Lenovo ThinkSystem SR450 V4 Server
Product Guide

The ThinkSystem SR450 V4 delivers current-generation Intel Xeon 6 performance in a cost-optimized 2U single-socket platform. Providing performance and efficiency without compromise, the platform is built and tested for high compute intensity and scale while remaining optimized for core business applications, file and storage services, and light virtualization. With up to 32 cores, 512GB of TruDDR5 memory, and support for up to 8 NVMe drives, the SR450 V4 delivers balanced compute and storage performance for SMB infrastructure modernization.

The following figure shows the Lenovo ThinkSystem SR450 V4 with an optional security bezel.



Figure 1. Lenovo ThinkSystem SR450 V4 with optional security bezel

Did you know?

Not every workload requires a dual-socket server, GPU acceleration, or extensive expansion capabilities. The ThinkSystem SR450 V4 was purpose-built for organizations seeking a practical balance of performance, cost, and simplicity. Its streamlined single-socket architecture, integrated vertical PCIe slots, and focused feature set help reduce unnecessary system complexity while retaining the capabilities required for everyday IT operations. The result is a server designed around what customers use most, rather than features they may never need.

Key features

The Lenovo ThinkSystem SR450 V4 delivers current-generation Intel Xeon 6 performance in a cost-optimized 2U single-socket platform, providing performance and efficiency without compromise. Built and tested for high compute intensity and scale, it supports core business applications, file and storage services, and light virtualization. With up to 32 cores, 512GB of TruDDR5 memory, and up to 8 NVMe drives, it delivers balanced performance for SMB infrastructure modernization.

Scalability and performance

The ThinkSystem SR450 V4 offers numerous features to boost performance, improve scalability and reduce costs:

- Supports one Intel Xeon 6700-series or 6500-series processors with Performance-cores (P-cores)
  - Up to 32 cores and 64 threads
  - Core speeds of up to 4 GHz
  - TDP ratings of up to 250 W
- Support for DDR5 memory DIMMs to maximize the performance of the memory subsystem:
  - Up to 8 DDR5 memory DIMMs
  - 8 memory channels per processor (1 DIMM per channel)
  - Memory operates at 6400 MT/s
  - Using 64GB RDIMMs, the server supports up to 512GB of system memory
- Built for economical growth, with flexible 8x 2.5-inch hot-swap storage (SAS/SATA or NVMe) or 8x 3.5-inch hot-swap storage (SAS/SATA)
- Supports 8x NVMe drives without oversubscription of PCIe lanes (1:1 connectivity). The use of NVMe drives maximizes drive I/O performance, in terms of throughput and latency.
- Supports up to 8x 3.5-inch drive bays for lower-cost high-capacity HDD storage
- Supports high-speed RAID controllers and SAS HBAs providing 12 Gb SAS connectivity to the drive backplanes.
- Supports M.2 drives for convenient operating system boot functions. M.2 drives are mounted at the rear of the server as hot-swap drives with RAID-0 or RAID-1 support.
- Up to 3x PCIe slots (rear accessible), plus a dedicated OCP 3.0 slot for ample expansion capability. PCIe slots are implemented directly on the system board to provide straightforward expansion while eliminating the need for additional riser cards, thereby reducing system complexity and cost.
- The server has a dedicated industry-standard OCP 3.0 slots supporting a variety of Ethernet network adapters. A simple-swap mechanism with a thumbscrew and pull-tab enables tool-less installation and removal of the adapter. The adapter supports shared BMC network sideband connectivity to enable out-of-band systems management.
- The server offers PCI Express 5.0 I/O expansion capabilities that doubles the theoretical maximum bandwidth of PCIe 4.0 (32GT/s in each direction for PCIe Gen 5, compared to 16 GT/s with PCIe Gen 4 and 8 GT/s with PCIe Gen 3).

Availability and serviceability

The SR450 V4 provides many features to simplify serviceability and increase system uptime:

- Designed to run 24 hours a day, 7 days a week
- The server offers Single Device Data Correction (SDDC, also known as Chipkill), Adaptive Double-Device Data Correction (ADDDC, also known as Redundant Bit Steering or RBS), and memory mirroring for redundancy in the event of a non-correctable memory failure.
- The server offers hot-swap drives, supporting RAID redundancy for data protection and greater system uptime.

- Available M.2 boot adapter support RAID-1 using onboard hardware RAID which can enable two M.2 drives to be configured as a redundant pair.
- The server has up to 2x hot-swap redundant power supplies and 3x hot-swap redundant fans to provide availability for business-critical applications.
- The light path diagnostics feature uses LEDs to lead the technician to failed (or failing) components, which simplifies servicing, speeds up problem resolution, and helps improve system availability.
- Solid-state drives (SSDs) offer more reliability and performance than traditional mechanical HDDs for greater uptime.
- Proactive Platform Alerts (including PFA and SMART alerts): Processors, voltage regulators, memory, internal storage (SAS/SATA HDDs and SSDs, NVMe SSDs, M.2 storage), fans, power supplies, RAID controllers, server ambient and subcomponent temperatures. Alerts can be surfaced through the XClarity Controller to managers such as Lenovo XClarity One, VMware vCenter, and Microsoft System Center. These proactive alerts let you take appropriate actions in advance of possible failure, thereby increasing server uptime and application availability.
- The built-in XClarity Controller continuously monitors system parameters, triggers alerts, and performs recovery actions in case of failures to minimize downtime.
- Built-in diagnostics in UEFI, using Lenovo XClarity Provisioning Manager, speed up troubleshooting tasks to reduce service time.
- Lenovo XClarity Provisioning Manager supports diagnostics and can save service data to a USB key drive or remote CIFS share folder for troubleshooting and reduce service time.
- Auto restart in the event of a momentary loss of AC power (based on power policy settings in the XClarity Controller service processor)
- Offers a diagnostics port on the front of the server to allow you to attach an external diagnostics handset for enhanced systems management capabilities.
- Support for the XClarity Mobile app running on a supported smartphone or tablet and connected to the server through the service-enabled USB port, enables additional local systems management functions.
- Three-year customer-replaceable unit and onsite limited warranty (varies by geography), 9 x 5 next business day. Optional service upgrades are available.

Manageability and security

The SR450 V4 simplifies deployment and day-to-day operation for resource-constrained IT teams. Lenovo XClarity Controller, Redfish support, and UEFI based on OpenEDK provide a common system management platform for multi-vendor environments.

Systems management features simplify local and remote management of the SR450 V4:

- The server includes XClarity Controller 3 (XCC3) to monitor server availability. Optional upgrade to XCC3 Premier to provide remote control (keyboard video mouse) functions, support for the mounting of remote media files (ISO and IMG image files), boot capture and power capping. XCC3 Premier also offers additional features such as Neighbor Groups, System Guard, a CNSA-compliant security mode, a FIPS 140-3-compliant mode, and enhanced NIST 800-193 support.
- Dedicated Ethernet port at the rear of the server for remote management (BMC management).
- Lenovo XClarity One offers comprehensive hardware management tools that help to increase uptime, reduce costs and improve productivity through advanced server management capabilities.
- UEFI-based Lenovo XClarity Provisioning Manager, accessible from F1 during boot, provides system inventory information, graphical UEFI Setup, platform update function, RAID Setup wizard, operating system installation function, and diagnostic functions.
- Support for Lenovo XClarity Energy Manager which captures real-time power and temperature data from the server and provides automated controls to lower energy costs.

- An integrated industry-standard Unified Extensible Firmware Interface (UEFI) enables improved setup, configuration, and updates, and simplifies error handling.
- Enhanced security for storage connectivity with Fibre Channel adapters such as the Emulex SecureHBA, which provides autonomous in-flight encryption with integrated post-quantum cryptography (PQC) algorithms and CNSA 1.0 and 2.0 compliance.
- Support for industry standard management protocols, IPMI 2.0, SNMP 3.0, Redfish REST API, serial console via IPMI
- An integrated hardware Trusted Platform Module (TPM) supporting TPM 2.0 enables advanced cryptographic functionality, such as digital signatures and remote attestation.
- Administrator and power-on passwords help protect from unauthorized access to the server.
- Supports Secure Boot to ensure only a digitally signed operating system can be used. Supported with HDDs and SSDs, as well as M.2 drives.
- Industry-standard Advanced Encryption Standard (AES) NI support for faster, stronger encryption.
- Intel Execute Disable Bit functionality can prevent certain classes of malicious buffer overflow attacks when combined with a supported operating system.
- Intel Trusted Execution Technology provides enhanced security through hardware-based resistance to malicious software attacks, allowing an application to run in its own isolated space, protected from all other software running on a system.
- Additional physical security features are an available chassis intrusion switch and an available lockable front bezel.

Energy efficiency

The SR450 V4 offers the following energy-efficiency features to save energy, reduce operational costs, and increase energy availability:

- Energy-efficient system board components help lower operational costs.
- High-efficiency power supplies with 80 PLUS Titanium certifications
- Solid-state drives (SSDs) consume as much as 80% less power than traditional spinning 2.5-inch HDDs.
- Support for Lenovo XClarity Energy Manager provides advanced data center power notification, analysis, and policy-based management to help achieve lower heat output and reduced cooling needs.
- The server uses hexagonal ventilation holes, which can be grouped more densely than round holes, providing more efficient airflow through the system and thus keeping your system cooler.

Performance benchmarks

At Lenovo, we know customers care most about how their workloads perform in real-world environments, which is why we carefully tune our server hardware, firmware, and drivers to help deliver strong benchmark results that reflect practical business needs. The goal is simple: to help customers run their critical applications more efficiently and achieve better outcomes.

Lenovo performance engineers have achieved world record performance benchmarks on many ThinkSystem servers. See the complete list of current world records in the Lenovo Press article Performance Benchmark World Record Summary for Lenovo ThinkSystem Servers.

The Lenovo Server Performance Team also publishes reports on key performance world records at the time the world record is announced. See all published Performance Benchmark Reports.

Components and connectors

The following figure shows the front of the SR450 V4.

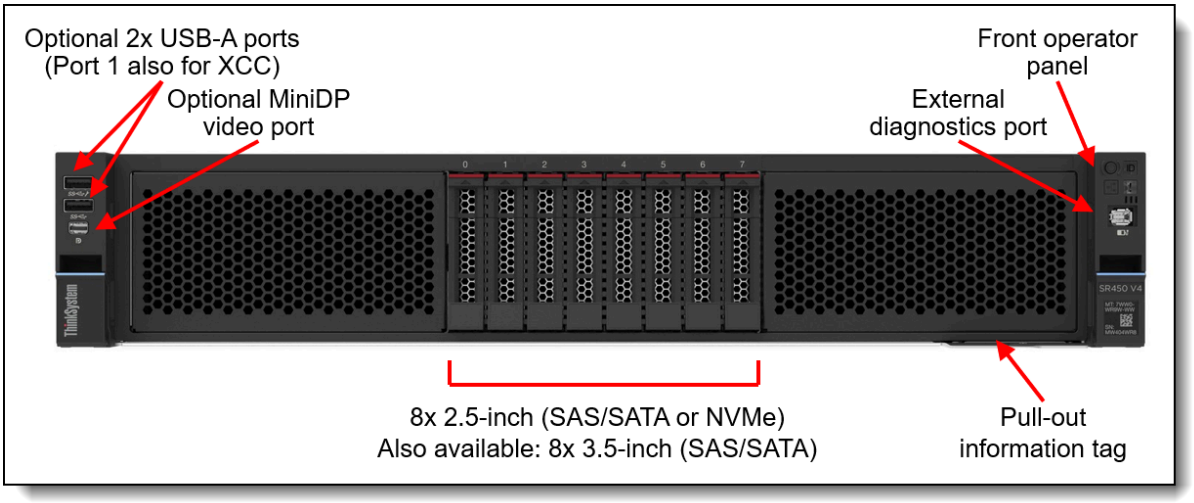


Figure 2. Front view of the ThinkSystem SR450 V4 with 2.5-inch drive bays

For details on the front ports, including the optional front USB and Mini DP video port, see the Local management section.

The following figure shows the front configurations of the SR450 V4. The server supports either 8x 2.5-inch hot-swap drives or 8x 3.5-inch hot-swap drives at the front.

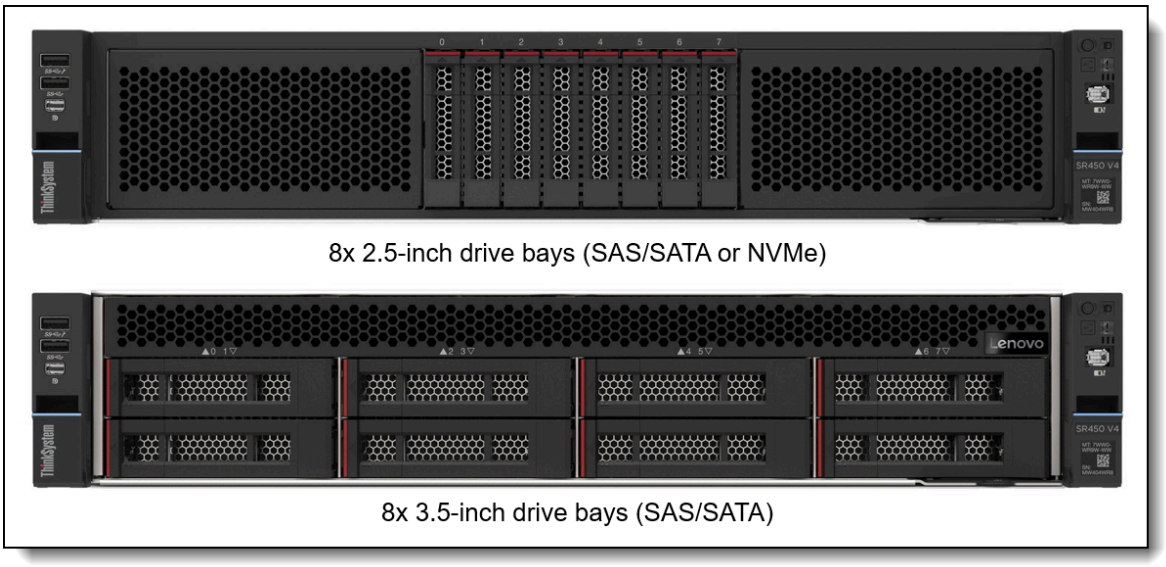


Figure 3. Front view configurations of the ThinkSystem SR450 V4

The following figure shows the components visible from the rear of the server. The figure shows one configuration, with ten PCIe slots, however there are additional rear configurations which include 3.5-inch drive bays or 2.5-inch drive bays, and rear-accessible hot-swap M.2 drive bays.

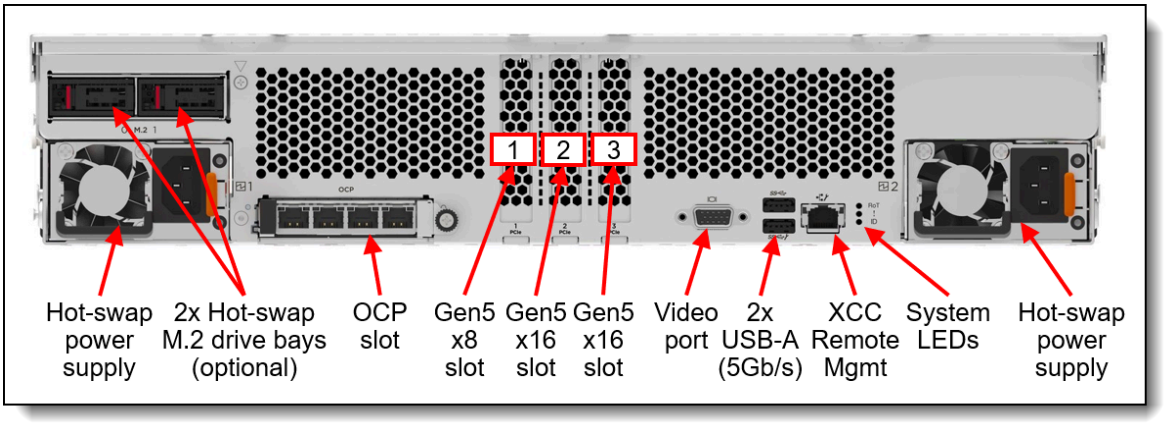


Figure 4. Rear view of the ThinkSystem SR450 V4 (configuration with ten PCIe slots)

The following figure shows the locations of key components inside the server.

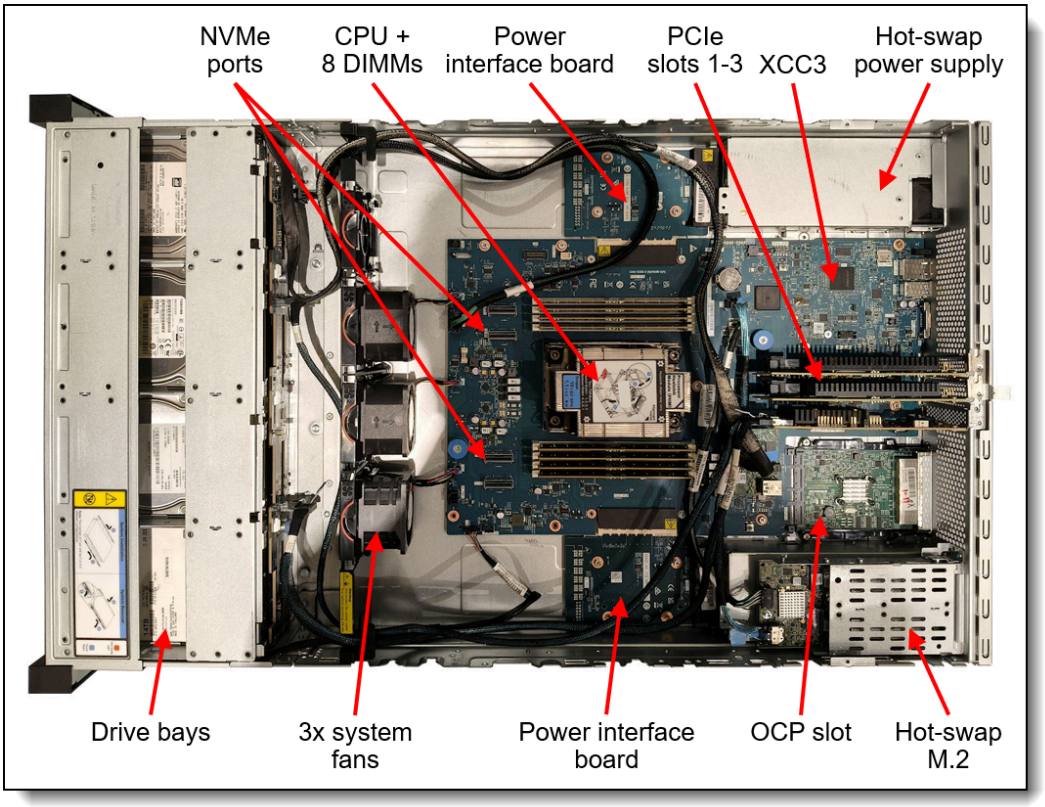


Figure 5. Internal view of the ThinkSystem SR450 V4

System architecture

The following figure shows the architectural block diagram of the SR450 V4, showing the major components and their connections.

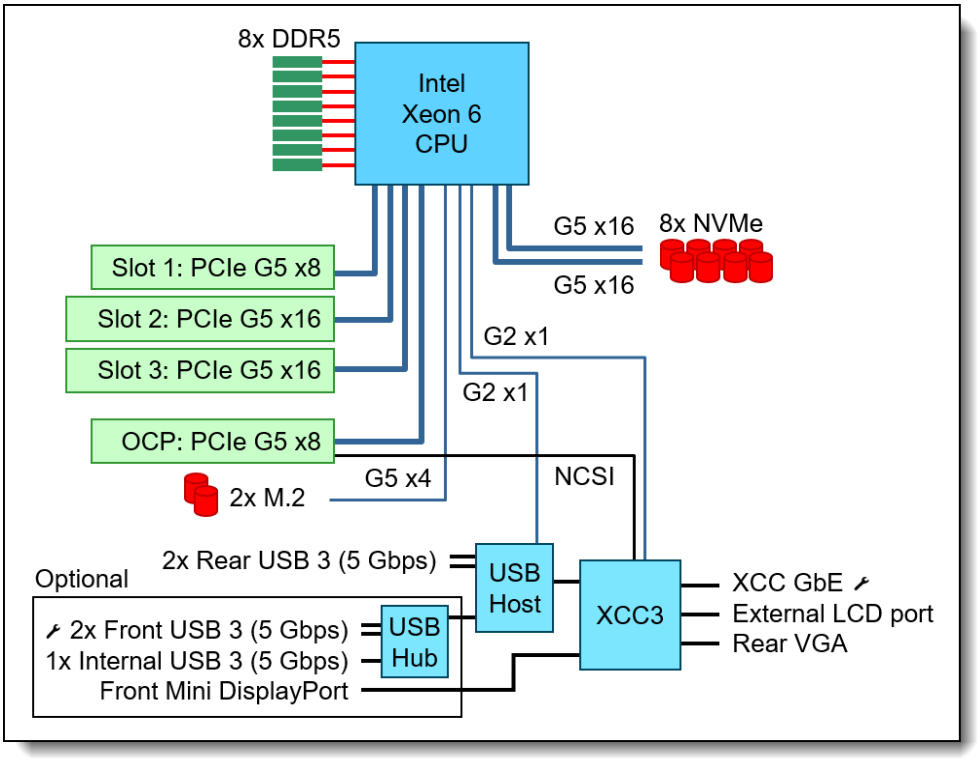


Figure 6. SR450 V4 system architectural block diagram

Standard specifications

The following table lists the standard specifications.

Table 1. Standard specifications

Components	Specification
Machine types	7DQX - 3-year warranty
Form factor	2U rack
Processor	One Intel Xeon 6700P-series or 6500P-series processors (formerly codenamed "Granite Rapids"). Supports processors up to 32 cores and 64 threads, core speeds of up to 4.0 GHz, and TDP ratings of up to 250 W.
Chipset	None. Integrated into the processor
Memory	8 DIMM slots. Each processor has 8 memory channels, with 1 DIMM per channel (DPC). Lenovo TruDDR5 RDIMMs are supported, operating at 6400 MT/s.
Memory maximum	Up to 512GB by using 8x 64GB RDIMMs
Memory protection	ECC, SDDC (for x4-based memory DIMMs), ADDDC (for x4-based memory DIMMs), and memory mirroring.

Components	Specification
Disk drive bays	Up to 8x hot-swap drive bays, front mounted: • 8x 2.5-inch drive bays, supporting either SAS/SATA drives or NVMe drives • 8x 3.5-inch drive bays, supporting SAS or SATA drives M.2 support, for OS boot and drive storage support: • 2x rear hot-swap M.2 drive bays See Supported drive bay combinations for details. NVMe bays only support NVMe drives.

Maximum internal storage	• 2.5-inch drives:
	  ◦ 122.88TB using 8x 15.36TB 2.5-inch SAS SSDs
	  ◦ 15.36TB using 8x 1.92TB 2.5-inch SATA SSDs
	  ◦ 245.76TB using 8x 30.72TB 2.5-inch NVMe SSDs
	• 3.5-inch drives:
	  ◦ 128TB using 8x 16TB 3.5-inch SAS HDDs
	  ◦ 128TB using 8x 16TB 3.5-inch SATA HDDs

Storage controllers	• Onboard NVMe ports with optional RAID support using Intel VROC • 12 Gb SAS/SATA RAID adapters, PCIe 4.0 host interface • 12 Gb SAS/SATA HBA (non-RAID), PCIe 4.0 host interface
Optical drive bays	No internal optical drive.
Tape drive bays	No internal backup drive.
Network interfaces	One dedicated OCP 3.0 SFF slot with a PCIe 5.0 x8 host interface. Support a variety of 2-port and 4-port adapters with up to 25GbE network connectivity. One port of the installed OCP adapter can optionally be shared with the XClarity Controller (XCC) management processor for Wake-on-LAN and NC-SI support.
PCI Expansion slots	Up to 3x slots, all at the rear, plus 1x OCP slot. All slots are PCIe 5.0. All slots are onboard; no riser cards needed • Slot 1: PCIe 5.0 x8, supporting low profile adapters • Slot 2: PCIe 5.0 x16, supporting low profile adapters • Slot 3: PCIe 5.0 x16, supporting low profile adapters • OCP slot: PCIe 5.0 x8
GPU support	No support
Ports	Front: External diagnostics port, optional 2x USB 3 (5 Gb/s) port, one supports XCC local management, optional Mini DisplayPort (miniDP) v1.1a video port. Rear: 2x USB 3 (5 Gb/s) ports, 1x VGA video port, 1x RJ-45 1GbE systems management port for XCC remote management.
Cooling	3x single-rotor hot swap 60 mm 24K RPM fans. Fans are N+1 redundant, tolerating a single-rotor failure. One fan integrated in each power supply.
Power supply	Up to two hot-swap redundant AC power supplies, 80 PLUS Titanium certification. 800W or 1300W AC options. Power supplies support 230V (high-line) or 115V (low-line) input supply.
Video	Embedded graphics with 16 MB memory with 2D hardware accelerator, integrated into the XClarity Controller 3 management controller. Two video ports (rear VGA and optional front Mini DisplayPort); both can be used simultaneously if desired. Maximum resolution is 1920x1200 32bpp at 60Hz.
Hot-swap parts	Drives, power supplies, and fans.

Components	Specification
Systems management	Operator panel with status LEDs. Optional External Diagnostics Handset with LCD display. Clarity Controller 3 (XCC3) embedded management based on the ASPEED AST2600 baseboard management controller (BMC) and OpenBMC, XClarity One centralized infrastructure delivery, XClarity Integrator plugins, and XClarity Energy Manager centralized server power management. Optional XCC3 Premier to enable remote control functions and other features.
Security features	Chassis intrusion switch, Power-on password, administrator's password, Root of Trust module supporting TPM 2.0 and Platform Firmware Resiliency (PFR). Optional lockable front security bezel.
Operating systems supported	Microsoft Windows Server, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, VMware ESXi, Ubuntu Server. See the Operating system support section for specifics.
Limited warranty	Three-year customer-replaceable unit and onsite limited warranty with 9x5 next business day (NBD).
Service and support	Optional service upgrades are available through Lenovo Services: 4-hour or 2-hour response time, 6-hour fix time, 1-year or 2-year warranty extension, software support for Lenovo hardware and some third-party applications.
Dimensions	Width: 445 mm (17.5 in.), height: 87 mm (3.4 in.), depth: 797 mm (31.4 in.). See Physical and electrical specifications for details.
Weight	Maximum weight: 22 kg (48.5 lb)

Lenovo Top Choice

Lenovo offers two “quick-ship” programs to make it easy for our customers to get quick delivery of our offerings:

- **Lenovo Top Choice Express:** A Configure-to-Order (CTO) model that uses a "best of" subset of components. It allows for customization while maintaining significantly faster lead times than standard CTO.

  Top Choice Express (TCE) is the way to get custom configurations as quickly as possible. It allows DCSC configurator users to configure systems in **CTO Mode**, selecting the required hardware components while still benefiting from faster turnaround than traditional CTO. These configurations are built and fully integrated by Lenovo Manufacturing, with simple configuration steps, instant pricing, and quicker delivery.

  To see which components are TCE, check the TCE column in the various component tables in this product guide. Green cells mean that the component is enabled for ordering with Top Choice Express in all regions world-wide. Orange cells with the ℹ symbol mean that the component is enabled for Top Choice Express in only some regions. Mouse over or tap on the cell to see which regions have it enabled for TCE.

  Note: Top Choice Express is for configure-to-order builds only, not for standalone option part numbers.

- **Lenovo Top Choice Stock:** Pre-built, fixed-configuration units held in distribution. They are the "Ready-to-Ship" inventory options for customers who need a server quickly.

  Top Choice Stock (TCS) is used in **Preconfigured Mode** in DCSC, starting from a standard pre-built configuration and adding option components as needed. Systems are assembled and fulfilled by Lenovo partners, enabling quick order processing and fast shipment through distribution. This path supports rapid delivery while maintaining flexibility through add-on options. For details of TCS models, see the Preconfigured Models section.

Note: Ship dates are estimates only; actual ship times may vary based on platform and component availability, order processing, logistics, and external factors beyond Lenovo’s control. Lenovo is not liable for

delays.

Models

ThinkSystem SR450 V4 models can be configured by using the Lenovo Data Center Solution Configurator (DCSC).

Topics in this section:

- CTO models
- Base feature codes
- Preconfigured models

CTO models

ThinkSystem SR450 V4 models can be configured by using the Lenovo Data Center Solution Configurator (DCSC).

Preconfigured server models may also be available for the SR450 V4, however these are region-specific; that is, each region may define their own server models, and not all server models are available in every region.

The following table lists the base CTO models of the ThinkSystem SR450 V4 server.

Table 2. Base CTO models

Machine Type/Model	Description
7DQXCTO1WW	ThinkSystem SR450 V4 – 3-year base warranty

Base feature codes

Models of the SR450 V4 are defined based on the configuration of the front drive bays. The feature codes for these chassis bases are as listed in the following table.

Table 3. Chassis base feature codes

Feature code	Description	Top Choice Express	Purpose
CHYV	ThinkSystem SR450 V4 8x3.5" Chassis	-	Configurations with 3.5-inch hot-swap drives
CHZ7	ThinkSystem SR450 V4 8x2.5" Chassis	-	Configurations with 2.5-inch hot-swap drives

Preconfigured models

The following tables list the available preconfigured models, grouped by region.

- Models for Asia Pacific region
- Models for Brazil
- Models for EMEA region
- Models for Latin American countries (except Brazil)

Refer to the Specifications section for information about standard features of the server.

Common to all models:

- Power supplies are Platinum unless otherwise stated
- All models include a Toolless Slide Rail Kit

Models for Asia Pacific region

The following table lists the models for the Asia Pacific region: Australia, Bangladesh, Brunei, Hong Kong, India, Japan, Korea, Sri Lanka, Malaysia, New Zealand, Philippines, Singapore, Thailand, Taiwan, Vietnam

Table 4. Models for Asia Pacific markets

Model	Top Choice Stock	Intel Xeon Scalable processor†	Memory	RAID	Drive bays	OCP	Slots	Power supply	Internal USB	Front USB/DP	XCC3	Intru switch
7DQXA006AP	N	1x 6505P 12C 150W 2.2GHz	1x16GB	545-8i	8x 3.5" SAS Open bay	Open	Open	2x 800W TT	Opt	Opt	Pre	Opt
7DQXA00MAP	N	1x 6507P 8C 150W 3.5GHz	1x16GB	545-8i	8x 3.5" SAS Open bay	Open	Open	2x 800W TT	Opt	Opt	Pre	Opt
7DQXA008AP	N	1x 6515P 16C 150W 2.3GHz	1x32GB 2Rx8	940-8i 4GB	8x 2.5" SAS Open bay	Open	Open	2x 800W TT	Opt	Opt	Pre	Opt
7DQXA00KAP	N	1x 6517P 16C 190W 3.2GHz	1x32GB 2Rx8	940-8i 4GB	8x 2.5" SAS Open bay	Open	Open	2x 800W TT	Opt	Opt	Pre	Opt

† Processor description: Processor model, number of cores, thermal design power (TDP), core frequency

Models for Brazil

Table 5. Models for Brazil

Model	Top Choice Stock	Intel Xeon Scalable processor†	Memory	RAID	Drive bays	OCP	Slots	Power supply	Internal USB	Front USB/DP	XCC3	Intru switch
7DQXA004BR	N	1x 6505P 12C 150W 2.2GHz	1x16GB	545-8i	8x 3.5" SAS Open bay	Open	Open	2x 800W TT	Opt	Opt	Pre	Opt
7DQXA00BBR	N	1x 6507P 8C 150W 3.5GHz	1x16GB	545-8i	8x 3.5" SAS Open bay	Open	Open	2x 800W TT	Opt	Opt	Pre	Opt
7DQXA00JBR	N	1x 6515P 16C 150W 2.3GHz	1x32GB 2Rx8	940-8i 4GB	8x 2.5" SAS Open bay	Open	Open	2x 800W TT	Opt	Opt	Pre	Opt
7DQXA007BR	N	1x 6517P 16C 190W 3.2GHz	1x32GB 2Rx8	940-8i 4GB	8x 2.5" SAS Open bay	Open	Open	2x 800W TT	Opt	Opt	Pre	Opt

† Processor description: Processor model, number of cores, thermal design power (TDP), core frequency

Models for EMEA region

Table 6. Models for EMEA region

Model	Top Choice Stock	Intel Xeon Scalable processor†	Memory	RAID	Drive bays	OCP	Slots	Power supply	Internal USB	Front USB/DP	XCC3	Intru switch
7DQXA00DEA	N	1x 6505P 12C 150W 2.2GHz	1x16GB	545-8i	8x 3.5" SAS Open bay	Open	Open	2x 800W TT	Opt	Opt	Pre	Opt
7DQXA005EA	N	1x 6507P 8C 150W 3.5GHz	1x16GB	545-8i	8x 3.5" SAS Open bay	Open	Open	2x 800W TT	Opt	Opt	Pre	Opt
7DQXA00NEA	N	1x 6515P 16C 150W 2.3GHz	1x32GB 2Rx8	545-8i	8x 2.5" SAS Open bay	Open	Open	2x 800W TT	Opt	Opt	Pre	Opt
7DQXA00GEA	N	1x 6517P 16C 190W 3.2GHz	1x32GB 2Rx8	545-8i	8x 2.5" SAS Open bay	Open	Open	2x 800W TT	Opt	Opt	Pre	Opt

† Processor description: Processor model, number of cores, thermal design power (TDP), core frequency

Models for Latin American countries (except Brazil)

Table 7. Models with a 3-year warranty for Latin American countries (except Brazil)

Model	Top Choice Stock	Intel Xeon Scalable processor†	Memory	RAID	Drive bays	OCP	Slots	Power supply	Internal USB	Front USB/DP	XCC3	Intru switch
7DQXA009LA	N	1x 6505P 12C 150W 2.2GHz	1x16GB	545-8i	8x 3.5" SAS Open bay	Open	Open	2x 800W TT	Opt	Opt	Pre	Opt
7DQXA00FLA	N	1x 6505P 12C 150W 2.2GHz	1x16GB	545-8i	8x 3.5" SAS Open bay	Open	Open	2x 800W TT	Opt	Opt	Pre	Opt
7DQXA00HLA	N	1x 6507P 8C 150W 3.5GHz	1x16GB	545-8i	8x 3.5" SAS Open bay	Open	Open	2x 800W TT	Opt	Opt	Pre	Opt
7DQXA00LLA	N	1x 6507P 8C 150W 3.5GHz	1x16GB	545-8i	8x 3.5" SAS Open bay	Open	Open	2x 800W TT	Opt	Opt	Pre	Opt
7DQXA00CLA	N	1x 6515P 16C 150W 2.3GHz	1x32GB 2Rx8	940-8i 4GB	8x 2.5" SAS Open bay	Open	Open	2x 800W TT	Opt	Opt	Pre	Opt
7DQXA00ELA	N	1x 6515P 16C 150W 2.3GHz	1x32GB 2Rx8	940-8i 4GB	8x 2.5" SAS Open bay	Open	Open	2x 800W TT	Opt	Opt	Pre	Opt
7DQXA00ALA	N	1x 6517P 16C 190W 3.2GHz	1x32GB 2Rx8	940-8i 4GB	8x 2.5" SAS Open bay	Open	Open	2x 800W TT	Opt	Opt	Pre	Opt
7DQXA00PLA	N	1x 6517P 16C 190W 3.2GHz	1x32GB 2Rx8	940-8i 4GB	8x 2.5" SAS Open bay	Open	Open	2x 800W TT	Opt	Opt	Pre	Opt

† Processor description: Processor model, number of cores, thermal design power (TDP), core frequency

Processors

The SR450 V4 supports one or two of the following Intel processors:

- Intel Xeon 6500-series with P-cores (formerly "Granite Rapids" or GNR)
- Intel Xeon 6700-series with P-cores (formerly "Granite Rapids" or GNR)

Topics in this section:

- Processor options
- Processor features
- Processor cooling
- UEFI operating modes

Processor options

The following table lists the Intel Xeon 6 processors with P-cores that are supported by the SR450 V4.

Processor option part numbers include a heatsink, however they do not include a system fan.

The table includes a Top Choice Express column; for CTO orders, select a TCE component for faster delivery. See the Lenovo Top Choice section for more information.

Table 8. Intel Xeon 6 P-core processor support

Part number	Feature code	SKU	Description	Lenovo Top Choice Express	Maximum quantity
Intel Xeon 6500-series with P-cores					
CTO only	CGVJ	6503P	Intel Xeon 6503P 8C 135W 2.8GHz Processor	-	1
CTO only	C5QQ	6505P	Intel Xeon 6505P 12C 150W 2.2GHz Processor	-	1
CTO only	C5R6	6507P	Intel Xeon 6507P 8C 150W 3.5GHz Processor	-	1
CTO only	C5RD	6515P	Intel Xeon 6515P 16C 150W 2.3GHz Processor	-	1
CTO only	C5QV	6517P	Intel Xeon 6517P 16C 190W 3.2GHz Processor	-	1
CTO only	C5QR	6520P	Intel Xeon 6520P 24C 210W 2.4GHz Processor	-	1
CTO only	C5QT	6530P	Intel Xeon 6530P 32C 225W 2.3GHz Processor	-	1
Intel Xeon 6700-series with P-cores					
CTO only	C5R7	6714P	Intel Xeon 6714P 8C 165W 4.0GHz Processor	-	1
CTO only	C5R5	6724P	Intel Xeon 6724P 16C 210W 3.6GHz Processor	-	1
CTO only	C5R4	6730P	Intel Xeon 6730P 32C 250W 2.5GHz Processor	-	1

Processor features

Processors supported by the SR450 V4 include embedded accelerators to add even more processing capability:

- QuickAssist Technology (Intel QAT)

  Help reduce system resource consumption by providing accelerated cryptography, key protection, and data compression with Intel QuickAssist Technology (Intel QAT). By offloading encryption and decryption, this built-in accelerator helps free up processor cores and helps systems serve a larger number of clients.

- Intel Dynamic Load Balancer (Intel DLB)

  Improve the system performance related to handling network data on multi-core Intel Xeon Scalable processors. Intel Dynamic Load Balancer (Intel DLB) enables the efficient distribution of network processing across multiple CPU cores/threads and dynamically distributes network data across multiple CPU cores for processing as the system load varies. Intel DLB also restores the order of networking data packets processed simultaneously on CPU cores.

- Intel Data Streaming Accelerator (Intel DSA)

  Drive high performance for storage, networking, and data-intensive workloads by improving streaming data movement and transformation operations. Intel Data Streaming Accelerator (Intel DSA) is designed to offload the most common data movement tasks that cause overhead in data center-scale deployments. Intel DSA helps speed up data movement across the CPU, memory, and caches, as well as all attached memory, storage, and network devices.

- Intel In-Memory Analytics Accelerator (Intel IAA)

  Run database and analytics workloads faster, with potentially greater power efficiency. Intel In-Memory Analytics Accelerator (Intel IAA) increases query throughput and decreases the memory footprint for in-memory database and big data analytics workloads. Intel IAA is ideal for in-memory databases, open source databases and data stores like RocksDB, Redis, Cassandra, and MySQL.

- Intel Advanced Matrix Extensions (Intel AMX)

  Intel Advanced Matrix Extensions (Intel AMX) is a built-in accelerator in Xeon 6 P-core processors that significantly improves deep learning training and inference. With Intel AMX, you can fine-tune deep learning models or train small to medium models in just minutes. Intel AMX offers discrete accelerator performance without added hardware and complexity.

The processors also support a separate and encrypted memory space, known as the SGX Enclave, for use by Intel Software Guard Extensions (SGX). The size of the SGX Enclave supported varies by processor model. Intel SGX offers hardware-based memory encryption that isolates specific application code and data in memory. It allows user-level code to allocate private regions of memory (enclaves) which are designed to be protected from processes running at higher privilege levels.

The following table summarizes the key features of the Intel Xeon 6 P-core processors that are supported in the SR450 V4.

Table 9. Intel 6 P-core processor features

CPU model	Die	Cores/ threads	Core speed (Base / TB max)	L3 cache	Mem. chan	Max RDIMM speed	Max MRDIMM speed	UPI 2.0 links & speed	PCIe lanes	TDP	Accelerators				SGX Enclave Size
											QAT	DLB	DSA	IAA	
Intel Xeon 6500-series with P-cores															
6503P	LCC	8 / 16	2.8GHz / 4.3 GHz	48 MB	8	6400 MHz	None	3 / 24 GT/s	88	135W	2	2	2	2	512GB
6505P	LCC	12 / 24	2.2GHz / 4.1 GHz	48 MB	8	6400 MHz	None	3 / 24 GT/s	88	150W	2	2	2	2	128GB
6507P	LCC	8 / 16	3.5GHz / 4.3 GHz	48 MB	8	6400 MHz	None	3 / 24 GT/s	88	150W	2	2	2	2	512GB
6515P	LCC	16 / 32	2.3GHz / 3.8 GHz	72 MB	8	6400 MHz	None	3 / 24 GT/s	88	150W	2	2	2	2	128GB
6517P	LCC	16 / 32	3.2GHz / 4.2 GHz	72 MB	8	6400 MHz	None	3 / 24 GT/s	88	190W	2	2	2	2	512GB
6520P	HCC	24 / 48	2.4GHz / 4 GHz	144 MB	8	6400 MHz	None	4 / 24 GT/s	88	210W	2	2	2	2	128GB
6530P	HCC	32 / 64	2.3GHz / 4.1 GHz	144 MB	8	6400 MHz	None	4 / 24 GT/s	88	225W	2	2	2	2	128GB
Intel Xeon 6700-series with P-cores															
6714P	LCC	8 / 16	4.0GHz / 4.3 GHz	48 MB	8	6400 MHz	None	3 / 24 GT/s	88	165W	2	2	2	2	512GB
6724P	LCC	16 / 32	3.6GHz / 4.3 GHz	72 MB	8	6400 MHz	None	3 / 24 GT/s	88	210W	2	2	2	2	512GB
6730P	HCC	32 / 64	2.5GHz / 3.8 GHz	288 MB	8	6400 MHz	None	4 / 24 GT/s	88	250W	4	4	4	4	512GB

Processor cooling

The SR450 V4 uses two different heatsinks to remove heat from the processors:

- Entry heatsinks, suitable for ambient temperatures ≤ 35°C
- Standard heatsinks with integrated heat pipes, suitable for ambient temperatures > 35°C

Additional requirements:

- The use of the Intel Xeon 6724P processor requires the standard heatsink
- The use of active optical cables (AOCs) requires ambient temperatures ≤ 35°C

Ordering information is listed in the following table.

Table 10. Processor cooling options

Feature code	Description	Top Choice Express	Purpose
Heatsink selections			
BPDQ	ThinkSystem SR650 V3 AL Extrusion Entry Heatsink	-	Entry 2U heatsink. Automatically selected based on the server configuration.
BPDR	ThinkSystem V4 2U Standard Heatsink	-	Standard 2U heatsink. Automatically selected based on the server configuration.

UEFI operating modes

The SR450 V4 offers preset operating modes that affect energy consumption and performance. These modes are a collection of predefined low-level UEFI settings that simplify the task of tuning the server to suit your business and workload requirements.

The following table lists the feature codes that allow you to specify the mode you wish to preset in the factory for CTO orders.

Limited choice for LCC processors: If you select a processor with an LCC topology (see the Die column in the Processor features table), you will only be able to select General Computing - Power Efficiency (C3JB) in DCSC. The other modes are still supported, however, they can only be set in the field, not in the factory. Note that this is the only mode that is ERP Lot9-compliant for EU and UK customers.

Table 11. UEFI operating mode presets in DCSC

Feature code	Description	Top Choice Express
C3JB	ThinkSystem General Computing - Power Efficiency (default)	-
C3JA	ThinkSystem General Computing - Peak Frequency	-
C3J9	ThinkSystem General Computing - Max Performance	-
C3J8	ThinkSystem High Performance Computing (HPC)	-
C9U8	ThinkSystem Low Latency	-
C9UA	ThinkSystem Virtualization - Power Efficiency	-
C9U9	ThinkSystem Virtualization - Max Performance	-
C9U7	ThinkSystem DataBase - Transaction Processing	-
CCVW	ThinkSystem Database Memory	-

The preset modes for the SR450 V4 are as follows:

- **ThinkSystem General Computing - Power Efficiency** (feature C3JB): This workload profile optimizes the performance per watt efficiency with a bias towards performance. This workload profile is analogous to “Efficiency – Favor Performance” operating mode on ThinkSystem V3 servers. This profile contains settings for ENERGY STAR® and ERP Lot9 compliance.
- **ThinkSystem General Computing - Peak Frequency** (feature C3JA): This workload profile is defined by the requirement to drive the highest core frequencies out of a processor across a subset of cores available – not for all cores active. This workload profile benefits workloads requiring either high per core and / or overall CPU package frequency. These workloads may have variable resource demands, are relatively insensitive to overall platform latency, and are generally CPU clock constrained. Tuning a system for highest possible core frequency may mean allowing inactive cores to transfer in and out of sleep states (C-states), which allows active cores to run at higher frequency for different durations of time. Allowing cores to go into low power states allows for higher per core frequency but can introduce “jitter” in the systems clock frequency.
- **ThinkSystem General Computing - Max Performance** (feature C3J9): This workload profile maximizes the absolute performance of the system without regard for power savings. Power savings features are disabled. This operating mode should be used when an application can sustain work across all cores simultaneously and is Non-uniform Memory Access (NUMA) aware.
- **ThinkSystem High Performance Computing (HPC)** (feature C3J8): This profile is for customers running large-scale scientific and engineering workloads. These environments tend to be clustered environments where each node performs at maximum utilization for extended periods of time, and the application is Non-Uniform Memory Access (NUMA) aware.
- **ThinkSystem Low Latency** (feature C9U8): This workload profile seeks to minimize overall transaction latency. Low wait times for core-to-core, core-to-cache, CPU-to-memory, and CPU-to-adapter communication are critical. Clock frequency is only important in so far as it minimizes intra- and inter-CPU latency. This profile is characterized by maintaining low processor clock variability and maintaining all external CPU links, memory and PCIe subsystems at maximum frequency.
- **ThinkSystem Virtualization - Power Efficiency** (feature C9UA): This workload profile is for virtualization environments. The profile ensures that all available virtualization options are enabled. Power saving features are enabled.
- **ThinkSystem Virtualization - Max Performance** (feature C9U9): This workload profile is for virtualization environments. The profile ensures that all available virtualization options are enabled. Power saving features are disabled.
- **ThinkSystem DataBase - Transaction Processing** (feature C9U7): This workload profile is for online transaction processing (OLTP) applications that require a database back-end.

Memory

The SR450 V4 uses Lenovo TruDDR5 memory operating at up to 6400 MT/s. The processor has 8 memory channels and supports 8 DIMMs (1 DIMM per channel). The server supports up to 512GB of memory using 8x 64GB RDIMMs.

Lenovo TruDDR5 memory uses the highest quality components that are sourced from Tier 1 DRAM suppliers and only memory that meets the strict requirements of Lenovo is selected. It is compatibility tested and tuned to maximize performance and reliability. From a service and support standpoint, Lenovo TruDDR5 memory automatically assumes the system warranty, and Lenovo provides service and support worldwide.

The following table lists the memory DIMMs that are currently supported by the SR450 V4. The table includes a Top Choice Express column; for CTO orders, select a TCE component for faster delivery. See the Top Choice section for more information.

Table 12. Memory options

Part number	Feature code	Description	Top Choice Express	DRAM technology	Quantity supported
x4 RDIMMs					
4X77A90966	C0TQ	ThinkSystem 64GB TruDDR5 6400MHz (2Rx4) RDIMM	-	16Gb	1, 2, 4, 6, 8
x8 RDIMMs					
4X77A90963	C0U2	ThinkSystem 16GB TruDDR5 6400MHz (1Rx8) RDIMM	-	16Gb	1, 2, 4, 6, 8
4X77A90965	BYTJ	ThinkSystem 32GB TruDDR5 6400MHz (2Rx8) RDIMM	-	16Gb	1, 2, 4, 6, 8

For more information on this memory, see the Lenovo Press paper, Introduction to DDR5 Memory.

The following rules apply when specifying the memory configuration:

- The tables above list the supported quantities per processor. Other quantities are not supported.
- All installed RDIMMs must be identical part numbers; mixing not supported

For best performance, consider the following:

- Ensure the memory installed is at least the same speed as the memory bus of the selected processor.
- Populate all memory channels.

The following memory protection technologies are supported:

- ECC detection/correction
- Bounded Fault detection/correction
- SDDC (for 10x4-based memory DIMMs; look for "x4" in the DIMM description)
- ADDDC (for 10x4-based memory DIMMs)
- Memory mirroring

See the Lenovo Press article "RAS Features of the Lenovo ThinkSystem Intel Servers" for more information about memory RAS features: https://lenovopress.lenovo.com/lp1711-ras-features-of-the-lenovo-thinksystem-intel-servers

If memory channel mirroring is used, then DIMMs must be installed in pairs (minimum of one pair per processor), and both DIMMs in the pair must be identical in type and size. 50% of the installed capacity is

available to the operating system.

Memory rank sparing is implemented using ADDDC/ADC-SR/ADDDC-MR to provide DRAM-level sparing feature support.

Internal storage

The SR450 V4 support the following drive bay configurations:

- Up to 8x 3.5-inch hot-swap bays, or
- Up to 8x 2.5-inch hot-swap bays

The server also supports one or two hot-swap M.2 drives in the rear of the server.

In this section:

- NVMe drive support
- Front drive bays
- Storage configurations
- Field upgrades
- RAID flash power module (supercap) support
- M.2 drives
- SED encryption key management with SKLM
- Encryption Enablement

NVMe drive support

The SR450 V4 supports NVMe drives to maximize storage performance:

- In a 2.5-inch drive configuration, the server supports 8x NVMe drives without oversubscription (that is, each x4 drive has a dedicated x4 (4 lanes) connection to the processor)
- In a 3.5-inch drive configuration, NVMe drives are currently not supported

In addition, the SR450 V4 supports two M.2 NVMe drives for use as boot drives, as described in the M.2 drives section

The specifics of these configurations are covered in the Storage configurations section. The tables in those sections indicate the number of NVMe drives in each configuration.

Front drive bays

The front drive bays supports the following configurations:

- 8x 3.5-inch drive bays (hot-swap)
- 8x 2.5-inch drive bays (hot-swap)
- No backplanes and no drives (supports field upgrades)

The specific combinations that are supported in the SR450 V4 are shown in the following figures. The feature codes listed are the backplane feature codes when ordering CTO and correspond to the feature codes listed in the table below the figure.

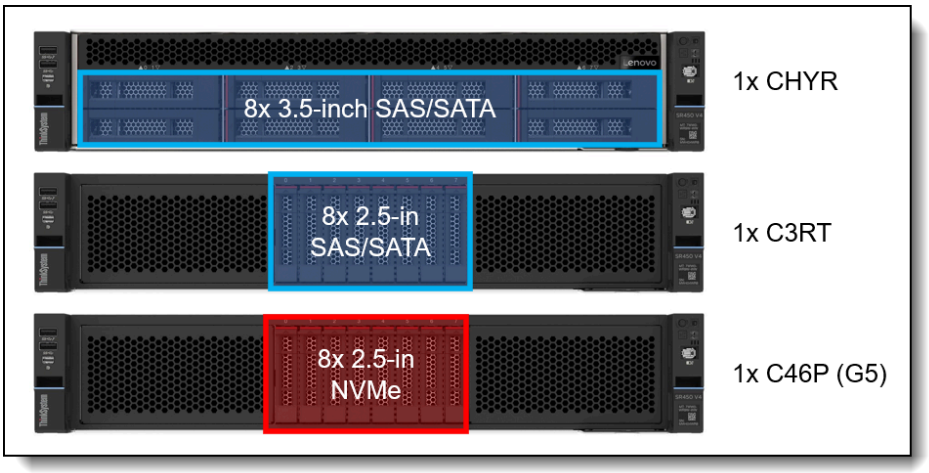


Figure 7. SR450 V4 front drive bay configurations

The backplanes used to provide these drive bays are listed in the following table. The table includes a Top Choice Express column: for CTO orders, select a TCE component for faster delivery. See the Top Choice section for more information.

Field upgrades: All front backplanes are available as part numbers for field upgrades along with require cable option kits, as described in the Field upgrades section below.

Table 13. Backplanes for drive bays

Feature	Description	Top Choice Express	Bays	PCIe Gen	SAS Gen	Max qty
Front 3.5-inch drive backplanes (requires base feature CHYV - see Base feature codes section)						
CHYR	ThinkSystem 8x3.5" SAS/SATA Backplane	-	8	-	12Gb	1
Front 2.5-inch drive backplanes (requires base feature CHZ7 - see Base feature codes section)						
C3RT	ThinkSystem 2U V4 8x2.5" SAS/SATA Backplane	-	8	-	12Gb	1
C46P	ThinkSystem 2U V4 8x2.5" NVMe Backplane	-	8	Gen5	-	1

The SR450 V4 also supports configurations without any drive bays, allowing for drive bay upgrades as described in the field upgrades section.

Storage configurations

This section describes the various combinations of drive bays and controllers that the server supports.

Tip: These tables are based on Storage Configs v0.4

Table 14. Storage configurations

Config	3.5-inch SAS/SATA	2.5-inch SAS/SATA	2.5-inch NVMe	Backplanes	M.2	Controllers
1-1	0	8	0	8x2.5" SAS/SATA (C3RT)	Option	(440-16i or 545-8i or 940-8i)
2-1	0	0	8	8x2.5" NVMe G5 (C46P)	Option	OB NVMe
3-1	8	0	0	8x3.5" SAS/SATA (CHYR)	Option	(440-16i or 545-8i or 940-8i)

Field upgrades

The SR450 V4 is orderable without drive bays, allowing you to add a backplane, cabling and controllers as field upgrades.

To add drive bays you will need to order both drive backplanes and cable kits. Backplane kits do not include cables.

When adding drive bays, you will also need to add the appropriate storage controller(s). Consult the tables in the Storage configurations section to determine what controller sections are supported and what additional controllers you will need. Controllers are described in the Controllers for internal storage section.

Table 15. Storage configurations

Config	3.5-inch SAS/SATA	2.5-inch SAS/SATA	2.5-inch NVMe	Backplane and cable kits required (all required)
1-1	0	8	0	• 4XH7B18539, ThinkSystem SR450 V4 8x2.5'' SAS/SATA Backplane Option Kit • 4X97B18543, ThinkSystem SR450 V4 8X2.5" Chassis Front Backplane SAS/SATA Cable Kit
2-1	0	0	8	• 4XH7B18538, ThinkSystem SR450 V4 8x2.5'' NVMe PCIe Gen5 x4 Backplane Option Kit • 4X97B18542, ThinkSystem SR450 V4 8x2.5" Chassis Front Backplane NVMe Cable Kit
3-1	8	0	0	• 4XH7B18540, ThinkSystem SR450 V4 8x3.5'' SAS/SATA Backplane Option Kit • 4X97B18544, ThinkSystem SR450 V4 8x3.5" Chassis Front Backplane SAS/SATA Cable Kit

RAID flash power module (supercap) support

The RAID 940-8i adapter includes a RAID flash power module (supercap) that needs to be mounted properly. In the SR450 V4, the supercap holder is mounted towards the front of the server, between the drive bays and system fans.

For field upgrades that add the RAID 940-8i adapter, order the following part number for the supercap holder.

Table 16. Supercaps

Part number	Description
4M17A61230	ThinkSystem 2U Supercap Holder Kit

M.2 drives

The SR450 V4 optionally supports one or two M.2 form-factor NVMe drives for use as an operating system boot solution or as additional storage. In the SR450 V4, the M.2 drives are hot-swap with integrated RAID support.

In this section:

- M.2 ordering information
- M.2 adapter features
- M.2 field upgrades for hot-swap M.2

The following figure shows the location of the rear hot-swap M.2 drive bays.

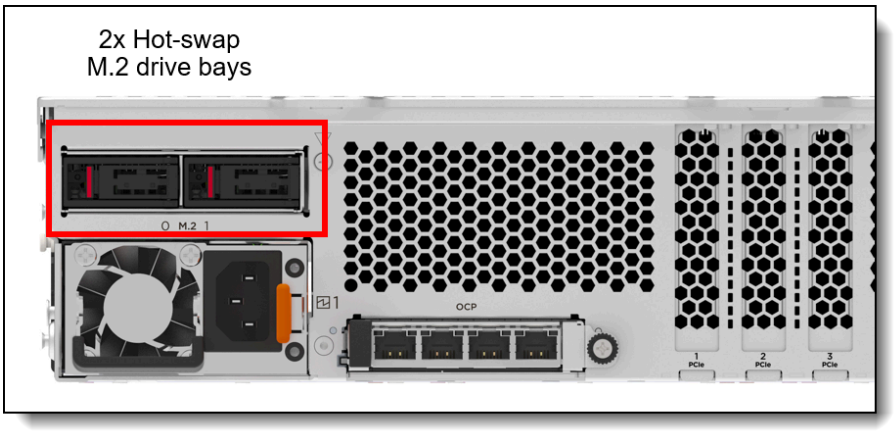


Figure 8. Hot-swap M.2 drive bays

The following figure shows the components of the rear hot-swap M.2 drive bays.

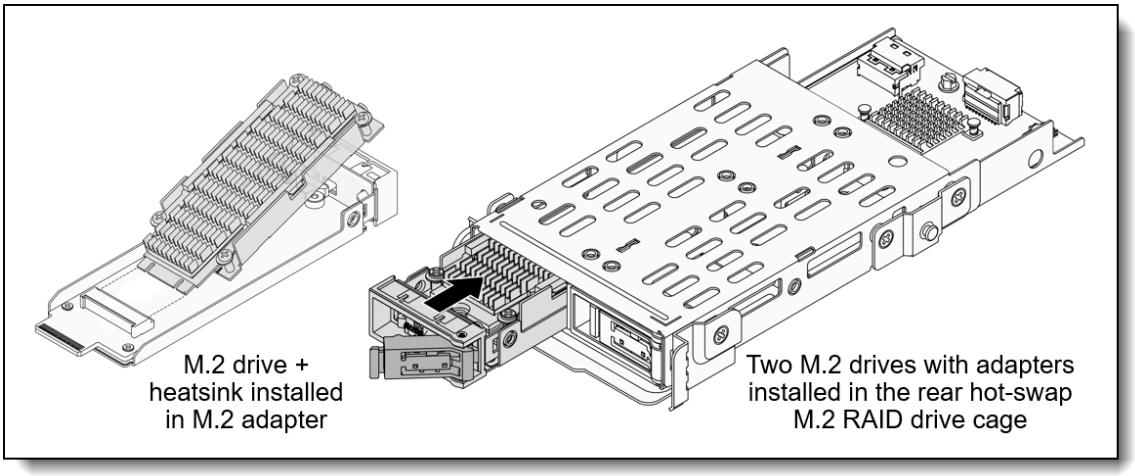


Figure 9. Rear hot-swap M.2 drive bays

M.2 ordering information

The supported M.2 module is listed in the following table. For field upgrades see the M.2 field upgrades section below.

Table 17. M.2 adapters

Part number	Feature code	Description	Top Choice Express	SATA drives	NVMe drives	RAID	Max Qty
4XH7B18541	CCCZ	ThinkSystem SR450 V4 Rear M.2 RAID B550p-2HS SATA/NVMe Enablement Kit • M.2 rear drive cage • M.2 2-drive hot-swap backplane • Signal and power cables	-	No	Yes (x1 lane per drive)	Integrated (Broadcom)	1

Configuration notes:

- M.2 drives are installed in a dedicated location with the SR450 V4 and are supported with all storage configurations.

- For CTO orders, all other necessary components, except for the M.2 drives themselves, will be automatically included in the order. For drives, see the Internal drive options section.

M.2 adapter features

The B550p-2HS (4XH7B18541, feature CCCZ) both have the following features:

- Supports one or two NVMe M.2 drives (SATA not supported)
- Each drive is installed in a hot-swap carrier
- Support M.2 2280 (80mm) drive form factor only
- RAID support via an onboard Broadcom SAS3808N RAID Controller
- With 1 drive, supports JBOD
- With 2 drives, supports 2-drive RAID-0, 2-drive RAID-1, or JBOD
- PCIe 4.0 x2 host interface; PCIe 4.0 x1 connection to each drive
- Management and configuration support via UEFI and OS-based tools
- Supports monitoring and reporting of events and temperature
- Firmware update via Lenovo firmware update tools
- Supports SED drive encryption

M.2 field upgrades for hot-swap M.2

For field upgrades to add one of the supported hot-swap M.2 modules, order the hot-swap part numbers as listed in the M.2 ordering information section. Unlike internal M.2 used in other servers, an additional cable kit is not required for hot-swap M.2.

The hot-swap M.2 drive bays require M.2 drives with a hot-swap assembly attached. For configure-to-order builds, the hot-swap drive assembly is automatically included in the order for all M.2 drives. For field upgrades, the supported M.2 drives thjat are listed in the Internal drive options section include include the hot-swap tray.

SED encryption key management with SKLM

The server supports self-encrypting drives (SEDs) as listed in the Internal drive options section. To effectively manage a large deployment of these drives in Lenovo servers, IBM Security Key Lifecycle Manager (SKLM) offers a centralized key management solution.

The IBM Security Key Lifecycle Manager software is available from Lenovo using the ordering information listed in the following table.

Table 18. IBM Security Key Lifecycle Manager licenses

Part number	Feature	Description
SKLM Basic Edition		
7S0A007FWW	S874	IBM Security Key Lifecycle Manager Basic Edition Install License + SW Subscription & Support 12 Months
7S0A008VWW	SDJR	IBM Security Key Lifecycle Manager Basic Edition Install License + SW Subscription & 3 Years Of Support
7S0A008WWW	SDJS	IBM Security Key Lifecycle Manager Basic Edition Install License + SW Subscription & 4 Years Of Support
7S0A008XWW	SDJT	IBM Security Key Lifecycle Manager Basic Edition Install License + SW Subscription & 5 Years Of Support
SKLM For Raw Decimal Terabyte Storage		
7S0A007HWW	S876	IBM Security Key Lifecycle Manager For Raw Decimal Terabyte Storage Resource Value Unit License + SW Subscription & Support 12 Months
7S0A008YWW	SDJU	IBM Security Key Lifecycle Manager For Raw Decimal Terabyte Storage Resource Value Unit License + SW Subscription & 3 Years Of Support

Part number	Feature	Description
7S0A008ZWW	SDJV	IBM Security Key Lifecycle Manager For Raw Decimal Terabyte Storage Resource Value Unit License + SW Subscription & 4 Years Of Support
7S0A0090WW	SDJW	IBM Security Key Lifecycle Manager For Raw Decimal Terabyte Storage Resource Value Unit License + SW Subscription & 5 Years Of Support
SKLM For Raw Decimal Petabyte Storage		
7S0A007KWW	S878	IBM Security Key Lifecycle Manager For Raw Decimal Petabyte Storage Resource Value Unit License + SW Subscription & Support 12 Months
7S0A0091WW	SDJX	IBM Security Key Lifecycle Manager For Raw Decimal Petabyte Storage Resource Value Unit License + SW Subscription & 3 Years Of Support
7S0A0092WW	SDJY	IBM Security Key Lifecycle Manager For Raw Decimal Petabyte Storage Resource Value Unit License + SW Subscription & 4 Years Of Support
7S0A0093WW	SDJZ	IBM Security Key Lifecycle Manager For Raw Decimal Petabyte Storage Resource Value Unit License + SW Subscription & 5 Years Of Support
SKLM For Usable Decimal Terabyte Storage		
7S0A007MWW	S87A	IBM Security Key Lifecycle Manager For Usable Decimal Terabyte Storage Resource Value Unit License + SW Subscription & Support 12 Months
7S0A0094WW	SDK0	IBM Security Key Lifecycle Manager For Usable Decimal Terabyte Storage Resource Value Unit License + SW Subscription & 3 Years In Support
7S0A0095WW	SDK1	IBM Security Key Lifecycle Manager For Usable Decimal Terabyte Storage Resource Value Unit License + SW Subscription & 4 Years In Support
7S0A0096WW	SDK2	IBM Security Key Lifecycle Manager For Usable Decimal Terabyte Storage Resource Value Unit License + SW Subscription & 5 Years In Support
SKLM For Usable Decimal Petabyte Storage		
7S0A007PWW	S87C	IBM Security Key Lifecycle Manager For Usable Decimal Petabyte Storage Resource Value Unit License + SW Subscription & Support 12 Months
7S0A0097WW	SDK3	IBM Security Key Lifecycle Manager For Usable Decimal Petabyte Storage Resource Value Unit License + SW Subscription & 3 Years Of Support
7S0A0098WW	SDK4	IBM Security Key Lifecycle Manager For Usable Decimal Petabyte Storage Resource Value Unit License + SW Subscription & 4 Years Of Support
7S0A0099WW	SDK5	IBM Security Key Lifecycle Manager For Usable Decimal Petabyte Storage Resource Value Unit License + SW Subscription & 5 Years Of Support

Encryption Enablement

For CTO orders, the configurator allows you to specify that you want to create an "encryption-ready" server, and to ensure that only components that support encryption are selectable in the configurator. This is done in DCSC and x-config configurator tools by selecting the feature code listed in the following table.

Table 19. Encryption Enablement

Part number	Feature code	Description	Top Choice Express
CTO only	CES1*	Drive Encryption Enablement (not supported with vSAN)	-

* In DCSC, this feature is in **Storage > Internal Storage** under the heading "Encryption Enablement"

Tip: This feature will not be selectable until an SED-capable drive is selected.

By selecting this feature code, the following requirements will be enabled in the configurator:

- SED drives will be required

- XCC3 Premier will be required
- VROC NVMe RAID cannot be selected
- 440-8i and 440-16i HBAs cannot be selected

Configuration notes:

- Do not use this feature code for VMware vSAN or Nutanix servers, since these virtualization offerings do not support HW RAID adapter-based encryption
- Selecting this feature code does not enable encryption at the factory
- If you don't select this feature code, you will still be able to enable encryption in your server, however you will need to ensure that you have suitable storage controllers and drives installed in the server

Controllers for internal storage

The SR450 V4 offers the following controller options for internal drives:

- For 3.5-inch and 2.5-inch hot-swap drives:
  - Onboard NVMe ports with RAID support using Intel VROC NVMe RAID
  - RAID adapters and HBAs for SAS/SATA drives (PCIe slot-based)
- For M.2 drives (see M.2 drives section)
  - NVMe controller integrated on the M.2 adapters with integrated RAID

The following table lists the adapters used for the internal storage of the server. The table includes a Top Choice Express column; for CTO orders, select a TCE component for faster delivery. See the Top Choice section for more information.

No Onboard SATA support: The processor in the SR450 V4 does not offer onboard SATA support. For SATA drives, you will need either a RAID adapter or an HBA.

Table 20. Storage controller support for internal drives

Part number	Feature code	Description	Top Choice Express	RAID level	Max Qty	Slots	Supercap
Onboard NVMe - PCIe 5.0 - RAID using Intel VROC.							
CTO only	BC4V	Non RAID NVMe	-	Optional; See VROC	1	None	No
SAS HBA - PCIe 4.0							
4Y37A78602	BM50	ThinkSystem 440-16i SAS/SATA PCIe Gen4 12Gb HBA	-	None	1	All slots	No
RAID Adapter - PCIe 4.0 (SAS/SATA only)							
4Y37A93012	C0TU	ThinkSystem RAID 545-8i PCIe Gen4 12Gb Adapter	-	0, 1, 10	1	All slots	No
4Y37A09728	B8NY	ThinkSystem RAID 940-8i 4GB Flash PCIe Gen4 12Gb Adapter	-	0, 1, 10, 5, 50, 6, 60	1	All slots	Included

Configuration notes:

- **Field upgrades**: If you are adding a RAID adapter with supercap to the server as a field upgrade, you may need a supercap holder as described in the RAID flash power module (supercap) support section.

The onboard NVMe support has the following features:

- Support integrated into the Intel processor
- Each drive has PCIe 5.0 x4 host interface
- Supports JBOD

- Supports RAID using Intel VROC

For specifications about the RAID adapters and HBAs supported by the SR450 V4, see the ThinkSystem RAID Adapter and HBA Comparison, available from: https://lenovopress.com/lp1288-lenovo-thinksystem-raid-adapter-and-hba-reference#sr650-v4-support=SR650%2520V4

For details about these adapters, see the relevant product guide:

- SAS HBAs: https://lenovopress.com/servers/options/hba
- RAID adapters: https://lenovopress.com/servers/options/raid

Intel VROC onboard RAID

Intel VROC (Virtual RAID on CPU) is a feature of the Intel processor that enables Integrated RAID support.

On the SR450 V4, Intel VROC provides RAID functions for the onboard NVMe controller (Intel VROC NVMe RAID).

VROC NVMe RAID offers RAID support for any NVMe drives directly connected to the ports on the server's system board or via adapters such as NVMe retimers or NVMe switch adapters. On the SR450 V4, RAID levels implemented are based on the VROC feature selected as indicated in the following table. RAID 1 is limited to 2 drives per array, and RAID 10 is limited to 4 drives per array. Hot-spare functionality is also supported.

Performance tip: For best performance with VROC NVMe RAID, the drives in an array should all be connected to the same processor. Spanning processors is possible however performance will be unpredictable and should be evaluated based on your workload.

The SR450 V4 supports the VROC NVMe RAID offerings listed in the following table.

Table 21. Intel VROC NVMe RAID ordering information and feature support

Part number	Feature code	Description	Lenovo Top Choice Express	Intel NVMe SSDs	Non-Intel NVMe SSDs	RAID 0	RAID 1	RAID 10	RAID 5
4L47A83669	BR9B	Intel VROC (VMD NVMe RAID) Standard	-	Yes	Yes	Yes	Yes	Yes	No
4L47A39164	B96G	Intel VROC (VMD NVMe RAID) Premium	-	Yes	Yes	Yes	Yes	Yes	Yes

Configuration notes:

- If a feature code is ordered in a CTO build, the VROC functionality is enabled in the factory. For field upgrades, order a part number and it will be fulfilled as a Feature on Demand (FoD) license which can then be activated via the XCC management processor user interface.
- SED functionality is not supported with VROC NVMe RAID

Virtualization support: Virtualization support for Intel VROC is as follows:

- **VROC (VMD) NVMe RAID**: VROC (VMD) NVMe RAID is supported by ESXi, KVM, Xen, and Hyper-V. ESXi support is limited to RAID 1 only; other RAID levels are not supported. Windows and Linux OSes support VROC RAID NVMe, both for host boot functions and for guest OS function, and RAID-0, 1, 5, and 10 are supported. On ESXi, VROC is supported with both boot and data drives.

Internal drive options

VMware vSAN and Microsoft S2D configurations: Vendor Agnostic (VA) drives are based on drives from multiple vendors, and not all vendor variants are VMware vSAN or Microsoft S2D certified. Additionally, ISVs require a single drive vendor per host and cluster to ensure optimal performance; a requirement that VA drives may not consistently meet. To ensure certification compliance, hardware uniformity, and alignment with VMware and Microsoft best practices, use ThinkAgile VX or ThinkAgile FX for all vSAN configurations and ThinkAgile MX for all S2D configurations, instead of general purpose ThinkSystem servers.

The following tables list the drive options for internal storage of the server.

2.5-inch hot-swap drives:

- 2.5-inch hot-swap 24 Gb SAS SSDs
- 2.5-inch hot-swap 6 Gb SATA SSDs
- 2.5-inch hot-swap PCIe 5.0 NVMe SSDs

3.5-inch hot-swap drives:

- 3.5-inch hot-swap 12 Gb SAS HDDs
- 3.5-inch hot-swap 6 Gb SATA HDDs

M.2 drive support: The use of M.2 drives requires an additional adapter as described in the M.2 drives subsection.

SED support: The tables include a column to indicate which drives support SED encryption. The encryption functionality can be disabled if needed. Note: Not all SED-enabled drives have "SED" in the description.

Table 22. 2.5-inch hot-swap 24 Gb SAS SSDs

Part number	Feature code	Description	Top Choice Express	SED support	Max Qty
2.5-inch hot-swap SSDs - 24 Gb SAS - Mixed Use (3-5 DWPD)					
4XB7B07613	CABR	ThinkSystem 2.5" VA 1.6TB Mixed Use SAS 24Gb HS SSD	-	Support	8
4XB7B07614	CABQ	ThinkSystem 2.5" VA 3.2TB Mixed Use SAS 24Gb HS SSD	-	Support	8
4XB7B07615	CABK	ThinkSystem 2.5" VA 6.4TB Mixed Use SAS 24Gb HS SSD	-	Support	8
2.5-inch hot-swap SSDs - 24 Gb SAS - Read Intensive (<3 DWPD)					
4XB7B07601	CABV	ThinkSystem 2.5" VA 1.92TB Read Intensive SAS 24Gb HS SSD	-	Support	8
4XB7B07602	CABT	ThinkSystem 2.5" VA 3.84TB Read Intensive SAS 24Gb HS SSD	-	Support	8
4XB7B07603	CABY	ThinkSystem 2.5" VA 7.68TB Read Intensive SAS 24Gb HS SSD	-	Support	8
4XB7B07604	CABX	ThinkSystem 2.5" VA 15.36TB Read Intensive SAS 24Gb HS SSD	-	Support	8

Table 23. 2.5-inch hot-swap 6 Gb SATA SSDs

Part number	Feature code	Description	Top Choice Express	SED support	Max Qty
2.5-inch hot-swap SSDs - 6 Gb SATA - Read Intensive (<3 DWPD)					
4XB7B09967	CBVE	ThinkSystem 2.5" VA 480GB Read Intensive SATA 6Gb HS SSD SED	-	Support	8
4XB7B09968	CBVD	ThinkSystem 2.5" VA 960GB Read Intensive SATA 6Gb HS SSD SED	-	Support	8
4XB7B09969	CBVC	ThinkSystem 2.5" VA 1.92TB Read Intensive SATA 6Gb HS SSD SED	-	Support	8

Table 24. 2.5-inch hot-swap PCIe 5.0 NVMe SSDs

Part number	Feature code	Description	Top Choice Express	SED support	Max Qty
2.5-inch SSDs - U.2 PCIe 5.0 NVMe - Mixed Use (3-5 DWPD)					
4XB7A93127	C0ZR	ThinkSystem 2.5" U.2 VA 1.6TB Mixed Use NVMe PCIe 5.0 x4 HS SSD	-	Support	8
4XB7A93128	C0ZQ	ThinkSystem 2.5" U.2 VA 3.2TB Mixed Use NVMe PCIe 5.0 x4 HS SSD	-	Support	8
4XB7A93129	C0ZP	ThinkSystem 2.5" U.2 VA 6.4TB Mixed Use NVMe PCIe 5.0 x4 HS SSD	-	Support	8
4XB7A93130	C0ZN	ThinkSystem 2.5" U.2 VA 12.8TB Mixed Use NVMe PCIe 5.0 x4 HS SSD	-	Support	8
2.5-inch SSDs - U.2 PCIe 5.0 NVMe - Read Intensive (<3 DWPD)					
4XB7A93122	C0ZV	ThinkSystem 2.5" U.2 VA 1.92TB Read Intensive NVMe PCIe 5.0 x4 HS SSD	-	Support	8
4XB7A93123	C0ZU	ThinkSystem 2.5" U.2 VA 3.84TB Read Intensive NVMe PCIe 5.0 x4 HS SSD	-	Support	8
4XB7A93124	C0ZT	ThinkSystem 2.5" U.2 VA 7.68TB Read Intensive NVMe PCIe 5.0 x4 HS SSD	-	Support	8
4XB7A93125	C0ZS	ThinkSystem 2.5" U.2 VA 15.36TB Read Intensive NVMe PCIe 5.0 x4 HS SSD	-	Support	8
4XB7A93126	C1W7	ThinkSystem 2.5" U.2 VA 30.72TB Read Intensive NVMe PCIe 5.0 x4 HS SSD	-	Support	8

Table 25. 3.5-inch hot-swap 12 Gb SAS HDDs

Part number	Feature code	Description	Top Choice Express	SED support	Max Qty
3.5-inch hot-swap HDDs - 12 Gb NL SAS					
4XB7B01235	C5X9	ThinkSystem 3.5" 4TB 7.2K SAS 12Gb Hot Swap 512e HDD v2	-	Support	8
4XB7B01239	C5XD	ThinkSystem 3.5" 8TB 7.2K SAS 12Gb Hot Swap 512e HDD v2	-	Support	8
4XB7A93788	C4DA	ThinkSystem 3.5" 12TB 7.2K SAS 12Gb Hot Swap 512e HDD v2	-	Support	8
4XB7A93786	C4D8	ThinkSystem 3.5" 16TB 7.2K SAS 12Gb Hot Swap 512e HDD v2	-	Support	8

Table 26. 3.5-inch hot-swap 6 Gb SATA HDDs

Part number	Feature code	Description	Top Choice Express	SED support	Max Qty
3.5-inch hot-swap HDDs - 6 Gb NL SATA					
4XB7B01236	C5XA	ThinkSystem 3.5" 4TB 7.2K SATA 6Gb Hot Swap 512e HDD v2	-	Support	8
4XB7B01240	C5XE	ThinkSystem 3.5" 8TB 7.2K SATA 6Gb Hot Swap 512e HDD v2	-	Support	8
4XB7A93787	C4D9	ThinkSystem 3.5" 12TB 7.2K SATA 6Gb Hot Swap 512e HDD v2	-	Support	8
4XB7A93785	C4D7	ThinkSystem 3.5" 16TB 7.2K SATA 6Gb Hot Swap 512e HDD v2	-	Support	8

Internal backup units

The server does not supports any internal backup units, such as tape drives or RDX drives. External backup units are available as described in the External backup units section.

Optical drives

The server supports the external USB optical drive listed in the following table.

Table 27. External optical drive

Part number	Feature code	Description	Lenovo Top Choice Express
7XA7A05926	AVV8	ThinkSystem External USB DVD RW Optical Disk Drive	-

The drive is based on the Lenovo Slim DVD Burner DB65 drive and supports the following formats: DVD-RAM, DVD-RW, DVD+RW, DVD+R, DVD-R, DVD-ROM, DVD-R DL, CD-RW, CD-R, CD-ROM.

I/O expansion

The SR450 V4 supports a total of up to 3x PCIe slots plus 1x OCP slot, all at the rear of the server. All slots are mounted on the system board and no riser cards are needed.

The following figure shows the locations of the rear-accessible slots. All slots are PCIe Gen 5.

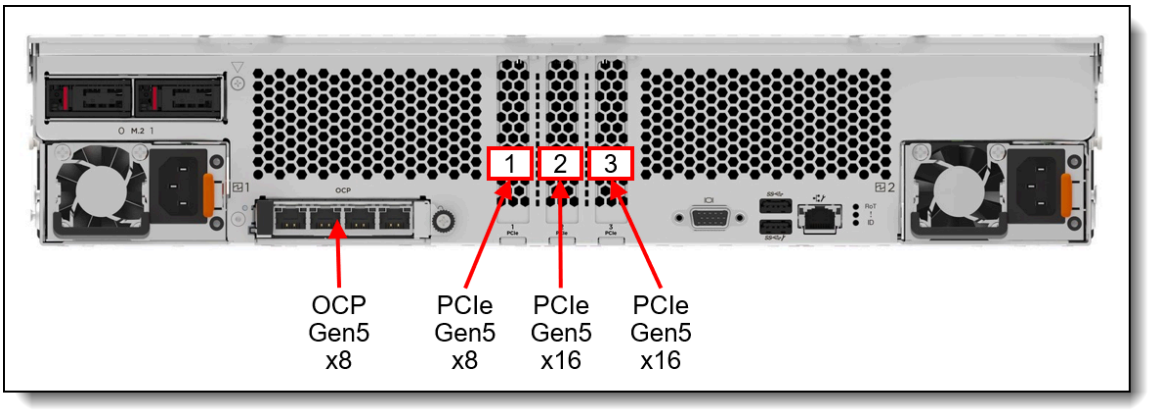


Figure 10. SR450 V4 rear slots

The supported slot are as follows:

- Slot 1: PCIe 5.0 x8, supporting low profile adapters
- Slot 2: PCIe 5.0 x16, supporting low profile adapters
- Slot 3: PCIe 5.0 x16, supporting low profile adapters
- OCP slot: PCIe 5.0 x8

Slot 1 is a closed-ended x8 slot which does not accept x16 adapters.

All slots are standard and are available in all configurations, both with 2.5-inch and 3.5-inch drive bays.

Network adapters

This section lists the supported network adapters:

- OCP network adapters
- PCIe network adapters
- Vendor Agnostic (VA) network adapters
- Adapters with Generic firmware

OCP network adapters

The server has one dedicated OCP 3.0 SFF slot with a PCIe x8 host interface, located at the rear of the server. See the figure above, in the I/O Expansion section, for the location of the OCP slot.

The following table lists the supported OCP adapters. One port can optionally be shared with the XCC management processor for Wake-on-LAN and NC-SI support. The table includes a Top Choice Express column; for CTO orders, select a TCE component for faster delivery. See the Top Choice section for more information.

Table 28. Supported OCP adapters

Part number	Feature code	Description	Top Choice Express	Maximum supported
Gigabit Ethernet				
4XC7A08235	B5T1	ThinkSystem Broadcom 5719 1GbE RJ45 4-port OCP Ethernet Adapter	-	1
4XC7B17532	CJF8	ThinkSystem VA 1GbE RJ45 4-Port OCP Ethernet Adapter**	-	1
10 Gb Ethernet - 10GBASE-T				
4XC7B16889	CJNP	ThinkSystem VA 10GBASE-T 2-port OCP Ethernet Adapter	-	1
4XC7B16890	CJE2	ThinkSystem VA 10GBASE-T 4-port OCP Ethernet Adapter**	-	1
4XC7A95696	C4GB	ThinkSystem Broadcom 57412 10GBase-T 4-Port OCP Ethernet Adapter	-	1
4XC7A96732	C4HS	ThinkSystem Intel E610-T2 10GBase-T 2-Port OCP Ethernet Adapter(Generic FW)*	-	1
25 Gb Ethernet				
4XC7A80567	BPPW	ThinkSystem Broadcom 57504 10/25GbE SFP28 4-Port OCP Ethernet Adapter	-	1
4XC7B13330	CJ8E	ThinkSystem Intel E835-XXVDA2 10/25GbE SFP28 2-Port OCP Ethernet Adapter(Generic FW)*	-	1
4XC7B16892	CJ8F	ThinkSystem VA 10/25GbE SFP28 2-port OCP Ethernet Adapter**	-	1
4XC7B16894	CJE4	ThinkSystem VA 10/25GbE SFP28 4-port OCP Ethernet Adapter**	-	1

* See the Adapters with Generic firmware section
** For information about VA network adapters, see the Vendor Agnostic (VA) network adapters section

PCIe network adapters

The following table lists additional supported network adapters that can be installed in the regular PCIe slots. The table includes a Top Choice Express column; for CTO orders, select a TCE component for faster delivery. See the Top Choice section for more information.

Table 29. Supported PCIe Network Adapters

Part number	Feature code	Description	Top Choice Express	Maximum supported	Slots
Gigabit Ethernet					
4XC7B17531	CJF7	ThinkSystem VA 1GbE RJ45 4-Port PCIe Ethernet Adapter**	-	3	All slots
7ZT7A00484	AUZV	ThinkSystem Broadcom 5719 1GbE RJ45 4-Port PCIe Ethernet Adapter	-	3	All slots
10 Gb Ethernet - 10GBASE-T					
4XC7B16891	CJE3	ThinkSystem VA 10GBASE-T 4-port PCIe Ethernet Adapter**	-	3	All slots
4XC7A95697	C4GC	ThinkSystem Broadcom 57412 10GBase-T 4-Port PCIe Ethernet Adapter	-	3	All slots
25 Gb Ethernet					
4XC7B16893	CJ8G	ThinkSystem VA 10/25GbE SFP28 2-port PCIe Ethernet Adapter**	-	3	All slots
4XC7B16895	CJE5	ThinkSystem VA 10/25GbE SFP28 4-port PCIe Ethernet Adapter**	-	2	2, 3
4XC7A80566	BNWM	ThinkSystem Broadcom 57504 10/25GbE SFP28 4-port PCIe Ethernet Adapter	-	2	2, 3
4XC7B13329	CJ8D	ThinkSystem Intel E835-XXVDA2 10/25GbE SFP28 2-Port PCIe Ethernet Adapter(Generic FW)	-	3	All slots

* See the Adapters with Generic firmware section
** For information about VA network adapters, see the Vendor Agnostic (VA) network adapters section

For more information, including the transceivers and cables that each adapter supports, see the list of Lenovo Press Product Guides in the Networking adapters category:
https://lenovopress.com/servers/options/ethernet

Vendor Agnostic (VA) network adapters

The SR450 V4 supports the selection of VA (vendor agnostic) network adapters. This is a new ordering and fulfillment program that improves supply-chain flexibility, increases component availability, reduces lead-time and sourcing risks. VA adapters are available across a range of Ethernet and Fibre Channel technologies.

These are not new physical adapters but a way to effectively indicate "I don't have a brand preference" when selecting a network adapter. VA adapter part numbers represent offerings that can be fulfilled by one of multiple Lenovo-qualified adapters. The specific qualified adapter is selected by Lenovo during fulfillment based on availability.

Tip: If customers require a specific adapter, they should select the corresponding branded adapter rather than the Vendor Agnostic offering.

How it works:

1. In DCSC and x-config, the user selects a VA network adapter by its feature code or part number
2. In the fulfillment process, Lenovo substitutes the VA adapter with a branded adapter, ensuring that the fundamental characteristics of the adapter remain the same (adapter form factor, network speed, port type, port count)
3. The server is built in the factory with the substituted branded adapter
4. The invoice and warranty records indicate the branded adapter that is shipped in the server
5. XCC and all systems management tools recognize the branded adapter

6. Warranty claims will replace any failed branded adapter with the exact same branded adapter

When there are multiple servers on one order, each with VA network adapters, Lenovo will attempt to maintain adapter consistency within the order where supply permits, but a specific vendor is not guaranteed with a VA offering. Customers requiring a particular vendor or homogeneous adapter population should select the corresponding branded adapter.

Adapters with Generic firmware

As indicated in the tables of supported adapters, some adapters are now offered by Lenovo with standard vendor firmware (look for "Generic FW" or "Generic" in the adapter names). These adapters are supported in Lenovo servers and with Lenovo management tools.

Support in Lenovo XClarity management tools for adapters with generic firmware is per the following table.

Tip: Always use firmware that is obtained from Lenovo sources to ensure the firmware is fully tested by Lenovo and is supported. You should not use firmware that is obtained from the vendor web site, unless directed to do so by Lenovo support.

Table 30. Lenovo XClarity management tools support for adapters with generic firmware

Function	Lenovo XClarity Provisioning Manager	Lenovo XClarity OneCLI (out-of-band)	Lenovo XClarity OneCLI (in-band)	Lenovo XClarity Administrator
Adapter configuration	Supported (in-band via UEFI)	Supported with latest UEFI firmware*	Supported with latest UEFI firmware*	Supported with latest UEFI firmware*

* Minimum supported UEFI firmware is as follows: SR630 V4, SR650 V4, SR650a V4: Release IHE116I; SR850 V4, SR860 V4: Release RVE106I.

GPU adapters

The SR450 V4 does not support GPUs

Fibre Channel host bus adapters

The following table lists the Fibre Channel HBAs supported by the SR450 V4. The table includes a Top Choice Express column; for CTO orders, select a TCE component for faster delivery. See the Top Choice section for more information.

Table 31. Fibre Channel HBAs

Part number	Feature code	Description	Top Choice Express	Maximum supported	Slots
32Gb Fibre Channel					
4XC7B17129	CJNT	ThinkSystem VA 32Gb 1-port PCIe Fibre Channel Adapter	-	3	All slots
4XC7B16896	CJNQ	ThinkSystem VA 32Gb 2-port PCIe Fibre Channel Adapter	-	3	All slots
4XC7B16931	CJE6	ThinkSystem Emulex LPe37100 32Gb 1-Port SecureHBA PCIe Fibre Channel Adapter(Generic FW)	-	3	All slots
4XC7A96457	C5FC	ThinkSystem Emulex LPe37102 32Gb 2-port SecureHBA PCIe Fibre Channel Adapter(Generic FW)	-	3	All slots
64Gb Fibre Channel					
4XC7B17130	CJNU	ThinkSystem VA 64Gb 2-port PCIe Fibre Channel Adapter	-	3	All slots
4XC7A96458	C5FD	ThinkSystem Emulex LPe38102 64Gb 2-port SecureHBA PCIe Fibre Channel Adapter(Generic FW)	-	3	All slots

For more information, see the list of Lenovo Press Product Guides in the Host bus adapters category: https://lenovopress.com/servers/options/hba

SAS adapters for external storage

The SR450 V4 does not support SAS HBAs or RAID adapters for external storage connectivity.

Cooling

The SR450 V4 server has three 60 mm single-rotor hot-swap cabled fans. Fans are variable-speed, up to 24K RPM, and do not require tools to install or remove. The server offers N+1 rotor redundancy. All three fans are included in all configurations.

The server also has an additional fan integrated into each of the two power supplies.

Power supplies

The SR450 V4 supports up to two redundant hot-swap power supplies.

The power supply choices are listed in the following table. If two power supplies are installed, both power supplies used in server must be identical.

Topics in this section:

- Power supply LEDs
- Zero-output mode
- Power cords (C13 connectors)

Tip: When configuring a server in the DCSC configurator, power consumption is calculated precisely by interfacing with Lenovo Capacity Planner. You can therefore select the appropriate power supply for your configuration. However, do consider future upgrades that may require additional power needs.

Table 32. Power supply options

Part number	Feature code	Description	Top Choice Express	Min Qty	Max Qty	Capacity (230V)	Capacity (115V)	Voltage	Conn.
Titanium AC power supplies - CRPS Premium									
4P57A88621	C0U4	ThinkSystem 1300W 230V/115V Titanium CRPS Premium Hot-Swap Power Supply	-	1	2	1300W	1000W	230V/115V	C14
Titanium AC power supplies - CRPS									
4P57A87056	BWM3	ThinkSystem 800W 230V/115V Titanium CRPS Hot-Swap Power Supply v1.4	-	1	2	800W	800W	230V/115V	C14

Configuration rules:

- The 230V/115V AC power supplies support both low-range (100-127V 50/60 Hz) and high-range (200-240V 50/60 Hz) power, except where noted. For China customers, all power supplies support 240V DC.
- When 2x power supplies are installed, they form a redundant pair; power supplies must be identical part numbers

For inlet current requirements, see the Physical and electrical specifications section.

Power supply options do not include a line cord. See the tables below for details about supported line cords, including the power cords for the DC power supplies. For server configurations, the inclusion of a power cord is model dependent. Configure-to-order models can be configured without power cords if desired.

The SR450 V4 supports both CRPS and CRPS Premium power supplies. CRPS Premium power supplies offer the following additional features:

- More accurate power metering
- Virtual reseat
- Enhanced fault detection
- System cooling assist (fan override)
- Fault LEDs
- VPD support
- Zero-output mode support (cold redundancy mode) (see the Zero-output mode section)

Power supply LEDs

CRPS Premium power supplies have two LEDs:

- Power output/fault LED:
  - Green: The server is on and the power supply is working normally
  - Green, slow blinking (1 flash/sec): The power supply is in Zero-output/Standby mode (see below)
  - Green, fast blinking (5 flashes/sec): The power supply unit is in firmware update mode
  - Yellow: The power supply unit may have failed.
  - Off: The server is powered off, or the power supply is not working properly
- Power input LED:
  - Green: The power supply is connected to the input power source
  - Off: The power supply is disconnected from the AC power source or a power problem has occurred

CRPS power supplies have one LED:

- Green: The server is on and the power supply is working normally
- Green, blinking: The power supply unit is in firmware update mode
- Yellow: Either the power supply has failed, or two power supplies are installed but one is not connected to the input power source
- Yellow, blinking: The power supply is indicating a warning such as over-temperature warning, over-current warning, or a slow fan speed
- Off: The server is powered off, or the power supply is not working properly

Zero-output mode

Zero-output mode (also known as Standby mode or Cold Redundancy mode) allows a power supply to enter a low-power mode when it is not needed. Zero-output mode is only supported on CRPS Premium power supplies.

When Zero-output mode is configured in XCC and the server power load is sufficiently low, one of the installed power supplies enters into the Standby state while the other one delivers entire load. When the power load increases, the standby power supply will switch to Active state to provide sufficient power to the server.

Zero-output mode can be enabled or disabled in the XClarity Controller web interface, **Server Configuration > Power Policy**. If you select Disable, then both power supplies will be in the Active state.

Supported with CRPS Premium only: Zero-output mode is supported with CRPS Premium power supplies, but not with CRPS non-Premium power supplies

Power cords (C13 connectors)

Line cords and rack power cables with C13 connectors can be ordered as listed in the following table.

115V customers: If you plan to use the 1300W power supply with a low-range (100-127V) power source, select a power cable that is rated above 10A. Power cables that are rated at 10A or below are not supported with low-range power.

Table 33. Power cords

Market/region	Part number	Feature code	Description
Rack cables - C13 to C14			

Market/region	Part number	Feature code	Description
Worldwide	4L67A08367	B0N5	1.0m, 10A/13A, 100-250V, C13 to C14 Jumper Cord
Worldwide	4L67A08368	B0N6	1.5m, 10A/13A, 100-250V, C13 to C14 Jumper Cord
Worldwide	4L67A08369	6570	2.0m, 10A/13A, 100-250V, C13 to C14 Jumper Cord
Worldwide	4L67A08370	6400	2.8m, 10A/13A, 100-250V, C13 to C14 Jumper Cord
Worldwide	4L67A08371	6583	4.3m, 10A/13A, 100-250V, C13 to C14 Jumper Cord
Rack cables for India - C13 to C14			
India	4L67B10326	CC6R	2.0m, 10A/100-250V, C13 to C14 Jumper Cord (India)
India	4L67B10327	CC6S	2.8m, 10A/100-250V, C13 to C14 Jumper Cord (India)
India	4L67B10328	CC6T	4.3m, 10A/100-250V, C13 to C14 Jumper Cord (India)
Rack cables - C13 to C20 (Y-cable)			
Worldwide	47C2491	A3SW	1.2m, 16A/100-250V, 2 Short C13s to Short C20 Rack Power Cable
Worldwide	47C2492	A3SX	2.5m, 16A/100-250V, 2 Long C13s to Short C20 Rack Power Cable
Worldwide	47C2493	A3SY	2.8m, 16A/100-250V, 2 Short C13s to Long C20 Rack Power Cable
Worldwide	47C2494	A3SZ	4.1m, 16A/100-250V, 2 Long C13s to Long C20 Rack Power Cable
Line cords			
Argentina	39Y7930	6222	2.8m, 10A/250V, C13 to IRAM 2073 (Argentina) Line Cord
Argentina	81Y2384	6492	4.3m,10A/250V, C13/IRAM 2073 (Argentina) Line Cord
Australia/NZ	39Y7924	6211	Australia/NZ 10A line C13 to SAA-AS C112 (2.8M)
Australia/NZ	81Y2383	6574	4.3m,10A/250V, C13/AS/NZS 3112/2000 (Australia) Line Cord
Brazil	69Y1988	6532	2.8m, 10A/250V, C13 to NBR 14136 (Brazil) Line Cord
Brazil	81Y2387	6404	4.3m,10A/250V, C13/NBR 14136 (Brazil) Line Cord
China	39Y7928	6210	2.8m, 10A/220V, C13 to GB 2099.1 (China) Line Cord
China	81Y2378	6580	4.3m,10A/250V, C13/GB2099.1 (China) Line Cord
Denmark	39Y7918	6213	Line cord - 2.8m, 10A/250V, C13 to DK2-5a (Denmark)
Denmark	81Y2382	6575	4.3m,10A/250V, C13/SB107-2-DI (Denmark) Line Cord
Europe	39Y7917	6212	European 10A line C13 to CEE 7/7 (2.8M)
Europe	81Y2376	6572	4.3m,10A/230V, C13 to CEE7-VII (Europe) Line Cord
India	39Y7927	6269	2.8m, 6A Line C13 to Fig 68 (India) Line Cord
India	81Y2386	6567	4.3m, 10A/250V, C13 to IS 6538 (India) Line Cord
Israel	39Y7920	6218	Israel 10A line C13 to SI 32 (2.8M)
Israel	81Y2381	6579	4.3m,10A/250V, C13/SI 32 (Israel) Line Cord
Italy/Chile	39Y7921	6217	Italy 10A line C13 to CEE 7/7 (2.8M)
Italy/Chile	81Y2380	6493	4.3m,10A/250V, C13/CEI 23-16 (IT) Line cord
Japan	46M2593	A1RE	Japan 12A/125V C13 to JIS C-8303 2.8m line cord
Japan	4L67A08362	6495	4.3m, 12A/200V, C13 to JIS C-8303 (Japan) Line Cord
Japan	39Y7926	6335	4.3m, 12A/100V, C13 to JIS C-8303 (Japan) Line Cord
South Africa	39Y7922	6214	South Africa 10A line C13 to SABS 164/1 (2.8M)
South Africa	81Y2379	6576	4.3m,10A/250V, C13/SANS 164-1 (South Africa) Line Cord
South Korea	39Y7925	6219	Korea 7A line C13 to KETI 15A/250V (2.8M)
South Korea	81Y2385	6494	4.3m, 12A/250V C13/KSC 8305 (Korea) Line Cord
Switzerland	39Y7919	6216	Switzerland 10A line C13 to SEV 1011 (2.8M)
Switzerland	81Y2390	6578	4.3m,10A/250V, C13/SEV 1011 (Switzerland)Line Cord
Taiwan	23R7158	6386	Line cord - 2.8m, 10A/125V, C13 to CNS 10917-3 (Taiwan)

Market/region	Part number	Feature code	Description
Taiwan	81Y2375	6317	Taiwan 10A/250V C13/CNS 10917 2.8m line cord
Taiwan	81Y2374	6402	2.8m, 13A/125V, C13 to CNS 60799 (Taiwan) Line Cord
Taiwan	4L67A08363	AX8B	4.3m, 10A/125V, C13 to CNS 10917 (Taiwan) Line Cord
Taiwan	81Y2389	6531	4.3m, 10A/250V, C13/CNS 10917 (Taiwan) Line Cord
Taiwan	81Y2388	6530	Taiwan 13A/125V C13/CNS 10917 4.3m line cord
UK	39Y7923	6215	United Kingdom 10A line C13 to BS 1363 (2.8M)
UK	81Y2377	6577	4.3m,10A/230V, C13 to BS 1363/A (UK) Line Cord
USA/Canada	90Y3016	6313	2.8m, 10A/120V, C13 to NEMA 5-15P (US) Line Cord
USA/Canada	46M2592	A1RF	10A/250V C13 to NEMA 6-15P 2.8m line cord
USA/Canada	00WH545	6401	2.8m, 13A/120V, C13 to NEMA 5-15P (US) Line Cord
USA/Canada	4L67A08359	6370	4.3M, 10A/125V, C13 to NEMA 5-15P (US) Line Cord
USA/Canada	4L67A08361	6373	4.3m, 10A/250V, C13 to NEMA 6-15P (US) Line Cord
USA/Canada	4L67A08360	AX8A	4.3m, 13A/125V, C13 to NEMA 5-15P (US) Line Cord

Systems management

The system board of the SR450 V4 contains an integrated service processor, XClarity Controller 3 (XCC3), which provides advanced control, monitoring, and alerting functions. The XCC3 is based on an OpenBMC design, using the AST2600 baseboard management controller (BMC) with a dual-core ARM Cortex A7 32-bit RISC service processor running at 1.2 GHz.

The system board of also has the following components:

- Root of Trust (RoT) module - implements Platform Firmware Resiliency (PFR) hardware Root of Trust (RoT) which enables the server to be NIST SP800-193 compliant. For more details about PFR, see the Security section.
- MicroSD card port to enable the use of a MicroSD card for additional storage for use with the XCC3 controller. XCC3 can use the storage as a Remote Disc on Card (RDOC) device (up to 4GB of storage). It can also be used to store firmware updates (including N-1 firmware history) for ease of deployment.

  Tip: Without a MicroSD card installed, the XCC controller will have 100MB of available RDOC storage.

Note: Customers will need to supply their own MicroSD card for use in this card slot. Lenovo does not offer a MicroSD card for use in the SR450 V4.

Topics in this section:

- Local management
- System status with XClarity One Mobile
- Remote management
- XCC3 Premier
- Lenovo XClarity Provisioning Manager
- Lenovo XClarity One
- Lenovo XClarity Essentials
- Lenovo XClarity Energy Manager
- Lenovo Capacity Planner

Local management

The SR450 V4 offers a front operator panel with key LED status indicators, as shown in the following figure.

Tip: The Network LED only shows network activity of an installed OCP network adapter. The LED shows activity from both OCP adapters if two are installed.

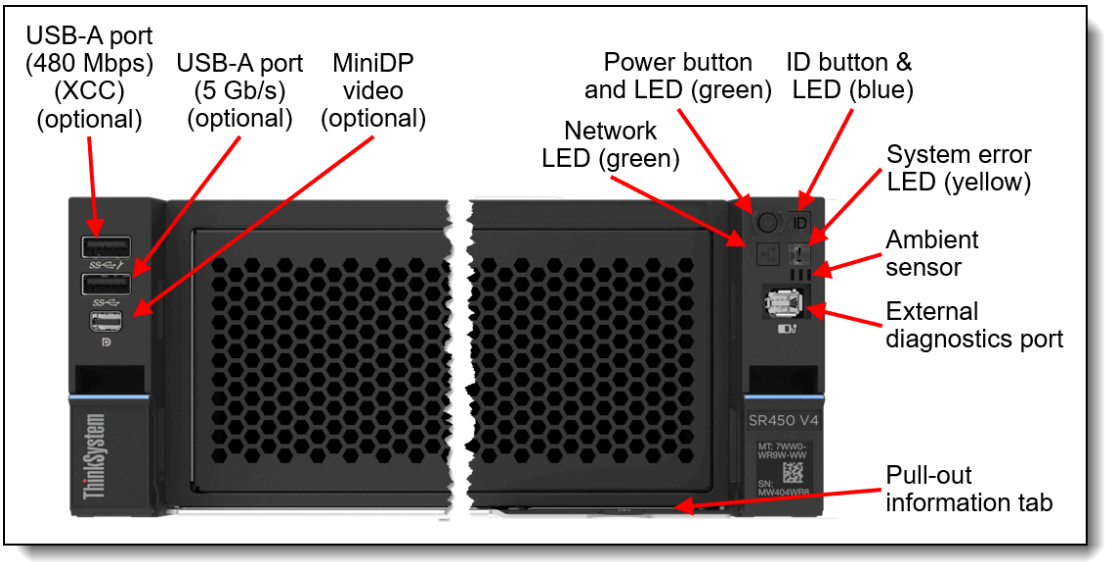


Figure 11. Front operator controls are on the left and right side of the server

Front DisplayPort video port and Front/Internal USB ports

The rear USB ports and VGA video port are standard on all models of the SR450 V4, however the front and internal USB ports, and front MiniDP video port are optional, and can be configured in the factory in CTO orders, or as field upgrades using option part numbers.

Internal USB port: The internal USB port supports USB drives that have an overall length of less than 30mm. Customers will need to supply their own USB flash drive. Lenovo does not offer a USB flash drive for use in the SR450 V4.

For CTO orders, the feature codes are listed in the following table.

Table 34. CTO orders - Front & internal ports

Feature code	Description	Top Choice Express	Purpose
BQQ2	ThinkSystem 2U V3 EIA Latch Standard	-	No front USB ports, no MiniDP video port
C1YR	ThinkSystem 1U/2U V4 USB Ports Extension Board	-	Provides the Internal USB 3 port (5 Gb/s)
C3RG*	ThinkSystem SR650 V4 Left Rack Latch with USB/MiniDP	-	Provides the 2x Front USB 3 ports (5 Gb/s) and MiniDP 1.1a port (requires Internal USB port, C1YR)

* Feature C1YR must also be selected

Configuration rules:

- The Internal USB port (C1YR) can be selected without also selecting the front USB/MiniDP ports

- The Front USB ports and MiniDP requires that the Internal USB port (C1YR) also be selected
- The front USB ports are required to use XClarity Mobile, as described in the System status with XClarity Mobile section.

For field upgrades, the part numbers listed in the following table are available.

Table 35. Local management

Part number	Description	Purpose
4XF7B18545	ThinkSystem SR450 V4 Left Rack Latch with USB/MiniDP Option kit • USB I/O board with Internal USB port • Front media bezel with USB ports and MiniDP port	Adds Internal USB 3 port (5 Gb/s), 2x Front USB 3 ports (5 Gb/s), MiniDP 1.1a video port
4XF7A99087	ThinkSystem V4 Internal USB I/O Board Option kit • USB I/O board with Internal USB port	Adds Internal USB 3 port (5 Gb/s) only.

Configuration notes for field upgrades:

- If you order ThinkSystem SR450 V4 Left Rack Latch with USB/MiniDP Option kit (4XF7B18545) for use in a server that already has the internal USB port installed (feature C1YR), the USB I/O board from the kit will not be needed as it is a duplicate of what is already installed.
- ThinkSystem SR450 V4 Left Rack Latch with USB/MiniDP Option kit (4XF7B18545) is required to use XClarity Mobile, as described in the System status with XClarity Mobile section.

External Diagnostics Handset

The SR450 V4 optionally has a port to connect an External Diagnostics Handset as described in the preceding section. The External Diagnostics Handset has the same functions as the Integrated Diagnostics Panel but has the advantages of not consuming space on the front of the server plus it can be shared among many servers in your data center. The handset has a magnet on the back of it to allow you to easily mount it on a convenient place on any rack cabinet.

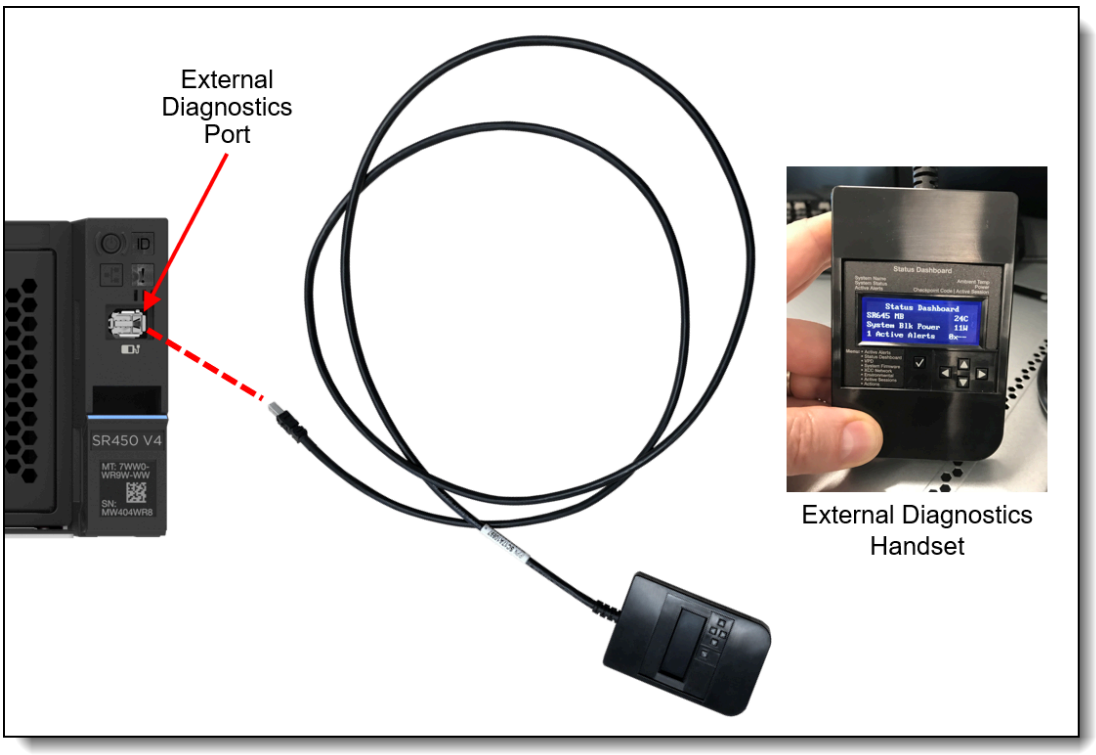


Figure 12. External Diagnostics Handset

The External Diagnostics Handset allows quick access to system status, firmware, network, and health information. The LCD display and the function buttons give you access to the following information:

- Active alerts
- Status Dashboard
- System VPD: machine type & mode, serial number, UUID string
- System firmware levels: UEFI and XCC firmware
- XCC network information: hostname, MAC address, IP address, DNS addresses
- Environmental data: Ambient temperature, CPU temperature, AC input voltage, estimated power consumption
- Active XCC sessions
- System reset action

Ordering information for the External Diagnostics Handset with is listed in the following table.

Table 36. External Diagnostics Handset ordering information

Part number	Feature code	Description
4TA7A64874	BEUX	ThinkSystem External Diagnostics Handset

Information pull-out tab

The front of the server also houses an information pull-out tab (also known as the network access tag). See Figure 2 for the location. A label on the tab shows the network information (MAC address and other data) to remotely access the service processor.

Light path diagnostics

The server offers light path diagnostics. If an environmental condition exceeds a threshold or if a system component fails, XCC lights LEDs inside the server to help you diagnose the problem and find the failing

part.

The server has fault LEDs next to the following components:

- Each drive bay
- Each power supply

System status with XClarity One Mobile

The XClarity One Mobile app includes a tethering function where you can connect your Android or iOS device to the server via USB to see the status of the server.

Download the XClarity One Mobile app from these sites:

- Google Play Store
- Apple App Store

The steps to connect the mobile device to the server are as follows:

1. In the XCC web interface under **BMC Configuration > Network**, set the USB mode to **Shared mode: Owned by BMC**
2. Connect the mobile device via a USB cable to the server's USB port with the management symbol 
3. In iOS or Android settings, enable Personal Hotspot or USB Tethering
4. Launch the Lenovo XClarity Mobile app

Once connected you can see the following information:

- Server status including error logs (read only, no login required)
- Server management functions (XClarity login credentials required)

Configuration notes:

- The use of XClarity Mobile requires front USB ports. If your server doesn't already include front USB ports, order the field upgrade ThinkSystem SR650/a V4 Left Rack Latch with USB/MiniDP Option kit (4XF7B03892) as described in the Local management section

Remote management

The server offers a dedicated RJ45 Ethernet port at the rear of the server for remote management via the XClarity Controller management processor. The port supports 10/100/1000 Mbps speeds.

Remote server management is provided through industry-standard interfaces:

- Intelligent Platform Management Interface (IPMI) Version 2.0
- Simple Network Management Protocol (SNMP) Version 3 (no SET commands; no SNMP v1)
- Common Information Model (CIM-XML)
- Representational State Transfer (REST) support
- Redfish support (DMTF compliant)
- Web browser - HTML 5-based browser interface (Java and ActiveX not required) using a responsive design (content optimized for device being used - laptop, tablet, phone) with NLS support

IPMI via the Ethernet port (IPMI over LAN) is supported, however it is disabled by default. For CTO orders you can specify whether you want to the feature enabled or disabled in the factory, using the feature codes listed in the following table.

Table 37. IPMI-over-LAN settings

Feature code	Description	Top Choice Express
B7XZ	Disable IPMI-over-LAN (default)	-
B7Y0	Enable IPMI-over-LAN	-

XCC3 Premier

The XCC3 service processor in the SR450 V4 supports an upgrade to the Premier level of features. XCC3 Premier in ThinkSystem V4 servers is equivalent to the XCC2 Premium offering in ThinkSystem V3 servers.

XCC3 Premier adds the following functions:

- System Guard - Monitor hardware inventory for unexpected component changes, and simply log the event or prevent booting
- Neighbor Group - Enables administrators to manage and synchronize configurations and firmware level across multiple servers
- Syslog alerting
- Lenovo SED security key management
- Boot video capture and crash video capture
- Virtual console collaboration - Ability for up to 6 remote users to be log into the remote session simultaneously
- Remote console
- System utilization data and graphic view
- Single sign on with Lenovo XClarity Administrator
- Update firmware from a repository
- Enterprise Strict Security mode - Enforces CNSA 1.0 level security
- Remotely viewing video with graphics resolutions up to 1600x1200 at 75 Hz with up to 23 bits per pixel, regardless of the system state
- Remotely accessing the server using the keyboard and mouse from a remote client
- International keyboard mapping support
- Redirecting serial console via SSH
- Component replacement log (Maintenance History log)
- Access restriction (IP address blocking)
- Displaying graphics for real-time and historical power usage data and temperature
- Mapping the ISO and image files located on the local client as virtual drives for use by the server
- Mounting the remote ISO and image files via HTTPS, SFTP, CIFS, and NFS
- Power capping
- License for XClarity Energy Manager

Ordering information is listed in the following table. XCC3 Premier is a software license upgrade - no additional hardware is required.

Table 38. XCC3 Premier license upgrade

Part number	Feature code	Description
7S0X000XWW	SCY0	Lenovo XClarity Controller 3 (XCC3) Premier

With XCC3 Premier, for CTO orders, you can request that System Guard be enabled in the factory and the first configuration snapshot be recorded. To add this to an order, select feature code listed in the following table. The selection is made in the Security tab of the configurator.

Table 39. Enable System Guard in the factory (CTO orders)

Feature code	Description	Lenovo Top Choice Express
BUT2	Enable System Guard	-

For more information about System Guard, see https://pubs.lenovo.com/xcc3/nn1ia_c_systemguard

Lenovo XClarity Provisioning Manager

Lenovo XClarity Provisioning Manager (LXPM) is a UEFI-based application embedded in ThinkSystem servers and accessible via the F1 key during system boot.

LXPM provides the following functions:

- Graphical UEFI Setup
- System inventory information and VPD update
- System firmware updates (UEFI and XCC)
- RAID setup wizard
- OS installation wizard (including unattended OS installation)
- Diagnostics functions

Lenovo XClarity One

Lenovo XClarity One is a cloud-native unified Management-as-a-Service (MaaS) platform, engineered to modernize IT infrastructure. .

XClarity One is the next milestone in Lenovo's portfolio of systems management products. Now you can leverage the benefits of a true next-generation platform for the deployment, management, and maintenance of your infrastructure through a single, centralized platform that delivers a consistent user experience across all Lenovo products.

XClarity One's primary architectural value is divided into three key areas:

- How it predicts issues (AI/Analytics)
- How it securely connects (Secure Management Hubs),
- How it actually configures the hardware at scale (Template-Driven Lifecycle Control)

AI-powered Automation

XClarity One harnesses the power of AI and predictive analytics to enhance the performance and reliability of your infrastructure with proactive protection.

- **AI-Powered Predictive Failure Analytics** - XC1 utilizes machine learning infrastructure to look at live device telemetries. The platform securely collects memory-diagnostic logs and pushes them into an active MPFA AI model infrastructure to analyze health patterns and predict probable hardware degradation before it manifests as a hard failure.
- **AI-Powered Call-Home** - A Call-Home serviceable event opens a support ticket automatically, leveraging AI technology (in the case of MPFA) for problem determination and fast resolution automatically dispatching parts and services, reducing service costs and minimizing downtime.

Secure Management Hub

Lenovo's proprietary Management Hub is an on-premises virtual appliance that acts as the bridge between your infrastructure and the cloud.

- **On-Premises Security with Cloud Flexibility** - your infrastructure has no direct connection to the cloud, greatly reducing your attack surface from external threats while still having the deployment

benefits, flexibility, and scalability of a cloud solution.

- **Authentication and Authorization** - built on a Zero Trust Architecture and requiring OTP Application authentication for all users to handle the support of all customers' servers and client devices. Role-based access controls help define and restrict permissions based on user roles.

Template-Driven Lifecycle Control

Lenovo's unified management model eliminates fragmented server administration, allowing you to deploy, track, and maintain your entire infrastructure fleet from a single cloud-native dashboard.

- **Automated Configuration and Compliance:** Leverage scalable, repeatable device templates to rapidly deploy firmware updates, operating systems, and core baseboard management controller (BMC/UEFI) simultaneously across multiple sites. XClarity One continuously analyzes hardware compliance, shifting out-of-compliance systems to a critical status until a template re-deployment aligns them back to corporate standards.
- **Global Asset Visibility and Fleet Telemetry:** Centralize real-time tracking of component health, warranty status, and comprehensive hardware inventories. The platform aggregates live usage data, including memory allocation, power consumption, and processor thermal trends, giving you total operational awareness whether a server resides in a centralized data center or a remote edge environment.

Centralized management via Lenovo XClarity One can be integrated into your environment as an optional component. License information for XClarity One is listed in the following table.

Table 40. XClarity One license information

Part number	Feature code	Description
Starter licenses (limited to 10 devices per organization)		
7S0X001EWW	SF8Y	XClarity One - Starter, Per Endpoint w/1 Yr SW S&S
7S0X001FWW	SF8Z	XClarity One - Starter, Per Endpoint w/2 Yr SW S&S
7S0X001GWW	SF90	XClarity One - Starter, Per Endpoint w/3 Yr SW S&S
7S0X001HWW	SF91	XClarity One - Starter, Per Endpoint w/4 Yr SW S&S
7S0X001JWW	SF92	XClarity One - Starter, Per Endpoint w/5 Yr SW S&S
Standard licenses		
7S0X000LWW	SCJC	XClarity One - Standard, Per Endpoint w/1 Yr SW S&S
7S0X001CWW	SENW	XClarity One - Standard, Per Endpoint w/2Yr SW S&S
7S0X000MWW	SCJD	XClarity One - Standard, Per Endpoint w/3 Yr SW S&S
7S0X001DWW	SENX	XClarity One - Standard, Per Endpoint w/4Yr SW S&S
7S0X000NWW	SCJE	XClarity One - Standard, Per Endpoint w/5 Yr SW S&S
7S0X000VWW	SFQ1	XClarity One - Standard, Per Endpoint w/6Yr SW S&S
7S0X000WWW	SFQ2	XClarity One - Standard, Per Endpoint w/7Yr SW S&S

Licensing notes:

- One license is needed per physical managed device.
- Starter license is functionally identical to Standard license but is limited to 10 devices per organization maximum.

For more information, see these resources:

- Lenovo XClarity One datasheet:
  https://lenovopress.lenovo.com/ds0188-lenovo-xclarity-one
- Lenovo XClarity One product guide:
  https://lenovopress.lenovo.com/lp1992-lenovo-xclarity-one
- Migrating to Lenovo XClarity One: An Overview:
  https://lenovopress.lenovo.com/lp2429-migrating-to-lenovo-xclarity-one-an-overview

Lenovo XClarity Essentials

Lenovo offers the following XClarity Essentials software tools that can help you set up, use, and maintain the server at no additional cost:

- Lenovo Essentials OneCLI

  OneCLI is a collection of server management tools that uses a command line interface program to manage firmware, hardware, and operating systems. It provides functions to collect full system health information (including health status), configure system settings, and update system firmware and drivers.

- Lenovo Essentials UpdateXpress

  The UpdateXpress tool is a standalone GUI application for firmware and device driver updates that enables you to maintain your server firmware and device drivers up-to-date and help you avoid unnecessary server outages. The tool acquires and deploys individual updates and UpdateXpress System Packs (UXSPs) which are integration-tested bundles.

- Lenovo Essentials Bootable Media Creator

  The Bootable Media Creator (BOMC) tool is used to create bootable media for offline firmware update.

ThinkSystem V4 servers: The format of UEFI and BMC settings has changed for ThinkSystem V4 servers, to align with OpenBMC and Redfish requirements. See the documentation of these tools for details. As a result, the following versions are required for these servers:

- OneCLI 5.x or later
- UpdateXpress 5.x or later
- BOMC 14.x or later

For more information and downloads, visit the Lenovo XClarity Essentials web page:
http://support.lenovo.com/us/en/documents/LNVO-center

Lenovo XClarity Energy Manager

Lenovo XClarity Energy Manager (LXEM) is a power and temperature management solution for data centers. It is an agent-free, web-based console that enables you to monitor and manage power consumption and temperature in your data center through the management console. It enables server density and data center capacity to be increased through the use of power capping.

LXEM is a licensed product. A single-node LXEM license is included with the XClarity Controller Premier upgrade as described in the XCC3 Premier section. If your server does not have the XCC Premier upgrade, Energy Manager licenses can be ordered as shown in the following table.

Table 41. Lenovo XClarity Energy Manager

Part number	Description
4L40E51621	Lenovo XClarity Energy Manager Node License (1 license needed per server)

For more information about XClarity Energy Manager, see the following resources:

- Lenovo Support page:
  https://datacentersupport.lenovo.com/us/en/solutions/lnvo-lxem
- User Guide for XClarity Energy Manager:
  https://pubs.lenovo.com/lxem/

Lenovo Capacity Planner

Lenovo Capacity Planner is a power consumption evaluation tool that enhances data center planning by enabling IT administrators and pre-sales professionals to understand various power characteristics of racks, servers, and other devices. Capacity Planner can dynamically calculate the power consumption, current, British Thermal Unit (BTU), and volt-ampere (VA) rating at the rack level, improving the planning efficiency for large scale deployments.

For more information, refer to the Capacity Planner web page:
http://datacentersupport.lenovo.com/us/en/solutions/lnvo-lcp

Security

Topics in this section:

- Security features
- Platform Firmware Resiliency - Lenovo ThinkShield
- Security standards

Security features

The SR450 V4 server offers the following electronic security features:

- Secure Boot function of the Intel Xeon processor
- Support for Platform Firmware Resiliency (PFR) hardware Root of Trust (RoT) - see the Platform Firmware Resiliency section
- Firmware signature processes compliant with FIPS and NIST requirements
- System Guard (part of XCC3 Premier) - Proactive monitoring of hardware inventory for unexpected component changes
- Administrator and power-on password
- Integrated Trusted Platform Module (TPM) supporting TPM 2.0
- Self-encrypting drives (SEDs) with support for enterprise key managers - see the SED encryption key management section

The server is NIST SP 800-147B compliant.

The SR450 V4 server also offers the following optional physical security features:

- Optional chassis intrusion switch
- Optional lockable front security bezel

The optional lockable front security bezel is shown in the following figure and includes a key that enables you to secure the bezel over the drives and system controls thereby reducing the chance of unauthorized or accidental access to the server.



Figure 13. Lockable front security bezel

The dimensions of the security bezel are:

- Width: 435 mm (17.1 in.)
- Height: 87 mm (3.4 in.)
- Width: 30 mm (1.2 in.)

The following table lists the security options for the SR450 V4.

Table 42. Security features

Part number	Feature code	Description	Top Choice Express
4X97A96849	C21F	ThinkSystem SR630 V4 Intrusion Cable kit	-
4XF7B03891	C1S5	2U Bezel Option Kit	-

Platform Firmware Resiliency - Lenovo ThinkShield

Lenovo's ThinkShield Security is a transparent and comprehensive approach to security that extends to all dimensions of our data center products: from development, to supply chain, and through the entire product lifecycle.

The ThinkSystem SR450 V4 includes Platform Firmware Resiliency (PFR) hardware Root of Trust (RoT) which enables the system to be NIST SP800-193 compliant. This offering further enhances key platform subsystem protections against unauthorized firmware updates and corruption, to restore firmware to an integral state, and to closely monitor firmware for possible compromise from cyber-attacks.

PFR operates upon the following server components:

- UEFI image – the low-level server firmware that connects the operating system to the server hardware
- XCC image – the management “engine” software that controls and reports on the server status separate from the server operating system
- FPGA image – the code that runs the server’s lowest level hardware controller on the motherboard

The Lenovo Platform Root of Trust Hardware performs the following three main functions:

- Detection – Measures the firmware and updates for authenticity
- Recovery – Recovers a corrupted image to a known-safe image
- Protection – Monitors the system to ensure the known-good firmware is not maliciously written

These enhanced protection capabilities are implemented using a dedicated, discrete security processor whose implementation has been rigorously validated by leading third-party security firms. Security evaluation results and design details are available for customer review – providing unprecedented transparency and assurance.

The SR450 V4 includes support for Secure Boot, a UEFI firmware security feature developed by the UEFI Consortium that ensures only immutable and signed software are loaded during the boot time. The use of Secure Boot helps prevent malicious code from being loaded and helps prevent attacks, such as the installation of rootkits. Lenovo offers the capability to enable secure boot in the factory, to ensure end-to-end protection. Alternatively, Secure Boot can be left disabled in the factory, allowing the customer to enable it

themselves at a later point, if desired.

The following table lists the relevant feature code(s).

Table 43. Secure Boot options

Part number	Feature code	Description	Lenovo Top Choice Express	Purpose
CTO only	BPKQ	TPM 2.0 with Secure Boot	-	Configure the system in the factory with Secure Boot enabled.
CTO only	BPKR	TPM 2.0	-	Configure the system without Secure Boot enabled. Customers can enable Secure Boot later if desired.

Tip: If Secure Boot is not enabled in the factory, it can be enabled later by the customer. However once Secure Boot is enabled, it cannot be disabled.

Security standards

The SR450 V4 supports the following security standards and capabilities:

- **Industry Standard Security Capabilities**
  - Intel CPU Enablement
    - Intel Trust Domain Extensions (Intel TDX)
    - Intel Crypto Acceleration
    - Intel QuickAssist Software Acceleration
    - Intel Platform Firmware Resilience Support
    - Intel Control-Flow Enforcement Technology
    - Intel Total Memory Encryption - Multi Key
    - Intel Total Memory Encryption
    - Intel AES New Instructions (AES-NI)
    - Intel OS Guard
    - Execute Disable Bit (XD)
    - Intel Boot Guard
    - Mode-based Execute Control (MBEC)
    - Intel Virtualization Technology (VT-x)
    - Intel Virtualization Technology for Directed I/O (VT-d)
  - Microsoft Windows Security Enablement
    - Credential Guard
    - Device Guard
    - Host Guardian Service
  - TPM 2.0 (Trusted Platform Module 2.0)
  - UEFI (Unified Extensible Firmware Interface) Forum Secure Boot
- **Hardware Root of Trust and Security**
  - Independent security subsystem providing platform-wide NIST SP800-193 compliant Platform Firmware Resilience (PFR)
  - Management domain RoT provided by the Secure Boot feature of the Baseboard Management Controller (BMC)
- **Platform Security**
  - Boot and run-time firmware integrity monitoring with rollback to known-good firmware (e.g., “self-healing”)

- Non-volatile storage bus security monitoring and filtering
- Resilient firmware implementation, such as to detect and defeat unauthorized flash writes or SMM (System Management Mode) memory incursions
- Patented IPMI KCS channel privileged access authorization (USPTO Patent# 11,256,810)
- Host and management domain authorization, including integration with CyberArk for enterprise password management
- KMIP (Key Management Interoperability Protocol) compliant, including support for IBM SKLM and Thales KeySecure
- Reduced “out of box” attack surface
- Configurable network services
- FIPS 140-3 validated cryptography for XCC (Certificate # 5548)
- CNSA Suite 1.0 Quantum-resistant cryptography for XCC (included with XCC3 Premier)

For more information on platform security, see the paper “How to Harden the Security of your ThinkSystem Server and Management Applications” available from https://lenovopress.com/lp1260-how-to-harden-the-security-of-your-thinksystem-server.

- **Standards Compliance and/or Support**
  - NIST SP800-131A rev 2 “Transitioning the Use of Cryptographic Algorithms and Key Lengths”
  - NIST SP800-147B “BIOS Protection Guidelines for Servers”
  - NIST SP800-193 “Platform Firmware Resiliency Guidelines”
  - ISO/IEC 11889 “Trusted Platform Module Library”
  - Common Criteria TCG Protection Profile for “PC Client Specific TPM 2.0”
  - European Union Commission Regulation 2019/424 (“ErP Lot 9”) “Ecodesign Requirements for Servers and Data Storage Products” Secure Data Deletion
  - FIPS 140-3 validated cryptography for XCC (Certificate # 5548)
  - CNSA Suite 1.0 Quantum-resistant cryptography for XCC (included with XCC3 Premier)
  - Optional FIPS 140-2 validated Self-Encrypting Disks (SEDs) with external KMIP-based key management
- **Product and Supply Chain Security**
  - Suppliers validated through Lenovo’s Trusted Supplier Program
  - Developed in accordance with Lenovo’s Secure Development Lifecycle (LSDL)
  - Continuous firmware security validation through automated testing, including static code analysis, dynamic network and web vulnerability testing, software composition analysis, and subsystem-specific testing, such as UEFI security configuration validation
  - Ongoing security reviews by US-based security experts, with attestation letters available from our third-party security partners
  - Digitally signed firmware, stored and built on US-based infrastructure and signed on US-based Hardware Security Modules (HSMs)
  - TAA (Trade Agreements Act) compliant manufacturing, by default in Mexico for North American markets with additional US and EU manufacturing options
  - US 2019 NDAA (National Defense Authorization Act) Section 889 compliant

Rack installation

The following table lists the rack installation options that are available for the SR450 V4.

For supported racks, see the Rack cabinets section.

Table 44. Rack installation options

Part number	Feature Code	Description	Top Choice Express	CMA support
Rail kits				
4XF7A97379	C2DG	ThinkSystem Toolless Friction Rail V4	-	No support
4XF7A97370	C2DH	ThinkSystem Toolless Slide Rail Kit V4	-	Optional - 7M27A05698
4XF7A97374	C3QS	ThinkSystem Toolless Slide Rail Kit V4 with 2U CMA	-	Included
Cable management arm for field upgrades only (for CTO orders, use one of the above kits where the CMA is included)				
7M27A05698	-	ThinkSystem 2U CMA Upgrade Kit for Toolless Slide Rail	-	Yes

See the Rail Kit comparison for the specifications of each rail kit:
https://lenovopress.lenovo.com/lp1838-thinksystem-and-thinkedge-rail-kit-reference#availability=Available&sr450-v4-support=SR450%2520V4

Operating system support

The SR450 V4 supports the following operating systems:

- Microsoft Windows Server 2025
- Red Hat Enterprise Linux 10.2
- Red Hat Enterprise Linux 9.8
- SUSE Linux Enterprise Server 15 SP7
- SUSE Linux Enterprise Server 16
- VMware ESXi 8.0 U3
- VMware ESXi 9.1
- Canonical Ubuntu 24.04.2 LTS

For a complete list of supported, certified and tested operating systems, plus additional details and links to relevant web sites, see the Operating System Interoperability Guide: https://lenovopress.lenovo.com/osig

For configure-to-order configurations, the SR450 V4 can be preloaded with VMware ESXi. Ordering information is listed in the following table.

Table 45. VMware ESXi preload

Part number	Feature code	Description	Lenovo Top Choice Express
CTO only	BZ97	VMware ESXi 8.0 U3 (Factory Installed)	-
CTO only	CHGN	VMware ESXi 9.1 (Factory Installed)	-

Configuration rule:

- An ESXi preload cannot be selected if the configuration includes an NVIDIA GPU (ESXi preload cannot include the NVIDIA driver)

You can download supported VMware vSphere hypervisor images from the following web page and install it using the instructions provided:
https://vmware.lenovo.com/content/custom_iso/

Physical and electrical specifications

The SR450 V4 has the following overall physical dimensions, excluding components that extend outside the standard chassis, such as EIA flanges, front security bezel (if any), and power supply handles:

- Width: 445 mm (17.5 inches)
- Height: 87 mm (3.4 inches)
- Depth: 797 mm (31.4 inches)

The following table lists the detailed dimensions. See the figure below for the definition of each dimension.

Table 46. Detailed dimensions

Dimension	Description
482 mm	X_a = Width, to the outsides of the front EIA flanges
435 mm	X_b = Width, to the rack rail mating surfaces
445 mm	X_c = Width, to the outer most chassis body feature
87 mm	Y_a = Height, from the bottom of chassis to the top of the chassis
725 mm	Z_a = Depth, from the rack flange mating surface to the rearmost I/O port surface
762 mm	Z_b = Depth, from the rack flange mating surface to the rearmost feature of the chassis body
762 mm	Z_c = Depth, from the rack flange mating surface to the rearmost feature such as power supply handle
35 mm	Z_d = Depth, from the forwardmost feature on front of EIA flange to the rack flange mating surface
51 mm	Z_e = Depth, from the front of security bezel (if applicable) or forwardmost feature to the rack flange mating surface

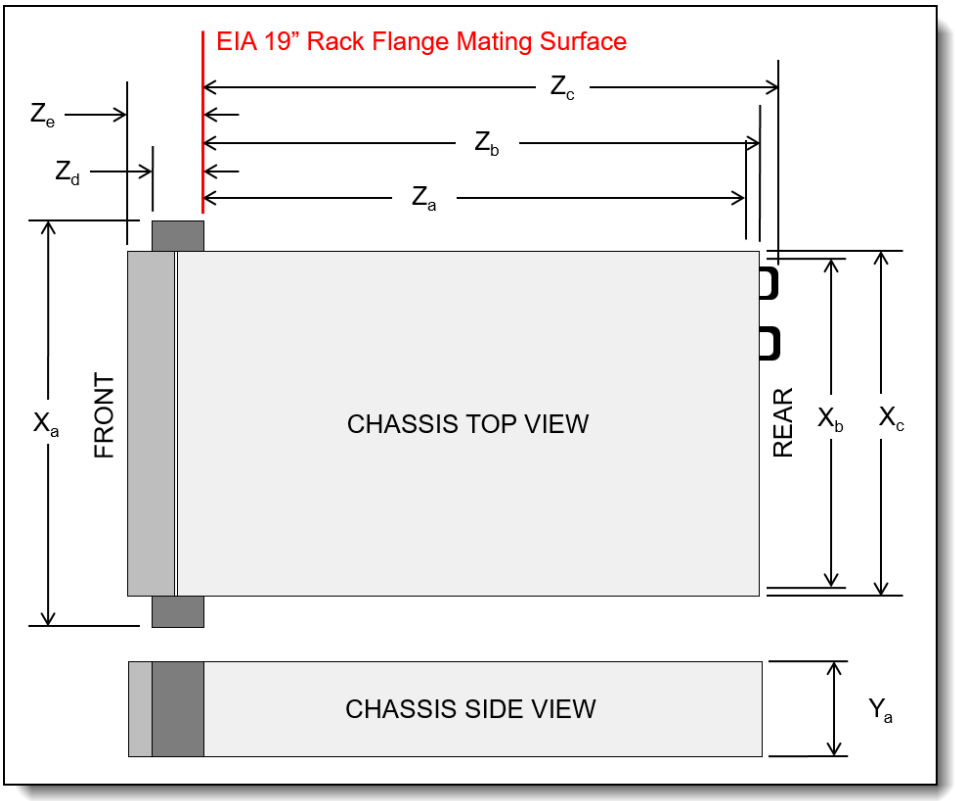


Figure 14. Server dimensions

The shipping (cardboard packaging) dimensions of the SR450 V4 are as follows:

- Width: 592 mm (23.3 inches)
- Height: 282 mm (11.1 inches)
- Depth: 992 mm (39.1 inches)

The server has the following weight:

- Maximum weight: 22 kg (48.5 lb)

The server has the following electrical specifications for AC input power supplies:

- Input voltage:
  - 100 to 127 (nominal) Vac, 50 Hz or 60 Hz
  - 200 to 240 (nominal) Vac, 50 Hz or 60 Hz
  - 180 to 300 Vdc (China only)
- Inlet current: see the following table.

Table 47. Maximum inlet current

Part number	**Description**	**100V AC**	**200V AC**	**240V DC (China)**
Titanium AC power supplies				
4P57A87056	ThinkSystem 800W 230V/115V Titanium CRPS Hot-Swap Power Supply v1.4	10A	5A	5A
4P57A88621	ThinkSystem 1300W 230V/115V Titanium CRPS Premium Hot-Swap Power Supply	11.4A	7.2A	6.2A

Operating environment

The SR450 V4 server complies with ASHRAE Class A2 specifications with most configurations, and depending on the hardware configuration, also complies with ASHRAE Class A3 and Class A4 specifications. System performance may be impacted when operating temperature is outside ASHRAE A2 specification.

Depending on the hardware configuration, the SR450 V4 server also complies with ASHRAE Class H1 specification. System performance may be impacted when operating temperature is outside ASHRAE H1 specification.

Topics in this section:

- Ambient temperature requirements
- Temperature and humidity
- Acoustical noise emissions
- Shock and vibration
- Particulate contamination

Ambient temperature requirements

The restrictions to ASHRAE support are as follows:

- For configurations with the standard heat sink, the ambient temperature must not exceed 45°C.
- For configurations that include any of the following components, the ambient temperature must not exceed 35°C:
  - Entry heat sink
  - Active optical cables (AOC)
  - 25GBASE-SR transceiver

Temperature and humidity

The server is supported in the following environment:

- Air temperature:
  - Operating:
    - ASHRAE Class H1: 5 °C to 25 °C (41 °F to 77 °F); Decrease the maximum ambient temperature by 1°C for every 500 m (1640 ft) increase in altitude above 900 m (2,953 ft).
    - ASHRAE Class A2: 10°C to 35°C (50°F to 95°F); the maximum ambient temperature decreases by 1°C for every 300 m (984 ft) increase in altitude above 900 m (2,953 ft).
    - ASHRAE Class A3: 5°C to 40°C (41°F to 104°F); the maximum ambient temperature decreases by 1°C for every 175 m (574 ft) increase in altitude above 900 m (2,953 ft).
    - ASHRAE Class A4: 5°C to 45°C (41°F to 113°F); the maximum ambient temperature decreases by 1°C for every 125 m (410 ft) increase in altitude above 900 m (2,953 ft).
  - Server off: -10°C to 60°C (14°F to 140°F)
  - Shipment/storage: -40°C to 70°C (-40°F to 158°F)
- Maximum altitude: 3,050 m (10,000 ft)
- Relative Humidity (non-condensing):
  - Operating
    - ASHRAE Class H1: 8% to 80%; Maximum dew point: 17°C (63°F)
    - ASHRAE Class A2: 8% to 80%; maximum dew point: 21°C (70°F)
    - ASHRAE Class A3: 8% to 85%; maximum dew point: 24°C (75°F)
    - ASHRAE Class A4: 8% to 90%; maximum dew point: 24°C (75°F)
  - Shipment/storage: 8% to 90%

Acoustical noise emissions

The server has the following acoustic noise emissions declaration.

Table 48. Acoustic noise emissions declaration

Acoustic performance @ 25°C ambient	Configuration	Config. 1	Config. 2
Declared mean A-weighted sound power level, LWA,m (B) Statistical adder for verification, Kv (B) = 0.4	Idle mode	5.7	5.8
	Operating mode 1	5.9	6.5
	Operating mode 2	8.2	8.2
Declared mean A-weighted emission sound pressure level, LpA,m (dB) Bystander position	Idle mode	48.1	49.1
	Operating mode 1	50.6	56.4
	Operating mode 2	71.6	71.6

Notes:

- These sound levels were measured in controlled acoustical environments according to procedures specified by ISO7779 and are reported in accordance with ISO 9296.
- The modes listed in the table are as follows:
  - Idle mode is the steady state in which the server is powered on but not operating any intended function.
  - Operating mode 1 is the maximum acoustic output of 100% CPU TDP.
  - Operating mode 2 is the maximum acoustic output of 100% CPU TDP with 100% fan speed.
- The declared acoustic sound levels are based on the following configurations, which may change depending on configuration or conditions.
  - **Config. 1**: 1 x 250W CPU, 1 x entry heat sink, 8 x 64 GB RDIMMs, 8 x 2.5" SATA HDDs, 1 x RAID 940-8i, 1 x ThinkSystem Broadcom 5719 1GbE RJ45 4-port OCP Ethernet Adapter, 2 x 800W PSUs
  - **Config. 2**: 1 x 250W CPU, 1 x entry heat sink, 8 x 64 GB RDIMMs, 8 x 3.5" SAS HDDs, 1 x RAID 940-8i, 1 x ThinkSystem Broadcom 57504 10/25GbE SFP28 4-port PCIe Ethernet Adapter, 1 x ThinkSystem Emulex LPe38102 64Gb 2-port SecureHBA PCIe Fibre Channel Adapter(Generic FW), 1 x ThinkSystem Broadcom 5719 1GbE RJ45 4-port OCP Ethernet Adapter, 2 x 800W PSUs
- Government regulations (such as those prescribed by OSHA or European Community Directives) may govern noise level exposure in the workplace and may apply to you and your server installation. The actual sound pressure levels in your installation depend upon a variety of factors, including the number of racks in the installation; the size, materials, and configuration of the room; the noise levels from other equipment; the room ambient temperature, and employee's location in relation to the equipment. Further, compliance with such government regulations depends on a variety of additional factors, including the duration of employees' exposure and whether employees wear hearing protection. Lenovo recommends that you consult with qualified experts in this field to determine whether you are in compliance with the applicable regulations.

Shock and vibration

The server has the following vibration and shock limits:

- Vibration:
  - Operating: 0.21 G rms at 5 Hz to 500 Hz for 15 minutes across 3 axes
  - Non-operating: 1.04 G rms at 2 Hz to 200 Hz for 15 minutes across 6 surfaces
- Shock:
  - Operating: 15 G for 3 milliseconds in each direction (positive and negative X, Y, and Z axes)
  - Non-operating:
    - 12 kg - 22 kg: 50 G for 152 in./sec velocity change across 6 surfaces
    - 23 kg - 31 kg: 35 G for 152 in./sec velocity change across 6 surfaces
    - 32 kg - 68 kg: 35 G for 136 in./sec velocity change across 6 surfaces

Particulate contamination

Airborne particulates (including metal flakes or particles) and reactive gases acting alone or in combination with other environmental factors such as humidity or temperature might damage the system that might cause the system to malfunction or stop working altogether.

The following specifications indicate the limits of particulates that the system can tolerate:

- Reactive gases:
  - The copper reactivity level shall be less than 200 Angstroms per month (Å/month)
  - The silver reactivity level shall be less than 200 Å/month
- Airborne particulates:
  - The room air should be continuously filtered with MERV 8 filters.
  - Air entering a data center should be filtered with MERV 11 or preferably MERV 13 filters.
  - The deliquescent relative humidity of the particulate contamination should be more than 60% RH
  - Environment must be free of zinc whiskers

For additional information, see the Specifications section of the documentation for the server, available from the Lenovo Documents site, https://pubs.lenovo.com/

Warranty upgrades and post-warranty support

The SR450 V4 server (machine type 7DQX) has a 3-year warranty.

Our global network of regional support centers offers consistent, local-language support enabling you to vary response times and level of service to match the criticality of your support needs:

- **Standard Next Business Day** – Best choice for non-essential systems requiring simple maintenance.
- **Premier Next Business Day** – Best choice for essential systems requiring technical expertise from senior-level Lenovo Engineers.
- **Premier 24x7 4-Hour Response** – Best choice for systems where maximum uptime is critical.
- **Premier Support Plus 24x7 4-Hour Response** – Best choice for systems where maximum uptime is critical.

For more information, consult our Lenovo Operational Support Services for Data Centers Services Brochure.

Note: Some warranty upgrades may not be available in all markets or regions. For more information, go to https://lenovolocator.com/. For information about Lenovo warranty upgrade offerings that are available in your region, contact your local Lenovo sales representative or business partner.

Services

Lenovo Infrastructure Services empower you at every stage of your IT lifecycle. From expert advisory and strategic planning to seamless deployment and ongoing support, we ensure your infrastructure is built for success. Our comprehensive services accelerate time to value, minimize downtime, and free your IT staff to focus on driving innovation and business growth.

Note: Some service options may not be available in all markets or regions. For more information, go to https://lenovolocator.com/. For information about Lenovo service upgrade offerings that are available in your region, contact your local Lenovo sales representative or business partner.

In this section:

- Lenovo Advisory Services
- Lenovo Implementation Services
- Infrastructure Deployment Services
- Lenovo Support Services
- Lenovo Managed Services
- Lenovo Sustainability Services

Lenovo Advisory Services

Lenovo Advisory Services simplify the planning process, enabling customers to build future-proofed strategies in as little as six weeks. Consultants provide guidance on projects including VM migration, storage, backup and recovery, and cost management to accelerate time to value, improve cost efficiency, and build a flexibly scalable foundation.

- **Assessment Services**

  An Assessment helps solve your IT challenges through an onsite, multi-day session with a Lenovo technology expert. We perform a tools-based assessment which provides a comprehensive and thorough review of a company's environment and technology systems. In addition to the technology-based functional requirements, the consultant also discusses and records the non-functional business requirements, challenges, and constraints. Assessments help organizations like yours, no matter how large or small, get a better return on your IT investment and overcome challenges in the ever-changing technology landscape.

Lenovo Implementation Services

Optimize your IT operations by shifting labor-intensive functions to Lenovo's skilled technicians for seamless on-site or remote deployment, configuration, and migration. Enjoy peace of mind, faster time to value, and comprehensive knowledge sharing with your IT staff, backed by our best-practice methodology.

Infrastructure Configuration Services

- **Factory Integrated Services**

  A suite of value-added offerings provided during the manufacturing phase of a server or storage system that reduces time to value. These services aim at improving your hardware deployment experience and enhance the quality of a standard configuration before it arrives at your facility.

Infrastructure Deployment Services

Lenovo Infrastructure Deployment Services help you move from hardware delivery toward production with the planning, installation, configuration, integration, validation, documentation, and operational handoff support your project requires. Choose from clearly defined Premier Deploy for Infrastructure options, Specialized Deployment Services, or Hardware Installation Services based on your platform, project

complexity, internal IT capabilities, and desired level of assurance.

For more information, consult our Lenovo Infrastructure Deployment Services Catalog.

- **Premier Deploy for Infrastructure**

  Clearly defined deployment options for eligible ThinkSystem servers, ThinkSystem storage arrays, and ThinkAgile solutions.

  Table 49. Premier Deploy for Infrastructure

	Standard Deploy	Premier Deploy	Premier Deploy Plus
Choose when:	You need straightforward physical hardware installation and customer acceptance.	You need operating system installation and/or system configuration, integration and validation.	You need extended post-deployment assurance and visibility after implementation.
You gain:	An installed, accepted, and documented hardware foundation.	A validated, integrated environment ready to move into production.	Added assurance as your team transitions into ongoing operations.

  For more information, see the Premier Deploy for Infrastructure 1-pager.

- **Specialized Deployment Services**

  Focused deployment expertise for specific technologies or project requirements when Premier Deploy for Infrastructure is not supported or is not the right fit for your project. Services can support ThinkSystem storage arrays, ThinkAgile solutions, HPC, liquid cooling, and private cloud environments through activities such as readiness planning, configuration, integration, validation, documentation, knowledge transfer, and operational handoff, as applicable. Availability and scope vary by platform, project requirements, geography, and service scope.

- **Hardware Installation Services**

  Expert physical installation for eligible hardware outside the Premier Deploy for Infrastructure scope, or for projects that require installation only.

- **Hardware Installation Plus**

  Extends Hardware Installation Services with:

  - RAID configuration
  - Supported operating system installation
  - Driver-level verification

Lenovo Support Services

In addition to response time options for hardware parts, repairs, and labor, Lenovo offers a wide array of additional support services to ensure your business is positioned for success and longevity. Our goal is to reduce your capital outlays, mitigate your IT risks, and accelerate your time to productivity.

- **Premier Support for Infrastructure**

  Helps you build business resilience with expert-led support, responsive issue resolution, and coordinated troubleshooting across supported Lenovo server and storage environments. Direct access to Lenovo expertise and accountable end-to-end case ownership help reduce disruption and simplify ongoing infrastructure operations.

- **Premier Support Plus for Infrastructure**

  Gain all the benefits of Premier Support for Infrastructure, with proactive and predictive support capabilities, designated account oversight, preventative maintenance guidance, and Keep Your Drive to help identify potential issues earlier, plan service more effectively, and maintain control of sensitive data.

- **Committed Service Repair (CSR)**

  Our commitment to ensuring the fastest, most seamless resolution times for mission-critical systems that require immediate attention to ensure minimal downtime and risk for your business. This service is only available for machines under the Premier 4-Hour Response SLA.

- **Multivendor Support Services (MVS)**

  Your single point of accountability for resolution support across a vast range of leading Server, Storage, and Networking OEMs, allowing you to manage all your supported infrastructure devices seamlessly from a single source.

- **Keep Your Drive (KYD)**

  Protect sensitive data and maintain compliance with corporate retention and disposal policies to ensure your data is always under your control, regardless of the number of drives that are installed in your Lenovo server.

- **Technical Account Manager (TAM)**

  Your single point of contact to expedite service requests, provide status updates, and furnish reports to track incidents over time, ensuring smooth operations and optimized performance as your business grows.

- **Enterprise Software Support (ESS)**

  Gain comprehensive, single-source, and global support for a wide range of server operating systems and Microsoft server applications.

For more information, consult our Lenovo Operational Support Services for Data Centers Services Brochure.

Lenovo Managed Services

Achieve peak efficiency, high security, and minimal disruption with Lenovo's always-on Managed Services. Our real-time monitoring, 24x7 incident response, and problem resolution ensure your infrastructure operates seamlessly. With quarterly health checks for ongoing optimization and innovation, Lenovo's remote active monitoring boosts end-user experience and productivity by keeping your data center's hardware performing at its best.

- **Managed Services**

  Lenovo Managed Services provides continuous 24x7 remote monitoring (plus 24x7 call center availability) and proactive management of your data center using state-of-the-art tools, systems, and practices by a team of highly skilled and experienced Lenovo services professionals.

  Quarterly reviews check error logs, verify firmware & OS device driver levels, and software as needed. We'll also maintain records of the latest patches, critical updates, and firmware levels, to ensure your systems are providing business value through optimized performance.

Lenovo Sustainability Services

Lenovo Sustainability Services helps you address sustainability priorities across the IT lifecycle, from offsetting emissions associated with device purchases and extending equipment life to securely managing assets at end of life. Together, these services support more circular IT practices while helping you protect data, manage costs, and recover value from technology investments.

- **Asset Recovery Services**

  Lenovo Asset Recovery Services (ARS) provides a secure, seamless solution for managing end-of-life IT assets, ensuring data is safely sanitized while contributing to a more circular IT lifecycle. By maximizing the reuse or responsible recycling of devices, ARS helps businesses meet sustainability goals while recovering potential value from their retired equipment. For more information, see the Simplify IT Asset Recovery page.

- **CO2 Offset Services**

  Lenovo's CO2 Offset Services offer a simple and transparent way for businesses to take tangible action on their IT footprint. By integrating CO2 offsets directly into device purchases, customers can easily support verified climate projects and track their contributions, making meaningful progress toward their sustainability goals without added complexity.

- **Lenovo Certified Refurbished**

  Lenovo Certified Refurbished offers a cost-effective way to support IT circularity without compromising on quality and performance. Each device undergoes rigorous testing and certification, ensuring reliable performance and extending its lifecycle. With Lenovo's trusted certification, you gain peace of mind while making a more sustainable IT choice.

Lenovo TruScale

Lenovo TruScale XaaS is your set of flexible IT services that makes everything easier. Streamline IT procurement, simplify infrastructure and device management, and pay only for what you use – so your business is free to grow and go anywhere.

Lenovo TruScale is the unified solution that gives you simplified access to:

- The industry's broadest portfolio – from pocket to cloud – all delivered as a service
- A single-contract framework for full visibility and accountability
- The global scale to rapidly and securely build teams from anywhere
- Flexible fixed and metered pay-as-you-go models with minimal upfront cost
- The growth-driving combination of hardware, software, infrastructure, and solutions – all from one single provider with one point of accountability.

For information about Lenovo TruScale offerings that are available in your region, contact your local Lenovo sales representative or business partner.

Regulatory compliance

The SR450 V4 conforms to the following standards:

- ANSI/UL 62368-1
- IEC 62368-1 (CB Certificate and CB Test Report)
- CSA C22.2 No. 62368-1
- Argentina IEC 62368-1
- Mexico NOM-019
- India BIS 13252 (Part 1)
- Germany GS
- TUV-GS (EN62368-1, and EK1-ITB2000)
- South Africa NRCS LOA
- Ukraine UkrCEPRO
- Morocco CMIM Certification (CM)
- Russia, Belorussia and Kazakhstan, TP EAC 037/2016 (for RoHS)
- Russia, Belorussia and Kazakhstan, EAC: TP TC 004/2011 (for Safety); TP TC 020/2011 (for EMC)
- CE, UKCA Mark (EN55032 Class A, EN62368-1, EN55035,(EN61000-3-2, EN61000-3-3 or EN61000-3-11, EN61000-3-12) , (EU) 2019/424, and EN IEC 63000 (RoHS))
- FCC - Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, issue 7, Class A
- CISPR 32, Class A, CISPR 35
- Korea KS C 9832 Class A, KS C 9835
- Japan VCCI, Class A
- Taiwan BSMI CNS15936, Class A; CNS15598-1; Section 5 of CNS15663
- Australia/New Zealand AS/NZS CISPR 32, Class A; AS/NZS 62368.1
- Energy Star 4.0
- Japanese Energy-Saving Act
- EU2019/424 Energy Related Product (ErP Lot9)

External drive enclosures

The server supports attachment to external drive enclosures using a RAID controller with external ports or a SAS host bus adapter. Adapters supported by the server are listed in the SAS adapters for external storage section.

Note: Information provided in this section is for ordering reference purposes only. For the operating system and adapter support details, refer to the interoperability matrix for a particular storage enclosure that can be found on the Lenovo Data Center Support web site:
http://datacentersupport.lenovo.com

Table 50. External drive enclosures

Model	Description
7DAHCTO1WW	Lenovo ThinkSystem D4390 Direct Attached Storage (4U enclosure with 90x LFF drive bays)

For details about supported drives, adapters, and cables, see the following Lenovo Press Product Guides:

- Lenovo ThinkSystem D4390
  https://lenovopress.lenovo.com/lp1681

External storage systems

Lenovo offers the ThinkSystem DE Series, ThinkSystem DG Series, ThinkSystem DM Series and ThinkSystem DS Series external storage systems for high-performance storage. See the DE Series, DG Series and DM Series product guides for specific controller models, expansion enclosures and configuration options:

- ThinkSystem DE Series Storage
  https://lenovopress.com/storage/thinksystem/de-series#rt=product-guide
- ThinkSystem DS Series Storage
  https://lenovopress.lenovo.com/storage/thinksystem/ds-series
- ThinkSystem DM Series Storage
  https://lenovopress.com/storage/thinksystem/dm-series#rt=product-guide
- ThinkSystem DG Series Storage
  https://lenovopress.com/storage/thinksystem/dg-series#rt=product-guide

External backup units

The following table lists the external backup options that are offered by Lenovo.

Table 51. External backup options

Part number	Description
External SAS tape backup drives	
6160S8E	IBM TS2280 Tape Drive Model H8S
6160S9E	IBM TS2290 Tape Drive Model H9S
External SAS tape backup autoloaders	
6171S8R	IBM TS2900 Tape Autoloader w/LTO8 HH SAS
6171S9R	IBM TS2900 Tape Autoloader w/LTO9 HH SAS
External tape backup libraries	
6741B1F	IBM TS4300 3U Tape Library Base Unit - Max 48U
6741B3F	IBM TS4300 3U Tape Library Expansion Unit - Max 48U
SAS backup drives for TS4300 Tape Library	
01KP937	LTO 7 HH SAS Drive
01KP953	LTO 8 HH SAS Drive
02JH836	LTO 9 HH SAS Drive
Full High 8 Gb Fibre Channel for TS4300	
01KP938	LTO 7 FH Fibre Channel Drive
01KP954	LTO 8 FH Fibre Channel Drive
02JH837	LTO 9 FH Fibre Channel Drive
Half High 8 Gb Fibre Channel for TS4300	
01KP936	LTO 7 HH Fibre Channel Drive
01KP952	LTO 8 HH Fibre Channel Drive
02JH835	LTO 9 HH Fibre Channel Drive
Half High 6 Gb SAS for TS4300	
01KP937	LTO 7 HH SAS Drive
01KP953	LTO 8 HH SAS Drive

Part number	Description
02JH836	LTO 9 HH SAS Drive

For more information, see the list of Product Guides in the Backup units category:
https://lenovopress.com/servers/options/backup

Fibre Channel SAN switches

Lenovo offers the ThinkSystem DB Series of Fibre Channel SAN switches for high-performance storage expansion. See the DB Series product guides for models and configuration options:

- ThinkSystem DB Series SAN Switches:
  https://lenovopress.com/storage/switches#rt=product-guide

Uninterruptible power supply units

The following table lists the uninterruptible power supply (UPS) units that are offered by Lenovo.

Table 52. Uninterruptible power supply units

Part number	Description
Rack-mounted or tower UPS units - 200-240VAC	
7DD5A002WW	RT1.5kVA 2U Rack or Tower UPS-G2 (200-240VAC)
7DD5A005WW	RT3kVA 2U Rack or Tower UPS-G2 (200-240VAC)

For more information, see the list of Product Guides in the UPS category:
https://lenovopress.com/servers/options/ups

Power distribution units

The following table lists the power distribution units (PDUs) that are offered by Lenovo.

Table 53. Power distribution units

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
0U Basic PDUs															
4PU7A93176	C0DA	0U 36 C13 and 6 C19 Basic 32A 1 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93177	C0D9	0U 24 C13/C15 and 24 C13/C15/C19 Basic 32A 3 Phase WYE PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
0U Monitored PDUs															
4PU7B08150	CD17	0U 3 C13 and 18 C19 Monitored 80A 3 Phase WYE PDU	N	N	N	N	N	N	N	N	N	N	N	Y	N
4PU7B08148	CD15	0U 3 C13 and 18 C19 Monitored 48A 3 Phase WYE PDU	N	N	N	N	N	N	N	N	N	N	N	Y	N
4PU7B08149	CD16	0U 3 C13 and 18 C19 Monitored 63A 3 Phase WYE PDU	N	N	N	Y	N	N	Y	Y	N	N	N	N	N
4PU7B08151	CD18	0U 21 Saf-D-Grid 300 Monitored 80A 3 Phase WYE High Voltage PDU	N	N	N	N	N	N	N	N	N	N	N	Y	N
0U Switched and Monitored PDUs															
4PU7A93181	C0D5	0U 21 C13/C15 and 21 C13/C15/C19 Switched and Monitored 60A 3 Phase Delta PDU v2	N	Y	N	N	Y	N	N	Y	N	Y	N	Y	N
4PU7A93178	C0D8	0U 20 C13 and 4 C19 Switched and Monitored 32A 1 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93182	C0CS	0U 18 C13/C15 and 18 C13/C15/C19 Switched and Monitored 63A 3 Phase WYE PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A93180	C0D6	0U 18 C13/C15 and 18 C13/C15/C19 Switched and Monitored 32A 3 Phase WYE PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A93179	C0D7	0U 16 C13/C15 and 16 C13/C15/C19 Switched and Monitored 30A 1 Phase PDU v2	N	Y	N	N	N	N	N	Y	N	Y	Y	Y	N
4PU7B08152	CD19	0U 21 Saf-D-Grid 300 Switched and Monitored 80A 3 Phase WYE High Voltage PDU	N	N	N	N	N	N	N	N	N	N	N	Y	N
1U Basic PDUs															
4PU7B12339	CE6L	1U Basic 16A 1 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
1U Switched and Monitored PDUs															
4PU7B13376	CJVY	1U 18 C19/C13 Switched and Monitored 48A 3 Phase WYE PDU v3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A90809	C0DE	1U 18 C19/C13 Switched and monitored 48A 3P WYE PDU V2 CE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y
4PU7A90810	C0DD	1U 18 C19/C13 Switched and monitored 80A 3P Delta PDU V2	N	N	N	N	N	N	N	Y	N	Y	Y	Y	N
4PU7A90811	C0DC	1U 12 C19/C13 Switched and monitored 32A 3P WYE PDU V2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A90812	C0DB	1U 12 C19/C13 Switched and monitored 60A 3P Delta PDU V2	N	N	Y	N	N	N	N	Y	N	Y	Y	Y	N
Line cords for 1U PDUs that ship without a line cord															

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
40K9611	6504	4.3m, 32A/380-415V, EPDU/IEC 309 3P+N+G 3ph wye (non-US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9612	6502	4.3m, 32A/230V, EPDU to IEC 309 P+N+G (non-US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9613	6503	4.3m, 63A/230V, EPDU to IEC 309 P+N+G (non-US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9614	6500	4.3m, 30A/208V, EPDU to NEMA L6-30P (US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9615	6501	4.3m, 60A/208V, EPDU to IEC 309 2P+G (US) Line Cord	N	N	Y	N	N	N	Y	N	N	Y	Y	Y	N

For more information, see the Lenovo Press documents in the PDU category:
https://lenovopress.com/servers/options/pdu

Rack cabinets

The following table lists the supported rack cabinets.

Table 54. Rack cabinets

Model	Description
7D6DA007WW	ThinkSystem 42U Onyx Primary Heavy Duty Rack Cabinet (1200mm)
7D6DA008WW	ThinkSystem 42U Pearl Primary Heavy Duty Rack Cabinet (1200mm)
7D6EA009WW	ThinkSystem 48U Onyx Primary Heavy Duty Rack Cabinet (1200mm)
7D6EA00AWW	ThinkSystem 48U Pearl Primary Heavy Duty Rack Cabinet (1200mm)
1410O42	Lenovo EveryScale 42U Onyx Heavy Duty Rack Cabinet
1410P42	Lenovo EveryScale 42U Pearl Heavy Duty Rack Cabinet
1410O48	Lenovo EveryScale 48U Onyx Heavy Duty Rack Cabinet
1410P48	Lenovo EveryScale 48U Pearl Heavy Duty Rack Cabinet
93072RX	25U Standard Rack (1000mm)
93072PX	25U Static S2 Standard Rack (1000mm)
93604PX	42U 1200mm Deep Dynamic Rack
93614PX	42U 1200mm Deep Static Rack
93634PX	42U 1100mm Dynamic Rack
93634EX	42U 1100mm Dynamic Expansion Rack

For specifications about these racks, see the Lenovo Rack Cabinet Reference, available from:
https://lenovopress.com/lp1287-lenovo-rack-cabinet-reference

For more information, see the list of Product Guides in the Rack cabinets category:
https://lenovopress.com/servers/options/racks

KVM console options

The following table lists the supported KVM consoles.

Table 55. KVM console

Part number	Description
4XF7A84188	ThinkSystem 18.5" LCD console (with US English keyboard)

The following table lists the available KVM switches and the options that are supported with them.

Table 57. KVM switches and options

Part number	Description
KVM Console switches	
1754A1X	Local 1x8 Console Manager (LCM8)
Cables for GCM and LCM Console switches	
46M5383	Virtual Media Conversion Option Gen2 (VCO2)
46M5382	Serial Conversion Option (SCO)

For more information, see the list of Product Guides in the KVM Switches and Consoles category:
http://lenovopress.com/servers/options/kvm

Lenovo Financial Services

Why wait to obtain the technology you need now? No payments for 90 days and predictable, low monthly payments make it easy to budget for your Lenovo solution.

- **Flexible**

  Our in-depth knowledge of the products, services and various market segments allows us to offer greater flexibility in structures, documentation and end of lease options.

- **100% Solution Financing**

  Financing your entire solution including hardware, software, and services, ensures more predictability in your project planning with fixed, manageable payments and low monthly payments.

- **Device as a Service (DaaS)**

  Leverage latest technology to advance your business. Customized solutions aligned to your needs. Flexibility to add equipment to support growth. Protect your technology with Lenovo's Premier Support service.

- **24/7 Asset management**

  Manage your financed solutions with electronic access to your lease documents, payment histories, invoices and asset information.

- **Fair Market Value (FMV) and $1 Purchase Option Leases**

  Maximize your purchasing power with our lowest cost option. An FMV lease offers lower monthly payments than loans or lease-to-own financing. Think of an FMV lease as a rental. You have the flexibility at the end of the lease term to return the equipment, continue leasing it, or purchase it for the fair market value. In a $1 Out Purchase Option lease, you own the equipment. It is a good option when you are confident you will use the equipment for an extended period beyond the finance term. Both lease types have merits depending on your needs. We can help you determine which option will best meet your technological and budgetary goals.

Ask your Lenovo Financial Services representative about this promotion and how to submit a credit application. For the majority of credit applicants, we have enough information to deliver an instant decision and send a notification within minutes.

Seller training courses

The following sales training courses are offered for employees and partners (login required). Courses are listed in date order.

1. **联想数据中心销售认证考试学习指南**
   2026-11-04 | 10 minutes | Employees and Partners

   本指南包含相关信息，旨在帮助考生准备并报名参加数据中心销售（Data Center Sales）实践考试及认证考试。

   Published: 2026-11-04
   Length: 10 minutes

   Start the training:
   Employee link: Grow@Lenovo
   Partner link: Lenovo 360 Learning Center

   Course code: LENU-125C-SG-CHS

2. **レノボ データセンターセールス認定試験対策ガイド**
   2026-11-04 | 10 minutes | Employees and Partners

   本ガイドには、候補者がデータセンター・セールス分野の練習試験および認定試験に向けて準備し、登録を行う際に役立つ情報が記載されています。

   Published: 2026-11-04
   Length: 10 minutes

   Start the training:
   Employee link: Grow@Lenovo
   Partner link: Lenovo 360 Learning Center

   Course code: LENU-125C-SG-JPN

3. **Vente pour centres de données Lenovo Guide de préparation à l’examen de certification**
   2026-11-04 | 10 minutes | Employees and Partners

   Ce guide contient des informations destinées à aider les candidats à se préparer et à s’inscrire aux examens d’entraînement et de certification liés aux ventes de centres de données (Data Center Sales).

   Published: 2026-11-04
   Length: 10 minutes

   Start the training:
   Employee link: Grow@Lenovo
   Partner link: Lenovo 360 Learning Center

   Course code: LENU-125C-SG-FRA

4. **VTT: Driving Flexible Infrastructure with ThinkSystem Disaggregated Solutions Powered by Nutanix**
   2026-10-14 | 47 minutes | Employees Only

   Join Paula Contreras, Lenovo Senior Project Manager, and Alejandro Perez Quintero, Lenovo Sr. Enterprise IT Solution Manager, for a technical webinar focused on Nutanix Compute Cluster on Lenovo ThinkSystem Servers. This solution combines Nutanix AHV with Lenovo ThinkSystem infrastructure to deliver a flexible virtualization platform that enables customers to modernize their environments, simplify operations, and preserve existing storage investments.
   In this session, you'll learn how Lenovo and Nutanix help organizations deploy right-sized virtualization environments using supported ThinkSystem servers, with the flexibility to leverage external storage when Nutanix distributed storage is not required. We'll cover architecture, sizing recommendations, deployment considerations, and practical sales positioning for customers evaluating virtualization modernization strategies.
   What You'll Learn
   - Solution Architecture: Understand the Nutanix AHV-based compute cluster architecture running on Lenovo ThinkSystem servers and supported external storage options.
   - Sizing and Planning: Learn about the suggested small, medium, and large deployment models, workload sizing methodology, and key capacity-planning considerations.
   - Customer Use Cases: Identify opportunities involving virtualization modernization, external storage preservation, branch offices, mid-market deployments, and server consolidation.
   - Sales Positioning: Gain guidance on positioning Nutanix Compute Cluster versus traditional HCI approaches and articulating the value of flexible compute scaling and operational simplicity.

   Tags: Nutanix, HCI, Hyperconverged, Disaggregated, Disaggregated Solution, ThinkSystem, Storage

   Published: 2026-10-14
   Length: 47 minutes

   Start the training:
   Employee link: Grow@Lenovo

   Course code: DVCLD238

5. **Lenovo Data Center Sales Certification Exam Study Guide**
   2026-10-09 | 10 minutes | Employees and Partners

   This guide includes information to help candidates prepare and register for the Data Center Sales practice and certification exams.

   Published: 2026-10-09
   Length: 10 minutes

   Start the training:
   Employee link: Grow@Lenovo
   Partner link: Lenovo 360 Learning Center

   Course code: LENU-125C-SG

6. **AI Express & AI Token Economics**
   2026-10-07 | 60 minutes | Employees and Partners

   In this 60-minute replay, Mark Bica reviews the newly announced AI Express solutions, while Nicholas Borsotto explains Token Economics.

   Published: 2026-10-07
   Length: 60 minutes

   Start the training:
   Employee link: Grow@Lenovo
   Partner link: Lenovo 360 Learning Center

   Course code: OCT0226

7. **VTT: Navigating SAP’s ERP Transformation - Positioning Lenovo Infrastructure for Growth**
2026-10-07 | 49 minutes | Employees and Partners

SAP customers are entering a critical phase of ERP modernization as they transition from legacy SAP ECC environments to SAP S/4HANA and increasingly adopt cloud and hybrid cloud operating models. Join Graeme Trevayne, Lenovo ISG SAP Alliance Director, and Catherine Maina, Lenovo Sr. Product Manager for understanding why the technical and business implications of this shift is essential for designing the right infrastructure solutions and helping customers make informed decisions throughout their transformation journey.
This webinar provides an overview of SAP's ERP and cloud strategy, the current state of customer migration to SAP S/4HANA, and the expected impact on traditional SAP infrastructure investments. Attendees will gain insight into the market outlook for Lenovo's SAP business and learn how Lenovo is adapting its portfolio and go-to-market approach to maximize revenue and profitability during this transition period.
The session will cover Lenovo's SAP-certified infrastructure solutions for both traditional SAP ECC and modern SAP S/4HANA deployments, including sizing, performance, scalability, and modernization considerations. You will also learn how to position ThinkSystem servers as the foundation for mission-critical SAP workloads while incorporating ThinkAgile VX as a strategic platform for virtualization, infrastructure consolidation, operational simplification, and hybrid cloud readiness.
In addition, the webinar will explore emerging growth opportunities across the SAP ecosystem, including SAP migration projects, infrastructure refreshes, private cloud initiatives, data and analytics platforms, AI-enabled business processes, and managed services opportunities. Attendees will leave with practical technical positioning guidance, solution-selling strategies, and customer conversation frameworks that align Lenovo solutions with evolving SAP customer requirements.
Webinar Objectives
• Explain SAP's ERP modernization strategy and cloud transformation roadmap.
• Describe the current progress and adoption trends of SAP S/4HANA migrations.
• Understand the outlook for traditional Lenovo SAP infrastructure opportunities.
• Articulate Lenovo's strategy for maintaining growth and profitability during the SAP transition.
• Differentiate Lenovo solutions supporting SAP ECC and SAP S/4HANA environments.
• Position ThinkSystem servers for performance, reliability, scalability, and SAP-certified deployments.
• Position ThinkAgile VX alongside ThinkSystem to support virtualization, infrastructure modernization, and hybrid cloud architectures.
• Identify new business opportunities within the evolving SAP ecosystem.

Tags: SAP, SAP EcoSystem, Cloud, Large Memory, Database

Published: 2026-10-07
Length: 49 minutes

Start the training:
Employee link: Grow@Lenovo
Partner link: Lenovo 360 Learning Center

Course code: DVCLD237

8. **VTT: Beyond Kubernetes - Driving AI and Enterprise Innovation with Red Hat OpenShift**
2026-10-01 | 65 minutes | Employees Only

Discover how Red Hat OpenShift is redefining the hybrid cloud landscape. This presentation will provide Lenovo with a comprehensive overview of the OpenShift ecosystem, breaking down its architecture and highlighting the critical differences between enterprise-ready OpenShift and upstream Kubernetes. We will explore high-impact use cases, from seamless container orchestration and developer empowerment to cutting-edge OpenShift Virtualization and Red Hat AI integrations. Finally, we will preview the highlights of the next major OpenShift release and host an interactive discussion on strategic partnership opportunities, exploring how Lenovo and Red Hat can collaborate to shape the future of the OpenShift community.
Tags: Red Hat, Openshift, Open Shift, Kubernetes, AI, Cloud, Hybrid Cloud,

Published: 2026-10-01
Length: 65 minutes

Start the training:
Employee link: Grow@Lenovo

Course code: DVCLD236

9. **VTT: Simplifying Private Cloud and Edge Infrastructure with Canonical MicroCloud**
2026-09-24 | 56 minutes | Employees and Partners

As organizations expand their IT footprint across data centers, branch locations, and edge environments, the need for a cloud platform that is simple to deploy, easy to manage, and built for scale has never been greater. Join Miona Aleksic and Leonardo Queirolo from Canonical and Jakob Andersen from Lenovo for an engaging webinar exploring MicroCloud, a lightweight, open-source cloud platform designed to deliver production-grade private cloud infrastructure with minimal operational overhead.
Built with simplicity, security, and automation at its core, MicroCloud enables organizations to rapidly deploy and manage scalable clusters for both on-premises and edge environments. Its streamlined architecture reduces complexity while providing a prescriptive cloud experience that helps organizations achieve a true "zero-ops" approach in distributed environments.
During this session, our experts will discuss:
• Key features and benefits of MicroCloud and how it simplifies private cloud deployment
• Use cases for both on-premises cloud infrastructure and edge computing environments
• How MicroCloud's lightweight architecture supports distributed deployments with reduced operational complexity
• The role of automation and built-in security in enabling a zero-ops cloud experience
• Best practices and available resources for positioning MicroCloud with prospective customers
• How Lenovo and Canonical are helping organizations modernize infrastructure with open, scalable cloud solutions
This webinar will provide practical insights into how MicroCloud can accelerate cloud adoption while reducing operational burden.

Tags: Cloud, Micro Cloud, Microcloud, Canonical, VTT

Published: 2026-09-24
Length: 56 minutes

Start the training:
Employee link: Grow@Lenovo
Partner link: Lenovo 360 Learning Center

Course code: DVCLD235

10. **AMD Update**
    2026-09-22 | 60 minutes | Employees and Partners

    In this 60 minute replay, Maxwell Blackington, Field Applications Engineer at AMD, covered the latest AMD data center processor topics and strategies.

    Published: 2026-09-22
    Length: 60 minutes

    Start the training:
    Employee link: Grow@Lenovo
    Partner link: Lenovo 360 Learning Center

    Course code: SEP1826

11. **Partner Technical Webinar: Intel Xeon 6 & Ethernet NIC update**
    2026-07-14 | 60 minutes | Employees and Partners

    In this 60 minute replay, Madhu Bramharouthu and Raj Pathak from Intel presented the latest information on Xeon 6 processors and Intel Ethernet adapters.

    Published: 2026-07-14
    Length: 60 minutes

    Start the training:
    Employee link: Grow@Lenovo
    Partner link: Lenovo 360 Learning Center

    Course code: JUL1026

12. **Lenovo Data Center Technical Certification Exam Study Guide**
    2026-07-13 | 10 minutes | Employees and Partners

    This guide includes information to help candidates prepare and register for the Data Center Technical practice and certification exams.

    Published: 2026-07-13
    Length: 10 minutes

    Start the training:
    Employee link: Grow@Lenovo
    Partner link: Lenovo 360 Learning Center

    Course code: LENU-322C-SG

13. **Partner Technical Webinar - TCE, DCSC, Enterprise Solutions, & LBPe ISG Financing**
    2026-06-09 | 60 minutes | Employees and Partners

    In this 60-minute replay, we received updates from George Scarbrough on TCE, Amit Chandok on the DCSC, Tracie Heath Garcia on LBPe ISG Financing, and Alejandro Perez Quintero on Enterprise IT Solutions.

    Published: 2026-06-09
    Length: 60 minutes

    Start the training:
    Employee link: Grow@Lenovo
    Partner link: Lenovo 360 Learning Center

    Course code: JUN0526

14. **Partner Technical Webinar - mAInstream Volume Enterprise AI**
2026-05-11 | 45 minutes | Employees and Partners

In this 45 minute replay, Alex “Doc” Docherty, Lenovo AI Technology for NA Channel, discussed Mainstream and volume Servers for enterprise AI solutions. He talked about the need, the supply and some new programs for the channel.

Published: 2026-05-11
Length: 45 minutes

Start the training:
Employee link: Grow@Lenovo
Partner link: Lenovo 360 Learning Center

Course code: MAY0826

15. **Partner Technical Webinar - AI Servers**
2026-04-20 | 30 minutes | Employees and Partners

In this 30 minute replay, Mark Bica, Lenovo NA ISG Server Product Manager, presented the Lenovo AI Servers. Mark also gave an update on M.2 changes the latest with TCE (Top Choice Express).

Published: 2026-04-20
Length: 30 minutes

Start the training:
Employee link: Grow@Lenovo
Partner link: Lenovo 360 Learning Center

Course code: APR1726

16. **Partner Technical Webinar - Server Review Racks, Towers & Edge**
2026-03-16 | 60 minutes | Employees and Partners

In this 60-minute replay, the Channel Solution Architect team provides an overview of the Lenovo ISG server portfolio. Eugene Grandberry, Ian Sloan, and Chris Laffey cover Towers, Racks, Edge, and TCE.

Published: 2026-03-16
Length: 60 minutes

Start the training:
Employee link: Grow@Lenovo
Partner link: Lenovo 360 Learning Center

Course code: MAR1326

17. **ISG Smarter Tools, Faster Deals and Better Outcomes**
2026-02-27 | 40 minutes | Employees and Partners

In this 40-minute video, we review several tools and programs from Lenovo ISG to help our Partners' Data Center selling efforts: Smarter Tools / Faster Deals / Better Outcomes. We cover Top Choice Express, our premier program for supply optimized solutions. We next demonstrated DCSC, the Data Center Solution Configurator, Compete Tool for comparisons with our competition, and XClarity One, the next evolution of our XClarity Systems Management tool.

Tags: DataCenter Products

Published: 2026-02-27
Length: 40 minutes

Start the training:
Employee link: Grow@Lenovo
Partner link: Lenovo 360 Learning Center

Course code: FEB2426

18. **ThinkSystem Rackmount and Tower Servers powered by AMD**
2026-02-23 | 25 minutes | Employees and Partners

This course presents the key products and features of the ThinkSystem Rackmount and Tower server family powered by AMD processors. It describes customer benefits and will help you recognize when a specific product should be selected.

By the end of this course, you should be able to:
- Identify products and features within the family
- Describe customer benefits offered by this family
- Recognize when a specific product should be selected

Last updated: 2/24/2026

Tags: Server, ThinkSystem

Published: 2026-02-23
Length: 25 minutes

Start the training:
Employee link: Grow@Lenovo
Partner link: Lenovo 360 Learning Center

Course code: SXXW1216r11

19. **OneIQ Overview and Demo**
    2026-02-10 | 35 minutes | Employees and Partners

    In this 35-minute video, Peter Grant, Head of Customer Experience for OneIQ, presents and overview and demo of OneIQ for Lenovo Partners.

    Tags: Sales Tools

    Published: 2026-02-10
    Length: 35 minutes

    Start the training:
    Employee link: Grow@Lenovo
    Partner link: Lenovo 360 Learning Center

    Course code: ONEIQ101

20. **Family Portfolio: ThinkSystem Rack and Tower Servers Powered by Intel**
    2026-02-04 | 25 minutes | Employees and Partners

    This course is designed to give Lenovo sales and partner representatives a foundation of the ThinkSystem Intel Rackmount and Tower server family.
    After completing this course, you will be able to:
    - Identify products within this ThinkSystem server family
    - Describe features of this family
    - Recognize when a specific product should be selected

    Tags: Server, ThinkSystem

    Published: 2026-02-04
    Length: 25 minutes

    Start the training:
    Employee link: Grow@Lenovo
    Partner link: Lenovo 360 Learning Center

    Course code: SXXW1204r15

21. **ThinkSystem Rack & Tower Server Primer - Module 2**
2025-12-17 | 45 minutes | Employees Only

This course builds on the foundational concepts from the prework modules, helping Client Managers deepen their understanding of ThinkSystem Rack and Tower Servers and apply that knowledge to confidently initiate value-driven customer conversations. Please Note: The videos in this course are taken from the Module 2 live session led by Tikiri Wandregala.

By the end of this course, you will be able to:

- Demonstrate the ability to initiate a data center discussion with a customer.
- Analyze and evaluate potential data center opportunities.
- Apply criteria to effectively qualify an opportunity.
- Locate and differentiate key resources and contacts.

Tags: DataCenter Products, ThinkSystem

Published: 2025-12-17
Length: 45 minutes

Start the training:
Employee link: Grow@Lenovo

Course code: DSRTB101

22. **Think AI Weekly: ISG & SSG Better Together: Uniting AI Solutions & Services for Smarter Outcomes**
2025-08-01 | 55 minutes | Employees Only

View this session to hear from our speakers Allen Holmes, AI Technologist, ISG and Balaji Subramaniam, AI Regional Leader-Americas, SSG.

Topics include:

• An overview of ISG & SSG AI CoE Offerings with Customer Case Studies
• The Enterprise AI Deal Engagement Flow with ISG and SSG
• How sellers can leverage this partnership to differentiate with Enterprise clients.
• NEW COURSE: From Inception to Execution: Evolution of an AI Deal

Tags: Artificial Intelligence (AI), Sales, Services, Technology Solutions, TruScale Infrastructure as a Service

Published: 2025-08-01
Length: 55 minutes

Start the training:
Employee link: Grow@Lenovo

Course code: DTAIW145

23. **VTT-HPC: Explaining HPC Benchmarking: Processes, Standards and Best Practices**
2025-07-30 | 87 minutes | Employees Only

Please join us as Eric Michel, HPC & AI Performance Team Coordinator and Kevin Dean, Sr Manager, HPC Performance, Projection & Operations speak with us about HPC Benchmarking.

Topics will include:

• Why sellers need to request benchmarks
• How to request benchmarks
• How the team performs a benchmark
• The performance database
• Demonstration of the tool

Tags: Advanced Data Center, High Performance Computing (HPC), Technical Sales

Published: 2025-07-30
Length: 87 minutes

Start the training:
Employee link: Grow@Lenovo

Course code: DVHPC224

24. **Family Portfolio: Server Component Options**
2025-07-21 | 20 minutes | Employees and Partners

This course covers opportunities that are available to upsell server components. By upselling the correct components, you can increase the size and revenue of the original sale.
After completing this course, you should be able to:
• Identify the opportunities for an upsell
• Recognize when specific products should be discussed
• Emphasize how a product benefits the customer
• Identify keywords that indicate upsell opportunities

Tags: Server, Storage

Published: 2025-07-21
Length: 20 minutes

Start the training:
Employee link: Grow@Lenovo
Partner link: Lenovo 360 Learning Center

Course code: SXXW1109r2

25. **ThinkSystem Rack and Tower Introduction for ISO Client Managers**
2025-06-16 | 20 minutes | Employees Only

In this course, you will learn about Lenovo's Data Center Portfolio, its ThinkSystem Family and the key features of the Rack and Tower servers. It will equip you with foundational knowledge which you can then expand upon by participating in the facilitated session of the curriculum.

Tags: Server, ThinkSystem

Published: 2025-06-16
Length: 20 minutes

Start the training:
Employee link: Grow@Lenovo

Course code: DSRTO101r2_JP

26. **VTT HPC: AI and the Impact on the Environment**
2025-06-11 | 58 minutes | Employees Only

Please join us as Matthew Ziegler, Director of Lenovo Neptune and Sustainability speaks with us about AI and the Impact on the Environment.

Topics will include:

- Why is ESG essential for your customer?
- How to find and read an eco declaration
- What is a product carbon footprint?
- Demo of the Lenovo Capacity Planner

Tags: Advanced DataCenter, Artificial Intelligence (AI), Environmental Social Governance (ESG), High-Performance Computing (HPC), Server

Published: 2025-06-11
Length: 58 minutes

Start the training:
Employee link: Grow@Lenovo

Course code: DVHPC223

27. **Lenovo Data Center Product Portfolio**
2025-06-11 | 20 minutes | Employees and Partners

This course introduces the Lenovo data center portfolio, and covers servers, storage, storage networking, and software-defined infrastructure products. After completing this course about Lenovo data center products, you will be able to identify product types within each data center family, describe Lenovo innovations that this product family or category uses, and recognize when a specific product should be selected.

Course objectives:
1.Identify product types within each data center family
2.Describe the features of the product family or category
3.Recognize when a specific product should be selected

Tags: Advanced DataCenter, DataCenter Products, Server, ThinkAgile, ThinkEdge, ThinkSystem

Published: 2025-06-11
Length: 20 minutes

Start the training:
Employee link: Grow@Lenovo
Partner link: Lenovo 360 Learning Center

Course code: SXXW1110r8

28. **Family Portfolio: Storage Controller Options**
2025-03-03 | 25 minutes | Employees and Partners

This course covers the storage controller options available for use in Lenovo servers. The classes of storage controller are discussed, along with a discussion of where they are used, and which to choose.

After completing this course, you will be able to:
• Describe the classes of storage controllers
• Discuss where each controller class is used
• Describe the available options in each controller class

Tags: Sales, Storage

Published: 2025-03-03
Length: 25 minutes

Start the training:
Employee link: Grow@Lenovo
Partner link: Lenovo 360 Learning Center

Course code: SXXW1111r2

29. **ThinkSystem Rack and Tower Introduction for ISO Client Managers**
2024-12-10 | 20 minutes | Employees Only

In this course, you will learn about Lenovo's Data Center Portfolio, its ThinkSystem Family and the key features of the Rack and Tower servers. It will equip you with foundational knowledge which you can then expand upon by participating in the facilitated session of the curriculum.

Course Objectives:
• By the end of this course, you should be able to:
• Identify Lenovo's main data center brands.
• Describe the key components of the ThinkSystem Family servers.
• Differentiate between the Rack and Tower servers of the ThinkSystem Family.
• Understand the value Rack and Tower servers can provide to customers.

Tags: Server, ThinkSystem

Published: 2024-12-10
Length: 20 minutes

Start the training:
Employee link: Grow@Lenovo

Course code: DSRTO101r2

30. **SAP Webinar for Lenovo Sellers: Lenovo Portfolio Update for SAP Landscapes**
2024-06-04 | 60 minutes | Employees Only

Join Mark Kelly, Advisory IT Architect with the Lenovo Global SAP Center of Competence as he discusses:
•Challenges in the SAP environment
•Lenovo On-premise Solutions for SAP
•Lenovo support resources for SAP solutions

Tags: SAP, ThinkAgile, ThinkEdge, ThinkSystem

Published: 2024-06-04
Length: 60 minutes

Start the training:
Employee link: Grow@Lenovo

Course code: DSAPF101

Related publications and links

For more information, see these resources:

- Lenovo SR450 V4 product page:
  https://www.lenovo.com/us/en/p/servers-storage/servers/racks/thinksystem-sr450-v4/len21ts0053
- ThinkSystem SR450 V4 datasheet
  https://lenovopress.lenovo.com/datasheet/ds0213-lenovo-thinksystem-sr450-v4
- Interactive 3D Tour of the ThinkSystem SR450 V4:
  https://lenovopress.lenovo.com/lp2523
- ThinkSystem SR450 V4 drivers and support
  http://datacentersupport.lenovo.com/products/servers/thinksystem/sr450v4/7dqx/downloads
- User Guides for options:
  https://serveroption.lenovo.com
- ServerProven hardware compatibility:
  http://serverproven.lenovo.com

Related product families

Product families related to this document are the following:

- 2-Socket Rack Servers

Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area. Any reference to a Lenovo product, program, or service is not intended to state or imply that only that Lenovo product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any Lenovo intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any other product, program, or service. Lenovo may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

Lenovo (United States), Inc.
8001 Development Drive
Morrisville, NC 27560
U.S.A.
Attention: Lenovo Director of Licensing

LENOVO PROVIDES THIS PUBLICATION ”AS IS” WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. Lenovo may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

The products described in this document are not intended for use in implantation or other life support applications where malfunction may result in injury or death to persons. The information contained in this document does not affect or change Lenovo product specifications or warranties. Nothing in this document shall operate as an express or implied license or indemnity under the intellectual property rights of Lenovo or third parties. All information contained in this document was obtained in specific environments and is presented as an illustration. The result obtained in other operating environments may vary. Lenovo may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any references in this publication to non-Lenovo Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this Lenovo product, and use of those Web sites is at your own risk. Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

© Copyright Lenovo 2026. All rights reserved.

This document, LP2494, was created or updated on November 17, 2026.

Send us your comments in one of the following ways:

- Use the online Contact us review form found at:
  https://lenovopress.lenovo.com/LP2494
- Send your comments in an e-mail to:
  comments@lenovopress.com

This document is available online at https://lenovopress.lenovo.com/LP2494.

Trademarks

Lenovo and the Lenovo logo are trademarks or registered trademarks of Lenovo in the United States, other countries, or both. A current list of Lenovo trademarks is available on the Web at https://www.lenovo.com/us/en/legal/copytrade/.

The following terms are trademarks of Lenovo in the United States, other countries, or both:
Lenovo®
AnyBay®
Lenovo TruScale®
Neptune™
ServerProven®
System x®
ThinkAgile®
ThinkShield®
ThinkSystem®
TruScale®
XClarity®

The following terms are trademarks of other companies:

AMD® is a trademark of Advanced Micro Devices, Inc.

Intel®, the Intel logo, Intel Core®, and Xeon® are trademarks of Intel Corporation or its subsidiaries.

Linux® is the trademark of Linus Torvalds in the U.S. and other countries.

Microsoft®, ActiveX®, Hyper-V®, PowerPoint®, SharePoint®, Windows Server®, and Windows® are trademarks of Microsoft Corporation in the United States, other countries, or both.

TPC® is a trademark of Transaction Processing Performance Council.

SPEC®, SPEC ACCEL®, SPEC CPU®, SPEC MPI®, SPEC OMP®, SPEChpc™, SPECjbb®, SPECpower®, SPECrate®, and SPECspeed® are trademarks of the Standard Performance Evaluation Corporation (SPEC).

IBM® and IBM Security® are trademarks of IBM in the United States, other countries, or both.

NVIDIA® is a trademark of NVIDIA Corporation.

Other company, product, or service names may be trademarks or service marks of others.