IBM System x3950 M2 servers featuring latest Intel Xeon MP processors

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At a glance

New IBM® System x3950 M2 servers incorporate high-performance, Xeon® MP processors:

- Models of the x3950 M2 server are powered with quad-core and six-core Intel® Xeon MP processors at up to 2.66 GHz with 9 MB of L2 cache and 16 MB L3 cache
- Up to 256 GB of high-speed, lower-power, PC2-5300 ECC double data rate 2 (DDR2) SDRAM system per chassis memory with the ability to scale to 1 TB
- Seven 2.5 Gb PCIE x8 I/O slots (two are hot-plug) per chassis with ability to scale to 28 slots in a 4-chassis configuration
- Serial Attached SCSI (SAS) controller
- Integrated Broadcom 5709 Dual-port 10/100/1000 Gigabit Ethernet
- Four 2.5-inch hot-swap bays for flexible installation of HDDs, supporting up to 584 GB[1] internal data storage
- Standard Remote Supervisor Adapter II Slimline, enabling remote, full-band systems management
- Two 1440-watt, voltage sensing, rear access, hot-swap power supplies
- UltraSlim Enhanced SATA CD-RW / DVD-ROM Combo drive
- Five USB ports (two can be used for USB keyboard and mouse), SVGA video port, one serial port, and two Gb Ethernet ports per chassis

Warranty: Three years, customer replaceable unit (CRU) and on-site[2] service, limited warranty[3]; optional warranty service upgrades available.

Overview

Models of the x3950 M2 server are powered with quad-core and six-core Intel Xeon MP processors at up to 2.66 GHz with 9 MB of L2 cache and 16 MB L3 cache.

1

The x3950 M2 server is the fourth generation of the Enterprise X-Architecture®. It delivers innovation with enhanced reliability and availability features to enable optimal performance for databases, enterprise applications, and virtualized environments.

Potential benefits include:

- Increased performance
- Memory reliability and availability
- Scalability up to 16 sockets
- Low-power cost-effective memory with Advanced Buffer eXecution chip helps lower power usage by the memory subsystem as much as 37% and low latency for optimal performance
- Enhanced systems management capabilities
- Power management savings
- Quad-core and six-core processing performance

Power and scalability

- Fourth-generation EXA chipset powering XpandOnDemand up to 16-socket (64-core)
- Active Memory™ with hot-swap support: Memory ProteXion, Chipkill™ memory mirroring, and hot-swap and hot-add memory, for high performance with 256 MB XceL4v cache per chassis
- Up to 32 DIMM slots per chassis delivering up to 256 GB of high-speed PC2-5300 double data rate (DDR2) memory per chassis; expandable to 1 TB in a 16-socket (64-core) complex
- Serial Attach SCSI (SAS) plus RAID to maximize throughput and ease installation of a RAID card
- Four 2.5-inch SAS HDDs, up to 584 GB of maximum internal storage
- High-performance integrated dual Gigabit Ethernet built-in, high-speed networking with support for latest technologies
- Integrated Remote Supervisor Adapter II Slimline
- 4U rack-optimized, tool-free chassis that strikes the balance between rack density and ease of maintenance
- Rear access power supplies for easy access

Fourth-generation EXA features

- Advanced fourth-generation Chipkill ECC memory controller to help correct single-, two-, three-, and four-bit memory errors
- Memory ProteXion and memory mirroring support
- Active PCIE x8 I/O slots, as well as hot-add and hot-swap adapters
- Hot-swap drive bays and redundant fans to replace select components without powering down the server
- Two hot-swap, rear access, redundant power supplies
- Predictive Failure Analysis® (PFA) on processors, memory, fans, power supply, and HDD options to help warn of problems before they occur
- Innovative light path diagnostics and top access design; easy to service and configure

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

[2] IBM sends a technician after attempting to diagnose and resolve the problem remotely.

[3] For information on the IBM Statement of Limited Warranty, contact your IBM representative or reseller. Copies are available upon request.

[4] IBM makes no warranties, expressed or implied, regarding non-IBM products and services that are ServerProven®, including but not implied warranties and of merchantability and fitness for a particular purpose. These products are offered and warranted solely by third parties.

Key prerequisites

Refer to the Hardware requirements section for details.

Planned availability date

October 10, 2008

Description

Related options

Intel Xeon Processor E7420 - 2.13 GHz 6 MB L2 Cache 1066 MHz Intel Four Core Processor Upgrade (44E4469) supports internal processing speeds of 2.13 GHz and external processing operations to memory at 1066 MHz. It contains an integrated, full-speed, 6 MB level 2 cache and 8 MB of L3 cache.

Intel Xeon Processor E7430 - 2.13 GHz 6 MB L2 Cache 1066 MHz Intel Four Core Processor Upgrade (44E4470) supports internal processing speeds of 2.13 GHz and external processing operations to memory at 1066 MHz. It contains an integrated, full-speed, 6 MB level 2 cache and 12 MB of L3 cache.

Intel Xeon Processor L7445 - 2.13 GHz 6 MB L2 Cache 1066 MHz Intel Four Core Processor Upgrade (44E4517) supports internal processing speeds of 2.13 GHz and external processing operations to memory at 1066 MHz. It contains an integrated, full-speed, 6 MB level 2 cache and 12 MB of L3 cache.

Intel Xeon Processor L7455 - 2.13 GHz 6 MB L2 Cache 1066 MHz Intel Six Core Processor Upgrade (44E4468) supports internal processing speeds of 2.13 GHz and external processing operations to memory at 1066 MHz. It contains an integrated, full-speed, 9 MB level 2 cache and 12 MB of L3 cache.

Intel Xeon Processor E7450 - 2.40 GHz 9 MB L2 Cache 1066 MHz Intel Six Core Processor Upgrade (44E4472) supports internal processing speeds of 2.40 GHz and external processing operations to memory at 1066 MHz. It contains an integrated, full-speed, 9 MB level 2 cache and 12 MB of L3 cache.

Intel Xeon Processor E7440 - 2.40 GHz 6 MB L2 Cache 1066 MHz Intel Quad Core Processor Upgrade (44E4471) supports internal processing speeds of 2.40 GHz and external processing operations to memory at 1066 MHz. It contains an integrated, full-speed, 6 MB level 2 cache and 16 MB of L3 cache.

Intel Xeon Processor x7460 - 2.66 GHz 9 MB L2 Cache 1066 MHz Intel Six Core Processor Upgrade (44E4473) supports internal processing speeds of 2.66 GHz and external processing operations to memory at 1066 MHz. It contains an integrated, full-speed, 9 MB level 2 cache and 16 MB of L3 cache.

These processor options support up to 16-socket (96-core) SMP applications in the x3950 M2. A VRM and heatsink, specifically designed to support this, are included.

2 GB (2x1GB Kit) PC2-5300 CL5 ECC DDR2 SDRAM RDIMM (41Y2762)

4 GB (2x2GB Kit) PC2-5300 CL5 ECC DDR2 SDRAM RDIMM (41Y2771)

8 GB (2x4GB Kit) PC2-5300 CL5 ECC DDR2 SDRAM RDIMM (41Y2768)

16 GB (2x8GB Kit) PC2-5300 CL5 ECC DDR2 SDRAM RDIMM (43V7356) (***)

(***) These will be supported in the fourth quarter of 2008

For information on support, visit

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

These high-speed, DDR2 registered DIMMs are synchronized to the processor. Once addressed, data can be transferred on both edges of the clock signal. This significantly improves performance of the 1066 MHz front-side bus Xeon MP processor.

Memory Expansion Card (44E4252) allows you to upgrade your machine with up to four memory expansion cards. System memory can be expanded to 256 GB.

Scalability options

- ScaleXpander Option Kit (2-3 Node) - (44E4249)
  - Scalability Cable 3.08m
  - Entry Cable Management Arm
  - ScaleXpander chip

IBM Director CD with 20 agent license proofs of entitlement includes support for the IBM System x3950 M2 server.

IBM System x3950

M2 server description

High-performance server subsystems

x3950 M2 servers are high-throughput, scalable SMP-capable quad-core and six-core Xeon-based network servers. They deliver excellent scalability for adding memory, adapter cards, or multiple processors.

Models are powered with four- and six-core Intel Xeon MP processors at up to 2.66 GHz with 9 MB of L2 cache and 16 MB L3 cache that uses 64-byte cache lines. EMT64T architecture supports 64-bit extensions. Four connectors for Xeon MP processors are standard on the system board. High-speed PC2-5300 ECC SDRAM provides excellent processor-to-memory subsystem performance.

The x3950 M2 system architecture is fine tuned and engineered to optimize the powerful Xeon MP processors. This architecture consists of the following components:

- Four-core and six-core Xeon MP processors
- Fourth-generation EXA-64e chipset
- System memory cards
- PCI-E host-bridge controllers

These Xeon MP processors use 1066 MHz common clock speed for external operations. The chipset supports eight 533 MHz buses to the memory controller, for a total of 34.1 GB/s of memory bandwidth.

The memory I/O controller (MIOC) supports:

- Data flow between the processor and memory, and to the PCIE host-bridge controller
- Chipkill ECC memory function

The two PCIE host-bridge controllers reside between the PCI buses and memory controller.

High-availability and serviceability features

Many enterprise on demand environments run around the clock to supply information around the globe. These environments require ruggedly dependable servers designed with features that can tolerate a component failure without total shutdown. x3950 M2 servers pack numerous fault-tolerant and high-availability features into a high-density, rack-optimized package that helps significantly reduce the space needed to support massive network computing operations.

Features include:

- Seven 2.5 Gb PCIE x8 I/O slots (two are hot-plug); hot-add and hot-swap adapters in Microsoft Windows and Linux® environments
- Four Serial Attach SCSI (SAS) HDD bays
- ECC DIMMs combined with an integrated advanced ECC memory controller with fourth-generation Chipkill support to correct many single-, two-, three-, and four-bit memory errors to minimize disruption of service to LAN clients
- Memory ProteXion and memory mirroring hot-add and hot-swap memory support
- Memory hardware scrubbing to correct many soft memory errors automatically without software intervention downtime
- PFA on HDD options, memory, processors, power supply, and fans, in conjunction with IBM Director, to help alert the system administrator of an imminent component failure
- Two 1440-watt power supplies that support typical configuration redundancy or full configurations requiring redundancy
- Six hot-swap, multispeed fans to provide cooling redundancy and enable individual fan replacement without powering down the server, plus one fan in each of the two hot-swap power supplies
- Standard Remote Supervisor Adapter II Slimline enabling diagnostic, reset, POST, and auto recovery functions from remote locations and monitoring of temperature, voltage, and fan speed; alerts generated when thresholds are exceeded without utilizing an I/O slot
- Information LED panel, diagnostics LED panel, and component LEDs for visual indications of system well-being
- Light path diagnostics for an outside view of the potential problem without removing the cover to reduce downtime and service costs
- Easy top access to system board, adapter cards, and memory
- CPU failure recovery in SMP configurations, allowing a failed processor to be forced offline, the server rebooted, an alert generated, and operation continued with the working processor

XpandOnDemand scalability

The x3950 M2 servers are designed for complex applications. They feature XpandOnDemand scalability from fourth-generation Enterprise X-Architecture technology for future growth potential.

The servers include:

- Massive I/O expansion options supporting up to 28 PCIE x8 I/O card slots with a 4-chassis configuration
- Up to 16-socket (64-core) SMP operations with powerful Xeon MP processors
- 4 GB or 8 GB high-speed PC2-5300 DDR2 ECC memory standard, supporting up to 512 GB of system memory per chassis and up to 1 TB in a 4-chassis configuration
- Two worldwide, voltage-sensing 1440-watt, hot-swap power supplies with auto restart, standard
- Four hot-swap drive bays, supporting up to 584 GB of internal data storage (using four 146 GB SAS Hot-Swap HDDs)
- Terabytes of external data storage supporting optional storage units, ServeRAID™ SCSI controllers, and Fibre Channel controllers and storage units

Configurations

XpandOnDemand scalability

- Modular building-block scalability delivers the flexibility to optimize your system for your business and application needs.

Scalable Partition Web Interface

The Scalable Partition Web Interface, an extension of the Remote Supervisor Adapter II (RSA II) Slimline Web interface, is used to create, delete, control, and view scalable partitions. This Web interface is in the RSA II Slimline service processor.

The scalable partition defines a multinode configuration that interconnects two, three, or four servers for up to 16-way operation. With this configuration you can individually power on and power off each node. The multinode configuration uses a single, contiguous memory space, and provides access to all associated adapters. Each multinode configuration can have one or more scalable partitions.

Systems management

x3950 M2 servers feature IBM Director, a powerful, highly integrated, systems-management software solution built on industry standards and designed for ease of use.

With IBM Director, a network administrator can perform the following tasks:

- View the hardware configuration of remote systems in detail
- Monitor the usage and performance of critical components such as microprocessors, disks, and memory
- Centrally manage individual or large groups of IBM and non-IBM Intel-based servers, desktop computers, workstations, and mobile computers on a variety of platforms

IBM Director provides a comprehensive entry-level workgroup hardware manager. It includes the following key features:

- Advanced self-management capabilities for maximum system availability.
- Support for multiple operating systems, including Microsoft Windows 2003 Server, Windows XP Professional, Red Hat Linux, SUSE Linux, and Novell NetWare. For a complete list of operating systems that support IBM Director, visit

  http://publib.boulder.ibm.com/infocenter/eserver/v1r2/index.jsp?topic=/di ricinfo_5.20/fqm0_r_supported_operating_systems.html

  The list is updated periodically.
- Support for IBM and non-IBM servers, desktop computers, workstations, and mobile computers.
- Support for systems-management industry standards.
- Integration into leading workgroup and enterprise systems-management environments.
- Ease of use, training, and setup.

IBM Director also provides an extensible platform that supports advanced server tools that are designed to help reduce the total cost of managing and supporting networked systems. By deploying IBM Director, you may achieve reductions in ownership costs through the following potential benefits:

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

For more information about IBM Director, refer to the CD that comes with the server or the IBM Director documentation on the CD, or visit

  http://www.ibm.com/systems/management/director/resources/

IBM Director includes IBM Director Extensions, a portfolio of server tools that integrates into the IBM Director interface and works with the Remote Supervisor Adapter II Slimline or other systems-management monitoring functions contained in IBM System x3950 M2 servers. Typical functions and monitoring capabilities can include:

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

The IT administrator gains comprehensive, virtual on-site control of IBM System x3950 M2 servers through the ability to remotely:

- Access the server, in many cases 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
- 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
  - Power supplies
  - HDDs
- Define automated actions such as:
  - Send an e-mail or a page to an administrator
  - Execute a command or program
  - Pop up an error message to the IBM Director console
- Flash BIOS
- Monitor and graph the utilization of server resources such as:
  - Memory
  - Processor
  - HDDs
- Identify potential performance bottlenecks and react to prevent downtime
- Monitor, manage, and configure RAID subsystems without taking them offline

IBM Director Agent provides integration into leading workgroup and enterprise system management environments, via Upward Integration Modules. This enables the advanced management capabilities built into IBM System x3950 M2 servers to be accessed from:

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

- BMC Patrol
- NetIQ

Active Energy Manager tools and programs

The IBM Active Energy Manager tool is available on the System x3950 M2 server and allows direct power monitoring through IBM Director. This tool helps you monitor power consumption to allow better utilization of available power resources.

For more information see

   http://www-03.ibm.com/servers/eserver/xseries/systems_management/ibm_dire ctor/extensions/powerexec.html

World-class support tools and programs

x3950 M2 servers include tools and programs designed to make ownership a positive experience. From the start, IBM programs help you purchase servers, get them running, and keep them running. IBM can help your company maintain ownership of technology leadership network servers.

- IBM customer replaceable unit (CRU) and on-site service (optional warranty service upgrades available) protects your investment if a problem occurs. This service also includes replacement of parts identified through PFA.
- The ServerProven(4) 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 x3950 M2 server with various adapters and devices.
- The ServerGuide(5) CD library includes online publications and utilities and drivers that help you load popular network operating systems.
- Electronic support on the Web offers additional support in an easy-to-use format.

(5) IBM makes no warranties, expressed or implied, regarding non-IBM products and services that are ServerProven, including but not limited to implied warranties of merchantability and fitness for a particular purpose. These products are offered and warranted solely by third parties.

Standard x3950 M2 Configurations

```
System SEO  Processor   L2    L3     Memory   HDD   HDD       Power
number                  cache                 iface           supply

7233-2SG  2 x 2.13 GHz  6 MB   8 MB  4x1 GB   SAS  open bay   two
          Xeon E7420                  w/2 memory cards
          4 core
7233-5SG  2 x 2.4 GHz   9 MB  12 MB  8x1 GB   SAS  open bay   two
          Xeon E7450                  w/4 memory cards
          6 core
7233-6SG  2 x 2.66 GHz  9 MB  16 MB  8x1 GB   SAS  open bay   two
          Xeon x7460                  w/4 memory cards
          6 core
7233-7SG  2 x 2.13 GHz  6 MB  12 MB  4x1 GB   SAS  open bay   two
          Xeon L7445                  w/2 memory cards
          4 core
```

Product positioning

These new IBM System x3950 M2 models enhance the server line by providing new levels of performance and price/performance. The IBM System x3950 M2 server features a high-density, 4U mechanical platform that supports quad-core and six-core Xeon MP processors, PCI-E architecture, and high-speed DDR2 memory.

IBM System x3950 M2 servers deliver additional processing, expandability, and high-availability features over those of the IBM System x3950 server. These features make them ideal for

handling complex, business-critical On Demand Business applications that must be supported by space-saving, rack-optimized servers.

The IBM System x3950 M2 server is designed for extremely complex, compute-intense applications requiring six-socket plus processing power and large memory support.

The IBM System x3950 M2 servers provide excellent scalable processing capability supporting high-speed memory, PCI-E bus architecture, and quad- and six-core Intel Xeon MP processors at up to 2.66 GHz with 9 MB of L2 cache and 16 MB L3 cache.

This makes the IBM System x3950 M2 servers an excellent fit for current and future enterprise on demand applications.

These high-density, Xeon-based servers are designed to handle complex applications requiring high-speed computing power, advanced high-availability functions, and a minimum amount of rack space.

Applications include:

- On Demand Business
- Business intelligence
- Transaction processing
- Enterprise resource planning
- Collaboration applications (Microsoft Exchange and Lotus Notes®)
- Server consolidation
- Internet or intranet front-end serving
- Web content serving
- Database storage as a SAN solution

Reference information

For information on ServicePacs, refer to Hardware Announcement ZG06-0848, dated November 07, 2006.

Product number

```
Description            Machine   Models            NumberIBM System x3950 M2
                       7233      2SG               72332SG
                       7233      5SG               72335SG
                       7233      6SG               72336SG
                       7233      7SG               72337SG
```

REMEMBER a line cord has to be ordered separately for each model. These options can be ordered with the systems.

```
                                          Order
Description                               number    EAN number

IBM Enhanced Performance Keyboard -
USB Arabic                                40K9585   50-50689-87941-6
IBM Enhanced Performance Keyboard -
USB Arabic / French                       42C0101   50-50689-87942-3
IBM Enhanced Performance Keyboard -
USB Belgium / French                      42C0102   50-50689-87936-2
IBM Enhanced Performance Keyboard -
USB Belgium / UK                          42C0103   50-50689-87937-9
IBM Enhanced Performance Keyboard -
USB Bulgarian                             42C0105   50-50689-87939-3
IBM Enhanced Performance Keyboard -
USB Czech                                 42C0107   50-50689-87944-7
IBM Enhanced Performance Keyboard -
```

```
USB Danish                                42C0109  50-50689-87946-1
IBM Enhanced Performance Keyboard -
USB Dutch                                 42C0110  50-50689-87947-8
IBM Enhanced Performance Keyboard -
USB French                                42C0111  50-50689-87948-5
IBM Enhanced Performance Keyboard -
USB German                                42C0114  50-50689-87951-5
IBM Enhanced Performance Keyboard -
USB Greek                                 42C0115  50-50689-87952-2
IBM Enhanced Performance Keyboard -
USB Hebrew                                42C0116  50-50689-87953-9
IBM Enhanced Performance Keyboard -
USB Hungarian                             42C0117  50-50689-87954-6
IBM Enhanced Performance Keyboard -
USB Iceland                               42C0118  50-50689-87955-3
IBM Enhanced Performance Keyboard -
USB Italy                                 42C0119  50-50689-87956-0
IBM Enhanced Performance Keyboard -
USB Norway                                42C0123  50-50689-87960-7
IBM Enhanced Performance Keyboard -
USB Poland                                42C0124  50-50689-87961-4
IBM Enhanced Performance Keyboard -
USB Portugal                              42C0125  50-50689-87962-1
IBM Enhanced Performance Keyboard -
USB Romania                               42C0126  50-50689-87963-8
IBM Enhanced Performance Keyboard -
USB Russian / Cyrillic                    42C0128  50-50689-87965-2
IBM Enhanced Performance Keyboard -
USB Serbian / Cyrillic                    42C0129  50-50689-87966-9
IBM Enhanced Performance Keyboard -
USB Slovak                                42C0130  50-50689-87967-6
IBM Enhanced Performance Keyboard -
USB Swedish / Finnish                     42C0131  50-50689-87968-3
IBM Enhanced Performance Keyboard -
USB Swiss F/G                             42C0132  50-50689-87969-0
IBM Enhanced Performance Keyboard -
USB UK English                            42C0133  50-50689-87970-6
IBM Enhanced Performance Keyboard -
USB US Euro                               42C0137  50-50689-87974-4
IBM Enhanced Performance Keyboard -
USB Turkish 440                           42C0138  50-50689-87975-1
IBM Enhanced Performance Keyboard -
USB Turkish 179                           42C0139  50-50689-87976-8

Power Cords

European 10A C13 to CEE 7/7 2.8M Power Cord
Option                                    39Y7917  50-50689-85276-1
Denmark 10A C13 to DK2-5A 2.8M Power Cord
Option                                    39Y7918  50-50689-85277-8
Switzerland 10A C13 to SEV 1011 2.8M
Power Cord Option                         39Y7919  50-50689-85280-8
Israel 10A C13 to SI 32 2.8M Power Cord
Option                                    39Y7920  50-50689-85282-2
Italy 10A C13 to CEE 7/7 2.8M Power Cord
Option                                    39Y7921  50-50689-85281-5
South Africa 10A C13 to SABS 164/1 2.8M Power
Cord Option                               39Y7922  50-50689-85278-5
United Kingdom 10A C13 to BS 1363 2.8M Power
Cord Option                               39Y7923  50-50689-85279-2
Universal Jumper Cord - 1.5 m             39Y7937  50-50689-85287-7
IEC C13 to C20 2.5M Power Jumper Cord
Option                                    39Y7938  50-50689-85290-7
```

Additional information

Memory ProteXion -- Redundant bit steering

- Utilizes unused bits in each memory DIMM (hot-spare bits)

- Doubles the amount of Chipkill memory sustainable per server

- Included at no additional cost, requires no additional hardware, and works independently of
  operating system

- Similar to the "hot-spare" of a DASD array

Memory mirroring

- Propels Intel-based servers towards continuous operations
- Dramatically helps to increase uptime and allows scheduled maintenance
- Provides capability and reliability approaching a mainframe
- Operating system independent; does not require drivers or operating system support

Chipkill memory

- Integrated XA-64e chipsets for using off-the-shelf DIMMs
- Better memory reliability to support in-memory databases
- Increased availability by detecting and helping to many correct single-, two-, three-, and four-bit memory errors
- Fourth-generation Chipkill design

Publications

The following publications and CD-ROMs are shipped with the x3950 M2 servers.

- *x3950 M2 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 illustrations to enable you to quickly set up your x3950 M2 server.
- *ServerGuide* contains online publications and drivers to support the x3950 M2 server. In addition, it includes a set of easy-to-use utilities on CD to help you install 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.

The following publications are available immediately.

To order, contact your IBM representative.

The *x3950 M2 Installation Guide* and the *Problem Determination Guide*, in U.S. English versions, are available from:

http://www.ibm.com/support

IBM Publications Center Portal

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

The Publications Center is a worldwide central repository for IBM product publications and marketing material with a catalog of 70,000 items. Extensive search facilities are provided, as well as payment options via credit card. A large number of publications are available online in various file formats, which can currently be downloaded free of charge.

The *x3950 M2 Installation Guide* is available immediately.

Services

Global Technology Services

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

These services help you learn about, plan, install, manage, or optimize your IT infrastructure to be an On Demand Business. They can help you integrate your high-speed networks, storage systems, application servers, wireless protocols, and an array of platforms, middleware, and

communications software for IBM and many non-IBM offerings. IBM is your one-stop shop for IT support needs.

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

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

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

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

For details on education offerings related to specific products, visit

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

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

Technical information

Specified operating environment

Physical specifications

x3950 M2

EMEA x=G

```
                                  72332Sx

    Processor                 Xeon E7420
     Quad-core
     Internal speed           2.13 GHz
     External speed           1066 MHz
     Number standard          2
     Maximum                  4
    L2 cache total            6 MB
    L3 cache total            8 MB
    Memory (PC2-5300 DDR2)    4 GB ECC
     DIMMs                    4 x 1 GB
     DIMM sockets standard    16
     DIMM sockets maximum     32

     Capacity                 256 GB 6
    Memory Expansion Card
     Number standard          2
     Maximum                  4
    Video                     SVGA
     Memory                   16 MB
    SAS SCSI controller       3.0 GHz
     Ports                    8
     Connector internal       4
     Connector external       1
    HDD standard              0
    Bays available            4
     5.25-inch slim           0
     3.5-inch slim            0
     Hot-swap                 4

     Internal capacity        584 GB 7
    PCIE x8 slots             7
     Hot-swap                 2
    Management processor
     BMC                      Standard
     RSA-II                   Standard
     RAID 0/1                 Standard
     ServeRAID-MR10k          Optional
    Dual Ethernet             10/100/1000 Mbps
     controller
```

```
CD-RW / DVD-ROM drive       Standard
CD-RW / DVD-RW drive        Optional
Power supply                1440 W
 Number standard            2
 Maximum                    2
 Hot-swap                   Yes
 Redundant power            Standard
 Auto restart               Yes


                             72335Sx


Processor                   Xeon E7450
 Six-core
 Internal speed             2.40 GHz
 External speed             1066 MHz
 Number standard            2
 Maximum                    4
L2 cache total              9 MB
L3 cache total              12 MB
Memory (PC2-5300 DDR2)      8 GB ECC
 DIMMs                      8 x 1 GB
 DIMM sockets standard      32
 DIMM sockets maximum       32
 Capacity                   256 GB $^6$
Memory Expansion Card
 Number standard            4
 Maximum                    4
Video                       SVGA
 Memory                     16 MB
SAS SCSI controller         3.0 GHz
 Ports                      8
 Connector internal         4
 Connector external         1
HDD standard                0
Bays available              4
 5.25-inch slim             0
 3.5-inch slim              0
 Hot-swap                   4
 Internal capacity          584 GB $^7$
PCIE x8 slots               7
 Hot-swap                   2
Management processor
 BMC                        Standard
 RSA-II                     Standard
 RAID 0/1                   Standard
 ServeRAID-MR10k            Optional
Dual Ethernet               10/100/1000 Mbps
 controller
CD-RW / DVD-ROM drive       Standard
CD-RW / DVD-RW drive        Optional
Power supply                1440 W
 Number standard            2
 Maximum                    2
 Hot-swap                   Yes
 Redundant power            Standard
 Auto restart               Yes


                             72336Sx


Processor                   Xeon x7460
 Six-core
 Internal speed             2.66 GHz
 External speed             1066 MHz
 Number standard            2
 Maximum                    4
L2 cache total              9 MB
L3 cache total              16 MB
Memory (PC2-5300 DDR2)      8 GB ECC
 DIMMs                      8 x 1 GB
 DIMM sockets standard      32
 DIMM sockets maximum       32
 Capacity                   256 GB $^6$
```

```
Memory Expansion Card
 Number standard          4
 Maximum                  4
Video                     SVGA
 Memory                   16 MB
SAS SCSI controller       3.0 GHz
 Ports                    8
 Connector internal       4
 Connector external       1
HDD standard              0
Bays available            4
 5.25-inch slim           0
 3.5-inch slim            0
 Hot-swap                 4

 Internal capacity        584 GB 7
PCIE x8 slots             7
 Hot-swap                 2
Management processor
 BMC                      Standard
 RSA-II                   Standard
 RAID 0/1                 Standard
 ServeRAID-MR10k          Optional
Dual Ethernet             10/100/1000 Mbps
 controller
CD-RW / DVD-ROM drive     Standard
CD-RW / DVD-RW drive      Optional
Power supply              1440 W
 Number standard          2
 Maximum                  2
 Hot-swap                 Yes
 Redundant power          Standard
 Auto restart             Yes


                          72337Sx


Processor                 Xeon L7445
 Quad-core
 Internal speed           2.13 GHz
 External speed           1066 MHz
 Number standard          2
 Maximum                  4
L2 cache total            6 MB
L3 cache total            12 MB
Memory (PC2-5300 DDR2)    4 GB ECC
 DIMMs                    4 x 1 GB
 DIMM sockets standard    32
 DIMM sockets maximum     32

 Capacity                 256 GB 6
Memory Expansion Card
 Number standard          2
 Maximum                  4
Video                     SVGA
 Memory                   16 MB
SAS SCSI controller       3.0 GHz
 Ports                    8
 Connector internal       4
 Connector external       1
HDD standard              0
Bays available            4
 5.25-inch slim           0
 3.5-inch slim            0
 Hot-swap                 4

 Internal capacity        584 GB 7
PCIE x8 slots             7
 Hot-swap                 2
Management processor
 BMC                      Standard
 RSA-II                   Standard
 RAID 0/1                 Standard
 ServeRAID-MR10k          Optional
Dual Ethernet             10/100/1000 Mbps
 controller
```

```
CD-RW / DVD-ROM drive      Standard
CD-RW / DVD-RW drive       Optional
Power supply               1440 W
 Number standard           2
 Maximum                   2
 Hot-swap                  Yes
 Redundant power           Standard
 Auto restart              Yes
```

[6] Capacities are based on installation of the four memory expansion cards (44E4252) and 4 x 8 GB DIMMs installed in each card.

[7] Capacities are based on installation of four 73.4 GB 2.5-inch SAS HDDs. For the latest information on supported HDD options, visit

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

Supported video mode capabilities for the SVGA PCI controller:

```
Microsoft Windows 2000 and Windows 2003

                             Refresh
  Resolution      Colors     rate (Hz)

  640 x 480 x 8   256        60, 72, 75, 85
  640 x 480 x 16  64K        60, 72, 75, 85
  640 x 480 x 32  16 million 60, 72, 75, 85
  800 x 600 x 8   256        60, 72, 75, 85
  800 x 600 x 16  64K        60, 72, 75, 85
  800 x 600 x 32  16 million 60, 72, 75, 85
 1024 x 768 x 8   256        60, 70, 75, 85
 1024 x 768 x 16  64K        60, 70, 75, 85
 1024 x 768 x 32  16 million 60, 70, 75, 85
```

Dimensions

4U rack drawer

- Width: 443.6 mm (17.46 in)
- Depth: 720.2 mm (28.35 in)
- Height: 172.8 mm (6.80 in)

- Minimum configuration: 31.75 kg (70 lb)
- Maximum configuration: 43.2 kg (95 lb)

Electrical

- 100 to 127 (nominal) V ac; 50 Hz or 60 Hz; System 17.2A (8.6A/PS)
- 200 to 240 (nominal) V ac; 50 Hz or 60 Hz; System 8A
- Input kilovolt-amperes (kVA) (approximately):
  - Minimum configuration: 0.30 kVA (two power supplies)
  - Typical configuration: 0.82 kVA (two power supplies)
  - Maximum configuration: 1.65 kVA (two power supplies)
- Btu output:
  - Ship configuration: 990 Btu/hr (290 watts)
  - Typical configuration: 2,730 Btu/hr (800 watts)
  - Full configuration: 5,527 Btu/hr (1620 watts)
- Noise level horizontal position: 6.6 bels

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.

Physical specifications

```
Approximate shipping dimensions and weight:
  - Single Pack Dimensions   L 1000 mm (39.5 in) x W 597 mm
                               (23.5 in) x H 302 mm (11.9 in)
  - Single Pack Weight       43 - 52 kg (95 - 115 lb)
  - Quantity per Pallet      8
  - Pallet Load Dimensions   1219 mm (48 in) x 1016 mm (40 in)
                               x 1346 mm (53in)
  - Pallet Load Weight       367 - 439 kg (808 - 968 lb)
  - Estimated Safe Stacking  4 high
```

Standards

These systems support or comply with the following standards:

- Multiprocessor Specification (MPS) 1.4
- Hardware-enabled to meet ISO 9241, Part 3

In addition to the above standards, they are compatible with the PCI-E specification.

Equipment approvals and safety

- CE Mark (EN55022 Class A, EN60950, and EN55024)
- CISPR 22, Class A
- TUV-GS (EN60950-1:2001, 1st edition)
- FCC - Verified to comply with Part 15 of the FCC Rules (Class A) prior to product delivery
- IEC-60950-1, 1st edition (CB Certificate and CB Test Report)

Operating environment

- Temperature:
  - 10.0 to 35.0 degrees C (50 to 95 degrees F) at 0 to 914 m (0 to 3,000 ft)
  - 10.0 to 32.0 degrees C (50 to 90 degrees 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
- 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
- Display

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

Programming requirements

The following network operating systems have been tested for compatibility with the x3950 M2 server:

Network operating systems

- Microsoft
  - Windows Server 2003 R2 (64-bit)
  - Windows Server 2003 R2 (32-bit)
  - Windows Server 2008 (64-bit)
- Linux
  - Red Hat EL 5 Server for 32-bit
  - Red Hat EL 5 Server for 32-bit (with Xen)
  - Red Hat EL 5 Server for 64-bit
  - Red Hat EL 5 Server for 64-bit (with Xen)
  - Red Hat EL 4 AS, ES for 64-bit
  - SUSE Linux ES 10 for 32-bit
  - SUSE Linux ES 10 for 64-bit
  - SUSE Linux ES 10 for 64-bit (with Xen)
  - SUSE Linux ES 9 for 64-bit

Note: For information on additional support, certification, and versions of network operating systems, visit:

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

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

Compatibility

The IBM System x3950 M2 server contains licensed system programs that include set configuration, set features, and test programs. IBM 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 IBM System x3950 M2 server 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 IBM System x3950 M2 servers, visit

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

Contact your IBM representative, IBM Business Partner, or refer to the IBM Sales Manual for information on the compatibility of hardware and software for IBM System x3950 M2 servers. The Sales Manual is updated periodically as new features and options are announced that support these servers.

Limitations

Memory

The x3950 M2 servers are shipped with up to 8 GB (8 x 1 GB) of memory. A maximum of up to 256 GB of system memory is supported by adding a 8 GB PC2-5300 CL5 ECC DDR2 SDRAM RDIMM in each of the eight DIMM sockets. This capacity is based on installation of the four memory expansion cards (44E4252) and 4 x 8 GB DIMMs installed in each card. All supported system memory is addressable through direct memory access (DMA). This server supports 1 GB, 2 GB, 4 GB and 8 GB 1.8 V, 240-pin, PC2-5300 ECC DDR-2 SDRAM RDIMMs. Supported DIMMs can coexist in the same server; however, memory DIMMs of the same capacity must be installed in matched pairs. Refer to the Planning information section or the IBM System x3950 M2 server Web page memory options.

The x3950 M2 has RAID 0 and 1 standard. The optional ServeRAID-MR10k SAS/SATA Controller provides additional RAID levels.

ServerGuide

Use the version of *ServerGuide* that is shipped with the system, or a later version, to load software and drivers. Earlier versions of *ServerGuide* may not be compatible with the server.

For the two-socket, and four-socket configurations, *ServerGuide* can help you:

- Set up and configure the system
- Set up and configure any ServeRAID adapters as well as the onboard SAS chipset
- Perform an unattended install of Windows 2003 with SP2 integrated CD (32-bit only)

For the 16-socket configurations, the ServerGuide can help you:

- Set up and configure the system
- Set up and configure any ServeRAID adapters as well as the onboard SAS chipset

The *ServerGuide* cannot help you perform unattended Windows installations (32-bit).

5709 native support limitations

5709 support will not be native to RHEL5.0 and that network installs would be impacted until RHEL5.1 when native 5709 would be included in the bnx2 driver, that are shipping at the launch of the product. The software updates necessary will be released by the appropriate networking operating system.

Hot-swap limitations

- Active-PCI-E currently is not supported by Linux versions that are shipping at the launch of the product. The software updates necessary will be released by the appropriate networking operating system.
- PCI hot-plug support is limited in SLES9.
- For Linux, multifunction adapters (those that use PCI bridges) are currently not supported.

Refer to the Programming requirementssection for operating system limitations.

Planning information

Customer responsibilities

x3950 M2 Server and Related Options

The x3950 M2 server is designated as customer setup. Customer setup instructions are shipped with systems.

Configuration information:

Bay configuration

The x3950 M2 server contains five customer-accessible drive bays on the front of the server. The top right bay is for the slim combo drive. Four unpopulated 2.5-inch, slim-high, hot-swap drive bays are located beneath this bay.

The UltraSlim Enhanced SATA CD-RW / DVD-ROM Combo drive is cabled directly to the SATA port. The four hot-swap bays are connected to the integrated SAS SCSI controller through an integrated circuit.

Internal SCSI cabling

The x3950 M2 server contains a DASD backplane supporting four hot-swap, SCA-2-compliant drive bays. The x3950 M2 has RAID 0 and 1 standard. The optional ServeRAID-MR10k SAS/SATA Controller provides additional RAID levels.

Processor upgrades

The following processor upgrade option is supported:

- Intel Xeon Processor E7420 - 2.13 GHz 6 MB L2 Cache 1066 MHz Intel Four Core Processor Upgrade (44E4469) supports internal processing speeds of 2.13 GHz and external processing operations to memory at 1066 MHz. It contains an integrated, full-speed, 6 MB level 2 cache and 8 MB of L3 cache.
- Intel Xeon Processor E7430 - 2.13 GHz 6 MB L2 Cache 1066 MHz Intel Four Core Processor Upgrade (44E4470) supports internal processing speeds of 2.13 GHz and external processing operations to memory at 1066 MHz. It contains an integrated, full-speed, 6 MB level 2 cache and 12 MB of L3 cache.
- Intel Xeon Processor L7445 - 2.13 GHz 6 MB L2 Cache 1066 MHz Intel Four Core Processor Upgrade (44E4517) supports internal processing speeds of 2.13 GHz and external processing operations to memory at 1066 MHz. It contains an integrated, full-speed, 6 MB level 2 cache and 12 MB of L3 cache.
- Intel Xeon Processor L7455 - 2.13 GHz 6 MB L2 Cache 1066 MHz Intel Six Core Processor Upgrade (44E4468) supports internal processing speeds of 2.13 GHz and external processing operations to memory at 1066 MHz. It contains an integrated, full-speed, 9 MB level 2 cache and 12 MB of L3 cache.
- Intel Xeon Processor E7450 - 2.40 GHz 9 MB L2 Cache 1066 MHz Intel Six Core Processor Upgrade (44E4472) supports internal processing speeds of 2.40 GHz and external processing operations to memory at 1066 MHz. It contains an integrated, full-speed, 9 MB level 2 cache and 12 MB of L3 cache.
- Intel Xeon Processor E7440 - 2.40 GHz 6 MB L2 Cache 1066 MHz Intel Quad Core Processor Upgrade (44E4471) supports internal processing speeds of 2.40 GHz and external processing operations to memory at 1066 MHz. It contains an integrated, full-speed, 6 MB level 2 cache and 16 MB of L3 cache.
- Intel Xeon Processor x7460 - 2.66 GHz 9 MB L2 Cache 1066 MHz Intel Six Core Processor Upgrade (44E4473) supports internal processing speeds of 2.66 GHz and external processing operations to memory at 1066 MHz. It contains an integrated, full-speed, 9 MB level 2 cache and 16 MB of L3 cache.

Memory support

The following memory options are supported:

- 2 GB (2x1GB Kit) PC2-5300 CL5 ECC DDR2 SDRAM RDIMM (41Y2762)
- 4 GB (2x2GB Kit) PC2-5300 CL5 ECC DDR2 SDRAM RDIMM (41Y2771)
- 8 GB (2x4GB Kit) PC2-5300 CL5 ECC DDR2 SDRAM RDIMM (41Y2768)
- 16 GB (2x8GB Kit) PC2-5300 CL5 ECC DDR2 SDRAM RDIMM (43V7356) (***)

(***) These will be supported in the 4th quarter of 2008

For information on support, visit

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

The 256 MB XceL4v cache, in multi-chassis configurations, uses system memory for this function. The total system memory as seen by the operating system is reduced by 256 MB per chassis for configurations of more than four sockets.

PCI-E adapter installations

The x3950 M2 server contains PCI-E architecture. Seven 2.5 Gb PCIE x8 I/O slots (two are hot-plug).

Rack installations

x3950 M2 4U, rack-drawer models are designed to be installed in a 19-inch rack cabinet designed for 26-inch deep devices, such as the NetBAY42 ER, NetBAY42 SR, NetBAY25 SR, or NetBAY11.

If using a non-IBM rack, the cabinet must meet the EIA-310-D standards with a depth of at least 71.1 cm (28 in). Also, adequate space (approximately 5 cm (2 in) for the front bezel and 2.5 cm (1 in) for air flow) must be maintained from the slide assembly to the front door of the rack cabinet to allow sufficient space for the door to close and provide adequate air flow.

Power considerations

These x3950 M2 models include two standard 1440-watt, hot-swap power supplies which have redundancy for all configurations when powered at 200 to 240 V ac.

Cable orders

The 10/100/1000 Mbps full-duplex, Dual Ethernet PCI-E Controller is standard with the x3950 M2 server. The RJ-45 connectors provide a 10BaseT or 100/1000Base-TX interface for connecting twisted-pair cable to the Ethernet network. Cabling is not included with the server. To connect the Ethernet controller to a repeater or switch, use a UTP cable with RJ-45 connectors at both ends. For 100/1000 Mbps operation, Category 5 cabling must be used. For 10 Mbps operation, Category 3, or better, cabling must be used.

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

Installability

The x3950 M2 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

```
                                                Number of
Product                 Shipment group          boxes

IBM System x3950 M2       System unit carton         1

                          Contents:

                          System unit
                          Rack components:
                            Rails
                            Cable management hardware

IBM System x3950 M2       Country kit carton         1

                          Contents:

        Two 9-foot 220 V intra-rack cables
        IBM System x3950 M2 Installation Guide
        Safety booklet
        SCSI cable
        Rack install template
        IBM Director
        ServerGuide
        CD-ROM Packages
        On/off switch cover
```

The x3950 M2 system is shipped as a single package. The country kit carton is contained inside the top portion of the system unit carton, while the rack components are contained in the system unit carton.

Related options

Processor upgrades

- Xeon MP processor
- VRM and heat sink
- Installation publications/warranty

Supplies

None

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.
- A 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.
- A selectable boot sequence can be used to prevent unauthorized installation of software or removal of data from the diskette drive.
- Winbond Trusted Platform Module V1.2, Trusted Computing Group (TCG) compliant.
  - Secure Boot

Limitations

The x3950 M2 server has no security intrusion detection; therefore, it should be installed in a rack environment that provides security through lockable doors or other security measures. It is a customer's responsibility to ensure that the server is secure to protect sensitive data.

The system supports integrity measurements. The TPM is TCG V1.2-compliant, and is ready for use with Software purchased from third-party TPM Ecosystem partners in compliance with the TPM V1.2 specification.

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

Global Technology Services

Contact your IBM representative for the list of selected services available in your country, either as standard or customized offerings, for the efficient installation, implementation, and/or integration of this product.

General product/system description

x3950 M2 servers are rack-optimized 4 U enterprise application network servers using industry-standard architectures. These models incorporate powerful Xeon MP processors. Additional standard features include standard ECC Chipkill system memory and the following integrated functions:

- Serial Attached SCSI (SAS) controller
- Seven 2.5Gb PCIE x8 I/O slots (2 are hot-plug)
- SVGA video controller with 16 MB of video memory
- Integrated Broadcom 5709 Dual-port 10/100/1000 Gigabit Ethernet

Standard storage device includes a Combo Drive.

Model Configuration:

```
System SEO  Processor    L2    L3    Memory    HDD    HDD       Power
number                   cache               iface            supply

7233-2SU  2 x 2.13 GHz  6 MB   8 MB   4x1 GB   SAS   open bay   two
          Xeon E7420                   w/2 memory cards
          4 core
7233-5SU  2 x 2.4 GHz   9 MB  12 MB   8x1 GB   SAS   open bay   two
          Xeon E7450                   w/4 memory cards
          6 core
7233-6SU  2 x 2.66 GHz  9 MB  16 MB   8x1 GB   SAS   open bay   two
```

```
        Xeon x7460              w/4 memory cards
          6 core
7233-7SU  2 x 2.13 GHz  6 MB  12 MB  4x1 GB  SAS  open bay  two
        Xeon L7445              w/2 memory cards
          4 core
```

- The x3950 M2 has scalable SMP capability by adding multiple processors of the same type, speed, and cache size.
- System memory can be expanded to 256 GB (configuration dependent) by adding a 8GB PC2-5300 CL5 ECC DDR2 SDRAM RDIMM in each of the 8 DIMM sockets. This capacity is based on installation of the four memory expansion cards (44E4252) and 4 x 8 GB DIMMs installed in each card.
- This model contains four unpopulated, hot-swap bays

Two 1440-watt, hot-swap power supplies with auto restart capability are standard.

- Seven 2.5Gb PCIE x8 I/O slots (2 are hot-plug)

The x3950 M2 standard features include:

- Two Xeon MP processors
- Two additional sockets for SMP Xeon MP processor upgrades
- Up to 8 GB of PC2-5300 ECC DDR2 SDRAM
- Chipkill ECC memory support on memory controller - corrects many single-, two-, three-, and four-bit memory errors
- An SVGA controller with 16 MB video memory
- Serial Attached SCSI (SAS) controller
- Integrated Broadcom 5709 Dual-port 10/100/1000 Gigabit Ethernet
- Time Of Day clock and battery
- Standard Device Ports/Connectors:
  - Keyboard
  - Pointing Device
  - SVGA port
  - 1 Serial port
  - Two 10/100/1000 Mbps Ethernet ports using RJ-45 connectors
  - Five USB ports
  - Remote System Management Adapter port; Ethernet

AP, LA, CAN, Europe considerations

NLS support is provided for many of the x3950 M2 components in the following languages: U.S. English, Worldwide English (U.K.), French, German, Italian, Spanish, and Japanese.

The NLS support includes national language keyboard support, multilingual nomenclature, and translated documentation as required by the individual countries.

Terms and conditions

IBM System x3950 M2

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

Warranty period

- Three years

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

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

- System battery
- RAID battery

Warranty service

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

The type of service is 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 or a Tier 2 CRU. Installation of a Tier 1 CRU is your responsibility. If IBM installs a Tier 1 CRU, at your request, you will be charged for the installation. You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service specified below, On-site Service.

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

The following have been designated as a Tier 1 CRU:

- Blank filler
- Cable-management arm
- Hard disk drive
- Hot-swap fan
- Hot-swap power supply
- Memory DIMM
- Memory expansion card
- Memory card guide
- Fan cage
- Bezel
- RAID controller
- ScaleXpander Key
- ScaleXpander Cable
- System Label
- Optical drive
- PCI adapter
- PCI divider

- Power cord
- Service label
- Service processor
- Top cover
- Voltage regulator module

On-site Service

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

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 ZS01-0168, 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.

IBM hourly service rate classification

Two

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.

Licensed machine code

IBM Machine Code is licensed for use by a customer on the IBM machine for which it was provided by IBM under the terms and conditions of the IBM License Agreement for Machine Code, to enable the machine to function in accordance with its specifications, and only for the

capacity authorized by IBM and acquired by the customer. You can obtain the agreement by contacting your IBM representative or visiting

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

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.

Pricing

For all local charges, contact your IBM representative.

Announcement countries

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