IBM System x3650 M3 server models include Intel Xeon 5600 series processors and some preloaded models with SAP Discovery software

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At a glance

Power, scalability, control, and serviceability for dynamic web-serving and on demand business applications:

- Ultrathin, high-availability, rack-optimized, 2U platform
- 2 GB, 4 GB, 8 GB, or 16 GB of high-speed DDR-3 SDRAM Registered DIMM memory; 18 DIMM slots that support up to 192 GB maximum memory with 16 GB optional DIMMs, or support up to 48 GB of DDR3 SDRAM Unbuffered DIMM memory via 12 DIMM slots
- Support for up to sixteen 2.5-inch hot-swap SAS or hot-swap SATA HDDs or SSDs
- Four PCI-Express x8 Gen 2 slots:
    - Two x8 - full length, full height
    - One x8 - half length, full height
    - One x8 - low profile
- 460-watt ac, 675-watt ac, 675-watt dc, and 675-watt high-efficiency ac, auto-ranging power supplies (model dependent)
- Integrated systems management processor
- Integrated dual Gigabit Ethernet ports (standard) for high I/O capacity, plus two additional GbE ports (option) with failover capability
- One serial port (16550A-compatible), four USB ports (front and rear), and two video ports (front and rear)

For ordering, contact your IBM® representative, an IBM Business Partner, or IBM Americas Call Centers at 800-IBM-CALL (Reference: YE001).

Overview

This 2U-high, rack-optimized server features superior power, optimized performance, and leadership virtualization and systems management for business-critical workloads built on IBM X-Architecture®.

Optimized for energy efficiency and performance

New, innovative, energy-smart design with powerful high-performance processors, a large capacity of high-performing DDR3 memory, and a no-compromise feature set ideal for most general business applications:

- Powerful Intel® quad- and six-core processors
- New energy-efficient design incorporating 460 W and 675 W high-efficiency power supplies, six cooling fans (three banks of counter-rotating dual fans), altimeter (barometric pressure sensor), and energy-efficient planar components to help lower operational costs
- Highly functional chipset optimized for better application computing for general business workloads
- Eighteen DIMM slots that enable you to deploy up to 192 GB of DDR3 SDRAM Registered DIMM memory, with 4 GB memory standard, or support up to 48 GB of DDR3 SDRAM Unbuffered DIMM memory via 12 DIMM slots
- Standard SAS/SATA HDDs or SSDs with RAID support on hot-swap models
- Support for up to sixteen hot-swap SAS/SATA HDDs or SSDs
- Integrated Dual Gigabit Ethernet ports (standard) for high I/O capacity, and two additional GbE ports (optional) with failover capability
- Support for Embedded VMware ESXi 4.1 hypervisor (connector on an internal SAS riser card activated with optional 2 GB USB key)
- Four PCI-Express x8 high-performance Gen 2 I/O slots that help provide greater network performance with long-term investment protection (four PCIe x8 convertible to two x16 PCIe or four PCI-X 64-bit slots)
- NEBS 1/ETSI equivalent compliance for both ac and dc power supply (model dependent)
- Compliance with 80PLUS and ENERGY STAR standards (model dependent)

Manage with efficiency

High availability, manageability, and serviceability features help diagnose problems quickly, even from remote locations:

- IBM Systems Director Active Energy Manager™ for advanced datacenter power notification and management to help achieve lower heat output and reduced cooling needs
- Snoop filters to boost processor performance
- Integrated SAS controller supporting up to sixteen 2.5-inch hot-swap HDD bays (four or eight bays standard, four-bay kits that upgrade from four to eight bays or eight-bay kits that upgrade from eight to sixteen bays optional) with five RAID alternatives, helping to safeguard your data with either the standard RAID controller at no additional cost or an optional RAID controller for enhanced support.
- Memory mirroring, configurable using Unified Extensible Firmware Interface (UEFI) setup
- Integrated Management Module (IMM) systems management processor
- Monitoring and control of operating status and key server components
- Predictive Failure Analysis® (PFA) on selected components that warns of problems before they occur
- Fast and easy servicing through innovative light path diagnostics, improved onboard diagnostics, and LED diagnostic panel

Ultimate fault tolerant protection

- Hot-swap, redundant fans with calibrated vectored cooling to keep components cool, and simplified fan replacement
- Optional hot-swap, redundant power supplies to help reduce down time
- IBM Director and web support
- Three-year, Customer Replaceable Unit (CRU) and on-site labor[1], limited warranty[2]; optional warranty service upgrades available

IBM is releasing models of this product that come preloaded with SAP Discovery System V4. The SAP Discovery System is an out-of-the-box, fully configured and preintegrated service-oriented architecture (SOA) platform enabler for SAP development environments. The models that include the preinstalled copy of SAP software do not include a license to use such SAP software. You are not licensed to use the copy of SAP software contained in the IBM system until you have purchased or licensed the use of the SAP software from SAP or its authorized distributors. Usage of the SAP software is subject to the applicable SAP end-user license supplement. Your purchase of the IBM hardware system does not include a license to use the SAP software or to use any other SAP software. SAP is under no obligation to license the preloaded SAP software to you. Please contact your responsible SAP representative to obtain the appropriate license rights to use the SAP software. SAP Discovery Server is preinstalled on specific models of this product as a convenience only; IBM makes no representation or warranty with respect to SAP software and grants no license to use any preinstalled SAP software.

IBM Express models

New System x® configurations are being added to the IBM Express Portfolio™, designed and priced to meet the needs of mid-sized businesses. Reliable and easy to manage, Express models and configurations vary by country. They further enhance the ease of doing business with IBM by offering a robust portfolio of products supported by aggressive pricing and simplified incentives.

The latest System x Express models consist of relevant system configurations for the System x3650 M3 servers.

System x Express servers deliver robust capabilities while taking into account limited resources and budgets. Find the right hardware for your business needs today, while helping to protect your investments with flexible, scalable products that can grow with your business.

[1] You may be asked certain diagnostic questions before a technician is sent.

[2] For information on IBM's Statement of Limited Warranty, call 800-IBM-SERV (426-7378) or contact your IBM representative or reseller. Copies are available upon request.

[3] GHz and MHz denote the internal and/or external clock speed of the microprocessor only, not application performance. Many factors affect application performance.

Note: The Microsoft® Windows® Preinstallation Environment software contains a security feature that will cause an end-user customer's system to reboot without prior notification to the end-user customer after 24 hours of continuous use of the Microsoft Windows Preinstallation Environment. During routine usage of ServerGuide™, which does not usually require usage of the Microsoft Windows Preinstallation Environment software for such an extended time period, this condition should not occur.

Key prerequisites

- Monitor, USB keyboard, and USB mouse

Note: PS/2-style keyboard and mouse are not supported.

Planned availability date

March 15, 2011 -- All models except:

- IBM System x3650 M3 (7945J6x): April 8, 2011

Description

System x3650 M3 server

The System x3650 M3 server features Intel Xeon® multicore processors that support internal processing speeds of up to 3.46 GHz[3] (six-core) or 3.60 GHz (four-core) and processing operations to memory up to 1333 MHz.

High-performance server subsystems

The System x3650 M3 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 up to 12 MB L3 cache. The advanced transfer L3 cache is integrated onto the processor 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 PC3 DDR3 Advanced Memory Feature DIMMs run at 1333 MHz DRAM clock speed and offer maximum 10667 MB/s bandwidth, processor-to-memory subsystem performance. The x3650 M3 server uses the Intel 5600 chipset with Chipkill™ technology to maximize throughput from processors, to memory, to the 32-bit and 64-bit PCI buses.

Standard System x3650 M3 configurations

SEO number	Processor	Memory	GT/s	HDD interface	HDD	Other
794512x	1.60 GHz Cache:	4 GB 4 MB	4.8	SAS/SATA	2.5-in	Open bay hot-swap 1 x 460W
794522x	2.13 GHz Cache:	4 GB 8 MB	4.8	SAS/SATA	2.5-in	Open bay hot-swap 1 x 460W
794532x	2.26 GHz Cache:	4 GB 8 MB	4.8	SAS/SATA	2.5-in	Open bay hot-swap 1 x 460W
7945D4x	2.40 GHz Cache:	4 GB 12 MB	5.86	SAS/SATA	2.5-in	Open bay hot-swap 1 x 460W
7945H4x	2.26 GHz Cache:	4 GB 12 MB	5.86	SAS/SATA M5015	2.5-in	Open bay hot-swap 1 x 460W
794552x	2.40 GHz Cache:	4 GB 12 MB	5.86	SAS/SATA M5014	2.5-in	Open bay hot-swap 1 x 460W
794554x	2x2.40 GHz Cache:	8 GB 12 MB	5.86	SAS/SATA M5014	2.5-in	Open bay hot-swap 2 x 675W HE
794562x	2.53 GHz Cache:	4 GB 12 MB	5.86	SAS/SATA M5014	2.5-in	Open bay hot-swap 1 x 460W

	Processor	Memory	GT/s	HDD interface	HDD	Other
7945J4x	2.66 GHz Cache: 12 MB	4 GB	6.4	SAS/SATA M5015	2.5-in	Open bay hot-swap 1 x 675W
7945J6x	2x2.66 GHz Cache: 12 MB	24 GB	6.4	SAS/SATA M5015 Multiburner	2.5-in	1x500 GB 7x300 GB hot-swap SAP Disc 2 x 675W HE
7945L4x	2.80 GHz Cache: 12 MB	4 GB	6.4	SAS/SATA M5015	2.5-in	Open bay hot-swap 1 x 675W
794572x	3.06 GHz Cache: 12 MB	4 GB	6.4	SAS/SATA M5015	2.5-in	Open bay hot-swap 1 x 675W HE
794582x	3.46 GHz Cache: 12 MB	4 GB	6.4	SAS/SATA M5015	2.5-in	Open bay hot-swap 1 x 675W HE

Note: The model "x" designation is geography dependent and is spelled out explicitly in the section.

Express models:

SEO number	Processor	Memory	GT/s	HDD interface	HDD	Other
7945E4U	2.26 GHz Cache: 8 MB	6 GB	4.8	SAS/SATA Multiburner	2.5-in	Open bay hot-swap 1 x 460W
7945E5U	2.40 GHz Cache: 12 MB	6 GB	5.86	SAS/SATA Multiburner	2.5-in	Open bay hot-swap 1 x 460W
7945E6U	2.53 GHz Cache: 12 MB	12 GB	5.86	SAS/SATA Multiburner	2.5-in	Open bay hot-swap 2 x 460W
7945E7U	2x3.06 GHz Cache: 12 MB	24 GB	6.4	SAS/SATA M5015 Multiburner	2.5-in	Open bay hot-swap 2 x 675W

Additional features

- Up to twelve-core processing achieved with a second processor of equal speed and processor type
- System board containing 18 DIMM connectors supporting 2 GB, 4 GB, 8 GB, and 16 GB DDR3 PC3-10600 SDRAM ECC RDIMMs with:
  - DDR3 memory for improved performance
  - Up to 192 GB of system memory using 16 GB optional DIMMs
  - Up to 48 GB of system memory using 4 GB DDR3 PC3-10600 SDRAM ECC UDIMM memory
  - Two DIMMs per channel at 1333 MHz supported on single-rank and dual-rank RDIMMs and UDIMMs for L5640, E5645, E5649, and X5600 series 1333 MHz processors
- High-speed, wide-bandwidth PCI-Express or PCI/PCI-X bus slots
- On standard models, either four or eight 2.5-inch bays to support optional SAS HDDs and one bay to support an optical drive (optical standard in some models)
- Dual Broadcom 5709 chip that supports dual Gigabit (10/100/1000) Ethernet ports, which speed network communications to LAN clients

The System x3650 M3 server offers solid system throughput from processor, to memory, to bus, to disk-intensive I/O. These features, combined with multicore capability, make the x3650 M3 server an excellent choice for a stand-alone or clustered general-business application, file, and print server.

High-availability and serviceability features

The System x3650 M3 server subsystem delivers excellent reliability and serviceability features:

- Support for light path diagnostics with viewable drop-down panel, Wake on LAN®, and PXE
- Up to six hot-swap fans (three pairs)
- Up to sixteen 2.5-inch HS HDDs with optional upgrade kit levels
- Chipkill memory that basically distributes information covered by error correction coding across separate memory chips; if any of the chips fail, the data can in many cases still be reconstructed from the remaining chips, and the system can continue running
- ECC L3 cache processors to help improve data integrity and help reduce down time
- Predictive Failure Analysis (PFA) on processors, HDD options, memory, voltage regulator modules (VRMs), power supply, and fans (when Remote Supervisor Adapter is installed), to help alert the system administrator of imminent component failure
- Worldwide voltage-sensing, 460-watt ac, 675-watt ac, 675-watt high-efficiency ac, and 675-watt dc hot-plug power supply
- Optional 460-watt ac, 675-watt ac, 675-watt high-efficiency ac, and 675-watt dc hot-swap power supply upgrade
- Optional Virtual Media Key to enable the remote presence and blue-screen capture features
- Integrated Management Module 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 locate a failing component, helping reduce down time and service costs
- Support for virtual floppy (with optional Virtual Media Key), which enables a 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 configurations, which:
  - Forces the failed processor offline
  - Reboots the server automatically
  - Generates alerts
  - Continues operations with the working processor

Expandability and growth

The System x3650 M3 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, 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)

– IBM Virtual Media Key
- Support for up to 16000 GB of internal data storage, using sixteen 1 TB NL SAS/ NL SATA HDDs

Systems management

Integrated Management Module (IMM)

The System x3650 M3 includes an integrated Management Module that provides industry-standard Intelligent Platform Management Interface (IPMI) 2.0-compliant systems management. The IMM comes standard, and shares one of the two onboard Ethernet ports for access. The IMM can be accessed via software that is compatible with IPMI 2.0 (xCAT, for example). The IMM is implemented using industry-leading OSA firmware and applications in conjunction with the Integrated Management Module.

Features and benefits:

- Monitoring:
  - System voltages
  - Battery voltage
  - System temperatures
  - Fan speed control
  - Fan tachometer monitor
  - Good Power signal monitor
  - System ID and planar version detection
  - System power and reset control
  - NMI detection (system interrupts)
  - SMI detection and generation (system interrupts)
  - Serial port text console redirection
  - System LED control (power, HDD, activity, alerts, and heartbeat)
- An embedded web server that gives you remote control from any standard web browser. No additional software is required on the remote administrator's workstation.
- For users who are accustomed to a command-line interface (CLI), the ability of the administrator to use the CLI from a Telnet session to perform some of the functions that can be performed from the web server.
- Secure Socket Layer (SSL) and Lightweight Directory Access Protocol (LDAP).
- Built-in LAN and serial connectivity that supports virtually any network infrastructure.
- Multiple alerting functions to warn systems administrators of potential problems through email, IPMI PETs, and SNMP.

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

IBM Virtual Media Key

The optional Virtual Media Key delivers advanced control and monitoring features to manage your IBM System x3650 M3 server at virtually any time, from virtually any place. The key can be added to the server through a connector on the planar. This key enables easy console redirection with text and graphics, and keyboard and mouse (operating system must support USB) support over the system management LAN connections.

IBM Director

The System x3650 M3 server also features IBM Director, a powerful, highly integrated, systems-management software solution built on industry standards and designed for ease of use. Exploit your existing enterprise or workgroup-management environments, and use rich security to access and manage physically dispersed IT assets more efficiently over the Internet. It can help reduce costs through potentially:

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

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 a portfolio of integrated server tools that work with the systems management monitoring functions. Typical functions and monitoring capabilities can include:

- PFA-enabled critical hardware components
- Temperature
- Voltage
- Fan speed
- Light path diagnostics

IT administrators have comprehensive, virtual on-site control of System x servers with the ability to remotely:

- Access the server, often regardless of its 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
- Monitor and set thresholds on server health including:
  - Operating system load
  - POST time-out
  - Voltage
  - Temperature
- Set proactive alerts for critical server events including PFA on:
  - Processors
  - Memory
  - HDDs
  - Voltage regulator modules (VRMs)
  - Power supplies
  - Fans
- Define automated actions, such as:
  - Send email or page to an administrator
  - Execute a command or program
  - Pop up an error message to the IBM Director console
- Flash UEFI
- Monitor and graph the use of server resources, such as:
  - Memory

- Processor
- HDDs
- Identify potential performance bottlenecks and react to prevent down time

IBM Director Agent integrates into leading workgroup and enterprise systems management environments via upward integration modules (available from IBM and third parties). Advanced management capabilities built into System x servers are available through:

- Tivoli® Enterprise and Tivoli NetView®
- Computer Associates Unicenter TNG
- HP OpenView
- Microsoft SMS
- BMC Patrol
- NetIQ

IBM Active Energy Manager

IBM Active Energy Manager offers direct monitoring of power consumption and thermal load of your server through IBM Director. You can monitor power consumption to track utilization of energy resources. IBM Active Energy Manager is a leading solution on the market providing users with the combination of intelligence and features needed to effectively monitor power consumption in the datacenter. Active Energy Manager, an extension to 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, Active Energy Manager 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, as well as its BladeCenter® line of systems. With Active Energy Manager, the user is able to understand the actual power draw.

With the addition of the optional IBM Virtual Media Key, the IT administrator achieves comprehensive, virtual on-site control of System x 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
  - Memory
  - Fans
  - HDDs
  - Voltage regulator modules (VRMs)
  - Power supplies
- Define automated actions, such as:

- – Send an email or a page to an administrator
  - – Execute a command or program
  - – Pop-up an error message to the director console
- Manage flash UEFI
- 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

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 Microsoft 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 System x3650 M3 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.

- The server purchase includes a three-year, customer replaceable unit (CRU) and on-site service, limited warranty; optional warranty service upgrades are available.
- 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.
- Electronic support on the web offers additional support in an easy-to-use format.

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

Accessibility by people with disabilities

A U.S. Section 508 Voluntary Product Accessibility Template (VPAT) containing details on accessibility compliance can be requested at

  http://www.ibm.com/able/product_accessibility/index.html

Product positioning

The System x3650 M3 servers are a part of the System x rack-optimized server line. These two-socket servers deliver Intel Xeon multicore power and excellent server function in an ultrathin, rack-optimized, 2U footprint.

Optimized for speed

The System x3650 M3 server offers new levels of fast Intel Xeon multicore processors with up to 6.4 GT/s and lower power for datacenter environments and collaboration applications. This server is uniquely optimized for better application computing with a highly functional chipset and eighteen DIMM slots for a maximum of 192 GB of DDR-3 SDRAM Registered DIMM memory.

Innovation comes standard

- Application efficiency increases with snoop filters that free up cache and improve processor performance.
- Supercharged TOE optimizes system performance by offloading protocol processing.
- A drop-down light path diagnostics panel improves in-rack manageability and allows easy problem identification.

Ultimate fault-tolerant protection

- A memory mirroring feature enables you to increase memory reliability.
- A SAS controller with RAID-0, -1, and -1E on hot-swap SAS models helps safeguard your data at no additional cost.

Target applications

- Database
- Email collaboration
- File/print
- Virtualization
- Linux® clustering
- Scientific and technical computing

These powerful servers also meet traditional enterprise network server requirements, but with an added benefit of requiring less space.

Product number

The following are newly announced features on the specified models of the IBM xSeries® 7945 machine type:

Description	MT	Model	Feature
2GB (1x2GB, 1Rx8, 1.35V) PC3L-10600 ECC DDR3 1333MHz LP UDIMM	7945	AC1 MC1	A0QS
Addl Intel Xeon Processor E5645 6C 2.40GHz 12MB Cache 1333MHz 80W	7945	AC1 MC1	A0YW
Addl Intel Xeon Processor E5603 4C 1.60GHz 4MB Cache 1066MHz 80W	7945	AC1 MC1	A0YX
Addl Intel Xeon Processor E5606 4C 2.13GHz 8MB Cache 1066MHz 80W	7945	AC1 MC1	A0YY
Addl Intel Xeon Processor E5607 4C 2.26GHz 8MB Cache 1066MHz 80W	7945	AC1 MC1	A0YZ
Addl Intel Xeon Processor X5647 4C 2.93GHz 12MB Cache 1066MHz 130W	7945	AC1 MC1	A0Z0
Addl Intel Xeon Processor E5649 6C 2.53GHz 12MB Cache 1333MHz 80W	7945	AC1 MC1	A0Z1
Addl Intel Xeon Processor X5672 4C 3.20GHz 12MB Cache 1333MHz 95W	7945	AC1 MC1	A0Z2
Addl Intel Xeon Processor X5675 6C 3.06GHz 12MB Cache 1333MHz 95W	7945	AC1 MC1	A0Z3
Addl Intel Xeon Processor X5687 4C 3.60GHz 12MB Cache 1333MHz 130W	7945	AC1 MC1	A0Z4

Description	MT	Model	Feature
Addl Intel Xeon Processor X5690 6C 3.46GHz 12MB Cache 1333MHz 130w	7945	AC1 MC1	A0Z5
Intel Xeon Processor E5645 6C 2.40GHz 12MB Cache 1333MHz 80W	7945	AC1 MC1	A0Z6
Intel Xeon Processor E5603 4C 1.60GHz 4MB Cache 1066MHz 80W	7945	AC1 MC1	A0Z7
Intel Xeon Processor E5606 4C 2.13GHz 8MB Cache 1066MHz 80W	7945	AC1 MC1	A0Z8
Intel Xeon Processor E5607 4C 2.26GHz 8MB Cache 1066MHz 80W	7945	AC1 MC1	A0Z9
Intel Xeon Processor X5647 4C 2.93GHz 12MB Cache 1066MHz 130W	7945	AC1 MC1	A0ZA
Intel Xeon Processor E5649 6C 2.53GHz 12MB Cache 1333MHz 80W	7945	AC1 MC1	A0ZB
Intel Xeon Processor X5672 4C 3.20GHz 12MB Cache 1333MHz 95w	7945	AC1 MC1	A0ZC
Intel Xeon Processor X5675 6C 3.06GHz 12MB Cache 1333MHz 95W	7945	AC1 MC1	A0ZD
Intel Xeon Processor X5687 4C 3.60GHz 12MB Cache 1333MHz 130w	7945	AC1 MC1	A0ZE
Intel Xeon Processor X5690 6C 3.46GHz 12MB Cache 1333MHz 130w	7945	AC1 MC1	A0ZF
IBM 675W High Efficiency Redundant AC Power Supply	7945	AC1 MC1	A0ZG
IBM 460W Redundant Power Supply Unit	7945	AC1 MC1	A0ZH
IBM Ball Bearing Slides kit	7945	AC1 MC1	A0ZJ
Base with High Efficiency 675W Redundant AC Power Supply	7945	AC1 MC1	A0ZK
Base with 460W Redundant AC Power Supply	7945	AC1 MC1	A0ZL

The following are features already announced for the 7945 machine type:

Description	MT	Model	Feature
2GB (1x2GB, 1Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP RDIMM	7945	AC1	8940

Single Entity Offerings (SEOs)

Description	SEO number
IBM System x3650 M3	794512U
	794522U
	794532U
	7945D4U
	7945H4U
	794552U
	794554U
	794562U
	7945J4U
	7945L4U
	794572U
	794582U

Express models:

Description	SEO number

```
IBM System x3650 M3                                            7945E4U
                                                              7945E5U
                                                              7945E6U
                                                              7945E7U

                                                              SEO
Description                                                   number

IBM System x3650 M3                                           7945J6U
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Note: SAP Discovery system v4 preload SAP Business All-in one is included with the 7945J6x and the 7945JCU.

Option SEOs

The following are new unique option part numbers for System x3650 M3 server.

```
SEO
number    Description

81Y6557   IBM 675W High Efficiency Redundant AC Power Supply
81Y6558   IBM 465W Redundant AC Power Supply
81Y6537   Intel Xeon Processor E5645 6C 2.40GHz 12MB Cache 1333MHz 80w
81Y6538   Intel Xeon Processor E5603 4C 1.60GHz 4MB Cache 1066MHz 80w
81Y6539   Intel Xeon Processor E5606 4C 2.13GHz 8MB Cache 1066MHz 80w
81Y6540   Intel Xeon Processor E5607 4C 2.26GHz 8MB Cache 1066MHz 80w
81Y6541   Intel Xeon Processor X5647 4C 2.93GHz 12MB Cache 1066MHz 130w
81Y6542   Intel Xeon Processor E5649 6C 2.53GHz 12MB Cache 1333MHz 80w
81Y6543   Intel Xeon Processor X5672 4C 3.20GHz 12MB Cache 1333MHz 95w
81Y6544   Intel Xeon Processor X5675 6C 3.06GHz 12MB Cache 1333MHz 95w
81Y6545   Intel Xeon Processor X5687 4C 3.60GHz 12MB Cache 1333MHz 130w
81Y6546   Intel Xeon Processor X5690 6C 3.46GHz 12MB Cache 1333MHz 130w
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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).

https://www.ibm.com/partnerworld/mem/sla.jsp?num=111-009

Publications

The following CD-ROM is shipped with the x3650 M3 server:

• 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.

The *System x3650 M3 Server Installation and User's Guide* and *Problem Determination and Service Guide,* in U.S. English versions, are available from

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

Select "Product Support," "System x," then "Product family," and then click "Publications lookup."

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For more information, visit

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

Technical information

Specified operating environment

Physical specifications

System x3650 M3:

	7945J6x
Processor	Xeon 6C X5650 (95w)
Internal speed	2.66 GHz
External speed	6.4 GTS
Number standard	2
Maximum	2
L3 cache (full-speed)	12 MB
Memory	24 GB ECC
RDIMMs	6 x 4 GB
DIMM sockets	18
Capacity (4)	192 GB
Video	SVGA
Memory	16 MB
SATA controller	SAS/SATA
Channels	4
Connector internal	1
HDD (5)	
Total bays	9 (standard)
5.25 slim	1
3.5-in tape	0
Hot-swap (3.5-in)	0
Hot-swap (2.5-in)	8 standard (1 x 500 GB and 7 x 300 GB)
Internal capacity	9.6 TB (with upgrade)
Bays available	0
5.25 slim	0
3.5-in tape	0
Hot-swap (3.5-in)	0
Hot-swap (2.5-in)	0
Total PCI slots	4
PCI_E (x8) (6)	4
System management	Standard
Ethernet controller	Two 1 Gb
Optical drive (SATA)	Multiburner
Power supply	675 W HE
Number standard	2
Maximum	2
Hot-swap	Yes
Redundant power	Yes
Auto restart	Yes

System x3650 M3:

	794512x	794522x
Processor	Xeon 4C E5603 (80 w)	Xeon 4C E5606 (80 w)
Internal speed	1.60 GHz	2.13 GHz
External speed	4.8 GT/s	4.8 GT/s
Number standard	1	1
Maximum	2	2
L3 cache (full-speed)	4 MB	8 MB
Memory	4 GB ECC	4 GB ECC
RDIMMs	1 x 4 GB	1 x 4 GB
DIMM sockets	18	18
Capacity (4)	192 GB	192 GB
Video	SVGA	SVGA
Memory	16 MB	16 MB
SATA controller	SAS/SATA	SAS/SATA
Channels	4	4
Connector internal	4	4
HDD (5)		
Total bays	5 (standard)	9 (standard)

```
      5.25 slim               1                      1
      3.5-in tape             0                      0
      Hot-swap (3.5-in)       0                      0
      Hot-swap (2.5-in)       4 standard             8 standard
      Internal capacity       9.6 TB (with upgrade)  9.6 TB (with upgrade)
   Bays available             5                      9
      5.25 slim               1                      1
      3.5-in tape             0                      0
      Hot-swap (3.5-in)       0                      0
      Hot-swap (2.5-in)       4                      8
   Total PCI slots            4                      4
      PCI_E (x8) (6)          4                      4
   System management          Standard               Standard
   Ethernet controller        Two 1 Gb               Two 1 Gb
   Optical drive (SATA)       Optional               Optional
   Power supply               460 W                  460 W
      Number standard         1                      1
      Maximum                 2                      2
      Hot-swap                Yes                    Yes
      Redundant power         Optional               Optional
      Auto restart            Yes                    Yes
```

System x3650 M3:

```
                             794532x                7945D4x

   Processor                 Xeon 4C E5607 (80w)    Xeon 4C E5620 (80w)
      Internal speed         2.26 GHz               2.40 GHz
      External speed         4.8 GTS                5.86 GTS
      Number standard        1                      1
      Maximum                2                      2
   L3 cache (full-speed)     8 MB                   12 MB
   Memory                    4 GB ECC               4 GB ECC
      RDIMMS                 1 x 4 GB               1 x 4 GB
      DIMM sockets           18                     18
      Capacity (4)           192 GB                 192 GB
   Video                     SVGA                   SVGA
      Memory                 16 MB                  16 MB
   SATA controller           SAS/SATA               SAS/SATA
      Channels               4                      4
      Connector internal     4                      4
   HDD (5)
   Total bays                9 (standard)           9 (standard)
      5.25 slim              1                      1
      3.5-in tape            0                      0
      Hot-swap (3.5-in)      0                      0
      Hot-swap (2.5-in)      8 standard             8 standard
      Internal capacity      9.6 TB (with upgrade)  9.6 TB (with upgrade)
   Bays available            9                      9
      5.25 slim              1                      1
      3.5-in tape            0                      0
      Hot-swap (3.5-in)      0                      0
      Hot-swap (2.5-in)      8                      8
   Total PCI slots           4                      4
      PCI_E (x8) (6)         4                      4
   System management         Standard               Standard
   Ethernet controller       Two 1Gb                Two 1Gb
   Optical drive (SATA)      Optional               Optional
   Power supply              460 W                  460 W
      Number standard        1                      1
      Maximum                2                      2
      Hot-swap               Yes                    Yes
      Redundant power        Optional               Optional
      Auto restart           Yes                    Yes
```

System x3650 M3:

```
                             7945H4x                794552x

   Processor                 Xeon 6C L5640 (60w)    Xeon 6C E5645 (80w)
      Internal speed         2.26 GHz               2.40 GHz
      External speed         5.86 GTS               5.86 GTS
      Number standard        1                      1
```

```
   Maximum                2                        2
L3 cache (full-speed)     12 MB                    12 MB
Memory                    4 GB ECC                 4 GB ECC
   RDIMMs                 1 x 4 GB                 1 x 4 GB
   DIMM sockets           18                       18
   Capacity (4)           192 GB                   192 GB
Video                     SVGA                     SVGA
   Memory                 16 MB                    16 MB
SATA controller           SAS/SATA                 SAS/SATA
   Channels               4                        4
   Connector internal     4                        4
HDD (5)
Total bays                9 (standard)             9 (standard)
   5.25 slim              1                        1
   3.5-in tape            0                        0
   Hot-swap (3.5-in)      0                        0
   Hot-swap (2.5-in)      8 standard               8 standard
   Internal capacity      9.6 TB (with upgrade)    9.6 TB (with upgrade)
Bays available            9                        9
   5.25 slim              1                        1
   3.5-in tape            0                        0
   Hot-swap (3.5-in)      0                        0
   Hot-swap (2.5-in)      8                        8
Total PCI slots           4                        4
   PCI_E (x8) (6)         4                        4
System management         Standard                 Standard
Ethernet controller       Two 1Gb                  Two 1Gb
Optical drive (SATA)      Optional                 Optional
Power supply              460 W                    460 W
   Number standard        1                        1
   Maximum                2                        2
   Hot-swap               Yes                      Yes
   Redundant power        Optional                 Optional
   Auto restart           Yes                      Yes
```

System x3650 M3:

```
                          794554x                  794562x


Processor                 Xeon 6C E5645 (80w)      Xeon 6C E5649 (80w)
   Internal speed         2.40 GHz                 2.53 GHz
   External speed         5.86 GTS                 6.4 GTS
   Number standard        2                        1
   Maximum                2                        2
L3 cache (full-speed)     12 MB                    12 MB
Memory                    8 GB ECC                 4 GB ECC
   RDIMMs                 2 x 4 GB                 1 x 4 GB
   DIMM sockets           18                       18
   Capacity (4)           192 GB                   192 GB
Video                     SVGA                     SVGA
   Memory                 16 MB                    16 MB
SATA controller           SAS/SATA                 SAS/SATA
   Channels               4                        4
   Connector internal     4                        4
HDD (5)
Total bays                9 (standard)             9 (standard)
   5.25 slim              1                        1
   3.5-in tape            0                        0
   Hot-swap (3.5-in)      0                        0
   Hot-swap (2.5-in)      8 standard               8 standard
   Internal capacity      9.6 TB (with upgrade)    9.6 TB (with upgrade)
Bays available            9                        9
   5.25 slim              1                        1
   3.5-in tape            0                        0
   Hot-swap (3.5-in)      0                        0
   Hot-swap (2.5-in)      8                        8
Total PCI slots           4                        4
   PCI_E (x8) (6)         4                        4
System management         Standard                 Standard
Ethernet controller       Two 1Gb                  Two 1Gb
Optical drive (SATA)      Optional                 Optional
Power supply              675 W HE                 460 W
   Number standard        2                        1
```

Maximum	2	2
Hot-swap	Yes	Yes
Redundant power	Standard	Optional
Auto restart	Yes	Yes

System x3650 M3:

	7945J4x
Processor	Xeon 6C X5650 (95w)
Internal speed	2.66 GHz
External speed	6.4 GTS
Number standard	1
Maximum	2
L3 cache (full-speed)	12 MB
Memory	4 GB ECC
RDIMMs	1 x 4 GB
DIMM sockets	18
Capacity (4)	192 GB
Video	SVGA
Memory	16 MB
SATA controller	SAS/SATA
Channels	4
Connector internal	4
HDD (5)	
Total bays	9 (standard)
5.25 slim	1
3.5-in tape	0
Hot-swap (3.5-in)	0
Hot-swap (2.5-in)	8 standard
Internal capacity	9.6 TB (with upgrade)
Bays available	9
5.25 slim	1
3.5-in tape	0
Hot-swap (3.5-in)	0
Hot-swap (2.5-in)	8
Total PCI slots	4
PCI_E (x8) (6)	4
System management	Standard
Ethernet controller	Two 1Gb
Optical drive (SATA)	Optional
Power supply	675 W
Number standard	1
Maximum	2
Hot-swap	Yes
Redundant power	Optional
Auto restart	Yes

System x3650 M3:

	7945L4x	794572x
Processor	Xeon 6C X5660 (95w)	Xeon 6C X5675 (95w)
Internal speed	2.80 GHz	3.06 GHz
External speed	6.4 GTS	6.4 GTS
Number standard	1	1
Maximum	2	2
L3 cache (full-speed)	12 MB	12 MB
Memory	4 GB ECC	4 GB ECC
RDIMMs	1 x 4 GB	1 x 4 GB
DIMM sockets	18	18
Capacity (4)	192 GB	192 GB
Video	SVGA	SVGA
Memory	16 MB	16 MB
SATA controller	SAS/SATA	SAS/SATA
Channels	4	4
Connector internal	4	4
HDD (5)		
Total bays	9 (standard)	9 (standard)
5.25 slim	1	1
3.5-in tape	0	0
Hot-swap (3.5-in)	0	0
Hot-swap (2.5-in)	8 standard	8 standard

```
   Internal capacity    9.6 TB (with upgrade)  9.6 TB (with upgrade)
Bays available          9                      9
   5.25 slim            1                      1
   3.5-in tape          0                      0
   Hot-swap (3.5-in)    0                      0
   Hot-swap (2.5-in)    8                      8
Total PCI slots         4                      4
   PCI_E (x8) (6)       4                      4
System management       Standard               Standard
Ethernet controller     Two 1Gb                Two 1Gb
Optical drive (SATA)    Optional               Optional
Power supply            675 W                  675 W HE
   Number standard      1                      1
   Maximum              2                      2
   Hot-swap             Yes                    Yes
   Redundant power      Optional               Optional
   Auto restart         Yes                    Yes
```

System x3650 M3:

```
                        7945-82x


Processor               Xeon 6C X5690 (130w)
   Internal speed       3.46 GHz
   External speed       6.4 GTS
   Number standard      1
   Maximum              2
L3 cache (full-speed)   12 MB
Memory                  4 GB ECC
   RDIMMS               1 x 4 GB
   DIMM sockets         18
   Capacity (4)         192 GB
Video                   SVGA
   Memory               16 MB
SATA controller         SAS/SATA
   Channels             4
   Connector internal   4
HDD (5)
Total bays              9 (standard)
   5.25 slim            1
   3.5-in tape          0
   Hot-swap (3.5-in)    0
   Hot-swap (2.5-in)    8 standard
   Internal capacity    9.6 TB (with upgrade kit)
Bays available          9
   5.25 slim            1
   3.5-in tape          0
   Hot-swap (3.5-in)    0
   Hot-swap (2.5-in)    8
Total PCI slots         4
   PCI_E (x8) (6)       4
System management       Standard
Ethernet controller     Two 1Gb
Optical drive (SATA)    Optional
Power supply            675 W HE
   Number standard      1
   Maximum              2
   Hot-swap             Yes
   Redundant power      Optional
   Auto restart         Yes
```

System x3650 M3 Express models

```
                        7945E4U                7945E5U


Processor               Xeon 4C E5607 (80w)    Xeon 4C E5620 (80w)
   Internal speed       2.26 GHz               2.40 GHz
   External speed       4.8 GTS                5.86 GTS
   Number standard      1                      1
   Maximum              2                      2
L3 cache (full-speed)   12 MB                  12 MB
Memory                  6 GB ECC               6 GB ECC
   RDIMMS               3 x 2 GB               3 x 2 GB
```

```
   DIMM sockets          18                       18
   Capacity (4)          192 GB                   192 GB
Video                    SVGA                     SVGA
   Memory                16 MB                    16 MB
SATA controller          SAS/SATA                 SAS/SATA
   Channels              4                        4
   Connector internal    4                        4
HDD (5)
Total bays               9 (standard)             9 (standard)
   5.25 slim             1                        1
   3.5-in tape           0                        0
   Hot-swap (3.5-in)     0                        0
   Hot-swap (2.5-in)     8 standard               8 standard
   Internal capacity     9.6 TB (with upgrade)    9.6 TB (with upgrade)
Bays available           9                        9
   5.25 slim             1                        1
   3.5-in tape           0                        0
   Hot-swap (3.5-in)     0                        0
   Hot-swap (2.5-in)     8                        8
Total PCI slots          4                        4
   PCI_E (x8) (6)        4                        4
System management        Standard                 Standard
Ethernet controller      Two 1Gb                  Two 1Gb
Optical drive (SATA)     Multiburner              Multiburner
Power supply             460 W                    460 W
   Number standard       1                        1
   Maximum               2                        2
   Hot-swap              Yes                      Yes
   Redundant power       Optional                 Optional
   Auto restart          Yes                      Yes


                         7945E6U


Processor                Xeon 6C E5649 (80w)
   Internal speed        2.53 GHz
   External speed        6.4 GTS
   Number standard       1
   Maximum               2
L3 cache (full-speed)    12 MB
Memory                   12 GB ECC
   RDIMMs                3 x 4 GB
   DIMM sockets          18
   Capacity (4)          192 GB
Video                    SVGA
   Memory                16 MB
SATA controller          SAS/SATA
   Channels              4
   Connector internal    4
HDD (5)
Total bays               9 (standard)
   5.25 slim             1
   3.5-in tape           0
   Hot-swap (3.5-in)     0
   Hot-swap (2.5-in)     8 standard
   Internal capacity     9.6 TB (with upgrade)
Bays available           9
   5.25 slim             1
   3.5-in tape           0
   Hot-swap (3.5-in)     0
   Hot-swap (2.5-in)     8
Total PCI slots          4
   PCI_E (x8) (6)        4
System management        Standard
Ethernet controller      Two 1Gb
Optical drive (SATA)     Multiburner
Power supply             460 W
   Number standard       2
   Maximum               2
   Hot-swap              Yes
   Redundant power       Standard
   Auto restart          Yes


                         7945E7U
```

```
Processor              Xeon 6C X5675 (95w)
  Internal speed       3.06 GHz
  External speed       6.4 GTS
  Number standard      2
  Maximum              2
L3 cache (full-speed)  12 MB
Memory                 24 GB ECC
  RDIMMs               6 x 4 GB
  DIMM sockets         18
  Capacity (4)         192 GB
Video                  SVGA
  Memory               16 MB
SATA controller        SAS/SATA
  Channels             4
  Connector internal   4
HDD (5)
Total bays             9 (standard)
  5.25 slim            1
  3.5-in tape          0
  Hot-swap (3.5-in)    0
  Hot-swap (2.5-in)    8 standard
  Internal capacity    9.6 TB (with upgrade)
Bays available         9
  5.25 slim            1
  3.5-in tape          0
  Hot-swap (3.5-in)    0
  Hot-swap (2.5-in)    8
Total PCI slots        4
  PCI_E (x8) (6)       4
System management      Standard
Ethernet controller    Two 1Gb
Optical drive (SATA)   Multiburner
Power supply           675 W
  Number standard      2
  Maximum              2
  Hot-swap             Yes
  Redundant power      Standard
  Auto restart         Yes
```

[4] Maximum of 192 GB by using 12 x 16 GB optional DIMMs.

[5] The standard system can hold four or eight 2.5-inch HS HDDs. Maximum capacities are based on installation of sixteen 600 GB SAS HDDs with one or two optional 8-bay HDD expansion options.

Note: For the latest information on supported HDD options, refer to the *Sales Manual* or visit

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

[6] PCI_E is the standard feature for PCI or you may replace it with the PCI Riser Card PCI-X Option for PCI/PCI-X 133 MHz/100 MHz 64-bit, or 66/33 MHz/32 bit slots.

Video subsystem

- SVGA compatible video controller (Matrox G200eV).

- Integrated on Integrated Management Module (IMM).

- Integrated on planar and connected to the PCI bus.

- DDR2-250MHz SDRAM video memory controller.

- Video memory is not expandable.

- One DVI (Digital Video Interface) is not used.

- Avocent Digital Video Compression (with Virtual Media Key option).

Supported video mode capabilities for the SVGA PCI controller with a 200 MHz memory clock:

```
Microsoft  Windows 2008 or Windows 2003 (32- and 64-bit) and
Linux (all distributions)

                           Refresh
  Resolution       Colors  rate (Hz)

  640 x 480 x 8     256    60, 72, 75, 85, 90, 100, 120, 160, 200
  640 x 480 x 16    64K    60, 72, 75, 85, 90, 100, 120, 160, 200
  640 x 480 x 32    16M    60, 72, 75, 85, 90, 100, 120, 160, 200
  800 x 600 x 8     256    60, 70, 72, 75, 85, 90, 100, 120, 160, 200
  800 x 600 x 16    64K    60, 70, 72, 75, 85, 90, 100, 120, 160, 200
  800 x 600 x 32    16M    60, 70, 72, 75, 85, 90, 100, 120, 160
  1024 x 768 x 8    256    60, 70, 72, 75, 85, 90, 100, 120, 140, 150,
                           160, 200
  1024 x 768 x 16   64K    60, 70, 72, 75, 85, 90, 100, 120, 140, 150,
                           160, 200
  1024 x 768 x 32   16M    60, 70, 72, 75, 85, 90, 100
  1280 x 1024 x 8   256    60, 72, 75
  1280 x 1024 x 16  64K    60, 72, 75
  1280 x 1024 x 32  16M    60, 72, 75
```

Note: Some modes are not supported by all monitors.

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)
  - Weight: (maximum configuration)  25.0 kg (55 lb)
```

Electrical

Models with 675 W power supplies:

- 100 to 127 (nominal) V ac; 50 Hz or 60 Hz; 7.8 A
- 200 to 240 (nominal) V ac; 50 Hz or 60 Hz; 3.8 A
- Input kilovolt-amperes (kVA) (approximately):
  - Minimum configuration: 0.12 kVA
  - Maximum configuration: 0.78 kVA

Models with 460 W power supplies:

- 100 to 127 (nominal) V ac; 50 Hz or 60 Hz; 5.3 A
- 200 to 240 (nominal) V ac; 50 Hz or 60 Hz; 2.6 A
  - Minimum configuration: 0.12 kVA
  - Maximum configuration: 0.53 kVA
- Btu output:
  - Minimum configuration: 307 Btu/hr (90 watts)
  - Maximum configuration: 2260 Btu/hr (780 watts)
- Noise level (horizontal position): 6.5 bels (operating)
- Noise level (horizontal position): 6.3 bels (idle)

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

System x3650 M3 server 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 agency approvals and safety

- FCC - Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, issue 4, Class A
- UL 60950-1
- CAN/CSA-C22.2 No. 60950-1
- NOM-019
- Argentina IEC60950-1
- IEC 60950-1

Operating environment

Air temperature:

- Server on: 10 degrees C to 35 degrees C (50.0 degrees F to 95.0 degrees F); altitude: 0 to 914.4 m (3,000ft). Decrease system temperature by 0.75 degrees C for every 1,000-foot increase in altitude.
- Server off: 5 degrees C to 45 degrees C (41.0 degrees F to 113 degrees F)
- Shipment: -40 degrees C to +60 degrees C (-40 degrees F to 140 degrees F)

Humidity:

- Server on: 20% to 80%, maximum dew point 21 degrees C, maximum rate of change 5 C/hr
- Server off: 8% to 80%, maximum dew point 27 degrees C

Hardware requirements

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

- Keyboard
- Mouse
- HDD
- Display

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

For service, the server requires a compatible:

- Keyboard
- Mouse
- HDD
- Display

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 software products have been tested by IBM and software publishers in the latest available versions, and where appropriate, are or will soon be certified by the publisher to be compatible with the System x3650 M3.

Operating systems

- Microsoft
  - Microsoft Windows Server 2008 R2
  - Microsoft Windows Server 2008, Datacenter x64 Edition
  - Microsoft Windows Server 2008, Enterprise x64 Edition
  - Microsoft Windows Server 2008, Standard x64 Edition
  - Microsoft Windows Server 2008, Web x64 Edition
  - Windows Small Business Server 2008 Premium Edition
  - Windows Small Business Server 2008 Standard Edition
- Linux
  - SUSE Linux Enterprise Server 11 for AMD64/EM64T
  - SUSE Linux Enterprise Server 11 with Xen for AMD64/EM64T
- VMware
  - VMware ESX 4.1
  - VMware ESXi 4.1

Note: For information on additional support, certification, version information, or network operating systems, visit

   http://www-03.ibm.com/servers/eserver/serverproven/compat/us/

IBM makes no representation or warranty regarding third-party products, including those designated as ServerProven.

Compatibility

The System x3650 M3 server systems contain licensed system programs that include set configuration, set features, and test programs. System UEFI is loaded from a "flash" EEPROM into system memory. This UEFI provides instructions and interfaces designed to support the standard features of the x3650 M3 and to maintain compatibility with many current software programs.

For detailed information about IBM and non-IBM devices, adapters, software, and network operating systems supported with xSeries servers, visit

   http://www-03.ibm.com/servers/eserver/serverproven/compat/us/

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

Limitations

- The System x3650 M3 server contains a single, configurable serial port. It can be configured to be operating-system-controlled, service-processor-controlled, or shared between the two. You can set the configuration by UEFI configuration. The default configuration from the factory is in the shared position. In the shared position, the service processor controls the port until the operating system is running, then the operating system takes control. The service processor can regain control of the port for user-configured dial-out situations or if the operating system is not available, but operating system control cannot be reestablished without resetting the server.
- To ensure proper air flow for cooling, the System x3650 M3 server requires a rack with a perforated door, such as the NetBAY42 SR or NetBAY25 SR. An

alternative is to remove the front door of rack cabinets where the door panel is of solid construction.

- Microprocessor upgrades must be of the same type and clock speed. Mixing microprocessors of different speeds or cache size is not supported.

Note: Refer to the Software requirements section for operating system limitations.

Planning information

Customer responsibilities

The System x3650 M3 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 user to set up a RAID-1 configuration.

The two instructions are:

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

Cabling

Simple-swap non-RAID configuration contains cables supporting up to four simple-swap non-RAID SATA drives. It does not contains any backplane.

Rack installations

System x3650 M3 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 M3 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 - 762 mm (27.5 in. - 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 (.28 in.) diameter holes or 9.6-mm (.38 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 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 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, 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

```
59Y4018 Intel Xeon Processor L5630 4C 2.13GHz 12M Cache 1066MHz 40w
59Y4020 Intel Xeon Processor E5620 4C 2.40GHz 12M Cache 1066MHz 80w
59Y4021 Intel Xeon Processor E5630 4C 2.53GHz 12M Cache 1066MHz 80w
59Y4022 Intel Xeon Processor E5640 4C 2.66GHz 12M Cache 1066MHz 80w
81Y6538 Intel Xeon Processor E5603 4C 1.60GHz 4MB Cache 1066MHz 80w
81Y6539 Intel Xeon Processor E5606 4C 2.13GHz 8MB Cache 1066MHz 80w
81Y6540 Intel Xeon Processor E5607 4C 2.26GHz 8MB Cache 1066MHz 80w
59Y4023 Intel Xeon Processor X5650 6C 2.66GHz 12M Cache 1333MHz 95w
59Y4024 Intel Xeon Processor X5660 6C 2.80GHz 12M Cache 1333MHz 95w
59Y4025 Intel Xeon Processor X5667 4C 3.06GHz 12MB Cache 1333MHz 95w
59Y4026 Intel Xeon Processor X5670 6C 2.93GHz 12MB Cache 1333MHz 95w
59Y4027 Intel Xeon Processor X5677 4C 3.46GHz 12M Cache 1333MHz 130w
59Y4028 Intel Xeon Processor X5680 6C 3.33GHz 12M Cache 1333MHz 130w
81Y6537 Intel Xeon Processor E5645 6C 2.40GHz 12MB Cache 1333MHz 80w
81Y6541 Intel Xeon Processor X5647 4C 2.93GHz 12MB Cache 1066MHz 130w
81Y6542 Intel Xeon Processor E5649 6C 2.53GHz 12MB Cache 1333MHz 80w
81Y6543 Intel Xeon Processor X5672 4C 3.20GHz 12MB Cache 1333MHz 95w
81Y6544 Intel Xeon Processor X5675 6C 3.06GHz 12MB Cache 1333MHz 95w
81Y6545 Intel Xeon Processor X5687 4C 3.60GHz 12MB Cache 1333MHz 130w
81Y6546 Intel Xeon Processor X5690 6C 3.46GHz 12MB Cache 1333MHz 130w
59Y4017 Intel Xeon Processor L5609 4C 1.86GHz 12M Cache 1066MHz 40w
59Y4019 Intel Xeon Processor L5640 6C 2.26GHz 12M Cache 1333MHz 60w
59Y4015 Intel Xeon Processor E5503 2C 2.0GHz 4M Cache 800MHz 80w
59Y4016 Intel Xeon Processor E5507 4C 2.26GHz 4M Cache 800MHz 80w
```

Supported memory options

The following memory options are supported:

```
44T1592 2GB 1Rx8 2Gbit PC3-10600R-999 LP RDIMM
44T1599 4GB 2Rx8 2Gbit PC3-10600R-999, LP RDIMM
46C7449 8GB PC3-10600 CL9 ECC DDR3 1333MHz Chipkill LP RDIMM
46C7483 16GB 4Rx4 2Gbit PC3-8500 DDR3-1066 LP RDIMM
49Y1392 2GB 2Rx8 1Gbit PC3L-10600R LP RDIMM 1.35V Capable
49Y1394 4GB 2Rx4 1Gbit PC3L-10600R LP RDIMM 1.35V Capable
49Y1397 8GB 2Rx4 2Gbit PC3L-10600R LP RDIMM 1.35V Capable
49Y1398 8GB 2Rx4 2Gbit PC3L-8500R LP RDIMM 1.35V Capable
49Y1400 16GB (2Gb, 4Rx4, 1.35V) PC3L-8500R LP RDIMM
49Y1405 2GB (2Gb, 1Rx8, 1.35V) PC3L-10600R ECC  LP RDIMM
49Y1406 4GB (2Gb, 1Rx4, 1.35V) PC3L-10600R ECC  LP RDIMM
49Y1407 4GB (2Gb, 2Rx8, 1.35V) PC3L-10600R ECC  LP RDIMM
49Y1433 2GB (1x2GB, 2Rx8, 1.5V) PC3-10600 CL9 ECC DDR3 1333MHz LP RDIMM
49Y1434 2GB (1x2GB, 1Rx4, 1.5V) PC3-10600 CL9 ECC DDR3 1333MHz LP RDIMM
49Y1435 4GB (1x4GB, 2Rx4, 1.5V) PC3-10600 CL9 ECC DDR3 1333MHz LP RDIMM
49Y1436 8GB (1x8GB, 2Rx4, 1.5V) PC3-10600 CL9 ECC DDR3 1333MHz LP RDIMM
44T1569 2GB (1x2GB) 2Rx8 1Gbit PC3-10600 DDR3-1333 LP UDIMM
49Y1404 4GB (2Gb, 2Rx8, 1.35V) PC3L-10600E LP UDIMM
```

Power considerations

The System x3650 M3 server includes a standard 460-watt or 675-watt hot-swap power supply (model dependent). Either power supply supplies sufficient power to run the server.

Cable orders

Two 10/100/1000 Mbps, full-duplex Ethernet PCI controllers, standard with the System x3650 M3 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 M3 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 M3      System unit carton                   1

                        Contents:

                     System unit
                     Rack kit

System x3650 M3      System unit carton                   1

                        Contents:

        Important Notices Flyer
        Rack Installation Instructions
        CD - Documentation
        CD - Director
```

The System x3650 M3 server system is shipped as a single package. Other items are in zipped bags or boxes.

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.

The servers are intended to be installed in a rack and secured in a rack. It is a customer's responsibility to ensure that the server is secure to prevent sensitive data from being removed.

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

IBM Electronic Services

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

complementary, elements: Electronic Services news page and Electronic Services Agent.

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

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

To learn how Electronic Services can work for you, visit

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

Terms and conditions

IBM 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

- Three years
- Optional features - One year

An IBM part or feature installed during the initial installation of an IBM machine is subject to a full warranty effective on the date of installation of the machine. An IBM part or feature that replaces a previously installed part or feature assumes the remainder of the warranty period for the replaced part or feature. An IBM part or feature added to a machine without replacing a previously installed part or feature is subject to a full warranty effective on its date of installation. Unless specified otherwise, the warranty period, type of warranty service, and service level of a part or feature are the same as those for the machine in which it is installed.

The following have been designated as consumables or supply items and are, therefore, not covered by this warranty:

- RAID batteries

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 website. Certain machines contain remote support capabilities for direct problem reporting, remote problem determination, and resolution with IBM. You must follow the problem

determination and resolution procedures that IBM specifies. Following problem determination, if IBM determines On-site Service is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts. Service levels are response-time objectives and are not guaranteed. The specified level of warranty service may not be available in all worldwide locations. Additional charges may apply outside IBM's normal service area. Contact your local IBM representative or your reseller for country- and location-specific information.

The type of service is Customer Replaceable Unit (for example, keyboard, mouse, speaker, memory, or hard disk drive) Service and On-site Service.

Customer Replaceable Unit (CRU) Service

IBM provides a replacement CRU to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM at any time on your request. A CRU is designated as being either a Tier 1 (mandatory) or a Tier 2 (optional) CRU. Installation of Tier 1 CRUs, as specified in this announcement, 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 designated for your machine.

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

The following parts or features have been designated as Tier 1 CRUs:

- Air baffles
- Blank filler
- CMOS batteries
- Cable-management arm
- Hard disk drives
- Hot-swap fan
- Hot-swap AC power supply
- Lift handle kit
- Memory DIMM
- Optical drive
- PCI adapter
- Power cord
- Service label
- System label
- Top cover
- Fan bracket
- Hypervisor™ USB key
- PCI riser
- RAID card without battery
- Tape drive
- Ethernet daughter card

On-site Service

At IBM's discretion you will receive CRU service or IBM or your reseller will repair the failing machine at your location and verify its operation. If required, On-site

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Repair is provided, 9 hours per day, Monday through Friday excluding holidays, NBD response. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well lit, and suitable for the purpose. On-site Service is not available in all countries, and some countries have kilometer or mileage limitations from an IBM service center. In those locations where On-site Service is not available, the normal in-country service delivery is used.

Call IBM at 1-800-IBM-SERV (426-7378) to assist with problem isolation for hardware to determine if warranty service is required. Telephone support may be subject to additional charges, even during the limited warranty period.

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

International Warranty Service

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

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

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

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

http://www-304.ibm.com/jct01004c/systems/support/supportsite.wss/warrantyform?brandind=5000008

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

Licensing

Programs included with this product are licensed under the terms and conditions of the License Agreements that are shipped with the system.

Maintenance services

ServicePac , ServiceSuite , ServiceElect, and ServiceElite

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

Warranty service upgrade

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

IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM website. Certain machines contain remote support capabilities for direct problem reporting, remote problem determination, and resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM determines On-site Service is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts.

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.

See the Pricing section for specific offerings.

Maintenance service

If required, IBM provides repair or exchange service, depending on the type of maintenance service specified below for the machine. IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM website. Certain machines contain remote support capabilities for direct problem reporting, remote problem determination, and resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM determines On-site Service is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts. Service levels are response-time objectives and are not guaranteed.

CRU Service

If your problem can be resolved with a CRU (for example, keyboard, mouse, speaker, memory, or 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, return instructions and a container are shipped with the replacement CRU, and you may be charged for the replacement CRU if IBM does not receive the defective CRU within 15 days of your receipt of the replacement.

On-site Service

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

See the Pricing section for specific offerings.

Maintenance service (ICA)

Maintenance services are available for ICA legacy contracts.

Alternative service (warranty service upgrades)

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

IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM website. Certain machines contain remote support capabilities for direct problem reporting, remote problem determination, and resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM determines On-site Service is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts.

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

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.

See the Pricing section for specific offerings.

Maintenance service

If required, IBM provides repair or exchange service, depending on the type of maintenance service specified below for the machine. IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM website. Certain machines contain remote support capabilities for direct problem reporting, remote problem determination, and resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM determines On-site Service is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts. Service levels are response-time objectives and are not guaranteed.

CRU Service

If your problem can be resolved with a CRU (for example, keyboard, mouse, speaker, memory, or 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, return instructions and a container are shipped with the replacement CRU, and you may be charged for the replacement CRU if IBM does not receive the defective CRU within 15 days of your receipt of the replacement.

On-site Service

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

See the Pricing section for specific offerings.

Non-IBM parts support

Warranty service

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

Warranty service upgrades and maintenance services

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

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

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

Warranty service upgrades

IBM hourly service rate classification

One

Field-installable features

Yes

Model conversions

No

Machine installation

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

Graduated program license charges apply

No

Licensed Machine Code

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

http://www-304.ibm.com/systems/support/machine_warranties/machine_code.html

IBM may release changes to the Machine Code. IBM plans to make the Machine Code changes available for download from the IBM System x technical support website:

http://www-304.ibm.com/systems/support/

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

Educational allowance

None

Pricing

For current prices, contact IBM at 888-Shop-IBM (746-7426) or visit

http://www-03.ibm.com/systems/x/

The following are newly announced features on the specified models of the IBM xSeries 7945 machine type:

Description	Model number	Feature number	Initial/ MES/ Both support	CSU	RP MES
2GB (1x2GB, 1Rx8, 1.35V) PC3L-10600 ECC DDR3 1333MHz LP UDIMM					
	AC1	A0QS	Initial		
	MC1		Initial		
Addl Intel Xeon Processor E5645 6C 2.40GHz 12MB Cache 1333MHz 80W					
	AC1	A0YW	Initial		
	MC1		Initial		
Addl Intel Xeon Processor E5603 4C 1.60GHz 4MB Cache 1066MHz 80W					
	AC1	A0YX	Initial		
	MC1		Initial		
Addl Intel Xeon Processor E5606 4C 2.13GHz 8MB Cache 1066MHz 80W					
	AC1	A0YY	Initial		
	MC1		Initial		
Addl Intel Xeon Processor E5607 4C 2.26GHz 8MB Cache 1066MHz 80W					
	AC1	A0YZ	Initial		
	MC1		Initial		
Addl Intel Xeon Processor X5647 4C 2.93GHz 12MB Cache 1066MHz 130W					
	AC1	A0Z0	Initial		
	MC1		Initial		
Addl Intel Xeon Processor E5649 6C 2.53GHz 12MB Cache 1333MHz 80W					
	AC1	A0Z1	Initial		
	MC1		Initial		
Addl Intel Xeon Processor X5672 4C 3.20GHz 12MB Cache 1333MHz 95W					
	AC1	A0Z2	Initial		
	MC1		Initial		
Addl Intel Xeon Processor X5675 6C 3.06GHz 12MB Cache 1333MHz 95W					
	AC1	A0Z3	Initial		
	MC1		Initial		
Addl Intel Xeon Processor X5687 4C 3.60GHz 12MB Cache 1333MHz 130W					
	AC1	A0Z4	Initial		
	MC1		Initial		
Addl Intel Xeon Processor X5690 6C 3.46GHz 12MB Cache 1333MHz 130W					
	AC1	A0Z5	Initial		
	MC1		Initial		
Intel Xeon Processor E5645 6C 2.40GHz 12MB Cache 1333MHz 80W					
	AC1	A0Z6	Initial		
	MC1		Initial		
Intel Xeon Processor E5603 4C 1.60GHz 4MB Cache 1066MHz 80W					
	AC1	A0Z7	Initial		
	MC1		Initial		
Intel Xeon Processor E5606 4C 2.13GHz 8MB Cache 1066MHz 80W					
	AC1	A0Z8	Initial		
	MC1		Initial		
Intel Xeon Processor E5607 4C 2.26GHz 8MB Cache 1066MHz 80W					
	AC1	A0Z9	Initial		
	MC1		Initial		
Intel Xeon Processor X5647 4C 2.93GHz 12MB Cache 1066MHz 130W					
	AC1	A0ZA	Initial		
	MC1		Initial		

```
Intel Xeon Processor E5649 6C 2.53GHz 12MB Cache
1333MHz 80W
                              AC1       A0ZB           Initial
                              MC1                      Initial
Intel Xeon Processor X5672 4C 3.20GHz 12MB Cache
1333MHz 95w
                              AC1       A0ZC           Initial
                              MC1                      Initial
Intel Xeon Processor X5675 6C 3.06GHz 12MB Cache
1333MHz 95W
                              AC1       A0ZD           Initial
                              MC1                      Initial
Intel Xeon Processor X5687 4C 3.60GHz 12MB Cache
1333MHz 130w
                              AC1       A0ZE           Initial
                              MC1                      Initial
Intel Xeon Processor X5690 6C 3.46GHz 12MB Cache
1333MHz 130w
                              AC1       A0ZF           Initial
                              MC1                      Initial
IBM 675W High Efficiency Redundant AC Power Supply
                              AC1       A0ZG           Initial
                              MC1                      Initial
IBM 460W Redundant  Power Supply Unit
                              AC1       A0ZH           Initial
                              MC1                      Initial
IBM Ball Bearing Slides kit
                              AC1       A0ZJ           Initial
                              MC1                      Initial
Base with High Efficiency 675W Redundant AC Power
Supply
                              AC1       A0ZK           Initial
                              MC1                      Initial
Base with 460W Redundant AC Power Supply
                              AC1       A0ZL           Initial
                              MC1                      Initial
```

The following are features already announced for the 7945 machine type:

Description	Model number	Feature number	Initial/ MES/ Both support	CSU	RP MES
2GB (1x2GB, 1Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP RDIMM					
	AC1	8940	Initial		

Description	SEO number	Initial/ MES/ Both support	CSU	RP MES
Xeon E5603 4GB SAS/SATA 2.5 open bay	794512U	Both	Yes	
Xeon E5606 4GB SAS/SATA 2.5 open bay	794522U	Both	Yes	
Xeon E5607 4GB SAS/SATA 2.5 open bay	794532U	Both	Yes	
Xeon E5620 4GB SAS/SATA 2.5 open bay	7945D4U	Both	Yes	
Xeon L5640 4GB SAS/SATA 2.5 open bay	7945H4U	Both	Yes	
Xeon E5645 4GB SAS/SATA 2.5 open bay	794552U	Both	Yes	
2xXeon E5645 8GB SAS/SATA 2.5 open bay	794554U	Both	Yes	
Xeon E5649 4GB SAS/SATA 2.5 open bay	794562U	Both	Yes	
Xeon X5650 4GB SAS/SATA 2.5 open bay	7945J4U	Both	Yes	
2xXeon X5650 24GB SAS/SATA 2.5 open bay	7945J6U	Both	Yes	
Xeon X5660 4GB SAS/SATA 2.5 open bay	7945L4U	Both	Yes	
Xeon X5675 4GB SAS/SATA 2.5 open bay	794572U	Both	Yes	
Xeon X5690 4GB SAS/SATA 2.5 open bay	794582U	Both	Yes	

System X3650 M3 Express models

Description	SEO number	Initial/ MES/ Both support	CSU	RP MES

```
Xeon E5607 6GB SAS/SATA 2.5 open bay      7945E4U          Both    Yes
Xeon E5620 6GB SAS/SATA 2.5 open bay      7945E5U          Both    Yes
Xeon E5649 12GB SAS/SATA 2.5 open bay     7945E6U          Both    Yes
Xeon X5675 24GB SAS/SATA 2.5 open bay     7945E7U          Both    Yes


Option SEO

                                                   Initial/
                                                   MES/
                                          SEO      Both              RP
        Description                       number   support  CSU MES

         IBM 675W High Efficiency Redundant   81Y6557       Both    Yes
         AC Power Supply
         IBM 465W Redundant AC Power Supply   81Y6558       Both    Yes
         Intel Xeon Processor E5645 6C 2.40GHz  81Y6537     Both    Yes
         12MB Cache 1333MHz 80w
         Intel Xeon Processor E5603 4C 1.60GHz  81Y6538     Both    Yes
         4MB Cache 1066MHz 80w
         Intel Xeon Processor E5606 4C 2.13GHz  81Y6539     Both    Yes
         8MB Cache 1066MHz 80w
         Intel Xeon Processor E5607 4C 2.26GHz  81Y6540     Both    Yes
         8MB Cache 1066MHz 80w
         Intel Xeon Processor X5647 4C 2.93GHz  81Y6541     Both    Yes
         12MB Cache 1066MHz 130w
         Intel Xeon Processor E5649 6C 2.53GHz  81Y6542     Both    Yes
         12MB Cache 1333MHz 80w
         Intel Xeon Processor X5672 4C 3.20GHz  81Y6543     Both    Yes
         12MB Cache 1333MHz 95w
         Intel Xeon Processor X5675 6C 3.06GHz  81Y6544     Both    Yes
         12MB Cache 1333MHz 95w
         Intel Xeon Processor X5687 4C 3.60GHz  81Y6545     Both    Yes
         12MB Cache 1333MHz 130w
         Intel Xeon Processor X5690 6C 3.46GHz  81Y6546     Both    Yes
         12MB Cache 1333MHz 130w
```

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