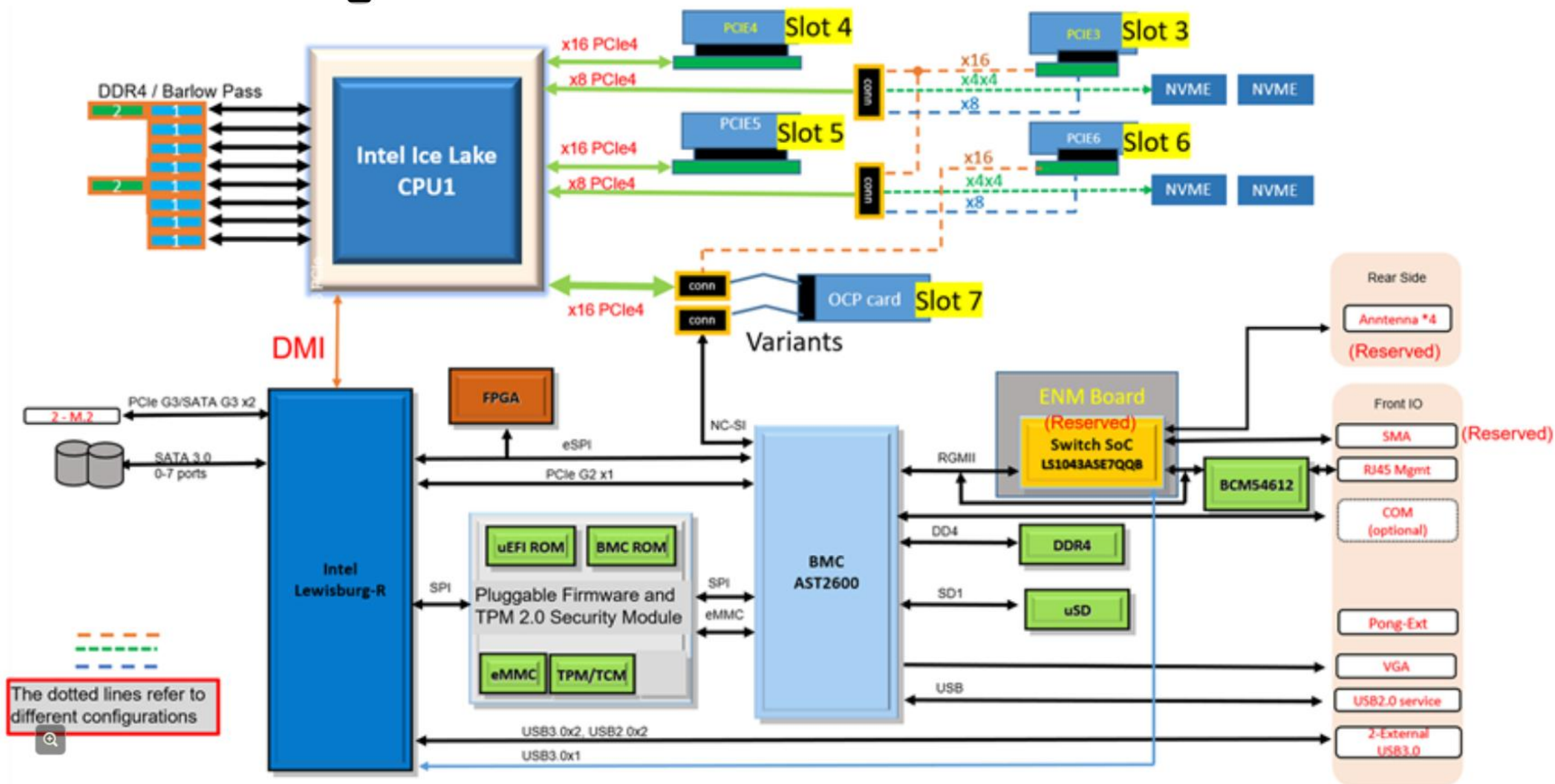


# System configurations and diagrams

System diagram, mounting options, and PCIe configurations



## System block diagram



# ThinkEdge SE450 mounting options

The SE450 has the following mounting options:

- Rail Mount (standard) – refer to the [Rail mount installation guide](#) for installation instructions
- Floor Stand configuration, also known as a bookshelf (optional) – refer to the [Floor stand installation guide](#) for installation instructions
- Wall Mount configuration (optional) – refer to the [Wall mount installation guide](#) for installation instructions



Floor Stand



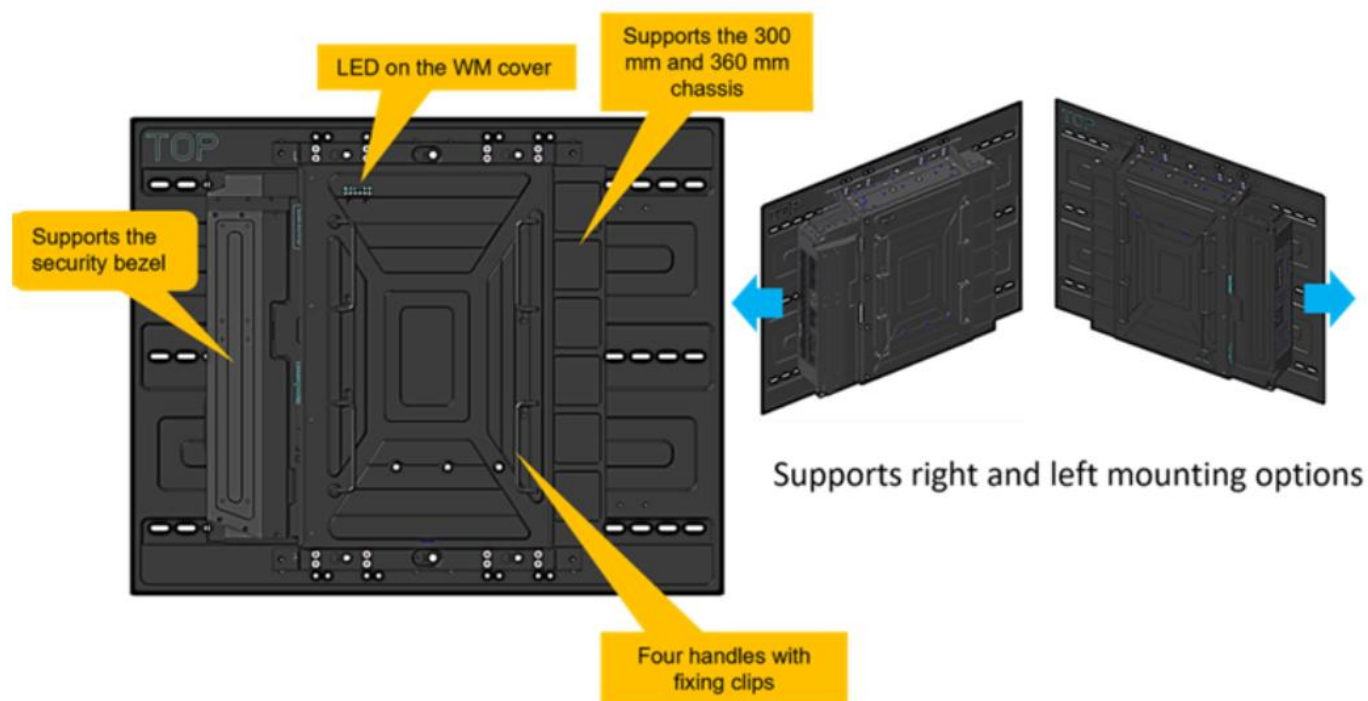
Wall Mount



Rail Mount (2U)

# Mounting bracket versatility

Mounting option	300 mm	360 mm	Security bezel	DW GPU
Wall Mount (WM)	Supported	Supported	Supported	Supported
Floor Stand (FS)	Supported	Supported	Supported	Supported



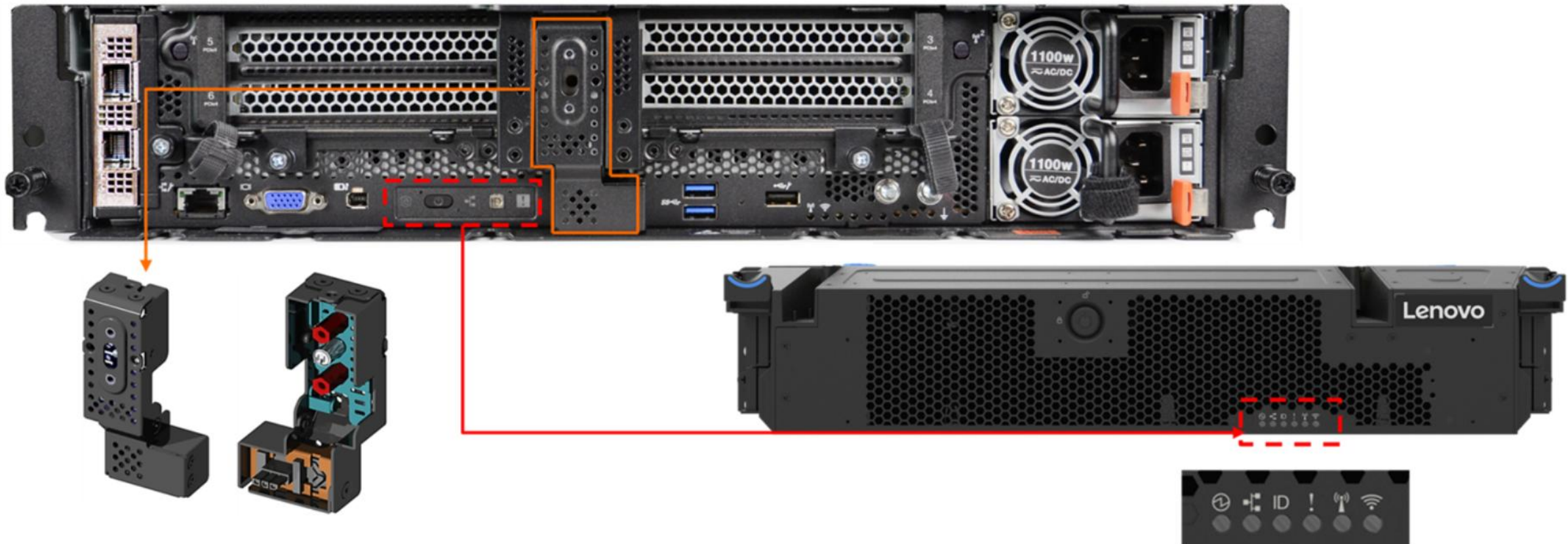
Wall Mount



Floor Stand

# Security bezel cable module

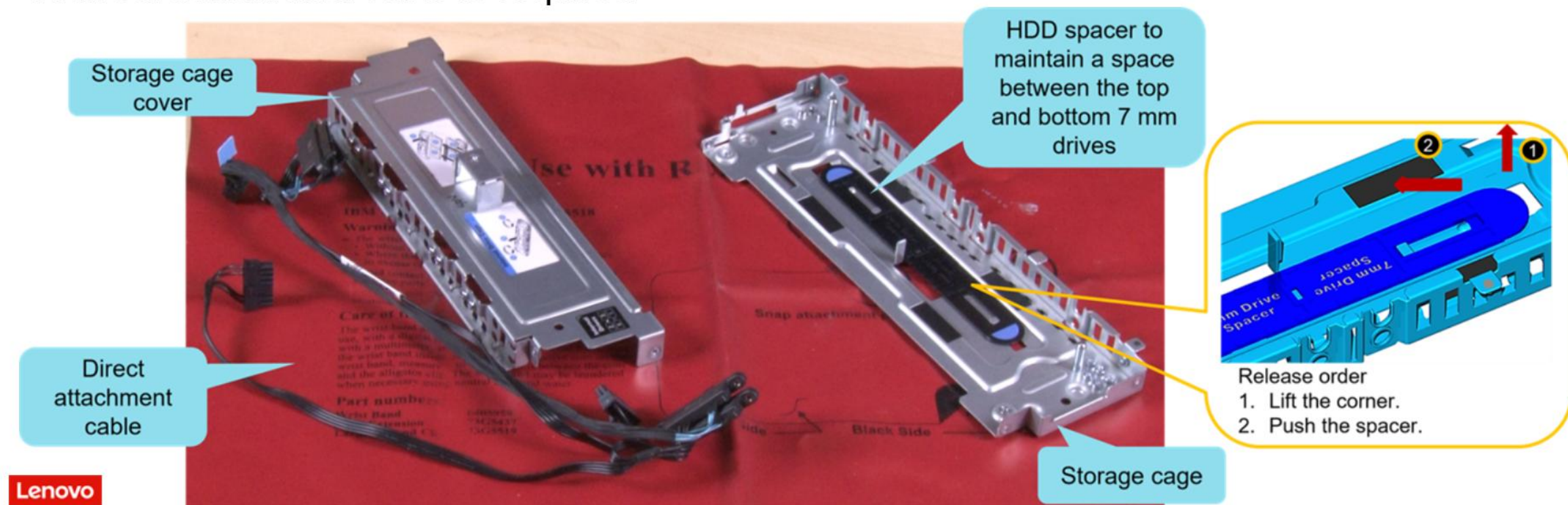
The SE450 security bezel cable module is used to redirect operation panel LEDs from the front of the chassis to an installed security bezel.



## ThinkEdge SE450 internal storage

The following internal storage specifications apply to both the 300 mm and 360 mm models:

- Up to four 7 mm drives or up to two 15 mm drives are supported
- SATA, SAS, or NVMe drives are supported
- A combination of drive types is not supported – you cannot install SAS, SATA, and NVMe drives at the same time
- A direct attachment cable is required

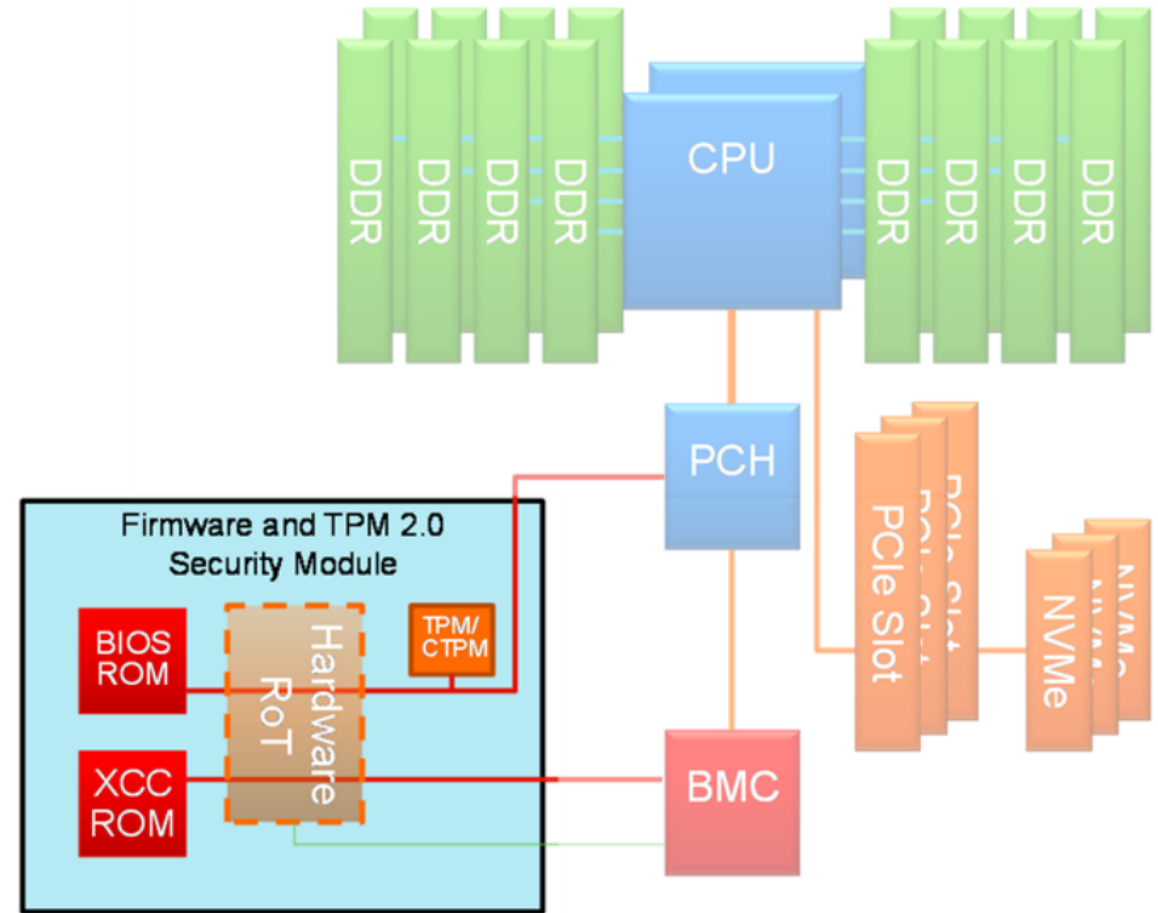


# Firmware and TPM 2.0 Security Module

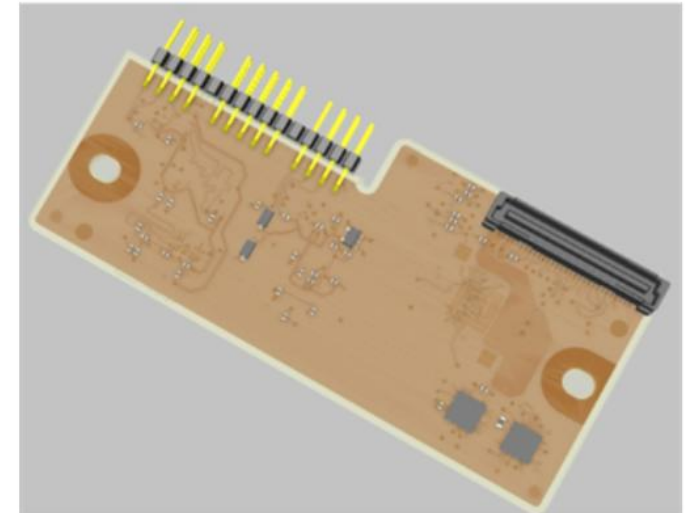
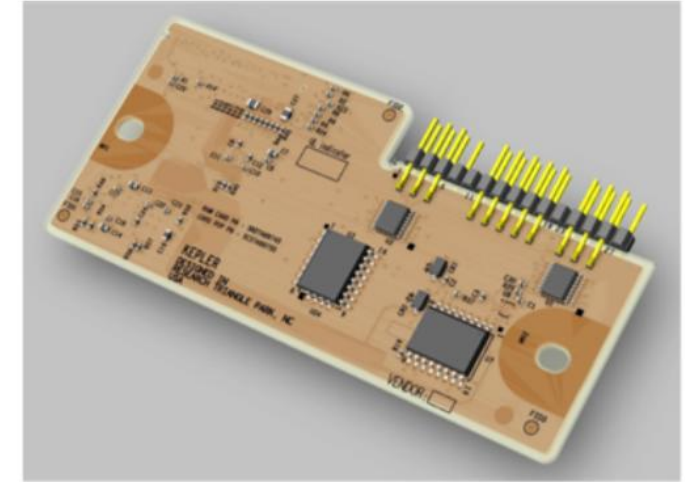
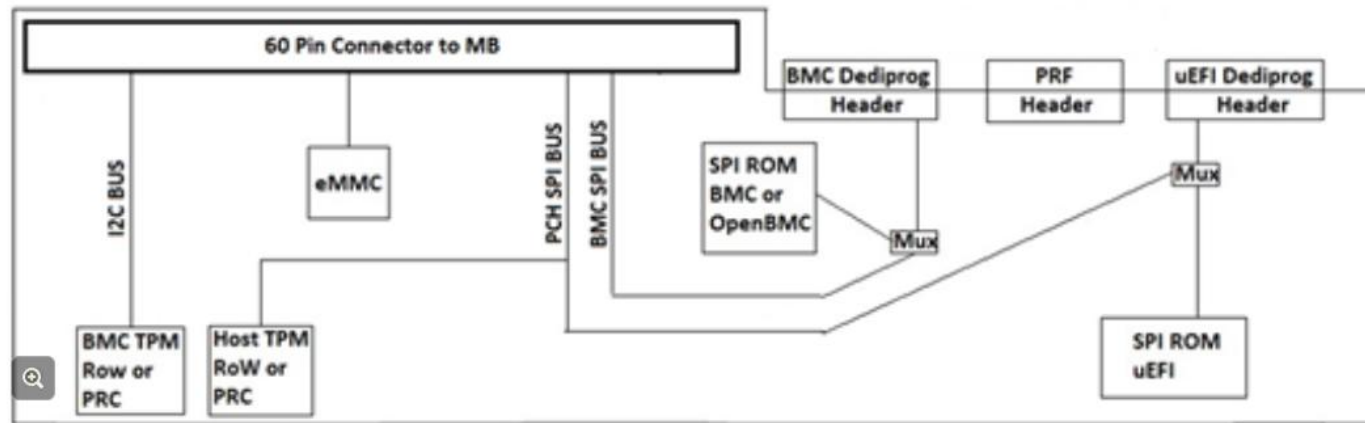
The Firmware and TPM 2.0 Security Module is a mezzanine card containing a Trusted Platform Module (TPM), a 32 MB UEFI SPI flash chip, a 4 MB XCC SPI flash chip, and 16 GB XCC eMMC storage. The module is necessary for a system boot.

This module performs power-on time protection and validation of core boot elements for both XCC firmware and UEFI/BIOS firmware in a cryptographically secure fashion.

**Note:** The Aspeed AST2600 is the main BMC chipset, and it's placed on a planar. While its firmware (XCC) is stored separately in a 4 MB XCC SPI flash chip, the flash chip is now located on the Firmware and TPM 2.0 Security Module.

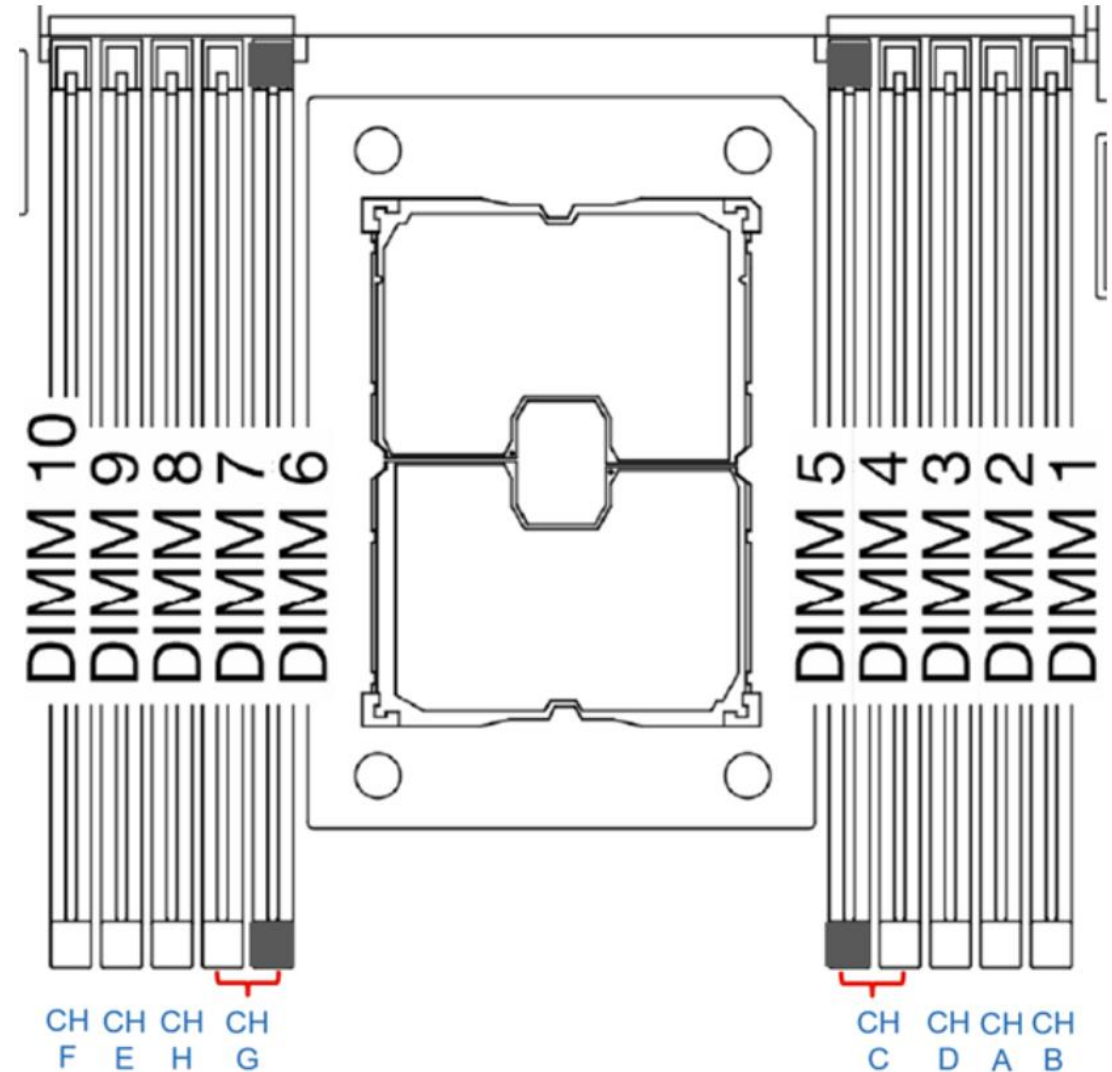


# Firmware and TPM 2.0 Security Module block diagram



## SE450 memory subsystem overview

The SE450 is equipped with 10 DIMM slots and supports RDIMMs, 3DS RDIMMs, and DCPMMs (PMems). Six channels (CH\_A, CH\_B, CH\_D, CH\_E, CH\_F, and CH\_H) support one DIMM per channel (1DPC) and two channels (CH\_C and CH\_G) support two DIMMs per channel (2DPC).



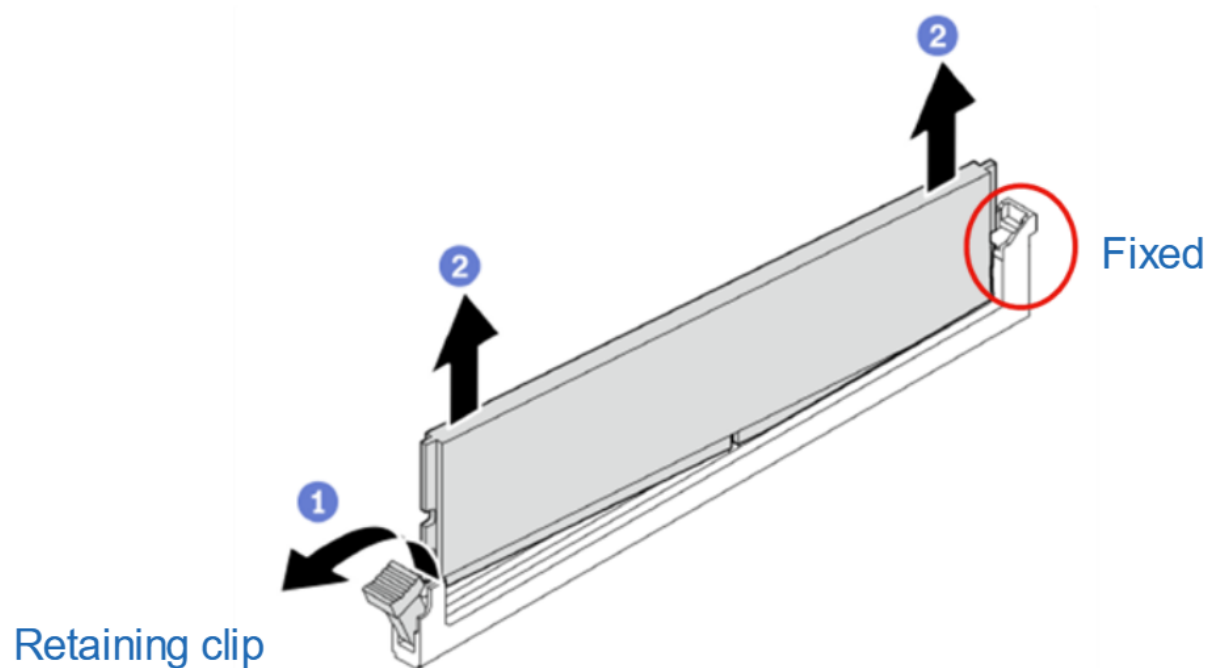
**Note:** DIMM slots 5 and 6 are for DCPMM installation only. For better identification, the retaining clips on these slots are black rather than white.

## Memory installation tip

Due to space limitations, DIMM slots on the SE450 only have one retaining clip.

To remove a DIMM:

1. Open the retaining clip to disengage the memory module. One end of the module will rise up slightly higher than the other.
2. Hold both ends of the memory module, and then lift it up from the slot.



# Memory configuration rules – DDR4 only

If only DDR4 modules are installed, the SE450 supports both Independent Mode and Memory Mirroring Mode.

Scroll down for more information

Integrated Memory Controller (iMC)		iMC2		iMC3				iMC1			iMC0	
Channel		CH1 (F)	CH0 (E)	CH1 (H)	CH0 (G)			CH0 (C)		CH1 (D)	CH0 (A)	CH1 (B)
		DIMM0	DIMM0	DIMM0	DIMM0	DIMM1		DIMM1	DIMM0	DIMM0	DIMM0	DIMM0
DDR4 quantity	Slot number	10	9	8	7	6	CPU	5	4	3	2	1
	Memory mode											
1	Independent										V	
2	Independent if both DIMMs have the same capacity								V		V	
2	Independent if both DIMMs have different capacities									V	V	
4	Independent if all DIMMs have the same capacity		V		V				V		V	
4	Independent if there are different capacities of DIMMs		V	V						V	V	

# Memory configuration rules – DDR4 only

If only DDR4 modules are installed, the SE450 supports both Independent Mode and Memory Mirroring Mode.

Scroll down for more information

Integrated Memory Controller (iMC)		iMC2		iMC3				iMC1			iMC0	
Channel		CH1 (F)	CH0 (E)	CH1 (H)	CH0 (G)			CH0 (C)		CH1 (D)	CH0 (A)	CH1 (B)
		DIMM0	DIMM0	DIMM0	DIMM0	DIMM1		DIMM1	DIMM0	DIMM0	DIMM0	DIMM0
2	Independent if both DIMMs have the same capacity						CPU		V		V	
2	Independent if both DIMMs have different capacities									V	V	
4	Independent if all DIMMs have the same capacity		V		V				V		V	
4	Independent if there are different capacities of DIMMs		V	V						V	V	
6	Independent if all DIMMs have the same capacity	V	V		V				V		V	V
8	Independent	V	V	V	V				V	V	V	V
8	Memory mirroring	V	V	V	V				V	V	V	V

# Memory configuration rules – DDR4 and DCPMM

If DDR4 and DCPMM modules are installed, the SE450 supports App Direct Mode and Memory Mode.

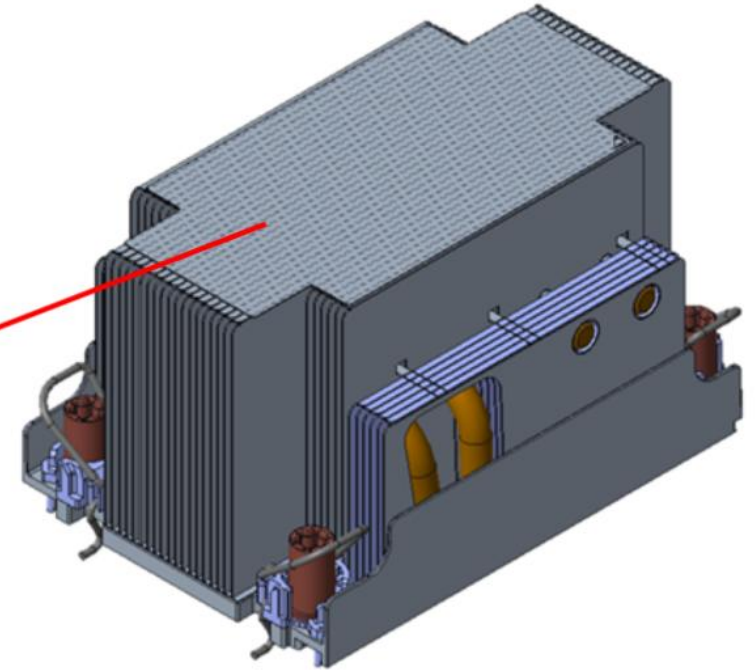
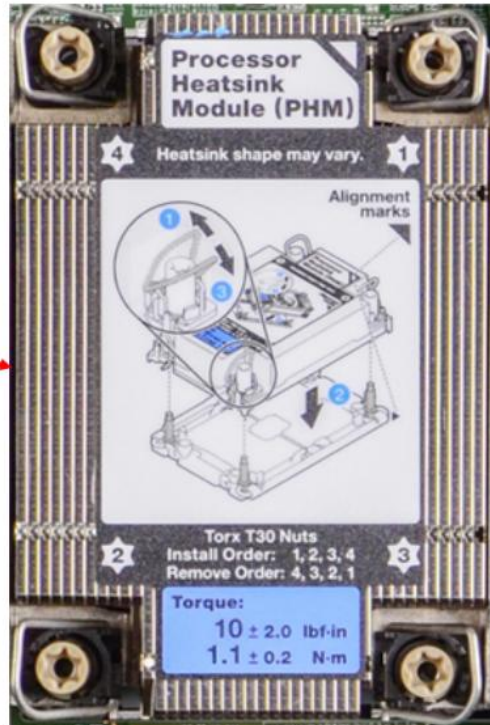
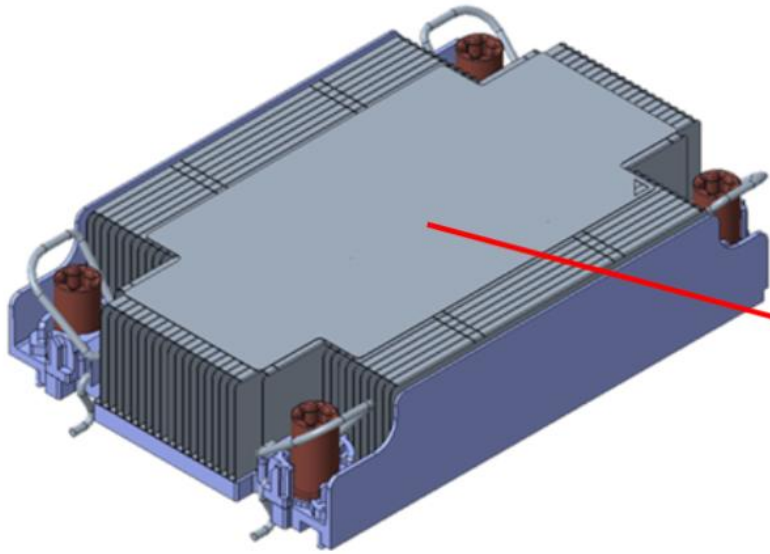
Integrated Memory Controller (iMC)			iMC2		iMC3				iMC1			iMC0	
Channel			CH1 (F)	CH0 (E)	CH1 (H)	CH0 (G)			CH0 (C)		CH1 (D)	CH0 (A)	CH1 (B)
			DIMM0	DIMM0	DIMM0	DIMM0	DIMM1		DIMM1	DIMM0	DIMM0	DIMM0	DIMM0
DDR4(D) QTY	PMem (P) QTY	Slot number Memory mode	10	9	8	7	6	CPU	5	4	3	2	1
4	4	APP Direct	P	D	P	D				D	P	D	P
4	4	Memory Mode	P	D	P	D				D	P	D	P
6	1	APP Direct	D	D		D				D	P	D	D
8	1	APP Direct	D	D	D	D			P	D	D	D	D

# Heat sinks

The SE450 supports 1U and 2U heat sinks for different types of processor.

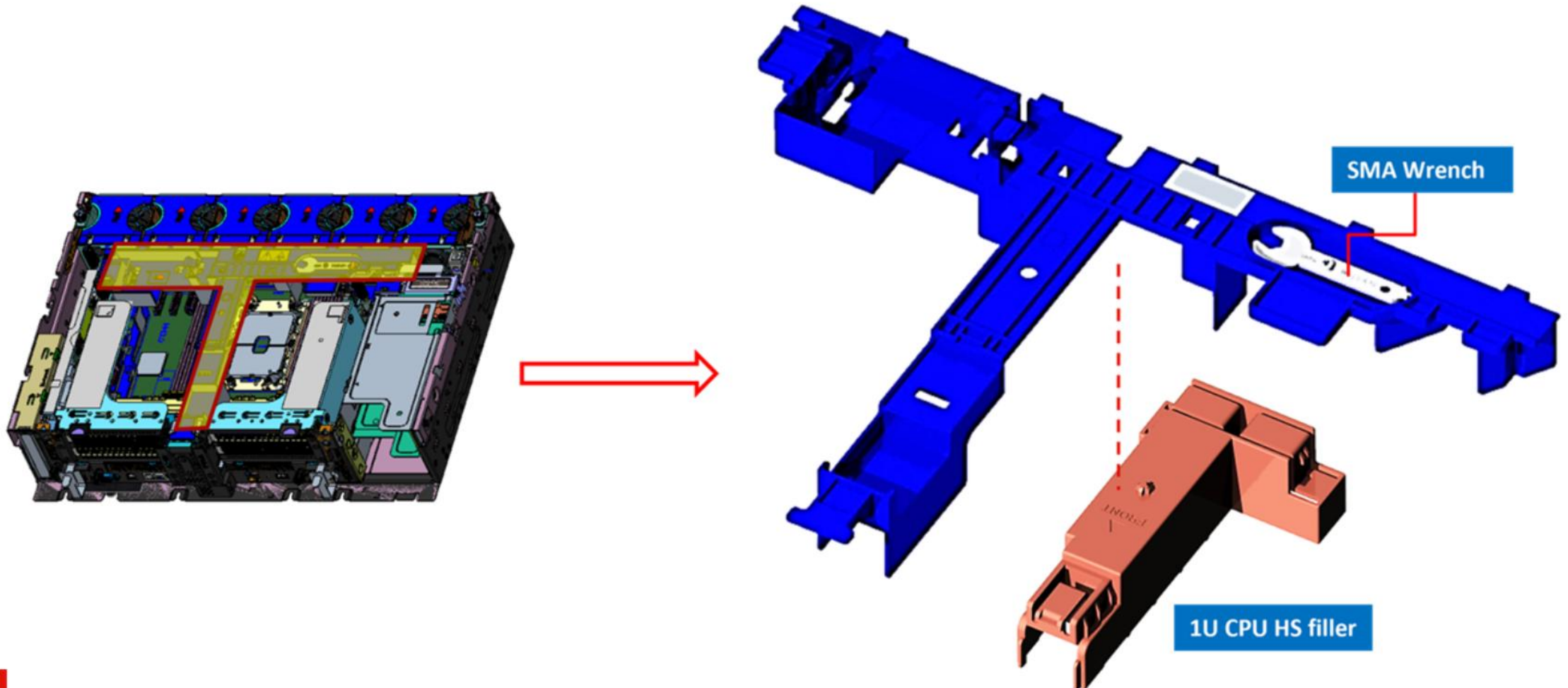
- Use a 1U heat sink for processors with a TDP of up to 165 watts at ASHRAE3
- Use a 2U heat sink for processors with a TDP of up to 205 watts at AHSRAE3

Both types of heat sink have a label indicating the installation and removal order for the nuts as well as information about the required level of torque.



## Air baffle – 300 mm chassis

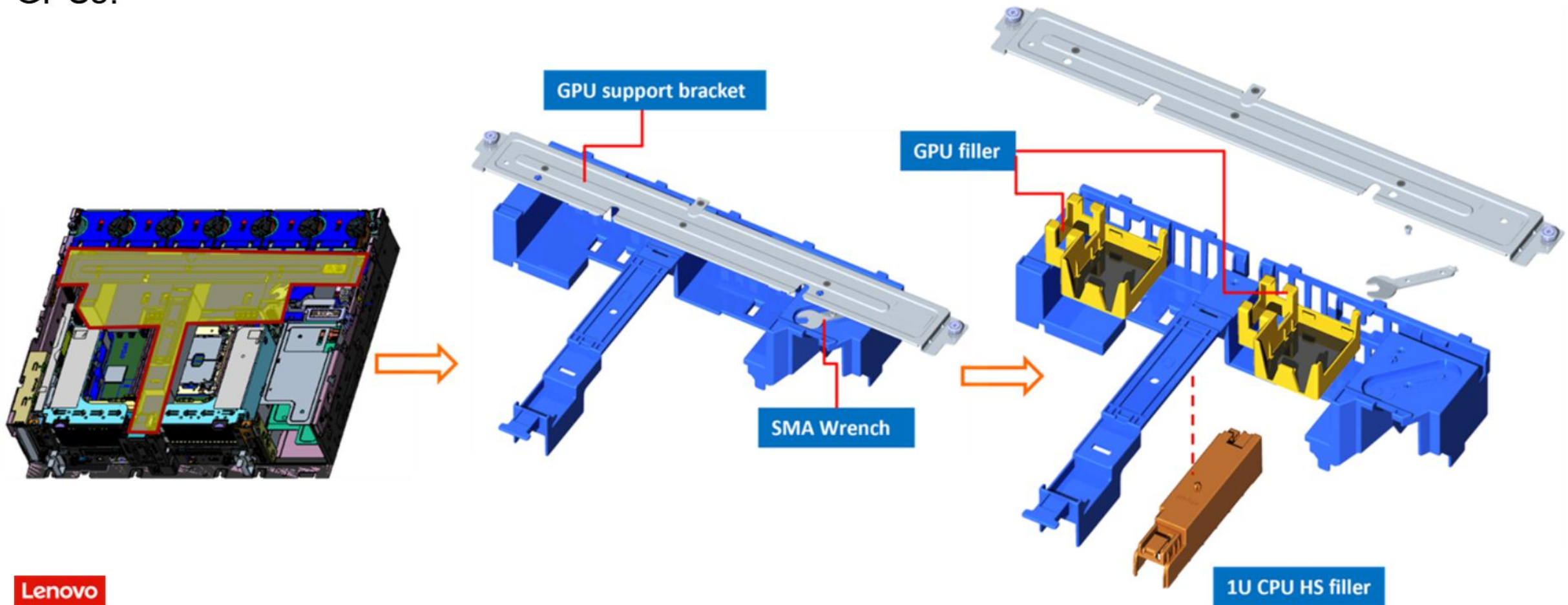
The 300 mm and 360 mm chassis are equipped with different air baffles.  
If a 1U heat sink is installed, the 1U heat sink filler should also be installed.



## Air baffle – 360 mm chassis

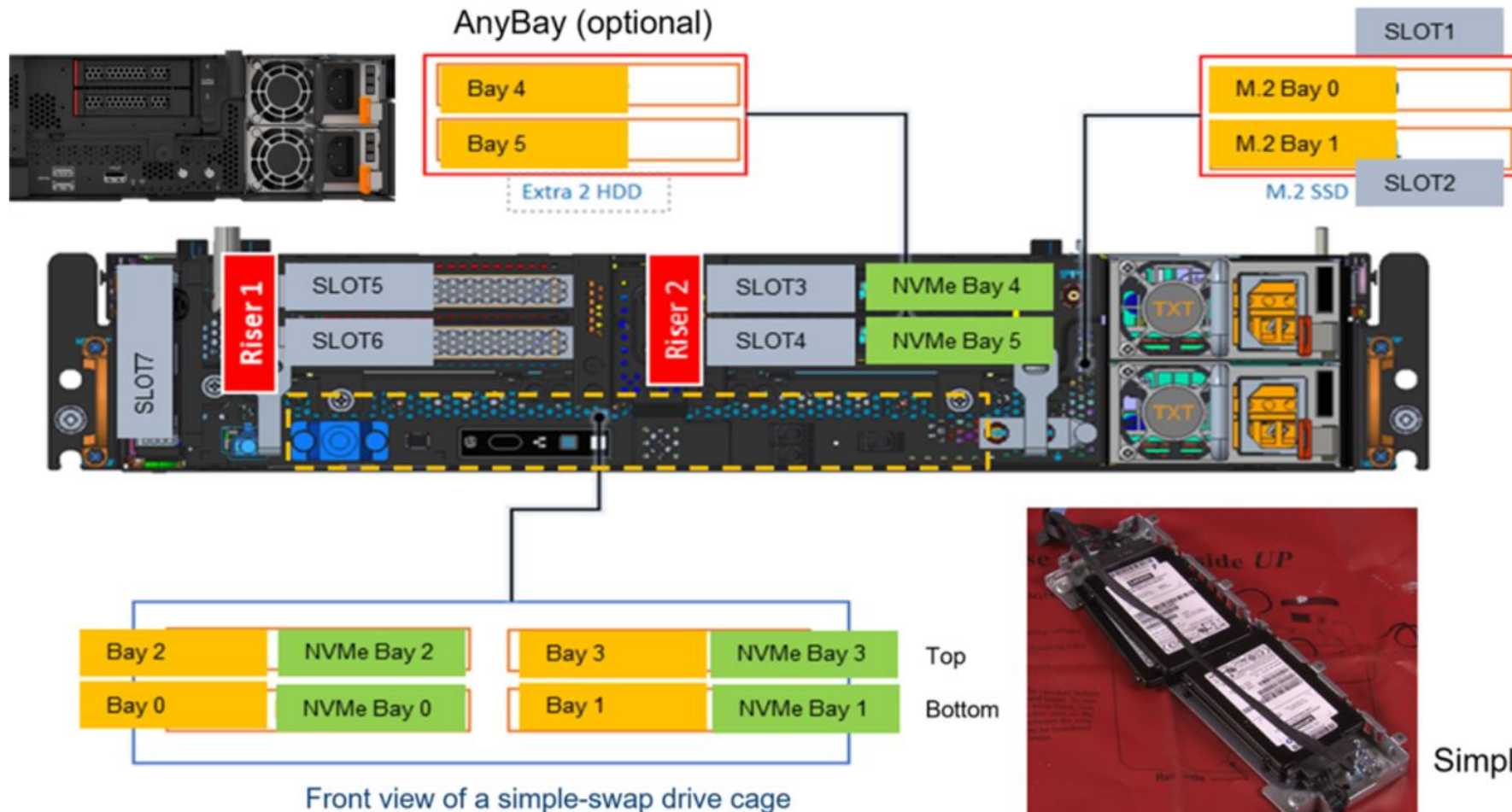
The 300 mm and 360 mm chassis are equipped with different air baffles.

If a 1U heat sink is installed, the 1U heat sink filler should also be installed. The 360 mm chassis air baffle has two GPU fillers and a GPU support bracket to support the installation of GPUs.



# PCIe slot and drive numbering

- The riser 2 assembly can be replaced with an optional AnyBay drive cage to get two extra front-accessible drives.
- PCIe slot 1 and slot 2 are used internally for an M.2 boot adapter.



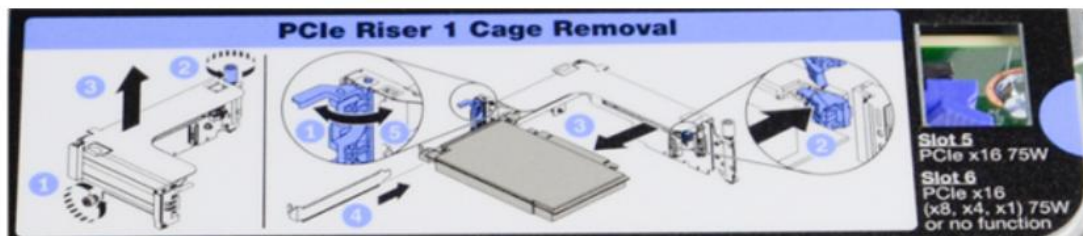
M.2 boot adapter



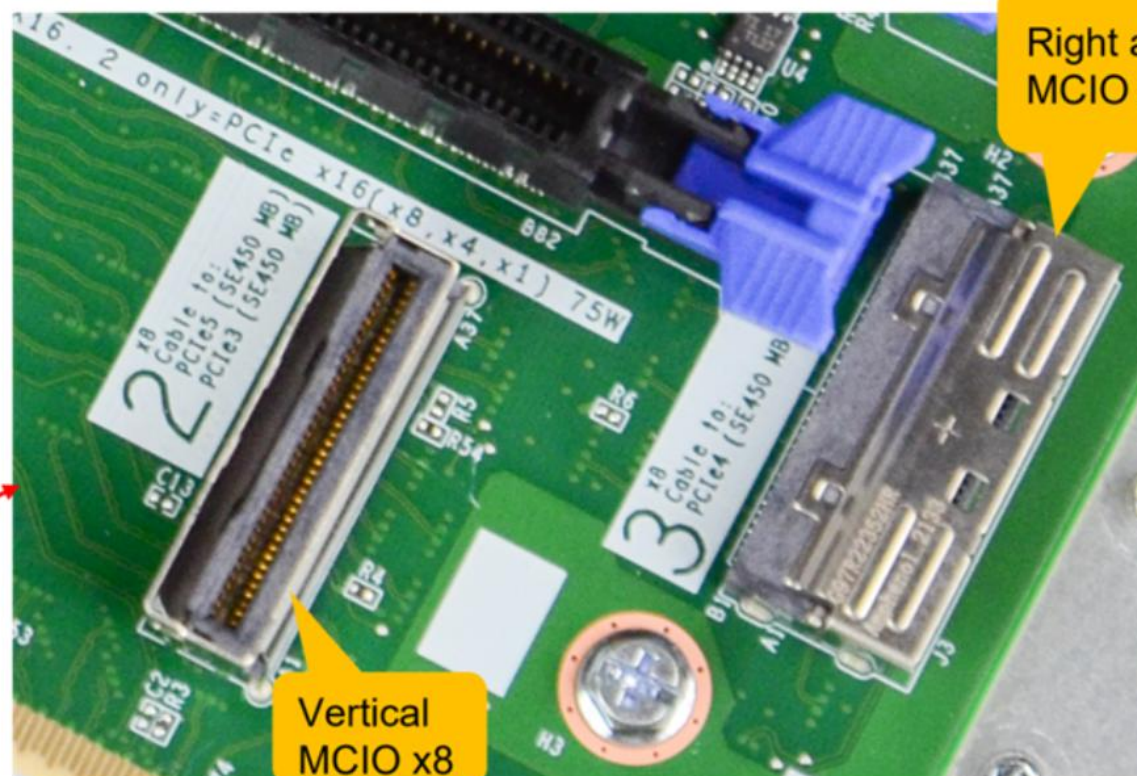
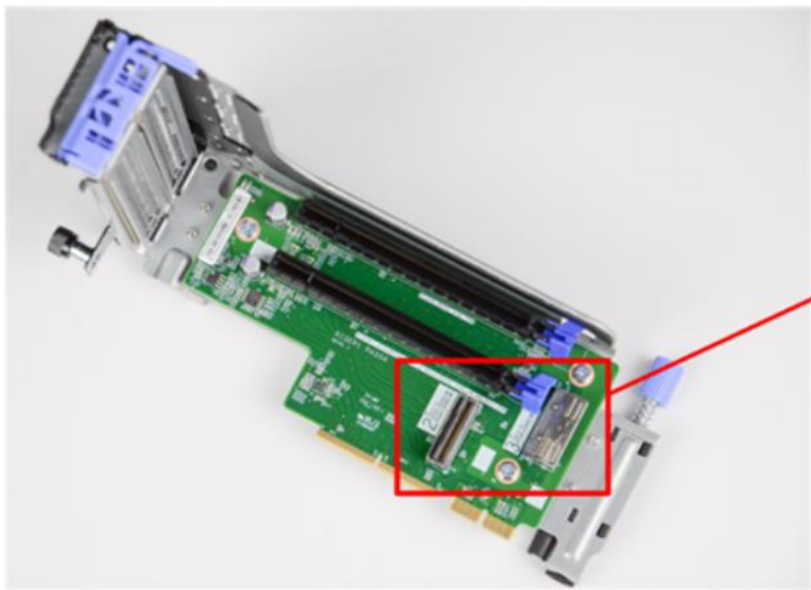
Simple-swap drive cage

## Riser 1 (left riser)

- Supports two x16 PCIe 4.0 slots
- Two MCIO (Mini Cool Edge IO) x8 connectors connecting to the planar



Riser 1 cage label



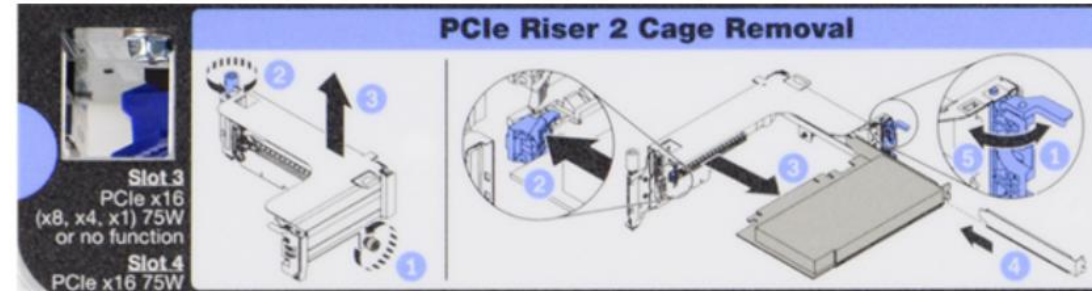
## Riser 2 (right riser)

- Supports two x16 PCIe 4.0 slots
- Two MCIO x8 connectors connecting to the planar

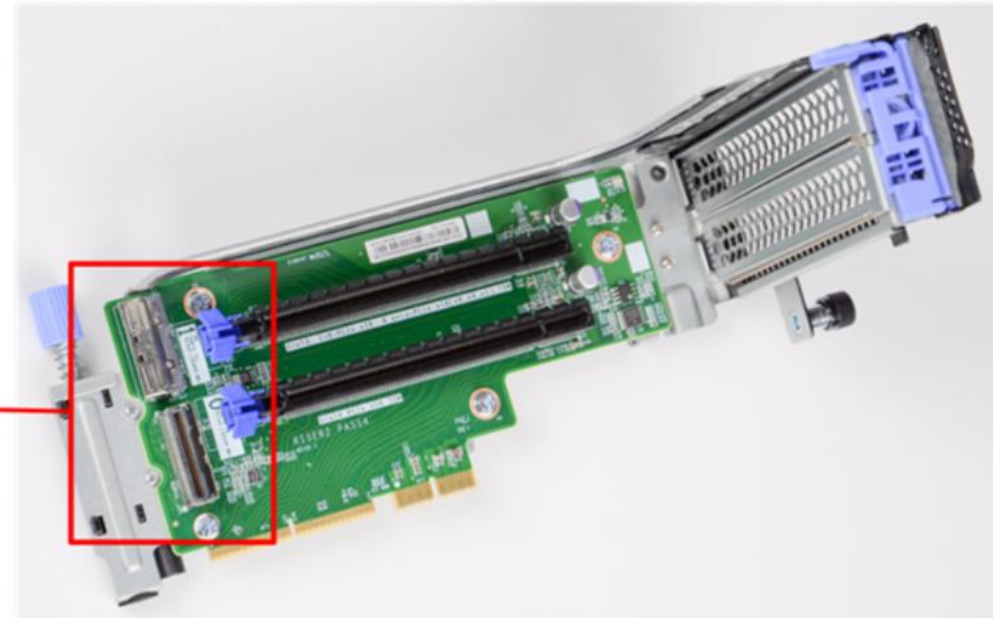
Right angle  
MCIO x8



Vertical  
MCIO x8

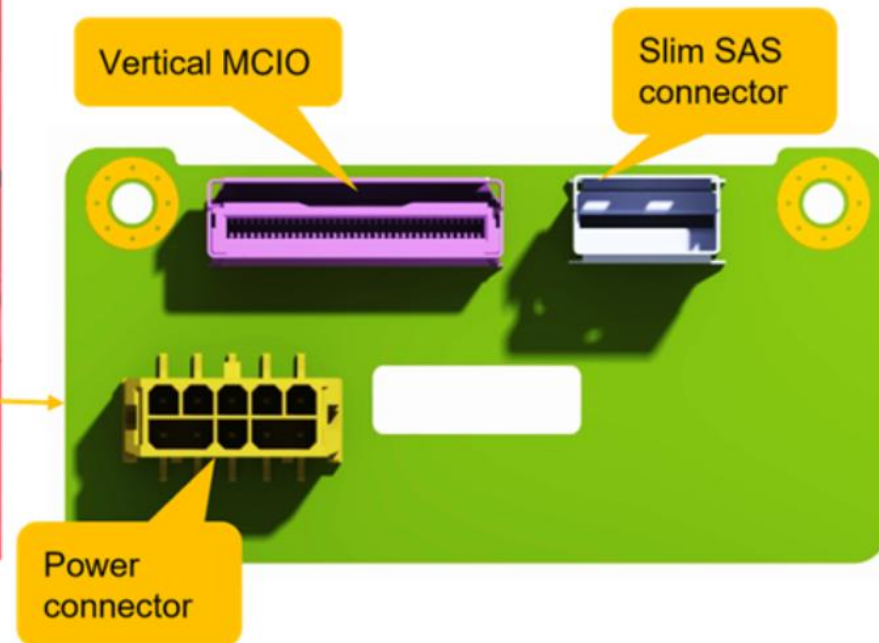
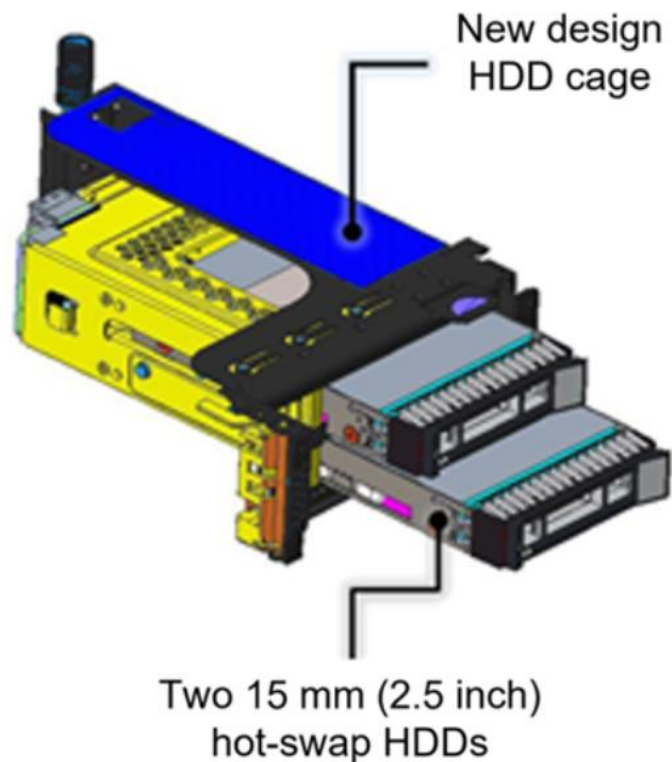


Riser 2 cage label



# AnyBay drive cage and HDD backplane

- Supports two AnyBay HDD slots
- When installed, it occupies the riser 2 slot location

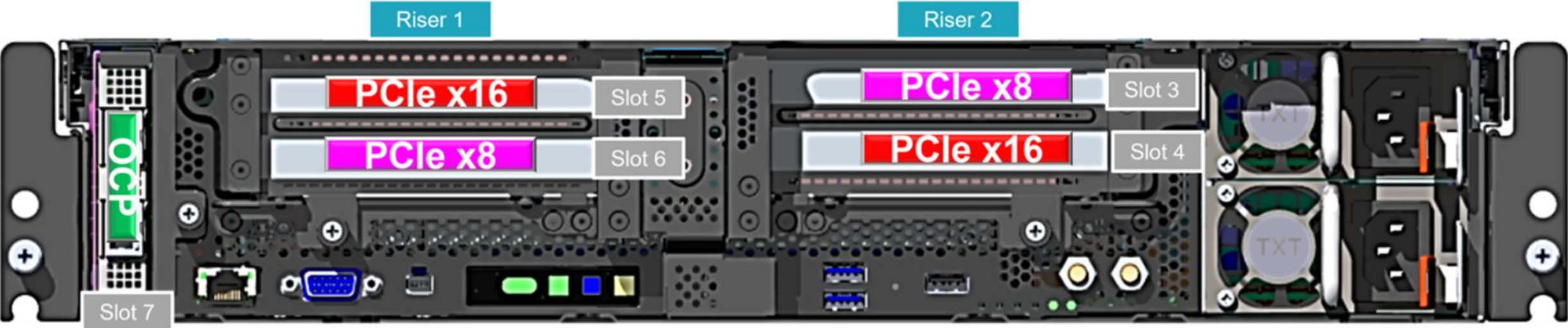


## PCIe and HDD configuration – 300 mm chassis

The 300 mm chassis supports six PCIe and HDD slots. These models are shipped by order and cannot be changed or upgraded in the field.

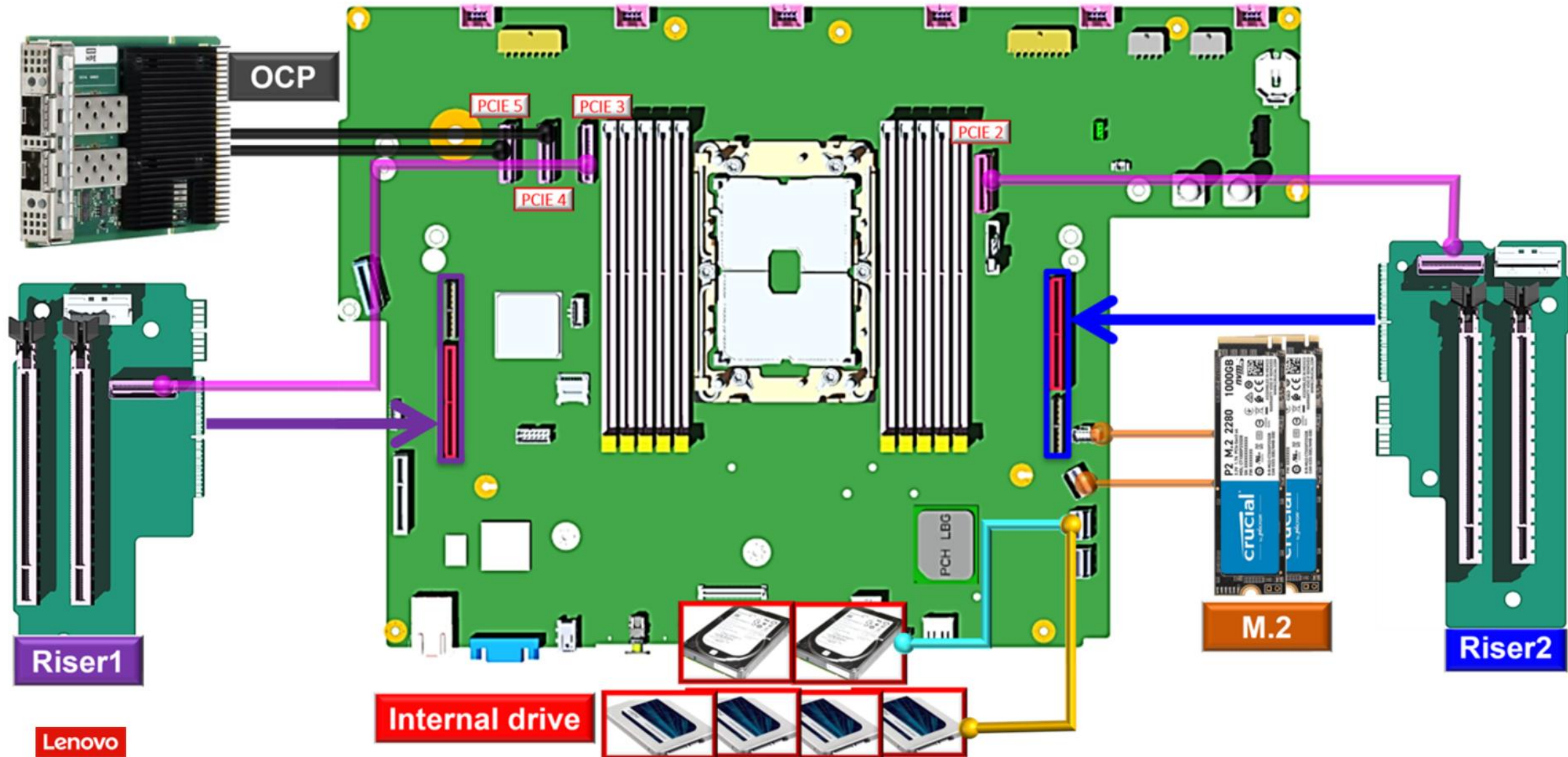
300 mm config	Riser 1		Riser 2		OCP	Front storage (occupies riser 2)	Internal storage	DW FL GPU	Description
	Slot 5	Slot 6	Slot 3	Slot 4					
1	X16	X8	X8	X16	X16	N/A	Two 15 mm or four 7 mm SAS/SATA drives	No	Basic configuration
2	X16	X16	X16	X16	N/A	N/A	Two 15 mm or four 7 mm SAS/SATA drives	No	Supports up to four x16 PCIe slots
3	X16	N/A	N/A	X16	X16	N/A	Two 15 mm or four 7 mm NVMe drives	No	Supports up to four internal 7 mm NVMe or two 15 mm NVMe drives
4	X16	X16	X8	X16	N/A	N/A	Two 15 mm NVMe drives	No	Supports up to two internal 15 mm NVMe drives
5	X16	N/A	N/A	N/A	X16	Two AnyBay drives	Two 15 mm NVMe drives or Two 15 mm or four 7 mm SATA drives	No	Storage configuration (No RAID/HBA support)
6	X16	X16	N/A	N/A	N/A	Two AnyBay drives	Two 15 mm NVMe drives or Two 15 mm or four 7 mm SATA drives	No	Storage configuration

# 300 mm configuration 1 – front view

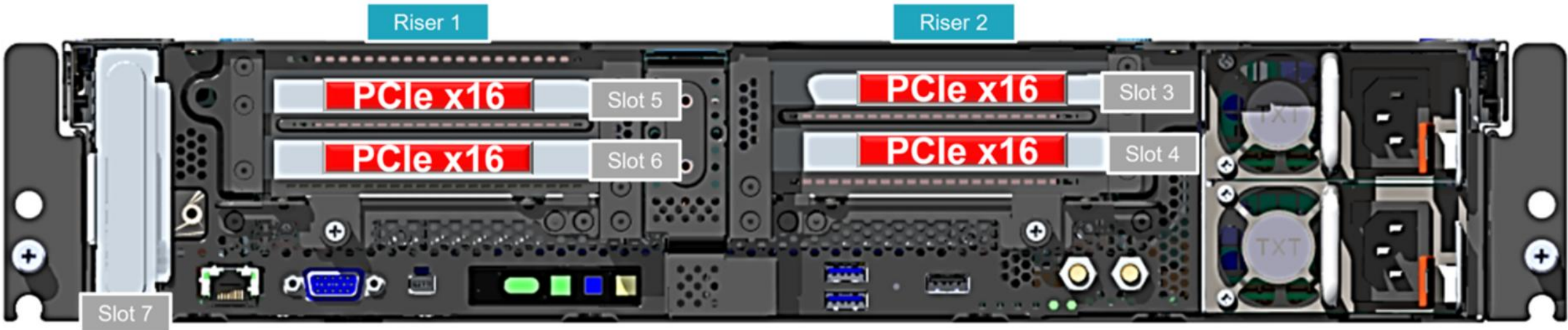


300 mm config	Riser 1		Riser 2		OCP	Front storage (occupies riser 2)	Internal storage	DW FL GPU	Description
	Slot 5	Slot 6	Slot 3	Slot 4					
1	X16	X8	X8	X16	X16	N/A	Two 15 mm or four 7 mm SAS/SATA drives	No	Basic configuration

## 300 mm configuration 1 – cable connections

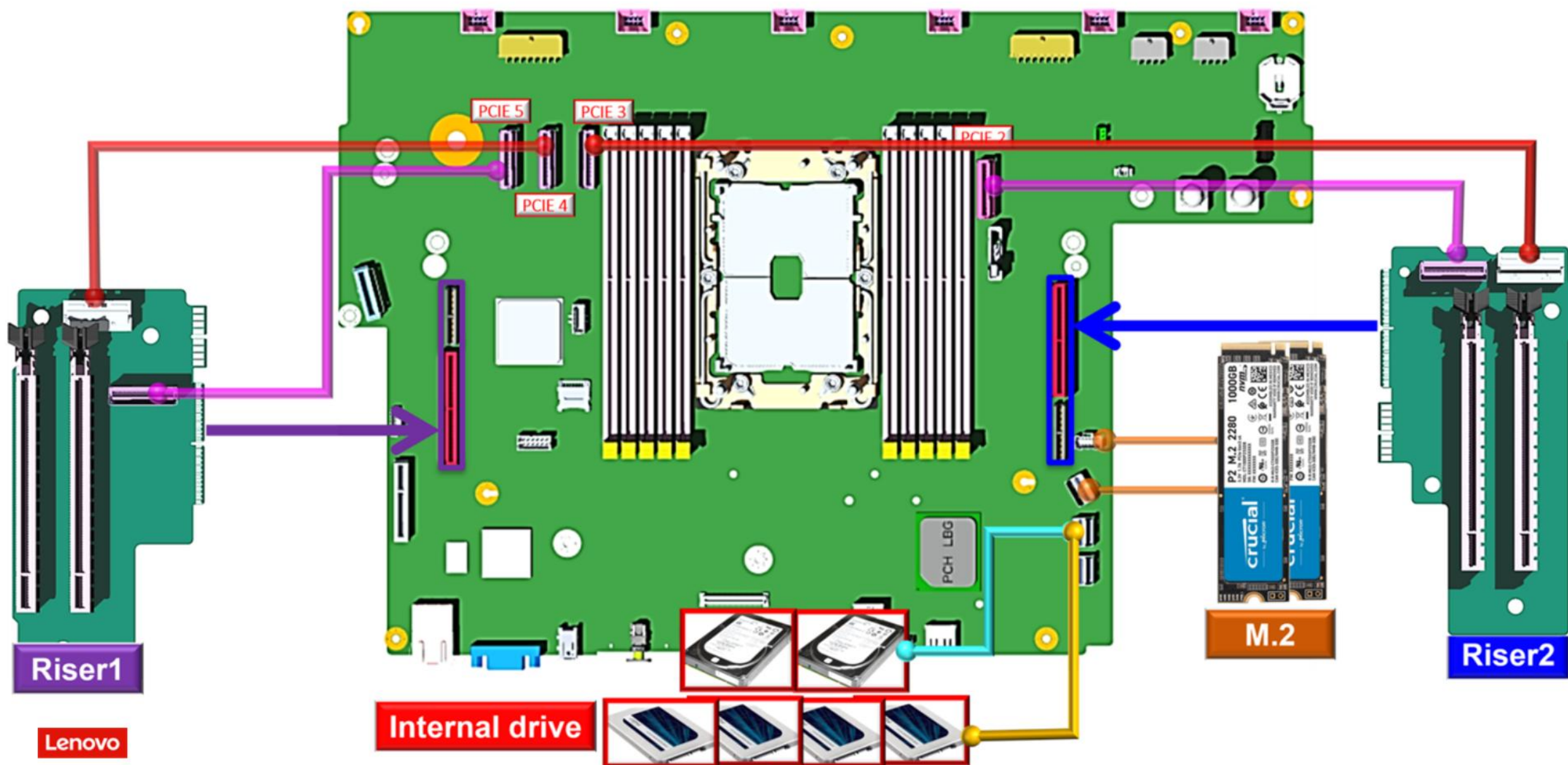


# 300 mm configuration 2 – front view

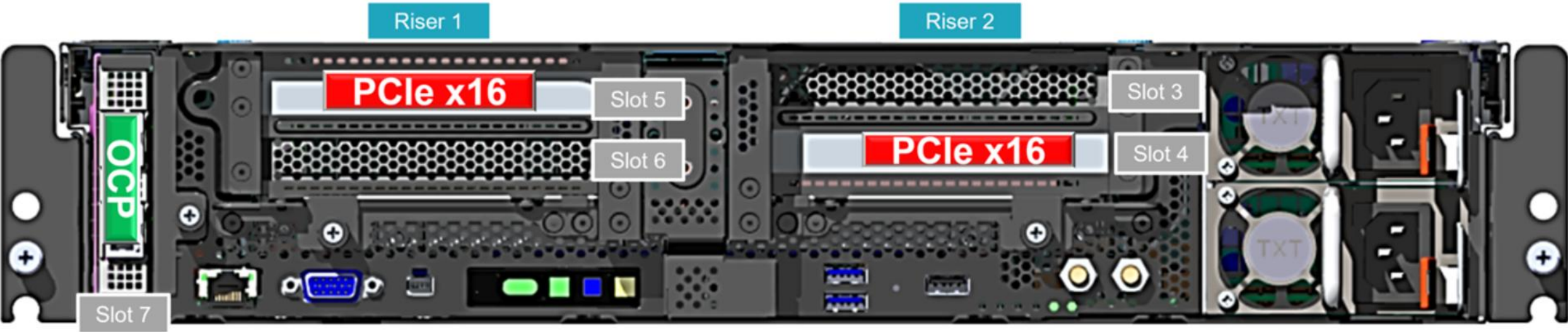


300 mm config	Riser 1		Riser 2		OCP	Front storage (occupies riser 2)	Internal storage	DW FL GPU	Description
	Slot 5	Slot 6	Slot 3	Slot 4					
2	X16	X16	X16	X16	N/A	N/A	Two 15 mm or four 7 mm SAS/SATA drives	No	Supports up to four x16 PCIe slots

## 300 mm configuration 2 – cable connections

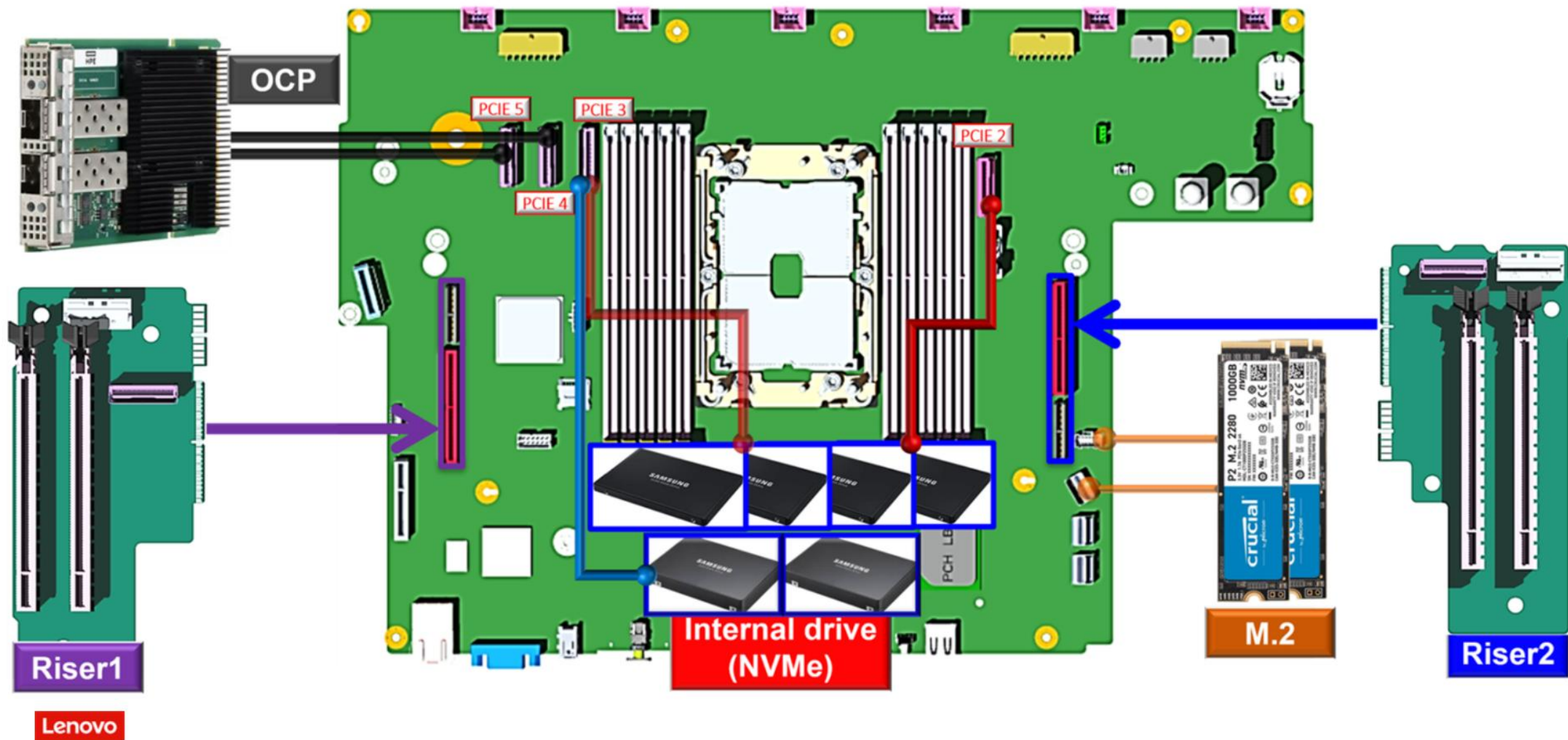


# 300 mm configuration 3 – front view

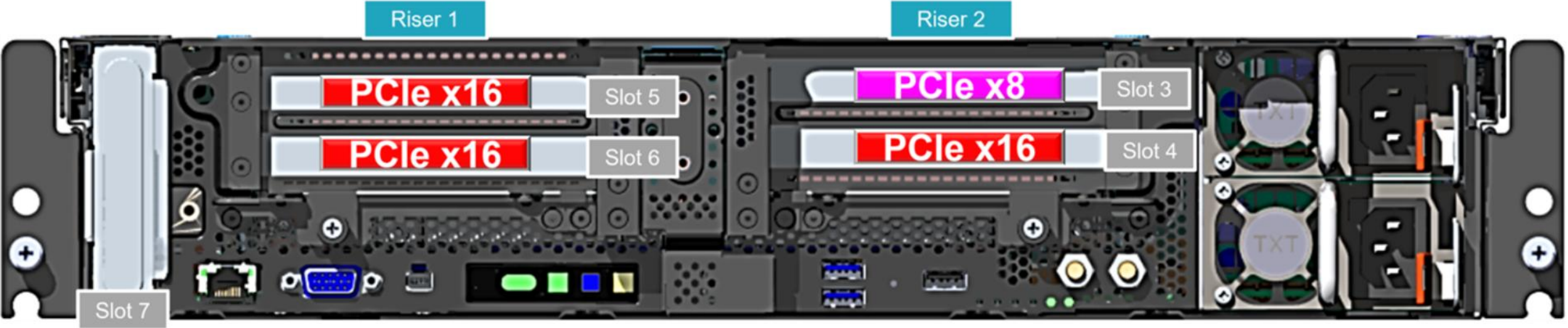


300 mm config	Riser 1		Riser 2		OCP	Front storage (occupies riser 2)	Internal storage	DW FL GPU	Description
	Slot 5	Slot 6	Slot 3	Slot 4					
3	X16	N/A	N/A	X16	X16	N/A	Two 15 mm or four 7 mm NVMe drives	No	Supports up to four internal 7 mm NVMe or two 15 mm NVMe drives

## 300 mm configuration 3 – cable connections

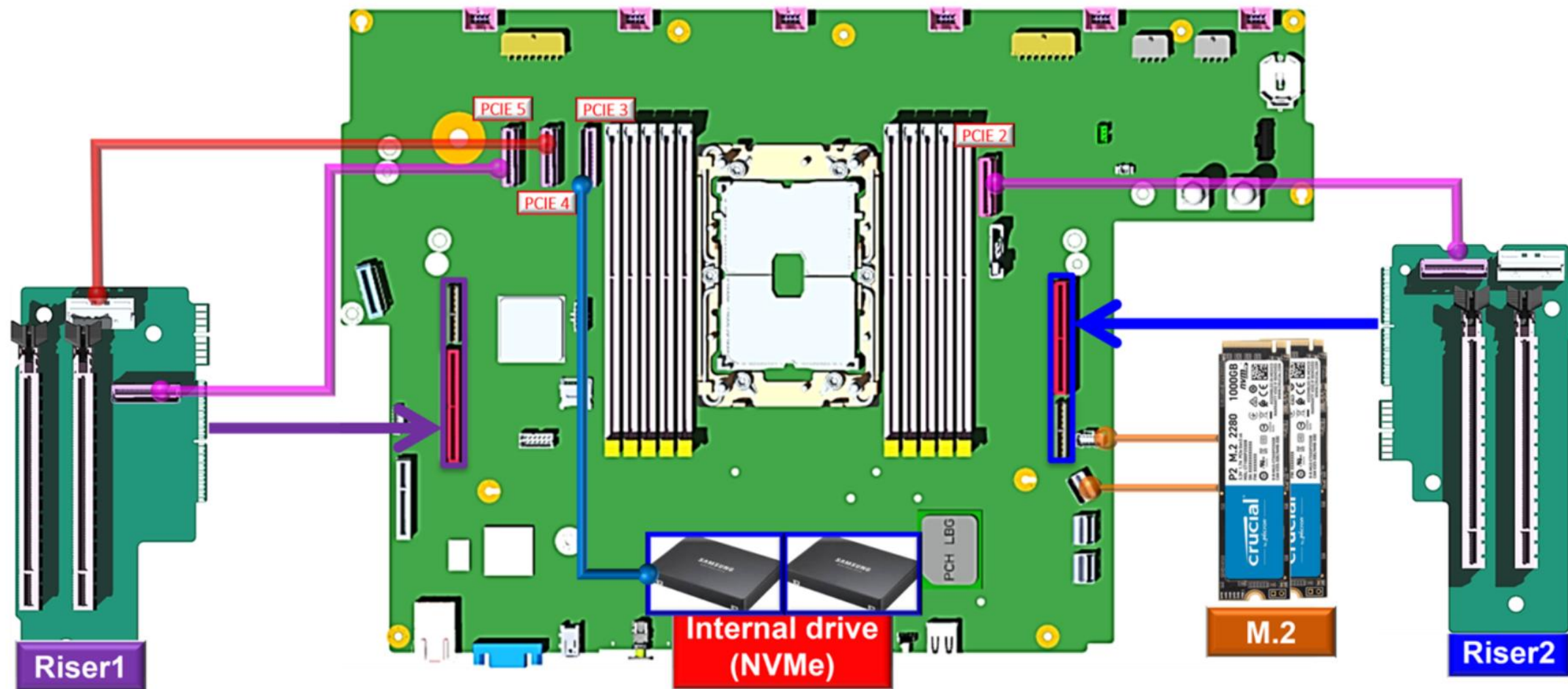


# 300 mm configuration 4 – front view



300 mm config	Riser 1		Riser 2		OCP	Front storage (occupies riser 2)	Internal storage	DW FL GPU	Description
	Slot 5	Slot 6	Slot 3	Slot 4					
4	X16	X16	X8	X16	N/A	N/A	Two 15 mm NVMe drives	No	Supports up to two internal 15 mm NVMe drives

## 300 mm configuration 4 – cable connections

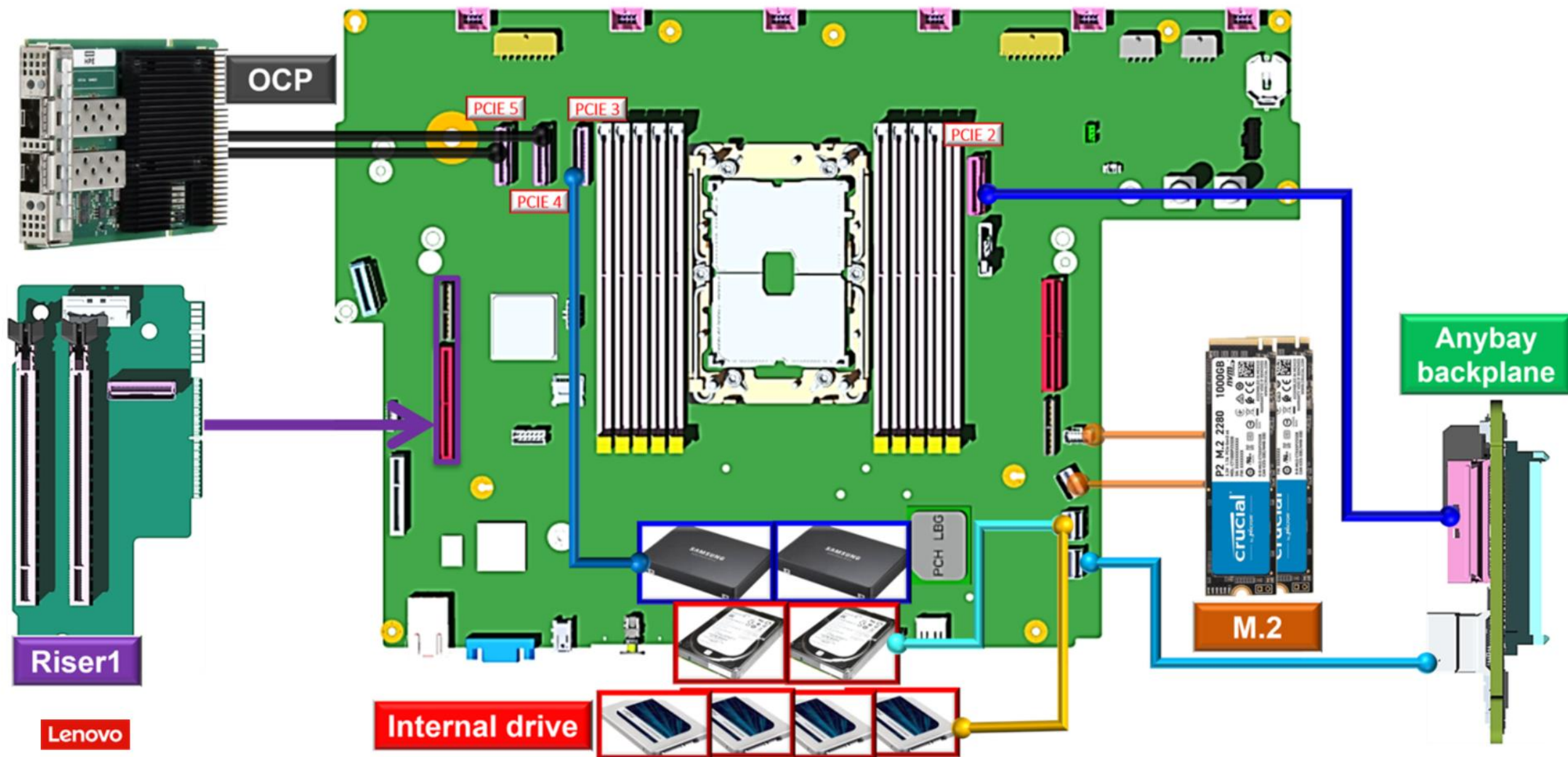


# 300 mm configuration 5 – front view



300 mm config	Riser 1		Riser 2		OCP	Front storage (occupies riser 2)	Internal storage	DW FL GPU	Description
	Slot 5	Slot 6	Slot 3	Slot 4					
5	X16	N/A	N/A	N/A	X16	Two AnyBay drives	Two 15 mm NVMe drives or Two 15 mm or four 7 mm SATA drives	No	Storage configuration (No RAID/HBA support)

## 300 mm configuration 5 – cable connections

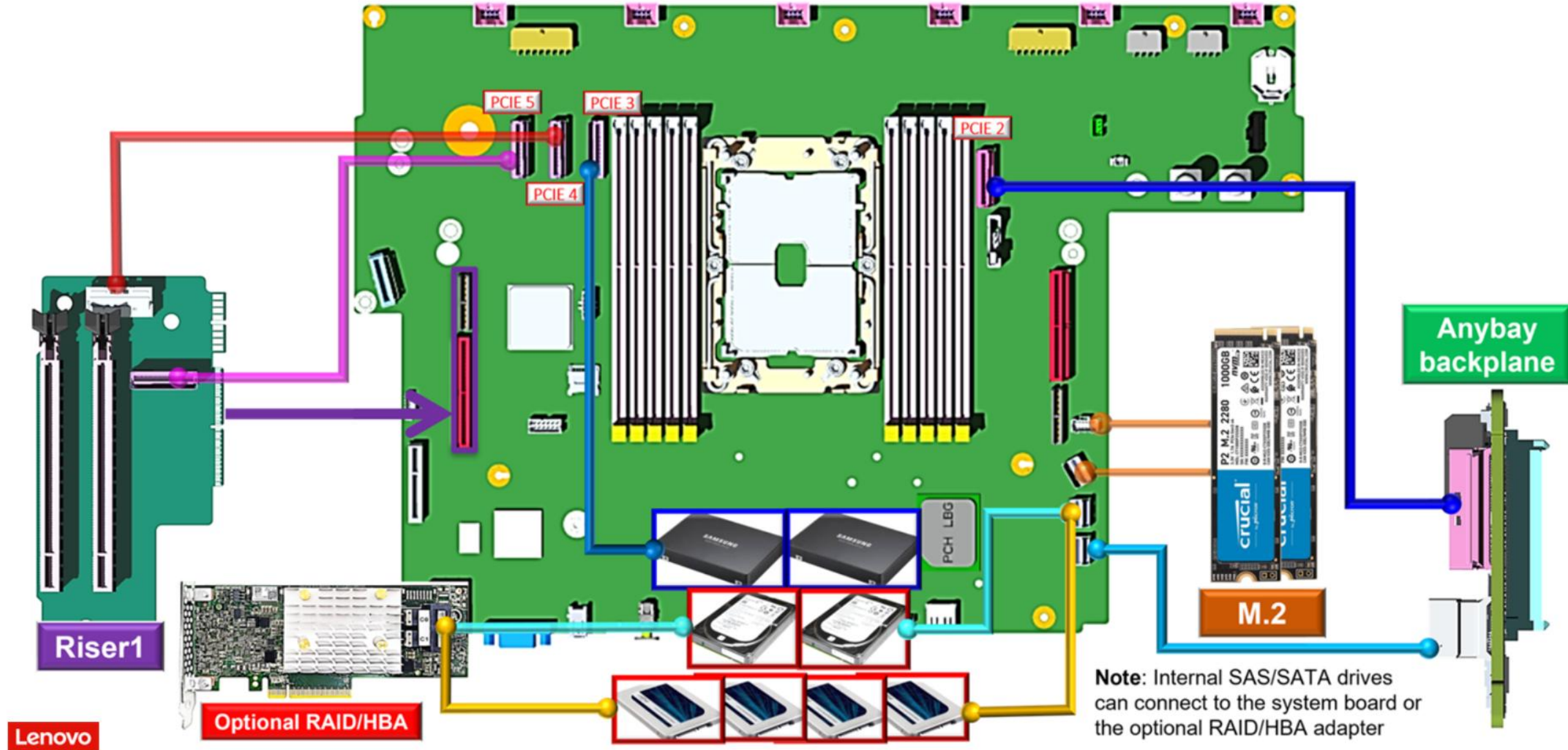


# 300 mm configuration 6 – front view



300 mm config	Riser 1		Riser 2		OCP	Front storage (occupies riser 2)	Internal storage	DW FL GPU	Description
	Slot 5	Slot 6	Slot 3	Slot 4					
6	X16	X16	N/A	N/A	N/A	Two AnyBay drives	Two 15 mm NVMe drives or Two 15 mm or four 7 mm SATA drives	No	Storage configuration

## 300 mm configuration 6 – cable connections



## PCIe and HDD configuration – 360 mm depth chassis

The 360 mm chassis supports two PCIe and HDD configurations. These models are shipped by order and cannot be changed or upgraded in the field.

360 mm config	Riser 1		Riser 2		OCP	Front storage (occupies riser 2)	Internal storage	DW FL GPU	Description
	Slot 5	Slot 6	Slot 3	Slot 4					
1	X16	N/A	N/A	X16	X16	N/A	Two 15 mm or four 7 mm NVMe/SATA drives	2	GPU configuration
2	X16	N/A	N/A	N/A	X16	Two AnyBay drives	Two 15 mm NVMe drives or Two 15 mm or four 7 mm SATA drives	1	GPU and storage configuration (No RAID/HBA support)

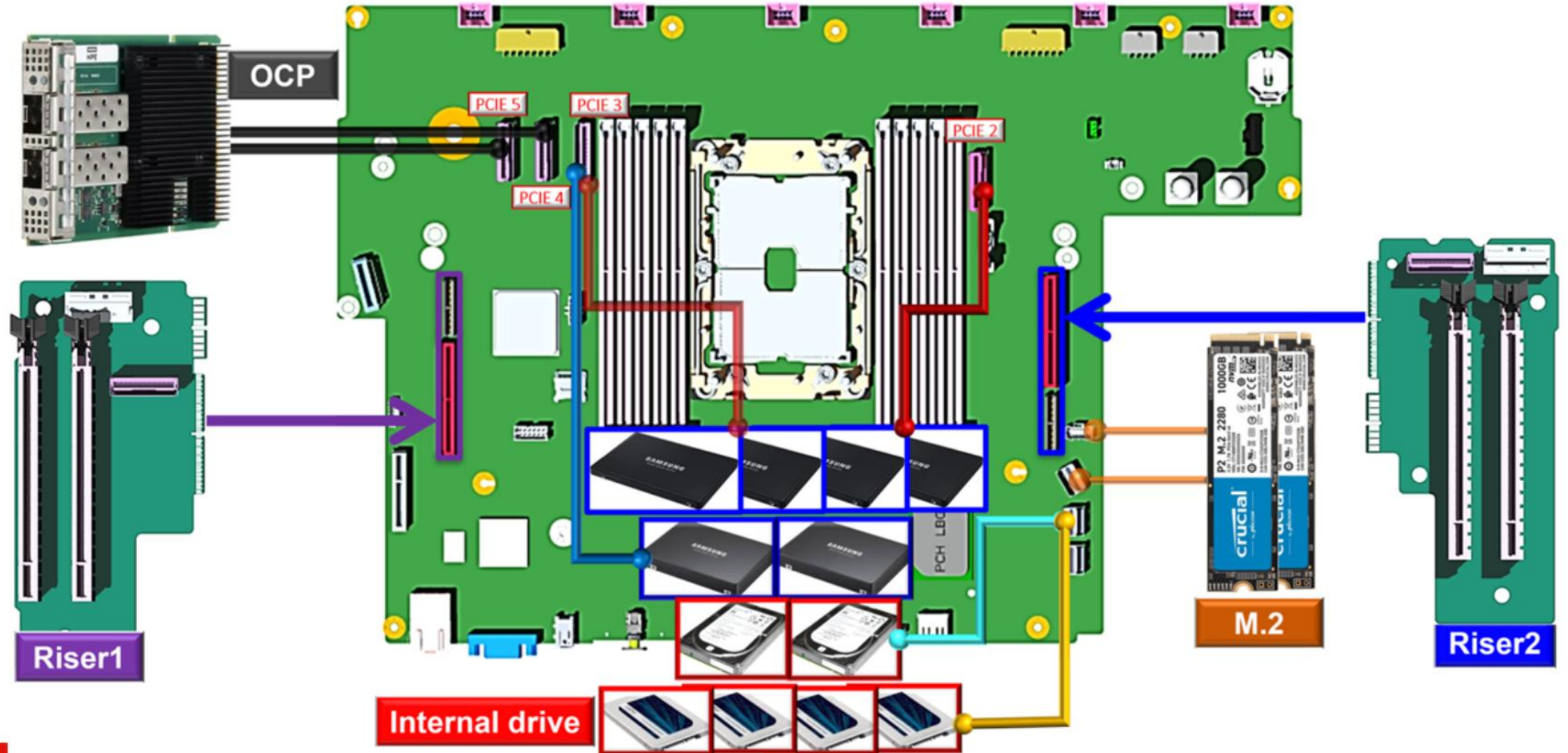
**Note:** Refer to the [ThinkEdge SE450 internal cable routing guide](#) for more information.

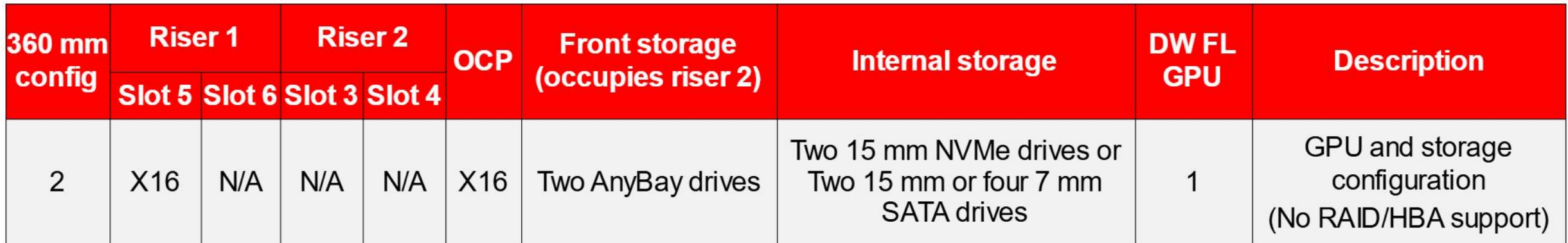
## 360 mm configuration 1 – front view



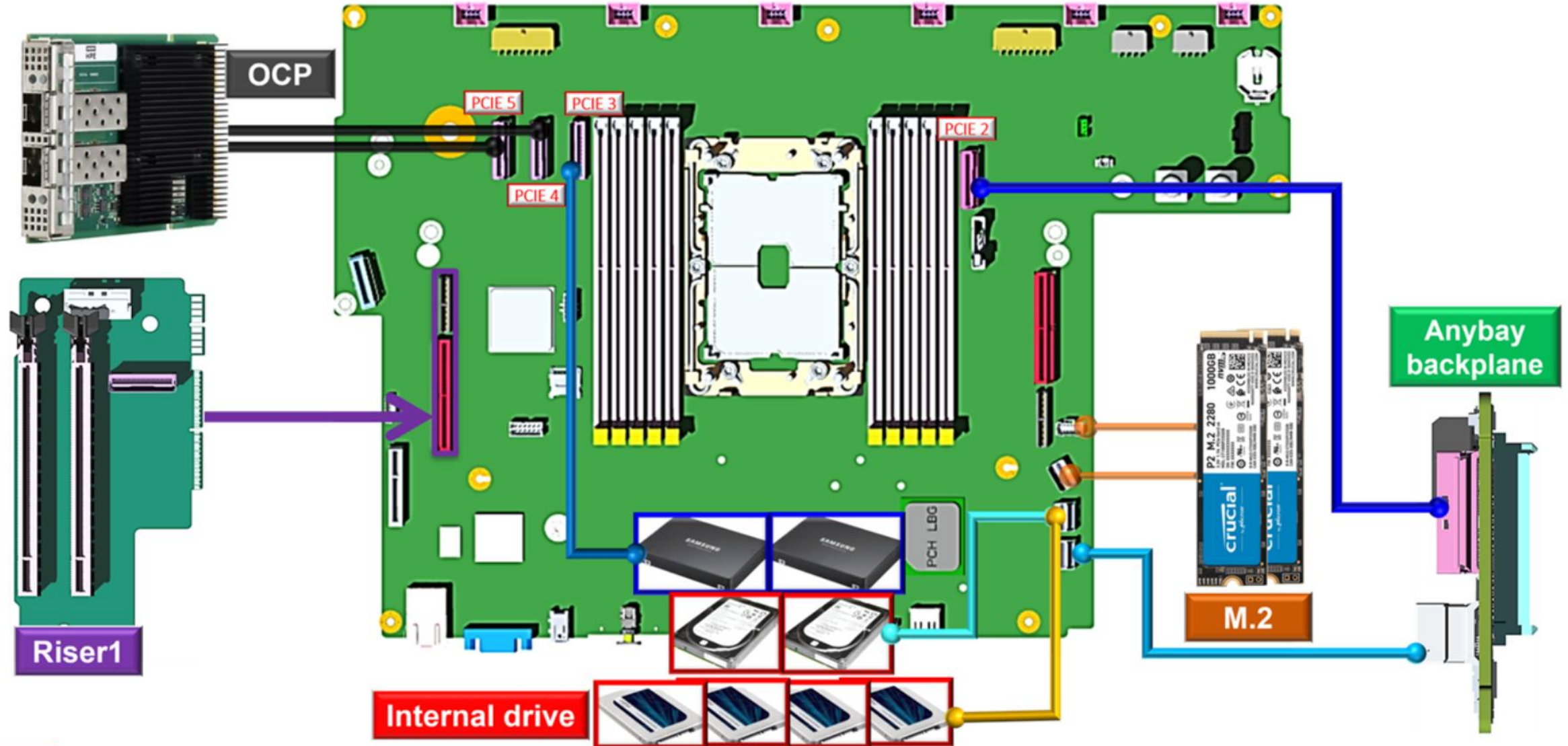
360 mm config	Riser 1		Riser 2		OCP	Front storage (occupies riser 2)	Internal storage	DW FL GPU	Description
	Slot 5	Slot 6	Slot 3	Slot 4					
1	X16	N/A	N/A	X16	X16	N/A	Two 15 mm or four 7 mm NVMe/SATA drives	2	GPU configuration

# 360 mm configuration 1 – cable connections





## 360 mm configuration 2 – cable connections



# PCIe adapter support

The SE450 supports both Full-Height Half-Length (FHHL) and Half-Height Half-Length (HHHL) PCIe adapters, but there are limitations depending on the heat sink used in the configuration.

Configuration		PCIe slot 3 x8/x16	PCIe slot 4 x16	PCIe slot 5 x16	PCIe slot 6 x8/x16
300 mm chassis	1U heat sink	FHHL	FHHL	FHHL	FHHL
	2U heat sink	HHHL	HHHL	FHHL	HHHL
360 mm chassis	1U heat sink	Not supported	*Full-Height 10.5-inch Length DW GPU	*Full-Height 10.5-inch Length DW GPU	Not supported
	2U heat sink	HHHL	HHHL	FHHL	HHHL
*The 360 mm chassis with a 1U heat sink supports PCIe adapters under 227 mm in length.					

