System components

Components overview

System board assembly

The SR780a V3 system board has two components:
- Processor board
  - A board containing CPU sockets, PCIe connectors, memory slots, and other server component connectors

  Click **HERE** to see the processor board.

- System I/O board
  - A board containing the system BMC (XCC2) management port, USB ports, and a VGA connector
  - Integrated Root of Trust security module containing the Trusted Platform Module (TPM), UEFI firmware, XCC2 firmware, and a silicon Root of Trust
  - A Micro SD card slot to extend XCC2 storage space for the backup of firmware and for remote console virtual media
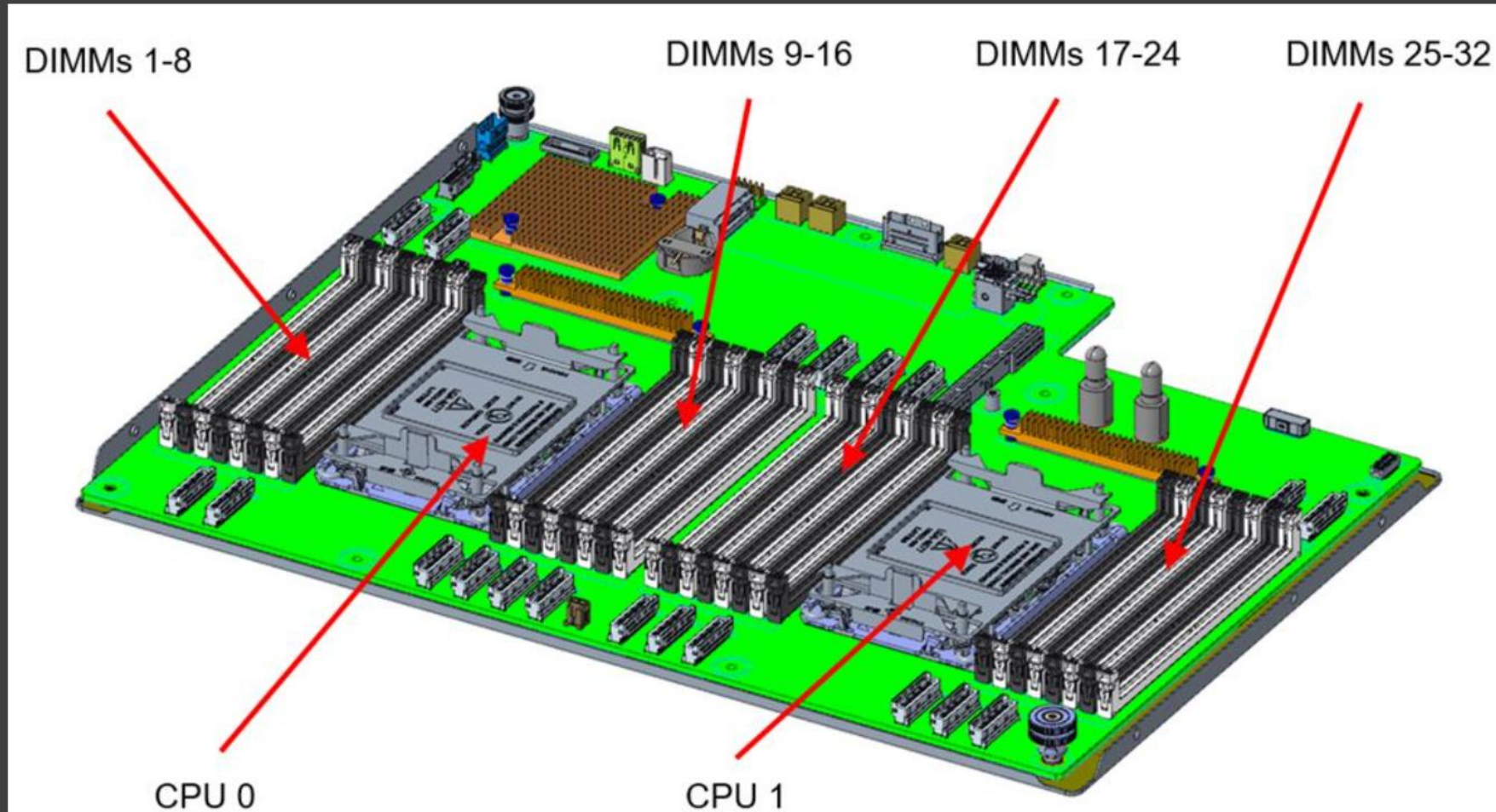 - A signal connector to the processor board

  Click **HERE** to see the system I/O board.

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System board assembly

Processor board

DIMMs 1-8   DIMMs 9-16   DIMMs 17-24   DIMMs 25-32

CPU 0   CPU 1

System board assembly

System I/O board

CPU complex assembly

Water hose between CPUs

CPU 0 and 16 DIMMs

Two M.2 drives

Riser 2 (slot 10)

Slot 11

Rear of server

Eight PCIe Gen 5 x16 links to PCIe switches

CPU 1 and   Water   Riser 1   System I/O Board
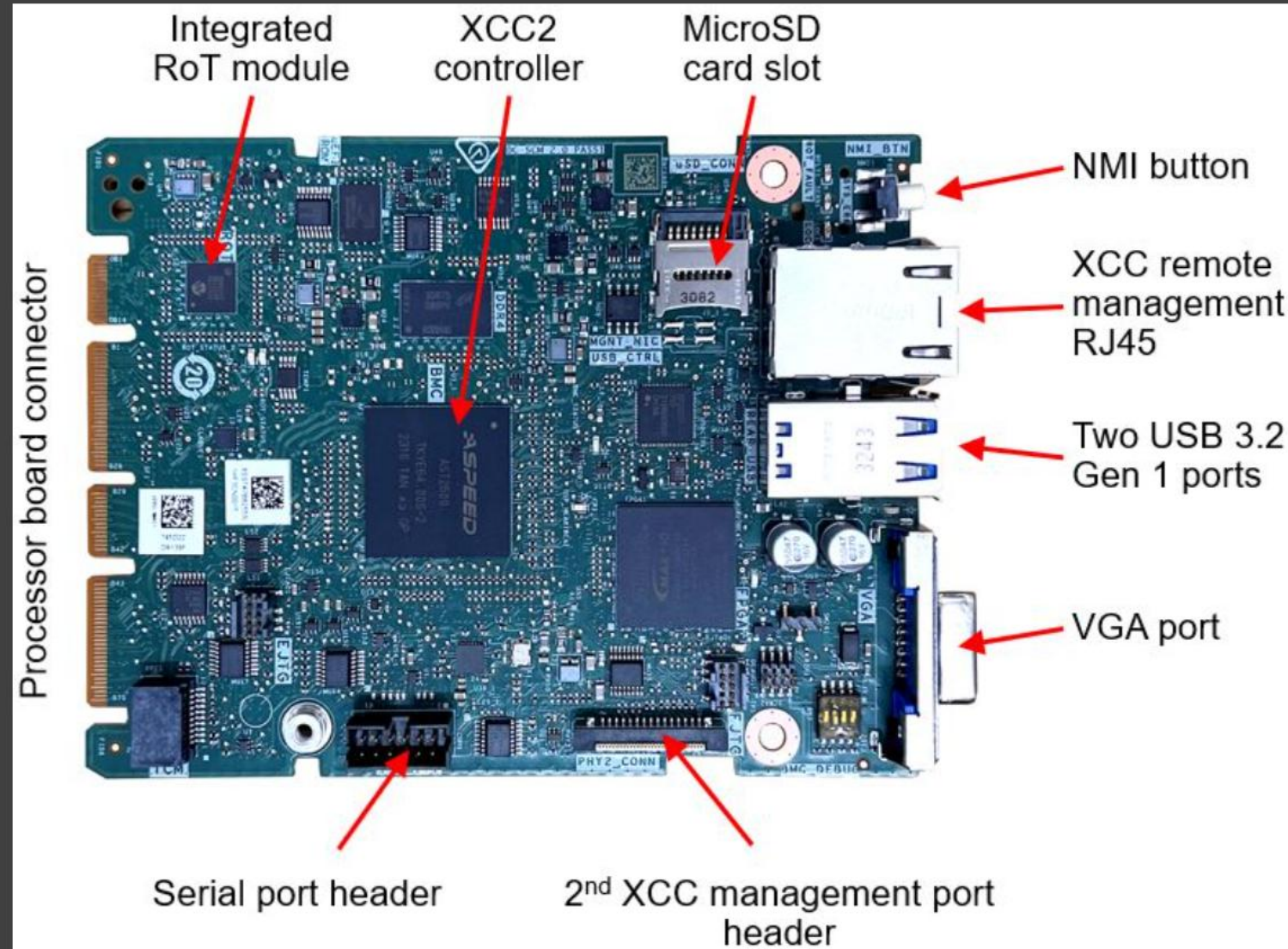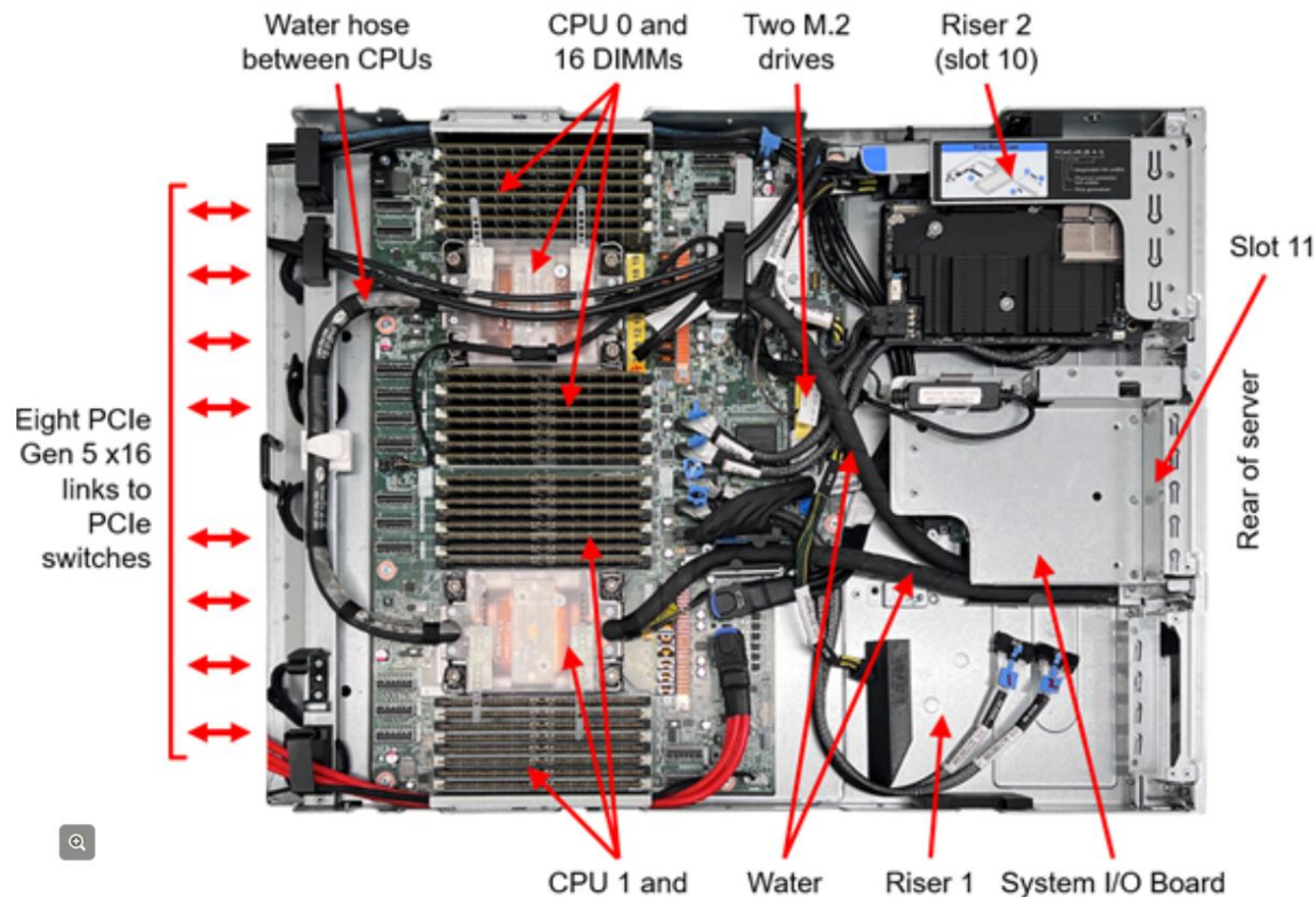
OAM – GPUs

OAMs (OCP Accelerator Modules) are a type of GPU based on the OCP (Open Compute Project) standard design. They are designed to handle large-scale AI training and HPC data workloads. The standard configuration for the SR780a V3 is eight GPUs – users cannot purchase fewer than eight OAMs. For more information, refer to the following websites:
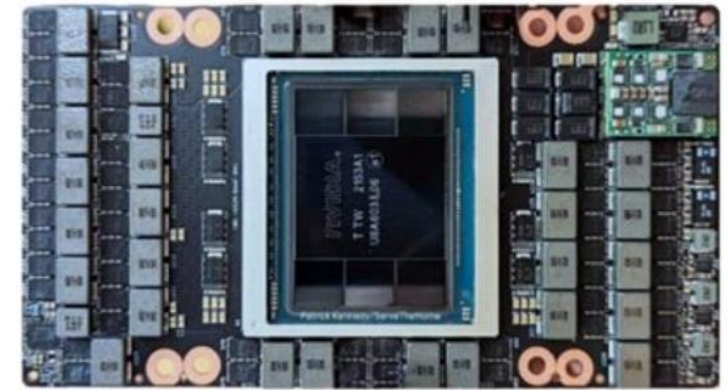
- NVIDIA HGX H100
- NVIDIA HGX H200
- NVIDIA HGX B200

An NVIDIA H200 GPU
without a heat sink

An NVIDIA B200 GPUs
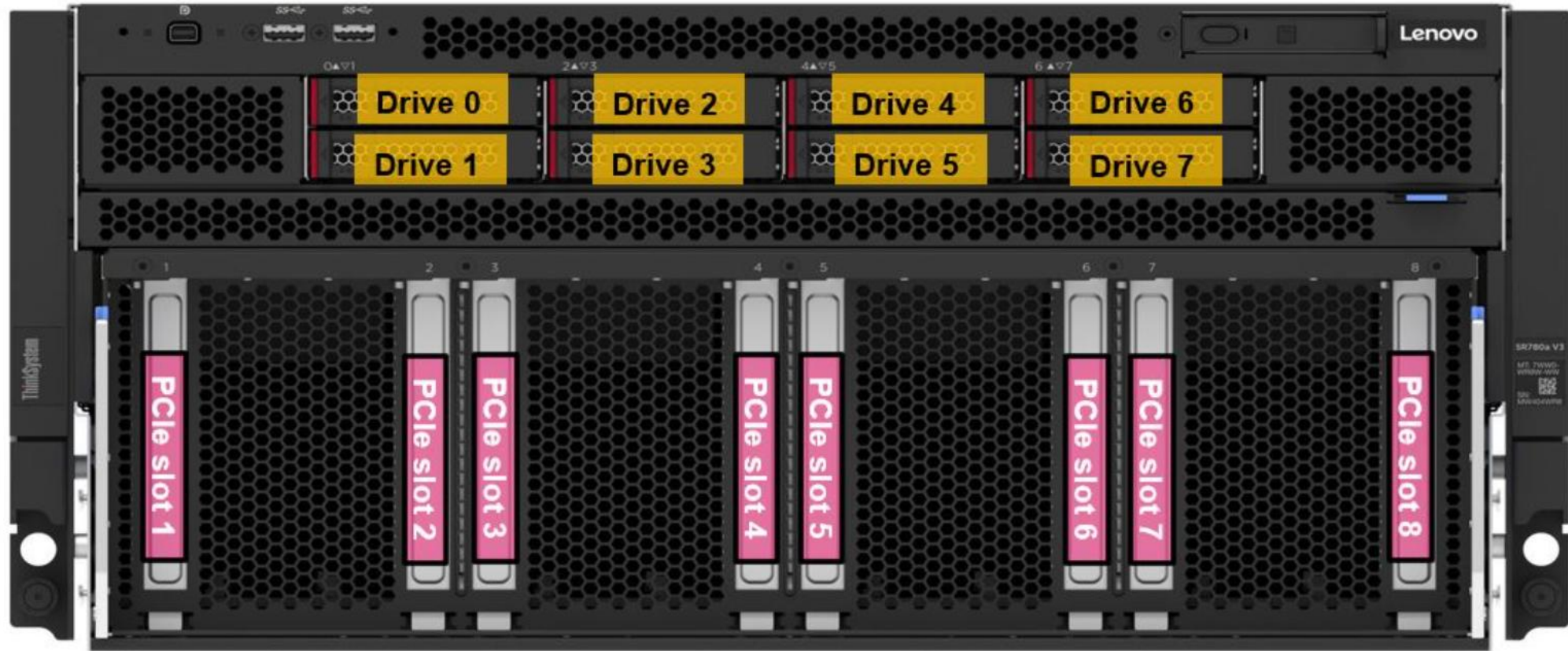without a heat sink

An NVIDIA H100 GPU
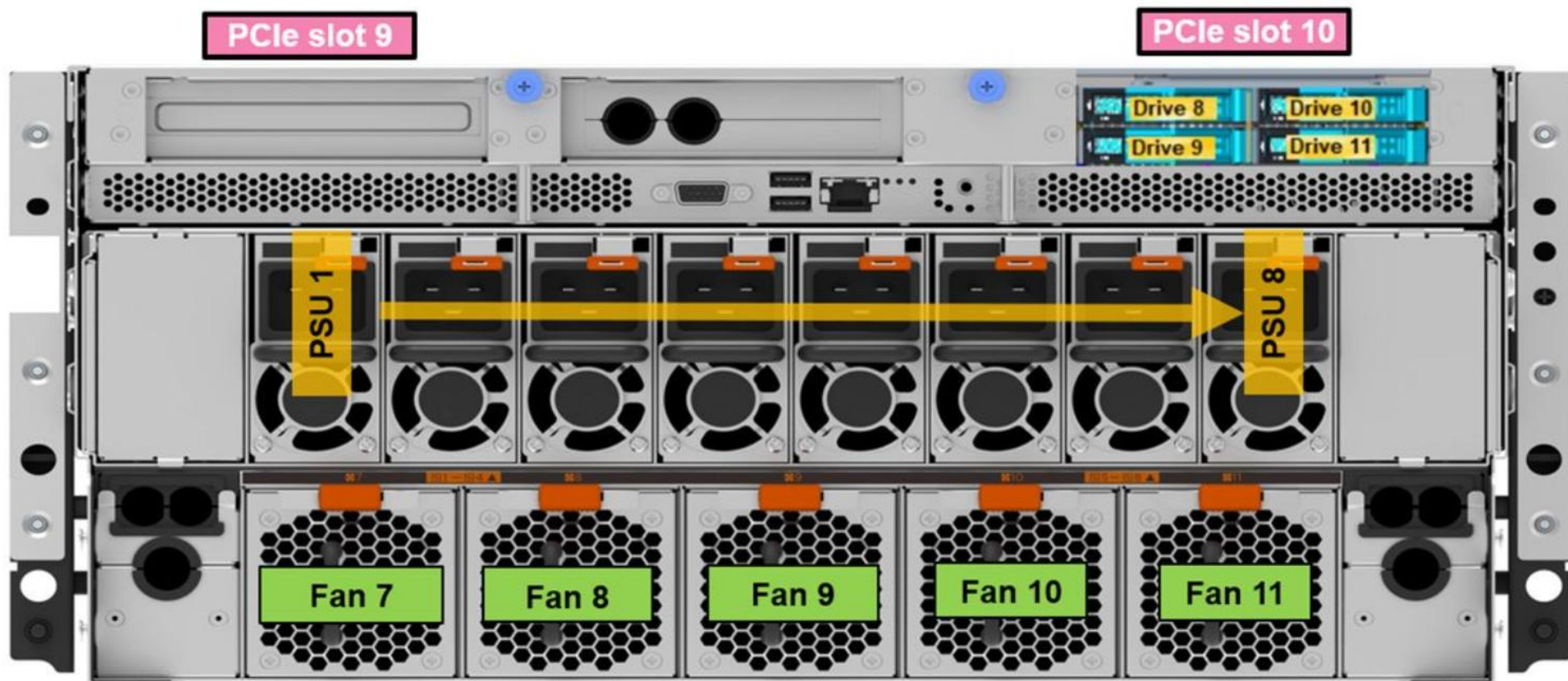without a heat sink

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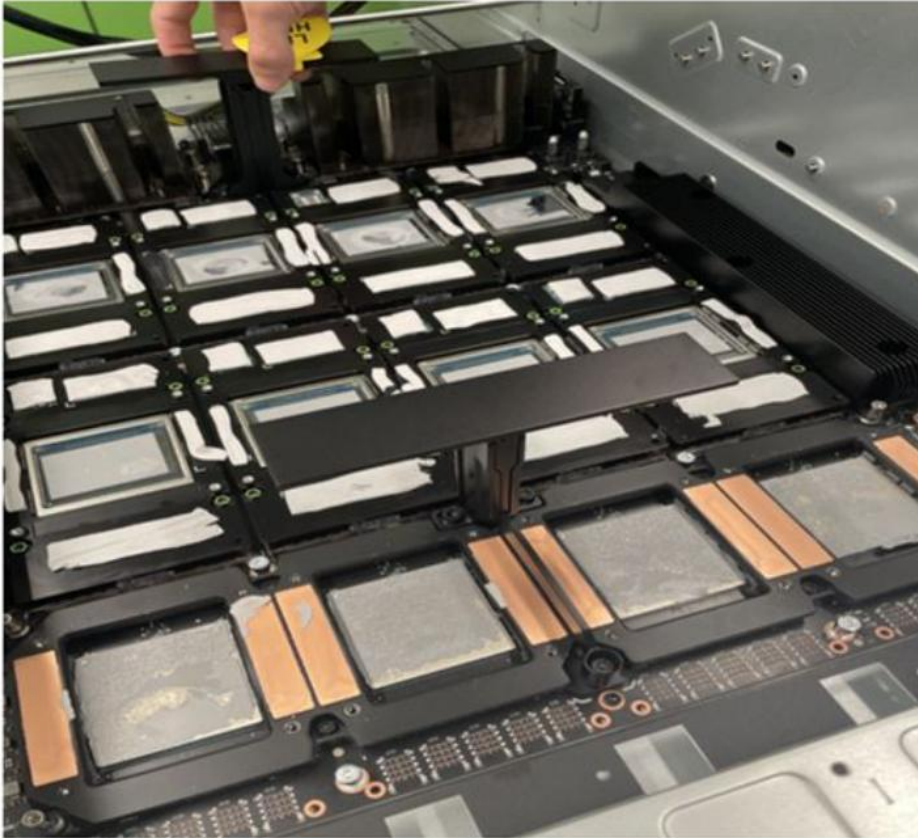# Front components and slot numbering

Rear components and slot numbering

If the 2.5-inch drive bay option (drives 8 to 11) is installed, it will occupy PCIe slot 10.
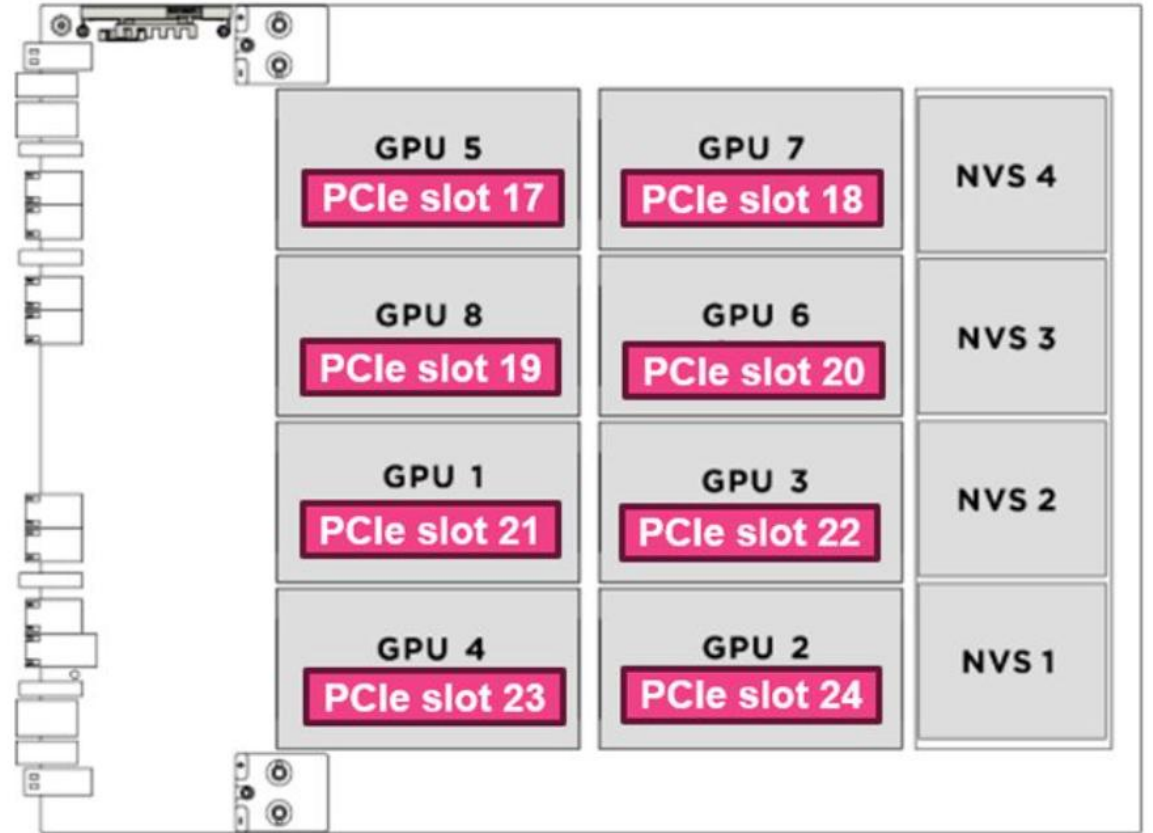
NVIDIA H100/H200 GPU numbering

Front of the server

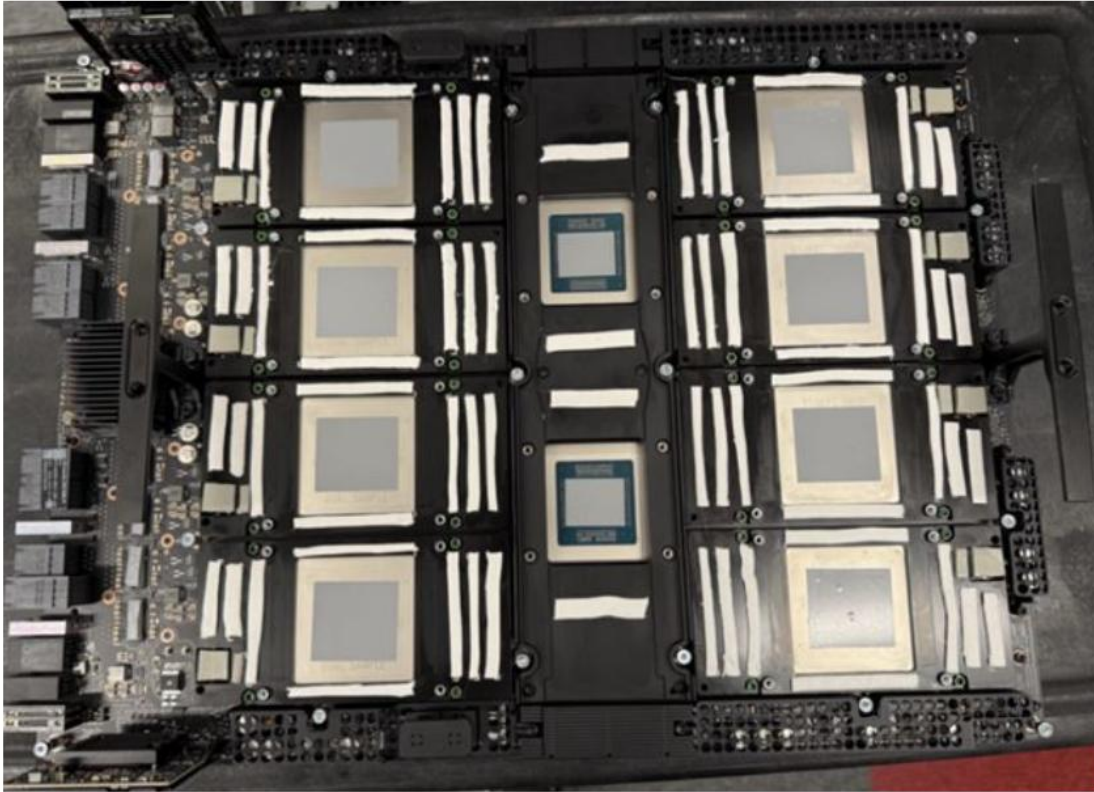Front of the server

GPU 5 PCIe slot 17	GPU 7 PCIe slot 18	NVS 4
GPU 8 PCIe slot 19	GPU 6 PCIe slot 20	NVS 3
GPU 1 PCIe slot 21	GPU 3 PCIe slot 22	NVS 2
GPU 4 PCIe slot 23	GPU 2 PCIe slot 24	NVS 1

NVIDIA GPU numbering

NVIDIA B200 GPU numbering

Front of the server

Front of the server

| GPU 5 PCIe slot 17 | NVS 2 | GPU 7 PCIe slot 18 |
GPU 8 PCIe slot 19		GPU 6 PCIe slot 20
GPU 1 PCIe slot 21		GPU 3 PCIe slot 22
GPU 4 PCIe slot 23	NVS 1	GPU 2 PCIe slot 24
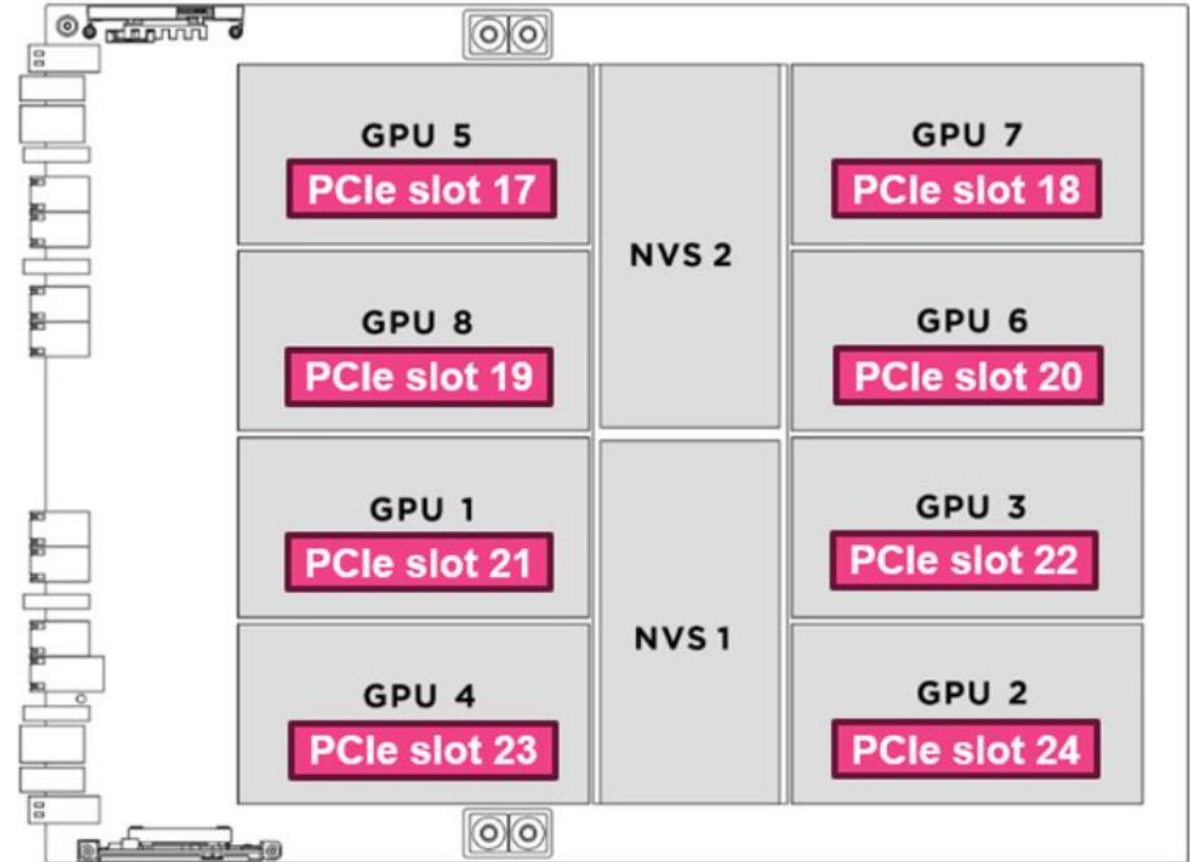
NVIDIA GPU numbering

Front PCIe expansion slots

The SR780a V3 supports eight front PCIe Gen 5 x16 FHHL slots designed for high-speed GPU Direct networking, connected to the processors and GPUs via a PCIe switch. Slots 1 to 4 are connected to CPU 1, and slots 5 to 8 are connected to CPU 2. Four or eight adapters are supported in these front PCIe slots; all adapters must be identical, and mixing is not supported. For more information about supported adapters and slot placement, refer to Lenovo Press.
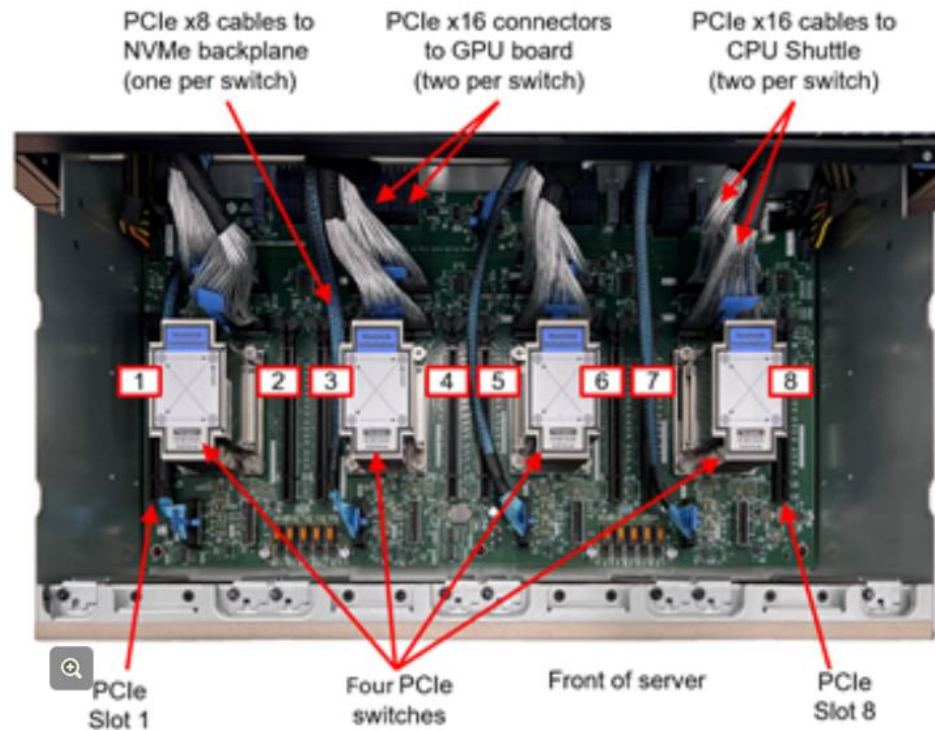
Rear PCIe expansion slots

The SR780a V3 supports up to three PCIe Gen 5 FHHL slots, which can be configured as either two x16 slots or two x8 slots plus one x16 slot, as follows:

- Slot 9: PCIe Gen 5 FHHL, connected to CPU 2
    - If slot 11 is not present, slot 9 will operate as PCIe Gen 5 x16
    - If slot 11 is present, slot 9 will operate as PCIe Gen 5 x8
- Slot 10: PCIe Gen 5 x16 FHHL, connected to CPU 1 (mutually exclusive with rear drive bays)
- Slot 11: PCIe Gen 5 x8 FHHL, connected to CPU 2

For more information about supported adapters and slot placement, refer to Lenovo Press.
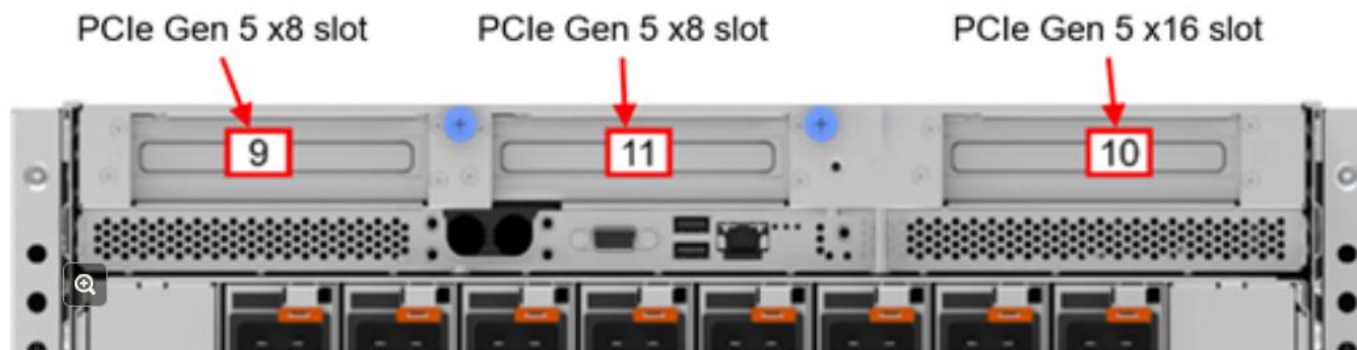
DIMMs

The SR780a V3 supports up to 32 DDR5 RDIMMs:
- One DIMM per channel, up to 4800 MHZ
- Two DIMMs per channel, up to 5600 MHZ
- Support for RDIMMs (1Rx8, 2Rx4, and 2Rx8)
- Support for 3DS RDIMMs (2S2Rx4)
- Support for the mixing of memory speeds
    - The system will operate at the lowest DIMM speed
- Support for the mixing of DIMM vendors
- DIMMs for each memory channel and CPU must have the same memory capacity and rank
- DIMMs must be installed in a specific order based on the system configuration
  For more information, refer to the *Memory module installation rules and order* section of the *SR780a V3 User Guide* on the Lenovo Docs website
- Click HERE to see the SR780a V3 DIMMs block diagram

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DIMMs

## SR780a V3 memory slot and channel identification

Processor	Processor 0															
Controller	iMC3				iMC2				iMC0				iMC1			
Channel	CH1		CH0		CH1		CH0		CH0		CH1		CH0		CH1	
Slot No.	0	1	0	1	0	1	0	1	1	0	1	0	1	0	1	0
DIMM No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Processor	Processor 1															
Controller	iMC3				iMC2				iMC0				iMC1			
Channel	CH1		CH0		CH1		CH0		CH0		CH1		CH0		CH1	
Slot No.	0	1	0	1	0	1	0	1	1	0	1	0	1	0	1	0
DIMM No.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

M.2 adapters

The SR780a V3 supports two stacked M.2 NVMe drives that are directly attached to the processor board in the CPU complex.
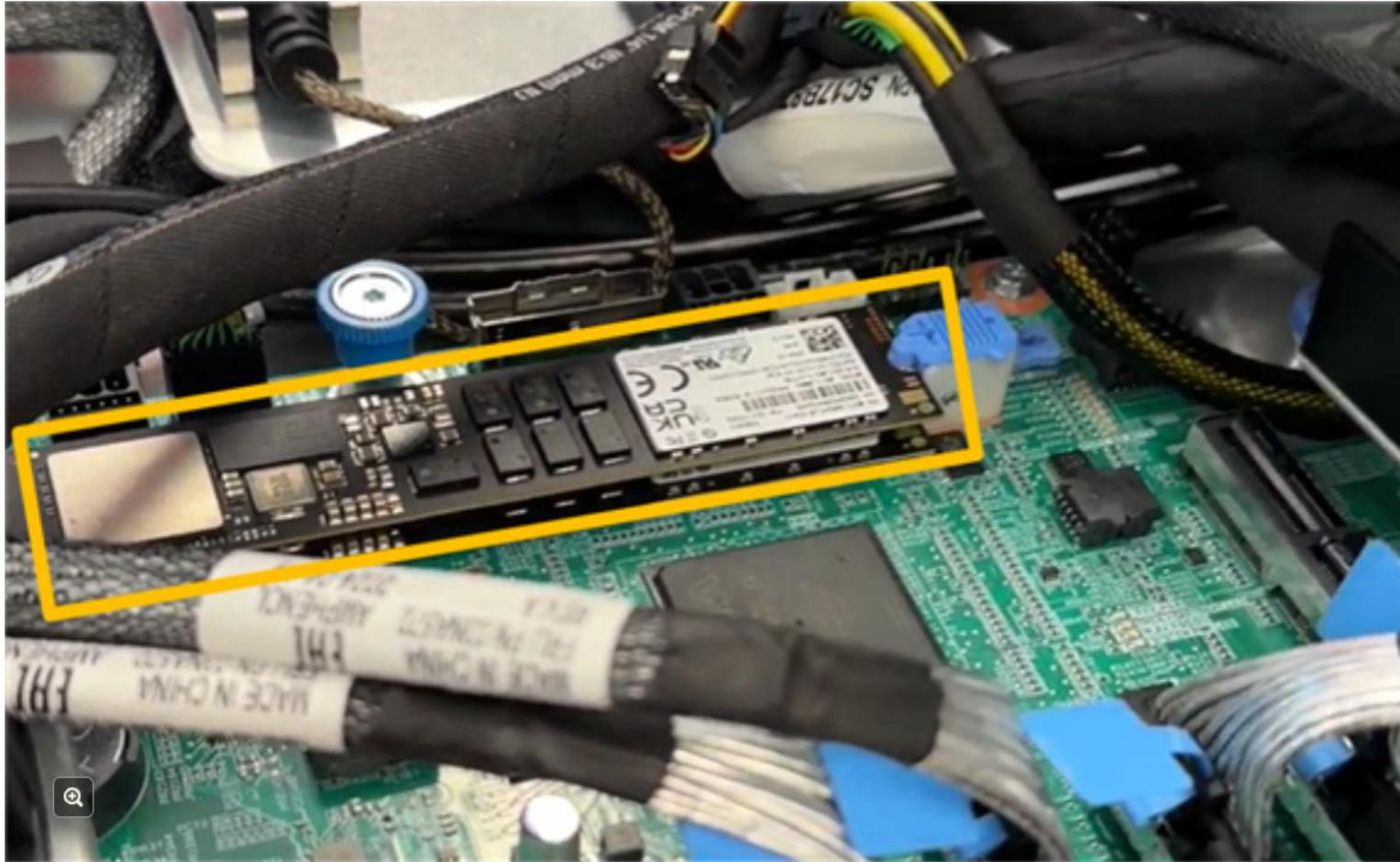
System board assembly connectors
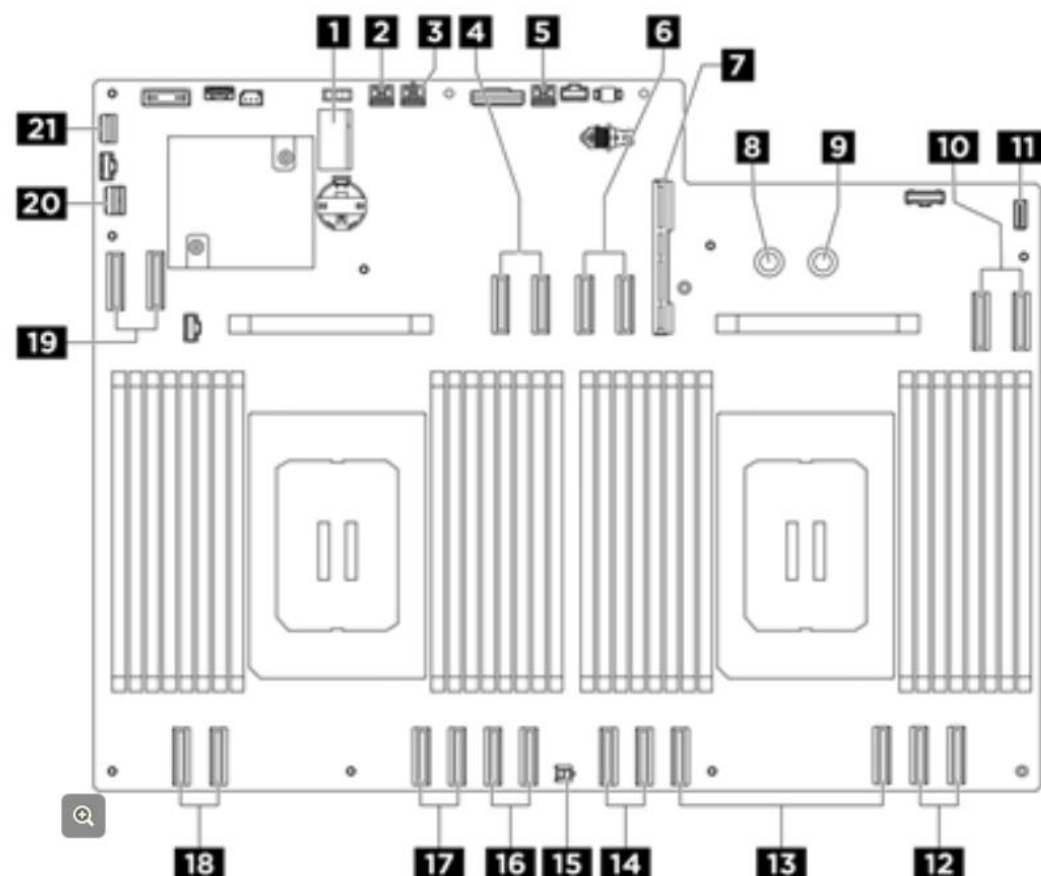
System board connectors			
1	M.2 slot 1 / M.2 slot 2	2	PCIe riser 2 power and sideband connector / Rear drive backplane power connector
3	PCIe riser 3 power and sideband connector	4	MCIO connector 4 / PCIe riser 2 signal connector / Rear drive backplane signal connector
5	PCIe riser 1 power and sideband connector	6	MCIO connector 8 / PCIe riser 1 signal connector / PCIe riser 3 signal connector
7	System I/O board connector (DC-SCM)	8	Ground (-) connector (PSU_GND)
9	12V (+) connector (PSU_P12V)	10	MCIO connector 7
11	Integrated diagnostics panel connector	12	MCIO connector 6
13	MCIO connector 5	14	MCIO connector 10
15	CPU leakage sensor module connector	16	MCIO connector 3
17	MCIO connector 2	18	MCIO connector 1
19	MCIO connector 9	20	PCIe switch sideband connector
21	Front USB / Mini DisplayPort connector		

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