

## System x3650 M4 HD

### Product Guide (withdrawn product)

The System x3650 M4 HD is a 2-socket 2U rack-optimized server. It supports up to 32 internal drives and features an innovative design that delivers an optimal balance of performance, uptime, and dense storage. It offers excellent reliability, availability, and serviceability (RAS) for an improved business environment. The System x3650 M4 HD is designed for easy deployment, integration, service, and management.

*Suggested use:* Big data applications, cloud-computing deployments, data management, and business-critical workloads

The following figure shows the System x3650 M4 HD configured with 24 hot-swap 2.5-inch drive bays.



Figure 1. The System x3650 M4 HD

### Did you know?

The x3650 M4 HD offers a flexible design that supports up to 26 2.5-inch drives (24 in the front, two accessible from the rear), or 16 2.5-inch drives and 16 1.8-inch solid-state drive bays. Combined with Intel E5-2600 v2 processors, up to 768 GB of memory, 12 Gbps SAS controllers, and up to 6 PCIe 3.0 slots, you have a system that can handle big data applications. Comprehensive systems management tools with the next-generation Integrated Management Module II (IMM2) make the server easy to deploy, integrate, service, and manage.

## Key features

The x3650 M4 HD is an outstanding 2U two-socket business-critical server, offering improved performance and pay-as-you grow flexibility along with new features that improve server management capability. This powerful system is designed for your most important business applications and cloud deployments.

Combining balanced performance and flexibility, the x3650 M4 HD is a great choice for small and medium businesses up to the large enterprise. It can provide outstanding uptime to keep business-critical applications and cloud deployments running safely. Ease of use and comprehensive systems management tools make it easy to deploy. Outstanding RAS and high-efficiency design improve your business environment and help save operational costs.

## Scalability and performance

The x3650 M4 HD offers numerous features to boost performance, improve scalability, and reduce costs:

- Featuring the Intel Xeon processor E5-2600 v2 product family, which improves productivity by offering superior system performance with up to 12 core per processors, core speeds up to 3.5 GHz, L3 cache up to 30 MB, and QPI interconnect links of up to 8 GTps.
- Two processors, up to 24 cores, and 48 threads maximize the concurrent execution of multi-threaded applications.
- Intelligent and adaptive system performance with Intel Turbo Boost Technology 2.0 allows CPU cores to run at maximum speeds during peak workloads by temporarily going beyond processor thermal design power (TDP).
- Intel Hyper-Threading Technology boosts performance for multi-threaded applications by enabling simultaneous multi-threading within each processor core, up to two threads per core.
- Intel Virtualization Technology integrates hardware-level virtualization hooks that allow operating system vendors to better use the hardware for virtualization workloads.
- Intel Advanced Vector Extensions (AVX) improve floating-point performance for compute-intensive technical and scientific applications.
- Supports up to 24 Load Reduced DIMMs (LRDIMMs) of 1866 MHz DDR3 ECC memory, which provide speed, high availability, and a memory capacity of up to 768 GB (running at 1066 MHz).
- The use of solid-state drives (SSDs) instead of, or along with, traditional hard disk 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.
- Up to 26x 2.5-inch bays or a combination of up to 16x 2.5-inch bays and 16x 1.8-inch SSD bays provide a flexible and scalable platform to meet your increasing demands.
- The server has four integrated Gigabit Ethernet ports and two optional 10 Gb Ethernet (or InfiniBand) ports with mezzanine cards that do not use PCIe slots.
- The server offers PCI Express 3.0 I/O expansion capabilities that improve the theoretical maximum bandwidth by 60% (8 GTps per link) compared to the previous generation of PCI Express 2.0.
- With Intel Integrated I/O Technology, the PCI Express 3.0 controller is integrated into the Intel Xeon processor E5 family. This integration helps to reduce I/O latency dramatically and increase overall system performance.
- Support for up to two NVIDIA Quadro graphics processing units (GPUs) to maximize computing power.

## Availability and serviceability

The x3650 M4 HD provides many features to simplify serviceability and increase system uptime:

- The server offers memory mirroring and memory rank sparing for redundancy in the event of a non-correctable memory failure.
- Tool-less cover removal provides easy access to upgrades and serviceable parts, such as CPU, memory, and adapters.

- The server offers hot-swap drives, supporting RAID redundancy for data protection and greater system uptime.
- The server has up to two redundant hot-swap power supplies and four hot-swap dual-motor redundant fans (two fan zones with an N+1 fan design) to provide availability for business-critical applications.
- A 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.
- SSDs offer better reliability than traditional HDDs for greater uptime.
- The built-in Integrated Management Module Version II (IMM2) continuously monitors system parameters, triggers alerts, and performs recovery 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 onsite 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 x3650 M4 HD:

- Local console ports are standard at the rear of the server. Front video and USB ports are available through an optional console breakout cable.
- The server includes an Integrated Management Module II (IMM2) to monitor server availability and perform remote management.
- An Integrated industry-standard Unified Extensible Firmware Interface (UEFI) enables improved setup, configuration, and updates, and simplifies error handling.
- Integrated Trusted Platform Module (TPM) 1.2 support enables advanced cryptographic functionality, such as digital signatures and remote attestation.
- Industry-standard Advanced Encryption Standard (AES) NI support for faster, stronger encryption.
- IBM Systems Director is included for proactive systems management. It offers comprehensive systems management tools that help increase uptime, reduce costs, and improve productivity through advanced server management capabilities.
- Intel Execute Disable Bit functionality can 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, protected from all other software running on a system.

### **Energy efficiency**

The x3650 M4 HD offers the following energy-efficiency features to save energy, reduce operational costs, increase energy availability, and contribute to a green environment:

- Energy-efficient system board components help lower operational costs.
- The x3650 M4 HD is Energy Star 2.0 compliant. Energy Star is the trusted, US government-backed symbol for energy efficiency, with the goal of helping customers save money and protect the environment through energy efficient products and practices. For the Power and Performance Data Sheet, see <http://ibm.com/systems/x/hardware/energy-star>
- There are highly efficient 550 W, 750 W, and 900 W AC power supplies with 80 PLUS Platinum certification. A 750W DC power option is available.

- The Intel Xeon processor E5-2600 v2 product family offers better performance over the previous generation while fitting into the same thermal design power (TDP) limits.
- Intel Intelligent Power Capability powers individual processor elements on and off as needed to reduce power draw.
- Low-voltage Intel Xeon processors draw less energy to satisfy the demands of power and thermally constrained data centers and telecommunication environments.
- Low-voltage 1.35 V DDR3 memory RDIMMs consume 15% less energy compared to 1.5 V DDR3 RDIMMs.
- SSDs use as much as 80% less power than traditional 2.5-inch HDDs.
- The server uses hexagonal ventilation holes, which are a part of Calibrated Vecteded 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 and connectors

The following figure shows the front of the server.

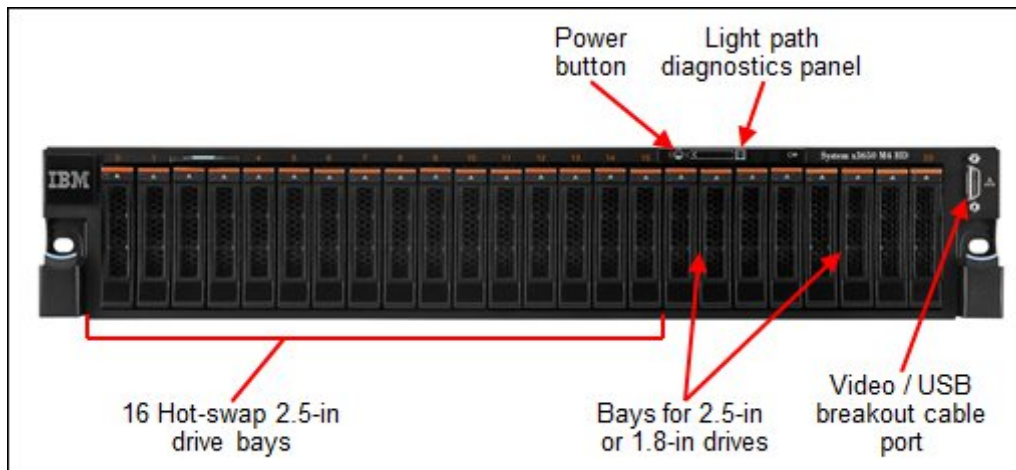


Figure 2. Front view of the System x3650 M4 HD

The following figure shows the rear of the server.

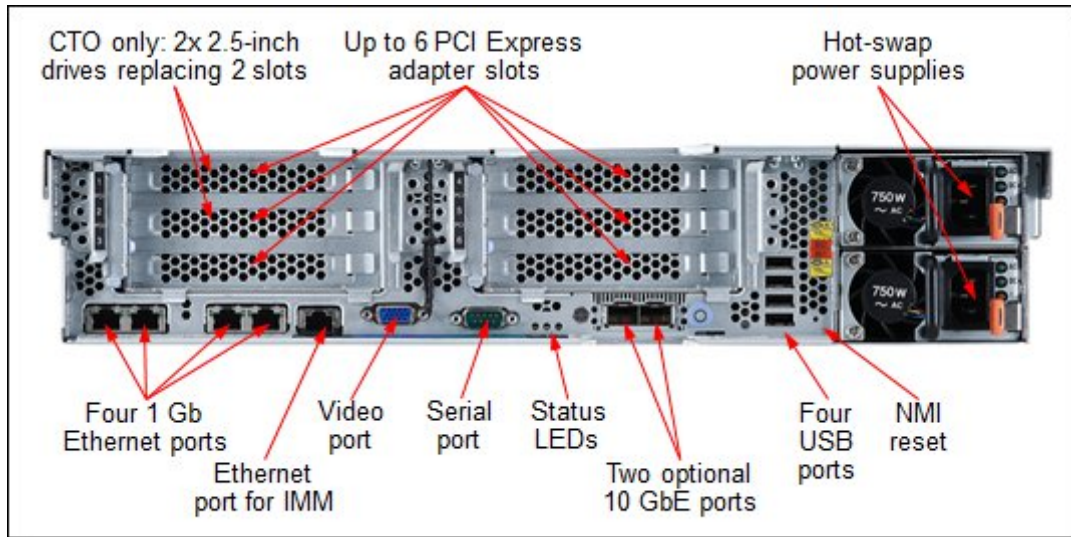


Figure 3. Rear view of the System x3650 M4 HD

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

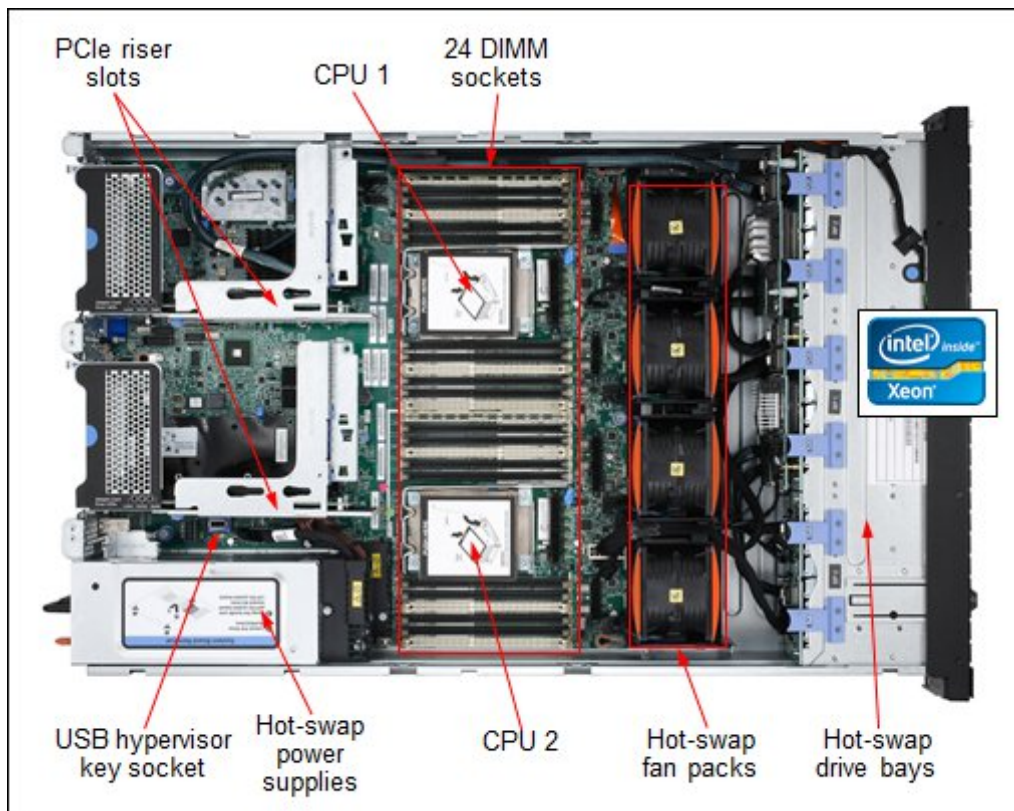


Figure 4. Inside view of the System x3650 M4 HD

## Standard specifications

The following table lists the standard specifications.

Table 1. Standard specifications

| Components               | Specification  |
|--------------------------|--|
| Machine type             | 5460   |
| Form factor              | 2U rack.   |
| Processor                | Up to two Intel Xeon processor E5-2600 v2 product family CPUs. Two QPI links up to 8.0 GTps each. Up to 1866 MHz memory speed.<br>Twelve cores up to 2.7 GHz and 30 MB L3 cache<br>Ten cores up to 3.0 GHz and 25 MB L3 cache<br>Eight cores up to 3.3 GHz and 25 MB L3 cache<br>Six cores up to 3.5 GHz and 25 MB L3 cache<br>Four cores up to 3.5 GHz and 15 MB L3 cache   |
| Chipset                  | Intel C602J.   |
| Memory                   | Up to 24 DIMM sockets (12 DIMMs per processor). RDIMMs, UDIMMs, and LRDIMMs (Load Reduced DIMMs) are supported, but memory types cannot be intermixed. Memory speed up to 1866 MHz.  |
| Memory maximums          | With RDIMMs: Up to 384 GB with 24x 16 GB RDIMMs and two processors.<br>With UDIMMs: Up to 128 GB with 16x 8 GB UDIMMs and two processors.<br>With LRDIMMs: Up to 768 GB with 24x 32 GB LRDIMMs and two processors.   |
| Memory protection        | ECC, Chipkill, memory mirroring, and memory rank sparing.  |
| Disk drive bays          | Up to 26x 2.5-inch hot-swap bays supporting HDDs or SSDs (24 bays front accessible and 2 bays rear accessible); or 16x 2.5-inch HDDs/SSDs (front) plus 16x 1.8-inch SSDs (front accessible).   |
| Maximum internal storage | Up to 41.6 TB with 26x 1.6TB 2.5" SSDs. Up to 31.2 TB with 26x 1.2TB SAS HDDs. An intermix of SAS/SATA is supported.   |
| RAID support             | RAID 0, 1, and 10 with integrated ServeRAID M5210e. Optional upgrades to RAID 5 and 50 are available with zero-cache, 1 GB cache without battery, or 1 GB or 2 GB flash-backed cache. Optional upgrade to RAID 6 or 60.  |
| Optical drive bays       | No internal bays; use an external USB drive. See <a href="http://support.lenovo.com/en/documents/pd011281">http://support.lenovo.com/en/documents/pd011281</a> for options.  |
| Tape drive bays          | None.  |
| Network interfaces       | Four integrated Gigabit Ethernet 1000BASE-T ports (RJ-45): Two embedded 10 Gb Ethernet ports (10GBASE-T RJ-45 or 10GBASE-SR SFP+ based) on an optional 10 Gb Ethernet mezzanine card (does not use a PCIe slot).   |
| PCI Expansion slots      | Up to six slots depending on the riser cards that are installed. The slots are as follows: <ul style="list-style-type: none"> <li>Slot 1: PCIe 3.0 x8; full-height, full-length</li> <li>Slot 2: PCIe 3.0 x8; full-height, half-length</li> <li>Slot 3: PCIe 3.0 x8; full-height, half-length</li> <li>Slot 4: Optional, requires second processor and second riser card</li> <li>Slot 5: Optional, requires second processor and second riser card</li> <li>Slot 6: Optional, requires second processor and second riser card</li> </ul> Optional riser cards available through CTO with PCIe x8 or PCIe x16 or PCI-X slots. Slots 1 and 2 can be replaced with two 2.5-inch hot-swap drive bays through CTO. |

| Components                  | Specification  |
|-----------------------------|--|
| Ports                       | Front: A breakout cable port offers two USB 2.0 ports and one DB-15 video. Four USB 2.0, one DB-15 video, one DB-9 serial, one RJ-45 systems management, four RJ-45 GbE network ports, two optional RJ-45 or SFP+ 10 GbE network ports on rear. One internal USB port for embedded hypervisor. |
| Cooling                     | Calibrated Vectored Cooling with up to four redundant hot swap fans (all standard; two fan zones with N+1 fan design; each fan has two motors).  |
| Power supply                | Up to two redundant hot-swap 550 W AC, 750 W AC, or 900 W AC power supplies (all 80 PLUS Platinum certification), or -48V 750 W DC power supply options.   |
| Video                       | Matrox G200eR2 with 16 MB memory integrated into the IMM2. Maximum resolution is 1600x1200 at 75 Hz with 16 M colors.  |
| Hot-swap parts              | Hard disk drives, power supplies, and fans.  |
| Systems management          | UEFI, Integrated Management Module II (IMM2), Predictive Failure Analysis, Light Path Diagnostics, Automatic Server Restart, Systems Director and Active Energy Manager, and ServerGuide. Optional IMM Advanced Upgrade software feature for remote presence.                                  |
| Security features           | Power-on password, administrator's password, and Trusted Platform Module (TPM).  |
| Operating systems supported | Microsoft Windows Server 2012, 2008 R2 and 2008, Red Hat Enterprise Linux 6, SUSE Linux Enterprise Server 11, and VMware vSphere 5.1   |
| Limited warranty            | Three-year customer-replaceable unit and onsite limited warranty with 9x5 next business day (NBD).   |
| Service and support         | Optional service upgrades are available through ServicePac® offerings: Four-hour or two-hour response time, eight-hour fix time, one-year or two-year warranty extension, remote technical support for Lenovo hardware and some Lenovo and third-party applications.                           |
| Dimensions                  | Height: 86 mm (3.4 in.), width: 445 mm (17.5 in.), depth: 746 mm (29.4 in.)  |
| Weight                      | Minimum configuration: 25 kg (55 lb), maximum: 30 kg (65 lb)   |

The x3650 M4 HD servers are shipped with the following items:

- Statement of Limited Warranty
- Important Notices
- Rack Installation Instructions
- Documentation CD that contains the *Installation and Service Guide*
- System x® Gen-III Slides Kit
- System x Gen-III Cable Management Arm (CMA)
- 2.8 m (9.18 in.) C13-C14 power cord (one for models with one power supply, and two for models with two power supplies)

## Standard models

The following table lists the standard models.

Table 2. Standard models

| Model    | Intel Xeon processors†<br>(two maximum)       | Memory                | RAID               | Disk bays  | Disks | Slots*<br>S/A/M | GbE | Power supply |
|----------|---|-----------------------|--------------------|------------|-------|-----------------|-----|--------------|
| 5460-B3x | 1x E5-2609 v2 4C 2.5GHz<br>10MB 1333MHz 80W   | 1x 8 GB<br>(1333MHz)‡ | M5210-e            | 16x 2.5"   | Open  | 3 / 3 / 6       | 4   | 1x 750W      |
| 5460-C3x | 1x E5-2620 v2 6C 2.1GHz<br>15MB 1600MHz 80W   | 1x 8 GB<br>1600 MHz   | M5210-e            | 16x 2.5"   | Open  | 3 / 3 / 6       | 4   | 1x 750W      |
| 5460-D3x | 1x E5-2630 v2 6C 2.6GHz<br>15MB 1600MHz 80W   | 1x 8 GB<br>1600 MHz   | M5210-e            | 16x 2.5"   | Open  | 3 / 3 / 6       | 4   | 1x 750W      |
| 5460-F3x | 1x E5-2640 v2 8C 2.0GHz<br>20MB 1600MHz 95W   | 1x 8 GB<br>1600 MHz   | M5210-e            | 16x 2.5"   | Open  | 3 / 3 / 6       | 4   | 1x 750W      |
| 5460-G3x | 1x E5-2650 v2 8C 2.6GHz<br>20MB 1866MHz 95W   | 1x 8 GB<br>1866 MHz   | M5210-e            | 16x 2.5"   | Open  | 3 / 3 / 6       | 4   | 1x 750W      |
| 5460-H3x | 1x E5-2660 v2 10C 2.2GHz<br>25MB 1866MHz 95W  | 1x 8 GB<br>1866 MHz   | M5210-e +<br>H1110 | 16+2x 2.5" | Open  | 1 / 0 / 4       | 4   | 1x 750W      |
| 5460-J3x | 1x E5-2670 v2 10C 2.5GHz<br>25MB 1866MHz 115W | 1x 16 GB<br>1866 MHz  | M5210-e            | 16x 2.5"   | Open  | 3 / 3 / 6       | 4   | 1x 750W      |
| 5460-L3x | 1x E5-2680 v2 10C 2.8GHz<br>25MB 1866MHz 115W | 1x 16 GB<br>1866 MHz  | M5210-e            | 16x 2.5"   | Open  | 3 / 3 / 6       | 4   | 1x 750W      |
| 5460-M3x | 1x E5-2690 v2 10C 3.0GHz<br>25MB 1866MHz 130W | 1x 16 GB<br>1866 MHz  | M5210-e            | 16x 2.5"   | Open  | 3 / 3 / 6       | 4   | 1x 900W      |
| 5460-83x | 1x E5-2697 v2 12C 2.7GHz<br>30MB 1866MHz 130W | 1x 16 GB<br>1866 MHz  | M5210-e            | 16x 2.5"   | Open  | 3 / 3 / 6       | 4   | 1x 900W      |

† Processor detail: Processor quantity and model, cores, core speed, L3 cache, memory speed, and power consumption.

\* The PCIe slot counts are: Slots standard / slots available / slots maximum.

‡ Model B3x includes a 1600 MHz DIMM standard, however, it operates at 1333 MHz to match the installed processor.

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



## Express models

The following table lists the express models.

Table 3. Express models

| Model   | Intel Xeon processors†<br>(two maximum)     | Memory                 | RAID controller           | Disk bays | Disks               | Slots*<br>S/A/M | GbE | Power   |
|---|---|------------------------|---------------------------|-----------|---------------------|-----------------|-----|---------|
| North America (NA)  |   |                        |                           |           |                     |                 |     |         |
| 5460-EAU  | 1x E5-2640 v2 8C 2.0GHz<br>20MB 1600MHz 95W | 1x 8 GB<br>1600 MHz    | M5210-e                   | 16x 2.5"  | 4x 1TB<br>NL<br>SAS | 3 / 3 / 6       | 4   | 1x 750W |
| Latin America (LA)  |   |                        |                           |           |                     |                 |     |         |
| 5460-EAU  | 1x E5-2640 v2 8C 2.0GHz<br>20MB 1600MHz 95W | 1x 8 GB<br>1600 MHz    | M5210-e                   | 16x 2.5"  | 4x 1TB<br>NL<br>SAS | 3 / 3 / 6       | 4   | 1x 750W |
| Europe Integrated Operating Team (IOT)                            |   |                        |                           |           |                     |                 |     |         |
| 5460-E1G  | 1x E5-2620 v2 6C 2.1GHz<br>15MB 1600MHz 80W | 1x 8 GB<br>1600 MHz    | M5210-e<br>+ 1GB Flash/R5 | 16x 2.5"  | Open                | 3 / 3 / 6       | 4   | 1x 750W |
| Central and Eastern Europe (CEE) and Middle East and Africa (MEA) |   |                        |                           |           |                     |                 |     |         |
| 5460-E1G  | 1x E5-2620 v2 6C 2.1GHz<br>15MB 1600MHz 80W | 1x 8 GB<br>1600 MHz    | M5210-e<br>+ 1GB Flash/R5 | 16x 2.5"  | Open                | 3 / 3 / 6       | 4   | 1x 750W |
| Russia/Commonwealth of Independent States (CIS)                   |   |                        |                           |           |                     |                 |     |         |
| 5460-E1G  | 1x E5-2620 v2 6C 2.1GHz<br>15MB 1600MHz 80W | 1x 8 GB<br>1600 MHz    | M5210-e<br>+ 1GB Flash/R5 | 16x 2.5"  | Open                | 3 / 3 / 6       | 4   | 1x 750W |
| Japan   |   |                        |                           |           |                     |                 |     |         |
| 5460-PAA  | 1x E5-2603 v2 4C 1.8GHz<br>10MB 1333MHz 80W | 1x 8 GB<br>(1333 MHz)‡ | M5210-e<br>+ 1GB Flash/R5 | 16x 2.5"  | Open                | 3 / 3 / 6       | 4   | 1x 750W |

† Processor detail: Processor quantity and model, cores, core speed, L3 cache, memory speed, power consumption.

\* The PCIe slot counts are: Slots standard / slots available / slots maximum.

‡ Model PAA includes a 1600 MHz DIMM standard, however, it operates at 1333 MHz to match the installed processor.

## Processor options

The x3650 M4 HD supports the processor options that are listed in the following table. The server supports up to two processors. This table shows which server models have each processor standard. If there is no corresponding *where-used* model for a particular processor, this processor is available only through CTO.

Table 4. Processor options

| Part number | Feature codes* | Description  | Models where used |
|-------------|----------------|--|-------------------|
| 46W4210     | A3PT / A3RJ    | Intel Xeon E5-2603 v2 4C 1.8GHz 10MB 1333MHz 80W   | -                 |
| 46W4211     | A3PU / A3RK    | Intel Xeon E5-2609 v2 4C 2.5GHz 10MB 1333MHz 80W   | B3x               |
| 46W4213     | A3PW / A3RM    | Intel Xeon E5-2620 v2 6C 2.1GHz 15MB 1600MHz 80W   | C3x, E1x          |
| 00Y8430     | A4EU / A4EW    | Intel Xeon E5-2628L v2 8C 1.9GHz 20MB 1600MHz 70W  | -                 |
| 46W4214     | A3PX / A3RN    | Intel Xeon E5-2630 v2 6C 2.6GHz 15MB 1600MHz 80W   | D3x               |
| 46W4226     | A3S2 / A3S0    | Intel Xeon E5-2630L v2 6C 2.4GHz 15MB 1600MHz 60W  | -                 |
| 46W4212     | A3PV / A3RL    | Intel Xeon E5-2637 v2 4C 3.5GHz 15MB 1866MHz 130W  | -                 |
| 46W4217     | A3Q0 / A3RR    | Intel Xeon E5-2640 v2 8C 2.0GHz 20MB 1600MHz 95W   | EAx, F3x          |
| 46W4221     | A3Q4 / A3RV    | Intel Xeon E5-2643 v2 6C 3.5GHz 25MB 1866MHz 130W  | -                 |
| 00Y8431     | A4EV / A4EX    | Intel Xeon E5-2648L v2 10C 1.9GHz 25MB 1866MHz 70W | -                 |
| 46W4215     | A3PY / A3RP    | Intel Xeon E5-2650 v2 8C 2.6GHz 20MB 1866MHz 95W   | G3x               |
| 46W4225     | A3Q8 / A3RZ    | Intel Xeon E5-2650L v2 10C 1.7GHz 25MB 1600MHz 70W | -                 |
| 46W4216     | A3PZ / A3RQ    | Intel Xeon E5-2660 v2 10C 2.2GHz 25MB 1866MHz 95W  | H3x               |
| 46W4222     | A3Q5 / A3RW    | Intel Xeon E5-2667 v2 8C 3.3GHz 25MB 1866MHz 130W  | -                 |
| 46W4219     | A3Q2 / A3RT    | Intel Xeon E5-2670 v2 10C 2.5GHz 25MB 1866MHz 115W | J3x               |
| 46W4220     | A3Q3 / A3RU    | Intel Xeon E5-2680 v2 10C 2.8GHz 25MB 1866MHz 115W | L3x               |
| 46W4297     | A3Q9 / A3S1    | Intel Xeon E5-2690 v2 10C 3.0GHz 25MB 1866MHz 130W | M3x               |
| 46W4223     | A3Q6 / A3RX    | Intel Xeon E5-2695 v2 12C 2.4GHz 30MB 1866MHz 115W | -                 |
| 46W4224     | A3Q7 / A3RY    | Intel Xeon E5-2697 v2 12C 2.7GHz 30MB 1866MHz 130W | 83x               |

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

## Memory options

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

The System x3650 M4 HD supports DDR3 memory. The server supports up to 12 DIMMs when one processor is installed and up to 24 DIMMs when two processors are installed. Each processor has four memory channels, and there are three DIMMs per channel.

The following rules apply when selecting the memory configuration:

- The server supports UDIMMs, RDIMMs, and LRDIMMs.
- Mixing different types of memory (UDIMMs, RDIMMs, and LRDIMMs) is not supported.
- Mixing 1.5 V and 1.35 V DIMMs is supported; in such a case, all DIMMs operate at 1.5 V.
- The maximum number of ranks per one channel is eight (except for Load Reduced DIMMs, where more than eight ranks are supported, because one quad-rank LRDIMM provides the same electrical load on a memory bus as a single-rank RDIMM).

- The maximum quantity of DIMMs that can be installed in the server depends on the number of CPUs, DIMM type, rank, and operating voltage, as shown in the "Max. qty supported" row in Table 5.
- All DIMMs in the server operate at the same speed, which is determined as the lowest value of the following items:
  - Memory speed that is supported by the specific CPU.
  - 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 the "Maximum operating speed" section in Table 5.

The following table (Parts 1 and 2) shows the characteristics of the supported DIMMs. Tables cells that are highlighted with a gray background indicate when the combination of DIMM voltage and the number of DIMMs per channel still allows the DIMMs to operate at a rated speed.

Table 5. Maximum memory speeds (Part 1: RDIMMs)

| DIMM specification             | RDIMM                            |                                  |                                   |   |          |          |
|--------------------------------|----------------------------------|----------------------------------|-----------------------------------|---|----------|----------|
|                                | Single rank                      |                                  |                                   | Dual rank   |          |          |
| Rank                           |                                  |                                  |                                   |   |          |          |
| Part numbers                   | 00D5024 (4 GB)<br>00D5036 (8 GB) | 00D5020 (4 GB)<br>00D5032 (8 GB) | 00D5044 (8 GB)<br>46W0672 (16 GB) | 00D5028 (4 GB)<br>00D5040 (8 GB)<br>00D5048 (16 GB) |          |          |
| Rated speed                    | 1600 MHz                         |                                  | 1866 MHz                          | 1600 MHz  |          | 1866 MHz |
| Rated voltage                  | 1.35 V                           |                                  | 1.5 V                             | 1.35 V  |          | 1.5 V    |
| Operating voltage              | 1.35 V                           | 1.5 V                            | 1.5 V                             | 1.35 V  | 1.5 V    | 1.5 V    |
| Max qty supported*             | 24                               | 24                               | 24                                | 24  | 24       | 24       |
| Max DIMM capacity              | 8 GB                             | 8 GB                             | 8 GB                              | 16 GB   | 16 GB    | 16 GB    |
| Max memory capacity            | 192 GB                           | 192 GB                           | 192 GB                            | 384 GB  | 384 GB   | 384 GB   |
| Max. memory at rated speed     | None                             | 128 GB                           | 64 GB                             | None  | 256 GB   | 128 GB   |
| <b>Maximum operating speed</b> |                                  |                                  |                                   |   |          |          |
| 1 DIMM per channel             | 1333 MHz                         | 1600 MHz                         | 1866 MHz                          | 1333 MHz  | 1600 MHz | 1866 MHz |
| 2 DIMMs per channel            | 1333 MHz                         | 1600 MHz                         | 1600 MHz                          | 1333 MHz  | 1600 MHz | 1600 MHz |
| 3 DIMMs per channel            | 800 MHz                          | 1066 MHz                         | 1066 MHz                          | 800 MHz   | 1066 MHz | 1066 MHz |

\* The maximum quantity that is supported is shown for two processors installed.

Table 6. Maximum memory speeds (Part 2: UDIMMs and LRDIMMs)

| <b>DIMM specification</b>      | <b>UDIMM</b>   |            | <b>LRDIMM</b>   |
|--------------------------------|----------------|------------|-----------------|
| Rank                           | Dual rank      |            | Quad rank       |
| Part number                    | 00D5016 (8 GB) |            | 46W0761 (32 GB) |
| Rated speed                    | 1600 MHz       |            | 1866 MHz        |
| Rated voltage                  | 1.35 V         |            | 1.5 V           |
| Operating voltage              | 1.35 V         | 1.5 V      | 1.5 B           |
| Max. qty supported*            | 16             | 16         | 24              |
| Max. DIMM capacity             | 8 GB           | 8 GB       | 32 GB           |
| Max. memory capacity           | 128 GB         | 128 GB     | 768 GB          |
| Max. memory at rated speed     | None           | 128 GB     | 256 GB          |
| <b>Maximum operating speed</b> |                |            |                 |
| 1 DIMM per channel             | 1333 MHz       | 1600 MHz   | 1866 MHz        |
| 2 DIMMs per channel            | 1333 MHz       | 1600 MHz   | 1600 MHz        |
| 3 DIMMs per channel            | No support     | No support | 1066 MHz        |

\* The maximum quantity that is supported is shown for two processors installed.

The following memory protection technologies are supported:

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

If memory mirroring is used, DIMMs must be installed in pairs (minimum of one pair per each CPU), and both DIMMs in a pair must be identical in type and size.

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

The following table lists the memory options that are available for x3650 M4 HD server.

Table 7. Memory options

| Part number       | Feature codes | Description  | Maximum supported | Standard models where used   |
|-------------------|---------------|--|-------------------|------------------------------|
| UDIMMs            |               |  |                   |                              |
| 00D5016           | A3QC          | 8GB (1x8GB, 2Rx8, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP UDIMM   | 16 (8 per CPU)    | -                            |
| RDIMMs - 1866 MHz |               |  |                   |                              |
| 00D5020           | A3QD          | 4GB (1x4GB, 1Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM     | 24 (12 per CPU)   | -                            |
| 00D5028           | A3QF          | 4GB (1x4GB, 2Rx8, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM     | 24 (12 per CPU)   | -                            |
| 00D5032           | A3QG          | 8GB (1x8GB, 1Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM     | 24 (12 per CPU)   | G3x, H3x                     |
| 00D5040           | A3QJ          | 8GB (1x8GB, 2Rx8, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM     | 24 (12 per CPU)   | 83x, J3x, L3x, M3x           |
| 00D5048           | A3QL          | 16GB (1x16GB, 2Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM   | 24 (12 per CPU)   | -                            |
| RDIMMs - 1600 MHz |               |  |                   |                              |
| 00D5024           | A3QE          | 4GB (1x4GB, 1Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM   | 24 (12 per CPU)   | -                            |
| 00D5036           | A3QH          | 8GB (1x8GB, 1Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM   | 24 (12 per CPU)   | B3x, C3x, D3x, E1x, EAx, F3x |
| 00D5044           | A3QK          | 8GB (1x8GB, 2Rx8, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM   | 24 (12 per CPU)   | -                            |
| 46W0672           | A3QM          | 16GB (1x16GB, 2Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM | 24 (12 per CPU)   | -                            |
| LRDIMMs           |               |  |                   |                              |
| 46W0761           | A47K          | 32GB (1x32GB, 4Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP LRDIMM  | 24 (12 per CPU)   | -                            |

## Internal storage

System x3650 M4 HD server supports 1.8-inch and 2.5-inch drives. The server supports the following drive configurations:

- 16x 2.5-inch hot-swap drive bays (front of server)
- 16x 2.5-inch hot-swap drive bays (front) + 2x 2.5-inch hot-swap drive bays (rear)
- 24x 2.5-inch hot-swap drive bays (front)
- 24x 2.5-inch hot-swap drive bays (front) + 2x 2.5-inch hot-swap drive bays (rear)
- 16x 2.5-inch hot-swap drive bays (front) + 16x 1.8-inch hot-swap drive bays (front)

**Note:** The combination of 16x 2.5-inch hot-swap drive bays (front) + 16x 1.8-inch hot-swap drive bays (front) + 2x 2.5-inch hot-swap drive bays (rear) is not supported.

The following figure shows these drive bay configurations.

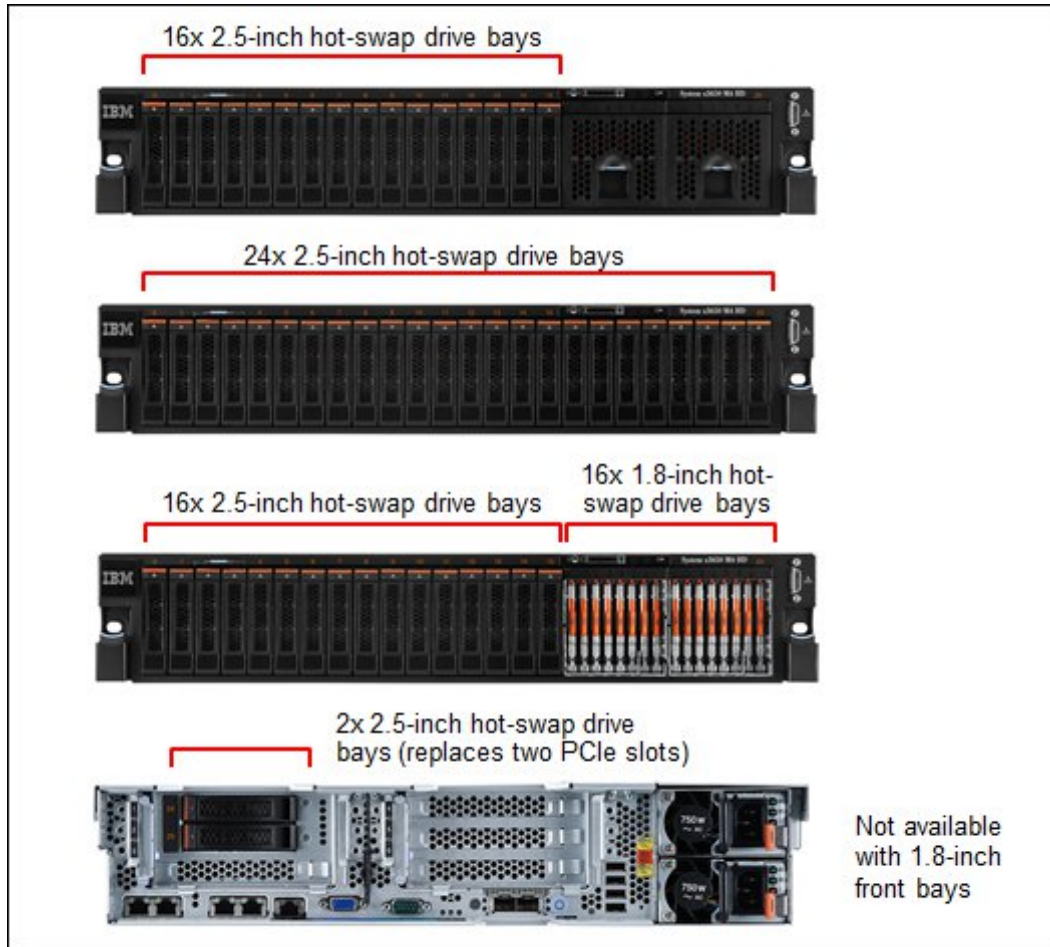


Figure 5. Internal drive configurations

### Backplanes and enablement kits

All standard models ship with 16x 2.5-inch hot-swap drive bays (feature code A3NR). Model H3x also ships with 2x 2.5-inch bays in the rear of the server (feature code A3NQ).

Backplane and enablement kits are listed in the following table. All backplanes operate at 6 Gbps SAS.

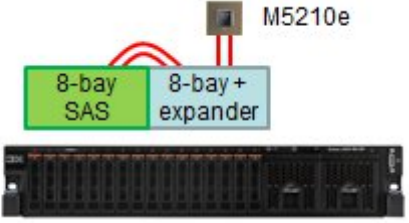
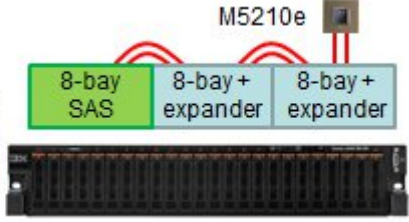
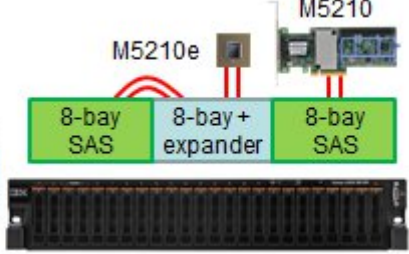
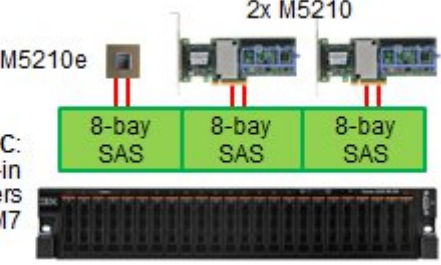
Table 8. Backplane kits

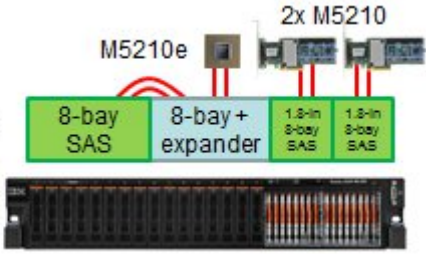
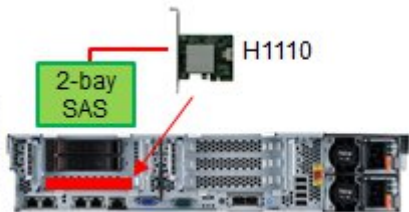
| Part number | Feature codes | Description   | Maximum supported         | Models where used |
|-------------|---------------|---|---------------------------|-------------------|
| None        | A3NR          | System x3650 M4 HD 16 Base Kit                              | 1                         | All models        |
| 46W4204     | A4M4          | x3650 M4 HD Plus 8 x 2.5" HS HDD Assembly Kit with Expander | 1<br>(mutually exclusive) | -                 |
| 46W4206     | A4M6          | x3650 M4 HD Plus 8 x 2.5" HS HDD Assembly Kit               |                           | -                 |
| 00Y7658     | A4M7          | x3650 M4 HD 3 x 8 2.5" HS HDD Assembly Kit                  |                           | -                 |
| 46W4205     | A4M5          | x3650 M4 HD Plus 16 x 1.8" SSD Assembly Kit                 |                           | -                 |
| None        | A3NQ          | x3650 M4 HD Rear 2 HDD Kit*                                 | 1*                        | -                 |

\* Model H3x or CTO only. A3NQ can be combined with A3NR, A4M4, A4M6, and A4M7 (but not A4M5).

The following table shows the internal storage expansion options that are available for the x3650 M4 HD server.

Table 9. Internal storage expansion options

| Configuration   | Name and description  |
|---|---|
| <p><b>Base:</b><br/>16x 2.5-in<br/>1 controller<br/>Feature A3NR</p>             | <p><b>Base offering, feature A3NR</b></p> <ul style="list-style-type: none"> <li>• 16x 2.5-inch hot-swap drive bays (front).</li> <li>• One 8-bay backplane + one 8-bay backplane with SAS expander.</li> <li>• The SAS expander is mounted on the backplane and does not use a PCIe slot.</li> <li>• All 16 drives are driven by an onboard M5210e controller.</li> </ul>                            |
| <p><b>CTO option A:</b><br/>24x 2.5-in<br/>1 controller<br/>Feature A4M4</p>     | <p><b>CTO Option A, feature A4M4</b><br/><b>x3650 M4 HD Plus 8x 2.5" HS HDD Assembly Kit with Expander</b></p> <ul style="list-style-type: none"> <li>• One 8-bay backplane + two 8-bay backplanes with SAS expanders</li> <li>• The SAS expanders are mounted on backplanes and do not use a PCIe slot.</li> <li>• All 24 drives are driven by two ports of an onboard M5210e controller.</li> </ul> |
| <p><b>CTO option B:</b><br/>24x 2.5-in<br/>2 controllers<br/>Feature A4M6</p>  | <p><b>CTO Option B, feature A4M6</b><br/><b>x3650 M4 HD Plus 8 2.5" HS HDD Assembly Option Kit</b></p> <ul style="list-style-type: none"> <li>• One 8-bay backplane + two 8-bay backplanes with SAS expanders.</li> <li>• Two backplanes connect to M5210e.</li> <li>• One backplane connects to an M5210 or N2215 adapter.</li> <li>• Adapters are not part of feature A4M6.</li> </ul>              |
| <p><b>CTO option C:</b><br/>24x 2.5-in<br/>3 controllers<br/>Feature A4M7</p>  | <p><b>CTO Option C, feature A4M7</b><br/><b>x3650 M4 HD 3 x 8 2.5" HS HDD Assembly Kit</b></p> <ul style="list-style-type: none"> <li>• Maximizes the performance of the RAID subsystem.</li> <li>• Three 8-bay backplanes.</li> <li>• One backplane connects to M5210e.</li> <li>• One backplane connects to an M5210 or N2215 adapter.</li> <li>• Adapters are not part of feature A4M7.</li> </ul> |

| Configuration  | Name and description   |
|--|--|
| <p><b>CTO option D:</b><br/>16x 2.5-in +<br/>16x 1.8-in<br/>3 controllers<br/>Feature A4M5</p>  | <p><b>CTO Option D, feature A4M5</b><br/><b>x3650 M4 HD Plus 16 x 1.8" SSD Assembly Kit</b></p> <ul style="list-style-type: none"> <li>• Best use case for storage tiering.</li> <li>• Two 8-bay 2.5-inch backplanes with M5210e.</li> <li>• Two 8-bay 1.8-inch backplanes.</li> <li>• Each 1.8-in backplane connects to an M5210 or N2215 adapter.</li> <li>• Adapters are not part of feature A4M5.</li> </ul> |
| <p><b>CTO Rear option:</b><br/>2x 2.5-in<br/>1 controller<br/>Feature A3NQ</p>                  | <p><b>x3650 M4 HD Rear 2 HDD Kit, feature A3NQ</b></p> <ul style="list-style-type: none"> <li>• Add-on for Option A, B or C; not supported by D.</li> <li>• Two drives are installed in place of PCIe slots 1 and 2.</li> <li>• ServeRAID H1110 is installed in slot 3.</li> <li>• CTO only.</li> <li>• The adapter is separate from feature A3NQ.</li> </ul>  |

The following figure shows the inside of the server with the x3650 M4 HD Plus 8 x 2.5" HS HDD Assembly Kit with Expander installed (option 46W4204 or feature code A4M4). You can see the three backplanes, two of which have SAS expanders.



Figure 6. x3650 M4 HD Plus 8 x 2.5" HS HDD Assembly Kit with Expander installed in the server

## Controllers for internal storage

The following table lists the RAID controllers, SAS HBAs, and additional options that are used for the internal disk storage of an x3650 M4 HD server.



Table 10. RAID controllers and SAS HBAs for internal storage

| Part number   | Feature code | Description  | Maximum supported | Standard models where used |
|---|--------------|--|-------------------|----------------------------|
| Integrated  | None         | ServeRAID M5210e SAS/SATA Controller                 | 1                 | All models                 |
| 46C9110   | A3YZ         | ServeRAID M5210 SAS/SATA Controller                  | 2                 | -                          |
| 81Y4492   | A1XL         | ServeRAID H1110 SAS/SATA Controller                  | 1                 | H3x                        |
| 47C8675   | A3YY         | N2215 SAS/SATA HBA for System x                      | 2                 | -                          |
| Hardware upgrades for the M5210 and M5210e          |              |  |                   |                            |
| 47C8656   | A3Z0         | ServeRAID M5200 Series 1GB Cache/RAID 5 Upgrade      | 1                 | -                          |
| 47C8660   | A3Z1         | ServeRAID M5200 Series 1GB Flash/RAID 5 Upgrade      | 1                 | -                          |
| 47C8664   | A3Z2         | ServeRAID M5200 Series 2GB Flash/RAID 5 Upgrade      | 1                 | -                          |
| 47C8668   | A3Z3         | ServeRAID M5200 Series 4GB Flash/RAID 5 Upgrade      | 1                 | -                          |
| Feature on Demand upgrades for the M5210 and M5210e |              |  |                   |                            |
| 47C8706   | A3Z5         | ServeRAID M5200 Series RAID 6 Upgrade-FoD            | 1†                | -                          |
| 47C8708   | A3Z6         | ServeRAID M5200 Series Zero Cache/RAID 5 Upgrade-FoD | 1                 | -                          |
| 47C8710   | A3Z7         | ServeRAID M5200 Series Performance Accelerator-FoD   | 1                 | -                          |
| 47C8712   | A3Z8         | ServeRAID M5200 Series SSD Caching Enabler-FoD       | 1                 | -                          |

† The ServeRAID M5200 Series RAID 6 Upgrade (47C8706) requires one of the RAID 5 upgrades with cache (47C8656, 47C8660, 47C8664).

The integrated ServeRAID M5210e SAS/SATA Controller has the following specifications:

- Two x4 mini-SAS HD internal connectors (SFF8643)
- Supports RAID levels 0, 1, and 10
- Supports RAID levels 5 and 50 with optional M5200 Series RAID 5 upgrades
- Supports RAID 6 and 60 with the optional M5200 Series RAID 6 Upgrade
- Supports 1 GB cache (no battery backup) or 1 GB or 2 GB flash-backed cache
- Supports performance upgrades through Features on Demand
- 12 Gbps throughput per port
- PCIe x8 Gen 3 host interface
- Based on the LSI SAS3108 12 Gbps ROC controller

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

- Eight internal 12 Gbps SAS/SATA ports
- Two x4 mini-SAS HD internal connectors (SFF8643)
- Supports connections to SAS/SATA drives and SAS Expanders
- Supports RAID levels 0, 1, and 10
- Supports RAID levels 5 and 50 with optional M5200 Series RAID 5 upgrades
- Supports RAID 6 and 60 with the optional M5200 Series RAID 6 Upgrade
- Supports 1 GB cache (no battery backup) or 1 GB or 2 GB flash-backed cache
- Supports performance upgrades through Features on Demand
- 12 Gbps throughput per port

- PCIe 3.0 x8 host interface
- Based on the LSI SAS3108 12 Gbps ROC controller
- IBM PowerPC® 476 1.2GHz dual core processor

The ServeRAID H1110 adapter has the following specifications:

- Four internal 6 Gbps SAS/SATA ports
- One x4 mini-SAS internal connector (SFF8087)
- 6 Gbps throughput per port
- Based on the LSI SAS2004 6 Gbps RAID on Chip (ROC) controller
- PCIe 2.0 x4 host interface
- Supports RAID 0, 1, 1E, and 10
- Connects to up to four SAS or SATA drives (SAS expanders are not supported.)

The N2215 SAS/SATA host bus adapter has the following specifications:

- Two internal mini-SAS HD x4 connectors (SFF8643)
- MD2 small form factor
- PCI Express x8 3.0 host interface
- SAS Controller: LSI SAS3008
- 12 Gbps per port data transfer rate
- No RAID support, no cache
- UEFI support

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

## Internal drive options

The following table lists hard disk drive options for the internal disk storage of the x3650 M4 HD server.

Table 11. Disk drive options for internal disk storage

| Part number  | Feature code | Description                               | Maximum supported |
|--|--------------|---|-------------------|
| <b>2.5" NL SAS Hot-Swap HDDs</b>                           |              |   |                   |
| 90Y8953  | A2XE         | 500GB 7.2K 6Gbps NL SAS 2.5" SFF G2HS HDD | 26                |
| 81Y9690  | A1P3         | 1TB 7.2K 6Gbps NL SAS 2.5" SFF HS HDD     | 26                |
| <b>2.5" 15K SAS Hot-Swap HDDs</b>                          |              |   |                   |
| 90Y8926  | A2XB         | 146GB 15K 6Gbps SAS 2.5" SFF G2HS HDD     | 26                |
| 81Y9670  | A283         | 300GB 15K 6Gbps SAS 2.5" G2HS HDD         | 26                |
| 00AJ300  | A4VB         | 600GB 15K 6Gbps SAS 2.5" G2HS HDD         | 26                |
| <b>2.5" 10K SAS Hot-Swap HDDs</b>                          |              |   |                   |
| 90Y8877  | A2XC         | 300GB 10K 6Gbps SAS 2.5" SFF G2HS HDD     | 26                |
| 90Y8872  | A2XD         | 600GB 10K 6Gbps SAS 2.5" SFF G2HS HDD     | 26                |
| 81Y9650  | A282         | 900GB 10K 6Gbps SAS 2.5" SFF HS HDD       | 26                |
| 00AD075  | A48S         | 1.2TB 10K 6Gbps SAS 2.5" G2HS HDD         | 26                |
| 00NA441  | ASCD         | 1.8TB 10K 6Gbps SAS 2.5" G2HS 512e HDD    | 26                |
| <b>2.5" 10K SAS Hot-Swap self-encrypting drives (SEDs)</b> |              |   |                   |

| Part number  | Feature code | Description                                       | Maximum supported |
|--|--------------|---|-------------------|
| 90Y8908  | A3EF         | 600GB 10K 6Gbps SAS 2.5" SFF G2HS SED             | 26                |
| 81Y9662  | A3EG         | 900GB 10K 6Gbps SAS 2.5" SFF G2HS SED             | 26                |
| 00AD085  | A48T         | 1.2TB 10K 6Gbps SAS 2.5" G2HS SED                 | 26                |
| 00NA476  | ASCF         | 1.8TB 10K 6Gbps SAS 2.5" G2HS 512e SED            | 26                |
| 2.5" 10K SAS Hot-Swap SAS-SSD Hybrid drives                  |              |   |                   |
| 00AD102  | A4G7         | 600GB 10K 6Gbps SAS 2.5" G2HS Hybrid              | 26                |
| 2.5" solid-state drives (SSDs) - hot-swap - Enterprise       |              |   |                   |
| 00W1125  | A3HR         | 100GB SATA 2.5" MLC HS Enterprise SSD             | 26                |
| 49Y6134  | A3EY         | 400GB SAS 2.5" MLC HS Enterprise SSD              | 26                |
| 49Y6139  | A3F0         | 800GB SAS 2.5" MLC HS Enterprise SSD              | 26                |
| 49Y6195  | A4GH         | 1.6TB SAS 2.5" MLC HS Enterprise SSD              | 26                |
| 41Y8331  | A4FL         | S3700 200GB SATA 2.5" MLC HS Enterprise SSD       | 26                |
| 41Y8336  | A4FN         | S3700 400GB SATA 2.5" MLC HS Enterprise SSD       | 26                |
| 41Y8341  | A4FQ         | S3700 800GB SATA 2.5" MLC HS Enterprise SSD       | 26                |
| 2.5" solid-state drives (SSDs) - hot-swap - Enterprise Value |              |   |                   |
| 00AJ355  | A56Z         | 120GB SATA 2.5" MLC HS Enterprise Value SSD       | 26                |
| 00AJ360  | A570         | 240GB SATA 2.5" MLC HS Enterprise Value SSD       | 26                |
| 00AJ365  | A571         | 480GB SATA 2.5" MLC HS Enterprise Value SSD       | 26                |
| 00AJ370  | A572         | 800GB SATA 2.5" MLC HS Enterprise Value SSD       | 26                |
| 00AJ000  | A4KM         | S3500 120GB SATA 2.5" MLC HS Enterprise Value SSD | 26                |
| 00AJ005  | A4KN         | S3500 240GB SATA 2.5" MLC HS Enterprise Value SSD | 26                |
| 00AJ010  | A4KP         | S3500 480GB SATA 2.5" MLC HS Enterprise Value SSD | 26                |
| 00AJ015  | A4KQ         | S3500 800GB SATA 2.5" MLC HS Enterprise Value SSD | 26                |
| 00FN268  | A5U4         | S3500 1.6TB SATA 2.5" MLC HS Enterprise Value SSD | 26                |
| 2.5" solid-state drives (SSDs) - hot-swap - Entry            |              |   |                   |
| 00FN298  | AS0D         | 240GB SATA 2.5" MLC HS Entry SSD                  | 26                |
| 00FN327  | AS0E         | 480GB SATA 2.5" MLC HS Entry SSD                  | 26                |
| 00FN332  | AS0F         | 960GB SATA 2.5" MLC HS Entry SSD                  | 26                |
| 1.8" solid-state drives (SSDs) - Enterprise                  |              |   |                   |
| 41Y8366  | A4FS         | S3700 200GB SATA 1.8" MLC Enterprise SSD          | 16                |
| 41Y8371  | A4FT         | S3700 400GB SATA 1.8" MLC Enterprise SSD          | 16                |
| 00W1120  | A3HQ         | 100GB SATA 1.8" MLC Enterprise SSD                | 16                |
| 49Y6119  | A3AN         | 200GB SATA 1.8" MLC Enterprise SSD                | 16                |
| 49Y6124  | A3AP         | 400GB SATA 1.8" MLC Enterprise SSD                | 16                |
| 1.8" solid-state drives (SSDs) - Enterprise Value            |              |   |                   |
| 00AJ040  | A4KV         | S3500 80GB SATA 1.8" MLC Enterprise Value SSD     | 16                |
| 00AJ045  | A4KW         | S3500 240GB 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                |
| 00AJ335  | A56V         | 120GB SATA 1.8" MLC Enterprise Value SSD          | 16                |
| 00AJ340  | A56W         | 240GB SATA 1.8" MLC Enterprise Value SSD          | 16                |

| Part number | Feature code | Description                              | Maximum supported |
|-------------|--------------|--|-------------------|
| 00AJ345     | A56X         | 480GB SATA 1.8" MLC Enterprise Value SSD | 16                |
| 00AJ350     | A56Y         | 800GB SATA 1.8" MLC Enterprise Value SSD | 16                |

\* Withdrawn from marketing

## Internal backup units

The server does not support an internal tape drive.

## Optical drives

No internal bays; use an external USB drive. See <http://support.lenovo.com/en/documents/pd011281> for options.

## I/O expansion options

The server supports up to six PCIe slots with different riser cards that are installed into two riser sockets on the system board (one riser socket supports the installation of one riser card). Riser 1 supplies slots 1, 2, and 3. Riser 2 supplies slots 4, 5, and 6. Standard models have Riser card 1 installed with three PCIe 3.0 x8 slots. To enable slots 4 - 6, install a second processor and a second riser card.

These options are available through CTO only. Slots 1 and 2 can be replaced with a two-bay 2.5-inch hot-swap drive kit, feature A3NQ. The kit includes a 1-card riser for a RAID card that is installed in slot 3.a

The following table lists the PCI riser card options that are available.

Table 12. PCI riser card options

| Part number | Feature code* | Description   | Maximum supported | Models where used |
|-------------|---------------|---|-------------------|-------------------|
| None*       | A47M          | x3650 M4 HD PCIe Riser Card 1<br>(1 x16 FH/FL + 1 x8 FH/HL Slots)       | 1                 | -                 |
| 00Y7757     | A47Z          | x3650 M4 HD PCIe Riser Card 2<br>(1 x16 FH/FL + 1 x8 FH/HL Slots)       | 1†                | -                 |
| None*       | A47Y          | x3650 M4 HD PCIX Riser Card 1<br>(1 x16 FH/HL PCIe + 2 PCI-X FH/FL)     | 1                 | -                 |
| 00Y7758     | A480          | x3650 M4 HD PCIX Riser Card 2<br>(1 x16 FH/HL PCIe + 2 PCI-X FH/FL)     | 1†                | -                 |
| None*       | A47N          | x3650 M4 HD PCIe Riser Card 1<br>(1 x8 FH/FL + 2 x8 FH/HL Slots)        | 1                 | All other models  |
| 00Y7759     | A481          | x3650 M4 HD PCIe Riser Card 2<br>(1 x8 FH/FL + 2 x8 FH/HL Slots)        | 1†                | -                 |
| None*       | A47P          | x3650 M4 HD PCIe Riser Card 1<br>(1 x16 for GPU + 1 x8 FH/HL Slots)     | 1                 | -                 |
| 00Y7760     | A47Q          | x3650 M4 HD PCIe Riser Card 2<br>(1 x16 for GPU + 1 x8 FH/HL Slots)     | 1†                | -                 |
| None        | A3NQ          | x3650 M4 HD Rear 2 HDD Kit<br>-- includes riser for RAID card in slot 3 | 1                 | H3x               |

\* CTO only.

† The use of Riser card slot 2 requires a second processor to be installed.

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



Figure 7. Slot dimensions

The specific slots that are available depend on the riser cards that are installed in Riser socket 1 and Riser socket 2, as shown in the following table. Standard models except for model H3x have 00Y7759 installed in Riser socket 1.

**Tip:** All slots support full-height adapters. Slots 1, 4, and 5 support full-length adapters, and slots 2, 3, and 6 (when present) support half-length adapters.

Table 13. PCIe slot descriptions (FH=full height, FL=full length, HL=half length, DW=double width)

| Slot number                           | PCIe 3 x8 riser<br>00Y7759 (standard) | PCIe x16 riser<br>00Y7757 | PCI-X riser<br>00Y7758  | GPU riser<br>00Y7760       |
|---------------------------------------|---------------------------------------|---------------------------|-------------------------|----------------------------|
| Riser socket 1<br>(CPU 1)             | 1: PCIe 3.0 x8; FH, FL                | 1: PCIe 3.0 x16 FH, FL    | 1: PCI-X 64b/133 FH, FL | 1: No slot present         |
|                                       | 2: PCIe 3.0 x8; FH, HL                | 2: PCIe 3.0 x8 FH, HL     | 2: PCI-X 64b/133 FH, HL | 2: PCIe 3.0 x16 FH, FL, DW |
|                                       | 3: PCIe 3.0 x8; FH, HL                | 3: No slot present        | 3: PCIe 3.0 x16 FH, HL  | 3: PCIe 3.0 x8 FH, HL      |
| Riser socket 2<br>(CPU 2<br>required) | 4: PCIe 3.0 x8 FH, FL                 | 4: PCIe 3.0 x16 FH, FL    | 4: PCI-X 64b/133 FH, FL | 4: No slot present         |
|                                       | 5: PCIe 3.0 x8 FH, FL                 | 5: PCIe 3.0 x8 FH, FL     | 5: PCI-X 64b/133 FH, FL | 5: PCIe 3.0 x16 FH, FL, DW |
|                                       | 6: PCIe 3.0 x8 FH, HL                 | 6: No slot present        | 6: PCIe 3.0 x16 FH, HL  | 6: PCIe 3.0 x8 FH, HL      |

**Note:** Slots 4, 5, and 6 require a second processor to be installed.

## Network adapters

x3650 M4 HD supports four integrated Gigabit Ethernet ports. Optionally, two 10 Gb Ethernet ports or InfiniBand can be added by installing one of the available dual-port mezzanine cards that are listed in the following table. These cards use a dedicated connector on the system board and do not use a PCI expansion slot.

Integrated NICs have the following features:

- Intel I350AM4 chip
- Four GbE ports
- TCP Offload Engine (TOE) support
- Wake on LAN support
- 802.1Q VLAN tagging support
- NIC Teaming (load balancing and failover)

The following table lists additional supported network adapters.

Table 14. Network adapters

| Part number  | Feature code | Description  | Maximum supported# |
|--|--------------|--|--------------------|
| Mezzanine Card - does not use a PCI expansion slot |              |  |                    |
| 49Y7980  | A3JS         | Intel X520 Dual Port 10GbE SFP+ Embedded Adapter   | 1                  |
| 49Y7990  | A3JT         | Intel X540 Dual Port 10GBase-T Embedded Adapter  | 1                  |
| 00Y7730  | A4MC         | Emulex Dual Port 10GbE SFP+ Embedded VFA IIIr for System x   | 1                  |
| 90Y5178  | A2TE         | Emulex Mezz VFA III/IIIr FCoE/iSCSI License for System x (FoD)<br>(Features on Demand upgrade for 00Y7730)                 | 1                  |
| 00D4143  | A36R         | Dual Port FDR Embedded Adapter   | 1                  |
| 90Y6454  | A22H         | QLogic Dual Port 10GbE SFP+ Embedded VFA   | 1                  |
| 90Y5179  | A2TF         | QLogic Embedded VFA FCoE/iSCSI License for System x (FoD)<br>(Features on Demand upgrade for 90Y6454)                      | 1                  |
| 40 Gb Ethernet                                     |              |  |                    |
| 00D9550  | A3PN         | Mellanox ConnectX-3 40GbE / FDR IB VPI Adapter for System x  | 6                  |
| 10 Gb Ethernet                                     |              |  |                    |
| 49Y7910  | A18Y         | Broadcom NetXtreme II Dual Port 10GBaseT Adapter   | 6                  |
| 44T1360  | A4YQ         | Broadcom NetXtreme 2x10 GbE SFP+ Mezz Adapter for System x   | 6                  |
| 44T1370  | A5GZ         | Broadcom NetXtreme 2x10GbE BaseT Adapter for System x  | 6                  |
| 94Y5180  | A4Z6         | Broadcom NetXtreme Dual Port 10GbE SFP+ Adapter for System x   | 6                  |
| 00D8540  | A4XH         | Emulex Dual Port 10GbE SFP+ VFA IIIr for System x  | 6                  |
| 95Y3760  | A2U2         | Emulex VFA III/IIIr FCoE/iSCSI License for System x (FoD)<br>(Features on Demand upgrade for 00D8540)                      | 6                  |
| 00JY830  | A5UU         | Emulex VFA5 2x10 GbE SFP+ Adapter and FCoE/iSCSI SW for System x   | 6                  |
| None*  | AS3M         | Emulex VFA5 2x10 GbE SFP+ Integrated Adapter for System x  | 6                  |
| 00JY820  | A5UT         | Emulex VFA5 2x10 GbE SFP+ PCIe Adapter for System x  | 6                  |
| 00JY824  | A5UV         | Emulex VFA5 FCoE/iSCSI SW for PCIe Adapter for System x (FoD)<br>(Features on Demand upgrade for 00JY820 and feature AS3M) | 6                  |
| 49Y7960  | A2EC         | Intel X520 Dual Port 10GbE SFP+ Adapter for System x   | 6                  |
| 49Y7970  | A2ED         | Intel X540-T2 Dual Port 10GBaseT Adapter for System x  | 6                  |
| 81Y3520  | AS73         | Intel X710 2x10GbE SFP+ Adapter for System x   | 6                  |
| 00D9690  | A3PM         | Mellanox ConnectX-3 10 GbE Adapter for System x  | 6                  |
| 42C1800  | 5751         | QLogic 10Gb CNA for System x   | 6                  |
| 90Y4600  | A3MR         | QLogic 8200 Dual Port 10GbE SFP+ VFA for System x  | 6                  |
| 00Y5624  | A3MT         | QLogic 8200 VFA FCoE/iSCSI License for System x (FoD)<br>(Features on Demand upgrade for 90Y4600)                          | 6                  |
| Gigabit Ethernet                                   |              |  |                    |
| 90Y9370  | A2V4         | Broadcom NetXtreme I Dual Port GbE Adapter for System x  | 6                  |
| 90Y9352  | A2V3         | Broadcom NetXtreme I Quad Port GbE Adapter for System x  | 6                  |
| 49Y4230  | 5767         | Intel Ethernet Dual Port Server Adapter I340-T2 for System x   | 6                  |
| 49Y4240  | 5768         | Intel Ethernet Quad Port Server Adapter I340-T4 for System x   | 6                  |
| 00AG500  | A56K         | Intel I350-F1 1xGbE Fiber Adapter for System x   | 6                  |
| 00AG510  | A56L         | Intel I350-T2 2xGbE BaseT Adapter for System x   | 6                  |
| 00AG520  | A56M         | Intel I350-T4 4xGbE BaseT Adapter for System x   | 6                  |

| Part number | Feature code | Description   | Maximum supported# |
|-------------|--------------|---|--------------------|
| 42C1780     | 2995         | NetXtreme II 1000 Express Dual Port Ethernet Adapter        | 6                  |
| None*       | 1485         | NetXtreme II 1000 Express G Ethernet Adapter- PCIe          | 6                  |
| 42C1750     | 2975         | PRO/1000 PF Server Adapter                                  | 6                  |
| InfiniBand  |              |   |                    |
| 95Y3750     | A2MY         | Mellanox ConnectX-2 Dual-port QSFP QDR IB Adapter           | 6                  |
| 00D9550     | A3PN         | Mellanox ConnectX-3 40GbE / FDR IB VPI Adapter for System x | 6                  |

\* CTO only.

# Maximum quantity is achieved with two processors installed. With one processor, the maximum quantity is half of the listed value (this does not apply to mezzanine cards).

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

## Storage HBAs and external RAID controllers

The following table lists the storage HBAs that are supported by the x3650 M4 HD server. The maximum quantity that is listed is for configurations with two processors installed. If one processor is installed, the maximum quantity that is supported is half of the listed value.

Table 15. Storage adapters

| Part number           | Feature code | Description                                  | Maximum supported |
|-----------------------|--------------|--|-------------------|
| Fibre Channel - 16 Gb |              |  |                   |
| 81Y1668               | A2XU         | Brocade 16Gb FC Single-port HBA for System x | 6                 |
| 81Y1675               | A2XV         | Brocade 16Gb FC Dual-port HBA for System x   | 6                 |
| 81Y1655               | A2W5         | Emulex 16Gb FC Single-port HBA for System x  | 6                 |
| 81Y1662               | A2W6         | Emulex 16Gb FC Dual-port HBA for System x    | 6                 |
| 00Y3337               | A3KW         | QLogic 16Gb FC Single-port HBA for System x  | 6                 |
| 00Y3341               | A3KX         | QLogic 16Gb FC Dual-port HBA for System x    | 6                 |
| Fibre Channel - 8 Gb  |              |  |                   |
| 46M6049               | 3589         | Brocade 8 Gb FC Single-port HBA for System x | 6                 |
| 46M6050               | 3591         | Brocade 8 Gb FC Dual-port HBA for System x   | 6                 |
| 42D0485               | 3580         | Emulex 8 Gb FC Single-port HBA for System x  | 6                 |
| 42D0494               | 3581         | Emulex 8 Gb FC Dual-port HBA for System x    | 6                 |
| 42D0501               | 3578         | QLogic 8 Gb FC Single-port HBA for System x  | 6                 |
| 42D0510               | 3579         | QLogic 8 Gb FC Dual-port HBA for System x    | 6                 |
| SAS                   |              |  |                   |
| 00AE912               | A5M0         | N2225 SAS/SATA HBA for System x              | 2                 |
| 00AE916               | A5M1         | N2226 SAS/SATA HBA for System x              | 2                 |

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

The server supports attachments to the external storage expansion enclosures, by using the ServeRAID M5225 SAS/SATA Controller.

The following table provides the ordering part numbers for the ServeRAID M5225 SAS/SATA Controller and upgrades.

Table 16. Ordering part numbers and feature codes

| Part number            | Feature code | Description  | Maximum supported |
|------------------------|--------------|--|-------------------|
| Adapters               |              |  |                   |
| 00AE938                | A5ND         | ServeRAID M5225-2GB SAS/SATA Controller for System x | 4                 |
| Upgrades for the M5225 |              |  |                   |
| 47C8706                | A3Z5         | ServeRAID M5200 Series RAID 6 Upgrade FoD            | 1*                |
| 47C8708                | A3Z6         | ServeRAID M5200 Series Zero Cache/RAID 5 Upgrade FoD | 1*                |
| 47C8710                | A3Z7         | ServeRAID M5200 Series Performance Accelerator FoD   | 1*                |
| 47C8712                | A3Z8         | ServeRAID M5200 Series SSD Caching Enabler FoD       | 1*                |

\* 1 Features on Demand (FoD) upgrade will enable all M5200 series adapters installed in the server

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

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

For more information, see the Lenovo Press Product Guide *ServeRAID M5225-2GB SAS/SATA Controller* at: <http://lenovopress.com/tips1258>



## PCIe SSD adapters

The server supports the High IOPS SSD adapters that are listed in the following table.

Table 17. SSD adapters

| Part number | Feature code | Description  | Maximum supported |
|-------------|--------------|--|-------------------|
| 00AE983     | ARYK         | 1250GB Enterprise Value io3 Flash Adapter for System x | 4                 |
| 00AE986     | ARYL         | 1600GB Enterprise Value io3 Flash Adapter for System x | 4                 |
| 00AE989     | ARYM         | 3200GB Enterprise Value io3 Flash Adapter for System x | 4                 |
| 00AE992     | None*        | 6400GB Enterprise Value io3 Flash Adapter for System x | 4                 |
| 00AE995     | ARYP         | 1000GB Enterprise io3 Flash Adapter for System x       | 4                 |
| 00AE998     | ARYQ         | 1300GB Enterprise io3 Flash Adapter for System x       | 4                 |
| 00JY001     | ARYR         | 2600GB Enterprise io3 Flash Adapter for System x       | 4                 |
| 00JY004     | None*        | 5200GB Enterprise io3 Flash Adapter for System x       | 4                 |

\* These adapters cannot be ordered via CTO. They must be ordered as options and shipped separately from the server.

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

## GPU adapters

The server supports graphics processing units (GPUs).

The following table lists the supported GPUs. Certain riser cards are needed as listed in the table. The server supports up to two NVIDIA adapters, one in each riser card. The use of the second GPU requires that the second processor be installed. GPUs are available through CTO only. Additional cables and other components are included by the configurator.

Table 18. GPU adapters

| Part number | Feature code | Description         | Riser used              | Maximum supported |
|-------------|--------------|---------------------|-------------------------|-------------------|
| None*       | A3WJ         | NVIDIA Quadro K2000 | GPU riser, 00Y7760      | 2                 |
| None*       | A3WH         | NVIDIA Quadro K600  | PCIe x16 riser, 00Y7757 | 2                 |

\* CTO only.

## Power supplies

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

Table 19. Power supplies

| Part number | Feature code | Description  | Maximum supported | Standard models where used |
|-------------|--------------|--|-------------------|----------------------------|
| 94Y6667     | A2EB         | System x 900W High Efficiency Platinum AC Power Supply | 2                 | M3x, 83x                   |
| 94Y6669     | A1H5         | System x 750W High Efficiency Platinum AC Power Supply | 2                 | All other models           |
| 94Y6668     | A1H6         | System x 550W High Efficiency Platinum AC Power Supply | 2                 |                            |
| 94Y7631     | A39N         | System x 750W High Efficiency -48 V DC Power Supply    | 2                 | -                          |

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

All CFF power supplies are compliant with and exceed 80 Plus Platinum standard, as shown in the following table. Maximum power efficiency is achieved at 50% load.

Table 20. Power supply efficiencies

| Power supply unit                                      | 20% load | 50% load | 100% load |
|--|----------|----------|-----------|
| 80 PLUS Platinum standard                              |          |          |           |
|  | 90.00%   | 94.00%   | 91.00%    |
| Power supplies   |          |          |           |
| System x 900W High Efficiency Platinum AC Power Supply | 90.45%   | 94.02%   | 91.89%    |
| System x 750W High Efficiency Platinum AC Power Supply | 92.32%   | 94.31%   | 93.14%    |
| System x 550W High Efficiency Platinum AC Power Supply | 92.94%   | 94.21%   | 92.74%    |

For power supply selection, use the following rule-of-thumb:

Select 550W power supplies if all of the following items are true:

- 8 or fewer DIMMs (no LRDIMMs)
- 16 or fewer HDDs
- One CPU 115W or lower
- 1 or 2 PCIe adapters
- No High IOPS adapters
- No GPUs

Select 750 W power supplies if all of the following items are true:

- 16 or fewer DIMMs (no LRDIMMs)
- 24 or fewer drives
- Two CPUs 115 W or lower
- No High IOPS adapters
- No GPUs

Select 900 W power supplies if all of the following items are true:

- More than 16 DIMMs
- 26 or 32 drives

- CPUs above 115 W
- High IOPS adapters
- GPU adapters

For accurate power supply selection, use the Power Configurator:  
<http://ibm.com/systems/bladecenter/resources/powerconfig.html>

## Integrated virtualization

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

Table 21. Virtualization options

| Part number | Feature code | Description                                    | Maximum supported | Standard models where used |
|-------------|--------------|--|-------------------|----------------------------|
| 41Y8298     | A2G0         | Blank USB Memory Key for VMware ESXi Downloads | 1                 | None                       |

## Local server management

The x3650 M4 HD offers local console access USB ports and a video port on the rear of the server, as shown in Figure 3. Console access from the front of the server is available through an optional console breakout cable that is connected to a port on the front of the server as shown in the following figure.



Figure 8. Optional console breakout cable

The console breakout cable can be ordered by using the information in the following table.

Table 22. Console breakout cable

| Part number | Feature code | Description                              | Maximum supported | Standard models where used |
|-------------|--------------|--|-------------------|----------------------------|
| 00Y8325     | A47X         | x3650 M4 HD Video and USB Breakout Cable | 1                 | None                       |

To aid with problem determination, the server includes basic light path diagnostics, which are a set of LEDs on the front of the server and inside the server that show you which component is failing. The LEDs are shown in the following figure.

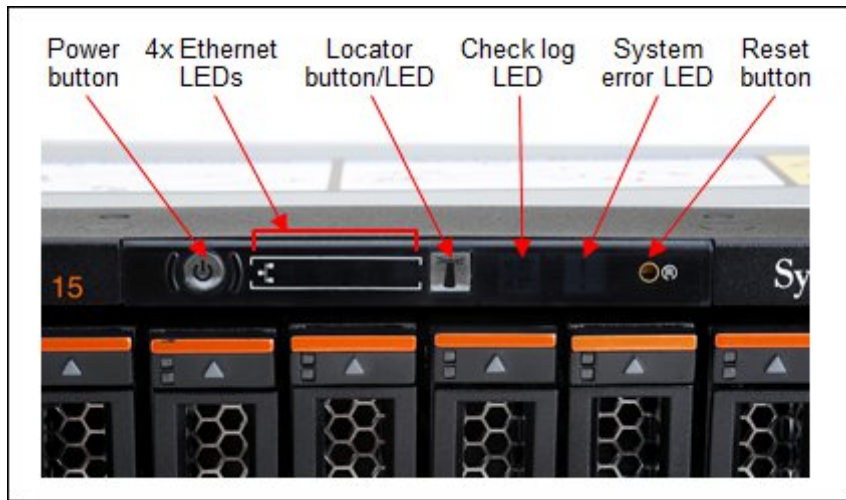


Figure 9. Power button and system LEDs

When an error occurs, the system error LED lights up. You can review the logs through the web interface of the IMMv2 (see the "Remote management" section).

## Remote management

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

The x3650 M4 HD offers a dedicated Ethernet port at the rear of the server for remote access to the IMM2. Alternatively, one of the four Ethernet ports that are accessible by the operating system can be shared with IMM2 access. This feature is enabled through the system setup in UEFI.

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 optional Integrated Management Module Advanced Upgrade is required to enable the remote presence and blue-screen capture features. The remote presence feature provides the following functions:

- Remotely viewing video with graphics resolutions up to 1600x1200 at 75 Hz with up to 23 bits per pixel colors, 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

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 to assist in determining the cause of the hang condition. The following table lists the remote management option ordering information.

Table 23. Remote management option

| Part number | Feature code | Description                                   | Maximum supported | Models where used |
|-------------|--------------|---|-------------------|-------------------|
| 90Y3901     | A1ML         | Integrated Management Module Advanced Upgrade | 1                 | None              |

## Supported operating systems

The server supports the following operating systems:

- Microsoft Windows Server 2008 R2
- Microsoft Windows Server 2008, Datacenter x64 Edition
- Microsoft Windows Server 2008, Datacenter x86 Edition
- Microsoft Windows Server 2008, Enterprise x64 Edition
- Microsoft Windows Server 2008, Enterprise x86 Edition
- Microsoft Windows Server 2008, Standard x64 Edition
- Microsoft Windows Server 2008, Standard x86 Edition
- Microsoft Windows Server 2008, Web x64 Edition
- Microsoft Windows Server 2008, Web x86 Edition
- Microsoft Windows Server 2012
- Microsoft Windows Server 2012 R2
- Red Hat Enterprise Linux 6 Server Edition
- Red Hat Enterprise Linux 6 Server x64 Edition
- Red Hat Enterprise Linux 7
- SUSE LINUX Enterprise Server 11 for AMD64/EM64T
- SUSE LINUX Enterprise Server 11 for x86
- SUSE LINUX Enterprise Server 11 with Xen for AMD64/EM64T
- SUSE Linux Enterprise Server 12
- SUSE Linux Enterprise Server 12 with XEN
- VMware vSphere 5.1 (ESXi)
- VMware vSphere 5.5 (ESXi)

For more information about the specific versions and service levels that are supported and any other prerequisites, see the Operating System Interoperability Guide:

<http://lenovopress.com/osig>

## Physical and electrical specifications

Dimensions and weight:

- Height: 86.5 mm (3.4 in.)
- Width: 445 mm (17.5 in.)
- Depth: 746 mm (29.4 in.)
- Weight:
  - Minimum configuration: 25 kg (55 lb)
  - Maximum configuration: 30 kg (65 lb)

Supported environment:

The System x3650 M4 HD complies with ASHRAE class A3 specifications.

- Power on:
  - Temperature: 5 °C to 40 °C (41 °F to 104 °F) up to 950 m (3,117 ft)
  - Above 950 m, de-rated maximum air temperature 1 °C / 175 m
  - Humidity, non-condensing: -12 °C dew point (10.4 °F) and 8% - 85% relative humidity
  - Maximum dew point: 24 °C (75 °F)

- Maximum altitude: 3050 m (10,000 ft) and 5 °C to 28 °C (41 °F to 82 °F)
  - Maximum rate of temperature change: 20 °C/hr (68 °F/hr) for HDDs
- Power off:
  - Temperature: 5 °C to 45 °C (41 °F to 113 °F)
  - Relative humidity: 8% - 85%
  - Maximum dew point: 27 °C (80.6 °F)
- Storage (non-operating):
  - Temperature: 1 °C to 60 °C (33.8 °F to 140 °F)
  - Altitude: 3050 m (10,000 ft)
  - Relative humidity: 5% - 80%
  - Maximum dew point: 29 °C (84.2 °F)
- Shipment (non-operating):
  - Temperature: -40 °C to 60 °C (-40 °F to 140 °F)
  - Altitude: 10,700 m (35,105 ft)
  - Relative humidity: 5% - 100%
  - Maximum dew point: 29 °C (84.2 °F)
- Electrical:
  - Models with 900 W power supplies:
    - 100 to 127 (nominal) V AC; 50 Hz or 60 Hz; 10 A
    - 200 to 240 (nominal) V AC; 50 Hz or 60 Hz; 5 A
    - Input kilovolt-amperes (kVA) (approximately):
      - Minimum configuration: 0.15 kVA
      - Maximum configuration: 1.2 kVA
  - Models with 750 W AC power supplies:
    - 100 to 127 (nominal) V AC; 50 Hz or 60 Hz; 8.9 A
    - 200 to 240 (nominal) V AC; 50 Hz or 60 Hz; 4.5 A
    - Input kilovolt-amperes (kVA) (approximately):
      - Minimum configuration: 0.15 kVA
      - Maximum configuration: 0.99 kVA
  - Models with 550 W power supplies:
    - 100 to 127 (nominal) V AC; 50 Hz or 60 Hz; 6.5 A
    - 200 to 240 (nominal) V AC; 50 Hz or 60 Hz; 3.3 A
    - Input kilovolt-amperes (kVA) (approximately):
      - Minimum configuration: 0.16 kVA
      - Maximum configuration: 0.73 kVA
- BTU output:
  - Minimum configuration: 525 Btu/hr (154 watts)
  - Maximum configuration: 4053 Btu/hr (1188 watts)
- Noise level:
  - 6.6 bels (operating)
  - 6.4 bels (idle)

## Warranty options

The System x3650 M4 HD has a three-year warranty with 24x7 standard call center support and 9x5 Next Business Day onsite coverage. Also available are Lenovo Services warranty maintenance upgrades and post-warranty maintenance agreements, with a well-defined scope of services, including service hours, response time, term of service, and service agreement terms and conditions.

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

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

The following table explains warranty service definitions in more detail.

Table 24. Warranty service definitions

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

The following Lenovo warranty service upgrades are available:

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

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

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

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

Keeping microcode current helps prevent hardware failures and security exposure. There are two levels of service: analysis of the installed base and analysis and update where required. Offerings vary



by country and can be bundled with other warranty upgrades and extensions.

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

## Regulatory compliance

The server conforms to the following standards:

- Energy Star 2.0
- FCC - Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, issue 5, Class A
- UL/IEC 60950-1
- CSA C22.2 No. 60950-1
- NOM-019
- Argentina IEC60950-1
- Japan VCCI, Class A
- Australia/New Zealand AS/NZS CISPR 22, Class A; AS/NZS 60950.1
- IEC 60950-1(CB Certificate and CB Test Report)
- China CCC GB4943.1, GB9254 Class A, and 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 25. 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 26. 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 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 27. 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 28. 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 29. 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 |
| 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)                         |

| Part number   | Description   |
|---|---|
| 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 that are listed in the following table.

Table 30. Rack cabinets

| Part number | Description                             |
|-------------|---|
| 201886X     | 11U Office Enablement Kit               |
| 93072PX     | 25U Static S2 Standard Rack             |
| 93072RX     | 25U Standard Rack                       |
| 93074RX     | 42U Standard Rack                       |
| 93074XX     | 42U Standard Rack Extension             |
| 93084EX     | 42U Enterprise Expansion Rack           |
| 93084PX     | 42U Enterprise 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            |
| 99564RX     | S2 42U Dynamic Standard Rack            |
| 99564XX     | S2 42U Dynamic Standard Expansion Rack  |

For more information, see the list of Lenovo Press Product Guides in the Rack cabinets and options category:

<http://lenovopress.com/systemx/rack>

## KVM console options

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

Table 31. Console keyboards

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

| <b>Part number</b>           | <b>Description</b>  |
|------------------------------|---|
| 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  |
| <b>Console switches</b>      |   |
| 1754D2X                      | Global 4x2x32 Console Manager (GCM32)                         |
| 1754D1X                      | Global 2x2x16 Console Manager (GCM16)                         |
| 1754A2X                      | Local 2x16 Console Manager (LCM16)                            |
| 1754A1X                      | Local 1x8 Console Manager (LCM8)                              |
| <b>Console switch cables</b> |   |
| 43V6147                      | Single Cable USB Conversion Option (UCO)                      |
| 39M2895                      | USB Conversion Option (4 Pack UCO)                            |
| 46M5383                      | Virtual Media Conversion Option Gen2 (VCO2)                   |
| 46M5382                      | Serial Conversion Option (SCO)                                |

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

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## Related publications and links

For more information, see these resources:

- US Announcement Letter  
<http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS113-151>
- *System x3650 M4 HD Installation and Service Guide*  
<http://ibm.com/support>
- xREF - System x Reference Sheets  
<http://lenovopress.com/xref>
- System x Support Portal  
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## Related product families

Product families related to this document are the following:

- [2-Socket Rack Servers](#)



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