



Special IBM BladeCenter HX5 blade server model features Intel Xeon Processor E7-4850

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Overview

The IBM® BladeCenter® HX5 is a blade server designed to provide new levels of utilization, performance, and reliability for compute-intensive and memory-intensive workloads such as database, virtualization, business intelligence, modeling and simulation, and other enterprise applications.

Going beyond the industry standards with unique innovations from fifth-generation IBM X-Architecture® technology (eX5), the new IBM BladeCenter HX5 models deliver improved compute performance, memory footprint, and I/O bandwidth to enable new levels of utilization in a blade form factor for compute-intensive and memory-intensive enterprise workloads.

These new IBM BladeCenter HX5 models are configured with base processor and memory options, making them easy to order, configure, and deploy.

The HX5 features:

- Single-wide (30 mm), high-performance blade server
- One Intel Xeon™ E7-4850 CPU per node
- Two 8 GB DDR3 VLP DIMMs per node
- Integrated dual Gigabit Ethernet connections

Feature exchange

Not applicable.

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

Key prerequisites

- BladeCenter chassis (BCH, BCS, BCHT)
- Monitor, keyboard, and mouse for setup
- Network switch module
- Boot device, such as on-board SSD or network storage device
- Advanced Management Module with latest-level firmware
- Rack and appropriate PDUs and main power distribution

Planned availability date

November 13, 2012: BladeCenter System

Description

BladeCenter HX5

High-performance, blade server subsystems

The IBM BladeCenter HX5 is a blade server designed to provide new levels of utilization, performance, and reliability for compute-intensive and memory-intensive workloads such as database, virtualization, business intelligence, modeling and simulation, and other enterprise applications.

The BladeCenter HX5 server supports up to two Intel Xeon processors. The processor board has the following major components:

- Two 1,567-pin LGA sockets for dual-processor operation.
- Two Enterprise Voltage Regulator-Down (EVRD) regulators. The EVRD supplies the processor core voltage, I/O voltage, and L2 cache voltage, and must adhere to Intel™ Voltage Regulator Module (VRM) and Enterprise Voltage-Regulator-Down (EVRD) 11.1 Specification.
- One Intel 7500 IOH I/O Controller.
- One Intel ICH10 South Bridge.
- Eight Intel 7500 Memory Buffers.
- Sixteen DDR-3 Very Low Profile (VLP) memory DIMM sockets.
- One Vitesse VSC452 Integrated Management Module (IMM) with Integrated VGA Controller.
- 128 MB DDR-2 Video Memory.
- One 8 Mb IMM Boot ROM.
- One Broadcom BCM5709S dual-port 1 Gigabit Ethernet Controller.
- One Spartan 3E FPGA.
- One 128 Mb UEFI Flash ROM.
- One 4 Gb NAND Flash ROM and EEPROM for DSA, IMM Kernel, and IMM SDR/SER Logs.
- One TPM 1.2 Controller.
- Light Path LEDs.
- USB ports for keyboard, mouse, FDD, CD-ROM, and DVD-ROM.
- One CIOv Expansion Card Connector, which supports CIOv PCIe Expansion Cards.
- One CFFh Blade Expansion Connector, CFFh PCIe Expansion Cards, or Expansion Blades.
- One PCIe expansion connector to support the SSD Expansion Card option.
- One LGA Flex Scalability Connector, which interfaces with either the one-node speed burst card or the two-node scalability expansion cards.
- One USB connector, which supports the USB Key for Embedded Hypervisor.

The Intel processor contains 10 cores, a memory controller, and QPI links to the other bridge chips. The Intel IOH provides PCI Express® links to the Blade Expansion Connectors and CIOv Expansion Connector. The Intel ICH10 provides a PCI Express link to the IMM and Broadcom BCM5709S Gigabit Ethernet Controller, an LPC bus interface to the IMM, and USB interfaces.

The I/O functions on BladeCenter HX5 include Video, I2C, USB, SATA, Gigabit Ethernet, USB (floppy, CD-ROM or DVD-ROM, keyboard, and mouse), and Serial over LAN.

The Intel I/O Hub (IOH) contains the following features:

- Dual independent processor QPI links - one processor per QPI link
- One ESI x4 bus to interface to the ICH10
- PCI Express features:
 - Support for up to x36 PCI Express links operating at 5 GBps
 - PCI Express 1.0 and 2.0 compliant

On the HX5, the PCI Express links on the IOH are configured as follows:

- Two x16 PCI Express links routed to CFFh expansion connector and SSD expansion option connector - one x16 PCIe link for each connector. Each x16 PCIe lane can be configured as one x16, or two x8. CFFh connector can also be configured as four x4 lanes.
- One x4 PCI Express link routed to a PCI Express switch that routes an x4 PCIe link to the CIOv Blade Expansion Connector.

Intel ICH10

The Intel I/O Controller Hub 10 (ICH10) provides South bridge function to the system. It provides PCI Express, USB, SMBus, and LPC interfaces to peripherals and integrates functions such as timer, battery-backed SRAM, DMA, and interrupt controller.

The HX5 server memory is contiguous and is shared by both processors when both processors are installed. It is Error Correction Code (ECC) protected and supports 4 GB to 128 GB for each processor blade using 2 GB, 4 GB, 8 GB, or 16 GB industry-standard 240-pin, 72-bit, Very Low Profile (VLP) DDR-3 DIMMs on 16 DIMM connectors.

The operating speed of the memory is dependent on the SMI link speed of the processor.

The HX5 supports memory mirroring. Chipkill is supported in all memory configurations.

Standard BladeCenter HX5 configuration

Model information

Model	Intel Xeon name	Cores	CPU speed	CPU power	QPI speed	Cache
7873B3U	E7-4850	10	2.00 GHz	130w	6.40 GT/s	24 MB

Model configurations

Model	Intel Xeon name	CPUs	Standard memory	DIMM slots	SSDs	Blade width	Chassis
7873B3U	E7-4850	1	2 x 8 GB	16	Open	30 mm	See Below

The model supports the following chassis:

- BladeCenter H Base Model (8852-4XX)
- BladeCenter H Xccelerator Model (8852-HC1)
- BladeCenter HT (Telco) AC Model (8750-1RX)

- BladeCenter HT (Telco) DC Model (8740-1RX)
- BladeCenter S Base Model (8886-1MX)
- BladeCenter S Xccelerator Model (8886-AC1)
- BladeCenter H-R3 Model (8852-4Tx)

Additional features

- The BladeCenter HX5 system board contains 16 DIMM connectors (30 mm blade).
- Each DIMM connector supports 2 GB, 4 GB, 8 GB, or 16 GB DIMM options:
 - Chipkill is supported in all memory configurations.
- One or two solid-state drives (50 GB or 200 GB each) are supported in each blade.
- Dual Gigabit Ethernet connections are provided.

BladeCenter HX5 blade servers are designed for high throughput from processor to memory, and to bus I/O.

These features, combined with SMP capability and blade-thin density, make it an excellent choice for space-constrained and power-constrained environments used for:

- Database
- Virtualization
- General enterprise applications such as ERP and SCM
- Simulations

High-availability and serviceability features

- Hot-swap blades are designed to enable easy access to each blade server.
- The management module interfaces with each blade server for single systems management control.

The BladeCenter HX5 blade servers deliver reliability and serviceability.

Features include:

- High-performance ECC memory, combined with an integrated ECC memory controller, to help correct soft and hard multi-bit memory errors, while reducing disruption of service to LAN clients.
- Chipkill memory correction for up to eight bits per DIMM to help keep your blade server up and running.
- Hardware memory scrubbing, designed to correct many soft memory errors automatically without software intervention.
- Processor L2 cache ECC to help improve data reliability and reduce downtime.
- CPU failure recovery in Symmetric Multi-Processing (SMP) configurations:
 - Forces failed processor offline
 - Automatically reboots server
 - Generates alerts
 - Continues operations with the working processor
- PFA on memory and processors to help alert the system administrator of an imminent component failure.
- Support for dual Gigabit Ethernet connections:
 - Failover, adapter fault tolerance
 - PXE 2.0 Boot Agent
 - Wake on LAN
 - Load balancing or teaming

- Integrated management processor that supports diagnostic, reset, POST, and auto-recovery functions, and monitors temperature and voltage. Alerts are generated when certain thresholds are exceeded (refer to the [Limitations](#) section for restrictions).

IBM Systems Director

BladeCenter HX5 blade servers include IBM Systems Director. IBM Systems Director is designed to be an easy-to-use, point-and-click, platform management solution that streamlines the way physical and virtual systems are managed across a multisystem environment. Leveraging industry standards, IBM Systems Director supports multiple operating systems and virtualization technologies across IBM and non-IBM x86 platforms. Through a single user interface, IBM Systems Director provides consistent views for visualizing managed systems and determining how these systems relate to one another while identifying their individual status, thus helping to correlate technical resources with business needs.

IBM Systems Director utilizes a modular and extensible platform services foundation, providing a way to easily add advanced platform management capabilities to the base offering. The IBM Systems Director offering provides the base function needed for platform management. Advanced platform management functions can be seamlessly added as they are required. Systems Director is based on industry standards and can report results to other tools. IBM Systems Director is a strategic platform management tool that grows with the needs of a business.

Optional add-ons (available for an additional charge)

- Active Energy Manager (AEM) is positioned as a key component of the energy-efficient technologies and services of IBM, which are part of the IBM Project Green initiative that began May 2007. AEM can measure, monitor, and manage the energy management components built into IBM servers and can provide a cross-platform management solution. AEM also retrieves temperature and power information through wireless sensors (SynapSense) and collects alerts, events, and data from facility providers related to power and cooling equipment.
- BladeCenter Open Fabric Manager is designed to help you manage growth and complexity by making it easy to manage I/O and network interconnects for up to 100 BladeCenter chassis - up to 1,400 blade servers. BladeCenter Open Fabric Manager helps make blade deployment **easy**: once installed, the utility is resident in the Advanced Management Module (AMM) so you can preconfigure LAN and SAN connections. Thus, I/O connections are made automatically when you plug in a blade. And no special tools or training is required; just manage with the GUI designed for ease of use.

IBM ToolsCenter

The IBM System x® ToolsCenter is a collection of system management tools that can help manage your HX5 blade server and BladeCenter environment. ToolsCenter makes managing your server environment less complicated, more productive, and cost-effective.

These tools include:

- Deployment

IBM ServerGuide is a tool that simplifies the process of installing and configuring IBM System x and BladeCenter servers. ServerGuide automates installation of Microsoft™ Windows™ server operating systems, device drivers, and other system components, with minimal user intervention.

The ServerGuide Scripting Toolkit enables you to tailor and build custom hardware deployment solutions. It provides hardware configuration utilities and operating system (OS) installation examples for IBM System x and BladeCenter x86-based hardware. The ServerGuide Scripting Toolkit, Windows Edition enables you to create a bootable Windows Preinstallation Environment (Windows PE) 2.1 CD or DVD.

BladeCenter Start Now Advisor is a configuration tool that can help you quickly configure components of the BladeCenter S chassis. It automatically updates the firmware for selected chassis components, and provides you with the option of saving your configuration. Start Now Advisor guides you through the process of connecting your computer to the chassis, either over a network or through a direct attachment to the Ethernet port on the Advanced Management Module.

- Configuration

The Advanced Settings Utility (ASU) systems configuration utility provides a command line interface and unattended scripting capability, and is supported in multiple operating-system platforms such as DOS, Linux™, Solaris, Windows, and WinPE.

Storage Configuration Manager (SCM) is a scalable and integrated storage management tool for both internal and external storage subsystems for IBM System x and BladeCenter. Storage Configuration Manager is an open standards-based management tool that provides a uniform and rich user interface that is designed for ease of use.

- Updates

The UpdateXpress System Packs (UXSPs) contain an integration-tested bundle of online firmware and device driver updates for your server. UXSPs facilitate the downloading and installation of all drivers and firmware for a given system and verify that you are working with a complete set of updates that have been tested together.

Bootable Media Creator pulls current updates for firmware and drivers from the IBM website and creates custom bootable media to CD, DVD, or USB key.

- Diagnostics

Dynamic System Analysis (DSA) collects and analyzes system information to aid in diagnosing system problems. DSA creates a merged log that allows for easy identification of cause-and-effect relationships from different log sources in the system.

BladeCenter advanced management module

BladeCenter HX5 is supported on the Advanced Management Module.

Use the Advanced Management Module in the BladeCenter to manage the BladeCenter and obtain vital system information about your installed BladeCenter HX5 servers. The management module communicates with the blade servers within the BladeCenter using an RS-485 intermanagement network. This network relays vital information about individual blade servers, such as:

- Voltages
- Power supply status
- Memory status
- Fan status
- SSD status
- Error and status log

You receive status and control all blade servers within the BladeCenter. You can shut down and restart any blade server from anywhere on the network to help save time and costs associated with travel to the actual installation.

These manageability functions are provided through a self-contained web page, creating an easy and familiar way for administrators to monitor, control, and maintain high availability.

Standard BladeCenter HX5 configuration

Model	Processor	CPU Cache	Memory	SSD Iface	SSD	Power Supply
BladeCenter HX5						
7873-B3U	1 x 2.00 GHz Intel Xeon E7-4850	24 MB 10C	2x8 GB 130W S4S	SAS	Open Bay	(Note)

Note: Power supplied through BladeCenter chassis.

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-03.ibm.com/able/product_accessibility/index.html

Product positioning

The IBM BladeCenter HX5 is a blade server designed to provide maximum utilization, performance, and reliability for compute-intensive and memory-intensive workloads such as database, virtualization, business intelligence, modeling and simulation, and other enterprise applications.

The BladeCenter HX5 blades can require less space and power resources than traditional rack offerings because of their high-density design, reduced power requirements, and single environment systems management. This is an extremely important consideration for:

- Large enterprises
- Application service providers
- Scientific and technical computing businesses

They are an excellent fit for applications such as:

- Databases
- Virtualization
- General enterprise applications such as ERP and SCM
- Simulations

Product number

The Single Entity Offerings (SEO)

Description	SEO Number
BladeCenter HX5	7873B3U

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=112-222>

Publications

An installation and user's guide, and safety and warranty publications are shipped with each IBM BladeCenter HX5 blade. The following publications are available immediately.

Title	Order Number
BladeCenter Solutions	GM13-0127
System x Family Brochure	GM13-0128

The publication *IBM BladeCenter HX5 Installation and User's Guide and Problem Determination and Service Guide*, in US English versions, are available from

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

The IBM Systems Information Center provides you with a single information center where you can access product documentation for IBM systems hardware, operating systems, and server software. Through a consistent framework, you can efficiently find information and personalize your access. The IBM Systems Information Center is at

<http://publib14.boulder.ibm.com/infocenter/systems>

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.

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

BladeCenter HX5

7873-B3U

Processor	Intel Xeon E7-4850 10 core 130w
Int. speed	2.00 GHz
Max. mem. speed	1066 MHz
Interconnect speed	6.4 GT/s
Number standard	1
Maximum	2
L3 cache (full speed)	24 MB
Memory (VLP ECC DDR3)	16 GB
DIMMs (Standard)	2 x 8 GB
DIMM sockets	16
Capacity	256 GB ¹
Video	SVGA
Memory	128 MB
Disk controller	SAS (optional)
Channels	4
Connector internal	2
Connector external	0
RAID	Yes (optional)
SSD	0
Connectors	2
Internal capacity	800 GB ²
Total HDD bays	Up to 2
PCI slots	0
Management processor	Standard
Ethernet controller	Dual Gb
FC card	Optional
DVD-ROM (IDE)	0
Diskette drive	0

Power supply	0
Blade width	30 mm

¹ Total system memory capacity is based on using 16 GB memory DIMMs.

² Capacities are based on installation of two 400 GB SSDs.

For latest information on supported HDD options, visit

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

Video subsystem

- Matrox video core
- Integrated on the blade

Supported BladeCenter HX5 video resolutions

Resolution	Maximum Refresh Rate Supported	CRT Support	CRT ISO 9241.3 Compliance	Flat Panel Support
640 x 480	85 Hz	Yes	Yes	Yes
800 x 600	85 Hz	Yes	Yes	Yes
1024 x 768	75 Hz	Yes	Yes	Yes

Note: For resolutions supported by different operating systems, refer to the operating system documentation.

Dimensions - BladeCenter HX5

- Height: 24.5 cm (9.7 in)
- Depth: 44.6 cm (17.6 in)
- Width: 5.8 cm (2.28 in)
- Maximum weight: 9.5 kg (21 lb) (depending on the configuration when options are added)

Electrical

BladeCenter chassis: 200 to 240 (nominal) V ac; 50 Hz or 60 Hz

BladeCenter HX5: 12.2 (nominal) V dc

Note: All weights and measurements are approximate.

Standards

This system supports or complies with the following standards:

- Multiprocessor Specification (MPS) 1.4
- Hardware-enabled to meet the International Organization for Standardization (ISO) 9241, Part 3

Equipment approvals and safety

- FCC - Verified to comply with Part 15 of the FCC Rules, Class A
- UL 60950 Safety of Information Technology Equipment
- CSA C22.2 No.60950 Safety of Information Technology Equipment 60950
- NOM-019 Seguridad de Equipo de Procesamiento de Datos within 30 days of planned availability

Operating environment - BladeCenter HX5

- 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%
- Maximum altitude: 2,133 m (7,000 ft)

Hardware requirements

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

- Keyboard
- Mouse
- Display

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

For service, the server requires a compatible:

- Keyboard
- Mouse
- Display

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

Software requirements

Programming requirements

The following network operating systems have been tested for compatibility with the BladeCenter HX5:

- Microsoft :
 - Microsoft Windows Server 2008 R2
 - Microsoft Windows Server 2008, Datacenter x64 Edition
 - Microsoft Windows Server 2008, Enterprise x64 Edition
 - Microsoft Windows Server 2008 HPC Edition
 - Microsoft Windows Server 2008, Standard x64 Edition
 - Microsoft Windows Server 2008, Web x64 Edition
 - Windows Small Business Server 2008, Premium Edition
 - Windows Small Business Server 2008, Standard Edition
- Linux :
 - SUSE Linux Enterprise Server 10 for AMD64/EM64T
 - SUSE Linux Enterprise Server 10 with Xen for AMD64/EM64T
 - SUSE Linux Enterprise Server 11 for AMD64/EM64T
 - SUSE Linux Enterprise Server 11 with Xen for AMD64/EM64T
 - Red Hat Enterprise Linux 5 Server x64 Edition
 - Red Hat Enterprise Linux 5 Server with Xen x64 Edition
 - Red Hat Enterprise Linux 6 Server x64 Edition
- Other:
 - VMware ESX 4.1
 - VMware ESXi 4.1

For additional information, support, certification, and versions of network operating systems, access

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

Compatibility

The IBM BladeCenter HX5 contains licensed system programs that include set configuration, set features, and test programs. IBM system BIOS is loaded from a "flash" EEPROM into system memory. This BIOS provides instructions and interfaces designed to support the standard features of the IBM BladeCenter HX5 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 System x servers, visit

<http://www.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

- Minimum supported VMware version is vSphere 4.1.
- A minimum of two DIMMs per CPU must be installed; DIMMs must be installed in pairs after that. DIMMs must be installed in matched pairs for Mirror Mode.
 - Supports 2 GB, 4 GB, 8 GB, and 16 GB DIMMs.

Refer to the [Planning information](#) section or the System x server web page for memory options.

- Microprocessors must be of the same type, power level, and clock speed on each BladeCenter HX5. Mixing microprocessors of different speeds, power levels, or cache sizes or upgrading the base processors is not supported. The latest BladeCenter hardware and software compatibility is available at <http://www.ibm.com/servers/eserver/serverproven/compat/us/>
- The BladeCenter HX5 is supported in the BladeCenter H chassis (machine type 8852), the BladeCenter S chassis (machine type 8886), and the BladeCenter HT chassis (machine types 8740 and 8750). For supported configurations, refer to the AC Model BladeCenter hardware configuration tools via the website <http://www-03.ibm.com/systems/x/hardware/configtools.html>

Refer to the [Software requirements](#) section for operating system limitations.

Planning information

Customer responsibilities

This product is designated as customer setup. Customer setup instructions are shipped with the product.

Configuration information

BladeCenter HX5 blades must be installed in a BladeCenter chassis.

BladeCenter configuration

The BladeCenter contains 14 blade server bays supporting up to 14 hot-swap BladeCenter HX5 blades. A control panel, located at the top left of the unit, contains the following LEDs:

- Power good
- Blade location
- Over temperature
- Information
- General fault

Memory support

The following memory options are supported with BladeCenter HX5:

Option Description	Option
2 GB (1x2 GB, 1Rx8, 1.35V) PC3-10600 CL9 ECC DDR3 1333 MHZ VLP RDIMM	46C0560
4 GB (1x4 GB, 2Rx8, 1.35V) PC3-10600 CL9 ECC DDR3 1333 MHZ VLP RDIMM	46C0564
8 GB (1x8 GB, 4Rx8, 1.35V) PC3-8500 CL7 ECC DDR3 1066 MHZ VLP RDIMM	46C0570
16 GB (1x16 GB, 2Rx4, 1.35V) PC3-10600 CL9 ECC DDR3 1333 MHZ VLP RDIMM	46C0599
16 GB (1x16 GB, 4Rx4, 1.35V) PC3L-8500 CL7 ECC DDR3 1066 MHZ VLP RDIMM	90Y3221

Memory must be installed in pairs of two identical DIMMs per processors installed. Although the DIMM pairs installed can be of different sizes, the pairs must be of the same speed.

Power considerations

The BladeCenter HX5 is supported in the BladeCenter H chassis (machine type 8852), the BladeCenter S chassis (machine type 8886), and the BladeCenter HT chassis (machine types 8740 and 8750). For supported configurations, refer to the AC Model BladeCenter hardware configuration tools via the web

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

Note: Consult specific chassis announcements for more information on setup and redundancy.

Cable orders

Each BladeCenter HX5 blade contains two Gigabit Ethernet connections. An optional BladeCenter Gigabit Ethernet Switch Module must be installed in the BladeCenter to support external Ethernet connections.

Cabling is not included with the server. Consult the Ethernet Switch module documentation for external cabling requirements.

Installations using the BladeCenter Fibre Channel Switch Module require short-wave or long-wave small form factor pluggable (SFP) options and appropriate Fibre Channel cabling.

Installability

Each IBM BladeCenter HX5 requires approximately 10 minutes for installation. Installation includes unpacking, setting up, and powering on the system. Additional time is required to install an operating system, additional options, or features.

Packaging - BladeCenter HX5

Product	Package Description	Boxes
BladeCenter HX5	BladeCenter HX5 Carton	1
Contents:		

	BladeCenter HX5 Publications/CD Package	1 1
BladeCenter HX5	Publications Package	1

Contents:

Documentation CD-ROM (softcopy of publications)
Safety flyer
Standard form factor I/O Expansion card tray kit

The BladeCenter HX5 blades are shipped in a single package. The approximate shipping dimensions and weight are:

- Single pack dimensions: 60.32 cm x 33.4 cm x 15.57 cm (23.75 in. x 13.13 in. x 6.13 in.)
- Single pack weight: 9.0 kg (20 lb)

Security, auditability, and control

Security and auditability features include:

- A power-on password function helps provide control 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 hard disk drive.
- A selectable boot sequence can be used to help prevent unauthorized installation of software or removal of data from the diskette drive.

The IBM BladeCenter HX5 blades 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 the client's responsibility to ensure that the server is secure to protect sensitive data.

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

IBM Electronic Services

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

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

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

for problem reporting enables IBM to provide better support and service for your IBM server.

To learn how Electronic Services can work for you, visit

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

Terms and conditions

IBM Global Financing

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

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

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

Warranty period

- Three years
- Optional features - One year

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 has been designated as a consumable or supply item and is, therefore, not covered by this warranty:

- 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.

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 have been designated as Tier 1 CRUs:

- Blank filler
- Cable-management arm
- Solid-state drive
- Hot-swap fan
- Hot-swap power supply
- Lift handle kit
- Memory DIMM card
- Optical drive
- PCI adapter
- Power cord
- Service label
- System label
- Top cover

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.ibm.com/servers/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.ibm.com/servers/support/machine_warranties/

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 additional information and current prices, contact your local IBM representative.

IBM BladeCenter HX5

Description	SEO Number	Initial/ MES/ Both/ Support	CSU
1x E7-4850 10C 2.00 GHZ, 130W S4S 2x8 GB	7873B3U	Both	Yes

ServicePac for Warranty and Maintenance

Machine Type/Model	Service Description	ServicePac SEO	ServicePac MTM
7873	3 Year Onsite Repair 9x5 4 Hour Response	84Y2399	67567D8
7873	3 Year Onsite Repair 24x7 4 Hour Response	84Y2400	67567D9
7873	3 Year Onsite Repair 24x7 2 Hour Response	84Y2401	67567DA
7873	4 Year Onsite Repair 9x5 Next Business Day	84Y2402	67567DB
7873	4 Year Onsite Repair 9x5 4 Hour Response	84Y2403	67567DC
7873	4 Year Onsite Repair 24x7 4 Hour Response	84Y2404	67567DD
7873	4 Year Onsite Repair 24x7 2 Hour Response	84Y2405	67567DF
7873	5 Year Onsite Repair 9x5 Next Business Day	84Y2406	67567DG
7873	5 Year Onsite Repair 9x5 4 Hour Response	84Y2407	67567DH
7873	5 Year Onsite Repair 24x7 4 Hour Response	84Y2408	67567DJ
7873	5 Year Onsite Repair 24x7 2 Hour Response	84Y2409	67567DK

ServicePac for Maintenance Agreement

Machine Type/Model	Description	ServicePac SEO	ServicePac MTM
7873	1 Year Onsite Repair 9x5 Next Business Day	84Y2410	6756MD7
7873	1 Year Onsite Repair 9x5 4 Hour Response	84Y2411	6756MD8
7873	1 Year Onsite Repair 24x7 4 Hour Response	84Y2412	6756MD9
7873	1 Year Onsite Repair 24x7 2 Hour Response	84Y2413	6756MDA
7873	2 Year Onsite Repair 9x5 Next Business Day	84Y2414	6756MDB
7873	2 Year Onsite Repair 9x5 4 Hour Response	84Y2415	6756MDC
7873	2 Year Onsite Repair 24x7 4 Hour Response	84Y2416	6756MDD
7873	2 Year Onsite Repair 24x7 2 Hour Response	84Y2417	6756MDF

ServicePac for Essential Support

Warranty and Maintenance Option plus Remote Technical Support

Machine Type/Model	Description	ServicePac SEO
7873	3 Year Onsite Repair 24x7 4 Hour Response, Base Software Support, Hardware How-To 24x7	84Y2418

Maintenance plus Remote Technical Support

Machine Type/Model	Description	ServicePac SEO
7873	1 Year Onsite Repair 24x7 4 Hour Response plus 1 Year Base Software Support and Hardware How To 24x7	84Y2419
7873	1 Year Onsite Repair 9x5 NBD plus 1 Year Base Software Support and Hardware How To 24x7	84Y2420

ServicePac prices

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

IBM Global Financing

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