

System x3500 M4 Product Guide

The System x3500 M4 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 processors, you can reduce costs while maintaining speed and availability.

Suggested use: infrastructure applications, collaboration/email, web, and virtualized desktops in a workgroup or distributed environments.

Figure 1 shows the System x3500 M4.



Figure 1. The System x3500 M4

Did you know?

The x3500 M4 offers a flexible, scalable design and simple upgrade path to 32 HDDs, with up to eight PCIe 3.0 slots and up to 768 GB 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 (IMM2) make it easy to deploy, integrate, service, and manage.

Key features

A high-performance dual-socket tower server, the System x3500 M4, 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 M4 offers numerous features to boost performance, improve scalability, and reduce costs:

- Intel Xeon processor E5-2600 v2 product family
 - Improves productivity by offering superior system performance with 4-core and 6-core processors (up to 3.5 GHz core speeds), 8-core processors (up to 3.3 GHz core speeds), 10-core processors (up to 3.0 GHz), and 12-core processors (up to 2.7 GHz core speeds), up to 30 MB of L3 cache, and up to two 8 GT/s QPI interconnect links.
 - Supports up to two processors, 24 cores, and 48 threads maximize the concurrent execution of multi-threaded applications.
 - Supports up to 1866 MHz memory speeds.
 - Will support up to 768 GB memory with 32 GB LRDIMMs when and if they become available.
- Intel Xeon processor E5-2600 product family
 - Improves productivity by offering superior system performance with 8-core processors and up to 2.9 GHz core speeds, up to 20 MB of L3 cache, and up to two 8 GT/s QPI interconnect links.
 - Supports up to two processors, 16 cores, and 32 threads maximize the concurrent execution of multi-threaded applications.
 - Supports up to 1600 MHz memory speeds.
 - Supports up to 768 GB memory with 32 GB LRDIMMs.
- Intelligent and adaptive system performance with Intel Turbo Boost Technology 2.0 allows CPU cores to run at maximum speeds during peak workloads by temporarily going beyond processor TDP.
- Intel Hyper-Threading Technology boosts performance for multi-threaded applications by enabling simultaneous multi-threading 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 utilize the hardware for virtualization workloads.
- Intel Advanced Vector Extensions (AVX) can significantly improve floating point performance for compute-intensive technical and scientific applications.
- Up to 32 drive bays together with internal backup and optical drive at the same time provide a flexible and scalable all-in-one platform to meet increasing demands.
- Support for 12 Gbps SAS RAID and HBA portfolio.
- The use of solid-state drives (SSDs) instead of or along with traditional spinning 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 that double the network throughput compared with the previous generation of System x® servers.
- The server offers PCI Express 3.0 I/O expansion capabilities that improve the theoretical maximum bandwidth by almost 100% (8 GT/s per link using 128b/130b encoding) compared to the previous generation of PCI Express 2.0 (5 GTps per link using 8b/10b encoding).
- With Intel Integrated I/O Technology, the PCI Express 3.0 controller is integrated into the Intel Xeon processor E5 family. This helps to dramatically reduce I/O latency and increase overall system performance.
- Support for NVIDIA Quadro graphics processing units (GPUs) to maximize computing power.

Availability and serviceability

The x3500 M4 provides many 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.
- The server offers hot-swap drives supporting RAID redundancy for data protection and greater system uptime.
- The server has up to two redundant hot-swap power supplies and up to six simple swap N+N redundant fans to provide availability for business-critical applications.
- The light path diagnostics panel and individual light path LEDs quickly lead the technician to failed (or failing) components. This simplifies servicing, speeds up problem resolution and helps improve system availability.
- The Predictive Failure Analysis (PFA) detects when system components (for example, processors, memory, hard disk drives) operate outside of standard thresholds and generates pro-active alerts in advance of possible failure, therefore increasing uptime.
- Solid-state drives (SSDs) offer significantly better reliability than traditional mechanical HDDs for greater uptime.
- Built-in Integrated Management Module Version II (IMM2) continuously monitors system parameters, triggers alerts, and performs recovering actions in case of failures to minimize downtime.
- Built-in diagnostics 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

Powerful systems management features simplify local and remote management of the x3500 M4:

- The server includes an Integrated Management Module II (IMM2) 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.
- Integrated Trusted Platform Module (TPM) 1.2 support enables advanced cryptographic functionality, such as digital signatures and remote attestation.
- Industry-standard AES NI support for faster, stronger encryption.
- IBM Systems Director is included for proactive systems management. It offers comprehensive systems management tools that help to increase up-time, 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, allowing an application to run in its own isolated space protected from all other software running on a system.

Energy efficiency

The x3500 M4 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.
- The x3500 M4 is Energy Star 2.0 compliant. Energy Star is the trusted, US government-backed symbol for energy efficiency, with the goal of helping customers save money and protect the environment through energy efficient products and practices.
- High-efficient 550 W, 750 W and 900 W power supplies with 80 PLUS Platinum certification.
- The Intel Xeon processor E5-2600 and E5-2600 v2 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 1.35 V DDR3 memory RDIMMs consume 15% less energy than 1.5 V DDR3 RDIMMs.
- Solid state drives (SSDs) consume as much as 80% less power than traditional spinning 2.5-inch HDDs.
- The server uses hexagonal ventilation holes, a part of Calibrated Vecteded Cooling™ technology. Hexagonal holes can be grouped more densely than round holes, providing 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

Figure 2 shows the front of the server.

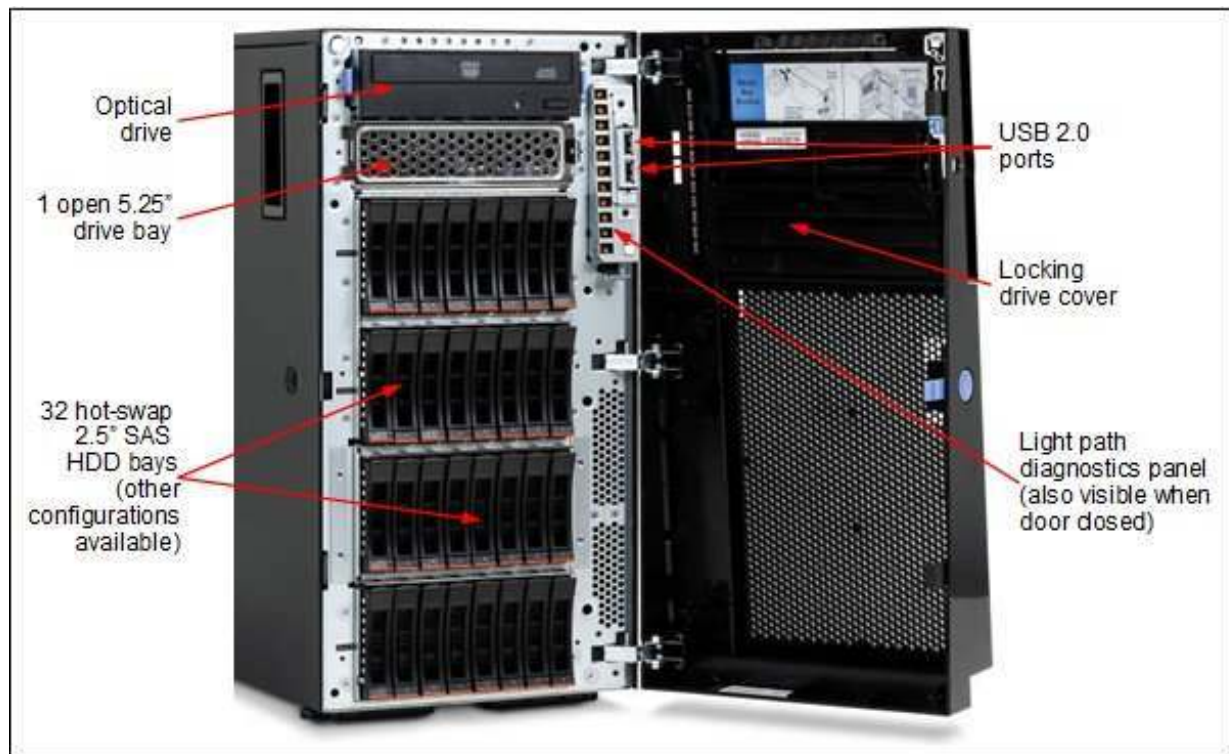


Figure 2. Front view of the System x3500 M4

Figure 3 shows the rear of the server.

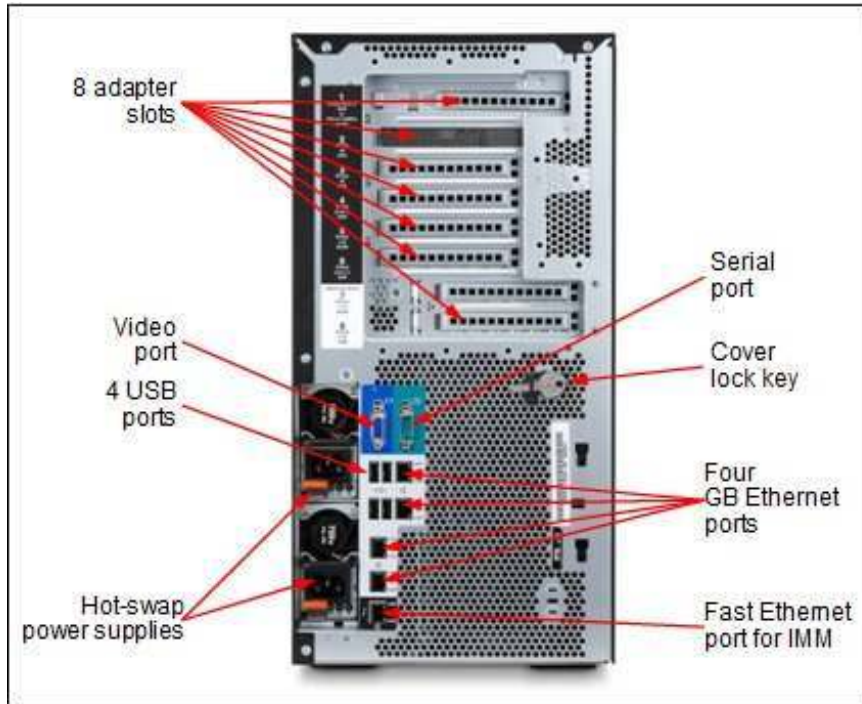


Figure 3. Rear view of the System x3500 M4

Figure 4 shows the locations of key components inside the server.

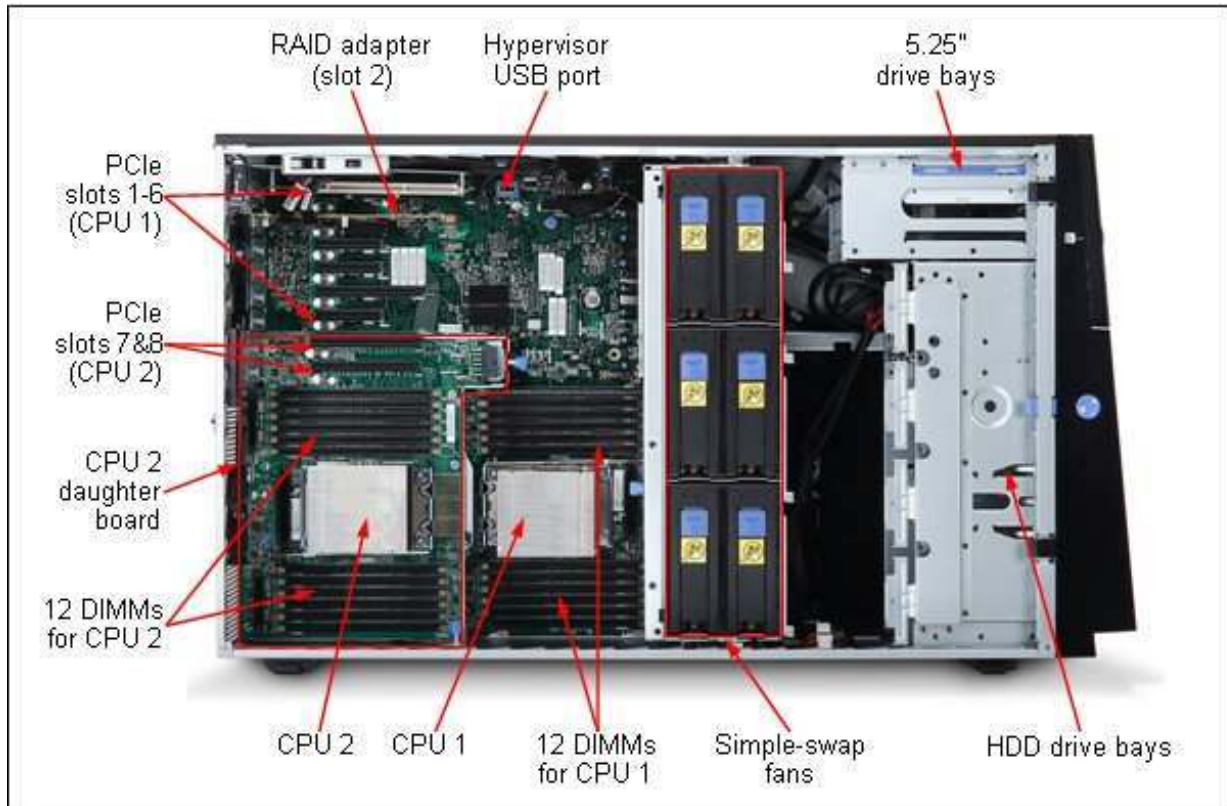


Figure 4. Inside view of the System x3500 M4

Standard specifications

The following table lists the standard specifications.

Table 1. Standard specifications

Components	Specification
Form factor	Tower or 5U Rack.
Processor	E5-2600 v2: Up to two Intel Xeon processor E5-2600 v2 product family CPUs with 12 cores (up to 2.7 GHz) or ten cores (up to 3.0 GHz) or eight cores (up to 3.3 GHz) or six cores (up to 3.5 GHz) or four cores (up to 3.5 GHz). Two QPI links up to 8.0 GT/s each. Up to 1866 MHz memory speed. Up to 30 MB L3 cache. E5-2600: Up to two Intel Xeon processor E5-2600 product family CPUs with eight cores (up to 2.9 GHz) or six cores (up to 2.9 GHz) or quad-cores (up to 3.3 GHz). Two QPI links up to 8.0 GT/s each. Up to 1600 MHz memory speed. Up to 20 MB L3 cache.
Chipset	Intel C602J.
Memory	Up to 24 DDR3 DIMM sockets (12 DIMMs per processor). E5-2600 v2: RDIMMs, UDIMMs, and LRDIMMs (Load Reduced DIMMs) are supported. Memory types cannot be intermixed. Memory speed up to 1866 MHz. E5-2600: RDIMMs, UDIMMs, and LRDIMMs are supported, but memory types cannot be intermixed.
Memory maximums	E5-2600 v2: <ul style="list-style-type: none"> • With UDIMMs: Up to 128 GB with 16x 8 GB UDIMMs and two processors. • With RDIMMs: Up to 384 GB with 24x 16 GB RDIMMs and two processors • With LRDIMMs: Up to 768 GB with 24x 32 GB LRDIMMs and two processors E5-2600: <ul style="list-style-type: none"> • With LRDIMMs: Up to 768 GB with 24x 32 GB LRDIMMs and two processors. • With RDIMMs: Up to 384 GB with 24x 16 GB RDIMMs and two processors. • With UDIMMs: Up to 64 GB with 16x 4 GB UDIMMs and two processors.
Memory protection	ECC, Chipkill (for x4-based memory DIMMs), memory mirroring, and memory rank sparing.
Disk drive bays	Up to 32 2.5" hot-swap SAS/SATA HDDs, or up to eight 3.5" hot-swap SAS/SATA HDDs, or up to eight 3.5" Simple Swap SATA HDDs.
Maximum internal storage	38.4 TB with 1.2 TB 2.5" SAS HDDs, or 32 TB with 1 TB 2.5" SATA HDDs, or 32 TB with 4 TB 3.5" SATA HDDs, or 51.2 TB with 1.6 TB 2.5" SAS SSDs. Intermix of SAS/SATA is supported.
RAID support	6 Gb SAS/SATA: RAID 0, 1, 10 with M1115 or M5110. Optional upgrade to RAID 5, 50 available for M1115. Optional upgrades to RAID 5, 50 are available for M5110 (zero-cache; 512 MB battery-backed cache; 512 MB or 1 GB flash-backed cache). Optional upgrade to RAID 6, 60 available for M5110 with 512 MB or 1 GB cache upgrades. 12 Gb SAS/SATA: RAID 0, 1, 10 with optional M5210. Optional upgrades to RAID 5, 50 are available for M5210 (zero-cache; 1 GB non-backed cache; 1 GB or 2 GB flash-backed cache). Optional upgrade to RAID 6, 60 for M5210 with 1 GB or 2 GB cache upgrades.
Optical drive bays	Two half-height 5.25" bays for optical or tape drives. Supports DVD-ROM or Multiburner.
Tape drive bays	Two half-height 5.25" bays for optical or tape drives. Support for one RDX or DDS internal USB tape drive. Supports up to two LTO internal SAS tape drives.
Network interfaces	Four integrated Gigabit Ethernet 1000BASE-T ports (RJ-45) based on Intel I350AM4 Quad Port GbE LAN Controller chip.

Components	Specification
PCI Expansion slots	Up to eight slots with two processors and six slots when one CPU is installed. All slots are PCIe 3.0 slots except Slot 1, which is a Gen 2 slot: <ul style="list-style-type: none"> Slot 1: PCIe x8 (x4 wired); full-height, half-length (supports optional PCI-X 64 bit/133 MHz interposer card) Slot 2: PCIe x8; full-height, half-length Slot 3: PCIe x8; full-height, full-length Slot 4: PCIe x8 (x4 wired); full-height, full-length Slot 5: PCIe x16; full-height, full-length Slot 6: PCIe x8 (x4 wired); full-height, full-length Slot 7: PCIe x16; full-height, full-length (requires second processor) Slot 8: PCIe x16; full-height, full-length (requires second processor)
Ports	Two USB 2.0 ports on front. Four USB 2.0, one DB-15 video, one DB-9 serial, one RJ-45 systems management, four RJ-45 GbE network ports on rear. Two internal USB ports (for embedded hypervisor and internal tape drive).
Cooling	Calibrated Vectored Cooling with up to six simple swap fans (two fans shipped standard on single processor models and three fans shipped on dual processor models) with optional N+N redundancy available .
Power supply	Up to two redundant hot-swap 550 W ac, 750 W ac or 900 W ac power supplies (80 PLUS Platinum certification).
Hot-swap parts	Hard drives, power supplies.
Systems management	UEFI, Integrated Management Module II (IMM2), Predictive Failure Analysis, Light Path Diagnostics, Automatic Server Restart, IBM Systems Director and IBM Systems Director Active Energy Manager, ServerGuide. Optional Integrated Management Module Advanced Upgrade via Feature on Demand (FoD) for remote presence (graphics, keyboard and mouse, virtual media).
Security features	Power-on password, administrator's password, Trusted Platform Module (TPM).
Video	Matrox G200eR2 with 16 MB memory integrated into the IMM2. Maximum resolution is 1600x1200 at 75 Hz with 16 M colors.
Operating systems supported	Microsoft Windows Server 2008 R2, 2008 and 2012 (support for 2012 R2 is planned for earlier in 2014), Red Hat Enterprise Linux 5 and 6, SUSE Linux Enterprise Server 10 and 11, VMware ESX 4.1 and ESXi 4.1 (E5-2600 only), and VMware vSphere 5.0 and 5.1.
Limited warranty	3-year customer-replaceable unit and onsite limited warranty with 9x5/NBD.
Service and support	Optional service upgrades are available through warranty upgrades: 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	Width: 218 mm (8.6 in), depth: 750 mm (29.5 in), height: 440 mm (17.3 in).
Weight	Minimum configuration: 25.0 kg (55.1 lb), maximum: 39.8 kg (87.7lb).

The x3500 M4 servers are shipped with the following items:

- Statement of Limited Warranty
- Important Notices
- Registration flyer
- IBM Systems Director Flyer

- Documentation CD that contains the *Installation and User's Guide*
- One 2.8 m C13 line cord (country-specific)

Note: 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 (Part 1: Intel Xeon E5-2600 v2 processors)

MTM*	Intel Xeon processors† (two maximum)	Memory	RAID	Drive bays (std / max)	Drives	GbE	I/O slots (std / max)	Optical	Power supply (std / max)
Models announced September 2013									
7383-A5x	1x E5-2603 v2 4C 1.8GHz 10MB 1333MHz 80W	1x 4GB 1600MHz§	M1115	8x 2.5" HS / 32	Open bay	4	8 / 8	DVD- ROM	1x 750W HS / 2
7383-B5x	1x E5-2609 v2 4C 2.5GHz 10MB 1333MHz 80W	1x 4GB 1600MHz§	M1115	8x 2.5" HS / 32	Open bay	4	8 / 8	DVD- ROM	1x 750W HS / 2
7383-C5x	1x E5-2620 v2 6C 2.1GHz 15MB 1600MHz 80W	1x 8GB 1600MHz	M1115	8x 2.5" HS / 32	Open bay	4	8 / 8	DVD- ROM	1x 750W HS / 2
7383-C7x	1x E5-2620 v2 6C 2.1GHz 15MB 1600MHz 80W	1x 8GB 1600MHz	M1115	8x 3.5" HS / 8	Open bay	4	8 / 8	DVD- ROM	1x 750W HS / 2
7383-C9x‡	1x E5-2620 v2 6C 2.1GHz 15MB 1600MHz 80W	1x 8GB 1600MHz	M5110 1GB Flash	8x 3.5" HS / 8	Open bay	4	8 / 8	DVD- ROM	1x 750W HS / 2
7383-D5x	1x E5-2630 v2 6C 2.6GHz 15MB 1600MHz 80W	1x 8GB 1600MHz	M1115	8x 2.5" HS / 32	Open bay	4	8 / 8	DVD- ROM	1x 750W HS / 2
7383-F5x	1x E5-2640 v2 8C 2.0GHz 20MB 1600MHz 95W	1x 8GB 1600MHz	M5110 512MB Flash	8x 2.5" HS / 32	Open bay	4	8 / 8	DVD- ROM	1x 750W HS / 2
7383-G5x	1x E5-2650 v2 8C 2.6GHz 20MB 1866MHz 95W	2x 4GB 1866MHz	M5110 1GB Flash	8x 2.5" HS / 32	Open bay	4	8 / 8	DVD- ROM	1x 750W HS / 2
7383-G9x‡	1x E5-2650 v2 8C 2.6GHz 20MB 1866MHz 95W	2x 4GB 1866MHz	M5110 1GB Flash	8x 2.5" HS / 32	Open bay	4	8 / 8	DVD- ROM	1x 750W HS / 2
7383-H5x	1x E5-2670 v2 10C 2.5GHz 25MB 1866MHz 115W	2x 4GB 1866MHz	M5110 1GB Flash	8x 2.5" HS / 32	Open bay	4	8 / 8	DVD- ROM	1x 900W HS / 2
7383-J5x	1x E5-2680 v2 10C 2.8GHz 25MB 1866MHz 115W	2x 4GB 1866MHz	M5110 1GB Flash	8x 2.5" HS / 32	Open bay	4	8 / 8	DVD- ROM	1x 900W HS / 2

* x in the Machine Type Model (MTM) represents a country-specific letter (for example, the EMEA MTM is 7983-A5G, and the US MTM is 7383-A5U). Ask a Lenovo representative for specifics.

† Processor detail: Processor quantity and model, cores, core speed, L3 cache, memory speed, TDP.

§ For models A5x and B5x, the standard DIMM is rated at 1600 MHz, but operates at up to 1333 MHz to match the processor memory speed. Actual memory speed maximums depend on several factors, as described in "Memory options".

‡ Rack-mount models.

Table 3. Standard models (Part 2: Intel Xeon E5-2600 processors)

Model	Intel Xeon processors† (2 maximum)	Memory	RAID	Disk bays	Disks	GbE	DVD	Power
Models announced March 2012								
7383-A2x	1x E5-2603 4C 1.8GHz 10MB 1066MHz 80W	1x 4 GB	M1115	8x 2.5" HS / 32	Open	4	DVD-ROM	1x 750W
7383-B2x	1x E5-2609 4C 2.4GHz 10MB 1066MHz 80W	1x 4 GB	M1115	8x 2.5" HS / 32	Open	4	DVD-ROM	1x 750W
7383-C2x	1x E5-2620 6C 2.0GHz 15MB 1333MHz 95W	1x 8 GB	M1115	8x 2.5" HS / 32	Open	4	DVD-ROM	1x 750W
7383-C4x	1x E5-2620 6C 2.0GHz 15MB 1333MHz 95W	1x 8 GB	M1115	8x 3.5" HS / 8	Open	4	DVD-ROM	1x 750W
7383-D2x	1x E5-2630 6C 2.3GHz 15MB 1333MHz 95W	1x 8 GB	M1115	8x 2.5" HS / 32	Open	4	DVD-ROM	1x 750W
7383-F2x	1x E5-2640 6C 2.5GHz 15MB 1333MHz 95W	1x 8 GB	M5110 512MB (f)	8x 2.5" HS / 32	Open	4	DVD-ROM	1x 750W
7383-G2x	1x E5-2650 8C 2.0GHz 20MB 1600MHz 95W	1x 8 GB	M5110 1GB (f)	8x 2.5" HS / 32	Open	4	DVD-ROM	1x 900W
7383-H2x	1x E5-2670 8C 2.6GHz 20MB 1600MHz 115W	1x 8 GB	M5110 1GB (f)	8x 2.5" HS / 32	Open	4	DVD-ROM	1x 900W
7383-J2x	1x E5-2680 8C 2.7GHz 20MB 1600MHz 130W	1x 8 GB	M5110 1GB (f)	8x 2.5" HS / 32	Open	4	DVD-ROM	1x 900W

† Processor detail: Processor quantity and model, number of cores, core speed, L3 cache, memory speed, power consumption.

(f) The ServeRAID M5110 RAID controller in this model includes flash-backed cache. The cache size is 512 MB or 1 GB, as indicated.

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

Express models

The following table lists the express models.

Table 4. Express models (Part 1: Intel Xeon E5-2600 v2 processors)

MTM**	Intel Xeon processors† (two maximum)	Memory	RAID	Drive bays (std / max)	Drives	GbE	I/O slots (std / max)	Optical	Power supply (std / max)
United States, Canada, Latin America									
7383-EGU	1x E5-2609 v2 4C 2.5GHz 10MB 1333MHz 80W	1x 8GB 1600MHz§	M1115	8x 3.5" HS / 8	Open bay	4	8 / 8	Multi-burner	1x 750W HS / 2
7383-EHU	1x E5-2620 v2 6C 2.1GHz 15MB 1600MHz 80W	1x 8GB 1600MHz	M5110	8x 3.5" HS / 8	Open bay	4	8 / 8	Multi-burner	1x 750W HS / 2
7383-EJU	1x E5-2630 v2 6C 2.6GHz 15MB 1600MHz 80W	1x 8GB 1600MHz	M5110	8x 2.5" HS / 32	Open bay	4	8 / 8	Multi-burner	1x 750W HS / 2
7383-EKU	1x E5-2640 v2 8C 2.0GHz 20MB 1600MHz 95W	1x 8GB 1600MHz	M5110	8x 2.5" HS / 32	Open bay	4	8 / 8	Multi-burner	1x 750W HS / 2
Latin America (Brazil only)									
7383-EPP	1x E5-2620 v2 6C 2.1GHz 15MB 1600MHz 80W	1x 8GB 1600MHz	M1115	8x 3.5" HS / 8	2x 500GB NL SATA	4	8 / 8	DVD-ROM	2x 550W HS / 2
7383-EQP	1x E5-2620 v2 6C 2.1GHz 15MB 1600MHz 80W	1x 8GB 1600MHz	M1115	8x 2.5" HS / 32	2x 300GB 10K	4	8 / 8	DVD-ROM	2x 550W HS / 2
Asia Pacific (China only)									
7383-ELC	1x E5-2603 v2 4C 1.8GHz 10MB 1333MHz 80W	1x 8GB 1600MHz§	M5110	8x 2.5" HS / 32	1x 300GB 10K	4	8 / 8	DVD-ROM	1x 750W HS / 2
7383-ERC	1x E5-2609 v2 4C 2.5GHz 10MB 1333MHz 80W	1x 8GB 1600MHz§	M5110	8x 2.5" HS / 32	1x 300GB 10K	4	8 / 8	DVD-ROM	1x 750W HS / 2
7383-ESC	1x E5-2609 v2 4C 2.5GHz 10MB 1333MHz 80W	2x 8GB 1600MHz§	M5110	8x 2.5" HS / 32	Open bay	4	8 / 8	DVD-ROM	2x 900W HS / 2
7383-ETC	1x E5-2620 v2 6C 2.1GHz 15MB 1600MHz 80W	1x 8GB 1600MHz	M5110	8x 2.5" HS / 32	1x 300GB 10K	4	8 / 8	DVD-ROM	1x 750W HS / 2
Europe									
7383-E7G	1x E5-2603 v2 4C 1.8GHz 10MB 1333MHz 80W	1x 4GB 1600MHz§	M1115	8x 3.5" HS / 8	Open bay	4	8 / 8	Multi-burner	1x 550W HS / 2
7383-E8G	1x E5-2603 v2 4C 1.8GHz 10MB 1333MHz 80W	1x 4GB 1600MHz§	M1115 RAID 5	8x 2.5" HS / 32	Open bay	4	8 / 8	Multi-burner	1x 550W HS / 2
7383-E9G	1x E5-2620 v2 6C 2.1GHz 15MB 1600MHz 80W	1x 8GB 1600MHz	M5110 512MB (c)	8x 2.5" HS / 32	Open bay	4	8 / 8	Multi-burner	2x 550W HS / 2
7383-K6G	1x E5-2609 v2 4C 2.5GHz 10MB 1333MHz 80W	1x 4GB 1600MHz§	M5110 512MB (f)	8x 2.5" HS / 32	Open bay	4	8 / 8	Multi-burner	1x 550W HS / 2

MTM**	Intel Xeon processors† (two maximum)	Memory	RAID	Drive bays (std / max)	Drives	GbE	I/O slots (std / max)	Optical	Power supply (std / max)
7383-K7G	1x E5-2620 v2 6C 2.1GHz 15MB 1600MHz 80W	1x 8GB 1600MHz	M5110 512MB (f)	8x 2.5" HS / 32	3x 300GB 10K	4	8 / 8	Multi- burner	1x 750W HS / 2
Central and Eastern Europe (CEE) and Middle East and Africa (MEA)									
7383-E9G	1x E5-2620 v2 6C 2.1GHz 15MB 1600MHz 80W	1x 8GB 1600MHz	M5110 512MB (c)	8x 2.5" HS / 32	Open bay	4	8 / 8	Multi- burner	2x 550W HS / 2
7383-K6G	1x E5-2609 v2 4C 2.5GHz 10MB 1333MHz 80W	1x 4GB 1600MHz§	M5110 512MB (f)	8x 2.5" HS / 32	Open bay	4	8 / 8	Multi- burner	1x 550W HS / 2
7383-K7G	1x E5-2620 v2 6C 2.1GHz 15MB 1600MHz 80W	1x 8GB 1600MHz	M5110 512MB (f)	8x 2.5" HS / 32	3x 300GB 10K	4	8 / 8	Multi- burner	1x 750W HS / 2
Russia/Commonwealth of Independent States (CIS)									
7383-E7G	1x E5-2603 v2 4C 1.8GHz 10MB 1333MHz 80W	1x 4GB 1600MHz§	M1115	8x 3.5" HS / 8	Open bay	4	8 / 8	Multi- burner	1x 550W HS / 2
7383-EMG	1x E5-2620 v2 6C 2.1GHz 15MB 1600MHz 80W	1x 8GB 1600MHz	M5110 512MB (f)	8x 2.5" HS / 32	Open bay	4	8 / 8	Multi- burner	1x 550W HS / 2
7383-K6G	1x E5-2609 v2 4C 2.5GHz 10MB 1333MHz 80W	1x 4GB 1600MHz§	M5110 512MB (f)	8x 2.5" HS / 32	Open bay	4	8 / 8	Multi- burner	1x 550W HS / 2
7383-K7G	1x E5-2620 v2 6C 2.1GHz 15MB 1600MHz 80W	1x 8GB 1600MHz	M5110 512MB (f)	8x 2.5" HS / 32	3x 300GB 10K	4	8 / 8	Multi- burner	1x 750W HS / 2

** MTM = Machine Type Model

† Processor detail: Processor quantity and model, number of cores, core speed, L3 cache, memory speed, TDP.

(c) The ServeRAID M5110 RAID controller in this model includes cache memory with optional battery backup.

(f) The ServeRAID M5110 RAID controller in this model includes flash-backed cache memory.

§ For these models, the standard DIMM is rated at 1600 MHz, but operates at up to 1333 MHz to match the processor memory speed. Actual memory speed maximums depend on several factors, as described in "Memory options".

Table 5. Express models (Part 2: Intel Xeon E5-2600 processors)

Model	Processor†	RAM	RAID	Disk bays	Disks	Network	Optical	Power
North America (NA), Latin America (LA)								
7383-EAU	1x Xeon E5-2609 4C 2.4GHz 10MB 1066MHz 80W	1x 4 GB	M1115	8x 3.5" HS / 8	Optional	4x GbE	Multi- burner	1x 750 W
7383-EBU	1x Xeon E5-2620 6C 2.0GHz 15MB 1333MHz 95W	1x 8 GB	M5110 512MB(f)	8x 3.5" HS / 8	Optional	4x GbE	Multi- burner	1x 750 W
7383-ECU	1x Xeon E5-2640 6C 2.5GHz 15MB 1333MHz 95W	2x 8 GB	M5110 512MB(f)	8x 2.5" HS / 32	Optional	4x GbE	Multi- burner	2x 750 W
7383-EDU	1x Xeon E5-2650 8C 2.0GHz 20MB 1600MHz 95W	1x 8 GB	M5110 1GB(f)	8x 2.5" HS / 32	Optional	4x GbE	Multi- burner	1x 750 W
Europe								

Model	Processor†	RAM	RAID	Disk bays	Disks	Network	Optical	Power
7383-E1G	1x Xeon E5-2603 4C 1.8GHz 10MB 1066MHz 80W	1x 4 GB	M1115	8x 3.5" HS / 8	Optional	4x GbE	Multi-burner	1x 750 W
7383-E2G	1x Xeon E5-2603 4C 1.8GHz 10MB 1066MHz 80W	1x 4 GB	M1115	8x 2.5" HS / 32	Optional	4x GbE	Multi-burner	1x 750 W
7383-E3G	1x Xeon E5-2609 4C 2.4GHz 10MB 1066MHz 80W	1x 4 GB	M5110	8x 2.5" HS / 32	2x 300GB 10k 2.5" SAS	4x GbE	Multi-burner	1x 750 W
7383-E4G	1x Xeon E5-2620 6C 2.0GHz 15MB 1333MHz 95W	1x 8 GB	M5110	8x 2.5" HS / 32	Optional	4x GbE	Multi-burner	2x 750 W
7383-E5G	1x Xeon E5-2620 6C 2.0GHz 15MB 1333MHz 95W	1x 8 GB	M5110	8x 3.5" HS / 8	Optional	4x GbE	Multi-burner	1x 750 W
7383-E6G	1x Xeon E5-2620 6C 2.0GHz 15MB 1333MHz 95W	1x 8 GB	M5110	8x 2.5" HS / 32	2x 300GB 10k 2.5" SAS	4x GbE	Multi-burner	1x 750 W
Central and Eastern Europe (CEE) and Middle East & Africa (MEA)								
7383-E1G	1x Xeon E5-2603 4C 1.8GHz 10MB 1066MHz 80W	1x 4 GB	M1115	8x 3.5" HS / 8	Optional	4x GbE	Multi-burner	1x 750 W
7383-E2G	1x Xeon E5-2603 4C 1.8GHz 10MB 1066MHz 80W	1x 4 GB	M1115	8x 2.5" HS / 32	Optional	4x GbE	Multi-burner	1x 750 W
7383-E3G	1x Xeon E5-2609 4C 2.4GHz 10MB 1066MHz 80W	1x 4 GB	M5110	8x 2.5" HS / 32	2x 300GB 10k 2.5" SAS	4x GbE	Multi-burner	1x 750 W
7383-E5G	1x Xeon E5-2620 6C 2.0GHz 15MB 1333MHz 95W	1x 8 GB	M5110	8x 3.5" HS / 8	Optional	4x GbE	Multi-burner	1x 750 W
7383-E6G	1x Xeon E5-2620 6C 2.0GHz 15MB 1333MHz 95W	1x 8 GB	M5110	8x 2.5" HS / 32	2x 300GB 10k 2.5" SAS	4x GbE	Multi-burner	1x 750 W
7383-K1G	1x Xeon E5-2620 6C 2.0GHz 15MB 1333MHz 95W	1x 8 GB	M5110	8x 2.5" HS / 32	3x 300GB 10k 2.5" SAS	4x GbE	Multi-burner	2x 750 W
7383-K3G	1x Xeon E5-2620 6C 2.0GHz 15MB 1333MHz 95W	1x 8 GB	M5110	8x 2.5" HS / 32	Optional	4x GbE	Multi-burner	2x 750 W
Russia/Commonwealth of Independent States (CIS)								
7383-E1G	1x Xeon E5-2603 4C 1.8GHz 10MB 1066MHz 80W	1x 4 GB	M1115	8x 3.5" HS / 8	Optional	4x GbE	Multi-burner	1x 750 W
7383-K2G	1x Xeon E5-2609 4C 2.4GHz 10MB 1066MHz 80W	1x 4 GB	M5110	8x 2.5" HS / 32	Optional	4x GbE	Multi-burner	1x 750 W
7383-K3G	1x Xeon E5-2620 6C 2.0GHz 15MB 1333MHz 95W	1x 8 GB	M5110	8x 2.5" HS / 32	Optional	4x GbE	Multi-burner	2x 750 W
7383-K4G	1x Xeon E5-2620 6C 2.0GHz 15MB 1333MHz 95W	1x 8 GB	M5110	8x 2.5" HS / 32	Optional	4x GbE	Multi-burner	2x 750 W

Processor options

The x3500 M4 supports the processor options listed in the following table. The server supports up to two processors. This table shows which server models have each processor standard. If there is no corresponding *where-used* model for a particular processor, then this processor is only available through CTO.

Table 6. Processor options (Part 1: Intel Xeon E5-2600 v2 processors)

Part number	Feature codes*	Description	Standard models where used
46W9128	A3YB / A3XT	Intel Xeon Processor E5-2603 v2 4C 1.8GHz 10MB Cache 1333MHz 80W	A5x
46W9129	A3YC / A3XU	Intel Xeon Processor E5-2609 v2 4C 2.5GHz 10MB Cache 1333MHz 80W	B5x
46W9130	A3YDA3XV	Intel Xeon Processor E5-2620 v2 6C 2.1GHz 15MB Cache 1600MHz 80W	C5x, C7x, C9x
00Y8265	A476 / A474	Intel Xeon Processor E5-2628L v2 8C 1.9GHz 20MB Cache 1600MHz 70W	-
46W9131	A3YE / A3XW	Intel Xeon Processor E5-2630 v2 6C 2.6GHz 15MB Cache 1600MHz 80W	D5x
46W9142	A3YR / A3Y7	Intel Xeon Processor E5-2630L v2 6C 2.4GHz 15MB Cache 1600MHz 60W	-
46W9139	A3YN / A3Y4	Intel Xeon Processor E5-2637 v2 4C 3.5GHz 15MB Cache 1866MHz 130W	-
46W9132	A3YF / A3XX	Intel Xeon Processor E5-2640 v2 8C 2.0GHz 20MB Cache 1600MHz 95W	F5x
46W9140	A3YP / A3Y5	Intel Xeon Processor E5-2643 v2 6C 3.5GHz 25MB Cache 1866MHz 130W	-
00Y8266	A477 / A475	Intel Xeon Processor E5-2648L v2 10C 1.9GHz 25MB Cache 1866MHz 70W	-
46W9133	A3YG / A3XY	Intel Xeon Processor E5-2650 v2 8C 2.6GHz 20MB Cache 1866MHz 95W	G5x, G9x
46W9143	A3YS / A3Y8	Intel Xeon Processor E5-2650L v2 10C 1.7GHz 25MB Cache 1600MHz 70W	-
46W9134	A3YH / A3XZ	Intel Xeon Processor E5-2660 v2 10C 2.2GHz 25MB Cache 1866MHz 95W	-
46W9141	A3YQ / A3Y6	Intel Xeon Processor E5-2667 v2 8C 3.3GHz 25MB Cache 1866MHz 130W	-
46W9135	A3YJ / A3Y0	Intel Xeon Processor E5-2670 v2 10C 2.5GHz 25MB Cache 1866MHz 115W	H5x
46W9136	A3YK / A3Y1	Intel Xeon Processor E5-2680 v2 10C 2.8GHz 25MB Cache 1866MHz 115W	J5x
46W9137	A3YL / A3Y2	Intel Xeon Processor E5-2690 v2 10C 3.0GHz 25MB Cache 1866MHz 130W	-
46W9126	A3Y9 / A3XR	Intel Xeon Processor E5-2695 v2 12C 2.4GHz 30MB Cache 1866MHz 115W	-
46W9127	A3YA / A3XS	Intel Xeon Processor E5-2697 v2 12C 2.7GHz 30MB Cache 1866MHz 130W	-

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

Table 7. Processor options (Part 2: Intel Xeon E5-2600 processors)

Part number	Feature codes*	Description	Standard models where used
Intel Xeon processor E5-2600 product family			
90Y5942	A1G9 / A1GP	Intel Xeon Processor E5-2603 4C 1.8GHz 10MB Cache 1066MHz 80W	A2x
90Y5944	A1GB / A1GR	Intel Xeon Processor E5-2609 4C 2.4GHz 10MB Cache 1066MHz 80W	B2x
90Y5945	A1GC / A1GS	Intel Xeon Processor E5-2620 6C 2.0GHz 15MB Cache 1333MHz 95W	C2x, C4x
90Y5946	A1GD / A1GT	Intel Xeon Processor E5-2630 6C 2.3GHz 15MB Cache 1333MHz 95W	D2x
90Y5953	A1GL / A1H0	Intel Xeon Processor E5-2630L 6C 2.0GHz 15MB Cache 1333MHz 60W	-
94Y7342	A2CQ / A2CT	Intel Xeon Processor E5-2637 2C 3.0GHz 5MB Cache 1600MHz 80W	-
90Y5947	A1GE / A1GU	Intel Xeon Processor E5-2640 6C 2.5GHz 15MB Cache 1333MHz 95W	F2x
94Y7341	A2CP / A2CS	Intel Xeon Processor E5-2643 4C 3.3GHz 10MB Cache 1600MHz 130W	-
00D4474	A391 / A393	Intel Xeon Processor E5-2648L 8C 1.8GHz 20MB Cache 1600MHz 70W	-
90Y5948	A1GF / A1GV	Intel Xeon Processor E5-2650 8C 2.0GHz 20MB Cache 1600MHz 95W	G2x
90Y5954	A1GM / A1H1	Intel Xeon Processor E5-2650L 8C 1.8GHz 20MB Cache 1600MHz 70W	-
00D4473	A390 / A392	Intel Xeon Processor E5-2658 8C 2.1GHz 20MB Cache 1600MHz 95W	-
90Y5949	A1GG / A1GW	Intel Xeon Processor E5-2660 8C 2.2GHz 20MB Cache 1600MHz 95W	-
94Y7442	A2H5 / A2H6	Intel Xeon Processor E5-2665 8C 2.4GHz 20MB Cache 1600MHz 115W	-
90Y5951	A1GJ / A1GY	Intel Xeon Processor E5-2667 6C 2.9GHz 15MB Cache 1600MHz 130W	-
90Y5955	A1GN / A1H2	Intel Xeon Processor E5-2670 8C 2.6GHz 20MB Cache 1600MHz 115W	H2x
90Y5950	A1GH / A1GX	Intel Xeon Processor E5-2680 8C 2.7GHz 20MB Cache 1600MHz 130W	J2x
94Y7343	A2CR / A2CU	Intel Xeon Processor E5-2690 8C 2.9GHz 20MB Cache 1600MHz 135W	-

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

Memory options

Lenovo DDR3 memory is compatibility tested and tuned for optimal System x performance and throughput. Lenovo memory specifications are integrated into the light path diagnostics for immediate

system performance feedback and optimum system uptime. From a service and support standpoint, Lenovo memory automatically assumes the system warranty, and Lenovo provides service and support worldwide.

The System x3500 M4 supports DDR3 memory. 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, and there are three DIMMs per channel.

The following rules apply when selecting the memory configuration:

- The server supports UDIMMs, RDIMMs, and LRDIMMs.
- Mixing different types of memory (UDIMMs, RDIMMs, and LRDIMMs) is not supported.
- Mixing 1.5 V and 1.35 V DIMMs in the same server is supported. In such a case all DIMMs operate at 1.5 V.
- The maximum number of ranks per channel is eight (with the exception of Load Reduced DIMMs, where more than eight ranks are supported because one quad-rank LRDIMM provides the same electrical load on a memory bus as a single-rank RDIMM).
- The maximum quantity of DIMMs that can be installed in a server depends on the number of CPUs, DIMM type, rank, and operating voltage, as shown in the "Max. qty supported" row in Table 5.
- All DIMMs in the server operate at the same speed, which is determined as the lowest value of:
 - Memory speed supported by specific CPU
 - Lowest maximum operating speed for the selected memory configuration that depends on rated speed, operating voltage, and quantity of DIMMs per channel, as shown in the "Max. operating speed" section in Table 5

Table 8. Maximum memory speeds (Part 1: Intel Xeon E5-2600 v2 processors - RDIMMs)

DIMM specification	RDIMM					
	Single rank		Dual rank			
Rank						
Part numbers	00D5024 (4 GB) 00D5036 (8 GB)		00D5044 (8 GB)		00D5028 (4 GB)	00D5048 (16 GB)
Rated speed	1600 MHz		1600 MHz		1866 MHz	1866 MHz
Rated voltage	1.35 V		1.35 V		1.5 V	1.5 V
Operating voltage	1.35 V	1.5 V	1.35 V	1.5 V	1.5 V	1.5 V
Max qty supported*	24	24	24	24	24	24
Max DIMM capacity	8 GB	8 GB	8 GB	8 GB	4 GB	16 GB
Max memory capacity	192 GB	192 GB	192 GB	192 GB	96 GB	384 GB
Max. memory at rated speed	None	128 GB	None	128 GB	64 GB	256 GB
Maximum operating speed						
1 DIMM per channel	1333 MHz	1600 MHz	1333 MHz	1600 MHz	1866 MHz	1866 MHz
2 DIMMs per channel	1333 MHz	1600 MHz	1333 MHz	1600 MHz	1600 MHz	1866 MHz
3 DIMMs per channel	800 MHz	1066 MHz	800 MHz	1066 MHz	1066 MHz	1066 MHz

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

Table 9. Maximum memory speeds (Part 2: Intel Xeon E5-2600 v2 processors - UDIMMs and LRDIMMs)

DIMM specification	UDIMM		LRDIMM
Rank	Dual rank		Quad rank
Part number	00D5012 (4 GB) 00D5016 (8 GB)		46W0761 (32 GB)
Rated speed	1600 MHz		1866 MHz
Rated voltage	1.35 V		1.5 V
Operating voltage	1.35 V	1.5 V	1.5 V
Max. qty supported*	16	16	24
Max. DIMM capacity	8 GB	8 GB	32 GB
Max. memory capacity	128 GB	128 GB	768 GB
Max. memory at rated speed	None	128 GB	256 GB
Maximum operating speed			
1 DIMM per channel	1333 MHz	1600 MHz	1866 MHz
2 DIMMs per channel	1333 MHz	1600 MHz	1600 MHz
3 DIMMs per channel	No support	No support	1066 MHz

* Maximum quantity supported is shown for two processors installed.

Table 10. Maximum memory speeds (Part 3: Intel Xeon E5-2600 processors - RDIMMs)

DIMM specification	RDIMM							
Rank	Single rank			Dual rank			Quad rank	
Part number	49Y1405 (1 GB) 49Y1406 (2 GB)		49Y1559 (4 GB)	49Y1407 (4 GB) 49Y1397 (8 GB) 49Y1563 (16 GB)		90Y3178 (4 GB) 90Y3109 (8 GB) 00D4968 (16 GB)		49Y1400 (16 GB)
Rated speed	1333 MHz		1600 MHz	1333 MHz		1600 MHz	1066 MHz	
Rated voltage	1.35 V		1.5 V	1.35 V		1.5 V	1.35 V	
Operating voltage	1.35 V	1.5 V	1.5 V	1.35 V	1.5 V	1.5 V	1.35 V	1.5 V
Max. qty supported*	16	24	24	16	24	24	16	16
Max. DIMM capacity	4 GB	4 GB	4 GB	16 GB	16 GB	16 GB	16 GB	16 GB
Max. memory capacity	64 GB	96 GB	96 GB	256 GB	384 GB	384 GB	256 GB	256 GB
Max. memory at rated speed	64 GB	64 GB	64 GB	256 GB	256 GB	256 GB	NS**	128 GB
Maximum operating speed								
1 DIMM per channel	1333 MHz	1333 MHz	1600 MHz	1333 MHz	1333 MHz	1600 MHz	800 MHz	1066 MHz
2 DIMMs per channel	1333 MHz	1333 MHz	1600 MHz	1333 MHz	1333 MHz	1600 MHz	800 MHz	800 MHz
3 DIMMs per channel	NS**	1066 MHz	1066 MHz	NS**	1066 MHz	1066 MHz	NS**	NS**

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

** NS = Not supported.

Table 11. Maximum memory speeds (Part 4: Intel Xeon E5-2600 processors - UDIMMs and LRDIMMs)

DIMM specification	UDIMM		LRDIMM	
Rank	Dual rank		Quad rank	
Part number	49Y1403 (4 GB) 49Y1404 (8 GB)		90Y3105 (32 GB)	
Rated speed	1333 MHz		1333 MHz	
Rated voltage	1.35 V		1.35 V	
Operating voltage	1.35 V	1.5 V	1.35 V	1.5 V
Max. qty supported*	16	16	24	24
Max. DIMM capacity	4 GB	4 GB	32 GB	32 GB
Max. memory capacity	64 GB	64 GB	768 GB	768 GB
Max. memory at rated speed	64 GB	64 GB	256 GB	512 GB
Maximum operating speed_				
1 DIMM per channel	1333 MHz	1333 MHz	1333 MHz	1333 MHz
2 DIMMs per channel	1333 MHz	1333 MHz	1066 MHz	1333 MHz
3 DIMMs per channel	Not supported	Not supported	1066 MHz	1066 MHz

* The maximum quantity supported is shown for two processors installed. When one processor installed the maximum quantity supported is a half of that shown.

The following memory protection technologies are supported:

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

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

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

If memory rank sparing is used, then a minimum of one quad-rank DIMM or two single-rank or dual-rank DIMMs must be installed per populated channel (the DIMMs do not need being 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.

Note: 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 lists memory options available for the x3500 M4 server.

Table 12. Memory options (Part 1: Intel Xeon processor E5-2600 v2 product family)

Part number	Feature code	Description	Maximum supported	Standard models where used
UDIMMs				
00D5012	A3QB	4GB (1x4GB, 2Rx8, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP UDIMM	16 (8 per CPU)	-
00D5016	A3QC	8GB (1x8GB, 2Rx8, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP UDIMM	16 (8 per CPU)	-
RDIMMs - 1600 MHz				
00D5024	A3QE	4GB (1x4GB, 1Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	24 (12 per CPU)	A5x, B5x
00D5036	A3QH	8GB (1x8GB, 1Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	24 (12 per CPU)	-
00D5044	A3QK	8GB (1x8GB, 2Rx8, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	24 (12 per CPU)	C5, C7x, C9x, D5x, F5x
RDIMMs - 1866 MHz				
00D5028	A3QF	4GB (1x4GB, 2Rx8, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM	24 (12 per CPU)	G5x, G9x, H5x, J5x
00D5048	A3QL	16GB (1x16GB, 2Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM	24 (12 per CPU)	-
LRDIMMs				
46W0761	A47K	32GB (1x32GB, 4Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP LRDIMM	24 (12 per CPU)	-

Table 13. Memory options (Part 2: Intel Xeon processor E5-2600 product family)

Part number	Feature code	Description	Maximum quantity supported	Standard models where used
UDIMMs				
49Y1403	A0QS	2GB (1x2GB, 1Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP UDIMM	16 (8 per CPU)	-
49Y1404	8648	4GB (1x4GB, 2Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP UDIMM	16 (8 per CPU)	-
RDIMMs				
49Y1405	8940	2GB (1x2GB, 1Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333 MHz LP RDIMM	24 (12 per CPU)	-
49Y1406	8941	4GB (1x4GB, 1Rx4, 1.35V) PC3L-10600 CL9 ECC DDR3 1333 MHz LP RDIMM	24 (12 per CPU)	-
49Y1559	A28Z	4GB (1x4GB, 1Rx4, 1.5V) PC3-12800 CL11 ECC DDR3 1600MHz LP RDIMM	24 (12 per CPU)	-
49Y1407	8942	4GB (1x4GB, 2Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333 MHz LP RDIMM	24 (12 per CPU)	A2x, B2x
90Y3178	A24L	4GB (1x4GB, 2Rx8, 1.5V) PC3-12800 CL11 ECC DDR3 1600MHz LP RDIMM	24 (12 per CPU)	-
49Y1397	8923	8GB (1x8GB, 2Rx4, 1.35V) PC3L-10600 CL9 ECC 1333 MHz LP RDIMM	24 (12 per CPU)	C2x, C4x, D2x, F2x, G2x, H2x, J2x
90Y3109	A292	8GB (1x8GB, 2Rx4, 1.5V) PC3-12800 CL11 ECC DDR3 1600MHz LP RDIMM	24 (12 per CPU)	-
49Y1563	A1QT	16GB (1x16GB, 2Rx4, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP RDIMM	24 (12 per CPU)	-
00D4968	A2U5	16GB (1x16GB, 2Rx4, 1.5V) PC3-12800 CL11 ECC DDR3 1600MHz LP RDIMM	24 (12 per CPU)	-
49Y1400	8939	16GB (1x16GB, 4Rx4, 1.35V) PC3L-8500 CL7 ECC DDR3 1066MHz LP RDIMM	16 (8 per CPU)	-
LRDIMMs				
90Y3105	A291	32GB (1x32GB, 4Rx4, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP LRDIMM	24 (12 per CPU)	-

Internal storage

The System x3500 M4 server supports the following internal storage configurations:

- 6 Gb SAS/SATA
 - 8x 3.5" Simple Swap SATA hard drive bays (only available in CTO)
 - 8x 3.5" hot-swap SAS/SATA hard drive bays
 - 8x 3.5" hot-swap SAS/SATA drive bays + 8x 2.5" Slim-SFF SAS/SATA hot-swap drive bays (only available in CTO, requires two RAID controllers)
 - 8x 2.5" Slim-SFF SAS/SATA hot-swap hard drive bays
 - 16x 2.5" Slim-SFF SAS/SATA hot-swap hard drive bays
 - 24x 2.5" Slim-SFF SAS/SATA hot-swap hard drive bays
 - 32x 2.5" Slim-SFF SAS/SATA hot-swap hard drive bays
- 12 Gb SAS/SATA
 - 8x 2.5" Slim-SFF SAS/SATA hot-swap hard drive bays (CTO only)

- o 16x 2.5" Slim-SFF SAS/SATA hot-swap hard drive bays
- o 24x 2.5" Slim-SFF SAS/SATA hot-swap hard drive bays
- o 32x 2.5" Slim-SFF SAS/SATA hot-swap hard drive bays

Figure 5 shows these configurations.

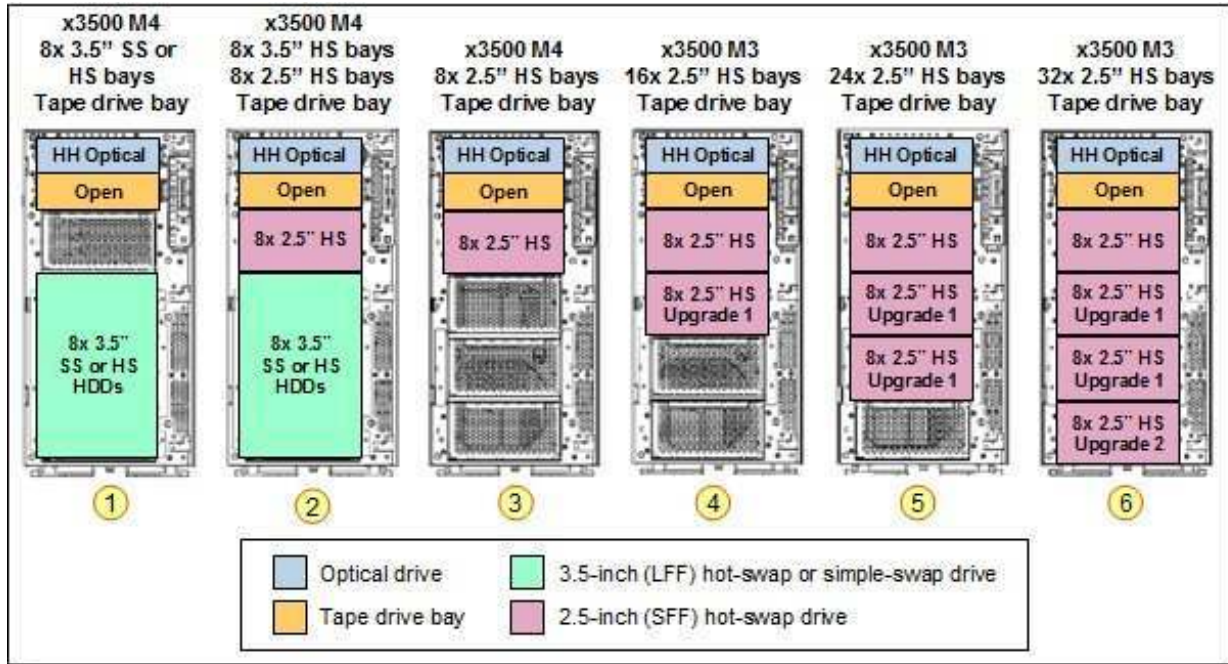


Figure 5. Internal drive configurations

Backplanes

Standard models of x3500 M4 ship with eight (all models except C4x, C7x, and C9x) 2.5" Slim-SFF SAS/SATA hot-swap drive bays. Models C4x, C7x, and C9x ship with eight 3.5" SAS/SATA hot-swap hard drive bays. The following table shows internal storage expansion options available for the x3500 M4.

Table 14. Internal storage expansion options

Part number	Feature code	Name	Max qty supported
6 Gb SAS/SATA internal drive connectivity			
94Y5978	A1WZ	Additional 8 x 2.5" Hot-Swap SAS/SATA Upgrade Kit for 16 or 24 HDDs (shown in Figure 5 as an Upgrade 1 used in configurations 4, 5, and 6)	2
81Y7010	A1FW	Additional 8 x 2.5" Hot-Swap SAS/SATA Upgrade Kit for 32 HDDs (shown in Figure 5 as an Upgrade 2 used in configuration 6)	1
12 Gb SAS internal drive connectivity			
46W9242	A47B	Add'l 8x 2.5" Hot-Swap SAS/SATA Upgrade Kit for 16 or 24 HDDs (12Gb) (shown in Figure 5 as an Upgrade 1 used in configurations 4, 5, and 6)	2
46W9243	A47A	Add'l 8x 2.5" Hot-Swap SAS/SATA Upgrade Kit for 32 HDDs (12Gb) (shown in Figure 5 as an Upgrade 2 used in configuration 6)	1
46W9244	A478	SAS cable option for Two 12Gb RAID cards	1

These options are used as follows:

- 6 Gb SAS/SATA internal drive connectivity:

- 94Y5978 upgrades models with eight hot-swap 2.5" drive bays to 16 hot-swap 2.5" drive bays or models with 16 hot-swap 2.5" drive bays to 24 hot-swap 2.5" drive bays. This option includes a SAS expander card that is mounted on an HDD backplane, and does not consume a PCIe slot.
- 81Y7010 upgrades models with 24 hot-swap 2.5" drive bays to 32 hot-swap 2.5" drive bays. This option does not include an SAS expander.
- Configurations 4, 5, and 6 shown in Figure 5 can be implemented with one or two RAID controllers (M1115 or M5110). Configuration 2 requires two RAID controllers.
- 12 Gb SAS/SATA internal drive connectivity:
 - 46W9242 upgrades 12 Gb SAS/SATA models with eight hot-swap 2.5" drive bays (CTO only) to 16 hot-swap 2.5" drive bays or 12 Gbps SAS/SATA models with 16 hot-swap 2.5" drive bays to 24 hot-swap 2.5" drive bays. This option includes a SAS expander card that is mounted on an HDD backplane, and does not consume a PCIe slot.
 - 46W9243 upgrades 12 Gb SAS/SATA models with 24 hot-swap 2.5" drive bays to 32 hot-swap 2.5" drive bays. This option does not include an SAS expander.
 - Configurations 3 and 4 shown in Figure 5 can be implemented with one N2215 SAS/SATA HBA or one or two ServeRAID M5210 SAS/SATA Controllers.
 - Configurations 5 and 6 shown in Figure 5 can be implemented with one or two ServeRAID M5210 SAS/SATA Controllers.
 - If the second M5210 controller is used, SAS cable option (46W9244) must be ordered.
 - Configurations 1 and 2 are not supported.
- 6 Gb SAS/SATA and 12 Gb SAS/SATA configurations are mutually exclusive.

As shown in Figure 5, each configuration supports an optical drive and a tape drive. All standard configurations ship with DVD-ROM optical drive. For configure-to-order (CTO) configurations, you can add a tape drive instead of an optical drive if so desired.

Controllers for internal storage

The following table lists the RAID controllers and additional options used for internal disk storage of the x3500 M4 server.

Table 15. RAID controllers and HBAs for internal storage (Part 1: 6 Gbps SAS/SATA)

Part number	Feature code	Description	Maximum supported	Standard models where used
6 Gb Controllers				
81Y4448	A1MZ	ServeRAID M1115 SAS/SATA Controller	2	A2x, B2x, C2x, C4x, D2x, A5x, B5x, C5x, C7x, D5x
81Y4481	A347	ServeRAID M5110 SAS/SATA Controller	2	C9x, F2x, G2x, H2x, J2x, F5x, G5x, G9x, H5x, J5x
46M0912	3876	6Gb Performance Optimized HBA	1	-
46C8988	A3MW	N2115 SAS/SATA HBA	1	-
Features on Demand upgrades				
81Y4542	A1X1	ServeRAID M1100 Series Zero Cache/RAID 5 Upgrade	1*	-
81Y4544	A1X2	ServeRAID M5100 Series Zero Cache/RAID 5 Upgrade	1*	-
81Y4546	A1X3	ServeRAID M5100 Series RAID 6 Upgrade	1*†	-
90Y4273	A2MC	ServeRAID M5100 Series SSD Performance Accelerator	1*	-
90Y4318	A2MD	ServeRAID M5100 Series SSD Caching Enabler	1*	-
Hardware upgrades				
81Y4484	A1J3	ServeRAID M5100 Series 512MB Cache/RAID 5 Upgrade	2	-
81Y4487	A1J4	ServeRAID M5100 Series 512MB Flash/RAID 5 Upgrade	2	F2x, F5x
81Y4559	A1WY	ServeRAID M5100 Series 1GB Flash/RAID 5 Upgrade	2	C9x, G2x, H2x, J2x, G5x, G9x, H5x, J5x
47C8670	A4G6	ServeRAID M5100 Series 2GB Flash/RAID 5 Upgrade	1	-
81Y4508	A22E	ServeRAID M5100 Series Battery Kit	2**	-

* Only one M1100 or M5100 Series FoD software license is required per server.

** The ServeRAID M5100 Series Battery Kit (81Y4508) is only supported with ServeRAID M5100 Series 512MB Cache/RAID 5 Upgrade (81Y4484).

† The ServeRAID M5100 Series RAID 6 Upgrade (81Y4546) requires 512 MB or 1 GB cache upgrades.

Table 16. RAID controllers and HBAs for internal storage (Part 2: 12 Gbps SAS/SATA)

Part number	Feature code	Description	Maximum supported	Standard models where used
12 Gb Controllers				
00AE938	A5ND	ServeRAID M5225 SAS/SATA Controller	2	-
46C9114	A45W	ServeRAID M1215 SAS/SATA Controller	2	-
46C9110	A3YZ	ServeRAID M5210 SAS/SATA Controller	2	-
47C8675	A3YY	N2215 SAS/SATA HBA	1	-
Hardware upgrades for the M5210				
47C8656	A3Z0	ServeRAID M5200 Series 1GB Cache/RAID 5 Upgrade	1	-
47C8660	A3Z1	ServeRAID M5200 Series 1GB Flash/RAID 5 Upgrade	1	-
47C8664	A3Z2	ServeRAID M5200 Series 2GB Flash/RAID 5 Upgrade	1	-
47C8668	A3Z3	ServeRAID M5200 Series 4GB Flash/RAID 5 Upgrade	1	-
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, or 47C8664).

The ServeRAID M1115 SAS/SATA Controller has the following specifications:

- Eight internal 6 Gbps SAS/SATA ports
- Two x4 mini-SAS internal connectors (SFF-8087)
- Supports RAID levels 0, 1, and 10
- Supports RAID levels 5 and 50 with optional M1100 Series RAID 5 upgrades
- 6 Gbps throughput per port
- PCIe 3.0 x8 host interface
- Based on the LSI SAS2008 6 Gbps ROC controller

The ServeRAID M5110 SAS/SATA Controller has the following specifications:

- Eight internal 6 Gbps SAS/SATA ports
- Two x4 mini-SAS internal connectors (SFF-8087)
- Supports RAID levels 0, 1, and 10
- Supports RAID levels 5 and 50 with optional M5100 Series RAID 5 upgrades
- Supports RAID 6 and 60 with the optional M5100 Series RAID 6 Upgrade
- Supports 512 MB battery-backed cache or 512 MB or 1 GB flash-backed cache
- 6 Gbps throughput per port
- PCIe 3.0 x8 3 host interface
- Based on the LSI SAS2208 6 Gbps ROC controller

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)
- 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
- Two x4 HD mini-SAS internal connectors (SFF-8643)
- Supports connections to SAS/SATA drives and SAS Expanders
- Supports RAID levels 0, 1, and 10
- Supports RAID levels 5 and 50 with optional M5200 Series RAID 5 upgrades
- Supports RAID 6 and 60 with the optional M5200 Series RAID 6 Upgrade
- Supports 1 GB non-backed cache or 1 GB or 2 GB flash-backed cache
- Up to 12 Gbps throughput per port
- PCIe 3.0 x8 host interface
- Based on the LSI SAS3108 12 Gbps ROC controller

The 6Gb Performance Optimized HBA has the following specifications:

- Eight internal 6 Gbps SAS/SATA ports
- Two x4 mini-SAS internal connectors (SFF-8087)
- Supports connections SSDs (does not support HDDs in x3500 M4)
- Optimized for SSD performance
- No RAID support
- Up to 6 Gbps throughput per port
- PCIe 2.0 x8 host interface
- Based on the LSI SAS2008 6 Gbps controller

The N2115 SAS/SATA HBA has the following specifications:

- Eight internal 6 Gbps SAS/SATA ports
- Two x4 mini-SAS internal connectors (SFF-8087)
- Supports connections to SSDs (does not support HDDs in x3500 M4)
- Optimized for SSD performance
- No RAID support
- Up to 6 Gbps throughput per port
- PCIe 3.0 x8 host interface
- Based on the LSI SAS2308 6 Gbps controller

The N2215 SAS/SATA HBA has the following specifications:

- Eight internal 12 Gbps SAS/SATA ports
- Two x4 HD mini-SAS internal connectors (SFF-8643)
- Supports connections to SSDs (does not support HDDs in x3500 M4)
- Optimized for SSD performance
- No RAID support
- Up to 12 Gbps throughput per port
- PCIe 3.0 x8 host interface
- Based on the LSI SAS3008 12 Gbps controller

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

Internal drive options

The following tables lists hard disk drive options for internal storage.

Table 17. 2.5-inch hot-swap 6 Gb SAS/SATA HDDs

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap HDDs - 6 Gb SAS 10K			
90Y8877	A2XC	300GB 10K 6Gbps SAS 2.5" SFF G2HS HDD	32
90Y8872	A2XD	600GB 10K 6Gbps SAS 2.5" SFF G2HS HDD	32
81Y9650	A282	900GB 10K 6Gbps SAS 2.5" SFF HS HDD	32
00AD075	A48S	1.2TB 10K 6Gbps SAS 2.5" G2HS HDD	32
2.5-inch hot-swap HDDs - 6 Gb SAS 15K			
90Y8926	A2XB	146GB 15K 6Gbps SAS 2.5" SFF G2HS HDD	32
81Y9670	A283	300GB 15K 6Gbps SAS 2.5" G2HS HDD	32
00AJ300	A4VB	600GB 15K 6Gbps SAS 2.5" G2HS HDD	32
2.5-inch hot-swap HDDs - 6 Gb NL SAS			
90Y8953	A2XE	500GB 7.2K 6Gbps NL SAS 2.5" SFF G2HS HDD	32
81Y9690	A1P3	1TB 7.2K 6Gbps NL SAS 2.5" SFF HS HDD	32
2.5-inch hot-swap HDDs - 6 Gb NL SATA			
81Y9726	A1NZ	500GB 7.2K 6Gbps NL SATA 2.5" SFF HS HDD	32
81Y9730	A1AV	1TB 7.2K 6Gbps NL SATA 2.5" SFF HS HDD	32
2.5-inch hot-swap SED HDDs - 6 Gb SAS 10K			
90Y8913	A2XF	300GB 10K 6Gbps SAS 2.5" SFF G2HS SED	32

Table 18. 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)			
49Y6129	A3EW	200GB SAS 2.5" MLC HS Enterprise SSD	32
49Y6134	A3EY	400GB SAS 2.5" MLC HS Enterprise SSD	32
49Y6139	A3F0	800GB SAS 2.5" MLC HS Enterprise SSD	32
2.5-inch hot-swap SSDs - 6 Gb SATA - Enterprise Mainstream (3-5 DWPD)			
00AJ355	A56Z	120GB SATA 2.5" MLC HS Enterprise Value SSD	32
00AJ360	A570	240GB SATA 2.5" MLC HS Enterprise Value SSD	32
00AJ365	A571	480GB SATA 2.5" MLC HS Enterprise Value SSD	32
00AJ370	A572	800GB SATA 2.5" MLC HS Enterprise Value SSD	32

Table 19. 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 SAS			
90Y8567	A26M	1TB 7.2K 6Gbps NL SAS 3.5" G2HS HDD	8
90Y8572	A2U0	2TB 7.2K 6Gbps NL SAS 3.5" G2HS HDD	8
00ML213	AS78	6TB 7.2K 6Gbps NL SAS 3.5" G2HS 512e HDD	8
3.5-inch hot-swap HDDs - 6 Gb NL SATA			
81Y9786	A22Y	500GB 7.2K 6Gbps NL SATA 3.5" G2HS HDD	8
81Y9790	A22P	1TB 7.2K 6Gbps NL SATA 3.5" G2HS HDD	8
81Y9794	A22T	2TB 7.2K 6Gbps NL SATA 3.5" G2HS HDD	8
00FN113	A5VD	2TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD	8
00FN143	A5VH	4TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD	8
00FN173	A5VM	6TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD	8

Table 20. 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	8
81Y9806	A22X	1TB 7.2K 6Gbps NL SATA 3.5" G2SS HDD	8
81Y9810	A22W	2TB 7.2K 6Gbps NL SATA 3.5" G2SS HDD	8

Internal backup units

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

Table 21. Internal tape drives

Part number	Feature code	Description	Maximum supported
00D2786	A2VE	RDX Internal USB 3.0 Dock with 320GB Cartridge	1
00D2787	A2VF	RDX Internal USB 3.0 Dock with 500GB Cartridge	1
00D2788	A2VG	RDX Internal USB 3.0 Dock with 1TB Cartridge	1
46C5364	-	RDX Removable Hard Disk System - Internal USB 160 GB Bundle	1
46C5387	-	RDX Removable Hard Disk System - Internal USB 320 GB Bundle	1
46C5388	-	RDX Removable Hard Disk System - Internal USB 500 GB Bundle	1
46C5399	5711	DDS Generation 5 USB Tape Drive	1
39M5636	5395	DDS Generation 6 USB Tape Drive	1
43W8478	5393	Half High LTO Gen 3 SAS Tape Drive	2*
44E8895	5397	Half High LTO Gen 4 SAS Tape Drive	2*
49Y9898	5345	Half High LTO Gen 5 Internal SAS Tape Drive	2*
00D8924	A3S3	Half High LTO Ultrium Gen 6 Internal SAS Tape Drive	2*

* Note: With standard models, installation of a second tape drive requires removal of DVD-ROM.

USB tape drives are attached to the internal USB connector. SAS tape drives require SAS HBA (sold separately). See Table 14 for list of available SAS HBAs.

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

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

Optical drives

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

Table 22. Optical drives

Part number	Feature code	Description	Maximum quantity supported	Standard models where used
None*	4154	Half-High SATA DVD-ROM	2	A2x, B2x, C2x, C4x, D2x, F2x, G2x, H2x, J2x, A5x, B5x, C5x, C7x, C9x, D5x, F5x, G5x, G9x, H5x, J5x
81Y6404	4155	Half-High SATA Multiburner	2	-

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

The two half-high drives in the table can be installed in any open 5.25" drive bay (Figure 5).

Half-High SATA DVD-ROM 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
- DVD-RAM (4.7/9.4 GB) 6X

Half-High SATA multiburner 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
- DVD-RAM 3X

I/O expansion options

The server supports up to eight PCIe slots: six slots (1 to 6) when one CPU is installed or eight slots when two CPUs are installed. These are the slot form factors:

- Slot 1: PCIe x8 (x4 wired); full-height, half-length (supports optional PCI-X interposer card)
- Slot 2: PCIe x8; full-height, half-length
- Slot 3: PCIe x8; full-height, full-length
- Slot 4: PCIe x8 (x4 wired); full-height, full-length
- Slot 5: PCIe x16; full-height, full-length
- Slot 6: PCIe x8 (x4 wired); full-height, full-length
- Slot 7: PCIe x16; full-height, full-length (requires second processor)
- Slot 8: PCIe x16; full-height, full-length (requires second processor)

All PCIe slots are PCI Express 3.0 slots except Slot 1, which is a PCI Express 2.0 slot. Slot 1 can be converted to a PCI-X slot with the PCI-X Conversion Kit, which is described in the following table.

Table 23. PCI riser card options

Part number	Feature code	Description	Maximum supported
81Y7012	A1G3	PCI-X Interposer Conversion Kit	1

Network adapters

x3500 M4 has four integrated Gigabit Ethernet ports. Integrated NICs have the following features:

- Intel I350AM4 chip
- Four GbE ports
- TCP Offload Engine (TOE) support
- Wake on LAN support
- 802.1Q VLAN tagging support
- NIC Teaming (load balancing and failover)

The following table lists additional supported network adapters.

Table 24. Network adapters

Part number	Feature code	Description	Maximum quantity supported (1 CPU / 2 CPUs)
10 Gb Ethernet			
49Y7910	A18Y	Broadcom NetXtreme II Dual Port 10GBaseT Adapter	6 / 8
None#*	A2UN	Emulex Dual Port 10GbE SFP+ Integrated VFA IIIx**	1 / 1
95Y3762*	A2U1	Emulex Dual Port 10GbE SFP+ VFA III for System x**	5 / 7
95Y3760*	A2U2	Emulex VFA III FCoE/iSCSI License for System x (FoD) (license for Emulex VFA III adapters, features A2UN and A2U1)	6 / 8
49Y7960	A2EC	Intel X520 Dual Port 10GbE SFP+ Adapter for System x**	6 / 8
49Y7970	A2ED	Intel X540-T2 Dual Port 10GBaseT Adapter for System x	6 / 8
42C1800	5751	QLogic 10Gb CNA for System x**	6 / 8
1 Gb Ethernet			
90Y9370	A2V4	Broadcom NetXtreme I Dual Port GbE Adapter for System x	6 / 8
90Y9352	A2V3	Broadcom NetXtreme I Quad Port GbE Adapter for System x	6 / 8
49Y4230	5767	Intel Ethernet Dual Port Server Adapter I340-T2 for System x	6 / 8
49Y4240	5768	Intel Ethernet Quad Port Server Adapter I340-T4 for System x	6 / 8
00AG500	A56K	Intel I350-F1 1xGbE Fiber Adapter for System x	6 / 8
00AG510	A56L	Intel I350-T2 2xGbE BaseT Adapter for System x	6 / 8
00AG520	A56M	Intel I350-T4 4xGbE BaseT Adapter for System x	6 / 8
42C1780	2995	NetXtreme II 1000 Express Dual Port Ethernet Adapter	6 / 8
42C1750	2975	PRO/1000 PF Server Adapter by Intel	6 / 8

* Not supported in E5-2600 v2 processor-based models.

Emulex Dual Port 10GbE SFP+ Integrated VFA III is only available through CTO or Special Bid (SBB 95Y3768)

** Require SFP+ optical transceivers or DAC cables that must be purchased separately.

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

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

Storage HBAs and external RAID controllers

The following table lists storage HBAs supported by the x3500 M4 server.

Table 25. Storage adapters

Part number	Feature code	Description	Maximum supported (1 CPU / 2 CPUs)
16 Gb Fibre Channel			
81Y1675	A2XV	Brocade 16Gb FC Dual-port HBA for System x	6 / 8
81Y1668	A2XU	Brocade 16Gb FC Single-port HBA for System x	6 / 8
81Y1662	A2W6	Emulex 16Gb FC Dual-port HBA for System x	6 / 8
81Y1655	A2W5	Emulex 16Gb FC Single-port HBA for System x	6 / 8
00Y3341	A3KX	QLogic 16Gb FC Dual-port HBA for System x	6 / 8
00Y3337	A3KW	QLogic 16Gb FC Single-port HBA for System x	6 / 8
8 Gb Fibre Channel			
46M6050	3591	Brocade 8Gb FC Dual-port HBA for System x	6 / 8
46M6049	3589	Brocade 8Gb FC Single-port HBA for System x	6 / 8
42D0494	3581	Emulex 8Gb FC Dual-port HBA for System x	6 / 8
42D0485	3580	Emulex 8Gb FC Single-port HBA for System x	6 / 8
42D0510	3579	QLogic 8Gb FC Dual-port HBA for System x	6 / 8
42D0501	3578	QLogic 8Gb FC Single-port HBA for System x	6 / 8
4 Gb Fibre Channel**			
59Y1993	3886	Brocade 4Gb FC Dual-port HBA for System x	6 / 8
59Y1987	3885	Brocade 4Gb FC Single-port HBA for System x	6 / 8
42C2071*	1699	Emulex 4Gb FC Dual-Port PCI-E HBA for System x	6 / 8
42C2069*	1698	Emulex 4Gb FC Single-Port PCI-E HBA for System x	6 / 8
39R6527	3568	Qlogic 4Gb FC Dual-Port PCIe HBA for System x	6 / 8
39R6525	3567	Qlogic 4Gb FC Single-Port PCIe HBA for System x	6 / 8
SAS			
46M0907	5982	6 Gb SAS HBA Controller	6 / 8
46C9010	A3MV	N2125 SAS/SATA HBA for System x	3 / 3
00AE912	A5M0	N2225 SAS/SATA HBA for System x	3 / 3
00AE916	A5M1	N2226 SAS/SATA HBA for System x	1 / 3

* Withdrawn from marketing

* Not supported in E5-2600 v2 processor-based models.

For more information, see the list of Product Guides in the Host bus adapters category:

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

The server supports attachment to external storage expansion enclosures, such as the EXP2500 series, by using the ServeRAID M5120 SAS/SATA Controller.

The following table provides the ordering part numbers for the ServeRAID M5120 SAS/SATA Controller.

Table 26. Ordering part numbers and feature codes

Part number	Feature code	Description	Maximum quantity supported
81Y4478	A1WX	ServeRAID M5120 SAS/SATA Controller	3*
81Y4484	A1J3	ServeRAID M5100 Series 512MB Cache/RAID 5 Upgrade	3*
81Y4487	A1J4	ServeRAID M5100 Series 512MB Flash/RAID 5 Upgrade	3*
81Y4559	A1WY	ServeRAID M5100 Series 1GB Flash/RAID 5 Upgrade	3*
81Y4508	A22E	ServeRAID M5100 Series Battery Kit	3*
81Y4546	A1X3	ServeRAID M5100 Series RAID 6 Upgrade	1**
90Y4273	A2MC	ServeRAID M5100 Series SSD Performance Accelerator	1**
90Y4318	A2MD	ServeRAID M5100 Series SSD Caching Enabler	1**

* The maximum number of remotely mounted battery/supercap units must not exceed 3 for all controllers installed in a server. This may further limit the maximum number of M5120 controllers supported.

** Only one M5100 Series FoD software license is required per server.

The ServeRAID M5120 SAS/SATA Controller has the following specifications:

- Eight external 6 Gbps SAS/SATA ports
- Two external x4 mini-SAS connectors (SFF-8088)
- Supports RAID levels 0, 1, and 10
- Supports RAID levels 5 and 50 with optional M5100 Series RAID 5 upgrades
- Supports RAID 6 and 60 with the optional M5100 Series RAID 6 Upgrade
- Supports 512 MB battery-backed cache or 512 MB or 1 GB flash-backed cache
- Up to 6 Gbps throughput per port
- PCIe 3.0 x8 host interface
- Based on the LSI SAS2208 6 Gbps ROC controller
- Supports connectivity to the EXP2512 and EXP2524 storage expansion enclosures

PCIe SSD adapters

The server supports the High IOPS SSD adapters listed in the following table.

These adapters require:

- Tower to Rack Conversion Kit, part 81Y7006, feature A1X0
- Redundant Cooling Upgrade Kit, part 81Y7007, feature A1G2

Table 27. SSD adapters

Part number	Feature code	Description	Max supported (1 CPU / 2 CPUs)
46C9078	A3J3	365GB High IOPS MLC Mono Adapter	6 / 8
46C9081	A3J4	785GB High IOPS MLC Mono Adapter	6 / 8
90Y4361*	A3MZ	300GB High IOPS MLC Modular Adapter*	5 / 7
90Y4365*	A3N0	600GB High IOPS MLC Modular Adapter*	5 / 7
90Y4369*	A3N1	800GB High IOPS MLC Modular Adapter*	5 / 7
90Y4373*	A3N2	300GB High IOPS SLC Modular Adapter*	5 / 7
90Y4377	A3DY	1.2TB High IOPS MLC Mono Adapter	6 / 8

* For important ordering and installation information about the Modular Adapters, see link <http://ibm.com/support/entry/portal/docdisplay?Indocid=serv-ioma>

For details about these adapters, see the Product Guides in the PCIe Flash Storage Adatper category: <https://lenovopress.com/servers/options/ssdadapter>

GPU adapters

The x3500 M4 server supports graphics processing units (GPUs) listed in the following table. Up to two GPUs are supported depending on the number of processors installed in a server (one GPU in slot 5 with one processor installed, or two GPUs in slot 5 and slot 7 with two processors installed).

Table 28. GPU adapters

Part number	Feature code	Description	Max. qty supported (1 CPU / 2 CPUs)
Intel Xeon processor E5-2600 v2 product family			
None*	A3YU	NVIDIA Quadro K4000	1 / 1
None*	A3WJ	NVIDIA Quadro K2000	1 / 1
None*	A3WH	NVIDIA Quadro K600	1 / 1
None*	A471	NVIDIA Tesla K20 (Actively Cooled)	1 / 2
Intel Xeon processor E5-2600 product family			
None*	A3YU	NVIDIA Quadro K4000	1 / 2
None*	A3WJ	NVIDIA Quadro K2000	1 / 2
None*	A3WH	NVIDIA Quadro K600	1 / 2
None*	A471	NVIDIA Tesla K20 (Actively Cooled)	1 / 2
00D4484*	A26Q	NVIDIA Quadro 6000	1 / 2
94Y5957	4798	NVIDIA Quadro 4000	1 / 2
00W2299	A1QU	NVIDIA Quadro 2000	1 / 2
81Y6399	A13K	NVIDIA Quadro 600	1 / 2

* If NVIDIA Quadro 6000 is installed in a PCIe slot, the next PCIe slot can not be used (if adapter is installed in slot 5, slot 6 can not be used; if adapter is installed in slot 7, slot 8 can not be used).

The use of a GPU adapter requires installation of one or two 900 W power supplies. 550 W or 750 W power supplies are not supported. The following additional rules apply:

- If the NVIDIA Quadro 600 is installed, the maximum memory that can be installed is 128 GB.
- If the NVIDIA Quadro 2000, 4000, or 6000 is installed, the maximum memory that can be installed is 512 GB.
- If NVIDIA Quadro K600, K2000, K4000, K5000, or Tesla K2 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 (model dependent). The server also comes standard with either two (for models with one processor installed) or three (for models with two processors installed) simple swap cooling fans. Optional upgrade is available to provide N+N cooling redundancy. The following table lists the power supplies and redundant cooling upgrade option.

Table 29. Power supplies

Part number	Feature code	Description	Maximum supported	Standard models where used
94Y5975	A22M	System x 550W High Efficiency Platinum AC Power Supply	2	-
94Y5974	A1G8	System x 750W High Efficiency Platinum AC Power Supply	2	A2x, B2x, C2x, C4x, D2x, F2x
94Y5973	A1G7	System x 900W High Efficiency Platinum AC Power Supply	2	G2x, H2x, J2x
81Y7007	A1G2	Redundant Cooling Upgrade Kit	1	-

An AC power supply ships standard without a line cord, it must be purchased separately. The redundant cooling kit contains three simple swap fans. Certain rules apply to the selection of power supply, these rules are listed in Table 17. Table 17 uses the following conventions:

- A grey cell means that the server can be filled with drives, GPUs, processors and DIMMs up to the maximum number according to server specifications.
- A yellow cell means that the maximum number of drives, GPUs, processors or DIMMs that the server can hold is fewer than the total number listed in server specifications.

Table 30. Configuration rules based on power supply used (PSU = power supply unit, NS = no support)

Power supply	PSU qty	PSU red.*	Max. drive qty		Intermixing 2.5" + 3.5"	Max. GPU qty	CPU support	Max. DIMM qty supported		
			2.5"	3.5"				UDIMM	RDIMM	LRDIMM
550 W	1	No	8	8	No support	NS	Max. 95 W	16	16 SR or DR (NS for QR)	NS
	2	Yes	8	8	No support	NS	Max. 95 W	16	16 SR or DR (NS for QR)	NS
750 W	1	No	16	8	8 + 8 drives	NS	All (135 W)	16	24	16
	2	Yes	16	8	8 + 8 drives	NS	All (135 W)	16	24	16
900 W	1	No	32	8	8 + 8 drives	NS	All (135 W)	16	24	16
	1	No	8	8	No support	1 GPU	All (135 W)	16	24	16
	1	No	16	8	8 + 8 drives	NS	All (135 W)	16	24	24
	2	Yes	32	8	8 + 8 drives	NS	All (135 W)	16	24	16
	2	Yes	8	8	No support	1 GPU	All (135 W)	16	24	16
	2	Yes	16	8	8 + 8 drives	NS	All (135 W)	16	24	24
	2	No	32	8	8 + 8 drives	2 GPUs	All (135 W)	16	24	24

* PSU redundancy

Integrated virtualization

The server 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 31. Virtualization options

Part number	Feature code	Description	Maximum supported
41Y8298	A2G0	Blank USB Memory Key for VMware ESXi Downloads	1
41Y8300	A2VC	USB Memory Key for VMware ESXi 5.0	1
41Y8307	A383	USB Memory Key for VMware ESXi 5.0 Update 1	1
41Y8311	A2R3	USB Memory Key for VMware ESXi 5.1	1
41Y8382	A4WZ	USB Memory Key for VMware ESXi 5.1 Update 1	1
41Y8385	A584	USB Memory Key for VMware ESXi 5.5	1

Systems management

The server contains Integrated Management Module II (IMM2), 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 lights LEDs to help you diagnose the problem, records the error in the event log, and alerts you to the problem. Optionally, the IMM2 also provides a virtual presence capability for remote server management capabilities.

The IMM2 provides remote server management through 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 IMM Advanced Upgrade (software feature) is required to enable the 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 color depths, regardless of the system state
- Remotely accessing the server 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 32. Remote management option

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

Supported operating systems

The server supports the following operating systems:

- Microsoft Windows Server 2008 R2
- Microsoft Windows Server 2008, Datacenter x64 Edition
- Microsoft Windows Server 2008, Datacenter x86 Edition
- Microsoft Windows Server 2008, Enterprise x64 Edition
- Microsoft Windows Server 2008, Enterprise x86 Edition
- Microsoft Windows Server 2008, Standard x64 Edition
- Microsoft Windows Server 2008, Standard x86 Edition
- Microsoft Windows Server 2008, Web x64 Edition
- Microsoft Windows Server 2008, Web x86 Edition
- Microsoft Windows Server 2012
- Microsoft Windows Server 2012 R2
- Microsoft Windows Small Business Server 2008 Premium Edition*
- Microsoft Windows Small Business Server 2008 Standard Edition*
- Red Hat Enterprise Linux 5 Server Edition
- Red Hat Enterprise Linux 5 Server with Xen x64 Edition
- Red Hat Enterprise Linux 5 Server x64 Edition
- Red Hat Enterprise Linux 6 Server Edition
- Red Hat Enterprise Linux 6 Server x64 Edition
- SUSE LINUX Enterprise Server 10 for AMD64/EM64T
- SUSE LINUX Enterprise Server 10 for x86
- SUSE LINUX Enterprise Server 11 for AMD64/EM64T
- SUSE LINUX Enterprise Server 11 for x86
- SUSE LINUX Enterprise Server 11 with Xen for AMD64/EM64T
- VMware ESX 4.1*
- VMware ESXi 4.1*
- VMware vSphere 5.0 (ESXi)
- VMware vSphere 5.1 (ESXi)
- VMware vSphere 5.5 (ESXi)

* Not supported with E5-2600 v2 processor-based servers.

See the ServerProven® website for the latest information about the specific versions and service levels supported and any other prerequisites:

<http://www.lenovo.com/us/en/serverproven/>

Physical and electrical specifications

Dimensions and weight (approximate):

Tower:

- Width: 218 mm (8.6 in)
- Depth: 750 mm (29.5 in)
- Height: 440 mm (17.3 in)
- Weight:
 - Minimum configuration: 25.0 kg (55.1 lb)
 - Maximum configuration: 39.8 kg (87.7 lb)

Rack (using the Tower-to-Rack Conversion Kit, 81Y7006):

- Width: 424 mm (16.7 in)
- Depth: 702 mm (27.6 in)
- Height: 218 mm (8.5 in)
- Weight:
 - 24.5 kg (53.9 lb) (minimum configuration)
 - 39.3 kg (86.6 lb) (maximum configuration)

Supported environment:

- Air temperature
 - Server on: 10 - 35 °C (50 to 95 °F); altitude: 0 - 915 m (3,000 ft)
 - Server on: 10 - 32 °C (50 - 90 °F); altitude: 915 m (3,000 ft) - 2,134 m (7,000 ft)
 - Server on: 10 - 28 °C (50 - 83 °F); altitude: 2,134 m (7,000 ft) - 3,050 m (10,000 ft)
 - Server off (with standby power): 5 - 45 °C (41.0 - 113 °F)
 - Shipping: -40 - 60 °C (-40 - 140 °F)
- Humidity
 - Server on: 20 - 80% , Max. Dew Point 21 °C, Max. rate of change 5 °C/hr
 - Server off: 8 - 80%, Max. Dew Point 27 °C
- Electrical
 - Models with 900 W power supplies:
 - 100 to 127 (nominal) V ac; 50 Hz or 60 Hz; 11 A
 - 200 to 240 (nominal) V ac; 50 Hz or 60 Hz; 5.5 A
 - Input kilovolt-amperes (kVA) (approximately):
 - Minimum configuration: 0.6 kVA
 - Maximum configuration: 1.1 kVA
 - Models with 750 W power supplies:
 - 100 to 127 (nominal) V ac; 50 Hz or 60 Hz; 8.9 A
 - 200 to 240 (nominal) V ac; 50 Hz or 60 Hz; 4.5 A
 - Input kilovolt-amperes (kVA) (approximately):
 - Minimum configuration: 0.6 kVA
 - Maximum configuration: 0.9 kVA
- BTU output
 - Minimum configuration: 2013 Btu/hr (590 watts)
 - Maximum configuration: 3610 Btu/hr (1056 watts)

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 country-specific. Not all warranty service upgrades are available in every country. For more information about Lenovo warranty service upgrade offerings that are available in your country, visit the Lenovo Quick Pick website:

<http://lenovoquickpick.com/>

The following table explains warranty service definitions in more detail.

Table 33. 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 country 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 2.0
- FCC - Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, issue 4, Class A
- UL/IEC 60950-1
- CSA C22.2 No. 60950-1-07
- NOM-019
- Argentina IEC60950-1
- Japan VCCI, Class A
- Australia/New Zealand AS/NZS CISPR 22:2006, Class A
- IEC-60950-1 (CB Certificate and CB Test Report)
- Taiwan BSMI CNS13438, Class A; CNS14336-1
- China CCC (GB4943-2001), GB9254-2008 class A, GB17625.1-2003
- Korea KN22, Class A; KN24
- CE Mark (EN55022 Class A, EN60950-1, EN55024, EN61000-3-2, and EN61000-3-3)
- CISPR 22, Class A
- TUV-GS EN60950-1 /IEC60950-1,EK1-ITB2000)
- Russia/GOST ME01, IEC-60950-1, GOST R 51318.22-99, GOST R 51318.24-99, GOST R 51317.3.2-99, GOST R 51317.3.3-99
- IEC 60950-1 (CB Certificate and CB Test Report)

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 external drive enclosures that can be used for direct-attach SAS storage. Lenovo Storage expansion units can also be used to expand the Lenovo Storage Systems listed in the [External storage systems](#) section.

Table 34. External expansion enclosures

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
70F0 / 70F1**	Lenovo ThinkServer SA120

* Not available for ordering in North America (United States and Canada).

** Machine Type; see the Lenovo ThinkServer SA120 Product Guide (<http://lenovopress.com/tips1234>) for available models.

For details about supported adapters, drives and cables for the Lenovo Storage E1012 and E1024, see the Lenovo Press Product Guide:

<http://lenovopress.com/lp0043>

For details about supported adapters, drives and cables for the Lenovo ThinkServer SA120, see the Lenovo Press Product Guide:

<http://lenovopress.com/tips1234>

External disk storage systems

The following table lists the NAS and SAN external storage systems that are offered by Lenovo.

Table 35. External disk storage systems

Part number	Description
Lenovo Network-Attached Storage (NAS connectivity)	
70FX / 70FY*	Lenovo Storage N3310
70G0 / 70G1*	Lenovo Storage N4610
Lenovo Storage S2200 (SAS, iSCSI, or FC host connectivity)	
64112B1	Lenovo Storage S2200 LFF Chassis SAS Single Controller, Rack Kit, 9x5NBD
64112B2	Lenovo Storage S2200 LFF Chassis SAS Dual Controller, Rack Kit, 9x5NBD
64114B1	Lenovo Storage S2200 LFF Chassis FC/iSCSI Single Controller, Rack Kit, 9x5NBD
64114B2	Lenovo Storage S2200 LFF Chassis FC/iSCSI Dual Controller, Rack Kit, 9x5NBD
64112B3	Lenovo Storage S2200 SFF Chassis SAS Single Controller, Rack Kit, 9x5NBD
64112B4	Lenovo Storage S2200 SFF Chassis SAS Dual Controller, Rack Kit, 9x5NBD
64114B3	Lenovo Storage S2200 SFF Chassis FC/iSCSI Single Controller, Rack Kit, 9x5NBD
64114B4	Lenovo Storage S2200 SFF Chassis FC/iSCSI Dual Controller, Rack Kit, 9x5NBD
Lenovo Storage S3200 (SAS, iSCSI, or FC host connectivity)	
64113B1	Lenovo Storage S3200 LFF Chassis SAS Single Controller, Rack Kit, 9x5NBD

Part number	Description
64113B2	Lenovo Storage S3200 LFF Chassis SAS Dual Controller, Rack Kit, 9x5NBD
64116B1	Lenovo Storage S3200 LFF Chassis FC/iSCSI Single Controller, Rack Kit, 9x5NBD
64116B2	Lenovo Storage S3200 LFF Chassis FC/iSCSI Dual Controller, Rack Kit, 9x5NBD
64113B3	Lenovo Storage S3200 SFF Chassis SAS Single Controller, Rack Kit, 9x5NBD
64113B4	Lenovo Storage S3200 SFF Chassis SAS Dual Controller, Rack Kit, 9x5NBD
64116B3	Lenovo Storage S3200 SFF Chassis FC/iSCSI Single Controller, Rack Kit, 9x5NBD
64116B4	Lenovo Storage S3200 SFF Chassis FC/iSCSI Dual Controller, Rack Kit, 9x5NBD
Lenovo Storage V Series (SAS, iSCSI, FC, or FCoE host connectivity)	
6535C1D	Lenovo Storage V3700 V2 LFF Control Enclosure
6535EC1	Lenovo Storage V3700 V2 LFF Control Enclosure (Top Seller)
6535C2D	Lenovo Storage V3700 V2 SFF Control Enclosure
6535EC2	Lenovo Storage V3700 V2 SFF Control Enclosure (Top Seller)
6535C3D	Lenovo Storage V3700 V2 XP LFF Control Enclosure
6535EC3	Lenovo Storage V3700 V2 XP LFF Control Enclosure (Top Seller)
6535C4D	Lenovo Storage V3700 V2 XP SFF Control Enclosure
6535EC4	Lenovo Storage V3700 V2 XP SFF Control Enclosure (Top Seller)
6536C12	Lenovo Storage V5030 LFF Control Enclosure 3Yr S&S
6536C32	Lenovo Storage V5030 LFF Control Enclosure 5Yr S&S
6536C22	Lenovo Storage V5030 SFF Control Enclosure 3Yr S&S
6536C42	Lenovo Storage V5030 SFF Control Enclosure 5Yr S&S
IBM Storwize for Lenovo (SAS [except V7000], iSCSI, FC, or FCoE host connectivity)	
6096CU2**	IBM Storwize V3500 3.5-inch Dual Control Storage Controller Unit
6096CU3**	IBM Storwize V3500 2.5-inch Dual Control Storage Controller Unit
6099L2C	IBM Storwize V3700 3.5-inch Storage Controller Unit
6099S2C	IBM Storwize V3700 2.5-inch Storage Controller Unit
6099T2C	IBM Storwize V3700 2.5-inch DC Storage Controller Unit
6194L2C†	IBM Storwize V5000 LFF Control Enclosure, w/3 Yr S&S
6194L2L‡	IBM Storwize V5000 LFF Control Enclosure, w/3 Yr S&S (LA)
61941A1†	IBM Storwize V5000 LFF Control Enclosure, w/5 Yr S&S
61941AL‡	IBM Storwize V5000 LFF Control Enclosure, w/5 Yr S&S (LA)
6194S2C†	IBM Storwize V5000 SFF Control Enclosure, w/3 Yr S&S
6194S2L‡	IBM Storwize V5000 SFF Control Enclosure, w/3 Yr S&S (LA)
61941C1†	IBM Storwize V5000 SFF Control Enclosure, w/5 Yr S&S
61941CL‡	IBM Storwize V5000 SFF Control Enclosure, w/5 Yr S&S (LA)
6195SC5†	IBM Storwize V7000 2.5-inch Storage Controller Unit, w/3 Yr S&S
6195SCL‡	IBM Storwize V7000 2.5-inch Storage Controller Unit, w/3 Yr S&S (LA)
61951F1†	IBM Storwize V7000 2.5-inch Storage Controller Unit, w/5 Yr S&S
61951FL‡	IBM Storwize V7000 2.5-inch Storage Controller Unit, w/5 Yr S&S (LA)

* Machine Type; see the respective Product Guide in the NAS Storage category for models:

<http://lenovopress.com/storage/nas>

** Available only in China.

† Available worldwide except Latin America.

‡ Available only in Latin America.

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

- Lenovo Network-Attached Storage: <http://lenovopress.com/storage/nas>
- Lenovo SAN Storage: <https://lenovopress.com/storage/san/lenovo>
- IBM Storwize: <https://lenovopress.com/storage/san/ibm>

External backup units

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

Table 36. External backup options

Part number	Description
External RDX USB drives (System x, Flex System, NeXtScale, BladeCenter)	
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	
6160S5E	IBM TS2250 Tape Drive Model H5S
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	
61732UL	IBM TS3100 Tape Library Model L2U
61734UL	IBM TS3200 Tape Library Model L4U
Fibre Channel backup drives for TS3100 and TS3200 Tape Libraries	
00NA107	6173 LTO Ultrium 5 Fibre Channel Drive
00NA113	6173 LTO Ultrium 5 Half High Fibre Drive Sled
00NA115	6173 LTO Ultrium 6 Fibre Channel Drive
00NA119	6173 LTO Ultrium 6 Half High Fibre Drive Sled
00WF765	6173 LTO Ultrium 7 Fibre Channel Drive
00WF769	6173 LTO Ultrium 7 Half High Fibre Drive Sled
SAS backup drives for TS3100 and TS3200 Tape Libraries	
00NA109	6173 LTO Ultrium 5 SAS Drive Sled
00NA111	6173 LTO Ultrium 5 Half High SAS Drive Sled
00NA117	6173 LTO Ultrium 6 Half High SAS Drive Sled
00WF767	6173 LTO Ultrium 7 Half High SAS Drive Sled

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 top-of-rack Ethernet switches that are offered by Lenovo.

Table 37. Top-of-rack Ethernet switches

Part number	Description
1 Gb Ethernet top-of-rack switches	
7159BAX	Lenovo RackSwitch G7028 (Rear to Front)
7159CAX	Lenovo RackSwitch G7052 (Rear to Front)
7159G52	Lenovo RackSwitch G8052 (Rear to Front)
10 Gb Ethernet top-of-rack switches	
7159BR6	Lenovo RackSwitch G8124E (Rear to Front)
7159G64	Lenovo RackSwitch G8264 (Rear to Front)
7159DRX	Lenovo RackSwitch G8264CS (Rear to Front)
7159CRW	Lenovo RackSwitch G8272 (Rear to Front)
7159GR6	Lenovo RackSwitch G8296 (Rear to Front)
40 Gb Ethernet top-of-rack switches	
7159BRX	Lenovo RackSwitch G8332 (Rear to Front)

For more information, see the list of Product Guides in the Top-of-rack switches 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>
- 40 Gb Ethernet switches: <http://lenovopress.com/networking/tor/40gb?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 38. 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)

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 39. 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
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
46M4143	0U 12 C19/12 C13 32A 3 Phase PDU with IEC 309 3P+N+Gnd line cord
Switched and Monitored PDUs	
00YJ781	0U 20 C13/4 C19 Switched and Monitored 24A/200-240V/1Ph PDU w/ NEMA L6-30P line cord
00YJ780	0U 20 C13/4 C19 Switched and Monitored 32A/200-240V/1Ph PDU w/ IEC60309 332P6 line cord

Part number	Description
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
46M4116	0U 24 C13 Switched and Monitored 30A PDU with NEMA L6-30P line cord
46M4137	0U 12 C19/12 C13 Switched and Monitored 32A 3 Phase PDU with IEC 309 3P+N+Gnd cord
46M4134	0U 12 C19/12 C13 Switched and Monitored 50A 3 Phase PDU with CS8365L 3P+Gnd 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
Universal PDUs (7x IEC 320 C13 outlets)	
39Y8951	DPI Universal Rack PDU with US LV and HV line cords
39Y8952	DPI Universal Rack PDU with CEE7-VII Europe line cord
39Y8953	DPI Universal Rack PDU with Denmark line cord
39Y8954	DPI Universal Rack PDU with Israel line cord
39Y8955	DPI Universal Rack PDU with Italy line cord
39Y8956	DPI Universal Rack PDU with South Africa line cord
39Y8957	DPI Universal Rack PDU with UK line cord
39Y8958	DPI Universal Rack PDU with AS/NZ line cord
39Y8959	DPI Universal Rack PDU with China line cord
39Y8962	DPI Universal Rack PDU (Argentina)
39Y8960	DPI Universal Rack PDU (Brazil)
39Y8961	DPI Universal Rack PDU (India)
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	

Part number	Description
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

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

Rack cabinets

The x3500 M4 server can be installed in the rack with the Tower to Rack Conversion Kit (81Y7006). The resulting server is a 5U rack-mountable server. The server supports the rack cabinets listed in the following table.

Table 40. Rack cabinets and Tower to Rack Conversion Kits

Part number	Feature code	Description
Tower to rack conversion kits		
81Y7006	A1X0	5U Tower to Rack Conversion Kit
Rack cabinets		
201886X	-	11U Office Enablement Kit
93072PX	-	25U Static S2 Standard Rack
93072RX	-	25U Standard Rack
93074RX	-	42U Standard Rack
93074XX	-	42U Standard Rack Extension
93084EX	-	42U Enterprise Expansion Rack
93084PX	-	42U Enterprise Rack
93604EX	-	42U 1200 mm Deep Dynamic Expansion Rack
93604PX	-	42U 1200 mm Deep Dynamic Rack
93614EX	-	42U 1200 mm Deep Static Expansion Rack
93614PX	-	42U 1200 mm Deep Static Rack
93624EX	-	47U 1200 mm Deep Static Expansion Rack
93624PX	-	47U 1200 mm Deep Static Rack
99564RX	-	S2 42U Dynamic Standard Rack
99564XX	-	S2 42U Dynamic Standard Expansion Rack

The Tower-to-Rack Conversion Kit Installation Instructions can be downloaded from: <https://ibm.com/support/entry/myportal/docdisplay?Indocid=migr-5089509>

Figure 6 shows the server installed in the 5U Tower to Rack Conversion Kit.



Figure 6. The System x3500 M4 with the 5U Tower to Rack Conversion Kit

KVM console options

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

Table 41. 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
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 - Portugese 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)

Part number	Description
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>

Related publications and links

For more information see these resources:

- System x3500 M4 Installation and User's Guide
<https://ibm.com/support/entry/myportal/docdisplay?Indocid=migr-5089504>
- 5U Tower-to-Rack Conversion Kit
<https://ibm.com/support/entry/myportal/docdisplay?Indocid=migr-5089509>
- System x3500 M4 Problem Determination and Service Guide
<https://ibm.com/support/entry/myportal/docdisplay?Indocid=migr-5089505>
- System x Support Portal
<http://ibm.com/support/entry/portal/>
http://ibm.com/support/entry/portal/Downloads/Hardware/Systems/System_x/System_x3500_M4

Related product families

Product families related to this document are the following:

- [2-Socket Tower Servers](#)

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