**IBM**

# e-business is your business.

*Your world, your rules.*

**Because e-business is your business**

**IBM @server systems**
*The engines of e-business*

Today's businesses rely more and more on e-business methods to achieve faster, more efficient results for customers. IBM @server brand is a portfolio of hardware, services and support that form the building blocks of successful e-business. At the core of the portfolio are four server categories:

- **xSeries**
- **iSeries**
- **pSeries**
- **zSeries**

These servers support the industry's broadest range of platforms— hardware, operating systems and applications—for a wide range of solutions to fit your needs, including open standards. IBM @server systems interconnect and merge smoothly with your existing technology to deliver a flexible and integrated infrastructure.

**IBM @server vision:**
Three critical elements make up the IBM vision for the future of e-business:

- **Application flexibility**— Choices in selecting, building and deploying applications

- **New tools for managing e-business**— New ways to manage end-to-end growth, risks and costs

- **Innovative technology**— Extreme performance and scalability with IBM reliability and security

IBM @server xSeries systems are the critical Intel processor-based component of @server solutions. They deliver on the @server vision to bring you application flexibility, new tools and innovative technology via the X-Architecture™ blueprint.

IBM @server xSeries systems support Project eLiza—an IBM initiative to advance the goal of self-managing systems. This support is achieved on xSeries servers by incorporating mainframe-derived technologies and intelligent management tools for real hands-off reliability. Part of the IBM @server hardware portfolio for e-business, xSeries systems are a high-performance line of Intel® processor-based servers spanning the solution spectrum from appliances to enterprise-class servers. The offering continues to grow with the addition of x360 servers with the latest Intel processors and Enterprise X-Architecture technologies.

*IBM @server xSeries 360*

*"We chose the IBM @server because it offers us rock-solid quality. And our customers can enjoy cross-platform capability with IBM @server."*

—Brian Turbow, President and Chief Information Technology Officer, Myrient

**Servers at a glance**

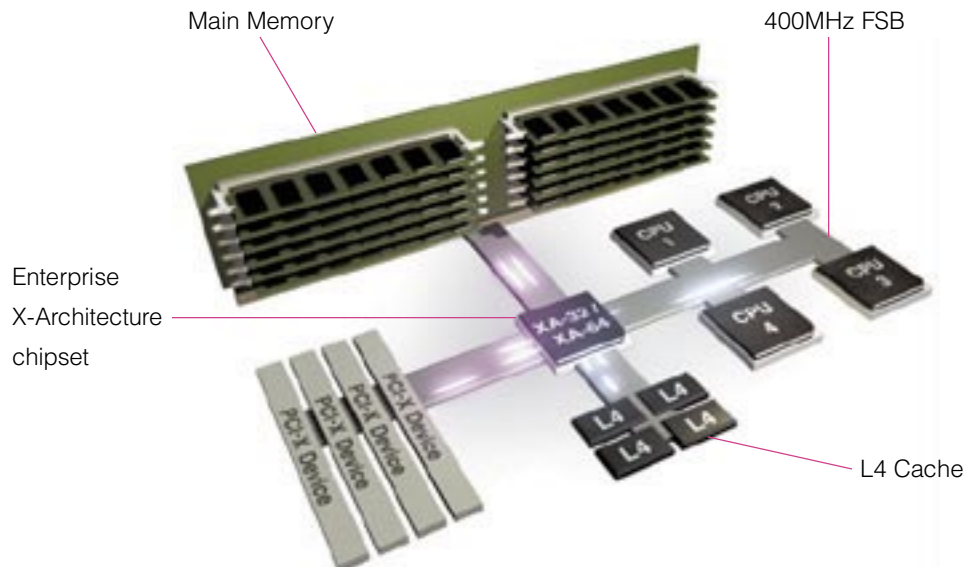## Enterprise X-Architecture technology

IBM X-Architecture technology is a blueprint for extending the benefits of advanced mainframe-inspired technologies to our Intel processor-based servers. These benefits enhance availability and scalability, systems management, service and support. IBM has been delivering on the promise of the X-Architecture model since 1998 with such innovative technologies as Active™ PCI, C2T Interconnect™ cabling, Chipkill™ memory, Predictive Failure Analysis®, Light Path Diagnostics™ and IBM Director Software Rejuvenation, to name a few.

Today, IBM extends the X-Architecture blueprint with Enterprise X-Architecture technologies—revolutionary advances that enhance the capabilities of I/O, memory and performance in xSeries servers. This peerless new server design creates a flexible "pay as you grow" approach to buying high-end 32-bit and 64-bit xSeries systems. The results: systems that can be scaled quickly, easily and inexpensively.

Enterprise X-Architecture technology enables the following capabilities:

- **XpandOnDemand™ scalability**— Supports upgrading processors, I/O slots and other resources via modular external cabinets so you can start small and grow big

- **System partitioning**— Allows you to run multiple operating systems and applications concurrently

- **Active™ PCI-X**— Enables hot-add/hot-swap PCI and PCI-X adapters

- **Remote I/O**— Lets you increase I/O when you add the IBM RXE-100 Remote Expansion Enclosure, an I/O expansion unit with 6 or 12 adapter slots

- **Real Time Diagnostics**— Lets you run diagnostics without taking the server offline

- **Memory enhancements**
  – **Large memory capacity**— Supports up to 256GB memory
  – **High-speed double data rate (DDR) memory**— Supports PC200 or standard ECC SDRAM memory
  – **Memory ProteXion™ and Chipkill memory**— Designed to correct virtually all memory errors
  – **Memory mirroring**— Supports redundant banks of memory
  – **Active Memory™ (hot-add/ hot-swap memory)**— Allows you to add or replace memory without taking the server offline

- **XceL4™ Server Accelerator Cache**— Provides up to 64MB of high-speed L4 cache

- **400MHz Front Side Bus (FSB)**— Moves data between devices faster than previously possible



Main Memory

400MHz FSB

Enterprise X-Architecture chipset

L4 Cache

| xSeries model | Point Solution<br>Out-of-the box deployment with prepackaged models to fit specific application needs | | | Universal<br>Designed for maximum internal scalability to meet demands for increased application data or user workload | | |
|---|---|---|---|---|---|---|
| | **x130/x135**<br>**Value** | **x130/x135**<br>**Performance** | **Internet**<br>**Caching**<br>**Appliance** | **x200** | **x220** | **x232** |
| **Form factor/height** | Rack/1U | Rack/1U | Rack/3U* | Tower, Rack/4U | Tower, Rack/4U | Tower, Rack/5U |
| **Intel processor** (max) | 800MHz Celeron™ | 1GHz Pentium® III | 866MHz Pentium III | 1.26GHz-S Pentium III | 1.26GHz-S Pentium III | 1.26GHz-S Pentium III |
| **Number of processors** (std/max) | 1/1 | 1/2 | 1/2 | 1/1 | 1/2 | 1/2 |
| **Level 2 cache** (max) | 128KB | 256KB | 256KB | 512KB | 512KB | 512KB |
| **Memory** (max) | 1.5GB | 2GB | 4GB | 1.5GB | 4GB | 4GB |
| **Expansion slots** (total/Active PCI) | 2/0 | 2/0 | 5/0 | 5/0 | 5/0 | 5/0 |
| **Disk bays** (total/hot-swap) | 2/0 | 2/0 | 6/3 | 4/0 (IDE or SCSI) | 4/3 | 9/9 with optional 3-pack hot-swap HDD kit |
| **CD-ROM/ diskette drive** | Yes | Yes | Yes | Yes | Yes | Yes |
| **Maximum internal storage** | 80GB[1] | 72.8GB | 440.4GB | 293.6GB | 293.6GB | 660.6GB |
| **Network** | Dual integrated 10/100 Ethernet | Dual integrated 10/100 Ethernet | Integrated 10/100 Ethernet | Integrated 10/100 Ethernet | Integrated 10/100 Ethernet | Integrated 10/100 Ethernet |
| **Advanced System Management processor** | N/A | Integrated | Integrated | N/A | Optional (supports Remote Supervisor Adapter) | Integrated (supports Remote Supervisor Adapter) |
| **Power supply** (std/max) | 200W 1/1 | 200W 1/1 | 350W 1/1 | 330W 1/1 | 340W 1/1 | 385W or 2x250W 1 or 2/3 hot-swap |
| **Hot-swap components** | N/A | N/A | Power supply, fans, HDDs | N/A | HDDs (select models) | Power supply, HDDs |
| **Light Path Diagnostics** | N/A | Yes | Yes (select models) | Limited | Limited | Yes |
| **RAID support** | N/A | N/A | N/A | Optional | Optional | Optional |
| **Limited warranty and support**** | 3-year parts/1-year onsite labor | 3-year parts/3-year onsite labor | 3-year parts/3-year onsite labor (select models) | 3-year or 1-year parts/1-year onsite labor | 3-year parts/1-year onsite labor | 3-year parts/3-year onsite labor |

\* Also available in tower and 1U models with other configurations.

\*\* See page 10 for limited warranty information[2].

| | x240 | x250 | x300 | x300 DC-power | x330 | x330 DC-power | x340 | x342 |
|---|---|---|---|---|---|---|---|---|
| | | | **Rack-optimized**<br>Delivers outstanding performance and manageability in the slimmest chassis possible | | | | | |
| | Tower, Rack/5U | Tower, Rack/8U | Rack/1U | Rack/1U | Rack/1U | Rack/1U | Rack/3U | Rack/3U |
| | 1GHz<br>Pentium III | 900MHz<br>Pentium III Xeon™ | 1GHz<br>Pentium III | 800MHz<br>Celeron | 1.26GHz-S<br>Pentium III | 1.26GHz-S<br>Pentium III | 1GHz<br>Pentium III | 1.26GHz-S<br>Pentium III |
| | 1/2 | 1/4 | 1/1 | 1/1 | 1/2 | 1/2 | 1/2 | 1/2 |
| | 256KB | 2MB | 256KB | 128KB | 512KB | 512KB | 256KB | 512KB |
| | 4GB | 16GB Chipkill | 1.5GB | 1.5GB | 4GB | 4GB | 4GB | 4GB |
| | 5/3 | 6/4 | 2/0 | 2/0 | 2/0 | 2/0 | 5/0 | 5/0 |
| | 9/9 with optional<br>3-pack hot-swap<br>HDD kit | 10/10 | 2/0 | 2/0 | 2/2 | 2/2 | 6/6 with optional<br>3-pack hot-swap<br>HDD kit | 6/6 with optional<br>3-pack hot-swap<br>HDD kit |
| | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | 660.6GB | 734GB | 160GB | 160GB | 146.8GB | 146.8GB | 440.4GB | 440.4GB |
| | Integrated<br>10/100 Ethernet | Integrated<br>10/100 Ethernet | Dual integrated<br>10/100 Ethernet | Dual integrated<br>10/100 Ethernet | Dual integrated<br>10/100 Ethernet | Dual integrated<br>10/100 Ethernet | Integrated<br>10/100 Ethernet | Integrated<br>10/100 Ethernet |
| | Integrated | Integrated | N/A | N/A | Integrated<br>(supports Remote<br>Supervisor Adapter) | Integrated<br>(supports Remote<br>Supervisor Adapter) | Integrated | Integrated<br>(supports Remote<br>Supervisor Adapter) |
| | 2x250W<br>2/3 hot-swap | 2x250W<br>2/4 hot-swap | 200W<br>1/1 | 200W<br>1-48V DC/1 | 200W<br>1/1 | 200W<br>1-48V DC/1 | 270W<br>1/2 hot-swap | 270W<br>1/2 hot-swap |
| | Power supply,<br>fans, HDDs, PCI | Power supply,<br>fans, HDDs, PCI | N/A | N/A | HDDs | HDDs | Power supply,<br>fans, HDDs | Power supply,<br>fans, HDDs |
| | Yes | Yes | N/A | N/A | Yes | Yes | Yes | Yes |
| | Optional | Optional | Optional | Optional | Optional | Optional | Optional | Optional |
| | 3-year<br>parts/3-year<br>onsite labor | 3-year<br>parts/3-year<br>onsite labor | 3-year<br>parts/1-year<br>onsite labor | 3-year<br>parts/1-year<br>onsite labor | 3-year<br>parts/3-year<br>onsite labor | 3-year<br>parts/3-year<br>onsite labor | 3-year<br>parts/3-year<br>onsite labor | 3-year<br>parts/3-year<br>onsite labor |

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to buy direct, locate an IBM reseller or for more information.

| | x350 | x360 | x370 | x380 |
|---|---|---|---|---|
| | Rack/4U | Rack/3U | Rack/8U | Rack/7U |
| | 900MHz Pentium III Xeon | 1.6GHz Xeon Processor MP | 900MHz Pentium III Xeon | 800MHz Itanium™ |
| | 1/4 | 2/4 | 1/8 | 1/4 |
| | 2MB | 1MB level 3 cache | 2MB | 1MB level 3 cache |
| | 16GB Chipkill | 8GB Chipkill DDR | 32GB | 64GB |
| | 6/6 | 6/6 Active PCI-X | 12/12 | 8/8*** |
| | 6/6 with optional 3-pack hot-swap HDD kit | 3/3 | 2/2 | 2/2 |
| | Yes | Yes | Yes | Yes/LS-120 |
| | 440.4GB | 220.2GB | 146.8GB | 72.8GB |
| | Integrated 10/100 Ethernet | Integrated 10/100 Ethernet | Optional 10/100 Ethernet | Integrated 10/100 Ethernet |
| | Integrated | PCI adapter in dedicated slot | PCI adapter in dedicated slot | Yes**** (ISC required) |
| | 270W 1/3 hot-swap | 370W 2/3 hot-swap | 3x550W (110v) or 3x750W (220v) 3/3 hot-swap | 4x800W 4/4 hot-swap |
| | Power supply, fans, HDDs, PCI | Power supply, fans, HDDs, PCI-X | Power supply, fans, HDDs, PCI | Power supply, fans, HDDs |
| | Yes | Yes | Yes | No |
| | Optional | Optional | Optional | Optional |
| | 3-year parts/3-year onsite labor | 3-year parts/3-year onsite labor | 3-year parts/3-year onsite labor | 3-year parts/3-year onsite labor |

*** Hot-swap operation requires operating system support and installation of the required device drivers (not included).

**** Intel Server Control (ISC) required—tool provided and supported by Intel at an additional cost.

## Unrivaled service and support

xSeries systems come with the acclaimed service and support you expect from IBM, offering enhanced value, peace of mind and confidence. Here are some of the many ways you can gain direct access to IBM expertise:

- **Three-year limited warranty**[*]—Includes parts and onsite labor. Available with most xSeries servers.

- **ServerGuide**—Enables rapid loading of major network operating systems and simplifies hardware configuration.

- **IBM High Availability Services for Business-Critical Systems**[4]—Uniquely tailored optional solutions available on certain xSeries servers to help meet your end-to-end business availability objectives.

- **IBM Global Services**—Providing end-to-end service suites that improve your ability to conduct business.

- **Education**—Key information training available through classroom, Internet and video media.

- **Support**—90-day startup.

*See page 10 for limited warranty information[2].

## Operating systems supported

- Microsoft® Windows® 2000
- Microsoft Windows NT®
- Novell NetWare
- SCO UnixWare
- Linux® (Red Hat, SuSE, Caldera, Turbolinux)
- IBM OS/2® (select models)

## Service, support and offerings

- Electronic Service Agent
- IBM Server Startup Support
- Visit **ibm.com**/pc/ww/eserver/xseries/services/index for more information

## It's about business, not just technology

The following programs can help reduce your total cost of ownership by lowering integration risks, helping ensure smooth installation and decreasing the need for post-implementation support.

### IBM ServerProven®

Open systems require open relationships. The ServerProven[5] program affords participating vendors the opportunity to work with IBM to test and optimize software applications, hardware and network operating systems for compatibility on IBM Intel processor-based servers. For an extensive selection of ServerProven software and middleware, visit the IBM Solution Library at www.developer.ibm.com/welcome/myvc.pl and select "Solutions Library." This library is one of the industry's premier repositories of marketing and technical information about IBM e-business solutions. Visit **ibm.com**/pc/support for more information.

### IBM ClusterProven™

The ClusterProven[5] program provides support to IBM solution developers who wish to join the market trend of delivering proven, highly available solutions to customers. When you see the IBM ClusterProven emblem, it means the entire solution—hardware, operating system, cluster middleware and applications—has been validated and tested. IBM ClusterProven reduces the guess-and-test cycle with clearly defined criteria for validating end-to-end clustering solutions.

*"I firmly believe that if I were not using IBM equipment, I would have to double or triple the size of my department."*

—Ronnie Chandler, Director of Technology, Muskogee Public Schools

## Why buy IBM Options for @server *xSeries servers?*

### xSeries Options for spiraling data demands

By 2002, 93% of firms expect to transact business over the Internet. By 2004, Web-based business-to-business commerce will reach nearly $3 trillion[6]. The figures are staggering. These trillions of dollars represent unthinkable quantities of data, all of it necessary to generate the next round of trillion-dollar e-business.

How do you keep your share of that data expanse protected? Available? Manageable, so that your data-warehousing and CRM applications can make sense of it all? And how do you equip your application servers to handle the spiraling workloads?

IBM xSeries Options offer a wide range of proven components that integrate easily into complete solutions for your storage and performance needs. They are designed to help you track, process, manage and share information more efficiently across your infrastructure—so you can tap into your data's real earning potential.

### Your data is your business

xSeries servers help protect your crucial information assets, keep your business-critical systems up and running, allow your network to grow with your business and provide an open path for the future. Large or small, your business should address the following five data requirements:

| Key IT business protection issues | xSeries Options |
|---|---|
| **Increasing storage needs**<br>Are you moving to an e-business environment and finding that your storage requirements are escalating? Is your data your most valuable asset? | • IBM offers SCSI and Fibre Channel hot-swap hard disk drives up to 73.4GB.<br>• Using an EXP300 SCSI expansion unit, you can load 14 73.4GB drives for over 1TB[1] of storage.<br>• IBM storage area network (SAN) solutions featuring IBM Fibre Array Storage Technology (FAStT) support the growing requirement of providing superior performance and high bandwidth for faster data access. |
| **Data availability**<br>Are there times when the network is unavailable because the server is down? Does your business lose money if your data is unavailable? | • IBM offers nine levels of RAID protection for the redundancy you need; both Fibre Channel and SCSI RAID adapters are available.<br>• IBM high-availability and clustering solutions enable multiple servers to operate as one system and provide around-the-clock operations, in a very cost-effective manner. |
| **Data protection**<br>How much is your data worth? Recreating lost computer data can cost thousands of dollars. Are your data backup systems adequate? | • IBM offers a complete family of tape options including tape libraries, autoloaders and rackable tape automation products to help your business run smoothly in critical, data-dependent environments. |
| **Space constraints**<br>How do you increase your computing capacity without driving your company out of its current space? | • Racks make it easy to centralize, organize and access your hardware for servicing, upgrading and managing your infrastructure. IBM racks offer server consolidation and space savings with easy access to components.<br>• IBM 42U rack enables 14TB of storage—or string eight together for 112TB of storage. |
| **Performance**<br>Does your current storage configuration provide sufficient data access to support your business needs? Do you have performance issues on your network? | • The IBM FAStT family of storage servers delivers the performance necessary to optimize data access and delivery.<br>• Adding memory or processors represents a significant performance increase, helping increase productivity.<br>• Increasing memory in a Web server can significantly increase your performance. |

## Service, support and solutions

# Intelligent systems management, rock-solid reliability

## Beating downtime

System downtime can be the number-one enemy of your business; simply put, it wastes resources for which you've already paid—from employees to hardware and software. That lost time can cut deeply into your bottom line. Sm@rtPartner magazine recently published various industry cost figures to show just how deep:

For an e-commerce company like Amazon.com, every second of downtime costs $4,000. For a Wall Street brokerage firm, the cost is $108,000 per second, or $6.5 million per hour*.

IBM @server xSeries servers and their systems management tools help protect your business from that kind of devastation. IBM @server xSeries hardware and software solutions help prevent most outages, and help you recover rapidly from the few that do occur.

*Sm@rtPartner magazine, September 18, 2000.

*NetBAY™ 42 Enterprise Rack*

## Achieving new levels of productivity

xSeries systems management comprises an integrated set of hardware instrumentation and advanced software tools that keep your network up and running at peak efficiency, while minimizing your total cost of ownership. These tools simplify and automate preventive and routine maintenance. The components listed below are standouts among the systems management portfolio:

### Hardware

• **Predictive Failure Analysis (PFA)** provides advanced notification of an impending failure so that corrective action may be taken to avoid unplanned downtime. IBM offers PFA on more components than any other server vendor: hard disk drives, memory, power supplies, fans, processors and voltage regulators.

• **Light Path Diagnostics** works in conjunction with PFA. Built-in LED indicators attached to individual components—as well as an external service panel— alert you to problems and their exact location, helping to expedite repairs and help minimize downtime.

• **IBM Advanced System Management (ASM) processors** enable remote management of xSeries systems and provide invaluable information about the server regardless of its operational status. Many xSeries servers include the ASM processor either built-in, or on an adapter. For select systems that do not feature an integrated ASM processor or that need added management capability, the IBM Remote Supervisor Adapter is available.

### Software

• **IBM Director** is the core of xSeries virtual onsite management and comes standard with most xSeries servers. It unites a wealth of management tools in a simple graphical user interface for easy single-click and drag-and-drop commands.

• **Capacity Manager**, a no-charge extension of IBM Director, tracks server resource utilization and identifies multiple levels of existing or potential bottlenecks. With built-in artificial intelligence, Capacity Manager also makes recommendations to avoid potential bottlenecks.

• **Software Rejuvenation**, a no-charge extension of IBM Director, automatically schedules software resets and protects the server from an unplanned outage caused by aging software.

• **Real Time Diagnostics**, a no-charge extension of IBM Director, helps maintain server availability by performing diagnostics on system and subsystem components while your server is still running.

**IBM**®

## Need more information?

**World Wide Web**

IBM @**server** xSeries    **ibm.com**/eserver/xseries

IBM Options for xSeries servers

    **ibm.com**/pc/us/eserver/xseries/storage

IBM X-Architecture technology

    **ibm.com**/eserver/xarchitecture

IBM Enterprise X-Architecture technology

    **ibm.com**/eserver/enterprise_xarchitecture

IBM Small Business Program    **ibm.com**/smallbusiness

IBM xSeries Systems Management

    **ibm.com**/pc/ww/eserver/xseries/systems_management

IBM High Availability Services for Business Critical Systems

    **ibm.com**/services/its/us/highavail2

ClusterProven    **ibm.com**/pc/ww/eserver/xseries/clusterproven

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Service and support    **ibm.com**/pc/support

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