

Innovation comes standard



IBM System x servers

Highlights

- **Build a cost-effective, flexible IT environment with IBM X-Architecture® technology.**
- **Achieve maximum performance per watt with the latest quad-core Intel® Xeon® processors.**
- **Help save money on energy costs by proactively controlling power with IBM PowerExecutive™ technology.**
- **Lower the total cost of managing and supporting your networked systems with IBM Director tools.**

Leadership with X-Architecture innovation

The X-Architecture blueprint focuses on meeting client needs in the x86 environment through innovative design and the application of technology. Now in its fourth generation, X-Architecture technology delivers IBM System x™ and BladeCenter® servers that combine technology innovation with industry-standard hardware and software for rock-solid servers with the following:

- *Adaptive performance—Balancing system design for maximum performance*
- *Inherent virtualization—Maximizing the utilization of the IT investment dollars*
- *Efficient energy management—Managing the increasing operational cost of technology*
- *Proactive management—Providing intuitive tools for easy systems management*
- *Dynamic availability—Maximizing uptime for business-critical applications*

These revolutionary advances help you build a cost-effective, flexible IT environment and help you become an agile business.

New quad-core processors

The IBM System x family is powered by high-octane, dual-core and quad-core Intel Xeon processors and dual-core AMD Opteron processors. With a wide range of scale-out and scale-up offerings, the System x family scales up to 32 sockets. While new quad-core processing provides the basis for increased system performance, it's IBM's balanced system design—more memory and more I/O than competitive systems—that allows you to realize enhanced performance—ideal for a virtualized world.

Inherent virtualization

IBM is a recognized leader in virtualization. And these new servers are designed to help you achieve the efficiency of virtualization, helping you maximize the business value of your server investment. With the new IBM Director extension, IBM Virtualization Manager, managing your virtualized server is even easier, giving you a single interface to manage both physical and virtual systems.

Efficient energy management

Providing proactive energy management, IBM PowerExecutive technology can help you collect actual energy data,

cap system power utilization and control your energy consumption. An integrated hardware and software solution building block, PowerExecutive allows you to match business goals with power and thermal limits at the system, chassis, rack and data center levels to help you save money on energy costs.

Dynamic availability

Proven IBM X-Architecture innovation provides the availability and reliability to help you deploy your business-critical applications. In addition to hot-swap and redundant components and fault-tolerant cluster technology, IBM features additional tools that help provide that your systems are continuously available.

Proactive management

IBM Director 5.20 is an integrated suite of software tools that provide a consistent, single point of server management and automation. IBM Director's open design and support for industry standards enable heterogeneous hardware management with broad platform and operating system support. IBM Director can help you:

- *Reduce downtime*
- *Increase productivity of IT personnel and end users*
- *Reduce service and support costs*

BladeCenter solutions

Tackle your IT complexity with IBM BladeCenter. BladeCenter helps you simplify by bringing together servers, storage and networking into a single enclosure and tying it together with powerful solution management tools. And, BladeCenter servers and switches can be easily moved between chassis—including BladeCenter H, BladeCenter and BladeCenter T. Visit ibm.com/systems/bladecenter for more information.

Clustering solution

The IBM System Cluster 1350 aggregates a variety of IBM System x and BladeCenter servers to form a high-performance, highly scalable Linux® solution for scientific, technical and commercial computing workloads. Since all components of the Cluster 1350 portfolio are cluster-tested in our labs, built in our factories and shipped intact and ready for installation at your site, you can be sure they deliver the ultimate in reliability.

Microsoft solutions

IBM System x servers provide outstanding performance and functionality running the Windows® operating system. System x supports a range of offers from select products preloaded 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 Enterprise and SUSE Linux, a Novell company, to offer tested and validated configuration for System x servers. This helps deliver outstanding performance and functionality. System x servers support a broad range of server offerings preloaded with the Linux operating system for customers who desire one-stop shopping for Linux. The range of Linux offerings available on System x servers gives you the flexibility to choose the optimum Linux implementation for your needs.

Leverage storage technology

Efficiently handling the growing amounts of data is one of the keys to success for an on demand business.

The IBM System Storage™ 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. Visit ibm.com/servers/storage for more information on System Storage solutions.

System x model	x3105	x3200	x3400
Form factor	Tower	Tower, 5U	Tower, rack/5U
Processor	AMD Opteron 1000 series (dual-core) or AMD Athlon 3500+ (single-core)	Intel Xeon (dual-core) up to 2.4 GHz or Intel Pentium® D (dual-core) up to 3.4 GHz	Dual-Core Intel Xeon 5130 up to 2.0 GHz and up to 1333 MHz front-side bus or Quad-Core Intel Xeon Processor E5320 up to 1.86 GHz
Number of processors (std/max)	1/1	1/1	1/2
Cache (max)	2x1MB or 512KB (model dependent)	Up to 4MB or 2x2MB	2x2MB L2 (dual-core) or 2x4MB L2 (quad-core)
Memory ¹ (std/max)	512MB or 1GB/8GB DDR II 667 MHz via 4 DIMM slots	Up to 8GB DDR II 667 MHz	1GB/32GB Fully Buffered DIMM 667 MHz via 8 DIMM slots
Expansion slots	2 PCI, 2 PCI-Express (x8, x8)	3 PCI and 2 PCI-Express (x8, x1), dedicated Remote Supervisor Adapter II slot, slotless hardware RAID-0, -1	3 PCI-Express, 2 PCI-X, and 2 PCI
Disk bays (total/hot-swap)	2 Serial ATA (SATA) or near-line SATA	Four 3.5" fixed simple-swap or hot-swap Serial ATA hard disk drives or four 2.5" or 3.5" hot-swap Serial Attached SCSI hard disk drives	4/0 or 8/8 (model dependent)
Maximum internal storage ^{1,2}	1.0TB SATA	Up to 1.2TB Serial Attached SCSI (SAS) HDDs, or up to 2.0TB Serial ATA HDDs	2.4TB hot-swap SAS, 2.0TB simple-swap SATA, 4.0TB hot-swap SATA
Network interface	Integrated Gigabit Ethernet	Integrated Gigabit Ethernet	Integrated Gigabit Ethernet
System management processor	IBM ServerGuide™	IPMI 1.5-compliant mini-BMC, IBM ServerGuide, supports optional Remote Supervisor Adapter II and optional Remote Deployment Manager	Integrated IPMI System Management Processor, supports optional Remote Supervisor Adapter II SlimLine
Power supply (std/max)	310W 1/1	400W 1/1 or 430W hot-swap redundant 2/2 (model dependent)	670W 1/1 or 835W 1/2
Hot-swap components	Not applicable	Hard disk drives, power supplies (model dependent)	Power supply, fans, hard disk drives
Light path diagnostics	Not applicable	Limited	Limited
RAID support	OS RAID-0, -1; hardware-based RAID-0, -1 optional	Integrated hardware RAID-0, -1 (model dependent), optional upgrade to RAID-5 and RAID-6	Integrated RAID-0, -1, -10, optional RAID-5
System x OS compatibilities support	Red Hat Linux, SUSE Linux, Microsoft® Windows, Novell NetWare	Red Hat Linux, SUSE Linux, Microsoft Windows, Novell NetWare, IBM OS 4690	Red Hat Linux, SUSE Linux, Microsoft Windows, Novell NetWare, VMware ESX Server, SCO UnixWare, SCO OpenServer

System x model	x3500	x3800	x3250
Form factor	Tower, rack/5U	Tower, rack/7U	Rack (22" depth)/1U
Processor	Dual-Core Intel Xeon 5160 up to 3.0 GHz and up to 1333 MHz front-side bus or Quad-Core Intel Xeon Processor E5320 up to 1.86 GHz and up to 1066 MHz front-side bus	Intel Xeon Processor MP up to 3.66 GHz (single-core) and 3.30 GHz (dual-core)/667 MHz front-side bus	Intel Xeon (dual-core) up to 2.4 GHz, or Intel Pentium D (dual-core) up to 3.4 GHz or Intel Celeron up to 2.93 GHz
Number of processors (std/max)	1/2	1 or 2/4	1/1
Cache (max)	2x2MB L2 (dual-core) or 2x4MB L2 (quad-core)	1MB L2 per processor (single-core) and up to 2x2MB L2 (dual-core) and up to 16MB L3 (dual-core)	2MB or 4MB (dual-core) or 4MB (dual-core) or 256KB
Memory¹ (std/max)	1GB/48GB Fully Buffered DIMM 667 MHz via 12 DIMM slots	1GB or 2GB/64GB PC2-3200 DDR II SDRAM	512MB or 1GB/8GB DDR II 667 MHz via 4 DIMM slots
Expansion slots	3 PCI-Express, 2 PCI-X and 1 PCI	6, two Active PCI-X 2.0/266 MHz and four PCI-Express x8	2 PCI-Express (x8)
Disk bays (total/hot-swap)	8/8	12/12 3.5" Serial Attached SCSI	Up to two 3.5" simple-swap Serial ATA, or two 3.5" hot-swap Serial ATA or Serial Attached SCSI hard disk drives, or four 2.5" hot-swap SAS
Maximum internal storage^{1,2}	2.4TB hot-swap SAS, 4TB hot-swap SATA	3.6TB SAS (supports 300GB SAS HDDs)	1.0TB Serial ATA or 600GB Serial Attached SCSI
Network interface	Integrated dual Gigabit Ethernet	Integrated dual Gigabit Ethernet	Dual Gigabit Ethernet
System management processor	Integrated IPMI System Management Processor, supports optional Remote Supervisor Adapter II SlimLine	IBM ServerGuide, optional Remote Supervisor Adapter II SlimLine	IPMI 1.5-compliant mini-BMC, IBM ServerGuide, Remote Deployment Manager, optional Remote Supervisor Adapter II SlimLine
Power supply (std/max)	835W 1/2	775W 2 or 3/3 hot-swap (N+1)	350W 1/1
Hot-swap components	Hard disk drives, power supply, fans	Power supply, fans, memory, hard disk drives, and PCI-Express and PCI-X adapters	Serial ATA and Serial Attached SCSI hard disk drives
Light path diagnostics	Yes	Yes	Not applicable
RAID support	Integrated RAID-0, -1, -1E, -5, -6, -10	RAID-0, -1, -5 optional (IBM ServeRAID™-8i)	Integrated hardware RAID-0, -1 (model dependent), optional upgrade to RAID-5 and -6
System x OS compatibilities support	Red Hat Linux, SUSE Linux, Microsoft Windows, Novell NetWare, VMware ESX Server, SCO OpenServer, SCO UnixWare	Red Hat Linux, SUSE Linux, Microsoft Windows, VMware ESX Server	Red Hat Linux, SUSE Linux, Microsoft Windows, Novell NetWare

System x model	x3455	x3550	x3650
Form factor	1U	Rack/1U	Rack/2U
Processor	AMD Dual-Core Opteron Model 2210, 2214, 2216, 2218, 2220 SE	Dual-Core Intel Xeon Processor 5160 up to 3.0 GHz and up to 1333 MHz front-side bus or Quad-Core Intel Xeon Processor E5320 up to 1.86 GHz and up to 1066 MHz front-side bus	Dual-Core Intel Xeon Processor 5160 up to 3.0 GHz and up to 1333 MHz front-side bus or Quad-Core Intel Xeon Processor E5320 up to 1.86 GHz and up to 1066 MHz front-side bus
Number of processors (std/max)	1/2	1/2	1/2
Cache (max)	2MB per socket	2x2MB L2 (dual-core) or 2x4MB L2 (quad-core)	2x2MB L2 (dual-core) or 2x4MB L2 (quad-core)
Memory ¹ (std/max)	2x512MB/48GB PC5300 ECC DDR II SDRAM IBM Chipkill™ 667 MHz via 12 DIMM slots	1GB or 2GB/32GB Fully Buffered DIMM 667 MHz	1GB or 2GB/48GB Fully Buffered DIMM 667 MHz via 12 DIMM slots
Expansion slots	2 PCI-Express or PCI-Express (1) x16, (1) x8 and 1 HTx	2 PCI-Express (x8) half-length, full-height or optional riser card for 1 PCI-X (64-bit 133 MHz)	4 PCI-Express or 2 PCI-X and 2 PCI-Express
Disk bays (total/hot-swap)	2	2/2 or 4/4	8/8
Maximum internal storage ^{1,2}	1.0TB SATA II or 600GB SAS (3.0 Gbps)	293.6GB hot-swap SAS or up to 1.0TB simple-swap SATA	1.8TB hot-swap SAS
Network interface	Integrated dual Gigabit Ethernet	Integrated dual Gigabit Ethernet	Integrated dual Gigabit Ethernet
System management processor	Serial over LAN (IPMI-2.0-compliant), IBM Director, Cluster Systems Management	Integrated Service Processor, supports optional Remote Supervisor Adapter II SlimLine	Integrated Service Processor, supports optional Remote Supervisor Adapter II SlimLine
Power supply (std/max)	650W capacity	670W 1/2	835W 1/2
Hot-swap components	Not applicable	Power supply, fans, hard disk drives (select models)	Power supply, fans and hard disk drives
Light path diagnostics	Yes	Yes	Yes
RAID support	Integrated RAID-0, -1 with SAS HDDs	Integrated RAID-0, -1, -10, optional RAID-5, -6	Integrated RAID-0, -1, -10, optional RAID-5, -6
System x OS compatibilities support	Red Hat Linux, SUSE Linux, Microsoft Windows	Red Hat Linux, SUSE Linux, Microsoft Windows, Novell NetWare, VMware ESX Server	Red Hat Linux, SUSE Linux, Microsoft Windows, Novell NetWare, VMware ESX Server

System x model	x3655	x3755	x3850	x3950
Form factor	2U	4U	Rack/3U	Rack/3U per chassis
Processor	AMD Dual-Core Opteron Model 2218 (2.6 GHz)	AMD Dual-Core Opteron Model 8220 (2.8 GHz)	Intel Xeon Processor MP up to 3.66 GHz (single-core) and 3.0 GHz (dual-core)/667 MHz front-side bus	Intel Xeon Processor MP up to 3.30 GHz (dual-core)/667 MHz front-side bus
Number of processors (std/max)	1/2	1/4 or 2/4	1 or 2/4	2/4 per chassis, 32 per configuration
Memory¹ (std/max)	64GB DDR II 667 MHz via 16 DIMMs	128GB DDR II 667 MHz (maximum)	2GB or 4GB/64GB PC2-3200 DDR II SDRAM	2GB or 4GB/64GB PC2-3200 DDR II per chassis, 512GB maximum
Expansion slots	Standard: 2 PCI-Express x8 (low-profile) and 1 PCI-Express x4 (low-profile)	7 total: 4 PCI-Express (1) x16; (2) x8; (1) x4 and 2 PCI-X; 1 HTx (half-length)	6, two Active PCI-X 2.0/266 MHz and four PCI-Express x8	6/6 (per chassis) Active PCI-X 2.0, all slots supporting up to 266 MHz
Disk bays (total/hot-swap)	Eight 2.5" hot-swap SAS hard disk drives (HDDs) or six 3.5" hot-swap SAS/SATA HDDs	4/4	6/6 2.5" Serial Attached SCSI	6/6 (per chassis) 2.5" Serial Attached SCSI
Maximum internal storage^{1,2}	1.8TB hot-swap SAS or 3TB hot-swap SATA or 584GB hot-swap SAS	1.2TB (4 x 300GB)	440.4GB Serial Attached SCSI	440.4GB SAS per chassis (supports 36.4GB and 73.4GB HDDs)
Network	Integrated dual Gigabit Ethernet with TOE	Integrated dual Gigabit Ethernet	Integrated dual Gigabit Ethernet	Integrated dual Gigabit Ethernet
System management processor	Baseboard Management Controller IPMI 2.0 standard, Remote Supervisor Adapter II SlimLine optional	Remote Supervisor Adapter II SlimLine optional	IPMI 2.0, integrated Remote Supervisor Adapter II SlimLine (model dependent)	Remote Supervisor Adapter II SlimLine standard
Power supply (std/max)	835W 1/2	1500W 1/2	1300W 1 or 2/2 hot-swap	1300W 220V 2/2
Hot-swap components	Power supply, HDDs, cooling fans	Power supply, HDDs, cooling fans	Power supplies, fans, memory, hard disk drives and PCI-Express/PCI-X adapters	Power supplies, fans, hard disk drives, PCI-X adapters and memory
RAID support	RAID-0, -1, -10 standard, RAID-5, -6, -10, -50, -60 and battery backup optional	Integrated RAID-0, -1, -10 standard, RAID-5 optional	RAID-0, -1, -5 optional (ServeRAID-8i)	Integrated RAID-0, -1,-5 (model dependent)
System x OS compatibilities support	Red Hat Linux, SUSE Linux, Microsoft Windows, VMware 3.0	Red Hat Linux, SUSE Linux, Microsoft Windows, VMware ESX Server	Red Hat Linux, SUSE Linux, Microsoft Windows, VMware ESX Server	Red Hat Linux, SUSE Linux, Microsoft Windows, VMware ESX Server

For more information:

World Wide Web

IBM System x	ibm.com/systems/x
BladeCenter	ibm.com/systems/bladecenter
IBM System Cluster 1350	ibm.com/servers/systems/clusters/
IBM Director	ibm.com/systems/management/director
IBM Power and cooling	ibm.com/systems/x/about/power.html
IBM System Storage	ibm.com/servers/systems/clusters/

IBM Express Portfolio

Select configurations of System x servers are part of the IBM Express Portfolio™, designed and priced to meet the needs of mid-sized businesses. Reliable and easy to manage, Express models and configurations vary by country.



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