Lenovo ThinkSystem ST250 Server (E-2100)
Product Guide

The Lenovo ThinkSystem ST250 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-2100 Series processor (formerly codenamed "Coffee Lake") and up to 128GB of 2666 MHz TruDDR4 ECC memory.

Figure 1 shows the Lenovo ThinkSystem ST250.



Figure 1. Lenovo ThinkSystem ST250

Did you know?

The ThinkSystem ST250 is an enterprise-grade server with enterprise-level 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 easy to deploy, integrate, service, and manage.

Key features

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

- The Intel Xeon E-2100 Series processors improves productivity by offering affordable single-socket system performance with 6-core processors with up to 3.8 GHz core speeds.
- Intelligent and adaptive system performance with Intel Turbo Boost Technology 2.0 allows processor cores to run at maximum speeds during peak workloads by temporarily going beyond processor thermal design power (TDP).
- Intel Hyper-Threading Technology boosts performance for multithreaded applications by enabling simultaneous multithreading within each processor core, up to two threads per core.
- Intel Virtualization Technology integrates hardware-level virtualization hooks that allow operating system vendors to better use the hardware for virtualization workloads.
- Up to four 2666 MHz DDR4 ECC or non-ECC UDIMMs provide speed and capacity of up to 128GB.
- The server offers PCI Express 3.0 I/O expansion capabilities that increase the theoretical maximum bandwidth by almost 100% (8 GTps per link using 128b/130b encoding) compared to the PCI Express 2.0 (5 GTps per link using 8b/10b encoding).
- With Intel Integrated I/O Technology, the PCI Express 3.0 controller is integrated into the Intel Xeon E-2100 Series processors. Such integration reduces I/O latency and increases overall system performance.
- The 12 Gbps SAS internal storage connectivity doubles the data transfer rate compared to 6 Gb SAS solutions to maximize performance of storage I/O-intensive applications.
- 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 and SSDs.
    - 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
    - Up to 8x 3.5-inch simple-swap drive bays
- 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 Broadcom provide 12 Gb SAS connectivity to the drive backplanes. A variety of RAID adapters are available, with cache up to 4 GB and support for 20 drives on a single controller.
- Offers two 5.25-inch media bays with support for optical drives or backup drives.
- Supports a single M.2 drive as an additional storage/boot device.
- The server has two integrated Gigabit Ethernet ports.
- The server offers PCI Express 3.0 I/O expansion capabilities that improve the theoretical maximum bandwidth by almost 100% (8 GT/ps per link using 128b/130b encoding) compared to the previous generation of PCI Express 2.0 (5 GT/s per link using 8b/10b encoding).
- The server offers up to four PCIe 3.0 I/O expansion slots
- Support for a NVIDIA graphics processing unit (GPU) to enhanced graphics.

Availability and serviceability

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

- The ST250 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 powerful systems management features simplify local and remote management of the ST250:

- The server includes an XClarity Controller (XCC) to monitor server availability. Optional upgrade to XCC Advanced to provide remote control (keyboard video mouse) functions. Optional upgrade to XCC Enterprise 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 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.
- 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 offers the following energy-efficiency 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 and Titanium certifications. Energy Star 3.0 certified.
- Intel Intelligent Power Capability powers individual processor elements on and off as needed to reduce power draw.
- Low-voltage 1.2 V DDR4 memory DIMMs use up to 20% less energy compared to 1.35 V DDR3 DIMMs.
- SSDs use as much as 80% less power than traditional spinning 2.5-inch 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.

Components and connectors

The following figure shows the front of the server.

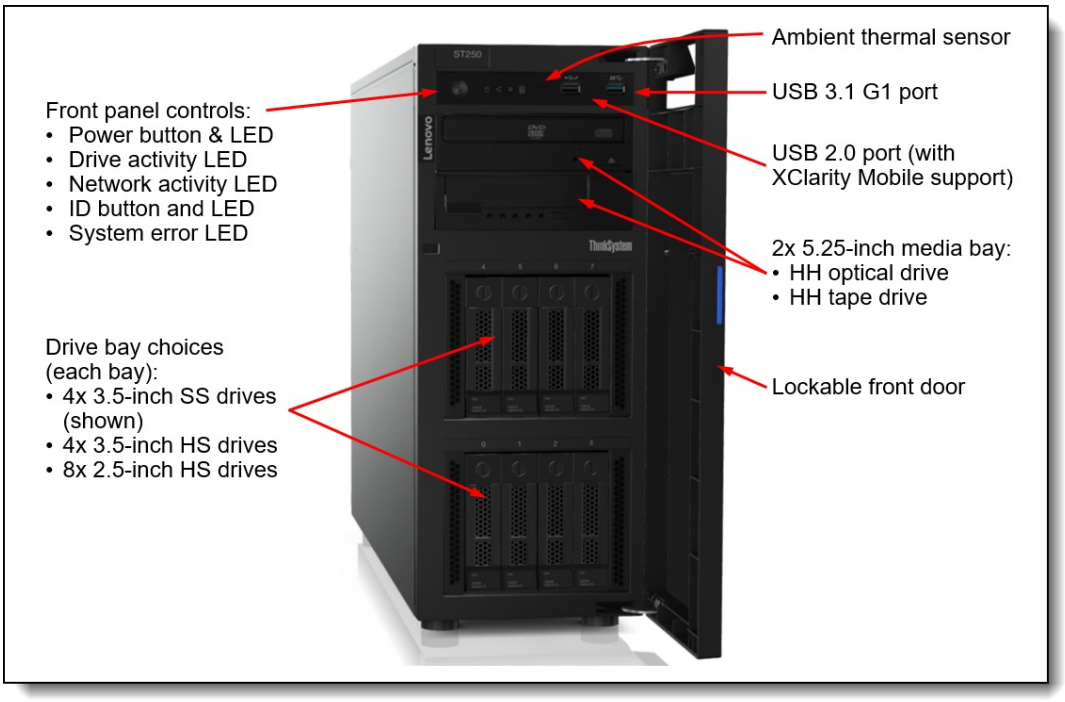

Figure 2. Front view of the ThinkSystem ST250 server

The following figure shows the rear of the server.

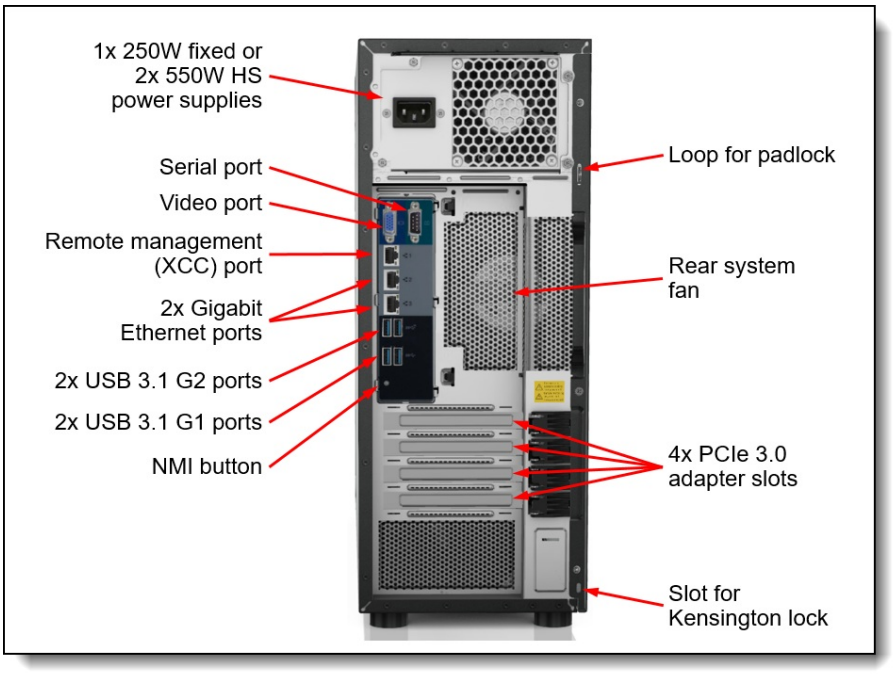

Figure 3. Rear view of the ThinkSystem ST250 server

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

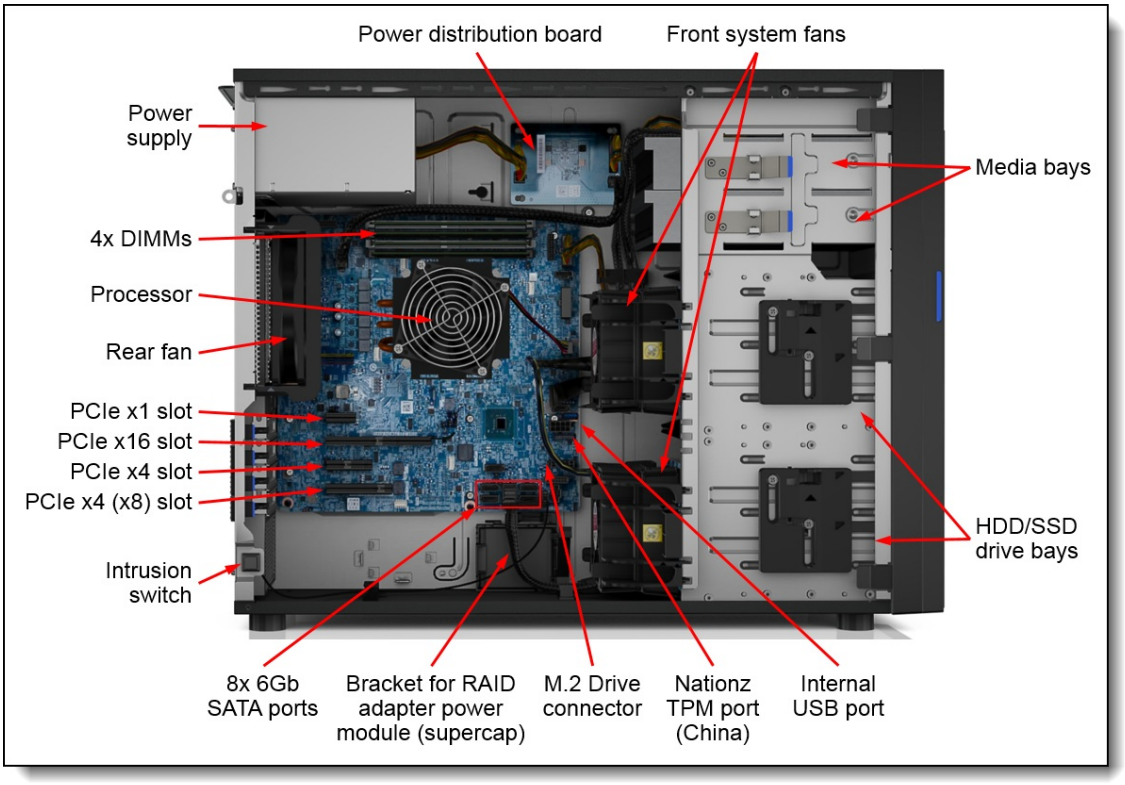

Figure 4. Internal view of the ThinkSystem ST250 server

System architecture

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

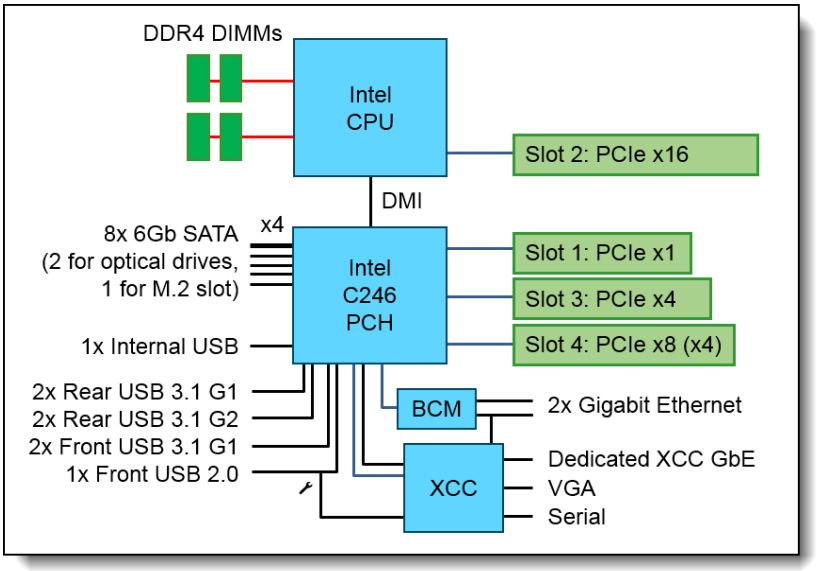

Figure 5. ST250 system architectural block diagram

A closer look at the SATA ports for use with SATA drives, optical drives and an M.2 drive, see the Internal storage section.

Standard specifications

The following table lists the standard specifications.

Table 1. Standard specifications

Components	Specification
Machine type	7Y46 - 1 year warranty 7Y45 - 3 year warranty
Form factor	Tower (can be installed in a rack with the available Rack Mount Kit)
Processor	One Intel processor (formerly codenamed "Coffee Lake"). Choose from: • Intel Xeon E-2100 Series processor up to 3.8 GHz • Intel Core i3-8100/8300 Series processor up to 4 GHz • Intel Pentium G5400/G5500/G5600 Series processor up to 3.9 GHz
Chipset	Intel C246 chipset
Memory	Four DIMM sockets supporting Lenovo TruDDR4 DIMMs at 2666 MHz. Support ECC UDIMMs.
Memory maximum	Up to 128GB with 4x 32GB UDIMMs
Memory protection	Error-correcting code (ECC)
Disk drive bays	Available configurations: • 8x or 16x 2.5-inch SAS/SATA hot-swap drive bays • 4x or 8x 3.5-inch SAS/SATA hot-swap drive bays • Both 4x 3.5-inch + 8x 2.5-inch SAS/SATA hot-swap drive bays • 8x 3.5-inch simple-swap drive bays In addition, the ST250 supports one M.2 Drive via an onboard connector. **Note**: If the onboard SATA controller is used to connect the drive bays, then only 6 drives can be installed if an M.2 drive is installed.

Maximum internal storage	• 2.5-inch drives:
	  ◦ 122.88TB using 16x 7.68TB 2.5-inch SAS/SATA SSDs
	  ◦ 38.4TB using 16x 2.4TB 2.5-inch HDDs
	• 3.5-inch drives:
	  ◦ 160TB using 8x 20TB 3.5-inch HDDs
	  ◦ 30.72TB using 8x 3.84TB 3.5-inch SAS/SATA SSDs
	• Intermix of SAS and SATA is supported

Storage controller	• Onboard 6 Gb SATA using embedded Intel RSTe software RAID, supporting RAID 0, 1, 10, 5, 50
	• 12 Gb SAS/SATA RAID for hot-swap drive configurations:
	  ◦ RAID 530i (cacheless) supports RAID 0, 1, 10, 5, 50
	  ◦ RAID 730-8i with 1GB cache supports RAID 0, 1, 10, 5, 50
	  ◦ RAID 930-8i with 2GB flash-backed cache supports RAID 0, 1, 10, 5, 50, 6, 60
	  ◦ RAID 930-16i and 24i with 4GB flash-backed cache supports RAID 0, 1, 10, 5, 50, 6, 60
	  ◦ RAID 940-8i with 4GB flash-backed cache supports RAID 0, 1, 10, 5, 50, 6, 60
	  ◦ RAID 940-16i with 4GB flash-backed cache supports RAID 0, 1, 10, 5, 50, 6, 60
	• 12 Gb SAS/SATA non-RAID:
	  ◦ 430-8i or 440-8i HBAs
	  ◦ 430-16i or 440-16i HBAs

Optical drive bays	Two half-height 5.25-inch bays for optical or tape drives. Supports SATA DVD-ROM or DVD-RW (multiburner). **Note**: If the onboard SATA controller is used to connect the drive bays, then only 6 drives can be installed if an optical drive is installed.
Tape drive bays	Two half-height 5.25-inch bays for optical or tape drives. Support for one RDX drive or one LTO tape 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.

Components	Specification
PCI Expansion slots	Four PCIe slots as follows: • Slot 1: PCIe 3.0 x1 full-height, half-length • Slot 2: PCIe 3.0 x16 full-height, half-length • Slot 3: PCIe 3.0 x4 full-height, half-length • Slot 4: PCIe 3.0 x4 full-height, half-length (x8 physical slot)

Ports	• Front:
	  ◦ One USB 3.1 G1 (5 Gb/s) port
	  ◦ One USB 2.0 port (supports XClarity Mobile connectivity for local systems management)
	• Rear:
	  ◦ Two USB 3.1 G1 (5Gb/s) ports
	  ◦ Two USB 3.1 G2 (10Gb/s) ports
	  ◦ One VGA video
	  ◦ One RJ-45 systems management
	  ◦ Two RJ-45 GbE network ports
	  ◦ One serial port
	• Internal:
	  ◦ One internal USB 3.0 port for RDX drive

Cooling	Supports ASHRAE A2 environments. Certain configurations support ASHRAE A3. Two or three fixed system fans depending on the drive bay configuration. Additional fans attached to the processor heat sink and in the power supplies.
Power supply	Two choices, model dependent: • One fixed power supply, 250W. 80 PLUS Platinum certified. • Two redundant hot-swap power supplies, each 550W. For China customers, the 550W power supplies support 240V DC input. 80 PLUS Platinum certified. Energy Star 3.0 compliant.
Hot-swap parts	Hard drives and 550W power supplies
Systems management	Operator panel with status LEDs. XClarity Controller 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 1.2 or TPM 2.0. In China only, optional Nationz TPM 2.0 module. Optional chassis intrusion switch. Padlock loop and Kensington cable slot and optional lockable front door for physical security.
Video	G200 graphics with 16 MB memory, integrated into the XClarity Controller. For use with local Administrator functions (not designed for workstation use). Maximum resolution is 1920x1200 32bpp at 60Hz.
Operating systems supported	Microsoft Windows Server, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, VMware ESXi. See the Operating system support 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 in.), height: 444 mm (17.5 in.), depth: 578 mm (22.8 in.). SeePhysical and electrical specifications for details.
Weight	Fully configured: 23.56 kg (51.94 lb)

The ST250 server is shipped with the following items:

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

Models

ThinkSystem ST250 models can be configured by using the Lenovo Data Center Solution Configurator (DCSC).

Configure-to-order (CTO) models are used to create models with factory-integrated server customizations. For CTO models, two base CTO models are available for the ST250 as listed in the following table, CTO1WW and CTOLWW:

- The CTO1WW base CTO model is for general business and is selectable by choosing **General Purpose** mode in DCSC.
- The CTOLWW base model is intended for High Performance Computing (HPC) and Artificial Intelligence (AI) configurations and solutions, including configurations for Lenovo Scalable Infrastructure (LeSI), and is enabled using either the **HPC & AI LeSI Solutions** mode or **HPC & AI Hardware** mode in DCSC. CTOLWW configurations can also be built using System x and Cluster Solutions Configurator (x-config).

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

Table 2. Base CTO models

Machine Type/Model General purpose	**Machine Type/Model for HPC and AI**	**Description**
7Y45CTO1WW	7Y45CTOLWW	ThinkSystem ST250 – 3-year Warranty
7Y46CTO1WW	7Y46CTOLWW	ThinkSystem ST250 – 1-year Warranty

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

- Models for Australia and New Zealand
- Models for South East Asian countries (ASEAN)
- Models for EMEA countries
- Models for Hong Kong, Taiwan, Korea (HTK)
- Models for Japan

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

Models for Australia and New Zealand

Table 3. Models for Australia and New Zealand

Model	Intel processor†	Memory	Drive Controller	Drive bays Drives	Optical	Power supply	Pwr cord	XCC	Sec. door	Intru sw.	Op Sys
Standard models with a 3-year model (machine type 7Y45)											
7Y45A01LAU	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard AHCI	8x 2.5-in HS* / Open bay	Open	1x 550W HS / 2	Yes	Ent	Option	Option	Not incl.
7Y45A01QAU	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard AHCI	4x 3.5-in HS / Open bay	Open	1x 550W HS / 2	Yes	Ent	Option	Option	Not incl.
7Y45A01RAU	Xeon E-2124G 4+2C 71W 3.4GHz	1x 8GB	Onboard AHCI	4x 3.5-in HS / Open bay	Open	1x 550W HS / 2	Yes	Ent	Option	Option	Not incl.
7Y45A01TAU	Xeon E-2126G 6+2C 80W 3.3GHz	1x 8GB	Onboard AHCI	8x 2.5-in HS* / Open bay	Open	1x 550W HS / 2	Yes	Ent	Option	Option	Not incl.
7Y45A01WAU	Xeon E-2126G 6+2C 80W 3.3GHz	1x 8GB	Onboard AHCI	4x 3.5-in HS / Open bay	Open	1x 550W HS / 2	Yes	Ent	Option	Option	Not incl.
7Y45A01NAU	Xeon E-2144G 4+2C 71W 3.6GHz	1x 16GB	Onboard AHCI	8x 2.5-in HS* / Open bay	Open	1x 550W HS / 2	Yes	Ent	Option	Option	Not incl.
7Y45A01PAU	Xeon E-2144G 4+2C 71W 3.6GHz	1x 16GB	Onboard AHCI	4x 3.5-in HS / Open bay	Open	1x 550W HS / 2	Yes	Ent	Option	Option	Not incl.
7Y45A01UAU	Xeon E-2176G 6+2C 80W 3.7GHz	1x 16GB	Onboard AHCI	8x 2.5-in HS* / Open bay	Open	1x 550W HS / 2	Yes	Ent	Option	Option	Not incl.
7Y45A01MAU	Xeon E-2186G 6+2C 95W 3.8GHz	1x 16GB	Onboard AHCI	8x 2.5-in HS* / Open bay	Open	1x 550W HS / 2	Yes	Ent	Option	Option	Not incl.

† Processor detail: Model, compute core count + graphics core count, 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.
‡ Includes Windows Server 2019 to Windows Server 2016 Downgrade Kit

Models for South East Asian countries (ASEAN)

Table 4. Models for South East Asian countries (ASEAN)

Model	Intel processor†	Memory	Drive Controller	Drive bays Drives	Optical	Power supply	Pwr cord	XCC	Sec. door	Intru sw.	Op Sys
TopSeller models with a 3-year model (machine type 7Y45)											
7Y45A00SSG	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard RSTe	4x 3.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A014SG	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	RAID 530-8i	8x 2.5-in HS / Open bay	1x DVD-RW	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A018SG	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	RAID 530-8i	4x 3.5-in HS / Open bay	1x DVD-RW	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A00YSG	Xeon E-2124G 4+2C 71W 3.4GHz	1x 8GB	Onboard RSTe	4x 3.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A01CSG	Xeon E-2124G 4+2C 71W 3.4GHz	1x 8GB	RAID 530-8i	4x 3.5-in HS / Open bay	1x DVD-RW	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A01HSG	Xeon E-2124G 4+2C 71W 3.4GHz	1x 8GB	RAID 530-8i	8x 2.5-in HS / Open bay	1x DVD-RW	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A015SG	Xeon E-2126G 6+2C 80W 3.3GHz	1x 8GB	Onboard RSTe	4x 3.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A01FSG	Xeon E-2126G 6+2C 80W 3.3GHz	1x 8GB	RAID 530-8i	4x 3.5-in HS / Open bay	1x DVD-RW	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A01JSG	Xeon E-2126G 6+2C 80W 3.3GHz	1x 8GB	RAID 530-8i	8x 2.5-in HS / Open bay	1x DVD-RW	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A01ZSG	Xeon E-2134 4C 71W 3.5GHz	1x 8GB	Onboard RSTe	4x 3.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A020SG	Xeon E-2136 6C 80W 3.3GHz	1x 8GB	Onboard RSTe	4x 3.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A00USG	Xeon E-2144G 4+2C 71W 3.6GHz	1x 8GB	RAID 530-8i	8x 2.5-in HS / Open bay	1x DVD-RW	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A00ZSG	Xeon E-2144G 4+2C 71W 3.6GHz	1x 8GB	RAID 530-8i	4x 3.5-in HS / Open bay	1x DVD-RW	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A013SG	Xeon E-2146G 6+2C 80W 3.5GHz	1x 8GB	RAID 530-8i	8x 2.5-in HS / Open bay	1x DVD-RW	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A01KSG	Xeon E-2146G 6+2C 80W 3.5GHz	1x 8GB	RAID 530-8i	4x 3.5-in HS / Open bay	1x DVD-RW	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A00PSG	Xeon E-2174G 4+2C 71W 3.8GHz	1x 8GB	RAID 530-8i	8x 2.5-in HS / Open bay	1x DVD-RW	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A017SG	Xeon E-2174G 4+2C 71W 3.8GHz	1x 8GB	RAID 530-8i	4x 3.5-in HS / Open bay	1x DVD-RW	1x 550W HS / 2	No	Std	Option	Option	Not incl.

† Processor detail: Model, compute core count + graphics core count, 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.
‡ Includes Windows Server 2019 to Windows Server 2016 Downgrade Kit

Models for EMEA countries

Table 6. Models for EMEA countries

Model	Intel processor†	Memory	Drive Controller	Drive bays Drives	Optical	Power supply	Pwr cord	XCC	Sec. door	Intru sw.	Op Sys
Standard models with 3 year warranty (machine type 7Y45)											
7Y45A06HEA	Xeon E-2146G 6+2C 80W 3.5GHz	1x 32GB	Onboard AHCI	8x 2.5-in HS* / Open bay	Open	250W fixed	Yes	Ent	Opt	Yes	Not incl.

† Processor detail: Model, compute core count + graphics core count, 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.
‡ Includes Windows Server 2019 to Windows Server 2016 Downgrade Kit

Models for Hong Kong, Taiwan, Korea (HTK)

Table 7. Models for Hong Kong, Taiwan, Korea (HTK)

Model	Intel processor†	Memory	Drive Controller	Drive bays Drives	Optical	Power supply	Pwr cord	XCC	Sec. door	Intru sw.	Op Sys
TopSeller models with 3 year warranty (machine type 7Y45)											
7Y45A00SCN	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard RSTe	4x 3.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A014CN	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	RAID 530-8i	8x 2.5-in HS / Open bay	1x DVD-RW	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A018CN	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	RAID 530-8i	4x 3.5-in HS / Open bay	1x DVD-RW	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A00YCN	Xeon E-2124G 4+2C 71W 3.4GHz	1x 8GB	Onboard RSTe	4x 3.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A01CCN	Xeon E-2124G 4+2C 71W 3.4GHz	1x 8GB	RAID 530-8i	4x 3.5-in HS / Open bay	1x DVD-RW	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A01HCN	Xeon E-2124G 4+2C 71W 3.4GHz	1x 8GB	RAID 530-8i	8x 2.5-in HS / Open bay	1x DVD-RW	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A015CN	Xeon E-2126G 6+2C 80W 3.3GHz	1x 8GB	Onboard RSTe	4x 3.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A01FCN	Xeon E-2126G 6+2C 80W 3.3GHz	1x 8GB	RAID 530-8i	4x 3.5-in HS / Open bay	1x DVD-RW	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A01JCN	Xeon E-2126G 6+2C 80W 3.3GHz	1x 8GB	RAID 530-8i	8x 2.5-in HS / Open bay	1x DVD-RW	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A01YCN	Xeon E-2134 4C 71W 3.5GHz	1x 8GB	Onboard RSTe	4x 3.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A01XCN	Xeon E-2136 6C 80W 3.3GHz	1x 8GB	Onboard RSTe	4x 3.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A00UCN	Xeon E-2144G 4+2C 71W 3.6GHz	1x 8GB	RAID 530-8i	8x 2.5-in HS / Open bay	1x DVD-RW	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A00ZCN	Xeon E-2144G 4+2C 71W 3.6GHz	1x 8GB	RAID 530-8i	4x 3.5-in HS / Open bay	1x DVD-RW	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A013CN	Xeon E-2146G 6+2C 80W 3.5GHz	1x 8GB	RAID 530-8i	8x 2.5-in HS / Open bay	1x DVD-RW	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A01KCN	Xeon E-2146G 6+2C 80W 3.5GHz	1x 8GB	RAID 530-8i	4x 3.5-in HS / Open bay	1x DVD-RW	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A00PCN	Xeon E-2174G 4+2C 71W 3.8GHz	1x 8GB	RAID 530-8i	8x 2.5-in HS / Open bay	1x DVD-RW	1x 550W HS / 2	No	Std	Option	Option	Not incl.
7Y45A017CN	Xeon E-2174G 4+2C 71W 3.8GHz	1x 8GB	RAID 530-8i	4x 3.5-in HS / Open bay	1x DVD-RW	1x 550W HS / 2	No	Std	Option	Option	Not incl.

† Processor detail: Model, compute core count + graphics core count, 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.
‡ Includes Windows Server 2019 to Windows Server 2016 Downgrade Kit

Models for Japan

Included with all Japan models:

- ThinkSystem Optical Wheel Mouse - USB
- ThinkSystem Preferred Pro II USB Keyboard - Japanese

Table 8. Models for Japan

Model	Intel processor†	Memory	Drive Controller	Drive bays Drives	Optical	Power supply	Pwr cord	XCC	Sec. door	Intru sw.	Op Sys
Standard models with 1 year warranty (machine type 7Y46)											
7Y46A02TJP	Xeon E-2124 4C 71W 3.3GHz	1x 8GB	RAID 930-8i	8x 2.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.
7Y46A030JP	Xeon E-2124 4C 71W 3.3GHz	1x 8GB	Onboard RSTe	4x 3.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.
7Y46A036JP	Xeon E-2124 4C 71W 3.3GHz	1x 8GB	RAID 530-8i	8x 2.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.
7Y46A037JP	Xeon E-2124 4C 71W 3.3GHz	1x 16GB	RAID 530-8i	8x 2.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.
7Y46A02DJP	Xeon E-2124G 4+2C 71W 3.4GHz	1x 8GB	RAID 930-8i	8x 2.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.
7Y46A02LJP	Xeon E-2124G 4+2C 71W 3.4GHz	1x 8GB	Onboard RSTe	4x 3.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.
7Y46A026JP	Xeon E-2126G 6+2C 80W 3.3GHz	1x 8GB	RAID 930-8i	8x 2.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.
7Y46A02GJP	Xeon E-2126G 6+2C 80W 3.3GHz	1x 8GB	Onboard RSTe	4x 3.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.
7Y46A03XJP	Xeon E-2126G 6+2C 80W 3.3GHz	1x 16GB	RAID 730-8i 2GB	8x 2.5-in HS / 3x 300GB 10K	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Yes	Option	WS19 Std Preload
7Y46A029JP	Xeon E-2134 4C 71W 3.5GHz	1x 8GB	RAID 930-8i	8x 2.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.
7Y46A02EJP	Xeon E-2134 4C 71W 3.5GHz	1x 8GB	Onboard RSTe	4x 3.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.
7Y46A038JP	Xeon E-2134 4C 71W 3.5GHz	1x 8GB	RAID 530-8i	8x 2.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.
7Y46A039JP	Xeon E-2134 4C 71W 3.5GHz	1x 16GB	RAID 530-8i	8x 2.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.

Model	Intel processor†	Memory	Drive Controller	Drive bays Drives	Optical	Power supply	Pwr cord	XCC	Sec. door	Intru sw.	Op Sys
7Y46A043JP	Xeon E-2134 4C 71W 3.5GHz	1x 16GB	RAID 530-8i	8x 2.5-in HS / 2x 300GB 10K	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Yes	Option	WS19 Std Preload
7Y46A044JP	Xeon E-2134 4C 71W 3.5GHz	1x 16GB	RAID 730-8i 2GB	8x 2.5-in HS / 3x 300GB 10K	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Yes	Option	WS19 Std Preload
7Y46A02FJP	Xeon E-2136 6C 80W 3.3GHz	1x 8GB	Onboard RSTe	4x 3.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.
7Y46A02JJP	Xeon E-2136 6C 80W 3.3GHz	1x 8GB	RAID 930-8i	8x 2.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.
7Y46A03YJP	Xeon E-2136 6C 80W 3.3GHz	1x 16GB	RAID 730-8i 2GB	8x 2.5-in HS / 3x 300GB 10K	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Yes	Option	WS19 Std Preload
7Y46A02PJP	Xeon E-2144G 4+2C 71W 3.6GHz	1x 8GB	Onboard RSTe	4x 3.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.
7Y46A02QJP	Xeon E-2144G 4+2C 71W 3.6GHz	1x 8GB	RAID 930-8i	8x 2.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.
7Y46A03AJP	Xeon E-2144G 4+2C 71W 3.6GHz	1x 16GB	RAID 530-8i	8x 2.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.
7Y46A03BJP	Xeon E-2144G 4+2C 71W 3.6GHz	1x 8GB	RAID 530-8i	8x 2.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.
7Y46A03VJP	Xeon E-2144G 4+2C 71W 3.6GHz	1x 16GB	RAID 730-8i 2GB	8x 2.5-in HS / 3x 300GB 10K	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Yes	Option	WS19 Std Preload
7Y46A041JP	Xeon E-2144G 4+2C 71W 3.6GHz	1x 16GB	RAID 530-8i	8x 2.5-in HS / 2x 300GB 10K	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Yes	Option	WS19 Std Preload
7Y46A02KJP	Xeon E-2146G 6+2C 80W 3.5GHz	1x 8GB	Onboard RSTe	4x 3.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.
7Y46A02NJP	Xeon E-2146G 6+2C 80W 3.5GHz	1x 8GB	RAID 930-8i	8x 2.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.
7Y46A042JP	Xeon E-2146G 6+2C 80W 3.5GHz	1x 16GB	RAID 730-8i 2GB	8x 2.5-in HS / 3x 300GB 10K	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Yes	Option	WS19 Std Preload
7Y46A02MJP	Xeon E-2174G 4+2C 71W 3.8GHz	1x 8GB	Onboard RSTe	4x 3.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.

Model	Intel processor†	Memory	Drive Controller	Drive bays Drives	Optical	Power supply	Pwr cord	XCC	Sec. door	Intru sw.	Op Sys
7Y46A02WJP	Xeon E-2174G 4+2C 71W 3.8GHz	1x 8GB	RAID 930-8i	8x 2.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.
7Y46A040JP	Xeon E-2174G 4+2C 71W 3.8GHz	1x 16GB	RAID 730-8i 2GB	8x 2.5-in HS / 3x 300GB 10K	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Yes	Option	WS19 Std Preload
7Y46A02SJP	Xeon E-2176G 6+2C 80W 3.7GHz	1x 8GB	RAID 930-8i	8x 2.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.
7Y46A031JP	Xeon E-2176G 6+2C 80W 3.7GHz	1x 8GB	Onboard RSTe	4x 3.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.
7Y46A045JP	Xeon E-2176G 6+2C 80W 3.7GHz	1x 16GB	RAID 730-8i 2GB	8x 2.5-in HS / 3x 300GB 10K	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Yes	Option	WS19 Std Preload
7Y46A02UJP	Xeon E-2186G 6+2C 95W 3.8GHz	1x 8GB	Onboard RSTe	4x 3.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.
7Y46A02ZJP	Xeon E-2186G 6+2C 95W 3.8GHz	1x 8GB	RAID 930-8i	8x 2.5-in HS / Open bay	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Option	Option	Not incl.
TopSeller models with 1 year warranty (machine type 7Y46)											
7Y46A03UJP	Xeon E-2124 4C 71W 3.3GHz	1x 16GB	Onboard RSTe	4x 3.5-in HS / 2x 1TB SATA HDD	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Yes	Option	WS19 Std Preload
7Y46A03WJP	Xeon E-2124 4C 71W 3.3GHz	1x 16GB	RAID 730-8i 2GB	4x 3.5-in HS / 2x 1TB SATA HDD	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Yes	Option	WS19 Std Preload
7Y46A03ZJP	Xeon E-2124 4C 71W 3.3GHz	1x 16GB	RAID 730-8i 2GB	8x 2.5-in HS / 3x 300GB 10K	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Yes	Option	WS19 Std Preload
7Y46A046JP	Xeon E-2124 4C 71W 3.3GHz	1x 16GB	RAID 530-8i	4x 3.5-in HS / 2x 1TB SATA HDD	1x DVD-ROM	1x 550W HS / 2	Yes	Adv	Yes	Option	WS19 Std Preload

† Processor detail: Model, compute core count + graphics core count, 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.
‡ Includes Windows Server 2019 to Windows Server 2016 Downgrade Kit

Processors

The ST250 supports one processor from the Intel product family formerly known by the codename "Coffee Lake". This includes processors from the Intel Xeon E, Core i3 and Pentium families.

Topics in this section:

- UEFI operating modes

E-2200 processors: The ST250 also supports Xeon E-2200 processors. For details, see https://lenovopress.com/lp1275.

The server supports the processors that are listed in the following table.

All supported processors have the following characteristics:

- 14 nm semiconductor process technology
- 8 GT/s DMI3 bus speed
- Two DDR4 memory channels
- 16 PCIe 3.0 I/O lanes

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

Table 11. Processor selections

Feature code	Intel processor	TDP	Cores / Threads	Base core speed	Cache	Memory bus speed	ECC	HT	Turbo Boost / Max speed	VT	Intel SGX*
B357	Core i3-8100	65W	4 / 4	3.6 GHz	6 MB	2400 MHz	Yes	No	No	Yes	No
B359	Core i3-8100T	35W	4 / 4	3.1 GHz	6 MB	2400 MHz	Yes	No	No	Yes	No
B35C	Pentium G5400	58W	2 / 4	3.7 GHz	4 MB	2400 MHz	Yes	Yes	No	Yes	No
B35G	Pentium G5400T	35W	2 / 4	3.1 GHz	4 MB	2400 MHz	Yes	Yes	No	Yes	No
B354	Xeon E-2104G	65W	4 / 4	3.2 GHz	8 MB	2666 MHz	Yes	No	No	Yes	No
B353	Xeon E-2124	71W	4 / 4	3.3 GHz	8 MB	2666 MHz	Yes	No	Yes / 4.30 GHz	Yes	No
B352	Xeon E-2124G	71W	4 / 4	3.4 GHz	8 MB	2666 MHz	Yes	No	Yes / 4.50 GHz	Yes	No
B351	Xeon E-2126G	80W	6 / 6	3.3 GHz	12 MB	2666 MHz	Yes	No	Yes / 4.50 GHz	Yes	No
B350	Xeon E-2134	71W	4 / 8	3.5 GHz	8 MB	2666 MHz	Yes	Yes	Yes / 4.50 GHz	Yes	No
B34Z	Xeon E-2136	80W	6 / 12	3.3 GHz	12 MB	2666 MHz	Yes	Yes	Yes / 4.50 GHz	Yes	No
B34Y	Xeon E-2144G	71W	4 / 8	3.6 GHz	8 MB	2666 MHz	Yes	Yes	Yes / 4.50 GHz	Yes	No
B34X	Xeon E-2146G	80W	6 / 12	3.5 GHz	12 MB	2666 MHz	Yes	Yes	Yes / 4.50 GHz	Yes	No
B34W	Xeon E-2174G	71W	4 / 8	3.8 GHz	8 MB	2666 MHz	Yes	Yes	Yes / 4.70 GHz	Yes	Yes
B34V	Xeon E-2176G	80W	6 / 12	3.7 GHz	12 MB	2666 MHz	Yes	Yes	Yes / 4.70 GHz	Yes	Yes
B34U	Xeon E-2186G	95W	6 / 12	3.8 GHz	12 MB	2666 MHz	Yes	Yes	Yes / 4.70 GHz	Yes	Yes

* Intel SGX support requires UEFI V1.03 (ISE110C) or later.

UEFI operating modes

The ST250 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 12. UEFI operating mode presets in DCSC

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

The preset modes for the ST250 are as follows:

- **Maximum Performance Mode** (feature BFYB): Achieves maximum performance but with higher power consumption and lower energy efficiency.

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

Memory options

The ST250 server supports Lenovo TruDDR4 memory. TruDDR4 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.

TruDDR4 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, TruDDR4 memory automatically assumes the system's warranty, and service and support provided worldwide.

The ST250 supports up to 4 DIMMs. The processors have 2 memory channels and support 2 DIMMs per channel.

All DIMMs operate at a speed of 2666 MHz. However, if the processor selected has a lower memory bus speed (eg 2400 MHz - see the Processor table), then all DIMMs will operate at that lower speed.

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

Table 13. Memory options

Part number	Feature code	Description	Maximum supported
ECC UDIMMs			
4ZC7A08696	B35J	ThinkSystem 8GB TruDDR4 2666MHz (1Rx8, 1.2V) ECC UDIMM	4
4ZC7A08699	B35K	ThinkSystem 16GB TruDDR4 2666MHz (2Rx8, 1.2V) ECC UDIMM	4
4ZC7A15142‡	B96E	ThinkSystem 32GB TruDDR4 2666MHz (2Rx8, 1.2V) ECC UDIMM	4

‡ Requires UEFI firmware upgrade, version 2.00 (ISE114H) or later.

The following rules and recommendations apply when selecting the memory configuration:

- The server only supports UDIMMs
- The use of the 32GB DIMM is only supported with Xeon processors. It is not supported with Core or Pentium processors.
- The use of the 32GB DIMM requires the server UEFI firmware be updated to Version 2.00 (ISE114H) or later.
- All DIMMs must be identical. Mixing DIMMs is not supported.
- For best performance when installing two DIMMs, install one in each memory channel

Internal storage

The ST250 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:

- Backplanes and drive bays
- Adapters and cabling
- Field upgrades
- M.2 drives
- SED encryption key management with ISKLM

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.

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. NVMe PCIe drives are not supported with any configuration.

The different drive bay configurations supported are shown in the following figure. The server also supports one M.2 drive, installed in a slot on the system board as shown in the internal view of the server.

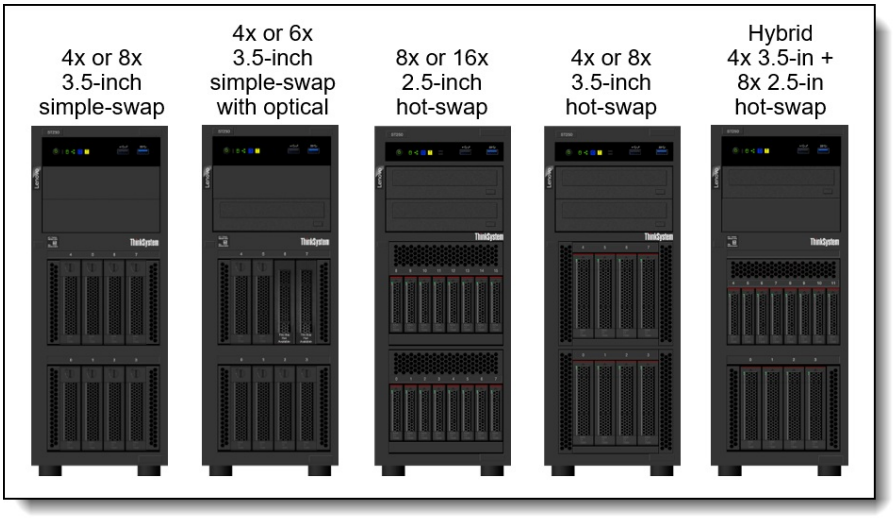

Figure 6. Internal drive bay configurations

The following table lists the available hot-swap backplanes and simple-swap backplates. The feature codes are used for configure-to-order and the option part numbers are for field installations & upgrades. See the Field upgrades section for details.

Table 14. Backplanes

Option part number	Feature code	Description
4M17A80523 or 4M17A12790	B41E	ThinkSystem ST250 2.5" SATA/SAS 8-Bay Backplane Kit
4M17A80608 or 4M17A80603	BN9N	ThinkSystem ST250 2.5" SATA/SAS 8-Bay Backplane Kit for X40 RAID
4M17A80522 or 4M17A12788	B41D	ThinkSystem ST250 3.5" SATA/SAS 4-Bay Backplane Kit
4M17A80604 or 4M17A80606		ThinkSystem ST250 3.5" SATA/SAS 4-Bay Backplane Kit with x40
4M17A80598	BN14	ThinkSystem ST250 3.5" SATA 4-Bay Simple Swap Bracket Plate Kit v2
4M17A12789	B4LP	ThinkSystem ST250 3.5" SATA 4-Bay Simple Swap Bracket Plate Kit

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

- If the onboard SATA controller is used, then up to 8 drives can be connected (hot-swap or simple-swap) provided no optical drive or M.2 drive is installed.
- If the onboard SATA controller is used and an optical drive or an M.2 drive is installed, then at most 6 drives can be installed. The last two drives (drive bays 6 and 7, where the first drive bay is bay 0) will not connected and should remain empty (and in the case of simple-swap drives, the SATA connections to the bays 6 & 7 should be disconnected)
- If the onboard SATA controller is used in RAID mode and an M.2 drive is installed, the M.2 cannot be used as a boot device to boot Windows.
- If the onboard SATA controller is used in RAID mode and eight drives are installed, the last two drives (drive bays 6 and 7, where the first drive bay is bay 0) cannot be used as a boot device to boot Windows.

Adapters and cabling

This section describes the adapter and cabling requirements for each drive bay configuration.

The ST250 has an onboard SATA controller for drive, optical drive and M.2 connectivity. For the drives, connections are via 5 connectors on the system board: four single-lane SATA connectors and one mini-SAS HD connector with 4 lanes.

When using the onboard SATA controller, SATA ports 6 and 7 are shared between drive bays 6 & 7, the two optical drive bays, and the M.2 connector. The connections are as follows, shown in the figure below:

- SATA ports 0, 1, 2 and 3 are connected to the first 4 drive bays (bays 0-3). These are routed to a single mini-SAS HD connector on the system board.
- SATA ports 4 and 5 are connected to bays 4 and 5
- SATA port 6 is either connected to drive bay 6 or optical drive bay 0 (lower bay).
- SATA port 7 is either connected to drive bay 7 or optical drive bay 1 (upper bay) or to the onboard M.2 connector. When an M.2 drive is inserted into the M.2 connector, it automatically connects to the SATA port and any connected drives (drive bay 7 or ODD1) are automatically disconnected.

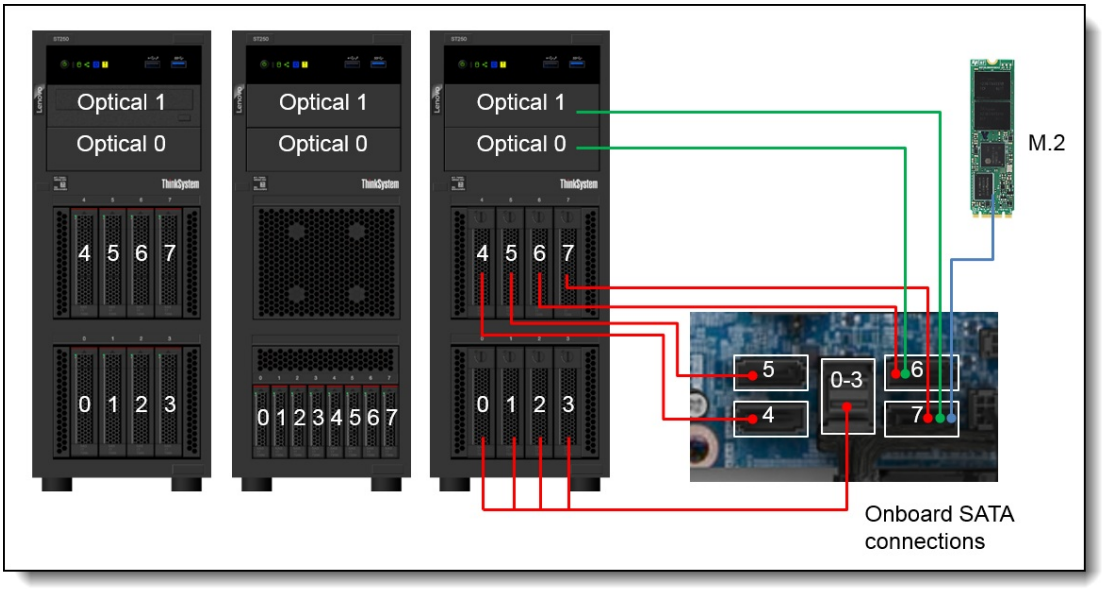

Figure 7. Onboard SATA connections

In summary, the following combinations are supported with the onboard SATA controller:

- 8x SATA drives
- 6x SATA drives + M.2
- 6x SATA drives + M.2 + 1x optical drive
- 6x SATA drives + 2x optical drives

The ST250 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 12-bay or 16-bay configurations, use the RAID 930-16i adapter and RAID 940-16i adapter
- It is supported to add any one of the following combinations to a RAID adapter/HBA configuration:
  - 1x SATA optical drive
  - 1x SATA optical drive + M.2 drive
  - 2x SATA optical drive

  It is not supported to add 2x SATA optical drives + M.2 drive to a RAID adapter or HBA configuration.

Field upgrades

The following table shows the upgrades you can perform to the ST250 after initial purchase. Upgrades you can perform are as follows:

- Replacing the onboard software RAID controller with a hardware RAID adapter or SAS HBA
- Replacing an existing adapter without cache with a RAID adapter with flash-backed cache
- Adding the second (upper) drive cage of 4x 3.5-inch or 8x 2.5-inch drive bays

Tip: In the tables, **RAID/HBA X30** refers to any of the following adapters:

- ThinkSystem 430-8i or 430-16i SAS/SATA 12Gb HBAs
- ThinkSystem RAID 530-8i PCIe 12Gb Adapter
- ThinkSystem RAID 730-8i 1GB Cache or RAID 730-8i 2GB Flash PCIe 12Gb Adapters
- ThinkSystem RAID 930-8i 2GB or RAID 930-16i 4GB Flash PCIe 12Gb Adapters

RAID/HBA X40 refers to any of the following adapters:

- ThinkSystem 440-8i or 440-16i SAS/SATA PCIe Gen4 12Gb HBAs
- ThinkSystem RAID 940-8i 4GB or RAID 940-16i 4GB Flash PCIe Gen4 12Gb Adapters

Table 15. Upgrading the internal drive bays in the field

Starting configuration	**Required configuration**	**Controller to add (X30 means 530, 730, 930 or 430) (X40 means 940 or 440)**	**Cable Kit**	**Backplane & Cage Kit**
Upgrading Onboard SATA to RAID Adapter/HBA (1 Drive Cage)				
4x3.5" HS SW RAID	4x3.5" HS HW RAID	Add 8-port RAID/HBA X30	4Z57A14087	Not needed
		Add 8-port RAID/HBA X40	4Z57A80611	Not needed
8x3.5" HS SW RAID	8x3.5" HS HW RAID	Add 8-port RAID/HBA X30	4Z57A14087	Not needed
		Add 8-port RAID/HBA X40	4Z57A80611	Not needed
8x2.5" HS SW RAID	8x2.5" HS HW RAID	Add 8-port RAID/HBA X30	4Z57A14087	Not needed
		Add 8-port RAID/HBA X40	4Z57A80611	Not needed
Upgrading Onboard SATA to RAID Adapter/HBA + Adding Upper Drive Cage				
4x3.5" HS SW RAID	8x3.5" HS HW RAID	Add 8-port RAID/HBA X30	4Z57A14087	4M17A80522 or 4M17A12788
		Add 8-port RAID/HBA X40	4Z57A80611	4M17A80604 or 4M17A80606
4x3.5" HS SW RAID	4x3.5" HS + 8x2.5" HW RAID	Add 16-port or 2x 8-port RAID/HBA X30	4Z57A14087	4M17A80523 or 4M17A12790
		Add 16-port or 2x 8-port RAID/HBA X40	4Z57A80611	4M17A80608 or 4M17A80603
8x2.5" HS SW RAID	16x2.5" HS HW RAID	Add 16-port or 2x 8-port RAID/HBA X30	4Z57A14087	4M17A80523 or 4M17A12790
		Add 16-port or 2x 8-port RAID/HBA X40	4Z57A80611	4M17A80608 or 4M17A80603
Replacing a RAID adapter/HBA with a RAID 930i adapter (requiring a bracket for the flash power module)				

Starting configuration	Required configuration	Controller to add (X30 means 530, 730, 930 or 430) (X40 means 940 or 440)	Cable Kit	Backplane & Cage Kit
Any HBA or RAID adapter without flash-backed cache	RAID with flash-backed cache	Replace existing adapter with RAID 930	4Z57A14087	Not needed
		Replace existing adapter with RAID 940	4Z57A80611	Not needed
Adding Upper Drive Cage (No change to existing controller if possible)				
4x3.5" SS SW RAID	8x3.5" SS SW RAID*	No change (onboard SATA)	None	4M17A80598 or 4M17A12789
4x3.5" HS SW RAID	8x3.5" HS SW RAID*	No change (onboard SATA)	None	4M17A80522 or 4M17A12788
4x3.5" HS HW RAID	8x3.5" HS HW RAID	No change (existing RAID/HBA X30)	None	4M17A80522 or 4M17A12788
		No change (existing RAID/HBA X40)	None	4M17A80604 or 4M17A80606
4x3.5" HS HW RAID	4x3.5" HS + 8x2.5" HW RAID	Add second 8-port or replace existing 8-port with 16-port RAID/HBA X30	None	4M17A80523 or 4M17A12790
		Add second 8-port or replace existing 8-port with 16-port RAID/HBA X40	None	4M17A80608 or 4M17A80603
8x 2.5" HS HW RAID	16x 2.5" HS HW RAID	Add second 8-port or replace existing 8-port with 16-port RAID/HBA X30	None	4M17A80523 or 4M17A12790
		Add second 8-port or replace existing 8-port with 16-port RAID/HBA X40	None	4M17A80608 or 4M17A80603

* If you have an optical drive or M.2 drive installed, you are limited to 6 drives

The following table lists the contents of the cable and backplane kits needed for the upgrades.

Table 16. Cable and backplane kits

Part number	Description and list of included components
Cable kits	
4Z57A80611	ThinkSystem ST250 X40 RAID/HBA Cable & Flash Mech Kit (for RAID/HBA X40 adapters) • 1x Slimline-SAS to MiniSAS HD cable • 1x Bracket for flash power module (supercap) for RAID adapter
4Z57A14087	ThinkSystem ST250 RAID/HBA Cable & Flash Mech Kit (for RAID/HBA X30 adapters) • 2x ST250 RAID HS HDD Signal Cables • 1x Bracket for flash power module (supercap) for RAID adapter
Backplane kits	

Part number	Description and list of included components
4M17A80523	ThinkSystem ST250 2.5" SATA/SAS 8-Bay Backplane Kit v2 (for RAID/HBA X30) • 1x 8x2.5" SATA/SAS backplane • 1x cage assembly • 2x SAS cables for RAID/HBA X30 adapters (SBB7A10260, SBB7A10229) • 1x power cable • 8x 2.5" drive bay fillers • 1x front fan and cable
4M17A12790	ThinkSystem ST250 2.5" SATA/SAS 8-Bay Backplane Kit (for RAID/HBA X30) • 1x 8x2.5" SATA/SAS backplane • 1x cage assembly • 2x SAS cables for RAID/HBA X30 adapters (SBB7A10260, SBB7A10229) • 1x power cable • 8x 2.5" drive bay fillers • 1x front fan and cable
4M17A80608	ThinkSystem ST250 2.5" Hot Swap SAS/SATA 8-Bay Backplane Kit for X40 RAID v2 • 1x 8x2.5" SATA/SAS backplane • 1x cage assembly • 1x Slimline-SAS to MiniSAS HD cable (SBB7A50173) • 1x power cable • 8x 2.5" drive bay fillers • 1x front fan and cable
4M17A80603	ThinkSystem ST250 2.5" SATA/SAS 8-Bay Backplane Kit for X40 RAID (for RAID/HBA X40) • 1x 8x2.5" SATA/SAS backplane • 1x cage assembly • 1x Slimline-SAS to MiniSAS HD cable (SBB7A50173) • 1x power cable • 8x 2.5" drive bay fillers • 1x front fan and cable
4M17A80522	ThinkSystem ST250 3.5" SATA/SAS 4-Bay Backplane Kit v2 (for RAID/HBA X30) • 1x 4x3.5" SATA/SAS backplane • 1x cage assembly • 1x MiniSAS HD cable with 4 connectors to system board (SBB7A10249) • 1x MiniSAS HD cable with 2 connectors to system board (use with optical drive) (SBB7A10250) • 1x SAS cable for RAID/HBA X30 adapters (SBB7A10251) • 1x power cable • 4x 3.5" drive bay fillers • 1x front fan and cable
4M17A12788	ThinkSystem ST250 3.5" SATA/SAS 4-Bay Backplane Kit (for RAID/HBA X30) • 1x 4x3.5" SATA/SAS backplane • 1x cage assembly • 1x MiniSAS HD cable with 4 connectors to system board (SBB7A10249) • 1x MiniSAS HD cable with 2 connectors to system board (use with optical drive) (SBB7A10250) • 1x SAS cable for RAID/HBA X30 adapters (SBB7A10251) • 1x power cable • 4x 3.5" drive bay fillers • 1x front fan and cable

Part number	Description and list of included components
4M17A80604	ThinkSystem ST250 3.5" Hot Swap SAS/SATA 4-Bay Backplane Kit for X40 RAID v2 • 1x 4x3.5" SATA/SAS backplane • 1x cage assembly • 1x MiniSAS HD cable with 4 connectors to system board • 1x MiniSAS HD cable with 2 connectors to system board (use with optical drive) • 1x SAS cable for RAID/HBA X40 adapters (SBB7A50173) • 1x power cable • 4x 3.5" drive bay fillers • 1x front fan and cable
4M17A80606	ThinkSystem ST250 3.5" SATA/SAS 4-Bay Backplane Kit for X40 RAID (for RAID/HBA X40) • 1x 4x3.5" SATA/SAS backplane • 1x cage assembly • 1x MiniSAS HD cable with 4 connectors to system board • 1x MiniSAS HD cable with 2 connectors to system board (use with optical drive) • 1x SAS cable for RAID/HBA X40 adapters (SBB7A50173) • 1x power cable • 4x 3.5" drive bay fillers • 1x front fan and cable
4M17A80598	ThinkSystem ST250 3.5" SATA 4-Bay Simple Swap Bracket Plate Kit v2 • 1x 4x3.5" SATA backplate + cable with 4 SATA connections • 1x 4x3.5" SATA backplate + cable with 2 SATA connections (use with optical drive) • 1x cage assembly • 4x 3.5" drive bay fillers • 1x front fan and cable
4M17A12789	ThinkSystem ST250 3.5" SATA 4-Bay Simple Swap Bracket Plate Kit • 1x 4x3.5" SATA backplate + cable with 4 SATA connections • 1x 4x3.5" SATA backplate + cable with 2 SATA connections (use with optical drive) • 1x cage assembly • 4x 3.5" drive bay fillers • 1x front fan and cable

M.2 drive

The ST250 server supports one M.2 form-factor SATA drive. The M.2 drive is installed in a slot directly on the system board as shown in the following figure.

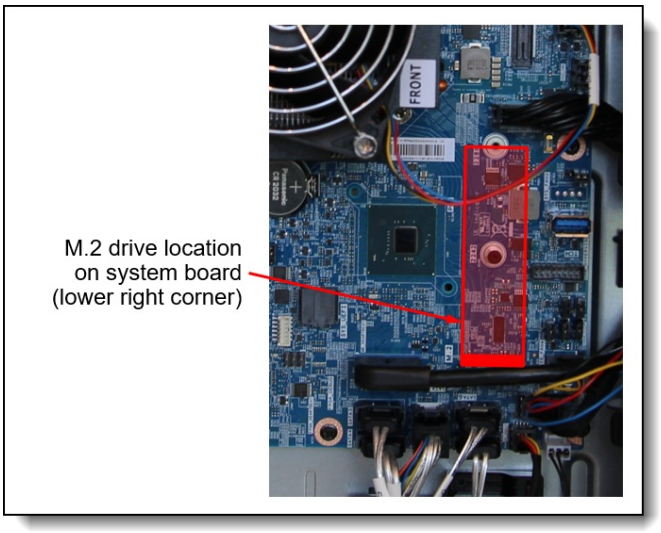

Figure 8. Location of the M.2 Drive on the ST250 system board

Supported drives are listed in the Internal drive options section.

Configuration notes:

- With an M.2 drive installed, if the onboard SATA controller is used to connect 2.5" or 3.5" drives, then only six drives can be installed. The other two drive bays must remain empty or disconnected.
- Only one optical drive can be installed if an M.2 drive is used. The use of two optical drives + M.2 is not supported.
- With an M.2 drive installed, if the onboard SATA controller is used to connect 2.5" or 3.5" drives and the controller is in RAID mode, then the M.2 cannot be used as a boot device to boot Windows.
- Configurations with an M.2 drive + optical drive + backup drive (either RDX or tape) is only supported as a field upgrade. Such configurations are not supported configure-to-order (CTO).

For details about M.2 components, see the *ThinkSystem M.2 Drives and M.2 Adapters* product guide: https://lenovopress.com/lp0769-thinksystem-m2-drives-adapters

Tip: The ThinkSystem M.2 Enablement Kit and ThinkSystem M.2 with Mirroring Enablement Kit that are supported in other ThinkSystem servers are not supported with the ST250.

Controllers for internal storage

The ST250 uses two onboard 6Gb SATA ports to connect the four or eight 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.

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.

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

Table 17. Controllers for internal storage - hot-swap drive support

Part number	Feature code	Description	Number of ports	Maximum supported	Slots supported
SAS/SATA HBA					
7Y37A01088	AUNL	ThinkSystem 430-8i SAS/SATA 12Gb HBA	8	3	2,3,4
7Y37A01089	AUNM	ThinkSystem 430-16i SAS/SATA 12Gb HBA	16	1	2,3,4
4Y37A78601	BM51	ThinkSystem 440-8i SAS/SATA PCIe Gen4 12Gb HBA	8	3	2,3,4
4Y37A78602	BM50	ThinkSystem 440-16i SAS/SATA PCIe Gen4 12Gb HBA	16	1	2,3,4
RAID adapters					
7Y37A01082	AUNG	ThinkSystem RAID 530-8i PCIe 12Gb Adapter	8	2	2,3,4
4Y37A78834	BMFT	ThinkSystem RAID 540-8i PCIe Gen4 12Gb Adapter	8	2	2,3,4
7Y37A01083*	AUNH*	ThinkSystem RAID 730-8i 1GB Cache PCIe 12Gb Adapter	8	2	2,3,4
4Y37A09722	B4RQ	ThinkSystem RAID 730-8i 2GB Flash PCIe 12Gb Adapter	8	1	2,3,4
7Y37A01084	AUNJ	ThinkSystem RAID 930-8i 2GB Flash PCIe 12Gb Adapter	8	1	2,3,4
7Y37A01085	AUNK	ThinkSystem RAID 930-16i 4GB Flash PCIe 12Gb Adapter	16	1	2,3,4
4Y37A09728	B8NY	ThinkSystem RAID 940-8i 4GB Flash PCIe Gen4 12Gb Adapter	8	1	2,3,4
4Y37A78600	BM35	ThinkSystem RAID 940-16i 4GB Flash PCIe Gen4 12Gb Adapter	16	1	2,3,4

* The RAID 730-8i adapter is not available in USA and Canada

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-support=ST250

Internal drive options

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

2.5-inch hot-swap drives:

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

3.5-inch hot-swap drives:

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

Simple-swap drives:

- 3.5-inch simple-swap 6 Gb SATA HDDs
- 3.5-inch simple-swap 6 Gb SATA SSDs

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 18. 2.5-inch hot-swap 12 Gb SAS HDDs

Part number	Feature code	Description	SED support	Max Qty
2.5-inch hot-swap HDDs - 12 Gb SAS 15K				
7XB7A00021	AULV	ThinkSystem 2.5" 300GB 15K SAS 12Gb Hot Swap 512n HDD	No	16
7XB7A00022	AULW	ThinkSystem 2.5" 600GB 15K SAS 12Gb Hot Swap 512n HDD	No	16
7XB7A00023	AULX	ThinkSystem 2.5" 900GB 15K SAS 12Gb Hot Swap 512e HDD	No	16
2.5-inch hot-swap HDDs - 12 Gb SAS 10K				
7XB7A00024	AULY	ThinkSystem 2.5" 300GB 10K SAS 12Gb Hot Swap 512n HDD	No	16
7XB7A00025	AULZ	ThinkSystem 2.5" 600GB 10K SAS 12Gb Hot Swap 512n HDD	No	16
7XB7A00026	AUM0	ThinkSystem 2.5" 900GB 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
7XB7A00069	B0YS	ThinkSystem 2.5" 2.4TB 10K SAS 12Gb Hot Swap 512e HDD	No	16
2.5-inch hot-swap HDDs - 12 Gb NL SAS				
7XB7A00034	AUM6	ThinkSystem 2.5" 1TB 7.2K SAS 12Gb Hot Swap 512n HDD	No	16
7XB7A00035	AUM7	ThinkSystem 2.5" 2TB 7.2K SAS 12Gb Hot Swap 512n HDD	No	16

Table 19. 2.5-inch hot-swap 6 Gb SATA HDDs

Part number	Feature code	Description	SED support	Max Qty
2.5-inch hot-swap HDDs - 6 Gb NL SATA				
7XB7A00036	AUUE	ThinkSystem 2.5" 1TB 7.2K SATA 6Gb Hot Swap 512n HDD	No	16
7XB7A00037	AUUJ	ThinkSystem 2.5" 2TB 7.2K SATA 6Gb Hot Swap 512e HDD	No	16

Table 20. 2.5-inch hot-swap 6 Gb SATA SSDs

Part number	Feature code	Description	SED support	Max Qty
2.5-inch hot-swap SSDs - 6 Gb SATA - Mixed Use/Mainstream (3-5 DWPD)				
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
4XB7A17087	B8J1	ThinkSystem 2.5" 5300 240GB Mainstream SATA 6Gb Hot Swap SSD	No	16
4XB7A17088	B8HY	ThinkSystem 2.5" 5300 480GB Mainstream SATA 6Gb Hot Swap SSD	No	16
4XB7A17089	B8J6	ThinkSystem 2.5" 5300 960GB Mainstream SATA 6Gb Hot Swap SSD	No	16
4XB7A17090	B8JE	ThinkSystem 2.5" 5300 1.92TB Mainstream SATA 6Gb Hot Swap SSD	No	16
4XB7A13633	B49L	ThinkSystem 2.5" S4610 240GB Mixed Use SATA 6Gb HS SSD	No	16
2.5-inch hot-swap SSDs - 6 Gb SATA - Read Intensive/Entry (<3 DWPD)				
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
4XB7A72438	BM8B	ThinkSystem 2.5" PM893 480GB Read Intensive SATA 6Gb HS SSD	No	16
4XB7A72439	BM8A	ThinkSystem 2.5" PM893 960GB Read Intensive SATA 6Gb HS SSD	No	16
4XB7A72440	BM89	ThinkSystem 2.5" PM893 1.92TB Read Intensive SATA 6Gb HS SSD	No	16
4XB7A72441	BM88	ThinkSystem 2.5" PM893 3.84TB Read Intensive SATA 6Gb HS SSD	No	16
4XB7A72442	BM87	ThinkSystem 2.5" PM893 7.68TB Read Intensive SATA 6Gb HS SSD	No	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
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
4XB7A38271	BCTC	ThinkSystem 2.5" Multi Vendor 240GB Entry SATA 6Gb Hot Swap SSD	No	16
4XB7A38272	BCTD	ThinkSystem 2.5" Multi Vendor 480GB Entry SATA 6Gb Hot Swap SSD	No	16
4XB7A38273	BCTE	ThinkSystem 2.5" Multi Vendor 960GB Entry SATA 6Gb Hot Swap SSD	No	16
4XB7A38274	BCTF	ThinkSystem 2.5" Multi Vendor 1.92TB Entry SATA 6Gb Hot Swap SSD	No	16
4XB7A38275	BCTG	ThinkSystem 2.5" Multi Vendor 3.84TB Entry SATA 6Gb Hot Swap SSD	No	16
4XB7A17075	B8HV	ThinkSystem 2.5" 5300 240GB Entry SATA 6Gb Hot Swap SSD	No	16
4XB7A17076	B8JM	ThinkSystem 2.5" 5300 480GB Entry SATA 6Gb Hot Swap SSD	No	16
4XB7A17077	B8HP	ThinkSystem 2.5" 5300 960GB Entry SATA 6Gb Hot Swap SSD	No	16
4XB7A17078	B8J5	ThinkSystem 2.5" 5300 1.92TB Entry SATA 6Gb Hot Swap SSD	No	16
4XB7A17079	B8JP	ThinkSystem 2.5" 5300 3.84TB Entry SATA 6Gb Hot Swap SSD	No	16
4XB7A38185	B9AC	ThinkSystem 2.5" 5210 960GB Entry SATA 6Gb Hot Swap QLC SSD	No	16
4XB7A10197	B34K	ThinkSystem 2.5" PM883 960GB Entry SATA 6Gb Hot Swap SSD	No	16

Table 21. 3.5-inch hot-swap 12 Gb SAS HDDs

Part number	Feature code	Description	SED support	Max Qty
3.5-inch hot-swap HDDs - 12 Gb SAS 15K				
7XB7A00038	AUU2	ThinkSystem 3.5" 300GB 15K SAS 12Gb Hot Swap 512n HDD	No	8
7XB7A00039	AUU3	ThinkSystem 3.5" 600GB 15K SAS 12Gb Hot Swap 512n HDD	No	8
7XB7A00040	AUUC	ThinkSystem 3.5" 900GB 15K SAS 12Gb Hot Swap 512e HDD	No	8
3.5-inch hot-swap HDDs - 12 Gb NL SAS				
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
7XB7A00067	B117	ThinkSystem 3.5" 12TB 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

Table 22. 3.5-inch hot-swap 6 Gb SATA HDDs

Part number	Feature code	Description	SED support	Max Qty
3.5-inch hot-swap HDDs - 6 Gb NL SATA				
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
7XB7A00068	B118	ThinkSystem 3.5" 12TB 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

Table 23. 3.5-inch hot-swap 6 Gb SATA SSDs

Part number	Feature code	Description	SED support	Max Qty
3.5-inch hot-swap SSDs - 6 Gb SATA - Mixed Use/Mainstream (3-5 DWPD)				
4XB7A17137	BA4W	ThinkSystem 3.5" S4620 480GB Mixed Use SATA 6Gb HS SSD	No	8
4XB7A17138	BA4X	ThinkSystem 3.5" S4620 960GB Mixed Use SATA 6Gb HS SSD	No	8
4XB7A17096	B8JL	ThinkSystem 3.5" 5300 240GB Mainstream SATA 6Gb Hot Swap SSD	No	8
4XB7A17097	B8JF	ThinkSystem 3.5" 5300 480GB Mainstream SATA 6Gb Hot Swap SSD	No	8
4XB7A17098	B8J0	ThinkSystem 3.5" 5300 960GB Mainstream SATA 6Gb Hot Swap SSD	No	8
4XB7A17099	B8HR	ThinkSystem 3.5" 5300 1.92TB Mainstream SATA 6Gb Hot Swap SSD	No	8
4XB7A13639	B49R	ThinkSystem 3.5" S4610 240GB Mixed Use SATA 6Gb HS SSD	No	8
3.5-inch hot-swap SSDs - 6 Gb SATA - Read Intensive/Entry (<3 DWPD)				
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
4XB7A38276	BCTH	ThinkSystem 3.5" Multi Vendor 240GB Entry SATA 6Gb Hot Swap SSD	No	8
4XB7A38277	BCTJ	ThinkSystem 3.5" Multi Vendor 480GB Entry SATA 6Gb Hot Swap SSD	No	8
4XB7A38278	BCTK	ThinkSystem 3.5" Multi Vendor 960GB Entry SATA 6Gb Hot Swap SSD	No	8
4XB7A38279	BCTL	ThinkSystem 3.5" Multi Vendor 1.92TB Entry SATA 6Gb Hot Swap SSD	No	8
4XB7A38281	BCTM	ThinkSystem 3.5" Multi Vendor 3.84TB Entry SATA 6Gb Hot Swap SSD	No	8
4XB7A17081	B8JB	ThinkSystem 3.5" 5300 240GB Entry SATA 6Gb Hot Swap SSD	No	8
4XB7A17082	B8J9	ThinkSystem 3.5" 5300 480GB Entry SATA 6Gb Hot Swap SSD	No	8
4XB7A17083	B8JC	ThinkSystem 3.5" 5300 960GB Entry SATA 6Gb Hot Swap SSD	No	8
4XB7A17084	B8HZ	ThinkSystem 3.5" 5300 1.92TB Entry SATA 6Gb Hot Swap SSD	No	8
4XB7A17085	B8HQ	ThinkSystem 3.5" 5300 3.84TB Entry SATA 6Gb Hot Swap SSD	No	8
4XB7A17179	B6JY	ThinkSystem 3.5" PM883 1.92TB Entry SATA 6Gb Hot Swap SSD	No	8

Table 24. 3.5-inch simple-swap 6 Gb SATA HDDs

Part number	Feature code	Description	SED support	Max Qty
3.5-inch simple-swap HDDs - 6 Gb NL SATA				
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
7XB7A00057	AUZU	ThinkSystem 4TB 7.2K 6Gbps SATA 3.5" Simple Swap 512n HDD	No	8
7XB7A00058	AXC7	ThinkSystem 6TB 7.2K 6Gbps SATA 3.5" Simple Swap 512e HDD	No	8
7XB7A00059	AXC6	ThinkSystem 8TB 7.2K 6Gbps SATA 3.5" Simple Swap 512e HDD	No	8

Table 25. 3.5-inch simple-swap 6 Gb SATA SSDs

Part number	Feature code	Description	SED support	Max Qty
3.5-inch simple-swap SSDs - 6 Gb SATA - Mixed Use/Mainstream (3-5 DWPD)				
4XB7A17134	BK7M	ThinkSystem 3.5" S4620 480GB Mixed Use SATA 6Gb SS SSD	No	8
4XB7A17135	BK7N	ThinkSystem 3.5" S4620 960GB Mixed Use SATA 6Gb SS SSD	No	8
3.5-inch simple-swap SSDs - 6 Gb SATA - Read Intensive/Entry (<3 DWPD)				
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 26. M.2 SATA drives

Part number	Feature code	Description	SED support	Max Qty
M.2 SSDs - 6 Gb SATA - Read Intensive/Entry (<3 DWPD)				
4XB7A82286	BQ1Z	ThinkSystem M.2 5400 PRO 240GB Read Intensive SATA 6Gb NHS SSD	Support	1
4XB7A82287	BQ1Y	ThinkSystem M.2 5400 PRO 480GB Read Intensive SATA 6Gb NHS SSD	Support	1
4XB7A82288	BQ20	ThinkSystem M.2 5400 PRO 960GB Read Intensive SATA 6Gb NHS SSD	Support	1
7N47A00129	AUUL	ThinkSystem M.2 32GB SATA 6Gbps Non-Hot Swap SSD	No	1
7N47A00130	AUUV	ThinkSystem M.2 128GB SATA 6Gbps Non-Hot Swap SSD	No	1
4XB7A17071	B8HS	ThinkSystem M.2 5300 240GB SATA 6Gbps Non-Hot Swap SSD	No	1
4XB7A17073	B919	ThinkSystem M.2 5300 480GB SATA 6Gbps Non-Hot Swap SSD	No	1

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 27. USB memory key

Part number	Feature	Description
4X77A08621	B8NV	ThinkSystem 32GB USB Flash Drive

Internal backup units

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

Table 28. Internal backup units

Part number	Feature code	Description	Maximum supported
Drives			
4T27A80487	B4BM	ThinkSystem Internal Half High LTO Gen8 SAS Tape Drive v2	1
4T27A10727	B4BM	ThinkSystem Internal Half High LTO Gen8 SAS Tape Drive	1
4T27A80486	AVF5	ThinkSystem Internal Half High LTO Gen7 SAS Tape Drive v2	1
7T27A01503	AVF5	ThinkSystem Internal Half High LTO Gen7 SAS Tape Drive	1
4T27A80485	AVF6	ThinkSystem Internal RDX USB 3.0 Dock v2	1
7T27A01501	AVF6	ThinkSystem Internal RDX USB 3.0 Dock	1
LTO Media			
7TP7A01606	AVF7	ThinkSystem LTO Gen7 6TB Tape	Not applicable
4TP7A09619	B4BN	ThinkSystem LTO Gen8 12TB Tape	Not applicable
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

Configuration notes:

- The RDX drive is attached via the internal USB 3.0 port on the system board. The USB cable ships with the drive.
- The use of an LTO tape drive requires a SAS HBA, either the 430-8i or 430-16i SAS/SATA 12Gb HBA. Details about the adapters in the SAS adapters for external storage section. The SAS cable ships with the tape drive.
- Configurations with an M.2 drive + optical drive + backup drive (either RDX or tape) is only supported as a field upgrade. Such configurations are not supported configure-to-order (CTO). For field upgrades, the drives are installed as follows:
  - Optical drive goes in Bay 1 (upper bay) connected to SATA port 6
  - Tape/RDX drive goes in Bay 0 (lower bay) connected to a SAS HBA or internal USB port

LTO tape drive in a rack conversion kit : The ST250 is supported installed on its side in a rack mount kit, however the use of an LTO tape drive in this configuration is supported but not recommended.

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

Table 29. Tape drive cable kit

Part number	Description
4Z57A80509	ThinkSystem ST250 ODD/Tape Cable Kit v2 • 1x ODD data cable • 1x ODD/tape power cable
4Z57A14085	ThinkSystem ST250 ODD/Tape Cable Kit • 1x ODD data cable • 1x ODD/tape power cable

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

Optical drives

The ST250 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 30. Optical drives

Part number	Feature code	Description	Maximum supported
Internal optical drives			
4XA7A80482	BN5H	ThinkSystem Half High SATA DVD-ROM Optical Disk Drive v2	2
7XA7A01204	AVEZ	ThinkSystem Half High SATA DVD-ROM Optical Disk Drive	2
4XA7A80481	BN5J	ThinkSystem Half High SATA DVD-RW Optical Disk Drive v2	2
7XA7A01202	AVEY	ThinkSystem Half High SATA DVD-RW Optical Disk Drive	2

Configuration rules:

- Only one optical drive can be installed if an M.2 drive is used. The use of two optical drives + M.2 is not supported.
- For configurations using the onboard SATA controller, if 1 or 2 optical drives are installed, only 6 HDDs or SSDs can be installed.
- Configurations with an M.2 drive + optical drive + backup drive (either RDX or tape) is only supported as a field upgrade. Such configurations are not supported configure-to-order (CTO). For field upgrades, the drives are installed as follows:
  - Optical drive goes in Bay 1 (upper bay) connected to SATA port 6
  - Tape/RDX drive goes in Bay 0 (lower bay) connected to a SAS HBA or internal USB port

For field upgrades to add one of the internal optical drives, you will need to also order the cable kit listed in the following table. For two internal optical drives, order two cable kits. This kit is not needed for factory (CTO) orders.

Table 31. Optical drive cable kit

Part number	Description
4Z57A80509	ThinkSystem ST250 ODD/Tape Cable Kit v2 • 1x ODD data cable • 1x ODD/tape power cable
4Z57A14085	ThinkSystem ST250 ODD/Tape Cable Kit • 1x ODD data cable • 1x ODD/tape power cable

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 32. 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 server has four PCIe 3.0 slots, as follows:

- Slot 1: PCIe 3.0 x1 full-height, half-length (x1 physical slot, closed ended)
- Slot 2: PCIe 3.0 x16 full-height, half-length (x16 physical slot, closed ended)
- Slot 3: PCIe 3.0 x4 full-height, half-length (x4 physical slot, open ended)
- Slot 4: PCIe 3.0 x4 full-height, half-length (x8 physical slot, closed ended)

Slot 3 in the ST250 is 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.

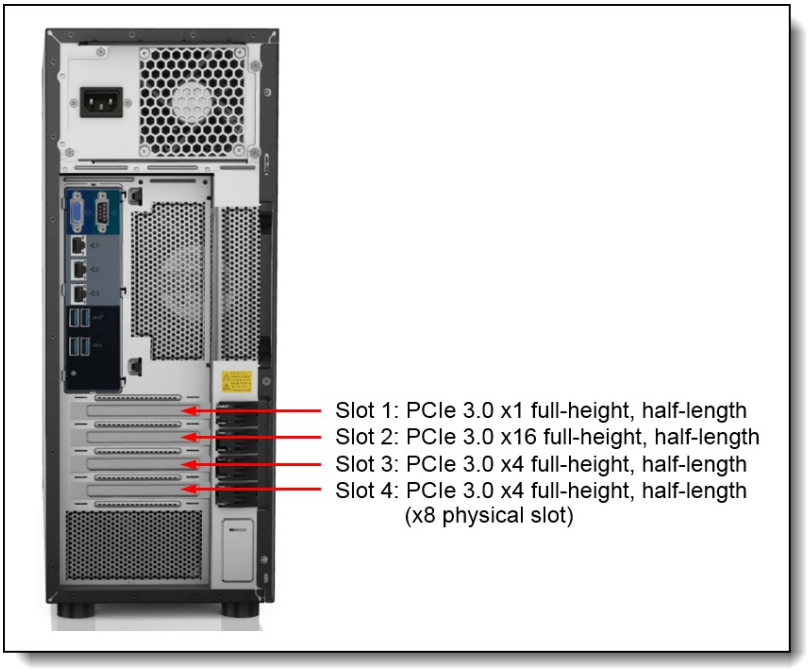

Figure 9. ThinkSystem ST250 PCIe slots

Network adapters

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

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 33. 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	2,3,4	2
7ZT7A00482	AUZX	ThinkSystem Broadcom 5720 1GbE RJ45 2-Port PCIe Ethernet Adapter	1,2,3,4	2
7ZT7A00534	AUZY	ThinkSystem I350-T2 PCIe 1Gb 2-Port RJ45 Ethernet Adapter	2,3,4	2
7ZT7A00535	AUZW	ThinkSystem I350-T4 PCIe 1Gb 4-Port RJ45 Ethernet Adapter	2,3,4	2
10 Gb Ethernet SFP+				
00AG580	AT7T	Emulex VFA5.2 2x10 GbE SFP+ Adapter and FCoE/iSCSI SW	2,3,4	2*
00AG570	AT7S	Emulex VFA5.2 2x10 GbE SFP+ PCIe Adapter	2,3,4	2*
7XC7A05525	B0YL	Intel X710-DA4 4x10Gb SFP+ Adapter	2,3,4	2*
7ZT7A00537	AUKX	ThinkSystem Intel X710-DA2 PCIe 10Gb 2-Port SFP+ Ethernet Adapter	2,3,4	2*
10 Gb Ethernet 10GBASE-T				
00MM850	ATRY	Intel X550-T1 Single Port 10GBase-T Adapter	2,3,4	2
00MM860	ATPX	Intel X550-T2 Dual Port 10GBase-T Adapter	2,3,4	2
7XC7A05927	B0X1	Intel X710-T4 4x10Gb Base-T Adapter	2,3,4	2
25 Gb Ethernet				
7XC7A05523	B0WY	ThinkSystem Intel XXV710-DA2 10/25GbE SFP28 2-Port PCIe Ethernet Adapter	2,3,4	2*

* Requires transceivers or DAC cables that must be ordered separately.

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:
https://lenovopress.com/servers/options/ethernet

SAS adapters for external storage

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

Table 34. Supported SAS HBAs and RAID adapters

Part number	Feature code	Description	Slots supported	Maximum supported
12 Gb SAS HBA				
7Y37A01090	AUNR	ThinkSystem 430-8e SAS/SATA 12Gb HBA	2,3,4	2
12 Gb RAID Adapter				
7Y37A01087	AUNQ	ThinkSystem RAID 930-8e 4GB Flash PCIe 12Gb Adapter	2,3,4	1*

* Limited by the number of supercap mounts in the server

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

The following table summarizes the features of supported adapters.

Table 35. Comparison of features

Feature	430-8e	RAID 930-8e
Adapter type	HBA	External RAID
Part number	7Y37A01090	7Y37A01087
Controller chip	LSI SAS3408	LSI SAS3516
Broadcom equivalent	HBA 9400-8e	MegaRAID 9480-8e
Host interface	PCIe 3.0x8	PCIe 3.0x8
Port interface	12 Gb SAS	12 Gb SAS
Number of ports	8	8
Port connectors	2x Mini-SAS HD SFF8644	2x Mini-SAS HD SFF8644
Drive interface	SAS/SATA	SAS,SATA
Drive type	HDD/SSD/SED*	HDD,SED,SSD
Hot-swap drives	Yes	Yes
Maximum devices	512 (planned: 1024)	64 (planned: 216)
RAID levels	None	0/1/10/5/50/6/60
JBOD mode	Yes	Yes
Cache	None	4GB (Standard)
CacheVault cache protection	None	Yes (Flash)
Performance Accelerator (FastPath)	No	Yes
SSD Caching (CacheCade Pro 2.0)	No	No
SED support*	Yes*	Yes

* SED (self-encrypting drive) support of the SAS HBA is by using software on the server (SED commands are passed through the HBA to the drives).

Fibre Channel host bus adapters

The following table lists the Fibre Channel HBAs supported by the server.

Table 36. Fibre Channel adapters

Part number	Feature code	Description	Slots supported	Maximum supported
16 Gb Fibre Channel				
01CV840	ATZV	Emulex 16Gb Gen6 FC Dual-port HBA	2,3,4	2
01CV830	ATZU	Emulex 16Gb Gen6 FC Single-port HBA	2,3,4	2

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

Flash Storage adapters

The server currently does not support Flash Storage adapters.

GPU adapters

The ST250 does not support any GPUs that are currently available.

Fans and cooling

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

- One or 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
- One fan in each power supply

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 38. Power supply options

Part number	Feature code	Description	Maximum supported	110V AC	220V AC	240V DC China only
None*	B41Q	ThinkSystem ST250 250W Fixed PSU	1	Yes	Yes	No
7N67A00882	B41P	550W (230V/115V) Platinum Hot-Swap Power Supply	2	Yes	Yes	Yes

* Configure-to-order only

The power supplies are auto-sensing and support both 110V AC (100-127V 50/60 Hz) and 220V AC (200-240V 50/60 Hz) power. In China only, the 550W power supply also support 240V DC. Both 250W and 550W power supplies are 80 PLUS Platinum certified. The 550W hot-swap power supply is Energy Star 3.0 compliant.

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 250W power supply.

Table 39. Maximum configuration for the 250W power supply

Subsystem	250W fixed power supply
Processor	Up to 80W TDP
Memory	No restriction
Drives	Up to 4x 3.5-inch drives or 8x 2.5-inch drives (HDD or SSD)
Media bays	1x optical drive or 1x LTO tape drive or 1x RDX drive
M.2	No restriction
Adapters (except GPU)	1 or 2 adapters up to PCIe x8
GPU	Not supported

For further power configuration of the server, use the Lenovo Capacity Planner, available at:
https://datacentersupport.lenovo.com/us/en/products/solutions-and-software/software/lenovo-capacity-planner/solutions/ht504651

Power cords

Line cords can be ordered as listed in the following table.

Table 40. Power cords

Region	Part number	Feature	Description
Argentina	39Y7930	6222	2.8m, 10A/250V, C13 to IRAM 2073 (Argentina) Line Cord
Argentina	81Y2384	6492	4.3m, 10A/220V, C13 to IRAM 2073 (Argentina) Line Cord
Australia/NZ	39Y7924	6211	2.8m, 10A/250V, C13 to AS/NZ 3112 (Australia/NZ) Line Cord
Australia/NZ	81Y2383	6574	4.3m, 10A/230V, C13 to AS/NZS 3112 (Aus/NZ) Line Cord
Brazil	69Y1988	6532	2.8m, 10A/250V, C13 to NBR 14136 (Brazil) Line Cord
Brazil	81Y2387	6404	4.3m, 10A/250V, C13 - 2P+Gnd (Brazil) Line Cord
China	39Y7928	6210	2.8m, 220-240V, C13 to GB 2099.1 (China) Line Cord
China	81Y2378	6580	4.3m, 10A/220V, C13 to GB 2099.1 (China) Line Cord
Denmark	39Y7918	6213	2.8m, 10A/250V, C13 to DK2-5a (Denmark) Line Cord
Denmark	81Y2382	6575	4.3m, 10A/230V, C13 to DK2-5a (Denmark) Line Cord
Europe	39Y7917	6212	2.8m, 10A/230V, C13 to CEE7-VII (Europe) Line Cord
Europe	81Y2376	6572	4.3m, 10A/230V, C13 to CEE7-VII (Europe) Line Cord
India	39Y7927	6269	2.8m, 10A/250V, C13(2P+Gnd) (India) Line Cord
India	81Y2386	6567	4.3m, 10A/240V, C13 to IS 6538 (India) Line Cord
Israel	39Y7920	6218	2.8m, 10A/250V, C13 to SI 32 (Israel) Line Cord
Israel	81Y2381	6579	4.3m, 10A/230V, C13 to SI 32 (Israel) Line Cord
Italy/Chile	39Y7921	6217	2.8m, 220-240V, C13 to CEI 23-16 (Italy/Chile) Line Cord
Italy/Chile	81Y2380	6493	4.3m, 10A/230V, C13 to CEI 23-16 (Italy/Chile) Line Cord
Japan	46M2593	A1RE	2.8m, 12A/125V, C13 to JIS C-8303 (Japan) Line Cord
Japan	4L67A08357	6533	2.8m, 200V, C13 to JIS C-8303 (Japan) Line Cord
Japan	39Y7926	6335	4.3m, 12A/100V, C13 to JIS C-8303 (Japan) Line Cord
Japan	4L67A08362	6495	4.3m, 12A/200V, C13 to JIS C-8303 (Japan) Line Cord
South Africa	39Y7922	6214	2.8m, 10A/250V, C13 to SABS 164 (S Africa) Line Cord
South Africa	81Y2379	6576	4.3m, 10A/230V, C13 to SABS 164 (South Africa) Line Cord
South Korea	39Y7925	6219	2.8m, 220-240V, C13 to KETI (S Korea) Line Cord
South Korea	81Y2385	6494	4.3m, 12A/220V, C13 to KSC 8305 (S. Korea) Line Cord
Switzerland	39Y7919	6216	2.8m, 10A/250V, C13 to SEV 1011-S24507 (Swiss) Line Cord
Switzerland	81Y2390	6578	4.3m, 10A/230V, C13 to SEV 1011-S24507 (Sws) Line Cord
Taiwan	23R7158	6386	2.8m, 10A/125V, C13 to CNS 10917-3 (Taiwan) Line Cord
Taiwan	81Y2375	6317	2.8m, 10A/240V, C13 to CNS 10917-3 (Taiwan) Line Cord
Taiwan	4L67A08363	AX8B	4.3m, 10A/125V, C13 to CNS 10917 (Taiwan) Line Cord
Taiwan	81Y2389	6531	4.3m, 10A/250V, C13 to 76 CNS 10917-3 (Taiwan) Line Cord
UK	39Y7923	6215	2.8m, 10A/250V, C13 to BS 1363/A (UK) Line Cord
UK	81Y2377	6577	4.3m, 10A/230V, C13 to BS 1363/A (UK) Line Cord
US/Canada	90Y3016	6313	2.8m, 10A/120V, C13 to NEMA 5-15P (US) Line Cord
US/Canada	46M2592	A1RF	2.8m, 10A/250V, C13 to NEMA 6-15P Line Cord
US/Canada	4L67A08359	6370	4.3m, 10A/125V, C13 to NEMA 5-15P (US) Line Cord
US/Canada	4L67A08361	6373	4.3m, 10A/250V, C13 to NEMA 6-15P (US) Line Cord

Integrated virtualization

The server supports booting from an operating system or hypervisor installed on an M.2 solid-state drive. See the M.2 drives section for details and the list of available options.

You can download supported VMware vSphere hypervisor images from the following web page and load it on the M.2 drive using the instructions provided:
https://vmware.lenovo.com/content/custom_iso/

Systems management

The ST250 contains an integrated service processor, XClarity Controller (XCC), 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.

Local management

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

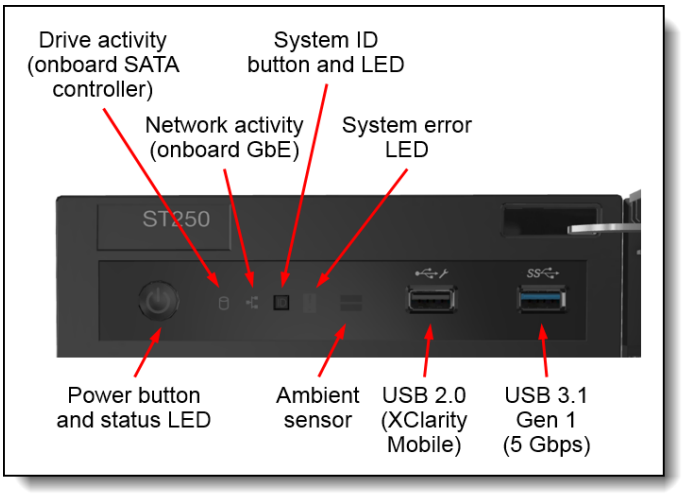

Figure 10. Front operator panel

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 41. IPMI-over-LAN settings

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

There are two XClarity Controller upgrades available for the server, Advanced and Enterprise.

Lenovo XClarity Controller Advanced adds the following remote control 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
- Capturing blue-screen errors
- International keyboard mapping support
- LDAP-based authentication

Lenovo XClarity Controller Enterprise enables the following additional features:

- Boot Capture
- Remote mounting of CD-ROM (ISO) and diskette (IMG) files as virtual drives
- Virtual console collaboration - Ability for up to 6 remote users to be log into the remote session simultaneously
- Power capping
- License for XClarity Energy Manager

Preconfigured models come with either XClarity Controller Standard, Advanced or Enterprise, depending on the model. See the Models section for details. The following table shows the field upgrades available for preconfigured models.

Table 42. XClarity Controller field upgrades

Part number	Feature code	Description
4L47A09132	AVUT	ThinkSystem XClarity Controller Standard to Advanced Upgrade (for servers that have XCC Standard)
4L47A09133	AVUU	ThinkSystem XClarity Controller Advanced to Enterprise Upgrade (for servers that have XCC Advanced)

For configure-to-order (CTO) models, you can elect to have one of the following XCC functionality by selecting the appropriate XCC feature codes as listed in the following table:

- XCC Standard - select neither feature listed in the table
- XCC Advanced - select feature AVUT
- XCC Enterprise - select feature AUPW

Table 43. XClarity Controller Upgrades for configure-to-order

Feature code	Description
AVUT	ThinkSystem XClarity Controller Standard to Advanced Upgrade
AUPW	ThinkSystem XClarity Controller Standard to Enterprise Upgrade

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. The software can be downloaded and used at no charge to discover and monitor the ST250 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 44. 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 Enterprise upgrade as described in the Remote Management section. If your server does not have the XCC Enterprise upgrade, Energy Manager licenses can be ordered as shown in the following table.

Table 45. 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

Security

The ST250 offers the following security features:

- Electronic security measures:
  - Administrator and power-on passwords
  - Trusted Platform Module (TPM) supporting both TPM 1.2 and 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 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 46. Security features

Part number	Feature code	Description
4M17A12791	B41K	ThinkSystem ST250 4U Security Door
4M17A12792	B4MA	ThinkSystem ST258 4U Security Door (China customers only)
4Z57A14086	B4LS	ThinkSystem ST250 Intrusion Cable Kit
CTO only*	B22N	ThinkSystem Nationz Trusted Platform Module v2.0 (China customers only)

* Available via configure-to-order or in preconfigured models only

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

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 47. 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 48. 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
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 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 49. Rack installation options

Part number	Description
4M17A12785	ThinkSystem ST50/ST250 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

Operating system support

The server supports the following operating systems:

- Microsoft Windows Server 2016
- Microsoft Windows Server 2019
- Microsoft Windows Server 2022
- Red Hat Enterprise Linux 7.5
- Red Hat Enterprise Linux 7.7
- Red Hat Enterprise Linux 7.8
- Red Hat Enterprise Linux 7.9
- Red Hat Enterprise Linux 8.0
- Red Hat Enterprise Linux 8.1
- Red Hat Enterprise Linux 8.2
- Red Hat Enterprise Linux 8.3
- Red Hat Enterprise Linux 8.4
- Red Hat Enterprise Linux 8.5
- Red Hat Enterprise Linux 8.6
- Red Hat Enterprise Linux 8.7
- Red Hat Enterprise Linux 8.8
- Red Hat Enterprise Linux 9.0
- Red Hat Enterprise Linux 9.1
- Red Hat Enterprise Linux 9.2
- SUSE Linux Enterprise Server 12 SP3
- SUSE Linux Enterprise Server 12 SP5
- SUSE Linux Enterprise Server 12 Xen SP3
- SUSE Linux Enterprise Server 12 Xen SP5
- SUSE Linux Enterprise Server 15
- SUSE Linux Enterprise Server 15 SP1
- SUSE Linux Enterprise Server 15 SP2
- SUSE Linux Enterprise Server 15 SP3
- SUSE Linux Enterprise Server 15 SP4
- SUSE Linux Enterprise Server 15 SP5
- SUSE Linux Enterprise Server 15 Xen
- SUSE Linux Enterprise Server 15 Xen SP1
- SUSE Linux Enterprise Server 15 Xen SP2
- SUSE Linux Enterprise Server 15 Xen SP3

- SUSE Linux Enterprise Server 15 Xen SP4
- SUSE Linux Enterprise Server 15 Xen SP5
- Ubuntu 22.04 LTS 64-bit
- VMware ESXi 6.5 U2
- VMware ESXi 6.5 U3
- VMware ESXi 6.7
- VMware ESXi 6.7 U2
- VMware ESXi 6.7 U3
- VMware ESXi 7.0
- VMware ESXi 7.0 U1
- VMware ESXi 7.0 U2
- VMware ESXi 7.0 U3
- VMware ESXi 8.0
- VMware ESXi 8.0 U1
- 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#servers=st250-7y45-7y46

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

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

Table 50. VMware ESXi preload

Part number	Feature code	Description
CTO only	B3VW	VMware ESXi 6.5 U2 (Factory Installed)
CTO only	B6U0	VMware ESXi 6.5 U3 (factory installed)
CTO only	B3VX	VMware ESXi 6.7 (Factory Installed)
CTO only	B6U1	VMware ESXi 6.7 U2 (factory installed)
CTO only	B88T	VMware ESXi 6.7 U3 (factory installed)
CTO only	BBZG	VMware ESXi 7.0 (Factory Installed)
CTO only	BE5E	VMware ESXi 7.0 U1 (Factory Installed)
CTO only	BHSR	VMware ESXi 7.0 U2 (Factory Installed)
CTO only	BMEY	VMware ESXi 7.0 U3 (Factory Installed)
CTO only	BMT5	VMware ESXi 8.0 (Factory Installed)
CTO only	BQ8S	VMware ESXi 8.0 U1 (Factory Installed)

Physical and electrical specifications

The ST250 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) (4U)
- 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 51. Detailed dimensions

Dimension	Description
176 mm (4U)	X_a = Width, using widest features (not including feet)
155 mm	X_b = Width, distance to outer edges of chassis feet (feet do not extend beyond the chassis)
444 mm	Y_a = Height, from bottom of feet to top of chassis body
430 mm	Y_b = Height, from bottom of chassis body to top of chassis body
544 mm	Z_a = Depth, from front door to most rearward I/O port surface
578 mm	Z_b = Depth, from front door to deepest feature of the chassis body feature
595 mm	Z_c = Depth, from front door to deepest feature such as power supply handle
23 mm	Z_e = Depth, front door to front plate of chassis body

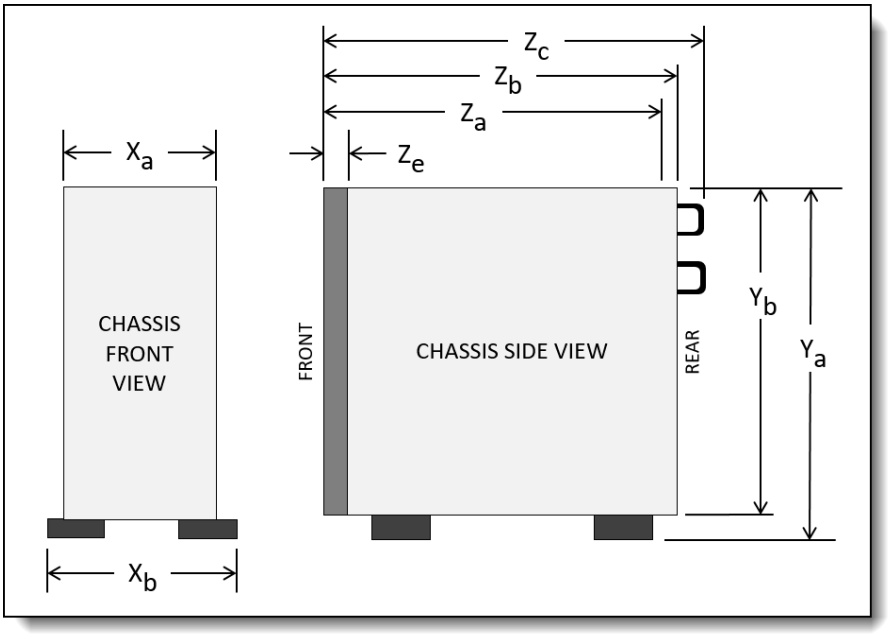

Figure 11. Server dimension

The shipping dimensions (cardboard packaging) of the ST250 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: 23.56 kg (51.94 lb)

Electrical requirements are as follows:

- Models with a 250 W AC fixed power supply:
  - 100-127 (nominal) V ac; 50 Hz or 60 Hz
  - 200 - 240 (nominal) V ac; 50 Hz or 60 Hz
- Models with 550 W AC hot-swap power supplies:
  - 100-127 (nominal) V ac; 50 Hz or 60 Hz; 6.2 A
  - 200 - 240 (nominal) V ac; 50 Hz or 60 Hz; 3.0 A
  - Input kilovolt-amperes (kVA) (approximately):
    - Minimum configuration: 0.16 kVA
    - Maximum configuration: 0.722 kVA
- Models with 550 W 240V DC power supplies (China customers running 240V DC input)

- 200 - 240 (nominal) V dc; 2.5 A
- Input kilovolt-amperes (kVA) (approximately):
  - Minimum configuration: 0.16 kVA
  - Maximum configuration: 0.70 kVA

Operating environment

The server can operate in ASHRAE A2 environments (10-35°C).

The server can be configured to operate in ASHRAE A3 environments (5-40°C), provided the following restrictions are met:

- Processor with a maximum TDP of 80W
- Maximum of 8x 2.5" drives
- PCIe adapters up to 10W power consumption

The server is supported operating in the following environments:

- ASHRAE A2:
  - Temperature: 10°C to 35°C
  - Humidity: 8% to 80%
  - Altitude 0-3000 m (10,000 ft), derated 1°C per 300 m above 950 m
- ASHRAE A3:
  - Temperature: 5°C to 40°C
  - Humidity: 8% to 85%
  - Altitude 0-3000 m (10,000 ft), derated 1°C per 175 m above 950 m

Non-operating environment support:

- Without packaging:
  - Temperature: -10 °C to 60 °C
  - Humidity: 8 to 90%
- Storage with packaging:
  - Temperature: -40 °C to 70 °C
  - Humidity: 8 to 90%

Thermal (heat) output:

- Minimum configuration: 238.6 BTU/hr, 69.8 W
- Maximum configuration: 1010.33 BTU/hr, 296.10 W

Acoustical noise emissions: See the following table.

Table 52. Acoustical noise emissions

	Minimum	**Typical**	**Maximum**
Sound power level			
Idle	3.7 bels	3.8 bels	4.3 bels
Operating	3.7 bels	4.0 bels	4.4 bels
Sound pressure level (tabletop)			
Idle	26.5 dBA	26.8 dBA	39.4 dBA
Operating	26.7 dBA	27.0 dBA	40.1 dBA
Sound pressure level (floor)			
Idle	19.3 dBA	19.5 dBA	29.5 dBA
Operating	19.4 dBA	21.0 dBA	32.3 dBA

Notes:

- These sound levels were measured in controlled acoustical environments according to procedures specified by ISO 7779 and are reported in accordance with ISO 9296.
- The declared acoustic noise levels are based on specified configurations, which may change slightly depending on configuration/conditions.

Warranty and Support

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

- 7Y46 - 1 year warranty
- 7Y45 - 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 server conforms to the following standards:

- Energy Star 3.0
- USA FCC Title 47 CFR Part 15 Subpart B
- Canada ICES-003, issue 6, Class A
- UL62368-1
- CSA C22.2, No. 62368-1-14
- NOM-019
- Argentina IEC60950-1
- Australia/New Zealand AS/NZS CISPR 32, Class A
- Japan VCCI 32-1
- IEC 60950-1 (CB Certificate and CB Test Report), IEC 62368-1 (CB Certificate and CB Test Report)
- China CCC (GB4943.1), GB9254 Class A, GB17625.1, CECP, CELP
- Taiwan BSMI CNS13438, Class A; CNS14336-1
- Korea KN32, Class A; KN35
- Russia, Belorussia and Kazakhstan, TR CU 020/2011 and TR CU 004/2011
- CE Mark (EN55032 Class A, EN60950-1, EN55024, EN61000-3-2, and EN61000-3-3, EN 62368-1)
- CISPR 32, Class A
- TUV-GS (EN62368-1, EK1-ITB2000)
- India BIS certification

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 53. 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)
7DAHCTO1WW	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

External backup units

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 54. 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

Fibre Channel SAN switches

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

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

Uninterruptible power supply units

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

Table 55. 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 56. Power distribution units

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
0U Basic PDUs															
00YJ776	ATZY	0U 36 C13/6 C19 24A 1 Phase PDU	N	Y	Y	N	N	N	N	N	N	Y	Y	Y	N
00YJ777	ATZZ	0U 36 C13/6 C19 32A 1 Phase PDU	Y	Y	N	Y	Y	Y	Y	Y	Y	N	N	Y	Y
0U Switched and Monitored PDUs															
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

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
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
1U Switched and Monitored PDUs															
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
1U Ultra Density Enterprise PDUs (9x IEC 320 C13 + 3x IEC 320 C19 outlets)															
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
1U C13 Enterprise PDUs (12x IEC 320 C13 outlets)															
39Y8941	6010	DPI C13 Enterprise PDU Module (WW)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
1U Front-end PDUs (3x IEC 320 C19 outlets)															
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
1U NEMA PDUs (6x NEMA 5-15R outlets)															
39Y8905	5900	DPI 100-127V NEMA PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Line cords for 1U PDUs that ship without a line cord															
40K9611	6504	4.3m, 32A/380-415V, EPDU/IEC 309 3P+N+G 3ph wye (non-US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9612	6502	4.3m, 32A/230V, EPDU to IEC 309 P+N+G (non-US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9613	6503	4.3m, 63A/230V, EPDU to IEC 309 P+N+G (non-US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9614	6500	4.3m, 30A/208V, EPDU to NEMA L6-30P (US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9615	6501	4.3m, 60A/208V, EPDU to IEC 309 2P+G (US) Line Cord	N	N	Y	N	N	N	Y	N	N	Y	Y	Y	N
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 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 57. Rack cabinets

Part number	Description
7D2B0001WW / 7D2N0001WW	12U 1200mm Deep Micro Datacenter Rack
7D2C0001WW / 7D2P0001WW	18U 1200mm Deep Micro Datacenter Rack
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 58. 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 60. 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

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

Related publications and links

For more information, see these resources:

- ThinkSystem ST250 product page
  https://www.lenovo.com/us/en/data-center/servers/towers/ThinkSystem-ST250/p/77XX7TRST25
- ThinkSystem ST250 drivers and support
  http://datacentersupport.lenovo.com/products/servers/thinksystem/st250/7y45/downloads
- Lenovo ThinkSystem ST250 product publications:
  http://thinksystem.lenovofiles.com/help/index.jsp
  - Quick Start
  - Tower-to-Rack Conversion Kit Installation Instructions
  - Setup Guide
  - Maintenance Manual
  - Lenovo XClarity Provisioning Manager User Guide
- ServerProven hardware compatibility:
  http://www.lenovo.com/us/en/serverproven

Related product families

Product families related to this document are the following:

- 1-Socket Tower Servers
- ThinkSystem ST250 Server

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