

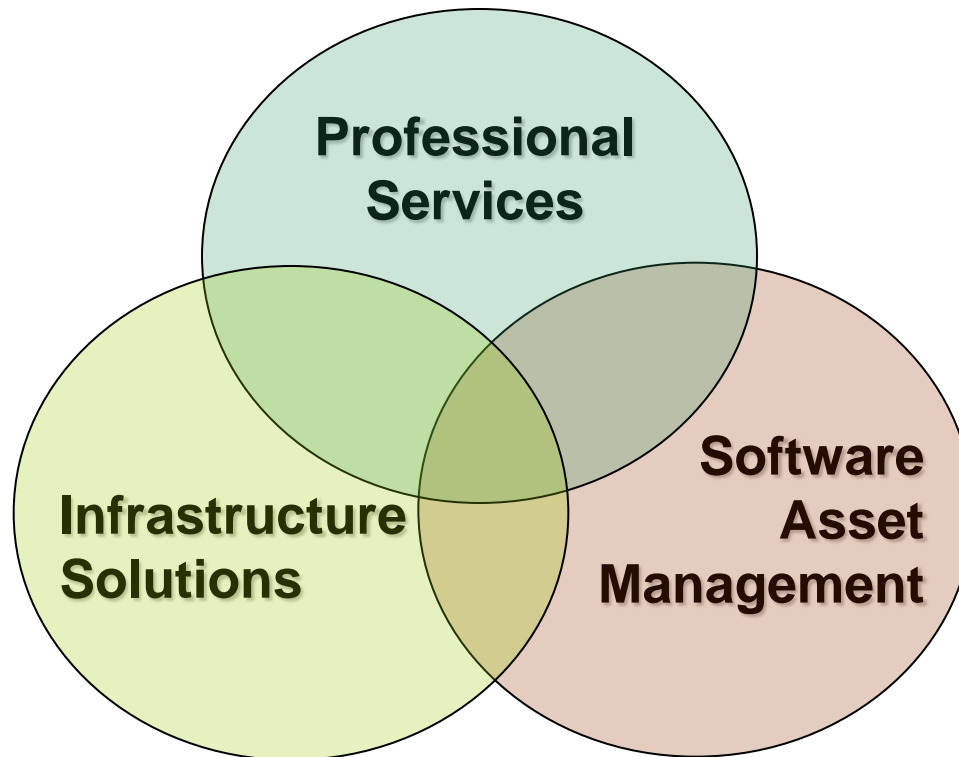
5th Generation Enterprise X-Architecture: Maximizing Client Value IBM eX5

Introducing Siwel Consulting

FOUNDED	August 1992
INCORPORATED	NY State
HEAD QUARTERS	NY City
GEO. COVERAGE	US & International
AFFILIATIONS	Women's Business Enterprise National Council



Siwel's Lines of Business



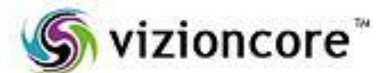
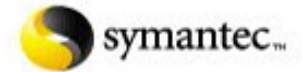
Value through Efficiency and Optimization.

Siwel Delivers Infrastructure Expertise

- **The Right Hardware**
 - To deliver increased density and better performance to maximize utilization.
- **The Right Software**
 - To deliver consolidation, data reduction, and data protection that minimizes the physical footprint while simplifying management.
- **The Right Partner**
 - To enable your organization to harness the power of these tools and extract the most value in shortest time.



Siwel's Key Technology Partners





- Maximize memory
- Minimize cost
- Simplify deployment

Client challenges with enterprise workloads: Database, Virtualization, Transaction processing

Limited memory slots

- Restricted server utilization
- Difficulty supporting more, bigger virtual machines, growing databases and increases in transaction processing.

Shrinking IT budgets

- A need to reduce operational expenses
- Having to cut license fees and energy costs
- Investing in only what is needed
- Having to get the most out of existing data centers.

Growing complexity

- Difficulty moving from development to production
- Challenges when trying to optimize performance for specific workloads.

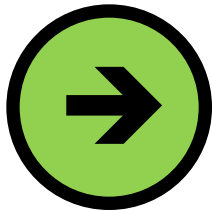


Challenges create an opportunity for innovation.....

Companies must be able to get more out of the people, IT assets and budget they have. They must have the flexibility to get the IT they need, the way they need it.

IBM is Building on Industry Standards

- The broadest portfolio of flexible enterprise rack and blade systems
- Lower entry points for enterprise technology
- The most memory, along with unique expansion capabilities
- The fastest access to integrated data
- Maximum flexibility with node partitioning
- Optimized configurations for target workloads



The result is innovation that addresses companies' real-world needs.

IBM System x and BladeCenter

Introducing eX5

- ➔ 5th generation portfolio of IBM industry-leading technology in enterprise x86 computing
- ➔ Expansion of Enterprise X-Architecture to IBM BladeCenter
- ➔ 2X the memory capability of competitive offerings resulting in up to 2/3 software costs
- ➔ Lowest costs of acquisition and deployment for enterprise x86 computing in the industry

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

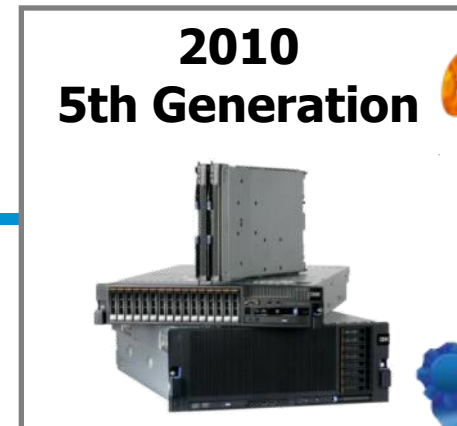
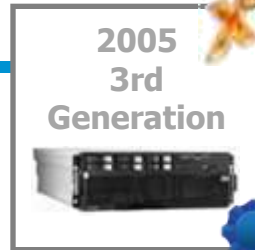
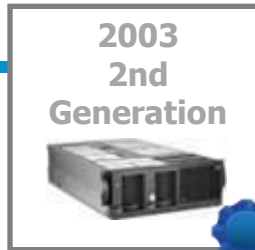
2nd Gen: First x86 server with 100 #1 benchmarks

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

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

**2010
5th Generation**

eX5



IBM Smarter Systems for a Smarter Planet

eX5 portfolio: more workload capability, new entry point, more choices

Four generations of enterprise x86 leadership in a scalable 4U/4S format.

The fifth generation extends Enterprise X-Architecture



IBM System x3850 X5



Delivering more workload capability than ever.



IBM BladeCenter HX5



Extending the value of the Enterprise X-Architecture to a blade server.



IBM System x3690 X5



New entry point for enterprise x86 technology.

IBM System x3850 X5

Available now!



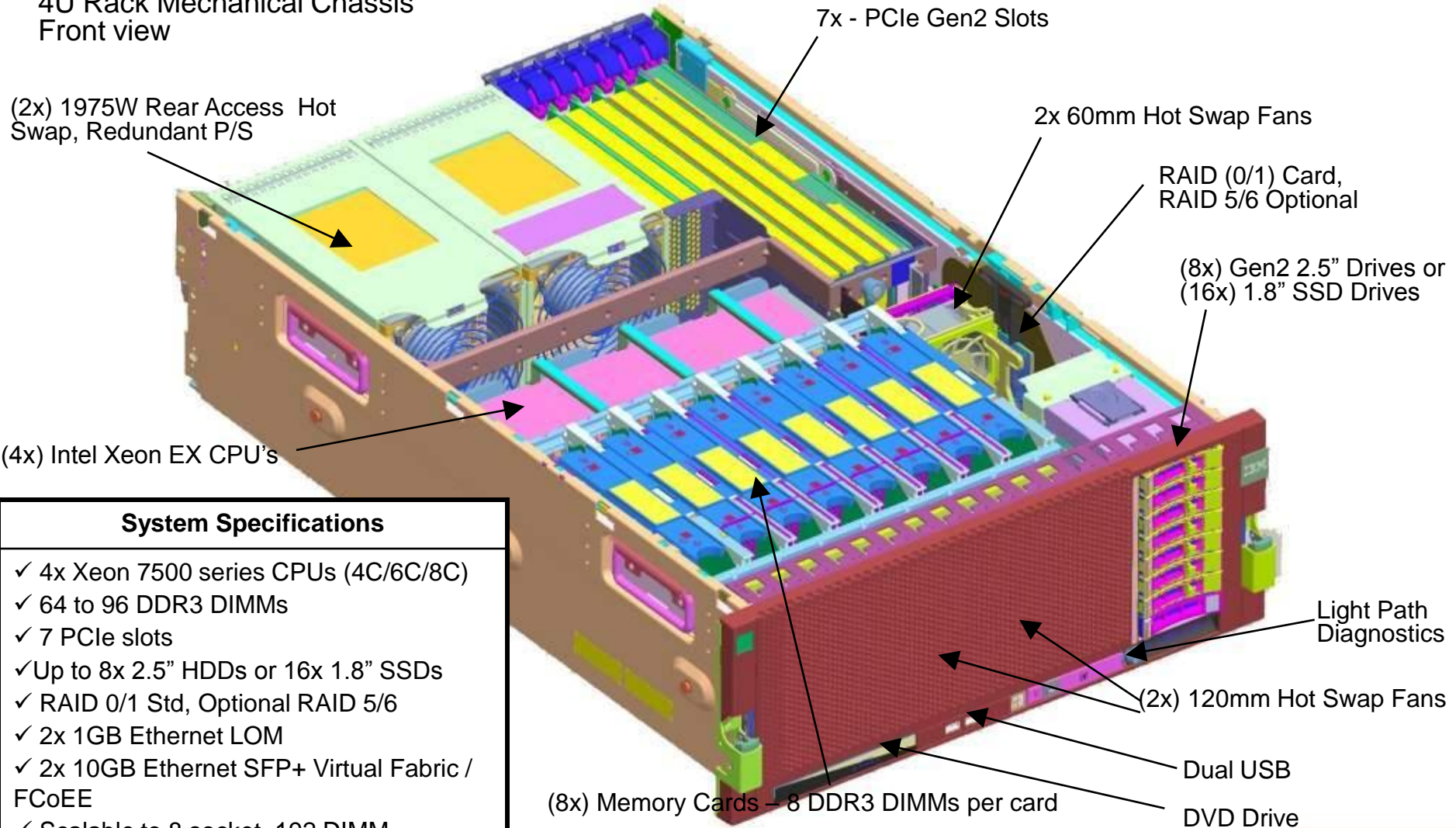
- Scalable 4-socket 4U server
- Up to 96 DIMMs with MAX5
- 8, 6, or 4-core Intel Xeon 7500 processors
- Seven I/O slots



With **6 leadership performance benchmarks**, get the best performance per workload with a versatile, scalable platform that delivers 6 times the memory of any 4-socket x86 system today for the maximum utilization, reliability and performance needed for compute- and memory-intensive workloads.

X3850 X5 - 4 Socket 4U EX platform

4U Rack Mechanical Chassis
Front view



System Specifications

- ✓ 4x Xeon 7500 series CPUs (4C/6C/8C)
- ✓ 64 to 96 DDR3 DIMMs
- ✓ 7 PCIe slots
- ✓ Up to 8x 2.5" HDDs or 16x 1.8" SSDs
- ✓ RAID 0/1 Std, Optional RAID 5/6
- ✓ 2x 1GB Ethernet LOM
- ✓ 2x 10GB Ethernet SFP+ Virtual Fabric / FCoEE
- ✓ Scalable to 8 socket, 192 DIMM
- ✓ Internal USB for embedded hypervisor
- ✓ IMM, uEFI & IBM Systems Director

x3850 X5: Leadership performance across the board

TPC-E

2,022.64 tpsE at
\$493.92 USD/tpsE⁽¹⁾
New world record!

VMmark

71.85 @ 49 Tiles⁽³⁾

SAP SD

10,450 SAP SD users⁽²⁾

SPECjbb

2,012,730 BOPS⁽⁴⁾

SPECcpu

SPECfp_rate_base2006:
533 ⁽⁵⁾

SPEC
jEnterprise

3,110.30 EjOPS ⁽⁶⁾

SAP Implementation

IBM x3850 versus HP DL580 G5

Sweet Spot

Customers running business applications on x86 servers, looking for better performance, growing number of users, or adding new application modules



	HP DL580 G5	IBM x3850	Benefits
System Description	2 four-socket DL580 servers with MS SQL	1 four-socket x3850 with MS SQL	
Total Cost of Server Acquisition :	\$42K	\$26K	Savings = \$16K
Database Costs	\$40K	\$20K	Savings = \$20K
Facilities Cost (Energy, Cooling, Space, etc)	\$20K	\$10K	Savings = \$10K
Three Year TCO:	\$102K	\$56K	Savings = \$46K

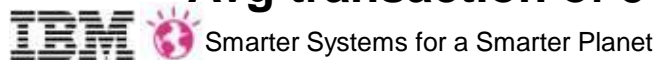
Designed Workload

- Support up to 5000 processes
- Capable of delivering at least 25,000 SAPS

Value Proposition

- Fewer servers required for same performance

Avg transaction of 5 servers delivers \$230K of savings to clients



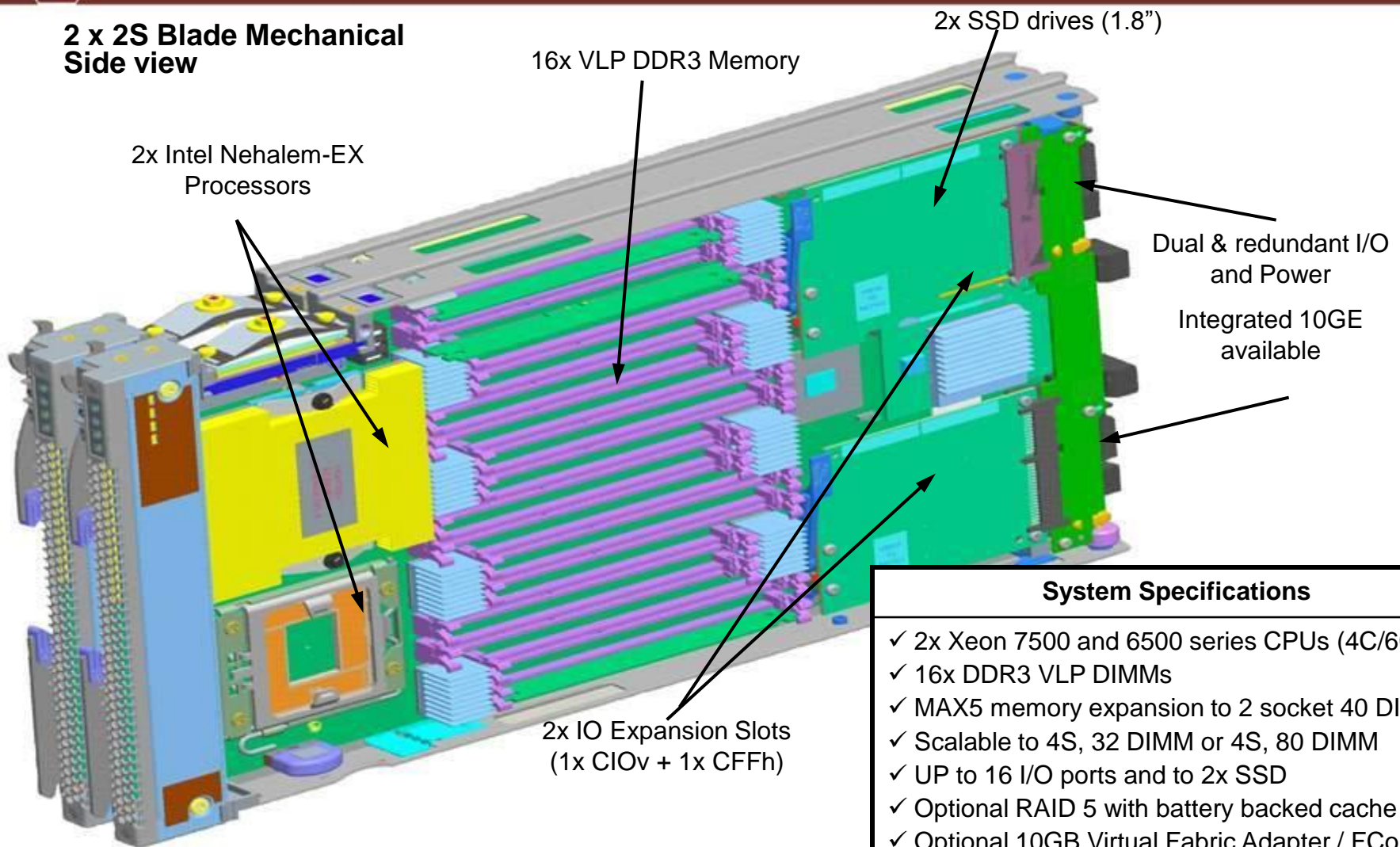
- Two-socket blade that scales to a 4-socket blade
- Up to 40 DIMMs per 2-socket system with MAX5
- 8, 6, or 4-core Intel Xeon 7500 processors
- Eight I/O ports per 2-socket system



A scalable blade server that enables standardization for 2- and 4-socket server needs, delivering faster time to value and greater productivity in high-density environments.

HX5 – 2 & 4 Socket Blade

2 x 2S Blade Mechanical Side view

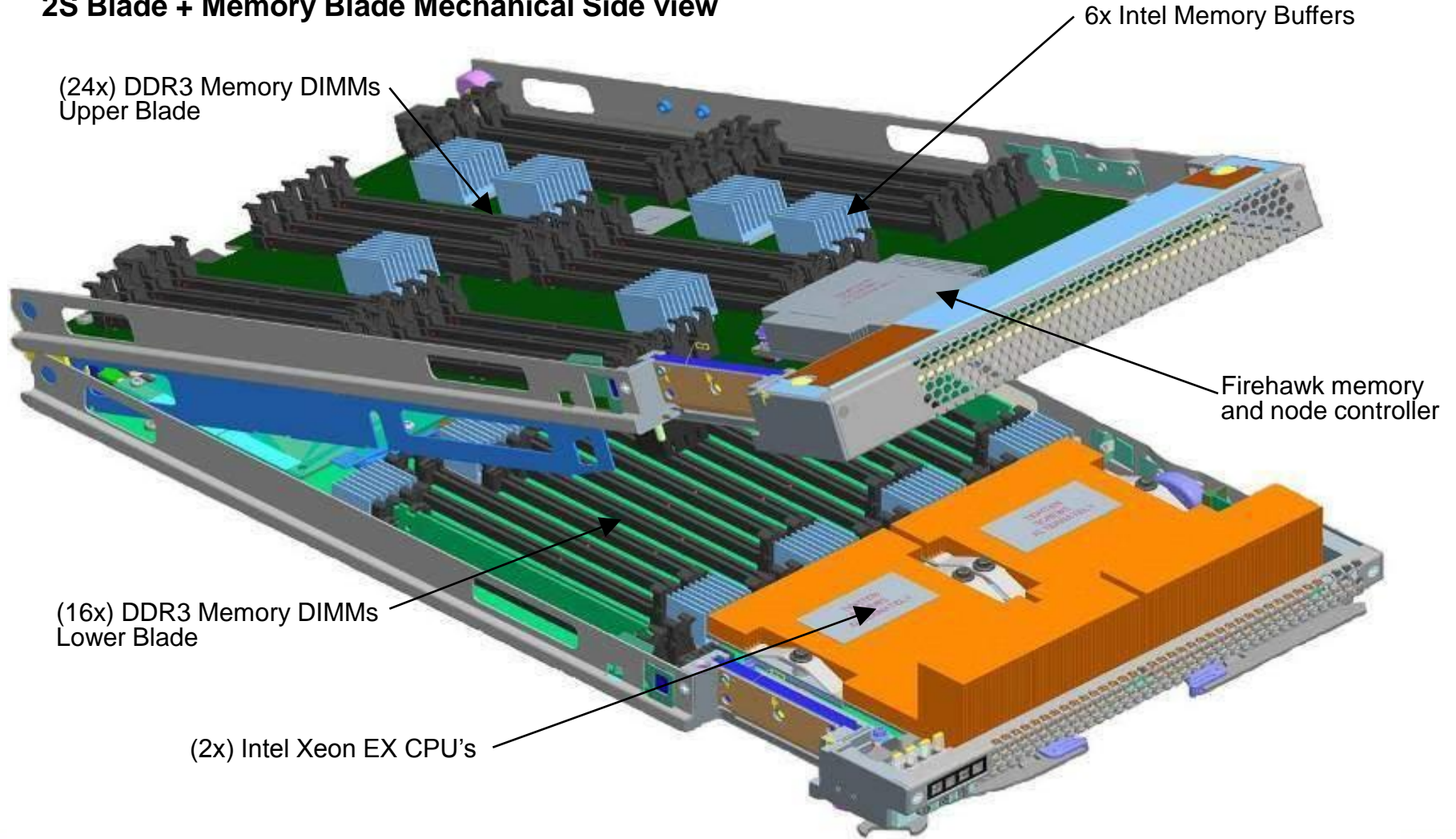


System Specifications

- ✓ 2x Xeon 7500 and 6500 series CPUs (4C/6C/8C)
- ✓ 16x DDR3 VLP DIMMs
- ✓ MAX5 memory expansion to 2 socket 40 DIMM
- ✓ Scalable to 4S, 32 DIMM or 4S, 80 DIMM
- ✓ UP to 16 I/O ports and to 2x SSD
- ✓ Optional RAID 5 with battery backed cache
- ✓ Optional 10GB Virtual Fabric Adapter / FCoEE
- ✓ Internal USB for embedded hypervisor
- ✓ IMM, uEFI, and IBM Systems Director

HX5 with MAX5

2S Blade + Memory Blade Mechanical Side view



IBM System x3690 X5

- Scalable 2 socket 2U server
- Up to 64 DIMMs with MAX5
- 8, 6, or 4-core Intel Xeon 6500 and 7500 processors
- Five I/O slots



A scalable server that delivers up to 4 times the memory capacity of today's 2-socket servers and double the processing cores, for unmatched performance.

3690 X5 – 2 Socket 2U EX platform

Maximum performance, maximum memory for virtualization and database applications

2U Rack Mechanical Chassis Top view

(1x) x16 (full height, full length)
or (2x) x8 (1 full size, 1 full height / half length)
(2x) PCIe x8 Low Profile

(4x) N+N 675W Rear Access
Hot Swap Redundant P/S

(16x) Gen2 2.5" Drives or
(24x) 1.8" SSD Drives

2 Scalability cables for eX5 Memory
Expansion and 4
Socket Scalability

Intel Nehalem EX processor
details, staired heat sinks

(16x) DDR3 Memory DIMMs
Upper mezzanine

System Specifications

- ✓ 2x Xeon 6500 & 7500 series CPUs (4C/6C/8C)
- ✓ 32 to 64 DDR3 DIMMs
- ✓ 2 x8 PCIe slots, 2 x8 Low Profile slots
- ✓ Up to 16x 2.5" HDDs or 32x 1.8" SSDs
- ✓ RAID 0/1 Std, Opt RAID 5
- ✓ 2x 1GB Ethernet
- ✓ Optional 2x 10GB SFP+ Virtual Fabric / FCoEE
- ✓ Scalable to 4 sockets, 64 DIMM or 128 DIMM
- ✓ Internal USB for embedded hypervisor
- ✓ IMM, uEFI, and IBM Systems Director

Minimize cost

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

82%
more VMs

Same 2S license cost

50%
license cost

Same number of VMs



x3690 X5 with MAX5



x3690 X5 with MAX5

2S Competition server



4S Competition server



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

Virtualization Implementation

IBM x3690 versus HP DL580 G5

Sweet Spot

Customers running multiple x86 servers, looking at consolidation to help drive down costs

Designed Workload

- Support for a large number of virtual systems
- Matching number of virtual systems between both servers

Value Proposition

- MAX5 memory drawer
- Virtualization is memory bound

vmware

	HP DL580 G5	NEW IBM x3690	Benefits
System Description	1 four-socket DL580 with VMware	1 two-socket x3690 with VMware	
Total Cost of Server Acquisition	\$26K	\$22K	Savings = \$4K
VMware Costs	\$14K	\$7K	Savings = \$7K
Facilities Cost (Energy, Cooling, Space, etc)	\$10K	\$10K	Savings = \$0K
Three Year TCO:	\$50K	\$39K	Savings = \$11K

Avg transaction of 5 servers delivers \$55K of savings to client

IBM Smarter Systems for a Smarter Planet

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)

Maximize memory

MAX5 enables eX5 systems to support twice the DIMMs per system, exceeding x86 limitations



More memory enables companies to support:

- More virtual machines
- Larger virtual machines
- Bigger databases



More memory can deliver:

- Improved database performance
- Greater server utilization



BladeCenter HX5 with MAX5
2-socket, 40 DIMMs



BladeCenter HX5 with MAX5
4-socket, 80 DIMMs



System x3690 X5 with MAX5
2-socket, 64 DIMMs



System x3850 X5 with MAX5
4-socket, 96 DIMMs



It's not just about the processors...it's about the system.

MAX5 doubles memory capacity in an x3690 X5

With embedded memory controllers, memory capacity is tied to processors

But not with MAX5...

- Expand memory capacity
- Up to double the number of memory DIMMs than the competitors
- No impact to memory latency
- Over five times the memory capacity in two sockets vs. today's leading two-socket systems
- MAX5 memory may be partitioned to CPUs or

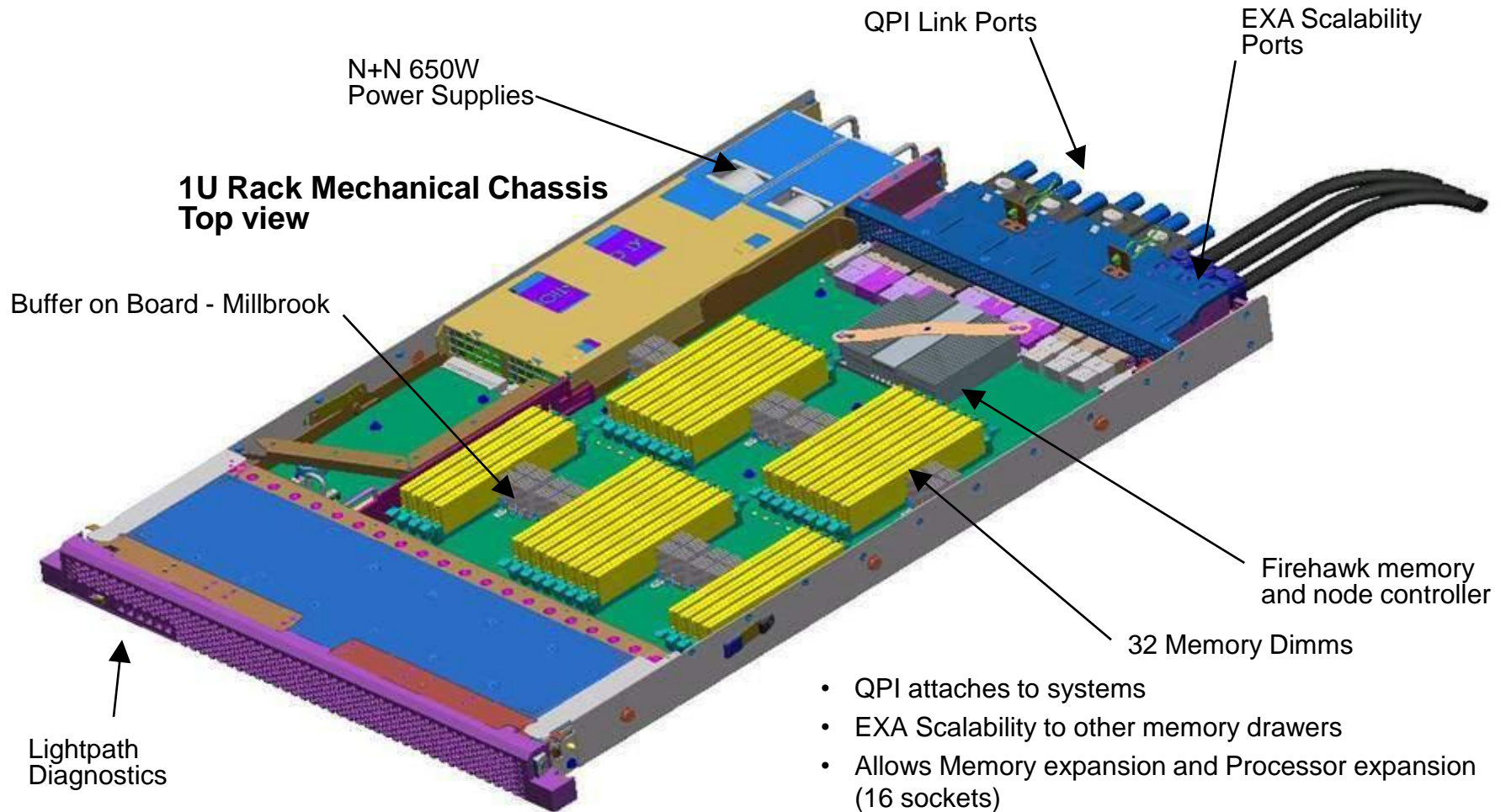


Provides the memory customers have needed for database and virtualization – up to 100% more virtual machines

Allows higher memory capacity to be reached with less expensive DIMMs for more economical high end implementations

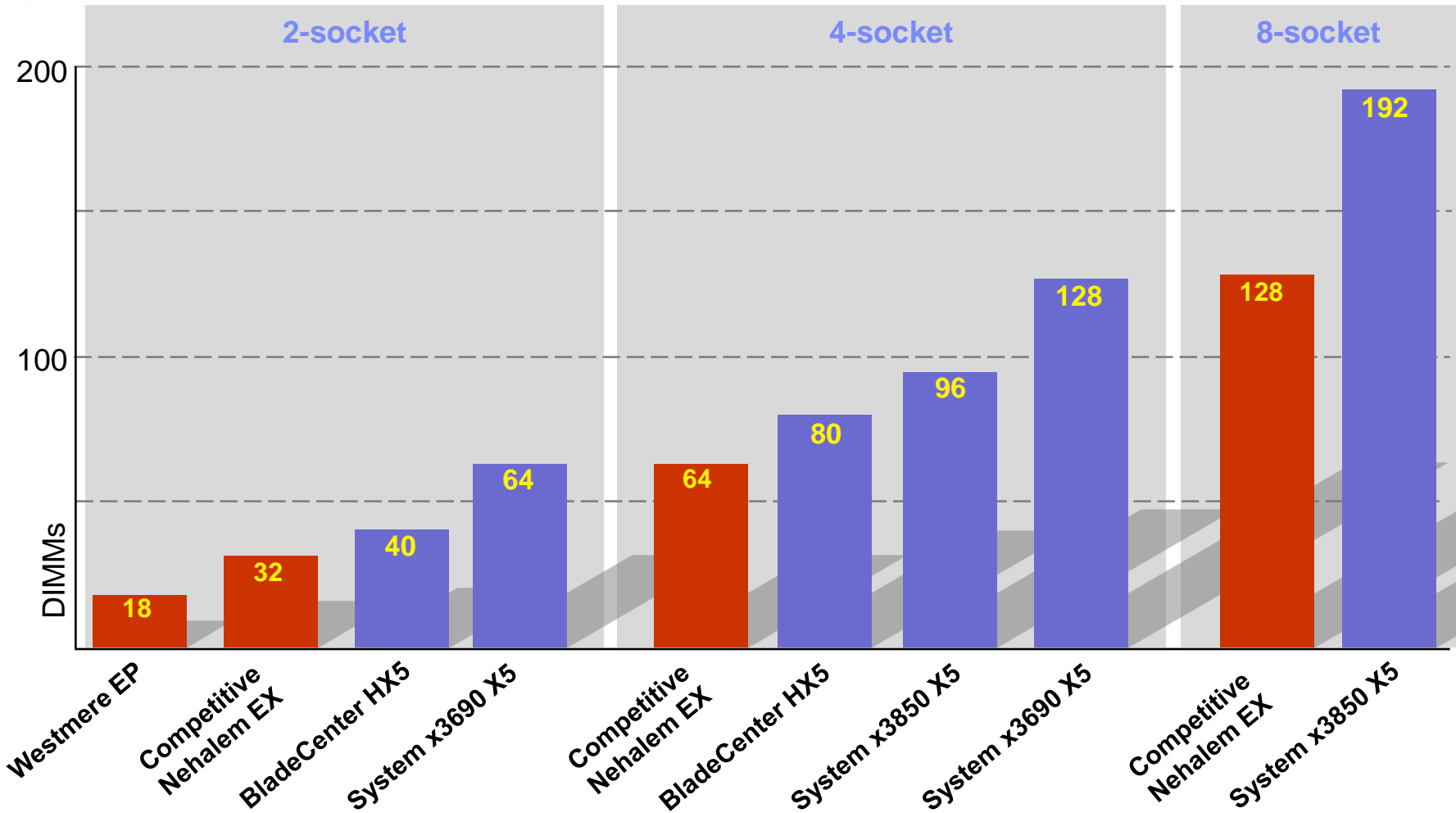
MAX5 for x3690 X5 and x3850 X5

eX5 memory expansion and scalability for leadership performance and increased utilization



Maximize memory

The new eX5 portfolio provides as much as twice the amount of memory as competitors



The new standard in storage performance

eXFlash delivers integrated solid-state disk technology and a high-speed controller architecture.

Same performance as

800
spinning
disks

97%
less
expensive

For same
performance as
spinning disk

Power reduced to

1%
of spinning
disks

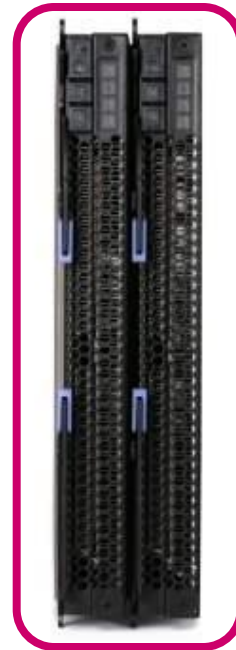


Take advantage of unprecedented flexibility

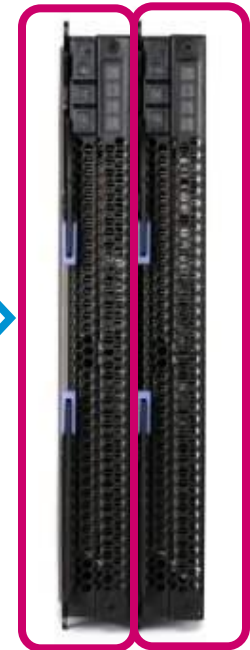
FlexNode – dynamically transform a single into two distinct systems—and then back again

- **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



Minimize cost

Reduce database costs by up to 97 percent using eXFlash

450k IOPs



97% less
cost

- Same performance as 800 spinning disks
- 1% of power required for spinning disks

450k IOPs



Gain up to 450K IOPs and 3.2 TB
per x3850 X5

Simplify deployment

Leverage automated image deployment and pre-configured server identities

NEW

- **Deploy virtual or physical systems easily:** Automated Server Image Deployment with Tivoli Provisioning Manager

NEW


- **Pre-configure server identity** for BladeCenter with Open Fabric Manager

NEW

- **Remotely re-purpose eX5 systems** using the node partitioning feature

NEW

- **Set up automatic recovery** parameters for an eX5 system
- **Utilize the system guardian** with the new Integrated Service Advisor “call home” feature
- **Minimize security-related** downtime with eX5 hardware security, plus available IBM Tivoli software and IBM Virtual Server Security for VMware
- **Take advantage of IBM Services** for skills transfer and hands-on training

 Smarter Systems for a Smarter Planet



Simplify deployment

Virtual Fabric has now been extended to the eX5 portfolio

- **Avoid complex LAN vs. SAN capacity planning:** Virtual Fabric can become Ethernet, FCoE, and iSCSI
- **Allocate bandwidth where needed:** Mission critical workloads get most, while test projects get appropriate share of bandwidth
- **Deploy less hardware:** Fewer adapters and switches needed to support the same workload with IBM Virtual Fabric technology

Any

Networking technology,
Networking speed

50%

Fewer adapters

75%

Fewer switch modules

Simplify deployment with eX5 workload optimized systems

Workload Optimized Systems available across eX5 portfolio; Pre-integrated and sized for small, medium, large database & virtualization workloads



IBM System x3950 X5



Highest performance x86 system optimized for databases & virtualization



IBM BladeCenter HX5



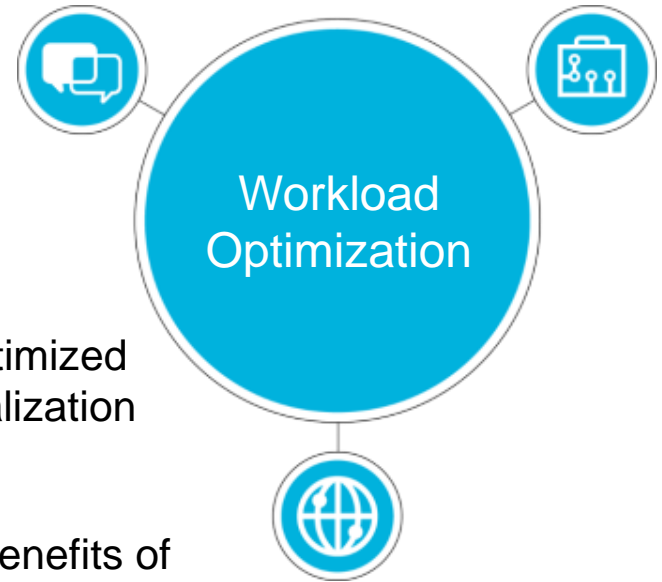
Combining the benefits of BladeCenter and Workload Optimized Systems for databases & virtualization



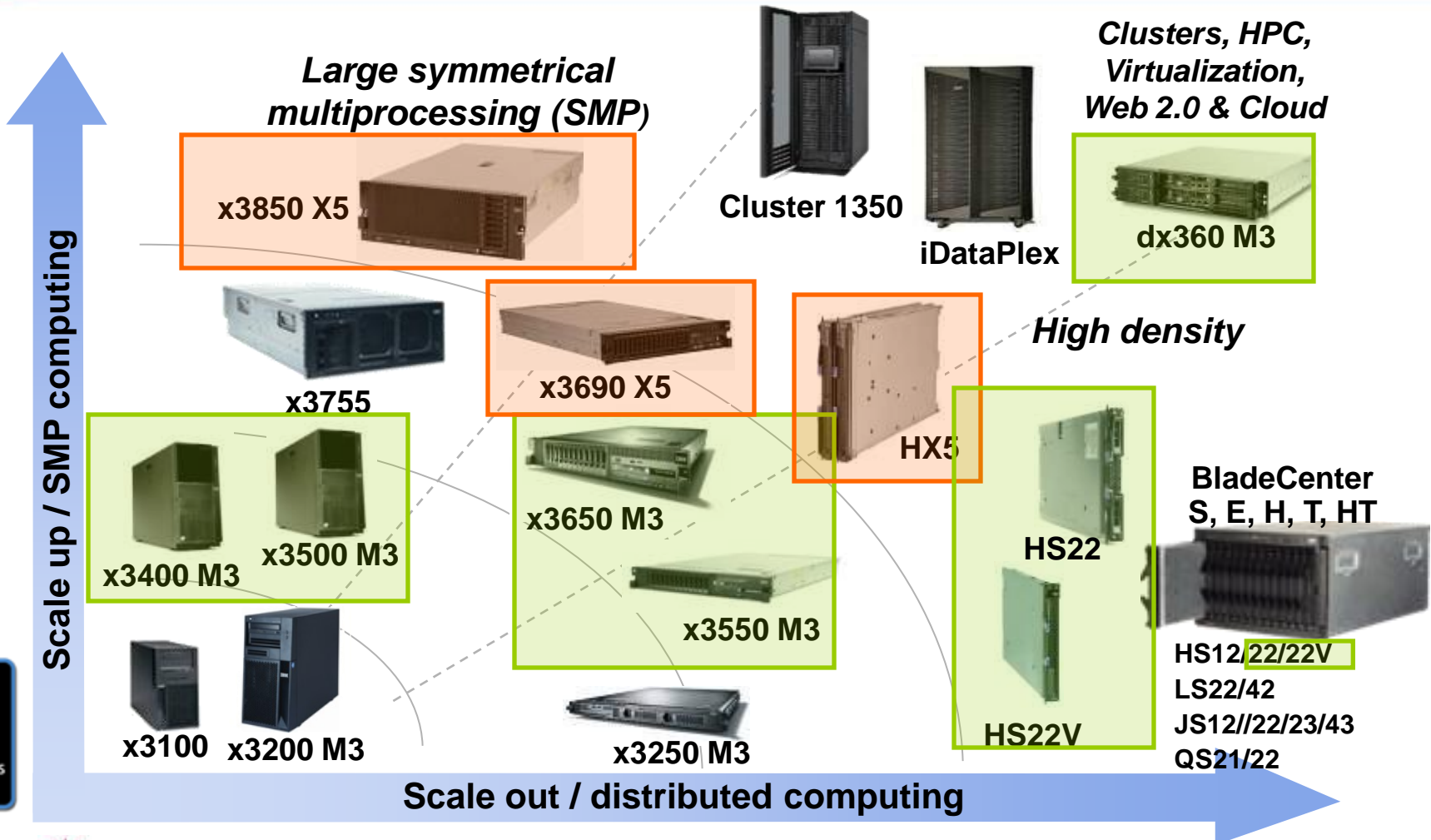
IBM System x3690 X5



Unique entry system enables benefits of reduced licensing fees and optimized for databases & virtualization



Portfolio-wide Innovation with IBM System x and BladeCenter



IBM x86 Product Highlights

New solutions that improve service, manage risk and reduce costs

System x3650 M3 & x3550 M3



- Flagship System x 1U and 2U 2-socket rack servers
- Exceptional quality, value, performance and ease of use

System x3500 M3 & x3400 M3



- The rock-solid performance data center next to your desk
- The engine of growth for your emerging business

BladeCenter HS22V & HS22



- High density, high performance blade optimized for virtualization and energy efficiency
- No Compromise, workhorse blade with breakneck speed

iDataPlex dx360 M3



- Maximize density, minimize power and cooling for high performance computing

Take the Next Step...

eX5



Let Siwel show you how to leverage IBM eX5 technology to:

- Maximize memory
- Minimize cost
- Simplify deployment

THANK YOU!