Hardware Announcement
May 13, 2003

IBM @server xSeries 345 Servers — Fast 3.06 GHz, 533 MHz, Intel Xeon Processor Helps Improve Scalability and Performance

Overview

xSeries™ 345 servers bring powerful, two-way, SMP-capable Intel® Xeon processing, PCI-X architecture, Ultra320 SCSI technology, and high-availability and manageability features to rack-optimized server applications. This server is available with a 3.06 GHz/533 MHz[1] Xeon processor with Hyper-Threading and simultaneous multithreaded (SMT) technologies[5] for more efficient program execution.

With a compact 2 U footprint, the rack-optimized xSeries 345 server helps save valuable rack space and resources. Yet, 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.

Powered and Scaled for e-business Growth

The xSeries 345 server applies powerful processors, large amounts of memory, and high-bandwidth PCI/PCI-X buses to Web-farm applications.

- 533 MHz front side bus (FSB) processors (quad-pumped 133 MHz) enabling 4.3 GB/s data transfer rates
- Two 256 MB high-speed PC2100 double data rate (DDR) ECC SDRAM RDIMMs, two-way interleaved, 133 MHz DDR memory interface[2]

High-performance integrated controllers:

- Dual Gigabit Ethernet
- Dual-channel Ultra320 SCSI (320 MB/s)

High Availability for Around-the-Clock e-business

High-availability, manageability, and serviceability features help you diagnose problems quickly, even from remote locations.

- Light Path Diagnostics, Wake on LAN®, and PXE Support
- Support for virtual floppy enabling user to easily direct a remote host to boot and use standard instructions stored anywhere on the network
- Integrated systems-management processor
- ECC Chipkill™ memory controller to detect and correct multibit errors
- Hot-swap/redundant power and cooling
- Lower cost of ownership with IBM Director
- Three-year warranty on parts and labor, limited[6,7]

Key Prerequisites

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

Planned Availability Date

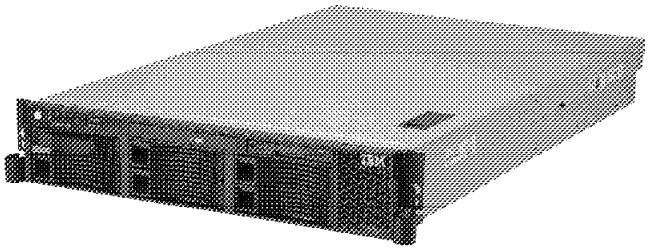
May 30, 2003

At a Glance

Using new design points and technologies, the newest xSeries 345 server is ready to handle your networked e-business applications with powerful two-way, SMP-capable processors, space-saving rack footprint, and high-availability and systems-management features:

- Powerful 3.06 GHz[1] Intel Xeon processor with 533 MHz front side bus (FSB)
- 512 MB of 133 MHz PC2100 double data rate (DDR) ECC system memory[2]
- Integrated dual-channel Ultra320 controller with integrated mirroring
- 514-watt voltage sensing hot-plug power supply
- Eight hot-swap fans; support for redundant cooling available
- Integrated systems-management processor
- Five available PCI/PCI-X slots, up to 133 MHz clock speed
- Eight drive bays: diskette, 24x-10x[3] slim-line CD-ROM, six hot-swap HDDs
- Up to 880.8 GB[4] hot-swap Ultra320 SCSI HDD storage
- Integrated dual-channel Gigabit Ethernet, ATI Rage XL SVGA video
- One serial port, three USB ports, two Ethernet (RJ-45), two systems-management, one external SCSI, mouse, and keyboard ports

Description



xSeries 345 Description

xSeries Hot-Swap Redundant Power Supply Option (74P4965): This 514 watt power supply option supports the new xSeries 345 server. The power supply is auto-sensing between high- and low-power voltage range.

High-Performance Server Subsystems

The xSeries 345 server expands the xSeries server line by adding a high level of processor power. This high-throughput, two-way, SMP-capable network server offers excellent performance and scalability when you add memory and a second processor. It incorporates powerful Xeon processors with 512 KB L2 cache. The advanced transfer L2 cache is integrated onto the processor core and runs at the same clock speed. The advanced transfer cache is a result of a "backside bus" that is 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 133 MHz SDRAM is optimized for 133 MHz processor-to-memory subsystem performance. The xSeries 345 server uses the ServerWorks CMIC-LE chipset with Chipkill technology to maximize throughput from processors to memory, and to the 32- and 64-bit PCI buses.

Standard xSeries 345 Configurations

Model	Processor	Cache	Memory	SCSI Interface	Mechanical
8670–71X	3.06 GHz	512 KB	512 MB	Dual Ultra320	Rack

Additional Features

- Achieve two-way SMP processing with a second processor of equal speed and processor type
- System board containing four DIMM connectors supporting 256 MB, 512 MB, 1 GB, and 2 GB 133 MHz DDR PC2100 SDRAM ECC RDIMMs:
  - Two-way interleaved memory for improved performance (memory must be installed in matched pairs)
  - Up to 8 GB of system memory using 2 GB DIMMs
- High-speed, wide-bandwidth PCI/PCI-X bus slots:
  - Two 64-bit/133 MHz PCI-X full-length card slots
  - Two 64-bit/100 MHz PCI-X low-profile full-length card slots
  - One 32-bit/33 MHz PCI half-length card slot, supporting Remote Supervisor Adapter
- Dual-channel, 64-bit Ultra320 (LVD) SCSI PCI controller supporting high-speed (320 MB/s) internal storage solutions
- Dual Gigabit (10/100/1000) Ethernet PCI controllers; speed network communications to LAN clients

The xSeries 345 servers provide solid system throughput from processor, to memory, to bus, to disk-intensive I/O. These features, combined with SMP capability, make the xSeries 345 server an excellent choice for stand-alone or clustered general-business application, file, and print server.

High-Availability and Serviceability Features

- Eight hot-swap fans
- Hot-swap HDD bays with SCA-2 connectors to support SAF-TE functions
- LSI 1030 dual-channel Ultra320 SCSI controller supporting internal Ultra320 devices
- DDR ECC RDIMMs, combined with an integrated ECC memory controller, to correct soft and hard multibit memory errors, while minimizing disruption of service to LAN clients
- Memory hardware with Chipkill technology to correct soft memory errors automatically without software intervention
- ECC L2 cache processors to improve data integrity and help reduce down time
- Predictive Failure Analysis® (PFA) on HDD options[8] memory, VRMs, processors, and fans when Remote Supervisor Adapter installed, to alert the system administrator of an imminent component failure
- Support for optional Remote Supervisor Adapter, enabling remote systems management through a Web-based browser
- Support for an optional RAID 5i adapter that works directly with on-board LSI 1030 SCSI chipset for both Ultra160 and Ultra320 HDDs
- Worldwide voltage-sensing, 514-watt, hot-plug power supply featuring auto restart
- Optional xSeries 514 W 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 (Light Path Diagnostics support)
  - Remote power control
  - Full interconnect and alerting via the integrated systems management RS-485 serial ports
  - Local firmware update
  - Error logging
- Information LED panel for visual indications of system well-being
- Light Path Diagnostics and on-board diagnostics with an LED map to a failing component to help reduce down time and service costs

- Support for virtual floppy enabling 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 SMP configurations:
  - Forces failed processor offline
  - Automatically reboots server
  - Generates alerts
  - Continues operations with the working processor

Expandability and Growth

The xSeries 345 server packs a lot of function and storage capacity into an 2 U 19-inch rack-drawer package, yet it is amazingly easy to upgrade and service. Functions such as SVGA video, dual-channel Ultra320 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
- Five PCI/PCI-X adapter card slots available
- Six slim-high, hot-swap HDD bays
- Support for up to 880.8 GB of internal data storage (using six 146.8 GB Ultra320 hot-swap HDDs)
- 24x-10x IDE CD-ROM and 1.44 MB diskette drive
- ATI Rage XL controller with 8 MB of video memory

Systems Management

xSeries 345 servers feature IBM Director, a powerful, highly integrated systems management software solution built on industry standards and designed for ease of use. Now you can exploit your existing enterprise or workgroup management environments and use the Internet to securely access and manage physically dispersed IT assets more efficiently. It can help reduce costs through:

- Reduced down time
- Increased productivity of IT personnel and end users
- Reduced service and support costs

IBM Director provides integration into leading workgroup and enterprise systems management environments via upward integration modules. This integration enables the advanced management capabilities built into xSeries servers 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.

It's 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[9] fails to respond. An alert is 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 Adapter Card installed)
  - Is installed or removed
- Power supply monitoring monitors the status of the power 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, reset sequencing are supported through system monitoring.
- Text console redirect features keyboard and mouse control.
- LED controls (Light Path support); Light Path 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.

The integrated systems management processor supports upgrading to Remote Supervisor Adapter for full out-of-band and in-band remote management. For detailed information about this option, refer to Hardware Announcement 100-305, dated October 3, 2000.

Remote Supervisor Adapter

Remote Supervisor Adapter features:

- Easy-to-use, Web-based management from standard Web browsers
- Multimode alerting including e-mail with log, paper, SNMP, and LAN
- Graphical console redirection; keyboard and mouse control
- Remote management independent of the server status
- Support for virtual floppy enabling user 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 firmware

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

- Access the server 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
  - Voltage Regulator Modules (VRMs)
  - Memory
  - Fans (when Remote Supervisor Adapter is installed)
  - Power supplies
  - HDDs (when ServeRAID™ adapter 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 down time
- Monitor, manage, and configure RAID subsystems without taking them off line

World-Class Support Tools and Programs

The xSeries 345 server provides 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 over the long haul. IBM can help your company maintain ownership of technology leadership network servers.

- IBM on-site, three-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®,[10] 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 xSeries 345 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.pc.ibm.com/support

Product Positioning

This two-way, SMP-capable server is positioned between the xSeries 335 and 360 servers. The 2 U xSeries 345 server offers more PCI adapter expansion than the 1 U high xSeries 330 server. The xSeries 360 servers support up to four Intel Xeon Processors MP. The SMP-capable platform supports larger memory capacities and requires 3 U of rack space.

This high-density xSeries 345 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. These applications include:

- e-commerce and e-business
- Application serving
- Web serving and
- 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] PC2100 DDR SDRAM is an extension of the PC133 and PC100 memory. PC2100 DDR memory stands for Double Data Rate and effectively you get 2X data in the same clock cycle. Data transfer is at 266 MHz.

[3] Actual playback speed will vary and is often less than the maximum possible.

[4] When referring to HDD or tape backup capacity, GB stands for one billion bytes. Total user capacity may vary depending on operating environment.

[5] A single physical processor's resources look like two logical processors to the Operating System and other applications allowing different tasks to execute simultaneously. This provides a performance boost on multitasking operations.

[6] With respect to on-site service, the customer 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/
Call 800-426-7378 or contact your IBM representative or reseller. Copies are available upon request.

[8] Available only when a ServeRAID adapter is installed.

[9] Currently supported with Windows NT® 4.0 and Windows® 2000.

[10] 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.

IBM US Announcement Supplemental Information

May 13, 2003

Publications

The following publications and CD-ROMs are shipped with the xSeries™ 345 server.

- The xSeries 345 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 xSeries 345 servers.
- The ServerGuide™ contains utilities and drivers to support the xSeries 345 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 may be discontinued at any time.

xSeries 345 Installation Guide and *Hardware Maintenance Manual*, in U.S. English versions, are available from:

http://www.pc.ibm.com/support

Click servers, then the server family, then Online Publications.

Technical Information

Physical Specifications

	8670-71X
Processor	Xeon
Internal speed	3.06 GHz
External speed	533 MHz
Number standard	1
Maximum	2
L2 cache (full-speed)	512 KB
Memory (133 MHz SDRAM)	512 MB DDR ECC
RDIMMs	2 x 256 MB
DIMM sockets	4
Capacity	8 GB[11]
Video	SVGA
Memory	8 MB
SCSI controller	Ultra320
Channels	2
Connector internal	1
Connector external	1
HDD	Open bay
Total bays	8
5.25-inch slim	1
3.5-inch slim	1
Hot-swap	6
Internal capacity	880.8 GB[12,13]
Bays available	6
5.25-inch slim	0
3.5-inch slim	0
Hot-swap	6
PCI slots	5
64-bit/133 MHz	2
64-bit/100 MHz	2
32-bit/33 MHz	1
Slots available	5
Management processor	Integrated
Ethernet controller	Dual gigabit
CD-ROM (IDE)	24x-10x
Diskette drive	1.44 MB
Power supply	514 W
Number standard	1
Hot-swap	Yes
Redundant power	Optional
Auto restart	Yes

[11] Supported only with the 514 Watt Hot-swap Power Supply Upgrade (74P4965)

[12] Capacities are based on installation of six 146.8 GB slim-high, Ultra320 HDDs. For latest information on supported HDD options, refer to the Sales Manual or visit: **http://www.ibm.com/pc/us/compat**

[13] When referring to HDD or tape backup capacity, GB stands for one billion bytes. Total user capacity may vary depending on operating environments.

24x-10x CD-ROM Drive[14] Characteristics

- Formatted capacity: 650 MB
- Average access time: 110 ms
- Burst data transfer rate: 16.6 MB/s (ATA PIO Mode 4)
- Technology: Full constant angular velocity (CAV)
- Buffer size: 1 MB

[14] 24x-10x CD-ROM variable read rate. Actual playback speed will vary and is often less than the maximum possible.

Video Subsystem

- ATI Rage XL graphics accelerator
- Integrated on planar and connected to the PCI bus
- 8 MB SDRAM standard/maximum 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
- DDC2B monitor communications support

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.

Supported video mode capabilities for the SVGA PCI controller:

Microsoft™ Windows NT® V4.0 and Windows® 2000

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	4G	60, 72, 75, 85
800 x 600 x 8	256	56, 60, 72, 75, 85
800 x 600 x 16	64K	56, 60, 72, 75, 85
800 x 600 x 32	16G	56, 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	4G	60, 70, 75, 85
1152 x 864 x 8	256	60, 70, 75
1152 x 864 x 16	64K	60, 70, 75
1152 x 864 x 32	4G	60
1280 x 1024 x 8	256	60, 75, 85
1280 x 1024 x 16	64K	60, 75, 85
1600 x 1200 x 8	256	60
1600 x 1200 x 16	64K	60

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

Dimensions

2 U Rack Drawer

- Width: 443.6 mm (17.5 in)
- Depth: 698.0 mm (27.5 in)
- Height: 85.4 mm (3.36 in)
- Weight:
  - Minimum configuration: 21.1 kg (46.5 lb)
  - Maximum configuration: 28.1 kg (62 lb)

Electrical

- 100 to 127 (nominal) V ac; 50 Hz or 60 Hz; 7.0 A
- 200 to 240 (nominal) V ac; 50 Hz or 60 Hz; 3.5 A
- Input kilovolt-amperes (kVA) (approximately):
  - Minimum configuration: 0.10 kVA
  - Maximum configuration: 0.70 kVA
- Btu output:
  - Ship configuration: 341 Btu/hr (100 watts)
  - Full configuration: 2,250 Btu/hr (660 watts)
- Noise level (horizontal position): 6.5 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 made in accordance with ISO 7779 and reported in conformance with ISO 9296.

xSeries 345 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 2.2
- Peripheral Component Interconnect (PCI-X) specification V1.0
- 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 3, Class A
- UL 1950[15]
- CSA C22.2 No. 950
- NOM-018[15]

[15] This server model is certified by the respective UL and NOM agencies.

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: 2,133 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[16] are supported on the xSeries 345 server:

- Microsoft
  - Windows 2000 Server
  - Windows 2000 Advanced Server
- Novell
  - NetWare 6.0
- Linux
  - Red Hat 7.3
  - SuSE 8.0
  - Red Hat Advance Server 2.1

[16] Certification is planned.

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

http://www.ibm.com/pc/us/compat

The following network operating systems are supported as preloads in the xSeries 345:

- Microsoft:
  - Windows 2000 Server
  - Windows 2000 Advanced Server
  - Windows Small Business Server 2000

Compatibility: The xSeries 345 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 xSeries 345 and to maintain compatibility with many current software programs.

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

Limitations

- The xSeries 345 server supports a maximum of 8 GB of system memory by adding a 2GB PC2100 CL2.5 ECC SDRAM RDIMM in each of the four DIMM slots. All supported system memory is addressable through direct memory access. The server supports 256 MB, 512 MB, 1 GB and 2 GB DDR PC2100 72-bit ECC SDRAM registered DIMMs. DIMMs must be installed in matched pairs. Refer to the **Planning Information** section for supported memory options.
- Microprocessor SMP 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 that is 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.

Planning Information

Customer Responsibilities: The xSeries 345 server is designated as customer setup. Customer setup instructions are shipped with system.

Configuration Information

Integrated RAID One Configuration: There are two manufacturing instructions (MI) available to allow the customer to setup a RAID one configuration. These instructions enable configuration via Odyssey at:

http://www.ibm.com

The two instructions are: Integrated Mirroring — 2 HDDs required via Instruction 01R1356 and Integrated Mirroring with HotSpare — 3 HDDs required via Instruction 01R1357.

Bay Configuration: The xSeries 345 server contains eight bays. The top bay on the right contains the standard, 3.5-inch slim-high diskette drive, the bay to left contains the slim-high CD-ROM drive. Six slim-high, hot-swap bays in the center of the server are ready for various supported hot-swap HDD drive options installation.

The 24x-10x IDE CD-ROM is connected to the IDE port through an interposer card.

Cabling — Standard Non-RAID Configurations: The xSeries 345 server contains a DASD backplane supporting six hot-swap, SCA-2 compliant drive bays. The backplane is connected to the one internal connector of the integrated Ultra320 SCSI controller through a 16-bit LVD SCSI cable. The other connector is for external use.

Note: Mixing Ultra320 drives with drives of any other speed rating causes them to run at Ultra160 speeds.

In configurations where an external SCSI device attachment is required, an external SCSI connector is available at rear of system.

Rack Installations: xSeries 345 2 U 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, and 9306200) will require a rack extension kit.

If an xSeries 345 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 in).
- The thickness of the mounting flanges must be between 1.9-3.3 mm.
- The mounting flanges must have either 7.1-mm (xx-in) diameter holes or 9.6-mm (xx-in) square holes on the standard EIA hole spacing.
- The rack must have a minimum depth of 70 mm (2.76 in) 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 in) between the rear mounting flange and inside of the rear door to install the server and provide cable management space.
- The minimum side-to-side clearance in the rack between the front and rear mounting flanges must be of 467 mm (18.2 in) 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 in) 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, PDUs, and so on.
- The rack must provide proper stabilization so that the rack does not become unstable when servers are pulled out for service.

Processor Upgrade Options: Upgrade Xeon Processor 3.06 GHz/533 MHz-512 KB L2 Cache (02R1988)

Supported Memory Options: The following memory options are supported:

- 256 MB PC2100 DDR CL2.5 ECC SDRAM RDIMM (33L5037)
- 512 MB PC2100 DDR CL2.5 ECC SDRAM RDIMM (33L5038)
- 1 GB PC2100 DDR CL2.5 ECC SDRAM RDIMM (33L5039)
- 2 GB PC2100 DDR CL2.5 ECC SDRAM RDIMM (33L5040)

Power Considerations: The xSeries 345 server includes a standard 514-watt hot-swap power supply. This power supply is capable of providing sufficient power to run the server. An xSeries 514-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 xSeries 345 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 xSeries 345 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

- System unit carton
  - System unit
  - Rack kit
- Country Kit Contents:
  - System unit power cord
  - PDU style power cord
  - xSeries 345 Installation Guide
  - Safety booklet
  - ServerGuide and IBM Director
  - CD-ROM packages
  - Media mounting kit
  - On/off switch cover

The xSeries 345 system is shipped as a single package. Other items are in zipped bags.

Power Supply Upgrade Option (74P4965)

- xSeries 514-watt hot-swap power supply
- C13/14 rack jumper cord
- Safety instructions/warranty

Security, Auditability, and Control

Security and auditability features include:

- Power-on and privileged access password functions provide controls of who has 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.

Terms and Conditions

This product is available for purchase under the terms of the IBM Customer Agreement (ICA).

IBM hardware products are manufactured from new parts, or new and used parts. In some cases, the hardware product may have been previously installed.

Regardless, IBM warranty terms apply.

IBM Credit Corporation Financing: Yes

To obtain copies of the IBM Statement of Limited Warranty, contact your reseller or call IBM. In the United States, call IBM at 800-426-7378. In Canada, call IBM at 800-565-3344.

Warranty Period

- System hardware — Three years on parts and labor
- Optional features — Three years

Warranty Service: System Hardware — IBM On-site Repair (IOR), 9 hours a day, Monday through Friday excluding holidays, next-business-day response

Features: Optional features are designated as Customer Carry-in Exchange/Repair (CCE/CCR).

Optional IBM features initially installed with an xSeries server carry the same warranty 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.

Call IBM at 800-426-7378 in the U.S. for assistance with problem isolation for hardware to determine if warranty service or parts exchange is required. Some parts of the system, such as the keyboard, mouse, and memory, are considered customer replaceable units (CRUs). Worldwide support center phone numbers can be found at:

http://www.ibm.com/planetwide

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 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.pc.ibm.com/support

Click on the Warranty Lookup tab.

For more information on IWS, refer to Service 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 — ServiceElect and ServiceSuite™

ServiceElect and ServiceSuite provide hardware warranty service upgrades, maintenance, and selected annuity support services in one agreement.

Warranty Service Upgrade: During the warranty period, Warranty Service Upgrade provides an enhanced level of service for an additional charge. This enhanced level of service provides a higher level of on-site service labor for all three years of the original warranty period. Parts are covered for three years by the original warranty.

The following warranty service upgrade options are available:

- IOR, 9 hours a day, Monday through Friday excluding holidays, 4-hour average response
- IOR, 24 hours a day, 7 days a week, 4-hour average response
- IOR, 24 hours a day, 7 days a week, 2-hour average response

Maintenance Service

- IOR, 9 hours a day, Monday through Friday excluding holidays, next-business-day (NBD) response
- IOR, 9 hours a day, Monday through Friday excluding holidays, 4-hour average response
- IOR, 24 hours a day, 7 days a week, 4-hour average response
- IOR, 24 hours a day, 7 days a week, 2-hour average response

Maintenance Service (ICA)

Currently available maintenance services 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 service for an additional charge. This enhanced level of service provides a higher level of on-site service labor during the original warranty period.

The following warranty service upgrade option is available.

IOR, 24 hours a day, 7 days a week, 4-hour average response

Maintenance Service

- IOR, 9 hours a day, Monday through Friday excluding holidays, NBD response
- IOR, 24 hours a day, 7 days a week, 4-hour average response

Mid-Range System Option: The xSeries 345 server is an eligible machine for the Mid-Range System Option of the ICA.

Eligible Type	Discount Three-Year	Five-Year
8670	17%	22%

Corporate Service Option: The xSeries 345 server is an eligible machine for the Corporate Service Option of the ICA.

Option	Discount Three-Year	Five-Year
Network	25%	30%
System	17%	22%

Extended Maintenance Option: No

Central Facility Maintenance Service (CFMS) Option: No

Non-IBM Parts Support

Warranty Service: IBM is now shipping IBM machines with selected non-IBM parts that contain an IBM field replaceable unit (FRU) part number label. These parts, parts with an IBM FRU label, 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 a warranty service upgrade 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 upgrade or maintenance services and provide the labor to replace the failing parts at no additional charge. If IBM has Technical Service Agreements with the manufacturers 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 parts at no additional charge. For all other non-IBM parts, the customers are responsible for sourcing the parts. Installation labor will be provided at no additional charge if the machine is covered under a warranty service upgrade or maintenance services.

IBM Hourly Service Rate Classification: One

ServicePac® Services Information

ServicePac for Warranty and Maintenance Options: The announced products may be eligible for ServicePacs for Warranty and Maintenance Options, convenient prepackaged offerings for warranty service upgrades and maintenance services.

ServicePac Installation Services: The announced products may be eligible for ServicePacs for Installation Services, convenient prepackaged offerings for installation services. Refer to the **Prices** section for information on the availability of ServicePac offerings.

For additional ServicePac information, visit:

http://www-1.ibm.com/services/its/us/servicepac.html

Rental Offering: No

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 Charges: No

Prices

Description	Machine Type/ Model	Part Number	IBM List Price[17]
xSeries 345 — Rack, 3.06 GHz/533 MHz — 512 KB L2, 512 MB	8670-71X	867071X	$3,059
Upgrade Xeon Processor 3.06GHz/533 MHz — 512 KB L2		02R1988	1,099
xSeries 514 Watt HS Redundant Power Supply Option (North America)		74P4965	249
xSeries 514 Watt HS Redundant Power Supply Option (International)		74P4955	249

[17] 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

Description	Part Number
Electronic 1 year IOR	
9 x 5, NBD response	69P9402
9 x 5, 4-hour average response	69P9403
7 x 24, 4-hour average response	69P9404
7 x 24, 2-hour average response	69P9405
Electronic 2 year IOR	
9 x 5, NBD response	96P2121
9 x 5, 4-hour average response	96P2122
7 x 24, 4-hour average response	96P2123
7 x 24, 2-hour average response	96P2124
Electronic 3 year IOR	
9 x 5, 4-hour average response	21P2077
7 x 24, 4-hour average response	21P2078
7 x 24, 2-hour average response	21P2093
Electronic 2 year IOR	
9 x 5, NBD response	96P2121
9 x 5, 4-hour	96P2122
7 x 24, 2-hour	96P2123
7 x 24, 2-hour	96P2124
Electronic 4 year IOR	
9 x 5, NBD response	69P9258
9 x 5, 4-hour average response	69P9259
7 x 24, 4-hour average response	69P9260
7 x 24, 2-hour average response	69P9261
Electronic 5 year IOR	
9 x 5, NBD response	69P9262
9 x 5, 4-hour average response	69P9263
7 x 24, 4-hour average response	69P9264
7 x 24, 2-hour average response	69P9265

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

For ServicePac prices, visit:

http://www-1.ibm.com/services/its/us/spwarmain.html

Maintenance Service Charges (ICA)

Alternative Service (Warranty Service Upgrades)

Machine Type/Model	IOR 24 x 7
8670-71X	$600

Annual Maintenance Service

Machine Type/Model	IOR 9 x 5	IOR 24 x 7
8670-71X	$700	$1,050

For ServiceElect (ESA) Maintenance Service Charges, contact IBM Global Services at 888-IBM-4343 (426-4343).

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, both from 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