



## Lenovo ThinkSystem ST50 Server Product Guide

The Lenovo ThinkSystem ST50 1-socket 4U rack-mountable 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-2100 Series processor (formerly codenamed "Coffee Lake") and up to 64 GB of 2666 MHz TruDDR4 ECC memory.

Figure 1 shows the Lenovo ThinkSystem ST50.



Figure 1. Lenovo ThinkSystem ST50

### Did you know?

The ThinkSystem ST50 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 runs a wide range of server operating systems plus support for Windows 10, and is quiet enough and small enough to fit under or beside an office desk.

## Key features

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

- The Intel Xeon E-2100 Series processors improves productivity by offering affordable single-socket system performance with 6-core processors with up to 3.8 GHz core speeds.
- Intelligent and adaptive system performance with Intel Turbo Boost Technology 2.0 allows processor cores to run at maximum speeds during peak workloads by temporarily going beyond processor thermal design power (TDP).
- Intel Hyper-Threading Technology boosts performance for multithreaded applications by enabling simultaneous multithreading within each processor core, up to two threads per core.
- Intel Virtualization Technology integrates hardware-level virtualization hooks that allow operating system vendors to better use the hardware for virtualization workloads.
- Up to four 2666 MHz DDR4 ECC or non-ECC UDIMMs provide speed and capacity of up to 64 GB.
- The server offers PCI Express 3.0 I/O expansion capabilities that increase the theoretical maximum bandwidth by almost 100% (8 GTps per link using 128b/130b encoding) compared to the PCI Express 2.0 (5 GTps per link using 8b/10b encoding).
- With Intel Integrated I/O Technology, the PCI Express 3.0 controller is integrated into the Intel Xeon E-2100 Series processors. Such integration reduces I/O latency and increases overall system performance.
- Up to four non-hot-swap (NHS) drive bays 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 (hard disk drives or HDDs) can significantly improve I/O performance.

### Availability and serviceability

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

- The ST50 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) 12.0 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:

- Intel Active Management Technology (AMT) 12.0 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 and 1.2 enables advanced cryptographic functionality, such as digital signatures and remote attestation.
- Administrator and power-on passwords help protect from unauthorized access to the server.
- An intrusion switch on the cover of the server and padlock loop at the rear 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 offers the following energy-efficiency 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.

## Components and connectors

The following figure shows the front of the server.

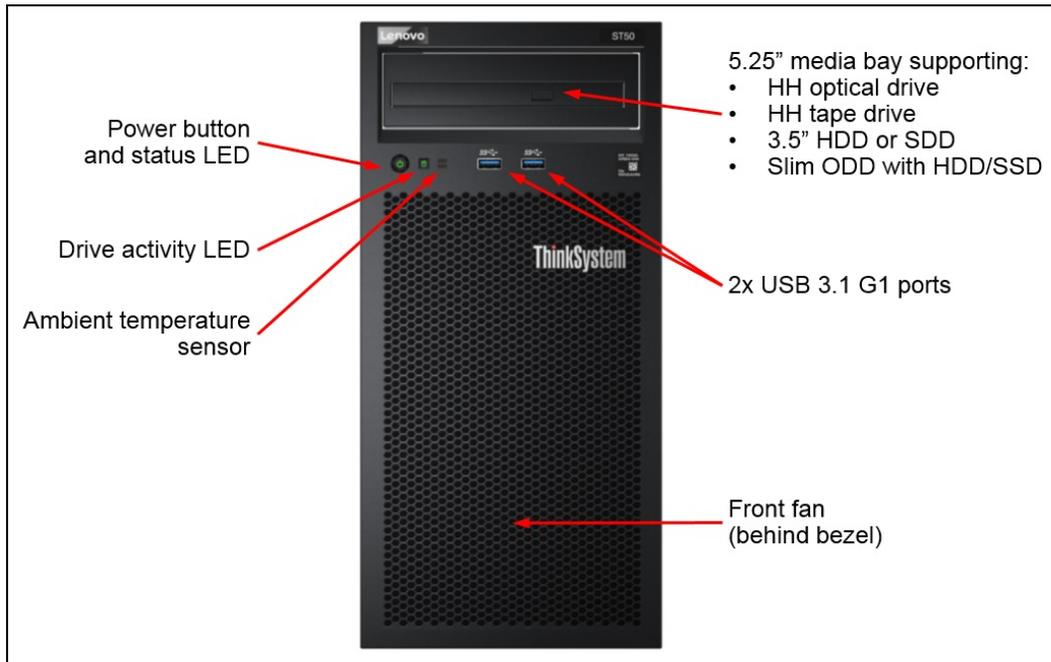


Figure 2. Front view of the ThinkSystem ST50 server

The following figure shows the rear of the server.

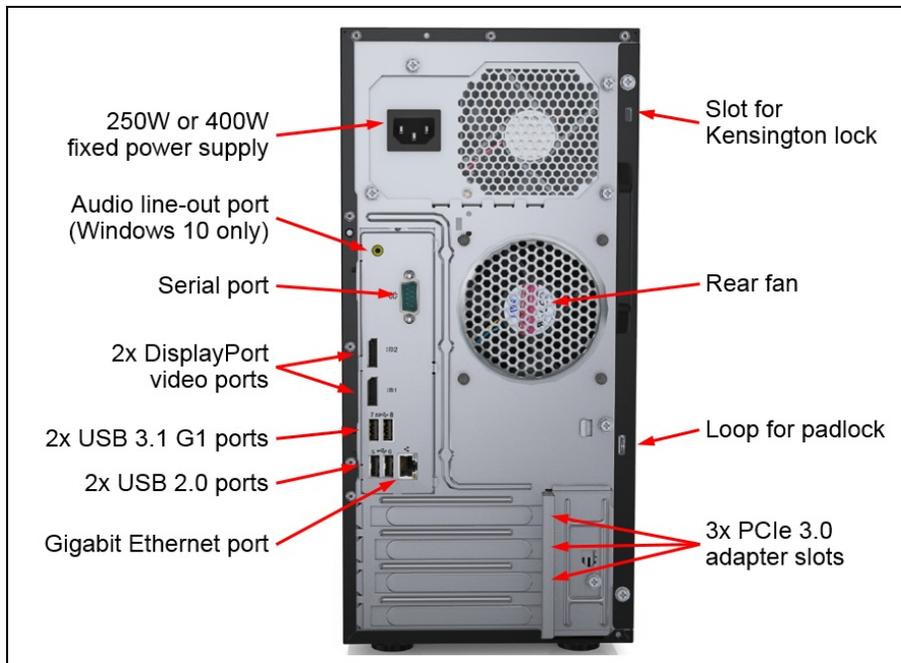


Figure 3. Rear view of the ThinkSystem ST50 server

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

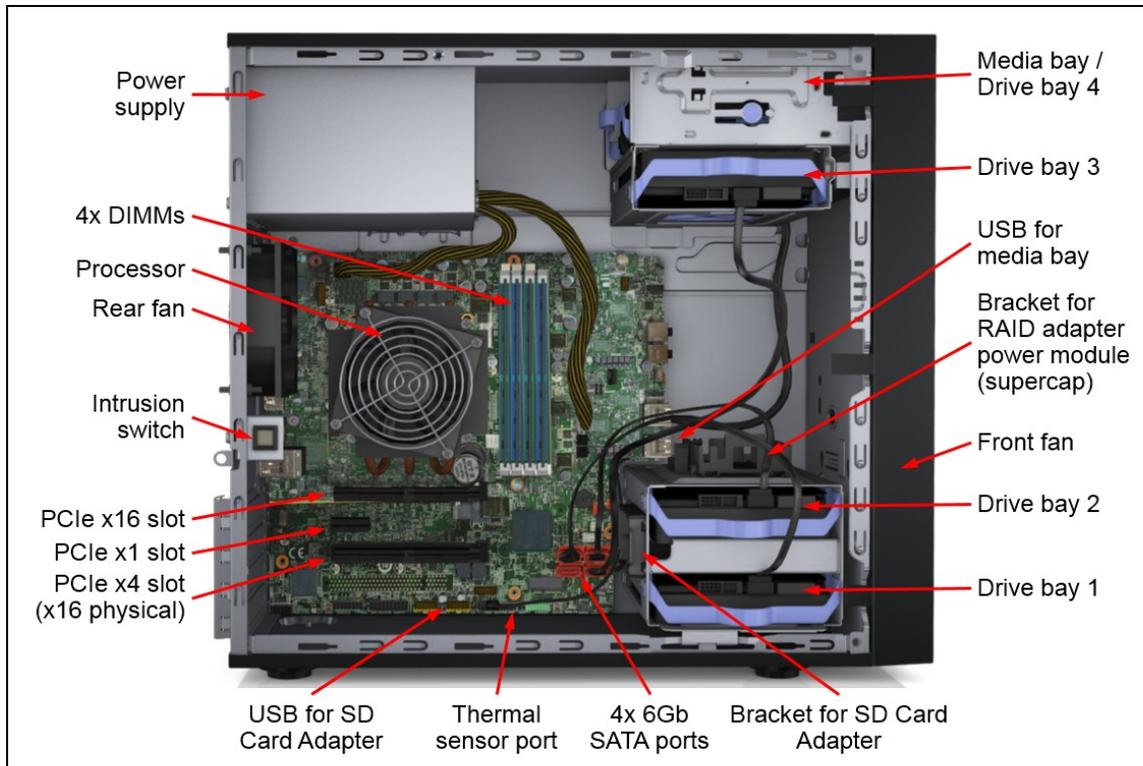


Figure 4. Internal view of the ThinkSystem ST50 server

## System architecture

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

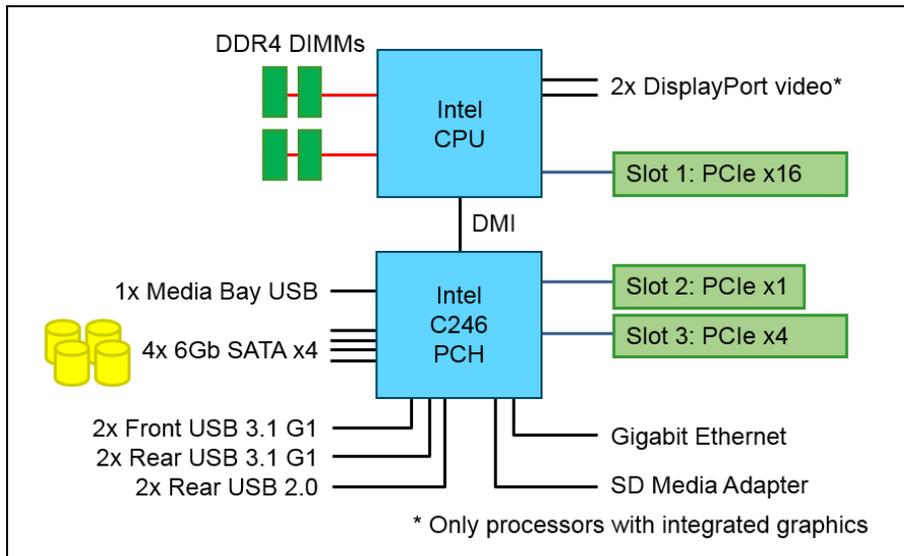


Figure 5. ST50 system architectural block diagram

## Standard specifications

The following table lists the standard specifications.

Table 1. Standard specifications

Components	Specification
Machine type	7Y49 - 1 year warranty 7Y48 - 3 year warranty
Form factor	Tower or 4U rack
Processor	One Intel processor (formerly codenamed "Coffee Lake"). Choose from: <ul style="list-style-type: none"> <li>• Intel Xeon E-2100 Series processor up to 3.8 GHz</li> <li>• Intel Core i3-8100/8300 Series processor up to 4 GHz</li> <li>• Intel Pentium G5400/G5500/G5600 Series processor up to 3.9 GHz</li> <li>• Intel Celeron G4900 Series processor up to 3.2 GHz</li> </ul>
Chipset	Intel C246 chipset
Memory	Four DIMM sockets supporting Lenovo TruDDR4 DIMMs at 2666 MHz. Support ECC UDIMMs. For China customers, the server supports non-ECC DIMMs (ECC and non-ECC cannot be mixed).
Memory maximums	Up to 64 GB with 4x 16 GB UDIMMs
Memory protection	Error-correcting code (ECC)
Disk drive bays	Up to 4x 3.5-inch non-hot swap (NHS) drive bays.  Bays 1-3 only support 3.5" HDD or SSD drives; Bay 4 supports one of the following configurations: <ul style="list-style-type: none"> <li>• 3.5-inch non-hot-swap HDD or SSD in a 5.25-inch conversion tray</li> <li>• Half-high optical drive (either DVD-ROM or DVD-RW)</li> <li>• Half-high backup unit (either LTO tape or RDX drive)</li> <li>• Combination 3.5-inch non-hot-swap HDD or SSD plus a slim optical DVD-RW</li> </ul> The server can be configured without any HDDs or SSDs. The server also supports 2x SD Cards installed in an optional SD Card Adapter (RAID not supported).
Maximum internal storage	<ul style="list-style-type: none"> <li>• Using HDDs: 32 TB using 4x 8TB SATA HDDs</li> <li>• Using SSDs: 3.84 TB using 4x 960GB SATA SSDs</li> </ul> HDDs and SSDs can be installed in the same server but are not supported in the same RAID volume
Storage controller	<ul style="list-style-type: none"> <li>• Onboard 6 Gb SATA controller, supporting AHCI mode (non-RAID) or Intel RSTe software RAID (RAID 0, 1, 10, 5)</li> <li>• 12 Gb RAID controller: <ul style="list-style-type: none"> <li>◦ RAID 530i (cacheless) supports RAID 0, 1, 10, 5 (planned support in 1Q/2019)</li> <li>◦ RAID 730-8i with 1GB cache supports RAID 0, 1, 10, 5</li> <li>◦ RAID 930-8i with 2GB flash-backed cache supports RAID 0, 1, 10, 5, 6</li> </ul> </li> <li>• 12 Gb Host Bus Adapter: <ul style="list-style-type: none"> <li>◦ 430-8i SAS/SATA 12Gb HBA</li> </ul> </li> </ul>
Media drive bay	One half-height 5.25-inch bay for optical or tape drive. Supports DVD-ROM or DVD-RW. Mutually exclusive with the fourth HDD/SSD.

Components	Specification
Network interfaces	One integrated Gigabit Ethernet 1000BASE-T port (RJ-45) using Intel i219-LM controller.
PCI Expansion slots	Three PCIe slots as follows: <ul style="list-style-type: none"> <li>Slot 1: PCIe 3.0 x16 full-height half-length (FHHL)</li> <li>Slot 2: PCIe 3.0 x1 full-height half-length (FHHL)</li> <li>Slot 3: PCIe 3.0 x4 (physical connector is x16) full-height half-length (FHHL)</li> </ul>
Ports	Front ports: <ul style="list-style-type: none"> <li>Two USB ports (both are USB 3.1 G1)</li> </ul> Rear ports: <ul style="list-style-type: none"> <li>Four USB ports (two USB 3.1 G1, two USB 2.0)</li> <li>Two DisplayPort video ports (require a processor with integrated graphics)</li> <li>One RJ-45 Gigabit Ethernet port</li> <li>One serial port</li> <li>One audio line-out ports (Windows 10 only; some line noise is possible)</li> </ul>
Cooling	Supports ASHRAE A2 and ASHRAE B environments. Two fixed system fans. Additional fans attached to the processor, in the power supply, and in the optional media bay enclosure.
Power supply	One fixed power supply, either 250W or 400W power supply. 80 PLUS Platinum certified.
Hot-swap parts	None
Systems management	Power and drive activity LEDs. Intel Active Management Technology (AMT) 12.0 server management. Supports Integrated Lenovo XClarity Provisioning Manager Lite (USB memory key-based) for system setup and firmware upgrades.
Security features	Power-on password, administrator's password, Trusted Platform Module (TPM), supporting TPM 1.2 or 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 <a href="#">Processors</a> 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 <a href="#">GPU adapters</a> for details.
Operating systems supported	Microsoft Windows Server, Red Hat Enterprise Linux, VMware ESXi. See the <a href="#">Operating system support</a> section for specifics.
Limited warranty	Three-year or one-year (model dependent) customer-replaceable unit and onsite limited warranty with 9x5 next business day (NBD).
Service and support	Optional service upgrades are available through Lenovo Services: 4-hour or 2-hour response time, 6-hour fix time, 1-year or 2-year warranty extension, software support for Lenovo hardware and some third-party applications.
Dimensions	Height: 375 mm (14.8 in), width: 175 mm (6.9 in), depth: 407 mm (16.0 in)
Weight	Minimum: 7.5 kg (16.5 lb), maximum: 11.2 kg (24.7 lb)

The ST50 server is shipped with the following items:

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

## Models

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

- [Models for Australia and New Zealand](#)
- [Models for Brazil](#)
- [Models for EMEA countries](#)
- [Models for Hong Kong, Taiwan, Korea \(HTK\)](#)
- [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 Australia and New Zealand

Table 2. Models for Australia and New Zealand

Model	Intel processor†	Memory	Drive Controller	Drive bays Drives	Media bay	GPU	Power supply & cord	TPM	Intru. switch
Standard models with a 1-year warranty (machine type 7Y49)									
7Y49A012AU	Xeon E-2124G 4+2C 71W 3.4GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	Open	Option	400W Yes	v1.2	Option
7Y49A01GAU	Xeon E-2126G 6+2C 80W 3.3GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	Open	No	250W Yes	v1.2	Option
7Y49A019AU	Xeon E-2136 6C 80W 3.3GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	Open	P620	400W Yes	v1.2	Option
7Y49A01PAU	Xeon E-2144G 4+2C 71W 3.6GHz	1x 8GB	Onboard AHCI	4 drive bays Open bay	Slim DVD-RW + 3.5-in bay	No	250W Yes	v1.2	Option
7Y49A01UAU	Xeon E-2174G 4+2C 71W 3.8GHz	1x 16GB	Onboard AHCI	3 drive bays Open bay	Open	No	250W Yes	v1.2	Option
7Y49A00PAU	Xeon E-2176G 6+2C 80W 3.7GHz	1x 16GB	Onboard AHCI	4 drive bays Open bay	Slim DVD-RW + 3.5-in bay	No	250W Yes	v1.2	Option
7Y49A00SAU	Xeon E-2186G 6+2C 95W 3.8GHz	1x 16GB	Onboard AHCI	3 drive bays Open bay	Open	No	250W Yes	v1.2	Option
7Y49A01RAU	Pentium G5600 2C+2 54W 3.9GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	Open	No	250W Yes	v1.2	Option
TopSeller models with a 1-year warranty (machine type 7Y49)									
7Y49A01JAU	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	Open	No	250W Yes	v1.2	Option
7Y49A00WAU	Xeon E-2124G 4+2C 71W 3.4GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	Open	No	250W Yes	v1.2	Option
7Y49A01KAU	Xeon E-2146G 6+2C 80W 3.5GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	Open	No	250W Yes	v1.2	Option
7Y49A014AU	Core i3-8300 4C+2 62W 3.7GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	Open	No	250W Yes	v1.2	Option

† Processor detail: Model, compute core count + graphics core count, TDP, core frequency

## Models for Brazil

Table 3. Models for Brazil

Model	Intel processors†	Memory	Drive Controller	Drive bays Drives	Media bay	GPU	Power supply & cord	TPM	Intru. switch
TopSeller models with a 3-year warranty (machine type 7Y48)									
7Y48A010BR	Xeon E-2104G 4+2C 65W 3.2GHz	1x 16GB	Onboard RSTe	3 drive bays 2x 1TB HDD	HH DVD-RW	No	250W Yes	v2.0	Yes
7Y48A014BR	Xeon E-2104G 4+2C 65W 3.2GHz	1x 16GB	Onboard RSTe	3 drive bays 1x 1TB HDD	HH DVD-RW	No	250W Yes	v2.0	Yes
7Y48A017BR	Xeon E-2104G 4+2C 65W 3.2GHz	1x 16GB	Onboard RSTe	3 drive bays 2x 2TB HDD	HH DVD-RW	No	250W Yes	v2.0	Yes
7Y48A01FBR	Xeon E-2104G 4+2C 65W 3.2GHz	1x 16GB	Onboard RSTe	3 drive bays 1x 2TB HDD	HH DVD-RW	No	250W Yes	v2.0	Yes
7Y48A00LBR	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard RSTe	3 drive bays 1x 1TB HDD	HH DVD-RW	No	250W Yes	v2.0	Yes
7Y48A00TBR	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard RSTe	3 drive bays 2x 2TB HDD	HH DVD-RW	No	250W Yes	v2.0	Yes
7Y48A018BR	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard RSTe	3 drive bays 2x 1TB HDD	HH DVD-RW	No	250W Yes	v2.0	Yes
7Y48A01EBR	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard RSTe	3 drive bays 1x 2TB HDD	HH DVD-RW	No	250W Yes	v2.0	Yes

† Processor detail: Model, compute core count + graphics core count, TDP, core frequency

## Models for EMEA countries

Table 4. Models for EMEA countries

Model	Intel processors†	Memory	Drive Controller	Drive bays Drives	Media bay	GPU	Power supply & cord	TPM	Intru. switch
Standard models with a 3-year warranty (machine type 7Y48)									
7Y48A003EA	Xeon E-2124G 4+2C 71W 3.4GHz	1x 8GB	Onboard AHCI	4 drive bays 1x 1TB HDD	Slim DVD-RW + 3.5-in bay	No	250W No	v2.0	Option
7Y48A006EA	Xeon E-2124G 4+2C 71W 3.4GHz	1x 8GB	Onboard AHCI	4 drive bays 2x 1TB HDD	Slim DVD-RW + 3.5-in bay	No	250W No	v2.0	Option
7Y48A007EA	Xeon E-2124G 4+2C 71W 3.4GHz	1x 8GB	Onboard AHCI	4 drive bays 2x 2TB HDD	Slim DVD-RW + 3.5-in bay	No	250W No	v2.0	Option
7Y48A008EA	Xeon E-2124G 4+2C 71W 3.4GHz	1x 8GB	Onboard AHCI	4 drive bays Open bay	Slim DVD-RW + 3.5-in bay	No	250W No	v2.0	Option
7Y48A00ZEA	Xeon E-2124G 4+2C 71W 3.4GHz	1x 8GB	Onboard AHCI	4 drive bays 2x 4TB HDD	Slim DVD-RW + 3.5-in bay	No	250W No	v2.0	Option
7Y48A00HEA	Xeon E-2126G 6+2C 80W 3.3GHz	1x 8GB	Onboard AHCI	4 drive bays 2x 4TB HDD	Slim DVD-RW + 3.5-in bay	No	250W No	v2.0	Option
7Y48A00BEA	Xeon E-2146G 6+2C 80W 3.5GHz	1x 8GB	Onboard AHCI	4 drive bays Open bay	Slim DVD-RW + 3.5-in bay	No	250W No	v2.0	Option
7Y48A001EA	Xeon E-2176G 6+2C 80W 3.7GHz	1x 16GB	Onboard AHCI	4 drive bays Open bay	Slim DVD-RW + 3.5-in bay	No	250W No	v2.0	Option
7Y49A01NEA	Xeon E-2124G 4+2C 71W 3.4GHz	1x 8GB	Onboard AHCI	4 drive bays 2x 1TB HDD	Slim DVD-RW + 3.5-in bay	No	250W No	v2.0	Option

† Processor detail: Model, compute core count + graphics core count, TDP, core frequency

## Models for Hong Kong, Taiwan, Korea (HTK)

Included with all Hong Kong, Taiwan, Korea models:

- 1x ThinkSystem ST50 DP to VGA Dongle Kit

Table 5. Models for Hong Kong, Taiwan, Korea (HTK)

Model	Intel processors†	Memory	Drive Controller	Drive bays Drives	Media bay	GPU	Power supply & cord	TPM	Intru. switch
TopSeller models with a 3-year warranty (machine type 7Y48)									
7Y48A00ACN	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard RSTe	3 drive bays 1x 1TB HDD	HH DVD-ROM	No	250W No	v1.2	Option
7Y48A00DCN	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard RSTe	3 drive bays 1x 1TB HDD	HH DVD-RW	Option	400W No	v1.2	Option
7Y48A01DCN	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	HH DVD-RW	Option	400W No	v1.2	Option
7Y48A00PCN	Xeon E-2124G 4+2C 71W 3.4GHz	1x 8GB	Onboard RSTe	3 drive bays 1x 1TB HDD	HH DVD-RW	Option	400W No	v1.2	Option
7Y48A019CN	Xeon E-2124G 4+2C 71W 3.4GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	HH DVD-ROM	No	250W No	v1.2	Option
7Y48A00CCN	Xeon E-2126G 6+2C 80W 3.3GHz	1x 8GB	Onboard RSTe	3 drive bays 1x 1TB HDD	HH DVD-RW	Option	400W No	v1.2	Option
7Y48A01ACN	Xeon E-2144G 4+2C 71W 3.6GHz	1x 8GB	Onboard RSTe	3 drive bays 1x 1TB HDD	HH DVD-ROM	No	250W No	v1.2	Option
7Y48A00QCN	Xeon E-2174G 4+2C 71W 3.8GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	HH DVD-ROM	No	250W No	v1.2	Option
7Y48A00WCN	Xeon E-2174G 4+2C 71W 3.8GHz	1x 8GB	Onboard RSTe	3 drive bays 1x 1TB HDD	HH DVD-ROM	No	250W No	v1.2	Option
7Y48A015CN	Xeon E-2174G 4+2C 71W 3.8GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	HH DVD-RW	Option	400W No	v1.2	Option

† Processor detail: Model, compute core count + graphics core count, TDP, core frequency

## Models for Japan

Included with all Japan models:

- 1x ThinkSystem ST50 DP to VGA Dongle Kit
- ThinkSystem Optical Wheel Mouse - USB
- ThinkSystem Preferred Pro II USB Keyboard - Japanese

Table 6. Models for Japan

Model	Intel processors†	Memory	Drive Controller	Drive bays Drives	Media bay	GPU	Power supply & cord	TPM	Intru. switch
Standard models with a 1-year warranty (machine type 7Y49)									
7Y49A01WJP	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	HH DVD-ROM	No	250W Yes	v1.2	Option
7Y49A01LJP	Xeon E-2124G 4+2C 71W 3.4GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	HH DVD-ROM	No	250W Yes	v1.2	Option
7Y49A017JP	Xeon E-2126G 6+2C 80W 3.3GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	HH DVD-ROM	No	250W Yes	v1.2	Option
7Y49A01SJP	Xeon E-2144G 4+2C 71W 3.6GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	HH DVD-ROM	No	250W Yes	v1.2	Option

Model	Intel processors†	Memory	Drive Controller	Drive bays Drives	Media bay	GPU	Power supply & cord	TPM	Intru. switch
7Y49A015JP	Xeon E-2146G 6+2C 80W 3.5GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	HH DVD-ROM	No	250W Yes	v1.2	Option
7Y49A00XJP	Xeon E-2174G 4+2C 71W 3.8GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	HH DVD-ROM	No	250W Yes	v1.2	Option
7Y49A01DJP	Xeon E-2176G 6+2C 80W 3.7GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	HH DVD-ROM	No	250W Yes	v1.2	Option
7Y49A01HJP	Xeon E-2186G 6+2C 95W 3.8GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	HH DVD-ROM	Option	400W Yes	v1.2	Option
7Y49A01MJP	Pentium G5400 2C+1 54W 3.7GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	HH DVD-ROM	No	250W Yes	v1.2	Option
7Y49A01VJP	Pentium G5400T 2C+1 35W 3.1GHz	1x 16GB	Onboard RSTe	3 drive bays Open bay	HH DVD-ROM	No	250W Yes	v1.2	Option
7Y49A00LJP	Pentium G5400T 2C+1 35W 3.1GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	HH DVD-ROM	No	250W Yes	v1.2	Option
7Y49A01BJP	Pentium G5500 2C+2 54W 3.8GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	HH DVD-ROM	No	250W Yes	v1.2	Option
7Y49A00ZJP	Pentium G5600 2C+2 54W 3.9GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	HH DVD-ROM	No	250W Yes	v1.2	Option
7Y49A01YJP	Core i3-8100 4C+2 65W 3.6GHz	1x 16GB	Onboard RSTe	3 drive bays Open bay	HH DVD-ROM	No	250W Yes	v1.2	Option
7Y49A00KJP	Core i3-8100 4C+2 65W 3.6GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	HH DVD-ROM	No	250W Yes	v1.2	Option
7Y49A022JP	Core i3-8300 4C+2 62W 3.7GHz	1x 16GB	Onboard RSTe	3 drive bays Open bay	HH DVD-ROM	No	250W Yes	v1.2	Option
7Y49A01ZJP	Core i3-8300 4C+2 62W 3.7GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	HH DVD-ROM	No	250W Yes	v1.2	Option
7Y49A020JP	Core i3-8350K 4C+2 91W 4GHz	1x 16GB	Onboard RSTe	3 drive bays Open bay	HH DVD-ROM	Option	400W Yes	v1.2	Option
7Y49A00TJP	Core i3-8350K 4C+2 91W 4GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	HH DVD-ROM	Option	400W Yes	v1.2	Option
Topseller Models with a 1-year warranty (machine type 7Y49)									
7Y49A010JP	Xeon E-2104G 4+2C 65W 3.2GHz	1x 16GB	Onboard RSTe	3 drive bays Open bay	HH DVD-ROM	No	250W Yes	v1.2	Option
7Y49A021JP	Xeon E-2124G 4+2C 71W 3.4GHz	1x 16GB	Onboard RSTe	3 drive bays Open bay	HH DVD-ROM	No	250W Yes	v1.2	Option
7Y49A00VJP	Xeon E-2126G 6+2C 80W 3.3GHz	1x 16GB	Onboard RSTe	3 drive bays Open bay	HH DVD-ROM	No	250W Yes	v1.2	Option
7Y49A00UJP	Xeon E-2144G 4+2C 71W 3.6GHz	1x 16GB	Onboard RSTe	3 drive bays Open bay	HH DVD-ROM	No	250W Yes	v1.2	Option
7Y49A016JP	Xeon E-2146G 6+2C 80W 3.5GHz	1x 16GB	Onboard RSTe	3 drive bays Open bay	HH DVD-ROM	No	250W Yes	v1.2	Option
7Y49A00NJP	Xeon E-2174G 4+2C 71W 3.8GHz	1x 16GB	Onboard RSTe	3 drive bays Open bay	HH DVD-ROM	No	250W Yes	v1.2	Option
7Y49A00MJP	Xeon E-2176G 6+2C 80W 3.7GHz	1x 16GB	Onboard RSTe	3 drive bays Open bay	HH DVD-ROM	No	250W Yes	v1.2	Option
7Y49A00JJP	Xeon E-2186G 6+2C 95W 3.8GHz	1x 16GB	Onboard RSTe	3 drive bays Open bay	HH DVD-ROM	Option	400W Yes	v1.2	Option

† Processor detail: Model, compute core count + graphics core count, TDP, core frequency

### Models for Latin American countries (except Brazil)

Table 7. Models for Latin American countries (except Brazil)

Model	Intel processor†	Memory	Drive Controller	Drive bays Drives	Media bay	GPU	Power supply & cord	TPM	Intru. switch
Topseller models with a 3-year warranty (machine type 7Y48)									
7Y48A004LA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 16GB	Onboard RSTe	3 drive bays 2x 1TB HDD	HH DVD-RW	No	250W Yes	v2.0	Option
7Y48A005LA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 16GB	Onboard RSTe	3 drive bays 1x 1TB HDD	HH DVD-RW	No	250W Yes	v2.0	Option
7Y48A009LA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 16GB	Onboard RSTe	3 drive bays 1x 1TB HDD	HH DVD-RW	No	250W Yes	v2.0	Option
7Y48A00FLA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 16GB	Onboard RSTe	3 drive bays 2x 2TB HDD	HH DVD-RW	No	250W Yes	v2.0	Option
7Y48A00GLA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 16GB	Onboard RSTe	3 drive bays 2x 2TB HDD	HH DVD-RW	No	250W Yes	v2.0	Option
7Y48A00RLA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 16GB	Onboard RSTe	3 drive bays 2x 2TB HDD	HH DVD-RW	No	250W Yes	v2.0	Option
7Y48A00XLA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 16GB	Onboard RSTe	3 drive bays 1x 1TB HDD	HH DVD-RW	No	250W Yes	v2.0	Option
7Y48A00YLA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 16GB	Onboard RSTe	3 drive bays 1x 2TB HDD	HH DVD-RW	No	250W Yes	v2.0	Option
7Y48A011LA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 16GB	Onboard RSTe	3 drive bays 2x 1TB HDD	HH DVD-RW	No	250W Yes	v2.0	Option
7Y48A013LA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 16GB	Onboard RSTe	3 drive bays 2x 1TB HDD	HH DVD-RW	No	250W Yes	v2.0	Option
7Y48A016LA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 16GB	Onboard RSTe	3 drive bays 1x 2TB HDD	HH DVD-RW	No	250W Yes	v2.0	Option
7Y48A01CLA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 16GB	Onboard RSTe	3 drive bays 1x 2TB HDD	HH DVD-RW	No	250W Yes	v2.0	Option
7Y48A000LA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard RSTe	3 drive bays 2x 2TB HDD	HH DVD-RW	No	250W Yes	v2.0	Option
7Y48A002LA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard RSTe	3 drive bays 2x 2TB HDD	HH DVD-RW	No	250W Yes	v2.0	Option
7Y48A00ELA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard RSTe	3 drive bays 2x 2TB HDD	HH DVD-RW	No	250W Yes	v2.0	Option
7Y48A00JLA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard RSTe	3 drive bays 1x 2TB HDD	HH DVD-RW	No	250W Yes	v2.0	Option
7Y48A00KLA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard RSTe	3 drive bays 1x 1TB HDD	HH DVD-RW	No	250W Yes	v2.0	Option
7Y48A00MLA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard RSTe	3 drive bays 1x 2TB HDD	HH DVD-RW	No	250W Yes	v2.0	Option
7Y48A00NLA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard RSTe	3 drive bays 1x 2TB HDD	HH DVD-RW	No	250W Yes	v2.0	Option
7Y48A00SLA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard RSTe	3 drive bays 1x 1TB HDD	HH DVD-RW	No	250W Yes	v2.0	Option
7Y48A00ULA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard RSTe	3 drive bays 1x 1TB HDD	HH DVD-RW	No	250W Yes	v2.0	Option
7Y48A00VLA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard RSTe	3 drive bays 2x 1TB HDD	HH DVD-RW	No	250W Yes	v2.0	Option
7Y48A012LA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard RSTe	3 drive bays 2x 1TB HDD	HH DVD-RW	No	250W Yes	v2.0	Option
7Y48A01BLA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard RSTe	3 drive bays 2x 1TB HDD	HH DVD-RW	No	250W Yes	v2.0	Option

## Models for USA and Canada

Table 8. Models for USA and Canada

Model	Intel processor†	Memory	Drive Controller	Drive bays Drives	Media bay	GPU	Power supply & cord	TPM	Intru. switch
Standard models with a 1-year warranty (machine type 7Y49)									
7Y49A01XNA	Xeon E-2104G 4+2C 65W 3.2GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	Open	No	250W Yes	v1.2	Option
7Y49A018NA	Xeon E-2124 4C 71W 3.3GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	HH DVD-RW	P620	400W Yes	v1.2	Option
7Y49A01FNA	Xeon E-2126G 6+2C 80W 3.3GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	Open	No	250W Yes	v1.2	Option
7Y49A00RNA	Xeon E-2134 4C 71W 3.5GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	Open	P620	400W Yes	v1.2	Option
7Y49A01ANA	Xeon E-2136 6C 80W 3.3GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	Open	P620	400W Yes	v1.2	Option
7Y49A01ENA	Xeon E-2146G 6+2C 80W 3.5GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	Open	No	250W Yes	v1.2	Option
7Y49A00QNA	Xeon E-2174G 4+2C 71W 3.8GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	Open	No	250W Yes	v1.2	Option
7Y49A01QNA	Xeon E-2186G 6+2C 95W 3.8GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	Open	No	250W Yes	v1.2	Option
TopSeller models with a 1-year warranty (machine type 7Y49)									
7Y49A013NA	Xeon E-2124G 4+2C 71W 3.4GHz	1x 8GB	Onboard AHCI	3 drive bays Open bay	HH DVD-RW	No	250W Yes	v1.2	Option
7Y49A01CNA	Xeon E-2144G 4+2C 71W 3.6GHz	1x 8GB	Onboard AHCI	4 drive bays Open bay	Slim DVD-RW + 3.5-in bay	No	250W Yes	v1.2	Option
7Y49A00YNA	Xeon E-2176G 6+2C 80W 3.7GHz	1x 8GB	Onboard AHCI	4 drive bays Open bay	Slim DVD-RW + 3.5-in bay	No	250W Yes	v1.2	Option

† Processor detail: Model, compute core count + graphics core count, TDP, core frequency

## Processors

The ST50 supports one processor from the Intel product family formerly known by the codename "Coffee Lake". This includes processors from the Intel Xeon E, Core i3, Pentium and Celeron families.

The server supports the processor options that are listed in the following table.

All supported processors have the following characteristics:

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

**Integrated graphics:** 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](#) and a 400W power supply.

Table 9. Processor options

Feature code	Intel processor	TDP	Cores	Integ. graphics / cores	Base core speed	Cache	Memory bus speed	ECC	HT	Turbo Boost / Max speed	VT	AMT
B35E	Celeron G4900	54W	2 / 2	Yes / 1	3.1 GHz	2 MB	2400 MHz	Yes	No	No	Yes	No
B35H	Celeron G4900T	35W	2 / 2	Yes / 1	2.9 GHz	2 MB	2400 MHz	Yes	No	No	Yes	No
B35D	Celeron G4920	54W	2 / 2	Yes / 1	3.2 GHz	2 MB	2400 MHz	Yes	No	No	Yes	No
B357	Core i3-8100	65W	4 / 4	Yes / 2	3.6 GHz	6 MB	2400 MHz	Yes	No	No	Yes	No
B359	Core i3-8100T	35W	4 / 4	Yes / 2	3.1 GHz	6 MB	2400 MHz	Yes	No	No	Yes	No
B356	Core i3-8300	62W	4 / 4	Yes / 2	3.7 GHz	8 MB	2400 MHz	Yes	No	No	Yes	No
B358	Core i3-8300T	35W	4 / 4	Yes / 2	3.2 GHz	8 MB	2400 MHz	Yes	No	No	Yes	No
B355	Core i3-8350K	91W	4 / 4	Yes / 2	4.0 GHz	8 MB	2400 MHz	Yes	No	No	Yes	No
B35C	Pentium G5400	54W	2 / 4	Yes / 1	3.7 GHz	4 MB	2400 MHz	Yes	Yes	No	Yes	No
B35G	Pentium G5400T	35W	2 / 4	Yes / 1	3.1 GHz	4 MB	2400 MHz	Yes	Yes	No	Yes	No
B35B	Pentium G5500	54W	2 / 4	Yes / 2	3.8 GHz	4 MB	2400 MHz	Yes	Yes	No	Yes	No
B35F	Pentium G5500T	35W	2 / 4	Yes / 2	3.2 GHz	4 MB	2400 MHz	Yes	Yes	No	Yes	No
B35A	Pentium G5600	54W	2 / 4	Yes / 2	3.9 GHz	4 MB	2400 MHz	Yes	Yes	No	Yes	No
B354	Xeon E-2104G	65W	4 / 4	Yes / 2	3.2 GHz	8 MB	2666 MHz	Yes	No	No	Yes	Yes
B353	Xeon E-2124	71W	4 / 4	None	3.3 GHz	8 MB	2666 MHz	Yes	No	Yes / 4.30 GHz	Yes	Yes*
B352	Xeon E-2124G	71W	4 / 4	Yes / 2	3.4 GHz	8 MB	2666 MHz	Yes	No	Yes / 4.50 GHz	Yes	Yes
B351	Xeon E-2126G	80W	6 / 6	Yes / 2	3.3 GHz	12 MB	2666 MHz	Yes	No	Yes / 4.50 GHz	Yes	Yes
B350	Xeon E-2134	71W	4 / 8	None	3.5 GHz	8 MB	2666 MHz	Yes	Yes	Yes / 4.50 GHz	Yes	Yes*
B34Z	Xeon E-2136	80W	6 / 12	None	3.3 GHz	12 MB	2666 MHz	Yes	Yes	Yes / 4.50 GHz	Yes	Yes*
B34Y	Xeon E-2144G	71W	4 / 8	Yes / 2	3.6 GHz	8 MB	2666 MHz	Yes	Yes	Yes / 4.50 GHz	Yes	Yes
B34X	Xeon E-2146G	80W	6 / 12	Yes / 2	3.5 GHz	12 MB	2666 MHz	Yes	Yes	Yes / 4.50 GHz	Yes	Yes
B34W	Xeon E-2174G	71W	4 / 8	Yes / 2	3.8 GHz	8 MB	2666 MHz	Yes	Yes	Yes / 4.70 GHz	Yes	Yes
B34V	Xeon E-2176G	80W	6 / 12	Yes / 2	3.7 GHz	12 MB	2666 MHz	Yes	Yes	Yes / 4.70 GHz	Yes	Yes
B34U	Xeon E-2186G	95W	6 / 12	Yes / 2	3.8 GHz	12 MB	2666 MHz	Yes	Yes	Yes / 4.70 GHz	Yes	Yes

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

## Memory options

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

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

The ST50 supports up to 4 DIMMs. The processors have 2 memory channels and support 2 DIMMs per channel.

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

The following table lists the memory options that are available for the ST550 server.

Table 10. Memory options

Part number	Feature code	Description	Maximum supported
ECC UDIMMs - available world wide			
4ZC7A08696	B35J	ThinkSystem 8GB TruDDR4 2666MHz (1Rx8, 1.2V) UDIMM	4
4ZC7A08699	B35K	ThinkSystem 16GB TruDDR4 2666MHz (2Rx8, 1.2V) UDIMM	4
Non-ECC UDIMMs - available only in China			
4ZC7A08700	B35L	ThinkSystem 4GB TruDDR4 2666MHz (1Rx16, 1.2V) Non-ECC UDIMM	4
4ZC7A08701	B35M	ThinkSystem 8GB TruDDR4 2666MHz (1Rx8, 1.2V) Non-ECC UDIMM	4
4ZC7A08702	B35N	ThinkSystem 16GB TruDDR4 2666MHz (2Rx8, 1.2V) Non-ECC UDIMM	4

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

- The server supports UDIMMs
- Mixing of ECC and non-ECC DIMMs is not supported.
- For best performance, all DIMMs should be identical
- For best performance when installing two DIMMs, install one in each memory channel

## Internal storage

The ST50 supports up to four 3.5-inch non-hot-swap drives plus two SD Cards for internal storage.

The non-hot-swap drive bays are as follows:

- Three drive bays dedicated to 3.5-inch HDDs or SSDs
- One 5.25-inch media drive bay which can hold a fourth 3.5-inch HDDs or SSDs

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

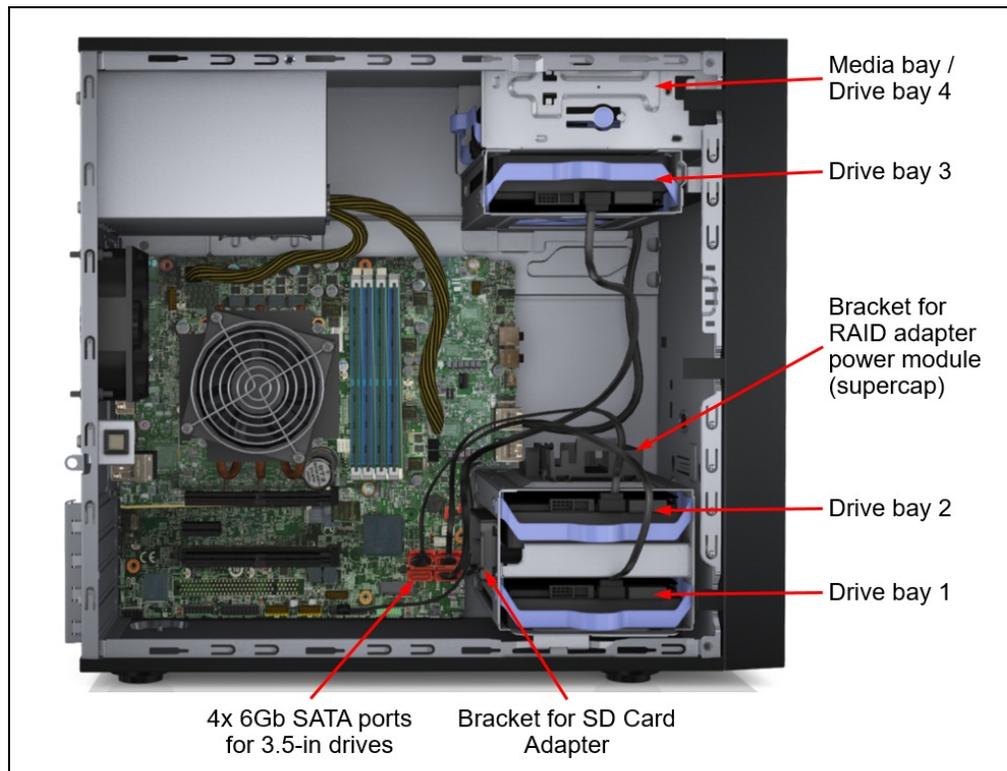


Figure 6. ST50 drive bays

The 5.25-inch media bay (bay 4) supports any one of the following configurations:

- 3.5-inch non-hot-swap HDD or SSD in a 5.25-inch conversion tray
- Combination 3.5-inch non-hot-swap HDD or SSD plus a slim optical DVD-RW
- Half-high optical drive (either DVD-ROM or DVD-RW)
- Half-high backup unit (either LTO tape or RDX drive)
- Empty bay

The ordering information for the drive trays is listed in the following table.

Table 11. Conversion tray and SD Adapter kit

Part number	Feature code	Description
4M17A12096	B35U	ThinkSystem ST50 5.25" to 3.5" HDD Kit w/ Slim ODD (provides a bay for a 3.5-inch HDD or SSD + a bay for a slim optical drive)
CTO only*	B35V	ThinkSystem 5.25" to 3.5" HDD Conversion Kit W/O Slim ODD (provides a bay for a 3.5-inch HDD or SSD without an optical drive bay)
4M17A12095	B3YV	ThinkSystem ST50 Dual SD Cards Adapter Kit, which contains: <ul style="list-style-type: none"> <li>• Adapter that supports two SD Cards</li> <li>• Bracket to mount the adapter to the side of bays 1 and 2</li> <li>• Cable to connect the adapter to the system board</li> </ul>

\* Configure-to-order only; Not available as a field upgrade

The server also supports 1 or 2 SD Cards that are installed in an adapter, 4M17A12095 as listed in the table. The adapter is mounted on the side of drive bays 1 and 2 as shown in the figure above. The SD Card are both accessible to the operating system as drives (JBOD). The adapter does not offer any RAID functionality.

## Controllers for internal storage

The ST50 has an onboard 6Gbps SATA controller with 4 connections on the system board for the 4 internal drive bays. These ports can be used in either AHCI (JBOD) mode or RSTe (RAID) mode. RSTe mode supports RAID 0, 1, 5 and 10.

**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.

Advanced RAID support or HBA support is available with the addition of a RAID adapter or HBA as listed in the following table. The HBA is needed when an internal LTO tape drive is installed.

Table 12. Adapters for internal storage

Part number	Feature code	Description	Slots supported	Maximum supported
SAS/SATA HBA				
7Y37A01088	AUNL	ThinkSystem 430-8i SAS/SATA 12Gb HBA	1,3	1
RAID adapters				
7Y37A01082†	AUNG†	ThinkSystem RAID 530-8i PCIe 12Gb Adapter	1,3	1
7Y37A01083*	AUNH*	ThinkSystem RAID 730-8i 1GB Cache PCIe 12Gb Adapter	1,3	1
7Y37A01084	AUNJ	ThinkSystem RAID 930-8i 2GB Flash PCIe 12Gb Adapter	1,3	1
Cable and Power Module Bracket Kit for internal RAID adapter				
4M17A12094	B46W	ThinkSystem ST50 Flash Power Module Mechanical Kit, contains: <ul style="list-style-type: none"> <li>• Mini-SAS HD-to-4x SATA cable</li> <li>• Bracket for flash power module for RAID 930-8i</li> </ul>	None	1

† Support of the RAID 530-8i is planned for 1Q/2019

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

If you are planning to use any of these RAID adapters or the HBA for connectivity to the drives, you will need to order the Flash Power Module Mechanical Kit, 4M17A12094. This kit contains the cable which connects the adapter to the four SATA drives, replacing the existing four SATA cables. For the RAID 930-8i adapter, the kit also contains the bracket for the RAID adapter's flash power module. The bracket is mounted on top of drive bay 2 as shown in [Figure 6](#).

The following table compare the functions of the storage adapters and the onboard SATA controller.

Table 13. Comparison of internal storage controllers - RAID controllers

Feature	Intel RSTe	430-8i	RAID 530-8i	RAID 730-8i*	RAID 930-8i
Adapter type	Software RAID	HBA	RAID controller	RAID controller	RAID controller
Part number	None	7Y37A01088	7Y37A01082	7Y37A01083	7Y37A01084
Form factor	Onboard	PCIe low profile	PCIe low profile	PCIe low profile	PCIe low profile
Controller chip	Intel PCH (RSTe)	LSI SAS3408	LSI SAS3408	LSI SAS3108	LSI SAS3508
Host interface	Not applicable	PCIe 3.0 x8	PCIe 3.0 x8	PCIe 3.0 x8	PCIe 3.0 x8
Port interface	6 Gb SATA	12 Gb SAS	12 Gb SAS	12 Gb SAS	12 Gb SAS
Number of ports	4	8	8	8	8
Port connectors	4x onboard SATA	2x Mini-SAS HD x4 (SFF-8643)			
Drive interface	SATA	SAS, SATA	SAS, SATA	SAS, SATA	SAS, SATA
Drive type	HDD, SSD	HDD, SSD, SED**	HDD, SSD, SED**	HDD, SSD	HDD, SSD, SED**
Max devices (ST50)	4	4	4	4	4
RAID levels (with 4 drives)	0, 1, 10, 5	No RAID	0, 1, 10, 5	0, 1, 10, 5	0, 1, 10, 5, 6
JBOD mode	Yes (AHCI)	Yes	Yes	Yes	Yes
Cache	None	No	None	1GB (Standard)	2GB (Standard)
CacheVault cache protection	No	No	No	No	Yes (Flash)
Performance Accelerator (FastPath)	No	No	Yes	No	Yes
SSD Caching (CacheCade Pro 2.0)	No	No	No	No	No
SED support	No	Yes**	Yes (SafeStore)**	No	Yes (SafeStore)**

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

\*\* SED support if/once the ST50 supports SED drives. SAS HBAs support SEDs (self-encrypting drives) by using software on the server and simply passing SED commands through the HBA to the drives.

## Internal drive options

The following tables list the hard disk drive and solid-state drive options for the internal disk storage of the server.

Table 14. Supported HDDs and SSDs

Part number	Feature	Description	Maximum supported
<b>Hard disk drives</b>			
4XB7A13554	B36T	ThinkSystem ST50 3.5" 1TB 7.2K SATA 6Gb Non-Hot Swap 512n HDD	4
4XB7A13555	B36U	ThinkSystem ST50 3.5" 2TB 7.2K SATA 6Gb Non-Hot Swap 512n HDD	4
4XB7A13556	B36V	ThinkSystem ST50 3.5" 4TB 7.2K SATA 6Gb Non-Hot Swap 512n HDD	4
4XB7A13557	B36W	ThinkSystem ST50 3.5" 6TB 7.2K SATA 6Gb Non-Hot Swap 512e HDD	4
4XB7A13558	B36X	ThinkSystem ST50 3.5" 8TB 7.2K SATA 6Gb Non-Hot Swap 512e HDD	4
<b>Solid state drives</b>			
4XB7A14914	B4N4	ThinkSystem ST50 3.5" Intel S4510 240GB Entry SATA 6Gb Non Hot Swap SSD	4
4XB7A14915	B4N5	ThinkSystem ST50 3.5" Intel S4510 480GB Entry SATA 6Gb Non Hot Swap SSD	4
4XB7A14916	B4N6	ThinkSystem ST50 3.5" Intel S4510 960GB Entry SATA 6Gb Non Hot Swap SSD	4

The following table lists the supported SD Cards.

Table 15. SD Cards

Part number	Feature code	Description	Maximum supported
4X77A12158	B3VZ	Blank SanDisk AF3 32G SD Card	2
4X77A12159	B3W0	Blank SanDisk AF3 64G SD Card	2

## Internal backup units

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

Table 16. Internal backup units

Part number	Feature code	Description
Cable Kit for internal RDX and LTO drives		
4Z57A13568	B46V	ThinkSystem ST50 HH ODD / Tape Cable Kit, contains: <ul style="list-style-type: none"> <li>• Power cable needed for HH optical drives, RDX drive and LTO tape drive</li> <li>• SATA cable only needed for HH optical drives</li> </ul>
LTO Drive and Media		
7T27A01503	Option only*	ThinkSystem Internal Half High LTO Gen7 SAS Tape Drive
7TP7A01606	Option only*	ThinkSystem LTO G7 6TB Tape
RDX Drive and Media		
7T27A01501	AVF6	ThinkSystem Internal RDX USB 3.0 Dock
7TP7A04318	AXD1	ThinkSystem RDX 4TB Cartridge
7TP7A01603	AVF0	ThinkSystem RDX 2TB Cartridge
7TP7A01602	AVF1	ThinkSystem RDX 1TB Cartridge
7TP7A01601	AVF8	ThinkSystem RDX 500GB Cartridge

\* The LTO tape drive is not available configure-to-order

The RDX drive is attached via the USB 3.0 port on the system board. The RDX drive requires a USB cable (included in the drive part number) and a power cable (included in cable kit 4Z57A13568).

The use of an LTO tape drive requires the ThinkSystem 430-8i SAS/SATA 12Gb HBA, 7Y37A01088. The LTO tape requires a SAS cable (included in the drive part number) and a power cable (included in cable kit 4Z57A13568).

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

## Optical drives

The ST50 supports the optical drive options listed in the following table. The internal optical drive is installed in the 5.25-inch media bay.

Table 17. Optical drives

Part number	Feature code	Description
Cable Kit for internal HH optical drives		
4Z57A13568	B46V	ThinkSystem ST50 HH ODD / Tape Cable Kit, contains: <ul style="list-style-type: none"> <li>• Power cable needed for HH optical drives, RDX drive and LTO tape drive</li> <li>• SATA cable only needed for HH optical drives</li> </ul>
Conversion Kit for Slim optical drive		
4M17A12096	B35U	ThinkSystem ST50 5.25" to 3.5" HDD Kit w/ Slim ODD
Internal optical drives		
4XA7A08377	B44Z	9.5mm Ultra-Slim USB DVD-RW
7XA7A01204	AVEZ	ThinkSystem Half High SATA DVD-ROM Optical Disk Drive
7XA7A01202	AVEY	ThinkSystem Half High SATA DVD-RW Optical Disk Drive
External optical drive		
7XA7A05926	AVV8	ThinkSystem External USB DVD RW Optical Disk Drive

The half-high optical drives are attached via a SATA port on the system board. The power and SATA cable are included in cable kit 4Z57A13568.

The use of the slim optical drive requires the media bay conversion kit 4M17A12096 (which also adds a fourth drive bay). The drive is connected by a USB cable which is included in the drive option part number. A separate power cable is not needed.

## I/O expansion options

The ST50 server has three PCIe 3.0 slots:

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

The following figure shows the locations of the PCIe slots.

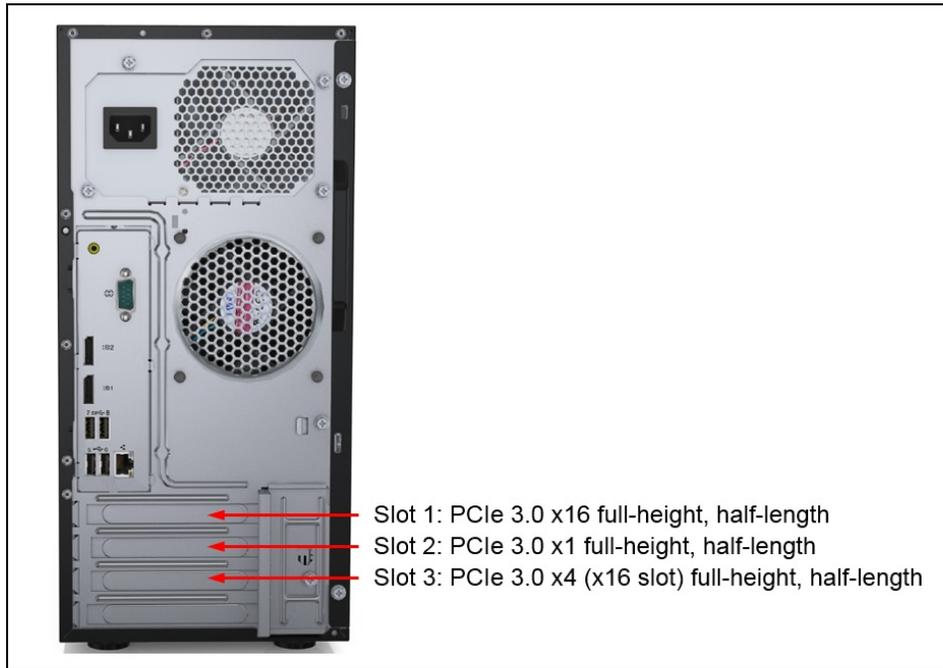


Figure 7. ThinkSystem ST50 PCIe slots

## 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
- VLAN tagging (IEEE 802.1Q)
- 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)

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 18. Network adapters

Part number	Feature code	Description	Slots supported	Maximum supported
<b>Gigabit Ethernet</b>				
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
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
<b>10 Gb Ethernet</b>				
00MM850	ATRY	Intel X550-T1 Single Port 10GBase-T Adapter	1,3	2
00MM860	ATPX	Intel X550-T2 Dual Port 10GBase-T Adapter	1,3	2
7XC7A05525	B0YL	Intel X710-DA4 4x10Gb SFP+ Adapter	1,3	2*
7ZT7A00496	AUKP	ThinkSystem Broadcom 57416 10GBASE-T 2-Port PCIe Ethernet Adapter	1,3	2

\* Requires SFP+ transceivers or DAC cables that must be purchased separately.

For more information, including the transceivers and cables that each adapter supports, see the list of Lenovo Press Product Guides in the Ethernet adapters category:

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

## SAS adapters for external storage

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

Table 19. Supported SAS HBAs and RAID adapters

Part number	Feature code	Description	Slots supported	Maximum supported
<b>12 Gb SAS HBA</b>				
7Y37A01090	AUNR	ThinkSystem 430-8e SAS/SATA 12Gb HBA	1,3	1
<b>12 Gb RAID Adapter</b>				
7Y37A01087	AUNQ	ThinkSystem RAID 930-8e 4GB Flash PCIe 12Gb Adapter	1,3	1
<b>Cable and Power Module Bracket Kit for internal RAID adapter</b>				
4M17A12094	B46W	ThinkSystem ST50 Flash Power Module Mechanical Kit, contains: <ul style="list-style-type: none"> <li>• Mini-SAS HD-to-4x SATA cable</li> <li>• Bracket for flash power module for RAID 930-8e</li> </ul>	Dedicated	1

If you select the RAID 930-8e adapter, also select the Flash Power Module Mechanical Kit, 4M17A12094. This kit contains the bracket for the RAID adapter's flash power module. The bracket is mounted on top of drive bay 2 as shown in [Figure 6](#).

The following table summarizes the features of supported adapters.

Table 20. Comparison of features

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

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

## Fibre Channel host bus adapters

The ST50 does not support Fibre Channel HBAs.

## Flash Storage adapters

The ST50 does not support Flash Storage adapters.

## GPU adapters

The ST50 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.
- The use of a GPU requires a chassis base with a 400W power supply
- 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.

Table 21. GPU adapters

Part number	Feature code	Description	Slots supported	Maximum supported
4X67A11584	B31D	ThinkSystem NVIDIA Quadro P620 2GB PCIe Active GPU	1	1

For details about the P620 GPU, see the ThinkSystem GPU Summary:

<https://lenovopress.com/lp0768-thinksystem-gpu-summary>

## Fans and cooling

The server can operate in environments up to ASHRAE A2 (35°C and 90% humidity).

The server has the following fans:

- One 80mm system fan at the front of the server inside the front bezel
- One 90mm system fan at the rear of the server
- Fan mounted on the heatsink of the processor
- Power supply fan
- Fan in the optional media bay enclosure

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

## Power supplies

The server has either a fixed 250W or 400W power supply, depending on the chassis base selected. The power supply cannot be upgraded.

Table 22. Power supply options

Feature code	Chassis base	Power supply	Voltage	80 PLUS certification	Configuration restrictions
B36B	ThinkSystem ST50 ATX-250W Chassis Base	250W	100-240V (autosensing)	Platinum	No support for a GPU adapter
B36C	ThinkSystem ST50 ATX-400W Chassis Base	400W	100-240V (autosensing)	Platinum	No restrictions

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

## Power cords

Country-specific line cords can be ordered as listed in the following table.

Table 23. Power cords

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

Region	Part number	Feature	Description
US/Canada	4L67A08359	6370	4.3m, 10A/125V, C13 to NEMA 5-15P (US) Line Cord
US/Canada	4L67A08361	6373	4.3m, 10A/250V, C13 to NEMA 6-15P (US) Line Cord

## Systems management

ST50 models with Intel Xeon E processors support Intel Active Management Technology (AMT) 12.0 which provides out-of-band, hardware-based advanced system control, monitoring, alerting, and remote presence functions.

ST50 models with Core i3, Pentium, or Celeron 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)

## Lenovo XClarity Provisioning Manager Lite

Lenovo XClarity Provisioning Manager 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 Lenovo XClarity Provisioning Manager Lite user interface is shown in the following figure.

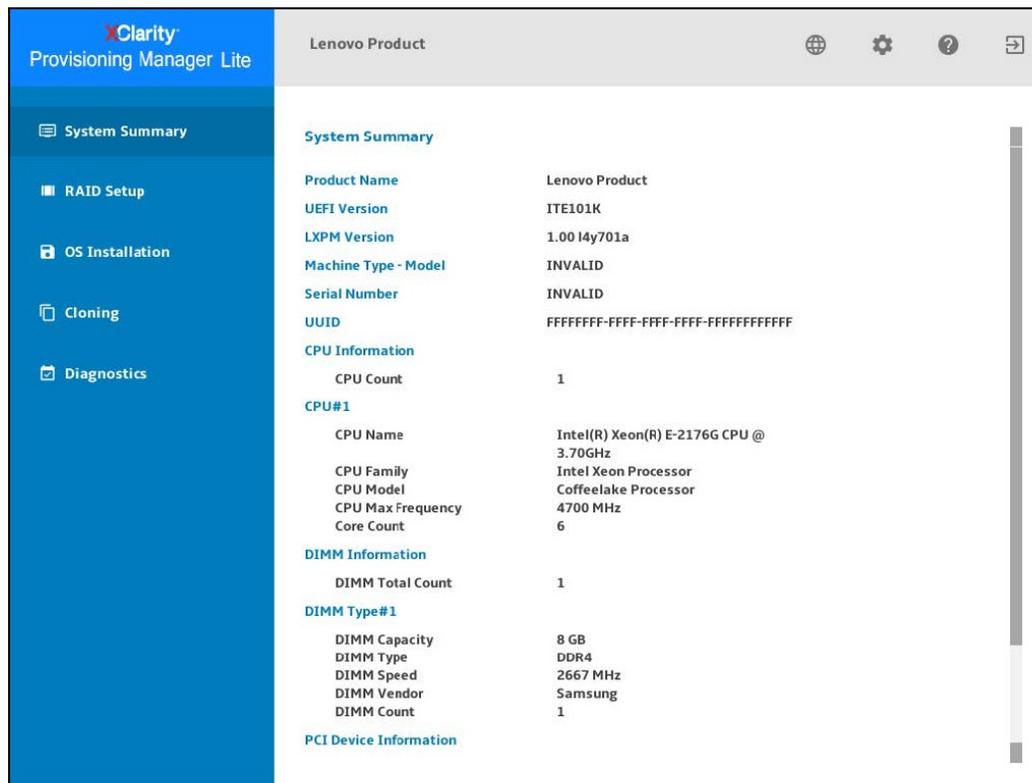


Figure 8. Lenovo XClarity Provisioning Manager Lite user interface

## Security

The ST50 offers the following security features:

- Electronic security measures:
  - Administrator and power-on passwords
  - Trusted Platform Module (TPM) supporting both TPM 1.2 and TPM 2.0
- 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 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 24. Security features

Part number	Feature code	Description
4Z57A15948	B364	ThinkSystem Chassis Intrusion Switch Kit for Side Door

## 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 25. 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
7ZB7A05506	AXTX	ThinkSystem Pref. Pro Keyboard USB - French 189 roHS v2

<b>Part number</b>	<b>Feature code</b>	<b>Description</b>
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 - Portugese 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 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 26. Video port dongles

Part number	Feature code	Description	Maximum supported
4X97A12100	B366	ThinkSystem ST50 DP to HDMI Dongle Kit	2
4X97A12099	B365	ThinkSystem ST50 DP to VGA 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

## Rack installation

The server can be installed in the rack with the Tower to Rack Conversion Kit, which converts the server to a 4U rack-mountable server.

Part number information is listed in the following table.

Table 27. Rack installation options

Part number	Feature code	Description
4M17A12785	B4RP	ThinkSystem ST50/ST250 4U Rack Mount Kit

The rack mount kit includes the following items:

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

## Operating system support

The server supports the following operating systems:

For a complete list of supported, certified and tested operating systems, plus additional details and links to relevant web sites, see the Operating System Interoperability Guide:

<https://lenovopress.com/osig#servers=st50-7y48-7y50>

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

Note: The DisplayPort video ports require the following:

- Windows: Intel VGA driver is installed.
- Linux: kernel/boot parameter "i915.alpha\_support=1" is added.

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

Table 28. VMware ESXi preload

Part number	Feature code	Description
CTO only	B3VW	VMware ESXi 6.5 U2 (factory installed)

## Physical and electrical specifications

The server has the following dimensions and weight:

- Height: 375 mm (14.8 in)
- Width: 175 mm (6.9 in)
- Depth: 407 mm (16.0 in)
- Weight: Minimum: 7.5 kg (16.5 lb), maximum: 11.2 kg (24.7 lb)

Electrical requirements are as follows:

- Chassis with 250W power supply:
  - 100-127 (nominal) V ac; 50 Hz or 60 Hz; 4 A
  - 200 - 240 (nominal) V ac; 50 Hz or 60 Hz; 2 A
  - Input kilovolt-amperes (kVA) (approximately):
    - Minimum configuration: 0.061 kVA
    - Maximum configuration: 0.208 kVA
- Chassis with 400W power supply:
  - 100-127 (nominal) V ac; 50 Hz or 60 Hz; 6 A
  - 200 - 240 (nominal) V ac; 50 Hz or 60 Hz; 3 A
  - Input kilovolt-amperes (kVA) (approximately):
    - Minimum configuration: 0.062 kVA
    - Maximum configuration: 0.212 kVA

## Operating environment

The ThinkSystem ST50 server complies with ASHRAE Class A2 specifications:

- Temperature: 10°C to 35°C
- Humidity: 20% to 80%
- Altitude 0-3000 m (10,000 ft), derated 1°C per 300 m above 950 m

Non-operating environment support:

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

Thermal (heat) output:

- Minimum configuration: 221 BTU/h, 65 W
- Maximum configuration: 699 BTU/h, 205 W

Acoustical noise emissions: See the following table.

Table 29. Acoustical noise emissions

	Minimum	Typical	Maximum
<b>Sound power level</b>			
Idle	2.9 bels	3.4 bels	4.6 bels
Operating	2.9 bels	3.4 bels	4.6 bels
<b>Sound pressure level (tabletop)</b>			
Idle	17.3 dBA	25.3 dBA	36.7 dBA
Operating	17.1 dBA	25.6 dBA	37.2 dBA
<b>Sound pressure level (floor)</b>			
Idle	15.2 dBA	18.4 dBA	29.3 dBA
Operating	15.1 dBA	19.5 dBA	29.5 dBA

Notes:

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

## Warranty options

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

- 7Y49 - 1 year warranty
- 7Y48 - 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.

Also available are Lenovo Services warranty maintenance upgrades and post-warranty maintenance agreements, with a predefined scope of services, including service hours, response time, term of service, and service agreement terms and conditions.

Lenovo warranty service upgrade offerings are country-specific. Not all warranty service upgrades are available in every country. For more information about Lenovo warranty service upgrade offerings that are available in your country, go to the Data Center Advisor and Configurator (formerly known as LESC) website <http://lesc.lenovo.com>, then do the following:

1. In the Customize a Model box in the middle of the page, select the **Services** option in the Customization Option dropdown menu
2. Enter the machine type & model of the system
3. From the search results, you can click either **Deployment Services** or **Support Services** to view the offerings

The following table explains warranty service definitions in more detail.

Table 30. Warranty service definitions

Term	Description
Onsite Service	If a problem with your product cannot be resolved via telephone, a Service Technician will be dispatched to arrive at your location.
Parts Delivered	If a problem with your product cannot be resolved via telephone and a CRU part is required, Lenovo will send a replacement CRU to arrive at your location. If a problem with your product cannot be resolved via telephone and a FRU part is required, a Service Technician will be dispatched to arrive at your location.
Technician Installed Parts	If a problem with your product cannot be resolved via telephone, a Service Technician will be dispatched to arrive at your location.
Hours of coverage	<ul style="list-style-type: none"> <li>• 9x5: 9 hours/day, 5 days/week, during normal business hours, excluding local public &amp; national holidays</li> <li>• 24x7: 24 hours per day, 7 days per week, 365 days per year.</li> </ul>
Response time target	2 hours, 4 hours, or Next Business Day: The time period from when the telephone based troubleshooting is completed and logged, to the delivery of the CRU or arrival of a Service Technician and part at the Customer's location for repair.
Committed Repair	6 hours: The time period between the service request registration in Lenovo's call management system and the restoration of the product to conformance with its specification by a Service Technician.

The following Lenovo warranty service upgrades are available:

- Warranty and maintenance service upgrades:
  - Three, four, or five years of 9x5 or 24x7 service coverage
  - Parts delivered or technician installed parts from next business day to 4 or 2 hours
  - Committed repair service
  - Warranty extension of up to 5 years
  - Post warranty extensions

- Committed Repair Service

Committed Repair Services enhances the level of Warranty Service Upgrade or Post Warranty/Maintenance Service offering associated with the selected systems. Offerings vary and are available in select countries.

- Priority handling to meet defined time frames to restore the failing machine to good working condition
- 24x7x6 committed repair: Service performed 24 hours per day, 7 days per week, within 6 hours

- YourDrive YourData

Lenovo's YourDrive YourData service 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 with Lenovo warranty upgrades and extensions.

- Microcode Support

Keeping microcode current helps prevent hardware failures and security exposure. There are two levels of service: analysis of the installed base and analysis and update where required. Offerings vary by country and can be bundled with other warranty upgrades and extensions.

- Enterprise Software Support

Lenovo Enterprise Server Software Support can help you troubleshoot your entire server software stack. Choose support for server operating systems from Microsoft, Red Hat, SUSE, and VMware; Microsoft server applications; or both operating systems and applications. Support staff can help answer troubleshooting and diagnostic questions, address product compatibility and interoperability issues, isolate causes of problems, report defects to software vendors, and more.

In addition, you can access hardware "how to" support for ThinkSystem servers. Staff can help resolve hardware problems not covered under warranty, refer you to the right documentation and publications, provide corrective service information for known defects, and transfer you to a hardware support call center if needed.

- Hardware Installation Services

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. Your new systems will be configured and ready for your software installation.

## Regulatory compliance

The ST50 server conforms to the following standards:

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

## External drive enclosures

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

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

<http://datacentersupport.lenovo.com>

Table 31. External drive enclosures

Description	Part number		
	Worldwide	Japan	PRC
Lenovo Storage D1212 LFF Disk Expansion with Dual SAS IO Modules	4587A11	4587A1J	4587A1C
Lenovo Storage D1224 SFF Disk Expansion with Dual SAS IO Modules	4587A31	4587A3J	4587A3C
Lenovo Storage D3284 4TB x 84 HD Expansion Enclosure	641311F		
Lenovo Storage D3284 6TB x 84 HD Expansion Enclosure	641312F		
Lenovo Storage D3284 8TB x 84 HD Expansion Enclosure	641313F		
Lenovo Storage D3284 10TB x 84 HD Expansion Enclosure	641314F		

For details about supported drives, adapters, and cables, see the following Lenovo Press Product Guides:

- Lenovo Storage D1212 and D1224  
<http://lenovopress.com/lp0512>
- Lenovo Storage D3284  
<http://lenovopress.com/lp0513>

## Top-of-rack Ethernet switches

The following table lists the Ethernet LAN switches that are offered by Lenovo.

Table 32. Ethernet LAN switches

Part number	Description
1 Gb Ethernet switches	
7165H1X	Juniper EX2300-C PoE Switch
7165H2X	Juniper EX2300-24p PoE Switch
7Y810011WW	Lenovo ThinkSystem NE0152T RackSwitch (Rear to Front)
7Z320011WW	Lenovo ThinkSystem NE0152TO RackSwitch (Rear to Front, ONIE)
7159BAX	Lenovo RackSwitch G7028 (Rear to Front)
7159CAX	Lenovo RackSwitch G7052 (Rear to Front)
7159G52	Lenovo RackSwitch G8052 (Rear to Front)
10 Gb Ethernet switches	
7159A1X	Lenovo ThinkSystem NE1032 RackSwitch (Rear to Front)
7159B1X	Lenovo ThinkSystem NE1032T RackSwitch (Rear to Front)
7159C1X	Lenovo ThinkSystem NE1072T RackSwitch (Rear to Front)
7159BR6	Lenovo RackSwitch G8124E (Rear to Front)
7159CRW	Lenovo RackSwitch G8272 (Rear to Front)
7159GR6	Lenovo RackSwitch G8296 (Rear to Front)
25 Gb Ethernet switches	
7159E1X	Lenovo ThinkSystem NE2572 RackSwitch (Rear to Front)
7Z210021WW	Lenovo ThinkSystem NE2572O RackSwitch (Rear to Front, ONIE)
100 Gb Ethernet switches	
7159D1X	Lenovo ThinkSystem NE10032 RackSwitch (Rear to Front)
7Z210011WW	Lenovo ThinkSystem NE10032O RackSwitch (Rear to Front, ONIE)

For more information, see the list of Product Guides in the following switch categories:

- 1 Gb Ethernet switches: <http://lenovopress.com/networking/tor/1gb?rt=product-guide>
- 10 Gb Ethernet switches: <http://lenovopress.com/networking/tor/10gb?rt=product-guide>
- 25 Gb Ethernet switches: <http://lenovopress.com/networking/tor/25gb?rt=product-guide>
- 40 Gb Ethernet switches: <http://lenovopress.com/networking/tor/40gb?rt=product-guide>
- 100 Gb Ethernet switches: <https://lenovopress.com/networking/tor/100Gb?rt=product-guide>

## Uninterruptible power supply units

The server supports attachments to the uninterruptible power supply (UPS) units that are listed in the following table.

Table 33. 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 34. Power distribution units

Part number	Description
0U Basic PDUs	
00YJ776	0U 36 C13/6 C19 24A/200-240V 1 Phase PDU with NEMA L6-30P line cord

Part number	Description
00YJ777	0U 36 C13/6 C19 32A/200-240V 1 Phase PDU with IEC60309 332P6 line cord
00YJ778	0U 21 C13/12 C19 32A/200-240V/346-415V 3 Phase PDU with IEC60309 532P6 line cord
00YJ779	0U 21 C13/12 C19 48A/200-240V 3 Phase PDU with IEC60309 460P9 line cord
Switched and Monitored PDUs	
00YJ780	0U 20 C13/4 C19 Switched and Monitored 32A/200-240V/1Ph PDU w/ IEC60309 332P6 line cord
00YJ781	0U 20 C13/4 C19 Switched and Monitored 24A/200-240V/1Ph PDU w/ NEMA L6-30P line cord
00YJ782	0U 18 C13/6 C19 Switched / Monitored 32A/200-240V/346-415V/3Ph PDU w/ IEC60309 532P6 cord
00YJ783	0U 12 C13/12 C19 Switched and Monitored 48A/200-240V/3Ph PDU w/ IEC60309 460P9 line cord
46M4002	1U 9 C19/3 C13 Switched and Monitored DPI PDU (without line cord)
46M4003	1U 9 C19/3 C13 Switched and Monitored 60A 3 Phase PDU with IEC 309 3P+Gnd line cord
46M4004	1U 12 C13 Switched and Monitored DPI PDU (without line cord)
46M4005	1U 12 C13 Switched and Monitored 60A 3 Phase PDU with IEC 309 3P+Gnd line cord
Ultra Density Enterprise PDUs (9x IEC 320 C13 + 3x IEC 320 C19 outlets)	
71762NX	Ultra Density Enterprise C19/C13 PDU Module (without line cord)
71763NU	Ultra Density Enterprise C19/C13 PDU 60A/208V/3ph with IEC 309 3P+Gnd line cord
C13 Enterprise PDUs (12x IEC 320 C13 outlets)	
39M2816	DPI C13 Enterprise PDU+ (without line cord)
39Y8941	DPI Single Phase C13 Enterprise PDU (without line cord)
C19 Enterprise PDUs (6x IEC 320 C19 outlets)	
39Y8948	DPI Single Phase C19 Enterprise PDU (without line cord)
39Y8923	DPI 60A 3 Phase C19 Enterprise PDU with IEC 309 3P+G (208 V) fixed line cord
Front-end PDUs (3x IEC 320 C19 outlets)	
39Y8938	DPI 30amp/125V Front-end PDU with NEMA L5-30P line cord
39Y8939	DPI 30amp/250V Front-end PDU with NEMA L6-30P line cord
39Y8934	DPI 32amp/250V Front-end PDU with IEC 309 2P+Gnd line cord
39Y8940	DPI 60amp/250V Front-end PDU with IEC 309 2P+Gnd line cord
39Y8935	DPI 63amp/250V Front-end PDU with IEC 309 2P+Gnd line cord
NEMA PDUs (6x NEMA 5-15R outlets)	
39Y8905	DPI 100-127V PDU with Fixed NEMA L5-15P line cord
Line cords for PDUs that ship without a line cord	
40K9611	DPI 32a Line Cord (IEC 309 3P+N+G)
40K9612	DPI 32a Line Cord (IEC 309 P+N+G)
40K9613	DPI 63a Cord (IEC 309 P+N+G)
40K9614	DPI 30a Line Cord (NEMA L6-30P)
40K9615	DPI 60a Cord (IEC 309 2P+G)
40K9617	DPI Australian/NZ 3112 Line Cord
40K9618	DPI Korean 8305 Line Cord

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

## Rack cabinets

The ST50 tower server can be converted to a 4U rack server using the Rack Mount Kit, as described in the [Rack installation](#) section.

The following table lists the supported rack cabinets.

Table 35. Rack cabinets

Part number	Description
93072RX	25U Standard Rack
93072PX	25U Static S2 Standard Rack
93634PX	42U 1100mm Dynamic Rack
93634EX	42U 1100mm Dynamic Expansion Rack
93604PX	42U 1200mm Deep Dynamic Rack
93614PX	42U 1200mm Deep Static Rack
93084EX	42U Enterprise Expansion Rack
93084PX	42U Enterprise Rack
93074RX	42U Standard Rack
Withdrawn rack cabinets	
201886X*	11U Office Enablement Kit
93604EX*	42U 1200mm Deep Dynamic Expansion Rack
93614EX*	42U 1200mm Deep Static Expansion Rack
93074XX*	42U Standard Rack Extension
93624PX*	47U 1200mm Deep Static Rack
93624EX*	47U 1200mm Deep Static Expansion Rack
93634BX*	PureFlex System 42U Expansion Rack
93634DX*	PureFlex System 42U Expansion Rack
93634AX*	PureFlex System 42U Rack
93634CX*	PureFlex System 42U Rack

\* Withdrawn from marketing

For specifications about these racks, see the Lenovo Rack Cabinet Reference, available from: <https://lenovopress.com/lp0658-lenovo-rack-cabinet-reference>

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

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<http://www.lenovofs.com>

## Related publications and links

For more information, see these resources:

- ThinkSystem ST50 product page  
<https://www.lenovo.com/us/en/data-center/servers/towers/ThinkSystem-ST50/p/77XX7TRST51>
- ThinkSystem ST50 drivers and support  
<http://datacentersupport.lenovo.com/products/servers/thinksystem/st50/7y48/downloads>
- Lenovo ThinkSystem ST50 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 Server](#)

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