System x3850 X6 (3837)
Product Guide (withdrawn product)

The System x3850 X6 server is a four-socket 4U rack-mounted server that represents the sixth generation of the Enterprise X-Architecture. It delivers fast application performance, is based on an agile system design, and is a resilient platform that is needed for mission-critical databases, enterprise applications, and virtualized environments.

The x3850 X6 packs numerous fault-tolerant and high-availability features into a high-density, 4U rack-optimized lid-less package that helps reduce the space that is needed to support massive network computing operations and simplify servicing. The x3850 X6 supports up to four Intel Xeon E7-4800/8800 v2 high-performance processors and up to 6 TB of memory.

Suggested use: Mission-critical scalable databases, business analytics, virtualization, enterprise applications, and cloud applications.

The following figure shows the System x3850 X6.

Figure 1. The System x3850 X6

Did you know?

The x3850 X6 server employs a lid-less design where all serviceable components are front- and rear-accessible. In addition, each major subsystem is implemented as modular "book" design, such as the Compute Books and I/O Books. This configuration means that components are easy to upgrade and service, which translates to greater uptime of applications to your users. The x3850 X6 offers enterprise scalability and advanced RAS features to support the most demanding mission-critical applications that require 24x7 operations.

Key features

The increasing demand for cloud-computing and analytics workloads by enterprises to meet social, mobile, and Big Data requirements drives innovation to find new ways to build informational systems. Clients are looking for cost-optimized fit-for-purpose IT solutions that manage large amounts of data, easily scale performance, and provide enterprise class reliability.

Built on decades of innovation, Lenovo introduces its sixth generation of Enterprise X-Architecture technology, the X6 servers. Lenovo X6 servers are fast, agile, and resilient:

- *Fast* application performance means immediate access to actionable information.
- *Agile* system design helps to reduce acquisition costs and provide the ability to upgrade processor and memory technology at each refresh within the same chassis.
- *Resilient* platforms maximize application uptime and promote easy integration in virtual environments.

Lenovo X6 servers continue to lead the way as the shift toward mission-critical scalable databases, business analytics, virtualization, enterprise applications, and cloud-computing applications accelerates.

Fast application performance

The server offer numerous features to boost performance:

- Supports memory-channel storage (eXFlash DIMMs), where solid-state storage devices are installed in memory DIMM sockets. These devices are directly connected to the processors and provide the lowest latency values in the industry.
- Based on the Intel Xeon processor E7-4800 v2 and E7-8800 v2 product family:
    - Supports up to four E7-4800/8800 v2 processors with 60 cores and 120 threads to maximize the concurrent running of multi-threaded applications.
    - Improves productivity by offering superior system performance with 15-core processors (up to 2.8 GHz core speeds), up to 37.5 MB of L3 cache, and up to three 8 GTps QPI interconnect links.
- Supports memory speeds up to 1600 MHz.
- Supports up to 96 DIMM sockets, with 24 DIMMs per processor.
- With eXFlash memory-channel storage, the server delivers up to 12.8 TB of ultra-low latency flash memory by using WriteNow technology, which is ideal for high-performance applications.
- Intelligent and adaptive system performance with Intel Turbo Boost Technology 2.0 allows processor cores to run at maximum speeds during peak workloads by temporarily going beyond processor thermal design power (TDP).
- Intel Hyper-Threading Technology boosts performance for multi-threaded applications by enabling simultaneous multi-threading within each processor core, up to two threads per core.
- Intel Virtualization Technology integrates hardware-level virtualization hooks that allow operating system vendors to better use the hardware for virtualization workloads.
- Intel Advanced Vector Extensions (AVX) improve floating-point performance for compute-intensive technical and scientific applications.
- Supports a 12 Gbps SAS RAID portfolio.
- The usage of solid-state drives (SSDs) instead of, or along with, traditional spinning drives (HDDs) can improve I/O performance. An SSD can support up to 100 times more I/O operations per second (IOPS) than a typical HDD.
- PCI Express 3.0 I/O adapter slots that improve the theoretical maximum bandwidth by almost 100% (8 GTps per link using 128b/130b encoding) compared to the previous generation of PCI Express 2.0 (5 GTps per link using 8b/10b encoding).
- With Intel Integrated I/O Technology, the PCI Express 3.0 controller is integrated into the Intel Xeon

processor E7-4800/8800 v2 product families. This integration helps reduce I/O latency and increase overall system performance.

- Support for up to two graphics processing units (GPUs) and co-processors to maximize computing power.
- Energy-efficient electronic components help lower operational costs, including highly efficient 900 W AC and 1400 W AC power supplies with 80 PLUS Platinum certification.

Agile system design

The server provides many scalability and flexibility features:

- Innovative module "book" design for each of the three subsystems: Compute Books, Storage Book, and I/O Books. Front and rear access means that you can easily scale the system by adding components without removing the entire server from the rack.
- The modular book design also allows clients to create the configuration that fits their application and environment needs, which reduces acquisition costs while giving them the flexibility to grow and modify their configuration later.
- The book design also means that subsystem upgrades are simpler, quicker to perform, and have a lower impact on the rest of the server.
- Using 64 GB LRDIMMs, the server supports up to 6 TB of memory.
- Up to 32 eXFlash DIMMs are supported for a total of 12.8 TB of low-latency and high-performance storage.
- Up to 16x 1.8-inch eXFlash SSD bays, or up to eight 2.5-inch bays, provide a flexible and scalable all-in-one platform to meet your increasing demands.
- Offers up to 11 PCIe slots plus a dedicated Mezzanine LOM (ML2) adapter slot. Most slots are PCIe 3.0 to maximize I/O scalability.
- PCIe slots are implemented in I/O Books to maximize modularity. Choose from Half-length I/O Books or Full-length I/O Books, depending on the adapters that you need to deploy.
- Most components are common between the four-socket x3850 X6 and eight-socket x3950 X6, making for a simple upgrade path with minimal parts on the floor.

Resilient platform

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

- Upward Integration Modules for standard hypervisors enable the creation and management of policies to maintain high availability of virtual machines and concurrent updating of the system firmware, with no impact on application performance or availability.
- Advanced Processor Recovery allows the system to automatically switch access and control of networking, management, and storage in the event of a processor 1 failure, providing higher availability and productivity.
- Advanced Page Retire proactively protects applications from corrupted pages in memory, which is crucial for scaling memory to terabytes.
- Redundant bit steering, memory mirroring, and memory rank sparing for redundancy in the event of a non-correctable memory failure.
- Intel Execute Disable Bit functionality can help prevent certain classes of malicious buffer overflow attacks when combined with a supported operating system.
- Intel Trusted Execution Technology provides enhanced security through hardware-based resistance to malicious software attacks, allowing an application to run in its own isolated space, which is protected from all other software running on a system.
- Redundant Intel Platform Controller Hub (PCH) connections to the processors allow the platform to maintain access to networking, storage, and server management during a processor failure.

- Hot-swap drives support RAID redundancy for data protection and greater system uptime.
- Hot-swap I/O Books enabling you to install or replace adapters while the server is still running.
- Tool-less lid-less design provides front and rear access for easy upgrades and serviceability. There is no need to pull the server out of the rack to access internal components.
- Hot-swap power supplies and hot-swap dual-motor redundant fans provide availability for mission-critical applications.
- A new LCD diagnostics panel that is combined with individual light path diagnostic LEDs quickly lead the technician to failed (or failing) components, which simplifies servicing, speeds up problem resolution, and helps improve system availability.
- Predictive Failure Analysis (PFA) detects when system components (processors, memory, HDDs, SSDs, fans, and power supplies) operate outside of standard thresholds and generates proactive alerts in advance of a possible failure, therefore increasing uptime.
- Built-in Integrated Management Module Version II (IMM2) continuously monitors system parameters, triggers alerts, and performs recovering actions in case of failures to minimize downtime.
- Includes a special Mezzanine LOM (ML2) adapter slot with support for adapters with either two 10 Gb ports or 4 Gb ports. Supports direct connectivity to the IMM2 service processor for out-of-band systems management.
- Integrated industry-standard Unified Extensible Firmware Interface (UEFI) enables improved setup, configuration, and updates, and simplifies error handling.
- Two integrated Trusted Platform Modules (TPMs) 1.2 support enables advanced cryptographic functionality, such as digital signatures and remote attestation.
- Industry-standard Advanced Encryption Standard (AES) NI support for faster and stronger encryption.
- IBM Systems Director® provides proactive systems management. It offers comprehensive systems management tools that help increase uptime, reduce costs, and improve productivity through advanced server management capabilities.
- Solid-state drives (SSDs) offer better reliability than traditional mechanical HDDs for greater uptime.
- Built-in diagnostic tests, using Dynamic Systems Analysis (DSA) Preboot, speed up troubleshooting tasks to reduce service time.
- Three-year customer-replaceable unit and onsite limited warranty, 9x5 next business day. Optional service upgrades are available.

Locations of key components and connectors

The following figure shows the front of the x3850 X6 server.

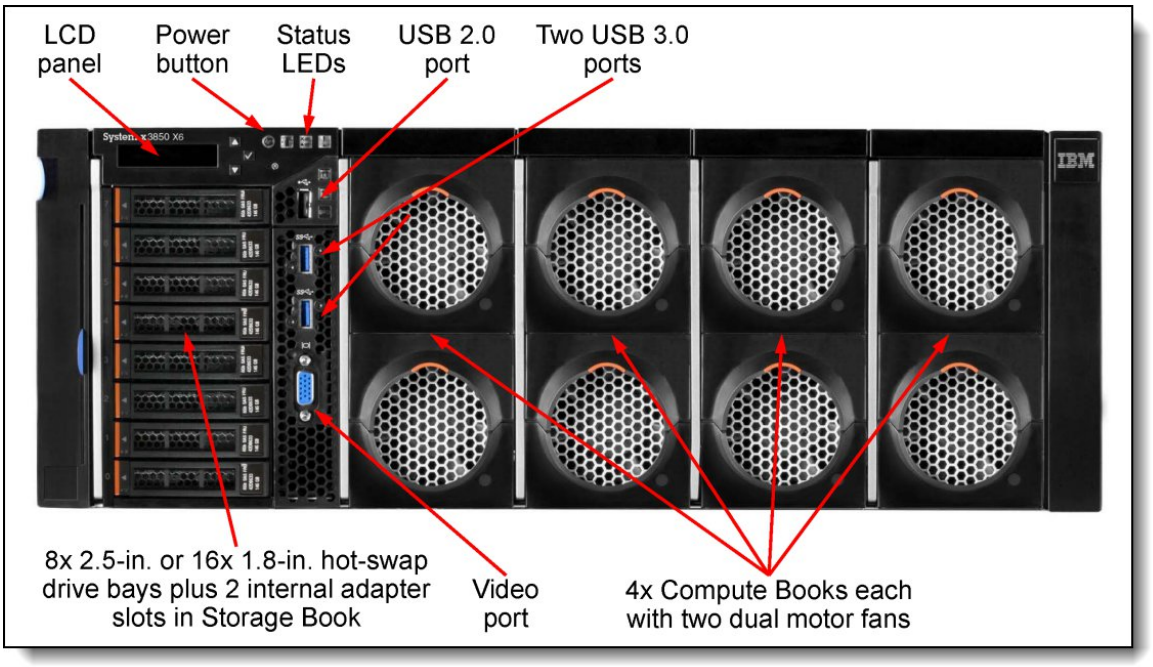

Figure 2. Front view of the System x3850 X6

The following figure shows the rear of the x3850 X6 server.

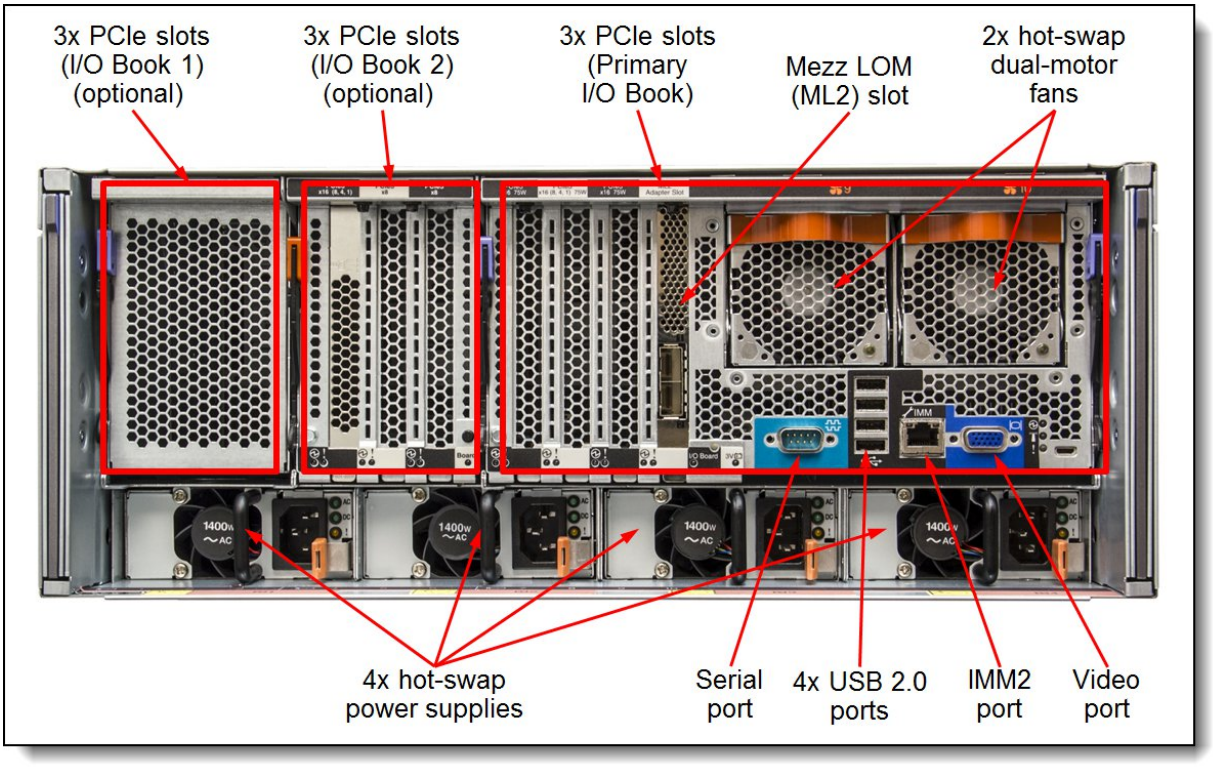

Figure 3. Rear view of the System x3850 X6

Standard specifications

The following table lists the standard specifications.

Table 1. Standard specifications

Components	Specification
Machine type	3837
Form factor	4U rack.
Processor	Up to four Intel Xeon E7-4800 v2 or E7-8800 v2 processors, each in a Compute Book. Each processor has either 15 cores (up to 2.8 GHz), 12 cores (up to 2.6 GHz), 10 cores (up to 2.2 GHz), eight cores (up to 2.0 GHz), or six cores (up to 3.4 GHz). There are three QPI links up to 8.0 GTps each. Up to 1600 MHz memory speed. Up to 37.5 MB L3 cache. Intel C602J chipset.
Memory	Up to 96 DIMM sockets (24 DIMMs per processor, installed in the Compute Book). RDIMMs and LRDIMMs (Load Reduced DIMMs) are supported, but memory types cannot be intermixed. Memory speed up to 1600 MHz.
Memory maximums	With RDIMMs: Up to 1.5 TB with 96x 16 GB RDIMMs and four processors. With LRDIMMs: Up to 6 TB with 96x 64 GB LRDIMMs and four processors.
Memory protection	ECC, Chipkill, RBS, memory mirroring, and memory rank sparing.
Memory-channel storage	eXFlash DIMMs are installed in memory DIMM slots, but are seen by the OS as storage devices. Memory channels with eXFlash DIMMs must also have at least one RDIMM. Cannot be mixed with LRDIMMs. A maximum of 32 eXFlash DIMMs can be installed. Maximum 12.8 TB with 32x 400GB eXFlash DIMMs.
Disk drive bays	Up to sixteen 1.8-inch eXFlash SSD bays, or up to eight 2.5-inch hot-swap SAS/SATA bays.
Maximum internal storage	Up to 14.4 TB with 1.8 TB 2.5-inch SAS HDDs, up to 12.8 TB with 1.6 TB 2.5-inch SAS SSDs, or up to 12.8 TB with 800 GB 1.8-inch SATA SSDs.
RAID support	12 Gb SAS/SATA RAID 0, 1, or 10 with ServeRAID M5210; optional upgrades to RAID 5 and 50 are available (zero-cache; 1 GB non-backed cache; 1 GB or 2 GB flash-backed cache). Upgrades to RAID 6 or 60 available for M5210 with 1 GB or 2 GB upgrades.
Optical and tape bays	None. Supports external USB optical drives.
Network interfaces	Mezzanine LOM (ML2) slot for dual-port 10 GbE cards with SFP+ or RJ-45 connectors or quad-port GbE cards with RJ-45 connectors. See Table 2. Dedicated 1 GbE port for systems management.
PCI Expansion slots	Up to 11 PCIe slots plus dedicated Mezzanine LOM slot. The slots are as follows: • Two PCIe 3.0 x8 slots for internal RAID controllers (Storage Book) • Two PCIe 3.0 x16 slots (x16-wired), half length, full height (Primary I/O Book) • One PCIe 3.0 x16 (x8-wired), half length, full height (Primary I/O Book) • One ML2 slot for network adapter (PCIe 3.0 x8) (Primary I/O Book) • Two optional I/O Books, each with three slots, all full height (using these I/O Books requires four processors). Optional books are hot-swap capable. Optional I/O Books can be either of the following options: • Half-length I/O Book: Two PCIe 3.0 x8 slots, one PCIe 3.0 x16 slot. • Full-length I/O Book: Two PCIe 3.0 x16, one PCIe 2.0 x4 slot; two aux power connectors: 150 W and 75 W. Supports one double-wide GPU up to 300 W.

Components	Specification
Ports	Front: Two USB 3.0, one USB 2.0, and one DB-15 video ports. Rear: Four USB 2.0, one DB-15 video, one DB-9 serial, and one 1 GbE RJ-45 systems management. Internal: USB 2.0 port for embedded hypervisor.
Cooling	Calibrated Vectored Cooling™. Up to ten redundant hot-swap fan packs and five fan zones with N+1 fan redundancy. Each fan pack includes two counter-rotated dual-motor fans.
Power supply	Up to four redundant hot-swap 900 W AC or 1400 W AC power supplies (all 80 PLUS Platinum certified). -48 V 750 W DC power supplies are available through CTO. Power supplies cannot be mixed.
Hot-swap parts	Drives, power supplies, fans, and optional I/O Books.
Video	Matrox G200eR2 with 16 MB memory that is integrated into the IMM2. Maximum resolution is 1600 x 1200 at 75 Hz with 16 M colors.
Security features	Power-on password, admin password, and two Trusted Platform Modules (TPMs).
Systems management	UEFI, Integrated Management Module II (IMM2) with remote presence feature, Predictive Failure Analysis, Light Path Diagnostics, Automatic Server Restart, IBM Systems Director and Active Energy Manager™, and ServerGuide.
Operating systems supported	Microsoft Windows Server 2012 R2, 2012, and 2008 R2, Red Hat Enterprise Linux 6 and 7, SUSE Linux Enterprise Server 11 and 12, and VMware vSphere ESXi 5.1 and 5.5.
Limited warranty	Three-year customer-replaceable unit (CRU) and onsite limited warranty with 9x5 next business day (NBD).
Service and support	Optional service upgrades are available through ServicePac® offerings: 4-hour or 2-hour response time, 8-hour fix time, 1-year or 2-year warranty extension, and remote technical support for Lenovo hardware and some Lenovo / OEM applications.
Dimensions	Height: 173 mm (6.8 in.), width: 482 mm (19.0 in.), depth: 804 mm (31.6 in), depth with cable management brackets installed: 836 mm (32.9 in), depth with Full-length I/O Book installed: 921 mm (36.2 in)
Weight	Minimum configuration: 35.9 kg (79.2 lb), typical: 46.4 kg (102.3 lb), maximum: 54.7 kg (120 lb)

The server is shipped with the following items:

- Rail kit
- Cable management brackets
- 2.8 m (9.18 ft) C13-C14 power cord (one for each power supply)
- Statement of Limited Warranty
- Important Notices
- Rack Installation Instructions
- Documentation CD that contains the *Installation and Service Guide*
- IBM Systems Director Flyer

Standard models

The following table lists the standard models.

Table 2. Standard models

Model†	Intel Xeon Processor* (in a Compute Book)	Memory	eXFlash DIMMs	RAID	Drive bays Drives	Ethernet‡	I/O slots§	Power supplies
Standard x3850 X6 models								
3837-A4x	1x E7-4809 v2 6C 1.9GHz 12MB 105W	2x 8GB (1333MHz)¤	Optional	Optional	Optional	4x 1 GbE	6 std 12 max	1x 900W HS / 4
3837-B1x	2x E7-4820 v2 8C 2.0GHz 16MB 105W	4x 8GB 1600MHz	Optional	1x M5210	4x 2.5" HS / 8 Open bay	4x 1 GbE	6 std 12 max	2x 900W HS / 4
3837-B3x	2x E7-4850 v2 12C 2.3GHz 24MB 105W	4x 8GB 1600MHz	Optional	1x M5210	4x 2.5" HS / 8 Open bay	2x 10 GbE‡	6 std 12 max	2x 900W HS / 4
3837-C1x	2x E7-4860 v2 12C 2.6GHz 30MB 130W	4x 8GB 1600MHz	Optional	1x M5210	4x 2.5" HS / 8 Open bay	4x 1 GbE	6 std 12 max	2x 900W HS / 4
3837-C4x	2x E7-4890 v2 15C 2.8GHz 37.5MB 155W	4x 8GB 1600MHz	Optional	1x M5210	4x 2.5" HS / 8 Open bay	4x 1 GbE	6 std 12 max	2x 900W HS / 4

† x in the Machine Type Model (MTM) represents a region-specific letter (for example, the EMEA MTM is 3837-A3G, and the US MTM is 3837-A4U). Ask a Lenovo representative for specifics.
* Processor detail: Processor quantity and model, cores, core speed, L3 cache, memory speed, and TDP.
¤ This model includes the DIMMs that are rated at 1600 MHz, but operate at up to 1333 MHz, as noted, to match the processor memory speed
‡ Model B3x includes the Broadcom NetXtreme II ML2 Dual Port 10GbE SFP+ adapter (BCM57810S based). All other models include Intel I350-T4 ML2 Quad Port GbE Adapter adapter (I350-AM4 based).
§ Models with six slots have the Primary I/O Book (four slots) and Storage Book (two slots) standard. Models with nine slots also include one Half-length I/O Book.

SAP HANA Workload Optimized Solution models

The System x3850 X6 Workload Optimized Solutions for SAP HANA provide optimal solutions for SAP NetWeaver Business Warehouse, data mart, and SAP Business Suite, Powered by SAP HANA applications. Preconfigured workload optimized server models for SAP HANA applications are configured with up to 1 TB of memory and are upgradeable to support larger single node and scale-out cluster implementations. These models include IBM General Parallel File System (GPFS) Single Server for x86 Integrated Offerings with 3-year software subscription and support.

The following table lists the Workload Optimized Solution models for SAP HANA.

Table 3. Workload Optimized Solution models for SAP HANA

Model	Intel Xeon Processor (in a Compute Book)	Memory	RAID	Drive bays Drives	Ethernet	I/O slots	Power supplies
3837-H2x	2x E7-8880 v2 15C 2.5GHz 37.5MB 1600 MHz 130W	128 GB 16x 8 GB RDIMM	1x M5210 + upgrades*	8x 2.5” HS 6x 1.2 TB SAS HDD 2x 400 GB S3700 SSD	1x 4x1GbE ML2 2x Mellanox 10Gb*	6 std 12 max	4x 1400W HS / 4
3837-H3x	2x E7-8880 v2 15C 2.5GHz 37.5MB 1600 MHz 130W	256 GB 16x 16 GB RDIMM	1x M5210 + upgrades*	8x 2.5” HS 6x 1.2 TB SAS HDD 2x 400 GB S3700 SSD	1x 4x1GbE ML2 2x Mellanox 10Gb*	6 std 12 max	4x 1400W HS / 4
3837-H4x	2x E7-8880 v2 15C 2.5GHz 37.5MB 1600 MHz 130W	512 GB 16x 32 GB LRDIMM	1x M5210 + upgrades*	8x 2.5” HS 6x 1.2 TB SAS HDD 2x 400 GB S3700 SSD	1x 4x1GbE ML2 2x Mellanox 10Gb*	6 std 12 max	4x 1400W HS / 4
3837-H5x	4x E7-8880 v2 15C 2.5GHz 37.5MB 1600 MHz 130W	512 GB 32x 16 GB RDIMM	1x M5210 + upgrades*	8x 2.5” HS 6x 1.2 TB SAS HDD 2x 400 GB S3700 SSD	1x 4x1GbE ML2 2x Mellanox 10Gb*	12 std 12 max	4x 1400W HS / 4
3837-H6x	4x E7-8880 v2 15C 2.5GHz 37.5MB 1600 MHz 130W	1024 GB 32x 32 GB LRDIMM	1x M5210 + upgrades* 1x M5120 + upgrades*	8x 2.5” HS 6x 1.2 TB SAS HDD 2x 400 GB S3700 SSD	1x 4x1GbE ML2 2x Mellanox 10Gb*	12 std 12 max	4x 1400W HS / 4

* See the list of specific components below

Each of these HANA models include the following components

- ServeRAID M5210 controller (46C9110) with 2GB cache upgrade with flash backup (47C8664), plus Performance Accelerator (47C8710) and SSD Caching Enabler (47C8712)
- Model H6x only: ServeRAID M5120 RAID controller for external connectivity (81Y4478), with 1GB cache upgrade with flash backup (47C8660) plus Performance Accelerator (47C8710) and SSD Caching Enabler (47C8712).
- Six 1.2TB 10K 6Gbps SAS 2.5" G3HS HDD (00AJ146)
- Two S3700 400GB SATA 2.5" MLC G3HS Enterprise SSD for System x (00AJ161)
- One Intel I350-T4 ML2 Quad Port GbE Adapter for System x (00D1998)
- Two Mellanox ConnectX-3 40GbE / FDR IB VPI Adapters (00D9550)
- Four SFP+ SR Transceiver (46C3447)
- Four Mellanox QSA Adapter (QSFP to SFP+) (90Y3842)
- Model H5x, H6x only: Two X6 Half-length I/O Books (44X4049)
- Lenovo solution for SAP HANA media
- License for IBM General Parallel File System (GPFS) Single Server for x86 Integrated Offerings with 3-year software subscription and support

Note: the operating system software is not included with the SAP HANA models. Operating system selection must be a separate line item included in order: SLES for SAP with standard or priority support. The SAP HANA Software is included, but the license is sold separately by SAP or an SAP business partner. VMware Enterprise Plus license sold separately.

For more information about the standard features of the server, see the "Specifications" section.

Upgrading to an 8-socket system

The x3850 X6 server has a flexible modular design that allows you to increase the server's compute power and I/O capabilities by adding additional Compute Books and I/O Books. The modular design also means that if your business needs additional processing or I/O capability within the same system image, then it is possible to migrate to an eight-socket x3950 X6.

Lenovo supports upgrading a 4-socket X6 server to an 8-socket X6 server. The two recommended methods are as follows:

- Start with a 4-socket x3950 X6 (8U chassis) and add additional processors when needed
- Start with a 4-socket x3850 X6 (4U chassis) and upgrade it when needed using an RPQ process

Option 1: Start with a 4-socket x3950 X6

With this option, you plan for the need for future 8-socket performance in advance and purchase an x3950 X6 with only four Compute Books installed. The initial order would contain:

- Four Compute Books with E7-8800 v2 series processors
- Four Power Supplies (preferably 1400W)
- Two Primary IO Book standard
- Two Storage Book Standard

Once the need arises to upgrade the server to six or eight processors, simply purchase more Compute Books with the same processor model, plus additional power supplies (as determined by using the Power Configurator), I/O Books, adapters and drives as needed.

For information about the x3950 X6, see the System x3950 X6 Product Guide:
http://lenovopress.com/tips1132

Option 2: Upgrade your 4-socket x3850 X6 using an RPQ

With this option, you don't have to plan for 8-socket capacity up front. You start with an x3850 X6 then when you are ready to upgrade to a 6-socket or 8-socket server, you purchase an upgrade offering via an RPQ.

As part of the RPQ, a Lenovo service engineer comes onsite with the new mechanical chassis and performs the field upgrade by transferring all components to the new chassis. This method also requires the x3850 X6 compute books be the same E7-8800 v2 processors as ordered for the RPQ, however, in this scenario, the server maintain the original serial number.

Note: Use of E7-4800 v2 processors: Intel Xeon E7-4800 v2 processors cannot be used in an x3950 X6. If your x3850 X6 has Compute Books with E7-4800 v2 processors, then these must be replaced with Compute Books with E7-8800 v2 processors if you plan to upgrade to an x3950 X6. The memory in the Compute Books can be reused in the x3950 X6, however.

For this method, submit an RPQ for assessment and pricing. The existing x3850 X6 configuration will be evaluated and recommendations will be made based on the workload requirements.

The major parts of the 4U to 8U upgrade are the 8U chassis, the Storage Book and the Primary I/O Book. All the components in the package will be installed in the top portion of the chassis. The 4U system's components will be transferred to the bottom section of the chassis.

Even though this upgrade requires a new 8U chassis replacing the existing 4U chassis, the majority of internal components can be moved from the x3850 X6 to the x3950 X6.

The x3850 X6 components that can be migrated to the x3950 X6 as part of the RPQ upgrade are:

- Compute Books, provided they use Intel Xeon E7-8800 v2 processors
- All memory DIMMs
- Storage Book
- All internal drives
- Primary I/O Book (and associated fans)
- Half-length I/O Books
- Full-length I/O Books
- All adapters
- All power supplies

The RPQ upgrade includes these parts:

- New 8U chassis and 8-socket midplane
- A second Storage Book
- A second Primary I/O Book

The RPQ upgrade may also require new parts:

- Additional Compute Books (a minimum of four Compute Books required in the x3950 X6)
- Additional power supplies (a minimum of four are required in the x3950 X6)
- Additional I/O Books, network adapters, drives as needed

There are key considerations for this upgrade:

- Processor support: Intel Xeon E7-4800 v2 processors cannot be used in an x3950 X6. If your x3850 X6 has Compute Books with E7-4800 v2 processors, then these must be replaced with Compute Books with E7-8800 v2 processors if you plan to upgrade to an x3950 X6. The memory in the Compute Books can be reused in the x3950 X6, however.
- All processors must be identical: All processors used in the x3950 X6 must be the identical. For example, all E7-8850 v2 processors. A minimum of four processors are required.
- The upgrade does result in some parts no longer being used (“parts on the floor”):
- Existing 4U chassis and 4-socket midplane
- Compute Books that are based on E7-4800 v2 processors
- Original x3850 X6 server may need to be ordered configure-to-order (CTO) or Special Bid: To minimize “parts on the floor” (parts that cannot be used in the upgraded system), the original x3850 X6 should be configured with Compute Books containin E7-8800 v2 processors. Since many standard models of the x3850 X6 (see Table 2) contain E7-4800 v2 processors, you may need to use CTO (using a configurator such as x-config) or order the server using Special Bid to create a server configuration with E7-8800 v2 processors.
- Serial number swap: The RPQ upgrade process also involves transferring the x3850 X6 serial number to the x3950 X6 chassis. This transfer makes the upgrade simpler from an asset or depreciation management point of view. This transfer also means that the old 4U chassis will be retired as it will no longer have a valid serial number.
- Power supplies: Ideally all power supplies are the 1400W variant. Regardless of the selection, the power supplies coexistence rules as decribed in the Power supplies section must be followed.
- Additional power: Depending on your workload and configuration you may need to provision for additional PDU outlets, cables and power capacity for your x3950 X6 server. Use the Power Configurator to determine your total power draw to assist you in provisioning adequate power. You can download the Power Configurator from http://ibm.com/systems/bladecenter/resources/powerconfig.html

- Additional rack space: An additional 4U of rack space is required when upgrading the x3850 X6 to the x3950 X6, for a total of 8U of rack space.
- Down time: In order to upgrade the x3850 X6 server to a x3950 X6 server you will need to allow for down time. The server will need to be completely powered off and have some of its components removed for re-installation into the new x3950 X6 server.

Processor options

The x3850 X6 supports up to four Intel Xeon E7 v2 processors. Processors are installed in Compute Books, one processor in each Compute Book. The following figure shows the components of the Compute Book:

- One processor
- A total of 24 DIMM slots, 12 on each side of the book
- Two hot-swap dual-motor fans that are mounted on the front of the book

The x3850 X6 supports two or four Compute Books. Three Compute Books are not supported. A configuration of one Compute Book is only supported in standard model 3837-A4x.

Each Compute Book is installed in the front of the server, as shown in the following figure.

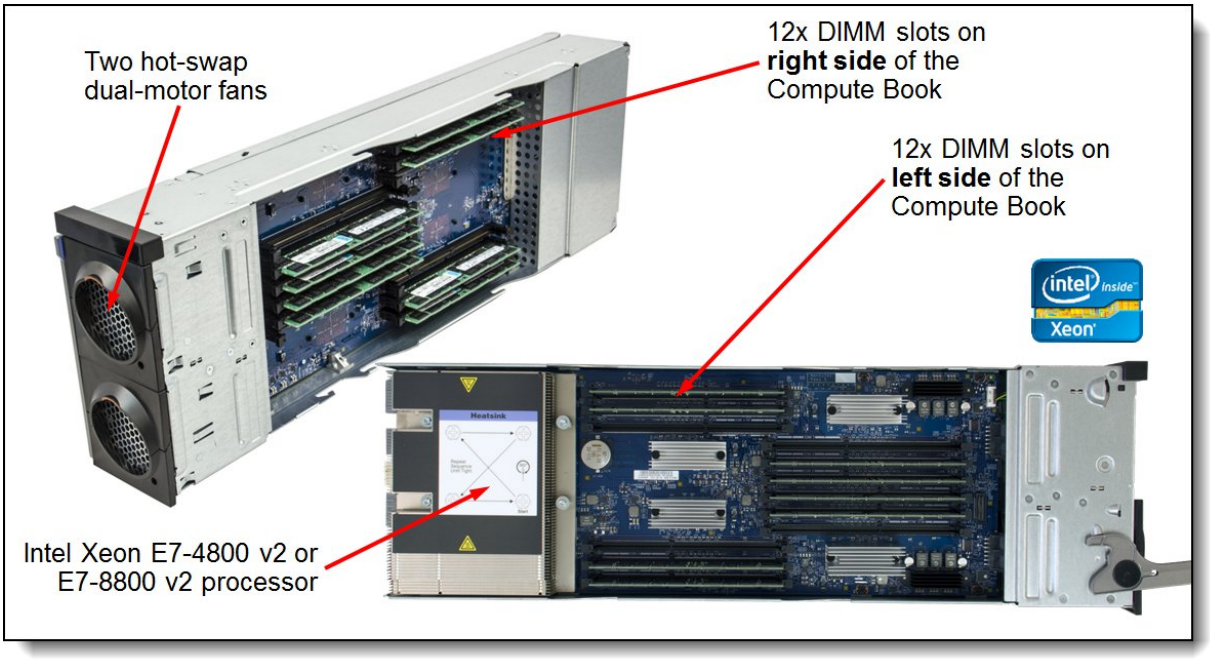

Figure 4. Compute Book

The following table shows the processor options. Each option includes the processor installed in a Compute Book. Compute Books with one of the E7-4800 family of processors are supported only in a four-socket x3850 X6 server and cannot be used in an x3950 X6 server.

The table also shows the maximum memory bus speed each processor supports plus which server models have each processor standard. If there is no corresponding *where-used* model for a particular processor, this processor is only available through CTO.

Table 4. Processor options

Part number	Feature code	Description (processor installed in a Compute Book)	Memory bus speed (RAS / Performance)†	Supported quantities x3850 X6*	x3850 X6 models where used
Intel Xeon E7-4800 v2 processor family (not supported in the x3950 X6)					
44X3961	A4B3	X6 Compute Book Intel Xeon E7-4809 v2 6C 1.9GHz 105W	1333 / 1066 MHz	2, 4	A4x
44X3966	A4B4	X6 Compute Book Intel Xeon E7-4820 v2 8C 2.0GHz 105W	1600 / 1066 MHz	2, 4	B1x
44X3971	A4B5	X6 Compute Book Intel Xeon E7-4830 v2 10C 2.2GHz 105W	1600 / 1066 MHz	2, 4	-
44X3976	A4B6	X6 Compute Book Intel Xeon E7-4850 v2 12C 2.3GHz 105W	1600 / 1066 MHz	2, 4	B3x
44X3981	A4B7	X6 Compute Book Intel Xeon E7-4860 v2 12C 2.6GHz 130W	1600 / 1333 MHz	2, 4	C1x
44X3986	A4B8	X6 Compute Book Intel Xeon E7-4870 v2 15C 2.3GHz 130W	1600 / 1333 MHz	2, 4	-
44X3991	A4B9	X6 Compute Book Intel Xeon E7-4880 v2 15C 2.5GHz 130W	1600 / 1333 MHz	2, 4	-
44X3996	A4BA	X6 Compute Book Intel Xeon E7-4890 v2 15C 2.8GHz 155W	1600 / 1333 MHz	2, 4	C4x
Intel Xeon E7-8800 v2 processor family (also supported in the x3950 X6)					
44X4001	A4BB	X6 Compute Book Intel Xeon E7-8850 v2 12C 2.3GHz 105W	1600 / 1066 MHz	2, 4	-
44X4031	A4BH	X6 Compute Book Intel Xeon E7-8857 v2 12C 3.0GHz 130W	1600 / 1333 MHz	2, 4	-
44X4011	A4BD	X6 Compute Book Intel Xeon E7-8870 v2 15C 2.3GHz 130W	1600 / 1333 MHz	2, 4	-
44X4016	A4BE	X6 Compute Book Intel Xeon E7-8880 v2 15C 2.5GHz 130W	1600 / 1333 MHz	2, 4	-
44X4036	A4BJ	X6 Compute Book Intel Xeon E7-8880L v2 15C 2.2GHz 105W	1600 / 1333 MHz	2, 4	-
44X4021	A4BF	X6 Compute Book Intel Xeon E7-8890 v2 15C 2.8GHz 155W	1600 / 1333 MHz	2, 4	-
44X4026	A4BG	X6 Compute Book Intel Xeon E7-8891 v2 10C 3.2GHz 155W	1600 / 1333 MHz	2, 4	-
44X4006	A4BC	X6 Compute Book Intel Xeon E7-8893 v2 6C 3.4GHz 155W	1600 / 1333 MHz	2, 4	-

† The processors support two memory modes, RAS mode (also known as lockstep mode) and Performance mode (also known as independent mode). In Performance mode, the SMI2 link operates at twice the memory bus speed shown.
* A configuration of one processor is only supported in model 3837-A4x. No other server model or CTO configuration supports one processor.

Memory options

Lenovo DDR3 memory is compatibility tested and tuned for optimal System x® performance and throughput. Lenovo memory specifications are integrated into the light path diagnostics for immediate system performance feedback and optimum system uptime. From a service and support standpoint, Lenovo memory automatically assumes the system warranty, and Lenovo provides service and support worldwide.

The x3850 X6 supports DDR3 memory operating at speeds up to 1600 MHz. The x3850 X6 supports up to 96 DIMMs when all processors are installed, 24 DIMMs per processor. Each processor has four memory channels that are implemented using Scalable Memory Interface generation 2 (SMI2) chips, and the server implements three DIMMs per channel. The processor and the corresponding memory DIMM slots are on the Compute Book.

The following table lists the memory options that are available for x3850 X6.

Table 5. Memory options

Part number	Feature code	Description	Maximum supported x3850 X6	Models where used
RDIMMs				
00D5024	A3QE	4GB (1x4GB, 1Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	96 (24 per CPU)	-
00D5036	A3QH	8GB (1x8GB, 1Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	96 (24 per CPU)	A4x, B1x, B3x, C1x, C4x,
46W0672	A3QM	16GB (1x16GB, 2Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	96 (24 per CPU)	-
LRDIMMs				
46W0676	A3SR	32GB (1x32GB, 4Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP LRDIMM	96 (24 per CPU)	-
46W0741	A451	64GB (1x64GB, 8Rx4, 1.35V) PC3-10600 DDR3 1333MHz LP LRDIMM	96 (24 per CPU)	-

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.
- The maximum number of ranks per one DDR3 channel is six with RDIMMs or 24 with LRDIMMs.
- In RAS (lockstep) mode, DIMMs must be installed in a pair.
- The maximum quantity of DIMMs that can be installed in the server depends on the number of processors, DIMM type, rank, and operating voltage, as shown in the "Maximum qty supported" row in the following table.
- All DIMMs in the server operate at the same speed, which is determined as the lowest value of one of the following options:
  - Memory speed that is supported by the specific processor.
  - Lowest of maximum operating speeds for selected memory configuration that depends on rated speed, operating voltage, and quantity of DIMMs per channel, as shown under "Maximum operating speed" section in the following table.
- The server also supports eXFlash DIMMs, which are also installed in the DIMM slots. The " eXFlash memory-channel storage" section describes these eXFlash DIMMs and the configuration rules.

The following table shows the characteristics of the supported DIMMs. Tables cells that are highlighted with a gray background indicate that the server supports higher memory frequencies or larger memory capacity (or both) than the Intel processor specification defines.

Memory speed: In performance mode, memory channels operate independently, and the SMI2 link operates at twice the DDR3 speed. In RAS mode, two channels operate synchronously, and the SMI2 link operates at the DDR3 speed.

Table 6. Maximum memory speeds

DIMM specification	**RDIMM**				**LRDIMM**			
Rank	Single rank		Dual rank		Quad rank		8-rank	
Part numbers	00D5024 (4GB) 00D5036 (8GB)		46W0672 (16GB)		46W0676 (32GB)		46W0741 (64GB)	
Rated speed	1600 MHz		1600 MHz		1600 MHz		1333 MHz	
Rated voltage	1.35 V		1.35 V		1.35 V		1.35 V	
Operating voltage	1.35 V	1.5 V	1.35 V	1.5 V	1.35 V	1.5 V	1.35 V	1.5 V
Max qty supported*	96	96	96	96	96	96	96	96
Max DIMM capacity	8 GB	8 GB	16 GB	16 GB	32 GB	32 GB	64 GB	64 GB
Max memory capacity	0.75 TB	0.75 TB	1.5 TB	1.5 TB	3 TB	3 TB	6 TB	6 TB
Maximum operating speed - Performance mode (2:1 mode - SMI2 link operates at twice the DDR3 speed shown)								
1 DIMM per channel	1333 MHz	1333 MHz	1333 MHz	1333 MHz	1333 MHz	1333 MHz	1333 MHz	1333 MHz
2 DIMMs per channel	1333 MHz	1333 MHz	1333 MHz	1333 MHz	1333 MHz	1333 MHz	1333 MHz	1333 MHz
3 DIMMs per channel	1066 MHz	1333 MHz	1066 MHz	1333 MHz	1333 MHz	1333 MHz	1333 MHz	1333 MHz
Maximum operating speed - RAS mode (1:1 mode - SMI2 link operates at the DDR3 speed shown)								
1 DIMM per channel	1333 MHz	1600 MHz	1333 MHz	1600 MHz	1333 MHz	1600 MHz	1333 MHz	1333 MHz
2 DIMMs per channel	1333 MHz	1600 MHz	1333 MHz	1600 MHz	1333 MHz	1600 MHz	1333 MHz	1333 MHz
3 DIMMs per channel	1066 MHz	1333 MHz	1066 MHz	1333 MHz	1333 MHz	1333 MHz	1333 MHz	1333 MHz

* Maximum quantity supported is shown for all processors that are installed.

The following memory protection technologies are supported:

- ECC
- Chipkill (for x4-based memory DIMMs)
- Redundant bit steering (Double Device Data Correction)
- Memory mirroring
- Memory rank sparing

Chipkill and Redundant Bit Steering are supported in RAS mode. Chipkill is supported in Performance mode.

If memory mirroring is used, DIMMs must be installed in pairs for Performance mode (minimum of one pair per each processor) and quads for RAS mode. DIMMs in the pair/quad must be identical in type and size.

If memory rank sparing is used, then a minimum of 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 that are installed.

eXFlash memory-channel storage

eXFlash memory-channel storage are storage offerings in the physical form of memory DIMMs. These eXFlash DIMMs are installed in memory DIMM sockets but appear to the operating system and applications as block storage devices. This new and innovative technology brings storage electrically closer to the processor subsystem, therefore improving performance considerably.

Withdrawn: Memory-channel storage is now withdrawn from marketing.

The following table shows the supported eXFlash DIMMs.

Table 7. Internal storage expansion options

Part number	Feature code	Name and description	Maximum supported
00FE000	A4GX	eXFlash 200GB DDR3 Storage DIMM	32
00FE005	A4GY	eXFlash 400GB DDR3 Storage DIMM	32

The following figure shows one eXFlash DIMM installed with RDIMMs in the Compute Book.

Figure 5. eXFlash DIMM installed in the Compute Book

The following rules apply when building a server configuration with eXFlash DIMMs:

- The 200 GB and 400 GB eXFlash DIMMs cannot be mixed.
- Performance memory mode must be selected. RAS (lockstep) memory mode is not supported.
- Only RDIMMs are supported by eXFlash DIMMs; LRDIMMs are not supported
- The maximum quantities of eXFlash DIMMs are as follows:
  - One processor: 8 eXFlash DIMMs
  - Two processors: 16 eXFlash DIMMs
  - Four processors: 32 eXFlash DIMMs

For more information, visit the eXFlash DIMM support page:
http://ibm.com/support/entry/portal/docdisplay?lndocid=SERV-FLASHDM

Internal storage

The server supports 1.8-inch solid-state drives in the eXFlash SSD units and 2.5-inch SSDs and HDDs. Drives are installed in the Storage Book. The x3850 X6 has one Storage Book. The Storage Book supports the following configurations:

- 4x 2.5-inch hot-swap drive bays
- 8x 2.5-inch hot-swap drive bays
- 4x 2.5-inch hot-swap drive bays + 8x 1.8-inch hot-swap SSD bays
- 8x 1.8-inch hot-swap SSD bays
- 16x 1.8-inch hot-swap SSD bays

The following figure shows these configurations.

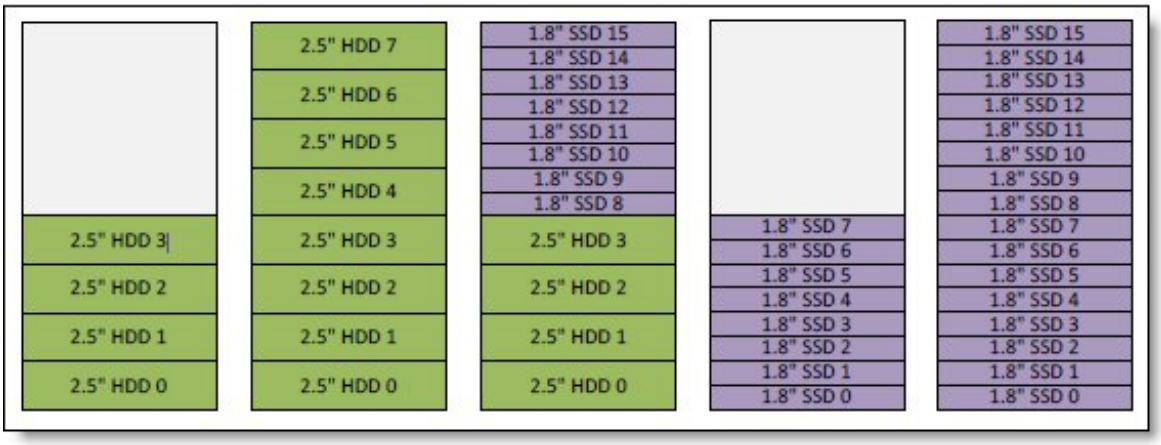

Figure 6. Internal drive configurations

Backplanes

All standard models ship with four 2.5-inch SAS/SATA hot-swap hard disk drive bays. The following table shows the internal storage expansion options that are available.

Table 8. Internal storage expansion options

Part number	Feature code	Description	Maximum supported x3850 X6
44X4104	A4A6	4x 2.5" HS 12Gb SAS HDD Backplane	2
44X4106	A4A7	8x 1.8" HS 12Gb SAS HDD Backplane	2

The backplanes are connected to one or two RAID controllers or HBAs depending on the number and type of backplane that is installed. The adapters are installed in PCIe slots in the Storage Book, as shown in the following figure.

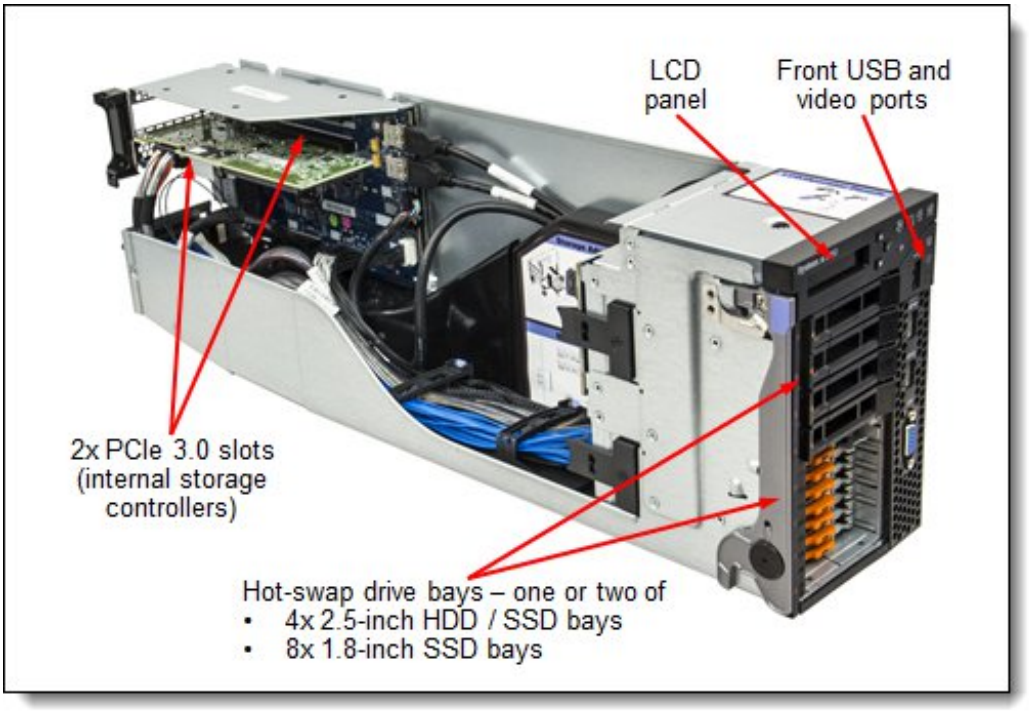

Figure 7. Storage Book

The following table shows the backplanes that are required per Storage Book and the number of controllers that are required. Note that the table shows the exact number of controllers supported for each drive/backplane configuration, no more, no fewer.

Table 9. Drive combinations per Storage Book

Drive combination	Backplanes required	Number of controllers supported
4x 2.5-inch hot-swap drive bays	1x 4x 2.5" HS 12Gb SAS HDD Backplane, 44X4104	1
8x 2.5-inch hot-swap drive bays	2x 4x 2.5" HS 12Gb SAS HDD Backplane, 44X4104	1
4x 2.5-inch hot-swap drive bays + 8x 1.8-inch hot-swap SSD bays	1x 4x 2.5" HS 12Gb SAS HDD Backplane, 44X4104 1x 8x 1.8" HS 12Gb SAS HDD Backplane, 44X4106	2
8x 1.8-inch hot-swap SSD bays	1x 8x 1.8" HS 12Gb SAS HDD Backplane, 44X4106	1
16x 1.8-inch hot-swap SSD bays	2x 8x 1.8" HS 12Gb SAS HDD Backplane, 44X4106	2

Controllers for internal storage

The following table lists the RAID controllers, HBAs, and additional hardware and feature upgrades that are used for internal disk storage. The adapters are installed in slots in the Storage Book.

Table 10. RAID controllers and HBAs for internal storage

Part number	Feature code	Description	Maximum supported x3850 X6	Where used
46C9110	A3YZ	ServeRAID M5210 SAS/SATA Controller	2	All models
47C8675	A3YY	N2215 SAS/SATA HBA for System x	2	-
Hardware upgrades for the M5210				
47C8656	A3Z0	ServeRAID M5200 Series 1GB Cache/RAID 5 Upgrade	2	-
47C8660	A3Z1	ServeRAID M5200 Series 1GB Flash/RAID 5 Upgrade	2	-
47C8664	A3Z2	ServeRAID M5200 Series 2GB Flash/RAID 5 Upgrade	2	-
47C8668	A3Z3	ServeRAID M5200 Series 4GB Flash/RAID 5 Upgrade	2	-
Features on Demand upgrades for the M5210				
47C8708	A3Z6	ServeRAID M5200 Series Zero Cache/RAID 5 Upgrade	1	-
47C8706	A3Z5	ServeRAID M5200 Series RAID 6 Upgrade	1*	-
47C8710	A3Z7	ServeRAID M5200 Series Performance Accelerator	1*	-
47C8712	A3Z8	ServeRAID M5200 Series SSD Caching Enabler	1*	-

* These M5210 features upgrades require a cache memory upgrade (47C8656, 47C8660, or 47C8664).

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

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

The N2215 SAS/SATA HBA has the following specifications:

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

For more information, see the list of Lenovo Press Product Guides in the RAID adapters category at the following address:
http://lenovopress.com/systemx/raid

Internal drive options

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

Table 11. 1.8-inch SSDs

Part number	Feature	Description	Maximum supported
1.8-inch hot-swap SSDs - 6 Gb SATA - Enterprise Mainstream (3-5 DWPD)			
00AJ335	A56V	120GB SATA 1.8" MLC Enterprise Value SSD	16
00AJ340	A56W	240GB SATA 1.8" MLC Enterprise Value SSD	16
00AJ345	A56X	480GB SATA 1.8" MLC Enterprise Value SSD	16
00AJ350	A56Y	800GB SATA 1.8" MLC Enterprise Value SSD	16

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

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap HDDs - 12 Gb SAS 10K			
00NA251	ASBH	900GB 10K 12Gbps SAS 2.5" G3HS 512e HDD	8
00NA241	ASBF	600GB 10K 12Gbps SAS 2.5" G3HS 512e HDD	8
00NA261	ASBK	1.2TB 10K 12Gbps SAS 2.5" G3HS 512e HDD	8
00NA271	ASBM	1.8TB 10K 12Gbps SAS 2.5" G3HS 512e HDD	8
2.5-inch hot-swap HDDs - 12 Gb SAS 15K			
00NA221	ASBB	300GB 15K 12Gbps SAS 2.5" G3HS 512e HDD	8
00NA231	ASBD	600GB 15K 12Gbps SAS 2.5" G3HS 512e HDD	8
2.5-inch hot-swap SED HDDs - 12 Gb SAS 10K			
00NA301	ASBT	1.2TB 10K 12Gbps SAS 2.5" G3HS 512e SED	8

Table 13. 2.5-inch hot-swap 6 Gb SAS/SATA HDDs

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap HDDs - 6 Gb SAS 15K			
00AJ111	A4TQ	146GB 15K 6Gbps SAS 2.5" G3HS HDD	8
2.5-inch hot-swap HDDs - 6 Gb NL SAS			
00AJ121	A4TT	500GB 7.2K 6Gbps NL SAS 2.5" G3HS HDD	8
2.5-inch hot-swap HDDs - 6 Gb NL SATA			
00AJ136	A4TW	500GB 7.2K 6Gbps NL SATA 2.5" G3HS HDD	8
00AJ141	A4TX	1TB 7.2K 6Gbps NL SATA 2.5" G3HS HDD	8

Table 14. 2.5-inch hot-swap 12 Gb SAS/SATA SSDs

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap SSDs - 12 Gb SAS - Enterprise Performance (10+ DWPD)			
00FN379	AS7C	200GB 12G SAS 2.5" MLC G3HS Enterprise SSD	8
00FN389	AS7E	400GB 12G SAS 2.5" MLC G3HS Enterprise SSD	8
00FN399	AS7G	800GB 12G SAS 2.5" MLC G3HS Enterprise SSD	8
00FN409	AS7J	1.6TB 12G SAS 2.5" MLC G3HS Enterprise SSD	8

Table 15. 2.5-inch hot-swap 6 Gb SAS/SATA SSDs

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap SSDs - 6 Gb SAS - Enterprise Capacity			
00NA671	ASW6	3.84TB 6Gb SAS Enterprise Capacity G3HS MLC SSD	8
2.5-inch hot-swap SSDs - 6 Gb SAS - Enterprise Performance (10+ DWPD)			
00AJ207	A4UA	200GB SAS 2.5" MLC G3HS Enterprise SSD	8
00AJ212	A4UB	400GB SAS 2.5" MLC G3HS Enterprise SSD	8
00AJ217	A4UC	800GB SAS 2.5" MLC G3HS Enterprise SSD	8
2.5-inch hot-swap SSDs - 6 Gb SATA - Enterprise Mainstream (3-5 DWPD)			
00AJ395	A577	120GB SATA 2.5" MLC G3HS Enterprise Value SSD	8
00AJ400	A578	240GB SATA 2.5" MLC G3HS Enterprise Value SSD	8
00AJ405	A579	480GB SATA 2.5" MLC G3HS Enterprise Value SSD	8
00AJ410	A57A	800GB SATA 2.5" MLC G3HS Enterprise Value SSD	8

Internal backup units

The server does not support internal tape drive options.

Optical drives

The server does not support internal optical drives.

I/O expansion options

The server supports up to 11 PCIe slots plus dedicated Mezzanine LOM slot (12 total) as follows:

- In the Storage Book (standard in all models): Two PCIe 3.0 x8 slots for supported internal RAID controllers and SAS HBAs
- In the Primary I/O Book (standard in all models):
  - Two PCIe 3.0 x16 slots (x16-wired), half length, full height, up to 75 W of power
  - One PCIe 3.0 x16 (x8-wired), half length, full height, up to 75 W of power
  - One mezzanine LOM 2 (ML2) slot for network adapters with the new ML2 form factor (PCIe 3.0 x8)
- Two optional I/O Books, each with three slots, all full height. Optional I/O Books are enabled for hot-swap.

The following figure shows the Primary I/O Book with the air baffle raised to show the internals.

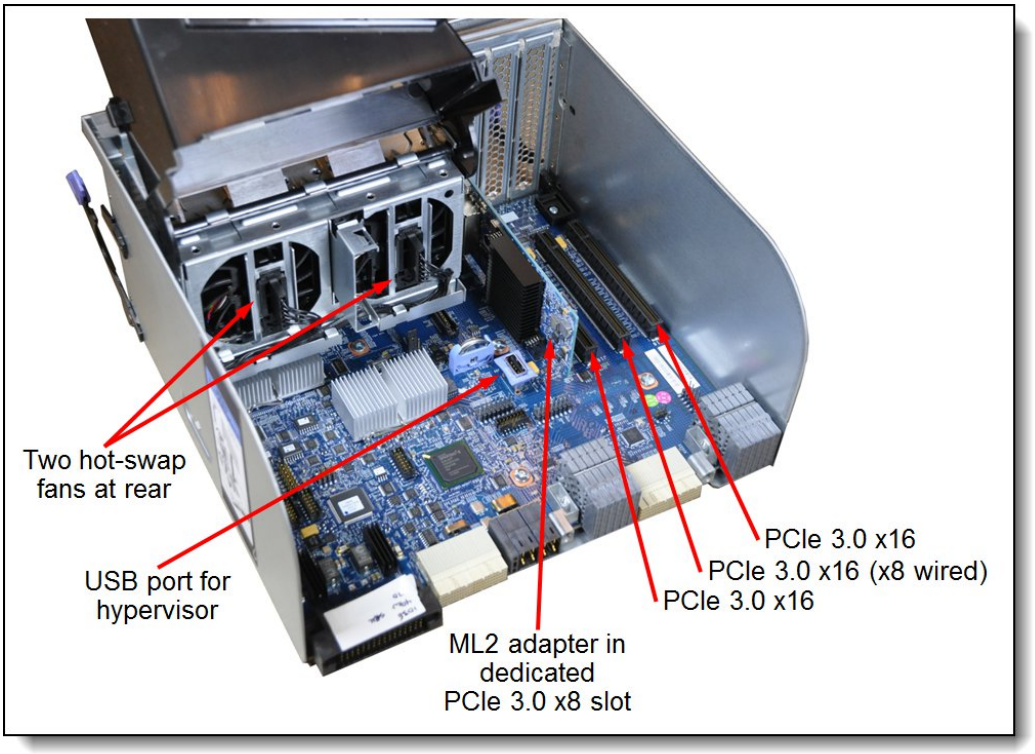

Figure 8. Primary I/O Book

Optional I/O Books can be either of:

- Half-length I/O Book:
  - Two PCIe 3.0 x8 slots (x8 wired)
  - One PCIe 3.0 x16 slot (x16 wired)
- Full-length I/O Book:
  - Two PCIe 3.0 x16 (x16 wired)
  - One PCIe 2.0 x8 slot (x4 wired)

In order for an I/O Book to be hot-swappable, all adapters that are installed in the book must support hot-swap and the operating system must also support hot-swap. These operating systems support hot-swap:

- Windows Server 2008 R2
- Windows Server 2012
- Windows Server 2012 R2

The adapters listed in the following table support hot-swap.

Table 16. Adapters that support hot swap

Part number	Feature code	Description
00D8540*	A4XH	Emulex Dual Port 10GbE SFP+ VFA IIIr for System x*
49Y7960	A2EC	Intel X520 Dual Port 10GbE SFP+ Adapter for System x
49Y7970	A2ED	Intel X540-T2 Dual Port 10GBaseT Adapter for System x
49Y4230	5767	Intel Ethernet Dual Port Server Adapter I340-T2 for System x
49Y4240	5768	Intel Ethernet Quad Port Server Adapter I340-T4 for System x
00AG500	A56K	Intel I350-F1 1xGbE Fiber Adapter for System x
00AG510	A56L	Intel I350-T2 2xGbE BaseT Adapter for System x
00AG520	A56M	Intel I350-T4 4xGbE BaseT Adapter for System x

* Hot-swap is only supported when the adapter is in pNIC mode. Hot-swap is not supported in either vNIC mode (Virtual Fabric mode or Switch Independent mode).

The usage of these Optional I/O Books requires all four processors to be installed.

The following table shows the ordering information for the optional I/O Books.

Table 17. I/O Book options

Part number	Feature code	Description	Maximum supported x3850 X6
44X4049	A4A2	X6 Half-Length I/O Book	2
44X4051	A4A3*	X6 Full-Length I/O Book	2

* The Full-length I/O Book can be ordered only as an option. It is not available through CTO because the Full-length I/O Book cannot be shipped installed in the server

The following figure shows the two optional I/O Books, the Half-length I/O Book and the Full-length I/O Book.

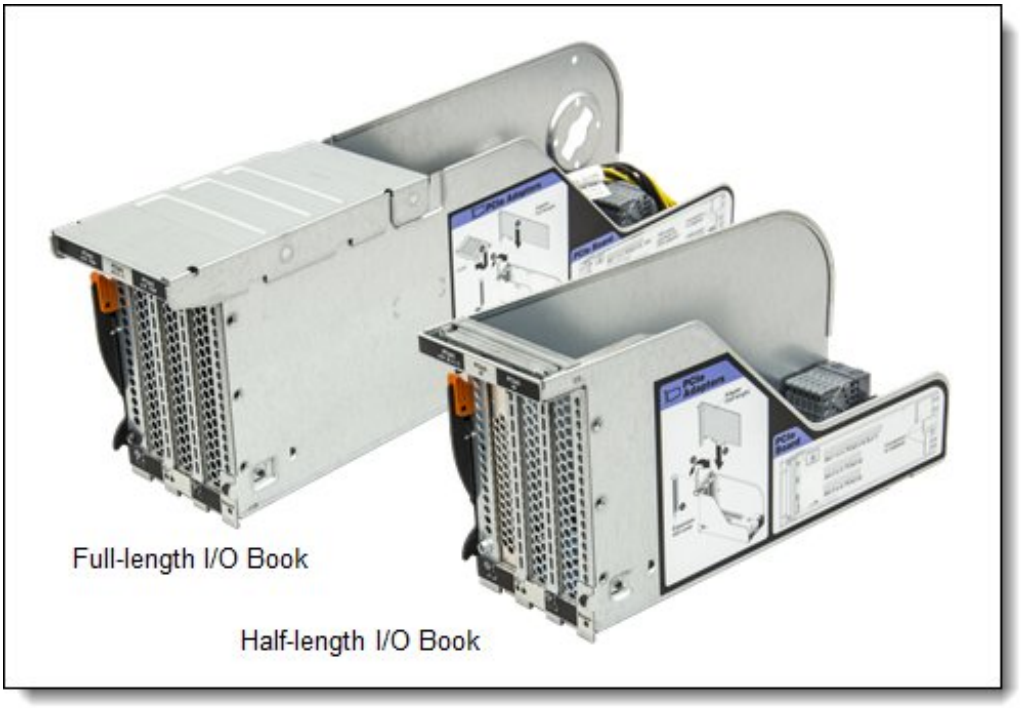

Figure 9. Half-length I/O Book and the Full-length I/O Book

The following figure shows the inside of the Half-length I/O Book.

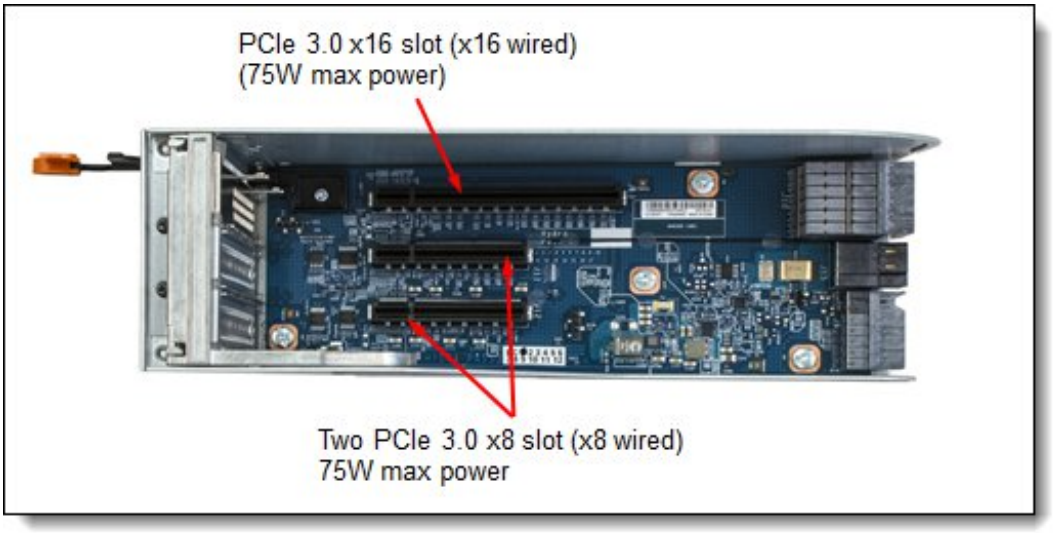

Figure 10. Half-length I/O Book

Each slot in the Half-length I/O Book and the Full-length I/O Book supplies up to 75 W of power.

The Full-length I/O Book also includes two auxiliary power connectors. With the use of these connectors and the supplied power cords, the I/O book supports one double-wide adapter up to 300 W. The auxiliary power connectors are as follows:

- One 2x4 power connector, which supplies up to 150 W of additional power to the adapter
- One 2x3 power connector, which supplies up to 75 W of additional power to the adapter

The combined power consumption of all the adapters that are installed in the Full-length I/O Book cannot exceed 300 W.

Note: The 2x3 connector is intended to be used only when one adapter is installed in the first x16 slot (the up-most slot in the following figure), either requiring 225 W or 300 W of power. The location of the 2x3 connector prevents an adapter from being installed in the other x16 slot.

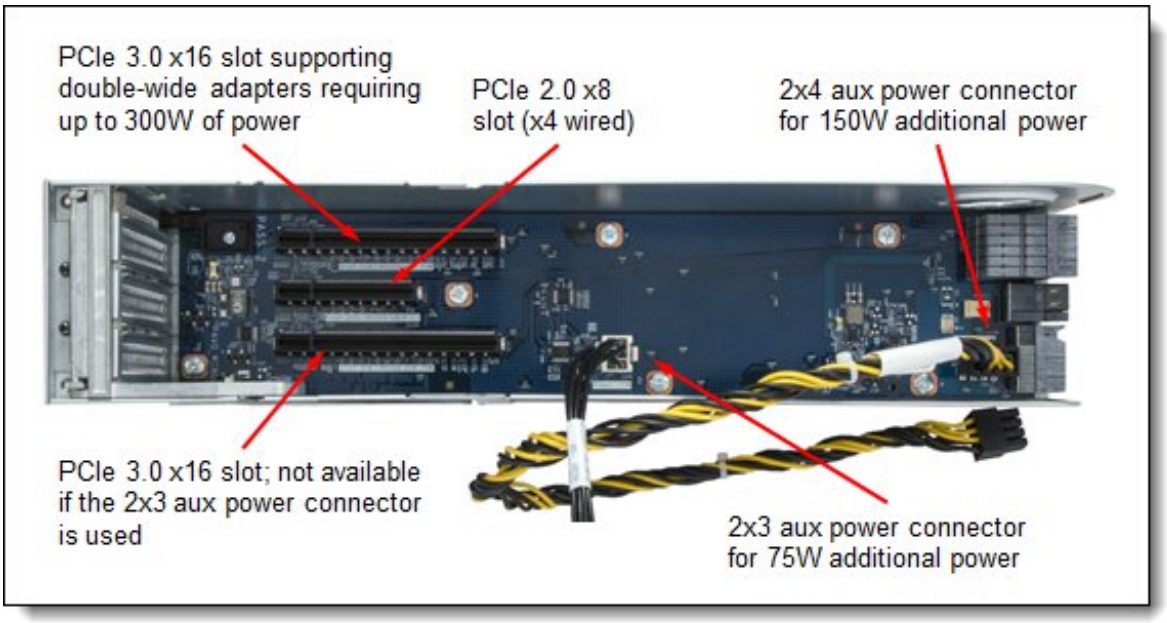

Figure 11. Full-length I/O Book

The Half-length I/O Book installs flush with the Primary I/O Book at the rear of the server. The Full-length I/O Book, when installed, adds a 99 mm (3.9 in.) mechanical extension to the base length dimension of the chassis.

The following figure shows a Full-length I/O Book and a Half-length I/O Book installed in the server.

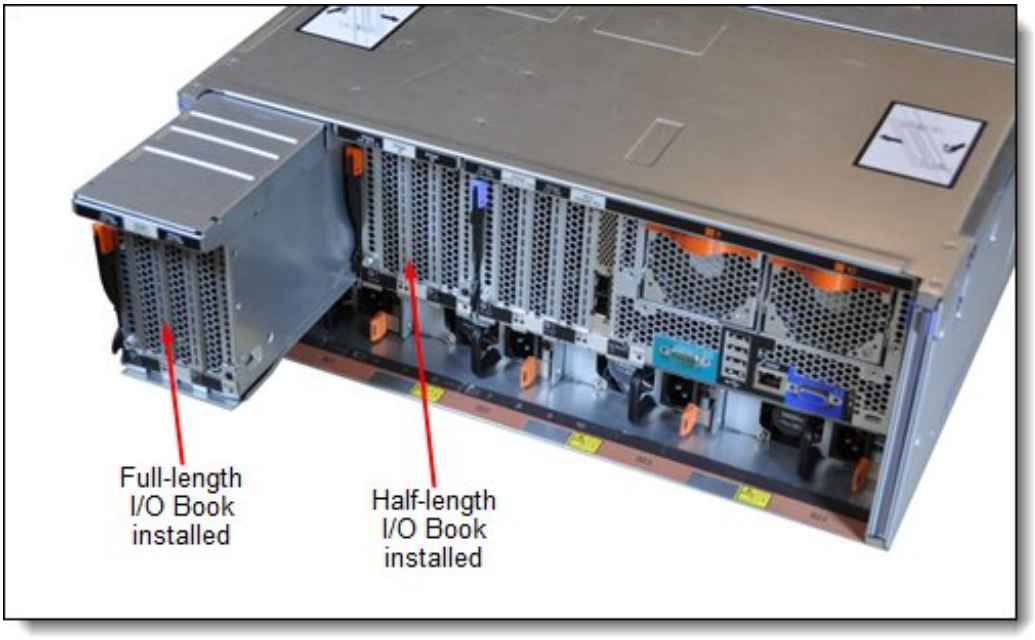

Figure 12. I/O Books that are installed in the x3850 X6

Network adapters

The server supports ML2 adapters that are installed in the custom ML2 slot. This slot supports adapters with either two 10 Gb ports or four Gigabit ports and supports direct connectivity to the IMM2 service processor for out-of-band systems management.

As listed in Table 2, Model B3x includes the Broadcom NetXtreme II ML2 Dual Port 10GbE SFP+ adapter as standard. All other standard models include an Intel I350-T4 ML2 Quad Port GbE Adapter (I350-AM4 based).

The Broadcom NetXtreme II ML2 Dual Port 10GbE SFP+ Adapter has the following specifications:

- Dual-port 10 Gb Ethernet connectivity
- Broadcom BCM57810S ASIC
- SFP+ ports supporting fiber optic and direct-attach copper (DAC) cables

For more information about this adapter, see the Lenovo Press Product Guide found at the following address:
http://lenovopress.com/tips1027

The Intel I350-T4 ML2 Quad Port GbE Adapter has the following specifications:

- Quad-port 1 Gb Ethernet connectivity
- Intel I350-AM4 ASIC
- RJ45 ports for copper cables

For more information about this adapter, see the Lenovo Press Product Guide:
http://lenovopress.com/tips1155

The following table lists the supported ML2 adapters.

Table 18. ML2 adapters

Part number	Feature code	Description	Maximum supported x3850 X6
00D2026	A40S	Broadcom NetXtreme II ML2 Dual Port 10GbaseT for System x	1
00D2028	A40T	Broadcom NetXtreme II ML2 Dual Port 10GbE SFP+ for System x	1
00D1996	A40Q	Emulex VFA5 ML2 Dual Port 10GbE SFP+ Adapter for System x	1
00D8544	A4NZ	Emulex VFA5 ML2 FCoE/iSCSI License for System x (FoD) (Features on Demand upgrade for 00D1996 - one for each adapter)	1
00D1998	A40R	Intel I350-T4 ML2 Quad Port GbE Adapter for System x	1
00D1994	A40P	Intel X540 ML2 Dual Port 10GbaseT Adapter for System x	1
94Y5200	AS74	Intel X710 ML2 4x10GbE SFP+ Adapter for System x	1
00FP650	A5RK	Mellanox ConnectX-3 Pro ML2 2x40GbE/FDR VPI Adapter for System x	1

The server also supports various other Ethernet and InfiniBand network adapters, as listed in the following table. The maximum quantity listed is for configurations with all processors and I/O books installed.

Table 19. Network adapters

Part number	Feature code	Description	Maximum supported x3850 X6
40 Gb Ethernet			
00D9550	A3PN	Mellanox ConnectX-3 40GbE / FDR IB VPI Adapter for System x	9
10 Gb Ethernet			
44T1370	A5GZ	Broadcom NetXtreme 2x10GbE BaseT Adapter for System x	9
49Y7910	A18Y	Broadcom NetXtreme II Dual Port 10GBaseT Adapter for System x	9
00JY820	A5UT	Emulex VFA5 2x10 GbE SFP+ PCIe Adapter for System x	9
00JY830	A5UU	Emulex VFA5 2x10 GbE SFP+ Adapter and FCoE/iSCSI SW for System x	9
00JY824	A5UV	Emulex VFA5 FCoE/iSCSI SW for PCIe Adapter for System x (FoD)	9
00D8540	A4M9	Emulex Dual Port 10GbE SFP+ VFA III-R for System x	9
49Y7960	A2EC	Intel X520 Dual Port 10GbE SFP+ Adapter for System x	9
49Y7970	A2ED	Intel X540-T2 Dual Port 10GBaseT Adapter for System x	9
81Y3520	AS73	Intel X710 2x10GbE SFP+ Adapter for System x	9
00D9690	A3PM	Mellanox ConnectX-3 10 GbE Adapter for System x	9
90Y4600	A3MR	QLogic 8200 Dual Port 10GbE SFP+ VFA for System x	9
00Y5624	A3MT	QLogic 8200 VFA FCoE/iSCSI License for System x (FoD)	9
47C9960	A47J	Solarflare SFN6122F 2x10GbE SFP+ Onload Adapter	9
Gigabit Ethernet			
00AG500	A56K	Intel I350-F1 1xGbE Fiber Adapter for System x	9
00AG510	A56L	Intel I350-T2 2xGbE BaseT Adapter for System x	9
00AG520	A56M	Intel I350-T4 4xGbE BaseT Adapter for System x	9
90Y9370	A2V4	Broadcom NetXtreme I Dual Port GbE Adapter for System x	9
90Y9352	A2V3	Broadcom NetXtreme I Quad Port GbE Adapter for System x	9
49Y4230	5767	Intel Ethernet Dual Port Server Adapter I340-T2 for System x	9
49Y4240	5768	Intel Ethernet Quad Port Server Adapter I340-T4 for System x	9
InfiniBand			
00D9550	A3PN	Mellanox ConnectX-3 40GbE / FDR IB VPI Adapter for System x	9

For more information, see the list of Lenovo Press Product Guides in the Networking adapters category found at the following address:
http://lenovopress.com/systemx/networkadapters

Fibre Channel host bus adapters

The following table lists the supported Fibre Channel HBAs

Table 20. Fibre Channel host bus adapters

Part number	Feature code	Description	Maximum supported
Fibre Channel - 16 Gb			
81Y1655	A2W5	Emulex 16Gb FC Single-port HBA for System x	9
81Y1662	A2W6	Emulex 16Gb FC Dual-port HBA for System x	9
81Y1668	A2XU	Brocade 16Gb FC Single-port HBA for System x	9
81Y1675	A2XV	Brocade 16Gb FC Dual-port HBA for System x	9
00Y3337	A3KW	QLogic 16Gb FC Single-port HBA for System x	9
00Y3341	A3KX	QLogic 16Gb FC Dual-port HBA for System x	9
Fibre Channel - 8 Gb			
42D0485	3580	Emulex 8 Gb FC Single-port HBA for System x	9
42D0494	3581	Emulex 8 Gb FC Dual-port HBA for System x	9
42D0501	3578	QLogic 8 Gb FC Single-port HBA for System x	9
42D0510	3579	QLogic 8 Gb FC Dual-port HBA for System x	9
46M6049	3589	Brocade 8 Gb FC Single-port HBA for System x	9
46M6050	3591	Brocade 8 Gb FC Dual-port HBA for System x	9

For more information, see the list of Lenovo Press Product Guides in the Host bus adapters category found at the following address:
http://lenovopress.com/systemx/hba

SAS adapters for external storage

The following table lists the supported SAS HBAs and RAID adapters.

Table 21. RAID controllers and options for external disk storage expansion

Part number	Feature code	Description	Maximum supported
SAS HBAs			
46C9010	A3MV	N2125 SAS/SATA HBA	9
00AE912	A5M0	N2225 SAS/SATA HBA	9
RAID controllers			
00AE938	A5ND	ServeRAID M5225-2GB SAS/SATA Controller	3
81Y4478	A1WX	ServeRAID M5120 SAS/SATA Controller	2
Features on Demand upgrades for the M5225			
47C8706	A3Z5	ServeRAID M5200 Series RAID 6 Upgrade for Systems-FoD	1
47C8710	A3Z7	ServeRAID M5200 Series Performance Accelerator for Systems-FoD	1
47C8712	A3Z8	ServeRAID M5200 Series SSD Caching Enabler for Systems-FoD	1
Hardware upgrades for the M5120			
81Y4487	A1J4	ServeRAID M5100 Series 512MB Flash/RAID 5 Upgrade	1
81Y4559	A1WY	ServeRAID M5100 Series 1GB Flash/RAID 5 Upgrade	1
47C8670	A4G6	ServeRAID M5100 Series 2GB Flash/RAID 5 Upgrade	1
Feature on Demand upgrades for the M5120			
90Y4318	A2MD	ServeRAID M5100 Series SSD Caching Enabler	1*
90Y4273	A2MC	ServeRAID M5100 Series SSD Performance Key	1*
81Y4546	A1X3	ServeRAID M5100 Series RAID 6 Upgrade	1*

* These M5120 features upgrades require a cache memory upgrade (81Y4487, 81Y4559, or 47C8670).

The ServeRAID M5225 SAS/SATA Controller has the following specifications:

- Eight external 12 Gbps SAS/SATA ports
- Supports 12, 6, and 3 Gbps SAS and 6 and 3 Gbps SATA data transfer rates
- Two external x4 mini-SAS HD connectors (SFF-8644)
- Supports 2 GB flash-backed cache (standard)
- Supports RAID levels 0, 1, 5, 10, and 50 (standard)
- Supports RAID 6 and 60 with the optional M5200 Series RAID 6 Upgrade
- Supports optional M5200 Series Performance Accelerator and SSD Caching upgrades
- PCIe x8 Gen 3 host interface
- Based on the LSI SAS3108 12 Gbps ROC controller
- Supports connectivity to the EXP2512 and EXP2524 storage expansion enclosures

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

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

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

- Supports connectivity to the EXP2512 and EXP2524 storage expansion enclosures

Cache upgrade required: The ServeRAID M5120 SAS/SATA Controller ships standard without a cache. One of the available cache upgrades (81Y4487, 81Y4559, or 47C8670) is required for the M5120 adapter operations, and it must be purchased together with the controller.

For more information about the ServeRAID M5120, see the Lenovo Press Product Guide at http://lenovopress.com/tips0858

PCIe SSD adapters

The server supports the High IOPS SSD adapters that are listed in the following table. The maximum quantity listed is for configurations with all processors and I/O books installed.

Table 22. SSD adapters

Part number	Feature code	Description	Maximum supported x3850 X6
46C9078	A3J3	365GB High IOPS MLC Mono Adapter	9
46C9081	A3J4	785GB High IOPS MLC Mono Adapter	9
90Y4377	A3DY	1.2TB High IOPS MLC Mono Adapter	9
90Y4397	A3DZ	2.4TB High IOPS MLC Duo Adapter	9
00AE995	ARYP	1000GB Enterprise io3 Flash Adapter	6
00AE998	ARYQ	1300GB Enterprise io3 Flash Adapter	6
00JY004	ARYS	5200GB Enterprise io3 Flash Adapter	6
00JY001	ARYR*	2600GB Enterprise io3 Flash Adapter	6
00AE983	ARYK	1250GB Enterprise Value io3 Flash Adapter	6
00AE986	ARYL	1600GB Enterprise Value io3 Flash Adapter	6
00AE989	ARYM	3200GB Enterprise Value io3 Flash Adapter	6
00AE992	ARYN*	6400GB Enterprise Value io3 Flash Adapter	6

* These adapters cannot be ordered via CTO. It can only be ordered as an option. The server cannot be shipped with this adapter installed. See http://ibm.com/support/entry/portal/docdisplay?lndocid=SERV-IO3

For more information about these adapters, see the Lenovo Press Product Guides in the Internal Storage category: http://lenovopress.com/systemx/internalstorage

GPU adapters and co-processors

The server supports the co-processors and graphics processing units (GPUs) that are listed in the following table. Each is installed in a Full-length I/O Book. No other adapter can be installed in the Full-length I/O Book. The Full-length I/O Book includes the necessary auxiliary power cables.

Notes:

- These adapters are not available through CTO and cannot be shipped installed in the server because they are installed in the Full-length I/O Book, which extends beyond the rear of the chassis (see Figure 12). These adapters must be shipped separately from the server. Order the adapter and Full-length I/O Book as separate options.
- If a NVIDIA Grid K1, Grid K2, Tesla K20, Tesla K40c, Quadro K4000 or Quadro K6000 is installed, the maximum system memory that can be installed is 1 TB.

Table 23. GPU adapters

Part number	Feature code	Description	Minimum system RAM	Maximum supported x3850 X6
00J6160	A3GM*	NVIDIA GRID K1	32 GB	2
00FP674	A470*	NVIDIA Grid K2 (Actively Cooled)	16 GB	2
00FP675	A3YU*	NVIDIA Quadro K4000	6 GB	2
00FP672	A3YV*	NVIDIA Quadro K6000	24 GB	2
00FP673	A471*	NVIDIA Tesla K20 (Actively Cooled)	10 GB	2
00FP676	A5FG*	NVIDIA Tesla K40c	24 GB	2

* Not available through CTO.

Power supplies

The x3850 X6 server supports up to four redundant power supplies. Standard models come with one, two, or four power supplies (model dependent). The following table lists the power supplies.

Table 24. Power supplies

Part number	Feature code	Description	Maximum supported x3850 X6	Models where used
44X4150	A54D	1400W HE Redundant Power Supply for altitudes >5000 meters	4	All HANA models
44X4152	A54E	1400W HE Redundant Power Supply	4	-
44X4132	A4R0	900W Power Supply	4	A4x, B1x, B3x, C1x, C4x
88Y7433	A2EA	750W High Efficiency -48 V DC Power Supply	4	-

An AC power supply ships standard with one 2.8 m C13 - C14 power cord.

Configuration rules are as follows:

- Power supplies must be in pairs (x3850 X6) or quads (x3950 X6), with the exception of model 3837-A4x, where one power supply is supported.
- The AC power supplies can be mixed. Valid combinations for the x3850 X6 for example, are:
  - Two 44X4132 and two 44X4152
  - Two 44X4132 and two 44X4150
- It is not recommended you mix the two 1400 W options (44X4152 for low altitude and 44X4150 for high altitude) as you will nullify the high-altitude capabilities of 44X4150.
- You cannot mix the AC power supplies with the DC power supply
- Use the Power Configurator to determine exactly what power your server needs: http://ibm.com/systems/bladecenter/resources/powerconfig.html

Integrated virtualization

The server supports VMware ESXi that is installed on a USB memory key. The key is installed in a USB socket that is on the primary I/O book inside the server. The following table lists the virtualization options.

Table 25. Virtualization options

Part number	Feature code	Description	Maximum supported
41Y8298	A2G0	Blank USB Memory Key for VMware ESXi Downloads	1
41Y8382	A4WZ	USB Memory Key for VMware ESXi 5.1 U1	1

Systems management

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

The IMM2 provides remote server management through industry-standard interfaces:

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

The remote presence provides the following functions:

- Remotely viewing video with graphics resolutions up to 1600 x 1200 at 75 Hz with up to 23 bits per pixel colors, regardless of the system state
- Remotely accessing the server by using the keyboard and mouse from a remote client
- Mapping the CD or DVD drive, diskette drive, and USB flash drive on a remote client, and mapping ISO and diskette image files as virtual drives that are available for use by the server
- Uploading a diskette image to the IMM memory and mapping it to the server as a virtual drive

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

Supported operating systems

The server supports the following operating systems:

- Microsoft Windows Server 2008 R2
- Microsoft Windows Server 2012
- Microsoft Windows Server 2012 R2
- Red Hat Enterprise Linux 6 Server x64 Edition
- Red Hat Enterprise Linux 7
- SUSE Enterprise Linux Server (SLES) 12
- SUSE LINUX Enterprise Server 11 for AMD64/EM64T
- SUSE LINUX Enterprise Server 11 with Xen for AMD64/EM64T
- SUSE Linux Enterprise Server 12 with XEN
- VMware vSphere 5.1 (ESXi)
- VMware vSphere 5.5 (ESXi)

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

Physical and electrical specifications

Dimensions and weight:

- Height: 173 mm (6.8 in.)
- Width: 482 mm (19.0 in.)
- Depth: 804 mm (31.6 in)
- Depth with cable management brackets installed: 836 mm (32.9”)
- Depth with Full-length I/O Book installed: 921 mm (36.2 in)
- Weight:
    - Minimum configuration: 35.9 kg (79.2 lb)
    - Typical configuration: 46.4 kg (102.3 lb)
    - Maximum configuration: 54.7 kg (120 lb)

Supported environment:

- Air temperature:
    - Server on: 5 °C to 40 °C (41 °F to 104 °F); altitude: 0 - 3,050 m (10,000 ft).
    - Server off: 5 °C to 45 °C (41 °F to 113 °F); altitude: 0 - 3,050 m (10,000 ft).
    - Shipment: -40 °C to 60 °C (-40 °F to 140 °F)
- Humidity:
    - Server on: 8% - 85%, maximum dew point 24 °C
    - Server off: 8% - 85%, maximum dew point 27 °C
- Electrical:
    - Models with 1400 W AC power supplies:
        - 100 -127 (nominal) V AC; 50 Hz or 60 Hz; 10 A (900 W DC output)
        - 200 - 240 (nominal) V AC; 50 Hz or 60 Hz; 8 A (1400 W DC output)
        - Input kilovolt-amperes (kVA) (approximately):
            - Minimum configuration: 0.16 kVA
            - Maximum configuration: 3.2 kVA
    - Models with 900 W AC power supplies:
        - 100 - 127 (nominal) V AC; 50 Hz or 60 Hz; 10.7 A
        - 200 - 240 (nominal) V AC; 50 Hz or 60 Hz; 5.3 A
        - Input kilovolt-amperes (kVA) (approximately):
            - Minimum configuration: 0.16 kVA
            - Maximum configuration: 2.0 kVA
    - Models with 750 W DC power supplies:
        - -40 to -75 (nominal) V DC
        - Input kilovolt-amperes (kVA) (approximately):
            - Minimum configuration: 0.16 kVA
            - Maximum configuration: 1.7 kVA
- BTU output:
    - Minimum configuration: 546 Btu/hr (160 watts)
    - Maximum configuration: 10,912 Btu/hr (3,200 watts)
- Noise level:
    - 6.6 bels (operating)
    - 6.4 bels (idle)

Warranty options

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

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

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

The following table explains warranty service definitions in more detail.

Table 26. Warranty service definitions

Term	Description
On-site service	A service technician will arrive at the client's location for equipment service.
24x7x2 hour	A service technician is scheduled to arrive at the client's location within two hours after remote problem determination is completed. Lenovo provides service around the clock, every day, including Lenovo holidays.
24x7x4 hour	A service technician is scheduled to arrive at the client's location within four hours after remote problem determination is completed. Lenovo provides service around the clock, every day, including Lenovo holidays.
9x5x4 hour	A service technician is scheduled to arrive at the client's location within four business hours after remote problem determination is completed. Lenovo provides service 8:00 am - 5:00 pm in the client's local time zone, Monday-Friday, excluding Lenovo holidays. For example, if a customer reports an incident at 3:00 pm on Friday, the technician will arrive by 10:00 am the following Monday.
9x5 next business day	A service technician is scheduled to arrive at the client's location on the business day after remote problem determination is completed. Lenovo provides service 8:00 am - 5:00 pm in the client's local time zone, Monday - Friday, excluding Lenovo holidays. Calls received after 4:00 pm local time require an extra business day for service dispatch. Next business day service is not guaranteed.
Committed Repair	Problems receive priority handling so that repairs are completed within the committed time of 6, 8, or 24 hours. Lenovo provides service 24 hours/day, every day, including Lenovo holidays.

The following Lenovo warranty service upgrades are available:

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

- Committed Repair Service
  Committed Repair Services enhances the level of Warranty Service Upgrade or Post Warranty/Maintenance Service offering associated with the selected systems. Offerings vary and are available in select countries.
    - Priority handling to meet defined time frames to restore the failing machine to good working condition
    - Committed repair service levels are measured within the following coverage hours:
      - 24x7x6: Service performed 24 hours per day, 7 days per week, within 6 hours
      - 24x7x8: Service performed 24 hours per day, 7 days per week, within 8 hours
      - 24x7x24: Service performed 24 hours per day, 7 days per week, within 24 hours
- Hard Disk Drive Retention
  Lenovo's Hard Disk Drive Retention (HDDR) service is a multi-drive hard drive retention offering that ensures your data is always under your control, regardless of the number of hard drives that are installed in your Lenovo server. In the unlikely event of a hard drive failure, you retain possession of your hard drive while Lenovo replaces the failed drive part. Your data stays safely on your premises, in your hands. The Hard Drive Retention service can be purchased in convenient bundles with our warranty upgrades and extensions.
- Microcode Support
  Keeping microcode current helps prevent hardware failures and security exposure. There are two levels of service: analysis of the installed base and analysis and update where required. Offerings vary by region and can be bundled with other warranty upgrades and extensions.
- Remote Technical Support Services (RTS)
  RTS provides comprehensive technical call center support for covered servers, storage, operating systems, and applications. Providing a single source for support of hardware and software issues, RTS can reduce problem resolution time, decreasing the cost to address technical problems and increasing uptime. Offerings are available for Windows, Linux, IBM Systems Director, VMware, Microsoft business applications, and Lenovo System x storage devices, and IBM OEM storage devices.

Regulatory compliance

The server conforms to the following regulations:

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

External drive enclosures

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

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

Table 27. E1012 and E1024 external drive enclosure models

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

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

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

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

Table 28. External drive enclosures

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

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

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

External storage systems

Lenovo offers the ThinkSystem DE Series, ThinkSystem DG Series and ThinkSystem DM Series external storage systems for high-performance storage. See the DE Series, DG Series and DM Series product guides for specific controller models, expansion enclosures and configuration options:

- ThinkSystem DE Series Storage
  https://lenovopress.com/storage/thinksystem/de-series#rt=product-guide
- ThinkSystem DM Series Storage
  https://lenovopress.com/storage/thinksystem/dm-series#rt=product-guide
- ThinkSystem DG Series Storage
  https://lenovopress.com/storage/thinksystem/dg-series#rt=product-guide

External backup units

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

Table 29. External backup options

Part number	Description
External RDX USB drives	
4T27A10725	ThinkSystem RDX External USB 3.0 Dock
External SAS tape backup drives	
6160S7E	IBM TS2270 Tape Drive Model H7S
6160S8E	IBM TS2280 Tape Drive Model H8S
6160S9E	IBM TS2290 Tape Drive Model H9S
External SAS tape backup autoloaders	
6171S7R	IBM TS2900 Tape Autoloader w/LTO7 HH SAS
6171S8R	IBM TS2900 Tape Autoloader w/LTO8 HH SAS
6171S9R	IBM TS2900 Tape Autoloader w/LTO9 HH SAS
External tape backup libraries	
6741A1F	IBM TS4300 3U Tape Library-Base Unit
6741A3F	IBM TS4300 3U Tape Library-Expansion Unit
Full High 8 Gb Fibre Channel for TS4300	
01KP938	LTO 7 FH Fibre Channel Drive
01KP954	LTO 8 FH Fibre Channel Drive
02JH837	LTO 9 FH Fibre Channel Drive
Half High 8 Gb Fibre Channel for TS4300	
01KP936	LTO 7 HH Fibre Channel Drive
01KP952	LTO 8 HH Fibre Channel Drive
02JH835	LTO 9 HH Fibre Channel Drive
Half High 6 Gb SAS for TS4300	
01KP937	LTO 7 HH SAS Drive
01KP953	LTO 8 HH SAS Drive
02JH836	LTO 9 HH SAS Drive

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

Top-of-rack Ethernet switches

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

Table 30. Ethernet LAN switches

Part number	Description
1 Gb Ethernet Rack switches	
7Y810011WW	Lenovo ThinkSystem NE0152T RackSwitch (Rear to Front)
7Z320O11WW	Lenovo ThinkSystem NE0152TO RackSwitch (Rear to Front, ONIE)
7159BAX	Lenovo RackSwitch G7028 (Rear to Front)
7159CAX	Lenovo RackSwitch G7052 (Rear to Front)
7159G52	Lenovo RackSwitch G8052 (Rear to Front)
7165H1X	Juniper EX2300-C PoE Switch
7165H2X	Juniper EX2300-24p PoE Switch
1 Gb Ethernet Campus switches	
7Z340011WW	Lenovo CE0128TB Switch (3-Year Warranty)
7Z360011WW	Lenovo CE0128TB Switch (Limited Lifetime Warranty)
7Z340012WW	Lenovo CE0128PB Switch (3-Year Warranty)
7Z360012WW	Lenovo CE0128PB Switch (Limited Lifetime Warranty)
7Z350021WW	Lenovo CE0152TB Switch (3-Year Warranty)
7Z370021WW	Lenovo CE0152TB Switch (Limited Lifetime Warranty)
7Z350022WW	Lenovo CE0152PB Switch (3-Year Warranty)
7Z370022WW	Lenovo CE0152PB Switch (Limited Lifetime Warranty)
10 Gb Ethernet switches	
7159A1X	Lenovo ThinkSystem NE1032 RackSwitch (Rear to Front)
7159B1X	Lenovo ThinkSystem NE1032T RackSwitch (Rear to Front)
7Z330O11WW	Lenovo ThinkSystem NE1064TO RackSwitch (Rear to Front, ONIE)
7159C1X	Lenovo ThinkSystem NE1072T RackSwitch (Rear to Front)
7159CRW	Lenovo RackSwitch G8272 (Rear to Front)
7159GR6	Lenovo RackSwitch G8296 (Rear to Front)
7159BR6	Lenovo RackSwitch G8124E (Rear to Front)
25 Gb Ethernet switches	
7159E1X	Lenovo ThinkSystem NE2572 RackSwitch (Rear to Front)
7Z210O21WW	Lenovo ThinkSystem NE2572O RackSwitch (Rear to Front, ONIE)
7Z330O21WW	Lenovo ThinkSystem NE2580O RackSwitch (Rear to Front, ONIE)
100 Gb Ethernet switches	
7159D1X	Lenovo ThinkSystem NE10032 RackSwitch (Rear to Front)
7Z210O11WW	Lenovo ThinkSystem NE10032O RackSwitch (Rear to Front, ONIE)

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

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

Fibre Channel SAN switches

Lenovo offers the ThinkSystem DB Series of Fibre Channel SAN switches for high-performance storage expansion. See the DB Series product guides for models and configuration options:

- ThinkSystem DB Series SAN Switches: https://lenovopress.com/storage/switches/rack#rt=product-guide

Uninterruptible power supply units

The following table lists the uninterruptible power supply (UPS) units that are offered by Lenovo.

Table 31. Uninterruptible power supply units

Part number	Description
Rack-mounted or tower UPS units - 100-125VAC	
7DD5A001WW	RT1.5kVA 2U Rack or Tower UPS-G2 (100-125VAC)
55941AX	RT1.5kVA 2U Rack or Tower UPS (100-125VAC)
55942AX	RT2.2kVA 2U Rack or Tower UPS (100-125VAC)
7DD5A003WW	RT3kVA 2U Rack or Tower UPS-G2 (100-125VAC)
55943AX	RT3kVA 2U Rack or Tower UPS (100-125VAC)
Rack-mounted or tower UPS units - 200-240VAC	
7DD5A002WW	RT1.5kVA 2U Rack or Tower UPS-G2 (200-240VAC)
55941KX	RT1.5kVA 2U Rack or Tower UPS (200-240VAC)
55942KX	RT2.2kVA 2U Rack or Tower UPS (200-240VAC)
7DD5A005WW	RT3kVA 2U Rack or Tower UPS-G2 (200-240VAC)
55943KX	RT3kVA 2U Rack or Tower UPS (200-240VAC)
7DD5A007WW	RT5kVA 3U Rack or Tower UPS-G2 (200-240VAC)
55945KX	RT5kVA 3U Rack or Tower UPS (200-240VAC)
7DD5A008WW	RT6kVA 3U Rack or Tower UPS-G2 (200-240VAC)
55946KX	RT6kVA 3U Rack or Tower UPS (200-240VAC)
55948KX	RT8kVA 6U Rack or Tower UPS (200-240VAC)
7DD5A00AWW	RT11kVA 6U Rack or Tower UPS-G2 (200-240VAC)
55949KX	RT11kVA 6U Rack or Tower UPS (200-240VAC)
55943KT†	ThinkSystem RT3kVA 2U Standard UPS (200-230VAC) (2x C13 10A, 2x GB 10A, 1x C19 16A outlets)
55943LT†	ThinkSystem RT3kVA 2U Long Backup UPS (200-230VAC) (2x C13 10A, 2x GB 10A, 1x C19 16A outlets)
55946KT†	ThinkSystem RT6kVA 5U UPS (200-230VAC) (2x C13 10A outlets, 1x Terminal Block output)
5594XKT†	ThinkSystem RT10kVA 5U UPS (200-230VAC) (2x C13 10A outlets, 1x Terminal Block output)
Rack-mounted or tower UPS units - 380-415VAC	
55948PX	RT8kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC)
55949PX	RT11kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC)

† Only available in China and the Asia Pacific market.

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

Power distribution units

The following table lists the power distribution units (PDUs) that are offered by Lenovo.

Table 32. Power distribution units

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
0U Basic PDUs															
4PU7A93176	C0QH	0U 36 C13 and 6 C19 Basic 32A 1 Phase PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93169	C0DA	0U 36 C13 and 6 C19 Basic 32A 1 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93177	C0QJ	0U 24 C13/C15 and 24 C13/C15/C19 Basic 32A 3 Phase WYE PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A93170	C0D9	0U 24 C13/C15 and 24 C13/C15/C19 Basic 32A 3 Phase WYE PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
00YJ776	ATZY	0U 36 C13/6 C19 24A 1 Phase PDU	N	Y	Y	N	N	N	N	N	N	Y	Y	Y	N
00YJ779	ATZX	0U 21 C13/12 C19 48A 3 Phase PDU	N	N	Y	N	N	N	Y	N	N	Y	Y	Y	N
00YJ777	ATZZ	0U 36 C13/6 C19 32A 1 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y
00YJ778	AU00	0U 21 C13/12 C19 32A 3 Phase PDU	Y	Y	N	Y	Y	Y	Y	Y	Y	N	N	Y	Y
0U Switched and Monitored PDUs															
4PU7A93181	C0QN	0U 21 C13/C15 and 21 C13/C15/C19 Switched and Monitored 48A 3 Phase Delta PDU v2 (60A derated)	N	Y	N	N	N	N	N	Y	N	Y	N	Y	N
4PU7A93174	C0D5	0U 21 C13/C15 and 21 C13/C15/C19 Switched and Monitored 48A 3 Phase Delta PDU (60A derated)	N	Y	N	N	N	N	N	Y	N	N	N	Y	N
4PU7A93178	C0QK	0U 20 C13 and 4 C19 Switched and Monitored 32A 1 Phase PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93171	C0D8	0U 20 C13 and 4 C19 Switched and Monitored 32A 1 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93182	C0QP	0U 18 C13/C15 and 18 C13/C15/C19 Switched and Monitored 63A 3 Phase WYE PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A93175	C0CS	0U 18 C13/C15 and 18 C13/C15/C19 Switched and Monitored 63A 3 Phase WYE PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93180	C0QM	0U 18 C13/C15 and 18 C13/C15/C19 Switched and Monitored 32A 3 Phase WYE PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A93173	C0D6	0U 18 C13/C15 and 18 C13/C15/C19 Switched and Monitored 32A 3 Phase WYE PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93179	C0QL	0U 16 C13/C15 and 16 C13/C15/C19 Switched and Monitored 24A 1 Phase PDU v2 (30A derated)	N	Y	N	N	N	N	N	Y	N	Y	N	Y	N

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
4PU7A93172	C0D7	0U 16 C13/C15 and 16 C13/C15/C19 Switched and Monitored 24A 1 Phase PDU(30A derated)	N	Y	N	N	N	N	N	Y	N	N	N	Y	N
00YJ783	AU04	0U 12 C13/12 C19 Switched and Monitored 48A 3 Phase PDU	N	N	Y	N	N	N	Y	N	N	Y	Y	Y	N
00YJ781	AU03	0U 20 C13/4 C19 Switched and Monitored 24A 1 Phase PDU	N	N	Y	N	Y	N	Y	N	N	Y	Y	Y	N
00YJ782	AU02	0U 18 C13/6 C19 Switched and Monitored 32A 3 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y
00YJ780	AU01	0U 20 C13/4 C19 Switched and Monitored 32A 1 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y
1U Switched and Monitored PDUs															
4PU7A90808	C0D4	1U 18 C19/C13 Switched and monitored 48A 3P WYE PDU V2 ETL	N	N	N	N	N	N	N	Y	N	Y	Y	Y	N
4PU7A81117	BNDV	1U 18 C19/C13 switched and monitored 48A 3P WYE PDU - ETL	N	N	N	N	N	N	N	N	N	N	N	Y	N
4PU7A90809	C0DE	1U 18 C19/C13 Switched and monitored 48A 3P WYE PDU V2 CE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y
4PU7A81118	BNDW	1U 18 C19/C13 switched and monitored 48A 3P WYE PDU – CE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y
4PU7A90810	C0DD	1U 18 C19/C13 Switched and monitored 80A 3P Delta PDU V2	N	N	N	N	N	N	N	Y	N	Y	Y	Y	N
4PU7A77467	BLC4	1U 18 C19/C13 Switched and Monitored 80A 3P Delta PDU	N	N	N	N	N	N	N	N	N	Y	N	Y	N
4PU7A90811	C0DC	1U 12 C19/C13 Switched and monitored 32A 3P WYE PDU V2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A77468	BLC5	1U 12 C19/C13 switched and monitored 32A 3P WYE PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A90812	C0DB	1U 12 C19/C13 Switched and monitored 60A 3P Delta PDU V2	N	N	N	N	N	N	N	Y	N	Y	Y	Y	N
4PU7A77469	BLC6	1U 12 C19/C13 switched and monitored 60A 3P Delta PDU	N	N	N	N	N	N	N	N	N	N	N	Y	N
46M4002	5896	1U 9 C19/3 C13 Switched and Monitored DPI PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
46M4004	5894	1U 12 C13 Switched and Monitored DPI PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
46M4003	5897	1U 9 C19/3 C13 Switched and Monitored 60A 3 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
46M4005	5895	1U 12 C13 Switched and Monitored 60A 3 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
1U Ultra Density Enterprise PDUs (9x IEC 320 C13 + 3x IEC 320 C19 outlets)															
71763NU	6051	Ultra Density Enterprise C19/C13 PDU 60A/208V/3PH	N	N	Y	N	N	N	N	N	N	Y	Y	Y	N
71762NX	6091	Ultra Density Enterprise C19/C13 PDU Module	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
1U C13 Enterprise PDUs (12x IEC 320 C13 outlets)															

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
39M2816	6030	DPI C13 PDU+	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
39Y8941	6010	Enterprise C13 PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
1U C19 Enterprise PDUs (6x IEC 320 C19 outlets)															
39Y8948	6060	Enterprise C19 PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
39Y8923	6061	Enterprise C19 3 phase PDU (60a)	N	N	Y	N	N	N	Y	N	N	N	Y	Y	N
1U Front-end PDUs (3x IEC 320 C19 outlets)															
39Y8938	6002	DPI 30amp/125V Front-end PDU with NEMA L5-30P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
39Y8939	6003	DPI 30amp/250V Front-end PDU with NEMA L6-30P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
39Y8934	6005	DPI 32amp/250V Front-end PDU with IEC 309 2P+Gnd	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
39Y8940	6004	DPI 60amp/250V Front-end PDU with IEC 309 2P+Gnd connector	Y	N	Y	Y	Y	Y	Y	N	N	Y	Y	Y	N
39Y8935	6006	DPI 63amp/250V Front-end PDU with IEC 309 2P+Gnd connector	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
1U NEMA PDUs (6x NEMA 5-15R outlets)															
39Y8905	5900	DPI 100-127v PDU with Fixed Nema L5-15P line cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Line cords for 1U PDUs that ship without a line cord															
40K9611	6504	DPI 32a Cord (IEC 309 3P+N+G)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9612	6502	DPI 32a Cord (IEC 309 P+N+G)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9613	6503	DPI 63a Cord (IEC 309 P+N+G)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9614	6500	DPI 30a Cord (NEMA L6-30P)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9615	6501	DPI 60a Cord (IEC 309 2P+G)	N	N	Y	N	N	N	Y	N	N	Y	Y	Y	N
40K9617	6505	4.3m, 32A/230V, Souriau UTG to AS/NZS 3112 (Aus/NZ) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9618	6506	4.3m, 32A/250V, Souriau UTG Female to KSC 8305 (S. Korea) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

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

Rack cabinets

The Lenovo racks supported by the server are listed in the following table.

Table 33. Rack cabinets

Part number	Description	Supported by x3850 X6	Maximum supported x3850 X6
2018-86X	11U Office Enablement Kit	No	Not applicable
9307-2PX	25U Static S2 Standard Rack	No	Not applicable
9307-2RX	25U Standard Rack	No	Not applicable
9307-4RX	42U Standard Rack	No	Not applicable
9307-4XX	42U Standard Rack Extension	No	Not applicable
9308-4EX	42U Enterprise Expansion Rack	Yes*	10
9308-4PX	42U Enterprise Rack	Yes*	10
9360-4PX	42U 1200mm Deep Dynamic Rack	Yes	10
9360-4EX	42U 1200mm Deep Dynamic Expansion Rack	Yes	10
9361-4PX	42U 1200mm Deep Static Rack	Yes	10
9361-4EX	42U 1200mm Deep Static Expansion Rack	Yes	10
9362-4PX	47U 1200mm Deep Static Rack	Yes	11
9362-4EX	47U 1200mm Deep Static Expansion Rack	Yes	11
9363-4CX	PureFlex System 42U Rack	Yes	10
9363-4DX	PureFlex System 42U Expansion Rack	Yes	10
9363-4PX	42U 1100mm Dynamic Rack	Yes	10
9363-4EX	42U 1100mm Dynamic Expansion Rack	Yes	10
1410-2RX	Intelligent Cluster 25U Rack Family	No	Not applicable
1410-4RX	Intelligent Cluster 42U Rack Family	Yes*	10
1410-PRA	Intelligent Cluster 42U 1200mm Deep Rack Family	Yes	10
1410-PRB	Intelligent Cluster 42U 1100mm Enterprise V2 Rack Family	Yes	10
7200-4PX	Smart Analytics 42U Rack Family	Yes*	10

* No support for Full-length I/O Books

For more information, see the list of Lenovo Press Product Guides in the Rack cabinets and options category found at the following address:
http://lenovopress.com/systemx/rack

KVM console options

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

Table 34. Console keyboards

Part number	Description
Consoles	
17238BX	1U 18.5" Standard Console (without keyboard)
Console keyboards	

Part number	Description
00MW310	Lenovo UltraNav Keyboard USB - US Eng
46W6713	Keyboard w/ Int. Pointing Device USB - Arabic 253 RoHS v2
46W6714	Keyboard w/ Int. Pointing Device USB - Belg/UK 120 RoHS v2
46W6715	Keyboard w/ Int. Pointing Device USB - Chinese/US 467 RoHS v2
46W6716	Keyboard w/ Int. Pointing Device USB - Czech 489 RoHS v2
46W6717	Keyboard w/ Int. Pointing Device USB - Danish 159 RoHS v2
46W6718	Keyboard w/ Int. Pointing Device USB - Dutch 143 RoHS v2
46W6719	Keyboard w/ Int. Pointing Device USB - French 189 RoHS v2
46W6720	Keyboard w/ Int. Pointing Device USB - Fr/Canada 445 RoHS v2
46W6721	Keyboard w/ Int. Pointing Device USB - German 129 RoHS v2
46W6722	Keyboard w/ Int. Pointing Device USB - Greek 219 RoHS v2
46W6723	Keyboard w/ Int. Pointing Device USB - Hebrew 212 RoHS v2
46W6724	Keyboard w/ Int. Pointing Device USB - Hungarian 208 RoHS v2
46W6725	Keyboard w/ Int. Pointing Device USB - Italian 141 RoHS v2
46W6726	Keyboard w/ Int. Pointing Device USB - Japanese 194 RoHS v2
46W6727	Keyboard w/ Int. Pointing Device USB - Korean 413 RoHS v2
46W6728	Keyboard w/ Int. Pointing Device USB - LA Span 171 RoHS v2
46W6729	Keyboard w/ Int. Pointing Device USB - Norwegian 155 RoHS v2
46W6730	Keyboard w/ Int. Pointing Device USB - Polish 214 RoHS v2
46W6731	Keyboard w/ Int. Pointing Device USB - Portuguese 163 RoHS v2
46W6732	Keyboard w/ Int. Pointing Device USB - Russian 441 RoHS v2
46W6733	Keyboard w/ Int. Pointing Device USB - Slovak 245 RoHS v2
46W6734	Keyboard w/ Int. Pointing Device USB - Spanish 172 RoHS v2
46W6735	Keyboard w/ Int. Pointing Device USB - Swed/Finn 153 RoHS v2
46W6736	Keyboard w/ Int. Pointing Device USB - Swiss F/G 150 RoHS v2
46W6737	Keyboard w/ Int. Pointing Device USB - Thai 191 RoHS v2
46W6738	Keyboard w/ Int. Pointing Device USB - Turkish 179 RoHS v2
46W6739	Keyboard w/ Int. Pointing Device USB - UK Eng 166 RoHS v2
46W6740	Keyboard w/ Int. Pointing Device USB - US Euro 103P RoHS v2
46W6741	Keyboard w/ Int. Pointing Device USB - Slovenian 234 RoHS v2
Console switches	
1754D2X	Global 4x2x32 Console Manager (GCM32)
1754D1X	Global 2x2x16 Console Manager (GCM16)
1754A2X	Local 2x16 Console Manager (LCM16)
1754A1X	Local 1x8 Console Manager (LCM8)
Console switch cables	
43V6147	Single Cable USB Conversion Option (UCO)
39M2895	USB Conversion Option (4 Pack UCO)
46M5383	Virtual Media Conversion Option Gen2 (VCO2)
46M5382	Serial Conversion Option (SCO)

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

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Related publications and links

For more information, see these resources:

- Lenovo System x3850 X6 product page
  http://shop.lenovo.com/us/en/systems/servers/mission-critical/x3850-x6/
- Lenovo System x3850 X6 Installation and Service Guide
  http://publib.boulder.ibm.com/infocenter/systemx/documentation/topic/com.ibm.sysx.3837.doc/printable_doc.html
- ServerProven hardware compatibility page for the x3850 X6 and x3950 X6
  http://www.lenovo.com/us/en/serverproven/xseries/3837.shtml
- xREF: System x Reference
  http://lenovopress.com/xref
- Golden Egg Visual Diagram
  http://www.goldeneggs.fi/documents/GE-IBM-X3850X6-A.pdf

Related product families

Product families related to this document are the following:

- 4-Socket Rack Servers
- Mission Critical Servers

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