IBM BladeCenter

Javier Suarez, e-TechServices
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Executive summary

- To meet your IT challenges, you need to drive innovation with technology advancements, improve responsiveness of systems and people and maximize return on your IT investments.

- With IBM BladeCenter® built on IBM X-Architecture®, you can choose the right solution – one tailored to fit your diverse needs – so you can realize innovation in your business.

- BladeCenter is open and easy to deploy, integrate and manage so you can improve the responsiveness of your systems and people and manage growth your way.

- BladeCenter helps you go green and start saving today for a better tomorrow – helping to improve overall costs while showing your corporate commitment to the environment.

- IBM has the thought leadership, commitment and experience in providing technology that can help advance your business.
What is IBM BladeCenter technology?

IBM BladeCenter is a simple integration of servers, storage and networking. Its innovative, open design offers a true alternative to sprawling racks and overheated server rooms:

- Built on the IBM X-Architecture strategy
- Five different chassis to choose from
- Seven different blades, including solid-state design and a range of expansion modules
- An expansive I/O portfolio with simplified deployment and failover capability
- Software for systems, energy and virtualization management
- IBM services and support
If your infrastructure looks like this …
IBM BladeCenter can help you take control

- Multiple server management tools reduced to one
- Storage area network (SAN) cables removed
- Local area network (LAN) cables removed
- Multiple external switches integrated inside the chassis
- Keyboard, video, mouse (KVM) costs eliminated
- Power distribution unit (PDU) costs drastically reduced
- Energy, heat and floor space conserved
Realize innovation with X-Architecture technology

The IBM X-Architecture blueprint delivers customer value through innovative design and the application of technology.

X-Architecture provides a comprehensive approach to solving your IT challenges today and a forward-looking approach to designing for tomorrow’s challenges.
Extend blade benefits to your entire business

Chassis tailored to your specific needs

IBM BladeCenter S
Distributed, small office, easy to configure

IBM BladeCenter E
Best energy efficiency, best density

IBM BladeCenter H
High performance

IBM BladeCenter T
Ruggedized

IBM BladeCenter HT
Ruggedized, high performance

- A common set of blades
- A common set of industry-standard switches and I/O fabrics
- A common management infrastructure

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Extend blade benefits to all your applications

Blades tailored to your specific needs

- A common set of blades
- A common set of industry-standard switches and I/O fabrics
- A common management infrastructure
## BladeCenter x86 Server Portfolio Positioning

<table>
<thead>
<tr>
<th></th>
<th>HS12</th>
<th>HS21</th>
<th>HS21 XM</th>
<th>LS22/42</th>
<th>JS12</th>
<th>JS22/QS22</th>
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<tr>
<td><strong>Entry and SMB Server</strong></td>
<td>Uni socket Xeon</td>
<td>General Purpose Enterprise Server</td>
<td>Targeted Enterprise Server</td>
<td>High Performance Blade Server</td>
<td>SMB Server</td>
<td>Scalable Enterprise Performance Blade Server</td>
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<td><strong>Target Market</strong></td>
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<td>SMB</td>
<td>Retail</td>
<td>LE Multi-location</td>
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<td><strong>Applications</strong></td>
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<td></td>
<td>File/Print</td>
<td>Workgroup apps</td>
<td>Vertical POS / DVS</td>
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<td><strong>Value Proposition</strong></td>
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<td></td>
<td>New levels of availability and performance in an ultra affordable uni blade</td>
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<td>Best price performance and energy-efficiency</td>
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<td>Mission-critical for business performance computing</td>
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<td></td>
<td>Uni socket Power6</td>
<td>2 socket Power / Cell</td>
<td>2/4 socket AMD</td>
<td>2 socket Xeon</td>
<td>2 socket Xeon</td>
<td>2/4 socket AMD</td>
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<td>HPC</td>
<td>SMB</td>
<td>Telco</td>
<td>General LE</td>
<td>Distributed Computing</td>
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<td></td>
<td>Clustering</td>
<td>Business Intelligence</td>
<td>Hosted Client</td>
<td>Memory Intensive</td>
<td>Digital Media</td>
<td>Modeling / Simulation</td>
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<tr>
<td><strong>Value Proposition</strong></td>
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<td></td>
<td>High performance per watt</td>
<td>Value and performance</td>
<td>Value and performance</td>
<td>High performance per watt</td>
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Announcing the IBM BladeCenter HS12

Why offer a Uni-Processor Blade server?

- Dual/Quad Core UP servers now have enough processing power to run most SME single applications
- Clients will expect the same uptime and management features they had on their Dual Processor servers
- Affordable blade replacement to replace aging tower and rack servers
- Low cost single socket Intel-based blade with the RAS features you expect from BladeCenter at lower cost/performance points matched to SMB
- Blade supported across all IBM chassis
- Dual processing power and performance at uni-processor price points
Introducing the IBM BladeCenter JS12

- Ideal as an alternative to a traditional AIX®, IBM i or Linux for Power™ rack-mount and desk side servers
- For replacing traditional UNIX®, IBM i (formerly known as i5/OS®) and Linux® servers
- For small database and application serving
- For a complete business system with an integrated database and application server
- Powered by the latest IBM processor technology, POWER6™, the JS12 Express provides outstanding price/performance in a commercial IT environment; superior reliability, availability and serviceability (RAS) characteristics; high energy efficiency; and outstanding built-in PowerVM™ virtualization to help achieve increased system utilization
Introducing:
IBM i Edition Express for BladeCenter S

Bringing the best of i and BladeCenter together
• Integrate both i and Windows blades plus storage, networking, I/O and applications into a single chassis
• Office-ready with quiet operation, can use standard office power
• Built-in PowerVM™ Virtualization

Price Positioned to Win
• Priced below a Power™ 520 1-core and considerably less than HALF the price of a Power 520 1 of 2-core
• Value equal to or potentially more than current monthly maintenance payments on existing i and/or Windows servers
• Partner Incentives on every sale!

Accelerate your move to blades
• Ideal alternative to traditional rack/tower servers
• Five additional blade slots for x86 consolidation and future growth
• Consolidate and manage multiple servers in the same chassis

i Edition Express for BladeCenter S includes:
✓ JS12 base configuration for i
✓ IBM i processor entitlement, 1yr SWMA & 10 users
✓ BladeCenter S chassis optimized for i
IBM BladeCenter HS21 XM
A Closer Look

- 8 FB DIMMs
- Up to 32GB of memory per blade
- SAS HDD (36, 73, 146GB)
- 2 NICs - Broadcom 5708S (TOE enabled)
- Diskless ready:
  - iSCSI and SAN boot for all OS
  - Support for IBM Modular Flash Device 4GB
- Dual and Quad-Core processors
  - 65W and 80W Woodcrest
    - 1.60-3.00GHz
    - 80W Clovertown
    - 1.60-2.33GHz
- Supports Concurrent KVM Mezzanine Card (cKVM)
- Supports PEU2 and SIO Expansion Units
- Support for the new MSIM Combo Form Factor (CFF) card to double port count per blade
# HS21 XM Critical Feature Enhancements

<table>
<thead>
<tr>
<th></th>
<th><strong>HS21</strong></th>
<th><strong>HS21 extended memory (XM)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Chipset</td>
<td>Intel Blackford chipset (MCH, ESB2V)</td>
<td>Intel Blackford chipset (MCH, ESB2V)</td>
</tr>
<tr>
<td>Memory</td>
<td>4 Fully Buffered DIMMs</td>
<td>8 Fully Buffered DIMMs</td>
</tr>
<tr>
<td>Processors</td>
<td>Up to two Intel Xeon with up to 2.33GHz 1333MHz FSB dual and quad core</td>
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</tr>
<tr>
<td>I/O Slots</td>
<td>1 High-speed x8 PCI-E daughter card slot (Also supports SIO and PEU)</td>
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</tr>
<tr>
<td></td>
<td>1 PCI-X legacy daughter card slot 133 MHz (supports StFF, SFF daughter cards)</td>
<td>1 PCI-X legacy daughter card slot 133 MHz (supports StFF, SFF daughter cards)</td>
</tr>
<tr>
<td>Hard disk drives</td>
<td>Two NHS SAS</td>
<td>One NHS SAS and <strong>one 4GB Modular Flash Drive</strong></td>
</tr>
<tr>
<td>Support</td>
<td></td>
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</tr>
<tr>
<td>IXA for iSeries</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Get support for diverse application needs

- **Simplify legacy application migration with the PCI Expansion Module**
  - Support 2 traditional PCI-X adapters
  - Industry exclusive

- **Move more applications to blades with the Storage and I/O Expansion Blade**
  - 3 hot-swap SAS hard disk drives
  - RAID-5 with battery-backed cache
  - Support up to 10 ports for rich I/O configurations

- **Boost memory and I/O performance with the Memory and I/O Expansion Blade**
  - Support for 4 DIMMs, 4 Ethernet ports and additional I/O
OPEN and innovative for a flexible business foundation

Easily manage your system and leverage industry standards with IBM BladeCenter solutions

- Connect your network with a comprehensive set of interconnects and a common management point
- Get the most out of third-party solutions
- Harness the power of the industry by tapping into a large support community
Extend blade benefits to connect your entire business

I/O tailored to your specific needs

- A common set of blades
- A common set of industry-standard switches and I/O fabrics
- A common management infrastructure
Significantly more flexibility and choice in I/O

- Simple pass-thru designs
- Super low-cost, simple switches
- Powerful, standard layer 2/3 offerings
- Highly advanced layer 2/7
- High-performance 4Gb Fibre Channel
- Industry’s only integrated full 10Gb Ethernet solution for blade servers

**Ethernet**
- Cisco Catalyst 3012
- Cisco Catalyst 3110x
- Cisco Catalyst 3110g
- Cisco Gb Copper
- Cisco Gb Fibre
- Server Connectivity Module
- Nortel 10Gb
- Nortel 1/10Gb
- Nortel Layer 2/3 Copper
- Nortel Layer 2/3 Fibre
- Nortel Layer 2-7 Gb
- Nortel Layer 2/3 10 Gb Uplk

**Fibre Channel**
- Cisco 4Gb 10 port
- Cisco 4Gb 20 port
- Brocade 4Gb 10 Port
- Brocade 4Gb 20 port
- QLogic 4Gb 10 port
- QLogic 4Gb 20 port

**Pass Thrus**
- Intelligent Copper PT
- QLogic 4Gb Intelligent PT
- 4X infiniband PT

**Infiniband**
- Cisco 4X Infiniband
- QLogic Infiniband FC Bridge
- QLogic Infiniband Eth Bridge
Increase number of connections per blade

More ports, more flexibility for more applications

- Unleash blade capacity
  Virtualization and multi-core environments require more connections
  - MSIM and BladeCenter H double the number of blade connections

- Double your connectivity
  Increase your Ethernet and Fibre Channel connections
  - New expansion cards allow up to 8 simultaneous connections per blade

- Help protect your investment
  No need to qualify new switch modules
  - Supports standard BladeCenter switches in new high-speed switch slots of BladeCenter H
You’re in good company with the IBM BladeCenter community

Alliance Program
- Hardware and software
- Making product info available
- More than 300 members

IBM OEMs
- Network equipment providers
- Appliances
- Server vendors

Blade.org
- Accelerating blade platform-based solutions to market
- Increasing the number of blade platform solutions
- Increasing end-user confidence in blade platform solutions
- More than 90 members

Open Specification
- Hardware vendors
- Access to BladeCenter specs
- Basic technical help
- 500 companies have downloaded

IBM Collaborators
- Working together to bring offerings to market
  - BNT
  - Brocade
  - Cisco
  - Emulex
  - McData
  - QLogic
  - Voltaire
  - Devon IT
BladeCenter protects your critical business operations

- **Engineered for reliability**
  - Dual power connections
  - Thermal/cooling redundancy
  - Dual blade connections for all I/O
  - Dual switch modules
  - Dual paths through backplane
  - Dual Management Modules
  - Dual N+N power topologies
  - True N+N thermal solutions

- **Engineered for availability**
  - Automated failover capability via Management Module
  - Management Module monitors health of chassis components
  - Comprehensive Predictive Failure Analysis® proactively identifies many potential issues before they cause failures
  - First Failure Data Capture helps provide integrity of error reporting
  - Light Path Diagnostics for easy troubleshooting

*No single point of failure*
Enterprise-class reliability with redundant I/O

- IBM provides dual I/O and dual power connections to the chassis on all blades
- Many other vendors fail to provide this protection

Would you connect your enterprise rack server to a single PDU or a single switch?

IBM BladeCenter —
Complete redundancy
Dual I/O, dual power

Competitors —
Lack redundancy
Single I/O, single power
Introducing next-generation local storage today

*Increase availability and efficiency with solid state drives*

- **Superior uptime**
  - 3X the availability of mechanical drives with RAID-1
  - No moving parts to fail
  - Enterprise read/write leveling to extend life even further

- **Less power and heat** than conventional disk drives — up to 87%

- **Flexible deployment** with full OS support
  - Operates as a standard hard disk drive
    - Supports Linux®, Windows and VMware
  - Works in standard drive bay
Help increase uptime with industry-leading tools

- **Preserve uptime** with Predictive Failure Analysis (PFA) and Light Path Diagnostics
  - Predict some failures — even before they happen
  - Find component via Light Path Diagnostics indicator — processors, memory, hard drives, power supplies, fans, voltage regulator module
  - Receive an alert via e-mail or pager

- **Make better decisions** with First Failure Data Capture
  - Simplifies problem identification
  - Creates detailed event logs via Advanced Management Module
GREEN today for a better tomorrow

IBM BladeCenter benefits your business by:

- Using less energy
- Running cooler
- Helping you be environmentally responsible
Take control of your power now

**IBM BladeCenter power efficiency:**
- Leadership performance/watt
- Right-sized for any business

**IBM BladeCenter power tools help:**
- Plan, monitor and control power usage
- Provide “cruise control” for power consumption of servers

**IBM leadership in virtualization helps:**
- Increase utilization rates
- Reduce number of server, storage, network devices
- Create shared, easily scalable infrastructure
Save on energy costs vs. rack servers with BladeCenter

- **BladeCenter beats comparable 1U servers**
  - More efficient power supplies and cooling
  - Fewer parts to consume power

- **Provides energy savings**
  - Every watt of power costs your business US$2/year
  - Each kilowatt of power dumps half a ton of CO\textsuperscript{2} into the environment

**Up to 58% MORE power**  **Up to 32% MORE heat**

<table>
<thead>
<tr>
<th>BladeCenter HS21 + BCH</th>
<th>Dell 1U PE 1950</th>
<th>HP 1U DL 360 G5</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 servers, 20 processors</td>
<td>10 servers, 20 processors</td>
<td>10 servers, 20 processors</td>
</tr>
<tr>
<td>2,703 W</td>
<td>4,276 W</td>
<td>3,570 W</td>
</tr>
<tr>
<td>9,220 BTU</td>
<td>14,584 BTU</td>
<td>12,173 BTU</td>
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</table>

Configuration notes: IBM power engineering test data. Numbers are average worst case for P6 Burn exerciser program. Like Intel configurations, tested in IBM lab. Blade power is average power of total chassis solution.
Save on infrastructure with IBM power tools

IBM Power Configurator

- Get better information for up-front planning by sizing the power needs of your unique configurations
- Select systems and IT infrastructure that best fit your data center infrastructure before you commit to buying the first server

IBM Systems Director Active Energy Manager

- Monitor and track power over time
- Make choices based on accurate information
- Take command with power virtualization

Included at no additional charge with IBM servers
## Take control with Systems Director Active Energy Manager

<table>
<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
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<tbody>
<tr>
<td>Report and collect actual power draw</td>
<td>No more data center budgeting assumptions</td>
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<tr>
<td>Power trending</td>
<td>System-level power analysis for better decision making</td>
</tr>
<tr>
<td>Intelligent power virtualization</td>
<td>Automated or user defined power control to help optimize (\text{performance/watt})</td>
</tr>
<tr>
<td>CPU control with Intel DBS/ AMD PowerNOW</td>
<td>Reduces power draw during low utilization via OS</td>
</tr>
<tr>
<td>OS independent</td>
<td>Works on all blades and all compatible OS</td>
</tr>
<tr>
<td>Cost per system</td>
<td>Included with virtually all blades</td>
</tr>
</tbody>
</table>
Simple and easy power management

- Compare actual vs. name plate power at system level
- View inlet and exhaust temperature
- Track heat emitted
- Compare rack actual power vs. label power
- Trend power use over time
- Trend temperature over time

GREEN
Put power where you need it with Active Energy Manager

- Rack density is based on power consumption estimates, which typically leads to a 20 percent over allocation of power.
- With Active Energy Manager exact power usage is possible.
- The power virtualization feature allows you to turn that wasted power into real productivity.

<table>
<thead>
<tr>
<th>Result is multiple servers, each with wasted overhead power</th>
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<tbody>
<tr>
<td>Allocation before Active Energy Manager</td>
</tr>
<tr>
<td>Server 1</td>
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</table>

<table>
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<th>Power is virtualized so you can add more servers</th>
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<td>Server 1</td>
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</tbody>
</table>
Increase your density with BladeCenter efficiency

10KW rack holds
23 Dell 1Us (427W)

10KW rack holds
37 blades (270W)

10KW rack holds
44 blades (270W)

Improve performance/watt by up to 90%

Inefficient Dell 1U servers

Power-efficient BladeCenter servers

Power-efficient BladeCenter with Active Energy Manager power virtualization
Cut heat up to 50 percent with Rear Door Heat eXchanger technology from IBM*

**This can help:**

- Increase density easily
- Solve hot spots in the data center
- Avoid cost of purchasing another air-conditioning unit
- Potentially postpone spend on major renovations in the data center

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Thank You

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