



IBM System x3650 M4 server model includes Intel Xeon E5-2600 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 two DIMMs per channel at 1600 MHz with supported 1600 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.
- Up to six PCIe 3.0 slots 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).

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

Overview

This 2U-high, rack-optimized server features 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 8-core powerful Intel Xeon™ E5-2600 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, fast memory bandwidth with

the ability to run two DIMMs per channel at 1600 MHz with supported 1600 MHz RDIMMs

- Integrated IBM ServeRAID M5110e on the motherboard, 6 Gbps hardware RAID-0, RAID-1, RAID-10; optional RAID-5, RAID-50, or RAID-6, RAID-60 (model dependent) and up to 1 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
- 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, help provide flexibility, greater performance with long-term investment protection
- New 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
- Compliant 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 datacenter 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 are designed to make it easy to replace failures without taking your system down
- Hot-swap, redundant fans with calibrated vectored cooling keep components cool, and simplified fan replacement
- Hot-swap, redundant power supplies to help reduce downtime
- Hot-swap, RAID protection disk helps secure your data and reduce downtime
- Predictive Failure Analysis provides advanced warning on memory, disks, fans, and power supplies
- Drop-down light path diagnostics panel 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 labor¹, limited warranty²; optional warranty service upgrades available

IBM is also releasing models that come preinstalled with SAP Discovery System V5. The SAP Discovery System is a fully configured and preintegrated service-oriented

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

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

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

Feature exchange

None

Key prerequisites

Monitor, USB keyboard, and USB mouse.

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

Planned availability date

September 19, 2012

Description

System x3650 M4 server

The System x3650 M4 server features Intel Xeon multicore processors that support internal processing speeds of up to 3.3 GHz³, and processing operations to memory up to 1600 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. Up to 20 MB cache, and up to two 8.0 GT/s QuickPath interconnect (QPI) with new Hyper Threading and Intel™ Turbo Boost Technology 2.0. It incorporates powerful Xeon processors with up to 20 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 1600 MHz DRAM clock speed and offer maximum 12800 Mbps bandwidth, processor-to-memory subsystem performance. The x3650 M4 server uses the Intel E5-2600 processor with Chipkill technology to maximize throughput from processors, to memory, to the 32-bit and 64-bit PCI buses.

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

Standard System x3650 M4 configurations

Model number	Processor	Memory	HDD		HDD	Other
			GT/s	Interface		
791532x	3.3 GHz Cache: 10 MB	4 GB	8.0	SAS/SATA M5110e	2.5-in	Open bay hot-swap 1 x 900W
7915M2x	2.9 GHz Cache: 20 MB	4 GB	8.0	SAS/SATA M5110e	2.5-in	Open bay hot-swap 1 x 900W
7915GSx	2.0 GHz Cache: 20 MB	32 GB	8.0	SAS/SATA M5100e+1GB Flash	2.5-in	1x1 TB 7x600 GB hot-swap SAP Disc 2 x 750W

Note: The model "x" designation is geography dependent and is spelled out explicitly in the [Product number](#) section

Additional features

- Up to 16-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, and 16 GB DDR3 PC3-12800 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
 - 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 (stand 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.)
- Compliant 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, 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 Socket Layer (SSL) and Lightweight Directory Access Protocol (LDAP).
- Built-in LAN and serial connectivity that supports virtually any network infrastructure.
- Multiple alerting functions to warn systems administrators of potential problems through email, IPMI PETS, and SNMP.

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 datacenter. Active Energy Manager, an extension to IBM Director systems management software, allows clients to "meter" actual power usage and trend data for any single physical system or group of systems. Developed by IBM Research, Active Energy Manager utilizes IBM-developed monitoring circuitry to help identify 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. Visit

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

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

Product number

The following are features already announced for the 3331, 7915 machine type:

Description	MT	Model	Feature
NVIDIA Quadro 4000	7915	AC1 MC1	4798
IBM DDS Gen 6 USB Tape Drive	7915	AC1 MC1	5395
IBM 200GB SATA 2.5" MLC SS SSD	7915	AC1 MC1	5419
IBM 200GB SATA 1.8" MLC SSD	7915	AC1 MC1	5420
IBM 50GB SATA 1.8" MLC SSD	7915	AC1 MC1	5428
IBM DDS Generation 5 USB Tape Drive	7915	AC1 MC1	5711
1.8" SAS Storage Support	7915	AC1	6138
NVIDIA Quadro 2000	7915	AC1 MC1	A1QU
IBM RDX 1TB Cartridge	7915	AC1 MC1	A1VL
Qlogic Dual Port 10GbE SFP+ Embedded VFA for IBM System x	7915	AC1 MC1	A22H
Mellanox ConnectX-3 Dual Port QDR/FDR10 Mezz Card	7915	AC1 MC1	A24F
4GB (1x4GB, 2Rx8, 1.5V) PC3-12800 CL11 ECC DDR3 1600MHZ LP RDIMM	7915	AC1 MC1	A24L
Mellanox ConnectX-2 Dual-port QSFP QDR IB Adapter for IBM System x	7915	AC1 MC1	A2MY
Emulex VFA III FCoE/iSCSI License for IBM System x			

(FoD)	7915	AC1 MC1	A2U2
IBM RDX 3 Internal USB Drive	7915	AC1 MC1	A2U7
IBM 128GB SATA 2.5" MLC SS Enterprise Value SSD	7915	AC1 MC1	A2UB
IBM 256GB SATA 2.5" MLC SS Enterprise Value SSD	7915	AC1 MC1	A2UC
Server RAID M5110 SAS/SATA Controller for IBM System x	7915	AC1 MC1	A347
IBM USB Memory Key for VMware ESXi 5.0 Update1	7915	AC1 MC1	A383
Intel Xeon Processor E5-2658 8C 2.1GHz 20MB Cache 1600MHz 95W	7915	AC1 MC1	A395
Intel Xeon Processor E5-2648L 8C 1.8GHz 20MB Cache 1600MHz 70W	7915	AC1 MC1	A396
Addl Intel Xeon Processor E5-2658 8C 2.1GHz 20MB 95W w/Fan	3331	HC1	A397
Addl Intel Xeon Processor E5-2658 8C 2.1GHz 20MB 95W w/Fan	7915	AC1 MC1	
Addl Intel Xeon Processor E5-2648L 8C 1.8GHz 20MB 70W w/Fan	3331	HC1	A398
Addl Intel Xeon Processor E5-2648L 8C 1.8GHz 20MB 70W w/Fan	7915	AC1 MC1	
IBM System x 750W High Efficiency -48 V DC Power Supply	7915	AC1 MC1	A39N
x3650 M4 Plus 8 2.5" HS HDD Assembly Kit	7915	AC1 MC1	A39W
x3650 M4 Hot-Swap 16/32 HDD Assembly Kit	7915	AC1 MC1	A39X
x3650 M4 16 Plus 16 1.8" SSD Assembly Kit	7915	AC1 MC1	A39Y
x3650 M4 8 2.5" Plus 16 1.8" SSD Assembly Kit	7915	AC1 MC1	A39Z
x3650 M4 2.5" Simple Swap Kit	7915	AC1 MC1	A3A0
x3650 M4 PCIe Riser Card 2 (1 x16 for GPU + 1 x8 FH/HL Slots)	7915	AC1 MC1	A3A1
IBM LLM-SM Dual Port 10GbE SFP+ Adapter for IBM System x	7915	AC1 MC1	A3A2
x3650 M4 925MM SAS Cable	7915	AC1 MC1	A3E9
x3650 M4 820MM SAS Cable	7915	AC1 MC1	A3EA
32GB (1x32GB, 1.5V) PC3-8500 CL7 ECC DDR3 1066MHZ LP HyperCloud DIMM	3331	HC1	A3EJ
32GB (1x32GB, 1.5V) PC3-8500 CL7 ECC DDR3 1066MHZ LP HyperCloud DIMM	7915	AC1 MC1	
x3650 M4 Plus 8 2.5" HS HDD Assembly Option Kit	3331	HC1	A3FP
x3650 M4 16 Plus 16 1.8" SSD Assembly Option Kit	3331	HC1	A3FQ
x3650 M4 8 2.5" Plus 16 1.8" SSD Assembly Option Kit	3331	HC1	A3FR
x3650 M4 PCIe Riser Card 2 (1 x16 for GPU + 1 x8 FH/HL Slots)	3331	HC1	A3A1
x3650 M4 925MM SAS Cable	3331	HC1	A3E9
IBM LLM-SM Dual Port 10GbE SFP+ Adapter for IBM System x	3331	HC1	A3A2
Qlogic Dual Port 10GbE SFP+ Embedded VFA for IBM System x	3331	HC1	A22H
Qlogic Embedded VFA FCoE/iSCSI License for IBM System x (FoD)	3331	HC1	A2TF

Single Entity Offerings (SEOs)

Description	SEO Number
IBM System x3650 M4	791532U 7915M2U 7915GSU

Note: The preinstalled SAP Discovery system V5, SAP Business all-in-one is included with the 7915GSU.

Option SEOs

The following are new unique option part numbers for System x3650 M4 server.

SEO number	Description
00D5004	32GB (1x32GB, 1.5V)PC3-8500 CL7 ECC DDR3 1066MHZ LP HyperCloud DIMM
00D9450	Intel Xeon Processor E5-2658 8C 2.1GHZ 20MB 1600MHZ 95W w/Fan
00D9451	Intel Xeon Processor E5-2648L 8C 1.8GHZ 20MB 1600MHZ 70W w/Fan
00D9490	x3650 M4 Plus 8 2.5" HS HDD Assembly Option Kit
00D9492	x3650 M4 16 Plus 16 1.8" SSD Assembly Option Kit
00D9493	x3650 M4 8 2.5" Plus 16 1.8" SSD Assembly Option Kit
90Y5085	x3650 M4 PCIe Riser Card 2 (1 x16 for GPU + 1 x8 FH/HL slots)
00D9532	x3650 M4 925MM SAS Cable
00D9501	IBM LLM-SM Dual Port 10GbE SFP+ Adapter for IBM System x
90Y6454	QLogic Dual Port 10GbE SFP+ Embedded VFA for IBM System x
90Y5179	QLogic Embedded VFA FCoE/iSCSI License for IBM System x (FOD)

Business Partner information

If you are a Direct Reseller - System Reseller acquiring products from IBM, you may link directly to Business Partner information for this announcement. A PartnerWorld ID and password are required (use IBM ID).

<https://www.ibm.com/partnerworld/mem/sla.jsp?num=112-144>

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 publications *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/>

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.

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.

System x and BladeCenter support services

Recommended core technical support

When you buy IBM System x technology, include the support services you need -- to help keep both your hardware and software working for you, day after day, at peak performance. It is your first step toward helping to protect your investment and sustain high levels of system availability. We offer service-level and response-time options to fit your business needs. And we will help you get started with a core support package that includes:

- **Continuous system monitoring**
Electronic monitoring that helps speed up problem-solving with automated, early detection of potential problems and system errors.
- **Hardware maintenance**
World-class remote and on-site hardware problem determination and repair services.
- **Software technical support**
Access to help line calls for fast, accurate answers to your questions during installation and throughout ongoing operations.

For more information, visit

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

Technical information

Specified operating environment

Physical specifications

System x3650 M4:

	791532x	7915M2x
Processor	Xeon E5-2643 4C (130w)	Xeon E5-2690 8C (135w)
Internal speed	3.3 GHZ	2.9 GHZ
External speed	8.0 GTS	8.0 GTS
Number standard	1	1
Maximum	2	2
L3 cache (full-speed)	10 MB	20 MB
Memory	4 GB ECC 1600 MHZ RDIMM	4 GB ECC 1600 MHZ RDIMM
RDIMMs	1 x 4 GB (2Gb,1Rx4,1.5V)	1 x 4 GB (2Gb,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	M5110e
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	16 TB (with upgrade)	16 TB (with 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
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

	7915GSx
Processor	Xeon E5-2650 8C (95w)
Internal speed	2.0 GHZ
External speed	8.0 GTS
Number standard	1
Maximum	2
L3 cache (full-speed)	20 MB
Memory	32 GB ECC 1600 MHZ
RDIMMs	4 x 8 GB
DIMM sockets	24
Capacity ⁴	768 GB
Video	SVGA
Memory	16 MB
HDD controller	SAS/SATA
Channels	8
Connector internal	2
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	16 TB (with upgrade)
Bays available	2 standard
5.25 slim	1
3.5-in tape	1
Hot-swap (3.5-in)	0
Hot-swap (2.5-in)	0 standard 1 x 1 TB and 7 x 600 GB
Total PCI slots ⁶	6 (with upgrade)
PCI_E (x8)	3 standard
System management	Standard
Ethernet controller	Four 1 Gb
Optical drive (SATA)	Optional
Power supply	2 (750 w)
Number standard	2
Maximum	2
Hot-swap	Yes
Redundant power	Yes
Auto restart	Yes

⁴ Maximum of 384 GB by using twenty-four 16 GB optional DIMMs, 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 sixteen 1 TB SAS HDDs with or by six 3 TB 3.5-inch 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 PCI_E is the standard feature for PCI or you may replace it with the PCI Riser Card PCI-X Option for PCI/PCI-X 133 MHz/100 MHz 64-bit, or 66 MHz/33 MHz 32-bit slots. Two processor machines have six PCI slots.

MultiBurner plus drive

- Specifications
 - DVD-ROM (6.6x-16x CAV, 4.7 GB DVD-ROM read): 9.17 - 22.16 Mbps
 - DVD-ROM (5.0x-126x CAV, 8.5 GB Dual-layer read): 6.8 - 16.62 Mbps
 - DVD-R/+R (3.3x-8X CAV, 4.7 GB DVD-R/+R read): 5.73 - 13.85 Mbps
 - DVD-R/+R (3.3x-8X CAV, 8.5 GB DVD-R/+R read): 4.58 - 11.08 Mbps
 - DVD-RW/+RW (3.3x-8X CAV, 4.7 GB DVD-RW/+RW read): 4.58 to 11.08 Mbps
 - DVD-RAM (6x-12x PCAV, 4.7 GB DVD_RAM read): 8.31 - 16.62 Mbps
 - CD-R/RW/ROM (17-40x CAV, read): 2.6 - 6.0 Mbps
 - DVD-R/+R (1x -16X PCAV, 4.7 GB DVD-R/+R write): 9.9 - 22.16 Mbps
 - DVD-R/+R (2x-8X CLV, 8.5 GB DVD-R/+R Dual-layer write): 5.54 Mbps
 - DVD-RW (2x-6X CLV, 4.7 GB DVD-RW write): 8.31 Mbps
 - DVD+RW (3.3x - 8X ZCLV, 4.7 GB DVD+RW write): 4.57 - 11.08 Mbps
 - DVD-RAM (6x-16x PCAV, 4.7 GB DVD-RAM write): 8.31 - 16.62 Mbps
 - CD-RW (8-32x ZCLV, write): 4.8 Mbps
- Max burst data transfer rate: Ultra DMA Mode 4: 66.6 Mbps
- Average access times:
 - DVD-ROM including latency and error correction: 145 ms
 - DVD-RAM including latency and error correction: 175 ms
 - CD-ROM including latency and error correction: 125 ms

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 1200⁷ 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: 0.66 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: 0.90 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: 1.022 kVA
- Btu output:
 - Minimum configuration: 525.45 Btu/hr (ac 154 watts)
 - Maximum configuration: 3480.24 Btu/hr (ac 1020 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.

Standards

These systems support or comply with the following standards:

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

Equipment agency approvals and safety

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

Operating environment

Air temperature:

- Server on: 5°C to 40°C (41.0°F to 104°F); altitude: 0 to 915 m (3,000 ft) for 60W to 95W processors models.
- Server on: 10°C to 35°C (50.0°F to 95°F); altitude: 0 to 915 m (3,000 ft) for 115W to 135W processors models.
- Server off: 5°C to 45°C (41.0°F to 113°F)
- Shipment: -40°C to +60°C (-40°F to 140°F)

Humidity:

For 115W to 130W processors/135W processors models

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

For 60W to 95W processors models

- Server on: 8% to 85%, maximum dew point 24°C, maximum rate of change 5°C/hr
- Server off: 8% to 80%, maximum dew point 27°C

Design to ASHRAE Class A3, ambient of 40°C, with relaxed support

- Support 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

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, 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 used of solid-state disk drives, 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 to which it can be subjected, 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 become incapable of being written to. Additional information is available at

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

- 00D4964 - 16 GB Hyper Cloud DIMM 16GB (16Gb, 2RX4, 1.5V) PC3L-10600 1333 DDR3 LP HCDIMM
- 49Y1397 - 8 GB 2Rx4 2Gbit PC3L-10600R LP RDIMM 1.35V Capable
- 49Y1399 - 8 GB (2Gb, 4Rx8,1.35V) DDR3-1066 LP RDIMM
- 49Y1405 - 2 GB (2Gb, 1Rx8, 1.35V) PC3L-10600R ECC LP RDIMM

- 49Y1406 - 4 GB (2Gb, 1Rx4, 1.35V) PC3L-10600R ECC LP RDIMM
- 49Y1407 - 4 GB (2Gb, 2Rx8, 1.35V) PC3L-10600R ECC LP RDIMM
- 49Y1559 - 4 GB (2Gb,1Rx4, 1.5V) PC3-12800 DDR3-1600 LP RDIMM
- 90Y3178 - 4 GB (2Gb, 2Rx8, 1.5V) PC3-12800 DDR3 1600 LP RDIMM
- 49Y1563 - 16 GB (4Gb,2Rx4,1.35V) PC3-10600 DDR3-1333 LP RDIMM
- 90Y3109 - 8 GB (2Gb, 2Rx4,1.5V) PC3-12800 DDR3-1600 LP RDIMM
- 49Y1404 - 4 GB (2Gb, 2Rx8, 1.35V) PC3L-10600E 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 10BASE-T, 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 clients responsibility to ensure that the server is secure to prevent sensitive data from being removed.

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

IBM Electronic Services

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

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

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

To learn how Electronic Services can work for you, visit

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

Terms and conditions

IBM Global Financing

Yes

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

In the United States, call 800-IBM-SERV (426-7378), or write to:

Warranty Information
P.O. Box 12195
Research Triangle Park, NC 27709
Attn: Dept JDJA/B203

Warranty period

- 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 which 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 is the same as the machine 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
- Hyper visor 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.

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

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

International Warranty Service (IWS)

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?Indocid=GCOR-3FBJK2>

For more information on IWS, refer to Services Announcement [601-034](#), dated September 25, 2001 .

Licensing

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

Maintenance services

ServicePac , ServiceSuite , ServiceElect, and ServiceElite

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

Warranty service upgrade

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

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

CRUs will be provided as part of the machine's standard warranty CRU Service except that you may install a Tier 1 CRU yourself or request IBM installation, at no additional charge, under one of the On-site Service levels specified below.

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

Maintenance service

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

CRU Service

If your problem can be resolved with a CRU (for example, keyboard, mouse, speaker, memory, or hard disk drive), IBM will ship the CRU to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM at any time on your request.

IBM specifies in the materials shipped with a replacement CRU whether a defective CRU must be returned to IBM . When return is required, return instructions and a container are shipped with the replacement CRU, and you may be charged for the replacement CRU if IBM does not receive the defective CRU within 15 days of your receipt of the replacement.

On-site Service

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

Maintenance service (ICA)

Maintenance services are available for ICA legacy contracts.

Alternative service (warranty service upgrades)

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

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

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

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

Maintenance service

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

CRU Service

If your problem can be resolved with a CRU (for example, keyboard, mouse, speaker, memory, or hard disk drive), IBM will ship the CRU to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM at any time on your request.

IBM specifies in the materials shipped with a replacement CRU whether a defective CRU must be returned to IBM . When return is required, return instructions and a container are shipped with the replacement CRU, and you may be charged for the replacement CRU if IBM does not receive the defective CRU within 15 days of your receipt of the replacement.

On-site Service

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

Non-IBM parts support

Warranty service

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

Warranty service upgrades and maintenance services

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

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

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

IBM hourly service rate classification

One

Field-installable features

Yes

Model conversions

No

Machine installation

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

Graduated program license charges apply

No

Licensed Machine Code

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

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

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

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

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

Educational allowance

None

Prices

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

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

To locate the web price, search on the feature number in the Search field.

The following are features already announced for the 3331 machine type:

Description	Model Number	Feature Number	Initial/MES/Both/Support
Addl Intel Xeon Processor E5-2658 8C 2.1GHZ 20MB 95W w/Fan	HC1	A397	MES
Addl Intel Xeon Processor E5-2648L 8C 1.8GHZ 20MB 70W w/Fan	HC1	A398	MES
32GB (1x32GB, 1.5V) PC3-8500 CL7 ECC DDR3 1066MHZ LP HyperCloud DIMM	HC1	A3EJ	MES
Qlogic Dual Port 10GbE SFP+ Embedded VFA for IBM System x	HC1	A22H	MES
Qlogic Embedded VFA FCoE/iSCSI License for IBM System x (FoD)	HC1	A2TF	MES
x3650 M4 Plus 8 2.5" HS HDD Assembly Option Kit	HC1	A3FP	MES
x3650 M4 16 Plus 16 1.8" SSD Assembly Option Kit	HC1	A3FQ	MES
x3650 M4 8 2.5" Plus 16 1.8" SSD Assembly Option Kit	HC1	A3FR	MES
x3650 M4 PCIe Riser Card 2 (1 x16 for GPU + 1 x8 FH/HL Slots)	HC1	A3A1	MES
x3650 M4 925MM SAS Cable	HC1	A3E9	MES
IBM LLM-SM Dual Port 10GbE SFP+ Adapter for IBM System x	HC1	A3A2	MES

The following are features already announced for the 7915 machine type:

Description	Model Number	Feature Number	Initial/MES/Both/Support
NVIDIA Quadro 4000	AC1 MC1	4798	Initial Initial
IBM DDS Gen 6 USB Tape Drive	AC1 MC1	5395	Initial Initial
IBM 200GB SATA 2.5" MLC SS SSD	AC1 MC1	5419	Initial Initial
IBM 200GB SATA 1.8" MLC SSD	AC1 MC1	5420	Initial Initial
IBM 50GB SATA 1.8" MLC SSD	AC1 MC1	5428	Initial Initial
IBM DDS Generation 5 USB Tape Drive	AC1 MC1	5711	Initial Initial
1.8" SAS Storage Support	AC1	6138	Initial
NVIDIA Quadro 2000	AC1 MC1	A1QU	Initial Initial
IBM RDX 1TB Cartridge	AC1 MC1	A1VL	Initial Initial
Qlogic Dual Port 10GbE SFP+ Embedded VFA for IBM System x	AC1 MC1	A22H	Initial Initial
Mellanox ConnectX-3 Dual Port QDR/FDR10 Mezz Card	AC1 MC1	A24F	Initial Initial
4GB (1x4GB, 2Rx8, 1.5V) PC3-12800 CL11 ECC DDR3 1600MHZ LP RDIMM	AC1 MC1	A24L	Initial Initial
Mellanox ConnectX-2 Dual-port QSFP QDR IB Adapter for IBM System x	AC1 MC1	A2MY	Initial Initial
Emulex VFA III FCoE/iSCSI License for IBM System x (FOD)	AC1 MC1	A2U2	Initial Initial
IBM RDX 3 Internal USB Drive	AC1 MC1	A2U7	Initial Initial
IBM 128GB SATA 2.5" MLC SS Enterprise Value SSD	AC1 MC1	A2UB	Initial Initial
IBM 256GB SATA 2.5" MLC SS Enterprise Value SSD	AC1 MC1	A2UC	Initial Initial
ServerAID M5110 SAS/SATA Controller for IBM System x	AC1 MC1	A347	Initial Initial
IBM USB Memory Key for VMware ESXi 5.0 Update1	AC1 MC1	A383	Initial Initial
Intel Xeon Processor E5-2658 8C 2.1GHZ 20MB Cache 1600MHZ 95W	AC1 MC1	A395	Initial Initial

Intel Xeon Processor E5-2648L 8C 1.8GHz 20MB Cache 1600MHz 70w	AC1 MC1	A396	Initial Initial
Addl Intel Xeon Processor E5-2658 8C 2.1GHz 20MB 95w w/Fan	AC1 MC1	A397	Initial Initial
Addl Intel Xeon Processor E5-2648L 8C 1.8GHz 20MB 70w w/Fan	AC1 MC1	A398	Initial Initial
IBM System x 750w High Efficiency -48 V DC Power Supply	AC1 MC1	A39N	Initial Initial
x3650 M4 Plus 8 2.5" HS HDD Assembly Kit	AC1 MC1	A39W	Initial Initial
x3650 M4 Hot-Swap 16/32 HDD Assembly Kit	AC1 MC1	A39X	Initial Initial
x3650 M4 16 Plus 16 1.8" SSD Assembly Kit	AC1 MC1	A39Y	Initial Initial
x3650 M4 8 2.5" Plus 16 1.8" SSD Assembly Kit	AC1 MC1	A39Z	Initial Initial
x3650 M4 2.5" Simple Swap Kit	AC1 MC1	A3A0	Initial Initial
x3650 M4 PCIe Riser Card 2 (1 x16 for GPU + 1 x8 FH/HL Slots)	AC1 MC1	A3A1	Initial Initial
IBM LLM-SM Dual Port 10GbE SFP+ Adapter for IBM System x	AC1 MC1	A3A2	Initial Initial
x3650 M4 925MM SAS Cable	AC1 MC1	A3E9	Initial Initial
x3650 M4 820MM SAS Cable	AC1 MC1	A3EA	Initial Initial
32GB (1x32GB, 1.5V) PC3-8500 CL7 ECC DDR3 1066MHZ LP HyperCloud DIMM	AC1 MC1	A3EJ	Initial Initial

Description	SEO Numbers	Initial/ MES/ Both/ Support	CSU
Xeon E5-2643 3.3GHz 4GB SAS/SATA 2.5-in 8.0 GTS 1600 MHz 900w	791532U	Both	Yes
Xeon E5-2690 2.9GHz 4GB SAS/SATA 2.5-in 8.0 GTS 1600 MHz 900w	7915M2U	Both	Yes
Xeon E5-2650 2.0GHz 32GB SAS/SATA 2.5-in 8.0 GTS 1600 MHz 2x750w 7x600GB 1x1TB SAS Disc	7915GSU	Both	Yes

Option SEO

Description	SEO Numbers	Initial/MES/Both/Support	CSU
32GB (1x32GB, 1.5V)PC3-8500 CL7 ECC DDR3 1066MHZ LP HyperCloud DIMM	00D5004	Both	Yes
Intel Xeon Processor E5-2658 8C 2.1GHZ 20MB 1600MHZ 95W w/Fan	00D9450	Both	Yes
Intel Xeon Processor E5-2648L 8C 1.8GHZ 20MB 1600MHZ 70W w/Fan	00D9451	Both	Yes
x3650 M4 Plus 8 2.5" HS HDD Assembly Option Kit	00D9490	Both	Yes
x3650 M4 16 Plus 16 1.8" SSD Assembly Option Kit	00D9492	Both	Yes
x3650 M4 8 2.5" Plus 16 1.8" SSD Assembly Option Kit	00D9493	Both	Yes
x3650 M4 PCIe Riser Card 2 (1 x16 for GPU + 1 x8 FH/HL Slots)	90Y5085	Both	Yes
x3650 M4 925MM SAS Cable	00D9532	Both	Yes
IBM LLM-SM Dual Port 10GbE SFP+ Adapter for IBM System x	00D9501	Both	Yes
Qlogic Dual Port 10GbE SFP+ Embedded VFA for IBM System x	90Y6454	Both	Yes
Qlogic Embedded VFA FCoE/iSCSI License for IBM System x (FoD)	90Y5179	Both	Yes

Maintenance charges

For additional information on maintenance and pricing, please contact your IBM Sales Representative or your IBM Business Partner, or call 1-800-IBM-CALL (1-800-426-2255).

For ServiceElect (ESA) maintenance service charges, contact IBM Global Services at 888-IBM-4343 (426-4343).

ServicePac information

ServicePac for Warranty and Maintenance

MT	Description	SEO	MTM
7915	3 Year Onsite Repair 9x5 4 Hour Response	00A4404	67567XQ
7915	3 Year Onsite Repair 24x7 4 Hour Response	00A4405	67567XR
7915	3 Year Onsite Repair 24x7 2 Hour Response	00A4406	67567XS
7915	4 Year Onsite Repair 9x5 Next Business Day	00A4407	67567XT
7915	4 Year Onsite Repair 9x5 4 Hour Response	00A4408	67567XU
7915	4 Year Onsite Repair 24x7 4 Hour Response	00A4409	67567XV
7915	4 Year Onsite Repair 24x7 2 Hour Response	00A4410	67567XW
7915	5 Year Onsite Repair 9x5 Next Business Day	00A4411	67567XX
7915	5 Year Onsite Repair 9x5 4 Hour Response	00A4412	67567XY
7915	5 Year Onsite Repair 24x7 4 Hour Response	00A4413	67567XZ
7915	5 Year Onsite Repair 24x7 2 Hour Response	00A4414	67567Y0
7915	3 Year Onsite Repair 24x7 4 Hour Response with HDDR	00A4415	67567Y1
7915	4 Year Onsite Repair 24x7 4 Hour Response with HDDR	00A4416	67567Y2
7915	4 Year Onsite Repair 9x5 Next Business Day Response with HDDR	00A4417	67567Y3
7915	5 Year Onsite Repair 24x7 4 Hour Response with HDDR	00A4418	67567Y4
7915	5 Year Onsite Repair 9x5 Next Business Day Response with HDDR	00A4419	67567Y5

ServicePac for Maintenance Agreement

MT	Description	SEO	MTM
7915	1 Year Onsite Repair 9x5 Next Business Day	00A4420	6756MW4
7915	1 Year Onsite Repair 9x5 4 Hour Response	00A4421	6756MW5
7915	1 Year Onsite Repair 24x7 4 Hour Response	00A4422	6756MW6
7915	1 Year Onsite Repair 24x7 2 Hour Response	00A4423	6756MW7
7915	2 Year Onsite Repair 9x5 Next Business Day	00A4424	6756MW8
7915	2 Year Onsite Repair 9x5 4 Hour Response	00A4425	6756MW9
7915	2 Year Onsite Repair 24x7 4 Hour Response	00A4426	6756MWA
7915	2 Year Onsite Repair 24x7 2 Hour Response	00A4427	6756MWB
7915	1 Year Onsite Repair 24x7 4 Hour Response with HDDR	00A4428	6756MWC
7915	2 Year Onsite Repair 24x7 4 Hour Response with HDDR	00A4429	6756MWD
7915	1 Year Onsite Repair 9x5 Next Business Day Response with HDDR	00A4430	6756MWF
7915	2 Year Onsite Repair 9x5 Next Business Day with HDDR	00A4431	6756MWG

ServicePac for Essential Support: Warranty and Maintenance Option plus Remote Technical Support

MT	Description	SEO	MTM
7915	3 Year Essential Support 24x7 4 Hour Response	00A4432	N/A

ServicePac for Essential Support: Maintenance plus Remote Technical Support

MT	Description	SEO	MTM
7915	1 Year Essential Support 24x7 4 Hour Response	00A4433	N/A
7915	1 Year Essential Support 9x5 Next Business Day Response	00A4434	N/A

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

Visit the following website for ServicePac information

http://www-935.ibm.com/services/us/its/html/servicepac_americas.html

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Corrections

(Corrected on August 30, 2012)

Revision to Product number and Prices sections.