

inspur 浪潮



NF5180M5 Technical White Paper

Issue: **5.0**

Date: **2020-05-15**

Copyright© Inspur Group Co., Ltd. 2017 All Rights Reserved.

No part of this document may be reproduced or transmitted in any form or by any means without prior written consent of Inspur.

Note: The products, services or characteristics you purchase shall be subject to the commercial contracts and terms of Inspur Group. All or part of the products, services or features described in this document may not be available within your purchase usage scope. Unless otherwise agreed in the contract, Inspur Group makes no express or implied representations or warranties regarding the contents of this document. This document will be updated from time to time for product version upgrade or other reasons. Unless otherwise agreed, this document is used as a guide only, and all statements, information and suggestions in this document do not constitute any express or implied warranty.

Inspur and “浪潮” are registered trademarks of Inspur Group.

Windows is a registered trademark of Microsoft.

Intel and Xeon are registered trademarks of Intel.

Other trademarks belong to their respective registered companies.

Technical service hotline: 4008600011

Address: No. 1036, Langchao Road, Jinan City, China
Inspur Electronic Information Industry Co., Ltd.

Post code: 250101

1	Product Overview	5
2	Product Feature	6
3	Logical Architecture Diagram	8
3.1	Logical Architecture	8
3.2	Lite Logical Architecture	8
4	Product Profile	9
4.1	Product Form	9
4.2	Front Panel	9
4.2.1	Front View of the Front Panel on Model 10x2.5"	9
4.2.2	Front View of the Front Panel on Model 4x3.5"	10
4.2.3	Hard Disk Tray Indicator	11
4.3	Rear Panel	11
4.3.1	Front View of the Rear Panel on the Hard Disk Model	11
4.3.2	Front View of the Rear Panel on the PCIe Model	12
4.4	Internal Top View	13
4.5	Riser Card	14
4.6	Mainboard Layout	14
4.6.1	Mainboard Layout	14
4.6.2	Lite Mainboard Layout	17
5	System Specifications	19
6	Parts and Compatibility	22
6.1	Processor	22
6.2	Memory	24
6.3	Storage	26
6.3.1	Hard disk	26
6.3.2	Installation Positions of Hard Disks	27
6.4	Hard Disk Backplane	29
6.5	RAID/SAS Card	29
6.6	OCP/PHY Mezzanine Card	30
6.7	Network adapter	31
6.8	FC HBA Card	31
6.9	HCA Card	32
6.10	Graphics Card	32
6.11	GPU	32
6.12	Power supply	32
6.13	Operating system	32
7	System Management	34
8	Physical Specifications	35
9	Certification	35
10	Support and Service	36

11	Description of New Technologies	36
11.1	Intel Scalable Architecture	36
11.2	Intel VROC Technology	36
11.3	QAT Technology	36
11.4	OCP Mezzanine Card.....	37
12	Relevant Documents	37
13	Trademark	37
14	Change List	37

1 Product Overview

The Inspur NF5180M5 server is a 1U 2-socket rack server designed for Internet, Internet Data Center (IDC), cloud computing, enterprise market and telecom applications based on Intel® Purley-based Xeon® scalable processors. This product supports services requiring a high network bandwidth, high computing performance and large memory capacity, and provides an excellent solution for customers requiring density and storage. It is especially suitable for business intelligence, financial services, public cloud and private cloud applications with demanding requirements on servers.

Figure 1-1 NF5180M5 physical image



2 Product Feature

Configured with all-flash hard disks, the Inspur NF5180M5 provides a high computing density, high scalability and flexible network deployment to meet the needs of various application scenarios in cloud computing data centers. Inspur applies the ultimate design philosophy to performance, scalability, availability and manageability, maintaining the consistent high quality and reliable performance of Inspur servers.

Performance

- The NF5180M5 uses the Intel® Purley-based Xeon® Skylake/Cascade Lake/Cascade Lake R scalable processors. Each processor has up to 28 cores, 56 threads, a Thermal Design Power (TDP) of 205 W, and a L3 cache of 38.5 MB at a dominant frequency of 3.8 GHz, with two 10.4 GT/s Ultra Path Interconnect (UPI) links between processors. This enables the NF5180M5 to provide high processing performance.
- A maximum of 24 DDR4 ECC RDIMMs, LRDIMMs, or AEP DIMMs with a transmission rate of 2933 MT/s provide a remarkable speed, high availability, and a maximum memory capacity of 3 TB.
- The NF5180M5 supports 10 hot-swappable NVMe SSDs in all-flash configuration that can provide IOPs ten times higher than high-end enterprise-class SATA SSDs and extreme storage I/O, bringing a qualitative leap in storage performance.

Scalability

- The NF5180M5 supports up to four 3.5-inch hard disks in combination with four 2.5-inch SSDs or a maximum of twelve 2.5-inch hard disks. The NF5180M5 has two built-in SATA M.2 or PCIe M.2 hard disks.
- The NF5180M5 supports the free switch between OCP and PHY network adapters, and provides 1G, 10G, 25G, and 40G network interfaces, allowing more flexible network structures for applications.
- The NF5180M5 supports up to three standard PCIe 3.0 expansion cards to further improve I/O performance.

Availability

- The NF5180M5 provides several functions to enhance availability and improve system uptime.
- The NF5180M5 enables toolless maintenance of the entire system based on the human centered design concept. The NF5180M5 allows quick disassembly/assembly through structural enhancement and optimization, which greatly reduces O&M time.
- The NF5180M5 achieves the optimal operating environment and ensures the stable operation of the system with Inspur's unique intelligent control technology combined with the advanced air cooled system.
- The NF5180M5 supports hot-swappable RAID 0/1/10/5/50/6/60 with a RAID cache, and uses a supercapacitor for power-off data protection.
- With the BMC, new generation of Inspur's server management system, the NF5180M5 allows technicians to quickly locate failed (or failing) components through the web-based management interface, troubleshooting LEDs, and UID LEDs on the front panel, simplifying maintenance, speeding up problem resolution, and increasing system availability.
- The NF5180M5 uses the BMC system to monitor system parameters and report alarms in advance, enabling technicians to take appropriate measures to ensure stable machine operation and minimize system downtime.

Manageability

- With Inspur's power management technology and Node manager 4.0 technology, the NF5180M5 enables users to accurately monitor and control system power consumption in real time, and effectively manage and control the overall energy consumption, further improving the energy efficiency of the overall IT architecture.

Energy Efficiency

- Equipped with the 550–1600 W 80 Plus-certified platinum PSU, the NF5180M5 allows a high efficiency of 94% at 50% load. It also supports 1300 W titanium PSUs.
- The NF5180M5 supports 1+1 redundant power supply and AC/DC integrated power supply to improve the power conversion efficiency.

The efficient voltage regulator down (VRD) power supply units (PSUs) reduce the loss in DC/DC power conversion.

The NF5180M5 supports intelligent speed regulation of system fans and frequency modulation of CPUs for energy conservation.

- The fully-optimized system cooling design and the efficient and energy-saving cooling fan can reduce the energy consumption in system heat dissipation.

Security

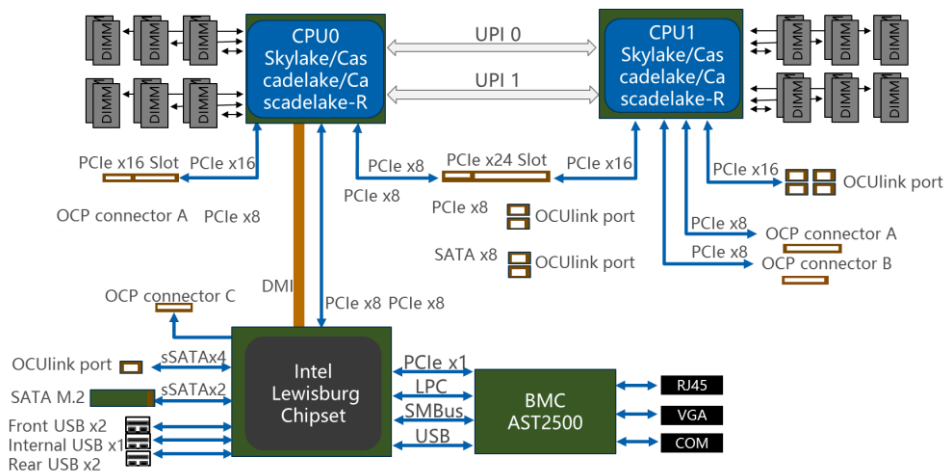
- The NF5180M5 implements firmware encryption/digital signatures to prevent unauthorized writes from unknown firmware.
- The NF5180M5 equipment is designed with a panel latch and chassis cover latch.

3 Logical Architecture Diagram

3.1 Logical Architecture

The NF5180M5 supports a maximum of two Intel® Xeon® Skylake/Cascade Lake/Cascade Lake R scalable processors and 24 DDR4 DIMMs with a transmission rate of 2933 MT/s. The CPUs are interconnected over two UPI buses with a transmission rate of 10.4 GT/s. The processor is connected to two PCIe riser cards over the PCIe bus and supports different PCIe slots via different PCIe riser cards.

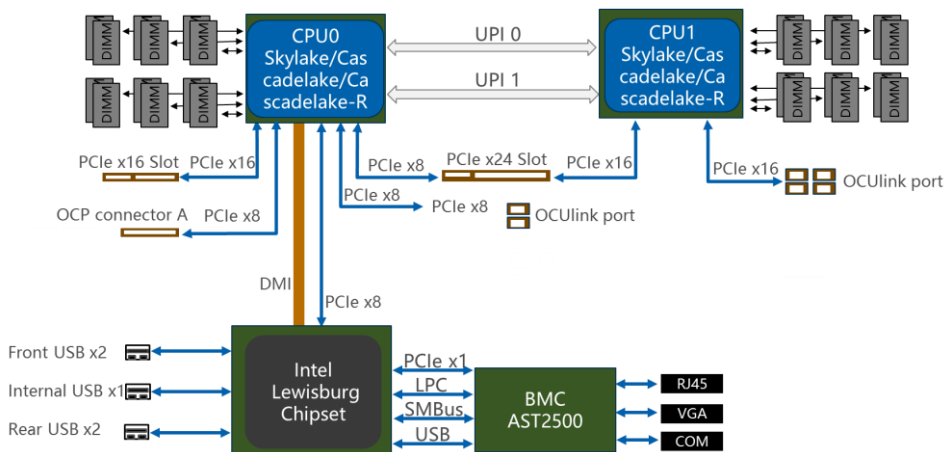
Figure 3-1 NF5180M5 logical architecture



3.2 Lite Logical Architecture

The new version of the NF5180M5 supports a maximum of two Intel® Xeon® Skylake/Cascade Lake/Cascade Lake R scalable processors and 24 DDR4 DIMMs with a transmission rate of 2933 MT/s. The CPUs are interconnected over two UPI buses with a transmission rate of 10.4 GT/s. The processor is connected to two PCIe riser cards over the PCIe bus and supports different PCIe slots via different PCIe riser cards.

Figure 3-2 NF5180M5 lite logical architecture digram



4 Product Profile

4.1 Product Form

This product is divided into the 10x2.5" model and 4x3.5" model according to the front panel form.

The 10x2.5" model supports ten 2.5-inch front hard disks.

The 4x3.5" model supports four 3.5-inch front hard disks and two 2.5-inch front SSDs.

This product can be divided into the hard disk model and PCIe model according to the rear panel form.

Figure 4-1 4x3.5" hard disk model



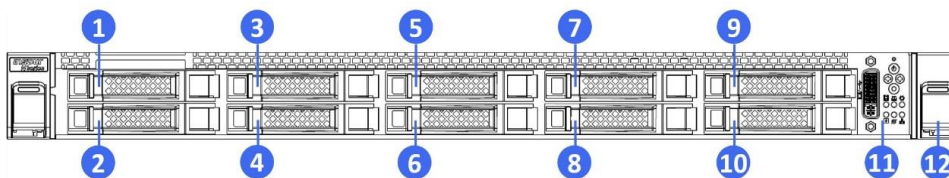
Figure 4-2 10x2.5" hard disk model



4.2 Front Panel

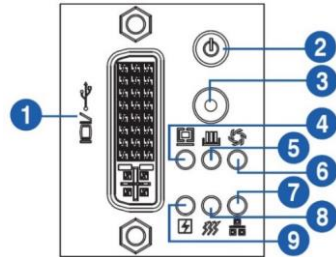
4.2.1 Front View of the Front Panel on Model 10x2.5"

Figure 4-3 Front view of model 10x2.5"



No.	Module Name	No.	Module Name
1-10	2.5" hard disks (0-9)	12	Server-cabinet fastener
11	Front control panel		

Figure 4-4 LEDs and buttons on the front control panel

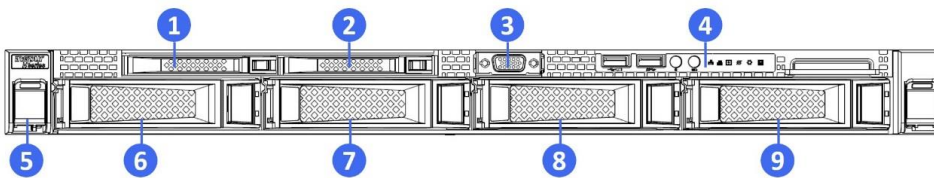


No.	Module Name	No.	Module Name
1	Dedicated high-density port	5	Memory fault indicator
	Can be converted to two USB 2.0 ports + one VGA port.	6	Fan fault indicator
2	Power button	7	Network status LED
3	UID LED & button	8	System overheat indicator
4	System fault indicator	9	Power fault indicator

Note: For the description of various LEDs, refer to the *Inspur Server NF5180M5 User Manual*.

4.2.2 Front View of the Front Panel on Model 4x3.5"

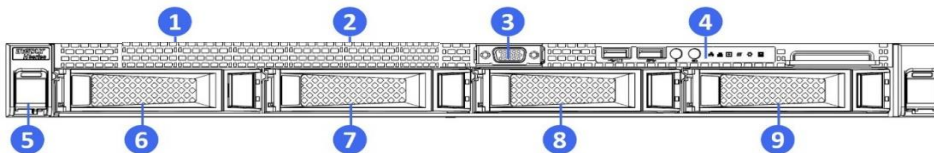
Figure 4-5 Front view of model 4x3.5"



No.	Module Name	No.	Module Name
1-2	2.5" SSD	5	Server-cabinet fastener
3	VGA interface		
4	Front control panel	6-9	3.5" hard disks (0-3)

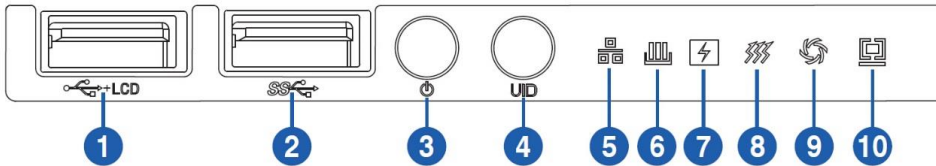
Note: For the description of various LEDs, refer to the *Inspur Server NF5180M5 User Manual*.

Figure 4-6 Front view of lite model 4x3.5"



No.	Module Name	No.	Module Name
1-2	2.5" SSD deleted	5	Server-cabinet fastener
3	VGA interface		
4	Front control panel	6-9	3.5" hard disks (0-3)

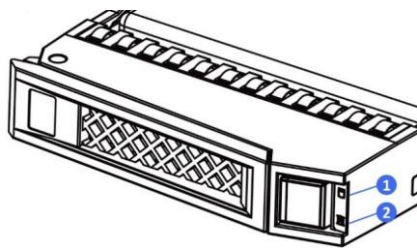
Figure 4-7 Front control panel buttons and LEDs



No.	Module Name	No.	Module Name
1	USB 2.0 port	6	Memory fault indicator
2	USB3.0	7	Power fault indicator
3	Power button	8	System overheat indicator
4	UID LED & button	9	Fan fault indicator
5	Network status LED	10	System fault indicator

4.2.3 Hard Disk Tray Indicator

Figure 4-8 Hard disk tray indicator

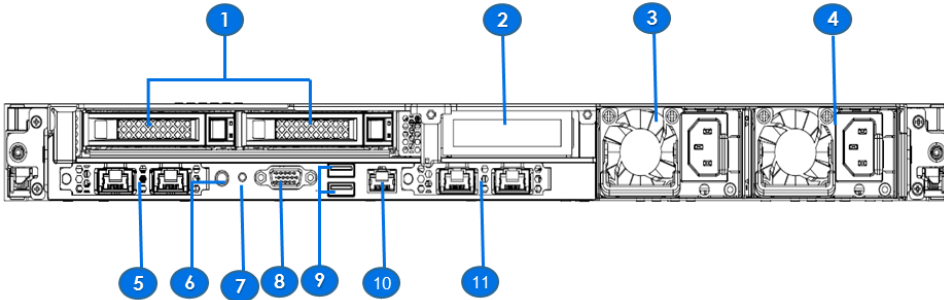


No.	Module Name	Description
1	Hard disk fault indicator	Steady red: The hard disk is faulty. Steady blue: The hard disk is being located. Blinking blue: The RAID is being reconstructed.
2	Hard disk status indicator	Steady green: The hard disk is normal. Blinking green: Data is being read from or written to the hard disk.

4.3 Rear Panel

4.3.1 Front View of the Rear Panel on the Hard Disk Model

Figure 4-9 Front view of the rear panel on the hard disk model

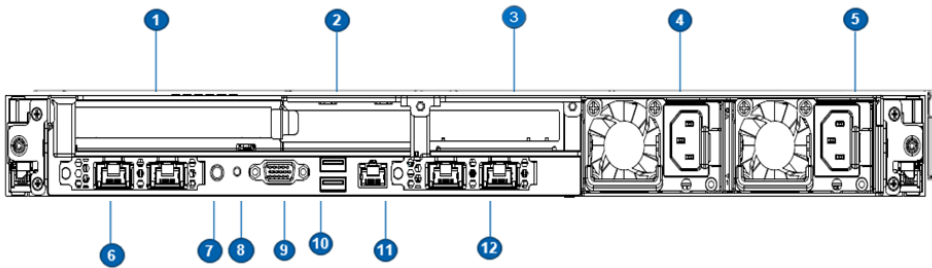


No.	Module Name	No.	Module Name
1	Rear 2.5" hard disk	6	UID LED & button
	(PCIe standard cards are supported if no hard disk is configured)	7	BMC reset button
2	PCIe card (optional)	8	VGA port
3	System power supply 0	9	USB3.0
4	System power supply 1	10	IPMI
5	OCP card 1 (optional)	11	OCP/PHY card 0 (optional)

Note: During hard disk configuration, one x8 PCIe slot and one x16 PCIe slot are occupied, and only one x16 half-height, half-length standard card can be used. The PCIe slot relationship is also described in the following PCIe model.

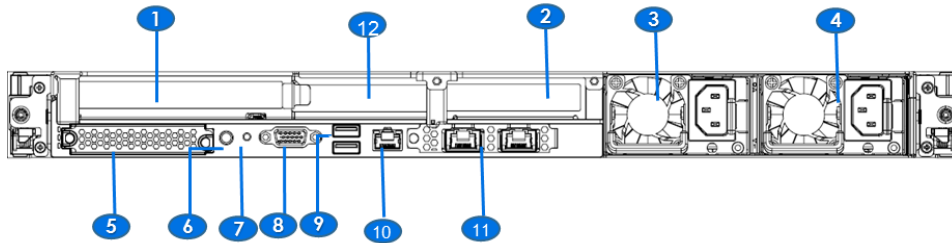
4.3.2 Front View of the Rear Panel on the PCIe Model

Figure 4-10 Front view of the rear panel on the PCIe model



No.	Module Name	No.	Module Name
1	Full-height and half-length PCIe 3.0 x16 cards	7	UID LED & button
2	Half-height and half-length PCIe 3.0 x8 cards	8	BMC reset button
3	Half-height and half-length PCIe 3.0 x16 cards	9	VGA port
4	System power supply 0	10	USB3.0
5	System power supply 1	11	IPMI
6	OCP card 1 (optional)	12	OCP/PHY card (optional)

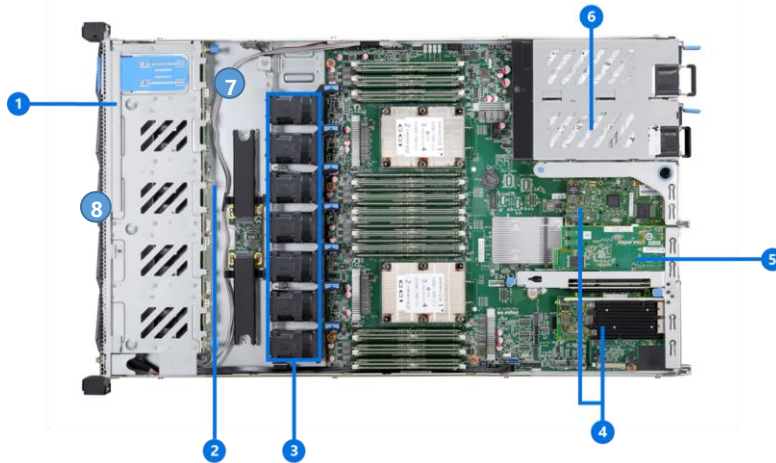
Figure 4-11 Front view of the rear panel on the lite PCIe model



No.	Module Name	No.	Module Name
1	Full-height and half-length PCIe 3.0 x16 cards	7	BMC reset button
2	Half-height and half-length PCIe 3.0 x16 cards	8	VGA port
3	System power supply 0	9	USB3.0
4	System power supply 1	10	IPMI
5	OCP card 4	11	OCP/PHY card (optional)
6	UID LED & button	12	Half-height and half-length PCIe 3.0 x8 cards

4.4 Internal Top View

Figure 4-12 Top view of the internal server

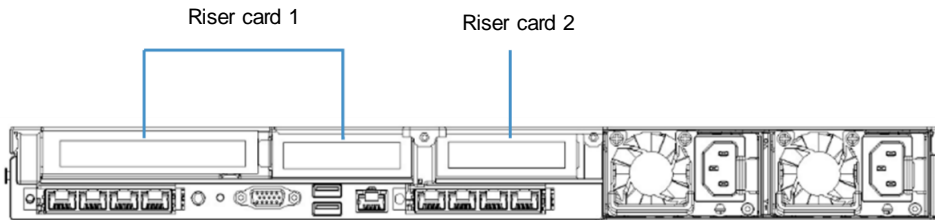


No.	Module Name	No.	Module Name
1	2.5" SATA SSD	4	Full-height and half-length PCIe x16 cards
		5	Half-height and half-length PCIe x8 cards
2	2.5" chassis PCIe 3.0/M.2	6	Redundant power supply
3	Seven 4056 fans	7	RAID card capacitor

Note: 2.5" SATA SSD numbered 1 is not supported on the front panel of the 2.5" chassis. The M.2 position of the 3.5" chassis is 8 in the figure.

4.5 Riser Card

Figure 4-13 Riser card placement diagram



Model	Riser card 1	Riser Card 2
PCIe Riser 1(x16*1+x8*1+x1)	Slot 1, Slot 2	NA
PCIe Riser 2(x16*1)	NA	Slot 3
PCIe Riser 3(4 OCU+ x8*1+x1)	4 OCU, Slot 2	NA

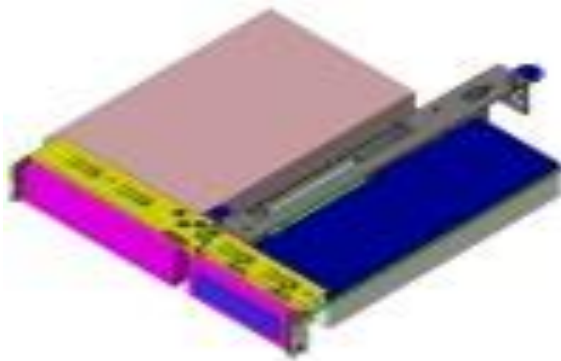
Note:

PCIe Riser 1 supports the NC-SI function with the Inspur network adapter through x1 interface.

PCIe Riser 3 supports the NC-SI function with the Inspur network adapter through x1 interface.

PCIe Riser 3 4*OCU is used to connect the NVMe hard disk to the backplane and supports four front NVMe hard disks.

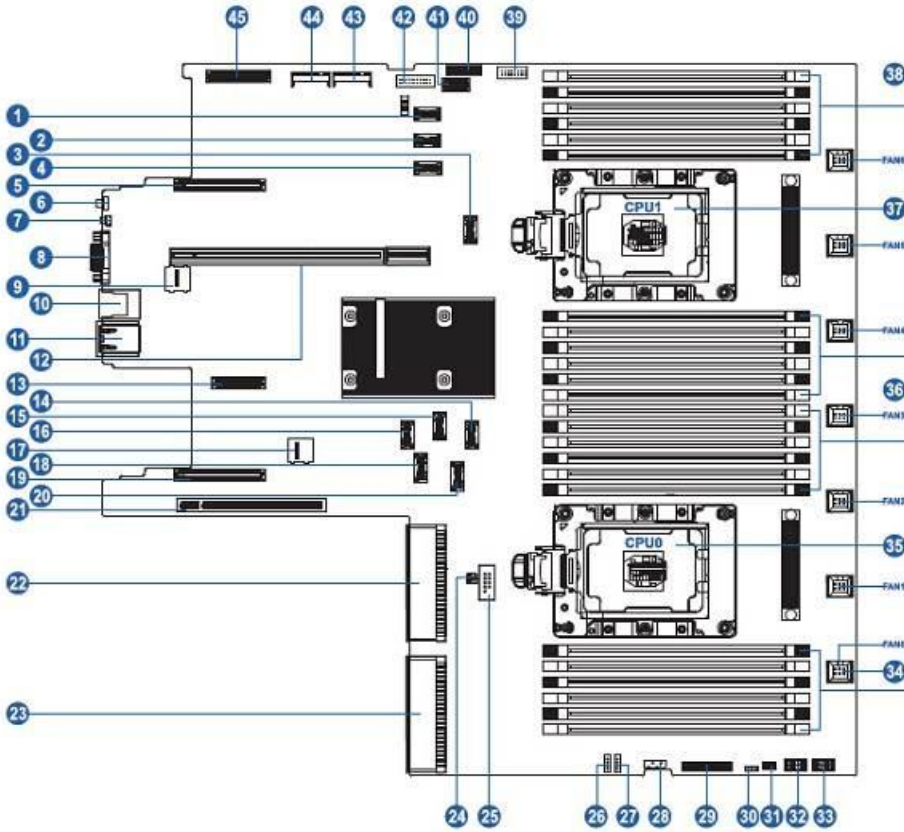
Figure 4-14 PCIe riser card



4.6 Mainboard Layout

4.6.1 Mainboard Layout

Figure 4-15 Mainboard layout



No.	Module Name	No.	Module Name	No.	Module Name
1	NVMe5_CPU1	16	sSATA2-5	31	M.2 hard disk power port
2	NVMe4_CPU1	17	SYS_TF slot (temporarily unavailable)	32	Backplane power port 0
3	NVMe2_CPU1	18	NVMe1_CPU0	33	Backplane power port 1
4	NVMe3_CPU1	19	OCPA_CPU0	34	System fans (0–6)
5	OCPA_CPU1 slot	20	NVMe0_CPU0	35	CPU0
6	UID LED & button	21	PCIe0_CPU0 card slot	36	DIMM slots (CPU0)
7	BMC reset button	22	System power supply 0	37	CPU1
8	VGA port	23	System power supply 1	38	DIMM slots (CPU1)
9	BMC_TF slot (temporarily unavailable)	24	Backplane power port 2	39	Front VGA port
10	Rear USB 3.0 port	25	COM0	40	Front USB + LCD port
11	IPMI	26	BP_I2C0	41	Built-in USB 3.0 port
12	PCIe1_CPU0/1 slot	27	BP_I2C1	42	TPM port
13	OCPA slot	28	IPMB	43	sSATA M.2_0 slot
14	SATA4-7	29	Front control panel port	44	sSATA M.2_1 slot

15	SATA0-3	30	Intrusion alarm port	45	OCPB_CPU1 slot
----	---------	----	----------------------	----	----------------

Remarks:

- PCIe slots:

- 21 is the PCIe x16 slot with the signal led out from CPU0 to PCIE Riser 3.
- 12 is the PCIe x24 slot composed of x8 and x16 with the x8 signal led out from CPU0 and the x16 signal led out from CPU1 to PCIE Riser 2 or PCIE Riser 1.

- PHY&OCP:

No.	Connector	Type	Signal Source	Configuration
45	OCP connector B	OCP	CPU1	One OCP connector can be placed in this area.
5	OCP connector A	OCP	CPU1	
13	OCP connector C	PHY	Chipset	One PHY or OCP connector can be placed in this area.
19	OCP connector A	OCP	CPU0	

- OCulink ports:

1/2/3/4/18/20 are six OCulink ports for connecting to NVMe hard disks with signals 1/2/3/4 led out from CPU1 and signals 18/20 led out from CPU0.

14/15/16 are three OCulink ports for connecting to SATA hard disks, and each port supports four SATA hard disks, with a total of 12 supported.

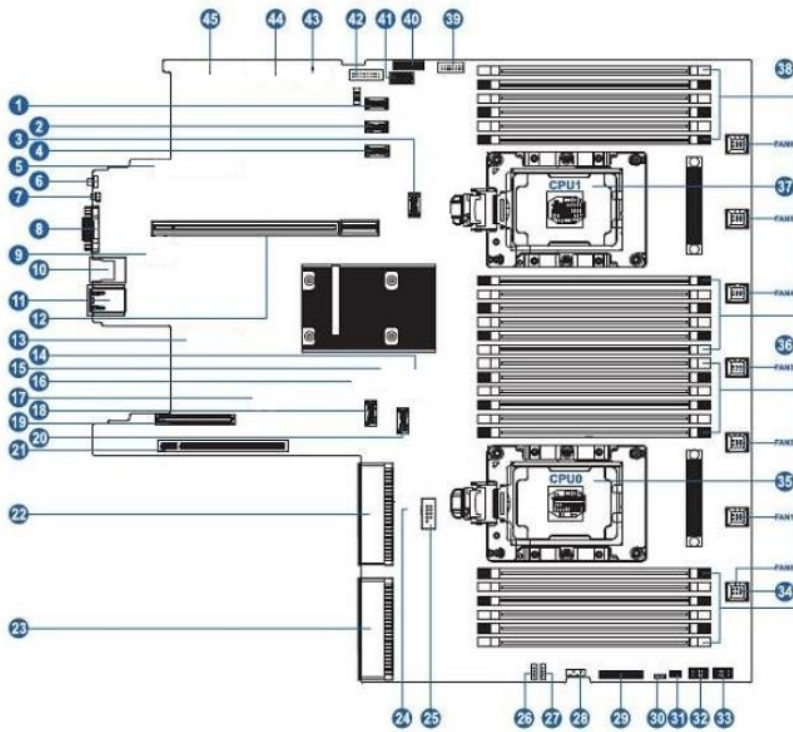
- NVMe hard disk configuration:

When $1 \leq \text{Number of NVMe hard disks} \leq 6$, the priority goes to the six OCulink ports on the mainboard.

When $7 \leq \text{Number of NVMe hard disks} \leq 10$, PCIe Riser 3 is configured.

4.6.2 Lite Mainboard Layout

Figure 4-16 Lite mainboard layout



No.	Module Name	No.	Module Name	No.	Module Name
1	NVMe5_CPU1	16	Deleted	31	M.2 hard disk power port
2	NVMe4_CPU1	17	Deleted	32	Backplane power port 0
3	NVMe2_CPU1	18	NVMe1_CPU0	33	Backplane power port 1
4	NVMe3_CPU1	19	OCPA_CPU0	34	System fans (0-6)
5	Deleted	20	NVMe0_CPU0	35	CPU0
6	UID LED & button	21	PCIe0_CPU0 card slot	36	DIMM slots (CPU0)
7	BMC reset button	22	System power supply 0	37	CPU1
8	VGA port	23	System power supply 1	38	DIMM slots (CPU1)
9	Deleted	24	Deleted	39	Front VGA port
10	Rear USB 3.0 port	25	COM0	40	Front USB port
11	IPMI	26	BP_FCO	41	Built-in USB 3.0 port
12	PCIe1_CPU0/1 slot	27	BP_FC1	42	TPM port
13	Deleted	28	IPMB	43	Deleted
14	Deleted	29	Front control panel port	44	Deleted
15	Deleted	30	Intrusion alarm port	45	Deleted

Note:

- PCIe slots:

- 21 is the PCIe x16 slot with the signal led out from CPU0 to PCIE Riser 3.
- 12 is the PCIe x24 slot composed of x8 and x16 with the x8 signal led out from CPU0 and the x16 signal led out from CPU1 to PCIE Riser 2 or PCIE Riser 1.

- OCP:

No.	Connector	Type	Signal Source	Configuration
19	OCP connector A	OCP	CPU0	One OCP connector can be placed in this area.

- OCulink ports:

1/2/3/4/18/20 are six OCulink ports for connecting to NVMe hard disks with signals 1/2/3/4 led out from CPU1 and signals 18/20 led out from CPU0.

- NVMe hard disk configuration:

When $1 \leq \text{Number of NVMe hard disks} \leq 6$, the priority goes to the six OCulink ports on the mainboard.

When $7 \leq \text{Number of NVMe hard disks} \leq 10$, PCIe Riser 3 is configured.

5 System Specifications

Table 5-1 NF5180M5 system specifications

Component	Description
Specifications	1U rack server
Processor	Supports one or two Intel® Xeon® 3100, 4100, 5100, 6100, and 8100 series scalable processors, or one or two Intel® Xeon® 4200, 5200, 6200 and 8200 series scalable processors. A single processor supports up to 28 cores (2.5 GHz frequency). A maximum frequency of 3.8GHz (4 cores) Two UPI links with a transmission rate up to 10.4 GT/s per link Supports a L3 cache of up to 1.375 MB per core. Supports a TDP up to 205 W.
Chipset	Intel C622/C624
Graphics card controller	Integrates the Aspeed 2500 chip and supports a maximum resolution of 1280 x 1024 pixels and 32 MB video memory.
Memory	Supports a maximum of 24 memory modules. Each processor supports six memory channels and each channel supports a maximum of two memory slots. Allows a maximum memory speed of 2933 MT/s. Supports RDIMMs and LRDIMMs. Supports ECC and memory mirroring for memory protection.
Maximum memory capacity	RDIMM: Two processors support up to 24 x 64 GB memory modules with a capacity of 1.5 TB. LRDIMM: Two processors support up to 24 x 128 GB memory modules with a capacity of 3 TB.
Storage	Front panel 10x2.5" NVMe or 4x2.5" SATA/SAS + 4x2.5" NVMe hard disks support hot swap. 6x2.5" SATA/SAS + 4x NVMe hard disks support hot swap. 2x2.5" SATA/SAS+8xNVMe hard disks support hot swap. 4x3.5" SATA/SAS/NVMe hard disks support hot swap + 2x2.5" SSDs. 3x3.5" SATA/SAS + 1x NVMe hard disks support hot swap + 2x2.5" SSDs. Rear panel 2x2.5" SATA SSDs support hot swap.
M.2	Supports up to two 110 mm PCIe x4 M.2 SSDs via Oculink ports and two 80 mm SATA M.2 SSDs via onboard ports.
Storage controller	External RAID/SAS card: RAID card controller SAS3108, SAS3008IMR, 9361-8i, or FM8060 SAS card controller 9400-8i or SAS3008IT Onboard SATA controller: Realizes SoftRAID by using the RAID key. The SATA provides RAID 0/1/5/6/10/50/60. Supports the mixed use of SATA and NVMe. The NVMe requires the separate configuration of RAID keys. Software RAID supports RAID 0/1/5 and RAID 0/1/10/5.
Network interface	PHY: 10 Gbit/s; OCP: 10 Gbit/s and 25 Gbit/s Standard PCIe network adapter: supports 1 Gbit/s, 10 Gbit/s, 25 Gbit/s, 40 Gbit/s, and 100 Gbit/s.
I/O expansion slot	Supports a maximum of five standard PCIe slots, among which one is the OCP (connector A/connector B) slot and another is the OCP/PHY (connector A/connector C) slot. Riser Card 1 can be expanded with two PCIe 3.0 slots (Riser 1 and Riser 3): One PCIe 3.0 x8 + x1 half-height and half-length One PCIe 3.0 x16 full-height and half-length Riser Card 2 can be expanded with one PCIe 3.0 slot: One PCIe 3.0 x16 half-height and half-length Note: One CPU can be configured with two standard PCIe cards and one OCP/PHY card. The PCIe expansion adopts modular toolless removal and screw fastening modes.
Interface	Model 4x3.5": Two rear USB 3.0 ports + One front USB 3.0 port + One front USB 2.0 port + One built-in USB 3.0 port 1 front VGA 1 rear VGA Model 10x2.5": Two rear USB 3.0 ports + Two front USB 2.0 ports + One built-in USB 3.0 port

	1 front VGA 1 rear VGA
Fan	Seven hot-swappable N+1 redundant 4056 dual-rotor fans
Power supply	Supports 1+1 redundant 550 W/800 W/1300 W/1600 W power supplies. Supports the CRPS, PMBUS and Node Manager 4.0 function.
Optical drive	Supports external USB drives.
System management	Integrates one independent 1000 Mbit/s network port, designed for IPMI 2.0 remote management.
Operating system	For details, see Section 6.13 "Operating System." Microsoft Windows Server Red Hat Enterprise Linux SUSE Linux Enterprise Server VMware SUSE Neokylin Oracle Citrix Ubuntu
Dimensions	<ul style="list-style-type: none"> ● Host: 435 mm (width) x 43.05 mm (height) x 750.5 mm (depth) ● External carton: 651 mm (width) x 307 mm (height) x 971 mm (depth)
Weight	<ul style="list-style-type: none"> ● 26.5 kg (model 10x2.5" in full configuration) ● 27.2 kg (model 4x3.5" in full configuration) Weight: host + packaging box + guide rail + accessory box.

Table 5-2 Lite NF5180M5 system specifications

Component	Description
Specifications	1U rack server
Processor	Supports one or two Intel® Xeon® 3100, 4100, 5100, 6100, and 8100 series scalable processors, or one or two Intel® Xeon® 4200, 5200, 6200 and 8200 series scalable processors. A single processor supports up to 28 cores (2.5 GHz frequency). A maximum frequency of 3.8GHz (4 cores) Two UPI links with a transmission rate up to 10.4 GT/s per link Supports a L3 cache of up to 1.375 MB per core. Supports a TDP up to 205 W.
Chipset	Intel C621 (LBG-1G)
Graphics card controller	Integrates the Aspeed 2500 chip and supports a maximum resolution of 1280 x 1024 pixels and 32 MB video memory.
Memory	Supports a maximum of 24 memory modules. Each processor supports six memory channels and each channel supports a maximum of two memory slots. Allows a maximum memory speed of 2933 MT/s. Supports RDIMMs and LRDIMMs. Supports ECC and memory mirroring for memory protection.
Maximum memory capacity	RDIMM: Two processors support up to 24 x 64 GB memory modules with a capacity of 1.5 TB. LRDIMM: Two processors support up to 24 x 128 GB memory modules with a capacity of 3 TB.
Storage	Front panel 10x2.5" NVMe hard disks support hot swap. 4x2.5" SATA/SAS + 6xNVMe hard disks support hot swap. 6x2.5" SATA/SAS + 4x NVMe hard disks support hot swap. 2x2.5" SATA/SAS+8x NVMe hard disks support hot swap. 4x3.5" SATA/SAS/NVMe hard disks support hot swap. 3x3.5" SATA/SAS+1xNVMe hard disks support hot swap.
Storage controller	External RAID/SAS card: RAID card controller SAS3108, SAS3008IMR, 9361-8i, or PM8060 SAS card controller 9400-8i or SAS3008IT Supports the mixed use of SATA and NVMe. The NVMe hard disk requires the separate configuration of RAID keys.

Network interface	OCP network adapter: supports 10 Gbit/s and 25 Gbit/s. Standard PCIe network adapter: supports 1 Gbit/s, 10 Gbit/s, 25 Gbit/s, 40 Gbit/s, and 100 Gbit/s.
I/O expansion slot	Supports a maximum of three standard PCIe slots: One is slot OCP_A (connected to CPU0). Riser Card 1 can be expanded with two PCIe 3.0 slots (Riser 1 and Riser 3): One PCIe 3.0 x8 + x1 half-height and half-length One PCIe 3.0 x16 full-height and half-length Riser Card 2 can be expanded with one PCIe 3.0 slot: One PCIe 3.0 x16 half-height and half-length The PCIe expansion adopts modular toolless removal and screw fastening modes.
Interface	Model 4x3.5": Two rear USB 3.0 ports + One front USB 3.0 port + One front USB 2.0 port + One built-in USB 3.0 port 1 front VGA 1 rear VGA Model 10x2.5": Two rear USB 3.0 ports + Two front USB 2.0 ports + One built-in USB 3.0 port 1 front VGA 1 rear VGA
Fan	Seven hot-swappable N+1 redundant 4056 dual-rotor fans
Power supply	Supports 1+1 redundant 550 W/800 W/1300 W/1600 W power supplies. Supports the CRPS, PMBUS and Node Manager 4.0 function.
Optical drive	Supports external USB drives.
System management	Integrates one independent 1000 Mbit/s network port, designed for IPMI 2.0 remote management.
Operating system	For details, see Section 6.13 "Operating System." Microsoft Windows Server Red Hat Enterprise Linux SUSE Linux Enterprise Server VMware SUSE Neokylin Oracle Citrix Ubuntu
Dimensions	<ul style="list-style-type: none"> ● Host: 435 mm (width) x 43.05 mm (height) x 750.5 mm (depth) ● External carton: 651 mm (width) x 307 mm (height) x 971 mm (depth)
Weight	<ul style="list-style-type: none"> ● 26.5 kg (model 10x2.5" in full configuration) ● 27.2 kg (model 4x3.5" in full configuration) Weight: host + packaging box + guide rail + accessory box.

6 Parts and Compatibility

6.1 Processor

The NF5180M5 supports one or two Intel® Xeon® scalable processors.

Table 6-1 Skylake CPU

Model	Cores	Threads	Basic Main Frequency GHz	Maximum Turbo GHz	Cache MB L3	Maximum Memory Supported	UPIs	Power Consumption
8180	28	56	2.50	3.80	38.50	768 GB	3	205 W
8176	28	56	2.10	3.80	38.50	768 GB	3	165 W
8170	26	52	2.10	3.70	35.75	768 GB	3	165 W
8168	24	48	2.70	3.70	33.00	768 GB	3	205 W
8164	26	52	2.00	3.70	35.75	768 GB	3	150 W
8160	24	48	2.10	3.70	33.00	768 GB	3	150 W
8156	4	8	3.60	3.70	16.50	768 GB	3	105 W
8153	16	32	2.20	2.80	22.00	768 GB	3	125 W
6154	18	36	3.00	3.70	24.75	768 GB	3	200 W
6152	22	44	2.10	3.70	30.25	768 GB	3	140 W
6150	18	36	2.70	3.70	24.75	768 GB	3	105 W
6148	20	40	2.40	3.70	27.5	768 GB	3	150W
6146	12	24	3.20	4.20	25	768 GB	3	165W
6144	8	16	3.50	4.20	24.75	768 GB	3	150W
6142	16	32	2.60	3.70	22.00	768 GB	3	150 W
6140	18	36	2.30	3.70	24.75	768 GB	3	140 W
6138	20	40	2.00	3.70	27.50	768 GB	3	125 W
6138T	20	40	2.00	3.70	27.50	768 GB	3	125 W
6136	12	24	3.00	3.70	24.75	768 GB	3	150 W
6134	8	16	3.20	3.70	24.75	768 GB	3	130 W
6132	14	28	2.60	3.70	19.25	768 GB	3	140W
6130	16	32	2.10	3.70	22.00	768 GB	3	125 W
6130T	16	32	2.10	3.70	22.00	768 GB	3	125 W
6128	6	12	3.40	3.70	19.25	768 GB	3	115 W
6126T	12	24	2.60	3.70	19.25	768 GB	3	125 W
6126	12	24	2.60	3.70	19.25	768 GB	3	125 W
5122	4	8	3.60	3.70	16.5	768 GB	2	105 W
5120	14	28	2.20	3.20	19.25	768 GB	2	105 W
5118	12	24	2.30	3.20	16.50	768 GB	2	105 W
5117	14	28	2.00	2.80	19.25	768 GB	2	105W
5115	10	20	2.40	3.20	13.75	768 GB	2	85W
4116	12	24	2.10	3.00	16.50	768 GB	2	85W
4114	10	20	2.20	3.00	13.75	768 GB	2	85W
4112	4	8	2.60	3.00	8.25	768 GB	2	85W
4110	8	16	2.10	3.00	11.00	768 GB	2	85W

4108	8	16	1.80	3.00	11.00	768 GB	2	85W
3106	8	8	1.70	/	11.00	768 GB	2	85W
3104	6	6	1.70	/	8.25	768 GB	2	85W

Note: For the component models not shown in this table, please consult Inspur technical engineers.

Table 6-2 Cascade Lake CPU

Model	Cores	Threads	Basic Main Frequency GHz	Maximum Turbo GHz	Cache MB L3	Maximum Memory Supported	UPIs	Power Consumption
8276	28	56	2.20	4.00	38.50	1TB	3	165 W
8276M	28	56	2.20	4.00	38.50	2TB	3	165 W
8276L	28	56	2.20	4.00	38.50	4.5TB	3	165 W
8270	26	52	2.70	4.00	35.75	1TB	3	205 W
8260	24	48	2.40	3.90	35.75	1TB	3	165 W
8260L	24	48	2.40	3.90	35.75	4.5TB	3	165 W
8256	4	8	3.80	3.90	16.50	1TB	3	105 W
8255C	24	48	2.50	3.0	33.00	1TB	3	165 W
8253	16	32	2.20	3.0	22.00	1TB	3	125 W
6252	24	48	2.10	3.70	35.75	1TB	3	150 W
6248	20	40	2.50	3.90	27.5	1TB	3	150W
6244	8	16	3.60	4.40	24.75	1TB	3	150W
6242	16	32	2.80	3.90	22.00	1TB	3	150 W
6240	18	36	2.60	3.90	24.75	1TB	3	150 W
6238	20	40	2.10	3.70	30.25	1TB	3	140 W
6234	8	16	3.30	3.90	24.75	1TB	3	130 W
6230	20	40	2.10	3.90	28.00	1TB	3	125 W
6226	12	24	2.60	3.70	19.25	1TB	3	125 W
5222	4	8	3.80	3.90	17	1TB	2	105 W
5220	18	36	2.20	3.90	25	1TB	2	125 W
5218	16	32	2.30	3.90	22	1TB	2	125 W
5217	8	16	3.00	3.70	11	1TB	2	115W
5215	10	20	2.50	3.40	13.75	4.5TB	2	85W
5215L	10	20	2.50	3.40	14	1TB	2	85W
4216	16	32	2.10	3.20	22	1TB	2	100W
4215	8	16	2.50	3.50	11	1TB	2	85W
4214	12	24	2.20	3.20	17	1TB	2	85W
4210	10	20	2.20	3.20	12.75	1TB	2	85W
4208	8	16	2.10	3.20	11.00	1TB	2	85W

6.2 Memory

Each CPU of the NF5180M5 supports a maximum of 12 LRDIMMs/RDIMMs; two CPUs support a maximum of 24 LRDIMMs/RDIMMs. LRDIMM and RDIMM supported.

Table 6-1 Dual-CPU common DIMM configuration

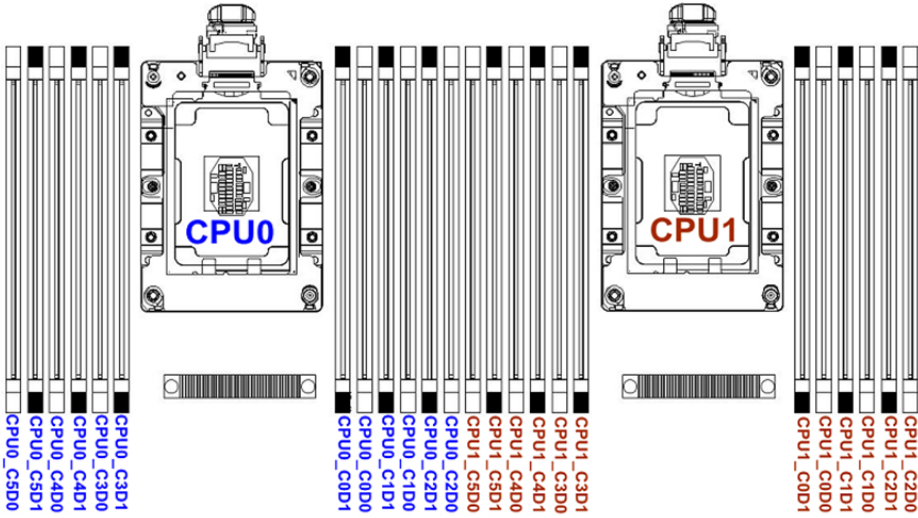
Memory Slot	Number of Memory Modules																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
CPU0	C0D0	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	C0D1			●			●						●	●	●	●	●	●	●	●	●	●	●	●
	C1D0				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	C1D1														●	●	●	●	●	●	●	●	●	●
	C2D0					●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	C2D1																	●	●	●		●	●	●
	C3D0			●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	C3D1																		●	●	●	●	●	●
	C4D0							●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	C4D1																			●	●	●	●	●
	C5D0										●	●	●	●	●	●	●	●	●	●	●	●	●	●
	C5D1																						●	●
CPU1	C0D0	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	C0D1														●	●	●	●	●	●	●	●	●	
	C1D0					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	C1D1															●	●	●	●	●	●	●	●	
	C2D0					●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	C2D1																	●	●			●	●	
	C3D0			●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	C3D1																			●	●	●	●	
	C4D0							●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	C4D1																			●	●	●	●	
	C5D0											●	●	●	●	●	●	●	●	●	●	●	●	
	C5D1																						●	

Table 6-2 Dual-CPU AEP DIMM configuration

		Dual CPU														
AEP Qty	CPU1						CPU0									
	CH5		CH4		CH3		CH0		CH1		CH2					
	D0	D1	D0	D1	D0	D1	D0	D1	D0	D1	D0	D1	D0	D1		
2	V	V	V	V	V	✓	V	V	V	V	V	V	V	✓	V	V
4	V	V	V	✓	V	✓	V	V	V	V	V	✓	V	✓	V	V
4	✓	V	V	V	V	V	V	V	✓	V	V	V	V	V	V	✓
4	✓	V	V	V	V	V	V	V	✓	✓	V	V	V	V	V	✓
8	V	V	✓	V	✓	V	✓	V	✓	V	V	✓	V	✓	V	✓
		Single CPU														
AEP Qty	CPU0															
	CH5		CH4		CH3		CH0		CH1		CH2					
	D0	D1	D0	D1	D0	D1	D0	D1	D0	D1	D0	D1	D0	D1		
1	V	V	V	V	V	✓	V	V	V	V						
2	V	V	V	✓	V	✓	V	V	V	V						
2	✓	V	V	V	V	V	V	V	✓	V						
2	✓	V	V	V	V	V	V	V	✓	✓						
4	V	V	✓	V	✓	V	✓	V	✓	V						

Note: ✓ stands for AEP DIMMs while V stands for common DIMMs.

Figure 6-3 DIMM slot identification diagram



Note: In the case of a single CPU, DIMMs conform to the silkscreen sequence: CPU0_C0D0, CPU0_C1D0, CPU0_C2D0, CPU0_C3D0, CPU0_C4D0, CPU0_C5D0, CPU0_C0D1, CPU0_C1D1, CPU0_C2D1, CPU0_C3D1, CPU0_C4D1, and CPU0_C5D1.

The following memory protection technologies are supported:

- ECC
- Memory mirroring
- Memory classified protection

Table 6-1 Memory component selection

Type	Capacity	Frequency	Rank Process
RDIMM	16GB	2400 MHz	1Rx4
RDIMM	32GB	2400 MHz	2Rx4
RDIMM	16GB	2666 MHz	1Rx4/2Rx8
RDIMM	32GB	2666 MHz	2Rx4
RDIMM	16GB	2933 MHz	1Rx4
RDIMM	32GB	2933 MHz	2Rx4
RDIMM	16GB	2933 MHz	2Rx8
LRDIMM	64GB	2400 MHz	4Rx4
LRDIMM	64GB	2666 MHz	4Rx4
AEP	128G	2666 MHz	
AEP	258G	2666 MHz	

Note:

For the component models not shown in this table, please consult Inspur technical engineers.

It is not allowed to mix memories of different models (RDIMM and LRDIMM) and different specifications (capacity, bit width, rank, height and other specifications) on a server.

The maximum memory capacity is achieved when two processors are installed. When a processor is used, the maximum memory capacity is half of the display capacity.

6.3 Storage

6.3.1 Hard disk

6.3.1.1 SATA/SAS Hard Disk

Table 6-2 SATA/SAS hard disk

Type	RPM	Capacity
2.5 SAS	7.2K	1T/2T
	10K	300G/450G/600G/900G/1.2T/1.8T
	15K	600G
2.5 SATA	7.2K	1T/2T
3.5 SAS	7.2K	1T/2T/4T/6T/8T/10T
3.5 SATA	7.2K	1T/2T/4T/6T/8T/10T

Note: For the component models not shown in this table, please consult Inspur technical engineers.

6.3.1.2 SSD

Table 6-3 SSD

Type	Capacity
SATA SSD	150G
SATA SSD	240G
SATA SSD	480G
SATA SSD	800G
SATA SSD	960G
SATA SSD	1.2T
SATA SSD	1.6T

SATA SSD	1.9T
SATA SSD	3.8T

Note: For the component models not shown in this table, please consult Inspur technical engineers.

6.3.1.3 U.2 NVMe SSD

Table 6-4 U.2 NVMe SSD

Type	Capacity	Maximum quantity
U.2 NVMe SSD	400G	10
U.2 NVMe SSD	450G	10
U.2 NVMe SSD	800G	10
U.2 NVMe SSD	1.2T	10
U.2 NVMe SSD	1.6T	10
U.2 NVMe SSD	1.8T	10
U.2 NVMe SSD	2T	10
U.2 NVMe SSD	2.4T	10
U.2 NVMe SSD	3.2T	10

Note:

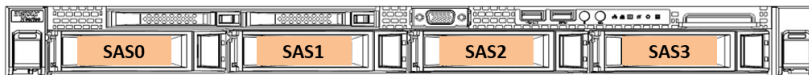
For the component models not shown in this table, please consult Inspur technical engineers.

The 10x2.5" chassis supports a maximum of 10 NVMe SSDs, and the 4x3.5" chassis supports a maximum of 4 NVMe SSDs.

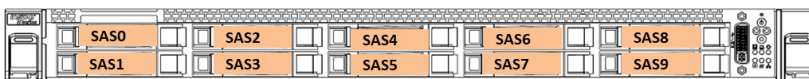
6.3.2 Installation Positions of Hard Disks

6.3.2.1 Common Hard Disk Installation Sequence

Model 4x3.5":



2.5x10:



6.3.2.2 Installation Position of NVMe Hard Disk

➤ Backplane: 3.5*4_4*NVMe

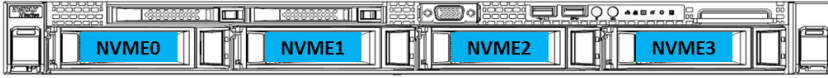
- NVMe only

Install NVMe hard disks to NVMe0, NVMe1, NVMe2 and NVMe3 in sequence.

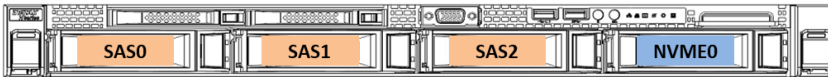
- Mixed installation of NVMe and common hard disks

Common hard disks: are installed to NVMe0, NVMe1, NVMe2 and NVMe3 in sequence.

NVMe hard disks: are installed to NVMe3, NVMe2, NVMe1 and NVMe0 in sequence.

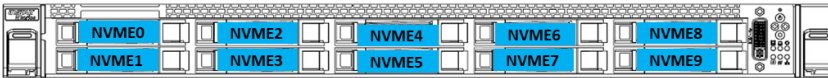


- Backplane: 3.5*4_3*SAS+1*NVMe
 - NVMe or common hard disks only
 - Common hard disks: are installed to SAS0, SAS1, SAS2, and NVMe0 in sequence.
 - NVMe hard disks: are installed to NVMe0 only.
 - Mixed installation of NVMe and common hard disks
 - Install common hard disks first and then the NVMe hard disk that can be installed to NVMe0 only.



- Backplane: 2.5X10_10NVMe

The backplane only supports NVMe hard disks that are installed to NVMe0–NVMe9 in sequence.

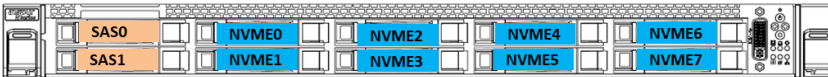


Note: When 10 NVMe hard disks are configured, PCIe riser card [YZRI-00787-101] is required. Signals of six NVMe hard disks are led to the six OCulink ports on the mainboard, while signals of the rest four NVMe hard disks are led to the four OCulink ports on the PCIe riser card. Among them, disks 0–3 are connected to the mainboard, disks 4–7 are connected to the PCIe riser card, and disks 8 and 9 are connected to the mainboard.

- Backplane: 2.5*10_2*SAS+8*NVMe

The backplane provides ports supporting NVMe hard disks and compatible with SAS/SATA hard disks.

 - NVMe only
 - NVMe hard disks: are installed to NVMe0–NVMe7 in sequence.
 - Mixed installation of NVMe and common hard disks
 - Common hard disks: are installed to SAS0–SAS1 and NVMe0–NVMe7 in sequence.
 - NVMe hard disks: are installed to NVMe7–NVMe0 in sequence. Among them, disks 0–3 are connected to the mainboard and disks 4–7 are connected to the PCIe riser card.



- Backplane: 2.5X10_4NVMe_6SAS/SATA

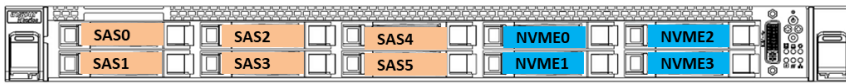
The backplane provides ports supporting NVMe hard disks and compatible with SAS/SATA hard disks.

 - NVMe or common hard disks only
 - Common hard disks: are installed to SAS0–SAS5 and NVMe0–NVMe3 in sequence.
 - NVMe hard disks: are installed to NVMe0–NVMe3 in sequence.

- Mixed installation of NVMe and common hard disks

Common hard disks: are installed to SAS0–SAS5 and NVMe0–NVMe3 in sequence.

NVMe hard disks: are installed to NVMe3, NVMe2, NVMe1 and NVMe0 in sequence.



6.4 Hard Disk Backplane

Table 6-5 Hard disk backplane

Backplane Type	Description	Description
10x2.5" hard disk backplane	Backplane_Inspur_5180M5_NVMe_2.5X10_10NVMe	1. Supports 10x NVMe hard disks. 2. Supports 6x NVMe + 4x SAS/SATA hard disks.
	Backplane_Inspur_5180M5_2.5X10_4NVMe_6SAS/SATA	1.Supports 4xNVMe+6xSAS/SATA 2.Supports 10 SAS/SATA hard disks
	Backplane_Inspur_2.5*10_2*SAS+8*NvMe	1. Supports 8xNVMe hard disks+2SAS/SATA 2. Supports 10xSAS/SATA hard disks
Rear 2x2.5" SSD backplane	Backplane_Inspur_NF5280M5_2.5*2_SAS	Applicable to models 10x2.5" and 4x3.5".
Front 2x2.5" SSD backplane	Backplane_Inspur_Shuyu1U_SATA_2.5X2_6G_NA	Applicable to model 4x3.5".
4x3.5" backplane	Backplane_Inspur_5280M5_3.5*4_3*SAS+ 1*NvMe	1. Supports 1xNVMe hard disk+3xSAS/SATA hard disks 2. Supports 4xSAS/SATA hard disks
	Backplane_Inspur_5270M5_3.5*4_4*NvMe	1. Supports 4x NVMe hard disks. 2. Supports 4x SAS/SATA hard disks.

6.5 RAID/SAS Card

Table 6-6 RAID/SAS card

Category	Brand	Description	Supercap
SAS card	Inspur	SAS card_L_SAS3008+IT+PCIe3.0	\
	LSI	SAS card_L_8R0_9400-8i_HDM12G_PCIe3.0	\
	LSI	SAS card_L_16R0_9400-16i_HDM12G_PCIE3	\
RAID card	Inspur	RAID card_L_SAS3108_2GB_SAS12G_PCIe3.0	Optional
		RAID card_L_PM8060_2GB_SAS12G_PCIe3.0	Optional
		RAID card_L_SAS3008+IMR+PCIe3.0	Optional
	LSI	RAID card_L_8R0_9361-8i_1GB_HDM12G_3.0	Optional
		RAID card_L_16R0_9361-16i_2GB_HDM12G_3.0	Optional
		RAID card_L_8R0_9361-8i_2GB_HDM12G_3.0	Optional
		RAID card_L_16R0_9460-16i_4GB_HDM12G_3.0	Optional
RAID card_L_8R0_9460-8i_2GB_HDM12G_3.0	Optional		

Table 6-7 Configuration relationship between the RAID/SAS card and hard disks

Front Hard Disk	Rear Hard Disk	Number of Hard Disks ≤ 8	Number of Hard Disks ≥ 9
2.5x10	\	SAS3108 2G, PM8060 2G, 9361-8i1G, 9361-8i 2G, SAS3008IMR, 9400-8i, 9400-16i , SAS3008I, T9460-8i	9361-16i 2G 9460-16i or two 8is
2.5x10	2.5x2	\	9361-16i 2G, 9460-16i
3.5x4	\	Same as the front 10x2.5" hard disks.	\
3.5 x 4 + 2.5 x 2	\	Same as the front 10x2.5" hard disks.	\
3.5x4	2.5x2	Same as the front 10x2.5" hard disks.	\
3.5 x 4 + 2.5 x 2	2.5x2	Same as the front 10x2.5" hard disks.	\

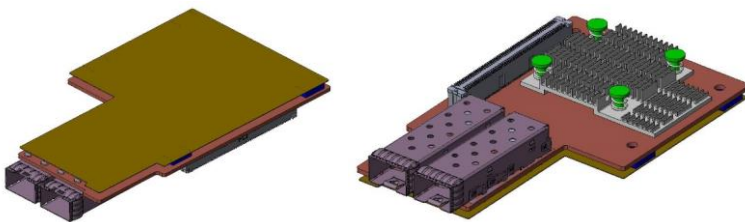
6.6 OCP/PHY Mezzanine Card

Table 6-8 PHY

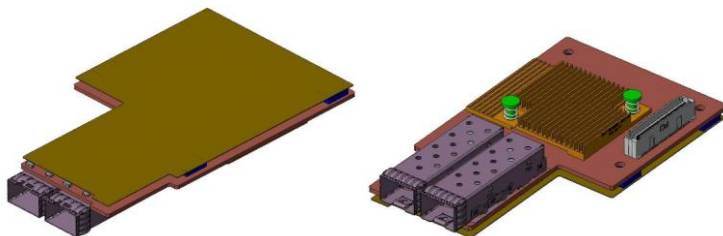
Brand	Type	Description
Inspur	Single-port 10G	Netw ork adapter_Inspur_5280M5_CS4227_10G_LC
Inspur	Dual-port, 10G	Netw ork adapter_Inspur_5280M5_10G_2
Inspur	Dual-port, 10G	Netw ork adapter_Inspur_5280M5_CS4227_10G_LC_2
Inspur	Four-port 10G	Netw ork adapter_Inspur_5280M5_CS4223_10G_4

Table 6-9 OCP

Brand	Type	Description
Inspur	Dual-port, 25G	Netw ork adapter_Inspur_OCP_25G_CX4LX_25G_LC_PCIEx8_2
Inspur	Single-port, 25G	Netw ork adapter_Inspur_OCP_25G_CX4LX_25G_LC_PCIEx8



Schematic diagram of OCP mezzanine card



Schematic diagram of PHY Mezzanine Card

6.7 Network adapter

Table 6-10 Network adapter

1G network adapter	Dual-port	Network adapter_Intel_W_I350-T2V2_RJ_PCI-E4X_1KM
	Dual-port	Network adapter_SC_W_I350_RJ_PCI-E4X_1000M
	Dual-port	Network adapter_I_1G_I350F2_LC_PCIEx4_2_MM
	Four-port	Network adapter_I_1G_I350F4_LC_PCIEx4_4_MM
	Four-port	Network adapter_SC_W_I350_RJ_PCI-E8X_1000M
10G network adapter	Single-port	Network adapter_Intel_W_82599ES_LC_PCI-E8X_10G
	Single-port	Network adapter_M_MCX311A-XCCT_LC_10G_PCIEx8_XR
	Dual-port	Network adapter_Intel_W_X540-T2_RJ45_PCI-E8X_10G
	Dual-port	Network adapter_M_MCX312B-XCCT_LC_10G_PCIEx8_XR
	Dual-port	Network adapter_Intel_W_82599ES_LC_PCI-E8X_10G
25G network adapter	Dual-port	Network adapter_M_25G_MCX4121A-ACAT_LC_PCIEx8_D_XR
	Dual-port	Network adapter_QL_25G_QL45212HLCU-SP_LC_PCIEx8_2_XR
	Dual-port	Network adapter_BROADCOM_25G_57414_LC_PCIEx8_2_XR_42C
40G network adapter	Single-port	Network adapter_I_40G_XL710_LC_PCIEx8_MM_single
	Single-port	Network adapter_M_MCX313A-BCCT_QSFP_40G_PCIEx8_XR
100G network adapter	Single-port	Network adapter_M_100G_MCX415A-CCAT_LC_PCIEx16_XR
Self-developed 10G network adapter Optical port Intel chip	Single-port	Network adapter_INSPUR_82599EN_10G_LC_PCIEx8_1_XR_subcard
	Dual-port	Network adapter_INSPUR_82599ES_10G_LC_PCIEx8_2_XR_subcard
	Dual-port	Network adapter_INSPUR_XL710_10G_LC_PCIEx8_2_XR_subcard
Self-developed 10G network adapter Optical port Mellanox chip	Single-port	Network adapter_INSPUR_10G_self-developed_network_adapter_CX3_PRO_10G_LC_S
Self-developed 10G network adapter Electrical port Intel chip	Dual-port	Network adapter_INSPUR_X540_10G_RJ45_PCIEx8

6.8 FC HBA Card

Table 6-11 HBA card

HBA Card	Qlogic	HBA card_Q_OR1_QLE2560_LC8G_PCIEx
		HBA card_QL_8R2_QLE2562_LC_PCIEx
		HBA card_Q_OR2_QLE2672_LC16G_PCIEx
		HBA card_QL_4R1_QLE2690-ISR-BK_FC16G_PCIEx
		HBA card_QL_4R2_QLE2692-ISR-BK_FC16G_PCIEx
	Emulex	HBA card_E_OR2_LPE12002_LC8G_PCIEx
		HBA card_E_8R0_LPE31000-M6_FC16G_PCIEx
		HBA card_E_8R2_LPE31002-M6_FC16G_PCIEx
		HBA card_E_OR2_LPE16002B_LC16G_PCIEx
		HBA card_E_OR4_LPE16004_LC16G_PCIEx

6.9 HCA Card

Table 6-12 HCA card

HCA card	Mellanox	Single-port 56G	HCA card_M_1-IB22.4X_MCX353A-FCBT_PCIE3.0
	Mellanox	Single-port 56G	HCA card_M_MCX353A-FCCT_FDR

6.10 Graphics Card

Table 6-13 Graphics card specifications

Model	Video RAM	Bit Width	Bus	Maximum Quantity
Leadtek P600 2G	2GB	128 bit	PCIe 3.0 x16	2

Note: This graphics card is a x16 bus and needs to be plugged into the x16 riser card slot.

6.11 GPU

Table 6-14 GPU specifications

Model	Video RAM	Bit Width	Bus	Maximum Quantity
Nvidia P4 8G	8GB	256 bit	PCIe 3.0 x16	1

Note: This GPU card needs to be inserted in the x16 slot of riser card YZRI-00869-101.

6.12 Power supply

Table 6-15 Power supply specifications

Power	Brand	Input parameter	Rated Input	Minimum Value	Maximum Value
550W 800W 1300W 1600W	GreatWall	AC	100-240 V AC	90	264
		Frequency	50Hz	47	63
		DC	192-300V DC	190	310
550W 800W 1600W	LITEON	AC	100-240 V AC	90	264
		Frequency	50-60 Hz	47	63
		DC	190-300V DC	164	300

6.13 Operating system

Table 6-16 Operating system

OS	HCL
Winserver2016	https://www.windowsservercatalog.com/item.aspx?itemid=f3f4a708-1131-4199-2187-9aad6086009d&bCatID=1282
Winserver2012/2012R2	https://www.windowsservercatalog.com/item.aspx?itemid=f3f4a708-1131-4199-2187-9aad6086009d&bCatID=1282
ESXi6.5	https://www.vmware.com/resources/compatibility/detail.php?deviceCategory=server&productid=44737&deviceCategory=server&details=1&keyword=44737&page=1&display_interval=10&sortColumn=Partner&sortOrder=Asc
ESXi6.0U3	https://www.vmware.com/resources/compatibility/detail.php?deviceCategory=server&productid=44737&deviceCategory=server&details=1&keyword=44737&page=1&display_interval=10&sortColumn=Partner&sortOrder=Asc
SLES11.4	https://www.suse.com/nbswebapp/yesBulletin.jsp?bulletinNumber=146166

SLES12.3	https://www.suse.com/nbswebapp/yesBulletin.jsp?bulletinNumber=146167
RHEL7.3 to 7.x	https://access.redhat.com/ecosystem/hardware/3213321?page=1
RHEL6.9 to 6.x	https://access.redhat.com/ecosystem/hardware/3213321
Neokylin6.9	http://neocertify.cs2c.com.cn/display/webCompatibleView.do?channelId=72&id=17509
OL69	https://linux.oracle.com/pls/apex/f?p=117:2:::NO:RP:P2_CERT_ID,P2_VIRTUAL_FLAG,P2_PRODUCT_ID:12949,1,722
OL74	https://linux.oracle.com/pls/apex/f?p=117:2:::NO:RP:P2_CERT_ID,P2_VIRTUAL_FLAG,P2_PRODUCT_ID:12946,1,542
OVM3.4.4	https://linux.oracle.com/pls/apex/f?p=117:2:::NO:RP:P2_CERT_ID,P2_VIRTUAL_FLAG,P2_PRODUCT_ID:12947,1,642
Citrix7.1 to 7.x	https://citrixready.citrix.com/inspur/nf5180m5.html
Ubuntu14.04.5	https://certification.canonical.com/hardware/201712-25994/
Ubuntu16.04	https://certification.canonical.com/hardware/201712-25994/

7 System Management

The NF5180M5 integrates the new-generation BMC intelligent management system that is a remote server management system independently developed by Inspur. It is compatible with IPMI2.0, the management benchmark in the server industry, and features highly reliable and more intelligent hardware monitoring and management.

The main features of Inspur BMC intelligent management system include:

- IPMI
- Support redirection of keyboard, mouse, video and text console
- Support remote virtual media
- Support Redfish protocol
- SNMP
- Web-based browser login

Table 7-1 describes the BMC specifications.

Table 7-1 BMC specifications

Specifications	Description
Management interface	Support a variety of management interfaces, meet various system integration methods; can be integrated into any standard management system, and support the following interfaces: IPMI CLI SNMP HTTPS Redfish
Fault detection	Provide rich fault detection functions to accurately locate hardware faults
Alarm management	Support alarm management and multiple formats of alarm reporting including SNMP Trap (v1/v2c/v3), Email Alert, and syslog service to ensure 7/24 highly reliable operation.
Virtual KVM	Provide convenient remote maintenance measures, and no on-site operation is required even when the system fails.
Virtual media	Support to virtualize local media devices or mirrors, USB devices, and folders into media devices of remote servers, simplify the complexity of operating system installation.
Web UI	Support visual image interface, in which one can quickly complete setting and query tasks with a simple click on the interface.
Screen shot	View the screen shot without log-in, making regular patrol inspection convenient.
Software dual-image backup	When the software is completely running currently crashes, it can be started from the backup image
Support intelligent power management	Power capping technology helps you easily increase deployment density, while dynamic energy saving technology helps you effectively reduce operating
IPv6	Support IPv6 functions to facilitate the construction of a full IPv6 environment and provide you with abundant IP address resources.
NC-SI function	The BMC supports the Network Controller Sideband Interface (NC-SI) function, which allows you to easily access the BMC system through the service network interface.
Hardware watchdog timer	When the BMC has no response for a period longer than the safety setting time, the control fan enters the full speed protection mode
Power supply control	on/off/cycle/status
UID remote control	The BMC allows manually turning on the UID indicator of a single machine to facilitate the search for equipment in the equipment room, and turn on the KVM. The UID indicator will blink during firmware upgrade.

Firmware upgrade	BMC/BIOS can be upgraded
Serial port redirection	Serial port I/O in IPMI session redirection system based on IP
Storage information viewing	Display Raid logical array information and the information of corresponding physical disks under logical array

8 Physical Specifications

Table 8-1 Physical specifications

Item	Specifications
Dimensions	435 mm (width) x 43.05 mm (height) x 750.5 mm (depth)
Weight	26.5 kg (model 10x2.5" in full configuration) (Weight: host + packaging box + guide rail + accessory box.) 27.2 kg (model 4x3.5" in full configuration) (Weight: host + packaging box + guide rail + accessory box.)
Power supply	550 W (input voltage: 100–240 V AC or 192–300 V DC) 800 W (input voltage: 100–240 V AC or 192–300 V DC) 1300 W (input voltage: 100–240 V AC or 192–300 V DC) 1600 W (input voltage: 100–240 V AC or 192–300 V DC)
Temperature	Operating temperature: 5°C to 35°C Storage temperature (with package): –40°C to +70°C Storage temperature (without package): –40°C to +55°C
Humidity	Working humidity: 10%–90% R.H. Storage humidity (with packaging): 10%–93% R.H. Storage humidity (without packaging): 10%–93%R.H.
Height	The operating temperatures from 0 to 914 meters (3,000 feet) range from 5°C to 40°C. The operating temperatures from 914 to 2133 meters (7,000 feet) range from 10°C to 32°C.

9 Certification

FCC

China CCC

CB

CE

UL

CU

BIS

KC

RCM

Energy Star

Table 9-1 System specifications

FCC	Federal Communications Commission
China CCC	china compulsory certification
CB	Scheme of the IECEE for Mutual Recognition of Test Certificates for Electrical Equipment
CE	Communate Europene
UL	Underwritter Laboratories Inc.
CU	Custom Union TR Certificate
BIS	The Bureau of Indian Standards

KC	Korea Certification
RCM	Regulatory Compliance Mark
Energy Star	Energy Star

10 Support and Service

Global service hotline:

1-844-860-0011 (toll free)

1-646-517-4966 (Direct line)

Service email: serversupport@inspur.com

Information required from customers:

Name

Tel

E-mail

Product model

Product service SN number

Problem description

11 Description of New Technologies

11.1 Intel Scalable Architecture

Based on the Skylake architecture, Intel's new generation of Xeon processors adopt the new mesh interconnection mode in substitution to the traditional ring interconnection mode in terms of chip design architecture, aiming to improve the CPU access delay and meet requirements for higher memory frequency bandwidth. At the same time, featured by low power consumption, it allows the processor to operate at a low processor clock speed and at a relatively lower voltage environment, so as to provide better performance improvement and improve energy efficiency. Compared with products of previous generations, the overall performance of Intel Xeon scalable processors has increased by 1.65 times and OLTP warehouse load has increased by 5 times compared with current system.

11.2 Intel VROC Technology

Intel VROC technology represents Virtual RAID on CPU and is specially designed for enterprise RAID solutions based on NVMe SSD. The biggest advantage is that it can directly manage connections to Intel's scalable PCIe channels without using a dedicated RAID HBA.

11.3 QAT Technology

Intel® QuickAssist Technology (Intel® QAT) accelerates applications by speeding up computationally intensive operations. It provides a software-enabled foundation for security, authentication, and compression, and significantly increases the performance and efficiency of standard platform solutions. This is reflected in the following:

Boost application throughput in the cloud field by adding hardware acceleration for network security, routing, storage, and big data to maximize CPU utilization.

In terms of network side, Intel® Quick Assistant technology is utilized to accelerate SSL/TLS, thus allowing higher performance encrypted communication and higher platform application efficiency in a secure network.

In terms of big data, compressed file system data blocks support faster analysis, which allows achieving faster Hadoop uptime, reducing processor requirements, completing each job with low latency, and thereby improving the overall performance.

11.4 OCP Mezzanine Card

The open compute project (OCP), an open-source server project designed specifically for the data center, aims to share more efficient server and data center designs. As an OCP member, Inspur has designed a series of OCP mezzanine cards in compliance with the OCP standard.

12 Relevant Documents

For more information, click the following link:

<http://en.inspur.com>

13 Trademark

Inspur and its logo belong to Inspur Group Co., Ltd. All other trademarks and trade names mentioned in this document are the property of their respective owners.

14 Change List

- I. Updates on July 9, 2018
 1. In chapter 2 "Product Feature", changed "supports up to four 3.5-inch hard disks in combination with four 2.5-inch hard disks" to "supports up to four 3.5-inch hard disks in combination with four 2.5-inch SSDs."
 2. In Figure 4-12 "Top view of the internal server", changed the original PCIe x8 slot near the power supply to PCIe x16 slot.
 3. In Table 5-1 "NF5180M5 system specifications", changed "10x2.5" SAS/SATA/NVMe" under the front panel on the storage line to "10x2.5" NVMe or 4x2.5" SATA/SAS + 6xNVMe hard disks support hot swap."
 4. In Section 6.1 "CPU", updated the CPU compatibility list.
 5. In Table 6-6 in Section 6.4, in description in line 1 for 10x2.5" hard disk backplane, changed "only supports NVMe hard disks" to "supports a maximum of four SAS/SATA hard disks" in the 10x2.5" hard disk backplane part.
 6. Added chapter 14 "Change List."
- II. Updates on July 20, 2018
 1. Deleted the description of the "optical path diagnosis" function unsupported by the NF5180M5.
 2. Modified the internal top view, marked the position of PCIe M.2, and modified PCIe specifications.
 3. Added the corresponding picture of the riser card and marked the specific position of Riser 1/2/3.
 4. Added notes to the mainboard layout diagram.
 5. Deleted NVDIMM-related information on the memory row from Table 5-1 "NF5180M5 system specifications."
 6. Added the "8G" capacity to lines M.2&SDD in Table 5-1 "NF5180M5 system specifications."
 7. Modified the description in "Storage controller" to provide detailed description in Table 5-1 "NF5180M5 system specifications."
 8. Modified the description in "Network adapter" to provide detailed description in Table 5-1 "NF5180M5 system specifications."

批注 [AD1]: 原文为“第六章第四节，表 6-6 中，2.5x10 硬盘背板第一行说明，将“仅仅支持 NVMe 硬盘”修改为“最多支持 4 个 SAS/SATA 硬盘” 表 6-6 中找不到相关内容，原文是否有误？

9. Deleted NVDIMM-related information from Section 6.2 "Memory."
 10. Updated the DIMM installation in Section 6.2 "Memory."
 11. Modified "Specification Process" to "Rank Process" in Table 6-2 "Memory component selection."
 12. Modified the note to the 10x2.5" backplane part to "1. Supports 10x NVMe hard disks. 2. Supports 6x NVMe + 4x SAS/SATA hard disks." in Table 6-6 in Section 6.4.
 13. Deleted "When the 10x2.5" hard disk backplane is not used and the number of hard disks is greater than 8, you can use one 16i RAID card or two 8i RAID cards." from Table 6-8.
 14. Modified the format of the OCP/PHY compatibility list in Section 6.6 "OCP/PHY Mezzanine Card."
 15. Changed "Quantity" to "Maximum Quantity" in Table 6-13 "Graphics card specifications."
 16. Changed "Quantity" to "Maximum Quantity" in Table 6-14.
 17. Added Section 6.12 "Power Supply" to explain the function of Micro SD cards.
 18. Modified power supply parameters in Table 6-15 "Power supply specifications."
 19. Deleted Section 11.15.
 20. Added chapter 14 "Change List."
- III. Updates on June 10, 2019
1. Changed "Xeon® scalable processors" to "Purley-based Xeon® scalable processors" in chapter 1 "Product Overview."
 2. Changed "Xeon® scalable processors" to "Purley-based Xeon® scalable processors" and modified the memory item to support up to 2933 MHz, in chapter 2 "Product Feature."
 3. Added Cascade Lake CPU options supported in the processor column in Table 5-1 "NF5180M5 system specifications."
 4. Added 2933 MHz memory options supported in the memory column in Table 5-1 "NF5180M5 system specifications."
 5. Added Table 6-2 "Cascade Lake CPU."
 6. Added 2933 MHz memory options in Table 6-3 "Memory component selection."