Lenovo ThinkServer TS150 (Intel Xeon E3-1200 v5, Core i3, Pentium/Celeron G Series Processors)
Product Guide

The Lenovo ThinkServer TS150 is the perfect first tower server for small and medium businesses, remote or branch offices, and retail environments. It features the latest Intel Xeon processor E3-1200 v5 product family with four cores and support for up to 64 GB of 2133 MHz DDR4 UDIMM memory. Also, it offers an integrated NIC and additional PCIe expansion slots for advanced RAID protection and network scalability. Up to 24 TB of internal enterprise-class storage supports storage-intensive workloads, such as office applications, web, e-mail and file and print serving, and provides growth capacity.

The following figure shows the Lenovo ThinkServer TS150.

Figure 1. Lenovo ThinkServer TS150

Did you know?

The TS150 offers enterprise-class reliability features such as error correcting code (ECC), the onboard RAID controller, and enterprise-class hard drives and network adapters at an affordable price.

Intel Active Management Technology (AMT) built into the TS150 offers easy-to-use, industry-standard management tools for remote monitoring, updates, and repairs.

The TS150 runs a wide range of server operating systems, and it also supports client OS capability.

The TS150 is among the quietest tower servers in the industry that fits under or beside an office desk.

Key features

The ThinkServer TS150 server is an office-friendly tower server that has been optimized to provide enterprise-class features to small-to-medium-sized businesses, retail stores, and distributed enterprises.

Scalability and performance

The TS150 offers numerous features to boost performance, improve scalability, and reduce costs:

- The Intel Xeon processor E3-1200 v5 improves productivity by offering affordable single-socket system performance with 4-core processors with up to 3.7 GHz core speeds and up to 8 MB cache.
- 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 2133 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 processor E3-1200 v5 product family. Such integration reduces I/O latency and increases overall system performance.
- Up to five non-hot-swap (NHS) drive bays provide flexible internal storage capacity.
- The use of solid-state drives (SSDs) instead of, or along with, traditional spinning drives (hard disk drives or HDDs) can significantly improve I/O performance.

Availability and serviceability

The TS150 provides many features to simplify serviceability and increase system uptime:

- The TS150 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 continuously monitors system parameters, sends alerts, and enables administrators to perform remote recovery actions to minimize downtime.
- The ThinkServer EasyUpdate firmware update tool enables you to keep your server firmware up-to-date and helps you avoid unnecessary server outages.
- The ThinkServer Diagnostics software speeds up troubleshooting tasks to reduce service time.
- 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 TS150:

- Active Management Technology 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.
- The ThinkServer EasyStartup tool simplifies the process of configuring RAID and installing supported Microsoft Windows and Linux operating systems, VMware hypervisors, and device drivers on a ThinkServer system.
- Optional Trusted Cryptographic Module (TCM) (available only in China) enables advanced cryptographic functionality, such as digital signatures and remote attestation.
- Administrator's and power-on passwords help protect from unauthorized access to the server.
- Optional server locks such as a padlock or cable lock help prevent unauthorized access to the internal components of the server, and the intrusion switch (select models) informs about the removed or improperly installed server cover.

Energy efficiency

The TS150 offers the following energy-efficiency features to save energy, reduce operational costs, increase energy availability, and contribute to a green environment:

- Energy-efficient planar components help lower operational costs.
- 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 ThinkServer Power 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 TS150.

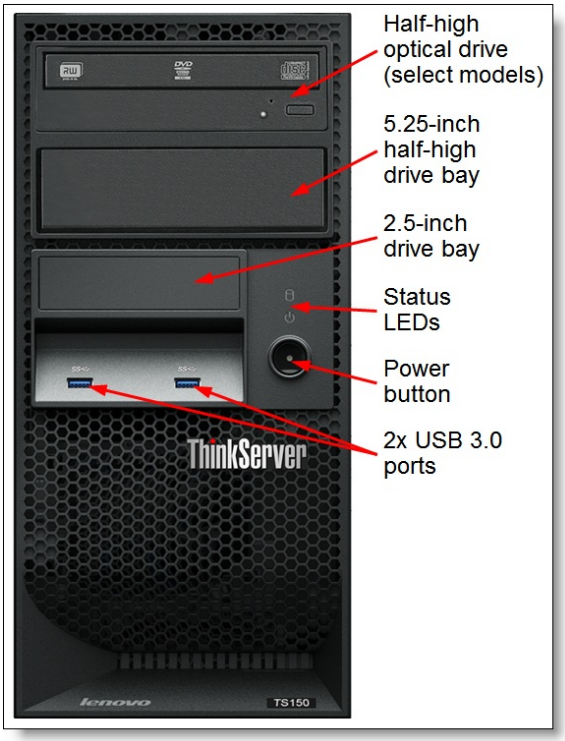

Figure 2. TS150 front view

The following figure shows the rear of the TS150.

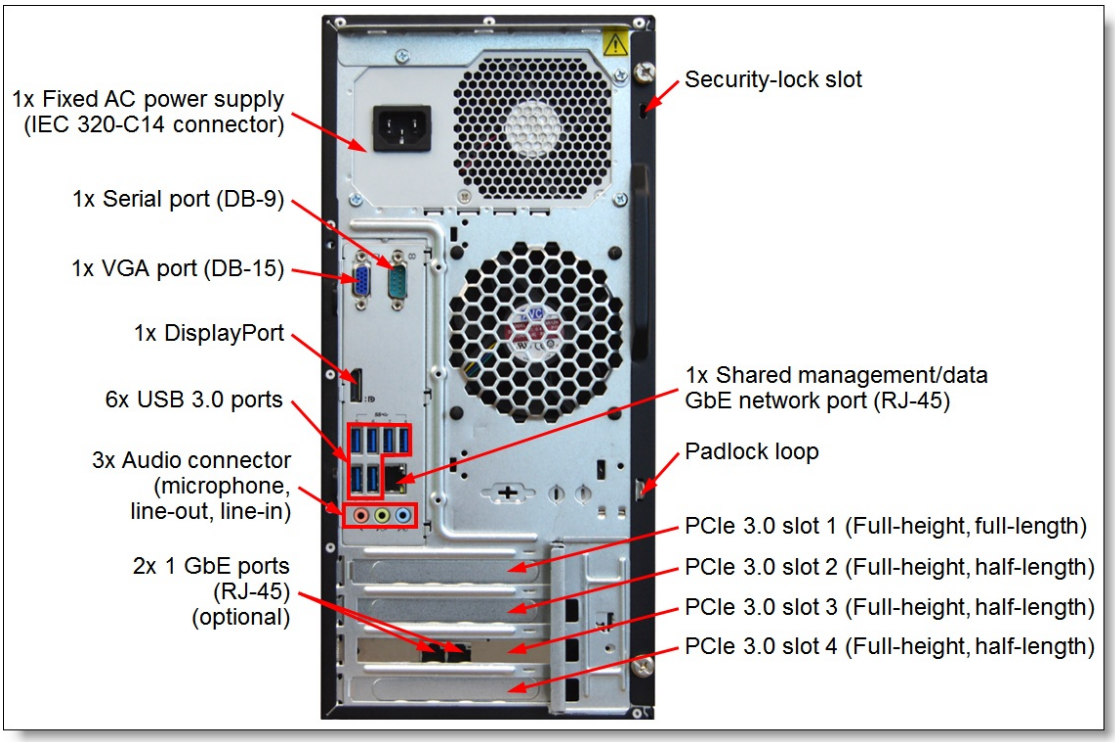

Figure 3. TS150 rear view

The following figure shows the internal components of the TS150.

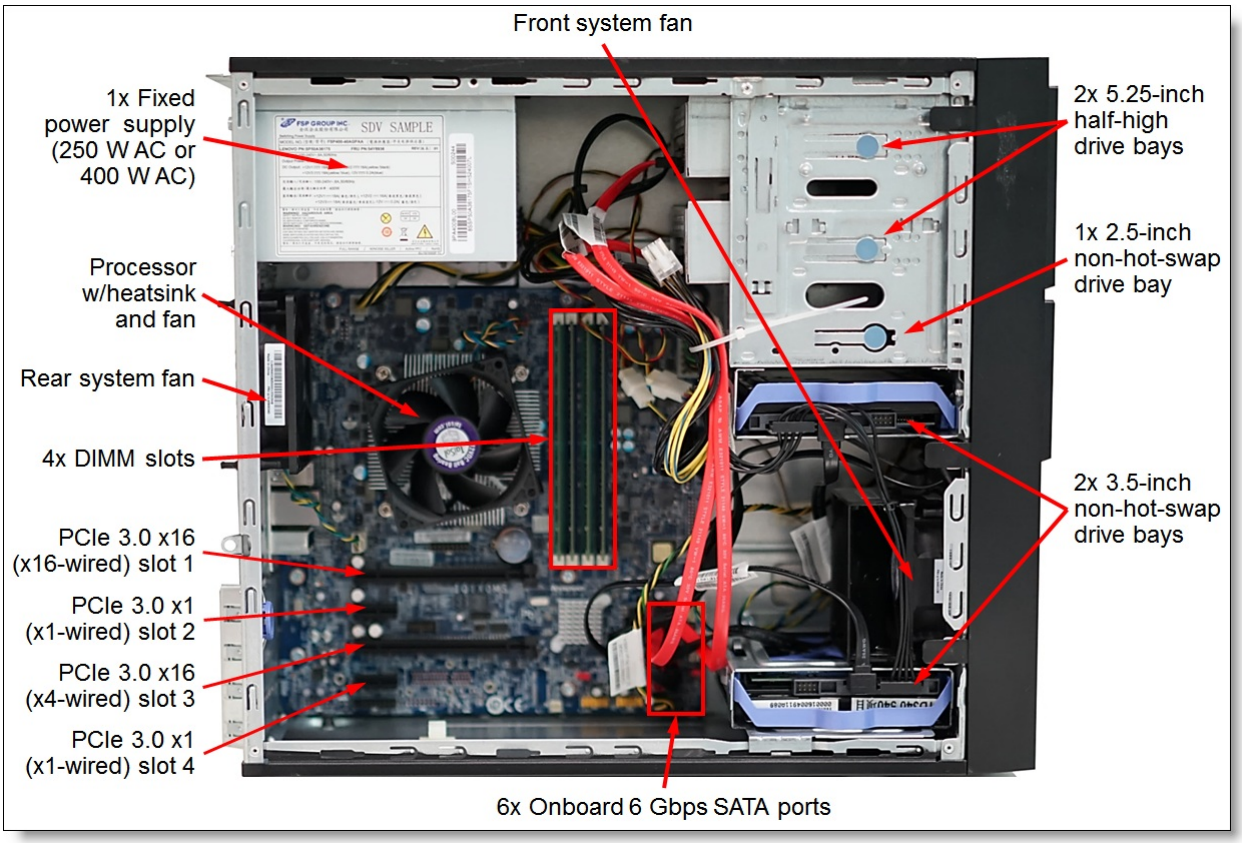

Figure 4. TS150 internal view

System specifications

The following table lists the system specifications.

Table 1. System specifications

Components	Specification
Form factor	Tower or 4U rack-mount (on a shelf)
Processor	One processor: • Intel Xeon processor E3-1200 v5 product family with four cores up to 3.7 GHz, 8 MB cache, and up to 2133 MHz memory speed; or • Intel Core i3 processor 6100/6300 product families with two cores up to 3.9 GHz, up to 4 MB cache, and 2133 MHz memory speed; or • Intel Pentium processor G4400/G4500 product families with two cores up to 3.6 GHz, 3 MB cache, and up to 2133 MHz memory speed; or • Intel Celeron Processor G3900 product family with two cores up to 2.9 GHz, 2 MB cache, and up to 1866 MHz memory speed.
Chipset	Intel C236.
Memory	Four DIMM sockets. Support for ECC and non-ECC UDIMMs. DIMM speeds up to 2133 MHz. Memory types (ECC and non-ECC) cannot be mixed.
Memory maximum	Up to 64 GB with 4x 16 GB UDIMMs.
Memory protection	Error-correcting code (ECC) memory (with ECC DIMMs).

Components	Specification
Drive bays	4x 3.5-inch + 1x 2.5-inch non-hot-swap SATA drive bays. Optional 2x SD card slots.
Drive types	2.5-inch drives (in a 3.5-inch drive tray): • SATA SSDs up to 960 GB 3.5-inch drives: • SATA HDDs up to 2 TB • Nearline (NL) SATA HDDs up to 6 TB SD cards up to 8 GB. Intermix of SATA HDDs and SSDs is supported within a system, but not within a RAID array.
Storage capacity	• Up to 24 TB with 4x 6 TB 3.5-inch NL SATA HDDs • Up to 8 TB with 4x 2 TB 3.5-inch SATA HDDs • Up to 4.8 TB with 5x 960 GB 2.5-inch SATA SSDs
RAID support	• Non-RAID with the integrated SATA controller. • RAID 0, 1, 10, and 5 with ThinkServer RAID 121i. • RAID 0, 1, 10 with ThinkServer RAID 520i. Optional RAID 5, 50 upgrade.
Optical drive bays	Two without a backup drive or one with a backup drive. Support for DVD-ROM or DVD-RW.
Backup drive bays	One. Support for the optional RDX backup drive.
Network interfaces	One integrated Gigabit Ethernet (10/100/1000 Mbps) RJ-45 port (Intel I219LM): A shared port for management and data.
I/O expansion slots	• Slot 1: PCIe 3.0 x16 (x16-wired); full-height, half-length • Slot 2: PCIe 3.0 x1 (x1-wired); full-height, half-length • Slot 3: PCIe 3.0 x16 (x4-wired); full-height, half-length • Slot 4: PCIe 3.0 x1 (x1-wired); full-height, half-length
Ports	• Front: 2x USB 3.0 ports. • Rear: 6x USB 3.0 ports, 1x DisplayPort port, 1x DB-15 VGA port, 1x DB-9 serial port, 3x audio connectors (line-in, line-out, microphone). • Internal: 1x USB 2.0 port for the RDX backup drive.
Cooling	Three fixed system fans with Intelligent Cooling Engine (ICE).
Power supply	One fixed 250 W AC (100 - 240 V) power supply (80 PLUS Bronze) or one fixed 400 W AC (100 - 240 V) power supply (80 PLUS Platinum).
Hot-swap parts	None.
Systems management	UEFI, system LEDs, ThinkServer EasyStartup, ThinkServer EasyUpdate, ThinkServer Power Planner, and ThinkServer Diagnostics, Intel Active Management Technology (AMT) 11.
Security features	Power-on password, administrator's password, Intrusion switch (select models), Trusted Cryptographic Module (TCM) (optional), security lock slot, and padlock loop.
Video	• Intel HD Graphics integrated into a processor (select models). • NVS 315 Graphic Adapter by NVIDIA (select models). • Quadro K620 Graphic Adapter by NVIDIA (select models) Maximum resolution is 1920x1200 at 60 Hz with 32 bits per pixel (16M colors).
Operating systems	Microsoft Windows 10; Microsoft Windows Server 2012, 2012 R2, and 2016; Red Hat Enterprise Linux (RHEL) Server 6 and 7; SUSE Linux Enterprise Server (SLES) 11 and 12; VMware vSphere (ESXi) 5.5, 6.0, and 6.5.
Warranty	One-year or three-year (model dependent) customer-replaceable unit (CRU) and on-site limited warranty with 9x5 next business day (NBD).
Service and support	Optional service upgrades (country-specific) are available through Lenovo Services offerings: 8-hour or 4-hour response time, warranty extension up to 5 years, Priority Technical Support, and Keep Your Drive Multi-Drive.

Components	Specification
Dimensions	Height: 375 mm (14.8 in.), width: 175 mm (6.9 in.), depth: 431 mm (17.0 in.)
Weight	Maximum: 12.5 kg (27.6 lb)

Relationship models

TS150 relationship models are country-specific; that is, each country may define their own server models, and not all server models are available in every country.

For a list of the TS150 relationship models (Machine Types 70LU and 70LW), contact a Lenovo or Lenovo Business Partner representative in your country.

The TS150 server models are shipped with the following items:

- *Electronic Publications* Flyer
- *ThinkServer EasyStartup Quick Start Guide* printed publication
- One country-specific power cord (except EMEA)

TopSeller models

TS150 TopSeller models are country-specific; that is, each country may define their own server models, and not all server models are available in every country.

For a list of the TS150 TopSeller models (Machine Types 70LV and 70LX), contact a Lenovo or Lenovo Business Partner representative in your country, or refer to the TS150 PSREF page: http://psref.lenovo.com/Product/ThinkServer_TS150

The TS150 server models are shipped with the following items:

- *Electronic Publications* Flyer
- *ThinkServer EasyStartup Quick Start Guide* printed publication
- One country-specific power cord (except EMEA)

Processors

The TS150 supports one processor. The following table lists the specifications of the processors that are available for the TS150.

Table 2. Processor specifications (Hyper-Threading [HT], Turbo Boost [TB], Virtualization Technology [VT])

Processor model	Core frequency (Base / TB Max)	Cores / Threads	Cache	Max DDR4 frequency	TDP	HT	TB	VT-x	VT-d	IG#	Mgmt*
Intel Xeon processors											
E3-1220 v5	3 / 3.5 GHz	4 / 4	8 MB	2133 MHz	80 W	No	Yes	Yes	Yes	No	AMT
E3-1225 v5	3.3 / 3.7 GHz	4 / 4	8 MB	2133 MHz	80 W	No	Yes	Yes	Yes	Yes	AMT
E3-1230 v5	3.4 / 3.8 GHz	4 / 8	8 MB	2133 MHz	80 W	Yes	Yes	Yes	Yes	No	AMT
E3-1240 v5	3.5 / 3.9 GHz	4 / 8	8 MB	2133 MHz	80 W	Yes	Yes	Yes	Yes	No	AMT
E3-1245 v5	3.5 / 3.9 GHz	4 / 8	8 MB	2133 MHz	80 W	Yes	Yes	Yes	Yes	Yes	AMT
E3-1270 v5	3.6 / 4 GHz	4 / 8	8 MB	2133 MHz	80 W	Yes	Yes	Yes	Yes	No	AMT
E3-1275 v5	3.6 / 4 GHz	4 / 8	8 MB	2133 MHz	80 W	Yes	Yes	Yes	Yes	Yes	AMT
E3-1280 v5	3.7 / 4 GHz	4 / 8	8 MB	2133 MHz	80 W	Yes	Yes	Yes	Yes	No	AMT
Intel Core processors											
i3-6100	3.7 GHz	2 / 4	3 MB	2133 MHz	51 W	Yes	No	Yes	Yes	Yes	ISM
i3-6100T	3.2 GHz	2 / 4	3 MB	2133 MHz	35 W	Yes	No	Yes	Yes	Yes	ISM
i3-6300	3.8 GHz	2 / 4	4 MB	2133 MHz	51 W	Yes	No	Yes	Yes	Yes	ISM
i3-6300T	3.3 GHz	2 / 4	4 MB	2133 MHz	35 W	Yes	No	Yes	Yes	Yes	ISM
i3-6320	3.9 GHz	2 / 4	4 MB	2133 MHz	51 W	Yes	No	Yes	Yes	Yes	ISM
Intel Pentium processors											
G4400	3.3 GHz	2 / 2	3 MB	2133 MHz	54 W	No	No	Yes	Yes	Yes	ISM
G4400T	2.9 GHz	2 / 2	3 MB	2133 MHz	35 W	No	No	Yes	Yes	Yes	ISM
G4500	3.5 GHz	2 / 2	3 MB	2133 MHz	51 W	No	No	Yes	Yes	Yes	ISM
G4500T	3 GHz	2 / 2	3 MB	2133 MHz	35 W	No	No	Yes	Yes	Yes	ISM
G4520	3.6 GHz	2 / 2	3 MB	2133 MHz	51 W	No	No	Yes	Yes	Yes	ISM
Intel Celeron processors											
G3900	2.8 GHz	2 / 2	2 MB	1866 MHz	51 W	No	No	Yes	Yes	Yes	ISM
G3900T	2.6 GHz	2 / 2	2 MB	1866 MHz	35 W	No	No	Yes	Yes	Yes	ISM
G3920	2.9 GHz	2 / 2	2 MB	1866 MHz	51 W	No	No	Yes	Yes	Yes	ISM

* Mgmt = Management
# IG = Intel Integrated HD Graphics

Memory

Lenovo DDR4 memory is compatibility tested and tuned for optimal ThinkServer performance and throughput. From a service and support standpoint, Lenovo memory automatically assumes the system warranty, and Lenovo provides service and support worldwide.

The TS150 server has four DIMM slots, and it supports DDR4 UDIMMs with ECC memory protection or without ECC protection. The processor has two memory channels and supports two DIMMs per channel.

The following rules apply when selecting the memory configuration:

- The TS150 server supports memory configurations with 1, 2, 3, or 4 UDIMMs.
- The TS150 server supports up to 2133 MHz memory speeds for one DIMM per channel and two DIMMs per channel configurations, provided that the processors support this memory speed (see the Processor options table in the Processors section for details).
- The TS150 server supports 2133 MHz and 2400 MHz UDIMMs. Mixing 2133 MHz UDIMMs and 2400 MHz UDIMMs is supported; however, all UDIMMs in the server will run at the same lower speed up to 2133 MHz.
- The TS150 server supports UDIMMs with ECC memory protection (Worldwide) or without ECC protection (China only). Mixing ECC and non-ECC UDIMMs is not supported.

The following table summarizes memory speeds and capacities that are supported by the TS150 server.

Table 3. TS150 maximum memory speeds and capacities

	UDIMM	
DIMMs per channel	**Maximum memory bus speed**	**Maximum capacity**
1 DPC	2133 MHz	32 GB (2x 16 GB)
2 DPC	2133 MHz	64 GB (4x 16 GB)

The following table lists the memory options that are available for the TS150 server.

Table 4. Memory options

Description	**Part number**	**Maximum supported**
2400 MHz ECC UDIMMs (Worldwide)		
ThinkServer 8GB 1RX8 PC4-2400-E TruDDR4-2400 ECC UDIMM	4X70G88325	4
ThinkServer 16GB 2RX8 PC4-2400-E TruDDR4-2400 ECC UDIMM	4X70G88326	4
2400 MHz Non-ECC UDIMMs (China only)		
ThinkServer 4GB 1RX16 PC4-2400-U DDR4-2400 UDIMM	4X70G88329	4
ThinkServer 8GB 1RX8 PC4-2400-U DDR4-2400 UDIMM	4X70G88327	4
ThinkServer 16GB 2RX8 PC4-2400-U DDR4-2400 UDIMM	4X70G88328	4
2133 MHz ECC UDIMMs (Worldwide)		
ThinkServer 4GB 1RX8 PC4-2133-E CL15 DDR4-2133 ECC-UDIMM	4X70G88315	4
ThinkServer 8GB 2RX8 PC4-2133-E CL15 DDR4-2133 ECC-UDIMM	4X70G88316	4
ThinkServer 16GB 2RX8 PC4-2133-E CL15 DDR4-2133 ECC-UDIMM	4X70G88317	4
2133 MHz Non-ECC UDIMMs (China only)		
ThinkServer 4GB 1RX8 PC4-2133-U DDR4-2133 UDIMM	4X70G88312	4
ThinkServer 8GB 2RX8 PC4-2133-U DDR4-2133 UDIMM	4X70G88313	4
ThinkServer 16GB 2RX8 PC4-2133-U DDR4-2133 UDIMM	4X70G88314	4

Internal storage

The TS150 server supports the following internal storage configurations:

1. 4x 3.5-inch + 1x 2.5-inch non-hot-swap drive bays + slim optical drive bay
2. 3x 3.5-inch + 1x 2.5-inch non-hot-swap drive bays + half high (HH) optical drive bay
3. 3x 3.5-inch + 1x 2.5-inch non-hot-swap drive bays + slim optical drive bay + ODD/backup drive bay
4. 2x 3.5-inch + 1x 2.5-inch non-hot-swap drive bays + HH optical drive bay + ODD/backup drive bay

These configurations are shown in the following figure.

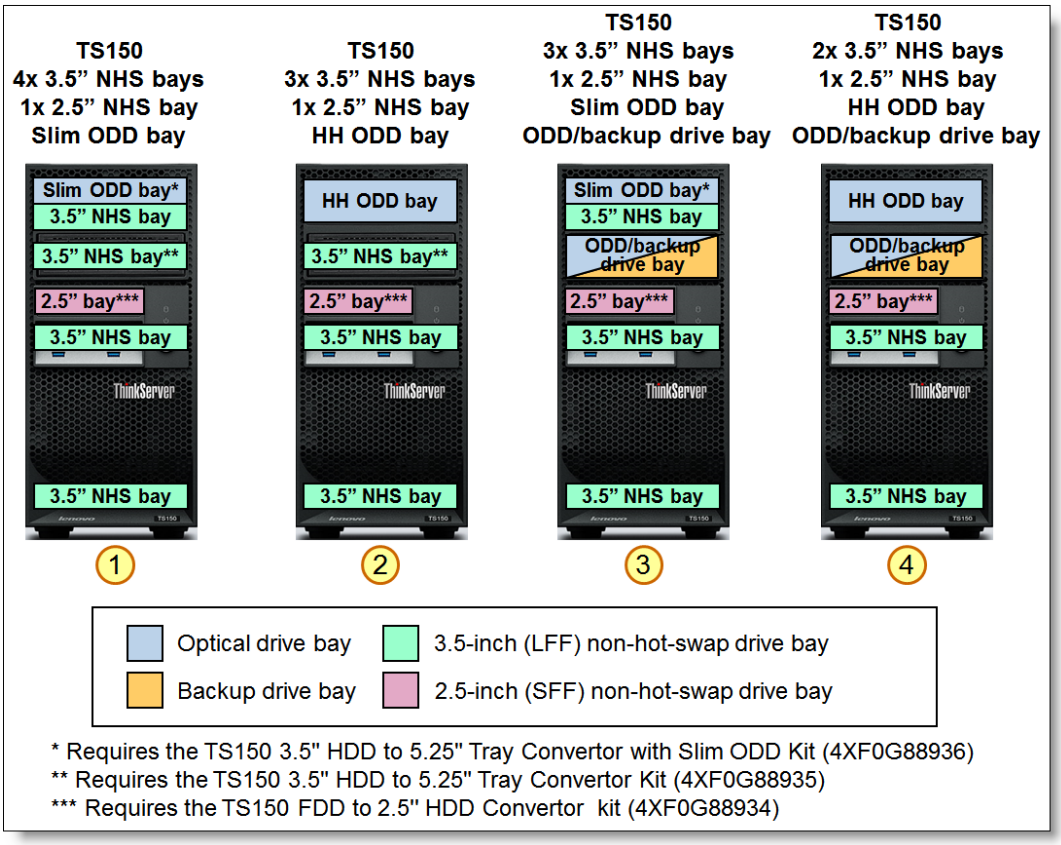

Figure 5. Internal storage configurations

In addition, the TS150 server can be upgraded with 2x SD card internal slots. The SD card slots are connected to the Intel Platform Controller Hub (PCH) via USB.

The following table lists the internal storage expansion options that are available for the TS150 server.

Table 5. Internal storage expansion options

Description	Part number	Maximum supported
ThinkServer TS150 3.5" HDD to 5.25" Tray Convertor Kit	4XF0G88935	1
ThinkServer TS150 3.5" HDD to 5.25" Tray Convertor with Slim ODD Kit	4XF0G88936	1
ThinkServer TS150 FDD to 2.5" HDD Convertor Kit	4XF0G88934	1
ThinkServer SDHC Flash Assembly Module	4XF0G88933	1

Configuration notes:

- The ThinkServer TS150 3.5" HDD to 5.25" Tray Convertor Kit is required when a 3.5-inch drive is installed in the ODD/backup drive bay.
- The ThinkServer TS150 3.5" HDD to 5.25" Tray Convertor with Slim ODD Kit is required when a 3.5-inch drive is installed in the half-high ODD bay, or a slim optical drive is installed in the half-high ODD bay, or both.
- The TS150 FDD to 2.5'' HDD Convertor Kit is required when a 2.5-inch drive is installed in the 2.5-inch drive bay.
- The SDHC Flash Assembly Module adds support for the use of up to two SD cards in the server.

Controllers for internal storage

The following table lists the internal RAID controllers and the additional options that are used for the internal disk storage of the TS150 server.

Table 6. Controllers for internal storage

Description	Part number	Maximum supported
ThinkServer RAID 121i Controller	None#	1
ThinkServer RAID 520i PCIe Adapter	4XC0G88840	1
ThinkServer RAID 520i RAID 5 Upgrade	4XC0G88841	1

RAID 121i is an onboard hardware-assist RAID controller.

The RAID 121i is an onboard RAID controller that does *not* consume a PCIe slot. The RAID 520i adapter is supported only in the PCIe slot 3.

Important: The RAID 121i controller is not supported by virtualization hypervisors, including VMware vSphere (ESXi), Linux KVM, Xen, and Microsoft Hyper-V.

The following table summarizes features of supported internal storage controllers.

Table 7. Internal storage controller features and specifications summary

Feature	RAID 121i	RAID 520i
Part number	None	4XC0G88840
Form factor	Onboard	Low profile
Controller chip	Not applicable*	LSI SAS3008
Host interface	Not applicable*	PCIe 3.0 x8
Port interface	6 Gbps SATA	12 Gbps SAS
Number of internal drive ports	6**	8
Internal port connectors	6x L-shape SATA	2x Mini-SAS HD x4 (SFF-8643)
Drive interface	SATA	SAS, SATA
Drive type	HDD, SSD	HDD, SSD
Non-hot-swap drive support	Yes	Yes
Hot-swap drive support	Yes	Yes
Optical drive support	Yes	No
Maximum number of drives	6**	8
RAID levels	0/1/10/5	0/1/10, Optional 5/50 (4XC0G88841)
JBOD mode	Yes	Yes

Feature	RAID 121i	RAID 520i
Cache	None	None
Cache protection	None	None
FastPath	None	None
CacheCade Pro 2.0	None	None

* The RAID 121i is a hardware-assist, software RAID feature (Intel Rapid Storage Technology Enterprise [RSTe]) integrated into the Intel C236 Platform Controller Hub (PCH).
** Up to four ports are used for SATA HDDs or SSDs, and the remaining two ports are used for optical drives; or up to five ports are used for SATA HDDs or SSDs, and the remaining port is used for an optical drive.

The following table lists drive types and internal drive bay configurations that are supported by the internal RAID controller.

Table 8. Storage controllers, drive types, and internal drive bays

Storage controller	Drive type	4x 3.5-inch + 1x 2.5-inch non-hot-swap drive bays
RAID 121i	NL SATA HDD	Yes
	SATA SSD	Yes
RAID 520i	NL SATA HDD	Yes
	SATA SSD	Yes

Drives for internal storage

The TS150 server supports the internal drive options listed in the following table.

Table 9. Internal drive options

Description	Part number	Maximum supported
3.5-inch non-hot-swap HDDs - SATA 6 Gbps		
ThinkServer 3.5" 1TB 7.2K SATA 6Gbps Hard Drive (Desktop)	4XB0G88755	4
ThinkServer 3.5" 2TB 7.2K SATA 6Gbps Hard Drive (Desktop)	4XB0G88756	4
3.5-inch non-hot-swap HDDs - NL SATA 6 Gbps		
ThinkServer TS150 3.5" 500GB 7.2K Enterprise SATA 6Gbps HDD	4XB0G88758	4
ThinkServer TS150 3.5" 1TB 7.2K Enterprise SATA 6Gbps HDD	4XB0G88760	4
ThinkServer TS150 3.5" 2TB 7.2K Enterprise SATA 6Gbps HDD	4XB0G88764	4
ThinkServer TS150 3.5" 4TB 7.2K Enterprise SATA 6Gbps HDD	4XB0G88796	4
ThinkServer TS150 3.5" 5TB 7.2K Enterprise SATA 6Gbps HDD	4XB0G88797	4
ThinkServer TS150 3.5" 6TB 7.2K Enterprise SATA 6Gbps HDD	4XB0G88798	4
2.5-inch non-hot-swap SSDs (2.5-in. SSDs in 3.5-in. drive trays) - 5100 Enterprise Mainstream SATA 6 Gbps		
TS150 2.5" 240GB 5100 Enterprise Mainstream SATA 6Gbps SSD with 3.5" Tray	4XB0K12422	5
TS150 2.5" 480GB 5100 Enterprise Mainstream SATA 6Gbps SSD with 3.5" Tray	4XB0K12424	5
TS150 2.5" 960GB 5100 Enterprise Mainstream SATA 6Gbps SSD with 3.5" Tray	4XB0K12426	5
2.5-inch non-hot-swap SSDs (2.5-in. SSDs in 3.5-in. drive trays) - 5100 Enterprise Entry SATA 6 Gbps		
TS150 2.5" 480GB 5100 Enterprise Entry SATA 6Gbps SSD with 3.5" Tray	4XB0N68492	5
TS150 2.5" 960GB 5100 Enterprise Entry SATA 6Gbps SSD with 3.5" Tray	4XB0N68494	5
2.5-inch non-hot-swap SSDs (2.5-in. SSDs in 3.5-in. drive trays) - PM863a Enterprise Entry SATA 6 Gbps		
TS150 2.5" 240GB PM863a Enterprise Entry SATA 6Gbps SSD with 3.5" Tray	4XB0K12354	5

Description	Part number	Maximum supported
TS150 2.5" 480GB PM863a Enterprise Entry SATA 6Gbps SSD with 3.5" Tray	4XB0K12355	5
TS150 2.5" 960GB PM863a Enterprise Entry SATA 6Gbps SSD with 3.5" Tray	4XB0K12356	5
2.5-inch non-hot-swap SSDs (2.5-in. SSDs in 3.5-in. drive trays) - S3520 Entry SATA 6 Gbps		
TS150 2.5" 240GB S3520 Entry SATA 6Gbps SSD with 3.5" Tray	4XB0K12328	5
TS150 2.5" 480GB S3520 Entry SATA 6Gbps SSD with 3.5" Tray	4XB0K12331	5
TS150 2.5" 960GB S3520 Entry SATA 6Gbps SSD with 3.5" Tray	4XB0K12334	5
SD cards		
ThinkServer 8GB SD Card	4X70F28592	2

Optical drives

The TS150 server supports the optical drive options listed in the following table.

Table 10. Optical drive options

Description	Part number	Maximum supported
Half high optical drives		
ThinkServer Half High SATA DVD-RW Optical Disk Drive	4XA0F28605	2
ThinkServer Half High SATA DVD-ROM Optical Disk Drive	4XA0F28606	2
Slim optical drives		
ThinkServer Slim SATA DVD-RW Optical Disk Drive	4XA0F28607	2
ThinkServer Slim SATA DVD-ROM Optical Disk Drive	4XA0F28608	2

The SATA Optical Disk Drives support the following types of media: CD-R, CD-ROM, CD-RW, DVD-R, DVD-R (dual-layer recording), DVD-RW, DVD+R, DVD+R (dual-layer recording), and DVD+RW.

Configuration notes:

- A slim optical drive allows support for up to 4x 3.5-inch + 1x 2.5-inch internal drive bays in the server without a second optical drive or an internal backup unit; or up to 3x 3.5-inch + 1x 2.5-inch internal drive bays in the server with a second optical drive or an internal backup unit.
- The 3.5" HDD to 5.25" Tray Convertor with Slim ODD Kit (4XF0G88936) is required to support a slim optical drive.
- A half high optical drive limits the maximum number of internal drive bays to 3x 3.5-inch + 1x 2.5-inch in the server without a second optical drive or an internal backup unit; or to 2x 3.5-inch + 1x 2.5-inch in the server with a second optical drive or an internal backup unit.
- If two optical drives are used, an internal backup unit is not supported.

Internal backup units

The TS150 server supports the internal backup unit options listed in the following table.

Table 11. Internal backup unit options

Description	Part number	Maximum supported
Internal RDX backup unit (USB)		
ThinkServer Internal RDX Tape Drive	4XF0F28769	1
Cartridges for RDX backup unit		
ThinkServer 1TB SATA 3Gbps RDX Cartridge	4XB0F28660	1
ThinkServer 2TB SATA 3Gbps RDX Cartridge	4XB0G88711	1

Configuration note: If an internal backup unit is used, a maximum of one optical drive is supported.

I/O expansion

The TS150 server has four I/O expansion slots:

- Slot 1: PCIe 3.0 x16 (x16-wired); full-height, half-length
- Slot 2: PCIe 3.0 x1 (x1-wired); full-height, half-length
- Slot 3: PCIe 3.0 x16 (x4-wired); full-height, half-length
- Slot 4: PCIe 3.0 x1 (x1-wired); full-height, half-length

The following adapter types are supported:

- RAID adapters (Refer to the Controllers for internal storage)
- Network adapters (Refer to the Network adapters section)

Network adapters

The TS150 server has one integrated Gigabit Ethernet port that is based on the Intel I219LM 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 the network adapter options for the TS150 server.

Table 12. Network adapter options

Description	Part number	Maximum supported
ThinkServer I210-T1 PCIe 1Gb 1-Port Base-T Ethernet Adapter by Intel (1x RJ-45 port)	4XC0G88844	2
ThinkServer I350-T2 PCIe 1Gb 2 Port Base-T Ethernet Adapter by Intel (2x RJ-45 ports)	4XC0F28730	2
ThinkServer I350-T4 PCIe 1Gb 4 Port Base-T Ethernet Adapter by Intel (4x RJ-45 ports)	4XC0F28731	2
ThinkServer TS150 PCIe Wireless Card	4XC0G88846	1*

* Available only in China.

GPU adapters

The TS150 server supports the GPU adapter options that are listed in the following table.

Note: A GPU adapter is required for server models that use processors without integrated graphics; a GPU adapter is not available for selection for server models that use processors with integrated graphics.

Table 13. GPU adapter options

Description	Part number	Maximum supported
ThinkServer 1GB NVS 315 PCIe x16 Graphic Adapter by NVIDIA	4X60G88210	1
ThinkServer 2GB Quadro K620 Graphic Adapter by NVIDIA	4X60G88211	1

Power supplies

The TS150 server supports one 250 W AC (100-240 V) fixed power supply (80 PLUS Bronze) or one 400 W AC (100-240 V) fixed power supply (80 PLUS Platinum). A country-specific power cord is included with the server (except EMEA models; EMEA models do not ship with a power cord).

Important: To ensure that the correct power supply is chosen, it is highly recommended to validate system configuration for specific power requirements by using the latest version of the ThinkServer Power Planner, which is available at this website:
http://support.lenovo.com/us/en/downloads/ds101155

Systems management

The ThinkServer TS150 models with Intel Xeon E3-1200 v5 processors support Intel Active Management Technology (AMT) which provides out-of-band, hardware-based advanced system control, monitoring, alerting, and remote presence functions. The TS150 models with Intel 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 KVM (keyboard, video, mouse) redirection (KVM redirection requires an Intel Xeon E3-1200 v5 processor with integrated graphics).

Important: 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 Ethernet port 0, 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)

AMT and ISM support the following management user interfaces:

- Web browser
- A third-party platform management software, including but not limited to the following tools:
    - RealVNC Viewer Plus (for remote KVM)
    - Intel Platform Solution Manager (for comprehensive support of AMT features)

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

- ThinkServer EasyStartup

  The ThinkServer EasyStartup tool simplifies the process of configuring RAID and installing supported Microsoft Windows and Linux operating systems, VMware hypervisors, and device drivers on a ThinkServer system.

- ThinkServer EasyUpdate

  The ThinkServer EasyUpdate firmware update tool enables you to maintain your server firmware up-to-date and helps you avoid unnecessary server outages.

- ThinkServer Diagnostics

  The ThinkServer Diagnostics software speeds up troubleshooting tasks to reduce service time.

Security

The TS150 offers the following security features:

- Administrator's and power-on password
- Intrusion switch (select models)
- Trusted Cryptographic Module (TCM) (optional; available only in China)
- Security lock slot
- Padlock loop

The following table lists the TCM option.

Table 14. TCM option

Description	Part number	Maximum supported
ThinkServer Gen 5 Trusted Cryptographic Module	4XF0G45869	1

Rack installation

The ThinkServer TS150 can be mounted in a rack cabinet by using the tower to rack conversion kit that is listed in the following table. The tower to rack conversion kit includes a shelf on which the server is placed, sliding rails for mounting a shelf, and a cable management arm (CMA).

Table 15. Rack installation options

Description	Part number	Maximum supported
ThinkServer Tower to Rack Conversion Kit v2.0	4XF0G88937	1

Operating systems

The ThinkServer TS150 supports the following operating systems:

- Microsoft (client operating systems)
  - Windows 10 Professional (x64)
- Microsoft (server operating systems)
  - Windows Server 2016 Essentials, Standard, Hyper-V
  - Windows Storage Server 2016
  - Windows Server 2012 R2 Foundation, Essentials, Standard, Hyper-V
  - Windows Storage Server 2012 R2
  - Windows Server 2012 Foundation, Essentials, Standard, Hyper-V
  - Windows Multipoint Server 2012
- SUSE
  - SUSE Linux Enterprise Server 12 SP2
  - SUSE Linux Enterprise Server 12 SP1
  - SUSE Linux Enterprise Server 11 SP4 (x64)
- Red Hat
  - Red Hat Enterprise Linux Server 7.3
  - Red Hat Enterprise Linux Server 7.2
  - Red Hat Enterprise Linux Server 6.8 (x64)
  - Red Hat Enterprise Linux Server 6.7 (x64)
- VMware
  - VMware vSphere 6.5 (ESXi)
  - VMware vSphere 6.0 (ESXi) Update 3
  - VMware vSphere 6.0 (ESXi) Update 2
  - VMware vSphere 6.0 (ESXi) Update 1
  - VMware vSphere 5.5 (ESXi) Update 3

Important: The RAID 121i controller is not supported by virtualization hypervisors, including VMware vSphere (ESXi), Linux KVM, Xen, and Microsoft Hyper-V.

For the latest information about the specific versions and service levels that are supported and any other prerequisites, see the Operating System Interoperability Guide: http://lenovopress.com/redposig.

Physical specifications

The TS150 has the following dimensions and weight (approximate):

- Height: 375 mm (14.8 in.)
- Width: 175 mm (6.9 in.)
- Depth: 431 mm (17.0 in.)
- Weight:
    - Maximum configuration without packaging: 12.5 kg (27.6 lb)
    - Maximum configuration with packaging: 14.5 kg (32.0 lb)

Operating environment

The TS150 server is supported in the following environment:

- Air temperature:
    - Operating: 10 °C - 35 °C (50 °F - 95 °F)
    - Storage: -40 °C - 60 °C (-40 °F - 140 °F) in the original shipping package
- Altitude: 0 m - 3,048 m (0 ft - 10,000 ft) in an unpressurized environment
- Humidity:
    - Operating: 8% - 80% (non-condensing)
    - Storage: 10% - 90% (non-condensing)
- Electrical:
    - 100 - 127 (nominal) V AC; 50 Hz or 60 Hz
    - 200 - 240 (nominal) V AC; 50 Hz or 60 Hz
- Acoustic level (maximum):
    - 35 dB (operating)
    - 34 dB (idle)

Regulatory compliance

The TS150 server conforms to the following regulations:

- RoHS
- FCC - Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, Class A
- EU Council Directive 2004/108/EC
- European Standard EN55022, Class A
- Korea Class A compliance
- Taiwan Class A compliance
- Japan VCCI, Class A

Warranty

The ThinkServer TS150 has a three-year or one-year warranty (model dependent) with 24x7 standard call center support and 9x5 next business day onsite coverage. Lenovo offers warranty maintenance upgrades and post-warranty maintenance agreements with a well-defined scope of services, including service hours, response time, and length of service coverage.

The Lenovo QuickPick tool helps locate compatible accessories and services and warranty information. Services offered may vary by geographic location. Access the tool via the following URL: http://lenovoquickpick.com

The following table explains warranty service definitions.

Table 16. Warranty service definitions

Term	Description
On-site service	A service technician will go to the client's location for equipment service.
24x7x4 hour	A service technician is scheduled to arrive at the client’s location within four hours after remote problem determination is completed. Lenovo provides service around the clock, every day, including Lenovo holidays.
24x7x8 hour	A service technician is scheduled to arrive at the client’s location within eight hours after remote problem determination is completed. Lenovo provides service around the clock, every day, including Lenovo holidays.
9x5x4 hour	A service technician is scheduled to arrive at the client’s location within four business hours after remote problem determination is completed. Lenovo provides service 8:00 am - 5:00 pm in the client's local time zone, Monday-Friday, excluding Lenovo holidays. For example, if a customer reports an incident at 3:00 pm on Friday, the technician will arrive by 10:00 am the following Monday.
9x5 next business day	A service technician is scheduled to arrive at the client’s location on the business day after remote problem determination is completed. Lenovo provides service 8:00 am - 5:00 pm in the client's local time zone, Monday - Friday, excluding Lenovo holidays. Calls received after 4:00 pm local time require an extra business day for service dispatch.

The following Lenovo warranty service upgrades are available:

- Warranty and maintenance service upgrades:
  - Three, four, or five years of 9x5 or 24x7 service coverage
  - Onsite response time from next business day to 4 hour same-day
  - Warranty extension of up to 5 years
  - Post warranty extensions offered in 1-year increments
- Priority Technical Support
  Lenovo’s Priority Support Offering enhances our award-winning call center support to provide top priority queue assignment to specialized Lenovo technicians. Priority support accelerates call center troubleshooting to get your problems resolved quickly, and includes other value-added support for Lenovo provided software tools. Priority support can be purchased stand alone to match the base warranty of your system or in convenient bundles with our same-day response services.
- Keep Your Drive Multi-Drive
  Lenovo’s Keep Your Drive Multi-Drive service is a multi-drive hard drive retention offering that ensures your data is always under your control, regardless of the number of hard drives that are installed in your Lenovo server. In the unlikely event of a hard drive failure, you retain possession of your hard drive while Lenovo replaces the failed drive part. Your data stays safely on your premises, in your hands. Keep Your Drive Multi-Drive covers multiple drives and multiple failures with one service offering at one value price. This service can be purchased stand-alone to match the base warranty of your system or in convenient bundles with our same-day response services.

External storage systems

The TS150 server can be attached to external NAS storage via 1 Gb Ethernet network, or SAN storage systems via 1 Gb iSCSI with an iSCSI software initiator in the operating system.

The following table lists the external storage systems that are offered by Lenovo and support 1 Gb Ethernet NAS or 1 Gb iSCSI connectivity.

Table 17. External storage systems

Description	Part number
Lenovo ThinkSystem DS Series Storage (iSCSI connectivity)	
Lenovo ThinkSystem DS2200 LFF FC/iSCSI Dual Controller Unit (US English documentation)	4599A31*
Lenovo ThinkSystem DS2200 LFF FC/iSCSI Dual Controller Unit (Simplified Chinese documentation)	4599A3C^
Lenovo ThinkSystem DS2200 LFF FC/iSCSI Dual Controller Unit (Japanese documentation)	4599A3J**
Lenovo ThinkSystem DS2200 SFF FC/iSCSI Dual Controller Unit (US English documentation)	4599A11*
Lenovo ThinkSystem DS2200 SFF FC/iSCSI Dual Controller Unit (Simplified Chinese documentation)	4599A1C^
Lenovo ThinkSystem DS2200 SFF FC/iSCSI Dual Controller Unit (Japanese documentation)	4599A1J**
Lenovo ThinkSystem DS4200 LFF FC/iSCSI Dual Controller Unit (US English documentation)	4617A31*
Lenovo ThinkSystem DS4200 LFF FC/iSCSI Dual Controller Unit (Simplified Chinese documentation)	4617A3C^
Lenovo ThinkSystem DS4200 LFF FC/iSCSI Dual Controller Unit (Japanese documentation)	4617A3J**
Lenovo ThinkSystem DS4200 SFF FC/iSCSI Dual Controller Unit (US English documentation)	4617A11*
Lenovo ThinkSystem DS4200 SFF FC/iSCSI Dual Controller Unit (Simplified Chinese documentation)	4617A1C^
Lenovo ThinkSystem DS4200 SFF FC/iSCSI Dual Controller Unit (Japanese documentation)	4617A1J**
Lenovo ThinkSystem DS6200 SFF FC/iSCSI Dual Controller Unit (US English documentation)	4619A11*
Lenovo ThinkSystem DS6200 SFF FC/iSCSI Dual Controller Unit (Simplified Chinese documentation)	4619A1C^
Lenovo Storage S Series (iSCSI connectivity)	
Lenovo Storage S2200 LFF Chassis FC/iSCSI Single Controller, Rack Kit, 9x5NBD	64114B1
Lenovo Storage S2200 LFF Chassis FC/iSCSI Dual Controller, Rack Kit, 9x5NBD	64114B2
Lenovo Storage S2200 SFF Chassis FC/iSCSI Single Controller, Rack Kit, 9x5NBD	64114B3
Lenovo Storage S2200 SFF Chassis FC/iSCSI Dual Controller, Rack Kit, 9x5NBD	64114B4
Lenovo Storage S3200 LFF Chassis FC/iSCSI Single Controller, Rack Kit, 9x5NBD	64116B1
Lenovo Storage S3200 LFF Chassis FC/iSCSI Dual Controller, Rack Kit, 9x5NBD	64116B2
Lenovo Storage S3200 SFF Chassis FC/iSCSI Single Controller, Rack Kit, 9x5NBD	64116B3
Lenovo Storage S3200 SFF Chassis FC/iSCSI Dual Controller, Rack Kit, 9x5NBD	64116B4
Lenovo Storage V Series (iSCSI connectivity)	
Lenovo Storage V3700 V2 LFF Control Enclosure	6535C1D
Lenovo Storage V3700 V2 LFF Control Enclosure (TopSeller)	6535EC1
Lenovo Storage V3700 V2 SFF Control Enclosure	6535C2D
Lenovo Storage V3700 V2 SFF Control Enclosure (TopSeller)	6535EC2
Lenovo Storage V3700 V2 XP LFF Control Enclosure	6535C3D
Lenovo Storage V3700 V2 XP LFF Control Enclosure (TopSeller)	6535EC3
Lenovo Storage V3700 V2 XP SFF Control Enclosure	6535C4D
Lenovo Storage V3700 V2 XP SFF Control Enclosure (TopSeller)	6535EC4
Lenovo Storage V5030 LFF Control Enclosure 3Yr S&S	6536C12

Description	Part number
Lenovo Storage V5030 LFF Control Enclosure 5Yr S&S	6536C32
Lenovo Storage V5030 SFF Control Enclosure 3Yr S&S	6536C22
Lenovo Storage V5030 SFF Control Enclosure 5Yr S&S	6536C42
Lenovo Storage V5030F SFF Control Enclosure 3Yr S&S	6536B1F
Lenovo Storage V5030F SFF Control Enclosure 5Yr S&S	6536B2F
IBM Storwize for Lenovo (iSCSI connectivity)	
IBM Storwize V3500 3.5-inch Dual Control Storage Controller Unit	6096CU2^
IBM Storwize V3500 2.5-inch Dual Control Storage Controller Unit	6096CU3^
IBM Storwize V3700 3.5-inch Storage Controller Unit	6099L2C
IBM Storwize V3700 2.5-inch Storage Controller Unit	6099S2C
IBM Storwize V7000 2.5-inch Storage Controller Unit, w/3 Yr S&S (Model 524)	6195SC5†
IBM Storwize V7000 2.5-inch Storage Controller Unit, w/3 Yr S&S (LA) (Model 524)	6195SCL‡
IBM Storwize V7000 2.5-inch Storage Controller Unit, w/5 Yr S&S (Model 524)	61951F1†
IBM Storwize V7000 2.5-inch Storage Controller Unit, w/5 Yr S&S (LA) (Model 524)	61951FL‡
IBM Storwize V7000 SFF Control Enclosure, 3YR SWMA (Model HC1 [Gen2+])	6195C32†
IBM Storwize V7000 SFF Control Enclosure, 3YR SWMA, LA (Model HC1 [Gen2+])	6195C3L‡
IBM Storwize V7000 SFF Control Enclosure, 5YR SWMA (Model HC1 [Gen2+])	6195C52†
IBM Storwize V7000 SFF Control Enclosure, 5YR SWMA, LA (Model HC1 [Gen2+])	6195C5L‡
Lenovo Storage DX8200 Series (NAS or iSCSI connectivity)	
Lenovo Storage DX8200D Storage Virtualization Entry, 4TB, 3yr SW S&S	5135A2x#
Lenovo Storage DX8200D Storage Virtualization Entry, 4TB, 4yr SW S&S	5135J2x#
Lenovo Storage DX8200D Storage Virtualization Entry, 4TB, 5yr SW S&S	51351Vx#
Lenovo Storage DX8200D Storage Virtualization Mid, 16TB, 3yr SW S&S	5135B2x#
Lenovo Storage DX8200D Storage Virtualization Mid, 16TB, 4yr SW S&S	5135L2x#
Lenovo Storage DX8200D Storage Virtualization Mid, 16TB, 5yr SW S&S	51352Vx#
Lenovo Storage DX8200D Storage Virtualization High, 64TB, 3yr SW S&S	5135C3x#
Lenovo Storage DX8200D Storage Virtualization High, 64TB, 4yr SW S&S	5135M3x#
Lenovo Storage DX8200D Storage Virtualization High, 64TB, 5yr SW S&S	51353Wx#
Lenovo Storage DX8200D ServerSAN Entry, 8TB, 3yr SW S&S	5135D2x#
Lenovo Storage DX8200D ServerSAN Entry, 8TB, 4yr SW S&S	5135N2x#
Lenovo Storage DX8200D ServerSAN Entry, 8TB, 5yr SW S&S	51354Vx#
Lenovo Storage DX8200D ServerSAN Mid, 16TB, 3yr SW S&S	5135F2x#
Lenovo Storage DX8200D ServerSAN Mid, 16TB, 4yr SW S&S	5135P2x#
Lenovo Storage DX8200D ServerSAN Mid, 16TB, 5yr SW S&S	51355Vx#
Lenovo Storage DX8200D ServerSAN High, 32TB, 3yr SW S&S	5135G3x#
Lenovo Storage DX8200D ServerSAN High, 32TB, 4yr SW S&S	5135Q3x#
Lenovo Storage DX8200D ServerSAN High, 32TB, 5yr SW S&S	51356Wx#
Lenovo Storage DX8200N with 1x N2226 HBA (Requires a supported external drive enclosure)	5128A1x#
Lenovo Storage DX8200N with 2x N2226 HBAs (Requires a supported external drive enclosure)	5128A2x#
Lenovo Storage DX8200 Series (S3 cloud storage)	
Lenovo Storage DX8200C 56TB (14x 4TB HDDs) with Cloudian HyperStore - 3yr HW/SW S&S	5120C1x#

Description	Part number
Lenovo Storage DX8200C 84TB (14x 6TB HDDs) with Cloudian HyperStore - 3yr HW/SW S&S	5120C3x#
Lenovo Storage DX8200C 112TB (14x 8TB HDDs) with Cloudian HyperStore - 3yr HW/SW S&S	5120C2x#
Lenovo Storage DX8200C 140TB (14x 10TB HDDs) with Cloudian HyperStore - 3yr HW/SW S&S	5120C4x#

* Available worldwide (except China and Japan).
^ Available only in China.
** Available only in Japan.
† Available worldwide except Latin America.
‡ Available only in Latin America.
# x represents a geo-specific letter (for example: U = North America, G = EMEA). Ask a Lenovo representative for specifics.

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

- Lenovo DS Series, S Series, and V Series storage:
  http://lenovopress.com/storage/san/lenovo?rt=product-guide
- IBM Storwize for Lenovo storage:
  http://lenovopress.com/storage/san/ibm?rt=product-guide
- Lenovo NAS storage:
  http://lenovopress.com/storage/nas?rt=product-guide
- Lenovo Cloud storage:
  http://lenovopress.com/storage/cloud?rt=product-guide

Ethernet LAN switches

The following table lists the top-of-rack Ethernet switches that are offered by Lenovo that can be used in ThinkServer TS150 solutions.

Table 18. Top-of-rack Ethernet switches

Description	Part number
1 Gb Ethernet top-of-rack switches	
Juniper EX2300-C PoE Switch	7165H1X
Juniper EX2300-24p PoE Switch	7165H2X
Lenovo RackSwitch G7028 (Rear to Front)	7159BAX
Lenovo RackSwitch G7052 (Rear to Front)	7159CAX
Lenovo RackSwitch G8052 (Rear to Front)	7159G52

For more information, see the list of Product Guides in the Top-of-rack Switches category:
http://lenovopress.com/servers/options/switches

Rack cabinets

The following table lists the rack cabinets that are offered by Lenovo that can be used in ThinkServer TS150 solutions.

Table 19. Rack cabinets

Description	Part number
25U S2 Standard Rack	93072RX
25U Static S2 Standard Rack	93072PX
42U S2 Standard Rack	93074RX
42U 1100mm Enterprise V2 Dynamic Rack	93634PX
42U 1100mm Enterprise V2 Dynamic Expansion Rack	93634EX
42U 1200mm Deep Dynamic Rack	93604PX
42U 1200mm Deep Static Rack	93614PX
42U Enterprise Rack	93084PX
42U Enterprise Expansion Rack	93084EX

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

KVM switches and consoles

The following table lists the KVM switches and consoles that are offered by Lenovo that can be used in ThinkServer TS150 solutions.

Table 20. KVM switch and console options

Description	Part number
Consoles	
1U 18.5" Standard Console (without keyboard)	17238BX
Console keyboards	
Lenovo UltraNav Keyboard USB - US Eng	00MW310
Keyboard w/ Int. Pointing Device USB - Arabic 253 RoHS v2	46W6713
Keyboard w/ Int. Pointing Device USB - Belg/UK 120 RoHS v2	46W6714
Keyboard w/ Int. Pointing Device USB - Chinese/US 467 RoHS v2	46W6715
Keyboard w/ Int. Pointing Device USB - Czech 489 RoHS v2	46W6716
Keyboard w/ Int. Pointing Device USB - Danish 159 RoHS v2	46W6717
Keyboard w/ Int. Pointing Device USB - Dutch 143 RoHS v2	46W6718
Keyboard w/ Int. Pointing Device USB - French 189 RoHS v2	46W6719
Keyboard w/ Int. Pointing Device USB - Fr/Canada 445 RoHS v2	46W6720
Keyboard w/ Int. Pointing Device USB - German 129 RoHS v2	46W6721
Keyboard w/ Int. Pointing Device USB - Greek 219 RoHS v2	46W6722
Keyboard w/ Int. Pointing Device USB - Hebrew 212 RoHS v2	46W6723
Keyboard w/ Int. Pointing Device USB - Hungarian 208 RoHS v2	46W6724
Keyboard w/ Int. Pointing Device USB - Italian 141 RoHS v2	46W6725
Keyboard w/ Int. Pointing Device USB - Japanese 194 RoHS v2	46W6726

Description	Part number
Keyboard w/ Int. Pointing Device USB - Korean 413 RoHS v2	46W6727
Keyboard w/ Int. Pointing Device USB - LA Span 171 RoHS v2	46W6728
Keyboard w/ Int. Pointing Device USB - Norwegian 155 RoHS v2	46W6729
Keyboard w/ Int. Pointing Device USB - Polish 214 RoHS v2	46W6730
Keyboard w/ Int. Pointing Device USB - Portugese 163 RoHS v2	46W6731
Keyboard w/ Int. Pointing Device USB - Russian 441 RoHS v2	46W6732
Keyboard w/ Int. Pointing Device USB - Slovak 245 RoHS v2	46W6733
Keyboard w/ Int. Pointing Device USB - Spanish 172 RoHS v2	46W6734
Keyboard w/ Int. Pointing Device USB - Swed/Finn 153 RoHS v2	46W6735
Keyboard w/ Int. Pointing Device USB - Swiss F/G 150 RoHS v2	46W6736
Keyboard w/ Int. Pointing Device USB - Thai 191 RoHS v2	46W6737
Keyboard w/ Int. Pointing Device USB - Turkish 179 RoHS v2	46W6738
Keyboard w/ Int. Pointing Device USB - UK Eng 166 RoHS v2	46W6739
Keyboard w/ Int. Pointing Device USB - US Euro 103P RoHS v2	46W6740
Keyboard w/ Int. Pointing Device USB - Slovenian 234 RoHS v2	46W6741
Console switches	
Global 4x2x32 Console Manager (GCM32)	1754D2X
Global 2x2x16 Console Manager (GCM16)	1754D1X
Local 2x16 Console Manager (LCM16)	1754A2X
Local 1x8 Console Manager (LCM8)	1754A1X
Console cables	
Single Cable USB Conversion Option (UCO)	43V6147
USB Conversion Option (4 Pack UCO)	39M2895
Virtual Media Conversion Option Gen2 (VCO2)	46M5383
Serial Conversion Option (SCO)	46M5382

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

Power distribution units

The following table lists the power distribution units (PDUs) that are offered by Lenovo that can be used in ThinkServer TS150 solutions.

Table 21. Power distribution units

Description	Part number
0U Basic PDUs	
0U 36 C13/6 C19 24A/200-240V 1 Phase PDU with NEMA L6-30P line cord	00YJ776
0U 36 C13/6 C19 32A/200-240V 1 Phase PDU with IEC60309 332P6 line cord	00YJ777
0U 21 C13/12 C19 32A/200-240V/346-415V 3 Phase PDU with IEC60309 532P6 line cord	00YJ778
0U 21 C13/12 C19 48A/200-240V 3 Phase PDU with IEC60309 460P9 line cord	00YJ779
Switched and Monitored PDUs	
0U 20 C13/4 C19 Switched and Monitored 24A/200-240V/1Ph PDU w/ NEMA L6-30P line cord	00YJ781
0U 20 C13/4 C19 Switched and Monitored 32A/200-240V/1Ph PDU w/ IEC60309 332P6 line cord	00YJ780
0U 18 C13/6 C19 Switched / Monitored 32A/200-240V/346-415V/3Ph PDU w/ IEC60309 532P6 cord	00YJ782
0U 12 C13/12 C19 Switched and Monitored 48A/200-240V/3Ph PDU w/ IEC60309 460P9 line cord	00YJ783
1U 9 C19/3 C13 Switched and Monitored DPI PDU (without line cord)	46M4002
1U 9 C19/3 C13 Switched and Monitored 60A 3Ph PDU with IEC 309 3P+Gnd cord	46M4003
1U 12 C13 Switched and Monitored DPI PDU (without line cord)	46M4004
1U 12 C13 Switched and Monitored 60A 3 Phase PDU with IEC 309 3P+Gnd line cord	46M4005
Ultra Density Enterprise PDUs (9x IEC 320 C13 + 3x IEC 320 C19 outlets)	
Ultra Density Enterprise C19/C13 PDU Module (without line cord)	71762NX
Ultra Density Enterprise C19/C13 PDU 60A/208V/3ph with IEC 309 3P+Gnd line cord	71763NU
C13 Enterprise PDUs (12x IEC 320 C13 outlets)	
DPI C13 Enterprise PDU+ (without line cord)	39M2816
DPI Single Phase C13 Enterprise PDU (without line cord)	39Y8941
C19 Enterprise PDUs (6x IEC 320 C19 outlets)	
DPI Single Phase C19 Enterprise PDU (without line cord)	39Y8948
DPI 60A 3 Phase C19 Enterprise PDU with IEC 309 3P+G (208 V) fixed line cord	39Y8923
Front-end PDUs (3x IEC 320 C19 outlets)	
DPI 30amp/125V Front-end PDU with NEMA L5-30P line cord	39Y8938
DPI 30amp/250V Front-end PDU with NEMA L6-30P line cord	39Y8939
DPI 32amp/250V Front-end PDU with IEC 309 2P+Gnd line cord	39Y8934
DPI 60amp/250V Front-end PDU with IEC 309 2P+Gnd line cord	39Y8940
DPI 63amp/250V Front-end PDU with IEC 309 2P+Gnd line cord	39Y8935
Universal PDUs (7x IEC 320 C13 outlets)	
DPI Universal 7 C13 PDU (with 2 m IEC 320-C19 to C20 rack power cord)	00YE443
NEMA PDUs (6x NEMA 5-15R outlets)	
DPI 100-127V PDU with fixed NEMA L5-15P line cord	39Y8905
Line cords for PDUs that ship without a line cord	
DPI 30a Line Cord (NEMA L6-30P)	40K9614
DPI 32a Line Cord (IEC 309 P+N+G)	40K9612

Description	Part number
DPI 32a Line Cord (IEC 309 3P+N+G)	40K9611
DPI 60a Cord (IEC 309 2P+G)	40K9615
DPI 63a Cord (IEC 309 P+N+G)	40K9613
DPI Australian/NZ 3112 Line Cord	40K9617

For more information, see the list of Product Guides in the Power Distribution Units category:
http://lenovopress.com/servers/options/pdu

Uninterruptible power supply units

The following table lists the uninterruptible power supply (UPS) units that are offered by Lenovo that can be used in ThinkServer TS150 solutions.

Table 22. Uninterruptible power supply units

Description	Part number
Tower UPS units	
T1kVA Tower UPS (100-125VAC)	55951AX
T1kVA Tower UPS (200-240VAC)	55951KX
T1.5kVA Tower UPS (100-125VAC)	55952AX
T1.5kVA Tower UPS (200-240VAC)	55952KX
Rack or Tower UPS units	
RT1.5kVA 2U Rack or Tower UPS (100-125VAC)	55941AX
RT1.5kVA 2U Rack or Tower UPS (200-240VAC)	55941KX
RT2.2kVA 2U Rack or Tower UPS (100-125VAC)	55942AX
RT2.2kVA 2U Rack or Tower UPS (200-240VAC)	55942KX
RT3kVA 2U Rack or Tower UPS (100-125VAC)	55943AX
RT3kVA 2U Rack or Tower UPS (200-240VAC)	55943KX
RT5kVA 3U Rack or Tower UPS (200-240VAC)	55945KX
RT6kVA 3U Rack or Tower UPS (200-240VAC)	55946KX
RT8kVA 6U Rack or Tower UPS (200-240VAC)	55948KX
RT11kVA 6U Rack or Tower UPS (200-240VAC)	55949KX
RT8kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC)	55948PX
RT11kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC)	55949PX

For more information, see the list of Product Guides in the Uninterruptible Power Supply Units category:
http://lenovopress.com/servers/options/ups

Lenovo Financial Services

Lenovo Financial Services reinforces Lenovo's commitment to deliver pioneering products and services that are recognized for their quality, excellence, and trustworthiness. Lenovo Financial Services offers financing solutions and services that complement your technology solution anywhere in the world.

We are dedicated to delivering a positive finance experience for customers like you who want to maximize your purchase power by obtaining the technology you need today, protect against technology obsolescence, and preserve your capital for other uses.

We work with businesses, non-profit organizations, governments and educational institutions to finance their entire technology solution. We focus on making it easy to do business with us. Our highly experienced team of finance professionals operates in a work culture that emphasizes the importance of providing outstanding customer service. Our systems, processes and flexible policies support our goal of providing customers with a positive experience.

We finance your entire solution. Unlike others, we allow you to bundle everything you need from hardware and software to service contracts, installation costs, training fees, and sales tax. If you decide weeks or months later to add to your solution, we can consolidate everything into a single invoice.

Our Premier Client services provide large accounts with special handling services to ensure these complex transactions are serviced properly. As a premier client, you have a dedicated finance specialist who manages your account through its life, from first invoice through asset return or purchase. This specialist develops an in-depth understanding of your invoice and payment requirements. For you, this dedication provides a high-quality, easy, and positive financing experience.

For your region specific offers please ask your Lenovo sales representative or your technology provider about the use of Lenovo Financial Services. For more information, see the following Lenovo website: http://www.lenovofs.com

Related publications and links

For more information, see these resources:

- ThinkServer TS150 User Guide and Hardware Maintenance Manual
  https://download.lenovo.com/pccbbs/thinkservers/ts150ughmm_en.pdf
- Lenovo Support for ThinkServer TS150
  http://datacentersupport.lenovo.com/us/en/products/servers/thinkserver/ts150
- ThinkServer Power Planner
  http://support.lenovo.com/us/en/downloads/ds101155
- Lenovo Press Product Guides for servers and options (filter by the Product Guide resource type)
  http://lenovopress.com

Related product families

Product families related to this document are the following:

- 1-Socket Tower Servers

Notices

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