



IBM System x3650 server features fast, powerful dual-core 1.6 GHz and 1.86 GHz/1066 MHz, 4 MB L2, and 2.0 GHz, 2.33 GHz, 2.66 GHz, and 3.0 GHz/1333 MHz, 4 MB L2 Intel Xeon processors

Overview

The System x3650 server enhances rack-optimized server applications with:

- Powerful, two-socket multicore Intel® Xeon processing
- 64-bit memory addressing — up to 48 GB memory (when 4 GB DIMM is available)
- PCI-Express architecture and PCI-X, up to 133 MHz
- Serial Attach SCSI (SAS) technology
- High-availability and manageability features

The server is available with a 1.6 GHz or 1.86 GHz/1066 MHz, or a 2.0, 2.33, 2.66, or 3.0 GHz/1333 MHz processor with 2 x 2 MB L2 cache (4 MB). These Xeon processors come with Enhanced Intel Speedstep (EIS) technology⁵ for more efficient program execution. All models have dual-core processors with 2 x 2 MB L2 cache.

With a compact 2U footprint, the rack-optimized System x3650 server helps save valuable rack space and resources. It is packed with highly integrated, advanced server features designed for compute-intensive, Web-based, or enterprise network applications, where space is a primary consideration.

Optimized for solid performance

The System x3650 server applies powerful processors, large amounts of memory, and high-bandwidth PCI/PCI-X and PCI-Express for business-critical applications:

- 1066 MHz (quad-pumped 266 MHz) or 1333 MHz (quad-pumped 333 MHz) FSB processors with 4 MB L2 cache,

2 x 2 MB L2 cache dual-core processor, enabling up to 10.66 GB/s data transfer rates

- Two 512 MB PC2-5300 high-speed DDR2 Advanced Memory Features DIMMs
- High-speed, wide-bandwidth, PCI/PCI-X and a PCI-E bus
- Support for four PCI slots:
 - Two PCI-Express low-profile card slots
 - Two PCI-X 133 MHz/64-bit (or two PCI-Express card slots), one full and one half length, both full height
- High-performance integrated controllers, including:
 - Two Broadcom Gigabit Ethernet controllers, with integrated TCP Offload Engine (TOE) technology
 - SAS SCSI host controller

Key prerequisites

- Monitor, keyboard, and mouse
- SAS SCSI HDD
- Rack

Planned availability date

July 14, 2006

At a glance

- Powerful 1.6, 1.86 GHz¹, Intel Xeon processors with 1066 MHz front side bus (FSB) or 2.0, 2.33, 2.66, and 3.0 GHz Intel processors with 1333 MHz FSB, and 4 MB L2 cache (each processor is dual core and comes with 2 x 2 MB L2 cache)
- Two 512 MB PC2-5300 high-speed DDR2 Advanced Memory Features DIMMs²
- Integrated SAS SCSI HDD controller with integrated mirroring
- 835-watt voltage autosensing hot-plug power supply
- Up to 10 hot-swap fans, supporting redundant cooling
- Integrated systems management processor
- Four available PCI slots: two PCI-Express low-profile card slots, two PCI-X 133 MHz/64-bit (or two PCI-Express card slots), one full and one half length
- Seven drive bays: 8x-24x³ CD-RW/DVD-ROM Combo Drive, six hot-swap HDDs, on 3.5-inch models
- Up to eight HS SAS 2.5-inch HDDs plus internal tape drive bay
- Two integrated gigabit Ethernet controllers using Broadcom chips, and featuring TCP Offload Engine (TOE)
- ATI RN50 video controller with 16 MB video memory and two video ports
- One serial port, seven USB ports, two Ethernet (RJ-45) ports, one systems management connector⁴, one external SAS connector, one internal SATA connector, and two video ports

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>.

Description

System x3650 server features are optimized for performance, availability, and flexibility for collaboration applications and virtualization opportunities.

Fully integrated enterprise-class management

Consolidate workloads and optimize more advanced solutions architectures at incredible IT savings and lower power levels.

- IBM PowerExecutive™ for advanced data center power notification and management to achieve lower heat output and reduced cooling needs
- Integrated systems management processor for improved manageability and uptime
- Optional RSA II SlimLine system management card; no PCI slot used
- Front, rear, and remote KVM that delivers easy hands-on management for any IT environment
- Drop-down light path diagnostic panel for improved in-rack manageability and easy problem identification, Wake on LAN®, and PXE
- Standard 8x-24x CD-RW/DVD-ROM Combo Drive for ease of imaging and application loading
- Support for virtual floppy to enable easy remote host booting, using standard instructions stored anywhere on the network

Protection for your IT investment

- Hot swap, redundant components: HDD, power and cooling
- Support for internal tape drive options that protect and secure data
- Scalable memory and I/O design that responds to your future business needs
- Advanced memory protection: memory mirroring, online hot-spare, and Chipkill™ memory
- Calibrated Vectored Cooling with hot swap fans
- Integrated SAS RAID-0, -1, and -10 with RAID-5 upgrade via daughter card —no PCI slot used
- Three year limited warranty⁶ on parts and labor⁷

Intel Xeon processor options

- xSeries® 1.6 GHz/1066 MHz —2 x 2 MB L2 Cache Xeon Processor —40K1231
- xSeries 1.86 GHz/1066 MHz —2 x 2 MB L2 Cache Xeon Processor —40K1232
- xSeries 2.0 GHz/1333 MHz —2 x 2 MB L2 Cache Xeon Processor —40K1233
- xSeries 2.33 GHz/1333 MHz —2 x 2 MB L2 Cache Xeon Processor —40K1234
- xSeries 2.66 GHz/1333 MHz —2 x 2 MB L2 Cache Xeon Processor —40K1235
- xSeries 3.0 GHz/1333 MHz —2 x 2 MB L2 Cache Xeon Processor —40K1236

These processors are ideal for data-intensive applications that range from data mining to evolving Web services. Innovative technologies deliver a processing speed of up to 3.0 GHz with a 1333 MHz FSB and 4 MB L2 cache for unpredictable server workloads and escalating computing needs.

These Intel Xeon processors with 4 MB L2 cache feature Intel Core microarchitecture with increased overall performance, greater energy efficiency, and more responsive multitasking to reduce thermal burdens in server data centers.

All x3650 models come with dual-core processors and have 2 x 2 MB L2 cache (4 MB).

This device provides 256 MB of battery-backed 533 MHz DDR2 standard power memory in a fixed mounting arrangement. It attaches directly to the IBM planar which can provide full RAID capability.

Most models come with the ServeRAID™ 8k controller which features:

- 256 MB DDR2 533 MHz
- 72 hours of battery life for three years at 45°C

RAID features:

- RAID-0, -1, -1E, -10, -5, and -6
- Copyback
- FlashCopy®
- Stripe-unit size: 16k, 32k, 64k, 128k, 256k, 512k, and 1024k
- One-year limited warranty on parts

IBM System x™ Hot-Swap Power Supply Options

- IBM System x 3650 835W Hot-Swap Power Supply (US) (40K1905)
- IBM System x 3650 835W Hot-Swap Power Supply (WW) (40K1906)

High-performance server subsystems

The x3650 server expands the new server line by adding a higher level of processor power. This high-throughput, two-way, multicore network server offers excellent performance and scalability when you add memory and a second processor. It incorporates powerful Xeon processors with 4 MB L2 cache. The advanced transfer L2 cache is integrated onto the processor in dual cores, and runs at the same clock speed. The advanced transfer cache is a result of a “backside bus” 256 bits wide. It features a quad-wide cache line that can transfer four 64-bit cache line segments at one time to deliver full-speed capability. The cache is eight-way set associative.

Two Intel Xeon processor connectors are standard on the system board to support installation of a second processor. High-speed PC2-5300 DDR2 Advanced Memory Features DIMMs run at 333 MHz DRAM clock speed and offer maximum 5333 MB/s bandwidth, processor-to-memory subsystem performance. The x3650 server uses the Intel 5000P chipset with Chipkill technology to maximize throughput from processors to memory, to the 32-bit and 64-bit PCI buses.

Standard x3650 configurations

Model	Processor	Cache	Memory	SCSI interface	Mechanical
7979-21x	1.6 GHz	4 MB	1 GB	ECC SAS	Rack
7979-2Ax	1.6 GHz	4 MB	1 GB	ECC SAS	Rack
7979-31x	1.86 GHz	4 MB	1 GB	ECC SAS	Rack
7979-3Ax	1.86 GHz	4 MB	1 GB	ECC SAS	Rack
7979-41x	2.0 GHz	4 MB	1 GB	ECC SAS	Rack
7979-4Ax	2.0 GHz	4 MB	1 GB	ECC SAS	Rack
7979-51x	2.33 GHz	4 MB	1 GB	ECC SAS	Rack
7979-5Ax	2.33 GHz	4 MB	1 GB	ECC SAS	Rack
7979-61x	2.66 GHz	4 MB	1 GB	ECC SAS	Rack
7979-6Ax	2.66 GHz	4 MB	1 GB	ECC SAS	Rack
7979-71x	3.0 GHz	4 MB	1 GB	ECC SAS	Rack
7979-7Ax	3.0 GHz	4 MB	1 GB	ECC SAS	Rack

Note: The System x3650 models use a Serial Attachment SCSI (SAS) controller for HDDs.

Additional features

- Four-core processing achieved with a second processor of equal speed and processor type
- System board containing 12 DIMM connectors supporting 512 MB, 1 GB, 2 GB, and 4 GB (when available) 333 MHz DDR2 PC2-5300 SDRAM ECC DIMMs:
 - Advanced memory features for improved performance (memory must be installed in matched pairs)
 - Up to 48 GB of system memory (using 4 GB DIMMs, when available)
- High-speed, wide-bandwidth PCI/PCI-X bus slots:
 - Two PCI-Express low-profile card slots
 - Two PCI-X 133 MHz/64-bit (or two PCI-Express card slots), one full and one half length
- Up to eight SAS ports to support six 3.5-inch SAS HDDs or eight 2.5-inch SAS HDDs (plus one USB tape drive when supported)
- Two Broadcom Chips for Gigabit (10/100/1000) Ethernet PCI, which speed network communications to LAN clients

The x3650 servers offer solid system throughput from processor, to memory, to bus, to disk-intensive I/O. These features, combined with multicore capability, make the x3650 server an excellent choice for a stand-alone or clustered general-business application, file, and print server.

High-availability and serviceability features

- Support for light path diagnostics with viewable drop-down panel, Wake on LAN, and PXE
- Up to 10 hot-swap fans
- Up to six 3.5-inch HS HDDs or up to eight 2.5-inch HS HDD bays plus internal USB tape drive (when supported)
- IBM ServeRAID SAS 8k-I controller on most models that supports 0, 1, and 10 as standard
- Chipkill memory that basically 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
- ECC L2 cache processors to help improve data integrity and help reduce downtime

- Predictive Failure Analysis® (PFA) on HDD options (when ServeRAID 8k is installed), memory, VRMs, processors, and fans (when Remote Supervisor Adapter is installed), to help alert the system administrator of imminent component failure
- Support for optional Remote Supervisor Adapter II SlimLine, which enables remote systems management through a Web-based browser
- Worldwide voltage-sensing, 835-watt, hot-plug power supply featuring auto restart
- Optional 835-watt hot-swap power supply upgrade for high-availability requirements
- Integrated systems-management processor that supports:
 - Automatic server restart (ASR)
 - Fan monitoring and control
 - Power supply monitoring
 - Temperature monitoring
 - Voltage monitoring
 - Power on/off, reset sequencing
 - LED controls (onboard diagnostics support with light path LED)
 - Remote power control
 - Local firmware update
 - Error logging
- Information LED panel for visual indications of system well-being
- Onboard diagnostics with an LED map to a failing component to help reduce downtime and service costs
- Support for virtual floppy which enables the user to easily direct a remote host to boot and use standard instructions stored anywhere on the network
- Easily accessible system board, adapter cards, processor, and memory
- CPU failure recovery in two sockets configurations, which:
 - Forces failed processor offline
 - Reboots server automatically
 - Generates alerts
 - Continues operations with the working processor

Expandability and growth

The x3650 server packs a lot of function and storage capacity into a 2U 19-inch rack-drawer package, yet it is amazingly easy to upgrade and service. Functions such as SVGA video, SAS SCSI, and full-duplex 10/100/1000 Mbps Ethernet are integrated on the system board. Features include:

- Rack-drawer models designed for 19-inch-wide by 28-inch-deep industry-standard rack enclosures, such as the NetBAY42 SR
- Four PCI/PCI-Express adapter card slots available (2 x PCI-Express slots may be replaced by a riser card option to get two PCI-X slots)
- System board optional upgrades (PCI slot not required)
 - Remote Supervisor Adapter II SlimLine (RSA II SlimLine)

- One ServeRAID connector
- Support for up to 1.8 TB of internal data storage, using six 300 GB SAS hot-swap HDDs (internal tape option may be used when available and supported)
- 8x-24x CD-R/CD-RW DVD Combo Drive
- ATI RN50 controller with 16 MB of embedded DDR1 video memory

Systems management

Integrated BMC: The System x3650 includes an integrated baseboard management controller that provides industry-standard Intelligent Platform Management Interface (IPMI) 2.0-compliant systems management. The BMC comes standard, and shares one of the two onboard Ethernet ports for access. The BMC can be accessed via software that is compatible with IPMI7 2.0 (xCAT, and more). The BMC is implemented using industry-leading OSA firmware and applications in conjunction with the integrated baseboard management controller.

- Features and benefits:
 - Monitoring of system voltages
 - Monitoring of battery voltage
 - Monitoring of 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 detection (System Interrupts)
 - SMI detection and generation (System Interrupts)
 - Serial port text console redirection
 - System LED control (power, HDD, activity, alerts, heartbeat)
 - Support for IPMI V2.0-compliant management software (for example, xCAT)

In addition you can purchase an optional Remote Supervisor Adapter II SlimLine to provide additional systems management functionality.

Optional Remote Supervisor Adapter II SlimLine (39Y9566): The optional RSA II SlimLine adds accelerated graphics and delivers advanced control and monitoring features to manage your IBM System x3650 server at virtually any time, from virtually any place. The adapter card can be added to the server through a connector that connects to the planar. This adapter enables easy console redirection with text and graphics, and keyboard and mouse (operating system must support USB) support over the system management LAN connections.

With video compression now built into the adapter hardware, it is designed to allow the greater screen sizes and refresh rates that are becoming standard in the marketplace. This feature allows the user to display server activities from power-on to full operation remotely, with remote user interaction at virtually any time.

The embedded Web server provides remote control from any standard Web browser. No additional software is required on the remote administrator's workstation. For

those users who are accustomed to a command line interface, the administrator can also use the provided CLI from a Telnet session to perform some of the functions that they can perform from the Web server. The Remote Supervisor Adapter II SlimLine provides remote management and control of the system independent of the server status, in many cases even if the server is powered off or otherwise disabled.

Features and benefits:

- The adapter continuously monitors system environmental (temperatures and voltages), operating system status, and critical system components, such as processors, VRMs, memory, fans, power supplies and power backplanes (where supported by the system).
- Video compression hardware is built in, eliminating drivers.
- Faster graphics support makes monitoring and control more efficient.
- Virtual CD and floppy is designed to provide the user with the ability to configure and diagnose a server remotely without a visit from your IT staff.
- RSA II SlimLine supports Secure Sockets Layer (SSL) and Lightweight Directory Access Protocol (LDAP).
- The adapter is integrated with IBM Director and Director Agent.
- Built-in LAN and serial connectivity supports virtually any network infrastructure.
- Multiple alerting functions warn systems administrators of potential problems, over e-mail, pager support, LAN, or SNMP.
- The adapter installs on the system planar using a dedicated connector, and eliminates the need to take a PCI-X slot.

The RSA II SlimLine features are similar to the RSA II with exception of following features:

- The reset button is not accessible from the back of the system.
- A mini-USB cable is no longer required. The device uses an internal USB bus. The system has a designated Systems Management Ethernet port, activated only when RSA II SlimLine is installed.
- External ac adapter not required (device uses standby power from system power supplies).
- Status LEDs are not externally viewable.
- The RSA II SlimLine no longer supports the prior RSA II interconnect function.

IBM Director: The x3650 server features IBM Director, a powerful, highly integrated systems management software solution built on industry standards, and designed for ease of use.

You can exploit your existing enterprise or workgroup management environments and use rich security features that access and manage physically dispersed IT assets efficiently over the Internet.

It can help reduce costs through:

- Reduced downtime
- Increased productivity of IT personnel and end users
- Potentially reduced service and support costs

IBM Director integrates leading workgroup and enterprise systems management environments via upward integration modules. This integration enables the advanced management capabilities built into the System x3650 server to be accessed from:

- Tivoli® Enterprise and Tivoli NetView®
- Computer Associates Unicenter TNG Framework
- NetIQ — BMC Patrol
- Microsoft™ SMS
- Intel LANDesk™ Management Suite

IT administrators can view the hardware configuration of remote systems in detail and monitor the usage and performance of critical components, such as processors, HDDs, and memory.

IBM Director includes self-management features and a portfolio of proactive predictive tools that enable advanced xSeries server management resulting in higher server availability and reliability.

Its industry-standard foundation enables heterogeneous hardware support. It works with the integrated systems-management processor to access environmental system information.

The integrated systems management processor monitors and controls operating status for critical errors.

- ASR monitors the operating system status and automatically restarts the server if the operating system fails to respond. An alert is then generated if the system has been restarted through ASR.
- Fan monitoring and control manages fan speed and automatically increases to maintain system cooling if temperature thresholds are exceeded. An alert is generated if a fan:
 - Fails, or failure is predicted (with Remote Supervisor II Adapter card installed)
 - Is installed or removed
- Power supply monitoring monitors for voltage ranges of supply.
- Temperature monitoring provides CPU and HDD backplane temperatures. 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.
- Voltage monitoring provides CPU and power subsystem voltage thresholds. An alert is generated if abnormal voltages are detected.
- Power on/off and reset sequencing are supported through system monitoring.
- Text console redirect features keyboard and mouse control.
- LED controls (light path support) provide onboard diagnostics with an LED map, which is 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.

The integrated systems management processor supports upgrading to Remote Supervisor Adapter II SlimLine for full out-of-band and in-band remote management.

PowerExecutive manager

IBM PowerExecutive is the first solution on the market that provides customers with the intelligence needed to effectively manage power consumption in the data center. PowerExecutive, an extension to the IBM Director systems management software, allows clients to “meter” actual power usage and trend data for any single physical system or group of systems. Developed by IBM Research, PowerExecutive utilizes IBM-developed monitoring circuitry to help identify how much actual power is being used and the temperature of the system. The software is available across IBM’s new System x servers introduced today, as well as its BladeCenter® line of systems. Under-sizing power or cooling can bring an entire data center down, while over-sizing can mean millions in excessive cost. With PowerExecutive, the user is able to understand the actual power draw, as opposed to benchmarked power consumption, and effectively allocate and match power and thermal limits in the data center at the system, chassis, or rack level. The tool will also help systems automatically respond to a power shortage or outage.

Remote Supervisor Adapter II SlimLine

Remote Supervisor Adapter II SlimLine features:

- Easy-to-use, Web-based management from standard Web browsers
- Multimode alerts including e-mail with log, paper, SNMP, and LAN
- Graphical console redirection; keyboard and mouse control
- Remote management in many cases, independent of the server status
- Support for virtual floppy which enables you to easily direct a remote host to boot and use standard instructions stored anywhere on the network
- Full remote control of hardware and graceful shutdown of operating system
- Remote update of the xSeries server and Remote Supervisor Adapter II SlimLine firmware

The IT administrator achieves comprehensive, virtual on-site control of xSeries servers through the ability to remotely:

- Access the server in many cases regardless of the status
- Inventory and display detailed system and component information
- View server bootup during POST
- Browse and delete logs of events and errors
- Reset or power cycle the server
- Run diagnostics, SCSI, and RAID setup during POST
- Monitor thresholds on server health, including:
 - Operating system load
 - POST time-out
 - Voltage
 - Temperature
- Set proactive alerts for critical server events including PFA on:
 - Processors
 - VRMs

- Memory
- Fans (when Remote Supervisor Adapter II SlimLine is installed)
- Power supplies
- HDDs (when ServeRAID 8k is installed)
- Define automated actions, such as:
 - Send e-mail or page to an administrator
 - Execute a command or program
 - Pop-up an error message to the director console
- Manage flash BIOS
- Monitor and graph the utilization of server resources, such as:
 - Memory
 - Processor
 - HDDs
- Identify potential performance bottlenecks and react to prevent downtime
- Monitor, manage, and configure RAID subsystems without taking them off line

Advanced Configuration and Power Interface (ACPI)

ACPI is an open industry specification that 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 handle all of the power management resources for computer subsystems and peripherals.

World-class support tools and programs

The x3650 server tools and programs can 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.

- IBM on-site, three-year limited warranty with next-business-day (NBD) service (same-business-day service optionally available) helps protect your investment if a problem occurs. This service also includes replacement of parts identified through PFA.
- The ServerProven® program lets you confidently configure your server with various devices and operating systems. This Web-based program provides compatibility information from actual testing of the System x3650 server with various adapters and devices.
- The ServerGuide™ CD includes utilities and drivers for assisted loading of popular network operating systems.
- Electronic support on the Web offers additional support in an easy-to-use format

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

Product positioning

This two-socket, multicore-capable server is positioned between the xSeries 336 and xSeries 366 servers.

The 2U System x3650 server offers more PCI adapter expansion than the 1U-high xSeries 336 server. The xSeries 366 server supports up to four Intel Xeon processors MP, driving large memory configurations, and requires 3U of rack space.

This high-density, highly integrated server is designed for customer installation of features to handle future expansion to meet changing needs. At the same time, it can handle emerging applications that require maximum computing power and function in the least amount of rack space.

Applications include:

- E-commerce and e-business
- Application serving
- Web serving
- Messaging and collaboration applications
- Proprietary applications

This powerful server also meets traditional enterprise network server requirements, but with an added benefit of requiring less space.

Reference information

- 1 GHz and MHz denote the internal and/or external clock speed of the microprocessor only, not application performance. Many factors affect application performance.
- 2 PC2-5300 DDR2 Advanced Memory Features DIMM indicates a 240-pin DDR2 (double data rate and effectively provide 2x data in the same clock cycle) DIMM running at 333 MHz DRAM clock speed and offering maximum 5333 MB/s bandwidth.
- 3 Actual playback speed varies and is often less than the maximum possible.
- 4 Connectors function only when the RSA II SlimLine option is installed.
- 5 Enhanced Intel Speedstep (EIS) Technology allows the system to dynamically adjust processor voltage and core frequency, which results in decreased power consumption, which results in decreased heat production, which in turn allows improved acoustics because fans do not need to spin as quickly.
- 6 For information on the IBM Statement of Limited Warranty, visit
http://www.ibm.com/servers/support/machine_warranties/
Call 800-426-7378 or contact your IBM representative or reseller. Copies are available upon request.
- 7 With respect to on-site service, the customer may be asked certain diagnostic questions before a technician is sent.
- 8 IBM makes no warranties, expressed or implied, regarding non-IBM products and services that are ServerProven, including but not limited to the 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 106-480

<https://www.ibm.com/partnerworld/mem/sla.jsp?num=106-480>

Trademarks

PowerExecutive, Chipkill, ServeRAID, System x, and ServerGuide are trademarks of International Business Machines Corporation in the United States or other countries or both.

Wake on LAN, xSeries, FlashCopy, Predictive Failure Analysis, Tivoli, NetView, BladeCenter, and ServerProven are registered trademarks of International Business Machines Corporation in the United States or other countries or both.

LANDesk is a trademark of Intel Corporation.

Intel is a registered trademark of Intel Corporation.

Microsoft and Windows are trademarks of Microsoft Corporation.

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



IBM United States Announcement Supplemental Information

June 27, 2006

Publications

The following publications and CD-ROMs are shipped with the x3650 server:

- The *x3650 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 x3650 server.
- The ServerGuide™ contains utilities and drivers to support the x3650 servers. In addition, it includes a set of easy-to-use utilities for assisted installation via CD of several popular network operating systems.
- IBM Director systems management software is included.

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

x3650 Installation Guide and *Problem Determination and Service Guide*, in U.S. English versions, are available from

[http://www.ibm.com/servers/eserver/
serverproven/compat/us/](http://www.ibm.com/servers/eserver/serverproven/compat/us/)

Click servers, then Server family, and then Online publications.

IBM Publications Center Portal

[http://www.elink.ibm.com/public/
applications/publications/cgibin/pbi.cgi](http://www.elink.ibm.com/public/applications/publications/cgibin/pbi.cgi)

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.

Displayable softcopy publications: The product books are offered in displayable softcopy form. All books are included. The displayable manuals are part of the basic machine-readable material. The files are shipped on DVD-ROM.

Terms and conditions for use of the machine-readable files are shipped with the files.

Source file publications: The product books are offered in source file form.

Services

IBM Integrated 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](http://www.ibm.com/services/learning/index.html)

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

xSeries® and BladeCenter support services

Recommended core technical support: When you buy IBM xSeries 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**

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

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>.

• **Hardware maintenance**

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

• **Software technical support**

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

For more information, refer to

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

Technical information

Specified operating environment

Physical specifications

The x3650:	7979-21x	7979-2Ax	7979-31x	7979-3Ax
Processor	Xeon	Xeon	Xeon	Xeon
Internal speed	1.6 GHz	1.6 GHz	1.86 GHz	1.86 GHz
External speed	1066 MHz	1066 MHz	1066 MHz	1066 MHz
Number standard	1	1	1	1
Maximum	2	2	2	2
L2 cache (full-speed)	4 MB	4 MB	4 MB	4 MB
Memory	1 GB ECC	1 GB ECC	1 GB ECC	1 GB ECC
RDIMMs	2x512 MB	2x512 MB	2x512 MB	2x512 MB
DIMM sockets	12	12	12	12
Capacity	48 GB	48 GB	48 GB	48 GB
Video memory	SVGA	SVGA	SVGA	SVGA
SCSI controller	SAS	SAS	SAS	SAS
Channels	2	2	2	2
Connector internal	1	1	1	1
Connector external	1	1	1	1
RAID controller	2	2	2	2
Channels	2	2	2	2
Connector internal	1	1	1	1
Connector external	1	1	1	1
HDD	open-bay	open-bay	open-bay	open-bay
Total bays	7	10	7	10
5.25 slim	1	1	1	1
3.5-in tape	0	1	0	1
Hot-swap	6 or 4(9)	8(9)	6 or 4(9)	8(9)
Internal capacity	1.8 TB(10)	584 GB(12)	1.8 TB(10)	584 GB(12)
Bays available	6	9	6	9
5.25 slim	0	0	0	0
3.5-in tape	0	1	0	1
Hot-swap	6(9)	8(9)	6(9)	8(9)
Total PCI slots	4	4	4	4
PCI-E (x4 LP)	2	2	2	2
PCI-E (x8)(11)	2	2	2	2
64-bit/133 MHz(11)	2	2	2	2
System management	Standard	Standard	Standard	Standard
Ethernet controller	Two Gb	Two Gb	Two Gb	Two Gb
CD-R/CD-RW DVD drive	8x-24x	8x-24x	8x-24x	8x-24x
Power supply	835 W	835 W	835 W	835 W
Number standard	1	1	1	1
Maximum	2	2	2	2
Hot-swap	Yes	Yes	Yes	Yes
Redundant power	Yes	Yes	Yes	Yes
Auto restart	Yes	Yes	Yes	Yes

	7979-41x	7979-4Ax	7979-51x	7979-5Ax
Processor	Xeon	Xeon	Xeon	Xeon
Internal speed	2.0 GHz	2.0 GHz	2.33 GHz	2.33 GHz
External speed	1333 MHz	1333 MHz	1333 MHz	1333 MHz
Number standard	1	1	1	1
Maximum	2	2	2	2
L2 cache (full-speed)	4 MB	4 MB	4 MB	4 MB
Memory	1 GB ECC	1 GB ECC	1 GB ECC	1 GB ECC
RDIMMs	2x512 MB	2x512 MB	2x512 MB	2x512 MB
DIMM sockets	12	12	12	12
Capacity	48 GB	48 GB	48 GB	48 GB
Video memory	SVGA	SVGA	SVGA	SVGA
SCSI controller	SAS	SAS	SAS	SAS
Channels	2	2	2	2
Connector internal	1	1	1	1
Connector external	1	1	1	1
RAID controller	2	2	2	2
Channels	2	2	2	2
Connector internal	1	1	1	1
Connector external	1	1	1	1
HDD	open-bay	open-bay	open-bay	open-bay
Total bays	7	10	7	10
5.25 slim	1	1	1	1
3.5-in slim	0	1	1	1
Hot-swap	6 or 4(9)	8(9)	6 or 4(9)	8(9)
Internal capacity	1.8 TB(10)	584 GB(12)	1.8 TB(10)	584 GB(12)
Bays available	6	9	6	6
5.25 slim	0	0	0	0
3.5-in slim	0	1	0	0
Hot-swap	6 or 4(9)	8(9)	6 or 4(9)	8(9)
Total PCI slots	4	4	4	4
PCI-E (x4 LP)	2	2	2	2
PCI-E (x8)(11)	2	2	2	2
64-bit/133 MHz(11)	2	2	2	2
System management	Standard	Standard	Standard	Standard
Ethernet controller	Two Gb	Two Gb	Two Gb	Two Gb
CD-R/CD-RW DVD drive	8x-24x	8x-24x	8x-24x	8x-24x
Power supply	835 W	835 W	835 W	835 W
Number standard	1	1	1	1
Maximum	2	2	2	2
Hot-swap	Yes	Yes	Yes	Yes
Redundant power	Yes	Yes	Yes	Yes
Auto restart	Yes	Yes	Yes	Yes

	7979-61x	7979-6Ax	7979-71x	7979-7Ax
Processor	Xeon	Xeon	Xeon	Xeon
Internal speed	2.66 GHz	2.66 GHz	3.0 GHz	3.0 GHz
External speed	1333 MHz	1333 MHz	1333 MHz	1333 MHz
Number standard	1	1	1	1
Maximum	2	2	2	2
L2 cache (full-speed)	4 MB	4 MB	4 MB	4 MB
Memory	1 GB ECC	1 GB ECC	1 GB ECC	1 GB ECC
RDIMMs	2x512 MB	2x512 MB	2x512 MB	2x512 MB
DIMM sockets	12	12	12	12
Capacity	48 GB	48 GB	48 GB	48 GB
Video memory	SVGA	SVGA	SVGA	SVGA
SCSI controller	SAS	SAS	SAS	SAS
Channels	8	8	8	8
Connector internal	1	1	1	1
Connector external	1	1	1	1
RAID controller	1	1	1	1
Channels	1	1	1	1
Connector internal	1	1	1	1
Connector external	1	1	1	1
HDD	open-bay	open-bay	open-bay	open-bay
Total bays	7	10	7	10
5.25 slim	1	1	1	1
3.5-in tape	1	1	1	1
Hot-swap	6 or 4(9)	8(9)	6 or 4(9)	8(9)
Internal capacity	1.8 TB(10)	584 GB(12)	1.8 TB(10)	584 GB(12)
Bays available	6	9	6	9
5.25 slim	0	0	0	0
3.5-in tape	0	1	0	1
Hot-swap	6 or 4(9)	8(9)	6 or 4(9)	8(9)
Total PCI slots	4	4	4	4
PCI-E (x4 LP)	2	2	2	2
PCI-E (x8)(11)	2	2	2	2
64-bit/133 MHz(11)	2	2	2	2
System management	Standard	Standard	Standard	Standard
Ethernet controller	Two Gb	Two Gb	Two Gb	Two Gb
CD-R/CD-RW DVD drive	8x-24x	8x-24x	8x-24x	8x-24x
Power supply	835 W	825 W	835 W	835 W
Number standard	1	1	1	1
Maximum	2	2	2	2
Hot-swap	Yes	Yes	Yes	Yes
Redundant power	Yes	Yes	Yes	Yes
Auto restart	Yes	Yes	Yes	Yes

⁹ The system can hold either six 3.5-inch HS HDDs or four 3.5-inch HS HDDs plus an internal tape drive; or eight 2.5-inch HDDs plus an internal tape drive.

¹⁰ Capacities are based on installation of six 300 GB slim-high, SAS HDDs.

¹¹ PCI-E is standard feature for PCI or you may replace with PCI Riser Card PCI-X Option for PCI/PCI-X 133 MHz/100 MHz 64-bit, or 66/33 MHz/32 bit slots.

¹² Capacities are based on installation of eight 73 GB 2.5-inch SAS HDDs. For latest information on supported HDD options, refer to the *Sales Manual* or visit

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

8x-24x¹³ CD-RW/DVD-ROM drive characteristics

- Formatted capacity: 650 MB
 - Average access time: 120 ms
 - Burst data transfer rate — 16.6 MB/s (ATA PIO Mode 4)
 - Technology: Full constant angular velocity (CAV)
 - Buffer size: 2 MB
- ¹³ 8x-24x CD-ROM variable read rate. Actual playback speed will vary and is often less than the maximum possible.

Video subsystem

- ATI RN50 video controller
- Integrated on planar and connected to the PCI bus
- 16 MB of embedded DDR1 video memory
- 128-bit graphics engine with 8, 16, and 32 bpp mode acceleration
- 32 bpp (4G colors/true color) support
- Integrated 230 MHz RAMDAC
- Display Data Channel Bi-Directional (DDC2B) monitor communications support

Supported video mode capabilities for the SVGA PCI controller

Microsoft(TM) Windows(TM) 2000 and Windows 2003

Resolution	Colors	Refresh Rate (Hz)
640 x 480 x 8	256	60, 72, 75, 85
640 x 480 x 16	64K	60, 72, 75, 85
640 x 480 x 32	16 million	60, 72, 75, 85
800 x 600 x 8	256	60, 72, 75, 85
800 x 600 x 16	64K	60, 72, 75, 85
800 x 600 x 32	16 million	60, 72, 75, 85
1024 x 768 x 8	256	60, 70, 75, 85
1024 x 768 x 16	64K	60, 70, 75, 85
1024 x 768 x 32	16 million	60, 70, 75, 85

Notes

The maximum resolution of the local monitor is limited to 1024 x 768 by the remote video capability of RSA-II SlimLine.

NetWare and SCO drivers are contained in the respective operating system packages or bulletin boards.

Dimensions

- 2U Rack Drawer:
 - Width: 443.6 mm (17.5 in)
 - Depth: 698.0 mm (27.5 in)
 - Height: 85.4 mm (3.36 in)
- Rack:
 - Weight:

- Minimum configuration — 21.1 kg (46.5 lb)
- Maximum configuration — 29.6 kg (65 lb)

Electrical

- 100 to 127 (nominal) V ac; 50 Hz or 60 Hz; 10 A
- 200 to 240 (nominal) V ac; 50 Hz or 60 Hz; 5 A
- Input kilovolt-amperes (kVA) (approximately): 1 kVA
 - Minimum configuration: 0.325 kVA
 - Maximum configuration: 1 kVA
- Btu output:
 - Ship configuration: 1108 Btu/hr (325 watts)
 - Full configuration: 3308 Btu/hr (970 watts)
- Noise level (horizontal position): 6.8 bels (operating)

Note: The noise emission level stated is the declared (upper limit) sound power level, in bels, for a random sample of machines. All measurements were made in accordance with ISO 7779 and reported in conformance with ISO 9296.

x3650 servers are intended for use as rack-drawer servers and are tested and designed to operate in a horizontal position.

Standards: These systems support or comply with the following standards:

- Multiprocessor Specification (MPS) 1.4
- Peripheral Component Interconnect (PCI) specification 2.3
- PCI-X specification V1.0a
- Hardware-enabled to meet the International Organization for Standardization (ISO) 9241, Part 3

Equipment approvals and safety

- FCC — Verified to comply with Part 15 of the FCC Rules, Class A
 - Canada ICES-003, issue 4, Class A
 - UL/IEC 60950-1¹⁴
 - CSA C22.2 No. 60950-1-03
 - NOM-019¹⁴
- ¹⁴ This server model is certified by the respective UL and NOM agencies.

Operating environment

- Temperature:
 - Server on: 10.0° to 35.0°C (50° to 95°F) at 0 to 914.4 m (0 to 3,000 ft).
 - Decrease system temperature by 0.75°C for every 1000 feet increase in altitude.
- Temperature:
 - Server off: 10° to 43°C (50.0° to 109.4°F)
- Temperature:
 - Shipment: -40° to 60°C (-40° to 140°F)
- Relative humidity: 8% to 80%
- Maximum altitude: 2,133 m (7,000 ft)

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

- Keyboard
- Mouse
- HDD
- Display (E51, E54, P76, G78, LCD, or equivalent)

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, P76, 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 on the x3650 server:

- Microsoft
 - Windows 2003, Standard Edition
 - Windows 2003, Enterprise Edition
 - Windows Server 2003
- Novell
 - NetWare 6.5
- Linux™
 - SUSE Linux Enterprise Server 9
 - Red Hat Enterprise Linux 4AS
 - Red Hat Enterprise Linux 4ES
 - Red Hat Enterprise Linux 4.0 for AMD64 and Intel® EM64T

Note: Certification is planned for all supported operating systems.

Note: For information on additional support, certification, and versions, visit

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

The following network operating systems are supported as preloads in the System x3650 server:

- SUSE Linux Enterprise Server 9
- Red Hat Enterprise Linux ES 4 AS
- Red Hat Enterprise Linux ES 4

Compatibility: The x3650 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 x3650 and to maintain compatibility with many current software programs.

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 System x servers. The Sales Manual is updated periodically as new features and options are announced that support these servers.

Limitations

- The x3650 server supports a maximum of 48 GB of

system memory by adding a 4 GB Advance Memory Features DIMM in each of the 12 DIMM slots (when 4 GB DIMM available). All supported system memory is addressable through direct memory access. The server supports 512 MB, 1 GB, 2 GB, and 4 GB PC2-5300 Advanced Memory Features DIMMs (4 GB when available). DIMMs must be installed in matched pairs. Refer to the **Planning information** section for supported memory options.

- Microprocessor upgrades must be of the same type and clock speed. Mixing microprocessors of different speeds or cache size is not supported.
- Use the version of ServerGuide shipped with the system, or a later version, to load software and drivers. Earlier versions of ServerGuide cannot be used with the server.

Refer to the **Software requirements** section for operating system limitations.

User group requirements: This announcement satisfies or partially satisfies the 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: The System x3650 server is designated as customer setup. Customer setup instructions are shipped with each system.

Configuration information

Integrated RAID-1 configuration: There are two manufacturing instructions (MI) available to allow the customer to set up a RAID-1 configuration. These instructions enable configuration via Odyssey (ibm.com).

The two instructions are:

- Integrated Mirroring — Two HDDs required via Instruction 01R1356
- Integrated Mirroring with HotSpare — Three HDDs required via Instruction 01R1357

Bay configuration: The x3650 server 3.5-inch models contain seven bays. The lower left bay on the system contains the slim-high CD-RW/DVD-ROM drive. Six slim-high, hot-swap bays at right on the server are ready for installation of various supported hot-swap HDD drive options.

The System x3650 server 2.5-inch models contain 10 bays. The lower left bay on the system contains the slim-high CD-RW/DVD-ROM drive. One tape drive bay and eight hot-swap bays on the server are ready for installation of various supported hot-swap HDD drive options.

The 8x-24x CD-R/CD-RW DVD drive is connected to the IDE port through an interposer card.

Cabling — Standard non-RAID configurations: The System x3650 server contains a DASD backplane supporting hot-swap, SAS compliant drive bays. The backplane is connected to the one internal connector of the integrated SAS SCSI controller through a cable. One external SAS connector is for external use.

Rack installations: System x3650 server 2U rack-drawer models are designed to be installed in a 19-inch rack cabinet designed for 28-inch deep devices, such as the

NetBAY42U ER and NetBAY42U SR. Installation into some of the older Netfinity® racks (9306900, 9306910, 9306200) requires a rack extension kit.

If a System x3650 is mounted in a non-IBM rack, the rack must satisfy the following specifications:

- The rack must meet EIA-310-D standards for mounting flanges and hole locations.
- The front to rear distance of the mounting flanges must be between 698.5 mm and 762 mm (27.5 and 30 inches).
- The thickness of the mounting flanges must be between 1.9 and 3.3 mm.
- The mounting flanges must have either 7.1-mm (.28-inch) diameter holes or 9.6-mm (.38-inch) square holes on the standard EIA hole spacing.
- The rack must have a minimum depth of 70 mm (2.76 inch) between the front mounting flange and inside of the front door for appropriate cooling.
- The rack must have a minimum depth of 157 mm (6.2 inch) between the rear mounting flange and inside of the rear door to install the server and make space for cable management.
- The minimum side-to-side clearance in the rack between the front and rear mounting flanges must be 467 mm (18.2 inch) to accommodate the width of the server and the slide mounting brackets.
- The minimum side-to-side clearance in the rack between each door and the mounting flanges must be 484 mm (19.1 inch) to accommodate the slide mounting brackets.
- The rack must 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 must be able to support the maximum rack configuration, including all servers, external cables, and PDUs.
- The rack must provide proper stabilization so that the rack does not become unstable when servers are pulled out for service.

Processor upgrade options

- xSeries 1.6 GHz/1066 MHz — 2 x 2 MB L2 Cache Xeon Processor — 40K1231
- xSeries 1.86 GHz/1066 MHz — 2 x 2 MB L2 Cache Xeon Processor — 40K1232
- xSeries 2.0 GHz/1333 MHz — 2 x 2 MB L2 Cache Xeon Processor — 40K1233
- xSeries 2.33 GHz/1333 MHz — 2 x 2 MB L2 Cache Xeon Processor — 40K1234
- xSeries 2.66 GHz/1333 MHz — 2 x 2 MB L2 Cache Xeon Processor — 40K1235
- xSeries 3.0 GHz/1333 MHz — 2 x 2 MB L2 Cache Xeon Processor — 40K1236

Supported memory options: The following memory options are supported:

- IBM 1GB PC2-5300 AMF — (39M5782) (2 x 512 MB AMF)
- IBM 2GB PC2-5300 AMF — (39M5785) (2 x 1 GB AMF)
- IBM 4GB PC2-5300 AMF — (39M5791) (2 x 2 GB AMF)

Power considerations: The System x3650 server includes a standard 835-watt hot-swap power supply. This power supply supplies sufficient power to run the server. A System x3650 835-watt hot-swap power supply upgrade is optionally available to support redundancy.

Cable orders: Two 10/100/1000 Mbps, full-duplex Ethernet PCI controllers, standard with the System x3650 server, are connected directly to an independent RJ-45 connector. The RJ-45 connector provides a 10BaseT, 100Base-TX, and 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 an unshielded twisted pair (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 x3650 server requires about 20 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 x3650	System unit carton	1
	Contents:	
	System unit	
	Rack kit	
System x3650 server	System unit carton	1
	Contents:	
	System unit power cord (1)	
	PDU style power cord (1)	
	System x3650 Installation Guide	
	Safety booklet	
	ServerGuide and IBM Director	
	DVD-ROM packages	
	Media mounting kit	
	On/off switch cover(1)	

The System x3650 server system is shipped as a single package. Other items are in zipped bags or boxes.

Power supply upgrade option

- xSeries 835-watt hot-swap power supply
- Six fans
- C13/14 rack jumper cord
- Safety instructions/warranty

Supplies: IBM System x3650 can be purchased through dealers around the world.

Security, auditability, and control

Security and auditability features include:

- Power-on and privileged access password functions control access to the data and server setup program on the server.
- Set unattended boot mode allows the system keyboard to be locked to all entries except the password and at

the same time allows other computers on the network to access the system disk drive.

- Selectable boot sequence can be used to prevent unauthorized installation of software or removal of data from the diskette drive.

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 Global Services has transformed its delivery of hardware and software support services to put you on the road to higher systems availability. IBM Electronic Services is a Web-enabled solution that provides you with an exclusive, no-additional-charge enhancement to the service and support available on the IBM eServer platform. These services provide the opportunity for greater system availability due to faster problem resolution and preemptive monitoring. IBM Electronic Services is comprised of two separate, but complementary, elements: IBM Electronic Services news page and IBM Electronic Service Agent™.

IBM Electronic Services news page provides you with a single Internet entry point that replaces the multiple entry points traditionally used by customers 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 IBM Electronic Service Agent is no-additional-charge software that resides on your IBM eServer system. It is designed to proactively monitor events and transmit system inventory information to IBM on a periodic, customer-defined timetable. The IBM Electronic Service Agent tracks system inventory, hardware error logs, and performance information. If the server is under a current IBM maintenance service agreement or within the IBM warranty period, the Service Agent automatically reports hardware problems to IBM. Early knowledge about potential problems enables IBM to provide proactive service that may result in higher system availability and performance. In addition, information collected through the Service Agent will be made available to IBM service support representatives when they are helping answer your questions or diagnosing problems.

To learn how IBM Electronic Services can work for you, visit

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

Terms and conditions

IBM Global 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

- System hardware — Three years
- Optional features — One year

Optional IBM features initially installed in an IBM system carry the same warranty and warranty service support category as the system. If installed after the initial system installation, they carry the balance of the system warranty or the optional feature warranty, whichever is greater.

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.

Customer Replaceable Unit (CRU) (for example, keyboard, mouse, speaker, memory, hard disk drive) Service and On-site Service for other selected parts.

CRU Service: IBM provides replacement CRUs 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. CRUs are designated as being either a Tier 1 or a Tier 2 CRU. Installation of Tier 1 CRUs 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 below, On-site Service.

Based upon availability, CRUs will be shipped for next business day delivery. IBM specifies in the materials shipped with a replacement CRU whether a defective CRU must be returned to IBM. When return is required, (1) return instructions and a container are shipped with the replacement CRU, and (2) you may be charged for the replacement CRU if IBM does not receive the defective CRU within 30 days of your receipt of the replacement.

The following parts have been designated as Tier 1 CRUs:

- Bezel
- Fillers
- Shell
- System service label
- Rack kit
- CD-RW combo
- Tray, media
- Rear panel, card/cable asm
- Management module
- Blower
- Fan pack
- Power supply
- Line cord
- Cable, serial port breakout

On-site Service: IBM On-site Repair (IOR), 9 hours per day, Monday through Friday excluding holidays, next business day response. 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. 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-county 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.

International Warranty Service (IWS): IWS is available during the warranty period to customers who travel or relocate to countries where their computer is sold and serviced by IBM or IBM resellers authorized to perform warranty service. Eligible IBM computers are identified by their four-digit machine type.

You can obtain IWS through the method of service, such as CRU, depot, carry-in, or on-site, provided in the servicing country. Service methods and procedures vary by country, and some service or parts may not be available in all countries. Service centers in certain countries may not be able to service all models of a particular machine type. In addition, some countries may have fees and restrictions that apply at the time of service.

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

<http://www-3.ibm.com/pc/support/site.wss/warranty/warranty.vm>

For more information on IWS, refer to Services Announcement 601-034, dated September 25, 2001.

Note: Due to the earth's magnetic field, cathode ray tube (CRT) monitors are manufactured to work in northern, southern, and equatorial regions of the earth and may not produce a satisfactory image when moved between them. Any required adjustment (if possible) is not covered under IWS and may be subject to a chargeable action. The magnetic field does not affect flat panel LCD monitors.

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

Warranty service upgrade: During the warranty period, 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.

Customer Replaceable Units (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 below.

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.

The following warranty service upgrade options are available:

- On-site Service — IBM On-site Repair (IOR), 9 hours per day, Monday through Friday excluding holidays, 4 hour average response
- On-site Service — IBM On-site Repair (IOR), 24 hours per day, 7 days a week, 4 hour average response
- On-site Service — IBM On-site Repair (IOR), 24 hours per day, 7 days a week, 2 hour average response

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, hard disk drive), 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, (1) return instructions and a container are shipped with the replacement CRU, and (2) you may be charged for the replacement CRU if IBM does not receive the defective CRU within 30 days of your receipt of the replacement.

On-site Service: IBM On-site Repair (IOR). 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.

The following On-site Service options are available:

- On-site Service — IBM On-site Repair (IOR), 9 hours per day, Monday through Friday excluding holidays, next business day response
- On-site Service — IBM On-site Repair (IOR), 9 hours per day, Monday through Friday excluding holidays, 4 hour average response
- On-site Service — IBM On-site Repair (IOR), 24 hours per day, 7 days a week, 4 hour average response
- On-site Service — IBM On-site Repair (IOR), 24 hours per day, 7 days a week, 2 hour average response

Maintenance service (ICA)

Maintenance services are available for ICA legacy contracts. The preferred go-to-market offerings are ServiceElect. However, ICA legacy contracts will still be available for current customers until they are withdrawn.

Alternative service (warranty service upgrades): During the warranty period, 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 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.

Customer Replaceable Units (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 to install it, at no additional charge, under the type of warranty service specified below, 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.

The following warranty service upgrade option is available.

- On-site Service — IBM On-site Repair (IOR), 24 hours per day, 7 days a week, 4 hour average response

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, hard disk drive), 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, (1) return instructions and a container are shipped with the replacement CRU, and (2) you may be charged for the replacement CRU if IBM does not receive the defective CRU within 30 days of your receipt of the replacement.

On-site Service: IBM On-site Repair (IOR). 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.

The following On-site Service options are available:

- On-site Service — IBM On-site Repair (IOR), 9 hours per day, Monday through Friday excluding holidays, next business day response
- On-site Service — IBM On-site Repair (IOR), 24 hours per day, 7 days a week, 4 hour average response

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 (adapter cards, PCMCIA cards, disk drives, memory, and so forth) installed within IBM systems 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. This product does not contain Licensed Internal Code or Licensed Machine Code.

Educational allowance available: None

Prices

Product charges

Description	Machine type	Model number	Part number	List price(15)
7979 Express models				
System x3650 -- Rack 1.6 GHz/1066 MHz/4 MB, 1 GB	7979	21U	797921U 79792AU	\$2,119 2,119
System x3650 -- Rack 1.86 GHz/1066 MHz/4 MB, 1 GB	7979	31U	797931U 79793AU	2,169 2,169
System x3650 -- Rack 2.0 GHz/1333 MHz/4 MB, 1 GB	7979	41U	797941U 79794AU	2,219 2,219
System x3650 -- Rack 2.33 GHz/1333 MHz/4 MB, 1 GB	7979	51U	797951U 79795AU	2,359 2,359
System x3650 -- Rack 2.66 GHz/1333 MHz/4 MB, 1 GB	7979	61U	797961U 79796AU	2,569 2,569
System x3650 -- Rack 3.0 GHz/1333 MHz/4 MB, 1 GB	7979	71U	797971U 79797AU	2,719 2,719

Description	Part number	List price(15)
Intel Xeon Processor 5110 FSB 2 x 2MB L2 Cache	40K1231	\$ 549
Intel Xeon Processor 5120 FSB 2 x 2MB L2 Cache	40K1232	639
Intel Xeon Processor 5130 FSB 2 x 2MB L2 Cache	40K1233	769
Intel Xeon Processor 5140 FSB 2 x 2MB L2 Cache	40K1234	999
Intel Xeon Processor 5150 FSB 2 x 2MB L2 Cache	40K1235	1,569
Intel Xeon Processor 5160 FSB 2 x 2MB L2 Cache	40K1236	1,899

¹⁵ IBM list price does not include tax or shipping and is subject to change without notice. Reseller prices may vary.

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

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

ServicePac for warranty and maintenance

Machine type/model	Description	ServicePac part number
7979 Express	Electronic -- 1yr IOR 9x5 NBD response	69P9402
	Electronic -- 1yr IOR 9x5 + 4 hour average response	69P9403
	Electronic -- 1yr IOR 7x24 + 4 hour average response	69P9404
	Electronic -- 1yr IOR 7x24 + 2 hour average response	69P9405
7979 Express	Electronic -- 2yr 9x5 IOR + NBD response	96P2121
	Electronic -- 2yr 9x5x4 IOR + 4 hour average response	96P2122
	Electronic -- 2yr 24x7x4 IOR + 4-hour average response	96P2123
	Electronic -- 2yr 24x7x2 IOR + 2-hour average response	96P2124
7979 Express	Electronic -- 3yr IOR 9x5 + 4 hour average response	21P2077
	Electronic -- 3yr IOR 7x24 + 4 hour average response	21P2078
	Electronic -- 3yr IOR 7x24 + 2 hour average response	21P2093

7979 Express	Electronic -- 4yr IOR 9x5 NBD response	69P9258
	Electronic -- 4yr IOR 9x5 + 4 hour average response	69P9259
	Electronic -- 4yr IOR 7x24 + 4 hour average response	69P9260
	Electronic -- 4yr IOR 7x24 + 2 hour average response	69P9261

7979 Express	Electronic -- 5yr IOR 9x5 NBD response	69P9262
	Electronic -- 5yr IOR 9x5 + 4 hour average response	69P9263
	Electronic -- 5yr IOR 7x24 + 4 hour average response	69P9264
	Electronic -- 5yr IOR 7x24 + 2 hour average response	69P9265

These ServicePac offerings are valid for models announced in the United States.

Maintenance service charges (ICA)

Alternative service (warranty service upgrades)

Description	Machine type/model	IWR On-site (24 x 7)
System x3650	7979	\$600

Annual maintenance service

Description	Machine type/model	I08 On-site (9 x 5)	I0R On-site (24 x 7)
System x3650	7979	\$700	\$1,050

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. Our 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 the Web at

<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.

Trademarks

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

eServer, ServerProven, xSeries, Netfinity, and ServicePac 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.

Microsoft and Windows are 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.