Lenovo ThinkSystem ST250 V2 Server
Product Guide

The ThinkSystem ST250 V2 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-2300 Series processor (formerly codenamed "Rocket Lake") or Intel Pentium ("Comet Lake Refresh") and up to 128 GB of 3200 MHz TruDDR4 ECC memory.

Figure 1 shows the ThinkSystem ST250 V2.



Figure 1. Lenovo ThinkSystem ST250 V2

Did you know?

The ThinkSystem ST250 V2 is an entry-level server with enterprise-grade management features and support for hot-swap power supplies and drives. It offers full support of Lenovo XClarity Administrator for comprehensive systems management and includes the next generation UEFI-based Lenovo XClarity Provisioning Manager for system setup and diagnosis, and the Lenovo XClarity Controller management processor for ongoing systems management and alerting. These tools make the ST250 V2 easy to deploy, integrate, service, and manage.

Key features

The ThinkSystem ST250 V2 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 V2 offers the following features to boost performance, improve scalability, and reduce costs:

- Improved single-socket processor performance:
  - Intel Xeon E-2300 Series processors ("Rocket Lake-E") up to to 8 cores and core speeds up to 3.7 GHz
  - Intel Pentium G6405, G6505 and G6605 processors ("Comet Lake Refresh") with 2 cores and core speeds up to 4.3 GHz
- Up to four 3200 MHz DDR4 ECC UDIMMs provide speed and capacity of up to 128 GB
- Four PCIe slots for I/O expansion, one of which has the new PCIe Gen4 interface to maximize I/O performance.
- Flexible storage configurations support either 2.5-inch or 3.5-inch hot-swap drive bays or a combination of the two (hybrid configuration). Drive bays support SAS and SATA HDDs 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
- The server also supports simple-swap drives, include 1x NVMe drive:
  - Up to 8x 3.5-inch SATA drive bays
  - Up to 7x 3.5-inch SATA drive bays + 1x 3.5-inch NVMe drive bay
- The use of solid-state drives (SSDs) instead of, or along with, traditional hard disk drives (HDDs) can significantly improve I/O performance. An SSD can support up to 100 times more I/O operations per second (IOPS) than a typical HDD
- New high-speed RAID controllers from Lenovo and Broadcom provide 12 Gb SAS connectivity to the drive backplanes
- Offers two 5.25-inch media bays with support for optical drives or backup drives
- Supports two M.2 drives for OS boot support with VROC RAID redundancy
- The server has two integrated Gigabit Ethernet ports
- The server offers one PCIe 4.0 slot plus three PCIe 3.0 I/O expansion slots
- Support for a NVIDIA GPU for enhanced workload performance

Availability and serviceability

The ST250 V2 provides the following features to simplify serviceability and increase system uptime:

- Designed to run 24 hours a day, 7 days a week
- The ST250 V2 supports UDIMM memory with ECC protection which provides error correction not available in PC-class "servers" that use parity memory. Avoiding system crashes (and data loss) due to soft memory errors means greater system uptime.
- The server offers hot-swap (HS) SSDs and HDDs, and supports RAID redundancy for data protection and greater system uptime.
- Much like hot-swap drives, simple-swap drives are mounted on an easy-to-remove tray and work with the same RAID options. Simple-swap require a system power-down before adding or replacing, however simple-swap drives are less expensive than hot-swap drives.
- The server supports hot-swap power supplies; with two installed, they form a redundant pair to provide availability for business-critical applications.
- Tool-less cover removal provides easy access to upgrades and serviceable parts, such as memory

and adapter cards.

- A choice of affordable onboard SATA RAID or advanced hardware RAID redundancy offers data protection and greater system uptime.
- The use of SSDs can provide better reliability than the use of traditional HDDs, for greater uptime.
- The built-in XClarity Controller continuously monitors system parameters, triggers alerts, and performs recovery actions in case of failures to minimize downtime.
- Allows preventive actions in advance of possible failure, thereby increasing server uptime and application availability with Proactive Platform Alerts (including PFA and SMART alerts) for memory, internal storage (SAS/SATA HDDs and SSDs, NVMe SSDs, M.2 SSDs), RAID controllers, and server ambient and sub-component temperatures.
- Built-in diagnostics in UEFI, using Lenovo XClarity Provisioning Manager, speed up troubleshooting tasks to reduce service time.
- Lenovo XClarity Provisioning Manager supports diagnostics and can save service data to a USB key drive or remote CIFS share folder for troubleshooting and reduce service time.
- Support for the XClarity Administrator Mobile app running on a supported smartphone and connected to the server through the service-enabled USB port, enables additional local systems management functions.
- Auto restart in the event of a momentary loss of AC power (based on power policy setting in the XClarity Controller service processor)
- One-year or three-year customer-replaceable unit (CRU) and onsite limited warranty with next business day response. Optional service upgrades are available.

Manageability and security

The following systems management features simplify local and remote management of the ST250 V2:

- 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 (Intel Xeon E processors only) provides enhanced security through hardware-based resistance to malicious software attacks, allowing an application to run in its own isolated space, protected from all other software running on a system.
- Helps prevent unauthorized software from running on the server by protecting against boot block-level malicious software with Intel Boot Guard technology.
- Protects application code and data from disclosure or modification with Intel Software Guard Extensions (SGX), enabling high-assurance security use cases, such as blockchain, identity and records privacy, secure browsing, and digital rights management (DRM).

- Physical security measures to prevent unauthorized access: Loop for a padlock to prevent the side panel from being opened and a slot at the rear of the server for a Kensington Cable Lock. Optional additional physical security features are a lockable front security door and a chassis intrusion switch (included in some models).

Energy efficiency

The ST250 V2 offers the following energy saving features to save energy, reduce operational costs, increase energy availability, and contribute to the green environment:

- Energy-efficient planar components help lower operational costs.
- High-efficiency power supplies with 80 PLUS Platinum certifications. Energy Star certified.
- Intel Intelligent Power Capability powers individual processor elements on and off as needed to reduce power draw.
- 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 HDDs.
- The server uses hexagonal ventilation holes, which can be grouped more densely than round holes, providing more efficient airflow through the system.
- Optional Lenovo XClarity Energy Manager provides advanced data center power notification, analysis, and policy-based management to help achieve lower heat output and reduced cooling needs.

Comparing the ST250 V2 to the ST250

The ThinkSystem ST250 V2 improves on the previous generation ST250, as summarized in the following table.

Table 1. Comparing the ST250 V2 to the ST250

Feature	ST250	ST250 V2	Benefits
Form Factor	• 1-Socket (1S) Tower • Convertible to a 5U tower configuration	• 1-Socket (1S) Tower • Convertible to a 5U tower configuration	• Versatile server design
Processor	• Supports single Xeon E2200 Series "Coffee Lake-S" processor up to 6C / 95W • Also supports Pentium, Core i3 and Celeron processors • Uses Intel C246 "Cannon Lake" Platform Controller Hub (PCH)	• Support single Xeon E2300 Series "Rocket Lake" processor up to 8C / 95W • Also supports Pentium processors • Intel C256 "Tiger Lake" Platform Controller Hub (PCH)	• Supports the latest generation Intel Xeon E processors
GPU	• NVIDIA Quadro P620 2GB PCIe Active GPU	• NVIDIA Quadro T1000 PCIe Active GPU	• GPU for advanced graphics processing

Feature	ST250	ST250 V2	Benefits
Memory	• 4x UDIMM slots, up to 64GB, 2666MHz • TruDDR4 ECC memory (in China, also support for non-ECC memory)	• 4x UDIMM slots, up to 128GB, 3200MHz with Xeon E-2300 processors • 4x UDIMM slots, up to 128GB, 2666MHz with Pentium processors • TruDDR4 ECC memory	• Enterprise-grade memory sufficient for most SMB and retail applications • Faster memory with Xeon processors • Larger memory capacity means greater performance with larger applications
Storage	• Up to 8x 3.5-inch hot-swap SAS/SATA drive bays or • Up to 16x 2.5-inch hot-swap SAS/SATA drive bays, or • Up to 8x 3.5-inch simple-swap SATA drive bays, or • 2x media bays supporting optical or backup drives • 1x M.2 SATA SSD, installs on the system board	• Up to 8x 3.5-inch hot-swap SAS/SATA drive bays or • Up to 16x 2.5-inch hot-swap SAS/SATA drive bays, or • Up to 8x 3.5-inch simple-swap SATA drive bays, or • Up to 7x 3.5-inch simple-swap SATA drive bays + 1x NVMe drive bay • 2x media bays supporting optical or backup drives • 2x M.2 SATA SSD supporting RAID 0 and RAID 1 using VROC, installs in an adapter in a PCIe slot	• Support for both HDDs for capacity and SSDs for performance • Simple-swap configurations support an NVMe drive for tiered storage • Optical drive support for ease of software installation • M.2 drive support to separate the OS from the applications and data • RAID support for M.2 to maximize uptime
RAID	• Supports a SAS HBA or RAID adapter for hardware RAID functionality • 12Gb SAS/SATA/RAID support • PCIe 3.0 adapters • Intel RSTe SW RAID	• Supports a SAS HBA or RAID adapter for hardware RAID functionality • 12Gb SAS/SATA/RAID support • PCIe 3.0 and PCIe 4.0 adapters • Intel VROC 6.x SW RAID	• Featuring industry's latest PCIe Gen4 based RAID adapters • RAID capability maximizes reliability and uptime
Cooling	• 4 system fans: 2 front for drive bays, 1 rear system fan, 1x CPU fan	• 4 system fans: 2 front for drive bays, 1 rear system fan, 1x CPU fan	• Ensures all components are sufficiently cooled
Networking	• 2x 1GbE Onboard Ethernet ports (Broadcom BCM5720) • Port 1 allows remote connectivity to the XCC management controller	• 2x 1GbE Onboard Ethernet ports (Broadcom BCM5720) • Port 1 allows remote connectivity to the XCC management controller	• Easy built-in networking
PCIe Slots	• 4x PCIe slots (x1, x16, x4, x4) • Includes a PCIe Gen3 x16 slot	• 4x PCIe slots (x4, x16, x4, x4) • Includes a PCIe Gen4 x16 slot (requires Xeon E-2300 processor)	• Support the latest PCIe Gen4 slot technology • Support for a high-performance PCIe x16 adapter

Feature	ST250	ST250 V2	Benefits
Front I/O	• Power button & LED • Thermal sensor • One USB 3.2 G1 (5 Gb/s) port • One USB 2.0 port (also supports XClarity Mobile connectivity for local systems management)	• Power button & LED • Thermal sensor • One USB 3.2 G1 (5 Gb/s) port • One USB 2.0 port (also supports XClarity Mobile connectivity for local systems management)	• Expansive USB support • Thermal sensor ensures the server does not overheat if the ambient temperature rises
Rear I/O	• 2x USB 3.2 G1 (5 Gb/s) ports • 2x USB 3.2 G2 (10 Gb/s) ports • 1x VGA video • 1x RJ-45 systems management • 2x RJ-45 GbE network ports • 1x serial port	• 4x USB 3.2 G2 (10 Gb/s) ports • 1x VGA video • 1x RJ-45 systems management • 2x RJ-45 GbE network ports • 1x serial port	• Expansive USB support • Integrated Gigabit networking • Serial port for applications that require it
Management and Security	• XClarity Controller with upgrades • Full XClarity software suite including XClarity Administrator • Dedicated Ethernet port for remote management • Optional intrusion switch and lockable door	• XClarity Controller with upgrades • Full XClarity software suite including XClarity Administrator • Dedicated Ethernet port for remote management • Optional intrusion switch and lockable door • Platform Firmware Resiliency (PFR) hardware Root of Trust	• Common management tools with prior generation • The server offers electronic and physical security features • Platform Firmware Resiliency is an advanced security solution with a silicon-based to guard against corruption and unauthorized firmware updates
Power Supply	• Choice of 1x fixed power supply or 2x hot-swap power supplies • 250W fixed power supply or 550W hot-swap power supply	• Choice of 1x fixed power supply or 2x hot-swap power supplies • 250W or 300W fixed power supplies, or 550W hot-swap power supply	• Select the power supply that best suits the configuration to maximize efficiency

Components and connectors

The following figure shows the front of the server.

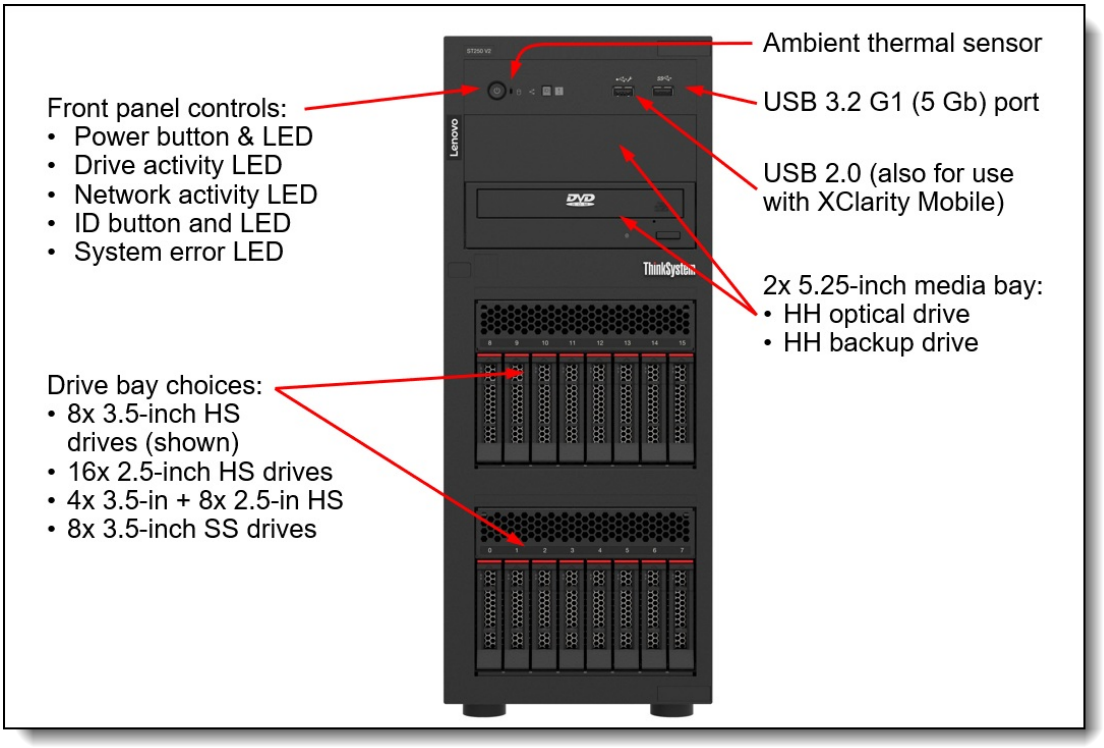


Figure 2. Front view of the ThinkSystem ST250 V2 server

The following figure shows the rear of the server.

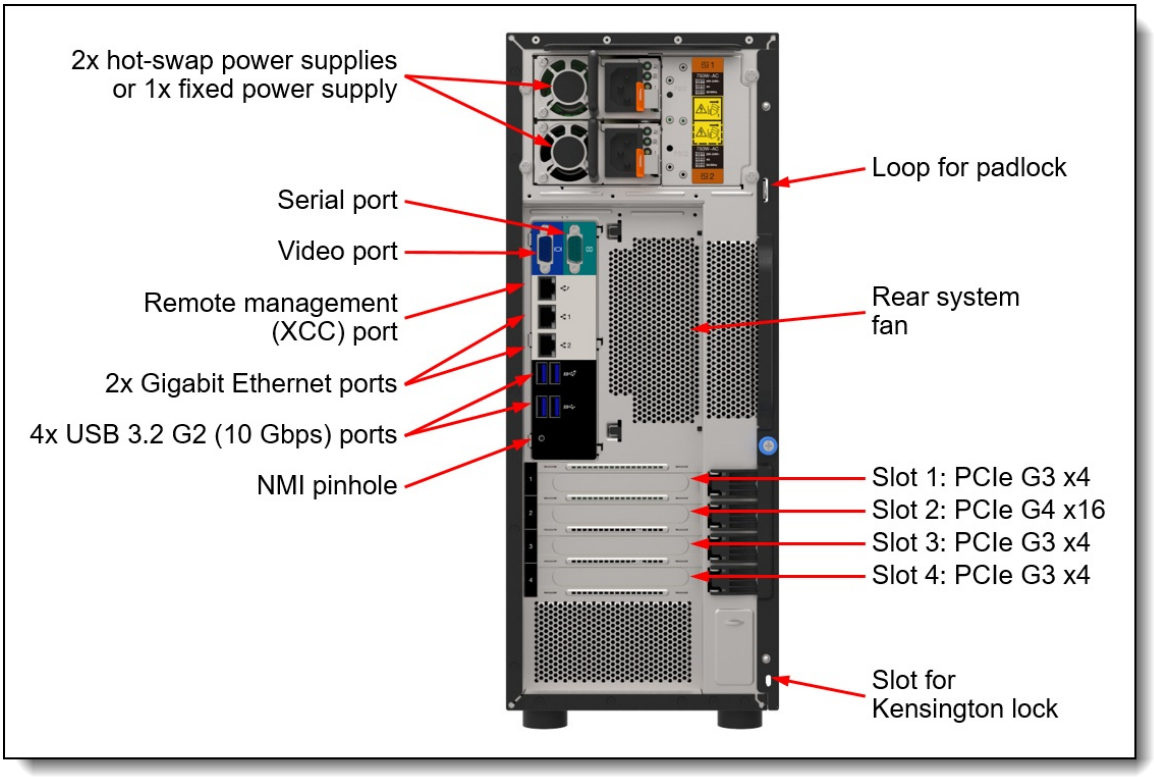


Figure 3. Rear view of the ThinkSystem ST250 V2 server

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

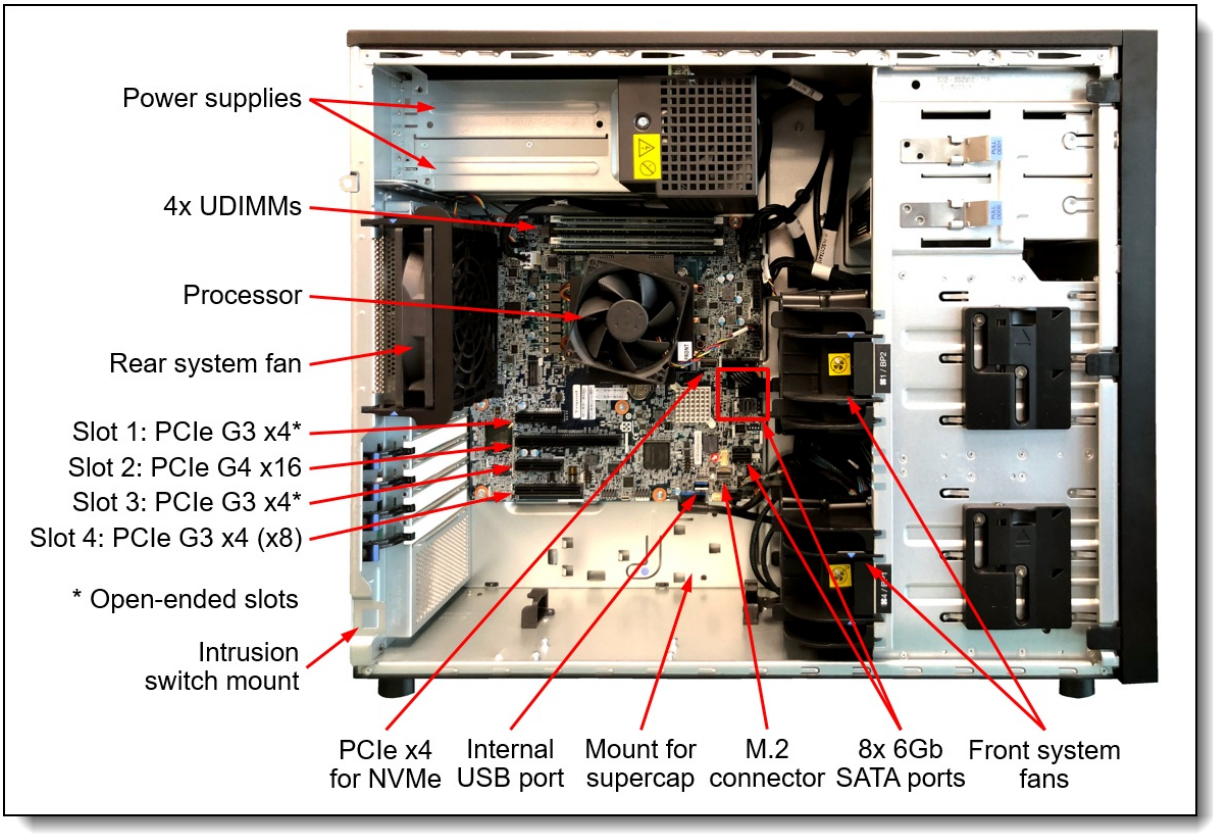


Figure 4. Internal view of the ThinkSystem ST250 V2 server

System architecture

The following figure shows the architectural block diagram of the ST250 V2, showing the major components and their connections.

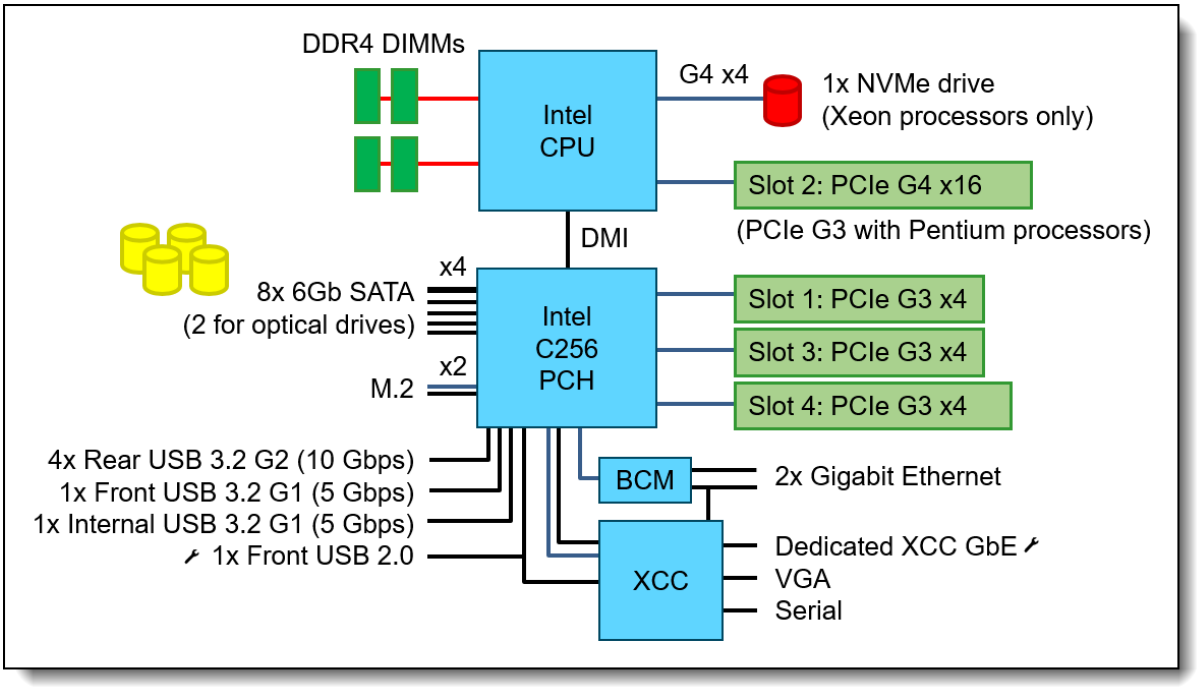


Figure 5. ST250 V2 system architectural block diagram

Standard specifications

The following table lists the standard specifications.

Table 2. Standard specifications

Components	Specification
Machine type	7D8G - 1 year warranty 7D8F - 3 year warranty
Form factor	Tower (can be installed in a rack with the available Rack Mount Kit)
Processor	One Intel processor. Choose from: • Intel Xeon E-2300 Series processors ("Rocket Lake-E") up to to 8 cores, with core speeds up to 3.7 GHz • Intel Pentium G6405, G6505 and G6605 processors ("Comet Lake Refresh") with 2 cores, with core speeds up to 4.3 GHz
Chipset	Intel C256 chipset ("Tiger Lake") part of the "Tatlow" platform
Memory	Four DIMM sockets supporting Lenovo TruDDR4 DIMMs at 3200 MHz (Xeon processors) or 2666 MHz (Pentium processors). Support ECC UDIMMs.
Memory maximum	Up to 128 GB using 4x 32 GB UDIMMs.
Memory protection	Error-correcting code (ECC)

Components	Specification
Disk drive bays	Available configurations: ● 8x or 16x 2.5-inch SAS/SATA hot-swap drive bays ● 4x or 8x 3.5-inch SAS/SATA hot-swap drive bays ● Both 4x 3.5-inch and 8x 2.5-inch SAS/SATA hot-swap drive bays ● Up to 8x 3.5-inch simple-swap SATA drive bays ● 7x 3.5-inch simple-swap SATA drive bays + 1x 3.5-inch simple-swap NVMe drive bay In addition, the ST250 V2 supports two M.2 drives installed in an M.2 adapter which is installed in PCIe slot.
Maximum internal storage	● 2.5-inch drives: ○ 122.88TB using 16x 7.68TB 2.5-inch SAS/SATA SSDs ○ 28.8TB using 16x 1.8TB 2.5-inch HDDs ● 3.5-inch drives: ○ 144TB using 8x 18TB 3.5-inch HDDs ○ 7.68TB using 8x 960GB 3.5-inch SAS/SATA SSDs ● Intermix of SAS and SATA is supported.
Storage controller	● Onboard 6 Gb SATA for simple-swap drive configurations, using embedded Intel RSTe software RAID, supporting RAID 0, 1, 10, 5, 50 ● 12 Gb SAS/SATA RAID adapters ● 12 Gb SAS/SATA host bus adapters
Optical drive bays	Two half-height 5.25-inch bays for optical or tape drives. Supports SATA DVD-ROM or DVD-RW (multiburner). **Note**: If the onboard SATA controller is used to connect the drive bays, then only 6 drives can be installed if an optical drive is installed.
Tape drive bays	Two half-height 5.25-inch bays for optical or tape drives. Support for one RDX drive.
Network interfaces	Two integrated Gigabit Ethernet 1000BASE-T ports (RJ-45) based on Broadcom BCM5720 embedded controller, one can be shared with XCC for systems management. Third dedicated Gigabit Ethernet port for XCC systems management.
PCI Expansion slots	Four PCIe slots (1x PCIe 4.0, 3x PCIe 3.0) as follows: ● Slot 1: PCIe G3 x4 (x4 slot, open-ended) 25W full-height half-length ● Slot 2: PCIe G4 x16 (x16 slot, closed-ended) 75W full-height half-length ● Slot 3: PCIe G3 x4 (x4 slot, open-ended) 25W full-height half-length ● Slot 4: PCIe G3 x4 (x8 slot, closed-ended) 25W full-height half-length Note: Slot 2 is PCIe Gen 4 with a Xeon processor, and PCIe Gen 3 with a Pentium processor
Ports	● Front: ○ One USB 3.2 G1 (5 Gb/s) port ○ One USB 2.0 port (also for XClarity Mobile connectivity for local systems management) ● Rear: ○ Four USB 3.2 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

Components	Specification
Cooling	Supports ASHRAE A2 environments. Certain configurations support ASHRAE A3. Two or three fixed system fans depending on the drive bay configuration. Additional fans attached to the processor heat sink and in the power supplies.
Power supply	Model dependent choices • One fixed 250W power supply: 80 PLUS Platinum certified, ErP Lot 9 compliant • One fixed 300W power supply: 80 PLUS Gold certified • Two hot-swap 550W redundant power supplies, 80 PLUS Platinum certified, Energy Star and ErP Lot 9 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 2.0. Optional chassis intrusion switch. Padlock loop and Kensington cable slot and optional lockable front door for physical security.
Video	G200 graphics with 16 MB memory, integrated into the XClarity Controller. For use with local Administrator functions (not designed for workstation use). Maximum resolution is 1920x1200 32bpp at 60Hz.
Operating systems supported	Microsoft Windows Server, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, VMware ESXi. See the Operating systems section for specifics.
Limited warranty	Three-year or one-year (model dependent) customer-replaceable unit and onsite limited warranty with 9x5 next business day (NBD).
Service and support	Optional service upgrades are available through Lenovo Services: 4-hour or 2-hour response time, 6-hour fix time, 1-year or 2-year warranty extension, software support for Lenovo hardware and some third-party applications.
Dimensions	Width: 176 mm (6.9 in.), height: 444 mm (17.5 in.), depth: 578 mm (22.8 in.). SeePhysical and electrical specifications for details.
Weight	Fully configured: 23.6 kg (52 lb)

The ST250 V2 server is shipped with the following items:

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

Models

ThinkSystem ST250 V2 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 V2 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 V2, 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 V2 server.

Table 3. Base CTO models

Machine Type/Model General purpose	Machine Type/Model for HPC and AI	Description
7D8FCTO1WW	7D8FCTOLWW	ThinkSystem ST250 V2 – 3-year Warranty
7D8GCTO1WW	7D8GCTOLWW	ThinkSystem ST250 V2 – 1-year Warranty

Models of the ST250 V2 are defined based on whether the server has 2.5-inch drive bays at the front (called the 2.5-inch chassis) or whether it has 3.5-inch drive bays at the front (called the 3.5-inch chassis). For models, the feature codes for these chassis bases are as listed in the following table.

Table 4. Chassis base feature codes

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

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

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

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

Models for Asia Pacific region

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

Table 5. Models for Asia Pacific markets

Model	Intel processors†	Memory	Drive Contr	Drive bays Drives	Add'l Cards	DVD	Power supply	Pwr cord	XCC	Sec. door	Intru. sw.
Standard models with a 3-year warranty (machine type 7D8F)											
7D8FA00YAP	Xeon E-2324G 4C 65W 3.1G	1x 8GB	SATA	4x 3.5-in HS / Open bay	Opt	1x DVD-RW	300W fixed	No	Std	Opt	Opt
7D8FA011AP	Xeon E-2324G 4C 65W 3.1G	1x 8GB	SATA	8x 2.5-in HS / Open bay	Opt	1x DVD-RW	1x 550W HS / 2 PT	No	Std	Opt	Opt
7D8FA00XAP	Xeon E-2356G 6C 80W 3.2G	1x 8GB	SATA	4x 3.5-in HS / Open bay	Opt	1x DVD-RW	300W fixed	No	Std	Opt	Opt
7D8FA010AP	Xeon E-2356G 6C 80W 3.2G	1x 8GB	SATA	8x 2.5-in HS / Open bay	Opt	1x DVD-RW	1x 550W HS / 2 PT	No	Std	Opt	Opt
7D8FA00UAP	Xeon E-2386G 6C 95W 3.5G	1x 8GB	SATA	4x 3.5-in HS / Open bay	Opt	1x DVD-RW	300W fixed	No	Std	Opt	Opt
7D8FA00ZAP	Xeon E-2386G 6C 95W 3.5G	1x 8GB	SATA	8x 2.5-in HS / Open bay	Opt	1x DVD-RW	1x 550W HS / 2 PT	No	Std	Opt	Opt

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

Models for Australia and New Zealand

AP models: Customers in Australia and New Zealand also have access to the Asia Pacific region models.

Table 6. Models for Australia and New Zealand

Model	Intel processors†	Memory	Drive Contr	Drive bays Drives	Add'l Cards	DVD	Power supply	Pwr cord	XCC	Sec. door	Intru. sw.
TopSeller models with a 3-year model (machine type 7D8F)											
7D8FA028AU	Xeon E-2324G 4C 65W 3.1GHz	1x 16GB	SATA	4x 3.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	Yes	Adv	Opt	Opt
7D8FA00PAU	Xeon E-2324G 4C 65W 3.1GHz	1x 16GB	SATA	8x 2.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	Yes	Ent	Yes	Yes
7D8FA00RAU	Xeon E-2356G 6C 80W 3.2G	1x 16GB	SATA	8x 2.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	Yes	Ent	Yes	Yes
7D8FA00AAU	Xeon E-2378G 8C 80W 2.8GHz	1x 16GB	SATA	8x 2.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	Yes	Ent	Yes	Yes

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

Models for Brazil

Table 7. Models for Brazil

Model	Intel processors†	Memory	Drive Contr	Drive bays Drives	Add'l Cards	DVD	Power supply	Pwr cord	XCC	Sec. door	Intru. sw.
TopSeller models with 3-year warranty (machine type 7D8F)											
7D8FA02BBR	Xeon E-2336 6C 65W 2.9GHz	2x 8GB	SATA	4x 3.5-in HS / 2x 2TB SATA HDD	1x 2x1Gb 5720	1x DVD-ROM	2x 550W HS / 2 PT	Yes	Ent	Opt	Opt
7D8FA02CBR	Xeon E-2336 6C 65W 2.9GHz	2x 8GB	SATA	4x 3.5-in HS / 2x 2TB SATA HDD	1x 2x1Gb 5720	1x DVD-ROM	2x 550W HS / 2 PT	Yes	Ent	Opt	Opt

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

Models for EMEA countries

Table 8. Models for EMEA countries

Model	Intel processors†	Memory	Drive Contr	Drive bays Drives	Add'l Cards	DVD	Power supply	Pwr cord	XCC	Sec. door	Intru. sw.
Standard models with 3-year warranty (machine type 7D8F)											
7D8FA00CEA	Xeon E-2314 4C 65W 2.8GHz	1x 8GB	SATA	4x 3.5-in HS / Open bay	Opt	Open	250W fixed	Yes	Std	Opt	Yes
7D8FA00DEA	Xeon E-2314 4C 65W 2.8GHz	1x 8GB	SATA	4x 3.5-in SS / Open bay	Opt	Open	250W fixed	Yes	Std	Opt	Yes
7D8FA00EEA	Xeon E-2314 4C 65W 2.8GHz	1x 16GB	SATA	4x 3.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	Yes	Std	Opt	Yes
7D8FA00LEA	Xeon E-2314 4C 65W 2.8GHz	1x 16GB	SATA	8x 2.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	Yes	Ent	Opt	Yes
7D8FA00FEA	Xeon E-2324G 4C 65W 3.1GHz	1x 16GB	SATA	4x 3.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	Yes	Std	Opt	Yes
7D8FA007EA	Xeon E-2334 4C 65W 3.4GHz	1x 16GB	SATA	4x 3.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	Yes	Std	Opt	Yes
7D8FA008EA	Xeon E-2334 4C 65W 3.4GHz	1x 16GB	5350-8i	4x 3.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	Yes	Std	Opt	Yes
7D8FA009EA	Xeon E-2334 4C 65W 3.4GHz	1x 16GB	SATA	4x 3.5-in HS / Open bay	Opt	Open	250W fixed	Yes	Std	Opt	Yes
7D8FA00NEA	Xeon E-2334 4C 65W 3.4GHz	1x 16GB	SATA	8x 2.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	Yes	Ent	Opt	Yes
7D8FA01KEA	Xeon E-2334 4C 65W 3.4G	1x 32GB	SATA	8x 2.5-in HS / 2x 960GB 5400 PRO	Opt	Open	1x 550W HS / 2 PT	Yes	Ent	Opt	Yes
7D8FA01SEA	Xeon E-2334 4C 65W 3.4G	1x 16GB	SATA	8x 2.5-in HS / Open bay	Opt	Open	500W fixed	Yes	Ent	Opt	Yes
7D8FA01UEA	Xeon E-2334 4C 65W 3.4G	1x 16GB	5350-8i	8x 2.5-in HS / Open bay	Opt	Open	1x 750W HS / 2 TT	Yes	Ent	Opt	Yes
7D8FA01VEA	Xeon E-2334 4C 65W 3.4G	1x 16GB	SATA	4x 3.5-in HS / Open bay	Opt	Open	500W fixed	Yes	Ent	Opt	Yes
7D8FA01WEA	Xeon E-2334 4C 65W 3.4G	1x 16GB	SATA	8x 2.5-in HS / Open bay	Opt	Open	1x 750W HS / 2 TT	Yes	Ent	Opt	Yes
7D8FA01GEA	Xeon E-2336 6C 65W 2.9G	1x 16GB	9350-8i	8x 2.5-in HS / 1x 1.2TB 10K	Opt	Open	1x 550W HS / 2 PT	Yes	Ent	Opt	Yes

Model	Intel processors†	Memory	Drive Contr	Drive bays Drives	Add'l Cards	DVD	Power supply	Pwr cord	XCC	Sec. door	Intru. sw.
7D8F100AEA	Xeon E-2356G 6C 80W 3.2G	1x 16GB	SATA	8x 2.5-in HS / Open bay	Opt	Open	1x 750W HS / 2 TT	Yes	Ent	Opt	Yes
7D8FA00BEA	Xeon E-2356G 6C 80W 3.2GHz	1x 16GB	9350-8i	8x 2.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	Yes	Ent	Opt	Yes
7D8FA00QEA	Xeon E-2356G 6C 80W 3.2GHz	1x 16GB	5350-8i	8x 2.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	Yes	Ent	Opt	Yes
7D8FA00SEA	Xeon E-2356G 6C 80W 3.2G	2x 16GB	5350-8i	8x 2.5-in HS / 2x 960GB MV SSD	Opt	Open	1x 550W HS / 2 PT	Yes	Ent	Opt	Yes
7D8FA00TEA	Xeon E-2356G 6C 80W 3.2G	1x 16GB	SATA	8x 2.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	Yes	Ent	Opt	Yes
7D8FA01LEA	Xeon E-2356G 6C 80W 3.2G	1x 32GB	5350-8i	8x 2.5-in HS / Open bay	Opt	Open	1x 750W HS / 2 TT	Yes	Ent	Opt	Yes
7D8FA01PEA	Xeon E-2356G 6C 80W 3.2G	1x 32GB	SATA	8x 2.5-in HS / Open bay	Opt	Open	1x 750W HS / 2 TT	Yes	Ent	Opt	Yes
7D8FA01TEA	Xeon E-2356G 6C 80W 3.2G	1x 16GB	SATA	8x 2.5-in HS / Open bay	Opt	Open	1x 750W HS / 2 TT	Yes	Ent	Opt	Yes
7D8FA01XEA	Xeon E-2356G 6C 80W 3.2G	1x 16GB	5350-8i	8x 2.5-in HS / Open bay	Opt	Open	1x 750W HS / 2 TT	Yes	Ent	Opt	Yes
7D8FA026EA	Xeon E-2356G 6C 80W 3.2GHz	1x 16GB	SATA	8x 2.5-in HS / 2x 480GB 5400 PRO	Opt	Open	1x 750W HS / 2 TT	Yes	Ent	Opt	Yes
7D8FA027EA	Xeon E-2356G 6C 80W 3.2GHz	1x 32GB	SATA	8x 2.5-in HS / 2x 960GB 5400 PRO	Opt	Open	1x 750W HS / 2 TT	Yes	Ent	Opt	Yes
7D8FA00HEA	Xeon E-2378 8C 65W 2.6GHz	1x 16GB	5350-8i	8x 2.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	Yes	Ent	Opt	Yes
7D8FA01JEA	Xeon E-2378 8C 65W 2.6G	1x 32GB	5350-8i	8x 2.5-in HS / 2x 960GB 5400 PRO	Opt	Open	1x 550W HS / 2 PT	Yes	Ent	Opt	Yes
7D8FA01QEA	Xeon E-2378 8C 65W 2.6G	1x 32GB	SATA	8x 2.5-in HS / Open bay	Opt	Open	1x 750W HS / 2 TT	Yes	Ent	Opt	Yes
7D8FA01REA	Xeon E-2378 8C 65W 2.6G	1x 16GB	SATA	8x 2.5-in HS / Open bay	Opt	Open	1x 750W HS / 2 TT	Yes	Ent	Opt	Yes
7D8FA01YEA	Xeon E-2378 8C 65W 2.6G	1x 32GB	5350-8i	8x 2.5-in HS / Open bay	Opt	Open	1x 750W HS / 2 TT	Yes	Ent	Opt	Yes
7D8FA01ZEA	Xeon E-2378 8C 65W 2.6G	1x 16GB	5350-8i	8x 2.5-in HS / Open bay	Opt	Open	1x 750W HS / 2 TT	Yes	Ent	Opt	Yes
7D8FA024EA	Xeon E-2378 8C 65W 2.6G	1x 16GB	5350-8i	8x 2.5-in HS / Open bay	Opt	Open	1x 750W HS / 2 TT	Yes	Ent	Opt	Yes
7D8FA00JEA	Xeon E-2378G 8C 80W 2.8GHz	1x 16GB	5350-8i	8x 2.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	Yes	Ent	Opt	Yes
7D8F100BEA	Xeon E-2388G 8C 95W 3.2G	1x 32GB	5350-8i	8x 2.5-in HS / 2x 960GB 5400 MAX	Opt	Open	2x 750W HS / 2 TT	Yes	Ent	Opt	Yes
7D8F100CEA	Xeon E-2388G 8C 95W 3.2G	1x 32GB	5350-8i	8x 2.5-in HS / 2x 960GB 5400 MAX	Opt	Open	2x 750W HS / 2 TT	Yes	Ent	Opt	Yes
7D8FA00KEA	Xeon E-2388G 8C 95W 3.2GHz	1x 16GB	5350-8i	8x 2.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	Yes	Ent	Opt	Yes
7D8FA01MEA	Xeon E-2388G 8C 95W 3.2G	1x 32GB	5350-8i	8x 2.5-in HS / Open bay	Opt	Open	1x 750W HS / 2 TT	Yes	Ent	Opt	Yes
7D8FA01NEA	Xeon E-2388G 8C 95W 3.2G	1x 32GB	SATA	8x 2.5-in HS / Open bay	Opt	Open	1x 750W HS / 2 TT	Yes	Ent	Opt	Yes

Model	Intel processors†	Memory	Drive Contr	Drive bays Drives	Add'l Cards	DVD	Power supply	Pwr cord	XCC	Sec. door	Intru. sw.
7D8GA013EA	Xeon E-2388G 8C 95W 3.2GHz	2x 32GB	5350-8i	8x 2.5-in HS / 2x 960GB 5400 PRO	Opt	Open	1x 750W HS / 2 TT	No	Ent	Opt	Opt

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

Models for India

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

Table 10. Models for India

Model	Intel processors†	Memory	Drive Contr	Drive bays Drives	Add'l Cards	DVD	Power supply	Pwr cord	XCC	Sec. door	Intru. sw.
TopSeller models with 3-year warranty (machine type 7D8F)											
7D8FA01ASG	Xeon E-2324G 4C 65W 3.1G	1x 8GB	SATA	4x 3.5-in HS / 1x 2TB SATA HDD	Opt	Open	1x 550W HS / 2 PT	No	Std	Opt	Opt
7D8FA01BSG	Xeon E-2324G 4C 65W 3.1G	1x 16GB	SATA	4x 3.5-in HS / 1x 2TB SATA HDD	Opt	Open	1x 550W HS / 2 PT	No	Std	Opt	Opt
7D8FA019SG	Xeon E-2336 6C 65W 2.9G	1x 8GB	SATA	8x 2.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	No	Std	Opt	Opt
7D8FA01CSG	Xeon E-2356G 6C 80W 3.2G	1x 16GB	SATA	8x 2.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	No	Std	Opt	Opt
7D8FA01DSG	Xeon E-2356G 6C 80W 3.2G	1x 8GB	SATA	8x 2.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	No	Std	Opt	Opt

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

Models for Japan

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

Included with all Japan models:

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

Table 11. Models for Japan

Model	Intel processors†	Memory	Drive Contr	Drive bays Drives	Add'l Cards	DVD	Power supply	Pwr cord	XCC	Sec. door	Intru. sw.
Standard models with 1-year warranty (machine type 7D8G)											
7D8GA00AJP	Xeon E-2314 4C 65W 2.8G	1x 16GB	9350-8i	8x 2.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA00JJP	Xeon E-2314 4C 65W 2.8G	1x 16GB	5350-8i	4x 3.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA00KJP	Xeon E-2314 4C 65W 2.8GHz	1x 16GB	SATA	8x 2.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA00PJP	Xeon E-2314 4C 65W 2.8GHz	1x 16GB	SATA	4x 3.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA00SJP	Xeon E-2314 4C 65W 2.8G	1x 16GB	9350-8i	4x 3.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA00XJP	Xeon E-2314 4C 65W 2.8G	1x 16GB	5350-8i	8x 2.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA00BJP	Xeon E-2324G 4C 65W 3.1G	1x 16GB	9350-8i	8x 2.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA00EJP	Xeon E-2324G 4C 65W 3.1G	1x 16GB	9350-8i	4x 3.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA00LJP	Xeon E-2324G 4C 65W 3.1GHz	1x 16GB	SATA	8x 2.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA00QJP	Xeon E-2324G 4C 65W 3.1GHz	1x 16GB	SATA	4x 3.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA00TJP	Xeon E-2324G 4C 65W 3.1GHz	1x 16GB	5350-8i	4x 3.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA00YJP	Xeon E-2324G 4C 65W 3.1G	1x 16GB	5350-8i	8x 2.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8G1003JP	Xeon E-2334 4C 65W 3.4G	1x 8GB	9350-8i	8x 2.5-in HS / 3x 600GB 10K	Opt	1x DVD-ROM	2x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8G1004JP	Xeon E-2334 4C 65W 3.4G	1x 16GB	9350-8i	8x 2.5-in HS / 3x 600GB 10K	Opt	1x DVD-ROM	2x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA006JP	Xeon E-2334 4C 65W 3.4GHz	1x 16GB	SATA	4x 3.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA008JP	Xeon E-2334 4C 65W 3.4G	1x 16GB	9350-8i	8x 2.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA00CJP	Xeon E-2334 4C 65W 3.4G	1x 16GB	9350-8i	4x 3.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA00GJP	Xeon E-2334 4C 65W 3.4GHz	1x 16GB	SATA	8x 2.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA00UJP	Xeon E-2334 4C 65W 3.4G	1x 16GB	5350-8i	4x 3.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA00VJP	Xeon E-2334 4C 65W 3.4G	1x 16GB	5350-8i	8x 2.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt

Model	Intel processors†	Memory	Drive Contr	Drive bays Drives	Add'l Cards	DVD	Power supply	Pwr cord	XCC	Sec. door	Intru. sw.
7D8GA007JP	Xeon E-2374G 4C 80W 3.7GHz	1x 16GB	SATA	4x 3.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA009JP	Xeon E-2374G 4C 80W 3.7G	1x 16GB	9350-8i	8x 2.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA00FJP	Xeon E-2374G 4C 80W 3.7G	1x 16GB	9350-8i	4x 3.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA00HJP	Xeon E-2374G 4C 80W 3.7GHz	1x 16GB	SATA	8x 2.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA00RJP	Xeon E-2374G 4C 80W 3.7G	1x 16GB	5350-8i	4x 3.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA00WJP	Xeon E-2374G 4C 80W 3.7G	1x 16GB	5350-8i	8x 2.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA00DJP	Xeon E-2378 8C 65W 2.6GHz	1x 16GB	5350-8i	8x 2.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA00MJP	Xeon E-2378 8C 65W 2.6GHz	1x 16GB	SATA	4x 3.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA00ZJP	Xeon E-2378 8C 65W 2.6GHz	1x 16GB	SATA	8x 2.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA00NJP	Xeon E-2388G 8C 95W 3.2GHz	1x 16GB	SATA	4x 3.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt
7D8GA010JP	Xeon E-2388G 8C 95W 3.2G	1x 16GB	SATA	8x 2.5-in HS / Open bay	Opt	1x DVD-ROM	1x 550W HS / 2 PT	Yes	Adv	Yes	Opt

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

Models for Latin American countries (except Brazil)

Table 12. Models for the Latin America market (excludes Brazil)

Model	Intel processors†	Memory	Drive Contr	Drive bays Drives	Additional Cards	DVD	Power supply	Pwr cord	XCC	Sec. door	Intru. sw.
Standard models with 3-year warranty (machine type 7D8F)											
7D8F1006LA	Xeon E-2314 4C 65W 2.8G	1x 16GB	5350-8i	4x 3.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	Yes	Std	Opt	Opt
7D8FA02ELA	Xeon E-2314 4C 65W 2.8GHz	1x 16GB	5350-8i	4x 3.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	Yes	Std	Opt	Opt
7D8F1002LA	Xeon E-2334 4C 65W 3.4G	1x 16GB	SATA	4x 3.5-in HS / Open bay	1x 2x1Gb 5720	Open	1x 550W HS / 2 PT	Yes	Ent	Opt	Opt
7D8F1001LA	Xeon E-2336 6C 65W 2.9G	1x 16GB	SATA	4x 3.5-in HS / Open bay	1x 2x1Gb 5720	Open	1x 550W HS / 2 PT	Yes	Ent	Opt	Opt
7D8F1005LA	Xeon E-2356G 6C 80W 3.2G	1x 16GB	5350-8i	8x 3.5-in HS / Open bay	1x 2x1Gb 5720	Open	1x 550W HS / 2 PT	No	Adv	Opt	Opt
7D8FA02DLA	Xeon E-2356G 6C 80W 3.2GHz	1x 16GB	5350-8i	8x 3.5-in HS / Open bay	1x 2x1Gb 5720	Open	1x 550W HS / 2 PT	Yes	Adv	Opt	Opt
7D8F1007LA	Xeon E-2386G 6C 95W 3.5G	1x 16GB	5350-8i	8x 3.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	Yes	Std	Opt	Opt
7D8F1000LA	Xeon E-2388G 8C 95W 3.2G	1x 32GB	5350-8i	8x 3.5-in HS / Open bay	1x 2x1Gb 5720	Open	1x 550W HS / 2 PT	Yes	Ent	Opt	Opt
7D8F1004LA	Xeon E-2388G 8C 95W 3.2G	1x 16GB	5350-8i	8x 3.5-in HS / Open bay	1x 2x1Gb 5720	Open	1x 550W HS / 2 PT	No	Adv	Opt	Opt
7D8F1008LA	Xeon E-2388G 8C 95W 3.2G	1x 16GB	5350-8i	8x 3.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	Yes	Std	Opt	Opt
7D8F1009LA	Xeon E-2388G 8C 95W 3.2G	1x 16GB	5350-8i	8x 2.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	Yes	Std	Opt	Opt

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

Models for USA and Canada

Table 13. Models for USA and Canada

Model	Intel processors†	Memory	Drive Contr	Drive bays Drives	Add'l Cards	DVD	Power supply	Pwr cord	XCC	Sec. door	Intru. sw.
Standard models with 3-year warranty (machine type 7D8F)											
7D8FA00WNA	Xeon E-2334 4C 65W 3.4G	1x 16GB	SATA	4x 3.5-in HS / Open bay	Opt	Open	300W fixed	Yes	Ent	Opt	Opt
7D8FA012NA	Xeon E-2336 6C 65W 2.9G	1x 16GB	SATA	4x 3.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	Yes	Ent	Opt	Opt
7D8FA01HNA	Xeon E-2336 6C 65W 2.9G	1x 8GB	SATA	4x 3.5-in HS / Open bay	Opt	1x DVD-RW	1x 550W HS / 2 PT	Yes	Ent	Opt	Opt
7D8FA013NA	Xeon E-2378 8C 65W 2.6G	1x 16GB	SATA	8x 2.5-in HS / Open bay	Opt	Open	1x 550W HS / 2 PT	Yes	Ent	Opt	Opt

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

Processors

The ST250 V2 supports one processor from the following Intel product families:

- Intel Xeon E-2300 Series processors ("Rocket Lake-E")
- Intel Pentium G6405, G6505 and G6605 processors ("Comet Lake Refresh")

All supported processors have the following characteristics:

- LGA 1200 socket (Socket H5)
- 14 nm semiconductor process technology
- Direct Media Interface (DMI) 3.0 connection to PCH
  - Xeon E-2300: DMI 3.0 x8 connection
  - Pentium: DMI 3.0 x4 connection
- Two DDR4 memory channels
- Support for ECC memory
  - Xeon E-2300: Up to 3200 MHz memory speed
  - Pentium: Up to 2666 MHz memory speed
- PCIe lanes:
  - Xeon E-2300: 20x PCIe 4.0 I/O lanes
  - Pentium: 16x PCIe 3.0 I/O lanes

The following table lists the supported processors.

Integrated graphics and management: Xeon processors with a G suffix include integrated graphics, however, this functionality is not used in the ST250 V2. Instead, graphics support is provided by XClarity Controller (XCC), or by an GPU add-in card. Similarly system management of the ST250 V2 is handled by XCC and as a result, the AMT management processor is disabled.

Table 14. Supported processors

Feature code	Intel model	TDP	Cores / threads	HT	Core speed / Max TB	Cache	Max memory speed	VT	Intel SGX / Enclave†
Intel Pentium processors									
BMDN	G6405	58W	2 / 4	Yes	4.1 GHz / No TB	4 MB	2666 MHz	Yes	No
BMDQ	G6405T	35W	2 / 4	Yes	3.5 GHz / No TB	4 MB	2666 MHz	Yes	No
BMDM	G6505	58W	2 / 4	Yes	4.2 GHz / No TB	4 MB	2666 MHz	Yes	No
BMDP	G6505T	35W	2 / 4	Yes	3.6 GHz / No TB	4 MB	2666 MHz	Yes	No
BMDL	G6605	58W	2 / 4	Yes	4.3 GHz / No TB	4 MB	2666 MHz	Yes	No
Intel Xeon E processors									
BMDD	E-2314	65W	4 / 4	No	2.8 GHz / 4.5 GHz	8 MB	3200 MHz	Yes	Yes / 512 MB
BMDK	E-2324G	65W	4 / 4	No	3.1 GHz / 4.6 GHz	8 MB	3200 MHz	Yes	Yes / 512 MB
BMDC	E-2334	65W	4 / 8	Yes	3.4 GHz / 4.8 GHz	8 MB	3200 MHz	Yes	Yes / 512 MB
BMDB	E-2336	65W	6 / 12	Yes	2.9 GHz / 4.8 GHz	12 MB	3200 MHz	Yes	Yes / 512 MB
BMDH	E-2356G	80W	6 / 12	Yes	3.2 GHz / 5.0 GHz	12 MB	3200 MHz	Yes	Yes / 512 MB
BMDJ	E-2374G	80W	4 / 8	Yes	3.7 GHz / 5.0 GHz	8 MB	3200 MHz	Yes	Yes / 512 MB
BMDA	E-2378	65W	8 / 16	Yes	2.6 GHz / 4.8 GHz	16 MB	3200 MHz	Yes	Yes / 512 MB
BMDF	E-2378G	80W	8 / 16	Yes	2.8 GHz / 5.1 GHz	16 MB	3200 MHz	Yes	Yes / 512 MB
BMDG	E-2386G	95W	6 / 12	Yes	3.5 GHz / 5.1 GHz	12 MB	3200 MHz	Yes	Yes / 512 MB
BMDE	E-2388G	95W	8 / 16	Yes	3.2 GHz / 5.1 GHz	16 MB	3200 MHz	Yes	Yes / 512 MB

† Intel SGX with Intel SPS / Intel SGX Enclave Page Cache size.

UEFI operating modes

The ST250 V2 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 15. UEFI operating mode presets in DCSC

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

The preset modes for the ST250 V2 are as follows:

- **Maximum Performance Mode** (feature BFYB): Achieves maximum performance but with higher power consumption and lower energy efficiency.
- **Efficiency Favoring Performance Mode** (feature BFYE): Maximize the performance/watt efficiency with a bias towards performance. This is the favored mode for Energy Star certification, for example.

Memory options

The ST250 V2 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 processors have 2 memory channels and support 2 DIMMs per channel. The ST250 V2 supports 1, 2 or 4 DIMMs. 3 installed DIMMs is not supported. All DIMMs installed must be identical.

DIMMs installed in the ST250 V2 operate at a speed based on the processor installed, the number of DIMMs installed, and whether the DIMMs are single-rank or dual-rank:

- When connected to a Xeon processor:
  - 1 or 2 DIMMs: 3200 MHz
  - 4 single-rank (1R) DIMMs: 3200 MHz
  - 4 dual-rank (2R) DIMMs: 2933 MHz
- When connected to a Pentium processor:
  - 1 or 2 DIMMs (1 DPC): 2666 MHz
  - 4 single-rank (1R) DIMMs: 2666 MHz
  - 4 dual-rank (2R) DIMMs: 2400 MHz

The following table lists the memory options that are available for the ST250 V2 server.

Table 16. Tatlow memory section

Part number	Feature code	Description	Maximum supported
4X77A77494	BMDV	ThinkSystem 8GB TruDDR4 3200 MHz (1Rx8, 1.2V) ECC UDIMM	4
4X77A77495	BMDW	ThinkSystem 16GB TruDDR4 3200 MHz (2Rx8, 1.2V) ECC UDIMM	4
4X77A77496	BMT4	ThinkSystem 32GB TruDDR4 3200MHz (2Rx8, 1.2V) ECC UDIMM	4

The following rules apply when selecting the memory configuration:

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

Internal storage

The ST250 V2 supports 2.5-inch hot-swap, 3.5-inch hot-swap, and 3.5-inch simple-swap drives in a variety of drive bay configurations.

In this section:

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

Drive bays required: It is not supported to configure the ST250 V2 server without drive bays.

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

NVMe support: NVMe support is limited to the 3.5-inch simple swap drive configuration and requires an Intel Xeon processor. Pentium processors installed in the ST250 V2 do not have enough lanes to support an NVMe drive.

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

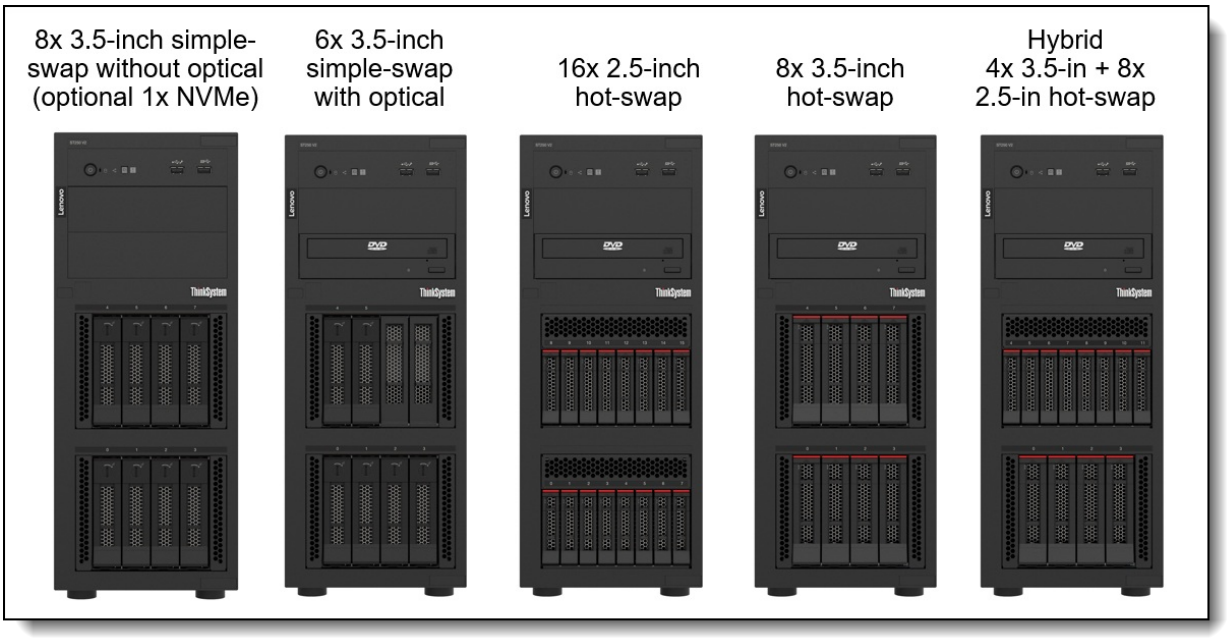


Figure 6. Internal drive bay configurations

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

Table 17. Backplanes for CTO orders

Feature code	Description	Maximum supported	Purpose
B41E	ThinkSystem ST250 V2 2.5" SATA/SAS 8-Bay Backplane Kit	2	2.5-inch hot-swap backplane
B41D	ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay Backplane Kit	2	3.5-inch hot-swap backplane
BN14	ThinkSystem ST250 3.5" SS Bracket Plate Kit for HDD No. 0-3 v2	1	Lower simple-swap backplane with 4 drives
BMPZ	ThinkSystem ST250 4x3.5" SS Bracket Plate Kit for HDD No. 4-5 v2	1	Upper simple-swap backplane with 2 drives (use with optical drives installed)
BN15	ThinkSystem ST250 4x3.5" SS Bracket Plate Kit for HDD No. 4-7 v2	1	Upper simple-swap backplane with 4 drives
BMT8	ThinkSystem ST250 V2 3.5" 3xSATA/1xNVMe 4-Bay Simple Swap Top Bracket Plate Kit	1	Upper simple-swap backplane with 4 drives (3x SATA, 1x NVMe)

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

- The onboard SATA controller has 8 SATA ports, which means that up to 8 SATA drives can be connected provided no optical drive is installed.
- If the onboard SATA controller is used and an optical drive is installed, then at most 6 drives can be installed. The other 2 onboard SATA ports are reserved for optical drives, even if only 1 optical drive is installed.
- The ST250 V2 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 one of the supported 16-port RAID adapters
    - It is supported to add 1 or 2 optical drives to a RAID adapter/HBA configuration

Storage configurations

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

Table 18. Storage configurations

Cfg	Description	Base	Drive tray	Drive support	ODD suppt	Backplanes (features)	Controller	Extra cables (derived feature or option kit)
1	4x 3.5" SS SATA to OB SATA	3.5-inch	Simple-swap	SATA	Yes	4x SATA SS to Onboard (BN14)	Onboard SATA	None
2	8x 3.5" SS SATA to OB SATA without ODD	3.5-inch	Simple-swap	SATA	No	4+4x SATA SS to Onboard (BN14, BN15)	Onboard SATA	None
3	7x 3.5" SS SATA + 1x NVMe to OB SATA	3.5-inch	Simple-swap	SATA + NVMe	No	7x SATA + 1x NVMe SS to OB (BN14, BMT8)	Onboard SATA+NVMe	None
4	6x 3.5" SS to OB SATA with ODD	3.5-inch	Simple-swap	SATA	Yes	4+2x SATA SS to Onboard (BN14, BMPZ)	Onboard SATA	None
5	4x 3.5" HS to OB SATA	3.5-inch	Hot-swap	SATA	Yes	4x 3.5-inch SAS/SATA HS (B41D)	Onboard SATA	Onboard SATA to BP (B41U)
6-1	4x 3.5" HS to HW RAID X350	3.5-inch	Hot-swap	SAS, SATA	Yes	4x 3.5-inch SAS/SATA HS (B41D)	RAID/HBA X350-8i	Gen3 RAID to BP (B41Y)
7	8x 3.5" HS to OB SATA	3.5-inch	Hot-swap	SATA	No	4+4x 3.5-inch SAS/SATA HS (B41D, B41D)	Onboard SATA	Onboard SATA multi to BP (BPR3)
8-1	8x 3.5" HS to HW RAID X350	3.5-inch	Hot-swap	SAS, SATA	Yes	4+4x 3.5-inch SAS/SATA HS (B41D, B41D)	RAID 9350-8i 2GB	2x Gen3 RAID to BP (B41Y, B41X)
9-1	8x 2.5" HS to OB SATA without ODD	2.5-inch	Hot-swap	SATA	No	8x 2.5-inch SAS/SATA HS (B41E)	Onboard SATA	Onboard SATA multi to BP (BPR3)
9-2	8x 2.5" HS to OB SATA with ODD	2.5-inch	Hot-swap	SATA	Yes	8x 2.5-inch SAS/SATA HS (2 bays unused) (B41E)	Onboard SATA	Onboard SATA multi to BP (BPR3)
10-1	8x 2.5" HS to HW RAID X350	2.5-inch	Hot-swap	SAS, SATA	Yes	8x 2.5-inch SAS/SATA HS (B41E)	RAID/HBA X350-8i	2x Gen3 RAID to BP (B41Y, B41Z)
11-1	16x 2.5" HS to HW RAID X350-16i	2.5-inch	Hot-swap	SAS, SATA	Yes	8+8x 2.5-inch SAS/SATA HS (B41E, B41E)	RAID/HBA X350-16i	4x Gen3 RAID to BP (B41Y, B41Z, B41X, B4LK)
11-2	16x 2.5" HS to HW RAID 2x X350-8i	2.5-inch	Hot-swap	SAS, SATA	Yes	8+8x 2.5-inch SAS/SATA HS (B41E, B41E)	2x RAID/HBA X350-8i	4x Gen3 RAID to BP (B41Y, B41Z, B41X, B4LK)
12-1	8x 2.5" HS + 4x 3.5" HS to HW RAID X350-8i	2.5-inch	Hot-swap	SAS, SATA	Yes	4x 3.5-inch + 8x 2.5-inch SAS/SATA HS (B41D, B41E)	RAID X350-16i	3x Gen3 RAID to BP (B41Y, B41X, B4LK)
12-2	8x 2.5" HS + 4x 3.5" HS to HW RAID 2x X350-8i	2.5-inch	Hot-swap	SAS, SATA	Yes	4x 3.5-inch + 8x 2.5-inch SAS/SATA HS (B41D, B41E)	2x RAID/HBA X350-8i	3x Gen3 RAID to BP (B41Y, B41X, B4LK)

Field upgrades

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

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

Table 19. Field upgrades

Starting configuration		Target configuration		Options needed (Backplanes and cables)
1	4x 3.5" SS SATA to OB SATA	2	8x 3.5" SS SATA to OB SATA without ODD	• 4XF7A81459, ThinkSystem ST250 V2 3.5" SATA 8-Bay X30/X40 Simple Swap Bracket Kit
1	4x 3.5" SS SATA to OB SATA	3	7x 3.5" SS SATA + 1x NVMe to OB SATA	• 4XF7A81460, ThinkSystem ST250 V2 7x3.5" Simple Swap SATA + 1x 3.5" Simple Swap NVMe Backplane Kit
1	4x 3.5" SS SATA to OB SATA	4	6x 3.5" SS to OB SATA with ODD	• 4XF7A81459, ThinkSystem ST250 V2 3.5" SATA 8-Bay X30/X40 Simple Swap Bracket Kit
1	4x 3.5" SS SATA to OB SATA	5	4x 3.5" HS to OB SATA	• 4XF7A81457, ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay X30/X40 Backplane Kit
1	4x 3.5" SS SATA to OB SATA	6	4x 3.5" HS to HW RAID	• 4XF7A81457, ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay X30/X40 Backplane Kit
1	4x 3.5" SS SATA to OB SATA	7	8x 3.5" HS to OB SATA	• 2x 4XF7A81457, ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay X30/X40 Backplane Kit
1	4x 3.5" SS SATA to OB SATA	8	8x 3.5" HS to HW RAID	• 2x 4XF7A81457, ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay X30/X40 Backplane Kit
1	4x 3.5" SS SATA to OB SATA	12	8x 2.5" HS + 4x 3.5" HS to HW RAID	• 4XF7A81457, ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay X30/X40 Backplane Kit • 4XF7A84197, ThinkSystem ST250 V2 8x2.5" Hot Swap SAS/SATA Backplane Kit for X350/X40 RAID/HBA (Drive Bay 4-11)
2	8x 3.5" SS SATA to OB SATA without ODD	3	7x 3.5" SS SATA + 1x NVMe to OB SATA	• 4XF7A81460, ThinkSystem ST250 V2 7x3.5" Simple Swap SATA + 1x 3.5" Simple Swap NVMe Backplane Kit
2	8x 3.5" SS SATA to OB SATA without ODD	4	6x 3.5" SS to OB SATA with ODD	• 4XF7A81459, ThinkSystem ST250 V2 3.5" SATA 8-Bay X30/X40 Simple Swap Bracket Kit
2	8x 3.5" SS SATA to OB SATA without ODD	5	4x 3.5" HS to OB SATA	• 4XF7A81457, ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay X30/X40 Backplane Kit
2	8x 3.5" SS SATA to OB SATA without ODD	6	4x 3.5" HS to HW RAID	• 4XF7A81457, ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay X30/X40 Backplane Kit
2	8x 3.5" SS SATA to OB SATA without ODD	7	8x 3.5" HS to OB SATA	• 2x 4XF7A81457, ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay X30/X40 Backplane Kit
2	8x 3.5" SS SATA to OB SATA without ODD	8	8x 3.5" HS to HW RAID	• 2x 4XF7A81457, ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay X30/X40 Backplane Kit
2	8x 3.5" SS SATA to OB SATA without ODD	12	8x 2.5" HS + 4x 3.5" HS to HW RAID	• 4XF7A81457, ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay X30/X40 Backplane Kit • 4XF7A84197, ThinkSystem ST250 V2 8x2.5" Hot Swap SAS/SATA Backplane Kit for X350/X40 RAID/HBA (Drive Bay 4-11)
3	7x 3.5" SS SATA + 1x NVMe to OB SATA	4	6x 3.5" SS to OB SATA with ODD	• 4XF7A81459, ThinkSystem ST250 V2 3.5" SATA 8-Bay X30/X40 Simple Swap Bracket Kit
3	7x 3.5" SS SATA + 1x NVMe to OB SATA	5	4x 3.5" HS to OB SATA	• 4XF7A81457, ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay X30/X40 Backplane Kit
3	7x 3.5" SS SATA + 1x NVMe to OB SATA	6	4x 3.5" HS to HW RAID	• 4XF7A81457, ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay X30/X40 Backplane Kit
3	7x 3.5" SS SATA + 1x NVMe to OB SATA	7	8x 3.5" HS to OB SATA	• 2x 4XF7A81457, ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay X30/X40 Backplane Kit
3	7x 3.5" SS SATA + 1x NVMe to OB SATA	8	8x 3.5" HS to HW RAID	• 2x 4XF7A81457, ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay X30/X40 Backplane Kit

Starting configuration		Target configuration		Options needed (Backplanes and cables)
3	7x 3.5" SS SATA + 1x NVMe to OB SATA	12	8x 2.5" HS + 4x 3.5" HS to HW RAID	• 4XF7A81457, ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay X30/X40 Backplane Kit • 4XF7A84197, ThinkSystem ST250 V2 8x2.5" Hot Swap SAS/SATA Backplane Kit for X350/X40 RAID/HBA (Drive Bay 4-11)
4	6x 3.5" SS to OB SATA with ODD	5	4x 3.5" HS to OB SATA	• 4XF7A81457, ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay X30/X40 Backplane Kit
4	6x 3.5" SS to OB SATA with ODD	6	4x 3.5" HS to HW RAID	• 4XF7A81457, ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay X30/X40 Backplane Kit
4	6x 3.5" SS to OB SATA with ODD	7	8x 3.5" HS to OB SATA	• 2x 4XF7A81457, ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay X30/X40 Backplane Kit
4	6x 3.5" SS to OB SATA with ODD	8	8x 3.5" HS to HW RAID	• 2x 4XF7A81457, ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay X30/X40 Backplane Kit
4	6x 3.5" SS to OB SATA with ODD	12	8x 2.5" HS + 4x 3.5" HS to HW RAID	• 4XF7A81457, ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay X30/X40 Backplane Kit • 4XF7A84197, ThinkSystem ST250 V2 8x2.5" Hot Swap SAS/SATA Backplane Kit for X350/X40 RAID/HBA (Drive Bay 4-11)
5	4x 3.5" HS to OB SATA	6	4x 3.5" HS to HW RAID	• 4X97A81466, ThinkSystem ST250 V2 X30/X40 RAID Cable Kit
5	4x 3.5" HS to OB SATA	7	8x 3.5" HS to OB SATA	• 4XF7A81457, ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay X30/X40 Backplane Kit
5	4x 3.5" HS to OB SATA	8	8x 3.5" HS to HW RAID	• 4XF7A81457, ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay X30/X40 Backplane Kit
5	4x 3.5" HS to OB SATA	12	8x 2.5" HS + 4x 3.5" HS to HW RAID	• 4XF7A84197, ThinkSystem ST250 V2 8x2.5" Hot Swap SAS/SATA Backplane Kit for X350/X40 RAID/HBA (Drive Bay 4-11)
6	4x 3.5" HS to HW RAID	8	8x 3.5" HS to HW RAID	• 4XF7A81457, ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay X30/X40 Backplane Kit
6	4x 3.5" HS to HW RAID	12	8x 2.5" HS + 4x 3.5" HS to HW RAID	• 4XF7A84197, ThinkSystem ST250 V2 8x2.5" Hot Swap SAS/SATA Backplane Kit for X350/X40 RAID/HBA (Drive Bay 4-11)
7	8x 3.5" HS to OB SATA	8	8x 3.5" HS to HW RAID	• 4X97A81466, ThinkSystem ST250 V2 X30/X40 RAID Cable Kit
7	8x 3.5" HS to OB SATA	12	8x 2.5" HS + 4x 3.5" HS to HW RAID	• 4XF7A84197, ThinkSystem ST250 V2 8x2.5" Hot Swap SAS/SATA Backplane Kit for X350/X40 RAID/HBA (Drive Bay 4-11)
8	8x 3.5" HS to HW RAID	12	8x 2.5" HS + 4x 3.5" HS to HW RAID	• 4XF7A84197, ThinkSystem ST250 V2 8x2.5" Hot Swap SAS/SATA Backplane Kit for X350/X40 RAID/HBA (Drive Bay 4-11)
9	8x 2.5" HS to OB SATA	10	8x 2.5" HS to HW RAID	• 4X97A81466, ThinkSystem ST250 V2 X30/X40 RAID Cable Kit
9	8x 2.5" HS to OB SATA	11	16x 2.5" HS to HW RAID	• 4XF7A81461, ThinkSystem ST250 V2 8x2.5" Hot Swap SAS/SATA Backplane Kit for X350/X40 RAID/HBA (Drive Bay 8-15)
10	8x 2.5" HS to HW RAID	11	16x 2.5" HS to HW RAID	• 4XF7A81461, ThinkSystem ST250 V2 8x2.5" Hot Swap SAS/SATA Backplane Kit for X350/X40 RAID/HBA (Drive Bay 8-15)

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

Table 20. Upgrade options table

Part number	Description
Backplane kits	
4XF7A81461	ThinkSystem ST250 V2 8x2.5" Hot Swap SAS/SATA Backplane Kit for X350/X40 RAID/HBA (Drive Bay 8-15) • 1x 8x2.5" SATA/SAS hot-swap backplane • 1x cage assembly • 10x signal and power cables • 8x 2.5" drive bay fillers • 1x front fan and cable • 2x supercap holders (adapter-specific)
4XF7A84197	ThinkSystem ST250 V2 8x2.5" Hot Swap SAS/SATA Backplane Kit for X350/X40 RAID/HBA (Drive Bay 4-11) (for hybrid 2.5" + 3.5" configuration) • 1x 8x2.5" SATA/SAS hot-swap backplane • 1x 8x2.5" cage assembly for a hybrid 2.5" + 3.5" configuration • 10x signal and power cables • 8x 2.5" drive bay fillers • 1x front fan and cable • 2x supercap holders (adapter-specific)
4XF7A81457	ThinkSystem ST250 V2 3.5" SATA/SAS 4-Bay X30/X40 Backplane Kit • 1x 4x3.5" SATA/SAS hot-swap backplane • 1x cage assembly • 8x signal and power cables • 4x 3.5" drive bay fillers • 1x front fan and cable • 2x supercap holders (adapter-specific)
4XF7A81459	ThinkSystem ST250 V2 3.5" SATA 8-Bay X30/X40 Simple Swap Bracket Kit • Upper simple-swap backplane + cable with 2 SATA connections (use with optical drive) • Upper simple-swap backplane + cable with 4 SATA connections • 1x cage assembly for 8x 3.5" drive bays • 8x 3.5" drive bay fillers • 1x front fan and cable • 2x supercap holders (adapter-specific)
4XF7A81460	ThinkSystem ST250 V2 7x3.5" Simple Swap SATA + 1x 3.5" Simple Swap NVMe Backplane Kit • Upper simple-swap backplane + cable with 3 SATA + 1 NVMe connections • 1x cage assembly for 8x 3.5" drive bays • 8x 3.5" drive bay fillers • 1x front fan and cable
Cable kits	
4X97A81466	ThinkSystem ST250 V2 X30/X40 RAID Cable Kit • 6x signal cables for upper & lower cage connections (adapter-specific cables) • 2x supercap holders (adapter-specific)

RAID flash power module (supercap) support

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

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

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

Table 21. Cable option kit

Part number	Description
4X97A81466	ThinkSystem ST250 V2 X30/X40 RAID Cable Kit

M.2 drives

The ST250 V2 server supports two M.2 form-factor SATA drives installed in an M.2 adapter attached to a dummy PCIe adapter. The PCIe adapter is in turn installed in a PCIe slot. The M.2 adapter is connected via cables to the system board; the edge connector of the PCIe adapter only provides physical support and does not provide PCIe signals or power.

The following figure shows the M.2 adapter for the ST250 V2.

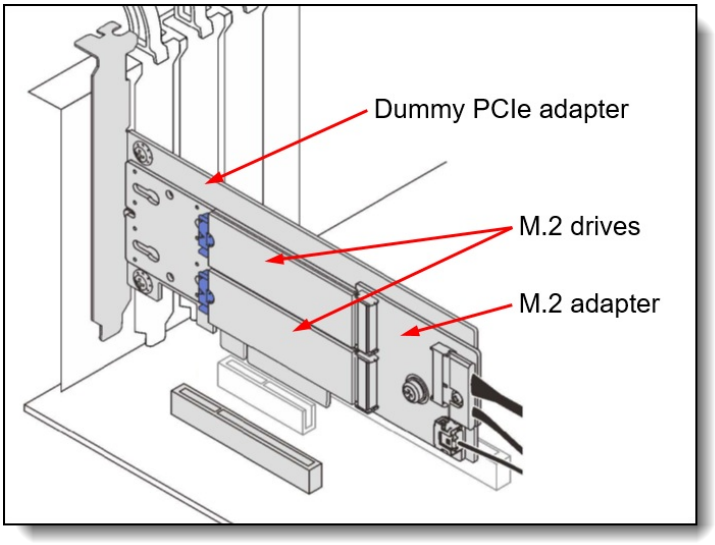


Figure 7. M.2 adapter with two M.2 drives installed in a PCIe slot

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

Supported drives are listed in the Internal drive options section.

Table 22. M.2 adapter for ST250 V2

Part number	Feature code	Description	Maximum supported	Slots supported
4C57A85377	B5XJ + BMTU	ThinkSystem M.2 SATA/NVMe 2-Bay Enablement Adapter • ThinkSystem M.2 SATA/NVMe 2-Bay Enablement Kit, B5XJ • ThinkSystem ST250 V2 Dummy PCIe Card, BMTU	1	4
4X97A82303	BMTD	ThinkSystem SR250 V2/ST250 V2 M.2 Signal & Power Cable Kit	1	Not applicable

No NVMe support: The ST250 V2 does not currently support NVMe M.2 drives.

Configuration rules:

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

The M.2 SATA/NVMe 2-Bay Enablement Kit has the following features when installed in the ST250 V2:

- Supports one or two M.2 SATA drives
- Support 42mm, 60mm, 80mm and 110mm drive form factors (2242, 2260, 2280 and 22110)
- JBOD native support; no built-in RAID support (RAID can be enabled via Intel VROC SATA RAID)
- Supports monitoring and reporting of events and temperature through I2C
- Firmware update via Lenovo firmware update tools

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

SED encryption key management with ISKLM

The server supports self-encrypting drives (SEDs) as listed in the Internal drive options section. To effectively manage a large deployment of these drives in Lenovo servers, IBM Security Key Lifecycle Manager (SKLM) offers a centralized key management solution. A Lenovo Feature on Demand (FoD) upgrade is used to enable this SKLM support in the management processor of the server.

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

Table 23. FoD upgrades for SKLM support

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

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

Table 24. IBM Security Key Lifecycle Manager licenses

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

Controllers for internal storage

The ST250 V2 supports the use of the onboard 6Gb SATA ports to connect SATA drives. Hot-swap and simple-swap SATA drives are supported. These onboard SATA ports support RSTe mode for RAID functionality or AHCI mode for JBOD support.

In addition to the onboard SATA controller, the ST250 V2 with hot-swap drives supports the use of an internal RAID adapter or HBA. The following table lists the supported adapters.

Table 25. Controllers for internal storage

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

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

Configuration notes:

- **Virtualization support**: The onboard SATA ports can be used with virtualization hypervisors, including VMware ESXi, Linux KVM, Xen, and Microsoft Hyper-V, however support is limited to AHCI (non-RAID) mode. RSTe mode is not supported with virtualization hypervisors.
- **Windows support**: Windows only supports a RSTe-based RAID array of no more than 6 drives.
- **E810 Ethernet and X350 RAID/HBAs**: The use of both an Intel E810 network adapter and an X350 HBA/RAID adapter (9350, 5350 and 4350) is currently not supported in ThinkSystem servers. For details see Support Tip HT513226. Planned support for this combination of adapters is 4Q/2023 (SI 23-2).

Internal drive options

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

2.5-inch hot-swap drives:

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

3.5-inch hot-swap drives:

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

Simple-swap drives:

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

M.2 drives:

- M.2 SATA drives

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

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

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

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

Table 27. 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
2.5-inch hot-swap SSDs - 6 Gb SATA - Read Intensive/Entry (<3 DWPD)				
4XB7A89423	BXDY	ThinkSystem 2.5" CM893a 1.92TB Read Intensive SATA 6Gb HS SSD	Support	16
4XB7A82258	BQ1Q	ThinkSystem 2.5" 5400 PRO 240GB Read Intensive SATA 6Gb HS SSD	Support	16
4XB7A82259	BQ1P	ThinkSystem 2.5" 5400 PRO 480GB Read Intensive SATA 6Gb HS SSD	Support	16
4XB7A82260	BQ1R	ThinkSystem 2.5" 5400 PRO 960GB Read Intensive SATA 6Gb HS SSD	Support	16
4XB7A82261	BQ1X	ThinkSystem 2.5" 5400 PRO 1.92TB Read Intensive SATA 6Gb HS SSD	Support	16
4XB7A82262	BQ1S	ThinkSystem 2.5" 5400 PRO 3.84TB Read Intensive SATA 6Gb HS SSD	Support	16
4XB7A82263	BQ1T	ThinkSystem 2.5" 5400 PRO 7.68TB Read Intensive SATA 6Gb HS SSD	Support	16
4XB7A17072	B99D	ThinkSystem 2.5" S4520 240GB Read Intensive SATA 6Gb HS SSD	No	16
4XB7A17101	BA7G	ThinkSystem 2.5" S4520 480GB Read Intensive SATA 6Gb HS SSD	No	16
4XB7A17102	BA7H	ThinkSystem 2.5" S4520 960GB Read Intensive SATA 6Gb HS SSD	No	16
4XB7A38273	BCTE	ThinkSystem 2.5" Multi Vendor 960GB Entry SATA 6Gb Hot Swap SSD	No	16

Table 28. 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 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
7XB7A00046	AUUG	ThinkSystem 3.5" 10TB 7.2K SAS 12Gb Hot Swap 512e HDD	No	8
7XB7A00067	B117	ThinkSystem 3.5" 12TB 7.2K SAS 12Gb Hot Swap 512e HDD	No	8
4XB7A13906	B496	ThinkSystem 3.5" 14TB 7.2K SAS 12Gb Hot Swap 512e HDD	No	8
4XB7A13911	B7EZ	ThinkSystem 3.5" 16TB 7.2K SAS 12Gb Hot Swap 512e HDD	No	8
4XB7A38266	BCFP	ThinkSystem 3.5" 18TB 7.2K SAS 12Gb Hot Swap 512e HDD	No	8
4XB7A80353	BPKU	ThinkSystem 3.5" 20TB 7.2K SAS 12Gb Hot Swap 512e HDD	No	8

Table 29. 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
7XB7A00054	AUUB	ThinkSystem 3.5" 10TB 7.2K SATA 6Gb Hot Swap 512e HDD	No	8
7XB7A00068	B118	ThinkSystem 3.5" 12TB 7.2K SATA 6Gb Hot Swap 512e HDD	No	8
4XB7A13907	B497	ThinkSystem 3.5" 14TB 7.2K SATA 6Gb Hot Swap 512e HDD	No	8
4XB7A13914	B7F0	ThinkSystem 3.5" 16TB 7.2K SATA 6Gb Hot Swap 512e HDD	No	8
4XB7A38130	BCFH	ThinkSystem 3.5" 18TB 7.2K SATA 6Gb Hot Swap 512e HDD	No	8
4XB7A80354	BPKV	ThinkSystem 3.5" 20TB 7.2K SATA 6Gb Hot Swap 512e HDD	No	8

Table 30. 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 - 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
4XB7A38278	BCTK	ThinkSystem 3.5" Multi Vendor 960GB Entry SATA 6Gb Hot Swap SSD	No	8

Table 31. 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

Table 32. 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 - 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 33. 3.5-inch simple-swap PCIe 4.0 NVMe SSDs

Part number	Feature code	Description	SED support	Max Qty
3.5-inch SSDs - U.2 PCIe 4.0 NVMe - Read Intensive/Entry (<3 DWPD)				
4XB7A79664	BNHZ	ThinkSystem 3.5" U.2 P5520 1.92TB Read Intensive NVMe PCIe 4.0 x4 SS SSD	Support	1
4XB7A82993	BQ1G	ThinkSystem 3.5" U.2 P5500 1.92TB Read Intensive NVMe PCIe 4.0 x4 SS SSD	No	1

Table 34. 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	2
4XB7A82287	BQ1Y	ThinkSystem M.2 5400 PRO 480GB Read Intensive SATA 6Gb NHS SSD	Support	2
7N47A00130	AUUV	ThinkSystem M.2 128GB SATA 6Gbps Non-Hot Swap SSD	No	2
4XB7A17073	B919	ThinkSystem M.2 5300 480GB SATA 6Gbps Non-Hot Swap SSD	No	2
4XB7A17074	B8JJ	ThinkSystem M.2 5300 960GB SATA 6Gbps Non-Hot Swap SSD	No	2

USB memory key

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

Table 35. USB memory key

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

Internal backup units

The ST250 V2 supports the internal backup unit options that are listed in the following table.

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

Table 36. Internal backup units

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

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

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

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

Table 37. Cable kit for field upgrades

Part number	Description
4X97A81465	ThinkSystem ST250 V2 ODD/Tape Cable Kit • 1x ODD data cable (SC17B01163, feature BMQT) -- not required for RDX dock • 1x ODD/tape power cable (SC17B01164, feature BMQU)

Optical drives

The ST250 V2 supports the internal optical drive options listed in the following table. The internal optical are installed in the 5.25-inch media drive bays.

Table 38. Optical drives

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

Configuration rules:

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

Table 39. Cable kit for field upgrades

Part number	Description	Maximum supported
4X97A81465	ThinkSystem ST250 V2 ODD/Tape Cable Kit • 1x ODD data cable (SC17B01163, feature BMQT) • 1x ODD/tape power cable (SC17B01164, feature BMQU)	2

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

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

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

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

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

Table 40. External optical drive

Part number	Feature code	Description
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 V2 server has one PCIe 4.0 slot and three PCIe 3.0 slots, as follows:

- Slot 1: PCIe 3.0 x4 full-height, half-length (x1 physical slot, open ended), supports 25W adapters
- Slot 2: PCIe 4.0 x16 full-height, half-length (x16 physical slot, closed ended), supports 75W adapters
- Slot 3: PCIe 3.0 x4 full-height, half-length (x4 physical slot, open ended), supports 25W adapters
- Slot 4: PCIe 3.0 x4 full-height, half-length (x8 physical slot, closed ended), supports 25W adapters

Slot 1 and slot 3 in the ST250 V2 are an open-end design, which means that it can accept adapters with a longer edge connector than the physical length of the slot connector. For example, if a x8 adapter is installed in the x4 slot 3 of the server, half of the edge connector will not be connected to the slot. The adapter will still function, however performance will be impacted.

The following figure shows the locations of the PCIe slots.

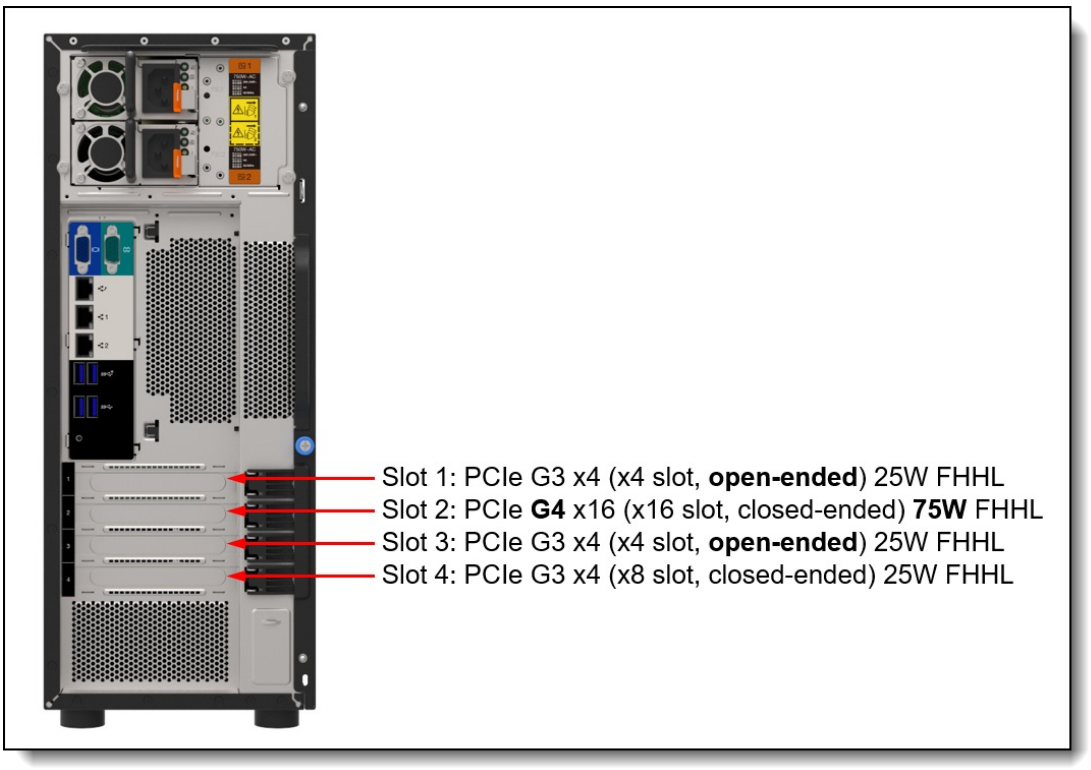


Figure 8. ThinkSystem ST250 V2 PCIe slots

Network adapters

The ST250 V2 has two onboard Gigabit Ethernet ports, connected to a Broadcom BCM5720 embedded controller.

The BCM5720 embedded controller has the following features:

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

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

Table 41. Network adapters

Part number	Feature code	Description	Slots supported	Maximum supported
Gigabit Ethernet				
7ZT7A00484	AUZV	ThinkSystem Broadcom 5719 1GbE RJ45 4-Port PCIe Ethernet Adapter	1, 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	1, 2, 3, 4	2
7ZT7A00535	AUZW	ThinkSystem I350-T4 PCIe 1Gb 4-Port RJ45 Ethernet Adapter	1, 2, 3, 4	2
10 Gb Ethernet - 10GBASE-T				
7ZT7A00496	AUKP	ThinkSystem Broadcom 57416 10GBASE-T 2-Port PCIe Ethernet Adapter	2*	1
00MM860	ATPX	Intel X550-T2 Dual Port 10GBase-T Adapter	1, 2, 3, 4	2
4XC7A79699	BMXB	ThinkSystem Intel X710-T4L 10GBase-T 4-Port PCIe Ethernet Adapter	1, 2, 3, 4	2
10 Gb Ethernet - SFP+				
7XC7A05525	B0YL	Intel X710-DA4 4x10Gb SFP+ Adapter	1, 2, 3, 4	2
25 Gb Ethernet				
4XC7A08238	B5T0	ThinkSystem Broadcom 57414 10/25GbE SFP28 2-port PCIe Ethernet Adapter	1, 4	2
4XC7A08295	BCD6	ThinkSystem Intel E810-DA2 10/25GbE SFP28 2-Port PCIe Ethernet Adapter	1, 2, 3, 4	2

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

Configuration notes:

- For more information, including the transceivers and cables that each adapter supports, see the list of Lenovo Press Product Guides in the Ethernet adapters category: http://lenovopress.com/servers/options/ethernet#rt=product-guide
- **E810 Ethernet and X350 RAID/HBAs**: The use of both an Intel E810 network adapter and an X350 HBA/RAID adapter (9350, 5350 and 4350) is currently not supported in ThinkSystem servers. For details see Support Tip HT513226. Planned support for this combination of adapters is 4Q/2023 (SI 23-2).

SAS adapters for external storage

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

Table 42. Supported external storage adapters

Part number	Feature code	Description	Slots supported	Maximum supported
12 Gb SAS HBA				
7Y37A01090	AUNR	ThinkSystem 430-8e SAS/SATA 12Gb HBA	1, 2, 3, 4	2
4Y37A78837	BNWK	ThinkSystem 440-8e SAS/SATA PCIe Gen4 12Gb HBA	1, 2, 3, 4	2

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

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

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

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

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

Fibre Channel host bus adapters

The ST250 V2 does not currently support Fibre Channel host bus adapters.

Flash Storage adapters

The ST250 V2 does not currently support Flash Storage adapters.

GPU adapters

The ST250 V2 server supports the graphics processing units (GPUs) listed in the following table.

Table 43. GPU adapters

Part number	Feature code	Description	Slots supported	Maximum supported
4X67A79777	BMXD	ThinkSystem NVIDIA T1000 8GB PCIe Active GPU	2	1
4X67A79778	BMXE	ThinkSystem NVIDIA T400 4GB PCIe Active GPU	2	1

The following rule applies:

- The use of a GPU requires 550W hot-swap power supplies
- Slot 3 must be left unoccupied for thermal reasons

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

Fans and cooling

The ST250 V2 has the following variable-speed 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 44. Power supplies

Part number	Feature code	Description	Maximum quantity	80 PLUS certification	ErP Lot 9 compliant	110V AC	220V AC	240V DC China only
Fixed power supplies								
CTO only	B41Q	ThinkSystem ST250 250W Fixed PSU	1	Platinum (94%)	Yes	Yes	Yes	No
CTO only	BMFL	ATX-300W Power Supply	1	Gold (90%)	No	Yes	Yes	No
CTO only	BMTC	ThinkSystem 500W Platinum ATX Power Supply	1	Platinum (94%)	Yes	Yes	Yes	No
Hot-swap redundant power supplies								
7N67A00882	BMTA	ThinkSystem ST250 V2 550W Platinum Redundant Power Supply	2	Platinum	No	Yes	Yes	No
4P57A82020	BR1Y	ThinkSystem V1 750W (230Vac) Titanium Hot Swap Power Supply	2	Titanium	Yes	No	Yes	No

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 and 300W power supplies.

Table 45. Maximum configuration for the 300W power supply

Subsystem	250W fixed power supply	300W fixed power supply
Processor	Up to 80W TDP (6 cores)	Up to 80W TDP (6 cores)
Memory	No restriction	No restriction
Drives	• Single drive backplane only • 4x 3.5-inch SAS/SATA drives only • 8x 2.5-inch drives not supported • Dual backplanes (8x 3.5" or 16x 2.5" or mix) not supported • NVMe drive configuration not supported	• Single drive backplane only • Up to 4x 3.5-inch SAS/SATA drives or 8x 2.5-inch drives (HDD or SSD) • Dual backplanes (8x 3.5" or 16x 2.5" or mix) not supported • NVMe drive configuration not supported
Media bays	1x optical drive or 1x RDX drive 2x drives not supported	1x optical drive or 1x RDX drive 2x drives not supported
M.2	No restriction	No restriction
Adapters (except GPU)	1 or 2 adapters up to PCIe x8	1 or 2 adapters up to PCIe x8
GPU	Not supported	Not supported

To ensures that the properly sized power supply is chosen for optimal performance, it is highly recommended to validate system configuration for specific power requirements by using the latest version of the Lenovo Capacity Planner:
https://datacentersupport.lenovo.com/us/en/products/solutions-and-software/software/lenovo-capacity-planner/solutions/ht504651

Power cords

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

Table 46. Power cords

Part number	Feature code	Description
Rack cables - C13 to C14		
SL67B08593	BPHZ	0.5m, 10A/100-250V, C13 to C14 Jumper Cord
00Y3043	A4VP	1.0m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable
4L67A08367	B0N5	1.0m, 13A/100-250V, C13 to C14 Jumper Cord
39Y7937	6201	1.5m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable
4L67A08368	B0N6	1.5m, 13A/100-250V, C13 to C14 Jumper Cord
4L67A08365	B0N4	2.0m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable
4L67A08369	6570	2.0m, 13A/100-250V, C13 to C14 Jumper Cord
4L67A08366	6311	2.8m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable
4L67A08370	6400	2.8m, 13A/100-250V, C13 to C14 Jumper Cord
39Y7932	6263	4.3m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable
4L67A08371	6583	4.3m, 13A/100-250V, C13 to C14 Rack Power Cable
Rack cables - C13 to C14 (Y-cable)		
00Y3046	A4VQ	1.345m, 2X C13 to C14 Jumper Cord, Rack Power Cable
00Y3047	A4VR	2.054m, 2X C13 to C14 Jumper Cord, Rack Power Cable
Rack cables - C13 to C20		
39Y7938	6204	2.8m, 10A/100-250V, C13 to IEC 320-C20 Rack Power Cable
Rack cables - C13 to C20 (Y-cable)		
47C2491	A3SW	1.2m, 16A/100-250V, 2 Short C13s to Short C20 Rack Power Cable
47C2492	A3SX	2.5m, 16A/100-250V, 2 Long C13s to Short C20 Rack Power Cable
47C2493	A3SY	2.8m, 16A/100-250V, 2 Short C13s to Long C20 Rack Power Cable
47C2494	A3SZ	4.1m, 16A/100-250V, 2 Long C13s to Long C20 Rack Power Cable
Line cords		
39Y7930	6222	2.8m, 10A/250V, C13 to IRAM 2073 (Argentina) Line Cord
81Y2384	6492	4.3m 10A/220V, C13 to IRAM 2073 (Argentina) Line Cord
39Y7924	6211	2.8m, 10A/250V, C13 to AS/NZ 3112 (Australia/NZ) Line Cord
81Y2383	6574	4.3m, 10A/230V, C13 to AS/NZS 3112 (Aus/NZ) Line Cord
69Y1988	6532	2.8m, 10A/250V, C13 to NBR 14136 (Brazil) Line Cord
81Y2387	6404	4.3m, 10A/250V, C13 - 2P+Gnd (Brazil) Line Cord
39Y7928	6210	2.8m, 220-240V, C13 to GB 2099.1 (China) Line Cord
81Y2378	6580	4.3m, 10A/220V, C13 to GB 2099.1 (China) Line Cord
39Y7918	6213	2.8m, 10A/250V, C13 to DK2-5a (Denmark) Line Cord
81Y2382	6575	4.3m, 10A/230V, C13 to DK2-5a (Denmark) Line Cord
39Y7917	6212	2.8m, 10A/230V, C13 to CEE7-VII (Europe) Line Cord
81Y2376	6572	4.3m, 10A/230V, C13 to CEE7-VII (Europe) Line Cord
39Y7927	6269	2.8m, 10A/250V, C13(2P+Gnd) (India) Line Cord

Part number	Feature code	Description
81Y2386	6567	4.3m, 10A/240V, C13 to IS 6538 (India) Line Cord
39Y7920	6218	2.8m, 10A/250V, C13 to SI 32 (Israel) Line Cord
81Y2381	6579	4.3m, 10A/230V, C13 to SI 32 (Israel) Line Cord
39Y7921	6217	2.8m, 220-240V, C13 to CEI 23-16 (Italy/Chile) Line Cord
81Y2380	6493	4.3m, 10A/230V, C13 to CEI 23-16 (Italy/Chile) Line Cord
46M2593	A1RE	2.8m, 12A/125V, C13 to JIS C-8303 (Japan) Line Cord
4L67A08362	6495	4.3m, 12A/200V, C13 to JIS C-8303 (Japan) Line Cord
39Y7926	6335	4.3m, 12A/100V, C13 to JIS C-8303 (Japan) Line Cord
39Y7922	6214	2.8m, 10A/250V, C13 to SABS 164 (S Africa) Line Cord
81Y2379	6576	4.3m, 10A/230V, C13 to SABS 164 (South Africa) Line Cord
39Y7925	6219	2.8m, 220-240V, C13 to KETI (S Korea) Line Cord
81Y2385	6494	4.3m, 12A/220V, C13 to KSC 8305 (S. Korea) Line Cord
39Y7919	6216	2.8m, 10A/250V, C13 to SEV 1011-S24507 (Swiss) Line Cord
81Y2390	6578	4.3m, 10A/230V, C13 to SEV 1011-S24507 (Sws) Line Cord
23R7158	6386	2.8m, 10A/125V, C13 to CNS 10917-3 (Taiwan) Line Cord
81Y2375	6317	2.8m, 10A/240V, C13 to CNS 10917-3 (Taiwan) Line Cord
81Y2374	6402	2.8m, 13A/125V, C13 to CNS 60799 (Taiwan) Line Cord
4L67A08363	AX8B	4.3m, 10A 125V, C13 to CNS 10917 (Taiwan) Line Cord
81Y2389	6531	4.3m, 10A/250V, C13 to 76 CNS 10917-3 (Taiwan) Line Cord
81Y2388	6530	4.3m, 13A/125V, C13 to CNS 10917 (Taiwan) Line Cord
39Y7923	6215	2.8m, 10A/250V, C13 to BS 1363/A (UK) Line Cord
81Y2377	6577	4.3m, 10A/230V, C13 to BS 1363/A (UK) Line Cord
90Y3016	6313	2.8m, 10A/120V, C13 to NEMA 5-15P (US) Line Cord
46M2592	A1RF	2.8m, 10A/250V, C13 to NEMA 6-15P Line Cord
00WH545	6401	2.8m, 13A/120V, C13 to NEMA 5-15P (US) Line Cord
4L67A08359	6370	4.3m, 10A/125V, C13 to NEMA 5-15P (US) Line Cord
4L67A08361	6373	4.3m, 10A/250V, C13 to NEMA 6-15P (US) Line Cord
4L67A08360	AX8A	4.3m, 13A/120V, C13 to NEMA 5-15P (US) Line Cord

Systems management

The ST250 V2 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.

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

Front operator panel

The ST250 V2 offers a front operator panel showing key LED status indicators, as shown in the following figure.

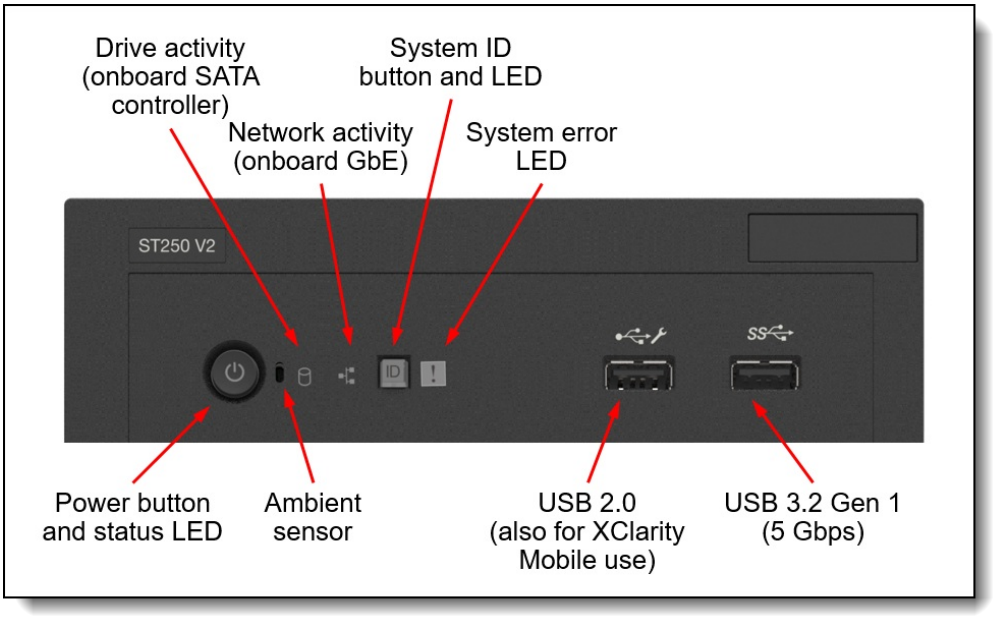


Figure 9. Front operator panel

System status with XClarity Mobile

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

The steps to connect the mobile device are as follows:

1. Enable USB Management on the server, by holding down the ID button for 3 seconds (or pressing the dedicated USB management button if one is present)
2. Connect the mobile device via a USB cable to the server's USB port with the management symbol 
3. In iOS or Android settings, enable Personal Hotspot or USB Tethering
4. Launch the Lenovo XClarity Mobile app

Once connected you can see the following information:

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

Remote management

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

Remote server management is provided through industry-standard interfaces:

- Intelligent Platform Management Interface (IPMI) Version 2.0
- Simple Network Management Protocol (SNMP) Version 3 (no SET commands; no SNMP v1)
- Common Information Model (CIM-XML)

- Representational State Transfer (REST) support
- Redfish support (DMTF compliant)
- Web browser - HTML 5-based browser interface (Java and ActiveX not required) using a responsive design (content optimized for device being used - laptop, tablet, phone) with NLS support

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

Table 47. IPMI-over-LAN settings

Part number	Feature code	Description
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 48. 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 49. 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 V2. The software can be downloaded and used at no charge to discover and monitor the ST250 V2 and to manage firmware upgrades.

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

The following table lists the Lenovo XClarity software license options.

Table 50. Lenovo XClarity Pro ordering information

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

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

- Auto-discovery and monitoring of Lenovo systems
- Firmware updates and compliance enforcement
- External alerts and notifications via SNMP traps, syslog remote logging, and e-mail
- Secure connections to managed endpoints
- NIST 800-131A or FIPS 140-2 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 51. Lenovo XClarity Energy Manager

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

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

- Lenovo Support page:
  https://datacentersupport.lenovo.com/us/en/solutions/lnvo-lxem
- Lenovo Information Center:
  https://sysmgt.lenovofiles.com/help/topic/LXEM/lxem_overview.html?cp=4

Security

Topics in this section:

- Security features
- Platform Firmware Resiliency - Lenovo ThinkShield
- Intel Transparent Supply Chain

Security features

The ST250 V2 offers the following security features:

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

The server is NIST SP 800-147B compliant.

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

The following table lists the security options for the server.

Table 52. Security

Part number	Feature code	Description
4XF7A81463	B41K	ThinkSystem ST250 V2 4U Security Door
4Z57A14086	B4LS	ThinkSystem ST250 Intrusion Cable Kit
CTO only	B8LE	ThinkSystem NationZ TPM 2.0 for PRC (China customers only)

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

Platform Firmware Resiliency - Lenovo ThinkShield

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

The ThinkSystem ST250 V2 includes Platform Firmware Resiliency (PFR) hardware Root of Trust (RoT) which enables the system to be NIST SP800-193 compliant. This offering further enhances key platform subsystem protections against unauthorized firmware updates and corruption, to restore firmware to an integral state, and to closely monitor firmware for possible compromise from cyber attacks.

PFR operates upon the following server components:

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

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

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

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

The ST250 V2 includes support for Secure Boot, a UEFI firmware security feature developed by the UEFI Consortium that ensures only immutable and signed software are loaded during the boot time. The use of Secure Boot helps prevent malicious code from being loaded and helps prevent attacks, such as the installation of rootkits. Lenovo offers the capability to enable secure boot in the factory, to ensure end-to-end protection. Alternatively, Secure Boot can be left disabled in the factory, allowing the customer to enable it themselves at a later point, if desired.

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

Table 53. Secure Boot options

Part number	Feature code	Description	Purpose

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

Intel Transparent Supply Chain

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

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

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

Table 54. 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 55. Lenovo Preferred Pro USB Full-sized keyboards - ThinkSystem

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

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

Rack installation

The ST250 V2 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 56. Rack installation options

Part number	Description
4XF7A78620	ThinkSystem ST50 V2/ST250 V2 Rack Mount Kit

The rack mount kit includes the following items:

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

The following table summarizes the rail kit features and specifications.

Table 57. Rail kit features and specifications summary

Feature	ThinkSystem ST50 V2/ST250 V2 Rack Mount Kit
Option part number	4XF7A78620
Rail type	Full-out slide rail (ball bearing)
Toolless installation	Yes
CMA support	Included
Supported rack type	Four-post IBM and Lenovo standard rack, complying with the IEC standard
In-rack server maintenance	No
1U PDU support	Yes
0U PDU support	Limited support**
Supported mounting holes	Square or round
Thickness of mounting flanges	2.0 to 3.3 mm (0.08 to 0.13 inches)
Supported distance between front and rear mounting flanges‡	665 to 900 mm (26.2 to 35.4 inches)
Rail length†	792 mm (31.2 inches)

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

The following figure shows the ST250 V2 installed in the Rack Mount Kit.



Figure 10. ST250 V2 installed in the Rack Mount Kit

Operating systems

The server supports the following operating systems:

- Microsoft Windows Server 2019
- Microsoft Windows Server 2022
- 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 15 SP3
- SUSE Linux Enterprise Server 15 SP4
- SUSE Linux Enterprise Server 15 SP5
- 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 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

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

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

Table 58. VMware ESXi preload

Part number	Feature code	Description
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 V2 has the following overall physical dimensions, including tower feet, excluding components that extend outside the standard chassis, such as power supply handles:

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

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

Table 59. Detailed dimensions

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

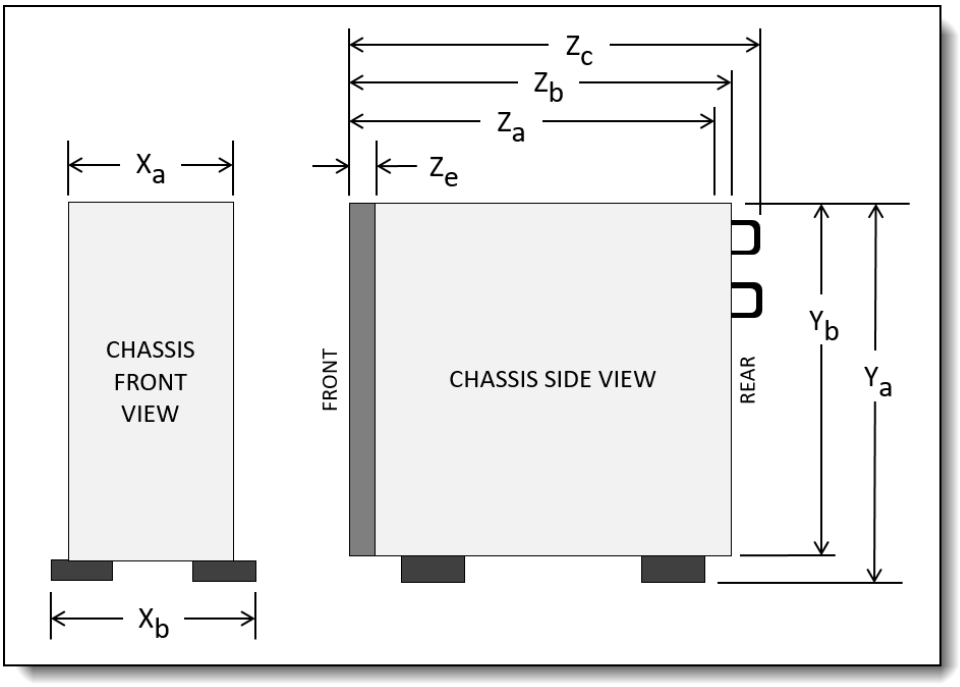


Figure 11. Server dimension

The shipping dimensions (cardboard packaging) of the ST250 V2 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: 23.6 kg (52 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, 2.93 A
  - 200-240 (nominal) V ac; 50 Hz or 60 Hz, 1.28 A
- Models with a 300 W AC fixed power supply:
  - 100-127 (nominal) V ac; 50 Hz or 60 Hz, 3.56 A
  - 200-240 (nominal) V ac; 50 Hz or 60 Hz, 1.55 A
- Models with 550 W AC hot-swap power supplies:
  - 100-127 (nominal) V ac; 50 Hz or 60 Hz; 6.35 A
  - 200-240 (nominal) V ac; 50 Hz or 60 Hz; 2.75 A

Note for customers in China: 240V DC is not supported.

Operating environment

The server is designed to operate in ASHRAE A2 environments (10-35°C). With certain configurations, the server can also operate within ASHRAE Class A3 and A4 specifications. System performance may be impacted when operating temperature is outside ASHRAE A2 specification.

The server can be configured to operate in ASHRAE A3 environments (5-40°C) or ASHRAE A4 environments (5-45°C), provided the following restrictions are met:

- Processor with a maximum TDP as follows:
  - ASHRAE A3: 80W TDP maximum
  - ASHRAE A4: 70W TDP maximum
- Maximum of 8x 2.5" drives or 4x 3.5-inch drives (one backplane)
- No support for GPUs
- No support for M.2 drives
- No support for NVMe drives
- No support for 10Gb or 25Gb Ethernet adapters
- No support for hot-swap power supplies

Configuration-specific requirements:

- When 480GB M.2 drives are installed, the ambient temperature cannot exceed 30°C

Temperature and humidity

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
- ASHRAE A4:
  - Temperature: 5°C to 45°C
  - Humidity: 8% to 90%
  - 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%

Heat output

Thermal (heat) output:

- Minimum configuration: 358.05 BTU per hour (105 watts)
- Maximum configuration: 1029.82 BTU per hour (302 watts)

Acoustical noise emissions

The server has the following acoustic noise emissions declaration:

- Sound power level (L_{WAd}):
  - Idling: 4.3 Bel (Typical), 4.4 Bel (Max)
  - Operating: 4.3 Bel (Typical), 4.5 Bel (Max)
- Sound pressure level (L_{pAm}):
  - Idling: 27.4 dBA (Typical), 28.6 dBA (Max)

    - Operating: 27.6 dBA (Typical), 29.0 dBA (Max)

Note:

- These sound levels were measured in controlled acoustical environments according to procedures specified by ISO7779 and are reported in accordance with ISO 9296, SPL is measured by bystander position (1m).
- The declared acoustic sound levels are based on the following configurations, which may change depending on configuration/conditions, for example M.2 drive, Broadcom 57414 25Gb NIC, Broadcom 57416 10Gb NIC, T1000, etc.
    - Typical: 1x 80W CPU, 4x 32GB DIMM, 2x HDD or SSD, RAID 5350-8i, 1x 300W PSU
    - Max: 1x 95W CPU, 4x 32GB DIMM, 2x HDD or SSD, 2x 550W PSU

Shock and vibration

The server has the following vibration and shock limits:

- Vibration:
    - Operating: 0.21 G rms at 5 Hz to 500 Hz for 15 minutes across 3 axes
    - Non-operating: 1.04 G rms at 2 Hz to 200 Hz for 15 minutes across 6 surfaces
- Shock:
    - Operating: 15 G for 3 milliseconds in each direction (positive and negative X, Y, and Z axes)
    - Non-operating:
        - 4 kg - 11 kg: 50 G for 167 in./sec velocity change across 6 surfaces
        - 12 kg - 22 kg: 50 G for 152 in./sec velocity change across 6 surfaces
        - 23 kg - 31 kg: 35 G for 152 in./sec velocity change across 6 surfaces

Particulate contamination

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

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

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

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

Warranty and Support

The ST250 V2 has a 1-year or 3-year warranty, based on the machine type of the system:

- 7D8G - 1 year warranty
- 7D8F - 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 V2 conforms to the following standards:

- ANSI/UL 62368-1
- IEC 62368-1 (CB Certificate and CB Test Report)
- FCC - Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, issue 7, Class A
- CSA C22.2 No. 62368-1
- CISPR 32, Class A, CISPR 35
- Argentina IEC 60950-1
- Japan VCCI, Class A
- Taiwan BSMI CNS13438, Class A; CNS14336-1; Section 5 of CNS15663
- CE, UKCA Mark (EN55032 Class A, EN62368-1, EN55024, EN55035, EN61000-3-2, EN61000-3-3, (EU) 2019/424, and EN50581-1 (RoHS))
- Korea KN32, Class A, KN35
- Russia, Belorussia and Kazakhstan, TP EAC 037/2016 (for RoHS)
- Russia, Belorussia and Kazakhstan, EAC: TP TC 004/2011 (for Safety); TP TC 020/2011 (for EMC)
- Australia/New Zealand AS/NZS CISPR 32, Class A; AS/NZS 62368.1
- UL Green Guard, UL2819
- Energy Star 3.0
- EPEAT (NSF/ ANSI 426) Bronze
- China CCC certificate, GB17625.1; GB4943.1; GB/T9254
- China CECP certificate, CQC3135
- China CELP certificate, HJ 2507-2011
- Japanese Energy-Saving Act
- Mexico NOM-019
- TUV-GS (EN62368-1, and EK1-ITB2000)
- India BIS 13252 (Part 1)
- Germany GS
- Brazil INMETRO
- South Africa NRCS LOA
- Ukraine UkrCEPRO
- Morocco CMIM Certification (CM)
- EU2019/424 Energy Related Product (ErP Lot9)

External drive enclosures

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

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

Table 60. 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 external USB backup options that are offered by Lenovo.

Table 61. External USB backup options

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

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

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

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

Table 62. External SAS backup options

Part number	Description
External SAS tape backup drives	
6160S7E	IBM TS2270 Tape Drive Model H7S
6160S8E	IBM TS2280 Tape Drive Model H8S
6160S9E	IBM TS2290 Tape Drive Model H9S
External SAS tape backup autoloaders	
6171S7R	IBM TS2900 Tape Autoloader w/LTO7 HH SAS
6171S8R	IBM TS2900 Tape Autoloader w/LTO8 HH SAS
6171S9R	IBM TS2900 Tape Autoloader w/LTO9 HH SAS
External tape backup libraries	
6741A1F	IBM TS4300 3U Tape Library-Base Unit
SAS backup drives for TS4300 Tape Library	
01KP937	LTO 7 HH SAS Drive
01KP953	LTO 8 HH SAS Drive
02JH836	LTO 9 HH SAS Drive

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

Uninterruptible power supply units

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

Table 63. 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 64. 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

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
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
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

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
40K9614	6500	4.3m, 30A/208V, EPDU to NEMA L6-30P (US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9615	6501	4.3m, 60A/208V, EPDU to IEC 309 2P+G (US) Line Cord	N	N	Y	N	N	N	Y	N	N	Y	Y	Y	N
40K9617	6505	4.3m, 32A/230V, Souriau UTG Female to AS/NZ 3112 (Aus/NZ) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9618	6506	4.3m, 32A/250V, Souriau UTG Female to KSC 8305 (S. Korea) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

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

Rack cabinets

The ST250 V2 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 65. Rack cabinets

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

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

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

KVM console options

The following table lists the supported KVM consoles.

Table 66. 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 68. 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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Related publications and links

For more information, see these resources:

- ThinkSystem ST250 V2 product page
  https://www.lenovo.com/us/en/data-center/servers/towers/ThinkSystem-ST250/p/77XX7TRST25
- ThinkSystem ST250 V2 interactive 3D tour
  https://lenovopress.com/lp1569-3d-tour-document-3d-tour-thinksystem-st250-v2
- ThinkSystem ST250 V2 drivers and support
  http://datacentersupport.lenovo.com/products/servers/thinksystem/st250v2/7d8f/downloads
- Lenovo ThinkSystem ST250 V2 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 V2 Server

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