



## 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 E-2400 Series processor (formerly codenamed "Raptor Lake") or Intel Pentium ("Alder Lake") and up to 128 GB of 4800 MHz TruDDR5 ECC memory.

Figure 1 shows the ThinkSystem ST250 V3.



Figure 1. Lenovo ThinkSystem ST250 V3

### 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 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 Gen4 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)
- 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                                                                                                                                                                                                                                                                  | ST250 V2                                                                                                                                                                                                                                 | ST250 V3                                                                                                                                                                                                                                                  | Benefits                                                                                                   |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Form Factor | <ul style="list-style-type: none"> <li>• 1-Socket (1S) Tower</li> <li>• Convertible to a 5U tower configuration</li> </ul>                                                                                                                                             | <ul style="list-style-type: none"> <li>• 1-Socket (1S) Tower</li> <li>• Convertible to a 5U tower configuration</li> </ul>                                                                                                               | <ul style="list-style-type: none"> <li>• 1-Socket (1S) Tower</li> <li>• Convertible to a 4U tower configuration</li> </ul>                                                                                                                                | <ul style="list-style-type: none"> <li>• Versatile server design</li> </ul>                                |
| Processor   | <ul style="list-style-type: none"> <li>• Supports single Xeon E2200 Series "Coffee Lake-S" processor up to 6C / 95W</li> <li>• Also supports Pentium, Core i3 and Celeron processors</li> <li>• Uses Intel C246 "Cannon Lake" Platform Controller Hub (PCH)</li> </ul> | <ul style="list-style-type: none"> <li>• Support single Xeon E2300 Series "Rocket Lake" processor up to 8C / 95W</li> <li>• Also supports Pentium processors</li> <li>• Intel C256 "Tiger Lake" Platform Controller Hub (PCH)</li> </ul> | <ul style="list-style-type: none"> <li>• Support single Xeon E-2400 Series "Raptor Lake" processor up to 8C / 95W</li> <li>• Also supports Pentium processors (Alder Lake)</li> <li>• Intel C266 "Raptor Lake" Platform Controller Hub (PCH-S)</li> </ul> | <ul style="list-style-type: none"> <li>• Supports the latest generation Intel Xeon E processors</li> </ul> |

| Feature | ST250                                                                                                                                                                                                                                                                                                                                         | ST250 V2                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ST250 V3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Benefits                                                                                                                                                                                                                                                                                                                                                                                  |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GPU     | <ul style="list-style-type: none"> <li>NVIDIA Quadro P620 2GB PCIe Active GPU</li> </ul>                                                                                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>NVIDIA Quadro T1000</li> <li>NVIDIA Quadro T400</li> </ul>                                                                                                                                                                                                                                                                                                                                                                         | <ul style="list-style-type: none"> <li>NVIDIA Quadro T1000</li> <li>NVIDIA Quadro T400</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                  | <ul style="list-style-type: none"> <li>GPU for advanced graphics processing</li> </ul>                                                                                                                                                                                                                                                                                                    |
| Memory  | <ul style="list-style-type: none"> <li>4x UDIMM slots, up to 64GB, 2666MHz</li> <li>TruDDR4 ECC memory (in China, also support for non-ECC memory)</li> </ul>                                                                                                                                                                                 | <ul style="list-style-type: none"> <li>4x UDIMM slots, up to 128GB, 3200MHz with Xeon E-2300 processors</li> <li>4x UDIMM slots, up to 128GB, 2666MHz with Pentium processors</li> <li>TruDDR4 ECC memory</li> </ul>                                                                                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>4x UDIMM slots, up to 128GB, 4800MHz with Xeon E-2400 processors</li> <li>4x UDIMM slots, up to 128GB, 4800MHz with Pentium processors</li> <li>TruDDR5 ECC memory</li> </ul>                                                                                                                                                                                                                                                                                               | <ul style="list-style-type: none"> <li>Enterprise-grade memory sufficient for most SMB and retail applications</li> <li>Faster memory with Xeon processors</li> <li>Larger memory capacity means greater performance with larger applications</li> </ul>                                                                                                                                  |
| Storage | <ul style="list-style-type: none"> <li>Up to 8x 3.5-inch hot-swap SAS/SATA drive bays or</li> <li>Up to 16x 2.5-inch hot-swap SAS/SATA drive bays, or</li> <li>Up to 8x 3.5-inch simple-swap SATA drive bays, or</li> <li>2x media bays supporting optical or backup drives</li> <li>1x M.2 SATA SSD, installs on the system board</li> </ul> | <ul style="list-style-type: none"> <li>Up to 8x 3.5-inch hot-swap SAS/SATA drive bays or</li> <li>Up to 16x 2.5-inch hot-swap SAS/SATA drive bays, or</li> <li>Up to 8x 3.5-inch simple-swap SATA drive bays, or</li> <li>Up to 7x 3.5-inch simple-swap SATA drive bays + 1x NVMe drive bay</li> <li>2x media bays supporting optical or backup drives</li> <li>2x M.2 SATA SSD supporting RAID 0 and RAID 1 using VROC, installs in an adapter in a PCIe slot</li> </ul> | <ul style="list-style-type: none"> <li>Up to 8x 3.5-inch hot-swap SAS/SATA drive bays or</li> <li>Up to 16x 2.5-inch hot-swap SAS/SATA drive bays, or</li> <li>Up to 8x 3.5-inch simple-swap SATA drive bays, or</li> <li>Up to 6x 3.5-inch simple-swap SATA drive bays + 2x NVMe drive bay</li> <li>2x media bays supporting optical or backup drives</li> <li>2x M.2 SATA SSD supporting RAID 0 and RAID 1 using VROC, installs in an adapter in a PCIe slot. Supporting SATA SSD or NVMe SSD drives.</li> </ul> | <ul style="list-style-type: none"> <li>Support for both HDDs for capacity and SSDs for performance</li> <li>Simple-swap configurations support an NVMe drive for tiered storage</li> <li>Optical drive support for ease of software installation</li> <li>M.2 drive support to separate the OS from the applications and data</li> <li>RAID support for M.2 to maximize uptime</li> </ul> |

| Feature    | ST250                                                                                                                                                                                                                                      | ST250 V2                                                                                                                                                                                                                                   | ST250 V3                                                                                                                                                                                                                                                    | Benefits                                                                                                                                                              |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RAID       | <ul style="list-style-type: none"> <li>Supports a SAS HBA or RAID adapter for hardware RAID functionality</li> <li>12Gb SAS/SATA/RAID support</li> <li>PCIe 3.0 adapters</li> <li>Intel RSTe SW RAID</li> </ul>                            | <ul style="list-style-type: none"> <li>Supports a SAS HBA or RAID adapter for hardware RAID functionality</li> <li>12Gb SAS/SATA/RAID support</li> <li>PCIe 3.0 and PCIe 4.0 adapters</li> <li>Intel VROC 6.x SW RAID</li> </ul>           | <ul style="list-style-type: none"> <li>Supports a SAS HBA or RAID adapter for hardware RAID functionality</li> <li>12Gb SAS/SATA/RAID support</li> <li>PCIe 4.0 and PCIe 5.0 adapters</li> <li>Intel VROC 6.x SW RAID (no support for NVMe RAID)</li> </ul> | <ul style="list-style-type: none"> <li>Featuring industry's latest PCIe Gen4 based RAID adapters</li> <li>RAID capability maximizes reliability and uptime</li> </ul> |
| Cooling    | <ul style="list-style-type: none"> <li>4 system fans: 2 front for drive bays, 1 rear system fan, 1x CPU fan</li> </ul>                                                                                                                     | <ul style="list-style-type: none"> <li>4 system fans: 2 front for drive bays, 1 rear system fan, 1x CPU fan</li> </ul>                                                                                                                     | <ul style="list-style-type: none"> <li>PCIe 4.0 and PCIe 5.0 adapters</li> <li>4 system fans</li> </ul>                                                                                                                                                     | <ul style="list-style-type: none"> <li>Ensures all components are sufficiently cooled</li> </ul>                                                                      |
| Networking | <ul style="list-style-type: none"> <li>2x 1GbE Onboard Ethernet ports (Broadcom BCM5720)</li> <li>Port 1 allows remote connectivity to the XCC management controller</li> </ul>                                                            | <ul style="list-style-type: none"> <li>2x 1GbE Onboard Ethernet ports (Broadcom BCM5720)</li> <li>Port 1 allows remote connectivity to the XCC management controller</li> </ul>                                                            | <ul style="list-style-type: none"> <li>2x 1GbE Onboard Ethernet ports (Broadcom BCM5720)</li> <li>Rear 1 port allows remote connectivity to the XCC2 management controller</li> </ul>                                                                       | <ul style="list-style-type: none"> <li>Easy built-in networking</li> </ul>                                                                                            |
| PCIe Slots | <ul style="list-style-type: none"> <li>4x PCIe slots (x1, x16, x4, x4)</li> <li>Includes a PCIe Gen3 x16 slot</li> </ul>                                                                                                                   | <ul style="list-style-type: none"> <li>4x PCIe slots (x4, x16, x4, x4)</li> <li>Includes a PCIe Gen4 x16 slot (requires Xeon E-2300 processor)</li> </ul>                                                                                  | <ul style="list-style-type: none"> <li>4x PCIe slots (x4, x16, x4, x4)</li> <li>Includes a PCIe Gen5 x16 slot (GPU support)</li> </ul>                                                                                                                      | <ul style="list-style-type: none"> <li>Support the latest PCIe Gen4 slot technology</li> <li>Support for a high-performance PCIe x16 adapter</li> </ul>               |
| Front I/O  | <ul style="list-style-type: none"> <li>Power button &amp; LED</li> <li>Thermal sensor</li> <li>One USB 3.2 G1 (5 Gb/s) port</li> <li>One USB 2.0 port (also supports XClarity Mobile connectivity for local systems management)</li> </ul> | <ul style="list-style-type: none"> <li>Power button &amp; LED</li> <li>Thermal sensor</li> <li>One USB 3.2 G1 (5 Gb/s) port</li> <li>One USB 2.0 port (also supports XClarity Mobile connectivity for local systems management)</li> </ul> | <ul style="list-style-type: none"> <li>Power button &amp; LED</li> <li>Ambient Thermal sensor</li> <li>One USB 3.2 G1 (5 Gb/s) port</li> <li>One USB 2.0 port (also supports XClarity Mobile connectivity for local systems management)</li> </ul>          | <ul style="list-style-type: none"> <li>Expansive USB support</li> <li>Thermal sensor ensures the server does not overheat if the ambient temperature rises</li> </ul> |

| Feature                 | ST250                                                                                                                                                                                                                                                                          | ST250 V2                                                                                                                                                                                                                                                                                                                                            | ST250 V3                                                                                                                                                                                                                                                                                                                                            | Benefits                                                                                                                                                                                                                                                                                                                             |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rear I/O                | <ul style="list-style-type: none"> <li>• 2x USB 3.2 G1 (5 Gb/s) ports</li> <li>• 2x USB 3.2 G2 (10 Gb/s) ports</li> <li>• 1x VGA video</li> <li>• 1x RJ-45 systems management</li> <li>• 2x RJ-45 GbE network ports</li> <li>• 1x serial port</li> </ul>                       | <ul style="list-style-type: none"> <li>• 4x USB 3.2 G2 (10 Gb/s) ports</li> <li>• 1x VGA video</li> <li>• 1x RJ-45 systems management</li> <li>• 2x RJ-45 GbE network ports</li> <li>• 1x serial port</li> </ul>                                                                                                                                    | <ul style="list-style-type: none"> <li>• 4x USB 3.2 G2 (5 Gb/s) ports</li> <li>• 1x VGA video</li> <li>• 1x RJ-45 systems management</li> <li>• 2x RJ-45 GbE network ports</li> <li>• 1x serial port</li> <li>• 1x NMI pinhole</li> </ul>                                                                                                           | <ul style="list-style-type: none"> <li>• Expansive USB support</li> <li>• Integrated Gigabit networking</li> <li>• Serial port for applications that require it</li> </ul>                                                                                                                                                           |
| Management and Security | <ul style="list-style-type: none"> <li>• XClarity Controller with upgrades</li> <li>• Full XClarity software suite including XClarity Administrator</li> <li>• Dedicated Ethernet port for remote management</li> <li>• Optional intrusion switch and lockable door</li> </ul> | <ul style="list-style-type: none"> <li>• XClarity Controller with upgrades</li> <li>• Full XClarity software suite including XClarity Administrator</li> <li>• Dedicated Ethernet port for remote management</li> <li>• Optional intrusion switch and lockable door</li> <li>• Platform Firmware Resiliency (PFR) hardware Root of Trust</li> </ul> | <ul style="list-style-type: none"> <li>• XClarity Controller with upgrades</li> <li>• Full XClarity software suite including XClarity Administrator</li> <li>• Dedicated Ethernet port for remote management</li> <li>• Optional intrusion switch and lockable door</li> <li>• Platform Firmware Resiliency (PFR) hardware Root of Trust</li> </ul> | <ul style="list-style-type: none"> <li>• Common management tools with prior generation</li> <li>• The server offers electronic and physical security features</li> <li>• Platform Firmware Resiliency is an advanced security solution with a silicon-based to guard against corruption and unauthorized firmware updates</li> </ul> |
| Power Supply            | <ul style="list-style-type: none"> <li>• Choice of 1x fixed power supply or 2x hot-swap power supplies</li> <li>• 250W fixed power supply or 550W hot-swap power supply</li> </ul>                                                                                             | <ul style="list-style-type: none"> <li>• Choice of 1x fixed power supply or 2x hot-swap power supplies</li> <li>• 250W or 300W fixed power supplies, or 550W hot-swap power supply</li> </ul>                                                                                                                                                       | <ul style="list-style-type: none"> <li>• Choice of 1x fixed power supply or 2x hot-swap power supplies</li> <li>• 300W or 500W fixed power supplies, or 800W hot-swap power supply</li> </ul>                                                                                                                                                       | <ul style="list-style-type: none"> <li>• Select the power supply that best suits the configuration to maximize efficiency</li> </ul>                                                                                                                                                                                                 |

## Components and connectors

The following figure shows the front of the server.

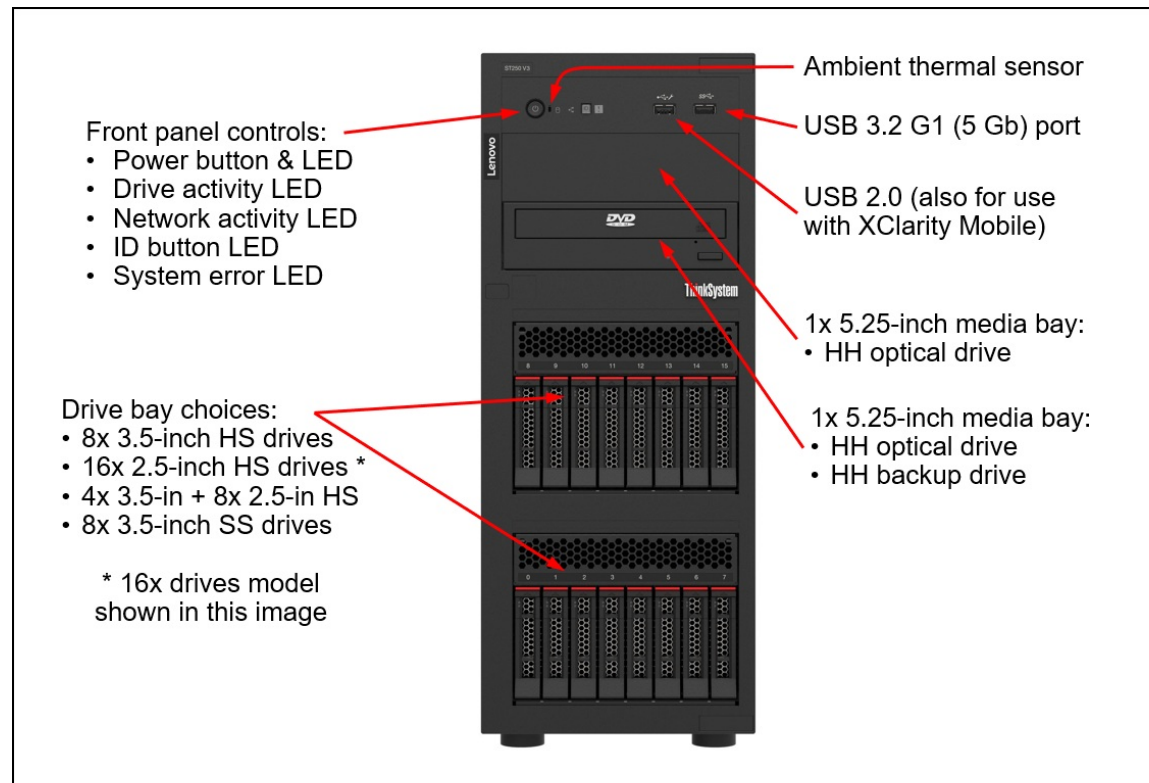


Figure 2. Front view of the ThinkSystem ST250 V3 server

The following figure shows the rear of the server.

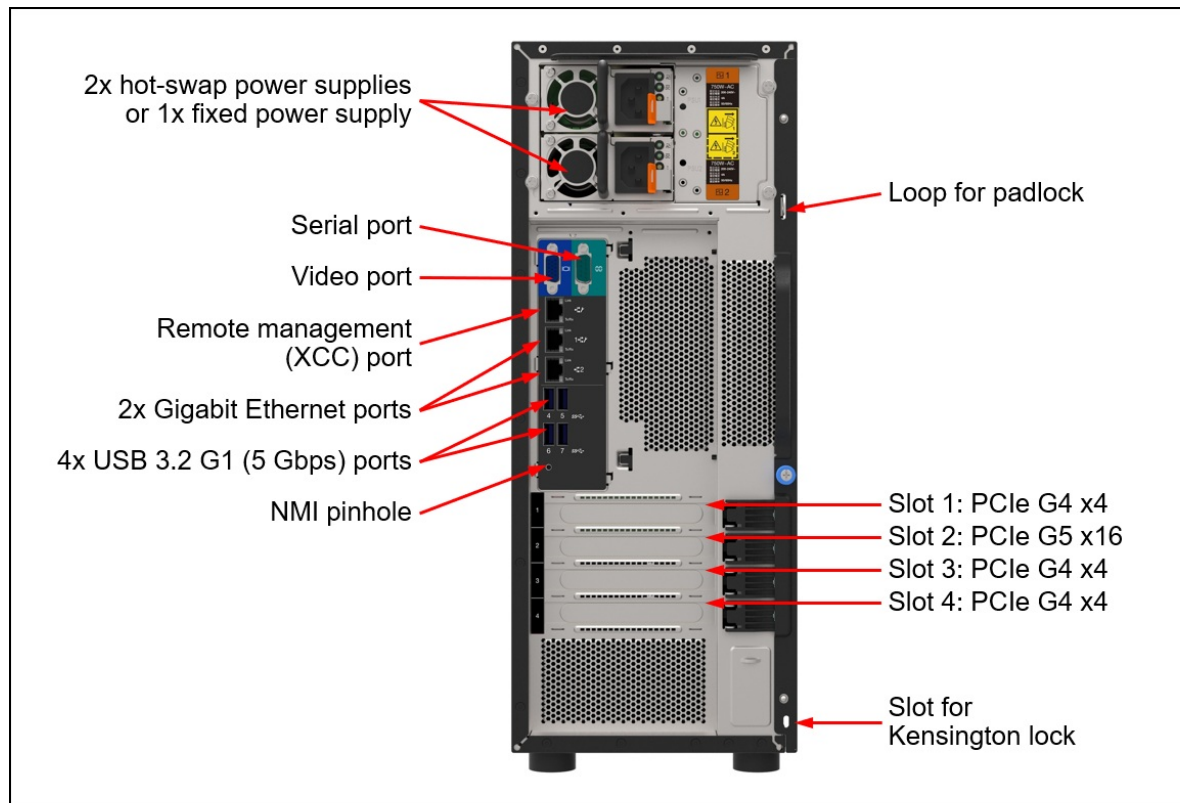


Figure 3. Rear view of the ThinkSystem ST250 V3 server

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

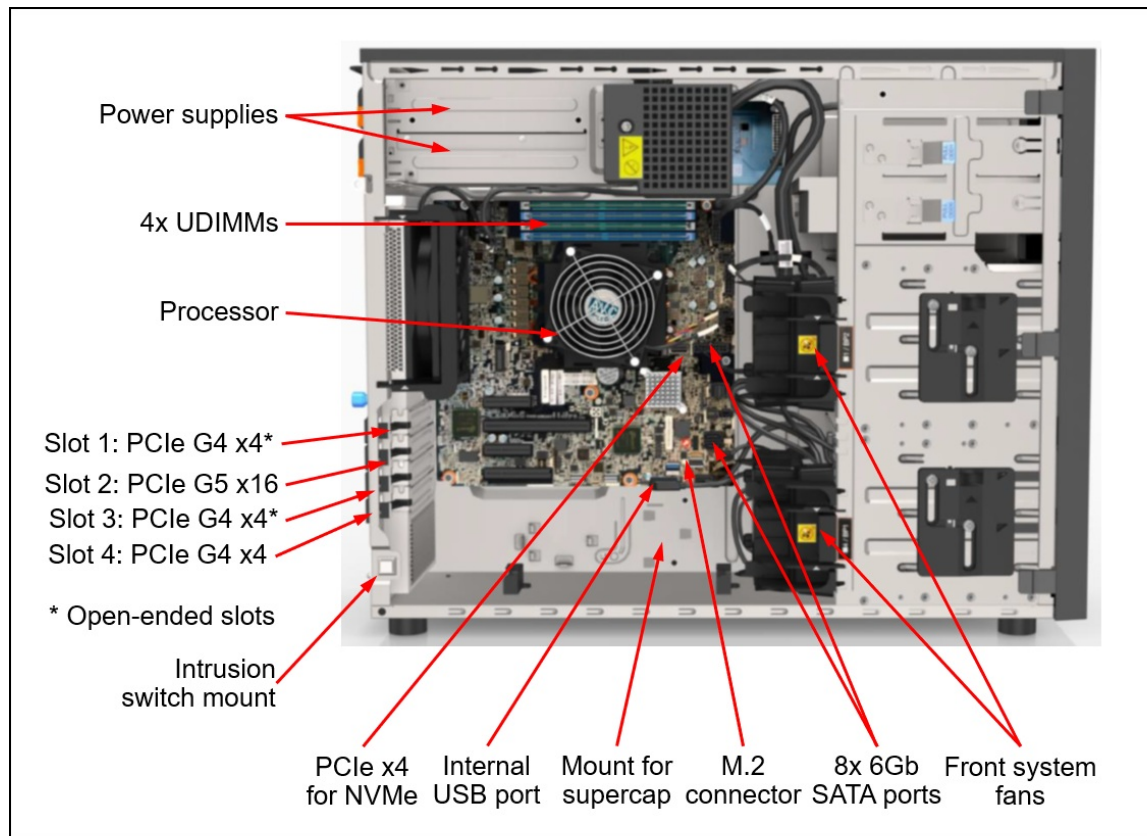


Figure 4. Internal view of the ThinkSystem ST250 V3 server

## System architecture

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

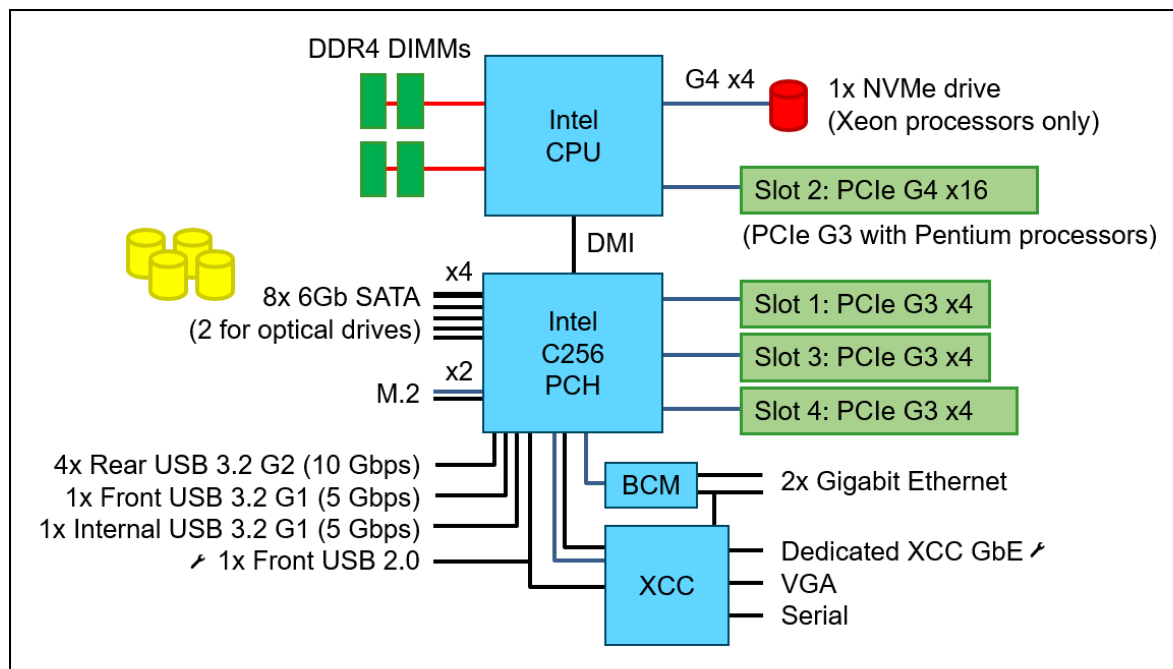


Figure 5. ST250 V3 system architectural block diagram

## Standard specifications

The following table lists the standard specifications.

Table 2. Standard specifications

| Components        | Specification                                                                                                                                                                                                                                                                                            |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Machine type      | 7DCF - 1 year warranty<br>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: <ul style="list-style-type: none"> <li>Intel Xeon E-2400 Series processors ("Raptor Lake-E") up to 8 cores, with core speeds up to 3.5 GHz</li> <li>Intel Pentium G7400 and G7400T processors ("Alder Lake-R") with 2 cores, with core speeds up to 3.7 GHz</li> </ul> |
| 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)                                                                                                                                                                                                                                                                              |

| Components               | Specification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Disk drive bays          | <p>Available configurations:</p> <ul style="list-style-type: none"> <li>• 8x or 16x 2.5-inch SAS/SATA hot-swap drive bays</li> <li>• 4x or 8x 3.5-inch SAS/SATA hot-swap drive bays</li> <li>• Both 4x 3.5-inch and 8x 2.5-inch SAS/SATA hot-swap drive bays</li> <li>• Up to 8x 3.5-inch simple-swap SATA drive bays</li> <li>• 6x 3.5-inch simple-swap SATA drive bays + 2x 3.5-inch simple-swap NVMe drive bay</li> </ul> <p>In addition, the ST250 V3 supports two M.2 drives installed in an M.2 adapter which is installed in PCIe slot.</p>                                                      |
| Maximum internal storage | <ul style="list-style-type: none"> <li>• 2.5-inch drives: <ul style="list-style-type: none"> <li>◦ 122.88TB using 16x 7.68TB 2.5-inch SATA SSDs</li> <li>◦ 38.4TB using 16x 2.4TB 2.5-inch HS HDDs</li> </ul> </li> <li>• 3.5-inch drives: <ul style="list-style-type: none"> <li>◦ 176TB using 8x 22TB 3.5-inch SAS HS HDDs</li> <li>◦ 61.4TB using 8x 7.68TB 3.5-inch SATA HS SSDs</li> </ul> </li> <li>• Intermix of SAS and SATA is supported.</li> </ul>                                                                                                                                           |
| Storage controller       | <ul style="list-style-type: none"> <li>• Onboard 6 Gb SATA for simple-swap drive configurations, using Intel VROC SATA RAID, supporting RAID 0, 1, 10, 5, 50</li> <li>• 12 Gb SAS/SATA RAID adapters</li> <li>• 12 Gb SAS/SATA host bus adapters</li> </ul>                                                                                                                                                                                                                                                                                                                                             |
| Optical drive bays       | Two half-height 5.25-inch bays for optical or tape drives. Supports SATA DVD-ROM or DVD-RW (multiburner). <b>Note:</b> 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 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      | <p>Four PCIe slots (1x PCIe 5.0, 3x PCIe 4.0) as follows:</p> <ul style="list-style-type: none"> <li>• Slot 1: PCIe G4 x4 (x4 slot, open-ended) 25W full-height half-length</li> <li>• Slot 2: PCIe G5 x16 (x16 slot, closed-ended) 75W full-height half-length</li> <li>• Slot 3: PCIe G4 x4 (x4 slot, open-ended) 25W full-height half-length</li> <li>• Slot 4: PCIe G4 x4 (x8 slot, closed-ended) 25W full-height half-length</li> </ul>                                                                                                                                                            |
| Ports                    | <ul style="list-style-type: none"> <li>• Front: <ul style="list-style-type: none"> <li>◦ One USB 3.2 G1 (5 Gb/s) port</li> <li>◦ One USB 2.0 port (also for XClarity Mobile connectivity for local systems management)</li> </ul> </li> <li>• Rear: <ul style="list-style-type: none"> <li>◦ Four USB 3.2 G2 (5 Gb/s) ports</li> <li>◦ One VGA video</li> <li>◦ One RJ-45 systems management</li> <li>◦ Two RJ-45 GbE network ports</li> <li>◦ One serial port</li> </ul> </li> <li>• Internal: <ul style="list-style-type: none"> <li>◦ One internal USB 3.0 port for RDX drive</li> </ul> </li> </ul> |
| 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.                                                                                                                                                                                                                                                                                                                                                                      |

| Components                  | Specification                                                                                                                                                                                                                                                                                                                             |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power supply                | Model dependent choices <ul style="list-style-type: none"> <li>One fixed 300W power supply: 80 PLUS Platinum certified, ErP Lot 9 compliant</li> <li>One fixed 500W power supply: 80 PLUS Gold certified</li> <li>Two hot-swap 800W redundant power supplies, 80 PLUS Platinum certified, Energy Star and ErP Lot 9 compliant.</li> </ul> |
| 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 <a href="#">Operating systems</a> 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 <a href="#">Physical and electrical specifications</a> for details.                                                                                                                                                                            |
| 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)

## 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 warranty |
| 7DCFCTO1WW         | ThinkSystem ST250 V3 – 1-year 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 models, grouped by region.

- [Models for Asia Pacific region](#)
- [Models for Australia and New Zealand](#)
- [Models for Brazil](#)
- [Models for EMEA countries](#)
- [Models for Latin American countries \(except Brazil\)](#)

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 | XCC  | Sec. door | Intru. sw. |
|------------------------------------------------------------|---------------------------|---------|-------------|-------------------------|-------------|-----|--------------|----------|------|-----------|------------|
| Standard models with a 3-year warranty (machine type 7DCE) |                           |         |             |                         |             |     |              |          |      |           |            |
| 7DCEA007AP                                                 | Xeon E-2436 6C 65W 2.9GHz | 1x 16GB | 9350-8i     | 4x 3.5-in HS / Open bay | Opt         | Opt | 500W fixed   | No       | XCC2 | Opt       | Opt        |
| 7DCEA009AP                                                 | Xeon E-2434 4C 55W 3.4GHz | 1x 16GB | 9350-8i     | 4x 3.5-in HS / Open bay | Opt         | Opt | 500W fixed   | No       | XCC2 | Opt       | Opt        |
| 7DCEA006AP                                                 | Xeon E-2414 4C 55W 2.8GHz | 1x 16GB | 9350-8i     | 4x 3.5-in HS / Open bay | Opt         | Opt | 500W fixed   | No       | XCC2 | Opt       | Opt        |
| 7DCEA008AP                                                 | Xeon E-2434 4C 55W 3.4GHz | 1x 16GB | 9350-8i     | 8x 2.5-in HS / Open bay | Opt         | Opt | 1x 800W HS   | No       | XCC2 | Opt       | Opt        |
| 7DCEA00AAP                                                 | Xeon E-2414 4C 55W 2.8GHz | 1x 16GB | 9350-8i     | 8x 2.5-in HS / Open bay | Opt         | Opt | 1x 800W HS   | No       | XCC2 | Opt       | Opt        |
| 7DCEA005AP                                                 | Xeon E-2436 6C 65W 2.9GHz | 1x 16GB | 9350-8i     | 8x 2.5-in HS / Open bay | Opt         | Opt | 1x 800W HS   | No       | XCC2 | 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<br>Drives                   | Add'l<br>Cards | DVD  | Power<br>supply  | Pwr<br>cord | XCC  | Sec.<br>door | Intru.<br>sw. |
|----------------------------------------------------------|---------------------------------|------------|-------------------------|----------------------------------------|----------------|------|------------------|-------------|------|--------------|---------------|
| Standard models with a 3-year model (machine type 7DCE)  |                                 |            |                         |                                        |                |      |                  |             |      |              |               |
| 7DCEA012AU                                               | Xeon E-2468<br>8C 65W<br>2.6GHz | 1x<br>32GB | 5350-8i                 | 8x 2.5-in HS / 3x<br>960GB<br>SATA HDD | 1x<br>4x1Gb    | No   | 1x<br>800W<br>HS | Yes         | XCC2 | Opt          | Opt           |
| 7DCEA014AU                                               | Xeon E-2468<br>8C 65W<br>2.6GHz | 1x<br>32GB | 5350-8i                 | 4x 3.5-in HS / 3x<br>12TB SAS HDD      | 1x<br>4x1Gb    | Open | 1x<br>800W<br>HS | Yes         | XCC2 | Opt          | Opt           |
| 7DCEA01BAU                                               | Xeon E-2414<br>4C 55W<br>2.8GHz | 1x<br>16GB | OB<br>SATA/SW<br>RAID** | 8x 2.5-in HS /<br>Open bay             | Opt            | No   | 1x<br>800W<br>HS | Yes         | XCC2 | Opt          | Opt           |
| TopSeller models with a 3-year model (machine type 7DCE) |                                 |            |                         |                                        |                |      |                  |             |      |              |               |
| 7DCEA013AU                                               | Xeon E-2478<br>8C 80W<br>2.8GHz | 1x<br>16GB | OB<br>SATA/SW<br>RAID** | 4x 3.5-in HS /<br>Open bay             | Opt            | Open | 1x<br>800W<br>HS | Yes         | XCC2 | Opt          | Opt           |
| 7DCEA01AAU                                               | Xeon E-2456<br>6C 80W<br>3.2GHz | 1x<br>16GB | OB<br>SATA/SW<br>RAID** | 8x 2.5-in HS /<br>Open bay             | Opt            | No   | 1x<br>800W<br>HS | Yes         | XCC2 | Opt          | Opt           |
| 7DCEA01DAU                                               | Xeon E-2478<br>8C 80W<br>2.8GHz | 1x<br>16GB | OB<br>SATA/SW<br>RAID** | 8x 2.5-in HS /<br>Open bay             | Opt            | No   | 1x<br>800W<br>HS | Yes         | XCC2 | Opt          | Opt           |
| 7DCEA01GAU                                               | Xeon E-2434<br>4C 55W<br>3.4GHz | 1x<br>16GB | OB<br>SATA/SW<br>RAID** | 8x 2.5-in HS /<br>Open bay             | Opt            | No   | 1x<br>800W<br>HS | Yes         | XCC2 | Opt          | Opt           |
| 7DCEA01CAU                                               | Xeon E-2488<br>8C 95W<br>3.2GHz | 1x<br>16GB | OB<br>SATA/SW<br>RAID** | 8x 2.5-in HS /<br>Open bay             | Opt            | No   | 1x<br>800W<br>HS | Yes         | XCC2 | 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 | XCC  | Sec. door | Intru. sw. |
|-----------------------------------------------------------|---------------------------|---------|-------------------|-------------------------|-------------|------|---------------|----------|------|-----------|------------|
| TopSeller models with 3-year warranty (machine type 7DCE) |                           |         |                   |                         |             |      |               |          |      |           |            |
| 7DCEA015BR                                                | Xeon E-2436 6C 65W 2.9GHz | 1x 16GB | 5350-8i           | 8x 2.5-in HS / Open bay | 1x 4x1Gb    | No   | 2x 800W HS    | Yes      | XCC2 | Opt       | Opt        |
| 7DCEA01EBR                                                | Xeon E-2468 8C 65W 2.6GHz | 1x 32GB | 5350-8i           | 4x 3.5-in HS / Open bay | 1x 4x1Gb    | Open | 2x 800W HS    | Yes      | XCC2 | Opt       | Opt        |
| 7DCEA018BR                                                | Xeon E-2414 4C 55W 2.8GHz | 1x 16GB | OB SATA/SW RAID** | 8x 2.5-in HS / Open bay | 1x 4x1Gb    | No   | 1x 500W fixed | Yes      | XCC2 | Opt       | Opt        |
| 7DCEA016BR                                                | Xeon E-2414 4C 55W 2.8GHz | 1x 16GB | OB SATA/SW RAID** | 4x 3.5-in HS / Open bay | 1x 4x1Gb    | Open | 1x 500W fixed | Yes      | XCC2 | 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 EMEA countries

Table 8. Models for EMEA countries

| Model                                                    | Intel processors†         | Memory  | Drive Contr       | Drive bays Drives       | Add'l Cards | DVD  | Power supply  | Pwr cord | XCC   | Sec. door | Intru. sw. |
|----------------------------------------------------------|---------------------------|---------|-------------------|-------------------------|-------------|------|---------------|----------|-------|-----------|------------|
| Standard models with 3-year warranty (machine type 7DCE) |                           |         |                   |                         |             |      |               |          |       |           |            |
| 7DCEA00EEA                                               | Xeon E-2434 4C 55W 3.4GHz | 1x 16GB | OB SATA/SW RAID** | 8x 2.5-in HS / Open bay | Opt         | Open | 1x 500W fixed | Yes      | Plati | Opt       | Yes        |
| 7DCEA00JEA                                               | Xeon E-2434 4C 55W 3.4GHz | 1x 16GB | OB SATA/SW RAID** | 4x 3.5-in SS / Open bay | Opt         | Open | 1x 500W fixed | Yes      | Plati | Opt       | Yes        |
| 7DCEA00TEA                                               | Xeon E-2436 6C 65W 2.9GHz | 1x 16GB | OB SATA/SW RAID** | 4x 3.5-in SS / Open bay | Opt         | Open | 1x 500W fixed | Yes      | Plati | Opt       | Yes        |
| 7DCEA00YEA                                               | Xeon E-2456 6C 80W 3.2GHz | 1x 32GB | OB SATA/SW RAID** | 4x 3.5-in SS / Open bay | Opt         | Open | 1x 500W fixed | Yes      | Plati | Opt       | Yes        |
| 7DCEA00PEA                                               | Xeon E-2414 4C 55W 2.8GHz | 1x 16GB | OB SATA/SW RAID** | 8x 2.5-in HS / Open bay | Opt         | Open | 1x 500W fixed | Yes      | Plati | Opt       | Yes        |
| 7DCEA00CEA                                               | Xeon E-2456 6C 80W 3.2GHz | 1x 16GB | OB SATA/SW RAID** | 8x 2.5-in HS / Open bay | Opt         | Open | 1x 500W fixed | Yes      | Plati | Opt       | Yes        |
| 7DCEA00DEA                                               | Xeon E-2414 4C 55W 2.8GHz | 1x 16GB | 5350-8i           | 8x 2.5-in HS / Open bay | Opt         | Open | 1x 800W HS    | Yes      | Plati | Opt       | Yes        |
| 7DCEA00MEA                                               | Xeon E-2434 4C 55W 3.4GHz | 1x 16GB | 5350-8i           | 8x 2.5-in HS / Open bay | Opt         | Open | 1x 800W HS    | Yes      | Plati | Opt       | Yes        |

| Model      | Intel processors†         | Memory  | Drive Contr       | Drive bays Drives       | Add'l Cards | DVD  | Power supply  | Pwr cord | XCC   | Sec. door | Intru. sw. |
|------------|---------------------------|---------|-------------------|-------------------------|-------------|------|---------------|----------|-------|-----------|------------|
| 7DCEA00KEA | Xeon E-2436 6C 65W 2.9GHz | 1x 16GB | 5350-8i           | 8x 2.5-in HS / Open bay | Opt         | Open | 1x 800W HS    | Yes      | Plati | Opt       | Yes        |
| 7DCEA00XEA | Xeon E-2456 6C 80W 3.2GHz | 1x 16GB | 5350-8i           | 8x 2.5-in HS / Open bay | Opt         | Open | 1x 800W HS    | Yes      | Plati | Opt       | Yes        |
| 7DCEA00HEA | Xeon E-2468 8C 65W 2.6GHz | 1x 16GB | 5350-8i           | 8x 2.5-in HS / Open bay | Opt         | Open | 1x 800W HS    | Yes      | Plati | Opt       | Yes        |
| 7DCEA00REA | Xeon E-2478 8C 80W 2.8GHz | 1x 16GB | 5350-8i           | 8x 2.5-in HS / Open bay | Opt         | Open | 1x 800W HS    | Yes      | Plati | Opt       | Yes        |
| 7DCEA00FEA | Xeon E-2488 8C 95W 3.2GHz | 1x 16GB | 5350-8i           | 8x 2.5-in HS / Open bay | Opt         | Open | 1x 800W HS    | Yes      | Plati | Opt       | Yes        |
| 7DCEA00SEA | Xeon E-2456 6C 80W 3.2GHz | 1x 32GB | 5350-8i           | 8x 2.5-in HS / Open bay | Opt         | Open | 1x 800W HS    | Yes      | Plati | Opt       | Yes        |
| 7DCEA00GEA | Xeon E-2478 8C 80W 2.8GHz | 1x 32GB | 5350-8i           | 8x 2.5-in HS / Open bay | Opt         | Open | 1x 800W HS    | Yes      | Plati | Opt       | Yes        |
| 7DCEA00WEA | Xeon E-2414 4C 55W 2.8GHz | 1x 16GB | OB SATA/SW RAID** | 4x 3.5-in SS / Open bay | Opt         | Open | 1x 500W fixed | Yes      | Plati | Opt       | Yes        |
| 7DCEA00QEA | Xeon E-2414 4C 55W 2.8GHz | 1x 16GB | OB SATA/SW RAID** | 8x 2.5-in HS / Open bay | Opt         | Open | 1x 800W HS    | Yes      | Plati | Opt       | Yes        |
| 7DCEA00BEA | Xeon E-2434 4C 55W 3.4GHz | 1x 16GB | OB SATA/SW RAID** | 8x 2.5-in HS / Open bay | Opt         | Open | 1x 800W HS    | Yes      | Plati | Opt       | Yes        |
| 7DCEA00NEA | Xeon E-2436 6C 65W 2.9GHz | 1x 16GB | OB SATA/SW RAID** | 8x 2.5-in HS / Open ba  | Opt         | Open | 1x 800W HS    | Yes      | Plati | Opt       | Yes        |
| 7DCEA00LEA | Xeon E-2456 6C 80W 3.2GHz | 1x 32GB | 5350-8i           | 4x 3.5-in SS / Open bay | Opt         | Open | 1x 800W HS    | Yes      | Plati | Opt       | Yes        |
| 7DCEA00VEA | Xeon E-2488 8C 95W 3.2GHz | 1x 32GB | 5350-8i           | 8x 2.5-in HS / Open bay | Opt         | Open | 1x 800W HS    | Yes      | Plati | Opt       | Yes        |
| 7DCEA00UEA | Xeon E-2436 6C 65W 2.9GHz | 1x 32GB | 5350-8i           | 4x 3.5-in SS / Open bay | Opt         | Open | 1x 800W HS    | Yes      | Plati | 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 9. Models for the Latin America market (excludes Brazil)

| Model                                                    | Intel processors†               | Memory     | Drive Contr             | Drive bays<br>Drives          | Additional<br>Cards | DVD  | Power<br>supply     | Pwr<br>cord | XCC  | Sec.<br>door | Intru.<br>sw. |
|----------------------------------------------------------|---------------------------------|------------|-------------------------|-------------------------------|---------------------|------|---------------------|-------------|------|--------------|---------------|
| Standard models with 3-year warranty (machine type 7DCE) |                                 |            |                         |                               |                     |      |                     |             |      |              |               |
| 7DCEA010LA                                               | Xeon E-2468<br>8C 65W<br>2.6GHz | 1x<br>32GB | 5350-8i                 | 4x 3.5-in<br>HS / Open<br>bay | 1x 4x1Gb            | Open | 1x 500W<br>fixed    | Yes         | XCC2 | Opt          | Opt           |
| 7DCEA011LA                                               | Xeon E-2436<br>6C 65W<br>2.9GHz | 1x<br>32GB | 5350-8i                 | 4x 3.5-in<br>HS / Open<br>bay | 1x 4x1Gb            | Open | 1x 500W<br>fixed    | Yes         | XCC2 | Opt          | Opt           |
| 7DCEA01HLA                                               | Xeon E-2436<br>6C 65W<br>2.9GHz | 1x<br>32GB | 5350-8i                 | 8x 2.5-in<br>HS / Open<br>bay | 1x 4x1Gb            | Open | 2x<br>800W<br>HS    | Yes         | XCC2 | Opt          | Opt           |
| 7DCEA019LA                                               | Xeon E-2468<br>8C 65W<br>2.6GHz | 1x<br>32GB | 5350-8i                 | 8x 2.5-in<br>HS / Open<br>bay | 1x 4x1Gb            | Open | 2x<br>800W<br>HS    | Yes         | XCC2 | Opt          | Opt           |
| 7DCEA00ZLA                                               | Xeon E-2414<br>4C 55W<br>2.8GHz | 1x<br>16GB | OB<br>SATA/SW<br>RAID** | 4x 3.5-in<br>HS / Open<br>bay | 1x 4x1Gb            | Open | 1x<br>500W<br>fixed | Yes         | XCC2 | Opt          | Opt           |
| 7DCEA017LA                                               | Xeon E-2414<br>4C 55W<br>2.8GHz | 1x<br>16GB | OB<br>SATA/SW<br>RAID** | 8x 2.5-in<br>HS / Open<br>bay | 1x 4x1Gb            | Open | 1x<br>500W<br>fixed | Yes         | XCC2 | Opt          | Opt           |
| 7DCEA01FLA                                               | Xeon E-2436<br>6C 65W<br>2.9GHz | 1x<br>32GB | 5350-8i                 | 8x 2.5-in<br>HS / Open<br>bay | 1x 4x1Gb            | Open | 1x<br>800W<br>HS    | Yes         | XCC2 | 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](#)

## Processors

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

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

All supported processors have the following characteristics:

- LGA 1700 socket
- 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 E-2400: Up to 4800 MHz memory speed
  - Pentium: Up to 4800 MHz memory speed
- PCIe lanes:
  - 16 lanes PCIe 5.0 + 4 lanes PCIe 4.0

The following table lists the supported processors.

**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 10. Supported processors

| Feature code                    | Intel model | TDP  | Cores | Core speed | Cache | Max memory speed |
|---------------------------------|-------------|------|-------|------------|-------|------------------|
| <b>Intel Pentium processors</b> |             |      |       |            |       |                  |
| BWM7                            | G7400T      | 35 W | 2     | 3.1 GHz    | 6 MB  | 4800 MHz         |
| BWM8                            | G7400       | 46 W | 2     | 3.7 GHz    | 6 MB  | 4800 MHz         |
| <b>Intel Xeon E processors</b>  |             |      |       |            |       |                  |
| BXJZ                            | E-2414      | 55 W | 4     | 2.6 GHz    | 8 MB  | 4800 MHz         |
| BWMA                            | E-2434      | 55 W | 4     | 3.4 GHz    | 8 MB  | 4800 MHz         |
| BWMB                            | E-2436      | 65 W | 6     | 2.9 GHz    | 12 MB | 4800 MHz         |
| BWMC                            | E-2456      | 80 W | 6     | 3.3 GHz    | 12 MB | 4800 MHz         |
| BWMD                            | E-2468      | 65 W | 8     | 2.6 GHz    | 16 MB | 4800 MHz         |
| BWME                            | E-2478      | 80 W | 8     | 2.8 GHz    | 16 MB | 4800 MHz         |
| BWLS                            | E-2486      | 95 W | 6     | 3.5 GHz    | 12 MB | 4800 MHz         |
| BWMF                            | E-2488      | 95 W | 8     | 3.2 GHz    | 16 MB | 4800 MHz         |

## 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.

Table 11. UEFI operating mode presets in DCSC

| Feature code | Description                                                            |
|--------------|------------------------------------------------------------------------|
| BFYB         | Operating mode selection for: "Maximum Performance Mode"               |
| BFYE         | Operating mode selection for: "Efficiency - Favoring Performance Mode" |

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.
- **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 options

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 or 4 DIMMs. 3 installed DIMMs is not supported. 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 DIMMs: 4400 MHz
  - 4 single-rank (1R) DIMMs: 4000 MHz
  - 4 dual-rank (2R) DIMMs: 3600 MHz

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

Table 12. Tatlow memory section

| Part number | Feature code | Description                                       | Maximum supported |
|-------------|--------------|---------------------------------------------------|-------------------|
| 4X77A88511  | BWLK         | ThinkSystem 16GB TruDDR5 4800MHz (1Rx8) ECC UDIMM | 4                 |
| 4X77A88512  | BWLJ         | ThinkSystem 32GB TruDDR5 4800MHz (2Rx8) ECC UDIMM | 4                 |

The following rules apply when selecting the memory configuration:

- The server only supports UDIMMs
- Quantities of 1, 2 or 4 DIMMs are supported. 3 DIMMs is not 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.

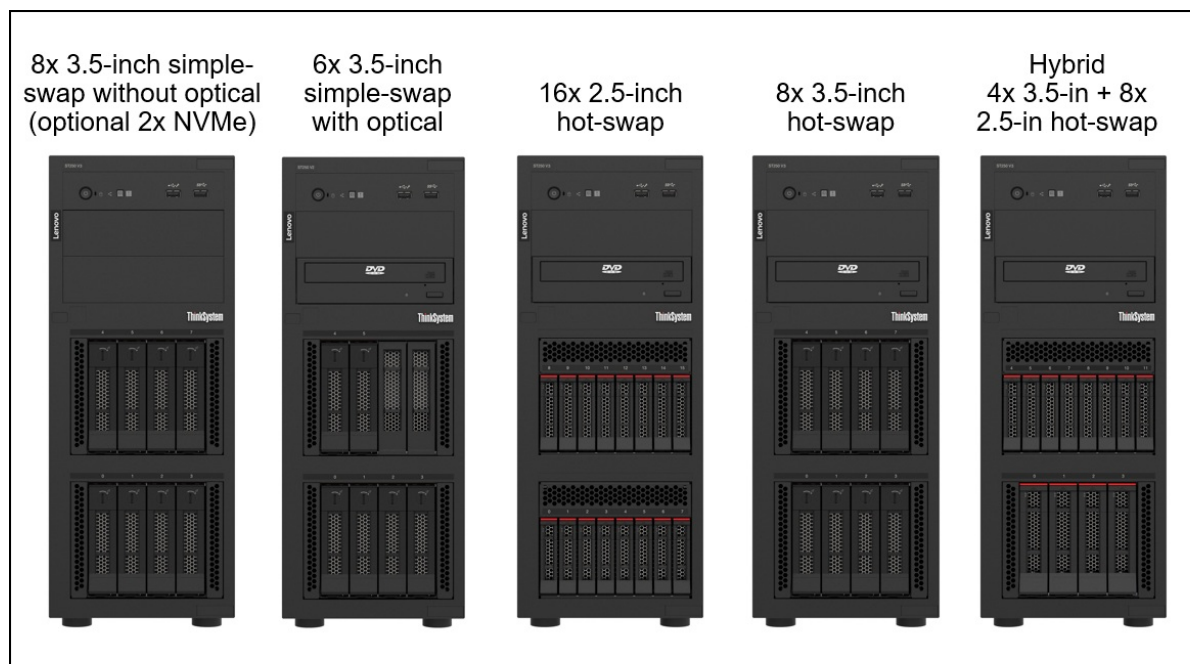


Figure 6. Internal drive bay configurations

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 13. Backplanes for CTO orders

| Feature code | Description                                                      | Maximum supported | Purpose                                                                       |
|--------------|------------------------------------------------------------------|-------------------|-------------------------------------------------------------------------------|
| B41E         | ThinkSystem ST250 V2 2.5" SATA/SAS 8-Bay Backplane Kit           | 2                 | 2.5-inch hot-swap backplane                                                   |
| B41D         | ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay Backplane Kit           | 2                 | 3.5-inch hot-swap backplane                                                   |
| BN14         | ThinkSystem ST250 3.5" SS Bracket Plate Kit for HDD No. 0-3 v2   | 1                 | Lower simple-swap backplane with 4 drives                                     |
| BMPZ         | ThinkSystem ST250 4x3.5" SS Bracket Plate Kit for HDD No. 4-5 v2 | 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 | 1                 | Upper simple-swap backplane with 4 drives                                     |
| BWLW         | MB 4xSATA + slimLinux8 + MF2x8 to 2xHDD + 2xNVMe/HDD             | 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 14. Storage configurations

| Cfg  | Description                                   | Base     | Drive tray  | Drive support | ODD support | 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 15. 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 | <ul style="list-style-type: none"> <li>4XF7A81459, ThinkSystem ST250 Series 4x3.5" Simple Swap Backplane Kit</li> </ul>                                                                                                   |
| 1                      | 4x 3.5" SS SATA to OB SATA             | 3                    | 6x 3.5" SS SATA + 2x NVMe to OB SATA   | <ul style="list-style-type: none"> <li>4Z57A89309, ThinkSystem ST250 V3 6x3.5" Simple Swap SATA + 2x3.5" Simple Swap NVMe Backplane Kit</li> </ul>                                                                        |
| 1                      | 4x 3.5" SS SATA to OB SATA             | 4                    | 6x 3.5" SS to OB SATA with ODD         | <ul style="list-style-type: none"> <li>4XF7A81459, ThinkSystem ST250 Series 4x3.5" Simple Swap Backplane Kit</li> </ul>                                                                                                   |
| 1                      | 4x 3.5" SS SATA to OB SATA             | 5                    | 4x 3.5" HS to OB SATA                  | <ul style="list-style-type: none"> <li>4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                             |
| 1                      | 4x 3.5" SS SATA to OB SATA             | 6                    | 4x 3.5" HS to HW RAID                  | <ul style="list-style-type: none"> <li>4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                             |
| 1                      | 4x 3.5" SS SATA to OB SATA             | 7                    | 8x 3.5" HS to OB SATA                  | <ul style="list-style-type: none"> <li>2x 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                          |
| 1                      | 4x 3.5" SS SATA to OB SATA             | 8                    | 8x 3.5" HS to HW RAID                  | <ul style="list-style-type: none"> <li>2x 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                          |
| 1                      | 4x 3.5" SS SATA to OB SATA             | 12                   | 8x 2.5" HS + 4x 3.5" HS to HW RAID     | <ul style="list-style-type: none"> <li>4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit</li> <li>4XF7A84197, ThinkSystem ST250 Series 8x2.5" Hybrid Hot Swap SAS/SATA Backplane Kit</li> </ul> |
| 2                      | 8x 3.5" SS SATA to OB SATA without ODD | 3                    | 7x 3.5" SS SATA + 1x NVMe to OB SATA   | <ul style="list-style-type: none"> <li>4Z57A89309, ThinkSystem ST250 V3 6x3.5" Simple Swap SATA + 2x3.5" Simple Swap NVMe Backplane Kit</li> </ul>                                                                        |
| 2                      | 8x 3.5" SS SATA to OB SATA without ODD | 4                    | 6x 3.5" SS to OB SATA with ODD         | <ul style="list-style-type: none"> <li>4XF7A81459, ThinkSystem ST250 Series 4x3.5" Simple Swap Backplane Kit</li> </ul>                                                                                                   |
| 2                      | 8x 3.5" SS SATA to OB SATA without ODD | 5                    | 4x 3.5" HS to OB SATA                  | <ul style="list-style-type: none"> <li>4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                             |
| 2                      | 8x 3.5" SS SATA to OB SATA without ODD | 6                    | 4x 3.5" HS to HW RAID                  | <ul style="list-style-type: none"> <li>4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                             |
| 2                      | 8x 3.5" SS SATA to OB SATA without ODD | 7                    | 8x 3.5" HS to OB SATA                  | <ul style="list-style-type: none"> <li>2x 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                          |
| 2                      | 8x 3.5" SS SATA to OB SATA without ODD | 8                    | 8x 3.5" HS to HW RAID                  | <ul style="list-style-type: none"> <li>2x 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                          |
| 2                      | 8x 3.5" SS SATA to OB SATA without ODD | 12                   | 8x 2.5" HS + 4x 3.5" HS to HW RAID     | <ul style="list-style-type: none"> <li>4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit</li> <li>4XF7A84197, ThinkSystem ST250 Series 8x2.5" Hybrid Hot Swap SAS/SATA Backplane Kit</li> </ul> |
| 3                      | 7x 3.5" SS SATA + 1x NVMe to OB SATA   | 4                    | 6x 3.5" SS to OB SATA with ODD         | <ul style="list-style-type: none"> <li>4XF7A81459, ThinkSystem ST250 Series 4x3.5" Simple Swap Backplane Kit</li> </ul>                                                                                                   |
| 3                      | 7x 3.5" SS SATA + 1x NVMe to OB SATA   | 5                    | 4x 3.5" HS to OB SATA                  | <ul style="list-style-type: none"> <li>4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                             |
| 3                      | 7x 3.5" SS SATA + 1x NVMe to OB SATA   | 6                    | 4x 3.5" HS to HW RAID                  | <ul style="list-style-type: none"> <li>4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                             |
| 3                      | 7x 3.5" SS SATA + 1x NVMe to OB SATA   | 7                    | 8x 3.5" HS to OB SATA                  | <ul style="list-style-type: none"> <li>2x 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                          |
| 3                      | 7x 3.5" SS SATA + 1x NVMe to OB SATA   | 8                    | 8x 3.5" HS to HW RAID                  | <ul style="list-style-type: none"> <li>2x 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                          |
| 3                      | 7x 3.5" SS SATA + 1x NVMe to OB SATA   | 12                   | 8x 2.5" HS + 4x 3.5" HS to HW RAID     | <ul style="list-style-type: none"> <li>4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit</li> <li>4XF7A84197, ThinkSystem ST250 Series 8x2.5" Hybrid Hot Swap SAS/SATA Backplane Kit</li> </ul> |
| 4                      | 6x 3.5" SS to OB SATA with ODD         | 5                    | 4x 3.5" HS to OB SATA                  | <ul style="list-style-type: none"> <li>4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                             |
| 4                      | 6x 3.5" SS to OB SATA with ODD         | 6                    | 4x 3.5" HS to HW RAID                  | <ul style="list-style-type: none"> <li>4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                             |

| Starting configuration |                                | Target configuration |                                    | Options needed (Backplanes and cables)                                                                                                                                                                                    |
|------------------------|--------------------------------|----------------------|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4                      | 6x 3.5" SS to OB SATA with ODD | 7                    | 8x 3.5" HS to OB SATA              | <ul style="list-style-type: none"> <li>2x 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                          |
| 4                      | 6x 3.5" SS to OB SATA with ODD | 8                    | 8x 3.5" HS to HW RAID              | <ul style="list-style-type: none"> <li>2x 4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                          |
| 4                      | 6x 3.5" SS to OB SATA with ODD | 12                   | 8x 2.5" HS + 4x 3.5" HS to HW RAID | <ul style="list-style-type: none"> <li>4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit</li> <li>4XF7A84197, ThinkSystem ST250 Series 8x2.5" Hybrid Hot Swap SAS/SATA Backplane Kit</li> </ul> |
| 5                      | 4x 3.5" HS to OB SATA          | 6                    | 4x 3.5" HS to HW RAID              | <ul style="list-style-type: none"> <li>4X97A81466, ThinkSystem ST250 Series RAID Cable Kit</li> </ul>                                                                                                                     |
| 5                      | 4x 3.5" HS to OB SATA          | 7                    | 8x 3.5" HS to OB SATA              | <ul style="list-style-type: none"> <li>4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                             |
| 5                      | 4x 3.5" HS to OB SATA          | 8                    | 8x 3.5" HS to HW RAID              | <ul style="list-style-type: none"> <li>4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                             |
| 5                      | 4x 3.5" HS to OB SATA          | 12                   | 8x 2.5" HS + 4x 3.5" HS to HW RAID | <ul style="list-style-type: none"> <li>4XF7A84197, ThinkSystem ST250 Series 8x2.5" Hybrid Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                      |
| 6                      | 4x 3.5" HS to HW RAID          | 8                    | 8x 3.5" HS to HW RAID              | <ul style="list-style-type: none"> <li>4XF7A81457, ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                             |
| 6                      | 4x 3.5" HS to HW RAID          | 12                   | 8x 2.5" HS + 4x 3.5" HS to HW RAID | <ul style="list-style-type: none"> <li>4XF7A84197, ThinkSystem ST250 Series 8x2.5" Hybrid Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                      |
| 7                      | 8x 3.5" HS to OB SATA          | 8                    | 8x 3.5" HS to HW RAID              | <ul style="list-style-type: none"> <li>4X97A81466, ThinkSystem ST250 Series RAID Cable Kit</li> </ul>                                                                                                                     |
| 7                      | 8x 3.5" HS to OB SATA          | 12                   | 8x 2.5" HS + 4x 3.5" HS to HW RAID | <ul style="list-style-type: none"> <li>4XF7A84197, ThinkSystem ST250 Series 8x2.5" Hybrid Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                      |
| 8                      | 8x 3.5" HS to HW RAID          | 12                   | 8x 2.5" HS + 4x 3.5" HS to HW RAID | <ul style="list-style-type: none"> <li>4XF7A84197, ThinkSystem ST250 Series 8x2.5" Hybrid Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                      |
| 9                      | 8x 2.5" HS to OB SATA          | 10                   | 8x 2.5" HS to HW RAID              | <ul style="list-style-type: none"> <li>4X97A81466, ThinkSystem ST250 Series RAID Cable Kit</li> </ul>                                                                                                                     |
| 9                      | 8x 2.5" HS to OB SATA          | 11                   | 16x 2.5" HS to HW RAID             | <ul style="list-style-type: none"> <li>4XF7A81461, ThinkSystem ST250 Series 8x2.5" Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                             |
| 10                     | 8x 2.5" HS to HW RAID          | 11                   | 16x 2.5" HS to HW RAID             | <ul style="list-style-type: none"> <li>4XF7A81461, ThinkSystem ST250 Series 8x2.5" Hot Swap SAS/SATA Backplane Kit</li> </ul>                                                                                             |

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

Table 16. Upgrade options table

| Part number    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Backplane kits |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 4XF7A81461     | <p>ThinkSystem ST250 Series 8x2.5" Hot Swap SAS/SATA Backplane Kit</p> <ul style="list-style-type: none"> <li>• 1x 8x2.5" SATA/SAS hot-swap backplane</li> <li>• 1x cage assembly</li> <li>• 10x signal and power cables</li> <li>• 8x 2.5" drive bay fillers</li> <li>• 1x front fan and cable</li> <li>• 2x supercap holders (adapter-specific)</li> </ul>                                                                                                 |
| 4XF7A84197     | <p>ThinkSystem ST250 Series 8x2.5" Hybrid Hot Swap SAS/SATA Backplane Kit (for hybrid 2.5" + 3.5" configuration)</p> <ul style="list-style-type: none"> <li>• 1x 8x2.5" SATA/SAS hot-swap backplane</li> <li>• 1x 8x2.5" cage assembly for a hybrid 2.5" + 3.5" configuration</li> <li>• 10x signal and power cables</li> <li>• 8x 2.5" drive bay fillers</li> <li>• 1x front fan and cable</li> <li>• 2x supercap holders (adapter-specific)</li> </ul>     |
| 4XF7A81457     | <p>ThinkSystem ST250 Series 4x3.5" Hot Swap SAS/SATA Backplane Kit</p> <ul style="list-style-type: none"> <li>• 1x 4x3.5" SATA/SAS hot-swap backplane</li> <li>• 1x cage assembly</li> <li>• 8x signal and power cables</li> <li>• 4x 3.5" drive bay fillers</li> <li>• 1x front fan and cable</li> <li>• 2x supercap holders (adapter-specific)</li> </ul>                                                                                                  |
| 4XF7A81459     | <p>ThinkSystem ST250 Series 4x3.5" Simple Swap Backplane Kit</p> <ul style="list-style-type: none"> <li>• Upper simple-swap backplane + cable with 2 SATA connections (use with optical drive)</li> <li>• Upper simple-swap backplane + cable with 4 SATA connections</li> <li>• 1x cage assembly for 8x 3.5" drive bays</li> <li>• 8x 3.5" drive bay fillers</li> <li>• 1x front fan and cable</li> <li>• 2x supercap holders (adapter-specific)</li> </ul> |
| 4Z57A89309     | <p>ThinkSystem ST250 V3 6x3.5" Simple Swap SATA + 2x3.5" Simple Swap NVMe Backplane Kit</p> <ul style="list-style-type: none"> <li>• Upper simple-swap backplane + cable with 3 SATA + 2 NVMe connections</li> <li>• 1x cage assembly for 8x 3.5" drive bays</li> <li>• 8x 3.5" drive bay fillers</li> <li>• 1x front fan and cable</li> </ul>                                                                                                               |
| Cable kits     |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 4X97A81466     | <p>ThinkSystem ST250 Series RAID Cable Kit</p> <ul style="list-style-type: none"> <li>• 6x signal cables for upper &amp; lower cage connections (adapter-specific cables)</li> <li>• 2x supercap holders (adapter-specific)</li> </ul>                                                                                                                                                                                                                       |

## 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 17. 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.

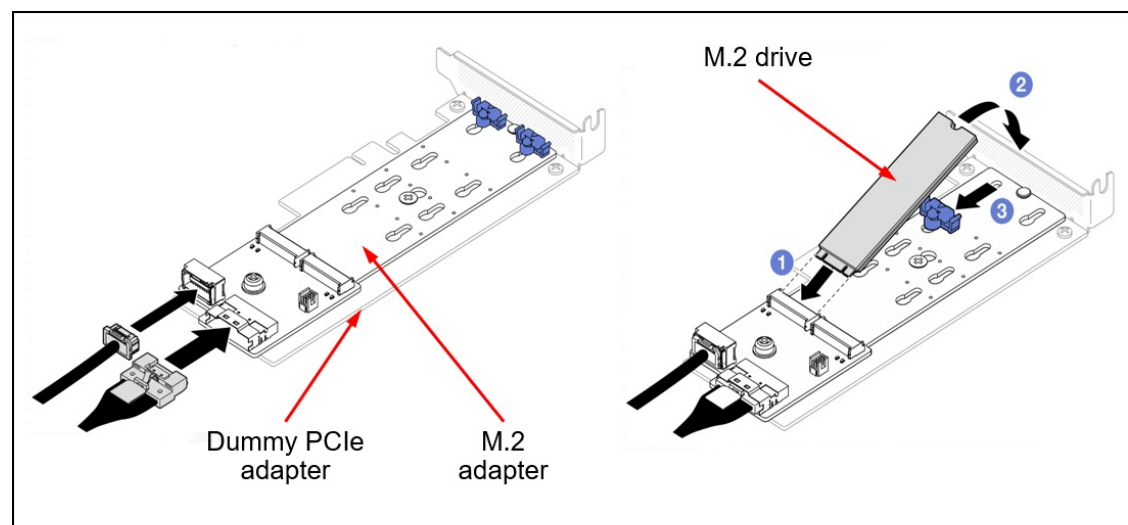


Figure 7. M.2 adapter (BM8X) with an M.2 drive installed in a PCIe slot

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 18. M.2 adapter for ST250 V3

| Part number | Feature code | Description                                                                                                                                                                                                                                                                                   | Maximum supported | Slots supported |
|-------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|
| CTO only    | BM8X         | ThinkSystem M.2 SATA/NVMe 2-Bay Enablement Adapter <ul style="list-style-type: none"> <li>• M.2 SATA/x4 NVMe 2-Bay Enablement Kit, BM8X</li> <li>• ThinkSystem ST250 Series Dummy PCIe Card, BMTU</li> <li>• M.2 signal Cable BWN1</li> <li>• M.2 Power Cable BWN2</li> </ul>                 | 1                 | slot 4          |
| 4Y37A79663  | N/A          | ThinkSystem M.2 SATA/x4 NVMe 2-Bay Enablement Kit                                                                                                                                                                                                                                             | 1                 | slot 4          |
| 4Z57A88898  | N/A          | ThinkSystem SR250 V3/ST250 Series M.2 Cable Kit <p>Includes:</p> <ul style="list-style-type: none"> <li>• ThinkSystem ST250 Series Dummy PCIe Card, BMTU</li> <li>• M.2 signal Cable BWN1</li> <li>• M.2 Power Cable BWN2</li> <li>• ThinkSystem M.2 ULP-PH 1.0+SLIMx4 130mm, BYY7</li> </ul> | 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, either SATA or NVMe
- When two drives installed, they must be either both SATA or both NVMe 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](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. A Lenovo Feature on Demand (FoD) upgrade is used to enable this SKLM support in the management processor of the server.

The following table lists the part numbers and feature codes for the upgrades.

Table 19. FoD upgrades for SKLM support

| Part number                                                                           | Feature code | Description                                                            |
|---------------------------------------------------------------------------------------|--------------|------------------------------------------------------------------------|
| Security Key Lifecycle Manager - FoD (United States, Canada, Asia Pacific, and Japan) |              |                                                                        |
| 00D9998                                                                               | A5U1         | SKLM for System x/ThinkSystem w/SEDs - FoD per Install with 1 year S&S |
| 00D9999                                                                               | AS6C         | SKLM for System x/ThinkSystem w/SEDs - FoD per Install with 3 year S&S |
| Security Key Lifecycle Manager - FoD (Latin America, Europe, Middle East, and Africa) |              |                                                                        |
| 00FP648                                                                               | A5U1         | SKLM for System x/ThinkSystem w/SEDs - FoD per Install with 1 year S&S |
| 00FP649                                                                               | AS6C         | SKLM for System x/ThinkSystem w/SEDs - FoD per Install with 3 year S&S |

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

Table 20. IBM Security Key Lifecycle Manager licenses

| Part number | Description                                                                                                                              |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------|
| 7S0A007FWW  | IBM Security Key Lifecycle Manager Basic Edition Install License + SW Subscription & Support 12 Months                                   |
| 7S0A007HWW  | IBM Security Key Lifecycle Manager For Raw Decimal Terabyte Storage Resource Value Unit License + SW Subscription & Support 12 Months    |
| 7S0A007KWW  | IBM Security Key Lifecycle Manager For Raw Decimal Petabyte Storage Resource Value Unit License + SW Subscription & Support 12 Months    |
| 7S0A007MWW  | IBM Security Key Lifecycle Manager For Usable Decimal Terabyte Storage Resource Value Unit License + SW Subscription & Support 12 Months |
| 7S0A007PWW  | IBM Security Key Lifecycle Manager For Usable Decimal Petabyte Storage Resource Value Unit License + SW Subscription & Support 12 Months |

## 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 21. Controllers for internal storage

| Part number              | Feature code | Description                                              | Slots supported | Maximum supported | Supercap included |
|--------------------------|--------------|----------------------------------------------------------|-----------------|-------------------|-------------------|
| SAS/SATA HBA             |              |                                                          |                 |                   |                   |
| 4Y37A72480               | BJHH         | ThinkSystem 4350-8i SAS/SATA 12Gb HBA                    | 2, 3, 4         | 2                 | No                |
| RAID adapters - 8 ports  |              |                                                          |                 |                   |                   |
| 4Y37A72482               | BJHK         | ThinkSystem RAID 5350-8i PCIe 12Gb Adapter               | 2, 3, 4         | 2                 | No                |
| 4Y37A72483               | BJHL         | ThinkSystem RAID 9350-8i 2GB Flash PCIe 12Gb Adapter     | 2, 3, 4         | 2                 | Yes               |
| 4Y37A09728               | B8NY         | ThinkSystem RAID 940-8i 4GB Flash PCIe Gen4 12Gb Adapter | 2, 3, 4         | 2                 | Yes               |
| RAID adapters - 16 ports |              |                                                          |                 |                   |                   |
| 4Y37A72485               | BJHN         | ThinkSystem RAID 9350-16i 4GB Flash PCIe 12Gb Adapter    | 2, 3, 4         | 1                 | Yes               |

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.
- **E810 Ethernet and X350 RAID/HBAs:** The use of both an Intel E810 network adapter and an X350 HBA/RAID adapter (9350, 5350 and 4350) is currently not supported in ThinkSystem servers. For details see [Support Tip HT513226](#). Planned support for this combination of adapters is 4Q/2023 (SI 23-2).

## 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](#)BP KU
- [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 22. 2.5-inch hot-swap 12 Gb SAS HDDs

| Part number                                       | Feature code | Description                                               | SED support | Max Qty |
|---------------------------------------------------|--------------|-----------------------------------------------------------|-------------|---------|
| <b>2.5-inch hot-swap HDDs - 12 Gb SAS 10K</b>     |              |                                                           |             |         |
| 7XB7A00025                                        | AULZ         | ThinkSystem 2.5" 600GB 10K SAS 12Gb Hot Swap 512n HDD     | No          | 16      |
| 7XB7A00027                                        | AUM1         | ThinkSystem 2.5" 1.2TB 10K SAS 12Gb Hot Swap 512n HDD     | No          | 16      |
| 7XB7A00028                                        | AUM2         | ThinkSystem 2.5" 1.8TB 10K SAS 12Gb Hot Swap 512e HDD     | No          | 16      |
| 4XB7A83970                                        | BRG7         | ThinkSystem 2.5" 2.4TB 10K SAS 12Gb Hot Swap 512e HDD v2  | No          | 16      |
| <b>2.5-inch hot-swap SED HDDs - 12 Gb SAS 10K</b> |              |                                                           |             |         |
| 7XB7A00031                                        | AUM5         | ThinkSystem 2.5" 600GB 10K SAS 12Gb Hot Swap 512n HDD SED | Support     | 16      |

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

| Part number                                                                   | Feature code | Description                                                     | SED support | Max Qty |
|-------------------------------------------------------------------------------|--------------|-----------------------------------------------------------------|-------------|---------|
| <b>2.5-inch hot-swap SSDs - 6 Gb SATA - Mixed Use/Mainstream (3-5 DWPD)</b>   |              |                                                                 |             |         |
| 4XB7A82289                                                                    | BQ21         | ThinkSystem 2.5" 5400 MAX 480GB Mixed Use SATA 6Gb HS SSD       | Support     | 16      |
| 4XB7A82290                                                                    | BQ24         | ThinkSystem 2.5" 5400 MAX 960GB Mixed Use SATA 6Gb HS SSD       | Support     | 16      |
| 4XB7A82291                                                                    | BQ22         | ThinkSystem 2.5" 5400 MAX 1.92TB Mixed Use SATA 6Gb HS SSD      | Support     | 16      |
| 4XB7A82292                                                                    | BQ23         | ThinkSystem 2.5" 5400 MAX 3.84TB Mixed Use SATA 6Gb HS SSD      | Support     | 16      |
| 4XB7A17125                                                                    | BA7Q         | ThinkSystem 2.5" S4620 480GB Mixed Use SATA 6Gb HS SSD          | No          | 16      |
| 4XB7A17126                                                                    | BA4T         | ThinkSystem 2.5" S4620 960GB Mixed Use SATA 6Gb HS SSD          | No          | 16      |
| <b>2.5-inch hot-swap SSDs - 6 Gb SATA - Read Intensive/Entry (&lt;3 DWPD)</b> |              |                                                                 |             |         |
| 4XB7A82258                                                                    | BQ1Q         | ThinkSystem 2.5" 5400 PRO 240GB Read Intensive SATA 6Gb HS SSD  | Support     | 16      |
| 4XB7A82259                                                                    | BQ1P         | ThinkSystem 2.5" 5400 PRO 480GB Read Intensive SATA 6Gb HS SSD  | Support     | 16      |
| 4XB7A82260                                                                    | BQ1R         | ThinkSystem 2.5" 5400 PRO 960GB Read Intensive SATA 6Gb HS SSD  | Support     | 16      |
| 4XB7A82261                                                                    | BQ1X         | ThinkSystem 2.5" 5400 PRO 1.92TB Read Intensive SATA 6Gb HS SSD | Support     | 16      |
| 4XB7A82262                                                                    | BQ1S         | ThinkSystem 2.5" 5400 PRO 3.84TB Read Intensive SATA 6Gb HS SSD | Support     | 16      |
| 4XB7A82263                                                                    | BQ1T         | ThinkSystem 2.5" 5400 PRO 7.68TB Read Intensive SATA 6Gb HS SSD | Support     | 16      |
| 4XB7A17072                                                                    | B99D         | ThinkSystem 2.5" S4520 240GB Read Intensive SATA 6Gb HS SSD     | No          | 16      |
| 4XB7A17101                                                                    | BA7G         | ThinkSystem 2.5" S4520 480GB Read Intensive SATA 6Gb HS SSD     | No          | 16      |
| 4XB7A17102                                                                    | BA7H         | ThinkSystem 2.5" S4520 960GB Read Intensive SATA 6Gb HS SSD     | No          | 16      |
| 4XB7A17103                                                                    | BA7J         | ThinkSystem 2.5" S4520 1.92TB Read Intensive SATA 6Gb HS SSD    | No          | 16      |
| 4XB7A17104                                                                    | BK77         | ThinkSystem 2.5" S4520 3.84TB Read Intensive SATA 6Gb HS SSD    | No          | 16      |
| 4XB7A17105                                                                    | BK78         | ThinkSystem 2.5" S4520 7.68TB Read Intensive SATA 6Gb HS SSD    | No          | 16      |
| 4XB7A17127                                                                    | BA4U         | ThinkSystem 2.5" S4620 1.92TB Mixed Use SATA 6Gb HS SSD         | No          | 16      |
| 4XB7A17128                                                                    | BK7L         | ThinkSystem 2.5" S4620 3.84TB Mixed Use SATA 6Gb HS SSD         | No          | 16      |

Table 24. 3.5-inch hot-swap 12 Gb SAS HDDs

| Part number                                  | Feature code | Description                                           | SED support | Max Qty |
|----------------------------------------------|--------------|-------------------------------------------------------|-------------|---------|
| <b>3.5-inch hot-swap HDDs - 12 Gb NL SAS</b> |              |                                                       |             |         |
| 7XB7A00042                                   | AUU5         | ThinkSystem 3.5" 2TB 7.2K SAS 12Gb Hot Swap 512n HDD  | No          | 8       |
| 7XB7A00043                                   | AUU6         | ThinkSystem 3.5" 4TB 7.2K SAS 12Gb Hot Swap 512n HDD  | No          | 8       |
| 7XB7A00044                                   | AUU7         | ThinkSystem 3.5" 6TB 7.2K SAS 12Gb Hot Swap 512e HDD  | No          | 8       |
| 7XB7A00045                                   | B0YR         | ThinkSystem 3.5" 8TB 7.2K SAS 12Gb Hot Swap 512e HDD  | No          | 8       |
| 7XB7A00046                                   | AUUG         | ThinkSystem 3.5" 10TB 7.2K SAS 12Gb Hot Swap 512e HDD | No          | 8       |
| 7XB7A00067                                   | B117         | ThinkSystem 3.5" 12TB 7.2K SAS 12Gb Hot Swap 512e HDD | No          | 8       |
| 4XB7A13906                                   | B496         | ThinkSystem 3.5" 14TB 7.2K SAS 12Gb Hot Swap 512e HDD | No          | 8       |
| 4XB7A13911                                   | B7EZ         | ThinkSystem 3.5" 16TB 7.2K SAS 12Gb Hot Swap 512e HDD | No          | 8       |
| 4XB7A38266                                   | BCFP         | ThinkSystem 3.5" 18TB 7.2K SAS 12Gb Hot Swap 512e HDD | No          | 8       |
| 4XB7A80353                                   | BPKU         | ThinkSystem 3.5" 20TB 7.2K SAS 12Gb Hot Swap 512e HDD | No          | 8       |
| 4XB7A83766                                   | BTR7         | ThinkSystem 3.5" 22TB 7.2K SAS 12Gb Hot Swap 512e HDD | No          | 8       |

Table 25. 3.5-inch hot-swap 6 Gb SATA HDDs

| Part number                                  | Feature code | Description                                           | SED support | Max Qty |
|----------------------------------------------|--------------|-------------------------------------------------------|-------------|---------|
| <b>3.5-inch hot-swap HDDs - 6 Gb NL SATA</b> |              |                                                       |             |         |
| 7XB7A00049                                   | AUUF         | ThinkSystem 3.5" 1TB 7.2K SATA 6Gb Hot Swap 512n HDD  | No          | 8       |
| 7XB7A00050                                   | AUUD         | ThinkSystem 3.5" 2TB 7.2K SATA 6Gb Hot Swap 512n HDD  | No          | 8       |
| 7XB7A00051                                   | AUU8         | ThinkSystem 3.5" 4TB 7.2K SATA 6Gb Hot Swap 512n HDD  | No          | 8       |
| 7XB7A00052                                   | AUUA         | ThinkSystem 3.5" 6TB 7.2K SATA 6Gb Hot Swap 512e HDD  | No          | 8       |
| 7XB7A00053                                   | AUU9         | ThinkSystem 3.5" 8TB 7.2K SATA 6Gb Hot Swap 512e HDD  | No          | 8       |
| 7XB7A00054                                   | AUUB         | ThinkSystem 3.5" 10TB 7.2K SATA 6Gb Hot Swap 512e HDD | No          | 8       |
| 7XB7A00068                                   | B118         | ThinkSystem 3.5" 12TB 7.2K SATA 6Gb Hot Swap 512e HDD | No          | 8       |
| 4XB7A13907                                   | B497         | ThinkSystem 3.5" 14TB 7.2K SATA 6Gb Hot Swap 512e HDD | No          | 8       |
| 4XB7A13914                                   | B7F0         | ThinkSystem 3.5" 16TB 7.2K SATA 6Gb Hot Swap 512e HDD | No          | 8       |
| 4XB7A38130                                   | BCFH         | ThinkSystem 3.5" 18TB 7.2K SATA 6Gb Hot Swap 512e HDD | No          | 8       |
| 4XB7A80354                                   | BPKV         | ThinkSystem 3.5" 20TB 7.2K SATA 6Gb Hot Swap 512e HDD | No          | 8       |
| 4XB7A83765                                   | BTR8         | ThinkSystem 3.5" 22TB 7.2K SATA 6Gb Hot Swap 512e HDD | No          | 8       |

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

| Part number                                                                   | Feature code | Description                                                 | SED support | Max Qty |
|-------------------------------------------------------------------------------|--------------|-------------------------------------------------------------|-------------|---------|
| <b>3.5-inch hot-swap SSDs - 6 Gb SATA - Read Intensive/Entry (&lt;3 DWPD)</b> |              |                                                             |             |         |
| 4XB7A17118                                                                    | BA7K         | ThinkSystem 3.5" S4520 240GB Read Intensive SATA 6Gb HS SSD | No          | 8       |
| 4XB7A17119                                                                    | BA7L         | ThinkSystem 3.5" S4520 480GB Read Intensive SATA 6Gb HS SSD | No          | 8       |
| 4XB7A17120                                                                    | BA7M         | ThinkSystem 3.5" S4520 960GB Read Intensive SATA 6Gb HS SSD | No          | 8       |

Table 27. 3.5-inch simple-swap 6 Gb SATA HDDs

| Part number                                     | Feature code | Description                                               | SED support | Max Qty |
|-------------------------------------------------|--------------|-----------------------------------------------------------|-------------|---------|
| <b>3.5-inch simple-swap HDDs - 6 Gb NL SATA</b> |              |                                                           |             |         |
| 7XB7A00055                                      | AUZS         | ThinkSystem 1TB 7.2K 6Gbps SATA 3.5" Simple Swap 512n HDD | No          | 8       |
| 7XB7A00056                                      | AUZT         | ThinkSystem 2TB 7.2K 6Gbps SATA 3.5" Simple Swap 512n HDD | No          | 8       |

Table 28. 3.5-inch simple-swap 6 Gb SATA SSDs

| Part number                                                                       | Feature code | Description                                                 | SED support | Max Qty |
|-----------------------------------------------------------------------------------|--------------|-------------------------------------------------------------|-------------|---------|
| <b>3.5-inch simple-swap SSDs - 6 Gb SATA - Read Intensive/Entry (&lt;3 DWPDP)</b> |              |                                                             |             |         |
| 4XB7A17109                                                                        | BK7C         | ThinkSystem 3.5" S4520 240GB Read Intensive SATA 6Gb SS SSD | No          | 8       |
| 4XB7A17110                                                                        | BK7D         | ThinkSystem 3.5" S4520 480GB Read Intensive SATA 6Gb SS SSD | No          | 8       |
| 4XB7A17111                                                                        | BK7E         | ThinkSystem 3.5" S4520 960GB Read Intensive SATA 6Gb SS SSD | No          | 8       |

Table 29. 3.5-inch simple-swap PCIe 4.0 NVMe SSDs

| Part number                                                                   | Feature code | Description                                                              | SED support | Max Qty |
|-------------------------------------------------------------------------------|--------------|--------------------------------------------------------------------------|-------------|---------|
| <b>3.5-inch SSDs - U.2 PCIe 4.0 NVMe - Read Intensive/Entry (&lt;3 DWPDP)</b> |              |                                                                          |             |         |
| 4XB7A79664                                                                    | BNHZ         | ThinkSystem 3.5" U.2 P5520 1.92TB Read Intensive NVMe PCIe 4.0 x4 SS SSD | Support     | 2       |

Table 30. M.2 SATA drives

| Part number                                                      | Feature code | Description                                                    | SED support | Max Qty |
|------------------------------------------------------------------|--------------|----------------------------------------------------------------|-------------|---------|
| <b>M.2 SSDs - 6 Gb SATA - Read Intensive/Entry (&lt;3 DWPDP)</b> |              |                                                                |             |         |
| 4XB7A82286                                                       | BQ1Z         | ThinkSystem M.2 5400 PRO 240GB Read Intensive SATA 6Gb NHS SSD | Support     | 2       |
| 4XB7A89422                                                       | BYF7         | ThinkSystem M.2 ER3 240GB Read Intensive SATA 6Gb NHS SSD      | Support     | 2       |
| 4XB7A82287                                                       | BQ1Y         | ThinkSystem M.2 5400 PRO 480GB Read Intensive SATA 6Gb NHS SSD | Support     | 2       |
| 4XB7A90049                                                       | BYF8         | ThinkSystem M.2 ER3 480GB Read Intensive SATA 6Gb NHS SSD      | Support     | 2       |
| 4XB7A82288                                                       | BQ20         | ThinkSystem M.2 5400 PRO 960GB Read Intensive SATA 6Gb NHS SSD | Support     | 2       |
| 4XB7A90230                                                       | BYF9         | ThinkSystem M.2 ER3 960GB Read Intensive SATA 6Gb NHS SSD      | Support     | 2       |

## USB memory key

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

Table 31. USB memory key

| Part number | Feature | Description                              |
|-------------|---------|------------------------------------------|
| 4X77A77065  | BNWN    | ThinkSystem USB 32GB USB 3.0 Flash Drive |

## 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 32. Internal backup units

| Part number | Feature code | Description                              | Maximum supported |
|-------------|--------------|------------------------------------------|-------------------|
| RDX dock    |              |                                          |                   |
| 4T27A80485  | AVF6         | ThinkSystem Internal RDX USB 3.0 Dock v2 | 1                 |
| RDX media   |              |                                          |                   |
| 7TP7A01601  | AVF8         | ThinkSystem RDX 500GB Cartridge          | Not applicable    |
| 7TP7A01602  | AVF1         | ThinkSystem RDX 1TB Cartridge            | Not applicable    |
| 7TP7A01603  | AVF0         | ThinkSystem RDX 2TB Cartridge            | Not applicable    |
| 7TP7A04318  | AXD1         | ThinkSystem RDX 4TB Cartridge            | Not applicable    |

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 33. Cable kit for field upgrades

| Part number | Description                                                                                                                                                                                              |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4X97A81465  | ThinkSystem ST250 Series ODD/Tape Cable Kit <ul style="list-style-type: none"><li>1x ODD data cable (feature BMQT) -- not required for RDX dock</li><li>1x ODD/tape power cable (feature BMQU)</li></ul> |

## 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 34. Optical drives

| Part number             | Feature code | Description                                             | Maximum supported |
|-------------------------|--------------|---------------------------------------------------------|-------------------|
| Internal optical drives |              |                                                         |                   |
| 4XA7A80481              | AVEY         | ThinkSystem Half High SATA DVD-RW Optical Disk Drive v2 | 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.

Table 35. Cable kit for field upgrades

| Part number | Description                                                                                                                                                                        | Maximum supported |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| 4X97A81465  | ThinkSystem ST250 Series ODD/Tape Cable Kit <ul style="list-style-type: none"> <li>• 1x ODD data cable (feature BMQT)</li> <li>• 1x ODD/tape power cable (feature BMQU)</li> </ul> | 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 36. External optical drive

| Part number | Feature code | Description                                        |
|-------------|--------------|----------------------------------------------------|
| 7XA7A05926  | AVV8         | ThinkSystem External USB DVD RW Optical Disk Drive |

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

## I/O expansion 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.

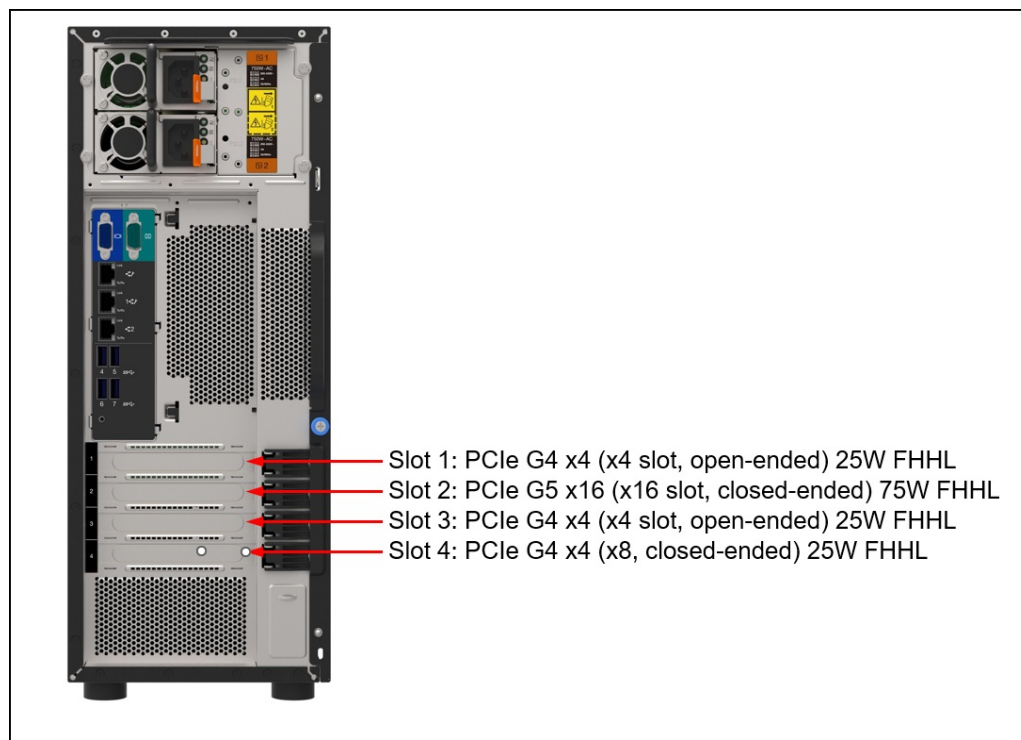


Figure 8. ThinkSystem ST250 V3 PCIe slots

## 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 37. Network adapters

| Part number                | Feature code | Description                                                            | Slots supported | Maximum supported |
|----------------------------|--------------|------------------------------------------------------------------------|-----------------|-------------------|
| Gigabit Ethernet           |              |                                                                        |                 |                   |
| 7ZT7A00484                 | AUZV         | ThinkSystem Broadcom 5719 1GbE RJ45 4-Port PCIe Ethernet Adapter       | 1, 2, 3, 4      | 2                 |
| 7ZT7A00535                 | AUZW         | ThinkSystem I350-T4 PCIe 1Gb 4-Port RJ45 Ethernet Adapter              | 1, 2, 3, 4      | 2                 |
| 10 Gb Ethernet - 10GBASE-T |              |                                                                        |                 |                   |
| 7ZT7A00496                 | AUKP         | ThinkSystem Broadcom 57416 10GBASE-T 2-Port PCIe Ethernet Adapter      | 1, 4            | 2                 |
| 4XC7A79699                 | BMXB         | ThinkSystem Intel X710-T4L 10GBase-T 4-Port PCIe Ethernet Adapter      | 1, 2, 3, 4      | 2                 |
| 25 Gb Ethernet             |              |                                                                        |                 |                   |
| 4XC7A08238                 | BK1H         | ThinkSystem Broadcom 57414 10/25GbE SFP28 2-port PCIe Ethernet Adapter | 1, 4            | 2                 |
| 4XC7A08295                 | BCD6         | ThinkSystem Intel E810-DA2 10/25GbE SFP28 2-Port PCIe Ethernet Adapter | 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>
- **E810 Ethernet and X350 RAID/HBAs:** The use of both an Intel E810 network adapter and an X350 HBA/RAID adapter (9350, 5350 and 4350) is currently not supported in ThinkSystem servers. For details see [Support Tip HT513226](#). Planned support for this combination of adapters is 4Q/2023 (SI 23-2).

## SAS adapters for external storage

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

Table 38. Supported external storage adapters

| Part number   | Feature code | Description                                    | Slots supported | Maximum supported |
|---------------|--------------|------------------------------------------------|-----------------|-------------------|
| 12 Gb SAS HBA |              |                                                |                 |                   |
| 4Y37A78837    | BNWK         | ThinkSystem 440-8e SAS/SATA PCIe Gen4 12Gb HBA | 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 39. GPU adapters

| Part number | Feature code | Description                                  | Slots supported | Maximum supported |
|-------------|--------------|----------------------------------------------|-----------------|-------------------|
| 4X67A79777  | BMXD         | ThinkSystem NVIDIA T1000 8GB PCIe Active GPU | slot 2          | 1                 |
| 4X67A79778  | BMXE         | ThinkSystem NVIDIA T400 4GB PCIe Active GPU  | 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 40. Power supplies

| Part number                              | Feature code | Description                                                         | Maximum quantity | 80 PLUS certification | ErP Lot 9 compliant | 110V AC | 220V AC |
|------------------------------------------|--------------|---------------------------------------------------------------------|------------------|-----------------------|---------------------|---------|---------|
| <b>Fixed power supplies</b>              |              |                                                                     |                  |                       |                     |         |         |
| CTO only                                 | BMFL         | ATX-300W Power Supply                                               | 1                | Gold                  | No                  | Yes     | Yes     |
| CTO only                                 | BMTC         | ThinkSystem 500W Platinum ATX Power Supply                          | 1                | Platinum              | Yes                 | Yes     | Yes     |
| <b>Hot-swap redundant power supplies</b> |              |                                                                     |                  |                       |                     |         |         |
| 4P57A87054                               | BWM5         | ThinkSystem 800W 230V/115V Platinum CRPS Hot-Swap Power Supply v1.1 | 2                | Platinum              | No                  | Yes     | Yes     |
| 4P57A87158                               | BWM6         | ThinkSystem 800W 230V/115V Platinum CRPS Hot-Swap Power Supply v1.2 | 2                | Platinum              | Yes                 | Yes     | Yes     |
| 4P57A87055                               | BWM4         | ThinkSystem 800W 230V Titanium CRPS Hot-Swap Power Supply v1.1      | 2                | Titanium              | Yes                 | No      | Yes     |
| 4P57A87056                               | BWM3         | ThinkSystem 800W 230V Titanium CRPS Hot-Swap Power Supply v1.2      | 2                | Titanium              | Yes                 | No      | Yes     |

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 300W power supplies.

Table 41. Maximum configuration for the 300W power supply

| Subsystem             | 300W fixed power supply                                                                                                                                                                                                                                                                 |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Processor             | Up to 80W TDP (6 cores)                                                                                                                                                                                                                                                                 |
| Memory                | No restriction                                                                                                                                                                                                                                                                          |
| Drives                | <ul style="list-style-type: none"> <li>• Single drive backplane only</li> <li>• Up to 4x 3.5-inch SAS/SATA drives or 8x 2.5-inch drives (HDD or SSD)</li> <li>• Dual backplanes (8x 3.5" or 16x 2.5" or mix) not supported</li> <li>• NVMe drive configuration not supported</li> </ul> |
| Media bays            | 1x optical drive or 1x RDX drive<br>2x drives not supported                                                                                                                                                                                                                             |
| M.2                   | No restriction                                                                                                                                                                                                                                                                          |
| Adapters (except GPU) | 1 or 2 adapters up to PCIe x8                                                                                                                                                                                                                                                           |
| GPU                   | Not supported                                                                                                                                                                                                                                                                           |

To ensure 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

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

**110V customers:** If you plan to use the 1100W power supply with a 110V power source, select a power cable that is rated above 10A. Power cables that are rated at 10A or below are not supported with 110V power.

Table 42. Power cords

| Part number                        | Feature code | Description                                             |
|------------------------------------|--------------|---------------------------------------------------------|
| Rack cables - C13 to C14           |              |                                                         |
| SL67B08593                         | BPHZ         | 0.5m, 10A/100-250V, C13 to C14 Jumper Cord              |
| 00Y3043                            | A4VP         | 1.0m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable |
| 4L67A08367                         | B0N5         | 1.0m, 13A/100-250V, C13 to C14 Jumper Cord              |
| 39Y7937                            | 6201         | 1.5m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable |
| 4L67A08368                         | B0N6         | 1.5m, 13A/100-250V, C13 to C14 Jumper Cord              |
| 4L67A08365                         | B0N4         | 2.0m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable |
| 4L67A08369                         | 6570         | 2.0m, 13A/100-250V, C13 to C14 Jumper Cord              |
| 4L67A08366                         | 6311         | 2.8m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable |
| 4L67A08370                         | 6400         | 2.8m, 13A/100-250V, C13 to C14 Jumper Cord              |
| 39Y7932                            | 6263         | 4.3m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable |
| 4L67A08371                         | 6583         | 4.3m, 13A/100-250V, C13 to C14 Rack Power Cable         |
| Rack cables - C13 to C14 (Y-cable) |              |                                                         |
| 00Y3046                            | A4VQ         | 1.345m, 2X C13 to C14 Jumper Cord, Rack Power Cable     |

| Part number                        | Feature code | Description                                                    |
|------------------------------------|--------------|----------------------------------------------------------------|
| 00Y3047                            | A4VR         | 2.054m, 2X C13 to C14 Jumper Cord, Rack Power Cable            |
| Rack cables - C13 to C20           |              |                                                                |
| 39Y7938                            | 6204         | 2.8m, 10A/100-250V, C13 to IEC 320-C20 Rack Power Cable        |
| Rack cables - C13 to C20 (Y-cable) |              |                                                                |
| 47C2491                            | A3SW         | 1.2m, 16A/100-250V, 2 Short C13s to Short C20 Rack Power Cable |
| 47C2492                            | A3SX         | 2.5m, 16A/100-250V, 2 Long C13s to Short C20 Rack Power Cable  |
| 47C2493                            | A3SY         | 2.8m, 16A/100-250V, 2 Short C13s to Long C20 Rack Power Cable  |
| 47C2494                            | A3SZ         | 4.1m, 16A/100-250V, 2 Long C13s to Long C20 Rack Power Cable   |
| Line cords                         |              |                                                                |
| 39Y7930                            | 6222         | 2.8m, 10A/250V, C13 to IRAM 2073 (Argentina) Line Cord         |
| 81Y2384                            | 6492         | 4.3m 10A/220V, C13 to IRAM 2073 (Argentina) Line Cord          |
| 39Y7924                            | 6211         | 2.8m, 10A/250V, C13 to AS/NZ 3112 (Australia/NZ) Line Cord     |
| 81Y2383                            | 6574         | 4.3m, 10A/230V, C13 to AS/NZS 3112 (Aus/NZ) Line Cord          |
| 69Y1988                            | 6532         | 2.8m, 10A/250V, C13 to NBR 14136 (Brazil) Line Cord            |
| 81Y2387                            | 6404         | 4.3m, 10A/250V, C13 - 2P+Gnd (Brazil) Line Cord                |
| 39Y7928                            | 6210         | 2.8m, 220-240V, C13 to GB 2099.1 (China) Line Cord             |
| 81Y2378                            | 6580         | 4.3m, 10A/220V, C13 to GB 2099.1 (China) Line Cord             |
| 39Y7918                            | 6213         | 2.8m, 10A/250V, C13 to DK2-5a (Denmark) Line Cord              |
| 81Y2382                            | 6575         | 4.3m, 10A/230V, C13 to DK2-5a (Denmark) Line Cord              |
| 39Y7917                            | 6212         | 2.8m, 10A/230V, C13 to CEE7-VII (Europe) Line Cord             |
| 81Y2376                            | 6572         | 4.3m, 10A/230V, C13 to CEE7-VII (Europe) Line Cord             |
| 39Y7927                            | 6269         | 2.8m, 10A/250V, C13(2P+Gnd) (India) Line Cord                  |
| 81Y2386                            | 6567         | 4.3m, 10A/240V, C13 to IS 6538 (India) Line Cord               |
| 39Y7920                            | 6218         | 2.8m, 10A/250V, C13 to SI 32 (Israel) Line Cord                |
| 81Y2381                            | 6579         | 4.3m, 10A/230V, C13 to SI 32 (Israel) Line Cord                |
| 39Y7921                            | 6217         | 2.8m, 220-240V, C13 to CEI 23-16 (Italy/Chile) Line Cord       |
| 81Y2380                            | 6493         | 4.3m, 10A/230V, C13 to CEI 23-16 (Italy/Chile) Line Cord       |
| 46M2593                            | A1RE         | 2.8m, 12A/125V, C13 to JIS C-8303 (Japan) Line Cord            |
| 4L67A08362                         | 6495         | 4.3m, 12A/200V, C13 to JIS C-8303 (Japan) Line Cord            |
| 39Y7926                            | 6335         | 4.3m, 12A/100V, C13 to JIS C-8303 (Japan) Line Cord            |
| 39Y7922                            | 6214         | 2.8m, 10A/250V, C13 to SABS 164 (S Africa) Line Cord           |
| 81Y2379                            | 6576         | 4.3m, 10A/230V, C13 to SABS 164 (South Africa) Line Cord       |
| 39Y7925                            | 6219         | 2.8m, 220-240V, C13 to KETI (S Korea) Line Cord                |
| 81Y2385                            | 6494         | 4.3m, 12A/220V, C13 to KSC 8305 (S. Korea) Line Cord           |
| 39Y7919                            | 6216         | 2.8m, 10A/250V, C13 to SEV 1011-S24507 (Swiss) Line Cord       |
| 81Y2390                            | 6578         | 4.3m, 10A/230V, C13 to SEV 1011-S24507 (Sws) Line Cord         |
| 23R7158                            | 6386         | 2.8m, 10A/125V, C13 to CNS 10917-3 (Taiwan) Line Cord          |
| 81Y2375                            | 6317         | 2.8m, 10A/240V, C13 to CNS 10917-3 (Taiwan) Line Cord          |
| 81Y2374                            | 6402         | 2.8m, 13A/125V, C13 to CNS 60799 (Taiwan) Line Cord            |
| 4L67A08363                         | AX8B         | 4.3m, 10A 125V, C13 to CNS 10917 (Taiwan) Line Cord            |
| 81Y2389                            | 6531         | 4.3m, 10A/250V, C13 to 76 CNS 10917-3 (Taiwan) Line Cord       |

| Part number | Feature code | Description                                         |
|-------------|--------------|-----------------------------------------------------|
| 81Y2388     | 6530         | 4.3m, 13A/125V, C13 to CNS 10917 (Taiwan) Line Cord |
| 39Y7923     | 6215         | 2.8m, 10A/250V, C13 to BS 1363/A (UK) Line Cord     |
| 81Y2377     | 6577         | 4.3m, 10A/230V, C13 to BS 1363/A (UK) Line Cord     |
| 90Y3016     | 6313         | 2.8m, 10A/120V, C13 to NEMA 5-15P (US) Line Cord    |
| 46M2592     | A1RF         | 2.8m, 10A/250V, C13 to NEMA 6-15P Line Cord         |
| 00WH545     | 6401         | 2.8m, 13A/120V, C13 to NEMA 5-15P (US) Line Cord    |
| 4L67A08359  | 6370         | 4.3m, 10A/125V, C13 to NEMA 5-15P (US) Line Cord    |
| 4L67A08361  | 6373         | 4.3m, 10A/250V, C13 to NEMA 6-15P (US) Line Cord    |
| 4L67A08360  | AX8A         | 4.3m, 13A/120V, C13 to NEMA 5-15P (US) Line Cord    |

## 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.

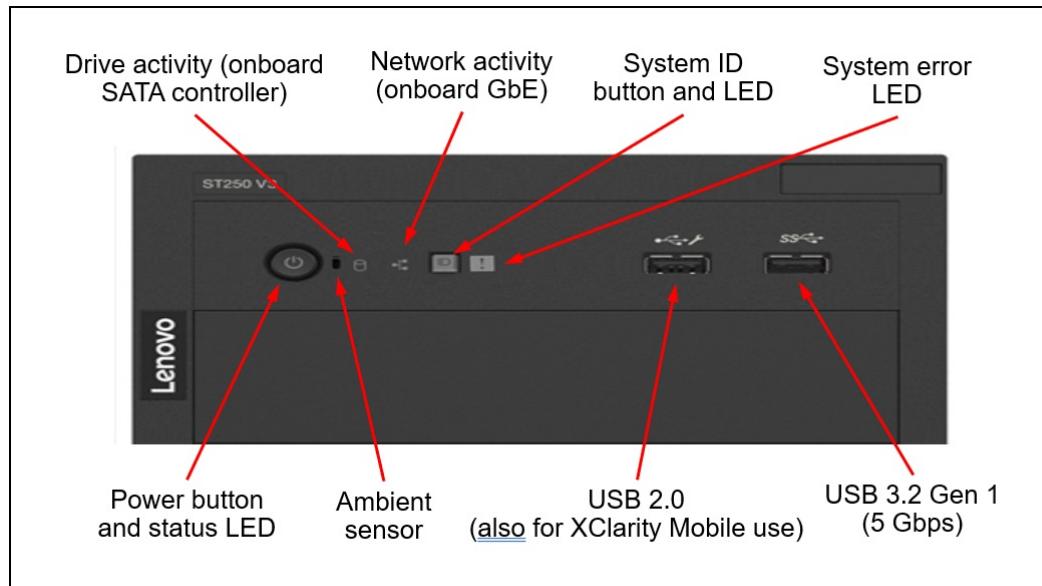


Figure 9. Front operator panel

## 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 43. IPMI-over-LAN settings

| Part number | Feature code | Description                     |
|-------------|--------------|---------------------------------|
| CTO only    | B7XZ         | Disable IPMI-over-LAN (default) |
| CTO only    | B7Y0         | Enable IPMI-over-LAN            |

## 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 44. 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 45. Enable System Guard in the factory (CTO orders)

| Feature code | Description          |
|--------------|----------------------|
| BUT2         | Install System Guard |

For more information about System Guard, see [https://pubs.lenovo.com/xcc2/NN1ia\\_c\\_systemguard](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, in addition to ThinkServer, System x, and Flex System 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 46. 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 140-2 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 [Remote Management](#) section. If your server does not have the XCC Platinum upgrade, Energy Manager licenses can be ordered as shown in the following table.

Table 47. 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>
- **Lenovo Information Center:**  
[https://sysmgt.lenovofiles.com/help/topic/LXEM/lxem\\_overview.html?cp=4](https://sysmgt.lenovofiles.com/help/topic/LXEM/lxem_overview.html?cp=4)

## Security

Topics in this section:

- [Security features](#)
- [Platform Firmware Resiliency - Lenovo ThinkShield](#)
- [Intel Transparent Supply Chain](#)

### 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 48. Security

| Part number | Feature code | Description                                  |
|-------------|--------------|----------------------------------------------|
| 4M17A12791  | B41K         | ThinkSystem ST250/ST250 Series Security Door |
| 4Z57A14086  | B4LS         | ThinkSystem ST250 Intrusion Cable Kit        |

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 49. Secure Boot options

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

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

## Intel Transparent Supply Chain

Add a layer of protection in your data center and have peace of mind that the server hardware you bring into it is safe authentic and with documented, testable, and provable origin.

Lenovo has one of the world's best supply chains, as ranked by Gartner Group, backed by extensive and mature supply chain security programs that exceed industry norms and US Government standards. Now we are the first Tier 1 manufacturer to offer Intel® Transparent Supply Chain in partnership with Intel, offering you an unprecedented degree of supply chain transparency and assurance.

To enable Intel Transparent Supply Chain for the Intel-based servers in your order, add the following feature code in the [DCSC configurator](#), under the Security tab.

Table 50. Intel Transparent Supply Chain ordering information

| Feature code | Description                    |
|--------------|--------------------------------|
| BB0P         | Intel Transparent Supply Chain |

For more information on this offering, see the paper *Introduction to Intel Transparent Supply Chain on Lenovo ThinkSystem Servers*, available from <https://lenovopress.com/lp1434-introduction-to-intel-transparent-supply-chain-on-thinksystem-servers>.

## 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 51. Lenovo Preferred Pro USB Full-sized keyboards - ThinkSystem

| Part number | Feature code | Description                                                          |
|-------------|--------------|----------------------------------------------------------------------|
| Mice        |              |                                                                      |
| 7M57A04698  | B0LN         | ThinkSystem Optical Wheel Mouse - USB                                |
| Keyboards   |              |                                                                      |
| 7ZB7A05521  | AXTM         | ThinkSystem Pref. Pro II USB Keyboard - Arabic                       |
| 7ZB7A05520  | AXTN         | ThinkSystem Pref. Pro II USB Keyboard - Arabic/French                |
| 7ZB7A05519  | AXTP         | ThinkSystem Pref. Pro II USB Keyboard - Belgium/French               |
| 7ZB7A05518  | AXTQ         | ThinkSystem Pref. Pro II USB Keyboard - Belgium/UK                   |
| 7ZB7A05517  | AXTR         | ThinkSystem Pref. Pro II USB Keyboard - Brazil/Portuguese            |
| 7ZB7A05515  | AXTS         | ThinkSystem Pref. Pro II USB Keyboard - Bulgarian                    |
| 7ZB7A05511  | AXTU         | ThinkSystem Pref. Pro II USB Keyboard - Czech                        |
| 7ZB7A05509  | AXTV         | ThinkSystem Pref. Pro II USB Keyboard - Danish                       |
| 7ZB7A05508  | AXTW         | ThinkSystem Pref. Pro II USB Keyboard - Dutch                        |
| 7ZB7A05506  | AXTX         | ThinkSystem Pref. Pro II USB Keyboard - French                       |
| 7ZB7A05496  | AXTZ         | ThinkSystem Pref. Pro II USB Keyboard - French Canadian French       |
| 7ZB7A05504  | AXTY         | ThinkSystem Pref. Pro II USB Keyboard - French Canadian Multilingual |
| 7ZB7A05495  | AXU0         | ThinkSystem Pref. Pro II USB Keyboard - German                       |
| 7ZB7A05494  | AXU1         | ThinkSystem Pref. Pro II USB Keyboard - Greek                        |
| 7ZB7A05493  | AXU2         | ThinkSystem Pref. Pro II USB Keyboard - Hebrew                       |
| 7ZB7A05492  | AXU3         | ThinkSystem Pref. Pro II USB Keyboard - Hungarian                    |
| 7ZB7A05491  | AXU4         | ThinkSystem Pref. Pro II USB Keyboard - Iceland                      |
| 7ZB7A05490  | AXU5         | ThinkSystem Pref. Pro II USB Keyboard - Italy                        |
| 7ZB7A05489  | AXU6         | ThinkSystem Pref. Pro II USB Keyboard -Japanese                      |
| 7ZB7A05488  | AXU7         | ThinkSystem Pref. Pro II USB Keyboard - Korean                       |
| 7ZB7A05487  | AXU8         | ThinkSystem Pref. Pro II USB Keyboard - LA Spanish                   |
| 7ZB7A05486  | AXU9         | ThinkSystem Pref. Pro II USB Keyboard - Norwegian                    |
| 7ZB7A05485  | AXUA         | ThinkSystem Pref. Pro II USB Keyboard - Polish                       |
| 7ZB7A05484  | AXUB         | ThinkSystem Pref. Pro II USB Keyboard- Portugese                     |
| 7ZB7A05483  | AXUC         | ThinkSystem Pref. Pro II USB Keyboard - Romanian                     |
| 7ZB7A05482  | AXUD         | ThinkSystem Pref. Pro II USB Keyboard - Russian/Cy                   |

| Part number | Feature code | Description                                             |
|-------------|--------------|---------------------------------------------------------|
| 7ZB7A05481  | AXUE         | ThinkSystem Pref. Pro II USB Keyboard - Serbian/Cyrilic |
| 7ZB7A05480  | AXUF         | ThinkSystem Pref. Pro II USB Keyboard - Slovak          |
| 7ZB7A05471  | AXUQ         | ThinkSystem Pref. Pro II USB Keyboard - Slovenian       |
| 7ZB7A05479  | AXUG         | ThinkSystem Pref. Pro II USB Keyboard - Spanish         |
| 7ZB7A05478  | AXUH         | ThinkSystem Pref. Pro II USB Keyboard- Swedish/Finn     |
| 7ZB7A05477  | AXUJ         | ThinkSystem Pref. Pro II USB Keyboard - Swiss, F/G      |
| 7ZB7A05476  | AXUK         | ThinkSystem Pref. Pro II USB Keyboard - Thailand        |
| 7ZB7A05513  | AXTT         | ThinkSystem Pref. Pro II USB Keyboard - Trad Chinese/US |
| 7ZB7A05474  | AXUM         | ThinkSystem Pref. Pro II USB Keyboard - Turkish 179     |
| 7ZB7A05475  | AXUL         | ThinkSystem Pref. Pro II USB Keyboard - Turkish 440     |
| 7ZB7A05473  | AXUN         | ThinkSystem Pref. Pro II USB Keyboard - UK English      |
| 7ZB7A05522  | AXTL         | ThinkSystem Pref. Pro II USB Keyboard - US English      |
| 7ZB7A05472  | AXUP         | ThinkSystem Pref. Pro II USB Keyboard - US Euro         |

## 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 52. Rack installation options

| Part number | Description                                           |
|-------------|-------------------------------------------------------|
| 4XF7A78620  | ThinkSystem ST50 Series / 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 53. Rail kit features and specifications summary

| Feature                                                     | ThinkSystem ST50 Series / 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 server supports the following operating systems:

- Microsoft Windows Server 2022
- Red Hat Enterprise Linux 8.8
- Red Hat Enterprise Linux 8.9
- Red Hat Enterprise Linux 9.2
- Red Hat Enterprise Linux 9.3
- SUSE Linux Enterprise Server 15 SP5
- SUSE Linux Enterprise Server 15 Xen SP5

- Ubuntu 22.04 LTS 64-bit
- VMware ESXi 8.0 U2

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 (CTO) configurations, the server can be preloaded with VMware ESXi installed on an M.2 drive. Ordering information is listed in the following table.

Table 54. VMware ESXi preload

| Part number | Feature code | Description                            |
|-------------|--------------|----------------------------------------|
| CTO only    | BYC7         | VMware ESXi 8.0 U2 (Factory Installed) |

## 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 55. Detailed dimensions

| Dimension | Description                                                                            |
|-----------|----------------------------------------------------------------------------------------|
| 176 mm    | X <sub>a</sub> = Width, using widest features (not including feet)                     |
| 155 mm    | X <sub>b</sub> = Width, with chassis feet extended                                     |
| 444 mm    | Y <sub>a</sub> = Height, from bottom of feet to top of chassis body                    |
| 430 mm    | Y <sub>b</sub> = Height, from bottom of chassis body to top of chassis body            |
| 544 mm    | Z <sub>a</sub> = Depth, from front door to most rearward I/O port surface              |
| 578 mm    | Z <sub>b</sub> = Depth, from front door to deepest feature of the chassis body feature |
| 595 mm    | Z <sub>c</sub> = Depth, from front door to deepest feature such as power supply handle |
| 23 mm     | Z <sub>e</sub> = Depth, front door to front plate of chassis body                      |

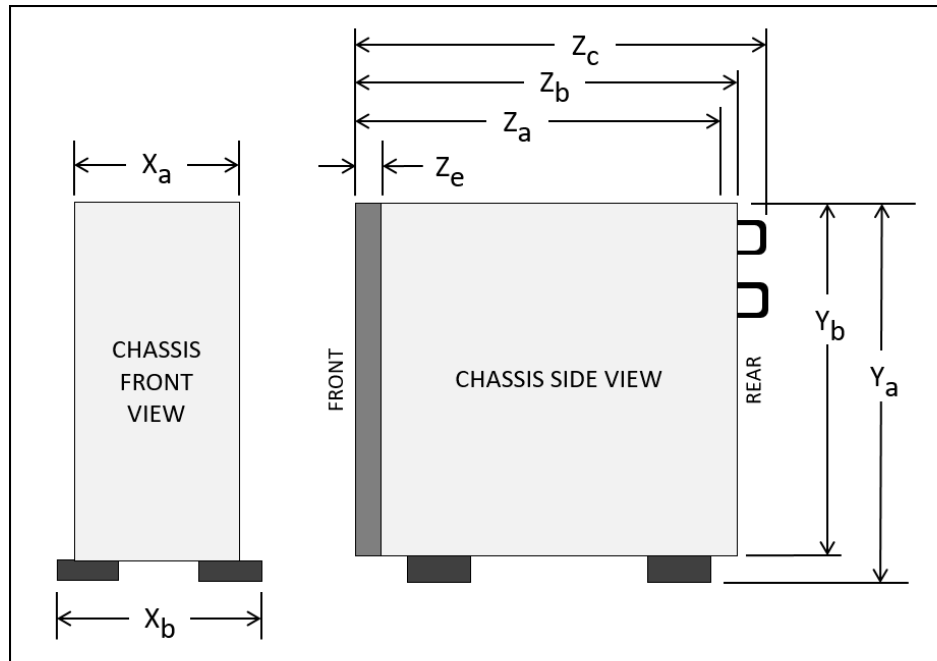


Figure 11. Server dimension

The shipping dimensions (cardboard packaging) 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, 3.56 A
  - 200-240 (nominal) V ac; 50 Hz or 60 Hz, 1.55 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.

### 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 and 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

The standard warranty terms are customer-replaceable unit (CRU) and onsite (for field-replaceable units FRUs only) with standard call center support during normal business hours and 9x5 Next Business Day Parts Delivered.

Lenovo's additional support services provide a sophisticated, unified support structure for your data center, with an experience consistently ranked number one in customer satisfaction worldwide. Available offerings include:

- **Premier Support**

Premier Support provides a Lenovo-owned customer experience and delivers direct access to technicians skilled in hardware, software, and advanced troubleshooting, in addition to the following:

- Direct technician-to-technician access through a dedicated phone line
- 24x7x365 remote support
- Single point of contact service
- End to end case management
- Third-party collaborative software support
- Online case tools and live chat support
- On-demand remote system analysis

- **Warranty Upgrade (Preconfigured Support)**

Services are available to meet the on-site response time targets that match the criticality of your systems.

- 3, 4, or 5 years of service coverage
- 1-year or 2-year post-warranty extensions
- **Foundation Service:** 9x5 service coverage with next business day onsite response. YourDrive YourData is an optional extra (see below).
- **Essential Service:** 24x7 service coverage with 4-hour onsite response or 24-hour committed repair (available only in select markets). Bundled with YourDrive YourData.
- **Advanced Service:** 24x7 service coverage with 2-hour onsite response or 6-hour committed repair (available only in select markets). Bundled with YourDrive YourData.

- **Managed Services**

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

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

- **Technical Account Management (TAM)**

A Lenovo Technical Account Manager helps you optimize the operation of your data center based on a deep understanding of your business. You gain direct access to your Lenovo TAM, who serves as your single point of contact to expedite service requests, provide status updates, and furnish reports to track incidents over time. In addition, your TAM will help proactively make service recommendations and manage your service relationship with Lenovo to make certain your needs are met.

- **Enterprise Server Software Support**

Enterprise Software Support is an additional support service providing customers with software support on Microsoft, Red Hat, SUSE, and VMware applications and systems. Around the clock availability for critical problems plus unlimited calls and incidents helps customers address challenges fast, without incremental costs. Support staff can answer troubleshooting and diagnostic questions, address product comparability and interoperability issues, isolate causes of problems, report defects to software vendors, and more.

- **YourDrive YourData**

Lenovo's YourDrive YourData is a multi-drive retention offering that ensures your data is always under your control, regardless of the number of drives that are installed in your Lenovo server. In the unlikely event of a drive failure, you retain possession of your drive while Lenovo replaces the failed drive part. Your data stays safely on your premises, in your hands. The YourDrive YourData service can be purchased in convenient bundles and is optional with Foundation Service. It is bundled with Essential Service and Advanced Service.

- **Health Check**

Having a trusted partner who can perform regular and detailed health checks is central to maintaining efficiency and ensuring that your systems and business are always running at their best. Health Check supports Lenovo-branded server, storage, and networking devices, as well as select Lenovo-supported products from other vendors that are sold by Lenovo or a Lenovo-Authorized Reseller.

Examples of region-specific warranty terms are second or longer business day parts delivery or parts-only base warranty.

If warranty terms and conditions include onsite labor for repair or replacement of parts, Lenovo will dispatch a service technician to the customer site to perform the replacement. Onsite labor under base warranty is limited to labor for replacement of parts that have been determined to be field-replaceable units (FRUs). Parts that are determined to be customer-replaceable units (CRUs) do not include onsite labor under base warranty.

If warranty terms include parts-only base warranty, Lenovo is responsible for delivering only replacement parts that are under base warranty (including FRUs) that will be sent to a requested location for self-service. Parts-only service does not include a service technician being dispatched onsite. Parts must be changed at customer's own cost and labor and defective parts must be returned following the instructions supplied with the spare parts.

Lenovo Service offerings are region-specific. Not all preconfigured support and upgrade options are available in every region. For information about Lenovo service upgrade offerings that are available in your region, refer to the following resources:

- Service part numbers in Lenovo Data Center Solution Configurator (DCSC):  
<http://dcsc.lenovo.com/#/services>
- Lenovo Services Availability Locator  
<http://lenovolocator.com/>

For service definitions, region-specific details, and service limitations, please refer to the following documents:

- Lenovo Statement of Limited Warranty for Infrastructure Solutions Group (ISG) Servers and System Storage  
<http://pcsupport.lenovo.com/us/en/solutions/ht503310>
- Lenovo Data Center Services Agreement  
<http://support.lenovo.com/us/en/solutions/ht116628>

## Services

Lenovo Services is a dedicated partner to your success. Our goal is to reduce your capital outlays, mitigate your IT risks, and accelerate your time to productivity.

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

Here's a more in-depth look at what we can do for you:

- **Asset Recovery Services**

Asset Recovery Services (ARS) helps customers recover the maximum value from their end-of-life equipment in a cost-effective and secure way. On top of simplifying the transition from old to new equipment, ARS mitigates environmental and data security risks associated with data center equipment disposal. Lenovo ARS is a cash-back solution for equipment based on its remaining market value, yielding maximum value from aging assets and lowering total cost of ownership for your customers. For more information, see the ARS page, <https://lenovopress.com/lp1266-reduce-e-waste-and-grow-your-bottom-line-with-lenovo-ars>.

- **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.

- **Basic Hardware Installation**

Lenovo experts can seamlessly manage the physical installation of your server, storage, or networking hardware. Working at a time convenient for you (business hours or off shift), the technician will unpack and inspect the systems on your site, install options, mount in a rack cabinet, connect to power and network, check and update firmware to the latest levels, verify operation, and dispose of the packaging, allowing your team to focus on other priorities.

- **Deployment Services**

When investing in new IT infrastructures, you need to ensure your business will see quick time to value with little to no disruption. Lenovo deployments are designed by development and engineering teams who know our Products & Solutions better than anyone else, and our technicians own the process from delivery to completion. Lenovo will conduct remote preparation and planning, configure & integrate systems, validate systems, verify and update appliance firmware, train on administrative tasks, and provide post-deployment documentation. Customer's IT teams leverage our skills to enable IT staff to transform with higher level roles and tasks.

- **Integration, Migration, and Expansion Services**

Move existing physical & virtual workloads easily, or determine technical requirements to support increased workloads while maximizing performance. Includes tuning, validation, and documenting ongoing run processes. Leverage migration assessment planning documents to perform necessary migrations.

## Regulatory compliance

The ST250 V3 conforms to the following standards:

- 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
- Japan VCCI, Class A
- Taiwan BSMI CNS15936, Class A; CNS15598-1; Section 5 of CNS15663
- CE, UKCA Mark (EN55032 Class A, EN62368-1, EN55035, EN61000-3-11, EN61000-3-12, (EU) 2019/424, and EN IEC 63000 (RoHS))
- Korea KN32, Class A, KN35
- 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)
- UL Green Guard, UL2819
- EPEAT (NSF/ ANSI 426) Bronze
- China CCC certificate, GB17625.1; GB4943.1; GB/T9254
- China CECP certificate, CQC3135
- China CELP certificate, HJ 2507-2011
- Japanese Energy-Saving Act
- Ukraine UkrCEPRO
- Morocco CMIM Certification (CM)
- EU2019/424 Energy Related Product (ErP Lot9)

## External drive enclosures

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

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

<http://datacentersupport.lenovo.com>

Table 56. External drive enclosures

| Model      | Description                                                                                 |
|------------|---------------------------------------------------------------------------------------------|
| 4587HC1    | Lenovo Storage D1212 Disk Expansion Enclosure (2U enclosure wth 12x LFF drive bays)         |
| 4587HC2    | Lenovo Storage D1224 Disk Expansion Enclosure (2U enclosure wth 24x SFF drive bays)         |
| 6413HC1    | Lenovo Storage D3284 High Density Expansion Enclosure (5U enclosure wth 84x LFF drive bays) |
| 7DAHCT01WW | Lenovo ThinkSystem D4390 Direct Attached Storage (4U enclosure wth 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 Storage D3284  
<http://lenovopress.lenovo.com/lp0513>
- Lenovo ThinkSystem D4390  
<https://lenovopress.lenovo.com/lp1681>

## External storage systems

Lenovo offers the ThinkSystem DE Series and ThinkSystem DM Series external storage systems for high-performance storage. See the DE 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 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 57. External USB backup options

| Part number             | Description                           |
|-------------------------|---------------------------------------|
| External RDX USB dock   |                                       |
| 4T27A10725              | ThinkSystem RDX External USB 3.0 Dock |
| External RDX cartridges |                                       |
| 7TP7A01601              | ThinkSystem RDX 500GB Cartridge       |
| 7TP7A01602              | ThinkSystem RDX 1TB Cartridge         |
| 7TP7A01603              | ThinkSystem RDX 2TB Cartridge         |
| 7TP7A04318              | ThinkSystem RDX 4TB Cartridge         |

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 58. External SAS backup options

| Part number                               | Description                              |
|-------------------------------------------|------------------------------------------|
| External SAS tape backup drives           |                                          |
| 6160S7E                                   | IBM TS2270 Tape Drive Model H7S          |
| 6160S8E                                   | IBM TS2280 Tape Drive Model H8S          |
| 6160S9E                                   | IBM TS2290 Tape Drive Model H9S          |
| External SAS tape backup autoloaders      |                                          |
| 6171S7R                                   | IBM TS2900 Tape Autoloader w/LTO7 HH SAS |
| 6171S8R                                   | IBM TS2900 Tape Autoloader w/LTO8 HH SAS |
| 6171S9R                                   | IBM TS2900 Tape Autoloader w/LTO9 HH SAS |
| External tape backup libraries            |                                          |
| 6741A1F                                   | IBM TS4300 3U Tape Library-Base Unit     |
| 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 59. Uninterruptible power supply units

| Part number                     | Description                                                                                    |
|---------------------------------|------------------------------------------------------------------------------------------------|
| Tower UPS units                 |                                                                                                |
| 55951AX                         | T1kVA Tower UPS (100-125VAC)                                                                   |
| 55951KX                         | T1kVA Tower UPS (200-240VAC)                                                                   |
| 55952AX                         | T1.5kVA Tower UPS (100-125VAC)                                                                 |
| 55952KX                         | T1.5kVA Tower UPS (200-240VAC)                                                                 |
| Rack-mounted or tower UPS units |                                                                                                |
| 55941AX                         | RT1.5kVA 2U Rack or Tower UPS (100-125VAC)                                                     |
| 55941KX                         | RT1.5kVA 2U Rack or Tower UPS (200-240VAC)                                                     |
| 55942AX                         | RT2.2kVA 2U Rack or Tower UPS (100-125VAC)                                                     |
| 55942KX                         | RT2.2kVA 2U Rack or Tower UPS (200-240VAC)                                                     |
| 55943AX                         | RT3kVA 2U Rack or Tower UPS (100-125VAC)                                                       |
| 55943KX                         | RT3kVA 2U Rack or Tower UPS (200-240VAC)                                                       |
| 55945KX                         | RT5kVA 3U Rack or Tower UPS (200-240VAC)                                                       |
| 55946KX                         | RT6kVA 3U Rack or Tower UPS (200-240VAC)                                                       |
| 55948KX                         | RT8kVA 6U Rack or Tower UPS (200-240VAC)                                                       |
| 55949KX                         | RT11kVA 6U Rack or Tower UPS (200-240VAC)                                                      |
| 55948PX                         | RT8kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC)                                             |
| 55949PX                         | RT11kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC)                                            |
| Rack-mounted UPS units          |                                                                                                |
| 55943KT†                        | ThinkSystem RT3kVA 2U Standard UPS (200-230VAC) (2x C13 10A, 2x GB 10A, 1x C19 16A outlets)    |
| 55943LT†                        | ThinkSystem RT3kVA 2U Long Backup UPS (200-230VAC) (2x C13 10A, 2x GB 10A, 1x C19 16A outlets) |
| 55946KT†                        | ThinkSystem RT6kVA 5U UPS (200-230VAC) (2x C13 10A outlets, 1x Terminal Block output)          |
| 5594XKT†                        | ThinkSystem RT10kVA 5U UPS (200-230VAC) (2x C13 10A outlets, 1x Terminal Block output)         |

† Only available in China and the Asia Pacific market.

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 60. Power distribution units

| Part number          | Feature code | Description                     | ANZ | ASEAN | Brazil | EET | MEA | RUCIS | WE | HTK | INDIA | JAPAN | LA | NA | PRC |
|----------------------|--------------|---------------------------------|-----|-------|--------|-----|-----|-------|----|-----|-------|-------|----|----|-----|
| <b>0U Basic PDUs</b> |              |                                 |     |       |        |     |     |       |    |     |       |       |    |    |     |
| 00YJ776              | ATZY         | 0U 36 C13/6 C19 24A 1 Phase PDU | N   | Y     | Y      | N   | N   | N     | N  | N   | N     | Y     | Y  | Y  | N   |

| Part number                                                                       | Feature code | Description                                                        | ANZ | ASEAN | Brazil | EET | MEA | RUCIS | WE | HTK | INDIA | JAPAN | LA | NA | PRC |
|-----------------------------------------------------------------------------------|--------------|--------------------------------------------------------------------|-----|-------|--------|-----|-----|-------|----|-----|-------|-------|----|----|-----|
| <b>0U Switched and Monitored PDUs</b>                                             |              |                                                                    |     |       |        |     |     |       |    |     |       |       |    |    |     |
| 00YJ783                                                                           | AU04         | 0U 12 C13/12 C19 Switched and Monitored 48A 3 Phase PDU            | N   | N     | Y      | N   | N   | N     | Y  | N   | N     | Y     | Y  | Y  | N   |
| 00YJ781                                                                           | AU03         | 0U 20 C13/4 C19 Switched and Monitored 24A 1 Phase PDU             | N   | N     | Y      | N   | Y   | N     | Y  | N   | N     | Y     | Y  | Y  | N   |
| <b>1U Switched and Monitored PDUs</b>                                             |              |                                                                    |     |       |        |     |     |       |    |     |       |       |    |    |     |
| 4PU7A81117                                                                        | BNDV         | 1U 18 C19/C13 switched and monitored 48A 3P WYE PDU - ETL          | N   | N     | N      | N   | N   | N     | N  | N   | N     | N     | N  | Y  | N   |
| 4PU7A77467                                                                        | BLC4         | 1U 18 C19/C13 Switched and Monitored 80A 3P Delta PDU              | N   | N     | N      | N   | N   | N     | N  | N   | N     | Y     | N  | Y  | N   |
| 4PU7A77469                                                                        | BLC6         | 1U 12 C19/C13 switched and monitored 60A 3P Delta PDU              | N   | N     | N      | N   | N   | N     | N  | N   | N     | N     | N  | Y  | N   |
| 4PU7A77468                                                                        | BLC5         | 1U 12 C19/C13 switched and monitored 32A 3P WYE PDU                | Y   | Y     | Y      | Y   | Y   | Y     | Y  | Y   | Y     | N     | Y  | Y  | Y   |
| 4PU7A81118                                                                        | BNDW         | 1U 18 C19/C13 switched and monitored 48A 3P WYE PDU - CE           | Y   | Y     | Y      | Y   | Y   | Y     | Y  | Y   | Y     | N     | Y  | N  | Y   |
| <b>1U Ultra Density Enterprise PDUs (9x IEC 320 C13 + 3x IEC 320 C19 outlets)</b> |              |                                                                    |     |       |        |     |     |       |    |     |       |       |    |    |     |
| 71763NU                                                                           | 6051         | Ultra Density Enterprise C19/C13 PDU 60A/208V/3PH                  | N   | N     | Y      | N   | N   | N     | N  | N   | N     | Y     | Y  | Y  | N   |
| 71762NX                                                                           | 6091         | Ultra Density Enterprise C19/C13 PDU Module                        | Y   | Y     | Y      | Y   | Y   | Y     | Y  | Y   | Y     | Y     | Y  | Y  | Y   |
| <b>1U C13 Enterprise PDUs (12x IEC 320 C13 outlets)</b>                           |              |                                                                    |     |       |        |     |     |       |    |     |       |       |    |    |     |
| 39Y8941                                                                           | 6010         | DPI C13 Enterprise PDU Module (WW)                                 | Y   | Y     | Y      | Y   | Y   | Y     | Y  | Y   | Y     | Y     | Y  | Y  | Y   |
| <b>1U Front-end PDUs (3x IEC 320 C19 outlets)</b>                                 |              |                                                                    |     |       |        |     |     |       |    |     |       |       |    |    |     |
| 39Y8938                                                                           | 6002         | DPI Single-phase 30A/120V Front-end PDU (US)                       | Y   | Y     | Y      | Y   | Y   | Y     | Y  | Y   | Y     | Y     | Y  | Y  | Y   |
| 39Y8939                                                                           | 6003         | DPI Single-phase 30A/208V Front-end PDU (US)                       | Y   | Y     | Y      | Y   | Y   | Y     | Y  | Y   | Y     | Y     | Y  | Y  | Y   |
| 39Y8934                                                                           | 6005         | DPI Single-phase 32A/230V Front-end PDU (International)            | Y   | Y     | Y      | Y   | Y   | Y     | Y  | Y   | Y     | Y     | Y  | Y  | Y   |
| 39Y8940                                                                           | 6004         | DPI Single-phase 60A/208V Front-end PDU (US)                       | Y   | N     | Y      | Y   | Y   | Y     | Y  | N   | N     | Y     | Y  | Y  | N   |
| 39Y8935                                                                           | 6006         | DPI Single-phase 63A/230V Front-end PDU (International)            | Y   | Y     | Y      | Y   | Y   | Y     | Y  | Y   | Y     | Y     | Y  | Y  | Y   |
| <b>1U NEMA PDUs (6x NEMA 5-15R outlets)</b>                                       |              |                                                                    |     |       |        |     |     |       |    |     |       |       |    |    |     |
| 39Y8905                                                                           | 5900         | DPI 100-127V NEMA PDU                                              | Y   | Y     | Y      | Y   | Y   | Y     | Y  | Y   | Y     | Y     | Y  | Y  | Y   |
| <b>Line cords for 1U PDUs that ship without a line cord</b>                       |              |                                                                    |     |       |        |     |     |       |    |     |       |       |    |    |     |
| 40K9611                                                                           | 6504         | 4.3m, 32A/380-415V, EPDU/IEC 309 3P+N+G 3ph wye (non-US) Line Cord | Y   | Y     | Y      | Y   | Y   | Y     | Y  | Y   | Y     | Y     | Y  | Y  | Y   |
| 40K9612                                                                           | 6502         | 4.3m, 32A/230V, EPDU to IEC 309 P+N+G (non-US) Line Cord           | Y   | Y     | Y      | Y   | Y   | Y     | Y  | Y   | Y     | Y     | Y  | Y  | Y   |
| 40K9613                                                                           | 6503         | 4.3m, 63A/230V, EPDU to IEC 309 P+N+G (non-US) Line Cord           | Y   | Y     | Y      | Y   | Y   | Y     | Y  | Y   | Y     | Y     | Y  | Y  | Y   |

| Part number | Feature code | Description                                                         | ANZ | ASEAN | Brazil | EET | MEA | RUCIS | WE | HTK | INDIA | JAPAN | LA | NA | PRC |
|-------------|--------------|---------------------------------------------------------------------|-----|-------|--------|-----|-----|-------|----|-----|-------|-------|----|----|-----|
| 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   |
| 40K9617     | 6505         | 4.3m, 32A/230V, Souriau UTG Female to AS/NZ 3112 (Aus/NZ) Line Cord | Y   | Y     | Y      | Y   | Y   | Y     | Y  | Y   | Y     | Y     | Y  | Y  | Y   |
| 40K9618     | 6506         | 4.3m, 32A/250V, Souriau UTG Female to KSC 8305 (S. Korea) Line Cord | Y   | Y     | Y      | Y   | Y   | Y     | Y  | Y   | Y     | Y     | Y  | Y  | Y   |

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 61. Rack cabinets

| Part number | Description                                                    |
|-------------|----------------------------------------------------------------|
| 93072RX     | 25U Standard Rack (1000mm)                                     |
| 93072PX     | 25U Static S2 Standard Rack (1000mm)                           |
| 7D6DA007WW  | ThinkSystem 42U Onyx Primary Heavy Duty Rack Cabinet (1200mm)  |
| 7D6DA008WW  | ThinkSystem 42U Pearl Primary Heavy Duty Rack Cabinet (1200mm) |
| 93604PX     | 42U 1200mm Deep Dynamic Rack                                   |
| 93614PX     | 42U 1200mm Deep Static Rack                                    |
| 93634PX     | 42U 1100mm Dynamic Rack                                        |
| 93634EX     | 42U 1100mm Dynamic Expansion Rack                              |
| 93074RX     | 42U Standard Rack (1000mm)                                     |
| 7D6EA009WW  | ThinkSystem 48U Onyx Primary Heavy Duty Rack Cabinet (1200mm)  |
| 7D6EA00AWW  | ThinkSystem 48U Pearl Primary Heavy Duty Rack Cabinet (1200mm) |

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 62. 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 64. KVM switches and options

| Part number                             | Description                                 |
|-----------------------------------------|---------------------------------------------|
| KVM Console switches                    |                                             |
| 1754D2X                                 | Global 4x2x32 Console Manager (GCM32)       |
| 1754D1X                                 | Global 2x2x16 Console Manager (GCM16)       |
| 1754A2X                                 | Local 2x16 Console Manager (LCM16)          |
| 1754A1X                                 | Local 1x8 Console Manager (LCM8)            |
| Cables for GCM and LCM Console switches |                                             |
| 46M5383                                 | Virtual Media Conversion Option Gen2 (VCO2) |
| 46M5382                                 | Serial Conversion Option (SCO)              |

For more information, see the list of Product Guides in the KVM Switches and Consoles category:

<http://lenovopress.com/servers/options/kvm>

## Lenovo Financial Services

Lenovo Financial Services reinforces Lenovo's commitment to deliver pioneering products and services that are recognized for their quality, excellence, and trustworthiness. Lenovo Financial Services offers financing solutions and services that complement your technology solution anywhere in the world.

We are dedicated to delivering a positive finance experience for customers like you who want to maximize your purchase power by obtaining the technology you need today, protect against technology obsolescence, and preserve your capital for other uses.

We work with businesses, non-profit organizations, governments and educational institutions to finance their entire technology solution. We focus on making it easy to do business with us. Our highly experienced team of finance professionals operates in a work culture that emphasizes the importance of providing outstanding customer service. Our systems, processes and flexible policies support our goal of providing customers with a positive experience.

We finance your entire solution. Unlike others, we allow you to bundle everything you need from hardware and software to service contracts, installation costs, training fees, and sales tax. If you decide weeks or months later to add to your solution, we can consolidate everything into a single invoice.

Our Premier Client services provide large accounts with special handling services to ensure these complex transactions are serviced properly. As a premier client, you have a dedicated finance specialist who manages your account through its life, from first invoice through asset return or purchase. This specialist develops an in-depth understanding of your invoice and payment requirements. For you, this dedication provides a high-quality, easy, and positive financing experience.

For your region-specific offers, please ask your Lenovo sales representative or your technology provider about the use of Lenovo Financial Services. For more information, see the following Lenovo website:

<https://www.lenovo.com/us/en/landingpage/lenovo-financial-services/>

## Seller training courses

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

### 1. **Family Portfolio: Intel Rack and Tower Servers** 2023-12-11 | 15 minutes | Employees and Partners

This course is designed to give Lenovo sales and partner representatives a foundation of the ThinkSystem Intel Rack and Tower server family. After completing this course, you will be able to identify products and features within the ThinkSystem Intel rack and tower server family, describe unique innovations that this product family uses and recognize when a specific product should be selected.

Published: 2023-12-11

Length: 15 minutes

Employee link: [Grow@Lenovo](mailto:Grow@Lenovo)

Partner link: [Lenovo Partner Learning](#)

Course code: SXXW1204r11

## 2. **FY24Q3 Intel Servers Update**

2023-12-11 | 15 minutes | Employees and Partners

This update is designed to help you discuss the features and customer benefits of Lenovo servers that use the 5th Gen Intel® Xeon® processors. Lenovo has also introduced a new server, the ThinkSystem SD650-N V3, which expands the supercomputer server family. Reasons to call your customer and talk about refreshing their infrastructure are also included as a guideline.

Published: 2023-12-11

Length: 15 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: SXXW2522a

## 3. **Lenovo Data Center Product Portfolio**

2023-07-21 | 15 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.

Published: 2023-07-21

Length: 15 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: SXXW1110r6

## 4. **Partner Technical Webinar - Data Center Limits and ISG TAA Compliance**

2023-05-16 | 60 minutes | Employees and Partners

In this 60-minute replay, we had two topics. First Vinod Kamath, Lenovo Distinguished Engineer for Data Center Cooling presented on the Systems Configuration and Data Center Ambient Limits. Second, Shama Patari, Lenovo Trade Council, and Glenn Johnson, Lenovo Principal Engineer for Supply Chain presented on ISG TAA Compliance.

Published: 2023-05-16

Length: 60 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: 051223

## 5. **Lenovo Sustainable Computing**

2022-09-16 | 4 minutes | Employees and Partners

This Quick Hit describes the Lenovo sustainable computing program, and the many ways in which Lenovo strives to respect and protect the environment.

Published: 2022-09-16

Length: 4 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: SXXW2504a

## 6. Intel Transparent Supply Chain on Lenovo Servers

2021-12-03 | 12 minutes | Employees and Partners

This course introduces the Intel Transparent Supply Chain (TSC) program, explains how the program works, and discusses the benefits of the Intel TSC program to customers. Adding the Intel TSC feature to an order is explained.

Published: 2021-12-03

Length: 12 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: SXXW1230

## 7. Family Portfolio: Storage Controller Options

2021-10-19 | 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.

Learning Objectives:

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

Published: 2021-10-19

Length: 25 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: SXXW1111

## 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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