System x3850 X5 (7143)
Product Guide (withdrawn product)

The x3850 X5 server is the fifth generation of the Enterprise X-Architecture, delivering innovation with enhanced reliability and availability features to enable optimal performance for databases, enterprise applications, and virtualized environments. Environments that run around the clock to supply information world-wide require dependable servers with features that can tolerate a component failure without total shutdown.

The x3850 X5 server packs numerous fault-tolerant and high-availability features into a high-density, rack-optimized package that helps to significantly reduce the space needed to support massive network computing operations. A single x3850 X5 supports up to four of the new Intel Xeon E7 high-performance 10-core processors and up to 3 TB of memory. Two x3850 X5 servers can be connected together to form a single-system image with up to eight processors and up to 6 TB of RAM. This processing capacity is ideal for large-scale database or virtualization requirements. Figure 1 shows the System x3850 X5.

Figure 1. The System x3850 X5

Did you know?

The x3850 X5 is an ideal server for enterprise database and virtualization workloads. The x3850 X5 held #1 scores in five industry-standard benchmarks. This included a four-socket TPC-C (database benchmark) result of over 2.3 million transactions per minute (27% better than the closest HP result at the time) and world record TPC-H (business intelligence) price performance result.

Key features

The x3850 X5 is a mission-critical 4U four-socket server, capable of expanding to up to 8 processor sockets and 6 TB of memory in 10U of rack space. It offering outstanding performance, and superior reliability and fault-tolerant memory characteristics.

Lenovo eX5 technology represents the fifth generation of enterprise servers based on the same design principle that began with in 1997: to offer systems that are expandable, offer "big iron" reliability, availability, and serviceability (RAS) features, with extremely competitive price/performance on an Intel Xeon processor-based system.

Scalability and performance

The x3850 X5 offers numerous features to boost performance, improve scalability, and reduce costs:

- The x3850 X5 supports up to four high-performance Intel Xeon E7 family allowing you to upgrade as business needs require.
- Scalable to eight processors by connecting two x3850 X5 servers together to form a single system image.
- Each x3850 X5 scalable to 2 TB of memory internally or 3 TB of memory with the addition of the MAX5 V2 memory expansion unit. With two x3850 X5 servers each with MAX5 units, the total available system memory is up to 6 TB.
- Supports the Intel Xeon E7-2800, E7-4800 and E7-8800 families of high performance processors, up to 10 cores each, offering superior system performance
- Intel Turbo Boost Technology dynamically turns off unused processor cores and increases the clock speed of the cores in use, by up to three model frequencies. For example, with 7-10 cores active, a 2.4 GHz E7-2870 10-core processor can run the cores at up to 2.53 GHz. With 5-6 cores active, it can run those cores at 2.67 GHz; with only 1-4 cores active, it can run those cores at 2.8 GHz
- Each processor includes two integrated memory controllers, to reduce memory bottlenecks and improve performance. Memory access is at up to 1066 MHz frequency, depending on the processor model and memory used.
- The MAX5 V2 adds an additional four memory controllers for a total of eight memory controllers to maximize memory parallelism and performance.
- In processors implementing Hyper-Threading technology, each core has two threads capable of running an independent process. Thus, an 8-core processor can run 16 threads concurrently.
- Intel's Virtualization Technology (VT) integrates hardware-level virtualization hooks that allow operating system vendors to better utilize the hardware for virtualization workloads.
- Intel QuickPath Interconnect (QPI) technology for processor-to-processor connectivity and Intel Scalable Memory Interconnect (SMI) processor-to-memory connectivity:
    - Intel QPI link topology at up to 6.4 Gbps with four QPI links per CPU
    - Intel SMI link topology at up to 6.4 Gbps with four SMI links per CPU
- Up to 64 DIMM sockets in the server (eight per memory card), plus an additional 32 DIMMs with an optional 1U MAX5 V2 memory expansion unit, for a total of 96 DIMM sockets. With two x3850 X5 servers each with MAX5 units, the total number of DIMM sockets is 192.
- The use of solid-state drives (SSDs) instead of, or along with, traditional spinning drives (HDDs) can significantly improve I/O performance. An SSD can support up to 100 times more I/O operations per second (IOPS) than a typical HDD.
- Up to 24 1.8-inch SSD bays, or up to 16 2.5-inch bays together with the option of an optical drive, provide a flexible and scalable all-in-one platform to meet your increasing demands.
- Seven PCIe 2.0 slots for maximum I/O expandability

Availability and serviceability

The x3850 X5 provides many features to simplify serviceability and increase system uptime:

- Support for machine check architecture (MCA) recovery, a feature of the Intel Xeon processor E7 family, which enables the handling of system errors that otherwise require the operating system to be halted. SAP HANA is one of the first application which leverages the MCA recovery to handle system errors in order to prevent the application from being terminated in case of a system error.

- Extensive memory protection with Chipkill, and, with DIMMs containing x4 DRAM modules, Redundant Bit Steering (RBS) (also known as Double Device Data Correction or DDDC) is also supported . The combination of Chipkill and RBS provides very robust memory protection that sustains to two sequential memory DRAM chip failures without affecting overall system performance.

- Redundant CPU-to-I/O hub interconnect links provide ability to self-recover from CPU failure. If primary CPU fails then eX5 systems can use the second CPU to boot the OS as they still have access to the integrated I/O devices because of redundant links between CPUs and I/O hubs.

- Single image 8-way systems consisting of two interconnected 4-way nodes provide self-healing capabilities in case of single node failure. Two independent nodes form a resilient 8-way configuration. In case of single node failure the system can be restarted in degraded mode thus eliminating unexpected downtime that requires service specialist to recover.

- Memory mirroring and memory rank sparing for redundancy in the event of a non-correctable memory failure.

- Hot-swap drives, supporting RAID redundancy for data protection and greater system uptime.

- Two 1975 W hot-swap power supplies and five fans (three hot-swap, two integrated into the power supplies).

- The power source independent light path diagnostics panel and individual light path LEDs quickly lead the technician to failed (or failing) components, which simplifies servicing, speeds up problem resolution, and helps improve system availability.

- Predictive Failure Analysis (PFA) detects when system components (processors, VRMs, memory, HDDs, fans, and power supplies) operate outside of standard thresholds and generates proactive alerts in advance of a possible failure, therefore increasing uptime.

- Solid-state drives (SSDs) offer significantly better reliability than traditional mechanical HDDs for greater uptime.

- Built-in Integrated Management Module (IMM) continuously monitors system parameters, triggers alerts, and performs recovering actions in case of failures to minimize downtime.

- Built-in diagnostics, using Dynamic Systems Analysis (DSA) Preboot, speed up troubleshooting tasks to reduce service time.

- Three-year customer-replaceable unit and on-site limited warranty, 9x5 next business day. Optional service upgrades are available.

Manageability and security

Powerful systems management features simplify local and remote management of the x3850 X5:

- The server includes an Integrated Management Module (IMM) to monitor server availability and perform remote management.

- Integrated industry-standard Unified Extensible Firmware Interface (UEFI) enables improved setup, configuration, and updates, and simplifies error handling.

- Integrated Trusted Platform Module (TPM) 1.2 support enables advanced cryptographic functionality, such as digital signatures and remote attestation.

- IBM Systems Director is included for proactive systems management. It offers comprehensive systems management tools that help to increase uptime, reduce costs, and improve productivity through advanced server management capabilities.

Energy efficiency

The x3850 X5 offers the following energy-efficiency features to save energy, reduce operational costs, increase energy availability, and contribute to the green environment:

- Energy-efficient planar components help lower operational costs.
- Support for one or two or four highly efficient 675 W ac power supplies allows for efficient use and scalability to meet the power requirements of the installed components.
- Intel Xeon processor E5-2600 product family offers significantly better performance over the previous generation while fitting into the same thermal design power (TDP) limits.
- Low-voltage Intel Xeon processors draw less energy to satisfy the demands of power and thermally constrained data centers and telecommunication environments.
- Low-voltage 1.35 V DDR3 memory RDIMMs consume 15% less energy compared to 1.5 V DDR3 RDIMMs.
- Solid state drives (SSDs) consume as much as 80% less power than traditional spinning 2.5-inch HDDs.
- The server uses hexagonal ventilation holes, which is a part of Calibrated Vectored Cooling™ technology. Hexagonal holes can be grouped more densely than round holes, providing more efficient airflow through the system.
- IBM Systems Director Active Energy Manager™ provides advanced data center power notification and management to help achieve lower heat output and reduced cooling needs.

Locations of key components

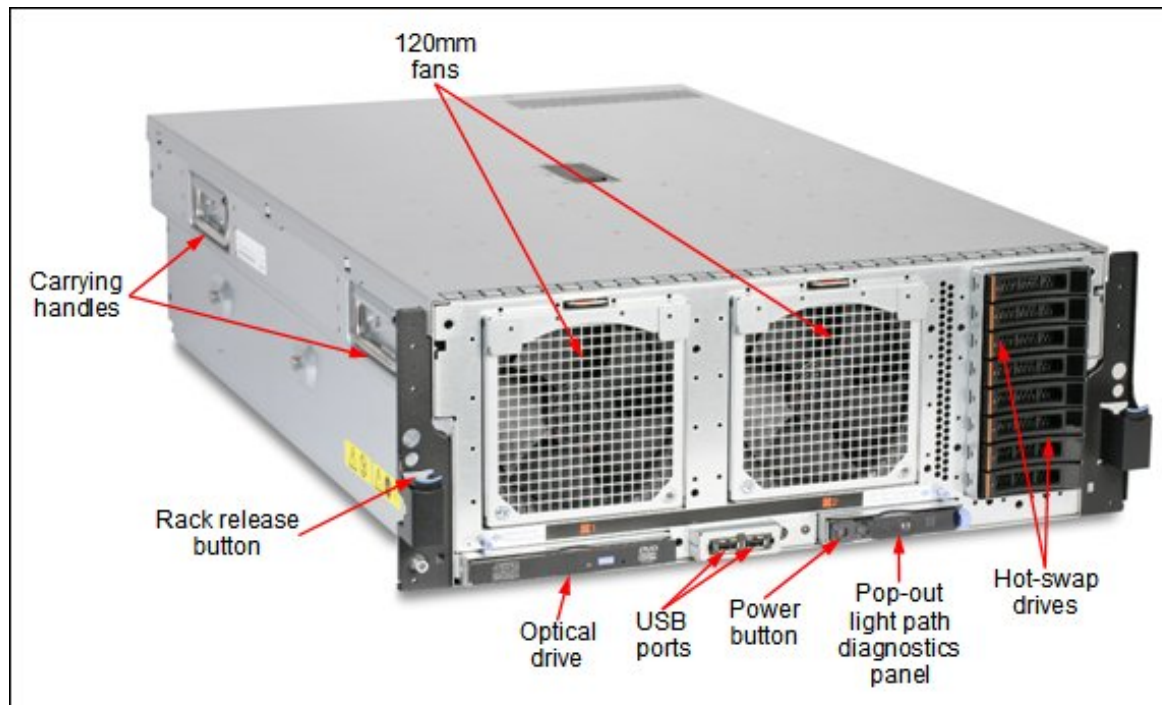Figure 2 shows the front of the server with the front bezel removed.

Figure 2. Front view of the System x3850 X5

Figure 3 shows the rear of the server.
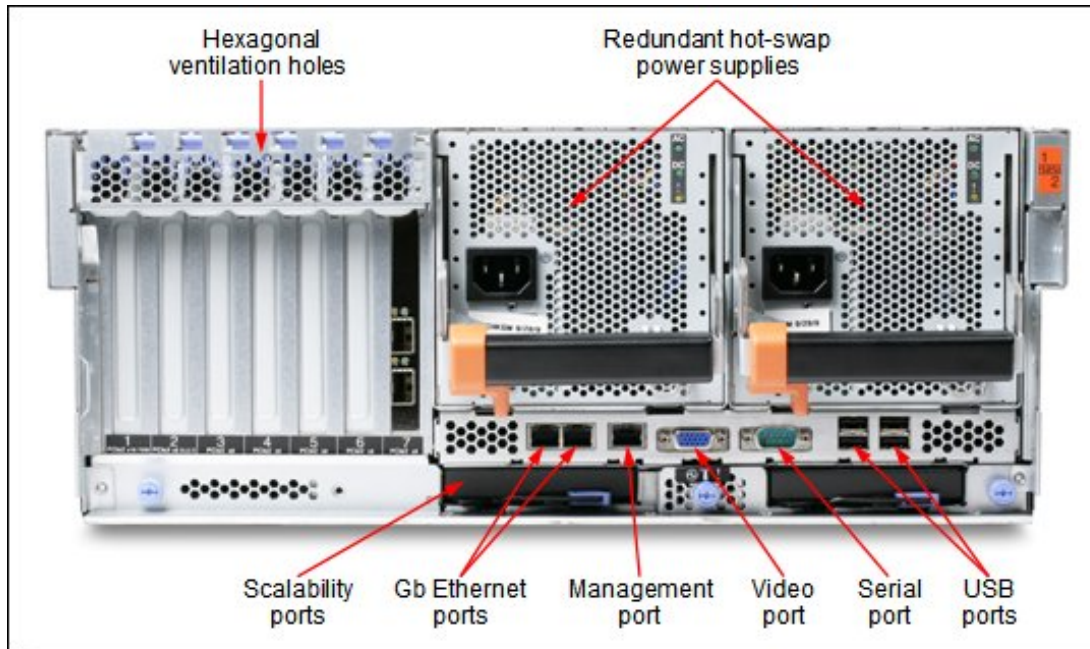
Figure 3. Rear view of the System x3850 X5

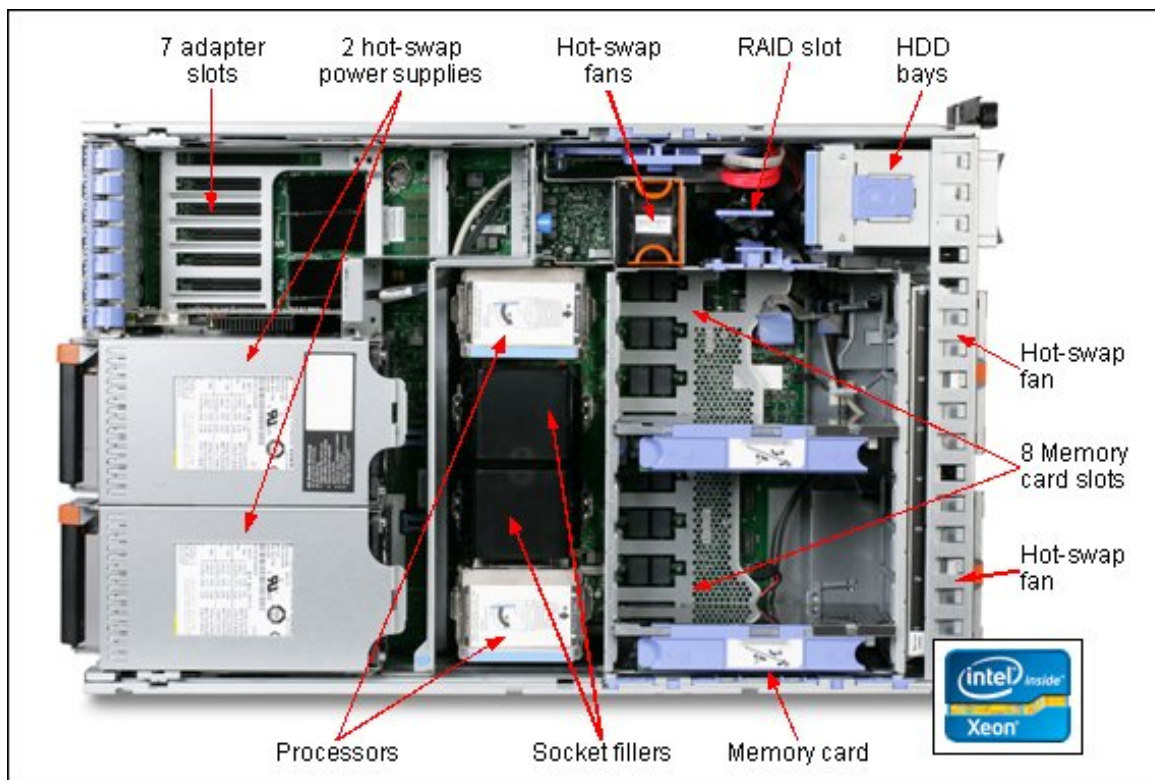Figure 4 shows the locations of key components inside the server.

Figure 4. Inside view of the System x3850 X5

The x3850 X5 supports the addition of the MAX5 memory expansion unit. This 1U device is cabled directly to the server and provides an additional 512 GB of memory capacity for applications that can benefit from the extra RAM. Figure 5 shows the MAX5 optional memory expansion unit.
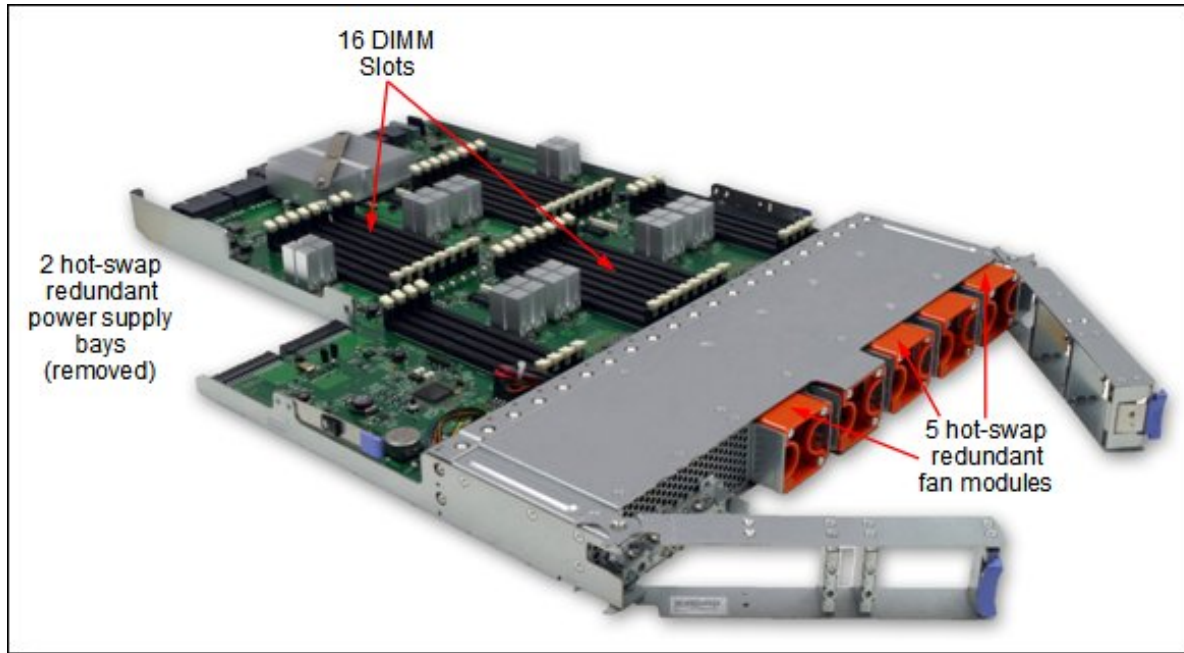
Figure 5. Inside view of the MAX5 optional memory expansion unit for the System x3850 X5

Standard specifications

The following table lists the standard specifications.

Table 1. Standard specifications

Components	Specification
Machine type	7143
Firmware	IBM-signed firmware
Form factor/height	Rack/4U per chassis; MAX5 adds 1U.
Scalability	Machine type 7143 can scale as follows: • One server (4U rack-mounted complex) • One server with MAX5 memory expansion unit (5U rack-mounted complex) • Two servers with two MAX5 memory expansion units (10U rack-mounted complex)
Processor type	Machine type 7143: Intel Xeon E7-8800 and E7-4800 families, up to 10 cores.
Number of processors	Most models: 2 standard (some 4 standard); 4 maximum.
Cache (max)	Up to 30 MB L3 cache
Memory DIMM sockets	Up to eight memory cards, each with eight DIMM sockets (64 DIMM sockets total). MAX5 adds 32 DIMM sockets.
Memory maximums	2.0 TB using 32 GB DIMMs. Up to 3.0 TB with the addition of MAX5. With two x3850 X5 servers and two MAX5 units, total capacity up to 6.0 TB

Components	Specification
Expansion slots	Eight slots total: • Seven PCIe 2.0 slots (one used by 10 Gb Ethernet card, if included). • One PCIe 2.0 slot for supported RAID card.
Disk bays	Eight 2.5" hot-swap SAS or sixteen 1.8" solid-state drives (SSD).
Maximum internal storage	Using NL SAS HDDs: 8 TB per chassis with eight 1 TB drives Using 2. 5-inch SSDs: 12.8 TB per chassis with eight 1.6 TB drives Using eXFlash solid-state drives: 8 TB per chassis with 16x 512 GB SSDs
Network interface	Two 1 Gb Ethernet ports. Broadcom 5709C controller. Emulex 10Gb Virtual Fabric Adapter standard on most models with two 10 Gb Ethernet ports
Power supply (std/max)	Up to two hot-swap redundant 1975 W power supplies
Hot-swap components	Power supplies, fans, hard disk drives, and solid-state-drives.
RAID support	7143: Integrated RAID-0, RAID-1 with ServeRAID M1015 in dedicated PCIe slot Optional RAID-5, 6, 10, 50, 60
External ports	Rear: Four scalability ports , one Ethernet for systems management, one serial port, four USB 2.0, one VGA, two Gb Ethernet Front: Two USB 2.0 Internal: One USB 2.0 port for Embedded Hypervisor
Systems management	Alert on LAN 2, Automatic Server Restart, IBM Systems Director, ServerGuide, Integrated Management Module (IMM), light path diagnostics (independently powered), Predictive Failure Analysis on hard disk drives, processors, VRMs, fans and memory, Wake on LAN, Dynamic System Analysis, QPI Faildown.
Operating systems supported	Microsoft® Windows Server® 2008 (Standard, Enterprise and Data Center Editions 64-bit), 64-bit Red Hat Enterprise Linux®, 64-bit SUSE Enterprise Linux, (Server and Advanced Server), VMware vSphere Hypervisor
Limited warranty	Three-year customer-replaceable unit and onsite limited warranty.
Dimensions	Width: 440 mm (17.3 inches), depth: 712 mm (28.0 inches), height: 173 mm (6.8 inches) or 4 rack units (4U)
Weight	Minimum configuration: 35.4 kg (78 lb), maximum configuration: 49.9 kg (110 lb)

The x3850 X5 servers are shipped with the following items:

- Rack rails and hardware
- Cable management hardware
- Country kit carton
- Two 2.8 m 220 V intra-rack cables
- On/off switch cover
- Documentation CD

Standard models

The following table lists the standard models.

Table 2. Standard models - Machine type 7143 (Intel Xeon E7-4800 and E7-8800 series processors)

Model 7143-	Intel Xeon CPUs (4 max) (quantity, model, core speed, cores, L3 cache, memory speed)	Scale without MAX5‡	Scale with MAX5‡	MAX5	Memory (cards)*	RAID	Bays (std/max) (No disks)	10G Std	Std PS
7143-B1x	2x E7-4807 6C 1.86GHz 18MB 800	No	Yes	Opt	2x4GB (1)	Opt	0 / 8 (2.5")	Opt	1
7143-B2x	2x E7-4820 8C 2.00GHz 18MB 1066	No	Yes	Opt	4x4GB (2)	M1015	4 / 8 (2.5")	Std	2
7143-B3x	2x E7-4830 8C 2.13GHz 24MB 1066	No	Yes	Opt	4x4GB (2)	M1015	4 / 8 (2.5")	Std	2
7143-B5x	2x E7-4850 10C 2.00GHz 24MB 1066	No	Yes	Opt	4x4GB (2)	M1015	4 / 8 (2.5")	Std	2
7143-B6x	2x E7-4860 10C 2.26GHz 24MB 1066	No	Yes	Opt	4x4GB (2)	M1015	4 / 8 (2.5")	Std	2
7143-B7x	2x E7-4870 10C 2.40GHz 30MB 1066	No	Yes	Opt	4x4GB (2)	M1015	4 / 8 (2.5")	Std	2
7143-C1x	2x E7-8850 10C 2.00GHz 24MB 1066	Yes	Yes	Opt	4x4GB (2)	M1015	4 / 8 (2.5")	Std	2
7143-C2x	2x E7-8860 10C 2.26GHz 24MB 1066	Yes	Yes	Opt	4x4GB (2)	M1015	4 / 8 (2.5")	Std	2
7143-C3x	2x E7-8870 10C 2.40GHz 30MB 1066	Yes	Yes	Opt	4x4GB (2)	M1015	4 / 8 (2.5")	Std	2

‡ Columns indicate whether the server can scale to two nodes without a MAX5 attached and with a MAX5 attached. * The number in brackets is the number of memory cards standard in each model. Up to eight cards are supported. Each holds up to eight DIMMs for a total of 64 DIMMs. The MAX5 adds 32 DIMM sockets for a total of 96 DIMMs.

Workload-optimized models

The following table lists the announced workload-optimized models. These are all named System x3950 X5 to distinguish them from base x3850 X5 models, even though the base hardware is the same. These are systems that are specially configured to meet the requirements of a particular software stack.

Table 3. Workload-optimized models - Machine type 7143 (Intel Xeon E7-4800 and E7-8800 series processors)

Model	Intel Xeon CPUs (4 max)**	MAX5	Memory (cards)*	Standard RAID	Disk bays (std/max)	Disks	Network†	DVD	PS
Database workload-optimized models									
7143-D3x	4x E7-4860 10C 2.26GHz 24MB	Opt	32x4GB (8 cards)	2x 6 Gb SSD HBA	16 / 16 (1.8" SSD)	16x 200GB	2x 1Gb + 2x 10Gb	Opt	2
7143-D4x	4x E7-4860 10C 2.26GHz 24MB	Opt	32x4GB (8 cards)	4x M5015 + perf keys	16 / 16 (1.8" SSD)	16x 200GB	2x 1Gb + 2x 10Gb	Opt	2
SAP HANA workload-optimized models									
7143-HAx	2x E7-8870 10C 2.40GHz 30MB	NS§	16x16GB (4 cards)	1x M5015 + battery	8 / 8 (2.5" HDD)	8x 900GB SAS 1x 1.2TB PCIe	6x 1Gb + 4x 10Gb	Multi	2
7143-HBx	4x E7-8870 10C 2.40GHz 30MB	NS§	32x16GB (8 cards)	1x M5015 + battery	8 / 8 (2.5" HDD)	8x 900GB SAS 1x 1.2TB PCIe	6x 1Gb + 4x 10Gb	Multi	2
7143-HCx‡	4x E7-8870 10C 2.40GHz 30MB	NS§	32x16GB (8 cards)	1x M5015 + battery	8 / 8 (2.5" HDD)	8x 900GB SAS 1x 1.2TB PCIe	6x 1Gb + 4x 10Gb	Opt	2
7143-HDx	4x E7-8870 10C 2.40GHz 30MB	NS§	32x32GB (8 cards)	1x M5015 + battery	8 / 8 (2.5" HDD)	8x 900GB SAS 1x 1.2TB PCIe	6x 1Gb + 4x 10Gb	Multi	2
7143-HEx‡	4x E7-8870 10C 2.40GHz 30MB	NS§	32x32GB (8 cards)	1x M5015 + battery	8 / 8 (2.5" HDD)	8x 900GB SAS 1x 1.2TB PCIe	6x 1Gb + 4x 10Gb	Opt	2
Virtualization workload-optimized models									
7143-F1x (ESX)	4x E7-4860 10C 2.26GHz 24MB	Std (V2)	96x4GB (8 cards)	1x M1015	4 / 8 (2.5" HDD)	Open	2x 1Gb + 2x 10Gb	Opt	2
7143-F2x (RH)	4x E7-4860 10C 2.26GHz 24MB	Std (V2)	96x4GB (8 cards)	1x M1015	4 / 8 (2.5" HDD)	Open	2x 1Gb + 2x 10Gb	Opt	2
7143-B9x (ESX)	4x E7-4807 6C 1.86GHz 18MB	Std (V2)	96x4GB (8 cards)	1x M1015	4 / 8 (2.5" HDD)	Open	2x 1Gb + 2x 10Gb	Opt	2

** Processor detail: Quantity, model, cores, core speed, memory speed, L3 cache.
* The number in brackets is the number of memory cards standard in each model. Up to eight cards are supported. Each holds up to eight DIMMs for a total of 64 DIMMs. The MAX5 adds 32 DIMM sockets for a total of 96 DIMMs.
† The H models include one Emulex 10GbE Integrated Virtual Fabric Adapter (with two 10GbE SW SFP+ Transceivers), one Emulex 10GbE Virtual Fabric Adapter II (with two 10GbE SW SFP+ Transceivers), and one Intel Ethernet Quad Port Server Adapter I340-T4 for a total of four 10Gb ports and six 1Gb ports. All F models include one Emulex 10GbE Integrated Virtual Fabric Adapter. D3x and D4x models include one Emulex 10GbE Integrated Virtual Fabric Adapter II.
‡ Models HCx and HEx include the QPI Scalability Kit (four cables), part number 46M0072. Use model HBx plus HCx or HDx plus HEx to form a 2-node scaled complex.
§ NS=Not supported. MAX5 is not currently certified for use with SAP HANA and is therefore not supported

About these models:

- Models 7143-D3x, D4x: These models are designed for database applications and use solid state drives for the best I/O performance.
  Backplane connections for sixteen 1.8-inch solid state drives (SSD) are standard, as are sixteen 200 GB high-performance solid-state drives. Model D3x includes two SSD host bus adapters. Model D4x includes four ServeRAID M5015 RAID controllers with four ServeRAID M5000 Series Performance Accelerator Keys.

- Models 7143-HAx, HBx, HCx: These models are optimized to run the SAP High-Performance Analytic Appliance (HANA) solution.
  The x3950 X5 Workload Optimized Solution for SAP HANA is an integrated, ready-to-run, hardware-software offering, featuring the new SAP HANA software. Models HDx and HEx are specifically designed for SAP Business Suite, powered by SAP HANA (OLTP) workloads.

Models HAx, HBx, HDx include a preload comprising SLES for SAP, IBM GPFS, and the SAP HANA software stack.

HCx, HEx are add-on models designed to be connected to model HBx or HDx system respectively to form an eight-processor system. HCx and HEx include the four QPI cables necessary to join two systems together to form a two-node complex. HCx and HEx also include the additional GPFS software and SLES licenses to cover the extra four sockets, but do not include any preload because the are designed as an add-on to the HBx and HDx offerings respectively.

All H models include either 256 GB, 512 GB or 1024 GB of RAM, SAS disk drives, and a high IOPS solid-state storage PCIe adapter.

- Model 7143-F1x, B9x: These models are designed for virtualization applications and include VMware ESXi 4.1 Update 1 on an integrated bootable USB memory key. The model comes standard with the MAX5 memory expansion unit and 384 GB of memory implemented using 4GB memory DIMMs (256 GB in the server and 128 GB in the MAX5).
  F1x is available world-wide and includes a MAX5 V2, 88Y6529. Model B9x is for China only and includes a MAX5 V2, 88Y6529.

- Model 7143-F2x: This model is designed for Open Virtualization and includes Red Hat Enterprise Linux with the Red Hat Enterprise Virtualization Hypervisor (Kernel-Based Virtual Machine, KVM). The software is not preloaded. The model comes standard with the MAX5 memory expansion unit and 384 GB of memory implemented using cost-effective 4GB memory DIMMs (256 GB in the server and 128 GB in the MAX5).

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

QPI wrap card

In the x3850 X5, QPI links are used for interprocessor communication both in a single-node system and in a two-node system. They are also used to connect the system to a MAX5 memory expansion unit. In a single-node x3850 X5, the QPI links connect in a full mesh between all CPUs. To complete this mesh, the QPI wrap card is used. QPI wrap cards are installed in sockets where the scalability cables are installed.

The QPI wrap cards are only for single-node configurations with three or four processors installed and only when a MAX5 unit is not installed. Two QPI wrap cards are needed.

Table 4. QPI wrap card

Part number	Feature code	Description	Maximum supported
49Y4379	5104	x3850 X5 and x3950 X5 QPI wrap card kit (quantity 2)	1 pair

QPI wrap cards are not necessary for any of the following configurations:

- Single-node configurations with two processors
- Any configurations with MAX5 memory expansion units
- Two-node configurations

MAX5

The MAX5 memory expansion unit is a 1U device and has 32 DDR3 DIMM sockets, two 675-watt power supplies, and five 40 mm hot-swap speed-controlled fans. It provides added memory and multinode scaling support for the x3850 X5 server. Some models include the MAX5 standard, as listed in Tables 2 and 3. MAX5 options are listed in the following table.

There are two MAX5 options available.

- MAX5 for System x®, part number 59Y6265 (also known as MAX5 V1)
- MAX5 V2 for System x, part number 88Y6529

Both x3850 X5 machine types (7143 and 7145) support both MAX5 options, provided the firmware is at least UEFI level G0E171T/A. When used with the x3850 X5 machine type 7143 (Intel Xeon E7-4800 and E7-8800 series processors), MAX5 V2 supports low-voltage (operating at 1.35V DIMMs).

Note that some models and some processors do not support the MAX5. See the model table and the processor options table for details. The MAX5 V1 includes one power supply. The second power supply is optional (part 60Y0332) and provides redundancy. The MAX5 V2 includes two power supplies; no additional power supplies are needed or available.

Table 5. MAX5

Part number	Feature code	Description	Maximum supported
59Y6265	4199	MAX5 for System x	1
88Y6529	A19H	MAX5 V2 for System x	1
60Y0332	4782	High Efficiency 675W Power Supply (MAX5 V1 only, 59Y6265)	1
59Y6267	4192	MAX5 to x3850 X5 Cable Kit (quantity of four cables) (Used to connect one server to one MAX5)	1

Two-node and MAX5 scaling

The x3850 X5 supports the following scalable configurations:

- A single x3850 X5 server with four processor sockets. This configuration is sometimes referred to as a single-node server.
- A single x3850 X5 server with a single MAX5 memory expansion unit attached. This configuration is sometimes referred to as a memory-expanded server.
- Two x3850 X5 servers connected together to form a single-image eight-socket server. This configuration is sometimes referred to as a two-node server.
- Two x3850 X5 servers connected together to form a single-image eight-socket server with two MAX5 memory expansion units attached. This configuration is sometimes referred to as a two-node memory-expanded server. Only machine type 7143 supports this configuration.

The following table lists the cable options needed when scaling. Note that not all processors and models support all of these configurations - see the Processor options section below for details.

Table 6. Cables for two-node and MAX5 scaling

Part number	Feature code	Description	Maximum supported
59Y6267	4192	MAX5 to x3850 X5 Cable Kit (quantity of four cables) Used to connect one server to one MAX5	1
46M0072	5103	x3850 X5 and x3950 X5 QPI Scalability Kit (Quantity 4 cables) Used to connect two servers together without MAX5 units	1
59Y6271	4198	eX5 MAX5 2-Node EXA Scalability Kit (for machine type 7143 only) Used to connect two servers together when MAX5 units are also used	1

Processor options

The x3850 X5 supports the processor options listed in the following table. The server supports up to four processors. The E7-8000 processors support native QPI scaling to two nodes without the need for a MAX5 memory expansion unit. All Intel Xeon E7 processors support two-node scaling with MAX5. Two-node scaling with MAX5 is supported with MAX5 V2 for System x (88Y6529) or MAX5 for System x (59Y6265).

Table 7. Processor options - Machine type 7143 (Intel Xeon E7-4800 and E7-8800 series processors)

Part number	Intel Xeon processor description	Can scale to two nodes without MAX5	Can scale to two nodes with MAX5*	Models where used
69Y1889	E7-4807 6C 1.86GHz 18MB 800MHz 95W	No	Yes	7143-B1x
69Y1890	E7-4820 8C 2.00GHz 18MB 1066MHz 105W	No	Yes	7143-B2x
69Y1891	E7-4830 8C 2.13GHz 24MB 1066MHz 105W	No	Yes	7143-B3x
88Y5358	E7-4850 10C 2.00GHz 24MB 1066MHz 130W	No	Yes	7143-B5x, D1x
69Y1892	E7-4860 10C 2.26GHz 24MB 1066MHz 130W	No	Yes	7143-B6x, D2x
69Y1893	E7-4870 10C 2.40GHz 30MB 1066MHz 130W	No	Yes	7143-B7x
69Y1896	E7-8830 8C 2.13GHz 24MB 1066MHz 105W	Yes	Yes	-
69Y1894	E7-8837 8C 2.67GHz 24MB 1066MHz 130W	Yes	Yes	-
88Y5357	E7-8850 10C 2.00GHz 24MB 1066MHz 130W	Yes	Yes	7143-C1x
69Y1898	E7-8860 10C 2.26GHz 24MB 1066MHz 130W	Yes	Yes	7143-C2x
69Y1897	E7-8867L 10C 2.13GHz 30MB 1066MHz 105W	Yes	Yes	-
69Y1899	E7-8870 10C 2.40GHz 30MB 1066MHz 130W	Yes	Yes	All Hxx models

* Supports MAX5 V2 for System x (88Y6529) or MAX5 for System x (59Y6265).

Memory options

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

The System x3850 X5 supports DDR3 memory. Memory is installed in memory cards. The server supports eight memory cards, and each card holds eight DIMMs. Two memory cards are connected to each processor. As a result, all eight memory cards are usable only when all four processors are installed. Adding a MAX5 memory expansion unit to the server offers an additional 32 DIMM slots for a total of 96 DIMM slots per node.

The following table lists the memory options that are supported in the server and MAX5 (either MAX5 V2 or MAX5).

Notes:

- In the MAX5 memory expansion unit, do not mix DIMMs with x4 technology (DIMMs with DRAMs that are organized with 4 data lanes, as indicated by "x4" in the description) with DIMMs with x8 technology (DIMMs with DRAMs that are organized with 8 data lanes).
- In the server, you can mix DIMMs with x4 and x8 technology.

Table 8. Memory options - x3850 X5 machine type 7143 (Intel Xeon E7 series processors)

Part number	x3850 X5 feature code	Description	Where used
69Y1888	A14D	x3850 X5 and x3950 X5 Memory Expansion Card (7143 only)	All 7143 models
44T1592	1712	2GB (1x2GB, 1Rx8, 1.5V) PC3-10600 CL9 ECC DDR3 1333MHz	-
49Y1407	8942	4GB (1x4GB, 2Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz	-
44T1599	1713	4GB (1x4GB, Dual Rankx8) PC3-10600 CL9 ECC DDR3 1333MHz	All other models
49Y1399	A14E	8GB (1x8GB, 4Rx8, 1.35V) PC3L-8500 CL7 ECC DDR3 1066MHz	-
46C7482	1706	8GB (1x8GB, Quad Rankx8) PC3-8500 CL7 ECC DDR3 1066MHz	-
49Y1400	8939	16GB (1x16GB, 4Rx4, 1.35V) PC3L-8500 CL7 ECC DDR3 1066MHz	All Hxx models
46C7483	1707	16GB (1x16GB, 4Rx4, 1.5V) PC3-8500 CL7 ECC DDR3 1066MHz	-
49Y1563	A1QT	16 GB (1x16GB, 2Rx4, 1.35V) PC3L-10600 CL9 ECC DDR3 1333 MHz LP RDIMM	-
90Y3101	A1CP	32GB (1x32GB, 4Rx4, 1.35V) PC3L-8500 CL7 ECC DDR3 1066MHz	-

Table 9. Memory options - MAX5 V2, 88Y6529

Part number	MAX5 V2 feature code	Description
44T1592	2429	2GB MAX5 1x2GB 1Rx8 1.5V PC3-10600 CL9 ECC DDR3 1333MHz LP RDIMM
49Y1407	A1MH	4GB MAX5 (1x4GB, 2Gb, 2Rx8, 1.35V) PC3L-10600R-999 LP ECC RDIMM
44T1599	2431	4GB MAX5 1x4GB DualRankx8 PC310600 CL9 ECC DDR3 1333MHz LP RDIMM
46C7482	2432	8GB MAX5 1x8GB QuadRankx8 PC3-8500 CL7 ECC DDR3 1066MHz LP RDIMM
49Y1399	A1N7	8GB MAX5 1x8GB, 4Rx8, 1.35V PC3L-8500 CL7 ECC DDR3 1066MHz LP RDIMM
46C7483	2433	16GB MAX5 1x16G QuadRankx4 PC3-8500 CL7 ECC DDR3 1066MHz LP RDIMM
None	A3E1	16GB MAX5 1x16GB 2Rx4 1.35V PC3L-10600 CL9 ECC DDR3 1333MHz LP RDIMM
49Y1400	A1N8	16GB MAX5 1x16GB 4Rx4 1.35V PC3L-8500 CL7 ECC DDR3 1066MHz LP RDIMM
90Y3101	A1R2	32GB MAX5 (4GB, 4Rx4, 1.35V) PC3L-8500 DDR3-1066MHz LP RDIMM

Table 10. Memory options - MAX5, 59Y6265

Part number	MAX5 feature code	Description
44T1592	2429	2GB MAX5 1x2GB 1Rx8 1.5V PC3-10600 CL9 ECC DDR3 1333MHz LP RDIMM
44T1599	2431	4GB MAX5 1x4GB DualRankx8 PC310600 CL9 ECC DDR3 1333MHz LP RDIMM
46C7482	2432	8GB MAX5 1x8GB QuadRankx8 PC3-8500 CL7 ECC DDR3 1066MHz LP RDIMM
46C7483	2433	16GB MAX5 1x16G QuadRankx4 PC3-8500 CL7 ECC DDR3 1066MHz LP RDIMM

The following memory protection technologies are supported:

- ECC
- ChipKill
- Memory Mirroring

- Memory Sparing
- Redundant Bit Steering (MAX5, or servers with E7 processors only, x4 DIMMs only)

Internal storage

The server supports either up to eight 2.5" drives or up to 16 1.8" drives internally. The number of drives that can be inserted depends on the backplanes that are installed. Backplane options are listed in the following table. The backplanes that are standard in each model are listed in the Standard models section.

Table 8. Drive backplane options

Part number	Feature code	Name	Maximum supported
59Y6213	4191	eXFlash 8x 1.8-inch HS SAS SSD Backplane Supports eight 1.8" drives (includes two SAS cables)	2
59Y6135	3873	2.5" Hot Swap SAS Hard Disk Drive Backplane Supports four 2.5-inch drives (includes one SAS cable)	2

Internal drive options

The following tables list the hard drive options available for internal storage.

Table 9. 1.8-inch SSDs

Part number	Feature	Description	Maximum supported
1.8-inch hot-swap SSDs - 6 Gb SATA - Enterprise Performance (10+ DWPD)			
41Y8366*	A4FS	S3700 200GB SATA 1.8" MLC Enterprise SSD	16
41Y8371*	A4FT	S3700 400GB SATA 1.8" MLC Enterprise SSD	16
1.8-inch hot-swap SSDs - 6 Gb SATA - Enterprise Mainstream (3-5 DWPD)			
00AJ335	A56V	120GB SATA 1.8" MLC Enterprise Value SSD	16
00AJ340	A56W	240GB SATA 1.8" MLC Enterprise Value SSD	16
00AJ345	A56X	480GB SATA 1.8" MLC Enterprise Value SSD	16
00AJ350	A56Y	800GB SATA 1.8" MLC Enterprise Value SSD	16
1.8-inch hot-swap SSDs - 6 Gb SATA - Enterprise Entry (<3 DWPD)			
00AJ040*	A4KV	S3500 80GB SATA 1.8" MLC Enterprise Value SSD	16
00AJ050	A4KX	S3500 400GB SATA 1.8" MLC Enterprise Value SSD	16
00AJ455*	A58U	S3500 800GB SATA 1.8" MLC Enterprise Value SSD	16

* Withdrawn from marketing

Table 10. 2.5-inch hot-swap 6 Gb SAS/SATA HDDs

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap HDDs - 6 Gb SAS 10K			
90Y8877	A2XC	300GB 10K 6Gbps SAS 2.5" SFF G2HS HDD	8
90Y8872	A2XD	600GB 10K 6Gbps SAS 2.5" SFF G2HS HDD	8
81Y9650	A282	900GB 10K 6Gbps SAS 2.5" SFF HS HDD	8
00AD075	A48S	1.2TB 10K 6Gbps SAS 2.5" G2HS HDD	8
2.5-inch hot-swap HDDs - 6 Gb SAS 15K			
90Y8926	A2XB	146GB 15K 6Gbps SAS 2.5" SFF G2HS HDD	8
81Y9670	A283	300GB 15K 6Gbps SAS 2.5" G2HS HDD	8
00AJ300	A4VB	600GB 15K 6Gbps SAS 2.5" G2HS HDD	8
2.5-inch hot-swap HDDs - 6 Gb NL SAS			
90Y8953	A2XE	500GB 7.2K 6Gbps NL SAS 2.5" SFF G2HS HDD	8
81Y9690	A1P3	1TB 7.2K 6Gbps NL SAS 2.5" SFF HS HDD	8
2.5-inch hot-swap HDDs - 6 Gb NL SATA			
81Y9722	A1NX	250GB 7.2K 6Gbps NL SATA 2.5" SFF HS HDD	8
81Y9726	A1NZ	500GB 7.2K 6Gbps NL SATA 2.5" SFF HS HDD	8
81Y9730	A1AV	1TB 7.2K 6Gbps NL SATA 2.5" SFF HS HDD	8
2.5-inch hot-swap SED HDDs - 6 Gb SAS 10K			
90Y8913	A2XF	300GB 10K 6Gbps SAS 2.5" SFF G2HS SED	8
90Y8908	A3EF	600GB 10K 6Gbps SAS 2.5" SFF G2HS SED	8
81Y9662	A3EG	900GB 10K 6Gbps SAS 2.5" SFF G2HS SED	8
00AD085	A48T	1.2TB 10K 6Gbps SAS 2.5" G2HS SED	8

Table 11. 2.5-inch hot-swap 6 Gb SAS/SATA SSDs

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap SSDs - 6 Gb SAS - Enterprise Performance (10+ DWPD)			
49Y6129	A3EW	200GB SAS 2.5" MLC HS Enterprise SSD	8
49Y6134	A3EY	400GB SAS 2.5" MLC HS Enterprise SSD	8
49Y6139	A3F0	800GB SAS 2.5" MLC HS Enterprise SSD	8
49Y6195	A4GH	1.6TB SAS 2.5" MLC HS Enterprise SSD	8
2.5-inch hot-swap SSDs - 6 Gb SATA - Enterprise Performance (10+ DWPD)			
41Y8331	A4FL	S3700 200GB SATA 2.5" MLC HS Enterprise SSD	8
41Y8336	A4FN	S3700 400GB SATA 2.5" MLC HS Enterprise SSD	8
41Y8341	A4FQ	S3700 800GB SATA 2.5" MLC HS Enterprise SSD	8
2.5-inch hot-swap SSDs - 6 Gb SATA - Enterprise Mainstream (3-5 DWPD)			
00AJ355	A56Z	120GB SATA 2.5" MLC HS Enterprise Value SSD	8
00AJ360	A570	240GB SATA 2.5" MLC HS Enterprise Value SSD	8
00AJ365	A571	480GB SATA 2.5" MLC HS Enterprise Value SSD	8
00AJ370	A572	800GB SATA 2.5" MLC HS Enterprise Value SSD	8
2.5-inch hot-swap SSDs - 6 Gb SATA - Enterprise Entry (<3 DWPD)			
00AJ000	A4KM	S3500 120GB SATA 2.5" MLC HS Enterprise Value SSD	8
00AJ005	A4KN	S3500 240GB SATA 2.5" MLC HS Enterprise Value SSD	8
00AJ010	A4KP	S3500 480GB SATA 2.5" MLC HS Enterprise Value SSD	8
00AJ015	A4KQ	S3500 800GB SATA 2.5" MLC HS Enterprise Value SSD	8

Controllers for internal storage

The following table lists the RAID controllers, SAS HBAs and additional options used for internal disk storage of x3850 X5 server.

Table 12. RAID controllers and SAS HBAs for internal storage

Part number	Feature code	Description	Maximum supported
Adapters			
90Y4304	A2NF	ServeRAID M5016 SAS/SATA Controller for System x	2
46M0916	3877	ServeRAID M5014 SAS/SATA Controller	4
46M0829	0093	ServeRAID M5015 SAS/SATA Controller	4
46M0831	0095	ServeRAID M1015 SAS/SATA Controller	1
46M0912	3876	6Gb Performance Optimized HBA	4
46C8988	A3MW	N2115 SAS/SATA HBA for System x	4
Adapter upgrades			
46M0832	9749	ServeRAID M1000 Series Advance Feature Key	1
81Y4426	A10C	ServeRAID M5000 Series Performance Accelerator Key†	4
46M0930	5106	ServeRAID M5000 Series Advance Feature Key†	4
46M0917	5744	ServeRAID M5000 Series Battery Assembly	4
88Y5874	A39Q	ServeRAID M5016 Battery Tray	1

† Only one key is supported in each controller, either the Advance Feature Key or the Performance Accelerator Key.

The ServeRAID M1015 SAS/SATA Controller has the following specifications:

- Two Mini-SAS internal connectors
- Supports RAID levels 0, 1, and 10
- Supports RAID levels 5 and 50 with optional ServeRAID M1000 Series Advanced Feature Key
- 6 Gbps throughput per port
- Based on the LSI SAS2008 6 Gbps RAID on Chip (ROC) controller
- PCI Express 2.0 x8 host interface
- Configurable stripe size up to 64 KB

The ServeRAID M5014 SAS/SATA Controller has the following specifications:

- Two Mini-SAS internal connectors
- Supports RAID levels 0, 1, 5, 10, and 50
- Supports RAID 6 and 60 with the optional M5000 Advanced Feature Key
- Performance optimization for SSD drives with optional M5000 Series Performance Accelerator Key
- 6 Gbps throughput per port
- PCI Express 2.0 x8 host interface
- Based on the LSI SAS2108 6 Gbps ROC controller
- 256 MB of onboard cache
- Optional Intelligent Li-Ion-based battery backup unit with the ServeRAID M5000 Series Battery Kit

The ServeRAID M5015 SAS/SATA Controller has the following specifications:

- Two Mini-SAS internal connectors
- Supports RAID levels 0, 1, 5, 10, and 50
- Supports RAID 6 and 60 with the optional M5000 Advanced Feature Key
- Performance optimization for SSD drives with optional M5000 Series Performance Accelerator Key
- 6 Gbps throughput per port
- PCI Express 2.0 x8 host interface
- Based on the LSI SAS2108 6 Gbps ROC controller
- 512 MB of onboard cache
- Standard Intelligent Li-Ion-based battery backup unit with up to 48 hours of data retention

The ServeRAID M5016 adapter card has the following specifications:

- Two Mini-SAS internal connectors (SFF-8087)
- 6 Gbps throughput per port
- 800 MHz dual-core PowerPC® processor with LSI SAS2208 6 Gbps RAID on Chip (ROC) controller
- PCI Express x8 Gen 2 host interface
- 1 GB of onboard data cache (DDR3 running at 1333 MHz)
- CacheVault flash power module to protect data in cache in case of critical power or server failure
- Supports RAID levels 0, 1, 5, 6, 10, 50, and 60
- Supports up to 64 logical volumes

- Supports LUN sizes up to 64 TB
- Configurable stripe size up to 1 MB

The ServeRAID M5016 Battery Tray, 90Y4304, is used to house the M5016 power module remotely from the controller. The tray replaces the existing tray supplied with the server and supports up to two power modules. Only one ServeRAID M5016 Battery Tray can be installed in the x3850 X5.

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

Internal tape drives

The server does not support an internal tape drive option.

Optical drives

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

Table 13. Optical drives

Part number	Feature code	Description	Maximum supported	Standard models where used
46M0901	4161	UltraSlim Enhanced SATA DVD-ROM	1	-
46M0902	4163	UltraSlim Enhanced SATA Multi-Burner	1	7143-HAx, HBx

UltraSlim Enhanced SATA DVD-ROM (part number 46M0901) supports the following media and speeds for reading:

- CD-ROM 24X
- CD-DA (DAE) 20X
- CD-R 24X
- CD-RW 24X
- DVD-ROM (single layer) 8X
- DVD-ROM (dual layer) 8X
- DVD-R (4.7 GB) 6X
- DVD-R DL 4X
- DVD+R 6X
- DVD+R DL 4X
- DVD-RW (4.7 GB) 4X
- DVD+RW 4X
- DVD-RAM (4.7/9.4 GB) 4X

UltraSlim Enhanced SATA Multi-Burner (part number 46M0902) supports the same media and speeds for reading as DVD-ROM (46M0901). In addition, this drive supports the following media and speeds for writing:

- CD-R 24X
- CD-RW 4X
- High Speed CD-RW 10X
- Ultra Speed CD-RW 16X
- Ultra Speed Plus CD-RW 16X
- DVD-R 8X
- DVD-R DL 6X
- DVD+R 8X
- DVD+R DL 6X
- DVD-RW 6X
- DVD+RW 8X
- DVD-RAM 5X

I/O expansion options

The server offers the following PCI Express 2.0 slots. None are hot-swap.

- Slot 1: PCI Express 2.0 x16, full length, full height
- Slot 2: PCI Express 2.0 x4 (x8 mechanical), full length, full height
- Slot 3: PCI Express 2.0 x8, full length, full height
- Slot 4: PCI Express 2.0 x8, full length, full height
- Slot 5: PCI Express 2.0 x8, half length, full height
- Slot 6: PCI Express 2.0 x8, half length, full height
- Slot 7: PCI Express 2.0 x8, half length, full height (used by the Emulex 10Gb Ethernet Adapter)

The server has an additional PCI Express slot dedicated to the BR10i RAID controller if installed.

Note: The use of slots 1 - 4 requires that a second processor be installed.

Network adapters

x3850 X5 offers two integrated Gigabit Ethernet ports, based on the Broadcom BCM5709C controller.

Most models also have an Emulex 10GbE Integrated Virtual Fabric Adapter II for System x (feature A148) installed as standard in slot 7. See Table 2 for specifics. This adapter is functionally identical to the Emulex 10Gb Virtual Fabric Adapter II for System x, 49Y7950. The difference is that the integrated adapter has a longer edge connector, meaning that the card can only be installed in this server.

For technical details about this card, see the Lenovo Press Product Guide Emulex 10GbE Virtual Fabric Adapter II and III family for System x, TIPS0844, available at http://lenovopress.com/tips0844

The following table lists additional supported network adapters.

Table 14. Network adapters

Part number	Feature code	Description	Maximum supported
40 Gb Ethernet			
00D9550	A3PN	Mellanox ConnectX-3 40GbE / FDR IB VPI Adapter for System x	7
10 Gb Ethernet			
44T1370	A5GZ	Broadcom NetXtreme 2x10GbE BaseT Adapter for System x	7
94Y5180	A4Z6	Broadcom NetXtreme Dual Port 10GbE SFP+ Adapter for System x	7
49Y7910	A18Y	Broadcom NetXtreme II Dual Port 10GBaseT Adapter for System x	7
None*	A148	Emulex 10GbE Integrated Virtual Fabric Adapter II for System x	1
49Y7950	A18Z	Emulex 10GbE Virtual Fabric Adapter II for System x	7
95Y3751	A348	Emulex Dual Port VFAII Adapter & FCoE/iSCSI License for System x	7
49Y7960	A2EC	Intel X520 Dual Port 10GbE SFP+ Adapter for System x	7
49Y7970	A2ED	Intel X540-T2 Dual Port 10GBaseT Adapter for System x	7
81Y3520	AS73	Intel X710 2x10GbE SFP+ Adapter for System x	7
81Y9990	A1M4	Mellanox ConnectX-2 Dual Port 10GbE Adapter for System x	7
00D9690	A3PM	Mellanox ConnectX-3 10 GbE Adapter for System x	7
42C1750	2975	PRO/1000 PF Server Adapter	7
42C1800	5751	QLogic 10Gb CNA for System x	7
47C9952	A47H	Solarflare SFN5162F MR Dual Port 10GbE SFP+ Adapter for System x	4
47C9960	A47J	Solarflare SFN6122F LL Dual Port 10GbE SFP+ Adapter for System x	4
1 Gb Ethernet			
90Y9370	A2V4	Broadcom NetXtreme I Dual Port GbE Adapter for System x	7
90Y9352	A2V3	Broadcom NetXtreme I Quad Port GbE Adapter for System x	7
49Y4230	5767	Intel Ethernet Dual Port Server Adapter I340-T2 for System x	7
49Y4240	5768	Intel Ethernet Quad Port Server Adapter I340-T4 for System x	7
00AG500	A56K	Intel I350-F1 1xGbE Fiber Adapter for System x	7
00AG510	A56L	Intel I350-T2 2xGbE BaseT Adapter for System x	7
00AG520	A56M	Intel I350-T4 4xGbE BaseT Adapter for System x	7
42C1780	2995	NetXtreme II 1000 Express Dual Port Ethernet Adapter	7
InfiniBand			
95Y3750	A2MY	Mellanox ConnectX-2 Dual-port QSFP QDR IB Adapter for System x	1
00D9550	A3PN	Mellanox ConnectX-3 40GbE / FDR IB VPI Adapter for System x	7

* The Emulex integrated adapters are either included in standard models or available via CTO only

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

Storage host bus adapters

The following table lists storage HBAs supported by the x3850 X5 server.

Table 15. Storage adapters

Part number	Feature code	Description	Maximum supported
16 Gb Fibre Channel			
81Y1675	A2XV	Brocade 16Gb FC Dual-port HBA for System x	7
81Y1668	A2XU	Brocade 16Gb FC Single-port HBA for System x	7
81Y1662	A2W6	Emulex 16Gb FC Dual-port HBA for System x	7
81Y1655	A2W5	Emulex 16Gb FC Single-port HBA for System x	7
00Y3341	A3KX	QLogic 16Gb FC Dual-port HBA for System x	7
00Y3337	A3KW	QLogic 16Gb FC Single-port HBA for System x	7
8 Gb Fibre Channel			
46M6050	3591	Brocade 8Gb FC Dual-port HBA for System x	7
46M6049	3589	Brocade 8Gb FC Single-port HBA for System x	7
42D0494	3581	Emulex 8Gb FC Dual-port HBA for System x	7
42D0485	3580	Emulex 8Gb FC Single-port HBA for System x	7
42D0510	3579	QLogic 8Gb FC Dual-port HBA for System x	7
42D0501	3578	QLogic 8Gb FC Single-port HBA for System x	7
SAS			
46M0907	5982	6Gb SAS HBA	7
46C9010	A3MV	N2125 SAS/SATA HBA for System x	7

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

The server supports the PCIe Flash Storage adapters listed in the following table.

Table 16. SSD adapters

Part number	Feature code	Description	Maximum supported
90Y4377	A3DY	1.2TB High IOPS MLC Mono Adapter	7
90Y4397	A3DZ	2.4TB High IOPS MLC Duo Adapter	2
46C9078	A3J3	365GB High IOPS MLC Mono Adapter	7
46C9081	A3J4	785GB High IOPS MLC Mono Adapter	7

* These modular adapters are not available via CTO or Special build. The adapter cannot be shipped installed and instead must be shipped in its option box and configured at the final installation location. For more information, see https://ibm.com/support/entry/myportal/docdisplay?lndocid=SERV-IOMA

For more information, see the list of Lenovo Press Product Guides in the PCIe SSD Adapters category: https://lenovopress.com/servers/options/ssdadapter

Power supplies

The server supports up to two redundant hot-swap power supplies, providing N+N redundancy. Most standard models come with two power supplies (Table 2).

The MAX5 power subsystem consists of two hot-pluggable 675 W power supplies, designed for N+N (fully redundant) hot-swap operation. The MAX5 V1 has one power supply standard and a second optional power supply for redundancy. See the MAX5 section for details. The MAX5 V2 has two power supplies installed. No further power supplies are needed or available.

Table 17. Power supplies

Part number	Feature code	Description	Maximum supported
59Y6139	2111	1975 W Power Supply (x3850 X5)	2 (1 or 2 standard)
60Y0332	4782	High Efficiency 675W Power Supply For second power supply for MAX5 V1	1 (MAX5 V1 only)

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

Integrated virtualization

The server supports VMware ESXi installed on a USB memory key. The key is installed in a USB socket inside the server. The following table lists the virtualization options.

Table 18. Virtualization options

Part number	Feature code	Description	Maximum supported
41Y8298	A2G0	Blank USB Memory Key for VMware ESXi Downloads	1
41Y8296	A1NP	USB Memory Key for VMware ESXi 4.1 Update 1	1
41Y8300	A2VC	USB Memory Key for VMWare ESXi 5.0	1
41Y8307	A383	USB Memory Key for VMware ESXi 5.0 Update1	1
41Y8311	A2R3	USB Memory Key for VMWare ESXi 5.1	1
41Y8382	A4WZ	USB Memory Key for VMware ESXi 5.1 Update 1	1
41Y8385	A584	USB Memory Key for VMWare ESXi 5.5	1

Remote management

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

The IMM 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 server also supports virtual media and remote control features, which provide the following functions:

- Remotely viewing video with graphics resolutions up to 1600x1200 at 75 Hz, regardless of the system state
- Remotely accessing the server using the keyboard and mouse from a remote client
- Mapping the CD or DVD drive, diskette drive, and USB flash drive on a remote client, and mapping ISO and diskette image files as virtual drives that are available for use by the server
- Uploading a diskette image to the IMM memory and mapping it to the server as a virtual drive
- Capture blue-screen errors

Supported operating systems

The server supports the following operating systems:

- Microsoft Windows Server 2008 HPC Edition
- Microsoft Windows Server 2008 R2
- Microsoft Windows Server 2008, Datacenter x64 Edition
- Microsoft Windows Server 2008, Enterprise x64 Edition
- Microsoft Windows Server 2008, Standard x64 Edition
- Microsoft Windows Server 2008, Web x64 Edition
- Microsoft Windows Server 2012
- Microsoft Windows Server 2012 R2
- Microsoft Windows Small Business Server 2008 Premium Edition
- Microsoft Windows Small Business Server 2008 Standard Edition
- Red Hat Enterprise Linux 5 Server with Xen x64 Edition
- Red Hat Enterprise Linux 5 Server x64 Edition
- Red Hat Enterprise Linux 6 Server x64 Edition
- Red Hat Enterprise Linux 7
- Red Hat Enterprise MRG 2.0 Realtime (x64)
- Solaris 10 Operating System
- SUSE LINUX Enterprise Server 10 for AMD64/EM64T
- SUSE LINUX Enterprise Server 10 with Xen for AMD64/EM64T
- SUSE LINUX Enterprise Server 11 for AMD64/EM64T
- SUSE LINUX Enterprise Server 11 with Xen for AMD64/EM64T
- VMware ESX 4.1
- VMware ESXi 4.1
- VMware vSphere 5.0 (ESXi)
- VMware vSphere 5.1 (ESXi)
- VMware vSphere 5.5 (ESXi)

See the ServerProven® website for the latest information about the specific versions and service levels supported and any other prerequisites:
http://www.ibm.com/systems/info/x86servers/serverproven/compat/us/nos/matrix.shtml

Physical and electrical specifications

Dimensions:

- Width: 440 mm (17.3 inches)
- Depth: 712 mm (28.0 inches)
- Height: 173 mm (6.8 inches) or 4 rack units (4U)

Weight:

- Minimum configuration: 35.4 kg (78 lb)
- Maximum configuration: 49.9 kg (110 lb)

Electrical:

- 100 to 127 (nominal) V ac; 50 or 60 Hz; System 20A (10A/PS)
- 200 to 208 (nominal) V ac; 50 or 60 Hz; System 10A
- 200 to 240 (nominal) V ac; 50 or 60 Hz; System 9A
    - Minimum configuration: 0.20 kVA (one power supply)
    - Minimum configuration: 0.26 kVA (two power supplies)
    - Typical configuration: 1.12 kVA (two power supplies)
    - Maximum configuration: 2.16 kVA (two power supplies)

Btu output:

- Ship configuration (one power supply): 648 Btu/hr (190 watts)
- Ship configuration (two power supplies): 802 Btu/hr (235 watts)
- Typical configuration: 3,753 Btu/hr (1100 watts)
- Full configuration: 7,336 Btu/hr (2150 watts)

Noise level: 6.3 bels

Note: The noise emission level stated is the declared (upper limit) sound power level, in bels, for a random sample of machines. All measurements made in accordance with ISO 7779 and reported in conformance with ISO 9296.

Warranty options

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

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

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

The following table explains warranty service definitions in more detail.

Table 19. Warranty service definitions

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

The following Lenovo warranty service upgrades are available:

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

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

  - Priority handling to meet defined time frames to restore the failing machine to good working condition
  - Committed repair service levels are measured within the following coverage hours:
    - 24x7x6: Service performed 24 hours per day, 7 days per week, within 6 hours
    - 24x7x8: Service performed 24 hours per day, 7 days per week, within 8 hours
    - 24x7x24: Service performed 24 hours per day, 7 days per week, within 24 hours

- Hard Disk Drive Retention
  Lenovo's Hard Disk Drive Retention (HDDR) service is a multi-drive hard drive retention offering that ensures your data is always under your control, regardless of the number of hard drives that are installed in your Lenovo server. In the unlikely event of a hard drive failure, you retain possession of your hard drive while Lenovo replaces the failed drive part. Your data stays safely on your premises, in your hands. The Hard Drive Retention service can be purchased in convenient bundles with our warranty upgrades and extensions.

- Microcode Support
  Keeping microcode current helps prevent hardware failures and security exposure. There are two levels of service: analysis of the installed base and analysis and update where required. Offerings vary by region and can be bundled with other warranty upgrades and extensions.

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

Regulatory compliance

The server conforms to the following international standards:

- Multiprocessor Specification (MPS) 1.4
- Hardware-enabled to meet ISO 9241, Part 3
- FCC - Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, issue 4, Class A
- IEC/UL 60950-1, 2nd Edition
- CAN/CSA - C22.2 No. 60950-1-07 2nd Edition
- NOM-019 (This server is certified by the respective UL and NOM agencies.)

External disk storage expansion

The following table lists the external SAS disk storage expansion enclosures that are available.

Table 20. External expansion enclosures

Part number	Description	Maximum quantity supported per one controller
70F0 / 70F1	Lenovo ThinkServer SA120	8
610012X	EXP2512 Storage Enclosure	17
610024X	EXP2524 Storage Enclosure	9

Lenovo ThinkServer SA120 support

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

EXP2512 and EXP2524 support

The external SAS cables listed in the following table are supported with EXP2512 and EXP2524 expansion enclosures and M5025 RAID controllers.

Table 21. External SAS cables for external storage expansion enclosures

Part number	Description	Maximum quantity supported per enclosure*
00WC017	1 m SAS Cable	1
00WC018	3 m SAS Cable	1

* Note: The EXP2500 series can be chained with each other. In such a case, one cable is used to connect first EXP25xx or EXP3000 to the RAID controller, and every consecutive EXP unit is connected to the previous one by one cable.

The following table lists the drives that are supported by EXP2512 external expansion enclosures.

Table 22. Drive options for EXP2512 external expansion enclosures

Part number	Description	Maximum quantity supported per one enclosure
3.5" NL SAS HS HDDs		
00NC555	2TB 7,200 rpm 6Gb SAS NL 3.5" HDD	12
00NC557	3TB 7,200 rpm 6Gb SAS NL 3.5" HDD	12
00NC559	4TB 7,200 rpm 6Gb SAS NL 3.5" HDD	12

The following table lists the hard disk drives that are supported by EXP2524 external expansion enclosures.

Table 23. Drive options for EXP2524 external expansion enclosures

Part number	Description	Maximum quantity supported per one enclosure
2.5" NL SAS HS HDDs		
00NC571	1TB 7,200 rpm 6Gb SAS NL 2.5" HDD	24
2.5" SAS HS HDDs		
00NC561	146GB 15,000 rpm 6Gb SAS 2.5" HDD	24
00NC563	300GB 15,000 rpm 6Gb SAS 2.5" HDD	24
00NC565	600GB 10,000 rpm 6Gb SAS 2.5" HDD	24
00NC567	900GB 10,000 rpm 6Gb SAS 2.5" HDD	24
00NC569	1.2TB 10,000 rpm 6Gb SAS 2.5" HDD	24
2.5" SAS HS SSDs		
00NC573	200GB 6Gb SAS 2.5" SSD	24
00NC575	400GB 6Gb SAS 2.5" SSD	24

The RAID controllers listed in the following table are supported with the EXP2512 and EXP2524 external expansion enclosures.

Table 24. RAID controllers for external storage expansion enclosures

Part number	Feature code	Description	Maximum supported
46M0830	0094	ServeRAID M5025 SAS/SATA Controller	2
46M0930	5106	ServeRAID M5000 Series Advance Feature Key†	1 per one M5025
81Y4426	A10C	ServeRAID M5000 Series Performance Accelerator Key†	1 per one M5025

† Only one key is supported in each controller, either the Advance Feature Key or the Performance Accelerator Key.

The ServeRAID M5025 SAS/SATA Controller has the following specifications:

- Two Mini-SAS external connectors
- Supports RAID levels 0, 1, 5, 10, and 50
- Supports RAID 6 and 60 with the optional M5000 Advanced Feature Key
- Performance optimization for SSD drives with optional M5000 Series Performance Accelerator Key
- 6 Gbps throughput per port
- PCI Express 2.0 x8 host interface

- Based on the LSI SAS2108 6 Gbps ROC controller
- 512 MB of onboard cache
- Intelligent Li-Ion-based battery backup unit with up to 48 hours of data retention
- Supports connectivity to the EXP3000, EXP2512, and EXP2524 storage expansion enclosures

For more information, see the Lenovo Press Product Guide *ServeRAID M5025 SAS/SATA Controller for System x* , TIPS0739, at: http://lenovopress.com/tips0739

External disk 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

External backup units

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

Table 25. External backup options

Part number	Description
External RDX USB drives	
4T27A10725	ThinkSystem RDX External USB 3.0 Dock
External SAS tape backup drives	
6160S6E	IBM TS2260 Tape Drive Model H6S
6160S7E	IBM TS2270 Tape Drive Model H7S
6160S8E	IBM TS2280 Tape Drive Model H8S
External SAS tape backup autoloaders	
6171S5R	IBM TS2900 Tape Autoloader w/LTO5 HH SAS
6171S6R	IBM TS2900 Tape Autoloader w/LTO6 HH SAS
6171S7R	IBM TS2900 Tape Autoloader w/LTO7 HH SAS
External tape backup libraries	
6741A1F	IBM TS4300 3U Tape Library-Base Unit
6741A3F	IBM TS4300 3U Tape Library-Expansion Unit
Full High 8 Gb Fibre Channel for TS4300	
01KP954	LTO 8 FH Fibre Channel Drive
01KP938	LTO 7 FH Fibre Channel Drive
01KP935	LTO 6 FH Fibre Channel Drive
Half High 8 Gb Fibre Channel for TS4300	
01KP952	LTO 8 HH Fibre Channel Drive
01KP936	LTO 7 HH Fibre Channel Drive
01KP933	LTO 6 HH Fibre Channel Drive
Half High 6 Gb SAS for TS4300	
01KP953	LTO 8 HH SAS Drive
01KP937	LTO 7 HH SAS Drive
01KP934	LTO 6 HH SAS Drive

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

Uninterruptible power supply units

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

Table 26. 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 countries in the Asia Pacific region.

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 27. Power distribution units

Part number	Description
0U Basic PDUs	
00YJ776	0U 36 C13/6 C19 24A/200-240V 1 Phase PDU with NEMA L6-30P line cord
00YJ777	0U 36 C13/6 C19 32A/200-240V 1 Phase PDU with IEC60309 332P6 line cord
00YJ778	0U 21 C13/12 C19 32A/200-240V/346-415V 3 Phase PDU with IEC60309 532P6 line cord
00YJ779	0U 21 C13/12 C19 48A/200-240V 3 Phase PDU with IEC60309 460P9 line cord
Switched and Monitored PDUs	
00YJ780	0U 20 C13/4 C19 Switched and Monitored 32A/200-240V/1Ph PDU w/ IEC60309 332P6 line cord
00YJ781	0U 20 C13/4 C19 Switched and Monitored 24A/200-240V/1Ph PDU w/ NEMA L6-30P line cord
00YJ782	0U 18 C13/6 C19 Switched / Monitored 32A/200-240V/346-415V/3Ph PDU w/ IEC60309 532P6 cord

Part number	Description
00YJ783	0U 12 C13/12 C19 Switched and Monitored 48A/200-240V/3Ph PDU w/ IEC60309 460P9 line cord
46M4002*	1U 9 C19/3 C13 Switched and Monitored DPI PDU (without line cord)
46M4003*	1U 9 C19/3 C13 Switched and Monitored 60A 3 Phase PDU with IEC 309 3P+Gnd line cord
46M4004*	1U 12 C13 Switched and Monitored DPI PDU (without line cord)
46M4005*	1U 12 C13 Switched and Monitored 60A 3 Phase PDU with IEC 309 3P+Gnd line cord
Ultra Density Enterprise PDUs (9x IEC 320 C13 + 3x IEC 320 C19 outlets)	
71762NX	Ultra Density Enterprise C19/C13 PDU Module (without line cord)
71763NU	Ultra Density Enterprise C19/C13 PDU 60A/208V/3ph with IEC 309 3P+Gnd line cord
C13 Enterprise PDUs (12x IEC 320 C13 outlets)	
39M2816	DPI C13 Enterprise PDU+ (without line cord)
39Y8941	DPI Single Phase C13 Enterprise PDU (without line cord)
C19 Enterprise PDUs (6x IEC 320 C19 outlets)	
39Y8948	DPI Single Phase C19 Enterprise PDU (without line cord)
39Y8923	DPI 60A 3 Phase C19 Enterprise PDU with IEC 309 3P+G (208 V) fixed line cord
Front-end PDUs (3x IEC 320 C19 outlets)	
39Y8938	DPI 30amp/125V Front-end PDU with NEMA L5-30P line cord
39Y8939	DPI 30amp/250V Front-end PDU with NEMA L6-30P line cord
39Y8934	DPI 32amp/250V Front-end PDU with IEC 309 2P+Gnd line cord
39Y8940	DPI 60amp/250V Front-end PDU with IEC 309 2P+Gnd line cord
39Y8935	DPI 63amp/250V Front-end PDU with IEC 309 2P+Gnd line cord
NEMA PDUs (6x NEMA 5-15R outlets)	
39Y8905	DPI 100-127V PDU with Fixed NEMA L5-15P line cord
Line cords for PDUs that ship without a line cord	
40K9611	DPI 32a Line Cord (IEC 309 3P+N+G)
40K9612	DPI 32a Line Cord (IEC 309 P+N+G)
40K9613	DPI 63a Cord (IEC 309 P+N+G)
40K9614	DPI 30a Line Cord (NEMA L6-30P)
40K9615	DPI 60a Cord (IEC 309 2P+G)
40K9617	DPI Australian/NZ 3112 Line Cord
40K9618	DPI Korean 8305 Line Cord

* Not available in USA and Canada

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 listed in the following table.

Table 28. Rack cabinets

Part number	Description
93072PX	25U Static S2 Standard Rack
93604EX	42U 1200 mm Deep Dynamic Expansion Rack
93604PX	42U 1200 mm Deep Dynamic Rack
93614EX	42U 1200 mm Deep Static Expansion Rack
93614PX	42U 1200 mm Deep Static Rack
93624EX	47U 1200 mm Deep Static Expansion Rack
93624PX	47U 1200 mm Deep Static Rack
93072RX	25U S2 standard Rack
14102RX	25U standard Rack
93074RX	NetBAY S2 42U Standard Rack Cabinet
93074XX	42U S2 expansion Rack
93084EX	42U Enterprise Expansion Rack
93084PX	42U Enterprise Rack
14104RX	42U S2 standard Rack
99564RX	S2 42U Dynamic Standard Rack Cabinet
99564XX	S2 42U Dynamic Expansion Rack Cabinet

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

Rack options

The server supports the rack console switches and monitor kits listed in the following table.

Table 29. Rack options

Part number	Feature code	Description
Monitor kits and keyboard trays		
17238BX	1723HC1 fc A3EK	1U 18.5" Standard Console
17238EX	1723HC1 fc A3EL	1U 18.5" Enhanced Media Console
172317X	1723HC1 fc 0051	1U 17in Flat Panel Console Kit
172319X	1723HC1 fc 0052	1U 19in Flat Panel Console Kit
Console switches		
1754D2X	1754HC2 fc 6695	Global 4x2x32 Console Manager (GCM32)
1754D1X	1754HC1 fc 6694	Global 2x2x16 Console Manager (GCM16)
1754A2X	1754HC4 fc 0726	Local 2x16 Console Manager (LCM16)
1754A1X	1754HC3 fc 0725	Local 1x8 Console Manager (LCM8)
Console cables		
43V6147	3757	Single Cable USB Conversion Option (UCO)
39M2895	3756	USB Conversion Option (4 Pack UCO)
39M2897	3754	Long KVM Conversion Option (4 Pack Long KCO)
46M5383	5341	Virtual Media Conversion Option Gen2 (VCO2)
46M5382	5340	Serial Conversion Option (SCO)

For more information, see the list of Lenovo Press Product Guides in the KVM Switches & Consoles category:
https://lenovopress.com/servers/options/kvm

Lenovo Financial Services

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We are dedicated to delivering a positive finance experience for customers like you who want to maximize your purchase power by obtaining the technology you need today, protect against technology obsolescence, and preserve your capital for other uses.

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

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

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

For your region specific offers please ask your Lenovo sales representative or your technology provider about the use of Lenovo Financial Services. For more information, see the following Lenovo website:

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

Related publications and links

For more information see the following resources:

- *System x 3850 X5 Installation and User's Guide*
  http://ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-5085479
- *System x 3850 X5 Problem Determination and Service Guide*
  http://ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-5084848
- ServerProven hardware compatibility page for the x3850 X5
  http://www.lenovo.com/us/en/serverproven/xseries_old/7145.shtml
- *Configuration and Option Guide*
  http://www.ibm.com/systems/xbc/cog/
- xREF: System x Reference
  http://lenovopress.com/xref
- System x Support Portal
  http://ibm.com/support/entry/portal/
  http://ibm.com/support/entry/portal/Downloads/Hardware/Systems/System_x/System_x3850_X5

Related product families

Product families related to this document are the following:

- Mission-Critical Rack Servers
- 4-Socket Rack Servers
- 8-Socket Rack Servers

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