Lenovo ThinkSystem ST250 V3 Server
Product Guide

The ThinkSystem ST250 V3 is a mainstream 1-socket tower server that also be rack mounted as a rack server. It is ideal for small-to-medium businesses, remote offices, branch offices, banking and public sector. The server supports one Intel Xeon 6300 Series processor, or one Intel Xeon E-2400 Series processor (formerly codenamed "Raptor Lake") or Intel Pentium ("Alder Lake") and up to 128 GB of memory.

Figure 1 shows the ThinkSystem ST250 V3.



Figure 1. Lenovo ThinkSystem ST250 V3

360° View | Full 3D Tour

Did you know?

The ThinkSystem ST250 V3 is an entry-level server with enterprise-grade management features and support for hot-swap power supplies and drives. It offers full support of Lenovo XClarity Administrator for comprehensive systems management and includes the next generation UEFI-based Lenovo XClarity Provisioning Manager for system setup and diagnosis, and the Lenovo XClarity Controller management processor for ongoing systems management and alerting. These tools make the ST250 V3 easy to deploy, integrate, service, and manage.

Key features

The ThinkSystem ST250 V3 is a office-friendly tower server that has been optimized to provide enterprise-class features to small businesses, retail, educational institutions and branch offices.

Scalability and performance

The ST250 V3 offers the following features to boost performance, improve scalability, and reduce costs:

- Improved single-socket processor performance:
  - Intel Xeon E-2400 Series processors ("Raptor Lake") up to to 8 cores and core speeds up to 3.5 GHz
  - Intel Pentium G7400 and G7400T processors ("Alder Lake") with 2 cores and core speeds up to 3.7 GHz
- Up to four 4800 MHz DDR5 ECC UDIMMs provide speed and capacity of up to 128 GB
- Four PCIe slots for I/O expansion, one of which has the new PCIe Gen5 interface to maximize I/O performance.
- Flexible storage configurations support either 2.5-inch or 3.5-inch hot-swap drive bays or a combination of the two (hybrid configuration). Drive bays support SAS and SATA HDDs, SSDs and HH Optical Disc Drive.
  - Up to 16x 2.5-inch hot-swap drive bays
  - Up to 8x 3.5-inch hot-swap drive bays
  - Up to 4x 3.5-inch + 8x 2.5-inch drive bays + 2x 5.25 HH (2x ODD or 1x ODD / 1x Tape drive) bay
- The server also supports simple-swap drives:
  - Up to 8x 3.5-inch SATA drive bays
  - Up to 6x 3.5-inch SATA drive bays + 2x 3.5-inch NVMe drive bay
  - Up to 6x 3.5-inch SATA drive bays + 2x 5.25 HH (2x ODD or 1x ODD / 1x Tape drive) bay
- The use of solid-state drives (SSDs) instead of, or along with, traditional hard disk drives (HDDs) can significantly improve I/O performance. An SSD can support up to 100 times more I/O operations per second (IOPS) than a typical HDD
- New high-speed RAID controllers from Lenovo and Broadcom provide 12 Gb SAS connectivity to the drive backplanes
- Offers two 5.25-inch media bays with support for optical drives or backup drives
- Supports two M.2 drives for OS boot support with VROC RAID redundancy (no support for NVMe RAID)
- The server has two integrated Gigabit Ethernet ports
- The server offers one PCIe 5.0 slot plus three PCIe 4.0 I/O expansion slots
- Support for a NVIDIA GPU for enhanced workload performance

Availability and serviceability

The ST250 V3 provides the following features to simplify serviceability and increase system uptime:

- Designed to run 24 hours a day, 7 days a week
- The ST250 V3 supports UDIMM memory with ECC protection which provides error correction not available in PC-class "servers" that use parity memory. Avoiding system crashes (and data loss) due to soft memory errors means greater system uptime.
- The server offers hot-swap (HS) SSDs and HDDs, and supports RAID redundancy for data protection and greater system uptime.
- Much like hot-swap drives, simple-swap drives are mounted on an easy-to-remove tray and work with the same RAID options. Simple-swap require a system power-down before adding or replacing,

however simple-swap drives are less expensive than hot-swap drives.

- The server supports hot-swap power supplies; with two installed, they form a redundant pair to provide availability for business-critical applications.
- Tool-less cover removal provides easy access to upgrades and serviceable parts, such as memory and adapter cards.
- A choice of affordable onboard SATA RAID or advanced hardware RAID redundancy offers data protection and greater system uptime.
- The use of SSDs can provide better reliability than the use of traditional HDDs, for greater uptime.
- The built-in XClarity Controller continuously monitors system parameters, triggers alerts, and performs recovery actions in case of failures to minimize downtime.
- Allows preventive actions in advance of possible failure, thereby increasing server uptime and application availability with Proactive Platform Alerts (including PFA and SMART alerts) for memory, internal storage (SAS/SATA HDDs and SSDs, NVMe SSDs, M.2 SSDs), RAID controllers, and server ambient and sub-component temperatures.
- 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.
- Support for the XClarity Administrator Mobile app running on a supported smartphone and connected to the server through the service-enabled USB port, enables additional local systems management functions.
- Auto restart in the event of a momentary loss of AC power (based on power policy setting in the XClarity Controller service processor) (hot-swap power supplies only)
- One-year or three-year customer-replaceable unit (CRU) and onsite limited warranty with next business day response. Optional service upgrades are available.

Manageability and security

The following systems management features simplify local and remote management of the ST250 V3:

- The server includes an XClarity Controller2 (XCC2) to monitor server availability. Optional upgrade to XCC Advanced to provide remote control (keyboard video mouse) functions. Optional upgrade to XCC2 Platinum enables the additional support for the mounting of remote media files (ISO and IMG image files), boot capture, and power capping.
- Lenovo XClarity Administrator offers comprehensive hardware management tools that help to increase uptime, reduce costs and improve productivity through advanced server management capabilities.
- New 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.
- Integrated Trusted Platform Module (TPM) 2.0 support enables advanced cryptographic functionality, such as digital signatures and remote attestation.
- 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 (Intel Xeon E processors only) 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.

- Helps prevent unauthorized software from running on the server by protecting against boot block-level malicious software with Intel Boot Guard technology.
- Protects application code and data from disclosure or modification with Intel Software Guard Extensions (SGX), enabling high-assurance security use cases, such as blockchain, identity and records privacy, secure browsing, and digital rights management (DRM).
- Physical security measures to prevent unauthorized access: Loop for a padlock to prevent the side panel from being opened and a slot at the rear of the server for a Kensington Cable Lock. Optional additional physical security features are a lockable front security door and a chassis intrusion switch (included in some models).

Energy efficiency

The ST250 V3 offers the following energy saving features to save energy, reduce operational costs, increase energy availability, and contribute to the green environment:

- Energy-efficient planar components help lower operational costs.
- High-efficiency power supplies with 80 PLUS Platinum certifications. Energy Star certified.
- Intel Intelligent Power Capability powers individual processor elements on and off as needed to reduce power draw.
- DDR5 memory DIMMs support up to 4800 MT/s.
- SSDs use as much as 80% less power than traditional spinning HDDs.
- The server uses hexagonal ventilation holes, which can be grouped more densely than round holes, providing more efficient airflow through the system.
- Optional 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.

Comparing the ST250 V3 to the ST250 series

The ThinkSystem ST250 V3 improves on the previous generation ST250, as summarized in the following table.

Table 1. Comparing the ST250 V3 to the ST250s

Feature	ST250 V3	ST250	ST250 V2	Benefits
Form Factor	• 1-Socket (1S) Tower • Convertible to a 5U rack configuration	• 1-Socket (1S) Tower • Convertible to a 5U rack configuration	• 1-Socket (1S) Tower • Convertible to a 5U rack configuration	• Versatile server design
Processor	• Supports single Xeon 6300 Series processor up to 8C / 95W • Supports single Xeon E-2400 Series "Raptor Lake" processor up to 8C / 95W • Also supports Pentium processors (Alder Lake) • Intel C266 "Raptor Lake" Platform Controller Hub (PCH-S)	• Supports single Xeon E2200 Series "Coffee Lake-S" processor up to 6C / 95W • Also supports Pentium, Core i3 and Celeron processors • Uses Intel C246 "Cannon Lake" Platform Controller Hub (PCH)	• Supports single Xeon E2300 Series "Rocket Lake" processor up to 8C / 95W • Also supports Pentium processors • Intel C256 "Tiger Lake" Platform Controller Hub (PCH)	• Supports the latest generation Intel Xeon E processors
GPU	• NVIDIA Quadro T1000 • NVIDIA Quadro T400	• NVIDIA Quadro P620 2GB PCIe Active GPU	• NVIDIA Quadro T1000 • NVIDIA Quadro T400	• GPU for advanced graphics processing
Memory	• 4x UDIMM slots, up to 128GB, 5600MHz with Xeon 6300 processors • 4x UDIMM slots, up to 128GB, 4800MHz or 5600MHz with Xeon E-2400 processors • 4x UDIMM slots, up to 128GB, 4800MHz or 5600MHz with Pentium processors • TruDDR5 ECC memory	• 4x UDIMM slots, up to 64GB, 2666MHz • TruDDR4 ECC memory (in China, also support for non-ECC memory)	• 4x UDIMM slots, up to 128GB, 3200MHz with Xeon E-2300 processors • 4x UDIMM slots, up to 128GB, 2666MHz with Pentium processors • TruDDR4 ECC memory	• Enterprise-grade memory sufficient for most SMB and retail applications • Faster memory with Xeon processors • Larger memory capacity means greater performance with larger applications

Feature	ST250 V3	ST250	ST250 V2	Benefits
Storage	• Up to 8x 3.5-inch hot-swap SAS/SATA drive bays or • Up to 16x 2.5-inch hot-swap SAS/SATA drive bays, or • Up to 8x 3.5-inch simple-swap SATA drive bays, or • Up to 6x 3.5-inch simple-swap SATA drive bays + 2x NVMe drive bay • 2x media bays supporting optical or backup drives • 2x M.2 SATA SSD supporting RAID 0 and RAID 1 using VROC, installs in an adapter in a PCIe slot.	• Up to 8x 3.5-inch hot-swap SAS/SATA drive bays or • Up to 16x 2.5-inch hot-swap SAS/SATA drive bays, or • Up to 8x 3.5-inch simple-swap SATA drive bays, or • 2x media bays supporting optical or backup drives • 1x M.2 SATA SSD, installs on the system board	• Up to 8x 3.5-inch hot-swap SAS/SATA drive bays or • Up to 16x 2.5-inch hot-swap SAS/SATA drive bays, or • Up to 8x 3.5-inch simple-swap SATA drive bays, or • Up to 7x 3.5-inch simple-swap SATA drive bays + 1x NVMe drive bay • 2x media bays supporting optical or backup drives • 2x M.2 SATA SSD supporting RAID 0 and RAID 1 using VROC, installs in an adapter in a PCIe slot	• Support for both HDDs for capacity and SSDs for performance • Simple-swap configurations support an NVMe drive for tiered storage • Optical drive support for ease of software installation • M.2 drive support to separate the OS from the applications and data • RAID support for M.2 to maximize uptime
RAID	• Supports a SAS HBA or RAID adapter for hardware RAID functionality • 12Gb SAS/SATA/RAID support • PCIe 4.0 and PCIe 5.0 adapters • Intel VROC 6.x SW RAID (no support for NVMe RAID)	• Supports a SAS HBA or RAID adapter for hardware RAID functionality • 12Gb SAS/SATA/RAID support • PCIe 3.0 adapters • Intel RSTe SW RAID	• Supports a SAS HBA or RAID adapter for hardware RAID functionality • 12Gb SAS/SATA/RAID support • PCIe 3.0 and PCIe 4.0 adapters • Intel VROC 6.x SW RAID	• Featuring industry's latest PCIe Gen4 based RAID adapters • RAID capability maximizes reliability and uptime
Cooling	• PCIe 4.0 and PCIe 5.0 adapters • 4 system fans	• 4 system fans: 2 front for drive bays, 1 rear system fan, 1x CPU fan	• 4 system fans: 2 front for drive bays, 1 rear system fan, 1x CPU fan	• Ensures all components are sufficiently cooled
Networking	• 2x 1GbE Onboard Ethernet ports (Broadcom BCM5720) • Rear 1 port allows remote connectivity to the XCC2 management controller	• 2x 1GbE Onboard Ethernet ports (Broadcom BCM5720) • Port 1 allows remote connectivity to the XCC management controller	• 2x 1GbE Onboard Ethernet ports (Broadcom BCM5720) • Port 1 allows remote connectivity to the XCC management controller	• Easy built-in networking

Feature	ST250 V3	ST250	ST250 V2	Benefits
PCIe Slots	• 4x PCIe slots (x4, x16, x4, x4) • Includes a PCIe Gen5 x16 slot (GPU support)	• 4x PCIe slots (x1, x16, x4, x4) • Includes a PCIe Gen3 x16 slot	• 4x PCIe slots (x4, x16, x4, x4) • Includes a PCIe Gen4 x16 slot (requires Xeon E-2300 processor)	• Support the latest PCIe Gen5 slot technology • Support for a high-performance PCIe x16 adapter
Front I/O	• Power button & LED • Ambient Thermal sensor • One USB 3.2 G1 (5 Gb/s) port • One USB 2.0 port (also supports XClarity Mobile connectivity for local systems management)	• Power button & LED • Thermal sensor • One USB 3.2 G1 (5 Gb/s) port • One USB 2.0 port (also supports XClarity Mobile connectivity for local systems management)	• Power button & LED • Thermal sensor • One USB 3.2 G1 (5 Gb/s) port • One USB 2.0 port (also supports XClarity Mobile connectivity for local systems management)	• Expansive USB support • Thermal sensor ensures the server does not overheat if the ambient temperature rises
Rear I/O	• 4x USB 3.2 G1 (5 Gb/s) ports • 1x VGA video • 1x RJ-45 systems management • 2x RJ-45 GbE network ports • 1x serial port • 1x NMI pinhole	• 2x USB 3.2 G1 (5 Gb/s) ports • 2x USB 3.2 G2 (10 Gb/s) ports • 1x VGA video • 1x RJ-45 systems management • 2x RJ-45 GbE network ports • 1x serial port	• 4x USB 3.2 G2 (10 Gb/s) ports • 1x VGA video • 1x RJ-45 systems management • 2x RJ-45 GbE network ports • 1x serial port	• Expansive USB support • Integrated Gigabit networking • Serial port for applications that require it

Feature	ST250 V3	ST250	ST250 V2	Benefits
Management and Security	• XClarity Controller with upgrades • Full XClarity software suite including XClarity Administrator • Dedicated Ethernet port for remote management • Optional intrusion switch and lockable door • Platform Firmware Resiliency (PFR) hardware Root of Trust	• XClarity Controller with upgrades • Full XClarity software suite including XClarity Administrator • Dedicated Ethernet port for remote management • Optional intrusion switch and lockable door	• XClarity Controller with upgrades • Full XClarity software suite including XClarity Administrator • Dedicated Ethernet port for remote management • Optional intrusion switch and lockable door • Platform Firmware Resiliency (PFR) hardware Root of Trust	• Common management tools with prior generation • The server offers electronic and physical security features • Platform Firmware Resiliency is an advanced security solution with a silicon-based to guard against corruption and unauthorized firmware updates
Power Supply	• Choice of 1x fixed power supply or 2x hot-swap power supplies • 300W or 500W fixed power supplies, or 800W hot-swap power supply	• Choice of 1x fixed power supply or 2x hot-swap power supplies • 250W fixed power supply or 550W hot-swap power supply	• Choice of 1x fixed power supply or 2x hot-swap power supplies • 250W or 300W fixed power supplies, or 550W hot-swap power supply	• Select the power supply that best suits the configuration to maximize efficiency

Components and connectors

The following figure shows the front of the server.

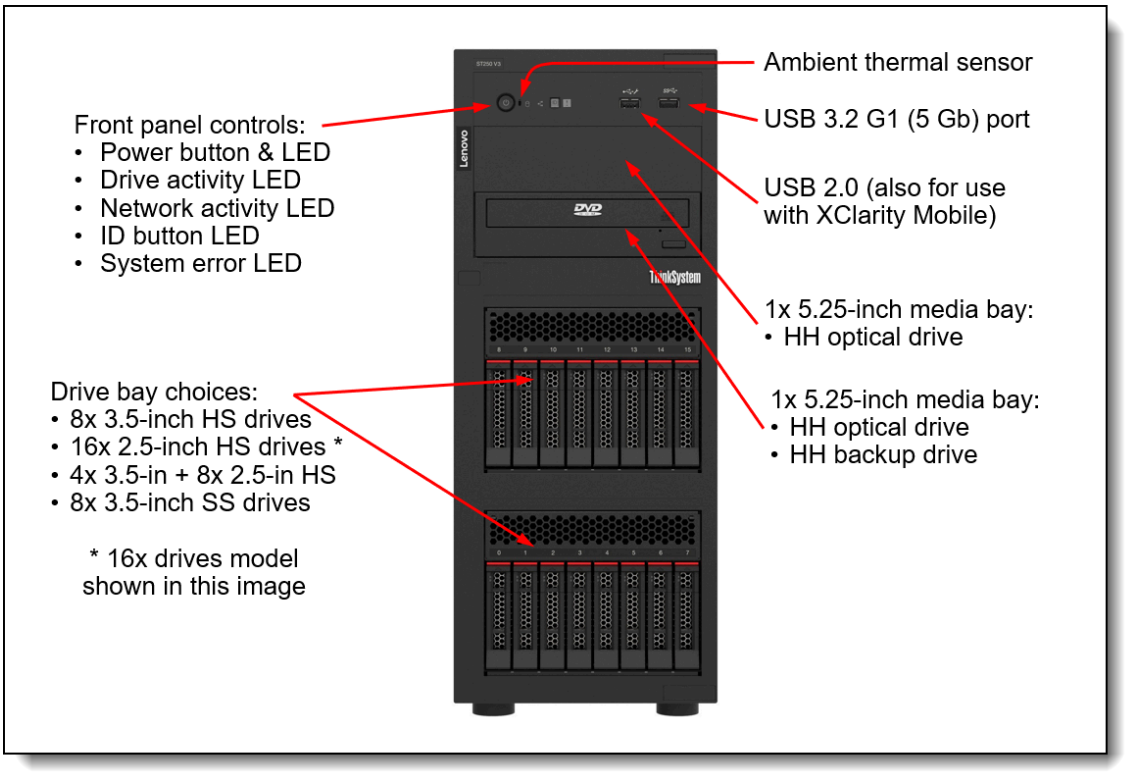


Figure 2. Front view of the ThinkSystem ST250 V3 server

The following figure shows the rear of the server.

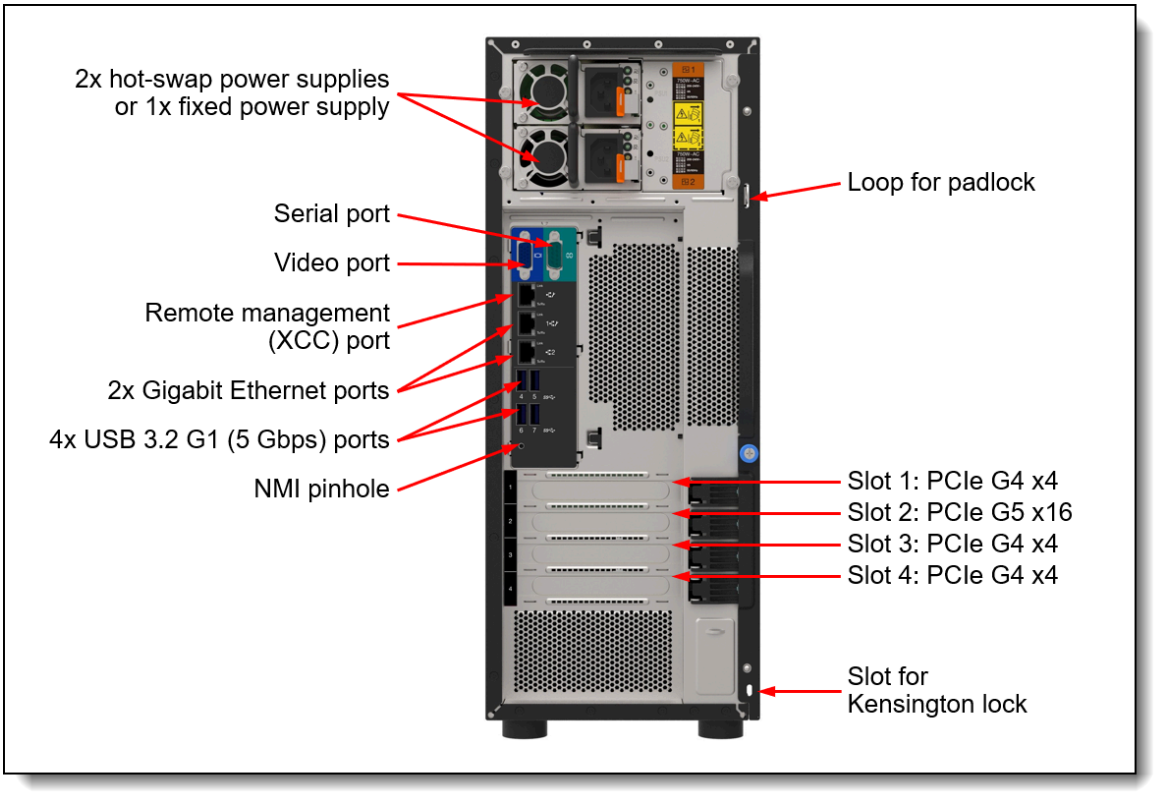


Figure 3. Rear view of the ThinkSystem ST250 V3 server

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

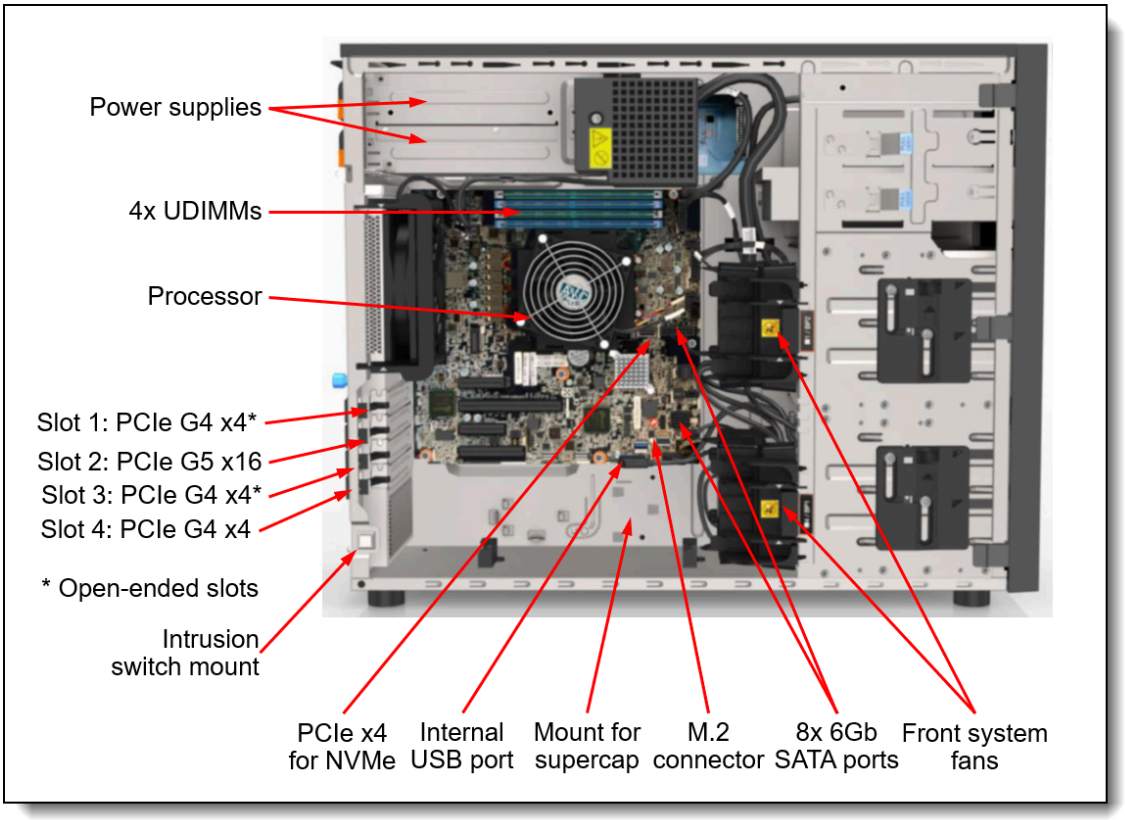


Figure 4. Internal view of the ThinkSystem ST250 V3 server

System architecture

The following figure shows the architectural block diagram of the ST250 V3, showing the major components and their connections.

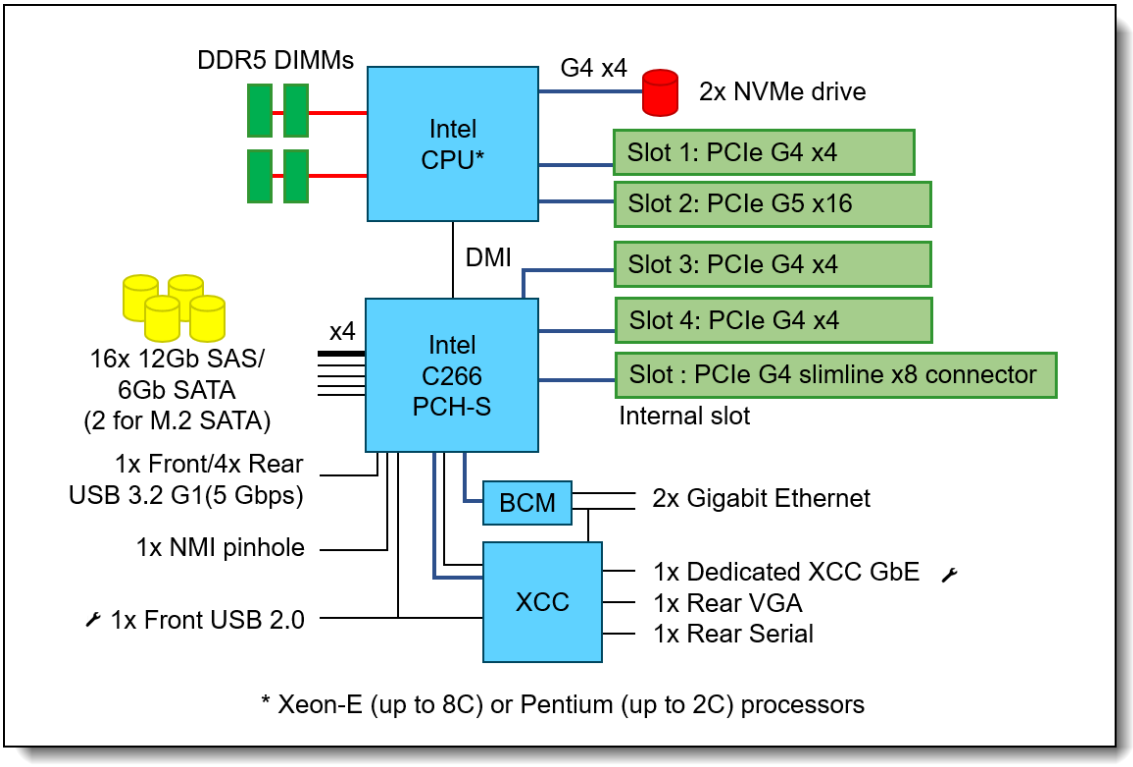


Figure 5. ST250 V3 system architectural block diagram

Standard specifications

The following table lists the standard specifications.

Table 2. Standard specifications

Components	Specification
Machine type	7DCF - 1 year warranty 7DCE - 3 year warranty
Form factor	Tower (can be installed in a rack with the available Rack Mount Kit)
Processor	One Intel processor. Choose from: • Intel Xeon 6300 Series processors up to to 8 cores, with core speeds up to 3.6 GHz • Intel Xeon E-2400 Series processors ("Raptor Lake-E") up to to 8 cores, with core speeds up to 3.5 GHz • Intel Pentium G7400 and G7400T processors ("Alder Lake-R") with 2 cores, with core speeds up to 3.7 GHz
Chipset	Intel Rocket Lake PCH-S, C266
Memory	Four DIMM sockets supporting Lenovo TruDDR5 DIMMs at 4400 MHz (Xeon processors) or 4400 MHz (Pentium processors). Support ECC UDIMMs.
Memory maximum	Up to 128 GB using 4x 32 GB UDIMMs.
Memory protection	Error-correcting code (ECC)
Disk drive bays	Available configurations: • 8x or 16x 2.5-inch SAS/SATA hot-swap drive bays • 4x or 8x 3.5-inch SAS/SATA hot-swap drive bays • Both 4x 3.5-inch and 8x 2.5-inch SAS/SATA hot-swap drive bays • Up to 8x 3.5-inch simple-swap SATA drive bays • 6x 3.5-inch simple-swap SATA drive bays + 2x 3.5-inch simple-swap NVMe drive bay In addition, the ST250 V3 supports two M.2 drives installed in an M.2 adapter which is installed in PCIe slot.

Maximum internal storage	• 2.5-inch drives:
	  ◦ 122.88TB using 16x 7.68TB 2.5-inch SATA SSDs
	  ◦ 38.4TB using 16x 2.4TB 2.5-inch HS HDDs
	• 3.5-inch drives:
	  ◦ 176TB using 8x 22TB 3.5-inch SAS HDDs
	  ◦ 176TB using 8x 22TB 3.5-inch SATA HDDs
	  ◦ 30.72TB using 8x 3.84TB 3.5-inch SATA SSDs
	• Intermix of SAS and SATA is supported.

Storage controller	• Onboard 6 Gb SATA for simple-swap drive configurations, using Intel VROC SATA RAID, supporting RAID 0, 1, 10, 5, 50 • 12 Gb SAS/SATA RAID adapters • 12 Gb SAS/SATA host bus adapters
Optical drive bays	Two half-height 5.25-inch bays for optical or tape drives. Supports SATA DVD-ROM or DVD-RW (multiburner). **Note**: If the onboard SATA controller is used to connect the drive bays, then only 6 drives can be installed if an optical drive is installed.
Tape drive bays	Two half-height 5.25-inch bays for optical or tape drives. Support for one RDX drive.

Components	Specification
Network interfaces	Two integrated Gigabit Ethernet 1000BASE-T ports (RJ-45) based on Broadcom BCM5720 embedded controller, one can be shared with XCC for systems management. Third dedicated Gigabit Ethernet port for XCC systems management.
PCI Expansion slots	Four PCIe slots (1x PCIe 5.0, 3x PCIe 4.0) as follows: • Slot 1: PCIe G4 x4 (x4 slot, open-ended) 25W full-height half-length • Slot 2: PCIe G5 x16 (x16 slot, closed-ended) 75W full-height half-length • Slot 3: PCIe G4 x4 (x4 slot, open-ended) 25W full-height half-length • Slot 4: PCIe G4 x4 (x8 slot, closed-ended) 25W full-height half-length

Ports	• Front:
	  ◦ One USB 3.2 G1 (5 Gb/s) port
	  ◦ One USB 2.0 port (also for XClarity Mobile connectivity for local systems management)
	• Rear:
	  ◦ Four USB 3.2 G1 (5 Gb/s) ports
	  ◦ One VGA video
	  ◦ One RJ-45 systems management
	  ◦ Two RJ-45 GbE network ports
	  ◦ One serial port
	• Internal:
	  ◦ One internal USB 3.0 port for RDX drive

Cooling	Supports ASHRAE A2 environments. Certain configurations support ASHRAE A3. Two or three fixed system fans depending on the drive bay configuration. Additional fans attached to the processor heat sink and in the power supplies.
Power supply	Model dependent choices • One fixed 300W Gold power supply • One fixed 500W Platinum power supply: Energy Star and ErP Lot 9 compliant • Two hot-swap 800W redundant power supplies, 80 PLUS Platinum certified, Energy Star and ErP Lot 9 compliant
Hot-swap parts	Hard drives and 800W power supplies
Systems management	Operator panel with status LEDs. XClarity Controller2 (XCC2) embedded management, XClarity Administrator centralized infrastructure delivery, XClarity Integrator plugins, and XClarity Energy Manager centralized server power management. Optional XClarity Controller Advanced to enable remote control functions.
Security features	Power-on password, administrator's password, Trusted Platform Module, supporting TPM 2.0. Optional chassis intrusion switch. Padlock loop and Kensington cable slot and optional lockable front door for physical security.
Video	G200 graphics with 16 MB memory, integrated into the XClarity Controller. For use with local Administrator functions (not designed for workstation use). Maximum resolution is 1920x1200 32bpp at 60Hz.
Operating systems supported	Microsoft Windows Server, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, VMware ESXi. See the Operating systems section for specifics.
Limited warranty	Three-year or one-year (model dependent) 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: 176 mm (6.9 inches), Height: 444 mm (17.5 inches), Depth: 578 mm (22.8 inches). See Physical and electrical specifications for details.

Components	Specification
Weight	Fully configured: 23.95 kg (52 lb) (3.5" config), or 15.81 kg (2.5" config)

The ST250 V3 server is shipped with the following items:

- Documentation flyer
- Power cords (model and region dependent)
- Mouse & keyboard (model dependent)

Top Choice

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

- **Top Choice Express (TCE):** 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 enable 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.

- **Top Choice Stock (TCS):** 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**, 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 ST250 V3 models can be configured by using the Lenovo Data Center Solution Configurator (DCSC).

Preconfigured server models may also be available for the ST250 V3, 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 ST250 V3 server.

Table 3. Base CTO models

Machine Type/Model	Description
7DCECTO1WW	ThinkSystem ST250 V3 – 3-year base warranty
7DCFCTO1WW	ThinkSystem ST250 V3 – 1-year base warranty

Models of the ST250 V3 are defined based on whether the server has 2.5-inch drive bays at the front (called the 2.5-inch chassis) or whether it has 3.5-inch drive bays at the front (called the 3.5-inch chassis). For models, the feature codes for these chassis bases are as listed in the following table.

Table 4. Chassis base feature codes

Feature code	Description
B3YZ	ThinkSystem ST250 3.5" Chassis Base
B3Z0	ThinkSystem ST250 2.5" Chassis Base

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

- Models for Asia Pacific region
- Models for Australia and New Zealand
- Models for Brazil
- Models for India
- Models for Japan
- Models for EMEA countries
- Models for Latin American countries (except Brazil)
- Models for USA and Canada

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

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 5. Models for Asia Pacific markets

Model	Intel processors†	Memory	Drive Contr*	Drive bays Drives	Add'l Cards	DVD	Power supply	Pwr cord	XCC2	Sec. door	Intru. sw.
3-year warranty (machine type 7DCE)											
7DCEA04QAP	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	940-8i 4GB	4x 3.5-in HS / Openbay	Opt	Opt	500W fixed	No	Std	Opt	Opt
7DCEA04MAP	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	940-8i 4GB	8x 2.5-in HS / Openbay	Opt	Opt	1x 800W HS	No	Std	Opt	Opt
7DCEA04NAP	Xeon 6325P 4C 55W 3.5GHz	1x 16GB	940-8i 4GB	4x 3.5-in HS / Openbay	Opt	Opt	500W fixed	No	Std	Opt	Opt
7DCEA04LAP	Xeon 6325P 4C 55W 3.5GHz	1x 16GB	940-8i 4G	8x 2.5-in HS / Openbay	Opt	Opt	1x 800W HS	No	Std	Opt	Opt
7DCEA05GAP	Xeon 6325P 4C 55W 3.5GHz	1x 16GB	940-8i 4GB	8x 2.5-in HS / Openbay	Opt	Opt	1x 800W HS	No	Std	Opt	Opt
7DCEA04PAP	Xeon 6333P 6C 65W 3.1GHz	1x 16GB	940-8i 4GB	8x 2.5-in HS / Openbay	Opt	Opt	1x 800W HS	No	Std	Opt	Opt
7DCEA04RAP	Xeon 6333P 6C 65W 3.1GHz	1x 16GB	940-8i 4GB	4x 3.5-in HS / Openbay	Opt	Opt	500W fixed	No	Std	Opt	Opt
7DCEA05FAP	Xeon 6333P 6C 65W 3.1GHz	1x 16GB	940-8i 4GB	8x 2.5-in HS / Openbay	Opt	Opt	1x 800W HS	No	Std	Opt	Opt
7DCEA05EAP	Xeon 6353P 8C 65W 2.7GHz	1x 16GB	940-8i 4GB	8x 2.5-in HS / Openbay	Opt	Opt	1x 800W HS	No	Std	Opt	Opt
Models for Taiwan only											
7DCEA053CN	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	940-8i 4GB	4x 3.5-in HS / 2x 2TB SAS HDD	Opt	Opt	1x 800W HS	Yes	Std	Opt	Opt

† Processor detail: Model, number of cores, TDP, core frequency
* A maximum of 6 drives can be installed in configurations that have the onboard SATA controller and have an internal optical drive installed.

Models for Australia and New Zealand

Table 6. Models for Australia and New Zealand

Model	Intel processors†	Memory	Drive Contr*	Drive bays Drives	Add'l Cards	DVD	Power supply	Pwr cord	XCC2	Sec. door	Intru. sw.
3-year model (machine type 7DCE)											
7DCE1019AU	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	8x 2.5-in HS / Openbay	Opt	Open	1x 800W HS	Yes	Std	Opt	Opt
7DCEA058AU	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	8x 2.5-in HS / Openbay	Opt	Open	1x 800W HS	Yes	Plat	Opt	Opt
7DCEA05BAU	Xeon 6325P 4C 55W 3.5GHz	1x 16GB	OB SATA/SW RAID**	8x 2.5-in HS / Openbay	Opt	Open	1x 800W HS	Yes	Plat	Opt	Opt
7DCEA059AU	Xeon 6333P 6C 65W 3.1GHz	1x 32GB	OB SATA/SW RAID**	4x 3.5-in HS / Openbay	Opt	Open	1x 800W HS	Yes	Plat	Opt	Opt
7DCEA056AU	Xeon 6333P 6C 65W 3.1GHz	1x 32GB	OB SATA/SW RAID**	8x 2.5-in HS / Openbay	Opt	Open	1x 800W HS	Yes	Plat	Opt	Opt
7DCE101AAU	Xeon 6353P 8C 65W 2.7GHz	1x 16GB	OB SATA/SW RAID**	4x 3.5-in HS / Openbay	Opt	Open	2x 800W HS	Yes	Std	Opt	Opt
7DCE101LAU	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	OB SATA/SW RAID**	4x 3.5-in HS / Openbay	Opt	Open	1x 800W HS	Yes	Std	Opt	Opt
7DCE101EAU	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	940-8i 4GB	8x 2.5-in HS / Openbay	Opt	Open	1x 800W HS	Yes	Std	Opt	Opt
7DCEA05AAU	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	545-8i	4x 3.5-in HS / Openbay	Opt	Open	1x 800W HS	Yes	Plat	Opt	Opt
7DCEA057AU	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	545-8i	8x 2.5-in HS / Openbay	Opt	Open	1x 800W HS	Yes	Plat	Opt	Opt

† Processor detail: Model, number of cores, TDP, core frequency
* A maximum of 6 drives can be installed in configurations that have the onboard SATA controller and have an internal optical drive installed.
**On Board SATA Software RAID (AVV0) - adapter reference

Models for Brazil

Table 7. Models for Brazil

Model	Intel processors†	Memory	Drive Contr*	Drive bays Drives	Add'l Cards	DVD	Power supply	Pwr cord	XCC2	Sec. door	Intru. sw.
3-year warranty (machine type 7DCE)											
7DCEA05MBR	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	4x 3.5-in HS / 1x 4TB SATA HDD	Opt	Open	1x 300W HS	Yes	Std	Opt	Opt
7DCE100ZBR	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	8x 2.5-in HS / Openbay	Opt	Open	1x 800W HS	Yes	Std	Opt	Opt
7DCEA018BR	Xeon E-2414 4C 55W 2.6GHz	1x 16GB	OB SATA/SW RAID**	8x 2.5-in HS / Openbay	1x 4x1Gb	Open	1x 500W fixed	Yes	Std	Opt	Opt
7DCEA016BR	Xeon E-2414 4C 55W 2.6GHz	1x 16GB	OB SATA/SW RAID**	4x 3.5-in HS / Open bay	1x 4x1Gb	Open	1x 500W fixed	Yes	Std	Opt	Opt
7DCEA041BR	Xeon 6333P 6C 65W 3.1GHz	1x 32GB	OB SATA/SW RAID**	4x 3.5-in HS / 1x 4TB SATA HDD	Opt	Open	2x 800W HS	Yes	Plat	Opt	Opt
7DCEA042BR	Xeon 6333P 6C 65W 3.1GHz	1x 16GB	OB SATA/SW RAID**	4x 3.5-in HS / 1x 4TB SATA HDD	Opt	Open	2x 800W HS	Yes	Plat	Opt	Opt
7DCEA043BR	Xeon 6333P 6C 65W 3.1GHz	1x 32GB	OB SATA/SW RAID**	4x 3.5-in HS / 1x 4TB SATA HDD	Opt	Open	2x 800W HS	Yes	Std	Opt	Opt
7DCEA044BR	Xeon 6333P 6C 65W 3.1GHz	1x 16GB	OB SATA/SW RAID**	4x 3.5-in HS / 1x 4TB SATA HDD	Opt	Open	2x 800W HS	Yes	Plat	Opt	Opt
7DCE100YBR	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	OB SATA/SW RAID**	4x 3.5-in HS / Open bay	Opt	Open	1x 800W HS	Yes	Std	Opt	Opt
7DCE100VBR	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	OB SATA/SW RAID**	4x 3.5-in HS / 2x 960GB SATA HDD	Opt	Open	1x 800W HS	Yes	Std	Opt	Opt
7DCE1014BR	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	940-8i 4GB	8x 2.5-in HS / 2x 960GB SATA HDD	Opt	Open	1x 800W HS	Yes	Std	Opt	Opt
7DCE1011BR	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	940-8i 4GB	8x 2.5-in HS / 2x 960GB SATA HDD	Opt	Open	1x 800W HS	Yes	Std	Opt	Opt

† Processor detail: Model, number of cores, TDP, core frequency
* A maximum of 6 drives can be installed in configurations that have the onboard SATA controller and have an internal optical drive installed.
**On Board SATA Software RAID (AVV0) - adapter reference

Models for India

Table 8. Models for India

Model	Intel processors†	Memory	Drive Contr*	Drive bays Drives	Add'l Cards	DVD	Power supply	Pwr cord	XCC2	Sec. door	Intru. sw.
3-year warranty (machine type 7DCE)											
7DCE1017SG	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	y8x 2.5-in HS / Openbay	Opt	No	1x 800W HS	Yes	Std	Opt	Yes
7DCEA03XSG	Xeon 6315P 4C 55W 2.8GHz	1x 32GB	OB SATA/SW RAID**	4x 3.5-in HS / 1x 2TB SATA	1x 4x1Gb	No	1x 800W HS	Yes	Std	Opt	Yes
7DCEA03YSG	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	OB SATA/SW RAID**	8x 2.5-in HS / Openbay	1x 4x1Gb	No	1x 800W HS	Yes	Std	Opt	Yes
7DCE101KSG	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	OB SATA/SW RAID**	4x 3.5-in HS / Open bay	Opt	No	1x 800W HS	Yes	Std	Opt	Yes
7DCE101BSG	Xeon 6353P 8C 65W 2.7GHz	1x 16GB	940-8i 4GB	8x 2.5-in HS / Openbay	Opt	No	1x 800W HS	Yes	Std	Opt	Yes
7DCE101HSG	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	940-8i 4GB	8x 2.5-in HS / Openbay	Opt	No	1x 800W HS	Yes	Std	Opt	Yes

† Processor detail: Model, number of cores, TDP, core frequency
* A maximum of 6 drives can be installed in configurations that have the onboard SATA controller and have an internal optical drive installed.
**On Board SATA Software RAID (AVV0) - adapter reference

Models for Japan

AP models: Customers in Japan also have access to the Asia Pacific region models.

Table 9. Models for Japan

Model	Intel Xeon Scalable processor†	Memory	Drive Contr*	Drive bays Drive	Add'l Cards	DVD	Power supply	Pwr cord	XCC2	Sec. door
3-year warranty (machine type 7DCL)										
7DCEA05JJP	Xeon 6325P 4C 55W 3.5GHz	1x 32GB	545-8i 4GB	8x 2.5" HS / Open bay	Opt	Yes	1x 800W HS	Yes (1)	Std	Yes
7DCEA05KJP	Xeon 6325P 4C 55W 3.5GHz	1x 16GB	545-8i 4GB	8x 2.5" HS / Open bay	Opt	Yes	1x 800W HS	Yes (1)	Std	Yes
7DCEA052JP	Xeon 6325P 4C 55W 3.5GHz	1x 16GB	940-8i 4GB	8x 2.5" HS / Open bay	Opt	Yes	1x 800W HS	Yes (1)	Std	Yes
7DCE100MJP	Xeon 6325P 4C 55W 3.5GHz	1x 16GB	940-8i 4GB	8x 2.5" HS / 3x 1.2TB 10k SAS HS	Opt	Yes	2x 800W HS	Yes (2)	Std	Yes
7DCE100LJP	Xeon 6325P 4C 55W 3.5GHz	1x 16GB	940-8i 4GB	8x 2.5" HS / 3x 600GB 10k SAS HS	Opt	Yes	2x 800W HS	Yes (2)	Std	Yes
7DCEA055JP	Xeon 6325P 4C 55W 3.5GHz	1x 32GB	940-8i 4GB	8x 2.5" HS / Open bay	Opt	Yes	1x 800W HS	Yes (1)	Std	Yes

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

Models for EMEA countries

Table 10. Models for EMEA countries

Model	Intel processors†	Memory	Drive Contr*	Drive bays Drives	Add'l Cards	DVD	Power supply	Pwr cord	XCC2	Sec. door	Intru. sw.
3-year warranty (machine type 7DCE)											
7DCE100BEA	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	8x 2.5-in HS / Open bay	Opt	Open	1x 800W HS	Yes	Plat	Opt	Yes
7DCE100CEA	Xeon 6353P 8C 65W 2.7GHz	1x 16GB	OB SATA/SW RAID**	4x 3.5-in HS / Openbay	Opt	Open	2x 800W HS	Yes	Plat	Opt	Yes
7DCE100FEA	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	940-8i 4GB	8x 2.5-in HS / 2x 960GB SATA	Opt	Open	1x 800W HS	Yes	Plat	Opt	Yes
7DCE100EEA	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	940-8i 4GB	8x 2.5-in HS / 2x 960GB SATA	Opt	Open	1x 800W HS	Yes	Plat	Opt	Yes
7DCE100DEA	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	940-8i 4GB	4x 3.5-in HS / 2x 960GB SATA	Opt	Open	1x 800W HS	Yes	Plat	Opt	Yes
7DCEA04XEA	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	545-8i	8x 2.5-in HS / Open bay	Opt	Open	1x 800W HS	Yes	Plat	Opt	Yes
7DCEA04WEA	Xeon 6353P 8C 65W 2.7GHz	1x 16GB	OB SATA/SW RAID**	4x 3.5-in HS / Openbay	Opt	Open	1x 800W HS	Yes	Plat	Opt	Yes

† Processor detail: Model, number of cores, TDP, core frequency
* A maximum of 6 drives can be installed in configurations that have the onboard SATA controller and have an internal optical drive installed.
**On Board SATA Software RAID (AVV0) - adapter reference

Models for Latin American countries (except Brazil)

Table 11. Models for the Latin America market (excludes Brazil)

Model	Intel processors†	Memory	Drive Contr*	Drive bays Drives	Additional Cards	DVD	Power supply	Pwr cord	XCC2	Sec. door	Intru. sw.
3-year warranty (machine type 7DCE)											
7DCEA00ZLA	Xeon E-2414 4C 55W 2.6GHz	1x 16GB	OB SATA/SW RAID**	4x 3.5-in HS / Openbay	1x 4x1Gb	Open	1x 500W fixed	Yes	Std	Opt	Opt
7DCE100QLA	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	8x 2.5-in HS / Openbay	Opt	Open	1x 800W HS	Yes	Std	Opt	Yes
7DCE100RLA	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	8x 2.5-in HS / Openbay	Opt	Open	1x 800W HS	Yes	Std	Opt	Yes
7DCE100ULA	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	OB SATA/SW RAID**	4x 3.5-in HS / 2x 960GB SATA	Opt	Open	1x 800W HS	Yes	Std	Opt	Yes
7DCE100XLA	Xeon 6353P 8C 65W 2.7GHz	1x 16GB	OB SATA/SW RAID**	4x 3.5-in HS / Openbay	Opt	Open	2x 800W HS	Yes	Std	Opt	Yes
7DCE1013LA	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	940-8i 4GB	8x 2.5-in HS / 2x 960GB SATA	Opt	Open	1x 800W HS	Yes	Std	Opt	Yes
7DCE1012LA	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	940-8i 4GB	8x 2.5-in HS / 2x 960GB SATA	Opt	Open	1x 800W HS	Yes	Std	Opt	Yes
7DCE1010LA	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	940-8i 4GB	8x 2.5-in HS / 2x 960GB SATA	Opt	Open	1x 800W HS	Yes	Std	Opt	Yes
7DCE100TLA	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	940-8i 4GB	8x 2.5-in HS / 2x 960GB SATA	Opt	Open	1x 800W HS	Yes	Std	Opt	Yes
7DCE100SLA	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	OB SATA/SW RAID**	4x 3.5-in HS / 2x 960GB SATA	Opt	Open	1x 800W HS	Yes	Std	Opt	Yes
7DCE100WLA	Xeon 6353P 8C 65W 2.7GHz	1x 16GB	940-8i 4GB	4x 3.5-in HS / Openbay	Opt	Open	2x 800W HS	Yes	Std	Opt	Yes
Models for Argentina only											
7DCE100RLA	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	8x 2.5-in HS / Openbay	Opt	Open	1x 800W HS	Yes	Plat	Opt	Yes
7DCE100WLA	Xeon 6353P 8C 65W 2.7GHz	1x 16GB	OB SATA/SW RAID**	4x 3.5-in HS / Openbay	Opt	Open	2x 800W HS	Yes	Plat	Opt	Yes
7DCE1012LA	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	940-8i 4GB	8x 2.5-in HS / 2x 960GB SATA	Opt	Open	1x 800W HS	Yes	Plat	Opt	Yes
7DCE100TLA	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	940-8i 4GB	8x 2.5-in HS / 2x 960GB SATA	Opt	Open	1x 800W HS	Yes	Plat	Opt	Yes
7DCE100SLA	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	OB SATA/SW RAID**	4x 3.5-in HS / 2x 960GB SATA	Opt	Open	1x 800W HS	Yes	Plat	Opt	Yes

† Processor detail: Model, number of cores, TDP, core frequency

* A maximum of 6 drives can be installed in configurations that have the onboard SATA controller and have

an internal optical drive installed.
**On Board SATA Software RAID (AVV0) - adapter reference

Models for USA and Canada

Table 12. Models for USA and Canada

Model	Intel processors†	Memory	Drive Contr*	Drive bays Drives	Additional Cards	DVD	Power supply	Pwr cord	XCC2	Sec. door	Intru. sw.
3-year warranty (machine type 7DCE)											
7DCE100GNA	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	8x 2.5-in HS / Open bay	Opt	Open	1x 800W fixed	Yes	Plat	Opt	Yes
7DCEA04VNA	Xeon 6333P 6C 65W 3.1GHz	1x 16GB	OB SATA/SW RAID**	8x 2.5-in HS / Open bay	Opt	Open	1x 800W PT HS	Yes	Plat	Opt	Yes
7DCE100HNA	Xeon 6353P 8C 65W 2.7GHz	1x 16GB	OB SATA/SW RAID**	4x 3.5-in HS / Open bay	Opt	Open	2x 800W fixed	Yes	Plat	Opt	Yes
7DCE100KNA	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	940-8i 4GB	8x 2.5-in HS / Open bay	Opt	Open	1x 800W fixed	Yes	Plat	Opt	Yes
7DCE100JNA	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	OB SATA/SW RAID**	4x 3.5-in HS / Open bay	Opt	Open	1x 800W fixed	Yes	Plat	Opt	Yes

† Processor detail: Model, number of cores, TDP, core frequency
* A maximum of 6 drives can be installed in configurations that have the onboard SATA controller and have an internal optical drive installed.
**On Board SATA Software RAID (AVV0) - adapter reference

Processors

The ST250 V3 supports one processor from the following Intel product families:

- Intel Xeon 6300 Series processors
- Intel Xeon E-2400 Series processors ("Raptor Lake-E")
- Intel Alder Lake Pentium Gold G7400 and G7400T processors

Topics in this section:

- Processor options
- Processor features
- UEFI operating modes

Processor options

All supported processors have the following characteristics:

- LGA 1700 socket
- 14 nm semiconductor process technology
- Direct Media Interface (DMI) 4.0 connection to PCH-S
  - Xeon E-2400: DMI 4.0 x8 connection
  - Pentium: DMI 3.0 x4 connection
- Two DDR5 memory channels
- Support for ECC memory
  - Xeon 6300: Supports 5600 MHz memory UDIMM*
  - Xeon E-2400: Supports 4800 MHz or 5600 MHz memory UDIMM*
  - Pentium: Supports 4800 MHz or 5600 MHz memory UDIMM*
    - (*Note: server supports performance at 4400MHz only)
- PCIe lanes:
  - up to 16 lanes of PCIe 5.0, up to 4 lanes of PCIe 4.0

Mainstream column: Processors marked as **Mainstream** can be configured in DCSC (select Full Mode) or in x-config. For processors marked as **Extended**, please contact your Lenovo sales representative.

The following table lists the supported processors and 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 13. Supported processors

Part number	Feature code	SKU	Description	Top Choice Express	Mainstream	Quantity supported
Intel Pentium processors						
CTO only*	BWM7	G7400T	Intel Pentium G7400T 2C 35W 3.1GHz Processor	Not TCE	Extended	1
CTO only*	BWM8	G7400	Intel Pentium G7400 2C 46W 3.7GHz Processor	Not TCE	Extended	1
Intel Xeon E processors						
CTO only*	BXJZ	E-2414	Intel Xeon E-2414 4C 55W 2.6GHz Processor	Not TCE	Extended	1
CTO only*	BWMA	E-2434	Intel Xeon E-2434 4C 55W 3.4GHz Processor	Not TCE	Extended	1
CTO only*	BWMB	E-2436	Intel Xeon E-2436 6C 65W 2.9GHz Processor	Not TCE	Extended	1

Part number	Feature code	SKU	Description	Top Choice Express	Mainstream	Quantity supported
CTO only*	BWMC	E-2456	Intel Xeon E-2456 6C 80W 3.3GHz Processor	Not TCE	Extended	1
CTO only*	BWMD	E-2468	Intel Xeon E-2468 8C 65W 2.6GHz Processor	Not TCE	Extended	1
CTO only*	BWME	E-2478	Intel Xeon E-2478 8C 80W 2.8GHz Processor	Not TCE	Extended	1
CTO only*	BWLS	E-2486	Intel Xeon E-2486 6C 95W 3.5GHz Processor	Not TCE	Extended	1
CTO only*	BWMF	E-2488	Intel Xeon E-2488 8C 95W 3.2GHz Processor	Not TCE	Extended	1
Intel Xeon 6300 series						
CTO only*	C51Z	6315P	Intel Xeon 6315P 4C 55W 2.8GHz Processor	TCE	Mainstream	1
CTO only*	C520	6325P	Intel Xeon 6325P 4C 55W 3.5GHz Processor	TCE	Mainstream	1
CTO only*	C521	6333P	Intel Xeon 6333P 6C 65W 3.1GHz Processor	TCE	Mainstream	1
CTO only*	C522	6337P	Intel Xeon 6337P 6C 80W 3.5GHz Processor	Not TCE	Extended	1
CTO only*	C523	6349P	Intel Xeon 6349P 6C 95W 3.6GHz Processor	Not TCE	Extended	1
CTO only*	C524	6353P	Intel Xeon 6353P 8C 65W 2.7GHz Processor	TCE	Mainstream	1
CTO only*	C525	6357P	Intel Xeon 6357P 8C 80W 3.0GHz Processor	Not TCE	Extended	1
CTO only*	C526	6369P	Intel Xeon 6369P 8C 95W 3.3GHz Processor	Not TCE	Extended	1

* Only available in configure-to-order builds or in preconfigured models. Not available as option part numbers.

Processor features

The following table summarizes the key features of all supported processors in the ST250 V3.

Integrated graphics and management: Xeon processors with a G suffix include integrated graphics, however, this functionality is not used in the ST250 V3. Instead, graphics support is provided by XClarity Controller (XCC), or by an GPU add-in card. Similarly system management of the ST250 V3 is handled by XCC and as a result, the AMT management processor is disabled.

Table 14. Supported processors

Feature code	Intel model	TDP	Cores	Core speed	Cache	Max memory speed
Intel Pentium processors						
BWM7	G7400T	35 W	2	3.1 GHz	6 MB	4400 MHz
BWM8	G7400	46 W	2	3.7 GHz	6 MB	4400 MHz
Intel Xeon E processors						
BXJZ	E-2414	55 W	4	2.6 GHz	12 MB	4400 MHz
BWMA	E-2434	55 W	4	3.4 GHz	12 MB	4400 MHz
BWMB	E-2436	65 W	6	2.9 GHz	18 MB	4400 MHz
BWMC	E-2456	80 W	6	3.3 GHz	18 MB	4400 MHz
BWMD	E-2468	65 W	8	2.6 GHz	24 MB	4400 MHz
BWME	E-2478	80 W	8	2.8 GHz	24 MB	4400 MHz
BWLS	E-2486	95 W	6	3.5 GHz	18 MB	4400 MHz
BWMF	E-2488	95 W	8	3.2 GHz	24 MB	4400 MHz
Intel Xeon 6300 series						
C51Z	6315P	55 W	4	2.8 GHz	12 MB	4400 MHz
C520	6325P	55 W	4	3.5 GHz	12 MB	4400 MHz
C521	6333P	65 W	6	3.1 GHz	18 MB	4400 MHz
C522	6337P	80 W	6	3.5 GHz	18 MB	4400 MHz
C523	6349P	95 W	6	3.6 GHz	18 MB	4400 MHz
C524	6353P	65 W	8	2.7 GHz	24 MB	4400 MHz
C525	6357P	80 W	8	3.0 GHz	24 MB	4400 MHz
C526	6369P	95 W	8	3.3 GHz	24 MB	4400 MHz

Memory support:

- 6300 Processor Series can only support 5600MHz UDIMM.
- Pentium / E-2400 Processor Series can support 4800MHz or 5600 MHz UDIMM.
- 5600MHz or 4800MHz memory dimms are backward compatible to 4400MHz.
- Memory performance for server's processors is limited to 4400MHz.

UEFI operating modes

The ST250 V3 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.

UK and EU customers: For compliance with the ERP Lot9 regulation, you should select feature BFYE. For some systems, you may not be able to make a selection, in which case, it will be automatically derived by the configurator.

Table 15. UEFI operating mode presets in DCSC

Feature code	Description	Top Choice Express
BFYB	Operating mode selection for: "Maximum Performance Mode"	TCE
BFYC	Operating mode selection for: "Minimal Power Mode"	TCE
BFYD	Operating mode selection for: "Efficiency Favoring Power Savings Mode"	TCE
BFYE	Operating mode selection for: "Efficiency - Favoring Performance Mode"	TCE

The preset modes for the ST250 V3 are as follows:

- **Maximum Performance Mode** (feature BFYB): Achieves maximum performance but with higher power consumption and lower energy efficiency.
- **Minimal Power Mode** (feature BFYC): Minimize the absolute power consumption of the system.
- **Efficiency Favoring Power Savings Mode** (feature BFYD): Maximize the performance/watt efficiency with a bias towards power savings. This is the favored mode for SPECpower benchmark testing, for example.
- **Efficiency Favoring Performance Mode** (feature BFYE): Maximize the performance/watt efficiency with a bias towards performance. This is the favored mode for Energy Star certification, for example.

Memory

The ST250 V3 supports Lenovo TruDDR5 memory. TruDDR5 memory uses the highest-quality components sourced from Tier 1 DRAM suppliers and only memory that meets strict requirements is selected. It is compatibility-tested and tuned to maximize performance and reliability.

TruDDR5 memory has a unique signature programmed into the DIMM, which enables ThinkSystem servers to verify whether the memory installed is qualified and supported. From a service and support standpoint, TruDDR5 memory automatically assumes the system's warranty, and service and support provided worldwide.

The processors have 2 memory channels and support 2 DIMMs per channel. The ST250 V3 supports 1, 2, 3or 4 DIMMs. All DIMMs installed must be identical.

DIMMs installed in the ST250 V3 operate at a speed based on the processor installed, the number of DIMMs installed, and whether the DIMMs are single-rank or dual-rank:

- When connected to a Xeon or Pentium processor:
  - 1 or 2 [single-rank (1R) / dual-rank (2R)] DIMMs: 4400 MHz
  - 3, 4 single-rank (1R) DIMMs: 4000 MHz
  - 3, 4 dual-rank (2R) DIMMs: 3600 MHz
  - Both 4800MHz and 5600MHz are backward compatible with 4400MHz

The following table lists the memory options that are available for the ST250 V3 server.

Table 16. Memory options for server

Part number	Feature code	Description	Top Choice Express	Maximum supported
4X77A88512	BWLJ	ThinkSystem 32GB TruDDR5 4800MHz (2Rx8) ECC UDIMM	Not TCE	4
4X77A99751	C527	ThinkSystem 16GB TruDDR5 5600MHz (1Rx8) ECC UDIMM	TCE	4
4X77A99752	C528	ThinkSystem 32GB TruDDR5 5600MHz (2Rx8) ECC UDIMM	TCE	4

The following rules apply when selecting the memory configuration:

- The server only supports UDIMMs
- Quantities of 1, 2, 3 or 4 DIMMs are supported.
- All DIMMs must be identical (same part number)
- When installing two DIMMs, install one in each memory channel (DIMM slots 1 and 3)
- Memory mirroring and memory rank sparing are not supported

Internal storage

The ST250 V3 supports 2.5-inch hot-swap, 3.5-inch hot-swap, and 3.5-inch simple-swap drives in a variety of drive bay configurations.

In this section:

- Drive bays and backplanes
- Storage configurations
- Field upgrades
- RAID flash power module (supercap) support
- M.2 drives
- SED encryption key management with SKLM

Drive bays and backplanes

The server supports up to 16 drive bays:

- Up to 16x 2.5-inch hot-swap drives
- Up to 8x 3.5-inch drives hot-swap drives
- Up to 8x 3.5-inch simple-swap drives
- A combination of 8x 2.5" hot-swap and 4x 3.5" hot-swap drives.

Drive bays required: It is not supported to configure the ST250 V3 server without drive bays.

Hot-swap configurations SAS and SATA drives depending on the controller used (the onboard SATA controller supports SATA drives only). Simple-swap drive configurations support SATA drives only, or SATA drives plus two NVMe drives.

NVMe support: NVMe support is limited to the 3.5-inch simple swap drive configuration. Intel VRoC does not support NVMe RAID and no support for VMware in raid configuration.

The different drive bay configurations supported are shown in the following figure. The server also supports two M.2 drives, installed in a PCIe slot as shown in the internal view of the server.

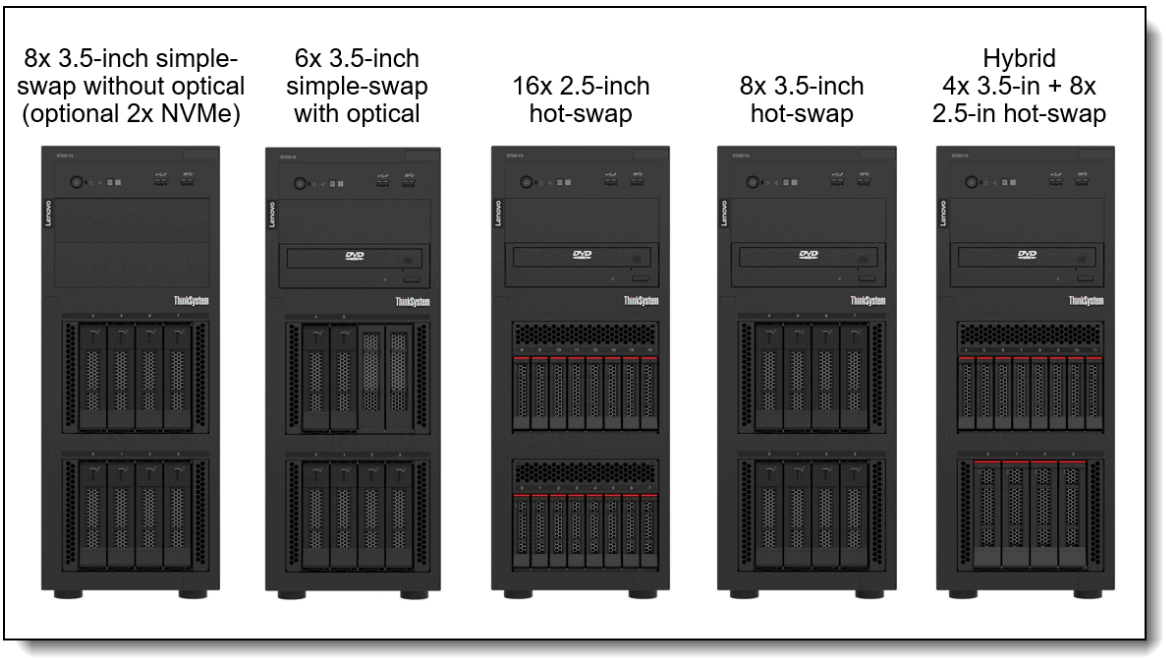


Figure 6. Internal drive bay configurations

The following table lists the available hot-swap and simple-swap backplanes for configure-to-order builds. See the Field upgrades section for option part numbers.

Table 17. Backplanes for CTO orders

Feature code	Description	Top Choice Express	Maximum supported	Purpose
B41E	ThinkSystem ST250 V2 2.5" SATA/SAS 8-Bay Backplane Kit	TCE	2	2.5-inch hot-swap backplane
B41D	ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay Backplane Kit	TCE	2	3.5-inch hot-swap backplane
BN14	ThinkSystem ST250 3.5" SS Bracket Plate Kit for HDD No. 0-3 v2	Not TCE	1	Lower simple-swap backplane with 4 drives
BMPZ	ThinkSystem ST250 4x3.5" SS Bracket Plate Kit for HDD No. 4-5 v2	Not TCE	1	Upper simple-swap backplane with 2 drives (use with optical drives installed)
BN15	ThinkSystem ST250 4x3.5" SS Bracket Plate Kit for HDD No. 4-7 v2	Not TCE	1	Upper simple-swap backplane with 4 drives
BWLW	MB 4xSATA + slimLinex8 + MF2x8 to 2xHDD + 2xNVMe/HDD	Not TCE	1	Upper simple-swap backplane with 4 drives (4x SATA, 2x NVMe)

Configuration notes regarding drive bays with the use of the onboard SATA controller:

- The onboard SATA controller has 8 SATA ports, which means that up to 8 SATA drives can be connected provided no optical drive is installed.
- If the onboard SATA controller is used and an optical drive is installed, then at most 6 drives can be installed. The other 2 onboard SATA ports are reserved for optical drives, even if only 1 optical drive is installed.
- The ST250 V3 also supports the use of a RAID adapter or SAS host bus adapter to support the use of SAS drives plus offering higher performance features and RAID functionality. Configurations guidance is as follows:

- For 8-bay configurations, use one of the supported 8-port RAID adapters or HBA
- For 16-bay configurations, use one of the supported 16-port RAID adapters
- It is supported to add 1 or 2 optical drives to a RAID adapter/HBA configuration

Storage configurations

The following table lists the supported combinations of drives, optical drives, drive backplanes and storage controllers.

Table 18. Storage configurations

Cfg	Description	Base	Drive tray	Drive support	ODD suppt	Backplanes (features)	Controller	Extra cables (derived feature or option kit)
1	4x 3.5" SS SATA to OB SATA	3.5-inch	Simple-swap	SATA	Yes	4x SATA SS to Onboard (BN14)	Onboard SATA	None
2	8x 3.5" SS SATA to OB SATA without ODD	3.5-inch	Simple-swap	SATA	No	4+4x SATA SS to Onboard (BN14, BN15)	Onboard SATA	None
3	6x 3.5" SS SATA + 1x NVMe to OB SATA	3.5-inch	Simple-swap	SATA + NVMe	No	6x SATA + 2x NVMe SS to OB (BN14, BWLW)	Onboard SATA+NVMe	None
4	6x 3.5" SS to OB SATA with ODD	3.5-inch	Simple-swap	SATA	Yes	4+2x SATA SS to Onboard (BN14, BMPZ)	Onboard SATA	None
5	4x 3.5" HS to OB SATA	3.5-inch	Hot-swap	SATA	Yes	4x 3.5-inch SAS/SATA HS (B41D)	Onboard SATA	Onboard SATA to BP (B41U)
6-1	4x 3.5" HS to HW RAID X350	3.5-inch	Hot-swap	SAS, SATA	Yes	4x 3.5-inch SAS/SATA HS (B41D)	RAID/HBA X350-8i	Gen3 RAID to BP (B41Y)
7	8x 3.5" HS to OB SATA	3.5-inch	Hot-swap	SATA	No	4+4x 3.5-inch SAS/SATA HS (B41D, B41D)	Onboard SATA	Onboard SATA multi to BP (BPR3)
8-1	8x 3.5" HS to HW RAID X350	3.5-inch	Hot-swap	SAS, SATA	Yes	4+4x 3.5-inch SAS/SATA HS (B41D, B41D)	RAID 9350-8i 2GB	2x Gen3 RAID to BP (B41Y, B41X)
9-1	8x 2.5" HS to OB SATA without ODD	2.5-inch	Hot-swap	SATA	No	8x 2.5-inch SAS/SATA HS (B41E)	Onboard SATA	Onboard SATA multi to BP (BPR3)
9-2	8x 2.5" HS to OB SATA with ODD	2.5-inch	Hot-swap	SATA	Yes	8x 2.5-inch SAS/SATA HS (2 bays unused) (B41E)	Onboard SATA	Onboard SATA multi to BP (BPR3)
10-1	8x 2.5" HS to HW RAID X350	2.5-inch	Hot-swap	SAS, SATA	Yes	8x 2.5-inch SAS/SATA HS (B41E)	RAID/HBA X350-8i	2x Gen3 RAID to BP (B41Y, B41Z)
11-1	16x 2.5" HS to HW RAID X350-16i	2.5-inch	Hot-swap	SAS, SATA	Yes	8+8x 2.5-inch SAS/SATA HS (B41E, B41E)	RAID/HBA X350-16i	4x Gen3 RAID to BP (B41Y, B41Z, B41X, B4LK)
11-2	16x 2.5" HS to HW RAID 2x X350-8i	2.5-inch	Hot-swap	SAS, SATA	Yes	8+8x 2.5-inch SAS/SATA HS (B41E, B41E)	2x RAID/HBA X350-8i	4x Gen3 RAID to BP (B41Y, B41Z, B41X, B4LK)
12-1	8x 2.5" HS + 4x 3.5" HS to HW RAID X350-8i	2.5-inch	Hot-swap	SAS, SATA	Yes	4x 3.5-inch + 8x 2.5-inch SAS/SATA HS (B41D, B41E)	RAID X350-16i	3x Gen3 RAID to BP (B41Y, B41X, B4LK)
12-2	8x 2.5" HS + 4x 3.5" HS to HW RAID 2x X350-8i	2.5-inch	Hot-swap	SAS, SATA	Yes	4x 3.5-inch + 8x 2.5-inch SAS/SATA HS (B41D, B41E)	2x RAID/HBA X350-8i	3x Gen3 RAID to BP (B41Y, B41X, B4LK)

Field upgrades

The following table lists the supported field upgrades. The table refers to configurations which are described in the Storage configurations section.

Note: If upgrading to a configuration with a RAID adapter or HBA, you will need to order the adapter in addition to the backplanes and cables listed.

Table 19. Field upgrades

Starting configuration		Target configuration		Options needed (Backplanes and cables)
1	4x 3.5" SS SATA to OB SATA	2	8x 3.5" SS SATA to OB SATA without ODD	• 4XF7A81459, ThinkSystem ST250 Series 4x3.5" Simple Swap Backplane Kit
1	4x 3.5" SS SATA to OB SATA	3	6x 3.5" SS SATA + 2x NVMe to OB SATA	• 4Z57A89309, ThinkSystem ST250 V3 6x3.5" Simple Swap SATA + 2x3.5" Simple Swap NVMe Backplane Kit
1	4x 3.5" SS SATA to OB SATA	4	6x 3.5" SS to OB SATA with ODD	• 4XF7A81459, ThinkSystem ST250 Series 4x3.5" Simple Swap Backplane Kit
1	4x 3.5" SS SATA to OB SATA	5	4x 3.5" HS to OB SATA	• 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit
1	4x 3.5" SS SATA to OB SATA	6	4x 3.5" HS to HW RAID	• 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit
1	4x 3.5" SS SATA to OB SATA	7	8x 3.5" HS to OB SATA	• 2x 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit
1	4x 3.5" SS SATA to OB SATA	8	8x 3.5" HS to HW RAID	• 2x 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit
1	4x 3.5" SS SATA to OB SATA	12	8x 2.5" HS + 4x 3.5" HS to HW RAID	• 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit • 4XF7A84197, ThinkSystem ST250 Series 8x2.5" Hybrid Hot Swap SAS/SATA Backplane Kit
2	8x 3.5" SS SATA to OB SATA without ODD	3	7x 3.5" SS SATA + 1x NVMe to OB SATA	• 4Z57A89309, ThinkSystem ST250 V3 6x3.5" Simple Swap SATA + 2x3.5" Simple Swap NVMe Backplane Kit
2	8x 3.5" SS SATA to OB SATA without ODD	4	6x 3.5" SS to OB SATA with ODD	• 4XF7A81459, ThinkSystem ST250 Series 4x3.5" Simple Swap Backplane Kit
2	8x 3.5" SS SATA to OB SATA without ODD	5	4x 3.5" HS to OB SATA	• 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit
2	8x 3.5" SS SATA to OB SATA without ODD	6	4x 3.5" HS to HW RAID	• 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit
2	8x 3.5" SS SATA to OB SATA without ODD	7	8x 3.5" HS to OB SATA	• 2x 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit
2	8x 3.5" SS SATA to OB SATA without ODD	8	8x 3.5" HS to HW RAID	• 2x 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit
2	8x 3.5" SS SATA to OB SATA without ODD	12	8x 2.5" HS + 4x 3.5" HS to HW RAID	• 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit • 4XF7A84197, ThinkSystem ST250 Series 8x2.5" Hybrid Hot Swap SAS/SATA Backplane Kit
3	7x 3.5" SS SATA + 1x NVMe to OB SATA	4	6x 3.5" SS to OB SATA with ODD	• 4XF7A81459, ThinkSystem ST250 Series 4x3.5" Simple Swap Backplane Kit
3	7x 3.5" SS SATA + 1x NVMe to OB SATA	5	4x 3.5" HS to OB SATA	• 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit
3	7x 3.5" SS SATA + 1x NVMe to OB SATA	6	4x 3.5" HS to HW RAID	• 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit
3	7x 3.5" SS SATA + 1x NVMe to OB SATA	7	8x 3.5" HS to OB SATA	• 2x 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit
3	7x 3.5" SS SATA + 1x NVMe to OB SATA	8	8x 3.5" HS to HW RAID	• 2x 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit
3	7x 3.5" SS SATA + 1x NVMe to OB SATA	12	8x 2.5" HS + 4x 3.5" HS to HW RAID	• 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit • 4XF7A84197, ThinkSystem ST250 Series 8x2.5" Hybrid Hot Swap SAS/SATA Backplane Kit
4	6x 3.5" SS to OB SATA with ODD	5	4x 3.5" HS to OB SATA	• 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit

Starting configuration		Target configuration		Options needed (Backplanes and cables)
4	6x 3.5" SS to OB SATA with ODD	6	4x 3.5" HS to HW RAID	• 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit
4	6x 3.5" SS to OB SATA with ODD	7	8x 3.5" HS to OB SATA	• 2x 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit
4	6x 3.5" SS to OB SATA with ODD	8	8x 3.5" HS to HW RAID	• 2x 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit
4	6x 3.5" SS to OB SATA with ODD	12	8x 2.5" HS + 4x 3.5" HS to HW RAID	• 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit • 4XF7A84197, ThinkSystem ST250 Series 8x2.5" Hybrid Hot Swap SAS/SATA Backplane Kit
5	4x 3.5" HS to OB SATA	6	4x 3.5" HS to HW RAID	• 4X97A81466, ThinkSystem ST250 Series RAID Cable Kit
5	4x 3.5" HS to OB SATA	7	8x 3.5" HS to OB SATA	• 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit
5	4x 3.5" HS to OB SATA	8	8x 3.5" HS to HW RAID	• 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit
5	4x 3.5" HS to OB SATA	12	8x 2.5" HS + 4x 3.5" HS to HW RAID	• 4XF7A84197, ThinkSystem ST250 Series 8x2.5" Hybrid Hot Swap SAS/SATA Backplane Kit
6	4x 3.5" HS to HW RAID	8	8x 3.5" HS to HW RAID	• 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit
6	4x 3.5" HS to HW RAID	12	8x 2.5" HS + 4x 3.5" HS to HW RAID	• 4XF7A84197, ThinkSystem ST250 Series 8x2.5" Hybrid Hot Swap SAS/SATA Backplane Kit
7	8x 3.5" HS to OB SATA	8	8x 3.5" HS to HW RAID	• 4X97A81466, ThinkSystem ST250 Series RAID Cable Kit
7	8x 3.5" HS to OB SATA	12	8x 2.5" HS + 4x 3.5" HS to HW RAID	• 4XF7A84197, ThinkSystem ST250 Series 8x2.5" Hybrid Hot Swap SAS/SATA Backplane Kit
8	8x 3.5" HS to HW RAID	12	8x 2.5" HS + 4x 3.5" HS to HW RAID	• 4XF7A84197, ThinkSystem ST250 Series 8x2.5" Hybrid Hot Swap SAS/SATA Backplane Kit
9	8x 2.5" HS to OB SATA	10	8x 2.5" HS to HW RAID	• 4X97A81466, ThinkSystem ST250 Series RAID Cable Kit
9	8x 2.5" HS to OB SATA	11	16x 2.5" HS to HW RAID	• 4XF7A81461, ThinkSystem ST250 Series 8x2.5" Hot Swap SAS/SATA Backplane Kit
10	8x 2.5" HS to HW RAID	11	16x 2.5" HS to HW RAID	• 4XF7A81461, ThinkSystem ST250 Series 8x2.5" Hot Swap SAS/SATA Backplane Kit

The following table lists the contents of the option part numbers for field upgrades.

Table 20. Upgrade options table

Part number	Description
Backplane kits	
4XF7A81461	ThinkSystem ST250 Series 8x2.5" Hot Swap SAS/SATA Backplane Kit • 1x 8x2.5" SATA/SAS hot-swap backplane • 1x cage assembly • 10x signal and power cables • 8x 2.5" drive bay fillers • 1x front fan and cable • 2x supercap holders (adapter-specific)

Part number	Description
4XF7A84197	ThinkSystem ST250 Series 8x2.5" Hybrid Hot Swap SAS/SATA Backplane Kit (for hybrid 2.5" + 3.5" configuration) • 1x 8x2.5" SATA/SAS hot-swap backplane • 1x 8x2.5" cage assembly for a hybrid 2.5" + 3.5" configuration • 10x signal and power cables • 8x 2.5" drive bay fillers • 1x front fan and cable • 2x supercap holders (adapter-specific)
4XF7A81457	ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit • 1x 4x3.5" SATA/SAS hot-swap backplane • 1x cage assembly • 8x signal and power cables • 4x 3.5" drive bay fillers • 1x front fan and cable • 2x supercap holders (adapter-specific)
4XF7A81459	ThinkSystem ST250 Series 4x3.5" Simple Swap Backplane Kit • Upper simple-swap backplane + cable with 2 SATA connections (use with optical drive) • Upper simple-swap backplane + cable with 4 SATA connections • 1x cage assembly for 8x 3.5" drive bays • 8x 3.5" drive bay fillers • 1x front fan and cable • 2x supercap holders (adapter-specific)
4Z57A89309	ThinkSystem ST250 V3 6x3.5" Simple Swap SATA + 2x3.5" Simple Swap NVMe Backplane Kit • Upper simple-swap backplane + cable with 3 SATA + 2 NVMe connections • 1x cage assembly for 8x 3.5" drive bays • 8x 3.5" drive bay fillers • 1x front fan and cable
Cable kits	
4X97A81466	ThinkSystem ST250 Series RAID Cable Kit • 6x signal cables for upper & lower cage connections (adapter-specific cables) • 2x supercap holders (adapter-specific)

RAID flash power module (supercap) support

Some high-performance RAID adapters include a RAID flash power module (supercap). The adapters that include a supercap are listed in the table in the Controllers for internal storage section.

The supercap is installed in the supercap holder than is located inside the server as shown in Components and connectors section.

For CTO orders, the required supercap holder is derived by the configurator. For field upgrades that add a RAID card with supercap, you will need to order the RAID Cable Kit, as listed in the following table. The cable kit includes two supercap holders, one for use with RAID 940 adapters, and one for use with RAID 9350 adapters.

Table 21. Cable option kit

Part number	Description
4X97A81466	ThinkSystem ST250 Series RAID Cable Kit

M.2 drives

The ST250 V3 server supports two M.2 form-factor SATA drives installed in an M.2 adapter attached to a dummy PCIe adapter. The PCIe adapter is in turn installed in a PCIe slot. The M.2 adapter is connected via cables to the system board; the edge connector of the PCIe adapter only provides physical support and does not provide PCIe signals or power.

The following figure shows the M.2 adapter for the ST250 V3.

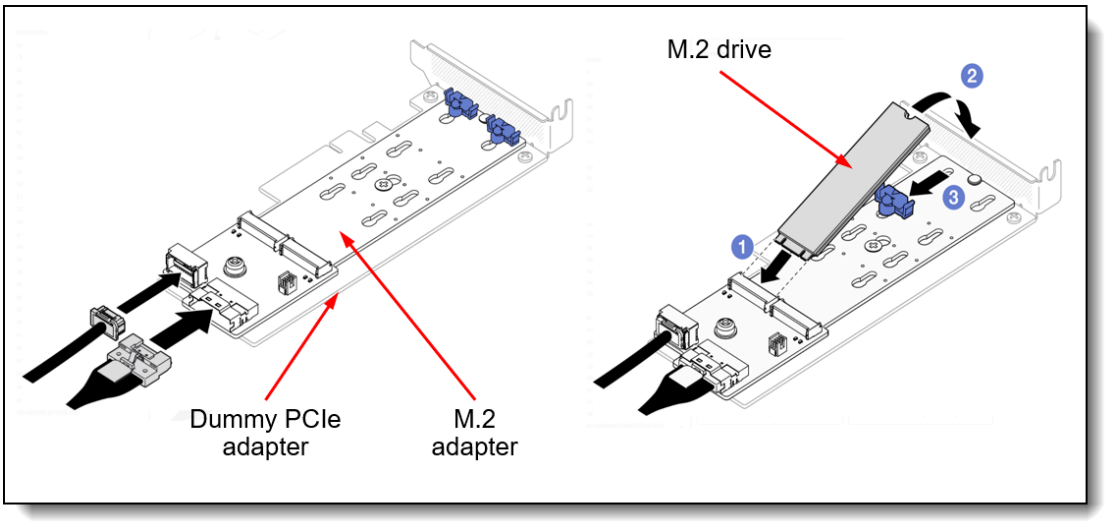


Figure 7. M.2 adapter (BM8X) with an M.2 drive installed in a PCIe slot

The following table lists the ordering information. For field upgrades, in addition to the ThinkSystem M.2 SATA/NVMe 2-Bay Enablement Adapter, you will also need to order the M.2 Signal & Power Cable Kit.

Supported drives are listed in the Internal drive options section.

Table 22. M.2 adapter for ST250 V3

Part number	Feature code	Description	Top Choice Express	Maximum supported	Slots supported
CTO only	BM8X	ThinkSystem M.2 SATA/NVMe 2-Bay Enablement Adapter • M.2 SATA/x4 NVMe 2-Bay Enablement Kit, BM8X • ThinkSystem ST250 Series Dummy PCIe Card, BMTU • M.2 signal Cable BWN1 • M.2 Power Cable BWN2	TCE	1	slot 4
4Y37A79663	N/A	ThinkSystem M.2 SATA/x4 NVMe 2-Bay Enablement Kit	N/A	1	slot 4
4Y37A90063	BYFF	ThinkSystem M.2 RAID B540i-2i SATA/NVMe Adapter	TCE	1	slot 4

Part number	Feature code	Description	Top Choice Express	Maximum supported	Slots supported
4Z57A88898	N/A	ThinkSystem SR250 V3/ST250 Series M.2 Cable Kit Includes: • ThinkSystem ST250 Series Dummy PCIe Card, BMTU • M.2 signal Cable BWN1 • M.2 Power Cable BWN2 • ThinkSystem M.2 ULP-PH 1.0+SLIMx4 130mm, BYY7	N/A	1	N/A

N/A - not applicable
Configuration rules:

- The M.2 PCIe adapter is only supported in slot 4
- M.2 is mutually exclusive with the use of optical drives (ODDs) as they share the same connector.

The M.2 SATA/NVMe 2-Bay Enablement Kit has the following features when installed in the ST250 V3:

- Supports one or two M.2 SATA drives
- JBOD native support; no built-in RAID support (RAID can be enabled via Intel VROC SATA RAID)
- Supports monitoring and reporting of events and temperature through I2C
- Firmware update via Lenovo firmware update tools

For details about M.2 components, see

- ThinkSystem M.2 Drives and M.2 Adapters product guide:

https://lenovopress.com/lp0769-thinksystem-m2-drives-adapters

- The Lenovo docs - server guide:

https://pubs.labs.lenovo.com/st250-v3/m2_drive_replacement

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 24. 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		

Part number	Feature	Description
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
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

Controllers for internal storage

The ST250 V3 supports the use of the onboard 6Gb SATA ports to connect SATA drives. Hot-swap and simple-swap SATA drives are supported. These onboard SATA ports support RSTe mode for RAID functionality or AHCI mode for JBOD support.

In addition to the onboard SATA controller, the ST250 V3 with hot-swap drives supports the use of an internal RAID adapter or HBA. The following table lists the supported adapters.

Table 25. Controllers for internal storage

Part number	Feature code	Description	Top Choice Express	Slots supported	Maximum supported	Supercap included
Onboard SATA - up to 8 drives - Intel VROC SATA RAID (Intel RSTe)						
None	AVV0	On Board SATA Software RAID Mode	TCE	Not applicable	1	No
12Gb SAS/6Gb SATA RAID Adapter - PCIe 4.0						
4Y37A09728	B8NY	ThinkSystem RAID 940-8i 4GB Flash PCIe Gen4 12Gb Adapter	TCE	2, 3, 4	1	Yes
4Y37A93012	C0TU	ThinkSystem RAID 545-8i PCIe Gen4 12Gb Adapter	TCE	2, 3, 4	1	No

For a comparison of the functions of the supported storage adapters, see the ThinkSystem RAID Adapter and HBA Reference:
https://lenovopress.com/lp1288-thinksystem-raid-adapter-and-hba-reference#st250-v2-support=ST250%2520V2

Configuration notes:

- **Virtualization support**: The onboard SATA ports can be used with virtualization hypervisors, including VMware ESXi, Linux KVM, Xen, and Microsoft Hyper-V, however support is limited to AHCI (non-RAID) mode. RSTe mode is not supported with virtualization hypervisors.
- **Windows support**: Windows only supports a RSTe-based RAID array of no more than 6 drives.

Internal drive options

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

2.5-inch hot-swap drives:

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

Simple-swap drives:

- 3.5-inch simple-swap 6 Gb SATA HDDs
- 3.5-inch simple-swap 6 Gb SATA SSDs
- 3.5-inch simple-swap PCIe 4.0 NVMe SSDs

M.2 drives:

- M.2 SATA drives

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 26. 2.5-inch hot-swap 12 Gb SAS HDDs

Part number	Feature code	Description	Top Choice Express	SED support	Max Qty
2.5-inch hot-swap HDDs - 12 Gb SAS 10K					
7XB7A00025	AULZ	ThinkSystem 2.5" 600GB 10K SAS 12Gb Hot Swap 512n HDD	Not TCE	No	16
7XB7A00027	AUM1	ThinkSystem 2.5" 1.2TB 10K SAS 12Gb Hot Swap 512n HDD	TCE	No	16
7XB7A00028	AUM2	ThinkSystem 2.5" 1.8TB 10K SAS 12Gb Hot Swap 512e HDD	Not TCE	No	16
4XB7A83970	BRG7	ThinkSystem 2.5" 2.4TB 10K SAS 12Gb Hot Swap 512e HDD v2	TCE	No	16
2.5-inch hot-swap SED HDDs - 12 Gb SAS 10K					
7XB7A00031	AUM5	ThinkSystem 2.5" 600GB 10K SAS 12Gb Hot Swap 512n HDD SED	Not TCE	Support	16

Table 27. 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 - Mixed Use/Mainstream (3-5 DWPD)					

Part number	Feature code	Description	Top Choice Express	SED support	Max Qty
4XB7B09972	CBV9	ThinkSystem 2.5" VA 480GB Mixed Use SATA 6Gb HS SSD SED	TCE	Support	16
4XB7B09973	CBV8	ThinkSystem 2.5" VA 960GB Mixed Use SATA 6Gb HS SSD SED	TCE	Support	16
4XB7B09974	CBV7	ThinkSystem 2.5" VA 1.92TB Mixed Use SATA 6Gb HS SSD SED	Not TCE	Support	16
4XB7B09975	CBV6	ThinkSystem 2.5" VA 3.84TB Mixed Use SATA 6Gb HS SSD SED	Not TCE	Support	16
4XB7A90884	BYM2	ThinkSystem 2.5" VA 480GB Mixed Use SATA 6Gb HS SSD v2	TCE	No	16
4XB7A90885	BYM4	ThinkSystem 2.5" VA 960GB Mixed Use SATA 6Gb HS SSD v2	TCE	No	16
4XB7A90886	BYM5	ThinkSystem 2.5" VA 1.92TB Mixed Use SATA 6Gb HS SSD v2	Not TCE	No	16
4XB7A90887	BYM6	ThinkSystem 2.5" VA 3.84TB Mixed Use SATA 6Gb HS SSD v2	Not TCE	No	16
2.5-inch hot-swap SSDs - 6 Gb SATA - Read Intensive/Entry (<3 DWPD)					
4XB7B09967	CBVE	ThinkSystem 2.5" VA 480GB Read Intensive SATA 6Gb HS SSD SED	TCE	Support	16
4XB7B09968	CBVD	ThinkSystem 2.5" VA 960GB Read Intensive SATA 6Gb HS SSD SED	TCE	Support	16
4XB7B09969	CBVC	ThinkSystem 2.5" VA 1.92TB Read Intensive SATA 6Gb HS SSD SED	TCE	Support	16
4XB7B09970	CBVB	ThinkSystem 2.5" VA 3.84TB Read Intensive SATA 6Gb HS SSD SED	TCE	Support	16
4XB7B09971	CBVA	ThinkSystem 2.5" VA 7.68TB Read Intensive SATA 6Gb HS SSD SED	TCE	Support	16
4XB7A90873	BYLR	ThinkSystem 2.5" VA 480GB Read Intensive SATA 6Gb HS SSD v2	TCE	No	16
4XB7A90874	BYLS	ThinkSystem 2.5" VA 960GB Read Intensive SATA 6Gb HS SSD v2	TCE	No	16
4XB7A90875	BYLT	ThinkSystem 2.5" VA 1.92TB Read Intensive SATA 6Gb HS SSD v2	TCE	No	16
4XB7A90876	BYLU	ThinkSystem 2.5" VA 3.84TB Read Intensive SATA 6Gb HS SSD v2	TCE	No	16
4XB7A90877	BYLV	ThinkSystem 2.5" VA 7.68TB Read Intensive SATA 6Gb HS SSD v2	Not TCE	No	16

Table 28. 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					
4XB7B01233	C5WY	ThinkSystem 3.5" 2TB 7.2K SAS 12Gb Hot Swap 512e HDD v2	Not TCE	Support	8
7XB7A00042	AUU5	ThinkSystem 3.5" 2TB 7.2K SAS 12Gb Hot Swap 512n HDD	Not TCE	No	8
4XB7B01235	C5X9	ThinkSystem 3.5" 4TB 7.2K SAS 12Gb Hot Swap 512e HDD v2	Not TCE	Support	8

Part number	Feature code	Description	Top Choice Express	SED support	Max Qty
7XB7A00043	AUU6	ThinkSystem 3.5" 4TB 7.2K SAS 12Gb Hot Swap 512n HDD	Not TCE	No	8
4XB7B01237	C5XB	ThinkSystem 3.5" 6TB 7.2K SAS 12Gb Hot Swap 512e HDD v2	Not TCE	Support	8
4XB7B01239	C5XD	ThinkSystem 3.5" 8TB 7.2K SAS 12Gb Hot Swap 512e HDD v2	Not TCE	Support	8
7XB7A00045	B0YR	ThinkSystem 3.5" 8TB 7.2K SAS 12Gb Hot Swap 512e HDD	TCE	No	8
4XB7B01241	C5XF	ThinkSystem 3.5" 10TB 7.2K SAS 12Gb Hot Swap 512e HDD v2	Not TCE	Support	8
7XB7A00046	AUUG	ThinkSystem 3.5" 10TB 7.2K SAS 12Gb Hot Swap 512e HDD	Not TCE	No	8
7XB7A00067	B117	ThinkSystem 3.5" 12TB 7.2K SAS 12Gb Hot Swap 512e HDD	Not TCE	No	8
4XB7A93788	C4DA	ThinkSystem 3.5" 12TB 7.2K SAS 12Gb Hot Swap 512e HDD v2	Not TCE	Support	8
4XB7A13911	B7EZ	ThinkSystem 3.5" 16TB 7.2K SAS 12Gb Hot Swap 512e HDD	Not TCE	No	8
4XB7A93786	C4D8	ThinkSystem 3.5" 16TB 7.2K SAS 12Gb Hot Swap 512e HDD v2	Not TCE	Support	8
4XB7A38266	BCFP	ThinkSystem 3.5" 18TB 7.2K SAS 12Gb Hot Swap 512e HDD	Not TCE	No	8
4XB7A80353	BPKU	ThinkSystem 3.5" 20TB 7.2K SAS 12Gb Hot Swap 512e HDD	Not TCE	No	8
4XB7A93784	C4D6	ThinkSystem 3.5" 20TB 7.2K SAS 12Gb Hot Swap 512e HDD v2	Not TCE	Support	8
4XB7A83766	BTR7	ThinkSystem 3.5" 22TB 7.2K SAS 12Gb Hot Swap 512e HDD	Not TCE	Support	8

Table 29. 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					
4XB7A97045	C5X6	ThinkSystem 3.5" 1TB 7.2K SATA 6Gb Hot Swap 512n HDD v2	Not TCE	Support	8
4XB7B01234	C5X8	ThinkSystem 3.5" 2TB 7.2K SATA 6Gb Hot Swap 512e HDD v2	TCE	Support	8
7XB7A00050	AUUD	ThinkSystem 3.5" 2TB 7.2K SATA 6Gb Hot Swap 512n HDD	Not TCE	No	8
4XB7B01236	C5XA	ThinkSystem 3.5" 4TB 7.2K SATA 6Gb Hot Swap 512e HDD v2	Not TCE	Support	8
7XB7A00051	AUU8	ThinkSystem 3.5" 4TB 7.2K SATA 6Gb Hot Swap 512n HDD	TCE	No	8
4XB7B01238	C5XC	ThinkSystem 3.5" 6TB 7.2K SATA 6Gb Hot Swap 512e HDD v2	Not TCE	Support	8
7XB7A00052	AUUA	ThinkSystem 3.5" 6TB 7.2K SATA 6Gb Hot Swap 512e HDD	Not TCE	No	8
4XB7B01240	C5XE	ThinkSystem 3.5" 8TB 7.2K SATA 6Gb Hot Swap 512e HDD v2	Not TCE	Support	8
7XB7A00053	AUU9	ThinkSystem 3.5" 8TB 7.2K SATA 6Gb Hot Swap 512e HDD	TCE	No	8
4XB7B01242	C5X7	ThinkSystem 3.5" 10TB 7.2K SATA 6Gb Hot Swap 512e HDD v2	Not TCE	Support	8
7XB7A00054	AUUB	ThinkSystem 3.5" 10TB 7.2K SATA 6Gb Hot Swap 512e HDD	Not TCE	No	8
7XB7A00068	B118	ThinkSystem 3.5" 12TB 7.2K SATA 6Gb Hot Swap 512e HDD	Not TCE	No	8
4XB7A93787	C4D9	ThinkSystem 3.5" 12TB 7.2K SATA 6Gb Hot Swap 512e HDD v2	Not TCE	Support	8

Part number	Feature code	Description	Top Choice Express	SED support	Max Qty
4XB7A13907	B497	ThinkSystem 3.5" 14TB 7.2K SATA 6Gb Hot Swap 512e HDD	Not TCE	No	8
4XB7A13914	B7F0	ThinkSystem 3.5" 16TB 7.2K SATA 6Gb Hot Swap 512e HDD	Not TCE	No	8
4XB7A93785	C4D7	ThinkSystem 3.5" 16TB 7.2K SATA 6Gb Hot Swap 512e HDD v2	Not TCE	Support	8
4XB7A38130	BCFH	ThinkSystem 3.5" 18TB 7.2K SATA 6Gb Hot Swap 512e HDD	Not TCE	No	8
4XB7A80354	BPKV	ThinkSystem 3.5" 20TB 7.2K SATA 6Gb Hot Swap 512e HDD	Not TCE	No	8
4XB7A93783	C4D5	ThinkSystem 3.5" 20TB 7.2K SATA 6Gb Hot Swap 512e HDD v2	Not TCE	Support	8
4XB7A83765	BTR8	ThinkSystem 3.5" 22TB 7.2K SATA 6Gb Hot Swap 512e HDD	Not TCE	Support	8

Table 30. 3.5-inch hot-swap 6 Gb SATA SSDs

Part number	Feature code	Description	Top Choice Express	SED support	Max Qty
3.5-inch hot-swap SSDs - 6 Gb SATA - Mixed Use/Mainstream (3-5 DWPD)					
4XB7B11652	CCZK	ThinkSystem 3.5" VA 480GB Mixed Use SATA 6Gb HS SSD SED	Not TCE	Support	8
4XB7B11653	CCZJ	ThinkSystem 3.5" VA 960GB Mixed Use SATA 6Gb HS SSD SED	Not TCE	Support	8
4XB7B11654	CCZH	ThinkSystem 3.5" VA 1.92TB Mixed Use SATA 6Gb HS SSD SED	Not TCE	Support	8
4XB7B11655	CCZG	ThinkSystem 3.5" VA 3.84TB Mixed Use SATA 6Gb HS SSD SED	Not TCE	Support	8
4XB7A90888	BYM3	ThinkSystem 3.5" VA 480GB Mixed Use SATA 6Gb HS SSD v2	TCE	No	8
4XB7A90889	BYM7	ThinkSystem 3.5" VA 960GB Mixed Use SATA 6Gb HS SSD v2	Not TCE	No	8
4XB7A90890	BYM8	ThinkSystem 3.5" VA 1.92TB Mixed Use SATA 6Gb HS SSD v2	Not TCE	No	8
4XB7A90891	BYLX	ThinkSystem 3.5" VA 3.84TB Mixed Use SATA 6Gb HS SSD v2	Not TCE	No	8
3.5-inch hot-swap SSDs - 6 Gb SATA - Read Intensive/Entry (<3 DWPD)					
4XB7B11648	CCZP	ThinkSystem 3.5" VA 480GB Read Intensive SATA 6Gb HS SSD SED	Not TCE	Support	8
4XB7B11649	CCZN	ThinkSystem 3.5" VA 960GB Read Intensive SATA 6Gb HS SSD SED	Not TCE	Support	8
4XB7B11650	CCZM	ThinkSystem 3.5" VA 1.92TB Read Intensive SATA 6Gb HS SSD SED	Not TCE	Support	8
4XB7B11651	CCZL	ThinkSystem 3.5" VA 3.84TB Read Intensive SATA 6Gb HS SSD SED	Not TCE	Support	8
4XB7A90879	BYLJ	ThinkSystem 3.5" VA 480GB Read Intensive SATA 6Gb HS SSD v2	TCE	No	8
4XB7A90880	BYLY	ThinkSystem 3.5" VA 960GB Read Intensive SATA 6Gb HS SSD v2	TCE	No	8
4XB7A90881	BYLZ	ThinkSystem 3.5" VA 1.92TB Read Intensive SATA 6Gb HS SSD v2	Not TCE	No	8

Part number	Feature code	Description	Top Choice Express	SED support	Max Qty
4XB7A90882	BYM0	ThinkSystem 3.5" VA 3.84TB Read Intensive SATA 6Gb HS SSD v2	Not TCE	No	8

Table 31. 3.5-inch simple-swap 6 Gb SATA HDDs

Part number	Feature code	Description	Top Choice Express	SED support	Max Qty
3.5-inch simple-swap HDDs - 6 Gb NL SATA					
7XB7A00056	AUZT	ThinkSystem 2TB 7.2K 6Gbps SATA 3.5" Simple Swap 512n HDD	Not TCE	No	8

Table 32. 3.5-inch simple-swap 6 Gb SATA SSDs

Part number	Feature code	Description	Top Choice Express	SED support	Max Qty
3.5-inch simple-swap SSDs - 6 Gb SATA - Read Intensive/Entry (<3 DWPD)					
4XB7A17110	BK7D	ThinkSystem 3.5" S4520 480GB Read Intensive SATA 6Gb SS SSD	Not TCE	No	8
4XB7A17111	BK7E	ThinkSystem 3.5" S4520 960GB Read Intensive SATA 6Gb SS SSD	Not TCE	No	8

Table 33. 3.5-inch simple-swap PCIe 4.0 NVMe SSDs

Part number	Feature code	Description	Top Choice Express	SED support	Max Qty
3.5-inch SSDs - U.2 PCIe 4.0 NVMe - Read Intensive/Entry (<3 DWPD)					
4XB7B01875	C7P1	ThinkSystem 3.5" U.2 Solidigm P5520 1.92TB Read Intensive NVMe PCIe 4.0 x4 SS SSD	Not TCE	Support	2

Table 34. M.2 SATA drives

Part number	Feature code	Description	Top Choice Express	SED support	Max Qty
M.2 SSDs - 6 Gb SATA - Read Intensive/Entry (<3 DWPD)					
4XB7B07588	CABU	ThinkSystem M.2 VA 480GB Read Intensive SATA 6Gb NHS SSD	Not TCE	Support	2
4XB7B07589	CACA	ThinkSystem M.2 VA 960GB Read Intensive SATA 6Gb NHS SSD	TCE	Support	2
4XB7A82287	BQ1Y	ThinkSystem M.2 5400 PRO 480GB Read Intensive SATA 6Gb NHS SSD	Not TCE	Support	2
4XB7A82288	BQ20	ThinkSystem M.2 5400 PRO 960GB Read Intensive SATA 6Gb NHS SSD	Not TCE	Support	2

USB flash drive

For general portable storage needs, the server also supports the USB flash drive option that is listed in the following table.

Table 35. USB memory key

Part number	Feature	Description	Top Choice Express
4X77A77065	BNWN	ThinkSystem USB 32GB USB 3.0 Flash Drive	Not TCE

Internal backup units

The ST250 V3 supports the internal backup unit options that are listed in the following table.

The RDX dock is attached via the internal USB 3.0 port on the system board. The USB cable ships with the dock. The RDX dock is supported only in the lower media bay (Bay 0).

Table 36. Internal backup units

Part number	Feature code	Description	Top Choice Express	Maximum supported
RDX dock				
4T27A80485	AVF6	ThinkSystem Internal RDX USB 3.0 Dock	Not TCE	1

For more information about the RDX dock, see the Backup Units page on the Lenovo Press site: https://lenovopress.com/servers/options/backup

For field upgrades to add an RDX dock, you will need to also order the cable kit listed in the following table for the required power cable. This kit is not needed for factory (CTO) orders.

Tip: If your server already has the power cable installed (check for SC17B01164 on the label of the cable), you do not need to order this cable kit when adding an RDX dock.

Table 37. Cable kit for field upgrades

Part number	Description
4X97A81465	ThinkSystem ST250 Series ODD/Tape Cable Kit • 1x ODD data cable (feature BMQT) -- not required for RDX dock • 1x ODD/tape power cable (feature BMQU)

Optical drives

The ST250 V3 supports the internal optical drive options listed in the following table. The internal optical are installed in the 5.25-inch media drive bays.

Table 38. Optical drives

Part number	Feature code	Description	Top Choice Express	Maximum supported
Internal optical drives				
4XA7A80481	AVEY	ThinkSystem Half High SATA DVD-RW Optical Disk Drive v2	Not TCE	2
4XA7B08457	CARW	ThinkSystem Half High SATA DVD-RW Optical Disk Drive v3	TCE	2

Configuration rules:

- For configurations using the onboard SATA controller, if 1 or 2 optical drives are installed, only 6 HDDs or SSDs can be installed.
- For field upgrades to add an optical drive, you will need to also order the cable kit listed in the following table. This kit is not needed for factory (CTO) orders.
- M.2 is mutually exclusive with the use of optical drives as they share the same connector.
- 2x ThinkSystem Optical Drive Signal 7-pin Cable, 600mm (CB0D) needed for 2x CARW.

Table 39. Cable kit for field upgrades

Part number	Description	Maximum supported
4X97A81465	ThinkSystem ST250 Series ODD/Tape Cable Kit • 1x ODD data cable (feature BMQT) • 1x ODD/tape power cable (feature BMQU)	2

The Half High SATA DVD-ROM drive supports the following media and speeds for reading:

- CD-ROM 48X
- CD-DA (DAE) 48X
- CD-R 48X
- CD-RW 40X
- DVD-ROM (single layer) 16X
- DVD-ROM (dual layer) 12X
- DVD-R (4.7 GB) 16X
- DVD-R DL 8X
- DVD+R 16X
- DVD+R DL 8X
- DVD-RW (4.7 GB) 8X
- DVD+RW 8X

The Half High SATA DVD-RW drive supports the same media and speeds for reading as HH DVD-ROM. In addition, this drive supports the following media and speeds for writing:

- CD-R 24X
- CD-RW 4X
- High Speed CD-RW 10X
- Ultra Speed CD-RW 16X
- DVD-R 8X
- DVD-R DL 8X
- DVD+R 8X
- DVD+R DL 8X
- DVD-RW 6X
- DVD+RW 8X

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

Table 40. External optical drive

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

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 options

The ST250 V3 server has one PCIe 5.0 slot and three PCIe 4.0 slots, as follows:

- Slot 1: PCIe 4.0 x4 full-height, half-length (x1 physical slot, open ended), supports 25W adapters
- Slot 2: PCIe 5.0 x16 full-height, half-length (x16 physical slot, closed ended), supports 75W adapters
- Slot 3: PCIe 4.0 x4 full-height, half-length (x4 physical slot, open ended), supports 25W adapters
- Slot 4: PCIe 4.0 x4 full-height, half-length (x8 physical slot, closed ended), supports 25W adapters

Slot 1 and slot 3 in the ST250 V3 are an open-end design, which means that it can accept adapters with a longer edge connector than the physical length of the slot connector. For example, if a x8 adapter is installed in the x4 slot 3 of the server, half of the edge connector will not be connected to the slot. The adapter will still function, however performance will be impacted.

The following figure shows the locations of the PCIe slots.

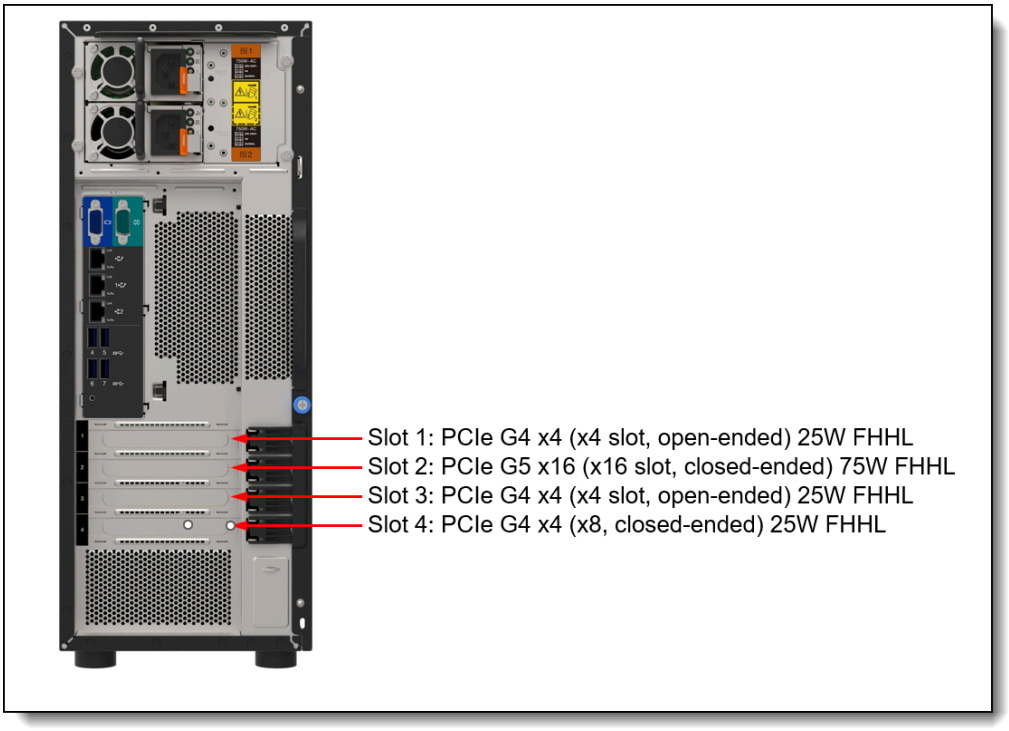


Figure 8. ThinkSystem ST250 V3 PCIe slots

Network adapters

The ST250 V3 has two onboard Gigabit Ethernet ports, connected to a Broadcom BCM5720 embedded controller.

The BCM5720 embedded controller has the following features:

- Two 10/100/1000 Mb Ethernet RJ-45 ports
- NIC Teaming (load balancing and failover)
- IEEE 802.3ad Link Aggregation
- I/O Virtualization (IOV) for VMWare NetQueue and Microsoft VMQ
- IEEE 802.1Q Virtual Local Area Networks (VLANs)
- IEEE 802.3x flow control
- TCP, IP, and UDP checksum offload
- Large Send Offload (LSO) and TCP Segmentation Offload (TSO)
- Receive Side Scaling (RSS) and Transmit Side Scaling (TSS)
- Jumbo frames up to 9600 bytes
- IEEE 802.3az-2010 Energy Efficient Ethernet (EEE) compliant
- Hardware assist for IEEE 1588 and IEEE 802.1AS time synchronization implementations
- Preboot eXecution Environment (PXE) remote boot
- Wake on LAN (WOL) support

The following table lists other supported network adapters. The maximum supported column indicates which slots each adapter is supported in. For slot locations see the I/O expansion options section.

Table 41. Network adapters

Part number	Feature code	Description	Top Choice Express	Slots supported	Maximum supported
Gigabit Ethernet					
7ZT7A00484	AUZV	ThinkSystem Broadcom 5719 1GbE RJ45 4-Port PCIe Ethernet Adapter	TCE	1, 2, 3, 4	2
7ZT7A00535	AUZW	ThinkSystem I350-T4 PCIe 1Gb 4-Port RJ45 Ethernet Adapter	TCE	1, 2, 3, 4	2
10 Gb Ethernet - 10GBASE-T					
7ZT7A00496	AUKP	ThinkSystem Broadcom 57416 10GBASE-T 2-Port PCIe Ethernet Adapter	TCE	1, 4	2
4XC7A79699	BMXB	ThinkSystem Intel X710-T4L 10GBase-T 4-Port PCIe Ethernet Adapter	TCE	2, 3, 4	2
25 Gb Ethernet					
4XC7A08238	BK1H	ThinkSystem Broadcom 57414 10/25GbE SFP28 2-port PCIe Ethernet Adapter	TCE	1, 4	2
4XC7A08295	BCD6	ThinkSystem Intel E810-DA2 10/25GbE SFP28 2-Port PCIe Ethernet Adapter	TCE	1, 2, 3, 4	2

* Only supported in slot 2 (x16 slot) and is therefore mutually exclusive with any GPU

Configuration notes:

- For more information, including the transceivers and cables that each adapter supports, see the list of Lenovo Press Product Guides in the Ethernet adapters category: http://lenovopress.com/servers/options/ethernet#rt=product-guide

SAS adapters for external storage

The following table lists the adapters suitable for connectivity to external SAS storage.

Table 42. Supported external storage adapters

Part number	Feature code	Description	Top Choice Express	Slots supported	Maximum supported
12 Gb SAS HBA					
4Y37A78837	BNWK	ThinkSystem 440-8e SAS/SATA PCIe Gen4 12Gb HBA	Not TCE	1, 2, 3, 4	2

For a comparison of the functions of the supported external storage adapters, see the ThinkSystem RAID Adapter and HBA Reference:
https://lenovopress.com/lp1288#st250-v2-support=ST250%20V2&internal-or-external-ports=External

Mixing storage adapter families: The following HBA/RAID adapter combinations are supported:

- X30 external adapters with other X30 adapters (internal or external)
- X40 external adapters with other X40 adapters (internal or external)
- X40 external adapters with X350 internal adapters

The following HBA/RAID adapter combinations are *not* supported:

- X30 adapters (internal or external) with X40 adapters (internal or external)
- X30 adapters (internal or external) with X350 internal adapters

Fibre Channel host bus adapters

The ST250 V3 does not currently support Fibre Channel host bus adapters.

Flash Storage adapters

The ST250 V3 does not currently support Flash Storage adapters.

GPU adapters

The ST250 V3 server supports the graphics processing units (GPUs) listed in the following table.

Table 43. GPU adapters

Part number	Feature code	Description	Top Choice Express	Slots supported	Maximum supported
4X67B03688	C9KE	ThinkSystem NVIDIA RTX A400 4GB PCIe Gen4 Active GPU	Not TCE	slot 2	1
4X67A96431	C39N	ThinkSystem NVIDIA RTX A1000 8GB PCIe Gen4 Active GPU	Not TCE	slot 2	1
4X67A79777	BMXD	ThinkSystem NVIDIA T1000 8GB PCIe Active GPU	Not TCE	slot 2	1
4X67A79778	BMXE	ThinkSystem NVIDIA T400 4GB PCIe Active GPU	Not TCE	slot 2	1

The following rule applies:

- The use of a GPU requires 500W or 800W hot-swap power supplies
- Slot 3 must be left unoccupied for thermal reasons
- An ESXi preload cannot be selected if the configuration includes an NVIDIA GPU (ESXi preload cannot include the NVIDIA driver)

For information about GPUs, see the ThinkSystem GPU Summary:
https://lenovopress.com/lp0768-thinksystem-gpu-summary

Fans and cooling

The ST250 V3 has the following variable-speed fans. All fans are fixed (non-hot-swap).

- Two system fans at the front of the server, mounted on the drive cages. If the server has one drive cage, only one front fan is included.
- One system fan at the rear of the server
- Fan mounted on the heatsink of the processor

See the Inside view in the Components and connectors section for locations.

Power supplies

The server supports either a single fixed power supply or one or two hot-swap power supplies. When two hot-swap power supplies are installed, they form a redundant pair. The following table lists the supported power supplies.

Table 44. Power supplies

Part number	Feature code	Description	Top Choice Express	Maximum quantity	80 PLUS certification	ErP Lot 9 compliant	110V AC	220V AC	240V DC*
Fixed power supplies									
CTO only	BMFL	ATX-300W Power Supply	TCE	1	Gold	No	Yes	Yes	No
CTO only	BMTC	ThinkSystem 500W Platinum ATX Power Supply	TCE	1	Platinum	Yes	Yes	Yes	No
Hot-swap redundant power supplies									
4P57A87054	BWM5	ThinkSystem 800W 230V/115V Platinum CRPS Hot-Swap Power Supply v1.4	TCE	2	Platinum	No	Yes	Yes	Yes
4P57A87056	BWM3	ThinkSystem 800W 230V/115V Titanium CRPS Hot-Swap Power Supply v1.4	TCE	2	Titanium	Yes	Yes	Yes	Yes

*PRC only
Power supply options do not include a line cord.

For server configurations, the inclusion of a power supply is model dependent. Configure-to-order models can be configured without a power cord if desired.

The following table lists the maximum configuration for the supported power supplies.

Table 45. Maximum configuration for the supported PSUs

PSU	300W fixed	500W fixed or 800W	300W fixed	300W fixed
1x Processor	80W	95W	70W	60W
Memory (<=32G DIMMS)	4 DIMMs	4 DIMMs	4 DIMMs	4 DIMMs
Rear IO (PCIe slot 1/3/4)	<= 25W	<= 25W	<= 25W	<= 25W
GPUs up to 75W (slot 2)	No support	One	No support	No support
Front Drives	• 8x 2.5" HDD or • 8x 3.5" HDD	• 16x 2.5" HDD or • 8x 3.5" HDD or • 4x 3.5" HDD + 8x 2.5" HDD	• 8x 2.5" HDD or • 4x 3.5" HDD	• 8x 2.5" HDD or • 4x 3.5" HDD
ODD / Tape	No support	No support	Supported	Supported
M.2	Supported	Supported	No support	No support

To ensures that the properly sized power supply is chosen for optimal performance, it is highly recommended to validate system configuration for specific power requirements by using the latest version of the Lenovo

Capacity Planner:
https://datacentersupport.lenovo.com/us/en/products/solutions-and-software/software/lenovo-capacity-planner/solutions/ht504651

Power cords (C13 connectors)

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

Table 46. Power cords

Part number	Feature code	Description	Top Choice Express
Rack cables - C13 to C14			
CTO only	BPHZ	0.5m, 10A/100-250V, C13 to C14 Jumper Cord	Not TCE
00Y3043	A4VP	1.0m, 10A/100-250V, C13 to C14 Jumper Cord	Not TCE
4L67A08367	B0N5	1.0m, 13A/100-250V, C13 to C14 Jumper Cord	TCE
39Y7937	6201	1.5m, 10A/100-250V, C13 to C14 Jumper Cord	TCE
4L67A08368	B0N6	1.5m, 13A/100-250V, C13 to C14 Jumper Cord	TCE
4L67A08365	B0N4	2.0m, 10A/100-250V, C13 to C14 Jumper Cord	TCE
4L67A08369	6570	2.0m, 13A/100-250V, C13 to C14 Jumper Cord	TCE
4L67A08366	6311	2.8m, 10A/100-250V, C13 to C14 Jumper Cord	TCE
4L67A08370	6400	2.8m, 13A/100-250V, C13 to C14 Jumper Cord	TCE
39Y7932	6263	4.3m, 10A/100-250V, C13 to C14 Jumper Cord	TCE
4L67A08371	6583	4.3m, 13A/100-250V, C13 to C14 Rack Power Cable	TCE
Rack cables for India - C13 to C14			
4L67B10326	CC6R	2.0m, 10A/100-250V, C13 to C14 Jumper Cord (India)	Not TCE
4L67B10327	CC6S	2.8m, 10A/100-250V, C13 to C14 Jumper Cord (India)	Not TCE
4L67B10328	CC6T	4.3m, 10A/100-250V, C13 to C14 Jumper Cord (India)	Not TCE
Rack cables - C13 to C14 (Y-cable)			
00Y3046	A4VQ	1.345m, 2X C13 to C14 Jumper Cord, Rack Power Cable	Not TCE
00Y3047	A4VR	2.054m, 2X C13 to C14 Jumper Cord, Rack Power Cable	Not TCE
Rack cables - C13 to C20			
39Y7938	6204	2.8m, 10A/100-250V, C13 to IEC 320-C20 Rack Power Cable	TCE
Rack cables - C13 to C20 (Y-cable)			
47C2491	A3SW	1.2m, 16A/100-250V, 2 Short C13s to Short C20 Rack Power Cable	Not TCE
47C2492	A3SX	2.5m, 16A/100-250V, 2 Long C13s to Short C20 Rack Power Cable	Not TCE
47C2493	A3SY	2.8m, 16A/100-250V, 2 Short C13s to Long C20 Rack Power Cable	Not TCE
47C2494	A3SZ	4.1m, 16A/100-250V, 2 Long C13s to Long C20 Rack Power Cable	Not TCE
Line cords			
39Y7930	6222	2.8m, 10A/250V, C13 to IRAM 2073 (Argentina) Line Cord	TCE
81Y2384	6492	4.3m 10A/220V, C13 to IRAM 2073 (Argentina) Line Cord	TCE
39Y7924	6211	2.8m, 10A/250V, C13 to AS/NZ 3112 (Australia/NZ) Line Cord	TCE
81Y2383	6574	4.3m, 10A/230V, C13 to AS/NZS 3112 (Aus/NZ) Line Cord	Not TCE
69Y1988	6532	2.8m, 10A/250V, C13 to NBR 14136 (Brazil) Line Cord	TCE
81Y2387	6404	4.3m, 10A/250V, C13 - 2P+Gnd (Brazil) Line Cord	TCE
39Y7928	6210	2.8m, 10A/220V, C13 to GB 2099.1 (China) Line Cord	Not TCE

Part number	Feature code	Description	Top Choice Express
81Y2378	6580	4.3m, 10A/220V, C13 to GB 2099.1 (China) Line Cord	Not TCE
39Y7918	6213	2.8m, 10A/250V, C13 to DK2-5a (Denmark) Line Cord	Not TCE
81Y2382	6575	4.3m, 10A/230V, C13 to DK2-5a (Denmark) Line Cord	Not TCE
39Y7917	6212	2.8m, 10A/230V, C13 to CEE7-VII (Europe) Line Cord	TCE
81Y2376	6572	4.3m, 10A/230V, C13 to CEE7-VII (Europe) Line Cord	Not TCE
39Y7927	6269	2.8m, 10A/250V, C13(2P+Gnd) (India) Line Cord	TCE
81Y2386	6567	4.3m, 10A/240V, C13 to IS 6538 (India) Line Cord	Not TCE
39Y7920	6218	2.8m, 10A/250V, C13 to SI 32 (Israel) Line Cord	TCE
81Y2381	6579	4.3m, 10A/230V, C13 to SI 32 (Israel) Line Cord	Not TCE
39Y7921	6217	2.8m, 220-240V, C13 to CEI 23-16 (Italy/Chile) Line Cord	TCE
81Y2380	6493	4.3m, 10A/230V, C13 to CEI 23-16 (Italy/Chile) Line Cord	Not TCE
46M2593	A1RE	2.8m, 12A/125V, C13 to JIS C-8303 (Japan) Line Cord	TCE
4L67A08362	6495	4.3m, 12A/200V, C13 to JIS C-8303 (Japan) Line Cord	Not TCE
39Y7926	6335	4.3m, 12A/100V, C13 to JIS C-8303 (Japan) Line Cord	TCE
39Y7922	6214	2.8m, 10A/250V, C13 to SABS 164 (S Africa) Line Cord	Not TCE
81Y2379	6576	4.3m, 10A/230V, C13 to SABS 164 (South Africa) Line Cord	Not TCE
39Y7925	6219	2.8m, 220-240V, C13 to KETI (S Korea) Line Cord	TCE
81Y2385	6494	4.3m, 12A/220V, C13 to KSC 8305 (S. Korea) Line Cord	Not TCE
39Y7919	6216	2.8m, 10A/250V, C13 to SEV 1011-S24507 (Swiss) Line Cord	TCE
81Y2390	6578	4.3m, 10A/230V, C13 to SEV 1011-S24507 (Sws) Line Cord	Not TCE
23R7158	6386	2.8m, 10A/125V, C13 to CNS 10917-3 (Taiwan) Line Cord	TCE
81Y2375	6317	2.8m, 10A/240V, C13 to CNS 10917-3 (Taiwan) Line Cord	Not TCE
81Y2374	6402	2.8m, 13A/125V, C13 to CNS 60799 (Taiwan) Line Cord	Not TCE
4L67A08363	AX8B	4.3m, 10A 125V, C13 to CNS 10917 (Taiwan) Line Cord	Not TCE
81Y2389	6531	4.3m, 10A/250V, C13 to 76 CNS 10917-3 (Taiwan) Line Cord	TCE
81Y2388	6530	4.3m, 13A/125V, C13 to CNS 10917 (Taiwan) Line Cord	TCE
39Y7923	6215	2.8m, 10A/250V, C13 to BS 1363/A (UK) Line Cord	TCE
81Y2377	6577	4.3m, 10A/230V, C13 to BS 1363/A (UK) Line Cord	TCE
90Y3016	6313	2.8m, 10A/120V, C13 to NEMA 5-15P (US) Line Cord	TCE
46M2592	A1RF	2.8m, 10A/250V, C13 to NEMA 6-15P Line Cord	TCE
00WH545	6401	2.8m, 13A/120V, C13 to NEMA 5-15P (US) Line Cord	TCE
4L67A08359	6370	4.3m, 10A/125V, C13 to NEMA 5-15P (US) Line Cord	TCE
4L67A08361	6373	4.3m, 10A/250V, C13 to NEMA 6-15P (US) Line Cord	Not TCE
4L67A08360	AX8A	4.3m, 13A/120V, C13 to NEMA 5-15P (US) Line Cord	TCE

Systems management

The ST250 V3 contains an integrated service processor, XClarity Controller2 (XCC2), which provides advanced service-processor control, monitoring, and alerting functions. The XCC is based on the Pilot4 XE401 baseboard management controller (BMC) using a dual-core ARM Cortex A9 service processor.

- Front operator panel
- System status with XClarity Mobile
- Remote management
- XCC2 Platinum
- Lenovo XClarity Provisioning Manager
- Lenovo XClarity Administrator
- Lenovo XClarity Integrators
- Lenovo XClarity Essentials
- Lenovo XClarity Energy Manager

Front operator panel

The ST250 V3 offers a front operator panel showing key LED status indicators, as shown in the following figure.

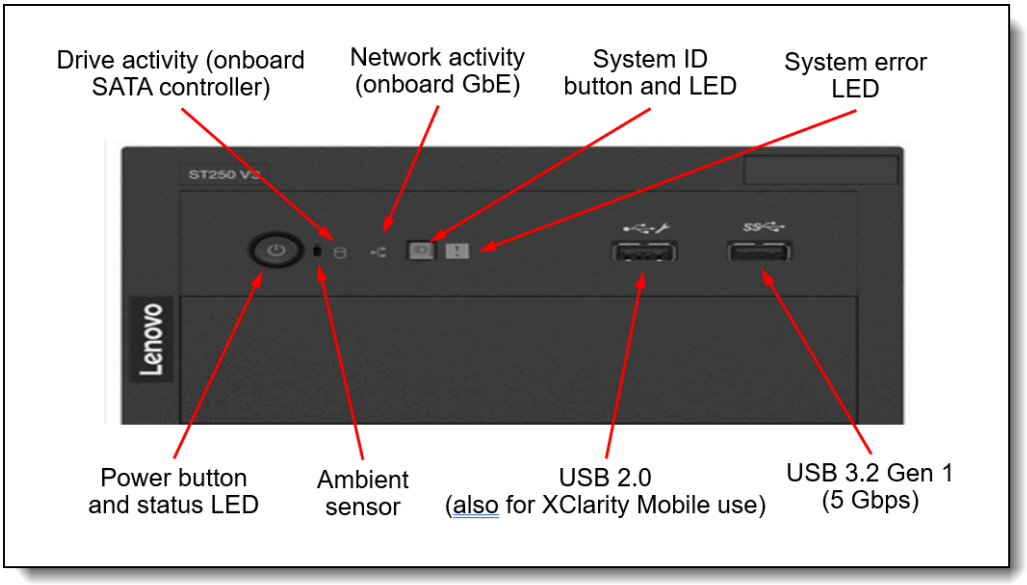


Figure 9. Front operator panel

System status with XClarity Mobile

The XClarity 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.

The steps to connect the mobile device are as follows:

1. Enable USB Management on the server, by holding down the ID button for 3 seconds (or pressing the dedicated USB management button if one is present)
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)

Remote management

The server offers a dedicated RJ45 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 47. IPMI-over-LAN settings

Part number	Feature code	Description	Top Choice Express
CTO only	B7XZ	Disable IPMI-over-LAN (default)	TCE
CTO only	B7Y0	Enable IPMI-over-LAN	TCE

XCC2 Platinum

The XCC2 service processor in the ST250 V3 supports an upgrade to the Platinum level of features. Compared to the XCC functions of ThinkSystem V2 and earlier systems, Platinum adds the same features as Enterprise and Advanced levels in ThinkSystem V2, plus additional features.

XCC2 Platinum adds the following Enterprise and Advanced functions:

- 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
- Syslog alerting
- Redirecting serial console via SSH
- Component replacement log (Maintenance History log)
- Access restriction (IP address blocking)
- Lenovo SED security key management
- Displaying graphics for real-time and historical power usage data and temperature
- 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 Java client
- 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
- System utilization data and graphic view

- Single sign on with Lenovo XClarity Administrator
- Update firmware from a repository
- License for XClarity Energy Manager

XCC2 Platinum also adds the following features that are new to XCC2:

- System Guard - Monitor hardware inventory for unexpected component changes, and simply log the event or prevent booting
- Enterprise Strict Security mode - Enforces CNSA 1.0 level security
- Neighbor Group - Enables administrators to manage and synchronize configurations and firmware level across multiple servers

Ordering information is listed in the following table. XCC2 Platinum is a software license upgrade - no additional hardware is required.

Table 48. XCC2 Platinum license upgrade

Part number	Feature code	Description
7S0X000KWW	SBCV	Lenovo XClarity Controller 2 (XCC2) Platinum Upgrade

With XCC2 Platinum, 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 DCSC configurator.

Table 49. Enable System Guard in the factory (CTO orders)

Feature code	Description	Top Choice Express
BUT2	Install System Guard	Not TCE

For more information about System Guard, see https://pubs.lenovo.com/xcc2/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 Administrator

Lenovo XClarity Administrator is a centralized resource management solution designed to reduce complexity, speed response, and enhance the availability of Lenovo systems and solutions. It provides agent-free hardware management for ThinkSystem servers. The administration dashboard is based on HTML 5 and allows fast location of resources so tasks can be run quickly.

Because Lenovo XClarity Administrator does not require any agent software to be installed on the managed endpoints, there are no CPU cycles spent on agent execution, and no memory is used, which means that up to 1GB of RAM and 1 - 2% CPU usage is saved, compared to a typical managed system where an agent is

required.

Lenovo XClarity Administrator is an optional software component for the ST250 V3. The software can be downloaded and used at no charge to discover and monitor the ST250 V3 and to manage firmware upgrades.

If software support is required for Lenovo XClarity Administrator, or premium features such as configuration management and operating system deployment are required, Lenovo XClarity Pro software subscription should be ordered. Lenovo XClarity Pro is licensed on a per managed system basis, that is, each managed Lenovo system requires a license.

The following table lists the Lenovo XClarity software license options.

Table 50. Lenovo XClarity Pro ordering information

Part number	Feature code	Description
00MT201	1339	Lenovo XClarity Pro, per Managed Endpoint w/1 Yr SW S&S
00MT202	1340	Lenovo XClarity Pro, per Managed Endpoint w/3 Yr SW S&S
00MT203	1341	Lenovo XClarity Pro, per Managed Endpoint w/5 Yr SW S&S
7S0X000HWW	SAYV	Lenovo XClarity Pro, per Managed Endpoint w/6 Yr SW S&S
7S0X000JWW	SAYW	Lenovo XClarity Pro, per Managed Endpoint w/7 Yr SW S&S

Lenovo XClarity Administrator offers the following standard features that are available at no charge:

- Auto-discovery and monitoring of Lenovo systems
- Firmware updates and compliance enforcement
- External alerts and notifications via SNMP traps, syslog remote logging, and e-mail
- Secure connections to managed endpoints
- NIST 800-131A or FIPS 140-3 compliant cryptographic standards between the management solution and managed endpoints
- Integration into existing higher-level management systems such as cloud automation and orchestration tools through REST APIs, providing extensive external visibility and control over hardware resources
- An intuitive, easy-to-use GUI
- Scripting with Windows PowerShell, providing command-line visibility and control over hardware resources

Lenovo XClarity Administrator offers the following premium features that require an optional Pro license:

- Pattern-based configuration management that allows to define configurations once and apply repeatedly without errors when deploying new servers or redeploying existing servers without disrupting the fabric
- Bare-metal deployment of operating systems and hypervisors to streamline infrastructure provisioning

For more information, refer to the Lenovo XClarity Administrator Product Guide:
http://lenovopress.com/tips1200

Lenovo XClarity Integrators

Lenovo also offers software plug-in modules, Lenovo XClarity Integrators, to manage physical infrastructure from leading external virtualization management software tools including those from Microsoft and VMware.

These integrators are offered at no charge, however if software support is required, a Lenovo XClarity Pro software subscription license should be ordered.

Lenovo XClarity Integrators offer the following additional features:

- Ability to discover, manage, and monitor Lenovo server hardware from VMware vCenter or Microsoft System Center
- Deployment of firmware updates and configuration patterns to Lenovo x86 rack servers and Flex System from the virtualization management tool
- Non-disruptive server maintenance in clustered environments that reduces workload downtime by dynamically migrating workloads from affected hosts during rolling server updates or reboots
- Greater service level uptime and assurance in clustered environments during unplanned hardware events by dynamically triggering workload migration from impacted hosts when impending hardware failures are predicted

For more information about all the available Lenovo XClarity Integrators, see the Lenovo XClarity Administrator Product Guide: https://lenovopress.com/tips1200-lenovo-xclarity-administrator

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.

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 Platinum upgrade as described in the XCC2 Platinum section. If your server does not have the XCC Platinum upgrade, Energy Manager licenses can be ordered as shown in the following table.

Table 51. 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/

Security

Topics in this section:

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

Security features

The ST250 V3 offers the following security features:

- Electronic security measures:
  - Administrator and power-on passwords
  - Secure firmware updates
  - Trusted Platform Module (TPM) supporting TPM 2.0
  - For China customers, the Nationz TPM plug-in module
  - Self-encrypting drives with support for IBM Security Key Lifecycle Manager
- Mechanical security measures
  - Loop for a padlock to prevent the side panel from being opened
  - Slot at the rear of the server for a Kensington Cable Lock
  - Optional lockable front door
  - Optional chassis intrusion switch

The server is NIST SP 800-147B compliant.

The Nationz TPM module is installed in a dedicated socket on the system board. See the Components and connectors section for locations of physical components.

The following table lists the security options for the server.

Table 52. Security

Part number	Feature code	Description	Top Choice Express
4M17A12791	B41K	ThinkSystem ST250/ST250 Series Security Door	TCE
4Z57A14086	B4LS	ThinkSystem ST250 Intrusion Cable Kit	TCE

For self-encrypting drives (SEDs) with support for enterprise key managers, see the SED encryption key management section.

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 ST250 V3 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 ST250 V3 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 53. Secure Boot options

Part number	Feature code	Description	Top Choice Express	Purpose
CTO only	BPKQ	TPM 2.0 with Secure Boot	TCE	Configure the system in the factory with Secure Boot enabled.
CTO only	BPKR	TPM 2.0	TCE	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 ST250 V3 supports the following security standards and capabilities:

- **Industry Standard Security Capabilities**
  - Intel CPU Enablement
    - AES-NI (Advanced Encryption Standard New Instructions)
    - Secure Key
    - MKTME/TME (Multi-Key Total Memory Encryption)
    - OS Guard
    - TXT (Trusted eXecution Technology)
    - XD (eXecute Disable)
    - Boot Guard
    - MBEC (Mode-based Execute Control)
    - VT-x (Virtualization Technology-x)
    - VT-rp (Virtualization Technology with Redirect Protection)
    - VT-d (Virtualization Technology for Directed I/O)
    - VT-x with EPT (Extended Page Tables)
  - 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 AST2600 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

  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
  - 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

Keyboards and Mice

The following table lists the supported full-sized USB keyboards and mice available for Lenovo ThinkSystem servers.

The keyboards have the following features:

- Full-sized 104-key keyboard with 3 special Windows keys
- 3 LEDs for caps lock, scroll lock and num lock
- Wired USB connection with 1.8m cable
- Adjustable feet at the rear of the keyboard

Tip: For keyboards that fit in the rack-mounted console kit, see the KVM console options section, or the ThinkSystem 18.5-inch LCD Console product guide

Table 54. Lenovo Preferred Pro USB Full-sized keyboards - ThinkSystem

Part number	Feature code	Description	Top Choice Express
Mice			
7M57A04698	B0LN	ThinkSystem Optical Wheel Mouse - USB	TCE
Keyboards			
7ZB7A05521	AXTM	ThinkSystem Pref. Pro II USB Keyboard - Arabic	Not TCE
7ZB7A05520	AXTN	ThinkSystem Pref. Pro II USB Keyboard - Arabic/French	Not TCE
7ZB7A05519	AXTP	ThinkSystem Pref. Pro II USB Keyboard - Belgium/French	Not TCE
7ZB7A05518	AXTQ	ThinkSystem Pref. Pro II USB Keyboard - Belgium/UK	Not TCE
7ZB7A05517	AXTR	ThinkSystem Pref. Pro II USB Keyboard - Brazil/Portuguese	Not TCE
7ZB7A05515	AXTS	ThinkSystem Pref. Pro II USB Keyboard - Bulgarian	Not TCE
7ZB7A05511	AXTU	ThinkSystem Pref. Pro II USB Keyboard - Czech	Not TCE
7ZB7A05509	AXTV	ThinkSystem Pref. Pro II USB Keyboard - Danish	Not TCE
7ZB7A05508	AXTW	ThinkSystem Pref. Pro II USB Keyboard - Dutch	Not TCE
7ZB7A05506	AXTX	ThinkSystem Pref. Pro II USB Keyboard - French	TCE
7ZB7A05496	AXTZ	ThinkSystem Pref. Pro II USB Keyboard - French Canadian French	Not TCE
7ZB7A05504	AXTY	ThinkSystem Pref. Pro II USB Keyboard - French Canadian Multilingual	TCE
7ZB7A05495	AXU0	ThinkSystem Pref. Pro II USB Keyboard - German	Not TCE
7ZB7A05494	AXU1	ThinkSystem Pref. Pro II USB Keyboard - Greek	Not TCE
7ZB7A05493	AXU2	ThinkSystem Pref. Pro II USB Keyboard - Hebrew	Not TCE
7ZB7A05492	AXU3	ThinkSystem Pref. Pro II USB Keyboard - Hungarian	Not TCE
7ZB7A05491	AXU4	ThinkSystem Pref. Pro II USB Keyboard - Iceland	Not TCE
7ZB7A05490	AXU5	ThinkSystem Pref. Pro II USB Keyboard - Italy	Not TCE
7ZB7A05489	AXU6	ThinkSystem Pref. Pro II USB Keyboard -Japanese	TCE
7ZB7A05488	AXU7	ThinkSystem Pref. Pro II USB Keyboard - Korean	Not TCE
7ZB7A05487	AXU8	ThinkSystem Pref. Pro II USB Keyboard - LA Spanish	TCE
7ZB7A05486	AXU9	ThinkSystem Pref. Pro II USB Keyboard - Norwegian	Not TCE
7ZB7A05485	AXUA	ThinkSystem Pref. Pro II USB Keyboard - Polish	Not TCE
7ZB7A05484	AXUB	ThinkSystem Pref. Pro II USB Keyboard- Portugese	Not TCE

Part number	Feature code	Description	Top Choice Express
7ZB7A05483	AXUC	ThinkSystem Pref. Pro II USB Keyboard - Romanian	Not TCE
7ZB7A05482	AXUD	ThinkSystem Pref. Pro II USB Keyboard - Russian/Cy	Not TCE
7ZB7A05481	AXUE	ThinkSystem Pref. Pro II USB Keyboard - Serbian/Cyrilic	Not TCE
7ZB7A05480	AXUF	ThinkSystem Pref. Pro II USB Keyboard - Slovak	Not TCE
7ZB7A05471	AXUQ	ThinkSystem Pref. Pro II USB Keyboard - Slovenian	Not TCE
7ZB7A05479	AXUG	ThinkSystem Pref. Pro II USB Keyboard - Spanish	Not TCE
7ZB7A05478	AXUH	ThinkSystem Pref. Pro II USB Keyboard- Swedish/Finn	Not TCE
7ZB7A05477	AXUJ	ThinkSystem Pref. Pro II USB Keyboard - Swiss, F/G	Not TCE
7ZB7A05476	AXUK	ThinkSystem Pref. Pro II USB Keyboard - Thailand	TCE
7ZB7A05513	AXTT	ThinkSystem Pref. Pro II USB Keyboard - Trad Chinese/US	TCE
7ZB7A05474	AXUM	ThinkSystem Pref. Pro II USB Keyboard - Turkish 179	Not TCE
7ZB7A05475	AXUL	ThinkSystem Pref. Pro II USB Keyboard - Turkish 440	Not TCE
7ZB7A05473	AXUN	ThinkSystem Pref. Pro II USB Keyboard - UK English	TCE
7ZB7A05522	AXTL	ThinkSystem Pref. Pro II USB Keyboard - US English	TCE
7ZB7A05472	AXUP	ThinkSystem Pref. Pro II USB Keyboard - US Euro	Not TCE

Rack installation

The ST250 V3 can be installed in the rack with the Rack Mount Kit, which converts the server to a rack-mountable server.

Note: The server is a 4U rack mount server, however the rack mount kit adds 1U to the vertical space occupied by the server. The total rack space occupied is 5U.

Part number information is listed in the following table. The kit can only be ordered as an option part number, not in a CTO order.

Table 55. Rack installation options

Part number	Description
4XF7A78620	ThinkSystem ST45/ST50/ST250 Series Rack Mount Kit

The rack mount kit includes the following items:

- 1U tray to hold the server horizontally
- Left and right slide rails
- Cable management arm
- Brackets and other hardware
- Installation instructions

The following table summarizes the rail kit features and specifications.

Table 56. Rail kit features and specifications summary

Feature	ThinkSystem ST45/ST50/ST250 Series Rack Mount Kit
Option part number	4XF7A78620
Rail type	Full-out slide rail (ball bearing)
Toolless installation	Yes
CMA support	Included
Supported rack type	Four-post IBM and Lenovo standard rack, complying with the IEC standard
In-rack server maintenance	No
1U PDU support	Yes
0U PDU support	Limited support**
Supported mounting holes	Square or round
Thickness of mounting flanges	2.0 to 3.3 mm (0.08 to 0.13 inches)
Supported distance between front and rear mounting flanges‡	665 to 900 mm (26.2 to 35.4 inches)
Rail length†	792 mm (31.2 inches)

** If you want to install the rails and a 0U PDU into the same rack, the rack must meet the height and depth requirements as described in ThinkSystem Rail Support Matrix.
‡ For best performance, it is recommended that you install the rails to the racks with a 719-mm distance (28.3-inch, Lenovo rack default distance) between the front and rear mounting flanges.
† Measured when mounted on the rack, from the front surface of the front mounting flange to the rear most point of the rail. Rail is in closed position.

The following figure shows the ST250 V3 installed in the Rack Mount Kit.



Figure 10. ST250 V3 installed in the Rack Mount Kit

Operating systems

The ST250 V3 with Intel Pentium or Intel Xeon E processors supports the following operating systems:

- Microsoft Windows Server 2022
- Microsoft Windows Server 2025
- Red Hat Enterprise Linux 8.8
- Red Hat Enterprise Linux 8.9
- Red Hat Enterprise Linux 8.10
- Red Hat Enterprise Linux 9.2
- Red Hat Enterprise Linux 9.3
- Red Hat Enterprise Linux 9.4
- Red Hat Enterprise Linux 9.5
- Red Hat Enterprise Linux 9.6
- Red Hat Enterprise Linux 9.7
- Red Hat Enterprise Linux 10.0
- Red Hat Enterprise Linux 10.1
- SUSE Linux Enterprise Server 15 SP5
- SUSE Linux Enterprise Server 15 SP6
- SUSE Linux Enterprise Server 15 SP7
- SUSE Linux Enterprise Server 15 Xen SP5
- SUSE Linux Enterprise Server 16
- Ubuntu 22.04 LTS 64-bit
- Ubuntu 24.04 LTS 64-bit
- VMware ESXi 8.0 U2
- VMware ESXi 8.0 U3
- VMware ESXi 9.0

The ST250 V3 with Intel Pentium or Intel Xeon 6300 series processors supports the following operating systems:

- Microsoft Windows Server 2022
- Microsoft Windows Server 2025
- Red Hat Enterprise Linux 8.10
- Red Hat Enterprise Linux 9.4
- Red Hat Enterprise Linux 9.5
- Red Hat Enterprise Linux 9.6
- Red Hat Enterprise Linux 9.7
- Red Hat Enterprise Linux 10.0
- Red Hat Enterprise Linux 10.1

- SUSE Linux Enterprise Server 15 SP6
- SUSE Linux Enterprise Server 15 SP7
- SUSE Linux Enterprise Server 16
- Ubuntu 22.04 LTS 64-bit
- Ubuntu 24.04 LTS 64-bit
- VMware ESXi 8.0 U3
- VMware ESXi 9.0

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.com/osig

Virtualization support: The onboard SATA ports of the server can be used with virtualization hypervisors, including VMware ESXi, Linux KVM, Xen, and Microsoft Hyper-V, however support is limited to AHCI (non-RAID) mode. RSTe mode is not supported with virtualization hypervisors.

For configure-to-order configurations, the ST250 V3 can be preloaded with VMware ESXi. Ordering information is listed in the following table.

Table 57. VMware ESXi preload

Part number	Feature code	Description	Top Choice Express
CTO only	BYC7	VMware ESXi 8.0 U2 (Factory Installed)	TCE
CTO only	BZ97	VMware ESXi 8.0 U3 (Factory Installed)	TCE
CTO only	C91V	VMware ESXi 9.0 (Factory Installed)	Not TCE

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 ST250 V3 has the following overall physical dimensions, including tower feet, excluding components that extend outside the standard chassis, such as power supply handles:

- Width: 176 mm (6.9 inches)
- Height: 444 mm (17.5 inches)
- Depth: 578 mm (22.8 inches)

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

Table 58. Detailed dimensions

Dimension	Description
176 mm	X_a = Width, using widest features (not including feet)
155 mm	X_b = Width, with chassis feet extended
444 mm	Y_a = Height, from bottom of feet to top of chassis body
430 mm	Y_b = Height, from bottom of chassis body to top of chassis body
544 mm	Z_a = Depth, from front door to most rearward I/O port surface
578 mm	Z_b = Depth, from front door to deepest feature of the chassis body feature
595 mm	Z_c = Depth, from front door to deepest feature such as power supply handle
23 mm	Z_e = Depth, front door to front plate of chassis body

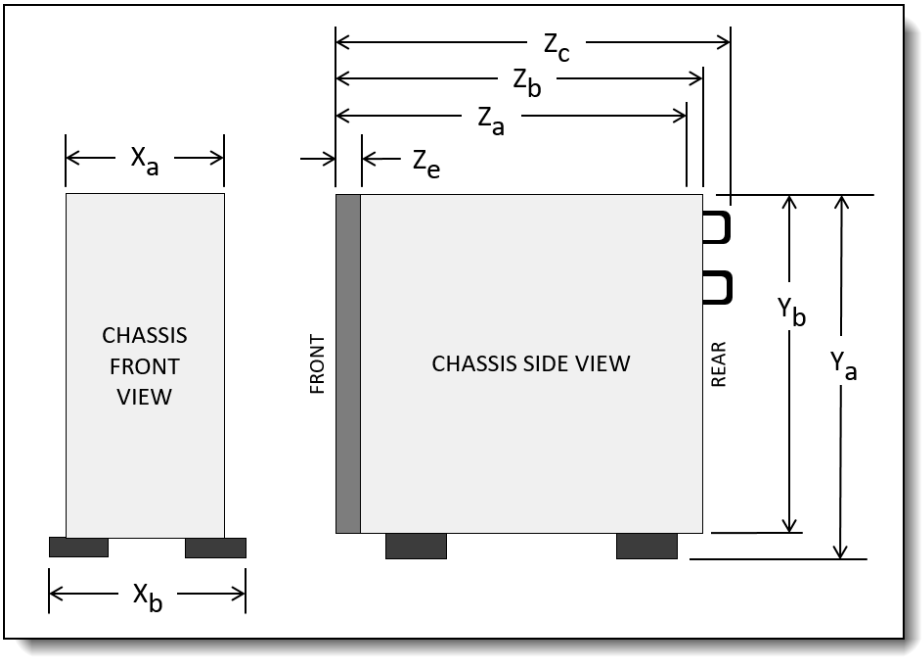


Figure 11. Server dimension

The shipping (cardboard packaging) dimensions of the ST250 V3 are as follows:

- Width: 579 mm (22.8 inches)
- Height: 298 mm (11.7 inches)
- Depth: 763 mm (30.0 inches)

The server has the following weight:

- Weight, fully configured: 23.95 kg (3.5" config) or 15.81 kg (2.5" config)

Electrical requirements are as follows:

- Models with a 300 W AC fixed power supply:
  - 100-127 (nominal) V ac; 50 Hz or 60 Hz, 5 A
  - 200-240 (nominal) V ac; 50 Hz or 60 Hz, 2.5 A
- Models with a 500 W AC fixed power supply:
  - 100-127 (nominal) V ac; 50 Hz or 60 Hz, 7 A
  - 200-240 (nominal) V ac; 50 Hz or 60 Hz, 3.5 A
- Models with a 800 W AC redundant power supply (Platinum, Titanium):
  - 100-127 (nominal) V ac; 50 Hz or 60 Hz, 10 A
  - 200-240 (nominal) V ac; 50 Hz or 60 Hz, 5 A

Operating environment

ThinkSystem ST250 V3 server complies with ASHRAE Class A2 specifications. Depending on the hardware configurations, some models comply with ASHRAE Class A3 and A4 specifications. System performance may be impacted when operating temperature is outside ASHRAE A2 specification.

- Air temperature:
  - Operating
    - 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: 5°C to 45°C (41°F to 113°F)
  - Shipment/storage: -40°C to 60°C (-40°F to 140°F)
- Maximum altitude: 3,050 m (10,000 ft)
- Relative Humidity (non-condensing):
  - Operating
    - 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%

Temperature and humidity

Adjust ambient temperature when specific configuration is applied:

- Keep ambient temperature to 45°C or lower when a 60W (or lower) TDP CPU and an 80W heat sink are installed.
- Keep ambient temperature to 40°C or lower when a 70W (or lower) TDP CPU and an 80W heat sink are installed.
- Keep ambient temperature to 35°C or lower when one of the following is installed:
  - 95W (or lower) TDP CPU and a 95W heat sink.
  - 80W (or lower) TDP CPU and an 80W heat sink.
  - GPUs, M.2 drives (480GB or below), U.2 drives, U.3 drives, and 25GbE Ethernet adapters.
- Keep ambient temperature to 30°C or lower when an M.2 drive 960GB is installed.
- Keep ambient temperature to 35°C or lower when 3.5" 20TB drive or larger than 20TB are installed.

Thermal/Heat output

The server generates the following approximate heat output:

- Minimum configuration: 484 BTU per hour (141 watts)
- Maximum configuration : 1397 BTU per hour (409 watts)

Acoustical noise emissions

The server has the following acoustic noise emissions declaration:

- Sound power level (L_{WAd}):
  - Idling: 4.6 Bel (Typical), 5.1 Bel (Max.)
  - Operating 1: 4.6 Bel (Typical), 5.1 Bel (Max.)
  - Operating 2: 4.8 Bel (Typical), 5.1 Bel (Max.)

- Sound pressure level (L_{pAm}):
  - Idling: 30.5 dBA (Typical), 35.9 dBA (Max.)
  - Operating 1: 30.5 dBA (Typical), 35.9 dBA (Max.)
  - Operating 2: 33.2 dBA (Typical), 35.9 dBA (Max.)

NOTE

- These sound levels were measured in controlled acoustical environments according to procedures specified by ISO7779 and are reported in accordance with ISO 9296.
- Idle mode is the steady state in which the server is powered on but not operating any intended function. Operating mode 1 is 70% CPU TDP. Operating mode 2 is 100% CPU TDP.
- The declared acoustic sound levels are based on the following configurations, which may change depending on configuration/conditions.
  - Typical: 1x 80W CPU, 1x 16GB DIMM, 2x HDD, 1x 800W GW PSU
  - Max: 1x 95W CPU, 2x 32GB DIMM, 2x HDD , 1x 9350-8i RAID,1x 10G NIC, 2x 800W GW PSU
- 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.

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 ST250 V3 has a 1-year or 3-year warranty, based on the machine type of the system:

- 7DCF - 1 year warranty
- 7DCE - 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 Enhanced Storage Support 24x7 4-Hour Response** – Best choice for storage systems where maximum uptime is critical.

For more information, consult the brochure Lenovo Operational Support Services for Data Centers Services.

* Some service levels may not be available in all markets. Contact your sales representative for more information.

Services

Lenovo Data Center 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 Plan & Design Services
- Lenovo Deployment, Migration, and Configuration 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.

- **Design Services**

  Professional Services consultants perform infrastructure design and implementation planning to support your strategy. The high-level architectures provided by the assessment service are turned into low level designs and wiring diagrams, which are reviewed and approved prior to implementation. The implementation plan will demonstrate an outcome-based proposal to provide business capabilities through infrastructure with a risk-mitigated project plan.

Lenovo Plan & Design Services

Unlock faster time to market with our tailored, strategic design workshops to align solution approaches with your business goals and technical requirements. Leverage our deep solution expertise and end-to-end delivery partnership to meet your goals efficiently and effectively.

Lenovo Deployment, Migration, and Configuration 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.

- **Deployment Services for Storage and ThinkAgile**

  A comprehensive range of remote and onsite options tailored specifically for your business needs to ensure your storage and ThinkAgile hardware are fully operational from the start.

- **Hardware Installation Services**

  A full-range, comprehensive setup for your hardware, including unpacking, inspecting, and positioning components to ensure your equipment is operational and error-free for the most seamless and efficient installation experience, so you can quickly benefit from your investments.

- **DM/DG File Migration Services**

  Take the burden of file migration from your IT's shoulders. Our experts will align your requirements and business objectives to the migration plans while coordinating with your team to plan and safely execute the data migration to your storage platforms.

- **DM/DG/DE Health Check Services**

  Our experts perform proactive checks of your Firmware and system health to ensure your machines are operating at peak and optimal efficiency to maximize up-time, avoid system failures, ensure the security of IT solutions and simplify maintenance.

- **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.

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 Data Centers**

  Your direct line to the solution that promises the best, most comprehensive level of support to help you fully unlock the potential of your data center.

- **Premier Enhanced Storage Support (PESS)**

  Gain all the benefits of Premier Support for Data Centers, adding dedicated storage specialists and resources to elevate your storage support experience to the next level.

- **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 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 the brochure Lenovo Operational Support Services for Data Centers.

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.

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 latest patches, critical updates, and firmware levels, to ensure you systems are providing business value through optimized performance.

Lenovo Sustainability Services

- **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 Asset Recovery Services offering 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 ST250 V3 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 60950-1
- Mexico NOM-019
- India BIS 13252 (Part 1)
- Germany GS
- TUV-GS (EN62368-1, and EK1-ITB2000)
- Brazil INMETRO
- 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, EN61000-3-11, 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 KN32, Class A, KN35
- 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
- UL Green Guard, UL2819
- Energy Star 4.0
- EPEAT (NSF/ ANSI 426) Bronze
- Japanese Energy-Saving Act
- EU2019/424 Energy Related Product (ErP Lot9)
- China CCC certificate, GB17625.1; GB4943.1; GB/T9254
- China CECP certificate, CQC3135
- China CELP certificate, HJ 2507-2011

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 59. External drive enclosures

Model	Description
4587HC1	Lenovo Storage D1212 Disk Expansion Enclosure (2U enclosure with 12x LFF drive bays)
4587HC2	Lenovo Storage D1224 Disk Expansion Enclosure (2U enclosure with 24x SFF drive bays)
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 Storage D1212 and D1224
  http://lenovopress.lenovo.com/lp0512
- 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 USB backup options that are offered by Lenovo.

Table 60. External USB backup options

Part number	Description
External RDX USB dock	
4T27A10725	ThinkSystem RDX External USB 3.0 Dock

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

The following table lists the available external SAS tape backup options.

Tip: Verify the end-to-end support of an IBM tape backup solution through the IBM System Storage Interoperation Center (SSIC): http://www.ibm.com/systems/support/storage/ssic

Table 61. External SAS 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

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

Uninterruptible power supply units

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

Table 62. Uninterruptible power supply units

Part number	Description
Tower UPS units - 100-125VAC	
7DD6A002WW	T1.5kVA Tower UPS-G2 (100-125VAC)
Tower UPS units - 200-240VAC	
7DD6A003WW	T1.5kVA Tower UPS-G2 (200-240VAC)
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 63. 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	C0QH	0U 36 C13 and 6 C19 Basic 32A 1 Phase PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93177	C0QJ	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 Switched and Monitored PDUs															
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	N	N	N	N	N	N
4PU7A93181	C0QN	0U 21 C13/C15 and 21 C13/C15/C19 Switched and Monitored 48A 3 Phase Delta PDU v2 (60A derated)	N	Y	N	N	N	N	N	Y	N	Y	N	Y	N
4PU7A93178	C0QK	0U 20 C13 and 4 C19 Switched and Monitored 32A 1 Phase PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93182	C0QP	0U 18 C13/C15 and 18 C13/C15/C19 Switched and Monitored 63A 3 Phase WYE PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A93175	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	N	Y	Y	Y
4PU7A93180	C0QM	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	C0QL	0U 16 C13/C15 and 16 C13/C15/C19 Switched and Monitored 24A 1 Phase PDU v2 (30A derated)	N	Y	N	N	N	N	N	Y	N	Y	Y	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															
4PU7A90808	C0D4	1U 18 C19/C13 Switched and monitored 48A 3P WYE PDU V2 ETL	N	N	N	N	N	N	N	Y	N	Y	Y	Y	N
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	N	N	N	N	N	Y	N	Y	Y	Y	N
Line cords for 1U PDUs that ship without a line cord															
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

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
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 ST250 V3 server can be installed horizontally in a rack cabinet using the Rack Mount Kit, as described in the Rack installation section.

The following table lists the supported rack cabinets.

Table 64. 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)
93074RX	42U 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 65. 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 67. 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

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Seller training courses

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

1. **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

2. **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

3. **Partner Technical Webinar - Mainstream CPUs**
   2025-09-29 | 40 minutes | Employees and Partners

   In this 40-minute replay, Brad Violand, Lenovo ISG Category team, reviewed the strategy to optimize the CPU portfolio and ensuing changes to DCSC planned for October 1, 2025.

   Tags: Server

   Published: 2025-09-29
   Length: 40 minutes

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

   Course code: SEP2625
4. **Partner Technical Webinar - ISG Portfolio - Wayne's World**
   2025-09-25 | 60 minutes | Employees and Partners

   In this 60-minute replay, Wayne Pecht, Lenovo Channel SA, shared his extensive experience and unique approach to the ISG Portfolio "Wayne's World for Lenovo ISG"!

   Tags: Channel, Technical Sales

   Published: 2025-09-25
   Length: 60 minutes

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

   Course code: SEP1925
5. **Partner Technical Webinar - OneIQ Demo**
   2025-09-08 | 60 minutes | Employees and Partners

   In this 60-minute replay, Joe Allen, Lenovo Senior Solution Architect for LETS, demonstrated the OneIQ tool. He showed how the collector is dispatched, how the data can be viewed, and how you build solutions based on the collected data.

   Tags: Server, ThinkSystem

   Published: 2025-09-08
   Length: 60 minutes

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

   Course code: SEP0525

6. **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
7. **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

8. **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

9. **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

10. **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
11. **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

12. **Partner Technical Webinar - RTX Pro 6000**
2025-05-22 | 60 minutes | Employees and Partners

In this 60-minute replay, Allen Bourgoyne, Product Marketing for NVIDIA, presented the newly announced RTX Pro 6000 Blackwell Server Edition GPU.

Tags: Artificial Intelligence (AI)

Published: 2025-05-22
Length: 60 minutes

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

Course code: MAY1525

13. **Partner Technical Webinar - DCSC Improvements - MAY0225**
2025-05-05 | 60 minutes | Employees and Partners

In this 60-minute replay, new improvements to DCSC were reviewed. Joe Allen, Lenovo NA LETS, presented the new PCI wizard and discussed RAID adapters. Ryan Tuttle, Lenovo NA LETS presented Spreadsheet import, Autocorrect and Expanded selections on by default. Joe Murphy, Lenovo NA LETS closed out with review of Error Message improvements and location of ThinkAgile MX and VX in the DCSC menus.

Tags: Technical Sales

Published: 2025-05-05
Length: 60 minutes

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

Course code: MAY0225

14. **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

15. **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

16. **Partner Technical Webinar - Server Update with Mark Bica**
2024-11-26 | 60 minutes | Employees and Partners

In this 60-minute replay, Mark Bica, Lenovo Product Manager gave an update on the server portfolio. Mark presented on the new V4 Intel servers with Xeon 6 CPUs. He reviewed where the new AMD 5th Gen EPYC CPUs will be used in our servers. He followed with a review of the GPU dense servers including SR680, SR680a, SR575 and SR780a. Mark concluded with a review of the SC777 and SC750 that were introduced at TechWorld.

Tags: Server

Published: 2024-11-26
Length: 60 minutes

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

Course code: 112224

17. **Partner Technical Webinar - LenovoPress updates and LPH Demo**
2024-11-13 | 60 minutes | Employees and Partners

In this 60-minute replay, we had 3 topics. First, David Watts, Lenovo Sr Manager LenovoPress, gave an update on LenovoPress and improvements to finding Seller Training Courses (both partner and Lenovo). Next, Ryan Tuttle, Lenovo LETS Solution Architect, gave a demo of Lenovo Partner Hub (LPH) including how to find replays of Partner Webinars in LPL. Finally, Joe Murphy, Lenovo Sr Manager of LETS NA, gave a quick update on the new Stackable Warranty Options in DCSC.

Tags: Technical Sales

Published: 2024-11-13
Length: 60 minutes

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

Course code: 110824

18. **Virtual Facilitated Session - ThinkSystem Rack and Tower Primer for ISO Client Managers - HISTORICAL**
2024-10-31 | 90 minutes | Employees Only

In this Virtual Instructor-Led Training Session, ISO Client Managers will be able to build on the knowledge gained in Module 1 (eLearning) of the ThinkSystem Rack and Tower Server Primer for ISO Client Managers curriculum.

IMPORTANT! Module 1 (eLearning) must be completed to be eligible to participate in this session. Please note that places are subject to availability. If you are selected, you will receive the invite to this session via email.

Tags: Sales, Server, ThinkSystem

Published: 2024-10-31
Length: 90 minutes

Start the training:
Employee link: Grow@Lenovo

Course code: DSRTO102

19. **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

20. **Family Introduction: Rack and Tower**
2024-01-19 | 11 minutes | Employees and Partners

This course is designed to give Lenovo sales and partner representatives a foundation on the characteristics of the rack and tower server family. As an introduction to the family, this course also includes positioning, when to use a product, and keywords a client may use when discussing a rack product.

Course Objectives:
•Family Characteristics
•Priority Positioning
•Product Usage
•Keywords and Phrases

Tags: Server

Published: 2024-01-19
Length: 11 minutes

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

Course code: SXXW1100r3

Related publications and links

For more information, see these resources:

- ThinkSystem ST250 V3 product page
  https://www.lenovo.com/us/en/data-center/servers/towers/ThinkSystem-ST250/p/77XX7TRST25
- ThinkSystem ST250 V3 interactive 3D tour
  https://lenovopress.lenovo.com/lp1805-3d-tour-thinksystem-st250-v3
- ThinkSystem ST250 V3 drivers and support
  https://datacentersupport.lenovo.com/us/en
- Lenovo ThinkSystem ST250 V3 product publications:
  https://pubs.lenovo.com/
  - Quick Start
  - Tower-to-Rack Conversion Kit Installation Instructions
  - Setup Guide
  - Maintenance Manual
  - Lenovo XClarity Provisioning Manager User Guide
- ServerProven hardware compatibility:
  https://serverproven.lenovo.com/

Related product families

Product families related to this document are the following:

- 1-Socket Tower Servers
- ThinkSystem ST250 V3 Server

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