



Lenovo System x3850 X6 and x3850 X6 Essential (6241) Product Guide

The Lenovo System x3850 X6 and x3850 X6 Essential, machine type 6241, are four-socket 4U rack-mounted servers that represent the sixth generation of the Enterprise X-Architecture. Now with Intel Xeon E7 v4 processors, the x3850 X6 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 server 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 v4 and v3 high-performance processors and up to 6 TB of memory. Also available in China is the x3850 X6 Essential which supports Intel Xeon E7 v4 or v3 processors and up to 3 TB of memory.

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



Figure 1. Lenovo System x3850 X6, machine type 6241

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 the sixth generation of Enterprise X-Architecture technology, Lenovo 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 offers numerous features to boost performance:

- Based on the Intel Xeon E7 family of processors:
 - Models based on E7-4800 v4 and E7-8800 v4 processors
 - Also available are models based on E7 v3 processors
 - Supports up to four E7 v4 processors with a total of 96 cores and 192 threads to maximize the concurrent running of multi-threaded applications.
 - Improves productivity by offering superior system performance with processors up to 18 cores and core frequencies up to 3.2 GHz core speeds, and up to 45 MB of L3 cache, and up to three 9.6 GTps QPI interconnect links.
- High performance memory subsystem:
 - x3850 X6 supports up to 96 DIMM sockets (24 DIMMs per processor). Supports DDR4 memory at speeds up to 1866 MHz, or DDR3 memory at speeds up to 1600 MHz depending on the Compute Book selected.
 - x3850 X6 Essential supports up to 48 DIMM sockets (12 DIMMs per processor). Supports DDR4 memory at speeds up to 1866 MHz.
- 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.
- Optional support for high-performance PCIe-attached NVMe Flash Storage solid-state drives (SSDs) can significantly improve I/O performance.
- 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 processors. 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.
- The server is Energy Star 2.0 compliant

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 with 24-DIMM Compute Books.
- Up to 16x 1.8-inch 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.
- Lenovo XClarity Administrator 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.

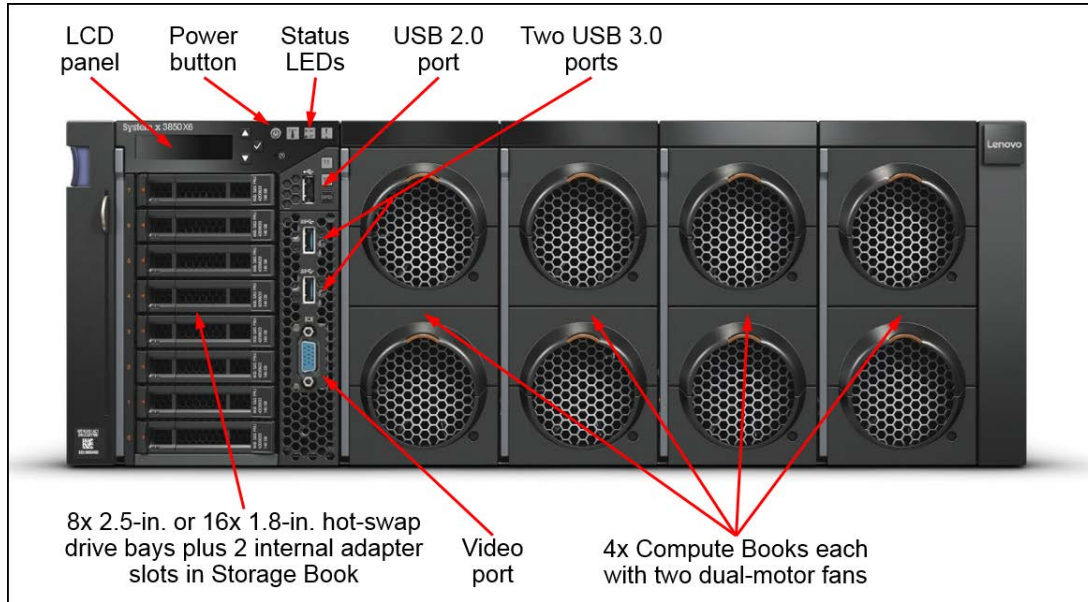


Figure 2. Front view of the Lenovo System x3850 X6

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

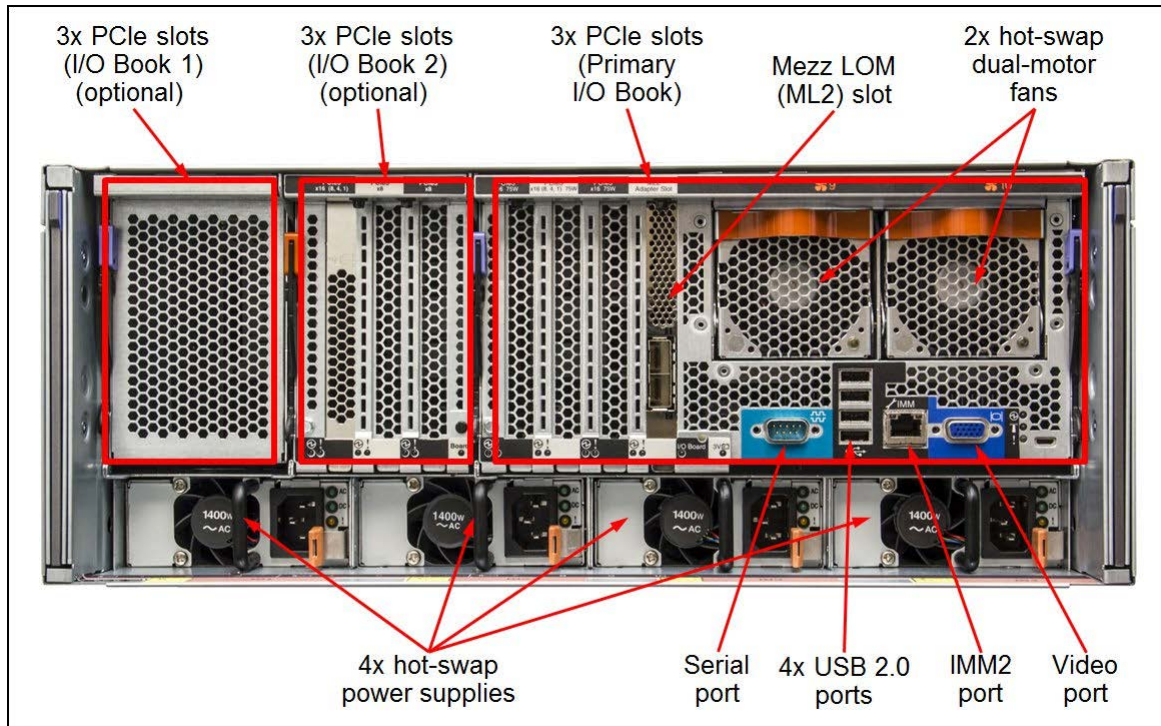


Figure 3. Rear view of the Lenovo System x3850 X6

System x3850 X6 Essential

The x3850 X6 Essential is a companion offering to the x3850 X6 and is suitable for customers who need the compute power and reliability of the x3850 X6 but do not need more than 3 TB of memory.

The x3850 X6 Essential is different to the x3850 X6 in the following ways:

- Support for Compute Books with 12 DIMM slots
- Compute Books have E7 v4 or v3 processors and TruDDR4 memory
- Memory mirroring not supported
- Cannot be upgraded to an x3950 X6

Standard specifications

The following table lists the standard specifications.

Table 1. Standard specifications

Components	Specification
Machine type	6241
Form factor	4U rack

Components	Specification
Processor	<p><i>Models with E7 v4 processors:</i> One, two or four Intel Xeon E7-4800 v4 or E7-8800 v4 processors, each in a Compute Book. Processor options have between 4 and 24 cores with core frequencies up to 3.2 GHz. Three QPI links up to 9.6 GT/s each. Compute Books have TruDDR4 memory up to 1866 MHz, but cannot be mixed. Up to 60 MB L3 cache. Intel C602J chipset.</p> <p><i>Models with E7 v3 processors:</i> One, two or four Intel Xeon E7-4800 v3 or E7-8800 v3 processors, each in a Compute Book. Processor options between 4 cores (3.2 GHz) and 18 cores (up to 2.5 GHz). Three QPI links up to 9.6 GT/s each. Compute Books have either DDR3 memory up to 1600 MHz or TruDDR4 memory up to 1866 MHz, but cannot be mixed. Up to 45 MB L3 cache. Intel C602J chipset.</p>
Memory	<p>x3850 X6: Up to 96 DIMM sockets (24 DIMMs per processor). Available compute books:</p> <ul style="list-style-type: none"> • Compute Books with E7 v4 processors and 24 TruDDR4 DIMMs • Compute Books with E7 v3 processors and 24 TruDDR4 DIMMs • Compute Books with E7 v3 processors and 24 DDR3 DIMMs <p>x3850 X6 Essential: Up to 48 DIMM sockets (12 DIMMs per processor)</p> <ul style="list-style-type: none"> • Compute Books with E7 v4 processors and 12 TruDDR4 DIMMs • Compute Books with E7 v3 processors and 12 TruDDR4 DIMMs <p>RDIMMs and LRDIMMs (Load Reduced DIMMs) are supported, but memory types cannot be intermixed. Memory is either TruDDR4 memory (up to 1866 MHz) or DDR3 memory (up to 1600 MHz), depending on the Compute Book selected. DDR3 memory and TruDDR4 memory cannot be mixed in the same Compute Book. Compute Books with DDR3 memory and Compute Books with TruDDR4 memory cannot be mixed in the same system.</p>
Memory maximums	<p>x3850 X6 models with Compute Books with 24 TruDDR4 DIMMs:</p> <ul style="list-style-type: none"> • With RDIMMs: Up to 3 TB with 96x 32 GB RDIMMs and four processors • With LRDIMMs: Up to 6 TB with 96x 64 GB LRDIMMs and four processors <p>x3850 X6 models with Compute Books with 24 DDR3 DIMMs:</p> <ul style="list-style-type: none"> • 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 <p>x3850 X6 Essential models with Compute Books with 12 TruDDR4 DIMMs:</p> <ul style="list-style-type: none"> • With RDIMMs: Up to 1.5 TB with 48x 32 GB RDIMMs and four processors • With LRDIMMs: Up to 3 TB with 48x 64 GB LRDIMMs and four processors
Memory protection	ECC, Chipkill, RBS, memory mirroring, and memory rank sparing.
Disk drive bays	Up to 16 1.8" SSD bays, or up to 8 2.5" hot-swap SAS/SATA bays, or up to 4x 2.5" hot-swap PCIe NVMe SSD drive bays.
Maximum internal storage	Up to 61.44 TB with 8x 7.68 TB 2.5-inch SAS SSDs or up to 14.4 TB with 1.8 TB 2.5-inch SAS HDDs, or up to 8 TB with 2 TB 2.5-inch PCIe NVMe SSDs.
RAID support	12 Gb SAS/SATA RAID 0, 1, or 10 with ServerRAID 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	No internal bays. See http://support.lenovo.com/en/documents/pd011281 for external DVD options.
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.

Components	Specification
PCI Expansion slots	Up to 11 PCIe slots plus dedicated Mezzanine LOM slot. The slots are as follows: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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.
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.
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, Lenovo XClarity Administrator, IBM Systems Director and Active Energy Manager™, and ServerGuide.
Operating systems	Microsoft Windows Server 2016, 2012 R2, 2012, and 2008 R2, RHEL 6 and 7, SLES 11 and 12, and VMware vSphere ESXi. See "Supported operating systems" section for details.
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)
- Documentation CD and safety/warranty/installation information

Standard models

The following tables list the standard models of the x3850 X6 and x3850 X6 Essential.

Notes:

- Models with E7 v2 processors are now withdrawn from marketing
- For CTO configurations, select base model 6241-AC1.

Table 2. Standard models with E7 v4 processors

Model†	Intel Xeon Processor* (in a Compute Book)	Memory	RAID	Drive bays Drives	Ethernet‡	I/O slots§	Power supplies
x3850 X6 models with E7 v4 processors and TruDDR4 memory							
6241-14x	1x E7-4809 v4 8C 2.1GHz 20M 115W	2x 8GB (1866MHz)¶	Optional	Optional	4x 1 GbE	6 std 12 max	1x 900W HS / 4
6241-24x	2x E7-4820 v4 10C 2.0GHz 25M 115W	4x 16GB (1866MHz)¶	1x M5210	4x 2.5" / 8 Open bay	4x 1 GbE	6 std 12 max	2x 900W HS / 4
6241-44x	2x E7-4850 v4 16C 2.1GHz 40M 115W	4x 16GB (1866MHz)¶	1x M5210	4x 2.5" / 8 Open bay	4x 1 GbE	6 std 12 max	2x 900W HS / 4
6241-54x	2x E7-8860 v4 18C 2.2GHz 45M 140W	4x 16GB (1866MHz)¶	1x M5210	4x 2.5" / 8 Open bay	4x 1 GbE	6 std 12 max	2x 900W HS / 4
6241-94x	2x E7-8890 v4 24C 2.2GHz 60M 165W	4x 16GB (1866MHz)¶	1x M5210	4x 2.5" / 8 Open bay	4x 1 GbE	6 std 12 max	2x 900W HS / 4
x3850 X6 Essential models with E7 v4 processors and TruDDR4 memory (12 DIMM slots per Compute Book)							
6241-1RC	1x E7-4809 v4 8C 2.1GHz 115W	2x 8GB (1866MHz)¶	Optional	Optional	4x 1 GbE	6 std 12 max	1x 900W HS / 4
6241-2RC	2x E7-4820 v4 10C 2.0GHz 115W	4x 16GB (1866MHz)¶	1x M5210	4x 2.5" / 8 Open bay	4x 1 GbE	6 std 12 max	2x 900W HS / 4
6241-4RC	2x E7-4850 v4 16C 2.1GHz 115W	4x 16GB (1866MHz)¶	1x M5210	4x 2.5" / 8 Open bay	4x 1 GbE	6 std 12 max	2x 900W HS / 4
6241-5RC	2x E7-8860 v4 18C 2.2GHz 140W	4x 16GB (1866MHz)¶	1x M5210	4x 2.5" / 8 Open bay	4x 1 GbE	6 std 12 max	2x 900W HS / 4
6241-9RC	2x E7-8890 v4 24C 2.2GHz 165W	4x 16GB (1866MHz)¶	1x M5210	4x 2.5" / 8 Open bay	4x 1 GbE	6 std 12 max	2x 900W HS / 4

† x in the Machine Type Model (MTM) represents a country-specific letter (for example, the EMEA MTM is 6241-A4G, and the US MTM is 6241-A4U). Ask a Lenovo representative for specifics.

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

¶ The DIMMs in these models operate at the speed indicated to match the memory bus speed of the processor

‡ Models include 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.

Table 3. Standard models with E7 v3 processors

x3850 X6 models with E7 v3 processors and TruDDR4 memory							
6241-D5x	1x E7-4809 v3 8C 2.0GHz 20MB 115W	2x 8GB DDR4 (1866MHz)¶	Optional	Optional	4x 1 GbE	6 std 12 max	1x 900W HS / 4
6241-F2x	2x E7-4820 v3 10C 1.9GHz 25MB 115W	4x 16GB DDR4 (1866MHz)¶	1x M5210	4x 2.5" / 8 Open bay	4x 1 GbE	6 std 12 max	2x 900W HS / 4
6241-F4x	2x E7-4850 v3 14C 2.2GHz 35MB 115W	4x 16GB DDR4 (1866MHz)¶	1x M5210	4x 2.5" / 8 Open bay	2x 10GbE‡	6 std 12 max	2x 900W HS / 4

6241-G2x	2x E7-8860 v3 16C 2.2GHz 40MB 140W	4x 16GB DDR4 (1866MHz)‡	1x M5210	4x 2.5" / 8 Open bay	4x 1 GbE	6 std 12 max	2x 900W HS / 4
6241-G4x	2x E7-8890 v3 18C 2.5GHz 45MB 165W	4x 16GB DDR4 (1866MHz)‡	1x M5210	4x 2.5" / 8 Open bay	4x 1 GbE	6 std 12 max	2x 900W HS / 4
x3850 X6 Essential models with E7 v3 processors and TruDDR4 memory (12 DIMM slots per Compute Book)							
6241-AAC	1x E7-4809 v3 8C 2.0GHz 20MB 115W	2x 8GB DDR4 (1866MHz)‡	Optional	Optional	4x 1 GbE	6 std 12 max	1x 900W HS / 4
6241-ABC	2x E7-4820 v3 10C 1.9GHz 25MB 115W	4x 16GB DDR4 (1866MHz)‡	1x M5210	4x 2.5" / 8 Open bay	4x 1 GbE	6 std 12 max	2x 900W HS / 4
6241-ACC	2x E7-4850 v3 14C 2.2GHz 35MB 115W	4x 16GB DDR4 (1866MHz)‡	1x M5210	4x 2.5" / 8 Open bay	2x 10GbE‡	6 std 12 max	2x 900W HS / 4
6241-ADC	2x E7-8860 v3 16C 2.2GHz 40MB 140W	4x 16GB DDR4 (1866MHz)‡	1x M5210	4x 2.5" / 8 Open bay	4x 1 GbE	6 std 12 max	2x 900W HS / 4
6241-AEC	2x E7-8890 v3 18C 2.5GHz 45MB 165W	4x 16GB DDR4 (1866MHz)‡	1x M5210	4x 2.5" / 8 Open bay	4x 1 GbE	6 std 12 max	2x 900W HS / 4
x3850 X6 models with E7 v3 processors and DDR3 memory							
6241-D4x	1x E7-4809 v3 8C 2.0GHz 20MB 115W	2x 8GB DDR3 1600MHz	Optional	Optional	4x 1 GbE	6 std 12 max	1x 900W HS / 4
6241-F1x	2x E7-4820 v3 10C 1.9GHz 25MB 115W	4x 16GB DDR3 1600MHz	1x M5210	4x 2.5" / 8 Open bay	4x 1 GbE	6 std 12 max	2x 900W HS / 4
6241-F3x	2x E7-4850 v3 14C 2.2GHz 35MB 115W	4x 16GB DDR3 1600MHz	1x M5210	4x 2.5" / 8 Open bay	2x 10GbE‡	6 std 12 max	2x 900W HS / 4
6241-G1x	2x E7-8860 v3 16C 2.2GHz 40MB 140W	4x 16GB DDR3 1600MHz	1x M5210	4x 2.5" / 8 Open bay	4x 1 GbE	6 std 12 max	2x 900W HS / 4
6241-G3x	2x E7-8890 v3 18C 2.5GHz 45MB 165W	4x 16GB DDR3 1600MHz	1x M5210	4x 2.5" / 8 Open bay	4x 1 GbE	6 std 12 max	2x 900W HS / 4

† x in the Machine Type Model (MTM) represents a country-specific letter (for example, the EMEA MTM is 6241-A4G, and the US MTM is 6241-A4U). Ask a Lenovo representative for specifics.

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

‡ The DIMMs in these models operate at the speed indicated to match the memory bus speed of the processor

‡ Models include 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.

SAP HANA Workload Optimized Solution models

The Lenovo 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.

Notes:

- Models with E7 v2 processors are now withdrawn from marketing, however the E7 v2 compute books are still available for existing customers.
- For CTO configurations of SAP HANA models, select base model 6241-AC3

Table 4. Workload Optimized Solution models for SAP HANA

Model	Intel Xeon (Compute Book)	Memory	RAID	Drive bays Drives	Ethernet	I/O slots	Power supplies
SAP HANA models with E7 v4 processors and TruDDR4 memory - Standard models							
6241-8Ax	2x E7-8880 v4 22C 2.2GHz 55M 150W	128 GB 16x 8GB DDR4 RDIMM	1x M5210 + upgrades*	8x 2.5" bays 6x 1.2 TB SAS HDD 2x 400 GB S3710 SSD	1x 4x1GbE ML2 2x Mellanox 10Gb*	6 std 12 max	4x 1400W HS / 4
6241-8Bx	2x E7-8880 v4 22C 2.2GHz 55M 150W	256 GB 16x 16GB DDR4 RDIMM	1x M5210 + upgrades*	8x 2.5" bays 6x 1.2 TB SAS HDD 2x 400 GB S3710 SSD	1x 4x1GbE ML2 2x Mellanox 10Gb*	6 std 12 max	4x 1400W HS / 4
6241-8Cx	2x E7-8880 v4 22C 2.2GHz 55M 150W	512 GB 16x 32GB DDR4 RDIMM	1x M5210 + upgrades*	8x 2.5" bays 6x 1.2 TB SAS HDD 2x 400 GB S3710 SSD	1x 4x1GbE ML2 2x Mellanox 10Gb*	6 std 12 max	4x 1400W HS / 4
6241-8Dx	4x E7-8880 v4 22C 2.2GHz 55M 150W	512 GB 32x 16GB DDR4 RDIMM	1x M5210 + upgrades*	8x 2.5" bays 6x 1.2 TB SAS HDD 2x 400 GB S3710 SSD	1x 4x1GbE ML2 2x Mellanox 10Gb*	12 std 12 max	4x 1400W HS / 4
6241-8Fx	4x E7-8880 v4 22C 2.2GHz 55M 150W	1024 GB 32x 32GB DDR4 RDIMM	1x M5210 + upgrades* + 1x M5225 + upgrades*	8x 2.5" bays 6x 1.2 TB SAS HDD 2x 400 GB S3710 SSD	1x 4x1GbE ML2 2x Mellanox 10Gb*	12 std 12 max	4x 1400W HS / 4
6241-8Fx	4x E7-8880 v4 22C 2.2GHz 55M 150W	1024 GB 32x 32GB DDR4 RDIMM	1x M5210 + upgrades* + 1x M5225 + upgrades*	8x 2.5" bays 6x 1.2 TB SAS HDD 2x 400 GB S3710 SSD	1x 4x1GbE ML2 2x Mellanox 10Gb*	12 std 12 max	4x 1400W HS / 4
SAP HANA models with E7 v3 processors and TruDDR4 memory - Standard models							
6241-HQx	4x E7-8880 v3 18C 2.3GHz 45MB 150W	1024 GB 32x 32GB DDR4 RDIMM	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
6241-HRx	4x E7-8880 v3 18C 2.3GHz 45MB 150W	512 GB 32x 16GB DDR4 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
6241-HSx	2x E7-8880 v3 18C 2.3GHz 45MB 150W	512 GB 16x 32GB DDR4 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
6241-HTx	2x E7-8880 v3 18C 2.3GHz 45MB 150W	256 GB 16x 16GB DDR4 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
6241-HUx	2x E7-8880 v3 18C 2.3GHz 45MB 150W	128 GB 16x 8GB DDR4 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
SAP HANA models with E7 v3 processors and DDR3 memory							
6241-HVx	4x E7-8880 v3 18C 2.3GHz 45MB 150W	1024 GB 32x 32 GB DDR3 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

6241-HWx	4x E7-8880 v3 18C 2.3GHz 45MB 150W	512 GB 32x 16 GB DDR3 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
6241-HXx	2x E7-8880 v3 18C 2.3GHz 45MB 150W	512 GB 16x 32 GB DDR3 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
6241-HYx	2x E7-8880 v3 18C 2.3GHz 45MB 150W	256 GB 16x 16 GB DDR3 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
6241-HZx	2x E7-8880 v3 18C 2.3GHz 45MB 150W	128 GB 16x 8 GB DDR3 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

* 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)
- Models HQx, HVx, H6x: 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).
- Model 8Fx: ServeRAID M5225-2GB RAID controller for external connectivity (00AE938) plus Performance Accelerator (47C8710) and SSD Caching Enabler (47C8712).
- Six 1.2TB 10K 6Gbps SAS 2.5" G3HS HDD (00AJ146)
- Models with E7 v4 processors: Two Intel S3710 400GB Enterprise Performance SATA G3HS 2.5" SSDs (00YC325)
- Models with E7 v3 processors: Two S3700 400GB SATA 2.5" MLC G3HS Enterprise SSD (00AJ161)
- One Intel I350-T4 ML2 Quad Port GbE Adapter (00D1998)
- Models with E7 v4 processors: Two Mellanox ConnectX-3 10 GbE Adapters (00D9690) plus four SFP+ SR Transceivers (46C3447)
- Models with E7 v3 processors: Two Mellanox ConnectX-3 40GbE / FDR IB VPI Adapters (00D9550) plus four Mellanox QSA Adapters (QSFP to SFP+) (90Y3842) and four SFP+ SR Transceivers (46C3447)
- Models with 12 standard slots: Two X6 Half-length I/O Books (44X4049)
- Lenovo solution for SAP HANA media

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. IBM Spectrum Scale (GPFS) is available from Lenovo separately.

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

Upgrading Compute Books

With the x3850 X6, machine type 6241, we support upgrading the server by simply replacing the Compute Books. The process to upgrade is made very simple because of the innovative book design of the x3850 X6.

Supported upgrades are:

- E7 v2 processors to E7 v3 processors with DDR3 DIMMs (optionally keep existing memory)
- E7 v2 processors to E7 v3 processors with DDR4 DIMMs (new DDR4 DIMMs required)

- E7 v2 processors to E7 v4 processors (new DDR4 DIMMs required)
- E7 v3 processors with DDR3 to E7 v4 processors (new DDR4 DIMMs required)
- E7 v3 processors with DDR4 to E7 v4 processors (optionally keep existing memory)

Notes:

- Upgrades to E7 v3 and v4 processors are only supported with machine type 6241. If you want to upgrade an X6 server with machine type 3837, contact your local representative.
- eXFlash DIMMs (now withdrawn from marketing) are not supported with TruDDR4 memory; Only DDR3 memory supports eXFlash DIMMs and only the compute books with 24 DIMM sockets (Compute books with 12 DIMMs do not support eXFlash DIMMs)
- Intel Xeon E7 v3 and v4 processors require minimum firmware levels. Consult the documentation that is included with the Compute Books.
- Compute books with E7 v4 processors do not support DDR3 memory
- If you upgrade from E7 v3 processors with DDR4 to E7 v4 processors, you can transfer the 2133 MHz DDR4 memory DIMMs to the new compute books. If you also want to add additional memory to the E7 v4 compute book, it is supported to use either 2133 MHz or 2400 MHz DDR4 memory DIMMs. It is supported to mix 2133 MHz and 2400 MHz DIMMs in the same compute book.

If you plan to use your existing DDR3 memory, the process to upgrade is as follows:

1. Purchase up to 4 new Compute Books
2. Check and if necessary, upgrade all firmware to at least the minimum levels needed to support the new processors
3. Power off the server and remove the existing Compute Books
4. Transfer all DDR3 memory DIMMs to the new Compute Books
5. Reinstall the new Compute Books

If you plan to upgrade to TruDDR4 memory, then you should also order the appropriate memory DIMMs to match your workload requirements. TruDDR4 DIMMs used in E7 v3 compute books can be used in E7 v4 compute books.

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.

Note: It is not supported to use Compute Books with only 12 DIMM sockets in an 8-socket configuration.

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/v3/v4 series processors (not E7-4800 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 Lenovo System x3950 X6 Product Guide: <http://lenovopress.com/tips1251>

Note: It is supported to install Compute Books in a x3950 X6 from either an System x3850 X6 (machine type 3837) or a Lenovo System x3850 X6 (machine type 6241)

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, an 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 processors as ordered for the RPQ, however, in this scenario, the server maintain the original serial number.

Note: Use of E7-4800 processors: Intel Xeon E7-4800 v2/v3/v4 processors cannot be used in an x3950 X6. If your x3850 X6 has Compute Books with E7-4800 processors, then these must be replaced with Compute Books with E7-8800 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 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/v3/v4 processors cannot be used in an x3950 X6. If your x3850 X6 has Compute Books with E7-4800 processors, then these must be replaced with Compute Books with E7-8800 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 v4 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 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 containing E7-8800 processors. Since many standard models of the x3850 X6 (see Table 2) contain E7-4800 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 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 described 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 Lenovo Power Configurator to determine your total power draw to assist you in provisioning adequate power. You can download the Power Configurator from <https://support.lenovo.com/documents/LNVO-PWRCONF>
- 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 processors, either E7v4 or E7 v3. Processors are installed in Compute Books, one processor in each Compute Book. The Compute Book has the following components:

- One processor

- A total of 24 DIMM slots, 12 on each side of the book (Compute Books in the x3850 X6 Essential have 12 DIMM slots, 6 on each side)
- 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 models 6241-A4x and 6241-D5x. All Compute Books must be identical.

The following figure shows the components of the Compute Book.

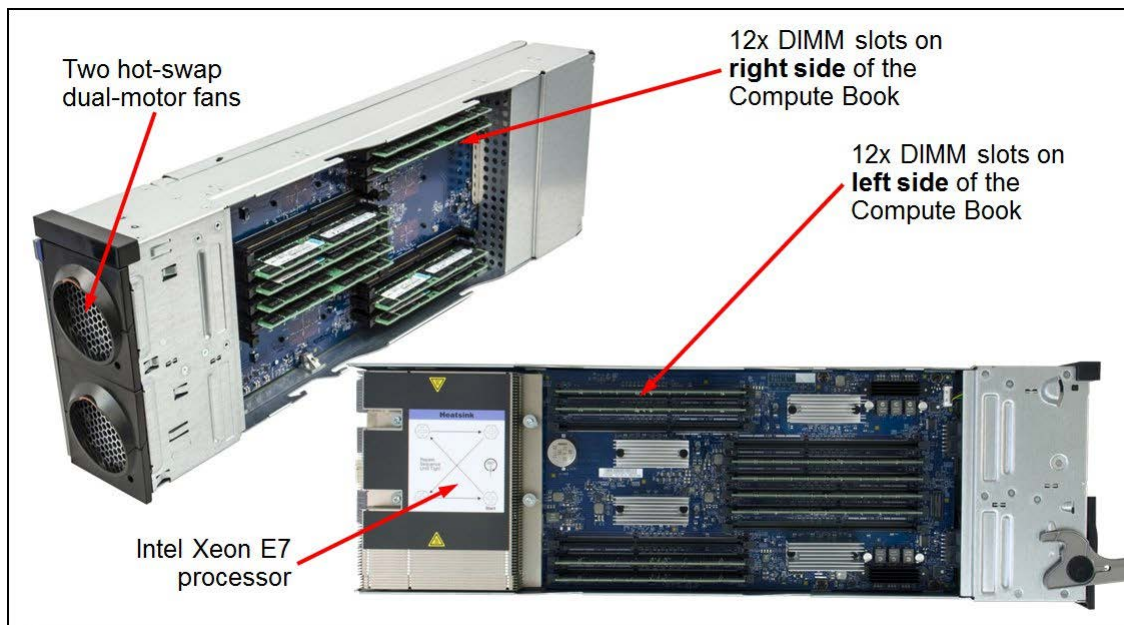


Figure 4. Compute Book

The following table shows the processor options, grouped as follows:

- E7-4800 v4 processors in Compute Books with TruDDR4 support
- E7-8800 v4 processors in Compute Books with TruDDR4 support
- E7-4800 v4 processors in Compute Books with TruDDR4 support (12 DIMMs) (China only)
- E7-8800 v4 processors in Compute Books with TruDDR4 support (12 DIMMs) (China only)
- E7-4800 v3 processors in Compute Books with DDR3 support (24 DIMMs)
- E7-8800 v3 processors in Compute Books with DDR3 support (24 DIMMs)
- E7-4800 v3 processors in Compute Books with TruDDR4 support (24 DIMMs)
- E7-8800 v3 processors in Compute Books with TruDDR4 support (24 DIMMs)
- E7-4800 v3 processors in Compute Books with TruDDR4 support (12 DIMMs) (China only)
- E7-8800 v3 processors in Compute Books with TruDDR4 support (12 DIMMs) (China only)

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. All Compute Books installed in a server must be identical.

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 5. Processor options

Part number Feature codes‡	Description (processor installed in a Compute Book)	L3 cache	QPI speed	Memory support	Memory bus speed (RAS / Performance)†	HT	TB	Models where used
Intel Xeon E7-4800 v4 processors (not supported in the x3950 X6)								
00WH302 ATX1 / ATXR	X6 Compute Book E7-4809 v4 8C 2.1GHz 20M 115W	20 MB	6.4 GHz	TruDDR4	1866 MHz / 1333 MHz	Y	N	14x
00WH306 ATX2 / ATXS	X6 Compute Book E7-4820 v4 10C 2.0GHz 25M 115W	25 MB	6.4 GHz	TruDDR4	1866 MHz / 1333 MHz	Y	N	24x, E1U
00WH310 ATX3 / ATXT	X6 Compute Book E7-4830 v4 14C 2.0GHz 35M 115W	35 MB	8 GHz	TruDDR4	1866 MHz / 1333 MHz	Y	Y	-
00WH314 ATX4 / ATXU	X6 Compute Book E7-4850 v4 16C 2.1GHz 40M 115W	40 MB	8 GHz	TruDDR4	1866 MHz / 1333 MHz	Y	Y	44x, E2U
Intel Xeon E7-8800 v4 processors (also supported in the x3950 X6)								
00KH384 ATWZ / ATYF	X6 Compute Book E7-8855 v4 14C 2.1GHz 35M 140W	35 MB	8 GHz	TruDDR4	1866 MHz / 1333 MHz	Y	Y	-
00WH322 ATX6 / ATXW	X6 Compute Book E7-8860 v4 18C 2.2GHz 45M 140W	45 MB	9.6 GHz	TruDDR4	1866 MHz / 1600 MHz	Y	Y	54x
00WH318 ATX5 / ATXV	X6 Compute Book E7-8867 v4 18C 2.4GHz 45M 165W	45 MB	9.6 GHz	TruDDR4	1866 MHz / 1600 MHz	Y	Y	-
00WH326 ATX7 / ATXX	X6 Compute Book E7-8870 v4 20C 2.1GHz 50M 140W	50 MB	9.6 GHz	TruDDR4	1866 MHz / 1600 MHz	Y	Y	-
00WH330 ATX8 / ATXY	X6 Compute Book E7-8880 v4 22C 2.2GHz 55M 150W	55 MB	9.6 GHz	TruDDR4	1866 MHz / 1600 MHz	Y	Y	HANA models
00WH334 ATX9 / ATXZ	X6 Compute Book E7-8890 v4 24C 2.2GHz 60M 165W	60 MB	9.6 GHz	TruDDR4	1866 MHz / 1600 MHz	Y	Y	94x, E3U
00WH342 ATXB / ATY1	X6 Compute Book E7-8891 v4 10C 2.8GHz 60M 165W	60 MB	9.6 GHz	TruDDR4	1866 MHz / 1600 MHz	Y	Y	-
00WH346 ATXC / ATY2	X6 Compute Book E7-8893 v4 4C 3.2GHz 60M 140W	60 MB	9.6 GHz	TruDDR4	1866 MHz / 1600 MHz	Y	Y	-
00YG935 AVR6 / AVR7	X6 Compute Book E7-8894 v4 24C 2.4GHz 60M 165W	60 MB	9.6 GHz	TruDDR4	1866 MHz / 1600 MHz	Y	Y	-
Intel Xeon E7-4800 v4 processors – 12 DIMMs max (For use with x3850 X6 Essential only)								
00WH352 ATXD / ATY3	X6 E Compute Book E7-4809 v4 8C 2.1GHz 115W	20 MB	6.4 GHz	TruDDR4	1866 MHz / 1333 MHz	Y	N	1RC
00WH356 ATXE / ATY4	X6 E Compute Book E7-4820 v4 10C 2.0GHz 115W	25 MB	6.4 GHz	TruDDR4	1866 MHz / 1333 MHz	Y	N	2RC
00WH360 ATXF / ATY5	X6 E Compute Book E7-4830 v4 14C 2.0GHz 115W	35 MB	8 GHz	TruDDR4	1866 MHz / 1333 MHz	Y	Y	
00WH364 ATXG / ATY6	X6 E Compute Book E7-4850 v4 16C 2.1GHz 115W	40 MB	8 GHz	TruDDR4	1866 MHz / 1333 MHz	Y	Y	4RC
Intel Xeon E7-8800 v4 processors – 12 DIMMs max (For use with x3850 X6 Essential only)								
00WG370 ATND / ATNR	X6 DDR4 E Compute Book E7-8860 v3 16C 2.2GHz	35 MB	8 GHz	TruDDR4	1866 MHz / 1333 MHz	Y	Y	5RC
00WG366 ATNC / ATNQ	X6 DDR4 E Compute Book E7-8867 v3 16C 2.5GHz	45 MB	9.6 GHz	TruDDR4	1866 MHz / 1600 MHz	Y	Y	
00WG374 ATNE / ATNS	X6 DDR4 E Compute Book E7-8870 v3 18C 2.1GHz	45 MB	9.6 GHz	TruDDR4	1866 MHz / 1600 MHz	Y	Y	

Part number Feature codes†	Description (processor installed in a Compute Book)	L3 cache	QPI speed	Memory support	Memory bus speed (RAS / Performance)†	HT	TB	Models where used
00WG378 ATNF / ATNT	X6 DDR4 E Compute Book E7-8880 v3 18C 2.3GHz	50 MB	9.6 GHz	TruDDR4	1866 MHz / 1600 MHz	Y	Y	
00WG386 ATNH / ATNV	X6 DDR4 E Compute Book E7-8880L v3 18C 2.0GHz	55 MB	9.6 GHz	TruDDR4	1866 MHz / 1600 MHz	Y	Y	
00WG382 ATNG / ATNU	X6 DDR4 E Compute Book E7-8890 v3 18C 2.5GHz	60 MB	9.6 GHz	TruDDR4	1866 MHz / 1600 MHz	Y	Y	9RC
00WG390 ATNJ / ATNW	X6 DDR4 E Compute Book E7-8891 v3 10C 2.8GHz	60 MB	9.6 GHz	TruDDR4	1866 MHz / 1600 MHz	Y	Y	
00WG394 ATNK / ATNX	X6 DDR4 E Compute Book E7-8893 v3 4C 3.2GHz	60 MB	9.6 GHz	TruDDR4	1866 MHz / 1600 MHz	Y	Y	
00YG937 AVR8 / AVR9	X6 Compute Book E7-8894 v4 24C 2.4GHz 60M 165W	60 MB	9.6 GHz	TruDDR4	1866 MHz / 1600 MHz	Y	Y	-
Intel Xeon E7-4800 v3 processors with support for DDR3 memory (not supported in the x3950 X6)								
00ML902 AS7T / AS8H	X6 DDR3 Compute Book E7-4809 v3 8C 2.0GHz 115W	20 MB	6.4 GHz	DDR3	1333 MHz / 1333 MHz	Y	N	D4x
00ML906 AS7U / AS8J	X6 DDR3 Compute Book E7-4820 v3 10C 1.9GHz 115W	25 MB	6.4 GHz	DDR3	1333 MHz / 1333 MHz	Y	N	F1x
00ML910 AS7V / AS8K	X6 DDR3 Compute Book E7-4830 v3 12C 2.1GHz 115W	30 MB	8 GHz	DDR3	1600 MHz / 1333 MHz	Y	Y	-
00ML914 AS7W / AS8L	X6 DDR3 Compute Book E7-4850 v3 14C 2.2GHz 115W	35 MB	8 GHz	DDR3	1600 MHz / 1333 MHz	Y	Y	F3x
Intel Xeon E7-8800 v3 processors with support for DDR3 memory (also supported in the x3950 X6)								
00ML922 AS7X / AS8M	X6 DDR3 Compute Book E7-8860 v3 16C 2.2GHz 140W	40 MB	9.6 GHz	DDR3	1600 MHz / 1600 MHz	Y	N	G1x
00FP692 AS7R / AS8F	X6 DDR3 Compute Book E7-8867 v3 16C 2.5GHz 165W	45 MB	9.6 GHz	DDR3	1600 MHz / 1600 MHz	Y	N	-
00ML926 AS7Y / AS8N	X6 DDR3 Compute Book E7-8870 v3 18C 2.1GHz 140W	45 MB	9.6 GHz	DDR3	1600 MHz / 1600 MHz	Y	Y	-
00ML930 AS7Z / AS8P	X6 DDR3 Compute Book E7-8880 v3 18C 2.3GHz 150W	45 MB	9.6 GHz	DDR3	1600 MHz / 1600 MHz	Y	Y	HANA models
00ML938 AS81 / AS8R	X6 DDR3 Compute Book E7-8880L v3 18C 2.0GHz 115W	45 MB	9.6 GHz	DDR3	1600 MHz / 1600 MHz	Y	Y	-
00ML934 AS80 / AS8Q	X6 DDR3 Compute Book E7-8890 v3 18C 2.5GHz 165W	45 MB	9.6 GHz	DDR3	1600 MHz / 1600 MHz	Y	Y	G3x
00ML942 AS82 / AS8S	X6 DDR3 Compute Book E7-8891 v3 10C 2.8GHz 165W	45 MB	9.6 GHz	DDR3	1600 MHz / 1600 MHz	Y	Y	-
00ML946 AS83 / AS8T	X6 DDR3 Compute Book E7-8893 v3 4C 3.2GHz 140W	45 MB	9.6 GHz	DDR3	1600 MHz / 1600 MHz	Y	Y	-
Intel Xeon E7-4800 v3 processors with support for TruDDR4 memory (not supported in the x3950 X6)								
00ML950 AS84 / AS8U	X6 DDR4 Compute Book E7-4809 v3 8C 2.0GHz 115W	20 MB	6.4 GHz	TruDDR4	1866 MHz / 1333 MHz	Y	N	D5x
00ML954 AS85 / AS8V	X6 DDR4 Compute Book E7-4820 v3 10C 1.9GHz 115W	25 MB	6.4 GHz	TruDDR4	1866 MHz / 1333 MHz	Y	N	F2x
00ML958 AS86 / AS8W	X6 DDR4 Compute Book E7-4830 v3 12C 2.1GHz 115W	30 MB	8 GHz	TruDDR4	1866 MHz / 1333 MHz	Y	Y	-

Part number Feature codes†	Description (processor installed in a Compute Book)	L3 cache	QPI speed	Memory support	Memory bus speed (RAS / Performance)†	HT	TB	Models where used
00ML962 AS87 / AS8X	X6 DDR4 Compute Book E7-4850 v3 14C 2.2GHz 115W	35 MB	8 GHz	TruDDR4	1866 MHz / 1333 MHz	Y	Y	F4x
Intel Xeon E7-8800 v3 processors with support for TruDDR4 memory (also supported in the x3950 X6)								
00ML970 AS88 / AS8Y	X6 DDR4 Compute Book E7-8860 v3 16C 2.2GHz 140W	40 MB	9.6 GHz	TruDDR4	1866 MHz / 1600 MHz	Y	Y	G2x
00FP696 AS7S / AS8G	X6 DDR4 Compute Book E7-8867 v3 16C 2.5GHz 165W	45 MB	9.6 GHz	TruDDR4	1866 MHz / 1600 MHz	Y	Y	-
00ML974 AS89 / AS8Z	X6 DDR4 Compute Book E7-8870 v3 18C 2.1GHz 140W	45 MB	9.6 GHz	TruDDR4	1866 MHz / 1600 MHz	Y	Y	-
00ML978 AS8A / AS90	X6 DDR4 Compute Book E7-8880 v3 18C 2.3GHz 150W	45 MB	9.6 GHz	TruDDR4	1866 MHz / 1866 MHz	Y	Y	HANA models
00ML986 AS8C / AS92	X6 DDR4 Compute Book E7-8880L v3 18C 2.0GHz 115	45 MB	9.6 GHz	TruDDR4	1866 MHz / 1600 MHz	Y	Y	-
00ML982 AS8B / AS91	X6 DDR4 Compute Book E7-8890 v3 18C 2.5GHz 165W	45 MB	9.6 GHz	TruDDR4	1866 MHz / 1600 MHz	Y	Y	G4x
00ML990 AS8D / AS93	X6 DDR4 Compute Book E7-8891 v3 10C 2.8GHz 165W	45 MB	9.6 GHz	TruDDR4	1866 MHz / 1600 MHz	Y	Y	-
00ML994 AS8E / AS94	X6 DDR4 Compute Book E7-8893 v3 4C 3.2GHz 140W	45 MB	9.6 GHz	TruDDR4	1866 MHz / 1600 MHz	Y	Y	-
Intel Xeon E7-4800 v3 processors with support for TruDDR4 memory – 12 DIMMs max (For use with x3850 X6 Essential only)								
00WG350 ATN8 / ATNL	X6 DDR4 E Compute Book E7-4809 v3 8C 2.0GHz	20 MB	6.4 GHz	TruDDR4 12 DIMMs	1866 MHz / 1333 MHz	Y	N	AAC
00WG354 ATN9 / ATNM	X6 DDR4 E Compute Book E7-4820 v3 10C 1.9GHz	25 MB	6.4 GHz	TruDDR4 12 DIMMs	1866 MHz / 1333 MHz	Y	N	ABC
00WG358 ATNA / ATNN	X6 DDR4 E Compute Book E7-4830 v3 12C 2.1GHz	30 MB	8 GHz	TruDDR4 12 DIMMs	1866 MHz / 1333 MHz	Y	Y	-
00WG362 ATNB / ATNP	X6 DDR4 E Compute Book E7-4850 v3 14C 2.2GHz	35 MB	8 GHz	TruDDR4 12 DIMMs	1866 MHz / 1333 MHz	Y	Y	ACC
Intel Xeon E7-8800 v3 processors with support for TruDDR4 memory – 12 DIMMs max (For use with x3850 X6 Essential only)								
00WG370 ATND / ATNR	X6 DDR4 E Compute Book E7-8860 v3 16C 2.2GHz	40 MB	9.6 GHz	TruDDR4 12 DIMMs	1866 MHz / 1600 MHz	Y	Y	ADC
00WG366 ATNC / ATNQ	X6 DDR4 E Compute Book E7-8867 v3 16C 2.5GHz	45 MB	9.6 GHz	TruDDR4 12 DIMMs	1866 MHz / 1600 MHz	Y	Y	-
00WG374 ATNE / ATNS	X6 DDR4 E Compute Book E7-8870 v3 18C 2.1GHz	45 MB	9.6 GHz	TruDDR4 12 DIMMs	1866 MHz / 1600 MHz	Y	Y	-
00WG378 ATNF / ATNT	X6 DDR4 E Compute Book E7-8880 v3 18C 2.3GHz	45 MB	9.6 GHz	TruDDR4 12 DIMMs	1866 MHz / 1866 MHz	Y	Y	-
00WG386 ATNH / ATNV	X6 DDR4 E Compute Book E7-8880L v3 18C 2.0GHz	45 MB	9.6 GHz	TruDDR4 12 DIMMs	1866 MHz / 1600 MHz	Y	Y	-
00WG382 ATNG / ATNU	X6 DDR4 E Compute Book E7-8890 v3 18C 2.5GHz	45 MB	9.6 GHz	TruDDR4 12 DIMMs	1866 MHz / 1600 MHz	Y	Y	AEC
00WG390 ATNJ / ATNW	X6 DDR4 E Compute Book E7-8891 v3 10C 2.8GHz	45 MB	9.6 GHz	TruDDR4 12 DIMMs	1866 MHz / 1600 MHz	Y	Y	-
00WG394 ATNK / ATNX	X6 DDR4 E Compute Book E7-8893 v3 4C 3.2GHz	45 MB	9.6 GHz	TruDDR4 12 DIMMs	1866 MHz / 1600 MHz	Y	Y	-

‡ The first feature code is for the first Compute Book. The second feature code is for all additional Compute Books
 † 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 models 6241-A4x and 6241-D5x. No other server model or CTO configuration supports one processor.

Memory options

The x3850 X6 (6241) supports either DDR3 or TruDDR4 memory, depending on the Compute Books used in the server. The x3850 X6 Essential (6241) supports TruDDR4 memory only.

The x3850 X6 and x3850 X6 Essential support TruDDR4 memory operating at speeds up to 1866 MHz. Note that even though supported TruDDR4 DIMMs are rated at 2400 MHz or 2133 MHz, when used in the x3850 X6 or x3850 X6 Essential, they operate at speeds up to 1866 MHz.

Lenovo TruDDR4 Memory uses the highest quality components that are sourced from Tier 1 DRAM suppliers and only memory that meets the strict requirements of Lenovo is selected. It is compatibility tested and tuned to maximize performance and reliability.

TruDDR4 Memory has a unique signature that is programmed into the DIMM that enables System x® servers to verify whether the memory that is installed is qualified or supported by Lenovo. Because TruDDR4 Memory is authenticated, certain extended memory performance features can be enabled to extend performance over industry standards.

The x3850 X6 supports DDR3 memory at speeds up to 1600 MHz. 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 TruDDR4 and DDR3 memory automatically assumes the system warranty, and Lenovo provides service and support worldwide.

The x3850 X6 supports up to 96 DIMMs when all four Compute Books are installed with 24 DIMMs per processor. Each processor has eight memory channels and 3 DIMMs per channel. The 8 memory channels are connected to the processor via four SMI2 memory buffers. The processor, memory buffers and the corresponding memory DIMM slots are all in the Compute Book.

The x3850 X6 Essential supports up to 48 DIMMs when all four Compute Books are installed and 12 DIMMs are installed in each Compute Book. Each processor has four memory channels and 3 DIMMs per channel. The 4 memory channels are connected to the processor via two SMI2 memory buffers. The processor, memory buffers and the corresponding memory DIMM slots are all in the Compute Book.

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

Table 6. Memory options

Part number	Feature code	Description	Maximum supported x3850 X6	Maximum supported x3850 X6 Essential	Models where used
2400 MHz TruDDR4 RDIMMs and LRDIMMs (for use with E7 v4 processors)					
46W0821	ATC8	8GB TruDDR4 Memory (1Rx4, 1.2V) PC4-19200 CL17 2400MHz LP RDIMM	96 (24 per CPU)	48 (12 per CPU)	14x
46W0829	ATCA	16GB TruDDR4 Memory (2Rx4, 1.2V)	96	48	All other v4 models

Part number	Feature code	Description	Maximum supported x3850 X6	Maximum supported x3850 X6 Essential	Models where used
		PC4-19200 CL17 2400MHz LP RDIMM	(24 per CPU)	(12 per CPU)	
46W0833	ATCB	32GB TruDDR4 Memory (2Rx4, 1.2V) PC4-19200 CL17 2400MHz LP RDIMM	96 (24 per CPU)	48 (12 per CPU)	8Cx, 8Fx, 8Hx, 8Jx
46W0841	ATGG	64GB TruDDR4 Memory (4Rx4, 1.2V) PC4-19200 CL17 2400MHz LP LRDIMM	96 (24 per CPU)	48 (12 per CPU)	-
2133 MHz TruDDR4 RDIMMs and LRDIMMs (for use with E7 v3 processors, also supported with E7 v4)					
46W0788	A5B5	8GB TruDDR4 Memory (1Rx4, 1.2V) PC4-17000 CL15 2133MHz LP RDIMM	96 (24 per CPU)	48 (12 per CPU)	D5x
46W0796	A5B7	16GB TruDDR4 Memory (2Rx4, 1.2V) PC4-17000 CL15 2133MHz LP RDIMM	96 (24 per CPU)	48 (12 per CPU)	F2x, F4x, G2x, G4x
95Y4808	A5UJ	32GB TruDDR4 Memory (2Rx4, 1.2V) PC4-17000 CL15 2133MHz LP RDIMM	96 (24 per CPU)	48 (12 per CPU)	-
00KH391†	AUF3	32GB TruDDR4 Memory (4Rx4, 1.2V) PC4-17000 CL15 2133MHz LP LRDIMM	96 (24 per CPU)	48 (12 per CPU)	-
95Y4812	A5UK	64GB TruDDR4 Memory (4Rx4, 1.2V) PC4-17000 CL15 2133MHz LP LRDIMM	96 (24 per CPU)	48 (12 per CPU)	-
DDR3 RDIMMs and LRDIMMs (for use with E7 v2 and v3 processors, except for 00D5024)					
00D5024**	A3QE	4GB (1x4GB, 1Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	96 (24 per CPU)	No support	-
00D5036	A3QH	8GB (1x8GB, 1Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	96 (24 per CPU)	No support	A4x, B1x, B3x, C1x, C4x, D4x
46W0672	A3QM	16GB (1x16GB, 2Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	96 (24 per CPU)	No support	F1x, F3x, G1x, G3x
46W0676	A3SR	32GB (1x32GB, 4Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP LRDIMM	96 (24 per CPU)	No support	-
46W0741*	A451	64GB (1x64GB, 8Rx4, 1.35V) PC3-10600 DDR3 1333MHz LP LRDIMM	96 (24 per CPU)	No support	-

* Withdrawn from marketing

** 00D5024 is supported only in Compute Books with E7 v2 processors

† 00KH391 is supported only in Compute Books with E7-8880 v3 or E7-8890 v3 processors; no other memory DIMM is supported if 00KH391 is installed

The following rules apply when selecting the memory configuration:

- The server supports RDIMMs and LRDIMMs.
- DDR4 Compute Books support mixing 2133 MHz and 2400 MHz DDR4 memory
- Mixing different types of memory (RDIMMs and LRDIMMs) is not supported.
- Mixing different generations of memory (DDR3 and TruDDR4) is not supported
- The x3850 X6 Essential does not support DDR3 memory.
- The maximum number of ranks per one memory 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 following tables show the characteristics of the supported DIMMs. Table 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 7. Maximum memory speeds - 2400 MHz TruDDR4 memory

Specification	TruDDR4 RDIMMs		TruDDR4 LRDIMMs
	Single rank	Dual rank	Quad rank
Rank			
Part numbers	46W0821 (8 GB)	46W0829 (16 GB) 46W0833 (32 GB)	46W0841 (64 GB)
Rated speed	2400 MHz	2400 MHz	2400 MHz
Rated voltage	1.2 V	1.2 V	1.2 V
Operating voltage	1.2 V	1.2 V	1.2 V
Maximum quantity*	96 / 48	96 / 48	96 / 48
Largest DIMM	8 GB	16 GB	64 GB
Max memory capacity*	768 GB / 384 GB	1.5 TB / 768 GB	6 TB / 3 TB
Maximum operating speed - Performance mode (2:1 mode - SMI2 link operates at twice the speed shown)			
1 DIMM per channel	1600 MHz	1600 MHz	1600 MHz
2 DIMMs per channel	1600 MHz	1600 MHz	1600 MHz
3 DIMMs per channel	1600 MHz	1600 MHz†	1600 MHz
Maximum operating speed - RAS mode (1:1 mode - SMI2 link operates at the speed shown)			
1 DIMM per channel	1866 MHz	1866 MHz	1866 MHz
2 DIMMs per channel	1866 MHz	1866 MHz	1866 MHz
3 DIMMs per channel	1600 MHz	1600 MHz†	1600 MHz

* Maximum quantity supported is shown for all processors that are installed (x3850 X6 / x3850 X6 Essential)

† This speed is achieved only when Lenovo TruDDR4 memory is used

Table 8. Maximum memory speeds - 2133 MHz TruDDR4 memory

Specification	TruDDR4 RDIMMs		TruDDR4 LRDIMMs
	Single rank	Dual rank	Quad rank
Rank	Single rank	Dual rank	Quad rank
Part numbers	46W0788 (8 GB)	46W0796 (16 GB) 95Y4808 (32 GB)	95Y4812 (64 GB)
Rated speed	2133 MHz	2133 MHz	2133 MHz
Rated voltage	1.2 V	1.2 V	1.2 V
Operating voltage	1.2 V	1.2 V	1.2 V
Maximum quantity*	96 / 48	96 / 48	96 / 48
Largest DIMM	8 GB	16 GB	64 GB
Max memory capacity*	768 GB / 384 GB	1.5 TB / 768 GB	6 TB / 3 TB
Maximum operating speed - Performance mode (2:1 mode - SMI2 link operates at twice the speed shown)			
1 DIMM per channel	1600 MHz	1600 MHz	1600 MHz
2 DIMMs per channel	1600 MHz	1600 MHz	1600 MHz
3 DIMMs per channel	1600 MHz	1600 MHz†	1600 MHz
Maximum operating speed - RAS mode (1:1 mode - SMI2 link operates at the speed shown)			
1 DIMM per channel	1866 MHz	1866 MHz	1866 MHz
2 DIMMs per channel	1866 MHz	1866 MHz	1866 MHz
3 DIMMs per channel	1600 MHz	1600 MHz†	1600 MHz

* Maximum quantity supported is shown for all processors that are installed (x3850 X6 / x3850 X6 Essential)

† This speed is achieved only when Lenovo TruDDR4 memory is used

Table 9. Maximum memory speeds - DDR3 memory

DIMM specification	DDR3 RDIMMs				DDR3 LRDIMMs			
	Single rank		Dual rank		Quad rank		8-rank	
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 (not supported with the x3850 X6 Essential)
- 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.

Internal storage

The x3850 X6 server supports 1.8-inch solid-state drives 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
- 4x 2.5-inch PCIe NVMe SSDs
- 2x 2.5-inch PCIe NVMe SSDs + 8x 1.8-inch HDD hot-swap drives
- 2x 2.5-inch PCIe NVMe SSDs + 4x 2.5-inch HDD hot-swap drives

The following figure shows these configurations.

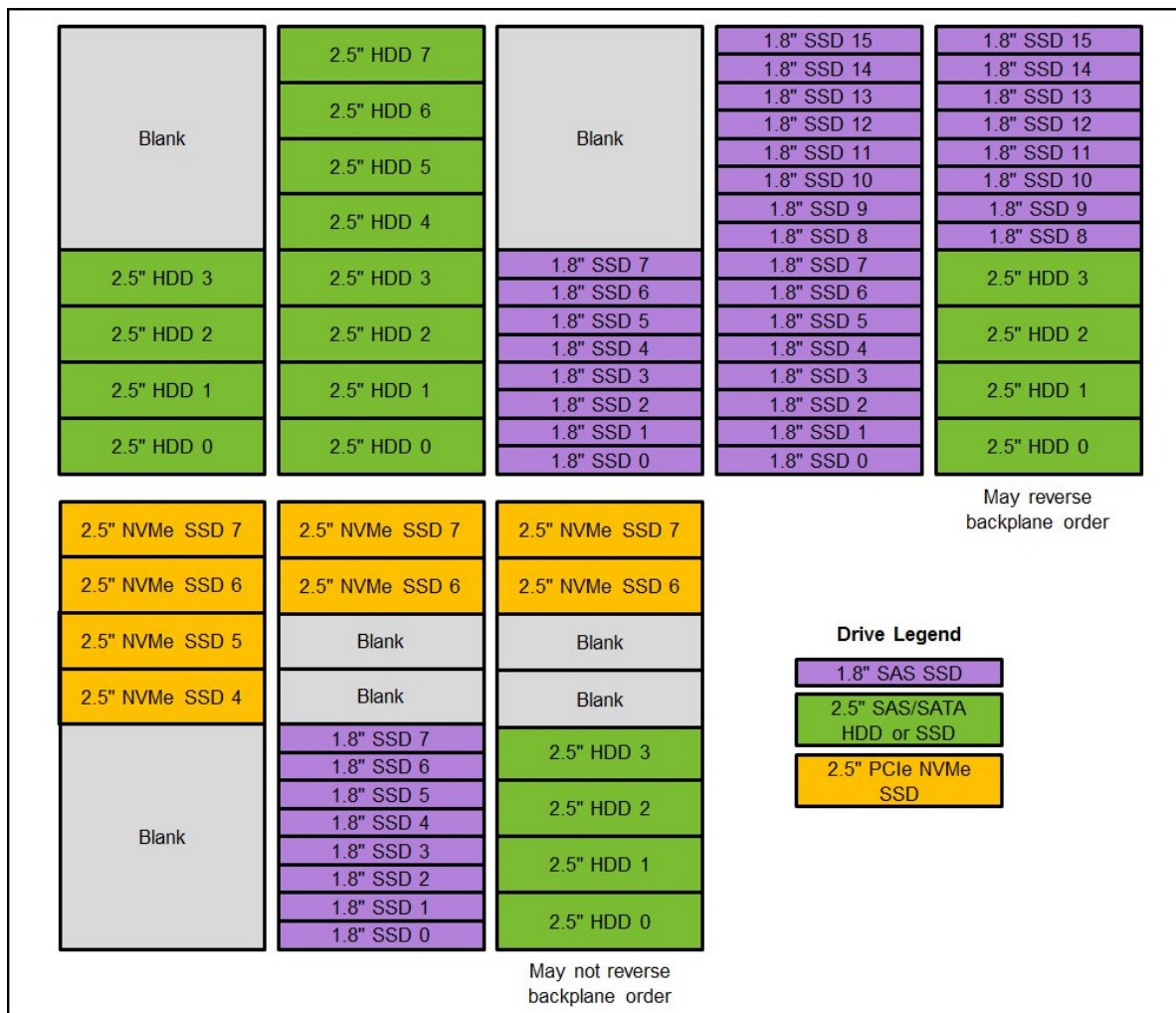


Figure 5. Internal drive configurations

Backplanes

All standard models ship with four 2.5-inch SAS/SATA hot-swap hard disk drive bays, except model 6241-A4x. The following table shows the internal storage expansion options that are available.

Table 10. 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
44X4108	A4A8	1x4 2.5-inch NVMe PCIe Gen3 SSD Backplane	1

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.

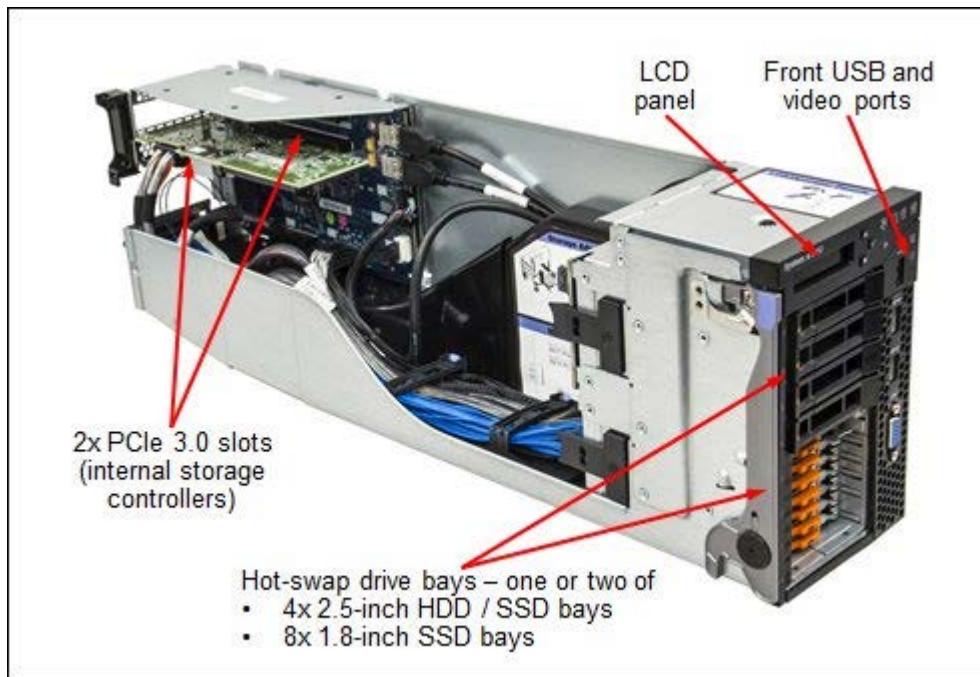


Figure 6. Storage Book

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 11. Drive combinations per Storage Book

Drive combination	Backplanes required	Number of adapters 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

Drive combination	Backplanes required	Number of adapters supported
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
4x 2.5-inch NVMe	1x 4x 2.5-inch NVMe PCIe SSD Backplane, 44X4108	1 or 2*
2x 2.5-inch NVMe + 4x 2.5-inch HDD/SSD	1x 4x 2.5-inch NVMe PCIe SSD Backplane, 44X4108 1x 4x 2.5" HS 12Gb SAS HDD Backplane, 44X4104	2
2x 2.5-inch NVMe + 8x 1.8-inch SSD	1x 4x 2.5-inch NVMe PCIe SSD Backplane, 44X4108 1x 8x 1.8" HS 12Gb SAS HDD Backplane, 44X4106	2

* The number of controllers required is dependent on the number of drives installed: 1 or 2 drives requires one controller, and 3 or 4 drives requires two controllers.

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 12. RAID controllers and HBAs for internal storage

Part number	Feature code	Description	Maximum supported (slot #)	Where used
46C9110	A3YZ	ServeRAID M5210 SAS/SATA Controller	2 (11, 12)	All models
47C8675	A3YY	N2215 SAS/SATA HBA for System x	2 (11, 12)	-
00ML997	AS95	NVMe PCIe SSD Extender Adapter	2 (11, 12)	-
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 following table compares the features of the supported controllers.

Table 13. Feature comparison

Feature	ServeRAID M5210	N2215	NVMe Extender
Adapter type	RAID controller	SAS HBA	PCIe Extender
Part number	46C9110	47C8675	00ML997
Form factor	PCIe low profile	PCIe low profile	PCIe low profile
Controller chip	LSI SAS3108	LSI SAS3008	None
Host interface	PCIe 3.0 x8	PCIe 3.0 x8	PCIe 3.0 x8
Port interface	12 Gbps SAS	12 Gbps SAS	PCIe NVMe
Number of ports	8	8	2
Port connectors	2x Mini-SAS HD x4 (SFF-8643)	2x Mini-SAS HD x4 (SFF-8643)	OCuLink
Drive interface	SAS, SATA	SAS, SATA	NVMe
Drive type	HDD, SSD, SED	HDD, SSD	SSD
Hot-swap drives	Yes	Yes	Yes
Max devices	240	1024	2
RAID levels	0/1/10; Optional 5/50 (RAID 5 FoD, 47C8708, or cache upgrades) Optional 6/60 (47C8706)	None	None
JBOD mode	Yes (without cache)	Yes	Yes
Cache	1 GB no backup (47C8656) 1 GB flash backup (47C8660) 2 GB flash backup (47C8664) 4 GB flash backup (47C8668)	None	None
CacheVault cache protection	Optional	None	None
Performance Accelerator (FastPath)	Optional (47C8710)	No	No
SSD Caching (CacheCade Pro 2.0)	Optional (47C8712)	No	No
SED support (SafeStore)	Yes (with RAID 5 FoD upgrade or any cache upgrade)	No	No

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>

The NVMe PCIe SSD Extender Adapter is a PCIe adapter that simply routes the PCIe 3.0 x8 signal from the slot in the Storage Book, splits the signal to two x4 links, and routes those via cables to the drive backplane. The extender adapter is shown in the following figure.

One adapter is required for every two drives installed in the Storage Book. Since there are only two PCIe slots in the Compute Book, only two adapters can be installed and therefore only four NVMe drives can be installed in a Storage Book.



Figure 7. NVMe PCIe SSD Extender Adapter

Internal drive options

The following tables list the drive options for internal storage.

- Table 15: 2.5-inch 12Gb HDDs
- Table 16: 2.5-inch 6Gb HDDs
- Table 17: 2.5-inch 12Gb SAS/SATA SSDs
- Table 18: 2.5-inch 6Gb SAS/SATA SSDs
- Table 19: 2.5-inch NVMe SSDs
- Table 20: 1.8-inch SSDs

Table 14. 2.5-inch 12Gb HDDs for internal storage

Part number	Feature code	Description	Maximum supported
2.5" 15K 12 Gb SAS HS HDDs			
00WG660	AT84	300GB 15K 12Gbps SAS 2.5" G3HS HDD	8
00WG665	AT85	600GB 15K 12Gbps SAS 2.5" G3HS HDD	8
01GV035	AVKU	900GB 15K 12Gbps SAS 2.5" G3HS 512e HDD	8
2.5" 10K 12 Gb SAS HS HDDs			
00WG685	AT89	300GB 10K 12Gbps SAS 2.5" G3HS HDD	8
00WG690	AT8A	600GB 10K 12Gbps SAS 2.5" G3HS HDD	8
00WG695	AT8B	900GB 10K 12Gbps SAS 2.5" G3HS HDD	8
00WG700	AT8C	1.2TB 10K 12Gbps SAS 2.5" G3HS HDD	8
00NA271	ASBM	1.8TB 10K 12Gbps SAS 2.5" G3HS 512e HDD	8

Part number	Feature code	Description	Maximum supported
2.5" 12 Gb NL SAS HDDs			
00NA491	AT7Z	1TB 7.2K 12Gbps NL SAS 2.5" G3HS HDD	8
00NA496	AT80	2TB 7.2K 12Gbps NL SAS 2.5" G3HS 512e HDD	8
2.5" 10K 12 Gb SAS HS SEDs			
00WG705	AT8D	300GB 10K 12Gbps SAS 2.5" G3HS SED	8
00WG710	AT8E	600GB 10K 12Gbps SAS 2.5" G3HS SED	8
00WG715	AT8F	900GB 10K 12Gbps SAS 2.5" G3HS SED	8
00WG720	AT8G	1.2TB 10K 12Gbps SAS 2.5" G3HS SED	8

Table 15. 2.5-inch 6Gb HDDs for internal storage

Part number	Feature code	Description	Maximum supported
2.5" 6 Gb NL SATA HS HDDs			
00AJ141	A4TX	1TB 7.2K 6Gbps NL SATA 2.5" G3HS HDD	8
00NA526	AT81	2TB 7.2K 6Gbps NL SATA 2.5" G3HS 512e HDD	8

Table 16. 2.5-inch 12Gb SAS/SATA SSDs for internal storage

Part number	Feature code	Description	Maximum supported
2.5" 12 Gb SAS HS SSDs - Enterprise Capacity offerings			
01GR786	AVKV	PM1633a 3.84TB Enterprise Capacity 12Gb SAS G3HS 2.5" SSD	8
01GR771	AUEJ	PM1633a 7.68TB Enterprise Capacity 12Gb SAS G3HS 2.5" SSD	8
2.5" 12 Gb SAS HS SSDs - Enterprise Performance offerings (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
2.5-inch hot-swap SSDs - 12 Gb SAS - Enterprise Mainstream (3-5 DWPD)			
01GV761	AWEY	PM1635a 400GB Enterprise Mainstream 12Gb SAS G3HS 2.5" SSD	8
01GV766	AWEZ	PM1635a 800GB Enterprise Mainstream 12Gb SAS G3HS 2.5" SSD	8
01GV771	AWF0	PM1635a 1.6TB Enterprise Mainstream 12Gb SAS G3HS 2.5" SSD	8
00YC460	AT9M	400GB Enterprise Mainstream 12Gb SAS G3HS 2.5" SSD	8
00YC465	AT9N	800GB Enterprise Mainstream 12Gb SAS G3HS 2.5" SSD	8
00YC470	AT9P	1.6TB Enterprise Mainstream 12Gb SAS G3HS 2.5" SSD	8

Table 17. 2.5-inch 6Gb SAS/SATA SSDs for internal storage

Part number	Feature code	Description	Maximum supported
2.5" 6 Gb SAS HS SSDs - Enterprise Capacity offerings			
00NA671	ASW6	3.84 TB 6 Gb SAS Enterprise Capacity G3HS MLC SSD	8
2.5" 6 Gb SAS HS SSDs - Enterprise Performance offerings (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
00AJ222	A4UD	1.6TB SAS 2.5" MLC G3HS Enterprise SSD	8
2.5" 6 Gb SATA HS SSDs - Enterprise Performance offerings (10+ DWPD)			
00YC320	AT9C	Intel S3710 200GB Enterprise Performance SATA G3HS 2.5" SSD	8
00YC325	AT9D	Intel S3710 400GB Enterprise Performance SATA G3HS 2.5" SSD	8
00YC330	AT9E	Intel S3710 800GB Enterprise Performance SATA G3HS 2.5" SSD	8
2.5" 6 Gb SATA HS SSDs - Enterprise Mainstream offerings (3-5 DWPD)			
00YK212	AU3C	Intel S3610 480GB Enterprise Mainstream SATA G3HS 2.5" SSD	8
00YK217	AU3D	Intel S3610 800GB Enterprise Mainstream SATA G3HS 2.5" SSD	8
00YK222	AU3E	Intel S3610 1.2TB Enterprise Mainstream SATA G3HS 2.5" SSD	8
00YK227	AU3F	Intel S3610 1.6TB Enterprise Mainstream SATA G3HS 2.5" SSD	8
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
2.5" 6 Gb SATA HS SSDs - Enterprise Entry offerings (<3 DWPD)			
01GR726	AUEM	Intel S3520 240GB Enterprise Entry SATA G3HS 2.5" SSD	8
01GR731	AUEP	Intel S3520 480GB Enterprise Entry SATA G3HS 2.5" SSD	8
01GR736	AUER	Intel S3520 960GB Enterprise Entry SATA G3HS 2.5" SSD	8
01GR836	AVHP	PM863a 240GB Enterprise Entry SATA G3HS 2.5" SSD	8
01GR841	AVHQ	PM863a 480GB Enterprise Entry SATA G3HS 2.5" SSD	8
01GR846	AVHR	PM863a 960GB Enterprise Entry SATA G3HS 2.5" SSD	8
01GR711	AUE7	1.92TB Enterprise Entry SATA G3HS 2.5" SSD	8
00WG630	AT95	Intel S3510 480GB Enterprise Entry SATA G3HS 2.5" SSD	8
00WG635	AT96	Intel S3510 800GB Enterprise Entry SATA G3HS 2.5" SSD	8
00YC385	AT8R	120GB Enterprise Entry SATA G3HS 2.5" SSD	8

Part number	Feature code	Description	Maximum supported
00YC390	AT8S	240GB Enterprise Entry SATA G3HS 2.5" SSD	8
00YC395	AT8T	480GB Enterprise Entry SATA G3HS 2.5" SSD	8
00YC400	AT8U	960GB Enterprise Entry SATA G3HS 2.5" SSD	8

Table 18. 2.5-inch NVMe SSDs for internal storage

Part number	Feature code	Description	Maximum supported
2.5" PCIe NVMe solid-state drives - Enterprise Performance offerings (10+ DWPD)			
00YA818	AT7V	Intel P3700 400GB NVMe 2.5" G3HS Enterprise Performance PCIe SSD	4
00YA821	AT7W	Intel P3700 800GB NVMe 2.5" G3HS Enterprise Performance PCIe SSD	4
00YA824	AT7X	Intel P3700 1.6TB NVMe 2.5" G3HS Enterprise Performance PCIe SSD	4
00YA827	AT7Y	Intel P3700 2.0TB NVMe 2.5" G3HS Enterprise Performance PCIe SSD	4
2.5" PCIe NVMe solid-state drives - Enterprise Mainstream offerings (3-5 DWPD)			
90Y3227	A5RW	Intel P3600 400GB NVMe 2.5-inch G3HS Enterprise Value PCIe SSD	4
90Y3230	A5RX	Intel P3600 800GB NVMe 2.5-inch G3HS Enterprise Value PCIe SSD	4
90Y3233	A5RY	Intel P3600 1.6TB NVMe 2.5-inch G3HS Enterprise Value PCIe SSD	4
90Y3236	A5RZ	Intel P3600 2.0TB NVMe 2.5" G3HS Enterprise Value PCIe SSD	4

Table 19. 1.8-inch SSDs for internal storage

Part number	Feature code	Description	Maximum supported
1.8-inch hot-swap SSDs - 6 Gb SATA - Enterprise Mainstream (3-5 DWPD)			
00AJ340	A56W	240GB SATA 1.8" MLC Enterprise Value SSD	16

Internal backup units

The server does not support internal tape drive options.

Optical drives

The server does not support an internal optical drive option, however, you can connect an external USB optical drive. See <http://support.lenovo.com/en/documents/pd011281> for information about available external optical drives from Lenovo.

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.

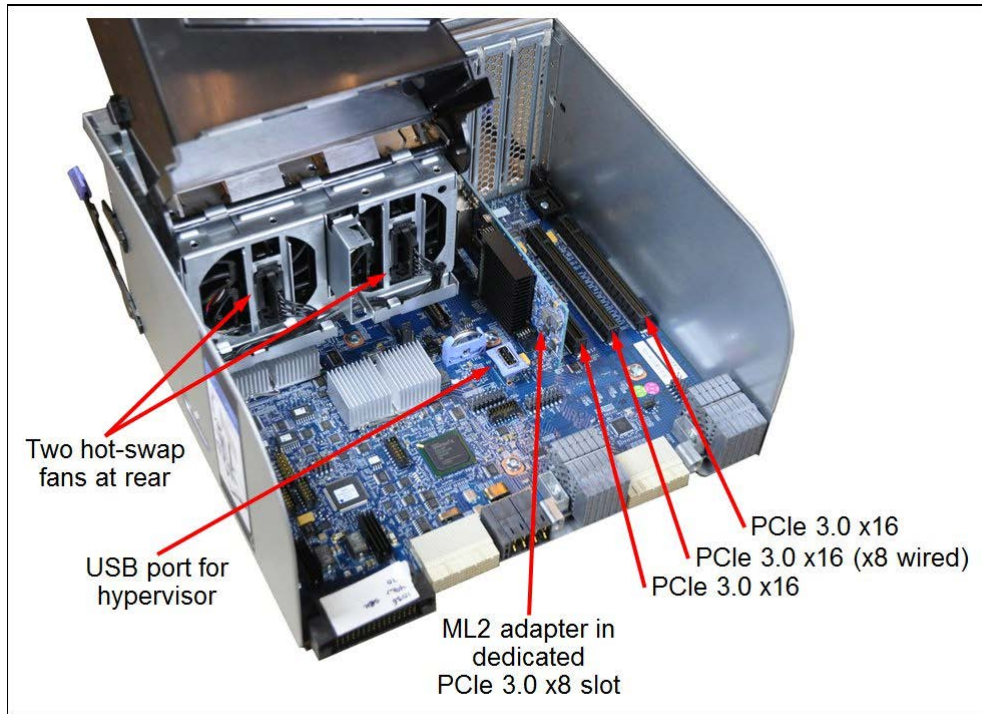


Figure 8. Primary I/O Book

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)

Hot-swap support

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 20. 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).

Optional I/O books

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 21. 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.

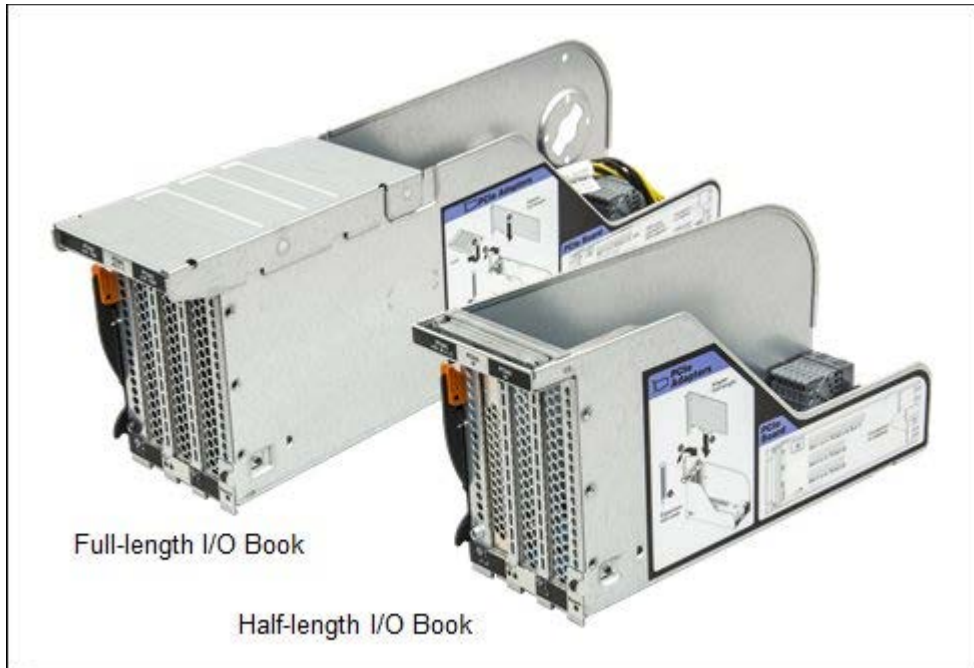


Figure 9. Half-length I/O Book and the Full-length I/O Book

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

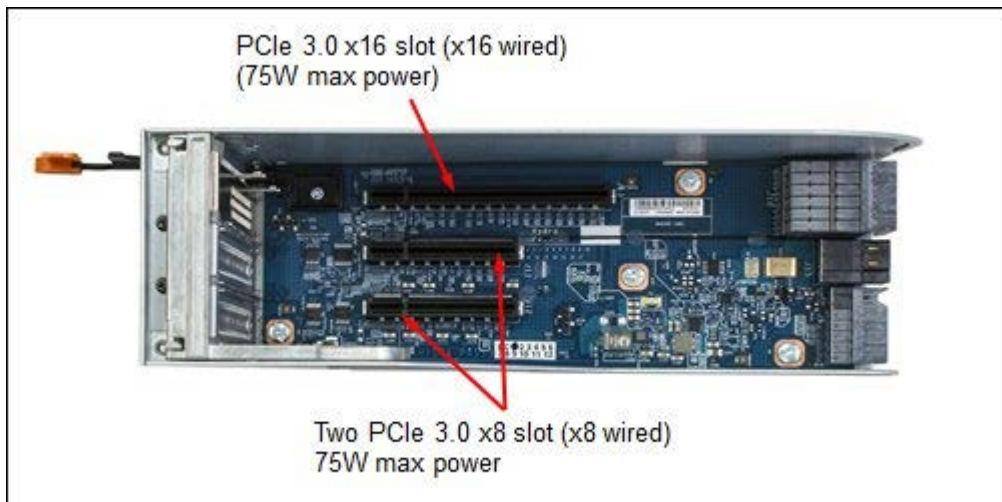


Figure 10. Half-length I/O Book

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.

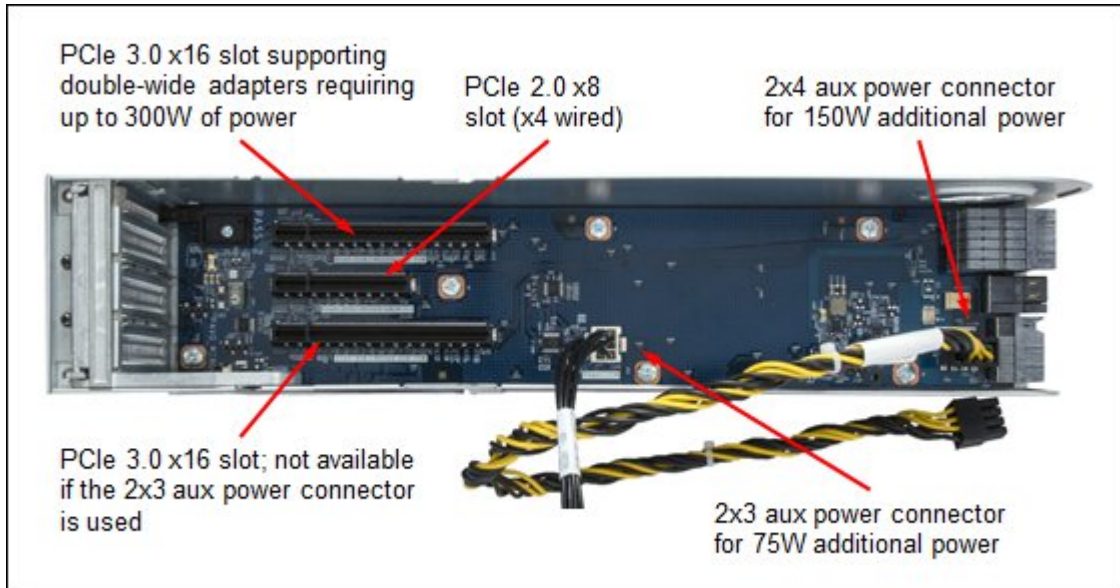


Figure 11. Full-length I/O Book

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.

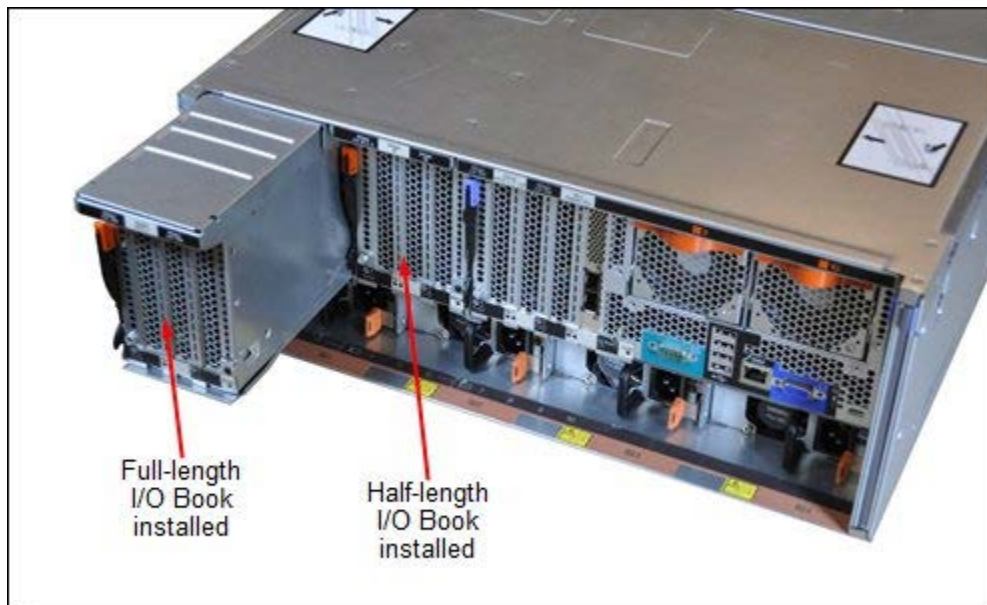


Figure 12. I/O Books that are installed in the x3850 X6

Slot locations

The slot numbering for the PCIe slots in the server are as shown in the following figure.

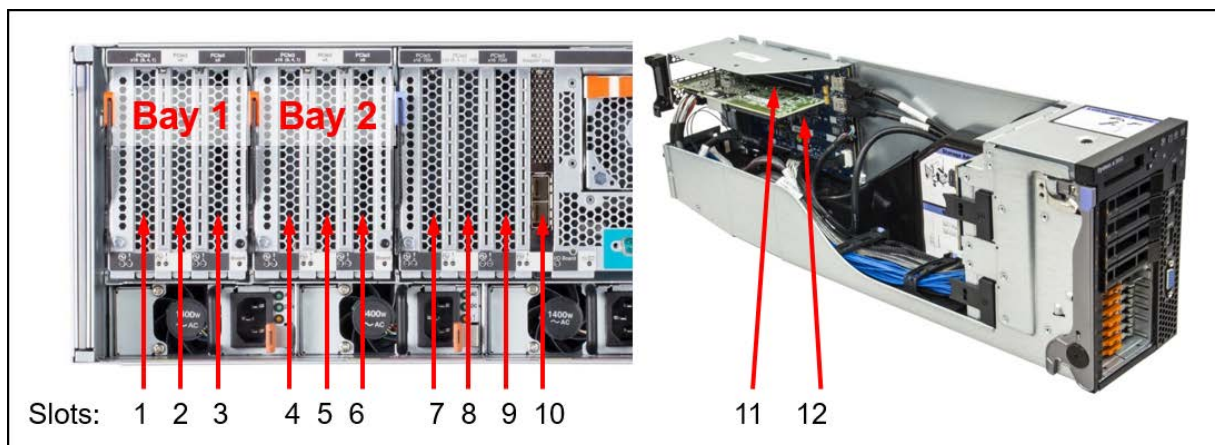


Figure 13. Slot numbering

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. ML2 adapters are installed only in the ML2 slot (slot 10 as show in the Slot locations section).

Table 22. ML2 adapters

Part number	Feature code	Description	Maximum supported (slot #)
25 Gb Ethernet			
00MN990*	ATZR	Mellanox ConnectX-4 Lx ML2 1x25GbE SFP28 Adapter	1* (10)
10 Gb Ethernet			
00D2026	A40S	Broadcom NetXtreme II ML2 Dual Port 10GbaseT for System x	1 (10)
00D2028	A40T	Broadcom NetXtreme II ML2 Dual Port 10GbE SFP+ for System x	1 (10)
00AG560	AT7U	Emulex VFA5.2 ML2 Dual Port 10GbE SFP+ Adapter	1 (10)
01CV770	AU7Z	Emulex VFA5.2 ML2 2x10 GbE SFP+ Adapter and FCoE/iSCSI SW	1 (10)
00D1994	A40P	Intel X540 ML2 Dual Port 10GbaseT Adapter for System x	1 (10)
00JY940*	ATRH	Intel X710-DA2 ML2 2x10GbE SFP+ Adapter	1* (10)
94Y5200	AS74	Intel X710 ML2 4x10GbE SFP+ Adapter for System x	1 (10)
Gigabit Ethernet			
00D1998	A40R	Intel I350-T4 ML2 Quad Port GbE Adapter for System x	1 (10)
InfiniBand			
00FP650	A5RK	Mellanox ConnectX-3 Pro ML2 2x40GbE/FDR VPI Adapter for System x	1 (10)

* Not supported in servers with E7 v2 compute books

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.

The maximum supported column also indicates which slots each adapter is supported in. For slot locations see the Slot locations section.

Table 23. Network adapters

Part number	Feature code	Description	Maximum supported (slot #)
100 Gb Ethernet			
00MM960*	ATRP	Mellanox ConnectX-4 2x100GbE/EDR IB QSFP28 VPI Adapter	4*(1, 4, 7, 9)
40 Gb Ethernet			
00MM950*	ATRN	Mellanox ConnectX-4 Lx 1x40GbE QSFP+ Adapter	9* (1-9)
00D9550	A3PN	Mellanox ConnectX-3 40GbE / FDR IB VPI Adapter for System x	9 (1-9)
25 Gb Ethernet			
01GR250	AUAJ	Mellanox ConnectX-4 Lx 2x25GbE SFP28 Adapter	9 (1-9)
10 Gb Ethernet			
44T1370	A5GZ	Broadcom NetXtreme 2x10GbE BaseT Adapter for System x	9 (1-9)
00AG570	AT7S	Emulex VFA5.2 2x10 GbE SFP+ PCIe Adapter	9 (1-9)
00AG580	AT7T	Emulex VFA5.2 2x10 GbE SFP+ Adapter and FCoE/iSCSI SW	9 (1-9)
00JY830	A5UU	Emulex VFA5 2x10 GbE SFP+ Adapter and FCoE/iSCSI SW for System x	9 (1-9)
00D8540	A4M9	Emulex Dual Port 10GbE SFP+ VFA III-R for System x	9 (1-9)
49Y7960	A2EC	Intel X520 Dual Port 10GbE SFP+ Adapter for System x	9 (1-9)
49Y7970	A2ED	Intel X540-T2 Dual Port 10GBaseT Adapter for System x	9 (1-9)
00MM860*	ATPX	Intel X550-T2 Dual Port 10GBase-T Adapter	9* (1-9)
81Y3520	AS73	Intel X710 2x10GbE SFP+ Adapter for System x	9 (1-9)
00D9690	A3PM	Mellanox ConnectX-3 10 GbE Adapter for System x	9 (1-9)
90Y4600	A3MR	QLogic 8200 Dual Port 10GbE SFP+ VFA for System x	9 (1-9)
Gigabit Ethernet			
90Y9370	A2V4	Broadcom NetXtreme I Dual Port GbE Adapter for System x	9 (1-9)
90Y9352	A2V3	Broadcom NetXtreme I Quad Port GbE Adapter for System x	9 (1-9)
49Y4230	5767	Intel Ethernet Dual Port Server Adapter I340-T2 for System x	9 (1-9)
49Y4240	5768	Intel Ethernet Quad Port Server Adapter I340-T4 for System x	9 (1-9)
00AG500	A56K	Intel I350-F1 1xGbE Fiber Adapter for System x	9 (1-9)
00AG510	A56L	Intel I350-T2 2xGbE BaseT Adapter for System x	9 (1-9)
00AG520	A56M	Intel I350-T4 4xGbE BaseT Adapter for System x	9 (1-9)
InfiniBand			
00D9550	A3PN	Mellanox ConnectX-3 40GbE / FDR IB VPI Adapter for System x	9 (1-9)
00MM960	ATRP	Mellanox ConnectX-4 2x100GbE/EDR IB QSFP28 VPI Adapter	4* (1, 4, 7, 9)

* Not supported in servers with E7 v2 compute books

For more information, see the list of Lenovo Press Product Guides in the Ethernet adapters category and the and the InfiniBand category:

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

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

The following table lists the supported 10Gb Ethernet SFP+ optical transceivers and DAC cables.

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

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

* One transceiver or cable is supported per adapter port. All adapter ports must have the same type of transceiver or DAC cable selected.

The following table lists the optical transceivers and DAC cables that can be used with the supported 40Gb Ethernet adapters listed.

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

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

* One transceiver or cable is supported per adapter port. All adapter ports must have the same type of transceiver or DAC cable selected.

Fibre Channel host bus adapters

The following table lists the Fibre Channel HBAs supported by the x3850 X6. The maximum quantity listed is for configurations with all processors and I/O books installed. The maximum supported column also indicates which slots each adapter is supported in. For slot locations see the Slot locations section.

Table 26. Storage adapters

Part number	Feature code	Description	Maximum supported (Slot #)
Fibre Channel - 16 Gb			
01CV830*	ATZU	Emulex 16Gb Gen6 FC Single-port HBA	9* (1-9)
01CV840*	ATZV	Emulex 16Gb Gen6 FC Dual-port HBA	9* (1-9)
01CV750*	ATZB	QLogic 16Gb Enhanced Gen5 FC Single-port HBA	9* (1-9)
01CV760*	ATZC	QLogic 16Gb Enhanced Gen5 FC Dual-port HBA	9* (1-9)
81Y1655	A2W5	Emulex 16Gb FC Single-port HBA for System x	9 (1-9)
81Y1662	A2W6	Emulex 16Gb FC Dual-port HBA for System x	9 (1-9)
00Y3337	A3KW	QLogic 16Gb FC Single-port HBA for System x	9 (1-9)
00Y3341	A3KX	QLogic 16Gb FC Dual-port HBA for System x	9 (1-9)
Fibre Channel - 8 Gb			
42D0485	3580	Emulex 8 Gb FC Single-port HBA for System x	9 (1-9)
42D0494	3581	Emulex 8 Gb FC Dual-port HBA for System x	9 (1-9)
42D0501	3578	QLogic 8 Gb FC Single-port HBA for System x	9 (1-9)
42D0510	3579	QLogic 8 Gb FC Dual-port HBA for System x	9 (1-9)

* Not supported in servers with E7 v2 compute books

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

SAS adapters for external storage

The following table lists the SAS HBAs and RAID adapters that are supported by the x3850 X6. The maximum quantity listed is for configurations with all processors and I/O books installed. The maximum supported column also indicates which slots each adapter is supported in. For slot locations see the Slot locations section.

Table 27. Storage adapters

Part number	Feature code	Description	Maximum supported (Slot #)
SAS HBAs			
46C9010	A3MV	N2125 SAS/SATA HBA	9 (1-9)
00AE912	A5M0	N2225 SAS/SATA HBA	9 (1-9)
00AE916	A5M1	N2226 SAS/SATA HBA	5 (1, 4, 7, 8, 9)

RAID adapters			
00AE938	A5ND	ServeRAID M5225-2GB SAS/SATA Controller	3
81Y4478	A1WX	ServeRAID M5120 SAS/SATA Controller	3
Features on Demand upgrades for the M5225 (1 per server)			
47C8706	A3Z5	ServeRAID M5200 Series RAID 6 Upgrade-FoD	1
47C8710	A3Z7	ServeRAID M5200 Series Performance Accelerator-FoD	1
47C8712	A3Z8	ServeRAID M5200 Series SSD Caching Enabler-FoD	1
Hardware upgrades for the M5120 (1 per adapter, mutually exclusive)			
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 (1 per server)			
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

The following table compares the specifications of the external SAS HBAs and RAID adapters.

Table 28. Specifications comparison

Feature	N2125	N2225	N2226	ServeRAID M5120	ServeRAID M5225
Adapter type	SAS HBA	SAS HBA	SAS HBA	RAID adapter	RAID adapter
Part number	46C9010	00AE912	00AE916	81Y4478	00AE938
Form factor	Low profile	Low profile	Low profile	Low profile	Low profile
Controller chip	LSI SAS2308	LSI SAS3008	LSI SAS3008	LSI SAS2208	LSI SAS3108
Host interface	PCIe 3.0 x8	PCIe 3.0 x8	PCIe 3.0 x8	PCIe 3.0 x8	PCIe 3.0 x8
Port interface	6 Gbps SAS	12 Gbps SAS	12 Gbps SAS	6 Gbps SAS	12 Gbps SAS
Number of external ports	8	8	16	8	8
External port connectors	2x Mini-SAS (SFF-8088)	2x Mini-SAS HD (SFF-8644)	4x Mini-SAS HD (SFF-8644)	2x Mini-SAS (SFF-8088)	2x Mini-SAS HD (SFF-8644)
Drive interface	SAS, SATA	SAS, SATA	SAS, SATA	SAS, SATA	SAS, SATA
Drive type	HDD, SSD	HDD, SSD	HDD, SSD	HDD, SED, SSD	HDD, SED, SSD
Maximum number of devices	1024	1024	1024	240	240
RAID levels	None	None	None	0/1/10; Optional 5/50 and 6/60	0/1/10/5/50; Optional 6/60 (47C8706)
JBOD mode	Yes	Yes	Yes	No	No
Cache	None	None	None	Optional; 512MB,	2 GB (included)

Feature	N2125	N2225	N2226	ServeRAID M5120	ServeRAID M5225
				1GB or 2GB	
CacheVault cache protection	None	None	None	Flash (with cache upgrades)	Flash (included)
FastPath	None	None	None	Optional (90Y4273)	Optional (47C8710)
CacheCade Pro 2.0	None	None	None	Optional (90Y4318)	Optional (47C8712)

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 adapters, see these Lenovo Press Product Guides:

- N2125: <http://lenovopress.com/tips1062>
- N2225 & N2226: <http://lenovopress.com/tips1175>
- ServeRAID M5120: <http://lenovopress.com/tips0858>
- ServeRAID M5225: <http://lenovopress.com/tips1258>

PCIe Flash Storage adapters

The server supports the Flash Storage adapters that are listed in the following table. The maximum quantity listed is for configurations with all processors and I/O books installed. The maximum supported column also indicates which slots each adapter is supported in. For slot locations see the Slot locations section.

Table 29. Flash Storage adapters

Part number	Feature code	Description	Form Factor	Maximum Supported (Slot #)
00YA800	AT7N	io3 1.25TB Enterprise Mainstream Flash Adapter	Low profile	6 (1, 3, 4, 6, 7, 9)
00YA803	AT7P	io3 1.6TB Enterprise Mainstream Flash Adapter	Low profile	6 (1, 3, 4, 6, 7, 9)
00YA806	AT7Q	io3 3.2TB Enterprise Mainstream Flash Adapter	Low profile	6 (1, 3, 4, 6, 7, 9)
00YA809	AT7R*	io3 6.4TB Enterprise Mainstream Flash Adapter	FH / HL	9 (1-9)
00YA812	AT7L	P3700 1.6TB NVMe Enterprise Performance Flash Adapter	Low profile	9 (1-9)
00YA815	AT7M	P3700 2.0TB NVMe Enterprise Performance Flash Adapter	Low profile	9 (1-9)
00AE995	ARYP	1000GB Enterprise io3 Flash Adapter	Low profile	6 (1, 3, 4, 6, 7, 9)
00AE998	ARYQ	1300GB Enterprise io3 Flash Adapter	Low profile	6 (1, 3, 4, 6, 7, 9)
00JY004	ARYS*	5200GB Enterprise io3 Flash Adapter	FH / HL	9 (1-9)
00JY001	ARYR	2600GB Enterprise io3 Flash Adapter	Low profile	6 (1, 3, 4, 6, 7, 9)

* 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?indocid=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. The maximum supported column indicates which slots each adapter is supported in. For slot locations see the Slot locations section.

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 an NVIDIA GPU is installed, the maximum system memory that can be installed is 1 TB.

Table 30. GPU adapters

Part number	Feature code	Description	Minimum system RAM	Maximum supported (slot #)
00FP672	A3YV†	NVIDIA Quadro K6000	24 GB	2 (1, 4)
00FP676	A5FG†	NVIDIA Tesla K40c	24 GB	2 (1, 4)
90Y2495	AU3W†	NVidia Quadro M6000 24GB GPU, PCIe (active)	24 GB	2 (1, 4)
00YL378*	ATZF†	NVidia Quadro M5000 GPU, PCIe (active)	16 GB	2* (1, 4)

* Not supported in servers with E7 v2 compute books

† 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 31. Power supplies

Part number	Feature code	Description	Maximum supported x3850 X6	Part number
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/support/entry/portal/docdisplay?Indocid=LNVO-PWRCONF>

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 32. Virtualization options

Part number	Feature code	Description	Maximum supported
00WH140	ATRM	Blank USB Memory Key 4G SLC for VMware ESXi Downloads	1
41Y8298	A2G0	Blank USB Memory Key for VMware ESXi Downloads	1
00ML235	ASN7	USB Memory Key for VMware ESXi 5.5 Update 2	1
00WH150*	ATZG	USB Memory Key for VMware ESXi 5.5 Update 3B	1*
00WH138	ATRL	USB Memory Key 4G for VMware ESXi 6.0 Update 1A	1
00WH151*	ATZH	USB Memory Key for VMware ESXi 6.0 Update 2	1*

* Not supported in servers with E7 v2 compute books

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.

Rack installation

All models of the x3850 X6 include a rail kit and cable management bracket kit for installation in a 19-inch rack cabinet. The contents of the kits are shown in the following figure.

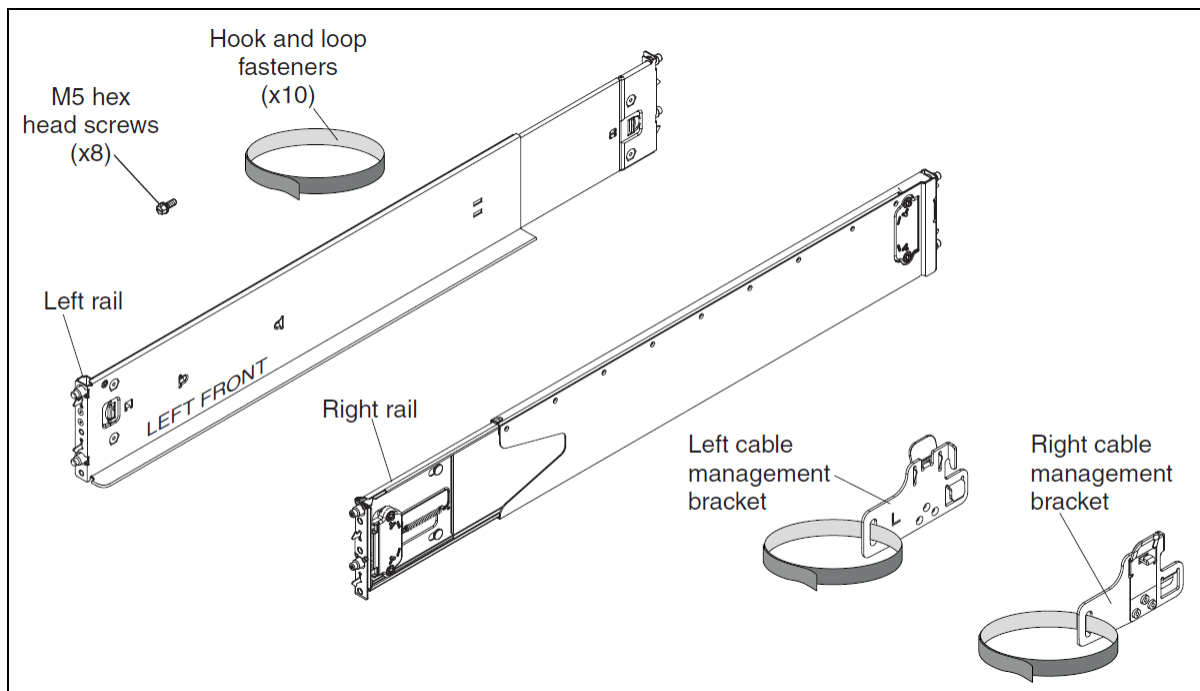


Figure 14. x3850 X6 rail kit and cable management bracket kit

Supported operating systems

The server supports the following operating systems:

- Microsoft Windows Server 2008 R2
- Microsoft Windows Server 2012
- Microsoft Windows Server 2012 R2
- Microsoft Windows Server 2016
- Red Hat Enterprise Linux 6 Server x64 Edition
- Red Hat Enterprise Linux 7

- SUSE LINUX Enterprise Server 11 for AMD64/EM64T
- SUSE LINUX Enterprise Server 11 with Xen for AMD64/EM64T
- SUSE Linux Enterprise Server 12
- SUSE Linux Enterprise Server 12 with XEN
- VMware vSphere 5.1 (ESXi) (Intel Xeon E7 v2 processors only)
- VMware vSphere 5.5 (ESXi) (Intel Xeon E7 v2 and E7 v3 processors only)
- VMware vSphere 6.0 (ESXi)
- VMware vSphere 6.5 (ESXi)

For the latest information about the specific versions and service levels that are supported and any other prerequisites, see the Operating System Interoperability Guide, <http://lenovopress.com/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 (acoustics):
 - 6.6 bels (operating)
 - 6.4 bels (idle)

Warranty options

The Lenovo System x3850 X6 has a three-year warranty with 24x7 standard call center support and 9x5 Next Business Day onsite coverage. Also available are Lenovo Services warranty maintenance upgrades and post-warranty maintenance agreements, with a well-defined scope of services, including service hours, response time, term of service, and service agreement terms and conditions.

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

<https://www-304.ibm.com/sales/gss/download/spst/servicepac/extProductSelectorWWW.do>

The following table explains warranty service definitions in more detail.

Table 33. Warranty service definitions

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

The following Lenovo warranty service upgrades are available:

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

Committed Repair Services enhances the level of Warranty Service Upgrade or Post Warranty/Maintenance Service offering associated with the selected systems. Offerings vary and are available in select countries.

- Priority handling to meet defined time frames to restore the failing machine to good working condition
 - Committed repair service levels are measured within the following coverage hours:
 - 24x7x6: Service performed 24 hours per day, 7 days per week, within 6 hours
 - 24x7x8: Service performed 24 hours per day, 7 days per week, within 8 hours
 - 24x7x24: Service performed 24 hours per day, 7 days per week, within 24 hours
 - Hard Drive Retention
- Lenovo's Hard Drive Retention service is a multi-drive hard drive retention offering that ensures your data is always under your control, regardless of the number of hard drives that are installed in your Lenovo server. In the unlikely event of a hard drive failure, you retain possession of your hard drive while Lenovo replaces the failed drive part. Your data stays safely on your premises, in your hands. The Hard Drive Retention service can be purchased in convenient bundles with our warranty upgrades and extensions.
- Microcode Support
- Keeping microcode current helps prevent hardware failures and security exposure. There are two levels of service: analysis of the installed base and analysis and update where required. Offerings vary by country and can be bundled with other warranty upgrades and extensions.- Remote Technical Support Services (RTS)

RTS provides comprehensive technical call center support for covered servers, storage, operating systems, and applications. Providing a single source for support of hardware and software issues, RTS can reduce problem resolution time, decreasing the cost to address technical problems and increasing uptime. Offerings are available for Windows, Linux, IBM Systems Director, VMware, Microsoft business applications, and Lenovo System x storage devices, and IBM OEM storage devices.

Regulatory compliance

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

Table 34. External expansion enclosures

Part number	Description
64111B1*	Lenovo Storage E1012 LFF Disk Expansion Single SAS IO Module, Rail Kit, 9x5 NBD
64111B2	Lenovo Storage E1012 LFF Disk Expansion Dual SAS IO Module, Rail Kit, 9x5 NBD
64111B3*	Lenovo Storage E1024 SFF Disk Expansion Single SAS IO Module, Rail Kit, 9x5 NBD
64111B4	Lenovo Storage E1024 SFF Disk Expansion Dual SAS IO Module, Rail Kit, 9x5 NBD
70F0 / 70F1**	Lenovo ThinkServer SA120

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

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

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

<http://lenovopress.com/lp0043>

For details about supported adapters, drives and cables for the Lenovo ThinkServer SA120, see the Lenovo Press Product Guide:
<http://lenovopress.com/tips1234>

External storage systems

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

Table 35. External disk storage systems

Part number	Description
Lenovo Network-Attached Storage (NAS connectivity)	
70FX / 70FY*	Lenovo Storage N3310
70G0 / 70G1*	Lenovo Storage N4610
Lenovo Storage S2200	
64112B1	Lenovo Storage S2200 LFF Chassis SAS Single Controller, Rack Kit, 9x5NBD
64112B2	Lenovo Storage S2200 LFF Chassis SAS Dual Controller, Rack Kit, 9x5NBD
64114B1	Lenovo Storage S2200 LFF Chassis FC/iSCSI Single Controller, Rack Kit, 9x5NBD
64114B2	Lenovo Storage S2200 LFF Chassis FC/iSCSI Dual Controller, Rack Kit, 9x5NBD
64112B3	Lenovo Storage S2200 SFF Chassis SAS Single Controller, Rack Kit, 9x5NBD
64112B4	Lenovo Storage S2200 SFF Chassis SAS Dual Controller, Rack Kit, 9x5NBD
64114B3	Lenovo Storage S2200 SFF Chassis FC/iSCSI Single Controller, Rack Kit, 9x5NBD
64114B4	Lenovo Storage S2200 SFF Chassis FC/iSCSI Dual Controller, Rack Kit, 9x5NBD
Lenovo Storage S3200	
64113B1	Lenovo Storage S3200 LFF Chassis SAS Single Controller, Rack Kit, 9x5NBD
64113B2	Lenovo Storage S3200 LFF Chassis SAS Dual Controller, Rack Kit, 9x5NBD
64116B1	Lenovo Storage S3200 LFF Chassis FC/iSCSI Single Controller, Rack Kit, 9x5NBD
64116B2	Lenovo Storage S3200 LFF Chassis FC/iSCSI Dual Controller, Rack Kit, 9x5NBD
64113B3	Lenovo Storage S3200 SFF Chassis SAS Single Controller, Rack Kit, 9x5NBD
64113B4	Lenovo Storage S3200 SFF Chassis SAS Dual Controller, Rack Kit, 9x5NBD
64116B3	Lenovo Storage S3200 SFF Chassis FC/iSCSI Single Controller, Rack Kit, 9x5NBD
64116B4	Lenovo Storage S3200 SFF Chassis FC/iSCSI Dual Controller, Rack Kit, 9x5NBD
IBM Storwize	
6096CU2	IBM Storwize V3500 3.5-inch Dual Control Storage Controller Unit
6096CU3	IBM Storwize V3500 2.5-inch Dual Control Storage Controller Unit
6099L2C	IBM Storwize V3700 3.5-inch Storage Controller Unit
6099S2C	IBM Storwize V3700 2.5-inch Storage Controller Unit

6099T2C	IBM Storwize V3700 2.5-inch DC Storage Controller Unit
6194L2C	IBM Storwize V5000 LFF Control Enclosure
6194S2C	IBM Storwize V5000 SFF Control Enclosure
6195SC5	IBM Storwize V7000 2.5-inch Storage Controller Unit

* Machine Type; see the respective Product Guide in the Network-Attached Storage category for available models.

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

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

External backup units

The server supports the external backup attachment options that are listed in the following table.

Table 36. External backup options

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

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

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

Top-of-rack Ethernet switches

The server supports the top-of-rack Ethernet switches that are listed in the following table.

Table 37. Top-of-rack switches

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

For more information, see the list of Product Guides in the Top-of-rack switches categories:

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

Fibre Channel SAN switches

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

Table 38. Fibre Channel SAN switches

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

For more information, see the list of Product Guides in the Rack SAN Switches category:

<http://lenovopress.com/storage/switches/rack>

Uninterruptible power supply units

The server supports attachments to the uninterruptible power supply (UPS) units that are listed in the following table.

Table 39. Uninterruptible power supply units

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

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

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

Power distribution units

The server supports attachments to the power distribution units (PDUs) that are listed in the following table.

Table 40. Power distribution units

Part number	Description
Switched and Monitored PDUs	
46M4002	1U 9 C19/3 C13 Active Energy Manager DPI PDU
46M4003	1U 9 C19/3 C13 Active Energy Manager 60A 3 Phase PDU
46M4004	1U 12 C13 Active Energy Manager DPI PDU
46M4005	1U 12 C13 Active Energy Manager 60A 3 Phase PDU
46M4167	1U 9 C19/3 C13 Switched and Monitored 30A 3 Phase PDU
46M4116	0U 24 C13 Switched and Monitored 30A PDU
46M4119	0U 24 C13 Switched and Monitored 32A PDU
46M4134	0U 12 C19/12 C13 Switched and Monitored 50A 3 Phase PDU
46M4137	0U 12 C19/12 C13 Switched and Monitored 32A 3 Phase PDU
Enterprise PDUs	
71762MX	Ultra Density Enterprise PDU C19 PDU+ (WW)
71762NX	Ultra Density Enterprise PDU C19 PDU (WW)
71763MU	Ultra Density Enterprise PDU C19 3 Phase 60A PDU+ (NA)
71763NU	Ultra Density Enterprise PDU C19 3 Phase 60A PDU (NA)
39M2816	DPI C13 Enterprise PDU without power cord
39Y8923	DPI 60A Three Phase C19 Enterprise PDU with IEC309 3P+G (208 V) fixed power cord
39Y8941	DPI Single Phase C13 Enterprise PDU without power cord
39Y8948	DPI Single Phase C19 Enterprise PDU without power cord
Front-end PDUs	
39Y8934	DPI 32 amp/250 V Front-end PDU with IEC 309 2P+Gnd connector
39Y8935	DPI 63 amp/250 V Front-end PDU with IEC 309 2P+Gnd connector
39Y8938	30 amp/125 V Front-end PDU with NEMA L5-30P connector
39Y8939	30 amp/250 V Front-end PDU with NEMA L6-30P connector
39Y8940	60 amp/250 V Front-end PDU with IEC 309 60A 2P+N+Gnd connector
Universal PDUs	
39Y8951	DPI Universal Rack PDU with US LV and HV power cords
39Y8952	DPI Universal Rack PDU with CEE7-VII Europe LC
39Y8953	DPI Universal Rack PDU with Denmark LC
39Y8954	DPI Universal Rack PDU with Israel LC

Part number	Description
39Y8955	DPI Universal Rack PDU with Italy LC
39Y8956	DPI Universal Rack PDU with South Africa LC
39Y8957	DPI Universal Rack PDU with UK LC
39Y8958	DPI Universal Rack PDU with AS/NZ LC
39Y8959	DPI Universal Rack PDU with China LC
39Y8962	DPI Universal Rack PDU (Argentina)
39Y8960	DPI Universal Rack PDU (Brazil)
39Y8961	DPI Universal Rack PDU (India)
0U Basic PDUs	
46M4122	0U 24 C13 16A 3 Phase PDU
46M4125	0U 24 C13 30A 3 Phase PDU
46M4128	0U 24 C13 30A PDU
46M4131	0U 24 C13 32A PDU
46M4140	0U 12 C19/12 C13 60A 3 Phase PDU
46M4143	0U 12 C19/12 C13 32A 3 Phase PDU

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

Rack cabinets

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

Table 41. 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

Part number	Description	Supported by x3850 X6	Maximum supported x3850 X6
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 console, keyboards and KVM switches.

Table 42. Console keyboards

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

46W6722	Keyboard w/ Int. Pointing Device USB - Greek 219 RoHS v2
46W6723	Keyboard w/ Int. Pointing Device USB - Hebrew 212 RoHS v2
46W6724	Keyboard w/ Int. Pointing Device USB - Hungarian 208 RoHS v2
46W6725	Keyboard w/ Int. Pointing Device USB - Italian 141 RoHS v2
46W6726	Keyboard w/ Int. Pointing Device USB - Japanese 194 RoHS v2
46W6727	Keyboard w/ Int. Pointing Device USB - Korean 413 RoHS v2
46W6728	Keyboard w/ Int. Pointing Device USB - LA Span 171 RoHS v2
46W6729	Keyboard w/ Int. Pointing Device USB - Norwegian 155 RoHS v2
46W6730	Keyboard w/ Int. Pointing Device USB - Polish 214 RoHS v2
46W6731	Keyboard w/ Int. Pointing Device USB - Portugese 163 RoHS v2
46W6732	Keyboard w/ Int. Pointing Device USB - Russian 441 RoHS v2
46W6733	Keyboard w/ Int. Pointing Device USB - Slovak 245 RoHS v2
46W6734	Keyboard w/ Int. Pointing Device USB - Spanish 172 RoHS v2
46W6735	Keyboard w/ Int. Pointing Device USB - Swed/Finn 153 RoHS v2
46W6736	Keyboard w/ Int. Pointing Device USB - Swiss F/G 150 RoHS v2
46W6737	Keyboard w/ Int. Pointing Device USB - Thai 191 RoHS v2
46W6738	Keyboard w/ Int. Pointing Device USB - Turkish 179 RoHS v2
46W6739	Keyboard w/ Int. Pointing Device USB - UK Eng 166 RoHS v2
46W6740	Keyboard w/ Int. Pointing Device USB - US Euro 103P RoHS v2
46W6741	Keyboard w/ Int. Pointing Device USB - Slovenian 234 RoHS v2
Console switches	
1754D2X	Global 4x2x32 Console Manager (GCM32)
1754D1X	Global 2x2x16 Console Manager (GCM16)
1754A2X	Local 2x16 Console Manager (LCM16)
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/>
- Customer Implementations of the x3850 X6 - Case Studies and Videos
https://lenovosuccess.com/search#term=&systems=System%2520x&system_models=x3850%2520X6
- Lenovo System x3850 X6 Installation and Service Guide
http://systemx.lenovofiles.com/help/index.jsp?topic=%2Fcom.lenovo.sysx.6241.doc%2Fprintable_doc.html
- Lenovo System x3850 X6 Rack Installation Instructions
http://systemx.lenovofiles.com/help/index.jsp?topic=%2Fcom.lenovo.sysx.6241.doc%2Fprintable_doc.html
- Lenovo System x3950 X6 Product Guide
<http://lenovopress.com/tips1251>
- ServerProven hardware compatibility page for the x3850 X6 and x3950 X6
<http://www.lenovo.com/us/en/serverproven/xseries/6241E7xxxxV4.shtml>

- xREF: System x Reference
<http://lenovopress.com/xref>
- Support Portal for the x3850 X6
<http://support.lenovo.com/products/Servers/Lenovo-x86-servers/Lenovo-System-x3850-X6/6241>
- IBM System Storage Interoperation Center
<http://www.ibm.com/systems/support/storage/ssic>

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