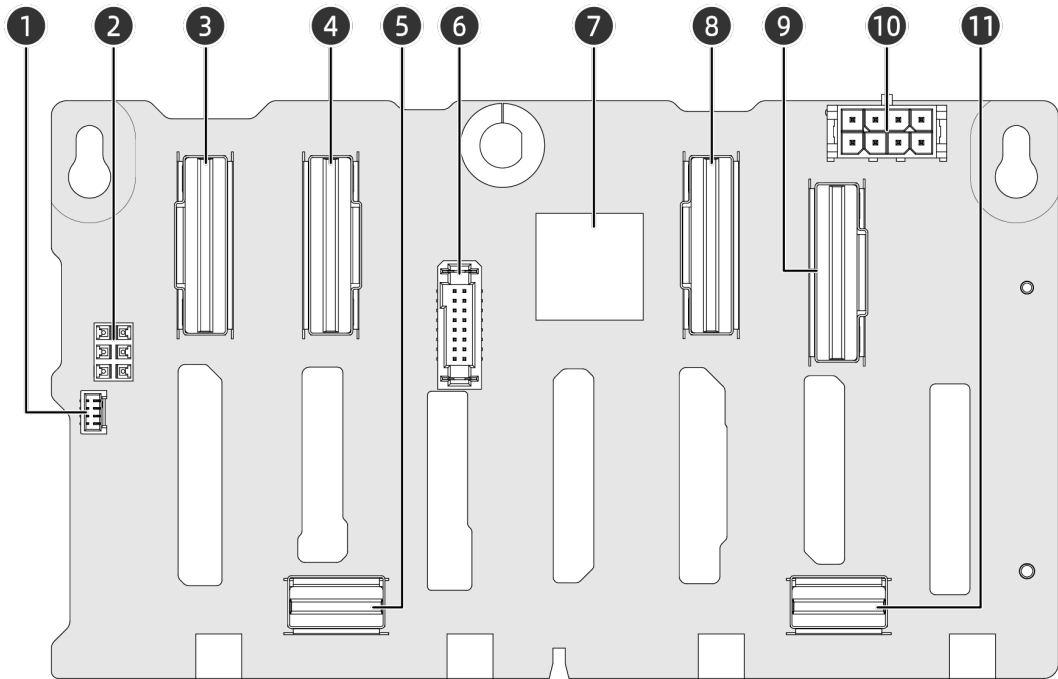
Item	Feature	Item	Feature
1	BMC I^{2}C Connector	2	CPLD JTAG Connector
3	Slimline x8 Connector 1	4	Slimline x8 Connector 2
5	Slimline x4 Connector 1	6	VPP Connector
7	CPLD	8	Slimline x8 Connector 3
9	Slimline x8 Connector 4	10	Power Connector
11	Slimline x4 Connector 2		

● 12 × 3.5-inch Drive Pass-Through Backplane

Figure 5-19 12 × 3.5-inch Drive Pass-Through Backplane
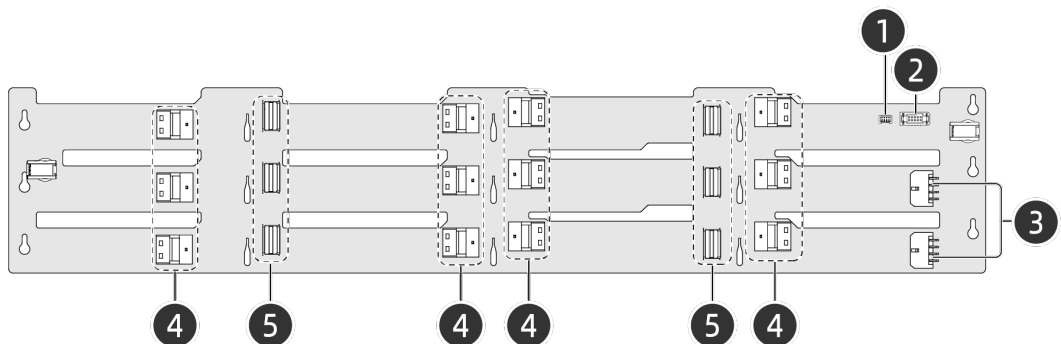
Item	Feature	Item	Feature
1	BMC I^{2}C Connector	2	VPP Signal Connector
3	Power Connector × 2	4	Slimline Connector × 12
5	Mini SAS Connector × 6		

2. Internal Drive Backplane

- 2 × M.2 Drive (2 × SATA/NVMe Drive) Pass-Through Backplane

Figure 5-20 Front View of 2 × M.2 Drive (2 × SATA/NVMe Drive) Pass-Through Backplane
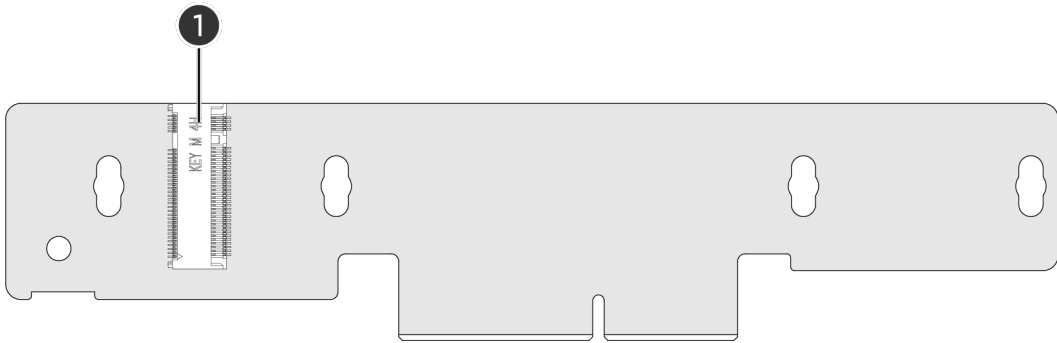
Figure 5-21 Rear View of 2 × M.2 Drive (2 × SATA/NVMe Drive) Pass-Through Backplane
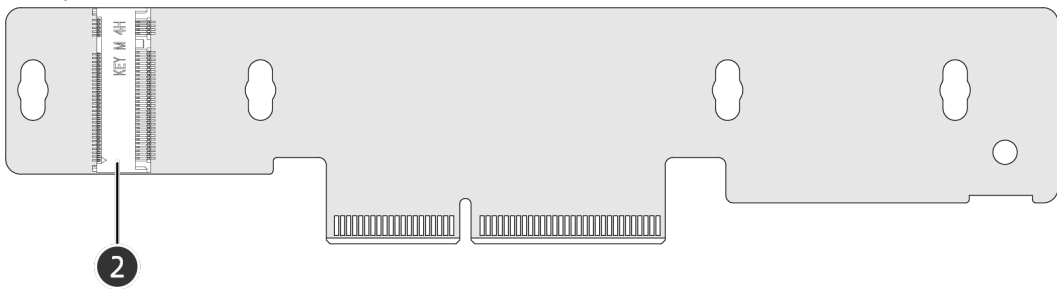
Table 5-10 Connectors on Internal Drive Backplane

Item	Feature	Item	Feature
1	M.2_1 Connector	2	M.2_2 Connector

5.10.3 GPU Board

Figure 5-22 GPU Board Layout
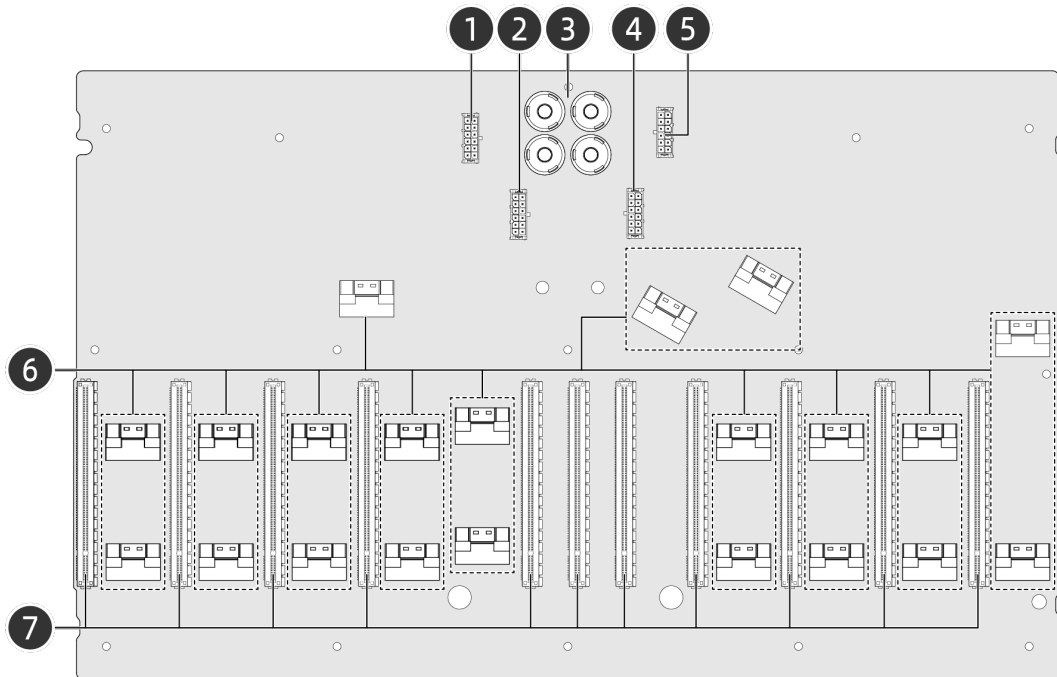
Item	Feature	Item	Feature
1	GPU Card Power Connector 1	2	GPU Card Power Connector 2
3	Radsok Connector	4	GPU Card Power Connector 3
5	GPU Card Power Connector 4	6	Slimline Connectors
7	PCIe Slots		

6 Product Specifications

6.1 Technical Specifications

Table 6-1 Technical Specifications

Item	Description
Form Factor	4U rack server
Processor	• 2 AMD Rome or Milan processors • Up to 64 cores • Max base frequency at 3.1 GHz • Up to 256 MB of L3 cache • Up to 3 xGMI links at up to 18 GT/s • TDP up to 280 W ▤NOTE The above information is for reference only, see 7.2 Hardware Compatibility for details.
Memory	• 16 × DIMM slot per processor, 32 in total • 8 × memory channel per processor, 16 in total • Supports DDR4 RDIMM/LRDIMM (3200 MT/s, 1 DPC) ▤NOTE The above information is for reference only, see 7.2 Hardware Compatibility for details.
Storage	• Supports multiple drive configurations, see 5.5.1 Drive Configuration for details. - Hot-swap SAS/SATA/NVMe drives. - Front: 24 × 2.5-inch drive or 12 × 3.5-inch drive, where 8 drive bays support U.2 NVMe SSDs (A technical review is required if more than 4 NVMe SSDs are installed); - Internal: 2 × M.2 SATA SSD. • Supports multiple models of RAID controller cards. ▤NOTE • The M.2 SSD is only used as the boot device for installing the OS.

Item	Description
	• The M.2 SSD has low endurance and cannot be used as a data storage device. It may be worn out within a short period of time in scenarios where frequent data erase and write occur. • For data storage, use enterprise-class SSDs or HDDs with higher DWPD. • Write-intensive service software will cause the M.2 SSD to reach write endurance and wear out; therefore, the M.2 SSD is not recommended for such service scenarios. • Do not use the M.2 SSD as caching. • A standard RAID controller card provides functions such as RAID configuration, RAID level migration, and disk roaming. • A standard RAID controller card offers data protection enabled by the super-capacitor in case of power failures. • A standard RAID controller card occupies 1 PCIe slot. • The above information is for reference only. For details on RAID controller cards, see 7.2 Hardware Compatibility.
Network	• Multiple network expansion capabilities • Standard NICs (1/10/25/40/100G) • 1 hot-swap OCP 3.0 card (occupying 1 slot) can be selected as needed NOTE Supports multiple OCP 3.0 cards, see 7.2 Hardware Compatibility for details.
IO Expansion	Up to 11 × PCIe slot (standard), including 1 OCP 3.0 card slot: • 8 × FHFL PCIe 4.0 x16 card • 1 × FHHL PCIe 4.0 x16 card (cannot be installed when OCP 3.0 card is installed) • 1 × FHHL PCIe 4.0 x16 card or 2 × FHHL PCIe 4.0 x8 card NOTE The above information is for reference only, see 7.2 Hardware Compatibility for details.

Port	Supports multiple ports
	
	• Front panel:
	
	  - 2 × USB 3.0 port
	
	  - 1 × VGA port
	
	  - 1 × system serial port
	
	• Rear panel:
	
	  - 2 × USB 3.0 port
	
	  - 1 × VGA port
	
	  - 1 × 3.5 mm jack

Item	Description
	- 1 × BMC management network port 📋NOTE OS installation on the USB mobile storage media is not recommended.
Fan	12 × 6056 Fan
System Management	Provides a dedicated Ethernet management port, which supports remote control, SMTP, KVM, management via SNMP, and virtual media
Power Supply	Four 1600/2000/2200/3000 W Platinum level PSUs in 2+2 redundancy

6.2 Environmental Specifications

Table 6-2 Environmental Specifications

Parameter	Description
Temperature[1, 2, 3]	• Operating: 5°C to 35°C (41°F to 95°F) • Storage (packed): -40°C to +70°C (-40°F to +158°F) • Storage (unpacked): -40°C to +55°C (-40°F to +131°F)
Relative Humidity (RH, non-condensing)	• Operating: 10% - 90% RH • Storage (packed): 10% - 93% RH • Storage (unpacked): 10% - 93% RH
Operating Altitude	≤ 3050 m (10000 ft) • 0 - 950 m (0 – 3,117 ft): The maximum allowable ambient temperature is 35°C (95°F) • 950 – 3,050 m (3,117 – 10,000 ft): The maximum allowable ambient temperature decreases by 1°C per 300 m (1°F per 546 ft)
Corrosive Gaseous Contaminants	Maximum growth rate of corrosion film thickness: • Copper coupon: 300 Å/month (compliant with the gaseous corrosivity level of G1 defined in ANSI/ISA-71.04-2013)

Parameter	Description
	• Silver coupon: 200 Å/month (compliant with the gaseous corrosivity level of G1 defined in ANSI/ISA-71.04-2013)
Particulate Contaminants	• Comply with the data centre cleaning standard ISO 14644-1 Class 8 • The server room must be free of explosive, conductive, magnetic, and corrosive dust 📋NOTE It is recommended to hire a professional organization to monitor the particulate contaminants in the server room.

Noise[4, 5, 6, 7]	Noise emissions are measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109). Listed are the declared A-weighted sound power levels (LWAd) and the declared average bystander position A-weighted sound pressure levels (LpAm) at a server operating temperature of 23°C (73.4°F):
	
	• Idle:
	
	   - LWAd: 5.9 Bels
	
	   - LpAm: 54.9 dBA
	
	• Operating:
	
	   - LWAd: 7.3 Bels
	
	   - LpAm: 67.2 dBA

📋NOTE

1. Not all configurations support the operating temperature range of 5°C to 35°C (41°F to 95°F). The GPU configuration supports the operating temperature range of 10°C to 35°C (50°F to 95°F).

2. Standard operating temperature:

    -   10°C to 35°C (50°F to 95°F) is the standard operating temperature at sea level. For temperatures between 10°C and 35°C (50°F and 95°F), de-rate the maximum allowable temperature by 1°C per 305 m (1°F per 556 ft) above sea level. The maximum temperature gradient is 20°C/h (36°F/h) and the maximum operating altitude is 3,050 m

(10,000 ft), both varying with server configuration.

- Any fan failure or operations above 30°C (86°F) may lead to system performance degradation.

3. Expanded operating temperature:

- As for certain approved configurations, the supported operating temperature can be expanded to 5°C to 10°C (41°F to 50°F) and 35°C to 45°C (95°F to 113°F) at sea level. At an altitude of 900 - 3,050 m (2,953 - 10,000 ft), de-rate the maximum allowable operating temperature by 1.0°C per 175 m (1°F per 319 ft).

- Any fan failure or operations under expanded environments may lead to system performance degradation.

4. This document lists the LWAd and the LpAm of the product at a 23°C (73.4°F) ambient environment. All measurements are conducted in conformance with ISO 7779 (ECMA 74) and declared in conformance with ISO 9296 (ECMA 109).

5. The sound levels shown here were measured based on specific testing configurations and will vary with server configuration. These values are for reference only and subject to change without notice.

6. Product conformance to cited normative standards is based on sample testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.

6.3 Physical Specifications

Table 6-3 Physical Specifications

Item	Description
Dimensions	Chassis Dimensions (W × H × D): • 2.5-inch drive configuration with mounting ears: 483 × 175.5 × 846.75 mm (19.02 × 6.91 × 33.34 in.) • 2.5-inch drive configuration without mounting ears: 447.6 × 175.5 × 819.25 mm (17.62 × 6.91 × 32.25 in.) • 3.5-inch drive configuration with mounting ears: 483 × 175.5 × 871.75 mm (19.02 × 6.91 × 34.32 in.) • 3.5-inch drive configuration without mounting ears: 447.6 × 175.5 × 844.25 mm (17.62 × 6.91 × 33.24 in.)

Item	Description
	• Outer packaging (L × W × H): 1200 × 800 × 480 mm (47.24 × 31.50 × 18.90 in.)
Weight	Chassis: • Maximum weight of the 12 × 3.5-inch front drive configuration: 54 kg (119.05 lbs) • Maximum weight of the 24 × 2.5-inch front drive configuration: 51 kg (112.44 lbs) Packaging materials: 32 kg (70.55 lbs) (including packaging box + rails + accessory box)
Power Consumption	Power consumption varies with configurations.

7 Operating System and Hardware Compatibility

This section describes the OS and hardware compatibility information. For the latest compatibility configuration and the component models not listed in this manual, contact your local Inspur sales representative.

ⓘ IMPORTANT

- Using incompatible components may cause the server to work abnormally, and such failures are not covered by technical support or warranty.
- The server performance is strongly influenced by application software, middleware and hardware. The subtle differences in them may lead to performance variation in the application and test software.
  - For requirements on the performance of specific application software, contact Inspur sales representatives to confirm the detailed hardware and software configurations during the pre-sales phase.
  - For requirements on hardware performance consistency, define specific configuration requirements (for example, specific drive models, RAID controller cards, or firmware versions) during the pre-sales phase.

7.1 Supported Operating System

Table 7-1 Operating System

OS	Version
Windows	Windows_Server 2019, 64 bit
Red Hat	Redhat 7.8, 64 bit
	Redhat 8.2, 64 bit
	Redhat 8.3, 64 bit
Ubuntu	Ubuntu 20.04, 64 bit
CentOS	CentOS 7.8, 64 bit
	CentOS 8.2, 64 bit
	CentOS 8.3, 64 bit

7.2 Hardware Compatibility

7.2.1 CPU Specifications

- Supports up to 2 AMD EPYC processors.

- Supports up to 64 cores.

- Max base frequency at 3.1 GHz.

- 3 xGMI links at up to 18 GT/s.

- Up to 256 MB of L3 cache.

- TDP up to 280 W.

Table 7-2 CPU Specifications

Model	Cores	Threads	Base Frequency (GHz)	Max Boost Frequency (GHz)	Cache (MB)	TDP (W)
7402	24	48	2.8	3.35	128	180
7282	16	32	2.8	3.2	64	120
7742	64	128	2.25	3.4	256	225
7702	64	128	2.0	3.35	256	225
7542	32	64	2.9	3.4	128	225
7H12	64	128	2.6	3.3	256	280
7502	32	64	2.5	3.35	128	180
7642	48	96	2.3	3.3	256	225
7302	16	32	3.0	3.3	74	155
7352	24	48	2.3	3.2	96	155
7252	8	16	3.1	3.2	32	120
7713	64	128	2.0	3.35	256	225
7532	32	64	2.4	3.3	256	200
7272	12	24	2.9	3.2	64	120
7543	32	64	2.8	3.7	256	225
7552	48	96	2.2	3.3	192	200
7313	16	32	3.0	3.7	128	155
75F3	32	64	2.95	4.0	256	280
7643	48	96	2.3	3.6	256	225
7763	64	128	2.45	3.5	256	280
7543	32	64	2.8	3.7	256	225

7.2.2 DIMM Specifications

The NF5468A5 supports up to 32 DDR4 RDIMMs/LRDIMMs (3200 or 2933 MT/s). Each processor supports 8 memory channels with 2 DIMM slots per channel. The following memory protection technology is supported:

- Error-Correcting Code (ECC)

Table 7-3 Memory Specifications

Type	Capacity (GB)	Speed	Data Width	Organization
RDIMM	16	3200	x72	1R x4/2R x8
RDIMM	32	3200	x72	2R x4/2R x8
RDIMM	64	3200	x72	2R x4
RDIMM	128	3200	x72	4R x4

7.2.3 Drive Specifications

Table 7-4 HDD Specifications

Model	Speed in rpm	Capacity	Max. Qty.
2.5-inch SAS Drive	10k	600 GB/1.2 TB/1.8 TB/2.4 TB	24
2.5-inch SAS Drive	15k	300 GB/600 GB	24

Table 7-5 SSD Specifications

Model	Capacity	Max. Qty.
M.2 SSD	240 GB	2
M.2 SSD	480 GB	2
M.2 SSD	960 GB	2
SATA SSD	240 GB	24
SATA SSD	480 GB	24
SATA SSD	960 GB	24
SATA SSD	1.92 TB	24
SATA SSD	3.84 TB	24
SATA SSD	7.68 TB	24

Table 7-6 U.2 NVMe SSD Specifications

Model	Capacity	Max. Qty.
U.2 NVMe SSD	0.96 TB	4
U.2 NVMe SSD	1 TB	4
U.2 NVMe SSD	1.92 TB	4
U.2 NVMe SSD	2 TB	4
U.2 NVMe SSD	3.84 TB	4
U.2 NVMe SSD	4 TB	4
U.2 NVMe SSD	6.4 TB	4
U.2 NVMe SSD	7.68 TB	4
U.2 NVMe SSD	8 TB	4

7.2.4 SAS/RAID Controller Card Specifications

Table 7-7 SAS/RAID Controller Card Specifications

Type	Manufacturer	Model
SAS Controller Card	LSI	9400-8i
	LSI	9400-16i
	Inspur	SAS3008
	Inspur	PM8222_SmartHBA
	Inspur	PM8222
RAID Controller Card	Inspur	SAS3108_2GB
		SAS3008
		PM8204-2GB
		PM8204-4GB
	LSI	9460-16i_4GB
		9460-8i_2GB
		9560-8i_4GB
		9361-8i-1GB
		9361-8i-2GB

7.2.5 NIC Specifications

Table 7-8 OCP NIC Specifications

Type	Model	Speed (Gb/s)	Network Port Qty.
OCP 3.0 Card	I350	1	2
	X710_10G	10	2
	BROADCM_25G	25	2

Type	Model	Speed (Gb/s)	Network Port Qty.
	25G_MCX562A-ACAB	25	2
	25G_MCX631432AN	25	2

Table 7-9 PCIe NIC Specifications

Type	Model	Speed (Gb/s)	Network Port Qty.
PCIe NIC	I350-T4V2	1	4
	I350AM4	1	4
	EX710DA2	10	2
	82599ES	10	2
	X710DA4FH	10	2
	X550T2	10	2
	X550	10	2
	MCX512A-ACAT	25	2
	MCX631102AN	25	2
	MCX4121A-ACAT	25	2
	MCX516A-GCAT	50	2
	MCX516A-CCAT	100	2

7.2.6 HCA Card Specifications

Table 7-10 HCA Card Specifications

Type	Model
HCA Card	MCX653105A-ECAT
	MCX653106A-ECAT
	MCX653105A-HDAT
	MCX653106A- HDAT

7.2.7 GPU Specifications

Table 7-11 GPU Specifications

Type	Model	Max. Qty.
GPU Card	Tesla-A100	8
GPU Card	NVIDIA-A100	8
GPU Card	NVIDIA-A30	8
GPU Card	NVIDIA-A40	8

Type	Model	Max. Qty.
GPU Card	Tesla-T4	8
GPU Card	NVIDIA-A10	8

7.2.8 PSU Specifications

The NF5468A5 supports up to four hot-swap Intel® CRPS 80 PLUS Platinum PSUs in 2+2 redundancy, with standard electrical and structural design, allowing customers to choose based on the actual configuration. The PSUs will lock automatically after being inserted into the power bay, enabling tool-less maintenance.

The following rated 110 VAC - 230 VAC and 240 VDC power supplies in 2+2 redundancy are supported:

- 1600 W Platinum Level PSUs: 1000 W (110 VAC), 1600 W (230 VAC), 1600 W (240 VDC for China)

- 2000 W Platinum Level PSUs: 1000 W (110 VAC), 2000 W (230 VAC), 2000 W (240 VDC for China)

- 2200 W Platinum Level PSUs: 1000 W (110 VAC), 2200 W (230 VAC), 2200 W (240 VDC for China)

- 3000 W Platinum Level PSUs: 1500 W (110 VAC), 3000 W (230 VAC), 3000 W (240 VDC for China)

⚠️ CAUTION

- At a rated voltage of 110 VAC, a 1600/2000/2200/3000 W PSU will be derated.
- Input voltage range:
  - 110 VAC - 230 VAC (rated voltage): 90 V - 264 V (operating voltage)
  - 240 VDC (rated voltage): 180 V - 320 V (operating voltage)

8 Regulatory Information

8.1 Safety

8.1.1 General

- Strictly comply with local laws and regulations while installing the equipment. The safety instructions in this section are only a supplement to local safety regulations.

- To ensure personal safety and to prevent damage to the equipment, all personnel must strictly observe the safety instructions in this section and on the device labels.

- People performing specialized activities, such as electricians and electric forklift operators, must possess qualifications recognized by the local government or authorities.

8.1.2 Personal Safety

- Only personnel certified or authorized by Inspur are allowed to perform the installation procedures.

- Stop any operation that could cause personal injury or equipment damage. Report to the project manager and take effective protective measures.

- Working during thunderstorms, including but not limited to handling equipment, installing cabinets and installing power cords, is forbidden.

- Do not carry the weight over the maximum load per person allowed by local laws or regulations. Arrange appropriate installation personnel and do not overburden them.

- Installation personnel must wear clean work clothes, work gloves, safety helmets and safety shoes, as shown in Figure 8-1.

Figure 8-1 Protective Clothing

- Before touching the equipment, put on ESD clothes and ESD gloves or an ESD wrist strap, and remove any conductive objects such as wrist watches or metal jewelry, as shown in Figure 8-2, in order to avoid electric shock or burns.

Figure 8-2 Removing Conductive Objects
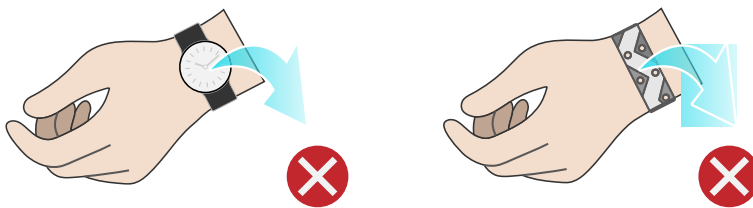
How to put on an ESD strap (Figure 8-3).

1. Put your hand through an ESD wrist strap.

2. Tighten the strap buckle to ensure a snug fit.

3. Plug the alligator clip of the ESD wrist strap into the corresponding jack on the grounded cabinet or grounded chassis.

Figure 8-3 Wearing an ESD Wrist Strap

- Use tools correctly to avoid personal injury.

- When moving or lifting equipment above shoulder height, use lifting devices and other tools as necessary to avoid personal injury or equipment damage due to equipment slippage.

- The power sources of the server carry a high voltage. Direct contact or indirect contact through damp objects with the high-voltage power source is fatal.

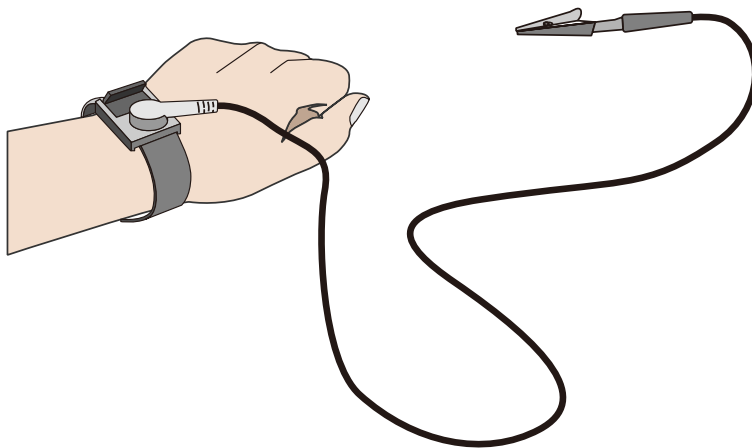- To ensure personal safety, ground the server before connecting power.

- When using ladders, always have someone hold and guard the bottom of the ladders. In order to prevent injury, never use a ladder alone.

- When connecting, testing or replacing optical fiber cable, avoid looking into the optical port without eye protection in order to prevent eye damage from laser light.

8.1.3 Equipment Safety

- To ensure personal safety and prevent equipment damage, use only the power cords and cables that come with the server. Do not use them with any other equipment.

- Before touching the equipment, put on ESD clothing and ESD gloves to prevent static electricity from damaging the equipment.

- When moving the server, hold the bottom of the server. Do not hold the handles of any module installed in the server, such as PSUs, fan modules, drive modules, or motherboard. Handle the equipment with care at all times.

- Use tools correctly to avoid damage to the equipment.

- Connect the power cords of active and standby PSUs to different PDUs to ensure high system reliability.

- To ensure equipment safety, always ground the equipment before powering it on.

8.1.4 Transportation Precautions

Contact the manufacturer for precautions before transportation as improper transportation may damage the equipment. The precautions include but not limited to:

- Use a trusted logistics company to move all equipment. The transportation process must comply with international transportation standards for electronic equipment. Always keep the equipment being transported upright. Avoid collision, moisture, corrosion, packaging damage or contamination.

- Transport the equipment in its original packaging.

- If the original packaging is unavailable, separately package heavy and bulky components (such as chassis, blade servers and blade switches), and fragile components (such as optical modules and PCIe cards).

- Power off all equipment before shipping.

8.1.5 Manual Handling Weight Limits

⚠️ CAUTION

Observe local laws or regulations regarding the manual handling weight limits per person. The limits shown on the equipment and in the document are recommendations only.

Table 8-1 lists the manual handling weight limits per person specified by some organizations.

Table 8-1 Manual Handling Weight Limits per Person

Organization	Weight Limit (kg/lbs)
European Committee for Standardization (CEN)	25/55.13
International Organization for Standardization (ISO)	25/55.13
National Institute for Occupational Safety and Health (NIOSH)	23/50.72
Health and Safety Executive (HSE)	25/55.13
General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China (AQSIQ)	• Male: 15/33.08 • Female: 10/22.05

8.2 Maintenance and Warranty

For information about warranty policies, refer to Chapter 9 Inspur Limited Warranty in *Inspur Server NF5468A5 User Manual*.

9 System Management

9.1 Intelligent Management System ISBMC

The NF5468A5 is integrated with Inspur's new-generation BMC intelligent management system (ISBMC). ISBMC is a self-developed remote server management system by Inspur. Compatible with the server management standard IPMI 2.0, ISBMC features reliable and intelligent hardware monitoring and management.

ISBMC supports:

- IPMI 2.0

- redirection of keyboard, video, mouse (KVM) and text console

- remote virtual media

- Redfish

- SNMP

- login to BMC via web browsers

Table 9-1 ISBMC Features

Feature	Description
Management Interface	Supports a variety of management interfaces for integration with any standard management system. The supported interfaces include: • IPMI • CLI • SNMP • HTTPS • Redfish
Accurate and Intelligent Fault Location	IDL, a self-developed fault diagnosis system, offers accurate and comprehensive hardware fault location capabilities, and outputs detailed fault causes and handling suggestions
Alert Management	Supports alert management and various alerting mechanisms such as SNMP Trap (v1/v2c/v3), email alerts, and syslog alerts to ensure 24 × 7 device reliability

Feature	Description
Remote Console KVM	Provides convenient remote maintenance without on-site operation in case of system failure
Remote Virtual Media	Supports virtualizing images, USB devices, folders and local media devices as media devices of remote servers, simplifying OS installation, file sharing, and other O&M tasks
Web GUI	Supports the visual management interface developed by Inspur, displaying abundant information of the server and components, and offers easy-to-use Web GUIs
Crash Screenshot and Manual Screenshot	Supports automatic crash screenshot with the last screen before crash saved, and provides manual screenshot, which can quickly capture the screen for easy inspection at scheduled time
Dual Flash and Dual Image	Supports dual flash and dual image, enabling automatic flash failover in case of software faults or flash damage, improving operational reliability
IPv6	Supports IPv6 and an IPv6-only environment can be built, providing customers with abundant IP resources
Auto-Switching of Management Network Ports	Supports auto-switching between the dedicated management network port and shared management network port, providing customers with flexible network deployment solutions for different management network deployment scenarios
Hardware Monitoring Timer	Full speed is activated for fans when BMC is unresponsive beyond the preset timeout period
Power Supply Control	Supports virtual power buttons for startup, shutdown, restart, and restart after shutdown.
UID LED and Remote Control LED	• Supports remote lighting of the UID LED for locating the server in the server room • Supports remote control LED. The UID LED flashes when a user remotely logs in via web, KVM, or SSH to inform the on-site personnel that an administrator is accessing the server
Secure Firmware Update	• Supports firmware update based on secure digital signatures, mismatch prevention mechanism for firmware from different manufacturers and firmware for different server models • Supports firmware update of BMC, BIOS, CPLD, etc
Serial Port Redirection	Supports remote redirection of the system serial port, BMC serial port, and other serial ports, and directs the server-side

Feature	Description
	serial port output to the local administrator via the network for server debugging
Storage Information Display	Displays RAID logical array information and drive information, supports remote RAID creation for improved deployment efficiency

9.2 Inspur Physical Infrastructure Manager (ISPIM)

The NF5468A5 server is compatible with the latest version of Inspur Physical Infrastructure Manager (ISPIM).

ISPIM is a new-generation infrastructure O&M management platform for industry data centers. Based on cutting-edge O&M concepts, ISPIM provides users with leading and efficient overall management solutions for data centers to ensure the advancement of their infrastructure management. This platform delivers a rich set of functions such as centralized resource management, in-depth fault diagnosis, second-level performance monitoring, intelligent energy consumption management, 3D automatic topology, and stateless automatic deployment. With these functions, users can implement central O&M of servers, storage devices, network devices, security devices, and edge devices, effectively improving O&M efficiency, reducing O&M costs, and ensuring the secure, reliable, and stable operation of data centers. ISPIM has the following key features:

● Lightweight deployment in multiple scenarios and full lifecycle management of devices.

● High reliability and on-demand node scalability enabled by 1 to N data collectors.

● Intelligent asset management and real-time tracking of asset changes.

● Comprehensive monitoring for overall business control.

● Intelligent fault diagnosis for reduced maintenance time.

● Second-level performance monitoring for real-time status of devices.

● Batch update, configuration and deployment for reduced deployment time.

● Version management for improved version management efficiency.

● Standardized northbound interfaces for easy integration and interfacing.

Table 9-2 ISPIM Specifications

Feature	Description
Centralized Device Management	Supports centralized management of network-wide devices, including servers (the full range of Inspur server family, including general-purpose rack servers, AI servers, blade servers, all-in-one servers and other high-end server products, and third-party servers), storage devices (Inspur general-purpose disk arrays, distributed storage devices, and storage devices of other manufacturers), and network devices (Inspur switches, third-party switches, and third-party firewall devices)
Monitoring	• Centralized display, search, blocking and email notifications of device alerts • Creation of alert rules, notification rules, and blocking rules • Alert severity level setting • Alert forwarding and southbound settings • Device performance monitoring • Distributed monitoring
Stateless Computing	• BMC/BIOS update and configuration of Inspur servers • RAID configuration of Inspur servers • Firmware configuration templates • Automatic firmware baseline management • Repository for update files
OS Deployment	• Batch deployment of OSs via BMC interfaces • One-click deployment with automatic and detailed logging and with no manual intervention needed • Concurrent deployment of up to 40 devices
Asset Management	• Part-level asset management and multi-dimensional asset report • 3D data centers • Asset maintenance management

Feature	Description
Fault Diagnosis	Powered by the Inspur expert pool, this feature provides Inspur 360° expert services to enable intelligent fault diagnosis, fault cause location, expert repair suggestions, and automatic repair reporting for the Inspur servers.
Power Consumption Management	• Multi-dimensional report of power consumption • Intelligent power capping strategies • A variety of power consumption optimization analyses, including cooling analysis, server utilization analysis, server power consumption analysis, and load distribution analysis • Intelligent power consumption prediction
Security Management	Implements security control of ISPIM by using a set of security policies such as user management, role management, authentication management (local authentication and LDAP authentication) and certificate management

9.3 Inspur Server Intelligent Boot (ISIB)

The NF5468A5 server is compatible with the latest version of Inspur Server Intelligent Boot (ISIB), a self-developed automatic O&M management system throughout the server lifecycle. Based on the SSH and PXE technologies, it is compatible with the full range of Inspur servers, and offers more efficient and reliable automatic deployment and software and hardware configuration management. ISIB has the following key features:

● Full lifecycle management from deployment to automatic O&M.

● One-stop and one-click deployment for bare metal servers.

● Flexible task scheduling with O&M capabilities in multiple scenarios.

● Large-scale deployment of technical architecture, shortening the deployment time.

● Zero network deployment with plug-and-play support.

● Accurate logging and instruction-level tracing of execution results.

● Rich built-in O&M scripts and management schemes.

Table 9-3 ISIB Specifications

Item	Description
Home	• Provides multi-dimensional reports of assets, repositories, operations and jobs • Displays jobs 24 hours dynamically • Displays column bars of jobs in the last 30 days
Asset	Supports automatic device discovery, OS information collection, and out-of-band/in-band power supply management
Repository	Enables you to manage images, software, firmware, configuration files, scripts and sources for easy OS deployment and firmware update
Operation	• Firmware update • Hardware configuration • Automatic OS installation via PXE • Installation template management • Image cloning and restoration • Software distribution • Configuration changes • System inspection
Task	• Supports job scheduling, and scheduled and periodic task execution • Provides visual multi-dimensional task display and detailed logging

10 Certifications

Table 10-1 Certifications

Country/Region	Certification	Logo	Mandatory/Voluntary
China	China Environmental Labelling		Voluntary
International Mutual Recognition	CB	N/A	Voluntary
EU	CE		Mandatory
US	FCC		Mandatory
	UL		Voluntary
Russia	EAC		Mandatory
	FSS	N/A	Mandatory
South Korea	KC		Mandatory

11 Appendix A

11.1 Operating Temperature and Specification Limits

Table 11-1 Operating Temperature and Specification Limits

Max. Operating Temperature: 35°C (95°F)	Max. Operating Temperature: 40°C (104°F)	Max. Operating Temperature: 45°C (113°F)
All configurations supported	• CPUs with TDP higher than 165 W not supported • Passive-cooling GPUs and FPGA cards not supported • Passive-cooling DIMMs higher than 12 W not supported	• Passive-cooling GPUs not supported • Passive-cooling CPUs with TDP higher than 165 W not supported • Passive-cooling DIMMs higher than 12 W not supported

11.2 Model

Table 11-2 Model

Certified Model	Description
NF5468A5	Global

11.3 RAS Features

The NF5468A5 supports a variety of RAS (Reliability, Availability, and Serviceability) features. By configuring these features, the NF5468A5 can provide greater reliability, availability, and serviceability.

11.4 Sensor List

Table 11-3 Sensor List

Sensor	Description	Sensor Location
Inlet_Temp	Air inlet temperature	Right mounting ear
Outlet_Temp	Air outlet temperature	BMC card
CPUn_Temp	CPUn core temperature	CPUn n indicates the CPU number with a value of 0 - 1
CPUn_VR_Temp	CPUn VR temperature	CPUn n indicates the CPU number with a value of 0 - 1
CPUn_DIMM_Temp	CPUn DIMM temperature	DIMM (CPUn) n indicates the CPU number with a value of 0 - 1
CPUN_DIMMVR_Temp	CPUn DIMM VR temperature	DIMM (CPUn) n indicates the CPU number with a value of 0 - 1
PSUn_Temp	PSUn temperature	The corresponding power supply for PSUn n indicates the PSU number with a value of 0 - 3
HDD_MAX_Temp	Maximum temperature among all drives	Drive attached to the drive backplane
OCP_Temp	OCP card temperature	OCP card
HDD_BP2_Temp	HDD BP2 backplane temperature	HDD BP2 backplane
RAID_Temp	Current maximum temperature on the RAID controller card	PCIe RAID controller card
GPUn_Temp	Current maximum temperature on the GPU card	PCIe GPU card
PCIe_Zone_Inlet	PCIe zone inlet temperature	M.2 backplane
PCIe_Zone_Temp	PCIe zone central temperature	Motherboard
MB_Outlet_Temp	Motherboard outlet temperature	Motherboard
HDD_BP0_Temp	HDD BP0 backplane temperature	HDD BP0 backplane
HDD_BP1_Temp	HDD BP1 backplane temperature	HDD BP1 backplane
SYS_12V	12 V voltage supplied by motherboard to CPU	Motherboard

Sensor	Description	Sensor Location
SYS_5V	5 V voltage supplied by motherboard to BMC	Motherboard
SYS_3V3	3.3 V voltage supplied by motherboard to BMC	Motherboard
CPUn_PVDDCR	CPUn core voltage	Motherboard n indicates the CPU number with a value of 0 - 1
CPUn_PVDDCR_SOC	CPUn memory controller voltage	Motherboard n indicates the CPU number with a value of 0 - 1
CPUn_1.8V	1.8 V CPUn voltage	Motherboard n indicates the CPU number with a value of 0 - 1
CPUn_1.8V_AUX	IO input and output voltage of CPUn channel 13/14	Motherboard n indicates the CPU number with a value of 0 - 1
PSUn_VIN	PSUn input voltage	Motherboard n indicates the PSU number with a value of 0 - 3
PSUn_VOUT	PSUn output voltage	Motherboard n indicates the PSU number with a value of 0 - 3
FANn_0	FANn speed	FANn n indicates the fan module number with a value of 0 - 11
FANn_1		
Total_Power	Total power of the server	The server power consumption components include PSUs, memories, drives, GPUs, CPUs, fans, PCIe cards, etc
PSUn_POUT	PSUn output power	PSUn n indicates the PSU number with a value of 0 - 3
FAN_Power	Total fan power	Fans

Sensor	Description	Sensor Location
CPU_Power	Total CPU power	CPU
GPU_Power	Total GPU power	GPU
MEM_Power	Total memory power	Memory
Disk_Power	Total drive power	Drives
PSUn_Power	Power consumption of PSUn	PSUn n indicates the PSU number with a value of 0 - 3
CPUn_Status	CPUn status	CPUn n indicates the CPU number with a value of 0 - 1
PSUn_Status	PSUn status	PSUn n indicates the PSU number with a value of 0 - 3
DISKn_Status	Drive fault status	Drive n n indicates the drive number with a value of 0 - 23
IPMI_Watchdog	Watchdog	Motherboard
Intrusion	Monitor the chassis-opening activity	Motherboard
SYS_Shutdown	Reason for system shutdown	/
ACPI_State	System ACPI PSU status	
SYS_Restart	Reason for system restart	
BIOS_Boot_Up	BIOS boot up complete	
POST_Status	POST status	
BMC_Boot_Up	Record the BMC startup boot events	
SEL_Status	Record the event that when SELs are almost full/cleared	/
BMC_Status	BMC status	

12 Appendix B - Abbreviations

12.1 A – E

A

AC	Alternating Current
AI	Artificial Intelligence

B

BIOS	Basic Input Output System
BMC	Baseboard Management Controller

C

CAS	Column Access Strobe
CE	Conformite Europeenne
CPLD	Complex Programmable Logic Device
CPU	Central Processing Unit

D

DB15	D-subminiature 15-pin
DC	Direct Current
DDR4	Double Data Rate 4
DIMM	Dual In-line Memory Module
DRAM	Dynamic Random-Access Memory

E

ECC	Error-Correcting Code
ECMA	European Computer Manufacturer Association
EN	European Norm

12.2 F - J

F

FHFL	Full Height Full Length

G

GE	Gigabit Ethernet
GPU	Graphics Processing Unit
GUI	Graphical User Interface

H

HDD	Hard Disk Drive
HDT	Hardware Debug Tool
HTTPS	Hypertext Transfer Protocol Secure

I

IOPS	Input/Output Operations per Second
IP	Internet Protocol
IPMI	Intelligent Platform Management Interface
ISBMC	Inspur Baseboard Management Controller

J

JTAG	Joint Test Action Group

12.3 K - O

K

KVM	Keyboard, Video and Mouse

L

LC	Lucent Connector
LRDIMM	Load-Reduced Dual In-line Memory Module
LED	Light Emitting Diode

N

NC-SI	Network Controller Sideband Interface
NIC	Network Interface Card
NVMe	Non-Volatile Memory Express

O

OCP	Open Compute Project
O&M	Operations and Maintenance
OS	Operating System

12.4 P - T

P

PCIe	Peripheral Component Interconnect Express
PSU	Power Supply Unit

PXE	Preboot Execution Environment

R

RAID	Redundant Array of Independent Disks
RAS	Reliability, Availability and Serviceability
RDIMM	Registered Dual In-line Memory Module
RJ45	Registered Jack 45
RoHS	Restriction of Hazardous Substances

S

SAS	Serial Attached Small Computer System Interface
SATA	Serial Advanced Technology Attachment
SMTP	Simple Mail Transfer Protocol
SN	Serial Number
SNMP	Simple Network Management Protocol
SSD	Solid-State Drive

T

TDP	Thermal Design Power
TF	TransFlash
TPM	Trusted Platform Module

12.5 U - Z

U

UID	Unit Identification

USB	Universal Serial Bus

V

VGA	Video Graphics Array
VPP	Virtual Pin Port
VR	Voltage Regulator
VRD	Voltage Regulator-Down

X

xGMI	External Global Memory Interconnect