

IBM System x3950 X5: Workload Optimized Solution for SAP HANA provides high performance, scalable, and flexible Intel Xeon processor-based systems for SAP HANA applications

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At a glance



New workload optimized models for SAP HANA provide optimal solutions for SAP HANA applications. The IBM® System x3950 X5: Workload Optimized Solution for SAP HANA models offers a preinstalled, optimized appliance starting with the 2-processor and 4-processor x3950 X5 models, and a model which enables scalability to eight processors with up to 1 TB of memory.

These models also include the following software: SUSE Linux™ Enterprise Server for SAP Applications operating system with 3-year SUSE priority support and the IBM General Parallel File System (GPFS™) on x86 Single Server for Integrated Offerings with 3-year software subscription and support.

Note: The SAP HANA software is included, but is sold separately by SAP.

New IBM System x3950 X5: Workload Optimized Solution models incorporate high-performance, 10-core Intel Xeon™ processors and include:

- Optimization for SAP HANA memory sizes of 256 GB, 512 GB, and 1 TB using high-speed, lower-power PC3-10600 ECC double data rate 3 (DDR3) SDRAM system memory
- eXA scaling with dual node systems for performance scaling up to eight sockets
- Two dual port 10 Gb Ethernet and six 1 Gb Ethernet ports
- Seven 5.0 Gb PCIe I/O (one x16, five x8, one x4) sockets
- Serial Attached SCSI (SAS) controller
- Eight 900 GB 2.5-inch hot-swap hard disks

- One 1.2 TB IBM High IOPs adapter
- Standard Integrated Management Module
- Up to two 1975-watt, voltage sensing, rear access, hot-swap power supplies in main x3950 X5 chassis
- UltraSlim Enhanced SATA CD-RW/DVD-ROM Combo drive in the HAx and HBx models
- Six USB ports (two can be used for USB keyboard and mouse), SVGA video port, one serial port, and two 1 Gb Ethernet ports per chassis
- IBM General Parallel File System (GPFS) on x86 Single Server for Integrated Offerings with 3-year software subscription and support
- SUSE Linux Enterprise Server for SAP Applications operating system with 3-year SUSE priority support

Warranty: Three years, customer replaceable unit (CRU) and on-site¹ service, limited warranty² ; optional warranty service upgrades available.

For ordering, contact your IBM representative, an IBM Business Partner, or IBM Americas Call Centers at 800-IBM-CALL (Reference: SE001).

Overview

The IBM System x3950 X5: Workload Optimized Solution for SAP HANA models offers a preconfigured, optimized appliance starting with the 2-processor and 4-processor x3950 X5 models, and a model which enables scalability to eight processors with up to 1 TB of memory. These models of the System x3950 X5 servers are powered with 10-core Intel Xeon processors, for powerful 4-socket, highly scalable systems. Workload optimized models for SAP HANA provide optimal solutions for SAP HANA applications.

Key enhancements to the x3950 X5 Workload Optimized Solution for SAP HANA include:

- Increased disk capacity and increased solid-state storage capacity for scale-out and highly available (HA) configurations
- Additional 10 Gb networking ports for enhanced scale-out and HA
- New GPFS software licensing for single node configurations

These models include the following software: SUSE Linux Enterprise Server for SAP Applications operating system with 3-year SUSE priority support and the new IBM General Parallel File System (GPFS) on x86 Single Server for Integrated Offerings, V3 with 3-year software subscription and support.

The SAP HANA software is included, but is sold separately by SAP.

The x3950 X5 servers are the fifth generation of the Enterprise X-Architecture® (eX5), delivering innovation with enhanced reliability and availability features to enable optimal performance for SAP HANA applications.

Key features of the new x3950 X5 Workload Optimized Solution for SAP HANA models include:

- 256 GB, 512 GB, and 1 TB single-node SAP HANA configurations
- Seamless multi-node scalability
- Two to eight processors with 10-core processing performance per socket
- Eight 900 GB SAS hard disk drives
- One 1.2 TB IBM High IOPs PCIe adapter
- High-speed networking with supports for four 10 GbE ports and six 1 GbE ports
- SUSE Linux Enterprise Server for SAP Applications operating system license and media with 3-year SUSE priority support

- IBM General Parallel File System (GPFS) on x86 Single Server for Integrated Offerings with 3-year software subscription and support
- IBM Director media
- System installation and recovery disk for SAP HANA

These Workload Optimized Solutions for SAP HANA are based on fifth-generation eX5 technology features which include:

- 4U server, tool-free chassis that strikes the balance between rack density and ease of maintenance
- Rear access power supplies designed for easy accessibility
- Memory ProteXion with Chipkill, memory mirroring, memory sparing, Intel™ SMI lane failover, SMI packet retry, and SMI clock failover
- Serial Attach SCSI (SAS) plus RAID to maximize throughput and ease installation and data protection
- eXA scaling with dual-node systems for performance scaling up to eight sockets
- Advanced fifth-generation Chipkill ECC memory controller to help correct single-bit, 2-bit, 3-bit, and 4-bit memory errors
- High-performance PCIe Gen 2 (5 GHz) I/O slots
- Hot-swap drive bays and redundant fans to replace select components without powering down the server
- Two hot-swap, rear access, redundant power supplies with 220 V ac input in the x3950 X5
- Predictive Failure Analysis (PFA) on processors, memory, fans, power supply, and HDD options to help warn of problems before they occur
- Innovative light path diagnostics and top access design for easier service and configuration

SUSE Linux Enterprise Server for SAP Applications

Boost overall performance and accelerate time to value. SUSE Linux Enterprise Server for SAP Applications delivers improved uptime and performance, even under full CPU loads and high memory stress. Rely on integrated support from SAP and SUSE. SUSE Linux Enterprise Server for SAP Applications offers integrated priority support and maintenance from both SUSE and SAP through the SAP Solution Manager.

Protect your critical business operations with built-in business continuity. SUSE Linux Enterprise Server for SAP Applications includes high-availability components that help build SAP clustering solutions for physical and virtual Linux deployments. Save time with faster deployment. SUSE Linux Enterprise Server for SAP Applications is designed to enable deployment in hours instead of days.

SUSE Linux Enterprise Server for SAP Applications is the only operating system that provides an automated, end-to-end installation workflow. SUSE Linux Enterprise Server for SAP Applications subscriptions include SUSE Linux Enterprise High Availability Extension which ensures continuous access to your mission-critical applications and data. This flexible, policy-driven clustering solution is designed to virtually eliminate service outages. Service outages and interruptions to business processes can take a terrible toll on productivity, revenue, and customer relationships. In some cases, they can even have legal consequences. SUSE Linux Enterprise High Availability Extension helps clients ensure that their most mission-critical applications continue to deliver business value, 24 hours a day, every day. This is achieved through the use of high availability clustering to automate application and data recovery. Clients can use SUSE's flexible, policy-driven clustering solution to implement highly available Linux clusters and eliminate single points of failure. The servers are continuously monitored; and when a fault or failure occurs, the workload is transferred from one server to another, or the application is automatically restarted on a known working system. This helps maintain business continuity and minimize unplanned downtime.

Subscription and Support offerings included with every SAP HANA configuration, the SUSE Linux Enterprise for SAP Applications offerings include an activation card

which contains the unique product registration number that will be needed to access integrated priority support and maintenance from both SUSE and SAP through the SAP Solution Manager. The term of the SLES for SAP Application subscription that has been included is three years. Renewals are available through IBM and IBM Business Partners.

IBM GPFS on x86 Single Server for Integrated Offerings

IBM GPFS on x86 Single Server for Integrated Offerings, V3 is now included preinstalled on selected IBM SAP HANA models. Licenses for IBM GPFS on x86 Single Server for Integrated Offerings, V3 cannot be ordered independent of the select hardware for which it is included. Licenses for offerings in this announcement include three years of Software Subscription and Support. Software Subscription and Support, including Subscription and Support renewals, are managed through Passport Advantage® or Passport Advantage Express® .

After receipt of an order for a x3950 X5 Workload Optimized Solution for SAP HANA model, the Business Partner or end-user customer will be required to register and accept Passport Advantage or Passport Advantage Express terms and conditions associated with IBM GPFS on x86 Single Server for Integrated Offerings, V3.

If a new release of the offering in this announcement is made generally available in Passport Advantage after the announcement of the offering in System x® ordering systems, clients with valid Software and Subscription contracts may elect to take electronic delivery of the latest release.

During the registration process, the end-user customer will be provided with a website for the electronic download.

The following x3950 X5 Workload Optimized Solution models include IBM GPFS on x86 Single Server Single Server for Integrated Offerings, V3 based on the PVU values for each model below:

Licenses including Subscription and Support for IBM GPFS on x86 Single Server for Integrated Offerings, V3 are entitled in increments of 10 Processor Value Units (PVUs).

7143HAX 256GB (S+)	4000PVU
7143HBX 512GB (M) (1st 4 processors)	4000PVU
7143HCX 512GB (L upgrade for 2nd 4 processors & 1TB)	5600PVU

Note: The 8-socket, 1 TB configuration comprising one 7143HBx plus one 7143-HCx requires 9600PVU total.

Processor Value Unit (PVU)

Processor Value Unit (PVU) is a unit of measure by which the program can be licensed.

IBM continues to define a processor, for the purposes of PVU-based licensing, to be each processor core on a chip. A dual-core processor chip, for example, has two processor cores. Full Capacity Licensing requires the Licensing, Licensee to obtain PVU entitlements sufficient to cover all activated processor cores in the physical hardware environment made available to, or managed by, the program except for those servers from which the program has been permanently removed.

The GPFS on x86 Single Server for Integrated Offerings, V3 provides file system capabilities for single-node integrated offerings. Clients with highly available, multi-node clustered scale-out configurations must also purchase the GPFS scale-out product.

¹ IBM sends a technician after attempting to diagnose and resolve the problem remotely.

² For information on the IBM Statement of Limited Warranty, visit

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

Alternatively, this information is also available by contacting your IBM representative or reseller. Copies are available upon request. For the latest information on safe and effective computing, visit

<http://www.ibm.com/pc/safecomputing/>

Note: The information in IBM announcement letters is subject to change without notice. Consult the *IBM Sales Manual*, or your IBM marketing representative or reseller, for the most current information regarding IBM products.

Feature exchange

None

Key prerequisites

Refer to the [Hardware requirements](#) section for details.

Planned availability date

October 24, 2012

Description

IBM System x3950 X5 servers

High-performance server subsystems

The new x3950 X5 servers are high-throughput, scalable, SMP-capable, 10-core Intel Xeon-based servers. They deliver excellent scalability for adding memory, adapter cards, or multiple processors.

Models are powered with 10-core Intel Xeon processors that use 64-byte cache lines. EMT64T architecture supports 64-bit extensions. Four connectors for Xeon MP processors are standard on the system board. High-speed PC3-10600 ECC SDRAM provides excellent processor-to-memory subsystem performance.

The x3950 X5 system architecture is fine tuned and engineered to optimize the powerful Xeon processors. This architecture consists of the following components:

- 10-core Xeon processors
- System memory cards with Intel Scalable Memory Buffers
- Intel host-bridge I/O controllers

These Xeon processors use Intel Quick Path Interconnect busses for external operations. Each processor supports four independent busses to the memory, for a total of 34 GBps of potential memory bandwidth per CPU.

High-availability and serviceability features

Many enterprise on-demand environments run around the clock to supply information around the globe. These environments require ruggedly dependable servers designed with features that can tolerate a component failure without total shutdown. x3950 X5 servers pack numerous fault-tolerant and high-availability features into a high-density, rack-optimized package that helps significantly reduce the space needed to support massive network computing operations.

Features include:

- Seven 5.0 Gb PCIe I/O (one x16, five x8, one x4) sockets
- Eight Serial Attach SCSI (SAS) HDD bays
- ECC DIMMs combined with an integrated advanced ECC memory controller with fourth-generation Chipkill support to correct many single-bit, 2-bit, 3-bit, and 4-bit memory errors to minimize disruption of service to LAN clients
- Memory ProteXion and memory mirroring
- Memory hardware scrubbing to correct many soft memory errors automatically without software intervention down time
- PFA on HDD options, memory, processors, power supply, and fans, in conjunction with IBM Systems Director, to help alert the system administrator of an imminent component failure
- Up to two 1975-watt, voltage sensing, rear access, hot-swap power supplies in the main x3950 X5 chassis, that enable individual fan replacement without powering down the server, plus one fan in each of the two hot-swap power supplies
- Standard IMM enabling diagnostic, reset, POST, and auto-recovery functions from remote locations and monitoring of temperature, voltage, and fan speed; alerts generated when thresholds are exceeded without utilizing an I/O slot
- Information LED panel, diagnostics LED panel, and component LEDs for visual indications of system well-being
- Light path diagnostics for an outside view of the potential problem without removing the cover, to help reduce down time and service costs
- Top access to system board, adapter cards, and memory
- CPU failure recovery in SMP configurations, allowing a failed processor to be forced offline, the server rebooted, an alert generated, and operation continued with the working processor
- Automatic node failover for increased availability in dual-node configurations

The servers include:

- Up to 8-socket (80-core) SMP operations with powerful 10-core Xeon processors.
- Up to 64 DIMM slots in 4U of rack space delivering up to 3 TB (with 32 GB DIMMs) of high-speed PC3-10600 DDR3 memory. **Note:** SAP HANA Workload Optimized models include sixteen or thirty-two 16 GB DIMMs.
- Two worldwide, voltage-sensing, 1975-watt, hot-swap power supplies with auto-restart, standard.
- Eight hot-swap drive bays, supporting up to 4 TB of internal data storage (using eight 900 GB SATA hot-swap HDDs).
- Terabytes of external data storage supporting optional storage units, ServeRAID SCSI controllers, and Fibre Channel controllers and storage units.

Configurations

XpandOnDemand scalability

- x3950 X5 Workload Optimized Solution for SAP HANA models are based on modular building-block scalability that delivers the flexibility to scale to meet your business needs and are optimized for your SAP HANA application.

IBM Systems Director CD with 20 agent license proofs of entitlement includes support for the IBM System x3950 X5 servers.

Systems management

x3950 X5 servers feature IBM Systems Director, a powerful, highly integrated, systems-management software solution built on industry standards and designed for ease of use.

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

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

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

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

http://publib.boulder.ibm.com/infocenter/eserver/v1r2/index.jsp?topic=/dirinfo_5.20/f_qm0_r_supported_operating_systems.html

The list is updated periodically. The Workload Optimized Solution for SAP HANA only supports SUSE Linux Enterprise Server for SAP Applications.

- Support for IBM and non-IBM servers, desktop computers, workstations, and mobile computers. (Not all IBM Systems Director features are supported on non-IBM servers.)
- Support for systems-management industry standards.
- Integration into leading workgroup and enterprise systems-management environments.
- Ease of use, training, and setup.

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

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

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

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

IBM Systems Director includes IBM Systems Director Extensions, a portfolio of server tools that integrates into the IBM Systems Director interface and works with the Integrated Management Module, or other systems-management monitoring functions contained in IBM System x eX5 servers. Typical functions and monitoring capabilities can include:

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

The IT administrator gains comprehensive, virtual on-site control of IBM System 3950 X5 servers through the ability to remotely:

- Access the server, in many cases regardless of its status
- Inventory and display detailed system and component information

- View server bootup during POST
- Browse and delete logs of events and errors
- Reset or power cycle the server
- Run diagnostics, SCSI, and RAID setup during POST
- Monitor thresholds on server health including:
 - Operating system load
 - POST time-out
 - Voltage
 - Temperature
- Set proactive alerts for critical server events including PFA on:
 - Processors
 - Memory
 - Fans
 - Power supplies
 - HDDs
- Define automated actions such as:
 - Send an email or page to an administrator
 - Run a command or program
 - Display and send an error message to the IBM Systems Director console
- Flash BIOS
- Monitor and graph the utilization of server resources such as:
 - Memory
 - Processor
 - HDDs
- Identify potential performance bottlenecks and react to prevent down time

Active Energy Manager tools and programs

The IBM Active Energy Manager tool is available on the System x3950 X5 servers. IBM Systems Director Active Energy Manager™ V3.1 is the next-generation product of IBM PowerExecutive™ which was previously available from IBM for x86 systems only. IBM Systems Director Active Energy Manager now supports multiple IBM platforms and provides new capabilities that build upon the functions previously available with IBM PowerExecutive V2.1. Enhancements to existing function include:

- Cross-system monitoring and management support
- Dynamic polling rate
- Discovery and monitoring of intelligent PDUs

The Active Energy Manager V3.1 offering has both no-charge (free) monitoring functions and optional chargeable (fee-based) management functions.

No-charge monitor functions

- Power trending
- Thermal trending
- iPDU support

Priced management functions

- Power capping
- Power savings mode

For more information, refer to

Memory ProteXion

- Is included at no additional cost, requires no additional hardware, and works independently of the operating system
- Is similar to the "hot-spare" of a DASD array

Memory mirroring:

- Propels Intel-based servers towards continuous operations
- Dramatically helps to increase up time and allow scheduled maintenance
- Helps provide capability and reliability approaching a mainframe
- Is operating system independent; does not require drivers or operating system support

Chipkill memory:

- Offers integrated XA-64e chipsets for using off-the-shelf DIMMs
- Provides better memory reliability to support in-memory databases
- Increases availability by detecting and helping to correct single-bit, 2-bit, 3-bit, and 4-bit memory errors

World-class support tools and programs

x3950 X5 servers include tools and programs designed to make ownership a positive experience. From the start, IBM programs help you purchase servers, get them running, and keep them running. IBM can help your company maintain ownership of technology leadership network servers.

- IBM customer replaceable unit (CRU) and on-site, 3-year limited warranty with next-business-day service (same-business-day service optionally available) protects your investment if a problem occurs. This service also includes replacement of parts identified through PFA.
- The ServerProven®³ program lets you confidently configure your server with various devices and operating systems. This web-based program provides compatibility information from actual testing of the x3950 X5 servers with various adapters and devices.
- The ServerGuide³ CD library includes online publications and utilities and drivers that help you load popular network operating systems.
- Electronic support on the web offers additional support in an easy-to-use format.

³ IBM makes no warranties, expressed or implied, regarding non-IBM products and services that are ServerProven, including but not implied warranties and of merchantability and fitness for a particular purpose. These products are offered and warranted solely by third parties.

IBM ToolsCenter

The IBM ToolsCenter is a collection of server management tools to help manage your IBM System x and BladeServer environment. ToolsCenter makes managing your server environment less complicated, more productive and cost-effective.

For more information, refer to

<http://www-947.ibm.com/support/entry/portal/docdisplay?brand=5000008&Indocid=TOOL-CENTE R>

Workload Optimized Solution for SAP HANA

The IBM System x3950 X5 Workload Optimized Solution for SAP HANA models offers a preinstalled, optimized appliance. These models include two or four processors and

256 GB or 512 GB of memory, and can scale up to an 8-socket 1 TB configuration. They are designed for use in medium to large SAP HANA deployments.

Note: The 8-socket, 1 TB configuration is achieved by combining 7143-HBx with 7143-HCx.

These models also include the following software: SUSE Linux Enterprise Server for SAP Applications operating system with 3-year SUSE priority support and the IBM General Parallel File System (GPFS) on x86 Single Server for Integrated Offerings, V3 with 3-year software subscription and support. SAP HANA software is included, but sold separately by SAP.

For those models with SAP HANA included, the following SAP software license terms apply:

SAP license terms

This IBM computer system is preinstalled with the SAP HANA appliance Platform Edition, which has been integrated or preinstalled as part of the IBM hardware system. You are not licensed to use this copy of the SAP software contained in the IBM hardware system until you have purchased or licensed the use of the SAP software from SAP or its authorized distributors. Use of the SAP software is subject to the applicable SAP end-user license agreement. Your purchase of the IBM hardware system does not include a license to use the SAP software to be preinstalled, or to any other SAP software. SAP is under no obligation to license the preinstalled SAP software to you. Contact your SAP representative to obtain the applicable license rights to use the SAP software.

IBM Tivoli® Storage Manager for ERP

IBM Tivoli Storage Manager for ERP is a simple, scalable data protection solution for SAP HANA and SAP ERP. Tivoli Storage Manager (TSM) for ERP V6.4 includes a one-step command that automates SAP HANA backup and TSM data protection.

IBM System x3950 X5 model configurations

IBM System x3950 X5: Workload Optimized Solution for SAP HANA model configurations

System SEO Number	Processor	Cache	Memory	HDD Iface	HDD	Power Supply
7143-HAU	2 x 2.40 GHz Xeon E7-8870 10 core 130w	30 MB	16x16 GB with 4 memory cards 16x16 GB on Riser	SAS	8x 900GB 10k	two 1975w
7143-HBU	4 x 2.40 GHz Xeon E7-8870 10 core 130w	30 MB	32x16 GB with 8 memory cards 32x16 GB on Riser	SAS	8x 900GB 10k	two 1975w
7143-HCU	4 x 2.40 GHz Xeon E7-8870 10 core 130w	30 MB	32x16 GB with 8 memory cards 32x16 GB on Riser	SAS	8x 900GB 10k	two 1975w

Product positioning

This new IBM System x3950 X5 Workload Optimized Solution for SAP HANA models enhances the server line by providing new expanded support for single-node and scale-out cluster configurations for SAP HANA. The IBM System x3950 X5: Workload Optimized Solution for SAP HANA models offer a preinstalled, optimized appliance starting with the 2-processor and 4-processor x3950 X5 models, and a model which enables scalability to eight processors and up to 1 TB of memory. These models of the System x3950 X5 servers are powered with 10-core Intel Xeon processors, for powerful 4-socket, highly scalable systems. Workload optimized models for SAP HANA provide optimal solutions for SAP HANA applications.

These models also include the following software: SUSE Linux Enterprise Server for SAP Applications operating system with 3-year SUSE priority support and the IBM General Parallel File System (GPFS) on x86 Single Server for Integrated Offerings, V3 with 3-year software subscription and support.

Note: The SAP HANA software is included, but is sold separately by SAP.

The x3950 X5 servers are the fifth generation of the Enterprise X-Architecture (eX5), delivering innovation with enhanced reliability and availability features to enable optimal performance for databases, enterprise applications.

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

Reference information

For information about GPS announcements, refer to IPLA Software Announcement [212-412](#), dated October 03, 2012 , IBM General Parallel File System on x86 Single Server for Integrated Offerings.

For information about support for IBM Tivoli Storage Manager for ERP V6.4, refer to Software Announcement [212-382](#), dated October 03, 2012 .

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=112-141>

Product number

The following are features already announced for the 7143 machine type:

Description	MT	Model	Feature
HANA Refresh Software Stack S+	7143	AC1	A3H9
HANA Refresh Software Stack M	7143	AC1	A3HA
HANA Refresh Software Stack L	7143	AC1	A3HB

The Single Entity Offerings (SEO)

IBM System x3950 X5: workload optimized solution for SAP HANA

7143	HAU	7143HAU
7143	HBU	7143HBU
7143	HCU	7143HCU

Note: SUSE Linux Enterprise Server for SAP Applications with SUSE 3-year SUSE priority support is included with the 7143-HAU and 7143-HBU.

Publications

The following publications will be available on the support website and on the Documentation CD.

The *IBM System Types 7145, 7146, 7143, and 7191 x3850 X5 and x3950 X5 Installation and User's Guide* , and the *IBM System Types 7145, 7146, 7143, and*

7191 x3850 X5 and x3950 X5 Problem Determination and Service Guide , in US English versions, are available from

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

They contain an introduction to the computer, installation and setup, installing options, reference information, and problem determination. The installation guide has easy-to-use text and illustrations to enable you to quickly set up your x3950 X5 servers.

IBM Systems Director systems-management software is included.

Note: Software versions, features, and functions shipped with these systems may change as new releases become available or may be discontinued at any time.

The following publications are available immediately.

The *IBM System Types 7145, 7146, 7143, and 7191 x3850 X5 and x3950 X5 Installation and User's Guide* , and the *IBM System Types 7145, 7146, 7143, and 7191 x3850 X5 and x3950 X5 Problem Determination and Service Guide* , in US English versions, are available from our website

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

IBM Publications Center Portal

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

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

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.

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's 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'll 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

x3950 X5

7143HAU

Processor	Xeon E7-8870
Ten-core	130w
Internal speed	2.40 GHz
Memory bus speed	1066 MHz
Number standard	2
Maximum	4
Interconnect speed	6.40 GT/s
L3 cache total	30 MB
Memory (PC3-10600 DDR3)	256 GB ECC
DIMMS	16 X 16 GB
DIMM sockets standard	32
DIMM sockets maximum	64
Capacity	1024 GB ⁴
Memory expansion card	
Number standard	4
Maximum	8
Video	SVGA
Memory	16 MB
SAS controller	ServerRAID-M5015 standard
Ports	8
Connector internal	2
Connector external	0
HDD standard	8 x 900 GB 10k SAS
Bays available	8 Standard
2.5-inch slim	8 Standard
Hot-swap	8 Standard
Internal capacity	4 TB ⁵
1200 GB Fusion IO	1
PCIe sockets	7

Management processor IMM	Standard
RAID 0/1	Standard
Server RAID M5015 6Gb + battery	Standard
Dual Ethernet controller 10/100/1000 Mbps	Standard
Emulex 10Gb Dual-port Ethernet Adapter	2 Standard
Intel Ethernet Quad Port Server Adapter I340-T4	Standard
10GbE SW SFP+ transceiver	4 Standard
Optical disk drive	Standard
SLES for SAP Applications v2	Standard
SAP stack preload	Standard
Power supply	1975 W
Number standard	2
Maximum	2
Hot-swap	Yes
Redundant power	Standard
Auto-restart	Yes

7143HBU

Processor	Xeon E7-8870
Ten-core	130W
Internal speed	2.40 GHz
Memory bus speed	1066 MHz
Number standard	4
Maximum	4
Interconnect speed	6.40 GT/s
L3 cache total	30 MB
Memory (PC3-10600 DDR3)	512 GB ECC
DIMMS	32 X 16 GB
DIMM sockets standard	64
DIMM sockets maximum	64
Capacity	1024 GB ⁴
Memory expansion card	
Number standard	8
Maximum	8
Video	SVGA
Memory	16 MB
SAS controller	Server RAID-M5015 standard
Ports	8
Connector internal	2
Connector external	0
HDD standard	8 x 900 GB 10k SAS
Bays available	8 Standard
2.5-inch slim	8 Standard
Hot-swap	8 Standard
Internal capacity	4 TB ⁵
1200 GB Fusion IO	1
PCIe sockets	7
Management processor IMM	Standard
RAID 0/1	Standard
Server RAID M5015 6Gb + battery	Standard
Dual Ethernet controller 10/100/1000 Mbps	Standard
Emulex 10Gb Dual-port Ethernet Adapter	2 Standard
Intel Ethernet Quad Port Server Adapter I340-T4	Standard
10GbE SW SFP+ transceiver	4 Standard
Optical disk drive	Standard
SLES for SAP Applications v2	Standard
SAP stack preload	Standard
Power supply	1975 W
Number standard	2
Maximum	2
Hot-swap	Yes
Redundant power	Standard
Auto-restart	Yes

7143HCU

Processor	Xeon E7-8870
Ten-core	130w
Internal speed	2.40 GHz
Memory bus speed	1066 MHz
Number standard	4
Maximum	4
Interconnect speed	6.40 GT/s
L3 cache total	30 MB
Memory (PC3-10600 DDR3)	512 GB ECC
DIMMS	32 X 16 GB
DIMM sockets standard	64
DIMM sockets maximum	64
Capacity	1024 GB ⁴
Memory expansion card	
Number standard	8
Maximum	8
Video	SVGA
Memory	16 MB
SAS controller	ServerRAID-M5015 standard
Ports	8
Connector internal	2
Connector external	0
HDD standard	8 x 900 GB 10k SAS
Bays available	8 Standard
2.5-inch slim	8 Standard
Hot-swap	8 Standard
Internal capacity	4 TB ⁵
1200 GB Fusion IO	1
PCIe sockets	7
Management processor IMM	Standard
RAID 0/1	Standard
ServerRAID M5015 6Gb + battery	Standard
Dual Ethernet controller	Standard
10/100/1000 Mbps	
Emulex 10Gb Dual-port Ethernet Adapter	2 Standard
Intel Ethernet Quad Port Server Adapter I340-T4	Standard
10GbE SW SFP+ transceiver	4 Standard
Optical disk drive	Optional
QPI Scalability Kit	Standard
Power supply	1975 w
Number standard	2
Maximum	2
Hot-swap	Yes
Redundant power	Standard
Auto-restart	Yes

⁴ Capacities are based on installation of the eight memory expansion cards and eight 16 GB DIMMs installed in each card.

⁵ Capacities are based on installation of eight 500 GB 2.5-inch SFF SATA HDDs. For the latest information on supported HDD options, visit

<http://www-03.ibm.com/servers/eserver/serverproven/compat/us/indexsp.html>

Supported video mode capabilities for the SVGA PCI controller:

windows 2003 (32- and 64-bit) and Linux (all distributions)

Resolution	Colors	Refresh Rate (Hz)
640 x 480 x 8	256	60, 72, 75, 85, 90, 100, 120, 160, 200
640 x 480 x 16	64K	60, 72, 75, 85, 90, 100, 120, 160, 200
640 x 480 x 32	16M	60, 72, 75, 85, 90, 100, 120, 160, 200

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

Dimensions

4U rack drawer

- Width: 440 mm (17.32 in.)
- Depth: 712.1 mm (28.04 in.)
- Height: 172.8 mm (6.81 in.)
- Minimum configuration: 35.4 kg (78 lb)
- Maximum configuration: 49.90 kg (110 lb)

Electrical

- 100 to 127 (nominal) V ac; 50 Hz or 60 Hz; System 20A (10A/PS)
- 200 to 208 (nominal) V ac; 50 Hz or 60 Hz; System 10A
- 200 to 240 (nominal) V ac; 50 Hz or 60 Hz; System 9A
 - Minimum configuration: 0.20 kVA (one power supply)
 - Minimum configuration: 0.26 kVA (two power supplies)
 - Typical configuration: 1.12 kVA (two power supplies)
 - Maximum configuration: 2.16 kVA (two power supplies)
- Btu output:
 - Ship configuration (1PS): 648 Btu/hr (190 watts)
 - Ship configuration (2PS): 802 Btu/hr (235 watts)
 - Typical configuration: 3,753 Btu/hr (1100 watts)
 - Full configuration: 7,336 Btu/hr (2150 watts)
- Noise level horizontal position: 6.3 bels

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

Standards

x3950 X5 servers are intended for use as rack-drawer servers and are tested and designed to operate in a horizontal position.

These systems support or comply with the following standards:

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

In addition to the above standards, they are compatible with the PCIe specification.

Equipment approvals and safety

- FCC - Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, issue 4, Class A
- IEC/UL 60950-1, 2nd Edition
- CAN/CSA - C22.2 No. 60950-1-07 2nd Edition
- NOM-019⁶

⁶ These servers are certified by the respective UL and NOM agencies.

Operating environment

- Temperature:
 - 10.0°C to 35.0°C (50°F to 95°F) at 0 to 914 m (0 to 3,000 ft)
 - 10.0°C to 32.0°C (50°F to 90°F) at 914 to 2,133 m (3,000 to 7,000 ft)
- Relative humidity: 8% to 80%

Hardware requirements

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

- Keyboard
- Mouse
- Display

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

For service, the servers require a compatible:

- Keyboard
- Mouse
- Display

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

Software requirements

Programming requirements

The following network operating systems have been tested for compatibility with the x3950 X5 server.

Network operating systems

- Microsoft :
 - Windows Server 2003 (64-bit)
 - Windows Server 2003 R2 (64-bit)
 - Windows Server 2008 R2 (64-bit)
 - Windows Server 2008 (64-bit)
- Linux :
 - Red Hat EL 5 Server for 64-bit
 - Red Hat EL 5 Server for 64-bit (with Xen)
 - Red Hat EL 6 Server for 64-bit
 - SUSE Linux ES 10 for x86-64

- SUSE Linux ES 10 for x86-64 (with Xen)
- SUSE Linux ES 11 for x86-64
- SUSE Linux ES 11 for x86-64 (with Xen)
- Other:
 - VMware vSphere Hypervisor 4.1 U1

SAP HANA Statement

The x3950 X5: Workload Optimized Solution for SAP HANA includes SUSE Linux ES for SAP Applications V2. No other operating system is presently supported with the SAP HANA 1.0 application. At the present time, the MAX5 drawer is also not supported. Contact the IBM SAP International Competence Center for the latest SAP HANA support information (isicc@de.ibm.com).

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

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

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

The IBM x3950 X5 Workload Optimized Solution for SAP HANA models include specific software validated by SAP. This software includes:

- SUSE Linux Enterprise Server for SAP Applications operating system license and media with 3-year SUSE priority support
- IBM General Parallel File System (GPFS) on x86 Single Server for Integrated Offerings with 3-year software service and support

For information on additional support for the SAP HANA application, contact the IBM SAP International Competence Center (ISICC) at:

- isicc@de.ibm.com

Compatibility

The IBM System x3950 X5 servers contain licensed system programs that include set configuration, set features, and test programs. IBM system BIOS is loaded from a "flash" EEPROM into system memory. This BIOS provides instructions and interfaces designed to support the standard features of the IBM System x3950 X5 servers and to maintain compatibility with many current software programs.

For detailed information about IBM and non-IBM devices, adapters, software, and network operating systems supported with IBM System x3950 X5 servers, visit

<http://www-03.ibm.com/servers/eserver/serverproven/compat/us/indexsp.html>

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 IBM System x3950 X5 servers. The *Sales Manual* is updated periodically as new features and options are announced that support these servers.

The IBM x3950 X5 Workload Optimized Solutions for SAP HANA models include specific software validated by SAP. This software includes:

- SUSE Linux Enterprise Server for SAP Applications operating system license and media with 3-year SUSE priority support
- IBM General Parallel File System (GPFS) on x86 Single Server for Integrated Offerings with 3-year software maintenance and support

Limitations

Memory

The x3950 X5 servers are shipped with up to 512 GB high-speed PC3-10600 DDR3 ECC memory standard, supporting up to 3 TB (with 32 GB DIMM) of system memory per server. All supported system memory is addressable through direct memory access (DMA). This server supports 2 GB, 4 GB, 8 GB, 16 GB, and 32 GB 1.5 V, or 1.35 V, 240-pin, PC3-10600 ECC DDR3 SDRAM RDIMMs. Supported DIMMs can coexist in the same server; however, memory DIMMs of the same capacity must be installed in matched pairs. Refer to the [Planning information](#) section or the IBM System x3950 X5 server web page for memory options.

The x3950 X5 servers have RAID 0 and 1 standard. The ServeRAID M5015 SAS/SATA Controller provides additional RAID levels.

ServerGuide

Use the version of *ServerGuide* available on the web to load software and drivers. Earlier versions of *ServerGuide* may not be compatible with the servers.

Planning information

Customer responsibilities

x3950 X5 Server and Related Options

The x3950 X5 servers for System x are designated as customer setup. Customer setup instructions are shipped with systems.

Configuration information

Bay configuration

The x3950 X5 servers contain eight customer-accessible drive bays on the front of the server. A lower left bay is for the slim combo drive. Eight unpopulated 2.5-inch, slim-high, hot-swap drive bays are located beneath this bay.

The UltraSlim Enhanced SATA CD-RW / DVD-ROM Combo drive is cabled directly to the SATA port.

Internal SCSI cabling

Models of the x3950 X5 servers contain a DASD backplane supporting four hot-swap, SCA-2-compliant drive bays. The x3950 X5 models with the BR-10i controller support RAID 0 and 1 standard. The optional ServeRAID-5015 SAS/SATA Controller provides additional RAID levels.

Processor upgrade

The following processor upgrade options are supported:

- **Intel Xeon Processor E7-8870 - 2.4 GHz 30 MB L3 Cache 1066 MHz ten-core Processor Upgrade (69Y1864)**

Memory support

The following memory options are supported:

- 16 GB PC3-8500 CL4 ECC DDR3 SDRAM RDIMM (46C7483) LP RDIMM (49Y1400)
- 2 GB PC3-10600 CL4 ECC DDR3 SDRAM RDIMM (44T1481)
- 4 GB PC3-8500 CL4 ECC DDR3 SDRAM RDIMM (46C7448)
- 8 GB PC3-8500 CL4 ECC DDR3 SDRAM RDIMM (46C7482)
- 16 GB PC3-8500 CL4 ECC DDR3 SDRAM RDIMM (46C7483)

- 32 GB PC3L-8500 CL7 ECC DDR3 SDRAM RDIMM (90Y3101)
- 4 GB (1x4GB, 2Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333 MHz LP RDIMM (49Y1407)
- 8 GB (1x8GB, 4Rx8, 1.35V) PC3L-8500 CL7 ECC DDR3 1066 MHz LP RDIMM (49Y1399)
- 16 GB (1x16GB, 4Rx4, 1.35V) PC3L-8500 CL7 ECC DDR3 1066 MHz LP RDIMM (449Y1400)
- 32 GB (1x32GB, 4Rx4, 1.35V) PC3L-8500 CL7 ECC DDR3 1066 MHz LP RDIMM (90Y3206)

Memory DIMMs should be plugged in order of size -- largest first, followed by the next size. When plug order moves to new DIMM numbers, start with the memory card with the smallest total amount.

- Example: Four CPUs, four memory cards, four 8 GB DIMMs, eight 4 GB DIMMs.
 - Card1 DIMMs 1 and 8 = 2 x 8 GB
 - Card7 DIMMs 1 and 8 = 2 x 8 GB
 - Card3 DIMMs 1 and 8 = 2 x 4 GB
 - Card5 DIMMs 1 and 8 = 2 x 4 GB
- When moving to next DIMM locations 3 and 6, start with the card with the least amount of memory.
 - Card3 DIMMs 3 and 6 = 2 x 4 GB
 - Card5 DIMMs 3 and 6 = 2 x 4 GB
- End result is four memory cards, each with 16 GB, balanced for the best performance

Note: Refer to details on the ServerProven Plan for memory supported in x3950.

<http://www-03.ibm.com/servers/eserver/serverproven/compat/us/indexsp.html>

PCIe adapter installations

The x3950 X5 servers contain PCIe architecture and seven 5.0 Gb PCIe I/O (one x16, five x8, one x4) sockets.

Rack installations

x3950 X5 4U, rack-drawer models are designed to be installed in a 19-inch rack cabinet designed for 26-inch deep devices, such as the NetBAY42 ER, NetBAY42 SR, NetBAY25 SR, or NetBAY11.

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

Power considerations

These x3950 X5 models include two 1975-watt, voltage sensing, rear access, hot-swap power supplies in the main x3950 X5 chassis.

Cable orders

The 10/100/1000 Mbps full-duplex, Dual Ethernet PCIe controller is standard with the x3950 X5 servers. The RJ-45 connectors provide a 10BASE-T or 100/1000BASE-TX interface for connecting twisted-pair cable to the Ethernet network. Cabling is not included with the server. To connect the Ethernet controller to a repeater or switch, use a UTP cable with RJ-45 connectors at both ends. For 100/1000 Mbps operation, Category 5 cabling must be used. For 10 Mbps operation, Category 3, or better, cabling must be used.

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

Installability

The x3950 X5 server requires about 40 minutes for installation. Installation includes unpacking, setting up, and powering on the system.

Installation services are required to install the SAP HANA software stack including SUSE Linux Enterprise Server for SAP Applications, IBM General Parallel File System (GPFS), and SAP HANA software. IBM Lab Services, IBM GTS and qualified IBM Business Partners can provide this software installation service.

Packaging

Product	Shipment group	Number of boxes
IBM System x3950 X5	System unit carton Contents: System unit Rack kits (two sets): Rails Cable management hardware	1
IBM System x3950 X5	Country kit carton	1

Contents:

- Four 2.8 m 220 V intra-rack cables
- Safety booklet
- CD-ROM Packages
- IBM Systems Director
- CD-ROM Packages
- Active Energy Manager
- On/off switch cover
- IBM Systems solution for SAP HANA recovery media
- SUSE Linux for SAP Applications license key
- IBM GPFS on x86 Single Server for Integrated Offerings, V3.x with 3-year SW S&S license letter
- IBM Systems Solution for SAP HANA appliance Quick Start Guide

The x3950 X5 systems are shipped as a single package. The country kit carton is contained inside the top portion of the system unit carton, while the rack components are contained in the system unit carton.

The following publications will be available on the support website and on the Documentation CD.

The *IBM System Types 7145, 7146, 7143, and 7191 x3850 X5 and x3950 X5 Installation and User's Guide* , and the *IBM System Types 7145, 7146, 7143, and 7191 x3850 X5 and x3950 X5 Problem Determination and Service Guide* , in US English versions, are available from our website.

The *Warranty Information* publication will be available as a hardcopy publication at

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

Related options

Processor upgrades

- Xeon processor
- Installation publications/warranty

Supplies

None

Security, auditability, and control

Security and auditability features include:

- Power-on and privileged access password functions provide controls of who has access to the data and server setup program on the server.
- A set unattended boot mode allows the system keyboard to be locked to all entries except the password and at the same time allows other computers on the network to access the system disk drive.
- A selectable boot sequence can be used to prevent unauthorized installation of software or removal of data from the diskette drive.
- These servers are Winbond Trusted Platform Module V1.2, Trusted Computing Group (TCG) compliant.

Limitations

The x3950 X5 servers have no security intrusion detection; therefore, they should be installed in a rack environment that provides security through lockable doors or other security measures. It is a customer's responsibility to ensure that the server is secure to protect sensitive data.

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

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

Terms and conditions

IBM Global Financing

Yes

IBM System x3950 X5

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

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

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

Warranty period

- Three years
- Optional features - One year

Note: For configurations that support the RAID Battery, the RAID battery will be warranted for 1 year 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 or supply items and are, therefore, not covered by this warranty:

- ServeRAID SAS controller battery
- Raid Battery

Warranty service

If required, IBM provides repair or exchange service, depending on the type of warranty service specified below for the machine. IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM 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.

SAP HANA software and support is licensed from SAP. SAP provides solution level support for the SAP HANA software and the appliance solution, including the x3950 X5 Workload Optimized Solution models. If you encounter a SAP HANA solution level issue, contact SAP through the SAP Online Service System (SAP OSS) website

<https://service.sap.com>

and create a service request ticket using BC-HAN as the problem component.

The IBM Systems solution for SAP HANA x3950 Workload Optimized Solution is delivered to you as an appliance. This implies certain restrictions with hardware modifications and software updates:

- All hardware components have been configured and tuned for optimal performance with SAP HANA.
- The solution must be operated only with hardware components and software levels that have been certified by IBM and SAP.
- No additional hardware and software components may be installed on the system without an explicit support statement from IBM and SAP - Failing to do so may void SAP support.
- If errors occur in any software component of SAP HANA, SAP is the main point of contact. SAP distributes all issues within the support organization. If the customer has defined special support agreements with IBM , the customer should contact IBM directly in the case of obvious hardware or system issues. To investigate SAP HANA-related problems, SAP support requires a support connection to all servers in the SAP HANA landscape. For more information about establishing a SAP service connection for SAP HANA, see SAP Service Marketplace SAP Note 1635304.

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.

Recovery media is included with the x3950 X5 Workload Optimized Solution to assist in returning the SAP HANA preload to the factory install state. Save this media along with the SUSE Linux Enterprise Server for SAP Applications license for system recovery and support use. If you cannot find the Workload Optimized Solution for SAP HANA recovery media, contact IBM support. Note, you should perform a system backup as soon as your system is set up. If your system is serviced, you may need to perform a recovery procedure on your system to return it to operational state. If you do not have a system backup, contact IBM services or a qualified IBM Business Partner to fully recover your SAP HANA workload optimized system.

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 have been designated as Tier 1 CRUs:

- Battery 3.0 Volt CMOS
- Op panel card
- 1975W PS
- PDU power cord
- 60 mm fan
- 120 mm fan
- Top cover
- Top bckt asm
- Sys bezel
- Rail kit
- Shipping brkt
- Cable management arm
- Filler kit
- Label kit
- SAS data cable
- Memory DIMMs
- Hard disk drives
- Ethernet adapter
- RAID card

On-site Service

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

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.

Product charges

The following are features already announced for the 7143 machine type:

Description	Model Number	Feature Number	Initial/MES/Both/Support
HANA Refresh Software Stack S+	AC1	A3H9	Initial
HANA Refresh Software Stack M			

	AC1	A3HA	Initial
HANA Refresh Software Stack L	AC1	A3HB	Initial
Description	SEO Number		Initial/ MES/ Both/ Support CSU
x3950 X5 - 2x2.40 GHz/30 MB, 256 GB	7143HAU		Both Yes
Xeon E7-8870 10-core 130w			
x3950 X5 - 4x2.40 GHz/30 MB, 512 GB	7143HBU		Both Yes
Xeon E7-8870 10-core 130w			
x3950 X5 - 4x2.40 GHz/30 MB, 512 GB	7143HCU		Both Yes
Xeon E7-8870 10-core 130w			

IBM System x3950 X5 - 7143

Hardware models announcing with this release will utilize existing US ServicePacs.

Reference the following IBM website for applicable US ServicePac information

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

ServicePac for Warranty and Maintenance

Machine Type/Model	Description	ServicePac Part Number
7143-XXX	3 YR onsite repair 9x5x4 hour average response	10N3058
7143-XXX	3 YR onsite repair 24x7x4 hour average response	10N3059
7143-XXX	3 YR onsite repair 24x7x2 hour average response	10N3060
7143-XXX	4 YR onsite repair 9x5/next day average response	10N3061
7143-XXX	4 YR onsite repair 9x5x4 hour average response	10N3062
7143-XXX	4 YR onsite repair 24x7x4 hour average response	10N3063
7143-XXX	4 YR onsite repair 24x7x2 hour average response	10N3064
7143-XXX	5 YR onsite repair 9x5/next day average response	10N3065
7143-XXX	5 YR onsite repair 9x5x4 hour average response	10N3066
7143-XXX	5 YR onsite repair 24x7x4 hour average response	10N3067
7143-XXX	5 YR onsite repair 24x7x2 hour average response	10N3068
7143-XXX	1-year MA IOR 9 x 5 Next Business Day average response	10N3069

7143-XXX	1-year MA IOR 9 x 5	10N3070
	4-hour average response	
7143-XXX	1-year MA IOR 24 x 7	10N3071
	4-hour average response	
7143-XXX	1-year MA IOR 24 x 7	10N3072
	2-hour average response	
7143-XXX	2-year MA IOR 9 x 5	10N3073
	Next Business Day average response	
7143-XXX	2-year MA IOR 9 x 5	10N3074
	4-hour average response	
7143-XXX	2-year MA IOR 24 x 7	10N3075
	4-hour average response	
7143-XXX	2-year MA IOR 24 x 7	10N3076
	4-hour average response	

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

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).

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