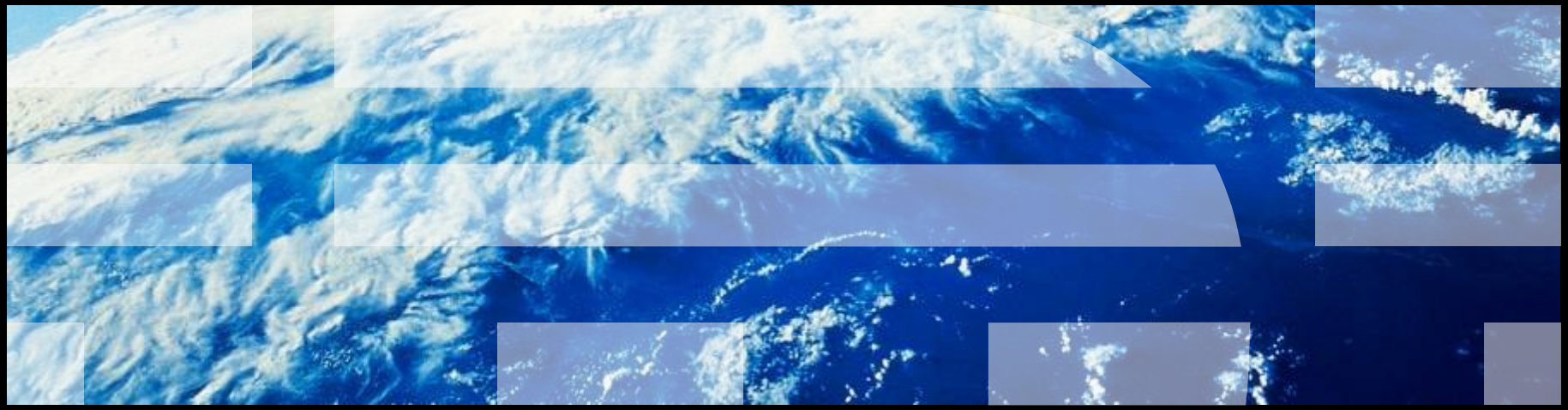
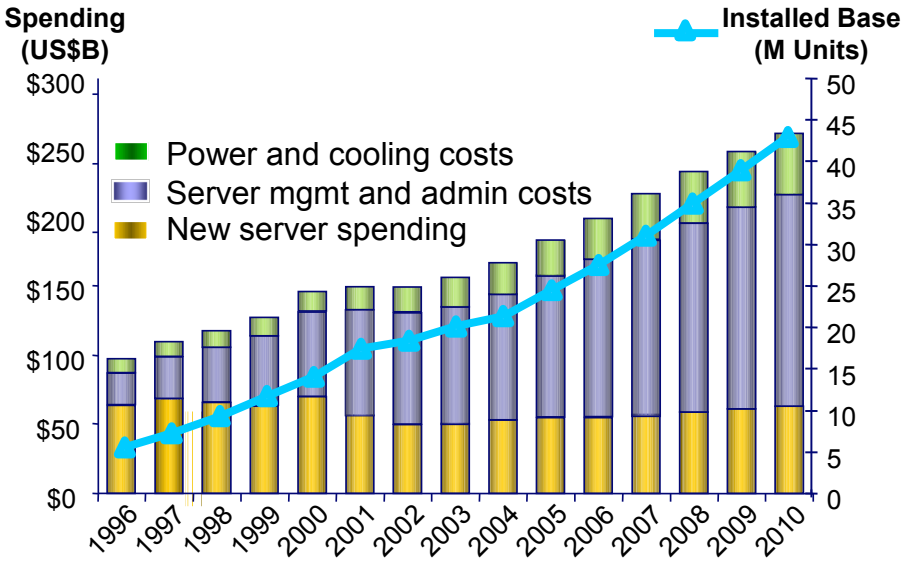
Petr Plodik – SME HE/blades IBM CEE
05/26/2009

IBM BladeCenter:
The efficient future of DataCenter



Customers' technology budgets are being consumed by administration and power costs. IBM can help!



Source: IDC, Virtualization 2.0: The Next Phase in Customer Adoption, Doc #204904, Dec 2006

- Expenses for server management and administration are nearly ***twice*** the capital expense for server purchases
- Energy costs have grown to ***half*** of hardware costs
- And both admin and energy costs continue to grow rapidly

IBM® Systems Director

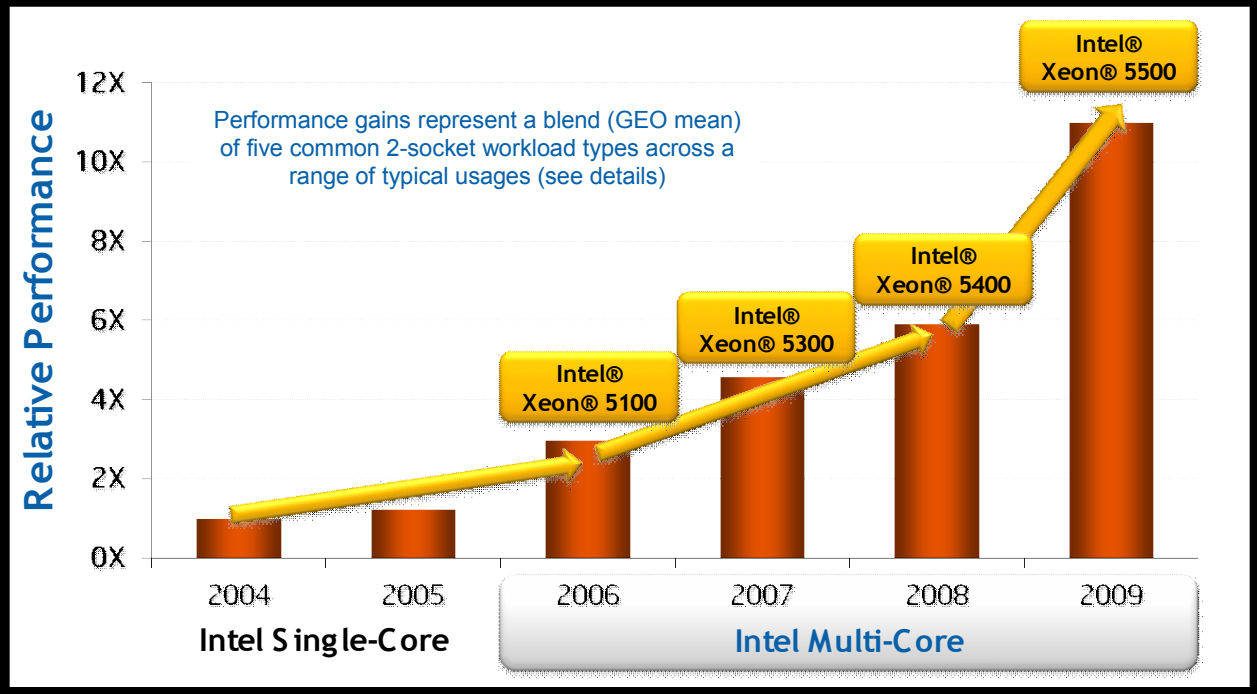
- The innovative hardware, tools and systems management of the new generation servers can help your customers achieve ***breakthrough productivity gains*** through automation, optimization and energy management
- IBM Systems Director 6.1 can help customers ***save 34% to 42%*** in administrative costs when compared with unmanaged environments[1]

1Challenges of Operational Management for Enterprise Server Installations," International Technology Group, © 2008

Improved productivity is available for our clients with unprecedented application performance

Compelling performance gains of the Intel Xeon 5500 Series Processors enables unprecedented opportunities for business

- **All of the new generation servers** boast processor performance improvements of:
  - Up to ***3.5x*** the bandwidth for technical computing†
  - Up to ***2.25x*** performance for enterprise computing†
  - ***2x*** software threads and performance boost on demand



† *Source: Intel internal measurements, January 2009.*

X86 Portfolio Covering the Spectrum of IT Needs

IBM gives clients the RIGHT choice for TAKING COSTS OUT OF IT!

High Value Portfolio

High Volume Portfolio

For client applications requiring massive scale out of 100's or 1000's of parallel processing nodes in Web 2.0 Data Centers, Clusters, and Large Grids

iDataPlex

Enterprise eX4 (High-end)

- Transition virtualization and enterprise workloads (SAP, Oracle, SQL, etc…) requiring high availability and large memory footprints to **High-end System x**.

Server Consolidation, Virtualization, Enterprise Workloads (SQL, SAP, Oracle)

Web 2.0, HPC, Grid

Infrastructure Simplification, Application Serving, Energy Efficiency

Scale Up

Scale Out

- Migrate client's rack installs for increased density, energy efficiency and simpler management with Chassis and servers tailored to client needs

BladeCenter

System x Rack and Tower

Single Applications

- For single application deployments "Xccelerated refresh" to new technology using fewer servers with improved power efficiency and performance to take costs out

Extend blade benefits to your entire business

Chassis tailored to your specific needs – FROM 2002!

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

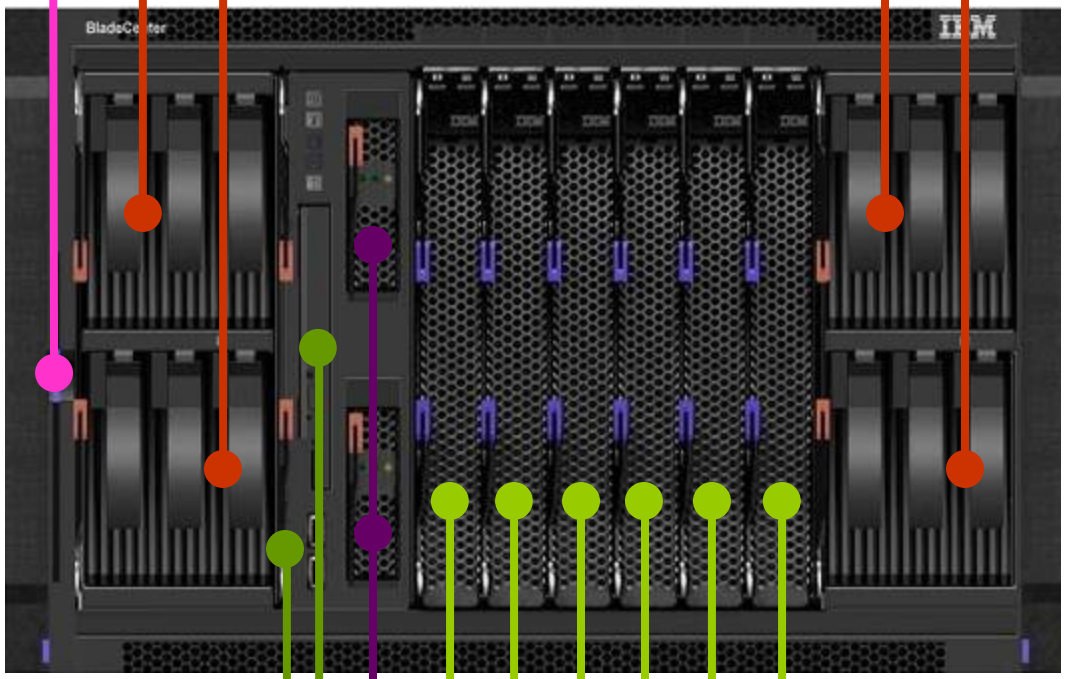
A common set of blades

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

A common management infrastructure

BladeCenter S Product Summary

- Service label cards slot enable quick and easy reference to BladeCenter S
- Ideal for tiered workloads; SAS, SATA, or Nearline SAS disks can be mixed in BladeCenter S. Near Line SAS disks share
- characteristics of SATA disks



- 7U

- Ideal for business-in-a-box configurations, legacy & future servers supported
- Easy access to shared USB ports & CD-RW / DVD-RW Combo
- Battery Backup Units for use with IBM BladeCenter SAS RAID Controller Module

Meet the IBM BladeCenter S

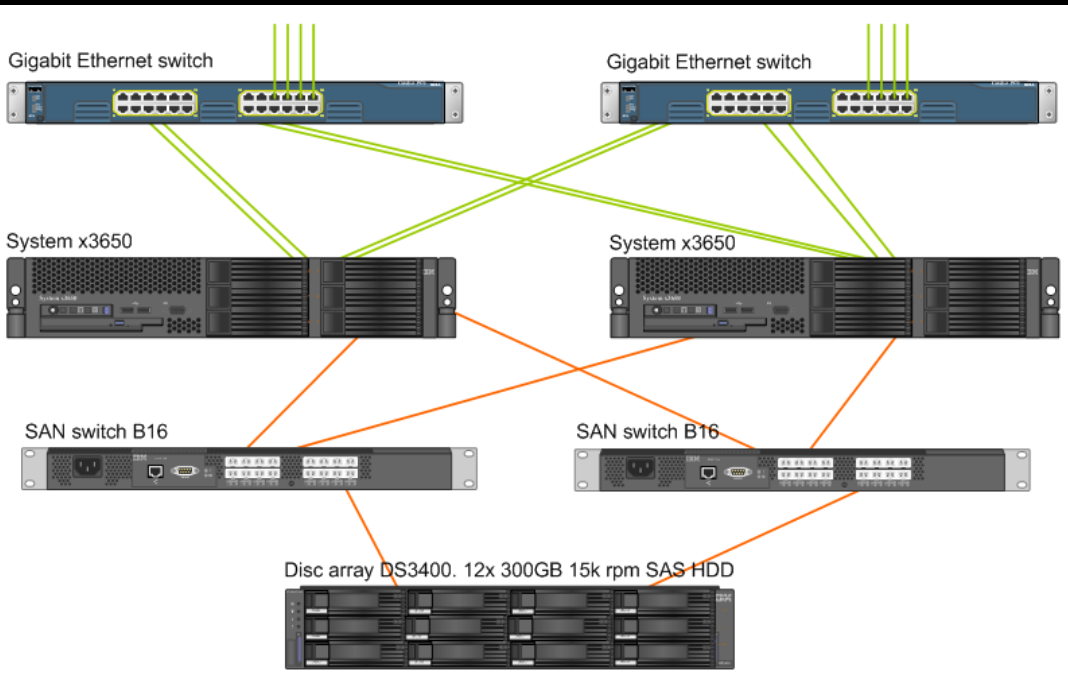
BladeCenter S – DataCenter in the box

BladeCenter S

Virtualization with BladeCenter S

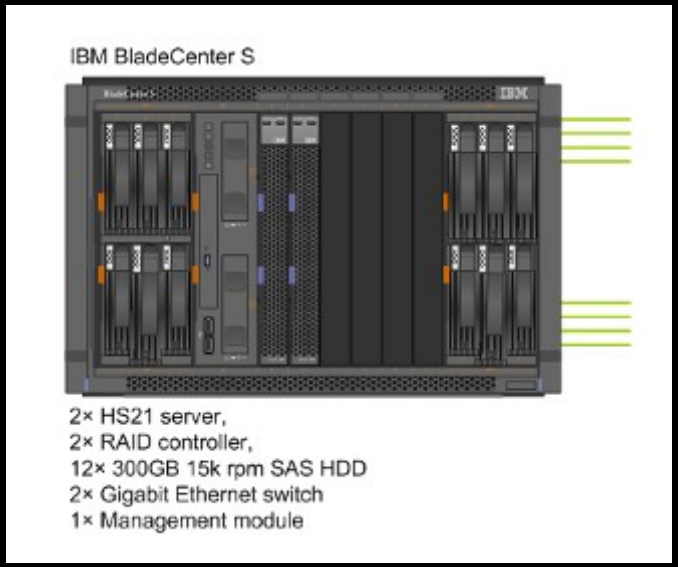
Certified configurations for VMware 3.5 Enterprise with VMotion support:
2× servers each with 8 cores, 16GB RAM, HDD, 4× GbE, 2× FC/SAS
2× Gigabit Ethernet switch, disc array 12× 300GB 15k rpm SAS HDD

Rack version



List price: 47 478 USD

Blade version



List price: 36 851 USD

-22%

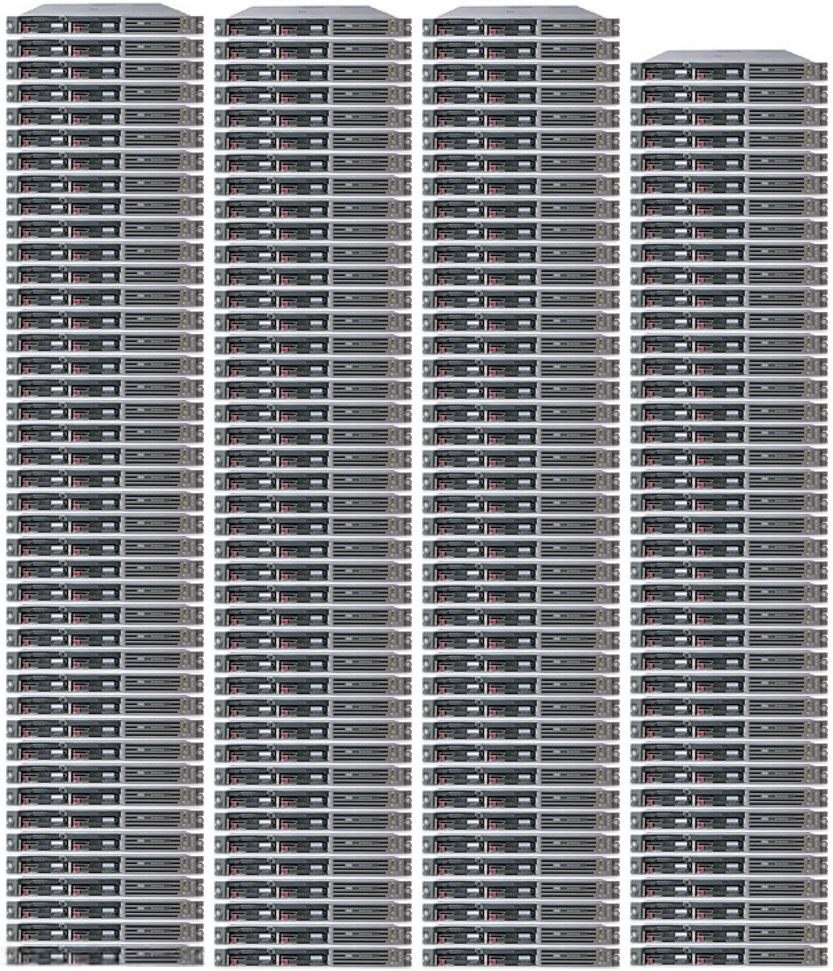
Virtualization with BladeCenter S

Rack version			List price	List price
System x	**2× x3650 + DS3400**			
7979B4G	x3650, Xeon Quad Core E5430 80W 2.66GHz/1333MHz/12MB L2, 2x1GB ChK, O/Bay 3.5i	2	2 827 USD	5 654 USD
44R5633	Quad-Core Intel Xeon Processor E5430 80w 2.66GHz/1333MHz/12MB L2	2	964 USD	1 928 USD
39M5791	4GB (2x2GB) PC2-5300 CL5 ECC DDR2 Chipkill FBDIMM Memory Kit	8	304 USD	2 432 USD
40K1043	IBM 73GB 3.5in 15K HS SAS HDD	2	335 USD	670 USD
39R6527	QLogic 4Gb FC Dual-port HBA for IBM System x	2	1 455 USD	2 910 USD
39Y6126	Intel PRO/1000 PT Dual Port Server Adapter	4	248 USD	992 USD
39Y9566	Remote Supervisor Adapter II Slimline	2	271 USD	542 USD
40K1906	xSeries 835W Redundant Power Option	2	411 USD	822 USD
172642X	IBM System Storage DS3400 Dual Controller	1	5 906 USD	5 906 USD
43X0802	IBM 300GB 3.5in 15K HS SAS HDD	12	820 USD	9 840 USD
39R6475	IBM 4-Gbps Optical Transceiver - SFP	4	63 USD	252 USD
39M5697	5m Fiber Optic Cable LC-LC	4	129 USD	516 USD
39M5696	1m Fiber Optic Cable LC-LC	4	59 USD	236 USD
	Gigabit Ehernet switch 24-port	2	1 755 USD	3 510 USD
249824E	Express IBM System Storage SAN24B-4	2	3 063 USD	6 126 USD
45W0501	SFP 8 Gbps SW 8-Pack	2	2 541 USD	5 082 USD
39Y7917	Line cord - 2.8m, 220-240V, C13 to CEE7-VII (European/Indonesian)	4	15 USD	60 USD
			Total	**47 478 USD**

Blade version			List price	List price
BladeCente	**BladeCenter S, 2× HS21 XM**			
88861MG	IBM BladeCenter S Chassis with 2x950/1450W PSU, Rackable	1	3 874 USD	3 874 USD
43W3581	IBM BladeCenter S 6-Disk Storage Module	1	1 003 USD	1 003 USD
43X0802	IBM 300GB 3.5in 15K HS SAS HDD	12	820 USD	9 840 USD
43W3584	IBM BladeCenter S SAS RAID Controller Module	2	3 624 USD	7 248 USD
43W3582	IBM BladeCenter S 950W/1450W Auto-Sensing Power Supplies 3 and 4	1	758 USD	758 USD
39Y9324	Server Connectivity Module for IBM BladeCenter	2	1 755 USD	3 510 USD
40K9766	C19 4.3 meter Line Cord - Europe	2	34 USD	68 USD
7995G4G	HS21 XM, Xeon Quad-Core E5430 80w 2.66GHz/1333MHz/12MB L2, 2x512MB, O/Bay SA	2	2 566 USD	5 132 USD
43W3994	Intel Xeon QC Processor Model E5430 80W 2.66GHz/1333MHz/12MB L2	2	964 USD	1 928 USD
46C7419	4 GB (2x2GB kit) Dual Rank PC2-5300 CL5 ECC Low Power	8	268 USD	2 144 USD
43X0845	IBM ServerBlade 73GB SAS 15K 2.5in SFF NHS HDD	2	479 USD	958 USD
39Y9190	SAS Expansion Card (CFFv) for IBM BladeCenter	2	194 USD	388 USD
			Total	**36 851 USD**

Reduce Cost with Improved Performance

Save over 93% on energy costs alone; complete ROI as fast as 6 months



166 2P Rack 1U servers (Xeon)

3.95 racks

2005

14 HS22 BladeCenter blades (Xeon 5500)

1 BladeCenter E Chassis

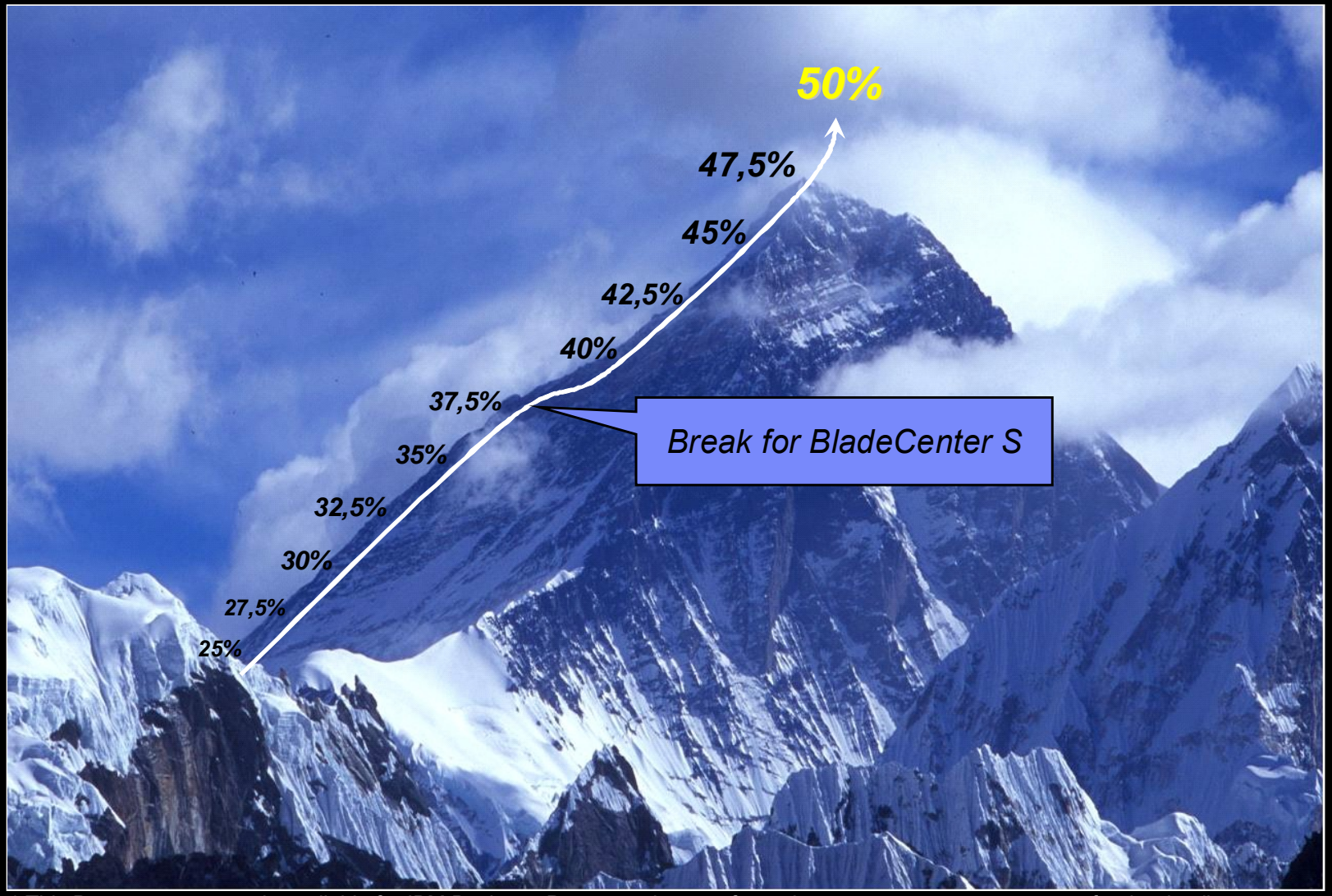
0.17 of a rack

2009

- ✓ Get the same or better performance
- ✓ Reduce your IT footprint by over **95%**
- ✓ Get greater than **11:1** consolidation ratio

Blade Accelerated Discount Program*

Leave the base camp and reach out for the Summit!



* This Promo programme is available for IBM Business Partners, please refer to the programme announcement for the details.

IBM BladeCenter Enterprise Blade Servers

HS12

Most affordable and green blade for single-threaded apps

1 Socket

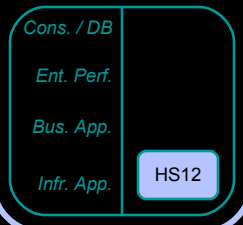
Proc: Xeon QC
Mem: 6 DIMM / 24GB
HDD: 2 HS

Key Features

- 2 hot-swap HDDs
- SAS/SATA/SSD
- Optional battery backed cache
- Max mem per socket

Sample Applications

- E-mail / Collaboration
- Hosted Client
- Web Serving



HS22

"No Compromise" Enterprise Blade

2 Socket

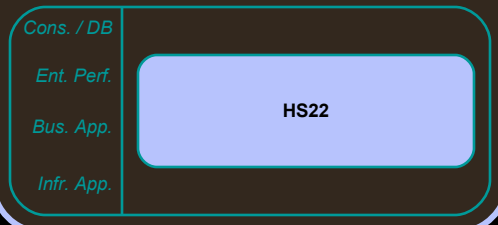
Proc: Xeon QC
Mem: 12 DIMM / 96GB
HDD: 2 HS

Key Features

- 2 HS HDDs with choice of SAS or SSD
- Maximum memory on a blade
- Embedded hypervisor
- Battery-backed cache option
- IMM

Sample Applications

- Virtualization
- E-mail/Collaboration
- Hosted Client
- Web Serving



LS22

High performance computing blade

2 Socket

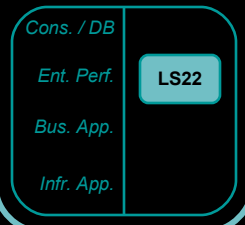
Proc: Opteron QC
Mem: 8 DIMM / 32GB
HDD: 2

Key Features

- 2P, 8 DIMMs, & 2HDDs in 30mm
- Memory booster for lower latency
- Fast 800MHz memory

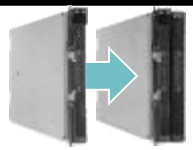
Sample Applications

- HPC
- Research
- Modeling



LS42

Innovative ,click-n-scale enterprise application blade server



2 - 4 Socket

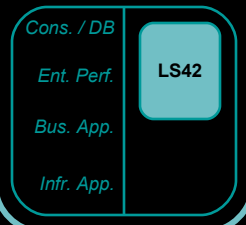
Proc: Opteron QC
Mem: 16 DIMM / 64GB
HDD: 2

Key Features

- Only blade that can scale from 2P, 30mm to 4P, 60mm
- Pay-as-you-grow
- Internal USB port (hypervisor-ready)

Sample Applications

- Virtualization
- Server consolidation
- Database
- Business Intelligence



JS12 Express

Exceptional value AIX, Linux or IBN i blade built on POWER6

1 Socket

Proc: IBM POWER6
Mem: 8 DIMM / 32GB
HDD: 2

Key Features

- AIX, i5/OS, Linux
- PowerVM virtualization
- EnergyScale
- DDR2 memory

Sample Applications

- Small database
- Application serving
- Perfect for SMB with the BladeCenter S
- Supported in all chassis

JS22 Express

Commercial AIX and Linux application server built on POWER6

2 Socket

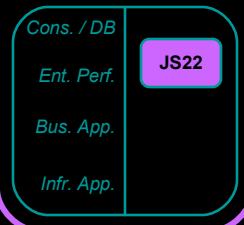
Proc: IBM POWER6
Mem: 4 DIMM / 32GB
HDD: 1

Key Features

- AIX, SLES or Red Hat Linux
- Advanced POWER Virtualization
- Integrated Virtual Ethernet

Sample Applications

- Virtualization
- JAVA and web serving
- HPC



HS12

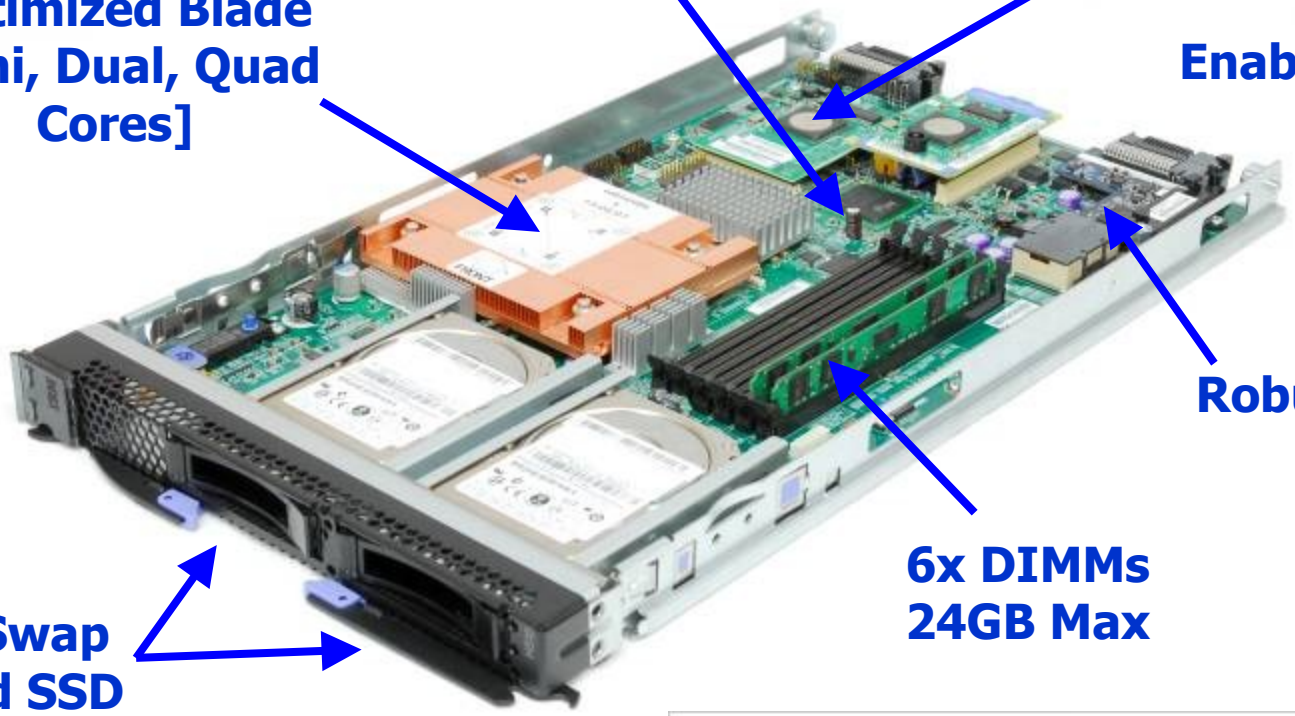
1st Single-Socket Optimized Blade [Uni, Dual, Quad Cores]

1st w/ Built-In Diagnostics

SAS or SATA

&

Enabled for BBC RAID



Robust I/O

6x DIMMs 24GB Max

1st Hot-Swap HDD and SSD

[or Fixed SATA]

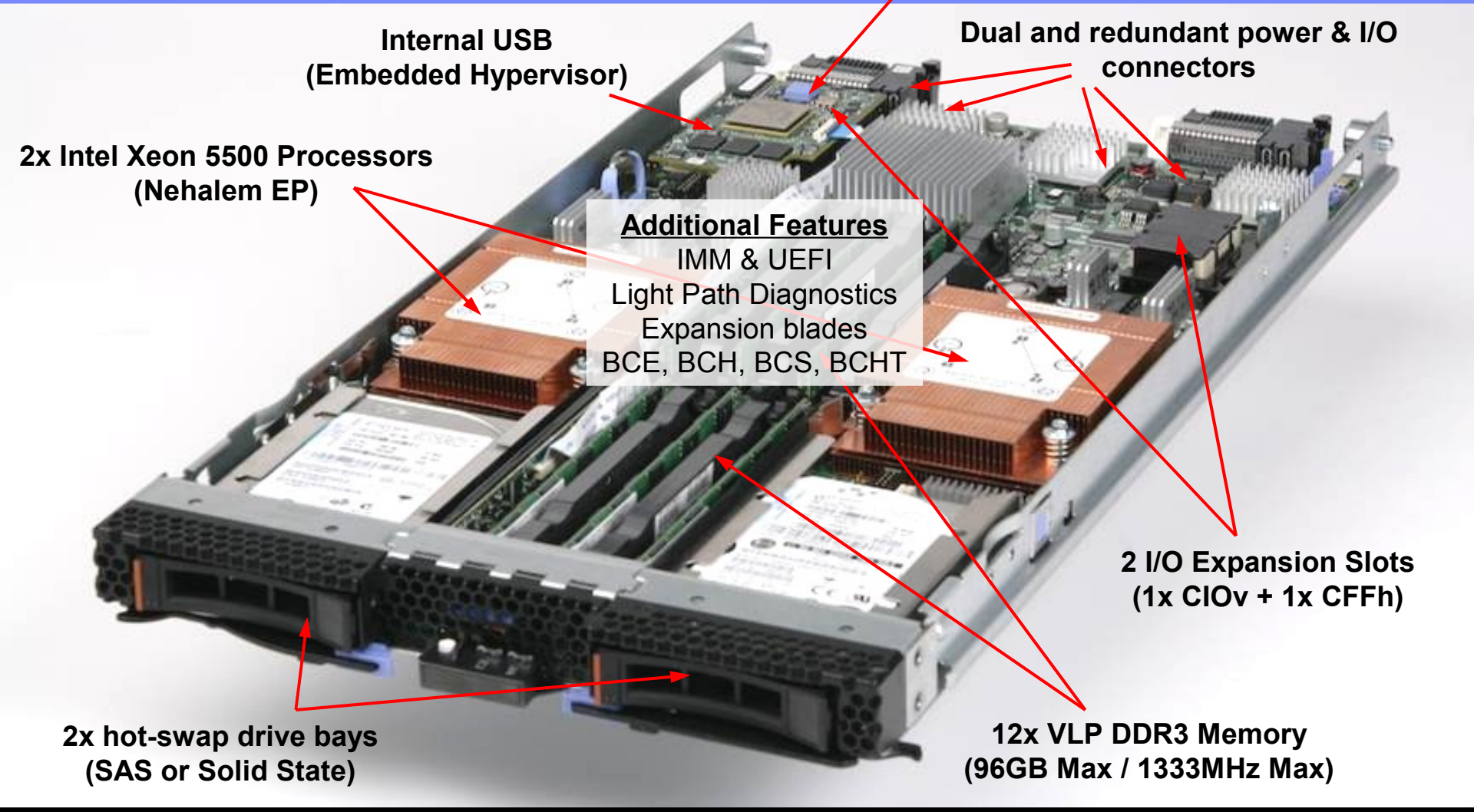
"Perfect Officemate"

[Plays Well w/ All Chassis]

IBM BladeCenter®

HS22 Hardware Overview

"No Compromises"



Extend blade benefits to connect your entire business

I/O tailored to your specific needs

InfiniBand™

Ethernet
Fibre Channel
InfiniBand

Fibre Channel

Fibre Channel
InfiniBand

1Gb, 10Gb
Ethernet

1Gb Ethernet
iSCSI
SAS

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 4/8Gb 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
QLogic 8Gb 10 port
QLogic 8Gb 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

• A common set of industry-standard switches and I/O fabrics

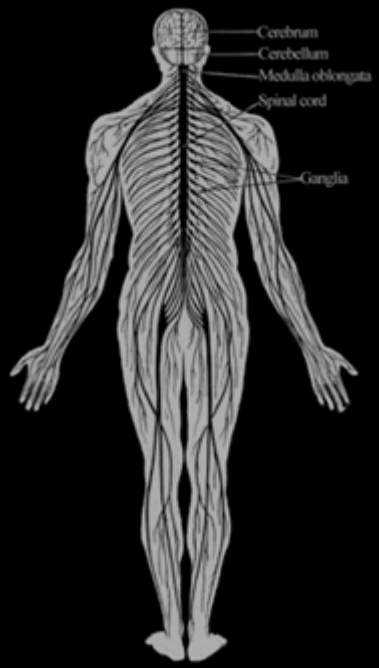
Introducing IBM BladeCenter Open Fabric

NEW

An integrated server I/O portfolio providing a comprehensive set of interconnects and smart management tools to help you run your business

Supported interconnects:

- Ethernet
- Fibre Channel
- Serial Attached SCSI (SAS)
- iSCSI
- InfiniBand



Software:

- BladeCenter Open Fabric Manager

Works with IBM:

- IBM Director
- Tivoli® Intelligent Orchestrator

Works with third parties:

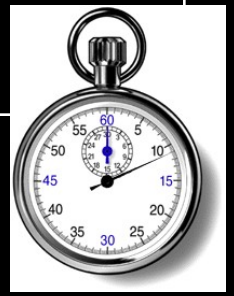
- BNT SmartConnect
- Cisco VFrame

Supported across virtually ALL chassis blades and switches

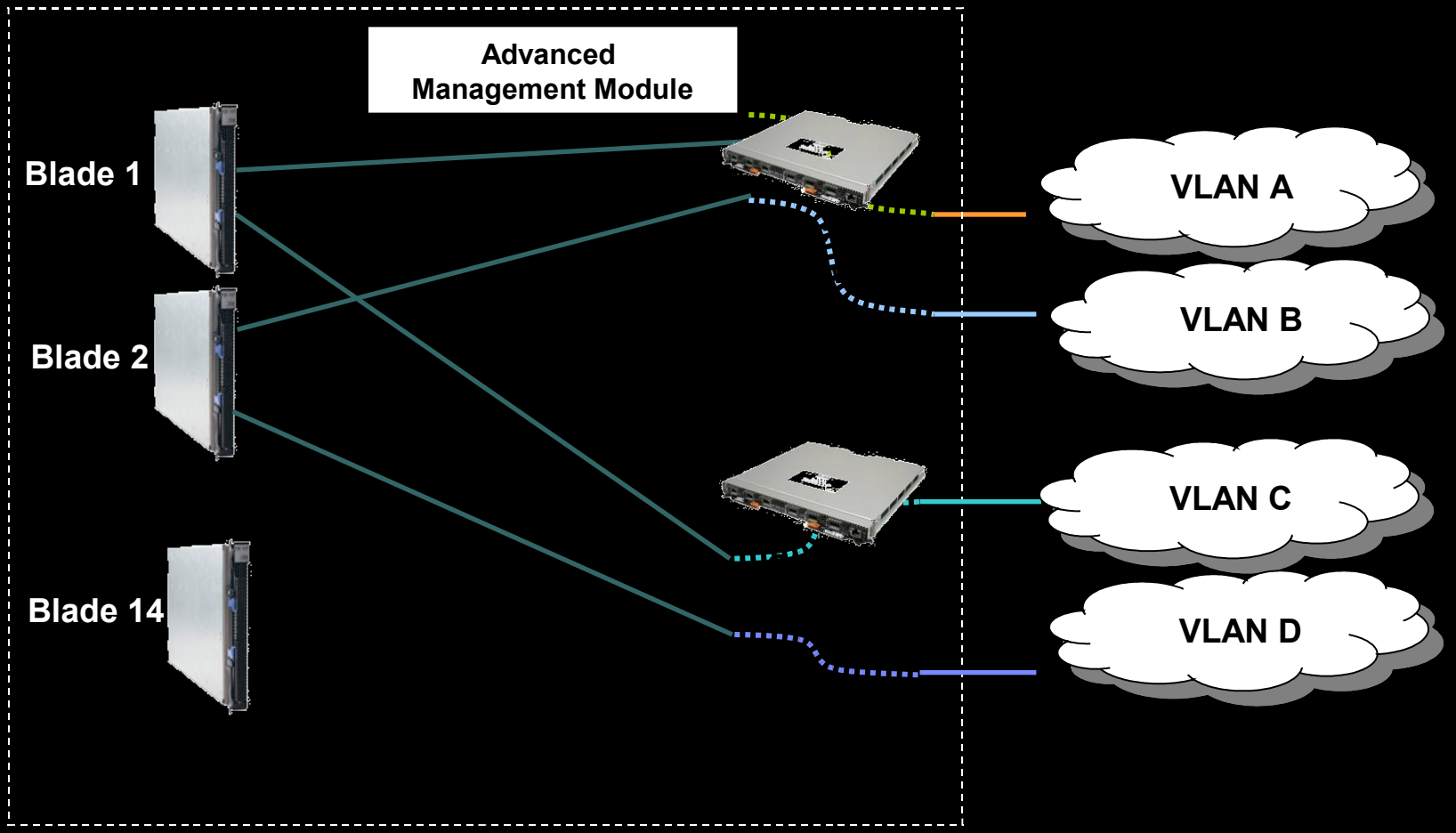
Speed deployment with Open Fabric Manager

Initial deployment	
Traditional rack environment	**Open Fabric Manager environment**
Install server and switches Cable servers to switches Cable switches to SAN/LAN After hardware installation is complete Assign LAN connections Assign SAN connections Repeat for every server	Install chassis and Advanced Management Modules Pre-assign connections via Open Fabric Manager
Install, redeploy or replace server	
Install new server LAN administrator configures LAN connections SAN administrator configures SAN connections	Open Fabric Manager automatically reassigns connections

Days → Minutes



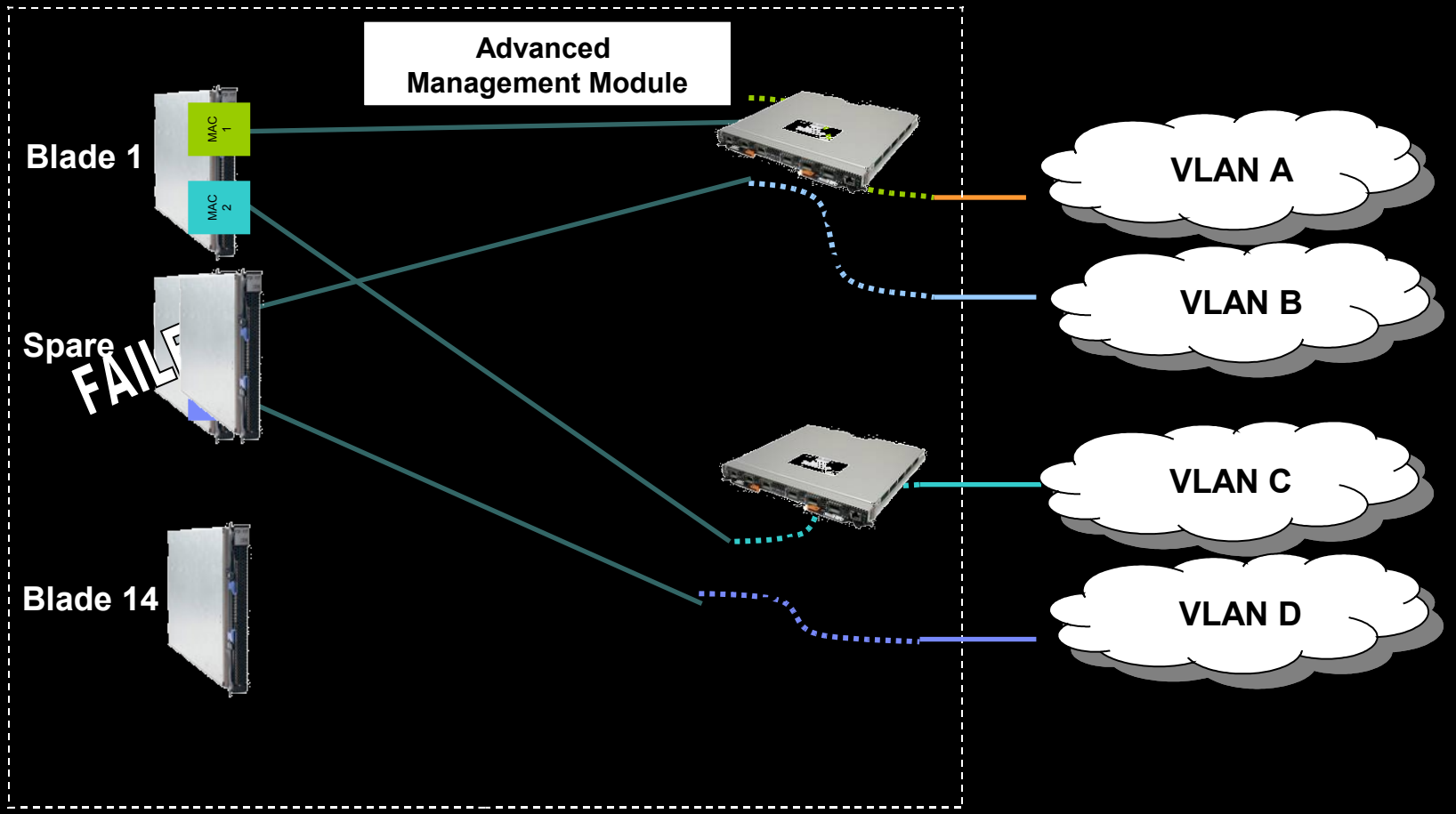
Automate failover with Open Fabric Manager



Ethernet MAC addresses are assigned to blade slot by the Advanced Management Module

EASY

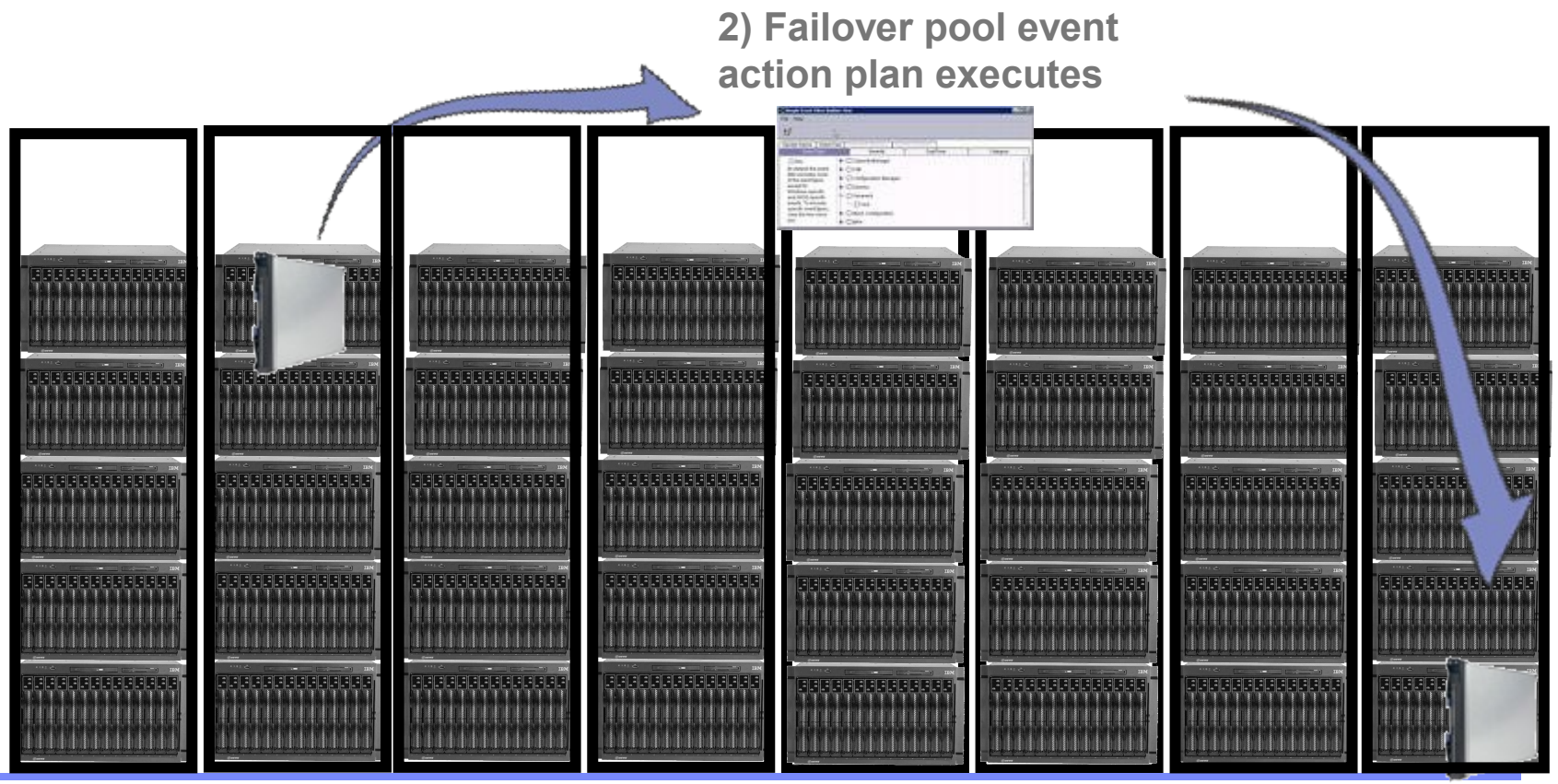
Automate failover with Open Fabric Manager



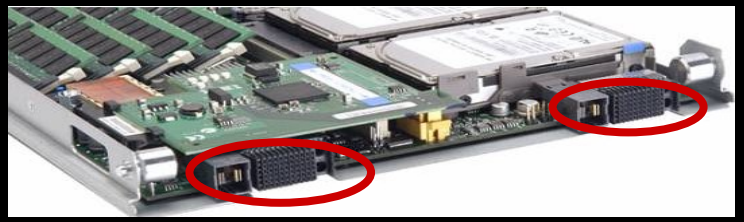
New blade inherits I/O addresses move to new blade assigned to slot

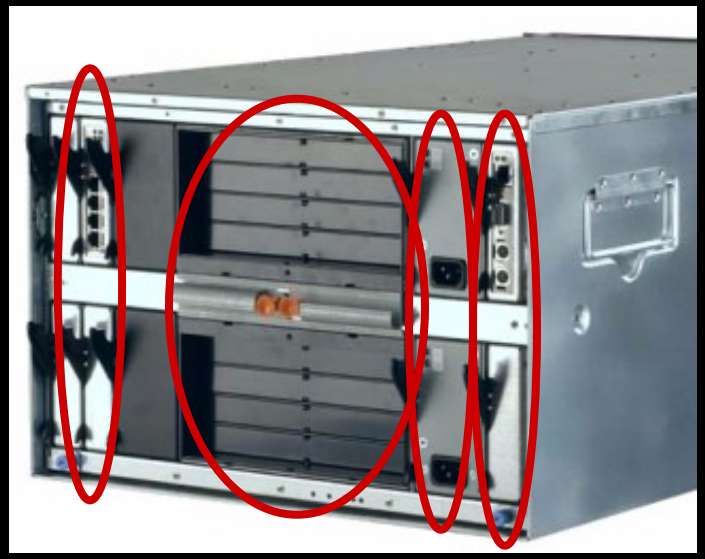
EASY

Open Fabric Manager failover across your data center



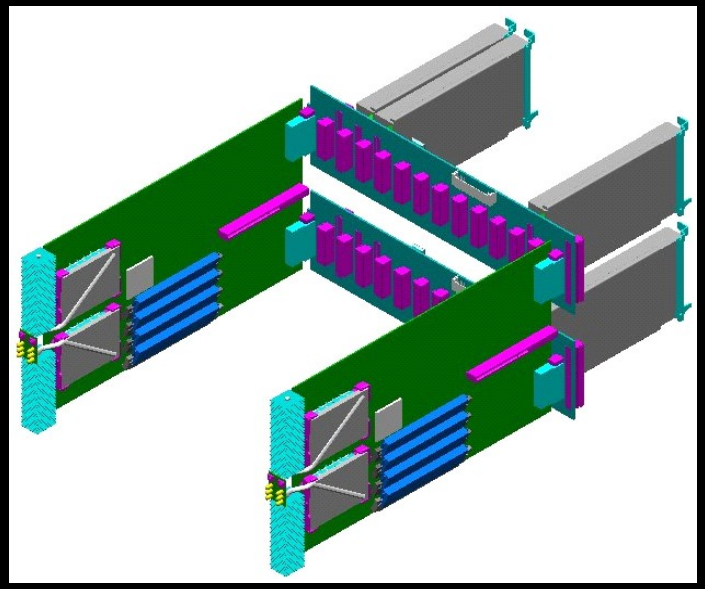
BladeCenter protects your critical business operations





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 trouble shooting

The Total Systems Management Experience

Delivering innovations throughout the systems management stack

Upward integration into Tivoli Service Management

Tivoli software — IBM Tivoli

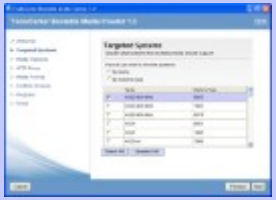
IBM Systems platform solution for System x, BladeCenter, Power Systems, System z and storage

IBM Systems Director

IBM Systems Director

- *Platform management that is easy and efficient*
- *Management of physical and virtual resources across heterogeneous systems*

Redesigned system tool portfolio for single-system management and scripting



ToolsCenter

- *Consolidated, integrated suite of management tools*
- *Powerful bootable media creator*

Hardware and firmware advances which are standard across all new systems

Integrated Management Module (IMM)

- *Standards-based hardware which combines diagnostic and remote control*

UEFI—next generation BIOS

- *Richer management experience and future-ready*

The new generation of IBM servers deliver benefits across the portfolio

Same management stack

- ✓ Integrated Management Module (IMM)
- ✓ Unified Extensive Firmware Interface (UEFI)
- ✓ IBM Systems Director 6.1 with Active Energy Manager
- ✓ ToolsCenter

Common hardware components

- ✓ Embedded hypervisor (internal USB)
- ✓ Hot-swap hard drives (common trays)
- ✓ Integrated storage controller (common LSI chip)
- ✓ Integrated Gigabit Ethernet (5709S)
- ✓ Trusted Platform Module