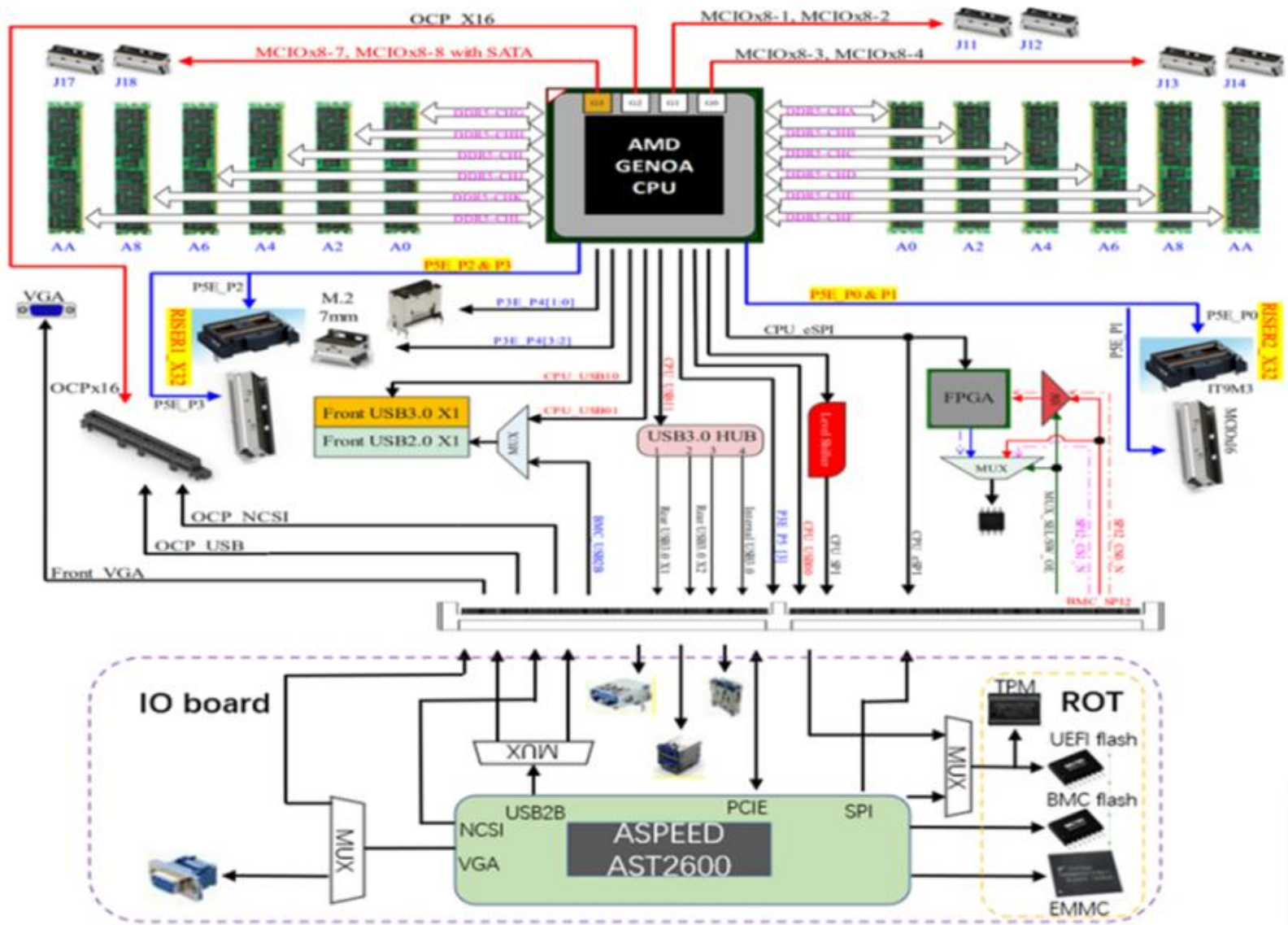
System configurations and diagrams

System block diagram and hardware configurations

Lenovo

Block diagram

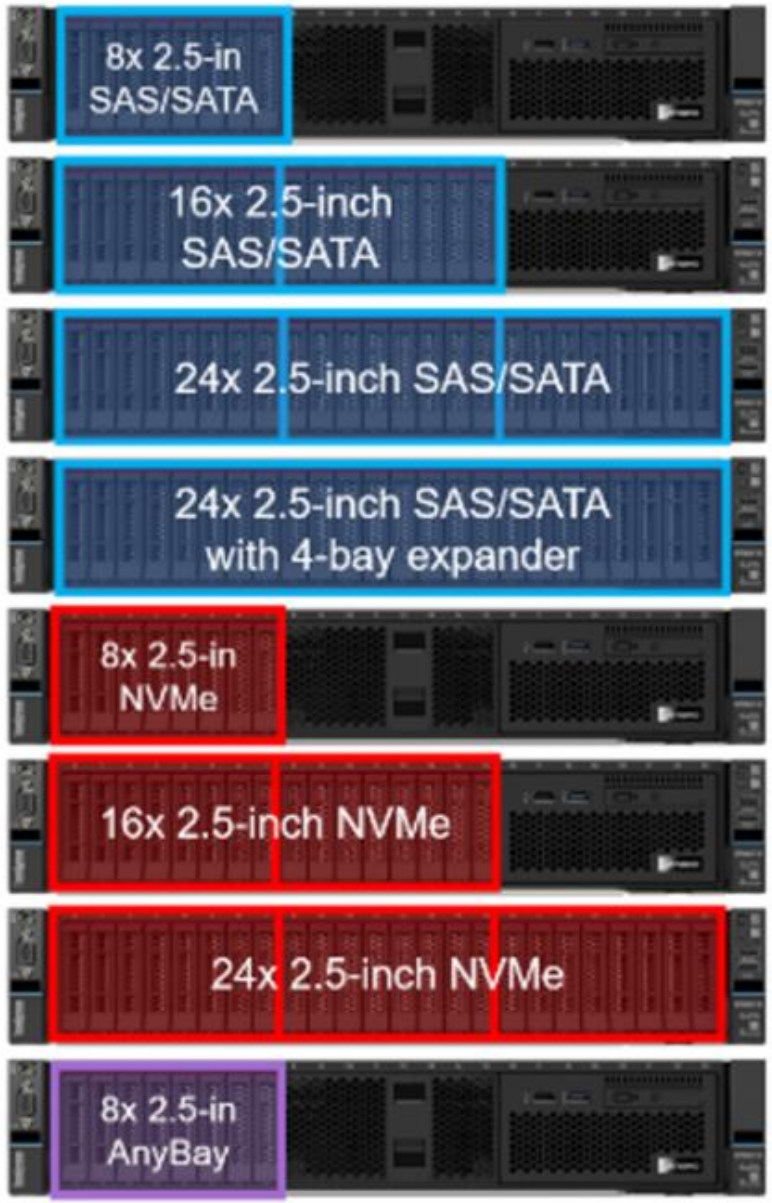


Front drive bay configurations -1

3.5-inch hot-swap drive bays

- No backplane and no drives (supports field upgrades)
- Eight 3.5-inch SAS/SATA
- 12 3.5-inch SAS/SATA
- 12 3.5-inch SAS/SATA with an attached SAS expander for four additional bays
- Eight 3.5-inch SAS/SATA + four 3.5-inch AnyBay
- Eight 3.5-inch SAS/SATA + four 3.5-inch NVMe

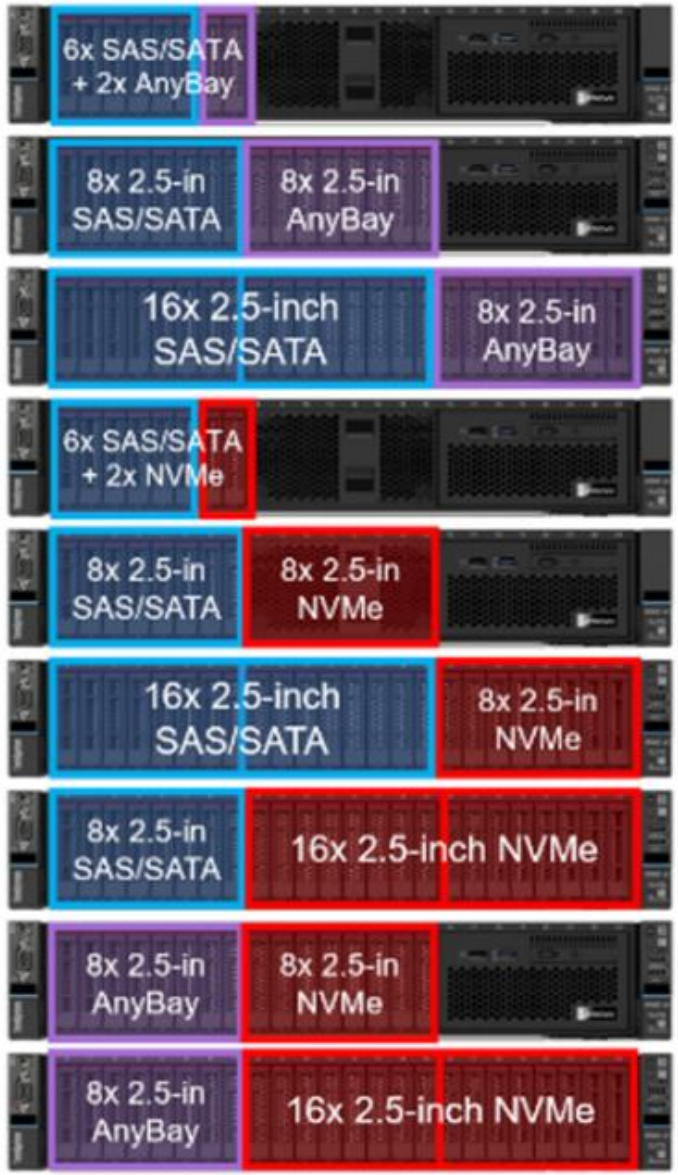
Front drive bay configurations -2



2.5-inch hot-swap drive bays – all drives have to be the same type

- Eight SAS/SATA
- 16 SAS/SATA
- 24 SAS/SATA
- 24 SAS/SATA with an attached SAS expander for four additional bays
- Eight NVMe
- 16 NVMe
- 24 NVMe
- Eight AnyBay

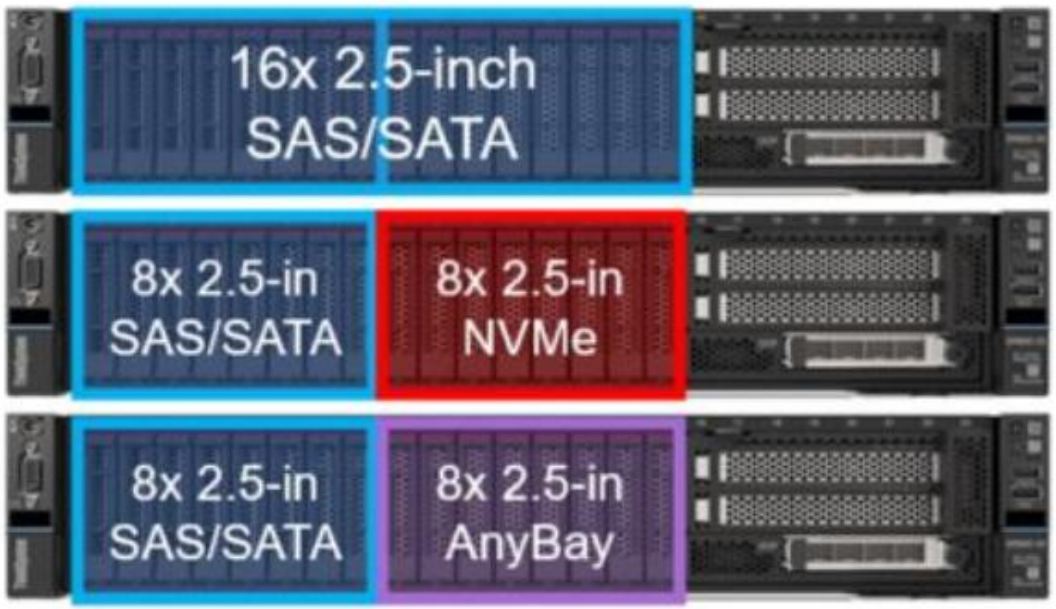
Front drive bay configurations -3



2.5-inch hot-swap drive bays – a combination of drive types

- Six SAS/SATA + two NVMe
- Eight SAS/SATA + eight AnyBay
- 16 SAS/SATA + eight AnyBay
- Six SAS/SATA + two AnyBay
- Eight SAS/SATA + eight NVMe
- 16 SAS/SATA + eight NVMe
- Eight SAS/SATA + 16 NVMe
- Eight AnyBay + eight NVMe
- Eight AnyBay + 16 NVMe

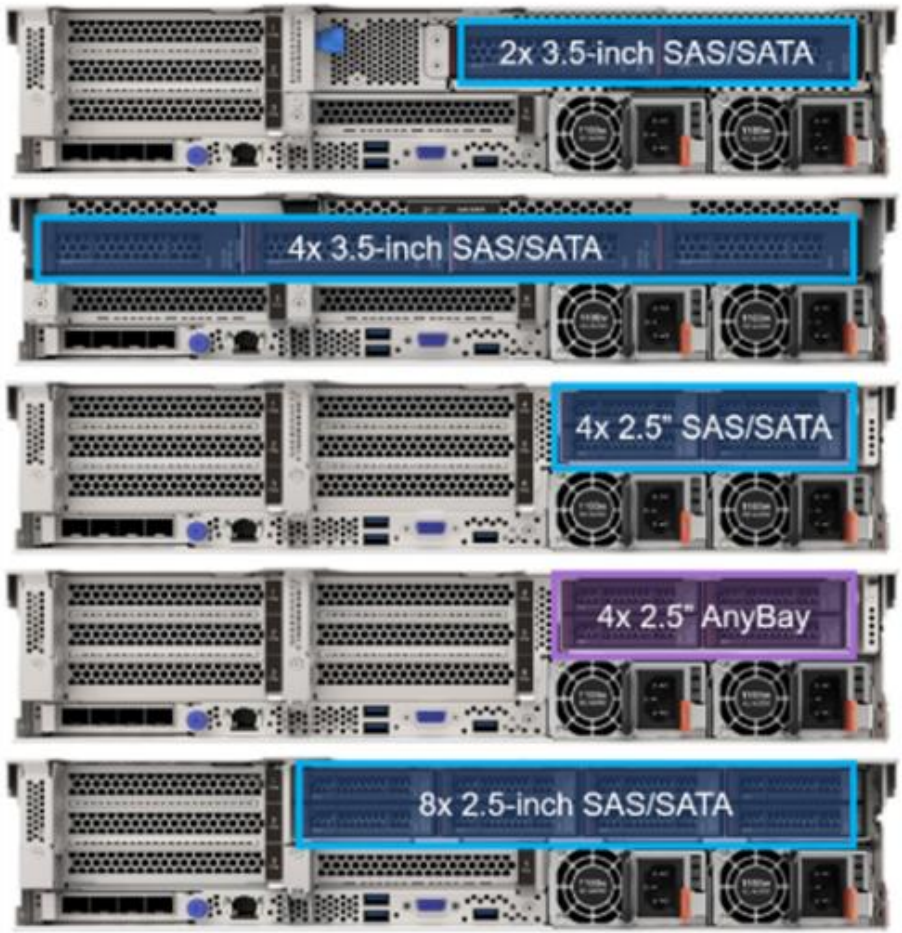
Front drive bay configurations -4



2.5-inch hot-swap drive bays – a combination of drive types with front PCIe slots

- 16 SAS/SATA
- Eight SAS/SATA + eight NVMe
- Eight SAS/SATA + eight AnyBay

Rear drive bay configurations



3.5-inch hot-swap drives
- Two SAS/SATA
- Four SAS/SATA

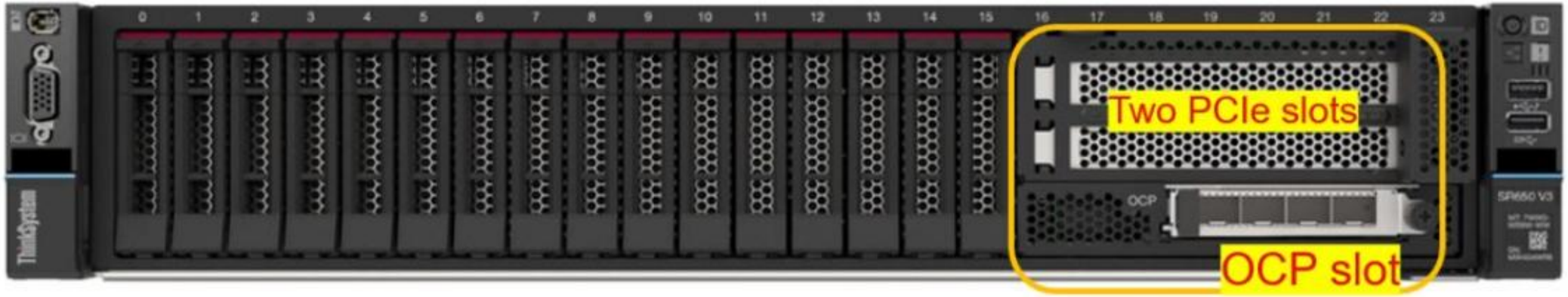
2.5-inch hot-swap drives
- Four SAS/SATA
- Four AnyBay
- Eight SAS/SATA

Front adapter cage

The SR655 V3 supports a front adapter cage, which includes two front-accessible PCIe slots plus a dedicated OCP 3.0 SFF slot for networking.

Front-accessible slots:

- Slot 11: PCIe 4.0 x16 FHHL (connects to CPU 2)
- Slot 12: PCIe 4.0 x16 FHHL (connects to CPU 1)

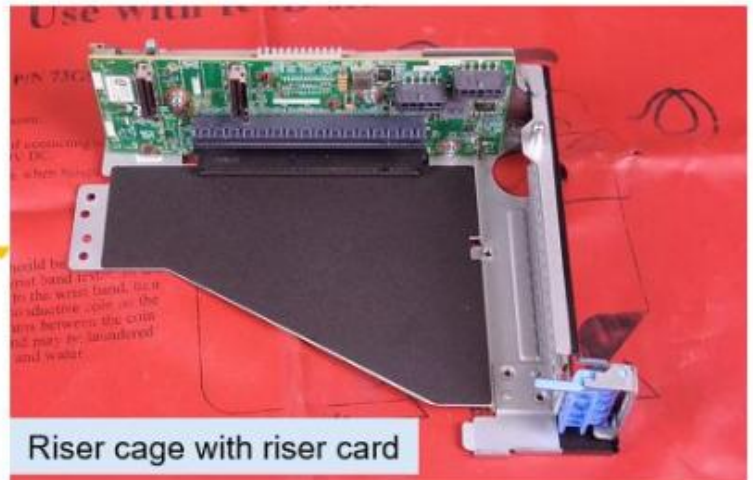


Front adapter cage

Front adapter cage components

The front adapter cage has the following components:

Front adapter cage



Riser cage with riser card

Bottom cage with front OCP interposer card

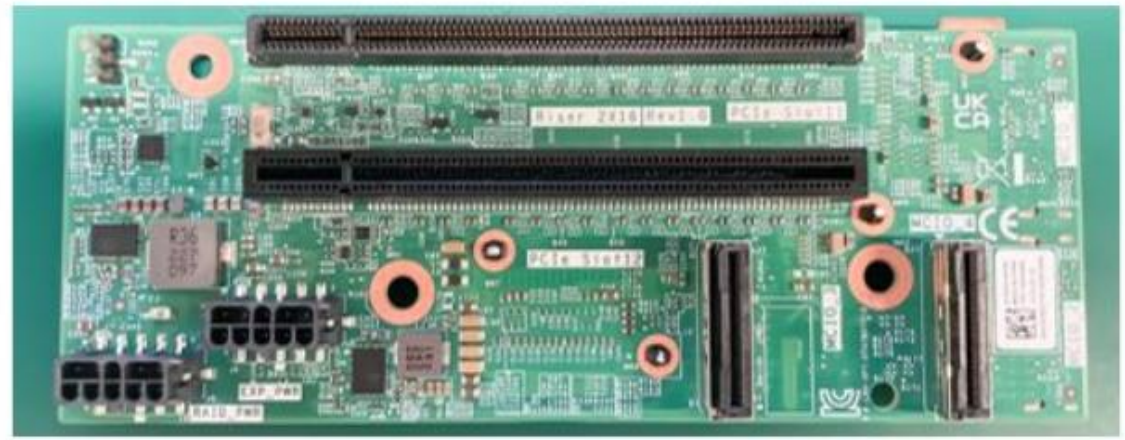
Front riser card and front OCP interposer card

Front OCP interposer card

Top view

Bottom view

Front riser card



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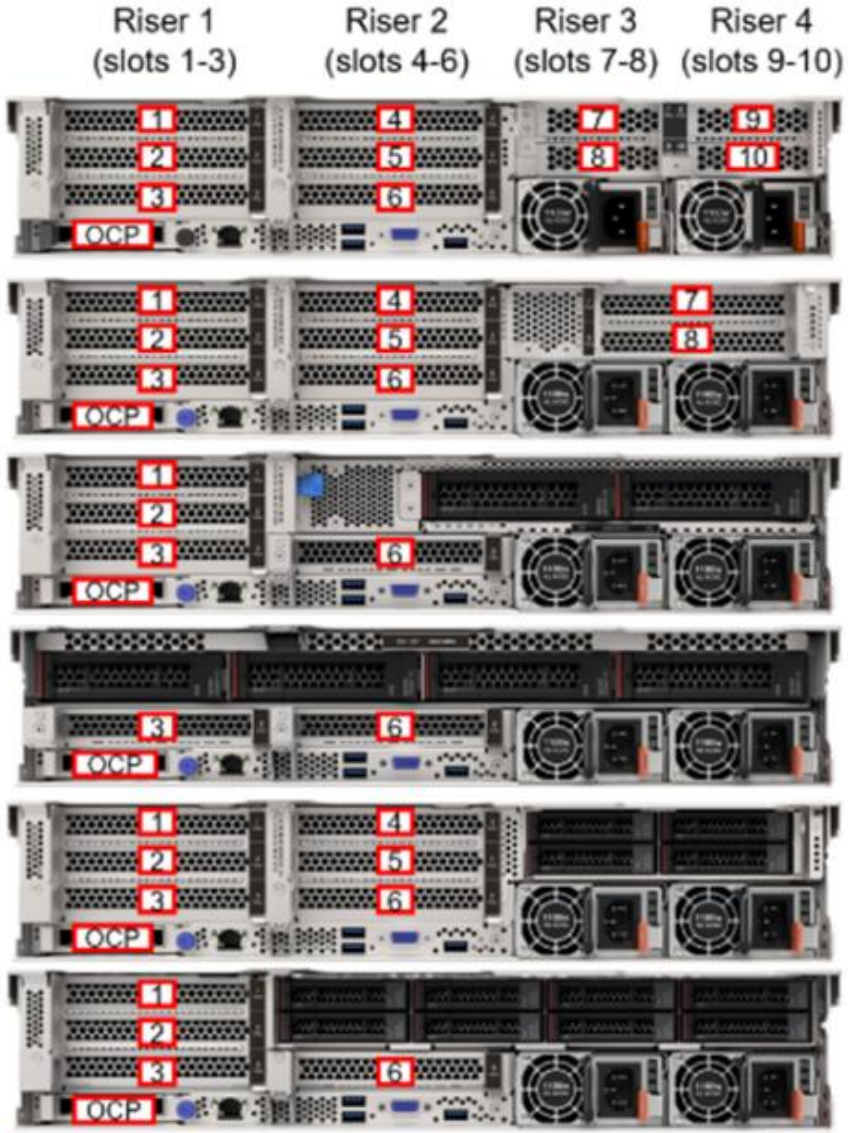
Rear-accessible slots



10 PCIe slots

Eight full-height PCIe slots

Four full-height PCIe slots + two 3.5-inch drives

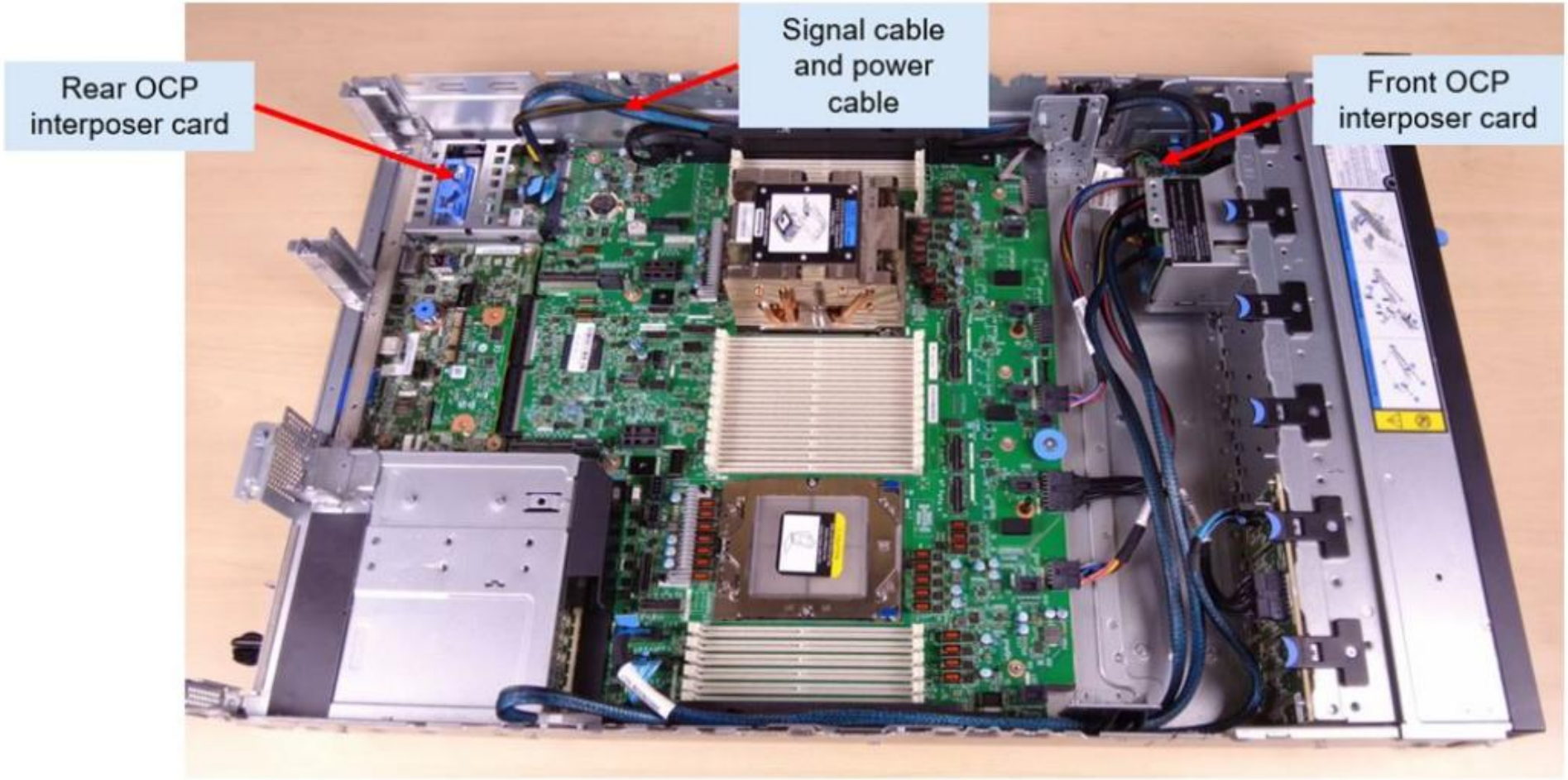
Two full-height PCIe slots + four 3.5-inch drives

Six full-height PCIe slots + four 2.5-inch drives

Four full-height PCIe slots + eight 2.5-inch drives

Rear OCP interposer card

The rear OCP adapter is installed in the rear OCP slot and is connected to cables to pass the signal and power to the front OCP interposer card, which means that an OCP adapter can be installed in the front.



Rear OCP interposer card location

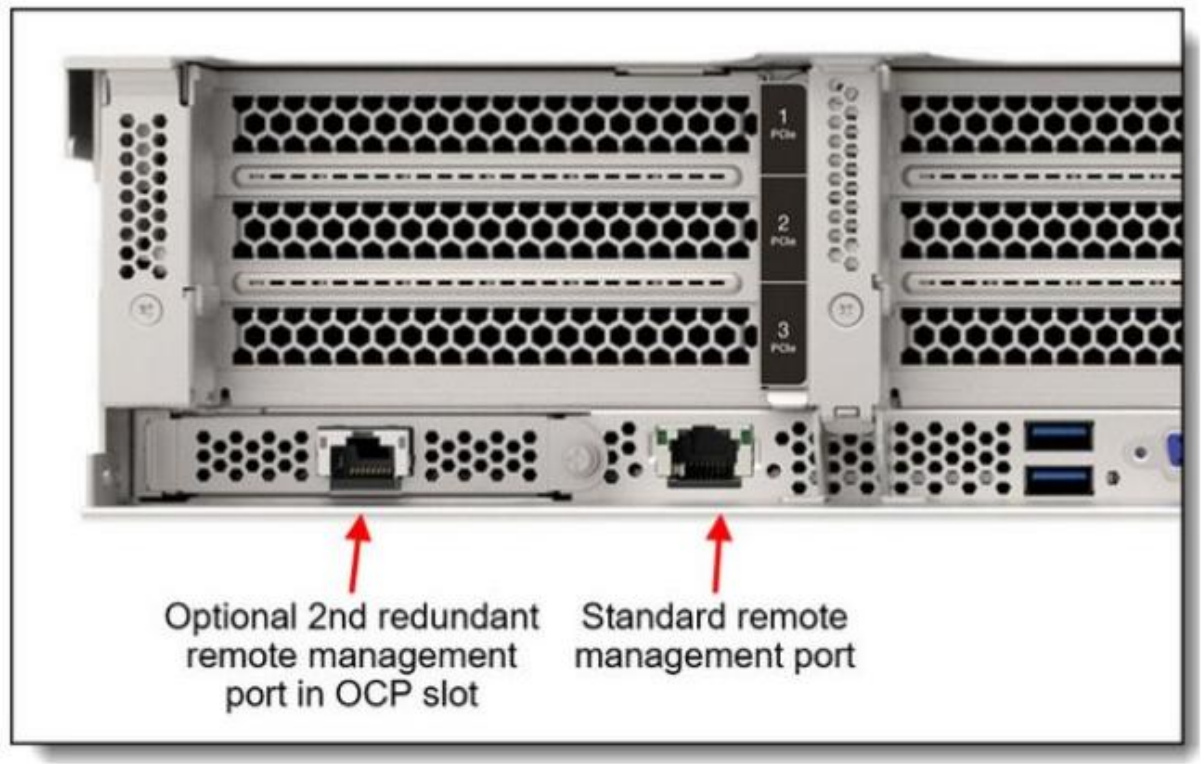
These figures show the rear OCP interposer card before and after being installed in the rear OCP slot.

Management NIC adapter

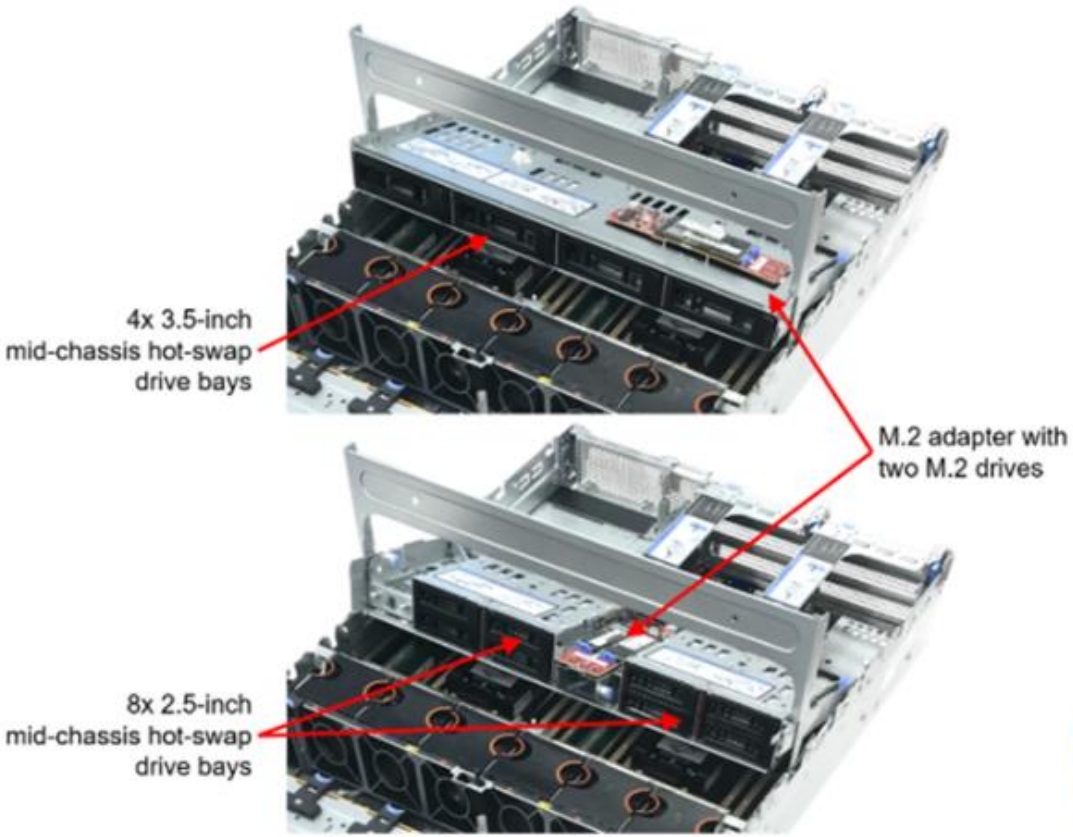
The use of this adapter allows for concurrent remote access using both the connection on the adapter and the onboard RJ45 (XCC) remote management port provided by the server. The adapter and onboard port have separate IP addresses.

Configuration rules:

- The management NIC adapter is installed in the OCP adapter slot at the rear of the server and cannot be used with any OCP network adapter.
- The management NIC adapter cannot be installed in the front OCP slot (if the front OCP slot is configured).
- If the management NIC adapter is installed in the rear slot, then the front OCP slot (if configured) cannot be used.



Mid drive bay configurations



The SR655 V3 supports hot-swap drives installed in the middle of the server chassis.

The following configurations are supported:

- Four 3.5-inch hot-swap SAS/SATA drive bays
- Eight 2.5-inch hot-swap SAS/SATA drive bays
- Four 2.5-inch hot-swap NVMe drive bays

M.2 support: When mid drive bays are configured, the M.2 adapter is installed on the mid drive bay mechanism.

7 mm drives

The SR655 V3 supports two 7 mm drives, either two SATA or two NVMe drives, at the rear of the server. These drives go in place of either PCIe slot 3 (Riser 1) or PCIe slot 6 (Riser 2).

2x 7mm SATA

2x 7mm NVMe

2x 7mm SATA

2x 7mm NVMe

- The 7 mm rear drive kit is supported in either slot 3 or slot 6, but not in both
- If RAID support is not required, the 7 mm drives connect to an onboard port
  No additional adapter is required
- Support for RAID-1 with the 7 mm drives requires an additional RAID adapter installed in PCIe slot 2
- RAID support for 7 mm SATA drives requires a RAID 5350-8i adapter
- RAID support for 7 mm NVMe drives requires a RAID 540-8i adapter operating in Tri-Mode
- The RAID adapter used for 7 mm drive support cannot be configured for use with other drive bays (not even with M.2 drives)
- M.2 RAID and 7 mm RAID are not supported together in the same configuration

M.2 drives

The SR655 V3 supports one or two M.2 form factor SATA or NVMe drives for use as an operating system boot solution or as additional storage.

The M.2 drives are installed into an M.2 module, which is mounted horizontally in the server:

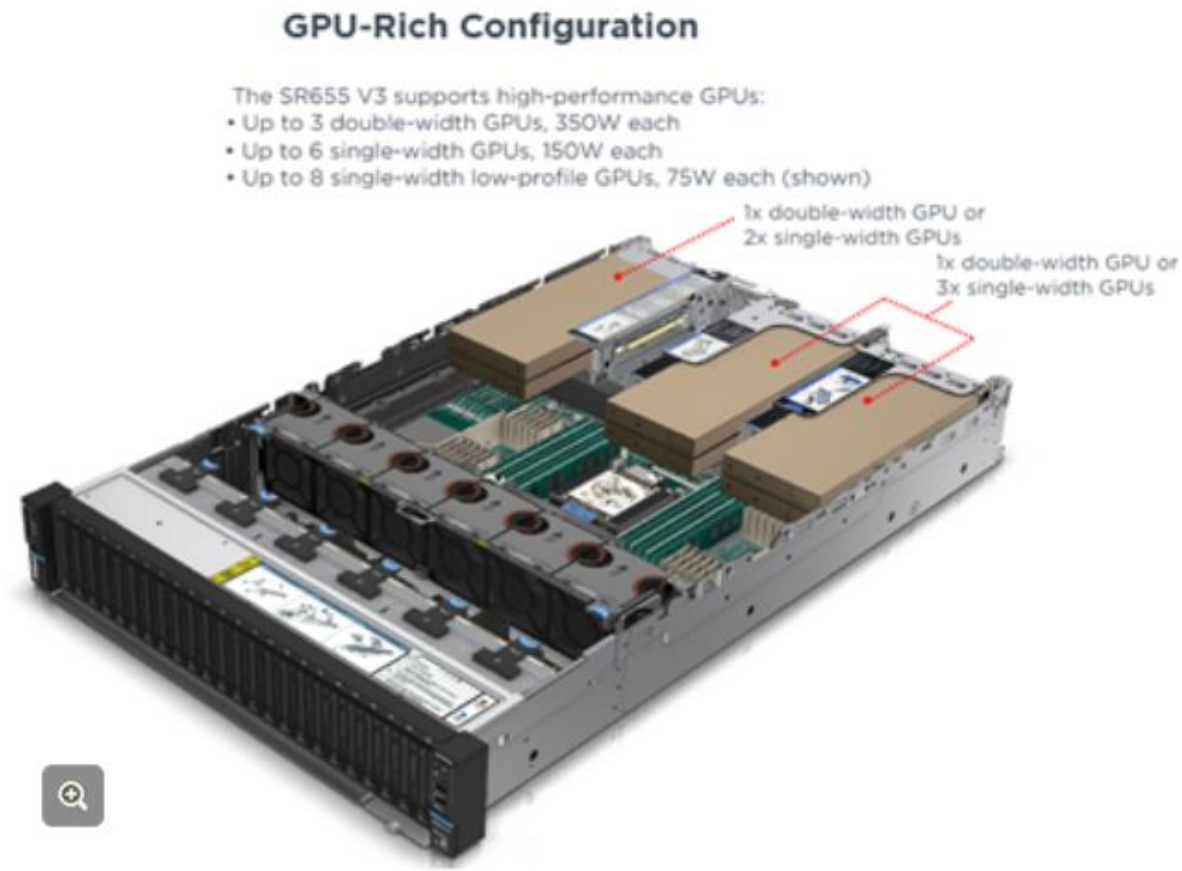
- In servers without mid-chassis drives, the M.2 module is mounted on the air baffle
- In servers with a mid-chassis drive cage (2.5-inch or 3.5-inch), the M.2 module is mounted on the drive cage, as shown on the Mid drive bay configurations page.
- If RAID support is not required, the M.2 adapter connects to an onboard port. No additional adapter is required
- Support for RAID-1 with M.2 drives requires an additional RAID adapter installed in PCIe slot 2
- RAID support for M.2 SATA drives requires a RAID 5350-8i adapter
- RAID support for M.2 NVMe drives requires a RAID 540-8i adapter operating in Tri-Mode
- The RAID adapter used for M.2 drive support cannot be configured for use with other drive bays (not even with 7 mm drives)
- M.2 RAID and 7 mm RAID are not supported together in the same configuration

Note: For more information about internal drive support, refer to the Internal storage section of the Lenovo Press Product Guide.

GPU adapter configuration rules

The following configuration requirements must be met when installing GPUs:

- All installed GPUs must be identical.
- When a double-width GPU is installed in slot 2, 5, or 7 with a double-width riser card, the adjacent slot (1, 4, or 8 respectively) will not be available.
- Flash storage adapters are not supported.
- Middle drive bays and rear drive bays are not supported.
- GPUs are not supported if CPUs with a TDP of more than 300 W are installed.
- When installing any full-length GPU as a field upgrade, the GPU Enablement Kit will also be needed. This kit is not required for the NVIDIA A2 GPU.



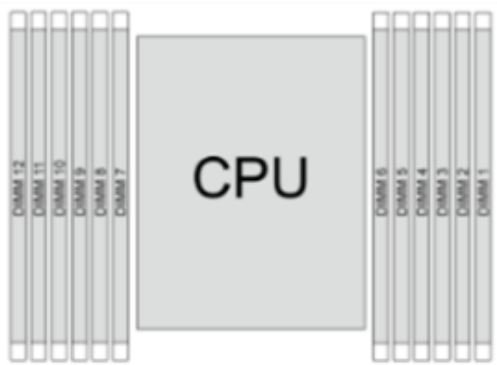
Note: For more information about supported GPU adapters and risers, refer to the GPU adapters section of the Lenovo Press Product Guide.

Memory module rules

The SR655 V3 has 12 memory slots and 12 channels – 12 channels per processor and one DIMM per channel. The SR655 V3 supports 16, 32, 64, or 128 GB TruDDR5 RDIMMs running at 4800 MT/s for a maximum memory capacity of 1.5 TB (twelve 128 GB RDIMMs).

Apply the following rules when installing DIMMs:

- Mixing DIMMs from different vendors is supported
- Mixing x4 and x8 DIMMs is not supported
- Only single rank and dual rank DIMM mixing is supported
- When installing DIMMs with different capacities, install the DIMM with the highest capacity first and follow the population sequence



Note: For a detailed memory installation sequence, refer to the ThinkSystem SR655 V3 User Guide on Lenovo Support.

System configuration limitations

Configuration	Limitations
3.5-inch drive configuration	CFF Raid HBA not supported
2.5-inch drive configuration	A configuration with 32 NVMe drives is supported (12 drives with onboard cables, four drives with retimer PCIe cards, and 16 drives with switch PCIe cards)
All configurations	• Support for one CFF RAID HBA and one CFF Expander • Riser 3/FIO/front OCP/CFF RAID/onboard NVMe/ onboard SATA support with the same connector (J11/J12/J13/J14/J17/J18)
Configurations with a middle bay or rear bay	GPU adapter not supported
Configurations without a middle or rear bay, Riser 3, or GPU; with a CPU TDP of less than or equal to 300 W; and with fewer than 12 3.5-inch or 24 2.5-inch drives	Use four fans, but fan failure in one of the four 6038/6056 fans is not supported
All configurations	Windows 10 does not support CPUs with more than 64 cores

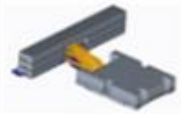
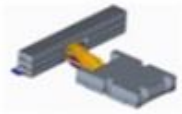
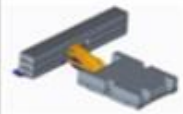
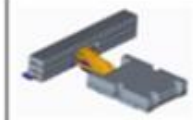
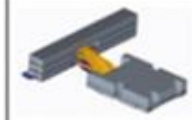
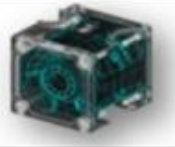
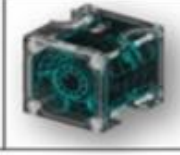
System thermal limitations (Standard configuration)

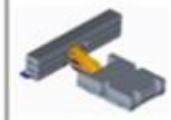
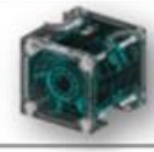
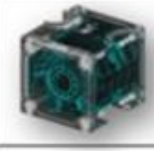
Standard Config.			
Chassis	8x2.5'		
Airduct	STD Airduct		
Max. Amb. Support	35	35	30
Genoa CPU	Group B (200~240)	Group A (260~300)	Group E (320~400)
Heatsink	2U STD HS	2U STD HS	2U Perf HS
Fan	STD Fan 6038*6	Performance 6056*6	

Standard Config.			
Chassis	16x2.5'/8x3.5'		
Airduct	STD Airduct		
Max. Amb. Support	35	35	25
Genoa CPU	Group B (200~240)	Group A (260~300)	Group E (320~400)
Heatsink	2U STD HS	2U STD HS	2U Perf HS
Fan	STD Fan 6038*6	Performance 6056*6	

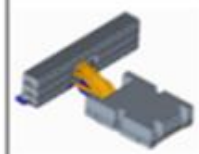
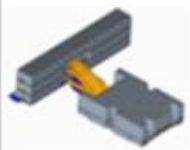
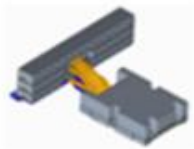
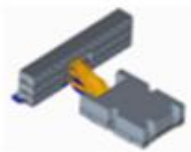
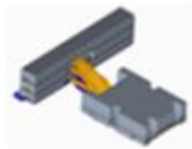
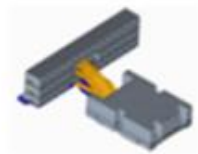
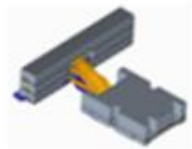
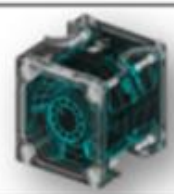
Standard Config.		
Chassis	8x2.5/16x2.5'_Without Riser 3	
Airduct	STD Airduct	
Max. Amb. Support	30	30
Genoa CPU	Group B (200~240)	Group A (260~300)
Heatsink	2U STD HS	2U Perf HS
Fan	STD Fan 6038*4	Performance 6056*4

System thermal limitations (Storage configuration)

Storage Config.							
Front	24x2.5"	24x2.5"	24x2.5"	24x2.5"	24x2.5"	24x2.5"	24x2.5"
Mid	/	/	/	8x2.5"Anybay	/	8x2.5"Anybay	8x2.5"Anybay
Rear	/	/	/	/	4x2.5"	4x2.5"	4x2.5"
Airduct	No						
Max. Amb. Support	30	30	25	30	30	30	25
Genoa CPU	Group B (200~240)	Group A (260~300)	Group E (320~400) Only Specific Type	Group A (260~300)	Group A (260~300)	Group B (200~240)	Group A (260~300)
Heatsink	2U STD HS	2U Perf HS	2U Perf HS	2U Perf HS	2U Perf HS	2U Perf HS	2U Perf HS
							
Fan	STD Fan 6038	Performance 6056	Performance 6056	Performance 6056	Performance 6056	Performance 6056	Performance 6056
							

Storage Config.							
Front	12x3.5"	12x3.5"	12x3.5"	12x3.5"	12x3.5"	12x3.5"	12x3.5"
Mid	/	/	/	4x3.5"	/	4x3.5"	4x3.5"
Rear	/	/	/	/	4x2.5"/4x3.5"	4x2.5"/4x3.5"	4x2.5"/4x3.5"
Airduct	No						
Max. Amb. Support	30	30	25	30	30	30	25
Genoa CPU	Group B (200~240)	Group A (260~300)	Group E (320~400) Only Specific Type	Group A (260~300)	Group A (260~300)	Group B (200~240)	Group A (260~300)
Heatsink	2U STD HS	2U Perf HS	2U Perf HS	2U Perf HS	2U Perf HS	2U Perf HS	2U Perf HS
							
Fan	Performance 6056	Performance 6056	Performance 6056	Performance 6056	Performance 6056	Performance 6056	Performance 6056
							

System thermal limitations (GPU configuration)

GPU Config.								
Chassis	8x2.5"/16x2.5"/8x3.5'				8x2.5"/16x2.5"/8x3.5'		24x2.5"	
	Rear GPU				Rear GPU		Rear GPU	
	40W *8pcs or 75W *8pcs		150W SW *6pcs or 250W/300W/350W DW *3pcs		40W *6pcs or 75W *6pcs	150W SW *4pcs or 250W/300W DW *2pcs	40W *6pcs or 75W *6pcs	150W SW *4pcs or 250W/300W DW *2pcs
Airduct	STD Airduct		GPU Airduct		STD Airduct	GPU Airduct	STD Airduct	GPU Airduct
								
Max. Amb. Support	30	30	30	30	25	25	25	25
Genoa CPU	Group B (200~240)	Group A (260~300)	Group B (200~240)	Group A (260~300)	Group E (320~400) Only Specific Type	Group E (320~400) Only Specific Type	Group A (260~300)	Group A (260~300)
Heatsink	2U STD HS	2U Perf HS	2U Perf HS	2U Perf HS	2U Perf HS	2U Perf HS	2U Perf HS	2U Perf HS
								
Fan	Performance 6056							
								

Note*	HHHL-SW	FHFL-SW	DW GPU			
	A2-60W	A10-150W	A40-300W	A100/MI210-300W A16-250W A30-165W	RTX A2000-HHHL DW-70W RTX A4500-FHFL DW-250W RTX A6000-FHFL DW-300W	H100-350W

SR655 V3 management tools

The SR655 V3 supports the following Lenovo management tools:

Options		Functions							
		Multi-system mgmt	OS deploy-ment	System configu-ration	Firm-ware up-dates[1]	Event-s/alert moni-toring	Inven-tory/ logs	Pow-er mgmt	Power planning
Lenovo XClarity Controller				√	√[2]	√	√[4]		
Lenovo XClarity Essen-tials toolset	OneCLI	√		√	√[2]	√	√[4]		
	Bootable Media Creator			√	√[2]		√[4]		
	UpdateXpress			√	√[2]				
Lenovo XClarity Provisioning Manager			√	√	√[3]		√[5]		

Note:

1. Most options can be updated with Lenovo tools, but others, such as GPU firmware or Omni-Path firmware, require the use of supplier tools.
2. To update the firmware for the ROM option using Lenovo XClarity Essentials (LXCE) or Lenovo XClarity Controller 2 (XCC2), the UEFI settings must be set to Auto or UEFI.
3. To allow detailed adapter card information, such as model name and firmware levels to be displayed in XCC or LXCE, the UEFI settings for the ROM option must be set to Auto or UEFI.
4. Firmware updates for optional devices, such as adapters, are not supported.
5. LXPM provides a limited list of information about parts.