IBM

IBM *@server* **BladeCenter T solutions**

Highlights

■ **Industry-standard building blocks**
A commercial-off-the-shelf (COTS) platform designed to 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

The IBM *@server*® 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, telecom companies can become more nimble, efficient and responsive to business changes and opportunities—meeting the challenges of delivering e-business on demand™.

Increased operational flexibility

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

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SPs the 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) III- and ETSI-compliant (planned[1]) server platform optimized for next-generation networks. 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 doubles 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 @server® BladeCenter™ HS20 (2-way) and IBM @server® BladeCenter™ HS40 (4-way) 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 telecom solution that includes NEBS- and ETSI-compliant (planned) 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

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

BladeCenter T systems help telecoms 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 telecom 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*
- *Comprehensive, integrated telecom 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 telecom and other rugged environments requiring highly reliable and/or compact solutions. This transformation is designed to provide faster time-to-market and 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, 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.

IBM @server **BladeCenter T at a glance**

Form factor	Rack/8U, high availability midplane
Blade bays	Up to 8 2-way, and up to 4 4-way
Standard media	60MB CD/DVD (RW) drive accessible from each blade server
Switch modules	4 switch module bays
Power supply modules	Up to 4 (hot-swap and redundant 1300W with load balancing and failover capabilities, 2 standard)
Cooling modules	4 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

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 to BladeCenter T systems and greater availability for applications, 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

Featuring Layer 2 switching technology, this option 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 options

These options are also available with the BladeCenter chassis.

Nortel Networks Layer 2-7 Gigabit Ethernet Switch Module

Featuring Layer 2 through 7 switching technology, this module integrates advanced Ethernet functionality into the chassis, decreasing complexity and increasing manageability.

2-port Fibre Channel (FC) Switch Module

Allowing attachment to a Storage Area Network (SAN), this option contains two FC uplinks as well as connections to every blade capable of supporting transmissions up to 2Gbps[2].

Optical Pass-thru Module

This option features an unswitched, unblocked network connection to each blade server bay. It must be used in conjunction with the Gigabit Ethernet Expansion Card, the FC Expansion Card or the integrated Gigabit Ethernet on the blade server.

IBM @server BladeCenter HS20 at a glance

Processor	Intel Xeon Processor up to 3.2GHz
Number of processors (std/max)	1/2
Level 3 cache	Up to 2MB
Front side bus	Up to 533MHz
Memory	Up to 8GB ECC DDR[3]
Internal hard disk drives[4]	Up to 2 IDE drives (either 40GB ATA 100 or 1GB, 2GB or 4GB flash drives)
Maximum internal storage[4]	293.6GB[4] SCSI (via 2 hot-swap Ultra320 drives with optional SCSI Storage Expansion Unit)/80GB IDE
RAID support	Integrated IDE RAID standard on blade server, integrated RAID with SCSI Storage Expansion Unit option
Network	2 integrated Gigabit Ethernet controllers
I/O Upgrade	1 expansion card connection
Systems management hardware	Integrated systems management processor
Systems management software	IBM Director with systems management and trial deployment tools, IBM Director Server Plus Pack optional
Predictive Failure Analysis	Hard disk drives, processors, blowers and memory
Light Path Diagnostics	Blade server, processor, memory, power supplies, blowers, switch module, management module, hard disk drives and expansion card
Limited warranty[6] and support	3-year onsite limited warranty
External storage	Support for IBM TotalStorage solutions (including FAStT and NAS family of products); support for NEBS/ETSI - compliant Fibre Channel SAN
Operating systems supported	Microsoft Windows Server 2003, Microsoft Windows 2000 Server/Advanced Server, Red Hat Linux, SUSE LINUX

Support for a range of blade servers

BladeCenter T systems support the HS20 blade, a 2-way blade server with up to two high-performance Intel® Xeon™ Processors and the HS40 blade, a 4-way blade server with up to four Intel Xeon Processors MP. HS20 and HS40 blade servers are ideal for compute-centric applications, including VoIP/softswitch, wireless, multimedia and emerging next-generation network applications. The HS20 and HS40 blades deliver rack-dense solutions for customers who demand high reliability and availability, rapid scalability and easy installation.

HS20 blade with low-profile handle

IBM @server **BladeCenter HS40 at a glance**

Processor	Intel Xeon Processor MP up to 3.0GHz
Number of processors (std/max)	1/4
Level 3 cache	Up to 2MB L3
Front side bus	Up to 400MHz
Memory	Up to 16GB ECC DDR Chipkill™
Internal hard disk drives	Up to 2 hot-swap Ultra320 SCSI drives with optional SCSI Storage Expansion Unit
Maximum internal storage	293.6GB[4] 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
Systems management software	IBM Director with systems management and trial deployment tools, IBM Director Server Plus Pack optional
Predictive Failure Analysis	Hard disk drives, processors, blowers and memory
Light Path Diagnostics	Blade server, processor, memory, power supplies, blowers, switch module, management module, hard disk drives and expansion card
Limited warranty[6] and support	3-year onsite limited warranty
External storage	Support for IBM TotalStorage solutions (including FAStT and NAS family of products); support for NEBS/ETSI - compliant Fibre Channel SAN
Operating systems supported	Microsoft Windows Server 2003, Microsoft Windows 2000 Server/Advanced Server, Red Hat Linux, SUSE LINUX

HS40 blade with low-profile handle

Blade server options[5]

Gigabit Ethernet Expansion Card

This I/O option allows for expansion of the Ethernet subsystem to enable additional bandwidth. It works in conjunction with the IBM BladeCenter T 4-port Gigabit Ethernet Switch Module, the Nortel Networks® Switch Module and the Optical Pass-thru Module.

Fibre Channel Expansion Card

This I/O expansion option adds dual-port FC connectivity at up to 2Gbps to each blade server. It works in conjunction with the IBM BladeCenter 2-port Fibre Channel Switch Module.

40GB 5400rpm ATA-100 Hard Disk Drive (HDD) (not supported in NEBS/ETSI environment)

Helping you achieve maximum density at a low cost, this option is a 2.5", slim-high EIDE HDD. The HS20 supports two HDDs for up to 80GB of storage capacity.

IDE flash disk drives

These optional 1GB, 2GB or 4GB disk drives support the boot of an operating system locally on a blade server. IDE flash disk drives feature non-rotating media desirable in NEBS/ETSI telecommunications environments.

PCI I/O Expansion Unit

Optional expansion module supports legacy telecom network interfaces, including T1/E1/J1, SS7, ATM over OC3/STM-1 and ipSEC connectivity. Each module, connected to an HS20 or HS40 blade server, supports two 100MHz PCI-X adapters.

SCSI Storage Expansion Unit

Enables the use of high-performance Ultra320 SCSI HDDs in your blades environment. This option provides integrated mirroring capabilities and uses standard IBM hot-swap HDDs.

For more information:

World Wide Web

U.S.	**ibm.com**/servers/eserver/bladecenter
Canada	**ibm.com**/pc/ca/eserver/xseries/bladecenter_family.shtml

Reseller locator and generation information

U.S.	1 800 426-4968
Canada	1 800 426-2255
	ibm.com/pc/us/businesspartner

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

[5] Option support varies by server platform.

[6] **Visit ibm.com**/pc/safecomputing **periodically for the latest information on safe and effective computing.** Warranty Information: For a copy of applicable product warranties, write to: Warranty Information, P.O. Box 12195, RTP, N.C. 27709, Attn: Dept. JDJA/B203. IBM makes no representation or warranty regarding third-party products or services.

[1] All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only. Contact your local IBM office or IBM authorized reseller for the full text of a specific Statement of General Direction.

[2] Speed denotes maximum possible and is dependent on many factors. Actual speed may vary and be less than the maximum.

[3] Memory with Chipkill-enabled technology is available as an option at 512MB DIMMs and higher.

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