



Product Guide

February 2011

IBM System x3630 M3

Product Overview

2U storage-rich server packed with innovation

Suggested Uses: Web 2.0 applications like online gaming, video/photo sharing, mail serving, community, messaging, web search, file/print, backup, imagery, and transactional data server.

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In today's tough economic environment, your challenge is to do more with less—serve more Web pages, handle more secure connections, support more e-mail users, and do it all on a tight budget. You need to reduce the costs of doing business and improve the service you deliver to your customers while lowering your overall risk. The **dual-socket IBM® System x3630 M3** can reduce your costs by combining traditional enterprise server features with an energy-smart design, budget-conscious features, and huge storage capacity. It can improve service with reduced operational complexity and increased management functionality. It can lower your IT risk with the resiliency that comes from hot-swap/redundant features. It offers abundant, high-performance local storage without the cost or complexity of going external, in only 2U of rack space. And like all IBM servers, the x3630 M3 offers you the trust that comes from the IBM global reach, service and support.

The x3630 M3 is a game-changing rack storage server that uses significantly less power than previous generations, with unified systems management tools; high reliability, availability, and serviceability features; and broad system flexibility, housed in a compact 2U mechanical package.

The x3630 M3 features **Intel® Xeon® 5600 series 6-core and 4-core**, and **5500 series 4-core and 2-core** processors, with up to **12MB** of shared **L3 cache**, to provide you with the computing power you need to match your business needs and growth. The new line of Intel processors delivers unprecedented intelligent performance with features like adaptive performance for applications and environments, Turbo Boost Technology and Hyper-Threading Technology, and integrated power gates and automated power management.

The x3630 M3 supports up to **12 DIMMs / 192GB** of RDIMM **1333MHz DDR3** memory and provides **Chipkill™ ECC** (Error Checking and Correcting) protection—for high performance and reliability. For even higher levels of availability, the x3630 M3 also offers **memory mirroring**. **Two** integrated high-speed **Gigabit Ethernet** ports are included, as are **two** high-performance **PCIe** adapter slots. The x3630 M3 offers an optional **embedded hypervisor** to manage your virtual workloads.

Some System x3630 M3 models support up to **14 hot-swap 3.5-inch** Serial-Attached SCSI (**SAS**) or Serial-Attached ATA (**SATA**) HDDs with an internal storage capacity of up to **28TB**. Other models support up to **28 hot-swap 2.5-inch SAS (16.8TB)** or **SATA (14TB)** drives. The servers offer a choice of several IBM ServeRAID® storage controllers that provide broad levels of **hardware-based RAID** solutions.

The ultra-dense **2U** form factor allows businesses to increase their computing power and spread their workload without outgrowing their current data center. Up to 21 of these **2U** servers can be installed in a single 42U rack, for a total of up to **42** processors, **252** processor cores (and **504** threads), offering tremendous deployment flexibility.

The x3630 M3 includes an **Integrated Management Module (IMM)** that enables the user to manage and control the server easily—both locally and remotely. The IMM offers a high level of manageability that is designed to keep costs down and the system up—even when network usage increases. The IMM helps maximize network availability by increasing uptime, as do **Active Memory™** protection, **hot-swap/redundant SAS or SATA** HDDs, hot-swap/redundant ultra-efficient **power supplies** and redundant **fan modules**; integrated **RAID**; **temperature-controlled fans**; **IPMI 2.0** support, including **highly secure remote power control** and **Serial over LAN**; as well as **text-console redirect over LAN**.

Another improvement with the new generation of X-Architecture is the replacement of old BIOS with a new generation **Unified Extensible Firmware Interface (UEFI)**. UEFI provides a more intuitive user interface and understandable event logs and better management.

With the inclusion of unique IBM service and support features such as the IMM, **IBM Systems**

Director, IBM Systems Director Active Energy Manager™, IBM ToolsCenter, IBM ServerGuide™, and support for the optional Virtual Media Key for remote presence capability, the x3630 M3 is designed for superior uptime.

If you need highly manageable, dual-socket/multi-core computing power in a storage-rich package, the x3630 M3 is the ideal system.

Selling Features

Price/Performance

The x3630 M3 offers numerous features to boost performance and reduce costs:

- Up to **two 2.26 to 3.06GHz 6-core** or **1.6GHz to 3.2GHz 4-core** Xeon **5600** series processors; or two **2.13GHz to 2.26GHz 4-core** or **2.0GHz 2-core** Xeon **5500** series processors, standard or via CTO with **12MB, 8MB** or **4MB** of cache per processor, offer superior price/performance capable of tackling the toughest jobs.. Xeon 5600 series processors offer up to **54%** better performance than the previous-generation 5500 series processors (depending on workload).
- **Low-voltage processors** (available via the Configure to Order process) draw less energy and produce less waste heat than high-voltage processors, thus helping to reduce data center energy costs. Selected **4-core** Xeon 5600 series processors use only **40W** and selected **6-core** processors consume only **60W**. This is less than half the wattage consumed by 130W processors.
- **Twelve** DIMMs of registered **1333MHz DDR3** ECC memory with **Chipkill**¹ protection (optional) provide speed, high availability, and a memory capacity of up to **192GB**.
- x3630 M3 servers using the **L5640** (via CTO) and **X56xx** processors support 2 DIMMs (running at 1.5V) per channel (2DPC) at 1333MHz.
- **Two high-speed PCIe Gen 2** slots offer investment protection by supporting high-performance adapters, such as 10Gb Ethernet, Fibre Channel and InfiniBand cards, none of which will run in older 33MHz and 66MHz conventional PCI slots.
- The integrated **6Gbps ServeRAID-M1015, ServeRAID-M5014, or ServeRAID-M5015** controllers (model-specific), in the x8/x8 PCIe Gen 2 slot, provide high-performance RAID support for SAS/SATA drives.
- Up to **14 3.5-inch** or **28 2.5-inch internal hot-swap SAS/SATA** hard disk drives offer high-performance/high capacity, with high availability
- Up to **28TB** of **internal** storage, without the cost or extra rack space of external storage solutions.
- The integrated **dual-port Gigabit Ethernet** controller with **IPMI 2.0** provide high-speed network communications.
- A **high degree of device integration**—including hot swap SAS/SATA HDDs, multiple hardware-based ServeRAID options, Gigabit Ethernet ports, systems management and video controllers—lowers costs and frees up valuable adapter slots.

Flexibility

The x3630 M3 has the ability to grow with your application requirements, thanks to

- A choice of **4-core** or **6-core** processors with **1.6 to 3.2GHz** clock rates, up to **4.8 to 6.4 gigatransfers per second**, and **80W** or **95W** maximum power draw. (Additionally, **40W 4-core** and **60W 6-core** processors are available via CTO.)
- A choice of either standard **1.5V** DIMMs or **1.35V** DIMMs that consume **19%** less energy.
- Up to **192GB** of high-speed registered **DDR3** system memory.
- **One available high-performance x16/x8 PCIe Gen 2** slot in all models.
- **ServeRAID** controllers provides up to **512MB** of battery-backed cache to enable higher-performance hardware RAID support, and allows the x3630 M3 to offer **five** RAID levels standard: **RAID-0/1/10/5/50** (and optionally **6/60** with **Self-Encrypting Drives**, or **SED**).
- The **five USB 2.0** ports (two front, two rear, one internal) are up to **40X** faster² than older **USB 1.1** ports. This provides speedy access to external HDDs (non-arrayed), floppy drives, optical drives, tape drives, and other USB devices. Two ports are on the front of the unit and two are on the back. The internal port supports an internal flash drive with embedded hypervisor.
- A choice of **12 3.5-inch hot-swap SAS/SATA** HDDs or **24 2.5-inch hot-swap SATA** drives standard, or optionally up to **14 3.5-inch hot-swap SAS/SATA** HDDs or **28 2.5-inch hot-swap SATA**. The **3.5-inch** models provide a maximum of **28.0TB** of internal storage, while the **2.5-inch** models support up to **16.8TB**, in only 2U of rack space. The x3630 M3 supports a combination of SAS and SATA drives in the same server.

¹ All models require Chipkill-enabled DIMMs (provided standard or available optionally, model-dependent) for Chipkill protection.

² Data transfer rates may be less than the maximum possible.

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- Alternatively, direct-attach, network-attached storage (NAS), or iSCSI or Fibre Channel-attached storage can be attached using IBM **System Storage**[®] servers.
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Manageability / Security

Powerful systems management features simplify local and remote management of the x3630 M3:

- The x3630 M3 includes an **Integrated Management Module (IMM)** to monitor server availability, perform Predictive Failure Analysis, etc., and trigger IBM **Systems Director** alerts. The IMM performs the functions of both the Baseboard Management Controller (**BMC**) of earlier systems and the advanced **Remote Supervisor Adapter II** and is upgradeable to **remote presence/cKVM**.
- An optional **Virtual Media Key** provides additional systems management capabilities, including Web-based out-of-band control; virtual floppy and optical drive support; Windows “blue screen” error capture; LDAP and SSL support; and remote redirection of keyboard, PCI video and text, and mouse (cKVM). And it does all this without consuming a valuable adapter slot.
- **Text Console Redirection** support allows the administrator to remotely view x3630 M3 text messages over Serial or LAN.
- Integrated industry-standard Unified Extensible Firmware Interface (**UEFI**) next-generation BIOS. New capabilities include:
 - Human readable event logs — no more beep codes
 - Complete out-of-band coverage by the Advance Settings Utility to simplify remote setup
 - A complete setup solution, allowing adapter configuration functions to be moved into UEFI
 - Consistent firmware management across an entire product line
- Industry-standard **AES NI** support for faster, stronger encryption (in 5600 series processors only).
- Integrated **IPMI 2.0** support alerts IBM Systems Director to anomalous environmental factors, such as voltage and thermal conditions. It also supports **highly secure remote power control** using data encryption.
- **IBM Systems Director** is included for proactive systems management. IBM Systems Director comes with a portfolio of tools, including **IBM Systems Director Active Energy Manager**, **IBM Service and Support Manager**, and others. In addition, IBM Systems Director offers extended systems management tools for additional server management and increased availability. When a problem is encountered, IBM Systems Director can issue administrator alerts via e-mail, pager, and other methods.
- **IBM Systems Director Active Energy Manager**, an IBM-exclusive, is designed to take advantage of new system power management features, by providing actual realtime energy monitoring and reporting features.

Availability and Serviceability

The System x3630 M3 provides many features to simplify serviceability and increase system uptime:

- x3630 M3 servers offer **Chipkill** ECC memory protection³ standard or optionally (model-dependent,). Chipkill memory is up to **16X** better than standard ECC memory at correcting memory errors. This can help reduce downtime caused by memory errors.
- The x3630 M3 offers **memory mirroring** for redundancy in the event of a non-correctable memory failure
- **Toolless cover removal** provides easy access to upgrades and serviceable parts. Similarly, the Virtual Media Key and the **ServeRAID** controller can be installed and replaced without tools. This means less time (and therefore less money) spent servicing the x3630 M3. Additionally, **hot-swap/redundant HDDs** and **power supplies, redundant fan modules**, as well as **mirrored** memory, mean greater system uptime while these components are being serviced.
- The **external LED panel** and helps to quickly lead the technician to failed components. This simplifies servicing, speeds up problem resolution and helps improve network availability.
- **Integrated 6Gbps** RAID controllers to enhance system availability and data protection.
- **IPMI 2.0** supports highly secure remote system power control using data encryption. This allows an administrator to restart a server without having to visit it in person, saving travel time and getting the server back up and running quickly and securely. It also adds new features to those provided by IPMI 1.5, including **VLAN** support, **Serial over LAN**, enhanced

³ Chipkill protection is supported with x4 DDR3 DIMMs, but not x8 DIMMs.

authentication and encryption algorithms (**RMCP+** and **AES**) and a **firmware firewall**.

- **Temperature-controlled fans** adjust to compensate for changing thermal characteristics. At the lower speeds they draw less power and suffer less wear. Equally important in a crowded data center, temperature-controlled fans produce less ambient noise in the data center than if they were constantly running at full speed.
- The **three-year (parts and labor) limited onsite warranty⁴** helps afford you peace of mind and greater investment protection than a one-year warranty does.

Key Features

High-Performance / High-Efficiency Xeon 5600 / 5500 Processors

The x3630 M3 supports up to two high-performance Intel **Xeon 5600** series or **5500** series processors, allowing you to upgrade to a second processor as your business needs require. The x3630 M3 offers a choice of processor clock rates, memory access speeds and energy draw, including:



- **95W 6-core** Xeon 5600 series models **X5675**, **X5670** or **X5650**, running at 3.06, 2.93 or 2.66GHz, respectively, with reduced power draw and impressive performance/watt (only **15.83W** per core; **6.4GTps** QPI speed), **12MB** of L3 processor cache, **1333MHz** memory access, 2 threads per core, and Intel Turbo Boost and Hyper Threading technology
- **80W 6-core** Xeon 5600 series model **X5649** or **X5645**, running at 2.53 or 2.4GHz, respectively, with reduced power draw and superior performance/watt (only **13.33W** per core; **6.4GTps** QPI speed), **12MB** of L3 processor cache, **1333MHz** memory access, 2 threads per core, and Intel Turbo Boost and Hyper Threading technology
- **80W 4-core** Xeon 5600 series models **E5640**, **E5630**, or **E5620** running at 2.66, 2.53, or 2.4GHz, respectively, with reduced power draw and excellent performance/watt (**20W** per core; **5.86GTps** QPI speed), **12MB** of L3 processor cache, **1066MHz** memory access, 2 threads per core, and Intel Turbo Boost and Hyper Threading technology
- **80W 4-core** Xeon 5600 series model **E5607** running at 2.26GHz, with reduced power draw and impressive performance/watt (**20W** per core; **4.8GTps** QPI speed), **8MB** of L3 processor cache, and **1066MHz** memory access
- **80W 4-core** Xeon 5600 series model **E5603** running at 1.6GHz, with reduced power draw and impressive performance/watt (**20W** per core; **4.8GTps** QPI speed), **8MB** or **4MB** (respectively) of L3 processor cache, and **1066MHz** memory access
- **80W 4-core** Xeon 5500 series models **E5507** or **E5506** running at 2.26 or 2.13GHz, respectively, with reduced power draw and excellent performance/watt (**20W** per core; **4.8GTps** QPI speed), **4MB** of L3 processor cache, and **800MHz** memory access

Also available, via configure-to-order (CTO):

- **95W 4-core** Xeon 5600 series model **X5672** running at 3.2GHz with reduced power draw and excellent performance/watt (only **23.75W** per core; **6.4GTps** QPI speed), **12MB** of L3 processor cache, **1333MHz** memory access, 2 threads per core, and Intel Turbo Boost technology and Hyper Threading Technology
- **95W 6-core** Xeon 5600 series model **X5660** running at 2.8GHz with reduced power draw and impressive performance/watt (only **15.83W** per core; **6.4GTps** QPI speed), **12MB** of L3 processor cache, **1333MHz** memory access, 2 threads per core, and Intel Turbo Boost technology and Hyper Threading Technology
- **60W 6-core** Xeon 5600 series **low-voltage** model **L5640** running at 2.26GHz with low power draw and amazing performance/watt (only **10W** per core; **5.86GTps** QPI speed), and **12MB** of shared L3 cache, **1333MHz** memory access, 2 threads per core, and Intel Turbo Boost and Hyper Threading technology (CTO only)
- **40W 4-core** Xeon 5600 series **low-voltage** model **L5630** running at 2.13GHz, with extremely low power draw and amazing performance/watt (only **10W** per core; **5.86GTps** QPI speed), **12MB** of L3 processor cache, **1066MHz** memory access, 2 threads per core, and Intel Turbo Boost technology
- **40W 4-core** Xeon 5600 series **low-voltage** model **L5609** running at 1.86GHz, with extremely low power draw and amazing performance/watt (only **10W** per core; **4.8GTps** QPI speed), **12MB** of L3 processor cache, and **1066MHz** memory access
- **80W 4-core** Xeon 5500 series model **E5606** running at 2.13GHz, with reduced power draw and impressive performance/watt (**20W** per core; **4.8GTps** QPI speed), **8MB** of L3 processor cache, and **1066MHz** memory access
- **80W 2-core** Xeon 5500 models **E5503** running at 2.0GHz with reduced power draw (**40W** per

⁴ For terms and conditions or copies of the IBM Statement of Limited Warranty, call 800-772-2227 in the U.S. In Canada call 800-426-2255. Telephone support may be subject to additional charges. For warranties including onsite labor, a technician is sent after IBM attempts to resolve the problem remotely. International warranty service is available in any country in which this product is sold.

core; **4.8GTps** QPI speed), **4MB** of L3 processor cache, and **800MHz** memory access

With the Xeon 5500 and 5600 series processors, Intel has diverged from its traditional Symmetric Multiprocessing (SMP) architecture to a Non-Uniform Memory Access (NUMA) architecture. The processors are connected through serial coherency links called QuickPath Interconnect (QPI). QPI is capable of 6.4, 5.6 or 4.8 GTps (gigatransfers per second), depending on the processor model.

6-core Xeon processors contain *six complete processor cores*. Each 5600 series processor contains one **12MB L3** cache shared by all the cores. The shared cache is dynamically allocated among the cores as needed. The multiple cores appear to software as multiple physical processors. Four- and six-core processors offer considerably higher performance than a same-speed Xeon processor with 2 cores.

Turbo Boost Technology increases performance by translating the temperature, power and current head room into higher frequency. It will dynamically increase by 133MHz for short and regular intervals until the upper limit is met or the maximum possible upside for the number of active cores is reached. The maximum frequency is dependent on the number of active cores. The amount of time the processor spends in the Turbo Boost Technology state depends on the workload and operating environment, providing the performance you need, when and where you need it. For example, a **2.66GHz 6-core X5650** processor with **3-6** cores active can run the cores at **2.93GHz**. With only **one** or **two** cores active, the same processor can run those cores at **3.06GHz**. Similarly, a **2.4GHz 4-core E5620** processor can run at **2.53GHz** or even **2.66GHz**. When the inactive cores are needed again, they are dynamically turned back on and the processor frequency is adjusted accordingly.

In processors implementing **Intel Hyper-Threading Technology**, each core has two threads capable of running an independent process. Thus, a 6-core processor can run **12** threads concurrently.

Intelligent Power Capability powers individual processor elements on and off as needed, to reduce power draw.

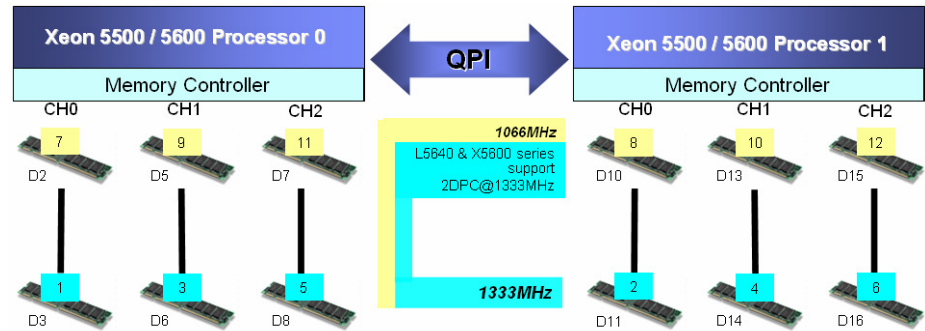
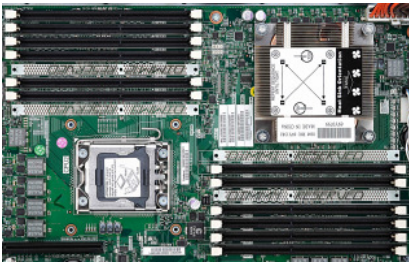
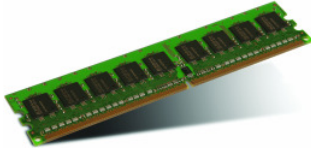
Execute Disable Bit functionality can help prevent certain classes of malicious buffer overflow attacks when combined with a supporting operating system.

Intel's **Virtualization Technology** (VT) integrates hardware-level virtualization hooks that allow operating system vendors to better utilize the hardware for virtualization workloads.

DDR3 Memory with Chipkill ECC Protection

The x3630 M3 ships with registered double data rate III (DDR3) memory and provides Active Memory features, including advanced **Chipkill** memory protection standard or optionally (model-specific), for **up to 16X** better error correction than standard ECC memory. In addition to offering better performance than DDR2 or fully-buffered memory, DDR3 memory also uses less energy. DDR2 memory already offered up to 37% lower energy use than fully buffered memory. Now, a generation later, DDR3 memory is even more efficient, using up to **15% less energy** than registered DDR2 memory (and even greater savings vs. fully buffered DDR2 memory).

The x3630 M3 currently supports up to **192GB** of 1.5V **RDIMM** (registered DIMM) memory in **12** DIMM slots. The x3630 M3 also supports either standard **1.5V** DIMMs or **1.35V** DIMMs that consume **19%** less energy than 1.5V DIMMs. Redesign in the architecture of the Xeon 5500 and 5600 series processors bring radical changes in the way memory works in these servers. For example, the Xeon 5500 and 5600 series processors **integrate the memory controller inside the processor**, resulting in two memory controllers in a 2-socket system. Each memory controller has three memory channels. Depending on the type of memory, population of memory, and processor model, the memory may be clocked at **1333MHz**, **1066MHz** or **800MHz**.



1-12: DIMM population sequence , D2-D16: DIMM slot assignments

Notes: Adding a second processor not only doubles the amount of memory available for use, but also doubles the number of memory controllers, thus doubling the system memory bandwidth. If you add a second processor, but no additional memory for the second processor, the second processor would have to access the memory from the first processor “remotely,” resulting in longer latencies and lower performance. The latency to access remote memory is almost **75% higher** than local memory access. So, the goal should be to always populate both processors with memory.

The **L5640** and **X56xx** processor models support up to 1333MHz memory clock speed. With new single-rank and dual-rank RDIMMs, **L5640** and **X56xx** processors support 2 DIMMs (running at 1.5V) per channel (2DPC) at 1333MHz. The **E562x**-and-up and **L56xx** models support a maximum of **1066MHz** clock speed (and thus memory access rate), and the **E550x** models support **800MHz** clock speed.

Running memory at 1333MHz (where supported) versus 1066MHz offers up to **9%** better performance, while memory running at 1066MHz produces up to **28%** better performance than memory running at 800MHz. Xeon 5500/5600 series processors access memory with almost **50% lower latency** than the earlier 5400 series processors. That can result in faster processing of latency-sensitive workloads.

Regardless of memory *speed*, the Xeon 5500/5600 platform represents a significant improvement in memory *bandwidth* over the previous Xeon 5400 platform. At 1333MHz, the improvement is almost **500%** over the previous generation. This huge improvement is mainly due to the dual integrated memory controllers and faster DDR3 1333MHz memory. Throughput at 800MHz is **25 gigabytes per second** (GBps); at 1066MHz it's **32GBps**; and at 1333MHz it's **35GBps**. This improvement translates into improved application performance and scalability.

Memory interleaving refers to how physical memory is interleaved across the physical DIMMs. A balanced system provides the best interleaving. A Xeon 5500/5600 series processor-based system is balanced when all memory channels on a socket have the same amount of memory.

The 5500 and 5600 series processors support single-, dual-, and quad-rank memory. A memory rank is simply a segment of memory that is addressed by a specific address bit.

- A typical memory DIMM description is 4GB 2Rx4 DIMM
- The 2R designator is the rank count for this particular DIMM (2R = dual-rank)
- The x4 designator is the data width of the rank

It is important to ensure that DIMMs with the appropriate number of ranks are populated in each channel for optimal performance. Whenever possible, **use dual-rank DIMMs** in the system. Dual-

rank DIMMs offer better interleaving and hence better performance than single-rank DIMMs. For instance, a system populated with six 2GB *dual*-rank DIMMs outperforms a system populated with six 2GB *single*-rank DIMMs by **7%** for SPECjbb2005. Dual-rank DIMMs are also better than quad-rank DIMMs because **quad-rank DIMMs will cause the memory speed to be down-clocked**.

Another important guideline is to populate equivalent ranks per channel. For instance, **mixing one single-rank DIMM and one dual-rank DIMM in a channel should be avoided**.

Notes: It is important to populate all three memory channels in each processor. The relative memory bandwidth decreases as the number of channels populated decreases. This is because the bandwidth of all the memory channels is utilized to support the capability of the processor. So, as the channels are decreased, the burden to support the requisite bandwidth is increased on the remaining channels, causing them to become a bottleneck. If 1.5V and 1.35V DIMMs are mixed, *all* DIMMs will run at 1.5V.

In addition to Chipkill error correction, the x3630 M3 offers an additional level of IBM Active Memory protection: **memory mirroring**.

Memory mirroring works much like disk mirroring. The total memory is divided into three channels: a primary channel, a backup channel, and an unused channel. Data is *written concurrently to both the primary and backup channels*. If a DIMM fails in one of the DIMMs in the primary channel, it is instantly disabled and the mirrored memory in the backup channel becomes active (primary) until the failing DIMM is replaced. One-third of total memory is available for use at any one time with mirroring enabled. (**Note:** Due to the double writes to memory, performance is affected.) Because the third channel is disabled with mirroring active, there is no point in populating it with memory.

Mirroring is handled at the hardware level; no operating system support is required.

DDR3 memory is currently available in **1GB, 2GB, 4GB, 8GB, and 16GB** RDIMMs. DIMMs can be installed individually (not in pairs). However, for performance reasons, in a 2-processor system, it's best to install a DIMM per processor.

Maximum memory capacity and speed in 2-processor configurations include:

Memory Frequency	DIMMs per Channel	Max. Memory Capacity	5600 Series	5500 Series
1333MHz	1 (6 DIMMs)	96GB RDIMM	X5650, L5640, E5645 and above	N/A
1333MHz	2 ⁵ (12 DIMMs)	192GB RDIMM	X5650, L5640, E5645 and above	N/A
1066MHz	2 (12 DIMMs)	192GB RDIMM	All	N/A
800MHz	2 (12 DIMMs)	192GB RDIMM	N/A	E5503, E5506, E5507
800MHz-1333MHz	2 (8 DIMMs)	64GB RDIMM	All	All

Integrated Virtualization

All models of the x3630 M3 support a **USB 2.0 Flash Key** installed preloaded with **VMware vSphere Hypervisor** (formerly ESXi). Rather than management through a Service Console based on a Linux operating system, vSphere Hypervisor relies on aggregate management tools, including VirtualCenter, the Remote Command Line interface and the introduction of CIM for standards-based and agentless hardware monitoring.

vSphere Hypervisor includes all the performance, scalability and compatibility features of a hypervisor installed on disk, including full **VMFS** support across FC SAN, iSCSI SAN, and NAS, and **4-way VSMP**. Because it runs from flash memory, it's extremely fast and ideal for diskless configurations. It also offers enhanced security, because it runs without an operating system-based console and is updated/patched much like firmware.

⁵ 2 DIMMs per channel at 1333MHz is supported only with 1.5V RDIMMs or 1.35V-capable DIMMs running at 1.5V.

Disk Controllers

The x3630 M3 **hot-swap** models include either a **ServeRAID-M1015**, **ServeRAID-M5014**, or **ServeRAID-M5015** controller standard (model-specific). They can be upgraded to other ServeRAID controllers. The supported ServeRAID controllers include:



- The **6Gbps (x8 PCIe) ServeRAID-M1015 SAS/SATA** controller supports **RAID-0/1/10** (no cache) for up to 16 drives. The **IBM ServeRAID M1000 Series Advance Feature Key** adds **RAID-5/50** with self-encrypting drive (SED) support.
- The **6Gbps (x8 PCIe) ServeRAID-M5014 SAS/SATA** controller offers enhanced performance with **256MB** of cache memory (with optional battery backup), and supports **RAID-0/1/10/5/50**.
- The **6Gbps (x8 PCIe) ServeRAID-M5015 SAS/SATA** controller offers enhanced performance with **512MB** of cache memory and battery backup included, and supports **RAID-0/1/10/5/50**.
- The **IBM ServeRAID M5000 Series Advance Feature Key** adds **RAID-6/60** with **SED** support to the ServeRAID-M5014 and M5015. The **IBM ServeRAID M5000 Series Battery Key** adds **battery backup** support to the M5014.

Additional external SAS/SATA disk storage, as well as tape backup, is available via one of several supported controllers.

Drive Bays

The x3630 M3 supports up to **14** or **28 hot-swap** drive bays in all (model-specific). Standard models include either **12 3.5-inch** or **24 2.5-inch** drive bays. The hot-swap bays support a combination of SATA and SAS HDDs. If more capacity is needed, an optional 3.5-inch or 2.5-inch **hot-swap cage assembly** can be installed for an additional **2 3.5-inch** or **4 2.5-inch** drive bays (model-specific). **Hot-swap** drives may be inserted or removed through the front of the server without powering off the system.

For additional storage, a direct-attach, NAS or SAN external expansion option can be added, using an optional controller.

No floppy, tape, or optical drive is supplied with any model; an external USB floppy or optical drive may be used, if needed.

Flexible Internal Storage

The x3630 M3 offers flexibility with up to either **14 3.5-inch** or **28 2.5-inch** HDD bays (model-specific), supporting high-performance/high-capacity drives that provide high density/high reliability and allow you to scale up as your business grows.

3.5-inch Hot-Swap SAS

- **7,200 RPMs** — 1 or **2TB (28TB** maximum capacity, with **14** bays)
- **15,000 RPMs** — 300, 450, or **600GB (8.4TB**, with **14** bays)

3.5-inch Hot-Swap SATA

- **7,200 RPMs** — 250 or 500GB, 1 or **2TB (28TB**, with **14** bays)
- **15,000 RPMs** — 250, or **500GB (7TB**, with **14** bays)

2.5-inch Hot-Swap SAS

- **7,200 RPMs** — **500GB (14TB**, with **28** bays)
- **10,000 RPMs** — 146.8, 300, **600GB (16.8TB**, with **28** bays)
- **15,000 RPMs** — **146.8GB (4.1TB**, with **28** bays)

2.5-inch Hot-Swap SATA

- **7,200 RPMs** — 160, **500GB (14TB**, with **28** bays)

The hot-swap drives use the Converged Tray for interchangeability with other IBM System x[®] systems. If you need more storage space, terabyte capacities are possible with external IBM System Storage direct-attach, NAS and SAN offerings.

High-Performance Adapter Slots

The x3630 M3 provides **two⁶ PCIe (PCI Express) Gen 2** I/O slots for long-term investment protection. **PCI Express** Gen 2 is the next-generation of high-performance, low-latency, serial I/O bus. Each slot is capable of supporting Gen 1 or Gen 2 adapters:

- One **x16/x8** (x16 physical/x8 electrical) **full-height, half-length (8GBps)**
- One **x8/x8** (x8 physical/x8 electrical) **full-height, half-length (8GBps)** — reserved for the ServeRAID controller





Dual-Port Gigabit Ethernet Controller

The x3630 M3 includes **one dual-port** integrated **Intel 82575** Gigabit Ethernet controller standard, for up to 10X higher maximum throughput than a 10/100 Ethernet controller and failover support.

The controller also supports **IPMI 2.0**, plus **Wake on LAN[®]** and **PXE** (Preboot Execution Environment) flash interface. Optional PCI adapters offering failover and load balancing between adapters are available for added throughput and increased system availability.

10 Gigabit Ethernet Virtual Fabric Adapter for IBM

The Emulex Virtual Fabric Adapter (part number 49Y4200, supported by CTO) is an industry-leading performance and scalability per watt, dual-port network adapter for 10Gbps Ethernet (10GbE) networks. It offers the benefits and flexibility of I/O convergence in a single end-to-end solution. Protocol offload for stateless TCP/IP and TCP Chimney provide maximum bandwidth with minimum use of CPU resources. It achieves line rate 10Gbps performance with support for TCP/IP stateless offloads and TCP Offload Engine (TOE) support. TOE reduces system processor utilization, providing increased system performance and reducing overall system power requirements.

The adapter is based on the Emulex OneConnect Universal Converged Network Adapter (UCNA) platform that also includes the capability for future upgrades to Fibre Channel over Ethernet (FCoE) and iSCSI protocol offloads. By using a common infrastructure for Ethernet and storage networks, data centers can reduce capital expense (CapEx) for adapters, switches and cables, and operational expense (OpEx) for power, cooling and IT administration.

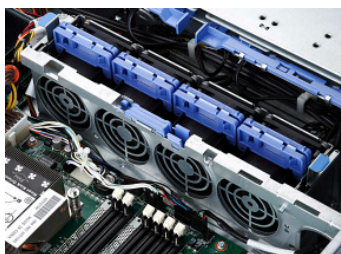
End-to-end data protection with hardware parity, CRC, ECC and other advanced error checking and correcting ensure that data is safe from corruption.

Dual 10Gbps Ethernet ports:

- IPv4/IPv6 TCP, UDP checksum offload; Large Send Offload (LSO); Large Receive Offload; Receive Side Scaling (RSS); IPV4 TCP Chimney Offload
- VLAN insertion and extraction
- Jumbo frames up to 9000 Bytes
- Preboot eXecutive Environment (PXE) 2.0 network boot support
- Interrupt coalescing
- Load balancing and failover support including adapter fault tolerance (AFT), switch fault tolerance (SFT), adaptive load balancing (ALB), teaming support and IEEE 802.3ad

Note: You must have either one SFP+ transceiver or one SFP+ direct-attached cable for *each* of the two 10Gb ports on the adapter.

Ultra-Efficient Cooling



Strategically located fans, combined with efficient airflow paths, provide highly effective system cooling for the x3630 M3. The base server includes **four** fan modules, for redundant cooling. Each module includes **2** back-to-back fans with counter-rotating blades. In addition, each power supply also contains a fan.

The system contains **two cooling zones**. **Zone 1** (incorporating one fan module) cools the PCIe slots, **Zone 2** (three fan modules) cools both processors and all the DIMMs.

The fans automatically adjust speeds in response to changing thermal requirements depending on the zone and internal temperatures. When the temperature inside the server increases, the fans speed up to maintain the proper ambient temperature. When the temperature returns to a normal operating level, the fans return to their default speed.

Why not simply run the fans at 100% capacity all the time? For several good reasons: to reduce the ambient noise, reduce the wear-and-tear on the fans and reduce the server power draw. The reduction in ambient noise and power draw may be relatively minor for a single server, but put dozens or hundreds in a data center and it can make a big difference.

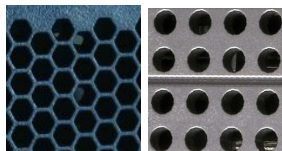
In addition, the server uses **hexagonal ventilation holes** in the chassis. Hexagonal holes can be grouped more densely than round holes, providing greater airflow through the system cover.

This cooling scheme is important because newer, more powerful processors generate a significant amount of heat, and heat must be controlled for the system to function properly.

Hot-Swap/Redundant Components

System availability is maximized through the extensive use of hot-swap and redundant components, including:

- **Redundant memory protection** (with **Chipkill** protection, and **memory mirroring** enabled)



-
- **Hot-swap, redundant hard disk drives** (with **RAID** protection)
 - **Optional hot-swap, redundant power supplies**
 - **Redundant fan modules**
-

Other Features

- **Five USB 2.0 ports** — Provides flexibility to add high-speed external devices. The USB 2.0 specification supports up to 480Mbps transfer rates. (**Note:** Not all USB 2.0 devices are capable of achieving this rate.) Two ports are provided on the front of the server, two on the back, and one internal USB connector reserved for a USB flash memory key containing an embedded hypervisor. For pre-boot and normal drive use, use the external ports.
 - **Toolless slides** — Allows quick rack installation and quicker upgrade and servicing of the server.
 - **Toolless chassis** — The cover can be opened without tools, and many components can be removed and replaced without tools, including the hot-swap drives, DIMMs, PCIe adapters, embedded hypervisor key, and Virtual Media Key. This can save a servicer significant time.
-

Extensive System Support Features

The IBM services and technical support portfolio provides world-class, consistent, high-quality service and support. The x3630 M3 server offers a number of tools and services designed to make ownership a positive experience. From the start, IBM programs make it easier for you to plan for, configure and purchase System x or xSeries servers, get them running and keep them running long-term. These features include IBM Express Portfolio, IBM ServerProven[®], IBM Standalone Solutions Configuration Tool, IBM System x and BladeCenter Power Configurator, IBM ServerGuide, IBM Systems Director Service and Support Manager, Product Customization Services and extensive technical support offerings.



The IBM **ServerProven** program provides the confidence that specific options and operating systems have been tested on the server and are officially supported to work together. It is updated frequently to ensure that the latest compatibility information is always at your fingertips.

The IBM **Standalone Solutions Configuration Tool** (SSCT) is a downloadable tool that simplifies the often complex chore of configuring a full rack of servers (including blade servers) and confirming that you have all the cables, power distribution units, KVM (keyboard, video and mouse) switch boxes and other components you need, as well as the proper airflow clearances, electrical circuits and other environmental conditions.

IBM **System x and BladeCenter Power Configurator** helps IT managers plan for data center power needs, by providing the following information for specific configurations of System x and BladeCenter systems: *power input* (watts), *PDU sizing* (amps), *heat output* (BTUs), *airflow requirements through chassis* (CFM), *VA rating*, *leakage current* (mA), and *peak inrush current* (amps).

IBM **ServerGuide** (installed from CD) simplifies the process of installing and configuring System x and xSeries servers. ServerGuide goes beyond mere hardware configuration by assisting with the automated installation of the Microsoft Windows Server[®] 2003 and 2008 operating systems, device drivers and other system components, with minimal user intervention. (Drivers are also included for support of Novell NetWare, Red Hat Linux and SUSE LINUX.) This focus on deployment helps you reduce both your total cost of ownership and the complexity that administrators and technical personnel face.

IBM **Systems Director Service and Support Manager** (previously called IBM Electronic Service Agent[™]) is an innovative "call home" feature that allows System x and BladeCenter servers to automatically report hardware problems to IBM support, which can even dispatch onsite service if necessary to those customers entitled to onsite support under the terms of their warranty or an IBM Maintenance Agreement. Service and Support Manager resides on a server and provides electronic support and problem management capabilities through a highly secure electronic dialogue between your systems and IBM. It monitors networked servers for hardware errors and it can perform hardware and software inventories and report inventory changes to IBM. All information sent to IBM is stored in a highly secure database and used for improved problem determination.

Additional services include hardware warranty upgrades and factory-installed **Product Customization Services** (PCS), such as asset tagging, hardware integration, software imaging and operating systems personalization.

IBM offers extensive **technical support** by phone and via the Web. Support options include links to forums/newsgroups, problem submission, online shopping support, service offerings, device drivers for all IBM product lines, software downloads and even upcoming technical seminar worldwide schedules and registration. Also available are remote installation, configuration and usage support for System x and xSeries hardware and software, as well as onsite custom services to provide the level of expertise you require.

IBM Maintenance and Technical Support solutions can help you get the most out of your IT

investment by reducing support costs, increasing availability and simplifying management with integrated support for your multiproduct, multivendor hardware and software environment. For more information on hardware maintenance, software support, solution support and managed support, visit <http://ibm.com/services/maintenance>.

Advanced Systems Management Capabilities

The x3630 M3 has a high level of systems management capabilities that are well-suited to remote locations as well as to stand-alone environments. Features include UEFI, IMM, IBM ToolsCenter, IBM Systems Director Active Energy Manager, Automatic Server Restart, Wake on LAN® support, PXE support, text console redirect, Predictive Failure Analysis, and IBM Systems Director.

The **Integrated Management Module (IMM)** provides industry-standard **Intelligent Platform Management Interface (IPMI) 2.0**-compliant systems management. It provides a number of important system functions, including:

- Monitoring of system and battery voltage, system temperature, fans, power supplies, processor and DIMM status
- Fan speed control
- Product ID and Family ID detection
- Highly secure remote power on/off
- System reset control
- NMI/SMI detection and generation
- System diagnostic LED control (power, HDD, activity, alerts, heartbeat)
- IPMI over LAN
- Serial Over LAN
- Proxy server support
- LAN messaging and alerting
- Text console redirection over LAN
- Predictive Failure Analysis for system fans
- Web-based out-of-band control
- SSL (Secure Socket Layer) and LDAP (Lightweight Directory Access Protocol) support
- Enhanced authentication and encryption algorithms (RMCP+ and AES)
- VLAN support
- Local update of IMM firmware
- Firmware firewall
- Support for IPMI v2.0 compliant management software (e.g., xCAT)
- Other mandatory and optional IPMI IMM functions

The IMM alerts IBM Systems Director to anomalous environmental factors, such as voltage and thermal conditions—even if the server has failed.

The x3630 M3 also supports an optional IBM Virtual Media Key for additional systems management capabilities, including:

- Latest OS failure screen capture
- Graphical console redirection over LAN
- High-speed remote redirection of PCI video, keyboard and mouse

IBM **ToolsCenter** consolidates 42 needed tools for managing servers individually into an integrated suite of 8 tools. They are organized by function: deployment, updates, configuration and diagnostics. Tools are now simpler to access and use with a single webpage for access, a common look and feel and a common command line interface for the scripting tools. The ToolsCenter **Bootable Media Creator** offers significantly more functionality than past tools with the ability to add more tools to the bootable image and to automatically download the bootable environment if needed. Bootable Media Creator allows you to create bootable USB keys for updates customized to your systems.

IBM developed IBM **Systems Director Active Energy Manager** to put control of system power-saving features at the fingertips of administrators. Active Energy Manager is designed to take advantage of new features, such as monitoring power usage and balancing the performance of the system according to available power input. It provides the ability to plan and predict power consumption based on your hardware configuration. It also helps enable you to reduce the infrastructure required for redundancy, by using fewer servers on smaller power feeds and potentially lowering your overall data center support costs. It does this by inventorying all components, then adding up the total power draw and tracking the usage. It also includes power management features to help administrators manage or reduce power usage.

Automatic Server Restart (ASR) helps reduce downtime by restarting the server automatically in the event of a system lockup. ASR technology is a combination of hardware circuitry tied into the server's system reset function and a device driver. As long as the server continues running, the ASR watchdog timer will keep being reset, but if the operating system crashes or the hardware freezes somehow the ASR software will be unable to reset the hardware timer. If the timer is not reset within five minutes, it automatically triggers the ASR hardware, which immediately restarts the server (and logs an ASR event with IBM Systems Director). These features are designed so that *no more than five minutes can pass before the server is restarted*.

Wake on LAN permits the server to be remotely powered on if it has been shut off. Once powered up, the server can be controlled across the network, using the **Preboot Execution Environment (PXE)**.

Like Wake on LAN, PXE is system firmware. It enables management software, such as the optional **Tivoli Provisioning Manager for OS Deployment**, to take control of a system before the BIOS, operating system or applications are loaded (using Wake on LAN/PXE) and lets an administrator perform many low-level tasks remotely that would otherwise require a visit to each system. These tasks may include such things as formatting a hard disk drive, updating system firmware, or deploying a Windows or Linux operating system.

Text Console Redirection support allows the administrator to remotely view x3630 M3 text messages over serial or LAN. An optional upgrade to the Virtual Media Key adds graphical console redirection.

Predictive Failure Analysis (PFA) is designed to allow the system to detect impending failure of supported components (memory, HDDs, and the onboard battery) *before* actual failure, and alert the administrator through IBM Systems Director. This gives you the ability to *replace* the failing component *before* it fails, resulting in increased uptime.

IBM Systems Director software for advanced workgroup management is included with the x3630 M3. IBM Systems Director comes with a portfolio of tools, including **IBM Systems Director Active Energy Manager™**, **Service and Support Manager**, and others. Other tools are available as add-ons for additional server management and increased availability. IBM Systems Director provides a single uniform graphical interface for all of these systems management functions.

IBM Systems Director enables you to customize thresholds and monitor system components (for things like temperature, voltage regulation, etc.) to help maximize uptime.

Key Options

IBM options for System x servers help you take your servers to a higher level

You rely on System x options to supply a complete solution for your business needs. Options help you create an optimized server system to meet your data protection, storage and availability needs. Every IBM option is designed and tested for peak performance and flexibility, helping to maximize your return on investment. The combination of System x servers and options lets you keep your fingers on the pulse of your e-business.

Processors — Intel Xeon processors provide high clock rates, 4 to 6 cores, and advanced features for performance, availability and power management. Large cache size, combined with fast **1333MHz, 1066MHz or 800MHz** memory access and an integrated memory controller reduce memory latency and facilitate the movement of data. (**Note:** System performance depends not only on the number of processors in the server but also on the frequency and functionality of each processor.) Adding a second processor may be a cost-effective way to achieve significant performance improvements.

Memory — Memory is a major factor in systems application performance. Adding more memory to a System x server is one of the most effective ways to increase application performance. For best performance in a server with a **4-core** processor, there should be twice as much memory as for a 2-core processor. A **6-core** processor should have three times as much memory as a 2-core processor.

Hard Disk Drives — IBM hard disk drives help you improve the transaction and cost performance of your System x servers. The choice of hard disk drives can be a critical aspect of maximizing the I/O throughput of the system. **3.5-inch hot-swap SAS** hard disk drives are available for the x3630 M3 with capacities of up to **2TB** at **7,200 RPMs** or up to **600GB** at **15,000 RPMs**. **3.5-inch hot-swap SATA** HDDs are available in capacities up to **2TB** at **7,200 RPMs** or up to **500GB** at **15,000 RPMs**. **2.5-inch SAS** HDDs are available with capacities of up to **600GB** at **10,000 RPMs**; and **SATA** HDDs offer capacities of up to **500GB** at **7,200 RPMs**.

Power Supply — The optional second power supply for the x3630 M3 enables redundancy for hot-swap power. In addition, its **92%-efficient** design helps lower your energy bill for power and cooling.

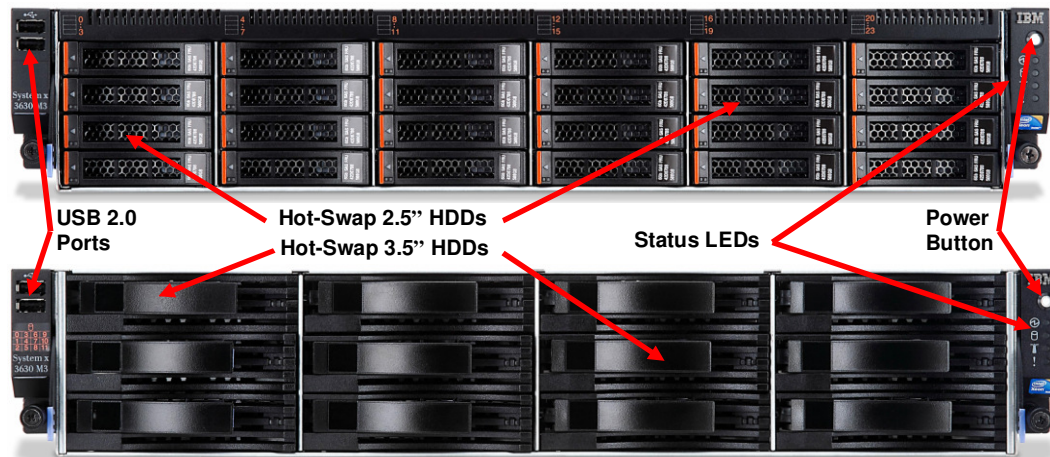
Virtual Media Key — The x3630 M3 includes a plethora of systems management features built-in; however, sometimes additional management capability is needed. In those situations, the Virtual Media Key not only offers powerful new features, it does so without taking up a valuable PCIe adapter slot, instead using a dedicated connector on the motherboard.

ServeRAID Controllers — System x servers using ServeRAID technology allow companies to build a reliable foundation for business-critical computing. IBM ServeRAID technology allows an array consisting of multiple physical hard disk drives to be treated as one logical drive. ServeRAID technology also allows data to be stored redundantly, across multiple hard disk drives—enhancing both the integrity and the availability of the data. SAS and SATA ServeRAID controllers offer enhanced performance due to onboard processors and cache. Because IBM ServeRAID controllers can help significantly improve data transfer rates, this technology is extremely effective when implementing demanding, transaction-oriented applications. By employing the advanced fault tolerance of IBM ServeRAID technology, companies can effectively implement networked business systems that require large amounts of storage space for data and applications that must be available for their businesses to continue operating.

The IBM **ServeRAID-M1015**, x8 PCIe and **6Gbps**, offers RAID-0/1/10; optionally RAID-5/50 with **SED** support. The IBM **ServeRAID-M5014**, x8 PCIe and **6Gbps**, provides **256MB** cache and RAID-0/1/10/5/50; optionally RAID-6/60 with SED, and battery backup). The IBM **ServeRAID-M5015**, x8 PCIe and **6Gbps**, has **512MB** cache and RAID-0/1/10/5/50; optionally RAID-6/60 with SED, and battery backup. The **IBM ServeRAID M1000 Series Advance Feature Key** adds **RAID-5/50** and **SED** support to the ServeRAID-M1015. Similarly, the **IBM ServeRAID M5000 Series Advance Feature Key** adds **RAID-6/60** with **SED** support to the M5014 and M5015. The **IBM ServeRAID M5000 Series Battery Key** adds **battery backup** support to the M5014.

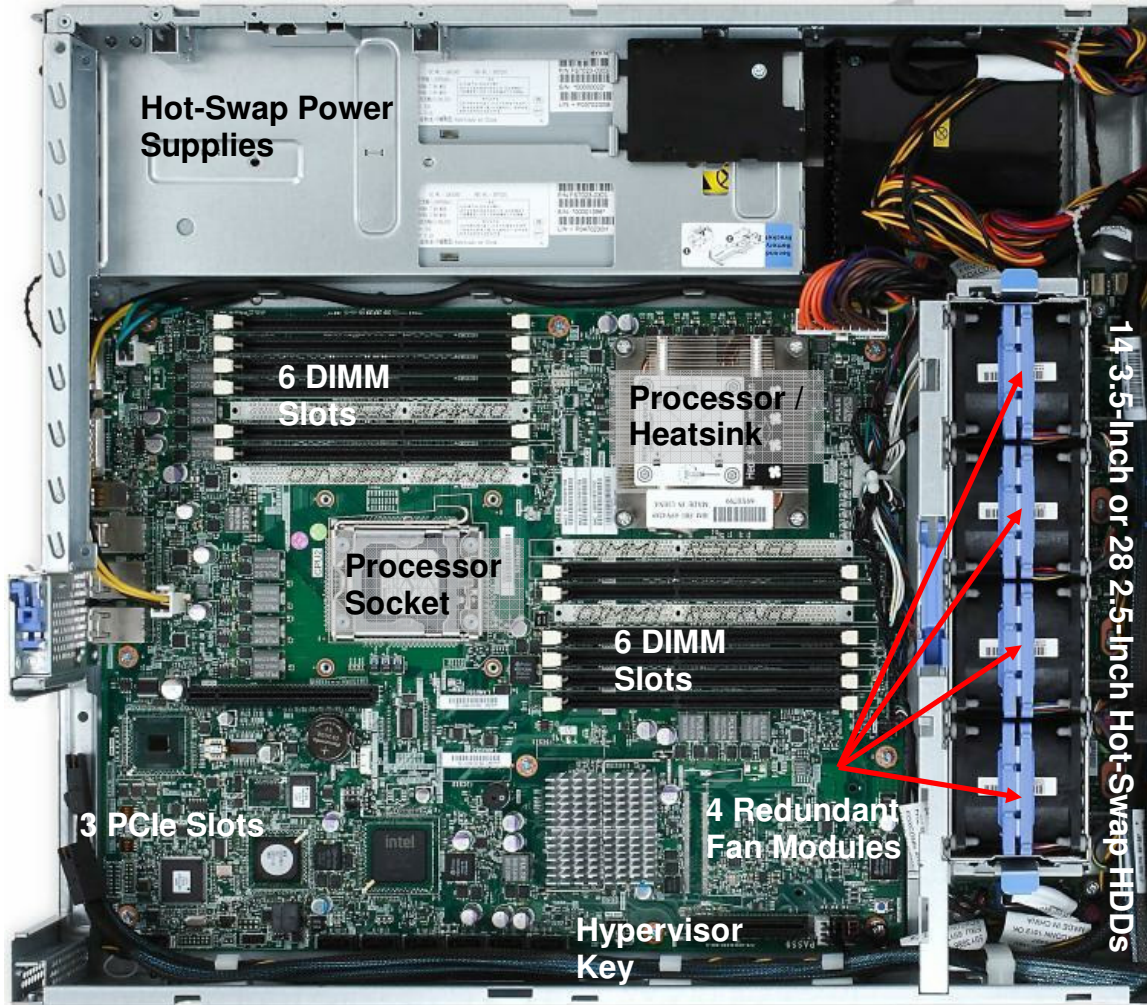
External Storage — The IBM **System Storage EXP810** and **EXP3000** expansion units, as well as the **DS4000** series storage subsystems comprise a powerful shared storage family with integrated management software designed to meet midrange and enterprise needs.

x3400 M3 Images Inside View

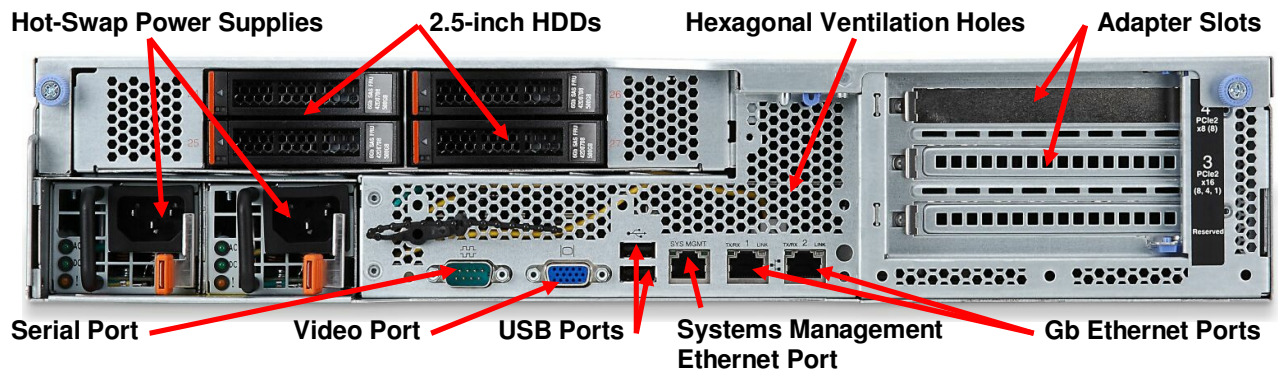


A cost-optimized storage-rich alternative to traditional enterprise 2U dual-socket servers

Inside View



Rear View



IBM System x3630 M3 Specifications				
Machine type	7377-22x, 32x, 42x, 52x, 62x/64x, 72x, A2x, B2x, C2x, D2x, F2x, G2x			
Form factor	2U			
Processor types (standard or via CTO)	6-Core Xeon (E56xx/L56xx/X56xx) 2.26GHz L5640 (CTO), 2.4GHz E5645 (D2x), 2.53GHz E5649 (F2x), 2.66GHz X5650 (62x/64x), 2.8GHz X5660 (CTO),, 2.93GHz X5670 (72x); 3.06GHz X5675 (G2x)		4-Core Xeon (E56xx/L56xx/56xx) 1.6GHz E5603 (A2x), 1.86GHz L5609 (CTO), 2.13GHz E5606 (CTO), 2.13GHz L5630 (CTO), 2.26GHz E5607 (B2x), 2.4GHz E5620 (C2x), 2.53GHz E5630 (42x), 2.66GHz E5640 (52x), 3.2GHz X5672 (CTO)	
			4-Core Xeon (E55xx) 2.13GHz E5506 (22x), 2.26GHz E5507 (32x) 2-Core Xeon (E55xx) 2.0GHz E5503 (CTO),	
Maximum processor power draw	95W —62x/64x, 72x, G2x, plus X5660/X5672 via CTO	80W —all other models, plus E5503, E5606/E5630 via CTO	60W —L5640 via CTO	40W —L5609/L5630 via CTO
QuickPath Interconnect (QPI) speed (gigatransfers per second)	6.4GTps (62x/64x, 72x, G2x, plus X5660/X5672 via CTO)		5.86GTps (42x, 52x, C2x, D2x, F2x, plus L5630/L5640 via CTO)	
# of processors standard / maximum	1 / 2			
Hyper Threading Technology supported	Yes (2 threads per core) — 42x, 52x, 62x/64x, 72x, C2x, D2x, F2x, G2x, plus L5630/L5640 via CTO		No — 22x, 32x, A2x, B2x, E5503, plus E5606, L5609 via CTO	
Turbo Boost Technology supported	Yes — 42x, 52x, 62x, 72x, C2x, D2x, F2x, G2x, plus L5630/L5640 via CTO		No — 22x, 32x, A2x, B2x, plus E5503, E5606, L5609 via CTO	
Internal L3 cache	12MB (1 shared 12MB cache)—42x, 52x, 62x/64x, 72x, C2x, D2x, F2x, G2x, plus E5620, L5630, L5640 via CTO		8MB (1 shared 8MB cache)—B2x, plus E5606 via CTO	
Internal L3 cache	4MB (1 shared 4MB cache)—22x, 32x, plus E5503, E5603 via CTO			
Chipset	Intel 5520			
BIOS type	Unified Extensible Firmware Interface (UEFI)			
Standard memory⁷ (96GB maximum)	12GB (3 x 4GB) — 62x, 72x		4GB (1 x 4GB) — 22x, 32x, 42x, 52x, 64x, A2x, B2x, C2x, D2x, F2x G2x	
# of DIMM sockets total / available	12 / 9 — 62x, 72x		12 / 11 — 22x, 32x, 42x, 52x	
Memory voltage standard	1.5V (22x, 32x, 42x, 52x, 62x, 72x, CTO)		1.35V (64x, A2x, B2x, C2x, D2x, F2x, G2x, CTO)	
Memory type standard	Registered PC3-10600 (DDR III ECC (Chipkill protection standard)—Dual-rank x4 (22x, 32x, 42x, 52x, 62x, 72x, CTO)		Registered PC3-10600 (DDR III ECC (Chipkill protection optional)—Single-rank x4 (64x, A2x, B2x, C2x, D2x, F2x, G2x, CTO)	
Maximum memory access speed	1333MHz (62x/64x, 72x, G2x, plus X5660 via CTO)		1066MHz (42x, 52x, C2x, D2x, F2x, plus L5609/L5630/L5640 via CTO)	
Memory interleaving	Yes (two-way using pairs of DIMMs)			
DIMM types / capacities supported	PC3-10600 1333MHz RDIMM 1GB single-rank x8, 1.5V;		PC3L-10600⁸ 1333MHz RDIMM 2GB dual-rank x8 1.35V;	
	PC3L-8500R 1066MHz RDIMM 8GB dual-rank x4 1.35V			

IBM System x3630 M3 Specifications				
	2GB single-rank x4 , 1.5V; 2GB dual-rank x8 1.5V; 4GB dual-rank x4 1.5V; 8GB dual-rank x4 1.5V	4GB dual-rank x4 1.35V; 8GB dual-rank x4 1.35V		
Supports 1333MHz with 2 DIMMs per channel	L5640 and X56xx processors support 2DPC at 1333MHz			
Online hot-spare memory supported	No			
Memory mirroring supported / # of DIMM sockets reserved for mirroring	Yes / 1 channel (2 slots per processor) active, 1 spare, 1 unused			
Storage technology	Hot-swap 2.5-inch/3.5-inch SAS/SATA			
# of HDD drive bays total / available	14 / 14 (3.5-inch hot-swap —using optional hot-swap cage assembly (22x, 32x, 42x, 62x/64x, A2x, B2x, D2x)	28 / 28 (2.5-inch hot-swap —using optional hot-swap cage assembly (52x, 72x, C2x, F2x, G2x)		
# of 5.25" bays total / available	None			
Maximum drive capacity	3.5-inch HS SAS 7.2TB (12 x 600GB) <i>without</i> 3.5-inch cage assembly; 28TB (14 x 2TB) <i>with</i> 3.5-inch cage assembly	3.5-inch HS SATA II 24TB (12 x 2TB) <i>without</i> 3.5-inch cage assembly; 28TB (14 x 2TB) <i>with</i> 3.5-inch cage assembly	2.5-inch HS SAS 14.4TB (24 x 600GB ³) <i>without</i> 2.5-inch cage assembly; 16.8TB (28 x 600GB) <i>with</i> 2.5-inch cage assembly	2.5-inch HS SATA II 12TB (24 x 500GB) <i>without</i> 2.5-inch cage assembly; 14TB (28 x 500GB) <i>with</i> 2.5-inch cage assembly
Drive capacities supported	3.5-inch HS SAS 300, 450, 600GB—15K ; 1, 2TB—7.2K	3.5-inch HS SATA II 250GB, 500GB—15K ; 1TB, 2TB—7.2K	2.5-inch HS SAS 500GB—7.2K ; 146.8, 300, 600GB—10K ; 146.8GB—15K	2.5-inch HS SATA II 160, 500GB—7.2K
# of HDDs standard	None (all models open bay)			
# of optical drives standard	None (optional via USB)			
# of diskette drives standard	None (optional via USB)			
Internal backup supported	None			
Integrated disk controller	Chipset			
RAID controllers standard	ServeRAID-M1015 (no cache)—RAID-0/1/10; optional RAID-5/50 with SED, 6Gbps; supports 8 drives—22x, 32x, A2x, B2x	ServeRAID-M5014 (256MB cache)—RAID-0/1/10/5/50; optional RAID-6/60 with SED, optional battery; 6Gbps; supports 8 drives—42x, 52x, C2x, D2x, F2x	ServeRAID-M5015 (512MB battery-backed cache)—RAID-0/1/10/5/50; optional RAID-6/60 with SED; 6Gbps ; supports 8 drives—62x/64x, 72x, G2x	
Optional RAID controllers	ServeRAID-M5014 —22x, 32x, A2x, B2x		ServeRAID-M5015 —22x, 32x, 42x, 52x, A2x, B2x, C2x, D2x, F2x	
External disk drives supported	None			
# of adapter slots total / available	2 / 1			
# of PCIe x16/x8 Gen 2 slots (8GBps)	1 (full-height/half-length)			
# of PCIe x8/x8 Gen 2 slots (8GBps)	1 (full-height/half-length) —contains the RAID controller			
# of PCIe x16/x4 Gen 2 slots (4GBps)	None ¹⁰			
# of PCI-X/133 slots (1GBps)	None			

IBM System x3630 M3 Specifications		
# of 33MHz legacy PCI slots	None	
# of video ports	1 (rear)	
Video controller	Matrox G200eV (in IMM) standard (NVIDIA FX580 optional)	
Video memory	16MB DDR3 SDRAM	
Maximum video resolutions	1280x1024 at 60Hz (32 bits)	1600x1200 at 85Hz (16 bits)
Gigabit Ethernet controller	Intel 82575	
Fabric acceleration standard	None	
# of Gigabit Ethernet ports	2	
Emulex 10GbE Integrated Virtual Fabric Adapter for IBM	2 ports available via CTO	
# of RS485 ports	None	
# of serial ports	1 (rear)	
# of parallel ports	None (USB-attached)	
# of mouse ports	None (USB-attached)	
# of keyboard ports	None (USB-attached)	
# of USB 2.0 ports	5 (2 front, 2 rear, 1 internal for a USB flash memory key containing an embedded hypervisor)	
Integrated systems management controller	Yes (IMM)	
Optional systems management adapter	Virtual Media Key (optional)	
Light path diagnostics support	No (LEDs only)	
Predictive Failure Analysis (PFA) support	Memory, HDDs, and the onboard battery	
Power supply size	675W universal, autoswitching, hot-swap; 92% efficiency (all models)	675W HE universal, autoswitching, hot-swap; 95% efficiency (optional)
# of power supplies standard / maximum	1 / 2	
Hot-swap/redundant power supported	Yes (with two power supplies installed)	
# of fan modules standard / maximum	4 / 4 (2 fans per module)	
Hot-swap/redundant fans supported	Redundant-only	
Heat emitted (minimum/maximum)	663 – 2,305 BTUs; 194 - 675 Watts	
Rack mount method	Rail	
Maximum altitude	7,000 ft; 2,133 m	
Operating temperature range	50 – 95° F; 10 – 35° C (up to 3,000 ft / 914.4 m)	50 – 90° F; 10 – 32° C (3,000 ft to 7,000 ft / 914.4m to 2,133m)
Dimensions (HWD) / weight	3.4" (86.5mm) H 19.2" (488.0mm) W 29.5" (749.4mm) D	35.7 (minimum) – 54.7 lb (maximum) 16.2 – 24.8 kg —2.5-inch drives
		36.2 (minimum) – 64.4 lb (maximum) 16.4 – 29.2 kg —3.5-inch drives
Operating systems supported	Microsoft Windows Server 2008 / 2008 R2 (Standard/Enterprise/Web/Datacenter), 64-bit; Microsoft Windows Server 2003 / 2003 R2 (Standard/Enterprise/Web/Datacenter), 64-bit; Microsoft SBS 2003 R2 (Standard/Premium); RHEL 5 U4 64-bit,	

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	with and without Xen; SLES 11 64-bit with and without Xen, 32-bit without Xen; SLES 10 SP3 64-bit with and without Xen; VMware ESX/ESXi/vSphere 4.0/4.1
Length of limited warranty	3 years (parts and labor) ¹¹

The Bottom Line

The IBM System x3630 M3 is an extremely energy efficient, powerful system, incorporating significantly redesigned management tools and abundant IBM-unique innovations:

Price/Performance

- **High-throughput processors** — Up to two **2.26 to 3.06GHz 6-core** or **1.6GHz to 3.2GHz 4-core** Xeon **5600** series processors; or two **2.13GHz to 2.26GHz 4-core** or **2.0GHz 2-core** Xeon **5500** series processors, standard or via CTO
- **Energy-efficient low-voltage processors** — **40W 4-core** and **60W 6-core** Xeon 5600 Series processors (via CTO)
- **Hyper Threading Technology** for up to **12** processor cores and **24** threads total (processor-specific)
- **Turbo Boost Technology** for a performance boost when not all cores are in use (processor-specific)
- **Large cache** — **12MB** or **4MB** of L3 processor cache (processor-specific)
- **Fast memory** — Registered **PC3-10600 DDR III ECC** DIMMs standard, operating at **1333MHz, 1066MHz** or **800MHz** (depending on processor model and memory configuration); supports 2 DIMMs per channel at 1333MHz (5600 series only)
- **Fast disk technology** — Supports high-performance **6Gbps SAS** drives that provide high density/high reliability and allow you to scale up as your business grows
- **High-capacity, low-cost storage** — Supports SAS and SATA II drives with capacities up to 2TB apiece (up to 28TB internal capacity)
- **Fast communications** — Integrated **dual Gigabit Ethernet** controllers standard, with **failover** support
- **Fast I/O** — Two **PCIe** adapter slots (x16/x8 and x8/x8)

Flexibility

- **Large memory capacity** — Up to **192GB** of registered DDR3 DIMMs, in **12** DIMM slots
- Up to **14 3.5-inch hot-swap SAS/SATA** or **28 2.5-inch hot-swap SAS/SATA** HDDs
- **Choice of disk storage** — Up to **28TB** of internal hot-swap **SAS/SATA** storage
- **High-performance external expansion** — **Five** 480Mbps **USB 2.0** ports (two front, two rear, one internal for a flash memory USB key containing an embedded hypervisor support)
- Hardware-based **6Gbps RAID-0/1/10** or **RAID-0/1/10/5/50** standard
- **Two** adapter slots:
 - One x16/x8¹² PCIe** Gen 2 slots (8GBps)
 - One x8/x8¹³ PCIe** Gen 2 slots (8GBps)—reserved for ServeRAID controller

Manageability, Serviceability and Availability

- **IBM Systems Director** systems management software, including (among others):
 - IBM Systems Director Active Energy Manager
 - IBM Service and Support Manager
- **Integrated Management Module (IMM):**
 - IPMI 2.0** compliance, including highly secure remote power control
 - Text console redirection** systems management standard
 - Optional **Virtual Media Key** daughter card (no slot required)
 - Supports **LDAP** and **SSL** industry standards
- **Active Memory protection:**
 - Advanced **Chipkill** ECC memory protection support
 - Memory mirroring**
- Integrated **ServeRAID** controller — enhances system availability and serviceability
- A choice of **hot-swap SAS/SATA** HDDs for quicker servicing than with fixed drives
- **Ultra-efficient cooling** with **redundant fan modules**
- Optional **hot-swap/redundant power supplies**

- Front-panel status LEDs
- Toolless chassis and toolless slide design

Server Comparison Chart

The following table shows the suggested uses for the respective IBM System x rack-optimized servers, including comparisons of the uses for which each server is best suited:

		Requirements								Rack-Optimized Servers												
Theme	Key Workloads	Scalability	Floating Point Performance	Memory Throughput	Integer Performance	IO and Storage	Density	High Availability	Systems Management	Security	Distributed Deployment	X3250 M3	X3550 M3	X3620 M3	X3630 M3	X3650 M3	X3690 X5	X3755 M3	X3850 X5	X3950 X5		
HPC	Cluster / HPC		Best	Best	Best	Best	Best	Best				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	
	Modeling & Simulation		Best	Best	Best	Best	Best	Best				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
	High Performance DB		Good	Good	Good	Good	Good	Good				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
	Business Intelligence		Good	Good	Good	Good	Good	Good				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Web 2.0 / Web 3D	Search		Good	Good	Good	Good	Good	Good				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
	Content		Good	Good	Good	Good	Good	Good				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
	Communities		Good	Good	Good	Good	Good	Good				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
	Commerce		Good	Good	Good	Good	Good	Good				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Business Applications	Collaboration		Good	Good	Good	Good	Good	Good				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
	ERP/SCM		Good	Good	Good	Good	Good	Good				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
	CRM		Good	Good	Good	Good	Good	Good				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
	Hosted Client		Good	Good	Good	Good	Good	Good				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Infrastructure Applications	Point of Sale		Good	Good	Good	Good	Good	Good				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
	Branch Office		Good	Good	Good	Good	Good	Good				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
	Virtualization		Good	Good	Good	Good	Good	Good				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
	Business Continuity		Good	Good	Good	Good	Good	Good				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
	Database		Good	Good	Good	Good	Good	Good				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
	Email/Collaboration		Good	Good	Good	Good	Good	Good				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Infrastructure Applications	Security		Good	Good	Good	Good	Good	Good				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
	Web Serving		Good	Good	Good	Good	Good	Good				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
	File & Print		Good	Good	Good	Good	Good	Good				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good

Important

Nice to Have

Can do without

Best

Better

Good



For More Information

IBM System x Servers	http://ibm.com/systems/x
IBM Systems Director Service and Support Manager	http://ibm.com/support/electronic
IBM System x and BladeCenter Power Configurator	http://ibm.com/systems/bladecenter/resources/powerconfig.html
IBM Standalone Solutions Configuration Tool	http://ibm.com/systems/x/hardware/configtools.html
IBM Configuration and Options Guide	http://ibm.com/systems/x/hardware/configtools.html
IBM ServerProven Program	http://ibm.com/systems/info/x86servers/serverproven/compat/us
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Other Technical Support Resources	http://ibm.com/systems/support

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MB, GB and TB = 1,000,000, 1,000,000,000 and 1,000,000,000,000 bytes, respectively, when referring to storage capacity. Accessible capacity is less; up to 3GB is used in service partition. Actual storage capacity will vary based upon many factors and may be less than stated.

Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will depend on considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

Maximum internal hard disk and memory capacities may require the replacement of any standard hard drives and/or memory and the population of all hard disk bays and memory slots with the largest currently supported drives available. When referring to variable speed CD-ROMs, CD-Rs, CD-RWs and DVDs, actual playback speed will vary and is often less than the maximum possible.

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