

Innovative, modular platform for next-generation networks and rugged environments



IBM BladeCenter T solutions



Highlights

■ **Industry-standard building blocks**

A commercial off-the-shelf (COTS) platform designed to help lower Total Cost of Ownership (TCO) and help accelerate new revenue generation for telecommunications service providers

■ **Design excellence**

Innovative, modular design delivers the reliability, flexibility and performance density capable of supporting an IP-based, next-generation network application infrastructure, integrating voice, data and multimedia

■ **On demand**

Integration of servers, I/O, storage, operating systems and applications into a single, compact network platform that is ideal for deploying autonomic capabilities, enabling an on demand operating environment

A scalable platform for next-generation networks

IBM BladeCenter® T extends the value of BladeCenter by providing a platform on which IBM Business Partners and Service Providers (SPs) can build their IP-based, next-generation networks. This high-performance, highly dense, scalable, industry-standard computing platform is designed to help SPs accelerate revenue generation, reduce costs and improve customer loyalty. By achieving these goals, telecommunications companies can become more nimble, efficient and responsive to business changes and opportunities—meeting the challenges of becoming an on demand business.

Increased operational flexibility

BladeCenter system compatibility—achieved through common components for blades, switches and options—combined with support for the Linux® operating system, helps give SPs the

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flexibility needed for application development and deployment. Focus on applications can be leveraged from one environment to another, expanding market reach and speeding time to market.

Highly reliable systems

BladeCenter T delivers rich telecom features and functionality, including integrated servers (i.e. processing), storage and networking, fault-tolerant features, optional hot-swappable redundant DC or AC power supplies and cooling, and built-in system management resources in a 20" deep chassis. The result is a Network Equipment Building Systems (NEBS-3-) and ETSI-compliant server platform optimized for next-generation networks.

NEBS-3-/ETSI-compliant BladeCenter T

- *Designed to meet the rigorous Network Equipment Building System (NEBS) standards for electromagnetic compatibility, thermal robustness, fire resistance, earthquake and office vibration resistance, transportation and handling durability, acoustics and illumination, and airborne contaminant resistance.*

- *Increases server availability under extreme temperatures via a power management capability that automatically reduces the frequency of the processor in order to maintain acceptable thermal levels. The processor frequency will automatically cycle back up as thermal conditions improve.*

This platform, coupled with the carrier-grade Linux operating system, provides a standards-based foundation for a new generation of mission-critical applications.

Highly dense, scalable solution

The dense blade design of BladeCenter T can double the density available from IBM's carrier-grade, rack-mount server by supporting the deployment of 80 CPUs in a 42U rack. BladeCenter T supports IBM BladeCenter HS20, JS21, JS20, LS20 and HS40 blade servers, making it a cost-effective, efficient solution for adding scale and capacity in next-generation network environments.

Products and services from trusted technology providers

Building a network or adding new services is a major undertaking that can be made smoother with the participation of a trusted technology company. IBM, together with worldwide IBM Business Partners, delivers a comprehensive telecommunications solution that includes NEBS-3- and ETSI-compliant products and services to create a trusted network environment. BladeCenter T systems can help provide a distinct cost and speed advantage in building out new networks and bringing new services to market. This solution can help SPs quickly find new sources of revenue and retain high-value customers.

e-business on demand solutions

BladeCenter T provides a solid foundation for next-generation networks, enabling SPs to become I/O on demand providers. Coupled with technological expertise within the enterprise data center, IBM is leveraging the industry know-how of key IBM Business Partners (IHVs, NEPs, ISVs and Linux distribution partners) to deliver added value within SP networks.

BladeCenter T helps telecommunications companies reduce costs and time-to-market to improve customer loyalty and retention—all while promoting the evolution to next-generation networks via:

- **Integration**

BladeCenter T enables the integration of servers, storage, I/O, operating systems and applications into a unified network platform enhancing flexibility, compatibility, efficiency and investment protection.

- **Infrastructure management and simplification**

BladeCenter T provides enhanced autonomic and virtualization capabilities via IBM Director, helping reduce costs associated with supporting multiple disparate servers and operating systems, including maintenance, licensing, floor space and other overhead.

Industry leadership

IBM is uniquely positioned to assist in the transformation of telecommunications networks, providing:

- *Excellence in modular design, featuring a 20" deep chassis, BladeCenter T helps optimize deployment of next-generation networks*
- *Experience helping enterprise and public networks efficiently converge into IP-based platforms*
- *Accelerated adoption and support of the trusted, carrier-grade Linux operating system*
- *Integration of third-party blade servers for robust control plane, service plane and transport plane (for example, I/O) solutions*
- *Comprehensive, integrated telecommunications platforms designed to quickly activate services and reduce costs*

- *Continued solution integration services and advancements in leveraging a carrier-grade open framework from IBM*
- *Commonality with the enterprise data center, helping reduce support costs and accelerating deployments*

In building BladeCenter T, IBM leverages its experience in deploying blade technologies within the enterprise—including banking, industrial and public sector—to the telecommunications and other rugged environments requiring highly reliable and/or compact solutions. This transformation is designed to provide faster time-to-market and help lower TCO.

Through industry-leading and innovative on demand initiatives and frameworks—such as Service Provider Delivery Environment (SPDE), Wireless Enterprise Delivery Environment (WEDE) and Cost Optimization and Strategic Transformation (COST)—IBM and its Business Partners are applying the practical technology advantages of COTS.

These transformation-enabling initiatives and solutions, coupled with strong support of carrier-grade Linux and AIX® (JS21 and JS20 blade servers only), its ISV porting and tuning capabilities, and the enterprise acceptance of IBM blades and racks, combine to solidify a leadership position for IBM in next-generation networks.

BladeCenter T chassis options

These options are available only with the BladeCenter T chassis.

BladeCenter T 1300W Power Supply Module (DC or AC power)

Bringing greater reliability and greater availability, this power supply module provides both power and redundancy to BladeCenter T environments requiring DC or AC power.

BladeCenter T 4-port Gigabit Ethernet Switch Module

Provides high-speed Ethernet connections between each blade server and the outside network environment.

BladeCenter T Redundant KVM/Management Module

This option enables system management resiliency and provides remote management and connectivity to the BladeCenter T chassis for the most critical applications.

BladeCenter T 2-Post and 4-Post Rackmount Kits

Specially designed to support the 20" deep BladeCenter T chassis, in 2-post or 4-post racks typically found in the telecommunications industry.

BladeCenter T chassis options¹

These options are also available with the BladeCenter chassis.

Nortel Networks Gigabit Ethernet Switch Modules

The Layer 2-7 Switch Module integrates advanced Ethernet functionality into the chassis, decreasing complexity and increasing manageability. The low-cost Layer 2/3 switch module provides six copper or fiber uplinks and 14 internal ports.

Cisco Systems Intelligent Gigabit Ethernet Switch Modules

The Cisco® Ethernet switch module provides four external copper or fiber Gigabit Ethernet ports and 14 internal Gigabit Ethernet ports interfacing via the BladeCenter midplane to the blade servers.

QLogic 2Gb and 4Gb Fibre Channel Switch Modules

These switches are interoperable in SCSW3-compliant SANs.

Brocade 2Gb and 4Gb Switch Modules

These switch modules are ideal for integration into Brocade environments.

McDATA® 2Gb and 4Gb SAN Switch Modules

The 2Gb and 4Gb switches are ideal for integration into McDATA environments.

Topspin IB Switch Module

Integrates Infiniband® connectivity directly into the BladeCenter chassis with up to four 4X uplink connections.

Copper and Optical Pass-thru Modules

Features a 1Gb unswitched, unblocked bidirectional copper or fiber Ethernet connection to each blade server.

Blade server options¹**High-speed interconnect expansion cards**

The Topspin IB expansion card option provides a high-speed/low-latency interconnect on each blade.

Gigabit Ethernet Expansion Card

Allows expansion of the Ethernet subsystem to enable more bandwidth.

2Gb and 4Gb dual-port Fibre Channel (FC) Expansion Cards

Adds dual-port FC HBAs for each blade server. These cards work with any of the SAN and FC Switch Modules.

QLogic® iSCSI Expansion Card

Acts as a hardware initiator to provide iSCSI communication from the blade server to an iSCSI storage device.

SCSI or IDE Hard Disk Drives (HDDs)

Achieve maximum blade density with Small Form Factor SCSI or IDE HDDs. Additional hot-swap HDDs are supported via the SCSI Storage Expansion Units.

SCSI Storage Expansion Unit

This option provides integrated mirroring capabilities and uses standard hot-swap Ultra320 SCSI HDDs. Also, it allows the addition of two I/O expansion cards to each blade.

PCI I/O Expansion Unit

Each unit connects to an HS20 blade (model dependent) supporting up to two legacy 100 MHz PCI-X adapters.

For more information:

World Wide Web

U.S. ibm.com/systems/bladecenter

Reseller locator and generation information

U.S. 1 800 426-4968

Canada 1 800 426-2255

BladeCenter T at a glance

Form factor	Rack/8U, high availability midplane
Blade bays	Up to eight 2-processor, and up to four 4-processor
Standard media	60MB CD/DVD (RW) drive accessible from each blade server
Switch modules	Four switch module bays
Power supply modules	Up to four (hot-swap and redundant 1300W with load balancing and failover capabilities, two standard)
Cooling modules	Four hot-swap and redundant blowers standard
Systems management hardware	1 management module standard, add an optional second module for redundancy
I/O ports	Keyboard, video, mouse, Ethernet, USB

Support for a range of blade servers

BladeCenter T supports the HS20 blade, a 2-processor blade server with up to two high-performance Intel® Xeon™ Processors; the new JS21 and JS20 blade, 2-processor PowerPC®-based servers; the LS20 blade, a 2-processor AMD Opteron™-based server; and the HS40 blade, a 4-processor blade server with up to four Intel Xeon Processors MP.

The HS20 blade (some models support 64-bit capability) and HS40 blade servers are ideal for compute-centric applications, including VoIP/softswitch, IPTV, IMS and wireless, multimedia and emerging next-generation network applications.

The JS21 and JS20 blades deliver a new level of price/performance for the BladeCenter T customer running 32-

64-bit Linux or UNIX® applications.

With a fast 2.2 GHz processor enhanced with 162 Single Instruction/Multiple Data (SIMD) instructions, the JS21 and JS20 blades can help telecommunications customers with data-intensive applications.

The HS20, JS20, JS21, LS20 and HS40 blades deliver rack-dense solutions for customers who demand high reliability and availability, rapid scalability and easy installation.

IBM BladeCenter HS20 at a glance

Processor	Intel Xeon Processor up to 3.80 GHz (some models support Intel Extended Memory 64 Technology (Intel EM64T))
Number of processors (std/max)	1/2
Cache (max)	1MB or 2MB (model dependent)
Front side bus	Up to 800 MHz
Memory³	Up to 8GB PC2-3200 DDR II
Internal hard disk drives	Up to 2 Ultra320 SCSI HDDs installed on each blade (or plus support for up to 2 hot-swap Ultra320 SCSI drives with optional SCSI Storage Expansion Unit)
Maximum internal storage^{3,4}	746.8GB (with optional Storage Expansion Unit)
RAID support	Integrated RAID-1 standard on blade server, integrated RAID-IE with SCSI Expansion Unit 2 option (on select blades)
Network	Dual Gigabit Ethernet
I/O upgrade	1 expansion card connection
Systems management hardware	Integrated systems management processor

IBM BladeCenter JS20 at a glance

Processor	PowerPC 970 at 2.2 GHz (64-bit)
Number of processors	2
Level 2 cache	512KB
Memory bus	1.1 GHz
Memory³	Up to 8GB DDR ECC SDRAM
Internal hard disk drives	Up to 2 IDE
Maximum internal storage^{3,4}	120GB
Network	2 integrated Gigabit Ethernet controllers
I/O upgrade	1 expansion card connection
Systems management hardware	Integrated systems management processor

IBM BladeCenter JS21 at a glance

Processor	PowerPC 970 up to 2.7 GHz (64-bit)
Number of processors	4
Level 2 cache	Up to 2x2MB
Memory bus	1.1 GHz
Memory³	Up to 16GB DDR II SDRAM
Internal hard disk drives	Up to two 73.4GB 2.5" SAS
Maximum internal storage^{3,4}	120GB
Network	2 integrated Gigabit Ethernet controllers
I/O upgrade	1 expansion card connection
Systems management hardware	Integrated systems management processor



AMD Opteron LS20 for IBM BladeCenter at a glance

Processor	AMD Opteron Model 246, 250, 252, 254, 270, 275
Number of processors	2
Level 2 cache	1MB per processing core
Memory³	Up to 16GB DDR VLP memory
Internal hard disk drives	Up to two Ultra320 SCSI HDDs
Maximum internal storage^{3,4}	146.8GB
Network	2 integrated Gigabit Ethernet controllers
I/O upgrade	1 expansion card connection
Systems management hardware	Integrated system management processor

IBM BladeCenter HS40 at a glance

Processor	Intel Xeon Processor MP up to 3.0 GHz
Number of processors (std/max)	1/4
Level 3 cache	Up to 2MB L3
Front side bus	Up to 400 MHz
Memory³	Up to 16GB ECC DDR Chipkill™
Internal hard disk drives	Up to 2 non-hot-swap IDE drives (and support for up to 2 hot-swap Ultra320 SCSI drives with optional SCSI Storage Expansion Unit)
Maximum internal storage^{3,4}	293.6GB SCSI
RAID support	Integrated RAID with SCSI Storage Expansion Unit option
Network	4 integrated Gigabit Ethernet controllers
I/O upgrade	2 expansion card connections
Systems management hardware	Integrated systems management processor

¹ Options support varies by server and chassis platform.

² KVM capability not available on JS21 and JS20.

³ Maximum internal hard disk and memory capacities may require the replacement of any standard hard drives and/or memory and the population of all hard disk bays and memory slots with the largest currently supported drives available. When referring to variable speed CD-ROMs, CD-Rs, CD-RWs and DVDs, actual playback speed will vary and is often less than the maximum possible.

⁴ When referring to storage capacity, GB means 1,000,000,000 bytes and TB means 1,000,000,000,000 bytes. Accessible capacity is less.

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Route 100
Somers, NY 10589

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