

Lenovo ThinkSystem ST50 V2 Server

Product Guide

The Lenovo ThinkSystem ST50 V2 single-socket tower server is an entry level server ideal for small businesses, home offices, retail, educational institutions and branch offices. The server supports one Intel Xeon E-2300 Series processor (formerly codenamed "Rocket Lake") or Intel Pentium ("Comet Lake Refresh") and up to 128 GB of 3200 MHz TruDDR4 ECC memory.

The following figure shows the ThinkSystem ST50 V2.



Figure 1. Lenovo ThinkSystem ST50 V2

Did you know?

The ThinkSystem ST50 V2 offers enterprise-class reliability features such as error correcting code (ECC) memory, the onboard RAID controller, and enterprise-class hard drives and network adapters at an affordable price. The server has Intel Active Management Technology (AMT) built-in, along with support for industry-standard management tools. The ST50 V2 runs a wide range of server operating systems and is quiet enough and small enough to fit under or beside an office desk.

Key features

The ThinkSystem ST50 V2 server is an 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 V2 offers numerous features to boost performance, improve scalability, and reduce costs:

- Improved single-socket processor performance:
 - Intel Xeon E-2300 Series processors ("Rocket Lake-E") up to 8 cores and core speeds up to 3.7 GHz
 - Intel Pentium G6405, G6505 and G6605 processors ("Comet Lake Refresh") with 2 cores and core speeds up to 4.3 GHz
- Up to four 3200 MHz DDR4 ECC UDIMMs provide speed and capacity of up to 64 GB (planned support for up to 128 GB)
- Three PCIe slots for I/O expansion, one of which has the new PCIe Gen4 interface to maximize I/O performance.
- Support for a NVMe M.2 drive for OS boot operations
- Up to three non-hot-swap (NHS) drive bays, two 3.5-inch and one 2.5-inch, supporting hard disk drives (HDDs) or solid-state drives (SSDs) provide flexible internal storage capacity.
- The use of SSDs instead of, or along with, traditional spinning drives (HDDs) can significantly improve I/O performance.

Availability and serviceability

The ST50 V2 provides many features to simplify serviceability and increase system uptime:

- Designed to run 24 hours a day, 7 days a week
- The server 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.
- Tool-less cover removal provides easy access to upgrades and serviceable parts, such as memory and adapter cards.
- A choice of affordable onboard SATA RAID or advanced hardware RAID redundancy offers data protection and greater system uptime.
- The use of SSDs can provide better reliability than the use of traditional HDDs, for greater uptime.
- Built-in Active Management Technology based on Intel Active Management Technology (AMT) 15.0 which continuously monitors system parameters, sends alerts, and enables administrators to perform remote recovery actions to minimize downtime.
- The Lenovo XClarity Provisioning Manager Lite tool can be used to install an operating system on the server and perform system diagnostics.
- 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

Powerful systems management features simplify local and remote management of the ST50 V2:

- Intel Active Management Technology (AMT) 15.0 monitors server availability and enables administrators to perform remote management.
- An integrated industry-standard Unified Extensible Firmware Interface (UEFI) enables improved setup, configuration, and updates, and simplifies error handling.
- An integrated hardware Trusted Platform Module (TPM) supporting TPM 2.0 enables advanced cryptographic functionality, such as digital signatures and remote attestation.
- Administrator and power-on passwords help protect from unauthorized access to the server.
- A padlock loop at the rear of the server plus an optional intrusion switch on the cover of the server help detect and prevent unauthorized physical access to the internal components of the server.
- A slot for a Kensington-style cable lock helps prevent theft.

Energy efficiency

The ST50 V2 offers the following energy saving features to save energy, reduce operational costs, increase energy availability, and contribute to a green environment:

- 80 PLUS Platinum-certified power supply (select models) enables greater energy savings while providing flexibility to meet your business needs.
- Intelligent Cooling Engine (ICE) actively monitors component temperatures in real-time and optimally adjusts the speeds of the fans to keep the system cooler and quieter.
- The ThinkSystem Capacity Planner tool provides information about the power consumption and electric current calculation for the different configurations of servers and other devices, which helps plan deployment of servers and devices in an efficient way.
- Intel Intelligent Power Capability powers individual processor elements on and off as needed, to reduce power draw.

Comparing the ST50 V2 to the ST50

The ThinkSystem ST50 V2 improves on the previous generation ST50, as summarized in the following table.

Table 1. Comparing the ST50 V2 to the ST50

| Feature | ST50 V2 | ST50 | Benefits |
|-------------|--|--|--|
| Form Factor | <ul style="list-style-type: none"> • 1-Socket (1S) Entry Tower • 17 liter chassis | <ul style="list-style-type: none"> • 1-Socket (1S) Entry Tower • 25 liter chassis | <ul style="list-style-type: none"> • Smaller unit takes up less space |
| Processor | <ul style="list-style-type: none"> • Support single Xeon E2300 Series "Rocket Lake" processor up to 8C / 95W • Also supports Pentium processors • Intel C256 "Tiger Lake" Platform Controller Hub (PCH) | <ul style="list-style-type: none"> • 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) | <ul style="list-style-type: none"> • Supports the latest generation Intel Xeon E processors |
| GPU | <ul style="list-style-type: none"> • NVIDIA Quadro T1000 PCIe Active GPU | <ul style="list-style-type: none"> • NVIDIA Quadro P620 2GB PCIe Active GPU | <ul style="list-style-type: none"> • GPU for advanced graphics processing |

| Feature | ST50 V2 | ST50 | Benefits |
|------------|--|--|--|
| Memory | <ul style="list-style-type: none"> 4x UDIMM slots, up to 64GB (128GB planned), 3200MHz with Xeon E-2300 processors 4x UDIMM slots, up to 64GB (128GB planned), 2666MHz with Pentium processors TruDDR4 ECC memory | <ul style="list-style-type: none"> 4x UDIMM slots, up to 64GB, 2666MHz TruDDR4 ECC memory (in China, also support for non-ECC memory) | <ul style="list-style-type: none"> Enterprise-grade memory sufficient for most SMB and retail applications |
| Storage | <ul style="list-style-type: none"> 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) | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Support for both HDDs for capacity and SSDs for performance Optical drive support for ease of software installation M.2 drive support to separate the OS from the applications and data |
| RAID | <ul style="list-style-type: none"> Intel VROC 6.x SW RAID HW RAID support (limited) | <ul style="list-style-type: none"> Intel RSTe SW RAID HW RAID support (limited) | <ul style="list-style-type: none"> RAID capability maximizes reliability and uptime |
| Cooling | <ul style="list-style-type: none"> 2x system fans (Front drive bay and rear), 1x CPU fan | <ul style="list-style-type: none"> 2x system fans (Front drive bay and rear), 1x CPU fan | <ul style="list-style-type: none"> Ensures all components are sufficiently cooled |
| Networking | <ul style="list-style-type: none"> 1x 1GbE Embedded (Intel I219-LM) | <ul style="list-style-type: none"> 1x 1GbE Embedded (Intel I219-LM) | <ul style="list-style-type: none"> Easy built-in networking |
| Management | <ul style="list-style-type: none"> Intel AMT 15 Management TPM embedded: TPM 2.0 Lenovo XClarity Provisioning Manager Lite (USB based) | <ul style="list-style-type: none"> Intel AMT 12 Management TPM embedded Optional : TPM 2.0 / TPM 1.2 Lenovo XClarity Provisioning Manager Lite (USB based) | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 3 PCIe slots (x16, x4, x1) Includes a PCIe Gen4 x16 slot (requires Xeon E-2300 processor) | <ul style="list-style-type: none"> 3 PCIe slots (x16, x4, x1) Includes a PCIe Gen3 x16 slot | <ul style="list-style-type: none"> Support the latest PCIe Gen4 slot technology Support for a high-performance PCIe x16 adapter |

| Feature | ST50 V2 | ST50 | Benefits |
|--------------|--|---|--|
| Front I/O | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • Power button & LED • Thermal sensor • 2x USB 3.1 G1 (5 Gbps) ports | <ul style="list-style-type: none"> • Expansive USB support • Thermal sensor ensures the server does not overheat if the ambient temperature rises |
| Rear I/O | <ul style="list-style-type: none"> • 4x USB 3.2 G1 (5 Gbps) ports • 2x DP Ports • 1x Serial port • 1x 1GbE LAN • 1x Audio line out | <ul style="list-style-type: none"> • 2x USB 3.1 G1 (5 Gbps), 2x USB 2.0 ports • 2x DP Ports • 1x Serial port • 1x 1GbE LAN • 1x Audio line out | <ul style="list-style-type: none"> • Expansive USB support • Integrated Gigabit networking • Serial port for applications that require it |
| Power Supply | <ul style="list-style-type: none"> • 1x Fixed power supply • Choose from 300W Gold or 500W Platinum | <ul style="list-style-type: none"> • 1x Fixed power supply • Choose from 250W Platinum or 400W Platinum | <ul style="list-style-type: none"> • Select the power supply that best suits the configuration to maximize efficiency |

Components and connectors

The following figure shows the front of the server.

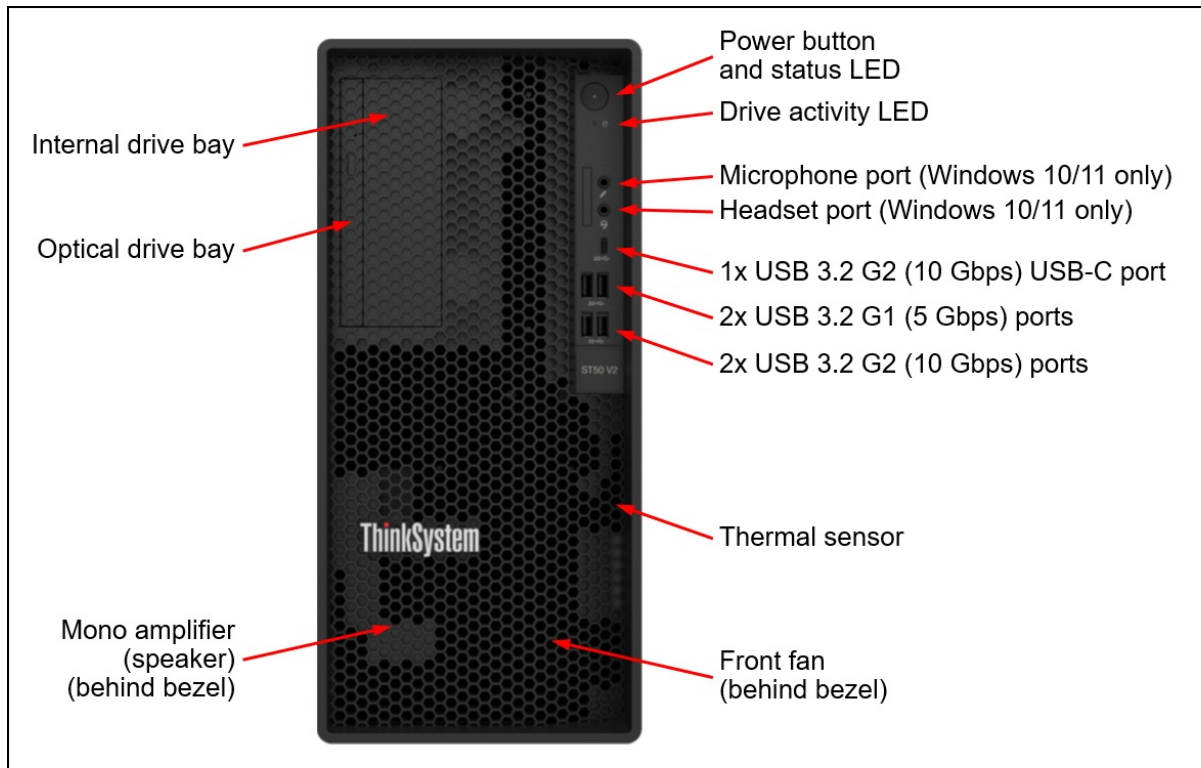


Figure 2. Front view of the ThinkSystem ST50 V2 server

The following figure shows the rear of the server.

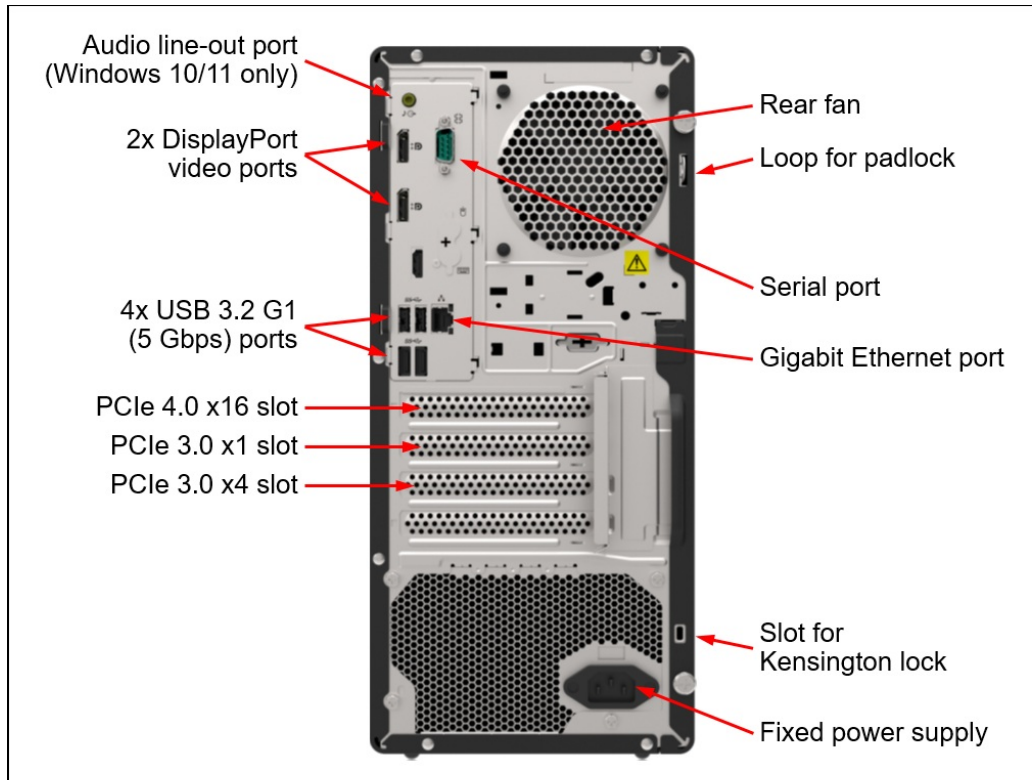


Figure 3. Rear view of the ThinkSystem ST50 V2 server

The following figure shows the locations of key components inside the server. The optical drive bay and drive bays 2 and 3 are removed to show the system board. To view the drive bays, see the [Internal storage](#) section.

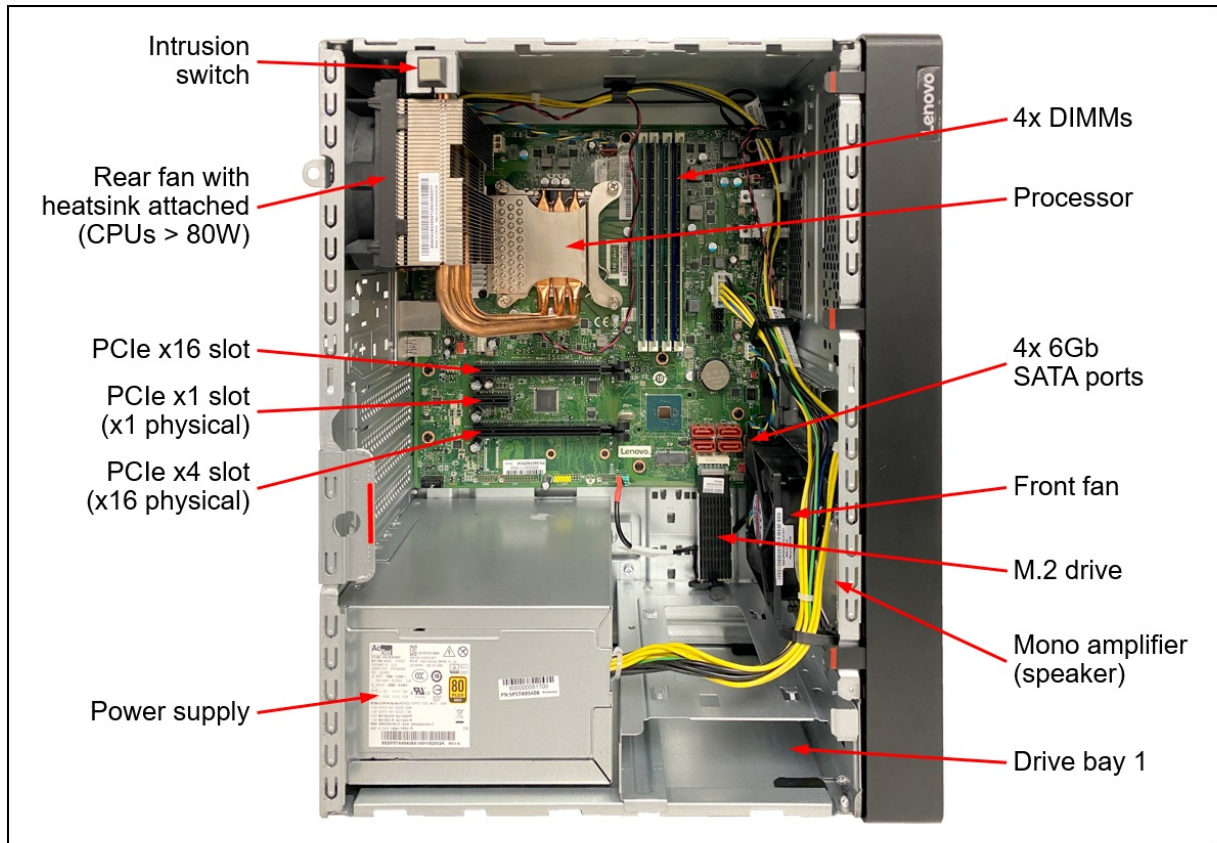


Figure 4. Internal view of the ThinkSystem ST50 V2 server

System architecture

The following figure shows the architectural block diagram of the ST50 V2, showing the major components and their connections.

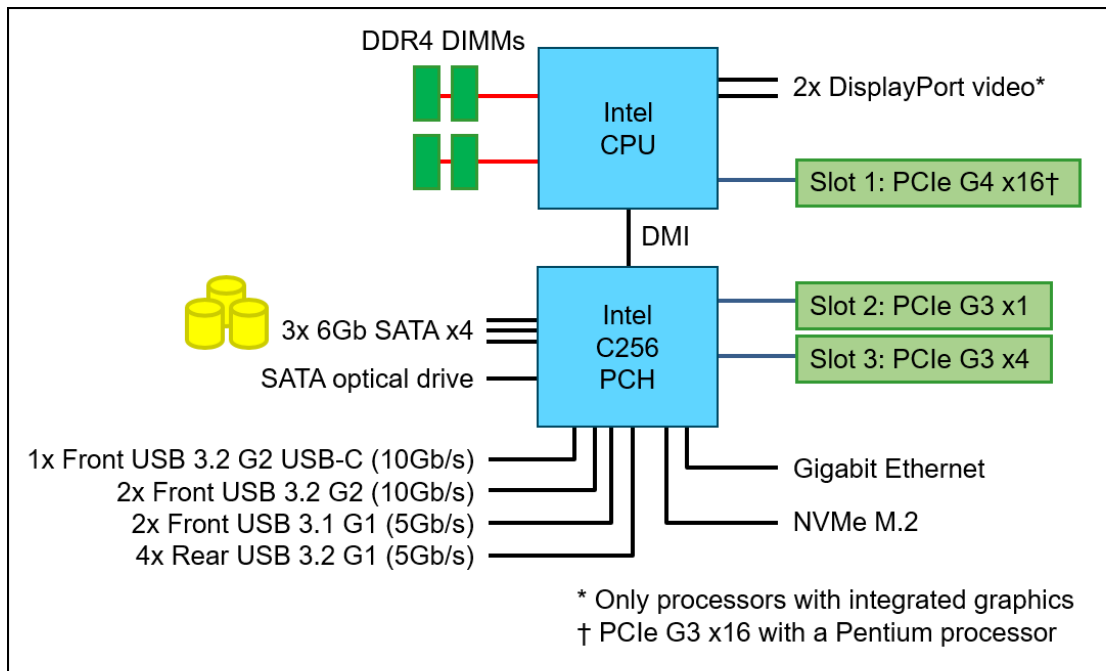


Figure 5. ST50 V2 system architectural block diagram

Standard specifications

The following table lists the standard specifications.

Table 2. Standard specifications

| Components | Specification |
|--------------------------|---|
| Machine type | 7D8K - 1 year warranty 7D8J - 3 year warranty |
| Form factor | Tower (can be installed in a rack with the available Rack Mount Kit) |
| Processor | One Intel processor. Choose from: <ul style="list-style-type: none"> Intel Xeon E-2300 Series processors ("Rocket Lake-E") up to to 8 cores, with core speeds up to 3.7 GHz Intel Pentium G6405, G6505 and G6605 processors ("Comet Lake Refresh") with 2 cores, with core speeds up to 4.3 GHz |
| Chipset | Intel C256 chipset ("Tiger Lake") part of the "Tatlow" platform |
| Memory | Four DIMM sockets supporting Lenovo TruDDR4 DIMMs at 3200 MHz (Xeon processors) or 2666 MHz (Pentium processors). Support ECC UDIMMs. |
| Memory maximums | Up to 64 GB using 4x 16 GB UDIMMs. Planned support for 128 GB using 4x 32 GB UDIMMs. |
| Memory protection | Error-correcting code (ECC) |
| Disk drive bays | Up to 3x non-hot swap (NHS) drive bays: <ul style="list-style-type: none"> 2x 3.5-inch NHS drive bays supporting HDDs or SSDs 1x 2.5-inch NHS drive bay supporting an SSD <p>The server can be configured without any HDDs or SSDs. The server also supports 1x NVMe M.2 drive installed in a socket on the system board as a boot drive.</p> |
| Maximum internal storage | <ul style="list-style-type: none"> 3.5-inch drives: <ul style="list-style-type: none"> 16TB using 2x 8TB 3.5-inch HDDs 1.92TB using 2x 960GB 3.5-inch SATA SSDs 2.5-inch drives: <ul style="list-style-type: none"> 960GB using 1x 960GB 2.5-inch SATA SSDs <p>HDDs and SSDs can be installed in the same server but are not supported in the same RAID volume</p> |
| Storage controller | <ul style="list-style-type: none"> Onboard 6 Gb SATA controller, supporting AHCI mode (non-RAID) or Intel RSTe software RAID (RAID 0, 1, 5) RAID 5350-8i adapter 4350-8i SAS/SATA 12Gb HBA |
| Optical drive | Optional slim DVD-RW drive in dedicated bay. |
| Network interfaces | One integrated Gigabit Ethernet 1000BASE-T port (RJ-45) using Intel I219-LM controller. |

| Components | Specification |
|-----------------------------|---|
| PCI Expansion slots | <p>Three PCIe slots as follows:</p> <ul style="list-style-type: none"> ● Slot 1: PCIe 4.0 x16 full-height half-length (FHHL) ● Slot 2: PCIe 3.0 x1 FHHL ● Slot 3: PCIe 3.0 x4 (physical connector is x16) FHHL <p>With a Pentium processor, Slot 1 is PCIe 3.0.</p> |
| Ports | <p>Front ports:</p> <ul style="list-style-type: none"> ● Five USB ports <ul style="list-style-type: none"> ○ 1x USB 3.2 G2 with USB-C connector (10Gbps) ○ 2x USB 3.2 G2 (10Gbps) ○ 2x USB 3.2 G1 (5Gbps) ● Microphone port* ● Headset port* <p>Rear ports:</p> <ul style="list-style-type: none"> ● Four USB ports (all USB 3.2 G1 (5Gbps)) ● Two DisplayPort video ports (require a processor with integrated graphics) ● One RJ-45 Gigabit Ethernet port ● One serial port ● One audio line-out port* <p>* Windows 10 and Windows 11 only; some line noise is possible</p> |
| Audio | Mono amplifier (speaker) mounted on the inside of the front bezel; Audio line-out port at the rear of the server; microphone and headset ports at the front of the server |
| Cooling | Two fixed system fans. Additional fans attached to the processor and power supply. Supports ASHRAE A2 environments. |
| Power supply | One fixed power supply, either 300W (80 PLUS Gold) or 500W (80 PLUS Platinum) power supply. |
| Hot-swap parts | None |
| Systems management | Power and drive activity LEDs. Intel Active Management Technology (AMT) 15.0 server management. Supports Integrated Lenovo XClarity Provisioning Manager Lite (USB memory key-based) for system setup and firmware upgrades. No support for XClarity Controller (XCC). |
| Security features | Power-on password, administrator's password, Trusted Platform Module (TPM), supporting TPM 2.0. Optional Chassis intrusion switch. Padlock loop and Kensington cable slot for physical security. |
| Video | Integrated Intel Graphics Technology (Intel GT) on most processors - see the Processors section. Two DisplayPort ports. Maximum resolution is 3840 x 2160 pixels (4K) at a refresh rate of 60Hz. On servers with a processor that does not have integrated graphics, the two DP ports are not connected and a separate GPU adapter is required. See GPU adapters for details. |
| Operating systems supported | Microsoft Windows Server, Red Hat Enterprise Linux, VMware ESXi. See the Operating system support section for specifics. |
| Limited warranty | Three-year or one-year (model dependent) customer-replaceable unit and onsite limited warranty with 9x5 next business day (NBD). |
| Service and support | Optional service upgrades are available through Lenovo Services: 4-hour or 2-hour response time, 6-hour fix time, 1-year or 2-year warranty extension, software support for Lenovo hardware and some third-party applications. |

| Components | Specification |
|------------|---|
| Dimensions | Width: 170 mm (6.7 in.), height: 376 mm (14.8 in.), depth: 316 mm (12.4 in.). See Physical and electrical specifications for details. |
| Weight | Maximum: 9.4 kg (20.7 lb) |

The server is shipped with the following items:

- Documentation flyer
- Power cord (model and region dependent)

Models

ThinkSystem ST50 V2 models can be configured by using the [Lenovo Data Center Solution Configurator \(DCSC\)](#).

Configure-to-order (CTO) models are used to create models with factory-integrated server customizations. For CTO models, two base CTO models are available for the ST50 V2 as listed in the following table, CTO1WW and CTOLWW:

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

Preconfigured server models may also be available for the ST50 V2, however these are region-specific; that is, each region may define their own server models, and not all server models are available in every region.

The following table lists the base CTO models of the ThinkSystem ST50 V2 server.

Table 3. Base CTO models

| Description | Machine Type/Model General purpose | Machine Type/Model for HPC and AI |
|---------------------------------------|---------------------------------------|--------------------------------------|
| ThinkSystem ST50 V2 - 3 year Warranty | 7D8JCTO1WW | 7D8JCTOLWW |
| ThinkSystem ST50 V2 - 1 year Warranty | 7D8KCTO1WW | 7D8KCTOLWW |

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 region](#)
- [Models for India](#)
- [Models for Japan](#)
- [Models for Latin American countries \(except Brazil\)](#)
- [Models for USA and Canada](#)

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

Models for Asia Pacific region

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

Table 4. Models for Asia Pacific markets

| Model | Intel processors† | Memory | Drive Contr | Drive bays (max 3); Drives | DVD | Cards | GPU | Power supply & cord | Rear fan | Dongle | Intru sw. |
|--|-----------------------------|--------|-------------|----------------------------|--------|-------|-----|---------------------|----------|--------|-----------|
| Standard models with a 3-year warranty (machine type 7D8J) | | | | | | | | | | | |
| 7D8JA00WAP | Xeon E-2324G 4C 65W 3.1G | 1x 8GB | SATA | 1x 3.5" bay; Open bay | DVD-RW | Opt | Opt | 500W / No | Opt | Option | Opt |
| 7D8JA00UAP | Xeon E-2356G 6C 80W 3.2G | 1x 8GB | SATA | 1x 3.5" bay; Open bay | DVD-RW | Opt | Opt | 500W / No | Opt | Option | Opt |
| 7D8JA00TAP | Xeon E-2386G 6C 95W 3.5G | 1x 8GB | SATA | 1x 3.5" bay; Open bay | DVD-RW | Opt | Opt | 500W / No | Opt | Option | Opt |

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

Models for Australia and New Zealand

AP models: Customers in Australia and New Zealand also have access to the [Asia Pacific region](#) models.

Table 5. Models for Australia and New Zealand

| Model | Intel processors† | Memory | Drive Contr | Drive bays (max 3); Drives | DVD | Cards | GPU | Power supply & cord | Rear fan | Dongle | Intru sw. |
|---|-----------------------------|---------|-------------|---------------------------------|-----|-------|-----|---------------------|----------|--------|-----------|
| TopSeller models with a 3-year warranty (machine type 7D8J) | | | | | | | | | | | |
| 7D8JA00LAU | Xeon E-2324G 4C 65W 3.1G | 1x 8GB | SATA | 2x 3.5"+ 1x 2.5" bays; Open bay | Opt | Opt | No | 300W / Yes | Yes | Option | Yes |
| 7D8JA00KAU | Xeon E-2356G 6C 80W 3.2G | 1x 16GB | SATA | 2x 3.5"+ 1x 2.5" bays; Open bay | Opt | Opt | No | 300W / Yes | Yes | Option | Yes |
| 7D8JA00CAU | Xeon E-2378G 8C 80W 2.8G | 1x 16GB | SATA | 2x 3.5"+ 1x 2.5" bays; Open bay | Opt | Opt | Opt | 500W / Yes | Yes | Option | Yes |

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

Models for Brazil

Table 6. Models for Brazil

| Model | Intel processors† | Memory | Drive Contr | Drive bays (max 3); Drives | DVD | Cards | GPU | Power supply & cord | Rear fan | Dongle | Intru sw. |
|---|--------------------------|---------|-------------|--|-----|---------------|-------|---------------------|----------|--------|-----------|
| Standard models with a 3-year warranty (machine type 7D8J) | | | | | | | | | | | |
| 7D8J1003BR | Xeon E-2324G 4C 65W 3.1G | 1x 16GB | SATA | 1x 3.5" bay; 1x 2TB HDD | Opt | 1x 2x1Gb 5720 | Opt | 500W / Yes | Opt | Option | Opt |
| 7D8J1004BR | Xeon E-2324G 4C 65W 3.1G | 1x 16GB | SATA | 1x 3.5" bay; 1x 4TB HDD | Opt | Opt | Opt | 500W / Yes | Opt | Option | Opt |
| TopSeller models with a 3-year warranty (machine type 7D8J) | | | | | | | | | | | |
| 7D8JA02DBR | Xeon E-2324G 4C 65W 3.1G | 1x 16GB | SATA | 2x 3.5" bays; 1x 4TB HDD | Opt | Opt | Opt | 500W / No | Yes | Option | Opt |
| 7D8J1005BR | Xeon E-2356G 6C 80W 3.2G | 2x 16GB | SATA | 1x 3.5" bay; Open bay, 1x 960GB N600Si M.2 | Opt | 1x 4x1Gb 5719 | T1000 | 500W / Yes | Opt | Option | Opt |

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

Models for EMEA region

Table 7. Models for EMEA region

| Model | Intel processors† | Mem | Drive Contr | Drive bays (max 3); Drives | DVD | Cards | GPU | Power supply & cord | Rear fan | Dongle | Intru sw. |
|--|--------------------------|---------|-------------|---|--------|-------|-----|---------------------|----------|--------|-----------|
| Standard models with a 3-year warranty (machine type 7D8J) | | | | | | | | | | | |
| 7D8J1009EA | Xeon E-2324G 4C 65W 3.1G | 1x 8GB | SATA | 1x 3.5" bay; 1x 1TB Client HDD | Opt | Opt | Opt | 500W / Yes | Opt | 1x VGA | Yes |
| 7D8J100AEA | Xeon E-2324G 4C 65W 3.1G | 1x 8GB | SATA | 2x 3.5"+ 1x 2.5" bays; 2x 3.5" 480GB 5300 | Opt | Opt | Opt | 500W / Yes | Yes | 1x VGA | Yes |
| 7D8J100BEA | Xeon E-2324G 4C 65W 3.1G | 1x 16GB | SATA | 2x 3.5"+ 1x 2.5" bays; 2x 3.5" 480GB 5300 | Opt | Opt | Opt | 500W / Yes | Yes | 1x VGA | Yes |
| 7D8J100CEA | Xeon E-2324G 4C 65W 3.1G | 1x 8GB | SATA | 1x 3.5" bay; 1x 1TB HDD | Opt | Opt | Opt | 500W / Yes | Opt | 1x VGA | Yes |
| 7D8JA007EA | Xeon E-2324G 4C 65W 3.1G | 1x 16GB | SATA | 2x 3.5"+ 1x 2.5" bays; 2x 2TB HDD | Opt | Opt | Opt | 500W / Yes | Yes | 1x VGA | Opt |
| 7D8JA00AEA | Xeon E-2324G 4C 65W 3.1G | 1x 8GB | SATA | 2x 3.5" bays; 2x 1TB Client HDD | DVD-RW | Opt | Opt | 500W / Yes | Yes | 1x VGA | Opt |
| 7D8JA00BEA | Xeon E-2324G 4C 65W 3.1G | 1x 16GB | SATA | 2x 3.5"+ 1x 2.5" bays; 2x 2TB HDD | DVD-RW | Opt | Opt | 500W / Yes | Yes | 1x VGA | Opt |
| 7D8JA00DEA | Xeon E-2324G 4C 65W 3.1G | 1x 16GB | SATA | 2x 3.5" bays; 2x 2TB Client HDD | DVD-RW | Opt | Opt | 500W / Yes | Yes | 1x VGA | Opt |
| 7D8JA00HEA | Xeon E-2324G 4C 65W 3.1G | 1x 8GB | SATA | 2x 3.5"+ 1x 2.5" bays; 2x 1TB HDD | DVD-RW | Opt | Opt | 500W / Yes | Yes | 1x VGA | Opt |

| Model | Intel processors† | Mem | Drive Contr | Drive bays (max 3); Drives | DVD | Cards | GPU | Power supply & cord | Rear fan | Dongle | Intru sw. |
|------------|----------------------------|--------|-------------|--|--------|-------|-----|---------------------|----------|--------|-----------|
| 7D8JA00NEA | Xeon E-2324G4C 65W3.1G | 1x8GB | SATA | 2x3.5"+ 1x2.5" bays; 2x 2TB HDD | Opt | Opt | Opt | 500W / Yes | Yes | 1x VGA | Opt |
| 7D8JA00PEA | Xeon E-2324G4C 65W3.1G | 1x8GB | SATA | 2x3.5"+ 1x2.5" bays; 2x 1TB HDD | Opt | Opt | Opt | 500W / Yes | Yes | 1x VGA | Opt |
| 7D8JA00QEA | Xeon E-2324G4C 65W3.1G | 1x8GB | SATA | 2x3.5" bays; 2x 1TB Client HDD | Opt | Opt | Opt | 500W / Yes | Yes | 1x VGA | Opt |
| 7D8JA00SEA | Xeon E-2324G4C 65W3.1G | 1x16GB | SATA | 2x3.5"+ 1x2.5" bays; 2x 1TB HDD | Opt | Opt | Opt | 500W / Yes | Yes | 1x VGA | Opt |
| 7D8JA02CEA | Xeon E-2324G4C 65W3.1G | 1x8GB | 5350-8i | 2x3.5"+ 1x2.5" bays; 1x 1TB HDD | DVD-RW | Opt | Opt | 500W / Yes | Yes | 1x VGA | Yes |
| 7D8JA008EA | Xeon E-2356G6C 80W3.2G | 1x16GB | SATA | 1x3.5" + 1x2.5" bays; 1x 3.5" 480GB 5300, 1x 2.5" 480GB 5300 | Opt | Opt | Opt | 500W / Yes | Opt | 1x VGA | Opt |
| 7D8JA00FEA | Xeon E-2356G6C 80W3.2G | 1x16GB | SATA | 2x3.5"+ 1x2.5" bays; 2x 2TB HDD | DVD-RW | Opt | Opt | 500W / Yes | Yes | 1x VGA | Opt |
| 7D8JA00GEA | Xeon E-2356G6C 80W3.2G | 1x16GB | SATA | 1x3.5" + 1x2.5" bays; 1x 3.5" 480GB 5300, 1x 2.5" 480GB 5300 | DVD-RW | Opt | Opt | 500W / Yes | Opt | 1x VGA | Opt |
| 7D8JA00MEA | Xeon E-2356G6C 80W3.2G | 1x16GB | SATA | 2x3.5"+ 1x2.5" bays; 2x 2TB HDD | Opt | Opt | Opt | 500W / Yes | Yes | 1x VGA | Opt |
| 7D8JA00REA | Xeon E-2356G6C 80W3.2G | 1x8GB | SATA | 2x3.5"+ 1x2.5" bays; 2x 2TB HDD | Opt | Opt | Opt | 500W / Yes | Yes | 1x VGA | Opt |
| 7D8JA026EA | Xeon E-2356G6C 80W3.2G | 1x8GB | SATA | 2x3.5"+ 1x2.5" bays; Open bay | DVD-RW | Opt | Opt | 500W / Yes | Yes | 1x VGA | Yes |
| 7D8JA027EA | Xeon E-2356G6C 80W3.2G | 1x8GB | SATA | 2x3.5"+ 1x2.5" bays; 1x 1TB HDD | DVD-RW | Opt | Opt | 500W / Yes | Yes | 1x VGA | Yes |
| 7D8JA028EA | Xeon E-2356G6C 80W3.2G | 1x8GB | SATA | 2x3.5"+ 1x2.5" bays; 1x 2TB HDD | DVD-RW | Opt | Opt | 500W / Yes | Yes | 1x VGA | Yes |
| 7D8JA029EA | Xeon E-2356G6C 80W3.2G | 1x8GB | SATA | 2x3.5"+ 1x2.5" bays; 1x 2TB HDD | Opt | Opt | Opt | 500W / Yes | Yes | 1x VGA | Yes |
| 7D8JA02AEA | Xeon E-2356G6C 80W3.2G | 1x8GB | SATA | 2x3.5"+ 1x2.5" bays; 1x 1TB HDD | Opt | Opt | Opt | 500W / Yes | Yes | 1x VGA | Yes |
| 7D8JA02BEA | Xeon E-2356G6C 80W3.2G | 1x8GB | SATA | 2x3.5"+ 1x2.5" bays; Open bay | Opt | Opt | Opt | 500W / Yes | Yes | 1x VGA | Yes |
| 7D8JA020EA | Pentium G65052C 58W4.2G | 1x8GB | SATA | 2x3.5"+ 1x2.5" bays; Open bay | Opt | Opt | Opt | 500W / Yes | Yes | 1x VGA | Yes |

| Model | Intel processors† | Mem | Drive Contr | Drive bays (max 3); Drives | DVD | Cards | GPU | Power supply & cord | Rear fan | Dongle | Intru sw. |
|------------|------------------------------|--------|-------------|-----------------------------------|--------|-------|-----|---------------------|----------|--------|-----------|
| 7D8JA021EA | Pentium G6505 2C 58W 4.2G | 1x 8GB | SATA | 2x 3.5"+ 1x 2.5" bays; 1x 1TB HDD | Opt | Opt | Opt | 500W / Yes | Yes | 1x VGA | Yes |
| 7D8JA022EA | Pentium G6505 2C 58W 4.2G | 1x 8GB | SATA | 2x 3.5"+ 1x 2.5" bays; 1x 2TB HDD | Opt | Opt | Opt | 500W / Yes | Yes | 1x VGA | Yes |
| 7D8JA023EA | Pentium G6505 2C 58W 4.2G | 1x 8GB | SATA | 2x 3.5"+ 1x 2.5" bays; 1x 2TB HDD | DVD-RW | Opt | Opt | 500W / Yes | Yes | 1x VGA | Yes |
| 7D8JA024EA | Pentium G6505 2C 58W 4.2G | 1x 8GB | SATA | 2x 3.5"+ 1x 2.5" bays; 1x 1TB HDD | DVD-RW | Opt | Opt | 500W / Yes | Yes | 1x VGA | Yes |
| 7D8JA025EA | Pentium G6505 2C 58W 4.2G | 1x 8GB | SATA | 2x 3.5"+ 1x 2.5" bays; Open bay | DVD-RW | Opt | Opt | 500W / Yes | Yes | 1x VGA | Yes |

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

Models for India

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

Table 8. Models for India

| Model | Intel processors† | Memory | Drive Contr | Drive bays (max 3); Drives | DVD | Cards | GPU | Power supply & cord | Rear fan | Dongle | Intru sw. |
|---|---------------------------|---------|-------------|---------------------------------|-----|-------|-----|---------------------|----------|--------|-----------|
| TopSeller models with a 3-year warranty (machine type 7D8J) | | | | | | | | | | | |
| 7D8JA014SG | Xeon E-2324G 4C65W3.1G | 1x 16GB | SATA | 2x3.5" bays; 1x 2TB HDD | Opt | Opt | No | 300W / No | Yes | Option | Yes |
| 7D8JA015SG | Xeon E-2324G 4C65W3.1G | 1x 16GB | SATA | 2x3.5"+ 1x2.5" bays; 1x 2TB HDD | Opt | Opt | No | 300W / No | Yes | Option | Yes |
| 7D8JA017SG | Xeon E-2324G 4C65W3.1G | 1x 16GB | SATA | 2x3.5"+ 1x2.5" bays; 1x 2TB HDD | Opt | Opt | Opt | 500W / No | Yes | Option | Yes |
| 7D8JA018SG | Xeon E-2324G 4C65W3.1G | 1x 8GB | SATA | 2x3.5" bays; 1x 2TB HDD | Opt | Opt | No | 300W / No | Yes | Option | Yes |
| 7D8JA019SG | Xeon E-2324G 4C65W3.1G | 1x 8GB | SATA | 2x3.5" bays; 1x 1TB HDD | Opt | Opt | No | 300W / No | Yes | Option | Yes |
| 7D8JA01ASG | Xeon E-2324G 4C65W3.1G | 1x 8GB | SATA | 2x3.5"+ 1x2.5" bays; 1x 2TB HDD | Opt | Opt | No | 300W / No | Yes | Option | Yes |
| 7D8JA01DSG | Xeon E-2324G 4C65W3.1G | 1x 8GB | SATA | 2x3.5"+ 1x2.5" bays; 1x 1TB HDD | Opt | Opt | No | 300W / No | Yes | Option | Yes |
| 7D8JA013SG | Xeon E-2356G 6C80W3.2G | 1x 8GB | SATA | 2x3.5" bays; 1x 1TB HDD | Opt | Opt | No | 300W / No | Yes | Option | Yes |
| 7D8JA016SG | Xeon E-2356G 6C80W3.2G | 1x 8GB | SATA | 2x3.5"+ 1x2.5" bays; 1x 1TB HDD | Opt | Opt | No | 300W / No | Yes | Option | Yes |
| 7D8JA01BSG | Xeon E-2356G 6C80W3.2G | 1x 8GB | SATA | 2x3.5"+ 1x2.5" bays; 1x 2TB HDD | Opt | Opt | No | 300W / No | Yes | Option | Yes |
| 7D8JA01CSG | Xeon E-2356G 6C80W3.2G | 1x 16GB | SATA | 2x3.5"+ 1x2.5" bays; 1x 2TB HDD | Opt | Opt | Opt | 500W / No | Yes | Option | Yes |

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

Models for Japan

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

Table 9. Models for Japan

| Model | Intel processor† | Memory | Drive Contr | Drive bays (max 3); Drives | DVD | Cards | GPU | Power supply & cord | Rear fan | Dongle | Intru sw. |
|--|--------------------------|---------|-------------|----------------------------|--------|-------|-----|---------------------|----------|--------|-----------|
| Standard models with a 1-year warranty (machine type 7D8K) | | | | | | | | | | | |
| 7D8KA008JP | Xeon E-2324G 4C 65W 3.1G | 1x 16GB | SATA | 2x3.5" bays; Open bay | DVD-RW | Opt | No | 300W / Yes | Yes | 1x VGA | Opt |
| 7D8KA006JP | Xeon E-2356G 6C 80W 3.2G | 1x 16GB | SATA | 2x3.5" bays; Open bay | DVD-RW | Opt | No | 300W / Yes | Yes | 1x VGA | Opt |
| 7D8KA007JP | Xeon E-2374G 4C 80W 3.7G | 1x 16GB | SATA | 2x3.5" bays; Open bay | DVD-RW | Opt | Opt | 500W / Yes | Yes | 1x VGA | Opt |
| 7D8KA004JP | Xeon E-2386G 6C 95W 3.5G | 1x 16GB | SATA | 2x3.5" bays; Open bay | DVD-RW | Opt | Opt | 500W / Yes | Opt | 1x VGA | Opt |
| 7D8KA005JP | Xeon E-2388G 8C 95W 3.2G | 1x 16GB | SATA | 2x3.5" bays; Open bay | DVD-RW | Opt | Opt | 500W / Yes | Opt | 1x VGA | Opt |

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

Models for Latin American countries (except Brazil)

Table 10. Models with a 3-year warranty for Latin American countries (except Brazil)

| Model | Intel processor† | Memory | Drive Contr | Drive bays (max 3); Drives | DVD | Cards | GPU | Power supply & cord | Rear fan | Dongle | Intru sw. |
|--|--------------------------|---------|-------------|----------------------------------|-----|---------------|-------|---------------------|----------|---------|-----------|
| Standard models with a 3-year warranty (machine type 7D8J) | | | | | | | | | | | |
| 7D8J1002LA | Xeon E-2324G 4C 65W 3.1G | 1x 16GB | SATA | 1x3.5" + 1x2.5" bays; 1x 2TB HDD | Opt | 1x 2x1Gb 5720 | Opt | 500W / Yes | Opt | 1x HDMI | Opt |
| 7D8JA01FLA | Xeon E-2324G 4C 65W 3.1G | 1x 16GB | SATA | 2x3.5"+ 1x2.5" bays; 1x 4TB HDD | Opt | Opt | Opt | 500W / Yes | Yes | 1x HDMI | Opt |
| 7D8JA01KLA | Xeon E-2324G 4C 65W 3.1G | 1x 16GB | SATA | 2x3.5"+ 1x2.5" bays; 1x 4TB HDD | Opt | Opt | T1000 | 500W / Yes | Yes | Option | Opt |
| 7D8JA02ELA | Xeon E-2324G 4C 65W 3.1G | 2x 16GB | 5350-8i | 2x3.5" bays; 2x 960GB 5300 RI | Opt | 1x 2x1Gb 5720 | No | 300W / Yes | Yes | 1x VGA | Opt |
| 7D8J1006LA | Xeon E-2356G 6C 80W 3.2G | 1x 16GB | SATA | 2x3.5"+ 1x2.5" bays; 2x 2TB HDD | Opt | 1x 2x1Gb 5720 | T1000 | 500W / Yes | Yes | Option | Opt |
| 7D8J1007LA | Xeon E-2356G 6C 80W 3.2G | 1x 16GB | SATA | 2x3.5"+ 1x2.5" bays; 2x 2TB HDD | Opt | 1x 2x1Gb 5720 | Opt | 500W / Yes | Yes | Option | Opt |
| 7D8J1008LA | Xeon E-2356G 6C 80W 3.2G | 1x 16GB | SATA | 2x3.5"+ 1x2.5" bays; 2x 2TB HDD | Opt | 1x 2x1Gb 5720 | Opt | 500W / Yes | Yes | 1x HDMI | Opt |
| 7D8JA01ELA | Xeon E-2356G 6C 80W 3.2G | 1x 16GB | SATA | 2x3.5"+ 1x2.5" bays; 1x 4TB HDD | Opt | Opt | Opt | 500W / Yes | Yes | 1x HDMI | Opt |

| Model | Intel processors† | Memory | Drive Contr | Drive bays (max 3); Drives | DVD | Cards | GPU | Power supply & cord | Rear fan | Dongle | Intru sw. |
|---|--------------------------|---------|-------------|----------------------------------|-----|---------------|-------|---------------------|----------|---------|-----------|
| 7D8JA01HLA | Xeon E-2356G 6C 80W 3.2G | 1x 16GB | SATA | 2x3.5"+ 1x2.5" bays; 1x 4TB HDD | Opt | Opt | T1000 | 500W / Yes | Yes | Option | Opt |
| 7D8JA01GLA | Xeon E-2388G 8C 95W 3.2G | 1x 16GB | SATA | 2x3.5"+ 1x2.5" bays; 1x 4TB HDD | Opt | Opt | Opt | 500W / Yes | Opt | Option | Opt |
| 7D8JA01JLA | Xeon E-2388G 8C 95W 3.2G | 1x 16GB | SATA | 2x3.5"+ 1x2.5" bays; 1x 4TB HDD | Opt | Opt | T1000 | 500W / Yes | Opt | Option | Opt |
| TopSeller models with a 3-year warranty (machine type 7D8J) | | | | | | | | | | | |
| 7D8JA00VLA | Xeon E-2356G 6C 80W 3.2G | 1x 16GB | SATA | 2x3.5" bays; 2x 3.5" 960GB S4520 | Opt | Opt | Opt | 500W / Yes | Yes | 1x HDMI | Opt |
| Standard models with a 1-year warranty (machine type 7D8K) | | | | | | | | | | | |
| 7D8K1000LA | Xeon E-2324G 4C 65W 3.1G | 1x 16GB | SATA | 2x3.5" bays; 1x 1TB HDD | Opt | 1x 2x1Gb 5720 | T1000 | 500W / Yes | Yes | Option | Opt |
| 7D8K1001LA | Xeon E-2324G 4C 65W 3.1G | 1x 16GB | SATA | 2x3.5" bays; 1x 1TB HDD | Opt | 1x 2x1Gb 5720 | Opt | 500W / Yes | Yes | 1x HDMI | Opt |
| TopSeller models with a 1-year warranty (machine type 7D8K) | | | | | | | | | | | |
| 7D8KA009LA | Xeon E-2324G 4C 65W 3.1G | 1x 16GB | SATA | 2x3.5" bays; 1x 2TB Client HDD | Opt | Opt | T1000 | 500W / Yes | Yes | Option | Opt |
| 7D8KA00ALA | Xeon E-2324G 4C 65W 3.1G | 1x 16GB | SATA | 2x3.5" bays; 1x 2TB HDD | Opt | Opt | Opt | 500W / Yes | Yes | 1x HDMI | Opt |
| 7D8KA00BLA | Xeon E-2324G 4C 65W 3.1G | 1x 16GB | SATA | 2x3.5" bays; 1x 2TB Client HDD | Opt | Opt | Opt | 500W / Yes | Yes | 1x HDMI | Opt |

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

Models for USA and Canada

Table 11. Models for USA and Canada

| Model | Intel processors† | Memory | Drive Contr | Drive bays (max 3); Drives | DVD | Cards | GPU | Power supply & cord | Rear fan | Dongle | Intru sw. |
|--|--------------------------|---------|-------------|----------------------------|-----|-------|-----|---------------------|----------|--------|-----------|
| Standard models with a 3-year warranty (machine type 7D8J) | | | | | | | | | | | |
| 7D8JA010NA | Xeon E-2356G 6C 80W 3.2G | 1x 16GB | SATA | 1x3.5" bay; Open bay | Opt | Opt | No | 300W / Yes | Opt | Option | Opt |
| 7D8JA00YNA | Xeon E-2386G 6C 95W 3.5G | 1x 16GB | SATA | 1x3.5" bay; Open bay | Opt | Opt | No | 300W / Yes | Opt | Option | Opt |

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

Processors

The ST50 V2 supports one processor from the following Intel product families:

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

All supported processors have the following characteristics:

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

The following table lists the supported processors.

Integrated graphics: As indicated in the table, some processors do not include Integrated graphics. If you use one of these processors in your configuration, you will also need to select a [GPU adapter](#).

Table 12. Supported processors

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

* Xeon E processors without integrated graphics do not support the KVM redirection functions of AMT.

† Intel SGX with Intel SPS / Intel SGX Enclave Page Cache size. Not supported in the ST50 V2.

Memory options

The ST50 V2 supports Lenovo TruDDR4 memory. TruDDR4 memory uses the highest-quality components sourced from Tier 1 DRAM suppliers and only memory that meets strict requirements is selected. It is compatibility-tested and tuned to maximize performance and reliability.

TruDDR4 memory has a unique signature programmed into the DIMM, which enables ThinkSystem servers to verify whether the memory installed is qualified and supported. From a service and support standpoint, TruDDR4 memory automatically assumes the system's warranty, and service and support provided worldwide.

The processors have 2 memory channels and support 2 DIMMs per channel. The ST50 V2 supports 1, 2 or 4 DIMMs. 3 installed DIMMs is not supported. All DIMMs installed must be identical.

DIMMs installed in the ST50 V2 operate at a speed based on the processor installed, the number of DIMMs installed, and whether the DIMMs are single-rank or dual-rank:

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

The following table lists the memory options that are available for the ST50 V2 server.

32GB UDIMM support: Support for the 32GB 2R UDIMM is planned.

Table 13. Tatlow memory section

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

The following rules apply when selecting the memory configuration:

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

Internal storage

The ST50 V2 supports up to three non-hot-swap drives, one 2.5-inch and two 3.5-inch drives. The system also supports an 9mm slim SATA optical disk drive.

Topics in this section:

- [Drive bays](#)
- [M.2 drives](#)
- [Field upgrades](#)

For information about the optical drive, see the [Optical drives](#) section.

Drive bays

The drive bays are as follows:

- Drive bay 1: 3.5-inch HDD or SSD, non-hot-swap
- Drive bay 2: 2.5-inch SSD, non-hot-swap, optional
- Drive bay 3: 3.5-inch HDD or SSD, non-hot-swap, optional

The location of these bays is shown in the following figure.

Note: Drive bays 1, 2 and 3 are only accessible from the side of the server, with the cover removed. The drive bays are not front accessible.

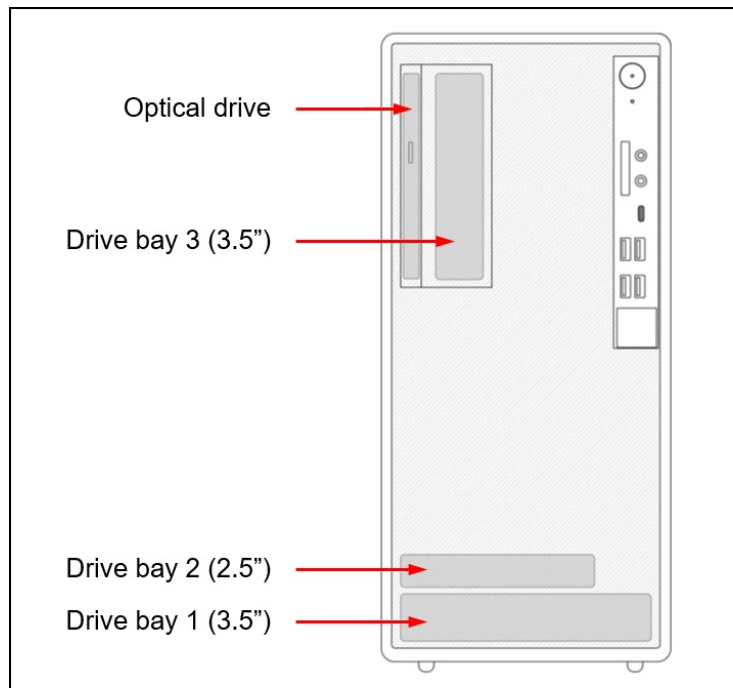


Figure 6. ST50 V2 drive bays (front view)

The following figure shows the internals of the server with the drive bays and optical drive installed.

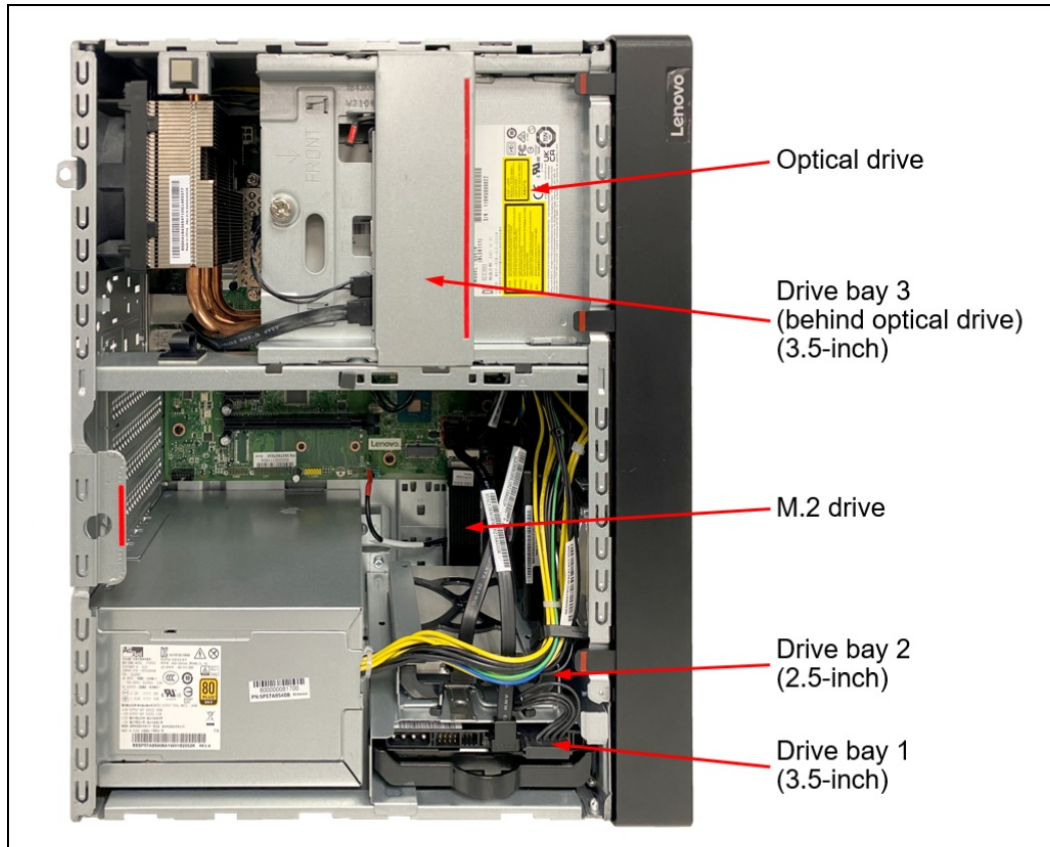


Figure 7. ST50 V2 drive bays (side view)

Drive bays 2 and 3 are optional. For CTO orders, the following table lists the ordering information to configure these bays.

Use of Client HDDs and Bay 2 : As described in the [Special Notice for Client drives](#) section, Client HDDs cannot be in the server along with other drive types. The impact of this rule is that in CTO orders, the 2.5-inch drive bay (Bay 2) is not selectable if you select any client HDDs.

Table 14. Drive bays

| Part number | Feature code | Description |
|-------------|--------------|---|
| 4XF7A78617* | BME0 | ThinkSystem ST50 V2 2.5" Drive Bay 2 Cage Kit Bracket to mount a 2.5-inch drive to drive bay 2 |
| 4XF7A79662* | BME1 | ThinkSystem ST50 V2 3.5" Drive Bay 3 Cage Kit Bracket to mount a 3.5-inch drive to drive bay 3 |

* The option part number includes a SATA cable. See [Field upgrades](#) for details.

M.2 drives

The ST50 V2 supports a single M.2 drive, mounted in a bracket. Ordering information for the bracket is listed in the following table.

Table 15. M.2 drives

| Part number | Feature code | Description |
|-------------|--------------|--|
| 4XF7A79661 | BMEK | ThinkSystem ST50 V2 NVMe M.2 Bracket Kit |

The following figure shows how the M.2 bracket is used.

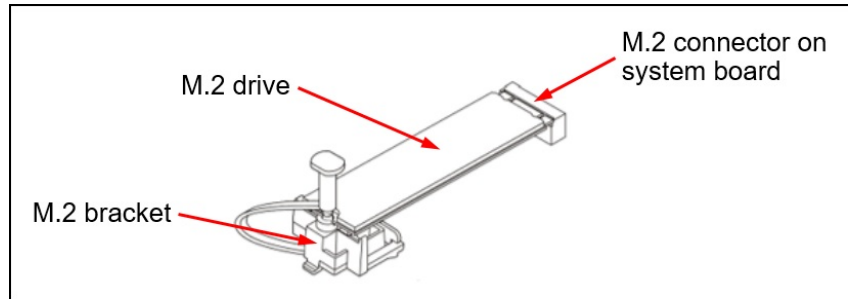


Figure 8. ThinkSystem ST50 V2 NVMe M.2 Bracket Kit

Supported M.2 drives are listed in the [Internal drive options](#) section.

Field upgrades

The ST50 V2 supports the following upgrades:

- Add drives to a zero drive (drive-less) server
- Add a RAID adapter or HBA to replace the onboard SATA drive controller
- Add drive bays
- Add an optical drive, as described in the [Optical drives](#) section

If you are planning to do a field upgrade of a server without drives to add drives that connect to the onboard SATA controller, you will need the power cables from the ThinkSystem ST50 V2 Internal Drive Cable Kit, 4X97A78621, plus the SATA cables that are included in each drive option.

If you are planning to do a field upgrade to add a RAID adapter or HBA, you will need the cables from ThinkSystem ST50 V2 Internal Drive Cable Kit, 4X97A78621. The MiniSAS data cable in the kit will replace the SATA data cables to all three drives. Use the power cables if you are upgrading from a server without any drives otherwise use the existing power cables already installed.

The following table lists the ordering information.

Table 16. Field upgrades

| Part number | Description | Purpose |
|------------------------------|--|---|
| Drive bay field upgrades | | |
| 4XF7A78617 | ThinkSystem ST50 V2 2.5" Drive Bay 2 Cage Kit, contains: <ul style="list-style-type: none"> ● Cage to mount a 2.5-inch drive to drive bay 2 (SBB7A46043) | Add drive bay 2 |
| 4XF7A79662 | ThinkSystem ST50 V2 3.5" Drive Bay 3 Cage Kit, contains: <ul style="list-style-type: none"> ● Cage to mount a 3.5-inch drive to drive bay 3 (SBB7A46044) ● 520mm SATA cable for drive bay 3 (SBB7A46040) ● Power cable for drive bay 3 (SBB7A46086) ● EMI shielding kit for drive bay 3 (SBB7A50242) Requirements: <ul style="list-style-type: none"> ● The rear system fan is required, either preinstalled or by ordering ThinkSystem ST50 V2 System Rear Fan Kit, 4F17A80568. ● Drive bay 3 mounts on the optical drive cage. The optical drive cage (with or without the optical drive) is therefore required, either preinstalled or by ordering ThinkSystem ST50 V2 Slim ODD Cage Kit, 4XF7A78619 | Add drive bay 3. Requires the rear system fan and the optical drive cage (with or without the optical drive installed). |
| Cable kit for field upgrades | | |
| 4X97A78621 | ThinkSystem ST50 V2 Internal Drive Cable Kit, contains: <ul style="list-style-type: none"> ● 1xSAS-to-4xSATA data cable, connects RAID/HBA to 3x SATA drives (SBB7A09984) ● 520mm SATA cable for drive bay 3 (SBB7A46040) ● Power cable for drive bay 3 and the optical drive (SBB7A46041) ● Power cable for drive bays 1 and 2 (SBB7A46039) Tip: All HDD and SSD drive options include the 185mm SATA cable for use with drive bay 1 or bay 2. The 520mm SATA cable is needed for use with drive bay 3. | Cables used in two scenarios: <ul style="list-style-type: none"> ● When adding drives to a server with drive bays (cages) but without any drives installed ● When upgrading from onboard SATA to an HBA or RAID adapter |

Controllers for internal storage

The ST50 V2 has an onboard 6Gbps SATA controller with 3 connections on the system board for the 3 internal drive bays. These ports can be used in either AHCI (JBOD) mode or RSTe (RAID) mode. RSTe mode supports RAID 0, 1 and 5.

Advanced RAID support or HBA support is available with the addition of a RAID adapter or HBA as listed in the following table.

Table 17. Adapters for internal storage

| Part number | Feature code | Description | Slots supported | Maximum supported |
|-------------|--------------|--|-----------------|-------------------|
| Adapters | | | | |
| 4Y37A72482 | BJHK | ThinkSystem RAID 5350-8i PCIe 12Gb Adapter | 1 | 1 |
| 4Y37A72480 | BJHH | ThinkSystem 4350-8i SAS/SATA 12Gb HBA | 1 | 1 |

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

<https://lenovopress.com/lp1288-lenovo-thinksystem-raid-adapter-and-hba-reference#st50-v2-support=ST50%2520V2>

Configuration notes:

- **RAID array support:** For CTO orders, you can only form a RAID array (RAID-0 or RAID-1) using the two 3.5-inch drives. If you require a CTO RAID configuration of three drives (RAID-5), then SSDs will be required for all drives and you will need to request a Special Bid order.
- **Virtualization support:** The 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.
- **E810 Ethernet and X350 RAID/HBAs:** The use of both an Intel E810 network adapter and an X350 HBA/RAID adapter (9350, 5350 and 4350) is currently not supported in ThinkSystem servers. Planned support for this combination of adapters is 4Q/2022 (22C).

Internal drive options

The ST50 V2 supports one or two 3.5-inch non-hot-swap drives and optionally one 2.5-inch non-hot-swap drive.

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 bay 1 or 2) to the onboard SATA controller on the system board.

The SATA cable needed when the drive is installed in bay 3 is preinstalled, included with ThinkSystem ST50 V2 3.5" Drive Bay 3 Cage Kit, 4XF7A79662, or included with ThinkSystem ST50 V2 Internal Drive Cable Kit, 4X97A78621. See the [Field upgrades](#) section for details.

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 PCIe 3.0 NVMe drives](#)

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

Table 18. 2.5-inch simple-swap 6 Gb SATA SSDs

| Part number | Feature | Description | Maximum supported |
|--|---------|--|-------------------|
| 2.5-inch simple-swap SSDs - 6 Gb SATA - Read Intensive/Entry (<3 DWPD) | | | |
| 4XB7A77457 | BME8 | ThinkSystem ST50 V2 2.5" 5300 480GB Read Intensive SATA 6Gb NHS SSD | 1 |
| 4XB7A77458 | BME7 | ThinkSystem ST50 V2 2.5" 5300 960GB Read Intensive SATA 6Gb NHS SSD | 1 |
| 4XB7A77459 | BMEB | ThinkSystem ST50 V2 2.5" S4520 240GB Read Intensive SATA 6Gb NHS SSD | 1 |
| 4XB7A77460 | BMEA | ThinkSystem ST50 V2 2.5" S4520 480GB Read Intensive SATA 6Gb NHS SSD | 1 |
| 4XB7A77461 | BME9 | ThinkSystem ST50 V2 2.5" S4520 960GB Read Intensive SATA 6Gb NHS SSD | 1 |

Table 19. 3.5-inch simple-swap 6 Gb SATA HDDs

| Part number | Feature | Description | Maximum supported |
|--|---------|--|-------------------|
| 3.5-inch simple-swap HDDs - 6 Gb NL SATA | | | |
| 4XB7A77445 | BMED | ThinkSystem ST50 V2 3.5" 1TB 7.2K SATA 6Gb NHS 512n HDD | 2 |
| 4XB7A77446 | BMEC | ThinkSystem ST50 V2 3.5" 2TB 7.2K SATA 6Gb NHS 512n HDD | 2 |
| 4XB7A77447 | BMEG | ThinkSystem ST50 V2 3.5" 4TB 7.2K SATA 6Gb NHS 512n HDD | 2 |
| 4XB7A77448 | BMEF | ThinkSystem ST50 V2 3.5" 6TB 7.2K SATA 6Gb NHS 512e HDD | 2 |
| 4XB7A77449 | BMEE | ThinkSystem ST50 V2 3.5" 8TB 7.2K SATA 6Gb NHS 512e HDD | 2 |
| 4XB7A77450 | BMEJ | ThinkSystem ST50 V2 3.5" 1TB Client 7.2K SATA 6Gb NHS 512e HDD | 2* |
| 4XB7A77451 | BMEH | ThinkSystem ST50 V2 3.5" 2TB Client 7.2K SATA 6Gb NHS 512e HDD | 2* |

* Support for client drives has special conditions of use. See [Special Notice for Client drives](#) for details

Table 20. 3.5-inch simple-swap 6 Gb SATA SSDs

| Part number | Feature | Description | Maximum supported |
|--|---------|--|-------------------|
| 3.5-inch simple-swap SSDs - 6 Gb SATA - Read Intensive/Entry (<3 DWPD) | | | |
| 4XB7A77452 | BME4 | ThinkSystem ST50 V2 3.5" 5300 480GB Read Intensive SATA 6Gb NHS SSD | 2 |
| 4XB7A77453 | BME3 | ThinkSystem ST50 V2 3.5" 5300 960GB Read Intensive SATA 6Gb NHS SSD | 2 |
| 4XB7A77454 | BME2 | ThinkSystem ST50 V2 3.5" S4520 240GB Read Intensive SATA 6Gb NHS SSD | 2 |
| 4XB7A77455 | BME6 | ThinkSystem ST50 V2 3.5" S4520 480GB Read Intensive SATA 6Gb NHS SSD | 2 |
| 4XB7A77456 | BME5 | ThinkSystem ST50 V2 3.5" S4520 960GB Read Intensive SATA 6Gb NHS SSD | 2 |

Table 21. M.2 PCIe 3.0 NVMe drives

| Part number | Feature | Description | Maximum supported |
|---|---------|---|-------------------|
| M.2 SSDs - PCIe 3.0 NVMe - Read Intensive/Entry (<3 DWPD) | | | |
| 4XB7A64203 | BE1W | ThinkSystem M.2 N600Si 960GB NVMe PCIe 3.0 x4 Non-Hot Swap SSD (Industrial) | 1 |

Special notice for Client drives

The ST50 V2 supports both Client HDDs and Enterprise Class HDDs. Client HDDs are designed for 8x5 operating environment whereas Enterprise Class HDDs are designed for 24x7 operating environment. Selecting the correct drive class will enable the critical areas of quality, functionality, performance, and reliability to be optimized for the target implementation.

When using Client Hard Disk Drives, you agree to the following terms of service:

- Update the firmware once you receive the server according to the "Lenovo Client HDD Upgrade for Windows and Linux" document in the download page: <https://datacentersupport.lenovo.com/products/servers/thinksystem/st50/7y48/downloads/driver-list/component?name=Storage>
- The use of the Lenovo Online SAS/SATA Hard Disk Drive Update Program is not supported.
- Maximum of 2 Client HDDs per server is supported
- Mixing Client HDDs with other drives is not supported.
- Only supported connected to the server's onboard 6Gbps SATA controller. RAID adapters and HBAs are not supported.
- Operational availability: 8 hours/day, 5 days/week.
- Workload rate limit: < 55 TB/year*

Choosing the right drive type depends on the usage pattern. Improper use of Client HDDs (such as the workload rate exceeding 55 TB/year) will lead to significant risk and increase the drives failure rate.

* The specifications for the product assumes the I/O workload does not exceed the average annualized workload rate limit of 55 TB/year. Workloads exceeding the annualized rate may degrade and impact reliability as experienced by the particular application. The average annualized workload rate limit is in units of TB per calendar year.

USB memory key

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

Table 22. USB memory key

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

Internal backup units

The server does not supports any internal backup unit, such as a tape drive or RDX drive. External backup units are available as described in the [External backup units](#) section.

Optical drives

The ST50 V2 optionally supports an internal optical drive. CTO ordering information is listed in the following table.

Table 23. Internal optical drive

| Feature code | Description |
|---------------|--|
| Optical drive | |
| BMEU | ThinkSystem ST50 V2 9mm-Slim SATA DVD-RW |
| CTO features | |
| BMEX | ThinkSystem ST50 V2 Slim ODD Cage Kit - Bracket to mount the optical drive |
| BMEW | ThinkSystem ST50 V2 Slim ODD Bezel Kit - Front bezel for the optical drive |
| BMEV | ThinkSystem ST50 V2 W/O Slim ODD Bezel Kit - Front bezel when no optical drive is configured |

To add the optical drive as a field upgrade, use the parts listed in the following table.

Table 24. Optical drive field upgrades

| Part number | Description | Purpose |
|-------------|---|--|
| 4XA7A77462 | ThinkSystem ST50 V2 Slim SATA DVD-RW Optical Drive Kit, contains: <ul style="list-style-type: none"> • Optical drive - ThinkSystem ST50 V2 9mm-Slim SATA DVD-RW (SBB7A45066) • 520mm SATA cable for optical drive (SBB7A46040) • Power cable for Drive bay 3 and optical drive (SBB7A46041) • Bezel for optical drive (SBB7A46134) | To add the optical drive, cables and front bezel. Requires the optical drive cage (preinstalled or by ordering 4XF7A78619 or 4XF7A78618) |
| 4XF7A78619 | ThinkSystem ST50 V2 Slim ODD Cage Kit, contains: <ul style="list-style-type: none"> • Cage to mount the optical drive (SBB7A50144) | To enable the use of an optical drive. Order the drive itself using 4XA7A77462. For systems without an optical drive cage. |
| 4XF7A78618 | ThinkSystem ST50 V2 3.5" Drive Bay 3 Cage + ODD Cage Kit, contains: <ul style="list-style-type: none"> • Cage to mount the optical drive (SBB7A50144) • Cage to mount drive bay 3 (SBB7A46044) • Power cable for drive bay 3 (SBB7A46086) • 520mm SATA cable for drive bay 3 (SBB7A46040) • EMI shielding kit for drive bay 3 (SBB7A50242) | To enable the use of an optical drive and drive bay 3. Mutually exclusive with 4XF7A78619 and 4XF7A79662 (Bay 3 upgrade). Order the drive itself using 4XA7A77462. For systems without both the optical drive cage and drive bay 3. |

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

External optical drive

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

Table 25. External optical drive

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

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

I/O expansion options

The ST50 V2 server has three PCIe 3.0 slots:

- Slot 1: PCIe 4.0 x16 (physical connector is x16) full-height half-length (FHHL)
- Slot 2: PCIe 3.0 x1 (physical connector is x1, open ended) full-height half-length (FHHL)
- Slot 3: PCIe 3.0 x4 (physical connector is x16) full-height half-length (FHHL)

Slot 3: Slot 3 physically supports x8 and x16 adapters, however only 4 lanes (x4) are connected. Performance may be impacted with x8 and x16 adapters as a result.

Pentium processor: When a Pentium processor is selected, slot 1 is a PCIe 3.0 (G3) slot.

The following figure shows the locations of the PCIe slots.

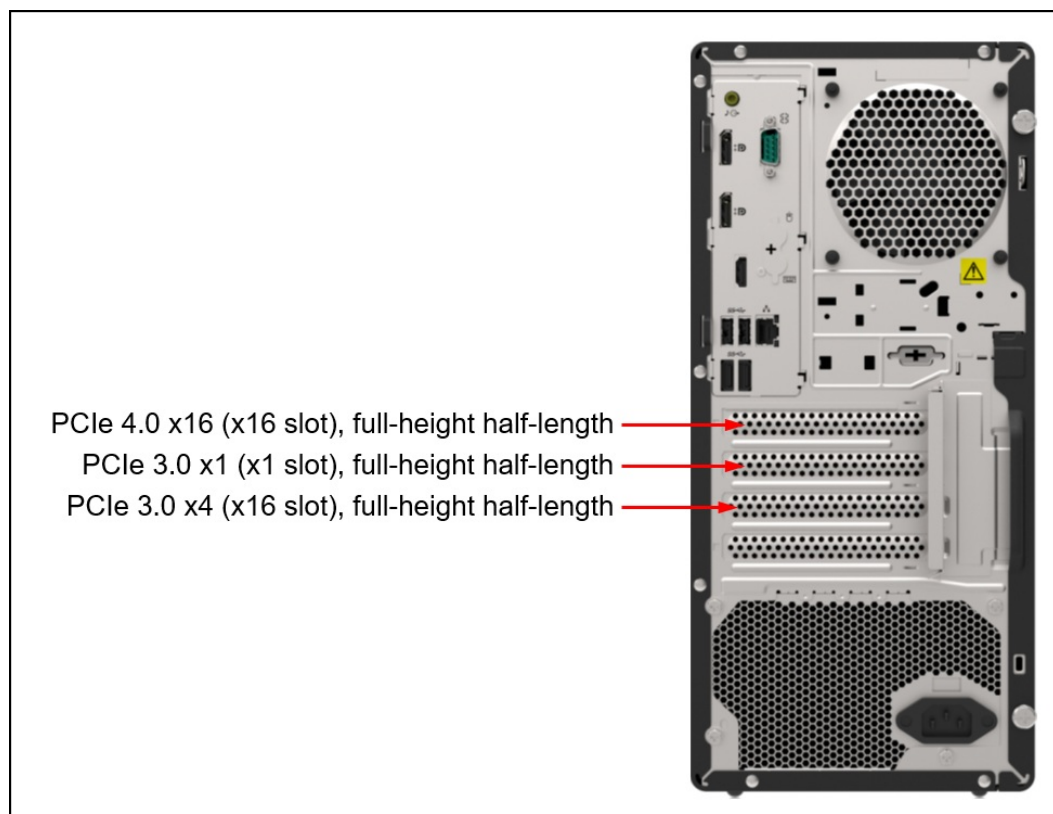


Figure 9. ThinkSystem ST50 V2 PCIe slots

Network adapters

The server has one integrated Gigabit Ethernet port that is based on the Intel I219-LM NIC (a shared port for operating system access and management network).

The onboard NIC has the following features:

- 1 Gb Ethernet IEEE 802.3, 802.3u, and 802.3ab PHY specifications compliant
- Integrated PHY for 10/100/1000 Mbps with speed and duplex auto-negotiation
- Energy Efficient Ethernet (IEEE 802.3az)
- Wake on LAN
- Class of Service (CoS) priority (IEEE 802.1p) marking

- TCP/UDP checksum and segmentation offload (IPv4 and IPv6)
- Receive Side Scaling
- Jumbo Frames (up to 9K)
- Timing and Synchronization (IEEE 802.1as / IEEE 1588)
- Load balancing and failover teaming support:
 - Adapter fault tolerance (AFT)
 - Switch fault tolerance (SFT)
 - Adaptive load balancing (ALB)

PXE boot restriction: The onboard I219-LM Ethernet controller in the ST50 V2 has some incompatibilities with PXE Boot. Therefore, if you plan to implement PXE Boot functionality on the server, it is recommended that you install a separate network adapter.

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 26. Network adapters

| Part number | Feature code | Description | Slots supported | Maximum supported |
|-------------------------|--------------|--|-----------------|-------------------|
| Gigabit Ethernet | | | | |
| 7ZT7A00484 | AUZV | ThinkSystem Broadcom 5719 1GbE RJ45 4-Port PCIe Ethernet Adapter | 3 | 1 |
| 7ZT7A00482 | AUZX | ThinkSystem Broadcom 5720 1GbE RJ45 2-Port PCIe Ethernet Adapter | 2,3 | 2 |
| 7ZT7A00534 | AUZY | ThinkSystem I350-T2 PCIe 1Gb 2-Port RJ45 Ethernet Adapter | 1,3 | 2 |
| 7ZT7A00535 | AUZW | ThinkSystem I350-T4 PCIe 1Gb 4-Port RJ45 Ethernet Adapter | 1,3 | 2 |
| 10 Gb Ethernet | | | | |
| 7ZT7A00496 | AUKP | ThinkSystem Broadcom 57416 10GBASE-T 2-Port PCIe Ethernet Adapter | 1,3 | 2 |
| 00MM860 | ATPX | Intel X550-T2 Dual Port 10GBase-T Adapter | 1,3 | 2 |
| 25 Gb Ethernet | | | | |
| 4XC7A08295 | BCD6 | ThinkSystem Intel E810-DA2 10/25GbE SFP28 2-Port PCIe Ethernet Adapter | 1,3 | 2 |

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: <https://lenovopress.com/servers/options/ethernet>
- **E810 Ethernet and X350 RAID/HBAs:** The use of both an Intel E810 network adapter and an X350 HBA/RAID adapter (9350, 5350 and 4350) is currently not supported in ThinkSystem servers. Planned support for this combination of adapters is 4Q/2022 (22C).

SAS adapters for external storage

The ST50 V2 currently does not support SAS adapters for external storage.

Fibre Channel host bus adapters

The ST50 V2 does not support Fibre Channel host bus adapters.

Flash Storage adapters

The ST50 V2 does not support Flash Storage adapters.

GPU adapters

The ST50 V2 server supports the graphics processing units (GPUs) listed in the following table.

Notes:

- If the processor selected does not include integrated graphics, then a GPU must be selected. See the [Processors](#) section for specifics.
- If a GPU is installed in a server that has a processor with integrated graphics, the integrated graphics (and the two DisplayPort video ports) will be disabled.
- The use of a GPU requires a power supply of at least a 300W capacity

Table 27. GPU adapters

| Part number | Feature code | Description | Slots supported | Maximum supported |
|-------------|--------------|---|-----------------|-------------------|
| 4X67A79777 | BMXD | ThinkSystem NVIDIA Quadro RTX T1000 8GB PCIe Active GPU | 1 | 1 |

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

Cooling

The server has the following fans:

- One 80mm system fan at the front of the server inside the front bezel
- One optional 92mm system fan at the rear of the server
- Fan mounted on the heatsink of the processor (only for processors $\leq 80W$)
- Power supply fan

With processors with TDP $\leq 80W$ a heatsink with fan is attached directly to the processor. With processors with TDP $> 80W$, the processor heatsink is instead attached directly to the rear system fan and is connected to the processor via heat-transfer pipes. These heatsinks are shown in the following figure.

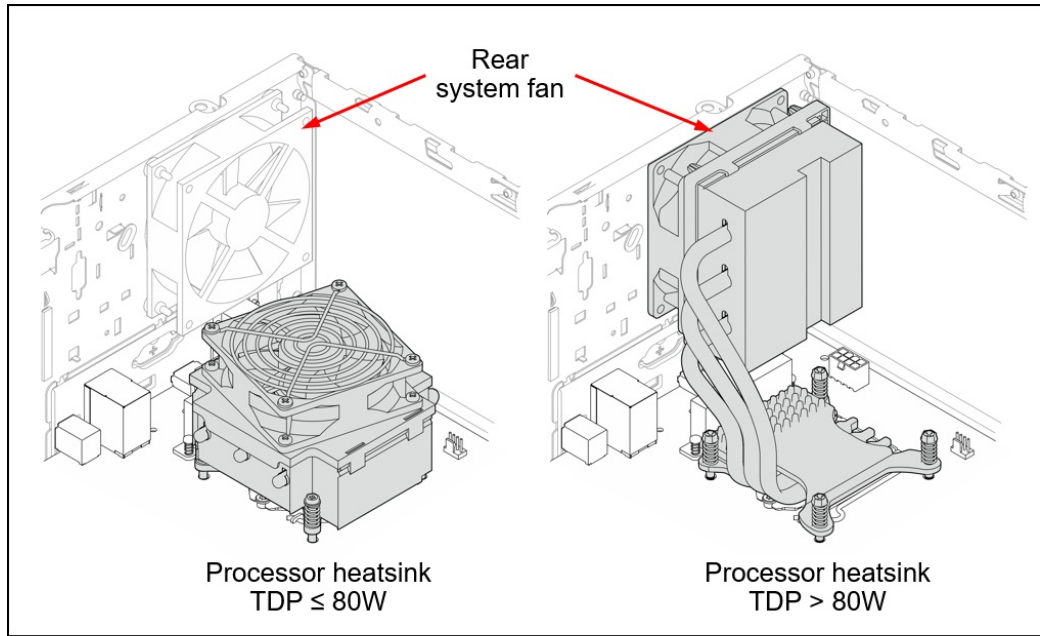


Figure 10. ST50 V2 processor heatsinks

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

Ordering information is listed in the following table.

Table 28. Rear fan option

| Part number | Feature code | Description |
|-------------|--------------|--|
| 4F17A80568 | BMDY | ThinkSystem ST50 V2 System Rear Fan Kit For use with processors ≤ 80W TDP |

Requirements:

- When the third drive bay is installed (BME1 or 4XF7A79662 or 4XF7A78618), the rear fan is required

Power supplies

The ST50 V2 server supports a single fixed (non-hot-swap) power supply. The power supply cannot be upgraded.

The inclusion of a power cord is model dependent as listed in the [Models](#) section.

Table 29. Power supply options

| Feature code | Chassis base | Capacity | Voltage | 80 PLUS certification |
|--------------|--|----------|---------------------------|-----------------------|
| BMFL* | ATX-300W Power Supply | 300W | 100-240V (autosensing) | Gold (90%)* |
| BMFM | ThinkSystem ST50 V2 Platinum ATX-500W Power Supply | 500W | 100-240V (autosensing) | Platinum (92%) |

* Not available in EU countries nor in the UK

The following restrictions apply when using the 300W power supply:

- 8-core processors (E-2378, E-2378G, E-2388G) are not supported

Power cords

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

Table 30. Power cords

| Part number | Feature code | Description |
|--------------------------|--------------|---|
| Rack cables - C13 to C14 | | |
| 00Y3043 | A4VP | 1.0m, 10A/100-250V, C13 to C14 Jumper Cord |
| 4L67A08367 | B0N5 | 1.0m, 13A/100-250V, C13 to C14 Jumper Cord |
| 39Y7937 | 6201 | 1.5m, 10A/100-250V, C13 to C14 Jumper Cord |
| 4L67A08368 | B0N6 | 1.5m, 13A/100-250V, C13 to C14 Jumper Cord |
| 4L67A08365 | B0N4 | 2.0m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable |
| 4L67A08369 | 6570 | 2.0m, 13A/100-250V, C13 to C14 Jumper Cord |
| 4L67A08366 | 6311 | 2.8m, 10A/100-250V, C13 to C14 Jumper Cord |
| 4L67A08370 | 6400 | 2.8m, 13A/100-250V, C13 to C14 Jumper Cord |
| 39Y7932 | 6263 | 4.3m, 10A/100-250V, C13 to C14 Jumper Cord |
| 4L67A08371 | 6583 | 4.3m, 13A/100-250V, C13 to C14 Jumper Cord |
| Line cords | | |
| 39Y7930 | 6222 | 2.8m, 10A/250V, C13 to IRAM 2073 (Argentina) Line Cord |
| 81Y2384 | 6492 | 4.3m, 10A/250V, C13 to IRAM 2073 (Argentina) Line Cord |
| 39Y7924 | 6211 | 2.8m, 10A/250V, C13 to AS/NZS 3112 (Australia/NZ) Line Cord |
| 81Y2383 | 6574 | 4.3m, 10A/250V, C13 to AS/NZS 3112 (Australia/NZ) Line Cord |
| 69Y1988 | 6532 | 2.8m, 10A/250V, C13 to NBR 14136 (Brazil) Line Cord |
| 81Y2387 | 6404 | 4.3m, 10A/250V, C13 to NBR 14136 (Brazil) Line Cord |
| 39Y7928 | 6210 | 2.8m, 10A/220V, C13 to GB 2099.1 (China) Line Cord |
| 81Y2378 | 6580 | 4.3m, 10A/250V, C13 to GB 2099.1 (China) Line Cord |
| 39Y7918 | 6213 | 2.8m, 10A/250V, C13 to DK2-5a (Denmark) Line Cord |
| 81Y2382 | 6575 | 4.3m, 10A/250V, C13 to DK2-5a (Denmark) Line Cord |
| 39Y7917 | 6212 | 2.8m, 10A/250V, C13 to CEE 7/7 (Europe) Line Cord |
| 81Y2376 | 6572 | 4.3m, 10A/250V, C13 to CEE 7/7 (Europe) Line Cord |
| 39Y7927 | 6269 | 2.8m, 10A/250V, C13 to IS 6538 (India) Line Cord |
| 81Y2386 | 6567 | 4.3m, 10A/250V, C13 to IS 6538 (India) Line Cord |
| 39Y7920 | 6218 | 2.8m, 10A/250V, C13 to SI 32 (Israel) Line Cord |
| 81Y2381 | 6579 | 4.3m, 10A/250V, C13 to SI 32 (Israel) Line Cord |
| 39Y7921 | 6217 | 2.8m, 10A/250V, C13 to CEI 23-16 (Italy) Line Cord |
| 81Y2380 | 6493 | 4.3m, 10A/250V, C13 to CEI 23-16 (Italy) Line Cord |
| 4L67A08362 | 6495 | 4.3m, 12A/200V, C13 to JIS C-8303 (Japan) Line Cord |
| 39Y7922 | 6214 | 2.8m, 10A/250V, C13 to SABS 164-1 (South Africa) Line Cord |
| 81Y2379 | 6576 | 4.3m, 10A/250V, C13 to SANS 164-1 (South Africa) Line Cord |
| 39Y7926 | 6335 | 4.3m, 12A/100V, C13 to JIS C-8303 (Japan) Line Cord |

| Part number | Feature code | Description |
|-------------|--------------|--|
| 39Y7925 | 6219 | 2.8m, 12A/220V, C13 to KSC 8305 (S. Korea) Line Cord |
| 81Y2385 | 6494 | 4.3m, 12A/250V, C13 to KSC 8305 (S. Korea) Line Cord |
| 39Y7919 | 6216 | 2.8m, 10A/250V, C13 to SEV 1011-S24507 (Swiss) Line Cord |
| 81Y2390 | 6578 | 4.3m, 10A/250V, C13 to SEV 1011-S24507 (Swiss) Line Cord |
| 23R7158 | 6386 | 2.8m, 10A/125V, C13 to CNS 10917 (Taiwan) Line Cord |
| 81Y2375 | 6317 | 2.8m, 10A/250V, C13 to CNS 10917 (Taiwan) Line Cord |
| 81Y2374 | 6402 | 2.8m, 13A/125V, C13 to CNS 10917 (Taiwan) Line Cord |
| 4L67A08363 | AX8B | 4.3m, 10A/125V, C13 to CNS 10917 (Taiwan) Line Cord |
| 81Y2389 | 6531 | 4.3m, 10A/250V, C13 to CNS 10917 (Taiwan) Line Cord |
| 81Y2388 | 6530 | 4.3m, 13A/125V, C13 to CNS 10917 (Taiwan) Line Cord |
| 39Y7923 | 6215 | 2.8m, 10A/250V, C13 to BS 1363/A (UK) Line Cord |
| 81Y2377 | 6577 | 4.3m, 10A/250V, C13 to BS 1363/A (UK) Line Cord |
| 90Y3016 | 6313 | 2.8M, 10A/125V, C13 to NEMA 5-15P (US) Line Cord |
| 46M2592 | A1RF | 2.8m, 10A/250V, C13 to NEMA 6-15P (US) Line Cord |
| 00WH545 | 6401 | 2.8M, 13A/125V, C13 to NEMA 5-15P (US) Line Cord |
| 4L67A08359 | 6370 | 4.3m, 10A/125V, C13 to NEMA 5-15P (US) Line Cord |
| 4L67A08361 | 6373 | 4.3m, 10A/250V, C13 to NEMA 6-15P (US) Line Cord |
| 4L67A08360 | AX8A | 4.3m, 13A/125V, C13 to NEMA 5-15P (US) Line Cord |

Systems management

ST50 V2 models with Intel Xeon E processors support Intel Active Management Technology (AMT) 15.0 which provides out-of-band, hardware-based advanced system control, monitoring, alerting, and remote presence functions.

ST50 V2 models with Pentium processors support Intel Standard Manageability (ISM), which is a subset of the AMT features.

Both AMT and ISM offer the following features:

- Out-of-band management
- System health and status monitoring
- System event log and alerting
- Hardware inventory
- Boot device selection
- Remote power control
- Serial over LAN
- IDE/USB Redirect for mounting remote media

In addition, AMT supports the following feature:

- KVM (keyboard, video, mouse) redirection

Note: KVM redirection requires an Intel Xeon E processor with integrated graphics.

Health monitoring, event log, alerts, hardware inventory, boot device selection, and remote power control features are accessible out-of-band with a web browser. Serial over LAN, IDE/USB Redirect, and KVM redirection features require third-party tools that are not supplied or supported by Lenovo.

Both AMT and ISM operate independently of the server and remain operational even if the server is powered off. Out-of-band management is performed through the standard Gigabit Ethernet port, which is a shared port for data and management.

AMT and ISM support the following management protocols:

- DASH 1.1
- WS-MAN
- SNMP Platform Event Traps (PET)

Note: The ST50 V2 server does not have an XClarity Controller (XCC) management processor

For more information about Intel AMT, see the the [Intel AMT Implementation and Reference Guide](#) .

Lenovo XClarity Provisioning Manager Lite

Lenovo XClarity Provisioning Manager Lite (LXPM Lite) is a USB memory key-based application for system setup and firmware upgrades.

The software tool provides the following functions:

- Easy-to-use, language-selectable graphical interface
- Integrated help system
- Automatic hardware detection
- Ability to install an operating system and device drivers either in an unattended mode or manually
- Ability to clone the settings in one server to other similarly configured Lenovo servers
- Supports RAID setup
- Diagnostics for memory test, hard disk drive test, and RAID log collection.

The LXPM Lite user interface is shown in the following figure.

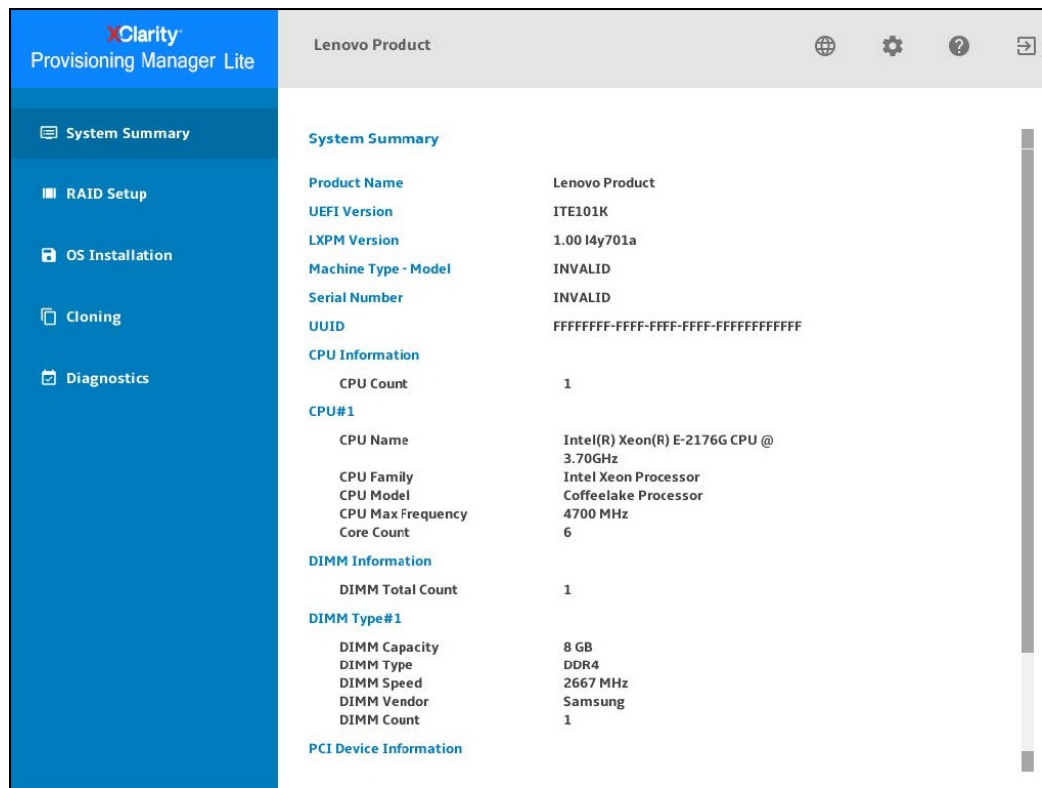


Figure 11. Lenovo XClarity Provisioning Manager Lite user interface

For more information about LXPM Lite, and to download the application, see the following support page: <https://datacentersupport.lenovo.com/us/en/solutions/HT507133>

Security

The ST50 V2 offers the following security features:

- Electronic security measures:
 - Administrator and power-on passwords
 - Trusted Platform Module (TPM) supporting TPM 2.0
- 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 ST50 V2 is NIST 800-147 compliant.

The following table lists the security options for the server. The location of the intrusion switch is shown in the [internal view of the server](#).

Table 31. Security features

| Part number | Feature code | Description |
|-------------|--------------|--|
| 4XF7A78616 | BMET | ThinkSystem ST50 V2 Intrusion Switch Kit |

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 [1U 18.5-inch Standard Media Console](#) product guide.

Table 32. Lenovo Preferred Pro USB Full-sized keyboards - ThinkSystem

| Part number | Feature code | Description |
|-------------|--------------|--|
| Mice | | |
| 7M57A04698 | B0LN | ThinkSystem Optical Wheel Mouse - USB |
| Keyboards | | |
| 7ZB7A05521 | AXTM | ThinkSystem Pref. Pro Keyboard USB - Arabic 253 RoHS v2 |
| 7ZB7A05520 | AXTN | ThinkSystem Pref. Pro Keyboard USB - Arabic French 462 RoHS v2 |
| 7ZB7A05519 | AXTP | ThinkSystem Pref. Pro Keyboard USB - Belgium/French 120 RoHS v2 |
| 7ZB7A05518 | AXTQ | ThinkSystem Pref. Pro Keyboard USB - Belgium/UK 120 RoHS v2 |
| 7ZB7A05517 | AXTR | ThinkSystem Pref. Pro Keyboard USB - Brazil/Portuguese 275 RoHS v2 |
| 7ZB7A05515 | AXTS | ThinkSystem Pref. Pro Keyboard USB - Bulgarian 442 RoHS v2 |
| 7ZB7A05511 | AXTU | ThinkSystem Pref. Pro Keyboard USB - Czech RoHS v2 |
| 7ZB7A05509 | AXTV | ThinkSystem Pref. Pro Keyboard USB - Danish 159 RoHS v2 |
| 7ZB7A05508 | AXTW | ThinkSystem Pref. Pro Keyboard USB - Dutch 143 RoHS v2 |

| Part number | Feature code | Description |
|-------------|--------------|---|
| 7ZB7A05506 | AXTX | ThinkSystem Pref. Pro Keyboard USB - French 189 roHS v2 |
| 7ZB7A05496 | AXTZ | ThinkSystem Pref. Pro Keyboard USB - French Canadian 058 French RoHS v2 |
| 7ZB7A05504 | AXTY | ThinkSystem Pref. Pro Keyboard USB - French Canadian 445 Multilingual RoHS v2 |
| 7ZB7A05495 | AXU0 | ThinkSystem Pref. Pro Keyboard USB - German 129 RoHS v2 |
| 7ZB7A05494 | AXU1 | ThinkSystem Pref. Pro Keyboard USB - Greek 319 RoHS v2 |
| 7ZB7A05493 | AXU2 | ThinkSystem Pref. Pro Keyboard USB - Hebrew RoHS v2 |
| 7ZB7A05492 | AXU3 | ThinkSystem Pref. Pro Keyboard USB - Hungarian 208 RoHS v2 |
| 7ZB7A05491 | AXU4 | ThinkSystem Pref. Pro Keyboard USB - Iceland 197 RoHS v2 |
| 7ZB7A05490 | AXU5 | ThinkSystem Pref. Pro Keyboard USB - Italy 141 RoHS v2 |
| 7ZB7A05489 | AXU6 | ThinkSystem Pref. Pro Keyboard USB - Japanese 194 RoHS |
| 7ZB7A05488 | AXU7 | ThinkSystem Pref. Pro Keyboard USB - Korean 413 RoHS v2 |
| 7ZB7A05487 | AXU8 | ThinkSystem Pref. Pro Keyboard USB - LA Spanish 171 RoHS v2 |
| 7ZB7A05486 | AXU9 | ThinkSystem Pref. Pro Keyboard USB - Norwegian 155 RoHS v2 |
| 7ZB7A05485 | AXUA | ThinkSystem Pref. Pro Keyboard USB - Polish RoHS v2 |
| 7ZB7A05484 | AXUB | ThinkSystem Pref. Pro Keyboard USB - Portuguese 163 RoHS v2 |
| 7ZB7A05483 | AXUC | ThinkSystem Pref. Pro Keyboard USB - Romanian RoHS v2 |
| 7ZB7A05482 | AXUD | ThinkSystem Pref. Pro Keyboard USB - Russian/Cyrillic 441 RoHS v2 |
| 7ZB7A05481 | AXUE | ThinkSystem Pref. Pro Keyboard USB - Serbian/Cyrillic RoHS v2 |
| 7ZB7A05480 | AXUF | ThinkSystem Pref. Pro Keyboard USB - Slovak 245 RoHS v2 |
| 7ZB7A05471 | AXUQ | ThinkSystem Pref. Pro Keyboard USB - Slovenian 234 RoHS v2 |
| 7ZB7A05479 | AXUG | ThinkSystem Pref. Pro Keyboard USB - Spanish 172 RoHS v2 |
| 7ZB7A05478 | AXUH | ThinkSystem Pref. Pro Keyboard USB - Swedish/Finn 153 RoHS v2 |
| 7ZB7A05477 | AXUJ | ThinkSystem Pref. Pro Keyboard USB - Swiss F/G 150 RoHS v2 |
| 7ZB7A05476 | AXUK | ThinkSystem Pref. Pro Keyboard USB - Thailand 191 RoHS v2 |
| 7ZB7A05513 | AXTT | ThinkSystem Pref. Pro Keyboard USB - Trad Chinese/US 467 RoHS v2 |
| 7ZB7A05474 | AXUM | ThinkSystem Pref. Pro Keyboard USB - Turkish 179 RoHS v2 |
| 7ZB7A05475 | AXUL | ThinkSystem Pref. Pro Keyboard USB - Turkish 440 RoHS v2 |
| 7ZB7A05473 | AXUN | ThinkSystem Pref. Pro Keyboard USB - UK English 166 RoHS v2 |
| 7ZB7A05522 | AXTL | ThinkSystem Pref. Pro Keyboard USB - US English 103P RoHS v2 |
| 7ZB7A05472 | AXUP | ThinkSystem Pref. Pro Keyboard USB - US Euro 103P RoHS v2 |

Video port adapters

The ST50 V2 has two integrated DisplayPort video ports at the back of the server. To use these ports with VGA or HDMI cables, use the dongle adapters listed in the following table.

Tip: Some models include a dongle kit. See the [Models](#) section for specifics.

Table 33. Video port dongles

| Part number | Feature code | Description | Maximum supported |
|-------------|--------------|-----------------------------------|-------------------|
| 4X97A12099 | B365 | ThinkSystem DP to VGA Dongle Kit | 2 |
| 4X97A12100 | B366 | ThinkSystem DP to HDMI Dongle Kit | 2 |

Maximum display resolutions are as follows:

- Native DisplayPort: 3840 x 2160 pixels (4K) at a refresh rate of 60Hz
- With the DP to VGA Dongle Kit: 1920 x 1200 pixels at 60 Hz
- With the DP to HDMI Dongle Kit: 1920 x 1200 pixels at 60 Hz

Configuration requirements:

- Only one type of dongle can be used at a time. The use of one of each is not supported.
- Some Xeon processors do not support integrated graphics and the use of the DisplayPort video ports. See the [Processors](#) section for details.

Rack installation

The ST50 V2 can be installed in the rack with the Rack Mount Kit, which converts the server to a rack-mountable server.

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

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

Table 34. Rack installation options

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

The rack mount kit includes the following items:

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

The following table summarizes the rail kit features and specifications.

Table 35. Rail kit features and specifications summary

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

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

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

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

Operating system support

The server supports the following operating systems:

- Microsoft Windows Server 2019
- Microsoft Windows Server 2022
- Red Hat Enterprise Linux 8.4
- Red Hat Enterprise Linux 8.5
- Red Hat Enterprise Linux 9.0
- SUSE Linux Enterprise Server 15 SP3
- SUSE Linux Enterprise Server 15 Xen SP3
- VMware ESXi 7.0 U3

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>

Additional requirements

Additional requirements for operating systems:

- The ST50 V2 does not support ACPI S3 (Sleep) or ACPI S4 (Hibernate) modes when running Windows 10 or Windows 11.
- The onboard SATA ports of the server can be used with virtualization hypervisors, including VMware ESXi, Linux KVM, Xen, and Microsoft Hyper-V Server, however support is limited to AHCI (non-RAID) mode. RSTe mode is not supported with virtualization hypervisors.
- VMware ESXi does not support the onboard Intel I219-LM Ethernet controller. As a result, a separate network adapter will be required.
- The DisplayPort video ports require the following:
 - Windows: Intel VGA driver is installed
 - Linux: kernel/boot parameter "nomodeset" is added

ESXi preloads

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

Table 36. VMware ESXi preload

| Part number | Feature code | Description |
|-------------|--------------|--|
| CTO only | BMEY | VMware ESXi 7.0 U3 (Factory Installed) |

Physical and electrical specifications

The ST50 V2 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: 316 mm (12.4 inches)

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

Table 37. Detailed dimensions

| Dimension | Description |
|-----------|---|
| 170 mm | X_a = Width, using widest features (not including feet) |
| 132 mm | X_b = Width, between the outer edges of the feet |
| 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 |
| 316 mm | Z_b = Depth, from front door to deepest feature of the chassis body feature |
| 316 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 |

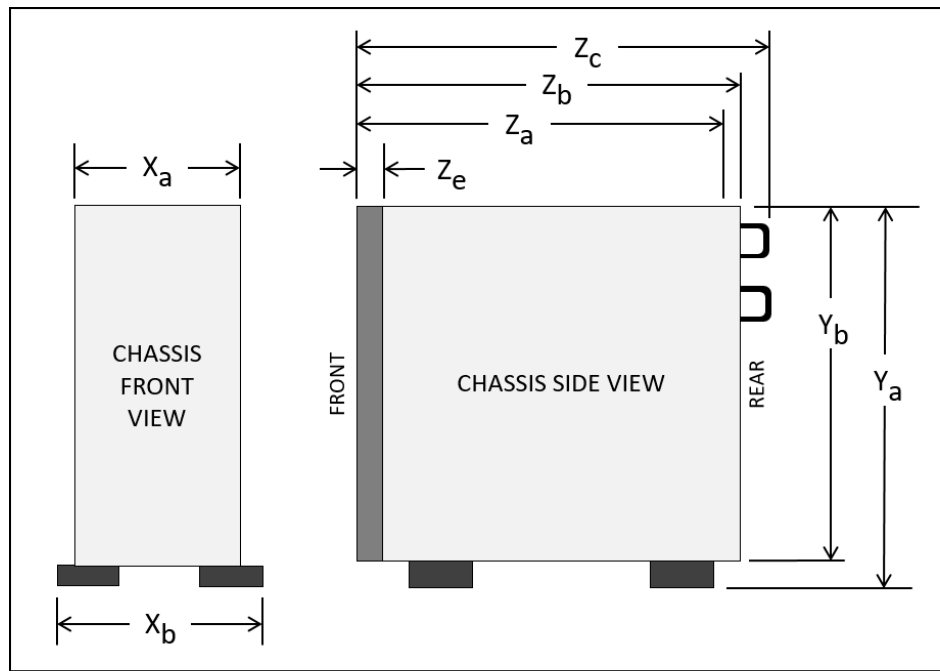


Figure 12. Server dimension

The shipping dimensions (cardboard packaging) of the ST50 V2 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:

- Maximum: 9.4 kg (20.7 lb)

Electrical requirements are as follows:

- Chassis with 300W 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
 - Input kilovolt-amperes (kVA): 0.365 kVA (maximum configuration)

- Chassis with 500W 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; 2.70 A
 - Input kilovolt-amperes (kVA): 0.619 kVA (maximum configuration)

Operating environment

The ST50 V2 server complies with ASHRAE Class A2 specifications.

Temperature and humidity

The server is supported in the following environment:

- 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), derated 1°C per 300 m above 950 m
- Relative Humidity (non-condensing):
 - Operating
 - ASHRAE Class A2: 8% to 80%; maximum dew point: 21°C (70°F)
 - Shipment/storage: 8% to 90%

Acoustic noise emissions

The server has the following acoustic noise emissions declaration:

- Sound power level (L_{WA}):
 - Idling: Typical: 3.5 Bel, Maximum: 5.0 Bel
 - Operating: Typical: 5.4 Bel, Maximum: 5.4 Bel
- Sound pressure level (L_{pAm}):
 - Idling: Typical: 25 dBA, Maximum: 37 dBA
 - Operating: Typical: 40 dBA, Maximum: 40 dBA

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.
- The declared acoustic sound levels are based on the following configurations, which may change depending on configuration/conditions:
 - Typical: 1x 80W CPU, 4x 32GB DIMM, 2x HDD or SSD, 1x 960G M.2, RAID 5350-8i, 1x 300W PSU
 - Maximum: 1x 95W CPU, 4x 32GB DIMM, 2x HDD or SSD, 1x 960G M.2, 1x T1000GPU, 1x 500W PSU

Heat output

The server generates the following heat:

- Heat/thermal output:
 - Minimum configuration: 443 BTU/hr, 130 W
 - Maximum configuration: 754 BTU/hr, 221 W

Shock and vibration

The server has the following vibration and shock limits:

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

Particulate contamination

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

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

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

For additional information, see the Specifications section of the Setup Guide for the server, available from the Lenovo ThinkSystem Information Center, <https://thinksystem.lenovofiles.com/help/index.jsp>

Warranty and Support

The ST50 V2 has a 1-year or 3-year warranty, based on the machine type of the system:

- 7D8K - 1 year warranty
- 7D8J - 3 year warranty

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

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

- **Premier Support**

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

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

- **Warranty Upgrade (Preconfigured Support)**

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

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

- **Managed Services**

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

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

- **Technical Account Management (TAM)**

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

- **Enterprise Server Software Support**

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

- **YourDrive YourData**

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

- **Health Check**

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

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

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

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

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

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

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

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

Services

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

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

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

- **Asset Recovery Services**

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

- **Assessment Services**

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

- **Design Services**

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

- **Basic Hardware Installation**

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

- **Deployment Services**

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

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

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

Regulatory compliance

The ST50 V2 conforms to the following standards:

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

External backup units

The following table lists the external RDX backup options available.

Table 38. External RDX dock and cartridges

| Part number | Feature code | Description |
|--------------------|--------------|--|
| External RDX docks | | |
| 4T27A10725 | B32R | ThinkSystem RDX External USB 3.0 Dock (No cartridge included with the drive) |
| Cartridges | | |
| 7TP7A01601 | AVF8 | ThinkSystem RDX 500GB Cartridge |
| 7TP7A01602 | AVF1 | ThinkSystem RDX 1TB Cartridge |
| 7TP7A01603 | AVF0 | ThinkSystem RDX 2TB Cartridge |
| 7TP7A04318 | AXD1 | ThinkSystem RDX 4TB Cartridge |

For more information, see the Lenovo RDX USB 3.0 Disk Backup Solution product guide:

<https://lenovopress.com/tips0894-rdx-usb-30>

Uninterruptible power supply units

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

Table 39. Uninterruptible power supply units

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

† Only available in China and countries in the Asia Pacific region.

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

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

Power distribution units

The following table lists the power distribution units (PDUs) that are offered by Lenovo.

Table 40. Power distribution units

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

| Part number | Feature code | Description | ANZ | ASEAN | Brazil | EET | MEA | RUCIS | WE | HTK | INDIA | JAPAN | LA | NA | PRC |
|---|--------------|---|-----|-------|--------|-----|-----|-------|----|-----|-------|-------|----|----|-----|
| 00YJ779 | ATZX | 0U 21 C13/12 C19 48A 3 Phase PDU | N | N | Y | N | N | N | Y | N | N | Y | Y | Y | N |
| 00YJ777 | ATZZ | 0U 36 C13/6 C19 32A 1 Phase PDU | Y | Y | N | Y | Y | Y | Y | Y | Y | N | N | Y | Y |
| 00YJ778 | AU00 | 0U 21 C13/12 C19 32A 3 Phase PDU | Y | Y | N | Y | Y | Y | Y | Y | Y | N | N | Y | Y |
| 0U Switched and Monitored PDUs | | | | | | | | | | | | | | | |
| 00YJ783 | AU04 | 0U 12 C13/12 C19 Switched and Monitored 48A 3 Phase PDU | N | N | Y | N | N | N | Y | N | N | Y | Y | Y | N |
| 00YJ781 | AU03 | 0U 20 C13/4 C19 Switched and Monitored 24A 1 Phase PDU | N | N | Y | N | Y | N | Y | N | N | Y | Y | Y | N |
| 00YJ782 | AU02 | 0U 18 C13/6 C19 Switched and Monitored 32A 3 Phase PDU | Y | Y | Y | Y | Y | Y | Y | Y | Y | N | Y | N | Y |
| 00YJ780 | AU01 | 0U 20 C13/4 C19 Switched and Monitored 32A 1 Phase PDU | Y | Y | Y | Y | Y | Y | Y | Y | Y | N | Y | N | Y |
| 1U Switched and Monitored PDUs | | | | | | | | | | | | | | | |
| 4PU7A81117 | BNDV | 1U 18 C19/C13 switched and monitored 48A 3P WYE PDU - ETL | N | N | N | N | N | N | N | N | N | N | N | Y | N |
| 4PU7A77467 | BLC4 | 1U 18 C19/C13 Switched and Monitored 80A 3P Delta PDU | N | N | N | N | N | N | N | N | N | Y | N | Y | N |
| 1U Ultra Density Enterprise PDUs (9x IEC 320 C13 + 3x IEC 320 C19 outlets) | | | | | | | | | | | | | | | |
| 71763NU | 6051 | Ultra Density Enterprise C19/C13 PDU 60A/208V/3PH | N | N | Y | N | N | N | N | N | N | Y | Y | Y | N |
| 71762NX | 6091 | Ultra Density Enterprise C19/C13 PDU Module | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 1U C13 Enterprise PDUs (12x IEC 320 C13 outlets) | | | | | | | | | | | | | | | |
| 39M2816 | 6030 | DPI C13 Enterprise PDU Plus Module (WW) | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 39Y8941 | 6010 | DPI C13 Enterprise PDU Module (WW) | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 1U C19 Enterprise PDUs (6x IEC 320 C19 outlets) | | | | | | | | | | | | | | | |
| 39Y8948 | 6060 | DPI C19 Enterprise PDU Module (WW) | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 39Y8923 | 6061 | DPI Three-phase 60A/208V C19 Enterprise PDU (US) | N | N | Y | N | N | N | Y | N | N | N | Y | Y | N |
| 1U Front-end PDUs (3x IEC 320 C19 outlets) | | | | | | | | | | | | | | | |
| 39Y8938 | 6002 | DPI Single-phase 30A/120V Front-end PDU (US) | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 39Y8939 | 6003 | DPI Single-phase 30A/208V Front-end PDU (US) | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 39Y8934 | 6005 | DPI Single-phase 32A/230V Front-end PDU (International) | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 39Y8940 | 6004 | DPI Single-phase 60A/208V Front-end PDU (US) | Y | N | Y | Y | Y | Y | Y | N | N | Y | Y | Y | N |
| 39Y8935 | 6006 | DPI Single-phase 63A/230V Front-end PDU (International) | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 1U NEMA PDUs (6x NEMA 5-15R outlets) | | | | | | | | | | | | | | | |
| 39Y8905 | 5900 | DPI 100-127V NEMA PDU | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Line cords for 1U PDUs that ship without a line cord | | | | | | | | | | | | | | | |

| Part number | Feature code | Description | ANZ | ASEAN | Brazil | EET | MEA | RUCIS | WE | HTK | INDIA | JAPAN | LA | NA | PRC |
|-------------|--------------|---|-----|-------|--------|-----|-----|-------|----|-----|-------|-------|----|----|-----|
| 40K9611 | 6504 | 4.3m, 32A/380-415V, EPDU/IEC 309 3P+N+G 3ph wye (non-US) Line Cord | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 40K9612 | 6502 | 4.3m, 32A/230V, EPDU to IEC 309 P+N+G (non-US) Line Cord | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 40K9613 | 6503 | 4.3m, 63A/230V, EPDU to IEC 309 P+N+G (non-US) Line Cord | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 40K9614 | 6500 | 4.3m, 30A/208V, EPDU to NEMA L6-30P (US) Line Cord | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 40K9615 | 6501 | 4.3m, 60A/208V, EPDU to IEC 309 2P+G (US) Line Cord | N | N | Y | N | N | N | Y | N | N | Y | Y | Y | N |
| 40K9617 | 6505 | 4.3m, 32A/230V, Souriau UTG Female to AS/NZ 3112 (Aus/NZ) Line Cord | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 40K9618 | 6506 | 4.3m, 32A/250V, Souriau UTG Female to KSC 8305 (S. Korea) Line Cord | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |

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

Rack cabinets

The ST50 V2 server can be installed horizontally in a rack cabinet using the Rack Mount Kit, as described in the [Rack installation](#) section.

The following table lists the supported rack cabinets.

Table 41. Rack cabinets

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

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

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

KVM console options

The following table lists the supported KVM consoles.

Table 42. KVM console

| Part number | Description |
|-------------|---|
| 4XF7A73009 | ThinkSystem 18.5" LCD Console (with English keyboard) |

The following table lists the available KVM switches and the options that are supported with them.

Table 44. KVM switches and options

| Part number | Description |
|--|---|
| KVM Console switches | |
| 1754D1T | ThinkSystem Digital 2x1x16 KVM Switch (DVI video output port) |
| 1754A1T | ThinkSystem Analog 1x8 KVM Switch (DVI video output port) |
| 1754D2X | Global 4x2x32 Console Manager (GCM32) |
| 1754D1X | Global 2x2x16 Console Manager (GCM16) |
| 1754A2X | Local 2x16 Console Manager (LCM16) |
| 1754A1X | Local 1x8 Console Manager (LCM8) |
| Cables for ThinkSystem Digital and Analog KVM Console switches | |
| 4X97A11108 | ThinkSystem VGA to DVI Conversion Cable |
| 4X97A11109 | ThinkSystem Single-USB Conversion Cable for Digital KVM |
| 4X97A11107 | ThinkSystem Dual-USB Conversion Cable for Digital KVM |
| 4X97A11106 | ThinkSystem USB Conversion Cable for Analog KVM |
| Cables for GCM and LCM Console switches | |
| 46M5383 | Virtual Media Conversion Option Gen2 (VCO2) |
| 46M5382 | Serial Conversion Option (SCO) |

For more information, see the list of Product Guides in the KVM Switches and Consoles category:
<http://lenovopress.com/servers/options/kvm>

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Related publications and links

For more information, see these resources:

- ThinkSystem ST50 V2 product page
<https://www.lenovo.com/us/en/p/data-center/servers/towers/thinksystem-st50-v2/len21ts0004>
- ThinkSystem ST50 V2 interactive 3D tour
<https://lenovopress.com/lp1568-3d-tour-thinksystem-st50-v2>
- ThinkSystem ST50 V2 drivers and support
<http://datacentersupport.lenovo.com/products/servers/thinksystem/st50v2/7d8j/downloads>
- ThinkSystem ST50 V2 product publications:
<http://thinksystem.lenovofiles.com/help/index.jsp>
 - Quick Start
 - Tower-to-Rack Conversion Kit Installation Instructions
 - Setup Guide
 - Maintenance Manual
 - Lenovo XClarity Provisioning Manager Lite User Guide
- ServerProven hardware compatibility:
<http://www.lenovo.com/us/en/serverproven>

Related product families

Product families related to this document are the following:

- [1-Socket Tower Servers](#)
- [ThinkSystem ST50 V2 Server](#)

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