IBM

e-business is your business.

Your world, your rules.

The engines of e-business

IBM @server systems

Customer demand for lightning-fast communication and transactions has driven the need for universal commitment to e-business. Most companies now conduct some facet of business over the Web. Success hinges on high-performance hardware that embraces open standards—exactly what you'll find in the IBM @server hardware portfolio and its commitment to e-business excellence:

- *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

At the core of the portfolio are four server categories—IBM @server xSeries™, iSeries™, pSeries™ and zSeries™—that interconnect and merge smoothly with your existing technology for flexible, dynamic solutions. IBM @server xSeries systems provide the critical Intel® processor-based component of these solutions.

Superior design, diverse offering

Through a combination of mainframe-inspired technologies and intelligent management tools, xSeries servers give you real hands-off reliability. This sophisticated functionality is available in a wide range of systems, from appliances to enterprise-class servers, engineered to fit any environment:

Rack-optimized servers help solve the data center space dilemma by delivering outstanding performance and manageability in a slim chassis.

Universal servers deliver versatility in designs that convert from tower to rack-mount. Value models take small business serving to new levels of productivity at very affordable prices; larger enterprise models combine maximum internal scalability and a range of high-availability tools for intense workloads.

Scalable servers have revolutionized the industry-standard server platform, creating a new breed of Intel-based enterprise server that delivers new levels of availability, scalability and transaction performance.

> *"The attractive price-to-performance ratio of the IBM @server platform and its high availability, security and compatibility with our software quickly won me over."*
>
> —Jose Monteagudo, Chief Information Officer, s.Oliver

New standout servers for dynamic solutions

● **Rack-optimized servers:** *Perfect for the space-constrained environment*

The feature-rich xSeries 345 2-way server delivers rack-dense computing power with high availability and rich expansion. The 2U x345 is packed with the latest Intel Xeon™ processors, DDR memory and Dual Ultra320 SCSI controllers to deliver high performance. With rich expansion capabilities, including six hot-swap hard disk drives (HDDs), five expansion slots (4 PCI-X, 1 PCI) and Integrated Dual Gigabit Ethernet, the x345 delivers application flexibility. In addition, redundant power and cooling subsystems and integrated RAID-1 ensure high availability for demanding applications.

IBM @server xSeries 345

The highly manageable xSeries 335 2-way server delivers maximum performance in space-constrained environments. Its 1U form factor allows installation of up to 42 systems in an industry-standard rack. The x335 features dual Intel Xeon processors, two IDE or Ultra320 SCSI hot-swap HDDs and C2T Interconnect™ cabling to reduce cable expense and rack clutter. Integrated RAID-1 functionality allows you to mirror HDDs for data protection and high availability. Dual Gigabit Ethernet and two PCI-X slots help deliver maximum performance computing in a space-constrained, rack-dense environment.

IBM @server xSeries 335

The ultra-dense xSeries 305 delivers an incredibly small, full-function Intel Pentium® 4 enterprise server. At 1U and less than 17" deep, the highly affordable x305 is ideal for Web and network infrastructures. The x305 offers IDE and SCSI hard disk drive (HDD) models, expanded memory capacity up to 4GB and tool-free slides with snap-in installation. Integrated Dual Gigabit Ethernet ports and two PCI-X slots help reduce I/O bottleneck limitations. Afforable performance and a depth less than 17" make the x305 a smart solution for front-end Web infrastructure in the service provider and telecommunications markets.

IBM @server xSeries 305

● **Universal servers:** *Smart solutions for small business and beyond*

The ultra-affordable xSeries 205 delivers outstanding levels of value and availability for small to medium businesses. This uni-processor server features an Intel Pentium 4 processor with 533MHz front-side bus speed, impressive internal storage and support for remote systems management capabilites. Hot-swap SCSI HDDs add a new level of availability to the value tower, complementing fixed IDE or SCSI models. The x205 makes new levels of availability and manageability affordable for all server customers.

IBM @server xSeries 205

IBM rack-optimized innovation

Business, government and academia face the challenge of administering large numbers of servers scattered across the enterprise. By centralizing IT administration to a rack-optimized data center environment, organizations can reap the benefits of reduced space requirements, enhanced security, lower utility costs and simpler administration.

Consider that by consolidating traditional tower or pedestal servers into a rack-optimized server environment, you may be able to save up to 40% or more of your available data center space, helping to prevent costly data center expansion in the future. And this doesn't include the benefits associated with the next generation of IBM rack-optimized systems.

Yet implementing an effective rack-dense environment introduces new challenges. There's managing the expense and bulk of KVM cabling, or installing and removing servers and options from fully populated racks. How do you manage data consolidation? And how do you easily and efficiently manage all these servers now that they're centralized?

IBM @server xSeries delivers one of the best total rack solutions in the industry—from affordable edge-of-network servers to highly scalable, high availability servers. These rack-dense servers, backed by outstanding xSeries Options and software tools, deliver complete rack solutions that fit your unique business needs and budget.

The newest members of the xSeries rack-optimized server family include:

xSeries 305

This edge-of-network server delivers affordable server performance for applications such as firewall, caching, load-balancing and Web-hosting infrastructure.

xSeries 335

This highly manageable, high-performance, 2-way server comes complete in a rack-dense 1U package. It's ideal for Web or collaborative applications.

xSeries 345

An expandable, high-availability, high-performance server for e-business applications and mail/collaborative applications in just 2U of space.

xSeries 360

This rack-dense, 4-way server helps you lower costs and reduce space by delivering high-performance processing power and high availability in 3U of space for e-mail collaboration, business intelligence and enterprise resource planning (ERP).

xSeries 440

Perfect for space-constrained environments, this 4U system can start as an economical 2-way and can be expanded up to 16-way SMP as your needs grow. Exceptional availability along with configuration and application flexibility make this system ideal for databases, server consolidation and clustering.

Centralize IT administration to a rack-optimized data center environment and realize the benefits of reduced space requirements, enhanced security and lower utility costs.

xSeries servers are designed with industry-leading technologies that help optimize your data center environment. Consider these benefits:

- Reduction of cable costs, bulk and complexity using new IBM Advanced Connectivity Technology (ACT) Interconnect products and/or C2T Interconnect cabling
- Adding or removing adapters without restarting your server thanks to Active™ PCI and Active™ PCI-X technologies
- Reduced system downtime using Light Path Diagnostics, Real Time Diagnostics and Predictive Failure Analysis®
- Innovative vectored cooling designs for reliable system operation in demanding rack environments

Dense rack server environments also drive data consolidation, and no rack solution is complete without addressing the storage and backup of your business-critical data. IBM offers a full line of storage options to meet these needs, including IBM ServeRAID™ SCSI products, Fibre Array Storage Technology SAN solutions as well as tape products ranging from tape drives to autoloaders to libraries. To house all your rack components, xSeries Options offer a complete line of IBM NetBAY™ rack options to organize and simplify your rack infrastructure.

Software brings it all together

In the rack environment, you need software tools to deploy and manage your resources and help drive productivity. IBM Director automates many processes required to run your consolidated data center productively, which allows you to focus on more important business matters. And Rack Manager, a feature of IBM Director, provides a graphical drag-and-drop interface that simplifies management of rack hardware. In addition to management, Remote Deployment Manager simplifies server installation by allowing you to centrally deploy and update hundreds of rack systems at a prearranged time. These tools save you precious time and resources, allowing you to focus on more critical business needs.

For complete rack solutions, turn to xSeries servers and options. Visit **ibm.com**/pc/us/eserver/xseries for more information on the best rack solutions in the industry.

IBM NetBAY42™ Enterprise Rack

"Due to very limited space for computing resources, we needed a rack-optimized solution that was highly manageable and affordably priced. IBM was able to deliver the right portfolio of products at a price that fit our budget."

— Dr. Steven Jones, Head of Bioinformatics
Genome Sciences Centre
British Columbia Cancer Research Centre

**Included software[2]
(most models)**

• IBM Director and IBM Director Extentions
• IBM ServerGuide™

**Operating systems supported
(select models)**

• Microsoft® Windows® 2000
• Microsoft Windows NT®
• Novell NetWare
• SCO UnixWare
• Linux® (Red Hat, SuSE, Caldera, Turbolinux)

	Appliance	Universal
xSeries model	**Hosting Appliance**	**x205**
Form factor/height	Rack/1U	Tower, Rack/4U
Intel processor (max)	950MHz Celeron®	2.4GHz Pentium 4
Number of processors (std/max)	1/1	1/1
Cache (max)	128KB L2	512KB L2
Memory (max)	1.5GB	2GB PC2100
Expansion slots (total/Active PCI)	2/0	5/0
Disk bays (total/hot-swap)	2/0	4/3 (IDE or SCSI)
CD-ROM/ diskette drive	Yes	Yes
Maximum internal storage	80GB[1]	360GB IDE 293.6GB SCSI
Network	Dual integrated 10/100 Ethernet	Gigabit Ethernet
System Management processor	N/A	Supports optional Remote Supervisor Adapter
Power supply (std/max)	220W 1/1	340W 1/1
Hot-swap components	N/A	HDDs (select models)
Light Path Diagnostics	N/A	Limited
RAID support	Optional	Optional
For more information or to purchase now, go to ibm.com and enter this NavCode™	**w413**	**x205**

x220	x235	x255	Rack-optimized			
			x305	x335	x345	x360
Tower, Rack/4U	Tower, Rack/5U	Tower, Rack/7U	Rack/1U	Rack/1U	Rack/2U	Rack/3U
1.4GHz Pentium III	2.4GHz Xeon	1.6GHz Xeon Processor MP	2.0GHz Pentium 4	2.4GHz Xeon	2.4GHz Xeon	1.6GHz Xeon Processor MP
1/2	1/2	1/4	1/1	1/2	1/2	2/4
512KB L2	512KB L2	1MB L3	512KB L2	512KB L2	512KB L2	1MB L3
4GB	12GB PC2100 DDR Chipkill™	12GB PC1600 DDR Chipkill	4GB PC2100	8GB PC2100 DDR Chipkill	8GB PC2100 DDR Chipkill	8GB PC1600 DDR Chipkill
5/0	6/2 Active PCI-X	7/6 Active PCI-X	2/0 PCI-X	2/0 PCI-X	4/0 PCI-X 1/0 PCI	6/6 Active PCI-X
4/3	9/9 with optional 3-pack hot-swap HDD kit	12/12 with optional 6-pack hot-swap HDD kit	2/0	2/2	6/6	3/3
Yes	Yes	Yes	Yes	Yes	Yes	Yes
293.6GB	660.6GB	880.8GB	160GB	240GB IDE or 146.8GB SCSI	440.4GB	220.2GB
Integrated 10/100 Ethernet	Integrated 10/100/1000 Ethernet	Integrated 10/100/1000 Ethernet	Dual integrated 10/100/1000 Ethernet	Dual integrated 10/100/1000 Ethernet	Dual Integrated 10/100/1000 Ethernet	Integrated 10/100 Ethernet
Supports optional Remote Supervisor Adapter	Integrated (supports Remote Supervisor Adapter)	Integrated (supports Remote Supervisor Adapter)	Supports optional Remote Supervisor Adapter	Integrated (supports Remote Supervisor Adapter)	Integrated (supports Remote Supervisor Adapter)	Remote Supervisor Adapter in dedicated slot
330W 1/1	560W 1 or 2/2 hot-swap	370W 2/4 hot-swap	200W 1/1	331W 1/1	350W 1/2 hot-swap	370W 1 or 2/3 hot-swap
HDDs (select models)	Power supply, fans, HDDs, PCI-X	Power supply, fans, HDDs, PCI-X	N/A	HDDs	Power supply, fans, HDDs	Power supply, fans, HDDs
Limited	Yes	Yes	N/A	Yes	Yes	Yes
Optional	Integrated RAID-1	Optional	Optional	Integrated RAID-1	Integrated RAID-1	Optional
x220	**x235**	**x255**	**x305**	**x335**	**x345**	**x360**

	Scalable		
x380	**x440 Entry**	**x440**	
Rack/7U	Rack/4U	Rack/4U	
800MHz Itanium™	2.4GHz Xeon	1.6GHz Xeon Processor MP	
1/4	2/4	2/8	
4MB L3	512KB L2 32MB L4/2-way	1MB L3 32MB L4/4-way	
64GB	32GB (16GB/2-way or or 32GB/4-way) Chipkill	32GB (16GB/4-way or 32GB/8-way) Chipkill	
8/8*	6/6 Active PCI-X	6/6 Active PCI-X	
2/2	2/2	2/2	
Yes/LS-120	Yes	Yes	
72.8GB	146.8GB	146.8GB	
Integrated 10/100 Ethernet	Integrated 10/100/1000 Ethernet	Integrated 10/100/1000 Ethernet	
Yes** (ISC required)	Remote Supervisor Adapter in dedicated slot	Remote Supervisor Adapter in dedicated slot	
800W 4/4 hot-swap	1050W 2/2 hot-swap	1050W 2/2 hot-swap	
Power supply, fans, HDDs	Power supply, fans, HDDs, PCI-X	Power supply, fans, HDDs, PCI-X	
No	Yes	Yes	
Optional	Optional	Optional	
x380	**x440 Entry**	**x440**	

"We appreciate the reduction in size, scalability possibilities and modular design of the x440. The x440 should be easier to service, and has improved redundancy features. We look forward to working with this new server."

—John Gayer, Senior Integration Architect, Ford Motor Company

*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.

Take your servers to a higher level

IBM @server xSeries Options maximize your server investment by integrating easily into complete solutions for your storage and performance needs. xSeries options are certified for peak performance on xSeries servers so you can achieve the IT goals that can help drive your business forward.

Tangible business results:

- *Doubling memory in a Web server can cut response time by more than 50%[3].* That translates into satisfied customers who repeatedly visit your site to transact business.
- *Upgrading your servers with Intel Xeon processors can increase throughput up to 47%[4].* That can translate into more e-commerce orders processed.
- *One study measured that 9GB of sales and marketing data is valued at $7.65 million, 9GB of engineering data at $44.1 million[5].*
  Help keep that data available and readily accessible through an IBM Fibre Channel (FC) SAN configuration. The new IBM TotalStorage™ FAStT EXP700 Storage Expansion Unit, when combined with the TotalStorage FAStT700 Storage Server and new 2Gbps FC HDDs, helps deliver an end-to-end 2Gbps FC storage solution. The superior speed and bandwidth of IBM 2Gbps FC products help accelerate your networks.
- *72% of businesses that suffer a major data loss disappear within 24 months, a study recently found[6].*
  When you back up your data with advanced, automated xSeries tape solutions, you protect your business from catastrophic loss and help ensure a healthy future.

xSeries Options multiply the power of your xSeries servers to process, track, protect and share data across your enterprise, so you can realize its full profit potential.

Key IT business protection issues	xSeries Options
Space constraints 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. • The innovative IBM ACT Interconnect family of products helps give you valuable space by reducing cable bulk and volume, gives you centralized control of up to 256 servers locally or remotely, and makes setup of rack dense solutions easier than ever.
Increasing storage needs Is the e-business environment escalating your storage requirements? Is your data your most valuable asset?	• Using an EXP300 SCSI expansion unit, you can load fourteen 73.4GB drives for more than 1TB[1] of storage. • IBM SAN solutions featuring IBM Fibre Array Storage Technology (FAStT) support the growing requirement of providing superior performance and high bandwidth for faster data access.
Performance/scalability Does your current storage configuration provide sufficient data access to support your business needs?	• The IBM FAStT family of storage servers delivers the performance necessary to help optimize data access and delivery. • The IBM RXE-100 Remote Expansion Enclosure gives you true pay as you grow scalability because it eliminates the need to buy an entire new system to increase your I/O capacity.
Data availability Is your network unavailable at times?	• IBM offers nine levels of RAID protection for the redundancy you need; both Fibre Channel and SCSI RAID adapters are available.
Data protection How much is your data worth, and 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.

Exceptional investment protection

Validated solutions

Help reduce your cost of ownership by lowering integration risks, helping ensure smooth installation and decreasing the need for post-implementation support.

The **IBM ServerProven®** program[7] is based on a simple idea: give customers the confidence that all parts of their solution—hardware, software and middleware—install quickly, start up easily and run reliably. When you see the ServerProven emblem, you'll know that the software application you're looking for is part of a complete business solution that has been identified, validated, optimized and documented by the ServerProven partner to run reliably on IBM servers.

Visit **ibm.com**/eserver/xseries/serverproven for more information.

Cost-effective server consolidation

System partitioning—the ability of one server to run multiple operating systems simultaneously—has traditionally been the domain of mainframes and other large, sophisticated servers.

But with **VMware™ ESX Server™,**[7] you can enable dynamic, logical partitioning on your IBM @server xSeries 330, 360 and 440 systems. Instead of deploying multiple servers scattered around your company and running a single application on each, you can consolidate servers. VMware allows each of your xSeries servers to run multiple operating systems and applications in virtual machines—allowing you to centralize IT management. This means that not only is VMware ESX Server software great for optimizing hardware usage, it can also give you the added benefits of higher availability and scalability.

Visit **ibm.com**/eserver/xseries/vmware for more information.

Data center services

Running large SMP operations on 16-way systems becomes easier, more manageable and more reliable.

Stemming from collaboration between IBM and Microsoft, the **IBM Datacenter Solution Program** offers you a wide array of services and support for running Microsoft Windows 2000 Datacenter Server[2], the industry's most scalable operating system.

Visit **ibm.com**/ww/eserver/xseries/windows/datacenter for more information.

Excellent support

The acclaimed **service and support** you expect from IBM offers enhanced value, peace of mind and confidence.

- *Limited warranty**—Includes parts and onsite labor.
- *ServerGuide*—Enables rapid loading of major network operating systems and simplifies hardware configuration.
- *IBM High Availability Services for Business-Critical Systems*[8]—Uniquely tailored optional solutions available on certain xSeries servers to help meet your 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.

Visit **ibm.com**/pc/support for more information.

*See page 12 for limited warranty information[9].

Intelligent systems management, rock-solid reliability

Self-managing capabilities

Systems management tools—a combination of hardware instrumentation and advanced software—endow select xSeries servers with actual self-managing capabilities. They optimize resources and network performance in the face of fluctuating workloads and help reduce management costs—for high-availability and rock-solid reliability. Visit **ibm.com**/pc/ww/eserver/xseries/ systems_management for more information.

Software

- *IBM Director 3.1* provides a simple graphical interface to remotely manage up to 5,000 Intel processor-based clients. It automates many of the processes required to run your networks productively, including performance planning and preventive maintenance. As part of your xSeries hardware purchase, IBM Director delivers a wide range of management tools, whereas other vendors charge extra for most of their tools.
- *IBM Director Extensions* are a bundled collection of software utilities that integrate with IBM Director to extend the manageability of your xSeries hardware. They deliver advanced, predictive, self-healing technologies. Examples include:
  - *Software Rejuvenation* predicts software failures before they become critical, automatically refreshes the software for optimal performance and notifies appropriate IT personnel.

  - *Rack Manager* features a drag-and-drop interface, allowing you to easily configure and monitor rack components.
  - *Active PCI Manager* helps optimize server throughput and performance by determining the best placement for PCI cards.
  - *Capacity Manager* tracks resource utilization, identifies multiple levels of existing or potential bottlenecks and makes recommendations to improve performance.
  - *RAID Manager*, designed to improve productivity and data security, lets you monitor, manage and configure RAID subsystems without taking the server offline.

Hardware

- *IBM Integrated System Management Processors (ISMP)* are literally individual computers within xSeries servers that give you around-the-clock remote management, including comprehensive monitoring and troubleshooting capabilities.
- *IBM Remote Supervisor Adapters* augment ISMP capability on select xSeries servers by giving you full out-of-band management functionality. Even if the server is powered down or otherwise non-responsive, its independently powered management processor can bring it back under your control with a Web-based graphical management interface.

"We found IBM's management suite to be comprehensive, easy to get up to speed on and effortless to administer from. IBM gets an A+ rating for manageability…."

—InternetWeek, *October 2001*

IBM®

Need more information?

World Wide Web

IBM @server xSeries	**ibm.com**/eserver/xseries
IBM @server xSeries Canada	**ibm.com**/ca/eserver/xseries
IBM @server xSeries Options	**ibm.com**/pc/us/eserver/xseries/storage
IBM @server xSeries Options Canada	**ibm.com**/ca/eserver/xseries/storage

Buy Direct

U.S.	1 888 SHOP IBM
Canada	1 888 SHOP IBM

IBM Reseller and general information

U.S.	1 800 426-4968
Canada	1 800 426-2255

[1] When referring to storage capacity, GB equals 1,000,000,000 and TB equals 1,000,000,000,000. Accessible capacity is less.

[2] Some software may differ from its retail version (if any) and may not include user manuals or all program functionality. Warranty, service and support for non-IBM products are provided directly to you by third parties, not IBM. IBM makes no representations or warranties regarding non-IBM products. For non-IBM software, applicable third-party software licenses may apply.

[3] "The Ultimate Memory Guide," Kingston Technology Company, 2001

[4] "Performance Guide for Servers, Intel Xeon Processor with 512KB L2 Cache," Intel Corporation, February 2002

[5] National Computer Security Association, 2001

[6] "A Few Facts About Data Security," SkyDesk Inc., 2001

[7] IBM makes no warranties, express or implied, regarding non-IBM products and services, and those that are ServerProven, including but not limited to the implied warranties of merchantability and fitness for particular purpose. These products are offered and warranted solely by third parties.

[8] The High Availability Services for Business-Critical Systems offering is an optional service in the U.S. only. It is offered for only selected xSeries models at this time. IBM reserves the right to change the terms and conditions of the offering at any time without notice.

[9] For a copy of the IBM Statement of Limited Warranty, call 1 800 772-2227. Telephone support may be subject to additional charges. For onsite service, IBM sends a technician after attempting to diagnose and resolve the problem remotely.

For Position Only

GM13-0128-02