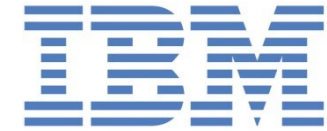


Zašto izabrati IBM x86 platformu

x86 servers for Windows and Linux

OD 16
HRONG



Dražen Miličević

Solution Representative/Brand Specialist - System x
Systems & Technology Group

IBM Oracle Alliance: Shared Commitment to Client Value

- Sustained collaboration
 - 25+ year track record of success

- Executive commitment
 - Dedicated Executive led Alliance teams
 - Regular Senior Development and Executive led reviews

- More than 140,000 Joint Customers

- Robust technology relationship
 - Technology enablement for customer choice and investment protection
 - Post sales technical support

- Unrivalled Support Process
 - Dedicated on site technical resources





Sustaining Partnership of 120K+ customers

- Oracle 22 Years, PeopleSoft 20 Years, JD Edwards 31 Years, Siebel 10 Years

Oracle is an IBM “Integrated Account”

- Over 120,000 Joint Technology Customers
 - Over 20,000 Joint Application Customers

Vibrant Technology Relationship

- Substantial investment in skills and resources
- Dedicated International Competency Centers

Market Leading Services Practice

- IBM's GBS is Oracle's #1 SI Partner (4900 Joint Projects!)
- 9,000 skilled, of which 5,000 are dedicated to Oracle

Unrivalled Customer Support Process

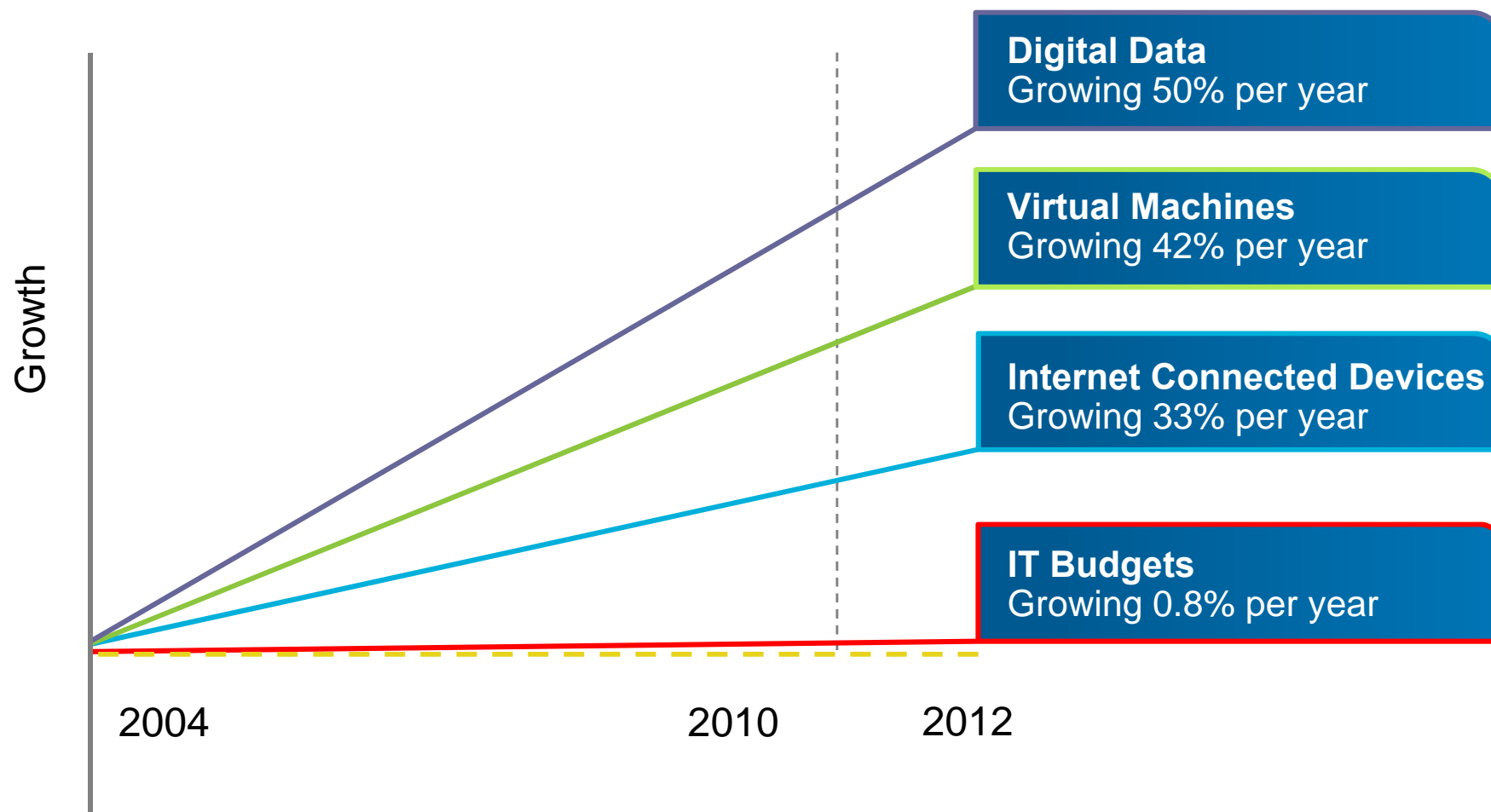
- Dedicated On-Site Resources
- Significant Program Investments

Coopetition is alive and well

IT complexity is growing

...but IT budgets are not

IT organizations must respond to dramatic increases in demand and workload



Spending on IT infrastructure is growing

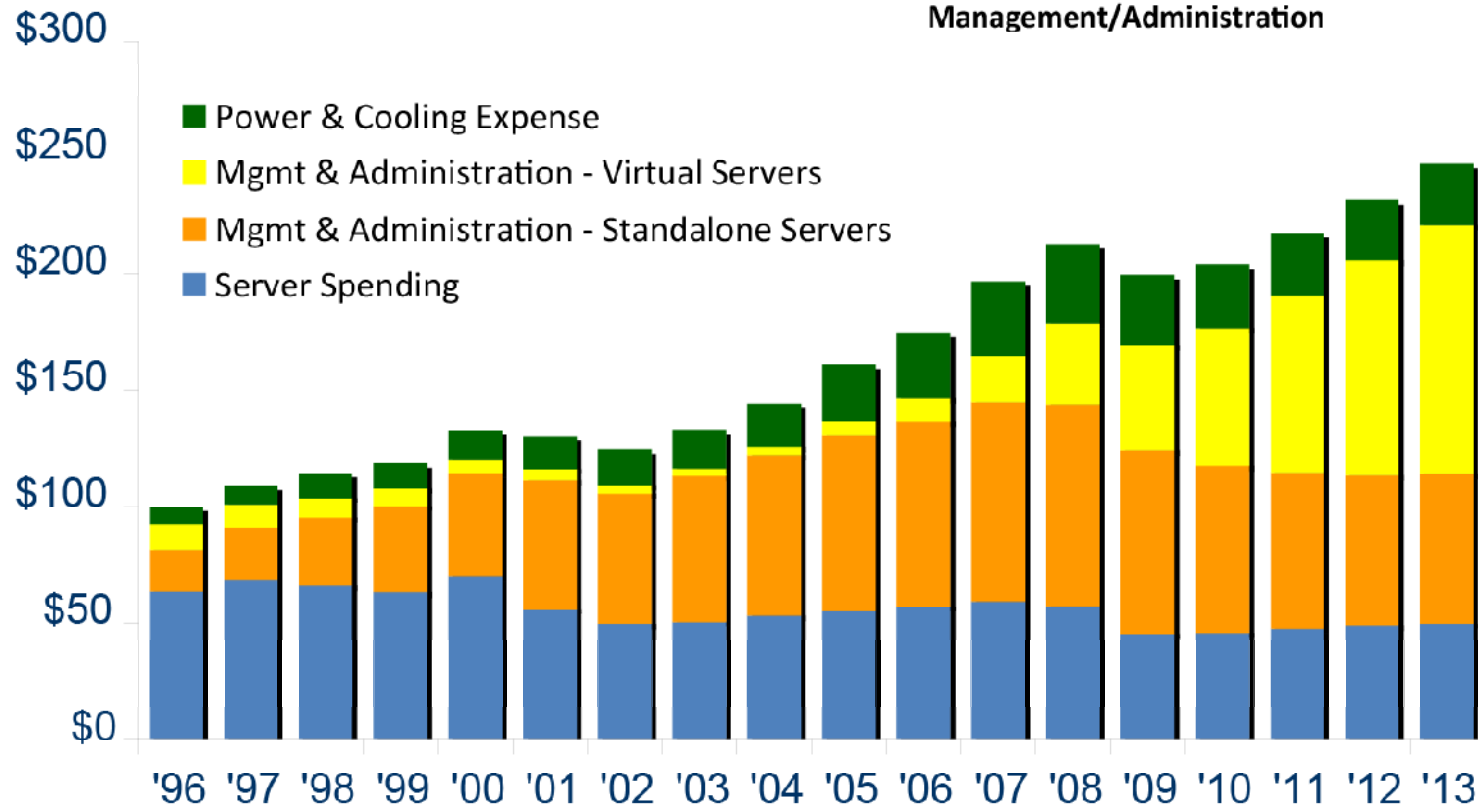


The majority of your technology budget goes to management, power, and cooling

Customer Spending (\$B)

WW Spending on Servers, Power and Cooling, and Management/Administration

Hardware spending is less than a third of the IT budget



Source: The IT Infrastructure of the Future: New Technologies in a Constrained Market, Matt Eastwood, March 2009

x86 servers are taking on more demanding roles, including high-end business critical applications



x86 server segment is the **largest and fastest growing**

Virtual workloads getting **larger, up by 3x** between 2006 and 2009

60% of customers deploying business critical workloads onto x86, up from 30% in 2008

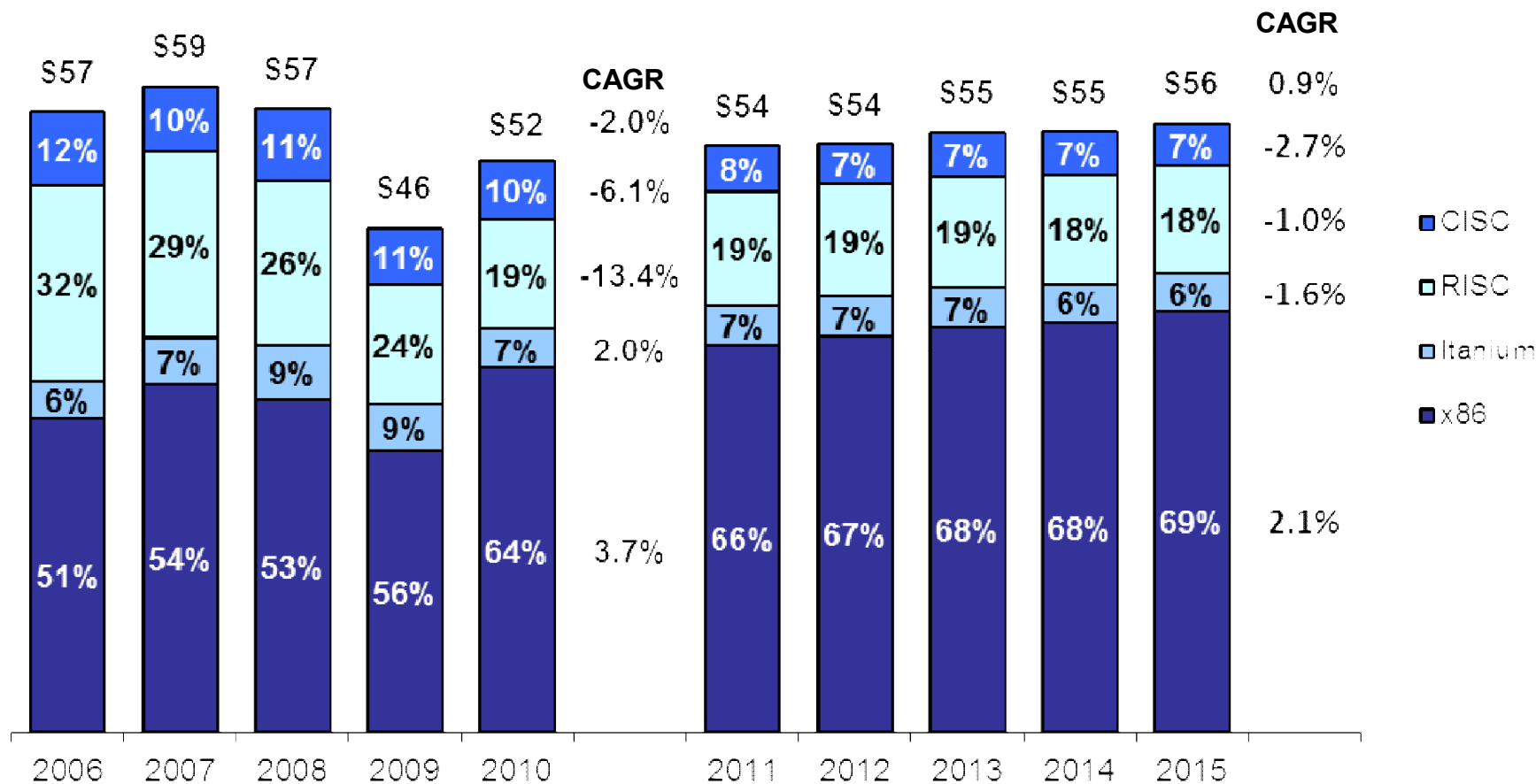
x86 important for database: **52% of relational database** on x86

51% of all x86 workloads virtualized by end of 2010, growing to 69% by 2013

59% of these databases are projected to be **larger than 3TB** by 2013

IDC reports continuing x86 growth in through 2011

Worldwide x86 server sockets (customer rev \$B)



Source: IDC Server Forecaster 4Q10 3/15/11

Source: IDC

Zašto izabrati IBM?

IBM is the leader in technology innovation



- IBM 5,896 + 20 %
- Samsung 4,551 + 26 %
- Microsoft 3,904 + 6 %

For **18** consecutive years
IBM inventors have received the most U.S. patents

5,000 patents in a single year

- HP 1,480 + 16 %

US companies + 14 %

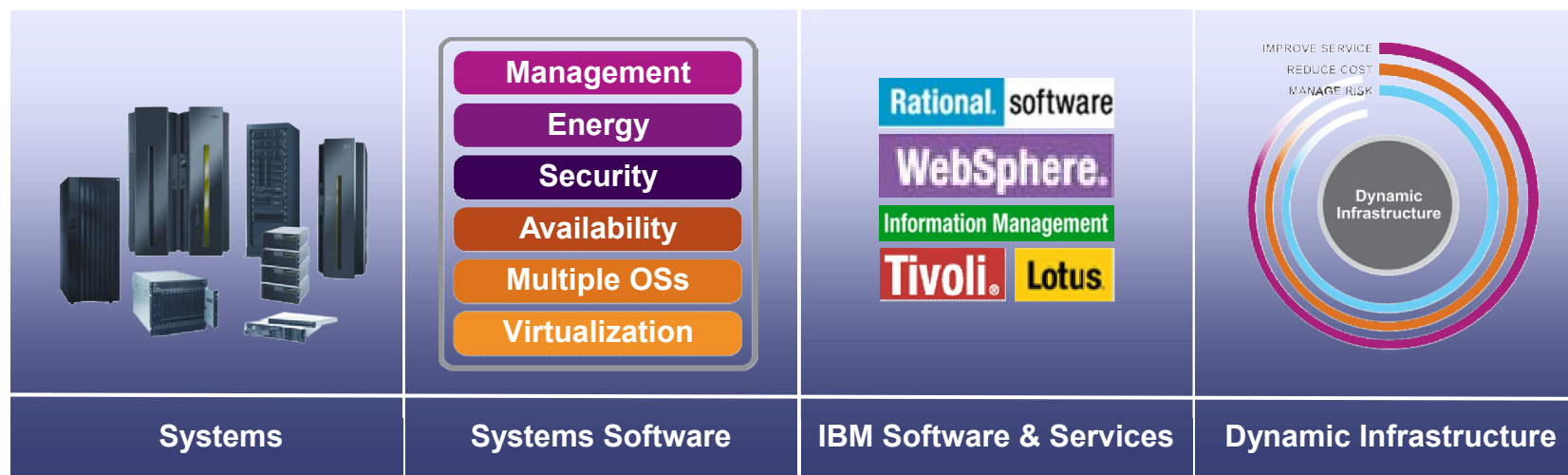
Non-US companies + 28 %

* Source: IFI Patent Intelligence



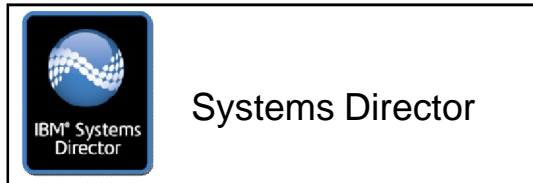
National Medal of Technology & Innovation

IBM is setting the infrastructure agenda for the industry



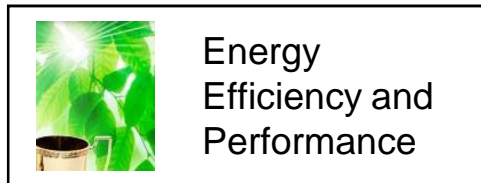
Delivering business value by helping clients improve service,
reduce cost and manage risk

- Systems that are fit for purpose
- Technology and expertise to drive business advantage
- Leading management, energy, security, resiliency and virtualization & consolidation capabilities
- Breadth of IBM to provide end-to-end business solutions



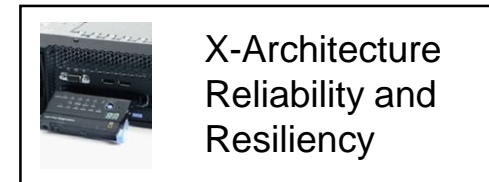
IMPROVE SERVICE

Not only ensuring high availability and quality of existing services, but also meeting customer expectations for real-time, dynamic access to innovative *new* services.



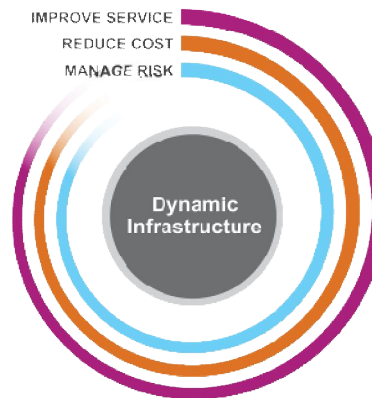
REDUCE COST

Not just containing operational cost and complexity, but achieving *breakthrough* productivity gains through virtualization, optimization, energy stewardship, and flexible sourcing.



MANAGE RISK

Not only addressing today's security, resiliency, and compliance challenges, but also preparing for the new risks posed by an even more *connected* and *collaborative* world.



Delivering superior business and IT services with agility and speed.

Why our customers care about System x...

quality
value
performance

Quality

High Quality

- Best in class reliability and availability
- The most extensive system testing in the industry
- Systems you can trust for business-critical workloads, like virtualization

Easy to Deploy, Manage & Service

- Straightforward tool-less design
- Hot swap components, full redundancy
- Enhanced systems management
- Common tools across System x

Value

Lower Cost

- IBM quality in competitively priced systems
- Leadership Predictive Failure Analysis and Light Path Diagnostics to maximize uptime
- High efficiency designs for lower power and cooling expense

Increased flexibility

- Widest range of configuration options
- Optimize systems for maximum performance, lowest power, storage capacity, or I/O requirements

Performance

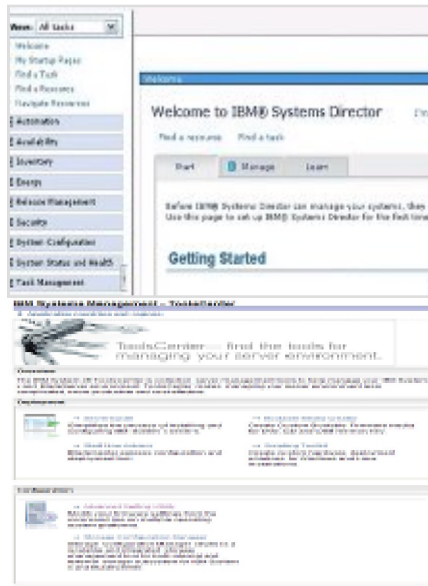
More Performance

- Latest generation technology
- High performance processors, storage and networking options
- Complete portfolio of systems, rack and power solutions



The IBM systems management framework

Quality

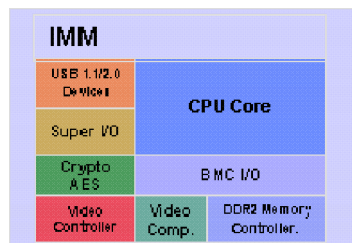


IBM Systems Director

- Easy-to-use, powerful tools for managing both physical and virtual resources
- Delivers broad cross-platform support including IBM Power Systems, System z, storage and non-IBM x86 servers
- Use of a shared, common agent with Tivoli provides simpler integration of Systems Director and select Tivoli products

IBM ToolsCenter

- Reduces complexity of choosing, finding, and learning management tools via single website
- Ability to create bootable media (CD, DVD or USB) w/updates customized for clients' systems
- Common look and feel across tool set reduces training



Integrated Management Module (IMM)

- Remote control to manage, monitor, and troubleshoot from any corner of the world
- Standards-based alerting to enable “out-of-the-box” integration into enterprise management environments



Unified Extensible Firmware Interface (UEFI)


- Single consistent system level code stack with advance setup and configuration
- Next-gen replacement for BIOS-based firmware provides richer management experience
- Removes limit on number of adapter cards—important to virtualized environments

Common tools and management across System x


IBM® Systems Director platform management

IBM Systems Director can help save 34% in administrative costs


Quality



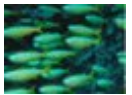
Configure Chassis **Deploy** Configure Access
Push OS Image*



Track Power Usage **Monitor** Notify on HW Problem
Record Performance



Check Compliance **Update** Download Updates
Push Firmware and Drivers



Remote Console **Control** Migrate VM
Cap Power*

PR/SM
z/VM



* Fee based plug-in required

Learn More

Achieve smarter systems with IBM Systems Director add-ons

Quality

IBM Systems Director can help save 34% in administrative costs

A leading IT analyst said that the new System x portfolio integrates advances such as UEFI firmware, embedded hypervisor support, integrated storage controllers, hot-swap hard drives, and a built-in altimeter that enable coordinated, system-level improvements. "These are not just a few more incremental server SKUs; this new generation represents a good opportunity for systematic server refreshes."

IBM Systems Director Active Energy Manager™

[Learn More](#)

IBM Systems Director Network Control

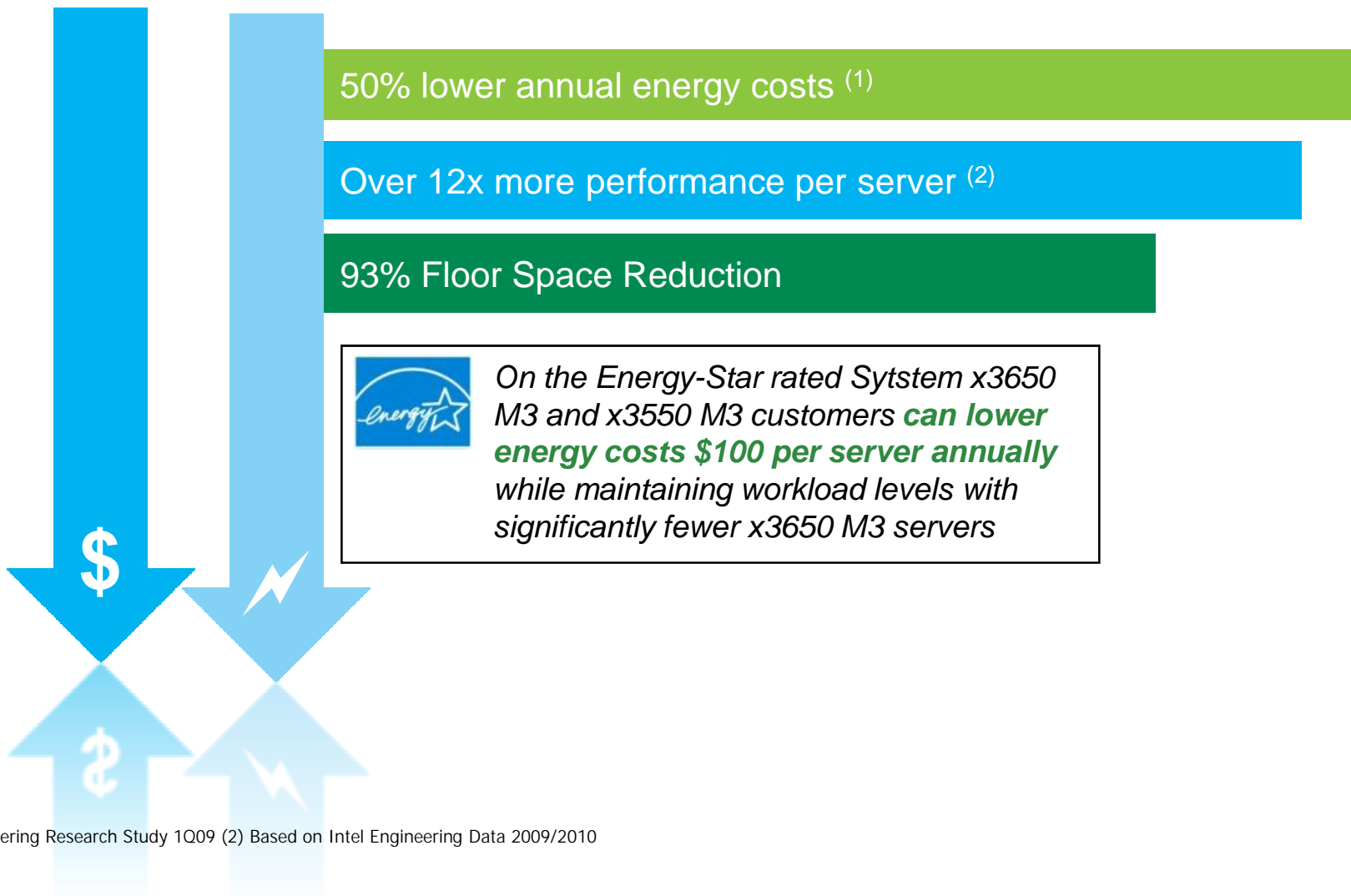
[Learn More](#)


IBM Systems Director VMControl™

[Learn More](#)

Bring operating costs down with leadership energy efficiency

Value



 *On the Energy-Star rated System x3650 M3 and x3550 M3 customers **can lower energy costs \$100 per server annually** while maintaining workload levels with significantly fewer x3650 M3 servers*

(1) IBM Engineering Research Study 1Q09 (2) Based on Intel Engineering Data 2009/2010

Bring your power and cooling costs down with Active Energy Manager

Value

- Consists of “no charge” monitoring functions and “priced” management functions

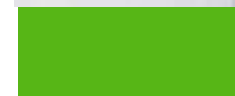
- Monitoring Functions

- Power Trending
- Thermal Trending
- PDU Support for IBM and non-IBM
- Support for Facility Providers and sensors
- Energy Thresholding

- Management Functions

- Power Capping

- Delivered as a plug-in to IBM Systems Director 6.1



AEM is available on all System x servers except the x3100 M3 and x3755 M3

Learn More

You can bring down your costs through leadership virtualization

Performance

Virtualization changes everything!

- *A higher degree of server utilization*
 - *Simpler, more comprehensive server management*
 - *Reliability and availability to minimize downtime*
-
- IBM was the first VMware system vendor and first VMware joint development partner as well as the first to leverage VMware SDK, the first to offer comprehensive support, and the first to integrate VMware into virtual client solution
 - All of the new generation products come standard with an embedded USB hypervisor
 - New integrated solutions for cloud computing including IBM CloudBurst, built on the IBM BladeCenter® and System x3650 M3 platform, provides pre-installed, fully integrated service management capabilities across hardware, middleware and applications



Industry Recognition

Value



The Score in 4Q10 TBR
IBM reiterates its singular No. 1 ranking for the fifth straight reporting period

- #1 in overall satisfaction¹
- #1 in HW quality and reliability¹
- #1 in overall value¹
- #1 in ease of doing business¹



- #1 in availability and reliability²
- #1 in raw performance^{2,3}
- #1 in observed performance^{2,4}



- #1 in volume mainstream business
- #1 in technical innovation⁵
- #1 in sales support⁵
- #1 in marketing support⁵
- #1 in training⁵
- #1 in ease of doing business⁵

“IBM built its rack servers to be rock-solid reliable. The servers deliver high availability with redundant, hot-swap power supplies as well as cooling fans. They feature IBM Predictive Failure Analysis and Light Path Diagnostics. Together, these features significantly reduce server downtime and in some cases, avoid failures altogether. The high reliability offered by System x servers means that businesses stay ahead of the competition while benefitting from enhanced investment protection and extended server lifespan.”

John Spooner, Technology Business Research

“IBM notches a solid victory, topping all competitors by a wide margin. Raw performance is a category that IBM has won for the past three years – and last year, the margin was even wider.”

Gabriel Consulting Group, 2010 GCG x86 Server Vendor Preference

“Customers see IBM’s System x brand as offering the best availability and reliability feature set.”

Gabriel Consulting Group, 2010 GCG x86 Server Vendor Preference

The fact that IBM took top honors for Partnership and Support wasn’t surprising to Jeff Wohlfarht, president and CEO of Advanced Concepts Inc., Milwaukee, who noted the personalized attention he receives.

“IBM makes us feel like we’re the most important customer,” he said. “They really treat us as if we’re a top earner, when in reality, we’re molecule-size.”

CRN

1: Source: Technology Business Research – x86-Based Servers: Corporate IT Buying Behavior & Customer Satisfaction Study February 2011
 2: Source: Gabriel Consulting Group, 2010 GCG x86 Server Vendor Preference
 3: Defined as speed on benchmarks and normal workloads
 4: Defined as best performance on customers’ own workloads
 5: Source: [CRN](#)

20:1 Consolidation Ratio⁽¹⁾ with Energy Efficient Design

Customers can lower energy costs \$100 per server annually and maintain workload levels with significantly fewer of the new IBM x3650 M3 servers⁽²⁾



2005

20 - x346 Server
Single-Core processor



- ✓ 50% lower annual energy costs⁽³⁾
- ✓ Over 12x more performance per server⁽³⁾
- ✓ 93% Floor Space Reduction

2011

1 - x3650 M3 Server
Six-Core processor

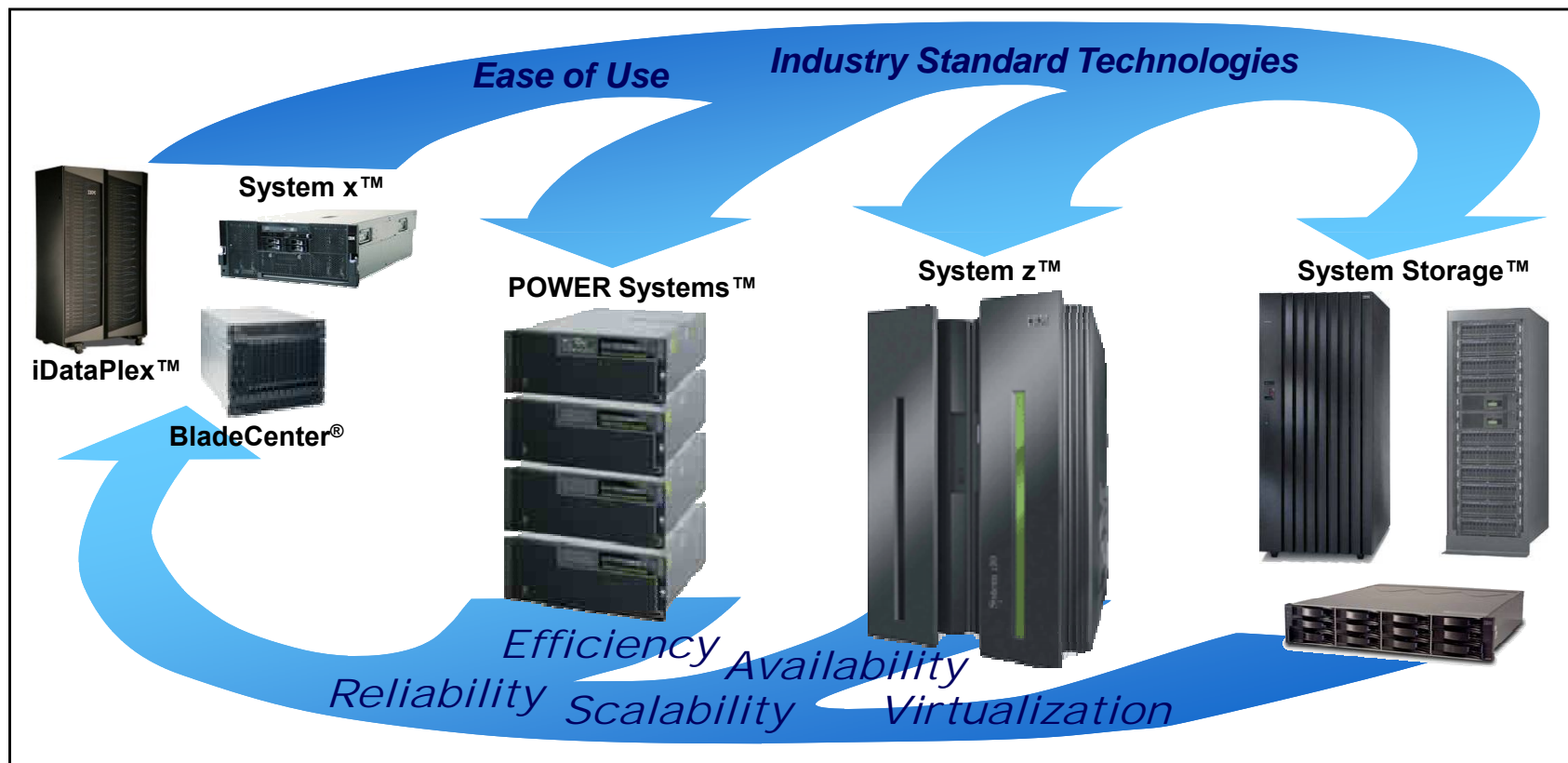


(1) Based on IBM Alinean Tool Results
(2) IBM Engineering Research Study, Feb 2009
(3) Based on Intel performance data, 2009

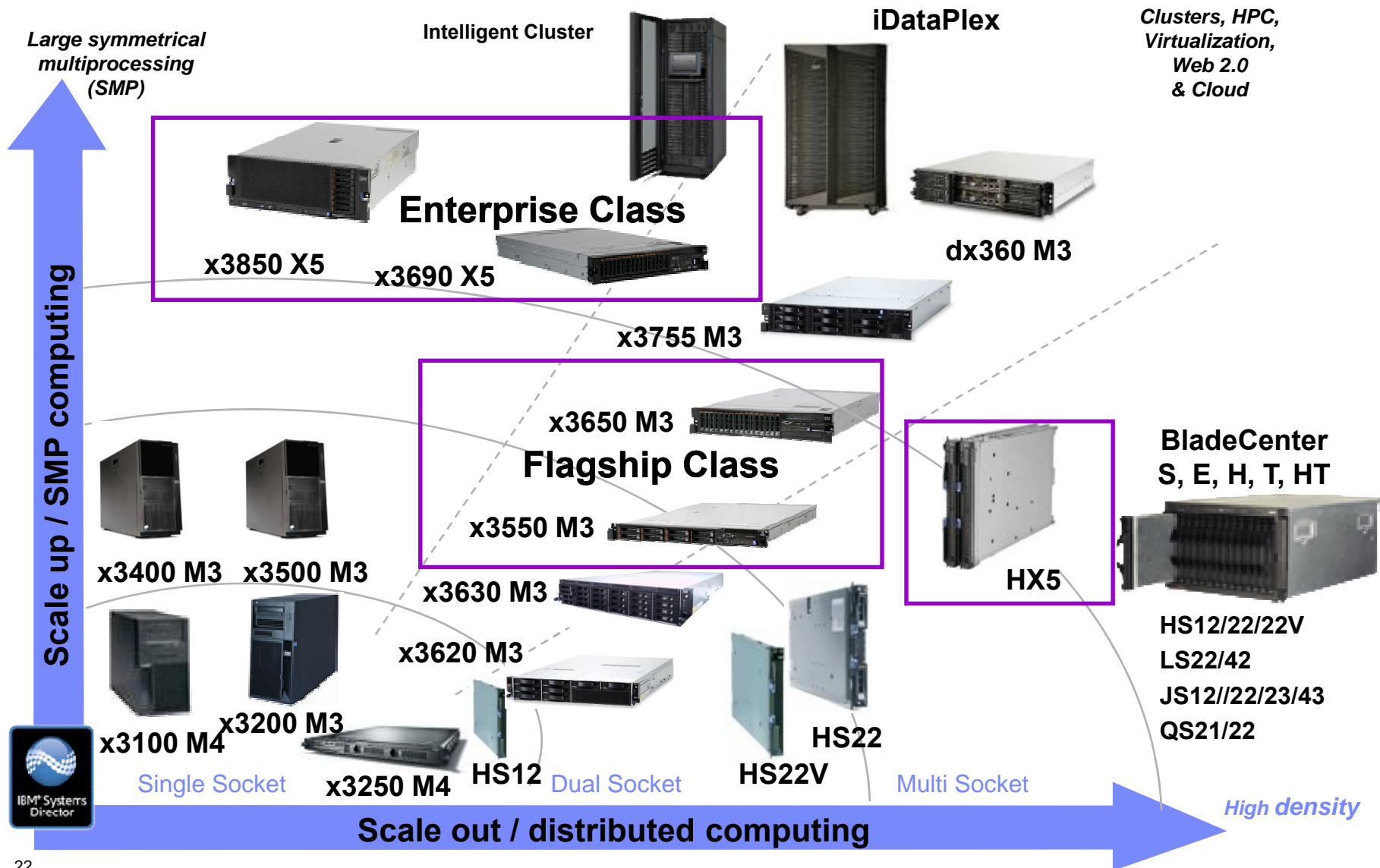
System x is one component of the IBM server ecosystem

IBM X-Architecture™

A design blueprint for building proven IBM innovation into the industry-standard System x product line



Portfolio-wide Innovation with IBM System x and BladeCenter

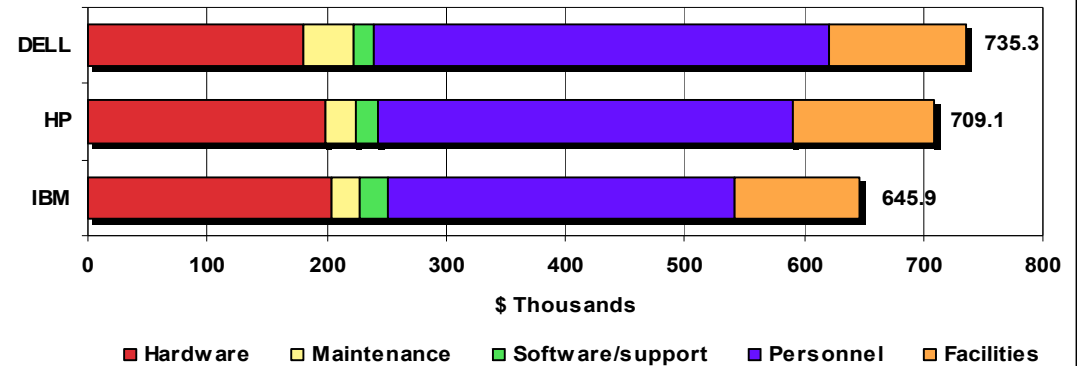


Why IBM?

Results of three year TCO study by International Technology Group (ITG)



A three year study by International Technology Group (ITG) shows that IBM servers and storage cost customers less than their Dell and HP counterparts, particularly in the areas of hardware, maintenance, software, personnel and facilities. Overall three year costs averaged 8.9% less than HP and 12.2% less than Dell.



Server Costs

- IBM's distinctive eX5 technology features help drive lower system administration and energy costs.
- IBM servers' embedded features achieved higher levels of performance and more efficient systems management than comparably-sized Dell and HP servers.
- Although there were differences in pricing practices, costs for hardware, maintenance, and software for the 3 platforms were generally similar.
- Lower IBM server costs were due primarily to lower system administration personnel and energy costs enabled by distinctive System x and BladeCenter hardware and software features.

Personnel Costs

- Costs for server administration personnel for IBM scenarios averaged:
 - 23.6% less than for Dell
 - 16.3% less than for HP
- Lower costs were the result of:
 - Lower full time equivalent (FTE) system administrator staffing enabled by IBM Director and embedded management functions
 - Distinctive reliability, availability, and serviceability (RAS) features in IBM platforms
 - Economies resulting from the use of high-end 8 and 16-way IBM System x3950 models

Facilities Costs

- Costs for power consumption and utilization improvements for IBM scenarios averaged:
 - 9.0% less than for Dell
 - 12.6% less than for HP
- Lower costs were the result of:
 - Design features resulting in lower power consumption by individual IBM System x servers
 - Incremental improvements in utilization enabled by the Active Energy Manager component of IBM Director.



For a copy of the report visit
<ftp://ftp.software.ibm.com/common/ssi/sa/wh/n/xsw03022usen/XSW03022USEN.PDF>

IBM leadership is about more than just servers

How does IBM differentiate itself in the crowded x86 marketplace where servers share the same industry-standard components?



What defines IBM System x high volume systems?

Availability

- Predictive Failure Analysis (PFA)
- Integrated RAID mirroring
- Integrated redundant ethernet
- Hot-swap and redundant components
- Chipkill memory
- Memory mirroring

Scalability

- Slotless RAID adapters
- Slotless systems management
- Slotless additional dual port ethernet
- Choice in drive technology:
 - Serial ATA (SATA)
 - Serial Attached SCSI (SAS)
 - Solid state (SSD)

Virtualization

- Embedded Hypervisor
- Systems Director VMControl
- Virtual-fabric capable



quality
value
performance



Energy Efficiency

- IBM Power Configurator
- IBM Active Energy Manager
- IBM Calibrated Vectors Cooling, including altimeter controlled fans
- Power supply efficiency
- DC Power models

Manageability

- Unified Extensible Firmware Interface (UEFI)
- IBM Integrated Management Module (IMM)
- IBM Virtual Media Key
- IBM Systems Director




















Service & Support

- IBM Dynamic System Analysis (DSA)
- IBM Light Path Diagnostics
- Color coded components
- IBM Simple-Swap hard drives
- Hot-swap components
- Tool free components
- IBM Electronic Service Agent
- IBM Service

IBM Predictive Failure Analysis (PFA)

Provides warning of impending failures prior to the actual component failure



Component				
 Hard Drive				
 Memory				
 Processor				
 VRM				
 Cooling Fan				
 Power Supply				

What is Predictive Failure Analysis (PFA)?

- Component analysis logic that can predict an impending failure based on data from the component
- Typically notification is within 24 to 48 hours of a potential failure

Benefits

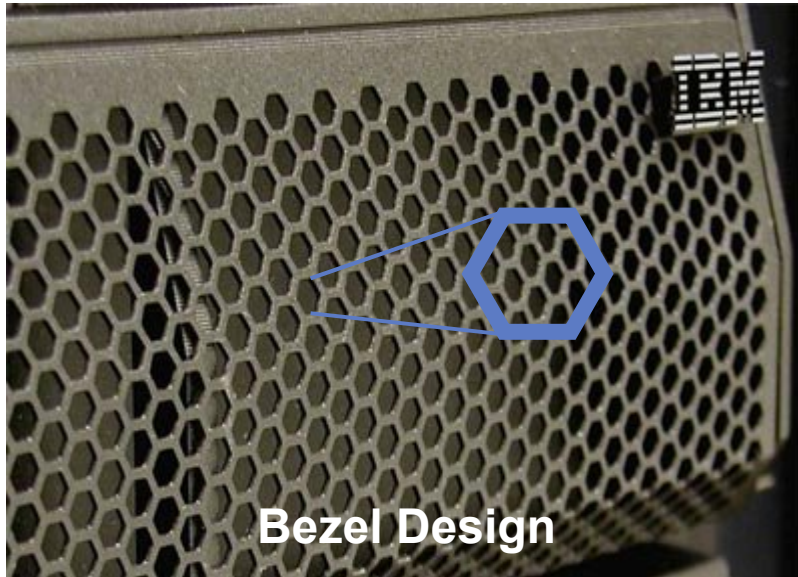
- Less unscheduled downtime
- Better overall availability of the servers
- Components can be replaced under warranty prior to a failure



Note: PFA capability shown is typical, and varies by vendor and server model

IBM Calibrated Vectors Cooling

Provides more efficient cooling for greater density and more internal components



What is Calibrated Vectors Cooling?

- Innovative thermal design that optimizes air intake, fan placement and zone cooling technologies to maximize the air flow inside the server for optimal cooling efficiency

Benefits

- More function in a smaller design
- Allows greater internal scalability as heat dissipates more efficiently
- Components run at cooler operating temperatures, resulting in improved reliability

Technologies

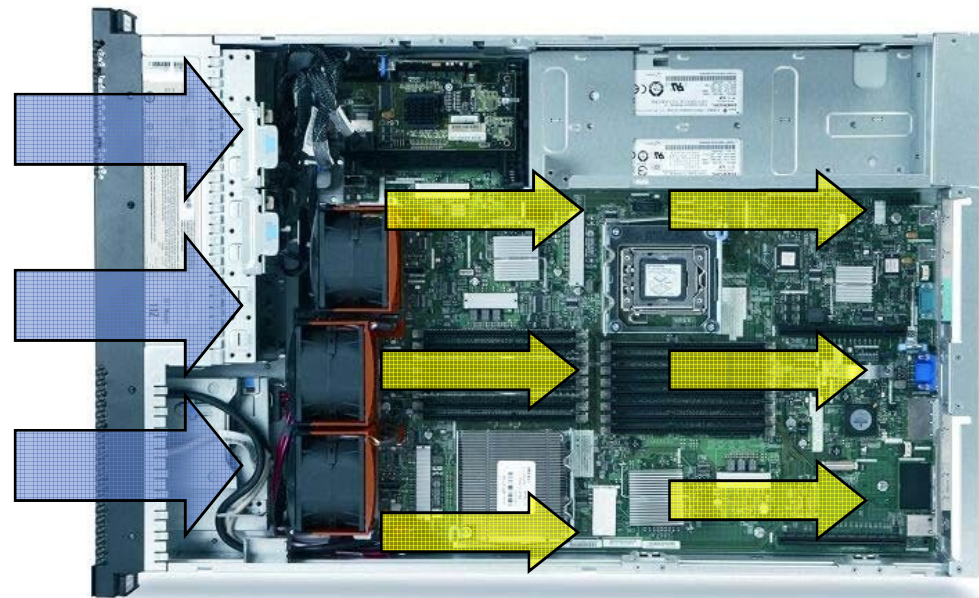
- Integrated, holistic server design (i.e. planar and mechanical designed together)
- Advanced thermal testing and design (i.e. airflow modeling and optimization)
- Isolated zone cooling
- Fan technologies (i.e. counter rotating fans, variable speed fans)
- Vapor chamber heat sinks



Mainframe Class Blowers



Altimeter Controlled Variable Speed Fans



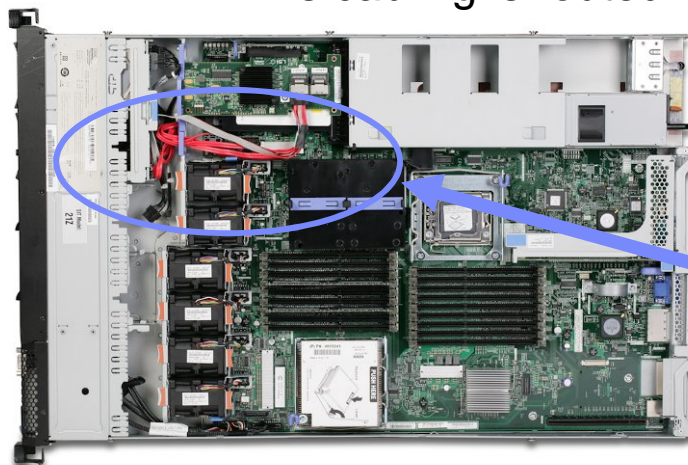
System x servers are designed for easy and efficient service

Quality

IBM's redundant fans are easily removable to ***minimize repair and down time***



IBM's cabling is routed neatly (note cable openings)



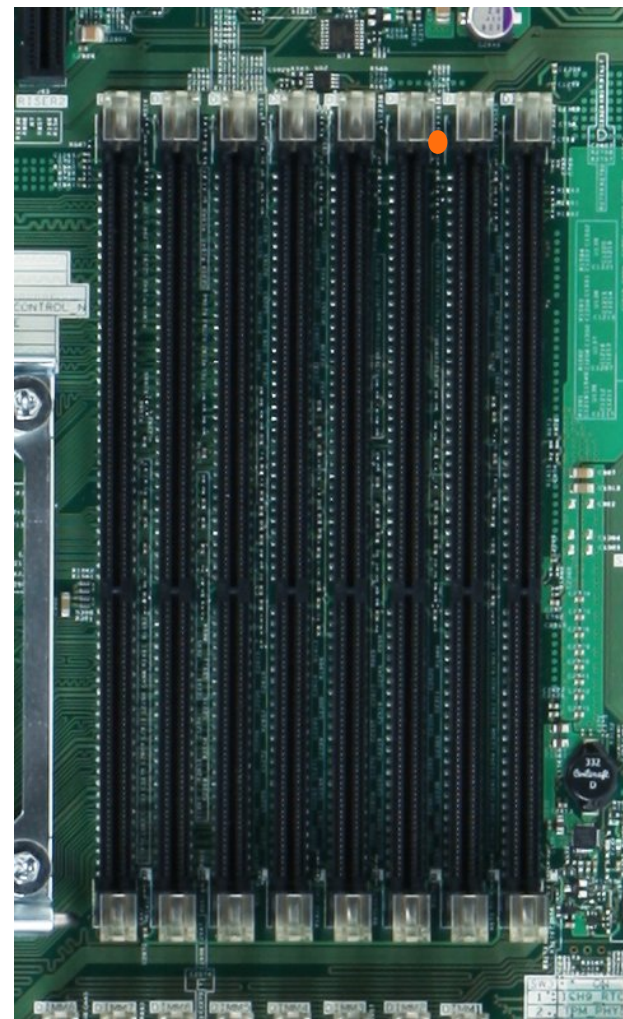
Manage risk with availability and serviceability with IBM-unique Light Path Diagnostics

Quality



Front of Light Path Diagnostics Panel
Amber light indicates there is a problem with the server

Light Path Diagnostics Component Level Lights
Indicates what individual component has PFA alert or has failed



Pop-Out Light Path Diagnostics Panel
Indicates what subsystem has problem

IBM Color Coded Components

Intuitive design that helps lower mean time to repair



Blue Tabs

- Designated as touch or release points of non hot-swap components
- Used to identify components that may be easily removed in tool-less fashion, such as memory cards, processor cards, adapters, simple swap hard drives, etc.



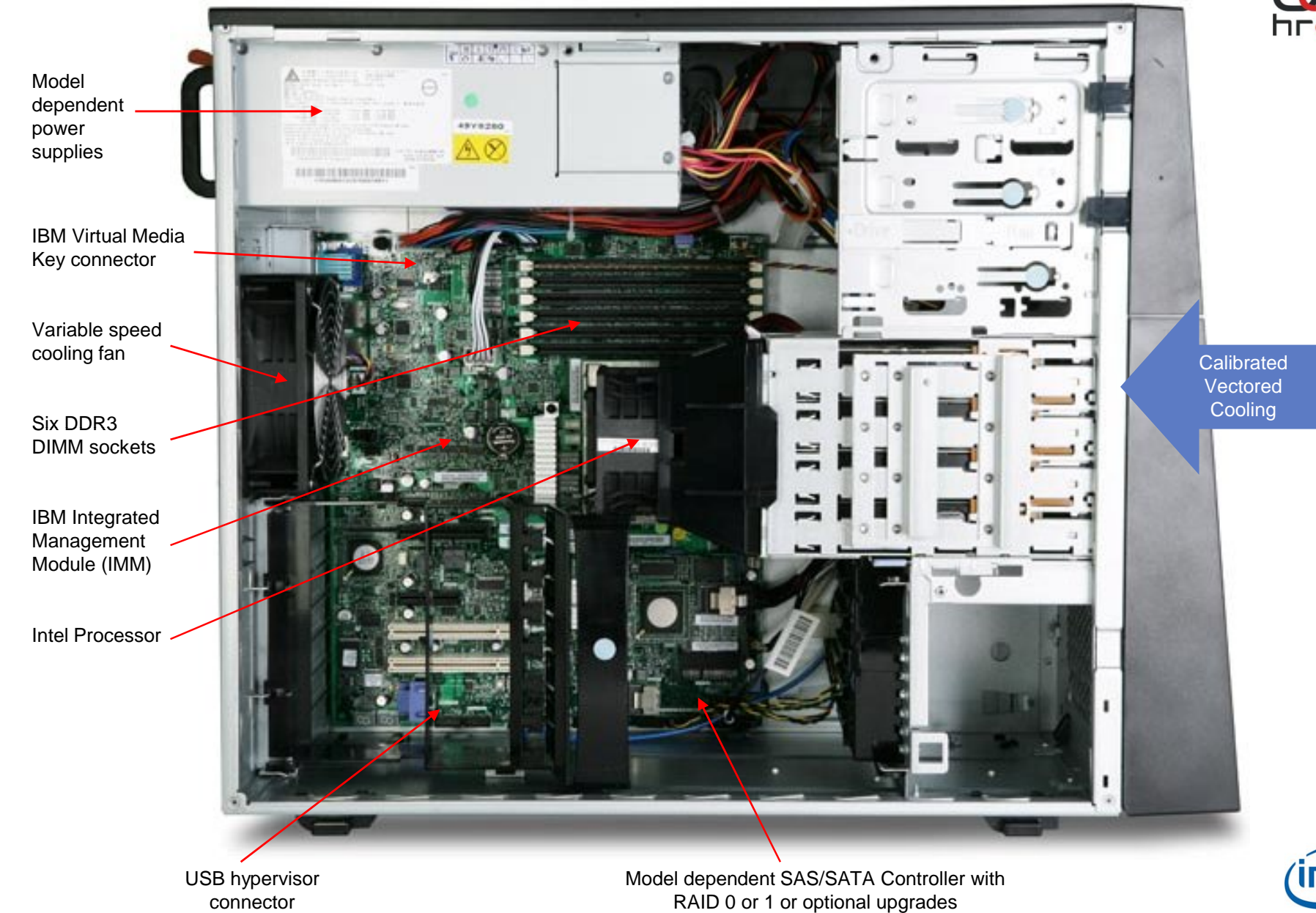
Orange Tabs

- Designated as touch or release points of hot-swap components
- Used to identify redundant and hot-swap components that may easily be removed when the server is running, such as power supplies, cooling fans, etc.



IBM System x3200 M3

Visual tour of the rear of the system





Single-socket performance servers that emphasizes security, simplicity, efficiency, and reliability, all at the right price

Business critical IT for the budget conscious client

Best for SMB

X3100 M3:

- Intel Xeon 4C or Core i3, up to 3 GHz
- 1 Socket
- 4 DIMMs (max 16 GB)
- 4 x 3.5" SATA
- Up to 4TB of storage (embedded RAID 0/1)
- 3 x PCIe I/O
- Gigabit Ethernet
- 350 W power supply
- 1 year warranty

X3200 M3:

- Intel Xeon X3400 4C, up to 2.8 GHz
- 1 Socket
- 6 DIMMs (max 32 GB)
- 4 x 3.5" SATA/SAS or 8 x 2.5" SAS
- Up to 4TB of storage (RAID 0/1, optional 5)
- 4 x PCIe I/O
- 2 x Gigabit Ethernet
- 430 W power supply, redundant
- 3 year warranty

System x3100 M4 overview



IBM x3100 M4	
Processors	Xeon, Core i3, Pentium
#Socket	1
Form factor	4U mini tower Tower to rack
Max Memory	32GB / 4 DIMMs DDR3 server-class ECC
HDD bays	4x 3.5" SS SATA or 8x 2.5" HS SAS*
RAID	Standard ServerRAID C100 supports 0,1,10; ServerRAID 5 (by upgrade key)* HW RAID 0/1/5 support
PCI-express x16/x8/x4/x1	1(mechanical x16, electrical x8) /1/1/1
Power	350W fixed or 300W HE (model dependent); Optional redundant power*
TPM	Standard
Ethernet	Dual gigabit
Management	IMM2, shared port
Warranty	1 year (parts/labor)



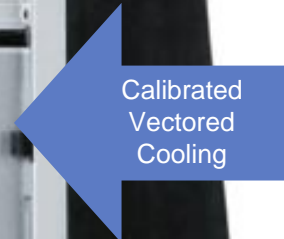
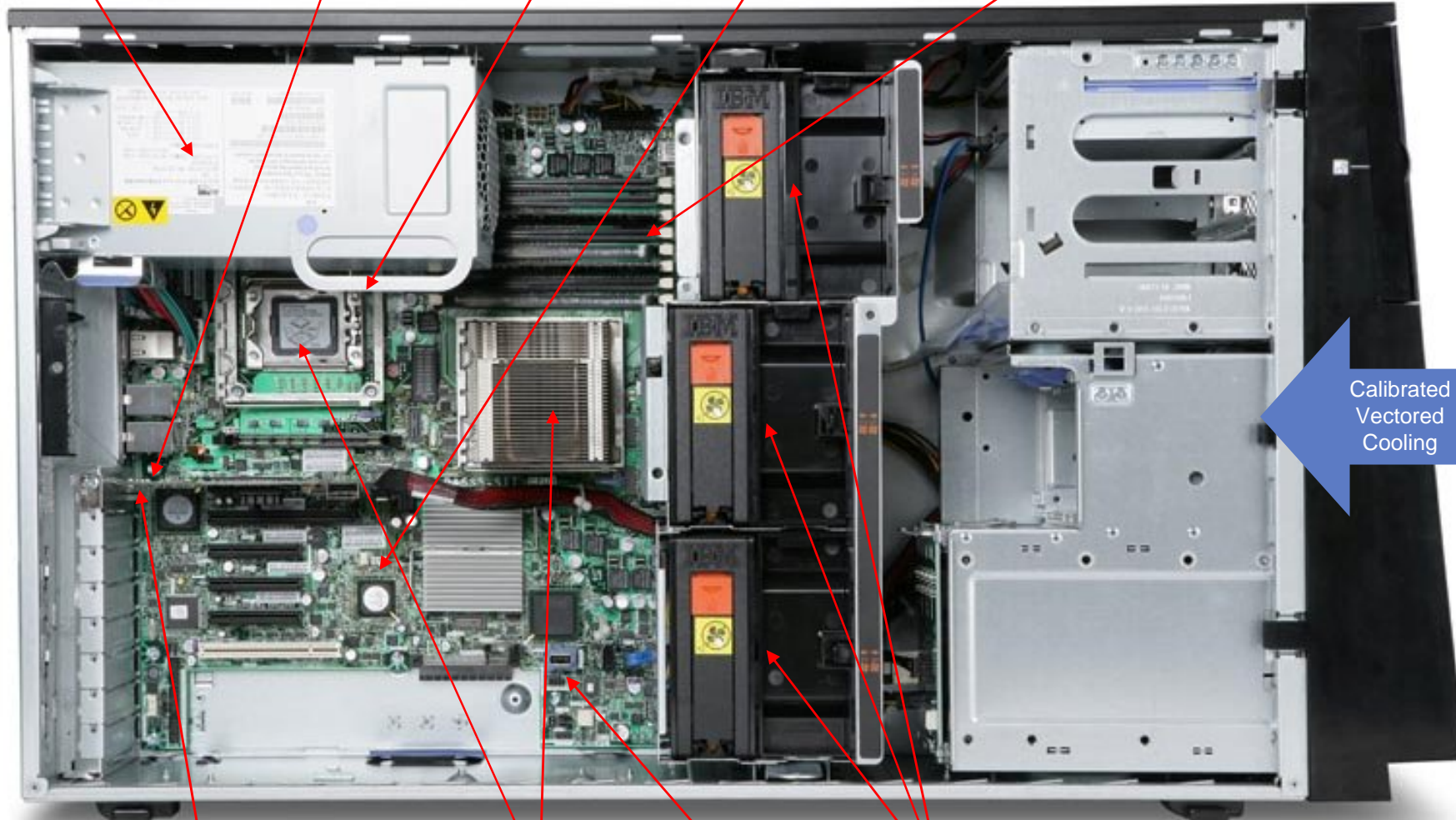
*Available at refresh 2Q12

IBM System x3400 M3

Visual tour of the inside of the system



- Model dependent power supplies with PFA
- IBM Virtual Media Key connector
- Flip handle
- IBM Integrated Management Module (IMM)
- Twelve ECC DDR3 SDRAM sockets with PFA (Chipkill, memory mirroring)



- IBM ServeRAID controller (model dependent) or optional upgrades
- Two Intel processor sockets with PFA
- USB hypervisor connector
- Up to six hot-swap redundant cooling fans with PFA



IBM System x3500 M3

Visual tour of the inside of the system



Up to two hot-swap power supplies with PFA (920W, 90% efficient)

IBM Virtual Media Key connector

IBM Integrated Management Module (IMM)

Flip handle

Sixteen ECC DDR3 SDRAM sockets with PFA (Chipkill, memory mirroring)



Calibrated Vectors Cooling

IBM ServerRAID controller or optional upgrades

Two Intel processor sockets

USB hypervisor connector

Up to six hot-swap redundant variable speed cooling fans with PFA





The value priced engine of growth for your emerging business provides outstanding performance with flexible configuration capabilities and the security to meet the needs of today's complex desk side or retail environment.

Full hot swap capability, including fans

Highly available, energy-efficient server for distributed environments and SMB

X3400 M3:

- 2 x Intel Xeon 4C & 6C Processor 5600 Series (up to 2.66 GHz)
- 16 DIMMs (max 64 GB)
- 4 x 3.5" SATA/SAS or 8 x 2.5" SAS
- Up to 8TB of storage (RAID 0/1, optional 5)
- 5 x PCIe I/O
- 2 x Gigabit Ethernet
- 670 or 920 W, redundant
- 3 year warranty

X3500 M3:

- 2 x Intel Xeon 4C & 6C 5600 Series (up to 3.33 GHz)
- 16 DIMMs (max 192 GB)
- Up to 24 x 2.5" HS SAS/SATA
- Up to 12TB of storage (RAID 0/1/5)
- 6 x PCIe I/O
- 2 x Gigabit Ethernet
- 6 Gb RAID
- 920 W, redundant
- 3 year warranty

IBM System x3250 M3

Visual tour of the inside of the system



351W Power Supply (or optional high efficiency power supply)

IBM Virtual Media Key connector

IBM Integrated Management Module (IMM)

Slot 2: PCI Express x8 half length, low profile

Slot 1: PCI Express x8 3/4 length, full height

USB hypervisor connector

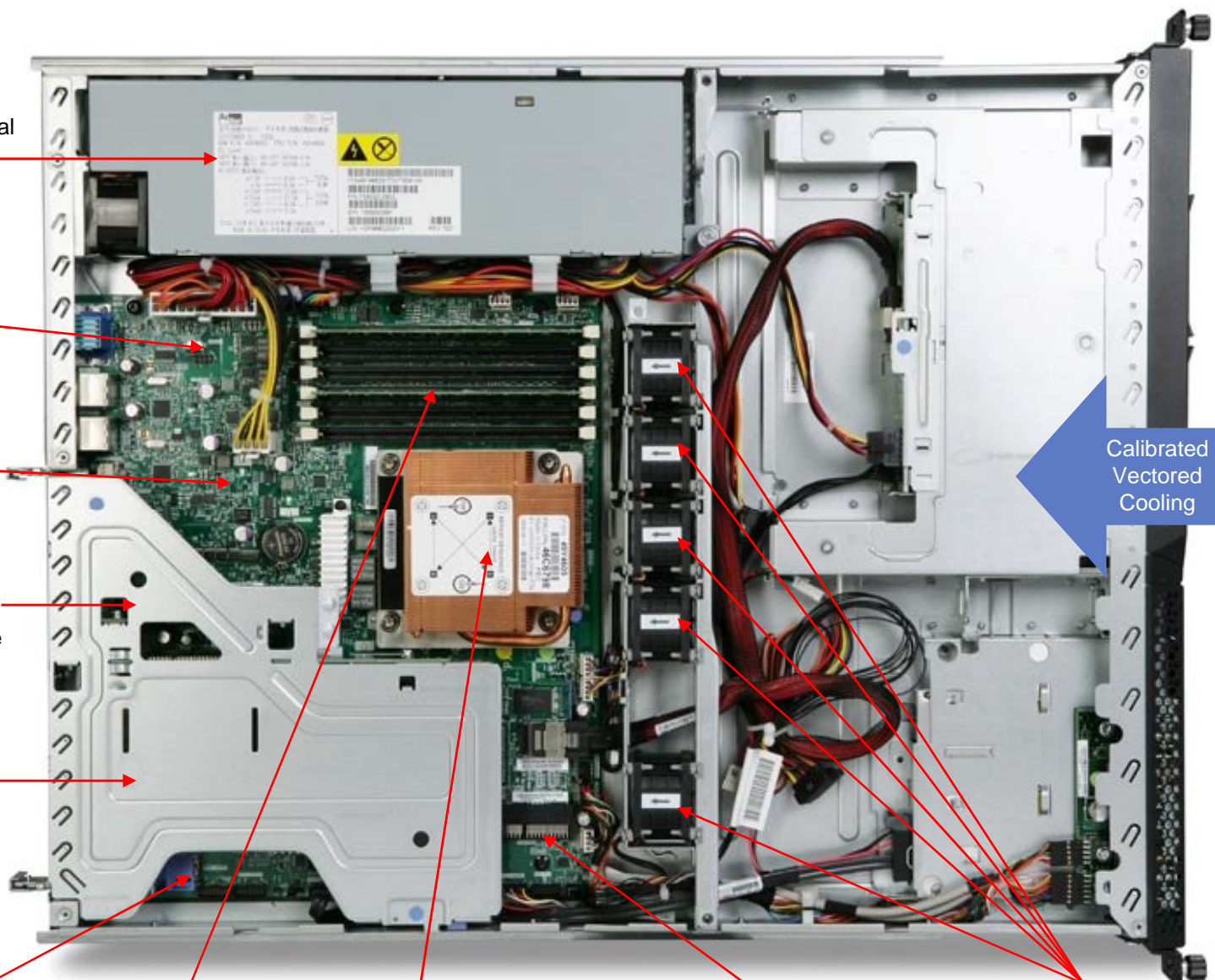
Six DDR3 DIMM Sockets

Intel Processor (Xeon, Celeron, Core i3)

IBM ServerRAID BR-10i controller (model dependent or optional upgrades)

Cooling Fans

Calibrated Vectors Cooling





- Xeon 3400series and Celeron, Pentium, Core-i3, up to 2.93 GHz
- 1-Socket, 1U
- 6 DIMMs (max 32 GB)
- 2 x 3.5" or 4 x 2.5" HS SAS/SATA
- Up to 2TB of storage (RAID 0/1, optional 5)
- 2 x PCIe I/O
- 2 x Gigabit Ethernet
- 350 W power supply
- 3 year warranty



Innovative value on critical business IT demand for price-sensitive environments

Flexible functionality in a 1U server at a compact price

Performance and flexibility to respond to changing business demands

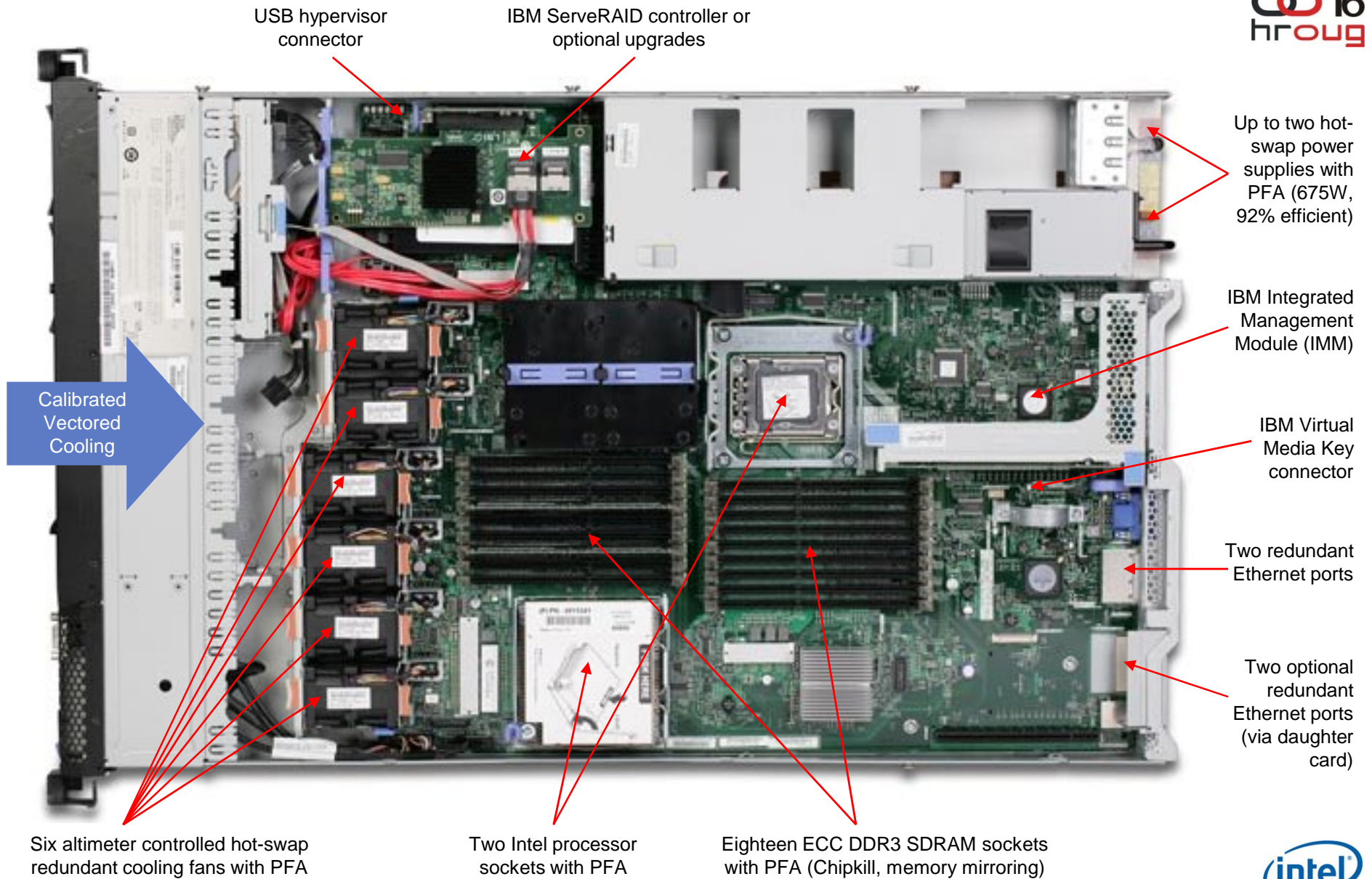
System x3250 M4 overview

IBM x3250 M4	
Processors	Xeon, Corei3, Pentium
#Socket	1
Form factor	1U rack, 22 " deep
Max Memory	32GB / 4 DIMMs DDR3 server-class ECC
HDD bays	2x 3.5" SS SATA or 4x 2.5" HS SAS or 4x 2.5" SS SATA (via CTO)
RAID	Standard ServeRAID C100 0/1/10; HW RAID 0/1/5 upgradable
PCI-express x16/x8/x4/x1	0 / 1 /1 (dedicated for RAID 0,1) /0
Power	1.300W fixed, 80 + Bonze 2. 460W Redundant, 80+ silver
TPM	Standard
Ethernet	Dual gigabit
Management	IMM2, shared port
Warranty	3 year (parts/labor)



IBM System x3550 M3

Visual tour of the inside of the system





- Intel 4C & 6C Intel® Xeon® Processor 5600 Series
- 2-socket, 1U
- 18 DIMMs (max 192 GB)
- 8 x 2.5" HS SAS/SATA/SSD
- Up to 2TB of storage (RAID 0/1, optional 5)
- 6 Gb RAID
- 2 x PCIe I/O
- 2 x Gigabit Ethernet
- 350 W power supply, redundant
- 3 year warranty



The flagship System x 1U 2-socket server is our low-cost rack server capable of handling many business critical applications. You get great server value in a compact 1U form factor.

Leadership
Energy Efficiency

High performance
and exceptional
reliability

System x 2S/2U feature comparison



x3620 M3
Cost Optimized Alternative
dual socket 2U Server
Starting at US \$1,849+

- Intel Xeon 5500 & 5600 w/ QPI
- Up to 95W support
- Quad-Core & Six Core
- 12 DIMMs / 96GB max
- **4x 3.5" SS w/ SW RAID 0,1 std or 8x 3.5" HS w/ HW RAID 0,1,10 std**
- **SS model offers SW RAID; HS models offer HW RAID**
- 2 x8 PCIe slots + 1 x4 PCIe internal
- 2 GbE ports
- HS Optional redundant power
- Optional redundant fans
- 3/3 warranty

Value 2U 2S storage server



x3630 M3
Low cost per TB at highest TB/U
dual socket 2U Server
Starting at US \$2,435+

- Intel Xeon 5500 & 5600 w/ QPI
- Up to 95W support
- Quad-Core & Six Core
- 12 DIMMs / 96GB max
- **12x 3.5" hot-swap std or 12+2x 3.5" hot-swap optional; 24x 3.5" hot-swap std or 24+4x 3.5" hot-swap optional**
- **Hot-swap models offer HW RAID, options HW RAID 0,1,10,5,50,(6,60)**
- 2 x8 PCIe slots + 1 x4 PCIe internal
- 2 GbE ports
- HS optional redundant power supply
- Optional redundant fans
- 3/3 warranty

Best choice for low cost , multi TB storage capacity in a 2U



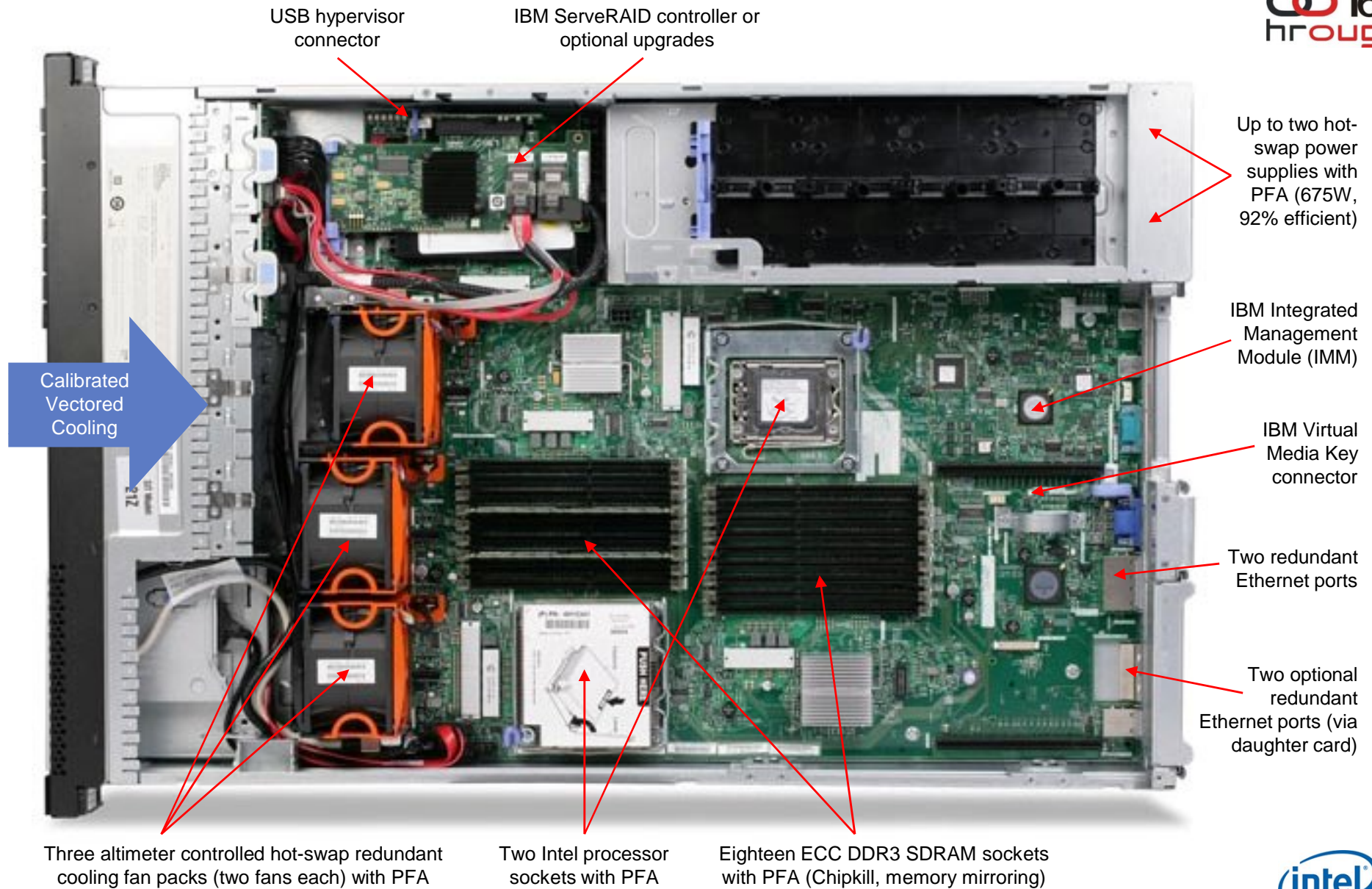
x3650 M3
Flagship business critical
expandable dual socket 2U Server
Starting at US \$2,519+

- Intel Xeon 5600 w/ QPI
- **Up to 130W support**
- Dual, Quad, & Six Core
- **18 DIMMs / 196GB max**
- 16x 2.5" HS HDD
- Integrated HW RAID 0,1
- Optional HW RAID 0,1,10,5,50,(6,60)
- **4+1 PCIe Slots**
- **2 GbE ports plus 2 optional**
- Full IMM
- **TOE and TPM**
- **Advanced Lightpath**
- Completely tool-free service
- Tool-less installation
- High quality slides
- HS Optional redundant power
- **HS redundant fans**
- 3/3 warranty

Flagship, business critical expandable server for the most demanding workloads with maximum performance and all high reliability features standard

IBM System x3650 M3

Visual tour of the inside of the system





- Intel 4C & 6C Intel® Xeon® Processor 5600 Series
- 2-Socket 2U
- 18 DIMMs (max 192 GB)
- 16 x 2.5" HS SAS/SATA/SSD
- Up to 9,6TB of storage (RAID 0/1, optional 5)
- 6 Gb RAID
- 4 x PCIe I/O
- 2 x Gigabit Ethernet
- 675 W power supply, redundant
- 3 year warranty



The flagship System x 2U 2-socket rack server delivers leadership performance per watt computing and handles business-critical applications. You get exceptional price/performance with low total cost of ownership.

#1 SPEC Power Benchmark

Best in class reliability and availability w/ predictive failure & redundancy

System x positioning map



Attribute	Towers				Rack-Optimized Servers				
									
	x3100 M3	x3200 M3	x3400 M3	x3500 M3	x3250 M3	x3550 M3	x3620 M3	x3630 M3	x3650 M3
Positioning	Selected Growth Markets) Entry Small-Business Server	Reliable Entry Server	Value Enterprise Server	Business-Critical All-in-one Server	Entry Infrastructure Server	Business-Critical Compact Application Server	Cost-effective 2U storage server	2U storage-rich server	Flagship Business- Critical Expandable Server
Form Factor	Tower	Tower (rackable 5U)	Tower (rackable 5U via CTO)	Tower (rackable 5U via CTO)	1U Rack	1U Rack	2U Rack	2U Rack	2U Rack
Processor Type (maximum cores)	Intel Xeon® (2-core)	Intel Xeon (4-core)	Intel Xeon (6-core)	Intel Xeon (6-core)	Intel Xeon (4-core)	Intel Xeon (6-core)	Intel Xeon (6-core)	Intel Xeon (6-core)	Intel Xeon (6-core)
Processor Sockets / Maximum Cores	1 / 2	1 / 4	2 / 12	2 / 12	1 / 4	2 / 12	2 / 12	2 / 12	2 / 12
HDD Type	SATA (Fixed)	SAS & SATA (SS & HS)	SAS & SATA (SS & HS)	SAS & SATA (HS)	SAS & SATA (SS & HS)	SAS, SATA, SSD (HS); or SSD (SS)	SAS, SATA (HS); or SATA (SS)	SAS or SATA (HS)	SAS, SATA, SSD (HS); or SSD (SS)
Maximum # HDDs	(4) 3.5"	(4) 3.5"; (8) 2.5"	(8) 2.5" or (4) 3.5"; (16) 2.5" or (8) 3.5" by CTO	(8 or 16) 2.5"; (24) 2.5" or (8) 3.5" by CTO	(2) 3.5"; (4) 2.5"	(8) 2.5"	(4) 3.5"; (8) 3.5"	(14) 3.5"; (28) 2.5"	(16) 2.5"
Maximum Memory	4 DIMMs 16 GB	4 UDIMMs / 6 RDIMMs 32 GB	16 RDIMMs / 128 GB; 12 UDIMMs / 48GB	16 RDIMMs / 192 GB; 12 UDIMMs / 48GB	4 UDIMMs / 6 RDIMMs 32 GB	18 RDIMMs 192 GB	12 RDIMMs 96 GB	12 RDIMMs 96 GB	18 RDIMMs 192 GB
Maximum I/O Slots	(3) PCIe & (1) PCI	(4) PCIe & (2) PCI	(5) PCIe & (1) PCI; opt. (1) PCIe or (2) PCI-X	(6) PCIe & (1) PCI; or (5) PCIe, (2) PCI-X & (1) PCI	(2) PCIe	(2) PCIe; or (1) PCIe & (1) PCI-X; or (2) PCI-X	(3) PCIe	(2) PCIe	(4) PCIe; or (2) PCIe & (1) or (2) PCI-X
Sample Applications	<ul style="list-style-type: none"> - SMB - File & Print - Email 	<ul style="list-style-type: none"> - File & Print - Email - Point-of-sale 	<ul style="list-style-type: none"> - File & Print - Email - Branch Office 	<ul style="list-style-type: none"> - Virtualization - ERP / CRM - Branch Office 	<ul style="list-style-type: none"> - Security - Collaboration - Web Serving 	<ul style="list-style-type: none"> - Database - Collaboration - Web Serving 	<ul style="list-style-type: none"> - File / print - Video / photo sharing - Email 	<ul style="list-style-type: none"> - Online gaming - File / print - Video / photo sharing - Email 	<ul style="list-style-type: none"> - Database - Virtual Desktop - Virtualization

eX5 leadership for an evolving marketplace with increasing demands

5th Gen: Breakthrough performance, ultimate flexibility, simpler management

4th Gen: First x86 server to break 1 Million tpmC

3rd Gen: First x86 server with Hot-swap memory

2nd Gen: First x86 server with 100 #1 Benchmarks

1st Gen: First x86 server with scalable 16 processor design



2010
5th Generation



2007
4th
Generation



2005
3rd
Generation



2003
2nd
Generation



2001
1st
Generation



eX5 Portfolio — Systems for a Smarter Planet



System x3850 X5

Consolidation, virtualization, and database workloads being migrated off of proprietary hardware are demanding more addressability



Broad coverage for most enterprise applications, server consolidation, virtualized workload enablement.



BladeCenter HX5

Demand for minimum footprint as well as integrated networking infrastructure has increased the growth of the blade form factor.

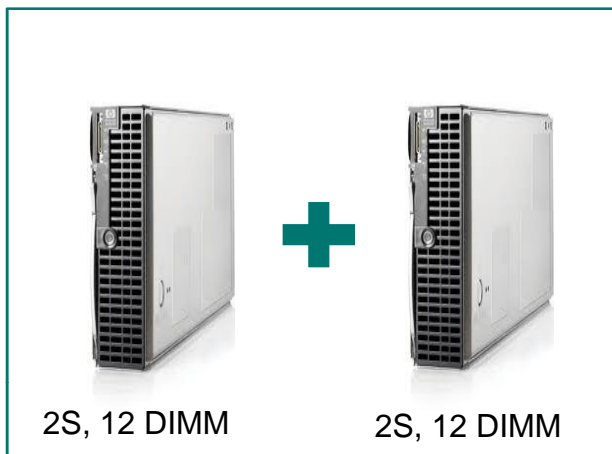


System x3690 X5

Powerful and scalable system allows some workloads to migrate onto 2-socket design that delivers enterprise computing in a dense package

MAX5 doubles memory without adding more processors

Reduce costs with virtualization



THE PROBLEM

Industry standard

With embedded memory controllers, memory capacity is tied to processors

- ✗ More software licenses to purchase
- ✗ More systems to manage



THE SOLUTION

MAX5

- ✓ Expand memory capacity without additional CPUs or software licenses
- ✓ Double the number of memory DIMMs per CPU
- ✓ 2x memory bandwidth
- ✓ Maintain full memory performance
- ✓ 5x the memory capacity in two-sockets vs. today's leading two-socket systems

Greater productivity and utilization through memory expansion and flexibility

Take your system to the MAX with **MAX5**

MAX memory capacity

- An additional 32 DIMM slots for x3850 X5 and x3690 X5
- An additional 24 DIMM slots for HX5

MAX virtual density

- Increase the size and number of VMs

MAX flexibility

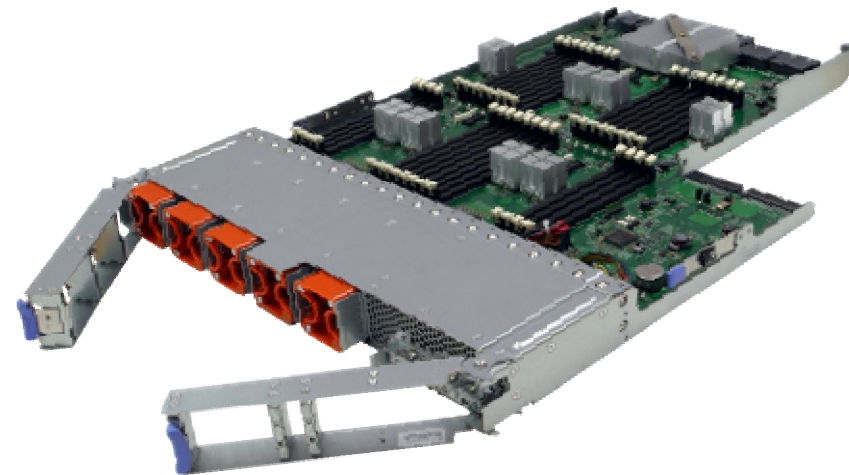
- Expand memory capacity, scale servers, or both

MAX productivity

- Increase server utilization and performance

MAX license optimization

- Get more done with fewer systems



Minimize cost

Eliminate the memory bottleneck and get the most from your virtualization investment with eX5

Reduce costs with virtualization

82%
more VMs

Same 2S license cost

50%
license cost

Same number of VMs



2S Competition server



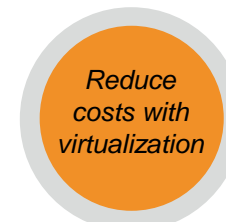
4S Competition server



Software licensing hypervisor cost: \$3,500 per processor.
Memory is constrained before processors are fully utilized.

Minimize cost

Reduce Microsoft SQL software licensing costs by 50 percent using eX5 technology



A 1,000 user SQL Server 2008 database using a two-socket Nehalem-EX system.

Competition Nehalem-EX server



System x3690 X5 2-socket Nehalem-EX server



50%
license cost

Same number of users

SQL Server 2008 Enterprise Edition licensing cost

US\$100,000

SQL Server 2008 Enterprise Edition licensing cost

US\$50,000

Notes:

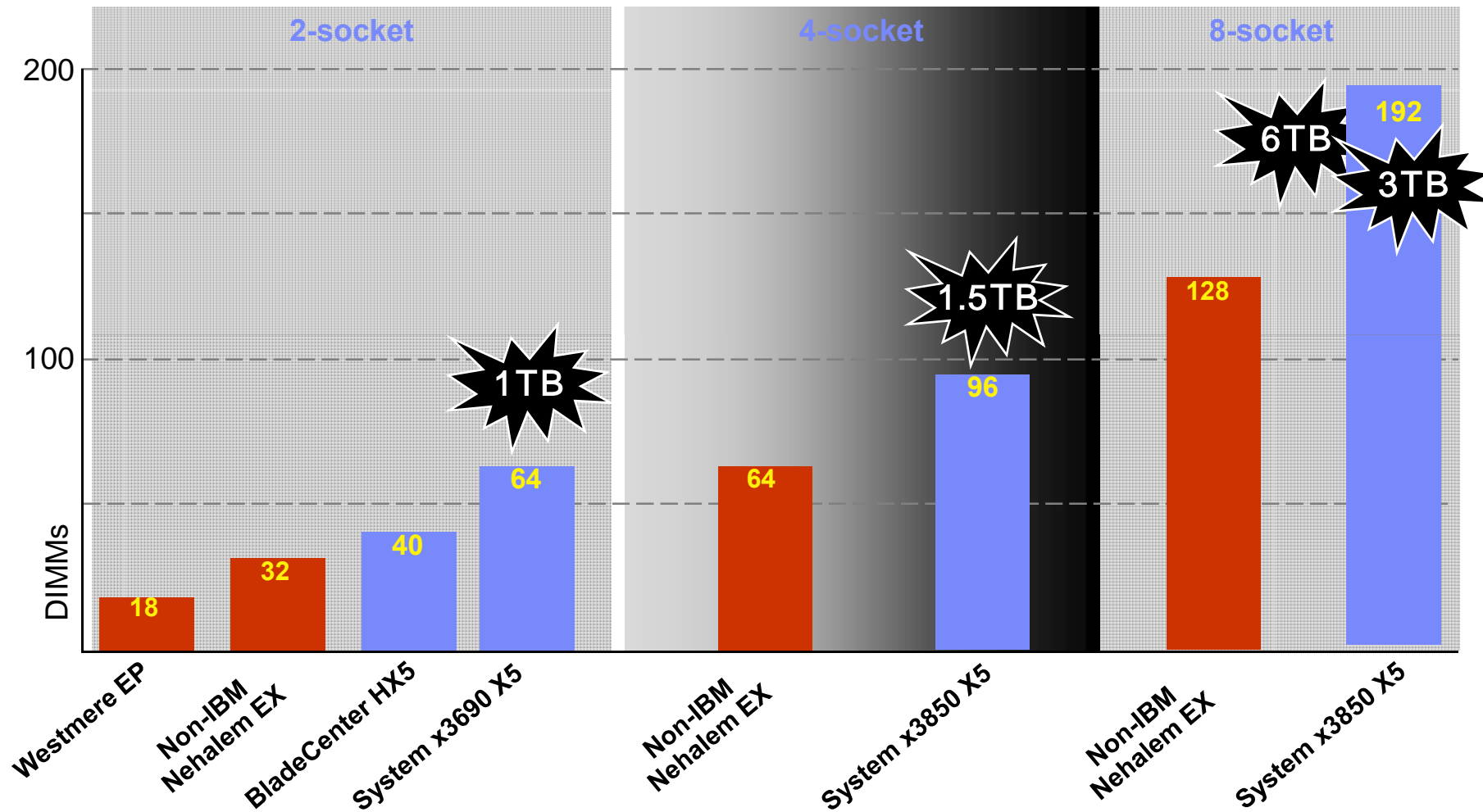
All pricing shown is Microsoft List Pricing as of January 2010 per the pricing information on <http://www.microsoft.com/sqlserver/2008/en/us/pricing.aspx>

Pricing model used is per processor licensing which is based on \$24,999 per physical socket on the server (logical cores are not counted)

MAX5: Memory Access for eX5



Maximize memory
The new eX5 portfolio provides as much as twice the amount of memory as competitive systems



eX5 FlashPack
Maximum internal storage performance

Combination of solid-state disk technology and high-speed controller architecture deliver extreme performance to replace limited IOPs of traditional HDDs

Maximize performance

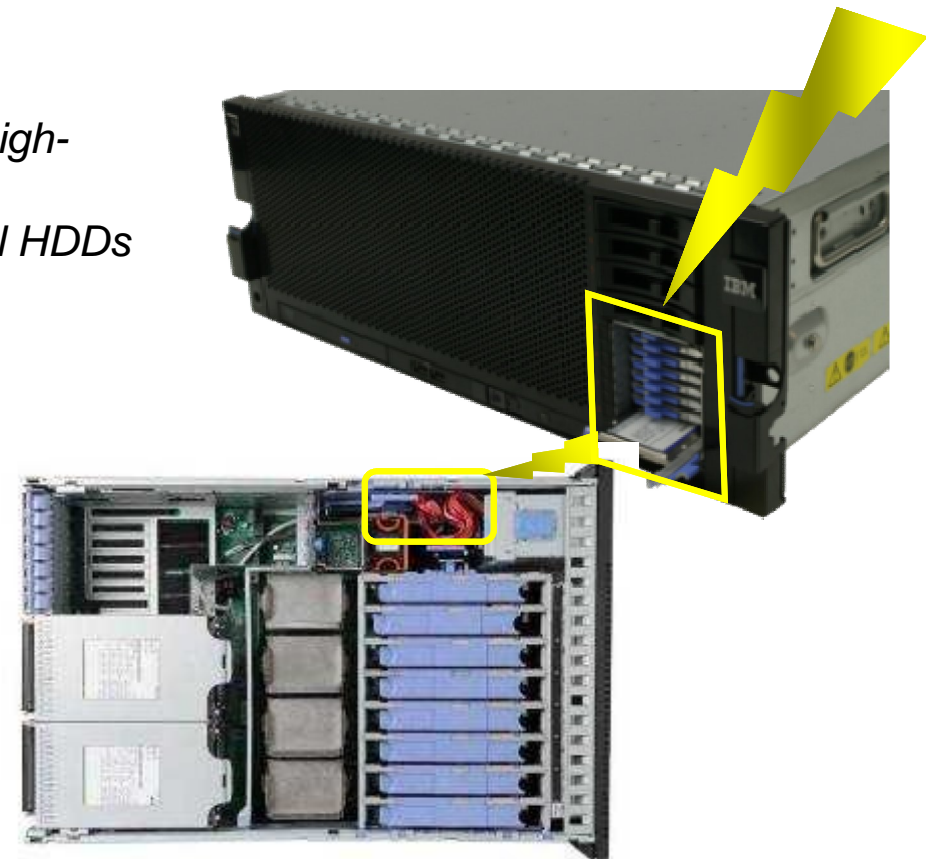
- Up to 200x performance increase for local databases
- 99% better performance per watt for database-type workloads

Maximize cost savings

- 100 to 1 replacement ratio of traditional drives, replacing thousands of drives and cables
- \$670,000 hardware savings per FlashPack over equal IOPs HDDs
- Up to 40x greater solution density over traditional HDD solution

Maximize reliability

- RAID 5/6 controller for redundant data storage reliability at 37.5% greater capacity
- Greater reliability over traditional HDDs



FlashPack Features	
✓	Up to 3 FlashPacks per system
✓	UP to 240,000 IOPs, 1.6TB per FlashPack
✓	RAID 5/6 and high throughput non-raided
✓	Hot swappable, front accessible, modules

eX5 delivers integrated, high speed data access at 97% lower cost and 99% less power versus traditional alternatives

Customer requirement: Fast data access with 240K IOPS

THE PROBLEM Industry standard

- ✗ 80 JBODS with 800 spinning disks
- ✗ Each with 300 IOPS
- ✗ Cost \$1153K over 3 years



THE SOLUTION eXFlash

- ✓ 1x eXFlash for self contained fast (240K) IOPS solution
- ✓ No additional parts required
- ✓ 97% less expensive and
- ✓ 99% less power



Only eX5 can deliver the fast access to data required for high quality of service in multi user database environments

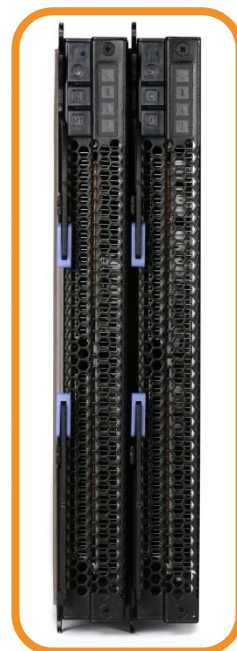
Take advantage of unprecedented flexibility

FlexNode enables you to dynamically transform a single into two distinct systems—and then back again

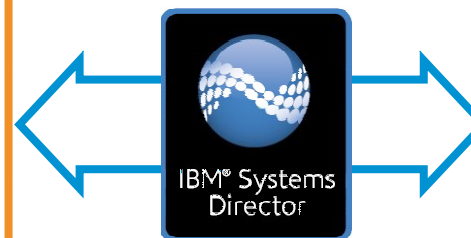
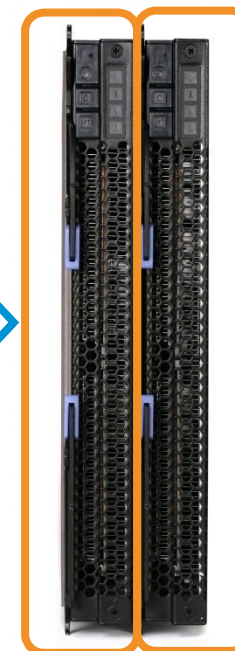
Reduce costs with virtualization

- **Optimize workloads:** Run interactive applications by day on a 2S system and batch jobs by night on 4S system
- **Help reduce software licensing costs:** Execute partitions to optimize software licensing costs when priced per system core.
- **Boost security:** Isolate workloads to help improve security and assure quality of service.

One 4S System



Two 2S Systems



Extend blade benefits to entire business

Chassis tailored to specific needs



IBM BladeCenter S
*Distributed, small office,
easy to configure*



IBM BladeCenter E
*Enterprise, best
efficiency, best density*



IBM BladeCenter H
*Enterprise high
performance*



IBM BladeCenter i
*Ruggedized, short-
depth*



IBM BladeCenter H
*Ruggedized, high
performance*

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

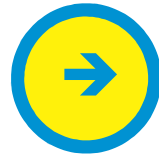
BladeCenter 2011 Positioning



Workloads	<ul style="list-style-type: none"> • Infrastructure applications • Small office / retail • Rack-to-blade migration 	<ul style="list-style-type: none"> • Broad enterprise applications • Does many things very well (workhorse) 	<ul style="list-style-type: none"> • Mainstream virtualization • Memory-intensive HPC 	<ul style="list-style-type: none"> • Max virtualization performance • HPC 	<ul style="list-style-type: none"> • Max virtualization and database performance • Business intelligence • SAP
Features	<ul style="list-style-type: none"> • Lowest absolute cost • Lowest absolute power consumption • Hot-swap storage • Density • OS4690 	<ul style="list-style-type: none"> • Balanced proc, memory, storage, & I/O • Performance/ watt leadership • High availability & manageability 	<ul style="list-style-type: none"> • Maximum memory density • Max memory for DP server • Embedded hypervisor & SSDs 	<ul style="list-style-type: none"> • Scalable 2-to-4+ • Density • Max IO • Optional 2x 1.8" SSDs w/HW RAID 	<ul style="list-style-type: none"> • +24 to +48 DIMMs on top of HX5 base • Firehawk chip • Scale mem and procs at lower cost
Differentiation	<ul style="list-style-type: none"> • Low cost point • Great green story • BCS-optimized • Easy to use • Only blade for retail 	<ul style="list-style-type: none"> • Flexibility • Compatibility with E chassis • Cooling • RAS 	<ul style="list-style-type: none"> • Memory capacity • SSDs with HW RAID • Integrated Virtual Fabric models 	<ul style="list-style-type: none"> • Max compute density • Max IO • Node partitioning • Node failover 	<ul style="list-style-type: none"> • Max memory density • Node partitioning • Node failover

Perfect fit for non-virtualized, infrastructure applications like file/print and saves up to 50% more energy versus typical 1U servers. In addition, OS4690 certified for retail store operations

HS12:



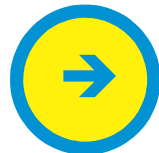
Cost-efficient uniprocessor blade

Ideal for general business applications



Offers outstanding performance, flexible configuration options and simple management in an efficient server to run a broad range of workloads

HS22:



Versatile, easy-to-use optimized for virtualization & performance

Excellent price / performance ratio

BladeCenter HS12 & HS22 Server Feature Comparison



HS12

Cost-efficient uniprocessor blade

Starting at US \$1,449+

- Intel Xeon Dual or Quad core
- 1 socket
- Up to 80W support
- 6 DIMMs / 24GB max
- **3 x 2.5" SAS/SATA/SSD**
- 1 PCI-e expansion card
- 2 GbE ports
- Integrated Management Module
- Light Path Diagnostic
- 3 year warranty

HS22

Business critical expandible blade

Starting at US \$1,902+

- Intel Xeon **5600 series** Dual or Quad or **Six** core
- **2 sockets**
- **Up to 130W support**
- **12 DIMMs / 96GB max**
- 2 x 2.5" SAS/SATA/SSD
- 1 PCI-e expansion card
- 2 GbE ports
- Integrated Management Module
- Light Path Diagnostic
- 3 year warranty

A picture is worth a thousand words:
Which solution would you rather have at your remote office?



OR



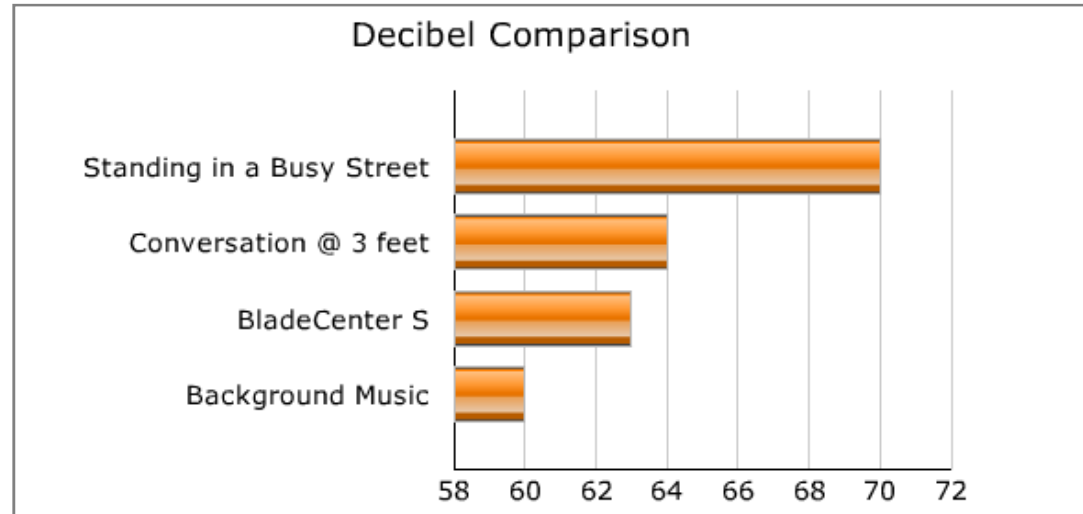
The IBM BladeCenter S combines servers, storages, switches, power, cooling and cables in to one self contained easily manageable solution for remote offices

IBM BladeCenter S Chassis

Visual tour of the IBM BladeCenter S Office Enablement Kit



IBM BladeCenter S with the optional Office Enablement Kit brings efficiency and the quietness of a conversation to the remote office



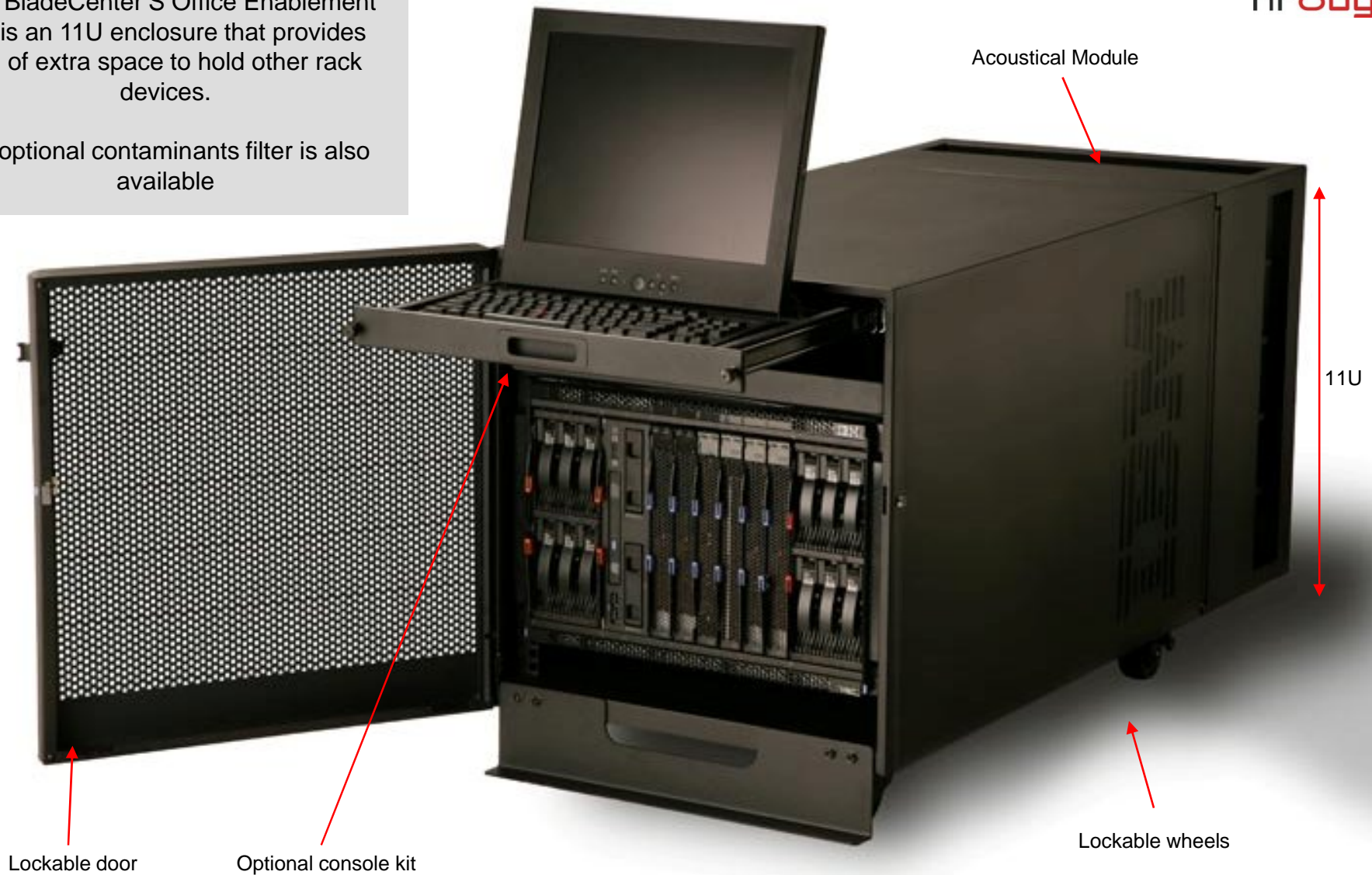
IBM BladeCenter S Chassis

Visual tour of the IBM BladeCenter S Office Enablement Kit



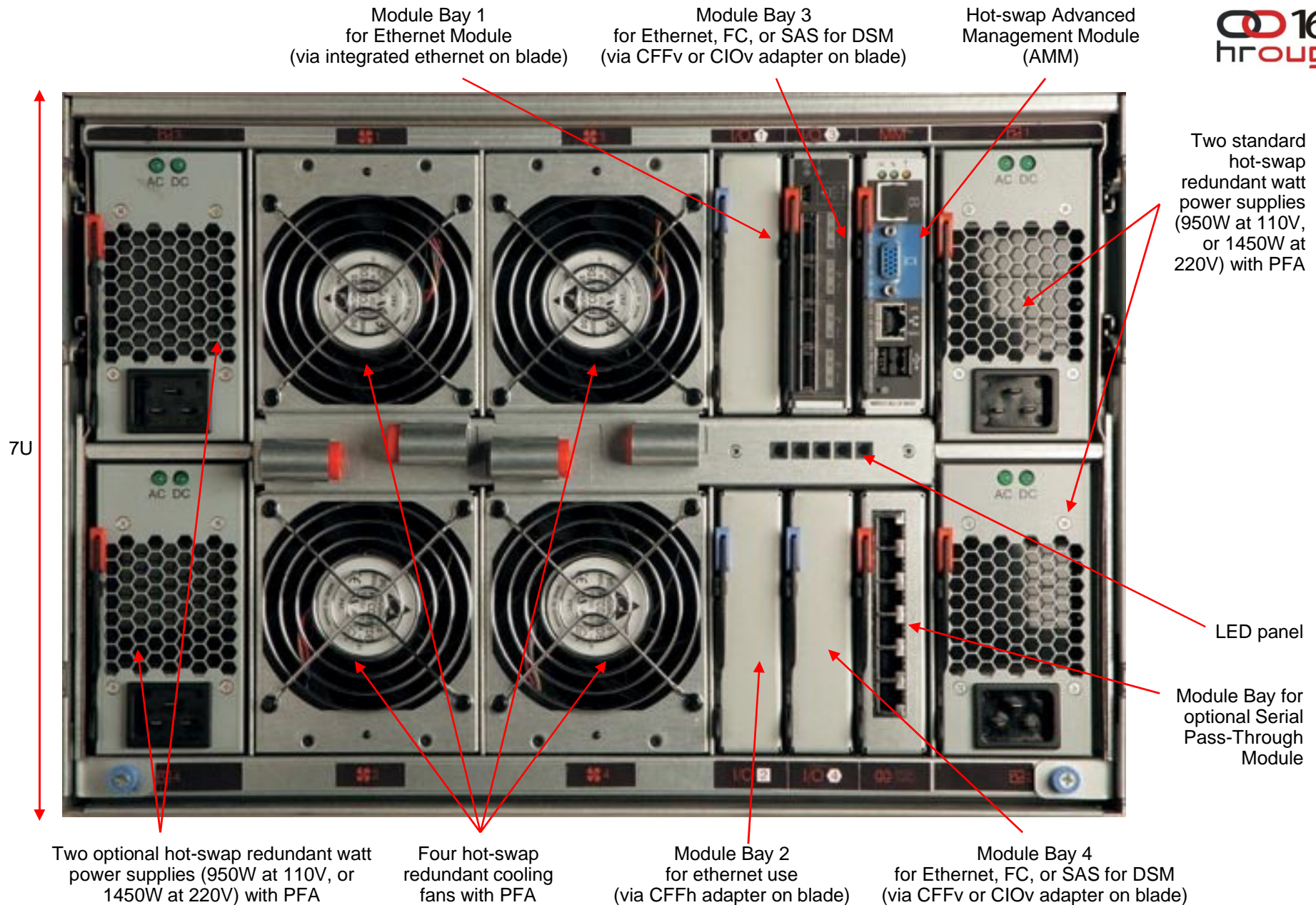
The BladeCenter S Office Enablement Kit is an 11U enclosure that provides 4U of extra space to hold other rack devices.

An optional contaminants filter is also available

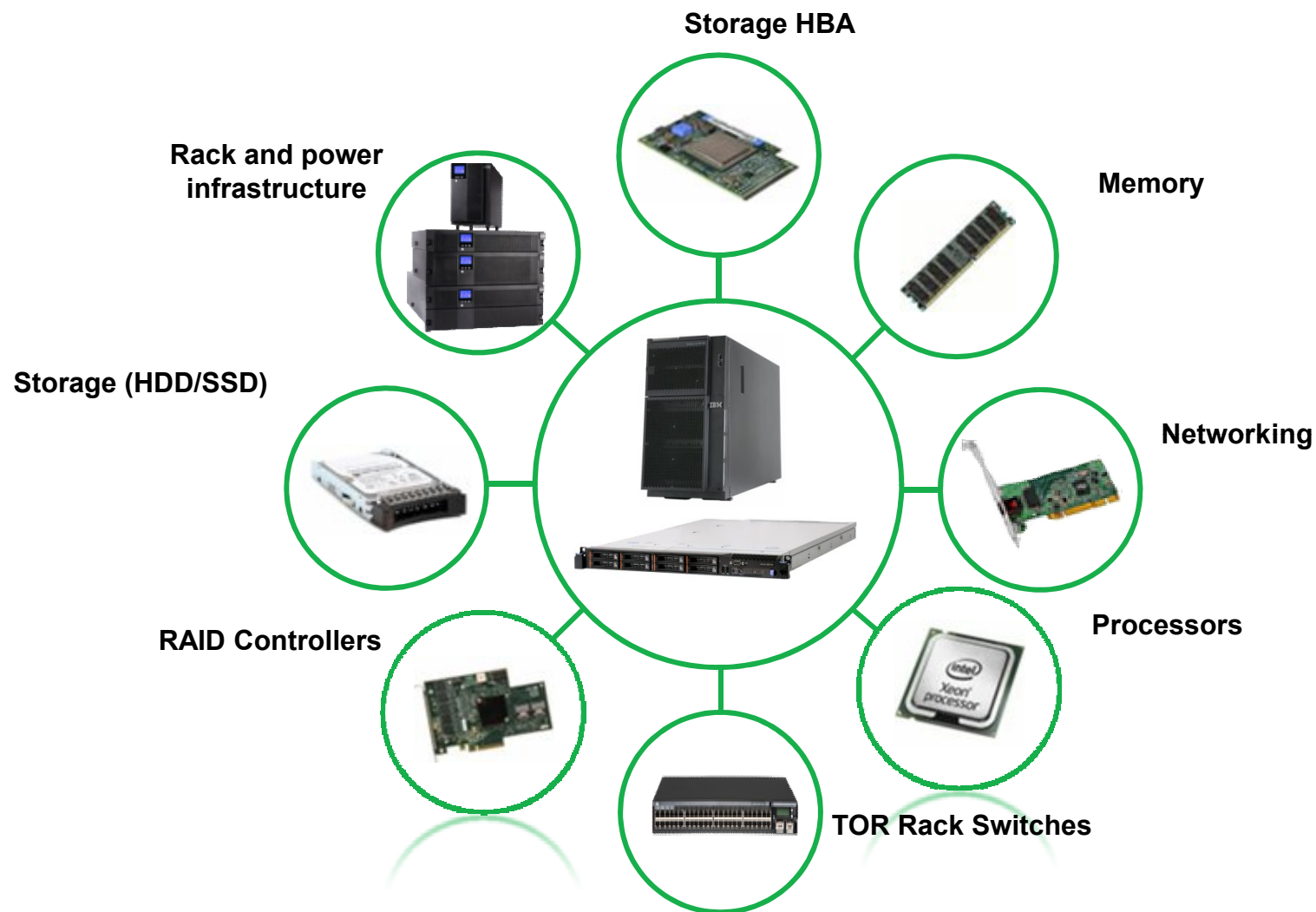


IBM BladeCenter S Chassis

Visual tour of the rear of the chassis



Enhancing your IT value with System x options



System x is a complete infrastructure solution

Rack System Enclosure

Optimized equipment mounting in a secure packaged solution.

Networking

Full top of rack switch portfolio, *providing open standard end-to-end network solutions.*

KVM Console Switches

Highly-scalable KVM switch allows administrators complete control of systems *at the rack or across the globe.*

Console

Sleek design and innovative features, such as the built-in DVD Drive and USB, allow administrators to do more *right from the console tray.*

Power Distribution Unit (PDU)

Efficiently distributes power and flexible design allows for easy mounting.

Uninterruptible Power Supplies (UPS)

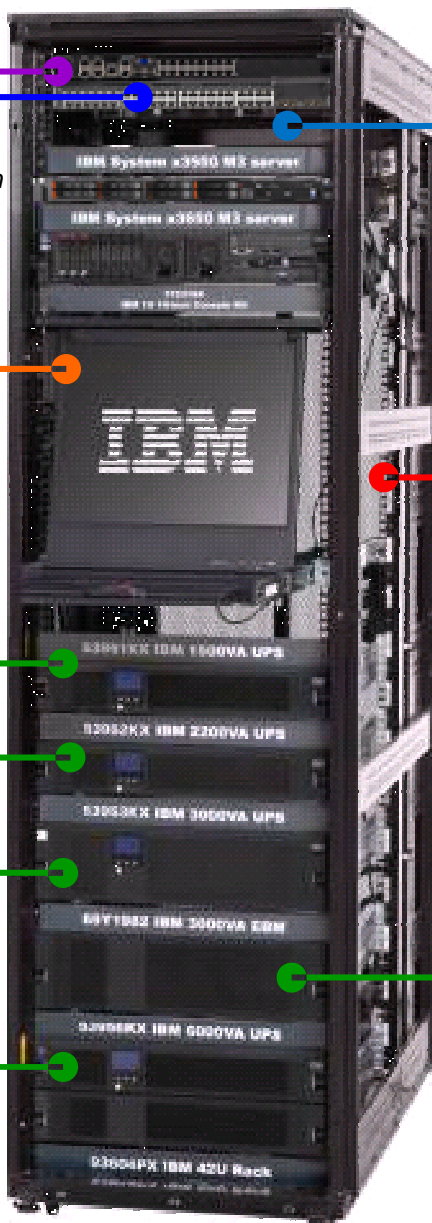
Deliver superior power protection and battery backup for continuous operation.

Software tools

Interfaces provide complete monitoring, measurement and management of installed servers and power devices

Extended Battery Module (EBM)

Prolongs UPS battery run time.



Broad OS portfolio and support delivers customer choice, convenience and confidence 16 HROUG

Key Features

- System x and BladeCenter offer a wide choice of operating systems.
- Operating systems available for purchase with new hardware.
- Each OS includes a native type 1 hypervisor for virtualization and may also be used as a guest with other OS hypervisors.

Benefits

- Broadens the application offerings available, increasing the ways clients can put System x servers to work.
- Purchasing the OS is as convenient as purchasing any other System x option, such as hard drives, memory or network and storage adapters.
- Creates a highly flexible, cost effective infrastructure that can quickly and easily adapt to business changes.

IBM Systems cover the full range of Oracle products



Mainframe Systems
System z
z/OS, Linux on z

System x
Linux, Windows

Power Systems
running IBM AIX and
Linux

Power Systems
running IBM i

← IBM System Storage™ →

Oracle Technology: Database, Fusion Middleware, BIEE		
Oracle E-Business Suite		
Database tier	PeopleSoft Enterprise	
Database tier	Siebel	
	JD Edwards EnterpriseOne	
		JD Edwards World
	Oracle Retail (Retek, ProfitLogic, 360Commerce)	
DB / Fusion MW	i-flex Flexcube Retail	(AIX partition)
	Oracle Communications (BRM, Metasolv)	
	Oracle Transportation Management (OTM, G-Log)	
	Demantra Demand Planning	

