

Lenovo ThinkSystem ST50 V3 Server

Product Guide

The ThinkSystem ST50 V3 is a value 1-socket tower server that also be rack mounted as a rack server. It is ideal for small-to-medium businesses, remote offices, branch offices, banking and public sector. The server supports one Intel Xeon 6300 Series processor or one Intel Xeon E-2400 Series processor (formerly codenamed "Raptor Lake") or Intel Pentium and up to 128 GB memory.

Figure 1 shows the ThinkSystem ST50 V3.



Figure 1. Lenovo ThinkSystem ST50 V3

[360° View](#)[Full 3D Tour](#)

Did you know?

The ThinkSystem ST50 V3 is an entry-level server with enterprise-grade management features. 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 ST50 V3 easy to deploy, integrate, service, and manage.

Key features

The ThinkSystem ST50 V3 is a office-friendly tower server that has been optimized to provide enterprise-class features to small businesses, retail, educational institutions and branch offices.

Scalability and performance

The ST50 V3 offers the following features to boost performance, improve scalability, and reduce costs:

- Improved single-socket processor performance:
 - Intel Xeon E-2400 Series processors ("Raptor Lake") up to to 8 cores and core speeds up to 3.5 GHz
 - Intel Pentium G7400 and G7400T processors ("Alder Lake") with 2 cores and core speeds up to 3.7 GHz
- Up to four 4800 MHz DDR5 ECC UDIMMs provide speed and capacity of up to 128 GB
- Three PCIe slots for I/O expansion, one of which has the new PCIe Gen5 interface to maximize I/O performance.
- Flexible storage configurations support either 2.5-inch or 3.5-inch NHS drives. Drive bays support SATA HDDs, SSDs and Slim Optical Disc Drive.
 - Up to 1x 2.5-inch NHS drive bays
 - Up to 3x 3.5-inch NHS drive bays
 - Up to 1x slim SATA ODD bay (Optional)
- 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
- Supports ThinkSystem RAID 5350-8i PCIe 12Gb Adapter and SATA Drives only
- Support for optical drives or external backup drives
- Supports two M.2 drives for OS boot support with VROC RAID redundancy (no support for NVMe RAID)
- The server has two integrated Gigabit Ethernet ports
- The server offers one PCIe 5.0 slot plus two PCIe 4.0 I/O expansion slots
- No support for GPU

Availability and serviceability

The ST50 V3 provides the following features to simplify serviceability and increase system uptime:

- Designed to run 24 hours a day, 7 days a week
- The ST50 V3 supports UDIMM memory with ECC protection which provides error correction not available in PC-class "servers" that use parity memory. Avoiding system crashes (and data loss) due to soft memory errors means greater system uptime.
- The server offers non-hot-swap (NHS) SSDs and HDDs, and supports RAID redundancy for data protection and greater system uptime.
- The server supports single power supply.
- 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 (SATA HDDs and SSDs, M.2 SSDs), RAID controllers, and server ambient and sub-component temperatures. SAS drives are not supported.

- Built-in diagnostics in UEFI, using Lenovo XClarity Provisioning Manager, speed up troubleshooting tasks to reduce service time.
- Lenovo XClarity Provisioning Manager supports diagnostics and can save service data to a USB key drive or remote CIFS share folder for troubleshooting and reduce service time.
- Support for the XClarity Administrator Mobile app running on a supported smartphone and connected to the server through the service-enabled USB port, enables additional local systems management functions.
- Auto restart in the event of a momentary loss of AC power (based on power policy setting in the XClarity Controller service processor) (hot-swap power supplies only)
- One-year or three-year customer-replaceable unit (CRU) and onsite limited warranty with next business day response. Optional service upgrades are available.

Manageability and security

The following systems management features simplify local and remote management of the ST50 V3:

- The server includes an XClarity Controller2 (XCC2) to monitor server availability. Optional upgrade to XCC2 Platinum enables the additional support for the mounting of remote media files (ISO and IMG image files), boot capture, and power capping.
- Lenovo XClarity Administrator offers comprehensive hardware management tools that help to increase uptime, reduce costs and improve productivity through advanced server management capabilities.
- New UEFI-based Lenovo XClarity Provisioning Manager, accessible from F1 during boot, provides system inventory information, graphical UEFI Setup, platform update function, RAID Setup wizard, operating system installation function, and diagnostic functions.
- Support for Lenovo XClarity Energy Manager which captures real-time power and temperature data from the server and provides automated controls to lower energy costs.
- Integrated Trusted Platform Module (TPM) 2.0 support enables advanced cryptographic functionality, such as digital signatures and remote attestation.
- Industry-standard Advanced Encryption Standard (AES) NI support for faster, stronger encryption.
- Intel Execute Disable Bit functionality can prevent certain classes of malicious buffer overflow attacks when combined with a supported operating system.
- Intel Trusted Execution Technology (Intel Xeon E processors only) provides enhanced security through hardware-based resistance to malicious software attacks, allowing an application to run in its own isolated space, protected from all other software running on a system.
- Helps prevent unauthorized software from running on the server by protecting against boot block-level malicious software with Intel Boot Guard technology.
- 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 chassis intrusion switch (included in some models).

Energy efficiency

The ST50 V3 offers the following energy saving features to save energy, reduce operational costs, increase energy availability, and contribute to the green environment:

- Energy-efficient planar components help lower operational costs.
- 500W PSU with ErP Lot9 Compliant. Energy Star certified.
- Intel Intelligent Power Capability powers individual processor elements on and off as needed to reduce power draw.
- DDR5 memory DIMMs support up to 4400 MT/s (One DIMM per Channel)

- 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 ST50 V3 to the ST50 series

The ThinkSystem ST50 V3 improves on the previous generation ST50, as summarized in the following table.

Table 1. Comparing the ST50 V3 to the ST50s

Feature	ST50 V3	ST50 V2	ST50	Benefits
Form Factor	1-Socket (1S) Entry Tower 17 liter chassis	1-Socket (1S) Entry Tower 17 liter chassis	1-Socket (1S) Entry Tower 25 liter chassis	Smaller unit takes up less space
Processor	- Supports single Xeon 6300 Series processor up to 8C / 95W - Supports single Xeon E-2400 Series "Raptor Lake" processor up to 8C / 95W - Also supports Pentium processors (Alder Lake) - Intel C266 "Raptor Lake" Platform Controller Hub (PCH-S)	- 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 single Xeon E2200 Series "Coffee Lake-S" processor up to 6C / 95W - Also supports Pentium, Core i3 and Celeron processors - Uses Intel C246 "Cannon Lake" Platform Controller Hub (PCH)	Supports the latest generation Intel Xeon E processors
Memory	4x UDIMM slots, up to 128GB, 5600MHz with Xeon 6300 processors 4x UDIMM slots, up to 128GB, 4800MHz or 5600MHz with Xeon E-2400 processors 4x UDIMM slots, up to 128GB, 4800MHz or 5600MHz with Pentium processors - TruDDR5 ECC memory (DDR5 memory support up to 4400 MT/s (One DIMM per Channel configurations))	4x UDIMM slots, up to 128GB, 3200MHz with Xeon E-2300 processors - TruDDR4 ECC memory	4x UDIMM slots, up to 64GB, 2666MHz - TruDDR4 ECC memory (in China, also support for non-ECC memory)	Enterprise-grade memory sufficient for most SMB and retail applications
Storage	- Up to 4 bays 3x 3.5" HDD or SSD, (1 standard, 2 optional); 1x2.5" SSD (optional) 2x M.2 SATA SSD supporting RAID 0 and RAID 1 using VROC, installs in an adapter in a PCIe slot. 1x slim SATA DVD-RW in dedicated bay (optional)	- Up to 3 bays 2x 3.5" HDD or SSD, (1 standard, 1 optional); 1x2.5" SSD (optional) 1x M.2 NVMe SSD (2280 form factor) 1x slim SATA DVD-RW in dedicated bay (optional)	- Up to 4 bays 4x 3.5" drive bays (includes one that can be shared with optical drive or used instead for RDX/tape drive) 2x SD cards in SD Adapter module 1x optical drive or RDX/tape drive bay	- Support for both HDDs for capacity and SSDs for better performance - Optical drive support for ease of software installation - M.2 drive support to separate the OS from the applications and data

Feature	ST50 V3	ST50 V2	ST50	Benefits
RAID	- Supports a SAS HBA or RAID adapter for hardware RAID functionality 12Gb SAS/SATA/RAID support - PCIe 4.0 and PCIe 5.0 adapters - Intel VROC 8.x SW RAID (no support for NVMe RAID)	- Intel VROC 6.x SW RAID - HW RAID support (limited)	- Intel RSTe SW RAID - HW RAID support (limited)	RAID capability maximizes reliability and uptime
Cooling	2x system fans (Front drive bay and rear), 1x CPU fan	2x system fans (Front drive bay and rear), 1x CPU fan	2x system fans (Front drive bay and rear), 1x CPU fan	Ensures all components are sufficiently cooled
Networking	2x 1GbE Onboard Ethernet ports (Broadcom BCM5720) - Rear 1 port allows remote connectivity to the XCC2 management controller	1x 1GbE Embedded (Intel I219-LM)	1x 1GbE Embedded (Intel I219-LM)	Easy built-in networking
Management	- XClarity Controller with upgrades - Full XClarity software suite including XClarity Administrator - Dedicated Ethernet port for remote management - Optional intrusion switch - Platform Firmware Resiliency (PFR) hardware Root of Trust	- Intel AMT 15 Management - TPM embedded: TPM 2.0 - Lenovo XClarity Provisioning Manager Lite (USB based)	- Intel AMT 12 Management - TPM embedded - Optional : TPM 2.0 / TPM 1.2 - Lenovo XClarity Provisioning Manager Lite (USB based)	- Supports the latest embedded systems management tools from Intel and Lenovo - TPM 2.0 enables advanced cryptographic functionality, such as digital signatures and remote attestation - LXPM Lite provides easy system setup and firmware upgrades
PCIe Slots	3 PCIe slots (x4, x16, x4) - Includes a PCIe Gen5 x16 slot	3 PCIe slots (x16, x4, x1) - Includes a PCIe Gen4 x16 slot (requires Xeon E-2300 processor)	3 PCIe slots (x16, x4, x1) - Includes a PCIe Gen3 x16 slot	- Support the latest PCIe Gen5 slot technology - Support for a high-performance PCIe x16 adapter

Feature	ST50 V3	ST50 V2	ST50	Benefits
Front I/O	- One USB 3.2 G1 (5 Gb/s) port - One USB 2.0 port (also for XClarity Mobile connectivity for local systems management)	- Power button & LED - Thermal sensor 1x USB 3.2 G2 (10 Gbps) with USB-C connector 2x USB 3.2 G1 (5 Gbps); 2x USB 3.2 G2 (10 Gbps) ports 1x Microphone port, 1x Headset port	- Power button & LED - Thermal sensor 2x USB 3.2 G1 (5 Gbps) ports	- Expansive USB support - Thermal sensor ensures the server does not overheat if the ambient temperature rises
Rear I/O	- Four USB 3.2 G1 (5 Gb/s) ports - One VGA video - One RJ-45 systems management - Two RJ-45 GbE network ports - One serial port	4x USB 3.2 G1 (5 Gbps) ports 2x DP Ports 1x Serial port 1x 1GbE LAN 1x Audio line out	2x USB 3.2 G1 (5 Gbps), 2x USB 2.0 ports 2x DP Ports 1x Serial port 1x 1GbE LAN 1x Audio line out	- Expansive USB support - Integrated Gigabit networking - Serial port for applications that require it
Power Supply	1x Fixed power supply - Choose from 300W Gold or 500W Platinum	1x Fixed power supply - Choose from 300W Gold or 500W Platinum	1x Fixed power supply - Choose from 250W Platinum or 400W Platinum	Select the power supply that best suits the configuration to maximize efficiency

View in Augmented Reality

View the ST50 V3 in augmented reality (AR) using your smartphone or tablet.

Simply follow these steps:

1. Scan the QR code* with the camera app on your phone
2. Point your phone at a flat surface
3. Wait a few seconds for the model to appear

Once the server appears, you can move your phone around it. You can also drag or rotate the server to reposition it.



For more information about the AR viewer, see the article "Introducing the Augmented Reality Viewer for Lenovo Servers", available from <https://lenovopress.lenovo.com/lp1952>

* If you're viewing this document on your phone or tablet, simply tap the QR code

Components and connectors

The following figure shows the front of the server.

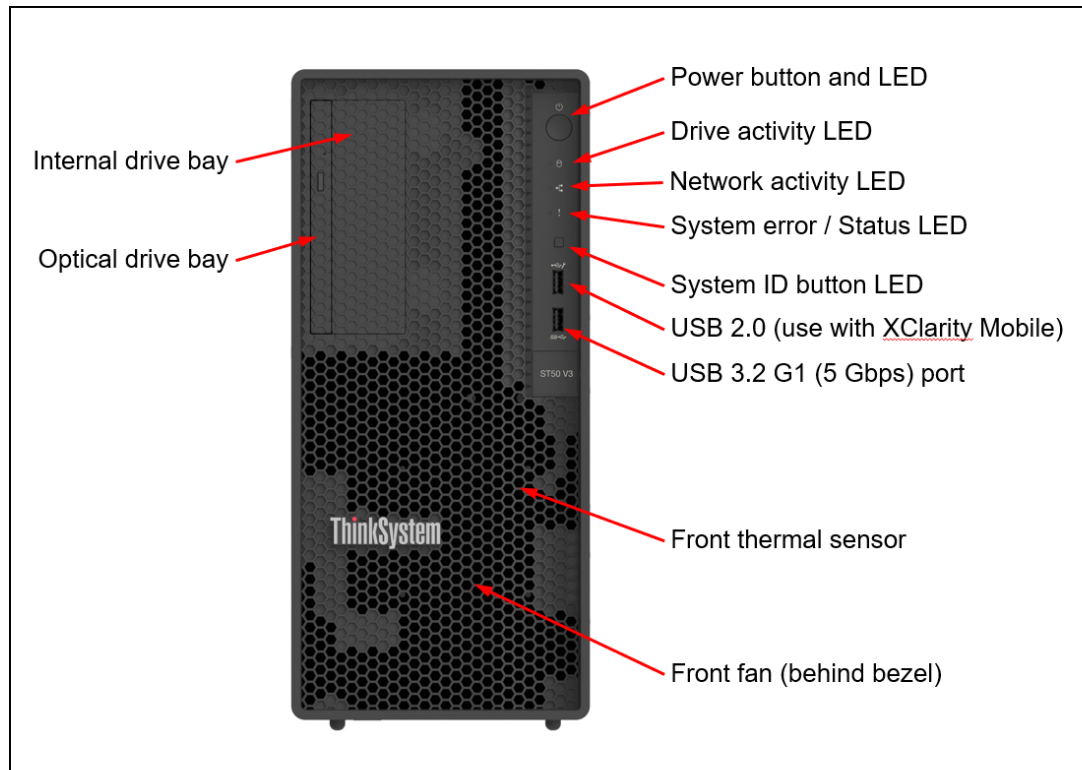


Figure 2. Front view of the ThinkSystem ST50 V3 server

The following figure shows the rear of the server.

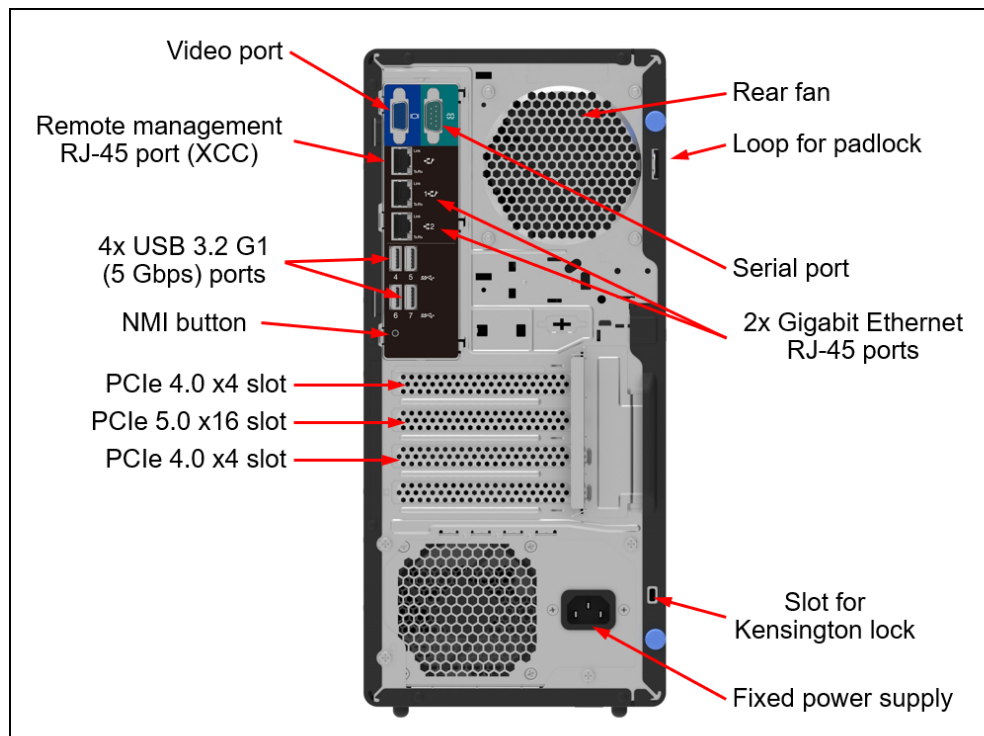


Figure 3. Rear view of the ThinkSystem ST50 V3 server

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

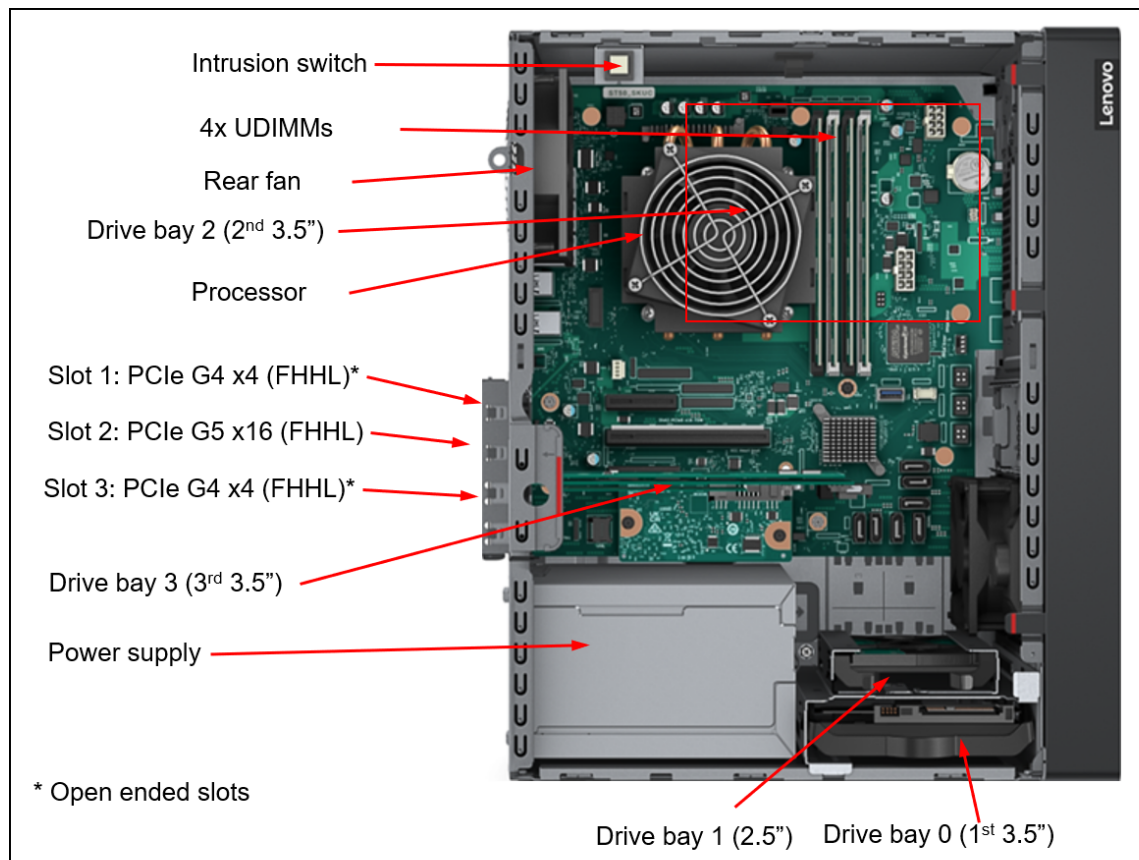


Figure 4. Internal view of the ThinkSystem ST50 V3 server

System architecture

The following figure shows the architectural block diagram of the ST50 V3, showing the major components and their connections.

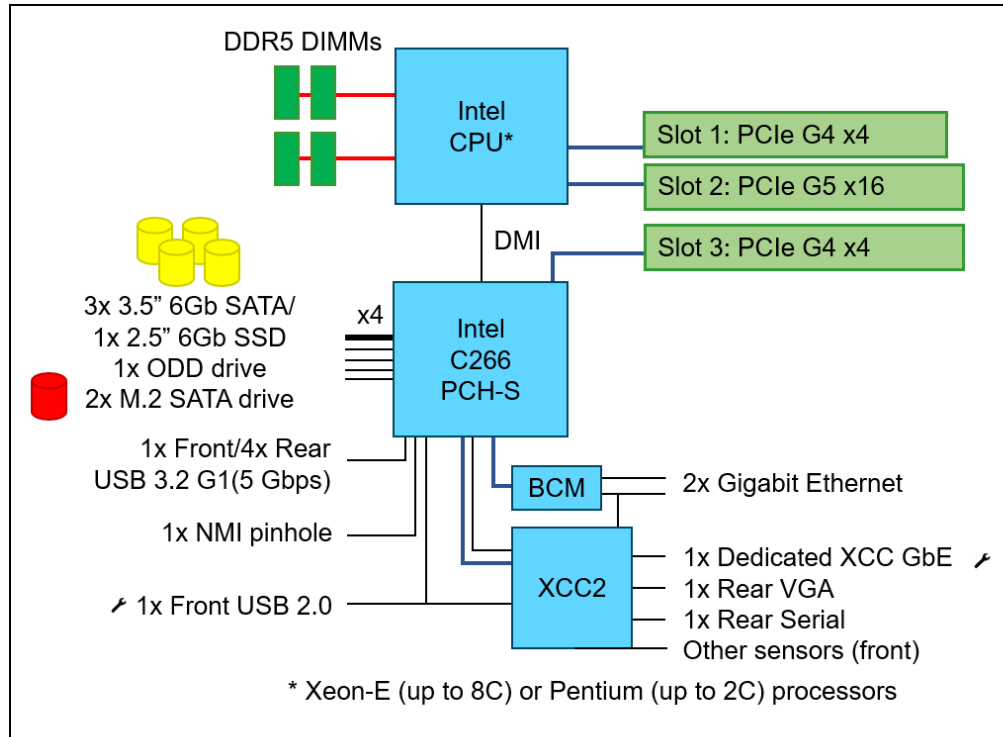


Figure 5. ST50 V3 system architectural block diagram

Standard specifications

The following table lists the standard specifications.

Table 2. Standard specifications

Components	Specification
Machine type	7DF4 - 1 year warranty 7DF3 - 3 year warranty
Form factor	Tower (can be installed in a rack with the available Rack Mount Kit)
Processor	One Intel processor. Choose from: - Intel Xeon 6300 Series processors up to 8 cores, with core speeds up to 3.6 GHz - Intel Xeon E-2400 Series processors ("Raptor Lake-E") up to 8 cores, with core speeds up to 3.5 GHz - Intel Pentium G7400 and G7400T processors ("Alder Lake-R") with 2 cores and core speeds up to 3.7 GHz
Chipset	Intel Rocket Lake PCH-S, C266
Memory	Four DIMM sockets supporting Lenovo TruDDR5 DIMMs at 4400 MHz (Xeon processors) or 4400 MHz (Pentium processors). Support ECC UDIMMs.
Memory maximum	Up to 128 GB using 4x 32 GB UDIMMs.
Memory protection	Error-correcting code (ECC)
Disk drive bays	Available configurations: 1x 2.5-inch NHS SATA SSD drive bays 3x 3.5-inch NHS SATA HDD/SSD drive bays 1x slim SATA ODD bay (optional) In addition, the ST50 V3 supports two M.2 drives installed in an M.2 adapter which is installed in PCIe slot 3. Note: Drive Bay 3 (3rd 3.5") kit and M.2 2-Bay Enablement Kit are mutually exclusive because both kits are installed/assembled at PCIe Slot 3.
Maximum internal storage	2.5-inch drives: 3.84TB using 1x 3.84TB Read Intensive SATA 6Gb NHS SSD 3.5-inch drives: 24TB using 3x 8TB 7.2K SATA 6Gb Non-Hot Swap 512e HDDs - Intermix of traditional HDDs and SSDs in the same array is not supported.
Storage controller	- Onboard 6 Gb SATA (OB SATA): - AHCI mode, for JBOD support - RAID Mode, using Intel VROC SATA RAID, supporting RAID 0, 1, 5 12 Gb SAS/SATA RAID adapter, supporting RAID 0, 1, 5 12 Gb SAS/SATA host bus adapters
Optical drive bays	Supports Slim SATA DVD-RW (multiburner).
Tape drive bays	Supports external one tape USB 3.0 RDX drive.

Components	Specification
Network interfaces	Two integrated Gigabit Ethernet 1000BASE-T ports (RJ-45) based on Broadcom BCM5720 embedded controller, one can be shared with XCC for systems management. Third dedicated Gigabit Ethernet port for XCC systems management.
PCI Expansion slots	Three PCIe slots (1x PCIe 5.0, 2x PCIe 4.0) as follows: - Slot 1: PCIe G4 x4 (x4 slot, open-ended) 25W full-height half-length (FHHL) - Slot 2: PCIe G5 x16 (x16 slot, closed-ended) 75W full-height half-length (FHHL) - Slot 3: PCIe G4 x4 (x4 slot, open-ended) 25W full-height half-length (FHHL)
Ports	Front: - One USB 3.2 G1 (5 Gb/s) port - One USB 2.0 port (also for XClarity Mobile connectivity for local systems management) Rear: - Four USB 3.2 G1 (5 Gb/s) ports - One VGA video - One RJ-45 systems management - Two RJ-45 GbE network ports - One serial port
Cooling	Supports ASHRAE A2 environments. Three fans. Two fixed system fans (front drive bay and rear). Additional fan attached to the processor heat sink and in the power supplies.
Power supply	Model dependent choices - One fixed 300W Gold power supply - One fixed 500W Platinum power supply: Energy Star and ErP Lot 9 compliant.
Systems management	Operator panel with status LEDs. XClarity Controller2 (XCC2) embedded management, XClarity Administrator centralized infrastructure delivery, XClarity Integrator plugins, and XClarity Energy Manager centralized server power management. Optional XClarity Controller platinum 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 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: 170 mm (6.7 inches), Height: 376 mm (14.8 inches) with stand, 370 mm (14.6 inches) without stand, Depth: 315 mm (12.4 inches). See Physical and electrical specifications for details.
Weight	Fully configured: 11.96 kg (26.4 lbs)

The ST50 V3 server is shipped with the following items:

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

Top Choice

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

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

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

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

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

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

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

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

Models

ThinkSystem ST50 V3 models can be configured by using the [Lenovo Data Center Solution Configurator \(DCSC\)](#).

Topics in this section:

- [CTO models](#)
- [Base feature codes](#)
- [Preconfigured models](#)

CTO models

ThinkSystem ST50 V3 models can be configured by using the [Lenovo Data Center Solution Configurator \(DCSC\)](#).

Preconfigured server models may also be available for the ST50 V3, however these are region-specific; that is, each region may define their own server models, and not all server models are available in every region.

The following table lists the base CTO models of the ThinkSystem ST50 V3 server.

Table 3. Base CTO models

Machine Type/Model	Description
7DF3CTO1WW	ThinkSystem ST50 V3 – 3-year base warranty
7DF4CTO1WW	ThinkSystem ST50 V3 – 1-year base warranty

Base feature codes

Models of the ST50 V3 are defined based on the configuration of drive bays. The feature code for this chassis base is listed in the following table.

Table 4. Chassis base feature code

Feature code	Description	Top Choice Express	Purpose
BZ8T	ThinkSystem ST50 V3 Chassis	TCE	Configurations with drive bays 1x 2.5-inch and 3x 1x 3.5-inch without front PCIe slots

Preconfigured models

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](#)
- [Models for Canada and US](#)

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, Indonesia, Japan, Korea, Sri Lanka, Malaysia, New Zealand, Philippines, Singapore, Thailand, Taiwan, Vietnam

Table 5. Models for Asia Pacific markets

Model	Top Choice Stock	Intel processor†	Memory	Drive Contr	Drive bays Drives	Add'l Cards	DVD	Power supply	Pwr cord	XCC2	Intru. sw.
3-year warranty (machine type 7DF3)											
7DF3A00RAP	N	Xeon E-2414 4C 55W 2.6GHz	1x 16GB	OB SATA / AHCI	3x 3.5-in NHS / Openbay	Opt	Yes	500W fixed	No	Std	Opt
7DF3A00KAP	N	Xeon E-2434 4C 55W 3.4GHz	1x 16GB	OB SATA / AHCI	3x 3.5-in NHS / Openbay	Opt	Yes	500W fixed	No	Std	Opt
7DF3A024AP	Y	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA / AHCI	3x 3.5-in NHS / Openbay	Opt	Yes	500W fixed	No	Std	Opt
7DF3A027AP	N	Xeon 6325P 4C 55W 3.5GHz	1x 16GB	OB SATA / AHCI	3x 3.5-in NHS / Openbay	Opt	Yes	500W fixed	No	Std	Opt
7DF3A025AP	N	Xeon 6333P 6C 65W 3.1GHz	1x 16GB	OB SATA / AHCI	3x 3.5-in NHS / Openbay	Opt	Yes	500W fixed	No	Std	Opt
7DF3A026AP	N	Xeon 6353P 8C 65W 2.7GHz	1x 16GB	OB SATA / AHCI	3x 3.5-in NHS / Openbay	Opt	Yes	500W fixed	No	Std	Opt
7DF3A04ASG	N	Xeon 6353P 8C 65W 2.7GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5-in NHS / 1x 960GB SATA NHS SSD	Opt	Yes	500W fixed	No	Std	Opt

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

Models for Australia and New Zealand

Table 6. Models for Australia and New Zealand

Model	Top Choice Stock	Intel processor†	Memory	Drive Contr	Drive bays Drives	Add'l Cards	DVD	Power supply	Pwr cord	XCC2	Intru. sw.
3-year model (machine type 7DF3)											
7DF3100WAU	N	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA / AHCI	3x 3.5-in NHS / Openbay	Opt	Yes	300W fixed	Yes	Std	Opt
7DF3100YAU	N	Xeon 6315P 4C 55W 2.8GHz	1x 32B	OB SATA / AHCI	3x 3.5-in NHS / Openbay	Opt	Yes	300W fixed	Yes	Std	Opt
7DF3100PAU	N	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	OB SATA / AHCI	3x 3.5-in NHS / Openbay	Opt	Yes	500W fixed	Yes	Std	Opt

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

Models for Brazil

Table 7. Models for Brazil

Model	Top Choice Stock	Intel processors†	Memory	Drive Contr	Drive bays Drives	Add'l Cards	DVD	Power supply	Pwr cord	XCC2	Intru. sw.
3-year model (machine type 7DF3 / 7DF4)											
7DF3A049BR	N	Xeon E-2414 4C 55W 2.6GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5" SATA: 1x 2TB SATA NHS HDD; 1x M.2 SATA/x4NVMe:Open bay	Opt	Yes	300W fixed	Yes	Std	Opt
7DF3A048BR	N	Xeon E-2414 4C 55W 2.6GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5" SATA: 2x 2TB SATA NHS HDD; 1x M.2 SATA/x4NVMe:Open bay	Opt	Yes	300W fixed	Yes	Std	Opt
7DF3A01LBR	N	Xeon E-2414 4C 55W 2.6GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5" SATA: 2x 480GB SATA SSD; 1x M.2 SATA/x4NVMe:Open bay	Opt	Yes	300W fixed	Yes	Std	Opt
7DF3A01HBR	N	Xeon E-2414 4C 55W 2.6GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5" SATA: 1x 960GB SATA SSD; 1x M.2 SATA/x4NVMe:Open bay	Opt	Yes	300W fixed	Yes	Std	Opt
7DF3A01KBR	N	Xeon E-2414 4C 55W 2.6GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5" SATA: 1x 2TB SATA HDD; 1x M.2 SATA/x4NVMe:Open bay	Opt	Yes	300W fixed	Yes	Std	Opt
7DF3A019BR	N	Xeon E-2414 4C 55W 2.6GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5" SATA: 2x 2TB SATA HDD; 1x M.2 SATA/x4NVMe:Open bay	Opt	Open	300W fixed	Yes	Std	Opt
7DF3A02SBR	N	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5" SATA: 1x 960GB SATA SSD; 1x M.2 SATA/x4NVMe:Open bay	Opt	Open	300W fixed	Yes	Std	Opt
7DF3A02TBR	N	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5" SATA: 1x 960GB SATA SSD; 1x M.2 SATA/x4NVMe:Open bay	Opt	Open	300W fixed	Yes	Std	Opt
7DF3100LBR	N	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5" SATA: 2x 480GB SATA SSD; 1x M.2 SATA/x4NVMe:Open bay	Opt	Open	300W fixed	Yes	Std	Opt
7DF3100MBR	N	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5-in NHS / Openbay	Opt	Open	300W fixed	Yes	Std	Opt
7DF3A03QBR	N	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5" SATA: 1x 2TB SATA HDD; 1x M.2 SATA/x4NVMe:Open bay	Opt	Open	300W fixed	Yes	Std	Opt
7DF3A047BR	N	Xeon 6325P 4C 55W 3.5GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5" SATA: 1x 2TB SATA NHS HDD; 1x M.2 SATA/x4NVMe:Open bay	Opt	Open	300W fixed	Yes	Std	Opt
7DF3A02UBR	N	Xeon E-2456 6C 80W 3.2GHz	1x 32GB	OB SATA / AHCI	3x 3.5" SATA: 2x 2TB SATA HDD; 1x M.2 SATA/x4NVMe:Open bay	Opt	Open	300W fixed	Yes	Std	Opt
7DF3A03DBR	N	Xeon 6333P 6C 65W 3.1GHz	1x 32GB	OB SATA / AHCI	3x 3.5" SATA: 1x 2TB SATA NHS HDD, 1x 960GB SATA NHS SSD; 1x M.2 SATA/x4NVMe:Open bay	Opt	Open	300W fixed	Yes	Plat	Opt
7DF3100FBR	N	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	OB SATA / AHCI	3x 3.5-in NHS / Openbay	Opt	Yes	500W fixed	Yes	Std	Opt

Model	Top Choice Stock	Intel processors†	Memory	Drive Contr	Drive bays Drives	Add'l Cards	DVD	Power supply	Pwr cord	XCC2	Intru. sw.
7DF3100GBR	N	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	OB SATA / AHCI	3x 3.5" SATA: 2x 960GB SATA SSD	Opt	Yes	500W fixed	Yes	Std	Opt
1-year model (machine type 7DF4)											
7DF4A00PBR	N	Xeon E-2414 4C 55W 2.6GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5" SATA: 1x 2TB SATA HDD; 1x M.2 SATA/x4NVMe:Open ba	Opt	Open	300W fixed	No	Std	Opt
7DF4A01PBR	N	Xeon 6315P 4C 55W 2.8GHz	1x 32GB	OB SATA/SW RAID**	3x 3.5-in NHS / Openbay	Opt	Open	300W fixed	Yes	Std	Opt
7DF4A01KBR	N	Xeon 6315P 4C 55W 2.8GHz	1x 32GB	OB SATA/SW RAID**	3x 3.5-in NHS / Openbay	Opt	Open	500W fixed	Yes	Std	Opt
7DF4A00SBR	N	Xeon E-2434 4C 55W 3.4GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5" SATA: 1x 960GB SATA SSD; 1x M.2 SATA/x4NVMe:Open ba	Opt	Open	300W fixed	No	Std	Opt
7DF4A01EBR	N	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5-in NHS / Openbay	Opt	Open	300W fixed	Yes	Std	Opt
7DF4A01DBR	N	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5-in NHS / Openbay	Opt	Open	300W fixed	Yes	Std	Opt
7DF4A00EBR	N	Xeon E-2414 4C 55W 2.6GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5" SATA: 1x 960GB SATA SSD; 1x M.2 SATA/x4NVMe:Open bay	Opt	Yes	300W fixed	Yes	Std	Opt
7DF4A00TBR	N	Xeon E-2414 4C 55W 2.6GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5" SATA: 1x 1TB SATA HDD; 1x M.2 SATA/x4NVMe:Open bay	Opt	Open	300W fixed	Yes	Std	Opt
7DF4A00FBR	N	Xeon E-2414 4C 55W 2.6GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5" SATA: 2x 480GB SATA HDD; 1x M.2 SATA/x4NVMe:Open bay	Opt	Yes	300W fixed	Yes	Std	Opt
7DF4A006BR	N	Xeon E-2414 4C 55W 2.6GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5" SATA: 1x 2TB SATA HDD; 1x M.2 SATA/x4NVMe:Open bay	Opt	Yes	300W fixed	Yes	Std	Opt
7DF4A00RBR	N	Xeon E-2434 4C 55W 3.4GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5" SATA: 1x 2TB SATA HDD; 1x M.2 SATA/x4NVMe:Open bay	Opt	Open	300W fixed	No	Std	Opt

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

**On Board SATA Software RAID (AVV0) - [adapter reference](#)

Models for EMEA countries

Table 8. Models for EMEA countries

Model	Top Choice Stock	Intel processors†	Memory	Drive Contr	Drive bays Drives*	Add'l Cards	DVD	Power supply	Pwr cord	XCC2	Intru. sw.
3-year warranty (machine type 7DF3)											
7DF31001EA	Y	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA / AHCI	3x 3.5" SATA: 2x 480GB SATA SSD	Opt	Open	500W fixed	Yes	Std	No
7DF31016EA	N	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA / SW RAID **	3x 3.5" SATA: 2x 2TB 7.2K SATA NHS HDD	Opt	Open	500W fixed	Yes	Plat	No
7DF31002EA	Y	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	OB SATA / AHCI	3x 3.5" SATA: 2x 960GB SATA SSD	Opt	Yes	500W fixed	Yes	Std	No

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

* Shown quantity for drives is maximum supported (eg. 3x 3.5" SATA max)

Models for India

Table 9. Models for India

Model	Top Choice Stock	Intel processors†	Memory	Drive Contr	Drive bays Drives	Add'l Cards	DVD	Power supply	Pwr cord	XCC2	Intru. sw.
3-year warranty (machine type 7DF3)											
7DF3100VSG	N	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA / SW RAID **	3x 3.5-in NHS / Openbay	Opt	Open	300W fixed	Yes	Std	No
7DF3A02NSG	Y	Xeon 6315P 4C 55W 2.8GHz	1x 32GB	OB SATA / SW RAID **	3x 3.5" SATA: 1x 2TB NHS SATA HDD	Opt	Open	300W fixed	Yes	Std	No
7DF3100XSG	N	Xeon 6315P 4C 55W 2.8GHz	1x 32GB	OB SATA / SW RAID **	3x 3.5-in NHS / Openbay	Opt	Open	300W fixed	Yes	Std	No
7DF3A02PSG	Y	Xeon 6333P 6C 65W 3.1GHz	1x 32GB	OB SATA / SW RAID **	3x 3.5" SATA: 1x 2TB NHS SATA HDD	Opt	Open	300W fixed	Yes	Std	No
7DF3100RSG	N	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	OB SATA / AHCI	3x 3.5-in NHS / Openbay	Opt	Yes	500W fixed	Yes	Std	No

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

** On Board SATA Software RAID (AVV0) - [adapter reference](#)

Models for Japan

AP models: Customers in Japan also have access to the [Asia Pacific region](#) models.

Table 10. Models for Japan

Model	Top Choice Stock	Intel processor†	Memory	Drive Contr	Drive bays Drives	Add'l Cards	DVD	Power supply	Pwr cord	XCC2	Intru. sw.
3-year warranty (machine type 7DF3)											
7DF31009JP	Y	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA / SW RAID **	2x 3.5" SATA: 2x 2TB NHS SATA HDD	Opt	Yes	300W fixed	Yes	Std	No
7DF31008JP	N	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA / SW RAID **	2x 3.5" SATA: 2x 1TB NHS SATA HDD	Opt	Yes	300W fixed	Yes	Std	No
7DF3100BJP	Y	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA / SW RAID **	2x 3.5" SATA: 2x 960GB NHS SATA SSD	Opt	Yes	300W fixed	Yes	Std	No
7DF3100AJP	Y	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA / SW RAID **	2x 3.5" SATA: 2x 480GB NHS SATA SDD	Opt	Yes	300W fixed	Yes	Std	No

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

** On Board SATA Software RAID (AVV0) - [adapter reference](#)

Models for Latin American countries

Table 11. Models for Latin American countries

Model	Top Choice Stock	Intel processors†	Memory	Drive C'troller	Drive bays Drives	Slots	Add'l Cards	Power supply (cord)	XCC2	Front VGA	Intru. sw.
3-year warranty (machine type 7DF3)											
7DF3A03RLA	N	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5" SATA: 1x 1TB SATA HDD; 1x M.2 SATA/x4NVMe:Open bay	Opt	Opt	1x 300W PSU / 1 (Y)	Std	Opt	Opt
7DF3A03PLA	N	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5" SATA: 1x 1TB SATA HDD; 1x M.2 SATA/x4NVMe:Open bay	Opt	Opt	1x 300W PSU / 1 (Y)	Std	Opt	Opt
7DF4A01JLA	N	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	2x 3.5-in NHS: 1x 2TB SATA NHS	Opt	Opt	1x 300W PSU / 1 (Y)	Std	Opt	Opt
7DF4A01NLA	N	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	2x 3.5-in NHS: 1x 2TB SATA NHS	Opt	Opt	1x 300W PSU / 1 (Y)	Std	Opt	Opt
7DF4A01MLA	N	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5-in NHS / Openbay	Opt	Opt	1x 300W PSU / 1 (Y)	Std	Opt	Opt
7DF4A01LLA	N	Xeon 6315P 4C 55W 2.8GHz	1x 32GB	OB SATA/SW RAID**	3x 3.5-in NHS / Openbay	Opt	Opt	1x 300W PSU / 1 (Y)	Std	Opt	Opt
7DF4A01GLA	N	Xeon 6315P 4C 55W 2.8GHz	1x 32GB	OB SATA/SW RAID**	3x 3.5-in NHS / Openbay	Opt	Opt	1x 300W PSU / 1 (Y)	Std	Opt	Opt
7DF3100JLA	N	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5-in NHS: 2x 480GB SATA NHS SSD	Opt	Opt	1x 300W PSU / 1 (Y)	Std	Opt	Opt
7DF31005LA	N	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5-in NHS: / Openbay	Opt	Opt	1x 300W PSU / 1 (Y)	Std	Opt	Opt
7DF3100KLA	N	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5-in NHS: 2x 480GB SATA NHS SSD	Opt	Opt	1x 300W PSU / 1 (Y)	Std	Opt	Opt
7DF3100DLA	N	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5-in NHS / Openbay	Opt	Opt	1x 300W PSU / 1 (Y)	Std	Opt	Opt
7DF3A030LA	Y	Xeon 6333P 6C 65W 3.1GHz	1x 32GB	OB SATA / AHCI	3x 3.5" SATA: 1x 2TB SATA HDD, 1x 960GB SSD/1x M.2 SATA/x4NVMe:Open bay	Opt	Opt	1x 300W PSU / 1 (Y)	Plat	Std	No

Model	Top Choice Stock	Intel processors†	Memory	Drive C'troller	Drive bays Drives	Slots	Add'l Cards	Power supply (cord)	XCC2	Front VGA	Intru. sw.
7DF3A031LA	Y	Xeon 6333P 6C 65W 3.1GHz	1x 32GB	OB SATA / AHCI	3x 3.5" SATA: 1x 2TB SATA HDD, 1x 960GB SSD/1x M.2 SATA/x4NVMe:Open bay	Opt	Opt	1x 300W PSU / 1 (Y)	Plat	Std	No
7DF3A03ULA	N	Xeon 6333P 6C 65W 3.1GHz	1x 32GB	OB SATA / AHCI	3x 3.5" SATA: 1x 2TB SATA HDD, 1x 960GB SSD/1x M.2 SATA/x4NVMe:Open bay	Opt	Opt	1x 300W PSU / 1 (Y)	Plat	Std	No
7DF3A02VLA	N	Xeon 6333P 6C 65W 3.1GHz	1x 32GB	OB SATA / AHCI	3x 3.5" SATA: 2x 2TB SATA HDD; 1x M.2 SATA/x4NVMe:Open bay	Opt	Opt	1x 300W PSU / 1 (Y)	Std	Std	No
7DF3A02WLA	N	Xeon 6333P 6C 65W 3.1GHz	1x 32GB	OB SATA / AHCI	3x 3.5" SATA: 2x 2TB SATA HDD; 1x M.2 SATA/x4NVMe:Open bay	Opt	Opt	1x 300W PSU / 1 (Y)	Std	Std	No
7DF4A01CLA	N	Xeon 6353P 8C 2.7GHz	1x 32GB	OB SATA/SW RAID**	3x 3.5-in NHS / Openbay	Opt	Opt	1x 500W PSU / 1 (Y)	Std	Opt	Opt
7DF3100NLA	N	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	OB SATA / AHCI	3x 3.5-in NHS / Openbay	Opt	Opt	1x 500W PSU / 1 (Y)	Std	Std	No
7DF3100HLA	N	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	OB SATA / AHCI	3x 3.5-in NHS: 2x 960GB SATA NHS SSD	Opt	Opt	1x 500W PSU / 1 (Y)	Std	Std	No
7DF3100ELA	N	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	OB SATA / AHCI	3x 3.5-in NHS: / Openbay	Opt	Opt	1x 500W PSU / 1 (Y)	Std	Std	No
7DF3100CLA	N	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	OB SATA / AHCI	3x 3.5-in NHS: 2x 960GB SATA NHS SSD	Opt	Opt	1x 500W PSU / 1 (Y)	Std	Std	No
1-year warranty (machine type 7DF4)											
7DF4A01HLA	N	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5-in NHS / Openbay	Opt	Opt	1x 300W PSU / 1 (Y)	Std	Opt	Opt
7DF4A01FLA	N	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	OB SATA / AHCI	3x 3.5-in NHS / Openbay	Opt	Opt	500W fixed	Std	Std	No

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

Models for Canada and US

Table 12. Models for Canada and US

Model	Top Choice Stock	Intel processor†	Memory	Drive Contr	Drive bays Drives	Additional Cards	DVD	Power supply	Pwr cord	XCC2	Intru. sw.
3-year warranty (machine type 7DF3)											
7DF31005NA	Y	Xeon 6315P 4C 55W 2.8GHz	1x 16GB	OB SATA/SW RAID**	3x 3.5-in NHS / Openbay	Opt	Opt	300W fixed	Std	Opt	Opt
7DF31006NA	Y	Xeon 6315P 4C 55W 2.8GHz	1x 32GB	OB SATA/SW RAID**	3x 3.5-in NHS / Openbay	Opt	Opt	300W fixed	Std	Opt	Opt
7DF3A03CNA	Y	Xeon 6333P 6C 65W 3.1GHz	1x 16GB	OB SATA / AHCI	3x 3.5" SATA: Open bay HDD	Opt	Open	300W fixed	Yes	Plat	Opt
7DF31007NA	Y	Xeon 6353P 8C 65W 2.7GHz	1x 32GB	OB SATA/SW RAID**	3x 3.5-in NHS / Openbay	Opt	Opt	500W fixed	Std	Opt	Opt

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

Processors

The ST50 V3 supports one processor from the following Intel product families:

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

Topics in this section:

- [Processor options](#)
- [Processor features](#)
- [UEFI operating modes](#)

Processor options

All supported processors have the following characteristics:

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

The following table lists the supported processors and includes a Top Choice Express column; for CTO orders, select a TCE component for faster delivery. See the [Top Choice](#) section for more information.

Table 13. Supported processors

Part number	Feature code	SKU	Description	Top Choice Express	Quantity supported
Intel Pentium processors					
CTO only*	BWM7	G7400T	Intel Pentium G7400T 2C 35W 3.1GHz Processor	Not TCE	1
CTO only*	BWM8	G7400	Intel Pentium G7400 2C 46W 3.7GHz Processor	Not TCE	1
Intel Xeon E processors					
CTO only*	BXJZ	E-2414	Intel Xeon E-2414 4C 55W 2.6GHz Processor	Not TCE	1
CTO only*	BWMA	E-2434	Intel Xeon E-2434 4C 55W 3.4GHz Processor	Not TCE	1
CTO only*	BWMB	E-2436	Intel Xeon E-2436 6C 65W 2.9GHz Processor	Not TCE	1
CTO only*	BWMC	E-2456	Intel Xeon E-2456 6C 80W 3.3GHz Processor	Not TCE	1
CTO only*	BWMD	E-2468	Intel Xeon E-2468 8C 65W 2.6GHz Processor	TCE ⓘ	1
CTO only*	BWME	E-2478	Intel Xeon E-2478 8C 80W 2.8GHz Processor	Not TCE	1
CTO only*	BWLS	E-2486	Intel Xeon E-2486 6C 95W 3.5GHz Processor	Not TCE	1
CTO only*	BWMF	E-2488	Intel Xeon E-2488 8C 95W 3.2GHz Processor	Not TCE	1
Intel Xeon 6300 series					
CTO only*	C51Z	6315P	Intel Xeon 6315P 4C 55W 2.8GHz Processor	Not TCE	1

Part number	Feature code	SKU	Description	Top Choice Express	Quantity supported
CTO only*	C520	6325P	Intel Xeon 6325P 4C 55W 3.5GHz Processor	Not TCE	1
CTO only*	C521	6333P	Intel Xeon 6333P 6C 65W 3.1GHz Processor	Not TCE	1
CTO only*	C522	6337P	Intel Xeon 6337P 6C 80W 3.5GHz Processor	Not TCE	1
CTO only*	C523	6349P	Intel Xeon 6349P 6C 95W 3.6GHz Processor	Not TCE	1
CTO only*	C524	6353P	Intel Xeon 6353P 8C 65W 2.7GHz Processor	Not TCE	1
CTO only*	C525	6357P	Intel Xeon 6357P 8C 80W 3.0GHz Processor	Not TCE	1
CTO only*	C526	6369P	Intel Xeon 6369P 8C 95W 3.3GHz Processor	Not TCE	1

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

Processor features

The following table summarizes the key features of all supported processors in the ST50 V3.

Table 14. Supported processors

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

Memory support:

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

UEFI operating modes

The ST50 V3 offers preset operating modes that affect energy consumption and performance. These modes are a collection of predefined low-level UEFI settings that simplify the task of tuning the server to suit your business and workload requirements.

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

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

Table 15. UEFI operating mode presets in DCSC

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

The preset modes for the ST50 V3 are as follows:

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

Memory

The ST50 V3 supports Lenovo TruDDR5 memory. TruDDR5 memory uses the highest-quality components sourced from Tier 1 DRAM suppliers and only memory that meets strict requirements is selected. It is compatibility-tested and tuned to maximize performance and reliability.

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

The processors have 2 memory channels and support 2 DIMMs per channel. The ST50 V3 supports 1, 2, 3 or 4 DIMMs. All DIMMs installed must be identical.

DIMMs installed in the ST50 V3 operate at a speed based on the processor installed, the number of DIMMs installed, and whether the DIMMs are single-rank or dual-rank:

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

The following table lists the memory options that are available for the ST50 V3 server.

Table 16. Memory options for server

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

The following rules apply when selecting the memory configuration:

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

Internal storage

The ST50 V3 supports 2.5-inch NHS SATA SSD and 3.5-inch NHS SATA HDD/SSD for internal drive bay configurations.

In this section:

- [Drive bays](#)
- [M.2 drives](#)
- [Encryption Enablement](#)

Drive bays

The server supports:

- Drive bay 0
 - 3.5-inch hard-disk drive or solid-state drive (non-hot-swap)
- Drive bay 1 (optional)
 - 2.5-inch hard-disk drive or solid-state drive (non-hot-swap)
- Drive bay 2 (optional)
 - 3.5-inch hard-disk drive or solid-state drive (non-hot-swap)
- Drive bay 3 (optional)
 - 3.5-inch hard-disk drive or solid-state drive (non-hot-swap)
- ODD drive bay (optional)
 - One 9mm-Slim SATA DVD-RW (Optical disk drive)

Note: Mixing of traditional HDDs and SSDs in the same array is not supported

The onboard SATA controller supports SATA drives only. NHS drive configurations supporting SATA drives only.

Note: Drive Bay 3 (3rd 3.5") kit and M.2 2-Bay Enablement Kit are mutually exclusive because both kits are installed/assembled at PCIe Slot 3.

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 3 and as shown in the [internal view](#) of the server.

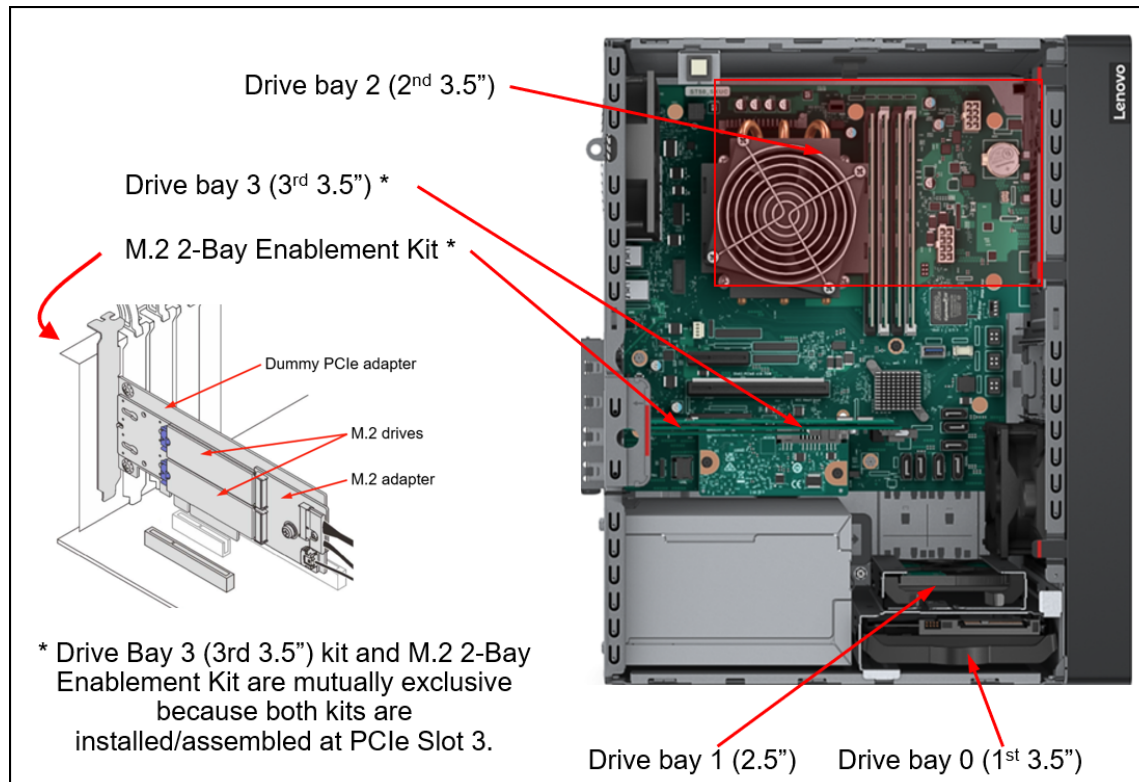


Figure 6. Internal drive bay configurations

M.2 drives

The ST50 V3 server supports two M.2 form-factor SATA drives installed in an M.2 adapter attached to a dummy PCIe adapter. The PCIe adapter is in turn installed in a PCIe slot. The M.2 adapter is connected via cables to the system board; the edge connector of the PCIe adapter only provides physical support and does not provide PCIe signals or power.

The following figure shows the M.2 adapter for the ST50 V3.

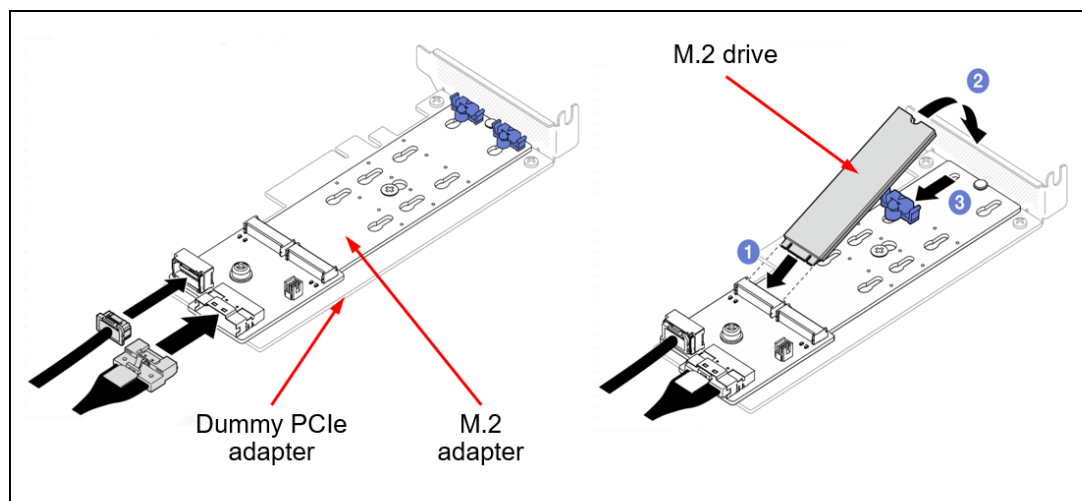


Figure 7. M.2 adapter (BM8X) with an M.2 drive installed in a PCIe slot

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

Supported drives are listed in the [Internal drive options](#) section.

Table 17. M.2 adapter for ST50 V3

Part number	Feature code	Description	Top Choice Express	Maximum supported	Slots supported
4Y37A79663	BM8X	ThinkSystem M.2 SATA/x4 NVMe 2-Bay Adapter - M.2 SATA/x4 NVMe 2-Bay Enablement Kit, BM8X - ThinkSystem ST250 Series Dummy PCIe Card, BMTU - M.2 signal Cable BWN1 - M.2 Power Cable BWN2	TCE	1	slot 3
4Z57A88898	N/A	ThinkSystem SR250/ST250/ST50 V3 M.2 Cable Kit Includes: - ThinkSystem ST250 Series Dummy PCIe Card, BMTU - M.2 signal Cable BWN1 - M.2 Power Cable BWN2	N/A	1	N/A

N/A - not applicable

Configuration rules:

- The M.2 PCIe adapter is only supported in slot 3
- M.2 2-Bay Enablement Kit and Drive Bay 3 (3rd 3.5") kit are mutually exclusive because both kits are installed / assembled at PCIe Slot 3 (dedicated SATA 6, 7 connector of M.2 connection).

The M.2 SATA/NVMe 2-Bay Enablement Kit has the following features when installed in the ST50 V3:

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

- Firmware update via Lenovo firmware update tools

For details about M.2 components, see

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

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

- The Lenovo docs - server guide:

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

Encryption Enablement

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

Table 18. Encryption Enablement

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

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

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

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

- SED drives will be required
- XCC2 Platinum will be required
- VROC SATA RAID (RSTe) cannot be selected

Configuration notes:

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

Controllers for internal storage

The ST50 V3 supports the use of the onboard 6Gb SATA ports to connect SATA drives. Non-Hot-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 ST50 V3 with hot-swap drives supports the use of an internal RAID adapter or HBA. The following table lists the supported adapters.

Table 19. Controllers for internal storage

Part number	Feature code	Description	Top Choice Express	Slots supported	Maximum supported	Supercap included
Onboard SATA - Intel VROC SATA RAID (Intel RSTe)						
None	AVV0	On Board SATA Software RAID Mode	TCE	Not applicable	1	No
None	BS7Q	On Board SATA Software RAID Mode for M.2	TCE	Not applicable	1	No
RAID adapters						
4Y37A93012	C0TU	ThinkSystem RAID 545-8i PCIe Gen4 12Gb Adapter	Not TCE	1, 2, 3	1	No

For a comparison of the functions of the supported storage adapters, see the ThinkSystem RAID Adapter and HBA Reference:

<https://lenovopress.lenovo.com/lp1288-thinksystem-raid-adapter-and-hba-reference#st250-v3-support=ST250%2520V3>

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.
- **DCSC configurator:** When adapter (545-8i PCIe Gen4) is selected, cable (4X97B11368 CCRP ThinkSystem ST45 V3 545-8i Cable Kit) is auto-derived.

For more information about the backplane kits and cable kits, see the Lenovo server options site:

https://serveroption.lenovo.com/cable_kit_options/

Field upgrades

The following table lists the supported field upgrades.

Table 20. Kits available for field upgrades

Part number	Description
4XF7A78617	ThinkSystem ST50 V2/V3 2.5" HDD Cage Kit
4XF7A79662	ThinkSystem ST50 V2/V3 2nd 3.5" HDD Cage Kit
4F17A80568	ThinkSystem ST50 V2/V3 System Rear Fan Kit
4XF7A93516	ThinkSystem ST50 V3 3rd 3.5" HDD Cage kit
4X97A93517	ThinkSystem ST50 V3 Internal Drive Cable Accessories Kit

For more information on part numbers refer to:
<https://serverproven.lenovo.com/server/st50-v3/>

Internal drive options

The ST50 V3 supports one 2.5-inch NHS SATA SSD and three 3.5-inch NHS SATA HDD/SSD for internal drive bay configurations.

Each drive option part number includes:

- Tray to mount the drive in the server
- 185mm SATA signal cable to connect the drive (when installed in drive bays) to the onboard SATA controller on the system board.

For CTO orders, the necessary cables and trays will be derived by the configurator.

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

Simple-swap drives:

- [2.5-inch simple-swap 6 Gb SATA SSDs](#)
- [3.5-inch simple-swap 6 Gb SATA HDDs](#)
- [3.5-inch simple-swap 6 Gb SATA SSDs](#)

M.2 drives:

- [M.2 SATA drives](#)

M.2 drive support: The use of M.2 drives requires an additional adapter as described in the [M.2 drives](#) subsection.

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

Table 21. 2.5-inch simple-swap 6 Gb SATA SSDs

Part number	Feature code	Description	Top Choice Express	SED support	Max Qty
2.5-inch simple-swap SSDs - 6 Gb SATA - Read Intensive/Entry (<3 DWPD)					
4XB7B04138	C8DT	ThinkSystem ST50/ST45 Series 2.5" VA 480GB Read Intensive SATA 6Gb NHS SSD	TCE	No	1
4XB7B04139	C8DS	ThinkSystem ST50/ST45 Series 2.5" VA 960GB Read Intensive SATA 6Gb NHS SSD	TCE	No	1
4XB7B04140	C8DR	ThinkSystem ST50/ST45 Series 2.5" VA 1.92TB Read Intensive SATA 6Gb NHS SSD	TCE	No	1
4XB7B04141	C8DQ	ThinkSystem ST50/ST45 Series 2.5" VA 3.84TB Read Intensive SATA 6Gb NHS SSD	TCE	No	1

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

Part number	Feature code	Description	Top Choice Express	SED support	Max Qty
3.5-inch simple-swap HDDs - 6 Gb NL SATA					
4XB7A77446	BMEC	ThinkSystem ST50/ST45 Series 3.5 2TB 7.2K SATA 6Gb Non-Hot Swap 512n HDD	TCE	No	3
4XB7A97044	C5X5	ThinkSystem ST50 V3 3.5" 2TB 7.2K SATA 6Gb Non-Hot Swap 512e HDD v2	Not TCE	Support	3
4XB7A77447	BMEG	ThinkSystem ST50/ST45 Series 3.5 4TB 7.2K SATA 6Gb Non-Hot Swap 512n HDD	TCE	No	3
4XB7B01927	C6C9	ThinkSystem ST50 V3 3.5" 4TB 7.2K SATA 6Gb Non-Hot Swap 512e HDD v2	Not TCE	Support	3
4XB7A77448	BMEF	ThinkSystem ST50/ST45 Series 3.5 6TB 7.2K SATA 6Gb Non-Hot Swap 512e HDD	Not TCE	No	3
4XB7A77449	BMEE	ThinkSystem ST50/ST45 Series 3.5 8TB 7.2K SATA 6Gb Non-Hot Swap 512e HDD	Not TCE	No	3

Part number	Feature code	Description	Top Choice Express	SED support	Max Qty
4XB7A77451	BMEH	ThinkSystem ST50/ST45 Series 3.5 2TB Client 7.2K SATA 6Gb Non-Hot Swap 512e HDD	Not TCE	No	3

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

Part number	Feature code	Description	Top Choice Express	SED support	Max Qty
3.5-inch simple-swap SSDs - 6 Gb SATA - Read Intensive/Entry (<3 DWPD)					
4XB7B04142	C8DP	ThinkSystem ST50/ST45 Series 3.5" VA 480GB Read Intensive SATA 6Gb NHS SSD	TCE	No	3
4XB7B04143	C8DN	ThinkSystem ST50/ST45 Series 3.5" VA 960GB Read Intensive SATA 6Gb NHS SSD	TCE	No	3
4XB7B04144	C8DM	ThinkSystem ST50/ST45 Series 3.5" VA 1.92TB Read Intensive SATA 6Gb NHS SSD	TCE	No	3
4XB7B04145	C8DL	ThinkSystem ST50/ST45 Series 3.5" VA 3.84TB Read Intensive SATA 6Gb NHS SSD	TCE	No	3

Table 24. M.2 SATA drives

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

External backup units

The ST50 V3 supports the external backup unit only. Options are listed in the following table.

Table 25. External backup units

Part number	Feature code	Description	Top Choice Express	Maximum supported
RDX dock				
4T27A10725	B32R	ThinkSystem RDX External USB 3.0 Dock	Not TCE	1
RDX media				
7TP7A01601	AVF8	ThinkSystem RDX 500GB Cartridge	Not TCE	Not applicable
7TP7A01602	AVF1	ThinkSystem RDX 1TB Cartridge	Not TCE	Not applicable
7TP7A01603	AVF0	ThinkSystem RDX 2TB Cartridge	Not TCE	Not applicable
7TP7A04318	AXD1	ThinkSystem RDX 4TB Cartridge	Not TCE	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>

Optical drives

The ST50 V3 supports the internal optical drive options listed in the following table. The internal optical is installed in the ODD Cage Kit.

Table 26. Optical drives

Part number	Feature code	Description	Top Choice Express	Maximum supported
Internal optical drives				
CTO only	BMEU	ThinkSystem ST50 V2/V3 9mm-Slim SATA DVD-RW	TCE	1
CTO only	BMEX	ThinkSystem ST50 V2/V3 Slim ODD Cage Kit	TCE	1

Configuration rules:

- 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.

Table 27. Upgrade options table

Part number	Description	Maximum supported
4XF7A78619	ThinkSystem ST50 V2/V3 Slim ODD Cage Kit	1
4XA7A77462	ThinkSystem ST50 V2/V3 9mm-Slim SATA DVD-RW	1

The optical drive is based on the HLDS Model GUE1N Super Multi DVD Writer and supports the following formats:

- DVD-ROM, DVD-ROM DL, DVD-R, DVD-R DL, DVD-RW, DVD-RAM, DVD+R, DVD+R DL, DVD+RW
- CD-ROM, CD-ROM XA, CD-I, Video CD, CD-Audio, CD-Extra, CD-Text, CD-R, CD-RW

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

Table 28. External optical drive

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

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

I/O expansion options

The ST50 V3 server has one PCIe 5.0 slot and two PCIe 4.0 slots, as follows:

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

Slot 1 and slot 3 in the ST50 V3 are an open-end design, which means that it can accept adapters with a longer edge connector than the physical length of the slot connector. For example, if a x8 adapter is installed in the x4 slot 3 of the server, half of the edge connector will not be connected to the slot. The adapter will still function, however performance will be impacted.

The following figure shows the locations of the PCIe slots.

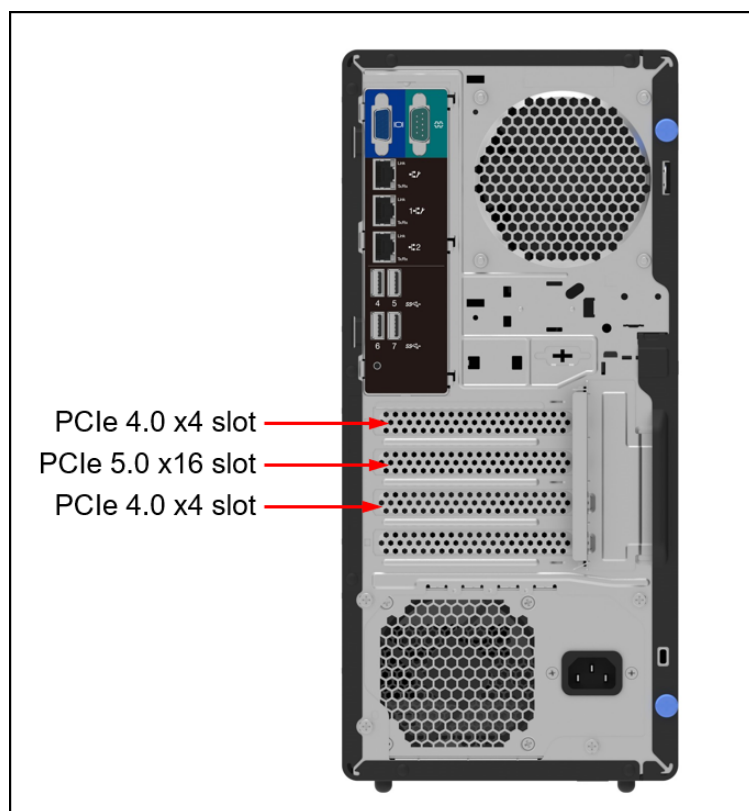


Figure 8. ThinkSystem ST50 V3 PCIe slots

Network adapters

The ST50 V3 has two onboard Gigabit Ethernet ports, connected to a Broadcom BCM5720 embedded controller.

The BCM5720 embedded controller has the following features:

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

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

Table 29. Network adapters

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

Configuration notes:

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

SAS adapters for external storage

The ST50 V3 does not currently support connectivity to external SAS storage.

Fibre Channel host bus adapters

The ST50 V3 does not currently support Fibre Channel host bus adapters.

Flash Storage adapters

The ST50 V3 does not currently support Flash Storage adapters.

GPU adapters

The ST50 V3 server does not support the graphics processing units (GPUs).

Fans and cooling

The ST50 V3 has the following variable-speed fans. All fans are fixed (non-hot-swap).

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

See the Inside view in the [Components and connectors](#) section for locations.

Power supplies

The server supports a single fixed power supply. The following table lists the supported power supplies.

Table 30. Power supplies

Part number	Feature code	Description	Top Choice Express	Maximum quantity	ErP Lot 9 compliant	110V AC	220V AC
Fixed power supplies							
CTO only	BMFL	ATX-300W Power Supply	TCE ⓘ	1	No	Yes	Yes
CTO only	BMTC	ThinkSystem 500W Platinum ATX Power Supply	TCE	1	Yes	Yes	Yes

Power supply options do not include a line cord.

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

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

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

Power cords (C13 connectors)

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

Table 31. Power cords

Market/region	Part number	Feature code	Description	Top Choice Express
Rack cables - C13 to C14				
Worldwide	00Y3043	A4VP	1.0m, 10A/100-250V, C13 to C14 Jumper Cord	TCE
Worldwide	4L67A08367	B0N5	1.0m, 13A/100-250V, C13 to C14 Jumper Cord	TCE
Worldwide	39Y7937	6201	1.5m, 10A/100-250V, C13 to C14 Jumper Cord	TCE
Worldwide	4L67A08368	B0N6	1.5m, 13A/100-250V, C13 to C14 Jumper Cord	TCE
Worldwide	4L67A08365	B0N4	2.0m, 10A/100-250V, C13 to C14 Jumper Cord	TCE
Worldwide	4L67A08369	6570	2.0m, 13A/100-250V, C13 to C14 Jumper Cord	TCE
Worldwide	4L67A08366	6311	2.8m, 10A/100-250V, C13 to C14 Jumper Cord	TCE
Worldwide	4L67A08370	6400	2.8m, 13A/100-250V, C13 to C14 Jumper Cord	TCE
Worldwide	39Y7932	6263	4.3m, 10A/100-250V, C13 to C14 Jumper Cord	TCE
Worldwide	4L67A08371	6583	4.3m, 13A/100-250V, C13 to C14 Rack Power Cable	TCE
Rack cables for India - C13 to C14				
India	4L67B10326	CC6R	2.0m, 10A/100-250V, C13 to C14 Jumper Cord (India)	Not TCE
India	4L67B10327	CC6S	2.8m, 10A/100-250V, C13 to C14 Jumper Cord (India)	TCE ⓘ
India	4L67B10328	CC6T	4.3m, 10A/100-250V, C13 to C14 Jumper Cord (India)	Not TCE
Rack cables - C13 to C20				

Market/region	Part number	Feature code	Description	Top Choice Express
Worldwide	39Y7938	6204	2.8m, 10A/100-250V, C13 to IEC 320-C20 Rack Power Cable	TCE
Rack cables - C13 to C20 (Y-cable)				
Worldwide	47C2491	A3SW	1.2m, 16A/100-250V, 2 Short C13s to Short C20 Rack Power Cable	Not TCE
Worldwide	47C2492	A3SX	2.5m, 16A/100-250V, 2 Long C13s to Short C20 Rack Power Cable	Not TCE
Worldwide	47C2493	A3SY	2.8m, 16A/100-250V, 2 Short C13s to Long C20 Rack Power Cable	Not TCE
Worldwide	47C2494	A3SZ	4.1m, 16A/100-250V, 2 Long C13s to Long C20 Rack Power Cable	Not TCE
Line cords				
Argentina	39Y7930	6222	2.8m, 10A/250V, C13 to IRAM 2073 (Argentina) Line Cord	TCE ⓘ
Argentina	81Y2384	6492	4.3m,10A/250V, C13/IRAM 2073 (Argentina) Line Cord	TCE ⓘ
Australia/NZ	39Y7924	6211	Australia/NZ 10A line C13 to SAA-AS C112 (2.8M)	TCE ⓘ
Australia/NZ	81Y2383	6574	4.3m,10A/250V, C13/AS/NZS 3112/2000 (Australia) Line Cord	TCE ⓘ
Brazil	69Y1988	6532	2.8m, 10A/250V, C13 to NBR 14136 (Brazil) Line Cord	TCE ⓘ
Brazil	81Y2387	6404	4.3m,10A/250V, C13/NBR 14136 (Brazil) Line Cord	TCE ⓘ
China	39Y7928	6210	2.8m, 10A/220V, C13 to GB 2099.1 (China) Line Cord	Not TCE
China	81Y2378	6580	4.3m,10A/250V, C13/GB2099.1 (China) Line Cord	Not TCE
Europe	39Y7917	6212	European 10A line C13 to CEE 7/7 (2.8M)	TCE
Europe	81Y2376	6572	4.3m,10A/230V, C13 to CEE7-VII (Europe) Line Cord	Not TCE
India	39Y7927	6269	2.8m, 6A Line C13 to Fig 68 (India) Line Cord	TCE ⓘ
India	81Y2386	6567	4.3m, 10A/250V, C13 to IS 6538 (India) Line Cord	TCE ⓘ
Israel	39Y7920	6218	Israel 10A line C13 to SI 32 (2.8M)	TCE
Italy/Chile	39Y7921	6217	Italy 10A line C13 to CEE 7/7 (2.8M)	TCE ⓘ
Italy/Chile	81Y2380	6493	4.3m,10A/250V, C13/CEI 23-16 (IT) Line cord	TCE ⓘ
Japan	46M2593	A1RE	Japan 12A/125V C13 to JIS C-8303 2.8m line cord	TCE ⓘ
Japan	39Y7926	6335	4.3m, 12A/100V, C13 to JIS C-8303 (Japan) Line Cord	TCE
South Africa	39Y7922	6214	South Africa 10A line C13 to SABS 164/1 (2.8M)	TCE ⓘ
South Africa	81Y2379	6576	4.3m,10A/250V, C13/SANS 164-1 (South Africa) Line Cord	TCE ⓘ
South Korea	39Y7925	6219	Korea 7A line C13 to KETI 15A/250V (2.8M)	TCE ⓘ
South Korea	81Y2385	6494	4.3m, 12A/250V C13/KSC 8305 (Korea) Line Cord	TCE ⓘ
Switzerland	39Y7919	6216	Switzerland 10A line C13 to SEV 1011 (2.8M)	TCE ⓘ
Switzerland	81Y2390	6578	4.3m,10A/250V, C13/SEV 1011 (Switzerland)Line Cord	Not TCE
Taiwan	23R7158	6386	Line cord - 2.8m, 10A/125V, C13 to CNS 10917-3 (Taiwan)	TCE ⓘ
Taiwan	81Y2375	6317	Taiwan 10A/250V C13/CNS 10917 2.8m line cord	TCE ⓘ
Taiwan	81Y2374	6402	2.8m, 13A/125V, C13 to CNS 60799 (Taiwan) Line Cord	TCE ⓘ
Taiwan	4L67A08363	AX8B	4.3m, 10A/125V, C13 to CNS 10917 (Taiwan) Line Cord	TCE ⓘ
Taiwan	81Y2389	6531	4.3m, 10A/250V, C13/CNS 10917 (Taiwan) Line Cord	TCE ⓘ

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

Systems management

The ST50 V3 has an integrated service processor, XClarity Controller 2 (XCC), which provides advanced control, monitoring, and alerting functions. The XCC2 is based on the AST2600 baseboard management controller (BMC) using a dual-core ARM Cortex A7 32-bit RISC service processor running at 1.2 GHz.

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

Front operator panel

The ST50 V3 offers a front operator panel showing key LED status indicators, as shown in the following figure.

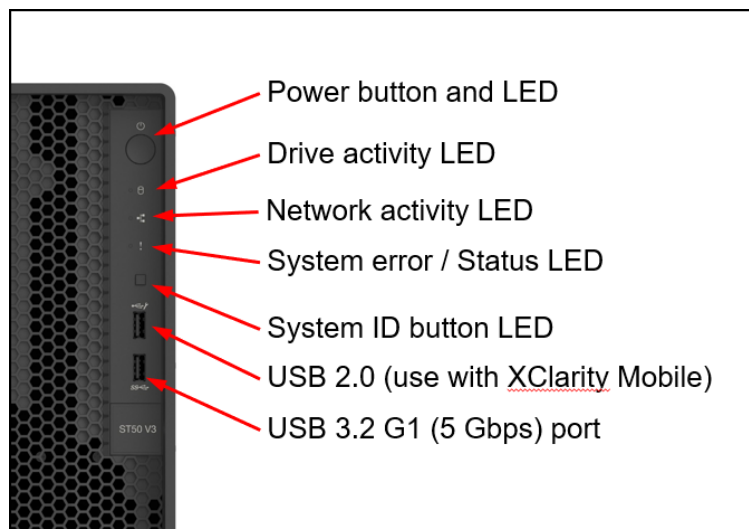


Figure 9. Front operator panel

System status with XClarity Mobile

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

The steps to connect the mobile device are as follows:

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

Once connected you can see the following information:

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

Remote management

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

Remote server management is provided through industry-standard interfaces:

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

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

Table 32. IPMI-over-LAN settings

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

XCC2 Platinum

The XCC2 service processor in the ST50 V3 supports an upgrade to the Platinum level of features. Compared to the XCC functions of ThinkSystem V2 and earlier systems, Platinum adds the same features as Enterprise and Advanced levels in ThinkSystem V2, plus additional features.

XCC2 Platinum adds the following Enterprise and Advanced functions:

- Remotely viewing video with graphics resolutions up to 1600x1200 at 75 Hz with up to 23 bits per pixel, regardless of the system state
- Remotely accessing the server using the keyboard and mouse from a remote client
- International keyboard mapping support
- Syslog alerting
- Redirecting serial console via SSH
- Component replacement log (Maintenance History log)
- Access restriction (IP address blocking)
- Lenovo SED security key management
- Displaying graphics for real-time and historical power usage data and temperature
- Boot video capture and crash video capture
- Virtual console collaboration - Ability for up to 6 remote users to be log into the remote session simultaneously
- Remote console Java client
- Mapping the ISO and image files located on the local client as virtual drives for use by the server
- Mounting the remote ISO and image files via HTTPS, SFTP, CIFS, and NFS
- Power capping
- System utilization data and graphic view

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

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

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

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

Table 33. XCC2 Platinum license upgrade

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

With XCC2 Platinum, for CTO orders, you can request that System Guard be enabled in the factory and the first configuration snapshot be recorded. To add this to an order, select feature code listed in the following table. The selection is made in the Security tab of the DCSC configurator.

Table 34. Enable System Guard in the factory (CTO orders)

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

For more information about System Guard, see https://pubs.lenovo.com/xcc2/NN1ia_c_systemguard

Lenovo XClarity Provisioning Manager

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

LXPM provides the following functions:

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

Lenovo XClarity Administrator

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

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

required.

Lenovo XClarity Administrator is an optional software component for the ST50 V3. The software can be downloaded and used at no charge to discover and monitor the ST50 V3 and to manage firmware upgrades.

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

The following table lists the Lenovo XClarity software license options.

Table 35. Lenovo XClarity Pro ordering information

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

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

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

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

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

For more information, refer to the Lenovo XClarity Administrator Product Guide:

<http://lenovopress.com/tips1200>

Lenovo XClarity Integrators

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

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

Lenovo XClarity Integrators offer the following additional features:

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

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

Lenovo XClarity Essentials

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

- Lenovo Essentials OneCLI

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

- Lenovo Essentials UpdateXpress

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

- Lenovo Essentials Bootable Media Creator

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

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

Lenovo XClarity Energy Manager

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

LXEM is a licensed product. A single-node LXEM license is included with the XClarity Controller Platinum upgrade as described in the [XCC2 Platinum](#) section. If your server does not have the XCC Platinum upgrade, Energy Manager licenses can be ordered as shown in the following table.

Table 36. 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/Invo-lxem>
- User Guide for XClarity Energy Manager:
<https://pubs.lenovo.com/lxem/>

Security

Topics in this section:

- [Security features](#)
- [Platform Firmware Resiliency - Lenovo ThinkShield](#)
- [Security standards](#)

Security features

The ST50 V3 offers the following security features:

- Electronic security measures:
 - Administrator and power-on passwords
 - Secure firmware updates
 - Trusted Platform Module (TPM) supporting TPM 2.0
 - For China customers, the Nationz TPM plug-in module
 - Self-encrypting drives with support for IBM Security Key Lifecycle Manager
- Mechanical security measures
 - Loop for a padlock to prevent the side panel from being opened
 - Slot at the rear of the server for a Kensington Cable Lock
 - Optional 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 37. Security

Part number	Feature code	Description	Top Choice Express
4XF7A78616	BMET	ThinkSystem ST50 V2/V3 Intrusion Switch Kit	TCE

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 ST50 V3 includes Platform Firmware Resiliency (PFR) hardware Root of Trust (RoT) which enables the system to be NIST SP800-193 compliant. This offering further enhances key platform subsystem protections against unauthorized firmware updates and corruption, to restore firmware to an integral state, and to closely monitor firmware for possible compromise from cyber-attacks.

PFR operates upon the following server components:

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

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

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

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

The ST50 V3 includes support for Secure Boot, a UEFI firmware security feature developed by the UEFI Consortium that ensures only immutable and signed software are loaded during the boot time. The use of Secure Boot helps prevent malicious code from being loaded and helps prevent attacks, such as the installation of rootkits. Lenovo offers the capability to enable secure boot in the factory, to ensure end-to-end protection. Alternatively, Secure Boot can be left disabled in the factory, allowing the customer to enable it themselves at a later point, if desired.

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

Table 38. Secure Boot options

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

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

Security standards

The ST50 V3 supports the following security standards and capabilities:

- **Industry Standard Security Capabilities**
 - Intel CPU Enablement
 - AES-NI (Advanced Encryption Standard New Instructions)
 - Secure Key
 - MKTME/TME (Multi-Key Total Memory Encryption)
 - OS Guard
 - TXT (Trusted eXecution Technology)
 - XD (eXecute Disable)
 - Boot Guard
 - MBEC (Mode-based Execute Control)
 - VT-x (Virtualization Technology-x)
 - VT-rp (Virtualization Technology with Redirect Protection)
 - VT-d (Virtualization Technology for Directed I/O)
 - VT-x with EPT (Extended Page Tables)
 - Microsoft Windows Security Enablement
 - Credential Guard
 - Device Guard
 - Host Guardian Service
 - TPM 2.0 (Trusted Platform Module 2.0)
 - UEFI (Unified Extensible Firmware Interface) Forum Secure Boot
- **Hardware Root of Trust and Security**
 - Independent security subsystem providing platform-wide NIST SP800-193 compliant Platform Firmware Resilience (PFR)

- Management domain RoT provided by the Secure Boot feature of the AST2600 Baseboard Management Controller (BMC)

- **Platform Security**

- Boot and run-time firmware integrity monitoring with rollback to known-good firmware (e.g., “self-healing”)
- Non-volatile storage bus security monitoring and filtering
- Resilient firmware implementation, such as to detect and defeat unauthorized flash writes or SMM (System Management Mode) memory incursions
- Patented IPMI KCS channel privileged access authorization (USPTO Patent# 11,256,810)
- Host and management domain authorization, including integration with CyberArk for enterprise password management
- KMIP (Key Management Interoperability Protocol) compliant, including support for IBM SKLM and Thales KeySecure
- Reduced “out of box” attack surface
- Configurable network services

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

- **Standards Compliance and/or Support**

- NIST SP800-131A rev 2 “Transitioning the Use of Cryptographic Algorithms and Key Lengths”
- NIST SP800-147B “BIOS Protection Guidelines for Servers”
- NIST SP800-193 “Platform Firmware Resiliency Guidelines”
- ISO/IEC 11889 “Trusted Platform Module Library”
- Common Criteria TCG Protection Profile for “PC Client Specific TPM 2.0”
- European Union Commission Regulation 2019/424 (“ErP Lot 9”) “Ecodesign Requirements for Servers and Data Storage Products” Secure Data Deletion
- Optional FIPS 140-2 validated Self-Encrypting Disks (SEDs) with external KMIP-based key management

- **Product and Supply Chain Security**

- Suppliers validated through Lenovo’s Trusted Supplier Program
- Developed in accordance with Lenovo’s Secure Development Lifecycle (LSDL)
- Continuous firmware security validation through automated testing, including static code analysis, dynamic network and web vulnerability testing, software composition analysis, and subsystem-specific testing, such as UEFI security configuration validation
- Ongoing security reviews by US-based security experts, with attestation letters available from our third-party security partners
- Digitally signed firmware, stored and built on US-based infrastructure and signed on US-based Hardware Security Modules (HSMs)
- TAA (Trade Agreements Act) compliant manufacturing, by default in Mexico for North American markets with additional US and EU manufacturing options
- US 2019 NDAA (National Defense Authorization Act) Section 889 compliant

Keyboards and Mice

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

The keyboards have the following features:

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

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

Table 39. Lenovo Preferred Pro USB Full-sized keyboards - ThinkSystem

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

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

Rack installation

The ST50 V3 can be installed in the rack with the Rack Mount Kit, which converts the server to a rack-mountable server.

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

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

Table 40. Rack installation options

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

The rack mount kit includes the following items:

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

The following table summarizes the rail kit features and specifications.

Table 41. Rail kit features and specifications summary

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

** If you want to install the rails and a 0U PDU into the same rack, the rack must meet the height and depth requirements as described in [ThinkSystem Rail Support Matrix](#).

‡ For best performance, it is recommended that you install the rails to the racks with a 719-mm distance (28.3-inch, Lenovo rack default distance) between the front and rear mounting flanges.

† Measured when mounted on the rack, from the front surface of the front mounting flange to the rear most point of the rail. Rail is in closed position.

Operating systems

The ST50 V3 with Intel Pentium or Intel Xeon E processors supports the following operating systems:

- Microsoft Windows Server 2022
- Microsoft Windows Server 2025
- Red Hat Enterprise Linux 8.10
- Red Hat Enterprise Linux 9.4
- Red Hat Enterprise Linux 9.5
- Red Hat Enterprise Linux 9.6
- Red Hat Enterprise Linux 9.7
- Red Hat Enterprise Linux 9.8
- Red Hat Enterprise Linux 10.0
- Red Hat Enterprise Linux 10.1
- Red Hat Enterprise Linux 10.2
- SUSE Linux Enterprise Server 15 SP5
- SUSE Linux Enterprise Server 15 SP6
- SUSE Linux Enterprise Server 15 SP7
- SUSE Linux Enterprise Server 15 Xen SP5
- SUSE Linux Enterprise Server 16
- Ubuntu 24.04 LTS 64-bit
- VMware ESXi 8.0 U2
- VMware ESXi 8.0 U3
- VMware ESXi 9.0
- VMware ESXi 9.1

The ST50 V3 with Intel Pentium or Intel Xeon 6300 series processors supports the following operating systems:

- Microsoft Windows Server 2022
- Microsoft Windows Server 2025
- Red Hat Enterprise Linux 8.10
- Red Hat Enterprise Linux 9.4
- Red Hat Enterprise Linux 9.5
- Red Hat Enterprise Linux 9.6
- Red Hat Enterprise Linux 9.7
- Red Hat Enterprise Linux 9.8
- Red Hat Enterprise Linux 10.0
- Red Hat Enterprise Linux 10.1
- Red Hat Enterprise Linux 10.2
- SUSE Linux Enterprise Server 15 SP6
- SUSE Linux Enterprise Server 15 SP7
- SUSE Linux Enterprise Server 16
- Ubuntu 22.04 LTS 64-bit
- Ubuntu 24.04 LTS 64-bit
- VMware ESXi 8.0 U3
- VMware ESXi 9.0
- VMware ESXi 9.1

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

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

For configure-to-order configurations, the ST50 V3 can be preloaded with VMware ESXi. Ordering information is listed in the following table.

Table 42. VMware ESXi preload

Part number	Feature code	Description	Top Choice Express
CTO only	BYC7	VMware ESXi 8.0 U2 (Factory Installed)	TCE
CTO only	BZ97	VMware ESXi 8.0 U3 (Factory Installed)	TCE
CTO only	C91V	VMware ESXi 9.0 (Factory Installed)	TCE

Configuration rule:

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

You can download supported VMware vSphere hypervisor images from the following web page and install it using the instructions provided:

https://vmware.lenovo.com/content/custom_iso/

Physical and electrical specifications

The ST50 V3 has the following overall physical dimensions, including tower feet, excluding components that extend outside the standard chassis, such as power supply handles:

- Width: 170 mm (6.7 inches)
- Height: 376 mm (14.8 inches)
- Depth: 315 mm (12.4 inches)

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

Table 43. Detailed dimensions

Dimension	Description
170 mm	X_a = Width, using widest features (not including feet)
132 mm	X_b = Width, with chassis feet extended
376 mm	Y_a = Height, from bottom of feet to top of chassis body
370 mm	Y_b = Height, from bottom of chassis body to top of chassis body
299 mm	Z_a = Depth, from front door to most rearward I/O port surface
315 mm	Z_b = Depth, from front door to deepest feature of the chassis body feature
315 mm	Z_c = Depth, from front door to deepest feature such as power supply handle
37 mm	Z_e = Depth, front door to front plate of chassis body

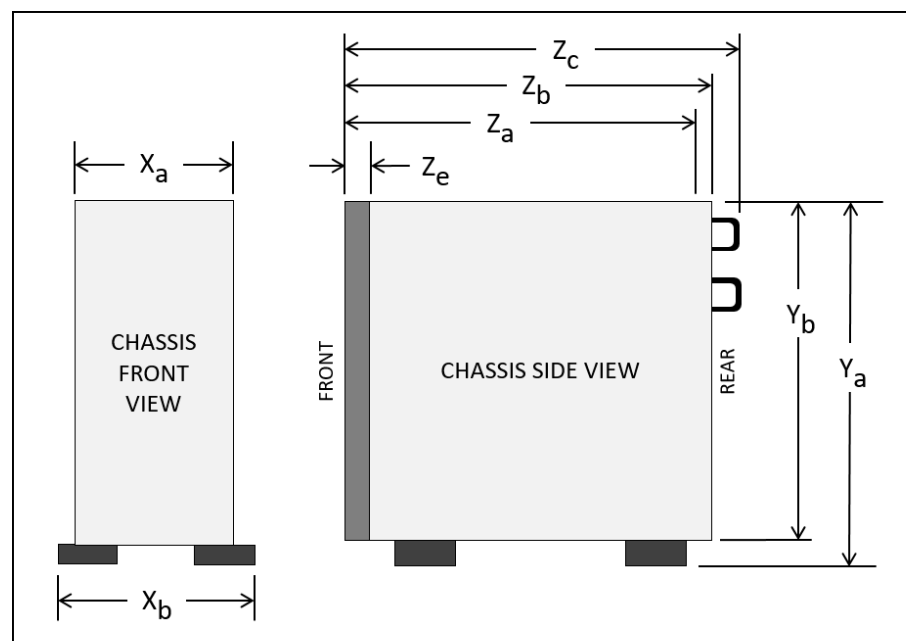


Figure 10. Server dimension

The shipping (cardboard packaging) dimensions of the ST50 V3 are as follows:

- Width: 280 mm (11.0 inches)
- Height: 540 mm (21.3 inches)
- Depth: 420 mm (16.5 inches)

The server has the following weight:

- Weight, fully configured: 11.96 kg (26.4 lbs)

Electrical requirements are as follows:

- Models with a 300 W AC fixed power supply:
 - 100-127 (nominal) V ac; 50 Hz or 60 Hz, 3.88 A
 - 200-240 (nominal) V ac; 50 Hz or 60 Hz, 1.69 A
- Models with a 500 W AC fixed power supply:
 - 100-127 (nominal) V ac; 50 Hz or 60 Hz, 6.13 A
 - 200-240 (nominal) V ac; 50 Hz or 60 Hz, 2.7 A

Operating environment

ThinkSystem ST50 V3 complies with ASHRAE Class A2 specifications. System performance may be impacted when the operating temperature is outside AHSARE A2 specification.

- Air temperature:
 - Operating
 - ASHRAE Class A2: 10°C to 35°C (50°F to 95°F); the maximum ambient temperature decreases by 1°C for every 300 m (984 ft) increase in altitude above 900 m (2,953 ft).
 - Server off: 5°C to 45°C (41°F to 113°F)
 - Shipment/storage: -20°C to 60°C (-4°F to 140°F)
- Maximum altitude: 3,050 m (10,000 ft)
- Relative Humidity (non-condensing):
 - Operating
 - ASHRAE Class A2: 8% to 80%; maximum dew point: 21°C (70°F)
 - Shipment/storage: 8% to 90%
- Particulate contamination

Temperature and humidity

The ambient temperature must be 35°C or lower if the server has any of the following components:

- M.2 drives (960 GB or below)

NOTE

When the ambient temperature is greater than the supported temperature, the server will shut down. The server will not power on again until the ambient temperature falls within the supported temperature range.

Thermal/Heat output

Approximate heat output:

- Minimum configuration: 354 BTU per hour (104 watts)
- Maximum configuration : 1009 BTU per hour (296 watts)

Acoustical noise emissions

The server has the following acoustic noise emissions declaration:

- Sound power level (L_{WAd})
 - Idling: 3.4 Bel (Typical), 4.0 Bel (Max.)
 - Operating 1: 3.4 Bel (Typical), 4.0 Bel (Max.)
 - Operating 2: 4.8 Bel (Typical), 5.4 Bel (Max.)
- Sound pressure level (L_{pAm}):
 - Idling: 20.3 dBA (Typical), 27.6 dBA (Max.)
 - Operating 1: 20.3 dBA (Typical), 27.6 dBA (Max.)
 - Operating 2: 35.1 dBA (Typical), 40.6 dBA (Max.)

NOTE

- These sound levels were measured in controlled acoustical environments according to procedures specified by ISO 7779 and are reported in accordance with ISO 9296. Testing was conducted at 23°C ± 2°C to align with ISO7779 procedures.
- Idling mode is the steady state in which the server is powered on but not operating any intended function. Operating mode 1 is 50% CPU TDP. Operating mode 2 is 100% CPU TDP.

- The declared acoustic sound levels are based on the following configurations, which may change depending on configuration/conditions:
 - Typical: 1x 80W CPU, 1x 16GB DIMM, 1x 3.5" HDD, 1x Slim SATA ODD, 1x 300W fixed PSU
 - Maximum: 1x 95W CPU, 4x 32 GB DIMM, 3x 3.5" HDD, 1x 2.5" SSD, 1x Slim SATA ODD, 1x 5350-8i RAID, 1x 1G NIC, 1x 500W fixed PSU
- Government regulations (such as those prescribed by OSHA or European Community Directives) may govern noise level exposure in the workplace and may apply to you and your server installation. The actual sound pressure levels in your installation depend upon a variety of factors, including the number of racks in the installation; the size, materials, and configuration of the room; the noise levels from other equipment; the room ambient temperature, and employee's location in relation to the equipment. Further, compliance with such government regulations depends on a variety of additional factors, including the duration of employees' exposure and whether employees wear hearing protection. Lenovo recommends that you consult with qualified experts in this field to determine whether you are in compliance with the applicable regulations.

Particulate contamination

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

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

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

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

Warranty upgrades and post-warranty support

The ST50 V3 has a 1-year or 3-year warranty, based on the machine type of the system:

- 7DF4 - 1 year warranty
- 7DF3 - 3 year warranty

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

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

For more information, consult the brochure [Lenovo Operational Support Services for Data Centers Services](#).

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

Services

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

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

In this section:

- [Lenovo Advisory Services](#)
- [Lenovo Plan & Design Services](#)
- [Lenovo Deployment, Migration, and Configuration Services](#)
- [Lenovo Support Services](#)
- [Lenovo Managed Services](#)
- [Lenovo Sustainability Services](#)

Lenovo Advisory Services

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

- **Assessment Services**

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

- **Design Services**

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

Lenovo Plan & Design Services

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

Lenovo Deployment, Migration, and Configuration Services

Optimize your IT operations by shifting labor-intensive functions to Lenovo's skilled technicians for seamless on-site or remote deployment, configuration, and migration. Enjoy peace of mind, faster time to value, and

comprehensive knowledge sharing with your IT staff, backed by our best-practice methodology.

- **Deployment Services for Storage and ThinkAgile**

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

- **Hardware Installation Services**

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

- **DM/DG File Migration Services**

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

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

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

- **Factory Integrated Services**

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

Lenovo Support Services

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

- **Premier Support for Data Centers**

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

- **Premier Support Plus (PSP) for Servers 24x7 4-Hour Response**

Helping customers reduce unplanned downtime by moving from reactive support to proactive and preventative care

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

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

- **Committed Service Repair (CSR)**

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

- **Multivendor Support Services (MVS)**

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

- **Keep Your Drive (KYD)**

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

- **Technical Account Manager (TAM)**

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

- **Enterprise Software Support (ESS)**

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

For more information, consult the brochure [Lenovo Operational Support Services for Data Centers](#).

Lenovo Managed Services

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

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

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

Lenovo Sustainability Services

- **Asset Recovery Services**

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

- **CO2 Offset Services**

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

- **Lenovo Certified Refurbished**

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

Lenovo TruScale

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

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

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

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

Regulatory compliance

The ST50 V3 conforms to the following standards:

External backup units

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

Table 44. External USB backup options

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

For more information, see the list of Product Guides in the Backup units category:

<https://lenovopress.com/servers/options/backup>

Rack cabinets

The ST50 V3 server can be installed horizontally in a rack cabinet using the Rack Mount Kit, as described in the [Rack installation](#) section.

The following table lists the supported rack cabinets.

Table 45. Rack cabinets

Model	Description
7D6DA007WW	ThinkSystem 42U Onyx Primary Heavy Duty Rack Cabinet (1200mm)
7D6DA008WW	ThinkSystem 42U Pearl Primary Heavy Duty Rack Cabinet (1200mm)
7D6EA009WW	ThinkSystem 48U Onyx Primary Heavy Duty Rack Cabinet (1200mm)
7D6EA00AWW	ThinkSystem 48U Pearl Primary Heavy Duty Rack Cabinet (1200mm)
1410O42	Lenovo EveryScale 42U Onyx Heavy Duty Rack Cabinet
1410P42	Lenovo EveryScale 42U Pearl Heavy Duty Rack Cabinet
1410O48	Lenovo EveryScale 48U Onyx Heavy Duty Rack Cabinet
1410P48	Lenovo EveryScale 48U Pearl Heavy Duty Rack Cabinet
93072RX	25U Standard Rack (1000mm)
93072PX	25U Static S2 Standard Rack (1000mm)
93074RX	42U Standard Rack (1000mm)
93604PX	42U 1200mm Deep Dynamic Rack
93614PX	42U 1200mm Deep Static Rack
93634PX	42U 1100mm Dynamic Rack
93634EX	42U 1100mm Dynamic Expansion Rack

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

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

KVM console options

The following table lists the supported KVM consoles.

Table 46. 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 48. KVM switches and options

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

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

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

Lenovo Financial Services

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

- **Flexible**

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

- **100% Solution Financing**

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

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

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

- **24/7 Asset management**

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

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

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

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

Seller training courses

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

1. Identifying Opportunities for Lenovo Solutions at the Edge

2026-05-27 | 25 minutes | Employees and Partners

Sellers should walk away with the ability to identify an opportunity for Lenovo solutions at the Edge.

Objectives:

- Present an overview of Lenovo solution offerings for Edge computing
- Articulate how a Lenovo solution at the Edge can help your customer
- Access Lenovo seller resources for selling Edge solutions

Published: 2026-05-27

Length: 25 minutes

Start the training:

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo 360 Learning Center](#)

Course code: DTEF102r2

2. Partner Technical Webinar - mAIstream Volume Enterprise AI

2026-05-11 | 45 minutes | Employees and Partners

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

Published: 2026-05-11

Length: 45 minutes

Start the training:

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo 360 Learning Center](#)

Course code: MAY0826

3. Partner Technical Webinar - AI Servers

2026-04-20 | 30 minutes | Employees and Partners

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

Published: 2026-04-20

Length: 30 minutes

Start the training:

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo 360 Learning Center](#)

Course code: APR1726

4. **Partner Technical Webinar - Server Review Racks, Towers & Edge**

2026-03-16 | 60 minutes | Employees and Partners

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

Published: 2026-03-16

Length: 60 minutes

Start the training:

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo 360 Learning Center](#)

Course code: MAR1326

5. **ISG Smarter Tools, Faster Deals and Better Outcomes**

2026-02-27 | 40 minutes | Employees and Partners

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

Tags: DataCenter Products

Published: 2026-02-27

Length: 40 minutes

Start the training:

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo 360 Learning Center](#)

Course code: FEB2426

6. **ThinkSystem Rackmount and Tower Servers powered by AMD**

2026-02-23 | 25 minutes | Employees and Partners

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

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

- Identify products and features within the family
- Describe customer benefits offered by this family
- Recognize when a specific product should be selected

Last updated: 2/24/2026

Tags: Server, ThinkSystem

Published: 2026-02-23

Length: 25 minutes

Start the training:

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo 360 Learning Center](#)

Course code: SXXW1216r11

7. **OneIQ Overview and Demo**

2026-02-10 | 35 minutes | Employees and Partners

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

Tags: Sales Tools

Published: 2026-02-10

Length: 35 minutes

Start the training:

Employee link: Grow@Lenovo

Partner link: [Lenovo 360 Learning Center](#)

Course code: ONEIQ101

8. **Family Portfolio: ThinkSystem Rack and Tower Servers Powered by Intel**

2026-02-04 | 25 minutes | Employees and Partners

This course is designed to give Lenovo sales and partner representatives a foundation of the ThinkSystem Intel Rackmount and Tower server family.

After completing this course, you will be able to:

- Identify products within this ThinkSystem server family
- Describe features of this family
- Recognize when a specific product should be selected

Tags: Server, ThinkSystem

Published: 2026-02-04

Length: 25 minutes

Start the training:

Employee link: Grow@Lenovo

Partner link: [Lenovo 360 Learning Center](#)

Course code: SXXW1204r15

9. ThinkSystem Rack & Tower Server Primer - Module 2

2025-12-17 | 45 minutes | Employees Only

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

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

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

Tags: DataCenter Products, ThinkSystem

Published: 2025-12-17

Length: 45 minutes

Start the training:

Employee link: Grow@Lenovo

Course code: DSRTB101

10. Partner Technical Webinar - Mainstream CPUs

2025-09-29 | 40 minutes | Employees and Partners

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

Tags: Server

Published: 2025-09-29

Length: 40 minutes

Start the training:

Employee link: Grow@Lenovo

Partner link: [Lenovo 360 Learning Center](#)

Course code: SEP2625

11. Partner Technical Webinar - ISG Portfolio - Wayne's World

2025-09-25 | 60 minutes | Employees and Partners

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

Tags: Channel, Technical Sales

Published: 2025-09-25

Length: 60 minutes

Start the training:

Employee link: Grow@Lenovo

Partner link: [Lenovo 360 Learning Center](#)

Course code: SEP1925

12. **Think AI Weekly: ISG & SSG Better Together: Uniting AI Solutions & Services for Smarter Outcomes**

2025-08-01 | 55 minutes | Employees Only

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

Topics include:

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

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

Published: 2025-08-01

Length: 55 minutes

Start the training:

Employee link: Grow@Lenovo

Course code: DTAIW145

13. **VTT-HPC: Explaining HPC Benchmarking: Processes, Standards and Best Practices**

2025-07-30 | 87 minutes | Employees Only

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

Topics will include:

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

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

Published: 2025-07-30

Length: 87 minutes

Start the training:

Employee link: Grow@Lenovo

Course code: DVHPC224

14. **Family Portfolio: Server Component Options**

2025-07-21 | 20 minutes | Employees and Partners

This course covers opportunities that are available to upsell server components. By upselling the correct components, you can increase the size and revenue of the original sale.

After completing this course, you should be able to:

- Identify the opportunities for an upsell
- Recognize when specific products should be discussed
- Emphasize how a product benefits the customer
- Identify keywords that indicate upsell opportunities

Tags: Server, Storage

Published: 2025-07-21

Length: 20 minutes

Start the training:

Employee link: Grow@Lenovo

Partner link: [Lenovo 360 Learning Center](#)

Course code: SXXW1109r2

15. **ThinkSystem Rack and Tower Introduction for ISO Client Managers**

2025-06-16 | 20 minutes | Employees Only

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

Tags: Server, ThinkSystem

Published: 2025-06-16

Length: 20 minutes

Start the training:

Employee link: Grow@Lenovo

Course code: DSRT0101r2_JP

16. **Lenovo Data Center Product Portfolio**

2025-06-11 | 20 minutes | Employees and Partners

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

Course objectives:

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

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

Published: 2025-06-11

Length: 20 minutes

Start the training:

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo 360 Learning Center](#)

Course code: SXXW1110r8

17. **VTT HPC: AI and the Impact on the Environment**

2025-06-11 | 58 minutes | Employees Only

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

Topics will include:

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

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

Published: 2025-06-11

Length: 58 minutes

Start the training:

Employee link: [Grow@Lenovo](#)

Course code: DVHPC223

18. **Partner Technical Webinar - RTX Pro 6000**

2025-05-22 | 60 minutes | Employees and Partners

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

Tags: Artificial Intelligence (AI)

Published: 2025-05-22

Length: 60 minutes

Start the training:

Employee link: Grow@Lenovo

Partner link: [Lenovo 360 Learning Center](#)

Course code: MAY1525

19. **Partner Technical Webinar - DCSC Improvements - MAY0225**

2025-05-05 | 60 minutes | Employees and Partners

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

Tags: Technical Sales

Published: 2025-05-05

Length: 60 minutes

Start the training:

Employee link: Grow@Lenovo

Partner link: [Lenovo 360 Learning Center](#)

Course code: MAY0225

20. **Family Portfolio: Storage Controller Options**

2025-03-03 | 25 minutes | Employees and Partners

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

After completing this course, you will be able to:

- Describe the classes of storage controllers
- Discuss where each controller class is used
- Describe the available options in each controller class

Tags: Sales, Storage

Published: 2025-03-03

Length: 25 minutes

Start the training:

Employee link: Grow@Lenovo

Partner link: [Lenovo 360 Learning Center](#)

Course code: SXXW1111r2

21. **ThinkSystem Rack and Tower Introduction for ISO Client Managers**

2024-12-10 | 20 minutes | Employees Only

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

Course Objectives:

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

Tags: Server, ThinkSystem

Published: 2024-12-10

Length: 20 minutes

Start the training:

Employee link: Grow@Lenovo

Course code: DSRT0101r2

22. **SAP Webinar for Lenovo Sellers: Lenovo Portfolio Update for SAP Landscapes**

2024-06-04 | 60 minutes | Employees Only

Join Mark Kelly, Advisory IT Architect with the Lenovo Global SAP Center of Competence as he discusses:

- Challenges in the SAP environment
- Lenovo On-premise Solutions for SAP
- Lenovo support resources for SAP solutions

Tags: SAP, ThinkAgile, ThinkEdge, ThinkSystem

Published: 2024-06-04

Length: 60 minutes

Start the training:

Employee link: Grow@Lenovo

Course code: DSAPF101

Related publications and links

For more information, see these resources:

- ThinkSystem ST50 V3 product page
<https://www.lenovo.com/us/en/p/servers-storage/servers/towers/lenovo-thinksystem-st50-v3/len21ts0034>
- ThinkSystem ST50 V3 interactive 3D tour
<https://lenovopress.lenovo.com/3dtours/st50-v3/>
- ThinkSystem ST50 V3 drivers and support
<https://datacentersupport.lenovo.com/us/en>
- Lenovo ThinkSystem ST50 V3 product publications:
<https://pubs.lenovo.com/st50-v3/>
 - User Guide, which includes:
 - System Configuration Guide
 - Hardware Maintenance Guide
 - Rack Installation Guides
 - Messages and Codes Reference
 - UEFI Manual for ThinkSystem Servers
- ServerProven hardware compatibility:
<https://serverproven.lenovo.com/server/st50-v3>

Related product families

Product families related to this document are the following:

- [1-Socket Tower Servers](#)
- [ThinkSystem ST50 V3 Server](#)

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