IBM System x3650 M4 server model includes new Intel Xeon E5-2600 v2 multicore processors

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At a glance

Power , scalability, control, and serviceability for dynamic high performance computing applications:

- Ultrathin, high-availability, rack-optimized, 2U platform
- High-speed DDR-3 SDRAM Registered DIMMs standard; 24 DIMM slots that support up to 384 GB maximum memory with 16 GB optional DIMMs, or up to 768 GB of memory with LRDIMMs or HyperCloud DIMMs, with the ability to run one DIMM per channel at 1866 MHz with supported 1866 MHz RDIMMs
- Support for up to 16 hot-swap SAS/SATA 2.5-inch HDDs or SSDs or up to six hot-swap SAS/SATA 3.5-inch HDDs or up to thirty-two 1.8-inch SSDs, or eight hot-swap SAS/SATA 2.5-inch HDDs plus 16 1.8-inch SSDs
- Up to six PCI 1.8-inch SSDs on two processor model servers
- 550-watt ac, 750-watt ac, 900-watt ac, or 750-watt dc auto-ranging power supplies (optional redundant and hot-swap)
- Integrated systems management processor
- Integrated quad Gigabit Ethernet ports for high I/O capacity, plus two optional embedded 10 GbE ports
- One serial port (16550A-compatible), eight USB ports (two front, four back, two internal), and two video ports (front and rear)

Overview

This 2U-high, rack-optimized server features extreme frequency, optimized performance, and systems management for business-critical applications and cloud deployments built on IBM® X-Architecture® .

Optimized for performance

New, innovative, energy-smart design with powerful high-performance processors, a large capacity of high-performing DDR3 memory, and an impressive feature set ideal for business-critical applications and cloud deployments:

- Up to two 12-core powerful Intel Xeon™ E5-2600 v2 series processors
- Twenty-four DIMM (RDIMM/UDIMM/LRDIMM/HCDIMM) slots that enable you to deploy up to 384 GB of DDR3 SDRAM Registered DIMM memory, or up to 768 GB of memory with LRDIMMs or HyperCloud DIMMs, and fast memory bandwidth with the ability to run one DIMM per channel at 1866 MHz with supported 1866 MHz RDIMMs

  Note: The System x3650 M4 server will support 768 GB with 32 GB LR/ Hypercloud DIMM / 12 Gb RAID portfolio when and if they become available.
- Integrated IBM ServeRAID M5110e on the system board, 6 Gbps hardware RAID-0, RAID-1, RAID-10; optional RAID-5, RAID-50, or RAID-6, or RAID-60 (model dependent) and up to 4 GB Flashback cache
- Support for up to 16 hot-swap SAS/SATA 2.5-inch HDDs or SSDs or up to six hot-swap SAS/SATA 3.5-inch HDDs or up to thirty-two 1.8-inch SSDs, or eight hot-swap SAS/SATA 2.5-inch HDDs plus 16 1.8-inch SSDs
- Highly functional chipset optimized for better application computing for general business workloads
- Integrated quad Gigabit Ethernet ports for high I/O capacity, plus two optional embedded 10 GbE ports
- Up to six PCIe 3.0 I/O slots with optional PCI-X and double width PCIe adapters support, helping to provide flexibility and greater performance with long-term investment protection
- Optional Broadcom 10GbaseT PCIe adapter which enables low-cost migration to 10Gb Ethernet for applications such as analytics, public and private cloud, and virtualization
- Energy-efficient design incorporating 550-watt ac, 750-watt ac, 900-watt ac, or 750-watt dc power supplies, up to eight cooling fans (four banks of counter-rotating dual fans), and energy-efficient planar components to help lower operational costs
- Compliance with 80 PLUS Platinum and ENERGY STAR (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 data center power notification and management to help achieve lower heat output and reduced cooling needs
- Snoop filters to boost processor performance
- Integrated SAS controller (IBM ServeRAID M5110e) for up to sixteen 2.5-inch hot-swap HDD bays
- Memory mirroring, configurable using Unified Extensible Firmware Interface (UEFI) setup
- Integrated Management Module 2 (IMM2) 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

Excellent RAS and outstanding uptime for an improved business environment

- Redundant, hot-swap components that are designed to make it easy to replace failures without taking your system down

- Hot-swap, redundant fans with calibrated vectored cooling to keep components cool, and simplified fan replacement
- Hot-swap, redundant power supplies to help reduce downtime
- Hot-swap, RAID protection disk that helps secure your data and reduce downtime
- Predictive Failure Analysis that provides advanced warning on memory, disks, fans, and power supplies
- Drop-down light path diagnostics panel that provides information about a failing component without opening chassis or interrupting system operation; expedites hardware repairs to dramatically reduce service time
- IBM Director and web support
- Three-year, customer replaceable unit (CRU) and on-site labor[2] , limited warranty[3] ; optional warranty service upgrades available

IBM Express® models

New System x® configurations are being added to the IBM Express Portfolio™ , designed and priced to meet the needs of midsized 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 M4 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.

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.

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

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

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

Key prerequisites

Monitor, USB keyboard, and USB mouse

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

Planned availability date

October 11, 2013 - All except:

November 8, 2013 - Brazil Express models 7915EPU and 7915EQU

November 29, 2013 - Options

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00Y7677 (A4GR) - x3650M4 16x2.5" HS HDD Assembly Kit with two expanders
00Y7626 (A461) - x3650M4 16x 2.5" HS HDD Assembly Kit with Expander
                 for 12Gb RAID
00Y7827 (A462) - x3650M4 16x 2.5" HS HDD Assembly Kit for 12Gb RAID
46W0767 (A4RE) - 32GB(1x32GB,1.35V)PC3L-10600 CL9 ECC DDR3 1333MHz LP
                 HyperCloud DIMM
46W0761 (A47K) - 32GB (1x32GB, 4Rx4, 1.5V) PC3-14900 CL13 ECC DDR3
                 1866MHz LP LRDIMM
00Y8333 (A471) - NVIDIA Tesla K20 (Actively Cooled)
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Description

System x3650 M4 server

The System x3650 M4 server features Intel Xeon multicore processors that support internal processing speeds of up to 3.5 GHz[1] , and processing operations to memory up to 1866 MHz.

High-performance server subsystems

The System x3650 M4 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 features up to 30 MB cache, and up to two 8.0 GT/s QuickPath interconnect (QPI) links with new Hyper Threading and Intel™ Turbo Boost Technology 2.0. It incorporates powerful Xeon processors with up to 30 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 up to 1866 MHz DRAM clock speed and offer maximum 12800 Mbps bandwidth, processor-to-memory subsystem performance. The x3650 M4 server uses the Intel E5-2600 v2 processor with Chipkill technology to maximize throughput from processors, to memory, to the 32-bit and 64-bit PCI buses.

Additional features

- Up to 24-core processing achieved with a second processor of equal speed and processor type.
- System board containing 24 DIMM (UDIMM/RDIMM/LRDIMM/HCDIMM) connectors supporting 4 GB, 8 GB, 16 GB, and 32 GB DDR3 PC3-14900 SDRAM ECC RDIMMs with:
  - DDR3 memory for improved performance
  - Up to 384 GB of system memory using 16 GB optional DIMMs, or up to 768 GB of memory with LRDIMM or HyperCloud DIMMs

  Note: 768 GB support will be available when 32 GB LRDIMM/HC DIMM is available.
- Up to six PCIe 3.0 slots.

  With single processor models:

  - Three PCIe 3.0 slots - one x8 full length, full height and two x8 half length, full height (standard models)
  - Two PCIe 3.0 slots - one x16 full length, full height and one x8 half length, full height
  - Two PCI-X plus one PCIe 3.0 slots - one PCI-X full length, full height and one PCIX half length, full height plus one x8 half length, full height PCIe 3.0
  - One double width plus one PCIe 3.0 slots - one x16 double width full length, full height for GPU and one x8 half length, full height

With dual processor models:

  - Three PCIe 3.0 slots - two x8 full length, full height and one x8 half length, full height
  - Two PCIe 3.0 slots - one x16 full length, full height and one x8 half length, full height
  - Two PCI-X plus one PCIe 3.0 slots - two PCI-X full length, full height and one x8 half length, full height PCIe 3.0
  - One double width plus one PCIe 3.0 slots - one x16 double width full length, full height for GPU and one x8 half length, full height

  The PCIe riser card offers adjustable length to meet different PCIe length card requirement.

- On standard models, eight 2.5-inch bays or six 3.5-inch bays to support optional SAS/SATA HDDs, one bay to support an optical drive, and one bay to support an optional tape drive.
- Intel i350-AM4 Quad-port Gigabit Ethernet on board and embedded 10 GbE Dual-port options (on a reserved connector) (10/100/1000) Ethernet ports, which speed network communications to LAN clients. (The embedded card supports Emulex, QLogic, and Mellanox with different protocols like 10 Gb SFP+ or InfiniBand.)
- Compliance with 80 PLUS Platinum and ENERGY STAR (model dependent).

The System x3650 M4 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 M4 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 M4 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 eight hot-swap fans (four pairs)
- Up to sixteen 2.5-inch HS HDDs with optional upgrade kit
- 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 downtime
- Predictive Failure Analysis (PFA) on HDD options, memory, power supply, and fans to help alert the system administrator of imminent component failure
- Worldwide voltage-sensing, 550-watt ac, 750-watt ac, and 900-watt high-efficiency hot-plug power supply options
- Optional IBM Integrated Management Module Advanced Upgrade (Feature on Demand (FoD)) 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 downtime and service costs
- Support for virtual floppy (with optional IBM Integrated Management Module Advanced Upgrade), 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 M4 server packs a lot of function and storage capacity into a 2U 19-inch rack-drawer package, yet it is designed to be 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 30-inch-deep industry-standard rack enclosures.
- Up to six PCIe 3.0 adapter card slots available. Three PCI-Express slots may be replaced by a riser card option to get two PCI-X plus one PCI-Express slots, two PCIe 3.0 slots, one x16 plus one x8 slots, two PCIe 3.0 slots, one x16 double width plus one x8 slots.
- System board optional upgrades (PCI slot not required).
  - IBM Integrated Management Module Advanced Upgrade. Remote presence function can be enabled by FoD.
- Support for up to 18000 GB of internal data storage, using six 3 TB SATA HDDs.

Systems management

Integrated Management Module 2 (iMM2)

The System x3650 M4 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 four onboard Ethernet ports for access. The IMM can be accessed using software that is compatible with IPMI 2.0 (for example xCAT). 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 Sockets 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.

IBM Integrated Management Module Advanced Upgrade

The optional IBM Integrated Management Module Advanced Upgrade delivers advanced control and monitoring features to manage your IBM System x3650 M4 server at virtually any time, from virtually any place. The key can be enabled by FoD. 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.

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

IBM Director

The System x3650 M4 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 downtime
- Increased productivity of IT personnel and 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:
  - Memory
  - HDDs
  - Power supplies
  - Fans
- Define automated actions, such as:
  - Send email or page to an administrator
  - Run a command or program
  - Send 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 downtime

IBM Director Agent integrates into leading workgroup and enterprise systems management environments through 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 data center. 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 the actual amount of power being used and the temperature of the system. The software is available across new IBM 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 Integrated Management Module, the IT administrator achieves 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:
  - Memory
  - Fans
  - HDDs
  - Power supplies
- Define automated actions, such as:
  - Send an email or a page to an administrator
  - Run a command or program
  - Send 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 downtime
- Monitor, manage, and configure RAID subsystems without taking them off line

Advanced Configuration and Power Interface (ACPI)

ACPI is an open industry specification that defines a flexible and extensible hardware interface for the system board. Software designers use this specification to integrate power management features throughout a computer system, including hardware, the operating system, and application software. This integration enables 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 M4 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/

Standard System x3650 M4 configurations

Model number	Processor	Memory	HDD GT/s	HDD interface	HDD	Other
7915A3x	E5-2603 v2 (4C) 1.8 GHz Cache: 10 MB	4 GB	6.4	SAS/SATA M5110e	2.5-in	Open bay 1 x 550W
7915B3x	E5-2609 v2 (4C) 2.5 GHz Cache: 10 MB	4 GB	6.4	SAS/SATA M5110e	2.5-in	Open bay 1 x 550W
7915C3x	E5-2620 v2 (6C) 2.1 GHz Cache: 15 MB	8 GB	7.2	SAS/SATA M5110e	2.5-in	Open bay 1 x 550W
7915C5x	E5-2620 v2 (6C) 2.1 GHz Cache: 15 MB	8 GB	7.2	SAS/SATA M5110e	3.5-in	Open bay 1 x 550W
7915D3x	E5-2630 v2 (6C) 2.6 GHz Cache: 15 MB	8 GB	7.2	SAS/SATA M5110e (512MB Flash)	2.5-in	Open bay x 550W
7915F3x	E5-2640 v2 (8C) 2.0 GHz Cache: 20 MB	8 GB	7.2	SAS/SATA M5110e (512MB Flash)	2.5-in	Open bay x 550W
7915G3x	E5-2650 v2 (8C) 2.6 GHz Cache: 20 MB	8 GB	8.0	SAS/SATA M5110e (1GB Flash)	2.5-in	Open bay x 750W
7915H3x	E5-2660 v2 (10C) 2.2 GHz Cache: 25 MB	8 GB	8.0	SAS/SATA M5110e (1GB Flash)	2.5-in	Open bay 1 x 750W
7915J3x	E5-2670 v2 (10C) 2.5 GHz Cache: 25 MB	8 GB	8.0	SAS/SATA M5110e (1GB Flash)	2.5-in	Open bay 1 x 750W
7915L3x	E5-2680 v2 (10C) 2.8 GHz Cache: 25 MB	8 GB	8.0	SAS/SATA M5110e (1GB Flash)	2.5-in	Open bay 1 x 900W
791523x	E5-2637 v2 (4C) 3.5 GHz Cache: 15 MB	8 GB	8.0	SAS/SATA M5110e	2.5-in	Open bay 1 x 900W
791533x	E5-2643 v2 (6C) 3.5 GHz Cache: 25 MB	8 GB	8.0	SAS/SATA M5110e	2.5-in	Open bay 1 x 900W
791543x	E5-2667 v2 (8C) 3.3 GHz Cache: 25 MB	8 GB	8.0	SAS/SATA M5110e	2.5-in	Open bay 1 x 900W
7915M3x	E5-2690 v2 (10C) 3.0 GHz Cache: 25 MB	8 GB	8.0	SAS/SATA M5110e	2.5-in	Open bay 1 x 900W
791553x	E5-2650L v2 (10C) 1.7 GHz Cache: 25 MB	8 GB	8.0	SAS/SATA M5110e (1GB Flash)	2.5-in	Open bay 1 x 550W
791573x	E5-2695 v2 (12C) 2.4 GHz Cache: 30 MB	8 GB	8.0	SAS/SATA M5110e (1GB Flash)	2.5-in	Open bay 1 x 900W
791583x	E5-2697 v2 (12C) 2.7 GHz	8 GB	8.0	SAS/SATA	2.5-in	Open bay

Cache: 30 MB M5110e (1GB Flash) 1 x 900W

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

Accessibility by people with disabilities

A US 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 M4 server is a part of the System x rack-optimized server line. This 2-socket server delivers Intel Xeon multicore high speed processors and excellent server function in an ultrathin, rack-optimized, 2U footprint.

Optimized for speed

The System x3650 M4 server offers new levels of Intel Xeon multicore processors with up to 8.0 GT/s and lower power for business-critical applications and cloud deployments. This server is uniquely optimized for better application computing with a highly functional chipset and 24 DIMM slots for a maximum of 384 GB of DDR-3 SDRAM Registered DIMM memory, or up to 768 GB of memory with LRDIMM or HyperCloud DIMMs.

Innovation comes standard

- Application efficiency increases with snoop filters that free up cache and improve processor performance.
- 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, RAID-1 on hot-swap SAS models helps safeguard your data at no additional cost.

Target applications

- General-purpose computing
- Database, ERP, mail, Web 2.0 applications
- Business-critical applications and cloud deployments
- Finance trading applications
- High performance computing

Statement of general direction

IBM intends to update select System x servers by providing a new optional for-charge feature to enable management of self-encrypting hard drive hardware options within the IBM Security Key Lifecycle Manager product.

IBM System x is issuing this statement of direction regarding the ServeRAID M5200 Series 4GB Flash/RAID 5 Upgrade for IBM Systems. The ServeRAID M5200 Series 4GB Flash/RAID 5 Upgrade for IBM Systems is intended for general availability in first quarter of 2014.

IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal without notice at IBM's sole discretion. Information regarding potential

future products is intended to outline our general product direction and it should not be relied on in making a purchasing decision. The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. Information about potential future products may not be incorporated into any contract. The development, release, and timing of any future features or functionality described for our products remain at our sole discretion.

Product number

The following are features already announced for the 3331 and 7915 machine types:

Description	MT	Model	Feature
8GB (1x8GB, 2Rx8, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP UDIMM	3331	HC1	A3QC
8GB (1x8GB, 2Rx8, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP UDIMM	7915	AC1 MC1	
4GB (1x4GB, 1Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM	3331	HC1	A3QD
4GB (1x4GB, 1Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM	7915	AC1 MC1	
4GB (1x4GB, 1Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	3331	HC1	A3QE
4GB (1x4GB, 1Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	7915	AC1 MC1	
8GB (1x8GB, 1Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM	3331	HC1	A3QG
8GB (1x8GB, 1Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM	7915	AC1 MC1	
8GB (1x8GB, 1Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	3331	HC1	A3QH
8GB (1x8GB, 1Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	7915	AC1 MC1	
8GB (1x8GB, 2Rx8, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	3331	HC1	A3QK
8GB (1x8GB, 2Rx8, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	7915	AC1 MC1	
16GB (1x16GB, 2Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM	3331	HC1	A3QL
16GB (1x16GB, 2Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM	7915	AC1 MC1	
16GB (1x16GB, 2Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	3331	HC1	A3QM
16GB (1x16GB, 2Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	7915	AC1 MC1	
IBM System x3650 M4 Planar (IVB Refresh)	7915	AC1 MC1	A3V6
Intel Xeon Processor E5-2603 v2 4C 1.8GHz 10MB Cache 1333MHz 80W	7915	AC1 MC1	A3V7
Intel Xeon Processor E5-2609 v2 4C 2.5GHz 10MB Cache 1333MHz 80W	7915	AC1 MC1	A3V8
Intel Xeon Processor E5-2637 v2 4C 3.5GHz15MB Cache 1866MHz 130W	7915	AC1 MC1	A3V9
Intel Xeon Processor E5-2620 v2 6C 2.1GHz 15MB Cache 1600MHz 80W	7915	AC1 MC1	A3VA
Intel Xeon Processor E5-2630 v2 6C 2.6GHz 15MB Cache 1600MHz 80W	7915	AC1	A3VB

		MC1	
Intel Xeon Processor E5-2650 v2 8C 2.6GHz 20MB Cache 1866MHz 95W	7915	AC1 MC1	A3VC
Intel Xeon Processor E5-2660 v2 10C 2.2GHz 25MB Cache 1866MHz 95W	7915	AC1 MC1	A3VD
Intel Xeon Processor E5-2640 v2 8C 2.0GHz 20MB Cache1600MHz 95W	7915	AC1 MC1	A3VE
Intel Xeon Processor E5-2670 v2 10C 2.5GHz 25MB Cache 1866MHz 115W	7915	AC1 MC1	A3VG
Intel Xeon Processor E5-2680 v2 10C 2.8GHz 25MB Cache 1866MHz 115W	7915	AC1 MC1	A3VH
Intel Xeon Processor E5-2643 v2 6C 3.5GHz 25MB Cache 1866MHz 130W	7915	AC1 MC1	A3VJ
Intel Xeon Processor E5-2667 v2 8C 3.3GHz 25MB Cache 1866MHz 130W	7915	AC1 MC1	A3VK
Intel Xeon Processor E5-2695 v2 12C 2.4GHz 30MB Cache 1866MHz 115W	7915	AC1 MC1	A3VL
Intel Xeon Processor E5-2697 v2 12C 2.7GHz 30MB Cache 1866MHz 130W	7915	AC1 MC1	A3VM
Intel Xeon Processor E5-2650L v2 10C 1.7GHz 25MB Cache 1600MHz 70W	7915	AC1 MC1	A3VN
Intel Xeon Processor E5-2630L v2 6C 2.4GHz 15MB Cache 1600MHz 60W	7915	AC1 MC1	A3VP
Intel Xeon Processor E5-2690 v2 10C 3.0GHz 25MB Cache 1866MHz 130W	7915	AC1 MC1	A3VQ
Addl Intel Xeon Processor E5-2603 v2 4C 1.8GHz 10MB Cache 80W	3331	HC1	A3VR
Addl Intel Xeon Processor E5-2603 v2 4C 1.8GHz 10MB Cache 80W	7915	AC1 MC1	
Addl Intel Xeon Processor E5-2609 v2 4C 2.5GHz 10MB Cache 80W	3331	HC1	A3VS
Addl Intel Xeon Processor E5-2609 v2 4C 2.5GHz 10MB Cache 80W	7915	AC1 MC1	
Addl Intel Xeon Processor E5-2637 v2 4C 3.5GHz15MB Cache 130W	3331	HC1	A3VT
Addl Intel Xeon Processor E5-2637 v2 4C 3.5GHz15MB Cache 130W	7915	AC1 MC1	
Addl Intel Xeon Processor E5-2620 v2 6C 2.1GHz 15MB Cache 80W	3331	HC1	A3VU
Addl Intel Xeon Processor E5-2620 v2 6C 2.1GHz 15MB Cache 80W	7915	AC1 MC1	
Addl Intel Xeon Processor E5-2630 v2 6C 2.6GHz 15MB Cache 80W	3331	HC1	A3VV
Addl Intel Xeon Processor E5-2630 v2 6C 2.6GHz 15MB Cache 80W	7915	AC1 MC1	
Addl Intel Xeon Processor E5-2650 v2 8C 2.6GHz 20MB Cache 95W	3331	HC1	A3VW
Addl Intel Xeon Processor E5-2650 v2 8C 2.6GHz 20MB Cache 95W	7915	AC1 MC1	
Addl Intel Xeon Processor E5-2660 v2 10C 2.2GHz 25MB Cache 95W	3331	HC1	A3VX
Addl Intel Xeon Processor E5-2660 v2 10C 2.2GHz 25MB Cache 95W	7915	AC1 MC1	
Addl Intel Xeon Processor E5-2640 v2 8C 2.0GHz 20MB Cache 95W	3331	HC1	A3VY

Addl Intel Xeon Processor E5-2640 v2 8C 2.0GHz 20MB Cache 95W	7915	AC1 MC1	
Addl Intel Xeon Processor E5-2670 v2 10C 2.5GHz 25MB Cache 115W	3331	HC1	A3W0
Addl Intel Xeon Processor E5-2670 v2 10C 2.5GHz 25MB Cache 115W	7915	AC1 MC1	
Addl Intel Xeon Processor E5-2680 v2 10C 2.8GHz 25MB Cache 115W	3331	HC1	A3W1
Addl Intel Xeon Processor E5-2680 v2 10C 2.8GHz 25MB Cache 115W	7915	AC1 MC1	
Addl Intel Xeon Processor E5-2643 v2 6C 3.5GHz 25MB Cache 130W	3331	HC1	A3W2
Addl Intel Xeon Processor E5-2643 v2 6C 3.5GHz 25MB Cache 130W	7915	AC1 MC1	
Addl Intel Xeon Processor E5-2667 v2 8C 3.3GHz 25MB Cache 130W	3331	HC1	A3W3
Addl Intel Xeon Processor E5-2667 v2 8C 3.3GHz 25MB Cache 130W	7915	AC1 MC1	
Addl Intel Xeon Processor E5-2695 v2 12C 2.4GHz 30MB Cache 115W	3331	HC1	A3W4
Addl Intel Xeon Processor E5-2695 v2 12C 2.4GHz 30MB Cache 115W	7915	AC1 MC1	
Addl Intel Xeon Processor E5-2697 v2 12C 2.7GHz 30MB Cache 130W	3331	HC1	A3W5
Addl Intel Xeon Processor E5-2697 v2 12C 2.7GHz 30MB Cache 130W	7915	AC1 MC1	
Addl Intel Xeon Processor E5-2650L v2 10C 1.7GHz 25MB Cache70W	3331	HC1	A3W6
Addl Intel Xeon Processor E5-2650L v2 10C 1.7GHz 25MB Cache70W	7915	AC1 MC1	
Addl Intel Xeon Processor E5-2630L v2 6C 2.4GHz 15MB Cache 60W	3331	HC1	A3W7
Addl Intel Xeon Processor E5-2630L v2 6C 2.4GHz 15MB Cache 60W	7915	AC1 MC1	
Addl Intel Xeon Processor E5-2690 v2 10C 3.0GHz 25MB Cache 130W	3331	HC1	A3W8
Addl Intel Xeon Processor E5-2690 v2 10C 3.0GHz 25MB Cache 130W	7915	AC1 MC1	
NVIDIA Quadro K600	7915	AC1 MC1	A3WH
NVIDIA Quadro K2000	7915	AC1 MC1	A3WJ
NVIDIA Quadro K5000	7915	AC1 MC1	A3YW
N2215 SAS/SATA HBA for IBM System x	7915	AC1 MC1	A3YY
ServeRAID M5210 SAS/SATA Controller for IBM System x	7915	AC1 MC1	A3YZ
ServeRAID M5200 Series 1GB Cache/RAID 5 Upgrade for IBM Systems	7915	AC1 MC1	A3Z0
ServeRAID M5200 Series 1GB Flash/RAID 5 Upgrade for IBM Systems	7915	AC1 MC1	A3Z1
ServeRAID M5200 Series 2GB Flash/RAID 5 Upgrade for IBM Systems	7915	AC1 MC1	A3Z2
ServeRAID M5200 Series RAID 6 Upgrade for IBM Systems-FoD	7915	AC1 MC1	A3Z5
ServeRAID M5200 Series Zero Cache/RAID 5 Upgrade for IBM Systems-FoD	7915	AC1 MC1	A3Z6

ServeRAID M5200 Series Performance Accelerator for IBM Systems-FoD	7915	AC1 MC1	A3Z7	
ServeRAID M5200 Series SSD Caching Enabler for IBM Systems-FoD	7915	AC1 MC1	A3Z8	
x3650M4 8x 2.5" HS HDD Assembly Kit for 12Gb RAID	7915	AC1 MC1	A460	
x3650M4 16x 2.5" HS HDD Assembly Kit with Expander for 12Gb RAID	3331	HC1	A461	
x3650M4 16x 2.5" HS HDD Assembly Kit with Expander for 12Gb RAID	7915	AC1 MC1		
x3650M4 16x 2.5" HS HDD Assembly Kit for 12Gb RAID	3331	HC1	A462	
x3650M4 16x 2.5" HS HDD Assembly Kit for 12Gb RAID	7915	AC1 MC1		
NVIDIA Tesla K20 (Actively Cooled)	7915	AC1 MC1	A471	
Super Cap Cable 925mm for ServRAID M5200 Series Flash	7915	AC1 MC1	A47F	
32GB (1x32GB, 4Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP LRDIMM	3331	HC1	A47K	
32GB (1x32GB, 4Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP LRDIMM	7915	AC1 MC1		
Essential Package	7915	AC1 MC1	A4CA	
Enhanced Package	7915	AC1 MC1	A4CB	
Elite Package	7915	AC1 MC1	A4CC	
Essential Package	7915	AC1 MC1	A4CD	
Enhanced Package	7915	AC1 MC1	A4CE	
Elite Package	7915	AC1 MC1	A4CF	
Intel Xeon Processor E5-2628L v2 8C 1.9GHz 20MB Cache 1600MHz 70W	7915	AC1 MC1	A4EN	
Intel Xeon Processor E5-2648L v2 10C 1.9GHz 25MB Cache 1866MHz 70W	7915	AC1 MC1	A4EP	
Addl Intel Xeon Processor E5-2628L v2 8C 1.9GHz 20MB Cache 70W	3331	HC1	A4EQ	
Addl Intel Xeon Processor E5-2628L v2 8C 1.9GHz 20MB Cache 70W	7915	AC1 MC1		
Addl Intel Xeon Processor E5-2648L v2 10C 1.9GHz 25MB Cache 70W	3331	HC1	A4ER	
Addl Intel Xeon Processor E5-2648L v2 10C 1.9GHz 25MB Cache 70W	7915	AC1 MC1		
x3650M4 16x2.5" HS HDD Assembly Kit with two expanders	3331	HC1	A4GR	
32GB(1x32GB,1.35V)PC3L-10600 CL9 ECC DDR3 1333MHz LP HyperCloud DIMM	7915	AC1 MC1	A4RE	
32GB(1x32GB,1.35V)PC3L-10600 CL9 ECC DDR3 1333MHz LP HyperCloud DIMM	3331	HC1	A4RE	
GPU K20 Power Cable	7915	AC1 MC1	A4W9	

Note: EMEA models are GAV models.

Description	MT	Mod	Part number
IBM System x3650 M4	7915	A3G	7915A3G
	7915	B3G	7915B3G
	7915	C3G	7915C3G

7915	C5G	7915C5G
7915	D3G	7915D3G
7915	F3G	7915F3G
7915	G3G	7915G3G
7915	H3G	7915H3G
7915	J3G	7915J3G
7915	L3G	7915L3G
7915	23G	791523G
7915	33G	791533G
7915	43G	791543G
7915	M3G	7915M3G
7915	53G	791553G
7915	73G	791573G
7915	83G	791583G

Options

Description	Type	Mod	Feature Number	Number
x3650M4 16x 2.5" HS HDD Assembly Kit with Expander for 12Gb RAID	3331	HC1	A461	00Y7627	00Y7627
x3650M4 16x 2.5" HS HDD Assembly Kit for 12Gb RAID	3331	HC1	A462	00Y7626	00Y7626
x3650M4 16x2.5" HS HDD Assembly Kit with two expanders	3331	HC1	A4GR	00Y7677	00Y7677
8GB (1x8GB, 2Rx8, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP UDIMM	3331	HC1	A3QC	00D5016	00D5016
4GB (1x4GB, 1Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM	3331	HC1	A3QD	00D5020	00D5020
4GB (1x4GB, 1Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	3331	HC1	A3QE	00D5024	00D5024
8GB (1x8GB, 1Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM	3331	HC1	A3QG	00D5032	00D5032
8GB (1x8GB, 1Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	3331	HC1	A3QH	00D5036	00D5036
8GB (1x8GB, 2Rx8, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	3331	HC1	A3QK	00D5044	00D5044
16GB (1x16GB, 2Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM	3331	HC1	A3QL	00D5048	00D5048
16GB (1x16GB, 2Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	3331	HC1	A3QM	46W0672	46W0672
32GB (1x32GB, 4Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP LRDIMM	3331	HC1	A47K	46W0761	46W0761
32GB(1x32GB,1.35V)PC3L-10600 CL9 ECC DDR3 1333MHz LP HyperCloud DIMM	3331	HC1	A4RE	46W0767	46W0767
Intel Xeon Processor E5-2628L v2 8C 1.9GHz 20MB Cache 1600MHz 70 W	3331	HC1	A4EQ	00Y7650	00Y7650
Intel Xeon Processor E5-2648L v2 10C 1.9GHz 25MB Cache 1866MHz 70W	3331	HC1	A4ER	00Y7652	00Y7652
Intel Xeon Processor E5-2603 v2 4C 1.8GHz 10MB Cache 1333MHz 80W	3331	HC1	A3VR	46W4360	46W4360
Intel Xeon Processor E5-2609 v2 4C 2.5GHz 10MB Cache 1333MHz 80W	3331	HC1	A3VS	46W4361	46W4361
Intel Xeon Processor E5-2637 v2 4C 3.5GHz 15MB Cache 1866MHz 130W	3331	HC1	A3VT	46W4362	46W4362
Intel Xeon Processor E5-2620 v2 6C 2.1GHz 15MB Cache 1600MHz 80W	3331	HC1	A3VU	46W4363	46W4363
Intel Xeon Processor E5-2630 v2 6C 2.6GHz 15MB Cache 1600MHz 80W	3331	HC1	A3VV	46W4364	46W4364
Intel Xeon Processor E5-2650 v2 8C 2.6GHz 20MB Cache 1866MHz 95W	3331	HC1	A3VW	46W4365	46W4365
Intel Xeon Processor E5-2660 v2 10C 2.2GHz 25MB Cache 1866MHz 95W	3331	HC1	A3VX	46W4366	46W4366
Intel Xeon Processor E5-2640 v2 8C 2.0GHz 20MB Cache 1600MHz 95W	3331	HC1	A3VY	46W4367	46W4367
Intel Xeon Processor E5-2670 v2 10C 2.5GHz 25MB Cache 1866MHz 115W	3331	HC1	A3W0	46W4369	46W4369
Intel Xeon Processor E5-2680 v2 10C 2.8GHz 25MB Cache 1866MHz 115W	3331	HC1	A3W1	46W4370	46W4370
Intel Xeon Processor E5-2643 v2 6C 3.5GHz 25MB Cache 1866MHz 130W	3331	HC1	A3W2	46W4371	46W4371
Intel Xeon Processor E5-2667 v2 8C 3.3GHz 25MB Cache 1866MHz 130W	3331	HC1	A3W3	46W4372	46W4372

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Intel Xeon Processor E5-2695 v2 12C
 2.4GHz 30MB Cache 1866MHz 115W     3331  HC1  A3W4  46W4373  46W4373
Intel Xeon Processor E5-2697 v2 12C
 2.7GHz 30MB Cache 1866MHz 130W     3331  HC1  A3W5  46W4374  46W4374
Intel Xeon Processor E5-2650L v2 10C
 1.7GHz 25MB Cache 1600MHz 70W      3331  HC1  A3W6  46W4375  46W4375
Intel Xeon Processor E5-2630L v2 6C
 2.4GHz 15MB Cache 1600MHz 60W      3331  HC1  A3W7  46W4376  46W4376
Intel Xeon Processor E5-2690 v2 10C
 3.0GHz 25MB Cache 1866MHz 130W     3331  HC1  A3W8  46W4377  46W4377
```

Pseudo part numbers

Note: The following pseudo part numbers cannot be ordered as stand-alone parts and can be ordered only by configurator.

```
Pseudo
part
number  Description

00D5017 8GB (1x8GB, 2Rx8, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP UDIMM
00D5021 4GB (1x4GB, 1Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM
00D5025 4GB (1x4GB, 1Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM
00D5033 8GB (1x8GB, 1Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM
00D5037 8GB (1x8GB, 1Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM
00D5045 8GB (1x8GB, 2Rx8, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM
00D5049 16GB (1x16GB, 2Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM
46W0673 16GB (1x16GB, 2Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM
46W4342 Intel Xeon Processor E5-2603 v2 4C 1.8GHz 10MB Cache 1333MHz 80W
46W4343 Intel Xeon Processor E5-2609 v2 4C 2.5GHz 10MB Cache 1333MHz 80W
46W4344 Intel Xeon Processor E5-2637 v2 4C 3.5GHz15MB Cache 1866MHz 130W
46W4345 Intel Xeon Processor E5-2620 v2 6C 2.1GHz 15MB Cache 1600MHz 80W
46W4346 Intel Xeon Processor E5-2630 v2 6C 2.6GHz 15MB Cache 1600MHz 80W
46W4347 Intel Xeon Processor E5-2650 v2 8C 2.6GHz 20MB Cache 1866MHz 95W
46W4348 Intel Xeon Processor E5-2660 v2 10C 2.2GHz 25MB Cache 1866MHz 95W
46W4349 Intel Xeon Processor E5-2640 v2 8C 2.0GHz 20MB Cache1600MHz 95W
46W4351 Intel Xeon Processor E5-2670 v2 10C 2.5GHz 25MB Cache 1866MHz 115W
46W4352 Intel Xeon Processor E5-2680 v2 10C 2.8GHz 25MB Cache 1866MHz 115W
46W4353 Intel Xeon Processor E5-2643 v2 6C 3.5GHz 25MB Cache 1866MHz 130W
46W4354 Intel Xeon Processor E5-2667 v2 8C 3.3GHz 25MB Cache 1866MHz 130W
46W4355 Intel Xeon Processor E5-2695 v2 12C 2.4GHz 30MB Cache 1866MHz 115W
46W4356 Intel Xeon Processor E5-2697 v2 12C 2.7GHz 30MB Cache 1866MHz 130W
46W4357 Intel Xeon Processor E5-2650L v2 10C 1.7GHz 25MB Cache 1600MHz 70W
46W4358 Intel Xeon Processor E5-2630L v2 6C 2.4GHz 15MB Cache 1600MHz 60W
46W4359 Intel Xeon Processor E5-2690 v2 10C 3.0GHz 25MB Cache 1866MHz 130W
46W4379 IBM System x3650 M4 Planar (IVB Refresh )
46W8464 NVIDIA Quadro K2000
46W8463 NVIDIA Quadro K600
00Y7623 x3650M4 8x 2.5" HS HDD Assembly Kit for 12Gb RAID
00Y7624 x3650M4 16x 2.5" HS HDD Assembly Kit with Expander for 12Gb RAID
00Y7625 x3650M4 16x 2.5" HS HDD Assembly Kit for 12Gb RAID
46W9202 NVIDIA Quadro K5000
00Y8333 NVIDIA Tesla K20 (Actively Cooled)
46W0762 32GB (1x32GB, 4Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP
         LRDIMM
00Y7644 Intel Xeon Processor E5-2628L v2 8C 1.9GHz 20MB Cache 1600MHz 70W
00Y7646 Intel Xeon Processor E5-2648L v2 10C 1.9GHz 25MB Cache 1866MHz 70W
46W0768 32GB(1x32GB,1.35V)PC3L-10600 CL9 ECC DDR3 1333MHz LP HyperCloud
        DIMM
00AM377 GPU K20 Power Cable
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Publications

The following CD-ROM is shipped with the x3650 M4 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 M4 server *Installation and User's Guide* and *Problem Determination and Service Guide,* in US English and translation versions, are available from

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

Multilingual support is provided for many of the System x3650 M4 server components in the following languages:

Brazilian Portuguese
Chinese (Simplified and Traditional)
English (US and UK)
French
German
Italian
Japanese
Korean
Spanish

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

Displayable softcopy publications

The product books are offered in displayable softcopy form. The displayable manuals are part of the basic machine-readable material. The files are shipped on CD-ROM. Terms and conditions for use of the machine-readable files are shipped with the files.

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

System x3650 M4:

	7915A3x	7915B3x
Processor	Xeon E5-2603 v2 (80W)	Xeon E5-2609 v2 (80w)
Internal speed	1.8 GHz	2.5 GHz
External speed	6.4 GT/s	6.4 GT/s
Number cores	4	4
Number standard	1	1
Maximum	2	2
Cache (full-speed)	10 MB	10 MB
Memory	4 GB ECC 1600 MHz RDIMM	4 GB ECC 1600 MHz RDIMM
RDIMMs	1 x 4 GB (1Rx4,1.35V)	1 x 4 GB (1Rx4,1.35V)
DIMM sockets	24	24
Capacity (4)	768 GB	768 GB
Video	SVGA	SVGA
Memory	16 MB	16 MB
HDD controller	SAS/SATA	SAS/SATA
Channels	8	8
Connector internal	2	2
RAID controller	M5110e (no Cache/Flash)	M5110e (no Cache/Flash)
HDD (5)		
Total bays	18 (with upgrade)	18 (with upgrade)
5.25 slim	1	1
3.5-in tape	1	1
Hot-swap (3.5-in)	0	0
Hot-swap (2.5-in)	16 (with upgrade)	16 (with upgrade)
Internal capacity	25.6 TB (with SSD upgrade)	25.6 TB (with SSD upgrade)
Bays available	10 standard	10 standard
5.25 slim	1	1
3.5-in tape	1	1
Hot-swap (3.5-in)	0	0
Hot-swap (2.5-in)	8	8
Total PCI slots (6)	6 (with upgrade)	6 (with upgrade)
PCI_E (x8)	3 standard	3 standard
Total PCI slots	3	3
PCI-E Gen3 x8 FH/FL	1	1
PCI-E Gen3 x8 FH/HL	2	2
Slots available	3	3
PCI-E Gen3 x8 FH/FL	1	1
PCI-E Gen3 x8 FH/HL	2	2
System management	Standard	Standard
Ethernet controller	Four 1 Gb	Four 1 Gb
Optical drive (SATA)	Optional	Optional
Power supply	550 W	550 W
Number standard	1	1
Maximum	2	2
Hot-swap	Yes	Yes
Redundant power	Optional	Optional
Auto restart	Yes	Yes

	7915C3x	7915C5x
Processor	Xeon E5-2620 v2 (80W)	Xeon E5-2620 v2 (80w)
Internal speed	2.1 GHz	2.1 GHz
External speed	7.2 GT/s	7.2 GT/s
Number cores	6	6
Number standard	1	1
Maximum	2	2
Cache (full-speed)	15 MB	15 MB
Memory	8 GB ECC 1600 MHz RDIMM	8 GB ECC 1600 MHz RDIMM
RDIMMs	1 x 8 GB (1Rx4,1.35V)	1 x 8 GB (1Rx4,1.35V)
DIMM sockets	24	24
Capacity (4)	768 GB	768 GB
Video	SVGA	SVGA
Memory	16 MB	16 MB
HDD controller	SAS/SATA	SAS/SATA
Channels	8	8
Connector internal	2	2

RAID controller	M5110e (no Cache/Flash)	M5110e (no Cache/Flash)
HDD (5)		
Total bays	18 (with upgrade)	8 (with upgrade)
5.25 slim	1	1
3.5-in tape	1	1
Hot-swap (3.5-in)	0	6
Hot-swap (2.5-in)	16 (with upgrade)	0
Internal capacity	25.6 TB (with SSD upgrade)	24 TB (with upgrade)
Bays available	10 standard	8 standard
5.25 slim	1	1
3.5-in tape	1	1
Hot-swap (3.5-in)	0	6
Hot-swap (2.5-in)	8	0
Total PCI slots (6)	6 (with upgrade)	6 (with upgrade)
PCI_E (x8)	3 standard	3 standard
Total PCI slots	3	3
PCI-E Gen3 x8 FH/FL	1	1
PCI-E Gen3 x8 FH/HL	2	2
Slots available	3	3
PCI-E Gen3 x8 FH/FL	1	1
PCI-E Gen3 x8 FH/HL	2	2
System management	Standard	Standard
Ethernet controller	Four 1 Gb	Four 1 Gb
Optical drive (SATA)	Optional	Optional
Power supply	550 W	550 W
Number standard	1	1
Maximum	2	2
Hot-swap	Yes	Yes
Redundant power	Optional	Optional
Auto restart	Yes	Yes
	7915D3x	7915F3x
Processor	Xeon E5-2630 v2 (80W)	Xeon E5-2640 v2 (95w)
Internal speed	2.6 GHz	2.0 GHz
External speed	7.2 GT/s	7.2 GT/s
Number cores	6	8
Number standard	1	1
Maximum	2	2
Cache (full-speed)	15 MB	20 MB
Memory	8 GB ECC 1600 MHz RDIMM	8 GB ECC 1600 MHz RDIMM
RDIMMs	1 x 8 GB (1Rx4,1.35V)	1 x 8 GB (1Rx4,1.35V)
DIMM sockets	24	24
Capacity (4)	768 GB	768 GB
Video	SVGA	SVGA
Memory	16 MB	16 MB
HDD controller	SAS/SATA	SAS/SATA
Channels	8	8
Connector internal	2	2
RAID controller	M5110e (512MB Flash)	M5110e (512MB Flash)
HDD (5)		
Total bays	18 (with upgrade)	18 (with upgrade)
5.25 slim	1	1
3.5-in tape	1	1
Hot-swap (3.5-in)	0	0
Hot-swap (2.5-in)	16 (with upgrade)	16 (with upgrade)
Internal capacity	25.6 TB (with SSD upgrade)	25.6 TB (with SSD upgrade)
Bays available	10 standard	10 standard
5.25 slim	1	1
3.5-in tape	1	1
Hot-swap (3.5-in)	0	0
Hot-swap (2.5-in)	8	8
Total PCI slots (6)	6 (with upgrade)	6 (with upgrade)
PCI_E (x8)	3 standard	3 standard
Total PCI slots	3	3
PCI-E Gen3 x8 FH/FL	1	1
PCI-E Gen3 x8 FH/HL	2	2
Slots available	3	3
PCI-E Gen3 x8 FH/FL	1	1
PCI-E Gen3 x8 FH/HL	2	2
System management	Standard	Standard

Ethernet controller	Four 1 Gb	Four 1 Gb
Optical drive (SATA)	Optional	Optional
Power supply	550 W	550 W
Number standard	1	1
Maximum	2	2
Hot-swap	Yes	Yes
Redundant power	Optional	Optional
Auto restart	Yes	Yes
	7915G3x	7915H3x
Processor	Xeon E5-2650 v2 (95W)	Xeon E5-2660 v2 (95w)
Internal speed	2.6 GHz	2.2 GHz
External speed	8.0 GT/s	8.0 GT/s
Number cores	8	10
Number standard	1	1
Maximum	2	2
Cache (full-speed)	20 MB	25 MB
Memory	8 GB ECC 1866 MHz RDIMM	8 GB ECC 1866 MHz RDIMM
RDIMMs	1 x 8 GB (1Rx4,1.5V)	1 x 8 GB (1Rx4,1.5V)
DIMM sockets	24	24
Capacity (4)	768 GB	768 GB
Video	SVGA	SVGA
Memory	16 MB	16 MB
HDD controller	SAS/SATA	SAS/SATA
Channels	8	8
Connector internal	2	2
RAID controller	M5110e (1GB Flash)	M5110e (1GB Flash)
HDD (5)		
Total bays	18 (with upgrade)	18 (with upgrade)
5.25 slim	1	1
3.5-in tape	1	1
Hot-swap (3.5-in)	0	0
Hot-swap (2.5-in)	16 (with upgrade)	16 (with upgrade)
Internal capacity	25.6 TB (with SSD upgrade)	25.6 TB (with SSD upgrade)
Bays available	10 standard	10 standard
5.25 slim	1	1
3.5-in tape	1	1
Hot-swap (3.5-in)	0	0
Hot-swap (2.5-in)	8	8
Total PCI slots (6)	6 (with upgrade)	6 (with upgrade)
PCI_E (x8)	3 standard	3 standard
Total PCI slots	3	3
PCI-E Gen3 x8 FH/FL	1	1
PCI-E Gen3 x8 FH/HL	2	2
Slots available	3	3
PCI-E Gen3 x8 FH/FL	1	1
PCI-E Gen3 x8 FH/HL	2	2
System management	Standard	Standard
Ethernet controller	Four 1 Gb	Four 1 Gb
Optical drive (SATA)	Optional	Optional
Power supply	750 W	750 W
Number standard	1	1
Maximum	2	2
Hot-swap	Yes	Yes
Redundant power	Optional	Optional
Auto restart	Yes	Yes
	7915J3x	7915L3x
Processor	Xeon E5-2670 v2 (115W)	Xeon E5-2680 v2 (115W)
Internal speed	2.5 GHz	2.8 GHz
External speed	8.0 GT/s	8.0 GT/s
Number cores	10	10
Number standard	1	1
Maximum	2	2
Cache (full-speed)	25 MB	25 MB
Memory	8 GB ECC 1866 MHz RDIMM	8 GB ECC 1866 MHz RDIMM
RDIMMs	1 x 8 GB (1Rx4,1.5V)	1 x 8 GB (1Rx4,1.5V)
DIMM sockets	24	24
Capacity (4)	768 GB	768 GB

Video	SVGA	SVGA
Memory	16 MB	16 MB
HDD controller	SAS/SATA	SAS/SATA
Channels	8	8
Connector internal	2	2
RAID controller	M5110e (1GB Flash)	M5110e (1GB Flash)
HDD (5)		
Total bays	18 (with upgrade)	18 (with upgrade)
5.25 slim	1	1
3.5-in tape	1	1
Hot-swap (3.5-in)	0	0
Hot-swap (2.5-in)	16 (with upgrade)	16 (with upgrade)
Internal capacity	25.6 TB (with SSD upgrade)	25.6 TB (with SSD upgrade)
Bays available	10 standard	10 standard
5.25 slim	1	1
3.5-in tape	1	1
Hot-swap (3.5-in)	0	0
Hot-swap (2.5-in)	8	8
Total PCI slots (6)	6 (with upgrade)	6 (with upgrade)
PCI_E (x8)	3 standard	3 standard
Total PCI slots	3	3
PCI-E Gen3 x8 FH/FL	1	1
PCI-E Gen3 x8 FH/HL	2	2
Slots available	3	3
PCI-E Gen3 x8 FH/FL	1	1
PCI-E Gen3 x8 FH/HL	2	2
System management	Standard	Standard
Ethernet controller	Four 1 Gb	Four 1 Gb
Optical drive (SATA)	Optional	Optional
Power supply	750 W	900 W
Number standard	1	1
Maximum	2	2
Hot-swap	Yes	Yes
Redundant power	Optional	Optional
Auto restart	Yes	Yes
	791523x	791533x
Processor	Xeon E5-2637 v2 (130W)	Xeon E5-2643 v2 (130W)
Internal speed	3.5 GHz	3.5 GHz
External speed	8.0 GT/s	8.0 GT/s
Number cores	4	6
Number standard	1	1
Maximum	2	2
Cache (full-speed)	15 MB	25 MB
Memory	8 GB ECC 1866 MHz RDIMM	8 GB ECC 1866 MHz RDIMM
RDIMMs	1 x 8 GB (1Rx4,1.5V)	1 x 8 GB (1Rx4,1.5V)
DIMM sockets	24	24
Capacity (4)	768 GB	768 GB
Video	SVGA	SVGA
Memory	16 MB	16 MB
HDD controller	SAS/SATA	SAS/SATA
Channels	8	8
Connector internal	2	2
RAID controller	M5110e (no Cache/Flash)	M5110e (no Cache/Flash)
HDD (5)		
Total bays	18 (with upgrade)	18 (with upgrade)
5.25 slim	1	1
3.5-in tape	1	1
Hot-swap (3.5-in)	0	0
Hot-swap (2.5-in)	16 (with upgrade)	16 (with upgrade)
Internal capacity	25.6 TB (with SSD upgrade)	25.6 TB (with SSD upgrade)
Bays available	10 standard	10 standard
5.25 slim	1	1
3.5-in tape	1	1
Hot-swap (3.5-in)	0	0
Hot-swap (2.5-in)	8	8
Total PCI slots (6)	6 (with upgrade)	6 (with upgrade)
PCI_E (x8)	3 standard	3 standard
Total PCI slots	3	3
PCI-E Gen3 x8 FH/FL	1	1

PCI-E Gen3 x8 FH/HL	2	2
Slots available	3	3
PCI-E Gen3 x8 FH/FL	1	1
PCI-E Gen3 x8 FH/HL	2	2
System management	Standard	Standard
Ethernet controller	Four 1 Gb	Four 1 Gb
Optical drive (SATA)	Optional	Optional
Power supply	900 W	900 W
Number standard	1	1
Maximum	2	2
Hot-swap	Yes	Yes
Redundant power	Optional	Optional
Auto restart	Yes	Yes

	791543x	7915M3x
Processor	Xeon E5-2667 v2 (130W)	Xeon E5-2690 v2 (130W)
Internal speed	3.3 GHz	3.0 GHz
External speed	8.0 GT/s	8.0 GT/s
Number cores	8	10
Number standard	1	1
Maximum	2	2
Cache (full-speed)	25 MB	25 MB
Memory	8 GB ECC 1866 MHz RDIMM	8 GB ECC 1866 MHz RDIMM
RDIMMs	1 x 8 GB (1Rx4,1.5V)	1 x 8 GB (1Rx4,1.5V)
DIMM sockets	24	24
Capacity (4)	768 GB	768 GB
Video	SVGA	SVGA
Memory	16 MB	16 MB
HDD controller	SAS/SATA	SAS/SATA
Channels	8	8
Connector internal	2	2
RAID controller	M5110e (no Cache/Flash)	M5110e (no Cache/Flash)
HDD (5)		
Total bays	18 (with upgrade)	18 (with upgrade)
5.25 slim	1	1
3.5-in tape	1	1
Hot-swap (3.5-in)	0	0
Hot-swap (2.5-in)	16 (with upgrade)	16 (with upgrade)
Internal capacity	25.6 TB (with SSD upgrade)	25.6 TB (with SSD upgrade)
Bays available	10 standard	10 standard
5.25 slim	1	1
3.5-in tape	1	1
Hot-swap (3.5-in)	0	0
Hot-swap (2.5-in)	8	8
Total PCI slots (6)	6 (with upgrade)	6 (with upgrade)
PCI_E (x8)	3 standard	3 standard
Total PCI slots	3	3
PCI-E Gen3 x8 FH/FL	1	1
PCI-E Gen3 x8 FH/HL	2	2
Slots available	3	3
PCI-E Gen3 x8 FH/FL	1	1
PCI-E Gen3 x8 FH/HL	2	2
System management	Standard	Standard
Ethernet controller	Four 1 Gb	Four 1 Gb
Optical drive (SATA)	Optional	Optional
Power supply	900 W	900 W
Number standard	1	1
Maximum	2	2
Hot-swap	Yes	Yes
Redundant power	Optional	Optional
Auto restart	Yes	Yes

	791553x	791573x
Processor	Xeon E5-2650L v2 (70W)	Xeon E5-2695 v2 (115W)
Internal speed	1.7 GHz	2.4 GHz
External speed	8.0 GT/s	8.0 GT/s
Number cores	10	12
Number standard	1	1
Maximum	2	2
Cache (full-speed)	25 MB	30 MB

Memory	8 GB ECC 1600 MHz RDIMM	8 GB ECC 1866 MHz RDIMM
RDIMMs	1 x 8 GB (2Rx8,1.35V)	1 x 8 GB (1Rx4,1.5V)
DIMM sockets	24	24
Capacity (4)	768 GB	768 GB
Video	SVGA	SVGA
Memory	16 MB	16 MB
HDD controller	SAS/SATA	SAS/SATA
Channels	8	8
Connector internal	2	2
RAID controller	M5110e (1GB Flash)	M5110e (1GB Flash)
HDD (5)		
Total bays	18 (with upgrade)	18 (with upgrade)
5.25 slim	1	1
3.5-in tape	1	1
Hot-swap (3.5-in)	0	0
Hot-swap (2.5-in)	16 (with upgrade)	16 (with upgrade)
Internal capacity	25.6 TB (with SSD upgrade)	25.6 TB (with SSD upgrade)
Bays available	10 standard	10 standard
5.25 slim	1	1
3.5-in tape	1	1
Hot-swap (3.5-in)	0	0
Hot-swap (2.5-in)	8	8
Total PCI slots (6)	6 (with upgrade)	6 (with upgrade)
PCI_E (x8)	3 standard	3 standard
Total PCI slots	3	3
PCI-E Gen3 x8 FH/FL	1	1
PCI-E Gen3 x8 FH/HL	2	2
Slots available	3	3
PCI-E Gen3 x8 FH/FL	1	1
PCI-E Gen3 x8 FH/HL	2	2
System management	Standard	Standard
Ethernet controller	Four 1 Gb	Four 1 Gb
Optical drive (SATA)	Optional	Optional
Power supply	550 W	900 W
Number standard	1	1
Maximum	2	2
Hot-swap	Yes	Yes
Redundant power	Optional	Optional
Auto restart	Yes	Yes

791583x

Processor	Xeon E5-2697 v2 (130W)
Internal speed	2.7 GHz
External speed	8.0 GT/s
Number cores	12
Number standard	1
Maximum	2
Cache (full-speed)	30 MB
Memory	8 GB ECC 1866 MHz RDIMM
RDIMMs	1 x 8 GB (1Rx4,1.5V)
DIMM sockets	24
Capacity (4)	768 GB
Video	SVGA
Memory	16 MB
HDD controller	SAS/SATA
Channels	8
Connector internal	2
RAID controller	M5110e (1GB Flash)
HDD (5)	
Total bays	18 (with upgrade)
5.25 slim	1
3.5-in tape	1
Hot-swap (3.5-in)	0
Hot-swap (2.5-in)	16 (with upgrade)
Internal capacity	25.6 TB (with upgrade)
Bays available	10 standard
5.25 slim	1
3.5-in tape	1
Hot-swap (3.5-in)	0
Hot-swap (2.5-in)	8

```
Total PCI slots (6)    6 (with upgrade)
  PCI_E (x8)           3 standard
Total PCI slots        3
 PCI-E Gen3 x8 FH/FL   1
 PCI-E Gen3 x8 FH/HL   2
Slots available        3
 PCI-E Gen3 x8 FH/FL   1
 PCI-E Gen3 x8 FH/HL   2
System management      Standard
Ethernet controller    Four 1 Gb
Optical drive (SATA)   Optional
Power supply           900 W
  Number standard      1
  Maximum              2
  Hot-swap             Yes
  Redundant power      Optional
  Auto restart         Yes
```

[4] Maximum of 384 GB by using twenty-four 16 GB optional RDIMMs, or up to 768 GB of memory with LRDIMM or HyperCloud DIMMs.

[5] The standard system can hold eight 2.5-inch HS HDDs. Maximum capacities are based on installation of 2.5-inch 1.6 TB HS SSD with 16x 2.5-inch option fitted or by six 3-inch 4 TB 3.5-inch SAS/SATA HDDs.

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] Standard models have three PCI-E slots from processor 1. You may replace the standard PCI-E Riser card with the PCI Riser Card PCI-X Option for PCI/PCI-X 133 MHz/100 MHz 64-bit, or 66 MHz/33 MHz 32-bit slots. Two processor machines have up to six PCI slots. When the second processor is fitted, along with second riser card, this adds a further two or three slots:

```
- 1x PCI-E Gen3 x16 FH/FL plus 1x PCI-E Gen3 x8 FH/HL
- 2x PCI-E Gen3 x8 FH/FL plus 1x PCI-E Gen3 x8 FH/HL
- 2x PCI-X FH/FL plus 1x PCI-E Gen3 x16 FH/HL
```

Video subsystem

- SVGA compatible video controller (Matrox G200eR2).
- Integrated on Integrated Management Module (iMM2).
- Integrated on planar and connected to the PCI bus.
- DDR3 528 or 504 MHz SDRAM video memory controller.
- Video memory is not expandable.
- One DVI (Digital Video Interface) is not used.
- Avocent Digital Video Compression (with IBM Integrated Management Module Advanced Upgrade)

Supported video modes

Width	Height	Refresh	Bpp
640	400	60, 72, 75, 85	8, 16, 32
800	600	56, 60, 72, 75, 85	8, 16, 32
1,024	768	60, 70, 75, 85	8, 16, 32
1,152	864	60	8, 16, 32
1,280	1,024	60	8, 16, 32
1,280	1,024	75, 85	8, 16
1,440	900	60	8, 16, 32
1,440	900	75, 85	8, 16
1,600	1,200	60, 65, 70, 75, 85	8, 16
1,680	1,050	60, 75, 85	8, 16

The maximum resolution of the video controller is 1600 x 1200[7] at 75.

[7] The maximum screen resolution is not supported for all Bits per Pixel (color depth) and refresh rates. The maximum Bits per Pixel (color depth) is not supported for all resolutions and refresh rates.

Dimensions

```
          2U Rack Drawer
   -  Width:  445 mm (17.52 in)
   -  Depth:  746 mm (29.37 in)
   -  Height:  86.5 mm (3.41 in)

Rack:
   -  Weight: (minimum configuration)  25 kg (55 lb)
   -  Weight: (maximum configuration)  30 kg (65 lb)
```

Electrical

Models with 550 W power supplies:

- 100 - 127 (nominal) V ac; 50 Hz or 60 Hz; 6.5 A
- 200 - 240 (nominal) V ac; 50 Hz or 60 Hz; 3.3 A
- Input kilovolt-amperes (kVA) (approximately):
  - Minimum configuration: 0.16 kVA
  - Maximum configuration: 0.731 kVA

Models with 750 W power supplies:

- 100 - 127 (nominal) V ac; 50 Hz or 60 Hz; 8.9 A
- 200 - 240 (nominal) V ac; 50 Hz or 60 Hz; 4.5 A
  - Minimum configuration: 0.15 kVA
  - Maximum configuration: 0.993 kVA

Models with 900 W power supplies:

- 100 - 127 (nominal) V ac; 50 Hz or 60 Hz; 10.0 A
- 200 - 240 (nominal) V ac; 50 Hz or 60 Hz; 5.0 A
  - Minimum configuration: 0.15 kVA
  - Maximum configuration: 1.201 kVA
- Btu output:
  - Minimum configuration: 525.45 Btu/hr (ac 154 watts)
  - Maximum configuration: 4053 Btu/hr (ac 1188 watts)
- Noise level: 6.6 bels (operating)
- Noise level: 6.4 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.

- Russia/GOST ME01, IEC-60950-1, GOST R 51318.22, GOST R 51318.24, GOST R 51317.3.2, GOST R 51317.3.3
- IEC 60950-1 (CB Certificate and CB Test Report)
- CE Mark (EN55022 Class A, EN60950-1, EN55024, EN61000-3-2, EN61000-3-3)
- CISPR 22, Class A
- TUV-GS (EN60950-1 /IEC60950-1,EK1-ITB2000)

Operating environment

Environment

The IBM System x3650 M4 HD compute node complies with ASHRAE class A3 specifications.

Power on:

- Temperature: 5°C to 40°C (41° F to 104°F) up to 950 m (3,117 ft) - Above 950 m, de-rated maximum air temperature 1°C / 175 m
- Humidity, noncondensing: -12°C dew point (10.4°F) and 8% - 85% relative humidity
- Maximum dew point: 24°C (75°F)
- Maximum altitude: 3050 m (10,000 ft) and 5°C - 28°C (41°F - 82°F)
- Maximum rate of temperature change: 5°C/hr (41°F/hr) for tape drive, 20°C/hr (68°F/hr) for HDDs

Power off:

- Temperature: 5°C to 45°C (41°F - 113°F)
- Relative humidity: 8% - 85%
- Maximum dew point: 27°C (80.6°F)

Storage (nonoperating):

- Temperature: 1°C to 60°C (33.8°F - 140°F)
- Altitude: 3050 m (10,000 ft)
- Relative humidity: 5% - 80%
- Maximum dew point: 29°C (84.2°F)

Shipment (nonoperating):

- Temperature: -40°C to 60°C (-40°F - 140°F)
- Altitude: 10,700 m (35,105 ft)
- Relative humidity: 5% - 100%
- Maximum dew point: 29°C (84.2°F)

Particulate contamination

Attention:

Design to ASHRAE Class A3, Temperature: 36°C - 40°C (96.8°F - 104°F) with relaxed support:

- The server supports cloud-like workload with no performance degradation acceptable (Turbo-Off).
- Under no circumstance, can any combination of worst case workload and configuration result in system shutdown or design exposure at 40°C.
- The worst case workload (like Linpack, Turbo-On) may have performance degradation.

Specific processors supported environment:

- Processor E5-2690 v1/135W Temperature: 10°C - 35°C (41°F - 95°F); Altitude: 0 - 304.8 m (1,000 ft)
- GPU 90Y2388 NVIDIA Quadro K5000: 10°C - 35°C (50°F - 95°F); Altitude: 0 - 914.4 m (3,000 ft)
- GPU 90Y2392 NVIDIA Tesla K20C: 10°C - 35°C (50°F - 95°F); Altitude: 0 - 914.4 m (3,000 ft)

Homologation

This product is not certified for direct connection by any means whatsoever to interfaces of public telecommunications networks. Certification may be required by law prior to making any such connection. Contact an IBM representative or reseller for any questions.

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 M4 server.

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 HPC Server 2008
- Linux™
  - SUSE Linux Enterprise Server 11 for AMD64/EM64T
  - Red Hat Enterprise Linux 5 Server x64 Edition

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 M4 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 M4 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 M4 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.
- System x3650 M4 servers can address a maximum of 768 GB of system memory. All supported system memory is addressable through direct memory access. The System x3650 M4 server supports 2 GB, 4 GB, 8 GB, and 16 GB DDR-3 SDRAM Registered DIMMs, 16 GB and 32 GB HyperCloud DIMMs, or 32 GB LRDIMM. Different types of DIMMs can not coexist in the same system. Refer to the Planning information section for supported memory options.
- To ensure proper air flow for cooling, the System x3650 M4 server requires a rack with a perforated door, such as the 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.
- Regarding the use of SSDs, solid-state memory cells have an intrinsic, finite number of write cycles that each cell can incur. As a result each solid-state device has a maximum amount of write cycles it can be subjected to, documented as TBW (Total Bytes Written). IBM is not responsible for replacement of hardware that has reached the maximum guaranteed number of write cycles. This limit may be revealed as the device failing to respond to system-generated commands or becoming incapable of being written to. Additional information is available at

  http://www-03.ibm.com/systems/x/options/storage/solidstate/index.html

  http://www-03.ibm.com/systems/x/options/storage/solidstate/adapters.html

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

Planning information

Customer responsibilities

The System x3650 M4 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 using Instruction 01R1356
- Integrated Mirroring with HotSpare - Three HDDs required using Instruction 01R1357

Cabling

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

Rack installations

System x3650 M4 server 2U rack-drawer models should be installed in a 19-inch rack cabinet designed for 30-inch deep devices, such as the NetBAY42U ER. Installation into some of the older Netfinity® racks (9306900, 9306910, 9306200) requires a rack extension kit.

If a System x3650 M4 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 698.5 - 762 mm (27.5 in - 30 in.).
- The thickness of the mounting flanges must be 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.

Supported memory options

The following memory options are supported:

```
46W0761 32GB (4Gb, 4Rx4, 1.5V) PC3-14900 DDR3 1866MHz LP LR-DIMM
00D5020 4GB (1x4GB, 1Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM
00D5024 4GB (1x4GB, 1Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP
         RDIMM
00D5032 8GB (1x8GB, 1Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM
00D5036 8GB (1x8GB, 1Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP
         RDIMM
```

```
00D5044 8GB (1x8GB, 2Rx8, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP
         RDIMM
00D5048 16GB (1x16GB, 2Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP
         RDIMM
46W0672 16GB (1x16GB, 2Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP
         RDIMM
46W0767 32GB(1x32GB,1.35V)PC3L-10600 CL9 ECC DDR3 1333MHz LP HyperCloud
         RDIMM
00D5016 8GB (1x8GB, 2Rx8, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP
         UDIMM
```

Power considerations

The System x3650 M4 server includes a standard 550-watt, 750-watt, or 900-watt hot-swap power supply. A System x3650 M4 hot-swap power supply upgrade is optionally available to support redundancy.

Cable orders

Four 10/100/1000 Mbps, full-duplex Ethernet PCI controllers, standard with the System x3650 M4 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 M4 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

Ship group

```
System x3650 M4      System unit carton

                         Contents:

        Important Notices Flyer
        Rack Installation Instructions
        CD - Documentation (installation and User Guides)
```

The System x3650 M4 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 client'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.

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.

IBM Electronic Services

Electronic Service Agent™ and the IBM Electronic Support web portal are dedicated to providing fast, exceptional support to IBM Systems customers. The IBM Electronic Service Agent tool is a no-additional-charge tool that proactively monitors and reports hardware events, such as system errors, performance issues, and inventory. The Electronic Service Agent tool can help you stay focused on your company's strategic business initiatives, save time, and spend less effort managing day-to-day IT maintenance issues. Servers enabled with this tool can be monitored remotely around the clock by IBM Support all at no additional cost to you.

Now integrated into the base operating system of AIX® 5.3, AIX 6.1, and AIX 7.1, Electronic Service Agent is designed to automatically and electronically report system failures and utilization issues to IBM , which can result in faster problem resolution and increased availability. System configuration and inventory information collected by the Electronic Service Agent tool also can be viewed on the secure Electronic Support web portal, and used to improve problem determination and resolution by you and the IBM support team. To access the tool main menu, simply type "smitty esa_main", and select "Configure Electronic Service Agent ." In addition, ESA now includes a powerful web user interface, giving the administrator easy access to status, tool settings, problem information, and filters. For more information and documentation on how to configure and use Electronic Service Agent , refer to

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

The IBM Electronic Support portal is a single Internet entry point that replaces the multiple entry points traditionally used to access IBM Internet services and support. This portal enables you to gain easier access to IBM resources for assistance in resolving technical problems. The My Systems and Premium Search functions make it even easier for Electronic Service Agent tool-enabled customers to track system inventory and find pertinent fixes.

Benefits

Increased uptime: The Electronic Service Agent tool is designed to enhance the Warranty or Maintenance Agreement by providing faster hardware error reporting and uploading system information to IBM Support. This can translate to less wasted time monitoring the "symptoms," diagnosing the error, and manually calling IBM Support to open a problem record. Its 24x7 monitoring and reporting mean no more dependence on human intervention or off-hours customer personnel when errors are encountered in the middle of the night.

Security: The Electronic Service Agent tool is designed to be secure in monitoring, reporting, and storing the data at IBM . The Electronic Service Agent tool securely transmits via either the Internet (HTTPS or VPN) or modem, and can be configured to communicate securely through gateways to provide customers a single point of exit from their site. Communication is one way. Activating Electronic Service Agent

does not enable IBM to call into a customer's system. System inventory information is stored in a secure database, which is protected behind IBM firewalls. It is viewable only by the customer and IBM . The customer's business applications or business data is never transmitted to IBM .

More accurate reporting: Since system information and error logs are automatically uploaded to the IBM Support center in conjunction with the service request, customers are not required to find and send system information, decreasing the risk of misreported or misdiagnosed errors. Once inside IBM , problem error data is run through a data knowledge management system and knowledge articles are appended to the problem record.

Customized support: Using the IBM ID entered during activation, customers can view system and support information in the "My Systems" and "Premium Search" sections of the Electronic Support website at

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

My Systems provides valuable reports of installed hardware and software using information collected from the systems by Electronic Service Agent . Reports are available for any system associated with the customer's IBM ID. Premium Search combines the function of search and the value of Electronic Service Agent information, providing advanced search of the technical support knowledgebase. Using Premium Search and the Electronic Service Agent information that has been collected from your system, customers are able to see search results that apply specifically to their systems.

For more information on how to utilize the power of IBM Electronic Services, contact your IBM Systems Services Representative, or visit

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

Terms and conditions

Warranty period

- System - Three years
- Optional features - One year
- ServeRAID M5100 Battery - One year

  Note: The ServeRAID M5100 Battery has a one-year warranty period effective on its "Date of Installation." All other product warranty terms for the machine remain unchanged.

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, supply items, or structural parts and therefore not covered by this warranty:

- Baffles
- Fillers
- Covers
- Tape bezel chassis
- Slide kits and cable management arms or kits
- Misc parts kit
- Fan bracket kit

- Lift handle kit
- Battery trays and holders
- HDD, 4 slot hot swap kit

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:

- CMOS batteries
- Hard disk drives
- Hot-swap fan
- Hot-swap AC power supply
- Memory DIMM
- Optical drive
- PCI adapter
- Power cord
- Service label
- System label
- Hypervisor USB key
- PCI riser
- RAID card without Battery
- Tape drive
- Ethernet daughter card
- Backplane

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 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.

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-947.ibm.com/support/entry/portal/docdisplay?lndocid=GCOR-3FBJK2

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.

Warranty service upgrades

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-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.

Prices

For all local charges, contact your IBM representative.

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

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