Lenovo System x3500 M5
Product Guide (withdrawn product)

The Lenovo System x3500 M5 server provides outstanding performance for your business-critical applications. Its energy-efficient design supports more cores, memory, and data capacity in a scalable Tower or 5U Rack package that is easy to service and manage. With more computing power per watt and the latest Intel Xeon E5-2600 v3 processors, you can reduce costs while maintaining speed and availability.

Suggested use: business-critical workloads, cloud computing, virtualization, virtual desktop, big data, analytics, SAP applications, database management, point of sale

Figure 1 shows the System x3500 M5.

Figure 1. The Lenovo System x3500 M5

Did you know?

The x3500 M5 offers a flexible, scalable design and simple upgrade path to 32 HDDs, with up to seven PCIe 3.0 slots and up to 1.5 TB of memory. The onboard Ethernet solution provides four standard integrated Gigabit Ethernet ports without occupying PCIe slots. Comprehensive systems management tools with the next-generation Integrated Management Module II make it easy to deploy, integrate, service, and manage.

Key features

A high-performance dual-socket tower server, the Lenovo System x3500 M5 can deliver the scalability, reliable performance, and optimized efficiency for your business-critical applications. Start with the basics and upgrade as your business changes without jeopardizing existing investments. Virtualizing the PC infrastructure into one server can provide access to a powerful server with abundant storage space, while significantly reducing IT costs.

Scalability and performance

The x3500 M5 offers the following features to boost performance, improve scalability, and reduce costs:

- Improves productivity by offering superior system performance with up to two processors (each with up to 18 cores), up to 45 MB of L3 cache, and up to 9.6 GT/s QPI interconnect links.
- Supports up to two processors, 36 cores, and 72 threads maximize the concurrent execution of multi-threaded applications.
- Intelligent and adaptive system performance with energy efficient Intel Turbo Boost Technology allows CPU 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.
- Intel Advanced Vector Extensions 2.0 (AVX 2.0) enable acceleration of enterprise-class workloads, including databases, and enterprise resource planning.
- Up to 2133 MHz memory speeds with two DIMMs per channel that are running at 2133 MHz to help maximize system performance.
- Up to 1.5 TB of memory capacity with 64 GB load-reduced DIMMs (LRDIMMs)
- The 12 Gbps SAS internal storage connectivity doubles the data transfer rate compared to 6 Gb SAS solutions to maximize performance of storage I/O-intensive applications.
- Up to 32 drive bays with internal backup and optical drive at the same time provide a flexible and scalable all-in-one platform to meet increasing demands.
- Flexible and scalable internal storage configurations provide for up to 122 TB of storage capacity.
- The use of solid-state drives (SSDs) instead of or along with traditional spinning hard disk drives (HDDs) can significantly improve I/O performance. An SSD can support up to 100 times more I/O operations per second (IOPS) than a typical HDD.
- The server has four integrated Gigabit Ethernet ports.
- The server offers up to seven PCI Express (PCIe) 3.0 I/O expansion slots.
- With Intel Integrated I/O Technology, the PCI Express 3.0 controller is integrated into the Intel Xeon processor E5 family. This integration helps to dramatically reduce I/O latency and increase overall system performance.
- Support for up to two NVIDIA Quadro graphics processing units (GPUs) to maximize computing power.

Availability and serviceability

The x3500 M5 provides the following features to simplify serviceability and increase system uptime:

- The server offers Chipkill, memory mirroring, and memory rank sparing for redundancy in the event of a non-correctable memory failure.
- Tool-less cover removal provides easy access to upgrades and serviceable parts, such as CPU, memory, and adapter cards.

- Offers hot-swap drives that support RAID redundancy for data protection and greater system uptime.
- Supports the ability to have redundant hot-swap power supplies and redundant hot-swap fans to provide availability for business-critical applications.
- The optional light path diagnostics panel and individual light path LEDs quickly lead the technician to failed (or failing) components. This feature simplifies servicing, speeds up problem resolution, and helps improve system availability.
- Proactive Platform Alerts (including PFA and SMART alerts): Processors, voltage regulators, memory, internal storage (SAS/SATA HDDs and SSDs), fans, power supplies, RAID controllers, and server ambient and sub-component temperatures. Alerts can be surfaced through the system IMM to managers such as Lenovo XClarity Administrator, VMware vCenter, and Microsoft System Center. These proactive alerts let you take appropriate actions in advance of possible failure, thereby increasing server uptime and application availability.
- SSDs offer significantly better reliability than traditional mechanical HDDs for greater uptime.
- Built-in Integrated Management Module II (IMM2.1) continuously monitors system parameters, triggers alerts, and performs recovery actions if there is a failure to minimize downtime.
- Built-in diagnostics by using Dynamic Systems Analysis (DSA) Preboot speeds up troubleshooting tasks to reduce service time.
- Three-year customer replaceable unit and onsite limited warranty; next business day 9x5. Optional service upgrades available.

Manageability and security

The following powerful systems management features simplify local and remote management of the x3500 M5:

- The server includes an IMM2.1 to monitor server availability and perform remote management.
- Integrated industry-standard Unified Extensible Firmware Interface (UEFI) enables improved setup, configuration, and updates and simplifies error handling.
- An integrated Trusted Platform Module (TPM) enables advanced cryptographic functionality such as digital signatures and remote attestation. TPM 2.0 supported with UEFI 2.21 or later.
- System x Trusted Platform Assurance, an exclusive set of System x security features and practices, establishes a foolproof security foundation for workloads by delivering firmware that is securely built, tested, digitally signed, and verified before running.
- The server offers enterprise-class data protection with optional self-encrypting drives and simple, centralized key management through IBM Security Key Lifecycle Management.
- Industry-standard AES NI support offers faster, stronger encryption.
- IBM Systems Director offers comprehensive systems management tools that help to increase uptime, reduce costs, and improve productivity through advanced server management capabilities.
- Intel Execute Disable Bit functionality can help prevent certain classes of malicious buffer overflow attacks when combined with a supporting operating system.
- Intel Trusted Execution Technology provides enhanced security through hardware-based resistance to malicious software attacks, which allows an application to run in its own isolated space that is protected from all other software running on a system.

Energy efficiency

The x3500 M5 offers the following energy-efficiency features to save energy, reduce operational costs, increase energy availability, and contribute to the green environment:

- Energy-efficient planar components help lower operational costs.
- High-efficiency power supplies with 80 PLUS Platinum and Titanium certifications. Energy Star 2.1

certified.

- Intel Intelligent Power Capability powers individual processor elements on and off as needed to reduce power draw.
- The Intel Xeon processor E5-2600 v3 product families offer significantly better performance over the previous generation while fitting into the same thermal design power (TDP) limits.
- Intel Intelligent Power Capability powers individual processor elements on and off as needed to reduce power draw.
- Low-voltage Intel Xeon processors draw less energy to satisfy demands of power and thermally constrained data centers and telecommunication environments.
- Low-voltage 1.2 V DDR4 memory DIMMs use up to 20% less energy compared to 1.35 V DDR3 DIMMs.
- SSDs use as much as 80% less power than traditional spinning 2.5-inch HDDs.
- The server uses hexagonal ventilation holes, which is a part of Calibrated Vectored Cooling™ technology. Hexagonal holes can be grouped more densely than round holes, which provides more efficient airflow through the system.
- IBM Systems Director Active Energy Manager™ provides advanced data center power notification and management to help achieve lower heat output and reduced cooling needs.

Locations of key components and connectors

The following figure shows the front of the server.

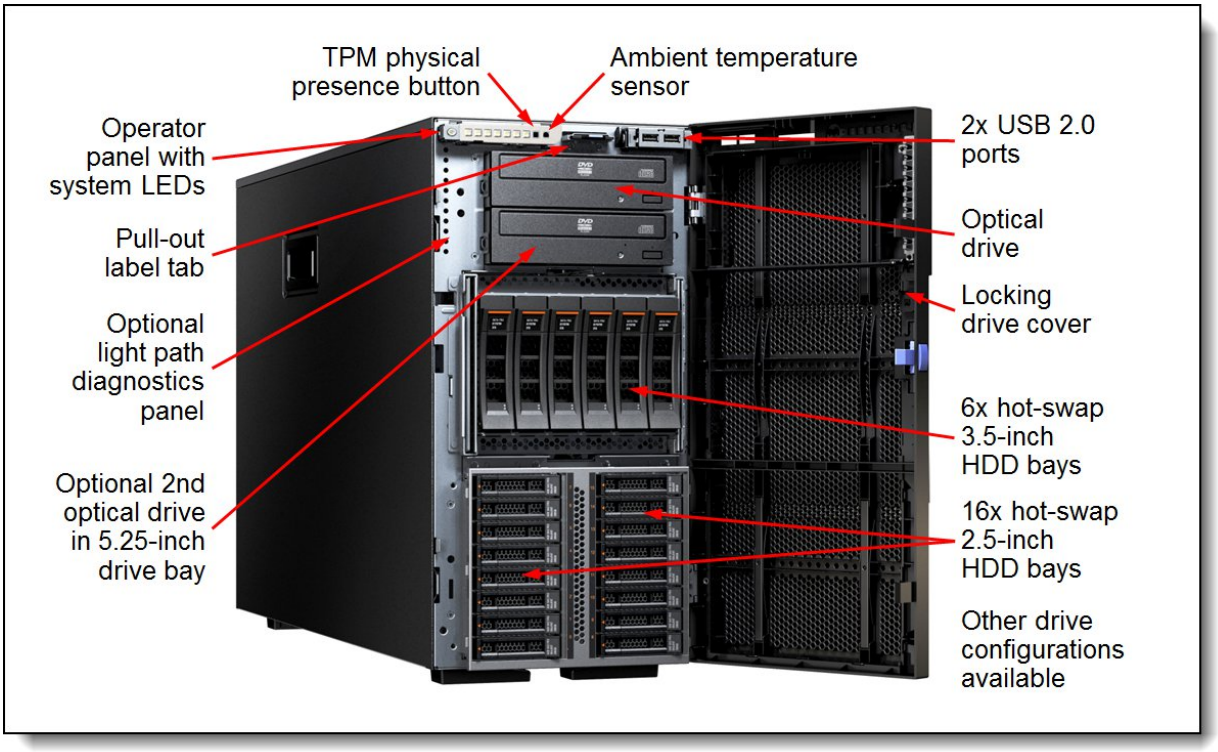


Figure 2. Front view of the System x3500 M5

The following figure shows the rear of the server.

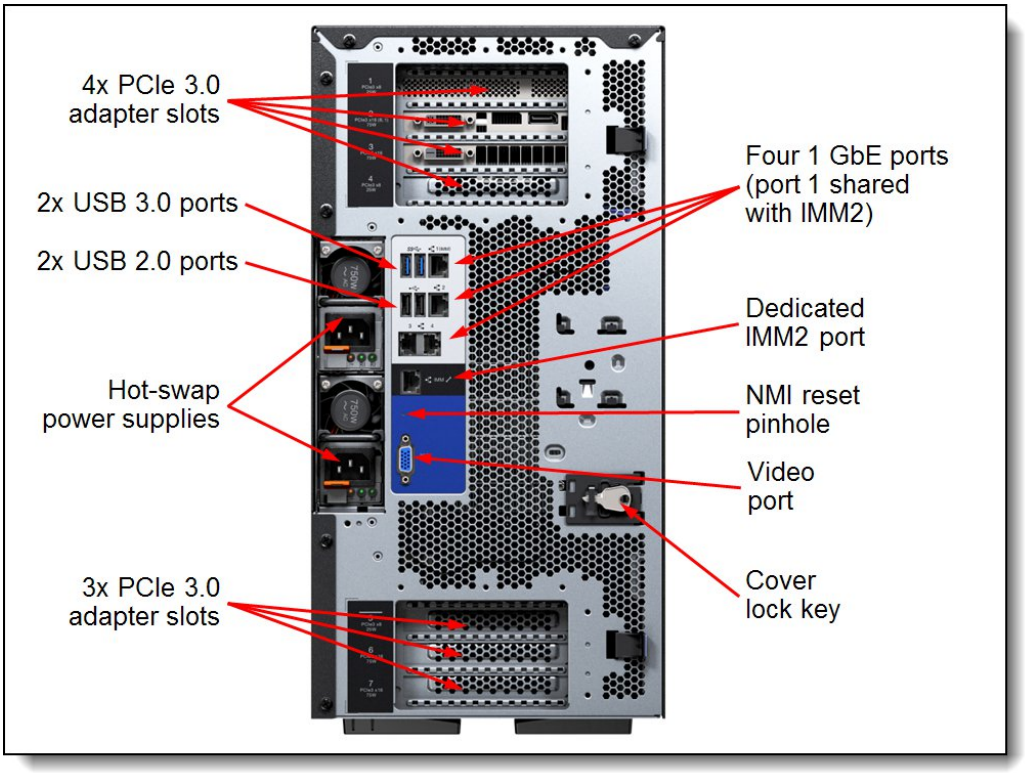


Figure 3. Rear view of the System x3500 M5

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

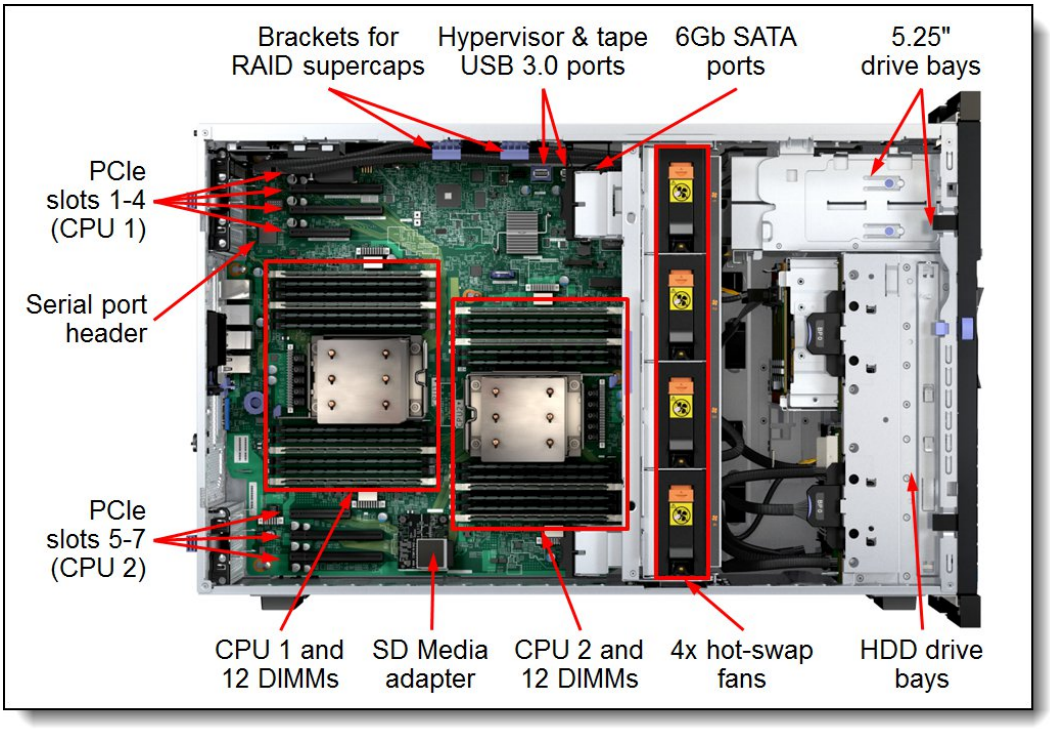


Figure 4. Inside view of the System x3500 M5

Standard specifications

The following table lists the standard specifications.

Table 1. Standard specifications

Components	Specification
Machine type	5464
Form factor	Tower or 5U Rack.
Processor	Up to two Intel Xeon processor E5-2600 v3 product family CPUs with 18 cores (2.8 GHz core speeds), or 16 cores (2.3 GHz), or 14 cores (2.6 GHz), 12 cores (up to 2.6 GHz), 10 cores (2.3 GHz), 8 cores (up to 3.2 GHz), 6 cores (up to 3.4 GHz), 4 cores (up to 3.5 GHz) Two QPI links up to 9.6 GT/s each. Up to 2133 MHz memory speed. Up to 45 MB L3 cache.
Chipset	Intel C612.
Memory	Up to 24 DIMM sockets (12 DIMMs per processor). RDIMMs and LRDIMMs are supported. Memory types cannot be intermixed. Memory speed up to 2133 MHz.
Memory maximums	With RDIMMs: Up to 768 GB with 24x 32 GB RDIMMs and two processors With LRDIMMs: Up to 1.5 TB with 24x 64 GB LRDIMMs and two processors
Memory protection	ECC, Chipkill (for x4-based memory DIMMs), memory mirroring, and memory rank sparing
Disk drive bays	Available configurations: • Up to 32x 2.5-inch hot-swap SAS/SATA HDDs • Up to 12x 3.5-inch hot-swap SAS/SATA HDDs or SSDs • Up to 6x 3.5-inch hot-swap HDDs + 16x 2.5-inch hot-swap drives HDDs/SSDs • Up to 6x 3.5-inch simple-swap SATA HDDs Additional drive bays for the above configurations: • Two 5.25-inch drive bays for optical drives
Maximum internal storage	• 122.9 TB with 32x 3.84TB 2.5-inch SAS hot-swap SSDs • 120 TB with 12x 10TB 3.5-inch NL SAS or NL SATA hot-swap HDDs • 38.4 TB with 32x 1.2TB 2.5-inch SAS hot-swap HDDs • 36 TB with 6x 6TB 3.5-inch NL SAS or NL SATA simple-swap HDDs • Intermix of SAS and SATA is supported.
Storage controller	• Onboard 6 Gb SATA: no RAID support • 12 Gb SAS/SATA RAID: RAID 0, 1, 10 with M1215 or M5210. Optional upgrade to RAID 5, 50 is available for M1215. Optional upgrade to RAID 5, 50 is available for M5210 (zero-cache; 1 GB non-backed cache; 1 GB, 2 GB or 4 GB flash-backed cache). Optional upgrade to RAID 6, 60 is available for M5210 with memory cache upgrades. • 12 Gb SAS/SATA non-RAID: N2215 HBA
Optical drive bays	Two half-height 5.25-inch bays for optical or tape drives. Supports DVD-ROM or Multiburner.
Tape drive bays	Two half-height 5.25-inch bays for optical or tape drives. Support for one RDX internal USB tape drive.
Network interfaces	Four integrated Gigabit Ethernet 1000BASE-T ports (RJ-45) based on Broadcom BCM5719 controller

Components	Specification
PCI Expansion slots	Up to seven slots with two processors and four slots when one CPU is installed. All slots are PCIe 3.0 slots: • Slot 1: PCIe 3.0 x8 (x8 wired); full-height, half-length • Slot 2: PCIe 3.0 x16 (x8 wired); full-height, full-length • Slot 3: PCIe 3.0 x16 (x16 wired); full-height, full-length • Slot 4: PCIe 3.0 x8 (x8 wired); full-height, full-length • Slot 5: PCIe 3.0 x8 (x8 wired); full-height, half-length (requires second processor) • Slot 6: PCIe 3.0 x16 (x16 wired); full-height, full-length (requires second processor) • Slot 7: PCIe 3.0 x16 (x16 wired) full-height, full-length (requires second processor) Slots 3 and 6 support double-wide GPUs
Ports	• Front: Two USB 2.0 ports • Rear: Four USB ports (two USB 2.0, two USB 3.0), one DB-15 video, one RJ-45 systems management, four RJ-45 GbE network ports, optional serial port. • Internal: Two internal USB 3.0 ports (for embedded hypervisor and internal tape drive). Optional SD Media Adapter.
Cooling	Calibrated Vectored Cooling with up to four hot-swap fans (two fans shipped standard on single processor models and four fans shipped on dual processor models). For single-processor models, optional Redundant Cooling Kit provides two extra fans for N+1 redundancy.
Power supply	Up to two redundant hot-swap 550 W, 750 W, 900 W or 1500 W High Efficiency Platinum AC power supplies, or 750 W High Efficiency Titanium AC power supplies.
Hot-swap parts	Hard drives, power supplies, and fans
Systems management	UEFI, IMM2.1 that is based on Renesas SH7758, Predictive Failure Analysis, light path diagnostics panel on the front of the server with optional upgrade kit, Automatic Server Restart, ToolsCenter, Systems Director and Active Energy Manager. Optional IMM Advanced Upgrade software feature for remote presence.
Security features	Power-on password, administrator's password, Trusted Platform Module (TPM) 1.2 or 2.0. TPM 2.0 requires UEFI 2.21 or later. Lockable front bezel.
Video	Matrox G200eR2 with 16 MB memory integrated into the IMM2.1. Maximum resolution is 1600x1200 at 75 Hz with 16 M colors.
Operating systems supported	Microsoft Windows Server, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, VMware ESXi. See the Operating system support section for specifics.
Limited warranty	Three-year customer-replaceable unit and onsite limited warranty with 9x5/NBD.
Service and support	Optional service upgrades are available through Lenovo: 4-hour or 2-hour response time, 8-hour fix time, 1-year or 2-year warranty extension, remote technical support for Lenovo hardware and selected Lenovo and third-party (Microsoft, Linux, VMware) software.
Dimensions	Tower: Width: 218 mm (8.6 in), depth: 720 mm (28.3 in), height: 440 mm (17.25 in). With rack conversion kit: Width: 423 mm (16.6 in), depth: 706 mm (27.8 in), height: 218 mm (8.6 in)
Weight	Tower: 45.5 kg (100.3 lb) fully configured, 30.8 kg (67.9 lb) minimum configuration With rack conversion kit: 44.2 kg (97.4 lb) fully configured, 29.5 kg (65 lb) minimum configuration

The x3500 M5 servers are shipped with the following items:

- Statement of Limited Warranty
- Important Notices
- Registration flyer
- One 2.8 m C13 line cord (country-specific)

Notes:

- Rack models include a rail kit but do not include a cable management arm. Order the CMA separately by using part number 00KC334.
- EMEA models do not contain line cord. It must be purchased separately.

Standard models

The following table lists the standard models.

Table 2. Standard models

MTM*	Intel Xeon processors† (two maximum)	Memory	RAID	Drive bays (std / max)	Drives	Slots (std / max)	GbE	Optical	Power supply (std / max)
Tower models									
5464-A2x	1x E5-2603 v3 6C 1.6GHz 15MB 1600MHz 85W	1x 8 GB	M1215	8x 2.5-inch HS / 32	Open	4 / 7	4	DVD	1x 550 W HS / 2
5464-B2x	1x E5-2609 v3 6C 1.9GHz 15MB 1600MHz 85W	1x 8 GB	M1215	8x 2.5-inch HS / 32	Open	4 / 7	4	DVD	1x 550 W HS / 2
5464-C2x	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	1x 16 GB	M1215	8x 2.5-inch HS / 32	Open	4 / 7	4	DVD	1x 550 W HS / 2
5464-C4x	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	1x 16 GB	M1215	6x 3.5-inch HS / 12	Open	4 / 7	4	DVD	1x 550 W HS / 2
5464-D2x	1x E5-2630 v3 8C 2.4GHz 20MB 1866MHz 85W	1x 16 GB	M1215	8x 2.5-inch HS / 32	Open	4 / 7	4	DVD	1x 550 W HS / 2
5464-G2x	1x E5-2650 v3 10C 2.3GHz 25MB 2133MHz 105W	1x 16 GB	M5210 1GB Flash	8x 2.-inch HS / 32	Open	4 / 7	4	DVD	1x 750 W HS / 2
5464-H2x	1x E5-2670 v3 12C 2.3GHz 30MB 2133MHz 120W	1x 16 GB	M5210 2GB Flash	8x 2.5-inch HS / 32	Open	4 / 7	4	DVD	1x 900 W HS / 2
5464-J2x	1x E5-2680 v3 12C 2.5GHz 30MB 2133MHz 120W	1x 16 GB	M5210 2GB Flash	8x 2.5-inch HS / 32	Open	4 / 7	4	DVD	1x 900 W HS / 2
Rack models									
5464-C3x	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	1x 16 GB	M1215	6x 3.5-inch HS / 12	Open	4 / 7	4	DVD	1x 550 W HS / 2
5464-G3x	1x E5-2650 v3 10C 2.3GHz 25MB 2133MHz 105W	1x 16 GB	M5210 1GB Flash	8x 2.5-inch HS / 32	Open	4 / 7	4	DVD	1x 750 W HS / 2

* x in the Machine Type Model (MTM) represents a region-specific letter (for example, the EMEA MTM is 7983-A5G, and the US MTM is 7383-A5U). Ask a Lenovo representative for specific information.
† Processor detail: Processor quantity and model, cores, core speed, L3 cache, memory speed, TDP.

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

TopSeller and Express models

The following table lists the express models.

Table 3. Express models

MTM** Form factor	Intel Xeon processors† (two maximum)	Memory	RAID	Drive bays (sth / max)	Drives	Slots (sth / max)	Optical	Power supply (2 max)
United States and Canada								
5464-EAU Tower	1x E5-2609 v3 6C 1.9GHz 15MB 1600MHz 85W	1x 8 GB	M1215	6x 3.5-inch HS / 12	Open	4 / 7	Multi-burner	1x 550W
5464-EBU Tower	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	1x 16 GB	M5210	6x 3.5-inch HS / 12	Open	4 / 7	Multi-burner	1x 750W
5464-ECU Tower	1x E5-2640 v3 8C 2.6GHz 20MB 1866MHz 90W	1x 16 GB	M5210	8x 2.5-inch HS / 32	Open	4 / 7	Multi-burner	1x 750W
5464-EDU Tower	2x E5-2609 v3 6C 1.9GHz 15MB 1600MHz 85W	2x 16 GB	M5210 2GB Flash	6x 3.5-inch HS / 12	Open	4 / 7	Multi-burner	2x 550W
5464-EEU Tower	2x E5-2640 v3 8C 2.6GHz 20MB 1866MHz 90W	2x 16 GB	M5210 2GB Flash	8x 2.5-inch HS / 32	Open	4 / 7	Multi-burner	2x 750W
Europe, Middle East & Africa (EMEA)								
5464-E1G Tower	1x E5-2603 v3 6C 1.6GHz 15MB 1600MHz 85W	1x 4 GB	M1215 + RAID 5/50	8x 2.5-inch HS / 32	Open	4 / 7	Multi-burner	1x 550W
5464-E2G Tower	1x E5-2609 v3 6C 1.9GHz 15MB 1600MHz 85W	1x 8 GB	M1215 + RAID 5/50	6x 3.5-inch HS / 12	Open	4 / 7	Multi-burner	1x 550W
5464-E3G Tower	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	1x 8 GB	M5210 1GB No backup	8x 2.5-inch HS / 32	Open	4 / 7	Multi-burner	2x 550W
5464-E4G Tower	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	1x 8 GB	M5210 1GB Flash	8x 2.5-inch HS / 32	3x 300GB 10K SAS	4 / 7	Multi-burner	2x 750W
5464-E5G Tower	1x E5-2640 v3 8C 2.6GHz 20MB 1866MHz 90W	1x 16 GB	M5210 2GB Flash	8x 2.5-inch HS / 32	Open	4 / 7	Multi-burner	2x 750W
Latin America & Brazil								
5464-EFx Tower	1x E5-2609 v3 6C 1.9GHz 15MB 1600MHz 85W	1x 8 GB	M5210 1GB Flash+Cap	8x 2.5-inch HS / 32	Open	4 / 7	DVD	1x 550W
5464-EGx Tower	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	1x 16 GB	M5210 1GB Flash	8x 2.5-inch HS / 32	Open	4 / 7	DVD	1x 550W
5464-EHx Tower	1x E5-2650 v3 10C 2.3GHz 25MB 2133MHz 105W	1x 16 GB	M5210 1GB Flash	8x 2.5-inch HS / 32	Open	4 / 7	DVD	1x 750W
Japan								
5464-E6J Tower	1x E5-2603 v3 6C 1.6GHz 15MB 1600MHz 85W	1x 8 GB	M5210 1GB Flash	8x 2.5-inch HS / 32	Open	4 / 7	DVD	1x 550W
5464-E7J Tower	1x E5-2609 v3 6C 1.9GHz 15MB 1600MHz 85W	1x 8 GB	M5210 1GB Flash	8x 2.5-inch HS / 32	Open	4 / 7	DVD	1x 550W
Australia & New Zealand								
5464-EIM Tower	1x E5-2609 v3 6C 1.9GHz 15MB 1600MHz 85W	1x 8 GB	M1215 + RAID 5/50	6x 3.5-inch HS / 12	Open	4 / 7	Multi-burner	1x 550W
5464-EJM Tower	1x E5-2609 v3 6C 1.9GHz 15MB 1600MHz 85W	1x 8 GB	M1215 + RAID 5/50	8x 2.5-inch HS / 32	Open	4 / 7	Multi-burner	1x 550W
5464-EKM Tower	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	2x 8 GB	M5210 1GB Flash+Cap	8x 2.5-inch HS / 32	Open	4 / 7	Multi-burner	1x 550W
5464-ELM Tower	1x E5-2640 v3 8C 2.6GHz 20MB 1866MHz 90W	2x 8 GB	M5210 1GB Flash+Cap	8x 2.5-inch HS / 32	Open	4 / 7	Multi-burner	1x 750W

** MTM = Machine Type Model
† Processor detail: Processor quantity and model, number of cores, core speed, L3 cache, memory speed, TDP.

Table 4. TopSeller Models

MTM** Form factor	Intel Xeon processors† (two maximum)	Memory	RAID	Drive bays (std / max)	Drives	Slots (std / max)	Optical	Power supply (2 max)
United States and Canada								
5464-NAY Tower	1x E5-2603 v3 6C 1.6GHz 15MB 1600MHz 85W	1x 8 GB	M1215	6x 3.5-inch HS / 12	Open	4 / 7	Open	1x 550W
5464-NBY Tower	1x E5-2609 v3 6C 1.9GHz 15MB 1600MHz 85W	1x 8 GB	M1215	8x 2.5-inch HS / 32	Open	4 / 7	Open	1x 550W
5464-NCY Tower	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	1x 16 GB	M1215	8x 2.5-inch HS / 32	Open	4 / 7	Open	1x 550W
5464-NDY Tower	1x E5-2630 v3 8C 2.4GHz 20MB 1866MHz 85W	1x 16 GB	M5210	8x 2.5-inch HS / 32	Open	4 / 7	Open	1x 550W
5464-NEY Tower	1x E5-2630 v3 8C 2.4GHz 20MB 1866MHz 85W	1x 16 GB	M5210	6x 3.5-inch HS / 12	Open	4 / 7	Open	1x 550W
5464-NFY Tower	1x E5-2650 v3 10C 2.3GHz 25MB 2133MHz 105W	1x 16 GB	M5210	8x 2.5-inch HS / 32	Open	4 / 7	Open	1x 750W
Europe, Middle East, and Africa (EMEA)								
5464-K1G Tower	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	1x 16 GB	M5210 2GB Flash	8x 2.5-inch HS / 32	Open	4 / 7	Multi-burner	1x 550W
5464-K2G Tower	1x E5-2603 v3 6C 1.6GHz 15MB 1600MHz 85W	1x 8 GB	M1215 + RAID 5	6x 3.5-inch HS / 12	Open	4 / 7	Open	1x 550W
5464-K3G Tower	1x E5-2603 v3 6C 1.6GHz 15MB 1600MHz 85W	1x 8 GB	M5210	8x 2.5-inch HS / 32	Open	4 / 7	Open	1x 550W
5464-K4G Tower	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	1x 16 GB	M5210	8x 2.5-inch HS / 32	Open	4 / 7	Open	1x 550W
5464-K5G Tower	1x E5-2630 v3 8C 2.4GHz 20MB 1866MHz 85W	1x 16 GB	M5210	8x 2.5-inch HS / 32	Open	4 / 7	Open	1x 750W
5464-K6G Tower	1x E5-2640 v3 8C 2.6GHz 20MB 1866MHz 90W	1x 16 GB	M5210	8x 2.5-inch HS / 32	Open	4 / 7	Open	1x 750W
5464-K7G Tower	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	1x 16 GB	M5210	6x 3.5-inch HS / 12	Open	4 / 7	Open	1x 750W
5464-K8G Tower	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	1x 16 GB	M5210	8x 2.5-inch HS / 32	Open	4 / 7	Open	1x 750W

Processor options

The x3500 M5 supports the processor options that are listed in the following table. The server supports up to two processors. This table shows which server models feature each processor as standard. If there is no corresponding *where-used* model for a particular processor, this processor is available through CTO only.

Table 5. Processor options

Part number	Feature codes*	Description	Standard models where used
81Y7113	A5C8 / A5MP	Intel Xeon E5-2603 v3 6C 1.6GHz 15MB 1600MHz 85W	A2x
00MW030	ASU2 / ASUD	Intel Xeon E5-2608L v3 6C 2.0GHz 15MB 1866MHz 52W	-
81Y7114	A5C9 / A5MQ	Intel Xeon E5-2609 v3 6C 1.9GHz 15MB 1600MHz 85W	B2x
00MW031	ASU3 / ASUE	Intel Xeon E5-2618L v3 8C 2.3GHz 20MB 1866MHz 75W	-
81Y7115	A5CA / A5MR	Intel Xeon E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	C2x, C3x, C4x
00MU332	ASLW / ASLZ	Intel Xeon E5-2623 v3 4C 3.0GHz 10MB 1866MHz 105W	-
00MW032	ASU4 / ASUF	Intel Xeon E5-2628L v3 10C 2.0GHz 25MB 1866MHz 75W	-
81Y7116	A5CB / A5MS	Intel Xeon E5-2630 v3 8C 2.4GHz 20MB 1866MHz 85W	D2x
00KG052	ARZK / ARZL	Intel Xeon E5-2630L v3 8C 1.8GHz 20MB 1866MHz 55W	-
00MW028	ASU0 / ASUB	Intel Xeon E5-2637 v3 4C 3.5GHz 15MB 2133MHz 135W	-
81Y7117	A5CC / A5MT	Intel Xeon E5-2640 v3 8C 2.6GHz 20MB 1866MHz 90W	-
00MW029	ASU1 / ASUC	Intel Xeon E5-2643 v3 6C 3.4GHz 20MB 2133MHz 135W	-
00MW033	ASU5 / ASUG	Intel Xeon E5-2648L v3 12C 1.8GHz 30MB 2133MHz 75W	-
81Y7118	A5CD / A5MU	Intel Xeon E5-2650 v3 10C 2.3GHz 25MB 2133MHz 105W	G2x, G3x
81Y7121	A5CG / A5MX	Intel Xeon E5-2650L v3 12C 1.8GHz 30MB 2133MHz 65W	-
00MW034	ASU6 / ASUH	Intel Xeon E5-2658 v3 12C 2.2GHz 30MB 2133MHz 105W	-
00MU330	ASLU / ASLX	Intel Xeon E5-2660 v3 12C 2.3GHz 30MB 2133MHz 105W	-
00MU331	ASLV / ASLY	Intel Xeon E5-2667 v3 8C 3.2GHz 20MB 2133MHz 135W	-
81Y7119	A5CE / A5MV	Intel Xeon E5-2670 v3 12C 2.3GHz 30MB 2133MHz 120W	H2x
81Y7120	A5CF / A5MW	Intel Xeon E5-2680 v3 12C 2.5GHz 30MB 2133MHz 120W	J2x
00MW026	ASTY / ASU9	Intel Xeon E5-2683 v3 14C 2.0GHz 35MB 2133MHz 120W	-
00MW027	ASTZ / ASUA	Intel Xeon E5-2685 v3 12C 2.6GHz 30MB 2133MHz 120W	-
00KG038	ARYU / ARYX	Intel Xeon E5-2690 v3 12C 2.6GHz 30MB 2133MHz 135W	-
00MW025	ASTX / ASU8	Intel Xeon E5-2695 v3 14C 2.3GHZ 35MB 2133MHz 120W	-
00KG039	ARYV / ARYY	Intel Xeon E5-2697 v3 14C 2.6GHz 35MB 2133MHz 145W	-
00MW024	ASTW / ASU7	Intel Xeon E5-2698 v3 16C 2.3GHz 40MB 2133MHz 135W	-
00KG040	ARYW / ARYZ	Intel Xeon E5-2699 v3 18C 2.8GHz 45MB 2133MHz 145W	-

* The first feature code is for the first processor; the second feature code is for the second processor.

Memory options

The System x3500 M5 supports TruDDR4 memory. TruDDR Memory uses the highest quality components that are sourced from Tier 1 DRAM suppliers and only memory that meets our strict requirements is selected. It is compatibility tested and tuned on every System x server to maximize performance and reliability. TruDDR4 Memory has a unique signature programmed into the DIMM that enables System x

servers to verify whether the installed memory is qualified or supported. Because TruDDR4 Memory is authenticated, certain extended memory performance features can be enabled to extend performance over industry standards. From a service and support standpoint, System x memory automatically assumes the system's warranty, and service and support provided worldwide.

The following table lists the available memory options for the x3500 M5 server.

Table 6. Memory options

Part number	Feature code	Description	Maximum supported	Standard models where used
RDIMMs - 2133 MHz				
46W0784	A5B6	4GB TruDDR4 Memory (1Rx8, 1.2V) PC4-17000 CL15 2133MHz LP RDIMM	24 (12 per CPU)	-
46W0788	A5B5	8GB TruDDR4 Memory (1Rx4, 1.2V) PC4-17000 CL15 2133MHz LP RDIMM	24 (12 per CPU)	A2x, B2x
46W0792	A5B8	8GB TruDDR4 Memory (2Rx8, 1.2V) PC4-17000 CL15 2133MHz LP RDIMM	24 (12 per CPU)	-
46W0796	A5B7	16GB TruDDR4 Memory (2Rx4, 1.2V) PC4-17000 CL15 2133MHz LP RDIMM	24 (12 per CPU)	All other models
95Y4808	A5UJ	32GB TruDDR4 Memory (2Rx4, 1.2V) PC4-17000 CL15 2133MHz LP RDIMM	24 (12 per CPU)	-
LRDIMMs - 2133 MHz				
46W0800*	A5B9	32GB TruDDR4 Memory (4Rx4, 1.2V) PC417000 CL15 2133MHz LP LRDIMM	24 (12 per CPU)	-
95Y4812	A5UK	64GB TruDDR4 Memory (4Rx4,1.2V) PC4-17000 CL15 2133MHz LP LRDIMM	24 (12 per CPU)	-

* Withdrawn from marketing

The server supports up to 12 DIMMs when one processor is installed and up to 24 DIMMs when two processors are installed. Each processor has four memory channels; there are three DIMMs per channel.

The following rules apply when the memory configuration is selected:

- The server supports RDIMMs and LRDIMMs.
- Mixing types of memory (RDIMMs and LRDIMMs) is not supported.
- The maximum quantity of DIMMs that can be installed in the server depends on the number of processors.
- All DIMMs in the server operate at the same speed, which is determined as the lowest value of the following factors:
    - Memory speed that is supported by the specific processor.
    - Lowest of maximum operating speeds for selected memory configuration that depends on quantity of DIMMs per channel, as shown under "Maximum operating speed" section in the following table.

The following memory protection technologies are supported:

- ECC
- Chipkill (for x4-based memory DIMMs)
- Memory mirroring
- Memory rank sparing

Chipkill works only in independent channel mode (the default is operational mode) and supports only x4-based memory DIMMs.

If memory mirroring is used, DIMMs must be installed in pairs (a minimum of one pair per each processor). Both DIMMs in a pair must be identical in type and size.

If memory rank sparing is used, a minimum of one quad-rank LRDIMM or two single-rank or dual-rank RDIMMs must be installed per populated channel (the DIMMs do not need to be identical). In rank sparing mode, one rank of a DIMM in each populated channel is reserved as spare memory. The size of a rank varies, depending on the DIMMs installed.

Chipkill, memory mirroring, and memory rank sparing modes are mutually exclusive. Only one operational memory mode can be enabled on a server, and it is a system-wide setting.

The following table shows the characteristics of the supported DIMMs. Tables cells that are highlighted with a gray background indicate when the number of DIMMs per channel still allows the DIMMs to operate at a rated speed.

Table 7. Maximum memory speeds

DIMM specification	**RDIMM**			**LRDIMM**
Rank	Single rank	Dual rank		Quad rank
Part numbers	46W0784 (4 GB) 46W0788 (8 GB)	46W0792 (8 GB)	46W0796 (16 GB) 95Y4808 (32 GB)	46W0800 (32 GB) 95Y4812 (64 GB)
Rated speed	2133 MHz	2133 MHz	2133 MHz	2133 MHz
Rated voltage	1.2 V	1.2 V	1.2 V	1.2 V
Maximum quantity supported*	24	24	24	24
Maximum DIMM capacity	8 GB	8 GB	16 GB	64 GB
Maximum memory capacity	192 GB	192 GB	384 GB	1.5 TB
Maximum memory at rated speed	64 GB	64 GB	256 GB	512 GB
Maximum operating speed				
1 DIMM per channel	2133 MHz	2133 MHz	2133 MHz	2133 MHz
2 DIMMs per channel	2133 MHz	2133 MHz	2133 MHz	2133 MHz
3 DIMMs per channel	1600 MHz	1600 MHz	1600 MHz	1866 MHz

* The maximum quantity that is supported is shown for two processors installed.

Internal storage

The internal drive bays of the x3500 M5 are shown in the following figure.

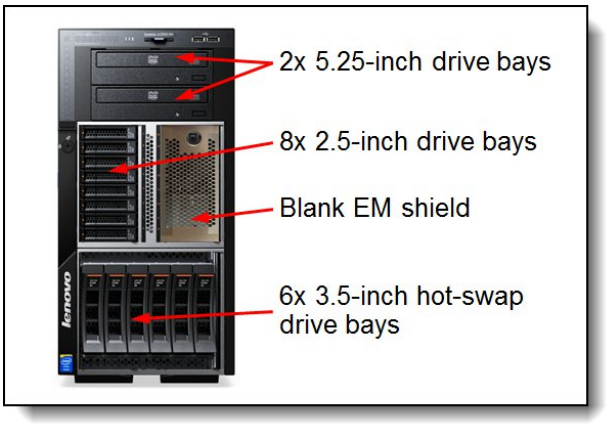


Figure 5. Internal drive bays

The System x3500 M5 server supports the following internal storage configurations:

- Configurations with 2.5-inch hot-swap drives:
  - 8x 2.5-inch hot-swap drives (1 RAID adapter)
  - 16x 2.5-inch hot-swap drives (1 RAID adapter)
  - 16x 2.5-inch hot-swap drives (2 RAID adapters)
  - 24x 2.5-inch hot-swap drives (1 RAID adapter)
  - 24x 2.5-inch hot-swap drives (2 RAID adapters)
  - 32x 2.5-inch hot-swap drives (1 RAID adapter)
  - 32x 2.5-inch hot-swap drives (2 RAID adapters)
- Configurations with 3.5-inch hot-swap drives:
  - 6x 3.5-inch hot-swap hard disk drives (1 RAID adapter)
  - 12x 3.5-inch hot-swap hard disk drives (2 RAID adapters)
- Configurations with 2.5-inch and 3.5-inch hot-swap drives: 6x 3.5-inch hot-swap hard disk drives + 16x 2.5-inch hot-swap drives (2 RAID adapters)
- Configurations with 3.5-inch simple-swap drives:
  - 6x 3.5-inch simple-swap hard disk drives (6 Gb SATA onboard connectors)
  - 6x 3.5-inch simple-swap hard disk drives (1 adapter)

  Note: A configuration of 12 simple-swap drives is not supported.

The following drive type mixing rules apply:

- Hot-swap SATA HDDs and hot-swap SAS HDDs can be intermixed on the same backplane , but cannot be intermixed in the same RAID array.
- Hot-swap SATA HDDs and hot-swap SAS HDDs can be intermixed with SSDs on the same backplane, but SAS nor SATA HDDs can be configured with SSDs within the same RAID array.

Backplanes

The following table lists the available backplanes for the x3500 M5. Standard models ship with one 8x 2.5-inch hot-swap backplane or one 6x 3.5-inch hot-swap backplane, as listed.

Table 8. Internal storage backplane (configure to order)

Feature code	Name	Models where used	Maximum supported
A5D4	System x3500 M5 2.5-inch Hot Swap SAS: • 8x 2.5-inch hot-swap drives • Connect to 1 adapter (2 ports) or 2 adapters (1 port each) • Supported by M5210, M1215, or N2215	All other standard models	2
A5N5	System x3500 M5 2.5-inch Hot Swap SAS 8-16: • 8x 2.5-inch hot-swap drives • Includes a SAS expander • Connects to backplane A5D4 to support up to 16 drives per port • Supported by M5210, M1215, or N2215	-	2
A5D5	System x3500 M5 3.5-inch Hot Swap SAS: • 6x 3.5-inch hot-swap drives • Supported by M5210, M1215, or N2215	C3x, C4x	2
A5UM	System x3500 M5 3.5-inch Simple Swap: • 6x 3.5-inch simple-swap drives • Connections to onboard SATA ports	-	1
A5D2	System x3500 M5 3.5-inch Simple Swap: • 6x 3.5-inch simple-swap drives • Connections to RAID controller	-	1

The following table list the available hot-swap drive bay upgrades.

Table 9. Drive bay upgrade options

Option part number	Name
00AL540	8x 2.5-inch Hot-Swap SAS/SATA Upgrade Kit for 16 or 24 HDDs: • For existing configurations with 8x or 16x 2.5-inch bays • Adds 8x 2.5-inch hot-swap drives • Backplane Includes a SAS expander • Same backplane as feature A5N5
00AL541	8x 2.5-inch Hot-Swap SAS/SATA Upgrade Kit for 32 HDDs: • For existing configurations with 24x 2.5-inch bays • Adds 8x 2.5-inch hot-swap drives • Same backplane as feature A5D4
00AL542	6x 3.5-inch Hot-Swap SAS/SATA Upgrade Kit for 12 HDDs: • For existing configurations with 6x 3.5-inch drives • Adds 6x 3.5-inch hot-swap drives • Same backplane as feature A5D5
00AL543	6x 3.5-inch Hot-Swap SAS/SATA Upgrade Kit for 22 HDDs (Intermix): • For existing configurations with 16x 2.5-inch drives • Adds 6x 3.5-inch hot-swap drives • Same backplane as feature A5D5
00AL544	8x 2.5-inch Hot-Swap SAS/SATA Upgrade Kit for 14 HDDs (Intermix): • For existing configurations with 6x 3.5-inch drives • Adds 8x 2.5-inch hot-swap drives • Same backplane as feature A5D4
00KG037	8x 2.5-inch Hot-Swap SAS/SATA Upgrade Kit for 22 HDDs (Intermix): • For existing configurations with 6x 3.5-inch and 8x 2.5-inch drives • Adds 8x 2.5-inch hot-swap drives • Same backplane as feature A5N5
00AL539	SAS cable option for Dual RAID array (RAID adapter not included): • For configurations with two RAID cards • Only needed when upgrading from 8x 2.5-inch drives to 16, 24 or 32 drives, as shown in Figure 7 below. • Connects second adapter to backplane

Drive bay configurations

The following figure shows how models with eight 2.5-inch drive bays can be upgraded to a total of 32 drive bays. In such configurations, all drives are connected to one RAID controller. Supported adapters are the ServeRAID M5210, ServeRAID M1215, and N2215 host bus adapter.

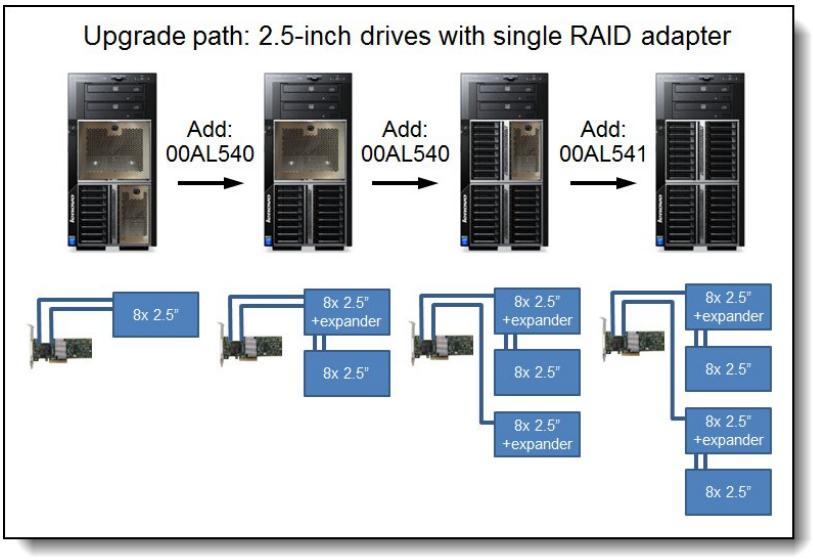


Figure 6. Configurations of 2.5-inch drives with one RAID adapter

The following figure shows how models with eight 2.5-inch drive bays can be upgraded to a total of 32 drive bays that use two RAID controller for added performance. Supported adapters are the ServeRAID M5210, ServeRAID M1215, and N2215 host bus adapter.

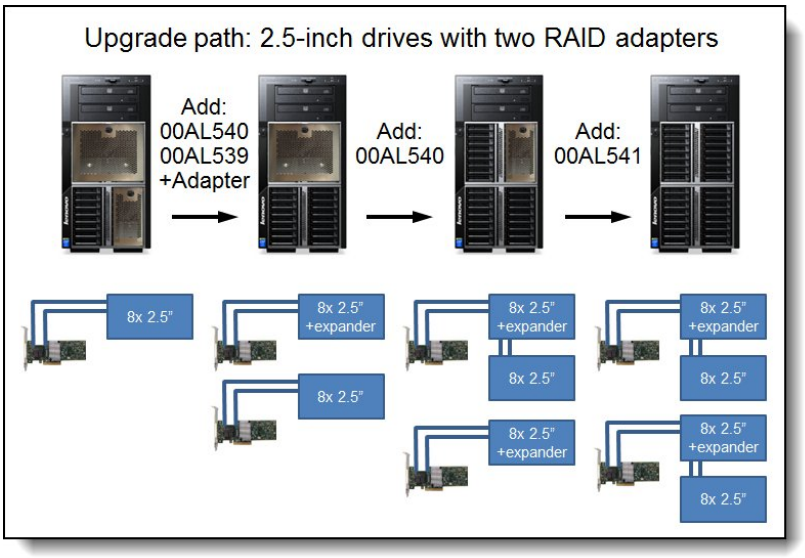


Figure 7. Configurations of 2.5-inch drives with two RAID adapters

The following figure shows how models with six 3.5-inch hot-swap drive bays can be upgraded to 12 drive bays. Such a configuration requires two RAID controllers. Supported adapters are the ServeRAID M5210, ServeRAID M1215, and N2215 host bus adapter.

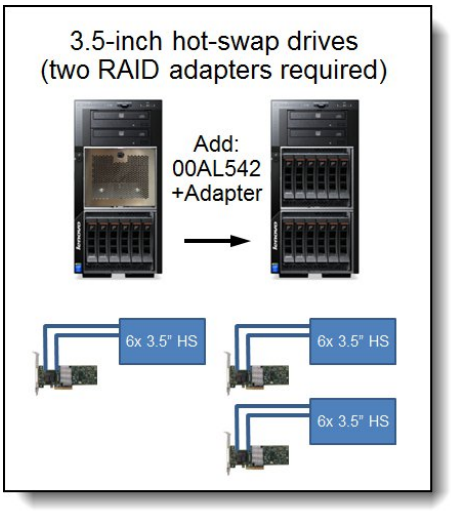


Figure 8. Configurations of 3.5-inch drives

For configure-to-order configurations, the server also supports simple-swap 3.5-inch drives. The simple-swap drives can be connected to the 6 Gb SATA ports on the system board of the server or to a RAID controller. Only six 3.5-inch drives are supported; a configuration of 12 simple-swap drives is not supported.

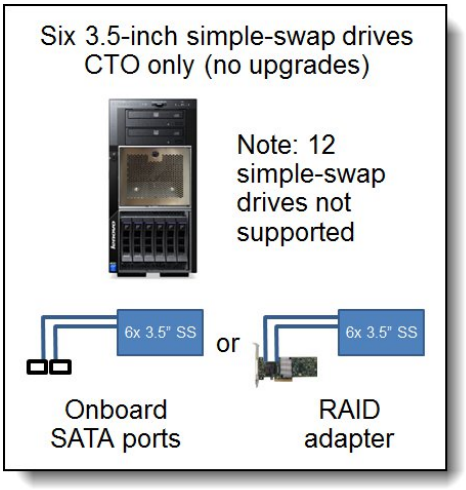


Figure 9. Simple-swap 3.5-inch drives

The server also supports combinations of 2.5-inch drive bays (up to 16) and 3.5-inch drive bays (6 bays). The upgrade path from models with 2.5-inch drives is shown in the following figure. The 3.5-inch drives must be connected to a separate RAID adapter.

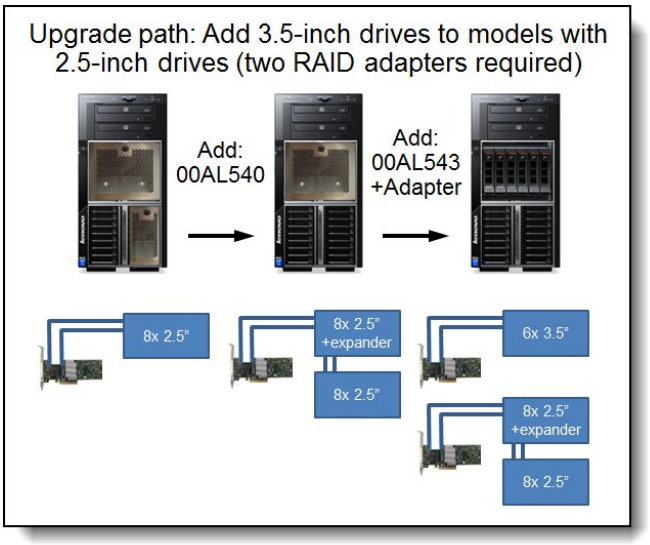


Figure 10. Combinations of 2.5-inch and 3.5-inch drive bays from a 2.5-inch base

The following figure shows the upgrade path from models with 3.5-inch drives.

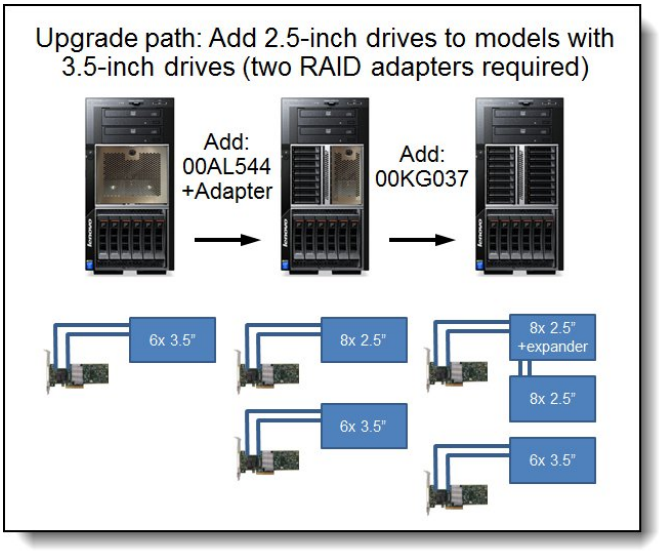


Figure 11. Combinations of 2.5-inch and 3.5-inch drive bays from a 3.5-inch base

Controllers for internal storage

The following table lists the RAID controllers and additional options that are used for internal disk storage of the x3500 M5 server. The maximum supported column indicates which slots each adapter is supported in. For slot locations see the I/O expansion options section.

Table 10. RAID controllers and HBAs for internal storage

Part number	Feature code	Description	Maximum supported (slot #)	Standard models where used
12 Gb Controllers				
46C9114	A45W	ServeRAID M1215 SAS/SATA Controller	2 (1, 2)	A2x, B2x, C2x, C3x, C4x, D2x
46C9110	A3YZ	ServeRAID M5210 SAS/SATA Controller	2 (1, 2)	G2x, G3x, H2x, J2x
47C8675	A3YY	N2215 SAS/SATA HBA	2 (1, 2)	-
Hardware upgrades for the M5210				
47C8656	A3Z0	ServeRAID M5200 Series 1GB Cache/RAID 5 Upgrade	2	-
47C8660	A3Z1	ServeRAID M5200 Series 1GB Flash/RAID 5 Upgrade	2	G2x, G3x
47C8664	A3Z2	ServeRAID M5200 Series 2GB Flash/RAID 5 Upgrade	2	H2x, J2x
47C8668	A3Z3	ServeRAID M5200 Series 4GB Flash/RAID 5 Upgrade	2	-
Feature on Demand upgrades for the M1215†				
00AE930	A5H5	ServeRAID M1200 Zero Cache/RAID 5 Upgrade	1†	-
Feature on Demand upgrades for the M5210†				
47C8708	A3Z6	ServeRAID M5200 Series Zero Cache/RAID 5 Upgrade	1†	-
47C8706	A3Z5	ServeRAID M5200 Series RAID 6 Upgrade	1†*	-
47C8710	A3Z7	ServeRAID M5200 Series Performance Accelerator	1†*	-
47C8712	A3Z8	ServeRAID M5200 Series SSD Caching Enabler	1†*	-

* Requires cache memory upgrade (47C8656, 47C8660, 47C8664 or 47C8668).
† Features on Demand (FoD) upgrades for ServeRAID adapters are applied system-wide; that is, one FoD upgrade is required to activate the feature on all RAID controllers of the same type installed in the server.

The ServeRAID M1215 SAS/SATA Controller has the following specifications:

- Eight internal 12 Gbps SAS/SATA ports
- Up to 12 Gbps throughput per port
- Two internal mini-SAS HD connectors (SFF-8643)
- Supports connections to SAS/SATA HDDs and SSDs
- LSI SAS3008 12 Gbps RAID on Chip (ROC) controller
- Support for RAID levels 0, 1, and 10 standard; support for RAID 5, 50 with optional FoD upgrade
- Zero Controller Cache, no battery/flash backup
- Optional support for self-encrypting drives (SEDs) with MegaRAID SafeStore (with RAID 5 upgrade)
- Fixed stripe size of 64 KB

The ServeRAID M5210 SAS/SATA Controller has the following specifications:

- Eight internal 12 Gbps SAS/SATA ports
- Up to 12 Gbps throughput per port
- Two x4 HD mini-SAS internal connectors (SFF-8643)
- Supports connections to SAS/SATA HDDs and SSDs and SAS Expanders
- Supports RAID 0, 1, and 10
- Supports RAID 5 and 50 with optional M5200 Series RAID 5 upgrades
- Supports RAID 6 and 60 with the optional M5200 Series RAID 6 upgrade
- Optional support for self-encrypting drives (SEDs) with MegaRAID SafeStore (with RAID 5 upgrade)
- Supports 1 GB non-backed cache or 1 GB, 2 GB or 4 GB flash-backed cache
- PCIe 3.0 x8 host interface
- Based on the LSI SAS3108 12 Gbps ROC controller

The N2215 SAS/SATA HBA has the following specifications:

- Eight internal 12 Gbps SAS/SATA ports
- Up to 12 Gbps throughput per port
- Two x4 HD mini-SAS internal connectors (SFF-8643)
- Supports connections to SAS/SATA HDDs and SSDs
- Optimized for SSD performance
- No RAID support
- PCIe 3.0 x8 host interface
- Based on the LSI SAS3008 12 Gbps controller

For more information, see the list of Lenovo Press Product Guides in the RAID adapters category:
https://lenovopress.com/servers/options/raid

Internal drive options

The following tables list the hard drive options that are currently available for the server.

- Table 11: 2.5-inch hot-swap 12 Gb SAS/SATA HDDs
- Table 12: 2.5-inch hot-swap 6 Gb SAS/SATA HDDs
- Table 13: 2.5-inch hot-swap 12 Gb SAS/SATA SSDs
- Table 14: 2.5-inch hot-swap 6 Gb SAS/SATA SSDs
- Table 15: 3.5-inch hot-swap 12 Gb SAS/SATA HDDs
- Table 16: 3.5-inch hot-swap 6 Gb SAS/SATA HDDs
- Table 17: 3.5-inch hot-swap 12 Gb SAS/SATA SSDs
- Table 18: 3.5-inch hot-swap 6 Gb SAS/SATA SSDs
- Table 19: 3.5-inch simple-swap 6 Gb SAS/SATA HDDs

Table 11. 2.5-inch hot-swap 12 Gb SAS/SATA HDDs

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap HDDs - 12 Gb SAS 10K			
00WG685	AT89	300GB 10K 12Gbps SAS 2.5" G3HS HDD	32
00WG690	AT8A	600GB 10K 12Gbps SAS 2.5" G3HS HDD	32
00WG695	AT8B	900GB 10K 12Gbps SAS 2.5" G3HS HDD	32
00WG700	AT8C	1.2TB 10K 12Gbps SAS 2.5" G3HS HDD	32
00NA271	ASBM	1.8TB 10K 12Gbps SAS 2.5" G3HS 512e HDD	32
2.5-inch hot-swap HDDs - 12 Gb SAS 15K			
00WG660	AT84	300GB 15K 12Gbps SAS 2.5" G3HS HDD	32
00WG665	AT85	600GB 15K 12Gbps SAS 2.5" G3HS HDD	32
2.5-inch hot-swap HDDs - 12 Gb NL SAS			
00NA491	AT7Z	1TB 7.2K 12Gbps NL SAS 2.5" G3HS HDD	32
00NA496	AT80	2TB 7.2K 12Gbps NL SAS 2.5" G3HS 512e HDD	32
2.5-inch hot-swap SEDs - 12 Gb SAS 10K			
00WG705	AT8D	300GB 10K 12Gbps SAS 2.5" G3HS SED	32
00WG710	AT8E	600GB 10K 12Gbps SAS 2.5" G3HS SED	32
00WG715	AT8F	900GB 10K 12Gbps SAS 2.5" G3HS SED	32
00WG720	AT8G	1.2TB 10K 12Gbps SAS 2.5" G3HS SED	32

Table 12. 2.5-inch hot-swap 6 Gb SAS/SATA HDDs

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap HDDs - 6 Gb NL SATA			
00AJ141	A4TX	1TB 7.2K 6Gbps NL SATA 2.5" G3HS HDD	32
00NA526	AT81	2TB 7.2K 6Gbps NL SATA 2.5" G3HS 512e HDD	32

Table 13. 2.5-inch hot-swap 12 Gb SAS/SATA SSDs

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap SSDs - 12 Gb SAS - Enterprise Performance (10+ DWPD)			
00FN379	AS7C	200GB 12G SAS 2.5" MLC G3HS Enterprise SSD	32
00FN389	AS7E	400GB 12G SAS 2.5" MLC G3HS Enterprise SSD	32
00FN399	AS7G	800GB 12G SAS 2.5" MLC G3HS Enterprise SSD	32
00FN409	AS7J	1.6TB 12G SAS 2.5" MLC G3HS Enterprise SSD	32
2.5-inch hot-swap SSDs - 12 Gb SAS - Enterprise Mainstream (3-5 DWPD)			
00YC465	AT9N	800GB Enterprise Mainstream 12Gb SAS G3HS 2.5" SSD	32

Table 14. 2.5-inch hot-swap 6 Gb SAS/SATA SSDs

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap SSDs - 6 Gb SAS - Enterprise Performance (10+ DWPD)			
00AJ222	A4UD	1.6TB SAS 2.5" MLC G3HS Enterprise SSD	32
2.5-inch hot-swap SSDs - 6 Gb SATA - Enterprise Performance (10+ DWPD)			
00YC330	AT9E	Intel S3710 800GB Enterprise Performance SATA G3HS 2.5" SSD	32
2.5-inch hot-swap SSDs - 6 Gb SATA - Enterprise Mainstream (3-5 DWPD)			
00YK217	AU3D	Intel S3610 800GB Enterprise Mainstream SATA G3HS 2.5" SSD	32
00YK222	AU3E	Intel S3610 1.2TB Enterprise Mainstream SATA G3HS 2.5" SSD	32
00AJ395	A577	120GB SATA 2.5" MLC G3HS Enterprise Value SSD	32
00AJ400	A578	240GB SATA 2.5" MLC G3HS Enterprise Value SSD	32
2.5-inch hot-swap SSDs - 6 Gb SATA - Enterprise Entry (<3 DWPD)			
00YC385	AT8R	120GB Enterprise Entry SATA G3HS 2.5" SSD	32
00YC400	AT8U	960GB Enterprise Entry SATA G3HS 2.5" SSD	32

Table 15. 3.5-inch hot-swap 12 Gb SAS/SATA HDDs

Part number	Feature	Description	Maximum supported
3.5-inch hot-swap HDDs - 12 Gb NL SAS			
00FN188	A5VP	2TB 7.2K 12Gbps NL SAS 3.5" G2HS 512e HDD	12
00FN228	A5VR	6TB 7.2K 12Gbps NL SAS 3.5" G2HS 512e HDD	12
00WH121	ATRS	8TB 7.2K 12Gbps NL SAS 3.5" G2HS 512e HDD	12
00YK336	AU7R	10TB 7.2K 12Gbps NL SAS 3.5" G2HS 512e HDD	12
00YL702	ATYM	1TB 7.2K 12Gbps NL SAS 3.5" G2HS HDD	12
00YK000	ATYL	2TB 7.2K 12Gbps NL SAS 3.5" G2HS HDD	12
00YK005	ATYN	4TB 7.2K 12Gbps NL SAS 3.5" G2HS HDD	12

Table 16. 3.5-inch hot-swap 6 Gb SAS/SATA HDDs

Part number	Feature	Description	Maximum supported
3.5-inch hot-swap HDDs - 6 Gb NL SATA			
81Y9786	A22Y	500GB 7.2K 6Gbps NL SATA 3.5" G2HS HDD	12
81Y9790	A22P	1TB 7.2K 6Gbps NL SATA 3.5" G2HS HDD	12
81Y9794	A22T	2TB 7.2K 6Gbps NL SATA 3.5" G2HS HDD	12
49Y6002	A3W9	4TB 7.2K 6Gbps NL SATA 3.5" G2HS HDD	12
00FN173	A5VM	6TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD	12
00WH126	ATRT	8TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD	12
00YK341	AU7S	10TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD	12

Table 17. 3.5-inch hot-swap 12 Gb SAS/SATA SSDs

Part number	Feature	Description	Maximum supported
3.5-inch hot-swap SSDs - 12 Gb SAS - Enterprise			
00WG675	AT87	300GB 15K 12Gbps SAS 3.5" G2HS HDD	12
00WG680	AT88	600GB 15K 12Gbps SAS 3.5" G2HS HDD	12

Table 18. 3.5-inch hot-swap 6 Gb SAS/SATA SSDs

Part number	Feature	Description	Maximum supported
3.5-inch hot-swap SSDs - 6 Gb SATA - Enterprise Performance (10+ DWPD)			
00YC345	AT9H	Intel S3710 800GB Enterprise Performance SATA HS 3.5" SSD	12
3.5-inch hot-swap SSDs - 6 Gb SATA - Enterprise Mainstream (3-5 DWPD)			
00YK242	AU3J	Intel S3610 800GB Enterprise Mainstream SATA HS 3.5" SSD	12
00YK247	AU3K	Intel S3610 1.2TB Enterprise Mainstream SATA HS 3.5" SSD	12
00AJ435	A57F	120GB SATA 3.5" MLC HS Enterprise Value SSD	12
3.5-inch hot-swap SSDs - 6 Gb SATA - Enterprise Entry (<3 DWPD)			
00YC420	AT8Y	960GB Enterprise Entry SATA HS 3.5" SSD	12

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

Part number	Feature	Description	Maximum supported
3.5-inch simple-swap HDDs - 6 Gb NL SATA			
81Y9802	A22U	500GB 7.2K 6Gbps NL SATA 3.5" G2SS HDD	6
81Y9806	A22X	1TB 7.2K 6Gbps NL SATA 3.5" G2SS HDD	6
81Y9810	A22W	2TB 7.2K 6Gbps NL SATA 3.5" G2SS HDD	6
00FN148	A5VJ	4TB 7.2K 6Gbps NL SATA 3.5" G2SS 512e HDD	6

Internal backup units

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

Table 20. Internal backup units

Part number	Feature code	Description	Maximum supported
Drives			
00D2785	A2U7	RDX 3 Internal USB Drive (includes USB cable)	1
00D2786	A2VE	RDX Internal USB 3.0 Dock with 320 GB Cartridge (includes USB cable)	1
00D2787	A2VF	RDX Internal USB 3.0 Dock with 500 GB Cartridge (includes USB cable)	1
00D2788	A2VG	RDX Internal USB 3.0 Dock with 1 TB Cartridge (includes USB cable)	1
00MW711*	AUBQ	Half High LTO Gen 6 Internal SAS Tape Drive**	2
Media			
00MW719*	AUBR	LTO 6 Media 2.5TB	
46W6589	A3S6	LTO Ultrium Gen 6 Single Media (2.6 TB native capacity)	
46C5367	5708	RDX 320GB Cartridge	
46C5368	5709	RDX 500GB Cartridge	
81Y3647	A1VL	RDX 1TB Cartridge	

* Withdrawn from marketing
** The LTO5 and LTO6 are supported with addition of the the N2215 SAS/SATA HBA; connectivity is via a 12Gb SAS Cable for LTO Tape drive which is included with the tape drive option part number or available separately as option part number 00MV227.

USB devices are attached to the internal USB connector. For option part number orders, the USB cable is included with the RDX drive. For CTO, use feature code 9266.

For more information, see the Lenovo Press Product Guide, *RDX USB 3.0 Disk Backup Solution* , available from:
http://lenovopress.com/tips0894

Optical drives

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

Table 21. Optical drives

Part number	Feature code	Description	Maximum supported	Standard models where used
None*	4154	Half-High SATA DVD-ROM	2	All standard models
81Y6404	4155	Half-High SATA Multiburner	2	-

* This option is available via CTO only or is already installed in standard models.

The two half-high drives in the table can be installed in any open 5.25-inch drive bay.

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

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

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

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

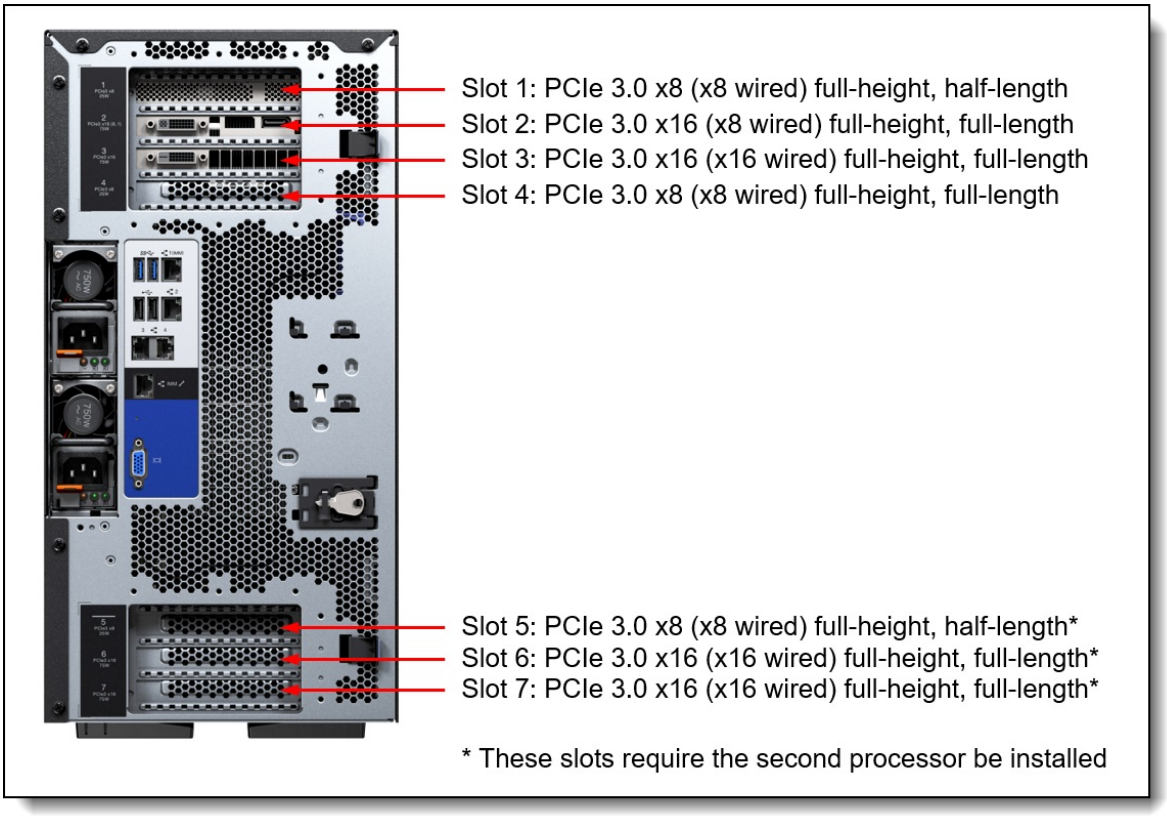
I/O expansion options

The server supports up to seven PCIe 3.0 slots: Four slots (1 - 4) when one CPU is installed or seven slots when two CPUs are installed. The following slot form factors are available:

- Slot 1: PCIe 3.0 x8 (x8 wired); full-height, half-length
- Slot 2: PCIe 3.0 x16 (x8 wired); full-height, full-length
- Slot 3: PCIe 3.0 x16 (x16 wired); full-height, full-length
- Slot 4: PCIe 3.0 x8 (x8 wired); full-height, full-length
- Slot 5: PCIe 3.0 x8 (x8 wired); full-height, half-length (requires second processor)
- Slot 6: PCIe 3.0 x16 (x16 wired); full-height, full-length (requires second processor)
- Slot 7: PCIe 3.0 x16 (x16 wired); full-height, full-length (requires second processor)

Slots 3 and 6 support double-wide GPUs

The following figure shows the locations of the PCIe slots.



Figre 12. System x3500 M5 PCIe slots

The COM Port Bracket, part number 00KC332, is used for making an external serial port available at the rear of the server. This option includes the bracket and the cable. The COM Port option is mounted in one of the PCIe slots and that PCIe slot cannot be used. The following table lists the PCIe slot options.

Table 22. System x3500 M5 COM Port Kit ordering information

Part number	Feature code	Description	Maximum supported
00KC332	ARZ0	System x3500 M5 COM Port Kit	1

Network adapters

The x3500 M5 supports four integrated Gigabit Ethernet ports with the following features:

- A Broadcom BCM5719 chip
- Four Gigabit Ethernet ports
- NIC Teaming (load balancing and failover)
- Ethernet features:
  - Compliant with 1 Gb Ethernet IEEE 802.3, 802.3u, and 802.3ab PHY specifications
  - Integrated PHY for 10/100/1000 Mbps for multispeed, full, and half-duplex auto-negotiation
  - Automatic MDI crossover
  - IEEE 802.3x-compliant flow control support
  - IEEE 1588 protocol and 802.1AS time synchronization implementation
  - IEEE802.3az - Energy Efficient Ethernet (EEE)
- I/O Virtualization features:
  - I/O Virtualization support for VMware NetQueue and Microsoft virtual machine queue (VMQ)
  - Function Level Reset (FLR)
  - IEEE 802.1q Virtual Local Area Network (VLAN) tagging support
- Stateless offload and performance features:
  - TCP, IP, and User Datagram Protocol (UDP) checksum offload
  - TCP segmentation offload (TCO)
  - Large Send Offload (LSO)
  - Receive Side Scaling (RSS) and Transmit Side Scaling (TSS)
  - Message Signal Interrupt (MSI) and Message Signal Interrupt Extension (MSI-X) support
  - Support for jumbo frames up to 9600 bytes

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 23. Network adapters

Part number	Feature code	Description	Maximum supported (1 CPU / 2 CPUs)
40 Gb Ethernet			
00D9550	A3PN	Mellanox ConnectX-3 40GbE / FDR IB VPI Adapter*	4 / 7 (All slots)
10 Gb Ethernet			
44T1370	A5GZ	Broadcom NetXtreme 2x10GbE BaseT Adapter	4 / 7 (All slots)
94Y5180	A4Z6	Broadcom NetXtreme Dual Port 10GbE SFP+ Adapter*	4 / 7 (All slots)
00AG570	AT7S	Emulex VFA5.2 2x10 GbE SFP+ PCIe Adapter*	4 / 7 (All slots)
00AG580	AT7T	Emulex VFA5.2 2x10 GbE SFP+ Adapter and FCoE/iSCSI SW*	4 / 7 (All slots)
None	AS3M	Emulex VFA5 2x10 GbE SFP+ Integrated Adapter*	1 / 1 (slot 3)
49Y7960	A2EC	Intel X520 Dual Port 10GbE SFP+ Adapter*	4 / 7 (All slots)
49Y7970	A2ED	Intel X540-T2 Dual Port 10GBaseT Adapter	4 / 7 (All slots)
01DA900	AU2Y	Intel X710-DA2 2x10GbE SFP+ Adapter	4 / 7 (All slots)
00D9690	A3PM	Mellanox ConnectX-3 10 GbE Adapter*	4 / 7 (All slots)
1 Gb Ethernet			
42C1780	2995	Broadcom NetXtreme 2xGbE BaseT Adapter	4 / 7 (All slots)
90Y9370	A2V4	Broadcom NetXtreme I Dual Port GbE Adapter	4 / 7 (All slots)
90Y9352	A2V3	Broadcom NetXtreme I Quad Port GbE Adapter	4 / 7 (All slots)
49Y4230	5767	Intel Ethernet Dual Port Server Adapter I340-T2	4 / 7 (All slots)
49Y4240	5768	Intel Ethernet Quad Port Server Adapter I340-T4	4 / 7 (All slots)
00AG510	A56L	Intel I350-T2 2xGbE BaseT Adapter	4 / 7 (All slots)
00AG520	A56M	Intel I350-T4 4xGbE BaseT Adapter	4 / 7 (All slots)

* Require SFP+ optical transceivers or DAC cables that must be purchased separately. See the following tables.

For more information, see the list of Lenovo Press Product Guides in the Ethernet adapters category: https://lenovopress.com/servers/options/ethernet

The following table lists the supported 10 Gb Ethernet SFP+ optical transceivers and DAC cables. For multi-port adapters, all adapter ports must have the same type of transceiver or DAC cable selected.

Table 24. Supported optical transceivers and DAC cables - 10 Gb Ethernet

Part number	Feature code	Description
10 GbE SFP+ LR transceivers (for SFP+ adapters)		
00FE331	B0RJ	Lenovo 10GBASE-LR SFP+ Transceiver
90Y9412	A1PM	Lenovo 10Gb/s LR SFP+ XCVR
10 GbE SFP+ SR transceivers (for SFP+ adapters)		
46C3447	5053	Lenovo 10GBASE-SR SFP+ Transceiver
49Y4216	0069	Brocade 10Gb SFP+ SR Optical Transceiver
49Y4218	0064	QLogic 10Gb SFP+ SR Optical Transceiver
10 GbE SFP+ DAC cables (for SFP+ adapters)		
00D6288	A3RG	Lenovo 0.5m Passive SFP+ DAC Cable
90Y9427	A1PH	Lenovo 1m Passive SFP+ DAC Cable
00AY764	A51N	Lenovo 1.5m Passive SFP+ DAC Cable
00AY765	A51P	Lenovo 2m Passive SFP+ DAC Cable
90Y9430	A1PJ	Lenovo 3m Passive SFP+ DAC Cable
90Y9433	A1PK	Lenovo 5m Passive SFP+ DAC Cable
00D6151	A3RH	Lenovo 7m Passive SFP+ DAC Cable

The following table lists the optical transceivers and DAC cables that can be used with the supported 40Gb Ethernet adapters listed. For multi-port adapters, all adapter ports must have the same type of transceiver or DAC cable selected.

Table 25. Supported optical transceivers and DAC cables - 40 Gb Ethernet

Part number	Feature code	Description
40 GbE QSFP+ transceivers (for 40 GbE QSFP+ adapters)		
49Y7884	A1DR	Lenovo 40GBASE-SR4 QSFP+ Transceiver
40 GbE QSFP+ DAC cables (for 40 GbE QSFP+ adapters)		
49Y7890	A1DP	Lenovo 1m Passive QSFP+ DAC Cable
49Y7891	A1DQ	Lenovo 3m Passive QSFP+ DAC Cable

SAS adapters for external storage

The following table lists the SAS HBAs and RAID adapters suitable for connectivity to external storage. The maximum supported column indicates which slots each adapter is supported in. For slot locations see the I/O expansion options section.

Table 26. Supported SAS HBAs and RAID adapters

Part number	Feature code	Description	Maximum supported (1 CPU / 2 CPUs)
SAS			
00AE912	A5M0	N2225 SAS/SATA HBA	4 / 7 (All slots)
00AE916	A5M1	N2226 SAS/SATA HBA	4 / 7 (All slots)
12 Gb RAID controllers			
00AE938	A5ND	ServeRAID M5225-2GB SAS/SATA Controller	3 (1 CPU: 1-4; 2 CPUs: 2-5)
Feature on Demand (FoD) upgrades for the M5225			
47C8706	A3Z5	ServeRAID M5200 Series RAID 6 Upgrade	1*
47C8710	A3Z7	ServeRAID M5200 Series Performance Accelerator	1*
47C8712	A3Z8	ServeRAID M5200 Series SSD Caching Enabler	1*

* One FoD upgrade for the M5225 activates the feature on all M5225 controllers that are installed in a server.

The following table summarizes features of supported adapters.

Table 27. SAS RAID controller and HBA features and specifications summary

Feature	M5225-2GB	N2226	N2225
Adapter type	RAID adapter	SAS HBA	SAS HBA
Part number	00AE938	00AE916	00AE912
Form factor	Low profile	Low profile	Low profile
Controller chip	LSI SAS3108	LSI SAS3008	LSI SAS3008
Host interface	PCIe 3.0 x8	PCIe 3.0 x8	PCIe 3.0 x8
Port interface	12 Gbps SAS	12 Gbps SAS	12 Gbps SAS
Number of external ports	8	16	8
External port connectors	2x Mini-SAS HD (SFF-8644)	4x Mini-SAS HD (SFF-8644)	2x Mini-SAS HD (SFF-8644)
Drive interface	SAS, SATA	SAS, SATA	SAS, SATA
Drive type	HDD, SED, SSD	HDD, SSD	HDD, SSD
Maximum number of devices	240	1024	1024
RAID levels	0/1/10/5/50; Optional 6/60 (47C8706)	None	None
JBOD mode	No	Yes	Yes
Cache	2 GB (included)	None	None
Cache protection	Flash (included)	None	None
Performance Accelerator (FastPath)	Optional (47C8710)	None	None
SSD Caching (CacheCade Pro 2.0)	Optional (47C8712)	None	None

For more information about the ServeRAID M5225-2GB, see the Lenovo Press Product Guide: http://lenovopress.com/tips1258

For more information about SAS HBAs, see the list of Product Guides in the Host bus adapters category: https://lenovopress.com/servers/options/hba

Fibre Channel host bus adapters

The following table lists Fibre Channel HBAs that are supported by the x3500 M5 server. The maximum supported column indicates which slots each adapter is supported in. For slot locations see the I/O expansion options section.

Table 28. Storage adapters

Part number	Feature code	Description	Maximum supported (1 CPU / 2 CPUs)
16 Gb Fibre Channel			
01CV830	ATZU	Emulex 16Gb Gen6 FC Single-port HBA	4 / 7 (All slots)
01CV840	ATZV	Emulex 16Gb Gen6 FC Dual-port HBA	4 / 7 (All slots)
01CV750	ATZB	QLogic 16Gb Enhanced Gen5 FC Single-port HBA	4 / 7 (All slots)
01CV760	ATZC	QLogic 16Gb Enhanced Gen5 FC Dual-port HBA	4 / 7 (All slots)
81Y1662	A2W6	Emulex 16Gb FC Dual-port HBA	4 / 7 (All slots)
81Y1655	A2W5	Emulex 16Gb FC Single-port HBA	4 / 7 (All slots)
00Y3341	A3KX	QLogic 16Gb FC Dual-port HBA	4 / 7 (All slots)
00Y3337	A3KW	QLogic 16Gb FC Single-port HBA	4 / 7 (All slots)
8 Gb Fibre Channel			
42D0494	3581	Emulex 8Gb FC Dual-port HBA	4 / 7 (All slots)
42D0485	3580	Emulex 8Gb FC Single-port HBA	4 / 7 (All slots)
42D0510	3579	QLogic 8Gb FC Dual-port HBA	4 / 7 (All slots)
42D0501	3578	QLogic 8Gb FC Single-port HBA	4 / 7 (All slots)

For more information, see the list of Lenovo Press Product Guides in the Host bus adapters category: https://lenovopress.com/servers/options/hba

Flash Storage adapters

The server currently does not support Flash Storage adapters.

GPU adapters

The x3500 M5 server supports graphics processing units (GPUs) that are listed in the following table. Up to two GPUs are supported, depending on the number of processors that are installed in a server. The maximum supported column indicates which slots each adapter is supported in. For slot locations see the I/O expansion options section.

Table 29. GPU adapters

Part number	Feature code	Description	Maximum supported (1 CPU / 2 CPUs) (slot #)
None**	A3YV	NVIDIA Quadro K6000*	1 / 2 (1 CPU: 3; 2 CPUs: 3, 6)
00YL371	ASPP	NVIDIA Quadro K620	2 / 4 (1 CPU: 2, 3; 2 CPUs: 2, 3, 6, 7)
00YL377	ASQL	NVIDIA Tesla M60 GPU, PCIe (active)*	1 / 2 (1 CPU: 3; 2 CPUs: 3, 6)
00YL378	ATZF	NVIDIA Quadro M5000 GPU, PCIe (active)*	1 / 2 (1 CPU: 3; 2 CPUs: 3, 6)
90Y2495	AU3W	NVidia Quadro M6000 24GB GPU, PCIe (active)*	1 / 2 (1 CPU: 3; 2 CPUs: 3, 6)

** Only available via configure-to-order
* Double-width adapter - occupies two slots

The following other rules apply:

- If two GPUs are installed, they must be identical
- The first GPU is installed in slot 3; the second GPU is installed in slot 6 and requires the second processor to be installed.
- The number of GPUs that can be installed depends on the type of power supply that is installed and the type and number of other components that are installed. For more information, see the Power Supply section.
- If a NVIDIA card is installed, the maximum memory that can be installed is 1 TB.

Power supplies and redundant cooling

The server supports up to two redundant power supplies. Standard models come with one or two power supplies (depending on the model).

The server also comes standard with two (for models with one processor installed) or four (for models with two processors installed) hot-swap cooling fans. For models with only one processor, an optional Redundant Cooling Kit provides N+1 cooling redundancy. The following table lists the power supplies and redundant cooling upgrade options.

Table 30. Power supplies

Part number	Feature code	Description	Maximum supported	Standard models where used
00AL533	A5MY	System x 550W High Efficiency Platinum AC Power Supply	2	A2x, B2x, C2x, C3x, C4x, D2x
00AL534	A5MZ	System x 750W High Efficiency Platinum AC Power Supply	2	G2x, G3x
00AL536	A5N0	System x 900W High Efficiency Platinum AC Power Supply	2	H2x, J2x
00MW035	ASUJ	System x 1500W High Efficiency Platinum AC Power Supply	2	-
00AL535	A5N1	System x 750W High Efficiency Titanium AC Power Supply	2	-
None*	A5CH	System x 550W High Efficiency Platinum AC Fixed Power Supply	1	-
00AL537	A5D6	System x3500 M5 Redundant Cooling Kit	1	-

* CTO only

The following two tables show the combinations supported.

Table 31. Supported configurations (550W, 750W and 1500W power supplies)

Power supply	**550 W (A)**	**550 W (B)**	**750 W (A)**	**750 W (B)**	**1500 W**
Maximum processors	1	2, max 90W	1	2	2
Memory maximums (mutually exclusive)					
RDIMMs	No limit	No limit	No limit	No limit	No limit
LRDIMMs	0	0	0	0	No limit
Drive maximums (mutually exclusive)					
3.5-inch drives only	No limit	6	No limit	No limit	No limit
2.5-inch drives only	16	8	16	16	No limit
Intermix 3.5-in and 2.5-in drives	6x 3.5 + 8x 2.5	No	6x 3.5 + 8x 2.5	6x 3.5 + 8x 2.5	No limit
PCIe adapters (non-GPU)*	No limit	No limit	No limit	No limit	No limit
Maximum GPUs	0	0	2 / 1**	0	4 / 2**

* GPUs use two PCIe slots; therefore, if a GPU is installed, the number of non-GPU adapters that are installed is reduced by two.
** The first number refers to the maximum quantity of single-width adapters supported and the second number refers to double-wide adapters

Table 32. Supported configurations (900W power supplies)

Power supply	**900 W (1A)**	**900 W (2A)**	**900 W (2B)**	**900 W (2C)**	**900 W (2D)**	**900 W (2E)**	**900 W (2F)**
Maximum processors	1	2	2	2	2, max 135W	2, max 90W	2, max 120W
Memory maximums (mutually exclusive)							
RDIMMs	No limit	No limit	No limit	No limit	No limit	12	12
LRDIMMs	0	12	0	No limit	0	0	12
Drive maximums (mutually exclusive)							
3.5-inch drives only	No limit	No limit	6	6	No limit	6	No limit
2.5-inch drives only	No limit	24	8	8	No limit	8	16
Intermix 3.5-in and 2.5-in drives	No limit	No limit	0	0	No limit	0	6x 3.5 + 8x 2.5
PCIe adapters (non-GPU)*	No limit	No limit	No limit	No limit	No limit	2	4
Maximum GPUs	2 / 1**	0	2 / 1**	0	0	4 / 2**	1 / 0**

* GPUs use two PCIe slots; therefore, if a GPU is installed, the number of non-GPU adapters that are installed is reduced by two.
** The first number refers to the maximum quantity of single-width adapters supported and the second number refers to double-wide adapters

AC power supply options ships without a line cord, it must be purchased separately. Line cords and rack cables can be ordered if needed, as listed in the following table.

Table 33. Power cables

Part number	Feature code	Description
Rack power cables		
39Y7932	6263	4.3m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable
39Y7937	6201	1.5m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable
39Y7938	6204	IEC309 C20 to C13 rack jumper cable
Power cords		
39Y7917	6212	European 10A line C13 to CEE 7/7 (2.8M)
39Y7918	6213	Denmark 10A line C13 to DK2-5A (2.8M)
39Y7919	6216	Switzerland 10A line C13 to SEV 1011 (2.8M)
39Y7920	6218	Israel 10A line C13 to SI 32 (2.8M)
39Y7921	6217	Italy 10A line C13 to CEE 7/7 (2.8M)
39Y7922	6214	South Africa 10A line C13 to SABS 164/1 (2.8M)
39Y7923	6215	United Kingdom 10A line C13 to BS 1363 (2.8M)
39Y7924	6211	Australia/NZ 10A line C13 to SAA-AS C112 (2.8M)
39Y7925	6219	Korea 7A line C13 to KETI 15A/250V (2.8M)
39Y7927	6269	India 6A line C13 to Fig 68 (2.8M)
39Y7928	6210	China 6A line C13 to GB 2099.1 (2.8M)
39Y7929	6223	Brazil 10A line C13 to NBR 6147 (2.8M)
39Y7930	6222	Argentina 10A line C13 to IRAM 2063 (2.8M)
39Y7931	6207	Power Cable - C13 / NEMA 5-15P 14ft
00CG265	A53E	Power Cord Taiwan AC plug 10A/250V, 2.8M; OPT
00CG267	A53F	Power Cord Taiwan AC plug 15A/125V; 2.8M; OPT
46M2592	A1RF	10A/250V C13 to NEMA 6-15P 2.8m line cord
46M2593	A1RE	Japan 12A/125V C13 to JIS C-8303 2.8m line cord

Integrated virtualization

The server supports the VMware vSphere (ESXi) hypervisor on one or two SD cards with the optional SD Media Adapter for System x. This adapter is in a dedicated connector on the system board.

Figure 13. SD Media Adapter with one SD Card installed

When only one SD card is installed in the adapter, you can create up to 16 volumes, each of which is presented to UEFI as a bootable device. When two SD Media cards are inserted, volumes can be mirrored (RAID 1) across both cards, up to a total of eight mirrored volumes. The use of mirrored volumes improves system availability because the server remains operational, even if one SD card fails. The RAID functionality is handled internally by the SD Media Adapter.

The following table shows the available options. The table also indicates whether the option includes the SD Media RAID Adapter and how many SD cards are included.

Table 34. Virtualization options

Part number	Feature code	Description	Includes Adapter	SD Cards Included
00ML706	A5TJ	SD Media Adapter for Systems x (Option 00ML706 includes 2 blank 32GB SD cards)	Yes	2*
00ML700	AS2V	Blank 32GB SD Media for System x	No	1
None**	AS4B	RAID Adapter for SD Media w/ VMware ESXi 5.1 U2 (2 SD Media, RAIDed)	Yes	2
None**	AS4C	RAID Adapter for SD Media w/ VMware ESXi 5.5 U2 (2 SD Media, RAIDed)	Yes	2
None**	ASCG	RAID Adapter for SD Media w/ VMware ESXi 5.1 U2 (1 SD Media)	Yes	1
None**	ASCH	RAID Adapter for SD Media w/ VMware ESXi 5.5 U2 (1 SD Media)	Yes	1

* Option 00ML706 includes two 32GB SD cards; however, for CTO orders, feature code A5TJ does not include SD media and the 32GB cards and VMware vSphere preload must be selected separately.
** CTO only.

The server also supports VMware ESXi installed on a USB memory key. The key is installed in a USB socket inside the server. The following table lists the virtualization options.

Table 35. Virtualization options - USB memory keys

Part number	Feature code	Description	Maximum supported
00WH140	ATRM	Blank USB Memory Key 4G SLC for VMware ESXi Downloads	1
41Y8298	A2G0	IBM Blank USB Memory Key for VMware ESXi Downloads	1
00ML233	ASN6	USB Memory Key for VMware ESXi 5.1 Update 2	1
00WH138	ATRL	USB Memory Key 4G for VMware ESXi 6.0 Update 1A	1

Systems management

The server contains IMM2.1, which provides advanced service-processor control, monitoring, and an alerting function. If an environmental condition exceeds a threshold or if a system component fails, the IMM2.1 lights LEDs to help you diagnose the problem, records the error in the event log, and alerts you to the problem. Optionally, the IMM2.1 also provides a virtual presence capability for remote server management capabilities.

The IMM provides remote server management through the following industry-standard interfaces:

- Intelligent Platform Management Interface (IPMI) Version 2.0
- Simple Network Management Protocol (SNMP) Version 3
- Common Information Model (CIM)
- Web browser

The optional Integrated Management Module Advanced Upgrade is required for enabling remote presence and blue-screen capture features. The remote presence feature provides the following functions:

- Remotely viewing video with graphics resolutions up to 1600x1200 at 75 Hz with up to 23 bits per pixel colors, regardless of the system state
- Remotely accessing the server by using the keyboard and mouse from a remote client
- Mapping the CD or DVD drive, diskette drive, and USB flash drive on a remote client, and mapping ISO and diskette image files as virtual drives that are available for use by the server
- Uploading a diskette image to the IMM memory and mapping it to the server as a virtual drive

The blue-screen capture feature captures the video display contents before the IMM restarts the server when the IMM detects an operating-system hang condition. A system administrator can use the blue-screen capture to assist in determining the cause of the hang condition. The following table lists the remote management option.

Table 36. Remote management option

Part number	Feature code	Description	Maximum supported
90Y3901	A1ML	Integrated Management Module Advanced Upgrade	1

All standard models include basic light path diagnostics, which include system LEDs on the front of the server (see the following figure) and LEDs near the monitored components (for example, the DIMM error LED on the system board). The server also offers an optional upgrade to supply another array of light path diagnostic LEDs on the front of the chassis.

The following table lists the ordering information for the light path diagnostics panel upgrade kit.

Table 37. Light path diagnostics option

Part number	Feature code	Description	Maximum supported
00AL566	A5N3	System x3500 M5 Lightpath Upgrade Kit	1

The following figure shows the meaning of each LED.

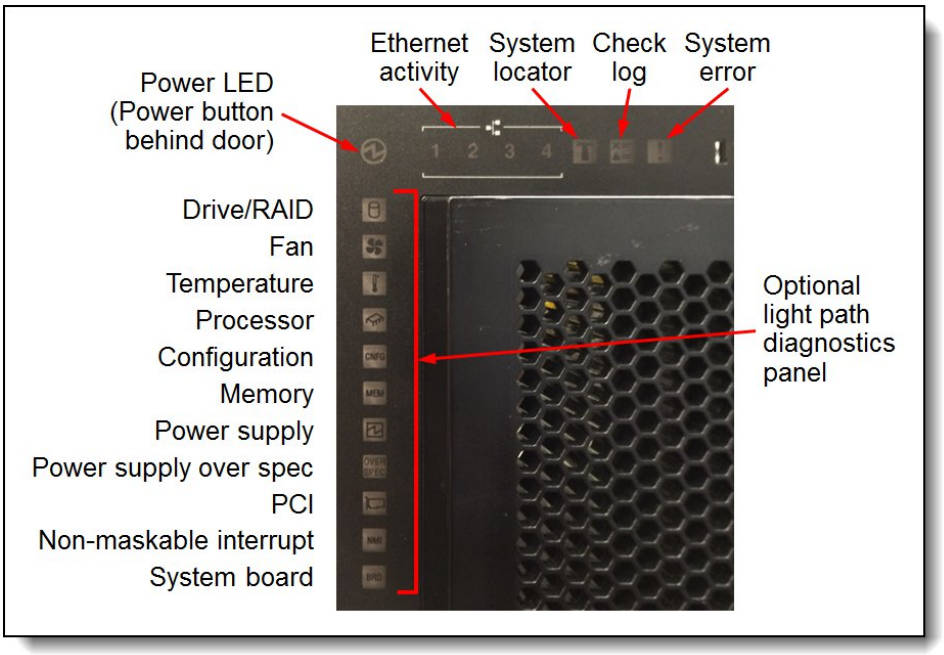


Figure 14. System LEDs and the optional light path diagnostics panel

Note: The light path diagnostics panel upgrade kit supplies the array of LEDs that is mounted in a bracket that is installed inside the server, as shown in the following figure. The light path diagnostics indicators are still visible on the front of the server, even if the upgrade kit is not installed.

Figure 15. System x3500 M5 Lightpath Upgrade Kit

IBM Security Key Lifecycle Manager for System x SEDs - FoD (SKLM - FoD) is an optional feature, which is available in System x environments that centralizes, simplifies, and automates the data encryption key management process to help minimize risk and reduce operational costs. SKLM - FoD offers a simple and robust solution for key storage, key serving, and key lifecycle management for self-encrypting drives (SEDs) in local and distributed System x environments. The FoD upgrade can be configured with the ServeRAID M5210 and M1215 RAID controllers paired with SEDs. The following table lists SKLM-FoD part numbers.

Table 38. Security Key Lifecycle Manager - FoD part numbers

Part number	Feature code	Description	Maximum supported
United States, Canada, Asia Pacific and Japan			
00D9998	A5U1	IBM SKLM for System x w/SEDs - FoD per Install w/1Yr S&S	1
00D9999	AS6C	IBM SKLM for System x w/SEDs - FoD per Install w/3Yr S&S	1
Latin America, Europe, Middle East and Africa			
00FP648	A5U1	IBM SKLM for System x w/SEDs - FoD per Install w/1Yr S&S	1
00FP649	AS6C	IBM SKLM for System x w/SEDs - FoD per Install w/3Yr S&S	1

Keyboards and Mice

The following table lists the supported full-sized USB keyboards and mice available for Lenovo System x 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 39. Lenovo Preferred Pro USB Full-sized keyboards - System x

Part number	Feature code	Description
Mice		
7M57A04698	B0LN	ThinkSystem Optical Wheel Mouse - USB
Keyboards		
4X37A09180	B22Q	Preferred Pro II USB Keyboard - Arabic 8827
4X37A09181	B22R	Preferred Pro II USB Keyboard - Arabic/French 8827
4X37A09182	B22S	Preferred Pro II USB Keyboard - Belgium/French 8827
4X37A09183	B22T	Preferred Pro II USB Keyboard - Belgium/UK 8827
4X37A09184	B22U	Preferred Pro II USB Keyboard - Brazil/Portuguese 8827
4X37A09185	B22V	Preferred Pro II USB Keyboard - Bulgarian 8827
4X37A09186	B22W	Preferred Pro II USB Keyboard - Chinese/US 8827
4X37A09187	B22X	Preferred Pro II USB Keyboard - Czech 8827
4X37A09188	B22Y	Preferred Pro II USB Keyboard - Danish 8827
4X37A09189	B22Z	Preferred Pro II USB Keyboard - Dutch 8827

Part number	Feature code	Description
4X37A09190	B230	Preferred Pro II USB Keyboard - French 8827
4X37A09192	B232	Preferred Pro II USB Keyboard - French Canadian French 8827
4X37A09191	B231	Preferred Pro II USB Keyboard - French Canadian Multilingual 8827
4X37A09193	B233	Preferred Pro II USB Keyboard - German 8827
4X37A09194	B234	Preferred Pro II USB Keyboard - Greek 8827
4X37A09195	B235	Preferred Pro II USB Keyboard - Hebrew 8827
4X37A09196	B236	Preferred Pro II USB Keyboard - Hungarian 8827
4X37A09197	B237	Preferred Pro II USB Keyboard - Iceland 8827
4X37A09198	B238	Preferred Pro II USB Keyboard - Italy 8827
4X37A09199	B239	Preferred Pro II USB Keyboard - Japanese 8827
4X37A09200	B23A	Preferred Pro II USB Keyboard - Korean 8827
4X37A09201	B23B	Preferred Pro II USB Keyboard - LA Spanish 8827
4X37A09202	B23C	Preferred Pro II USB Keyboard - Norwegian 8827
4X37A09203	B23D	Preferred Pro II USB Keyboard - Polish 8827
4X37A09204	B23E	Preferred Pro II USB Keyboard - Portugese 8827
4X37A09205	B23F	Preferred Pro II USB Keyboard - Romanian 8827
4X37A09206	B23G	Preferred Pro II USB Keyboard - Russian/Cy 8827
4X37A09207	B23H	Preferred Pro II USB Keyboard - Serbian/Cyrilic 8827
4X37A09208	B23J	Preferred Pro II USB Keyboard - Slovak 8827
4X37A09217	B23T	Preferred Pro II USB Keyboard - Slovenian 8827
4X37A09209	B23K	Preferred Pro II USB Keyboard - Spanish 8827
4X37A09210	B23L	Preferred Pro II USB Keyboard - Swedish/Finn 8827
4X37A09211	B23M	Preferred Pro II USB Keyboard - Swiss, F/G 8827
4X37A09212	B23N	Preferred Pro II USB Keyboard - Thailand 8827
4X37A09214	B23Q	Preferred Pro II USB Keyboard - Turkish 179 8827
4X37A09213	B23P	Preferred Pro II USB Keyboard - Turkish 440 8827
4X37A09215	B23R	Preferred Pro II USB Keyboard - UK English 8827
4X37A09179	B22P	Preferred Pro II USB Keyboard - US English 8827
4X37A09216	B23S	Preferred Pro II USB Keyboard - US Euro 8827

Rack installation

The x3500 M5 server can be installed in the rack with the Tower to Rack Conversion Kit (00AL538). The resulting server is a 5U rack-mountable server, as shown in the following figure.

Figure 16. The x3500 M5 with the 5U Tower to Rack Conversion Kit (included slide kit shown)

The Tower to Rack Conversion Kit (00AL538) includes a cable management arm; however, standard rack models (for example, 5464-C3x and G3x) do not include a cable management arm. Therefore, the arm must be ordered separately by using part number 00KC334.

The part numbers are summarized in the following table.

Table 40. Rack installation options

Part number	Feature code	Description
00KC334	ARZ2	System x3500 M5 Cable Management Kit
00AL538	A5N4	System x3500 M5 Tower to Rack Conversion Kit

Operating system support

The server supports the following operating systems:

- Microsoft Windows Server 2008 R2 SP1
- Microsoft Windows Server 2012
- Microsoft Windows Server 2012 R2
- Microsoft Windows Server 2016
- Microsoft Windows Server, version 1709
- Red Hat Enterprise Linux 6.10 x64
- Red Hat Enterprise Linux 6.5 x64
- Red Hat Enterprise Linux 6.6 x64
- Red Hat Enterprise Linux 6.7 x64
- Red Hat Enterprise Linux 6.8 x64
- Red Hat Enterprise Linux 7.0
- Red Hat Enterprise Linux 7.1
- Red Hat Enterprise Linux 7.2
- Red Hat Enterprise Linux 7.3
- Red Hat Enterprise Linux 7.4
- Red Hat Enterprise Linux 7.5
- Red Hat Enterprise Linux 7.6
- Red Hat Enterprise Linux 7.7
- SUSE Linux Enterprise Server 11 Xen x64 SP3
- SUSE Linux Enterprise Server 11 Xen x64 SP4
- SUSE Linux Enterprise Server 11 x64 SP3
- SUSE Linux Enterprise Server 11 x64 SP4
- SUSE Linux Enterprise Server 12
- SUSE Linux Enterprise Server 12 SP1
- SUSE Linux Enterprise Server 12 SP2
- SUSE Linux Enterprise Server 12 SP3
- SUSE Linux Enterprise Server 12 SP4
- SUSE Linux Enterprise Server 12 Xen
- SUSE Linux Enterprise Server 12 Xen SP1
- SUSE Linux Enterprise Server 12 Xen SP2
- SUSE Linux Enterprise Server 12 Xen SP3
- SUSE Linux Enterprise Server 12 Xen SP4
- VMware ESXi 5.1 U1
- VMware ESXi 5.1 U2
- VMware ESXi 5.1 U3
- VMware ESXi 5.5 U2
- VMware ESXi 5.5 U3
- VMware ESXi 6.0
- VMware ESXi 6.0 U1
- VMware ESXi 6.0 U2
- VMware ESXi 6.0 U3
- VMware ESXi 6.5
- VMware ESXi 6.5 U1
- VMware ESXi 6.5 U2
- VMware ESXi 6.5 U3
- VMware ESXi 6.7
- VMware ESXi 6.7 U1
- VMware ESXi 6.7 U2
- VMware ESXi 6.7 U3

For a complete list of supported, certified and tested operating systems, plus additional details and links to relevant web sites, see the Operating System Interoperability Guide:
https://lenovopress.com/osig#servers=x3500-m5-5464

Physical and electrical specifications

The server features the following dimensions and weight (approximate):

- Tower:
  - Width: 218 mm (8.6 in)
  - Depth: 720 mm (28.3 in)
  - Height: 440 mm (17.25 in)
  - Weight fully configured: 45.5 kg (100.3 lb)
  - Weight minimum configuration: 30.8 kg (67.9 lb)
- With rack conversion kit:
  - Width: 423 mm (16.6 in)
  - Depth: 706 mm (27.8 in)
  - Height: 218 mm (8.6 in)
  - Weight fully configured: 44.2 kg (97.4 lb)
  - Weight minimum configuration: 29.5 kg (65 lb) minimum configuration

The server features the following supported environment:

- Design to ASHRAE Class A3, ambient of 36 °C to 40 °C (96.8 °F to 104 °F), with relaxed support:
  - Supports cloud-like workload with no performance degradation acceptable (Turbo-Off).
  - Under no circumstance can any combination of worst-case workload and configuration result in system shutdown or design exposure at 40 °C.
  - The worst-case workload (like Linpack, Turbo-On) might have performance degradation.
- Air temperature:
  - Server on: 5 - 40 °C (41 to 104 °F); altitude: 0 - 950 m (3,100 ft)
  - Server on: 5 - 28 °C (41 - 82 °F); altitude: 915 m (3,000 ft) - 3050 m (10,000 ft)
  - Server off (with standby power): 5 - 45 °C (41 - 113 °F)
  - Storage: 1 - 60 °C (34 - 140 °F)
  - Shipping: -40 - 60 °C (-40 - 140 °F)
- Humidity: 8 - 85%, Max. Dew Point 24 °C
- Electrical:
  - Models with 1500 W AC power supplies:
    - 200 - 240 (nominal) V ac; 50 Hz or 60 Hz; 8.35 A
    - Input kilovolt-amperes (kVA) (approximately):
      - Minimum configuration: 0.10 kVA
      - Maximum configuration: 1.967 kVA
  - Models with 900 W AC power supplies:
    - 100 - 127 (nominal) V ac; 50 Hz or 60 Hz; 10.3 A
    - 200 - 240 (nominal) V ac; 50 Hz or 60 Hz; 5.0 A
    - Input kilovolt-amperes (kVA) (approximately):
      - Minimum configuration: 0.15 kVA
      - Maximum configuration: 1.194 kVA
  - Models with 750 W Platinum AC power supplies:
    - 100 - 127 (nominal) V ac; 50 Hz or 60 Hz; 8.6 A
    - 200 - 240 (nominal) V ac; 50 Hz or 60 Hz; 4.2 A
    - Input kilovolt-amperes (kVA) (approximately):
      - Minimum configuration: 0.15 kVA
      - Maximum configuration: 1.015 kVA
  - Models with 750 W Titanium AC power supplies:
    - 200 - 240 (nominal) V ac; 50 Hz or 60 Hz; 4.2 A
    - Input kilovolt-amperes (kVA) (approximately):
      - Minimum configuration: 0.15 kVA
      - Maximum configuration: 0.965 kVA

    - Models with 550 W AC power supplies:
        - 100 to 127 (nominal) V ac; 50 Hz or 60 Hz; 6.5 A
        - 200 to 240 (nominal) V ac; 50 Hz or 60 Hz; 3.3 A
        - Input kilovolt-amperes (kVA) (approximately):
            - Minimum configuration: 0.16 kVA
            - Maximum configuration: 0.732 kVA
- BTU output:
    - Base configuration: 2931 Btu/hr (859 watts)
    - Maximum configuration: 4043 Btu/hr (1185 watts)
- Acoustical noise emissions:
    - Sound power, idling: 6.0 bels
    - Sound power, operating: 6.0 bels

Warranty options

The system has a three-year warranty with 24x7 standard call center support and 9x5 Next Business Day onsite coverage. Also available are Lenovo Services warranty maintenance upgrades and post-warranty maintenance agreements, with a well-defined scope of services, including service hours, response time, term of service, and service agreement terms and conditions.

Lenovo warranty service upgrade offerings are region-specific. Not all warranty service upgrades are available in every region. For more information about Lenovo warranty service upgrade offerings that are available in your region, go to the Data Center Advisor and Configurator website http://dcsc.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 in 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 41. Warranty service definitions

Term	Description
On-site service	A service technician will arrive at the client's location for equipment service.
24x7x2 hour	A service technician is scheduled to arrive at the client's location within two hours after remote problem determination is completed. Lenovo provides service around the clock, every day, including Lenovo holidays.
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.
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. Next business day service is not guaranteed.
Committed Repair	Problems receive priority handling so that repairs are completed within the committed time of 6, 8, or 24 hours. Lenovo provides service 24 hours/day, every day, including Lenovo holidays.

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 from next business day to 2 or 4 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
  - Committed repair service levels are measured within the following coverage hours:
    - 24x7x6: Service performed 24 hours per day, 7 days per week, within 6 hours
    - 24x7x8: Service performed 24 hours per day, 7 days per week, within 8 hours
    - 24x7x24: Service performed 24 hours per day, 7 days per week, within 24 hours
- Hard Disk Drive Retention
  Lenovo's Hard Disk Drive Retention (HDDR) 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. The Hard Drive Retention service can be purchased in convenient bundles with our 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 region and can be bundled with other warranty upgrades and extensions.
- Remote Technical Support Services (RTS)
  RTS provides comprehensive technical call center support for covered servers, storage, operating systems, and applications. Providing a single source for support of hardware and software issues, RTS can reduce problem resolution time, decreasing the cost to address technical problems and increasing uptime. Offerings are available for Windows, Linux, IBM Systems Director, VMware, Microsoft business applications, and Lenovo System x storage devices, and IBM OEM storage devices.

Regulatory compliance

The server conforms to the following standards:

- Energy Star 2.1
- FCC - Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, issue 5, Class A
- UL/IEC 60950-1
- CSA C22.2 No. 60950-1-07
- NOM-019
- Argentina IEC60950-1
- Japan VCCI, Class A
- IEC-60950-1 (CB Certificate and CB Test Report)
- Australia/New Zealand AS/NZS CISPR 22:2006, Class A; AS/NZS 60950.1
- Taiwan BSMI CNS13438, Class A ;CNS14336-1
- GB9254 Class A, GB17625.1
- China CCC GB4943.1
- Korea KN22, Class A; KN24

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.

The following table lists the 6 Gbps SAS external drive enclosures that are offered by Lenovo that can be used with the server for storage expansion.

Table 42. E1012 and E1024 external drive enclosure models

Part number	Description
64111B1	Lenovo Storage E1012 LFF Disk Expansion Single SAS IO Module, Rail Kit, 9x5 NBD
64111B2	Lenovo Storage E1012 LFF Disk Expansion Dual SAS IO Module, Rail Kit, 9x5 NBD
64111B3	Lenovo Storage E1024 SFF Disk Expansion Single SAS IO Module, Rail Kit, 9x5 NBD
64111B4	Lenovo Storage E1024 SFF Disk Expansion Dual SAS IO Module, Rail Kit, 9x5 NBD

For details about supported drives and cables for the Lenovo Storage E1012 and E1024, see the Lenovo Press Product Guide:
http://lenovopress.com/lp0043

The following table lists the 12 Gbps SAS external drive enclosures offered by Lenovo that can be used with the server for storage expansion.

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 43. 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

External storage systems

The following table lists the external storage systems that are currently offered by Lenovo.

Note: Information provided in this section is for ordering reference purposes only. End-to-end storage configuration support *must* be verified through the interoperability matrix for a particular storage system that can be found on the Lenovo Data Center Support web site:
http://datacentersupport.lenovo.com

Table 44. External storage systems: DE Series

Description	Part number	
	Worldwide	Japan
Lenovo ThinkSystem DE Series Storage (SAS connectivity)		
Lenovo ThinkSystem DE2000H SAS Hybrid Flash Array LFF	7Y70A000WW	7Y701003JP
Lenovo ThinkSystem DE2000H SAS Hybrid Flash Array SFF	7Y71A000WW	7Y711003JP
Lenovo ThinkSystem DE4000H SAS Hybrid Flash Array 4U60	7Y77A002WW	7Y771000JP
Lenovo ThinkSystem DE4000H SAS Hybrid Flash Array LFF	7Y74A000WW	7Y74A000JP
Lenovo ThinkSystem DE4000H SAS Hybrid Flash Array SFF	7Y75A000WW	7Y75A000JP
Lenovo ThinkSystem DE4000F SAS All Flash Array SFF	7Y76A000WW	7Y76A000JP
Lenovo ThinkSystem DE6000H SAS Hybrid Flash Array 4U60	7Y80A000WW	7Y801002JP
Lenovo ThinkSystem DE6000H SAS Hybrid Flash Array SFF	7Y78A000WW	7Y781002JP
Lenovo ThinkSystem DE6000F SAS All Flash Array SFF	7Y79A000WW	7Y79A000JP
Lenovo ThinkSystem DE Series Storage (iSCSI connectivity)		
Lenovo ThinkSystem DE2000H 10GBASE-T Hybrid Flash Array LFF	7Y70A003WW	7Y701001JP
Lenovo ThinkSystem DE2000H 10GBASE-T Hybrid Flash Array SFF	7Y71A002WW	7Y711005JP
Lenovo ThinkSystem DE2000H iSCSI Hybrid Flash Array LFF	7Y70A004WW	7Y701000JP
Lenovo ThinkSystem DE2000H iSCSI Hybrid Flash Array SFF	7Y71A003WW	7Y711006JP
Lenovo ThinkSystem DE4000H iSCSI Hybrid Flash Array 4U60	7Y77A000WW	7Y771002JP
Lenovo ThinkSystem DE4000H iSCSI Hybrid Flash Array LFF	7Y74A002WW	7Y74A002JP
Lenovo ThinkSystem DE4000H iSCSI Hybrid Flash Array SFF	7Y75A001WW	7Y75A001JP
Lenovo ThinkSystem DE4000F iSCSI All Flash Array SFF	7Y76A002WW	7Y76A002JP
Lenovo ThinkSystem DE6000H iSCSI Hybrid Flash Array 4U60	7Y80A002WW	7Y801000JP
Lenovo ThinkSystem DE6000H iSCSI Hybrid Flash Array SFF	7Y78A002WW	7Y781000JP
Lenovo ThinkSystem DE6000F iSCSI All Flash Array SFF	7Y79A002WW	7Y79A002JP
Lenovo ThinkSystem DE Series Storage (FC connectivity)		
Lenovo ThinkSystem DE2000H FC Hybrid Flash Array LFF	7Y70A002WW	7Y701002JP
Lenovo ThinkSystem DE2000H FC Hybrid Flash Array SFF	7Y71A001WW	7Y711004JP
Lenovo ThinkSystem DE4000H FC Hybrid Flash Array 4U60	7Y77A001WW	7Y771001JP
Lenovo ThinkSystem DE4000H FC Hybrid Flash Array LFF	7Y74A001WW	7Y74A001JP
Lenovo ThinkSystem DE4000H FC Hybrid Flash Array SFF	7Y75A002WW	7Y75A002JP
Lenovo ThinkSystem DE4000F FC All Flash Array SFF	7Y76A001WW	7Y76A001JP
Lenovo ThinkSystem DE6000H FC Hybrid Flash Array 4U60	7Y80A001WW	7Y801001JP
Lenovo ThinkSystem DE6000H FC Hybrid Flash Array SFF	7Y78A001WW	7Y781001JP
Lenovo ThinkSystem DE6000F FC All Flash Array SFF	7Y79A001WW	7Y79A001JP

Table 45. External storage systems: DM Series

Description	Part number
Lenovo ThinkSystem DM Series Storage (iSCSI or FC connectivity)	
Lenovo ThinkSystem DM3000H Hybrid Storage Array (2U12 LFF, CTO only)	7Y42CTO1WW
Lenovo ThinkSystem DM3000H 48TB (12x 4TB HDDs) (Universal SFP+)	7Y420001EA*
Lenovo ThinkSystem DM3000H 48TB (12x 4TB HDDs) (10GBASE-T)	7Y420002EA*
Lenovo ThinkSystem DM5000H Hybrid Storage Array (2U24 SFF, CTO only)	7Y57CTO1WW
Lenovo ThinkSystem DM5000H 11.5TB (12x 960GB SSDs) (Universal SFP+)	7Y570001EA*
Lenovo ThinkSystem DM5000H 11.5TB (12x 960GB SSDs) (10GBASE-T)	7Y570002EA*
Lenovo ThinkSystem DM5000H 29TB (24x 1.2TB 10K HDDs) (Universal SFP+)	7Y570003EA*
Lenovo ThinkSystem DM5000H 29TB (24x 1.2TB 10K HDDs) (10GBASE-T)	7Y570004EA*
Lenovo ThinkSystem DM5000F Flash Storage Array (2U24 SFF, CTO only)	7Y41CTO1WW
Lenovo ThinkSystem DM7000H Hybrid Storage Array (3U, CTO only)	7Y56CTO1WW
Lenovo ThinkSystem DM7000F Flash Storage Array (3U, CTO only)	7Y40CTO1WW

* Available only in EMEA.

Table 46. External storage systems: DS Series

Description	Part number		
	Worldwide	Japan	PRC
Lenovo ThinkSystem DS Series Storage (SAS connectivity)			
Lenovo ThinkSystem DS2200 LFF SAS Dual Controller Unit	4599A41	4599A4J	4599A4C
Lenovo ThinkSystem DS2200 SFF SAS Dual Controller Unit	4599A21	4599A2J	4599A2C
Lenovo ThinkSystem DS4200 LFF SAS Dual Controller Unit	4617A41	4617A4J	4617A4C
Lenovo ThinkSystem DS4200 SFF SAS Dual Controller Unit	4617A21	4617A2J	4617A2C
Lenovo ThinkSystem DS6200 SFF SAS Dual Controller Unit	4619A21	4619A2J	4619A2C
Lenovo ThinkSystem DS Series Storage (iSCSI or FC connectivity)			
Lenovo ThinkSystem DS2200 LFF FC/iSCSI Dual Controller Unit	4599A31	4599A3J	4599A3C
Lenovo ThinkSystem DS2200 SFF FC/iSCSI Dual Controller Unit	4599A11	4599A1J	4599A1C
Lenovo ThinkSystem DS4200 LFF FC/iSCSI Dual Controller Unit	4617A31	4617A3J	4617A3C
Lenovo ThinkSystem DS4200 SFF FC/iSCSI Dual Controller Unit	4617A11	4617A1J	4617A1C
Lenovo ThinkSystem DS6200 SFF FC/iSCSI Dual Controller Unit	4619A11	4619A1J	4619A1C
DS6200F 12x 400GB 10DWD SSDs, 1x 8Gb FC SFP, 512 Snapshots, Replication	4619A1F	4619J1F	4619C1F
DS6200F 12x 800GB 3DWD SSDs, 1x 8Gb FC SFP, 512 Snapshots, Replication	4619A2F	4619J2F	4619C2F
DS6200F 12x 1.6TB 3DWD SSDs, 1x 8Gb FC SFP, 512 Snapshots, Replication	4619A3F	4619J3F	4619C3F
DS6200F 12x 3.84TB 1DWD SSDs, 1x 8Gb FC SFP, 512 Snapshots, Replication	4619A4F	4619J4F	4619C4F

Table 47. External storage systems: V Series and Storwize for Lenovo

Description	Part number
Lenovo Storage V Series (SAS [except V7000/V7000F], iSCSI, or FC connectivity)	
Lenovo Storage V3700 V2 LFF Control Enclosure	6535C1D
Lenovo Storage V3700 V2 SFF Control Enclosure	6535C2D
Lenovo Storage V3700 V2 XP LFF Control Enclosure	6535C3D
Lenovo Storage V3700 V2 XP SFF Control Enclosure	6535C4D
Lenovo Storage V5030 LFF Control Enclosure 3Yr S&S	6536C12
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
Lenovo Storage V7000 SFF Control Enclosure 3Yr S&S PRC	6538R11^
Lenovo Storage V7000 SFF Control Enclosure 5Yr S&S PRC	6538R21^
Lenovo Storage V7000F SFF Control Enclosure 3Yr S&S PRC	6538R1G^
Lenovo Storage V7000F SFF Control Enclosure 5Yr S&S PRC	6538R2G^
IBM Storwize for Lenovo (iSCSI or FC connectivity)	
IBM Storwize V7000 SFF Control Enclosure, 3YR SWMA	6195C32†
IBM Storwize V7000 SFF Control Enclosure, 3YR SWMA, LA	6195C3L‡
IBM Storwize V7000 SFF Control Enclosure, 5YR SWMA	6195C52†
IBM Storwize V7000 SFF Control Enclosure, 5YR SWMA, LA	6195C5L‡

^ Available only in PRC.
† Available worldwide except Latin America.
‡ Available only in Latin America.

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

- Lenovo DE Series, DM Series, DS 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

External backup units

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

Table 48. External backup options

Part number	Description
External RDX USB drives	
362532Y	RDX External USB 3.0 Dock with 320GB Cartridge
362550Y	RDX External USB 3.0 Dock with 500GB Cartridge
36251TY	RDX External USB 3.0 Dock with 1TB Cartridge
External RDX USB drives (ThinkServer)	
4XF0G88929	Lenovo ThinkServer External RDX Tape Drive
External SAS tape backup drives	
6160S6E	IBM TS2260 Tape Drive Model H6S
6160S7E	IBM TS2270 Tape Drive Model H7S
External SAS tape backup autoloaders	
6171S5R	IBM TS2900 Tape Autoloader w/LTO5 HH SAS
6171S6R	IBM TS2900 Tape Autoloader w/LTO6 HH SAS
6171S7R	IBM TS2900 Tape Autoloader w/LTO7 HH SAS
External tape backup libraries	
6741L1U	IBM TS4300 3U Tape Library-Base Unit
6741L3U	IBM TS4300 3U Tape Library-Expansion Unit
Full High 8 Gb Fibre Channel for TS4300	
01KP954	LTO 8 FH Fibre Channel Drive
01KP938	LTO 7 FH Fibre Channel Drive
01KP935	LTO 6 FH Fibre Channel Drive
Half High 8 Gb Fibre Channel for TS4300	
01KP952	LTO 8 HH Fibre Channel Drive
01KP936	LTO 7 HH Fibre Channel Drive
01KP933	LTO 6 HH Fibre Channel Drive
Half High 6 Gb SAS for TS4300	
01KP953	LTO 8 HH SAS Drive
01KP937	LTO 7 HH SAS Drive
01KP934	LTO 6 HH SAS Drive

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

Top-of-rack Ethernet switches

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

Table 49. Ethernet LAN switches

Part number	Description
1 Gb Ethernet Rack switches	
7Y810011WW	Lenovo ThinkSystem NE0152T RackSwitch (Rear to Front)
7Z320O11WW	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)
7165H1X	Juniper EX2300-C PoE Switch
7165H2X	Juniper EX2300-24p PoE Switch
1 Gb Ethernet Campus switches	
7Z340011WW	Lenovo CE0128TB Switch (3-Year Warranty)
7Z360011WW	Lenovo CE0128TB Switch (Limited Lifetime Warranty)
7Z340012WW	Lenovo CE0128PB Switch (3-Year Warranty)
7Z360012WW	Lenovo CE0128PB Switch (Limited Lifetime Warranty)
7Z350021WW	Lenovo CE0152TB Switch (3-Year Warranty)
7Z370021WW	Lenovo CE0152TB Switch (Limited Lifetime Warranty)
7Z350022WW	Lenovo CE0152PB Switch (3-Year Warranty)
7Z370022WW	Lenovo CE0152PB Switch (Limited Lifetime Warranty)
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)
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)
7Z210O21WW	Lenovo ThinkSystem NE2572O RackSwitch (Rear to Front, ONIE)
100 Gb Ethernet switches	
7159D1X	Lenovo ThinkSystem NE10032 RackSwitch (Rear to Front)
7Z210O11WW	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

Fibre Channel SAN switches

The following table lists the Fibre Channel SAN switches that are offered by Lenovo and can be used with this system.

Table 50. Fibre Channel SAN switches

Part number	Description
8 Gb FC	
3873AR6	Lenovo B300, E_Port License, 8 ports licensed, 8x 8Gb SWL SFPs, 1 PS, Rail Kit, 1Yr FW
16 Gb FC	
6559F2A	Lenovo ThinkSystem DB610S, 8 ports licensed, 8x 16Gb SWL SFPs, 1 PS, Rail Kit, 1Yr FW
6559F1A	Lenovo ThinkSystem DB610S, ENT Bundle, 24 ports licensed, 24x 16Gb SWL SFPs, 1 PS, Rail Kit, 1Yr FW
6559D1Y	Lenovo ThinkSystem DB610S, ENT Bundle, 24 ports licensed, 24x 16Gb SWL SFPs, 1 PS, Rail Kit, 3Yr FW
3873ER1	Lenovo B6505, 12 ports licensed, 12x 16Gb SWL SFPs, 1 PS, Rail Kit, 1Yr FW
3873AR5	Lenovo B6505, 12 ports licensed, 12x 16Gb SWL SFPs, 1 PS, Rail Kit, 3Yr FW
3873IR1	Lenovo B6510, 24 ports licensed, 24x 16Gb SWL SFPs, 2 PS, Rail Kit, 1Yr FW
3873BR3	Lenovo B6510, 24 ports licensed, 24x 16Gb SWL SFPs, 2 PS, Rail Kit, 3Yr FW
32 Gb FC	
6559F3A	Lenovo ThinkSystem DB610S, 8 ports licensed, No SFPs, 1 PS, Rail Kit, 1Yr FW
6559D3Y	Lenovo ThinkSystem DB610S, 8 ports licensed, No SFPs, 1 PS, Rail Kit, 3Yr FW
6415G3A	Lenovo ThinkSystem DB620S, 24 ports licensed, No SFPs, 2 PS, Rail Kit, 1Yr FW
6415H11	Lenovo ThinkSystem DB620S, 24 ports licensed, 24x 32Gb SWL SFPs, 2 PS, Rail Kit, 1Yr FW
6415G11	Lenovo ThinkSystem DB620S, 24 ports licensed, 24x 32Gb SWL SFPs, 2 PS, Rail Kit, 3Yr FW
6415H2A	Lenovo ThinkSystem DB620S, ENT Bundle, 48 ports licensed, 48x 32Gb SWL SFPs, 2 PS, Rail Kit, 1Yr FW
7D1SA001WW	Lenovo ThinkSystem DB630S, 48 ports licensed, No SFPs, 2 PS, Rail Kit, 1Yr FW
7D1SA002WW	Lenovo ThinkSystem DB630S, 48 ports licensed, 48x 32Gb SWL SFPs, 2 PS, Rail Kit, 1Yr FW
7D1SA003WW	Lenovo ThinkSystem DB630S, ENT, 96 ports licensed, 96x 32Gb SWL SFPs, 2 PS, Rail Kit, 1Yr FW
6684D2A	Lenovo ThinkSystem DB400D 32Gb FC Director, ENT. Feature set, 4 Blade slots, 8U, 1Yr FW
6684B2A	Lenovo ThinkSystem DB400D 32Gb FC Director, ENT. Feature set, 4 Blade slots, 8U, 3Yr FW
6682D1A	Lenovo ThinkSystem DB800D 32Gb FC Director, ENT. Feature set, 8 Blade slots, 14U, 1Yr FW

For more information, see the list of Product Guides in the Rack SAN Switches category:
http://lenovopress.com/storage/switches/rack#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 51. 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 52. 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

Supported rack cabinets are listed in the following table.

Table 53. Rack cabinets

Part number	Description
Tower to rack conversion kits	
00KC334	System x3500 M5 Cable Management Kit
00AL538	System x3500 M5 Tower to Rack Conversion Kit
Rack cabinets	
201886X	11U Office Enablement Kit
93072RX	25U Standard Rack
93072PX	25U Static S2 Standard Rack
93634EX	42U 1100mm Dynamic Expansion Rack
93634PX	42U 1100mm Dynamic Rack
93604EX	42U 1200mm Deep Dynamic Expansion Rack
93604PX	42U 1200mm Deep Dynamic Rack
93614EX	42U 1200mm Deep Static Expansion Rack
93614PX	42U 1200mm Deep Static Rack
93084EX	42U Enterprise Expansion Rack
93084PX	42U Enterprise Rack
93074RX	42U Standard Rack
93074XX	42U Standard Rack Extension
93624EX	47U 1200mm Deep Static Expansion Rack
93624PX	47U 1200mm Deep Static Rack
93634BX	PureFlex® System 42U Expansion Rack
93634DX	PureFlex System 42U Expansion Rack
93634AX	PureFlex System 42U Rack
93634CX	PureFlex System 42U Rack

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

KVM console options

The following table lists the supported KVM consoles, keyboards, and KVM switches.

Table 54. Console keyboards

Part number	Description
Consoles	
17238BX	1U 18.5" Standard Console (without keyboard)
Console keyboards	
00MW310	Lenovo UltraNav Keyboard USB - US Eng
46W6713	Keyboard w/ Int. Pointing Device USB - Arabic 253 RoHS v2
46W6714	Keyboard w/ Int. Pointing Device USB - Belg/UK 120 RoHS v2

Part number	Description
46W6715	Keyboard w/ Int. Pointing Device USB - Chinese/US 467 RoHS v2
46W6716	Keyboard w/ Int. Pointing Device USB - Czech 489 RoHS v2
46W6717	Keyboard w/ Int. Pointing Device USB - Danish 159 RoHS v2
46W6718	Keyboard w/ Int. Pointing Device USB - Dutch 143 RoHS v2
46W6719	Keyboard w/ Int. Pointing Device USB - French 189 RoHS v2
46W6720	Keyboard w/ Int. Pointing Device USB - Fr/Canada 445 RoHS v2
46W6721	Keyboard w/ Int. Pointing Device USB - German 129 RoHS v2
46W6722	Keyboard w/ Int. Pointing Device USB - Greek 219 RoHS v2
46W6723	Keyboard w/ Int. Pointing Device USB - Hebrew 212 RoHS v2
46W6724	Keyboard w/ Int. Pointing Device USB - Hungarian 208 RoHS v2
46W6725	Keyboard w/ Int. Pointing Device USB - Italian 141 RoHS v2
46W6726	Keyboard w/ Int. Pointing Device USB - Japanese 194 RoHS v2
46W6727	Keyboard w/ Int. Pointing Device USB - Korean 413 RoHS v2
46W6728	Keyboard w/ Int. Pointing Device USB - LA Span 171 RoHS v2
46W6729	Keyboard w/ Int. Pointing Device USB - Norwegian 155 RoHS v2
46W6730	Keyboard w/ Int. Pointing Device USB - Polish 214 RoHS v2
46W6731	Keyboard w/ Int. Pointing Device USB - Portuguese 163 RoHS v2
46W6732	Keyboard w/ Int. Pointing Device USB - Russian 441 RoHS v2
46W6733	Keyboard w/ Int. Pointing Device USB - Slovak 245 RoHS v2
46W6734	Keyboard w/ Int. Pointing Device USB - Spanish 172 RoHS v2
46W6735	Keyboard w/ Int. Pointing Device USB - Swed/Finn 153 RoHS v2
46W6736	Keyboard w/ Int. Pointing Device USB - Swiss F/G 150 RoHS v2
46W6737	Keyboard w/ Int. Pointing Device USB - Thai 191 RoHS v2
46W6738	Keyboard w/ Int. Pointing Device USB - Turkish 179 RoHS v2
46W6739	Keyboard w/ Int. Pointing Device USB - UK Eng 166 RoHS v2
46W6740	Keyboard w/ Int. Pointing Device USB - US Euro 103P RoHS v2
46W6741	Keyboard w/ Int. Pointing Device USB - Slovenian 234 RoHS v2
Console switches	
1754D2X	Global 4x2x32 Console Manager (GCM32)
1754D1X	Global 2x2x16 Console Manager (GCM16)
1754A2X	Local 2x16 Console Manager (LCM16)
1754A1X	Local 1x8 Console Manager (LCM8)
Console switch cables	
43V6147	Single Cable USB Conversion Option (UCO)
39M2895	USB Conversion Option (4 Pack UCO)
46M5383	Virtual Media Conversion Option Gen2 (VCO2)
46M5382	Serial Conversion Option (SCO)

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

Lenovo Financial Services

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https://www.lenovo.com/us/en/landingpage/lenovo-financial-services/

Related publications and links

For more information, see the following resources:

- Installation and Service Guide:
  https://download.lenovo.com/servers_pdf/x3500_m5_5464_isg_en.pdf
- ServerProven hardware compatibility page for the x3500 M5:
  http://www.lenovo.com/us/en/serverproven/xseries/5464.shtml
- x3500 M5 Support Portal (drivers and publications):
  http://support.lenovo.com/us/en/products/servers/lenovo-x86-servers/lenovo-system-x3500-m5
- *xREF: System x Reference*:
  http://lenovopress.com/xref
- Golden Eggs diagram
  http://www.goldeneggs.fi/documents/GE-LENOVO-X3500M5-A.pdf

Related product families

Product families related to this document are the following:

- 2-Socket Tower Servers

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