



IBM System x3450 servers feature Intel Xeon processors 2.80 GHz and 3.0 GHz/1600 MHz, with 12 MB L2, and 3.4 GHz/1600 MHz, with 6 MB L2, optimizing high performance

Key prerequisites	2
Description	2
Product positioning	5
Reference information	5
Publications	6
Services	7
Technical information	7
IBM Electronic Services	12
Terms and conditions	13
Prices	17
Order now	18



At a glance

The System x3450 servers feature:

- Powerful 2.80 GHz/1600 MHz Intel E5462 processor, 3.0 GHz/1600 MHz Intel E5472 or X5472 processor, quad-core, both with 12 MB L2 cache, and 3.4 GHz/1600 MHz Intel Xeon processor X5272 dual-core with 6 MB L2 cache¹
- 8 GB of 667 MHz DDR2 ECC system memory², 64 GB maximum
- Two-port SATA controller
- One 600-watt power supply, no optional power supply
- Integrated systems management processor
- One PCI-E slot Gen 2, full length/full height
- Three drive bays: DVD-ROM bay, and two 3.5-inch fixed HDD bays
- Up to 1.5 TB³ SATA disk storage
- Dual port Ethernet (10/100/1000 Intel 82563EB) controller
- 1U rack industry-standard models
- Three USB and one serial port, no integrated system management, one mouse, one keyboard, one video, and two 10/100/1000 RJ45 ports

For ordering, contact:

Your IBM representative or the Americas Call Centers at

800-IBM-CALL Reference: YE001

Overview

With fixed power, five nonredundant cooling fans, and improved systems management control, System x3450 servers feature:

- 1600 MHz front-side bus (FSB) support
- Five nonredundant fixed cooling fans standard
- 600-watt power supply with cooling
- One PCIe card slot (1 x 16) Gen 2, full length/full height
- Integrated dual Gigabit Ethernet
- SATA models with native SATA controller
- AMF DDR2 ECC DIMMs, combined with an integrated ECC memory controller in core logic, that correct many soft and hard single-bit memory errors, and minimize disruption of service to LAN clients

- Integrated systems management processor

Powered and scaled for needed business growth

- Powerful quad-core 2.80 GHz/1600 MHz Intel® E5462 Xeon processor, or 3.0 GHz/1600 MHz Intel E5472 (80 W) or X5472 (120 W) Xeon processor, all with 12 MB L2 cache, and 3.4 GHz/1600 MHz X5272 (80 W) dual-core Intel processor with 6 MB L2 cache¹
- 667 MHz FSB functional speed for processor operations to memory and PCI bus
- 8 GB of high-speed, two-way interleaved, PC2-5300, 667 MHz ECC memory standard; maximum system memory 64 GB
- One high-speed, wide-bandwidth, full-length PCI-E bus slot Gen 2
- Dual port Ethernet (10/100/1000 Intel 82563EB) and SATA support
- Two 3.5-inch HDD drive bays, up to 1.5 TB total capacity using 750 GB SATA HDD options³

High availability for around-the-clock business demand

- Integrated systems management processor
- Wake on LAN®
- ECC memory to detect many double-bit errors and correct many single-bit errors⁴
- Integrated memory mirroring and online spare options

Service and support perfected for needs of business

- IBM server support and Web support⁵
- One-year, customer replaceable unit (CRU) and on-site⁶ service, limited warranty^{7,8}
- Optional warranty service upgrades available

Key prerequisites

- Monitor
- Keyboard
- Mouse

Availability date

July 17, 2008

Description

Intel Xeon processors with 12 MB L2 cache feature Intel NetBurst microarchitecture with Extended Memory 64 Technology (EM64T), which increases overall throughput via a faster 667 MHz system bus and enhanced level 2 cache. These enhancements add up to a faster response time.

IBM PC2-5300 CL5 DDR2 Chipkill™ Memory Option Kit

- IBM 2 GB PC2-5300 CL5 ECC DDR2 Chipkill AMF DIMM 667 MHz (38L5905)
- IBM 4 GB PC2-5300 CL5 ECC DDR2 Chipkill AMF DIMM 667 MHz (43X5026)

Note: DDR2 ECC DIMMs, combined with an integrated ECC memory controller, correct many soft and hard single-bit memory errors and minimize disruption of service to LAN clients.

Chipkill distributes information covered by error correction coding across separate memory chips, so if any of the chips fail, the data can still be reconstructed from the remaining chips and

the system can continue running.

Increased processor performance coupled with DDR memory enables you to retrieve and process information faster and more efficiently. DDR II memory executes twice the number of operations per cycle than traditional SDRAM memory, effectively doubling the data exchange rate between memory and processors.

High-performance server subsystems

System x3450 servers are two-socket, 1U rack systems for High Performance Computing (HPC). The x3450 is designed with fewer general purpose features for quicker response to data calculations at a lower cost per transaction. These servers are optimized for the HPC market. They offer large memory addressability via 16 DIMM slots, Intel Xeon 1600 MHz FSB processors, an embedded dual Gigabit Ethernet controller, and one PCI-e Gen 2 slot. These servers support fixed SATA HDDs. They incorporate powerful Intel Xeon processors with 12 MB L2 cache or 6 MB L2, model dependent. These processors feature advanced transfer L2 caches integrated onto the processor core and run at the same clock speed as the processor core.

High-speed, 1600 MHz (bus speed runs at 400 MHz, but data is clocked on four edges, yielding a transfer rate of 1600 MHz), PC2-5300 DDR2 AMF DIMMs are optimized for 667 MHz processor-to-memory subsystem performance. The System x3450 servers use the Intel Seaburg chipset to maximize throughput from processor to memory, and system I/O buses.

Standard x3450 configurations

Model	Processor	Cache	Memory	HDD interface	Mechanical
7948-2Bx	2 x 3.4 GHz/1600 MHz	6 MB	8 GB	0/B SATA	Rack
7948-3Bx	2 x 2.8 GHz/1600 MHz	12 MB	8 GB	0/B SATA	Rack
7948-4Bx	2 x 3.0 GHz/1600 MHz	12 MB	8 GB	0/B SATA	Rack
7948-5Bx	2 x 3.0 GHz/1600 MHz	12 MB	8 GB	0/B SATA	Rack

Note: 7948-2BX contains dual-core processors. All other 7948 models contain quad-core processors.

Additional features

- System board that contains 16 DIMM connectors supporting 2 GB and 4 GB AMF DDR II-667 MHz SDRAMs
 - Two-way interleaved memory for improved performance (memory must be installed in matched pairs)
 - Up to 64 GB of system memory (with 4 GB memory DIMMs installed)
- High-speed, wide-bandwidth, full-length/full height PCIe bus slot — One adapter card slot: PCIe 1x16 Gen 2 slot, full height/full length
- A fixed 600-watt power supply, all models
- Nonredundant cooling fans
- Integrated dual Gigabit Ethernet
- Integrated systems management processor
- One 600-watt power supply to support robust configurations
- Fixed HDD bays with SATA connectors
- SATA controller to support up to two internal SATA HDD devices
- AMF DDR2 ECC DIMMs, combined with an integrated ECC memory controller in core logic, to correct many soft and hard single-bit memory errors (using memory mirroring), while minimizing disruption of services to LAN clients
- Memory hardware scrubbing to correct many soft memory errors automatically without software intervention
- L2 cache processors to improve data integrity and help reduce downtime
- PFA on processors, memory, fans, VRMs, and battery to help alert the system administrator of an imminent component failure
- Five non-hot-swap nonredundant system cooling fans
- Integrated systems management processor that supports:

- Fan monitoring and control
- Power supply monitoring
- Temperature monitoring
- Voltage monitoring
- Power on/off, reset sequencing
- LED controls (diagnostics support)
- IPMI capability that allows you to accept commands and send status
- Remote firmware update
- Numeric error logging
- Information LED panel to give visual indications of system health
- Onboard diagnostics LED map that provides error codes, which are explained in the hardware maintenance manual
- Easy access to system board, adapter cards, processor, and memory
- CPU failure recovery in SMP configurations; generates alerts and error logs

Expandability and growth

The System x3450 server is a 1U rack configuration engineered to meet the compactness of a 1U rack drawer. SVGA video, SATA, and full-duplex Gigabit Ethernet are integrated on the system board.

Features include:

- System memory expansion to 64 GB (with 4 GB memory DIMMs installed)
- One adapter card slot: PCIe 1 x 16 Gen 2 full-height/full-length
- Three drive bays:
 - Two 3.5-inch, HDD bays; one 5.25-inch drive bay for slimline drive
 - Internal support for high performance (7,200 rpm) for up to two SATA HDDs
 - Up to 1.5 TB of internal data storage, using two 750 GB SATA HDDs

These servers can handle applications for today and expand for future growth.

Systems management: The System x3450 servers include an integrated baseboard management controller (BMC) that provides industry-standard Intelligent Platform Management Interface (IPMI) 2.0-compliant systems management. The BMC comes standard and shares onboard Ethernet ports for access. It can be accessed via software that is compatible with IPMI 2.0 (such as xCAT). The BMC is implemented using industry-leading OSA firmware and applications.

- Features and benefits
 - Monitor of system and CMOS battery voltages
 - Monitor system temperatures
 - Fan speed control
 - Fan tachometer monitor
 - Good Power signal monitor
 - System ID and planar version detection
 - System power control
 - System reset control
 - NMI and SMI detection and generation (System Interrupts)
 - Serial port text console redirection
 - System LED control (power, HDD, error, heartbeat)

- CPU temperatures are monitored. An alert is generated if (preset) temperature warning thresholds are exceeded or restored and if critical temperature thresholds are exceeded. Soft and hard system shutdowns are automatically initiated if critical temperature thresholds are exceeded.
- CPU and power subsystem voltage thresholds are monitored. An alert is generated if over or under voltages occur.
- Diagnostics LEDs are illuminated in case of key component errors or failures to enable quick local diagnostics and servicing.
- Flash update enables updates to the integrated systems management processor firmware.

Advanced Configuration and Power Interface (ACPI)

This open industry specification defines a flexible and extensible hardware interface for the system board. Software designers use this specification to integrate power management features throughout a computer system, including hardware, the operating system, and application software. This integration enables Windows® to determine which applications are active and handles all of the power management resources for computer subsystems and peripherals.

World-class support tools and programs

The System x3450 server includes tools and programs designed to make ownership a positive experience. From the start, IBM programs help you purchase servers, get them running, and keep them running. IBM can help your company maintain ownership of technology leadership network servers.

- Support is available by calling 800-IBM SERV (426-7378) in the U.S. and Canada for problem determination or placement of service calls for warranty.
- IBM CRU and on-site, one-year limited warranty with next-business-day service (same-business-day service optionally available) protects your investment if a problem occurs. This service also includes replacement of parts identified through PFA.
- The ServerProven®⁸ program enables you to configure your server confidently with various devices and operating systems. This Web-based program provides compatibility information from actual testing of the System x3450 server with various adapters and devices.
- Electronic support on the Web provides additional support in an easy-to-use format.

Product positioning

The System x3450 servers are positioned above the High Performance Computing node, x3455 and below the stable business critical application server, x3550. These servers contain large 16 DIMM memory addressability, 1600 MHz FSB processors, and one PCI-Express slot. They are offered in flexible rack models. These servers are optimized for the HPC space. The System x3450 servers form a compact 1U, two-socket Xeon processor platform designed with fewer general purpose features for quicker response to data calculations at a lower cost per transaction. These servers are ideal for clients who require considerable processing power and large memory addressability in a space-saving 1U design.

Reference information

- ¹ GHz and MHz denote the internal or external clock speed of the microprocessor only, not application performance. Many factors affect application performance.
- ² PC2-5300-333 DDR2 AMF SDRAM memory. DDR2 memory stands for double data rate, which means up to twice the data is transferred in the same clock cycle. Actual data transfer is at 667 MHz.
- ³ When referring to HDD or tape backup capacity, GB stands for 1,000,000,000 bytes and TB stands for 1,000,000,000,000 bytes. User capacity may vary depending on operating environments.
- ⁴ Chipkill distributes information covered by error correcting code across separate memory chips. If any chip fails, the data can still be reconstructed from the remaining chips and the system can continue running.

- 5 Some programs may not be available in all countries.
- 6 With respect to on-site service, you may be asked certain diagnostic questions before a technician is sent.
- 7 For information on the IBM Statement of Limited Warranty, visit
http://www.ibm.com/servers/support/machine_warranties/
This information is also available by calling 800-426-7378 or contacting your IBM representative or reseller. Copies are available upon request.
- 8 IBM makes no warranties, expressed or implied, regarding non-IBM products and services that are ServerProven, including all implied warranties of merchantability and fitness for a particular purpose. These products are offered and warranted solely by third parties.

Business Partner information

If you are a Direct Reseller - System Reseller acquiring products from IBM, you may link directly to Business Partner information for this announcement. A PartnerWorld ID and password are required (use IBM ID).

BP Attachment for Announcement Letter 108-381

<https://www.ibm.com/partnerworld/mem/sla.jsp?num=108-381>

Trademarks

Chipkill and System i are trademarks of International Business Machines Corporation in the United States or other countries or both.

Wake on LAN and ServerProven are registered trademarks of International Business Machines Corporation in the United States or other countries or both.

Intel is a registered trademark of Intel Corporation.

Windows is a registered trademark of Microsoft Corporation.

Other company, product, and service names may be trademarks or service marks of others.

Publications

The following publications and CD-ROMs are shipped with the x3450 servers:

- The System x3450 Installation Guide contains an introduction to the computer, installation and setup, installing options, reference information, and problem determination. The installation guide has easy-to-use text and pictorials to enable you to quickly set up the System x3450.

Note: Software versions, features, and functions shipped with these systems may change as new releases become available or may be discontinued at any time.

The System x3450 Quick Setup Guide publication is available immediately. To order, contact your IBM representative.

The IBM Systems Information Center provides you with a single information center where you can access product documentation for IBM systems hardware, operating systems, and server software. Through a consistent framework, you can efficiently find information and personalize your access. The IBM Systems Information Center is at

<http://publib14.boulder.ibm.com/infocenter/systems>

IBM Publications Center Portal

<http://www.ibm.com/shop/publications/order>

The Publications Center is a worldwide central repository for IBM product publications and marketing material with a catalog of 70,000 items. Extensive search facilities are provided, as

well as payment options via credit card. A large number of publications are available online in various file formats, which can currently be downloaded free of charge.

Services

Global Technology Services

IBM services include business consulting, outsourcing, hosting services, applications, and other technology management.

These services help you learn about, plan, install, manage, or optimize your IT infrastructure to be an On Demand Business. They can help you integrate your high-speed networks, storage systems, application servers, wireless protocols, and an array of platforms, middleware, and communications software for IBM and many non-IBM offerings. IBM is your one-stop shop for IT support needs.

For details on available services, contact your IBM representative or visit

<http://www.ibm.com/services/>

For details on available IBM Business Continuity and Recovery Services, contact your IBM representative or visit

<http://www.ibm.com/services/continuity>

For details on education offerings related to specific products, visit

<http://www.ibm.com/services/learning/index.html>

Select your country, and then select the product as the category.

System x™ and BladeCenter® support services

Recommended core technical support: When you buy IBM System x technology, include the support services you need — to help keep both your hardware and software working for you, day after day, at peak performance. It's your first step toward helping to protect your investment and sustain high levels of system availability. We offer service-level and response-time options to fit your business needs. And we'll help you get started with a core support package that includes:

- **Continuous system monitoring**

Electronic monitoring that helps speed up problem-solving with automated, early detection of potential problems and system errors.

- **Hardware maintenance**

World-class remote and on-site hardware problem determination and repair services.

- **Software technical support**

Access to help line calls for fast, accurate answers to your questions during installation and throughout ongoing operations.

For more information, visit

<http://www.ibm.com/servers/eserver/xseries/services.html>

Technical information

Specified operating environment

Physical specifications: The x3450:

	7948- 3BX	7948- 4BX	7948- 5BX
Processor	Xeon Quad Core	Xeon Quad Core	Xeon Quad Core
Internal speed	2.8 GHz	3.0 GHz	3.0 GHz
External speed	1600 Mhz	1600 MHz	1600 MHz
Number standard	2	2	2
Maximum	2	2	2
L2 cache (full-speed)	12 MB	12 MB	12 MB
Memory (PC2-5300-667)	8 GB ECC	8 GB ECC	8 GB ECC
AMF	2 x 4 GB	2 x 4 GB	2 x 4 GB
DIMM sockets	Chi pki ll (TM)	Chi pki ll	Chi pki ll
Capacity	16	16	16
Video	64 GB(9)	64 GB(9)	64(9)
memory	SVGA	SVGA	SVGA
SATA controller	32 MB	32 MB	32 MB
Channels	1	1	1
Connector internal	2	2	2
Connector external	2	2	2
HDD	0	0	0
Total bays	Open bay	Open bay	Open bay
5.25-in	3	3	3
Fixed HDD	1	1	1
Internal capacity	2	2	2
Bays available	1.5 TB(10)	1.5 TB(10)	1.5 TB(10)
5.25 in	3	3	3
Fixed HDD	1	1	1
Total PCI slots	2	2	2
64-bit/133 MHz	1	1	1
64-bit/100 MHz	0	0	0
PCI_E slot Gen 2	0	0	0
32-bit/33 MHz	0	0	0
Slots available	1	1	1
System management	Standard(11)	Standard(11)	Standard(11)
Ethernet controllers	Dual	Dual	Dual
DVD-ROM (IDE)	0	0	0
Power supply	600 W(12)	600 W(12)	600 W(12)
Number standard	1	1	1
Hot-swap	No	No	No
Redundant power	No	No	No

7948- 2BX

Processor	Xeon Dual - Core
Internal speed	3.4 GHz
External speed	1600 MHz
Number standard	2
Maximum	2
L2 cache (full-speed)	6 MB
Memory (PC2-5300-667)	8 GB ECC
FBD	2 x 4 GB
DIMM sockets	Chi pki ll
Capacity	16
Video	64 GB(9)
memory	SVGA
SATA controller	32 MB
Channels	1
Connector internal	2
Connector external	2
HDD	0
Total bays	Open bay
5.25-in	3
Fixed HDD	1
Internal capacity	2
Bays available	1.5 TB(10)
5.25 in	3
Fixed	1
Total PCI slots	2
64-bit/133 MHz	1
64-bit/100 MHz	0
PCI_E slot Gen 2	0
32-bit/33 MHz	0

Slots available	1
System management	Standard(11)
Ethernet controllers	Dual
DVD-ROM (IDE)	0
Power supply	600 W(12)
Number standard	1
Hot-swap	No
Redundant power	No

- (9) The systems will support a maximum of 64 GB using 4 GB DIMMS in all 16 memory slots.
- (10) The maximum HDD capacity of 1.5 TB is based on installation of two 750 GB SATA HDDs.
- (11) These systems contain an integrated system management processor that provides a set of monitoring and alert features. Refer to the Description section for details.
- (12) The 600-watt power supply is designed to support all system models.

Video subsystem

- ATI ES1000 Graphics Accelerator
- Video integrated on planar and connected to the PCI bus
- 32 MB of embedded DDR SDRAM video memory

Dimensions: Rack — 1U

- Width: 424.0 mm (16.7 in)
- Depth: 696.0 mm (27.4 in)
- Height: 43.6 mm (1.72 in)

Rack:

- Weight:
 - 20 kg (42 lb) (minimum configuration)
 - 38 kg (84 lb) (maximum configuration)

To assure installability and serviceability in non-IBM industry-standard racks, review the installation planning information for any product-specific installation requirements.

Operating environment

- Temperature:
 - 10° to 35°C (50° to 95°F) at 0 to 914 m (0 to 3,000 ft)
 - 10° to 32°C (50° to 90°F) at 914 to 2,133 m (3,000 to 7,000 ft)
- Relative humidity: 8% to 80%
- Maximum altitude: 2,134 m (7,000 ft)

Hardware requirements: For attended installation of an operating system, this server requires a compatible:

- Keyboard
- Mouse
- HDD
- Display

Unattended or remote installation may be performed without requiring some or all of these components. Review your unattended software installation program information for specific hardware configuration requirements.

For service, the server requires a compatible:

- Keyboard
- Mouse
- HDD
- Display (E51, E54, E74, G78, LCD, or equivalent)

When having the unit serviced, plan to have these components attached to your server either directly or indirectly via a console switch.

Software requirements: The following network operating systems are supported in the x3450 server:

- Microsoft®
 - Windows® Server 2003, Standard Edition
 - Windows Server 2003, Enterprise Edition
 - Windows Server 2003, Web Edition
- Linux™
 - SUSE Linux Enterprise Server 10 for x86
 - SUSE Linux Enterprise Server 10 for AMD64/EM64T
 - SUSE Linux Enterprise Server 10 SP1 for x86
 - SUSE Linux Enterprise Server 10 SP1 for AMD64/EM64T
 - Red Hat Enterprise Linux 5 Server Edition
 - Red Hat Enterprise Linux 5 Server x64 Edition
 - Red Hat Enterprise Linux 5 SP1 Server Edition
 - Red Hat Enterprise Linux 5 SP1 Server x64 Edition

Note: Certification is planned for these operating systems. For additional information on support, certification, and versions on network operating systems, visit

<http://www.ibm.com/us/compat>

Compatibility: The System x3450 server systems contain licensed system programs that include set configuration, set features, and test programs. System BIOS is loaded from a "flash" EEPROM into system memory. This BIOS provides instructions and interfaces designed to support the standard features of the x3450 server and to maintain compatibility with many current software programs.

To view detailed information on the Internet about IBM and non-IBM devices, adapters, software, and network operating systems supported with x3450 servers, visit

<http://www.ibm.com/servers/eserver/serverproven/compat/us/>

Contact your IBM representative or IBM Business Partner, or refer to the IBM Sales Manual for information on the compatibility of hardware and software for x3450 servers. The Sales Manual is updated periodically as new features and options are announced that support these servers.

Limitations

- The System x3450 servers support a maximum of 64 GB of system memory when you add a 4 GB memory DIMM in each of the 16 DIMM slots. All supported system memory is addressable through direct memory access (DMA). The x3450 server supports 512 MB, 1 GB, 2 GB, and 4 GB DDR2 ECC SDRAM DIMMs, which are synchronized with processor FSB bandwidth (bus speeds run at 166 MHz but data is clocked on four edges, yielding a transfer rate of 667 MHz). DIMMs must be installed in matched pairs. Refer to the Planning information

section for supported memory options.

- Mixing microprocessors of different speeds or cache size is not supported.

User group requirements: This announcement satisfies or partially satisfies requirements from one or more of the worldwide user group communities. Groups include COMMON, COMMON Europe, Guide Share Europe (GSE), InterAction (Australia/New Zealand), Japan Guide Share (JGS), and SHARE Inc.

Planning information

Customer responsibilities

Customer setup: The x3450 servers are designated as customer setup. Customer setup instructions are shipped with systems and options.

Configuration information:

Bay configuration: The server contains three drive bays. The two 3.5-inch HDD bays are located on the right side of System x3450 rack models. These bays are ready for various supported HDD drive options installation. The one remaining 5.25-inch bay can contain a DVD-ROM.

The DVD-ROM is cabled directly to the IDE port.

External serial attachment

To attach an external serial cable RS-232, use the serial connector at the rear of the system.

Supported memory options

The following memory options are supported:

- IBM 2 GB Kit PC2-5300 CL5 ECC DDR2 Chipkill AMFDIMM 667 MHz (38L5905)
- IBM 4 GB Kit PC2-5300 CL5 ECC DDR2 Chipkill AMFDIMM 667 MHz (43X5026)

Power supply requirements: These models contain one 600-watt fixed power supply. One power supply has enough power to supply a fully loaded box. A fault light illuminates when a power supply fails.

Rack installations: These models are rack units and are designed so they can be installed in an industry-standard 19-inch rack cabinet such as the NetBAY42 or NetBAY25. The x3450 server system requires a rack mount kit for rack installation. In addition, it can also be installed in the deeper NetBAY42 ER.

If you choose not to use an IBM rack, the cabinet must meet EIA-310-D standards for mounting flanges and hole clearances with front to rear mounting of 70 to 73 cm (27.5 to 28.5 in). The rack must provide sufficient room in front of the forward EIA flange to allow for bezel attachment. The standard for 310-D suggests 49 mm (1.9 in) clearance. It must also provide adequate room at the rear of the rack, behind the rear flange for cable management.

The rack should include perforated front and rear doors and must not prevent the flow of cool air into or out of the rack. The weight handling capacity of the rack is 22.7 kg (50 lb). Finally, the rack must provide proper stabilization so that the rack does not become unstable when servers are pulled out of service.

Cable orders: Broadcom 5721 KFB3 10/100/1000 Mbps, full-duplex Ethernet PCI-Express controllers, standard with the x3450 server, are connected directly to one independent RJ-45 connector. The RJ-45 connectors provide a 10BaseT, 100Base-TX, or 1000Base-TX interface for connecting twisted-pair cable to the Ethernet network. Cabling is not included with the server. To connect the Ethernet controller to a repeater or switch, use a UTP cable with RJ-45 connectors at both ends. For 100/1000 Mbps operation, Category 5 cabling must be used. For 10 Mbps operation, Category 3, or better, cabling must be used.

There are no additional cabling requirements, other than for system power, keyboard, mouse, and monitor connections.

Installability: The System x3450 server requires about 30 minutes for installation. Installation

includes unpacking, setting up, and powering on the system. Additional time is required to install an operating system, additional adapters, or features.

Packaging

Product	Package Description	Boxes
System x3450	System Unit Carton Contents: System Unit	1
System x3450	Country Kit Carton Contents: Keyboard with attached cable Mouse with attached cable System unit PDU jumper cord System x3450 Installation Guide System x3450 Users Guide DVD-ROM Packages Publications CD New Broadcom Ethernet Driver CD	

The system is shipped as a single package. The country kit carton is contained inside the top portion of the system unit carton.

Supplies

For end users: IBM System x3450 can be purchased through the dealers around the world.

Remarketers in the United States who are interested in selling IBM printer supplies can obtain sales and marketing support by calling Global Marketing Services at 800-646-8028.

Security, auditability, and control

This product uses the security and auditability features of host hardware, host software, and application software.

It is a customer's responsibility to ensure that the server is secure to prevent sensitive data from being removed.

The customer is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communications facilities.

IBM Electronic Services

IBM has transformed its delivery of hardware and software support services to help you achieve higher system availability. Electronic Services is a Web-enabled solution that offers an exclusive, no-additional-charge enhancement to the service and support available for IBM servers. These services are designed to provide the opportunity for greater system availability with faster problem resolution and preemptive monitoring. Electronic Services comprises two separate, but complementary, elements: Electronic Services news page and Electronic Services Agent.

The Electronic Services news page is a single Internet entry point that replaces the multiple entry points traditionally used to access IBM Internet services and support. The news page enables you to gain easier access to IBM resources for assistance in resolving technical problems.

The Electronic Service Agent™ is no-additional-charge software that resides on your server. It monitors events and transmits system inventory information to IBM on a periodic, client-defined timetable. The Electronic Service Agent automatically reports hardware problems to IBM. Early knowledge about potential problems enables IBM to deliver proactive service that may result in higher system availability and performance. In addition, information collected through the Service Agent is made available to IBM service support representatives when they help answer your questions or diagnose problems. Installation and use of IBM Electronic Service Agent for problem reporting enables IBM to provide better support and service for your IBM server.

To learn how Electronic Services can work for you, visit

<http://www.ibm.com/support/electronic>

Terms and conditions

IBM credit corporation financing: Yes

To obtain copies of the IBM Statement of Limited Warranty, contact your reseller or IBM.

In the United States, call 800-IBM-SERV (426-7378), or write to:

Warranty Information
P.O. Box 12195
Research Triangle Park, NC 27709
Attn: Dept JDJA/B203

Warranty period

- Systems x3450 — One year

Optional IBM features initially installed in an IBM machine carry the same warranty period as the machine. If installed after the initial machine installation, they carry the balance of the machine warranty or the optional feature warranty, whichever is greater.

The following has been designated as a consumable or supply item; therefore, not covered by this warranty:

- Battery

Warranty service: If required, IBM provides repair or exchange service depending on the type of warranty service specified below for the machine. IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM Web site. You must follow the problem determination and resolution procedures that IBM specifies. Scheduling of service will depend upon the time of your call and is subject to parts availability. Service levels are response-time objectives and are not guaranteed. The specified level of warranty service may not be available in all worldwide locations. Additional charges may apply outside IBM's normal service area. Contact your local IBM representative or your reseller for country- and location-specific information.

The type of service is CRU (for example, keyboard, mouse, speaker, memory, or HDD) service and on-site service.

CRU service: IBM provides a replacement CRU to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM at any time on your request. A CRU is designated as being either a Tier 1 or a Tier 2 CRU. Installation of a Tier 1 CRU is your responsibility. If IBM installs a Tier 1 CRU, at your request, you will be charged for the installation. You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service specified.

Based upon availability, a CRU will be shipped for next-business-day (NBD) delivery. IBM specifies in the materials shipped with a replacement CRU whether a defective CRU must be returned to IBM. When return is required, return instructions and a container are shipped with the replacement CRU, and you may be charged for the replacement CRU if IBM does not receive the defective CRU within 15 days of your receipt of the replacement.

The following have been designated as a Tier 1 CRU:

- Blank filler
- Cable-management arm
- HDD
- Hot-swap fan
- Power supply

- Lift handle kit
- Memory DIMM
- Memory expansion card
- Optical drive
- PCI adapter
- PCI divider
- Power cord
- Service label
- Service processor
- System label
- Top cover
- Voltage regulator module

On-site service: This provides on-site repair (IOR), 9 hours per day, Monday through Friday excluding holidays, NBD response. IBM or your reseller will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well-lit, and suitable for the purpose. On-site Service is not available in all countries, and some countries have kilometer or mileage limitations from an IBM service center. In those locations where on-site service is not available, the normal in-country service delivery is used.

Call IBM at 800-IBM-SERV (426-7378) to assist with problem isolation for hardware to determine if warranty service is required. Telephone support may be subject to additional charges, even during the limited warranty period.

Calls must be received by 5:00 p.m. local time in order to qualify for NBD service.

International Warranty Service: IWS is available in selected countries or regions.

The warranty service type and the service level provided in the servicing country may be different from that provided in the country in which the machine was purchased.

Under IWS, warranty service will be provided with the prevailing warranty service type and service level available for the IWS-eligible machine type in the servicing country and the warranty period observed will be that of the country in which the machine was purchased.

To determine the eligibility of your machine and to view a list of countries where service is available, visit

<http://www-304.ibm.com/jct01004/c/systems/support/supportsite.wss/form?warrantybrandind=5000008>

For more information on IWS, refer to Services Announcement [601-034](#), dated September 25, 2001.

Licensing: Programs included with this product are licensed under the terms and conditions of the license agreements that are shipped with the system.

Maintenance services

ServicePac®, ServiceSuite™, ServiceElect, and ServiceElite: ServicePac, ServiceSuite, ServiceElect, and ServiceElite provide hardware warranty service upgrades, maintenance, and selected support services in one agreement.

Warranty service upgrade: During the warranty period, a warranty service upgrade provides an enhanced level of on-site service for an additional charge. A warranty service upgrade must be purchased during the warranty period and is for a fixed term (duration). It is not refundable or transferable and may not be prorated. If required, IBM will provide the warranty service upgrade enhanced level of on-site service acquired by the customer. Service levels are response-time objectives and are not guaranteed.

IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM Web site. You must follow the problem determination and resolution procedures that IBM specifies. Scheduling of service will depend upon the time of your call and is subject to parts availability.

CRUs will be provided as part of the machine's standard warranty CRU Service except that you may install a Tier 1 CRU yourself or request IBM installation, at no additional charge, under one of the on-site service levels specified.

IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well-lit, and suitable for the purpose.

Refer to the Prices section for specific offerings.

Maintenance service: If required, IBM provides repair or exchange service depending on the type of maintenance service specified below for the machine. IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM Web site. You must follow the problem determination and resolution procedures that IBM specifies. Scheduling of service will depend upon the time of your call and is subject to parts availability. Service levels are response-time objectives and are not guaranteed.

CRU service: If your problem can be resolved with a CRU (for example, keyboard, mouse, speaker, memory, or HDD), IBM will ship the CRU to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM at any time on your request.

IBM specifies in the materials shipped with a replacement CRU whether a defective CRU must be returned to IBM. When return is required, return instructions and a container are shipped with the replacement CRU, and you may be charged for the replacement CRU if IBM does not receive the defective CRU within 15 days of your receipt of the replacement.

On-site service: IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well-lit, and suitable for the purpose.

Refer to the Prices section for specific offerings.

Maintenance service (ICA)

Maintenance services are available for ICA legacy contracts.

Alternative service (warranty service upgrades): During the warranty period, a warranty service upgrade provides an enhanced level of On-site Service for an additional charge. A warranty service upgrade must be purchased during the warranty period and is for a fixed term (duration). It is not refundable or transferable and may not be prorated. If required, IBM will provide the warranty service upgrade enhanced level of on-site service acquired by the customer. Service levels are response-time objectives and are not guaranteed.

IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM Web site. You must follow the problem determination and resolution procedures that IBM specifies. Scheduling of service will depend upon the time of your call and is subject to parts availability.

A CRU will be provided as part of the machine's standard warranty CRU Service except that you may install a Tier 1 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service specified.

IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well-lit, and suitable for the purpose.

Refer to the Prices section for specific offerings.

Maintenance service: If required, IBM provides repair or exchange service depending on the type of maintenance service specified below for the machine. IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM Web site. You must follow the problem determination and resolution procedures that IBM specifies. Scheduling of service will depend upon the time of your call and is subject to parts availability. Service levels are response-time objectives and are not guaranteed.

CRU service: If your problem can be resolved with a CRU (for example, keyboard, mouse,

speaker, memory, or HDD), IBM will ship the CRU to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM at any time on your request.

IBM specifies in the materials shipped with a replacement CRU whether a defective CRU must be returned to IBM. When return is required, return instructions and a container are shipped with the replacement CRU, and you may be charged for the replacement CRU if IBM does not receive the defective CRU within 15 days of your receipt of the replacement.

On-site service: IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well-lit, and suitable for the purpose.

Refer to the Prices section for specific offerings.

Non-IBM parts support

Warranty service: IBM is now shipping machines with selected non-IBM parts that contain an IBM field replaceable unit (FRU) part number label. These parts are to be serviced during the IBM machine warranty period. IBM is covering the service on these selected non-IBM parts as an accommodation to their customers, and normal warranty service procedures for the IBM machine apply.

Warranty service upgrades and maintenance services: Under certain conditions, IBM Integrated Technology Services repairs selected non-IBM parts at no additional charge for machines that are covered under warranty service upgrades or maintenance services.

IBM Service provides hardware problem determination on non-IBM parts (for example, adapter cards, PCMCIA cards, disk drives, or memory) installed within IBM machines covered under warranty service upgrades or maintenance services and provides the labor to replace the failing parts at no additional charge.

If IBM has a Technical Service Agreement with the manufacturer of the failing part, or if the failing part is an accommodations part (a part with an IBM FRU label), IBM may also source and replace the failing part at no additional charge. For all other non-IBM parts, customers are responsible for sourcing the parts. Installation labor is provided at no additional charge, if the machine is covered under a warranty service upgrade or a maintenance service.

IBM hourly service rate classification: One

Field-installable features: Yes

Model conversions: No

Machine installation: Customer setup. Customers are responsible for installation according to the instructions IBM provides with the machine.

Graduated program license charges apply: No

Licensed machine code: IBM machine code is licensed for use by a customer on the IBM machine for which it was provided by IBM under the terms and conditions of the IBM License Agreement for machine code, to enable the machine to function in accordance with its specifications, and only for the capacity authorized by IBM and acquired by the customer. You can obtain the agreement by contacting your IBM representative or visiting

http://www-1.ibm.com/servers/support/machine_warranties/machine_code.html

IBM may release changes to the machine code. IBM plans to make the machine code changes available for download from the System x technical support Web site.

<http://www-304.ibm.com/jct01004c/systems/support/>

If the machine does not function as warranted and your problem can be resolved through your application of downloadable machine code, you are responsible for downloading and installing these designated machine code changes as IBM specifies. If you would prefer, you may request IBM to install downloadable machine code changes; however, you may be charged for that service.

Prices

Description	Model number	CSU
System x3450 7948	2BX	Yes
	3BX	Yes
	4BX	Yes
	5BX	Yes

The following are newly announced features on the specified models of the IBM System x 7948 machine type:

Description	Feature number	Initial / MES / Support
7948-AC1 System x3450		
1U 2 x X5272 3.4GHz-6MB DC 80w 2x4GB HDD	5623	Initial
1U 2 x E5462 2.8GHz-12MB QC 80w 2x4GB HDD	5624	Initial
1U 2 x X5472 3.0GHz-12MB QC 120w 2x4GB HDD	5625	Initial
1U 2 x E5472 3.0GHz-12MB QC 80w 2x4GB HDD	5626	Initial

Single Entity Offerings (SEOs)

Description	SEO number
System x3450	
2.8 GHz/1600 MHz/12 MB L2, 2 x 4 GB, SATA	79483BX
3.0 GHz/1600 MHz/12 MB L2, 2 x 4 GB, SATA	79484BX
3.0 GHz/1600 MHz/12 MB L2, 2 x 4 GB, SATA	79485BX
3.4 GHz/1600 MHz/6 MB L2, DC 2 x 4 GB, SS SATA	79482BX

To order direct, call IBM at 877-999-7115 and select option 4.

For the name of the nearest IBM representative or Business Partner, call 800-IBM-4YOU (426-4968).

ServicePac for warranty and maintenance

Hardware models announcing with this release will utilize existing ServicePacs.

Refer to the following IBM Web site or applicable ServicePac information

http://www-935.ibm.com/services/us/its/html/servicepac_americas.html

For ServiceElect (ESA) maintenance service charges, contact IBM Global Services at 888-IBM-4343 (426-4343).

IBM Global Financing: IBM Global Financing offers competitive financing to credit-qualified customers to assist them in acquiring IT solutions. Offerings include financing for IT acquisition, including hardware, software, and services, from both IBM and other manufacturers or vendors. Offerings (for all customer segments: small, medium, and large enterprise), rates, terms, and availability can vary by country. Contact your local IBM Global Financing organization or visit

<http://www.ibm.com/financing>

IBM Global Financing offerings are provided through IBM Credit LLC in the United States, and other IBM subsidiaries and divisions worldwide to qualified commercial and government customers. Rates are based on a customer's credit rating, financing terms, offering type,

equipment type, and options, and may vary by country. Other restrictions may apply. Rates and offerings are subject to change, extension, or withdrawal without notice.

Financing solutions from IBM Global Financing can help you stretch your budget and affordably acquire the new product. But beyond the initial acquisition, our end-to-end approach to IT management can also help keep your technologies current, reduce costs, minimize risk, and preserve your ability to make flexible equipment decisions throughout the entire technology life cycle.

Order now

To order, contact the Americas Call Centers or your local IBM representative.

To identify your local IBM representative, call 800-IBM-4YOU (426-4968).

Phone: 800-IBM-CALL (426-2255)
Fax: 800-2IBM-FAX (242-6329)
Internet: callserv@ca.ibm.com
Mail: IBM Teleweb Customer Support
IBM.com Sales Execution Center, Americas North
3500 Steeles Ave. East, Tower 3/4
Markham, Ontario
Canada
L3R 2Z1

Reference: YE001

The Americas Call Centers, our national direct marketing organization, can add your name to the mailing list for catalogs of IBM products.

Note: Shipments will begin after the planned availability date.

Trademarks

System x, Chipkill, Electronic Service Agent, and ServiceSuite are trademarks of International Business Machines Corporation in the United States or other countries or both.

eServer, BladeCenter, xSeries, ServerProven, and ServicePac are registered trademarks of International Business Machines Corporation in the United States or other countries or both.

Microsoft and Windows are registered trademarks of Microsoft Corporation.

Linux is a trademark of Linus Torvalds in the United States, other countries or both.

Other company, product, and service names may be trademarks or service marks of others.

This announcement is provided for your information only. For additional information, contact your IBM representative, call 800-IBM-4YOU, or visit the IBM home page at: <http://www.ibm.com>