Lenovo System x3950 X6 (6241)
Product Guide (withdrawn product)

The Lenovo System x3950 X6 server, machine type 6241, is an eight-socket 8U rack-mounted server that represents the sixth generation of the Enterprise X-Architecture. Now with Intel Xeon E7 v4 processors, the x3950 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 x3950 X6 packs numerous fault-tolerant and high-availability features into a high-density, 8U rack-optimized lid-less package that helps reduce the space that is needed to support massive network computing operations and simplify servicing. The x3950 X6 supports up to eight Intel Xeon E7 processors and up to 24 TB of memory.

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

Figure 1. Lenovo System x3950 X6

Did you know?

The x3950 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 x3950 X6 offers enterprise scalability and advanced RAS features to support the most demanding mission-critical applications that require 24x7 operations.

Key features

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

Built on decades of innovation, Lenovo introduces its sixth generation of Enterprise X-Architecture technology, 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.

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 E7-8800 v4 processors
    - Supports up to eight E7 v4 processors with a total of 192 cores and 384 threads to maximize the concurrent running of multi-threaded applications.
    - Improves productivity by offering superior system performance with processors up to 24 cores, core frequencies up to 3.2 GHz core speeds, L3 cache of up to 60 MB, and three QPI interconnect links at up to 9.6 GTps.
- Supports DDR4 memory at speeds up to 1866 MHz, or DDR3 memory at speeds up to 1600 MHz
- Supports up to 192 DIMM sockets, with 24 DIMMs per processor.
- 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) improves 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 processor. This integration helps reduce I/O latency and increase overall system performance.
- Support for up to four 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.
- 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 128 GB 3DS RDIMMs, the server supports up to 24 TB of memory.
- Up to 32x 1.8-inch SSD bays, or up to 16x 2.5-inch bays, provide a flexible and scalable all-in-one platform to meet your increasing demands.
- Offers up to 22 PCIe slots plus two dedicated Mezzanine LOM (ML2) adapter slots. 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.
- An 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.
- Proactive Platform Alerts (including PFA and SMART alerts): Processors, voltage regulators, memory, internal storage (SAS/SATA HDDs and SSDs, NVMe SSDs, flash storage adapters), fans, power supplies, RAID controllers, and server ambient and sub-component temperatures. Alerts can be surfaced through the system IMM to managers such as Lenovo XClarity Administrator, VMware vCenter, and Microsoft System Center. These proactive alerts let you take appropriate actions in advance of possible failure, thereby increasing server uptime and application availability.
- 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 two special Mezzanine LOM (ML2) adapter slots with support for adapters with either two 10 Gb ports or four 1 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.
- Integrated Trusted Platform Module (TPM) supporting TPM 2.0 and TPM 1.2 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 x3950 X6 server.

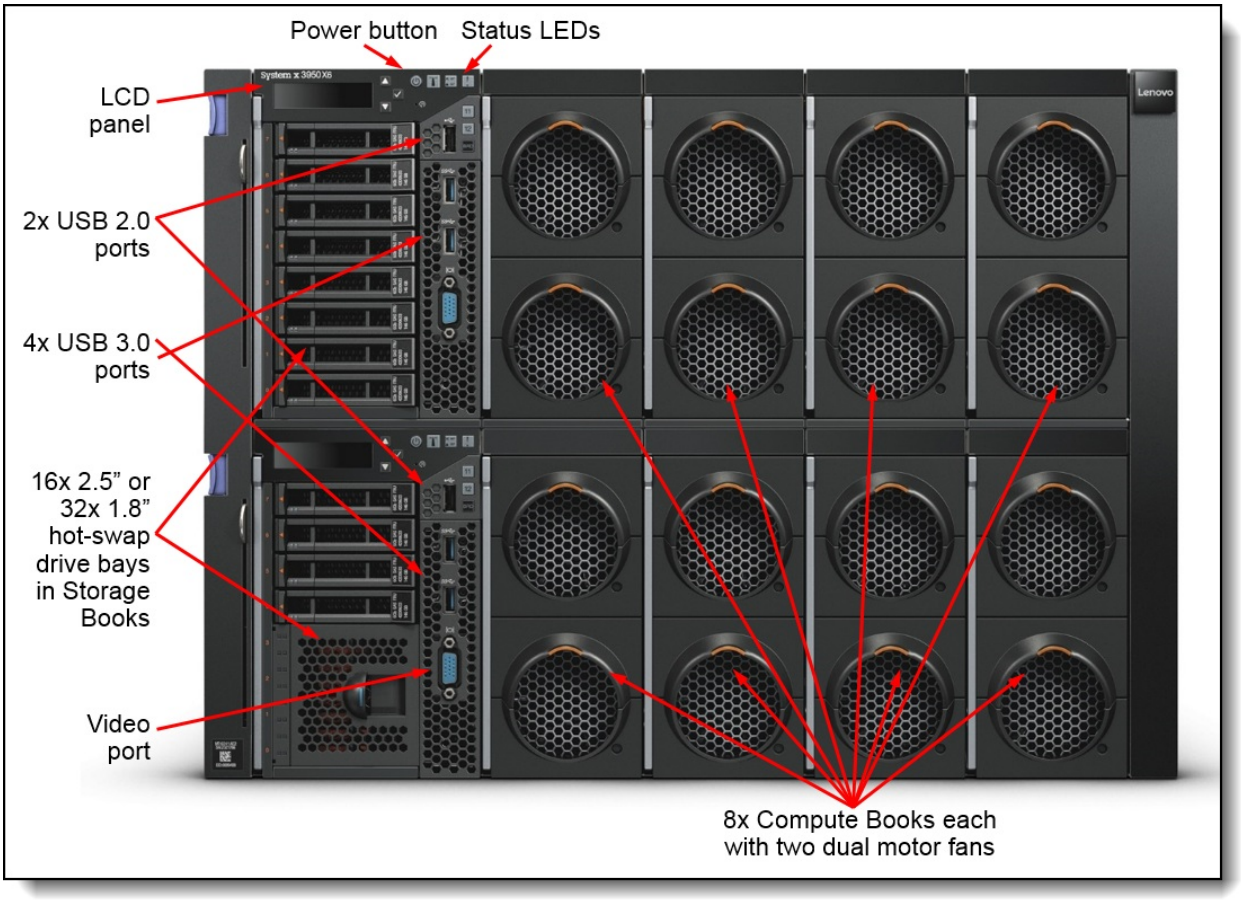

Figure 2. Front view of the Lenovo System x3950 X6

The following figure shows the rear of the x3950 X6 server.

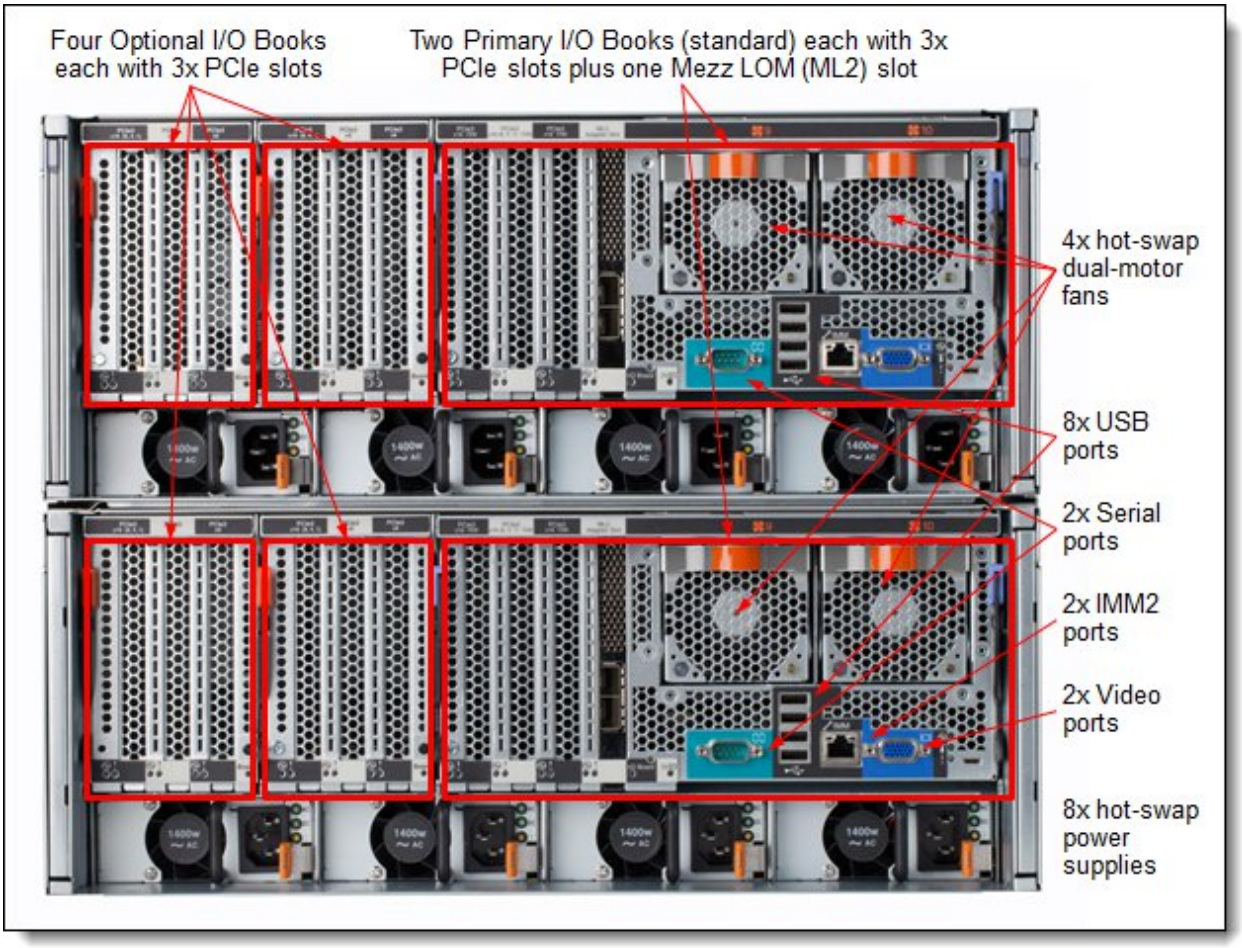

Figure 3. Rear view of the Lenovo System x3950 X6

Standard specifications

The following table lists the standard specifications.

Table 1. Standard specifications

Components	Specification
Machine type	6241
Firmware	Lenovo-signed firmware
Form factor	8U rack
Processor	Four, six or eight Intel Xeon 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.
Memory	Up to 192 DIMM sockets (24 DIMMs per processor, installed in the Compute Book). RDIMMs and LRDIMMs (Load Reduced DIMMs) are supported, but memory types cannot be intermixed. Memory 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.

Components	Specification
Memory maximums	With RDIMMs: Up to 6 TB with 192x 32 GB RDIMMs and eight processors With LRDIMMs: Up to 12 TB with 192x 64 GB LRDIMMs and eight processors With 3DS RDIMMs: Up to 24 TB with 192x 128 GB LRDIMMs and eight processors
Memory protection	ECC, Chipkill, RBS, memory mirroring, and memory rank sparing.
Disk drive bays	Up to 32x 1.8" SSD bays, or up to 16x 2.5" hot-swap SAS/SATA bays, or up to 8x 2.5” hot-swap PCIe NVMe SSD drive bays.
Maximum internal storage	Up to 122.9 TB with 16x 7.68 TB 2.5-inch SAS SSDs, or Up to 32 TB with 16x 2 TB 2.5-inch SAS HDDs, or Up to 32 TB with 8x 4 TB 2.5-inch PCIe NVMe SSDs
RAID support	12 Gb SAS/SATA RAID 0, 1, or 10 with ServeRAID M5210; optional upgrades to RAID 5 or 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) slots for dual-port 10 GbE cards with SFP+ or RJ-45 connectors or quad-port GbE cards with RJ-45 connectors. See Table 2. Dedicated 1 GbE port for systems management.
PCI Expansion slots	Up to 22 PCIe slots plus two dedicated Mezzanine LOM slots. The slots are as follows: • Four PCIe 3.0 x8 slots for internal RAID controllers (in two Storage Books) • Four PCIe 3.0 x16 slots (x16-wired), half length, full height (in two Primary I/O Books) • Two PCIe 3.0 x16 (x8-wired), half length, full height (in two Primary I/O Books) • Two ML2 slots for network adapter (PCIe 3.0 x8) (in two Primary I/O Books) • Four optional I/O Books, each with three slots, all full height (using two requires 6 processors; using all four requires 8 processors). Optional books are hot-swap capable. Optional I/O Books can be either of the following options: • Half-length I/O Book: Two PCIe 3.0 x8 slots, one PCIe 3.0 x16 slot. • Full-length I/O Book: Two PCIe 3.0 x16, one PCIe 2.0 x4 slot; two aux power connectors: 150 W and 75 W. Supports one double-wide GPU up to 300 W.
Ports	Front: Four USB 3.0, two USB 2.0, and one VGA video ports. Rear: Eight USB 2.0, two VGA video, two DB-9 serial, and two1 GbE RJ-45 IMM2 systems management. Internal: two USB 2.0 port for embedded hypervisor. The second video, IMM2, and internal USB hypervisor ports are used only when the server is partitioned into two four-socket servers.
Cooling	Calibrated Vectored Cooling™. Up to 20 redundant hot-swap fan packs and 10 fan zones with N+1 fan redundancy. Each fan pack includes two counter-rotated dual-motor fans.
Power supply	Up to eight 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 supporting TPM 2.0 and TPM 1.2.
Systems management	UEFI, Integrated Management Module II (IMM2) with remote presence feature, Predictive Failure Analysis, Light Path Diagnostics, Automatic Server Restart, Lenovo XClarity Administrator, Lenovo XClarity Integrators, and ServerGuide.

Components	Specification
Operating systems supported	Microsoft Windows Server, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, VMware ESXi. See the Operating system support section for specifics.
Limited warranty	Three-year customer-replaceable unit (CRU) and onsite limited warranty with 9x5 next business day (NBD).
Service and support	Optional service upgrades are available through Lenovo Services 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: 351 mm (13.7 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: 84.5 kg (186.3 lb), maximum: 110.0 kg (242.6 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 flyer and safety/warranty/installation information

Standard models

This following table lists the standard models.

Withdrawn: All models are now withdrawn from marketing.

Table 2. Standard models with E7 v4 processors

Model†	Intel Xeon** (Compute Book)	Memory	RAID	Drive bays Drives	Ethernet‡ (ML2 slot)	I/O slots§	Power supplies
x3950 X6 models with E7 v4 processors and TruDDR4 memory							
6241-58x*	4x E7-8860 v4 18C 2.2GHz 45M 140W	8x 16GB (1866MHz)¤	1x M5210	4x 2.5" / 8 Open bay	4x 1 GbE	12 std 24 max	4x 900W HS / 8
6241-78x*	4x E7-8870 v4 20C 2.1GHz 50M 140W	8x 16GB (1866MHz)¤	1x M5210	4x 2.5" / 8 Open bay	4x 1 GbE	12 std 24 max	4x 900W HS / 8
6241-98x*	4x E7-8890 v4 24C 2.2GHz 60M 165W	8x 16GB (1866MHz)¤	1x M5210	4x 2.5" / 8 Open bay	4x 1 GbE	12 std 24 max	4x 900W HS / 8

† x in the Machine Type Model (MTM) represents a region-specific letter (for example, the EMEA MTM is 6241-BAG, and the US MTM is 6241-BAU). Ask a Lenovo representative for specifics.
* Not available in North America
** Processor detail: Processor quantity and model, cores, core speed, L3 cache, and TDP.
‡ All models include one Intel I350-T4 ML2 Quad Port GbE Adapter (I350-AM4 based).
§ Models with 12 slots have two Primary I/O Books (each with four slots) and two Storage Books (each with two slots) standard.

For more information about the standard features of the server, see the Standard specification section.

SAP HANA Workload Optimized models

The Lenovo System x3950 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 2 TB of memory and are upgradeable to support larger single node and scale-out cluster implementations.

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

Withdrawn: All models are now withdrawn from marketing.

Note: For CTO configurations of SAP HANA models, select base model 6241-AC4

Table 3. Workload Optimized Solution models for SAP HANA

Model	Intel Xeon (Compute Book)	Memory	RAID	Drive bays Drives	Ethernet	I/O slots	Power supplies
x3950 X6 HANA models with E7 v4 processors and TruDDR4 memory - Standard models							
6241-8Gx	4x E7-8880 v4 22C 2.2GHz 55M 150W	32x 16GB (1866MHz)¤	1x M5210 + upgrades*	8x 2.5" bays 6x 1.2 TB SAS HDD 2x 400 GB S3710 SSD	2x 4x1GbE ML2 2x Mellanox 10Gb*	12 std 24 max	8x 1400W HS / 8
6241-8Hx	4x E7-8880 v4 22C 2.2GHz 55M 150W	32x 32GB (1866MHz)¤	2x M5210 + upgrades*	16x 2.5" bays 12x 1.2 TB SAS HDD 4x 400 GB S3710 SSD	2x 4x1GbE ML2 2x Mellanox 10Gb*	12 std 24 max	8x 1400W HS / 8
6241-8Jx	8x E7-8880 v4 22C 2.2GHz 55M 150W	64x 32GB (1866MHz)¤	2x M5210 + upgrades*	16x 2.5" bays 12x 1.2 TB SAS HDD 4x 400 GB S3710 SSD	2x 4x1GbE ML2 2x Mellanox 10Gb*	18 std 24 max	8x 1400W HS / 8
x3950 X6 HANA models with E7 v4 processors and TruDDR4 memory - TopSeller models							
6241-ELU	4x E7-8880 v4 22C 2.2GHz 55M 150W	32x 16GB (1866MHz)¤	1x M5210 + upgrades*	8x 2.5" bays 6x 1.2 TB SAS HDD 2x 400 GB S3710 SSD	2x 4x1GbE ML2 2x Mellanox 10Gb*	12 std 24 max	8x 1400W HS / 8

* See the list of specific components below

Each of these HANA models include the following components (see the proceeding table for specifics):

- One or two ServeRAID M5210 controller (46C9110) with 2GB cache upgrade with flash backup (47C8664) plus Performance Accelerator (47C8710) and SSD Caching Enabler (47C8712)
- Six or 12x 1.2TB 10K 6Gbps SAS 2.5" G3HS HDD (00AJ146)
- Two or four Intel S3710 400GB Enterprise Performance SATA G3HS 2.5" SSDs (00YC325)
- Two Intel I350-T4 ML2 Quad Port GbE Adapter for System x (00D1998)
- Two Mellanox ConnectX-3 10 GbE Adapters (00D9690) plus four SFP+ SR Transceivers (46C3447)
- Models with 18 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 Standard specification section.

Upgrading Compute Books

With the x3950 X6, machine type 6241, Lenovo supports upgrading the server processors by simply by 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 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 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) are not supported with TruDDR4 memory; Only DDR3 memory is supported
- Intel Xeon E7 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.

Processor options

The x3950 X6 supports up to eight Intel Xeon E7 v4 processors. Compute books with E7 v3 or E7 v2 processors are now withdrawn from marketing. Processors are installed in Compute Books, one processor in each Compute Book. The following figure shows the components of the Compute Book:

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

The x3950 X6 supports four, six, or eight Compute Books. Other combinations are not supported.

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

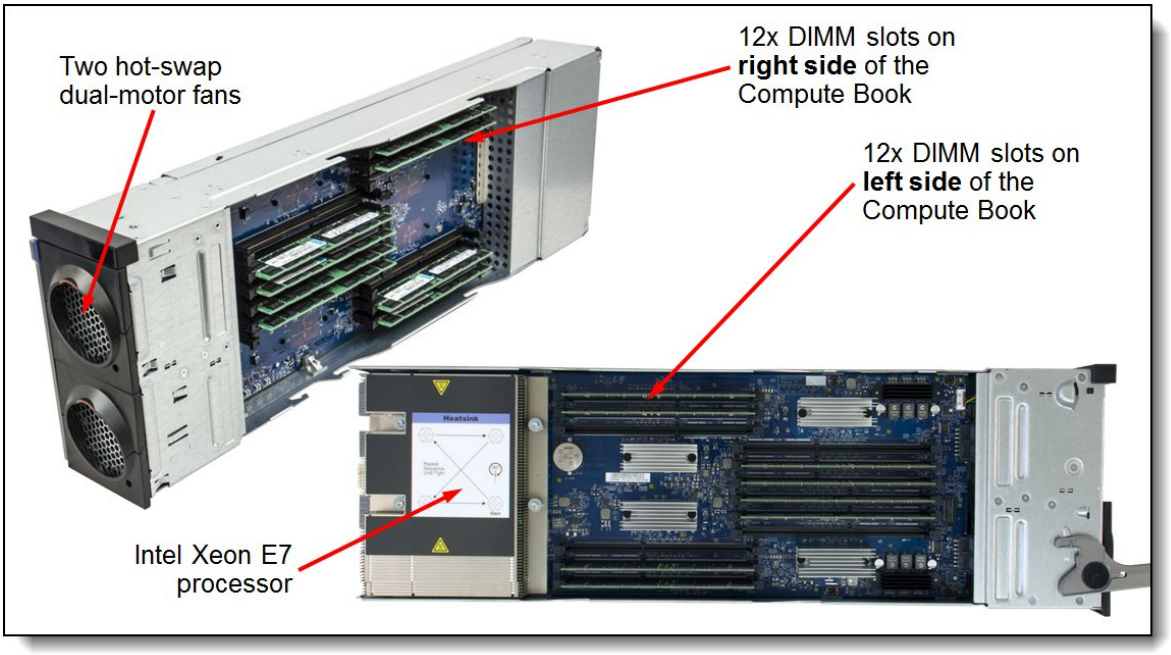

Figure 4. Compute Book

The following table shows the processor options, grouped as follows. Each option includes the processor installed in a Compute Book:

- E7-8800 v4 processors in Compute Books with TruDDR4 support

Note: Compute Books with E7-4800 processors are supported only in a four-socket x3850 X6 server and cannot be used in an x3950 X6 server.

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

Table 4. Compute book options (HT = Hyper Threading, TB = Turbo Boost 2.0)

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 E7-8800 v4 processors								
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	-

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
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	58x
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	78x
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	98x
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	-

‡ 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*.

Memory options

The x3950 X6 (6241) supports either DDR3 or TruDDR4 memory, depending on the Compute Books used in the server.

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.

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 x3950 X6 supports TruDDR4 memory operating at speeds up to 1866 MHz and DDR3 memory at speeds up to 1600 MHz. Note that even though supported TruDDR4 DIMMs are rated at 2400 MHz or 2133 MHz, when used in the x3950 X6, they operate at speeds up to 1866 MHz.

The x3950 X6 supports up to 192 DIMMs when all processors are installed, 24 DIMMs per processor. Each processor has four memory channels that are implemented using Scalable Memory Interface generation 2 (SMI2) chips, and the server implements three DIMMs per channel. The processor and the corresponding memory DIMM slots are on the Compute Book.

The following table lists the memory options that are available for x3950 X6.

Table 5. Memory options

Part number	Feature code	Description	Maximum supported x3950 X6	Standard models where used
2400 MHz TruDDR4 RDIMMs and LRDIMMs (for use with E7 v4 processors; also supported with E7 v3)				
46W0821	ATC8	8GB TruDDR4 Memory (1Rx4, 1.2V) PC4-19200 CL17 2400MHz LP RDIMM	192 (24 per CPU)	
46W0829	ATCA	16GB TruDDR4 Memory (2Rx4, 1.2V) PC4-19200 CL17 2400MHz LP RDIMM	192 (24 per CPU)	All other v4 models
46W0833	ATCB	32GB TruDDR4 Memory (2Rx4, 1.2V) PC4-19200 CL17 2400MHz LP RDIMM	192 (24 per CPU)	8Hx, 8Jx
46W0841	ATGG	64GB TruDDR4 Memory (4Rx4, 1.2V) PC4-19200 CL17 2400MHz LP LRDIMM	192 (24 per CPU)	-
00YG941	B0MV	128GB TruDDR4 Memory (8Rx4 1.2V) PC4-2400-R 2400MHz 3DS RDIMM	192 (24 per CPU)	-

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. (Note: 2133 MHz DIMMs are now withdrawn)
- Mixing different types of memory (combinations of RDIMMs, LRDIMMs, and 3DS RDIMMs) is not supported.
- Mixing different generations of memory (DDR3 and TruDDR4) is not supported
- The maximum number of ranks per one memory channel is six with RDIMMs, 12 with LRDIMMs, or 24 with 3DS RDIMMs.
- 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 "Max. 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 table shows the characteristics of the supported DIMMs. Tables cells that are highlighted with a gray background indicate that the server supports higher memory frequencies or larger memory capacity (or both) than the Intel processor specification defines.

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

Table 6. Maximum memory speeds - 2400 MHz TruDDR4 memory

Specification	**RDIMMs**		**LRDIMMs**	**3DS RDIMMs**
Rank	Single rank	Dual rank	Quad rank	Octo rank
Part numbers	46W0821 (8 GB)	46W0829 (16 GB) 46W0833 (32 GB)	46W0841 (64 GB)	00YG941 (128 GB)
Rated speed	2400 MHz	2400 MHz	2400 MHz	2400 MHz
Rated voltage	1.2 V	1.2 V	1.2 V	1.2 V
Operating voltage	1.2 V	1.2 V	1.2 V	1.2 V
Maximum quantity*	192	192	192	192
Largest DIMM	8 GB	32 GB	64 GB	128 GB
Max memory capacity	1.5 TB	6 TB	12 TB	24 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	1600 MHz
2 DIMMs per channel	1600 MHz	1600 MHz	1600 MHz	1600 MHz
3 DIMMs per channel	1600 MHz	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	1866 MHz
2 DIMMs per channel	1866 MHz	1866 MHz	1866 MHz	1866 MHz
3 DIMMs per channel	1600 MHz	1600 MHz†	1600 MHz	1600 MHz

* Maximum quantity supported is shown for all processors that are installed
† This speed is above the Intel standard and is achieved only when Lenovo TruDDR4 memory is used

The following memory protection technologies are supported:

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

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

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

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

Internal storage

The server supports 1.8-inch solid-state drives in the SSD units and 2.5-inch SSDs and HDDs. Drives are installed in the Storage Book. The x3950 X6 has two Storage Books.

Each 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.

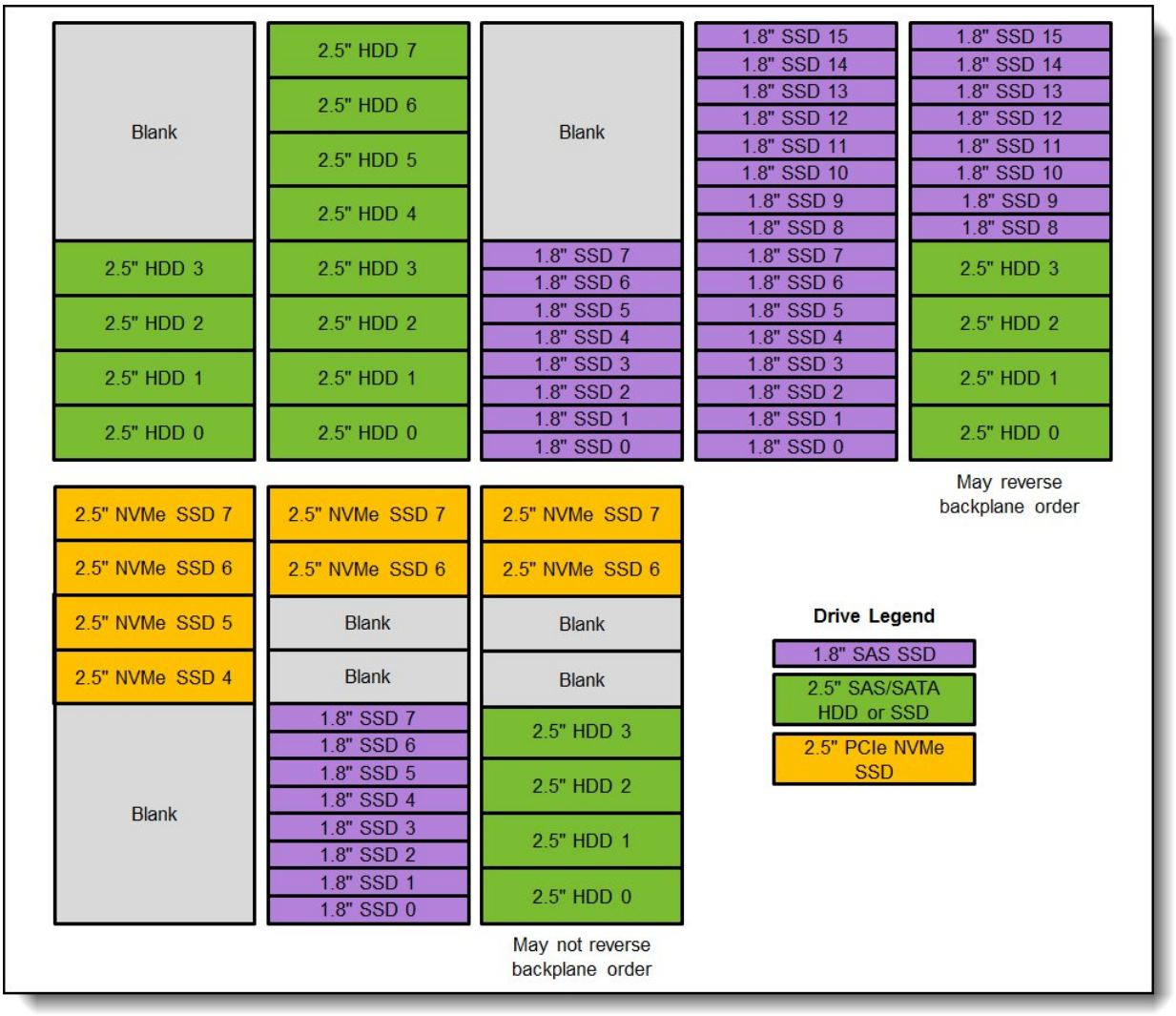

Figure 5. Internal drive configurations

Backplanes

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

Table 7. Internal storage expansion options

Part number	Feature code	Description	Maximum supported
44X4104	A4A6	4x 2.5" HS 12Gb SAS HDD Backplane	4
44X4106*	A4A7	8x 1.8" HS 12Gb SAS HDD Backplane	4
44X4108	A4A8	1x4 2.5-inch NVMe PCIe Gen3 SSD Backplane	2

* Withdrawn from marketing

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.

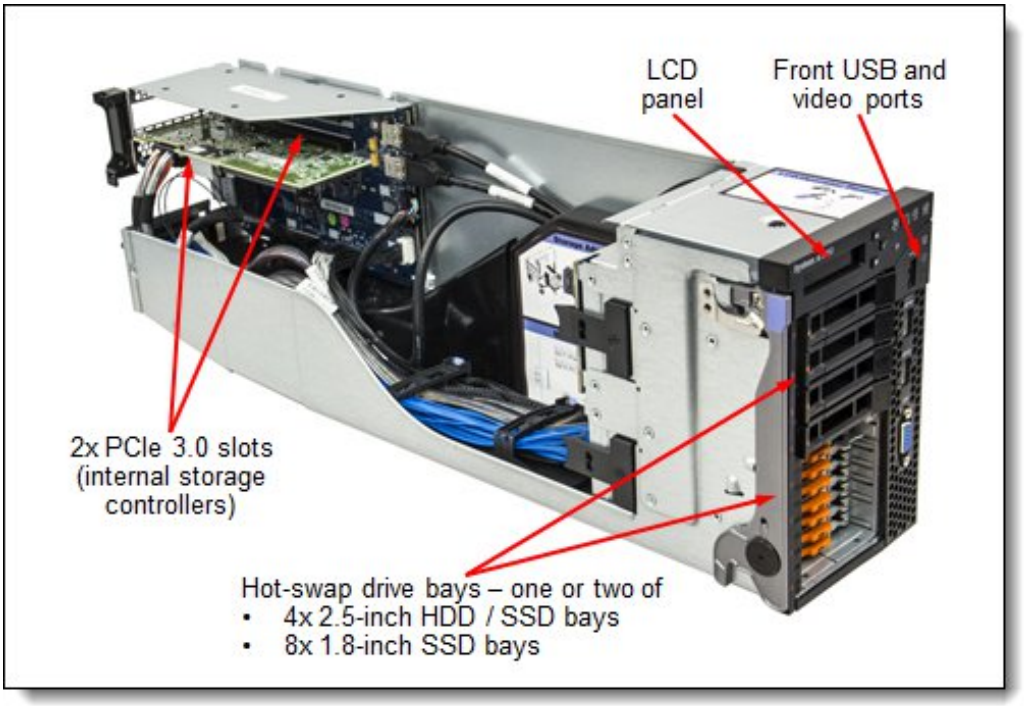

Figure 6. Storage Book

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 8. Drive combinations per Storage Book

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

Part number	Feature code	Description	Maximum supported (slots)	Models where used
46C9110	A3YZ	ServeRAID M5210 SAS/SATA Controller	4 (11, 12, 43, 44)	All models
47C8675	A3YY	N2215 SAS/SATA HBA	4 (11, 12, 43, 44)	-
00ML997	AS95	NVMe PCIe SSD Extender Adapter	4 (11, 12, 43, 44)	-
Hardware upgrades for the ServeRAID M5210				
47C8656	A3Z0	ServeRAID M5200 Series 1GB Cache/RAID 5 Upgrade	4	-
47C8660	A3Z1	ServeRAID M5200 Series 1GB Flash/RAID 5 Upgrade	4	-
47C8664	A3Z2	ServeRAID M5200 Series 2GB Flash/RAID 5 Upgrade	4	-
47C8668	A3Z3	ServeRAID M5200 Series 4GB Flash/RAID 5 Upgrade		
Features on Demand upgrades for the ServeRAID M5210				
47C8708	A3Z6	ServeRAID M5200 Series Zero Cache/RAID 5 Upgrade	1 / 2†	-
47C8706	A3Z5	ServeRAID M5200 Series RAID 6 Upgrade	1 / 2†*	-
47C8710	A3Z7	ServeRAID M5200 Series Performance Accelerator	1 / 2†*	-
47C8712	A3Z8	ServeRAID M5200 Series SSD Caching Enabler	1 / 2†*	-

† Only one FoD key is required if the x3950 X6 is configured as a single image 8-socket server. If you partition the server into two four-socket servers, then two FoD keys are required.
* These M5210 features upgrades require a cache memory upgrade (47C8656, 47C8660, or 47C8664).

The following table compares the features of the supported controllers.

Table 10. 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: https://lenovopress.com/servers/options/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.

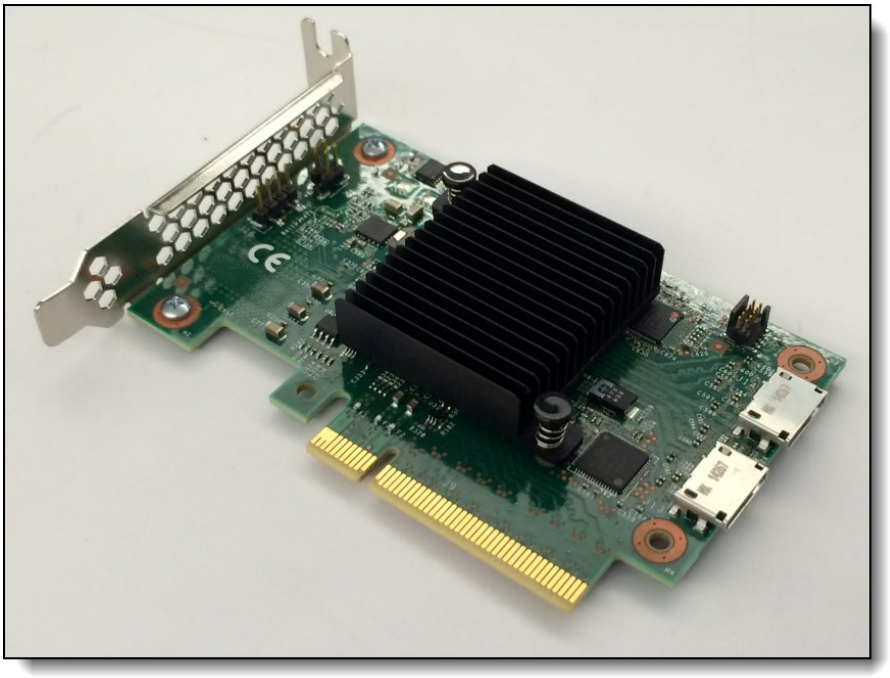

Figure 7. NVMe PCIe SSD Extender Adapter

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.

Internal drive options

The following tables list the hard disk drive and solid-state drive options for the internal disk storage of the server.

- Table 11: 2.5-inch hot-swap 12 Gb SAS HDDs
- Table 12: 2.5-inch hot-swap 6 Gb SAS/SATA HDDs
- Table 13: 2.5-inch hot-swap 12 Gb SAS SSDs
- Table 14: 2.5-inch hot-swap 6 Gb SAS/SATA SSDs
- Table 15: 2.5-inch NVMe SSDs

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

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap HDDs - 12 Gb SAS 10K			
00WG685	AT89	300GB 10K 12Gbps SAS 2.5" G3HS HDD	16
00WG690	AT8A	600GB 10K 12Gbps SAS 2.5" G3HS HDD	16
00WG695	AT8B	900GB 10K 12Gbps SAS 2.5" G3HS HDD	16
00WG700	AT8C	1.2TB 10K 12Gbps SAS 2.5" G3HS HDD	16
00NA271	ASBM	1.8TB 10K 12Gbps SAS 2.5" G3HS 512e HDD	16
2.5-inch hot-swap HDDs - 12 Gb SAS 15K			
00WG660	AT84	300GB 15K 12Gbps SAS 2.5" G3HS HDD	16
00WG665	AT85	600GB 15K 12Gbps SAS 2.5" G3HS HDD	16
01GV035	AVKU	900GB 15K 12Gbps SAS 2.5" G3HS 512e HDD	16
2.5-inch hot-swap HDDs - 12 Gb NL SAS			
00NA491	AT7Z	1TB 7.2K 12Gbps NL SAS 2.5" G3HS HDD	16
00NA496	AT80	2TB 7.2K 12Gbps NL SAS 2.5" G3HS 512e HDD	16
2.5-inch hot-swap SED HDDs - 12 Gb SAS 10K			
00WG705	AT8D	300GB 10K 12Gbps SAS 2.5" G3HS SED	16
00WG710	AT8E	600GB 10K 12Gbps SAS 2.5" G3HS SED	16
00WG715	AT8F	900GB 10K 12Gbps SAS 2.5" G3HS SED	16
00WG720	AT8G	1.2TB 10K 12Gbps SAS 2.5" G3HS SED	16

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

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap HDDs - 6 Gb SAS 10K			
01GV070	B0YT	2.4TB 10K 12Gbps SAS 2.5" G3HS 512e HDD	16
2.5-inch hot-swap HDDs - 6 Gb NL SATA			
00AJ141	A4TX	1TB 7.2K 6Gbps NL SATA 2.5" G3HS HDD	16
00NA526	AT81	2TB 7.2K 6Gbps NL SATA 2.5" G3HS 512e HDD	16

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

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap SSDs - 12 Gb SAS - Enterprise Capacity			
01GR786	AVKV	PM1633a 3.84TB Enterprise Capacity 12Gb SAS G3HS 2.5" SSD	16
01GR771	AUEJ	PM1633a 7.68TB Enterprise Capacity 12Gb SAS G3HS 2.5" SSD	16
2.5-inch hot-swap SSDs - 12 Gb SAS - Enterprise Performance (10+ DWPD)			
01GV711	AVL0	400GB Enterprise Performance 12G SAS G3HS 2.5" SSD	16
01GV716	AVL1	800GB Enterprise Performance 12G SAS G3HS 2.5" SSD	16
01GV721	AVL2	1.6TB Enterprise Performance 12G SAS G3HS 2.5" SSD	16
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	16
01GV766	AWEZ	PM1635a 800GB Enterprise Mainstream 12Gb SAS G3HS 2.5" SSD	16
01GV771	AWF0	PM1635a 1.6TB Enterprise Mainstream 12Gb SAS G3HS 2.5" SSD	16

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

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap SSDs - 6 Gb SATA - Enterprise Mainstream (3-5 DWPD)			
7SD7A05713	B10B	Intel S4600 480GB Enterprise Mainstream SATA G3HS 2.5" SSD	16
01GV863	AXFZ	5100 3.84TB Enterprise Mainstream SATA G3HS 2.5" SSD	16
2.5-inch hot-swap SSDs - 6 Gb SATA - Enterprise Entry (<3 DWPD)			
7SD7A05732	B0Z8	Intel S4500 240GB Enterprise Entry SATA G3HS 2.5" SSD	16
7SD7A05731	B0Z9	Intel S4500 480GB Enterprise Entry SATA G3HS 2.5" SSD	16
7SD7A05730	B0ZA	Intel S4500 960GB Enterprise Entry SATA G3HS 2.5" SSD	16
4XB7A08493	B0ZB	Intel S4500 1.92TB Enterprise Entry SATA G3HS 2.5" SSD	16
4XB7A08494	B0ZC	Intel S4500 3.84TB Enterprise Entry SATA G3HS 2.5" SSD	16
01GR836	AVHP	PM863a 240GB Enterprise Entry SATA G3HS 2.5" SSD	16
01GR846	AVHR	PM863a 960GB Enterprise Entry SATA G3HS 2.5" SSD	16
01GR711	AUE7	1.92TB Enterprise Entry SATA G3HS 2.5" SSD	16

Table 15. 2.5-inch NVMe SSDs

Part number	Feature	Description	Maximum supported
2.5-inch SSDs - NVMe - Enterprise Mainstream (3-5 DWPD)			
7SD7A05767	B11M	Intel P4600 1.6TB NVMe 2.5" Enterprise Mainstream PCIe SSD	8
7SD7A05766	B11N	Intel P4600 3.2TB NVMe 2.5" Enterprise Mainstream PCIe SSD	8
2.5-inch SSDs - NVMe - Enterprise Entry (<3 DWPD)			
01GT715	AVPP	PM963 3.84TB NVMe 2.5" Enterprise Value PCIe SSD	8
4XB7A08539	B1JK	Intel P4500 4.0TB NVMe 2.5" Enterprise Entry PCIe SSD	8

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 22 PCIe slots plus two dedicated Mezzanine LOM slots (24 total) as follows:

- In each of the two Storage Books (standard in all models): Two PCIe 3.0 x8 slots for supported internal RAID controllers and SAS HBAs
- In each of the two Primary I/O Books (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)
- Four optional I/O Books, each with three slots, all full height. Optional I/O Books are hot-swap capable.

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

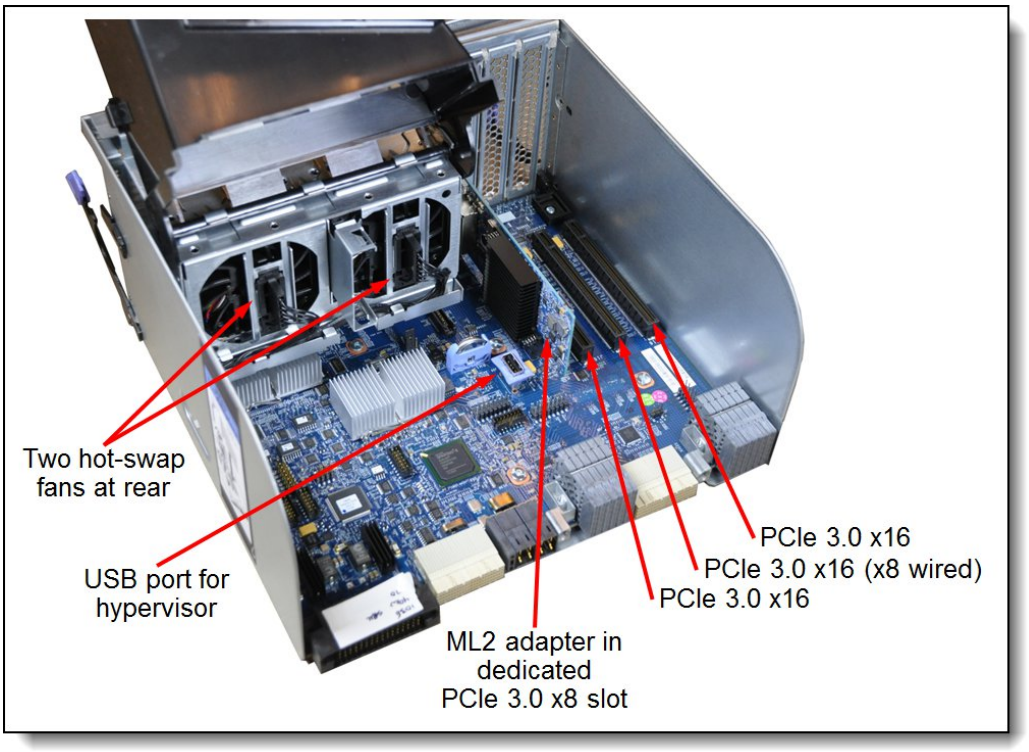

Figure 8. Primary I/O Book

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 16. Adapters that support hot swap

Part number	Feature code	Description
00D8540*	A4XH	Emulex Dual Port 10GbE SFP+ VFA IIIr for System x*
49Y7960	A2EC	Intel X520 Dual Port 10GbE SFP+ Adapter for System x
49Y7970	A2ED	Intel X540-T2 Dual Port 10GBaseT Adapter for System x
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 use of two Optional I/O Books requires six processors to be installed. The usage of all four Optional I/O Books requires all eight processors to be installed.

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

Table 17. I/O Book options

Part number	Feature code	Description	Maximum supported x3950 X6
44X4049	A4A2	X6 Half-Length I/O Book	4
44X4051	A4A3*	X6 Full-Length I/O Book	4

* 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.

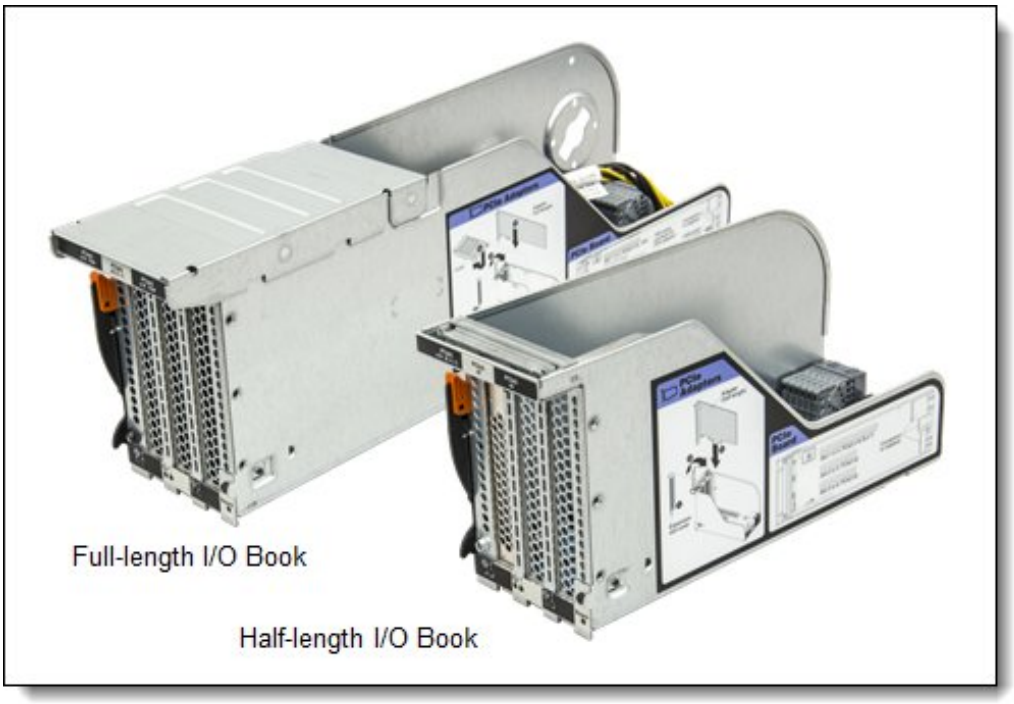

Figure 9. Half-length I/O Book and the Full-length I/O Book

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

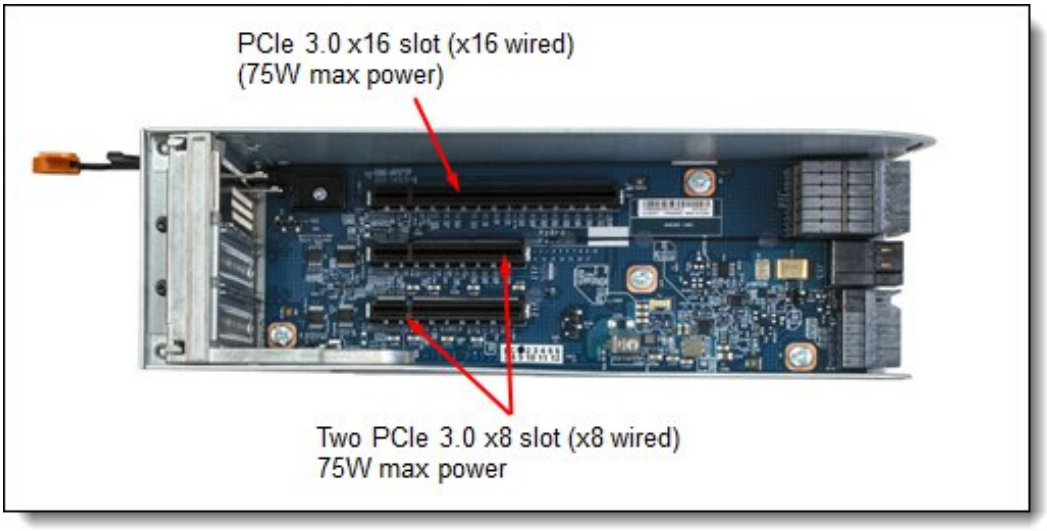

Figure 10. Half-length I/O Book

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 usage 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.

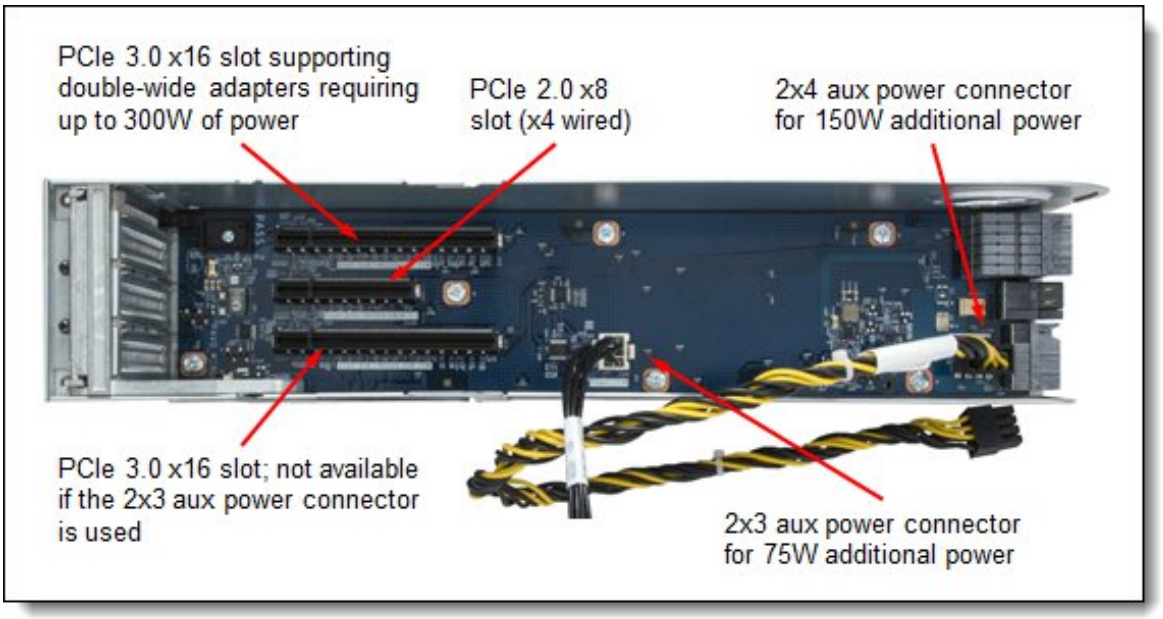

Figure 11. Full-length I/O Book

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.

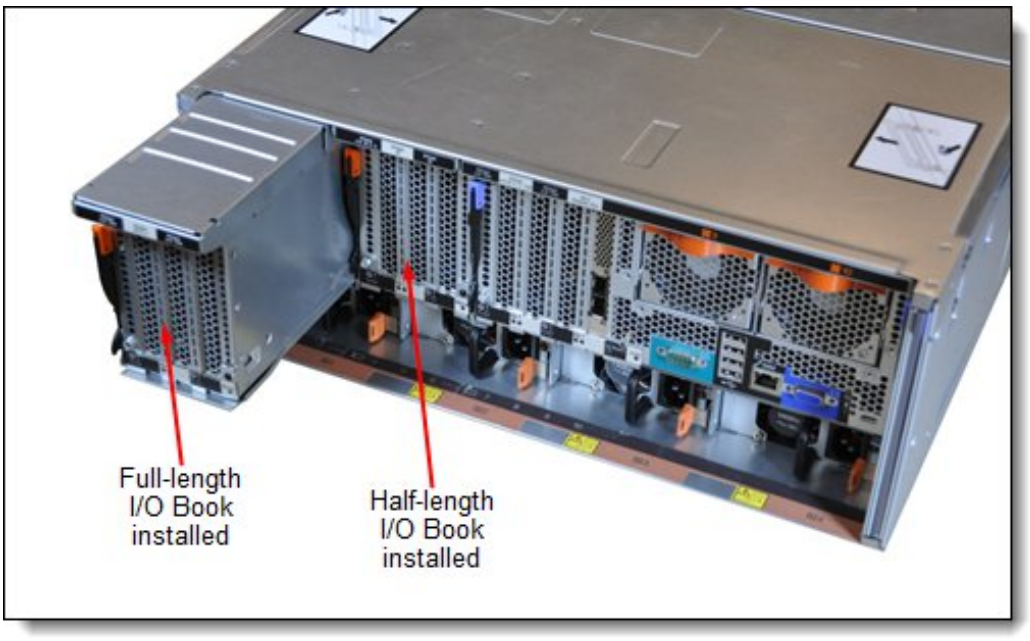

Figure 12. Optional I/O Books that are installed (x3850 X6 shown)

Slot locations

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

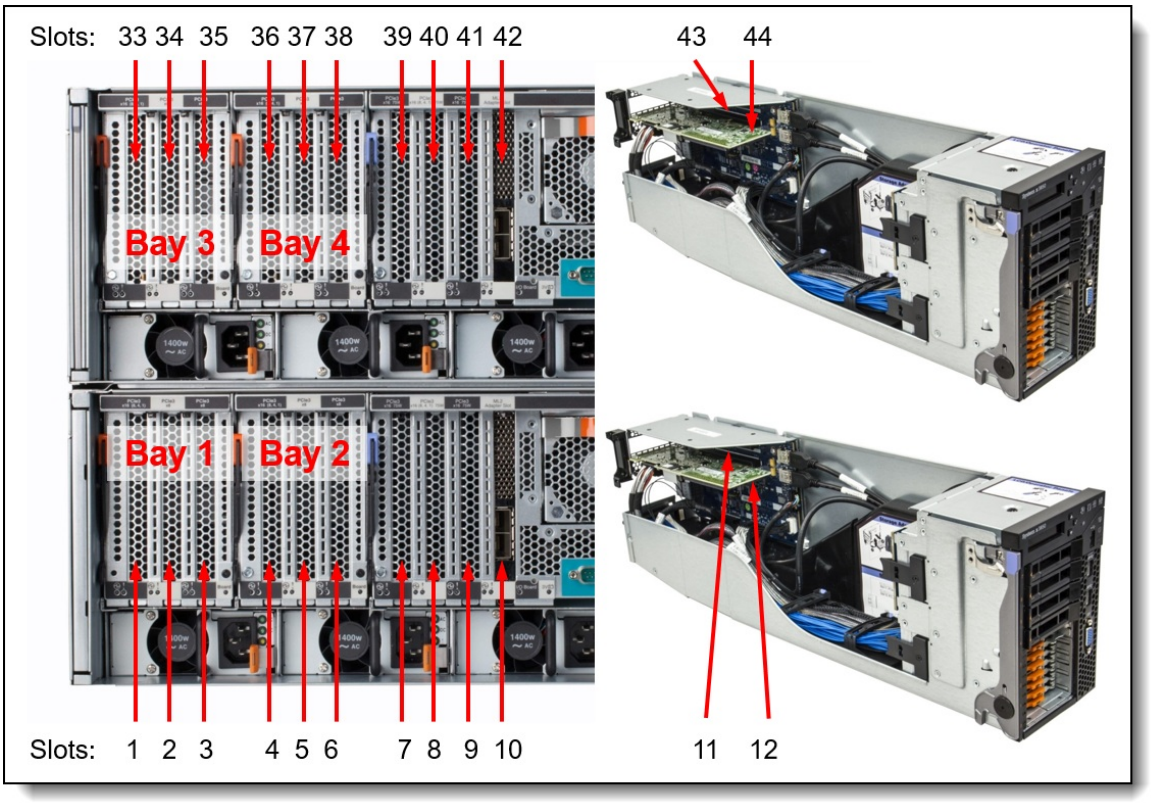

Figure 13. Slot numbering

Network adapters

The server supports ML2 adapters that are installed in the two ML2 slots, one in each Primary I/O Book. These ML2 slots support 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, all standard models of the x3950 X6 include an Intel I350-T4 ML2 Quad Port GbE Adapter (I350-AM4 based).

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

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

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

The following table lists the supported ML2 adapters. The following table lists the supported ML2 adapters. ML2 adapters are installed only in the ML2 slots (slot 10 and 42 as show in the Slot locations section).

Table 18. ML2 adapters

Part number	Feature code	Description	Maximum supported (slot #)
25 Gb Ethernet			
00MN990*	ATZR	Mellanox ConnectX-4 Lx ML2 1x25GbE SFP28 Adapter	2* (10, 42)
10 Gb Ethernet			
00D2026	A40S	Broadcom NetXtreme II ML2 Dual Port 10GbaseT	2 (10, 42)
00D2028	A40T	Broadcom NetXtreme II ML2 Dual Port 10GbE SFP+	2 (10, 42)
00AG560	AT7U	Emulex VFA5.2 ML2 Dual Port 10GbE SFP+ Adapter	2 (10, 42)
01CV770	AU7Z	Emulex VFA5.2 ML2 2x10 GbE SFP+ Adapter and FCoE/iSCSI SW	2 (10, 42)
00D1994	A40P	Intel X540 ML2 Dual Port 10GbaseT Adapter	2 (10, 42)
00JY940*	ATRH	Intel X710-DA2 ML2 2x10GbE SFP+ Adapter	2* (10, 42)
94Y5200	AS74	Intel X710 ML2 4x10GbE SFP+ Adapter	2 (10, 42)
Gigabit Ethernet			
00D1998	A40R	Intel I350-T4 ML2 Quad Port GbE Adapter	2 (10, 42)
InfiniBand			
00FP650	A5RK	Mellanox ConnectX-3 Pro ML2 2x40GbE/FDR VPI Adapter	2 (10, 42)

* Not supported in servers with E7 v2 compute books

The server also supports various other Ethernet, InfiniBand and Omni-Path 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 19. Network adapters

Part number	Feature code	Description	Maximum supported (slot #)
Omni-Path Architecture (OPA)			
00WE027	AU0B	Intel OPA 100 Series Single-port PCIe 3.0 x16 HFA	6 (7-9, 39-41)
00WE023	AU0A	Intel OPA 100 Series Single-port PCIe 3.0 x8 HFA	4 (7,9,39,41)
100 Gb Ethernet			
00MM960*	ATRP	Mellanox ConnectX-4 2x100GbE/EDR IB QSFP28 VPI Adapter	8* (1, 4, 7, 9, 33, 36, 39, 41)
40 Gb Ethernet			
00MM950*	ATRN	Mellanox ConnectX-4 Lx 1x40GbE QSFP+ Adapter	18* (1-9, 33-41)
00D9550	A3PN	Mellanox ConnectX-3 40GbE / FDR IB VPI Adapter	18 (1-9, 33-41)
25 Gb Ethernet			
01GR250	AUAJ	Mellanox ConnectX-4 Lx 2x25GbE SFP28 Adapter	18 (1-9, 33-41)
10 Gb Ethernet			
94Y5180	A4Z6	Broadcom NetXtreme Dual Port 10GbE SFP+ Adapter	18 (1-9, 33-41)
44T1370	A5GZ	Broadcom NetXtreme 2x10GbE BaseT Adapter	18 (1-9, 33-41)
00AG570	AT7S	Emulex VFA5.2 2x10 GbE SFP+ PCIe Adapter	18 (1-9, 33-41)
00AG580	AT7T	Emulex VFA5.2 2x10 GbE SFP+ Adapter and FCoE/iSCSI SW	18 (1-9, 33-41)
00D8540	A4M9	Emulex Dual Port 10GbE SFP+ VFA III-R	18 (1-9, 33-41)
49Y7960	A2EC	Intel X520 Dual Port 10GbE SFP+ Adapter	18 (1-9, 33-41)
49Y7970	A2ED	Intel X540-T2 Dual Port 10GBaseT Adapter	18 (1-9, 33-41)
00MM850†	ATRY	Intel X550-T1 Single Port 10GBase-T Adapter	18† (1-9, 33-41)
00MM860*	ATPX	Intel X550-T2 Dual Port 10GBase-T Adapter	18* (1-9, 33-41)
01DA900	AU2Y	Intel X710-DA2 2x10GbE SFP+ Adapter	18 (1-9, 33-41)
00D9690	A3PM	Mellanox ConnectX-3 10 GbE Adapter	18 (1-9, 33-41)
Gigabit Ethernet			
90Y9370	A2V4	Broadcom NetXtreme I Dual Port GbE Adapter	18 (1-9, 33-41)
90Y9352	A2V3	Broadcom NetXtreme I Quad Port GbE Adapter	18 (1-9, 33-41)
49Y4230	5767	Intel Ethernet Dual Port Server Adapter I340-T2	18 (1-9, 33-41)
49Y4240	5768	Intel Ethernet Quad Port Server Adapter I340-T4	18 (1-9, 33-41)
00AG500	A56K	Intel I350-F1 1xGbE Fiber Adapter	18 (1-9, 33-41)
00AG510	A56L	Intel I350-T2 2xGbE BaseT Adapter	18 (1-9, 33-41)
00AG520	A56M	Intel I350-T4 4xGbE BaseT Adapter	18 (1-9, 33-41)
InfiniBand			
00D9550	A3PN	Mellanox ConnectX-3 40GbE / FDR IB VPI Adapter	18 (1-9, 33-41)
00KH924	ASWQ	Mellanox ConnectX-4 EDR IB VPI Single-port x16 PCIe 3.0 HCA	8 (1,4,7,9, 33,36,39,41)

* Not supported in servers with E7 v2 compute books
† Only supported in servers with E7 v4 compute books

For more information, including supported transceivers and cables, see the list of Lenovo Press Product Guides in the Ethernet Adapters category and the InfiniBand & Omni-Path Adapters category.

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 20. Storage adapters

Part number	Feature code	Description	Maximum supported (slot #)
SAS HBAs			
00AE912	A5M0	N2225 SAS/SATA HBA	18 (1-9, 33-41)
00AE916	A5M1	N2226 SAS/SATA HBA	10 (1, 4, 7, 8, 9, 33, 36, 39, 40, 41)
RAID adapters			
00AE938	A5ND	ServeRAID M5225-2GB SAS/SATA Controller	6 (7, 8, 9, 39, 40, 41)
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

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

Table 21. Specifications comparison

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

Fibre Channel host bus adapters

The following table lists the Fibre Channel HBAs supported by the x3950 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 22. Storage adapters

Part number	Feature code	Description	Maximum supported
Fibre Channel - 16 Gb (32 Gb ASIC)			
01CV830*	ATZU	Emulex 16Gb Gen6 FC Single-port HBA	18* (1-9, 33-41)
01CV840*	ATZV	Emulex 16Gb Gen6 FC Dual-port HBA	18* (1-9, 33-41)
01CV750*	ATZB	QLogic 16Gb Enhanced Gen5 FC Single-port HBA	18* (1-9, 33-41)
01CV760*	ATZC	QLogic 16Gb Enhanced Gen5 FC Dual-port HBA	18* (1-9, 33-41)
Fibre Channel - 16 Gb			
81Y1655	A2W5	Emulex 16Gb FC Single-port HBA	18 (1-9, 33-41)
81Y1662	A2W6	Emulex 16Gb FC Dual-port HBA	18 (1-9, 33-41)
00Y3337	A3KW	QLogic 16Gb FC Single-port HBA	18 (1-9, 33-41)
00Y3341	A3KX	QLogic 16Gb FC Dual-port HBA	18 (1-9, 33-41)
Fibre Channel - 8 Gb			
42D0485	3580	Emulex 8 Gb FC Single-port HBA	18 (1-9, 33-41)
42D0494	3581	Emulex 8 Gb FC Dual-port HBA	18 (1-9, 33-41)
42D0501	3578	QLogic 8 Gb FC Single-port HBA	18 (1-9, 33-41)
42D0510	3579	QLogic 8 Gb FC Dual-port HBA	18 (1-9, 33-41)

* 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

PCIe Flash Storage adapters

All supported Flash Storage Adapters are now withdrawn from marketing.

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 also 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 in the I/O expansion options). 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, however, it is recommended you have less than 1 TB of memory installed. See https://support.lenovo.com/us/en/solutions/ht114952 for details.

Table 23. GPU adapters

Part number	Feature code	Description	Minimum system RAM	Maximum supported (slot #)
90Y2495	AU3W†	NVIDIA Quadro M6000 24GB GPU, PCIe (active)	48 GB	4 (1, 4, 33, 36)
00YL378*	ATZF†	NVidia Quadro M5000 GPU, PCIe (active)	16 GB	4* (1, 4, 33, 36)

* Not supported in servers with E7 v2 compute books
† Not available through CTO.

Power supplies

The x3950 X6 supports up to eight redundant power supplies. Standard models come with four power supplies (model dependent). The following table lists the power supplies.

Table 24. Power supplies

Part number	Feature code	Description	Maximum supported x3950 X6	Standard models where used
44X4150	A54D	1400W HE Redundant Power Supply for altitudes >5000 meters	8	All HANA models
44X4152	A54E	1400W HE Redundant Power Supply	8	-
44X4132	A4R0	900W Power Supply	8	BAx, CAx, CCx
88Y7433	A2EA	750W High Efficiency -48 V DC Power Supply	8	-

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 quads for the x3950 X6
- 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: https://support.lenovo.com/documents/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 25. Virtualization options

Part number	Feature code	Description	Maximum supported†
Blank USB keys			
00WH140	ATRM	Blank USB Memory Key 4G SLC for VMware ESXi Downloads (4GB capacity)	1 / 2
41Y8298	A2G0	Blank USB Memory Key for VMware ESXi Downloads (2GB capacity)	1 / 2
USB keys preloaded with Lenovo custom image			
00ML235	ASN7	USB Memory Key for VMware ESXi 5.5 Update 2	1 / 2
00WH150*	ATZG	USB Memory Key for VMware ESXi 5.5 Update 3B	1 / 2
00WH138	ATRL	USB Memory Key 4G for VMware ESXi 6.0 Update 1A	1 / 2
00WH151*	ATZH	USB Memory Key for VMware ESXi 6.0 Update 2	1 / 2
CTO only*	AVNW	USB Memory Key for VMware ESXi 6.5	1 / 2

* Not supported in servers with E7 v2 compute books
† 2 hypervisor keys are supported only if the x3950 X6 is configured to be partitioned, where the two halves of the server operate as two independent four-socket servers. However, CTO orders can include only one hypervisor key.

Systems management

The server contains Integrated Management Module 2.1 (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.

Lenovo XClarity Administrator

Lenovo XClarity Administrator is a centralized resource management solution designed to reduce complexity, speed response, and enhance the availability of Lenovo systems and solutions. It provides agent-free hardware management for ThinkSystem servers, in addition to ThinkServer, System x, and Flex System servers. The administration dashboard is based on HTML 5 and allows fast location of resources so tasks can be run quickly.

Because Lenovo XClarity Administrator does not require any agent software to be installed on the managed endpoints, there are no CPU cycles spent on agent execution, and no memory is used, which means that up to 1GB of RAM and 1 - 2% CPU usage is saved, compared to a typical managed system where an agent is required.

Lenovo XClarity Administrator is an optional software component for the x3950 X6. The software can be downloaded and used at no charge to discover and monitor the x3950 X6 and to manage firmware upgrades.

If software support is required for Lenovo XClarity Administrator, or premium features such as configuration management and operating system deployment are required, Lenovo XClarity Pro software subscription should be ordered. Lenovo XClarity Pro is licensed on a per managed system basis, that is, each managed Lenovo system requires a license.

The following table lists the Lenovo XClarity software license options.

Table 26. Lenovo XClarity Pro ordering information

Part number	Feature code	Description
00MT201	1339	Lenovo XClarity Pro, per Managed Endpoint w/1 Yr SW S&S
00MT202	1340	Lenovo XClarity Pro, per Managed Endpoint w/3 Yr SW S&S
00MT203	1341	Lenovo XClarity Pro, per Managed Endpoint w/5 Yr SW S&S
7S0X000HWW	SAYV	Lenovo XClarity Pro, per Managed Endpoint w/6 Yr SW S&S
7S0X000JWW	SAYW	Lenovo XClarity Pro, per Managed Endpoint w/7 Yr SW S&S

Lenovo XClarity Administrator offers the following standard features that are available at no charge:

- Auto-discovery and monitoring of Lenovo systems
- Firmware updates and compliance enforcement
- External alerts and notifications via SNMP traps, syslog remote logging, and e-mail
- Secure connections to managed endpoints
- NIST 800-131A or FIPS 140-2 compliant cryptographic standards between the management solution and managed endpoints
- Integration into existing higher-level management systems such as cloud automation and orchestration tools through REST APIs, providing extensive external visibility and control over hardware resources
- An intuitive, easy-to-use GUI
- Scripting with Windows PowerShell, providing command-line visibility and control over hardware resources

Lenovo XClarity Administrator offers the following premium features that require an optional Pro license:

- Pattern-based configuration management that allows to define configurations once and apply repeatedly without errors when deploying new servers or redeploying existing servers without disrupting the fabric
- Bare-metal deployment of operating systems and hypervisors to streamline infrastructure provisioning

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

Lenovo XClarity Integrators

Lenovo also offers software plug-in modules, Lenovo XClarity Integrators, to manage physical infrastructure from leading external virtualization management software tools including those from Microsoft and VMware.

These integrators are offered at no charge, however if software support is required, a Lenovo XClarity Pro software subscription license should be ordered.

Lenovo XClarity Integrators offer the following additional features:

- Ability to discover, manage, and monitor Lenovo server hardware from VMware vCenter or Microsoft System Center
- Deployment of firmware updates and configuration patterns to Lenovo x86 rack servers and Flex System from the virtualization management tool
- Non-disruptive server maintenance in clustered environments that reduces workload downtime by dynamically migrating workloads from affected hosts during rolling server updates or reboots
- Greater service level uptime and assurance in clustered environments during unplanned hardware events by dynamically triggering workload migration from impacted hosts when impending hardware failures are predicted

For more information about all the available Lenovo XClarity Integrators, see the Lenovo XClarity Administrator Product Guide: https://lenovopress.com/tips1200-lenovo-xclarity-administrator

Rack installation

All models of the x3950 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.

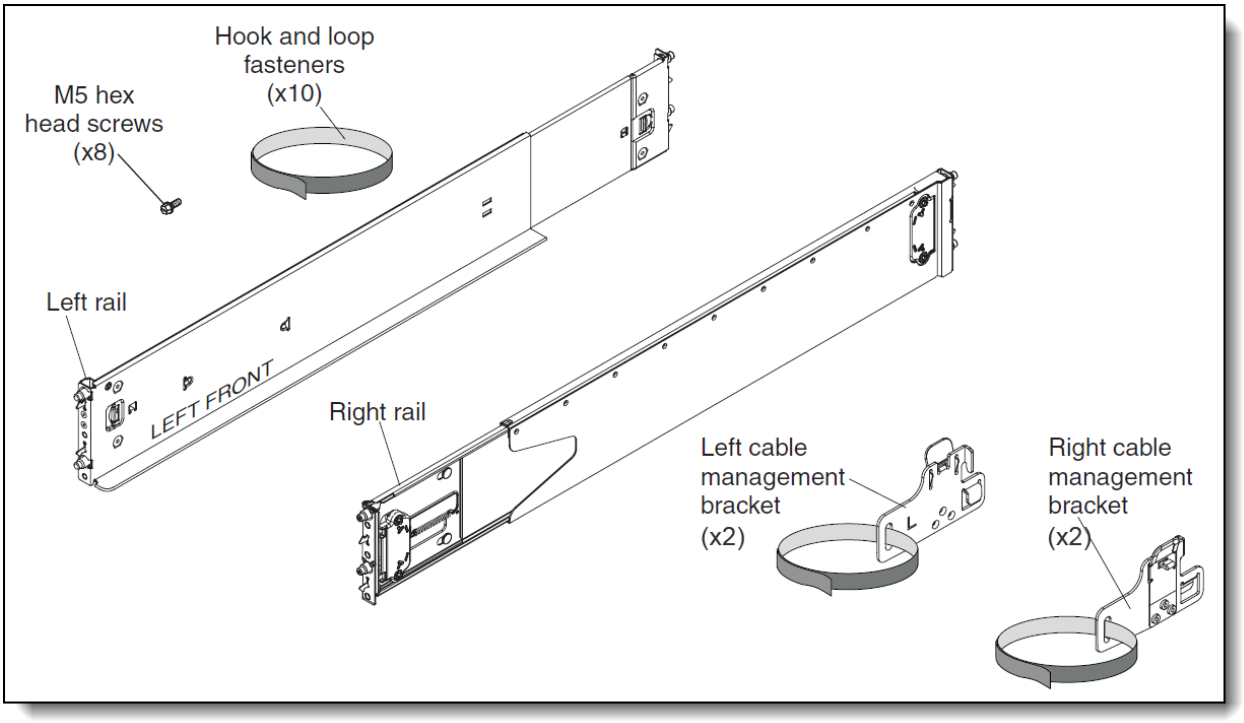

Figure 14. x3950 X6 rail kit and cable management bracket kit

Operating system support

Operating system support is based on the compute books installed in the server.

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

The following operating systems are supported with E7 v4 compute books:

- Microsoft Windows Server 2012
- Microsoft Windows Server 2012 R2
- Microsoft Windows Server 2016
- Microsoft Windows Server 2019
- Microsoft Windows Server, version 1709
- Red Hat Enterprise Linux 6.10 x64
- Red Hat Enterprise Linux 6.7 x64
- Red Hat Enterprise Linux 6.8 x64
- Red Hat Enterprise Linux 7.2
- Red Hat Enterprise Linux 7.3
- Red Hat Enterprise Linux 7.4
- Red Hat Enterprise Linux 7.5
- Red Hat Enterprise Linux 7.6
- Red Hat Enterprise Linux 7.7
- Red Hat Enterprise Linux 7.8
- Red Hat Enterprise Linux 7.9
- Red Hat Enterprise Linux 8.0
- Red Hat Enterprise Linux 8.1

- Red Hat Enterprise Linux 8.2
- Red Hat Enterprise Linux 8.3
- Red Hat Enterprise Linux 8.4
- Red Hat Enterprise Linux 8.5
- Red Hat Enterprise Linux 8.6
- Red Hat Enterprise Linux 8.7
- Red Hat Enterprise Linux 8.8
- SUSE Linux Enterprise Server 11 Xen x64 SP4
- SUSE Linux Enterprise Server 11 x64 SP4
- SUSE Linux Enterprise Server 12 SP1
- SUSE Linux Enterprise Server 12 SP2
- SUSE Linux Enterprise Server 12 SP3
- SUSE Linux Enterprise Server 12 SP4
- SUSE Linux Enterprise Server 12 SP5
- SUSE Linux Enterprise Server 12 Xen SP1
- SUSE Linux Enterprise Server 12 Xen SP2
- SUSE Linux Enterprise Server 12 Xen SP3
- SUSE Linux Enterprise Server 12 Xen SP4
- SUSE Linux Enterprise Server 12 Xen SP5
- SUSE Linux Enterprise Server 15
- SUSE Linux Enterprise Server 15 SP1
- SUSE Linux Enterprise Server 15 SP2
- SUSE Linux Enterprise Server 15 SP3
- SUSE Linux Enterprise Server 15 SP4
- SUSE Linux Enterprise Server 15 SP5
- SUSE Linux Enterprise Server 15 Xen
- SUSE Linux Enterprise Server 15 Xen SP1
- SUSE Linux Enterprise Server 15 Xen SP2
- SUSE Linux Enterprise Server 15 Xen SP3
- SUSE Linux Enterprise Server 15 Xen SP4
- SUSE Linux Enterprise Server 15 Xen SP5
- VMware ESXi 6.0 U2
- VMware ESXi 6.0 U3
- VMware ESXi 6.5
- VMware ESXi 6.5 U1
- VMware ESXi 6.5 U2
- VMware ESXi 6.5 U3
- VMware ESXi 6.7
- VMware ESXi 6.7 U1
- VMware ESXi 6.7 U2
- VMware ESXi 6.7 U3

The following operating systems are supported with E7 v3 compute books:

- Microsoft Windows Server 2008 R2 SP1
- Microsoft Windows Server 2012
- Microsoft Windows Server 2012 R2
- Microsoft Windows Server 2016
- Microsoft Windows Server, version 1709
- Red Hat Enterprise Linux 6.10 x64
- Red Hat Enterprise Linux 6.6 x64
- Red Hat Enterprise Linux 6.7 x64
- Red Hat Enterprise Linux 6.8 x64
- Red Hat Enterprise Linux 7.1
- Red Hat Enterprise Linux 7.2
- Red Hat Enterprise Linux 7.3
- Red Hat Enterprise Linux 7.4

- Red Hat Enterprise Linux 7.5
- Red Hat Enterprise Linux 7.6
- Red Hat Enterprise Linux 7.7
- Red Hat Enterprise Linux 7.8
- Red Hat Enterprise Linux 7.9
- SUSE Linux Enterprise Server 11 Xen x64 SP3
- SUSE Linux Enterprise Server 11 Xen x64 SP4
- SUSE Linux Enterprise Server 11 x64 SP3
- SUSE Linux Enterprise Server 11 x64 SP4
- SUSE Linux Enterprise Server 12
- SUSE Linux Enterprise Server 12 SP1
- SUSE Linux Enterprise Server 12 SP2
- SUSE Linux Enterprise Server 12 SP3
- SUSE Linux Enterprise Server 12 SP4
- SUSE Linux Enterprise Server 12 SP5
- SUSE Linux Enterprise Server 12 Xen
- SUSE Linux Enterprise Server 12 Xen SP1
- SUSE Linux Enterprise Server 12 Xen SP2
- SUSE Linux Enterprise Server 12 Xen SP3
- SUSE Linux Enterprise Server 12 Xen SP4
- SUSE Linux Enterprise Server 12 Xen SP5
- SUSE Linux Enterprise Server 15
- SUSE Linux Enterprise Server 15 SP1
- SUSE Linux Enterprise Server 15 SP2
- SUSE Linux Enterprise Server 15 SP3
- SUSE Linux Enterprise Server 15 SP4
- SUSE Linux Enterprise Server 15 SP5
- SUSE Linux Enterprise Server 15 Xen
- SUSE Linux Enterprise Server 15 Xen SP1
- SUSE Linux Enterprise Server 15 Xen SP2
- SUSE Linux Enterprise Server 15 Xen SP3
- SUSE Linux Enterprise Server 15 Xen SP4
- SUSE Linux Enterprise Server 15 Xen SP5
- VMware ESXi 5.5 U2
- VMware ESXi 5.5 U3
- VMware ESXi 6.0
- VMware ESXi 6.0 U1
- VMware ESXi 6.0 U2
- VMware ESXi 6.0 U3
- VMware ESXi 6.5
- VMware ESXi 6.5 U1
- VMware ESXi 6.5 U2
- VMware ESXi 6.5 U3

The following operating systems are supported with E7 v2 compute books:

- Microsoft Windows Server 2008 R2 SP1
- Microsoft Windows Server 2012
- Microsoft Windows Server 2012 R2
- Red Hat Enterprise Linux 6.10 x64
- Red Hat Enterprise Linux 6.5 x64
- Red Hat Enterprise Linux 6.6 x64
- Red Hat Enterprise Linux 6.7 x64
- Red Hat Enterprise Linux 6.8 x64
- Red Hat Enterprise Linux 7.0
- Red Hat Enterprise Linux 7.1
- Red Hat Enterprise Linux 7.2

- Red Hat Enterprise Linux 7.6
- Red Hat Enterprise Linux 7.7
- Red Hat Enterprise Linux 7.8
- Red Hat Enterprise Linux 7.9
- SUSE Linux Enterprise Server 11 Xen x64 SP3
- SUSE Linux Enterprise Server 11 Xen x64 SP4
- SUSE Linux Enterprise Server 11 x64 SP3
- SUSE Linux Enterprise Server 11 x64 SP4
- SUSE Linux Enterprise Server 12
- SUSE Linux Enterprise Server 12 SP1
- SUSE Linux Enterprise Server 12 SP2
- SUSE Linux Enterprise Server 12 SP3
- SUSE Linux Enterprise Server 12 SP4
- SUSE Linux Enterprise Server 12 Xen
- SUSE Linux Enterprise Server 12 Xen SP1
- SUSE Linux Enterprise Server 12 Xen SP2
- SUSE Linux Enterprise Server 12 Xen SP3
- SUSE Linux Enterprise Server 12 Xen SP4
- VMware ESXi 5.1 U2
- VMware ESXi 5.1 U3
- VMware ESXi 5.5
- VMware ESXi 5.5 U1
- VMware ESXi 5.5 U2
- VMware ESXi 5.5 U3
- VMware ESXi 6.0
- VMware ESXi 6.0 U1
- VMware ESXi 6.0 U2

Physical and environmental specifications

Dimensions and weight:

- Height: 351 mm (13.7 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: 84.5 kg (186.3 lb)
    - Typical configuration: 88.2 kg (194.5 lb)
    - Maximum configuration: 110.0 kg (242.6 lb)

Supported environment:

- The server is designed to the ASHRAE Class A3 guidelines
- Air temperature:
    - Server on: 5 °C to 40 °C (41 °F to 104 °F); altitude: 0 - 3,050 m (10,000 ft).
    - Server off: 5 °C to 45 °C (41 °F to 113 °F); altitude: 0 - 3,050 m (10,000 ft).
    - Shipment: -40 °C to 60 °C (-40 °F to 140 °F)
- Humidity:
    - Server on: 8% - 85%, maximum dew point 24 °C
    - Server off: 8% - 85%, maximum dew point 27 °C
- Electrical:
    - Models with 1400 W AC power supplies:
        - 100 - 127 (nominal) V AC; 50 Hz or 60 Hz; 10 A (900 W DC output)
        - 200 - 240 (nominal) V AC; 50 Hz or 60 Hz; 8 A (1400 W DC output)
        - Input kilovolt-amperes (kVA) (approximately):
            - Minimum configuration: 0.16 kVA
            - Maximum configuration: 3.2 kVA
    - Models with 900 W AC power supplies:
        - 100 - 127 (nominal) V ac; 50 Hz or 60 Hz; 10.7 A
        - 200 - 240 (nominal) V ac; 50 Hz or 60 Hz; 5.3 A
        - Input kilovolt-amperes (kVA) (approximately):
            - Minimum configuration: 0.16 kVA
            - Maximum configuration: 2.0 kVA
    - Models with 750 W DC power supplies:
        - -40 to -75 (nominal) V DC
        - Input kilovolt-amperes (kVA) (approximately):
            - Minimum configuration: 0.16 kVA
            - Maximum configuration: 1.7 kVA
- BTU output:
    - Minimum configuration: 546 Btu/hr (160 watts)
    - Maximum configuration: 10,912 Btu/hr (3,200 watts)
- Noise level:
    - 6.6 bels (operating)
    - 6.4 bels (idle)

Warranty and Support

The System x3950 X6, machine type 6241 has a three-year warranty.

The standard warranty terms are customer-replaceable unit (CRU) and onsite (for field-replaceable units FRUs only) with standard call center support during normal business hours and 9x5 Next Business Day Parts Delivered.

Lenovo's additional support services provide a sophisticated, unified support structure for your data center, with an experience consistently ranked number one in customer satisfaction worldwide. Available offerings include:

- **Warranty Upgrade (Preconfigured Support)**

  Services are available to meet the on-site response time targets that match the criticality of your systems.

  - 3, 4, or 5 years of service coverage
  - 1-year or 2-year post-warranty extensions
  - **Foundation Service**: 9x5 service coverage with next business day onsite response. YourDrive YourData is an optional extra (see below).
  - **Essential Service:** 24x7 service coverage with 4-hour onsite response or 24-hour committed repair (available only in select markets). Bundled with YourDrive YourData.
  - **Advanced Service:** 24x7 service coverage with 2-hour onsite response or 6-hour committed repair (available only in select markets). Bundled with YourDrive YourData.

- **Managed Services**

  Lenovo Managed Services provides continuous 24x7 remote monitoring (plus 24x7 call center availability) and proactive management of your data center using state-of-the-art tools, systems, and practices by a team of highly skilled and experienced Lenovo services professionals.

  Quarterly reviews check error logs, verify firmware & OS device driver levels, and software as needed. We'll also maintain records of latest patches, critical updates, and firmware levels, to ensure you systems are providing business value through optimized performance.

- **Technical Account Management (TAM)**

  A Lenovo Technical Account Manager helps you optimize the operation of your data center based on a deep understanding of your business. You gain direct access to your Lenovo TAM, who serves as your single point of contact to expedite service requests, provide status updates, and furnish reports to track incidents over time. In addition, your TAM will help proactively make service recommendations and manage your service relationship with Lenovo to make certain your needs are met.

- **Enterprise Server Software Support**

  Enterprise Software Support is an additional support service providing customers with software support on Microsoft, Red Hat, SUSE, and VMware applications and systems. Around the clock availability for critical problems plus unlimited calls and incidents helps customers address challenges fast, without incremental costs. Support staff can answer troubleshooting and diagnostic questions, address product comparability and interoperability issues, isolate causes of problems, report defects to software vendors, and more.

- **YourDrive YourData**

  Lenovo's YourDrive YourData is a multi-drive retention offering that ensures your data is always under your control, regardless of the number of drives that are installed in your Lenovo server. In the unlikely event of a drive failure, you retain possession of your drive while Lenovo replaces the failed drive part. Your data stays safely on your premises, in your hands. The YourDrive YourData service can be purchased in convenient bundles and is optional with Foundation Service. It is bundled with Essential Service and Advanced Service.

- **Health Check**

  Having a trusted partner who can perform regular and detailed health checks is central to maintaining efficiency and ensuring that your systems and business are always running at their best. Health Check supports Lenovo-branded server, storage, and networking devices, as well as select Lenovo-supported products from other vendors that are sold by Lenovo or a Lenovo-Authorized Reseller.

Examples of region-specific warranty terms are second or longer business day parts delivery or parts-only base warranty.

If warranty terms and conditions include onsite labor for repair or replacement of parts, Lenovo will dispatch a service technician to the customer site to perform the replacement. Onsite labor under base warranty is limited to labor for replacement of parts that have been determined to be field-replaceable units (FRUs). Parts that are determined to be customer-replaceable units (CRUs) do not include onsite labor under base warranty.

If warranty terms include parts-only base warranty, Lenovo is responsible for delivering only replacement parts that are under base warranty (including FRUs) that will be sent to a requested location for self-service. Parts-only service does not include a service technician being dispatched onsite. Parts must be changed at customer's own cost and labor and defective parts must be returned following the instructions supplied with the spare parts.

Lenovo Service offerings are region-specific. Not all preconfigured support and upgrade options are available in every region. For information about Lenovo service upgrade offerings that are available in your region, refer to the following resources:

- Service part numbers in Lenovo Data Center Solution Configurator (DCSC):
  http://dcsc.lenovo.com/#/services
- Lenovo Services Availability Locator
  http://lenovolocator.com/

For service definitions, region-specific details, and service limitations, please refer to the following documents:

- Lenovo Statement of Limited Warranty for Infrastructure Solutions Group (ISG) Servers and System Storage
  http://pcsupport.lenovo.com/us/en/solutions/ht503310
- Lenovo Data Center Services Agreement
  http://support.lenovo.com/us/en/solutions/ht116628

Services

Lenovo Services is a dedicated partner to your success. Our goal is to reduce your capital outlays, mitigate your IT risks, and accelerate your time to productivity.

Note: Some service options may not be available in all markets or regions. For more information, go to https://www.lenovo.com/services. For information about Lenovo service upgrade offerings that are available in your region, contact your local Lenovo sales representative or business partner.

Here's a more in-depth look at what we can do for you:

- **Asset Recovery Services**

  Asset Recovery Services (ARS) helps customers recover the maximum value from their end-of-life equipment in a cost-effective and secure way. On top of simplifying the transition from old to new equipment, ARS mitigates environmental and data security risks associated with data center equipment disposal. Lenovo ARS is a cash-back solution for equipment based on its remaining market value, yielding maximum value from aging assets and lowering total cost of ownership for your customers. For more information, see the ARS page, https://lenovopress.com/lp1266-reduce-e-waste-and-grow-your-bottom-line-with-lenovo-ars.

- **Assessment Services**

  An Assessment helps solve your IT challenges through an onsite, multi-day session with a Lenovo technology expert. We perform a tools-based assessment which provides a comprehensive and thorough review of a company's environment and technology systems. In addition to the technology based functional requirements, the consultant also discusses and records the non-functional business requirements, challenges, and constraints. Assessments help organizations like yours, no matter how large or small, get a better return on your IT investment and overcome challenges in the ever-changing technology landscape.

- **Design Services**

  Professional Services consultants perform infrastructure design and implementation planning to support your strategy. The high-level architectures provided by the assessment service are turned into low level designs and wiring diagrams, which are reviewed and approved prior to implementation. The implementation plan will demonstrate an outcome-based proposal to provide business capabilities through infrastructure with a risk-mitigated project plan.

- **Basic Hardware Installation**

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

- **Deployment Services**

  When investing in new IT infrastructures, you need to ensure your business will see quick time to value with little to no disruption. Lenovo deployments are designed by development and engineering teams who know our Products & Solutions better than anyone else, and our technicians own the process from delivery to completion. Lenovo will conduct remote preparation and planning, configure & integrate systems, validate systems, verify and update appliance firmware, train on administrative tasks, and provide post-deployment documentation. Customer’s IT teams leverage our skills to enable IT staff to transform with higher level roles and tasks.

- **Integration, Migration, and Expansion Services**

  Move existing physical & virtual workloads easily, or determine technical requirements to support increased workloads while maximizing performance. Includes tuning, validation, and documenting ongoing run processes. Leverage migration assessment planning documents to perform necessary migrations.

Regulatory compliance

The server conforms to the following regulations:

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

External drive enclosures

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

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

Table 27. E1012 and E1024 external drive enclosure models

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

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

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

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

Table 28. External drive enclosures

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

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

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

External storage systems

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

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

External backup units

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

Table 29. External backup options

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

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

Top-of-rack Ethernet switches

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

Table 30. Ethernet LAN switches

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

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

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

Fibre Channel SAN switches

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

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

Uninterruptible power supply units

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

Table 31. Uninterruptible power supply units

Part number	Description
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)
55943KT†	ThinkSystem RT3kVA 2U Standard UPS (200-230VAC) (2x C13 10A, 2x GB 10A, 1x C19 16A outlets)
55943LT†	ThinkSystem RT3kVA 2U Long Backup UPS (200-230VAC) (2x C13 10A, 2x GB 10A, 1x C19 16A outlets)
55946KT†	ThinkSystem RT6kVA 5U UPS (200-230VAC) (2x C13 10A outlets, 1x Terminal Block output)
5594XKT†	ThinkSystem RT10kVA 5U UPS (200-230VAC) (2x C13 10A outlets, 1x Terminal Block output)

† Only available in China and the Asia Pacific market.

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

Power distribution units

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

Table 32. Power distribution units

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
0U Basic PDUs															
00YJ776	ATZY	0U 36 C13/6 C19 24A 1 Phase PDU	N	Y	Y	N	N	N	N	N	N	Y	Y	Y	N
00YJ779	ATZX	0U 21 C13/12 C19 48A 3 Phase PDU	N	N	Y	N	N	N	Y	N	N	Y	Y	Y	N
00YJ777	ATZZ	0U 36 C13/6 C19 32A 1 Phase PDU	Y	Y	N	Y	Y	Y	Y	Y	Y	N	N	Y	Y
00YJ778	AU00	0U 21 C13/12 C19 32A 3 Phase PDU	Y	Y	N	Y	Y	Y	Y	Y	Y	N	N	Y	Y
0U Switched and Monitored PDUs															
00YJ783	AU04	0U 12 C13/12 C19 Switched and Monitored 48A 3 Phase PDU	N	N	Y	N	N	N	Y	N	N	Y	Y	Y	N
00YJ781	AU03	0U 20 C13/4 C19 Switched and Monitored 24A 1 Phase PDU	N	N	Y	N	Y	N	Y	N	N	Y	Y	Y	N
00YJ782	AU02	0U 18 C13/6 C19 Switched and Monitored 32A 3 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y
00YJ780	AU01	0U 20 C13/4 C19 Switched and Monitored 32A 1 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y
1U Switched and Monitored PDUs															
4PU7A81117	BNDV	1U 18 C19/C13 switched and monitored 48A 3P WYE PDU - ETL	N	N	N	N	N	N	N	N	N	N	N	Y	N
4PU7A77467	BLC4	1U 18 C19/C13 Switched and Monitored 80A 3P Delta PDU	N	N	N	N	N	N	N	N	N	Y	N	Y	N
4PU7A77469	BLC6	1U 12 C19/C13 switched and monitored 60A 3P Delta PDU	N	N	N	N	N	N	N	N	N	N	N	Y	N
4PU7A77468	BLC5	1U 12 C19/C13 switched and monitored 32A 3P WYE PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A81118	BNDW	1U 18 C19/C13 switched and monitored 48A 3P WYE PDU - CE	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y
46M4002	5896	1U 9 C19/3 C13 Switched and Monitored DPI PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
46M4004	5894	1U 12 C13 Switched and Monitored DPI PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
46M4003	5897	1U 9 C19/3 C13 Switched and Monitored 60A 3 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
46M4005	5895	1U 12 C13 Switched and Monitored 60A 3 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
1U Ultra Density Enterprise PDUs (9x IEC 320 C13 + 3x IEC 320 C19 outlets)															
71763NU	6051	Ultra Density Enterprise C19/C13 PDU 60A/208V/3PH	N	N	Y	N	N	N	N	N	N	Y	Y	Y	N
71762NX	6091	Ultra Density Enterprise C19/C13 PDU Module	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
1U C13 Enterprise PDUs (12x IEC 320 C13 outlets)															
39M2816	6030	DPI C13 Enterprise PDU Plus Module (WW)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
39Y8941	6010	DPI C13 Enterprise PDU Module (WW)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
1U C19 Enterprise PDUs (6x IEC 320 C19 outlets)															
39Y8948	6060	DPI C19 Enterprise PDU Module (WW)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
39Y8923	6061	DPI Three-phase 60A/208V C19 Enterprise PDU (US)	N	N	Y	N	N	N	Y	N	N	N	Y	Y	N
1U Front-end PDUs (3x IEC 320 C19 outlets)															
39Y8938	6002	DPI Single-phase 30A/120V Front-end PDU (US)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
39Y8939	6003	DPI Single-phase 30A/208V Front-end PDU (US)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
39Y8934	6005	DPI Single-phase 32A/230V Front-end PDU (International)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
39Y8940	6004	DPI Single-phase 60A/208V Front-end PDU (US)	Y	N	Y	Y	Y	Y	Y	N	N	Y	Y	Y	N
39Y8935	6006	DPI Single-phase 63A/230V Front-end PDU (International)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
1U NEMA PDUs (6x NEMA 5-15R outlets)															
39Y8905	5900	DPI 100-127V NEMA PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Line cords for 1U PDUs that ship without a line cord															
40K9611	6504	4.3m, 32A/380-415V, EPDU/IEC 309 3P+N+G 3ph wye (non-US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9612	6502	4.3m, 32A/230V, EPDU to IEC 309 P+N+G (non-US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9613	6503	4.3m, 63A/230V, EPDU to IEC 309 P+N+G (non-US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9614	6500	4.3m, 30A/208V, EPDU to NEMA L6-30P (US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9615	6501	4.3m, 60A/208V, EPDU to IEC 309 2P+G (US) Line Cord	N	N	Y	N	N	N	Y	N	N	Y	Y	Y	N
40K9617	6505	4.3m, 32A/230V, Souriau UTG Female to AS/NZ 3112 (Aus/NZ) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9618	6506	4.3m, 32A/250V, Souriau UTG Female to KSC 8305 (S. Korea) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

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

Rack cabinets

The server supports the rack cabinets that are listed in the following table.

Table 33. Rack cabinets

Part number	Description	Supported by x3950 X6	Maximum supported x3950 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*	5
9308-4PX	42U Enterprise Rack	Yes*	5
9360-4PX	42U 1200mm Deep Dynamic Rack	Yes	5
9360-4EX	42U 1200mm Deep Dynamic Expansion Rack	Yes	5
9361-4PX	42U 1200mm Deep Static Rack	Yes	5
9361-4EX	42U 1200mm Deep Static Expansion Rack	Yes	5
9362-4PX	47U 1200mm Deep Static Rack	Yes	5
9362-4EX	47U 1200mm Deep Static Expansion Rack	Yes	5
9363-4CX	PureFlex System 42U Rack	Yes	5
9363-4DX	PureFlex System 42U Expansion Rack	Yes	5
9363-4PX	42U 1100mm Dynamic Rack	Yes	5
9363-4EX	42U 1100mm Dynamic Expansion Rack	Yes	5
1410-2RX	Intelligent Cluster 25U Rack Family	No	Not applicable
1410-4RX	Intelligent Cluster 42U Rack Family	Yes*	5
1410-PRA	Intelligent Cluster 42U 1200mm Deep Rack Family	Yes	5
1410-PRB	Intelligent Cluster 42U 1100mm Enterprise V2 Rack Family	Yes	5
7200-4PX	Smart Analytics 42U Rack Family	Yes*	5

* No support for Full-length I/O Books

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

KVM console options

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

Table 34. Console keyboards

Part number	Description
Consoles	
17238BX	1U 18.5" Standard Console (without keyboard)
Console keyboards	
00MW310	Lenovo UltraNav Keyboard USB - US Eng

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

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

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

Related publications and links

For more information, see these resources:

- Lenovo System x3950 X6 product page
  https://www3.lenovo.com/us/en/data-center/servers/flex-blade-servers/compute-nodes/mission-critical/System-x3950-X6/p/WMD00000002
- Customer Implementations of the x3950 X6 - Case Studies and Videos
  https://lenovosuccess.com/search#term=&systems=System%2520x&system_models=x3950%2520X6
- ServerProven hardware compatibility page for the x3850 X6 and x3950 X6
  http://www.lenovo.com/us/en/serverproven/xseries/6241E7xxxxV4.shtml
- Lenovo System x3950 X6 Installation and Service Guide
  http://systemx.lenovofiles.com/help/index.jsp?topic=%2Fcom.lenovo.sysx.6241.doc%2Fprintable_doc.html
- Lenovo System x3950 X6 Rack Installation Instructions
  http://systemx.lenovofiles.com/help/index.jsp?topic=%2Fcom.lenovo.sysx.6241.doc%2Fprintable_doc.html
- xREF: System x Reference
  http://lenovopress.com/xref
- Support Portal for x3950 X6:
  http://support.lenovo.com/products/Servers/Lenovo-x86-servers/Lenovo-System-x3950-X6/6241
- IBM System Storage Interoperation Center
  http://www.ibm.com/systems/support/storage/ssic

Related product families

Product families related to this document are the following:

- 8-Socket Rack Servers
- Mission Critical Servers

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