

## IBM System x3630 M4 (E5-2400)

### IBM Redbooks Product Guide

The IBM® System x3630 M4 server offers a cost-effective high-capacity storage solution with exceptional energy-smart design, leadership virtualization, and powerful systems management. It supports up to two eight-core Intel Xeon processors and high-density memory designs with twelve DDR3 DIMM slots. This 2U server consolidates storage and server into one system, offers easy management, and saves floor space and power consumption, costing less money than traditional enterprise offerings. Designed with redundancy, flexible subsystems, and a wider range of configuration options, the x3630 M4 also offers an innovative Feature on Demand (FoD) design for an easier upgrade path.

*Suggested use:* Collaboration/email applications, light databases, virtualization/cloud, virtual desktops, web serving, and virtual storage.

The following figure shows the IBM System x3630 M4.



Figure 1. The IBM System x3630 M4

### Did you know

The IBM System x3630 M4 server is designed to provide exceptional value and flexibility to meet general business or storage-intensive requirements with up to 56 TB of storage space in a dense 2U form factor and 80 PLUS Platinum certified power supplies. The flexible onboard Ethernet solution provides two standard integrated Gigabit Ethernet ports and two additional integrated Gigabit Ethernet ports with an optional software FoD upgrade without needing to buy additional hardware. Comprehensive systems management tools with the next-generation Integrated Management Module II (IMM2) make it easy to deploy, integrate, service, and manage.

## Key features

Backed by the IBM legendary worldwide service and support, the x3630 M4 is developed, quality-tested, and certified by IBM, the leading vendor in technology patents for 17 years running. IBM System x® advancements in scalability, reliability, and performance can help your business innovate and thrive. With more flexible configuration options, energy-efficient components, and robust systems management tools, the x3630 M4 is an innovative design by IBM that can deliver business value over the long term.

### Scalability and performance

The x3630 M4 offers numerous features to boost performance, improve scalability, and reduce costs:

- The Intel Xeon processor E5-2400 product family improves productivity by offering affordable dual-socket system performance with eight-core processors with up to 2.3 GHz core speeds, up to 20 MB of L3 cache, and one QPI interconnect link of up to 8 GTps.
- Up to two processors, 16 cores, and 32 threads maximize the concurrent execution of multithreaded applications.
- Intelligent and adaptive system performance with Intel Turbo Boost Technology 2.0 allows processor cores to run at maximum speeds during peak workloads by temporarily going beyond processor thermal design power (TDP).
- Intel Hyper-Threading Technology boosts performance for multithreaded applications by enabling simultaneous multithreading 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.
- Up to 384 GB of memory capacity via 12 DIMM slots with 32 GB LRDIMMs.
- Up to 1600 MHz memory speeds with two DIMMs per channel running at 1600 MHz to help maximize system performance.
- The server offers up to four integrated Gigabit Ethernet ports with convenient Feature on Demand upgrade process that does not require the purchasing of an additional hardware.
- The server offers PCI Express 3.0 I/O expansion capabilities that improve the theoretical maximum bandwidth by almost 100% (8 GTps per link using 128b/130b encoding) compared to the previous generation of PCI Express 2.0 (5 GTps per link using 8b/10b encoding).
- With Intel Integrated I/O Technology, the PCI Express 3.0 controller is integrated into the Intel Xeon processor E5 family. This controller helps to reduce I/O latency and increase overall system performance.
- Up to fourteen 3.5-inch hot-swap drive bays provide maximum internal storage density of up to 56 TB in a 2U form factor.

### Availability and serviceability

The x3630 M4 provides many features to simplify serviceability and increase system uptime:

- The server offers Chipkill, memory mirroring, and memory rank sparing for redundancy in the event of a non-correctable memory failure to prevent an unplanned outage.
- Tool-less cover removal provides easy access to upgrades and serviceable parts, such as processor, memory, and adapter cards.
- The server offers simple-swap or hot-swap drives supporting affordable software RAID and advanced hardware RAID redundancy for data protection and greater system uptime.

- The server offers up to two redundant hot-swap power supplies and three dual-motor non-hot-swap redundant fans to provide cost-efficient availability for applications.
- The light path diagnostics panel and optional individual light path LEDs quickly lead the technician to failed (or failing) components. This panel simplifies servicing, speeds up problem resolution, and helps improve system availability.
- Predictive Failure Analysis (PFA) detects when system components (processors, memory, hard disk drives, fans, and power supplies) operate outside of standard thresholds and generates proactive alerts in advance of a possible failure, therefore increasing uptime.
- Solid-state drives (SSDs) offer significantly better reliability than traditional mechanical HDDs for greater uptime.
- The built-in Integrated Management Module II (IMM2) continuously monitors system parameters, triggers alerts, and performs recovery actions in case of failure, to minimize downtime.
- Built-in diagnostics using Dynamic Systems Analysis (DSA) Preboot speeds up troubleshooting tasks to reduce service time.
- Three-year customer replaceable unit and on-site limited warranty, next business day 9x5. Optional service upgrades available.

### **Manageability and security**

Powerful systems management features simplify local and remote management of the x3630 M4:

- 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) V1.2 support enables advanced cryptographic functionality, such as digital signatures and remote attestation.
- IBM Systems Director is included for proactive systems management. It offers comprehensive systems management tools that help increase uptime, reduce costs, and improve productivity through advanced server management capabilities.
- Industry-standard AES NI support provides faster and stronger encryption.
- Intel Execute Disable Bit functionality can help prevent certain classes of malicious buffer overflow attacks when combined with a supporting 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 x3630 M4 offers the following energy-efficiency features to save energy, reduce operational costs, increase energy availability, and contribute to a green environment:

- Energy-efficient planar components help lower operational costs.
- 80 PLUS Platinum certified power supplies enable greater energy savings while providing flexibility to meet your business needs.
- The Intel Xeon processor E5-2400 product family offers better performance over the previous generation, while fitting into the same 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 19% less energy compared to 1.5 V DDR3 RDIMMs.
- Solid state drives (SSDs) consume as much as 80% less power than traditional spinning HDDs.
- The server uses hexagonal ventilation holes, a part of IBM Calibrated Vectors 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 with eight 3.5-inch drive bays.

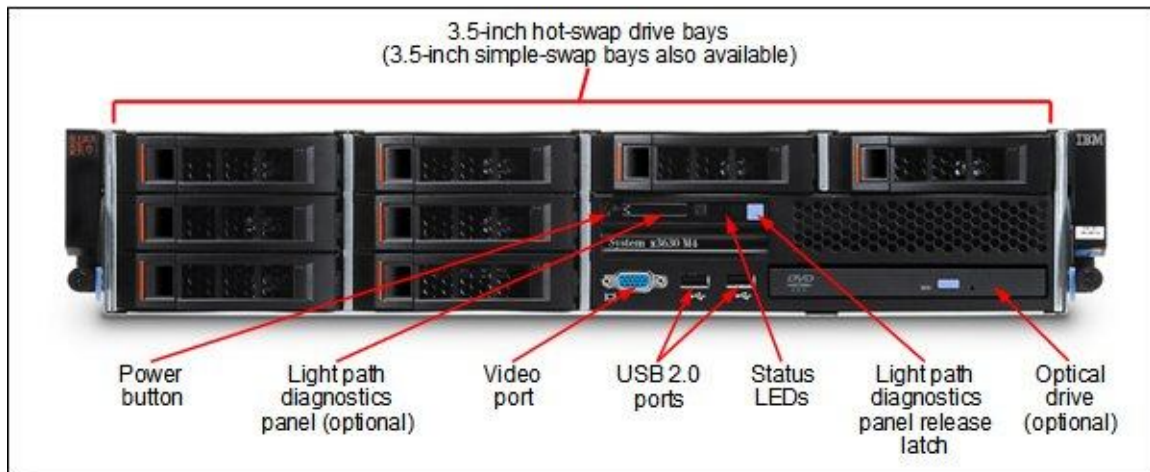


Figure 2. Front view of the IBM System x3630 M4 with eight drive bays

The following figure shows the front of the server with twelve 3.5-inch drive bays.

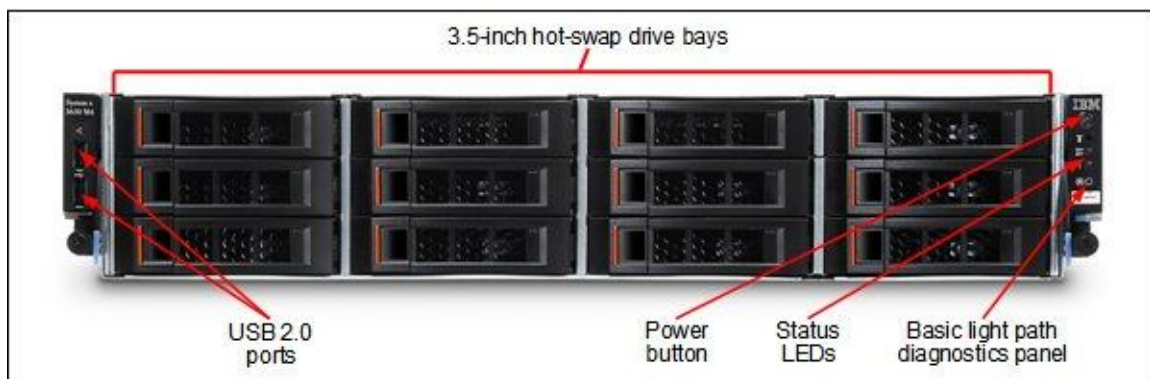


Figure 3. Front view of the IBM System x3630 M4 with twelve drive bays

The following figure shows the rear of the server without the optional rear HDD cage upgrade.

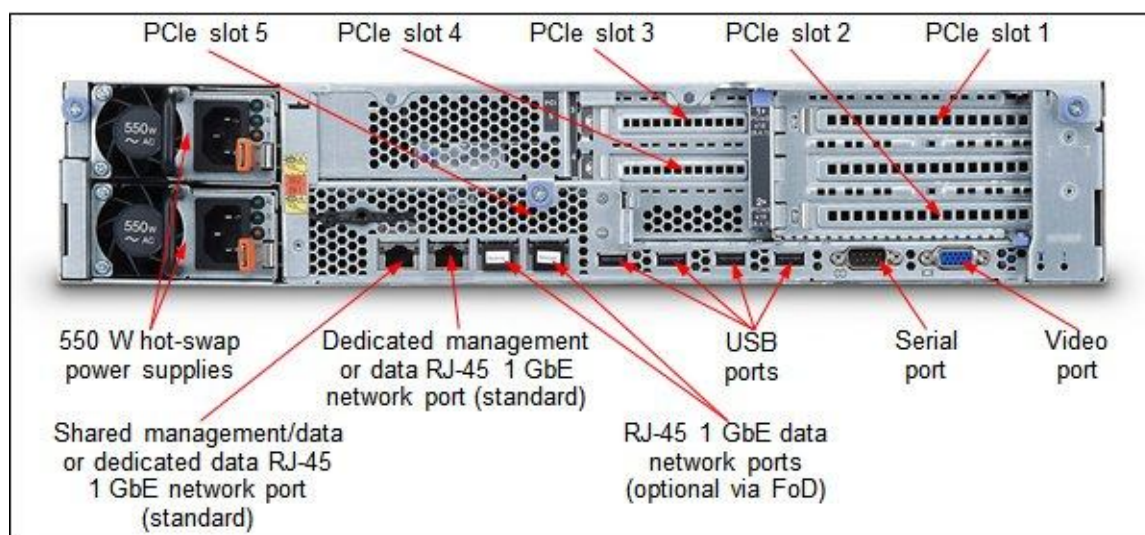


Figure 4. Rear view of the IBM System x3630 M4 without the rear HDD cage

The following shows the rear of the server with the optional rear HDD cage upgrade.

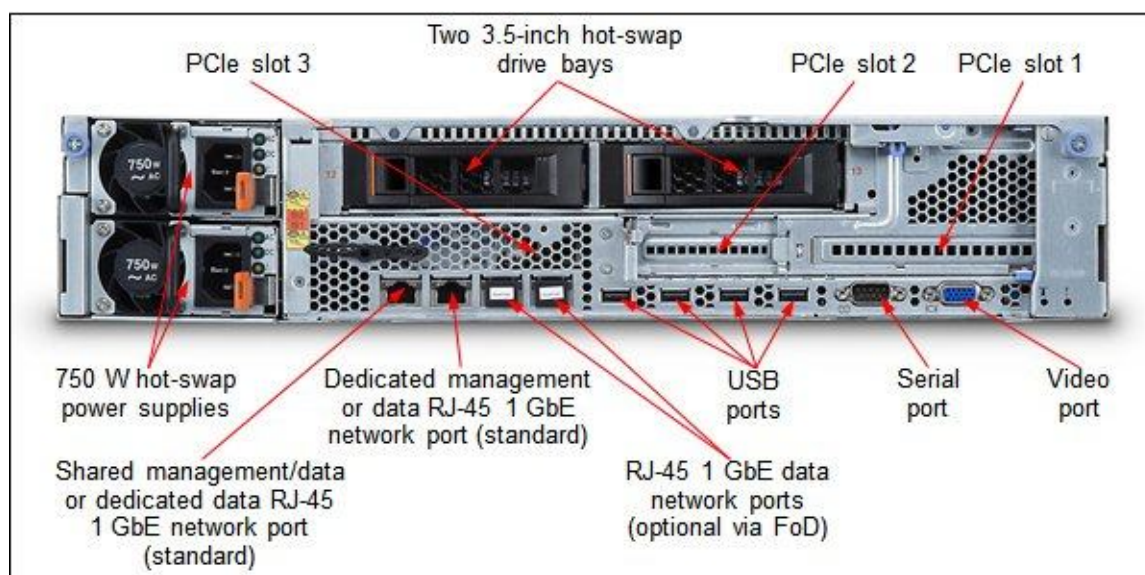


Figure 5. Rear view of the IBM System x3630 M4 with the rear HDD cage



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

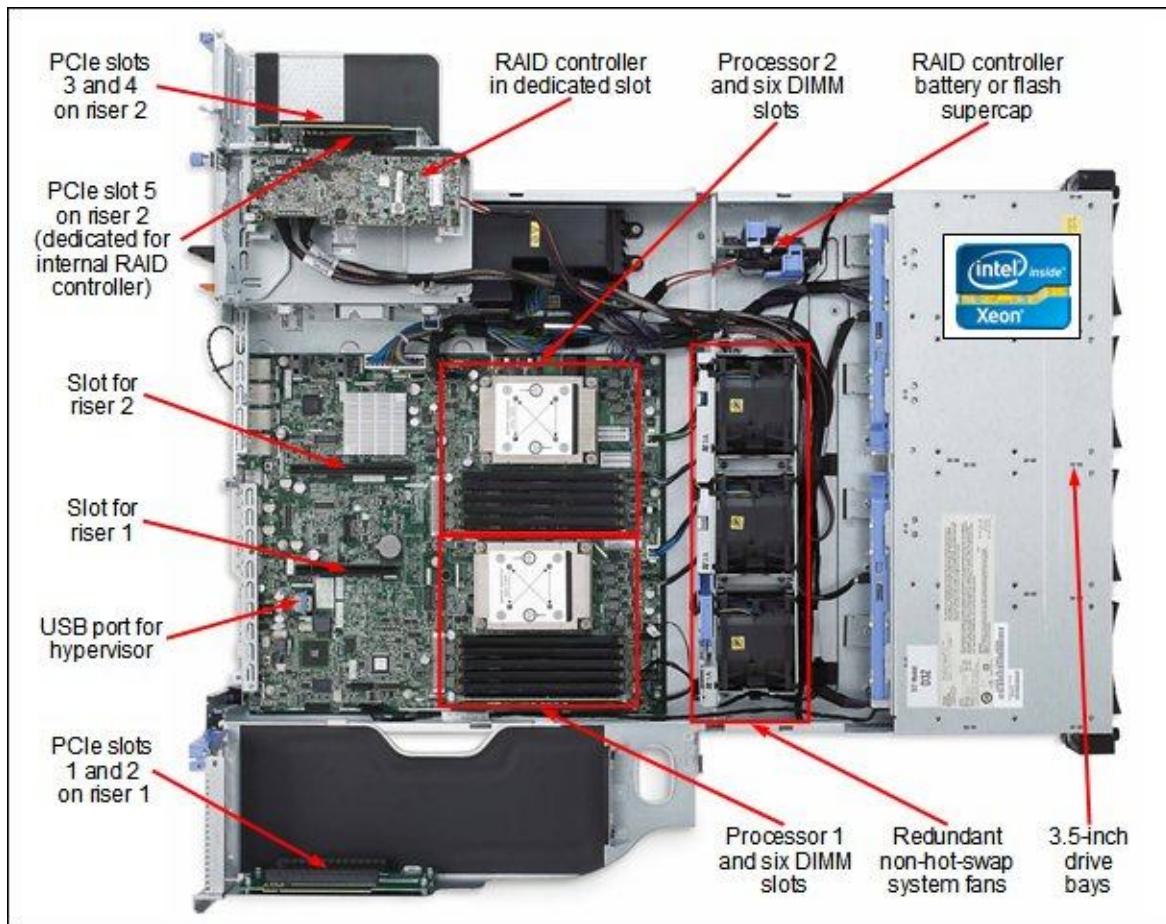


Figure 6. Inside view of the IBM System x3630 M4

## Standard specifications

The following table lists the standard specifications.

Table 1. Standard specifications (part 1)

| Components               | Specification   |
|--------------------------|---|
| Form factor              | 2U rack.  |
| Processor                | Up to two Intel Xeon processor E5-2400 product family processors with eight cores (up to 2.3 GHz), six cores (up to 2.4 GHz) or four cores (up to 2.2 GHz), one QPI link up to 8.0 GTps, up to 1600 MHz memory speed, up to 20 MB L3 cache; or one Intel Xeon processor E5-1400 product family processor with four cores up to 2.8 GHz, 10 MB L3 cache, and 1333 MHz memory speed (CTO only); or one Intel Pentium processor 1400 product family processor with two cores up to 2.8 GHz, 5 MB L3 cache, and 1066 MHz memory speed (CTO only). |
| Chipset                  | Intel C600 series.  |
| Memory                   | Up to 12 DIMM sockets (six DIMMs per processor). LRDIMMs, RDIMMs, and UDIMMs are supported, but memory types cannot be intermixed. DIMM speeds are up to 1600 MHz.  |
| Memory maximums          | With LRDIMMs: Up to 384 GB with 12x 32 GB RDIMMs and two processors<br>With RDIMMs: Up to 192 GB with 12x 16 GB RDIMMs and two processors<br>With UDIMMs: Up to 48 GB with 12x 4 GB UDIMMs and two processors   |
| Memory protection        | ECC, Chipkill, memory mirroring, and memory rank sparing.   |
| Disk drive bays          | Up to eight 3.5-inch SATA simple-swap drive bays, up to eight 3.5-inch SAS/SATA hot-swap drive bays, or up to fourteen 3.5-inch SAS/SATA hot-swap drive bays.   |
| Maximum internal storage | Up to 56 TB with 4 TB 3.5-inch NL SAS/SATA HS HDDs, up to 32 TB with 4 TB 3.5-inch SATA SS HDDs, or up to 11.2 TB with 800 GB 3.5-inch SATA HS SSDs. An intermix of SAS/SATA is supported.  |
| RAID support             | RAID 0 and 1 with C105. RAID 0, 1, and 10 with M1115 or M5110. Upgrades to RAID 5 and 50 are available for M1115. Upgrades to RAID 5 and 50 are available for M5110 (zero-cache; 512 MB battery-backed cache; 512 MB or 1 GB flash-backed cache). Upgrade to RAID 6 or 60 is available for M5110 with caches.   |
| Optical drive bays       | One, for models with up to eight 3.5-inch drive bays. Support for optional DVD-ROM or multiburner.  |
| Tape drive bays          | Optional, for models with up to eight 3.5-inch drive bays. Tape Enablement Kit is required to support the internal tape drive. Support for optional DDS5 or DDS6 USB tape drives is available.  |
| Network interfaces       | Up to four integrated Gigabit Ethernet 1000BASE-T RJ-45 ports (two ports enabled, and an additional two ports require the optional software FoD upgrade to enable them).  |
| Ports                    | Two USB 2.0 and one DB-15 video (not available on storage-rich models) port on the front. Four USB 2.0, one DB-15 video, one DB-9 serial, and four RJ-45 GbE network ports on the rear. Two internal USB ports (one for embedded hypervisor, one for internal USB tape drive).  |
| Cooling                  | IBM Calibrated Vectored Cooling with three redundant non-hot-swap fans; each fan has two motors.  |
| Power supply             | Up to two redundant hot-swap 550 W HE AC, 750 W HE AC, or 900 W HE AC power supplies (all AC power supplies are 80 PLUS Platinum certified), or up to two redundant hot-swap 750 W HE DC power supplies.  |
| Hot-swap parts           | Hard drives (hot-swap models), power supplies.  |

Table 1. Standard specifications (part 2)

| Components                  | Specification  |
|-----------------------------|--|
| I/O expansion slots         | <p>Up to five slots in models with up to 12 drive bays, depending on the riser cards installed. The slots are as follows:</p> <ul style="list-style-type: none"> <li>Slot 1: PCIe 3.0 x16 (x8-wired), optional PCIe 3.0 x16 (x16-wired); full-height, full-length</li> <li>Slot 2: PCIe 3.0 x16 (x8-wired); full-height, half-length (not present if optional x16-wired slot 1 riser is used)</li> <li>Slot 3: PCIe 3.0 x16 (x8-wired), optional PCIe 3.0 x16 (x16-wired); low-profile, half-length (the second processor is required to use this slot)</li> <li>Slot 4: PCIe 3.0 x16 (x8-wired); low-profile, half-length (not present if optional x16-wired slot 3 riser is used, the second processor is required to use this slot)</li> <li>Slot 5: PCIe 3.0 x8 (x4-wired); dedicated slot for ServeRAID adapter; standard on hardware RAID models, optional on software RAID models</li> </ul> <p>Up to three slots in models with 14 drive bays, depending on the riser cards installed. The slots are as follows:</p> <ul style="list-style-type: none"> <li>Slot 1: PCIe 3.0 x8 (x8-wired), optional PCIe 3.0 x16 (x16-wired); full-height, half-length</li> <li>Slot 2: PCIe 3.0 x8 (x8-wired); low-profile, half-length (not present if an optional x16-wired slot 1 riser is used)</li> <li>Slot 3: PCIe 3.0 x8 (x4-wired), optional PCIe 3.0 x8 (x8-wired); dedicated slot for ServeRAID adapter (x8-wired slot requires the second processor, x4-wired slot does not require the second processor)</li> </ul> |
| Systems management          | UEFI, IBM Integrated Management Module II (IMM2), Predictive Failure Analysis, light path diagnostics (basic standard, advanced optional), Automatic Server Restart, IBM Systems Director and IBM Systems Director Active Energy Manager, and IBM ServerGuide. Optional IMM Advanced FoD Upgrade for remote presence (graphics, keyboard and mouse, and virtual media).  |
| Security features           | Power-on password, administrator's password, and Trusted Platform Module (TPM).  |
| Video                       | Matrox G200eR2 with 16 MB memory integrated into the IMM2. Maximum resolution is 1600x1200 at 75 Hz with 16 M colors.  |
| Operating systems supported | Microsoft Windows Server 2012 R2, 2012, 2008 R2 and 2008 (x64), Red Hat Enterprise Linux 5 and 6, SUSE Linux Enterprise Server 10 and 11, VMware ESX 4.1 and VMware ESXi 4.1 embedded hypervisor, and VMware vSphere (ESXi) 5.0, 5.1, and 5.5.   |
| Limited warranty            | Three-year customer-replaceable unit and on-site limited warranty with 9x5/NBD.  |
| Service and support         | Optional service upgrades (country-specific) are available through IBM ServicePac® offerings: 4-hour or 2-hour response time, 8 hours fix time, one-year or two-year warranty extension, remote technical support for IBM hardware and selected IBM and third-party (Microsoft, Linux, VMware) software.   |
| Dimensions                  | Height: 86 mm (3.4 in.), width: 447 mm (17.6 in.), depth: 749 mm (29.5 in.)  |
| Weight                      | Minimum configuration: 16.4 kg (36.2 lb), maximum: 28.2 kg (62.2 lb)   |

The x3630 M4 servers are shipped with the following items:

- Registration flyer
- Statement of Limited Warranty
- Important Notices
- Rack Installation Instructions
- Documentation CD containing *Installation and User's Guide*
- Rail kit (static rails, non-sliding; no cable management arm included)
- One 2.8m, 10A/100-250V, C13 to IEC 320-C14 rack power cable



## Standard models

The following table lists the standard models.

Table 2. Standard models

| MTM*                      | Intel Xeon processor†<br>(2 maximum)      | Memory               | RAID                | Drive<br>bays       | Drives                 | Onboard<br>NIC<br>(std/max) | I/O<br>slots<br>(std/<br>max) | Optical<br>drive | Power<br>(std/<br>max) |
|---------------------------|---|----------------------|---------------------|---------------------|------------------------|-----------------------------|-------------------------------|------------------|------------------------|
| Models announced May 2012 |   |                      |                     |                     |                        |                             |                               |                  |                        |
| 7158-A2x                  | 1x E5-2403 4C 1.8GHz<br>10MB 1066MHz 80W  | 1x 4 GB<br>1333 MHz§ | C105                | 4x 3.5"<br>SS / 4   | Open bay               | 2x GbE / 4                  | 2 / 5                         | Optional         | 1x 550 W<br>HS / 2     |
| 7158-A4x                  | 1x E5-2403 4C 1.8GHz<br>10MB 1066MHz 80W  | 1x 4 GB<br>1333 MHz§ | C105                | 8x 3.5"<br>SS / 8   | Open bay               | 2x GbE / 4                  | 2 / 5                         | Optional         | 1x 550 W<br>HS / 2     |
| 7158-B2x                  | 1x E5-2407 4C 2.2GHz<br>10MB 1066MHz 80W  | 1x 4 GB<br>1333 MHz§ | C105                | 8x 3.5"<br>HS / 8   | Open bay               | 2x GbE / 4                  | 2 / 5                         | Optional         | 1x 550 W<br>HS / 2     |
| 7158-B4x                  | 1x E5-2407 4C 2.2GHz<br>10MB 1066MHz 80W  | 1x 4 GB<br>1333 MHz§ | M1115               | 12x 3.5"<br>HS / 14 | Open bay               | 2x GbE / 4                  | 5 / 5                         | None             | 1x 750 W<br>HS / 2     |
| 7158-C2x                  | 1x E5-2420 6C 1.9GHz<br>15MB 1333MHz 95W  | 1x 4 GB<br>1333 MHz  | M1115               | 8x 3.5"<br>HS / 8   | Open bay               | 2x GbE / 4                  | 5 / 5                         | Optional         | 1x 550 W<br>HS / 2     |
| 7158-C4x‡                 | 1x E5-2420 6C 1.9GHz<br>15MB 1333MHz 95W  | 1x 8 GB<br>1333 MHz  | M5110<br>512 MB     | 8x 3.5"<br>HS / 8   | 1x 500 GB<br>7.2K SATA | 2x GbE / 4                  | 5 / 5                         | Multi-<br>burner | 1x 550 W<br>HS / 2     |
| 7158-C6x‡                 | 1x E5-2420 6C 1.9GHz<br>15MB 1333MHz 95W  | 1x 8 GB<br>1333 MHz  | M5110<br>512 MB     | 12x 3.5"<br>HS / 14 | 1x 500 GB<br>7.2K SATA | 2x GbE / 4                  | 5 / 5                         | None             | 1x 750 W<br>HS / 2     |
| 7158-D2x                  | 1x E5-2430 6C 2.2GHz<br>15MB 1333MHz 95W  | 1x 4 GB<br>1333 MHz  | M5110<br>512 MB     | 12x 3.5"<br>HS / 14 | Open bay               | 2x GbE / 4                  | 5 / 5                         | None             | 1x 750 W<br>HS / 2     |
| 7158-F2x                  | 1x E5-2440 6C 2.4GHz<br>15MB 1333MHz 95W  | 1x 4 GB<br>1333 MHz  | M5110<br>512 MB (f) | 12x 3.5"<br>HS / 14 | Open bay               | 2x GbE / 4                  | 5 / 5                         | None             | 1x 750 W<br>HS / 2     |
| 7158-F4x                  | 1x E5-2440 6C 2.4GHz<br>15MB 1333MHz 95W  | 1x 4 GB<br>1333 MHz  | M5110<br>512 MB (f) | 8x 3.5"<br>HS / 8   | Open bay               | 2x GbE / 4                  | 5 / 5                         | Optional         | 1x 550 W<br>HS / 2     |
| 7158-G2x                  | 1x E5-2450 8C 2.1GHz<br>20MB 1600MHz 95W  | 1x 4 GB<br>1333 MHz§ | M5110<br>1 GB (f)   | 8x 3.5"<br>HS / 8   | Open bay               | 2x GbE / 4                  | 5 / 5                         | Optional         | 1x 550 W<br>HS / 2     |
| 7158-H2x                  | 1x E5-2470 8C 2.3GHz<br>20MB 1600MHz 95W  | 1x 8 GB<br>1333 MHz§ | M5110<br>1 GB (f)   | 12x 3.5"<br>HS / 14 | Open bay               | 2x GbE / 4                  | 5 / 5                         | None             | 1x 750 W<br>HS / 2     |
| 7158-J2x                  | 1x E5-2450L 8C 1.8GHz<br>20MB 1600MHz 70W | 1x 4 GB<br>1333 MHz§ | M5110<br>1 GB (f)   | 12x 3.5"<br>HS / 14 | Open bay               | 2x GbE / 4                  | 5 / 5                         | None             | 1x 750 W<br>HS / 2     |

\* x in the Machine Type Model (MTM) represents a country-specific letter (for example, the EMEA MTM is 7158-A1G, and the US MTM is 7158-A1U). Ask your local IBM representative for specifics.

† Processor detail: Processor quantity and model, number of cores, core speed, L3 cache, memory speed, TDP.

§ For models A2x, A4x, B2x, and B4x, the standard DIMM is rated at 1333 MHz, but operates at up to 1066 MHz to match the processor memory speed. Conversely, for models G2x, H2x, and J2x, the processor memory speed is rated at 1600 MHz, but operates at up to 1333 MHz to match the rated speed of the installed DIMM. Actual memory speed maximums depend on several factors, as described in "Memory options".

‡ Models C4x and C6x include Windows Storage Server 2008 R2 Standard preload.

(f) The ServeRAID M5110 RAID controller in this model includes flash-backed cache.

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

## Express models

The following table lists the express models.

Table 3. Express models

| MTM*                                 | Intel Xeon processor†<br>(2 maximum)     | Memory               | RAID                | Drive<br>bays       | Drives                 | Onboard<br>NIC<br>(std/max) | I/O<br>slots<br>(std/<br>max) | Optical<br>drive | Power<br>(std/<br>max) |
|--------------------------------------|--|----------------------|---------------------|---------------------|------------------------|-----------------------------|-------------------------------|------------------|------------------------|
| Central and Eastern Europe (CEE)     |  |                      |                     |                     |                        |                             |                               |                  |                        |
| 7158-E1G                             | 1x E5-2407 4C 2.2GHz<br>10MB 1066MHz 80W | 1x 4 GB<br>1333 MHz§ | M1115               | 8x 3.5"<br>HS / 8   | Open bay               | 2x GbE / 4                  | 5 / 5                         | Multi-<br>burner | 1x 550 W<br>HS / 2     |
| 7158-E2G#                            | 1x E5-2420 6C 1.9GHz<br>15MB 1333MHz 95W | 1x 8 GB<br>1333 MHz  | M5110               | 8x 3.5"<br>HS / 8   | Open bay               | 2x GbE / 4                  | 5 / 5                         | Multi-<br>burner | 1x 550 W<br>HS / 2     |
| 7158-E3G‡                            | 1x E5-2430 6C 2.2GHz<br>15MB 1333MHz 95W | 1x 8 GB<br>1333 MHz  | M5110<br>512 MB (f) | 12x 3.5"<br>HS / 14 | 2x 500 GB<br>7.2K SATA | 2x GbE / 4                  | 5 / 5                         | None             | 1x 750 W<br>HS / 2     |
| 7158-E4G                             | 1x E5-2420 6C 1.9GHz<br>15MB 1333MHz 95W | 1x 8 GB<br>1333 MHz  | M5110               | 8x 3.5"<br>HS / 8   | 1x 500 GB<br>7.2K SATA | 2x GbE / 4                  | 5 / 5                         | Multi-<br>burner | 1x 550 W<br>HS / 2     |
| Europe (excluding CEE)               |  |                      |                     |                     |                        |                             |                               |                  |                        |
| 7158-E1G                             | 1x E5-2407 4C 2.2GHz<br>10MB 1066MHz 80W | 1x 4 GB<br>1333 MHz§ | M1115               | 8x 3.5"<br>HS / 8   | Open bay               | 2x GbE / 4                  | 5 / 5                         | Multi-<br>burner | 1x 550 W<br>HS / 2     |
| 7158-E2G                             | 1x E5-2420 6C 1.9GHz<br>15MB 1333MHz 95W | 1x 8 GB<br>1333 MHz  | M5110               | 8x 3.5"<br>HS / 8   | Open bay               | 2x GbE / 4                  | 5 / 5                         | Multi-<br>burner | 1x 550 W<br>HS / 2     |
| 7158-E3G                             | 1x E5-2430 6C 2.2GHz<br>15MB 1333MHz 95W | 1x 8 GB<br>1333 MHz  | M5110<br>512 MB (f) | 12x 3.5"<br>HS / 14 | 2x 500 GB<br>7.2K SATA | 2x GbE / 4                  | 5 / 5                         | None             | 1x 750 W<br>HS / 2     |
| Middle East, Africa                  |  |                      |                     |                     |                        |                             |                               |                  |                        |
| 7158-E1G                             | 1x E5-2407 4C 2.2GHz<br>10MB 1066MHz 80W | 1x 4 GB<br>1333 MHz§ | M1115               | 8x 3.5"<br>HS / 8   | Open bay               | 2x GbE / 4                  | 5 / 5                         | Multi-<br>burner | 1x 550 W<br>HS / 2     |
| 7158-E3G                             | 1x E5-2430 6C 2.2GHz<br>15MB 1333MHz 95W | 1x 8 GB<br>1333 MHz  | M5110<br>512 MB (f) | 12x 3.5"<br>HS / 14 | 2x 500 GB<br>7.2K SATA | 2x GbE / 4                  | 5 / 5                         | None             | 1x 750 W<br>HS / 2     |
| 7158-E4G                             | 1x E5-2420 6C 1.9GHz<br>15MB 1333MHz 95W | 1x 8 GB<br>1333 MHz  | M5110               | 8x 3.5"<br>HS / 8   | 1x 500 GB<br>7.2K SATA | 2x GbE / 4                  | 5 / 5                         | Multi-<br>burner | 1x 550 W<br>HS / 2     |
| United States, Latin America, Canada |  |                      |                     |                     |                        |                             |                               |                  |                        |
| 7158-EAU                             | 1x E5-2407 4C 2.2GHz<br>10MB 1066MHz 80W | 1x 8 GB<br>1333 MHz§ | M5110               | 8x 3.5"<br>HS / 8   | Open bay               | 2x GbE / 4                  | 5 / 5                         | Multi-<br>burner | 1x 550 W<br>HS / 2     |
| 7158-EBU                             | 1x E5-2420 6C 1.9GHz<br>15MB 1333MHz 95W | 1x 8 GB<br>1333 MHz  | M5110<br>512 MB (f) | 8x 3.5"<br>HS / 8   | Open bay               | 2x GbE / 4                  | 5 / 5                         | Multi-<br>burner | 1x 550 W<br>HS / 2     |
| 7158-ECU                             | 1x E5-2440 6C 2.4GHz<br>15MB 1333MHz 95W | 1x 8 GB<br>1333 MHz  | M5110<br>1 GB (f)   | 8x 3.5"<br>HS / 8   | Open bay               | 2x GbE / 4                  | 5 / 5                         | Multi-<br>burner | 1x 550 W<br>HS / 2     |

\* MTM = Machine Type Model

† Processor detail: Processor quantity and model, number of cores, core speed, L3 cache, memory speed, TDP.

§ For models E1G and EAU, the standard DIMM is rated at 1333 MHz, but operates at up to 1066 MHz to match the processor memory speed. Actual memory speed maximums depend on several factors, as described in "Memory options".

# This model is available only in Russia/Commonwealth of Independent States (R/CIS).

‡ This model is not available in Russia/Commonwealth of Independent States (R/CIS).

(f) The ServerAID M5110 RAID controller in this model includes flash-backed cache.

## Processor options

The x3630 M4 (E5-2400) supports the processor options listed in the following table. The server supports up to two Intel Xeon processor E5-2400 product family processors, one Intel Xeon processor E5-1410, one Intel Pentium processor 1403, or one Intel Pentium processor 1407. This table shows which server models have each processor standard. If there is no corresponding *where used* model for a particular processor, then this processor is only available through CTO.

Table 4. Processor options

| Part number   | Description  | Standard models where used |
|---|--|----------------------------|
| Single or dual processor support: Intel Xeon processor E5-2400 product family                               |  |                            |
| 90Y6367   | Intel Xeon Processor E5-2403 4C 1.8GHz 10MB Cache 1066MHz 80W  | A2x, A4x                   |
| 90Y6365   | Intel Xeon Processor E5-2407 4C 2.2GHz 10MB Cache 1066MHz 80W  | B2x, B4x                   |
| 90Y6364   | Intel Xeon Processor E5-2420 6C 1.9GHz 15MB Cache 1333MHz 95W  | C2x, C4x, C6x              |
| 90Y6363   | Intel Xeon Processor E5-2430 6C 2.2GHz 15MB Cache 1333MHz 95W  | D2x                        |
| 90Y6384   | Intel Xeon Processor E5-2430L 6C 2.0GHz 15MB Cache 1333MHz 60W | -                          |
| 90Y6362   | Intel Xeon Processor E5-2440 6C 2.4GHz 15MB Cache 1333MHz 95W  | F2x, F4x                   |
| 90Y6361   | Intel Xeon Processor E5-2450 8C 2.1GHz 20MB Cache 1600MHz 95W  | G2x                        |
| 90Y6368   | Intel Xeon Processor E5-2450L 8C 1.8GHz 20MB Cache 1600MHz 70W | J2x                        |
| 90Y6356   | Intel Xeon Processor E5-2470 8C 2.3GHz 20MB Cache 1600MHz 95W  | H2x                        |
| Single processor support only: Intel Xeon processor E5-1410 and Intel Pentium processor 1400 product family |  |                            |
| None*   | Intel Pentium Processor 1403 2C 2.6GHz 5MB cache 1066MHz 80W   | -                          |
| None*   | Intel Pentium Processor 1407 2C 2.8GHz 5MB cache 1066MHz 80W   | -                          |
| None*   | Intel Xeon Processor E5-1410 4C 2.8GHz 10MB Cache 1333MHz 80W  | -                          |

\* These processors only support single processor configurations and are available only through CTO or special bid.

## Memory options

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

The x3630 M4 (E5-2400) supports DDR3 memory. The server supports up to six DIMMs when one processor is installed, and up to 12 DIMMs when two processors are installed. Each processor has three memory channels, and there are two DIMMs per channel. The following rules apply when selecting the memory configuration:

- Mixing different types of memory (UDIMMs, RDIMMs, and LRDIMMs) is not supported.
- Mixing 1.5 V and 1.35 V DIMMs in the same server is not supported.
- The maximum number of ranks supported per one channel is eight (with the exception of 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 a server depends on the number of processors (six DIMMs with one processor installed, 12 DIMMs with two processors installed)
- All DIMMs in all processor memory channels operate at the same speed, which is determined as the lowest value of:
  - The memory speed supported by the specific processor.
  - The lowest of maximum operating speeds for the selected memory configuration that depends on the rated speed, operating voltage, and quantity of DIMMs per channel, as shown under the "Maximum operating speed" section in Table 5.

The following memory protection technologies are supported:

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

Chipkill works only in independent channel mode (the default is operational mode) and supports only x4-based memory DIMMs.

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

If memory rank sparing is used, then two single-rank or dual-rank DIMMs must be installed per populated channel (the DIMMs do not need to be 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 installed.

Chipkill, memory mirroring, and memory rank sparing modes are mutually exclusive. Only one operational memory mode can be enabled on a server, and it is a system-wide setting.

The following table shows the characteristics of the supported DIMMs. Table cells 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)

| Specification                        | DIMM type RDIMM |          |          |           |          |          |           |
|--------------------------------------|-----------------|----------|----------|-----------|----------|----------|-----------|
| Rank                                 | Single rank     |          |          | Dual rank |          |          | Quad rank |
| Rated speed                          | 1333 MHz        |          | 1600 MHz | 1333 MHz  |          | 1600 MHz | 1066 MHz  |
| Rated voltage                        | 1.35 V          |          | 1.5 V    | 1.35 V    |          | 1.5 V    | 1.35 V    |
| Operating voltage                    | 1.35 V          | 1.5 V    | 1.5 V    | 1.35 V    | 1.5 V    | 1.5 V    | 1.35 V    |
| Max quantity*                        | 12              | 12       | 12       | 12        | 12       | 12       | 12        |
| Largest DIMM                         | 4 GB            | 4 GB     | 4 GB     | 16 GB     | 16 GB    | 8 GB     | 8 GB      |
| Max memory capacity                  | 48 GB           | 48 GB    | 48 GB    | 192 GB    | 192 GB   | 96 GB    | 96 GB     |
| Max memory at rated speed            | 48 GB           | 48 GB    | 48 GB    | 192 GB    | 192 GB   | 96 GB    | NS**      |
| <b>Maximum operating speed (MHz)</b> |                 |          |          |           |          |          |           |
| 1 DIMM per channel                   | 1333 MHz        | 1333 MHz | 1600 MHz | 1333 MHz  | 1333 MHz | 1600 MHz | 800 MHz   |
| 2 DIMMs per channel                  | 1333 MHz        | 1333 MHz | 1600 MHz | 1333 MHz  | 1333 MHz | 1600 MHz | 800 MHz   |

\* Maximum quantity supported is shown for two processors installed. When one processor is installed, the maximum quantity supported is a half of what is shown.

\*\* Rated speed is not supported. Memory DIMMs always operate at speeds lower than rated.

Table 5. Maximum memory speeds (Part 2: UDIMMs and LRDIMMs)

| Specification                        | DIMM type UDIMM |          | LRDIMM    |          |
|--------------------------------------|-----------------|----------|-----------|----------|
| Rank                                 | Dual rank       |          | Quad rank |          |
| Rated speed                          | 1333 MHz        |          | 1333 MHz  |          |
| Rated voltage                        | 1.35 V          |          | 1.35 V    |          |
| Operating voltage                    | 1.35 V          | 1.5 V    | 1.35 V    | 1.5 V    |
| Max quantity*                        | 12              | 12       | 12        | 12       |
| Largest DIMM                         | 4 GB            | 4 GB     | 32 GB     | 32 GB    |
| Max memory capacity                  | 48 GB           | 48 GB    | 384 GB    | 384 GB   |
| Max memory at rated speed            | 24 GB           | 24 GB    | NS**      | 192 GB   |
| <b>Maximum operating speed (MHz)</b> |                 |          |           |          |
| 1 DIMM per channel                   | 1333 MHz        | 1333 MHz | 1066 MHz  | 1333 MHz |
| 2 DIMMs per channel                  | 1066 MHz        | 1066 MHz | 800 MHz   | 1066 MHz |

\* Maximum quantity supported is shown for two processors installed. When one processor is installed, the maximum quantity supported is a half of what is shown.

\*\* Rated speed is not supported. Memory DIMMs always operate at speeds lower than rated.

The following table lists the memory options available for the x3630 M4 server.

Table 6. Memory options

| Part number | Feature code | Description  | Maximum supported    | Standard models where used                       |
|-------------|--------------|--|----------------------|--|
| UDIMMs      |              |  |                      |  |
| 49Y1404     | 8648         | 4GB (1x4GB, 2Rx8, 1.35V) PC3L-10600 CL9 ECC 1333MHz LP UDIMM         | 12 (6 per processor) | -  |
| RDIMMs      |              |  |                      |  |
| 49Y1405     | 8940         | 2GB (1x2GB, 1Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP RDIMM    | 12 (6 per processor) | -  |
| 49Y1406     | 8941         | 4GB (1x4GB, 1Rx4, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP RDIMM    | 12 (6 per processor) | A2x, A4x, B2x, B4x, C2x, D2x, F2x, F4x, G2x, J2x |
| 49Y1559     | A28Z         | 4GB (1x4GB, 1Rx4, 1.5V) PC3-12800 CL11 ECC DDR3 1600MHz LP RDIMM     | 12 (6 per processor) | -  |
| 49Y1407     | 8942         | 4GB (1x4GB, 2Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP RDIMM    | 12 (6 per processor) | -  |
| 90Y3178     | A24L         | 4GB (1x4GB, 2Rx8, 1.5V) PC3-12800 CL11 ECC DDR3 1600MHz LP RDIMM     | 12 (6 per processor) | -  |
| 49Y1397     | 8923         | 8GB (1x8GB, 2Rx4, 1.35V) PC3L-10600 CL9 ECC 1333MHz LP RDIMM         | 12 (6 per processor) | C4x, C6x, H2x                                    |
| 90Y3109     | A292         | 8GB (1x8GB, 2Rx4, 1.5V) PC3-12800 CL11 ECC DDR3 1600MHz LP RDIMM     | 12 (6 per processor) | -  |
| 49Y1399     | A14E         | 8GB (1x8GB, 4Rx8, 1.35V) PC3L-8500 CL7 ECC DDR3 1066MHz LP RDIMM     | 12 (6 per processor) | -  |
| 49Y1563     | A1QT         | 16GB (1x16GB, 2Rx4, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP RDIMM  | 12 (6 per processor) | -  |
| LRDIMMs     |              |  |                      |  |
| 90Y3105     | A291         | 32GB (1x32GB, 4Rx4, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP LRDIMM | 12 (6 per processor) | -  |



## Internal storage

The x3630 M4 server supports the following internal storage configurations:

- Four 3.5-inch SATA simple-swap drive bays
- Eight 3.5-inch SATA simple-swap drive bays
- Eight 3.5-inch SAS/SATA hot-swap drive bays
- Twelve 3.5-inch SAS/SATA hot-swap drive bays
- Fourteen 3.5-inch SAS/SATA hot-swap drive bays

In addition, four and eight bay models support the installation of either an internal optical drive or an internal tape drive.

The following figure shows some of these configurations.



Figure 7. Internal drive configurations

Standard models ship with four or eight 3.5-inch SATA simple-swap drive bays or eight 3.5-inch SAS/SATA hot-swap drive bays. Storage-rich models ship with twelve 3.5-inch SAS/SATA hot-swap drive bays, and they can also be upgraded to fourteen 3.5-inch hot-swap drive bay models with the optional rear HDD cage assembly. The following table shows the internal storage expansion options that are available.

Table 7. Internal storage expansion options

| Part number | Feature code | Description                                 | Maximum supported | Standard models where used        |
|-------------|--------------|---|-------------------|-----------------------------------|
| 00D9034     | A1Z9         | 3.5" Hot Swap Cage Assembly, Rear, 2 x 3.5" | 1                 | -                                 |
| 00D9051     | A1ZL         | x3630 M4 ODD Cage assembly                  | 1                 | A2x, A4x, B2x, C2x, C4x, F4x, G2x |
| 90Y6370     | A1ZM         | USB Tape Drive Cage assembling kit          | 1                 | -                                 |

Option 00D9034 is used to upgrade standard (see Table 2) or custom (CTO or special bid) models with twelve 3.5-inch hot-swap drive bays to fourteen 3.5-inch hot-swap drive bays. This option contains the HDD backplane, drive cage, signal and data cables, and two 1U riser cards: PCIe Riser Card 1 (1 x8 FH/HL + 1 x8 LP Slots) and PCIe Riser Card 2 (1 x4 LP for Slotless RAID). These 1U riser cards replace the standard 2U riser cards used in the models with twelve 3.5-inch hot-swap drive bays, limiting the maximum number of I/O slots to three (for more information, see the I/O expansion options section).

Option 00D9051 upgrades any four or eight bay model with an internal optical drive bay (for DVD-ROM or Multiburner). This option includes one USB cable and one power cable. The optical drive is ordered separately. This option is mutually exclusive with 90Y6370, Tape Drive Cage assembly.

**Note:** Option 00D9051, x3630 M4 ODD Cage assembly comes standard with every four or eight bay standard model listed in Table 2.

Option 90Y6370 upgrades any four or eight bay model with an internal tape drive bay (for DDS5 or DDS6 tape drives). This option includes one USB cable and one power cable. The tape drive is ordered separately. This option is mutually exclusive with 90Y6370, ODD Cage assembly.

## Controllers for internal storage

The following table lists the RAID controllers and the additional options used for the internal disk storage of the x3630 M4 server.

Table 8. RAID controllers for internal storage

| Part number | Feature code | Description   | Maximum supported | Standard models where used             |
|-------------|--------------|---|-------------------|--|
| None#       | A2VA         | ServeRAID C105 for IBM System x                                 | 1                 | A2x, A4x, B2x                          |
| 90Y4349§    | A2V7         | 8-pack SATA Enabler for IBM System x                            | 1                 | A4x, B2x                               |
| 81Y4492     | A1XL         | ServeRAID H1110 SAS/SATA Controller                             | 1                 | -                                      |
| 81Y4448     | A1MZ         | ServeRAID M1115 SAS/SATA Controller                             | 1                 | B4x, C2x                               |
| 81Y4542     | A1X1         | ServeRAID M1100 Series Zero Cache/RAID 5 Upgrade                | 1                 | -                                      |
| 81Y4481     | A347         | ServeRAID M5110 SAS/SATA Controller                             | 1                 | C4x, C6x, D2x, F2x, F4x, G2x, H2x, J2x |
| 81Y4544     | A1X2         | ServeRAID M5100 Series Zero Cache/RAID 5 Upgrade                | 1                 | -                                      |
| 81Y4484     | A1J3         | ServeRAID M5100 Series 512MB Cache/RAID 5 Upgrade               | 1                 | C4x, C6x, D2x                          |
| 81Y4487     | A1J4         | ServeRAID M5100 Series 512MB Flash/RAID 5 Upgrade               | 1                 | F2x, F4x                               |
| 81Y4559     | A1WY         | ServeRAID M5100 Series 1GB Flash/RAID 5 Upgrade                 | 1                 | G2x, H2x, J2x                          |
| 81Y4508     | A22E         | ServeRAID M5100 Series Battery Kit                              | 1*                | -                                      |
| 81Y4546     | A1X3         | ServeRAID M5100 Series RAID 6 Upgrade                           | 1†                | -                                      |
| 90Y4273     | A2MC         | ServeRAID M5100 Series Performance Accelerator for IBM System x | 1†                | -                                      |
| 90Y4318     | A2MD         | ServeRAID M5100 Series SSD Caching Enabler for IBM System x     | 1†                | -                                      |
| 46M0912     | 3876         | IBM 6Gb Performance Optimized HBA                               | 1                 | -                                      |
| 46C8988     | A3MW         | N2115 SAS/SATA HBA for IBM System x                             | 1                 | -                                      |

# The ServeRAID C105 is an onboard software RAID controller.

§ An FoD upgrade for ServeRAID C105 that supports eight SATA HDDs.

\* The ServeRAID M5100 Series Battery Kit (81Y4508) is only supported with ServeRAID M5100 Series 512MB Cache/RAID 5 Upgrade (81Y4484).

† The ServeRAID M5100 Series RAID 6 Upgrade (81Y4546), Performance Accelerator (90Y4273), and Caching Enabler (90Y4318) require RAID 5 Upgrade with caches (81Y4484, 81Y4487, or 81Y4559).

The internal hardware RAID controller is installed into a dedicated PCIe slot (slot 3 for models with 14 drive bays or slot 5 for models with up to 12 drive bays). See Table 12 and Table 13 (PCI riser card options) for more details.

The following table lists drive types and internal drive bay configurations supported by the RAID controllers (SAS HDDs include both SAS and NL SAS HDDs, and SATA HDDs include both SATA and NL SATA HDDs).

Table 9. Drive types and internal drive bay configurations supported by the RAID controllers

| RAID controller                           | Drive type | 8x 3.5-in.<br>hot-swap | 12x 3.5-in.<br>hot-swap | 14x 3.5-in.<br>hot-swap | 4x 3.5-in.<br>simple-swap | 8x 3.5-in.<br>simple-swap |
|---|------------|------------------------|-------------------------|-------------------------|---------------------------|---------------------------|
| ServeRAID C105                            | SAS HDD    | No support             | No support              | No support              | No support                | No support                |
|   | SATA HDD   | Yes*                   | No support              | No support              | Yes                       | Yes*                      |
|   | SATA SSD   | No support             | No support              | No support              | No support                | No support                |
| ServeRAID H1110                           | SAS HDD    | No support             | No support              | No support              | Yes                       | No support                |
|   | SATA HDD   | No support             | No support              | No support              | Yes                       | No support                |
|   | SATA SSD   | No support             | No support              | No support              | No support                | No support                |
| ServeRAID M1115                           | SAS HDD    | Yes                    | Yes                     | Yes                     | Yes                       | Yes                       |
|   | SATA HDD   | Yes                    | Yes                     | Yes                     | Yes                       | Yes                       |
|   | SATA SSD   | Yes                    | Yes                     | Yes                     | Yes                       | Yes                       |
| ServeRAID M5110                           | SAS HDD    | Yes                    | Yes                     | Yes                     | Yes                       | Yes                       |
|   | SATA HDD   | Yes                    | Yes                     | Yes                     | Yes                       | Yes                       |
|   | SATA SSD   | Yes                    | Yes                     | Yes                     | Yes                       | Yes                       |
| 6Gb Performance<br>Optimized HBA<br>N2115 | SAS HDD    | Yes                    | Yes                     | Yes                     | Yes                       | Yes                       |
|   | SATA HDD   | Yes                    | Yes                     | Yes                     | Yes                       | Yes                       |
|   | SATA SSD   | Yes                    | Yes                     | Yes                     | Yes                       | Yes                       |

\* Requires an FoD upgrade for ServeRAID C105 that supports eight SATA HDDs (8-pack SATA Enabler, part number 90Y4349).

The ServeRAID C105 onboard controller has the following specifications:

- Supports up to eight (up to four standard, with an additional four with optional 8-pack enabler, 90Y4349) SATA HDDs (SAS not supported)
- Supports hot-swap and simple-swap drives
- Support for RAID 0 and RAID 1 (non-RAID is not supported.)
- Up to 3 Gbps throughput per port
- Support for up to two volumes
- Support for virtual drive sizes greater than 2 TB
- Fixed stripe unit size of 64 KB
- Support for MegaRAID Storage Manager management software

The ServeRAID H1110 adapter has the following specifications:

- Four internal 6 Gbps SAS/SATA ports
- One x4 mini-SAS internal connector (SFF-8087)
- Up to 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 ServeRAID M1115 SAS/SATA Controller has the following specifications:

- Eight internal 6 Gbps SAS/SATA ports
- Two x4 mini-SAS internal connectors (SFF-8087)
- Supports connections to SAS/SATA drives and SAS Expanders
- Supports RAID levels 0, 1, and 10
- Supports RAID levels 5 and 50 with optional M1100 Series RAID 5 upgrades
- Up to 6 Gbps throughput per port
- PCIe 2.0 x8 host interface
- Based on the LSI SAS2008 6 Gbps ROC controller

The ServeRAID M5110 SAS/SATA Controller has the following specifications:

- Eight internal 6 Gbps SAS/SATA ports
- Two x4 mini-SAS internal connectors (SFF-8087)
- Supports connections to SAS/SATA drives and SAS Expanders
- Supports RAID levels 0, 1, and 10
- Supports RAID levels 5 and 50 with optional M5100 Series RAID 5 upgrades
- Supports RAID 6 and 60 with the optional M5100 Series RAID 6 Upgrade
- Supports 512 MB battery-backed cache or 512 MB or 1 GB flash-backed cache
- Support for SSD performance optimization with the optional M5100 Series Performance Accelerator and SSD Caching Enabler
- Up to 6 Gbps throughput per port
- PCIe 3.0 x8 host interface
- Based on the LSI SAS2208 6 Gbps ROC controller

The IBM 6Gb Performance Optimized HBA has the following specifications:

- Eight internal 6 Gbps SAS/SATA ports
- Two x4 mini-SAS internal connectors (SFF-8087)
- Supports connections to SAS/SATA HDDs and SATA SSDs
- Optimized for SSD performance
- No RAID support
- Up to 6 Gbps throughput per port
- PCIe 2.0 x8 host interface
- Based on the LSI SAS2008 6 Gbps ROC controller

The IBM N2115 SAS/SATA HBA has the following specifications:

- Eight internal 6 Gbps SAS/SATA ports
- Up to 6 Gbps throughput per port
- Two x4 mini-SAS internal connectors (SFF-8087)
- Supports connections to SAS/SATA HDDs and SATA SSDs
- Optimized for SSD performance
- No RAID support
- PCIe 3.0 x8 host interface
- Based on the LSI SAS2308 6 Gbps controller

For more information, see the list of IBM Redbooks Product Guides in the RAID adapters category:

<http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=raid>

## Internal drive options

The following table lists hard drive options for internal disk storage of the x3630 M4 server.

Table 10. Drive options for internal storage (Part 1)

| Part number  | Feature code | Description                                   | Maximum supported |
|--|--------------|---|-------------------|
| 3.5" SAS Hot-Swap HDDs                             |              |   |                   |
| 49Y6092  | A3DV         | IBM 300GB 15K 6Gbps SAS 3.5" G2HS HDD         | 14                |
| 49Y6097  | A3DW         | IBM 450GB 15K 6Gbps SAS 3.5" G2HS HDD         | 14                |
| 49Y6102  | A3DX         | IBM 600GB 15K 6Gbps SAS 3.5" G2HS HDD         | 14                |
| 3.5" NL SAS Hot-Swap Self-encrypting drives (SEDs) |              |   |                   |
| 00ML218  | AS79         | IBM 2TB 7.2K 6Gbps NL SAS 3.5" G2HS 512e SED  | 14                |
| 00ML223  | AS7A         | IBM 4TB 7.2K 6Gbps NL SAS 3.5" G2HS 512e SED  | 14                |
| 00ML228  | AS7B         | IBM 6TB 7.2K 6Gbps NL SAS 3.5" G2HS 512e SED  | 14                |
| 00W1533  | A4AH         | IBM 2TB 7.2K 6Gbps NL SAS 3.5" G2HS SED       | 14                |
| 00W1543  | A4AJ         | IBM 4TB 7.2K 6Gbps NL SAS 3.5" G2HS SED       | 14                |
| 3.5" NL SAS Hot-Swap HDDs                          |              |   |                   |
| 00ML203  | AS76         | IBM 2TB 7.2K 6Gbps NL SAS 3.5" G2HS 512e HDD  | 14                |
| 00ML208  | AS77         | IBM 4TB 7.2K 6Gbps NL SAS 3.5" G2HS 512e HDD  | 14                |
| 00ML213  | AS78         | IBM 6TB 7.2K 6Gbps NL SAS 3.5" G2HS 512e HDD  | 14                |
| 90Y8567  | A26M         | IBM 1TB 7.2K 6Gbps NL SAS 3.5" G2HS HDD       | 14                |
| 90Y8572  | A2U0         | IBM 2TB 7.2K 6Gbps NL SAS 3.5" G2HS HDD       | 14                |
| 90Y8577  | A2R2         | IBM 3TB 7.2K 6Gbps NL SAS 3.5" G2HS HDD       | 14                |
| 49Y6210  | A4AF         | IBM 4TB 7.2K 6Gbps NL SAS 3.5" G2HS HDD       | 14                |
| 3.5" NL SATA Hot-Swap HDDs                         |              |   |                   |
| 00FN113  | A5VD         | IBM 2TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD | 14                |
| 00FN128  | A5VF         | IBM 3TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD | 14                |
| 00FN143  | A5VH         | IBM 4TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD | 14                |
| 00FN158  | A5VK         | IBM 5TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD | 14                |
| 00FN173  | A5VM         | IBM 6TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD | 14                |
| 81Y9786  | A22Y         | IBM 500GB 7.2K 6Gbps NL SATA 3.5" G2HS HDD    | 14                |
| 81Y9790  | A22P         | IBM 1TB 7.2K 6Gbps NL SATA 3.5" G2HS HDD      | 14                |
| 81Y9794  | A22T         | IBM 2TB 7.2K 6Gbps NL SATA 3.5" G2HS HDD      | 14                |
| 81Y9798  | A22S         | IBM 3TB 7.2K 6Gbps NL SATA 3.5" G2HS HDD      | 14                |
| 49Y6002  | A3W9         | IBM 4TB 7.2K 6Gbps NL SATA 3.5" G2HS HDD      | 14                |



Table 10. Drive options for internal storage (Part 2)

| Part number                                | Feature code | Description                                       | Maximum supported |
|--|--------------|---|-------------------|
| 3.5" NL SATA Simple-Swap HDDs              |              |   |                   |
| 00FN118                                    | A5VE         | IBM 2TB 7.2K 6Gbps NL SATA 3.5" G2SS 512e HDD     | 8                 |
| 00FN133                                    | A5VG         | IBM 3TB 7.2K 6Gbps NL SATA 3.5" G2SS 512e HDD     | 8                 |
| 00FN148                                    | A5VJ         | IBM 4TB 7.2K 6Gbps NL SATA 3.5" G2SS 512e HDD     | 8                 |
| 00FN163                                    | A5VL         | IBM 5TB 7.2K 6Gbps NL SATA 3.5" G2SS 512e HDD     | 8                 |
| 00FN178                                    | A5VN         | IBM 6TB 7.2K 6Gbps NL SATA 3.5" G2SS 512e HDD     | 8                 |
| 81Y9802                                    | A22U         | IBM 500GB 7.2K 6Gbps NL SATA 3.5" G2SS HDD        | 8                 |
| 81Y9806                                    | A22X         | IBM 1TB 7.2K 6Gbps NL SATA 3.5" G2SS HDD          | 8                 |
| 81Y9810                                    | A22W         | IBM 2TB 7.2K 6Gbps NL SATA 3.5" G2SS HDD          | 8                 |
| 81Y9814                                    | A22V         | IBM 3TB 7.2K 6Gbps NL SATA 3.5" G2SS HDD          | 8                 |
| 49Y6012                                    | A3WA         | IBM 4TB 7.2K 6Gbps NL SATA 3.5" G2SS HDD          | 8                 |
| 3.5" SAS Hot-Swap SSDs - Enterprise        |              |   |                   |
| 00W1306                                    | A3HT         | IBM 200GB SAS 3.5" MLC HS Enterprise SSD          | 14                |
| 00W1311                                    | A4N8         | IBM 400GB SAS 3.5" MLC HS Enterprise SSD          | 14                |
| 00W1316                                    | A4N9         | IBM 800GB SAS 3.5" MLC HS Enterprise SSD          | 14                |
| 00AJ480                                    | A56G         | S3700 200GB SATA 3.5" MLC HS Enterprise SSD       | 14                |
| 00AJ485                                    | A56H         | S3700 400GB SATA 3.5" MLC HS Enterprise SSD       | 14                |
| 00AJ490                                    | A56J         | S3700 800GB SATA 3.5" MLC HS Enterprise SSD       | 14                |
| 3.5" SATA Hot-Swap SSDs - Enterprise Value |              |   |                   |
| 00AJ435                                    | A57F         | IBM 120GB SATA 3.5" MLC HS Enterprise Value SSD   | 14                |
| 00AJ440                                    | A57G         | IBM 240GB SATA 3.5" MLC HS Enterprise Value SSD   | 14                |
| 00AJ445                                    | A57H         | IBM 480GB SATA 3.5" MLC HS Enterprise Value SSD   | 14                |
| 00AJ450                                    | A57J         | IBM 800GB SATA 3.5" MLC HS Enterprise Value SSD   | 14                |
| 00AJ460                                    | A56C         | S3500 120GB SATA 3.5" MLC HS Enterprise Value SSD | 14                |
| 00AJ465                                    | A56D         | S3500 240GB SATA 3.5" MLC HS Enterprise Value SSS | 14                |
| 00AJ470                                    | A56E         | S3500 480GB SATA 3.5" MLC HS Enterprise Value SSD | 14                |
| 00AJ475                                    | A56F         | S3500 800GB SATA 3.5" MLC HS Enterprise Value SSD | 14                |
| 00W1286                                    | A3G1         | IBM 64GB SATA 3.5" MLC HS Enterprise Value SSD    | 14                |
| 00W1291                                    | A3G3         | IBM 128GB SATA 3.5" MLC HS Enterprise Value SSD   | 14                |
| 00W1296                                    | A3G4         | IBM 256GB SATA 3.5" MLC HS Enterprise Value SSD   | 14                |
| 00W1301                                    | A3G2         | IBM 512GB SATA 3.5" MLC HS Enterprise Value SSD   | 14                |

Table 10. Drive options for internal storage (Part 3)

| Part number                   | Feature code | Description                          | Maximum supported |
|-------------------------------|--------------|--------------------------------------|-------------------|
| 3.5" SATA Hot-swap Entry SSDs |              |                                      |                   |
| 00FN352                       | AS0K         | IBM 240GB SATA 3.5" MLC HS Entry SSD | 14                |
| 00FN357                       | AS0L         | IBM 480GB SATA 3.5" MLC HS Entry SSD | 14                |
| 00FN362                       | AS0M         | IBM 960GB SATA 3.5" MLC HS Entry SSD | 14                |

## Internal backup units

The server supports the internal backup options listed in the following table. The USB Tape Drive Cage assembling kit, part number 90Y6370, is required to support these tapes internally. The internal tape drive is connected to the dedicated internal USB port on a system board.

Table 11. Internal tape drives

| Part number | Feature code | Description                         | Maximum supported |
|-------------|--------------|-------------------------------------|-------------------|
| 90Y6370     | A1ZM         | USB Tape Drive Cage assembling kit  | 1                 |
| 46C5399     | 5711         | IBM DDS Generation 5 USB Tape Drive | 1                 |
| 39M5636     | 5395         | IBM DDS Generation 6 USB Tape Drive | 1                 |

## Optical drives

The server supports the optical drive options listed in the following table. The installation of optical drive may require x3630 M4 ODD Cage assembly, part number 00D9051. Standard models of x3630 M4 with four or eight HDDs ship with the ODD Cage assembly installed. Server models with twelve 3.5-inch HDDs do not support an internal optical drive.

Table 12. Optical drives

| Part number | Feature code | Description                              | Maximum supported | Standard models where used |
|-------------|--------------|--|-------------------|----------------------------|
| 46M0901     | 4161         | IBM UltraSlim Enhanced SATA DVD-ROM      | 1                 | -                          |
| 46M0902     | 4163         | IBM UltraSlim Enhanced SATA Multi-Burner | 1                 | C4x                        |

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

- CD-ROM 24X
- CD-R 24X
- CD-RW 24X
- DVD-ROM (4.7 GB) 8X
- DVD-ROM (dual layer, 8.5 GB) 8X
- DVD-R (4.7 GB) 8X
- DVD-R (dual layer, 8.5 GB) 8X
- DVD+R (4.7 GB) 8X
- DVD+R (dual layer, 8.5 GB) 8X
- DVD-RW (4.7 GB) 8X
- DVD+RW (4.7 GB) 8X
- DVD-RAM (4.7 GB) 5X

IBM UltraSlim Enhanced SATA Multi-Burner (46M0902) supports the same media and speeds for reading as DVD-ROM (46M0901). This drive also supports the following media and speeds for writing:

- CD-R 24X
- CD-RW 24X
- DVD-R (4.7 GB) 8X
- DVD-R (dual layer, 8.5 GB) 6X
- DVD+R (4.7 GB) 8X
- DVD+R (dual layer, 8.5 GB) 6X
- DVD-RW (4.7 GB) 6X
- DVD+RW (4.7 GB) 8X
- DVD-RAM (4.7 GB) 5X

## I/O expansion options

The server supports up to five PCIe slots with different riser cards installed into two riser sockets on the system planar (one riser socket supports the installation of one riser card). There are two types of riser cards: 2U risers and 1U risers. 2U risers are used in x3630 M4 models that do not have the rear HDD cage assembly (see Figure 4). 1U risers are used in models with the rear HDD cage assembly installed (see Figure 5). See Figure 4 and Figure 5 for slot locations and numbering.

**Note:** You cannot use 1U risers in models without the rear HDD cage. You cannot use 2U risers in models with the rear HDD cage assembly installed.

The slot form factors with 2U risers (models without the rear HDD cage assembly) are as follows:

- Slot 1: PCIe 3.0 x16 (x8-wired), optional PCIe 3.0 x16 (x16-wired); full-height, full-length
- Slot 2: PCIe 3.0 x16 (x8-wired); full-height, half-length (not present if optional x16-wired slot 1 riser is used)
- Slot 3: PCIe 3.0 x16 (x8-wired), optional PCIe 3.0 x16 (x16-wired); low-profile, half-length (the second processor is required to use this slot)
- Slot 4: PCIe 3.0 x16 (x8-wired); low-profile, half-length (not present if optional x16-wired slot 3 riser is used, the second processor is required to use this slot)
- Slot 5: PCIe 3.0 x8 (x4-wired); dedicated slot for ServeRAID adapter; standard on hardware RAID models, optional on software RAID models

**Note:** Standard models with software RAID (ServeRAID C105) ship with one 2U riser supplying slots 1 and 2 (slots 3, 4, and 5 are not present). Standard models with hardware RAID adapters (ServeRAID M1115 or M5110) ship with two 2U risers supplying all five slots. See Table 13 for details.

The slot form factors with 1U risers (models with the rear HDD cage assembly) are as follows:

- Slot 1: PCIe 3.0 x8 (x8-wired), optional PCIe 3.0 x16 (x16-wired); full-height, half-length
- Slot 2: PCIe 3.0 x8 (x8-wired); low-profile, half-length (not present if an optional x16-wired slot 1 riser is used)
- Slot 3: PCIe 3.0 x8 (x4-wired), optional PCIe 3.0 x8 (x8-wired); dedicated slot for ServeRAID adapter (x8-wired slot requires the second processor, x4-wired slot does not require the second processor)

**Note:** The 3.5" Hot Swap Cage Assembly, Rear, 2 x 3.5" option, part number 00D9034, ships with two 1U risers supplying x8-wired slots 1 and 2 and x4-wired slot 3. See Table 14 for details.

The following two tables lists the I/O riser card options, the 2U riser options and the 1U riser options.

Table 13. 2U I/O riser card options

| Part number                                   | Feature code | Description  | Maximum supported | Standard models where used                                      |
|---|--------------|--|-------------------|---|
| 2U Riser 1 option (supplies slots 1 and 2)    |              |  |                   |   |
| None*   | A1ZE         | PCIe Riser Card 1 (1 x8 FH/FL + 1 x8 FH/HL Slots)  | 1                 | A2x, A4x, B2x, B4x, C2x, C4x, C6x, D2x, F2x, F4x, G2x, H2x, J2x |
| 90Y6381                                       | A1ZG         | PCIe Riser Card 1 (1 x16 FH/FL Slot)<br>(Riser Kit for Slot 1)   | 1                 | -   |
| 2U Riser 2 option (supplies slot 3, 4, and 5) |              |  |                   |   |
| 00D8604                                       | A1ZF         | PCIe Riser Card 2 (2 x8 LP Slots + 1 x4 LP for Slotless RAID)  | 1                 | B4x, C2x, C4x, C6x, D2x, F2x, F4x, G2x, H2x, J2x                |
| 90Y6383                                       | A1ZH         | PCIe Riser Card 2 (1 x16 LP Slot + 1 x4 LP for Slotless RAID)<br>(Riser kit for Slot 2 with Slotless RAID) | 1                 | -   |

\* This riser card is installed in all standard models. It can also be used in CTO or special bid models.

Table 14. 1U I/O riser card options

| Part number                                | Feature code | Description   | Maximum supported | Standard models where used |
|--|--------------|---|-------------------|----------------------------|
| 1U Riser 1 option (supplies slots 1 and 2) |              |   |                   |                            |
| None†                                      | A1ZA         | PCIe Riser Card 1 (1 x8 FH/HL + 1 x8 LP Slots)        | 1                 | -                          |
| None*                                      | A1ZB         | PCIe Riser Card 1 (1 x16 FH/HL Slot) for Graphic card | 1                 | -                          |
| 1U Riser 2 option (supplies slot 3)        |              |   |                   |                            |
| None†                                      | A1ZC         | PCIe Riser Card 2 (1 x4 LP for Slotless RAID)         | 1                 | -                          |
| 00D8603                                    | A1ZD         | PCIe Riser Card 2 (1 x8 LP for Slotless RAID)         | 1                 | -                          |

† These riser cards come standard with the 3.5" Hot Swap Cage Assembly, Rear, 2 x 3.5" option (00D9034).

\* This riser card is only available through CTO or special bid models.

## Network adapters

The x3630 M4 supports up to four integrated Gigabit Ethernet ports (two enabled standard, and two enabled optionally with the FoD upgrade). Integrated NIC has the following features:

- An Intel I350-CM2 chip
- Up to four Gigabit Ethernet ports (two enabled standard, and two enabled optionally with the 90Y9314 FoD upgrade)
- NIC Teaming (load balancing and failover)
- Ethernet Features:
  - 1 Gb Ethernet IEEE 802.3, 802.3u, and 802.3ab PHY specifications compliant
  - Integrated PHY for 10/100/1000 Mbps for multispeed, full, and half-duplex auto-negotiation
  - IEEE 802.3x and 802.3z compliant flow control support with software-controllable Rx thresholds and Tx pause frames
  - Automatic cross-over detection function (MDI/MDI-X)
  - IEEE 1588 protocol and 802.1AS implementation
  - IEEE802.3az - Energy Efficient Ethernet (EEE)
  - Full wake up support
    - Advanced Power Management (APM) support
    - Advanced Configuration and Power Interface (ACPI) specification v2.0c
    - Magic packet wake-up enable
- I/O Virtualization Features:
  - Eight transmit (Tx) and receive (Rx) queue pairs per port
  - Flexible port partitioning: 32 virtual functions (VF) with four ports or 16 VFs with two ports
  - Rx/Tx round-robin scheduling
  - Traffic isolation and traffic steering
  - Virtual machine (VM) to VM packet forwarding (packet loopback)
  - MAC and VLAN anti-spoofing
  - Malicious driver detection
  - Storm control
  - Per-pool statistics, off loads, and jumbo support
  - Independent Function Level Reset (FLR) for physical and virtual functions
  - IEEE 802.1q Virtual Local Area Network (VLAN) support with VLAN tag insertion, stripping, and packet filtering for up to 4096 VLAN tags
  - IEEE 802.1q advanced packet filtering

- Mirroring rules
- Support for simple VEPA
- VF promiscuous modes
- Stateless offload and performance features:
  - TCP/UDP, IPv4 checksum offloads (Rx/ Tx/Large-send); extended Tx descriptors
  - IPv6 support for IP/TCP and IP/UDP receive checksum offload
  - Tx TCP segmentation offload (IPv4, IPv6)
  - Transmit Segmentation Offloading (TSO)
  - Interrupt throttling control
  - Legacy and Message Signal Interrupt (MSI)
  - Message Signal Interrupt Extension (MSI-X)
  - Receive Side Scaling (RSS) for Windows
  - Scalable I/O for Linux environments (IPv4, IPv6, TCP/UDP)
  - Support for packets up to 9.5 KB (jumbo frames)

The following table lists additional supported network adapters.

Table 15. Network adapters (Part 1)

| Gigabit Ethernet        |      |  |    |
|-------------------------|------|--|----|
| 39Y6066                 | 1485 | Broadcom NetXtreme 1xGbE BaseT Adapter for IBM System x              | 4  |
| 44T1370                 | A5GZ | Broadcom NetXtreme 2x10GbE BaseT Adapter for IBM System x            | 4  |
| 42C1780                 | 2995 | Broadcom NetXtreme 2xGbE BaseT Adapter for IBM System x              | 4  |
| 90Y9370                 | A2V4 | Broadcom NetXtreme I Dual Port GbE Adapter for IBM System x          | 4  |
| 90Y9352                 | A2V3 | Broadcom NetXtreme I Quad Port GbE Adapter for IBM System x          | 4  |
| 49Y4230                 | 5767 | Intel Ethernet Dual Port Server Adapter I340-T2 for IBM System x     | 4  |
| 49Y4240                 | 5768 | Intel Ethernet Quad Port Server Adapter I340-T4 for IBM System x     | 4  |
| 00AG500                 | A56K | Intel I350-F1 1xGbE Fiber Adapter for IBM System x                   | 4* |
| 00AG510                 | A56L | Intel I350-T2 2xGbE BaseT Adapter for IBM System x                   | 4* |
| 00AG520                 | A56M | Intel I350-T4 4xGbE BaseT Adapter for IBM System x                   | 4* |
| 42C1750                 | 2975 | PRO/1000 PF Server Adapter   | 4  |
| Integrated NIC upgrades |      |  |    |
| 90Y9314                 | A2GT | Intel I-350 Embedded Dual Port GbE Activation for IBM System x (FoD) | 1  |

\* These adapters require SFP+ optical transceivers or DAC cables that must be purchased separately.



Table 15. Network adapters (Part 2)

| Part number                     | Feature code | Description  | Maximum supported |
|---------------------------------|--------------|--|-------------------|
| 40 Gb Ethernet / FDR InfiniBand |              |  |                   |
| 00D9550                         | A3PN         | Mellanox ConnectX-3 40GbE / FDR IB VPI Adapter for IBM System x  | 4                 |
| 10 Gb Ethernet                  |              |  |                   |
| 94Y5180                         | A4Z6         | Broadcom NetXtreme Dual Port 10GbE SFP+ Adapter  | 4*                |
| 49Y7910                         | A18Y         | Broadcom NetXtreme II Dual Port 10GBaseT Adapter   | 4                 |
| None*                           | AS3M         | Emulex VFA5 2x10 GbE SFP+ Integrated Adapter for IBM System x  | 1*                |
| 00JY820                         | A5UT         | Emulex VFA5 2x10 GbE SFP+ PCIe Adapter for IBM System x  | 4*                |
| 00JY830                         | A5UU         | Emulex VFA5 2x10 GbE SFP+ Adapter and FCoE/iSCSI SW for IBM System x   | 4*                |
| 00JY824                         | A5UV         | Emulex VFA5 FCoE/iSCSI SW for PCIe Adapter (FoD)<br>(FoD license for 00JY820 or feature AS3M; included with 00JY830) | 4                 |
| None*                           | A2UN         | Emulex Dual Port 10GbE SFP+ Integrated VFA III for IBM System x  | 1*                |
| 95Y3762                         | A2U1         | Emulex Dual Port 10GbE SFP+ VFA III for IBM System x   | 4*                |
| 95Y3760                         | A2U2         | Emulex VFA III FCoE/iSCSI License for IBM System x (FoD)   | 4†                |
| 49Y7960                         | A2EC         | Intel X520 Dual Port 10GbE SFP+ Adapter for IBM System x   | 4*                |
| 49Y7970                         | A2ED         | Intel X540-T2 Dual Port 10GBaseT Adapter for IBM System x  | 4                 |
| 00D9690                         | A3PM         | Mellanox ConnectX-3 10 GbE Adapter for IBM System x  | 4*                |
| 42C1800                         | 5751         | QLogic 10Gb CNA for IBM System x   | 4*                |
| 90Y4600                         | A3MR         | QLogic 8200 Dual Port 10GbE SFP+ VFA for IBM System x  | 4*                |
| 00Y5624                         | A3MT         | QLogic 8200 VFA FCoE/iSCSI License for IBM System x (FoD)  | 4‡                |
| 47C9952                         | A47H         | Solarflare SFN5162F 2x10GbE SFP+ Performant Adapter for  | 4*                |
| 47C9960                         | A47J         | Solarflare SFN6122F 2x10GbE SFP+ Onload Adapter  | 4*                |

† One FCoE/iSCSI license per one Emulex Dual Port VFA III or Integrated VFA III.

‡ One FCoE/iSCSI license per one QLogic 8200 Dual Port VFA.

\* These adapters require SFP+ optical transceivers or DAC cables that must be purchased separately.

For more information, see the list of IBM Redbooks Product Guides in the Ethernet and IB adapters category:

<http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=networkadapters>

## Storage host bus adapters

The following table lists storage HBAs supported by the x3630 M4 server.

Table 16. Storage adapters

| Part number           | Feature code | Description  | Maximum supported |
|-----------------------|--------------|--|-------------------|
| Fibre Channel - 16 Gb |              |  |                   |
| 81Y1668               | A2XU         | Brocade 16Gb FC Single-port HBA for IBM System x     | 4                 |
| 81Y1675               | A2XV         | Brocade 16Gb FC Dual-port HBA for IBM System x       | 4                 |
| 81Y1662               | A2W6         | Emulex 16Gb FC Dual-port HBA for IBM System x        | 4                 |
| 81Y1655               | A2W5         | Emulex 16Gb FC Single-port HBA for IBM System x      | 4                 |
| 00Y3337               | A3KW         | QLogic 16Gb FC Single-port HBA for IBM System x      | 4                 |
| 00Y3341               | A3KX         | QLogic 16Gb FC Dual-port HBA for IBM System x        | 4                 |
| Fibre Channel - 8 Gb  |              |  |                   |
| 46M6050               | 3591         | Brocade 8Gb FC Dual-port HBA for IBM System x        | 4                 |
| 46M6049               | 3589         | Brocade 8Gb FC Single-port HBA for IBM System x      | 4                 |
| 42D0494               | 3581         | Emulex 8Gb FC Dual-port HBA for IBM System x         | 4                 |
| 42D0485               | 3580         | Emulex 8Gb FC Single-port HBA for IBM System x       | 4                 |
| 42D0510               | 3579         | QLogic 8Gb FC Dual-port HBA for IBM System x         | 4                 |
| 42D0501               | 3578         | QLogic 8Gb FC Single-port HBA for IBM System x       | 4                 |
| Fibre Channel - 4 Gb  |              |  |                   |
| 59Y1993               | 3886         | Brocade 4Gb FC Dual-port HBA for IBM System x        | 4                 |
| 59Y1987               | 3885         | Brocade 4Gb FC Single-port HBA for IBM System x      | 4                 |
| 42C2071               | 1699         | Emulex 4Gb FC Dual-Port PCI-E HBA for IBM System x   | 4                 |
| 42C2069               | 1698         | Emulex 4Gb FC Single-Port PCI-E HBA for IBM System x | 4                 |
| 39R6525               | 3567         | Qlogic 4Gb FC Single-Port PCIe HBA for System x      | 4                 |
| 39R6527               | 3568         | Qlogic 4Gb FC Dual-Port PCIe HBA for System x        | 4                 |
| SAS                   |              |  |                   |
| 46M0907               | 5982         | IBM 6Gb SAS HBA                                      | 4                 |
| 46C9010               | A3MV         | N2125 SAS/SATA HBA for IBM System x                  | 2                 |
| 00AE912               | A5M0         | N2225 SAS/SATA HBA for IBM System x                  | 2                 |
| 00AE916               | A5M1         | N2226 SAS/SATA HBA for IBM System x                  | 2                 |

For more information, see the list of IBM Redbooks Product Guides in the Host bus adapters category:  
<http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=hba>

## PCIe SSD adapters

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

Table 17. SSD adapters

| Part number | Feature code | Description   | Maximum supported |
|-------------|--------------|---|-------------------|
| 00AE861     | A4WT         | IBM Flash Adapter F825 Enterprise Value for System x  | 4                 |
| 00AE864     | A4WS         | IBM Flash Adapter F1650 Enterprise Value for System x | 4                 |
| 00AE867     | A4WR         | IBM Flash Adapter F3200 Enterprise Value for System x | 4                 |
| 46C9078     | A3J3         | IBM 365GB High IOPS MLC Mono Adapter                  | 3                 |
| 46C9081     | A3J4         | IBM 785GB High IOPS MLC Mono Adapter                  | 3                 |
| 90Y4377     | A3DY         | IBM 1.2TB High IOPS MLC Mono Adapter                  | 3                 |
| 90Y4361     | A3MZ         | IBM 300GB High IOPS MLC Modular Adapter               | 4                 |
| 90Y4365     | A3N0         | IBM 600GB High IOPS MLC Modular Adapter               | 4                 |
| 90Y4369     | A3N1         | IBM 800GB High IOPS MLC Modular Adapter               | 4                 |
| 90Y4373     | A3N2         | IBM 300GB High IOPS SLC Modular Adapter               | 4                 |

## GPU adapters

The server supports graphics processing units (GPUs) provided riser card 90Y6381 or FC A1ZB is installed. The following table lists the supported GPUs.

Table 18. GPU adapters

| Part number | Feature code | Description         | Maximum supported |
|-------------|--------------|---------------------|-------------------|
| None*       | A3WH         | NVIDIA Quadro K600  | 1                 |
| None*       | A3WJ         | NVIDIA Quadro K2000 | 1                 |
| None*       | A13K         | NVIDIA Quadro 600   | 1                 |
| None*       | A1QU         | NVIDIA Quadro 2000  | 1                 |
| 94Y5957     | 4798         | NVIDIA Quadro 4000  | 1                 |

\* This adapter can only be ordered through CTO or special bid.

The use of GPU adapters with 4x 3.5-inch or 8x 3.5-inch drive bay models requires installation of one or two 750 W power supplies. The use of GPU adapters with 12x 3.5-inch or 14x 3.5-inch drive bay models requires installation of one or two 900 W power supplies. 550 W power supplies are not supported with GPU adapters.

## Power supplies

The server supports up to two redundant hot-swap 550 W AC, 750 W AC, 900 W AC, or 750 W DC high efficient power supplies. AC power supplies are 80 PLUS Platinum certified. Standard models come with one 550 W AC (models with up to eight drive bays) or 750 W AC (storage-rich models with up to 14 drive bays) hot-swap power supply.

The following table lists the power supply options. An AC hot-swap power supply option ships standard with one 2.8m, 10A/100-250V, C13 to IEC 320-C14 rack power cable.

Table 19. Power supplies

| Part number | Feature code | Description  | Maximum supported | Standard models where used        |
|-------------|--------------|--|-------------------|-----------------------------------|
| 94Y6668     | A1H6         | IBM System x 550W High Efficiency Platinum AC Power Supply | 2                 | A2x, A4x, B2x, C2x, C4x, F4x, G2x |
| 94Y6669     | A1H5         | IBM System x 750W High Efficiency Platinum AC Power Supply | 2                 | B4x, C6x, D2x, F2x, H2x, J2x      |
| 94Y6667     | A2EB         | IBM System x 900W High Efficiency Platinum AC Power Supply | 2                 | -                                 |
| 94Y7631     | A39N         | IBM System x 750W High Efficiency -48 V DC Power Supply    | 2                 | -                                 |

**Note:** If you plan to use GPU adapters, refer to the "GPU adapters" section for the additional power supply selection guidelines.

## Integrated virtualization

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

Table 20. Virtualization options

| Part number | Feature code | Description  | Maximum supported |
|-------------|--------------|--|-------------------|
| 41Y8298     | A2G0         | IBM Blank USB Memory Key for VMware ESXi Downloads | 1                 |
| 41Y8300     | A2VC         | IBM USB Memory Key for VMware ESXi 5.0             | 1                 |
| 41Y8311     | A2R3         | IBM USB Memory Key for VMware ESXi 5.1             | 1                 |
| 41Y8382     | A4WZ         | IBM USB Memory Key for VMware ESXi 5.1 Update 1    | 1                 |
| 41Y8385     | A584         | IBM USB Memory Key for VMware ESXi 5.5             | 1                 |

## Remote management

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

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

The optional IBM 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, 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.

Table 21. Remote management option

| Part number | Feature code | Description                                       | Maximum supported |
|-------------|--------------|---|-------------------|
| 90Y3901     | A1ML         | IBM Integrated Management Module Advanced Upgrade | 1                 |

In the default UEFI configuration, Ethernet port 2 is configured to be dedicated to remote access to the IMM2. If preferred, you can change the UEFI setting so that remote access to the IMM2 is via Port 1 and also accessible to the operating system. This setting is also useful if you do not have a dedicated management network. The following table shows this setting and its effect on the Ethernet ports.

**Note:** The IMM2 network must operate 100 Mbps full duplex. The IMM2 network connection does not support Gigabit Ethernet. In shared mode, the production Ethernet network on that port still operates at Gigabit speeds.

Table 26. UEFI settings for remote access to the IMM

| UEFI mode                                      | Ethernet Port 1                           | Ethernet Port 2     | Ethernet Port 3 (optional) | Ethernet Port 4 (optional) |
|--|---|---------------------|----------------------------|----------------------------|
| IMM network interface port dedicated (default) | Production Ethernet                       | IMM2 dedicated*     | Production Ethernet        | Production Ethernet        |
| IMM network interface port shared              | Shared - Production Gb Ethernet and IMM2* | Production Ethernet | Production Ethernet        | Production Ethernet        |

\* The IMM network is limited to 100 Mbps full duplex

## Light path diagnostics panel

The light path diagnostics panel allows system engineers and administrators to easily and quickly diagnose hardware problems on the IBM System x servers. If a failure occurs, a light is illuminated on the front panel of the server (level 1 light path) to alert the systems administrator that there is a problem. The pop-out light path diagnostics panel (light path level 2) has a light against the failed subsystem. This light directs the engineer or administrator directly to the failed component, which also has an illuminated LED near it (light path level 3), for example, the DIMM error LED on the system board.

The x3630 M4 offers two variants of light path diagnostics: basic and advanced. All standard x3630 M4 models include basic functionality that provides light path levels 1 and 3. Advanced functionality is optional, and contains a pop-out panel that adds light path level 2. Storage-rich x3630 M4 servers (servers with 12 or 14 drive bays) only support basic light path.

The following two figures show the basic (level 1) light path level.

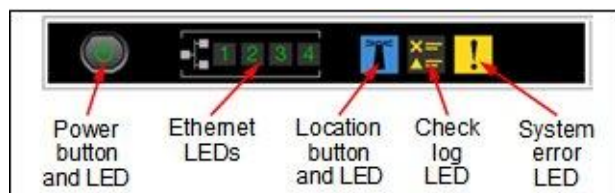


Figure 8. Basic (level 1) light path for models with eight drive bays

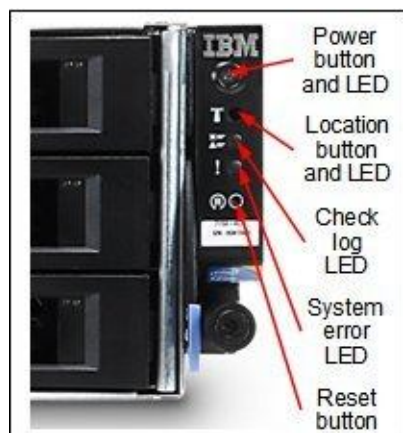


Figure 9. Basic (level 1) light path for storage-rich models

The following figure shows the advanced (level 2) light path level.



Figure 10. Advanced (level 2) light path for models with eight drive bays

The following table lists the advanced light path kit.

Table 23. Advanced light path kit

| Part number | Feature code | Description           | Maximum supported |
|-------------|--------------|-----------------------|-------------------|
| 90Y6533     | A2U6         | Lightpath Upgrade kit | 1                 |

## Supported operating systems

The server supports the following operating systems:

- Microsoft Windows Server 2012 R2
- Microsoft Windows Server 2012
- Microsoft Windows Server 2008 R2
- Microsoft Windows Server 2008, Datacenter x64 Edition
- Microsoft Windows Server 2008, Web x64 Edition
- Microsoft Windows Small Business Server 2008 Premium Edition
- Microsoft Windows Small Business Server 2008 Standard Edition
- Red Hat Enterprise Linux 5 Server Edition
- Red Hat Enterprise Linux 5 Server with Xen x64 Edition
- Red Hat Enterprise Linux 5 Server x64 Edition
- Red Hat Enterprise Linux 6 Server Edition
- Red Hat Enterprise Linux 6 Server x64 Edition
- SUSE LINUX Enterprise Server 10 for AMD64/EM64T
- SUSE LINUX Enterprise Server 10 for x86
- 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
- VMware ESX 4.1
- VMware ESXi 4.1
- VMware vSphere 5.0 (ESXi)
- VMware vSphere 5.1 (ESXi)
- VMware vSphere 5.5 (ESXi)

For the latest information about the specific versions and service levels supported and any other prerequisites, see the IBM ServerProven® website at:

<http://www.ibm.com/systems/info/x86servers/serverproven/compat/us/nos/matrix.shtml>

## Physical and electrical specifications

Dimensions and weight:

- Height: 86 mm (3.4 in.)
- Width: 447 mm (17.6 in.)
- Depth: 749 mm (29.5 in.)
- Weight:
  - Minimum configuration: 16.4 kg (36.2 lb).
  - Maximum configuration: 28.2 kg (62.2 lb).

Supported environment:

- Air temperature
  - Server on: 5 °C - 40 °C (41.0 °F - 104 °F); altitude: 0 - 915 m (3,000 ft).
  - Server on: 5 °C - 32 °C (41.0 °F - 89.6 °F); altitude: 915 - 2,134 m (7,000 ft).
  - Server on: 5 °C - 28 °C (41.0 °F - 82.4 °F); altitude: 2,134 - 3,050 m (10,000 ft).
  - Server off: 5 °C - 45 °C (41.0 °F - 113 °F).
  - Shipment: -40 °C - 60 °C (-40 °F - 140 °F).



- Humidity:
  - Server on: 8% - 85%, maximum dew point 24 °C, maximum rate of change 5 °C/hr.
  - Server off: 8% - 80%, maximum dew point 27 °C.
  - Shipment: 5% - 100%.
- Design to ASHRAE Class A3, ambient of 35 °C - 40 °C, with relaxed support:
  - Support cloud like workload with no performance degradation acceptable (Turbo-Off).
  - Under no circumstance can any combination of worst case workload and configuration result in system shutdown or design exposure at 40 °C.
- 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: 1.02 kVA
  - Models with 750 W hot-swap power supplies:
    - 100 - 127 (nominal) V AC; 50 Hz or 60 Hz; 8.9 A
    - 200 - 240 (nominal) V AC; 50 Hz or 60 Hz; 4.5 A
    - Input kilovolt-amperes (kVA) (approximately):
      - Minimum configuration: 0.14 kVA
      - Maximum configuration: 0.90 kVA
  - Models with 550 W hot-swap power supplies:
    - 100 - 127 (nominal) V AC; 50 Hz or 60 Hz; 6.5 A
    - 200 - 240 (nominal) V AC; 50 Hz or 60 Hz; 3.3 A
    - Input kilovolt-amperes (kVA) (approximately):
      - Minimum configuration: 0.12 kVA
      - Maximum configuration: 0.66 kVA
- BTU output
  - Minimum configuration: 406 Btu/hr (119 watts)
  - Maximum configuration: 3480 Btu/hr (1020 watts)
- Noise level
  - 6.6 bels (operating).
  - 6.6 bels (idle).

## Warranty options

The x3630 M4 has a three-year on-site warranty with 9x5/next business day terms. IBM offers the warranty service upgrades through IBM ServicePac offerings, which are described in this section. An IBM ServicePac® offering is a series of prepackaged 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.

IBM ServicePac offerings are country-specific, that is, each country might have its own service types, service levels, response times, and terms and conditions. Not all covered types of ServicePac offerings might be available in a particular country. For more information about IBM ServicePac offerings available in your country, visit the IBM ServicePac Product Selector at:

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

The following table explains warranty service definitions in more detail.

Table 24. Warranty service definitions

| Term                     | Description   |
|--------------------------|---|
| IBM on-site repair (IOR) | A service technician comes to the server's location for equipment repair.   |
| 24x7x2 hour              | A service technician is scheduled to arrive at your client's location within two hours after remote problem determination is completed. We provide service around the clock, every day, including IBM holidays.   |
| 24x7x4 hour              | A service technician is scheduled to arrive at your client's location within four hours after remote problem determination is completed. We provide service around the clock, every day, including IBM holidays.  |
| 9x5x4 hour               | A service technician is scheduled to arrive at your client's location within four business hours after remote problem determination is completed. We provide service from 8:00 a.m. - 5:00 p.m. in the client's local time zone, Monday through Friday, excluding IBM holidays. If after 1:00 p.m. it is determined that onsite service is required, the client can expect the service technician to arrive the morning of the following business day. For noncritical service requests, a service technician arrives by the end of the following business day. |
| 9x5 next business day    | A service technician is scheduled to arrive at your client's location on the business day after we receive your call, following remote problem determination. We provide service from 8:00 a.m. - 5:00 p.m. in the client's local time zone, Monday through Friday, excluding IBM holidays.   |

In general, the types of IBM ServicePac offerings are as follows:

- Warranty and maintenance service upgrades:
  - One, two, three, four, or five years of 9x5 or 24x7 service coverage
  - On-site repair from next business day to 2 or 4 hours
  - One or two years of warranty extension
- Remote technical support services:
  - One or three years with 24x7 coverage (severity 1) or 9x5/next business day for all severities
  - Installation and startup support for System x servers
  - Remote technical support for System x servers
  - Software support - Support Line:
    - Microsoft or Linux software
    - VMware
    - IBM Systems Director

## Regulatory compliance

The server conforms to the following standards:

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

The x3630 M4 supports attachments to the external storage expansion enclosures, such as the EXP2500 series, using the ServeRAID M5120 SAS/SATA Controller. The x3630 M4 server can also be attached to supported external storage systems, such as the IBM System Storage® DS3500 series, using the supported HBAs listed in Table 15.

The following table provides the ordering part numbers for the ServeRAID M5120 SAS/SATA Controller.

Table 25. Ordering part numbers and feature codes

| Part number | Feature code | Description   | Maximum supported |
|-------------|--------------|---|-------------------|
| 81Y4478     | A1WX         | ServeRAID M5120 SAS/SATA Controller for IBM System x                | 2                 |
| 81Y4484     | A1J3         | ServeRAID M5100 Series 512MB Cache/RAID 5 Upgrade for IBM System x  | 2                 |
| 81Y4487     | A1J4         | ServeRAID M5100 Series 512MB Flash/RAID 5 Upgrade for IBM System x  | 2                 |
| 81Y4559     | A1WY         | ServeRAID M5100 Series 1GB Flash/RAID 5 Upgrade for IBM System x    | 2                 |
| 81Y4508     | A22E         | ServeRAID M5100 Series Battery Kit for IBM System x                 | 2                 |
| 81Y4546     | A1X3         | ServeRAID M5100 Series RAID 6 Upgrade for IBM System x              | 1*                |
| 90Y4273     | A2MC         | ServeRAID M5100 Series SSD Performance Accelerator for IBM System x | 1*                |
| 90Y4318     | A2MD         | ServeRAID M5100 Series SSD Caching Enabler for IBM System x         | 1*                |

\* One M5100 Series FoD software license is required per server.

**Important:** The ServeRAID M5120 SAS/SATA Controller ships standard without a cache. One of the available cache upgrades (81Y4484, 81Y4487, or 81Y4559) is required for the M5120 adapter operations, and it must be purchased together with the controller.

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

- Eight external 6 Gbps SAS/SATA ports
- Two external x4 mini-SAS connectors (SFF-8088)
- Supports RAID levels 0, 1, and 10
- Supports RAID levels 5 and 50 with optional M5100 Series RAID 5 upgrades
- Supports RAID 6 and 60 with the optional M5100 Series RAID 6 Upgrade
- Supports 512 MB battery-backed cache or 512 MB or 1 GB flash-backed cache (cache)
- Up to 6 Gbps throughput per port
- PCIe 3.0 x8 host interface
- Based on the LSI SAS2208 6 Gbps ROC controller
- Supports connectivity to the EXP2512 and EXP2524 storage expansion enclosures

For more information, see the IBM Redbooks Product Guide *ServeRAID M5120 SAS/SATA Controller for IBM System x* at:

<http://www.redbooks.ibm.com/abstracts/tips0858.html?Open>

The ServeRAID M5120 SAS/SATA Controller supports connectivity to the IBM System Storage external expansion enclosures listed in the following table. Up to nine expansion enclosures can be daisy chained per one M5120 external port. For better performance, distribute expansion enclosures evenly across both M5120 ports.

Table 26. IBM System Storage external expansion enclosures

| Part number | Description                        | Maximum quantity supported per one M5120 |
|-------------|------------------------------------|--|
| 174712X     | IBM System Storage EXP2512 Express | 18                                       |
| 174724X     | IBM System Storage EXP2524 Express | 9  |

The external SAS cables listed in the following table support connectivity between external expansion enclosures and the ServeRAID M5120 SAS/SATA Controller.

Table 27. External SAS cables for external storage expansion enclosures

| Part number | Description       | Maximum quantity supported per one enclosure |
|-------------|-------------------|--|
| 39R6531     | IBM 3 m SAS Cable | 1  |
| 39R6529     | IBM 1 m SAS Cable | 1  |

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

Table 28. Drive options for EXP2512 external expansion enclosures

| Part number                | Description                       | Maximum quantity supported per one enclosure |
|----------------------------|-----------------------------------|--|
| <b>3.5" NL SAS HS HDDs</b> |                                   |  |
| 49Y1903                    | 1TB 7,200 rpm 6Gb SAS NL 3.5" HDD | 12   |
| 49Y1902                    | 2TB 7,200 rpm 6Gb SAS NL 3.5" HDD | 12   |
| 90Y8720                    | 3TB 7,200 rpm 6Gb SAS NL 3.5" HDD | 12   |
| 46W0975                    | 4TB 7,200 rpm 6Gb SAS NL 3.5" HDD | 12   |
| <b>3.5" SAS HS HDDs</b>    |                                   |  |
| 49Y1899                    | 300GB 15,000 rpm 6Gb SAS 3.5" HDD | 12   |
| 49Y1900                    | 450GB 15,000 rpm 6Gb SAS 3.5" HDD | 12   |
| 49Y1901                    | 600GB 15,000 rpm 6Gb SAS 3.5" HDD | 12   |

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

Table 29. Drive options for EXP2524 external expansion enclosures

| Part number                | Description                         | Maximum quantity supported per one enclosure |
|----------------------------|-------------------------------------|--|
| <b>2.5" NL SAS HS HDDs</b> |                                     |  |
| 49Y1898                    | 500GB 7,200 rpm 6Gb SAS NL 2.5" HDD | 24   |
| 81Y9952                    | 1TB 7,200 rpm 6Gb SAS NL 2.5" HDD   | 24   |
| <b>2.5" SAS HS HDDs</b>    |                                     |  |
| 49Y1896                    | 146GB 15,000 rpm 6Gb SAS 2.5" HDD   | 24   |
| 81Y9944                    | 300GB 15,000 rpm 6Gb SAS 2.5" HDD   | 24   |
| 00W1595                    | 600GB 10,000 rpm 6Gb SAS 2.5" HDD   | 24   |
| 46W0970                    | 900GB 10,000 rpm 6Gb SAS 2.5" HDD   | 24   |
| 46W0980                    | 1.2TB 10,000 rpm 6Gb SAS 2.5" HDD   | 24   |
| <b>2.5" SAS HS SSDs</b>    |                                     |  |
| 49Y6072                    | 200GB 6Gb SAS 2.5" SSD              | 24   |
| 49Y6077                    | 400GB 6Gb SAS 2.5" SSD              | 24   |

## External disk storage systems

The following table lists the external storage systems that are supported by the x3630 M4 server and can be ordered through the System x sales channel. The server may support other IBM disk systems that are not listed in this table. For further information, refer to the IBM System Storage Interoperation Center at: <http://www.ibm.com/systems/support/storage/ssic>

Table 30. External disk storage systems

| Part number | Description  |
|-------------|--|
| 1746A2D     | IBM System Storage DS3512 Express Dual Controller Storage System   |
| 1746A2S     | IBM System Storage DS3512 Express Single Controller Storage System |
| 1746A4D     | IBM System Storage DS3524 Express Dual Controller Storage System   |
| 1746A4S     | IBM System Storage DS3524 Express Single Controller Storage System |
| 181494H     | IBM System Storage DS3950 Model 94                                 |
| 181498H     | IBM System Storage DS3950 Model 98                                 |
| 2071CU2     | IBM Storwize® V3500 LFF Dual Control Enclosure                     |
| 2071CU3     | IBM Storwize V3500 SFF Dual Control Enclosure                      |
| 2072L2C     | IBM Storwize V3700 LFF Dual Control Enclosure                      |
| 2072S2C     | IBM Storwize V3700 SFF Dual Control Enclosure                      |

For more information, see the list of IBM Redbooks Product Guides in the System Storage category: <http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=externalstorage>

## External backup units

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

Table 31. External backup options (Part 1)

| Part number  | Description   |
|--|---|
| External tape expansion enclosures for internal tape drives  |   |
| 87651UX  | 1U Tape Drive Enclosure                                   |
| 8767HHX  | Half High Tape Drive Enclosure                            |
| 87651NX  | 1U Tape Drive Enclosure (with Nema 5-15P LineCord)        |
| 8767HNX  | Half High Tape Drive Enclosure (with Nema 5-15P LineCord) |
| Tape enclosure adapters (with cables)                        |   |
| 44E8869  | USB Enclosure Adapter Kit                                 |
| 40K2599  | SAS Enclosure Adapter Kit                                 |
| Internal backup drives supported by external tape enclosures |   |
| 46C5399  | IBM DDS Generation 5 USB Tape Drive                       |
| 39M5636  | IBM DDS Generation 6 USB Tape Drive                       |
| 43W8478  | IBM Half High LTO Gen 3 SAS Tape Drive                    |
| 44E8895  | IBM Half High LTO Gen 4 SAS Tape Drive                    |
| 49Y9898  | IBM Half High LTO Gen 5 Internal SAS Tape Drive           |
| 00D8924  | IBM Half High LTO Ultrium Gen 6 Internal SAS Tape Drive   |

Table 31. External backup options (Part 2)

| Part number            | Description   |
|------------------------|---|
| External backup units* |   |
| 36251TY                | IBM RDX USB 3.0 Dock with 1TB Cartridge                             |
| 362532Y                | IBM RDX USB 3.0 Dock with 320GB Cartridge                           |
| 362550Y                | IBM RDX USB 3.0 Dock with 500GB Cartridge                           |
| 3628L3X                | IBM Half High LTO Gen 3 External SAS Tape Drive (with US line cord) |
| 3628L4X                | IBM Half High LTO Gen 4 External SAS Tape Drive (with US line cord) |
| 3628L5X                | IBM Half High LTO Gen 5 External SAS Tape Drive (with US line cord) |
| 3628N3X                | IBM Half High LTO Gen 3 External SAS Tape Drive (without line cord) |
| 3628N4X                | IBM Half High LTO Gen 4 External SAS Tape Drive (without line cord) |
| 3628N5X                | IBM Half High LTO Gen 5 External SAS Tape Drive (without line cord) |
| 3580S3V                | System Storage TS2230 Tape Drive Express Model H3V                  |
| 3580S4V                | System Storage TS2240 Tape Drive Express Model H4V                  |
| 3580S5E                | System Storage TS2250 Tape Drive Express Model H5S                  |
| 3580S5X                | System Storage TS2350 Tape Drive Express Model S53                  |
| 3572S4R                | TS2900 Tape Library with LTO4 HH SAS drive & rack mount kit         |
| 3572S5R                | TS2900 Tape Library with LTO5 HH SAS drive & rack mount kit         |
| 35732UL                | TS3100 Tape Library Model L2U Driveless                             |
| 35734UL                | TS3200 Tape Library Model L4U Driveless                             |
| 46X2682†               | LTO Ultrium 5 Fibre Channel Drive                                   |
| 46X2683†               | LTO Ultrium 5 SAS Drive Sled  |
| 46X2684†               | LTO Ultrium 5 Half High Fibre Drive Sled                            |
| 46X2685†               | LTO Ultrium 5 Half High SAS Drive Sled                              |
| 46X6912†               | LTO Ultrium 4 Half High Fibre Channel Drive Sled                    |
| 46X7117†               | LTO Ultrium 4 Half High SAS DriveV2 Sled                            |
| 46X7122†               | LTO Ultrium 3 Half High SAS DriveV2 Sled                            |

\* Note: The external tape drives listed can be ordered through the IBM System x sales channel. The server may support other IBM tape drives that are not listed in this table. For further information, refer to the IBM System Storage Interoperation Center.

† Note: These part numbers are the tape drives options for 35732UL and 35734UL.

For more information, see the list of IBM Redbooks Product Guides in the Backup units category:  
<http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=tape>



## Top-of-rack Ethernet switches

The server supports the top-of-rack Ethernet switches from IBM System Networking listed in the following table.

Table 32. IBM System Networking - Top-of-rack switches

| Part number  | Description  |
|--|--|
| IBM System Networking - 1 Gb top-of-rack switches  |  |
| 7309BAX  | IBM System Networking RackSwitch G7028 (24 ports)        |
| 7309CAX  | IBM System Networking RackSwitch G7028 (48 ports)        |
| 0446013  | IBM System Networking RackSwitch G8000R                  |
| 7309CFC  | IBM System Networking RackSwitch G8000F                  |
| 7309G52  | IBM System Networking RackSwitch G8052R                  |
| 730952F  | IBM System Networking RackSwitch G8052F                  |
| IBM System Networking - 10 Gb top-of-rack switches |  |
| 7309DRX  | IBM System Networking RackSwitch G8264CS (Rear to Front) |
| 7309DFX  | IBM System Networking RackSwitch G8264CS (Front to Rear) |
| 7309BR6  | IBM System Networking RackSwitch G8124ER                 |
| 7309BF7  | IBM System Networking RackSwitch G8124EF                 |
| 7309G64  | IBM System Networking RackSwitch G8264R                  |
| 730964F  | IBM System Networking RackSwitch G8264F                  |
| 7309CR9  | IBM System Networking RackSwitch G8264TR                 |
| 7309CF9  | IBM System Networking RackSwitch G8264TF                 |
| IBM System Networking - 40 Gb top-of-rack switches |  |
| 8036BRX  | IBM System Networking RackSwitch G8332 (Rear to Front)   |
| 8036BFX  | IBM System Networking RackSwitch G8332 (Front to Rear)   |
| 8036ARX  | IBM System Networking RackSwitch G8316R                  |
| 8036AFX  | IBM System Networking RackSwitch G8316F                  |

For more information, see the list of IBM Redbooks Product Guides in the Top-of-rack switches category:  
<http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=tor>

## Uninterruptible power supply units

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

Table 33. Uninterruptible power supply units

| Part number      | Description                                  |
|------------------|--|
| Rack-mounted UPS |  |
| 21303RX          | IBM UPS 7500XHV                              |
| 21304RX          | IBM UPS 10000XHV                             |
| 24195KX          | IBM UPS5000                                  |
| 53951AX          | IBM 1500VA LCD 2U Rack UPS (100V/120V)       |
| 53951KX          | IBM 1500VA LCD 2U Rack UPS (230V)            |
| 53952AX          | IBM 2200VA LCD 2U Rack UPS (100V/120V)       |
| 53952KX          | IBM 2200VA LCD 2U Rack UPS (230V)            |
| 53953AX          | IBM 3000VA LCD 3U Rack UPS (100 V/120 V)     |
| 53953JX          | IBM 3000VA LCD 3U Rack UPS (200 V/208 V)     |
| 53956AX          | IBM 6000VA LCD 4U Rack UPS (200 V/208 V)     |
| 53956KX          | IBM 6000VA LCD 4U Rack UPS (230 V)           |
| 53959KX          | IBM 11000VA LCD 5U Rack UPS (200V/208V/230V) |

For more information, see the list of IBM Redbooks Product Guides in the Power infrastructure category:  
<http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=power>

## Power distribution units

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

Table 34. Power distribution units (part 1)

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

Table 34. Power distribution units (part 2)

| Part number    | Description   |
|----------------|---|
| Universal PDUs |   |
| 39Y8951        | DPI Universal Rack PDU with US LV and HV line cords |
| 39Y8952        | DPI Universal Rack PDU with CEE7-VII Europe LC      |
| 39Y8953        | DPI Universal Rack PDU with Denmark LC              |
| 39Y8954        | DPI Universal Rack PDU with Israel LC               |
| 39Y8955        | DPI Universal Rack PDU with Italy LC                |
| 39Y8956        | DPI Universal Rack PDU with South Africa LC         |
| 39Y8957        | DPI Universal Rack PDU with UK LC                   |
| 39Y8958        | DPI Universal Rack PDU with AS/NZ LC                |
| 39Y8959        | DPI Universal Rack PDU with China LC                |
| 39Y8962        | DPI Universal Rack PDU (Argentina)                  |
| 39Y8960        | DPI Universal Rack PDU (Brazil)                     |
| 39Y8961        | DPI Universal Rack PDU (India)                      |
| 0U Basic PDUs  |   |
| 46M4122        | IBM 0U 24 C13 16A 3 Phase PDU                       |
| 46M4125        | IBM 0U 24 C13 30A 3 Phase PDU                       |
| 46M4128        | IBM 0U 24 C13 30A PDU                               |
| 46M4131        | IBM 0U 24 C13 32A PDU                               |
| 46M4140        | IBM 0U 12 C19/12 C13 60A 3 Phase PDU                |
| 46M4143        | IBM 0U 12 C19/12 C13 32A 3 Phase PDU                |

For more information, see the list of IBM Redbooks Product Guides in the Power infrastructure category:  
<http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=power>

## Rack cabinets

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

Table 35. Rack cabinets

| Part number | Description                                |
|-------------|--|
| 201886X     | IBM 11U Office Enablement Kit              |
| 93072RX     | IBM 25U Standard Rack                      |
| 93072PX     | IBM 25U Static S2 Standard Rack            |
| 93634EX     | IBM 42U 1100mm Dynamic Expansion Rack      |
| 93634PX     | IBM 42U 1100mm Dynamic Rack                |
| 93604EX     | IBM 42U 1200mm Deep Dynamic Expansion Rack |
| 93604PX     | IBM 42U 1200mm Deep Dynamic Rack           |
| 93614EX     | IBM 42U 1200mm Deep Static Expansion Rack  |
| 93614PX     | IBM 42U 1200mm Deep Static Rack            |
| 93084EX     | IBM 42U Enterprise Expansion Rack          |
| 93084PX     | IBM 42U Enterprise Rack                    |
| 93074RX     | IBM 42U Standard Rack                      |
| 93074XX     | IBM 42U Standard Rack Extension            |
| 93624EX     | IBM 47U 1200mm Deep Static Expansion Rack  |
| 93624PX     | IBM 47U 1200mm Deep Static Rack            |
| 93634DX     | IBM PureFlex™ System 42U Expansion Rack    |
| 93634CX     | IBM PureFlex System 42U Rack               |
| 99564XX     | IBM S2 42U Dynamic Standard Expansion Rack |
| 99564RX     | IBM S2 42U Dynamic Standard Rack           |

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

<http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=rack>

## Rack options

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

Table 36. Rack options

| Part number                     | Feature code    | Description                                       |
|---------------------------------|-----------------|---|
| Monitor kits and keyboard trays |                 |   |
| 17238BX                         | 1723HC1 fc A3EK | IBM 1U 18.5" Standard Console                     |
| 17238EX                         | 1723HC1 fc A3EL | IBM 1U 18.5" Enhanced Media Console               |
| 172317X                         | 1723HC1 fc 0051 | 1U 17in Flat Panel Console Kit                    |
| 172319X                         | 1723HC1 fc 0052 | 1U 19in Flat Panel Console Kit                    |
| Console switches                |                 |   |
| 3858D3X                         | 3858HC1 fc A4X1 | Avocent Universal Management Gateway 6000 for IBM |
| 1754D2X                         | 1754HC2 fc 6695 | IBM Global 4x2x32 Console Manager (GCM32)         |
| 1754D1X                         | 1754HC1 fc 6694 | IBM Global 2x2x16 Console Manager (GCM16)         |
| 1754A2X                         | 1754HC4 fc 0726 | IBM Local 2x16 Console Manager (LCM16)            |
| 1754A1X                         | 1754HC3 fc 0725 | IBM Local 1x8 Console Manager (LCM8)              |
| Console cables                  |                 |   |
| 00AK142                         | A4X4            | UM KVM Module VGA+SD Dual RJ45                    |
| 43V6147                         | 3757            | IBM Single Cable USB Conversion Option (UCO)      |
| 39M2895                         | 3756            | IBM USB Conversion Option (4 Pack UCO)            |
| 39M2897                         | 3754            | IBM Long KVM Conversion Option (4 Pack Long KCO)  |
| 46M5383                         | 5341            | IBM Virtual Media Conversion Option Gen2 (VCO2)   |
| 46M5382                         | 5340            | IBM Serial Conversion Option (SCO)                |

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

<http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=rack>

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## Related publications and links

For more information, see these resources:

- US Announcement Letter - IBM System x3630 M4:  
<http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS112-095>
- IBM System x3630 M4 product page:  
<http://www.ibm.com/systems/x/hardware/rack/x3630m4/index.html>
- *IBM System x3630 M4 Installation and User's Guide*:  
<http://ibm.com/support/entry/portal/docdisplay?Indocid=MIGR-5090171>
- *IBM System x3630 M4 Problem Determination and Service Guide*:  
<http://ibm.com/support/entry/portal/docdisplay?Indocid=MIGR-5090165>
- ServerProven hardware compatibility page for the x3630 M4:  
<http://www.ibm.com/systems/info/x86servers/serverproven/compat/us/xseries/7158.html>
- IBM Redbooks Product Guides for IBM System x servers and options:  
<http://www.redbooks.ibm.com/portals/systemx?Open&page=pgbycat>
- IBM System x DDR3 Memory Configurator:  
<http://www.ibm.com/systems/x/hardware/ddr3config/>
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<http://www.ibm.com/systems/xbc/cog/>
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- IBM System Storage Interoperation Center:  
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