

Product Guide

September 2011



IBM System x3250 M4

Product Overview

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Value-priced performance, capacity and availability

Suggested uses: Retail/kiosks, and SMBs, looking for file and printer servers, Web serving, small business infrastructure, and virtual desktops for small workgroups.

Budgets are tight and you need to reduce IT infrastructure expenses and save space without sacrificing performance or quality. The **single-socket IBM® System x3250 M4**, incorporating **IBM X-Architecture®** features, is a cost-efficient, edge-of-network solution to that dilemma. It supports, at the high end, the latest **quad-core Intel® Xeon® E3** series processors, designed with speedy **1333MHz** memory access, **8MB** of L3 cache, and multithreading, to help provide the computing power you need to match your business needs and growth. For lower processing speed requirements, there are also models featuring **dual-core Core® i3** and **Pentium®** processors with **3MB** of L3 cache. All models are designed with an integrated memory controller for greatly improved memory performance (up to **1333MHz** access). In addition, the x3250 M4 uses industry-standard **DDR3 ECC** (Error Checking and Correcting) memory—for high performance and reliability.

All models offer impressive scalability, including up to **32GB** of memory and up to **two 3.5-inch simple-swap enterprise-class SATA II** hard disk drives with a total capacity of up to **6TB¹**, or up to **four 2.5-inch simple-swap enterprise-class SAS** hard disk drives with a total capacity of up to **2.4TB**, available via the configure-to-order (CTO) process.

IBM ServeRAID® C100 for IBM system x provides RAID-0/1 support for internal SATA HDDs. For data backup, the x3250 M4 supports external **tape drives** or an internal 3.5-inch DDS-6 tape drive or **RDX Removable Disk Cartridge** drive.

The x3250 M4 is compliant with **80 PLUS®** standards, demonstrating exceptional energy efficiency.

Standard in the x3250 M4 is the **Integrated Management Module version 2 (IMM2)** that enables the user to manage and control the server easily. The IMM2 offers a high level of manageability that is designed to keep costs down and the system up—even when network usage increases. Industry-standard **IPMI 2.0** support includes **highly secure remote power control** and **Serial over LAN**, as well as **text-console redirect over LAN**.

Unified Extensible Firmware Interface (**UEFI**) is an evolutionary leap over legacy BIOS. UEFI provides a more intuitive user interface and understandable event logs and better management. This high level of manageability is designed to keep costs down and the system up—even when network usage increases.

With the inclusion of unique IBM service and support features such as **IBM Systems Director**, and **IBM ServerGuide™**, the x3250 M4 is designed for superior uptime.

If you need single-socket, quad- or dual-core computing price/performance and vast internal storage in a budget rack package, the x3250 M4 is the ideal system.

Selling Features

Price/Performance

The x3250 M4 offers numerous features to boost performance and reduce product and operating costs:

- Models with a **quad-core Xeon** processor, high-end **1333MHz** memory access, and **8MB** of L3 cache, offer peak performance, capable of tackling the toughest jobs.
- Models containing a high-performance **dual-core Core i3** processor, with high-end **1333MHz** memory access and **3MB** of L3 cache, offer superior performance at an aggressive price.
- **Energy-efficient 20-65W processors** draw less power and produce less waste heat than high-wattage processors, thus helping to reduce your energy costs.
- Ultra-fast **1333MHz DDR3 ECC** memory offers high speed and high availability.
- **High-speed PCIe** adapter slots offers investment protection by supporting high-

¹ GB equals 1,000,000,000 bytes and TB equals 1,000,000,000,000 bytes when referring to hard disk drive capacity. Accessible capacity may be less.

performance adapters, such as Ethernet, Fibre Channel cards, none of which will run in older legacy PCI slots.

- Standard ServeRAID C100 for IBM System x provides integrated RAID-0/1 on SATA models for no additional cost.
- Optional integrated hardware **RAID-0/1/10/5/6** support offers improved performance and/or redundancy, but doesn't consume a valuable adapter slot.
- Support for **two simple-swap 3.5-inch SATA** hard disk drives or up to **four hot swap (HS) or simple-swap (SS) 2.5-inch SAS** HDDs (SS via CTO only) offers high-performance and large capacity with high availability. The SAS/SATA controller provides full-duplex data transfers for SAS drives.
- Up to **two 3.5-inch** enterprise-class **SATA II** or up to **four 2.5-inch SAS** hard disk drives (model-specific) offer terrific price/performance (incorporating up to **6Gbps** throughput).
- The two integrated single-port **Gigabit Ethernet** controllers with **IPMI 2.0** support provide high-speed network communications.
- A **high degree of device integration**, including SATA, systems management, video, dual Gigabit Ethernet, and optional RAID controllers, lowers costs and frees up valuable adapter slots.
- Energy-efficient components, including DDR3 memory and power supplies, help keep your energy bills down.

Flexibility

The x3250 M4 has the ability to grow with your application requirements, thanks to:

- A choice of one **quad-core Xeon E3** processor with **2.2 to 3.5GHz** clock rate, **8MB** of L3 cache, and **1333MHz** memory access, or a **dual-core Core i3** processor with a **3.1 or 3.3GHz** clock rate, **3MB** of L3 cache, and **1333MHz** memory access.
- A choice of **20 or 65W** dual-core or **45-95W** quad-core processors.
- Up to **32GB** of high-speed DDR3 system memory.
- Two adapter slots: **one PCIe x8**, plus **one PCIe x4** (used by the ServeRAID-BR10iL v2 controller, if installed) in all models.
- The **seven USB 2.0** ports (two front, four rear, one internal) are up to **40X** faster² than older **USB 1.1** ports. This provides speedy access to external HDDs (non-arrayed), optical drives, tape drives, and other USB devices. The internal ports can be used for an optional USB key with embedded hypervisor and an internal data backup device, such as a tape drive or RDX Removable Disk Cartridge drive.
- **Up to two** internal **3.5-inch simple-swap SATA** or **four 2.5-inch hot swap or simple-swap SAS HDDs** (model dependant), can be installed. Support for up to **four simple-swap 2.5-inch SAS** drives is available via CTO. This provides tremendous internal storage capability, along with full data backup.
- Alternatively, external SAS, SATA, iSCSI or Fibre Channel-attached storage can be attached using **IBM System Storage®** servers.

Manageability

Powerful systems management features simplify local and remote management of the x3250 M4:

- The x3250 M4 includes an **Integrated Management Module** version 2 (**IMM2**) to monitor server availability, perform Predictive Failure Analysis, etc., and trigger **IBM Systems Director** alerts.
- Integrated industry-standard Unified Extensible Firmware Interface (**UEFI**) next-generation BIOS. New capabilities include:
 - Human readable event logs; no more beep codes
 - Complete setup solution by allowing adapter configuration function to be moved into UEFI
 - Complete out-of-band coverage by Advance Settings Utility to simplify remote setup
- Integrated **IPMI 2.0** support alerts IBM Systems Director to anomalous environmental factors, such as voltage and thermal conditions.
- The completely redesigned **IBM Systems Director** is included for proactive systems management. IBM Systems Director comes with a portfolio of tools, including **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,

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

pager, and other methods.

- The x3250 M4 optionally supports **remote presence/concurrent KVM (cKVM)** and **concurrent media (cMedia)** access by multiple administrators at once, via the IMM2. (This feature requires an upgrade, via the Feature on Demand key, in 1H 2012.)

Availability and Serviceability

The x3250 M4 provides many features to simplify serviceability and increase system uptime:

- **Server-class components**, including the processor, memory, chipset, power supply, and others, are built for the rigors of an “always-on” environment. This helps reduce the risk of failure and life cycle costs, versus using a PC as a server.
- **ECC memory** provides error correction not available in PC-class “servers” that use parity memory. Avoiding system crashes (and data loss) due to soft memory errors can mean greater system uptime
- **Toolless cover removal** provides easy access to upgrades and serviceable parts, such as HDDs and memory. This means less time (and therefore less money) spent servicing the x3250 M4.
- **Toolless rails** ship with the server, which allow the rack server to easily slide into place
- A lighted LED beside each DIMM slot indicates a working DIMM. When a DIMM fails, the LED goes out. This quickly leads the technician to the failed DIMM and simplifies servicing, speeds up problem resolution and helps increase server availability.
- **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 2.0**, including **VLAN** support, **Serial over LAN**, enhanced authentication and encryption algorithms (**RMCP+** and **AES**) and a **firmware firewall**.
- The **three-year (parts and labor) limited onsite warranty**³ offered on standard models (Machine Type **2583**) helps give you peace of mind and greater investment protection than a one-year warranty does.



Key Features

Multicore Intel Processors

The x3250 M4 supports one of the latest Intel **Xeon E3** or **Core i3** processors, allowing you to choose the most appropriate processor for your business needs. The x3250 M4 offers a choice of processor clock rates, cache sizes, and power draw:

- **80W quad-core Xeon E3** models **1270** or **1220**, running at 3.4 or 3.1GHz (respectively), with reduced power draw and excellent performance/watt (only **20W** per core), **8MB** of L3 processor cache, **1333MHz** memory access, 2 threads per core, and Intel Turbo Boost technology
- **65W dual-core Intel Core i3** model **2100** running at 3.1GHz, with low power draw and good performance/watt (only **32.5W** per core), **3MB** of L3 processor cache, and **1333MHz** memory access
- **65W dual-core Intel Pentium** model **G850** running at 2.9GHz, with low power draw and good performance/watt (only **32.5W** per core), **3MB** of L3 processor cache, and **1333MHz** memory access

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

- **95W quad-core Xeon E3** model **1280**, running at 3.5GHz, with reduced power draw and excellent performance/watt (only **23.75W** per core), **8MB** of L3 processor cache, **1333MHz** memory access, 2 threads per core, and Intel Turbo Boost technology
- **80W quad-core Xeon E3** models **1240**, or **1230**, running at 3.3 or 3.2GHz (respectively), with reduced power draw and excellent performance/watt (only **20W** per core), **8MB** of L3 processor cache, **1333MHz** memory access, 2 threads per core, and Intel Turbo Boost technology
- **45W quad-core low-voltage Xeon E3** models **1260L**, running at 2.4GHz, with excellent power draw and performance/watt (only **11.25W** per core), **3MB** of L3 processor cache, **1333MHz** memory access, 2 threads per core, and Intel Turbo Boost technology
- **20W dual-core low-voltage Xeon E3** models **1220L**, running at 2.2GHz, with excellent power draw and performance/watt (only **10W** per core), **3MB** of L3 processor cache, **1333MHz** memory access, 2 threads per core, and Intel Turbo Boost technology

³ 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.

- **65W** dual-core Intel **Core i3** models **2130** or **2120** running at 3.4 or 3.3GHz, respectively, with low power draw and good performance/watt (only **32.5W** per core), **3MB** of L3 processor cache, and **1333MHz** memory access
- **65W** dual-core Intel **Pentium** models **G860** or **G840** running at 3.0 or 2.8GHz, respectively, with low power draw and good performance/watt (only **32.5W** per core), **3MB** of L3 processor cache, and **1333MHz** memory access
- **65W** dual-core Intel **Pentium** models **G630** or **G620** running at 2.7 or 2.6GHz, respectively, with low power draw and good performance/watt (only **32.5W** per core), **3MB** of L3 processor cache, and **1066MHz** memory access

The **two-core** processors contain **two complete processor cores**; **four-core** processors, similarly, contain **four** cores. The processors also contain one shared cache. The shared cache is dynamically allocated among cores as needed. The cores appear to software as physical processors. The two-core processors offer considerably higher performance than a same-speed Xeon processor with a single core. Likewise, four-core processors offer considerably higher performance than a same-speed Xeon processor with two cores.

1333MHz memory access offers up to **9%** higher throughput at the same processor clock speed than **1066MHz** memory access.

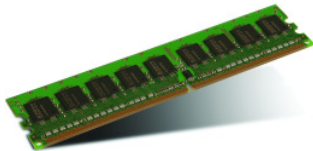
Note: Because of the integrated memory controllers the former front-side bus (FSB) no longer exists.

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.

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.



High- Performance, Low-Latency DDR3 ECC Memory

The x3250 M4 ships with one DIMM installed and supports up to **32GB** of Unbuffered DIMM (**UDIMM**) memory in **4** DIMM sockets. It uses **PC3-10600** double data rate III (**DDR3**) memory operating at **1333MHz** for fast access, and provides ECC memory protection.

The x3250 M4 supports either **1, 2, or 4** UDIMMs. When 2 or 4 DIMMs are installed, memory operates in **two-way interleaved** mode for increased performance. **UDIMMs** are available in kits consisting of *one* **1GB DIMM** or *two* **1GB, 2GB, 4GB or 8GB DIMMs** (available in 2Q 2011). The x3250 M4 supports both single- and dual-rank UDIMMs. **RDIMMs** and non-ECC memory are **not** supported.

Disk Controllers

The integrated **SATA** controller provides data transfer speeds of up to **3Gb** per second⁴ across the SATA bus for up to **two 3.5-inch** internal Serial ATA II (**SATA II**) or **four 2.5-inch** (via CTO) **SAS** drives. In addition, the standard ServeRAID C100 for IBM system x provides integrated RAID-0/1 on the planar at no additional cost, although without the performance boost of hardware RAID.

Optional RAID controllers include:

The **6Gbps** (x8 PCIe) **ServeRAID-M1015 SAS/SATA** controller supports **RAID-0/1/10** (no cache) for up to 4 drives (system limit). The **ServeRAID M1000 Series Advance Feature Key** adds **RAID-5** support.

The **6Gbps** (x8 PCIe) **ServeRAID-M5014 SAS/SATA** controller offers enhanced performance with **256MB** of cache memory, and supports **RAID-0/1/10/5/6** for up to 4 drives (system limit).

(**Note RAID-5** requires at least three drives, and **RAID-10** and **6** require at least 4 drives; therefore these RAID levels are not supported in the models containing two 3.5-inch SATA drive bays, only in models containing four 2.5-inch SAS drive bays. **RAID-50/60** require more drives than the server supports, and therefore are not supported in the x3250 M4)

⁴ Data transfer rates depend on many factors and are often less than the maximum possible.

Drive Bays

Some x3250 M4 models (3.5-inch HDD models) contain **3** drive bays, while others (2.5-inch HDD models) provide **5** drive bays. All models offer **one 5.25-inch** bay and either **two 3.5-inch simple-swap SATA** HDD bays or **four 2.5-inch hot-swap** or **simple-swap SAS** HDD bays standard. **Four 2.5-inch simple-swap SAS** HDD bays are available via CTO.

The **5.25-inch** bay supports an optional optical drive. No internal floppy drive is supported, however an *external* USB floppy drive may be used, if needed.

Hot-swap and simple-swap drives may be inserted or removed through the front of the server. **Hot-swap** drives *do not* require powering off the system. **Simple-swap** SATA drives *do* require powering off the system first; however, no tools or jumpers are required for installation and removal, allowing for faster, simpler servicing than fixed drives.

Large HDD Storage Capacity

The x3250 M4 offers a choice of disk storage, supporting up to **two 3.5-inch simple-swap** Serial ATA II (**SATA II**) drives, or **two 2.5-inch hot-swap** high-performance Serial-Attach SCSI (**SAS**) drives; up to **four 2.5-inch simple-swap SAS** drives are supported via CTO.

3.5-inch Simple-Swap SATA (6Gbps)

- **7,200 RPMs** — 250 or **500GB**, 1, 2, or **3TB (6.0TB maximum)**

2.5-inch Simple-Swap SAS (6Gbps)

- **10,000 RPMs** — 300 or **600GB (2.4TB)**
- **15,000 RPMs** — **146.8GB (587.2GB)**

2.5-inch Hot-Swap SAS (6Gbps)

- **7,200 RPMs** — **500GB (2.0TB)**
- **10,000 RPMs** — 300 or **600GB (2.4TB)**
- **15,000 RPMs** — **146.8GB (587.2GB)**

Notes: Enterprise-class 500GB or higher SATA drives offer increased reliability compared to lower-capacity SATA drives. Simple-swap SATA drives are *not* hot-swappable (the system must first be powered off); however, no tools or jumpers are required for installation and removal, allowing for faster, simpler servicing than fixed drives. Hot-swap SAS 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 direct-attach, NAS, and SAN solutions.



Internal Backup

The x3250 M4 supports **3.5-inch** internal USB-attached **half-high backup** options. Supported technologies include:

- **IBM DDS Gen 6 (USB)**
- **IBM RDX Removable Hard Disk Storage System (USB)**—external USB version also available

High-Performance Adapter Slots

The x3250 M4 offers **two** adapter slots via riser. **Two PCIe (PCI Express)** adapter slots are provided. PCI Express Gen 2 is the next generation of high-performance, low-latency, serial I/O bus. One slot is a **x8** (“by 8”) **Gen 2 half-length/full-height** slot; that is, **x8** physical and **x8** electrical (**8GBps**), capable of supporting **x1/x4/x8** Gen 1 or 2 adapters at their native speeds⁵.

The second PCIe slot, **x4 PCIe Gen 2 low-profile** slot, is dedicated for use with an IBM ServeRAID-BR10iL SAS/SATA Controller v2

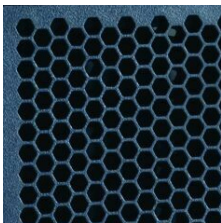
Gigabit Ethernet Controller

The x3250 M4 includes **two** integrated single-port **Intel 82574L** Gigabit Ethernet controllers for up to 10X higher maximum throughput than a 10/100 Ethernet controller. The controller provides fully integrated Media Access Control (MAC) and Physical-Layer (PHY) capabilities that can be configured for either 1000Mb/s or 10/100 Mb/s modes of operation. The first port supports the **IMM2** systems management functions.

The controller supports highly secure remote power management using **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.



⁵ The slot accepts **x1** or **x4** Gen 1 or Gen 2 adapters; however the slot provides a maximum of **x1** Gen 2 throughput.



Hot-Swap/Redundant Components

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

- **Hot-swap/redundant hard disk drives** (model-specific)
- **Hot-swap/redundant power supplies** (model-specific)

Ultra-Efficient Cooling

Strategically located fans, combined with efficient airflow paths, provide highly effective system cooling for the x3250 M4. The server includes **four** system fans, plus a fan in the power supply.

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.

Other Features

- **High-efficiency power supply**, achieving **80 Plus** certification (model-specific)
- **22-inch depth** — The small size offers greater back-of-rack airflow, promoting cooler rack temperatures.
- **Seven 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, four are on the back, and two are internal to support a hypervisor USB key and a USB-interface tape drive or RDX Removable Disk Cartridge drive.
- **Toolless chassis** — The cover can be opened without tools, and many components can be installed or removed and replaced without tools, including the optical drive, simple-swap and hot-swap HDDs, as well as PCIe adapters. 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 x3250 M4 server offers a number of tools and services designed to make ownership a positive experience. From the start, IBM programs make it easier for customers to plan for, configure and purchase System x servers, get them running and keep them running long-term. These features include IBM ServerProven[®], the IBM Standalone Solutions Configuration Tool, 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 customers' 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 ServerGuide (installed from CD) simplifies the process of installing and configuring System x 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 customers reduce both their 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 hardware and software, as well as onsite custom services to give customers the level of expertise they 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 x3250 M4 has a high level of systems management capabilities that are well-suited to remote locations as well as to stand-alone environments. Features include IMM2, IBM ToolsCenter, Automatic Server Restart, Wake on LAN[®] support, PXE support, UEFI, Predictive Failure Analysis, and IBM Systems Director.

The **IMM2** 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
- Predictive Failure Analysis for system fans
- 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 functions

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

The x3350 M4 also supports an optional IBM Virtual Media Key for additional systems management capabilities, including:

- Latest OS failure screen capture
- Graphical console redirection over LAN
- Remote virtual floppy and CD-ROM
- 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 CDs, DVD, and USB keys for updates customized to your systems.

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). These features are designed so that *no more than five minutes can pass before the server is restarted*.

Unified Extensible Firmware Interface (**UEFI**) is an evolutionary leap over legacy BIOS. UEFI provides a more intuitive user interface and understandable event logs and better management. This high level of manageability is designed to keep costs down and the system up—even when network usage increases. 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

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 software such as the optional **IBM Remote Deployment Manager** 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.

Predictive Failure Analysis (PFA) is designed to allow the system to detect impending failure of supported components (processors, memory, HDDs, power supplies and fans) *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 x3250 M4. IBM Systems Director comes with a portfolio of tools, including **IBM Systems Director Service and Support Manager**, and others. Others 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 let 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 business.

Memory — Memory is a significant 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 dual-core processor, there should be twice as much memory available as for a single-core processor. A quad-core processor should have twice as much memory as a dual-core processor.

Hard Disk Drives — IBM hard disk drives help customers improve the transaction and cost performance of their System x servers. The choice of hard disk drives can be a critical aspect of maximizing the I/O throughput of the system. Enterprise-class **SATA** hard disk drives (**3.5-inch**) are available for the x3250 M4 with capacities of up to **3TB** at **7,200 RPMs**. In addition, **2.5-inch SAS** drives with capacities of **500GB** at **7,200 RPMs**, up to **600GB** at **10,000 RPMs**, and **146.8GB** at **15,000 RPMs** are supported in some models.

IBM 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,

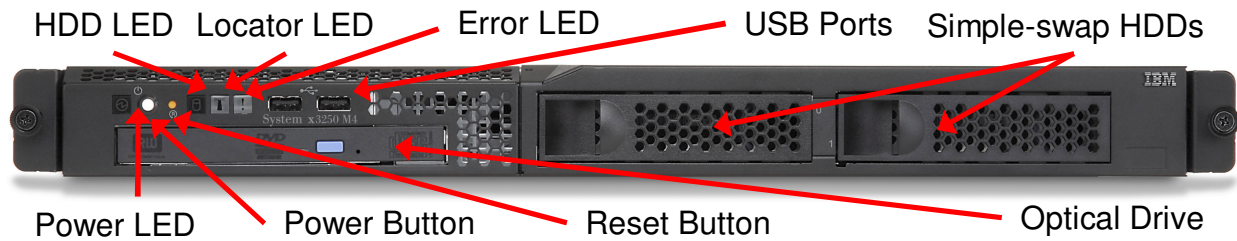
companies can effectively implement networked business systems that require large amounts of storage space for data and applications that must be available for their businesses to continue operating.

The **ServeRAID-M1015**, x8 PCIe and **6Gbps**, offers RAID-0/1/10; optionally RAID-5/50. The **ServeRAID-M5014**, x8 PCIe and **6Gbps**, provides **256MB** cache and RAID-0/1/10/5/50⁶; optionally RAID-6/60). The **ServeRAID M1000 Advance Feature Key** adds RAID-5/50 to the ServeRAID-M1015.

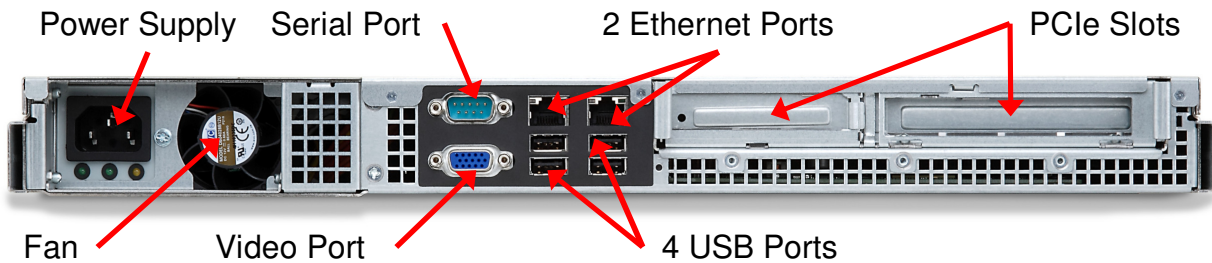
Power Supply — A redundant power supply is available for the x3250 M4 (2.5-inch HDD models only).

x3250 M4 Images

Front View



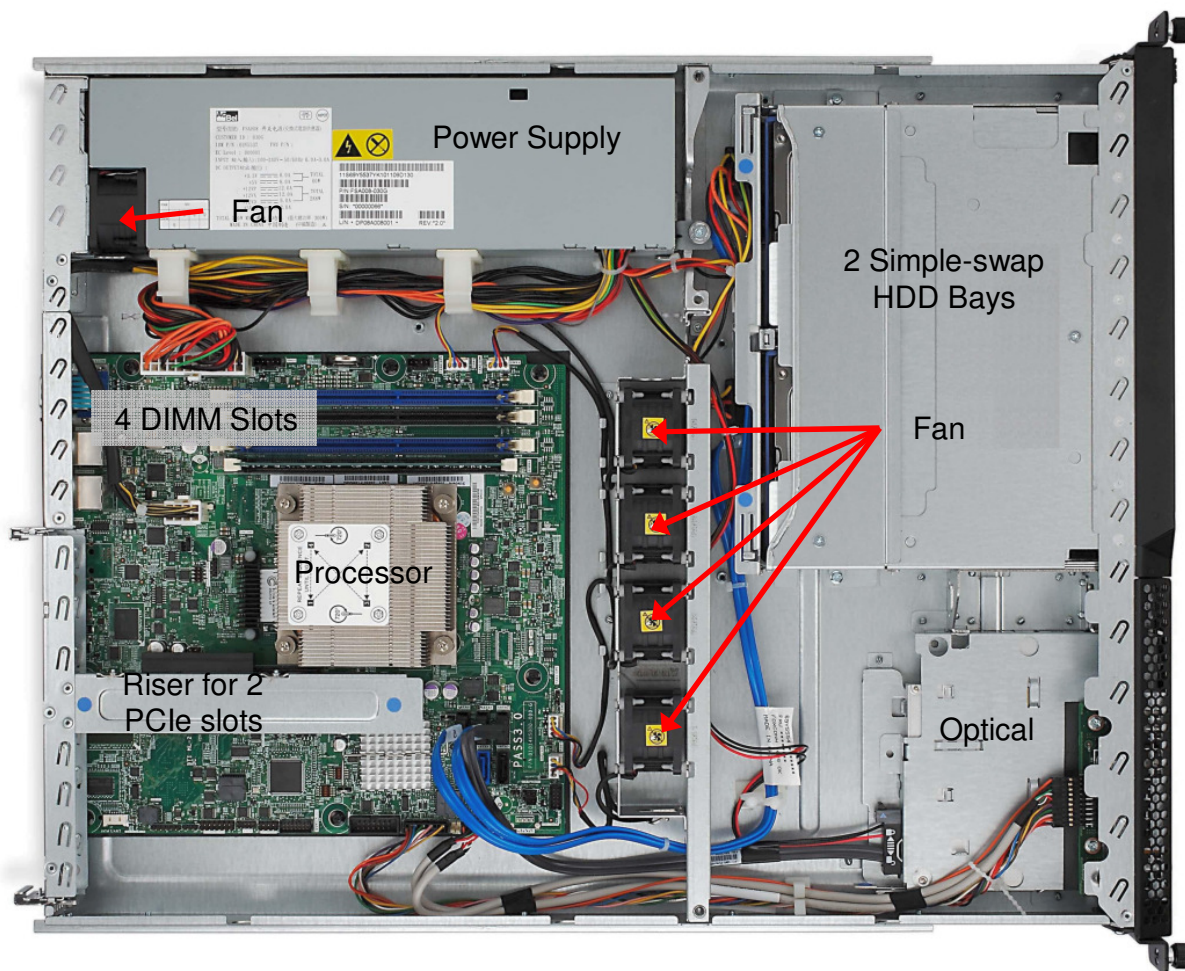
Rear View



⁶ Although the adapters support RAID-0/1/10/5/50/6/60, the system is limited by available drive bays to RAID-0/1/10/5/6. RAID-10/5/6 require four bays, available via CTO. RAID-10, -5 and -6 are not available in two-drive models.

A highly-affordable, ultradense, uniprocessor server for edge-of-network and Web-based computing in space-constrained environments

Interior View



x3250 M4 Specifications					
Machine type	2583-32x, 42x, 62x, 72x (3 yr. warranty)				
Form factor	1U rack				
Processor type	Quad-core Xeon E3 (12xx) 2.2GHz 1220L (CTO), 2.4GHz 1260L (CTO), 3.1GHz 1220 (62x), 3.2GHz 1230 (CTO), 3.3GHz 1240 (CTO), 3.4GHz 1270 (72x), 3.5GHz 1280 (CTO) Dual-core Core i3 (21xx) 3.1GHz 2100 (42x), 3.3GHz 2120 (CTO), 3.4GHz 2130 (CTO) Dual-Core Pentium (Gxxx) 2.6GHz G620 (CTO), 2.7GHz G630 (CTO), 2.7GHz G830 (CTO), 2.8GHz G840 (CTO), 2.9GHz G850 (32x), 3.0GHz G860 (CTO)				
Maximum processor power draw	95W (1280 via CTO)	80W (62x, 72x, and 1230/1240 via CTO)	65W (32x, 42x, and 2120/2130/G620/G630/G830/G840/G860 via CTO)	45W (1260L via CTO)	20W (1220L via CTO)
# of processors standard / maximum	1 / 1				

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x3250 M4 Specifications			
Internal L3 cache	8MB (shared)—62x, 72x, and 1230/1240/1280 via CTO		3MB (shared)—32x, 42x, and 1220L/1260L/2120/2130/G620/G630/G830/G840/G860 via CTO
Chipset	Intel C202		
Standard memory	2GB (1 x 2GB)		
Maximum memory⁷	32GB (4 x 8GB UDIMMs)		
Memory types supported	Unbuffered PC3-10600 (1333MHz) DDR3 ECC (non-Chipkill)		
Maximum memory access speed	1333MHz (32x, 42x, 62x, 72x, and 1220L/1230/1240/1260L/1280/2120/2130/G830/G840/G860 via CTO)		1066MHz (G620/G630 via CTO)
DIMM capacities supported	1GB, 2GB, 4GB, 8GB UDIMMs		
# of DIMM sockets total / available	4 / 4 UDIMMs		
# of DIMMs supported	1, 2, or 4 UDIMMs		
Online spare memory supported	No		
Memory mirroring supported	No		
# of drive bays total / available	5 / 4 (2.5-inch models)		3 / 2 (3.5-inch models)
# of HDD drive bays total / available	4 / 4 2.5-inch (SAS CTO)		2 / 2 3.5-inch (32x, 42x, 62x, 72x, SATA CTO)
# of 5.25" bays total / available	1 / 1 (optical drive installed)		
Maximum HDD capacity standard	6TB (2 x 3TB) 3.5-inch simple-swap SATA II 6Gbps (32x, 42x, 62x, 72x)	2.4GB (4 x 600GB) 2.5-inch hot-swap SAS 6Gbps (via CTO)	2.4GB (4 x 600GB) 2.5-inch simple-swap SAS 6Gbps (via CTO)
HDD capacities supported	3.5-inch Simple-Swap SATA 250, 500GB, 1, 2 or 3TB— 7.2K RPMs	2.5-inch Hot-Swap SAS 500GB—7.2K RPMs 300 or 600GB— 10,000 RPMs 146.8GB—15,000 RPMs	2.5-inch Simple-Swap SAS 300GB, 600GB—10K RPMs; 146.8GB—15K RPMs
# of HDDs standard	None		
Disk drive technology	3.5-inch simple-swap SATA (32x, 42x, 62x)		2.5-inch simple-swap or hot-swap SAS (72x, CTO)
Integrated disk controller	4-port SATA II (via chipset)—all models		ServeRAID-BR10i v2 (72x, SAS CTO)
# of disk drives supported per port	1		
Optional RAID controllers supported	3Gbps ServeRAID-BR10i v2 (no cache)— RAID-0/1/1E (all models)	6Gbps ServeRAID-M1015 (no cache)— RAID-0/1/10 ; optional RAID-5/50 (all models)	6Gbps ServeRAID-M5014 (256MB cache)— RAID-0/1/10/5/50
Internal backup drives supported	1 half-high 3.5-inch tape drive, optical, or RDX Removable Hard Disk Storage System ⁸		
# of optical drives standard	None		
Optical drives optional	DVD-ROM or Multiburner		
# of diskette drives standard	None (USB-attach)		

⁷ Maximum memory and disk capacity may require the replacement of standard components with the largest supported component available.

⁸ The internal backup options require a 3.5-inch drive; therefore they are not available in models using 2.5-inch drives. Using a backup option leaves only one 3.5-inch HDD bay. External backup options are also available.

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x3250 M4 Specifications		
# of adapter slots total / available	2 / 1 (72x and SAS CTO)	2 / 2 (all other models and SATA CTO)
# of PCI-E x8/x8 Gen 2 slots (8GBps)	1 full-height/half-length	
# of PCI-E x4/x4 Gen 2 slots (4GBps)	1 low-profile (dedicated to x4 ServeRAID-BR10i v2controller)	
# of legacy 33MHz legacy PCI slots	None	
# of video ports	1	
Video controller	Matrox G200eV graphic controller integrated in IMM2	
Video memory	16MB DDR2 standard (shared with IMM2)	
Maximum video resolution at 32-bit color	1600x1200 resolution with a color depth of 32 bits at 75Hz	
Gigabit Ethernet controllers	2 single-port Broadcom BCM82574L	
# of Gigabit Ethernet ports	2 (rear)—1 shared for systems management	
# of RS485 ports	None	
# of serial ports	1 (rear)	
# of parallel ports	None	
# of PS/2 mouse ports	1	
# of PS/2 keyboard ports	1	
# of USB 2.0 ports	7; 6 external ports (2 front, 4 rear); plus 1 internal connectors for tape drive, RDX Removable Disk Cartridge drive, or USB flash drive containing a hypervisor drive	
Integrated systems management controller	IMM2	
Optional systems management adapter	Remote presence upgrade via Feature on Demand (1H 2012)	
Light path diagnostics support	None (lighted LEDs next to DIMM sockets go out if DIMM fails)	
Predictive Failure Analysis support	Processors, memory, HDDs	
Hot-swap/redundant power supported	Yes / Yes (72x, CTO)	No / No (32x/42x/62x/72x)
# of power supplies standard / maximum	1 / 2 (72x, CTO)	1 / 1 (32x/42x/62x/72x)
Power supply size	460W universal, high-efficiency power supply (72x, CTO)	300W universal, autoswitching (32x, 42x, 62x)
# of fans/blowers standard / maximum	4 / 4	
Hot-swap/redundant fans supported	No	
Heat emitted: minimum / maximum BTUs per hour	171 BTUs per hour (50 watts) / 1024 BTUs per hour (300 watts)	
Rack mount method	Toolless rails (provided standard)	
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)	

x3250 M4 Specifications		
Operating humidity range	8-80%	
Dimensions (HWD) / weight	Height: 43 mm (1.69 inches); Depth: 575.8 mm (22.67 inches); Width: 439 mm (17.28 inches) without rack brackets Width: 478 mm (18.82 inches) with rack brackets	Maximum weight: 10.67 kg (23.53 lb), depending on configuration
Operating systems supported	Microsoft Windows Server 2008 & R2 (Standard/Enterprise Editions) 32-bit and 64-bit, Microsoft Small Business Server 2008 Standard/Premium Edition 64-bit, RHEL 5 32-bit, RHEL 5 64-bit with or without Xen, RHEL 6 32-bit and 64-bit; SLES 10/11 32-bit, SLES 10/11 64-bit with or without Xen, VMware vSphere Hypervisor 4.1	
Length of limited warranty	3 years (parts and labor) ⁹	

The Bottom Line

The x3250 M4 is an extremely powerful entry system, incorporating leading-edge industry-standard features and adding IBM-unique innovations:

Price/Performance

- **Low-cost/high-throughput processors** — A choice of one **3.1** or **3.4GHz quad-core** Xeon processor, one **3.1GHz dual-core Core i3** processor, or one **2.9GHz dual-core Pentium** processor standard, or other Xeon, Core i3, or Pentium processors via CTO
- **Generous cache** — **8MB** or **3MB** L3 processor cache (processor-specific)
- **Fast memory** — **1333MHz PC3-10600 DDR3** ECC memory standard with **two-way interleaving**. (1066MHz PC3-10600 DDR3 ECC memory maximum with specific CTO processors.)
- **Fast storage access** — Standard or optional integrated **ServeRAID** controllers offering **RAID-0/1/10/5/6** support (model-specific)
- **High-performance external expansion** — **Seven** 480Mbps **USB 2.0** ports (two front, four rear, one internal)
- **High-performance communications** — **Two** integrated **single-port Gigabit Ethernet** controllers
- **Fast I/O** — **Two** **PCIe Gen 2** adapter slots

Flexibility

- **Large memory capacity** — Up to **32GB** of **UDIMM ECC** memory, using 4 DIMMs
- **High-capacity disk storage** — Up to **6TB** of internal **3.5-inch simple-swap SATA II** storage, **2.4TB** of **2.5-inch hot-swap SAS** storage,; also, **2.4TB** of **2.5-inch simple-swap SAS** storage (via CTO)
- Support for an **optional optical drive**, or **RDX Removable Hard Disk Storage System** (in addition to the HDDs)
- Optional hardware **RAID-0/1/10/5/6** support
- **Two available** adapter slots:
 - ❑ **One x8/x8¹⁰ PCIe Gen 2** slot (8GBps)
 - ❑ **One x4/x4¹¹ PCIe Gen 2** slot (4GBps)—reserved for x4 ServeRAID-BR10i1 v2 controller

Manageability, Serviceability and Availability

- **IBM Systems Director** systems management software, including:
 - ❑ **IBM Service and Support Manager**
- **Integrated Management Module (IMM v2):**
 - ❑ **IPMI 2.0** compliance, including highly secure remote power control
- **IBM Systems Director**
- **IBM ServerGuide**

⁹ 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. IBM makes no representation or warranty regarding third-party products or services including those designated as ServerProven or ClusterProven. 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.

¹⁰ The x8/x8 slot can accept x1, x4, or x8 adapters running at x1, x4, or x8 throughput, respectively.

¹¹ The x4/x4 slot can accept x1 or x4 adapters running at x1 or x4 throughput, respectively.

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- **IBM ToolsCenter**
- **LEDs** to identify failed DIMMs
- **ECC memory protection**
- Support for **highly available** hardware **RAID-1/10/5/6** arrays
- Rack slides standard, for quicker servicing
- **Hot-swap SAS, simple-swap SAS** (via CTO), or **simple-swap SATA** hard disk drives, for quick and simple installation and replacement of drives
- **Ultra-efficient cooling**
- **Toolless chassis**
- **PFA support** for processors, memory, HDDs, power supplies and fans

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									
		Scalability	Performance	Memory Throughput	Integer Performance	I/O and Storage	Density	High Availability	Systems Management	Security	Distributed Deployment										
Theme	Key Workloads																				
HPC	Cluster / HPC																				
	Modeling & Simulation																				
	High Performance DB																				
	Business Intelligence																				
Web 2.0 / Web 3D	Search																				
	Content																				
	Communities																				
	Commerce																				
Business Applications	Collaboration																				
	ERP/SCM																				
	CRM																				
	Hosted Client																				
Infrastructure Applications	Point of Sale																				
	Branch Office																				
	Virtualization																				
	Business Continuity																				
	Database																				
	Email/Collaboration																				
	Security																				
	Web Serving																				
	File & Print																				

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>

Technical Support

<http://ibm.com/server/support>

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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