

Powering your business ... on demand



xSeries 445



xSeries 206



xSeries 345



xSeries 365



xSeries servers deliver outstanding performance with high-performance Intel® Xeon™ Processors

IBM @server xSeries systems

Highlights

- **High-performance, scalable xSeries servers, such as the IBM @server xSeries 365 and 445 with high-performance Intel® Xeon™ Processors MP, feature outstanding availability, 4-way and greater pay-as-you-grow scalability and investment protection.**
- **Rack-optimized xSeries servers—like the new IBM @server xSeries 306—help solve data center space constraints with compact designs that don't sacrifice performance or manageability.**
- **Tower xSeries servers—such as the new IBM @server xSeries 206—deliver innovation and usability at entry-level prices for small businesses or distributed computing.**

xSeries differentiation, innovation

A commitment to differentiation with the technology to fuel innovation. These are the reasons that are leading IBM @server® xSeries® systems to capture big gains in the marketplace today. By investing in innovation, bringing mainframe-inspired technologies to the industry-standard market and providing exceptional systems management offerings, these tower and rack-optimized xSeries systems are gaining marketplace momentum with customers, edging out the competition and earning increased market share.

Feature-rich functionality

xSeries servers range from affordable, workgroup systems to enterprise-class systems. High-performance xSeries servers deliver XpandOnDemand capability providing a simple route to higher performance. Add processing, memory and storage capacity as your needs grow, and protect your investment.

Distributed and rack solutions

xSeries tower and rack-dense servers deliver innovation across the product line with leading systems management and availability features such as remote power control and integrated RAID on every server. And new simple-swap serial ATA drives help lower computing costs. The rich server functions of xSeries systems are setting a new industry standard that deliver increased server performance and availability.

High-performance hardware

xSeries servers, part of the IBM @server product family, provide server solutions that feature virtual hands-off reliability through mainframe-inspired technologies. Built on IBM Enterprise X-Architecture™ technology, a blueprint for building mainframe muscle into Intel® processor-based systems, xSeries servers deliver revolutionary advancements to I/O, memory and processors, and a pay-as-you-grow approach to Intel 32-bit and 64-bit systems. Many xSeries systems feature high-performance Intel® Xeon™ Processors.

Smart systems management

IBM Director software provides comprehensive systems management, helping reduce the risk of downtime and lower IT costs. While IBM Director takes predictive and proactive actions to keep systems running, you're free to concentrate on important business matters.

On demand ready

Becoming an on demand business means finding ways to grow, adapt and respond in a dynamic business environment while managing costs. xSeries systems provide outstanding availability and systems management capabilities that help better manage and provision your computing resources, for a responsive IT environment that can grow with your business. Just what you need in today's on demand world.



BladeCenter solutions (HS20/HS40)

Tackle your server management challenges with IBM **@server** BladeCenter. BladeCenter's modular design gathers computing resources into cost-effective, high-density enclosures that support hot-swappable, high-performance 2-way (HS20) and 4-way (HS40) Intel® processor-based blade servers.

Now BladeCenter has expanded its hardware ecosystem by delivering new Cisco and Brocade switch modules to help clients lower the Total Cost of Ownership. These switch modules integrate industry-leading Ethernet and Fibre Channel technology into BladeCenter, simplifying its deployment in your data center environment.

Clustering solution

IBM **@server** Cluster 1350, IBM's industry-leading Linux cluster solution, now includes BladeCenter and the HS20 blade with Intel® Xeon™ Processors to provide outstanding performance and density. The Cluster 1350 combines the power of BladeCenter and other xSeries and **@server** rack-optimized servers with IBM Cluster Systems Management for Linux software, IBM storage products, leading third-party networking components and a single point of contact for warranty service for cluster components—creating powerful, flexible solutions for high-performance computing and commercial application environments.

Microsoft solutions

IBM works with Microsoft so that xSeries servers provide outstanding performance and functionality running different versions of the Windows operating system. xSeries supports a range of offers from select products pre-loaded with the Windows operating system for customers who desire one-stop shopping to distributing the Datacenter Edition for customers demanding scalability and reliability.

Linux solutions

IBM works with the leading Linux distribution companies, Red Hat®, Inc. and SUSE LINUX, a Novell company, to offer tested and validated configuration for xSeries servers. This helps deliver outstanding xSeries performance and functionality. xSeries supports a broad range of server offerings preloaded with the Linux operating system for customers who desire one-stop shopping for Linux and support services. The range of Linux offerings available on xSeries servers gives you the flexibility to choose the optimum Linux implementation for your unique requirements.

Leverage storage technology

Data represents a critical component of business today. Efficiently handling the growing amounts of information is one of the keys to success for an on demand business.

The IBM TotalStorage® family of products offers a broad portfolio of scalable, open and innovative storage technology including disk and tape storage systems, storage networking solutions, and virtualization and storage management software. IBM can help you deploy and maintain storage infrastructures, providing solutions designed to improve business efficiency and continuity, while helping enhance productivity through automation.

Affordable xSeries solutions

xSeries systems are designed to match nearly any application workload environment, from the entry-level, uni-processor x206 to the enterprise-powered, up to 32-way x445. Visit **ibm.com/eserver/xseries** for more information.

“xSeries servers are simply more efficient than our legacy servers. We can multithread applications and they deliver better performance for our Web environment. We're getting better performance for a lower investment.”

— Mick Jennings, Chief Technology Officer, Campbell Soup Company



	Universal			
xSeries model	x206	x225	x235	x255
Form Factor	Tower, rack/4U	Tower, rack/4U	Tower, rack/5U	Tower, rack/7U
Processor	Intel® Pentium® 4 Processor up to 3.20GHz/800MHz front-side bus	Intel® Xeon™ Processor up to 3.06GHz/533MHz front-side bus	Intel Xeon Processor up to 3.20GHz/533MHz front-side bus	Intel® Xeon™ Processor MP at up to 3GHz
Number of processors (std/max)	1/1	1/2	1/2	1/4
Cache (max)	1MB L2	512KB L2	Up to 1MB L3	4MB L3
Memory¹ (std/max)	256MB/4GB PC2700/PC3200 DDR standard (model dependent)	512MB/8GB PC2100 DDR ²	512MB or 1GB/12GB PC2100 DDR ²	512MB/24GB PC1600 DDR Chipkill™
Expansion Slots	2 PCI-X, 3 PCI	5 total/4 PCI-X	6 total/2 Active PCI-X	6 Active PCI-X
Disk bays (total/hot-swap)	4 non-hot-swap SCSI 3 hot-swap SCSI 2 simple-swap SATA (optional 4)	6/6 6 hot-swap SCSI 4 non-hot-swap SCSI	6/6	12/12 with optional 6-pack hot-swap hard disk drive kit
Maximum internal storage^{1,3}	587.2GB SCSI, 320GB SATA, 640GB SATA optional	880.8GB Ultra320 hot-swap, 587.2GB Ultra320 non-hot-swap	1.3TB ³ Ultra320 SCSI	1.76TB Ultra320 SCSI
Network	Integrated 10/100/1000 Ethernet	Integrated 10/100/1000 Ethernet	Integrated 10/100/1000 Ethernet	Integrated 10/100/1000 Ethernet
System Management processor	Supports optional Remote Supervisor Adapter II	Supports optional Remote Supervisor Adapter II	Integrated Systems Management Processor (supports optional Remote Supervisor Adapter II)	Integrated Systems Management Processor (supports optional Remote Supervisor Adapter II)
Power supply (std/max)	340W 1/1	425W or (2) 514W hot-swap	560W 1/2 or 660W 1/2	370W 2/4 hot-swap (redundant at 110V and 220V)
Hot-swap components	Hard disk drives (select models)	Power supply, hard disk drives (select models)	Drives, power supply, fans and PCI-X slots	Power supply, fans, hard disk drives, PCI-X adapters
Light Path Diagnostics	Limited	Limited	Yes	Yes
RAID support	Integrated IBM ServeRAID 7e (RAID 0,1)	Integrated RAID-1, optional RAID-5	Integrated RAID-1, optional RAID-5	Optional
xSeries OS compatibilities support	Red Hat, SUSE LINUX, Microsoft Windows®, Novell NetWare, OS 4690	Red Hat, SUSE LINUX, Microsoft Windows, Novell NetWare	Red Hat, SUSE LINUX, Turbolinux, Microsoft Windows, Novell NetWare, OS/2	Red Hat, SUSE LINUX, Microsoft Windows, Novell NetWare



	Rack-optimized				
xSeries model	x306	x335	x345	x365	x382
Form Factor	Rack/1U	Rack/1U	Rack/2U	Rack/3U	Rack/2U
Processor	Intel® Pentium® 4 Processor up to 3.20GHz/800MHz front-side bus	Intel® Xeon™ Processor up to 3.20GHz/533MHz front-side bus	Intel Xeon Processor up to 3.20GHz/533MHz front-side bus	Intel® Xeon™ Processor MP at up to 3GHz	Intel® Itanium® 2 Processor up to 1.50GHz
Number of processors (std/max)	1/1	1/2	1/2	1/4 or 2/4	2/2
Cache (max)	1MB L2	Up to 2MB L3	Up to 2MB L3	1MB or 2MB	Up to 6MB
Memory¹ (std/max)	512MB/4GB PC2700/PC3200 DDR standard (model dependent)	512MB or 1GB/8GB PC2100 ECC DDR ²	512MB or 1GB/8GB PC2100 ECC DDR ²	1GB/32GB or 2GB/32GB PC2100 DDR Chipkill ⁴	2GB or 4GB/16GB PC2100 DDR Chipkill
Expansion Slots	2 PCI-X (66MHz)	2 PCI-X (64-bit 100MHz)	4 PCI-X, 1 PCI	6 slots (5 available) Active PCI-X with optional 12 PCI-X slots via RXE-100 Remote Expansion Enclosure	3/3 PCI-X
Disk bays (total/hot-swap)	2/2 (SATA models only)	2/2	6/6	6/6	2/2
Maximum internal storage^{1,3}	320GB SATA or 293.6GB SCSI	293.6GB Ultra320 SCSI or 240GB IDE	880.8GB	876GB Ultra320 SCSI	293GB Ultra320 SCSI
Network	Dual integrated 10/100/1000 Ethernet	Dual integrated 10/100/1000 Ethernet	Dual integrated 10/100/1000 Ethernet	Dual integrated 10/100/1000 Ethernet	Dual integrated 10/100/1000 Ethernet
System Management processor	Supports optional Remote Supervisor Adapter II	Integrated Systems Management Processor (supports optional Remote Supervisor Adapter II)	Integrated Systems Management Processor (supports optional Remote Supervisor Adapter II)	Remote Supervisor Adapter II in dedicated slot	Integrated Intel IPMI 1.5
Power supply (std/max)	300W 1/1	332W 1/1 or 411W 1/1	350W 1/2 or 514W 1/2	950W 1 or 2/2 hot-swap	350W 2/3
Hot-swap components	Simple-swap SATA drives	Ultra320 SCSI hard disk drives	Power supply, fans and hard disk drives	Power supply, fans, hard disk drives and PCI-X adapters	Power supply and hard disk drives
Light Path Diagnostics	N/A	Yes	Yes	Yes	N/A
RAID support	Integrated IBM ServeRAID 7e (RAID 0, 1)	Integrated RAID-1 (mirroring)	Integrated RAID-1 (mirroring), optional RAID-5	RAID-0/1 standard, RAID-5 optional	Integrated RAID-1
xSeries OS compatibilities support	Red Hat, SUSE LINUX, Microsoft Windows, Novell NetWare	Red Hat, SUSE LINUX, Microsoft Windows, Novell NetWare	Red Hat, SUSE LINUX, Microsoft Windows, Novell NetWare, VMware™ ESX Server™	Red Hat, SUSE LINUX, Microsoft Windows, Novell NetWare, VMware ESX Server	Red Hat, SUSE LINUX, Microsoft Windows



High-performance scalable		
xSeries model	x445	x455
Form Factor	Rack/4U per chassis	Rack/4U per chassis
Processor	Intel® Xeon™ Processor MP up to 3GHz or Intel Xeon Processor 3GHz	Intel® Itanium® 2 Processor at up to 1.50GHz
Number of processors (std/max)	2/32 with Intel Xeon Processor MP 2/4 with Intel® Xeon™ Processor	1/16 (up to 4 processors per x455 unit)
Cache (max)	4MB L3, 64MB Xcel4™ Server Accelerator Cache per 4-way for Intel Xeon Processor MP or 512MB L2, 64MB Xcel4 per 2-way for Intel Xeon Processor	6MB L3, 64MB Xcel4 Server Accelerator Cache per 4-way for Itanium 2
Memory¹ (std/max)	64GB Chipkill DDR SDRAM per chassis	56GB Chipkill DDR SDRAM per 4-way, up to 224GB Chipkill DDR SDRAM per 16-way
Expansion Slots	6/6 Active PCI-X per chassis with optional RXE-100 Remote Expansion Enclosure	6/6 Active PCI-X per chassis with optional RXE-100 Remote Expansion Enclosure
Disk bays (total/hot-swap)	2/2 Supporting Ultra320 SCSI	2/2 Supporting Ultra320 SCSI
Maximum internal storage^{1,3}	293.6GB	293.6GB
Network	Integrated Dual 10/100/1000 Ethernet	Integrated Dual 10/100/1000 Ethernet
System Management processor	Remote Supervisor Adapter II-EXA in dedicated slot	Remote Supervisor Adapter in dedicated slot, IBM Director
Power supply (std/max)	1200W 2/2 hot-swap	1050W 2/2 hot-swap
Hot-swap components	Power supplies, cooling fans, hard disk drives, PCI-X adapters and memory DIMMs	Power supplies, cooling fans, hard disk drives, PCI-X adapters and memory DIMMs
Light Path Diagnostics	Yes	Yes
RAID support	Integrated RAID-1	Integrated RAID-1
xSeries OS compatibilities support	Red Hat, SUSE LINUX, Microsoft Windows, Novell NetWare, VMware ESX Server	Red Hat, SUSE LINUX, Microsoft Windows

For more information:

World Wide Web

U.S.	ibm.com/eserver/xseries
Canada	ibm.com/ca/eserver/xseries

IBM @server xSeries Options

U.S.	ibm.com/pc/us/eserver/xseries/storage
Canada	ibm.com/pc/ca/eserver/xseries/options

IBM TotalStorage Products

ibm.com/totalstorage

IBM @server xSeries Systems Management

ibm.com/servers/eserver/xseries/systems_management/xseries_sm.html

IBM @server Cluster 1350

ibm.com/servers/eserver/clusters/

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ibm.com/services/ondemand

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IBM @server BladeCenter at a glance (HS20 and HS40 chassis)

Form factor	Rack/7U, high-availability midplane
Blade bays	Up to 14 2-way, and up to 7 4-way
Standard media	CD-ROM and diskette drive accessible from each blade server
Switch modules	4 switch module bays
Power supply module	Up to 4 (hot-swap and redundant 1800W with load balancing and failover capabilities)
Cooling modules	2 hot-swap and redundant blowers standard
Systems management hardware	1 management module standard, add an optional second module for redundancy
I/O ports	Keyboard, video, mouse, Ethernet, USB

IBM @server BladeCenter HS20 at a glance

Processor	Intel® Xeon™ Processor up to 3.20GHz
Number of processors (std/max)	1/2
Level 2 cache	Up to 2MB L3 cache
Front side bus	Up to 533MHz
Memory¹	Up to 8GB ECC DDR
Internal hard disk drives	Up to 2 IDE (or up to 2 hot-swap Ultra320 SCSI drives with optional SCSI Storage Expansion Unit)
Maximum internal storage^{1,3}	293.6GB SCSI/80GB IDE
RAID support	Integrated IDE RAID standard on blade server, integrated RAID with SCSI Storage Expansion Unit option
Network	2 integrated Gigabit Ethernet controllers
I/O Upgrade	1 expansion card connection
Systems management hardware	Integrated systems management processor
Systems management software	IBM Director with systems management and trial deployment tools, IBM Director Server Plus Pack optional
Predictive Failure Analysis	Hard disk drives, processors, blowers, memory
Light Path Diagnostics	Blade server, processor, memory, power supplies, blowers, switch module, management module, hard disk drives and expansion card
Limited warranty⁵ and support	3-year onsite limited warranty
External storage	Support for IBM TotalStorage solutions (including FASTT and NAS family of products)
Operating systems supported	Microsoft Windows Server 2003, Microsoft Windows 2000 Server/Advanced Server, Red Hat Linux, SUSE LINUX, Novell Netware, VMware ESX Server

“The main advantage of switching over to BladeCenter is the cost-effective scalability. If we need more power, we can simply add another blade. For a fast-growing company like us, that’s a great selling point.”

— Andy Makings, Senior Infrastructure Analyst, Virgin Money

IBM @server BladeCenter HS40 at a glance

Processor	Intel® Xeon™ Processor MP up to 3GHz
Number of processors (std/max)	1/4
Level 3 cache	Up to 4MB
Front side bus	400MHz
Memory¹	Up to 16GB DDR ECC Chipkill™
Internal hard disk drives	Up to 2 hot-swap Ultra320 SCSI drives with optional SCSI storage expansion unit
Maximum internal storage^{1,3}	293.6GB SCSI
RAID support	Integrated RAID with SCSI storage expansion unit option
Network	4 integrated Gigabit Ethernet controllers
I/O Upgrade	2 expansion card connections
Systems management hardware	Integrated system management processor
Systems management software	IBM Director with systems management and trial deployment tools, IBM Director Server Plus Pack optional
Predictive Failure Analysis	Hard disk drives, processors, blowers, memory
Light Path Diagnostics	Blade server, processor, memory, power supplies, blowers, switch module, management module, hard disk drives and expansion card
Limited warranty⁴ and support	3-year onsite limited warranty
External storage	Support for IBM TotalStorage solutions (including FASTT and NAS family of products)
Operating systems supported	Microsoft® Windows® Server 2003, Microsoft Windows® 2000 Server/Advanced Server, Red Hat Linux, SuSE Linux, Novell NetWare

¹ 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.

² Memory with Chipkill-enabled technology is available as an option at 512MB DIMMs and higher.

³ When referring to storage capacity, GB = 1,000,000,000 bytes and TB = 1,000,000,000,000 bytes. Accessible capacity is less.

⁴ Using 2GB DIMMs.

⁵ **Visit ibm.com/pc/safecomputing periodically for the latest information on safe and effective computing.**

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