IBM

IBM BladeCenter HT solutions

Extending the BladeCenter family value

IBM BladeCenter HT, the newest NGN platform in the evolution of the BladeCenter family, is a powerful new chassis that helps reduce network infrastructure costs while increasing network infrastructure performance and flexibility—making it the ideal platform to support demanding next-generation, high-performance core telecom network applications such as Internet Protocol TV (IPTV), Video on Demand (VoD), IP Multimedia Subsystem (IMS) and Advanced Security.

The new chassis maintains compatibility with the BladeCenter family. The four chassis in the BladeCenter family share the same blades and switches, and support legacy and currently shipping blades. Compatibility will continue in the future as new blades are introduced with new capabilities, offering additional functionality to the family—BladeCenter,

Highlights

- **Leadership server performance—***high-performance dual-core and quad-core processors and large memory capacity are ideal for telecommunications Transport, Control and Service plane applications.*

- **High performance networking—***ideal platform for demanding high-throughput Control and Transport plane applications with multi-terabit backplane and 10 Gbps switch fabric.*

- **Operational flexibility, interoperability and investment protection—***compatible family using a single architecture with common components that helps reduce infrastructure costs and complexity.*

- **Increased scalability and density—***higher density of blades and switches in an IBM BladeCenter® HT chassis.*

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BladeCenter T and BladeCenter H chassis. Leveraging a single, compatible architecture enables you to reduce costs and complexity, while delivering investment protection for your next-generation network (NGN) infrastructures.

Customers who will benefit most from BladeCenter HT include telecommunications Network Equipment Providers and Service Providers (SPs) looking for:

- *An IMS that supports Control plane applications such as Home Location Register (HLR), Home Subscriber Server (HSS) and Media Resource Function (MRF) and Transport plane applications such as media servers and media gateways.*
- *IPTV, including VoD servers, channel change broadcast servers, applications and online gaming, content distribution and protection and online guides.*
- *High-speed advanced security solutions, such as firewall, Virtual Private Network (VPN), intrusion prevention, denial-of-service prevention, traffic shaping, antivirus, deep-packet inspection, Quality of Service (QoS), lawful intercept and anti-spam solutions.*

- *Control plane gateways that support Signaling System 7 (SS7), Voice over IP (VoIP), Internetworking and the use of transport plane Advanced Mezzanine Cards (AMC) commercial-off-the-shelf (COTS) products in various combinations to flexibly address existing public switched telephone network (PSTN) interfacing.*

A scalable platform for next-generation networks

BladeCenter HT extends the value of the BladeCenter family by providing a highly dense, carrier-grade platform on which IBM Business Partners, SPs and Network Equipment Providers can build their IP-based, next-generation networks. This high-performance, scalable, industry-standard computing platform is designed to help SPs accelerate revenue generation, reduce costs and improve customer loyalty. BladeCenter HT extends the ability of the BladeCenter family to scale, consolidate existing/new workloads efficiently and save valuable floor space and costs through a reduced footprint.

Leveraging the BladeCenter family of systems will enable telecommunications companies to become more nimble, efficient and responsive to business changes and opportunities—addressing the challenges of delivering new, revenue-generating services quickly and cost-effectively.

Increased operational flexibility

Since the introduction of BladeCenter in 2002, the BladeCenter family provides system compatibility—achieved through common components for blades, switches, I/O, storage, management and options. This is continued with BladeCenter HT and the additional operational flexibility provided for deploying systems based upon specific requirements—data center or central office, DC or AC power, NEBS-3/ETSI and high availability. When combined with support for the Linux®, Windows®, AIX® and Sun Solaris operating systems, the BladeCenter family helps give SPs the flexibility needed for application development and deployment. Focus on applications can be leveraged from one environment to another, expanding market reach and reducing time to market.

The BladeCenter family is unique in today's market as the only platform optimizing operational efficiency and flexibility—spanning both the telecommunications and enterprise markets—using a common set of components. BladeCenter, BladeCenter T and BladeCenter H have been designed to coexist with other telecommunications industry architectures.

Highly reliable systems

As with the BladeCenter T announced in 2004, BladeCenter HT 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. BladeCenter HT has been 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. The result is a chassis with easy deployment into telecommunications racks and infrastructures, helping reduce implementation complexity and time to market.

"IBM BladeCenter provides an effective in-network server platform for Bytemobile's Unison integrated IP services architecture, which offers wireless carriers seamless interoperability and scalability."

—Adrian Hall, Vice President of Marketing and Business Development, Bytemobile

This platform, coupled with the carrier-grade Linux operating system, provides a standards-based foundation for a new generation of mission-critical applications, providing additional resilience and reliability to your NGN infrastructures.

Highly dense, scalable solution

The dense architectural design of BladeCenter HT doubles the density available from IBM's carrier-grade, rack-mount servers by supporting the deployment of up to 12 blade servers per chassis. BladeCenter HT supports IBM blade servers including Intel® (HS20, HS21), AMD Opteron (LS20, LS21/41) and IBM POWER™ (JS20, JS21) processor-based blade servers, making it a cost-effective, efficient solution for adding scale and capacity for NGN environments and applications such as IPTV, VoD, IMS architectures and Advanced Security.

Infrastructure Management

BladeCenter, with integrated management tools, provides a single point of control for managing an entire telecommunications environment, helping to maximize system reliability and availability. Coupled with IBM Director management software, SPs can help simplify administration and reduce costs associated with supporting multiple disparate servers and operating systems, including maintenance, licensing, floor space and other overhead.

Collaborate to innovate

IBM has opened the design specifications for BladeCenter, allowing third parties to easily design compatible networking switches, blade adapter cards (daughter cards) and appliance and communications blades for the platform. The open BladeCenter design specifications are intended to harness

the development power of the industry and deliver an even more comprehensive solution to customers, reducing time to market for deploying new services.

Blade.org, formed in late 2005 as a group of companies driving innovation on BladeCenter-based platforms, has emerged into an open community comprised of more than 40 technology leaders that advance next-generation technologies for blades focusing on solution design guidance, compliance and interoperability testing. The BladeCenter Alliance Program, comprised of more than 700 members, extends the architecture of BladeCenter with the technological skills of companies from a wide range of disciplines. Alliance providers have chosen BladeCenter because they believe the architecture adds value to the solutions they create for their customers.

"IPTV service providers will appreciate the performance, ease of management and scalability offered by IBM's BladeCenter. Consumers are very demanding of their TV services, and IBM's proven, carrier-grade servers will allow our customers to roll out innovative IPTV offerings with confidence."

—Mauro Bonomi, CEO, Minerva Networks

Foundation for virtualization

BladeCenter HT takes virtualization to the next level by enabling server, storage and I/O sharing across multiple chassis of blades—making it ideal for even the most demanding telecommunications environments. Virtualization provides the ability to share and manage workloads across multiple resources, making your NGN infrastructure more responsive and efficient, enabling an improved user experience.

Openness

Making compatibility and upgrading even easier, IBM has published the design specifications for BladeCenter, allowing equipment manufacturers, SPs and ISVs to design compatible NGN and appliance blades, networking switches and adapter cards for the BladeCenter platform.

Increased Interoperability and Internetworking

The BladeCenter family addresses the connectivity, interoperability and internetworking requirements facing today's service providers with the introduction of the IBM BladeCenter 4x1 AdvancedMC Carrier Blade and the IBM BladeCenter NGN Gateway Blade. These provide the following:

- *Cost effectively integrate telecommunications transport plane applications, which often comprise a significant proportion of total network costs, such as Mobility/Wireless, Media and Signaling gateways, as well as Network Processors (NP), into BladeCenter.*

- *Route packets from a wireless LAN to another network (typically wired), enable multimedia communications across NGN networks over multiple transport protocols such as IP and ATM and deploy SS7 functionality for efficient call setup/tear down in BladeCenter. In addition, packet processing within IP networks can be enhanced and optimized.*

- *Enhance I/O interoperability between BladeCenter and legacy architectures, and AdvancedTCA, with industry-standard Advanced Mezzanine Cards (AMC), Network Processor and DSPs for such applications as WAN I/O transport, media gateway and signal internetworking.*

- *Dramatically increase scalability for emerging NGN applications, such as VoD, requiring many streaming ports to servers by providing up to eight Gigabit Ethernet ports.*

Industry leadership

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

- *Leadership server performance featuring high-performance dual-core and quad-core processors from Intel, AMD and IBM and large memory capacity are ideal for telecommunications Control and Service plane applications*
- *High-performance networking for throughput-intensive Transport plane applications with more than 1.2 Tbps backplane capacity (up to 40 Gbps throughput per blade)*

- *Operational flexibility, interoperability and investment protection with a compatible family of systems using a single architecture with common components help reduce cost and complexity of NGN implementations*
- *Increased scalability and density with more capacity for blades and switches. Certified testing by Underwriters Laboratories® (UL) of the BladeCenter HT chassis is in progress, and when complete the BladeCenter HT chassis will be covered under a UL certified NEBS Level 3/ETSI test report, which will be available for review with customers.*
- *Open, industry-standard platform based on open standards, BladeCenter HT leverages a broad ecosystem of industry-leading NGN applications, greatly enhancing interoperability and reducing time-to-market*

Delivering incredible core telecommunications performance and high-speed networking ideal for integrating Service, Control and Transport plane applications into a single, open, industry-standard platform that can significantly lower Service Provider capital and operating expenses—that's BladeCenter HT.

BladeCenter HT chassis options

These options are available only with the BladeCenter HT chassis.

BladeCenter HT Power Supply Module (DC or AC power)

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

BladeCenter HT 2-Post and 4-Post Rackmount Kits

Specially designed to support the compact BladeCenter HT chassis, in 2-post or 4-post racks, typically found in the telecommunications industry.

BladeCenter HT Advanced Management Module (AMM) Interposer

An extender (connection link) between the Advanced Management Module and the BladeCenter HT midplane maintains the internal fabric and signaling between the two. One of these interposers comes standard but this option must be ordered if a redundant AMM is deployed.

BladeCenter HT Interposer for Gigabit Switch and Bridge Bays

An extender (connection link) between the Gigabit Switch/Bridge Bays and the BladeCenter HT midplane maintains the internal fabric between the two. One of these interposers must be ordered for each Ethernet/network switch and/or Pass Thru module deployed.

BladeCenter HT Interposer for Gigabit Switch/Bridge Bays with Interswitch Links (ISL)

An "extender" (connection link) between the Gigabit Switch/Bridge Bays and the BladeCenter HT midplane maintains the internal fabric between the two. Interswitch links provide the ability to establish load balancing or high-speed communications between switch pairs without consuming valuable external ports.

BladeCenter HT Interposer for High-Speed Switch Bays

An extender (connection link) between the high-speed switch bays and the BladeCenter HT midplane maintains the internal fabric and signaling between the two. One of these interposers must be ordered for each high-speed switch module deployed.

BladeCenter HT Redundant Media Tray

A customer serviceable, half blade design media tray directly wired to the BladeCenter HT midplane can be removed without impacting operation of the chassis. This tray includes two external USB connectors and light path diagnostics and also supports optional 1GB and 4GB Compact Flash drive options typically used for local boot of OS.

BladeCenter HT 1GB Compact Flash Option

This optional 1GB compact flash module is a media tray option and supports the boot of an OS from any blade server. It provides flash-based storage (non-rotating media) that is capable of passing NEBS/ETSI certification as required in thermally challenged telecommunications environments.

BladeCenter HT 4GB Compact Flash Option

This optional 4GB compact flash module is a media tray option and supports the boot of an operating system from any blade server housed inside the BladeCenter HT chassis. It provides

flash-based storage (non-rotating media) that is capable of passing NEBS/ETSI certification as required in thermally challenged telecommunications environments.

BladeCenter HT Bezel (includes Filter and Cable Management Collar)

This 90mm thick bezel, which houses a customer replaceable filter and cable management arm to simplify cable routing, attaches to the front of the BladeCenter HT chassis and supports the deployment of I/O cabling inside the chassis "envelope" to maintain operational integrity of the system. The NEBS/ETSI test of the BladeCenter HT chassis includes this bezel.

BladeCenter HT Replacement Filters (4 pack)

A pack of four "customer replaceable" filters, which are easily deployed inside the BladeCenter HT Bezel. Typically, a filter should be replaced every 3-4 months to keep external contaminants such as dust and airborne particles from impacting the operational integrity of the BladeCenter HT chassis.

BladeCenter chassis at a glance

	BladeCenter HT	BladeCenter H	BladeCenter T	BladeCenter
Year introduced	2007	2006	2004	2002
Rack form factor	12U	9U	8U	7U
Blade bays	12	14	8	14
Standard media	USB, optional Compact Flash, (no DVD/CD)	DVD-ROM	DVD-ROM, floppy	DVD-ROM, floppy
Number of switch fabrics	Up to four legacy, up to four high speed and up to two bridge modules	Up to four legacy, up to four high speed and up to four bridge modules	Up to four	Up to four
Power supply module	AC or DC	AC	AC or DC	AC
Thermal design	Four hot-swap fan modules	Two hot-swap fan modules plus up to 12 hot-swap fans	Four hot-swap blowers	Two hot-swap blowers
Systems management controller	Up to two Advanced Management Modules	Up to two Advanced Management Modules	Up to two BCT Management Modules	Up to two BC Management Modules
NEBS-3/ETSI chassis	Yes	No	Yes	No
4X InfiniBand, 10Gb Ethernet capability (internal)	Yes	Yes	No	No
External I/O ports	USB-based keyboard, mouse (KM), Ethernet, DB15, Analog Video	Keyboard, video, mouse, Ethernet, USB	Keyboard, video, mouse, Ethernet, USB	Keyboard, video, mouse, Ethernet, USB
Systems management software	IBM Director with systems management and trial deployment tools			
IBM Predictive Failure Analysis®	Hard disk drives, processors, blowers, memory			
Light path diagnostics	Blade server, processor, memory, power supplies, blowers, switch module, management module, hard disk drives and expansion card			
Limited warranty[1]	3-year onsite limited warranty			
External storage	Support for IBM System Storage™ solutions			

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