Lenovo System x3650 M5 (E5-2600 v4)
Product Guide

With the powerful, versatile 2U rack server design, the dual-socket Lenovo System x3650 M5 (E5-2600 v4) server (Machine Type 8871) can run even more workloads, 24 x 7, and gain faster business insights. Integrated with Intel Xeon processor E5-2600 v4 product family and industry-leading two-socket storage capacity, the System x3650 M5 delivers exceptional performance. Flexible and scalable internal storage configurations include up to 28x 2.5-inch or 14x 3.5-inch drives with a wide selection of drive sizes and types.

Suggested uses: Database, cloud computing and virtualization, enterprise applications, collaboration/email, business analytics and big data, virtual desktops, and Microsoft RemoteFX applications.

The following figure shows the System x3650 M5.



Figure 1. Lenovo System x3650 M5

Did you know?

The System x3650 M5 incorporates energy-smart features for minimized costs and efficient performance. Dual fan zones support operation in up to 40°C environments. The 80 PLUS Titanium power supply units (PSUs) can deliver 96% efficiency at 50% load.

The System x3650 M5 has outstanding memory performance that is achieved by supporting two-RDIMMs-per-channel configurations at speeds up to 12% faster than the Intel specification, while still maintaining world-class reliability.

System x® servers achieved the highest reliability of any x86 servers; see ITIC 2015 - 2016 Global Server Hardware, Server OS Reliability Report, July 2015:
http://www.lenovo.com/images/products/system-x/pdfs/white-papers/itic_2015_reliability_wp.pdf

The System x3650 M5 integrates leadership security and reliability. System x Trusted Platform Assurance, an exclusive set of System x features and practices, establishes a solid security foundation for your workloads. Enterprise-class data protection is provided with optional self-encrypting drives, and advanced diagnostic tools facilitate reduced downtime and costs.

Key features

The System x3650 M5 is a versatile 2U dual-socket business-critical server that offers improved performance and pay-as-you-grow flexibility along with new features that improve server management capability. This powerful system is designed for your most important business applications and cloud deployments.

Combining balanced performance and flexibility, the System x3650 M5 is a great choice for small and medium businesses up to the large enterprise. It can provide outstanding uptime to keep business-critical applications and cloud deployments running safely. Ease of use and comprehensive systems management tools help make deployment easier. Outstanding reliability, availability, and serviceability (RAS) and high-efficiency design improve your business environment and help save operational costs.

Scalability and performance

The System x3650 M5 offers numerous features to boost performance, improve scalability, and reduce costs:

- Improves productivity by offering superior system performance with the Intel Xeon processor E5-2600 v4 product family with up to 22-core processors, up to 55 MB of L3 cache, and up to 9.6 GT/s QPI interconnect links.
    - Support for up to two processors, 44 cores, and 88 threads allows to maximize the concurrent execution of multithreaded applications.
    - Intelligent and adaptive system performance with energy efficient Intel Turbo Boost Technology allows CPU cores to run at maximum speeds during peak workloads by temporarily going beyond processor thermal design power (TDP).
    - Intel Hyper-Threading Technology boosts performance for multithreaded applications by enabling simultaneous multithreading within each processor core, up to two threads per core.
    - Intel Virtualization Technology integrates hardware-level virtualization hooks that allow operating system vendors to better utilize the hardware for virtualization workloads.
- Up to 2400 MHz memory speeds with two DIMMs per channel running at 2400 MHz to help maximize system performance.
- Up to 1.5 TB of memory capacity with 64 GB load-reduced DIMMs, or LRDIMMs
- The 12 Gbps SAS internal storage connectivity doubles the data transfer rate compared to 6 Gb SAS solutions to maximize performance of storage I/O-intensive applications.
- Flexible and scalable internal storage provides up to 112 TB for capacity-optimized storage configurations (using 8 TB 3.5-inch hard disk drives [HDDs]) or up to 28 drives for performance-optimized storage configurations in a 2U rack form factor.
- The use of solid-state drives (SSDs) instead of or along with traditional spinning HDDs can significantly improve I/O performance. An SSD can support a significantly higher number of I/O operations per second (IOPS) than a typical HDD.
- The server has four integrated Gigabit Ethernet ports and optional 10 Gb Ethernet ports with ML2 adapters.
- The server offers up to eight PCI Express (PCIe) 3.0 I/O expansion slots plus one dedicated PCIe 3.0 slot for an internal storage controller in a 2U rack form factor.
- With Intel Integrated I/O Technology, the PCI Express 3.0 controller is integrated into the Intel Xeon processor E5-2600 v4 product family. This helps to dramatically reduce I/O latency and increase overall system performance.

Availability and serviceability

The System x3650 M5 provides many features to simplify serviceability and increase system uptime:

- Tool-less cover removal provides easy access to upgrades and serviceable parts, such as processors, memory DIMMs, and adapter cards.
- The server offers hot-swap drives supporting RAID redundancy for data protection and greater system uptime.

- The server offers redundant hot-swap power supplies and hot-swap redundant fans to provide availability for business-critical applications.
- The new Next Gen light path diagnostics LCD display panel simplifies servicing, speeds up problem resolution, and helps improve system availability.
- Predictive Failure Analysis (PFA) detects when system components (memory and disks) operate outside of standard thresholds and generates proactive alerts in advance of possible failure, therefore increasing uptime.
- SSDs offer significantly better reliability than traditional mechanical HDDs for greater uptime.
- Built-in Integrated Management Module II (IMM2.1) continuously monitors system parameters, triggers alerts, and performs recovery actions in case of failure, to minimize downtime.
- Built-in diagnostics using Dynamic Systems Analysis (DSA) Preboot speeds up troubleshooting tasks to reduce service time.

Manageability and security

Powerful systems management features simplify local and remote management of the System x3650 M5 and deliver enterprise-class data protection:

- The server includes an Integrated Management Module II (IMM2.1) to monitor server availability and perform remote management.
- An integrated industry-standard Unified Extensible Firmware Interface (UEFI) enables improved setup, configuration, and updates, and simplifies error handling.
- Lenovo XClarity Administrator offers comprehensive hardware management tools that help to increase uptime, reduce costs and improve productivity through advanced server management capabilities.
- An integrated Trusted Platform Module (TPM) enables advanced cryptographic functionality such as digital signatures and remote attestation.
- System x Trusted Platform Assurance, an exclusive set of System x security features and practices, establishes a solid security foundation for workloads by delivering firmware that is securely built, tested, digitally signed and verified prior to execution.
- The server offers enterprise-class data protection with optional self-encrypting drives.

Energy efficiency

The System x3650 M5 offers the following energy-efficiency features to save energy, reduce operational costs, increase energy availability, and contribute to the green environment:

- Energy-efficient planar components help lower operational costs.
- High-efficiency power supplies with 80 PLUS Platinum and Titanium certifications.
- 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 the demands of power and thermally constrained data centers and telecommunication environments.
- Low-voltage 1.2 V DDR4 memory DIMMs offer energy savings compared to 1.35 V and 1.5 V DDR3 DIMMs.
- The server uses hexagonal ventilation holes, a part of Calibrated Vectored Cooling™ technology. Hexagonal holes can be grouped more densely than round holes, providing more efficient airflow through the system.
- Lenovo XClarity Energy Manager provide advanced data center power notification, analysis, and policy-based management to help achieve lower heat output and reduced cooling needs.

Components and connectors

The following figure shows the front of the System x3650 M5 server with up to 16x 2.5-inch drive bays and the Front IO Cage Entry (default).

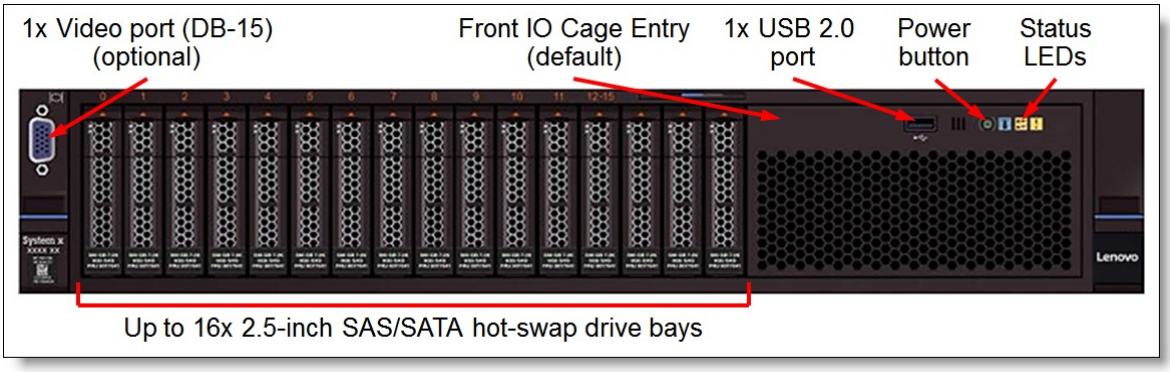

Figure 2. Front view of the System x3650 M5: 16x 2.5-inch drive bays; Front IO Cage Entry (default)

The following figure shows the front of the System x3650 M5 server with up to 16x 2.5-inch drive bays and the Front IO Cage Standard (optional).

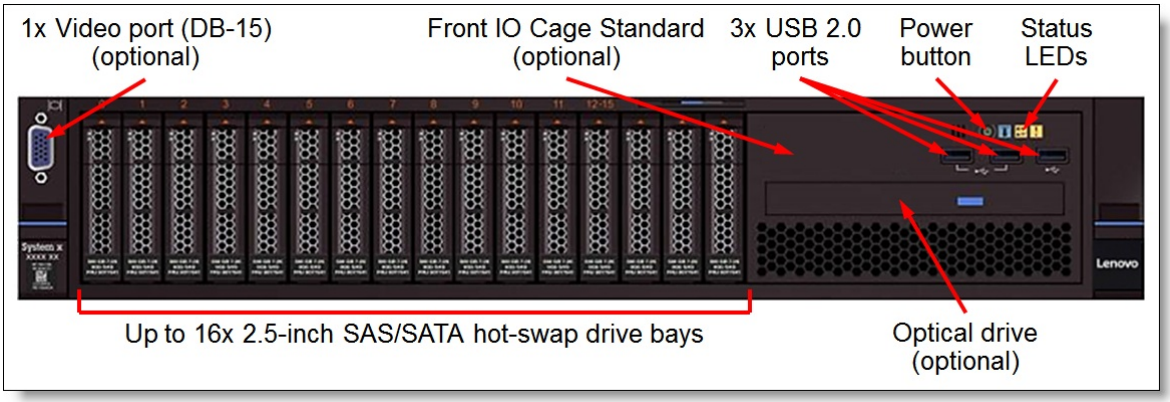

Figure 3. Front view of the System x3650 M5: 16x 2.5-inch drive bays; Front IO Cage Standard (optional)

The following figure shows the front of the System x3650 M5 server with up to 16x 2.5-inch drive bays and the Front IO Cage Advanced (optional).

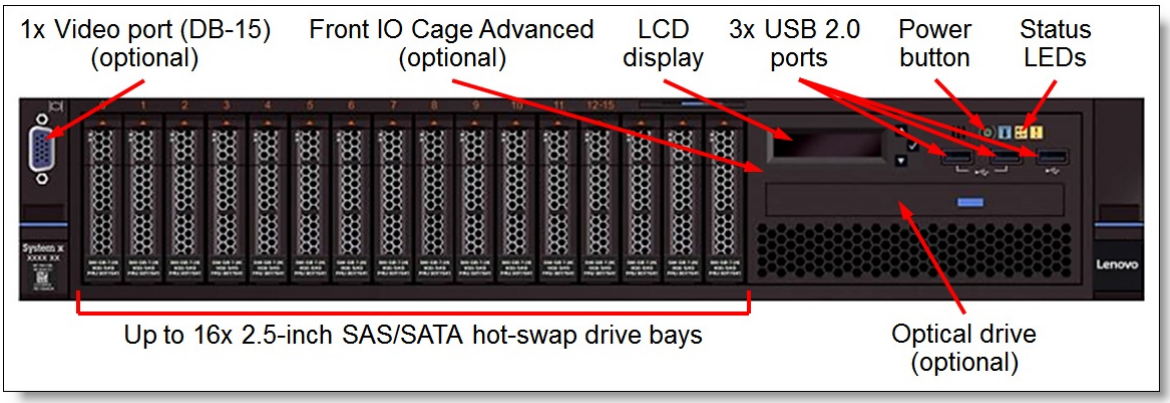

Figure 4. Front view of the System x3650 M5: 16x 2.5-inch drive bays; Front IO Cage Advanced (optional)

The following figure shows the front of the System x3650 M5 server with up to 24x 2.5-inch drive bays.

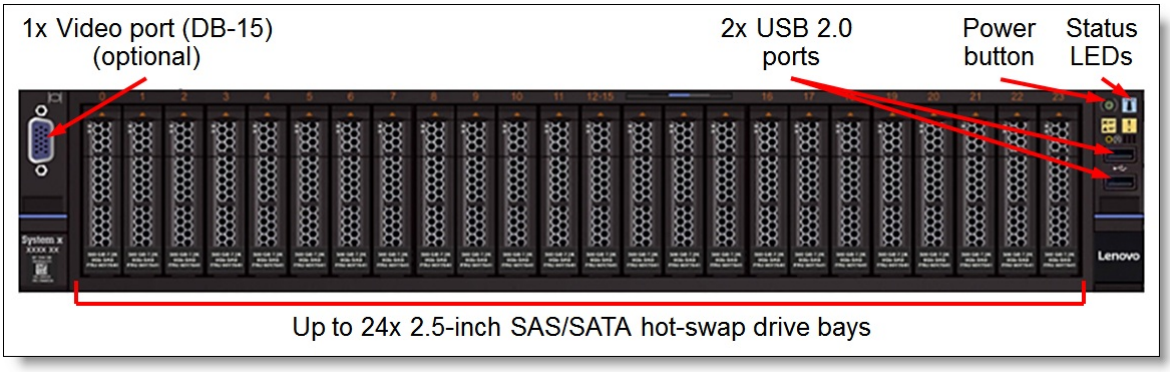

Figure 5. Front view of the System x3650 M5: 24x 2.5-inch drive bays

The following figure shows the front of the System x3650 M5 server with 8x 3.5-inch drive bays.

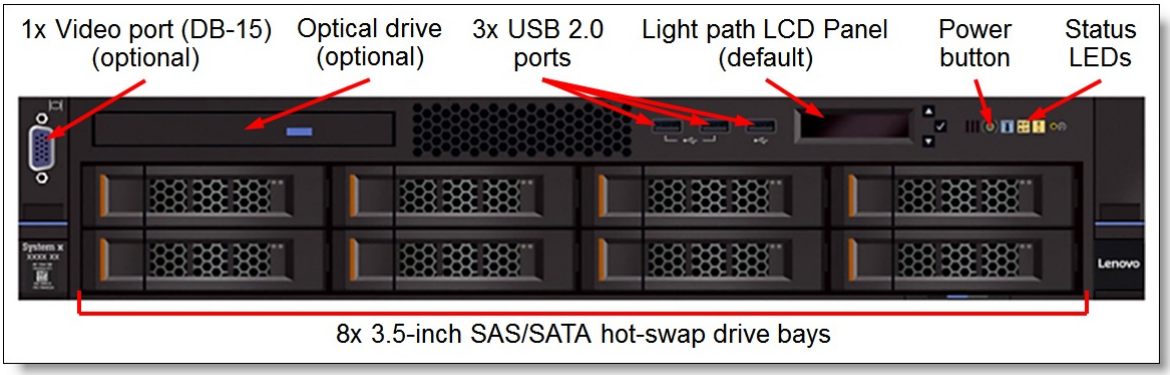

Figure 6. Front view of the System x3650 M5: 8x 3.5-inch drive bays

The following figure shows the front of the System x3650 M5 server with 12x 3.5-inch drive bays.

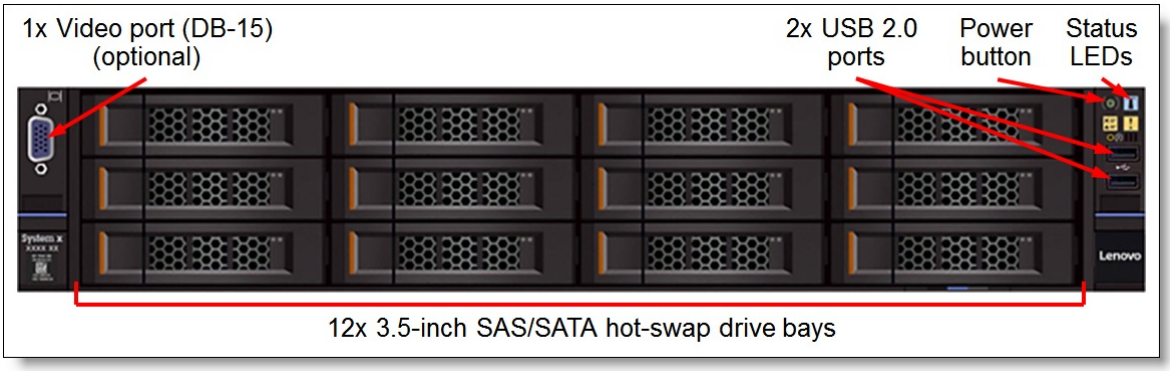

Figure 7. Front view of the System x3650 M5: 12x 3.5-inch drive bays

The following figure shows the rear of the System x3650 M5 server.

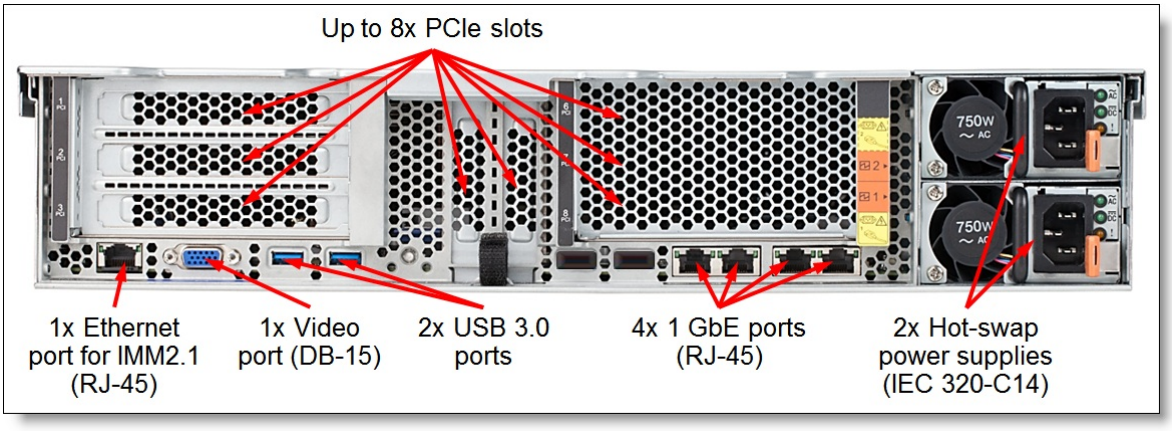

Figure 8. Rear view of the System x3650 M5

The following figure shows the locations of key components inside the System x3650 M5 server.

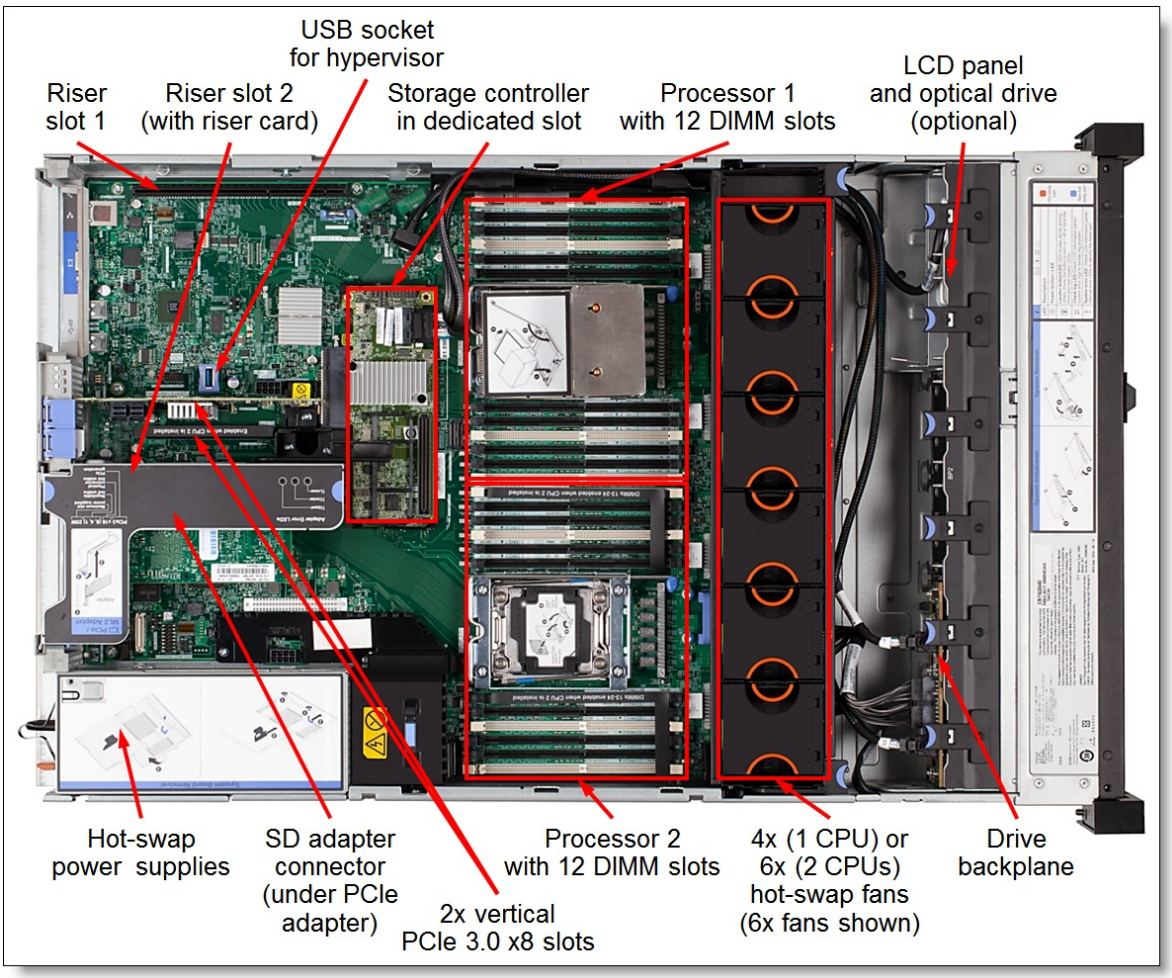

Figure 9. Internal view of the System x3650 M5

System specifications

The following table lists the system specifications.

Table 1. System specifications

Components	Specification
Machine type	8871
Form factor	2U rack-mount
Processor	Up to two processors of the Intel Xeon processor E5-2600 v4 product family: • Up to 22 cores (2.2 GHz core speeds) • Up to 3.5 GHz core speeds (4 cores) • Two QPI links up to 9.6 GT/s each • Up to 55 MB cache • Up to 2400 MHz memory speed
Chipset	Intel C612
Memory	Up to 24 DIMM sockets (12 DIMMs per processor; four memory channels per processor with three DIMMs per channel). Support for RDIMMs and LRDIMMs. Memory types cannot be intermixed. Memory speed up to 2400 MHz.
Memory maximums	• With RDIMMs: Up to 768 GB with 24x 32 GB RDIMMs and two processors • With LRDIMMs: Up to 1.5 TB with 24x 64 GB LRDIMMs and two processors
Memory protection	ECC, Chipkill (for x4-based memory DIMMs), memory mirroring, and memory rank sparing.
Drive bays	Up to 28 SFF SAS/SATA hot-swap drive bays: • 8x 2.5" (front) + 8x 2.5" (front) + 8x 2.5" (front) + 2x 2.5" (rear) + 2x 2.5" (rear) Up to 16 LFF+SFF SAS/SATA hot-swap drive bays: • 12x 3.5" (front) + 2x 3.5" (rear) + 2x 2.5" (rear) Up to 10 LFF or LFF+SFF SAS/SATA hot-swap drive bays: • 8x 3.5" (front) + 2x 3.5" (rear) • 8x 3.5" (front) + 2x 2.5" (rear) Up to 8 SFF NVMe PCIe SSD non-hot-swap + SFF SAS/SATA hot-swap drive bays: • 8x 2.5" SAS/SATA (front) + 4x 2.5" NVMe PCIe (front) + 4x 2.5" NVMe PCIe (front) • 8x 2.5" SAS/SATA (front) + 8x 2.5" SAS/SATA (front) + 4x 2.5" NVMe PCIe (front)
Storage capacity	• Up to 119.6 TB with 8 TB 3.5" NL SAS or NL SATA HDDs and 3.84 TB 2.5" SAS SSDs • Up to 107.5 TB with 3.84 TB 2.5" SAS SSDs • Up to 56 TB with 2 TB 2.5" NL SATA HDDs • Up to 50.4 TB with 1.8 TB 2.5" SAS HDDs • Up to 16 TB with 2 TB NVMe PCIe SSDs Intermix of SAS, SATA, and PCIe drives is supported.
Storage controller	• 12 Gb SAS/SATA RAID: RAID 0, 1, 10 with M1215 or M5210. Optional upgrade to RAID 5, 50 is available for M1215. Optional upgrade to RAID 5, 50 is available for M5210 (zero-cache; 1 GB non-backed cache; 1 GB, 2 GB or 4 GB flash-backed cache). Optional upgrade to RAID 6, 60 is available for M5210 (requires a cache upgrade). Optional SSD Caching and Performance Accelerator upgrades are available for M5210. • 12 Gb SAS/SATA non-RAID: N2215 HBA
Optical drive bays	One for models with 8x 3.5" or up to 16x 2.5" drive bays (models with 24x 2.5" or 12x 3.5" drive bays do not support an internal optical drive). Support for DVD-ROM or Multiburner.
Tape drive bays	None.

Components	Specification
Network interfaces	Four integrated RJ-45 Gigabit Ethernet 1000BASE-T ports (BCM5719); optional Mezzanine LOM (ML2) slot for dual-port or quad-port 10 GbE cards with SFP+ or RJ-45 connectors or quad-port GbE cards with RJ-45 connectors.
I/O expansion slots	Up to nine slots. Slots 0, 4, and 5 are the fixed slots on the system planar, and the remaining slots depend on the riser cards installed. The slots are as follows: • Slot 0: PCIe 3.0 x8 (dedicated for an internal storage controller) • Slot 1: PCIe 3.0 x16 or PCIe 3.0 x8; full-height, full-length (PCIe x16 slot is double-wide) • Slot 2: PCIe 3.0 x8; full-height, full-length (not present if the slot 1 is PCIe x16) • Slot 3: PCIe 3.0 x8 or ML2; full-height, half-length • Slot 4: PCIe 3.0 x8; low profile (vertical slot on system planar) • Slot 5: PCIe 3.0 x8; low profile (vertical slot on system planar) • Slot 6: PCIe 3.0 x16 or PCIe 3.0 x8; full-height, full-length (PCIe x16 slot is double-wide) • Slot 7: PCIe 3.0 x8; full-height, full-length (not present if the slot 6 is PCIe x16) • Slot 8: PCIe 3.0 x8; full-height, half-length Slots 5, 6, 7, and 8 require the second processor to be installed.
Ports	• Front: ◦ Models with 8x or 16x 2.5" drive bays: 1x USB 2.0 port (standard) or 3x USB 2.0 ports (optional). ◦ Models with 8x 3.5" drive bays: 3x USB 2.0 ports (standard). ◦ Models with 24x 2.5" or 12x 3.5" drive bays: 2x USB 2.0 ports (standard). ◦ 1x DB-15 video port (optional for all models). • Rear: 2x USB 3.0, 1x DB-15 video, 1x RJ-45 systems management, 4x RJ-45 GbE network ports. Optional 1x DB-9 serial port. • Internal: 1x USB 2.0 port (for embedded hypervisor), 1x SD Media Adapter slot (for embedded hypervisor).
Cooling	Calibrated Vectored Cooling with up to six redundant hot-swap fans (four standard, additional two fans with the second processor); two fan zones with N+1 fan redundancy; each fan has one rotor.
Power supply	Up to two redundant hot-swap 550 W, 750 W, or 900 W (100-240V), or 1500 W (200-240V) High Efficiency Platinum AC power supplies, or 750 W or 1300 W (200-240V) High Efficiency Titanium AC power supplies, or 900 W High Efficiency -48 V DC power supplies.
Video	Matrox G200eR2 with 16 MB memory integrated into the IMM2.1. Maximum resolution is 1600x1200 at 75 Hz with 16 M colors.
Hot-swap parts	Hard drives, power supplies, and fans.
Systems management	UEFI, Integrated Management Module II (IMM2.1) based on Renesas SH7758, Predictive Failure Analysis, light path diagnostics, Automatic Server Restart, ToolsCenter, XClarity Administrator, XClarity Energy Manager. Optional IMM2.1 Advanced Upgrade software feature for remote presence (graphics, keyboard and mouse, virtual media).
Security features	Power-on password, administrator's password, Trusted Platform Module (TPM) 2.0-ready. Optional lockable front bezel.
Operating systems	Microsoft Windows Server 2012 R2 and 2012; Red Hat Enterprise Linux 7; SUSE Linux Enterprise Server 11 and 12; VMware vSphere (ESXi) 5.5, and 6.0.
Warranty	Three-year customer-replaceable unit and onsite limited warranty with 9x5 next business day.
Service and support	Optional service upgrades are available through Lenovo Services: 4-hour or 2-hour response time, 6-hour fix time, 1-year or 2-year warranty extension, software support for System x hardware and some System x third-party applications.
Dimensions	Height: 87 mm (3.4 in), width: 434 mm (17.1 in), depth: 755 mm (29.7 in)
Weight	Minimum configuration: 19 kg (41.8 lb), maximum: 34 kg (74.8 lb)

Standard models

The following table lists the standard models of the System x3650 M5.

Product availability: Standard models of the x3650 M5 (E5-2600 v4) are not available in North America.

Table 2. Standard models (F = Flash backup)

Model number*	Intel Xeon processor** (2 maximum)	Memory (RDIMM)	RAID	Drive bays (std / max)	Drives	NIC	I/O slots (std / max)§	Optical drive§§	LCD display	Power supply (std / max)***
Models announced March 2016										
8871A2x	1x E5-2603 v4 6C 1.7GHz 15MB 1866MHz 85W	1x 8GB#	M1215	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 550W HS / 2
8871B2x	1x E5-2609 v4 8C 1.7GHz 20MB 1866MHz 85W	1x 8GB#	M1215	8x 3.5" HS / 10†	Open bay	4x GbE	3 / 9	Option	Included	1x 550W HS / 2
8871C2x	1x E5-2620 v4 8C 2.1GHz 20MB 2133MHz 85W	1x 16GB	M1215	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 550W HS / 2
8871C4x	1x E5-2620 v4 8C 2.1GHz 20MB 2133MHz 85W	1x 16GB	M1215	8x 3.5" HS / 10†	Open bay	4x GbE	3 / 9	Option	Included	1x 550W HS / 2
8871D2x	1x E5-2630 v4 10C 2.2GHz 25MB 2133MHz 85W	1x 16GB	M5210 1GB (F)	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 550W HS / 2
8871D4x	1x E5-2630 v4 10C 2.2GHz 25MB 2133MHz 85W	1x 16GB	M5210 1GB (F)	12x 3.5" HS / 16‡	Open bay	4x GbE	3 / 9	None	None	1x 750W HS / 2
8871F2x	1x E5-2640 v4 10C 2.4GHz 25MB 2133MHz 90W	1x 16GB	M5210 1GB (F)	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 550W HS / 2
8871F4x	1x E5-2640 v4 10C 2.4GHz 25MB 2133MHz 90W	1x 16GB	M5210 1GB (F)	8x 2.5" HS / 28	Open bay	4x GbE	3 / 9	None	None	1x 750W HS / 2
8871G2x	1x E5-2650 v4 12C 2.2GHz 30MB 2400MHz 105W	1x 16GB	M5210 1GB (F)	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 750W HS / 2
8871N2x	1x E5-2660 v4 14C 2.0GHz 35MB 2400MHz 105W	1x 16GB	M5210 2GB (F)	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option	Included	1x 750W HS / 2
8871R2x	1x E5-2667 v4 8C 3.2GHz 25MB 2400MHz 135W	1x 16GB	M5210 2GB (F)	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option	Included	1x 900W HS / 2
8871J2x	1x E5-2680 v4 14C 2.4GHz 35MB 2400MHz 120W	1x 16GB	M5210 2GB (F)	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 900W HS / 2
8871L2x	1x E5-2690 v4 14C 2.6GHz 35MB 2400MHz 135W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 900W HS / 2
8871Q2x	1x E5-2697 v4 18C 2.3GHz 45MB 2400MHz 145W	1x 16GB	M5210 2GB (F)	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option	Included	1x 900W HS / 2

* x in the Model number represents a country-specific letter (for example, the EMEA model number is 8871A2G). Ask a Lenovo representative for specifics.
** Processor details: Processor quantity and model, cores, core speed, cache, memory speed, and thermal design power (TDP).
§ With one processor, only two fixed onboard PCIe slots (Slots 0 and 4) can be used (Slot 5 requires the second processor). An internal storage controller occupies PCIe slot 0.
§§ An optional optical drive requires the ODD Cable (00AL956).
*** The power supplies are 80 PLUS Platinum certified.
# 8 GB 1Rx4 memory DIMM (46W0825).
^ An optional optical drive requires the Front IO Cage Standard (00YD070) or Advanced (00YD002).
^^ An optional LCD display is included in the Front IO Cage Advanced (00YD002).
† The maximum number of the drive bays (10) includes 8x 3.5" front bays and 2x 3.5" or 2x 2.5" rear bays.
‡ The maximum number of the drive bays (16) includes 12x 3.5" front bays, 2x 3.5" rear bays, and 2x 2.5" rear bays.

The standard models of the System x3650 M5 that are listed in Table 2 are shipped with the following items:

- Documentation package
- System x Enterprise Slides Kit

Notes:

- Cable Management Arm (CMA) is not included; see Rack installation for ordering information.
- Power cables are not included; see Power supplies and cables for ordering information.

TopSeller models

The following table lists the TopSeller models of the System x3650 M5.

Table 3. TopSeller models (F = Flash backup)

Model number	Intel Xeon processor* (2 maximum)	Memory (RDIMM)	RAID	Drive bays (std / max)	Drives	NIC	I/O slots (std / max)§	Optical drive§§	LCD display	Power supply (std / max)**
TopSeller - United States, Canada										
8871KAU	1x E5-2603 v4 6C 1.7GHz 15MB 1866MHz 85W	1x 16GB	M1215	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 900W HS / 2
8871KBU	1x E5-2603 v4 6C 1.7GHz 15MB 1866MHz 85W	1x 16GB	M1215	8x 3.5" HS / 10†	Open bay	4x GbE	3 / 9	Option	Included	1x 900W HS / 2
8871KCU	1x E5-2609 v4 8C 1.7GHz 20MB 1866MHz 85W	1x 16GB	M1215	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 900W HS / 2
8871KDU	1x E5-2609 v4 8C 1.7GHz 20MB 1866MHz 85W	1x 16GB	M1215	8x 3.5" HS / 10†	Open bay	4x GbE	3 / 9	Option	Included	1x 900W HS / 2
887116J	1x E5-2609 v4 8C 1.7GHz 20MB 1866MHz 85W	1x 16GB	M5210 2GB (F)	12x 3.5" HS / 16‡	Open bay	4x GbE	3 / 9	None	None	2x 900W HS / 2
887116I	1x E5-2609 v4 8C 1.7GHz 20MB 1866MHz 85W	1x 16GB	M5210 2GB (F)	24x 2.5" HS / 28	Open bay	4x GbE	3 / 9	None	None	2x 900W HS / 2
8871KEU	1x E5-2620 v4 8C 2.1GHz 20MB 2133MHz 85W	1x 16GB	M1215	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 900W HS / 2
8871KFU	1x E5-2620 v4 8C 2.1GHz 20MB 2133MHz 85W	1x 16GB	M1215	8x 3.5" HS / 10†	Open bay	4x GbE	3 / 9	Option	Included	1x 900W HS / 2
887116A	1x E5-2620 v4 8C 2.1GHz 20MB 2133MHz 85W	1x 16GB	M5210	24x 2.5" HS / 28	Open bay	4x GbE	3 / 9	None	None	1x 900W HS / 2
8871KGU	1x E5-2630 v4 10C 2.2GHz 25MB 2133MHz 85W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 900W HS / 2
8871KHU	1x E5-2630 v4 10C 2.2GHz 25MB 2133MHz 85W	1x 16GB	M5210	8x 3.5" HS / 10†	Open bay	4x GbE	3 / 9	Option	Included	1x 900W HS / 2
887116B	1x E5-2630 v4 10C 2.2GHz 25MB 2133MHz 85W	1x 16GB	M5210	24x 2.5" HS / 28	Open bay	4x GbE	3 / 9	None	None	1x 900W HS / 2
8871KQU	1x E5-2637 v4 4C 3.5GHz 15MB 2400MHz 135W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 900W HS / 2
8871KJU	1x E5-2640 v4 10C 2.4GHz 25MB 2133MHz 90W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 900W HS / 2
8871KKU	1x E5-2640 v4 10C 2.4GHz 25MB 2133MHz 90W	1x 16GB	M5210	8x 3.5" HS / 10†	Open bay	4x GbE	3 / 9	Option	Included	1x 900W HS / 2
8871K4U	1x E5-2640 v4 10C 2.4GHz 25MB 2133MHz 90W	1x 32GB	M5210	8x 2.5" HS / 28	Open bay	4x GbE	3 / 9	None	None	1x 900W HS / 2
887116F	1x E5-2640 v4 10C 2.4GHz 25MB 2133MHz 90W	1x 32GB	M5210	24x 2.5" HS / 28	Open bay	4x GbE	3 / 9	None	None	1x 900W HS / 2
8871K7U	2x E5-2640 v4 10C 2.4GHz 25MB 2133MHz 90W	2x 32GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	2x 900W HS / 2
8871KXU	2x E5-2640 v4 10C 2.4GHz 25MB 2133MHz 90W	4x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	2x 900W HS / 2
8871KLU	1x E5-2650 v4 12C 2.2GHz 30MB 2400MHz 105W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 900W HS / 2
8871KVU	2x E5-2650 v4 12C 2.2GHz 30MB 2400MHz 105W	8x 16GB	M5210	8x 2.5" HS / 20	2x 240GB SSD	4x GbE	3 / 9	Option^	Option^^	2x 900W HS / 2

Model number	Intel Xeon processor* (2 maximum)	Memory (RDIMM)	RAID	Drive bays (std / max)	Drives	NIC	I/O slots (std / max)§	Optical drive§§	LCD display	Power supply (std / max)**
8871KMU	1x E5-2660 v4 14C 2.0GHz 35MB 2400MHz 105W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 900W HS / 2
887116C	1x E5-2660 v4 14C 2.0GHz 35MB 2400MHz 105W	1x 16GB	M5210	24x 2.5" HS / 28	Open bay	4x GbE	3 / 9	None	None	1x 900W HS / 2
8871K3U	2x E5-2660 v4 14C 2.0GHz 35MB 2400MHz 105W	2x 32GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	2x 900W HS / 2
8871KYU	2x E5-2660 v4 14C 2.0GHz 35MB 2400MHz 105W	4x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	2x 900W HS / 2
8871KZU	2x E5-2660 v4 14C 2.0GHz 35MB 2400MHz 105W	4x 16GB	M5210 1GB (F)	12x 3.5" HS / 16‡	Open bay	4x GbE	3 / 9	None	None	2x 900W HS / 2
8871KRU	1x E5-2667 v4 8C 3.2GHz 25MB 2400MHz 135W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 900W HS / 2
8871KNU	1x E5-2680 v4 14C 2.4GHz 35MB 2400MHz 120W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 900W HS / 2
8871K5U	1x E5-2680 v4 14C 2.4GHz 35MB 2400MHz 120W	1x 32GB	M5210	8x 2.5" HS / 28	Open bay	4x GbE	3 / 9	None	None	1x 900W HS / 2
887116G	1x E5-2680 v4 14C 2.4GHz 35MB 2400MHz 120W	1x 32GB	M5210	24x 2.5" HS / 28	Open bay	4x GbE	3 / 9	None	None	1x 900W HS / 2
8871KPU	1x E5-2690 v4 14C 2.6GHz 35MB 2400MHz 135W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 900W HS / 2
887116D	1x E5-2690 v4 14C 2.6GHz 35MB 2400MHz 135W	1x 16GB	M5210	24x 2.5" HS / 28	Open bay	4x GbE	3 / 9	None	None	1x 900W HS / 2
8871KUU	2x E5-2690 v4 14C 2.6GHz 35MB 2400MHz 135W	2x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	2x 900W HS / 2
8871KWU	2x E5-2690 v4 14C 2.6GHz 35MB 2400MHz 135W	8x 16GB	M5210	8x 2.5" HS / 20	2x 240GB SSD	4x GbE	3 / 9	Option^	Option^^	2x 900W HS / 2
8871KSU	1x E5-2697 v4 18C 2.3GHz 45MB 2400MHz 145W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 900W HS / 2
8871K6U	1x E5-2697 v4 18C 2.3GHz 45MB 2400MHz 145W	1x 32GB	M5210	8x 2.5" HS / 28	Open bay	4x GbE	3 / 9	None	None	1x 900W HS / 2
887116H	1x E5-2697 v4 18C 2.3GHz 45MB 2400MHz 145W	1x 32GB	M5210	24x 2.5" HS / 28	Open bay	4x GbE	3 / 9	None	None	1x 900W HS / 2
8871KTU	1x E5-2699 v4 22C 2.2GHz 55MB 2400MHz 145W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 900W HS / 2
TopSeller - Europe, Middle East and Africa										
8871EBG	1x E5-2603 v4 6C 1.7GHz 15MB 1866MHz 85W	1x 8GB#	M1215	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 550W HS / 2
8871ECG	1x E5-2620 v4 8C 2.1GHz 20MB 2133MHz 85W	1x 16GB	M1215	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 550W HS / 2
8871EEG	1x E5-2620 v4 8C 2.1GHz 20MB 2133MHz 85W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 550W HS / 2
8871EFG	1x E5-2620 v4 8C 2.1GHz 20MB 2133MHz 85W	1x 16GB	M5210	8x 2.5" HS / 20	2x 300GB 10K	4x GbE	3 / 9	Option^	Option^^	2x 550W HS / 2
8871EJG	1x E5-2620 v4 8C 2.1GHz 20MB 2133MHz 85W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 750W HS / 2
8871ENG	1x E5-2620 v4 8C 2.1GHz 20MB 2133MHz 85W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 900W HS / 2
8871EWG	1x E5-2620 v4 8C 2.1GHz 20MB 2133MHz 85W	1x 16GB	M5210	8x 2.5" HS / 28	Open bay	4x GbE	3 / 9	None	None	1x 750W HS / 2
8871EAG	1x E5-2620 v4 8C 2.1GHz 20MB 2133MHz 85W	1x 16GB	M5210	8x 3.5" HS / 10†	Open bay	4x GbE	3 / 9	Option	Included	1x 750W HS / 2

Model number	Intel Xeon processor* (2 maximum)	Memory (RDIMM)	RAID	Drive bays (std / max)	Drives	NIC	I/O slots (std / max)§	Optical drive§§	LCD display	Power supply (std / max)**
8871EDG	1x E5-2630 v4 10C 2.2GHz 25MB 2133MHz 85W	1x 16GB	M1215	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 550W HS / 2
8871E6G	1x E5-2630 v4 10C 2.2GHz 25MB 2133MHz 85W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 900W HS / 2
8871EGG	1x E5-2630 v4 10C 2.2GHz 25MB 2133MHz 85W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 550W HS / 2
8871EKG	1x E5-2630 v4 10C 2.2GHz 25MB 2133MHz 85W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 750W HS / 2
8871EYG	1x E5-2637 v4 4C 3.5GHz 15MB 2400MHz 135W	1x 16GB	M5210	8x 2.5" HS / 28	Open bay	4x GbE	3 / 9	None	None	1x 1500W HS / 2
8871EHG	1x E5-2640 v4 10C 2.4GHz 25MB 2133MHz 90W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 550W HS / 2
8871ELG	1x E5-2640 v4 10C 2.4GHz 25MB 2133MHz 90W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 750W HS / 2
8871EPG	1x E5-2640 v4 10C 2.4GHz 25MB 2133MHz 90W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 900W HS / 2
8871EXG	1x E5-2640 v4 10C 2.4GHz 25MB 2133MHz 90W	1x 16GB	M5210	8x 2.5" HS / 28	Open bay	4x GbE	3 / 9	None	None	1x 900W HS / 2
8871E5G	1x E5-2650 v4 12C 2.2GHz 30MB 2400MHz 105W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 550W HS / 2
8871EMG	1x E5-2650 v4 12C 2.2GHz 30MB 2400MHz 105W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 750W HS / 2
8871EQG	1x E5-2650 v4 12C 2.2GHz 30MB 2400MHz 105W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 900W HS / 2
8871ERG	1x E5-2680 v4 14C 2.4GHz 35MB 2400MHz 120W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 750W HS / 2
8871ETG	1x E5-2680 v4 14C 2.4GHz 35MB 2400MHz 120W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 900W HS / 2
8871ESG	1x E5-2690 v4 14C 2.6GHz 35MB 2400MHz 135W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 750W HS / 2
8871EUG	1x E5-2690 v4 14C 2.6GHz 35MB 2400MHz 135W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 900W HS / 2
8871EVG	1x E5-2699 v4 22C 2.2GHz 55MB 2400MHz 145W	1x 16GB	M5210	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option^	Option^^	1x 1500W HS / 2
TopSeller - Japan										
8871E7J	1x E5-2603 v4 6C 1.7GHz 15MB 1866MHz 85W	1x 8GB#	M1215	8x 3.5" HS / 10†	Open bay	4x GbE	3 / 9	Option	Included	1x 550W HS / 2
8871E2J	1x E5-2603 v4 6C 1.7GHz 15MB 1866MHz 85W	1x 8GB#	M5210 1GB (F)	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option	Included	1x 550W HS / 2
8871E3J	1x E5-2609 v4 8C 1.7GHz 20MB 1866MHz 85W	1x 8GB#	M5210 1GB (F)	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option	Included	1x 550W HS / 2
8871E4J	1x E5-2620 v4 8C 2.1GHz 20MB 2133MHz 85W	1x 8GB#	M5210 1GB (F)	8x 2.5" HS / 20	Open bay	4x GbE	3 / 9	Option	Included	1x 550W HS / 2

* Processor details: Processor quantity and model, cores, core speed, cache, memory speed, and thermal design power (TDP).
§ With one processor, only two fixed onboard PCIe slots (Slots 0 and 4) can be used (Slot 5 requires the second processor). An internal storage controller occupies PCIe slot 0.
§§ An optional optical drive requires the ODD Cable (00AL956).
# 8 GB 1Rx4 memory DIMM (46W0825).
^ An optional optical drive requires the Front IO Cage Standard (00YD070) or Advanced (00YD002).
^^ An optional LCD display is included in the Front IO Cage Advanced (00YD002).
** The power supplies are 80 PLUS Platinum certified.
† The maximum number of the drive bays (10) includes 8x 3.5" front bays and 2x 2.5" rear bays.
‡ The maximum number of the drive bays (16) includes 12x 3.5" front bays, 2x 3.5" rear bays, and 2x 2.5" rear bays.

The TopSeller models of the System x3650 M5 that are listed in Table 3 are shipped with the following items:

- Documentation package
- System x Enterprise Slides Kit
- One or two 2.8 m IEC 320-C13 to C14 rack power cords (matches the quantitiy of power supplies)

Note: Cable Management Arm (CMA) is not included; see Rack installation for ordering information.

Processors

The System x3650 M5 supports up to two processors of the Intel Xeon processor E5-2600 v4 product family. The following table lists the specifications of the processors for the System x3650 M5.

Table 4. CPU specifications (HT = Hyper-Threading, TB = Turbo Boost, VT = Virtualization Technology)

Processor model	Core frequency (Base / TB Max)	Number of cores / threads	Cache	Max DDR4 frequency	QPI speed	TDP	HT	TB	VT-x	VT-d
E5-2603 v4	1.7 GHz	6 / 6	15 MB	1866 MHz	6.4 GT/s	85 W	No	No	Yes	Yes
E5-2608L v4	1.6 GHz	8 / 16	20 MB	1866 MHz	6.4 GT/s	50 W	Yes	No	Yes	Yes
E5-2609 v4	1.7 GHz	8 / 8	20 MB	1866 MHz	6.4 GT/s	85 W	No	No	Yes	Yes
E5-2618L v4	2.2 / 3.2 GHz	10 / 20	25 MB	2133 MHz	8.0 GT/s	75 W	Yes	Yes	Yes	Yes
E5-2620 v4	2.1 / 3 GHz	8 / 16	20 MB	2133 MHz	8.0 GT/s	85 W	Yes	Yes	Yes	Yes
E5-2623 v4	2.6 / 3.2 GHz	4 / 8	10 MB	2133 MHz	8.0 GT/s	85 W	Yes	Yes	Yes	Yes
E5-2628L v4	1.9 / 2.4 GHz	12 / 24	30 MB	2133 MHz	8.0 GT/s	75 W	Yes	Yes	Yes	Yes
E5-2630 v4	2.2 / 3.1 GHz	10 / 20	25 MB	2133 MHz	8.0 GT/s	85 W	Yes	Yes	Yes	Yes
E5-2630L v4	1.8 / 2.9 GHz	10 / 20	25 MB	2133 MHz	8.0 GT/s	55 W	Yes	Yes	Yes	Yes
E5-2637 v4	3.5 / 3.7 GHz	4 / 8	15 MB	2400 MHz	9.6 GT/s	135 W	Yes	Yes	Yes	Yes
E5-2640 v4	2.4 / 3.4 GHz	10 / 20	25 MB	2133 MHz	8.0 GT/s	90 W	Yes	Yes	Yes	Yes
E5-2643 v4	3.4 / 3.7 GHz	6 / 12	20 MB	2400 MHz	9.6 GT/s	135 W	Yes	Yes	Yes	Yes
E5-2648L v4	1.8 / 2.5 GHz	14 / 28	35 MB	2400 MHz	9.6 GT/s	75 W	Yes	Yes	Yes	Yes
E5-2650 v4	2.2 / 2.9 GHz	12 / 24	30 MB	2400 MHz	9.6 GT/s	105 W	Yes	Yes	Yes	Yes
E5-2650L v4	1.7 / 2.5 GHz	14 / 28	35 MB	2400 MHz	9.6 GT/s	65 W	Yes	Yes	Yes	Yes
E5-2658 v4	2.3 / 2.8 GHz	14 / 28	35 MB	2400 MHz	9.6 GT/s	105 W	Yes	Yes	Yes	Yes
E5-2660 v4	2 / 3.2 GHz	14 / 28	35 MB	2400 MHz	9.6 GT/s	105 W	Yes	Yes	Yes	Yes
E5-2667 v4	3.2 / 3.6 GHz	8 / 16	25 MB	2400 MHz	9.6 GT/s	135 W	Yes	Yes	Yes	Yes
E5-2680 v4	2.4 / 3.3 GHz	14 / 28	35 MB	2400 MHz	9.6 GT/s	120 W	Yes	Yes	Yes	Yes
E5-2683 v4	2.1 / 3 GHz	16 / 32	40 MB	2400 MHz	9.6 GT/s	120 W	Yes	Yes	Yes	Yes
E5-2690 v4	2.6 / 3.5 GHz	14 / 28	35 MB	2400 MHz	9.6 GT/s	135 W	Yes	Yes	Yes	Yes
E5-2695 v4	2.1 / 3.3 GHz	18 / 36	45 MB	2400 MHz	9.6 GT/s	120 W	Yes	Yes	Yes	Yes
E5-2697 v4	2.3 / 3.6 GHz	18 / 36	45 MB	2400 MHz	9.6 GT/s	145 W	Yes	Yes	Yes	Yes
E5-2698 v4	2.2 / 3.6 GHz	20 / 40	50 MB	2400 MHz	9.6 GT/s	135 W	Yes	Yes	Yes	Yes
E5-2699 v4	2.2 / 3.6 GHz	22 / 44	55 MB	2400 MHz	9.6 GT/s	145 W	Yes	Yes	Yes	Yes

For System x3650 M5 server models that come standard with one processor, the second processor can be ordered, if required (see the following table for ordering information). The second processor must be of the same model as the first processor. The second processor option includes two system fans.

Table 5. Processor options

Description	Part number	Feature codes*
Intel Xeon Processor E5-2603 v4 6C 1.7GHz 15MB Cache 1866MHz 85W	00YJ203	ATEU / ATFK
Intel Xeon Processor E5-2608L v4 8C 1.6GHz 20MB Cache 1866MHz 50W	00YJ219	ATFA / ATG1
Intel Xeon Processor E5-2609 v4 8C 1.7GHz 20MB Cache 1866MHz 85W	00YJ196	ATEM / ATFC
Intel Xeon Processor E5-2618L v4 10C 2.2GHz 25MB Cache 2133MHz 75W	00YJ218	ATF9 / ATG0
Intel Xeon Processor E5-2620 v4 8C 2.1GHz 20MB Cache 2133MHz 85W	00YJ195	ATEL / ATFB
Intel Xeon Processor E5-2623 v4 4C 2.6GHz 10MB Cache 2133MHz 85W	00YJ217	ATF8 / ATFZ
Intel Xeon Processor E5-2628L v4 12C 1.9GHz 30MB Cache 2133MHz 75W	00YJ215	ATF6 / ATFX
Intel Xeon Processor E5-2630 v4 10C 2.2GHz 25MB Cache 2133MHz 85W	00YJ198	ATEP / ATFE
Intel Xeon Processor E5-2630L v4 10C 1.8GHz 25MB Cache 2133MHz 55W	00YJ209	ATF0 / ATFR
Intel Xeon Processor E5-2637 v4 4C 3.5GHz 15MB Cache 2400MHz 135W	00YJ208	ATEZ / ATFQ
Intel Xeon Processor E5-2640 v4 10C 2.4GHz 25MB Cache 2133MHz 90W	00YJ199	ATEQ / ATFF
Intel Xeon Processor E5-2643 v4 6C 3.4GHz 20MB Cache 2400MHz 135W	00YJ207	ATEY / ATFP
Intel Xeon Processor E5-2648L v4 14C 1.8GHz 35MB Cache 2400MHz 75W	00YJ213	ATF4 / ATFV
Intel Xeon Processor E5-2650 v4 12C 2.2GHz 30MB Cache 2400MHz 105W	00YJ197	ATEN / ATFD
Intel Xeon Processor E5-2650L v4 14C 1.7GHz 35MB Cache 2400MHz 65W	00YJ210	ATF1 / ATFS
Intel Xeon Processor E5-2658 v4 14C 2.3GHz 35MB Cache 2400MHz 105W	00YJ214	ATF5 / ATFW
Intel Xeon Processor E5-2660 v4 14C 2.0GHz 35MB Cache 2400MHz 105W	00YJ205	ATEW / ATFM
Intel Xeon Processor E5-2667 v4 8C 3.2GHz 25MB Cache 2400MHz 135W	00YJ201	ATES / ATFH
Intel Xeon Processor E5-2680 v4 14C 2.4GHz 35MB Cache 2400MHz 120W	00YJ202	ATET / ATFJ
Intel Xeon Processor E5-2683 v4 16C 2.1GHz 40MB Cache 2400MHz 120W	00YJ216	ATF7 / ATFY
Intel Xeon Processor E5-2690 v4 14C 2.6GHz 35MB Cache 2400MHz 135W	00YJ200	ATER / ATFG
Intel Xeon Processor E5-2695 v4 18C 2.1GHz 45MB Cache 2400MHz 120W	00YJ206	ATEX / ATFN
Intel Xeon Processor E5-2697 v4 18C 2.3GHz 45MB Cache 2400MHz 145W	00YJ204	ATEV / ATFL
Intel Xeon Processor E5-2698 v4 20C 2.2GHz 50MB Cache 2400MHz 135W	00YJ212	ATF3 / ATFU
Intel Xeon Processor E5-2699 v4 22C 2.2GHz 55MB Cache 2400MHz 145W	00YJ211	ATF2 / ATFT

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

Memory

The System x3650 M5 supports TruDDR4 memory. TruDDR4 memory uses the highest-quality components sourced from Tier 1 DRAM suppliers and only memory that meets strict requirements is selected. It is compatibility tested and tuned on every System x server to maximize performance and reliability.

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

The System x3650 M5 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 RDIMMs and LRDIMMs.
- Mixing different types of memory (RDIMMs and LRDIMMs) is not supported.
- All DIMMs in the server operate at the same speed, which is determined as the lowest value of:
  - Memory speed that is supported by the specific processor.
  - Memory speed for selected quantity of DIMMs per channel.

The following memory protection technologies are supported:

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

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

If memory mirroring is used, then DIMMs must be installed in pairs (a minimum of one pair per each processor), 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.

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.

System x engineering tested and validated system designs that support memory speeds beyond Intel memory specifications, which provides benefits for workloads that require memory speed and density. System x TruDDR4 memory is fully supported up to the rated speeds that are shown in the following table.

Table 6. System x3650 M5 maximum memory speeds and capacities

	RDIMM		LR-DIMM	
DIMMs per channel	**Memory bus speed**	**Maximum capacity***	**Memory bus speed**	**Maximum capacity***
1 DPC	2400 MHz	256 GB (8x 32 GB)	2400 MHz	512 GB (8x 64 GB)
2 DPC	2400 MHz	512 GB (16x 32 GB)	2400 MHz	1,024 GB (16x 64 GB)
3 DPC	1866 MHz	768 GB (24x 32 GB)	2133 MHz	1,536 GB (24x 64 GB)

* Maximum memory capacity is achieved with two processors installed. With one processor, the maximum memory capacity is a half of what is shown.

The following table lists memory options available for the System x3650 M5 server.

Table 7. Memory options

Description	**Part number**	**Feature code**	**Maximum supported***
RDIMMs - 2400 MHz			
8GB TruDDR4 Memory (1Rx4, 1.2V) PC4-19200 CL17 2400MHz LP RDIMM	46W0821	ATC8	12 / 24
8GB TruDDR4 Memory (2Rx8, 1.2V) PC4-19200 CL17 2400MHz LP RDIMM	46W0825	ATC9	12 / 24
16GB TruDDR4 Memory (2Rx4, 1.2V) PC4-19200 CL17 2400MHz LP RDIMM	46W0829	ATCA	12 / 24
32GB TruDDR4 Memory (2Rx4, 1.2V) PC4-19200 CL17 2400MHz LP RDIMM	46W0833	ATCB	12 / 24
LRDIMMs - 2400 MHz			
64GB TruDDR4 Memory (4Rx4, 1.2V) PC4-19200 PC4 2400MHz LP LRDIMM	46W0841	ATGG	12 / 24

* One processor / two processors

Internal storage

The System x3650 M5 server supports the following drive bay configurations:

1. Models with 8x 2.5-inch SAS/SATA hot-swap drive bays that can be upgraded to the following drive bay configurations:
   a. 8x 2.5-inch (front) + 2x 2.5-inch (rear) SAS/SATA hot-swap + 4x 2.5-inch PCIe SSD (front) non-hot-swap drive bays
   b. 8x 2.5-inch SAS/SATA (front) + 8x 2.5-inch PCIe SSD (front) non-hot-swap drive bays
   c. 16x 2.5-inch SAS/SATA (front) + 4x 2.5-inch PCIe SSD (front) non-hot-swap drive bays
   d. 16x 2.5-inch (front) + 2x 2.5-inch (rear) + 2x 2.5-inch (rear) SAS/SATA hot-swap drive bays
2. Storage dense models with 8x 2.5-inch SAS/SATA hot-swap drive bays that can be upgraded to up to 28x (up to 24 on the front; up to 4 on the rear) 2.5-inch SAS/SATA hot-swap drive bays
3. Models with 8x 3.5-inch SAS/SATA hot-swap drive bays that can be upgraded to the following drive bay configurations (for a total of 10 drive bays):
   a. 8x 3.5-inch (front) + 2x 3.5-inch (rear) SAS/SATA hot-swap drive bays
   b. 8x 3.5-inch (front) + 2x 2.5-inch (rear) SAS/SATA hot-swap drive bays
4. Models with 12x 3.5-inch SAS/SATA hot-swap drive bays that can be upgraded to up to 16x SAS/SATA hot-swap drive bays: 12x 3.5-inch (front) + 2x 3.5-inch (rear) + 2x 2.5-inch (rear)

The following figure shows the drive bay configurations.

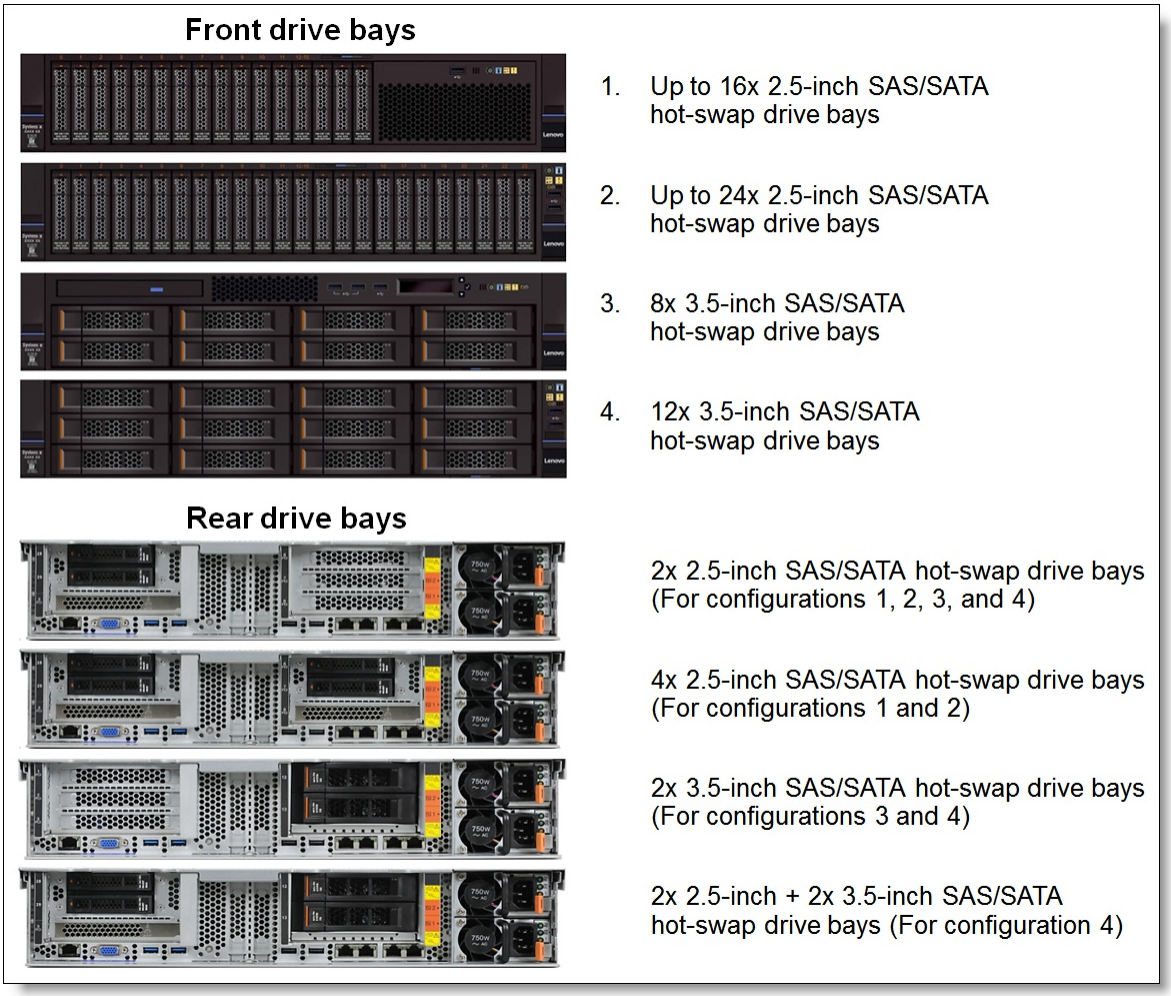

Figure 10. Internal front drive configurations

8x 3.5-inch drive bay models of the System x3650 M5 have one optical disk drive (ODD) bay. For models with up to 16x 2.5-inch drive bays, the optional Front IO Cage Standard or Advanced provides one optical drive bay and 3x USB 2.0 ports. In addition, the Front IO Cage Advanced provides an LCD display. These options are listed in the following table.

Table 8. Front panel options

Description	Part number	Feature code	Maximum supported
x3650 M5 Front IO Cage Entry (1x USB only)	None*	ATE5	1
x3650 M5 Front IO Cage Std. (3x USB, Optional LCD/Optical drive)	00YD070	ATE6	1
x3650 M5 Front IO Cage Adv. (3x USB, LCD, Optional Optical Drive)	00YD002**	None**	1

* Included with select standard and TopSeller models or configurable via CTO.
** The Front IO Cage Advanced part number (00YD002) includes the Front IO Cage Standard (feature code ATE6), System x3650 M5 2.5" Bezel with LCD Light Path (feature code ATE8), and LCD display (feature code A4VH). If configured via CTO, the LCD display (feature code A4VH) is derived when the Front IO Cage Standard (feature code ATE6) and System x3650 M5 2.5" Bezel with LCD Light Path (feature code ATE8) are selected.

The following table shows the internal storage options available for the System x3650 M5 server.

Table 9. Internal storage options

Description	Part number	Feature code	Maximum supported
Base drive kits (factory installed)*			
System x3650 M5 8x 2.5" HS HDD Assembly Kit (Single RAID)	None*	A5G6	1
System x3650 M5 16x 2.5" HS HDD Assembly Kit (Single RAID)	None*	A5GF	1
System x3650 M5 16x 2.5" HS HDD Assembly Kit (Dual RAID)	None*	A5GG	1
System x3650 M5 24x 2.5" HS HDD Assembly Kit (Single RAID)	None*	A5G7	1
System x3650 M5 24x 2.5" HS HDD Assembly Kit (Dual RAID)	None*	A5TN	1
System x3650 M5 24x 2.5" HS HDD Assembly Kit (Triple RAID)	None*	A5G8	1
System x3650 M5 8x 3.5" HS HDD Assembly Kit	None*	ATEG	1
System x3650 M5 12x 3.5" HS HDD Assembly Kit	None*	A5GE	1
System x3650 M5 Rear 2x 2.5" HDD Kit (Independent RAID)	None*	A5GH	2
System x3650 M5 Rear 2x 3.5" HDD Kit (Cascaded)**	None*	A5GL	1
System x3650 M5 Rear 2x 3.5" HDD Kit (Independent RAID)	None*	A5GK	1
System x3650 M5 Plus 4x 2.5" NVMe PCIe SSD Upgrade Kit	None*	ASRL	2
Upgrade drive kits (require the base drive kit)			
System x3650 M5 Plus 8x 2.5" HS HDD Assembly Kit with Expander	00FK661	AS44	2
System x3650 M5 Plus 8x 2.5" HS HDD Assembly Kit	00FK676	AS45	2
System x3650 M5 Rear 2x 2.5" HDD Kit	00FK658	AS42	2
System x3650 M5 Rear 2x 3.5" HDD Kit	00FK659	AS43	1
System x3650 M5 Plus 4x 2.5" NVMe PCIe SSD Upgrade Kit	00FK677	None***	2

* Base drive kits are always factory-installed in either standard or custom (CTO or Special Bid) models, and they might not have an option part number assigned.
** The 2x 3.5-inch Rear HDD Kit is connected to the SAS expander on the 12-drive backplane, that is, to the same storage controller as 12 drive bays on the front.
*** This Upgrade kit can be installed as a field upgrade only, and it includes 1x NVMe PCIe SSD Upgrade Kit (feature code ASRL) and 2x PCIe SSD Extender Adapters (feature code AS95).

The following table lists possible factory-installed internal storage configurations and field upgrades.

Table 10. Internal storage configurations (FC=Feature Code, PN=Part Number)

Drive bay configuration	**Storage controller***	**Drive kits required**
Front drive bays		
8x 2.5-in. SAS/SATA hot-swap (front)	1x RAID or HBA (8 drives)	Factory installed: • 1x x3650 M5 8x 2.5" HS HDD Assembly Kit (Single RAID) (FC A5G6)
16x 2.5-in. SAS/SATA hot-swap (front)	1x RAID or HBA (16 drives)	Factory installed: • 1x x3650 M5 16x 2.5" HS HDD Assembly Kit (Single RAID) (FC A5GF) Field upgrade for 8x 2.5-inch HS drive models: • 1x x3650 M5 Plus 8x 2.5" HS HDD Assembly Kit with Expander (PN 00FK661)
	2x RAID or HBA (8+8 drives)	Factory installed: • 1x x3650 M5 16x 2.5" HS HDD Assembly Kit (Dual RAID) (FC A5GG) Field upgrade for 8x 2.5-inch HS drive bay models: • 1x x3650 M5 Plus 8x 2.5" HS HDD Assembly Kit (PN 00FK676)
24x 2.5-in. SAS/SATA hot-swap (front)	1x RAID or HBA (24 drives)	Factory installed: • 1x x3650 M5 24x 2.5" HS HDD Assembly Kit (Single RAID) (FC A5G7) Field upgrade for 16 (8+8)x 2.5-inch HS drive models: • 1x x3650 M5 Plus 8x 2.5" HS HDD Assembly Kit with Expander (PN 00FK661)
	2x RAID or HBA (16+8 drives)	Factory installed: • 1x x3650 M5 24x 2.5" HS HDD Assembly Kit (Dual RAID) (FC A5TN) Field upgrade for 16 (8+8)x 2.5-inch HS drive models: • 1x x3650 M5 Plus 8x 2.5" HS HDD Assembly Kit with Expander (PN 00FK661) Field upgrade for 16 (16)x 2.5-inch HS drive models: • 1x x3650 M5 Plus 8x 2.5" HS HDD Assembly Kit (PN 00FK676)
	3x RAID or HBA (8+8+8 drives)	Factory installed: • 1x x3650 M5 24x 2.5" HS HDD Assembly Kit (Triple RAID) (FC A5G8) Field upgrade for 16 (8+8)x 2.5-inch HS drive models: • 1x x3650 M5 Plus 8x 2.5" HS HDD Assembly Kit (PN 00FK676)
4x 2.5-in. PCIe SSD non-hot-swap (front)	2x PCIe Extenders# (2+2)	Factory installed: • 1x x3650 M5 Plus 4x 2.5" NVMe PCIe SSD Upgrade Kit (FC ASRL)** Field upgrade for 8x 2.5-inch HS drive models: • 1x x3650 M5 Plus 4x 2.5" NVMe PCIe SSD Upgrade Kit (PN 00FK677)
8x 2.5-in. PCIe SSD non-hot-swap (front)	4x PCIe Extenders# (2+2+2+2)	Factory installed: • 2x x3650 M5 Plus 4x 2.5" NVMe PCIe SSD Upgrade Kit (FC ASRL)## Field upgrade for 8x 2.5-inch HS drive models: • 2x x3650 M5 Plus 4x 2.5" NVMe PCIe SSD Upgrade Kit (PN 00FK677)
8x 3.5-in. SAS/SATA hot-swap (front)	1x RAID or HBA (8 drives)	Factory installed: • 1x x3650 M5 8x 3.5" HS HDD Assembly Kit (FC ATEG)
12x 3.5-in. SAS/SATA hot-swap (front)	1x RAID or HBA (12 drives)	Factory installed: • 1x x3650 M5 12x 3.5" HS HDD Assembly Kit (FC A5GE)
Rear drive bays		
2x 2.5-in. SAS/SATA hot-swap (rear)	1x M1215 (2 drives)	Factory installed: • 1x x3650 M5 Rear 2x 2.5" HDD Kit (Independent RAID) (FC A5GH) Field upgrade for 2.5-inch and 3.5-inch HS drive models: • 1x x3650 M5 Rear 2x 2.5" HDD Kit (PN 00FK658)

Drive bay configuration	Storage controller*	Drive kits required
4x 2.5-in. SAS/SATA hot-swap (rear)	2x M1215 (2+2 drives)	Factory installed: • 2x x3650 M5 Rear 2x 2.5" HDD Kit (Independent RAID) (FC A5GH) Field upgrade for 2.5-inch HS drive models: • 2x x3650 M5 Rear 2x 2.5" HDD Kit (PN 00FK658)
2x 3.5-in. SAS/SATA hot-swap (rear) (Cascaded)	1x RAID or HBA (12+2 drives)***	Factory installed: • 1x x3650 M5 Rear 2x 3.5" HDD Kit (Cascaded) (FC A5GL) Field upgrade for 3.5-inch HS drive models: • 1x x3650 M5 Rear 2x 3.5" HDD Kit (PN 00FK659)
2x 3.5-in. SAS/SATA hot-swap (rear) (Independent RAID)	1x M1215 (2 drives)	Factory installed: • 1x x3650 M5 Rear 2x 3.5" HDD Kit (Independent RAID) (FC A5GK) Field upgrade for 3.5-inch HS drive models: • 1x x3650 M5 Rear 2x 3.5" HDD Kit (PN 00FK659)

* RAID or HBA indicates that any combination of the M1215, M5210, and N2215 storage controllers is supported up to a maximum quantity listed; the numbers in brackets (x+y+z) specify the quantity of drives connected to each of the controllers.
# Each PCIe SSD Extender Adapter (PN 00ML997) provides connectivity for up to two PCIe SSDs, and each adapter occupies a PCIe slot. For factory configured models, two or four PCIe SSD Extender Adapters (FC AS95) must be included in the configuration. For field upgrades, the PCIe SSD Upgrade Kit (PN 00FK677) includes two PCIe SSD Extenders.
** Requires the selection of 8x or 16x 2.5-in. hot-swap drive bays (with 16x 2.5-in. drive bays, the internal optical drive cannot be used).
Requires the selection of 8x 2.5-in. hot-swap drive bays.
*** Two drives in the 2x 3.5-inch Rear HDD Kit are connected to the SAS expander on the 12-drive backplane, that is, to the same storage controller as 12 drives on the front.

Configuration notes:

- 24x 2.5-inch front drives are supported on storage dense models only (models without the Standard [feature code ATE5] or Advanced [feature code ATE6] OP Panel).
- 2x 2.5-inch rear drives (1x Rear 2x 2.5" HDD Kit) are supported on 2.5-inch and 3.5-inch drive bay models.
    - The Rear 2.5" HDD Kit is installed in place of the PCIe Riser Card 1, and PCIe slots 1, 2 and 3 are not present. The kit includes special riser that provides PCIe 3.0 x8 slot for the M1215 RAID controller that is dedicated to 2x 2.5-inch rear drives.
- 4x 2.5-inch rear drives (2x Rear 2x 2.5" HDD Kits) are supported on 2.5-inch hot-swap drive bay models only.
    - The first Rear 2.5" HDD Kit is installed in place of the PCIe Riser Card 1, and PCIe slots 1, 2 and 3 are not present.
    - The second Rear 2.5" HDD Kit is installed in place of the PCIe Riser Card 2, and PCIe slots 6, 7 and 8 are not present.
    - Each kit includes special riser that provides PCIe 3.0 x8 slot for the M1215 RAID controller that is dedicated to 2x 2.5-inch rear drives.
- 2x 3.5-inch rear drives are supported on 3.5-inch hot-swap drive bay models only.
    - With 8x 3.5-inch HS drive bay models, the 2x 3.5-inch Rear HDD Kit is connected to a dedicated M1215 controller (Independent RAID).
    - With 12x 3.5-inch HS drive bay models, the 2x 3.5-inch Rear HDD Kit can be connected to a dedicated M1215 controller (Independent RAID) or SAS expander on the 12-drive backplane (Cascaded).
    - The Rear 3.5" HDD Kit is installed in place of PCIe Riser Card 2; PCIe slots 6, 7, and 8 are not present.
- For 8x 3.5-inch and 12x 3.5-inch drive bay models, either 1x Rear 2x 3.5" HDD Kit (Independent RAID) or 1x Rear 2x 2.5" HDD Kit (Independent RAID) can be used in the configuration, but not both.
- For 12x 3.5-inch drive bay models, either 1x Rear 2x 3.5" HDD Kit (Independent RAID) or 1x Rear 2x 3.5" HDD Kit (Cascaded) can be used in the configuration, but not both. If the Cascaded Kit is used, 1x Rear 2x 2.5" HDD Kit (Independent RAID) also can be used in the configuration.

- NVMe PCIe SSDs are supported on 8x or 16x 2.5-inch SAS/SATA hot-swap drive bay models only.
  - With one processor, up to one NVMe PCIe SDD Upgrade Kit is supported, and it requires one of the Riser 1 card options with PCIe x8 slots:
    - For the Riser 1 options with 3x PCIe x8 slots (part numbers 00KA519 or 00KA498), the PCIe SSD extenders are supported in PCIe slots 1 and 2.
    - For the Riser 1 options with 1x PCIe x8 slot (part number 00KA489), the PCIe SSD extenders are supported in PCIe slots 3 and 4.
  - With two processors, up to two NVMe PCIe SDD Upgrade Kits are supported, and they require a combination of the Riser 1 and Riser 2 card options with PCIe x8 slots:
    - For the Riser 1 and Riser 2 options with 3x PCIe x8 slots (part numbers 00KA519 [Riser 1] or 00KA498 [Riser 1 or Riser 2]), the PCIe SSD extenders are supported in PCIe slots 1 and 2 (Riser 1), and 6 and 7 (Riser 2).
    - For the Riser 1 and Riser 2 options with 1x PCIe x8 slot (part number 00KA489), the PCIe SSD extenders are supported in PCIe slots 3, 4, 5, and 8.
  - For 16x 2.5-inch SAS/SATA hot-swap drive bay configurations, the internal optical drive is not supported in the configurations with NVMe PCIe SSDs.
  - If only one NVMe PCIe SSD Upgrade Kit is used in the configurations with two processors, up to one 2.5-inch Rear HDD Kit is supported. In other configurations with the NVMe PCIe SSD Upgrade Kits, the 2.5-inch Rear HDD Kit cannot be used.

Controllers for internal storage

The following table lists the storage controllers and additional options used for internal storage of the System x3650 M5 server. The internal storage controllers are supported in the PCIe slots in the following order: Slot 0 (dedicated slot), Slot 4, Slot 1, and Slot 6 (Slot 6 requires the second processor).

Table 11. RAID controllers and HBAs for internal storage

Description	Part number	Feature code	Maximum supported
12 Gb SAS/SATA controllers			
ServeRAID M5210 SAS/SATA Controller	46C9110	A3YZ	3
ServeRAID M1215 SAS/SATA Controller	46C9114	A45W	3
N2215 SAS/SATA HBA	47C8675	A3YY	3
Hardware upgrades for the M5210 (one per controller)			
ServeRAID M5200 Series 1GB Cache/RAID 5 Upgrade	47C8656	A3Z0	3
ServeRAID M5200 Series 1GB Flash/RAID 5 Upgrade	47C8660	A3Z1	3
ServeRAID M5200 Series 2GB Flash/RAID 5 Upgrade	47C8664	A3Z2	3
ServeRAID M5200 Series 4GB Flash/RAID 5 Upgrade	47C8668	A3Z3	3
Features on Demand upgrades for the M5210 (system-wide)*			
ServeRAID M5200 Series Zero Cache/RAID 5 Upgrade (FOD)	47C8708	A3Z6	1
ServeRAID M5200 Series RAID 6 Upgrade (FOD)	47C8706	A3Z5	1**
ServeRAID M5200 Series Performance Accelerator (FOD)	47C8710	A3Z7	1**
ServeRAID M5200 Series SSD Caching Enabler (FOD)	47C8712	A3Z8	1**
Features on Demand upgrades for the M1215 (system-wide)***			
ServeRAID M1200 Zero Cache/RAID 5 Upgrade (FOD)	00AE930	A5H5	1
PCIe extenders (for NVMe PCIe SSDs)			
System x NVMe PCIe SSD Extender Adapter	00ML997	AS95	4

* One FoD upgrade enable the feature on all ServeRAID M5200 Series adapters (M5210, M5225) installed in the server.
** Requires cache memory upgrade (47C8656, 47C8660, 47C8664, or 47C8668).
*** One FoD upgrade enable the feature on all ServeRAID M1200 Series adapters (M1215) installed in the server.

The following table summarizes features of supported storage controllers.

Table 12. Storage controller features and specifications summary

Feature	M1215	M5210	N2215
Part number	46C9114	46C9110	47C8675
Form factor	PCIe low profile	PCIe low profile	PCIe low profile
Controller chip	LSI SAS3008	LSI SAS3108	LSI SAS3008
Host interface	PCIe 3.0 x8	PCIe 3.0 x8	PCIe 3.0 x8
Port interface	12 Gbps SAS	12 Gbps SAS	12 Gbps SAS
Number of ports	8	8	8
Port connectors	2x Mini-SAS HD x4 (SFF-8643)	2x Mini-SAS HD x4 (SFF-8643)	2x Mini-SAS HD x4 (SFF-8643)
Drive interface	SAS, SATA	SAS, SATA	SAS, SATA
Drive type	HDD, SSD, SED	HDD, SSD, SED	HDD, SSD
Drive form factor	SFF, LFF	SFF, LFF	SFF, LFF
Hot-swap drives	Yes	Yes	Yes
Max devices	32 (RAID); 64 (JBOD)	240	1024
RAID levels	0/1/10; Optional 5/50 (00AE930)	0/1/10; Optional 5/50 (RAID 5 FoD, 47C8708, or cache upgrades); Optional 6/60 (47C8706)	None
JBOD mode	Yes	Yes (without cache)	Yes
Cache	None	1 GB no backup (47C8656) 1 GB flash backup (47C8660) 2 GB flash backup (47C8664) 4 GB flash backup (47C8668)	None
SED support (SafeStore)	Yes (with RAID 5 FoD upgrade)	Yes (with RAID 5 FoD upgrade or any cache upgrade)	No
Performance Accelerator (FastPath)	No	Optional (47C8710)	No
SSD Caching (CacheCade Pro 2.0)	No	Optional (47C8712)	No

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

The following table lists supported combinations of the storage controllers and drive types for the System x3650 M5 drive bay configurations.

Table 13. Storage controllers, drive types, and internal drive bays

Drive bay configuration	Storage Controller	Drive type						
		SAS HDD	NL SAS HDD	NL SATA HDD	SAS SED	SAS SSD	SATA SSD	PCIe SSD
Front drive bays								
8/16/24x 2.5-inch SAS/SATA hot-swap (front)	M1215	Yes	Yes	Yes	Yes*	Yes	Yes	No
	M5210	Yes	Yes	Yes	Yes**	Yes	Yes	No
	N2215	Yes	Yes	Yes	No	Yes	Yes	No
8/12x 3.5-inch SAS/SATA hot-swap (front)	M1215	Yes	Yes	Yes	No	No	Yes	No
	M5210	Yes	Yes	Yes	No	No	Yes	No
	N2215	Yes	Yes	Yes	No	No	Yes	No
4/8x 2.5-inch NVMe PCIe non-hot-swap (front)	PCIe SSD Extender	No	No	No	No	No	No	Yes
Rear drive bays								
2/4x 2.5-inch SAS/SATA hot-swap (rear; independent RAID)	M1215	Yes	Yes	Yes	Yes*	Yes	Yes	No
2x 3.5-inch SAS/SATA hot-swap (rear; cascaded RAID)#	M1215	Yes	Yes	Yes	No	No	Yes	No
	M5210	Yes	Yes	Yes	No	No	Yes	No
	N2215	Yes	Yes	Yes	No	No	Yes	No
2x 3.5-inch SAS/SATA hot-swap (rear; independent RAID)	M1215	Yes	Yes	Yes	No	No	Yes	No

3.5" rear drives support cascaded connections only to the SAS expander on the 12-drive backplane (12x 3.5" drive bay models).
* SEDs are supported with the RAID 5 FoD upgrade (00AE930).
** SEDs are supported with the RAID 5 FoD upgrade (47C8708) or any cache upgrade (47C8656, 47C8660, 47C8664, 47C8668).

Drives for internal storage

The following tables list drive options for the System x3650 M5.

Table 14. Drive options for internal storage: 2.5-inch hot-swap drives

Description	Part number	Feature code	Maximum supported
2.5-inch hot-swap HDDs - 12 Gbps SAS			
300GB 10K 12Gbps SAS 2.5" G3HS HDD	00WG685	AT89	28
300GB 15K 12Gbps SAS 2.5" G3HS HDD	00WG660	AT84	28
300GB 15K 12Gbps SAS 2.5" G3HS 512e HDD	00NA221	ASBB	28
600GB 10K 12Gbps SAS 2.5" G3HS HDD	00WG690	AT8A	28
600GB 10K 12Gbps SAS 2.5" G3HS 512e HDD	00NA241	ASBF	28
600GB 15K 12Gbps SAS 2.5" G3HS HDD	00WG665	AT85	28
600GB 15K 12Gbps SAS 2.5" G3HS 512e HDD	00NA231	ASBD	28
900GB 10K 12Gbps SAS 2.5" G3HS HDD	00WG695	AT8B	28
900GB 10K 12Gbps SAS 2.5" G3HS 512e HDD	00NA251	ASBH	28
1.2TB 10K 12Gbps SAS 2.5" G3HS HDD	00WG700	AT8C	28
1.2TB 10K 12Gbps SAS 2.5" G3HS 512e HDD	00NA261	ASBK	28
1.8TB 10K 12Gbps SAS 2.5" G3HS 512e HDD	00NA271	ASBM	28
2.5-inch hot-swap HDDs - 12 Gbps NL SAS			
1TB 7.2K 12Gbps NL SAS 2.5'' G3HS HDD	00NA491	AT7Z	28
2TB 7.2K 12Gbps NL SAS 2.5'' G3HS HDD	00NA496	AT80	28
2.5-inch hot-swap HDDs - 6 Gbps NL SAS			
500GB 7.2K 6Gbps NL SAS 2.5" G3HS HDD	00AJ121	A4TT	28
2.5-inch hot-swap HDDs - 6 Gbps NL SATA			
500GB 7.2K 6Gbps NL SATA 2.5" G3HS HDD	00AJ136	A4TW	28
1TB 7.2K 6Gbps NL SATA 2.5" G3HS HDD	00AJ141	A4TX	28
2TB 7.2K 6Gbps NL SATA 2.5'' G3HS 512e HDD	00NA526	AT81	28
2.5-inch hot-swap SEDs - 12 Gbps SAS			
300GB 10K 12Gbps SAS 2.5" G3HS SED	00WG705	AT8D	28
600GB 10K 12Gbps SAS 2.5" G3HS SED	00WG710	AT8E	28
600GB 10K 12Gbps SAS 2.5" G3HS 512e SED	00NA291	ASBR	28
900GB 10K 12Gbps SAS 2.5" G3HS SED	00WG715	AT8F	28
1.2TB 10K 12Gbps SAS 2.5" G3HS SED	00WG720	AT8G	28
1.2TB 10K 12Gbps SAS 2.5" G3HS 512e SED	00NA301	ASBT	28
2.5-inch hot-swap SSDs - Enterprise 12 Gbps SAS			
200GB 12G SAS 2.5" MLC G3HS Enterprise SSD	00FN379	AS7C	28
400GB 12G SAS 2.5" MLC G3HS Enterprise SSD	00FN389	AS7E	28
800GB 12G SAS 2.5" MLC G3HS Enterprise SSD	00FN399	AS7G	28
1.6TB 12G SAS 2.5" MLC G3HS Enterprise SSD	00FN409	AS7J	28
2.5-inch hot-swap SSDs - Enterprise Mainstream 12 Gbps SAS			
400GB Enterprise Mainstream 12Gb SAS G3HS 2.5" SSD	00YC460	AT9M	28
800GB Enterprise Mainstream 12Gb SAS G3HS 2.5" SSD	00YC465	AT9N	28
1.6TB Enterprise Mainstream 12Gb SAS G3HS 2.5" SSD	00YC470	AT9P	28

Description	Part number	Feature code	Maximum supported
2.5-inch hot-swap SSDs - Enterprise 6 Gbps SAS			
200GB SAS 2.5" MLC G3HS Enterprise SSD	00AJ207	A4UA	28
400GB SAS 2.5" MLC G3HS Enterprise SSD	00AJ212	A4UB	28
800GB SAS 2.5" MLC G3HS Enterprise SSD	00AJ217	A4UC	28
2.5-inch hot-swap SSDs - Enterprise Capacity 6 Gbps SAS			
3.84TB 6Gb SAS Enterprise Capacity G3HS MLC SSD	00NA671	ASW6	28
2.5-inch hot-swap SSDs - Enterprise Performance 6 Gbps SATA			
Intel S3710 200GB Enterprise Performance SATA G3HS 2.5" SSD	00YC320	AT9C	28
Intel S3710 400GB Enterprise Performance SATA G3HS 2.5" SSD	00YC325	AT9D	28
Intel S3710 800GB Enterprise Performance SATA G3HS 2.5" SSD	00YC330	AT9E	28
2.5-inch non-hot-swap SSDs - Enterprise Performance PCIe 3.0 x4*			
Intel P3700 400GB NVMe 2.5" G3HS Enterprise Performance PCIe SSD	00YA818	AT7V	8
Intel P3700 800GB NVMe 2.5" G3HS Enterprise Performance PCIe SSD	00YA821	AT7W	8
Intel P3700 1.6TB NVMe 2.5" G3HS Enterprise Performance PCIe SSD	00YA824	AT7X	8
Intel P3700 2.0TB NVMe 2.5" G3HS Enterprise Performance PCIe SSD	00YA827	AT7Y	8
2.5-inch hot-swap SSDs - Enterprise Mainstream 6 Gbps SATA			
M500DC 480GB Enterprise Mainstream Plus SATA G3HS 2.5" SSD	00YC529	ATDW	28
2.5-inch hot-swap SSDs - Enterprise Entry 6 Gbps SATA			
120GB Enterprise Entry SATA G3HS 2.5" SSD	00YC385	AT8R	28
240GB Enterprise Entry SATA G3HS 2.5" SSD	00YC390	AT8S	28
480GB Enterprise Entry SATA G3HS 2.5" SSD	00YC395	AT8T	28
960GB Enterprise Entry SATA G3HS 2.5" SSD	00YC400	AT8U	28
Intel S3510 120GB Enterprise Entry SATA G3HS 2.5" SSD	00WG620	AT93	28
Intel S3510 240GB Enterprise Entry SATA G3HS 2.5" SSD	00WG625	AT94	28
Intel S3510 480GB Enterprise Entry SATA G3HS 2.5" SSD	00WG630	AT95	28
Intel S3510 800GB Enterprise Entry SATA G3HS 2.5" SSD	00WG635	AT96	28
2.5-inch hot-swap SSDs - Enterprise Value 6 Gbps SATA			
120GB SATA 2.5" MLC G3HS Enterprise Value SSD	00AJ395	A577	28
240GB SATA 2.5" MLC G3HS Enterprise Value SSD	00AJ400	A578	28
480GB SATA 2.5" MLC G3HS Enterprise Value SSD	00AJ405	A579	28
800GB SATA 2.5" MLC G3HS Enterprise Value SSD	00AJ410	A57A	28
2.5-inch non-hot-swap SSDs - Enterprise Value PCIe 3.0 x4*			
Intel P3600 400GB NVMe 2.5" G3HS Enterprise Value PCIe SSD	90Y3227	A5RW	8
Intel P3600 800GB NVMe 2.5" G3HS Enterprise Value PCIe SSD	90Y3230	A5RX	8
Intel P3600 1.6TB NVMe 2.5" G3HS Enterprise Value PCIe SSD	90Y3233	A5RY	8
Intel P3600 2.0TB NVMe 2.5" G3HS Enterprise Value PCIe SSD	90Y3236	A5RZ	8

* The NVMe PCIe SSDs are non-hot-swap when used in the System x3650 M5.

Table 15. Drive options for internal storage: 3.5-inch hot-swap drives

Description	Part number	Feature code	Maximum supported
3.5-inch hot-swap HDDs - 12 Gbps SAS			
300GB 15K 12Gbps SAS 3.5" G2HS HDD	00WG675	AT87	14
600GB 15K 12Gbps SAS 3.5" G2HS HDD	00WG680	AT88	14
3.5-inch hot-swap HDDs - 12 Gbps NL SAS			
1TB 7.2K 12Gbps NL SAS 3.5" G2HS HDD	00YL702	ATYM	14
2TB 7.2K 12Gbps NL SAS 3.5" G2HS HDD	00YK000	ATYL	14
2TB 7.2K 12Gbps NL SAS 3.5" G2HS 512e HDD	00FN188	A5VP	14
4TB 7.2K 12Gbps NL SAS 3.5" G2HS HDD	00YK005	ATYN	14
4TB 7.2K 12Gbps NL SAS 3.5" G2HS 512e HDD	00FN208	A5VQ	14
6TB 7.2K 12Gbps NL SAS 3.5" G2HS 512e HDD	00FN228	A5VR	14
8TB 7.2K 12Gbps NL SAS 3.5" G2HS 512e HDD	00WH121	ATRS	14
3.5-inch hot-swap HDDs - 6 Gbps NL SAS			
1TB 7.2K 6Gbps NL SAS 3.5" G2HS HDD	90Y8567	A26M	14
2TB 7.2K 6Gbps NL SAS 3.5" G2HS HDD	90Y8572	A2U0	14
3.5-inch hot-swap HDDs - 6 Gbps NL SATA			
500GB 7.2K 6Gbps NL SATA 3.5" G2HS HDD	81Y9786	A22Y	14
1TB 7.2K 6Gbps NL SATA 3.5" G2HS HDD	81Y9790	A22P	14
2TB 7.2K 6Gbps NL SATA 3.5" G2HS HDD	81Y9794	A22T	14
2TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD	00FN113	A5VD	14
4TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD	00FN143	A5VH	14
6TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD	00FN173	A5VM	14
8TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD	00WH126	ATRT	14
3.5-inch hot-swap SSDs - Enterprise Performance 6 Gbps SATA			
Intel S3710 400GB Enterprise Performance SATA HS 3.5" SSD	00YC340	AT9G	14
Intel S3710 800GB Enterprise Performance SATA HS 3.5" SSD	00YC345	AT9H	14
3.5-inch hot-swap SSDs - Enterprise Entry 6 Gbps SATA			
960GB Enterprise Entry SATA HS 3.5" SSD	00YC420	AT8Y	14
3.5-inch hot-swap SSDs - Enterprise Value 6 Gbps SATA			
120GB SATA 3.5" MLC HS Enterprise Value SSD	00AJ435	A57F	14
480GB SATA 3.5" MLC HS Enterprise Value SSD	00AJ445	A57H	14

Optical drives

The System x3650 M5 server supports the optical drive options listed in the following table. Storage dense models with 12x 3.5-inch or up to 24x 2.5-inch drive bays on the front do not support internal optical drive; a supported external optical drive can be used instead.

Table 16. Optical drives

Description	Part number	Feature code	Maximum supported
Optical drives			
Ultraslim 9.5mm SATA DVD-ROM	00AM066	A5KG	1
Ultraslim 9.5mm SATA Multi Burner	00AM067	A5KH	1
Optical drive cable (Required)			
System x3650 M5 ODD Cable Kit	00AL956	None*	1

* The ODD Cable Kit part number (00AL956) includes two cables: ODD Cable for 3.5" Model (feature code A5GM) and ODD Cable for 2.5" Model (feature code A5V7).

Ultraslim 9.5mm SATA DVD-ROM (part number 00AM066) supports the following media and speeds for reading:

- CD-ROM/CD-DA (DAE) 24X
- CD-R/RW 24X
- DVD-ROM 8X
- DVD-R 8X
- DVD+R 8X
- DVD-R DL 6X
- DVD+R DL 8X
- DVD-RW 8X
- DVD+RW 8X
- DVD-RAM (4.7 GB) 5X

Ultraslim 9.5mm SATA Multi Burner (part number 00AM067) supports the same media and speeds for reading as DVD-ROM (part number 00AM066), and it supports the following media and speeds for writing:

- CD-R 24X
- CD-RW 4X
- High Speed CD-RW 10X
- Ultra Speed CD-RW 24X
- DVD-R 8X
- DVD+R 8X
- DVD-R DL 6X
- DVD+R DL 6X
- DVD-RW 6X
- DVD+RW 8X
- DVD-RAM 5X

I/O expansion

The System x3650 M5 server supports up to nine PCIe slots: one slot on the system planar that is dedicated for an internal storage controller, two regular PCIe slots on the system planar, and up to six PCIe slots with different riser cards installed into two riser sockets on the system planar (one riser socket supports installation of one riser card). The slot form factors are as follows:

- Slot 0: PCIe 3.0 x8 (dedicated for an internal RAID controller)
- Slot 1: PCIe 3.0 x16 or PCIe 3.0 x8; full-height, full-length (PCIe x16 slot is double-wide)
- Slot 2: PCIe 3.0 x8; full-height, full-length (not present if the slot 1 is PCIe x16)
- Slot 3: PCIe 3.0 x8 or ML2; full-height, half-length
- Slot 4: PCIe 3.0 x8; low profile (vertical slot on system planar)
- Slot 5: PCIe 3.0 x8; low profile (vertical slot on system planar)
- Slot 6: PCIe 3.0 x16 or PCIe 3.0 x8; full-height, full-length (PCIe x16 slot is double-wide)
- Slot 7: PCIe 3.0 x8; full-height, full-length (not present if the slot 6 is PCIe x16)
- Slot 8: PCIe 3.0 x8; full-height, half-length

Note: Slots 5, 6, 7, and 8 require the second processor to be installed.

The locations of the PCIe slots are shown in the following figure.

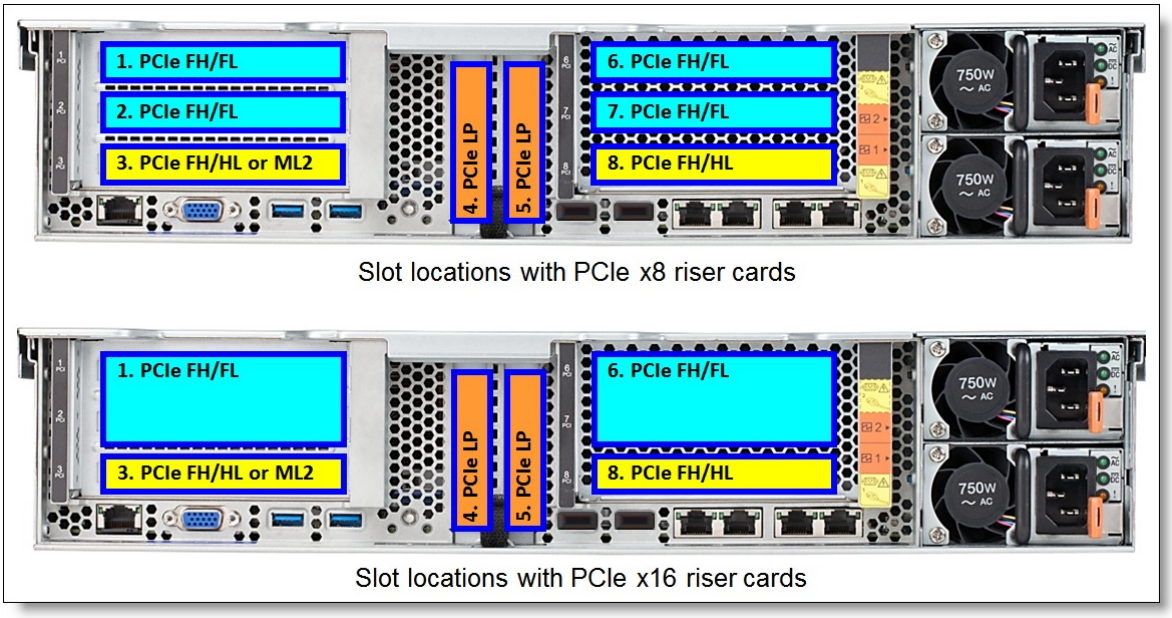

Figure 11. Slot locations

Riser 1 supplies slots 1, 2, and 3, and Riser 2 supplies slots 6, 7, and 8. The slots that are available for use depend on the number of riser cards that are installed and whether the second processor is installed, as shown in the following table.

Table 17. Slots available for use

Riser Card 1	Riser Card 2	Slots available for use
One processor		
None	None	0, 4
PCIe x8	None	0, 1, 2, 3, 4
PCIe x16	None	0, 1, 3, 4
Two processors		
None	None	0, 4, 5
PCIe x8	None	0, 1, 2, 3, 4, 5
PCIe x8	PCIe x8	0, 1, 2, 3, 4, 5, 6, 7, 8
PCIe x8	PCIe x16	0, 1, 2, 3, 4, 5, 6, 8
PCIe x16	None	0, 1, 3, 4, 5
PCIe x16	PCIe x8	0, 1, 3, 4, 5, 6, 7, 8
PCIe x16	PCIe x16	0, 1, 3, 4, 5, 6, 8

Standard models do not include any riser cards. The following table lists available PCIe riser card options.

Table 18. PCIe riser cards and miscellaneous options

Description	Part number	Feature code	Maximum supported
Riser 1 options (PCIe x8 riser supplies slots 1, 2 and 3; PCIe x16 riser supplies slots 1 and 3)			
System x3650 M5 PCIe Riser 1 (1 x16 FH/FL + 1 x8 ML2 Slots)	00KA504	A5FR	1
System x3650 M5 PCIe Riser 1 (2 x8 FH/FL + 1 x8 ML2 Slots)	00KA519	A5FQ	1
System x3650 M5 PCIe Riser (1 x16 FH/FL + 1 x8 FH/HL Slots)	00KA489	A5FN	1
System x3650 M5 PCIe Riser (2 x8 FH/FL + 1 x8 FH/HL Slots)	00KA498	A5FP	1
Riser 2 options (PCIe x8 riser supplies slots 6, 7 and 8; PCIe x16 riser supplies slots 6 and 8)			
System x3650 M5 PCIe Riser (1 x16 FH/FL + 1 x8 FH/HL Slots)	00KA489	A5R5	1
System x3650 M5 PCIe Riser (2 x8 FH/FL + 1 x8 FH/HL Slots)	00KA498	A5R6	1
Serial port bracket			
COM Port Bracket	00KA161	A5AN	1

Riser option part numbers 00KA489 and 00KA498 can be installed in both riser slots 1 and 2; for CTO or special bid orders these option part numbers have different feature codes depending on the riser slot into which they are installed.

The COM Port Bracket, part number 00KA161, is used for mounting the external serial port on the rear of the System x3650 M5. This option includes the bracket and the cable. The COM Port option is mounted in place of the PCIe slot 5, and the PCIe slot 5 cannot be used.

Network adapters

The System x3650 M5 supports four integrated Gigabit Ethernet ports. Optionally, the server supports ML2 adapters that are installed in the custom ML2 slot provided by the PCIe ML2 riser cards (part numbers 00KA504 and 00KA519). This slot supports adapters with either two 10 Gb ports or four Gigabit Ethernet ports and supports direct connectivity to the IMM2.1 service processor for out-of-band systems management.

The integrated network interface controller (NIC) has the following features:

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

The following table lists additional supported network adapters.

Table 19. Network adapters

Description	Part number	Feature code	Maximum supported#
100 Gb Ethernet - PCIe			
Mellanox ConnectX-4 2x100GbE/EDR IB QSFP28 VPI Adapter	00MM960	ATRP	1 / 2^
40 Gb Ethernet - ML2			
Mellanox ConnectX-3 Pro ML2 2x40GbE/FDR VPI Adapter	00FP650	A5RK	1*
40 Gb Ethernet - PCIe Low Profile (supported in low profile and full-high PCIe slots)			
Mellanox ConnectX-4 Lx 1x40GbE QSFP+ Adapter	00MM950	ATRN	3 / 6*
Mellanox ConnectX-3 2x40GbE / FDR IB VPI Adapter	00D9550	A3PN	3 / 6*
25 Gb Ethernet - ML2			
Mellanox ConnectX-4 Lx ML2 1x25GbE SFP28 Adapter	00MN990	ATZR	1^^
10 Gb Ethernet - ML2			
Broadcom NetXtreme II ML2 Dual Port 10GbaseT	00D2026	A40S	1
Broadcom NetXtreme II ML2 Dual Port 10GbE SFP+	00D2028	A40T	1*
Emulex VFA5 ML2 Dual Port 10GbE SFP+ Adapter	00D1996	A40Q	1*
Emulex VFA5.2 ML2 Dual Port 10GbE SFP+ Adapter	00AG560	AT7U	1*
Emulex VFA5 ML2 FCoE/iSCSI License (FoD) (FoD upgrade for 00D1996 and 00AG560 - one for each adapter)	00D8544	A4NZ	1

Description	Part number	Feature code	Maximum supported#
Intel X540 ML2 Dual Port 10GbaseT Adapter	00D1994	A40P	1
Intel X710-DA2 ML2 2x10GbE SFP+ Adapter	00JY940	ATRH	1*
10 Gb Ethernet - PCIe Low Profile (supported in low profile and half-high PCIe slots)			
Broadcom NetXtreme 2x10GbE BaseT Adapter	44T1370	A5GZ	4 / 8
Broadcom NetXtreme Dual Port 10GbE SFP+ Adapter	94Y5180	A4Z6	3 / 6*
Emulex VFA5 2x10 GbE SFP+ PCIe Adapter	00JY820	A5UT	3 / 6*
Emulex VFA5.2 2x10 GbE SFP+ PCIe Adapter	00AG570	AT7S	3 / 6*
Emulex VFA5 FCoE/iSCSI SW for PCIe Adapter (FoD) (FoD upgrade for 00JY820 and 00AG570 - one for each adapter)	00JY824	A5UV	3 / 6
Emulex VFA5 2x10 GbE SFP+ Adapter and FCoE/iSCSI SW	00JY830	A5UU	3 / 6*
Emulex VFA5.2 2x10 GbE SFP+ Adapter and FCoE/iSCSI SW	00AG580	AT7T	3 / 6*
Intel X520 Dual Port 10GbE SFP+ Adapter	49Y7960	A2EC	4 / 8*
Intel X540-T2 Dual Port 10GBaseT Adapter	49Y7970	A2ED	4 / 8
Intel X550-T2 Dual Port 10GBase-T Adapter	00MM860	ATPX	4 / 8
Intel X710-DA2 2x10GbE SFP+ Adapter	01DA900	AU2Y	3 / 6*
Mellanox ConnectX-3 10 GbE Adapter	00D9690	A3PM	3 / 6*
QLogic 8200 Dual Port 10GbE SFP+ VFA	90Y4600	A3MR	3 / 6*
QLogic 8200 VFA FCoE/iSCSI License (FoD) (FoD upgrade for 90Y4600 - one for each adapter)	00Y5624	A3MT	3 / 6
Solarflare SFN5162F 2x10GbE SFP+ Performant Adapter	47C9952	A47H	3 / 6*
Solarflare SFN7122F 2x10GbE SFP+ Flareon Ultra	47C9977	A522	3 / 6*
1 Gb Ethernet - ML2			
Intel I350-T4 ML2 Quad Port GbE Adapter	00D1998	A40R	1
1 Gb Ethernet - PCIe Low Profile (supported in low profile and full-high PCIe slots)			
Broadcom NetXtreme 2xGbE BaseT Adapter	42C1780	2995	4 / 8
Broadcom NetXtreme I Dual Port GbE Adapter	90Y9370	A2V4	4 / 8
Broadcom NetXtreme I Quad Port GbE Adapter	90Y9352	A2V3	4 / 8
Intel I350-F1 1xGbE Fiber Adapter	00AG500	A56K	4 / 8
Intel I350-T2 2xGbE BaseT Adapter (not supported in PCIe slot 4)	00AG510	A56L	3 / 7
Intel I350-T4 4xGbE BaseT Adapter (not supported in PCIe slots 4, 5)	00AG520	A56M	3 / 6
40 GbE QSFP+ transceivers and DAC cables (for 40 GbE QSFP+ adapters)			
Lenovo 40GBASE-SR4 QSFP+ Transceiver	49Y7884	A1DR	Port qty**
Lenovo 1m Passive QSFP+ DAC Cable	49Y7890	A1DP	Port qty**
Lenovo 3m Passive QSFP+ DAC Cable	49Y7891	A1DQ	Port qty**
10 GbE SFP+ transceivers and DAC cables (for 10 GbE SFP+ adapters)			
Lenovo 10GBASE-SR SFP+ Transceiver	46C3447	5053	Port qty**
Brocade 10Gb SFP+ SR Optical Transceiver	49Y4216	0069	Port qty**
QLogic 10Gb SFP+ SR Optical Transceiver	49Y4218	0064	Port qty**
Lenovo 0.5m Passive SFP+ DAC Cable	00D6288	A3RG	Port qty**
Lenovo 1m Passive SFP+ DAC Cable	90Y9427	A1PH	Port qty**
Lenovo 1.5m Passive SFP+ DAC Cable	00AY764	A51N	Port qty**
Lenovo 2m Passive SFP+ DAC Cable	00AY765	A51P	Port qty**
Lenovo 3m Passive SFP+ DAC Cable	90Y9430	A1PJ	Port qty**

Description	Part number	Feature code	Maximum supported#
Lenovo 5m Passive SFP+ DAC Cable	90Y9433	A1PK	Port qty**
Lenovo 7m Passive SFP+ DAC Cable	00D6151	A3RH	Port qty**

The maximum quantity shown is with one processor / two processors(this does not apply to ML2 adapters).
^ Supported only in PCIe slots 1 and 6; transceivers and DAC cables are available only from Mellanox or as a part of a Lenovo Intelligent Cluster solution.
* SFP+ and QSFP+ based PCIe adapters (except Intel X520 network adapter) are not supported in PCIe slots 3 and 8. SFP+ and QSFP+ based adapters require supported transceivers or DAC cables that must be purchased for the adapter (See "40 Gb QSFP+ transceivers and DAC cables" and "10 Gb SFP+ transceivers and DAC cables" in the table above).
^^ Transceivers and DAC cables are available only from Mellanox.
** The maximum number of transceivers or cables that are supported per adapter equals the quantity of the adapter ports. All adapter ports must have the same type of transceiver or DAC cable selected.

For more information, see the list of Product Guides in the Ethernet and InfiniBand adapter categories:
https://lenovopress.com/servers/options/ethernet
https://lenovopress.com/servers/options/infiniband

SAS adapters for external storage

The following table lists SAS RAID controllers and HBAs for external storage attachments that are supported by the System x3650 M5 server.

Table 20. SAS RAID adapters and HBAs for external storage

Description	Part number	Feature code	Maximum supported*
12 Gbps SAS RAID adapters - PCIe Low Profile			
ServeRAID M5225-2GB SAS/SATA Controller (supported in slots 1, 2, 6)	00AE938	A5ND	2 / 3
Feature on Demand (FoD) upgrades for the M5225 (one per server)**			
ServeRAID M5200 Series RAID 6 Upgrade	47C8706	A3Z5	1**
ServeRAID M5200 Series Performance Accelerator	47C8710	A3Z7	1**
ServeRAID M5200 Series SSD Caching Enabler	47C8712	A3Z8	1**
12 Gbps SAS HBAs (supported only in full-high slots on a PCIe riser card)			
N2225 SAS/SATA HBA (not supported in slots 3, 4, and 5)	00AE912	A5M0	2 / 5
N2226 SAS/SATA HBA (supported only in slots 1 and 6)***	00AE916	A5M1	1 / 2

* The maximum quantity shown is with one processor / two processors.
** One FoD upgrade for the M5225 activates the feature on all M5200 series controllers (M5210, M5225) installed in the server.
*** Supported only with the PCIe x16 riser cards (feature codes A5FN, A5FR, and A5R5).

The following table summarizes features of supported RAID controllers and HBAs.

Table 21. SAS RAID controller and HBA features and specifications summary (PN = Part number)

Feature	M5225-2GB	N2226	N2225
Part number	00AE938	00AE916	00AE912
Form factor	Low profile	Full height	Low profile
Controller chip	LSI SAS3108	LSI SAS3008	LSI SAS3008
Host interface	PCIe 3.0 x8	PCIe 3.0 x8	PCIe 3.0 x8
Port interface	12 Gbps SAS	12 Gbps SAS	12 Gbps SAS
Number of external ports	8	16	8
External port connectors	2x Mini-SAS HD (SFF-8644)	4x Mini-SAS HD (SFF-8644)	2x Mini-SAS HD (SFF-8644)
Drive interface	SAS, SATA	SAS, SATA	SAS, SATA

Feature	M5225-2GB	N2226	N2225
Drive type	HDD, SED, SSD	HDD, SSD	HDD, SSD
Maximum number of devices	240	1024	1024
RAID levels	0/1/10/5/50; Optional 6/60 (PN 47C8706)	None	None
JBOD mode	No	Yes	Yes
Cache	2 GB (included)	None	None
Cache protection	Flash (included)	None	None
Performance Accelerator (FastPath)	Optional (PN 47C8710)	None	None
SSD Caching (CacheCade Pro 2.0)	Optional (PN 47C8712)	None	None

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

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

Fibre Channel host bus adapters

The following table lists Fibre Channel HBAs supported by the System x3650 M5 server.

Table 22. Fibre Channel HBAs

Description	Part number	Feature code	Maximum supported*
16 Gb Fibre Channel - PCIe Low Profile (supported in Low Profile and Half-High PCIe slots)			
Emulex 16Gb FC Single-port HBA (Gen 6 16Gb FC) (not supported in slot 1)	01CV830	ATZU	3 / 7
Emulex 16Gb FC Single-port HBA (not supported in slot 1)	81Y1655	A2W5	3 / 7
Emulex 16Gb FC Dual-port HBA (Gen 6 16Gb FC) (not supported in slot 1)	01CV840	ATZV	3 / 7
Emulex 16Gb FC Dual-port HBA (not supported in slot 1)	81Y1662	A2W6	3 / 7
QLogic 16Gb FC Single-port HBA (Enhanced Gen 5 16Gb FC)	01CV750	ATZB	4 / 8
QLogic 16Gb FC Single-port HBA	00Y3337	A3KW	4 / 8
QLogic 16Gb FC Dual-port HBA (Enhanced Gen 5 16Gb FC)	01CV760	ATZC	4 / 8
QLogic 16Gb FC Dual-port HBA	00Y3341	A3KX	4 / 8
8 Gb Fibre Channel - PCIe Low Profile (supported in Low Profile and Half-High PCIe slots)			
Emulex 8Gb FC Dual-port HBA	42D0494	3581	4 / 8
Emulex 8Gb FC Single-port HBA	42D0485	3580	4 / 8
QLogic 8Gb FC Dual-port HBA	42D0510	3579	4 / 8
QLogic 8Gb FC Single-port HBA	42D0501	3578	4 / 8

* The maximum quantity shown is with one processor / two processors.

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

Flash storage adapters

The System x3650 M5 server supports the flash storage adapters listed in the following table.

Table 23. Flash storage adapters (LP = Low Profile PCIe adapter, FH = Full-High PCIe adapter)

Description	Part number	Feature code	Maximum supported*
Enterprise Performance			
Intel P3700 1.6TB NVMe Enterprise Performance Flash Adapter (LP)	00YA812	AT7L	2 / 5
Intel P3700 2.0TB NVMe Enterprise Performance Flash Adapter (LP)	00YA815	AT7M	2 / 5
Enterprise Mainstream			
io3 1.25TB Enterprise Mainstream Flash Adapter (LP)	00YA800	AT7N	2 / 5
io3 1.6TB Enterprise Mainstream Flash Adapter (LP)	00YA803	AT7P	2 / 5
io3 3.2TB Enterprise Mainstream Flash Adapter (LP)	00YA806	AT7Q	2 / 5
io3 6.4TB Enterprise Mainstream Flash Adapter (FH)	00YA809	AT7R	3 / 6
Enterprise			
1000GB Enterprise io3 Flash Adapter (LP)	00AE995	ARYP	2 / 5
1300GB Enterprise io3 Flash Adapter (LP)	00AE998	ARYQ	2 / 5
2600GB Enterprise io3 Flash Adapter (LP)	00JY001	ARYR	2 / 5
Enterprise Value			
1250GB Enterprise Value io3 Flash Adapter (LP)	00AE983	ARYK	2 / 5
1600GB Enterprise Value io3 Flash Adapter (LP)	00AE986	ARYL	2 / 5
3200GB Enterprise Value io3 Flash Adapter (LP)	00AE989	ARYM	2 / 5
6400GB Enterprise Value io3 Flash Adapter (FH)	00AE992	ARYN	3 / 6

* The maximum quantity shown is with one processor / two processors.The PCIe low profile (LP) adapters are not supported in slots 2, 3, and 8. The PCIe full-high (FH) adapters are not supported in slots 4 and 5.

Configuration notes:

- With 3.5-inch drive bay models, the Flash Adapters are supported only in the environments with the air temperature of up to 30 °C (86 °F).
- The io3 Flash Adapters cannot be factory installed; they are supported as field-installable options only. The server cannot be shipped with these adapters installed.

For more information, see the list of Product Guides in the Flash storage adapters category:
http://lenovopress.com/servers/options/ssdadapter

GPU adapters

The System x3650 M5 server supports graphics processing units (GPUs) listed in the following table.

Table 24. GPU adapters

Description	Part number	Feature code	Maximum supported**
Full-high PCIe x16 adapters (x16-wired)			
Intel Xeon Phi 3120A	None*	A4G4	1 / 2
Intel Xeon Phi 7120A	None*	ASQJ	1 / 2
NVIDIA Grid K1 (Actively Cooled)	00YL374	AS3G	1 / 2
NVIDIA Grid K2 (Actively Cooled)	00YL373	A470	1 / 2
NVIDIA Quadro K4200	None*	ASQN	1 / 2
NVIDIA Quadro K5200	None*	ASQP	1 / 2
NVIDIA Quadro K6000	None*	A3YV	1 / 2
NVidia Quadro M5000 GPU, PCIe (active)	00YL378	ATZF	1 / 2
NVIDIA Tesla K40c	00YL376	A5FG	1 / 2
NVidia Tesla M60 GPU, PCIe (active)	00YL377	ASQL	1 / 2
Full-high PCIe x16 adapters (x8-wired)			
NVIDIA Quadro K420	00YL370	ASPN	2 / 4
NVIDIA Quadro K620	00YL371	ASPP	2 / 4
NVIDIA Quadro K2200	00YL372	ASQM	2 / 4
NVIDIA Tesla K8 Actively Cooled	00YL375	ASQQ	2 / 4

* These GPU adapters are available only through Special Bid or CTO.
** The maximum quantity shown is with one processor / two processors.

Configuration notes:

- The NVIDIA PCIe x16 adapters (x16-wired) are supported only in slots 1 and 6 and require PCIe x16 riser cards.
- The NVIDIA PCIe x16 adapters (x8-wired) are supported in slots 1, 2, 6, and 7 with PCIe x8 or PCIe x16 riser cards, or a combination of PCIe x8 and PCIe x16 riser cards (with PCIe x16 riser cards, slots 2 [Riser 1] and 7 [Riser 2] are not available).
- All GPUs installed in the server must be the same with the following exceptions:
  - A combination of one K6000 and one K4200 is supported.
  - A combination of one K6000 and one K5200 is supported.
- The maximum memory that can be installed is 1 TB.
- With 2.5-inch drive bay models, the GPU adapters are supported only in the environments with the air temperature of up to 35 °C (95 °F).
- With 3.5-inch drive bay models, the GPU adapters are supported only in the following environments:
  - NVIDIA GPU adapters: Air temperature of up to 35 °C (95 °F).
  - Intel GPU adapters: Air temperature of up to 30 °C (86 °F) and up to 120 W TDP processors.
- Further restrictions may apply depending on the power supplies installed (see Power supplies and cables).

Cooling

The System x3650 M5 server supports up to six system fans that provide dual fan zones cooling with N+1 fan redundancy, and each system fan has one rotor.

System x3650 M5 server models with one processor include four system fans, and server models with two processors include six system fans. An optional PCIe thermal solution kit is also required if any of the ML2 adapters are present in the configuration. The PCIe thermal kit contains an air baffle.

The following table shows additional cooling options.

Table 25. Cooling options

Description	Part number	Feature code	Maximum supported
System x3650 M5 PCIe Thermal Solution Kit	00MU908	ASQD	1

Power supplies and cables

The System x3650 M5 server supports up to two redundant power supplies, and is capable of N+N redundancy depending on the configuration. Standard models come with one power supply. The following table lists the power supply options.

Table 26. Power supplies

Description	Part number	Feature code	Maximum supported
System x 550W High Efficiency Platinum AC Power Supply	00FK930	A5ET	2
System x 750W High Efficiency Platinum AC Power Supply	00FK932	A5EU	2
System x 750W High Efficiency Titanium AC Power Supply (200-240V)	00FK934	A5EV	2
System x 900W High Efficiency Platinum AC Power Supply	00FK936	A5EW	2
System x 900W High Efficiency -48 V DC Power Supply	00MU910	ASQF	2
System x 1300W High Efficiency Titanium AC Power Supply (200-240V)	00MU911	ASQG	2
System x 1500W High Efficiency Platinum AC Power Supply (200-240V)	00MU909	ASQE	2

General power supply rules are as follows:

- Minimum of 1 and maximum of 2 power supplies per system.
- If 2 are installed, power supplies must be identical.

Important: The Standalone Solution Configuration Tool (SSCT) and Lenovo Hardware Configurator power supply selection rules allow a subset of possible configurations due to power restrictions. Configurations that cannot be built in SSCT or Hardware Configurator due to power restrictions may still be supported. To verify support and ensure that the right power supply is chosen for optimal performance, you should always validate your server configuration using the latest version of the System x Power Configurator:
https://www.ibm.com/support/entry/portal/docdisplay?lndocid=LNVO-PWRCONF

The System x3650 M5 servers ship standard with or without a power cord (model dependent). A hot-swap power supply option ships standard with one 2.8m, 10A/100-250V, IEC 320-C13 to C14 rack power cable.

Country-specific line cords and rack power cables can be ordered, if needed (see the following table).

Table 27. Power cables

Description	Part number	Feature code
Rack power cables		
1.5m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	39Y7937	6201
2.8m, 10A/100-250V, C13 to IEC 320-C20 Rack Power Cable	39Y7938	6204
4.3m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	39Y7932	6263
Country-specific line cords		
Argentina 10A/250V C13 to IRAM 2073 2.8m line cord	39Y7930	6222
Australia/NZ 10A/250V C13 to AS/NZ 3112 2.8m line cord	39Y7924	6211
Brazil 10A/125V C13 to NBR 6147 2.8m line cord	39Y7929	6223
China 10A/250V C13 to GB 2099.1 2.8m line cord	39Y7928	6210
Denmark 10A/250V C13 to DK2-5a 2.8m line cord	39Y7918	6213
European 10A/230V C13 to CEE7-VII 2.8m line cord	39Y7917	6212
India 10A/250V C13 to IS 6538 2.8m line cord	39Y7927	6269
Israel 10A/250V C13 to SI 32 2.8m line cord	39Y7920	6218
Italy 10A/250V C13 to CEI 23-16 2.8m line cord	39Y7921	6217
Korea 12A/250V C13 to KETI 2.8m line cord	39Y7925	6219
South Africa 10A/250V C13 to SABS 164 2.8m line cord	39Y7922	6214
Switzerland 10A/250V C13 to SEV 1011-S24507 2.8m line cord	39Y7919	6216
Taiwan 10A/250V C13 to CNS 10917-3 2.8m line cord	00CG265	6317
Taiwan 15A/125V C13 to CNS 10917-3 2.8m line cord	00CG267	6386
United Kingdom 10A/250V C13 to BS 1363/A 2.8m line cord	39Y7923	6215
United States 10A/125V C13 to NEMA 5-15P 4.3m line cord	39Y7931	6207
United States 10A/250V C13 to NEMA 6-15P 2.8m line cord	46M2592	A1RF

Integrated virtualization

The System x3650 M5 server supports VMware ESXi installed on a USB memory key or one or two SD cards in the SD Media Adapter. The USB memory key is installed in a USB socket inside the server. The SD Media Adapter is installed in a dedicated slot inside the server.

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

The following table lists the virtualization option.

Table 28. Virtualization option

Description	Part number	Feature code	Maximum supported
USB memory key			
USB Memory Key for VMware ESXi 5.1 Update 2	00ML233	ASN6	1
USB Memory Key for VMware ESXi 5.5 Update 2	00ML235	ASN7	1
USB Memory Key for VMware ESXi 5.5 Update 3B	00WH150	ATZG	1
USB Memory Key 4G for VMware ESXi 6.0 Update 1A	00WH138	ATRL	1
USB Memory Key for VMware ESXi 6.0 Update 2	00WH151	ATZH	1
Blank USB Memory Key 4G SLC for VMware ESXi Downloads	00WH140	ATRM	1
Blank USB Memory Key for VMware ESXi Downloads	41Y8298	A2G0	1
32GB Enterprise Value USB Memory Key	00ML200	A5R7	1
SD Media Adapter and SD cards			
SD Media Adapter (Option 00ML706 includes 2 blank 32GB SD cards)	00ML706*	A5TJ	1
Blank SD Media for System x	00ML700	AS2V	2
RAID Adapter for SD Media w/ VMware ESXi 5.1 U2 (2 SD Media, RAIDed)	None**	AS4B	1
RAID Adapter for SD Media w/ VMware ESXi 5.5 U2 (2 SD Media, RAIDed)	None**	AS4C	1
RAID Adapter for SD Media w/ VMware ESXi 5.1 U2 (1 SD Media)	None**	ASCG	1
RAID Adapter for SD Media w/ VMware ESXi 5.5 U2 (1 SD Media)	None**	ASCH	1
RAID Adapter for SD Media w/ VMware ESXi 5.5 U3B (1 SD Media)	None**	ATZK	1
RAID Adapter for SD Media w/ VMware ESXi 5.5 U3B (2 SD Media,RAIDed)	None**	ATZJ	1
RAID Adapter for SD Media w/VMware ESXi 6.0 U1A (1 SD Media)	None**	ATSA	1
RAID Adapter for SD Media w/VMware ESXi 6.0 U1A (2 SD Media, RAIDed)	None**	ATS9	1
RAID Adapter for SD Media w/ VMware ESXi 6.0 U2 (1 SD Media)	None**	ATZM	1
RAID Adapter for SD Media w/ VMware ESXi 6.0 U2 (2 SD Media, RAIDed)	None**	ATZL	1

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

Operating systems

The System x3650 M5 server supports the following operating systems:

- Microsoft:
  - Microsoft Windows Server 2012 R2
  - Microsoft Windows Server 2012
- Red Hat:
  - Red Hat Enterprise Linux 7.2
  - Red Hat Enterprise Linux 6.7 Server x64 Edition
- SUSE:
  - SUSE Linux Enterprise Server 12 SP1
  - SUSE Linux Enterprise Server with Xen 12 SP1
  - SUSE Linux Enterprise Server 11 for AMD64/EM64T SP4
  - SUSE Linux Enterprise Server 11 with Xen for AMD64/EM64T SP4
- VMware:
  - VMware vSphere 6.0 (ESXi) 6.0 Update 2
  - VMware vSphere 5.5 (ESXi) Update 3

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/

Systems management

The System x3650 M5 supports the following systems management tools:

- Integrated Management Module 2.1
- Light path diagnostics
- Lenovo ToolsCenter
- Lenovo XClarity Administrator
- Lenovo XClarity Energy Manager

Integrated Management Module 2.1

The System x3650 M5 server contains Integrated Management Module II (IMM2.1), which provides advanced service-processor control, monitoring, and an alerting function. If an environmental condition exceeds a threshold or if a system component fails, the IMM2.1 lights LEDs to help you diagnose the problem, records the error in the event log, and alerts you to the problem. Optionally, the IMM2.1 also provides a virtual presence capability for remote server management capabilities.

The IMM2.1 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 Integrated Management Module Advanced Upgrade 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
- 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 IMM2.1 restarts the server when the IMM2.1 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 29. Remote management option

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

Light path diagnostics

All System x3650 M5 server models include basic light path diagnostics, which provides the system LEDs on the front of the server (see Components and connectors) and the LEDs near the monitored components (for example, the DIMM error LED on the system board).

Server models with 8x 3.5-inch or 8x or 16x 2.5-inch front drive bays support a next-gen light path diagnostics LCD display panel (standard on 8x 3.5-inch models; available as an option for 8x or 16x 2.5-inch models). With LCD display, you have quick access to system status, firmware, network, and health information.

Storage dense server models (models with USB ports and system LEDs that are located on the right EIA bracket) with 8x or 16x 2.5-inch front drive bays that are upgradeable to 24x 2.5-inch front drive bays and models with 12x 3.5-inch front drive bays do not support an LCD display panel.

The following table shows the LCD display panel ordering information.

Table 30. Light path diagnostics options

Description	Part number	Feature code	Maximum supported
x3650 M5 Front IO Cage Adv. (3x USB, LCD, Optional Optical Drive)	00YD002*	None*	1

* The Front IO Cage Advanced part number (00YD002) includes the Front IO Cage Standard (feature code ATE6), System x3650 M5 2.5" Bezel with LCD Light Path (feature code ATE8), and LCD display (feature code A4VH). If configured via CTO, the LCD display (feature code A4VH) is derived when the Front IO Cage Standard (feature code ATE6) and System x3650 M5 2.5" Bezel with LCD Light Path (feature code ATE8) are selected.

Lenovo ToolsCenter

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

- Lenovo ToolsCenter Suite
  The ToolsCenter Suite tool is a consolidation of server management tools that helps simplify the management of System x servers. It provides functions to collect full system health information (including health status), configure system setting, update system firmware and drivers, and FoD mass activation key management for multiple endpoints.
- Lenovo ServerGuide
  The ServerGuide tool simplifies the process of configuring RAID and installing supported Microsoft Windows Server operating systems and device drivers on a System x server.
- Lenovo UpdateXpress System Packs
  The UpdateXpress System Packs (UXSPs) are integration-tested bundles that enable you to maintain your server firmware and device drivers up-to-date and help you avoid unnecessary server outages.
- Lenovo Dynamic System Analysis
  The Dynamic System Analysis (DSA) pre-boot or standalone diagnostics software speeds up troubleshooting tasks to reduce service time.

For more information and downloads, visit the ToolsCenter web page:
https://www-947.ibm.com/support/entry/myportal/docdisplay?lndocid=LNVO-CENTER

Lenovo XClarity Administrator

Lenovo XClarity is a centralized systems management solution that helps administrators deliver infrastructure faster. This solution integrates easily with Lenovo x86 rack servers, Flex System, and RackSwitch switches, providing automated agent-less discovery, monitoring, firmware updates, configuration management, and bare metal deployment of operating systems and hypervisors across multiple systems.

Lenovo XClarity is an optional software component for the System x3650 M5 that is licensed on a per managed server basis, that is, each managed server requires a license.

The following table lists the geo-specific Lenovo XClarity software license options.

Table 31. Lenovo XClarity software options

Description	Part number (NA, AP, Japan)*	Part number (EMEA, LA)**	Quantity
Lenovo XClarity Administrator			
Lenovo XClarity Administrator, per Mngd Server w/1 Yr SW S&S	00JY340	00JY346	1
Lenovo XClarity Administrator, per Mngd Server w/3 Yr SW S&S	00JY341	00JY347	1
Lenovo XClarity Administrator, per Mngd Server w/5 Yr SW S&S	00JY342	00JY348	1
Lenovo XClarity Pro			
Lenovo XClarity Pro, per Mngd Server w/1 Yr SW S&S	00MT201	00MT207	1
Lenovo XClarity Pro, per Mngd Server w/3 Yr SW S&S	00MT202	00MT208	1
Lenovo XClarity Pro, per Mngd Server w/5 Yr SW S&S	00MT203	00MT209	1

* NA = North America; AP = Asia Pacific
** EMEA = Europe, Middle East, Africa; LA = Latin America

Lenovo XClarity Administrator offers the following features:

- Auto-discovery and monitoring of Lenovo x86 servers, RackSwitch switches, and Flex System chassis
- Firmware updates and compliance enforcement
- Pattern-based configuration management that allows to define configurations once and apply repeatedly without errors when deploying new servers or redeploying existing servers without disrupting the fabric
- Bare metal deployment of operating systems and hypervisors to streamline infrastructure provisioning
- External alerts and notifications via SNMP traps, syslog remote logging, and e-mail
- Secure connections to managed endpoints
- NIST 800-131A or FIPS 140-2 compliant cryptographic standards between the management solution and managed endpoints
- Integration into existing higher level management systems such as cloud automation and orchestration tools through REST APIs, providing extensive external visibility and control over hardware resources
- An intuitive, easy-to-use GUI
- Scripting with Windows PowerShell, providing command-line visibility and control over hardware resources

Lenovo XClarity Pro includes Lenovo XClarity Administrator and two software plug-in modules:

- Lenovo XClarity Integrator for Microsoft System Center
- Lenovo XClarity Integrator for VMware vCenter

Lenovo XClarity Pro delivers all the features of Lenovo XClarity Administrator, while also allowing administrators to manage physical infrastructure from leading external virtualization management software tools from Microsoft and VMware.

Lenovo XClarity Pro offers the following additional features:

- Ability to discover, manage, and monitor Lenovo server hardware from VMware vCenter or Microsoft System Center
- Deployment of firmware updates and configuration patterns to System x M5 and X6 rack servers and Flex System from the virtualization management tool
- Non-disruptive server maintenance in clustered environments that reduces workload downtime by dynamically migrating workloads from affected hosts during rolling server updates or reboots
- Greater service level uptime and assurance in clustered environments during unplanned hardware events by dynamically triggering workload migration from impacted hosts when impending hardware failures are predicted

For more information, refer to the Lenovo XClarity Administrator Product Guide:
http://lenovopress.com/tips1200

Lenovo XClarity Energy Manager

Lenovo XClarity Energy Manager provides a stand-alone, web-based agent-less power management console that provides real time data and enables you to observe, plan and manage power and cooling for Lenovo System x and ThinkServer x86 servers. Using built-in intelligence, it identifies server power consumption trends and ideal power settings and performs cooling analysis so that you can define and optimize power-saving policies.

Lenovo XClarity Energy Manager offers the following capabilities:

- Reports vital server information, such as power, temperature and resource utilization
- Monitors inlet temperature to locate hot spots, reducing the risk of data or device damage
- Provides finely-grained controls to limit platform power in compliance with IT policy
- Generates alerts when a user-defined threshold is reached

Lenovo XClarity Energy Manager is an optional software component for the System x3650 M5 that is licensed on a per managed node basis, that is, each managed server requires a license.

The following table lists the geo-specific Lenovo XClarity Energy Manager software license options.

Table 32. Lenovo XClarity Energy Manager software options

Description	Part number (NA, AP, Japan)*	Part number (EMEA, LA)**	Quantity
Lenovo XClarity Energy Manager, 1 Node w/ 1 Yr S&S	01DA225	01DA228	1
Lenovo XClarity Energy Manager, 5 Nodes w/ 1 Yr S&S	01DA226	01DA229	1
Lenovo XClarity Energy Manager, 50 Nodes w/ 1 Yr S&S	01DA227	01DA230	1

* NA = North America; AP = Asia Pacific
** EMEA = Europe, Middle East, Africa; LA = Latin America

Rack installation

The following table lists the rack installation options that are available for the System x3650 M5 server.

Table 33. Rack installation options

Description	Part number	Feature code	Maximum supported
4-post rail kits			
System x Enterprise Slides Kit	00FK656	A5FV	1
System x Gen-II Universal Slides Kit	00KA500	A5FW	1
System x M5 Custom Rail Kit	00MW239	ATLQ	1
Cable management arm (CMA)			
System x Enterprise 2U Cable Management Arm (CMA)	00FK622	A5FX	1*
Lockable front bezel			
System x3650 M5 Lockable Bezel	00FK660	A5G0	1
Front VGA port			
System x3650 M5 EIA L - VGA	00YD071	ATE9	1

* The System x CMA requires the Enterprise Slides Kit (00FK656) or Universal Slides Kit (00KA500). The Custom Rail Kit (00MW239) is not supported with the CMA.

Note: The System x Enterprise Slides Kit, part number 00FK656, is included with the standard models that are listed in Table 2 and TopSeller models that are listed in Table 3.

The following table summarizes the rail kit features and specifications.

Table 34. Rail kit features and specifications summary

Feature	System x Enterprise Slides Kit	System x Gen-II Universal Slides Kit	System x M5 Custom Rail Kit
Part number	00FK656	00KA500	00MW239
Rail type	Full-out slide (ball bearing)	Full-out slide (ball bearing)	Half-out slide (friction)
Toolless installation	Yes	No	Yes
CMA support	Yes	Yes	No
In-rack server maintenance	Yes	Yes	No
1U PDU support	Yes	Yes	Yes
0U PDU support	Limited*	Limited*	Limited**
Rack type	IBM and Lenovo 4-post, IEC standard-compliant	Any 4-post, IEC standard-compliant	IBM and Lenovo 4-post, IEC standard-compliant
Mounting holes	Square or round	Square, round, or threaded	Square or round
Mounting flange thickness	2 mm (0.08 in.) – 3.3 mm (0.13 in.)	2 mm (0.08 in.) – 4.65 mm (0.18 in.)	2 mm (0.08 in.) – 4 mm (0.16 in.)
Distance between front and rear mounting flanges	617 mm (24.29 in.) – 812 mm (31.97 in.)	617 mm (24.29 in.) – 812 mm (31.97 in.)	595 mm (23.43 in.) – 746 mm (29.37 in.)
Rail length***	833.5 mm (32.81 in.)	836.8 mm (32.94 in.)	755 mm (29.72 in.)

* The rack must be at least 1100 mm (43.31 in.) deep if no CMA is used, or at least 1200 mm (47.24 in.) deep if a CMA is used.
** The rack must be at least 1000 mm (39.37 in.) deep.
*** Measured when mounted on the rack, from the front surface of the front mounting flange to the rear most point of the rail.

Physical specifications

The System x3650 M5 server has the following dimensions and weight (approximate):

- Height: 87 mm (3.4 in.)
- Width: 434 mm (17.1 in.)
- Depth: 755 mm (29.7 in.)
- Weight:
    - Minimum configuration: 19 kg (41.8 lb)
    - Maximum configuration: 34 kg (74.8 lb)

Operating environment

The System x3650 M5 server is supported in the following environment:

- Air temperature:
    - Server on: 5 °C to 40 °C (41 °F to 104 °F); altitude: 0 to 950 m (3,117 ft); decrease the maximum system temperature by 1 °C for every 175-m increase in altitude above 950 m.
    - Server off: 5 °C to 45 °C (41 °F to 113 °F)
    - Maximum altitude: 3,050 m (10,000 ft), 5 °C to 28 °C (41 °F to 82 °F)
    - Shipment: -40 °C to +60 °C (-40 °F to 140 °F) at up to 10,700 m (35,105 ft)
- Humidity:
    - Server on: 8% to 85% (non-condensing), max dew point 24 °C, max rate of change 5 °C/hr
    - Server off: 8% to 85% (non-condensing), max dew point 27 °C
- Design to ASHRAE Class A3, ambient of 36 °C to 40 °C (96.8 °F to 104 °F), with relaxed support:
    - Supports cloud-like workload with no performance degradation acceptable (Turbo-Off).
    - Under no circumstance can any combination of worst-case workload and configuration result in system shutdown or design exposure at 40 °C.
    - The worst-case workload (like Linpack, Turbo-On) might have performance degradation.
- Electrical:
    - Models with 1500 W Platinum power supplies:
        - 200 - 240 (nominal) V ac; 50 Hz or 60 Hz; 8.35 A
        - Input kilovolt-amperes (kVA) (approximately):
            - Minimum configuration: 0.15 kVA
            - Maximum configuration: 1.967 kVA
    - Models with 1300 W Titanium power supplies:
        - 200 - 240 (nominal) V ac; 50 Hz or 60 Hz; 7.137 A
        - Input kilovolt-amperes (kVA) (approximately):
            - Minimum configuration: 0.15 kVA
            - Maximum configuration: 1.700 kVA
    - Models with 900 W AC power supplies:
        - 100 to 127 (nominal) V ac; 50 Hz or 60 Hz; 10.3 A
        - 200 to 240 (nominal) V ac; 50 Hz or 60 Hz; 5.0 A
        - Input kilovolt-amperes (kVA) (approximately):
            - Minimum configuration: 0.15 kVA
            - Maximum configuration: 1.194 kVA
    - Models with 750 W Platinum AC power supplies:
        - 100 to 127 (nominal) V ac; 50 Hz or 60 Hz; 8.6 A
        - 200 to 240 (nominal) V ac; 50 Hz or 60 Hz; 4.2 A
        - Input kilovolt-amperes (kVA) (approximately):
            - Minimum configuration: 0.15 kVA
            - Maximum configuration: 1.015 kVA
    - Models with 750 W Titanium AC power supplies:
        - 200 to 240 (nominal) V ac; 50 Hz or 60 Hz; 4.2 A
        - Input kilovolt-amperes (kVA) (approximately):
            - Minimum configuration: 0.15 kVA
            - Maximum configuration: 0.965 kVA

    - Models with 550 W AC power supplies:
        - 100 to 127 (nominal) V ac; 50 Hz or 60 Hz; 6.5 A
        - 200 to 240 (nominal) V ac; 50 Hz or 60 Hz; 3.3 A
        - Input kilovolt-amperes (kVA) (approximately):
            - Minimum configuration: 0.16 kVA
            - Maximum configuration: 0.732 kVA
    - Models with -48Vdc 900 W power supplies:
        - -48 - -60 (nominal) V dc; 25.8 A
        - Input kilovolt-amperes (kVA) (approximately):
            - Minimum configuration: 0.15 kVA
            - Maximum configuration: 1.237 kVA
- BTU output:
    - Minimum configuration: 525 Btu/hr (154 watts)
    - Maximum configuration: 6667 Btu/hr (1954 watts)
- Noise level:
    - 6.6 bels (operating)
    - 6.4 bels (idle)

Warranty

The System x3650 M5 has a three-year customer-replaceable unit (CRU) and onsite (for field-replaceable units [FRUs] only) limited warranty with standard call center support during normal business hours and 9x5 Next Business Day Parts Delivered. Also available are Lenovo Services warranty maintenance upgrades and post-warranty maintenance agreements, with a 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 Services website:
http://lenovoquickpick.com

The following table explains warranty service definitions in more detail.

Table 35. Warranty service definitions

Term	Description
Onsite Service	If a problem with your product cannot be resolved via telephone, a Service Technician will be dispatched to arrive at your location.
Parts Delivered	If a problem with your product cannot be resolved via telephone and a CRU part is required, Lenovo will send a replacement CRU to arrive at your location. If a problem with your product cannot be resolved via telephone and a FRU part is required, a Service Technician will be dispatched to arrive at your location.
Technician Installed Parts	If a problem with your product cannot be resolved via telephone, a Service Technician will be dispatched to arrive at your location.
Hours of coverage	• 9x5: 9 hours per day, 5 days per week, during normal business hours, excluding local public and national holidays • 24x7: 24 hours per day, 7 days per week, 365 days per year.
Response time target	2 hours, 4 hours, or Next Business Day: The time period from when the telephone based troubleshooting is completed and logged, to the delivery of the CRU or arrival of a Service Technician and part at the Customer's location for repair.
Committed Repair	6 hours: The time period between the service request registration in Lenovo's call management system and the restoration of the product to conformance with its specification by a Service Technician.

The following Lenovo warranty service upgrades are available:

- Warranty and maintenance service upgrades:
  - Three, four, or five years of 9x5 or 24x7 service coverage
  - Parts delivered or technician installed parts from next business day to 4 or 2 hours
  - Committed repair service
  - Warranty extension of up to 5 years
  - Post warranty extensions
- Committed Repair Service
  Committed Repair Services enhances the level of Warranty Service Upgrade or Post Warranty/Maintenance Service offering associated with the selected systems. Offerings vary and are available in select countries.
  - Priority handling to meet defined time frames to restore the failing machine to good working condition
  - 24x7x6 committed repair: Service performed 24 hours per day, 7 days per week, within 6 hours
- YourDrive YourData
  Lenovo's YourDrive YourData service is a multi-drive retention offering that ensures your data is always under your control, regardless of the number of drives that are installed in your Lenovo server. In the unlikely event of a drive failure, you retain possession of your drive while Lenovo replaces the failed drive part. Your data stays safely on your premises, in your hands. The YourDrive YourData service can be purchased in convenient bundles with Lenovo warranty upgrades and extensions.
- Microcode Support
  Keeping microcode current helps prevent hardware failures and security exposure. There are two levels of service: analysis of the installed base and analysis and update where required. Offerings vary by country and can be bundled with other warranty upgrades and extensions.
- Enterprise Software Support
  Lenovo Enterprise Server Software Support can help you troubleshoot your entire server software stack. Choose support for server operating systems from Microsoft, Red Hat, SUSE, and VMware; Microsoft server applications; or both operating systems and applications. Support staff can help answer troubleshooting and diagnostic questions, address product compatibility and interoperability issues, isolate causes of problems, report defects to software vendors, and more.

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

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

Regulatory compliance

The server conforms to the following regulations:

- FCC - Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, issue 5, Class A
- UL/IEC 60950-1
- CSA C22.2 No. 60950-1
- NOM-019
- Argentina IEC60950-1
- Japan VCCI, Class A
- Australia/New Zealand AS/NZS CISPR 22, Class A; AS/NZS 60950.1

- China CCC GB4943.1, GB9254 Class A, GB17625.1
- Taiwan BSMI CNS13438, Class A; CNS14336-1
- Korea KN22, Class A; KN24
- Russia, Belorussia and Kazakhstan, TR CU 020/2011 (for EMC) and TR CU 004/2011 (for safety)
- IEC 60950-1 (CB Certificate and CB Test Report)
- CE Mark (EN55022 Class A, EN60950-1, EN55024, EN61000-3-2, EN61000-3-3)
- CISPR 22, Class A
- TUV-GS (EN60950-1 /IEC60950-1,EK1-ITB2000)
- RoHS Directive

External drive enclosures

The following table lists the external drive enclosures that are offered by Lenovo that can be used with the System x3650 M5 for storage expansion.

Table 36. External drive enclosures

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

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

External storage systems

The following table lists the external storage systems that are currently offered by Lenovo that can be used with the System x3650 M5 in storage solutions.

Table 37. External storage systems

Description	Part number
Lenovo Storage N Series (NAS storage)	
Lenovo Storage N3310	70FX / 70FY*
Lenovo Storage N4610	70G0 / 70G1*
Lenovo Storage S Series (SAS, iSCSI, or FC host connectivity)	
Lenovo Storage S2200 LFF Chassis SAS Single Controller, Rack Kit, 9x5NBD	64112B1
Lenovo Storage S2200 LFF Chassis SAS Dual Controller, Rack Kit, 9x5NBD	64112B2
Lenovo Storage S2200 LFF Chassis FC/iSCSI Single Controller, Rack Kit, 9x5NBD	64114B1
Lenovo Storage S2200 LFF Chassis FC/iSCSI Dual Controller, Rack Kit, 9x5NBD	64114B2
Lenovo Storage S2200 SFF Chassis SAS Single Controller, Rack Kit, 9x5NBD	64112B3
Lenovo Storage S2200 SFF Chassis SAS Dual Controller, Rack Kit, 9x5NBD	64112B4
Lenovo Storage S2200 SFF Chassis FC/iSCSI Single Controller, Rack Kit, 9x5NBD	64114B3
Lenovo Storage S2200 SFF Chassis FC/iSCSI Dual Controller, Rack Kit, 9x5NBD	64114B4
Lenovo Storage S3200 LFF Chassis SAS Single Controller, Rack Kit, 9x5NBD	64113B1
Lenovo Storage S3200 LFF Chassis SAS Dual Controller, Rack Kit, 9x5NBD	64113B2
Lenovo Storage S3200 LFF Chassis FC/iSCSI Single Controller, Rack Kit, 9x5NBD	64116B1
Lenovo Storage S3200 LFF Chassis FC/iSCSI Dual Controller, Rack Kit, 9x5NBD	64116B2

Description	Part number
Lenovo Storage S3200 SFF Chassis SAS Single Controller, Rack Kit, 9x5NBD	64113B3
Lenovo Storage S3200 SFF Chassis SAS Dual Controller, Rack Kit, 9x5NBD	64113B4
Lenovo Storage S3200 SFF Chassis FC/iSCSI Single Controller, Rack Kit, 9x5NBD	64116B3
Lenovo Storage S3200 SFF Chassis FC/iSCSI Dual Controller, Rack Kit, 9x5NBD	64116B4
Lenovo Storage V Series (SAS, iSCSI, FC, or FCoE host connectivity)	
Lenovo Storage V3700 V2 LFF Control Enclosure	6535C1D
Lenovo Storage V3700 V2 LFF Control Enclosure (with integrated 12 Gb SAS host ports)	6535C3D
Lenovo Storage V3700 V2 LFF Control Enclosure (Top Seller)	6535EC1
Lenovo Storage V3700 V2 LFF Control Enclosure (Top Seller) (with integrated 12 Gb SAS host ports)	6535EC3
Lenovo Storage V3700 V2 SFF Control Enclosure	6535C2D
Lenovo Storage V3700 V2 SFF Control Enclosure (with integrated 12 Gb SAS host ports)	6535C4D
Lenovo Storage V3700 V2 SFF Control Enclosure (Top Seller)	6535EC2
Lenovo Storage V3700 V2 SFF Control Enclosure (Top Seller) (with integrated 12 Gb SAS host ports)	6535EC4
Lenovo Storage V5030 LFF Control Enclosure 3Yr S&S	6536C12
Lenovo Storage V5030 LFF Control Enclosure 5Yr S&S	6536C32
Lenovo Storage V5030 SFF Control Enclosure 3Yr S&S	6536C22
Lenovo Storage V5030 SFF Control Enclosure 5Yr S&S	6536C42
IBM Storwize for Lenovo (SAS [except V7000], iSCSI, FC, or FCoE host connectivity)	
IBM Storwize V3500 3.5-inch Dual Control Storage Controller Unit	6096CU2**
IBM Storwize V3500 2.5-inch Dual Control Storage Controller Unit	6096CU3**
IBM Storwize V3700 3.5-inch Storage Controller Unit	6099L2C
IBM Storwize V3700 2.5-inch Storage Controller Unit	6099S2C
IBM Storwize V3700 2.5-inch DC Storage Controller Unit	6099T2C
IBM Storwize V5000 LFF Control Enclosure, w/3 Yr S&S	6194L2C†
IBM Storwize V5000 LFF Control Enclosure, w/3 Yr S&S (LA)	6194L2L‡
IBM Storwize V5000 LFF Control Enclosure, w/5 Yr S&S	61941A1†
IBM Storwize V5000 LFF Control Enclosure, w/5 Yr S&S (LA)	61941AL‡
IBM Storwize V5000 SFF Control Enclosure, w/3 Yr S&S	6194S2C†
IBM Storwize V5000 SFF Control Enclosure, w/3 Yr S&S (LA)	6194S2L‡
IBM Storwize V5000 SFF Control Enclosure, w/5 Yr S&S	61941C1†
IBM Storwize V5000 SFF Control Enclosure, w/5 Yr S&S (LA)	61941CL‡
IBM Storwize V7000 2.5-inch Storage Controller Unit, w/3 Yr S&S	6195SC5†
IBM Storwize V7000 2.5-inch Storage Controller Unit, w/3 Yr S&S (LA)	6195SCL‡
IBM Storwize V7000 2.5-inch Storage Controller Unit, w/5 Yr S&S	61951F1†
IBM Storwize V7000 2.5-inch Storage Controller Unit, w/5 Yr S&S (LA)	61951FL‡

* Machine Type; see the respective Product Guide in the NAS Storage category (http://lenovopress.com/storage/nas) for models.
** 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 N Series storage: http://lenovopress.com/storage/nas
- Lenovo S Series and V Series storage: http://lenovopress.com/storage/san/lenovo
- IBM Storwize storage: http://lenovopress.com/storage/san/ibm

External backup units

The following table lists the external backup options that are offered by Lenovo that can be used with the System x3650 M5 in backup solutions.

Table 38. External backup options

Description	Part number
External RDX USB drives	
RDX External USB 3.0 Dock with 320GB Cartridge	362532Y
RDX External USB 3.0 Dock with 500GB Cartridge	362550Y
RDX External USB 3.0 Dock with 1TB Cartridge	36251TY
External SAS tape backup drives	
IBM TS2250 Tape Drive Model H5S	6160S5E
IBM TS2260 Tape Drive Model H6S	6160S6E
IBM TS2270 Tape Drive Model H7S	6160S7E
External SAS tape backup autoloaders	
IBM TS2900 Tape Autoloader w/LTO5 HH SAS	6171S5R
IBM TS2900 Tape Autoloader w/LTO6 HH SAS	6171S6R
IBM TS2900 Tape Autoloader w/LTO7 HH SAS	6171S7R
External tape backup libraries	
IBM TS3100 Tape Library Model L2U	61732UL
IBM TS3200 Tape Library Model L4U	61734UL
Fibre Channel backup drives for TS3100 and TS3200 Tape Libraries	
6173 LTO Ultrium 5 Fibre Channel Drive	00NA107
6173 LTO Ultrium 5 Half High Fibre Drive Sled	00NA113
6173 LTO Ultrium 6 Fibre Channel Drive	00NA115
6173 LTO Ultrium 6 Half High Fibre Drive Sled	00NA119
6173 LTO Ultrium 7 Fibre Channel Drive	00WF765
6173 LTO Ultrium 7 Half High Fibre Drive Sled	00WF769
SAS backup drives for TS3100 and TS3200 Tape Libraries	
6173 LTO Ultrium 5 SAS Drive Sled	00NA109
6173 LTO Ultrium 5 Half High SAS Drive Sled	00NA111
6173 LTO Ultrium 6 Half High SAS Drive Sled	00NA117
6173 LTO Ultrium 7 Half High SAS Drive Sled	00WF767

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 that can be used with the System x3650 M5 in network connectivity solutions.

Table 39. Top-of-rack switches

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

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

Fibre Channel SAN switches

The following table lists the Fibre Channel SAN switches that are offered by Lenovo that can be used with the System x3650 M5 in FC SAN storage connectivity solutions.

Table 40. Fibre Channel SAN switches

Description	Part number
8 Gb Fibre Channel	
Lenovo B300, 8 ports activated w/ 8Gb SWL SFPs, 1 PS, Rail Kit	3873AR3
Lenovo B6505, 12 ports activated w/ 8Gb SWL SFPs, 1 PS, Rail Kit	3873AR4
Lenovo B6510, 24 ports activated w/ 8Gb SWL SFPs, 2 PS, Rail Kit	3873BR2
16 Gb Fibre Channel	
Lenovo B6505, 12 ports activated w/ 16Gb SWL SFPs, 1 PS, Rail Kit	3873AR5
Lenovo B6510, 24 ports activated w/ 16Gb SWL SFPs, 2 PS, Rail Kit	3873BR3

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

Rack cabinets

The following table lists the rack cabinets that are offered by Lenovo that can be used in System x3550 M5 solutions.

Table 41. Rack cabinets

Description	Part number
11U Rack Office Enablement Kit (1156 mm deep)	201886X
25U S2 Standard Rack (1000 mm deep; 2 sidewall compartments)	93072RX
25U Static S2 Standard Rack (1000 mm deep; 2 sidewall compartments)	93072PX
42U S2 Standard Rack (1000 mm deep; 6 sidewall compartments)	93074RX
42U 1100mm Enterprise V2 Dynamic Rack (6 sidewall compartments)	93634PX
42U 1100mm Enterprise V2 Dynamic Expansion Rack (6 sidewall compartments)	93634EX
42U 1200mm Deep Dynamic Rack (6 sidewall compartments)	93604PX
42U 1200mm Deep Static Rack (6 sidewall compartments)	93614PX
42U Enterprise Rack (1105 mm deep; 4 sidewall compartments)	93084PX
42U Enterprise Expansion Rack (1105 mm deep; 4 sidewall compartments)	93084EX

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

KVM switches and consoles

The following table lists the KVM switches and consoles that are offered by Lenovo that can be used in System x3650 M5 solutions.

Table 42. KVM switch and console options

Description	Part number
Consoles	
1U 18.5" Standard Console (without keyboard)	17238BX
Console keyboards	
Lenovo UltraNav Keyboard USB - US Eng	00MW310
Keyboard w/ Int. Pointing Device USB - Arabic 253 RoHS v2	46W6713
Keyboard w/ Int. Pointing Device USB - Belg/UK 120 RoHS v2	46W6714
Keyboard w/ Int. Pointing Device USB - Chinese/US 467 RoHS v2	46W6715
Keyboard w/ Int. Pointing Device USB - Czech 489 RoHS v2	46W6716
Keyboard w/ Int. Pointing Device USB - Danish 159 RoHS v2	46W6717
Keyboard w/ Int. Pointing Device USB - Dutch 143 RoHS v2	46W6718
Keyboard w/ Int. Pointing Device USB - French 189 RoHS v2	46W6719
Keyboard w/ Int. Pointing Device USB - Fr/Canada 445 RoHS v2	46W6720
Keyboard w/ Int. Pointing Device USB - German 129 RoHS v2	46W6721
Keyboard w/ Int. Pointing Device USB - Greek 219 RoHS v2	46W6722
Keyboard w/ Int. Pointing Device USB - Hebrew 212 RoHS v2	46W6723
Keyboard w/ Int. Pointing Device USB - Hungarian 208 RoHS v2	46W6724
Keyboard w/ Int. Pointing Device USB - Italian 141 RoHS v2	46W6725
Keyboard w/ Int. Pointing Device USB - Japanese 194 RoHS v2	46W6726
Keyboard w/ Int. Pointing Device USB - Korean 413 RoHS v2	46W6727

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

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

Uninterruptible power supply units

The following table lists the uninterruptible power supply (UPS) units that are offered by Lenovo that can be used in System x3650 M5 solutions.

Table 43. Uninterruptible power supply units

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

For more information, see the list of Product Guides in the 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 that can be used in System x3650 M5 solutions.

Table 44. Power distribution units

Description	Part number
0U Basic PDUs	
0U 36 C13/6 C19 24A/200-240V 1 Phase PDU with NEMA L6-30P line cord	00YJ776
0U 36 C13/6 C19 32A/200-240V 1 Phase PDU with IEC60309 332P6 line cord	00YJ777
0U 21 C13/12 C19 32A/200-240V/346-415V 3 Phase PDU with IEC60309 532P6 line cord	00YJ778
0U 21 C13/12 C19 48A/200-240V 3 Phase PDU with IEC60309 460P9 line cord	00YJ779
Switched and Monitored PDUs	
0U 20 C13/4 C19 Switched and Monitored 24A/200-240V/1Ph PDU w/ NEMA L6-30P line cord	00YJ781
0U 20 C13/4 C19 Switched and Monitored 32A/200-240V/1Ph PDU w/ IEC60309 332P6 line cord	00YJ780
0U 18 C13/6 C19 Switched / Monitored 32A/200-240V/346-415V/3Ph PDU w/ IEC60309 532P6 cord	00YJ782
0U 12 C13/12 C19 Switched and Monitored 48A/200-240V/3Ph PDU w/ IEC60309 460P9 line cord	00YJ783
1U 9 C19/3 C13 Switched and Monitored DPI PDU (without line cord)	46M4002
1U 9 C19/3 C13 Switched and Monitored 60A 3Ph PDU with IEC 309 3P+Gnd cord	46M4003
1U 12 C13 Switched and Monitored DPI PDU (without line cord)	46M4004
1U 12 C13 Switched and Monitored 60A 3 Phase PDU with IEC 309 3P+Gnd line cord	46M4005
Ultra Density Enterprise PDUs (9x IEC 320 C13 + 3x IEC 320 C19 outlets)	
Ultra Density Enterprise C19/C13 PDU Module (without line cord)	71762NX

Description	Part number
Ultra Density Enterprise C19/C13 PDU 60A/208V/3ph with IEC 309 3P+Gnd line cord	71763NU
C13 Enterprise PDUs (12x IEC 320 C13 outlets)	
DPI C13 Enterprise PDU+ (without line cord)	39M2816
DPI Single Phase C13 Enterprise PDU (without line cord)	39Y8941
C19 Enterprise PDUs (6x IEC 320 C19 outlets)	
DPI Single Phase C19 Enterprise PDU (without line cord)	39Y8948
DPI 60A 3 Phase C19 Enterprise PDU with IEC 309 3P+G (208 V) fixed line cord	39Y8923
Front-end PDUs (3x IEC 320 C19 outlets)	
DPI 30amp/125V Front-end PDU with NEMA L5-30P line cord	39Y8938
DPI 30amp/250V Front-end PDU with NEMA L6-30P line cord	39Y8939
DPI 32amp/250V Front-end PDU with IEC 309 2P+Gnd line cord	39Y8934
DPI 60amp/250V Front-end PDU with IEC 309 2P+Gnd line cord	39Y8940
DPI 63amp/250V Front-end PDU with IEC 309 2P+Gnd line cord	39Y8935
Universal PDUs (7x IEC 320 C13 outlets)	
DPI Universal 7 C13 PDU (with 2 m IEC 320-C19 to C20 rack power cord)	00YE443
NEMA PDUs (6x NEMA 5-15R outlets)	
DPI 100-127V PDU with fixed NEMA L5-15P line cord	39Y8905
Line cords for PDUs that ship without a line cord	
DPI 30a Line Cord (NEMA L6-30P)	40K9614
DPI 32a Line Cord (IEC 309 P+N+G)	40K9612
DPI 32a Line Cord (IEC 309 3P+N+G)	40K9611
DPI 60a Cord (IEC 309 2P+G)	40K9615
DPI 63a Cord (IEC 309 P+N+G)	40K9613
DPI Australian/NZ 3112 Line Cord	40K9617

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

Lenovo Financial Services

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

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

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

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http://www.lenovofs.com

Related publications and links

For more information, see these resources:

- Lenovo servers product page
  http://www.lenovo.com/systems/servers
- Lenovo Hardware Configurator:
  http://lesc.lenovo.com
- ServerProven hardware compatibility page for the System x3650 M5
  http://www.lenovo.com/us/en/serverproven/xseries/8871.shtml
- *xREF: System x Reference*
  http://lenovopress.com/xref
- System x3650 M5 documentation
  http://support.lenovo.com/us/en/products/Servers/Lenovo-x86-servers/Lenovo-System-x3650-M5?tabName=Documentation
- Support Portal - System x3650 M5
  https://support.lenovo.com/products/Servers/Lenovo-x86-servers/Lenovo-System-x3650-M5

Related product families

Product families related to this document are the following:

- 2-Socket Rack Servers

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