Servicing the ThinkSystem SR650 V2

Prerequisites

- ES51757B – Introducing ThinkSystem tools
  https://lenovoedu.lenovo.com/course/view.php?idnumber=ES51757B

- ES41759B – ThinkSystem problem determination
  https://lenovoedu.lenovo.com/course/view.php?idnumber=ES41759B

- ES42108B – ThinkSystem V2 architecture introduction
  https://lenovoedu.lenovo.com/course/view.php?idnumber=ES42018B

- ES51965 – Introducing the Intel Optane DC persistent memory module
  https://lenovoedu.lenovo.com/course/view.php?idnumber=ES51965

- ES51780C – Servicing Lenovo ThinkSystem storage controllers
  https://lenovoedu.lenovo.com/course/view.php?idnumber=ES51780C

Objectives

After completing the course, you will be able to:

- Describe the Lenovo ThinkSystem SR650 V2 server and components
- List the SR650 V2 server specifications
- Describe the SR650 V2 server configurations and diagrams
- Describe the SR650 V2 server management tools
- Describe the problem determination steps and explain how to troubleshoot issues with the SR650 V2

Product overview

Product description and front, rear, and inside views

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ThinkSystem SR650 V2 product overview

The Lenovo ThinkSystem SR650 V2 is a 2U rack server that features 3rd Generation Intel Xeon Scalable processors (Intel code name: Ice Lake). The SR650 V2 supports up to 20 3.5-inch or 40 2.5-inch hot-swap drive bays with drive bay zones at the front, middle, and rear of the server. The SR650 also supports one or two processors and thirty-two DIMMs.

There are SR650 V2 machine types: the 7Z72 (1-year warranty) and 7Z73 (3-year warranty).

SR650 V2 specifications

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Attribute	Specifications
Form factor	2U rack mount
Processor	One or two 3rd Generation Intel Xeon Scalable processors (Intel code name: Ice Lake) – Silver, Gold, or Platinum level 3 UPIs supported
Memory	Up to 32 DIMMs slots (16 DIMMs per processor) • Supports up to 4 TB with 3200 TruDDR4 DIMMs • Supports up to 16 Intel Optane Persistent memory 200 Series modules

Disk drive bays	Up to 20 3.5-inch or 40 2.5-inch hot-swap drive bays:
	
	    • Front bays can be 3.5 inch (eight or 12 bays) or 2.5 inch (eight, 16, or 24 bays)
	
	    • Middle bays can be 3.5 inch (four bays) or 2.5 inch (eight bays)
	
	    • Rear bays can be 3.5 inch (two or four bays) or 2.5 inch (four or eight bays)
	
	    • Combinations of SAS/SATA, NVMe, or AnyBay are available
	
	The server also supports these drives for OS boot or drive storage:

SR650 V2 specifications

Attribute	Specifications

	The server also supports these drives for OS boot or drive storage:
	
	   • Two 7 mm drives at the rear of the server
	
	   • Internal M.2 module supporting up to two M.2 drives
	
	Note: The SR650 V2 does not currently support EDSFF drives

Network interface	Dedicated OCP 3.0 SFF slot with PCIe 4.0 x16 host interface Supports a variety of two-port and four-port adapters with 1 GbE, 10 GbE, and 25 GbE network connectivity
PCIe expansion slots	Up to eight PCIe 4.0 slots plus an OCP adapter Slots four to eight require two processors
GPU support	Supports up to eight single-wide GPUs or up to three double-wide GPUs
Cooling	Six N+1 redundant hot-swap 60 mm fans One additional fan integrated in each of the two power supplies
Power supplies	Up to two hot-swap redundant power supplies
Storage controller	• 12 Onboard SATA ports (Intel VROC SATA RAID, formerly known as Intel RSTe

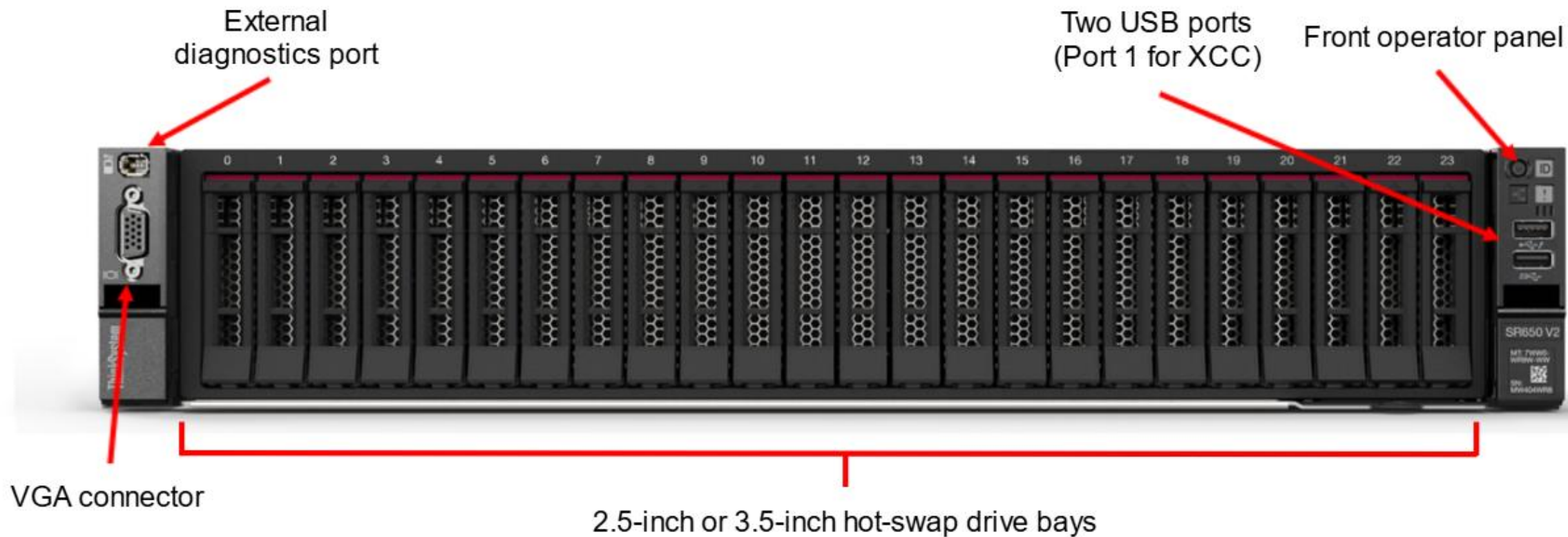Lenovo

SR650 V2 specifications

Attribute	Specifications

Storage controller	• 12 Onboard SATA ports (Intel VROC SATA RAID, formerly known as Intel RSTe RAID)
	• Up to 12 Onboard NVMe ports (includes Intel VROC NVMe RAID, with optional license for non-Intel NVMe SSDs)
	• NVMe adapter (supports Intel VROC NVMe RAID)
	• 12 Gb SAS/SATA RAID adapters:
	   • RAID 530i-8i (cacheless) supports RAID 0, 1, 10, 5, 50
	   • RAID 530i-16i (cacheless) supports RAID 0, 1, 10
	   • RAID 930-8i with 2 GB flash-backed cache supports RAID 0, 1, 10, 5, 50, 6, 60
	   • RAID 930-16i with 4 GB flash-backed cache supports RAID 0, 1, 10, 5, 50, 6, 60
	   • RAID 940-8i with 4 GB or 8 GB flash-backed cache supports RAID 0, 1, 10, 5, 50, 6, 60
	   • RAID 940-16i with 8 GB flash-backed cache supports RAID 0, 1, 10, 5, 50, 6, 60

SR650 V2 specifications

Scroll down for more information

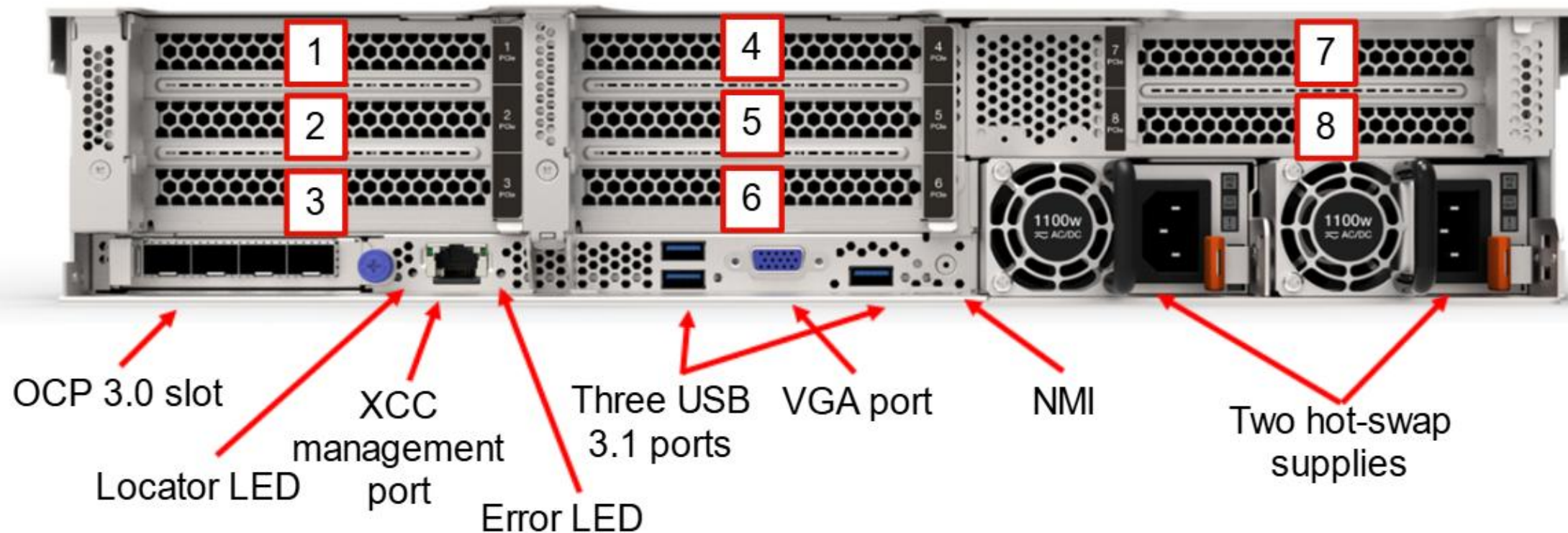| Attribute	Specifications

	• NVMe adapter (supports Intel VROC NVMe RAID)
	 • 12 Gb SAS/SATA RAID adapters:
	   • RAID 530i-8i (cacheless) supports RAID 0, 1, 10, 5, 50
	   • RAID 530i-16i (cacheless) supports RAID 0, 1, 10
	   • RAID 930-8i with 2 GB flash-backed cache supports RAID 0, 1, 10, 5, 50, 6, 60
	   • RAID 930-16i with 4 GB flash-backed cache supports RAID 0, 1, 10, 5, 50, 6, 60
	   • RAID 940-8i with 4 GB or 8 GB flash-backed cache supports RAID 0, 1, 10, 5, 50, 6, 60
	   • RAID 940-16i with 8 GB flash-backed cache supports RAID 0, 1, 10, 5, 50, 6, 60
	   • RAID 940-32i with 8 GB flash-backed cache supports RAID 0, 1, 10, 5, 50, 6, 60
	 • 12 Gb SAS/SATA non-RAID: 430-8i, 430-16i and 440-16i HBAs

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SR650 V2 front view

External
diagnostics port

Two USB ports
(Port 1 for XCC)

Front operator panel

VGA connector

2.5-inch or 3.5-inch hot-swap drive bays

Note: For details of front hot-swap drive configurations, refer to Lenovo Press.

SR650 V2 rear views

Eight PCIe slots

OCP 3.0 slot

XCC management port

Locator LED

Error LED

Three USB 3.1 ports

VGA port

NMI

Two hot-swap supplies

Note: For additional rear hot-swap drive and PCIe slot configuration information, refer to Lenovo Press.

SR650 V2 internal view
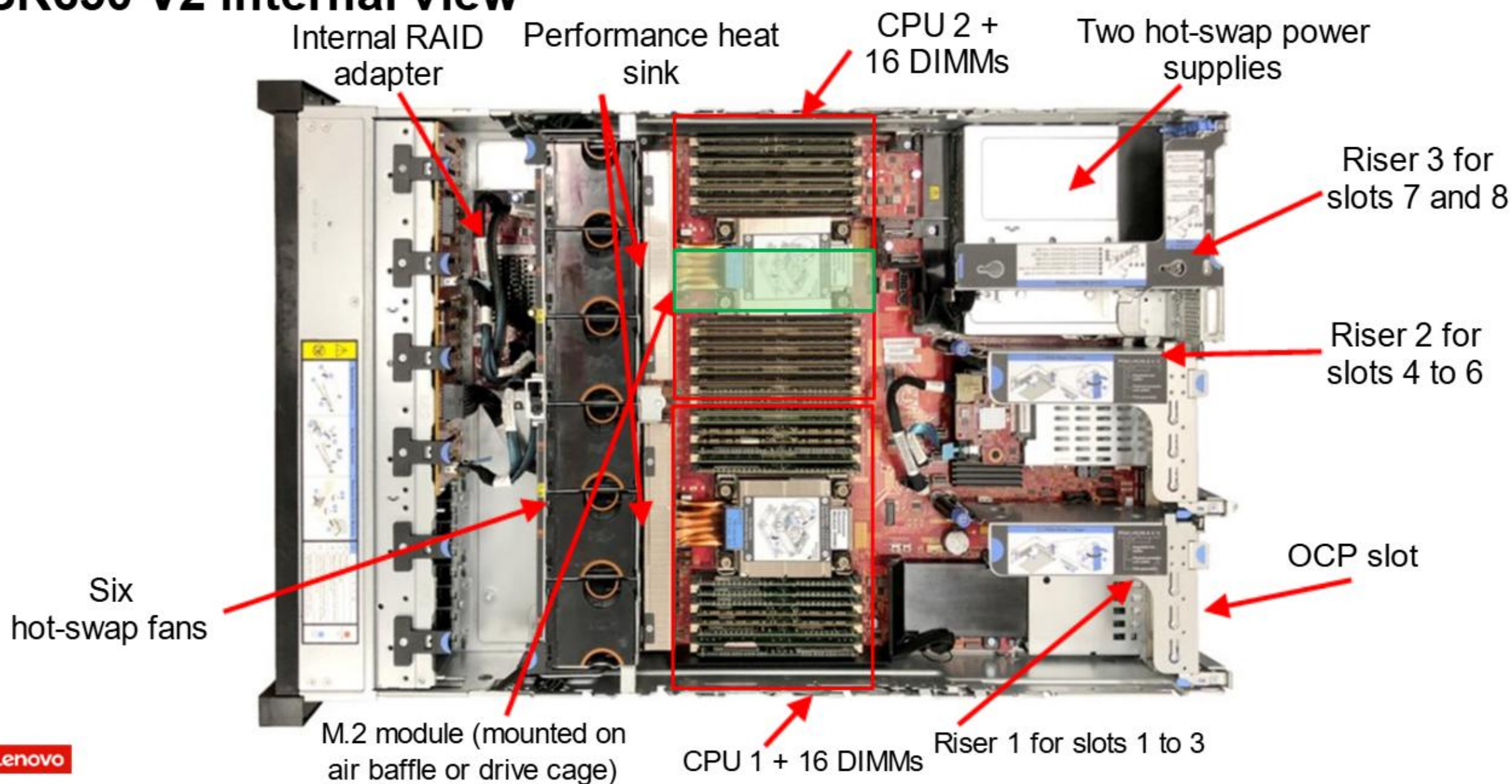
Internal RAID adapter

Performance heat sink

CPU 2 + 16 DIMMs

Two hot-swap power supplies

Riser 3 for slots 7 and 8

Riser 2 for slots 4 to 6

OCP slot

Six hot-swap fans

M.2 module (mounted on air baffle or drive cage)

CPU 1 + 16 DIMMs

Riser 1 for slots 1 to 3

Lenovo

LCD diagnostic panel

The SR650 V2 supports the external and internal LCD diagnostic panels. Either of the panels can be used to quickly access system information, such as active errors, system health status, firmware version, network connection status, and health information. A demo video is available on the course landing page.

Click the buttons to
check the panels

External
diagnostic
port

External

Internal

LCD diagnostic panel

The SR650 V2 supports the external and internal LCD diagnostic panels. Either of the panels can be used to quickly access system information, such as active errors, system health status, firmware version, network connection status, and health information. A demo video is available on the course landing page.

Click the buttons to check the panels

External

Internal

Fixed operator panel

Integrated diagnostic panel

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SR650 V2 processor heat sink

The SR650 V2 supports two types of heat sink: Standard and Performance.

Standard heat sink
For processors with a TDP of less than 205 watts

Performance heat sink
For processors with a TDP of more than 250 watts

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SR650 V2 cooling fans

The SR650 V2 supports up to six 60 mm hot-swap fans, and the fans are N+1 redundant. Depending on the configuration, all the server fans will have to be either standard (17K RPM) or performance (19K RPM). Six fans are needed when one processor is installed, and eight fans are needed when two processors are installed.

Performance fans are required if any of the following conditions are met:

• The processors have a TDP of more than 250 watts

• There is a front SAS/SATA or AnyBay drive backplane for 24 2.5-inch drives

• There is a front SAS/SATA or AnyBay drive backplane for 12 3.5-inch drives

• There are GPUs installed

Note: For a detailed list of heat sink or fan type rules, refer to Lenovo ThinkSystem Documentation.

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