IBM System i™

IBM Systems update
IT Manager Konference 2006

Kim Mortensen

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IBM eServer Manager

i want stress-free IT.
i want control.
i want an i.

IBM Systems product range

IBM System z
Mainframe Server
zOS®, Linux

IBM System i
Integrated Midrange Server
OS/400®, Linux
i5/OS™, AIX 5L®, Linux on eServer i5

IBM System p
High Performance Unix Server
AIX 5L, Linux

IBM OpenPower®
High Performance Linux Server

IBM System x
Uni to 32 way Intel®-processor based Server
Windows®, Linux

IBM BladeCenter
Scale-Out Deployment
Windows, Linux

IBM System Storage
- Simplification of underlying infrastructure and its management
- Assuring business continuity, security and data protection
- Efficiently managing information over its lifecycle.


IBM
360
EXIT

Lots of Patents

VM and Virtual Storage

UPC

Batch
IMS
CICS

S/390

Sysplex

CMOS

G5/G6

z900/z990

z800/z890

Z9 BC & EC

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IBM System z
Mainframe Server
zOS®, Linux

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Integrated Midrange Server
OS/400®, Linux
i5/OS™, AIX 5L®, Linux on eServer i5

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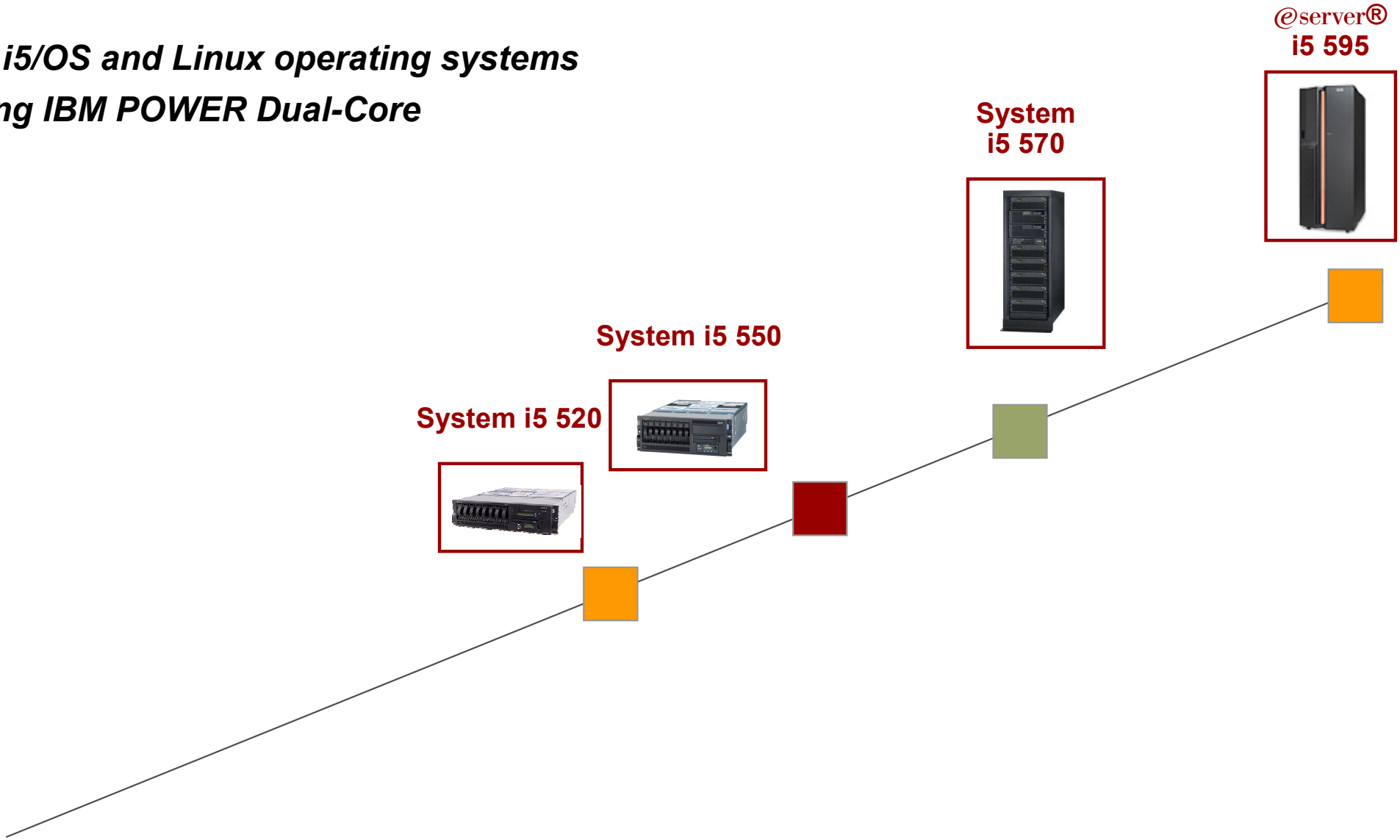
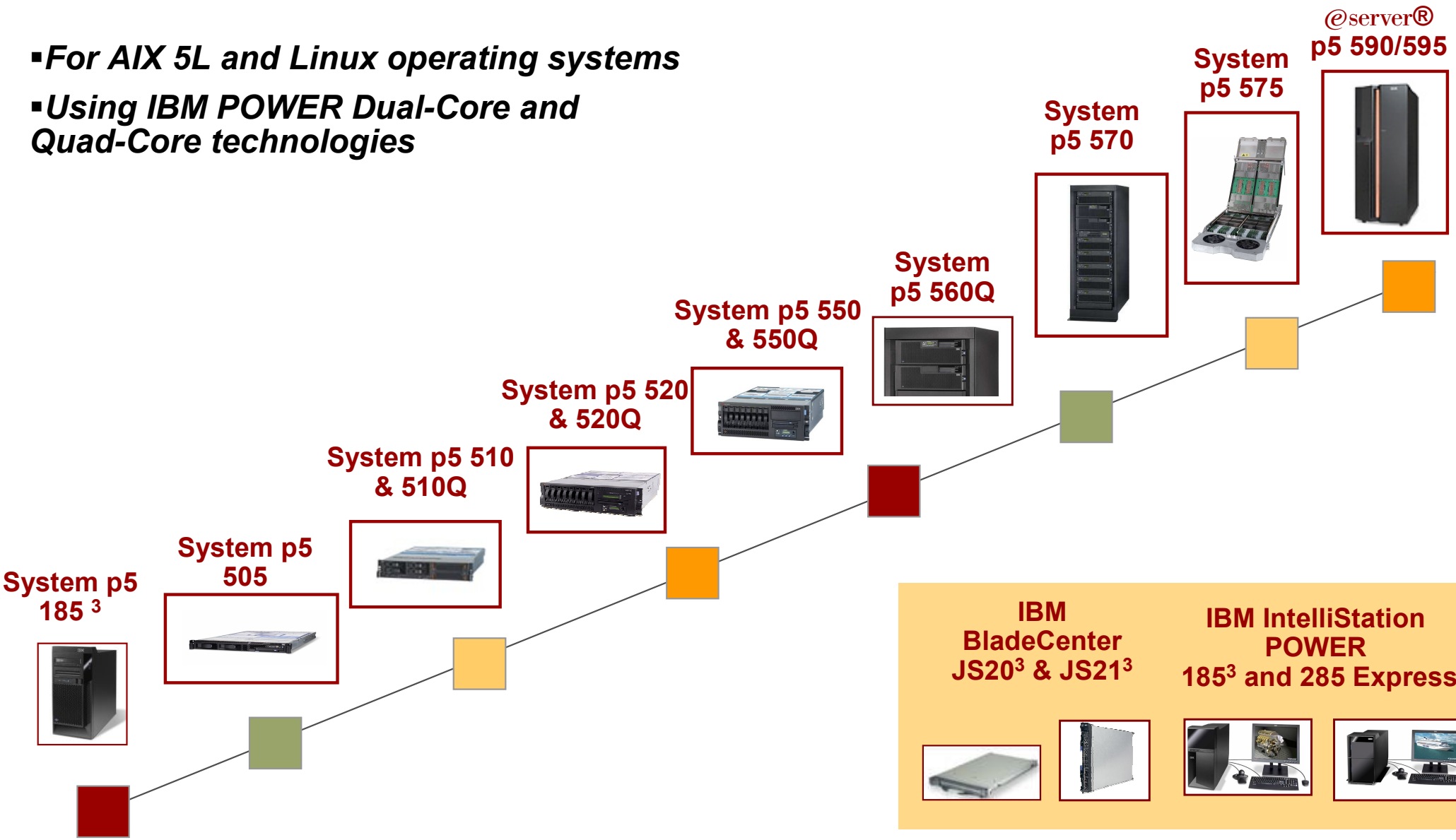
IBM System i5 family

- *For i5/OS and Linux operating systems*
- *Using IBM POWER Dual-Core*



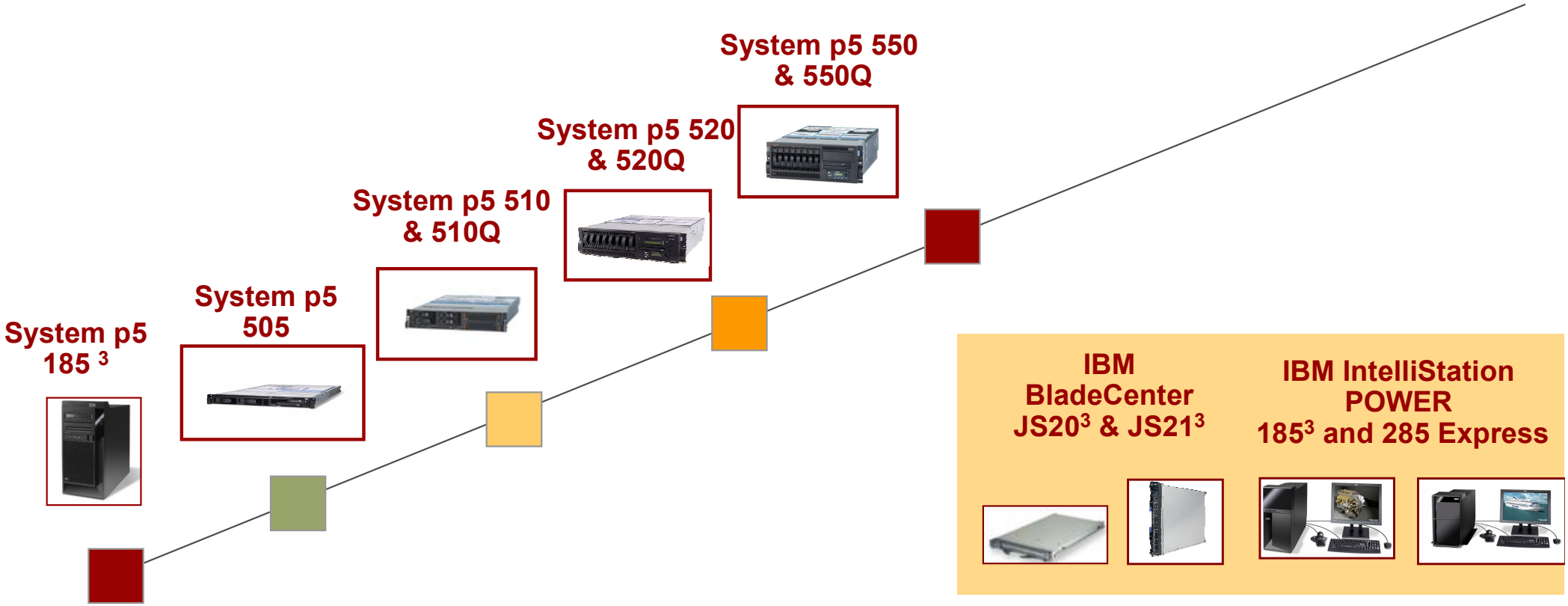
IBM System p5 family

- *For AIX 5L and Linux operating systems*
- *Using IBM POWER Dual-Core and Quad-Core technologies*



IBM System OpenPower family

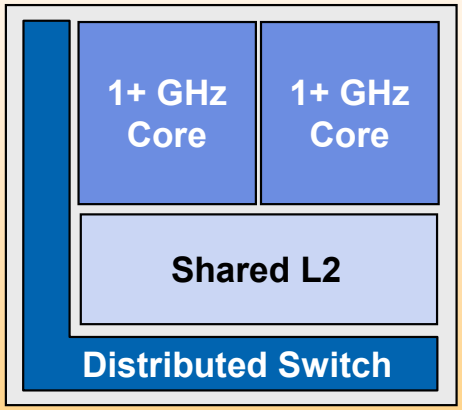
- *For Linux ONLY operating systems*
- *Using IBM POWER Dual-Core and Quad-Core technologies*



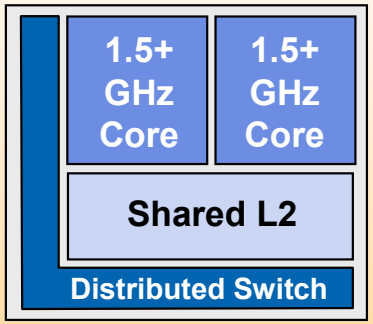
IBM POWER technology roadmap for System p & i

Planned *

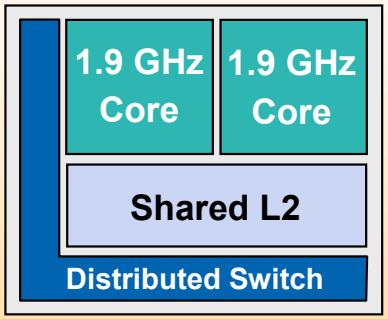
2001	2002-4	2004	2005-06	2006-07
POWER4	POWER4+	POWER5	POWER5+	POWER6
180 nm	130 nm	130 nm	90 nm	65 nm

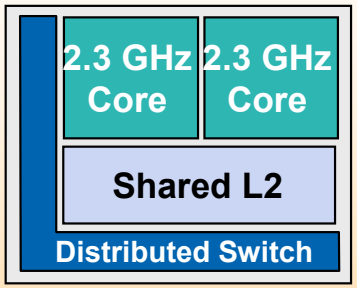


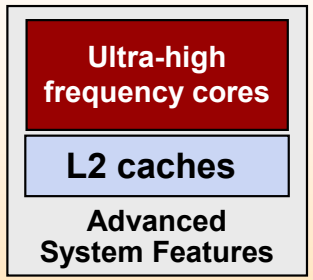
- Chip multiprocessing
  - Distributed switch
  - Shared L2
- Dynamic LPARs (16)



- Reduced size
- Lower power
- Larger L2
- More LPARs (32)







- Simultaneous multithreading
- Micro-Partitioning
- Selective dynamic firmware updates
- Enhanced scalability
- High throughput performance
- Enhanced cache/memory subsystem
- Up to 254 LPARs

Autonomic Computing Enhancements

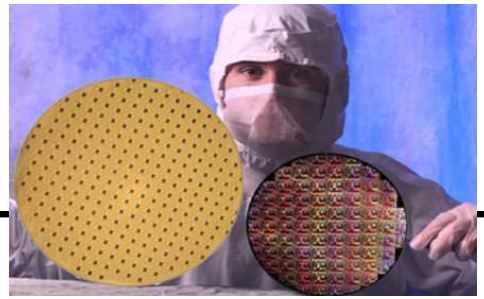
POWER is everywhere

Blade Servers

Supercomputers

PDA

Central Servers



Imaging

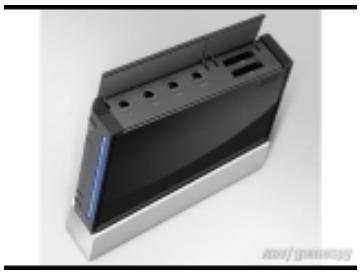
Power Architecture

Distributed Servers

Gaming

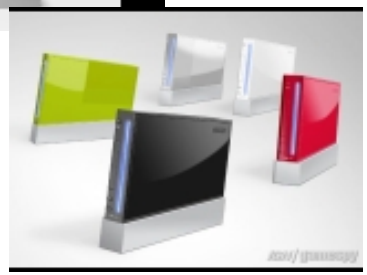
Consumer

Embedded

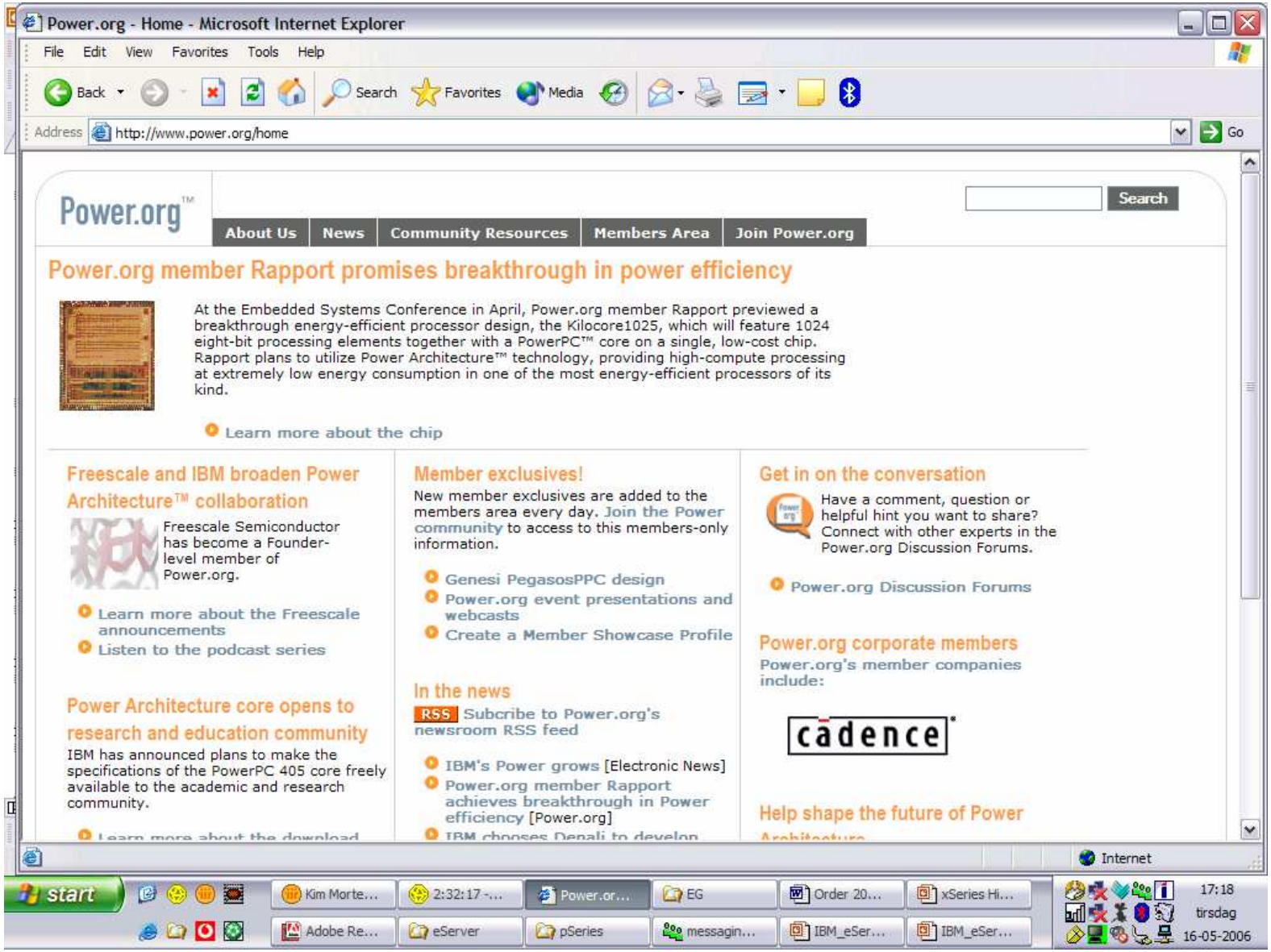


IBM powers them all

Xbox 360, PlayStation 3, Revolution. The hot game consoles have one thing in common...



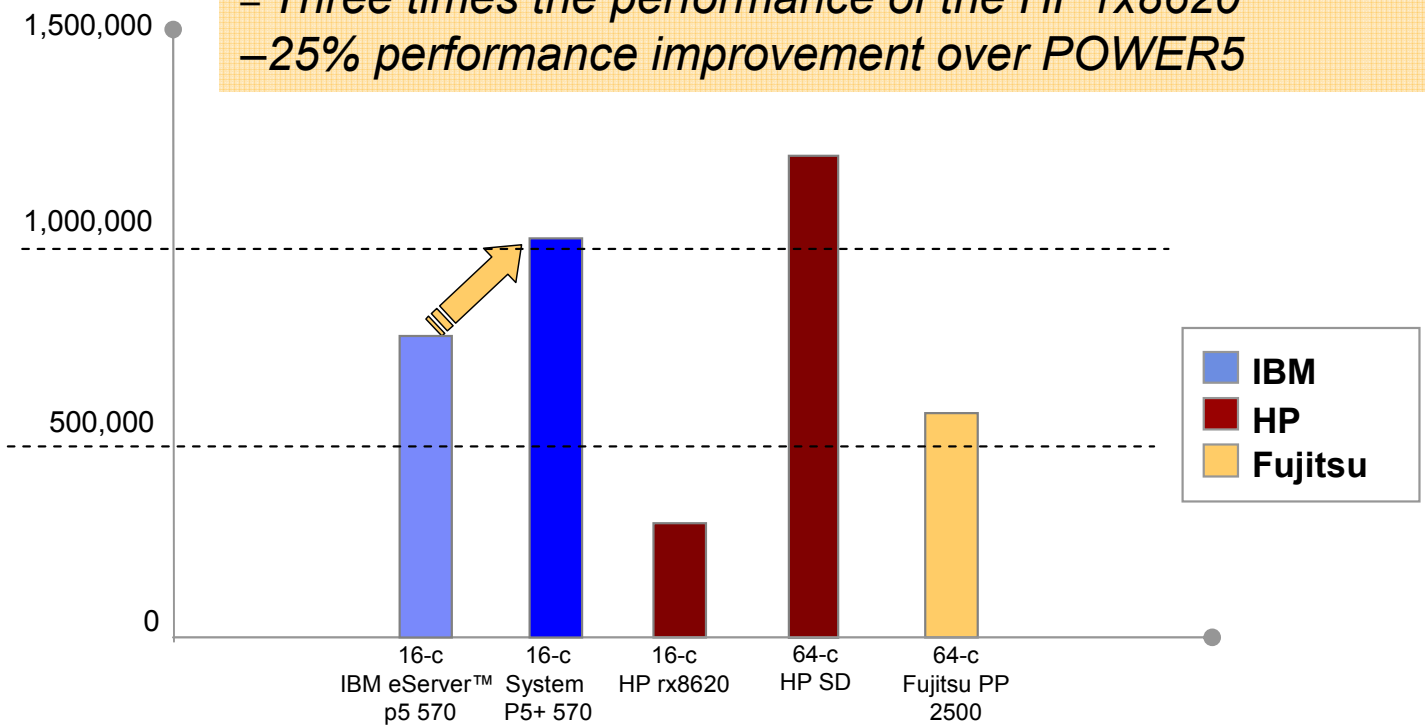
www.power.org



p5-570 with Power5+

16-core tpmC results with the System p5 570 break the 1 mil mark

- *Three times the performance of the HP rx8620*
- *25% performance improvement over POWER5*



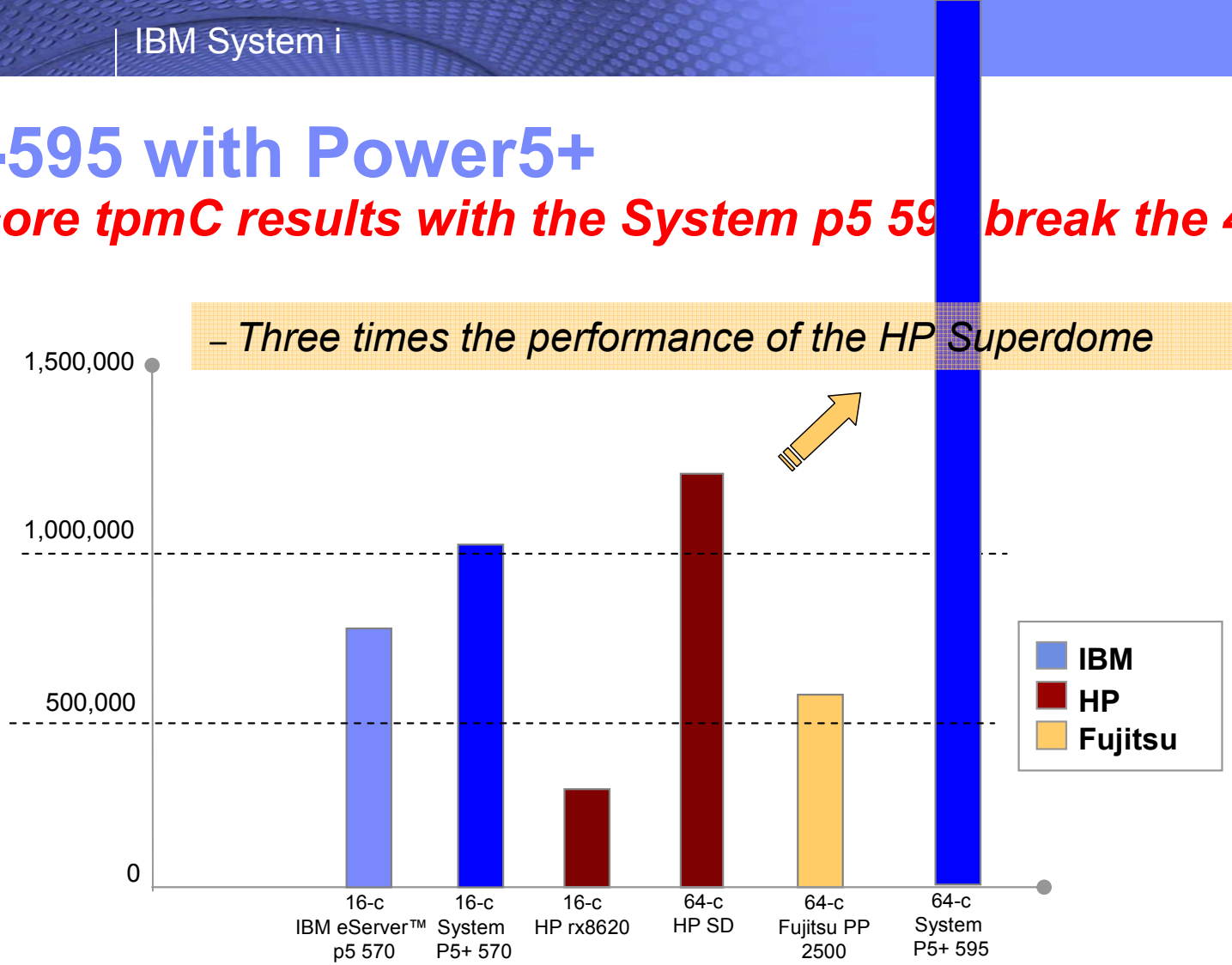
System	eServer p5 570	System p5 570	HP rx8620	HP Superdome running HP-UX	Fujitsu PRIMEPOWER 2500
Processors	**16 POWER5**	**16 POWER5+**	**16 Itanium2**	**64 Itanium2**	**64 SPARC64 V**
Cores	**16 @ 1.9GHz**	**16 @ 2.2GHz**	**16 @ 1.6GHz**	**64 @ 1.6GHz**	**64 @ 1.3GHz**
Threads	**32**	**32**	**16**	**64**	**64**
tpmC	**809,144**	**1,025,169**	**332,265**	**1.231,433**	**595,702**
$/tpmC	**$4.95**	**$4.43**	**$4.48**	**$4.82**	**$12.43**

Source http://www.tpc.org
* IBM result submitted on 2/14/06
All other results current as of 2/13/06

p5-595 with Power5+

64-core tpmC results with the System p5 59 break the 4 mil mark

– *Three times the performance of the HP Superdome*



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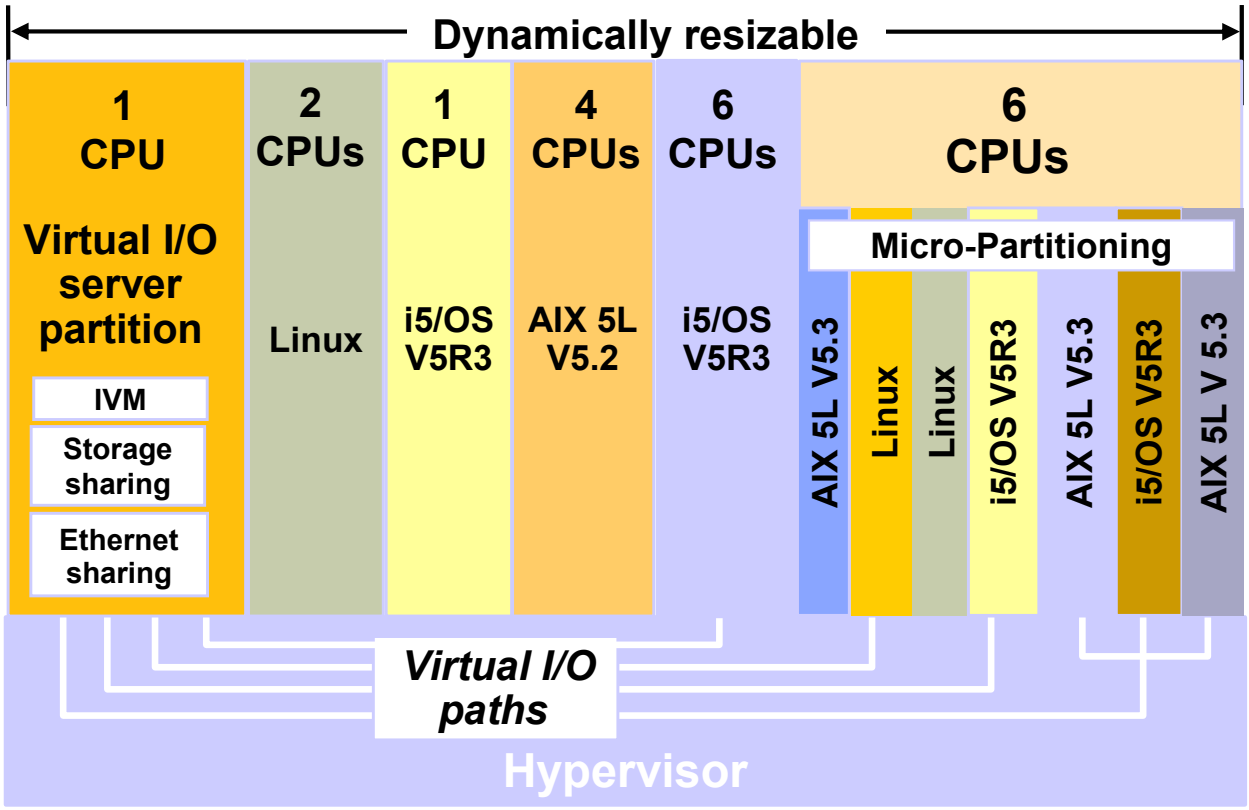
Advanced POWER Virtualization



Virtual I/O Server

- Shared Ethernet
- Shared SCSI and Fibre Channel-attached disk subsystems
- Supports AIX v5.3 and Linux* partitions

Micro-Partitioning

- Share processors across multiple partitions
- Minimum partition 1/10th processor
- AIX v5.3, Linux, or i5/OS

Managed via HMC or IVM

IBM Systems product range

IBM System z
Mainframe Server
zOS®, Linux

IBM System i
Integrated Midrange Server
OS/400®, Linux
i5/OS™, AIX 5L®, Linux on eServer i5

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High Performance Unix Server
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Scale-Out Deployment
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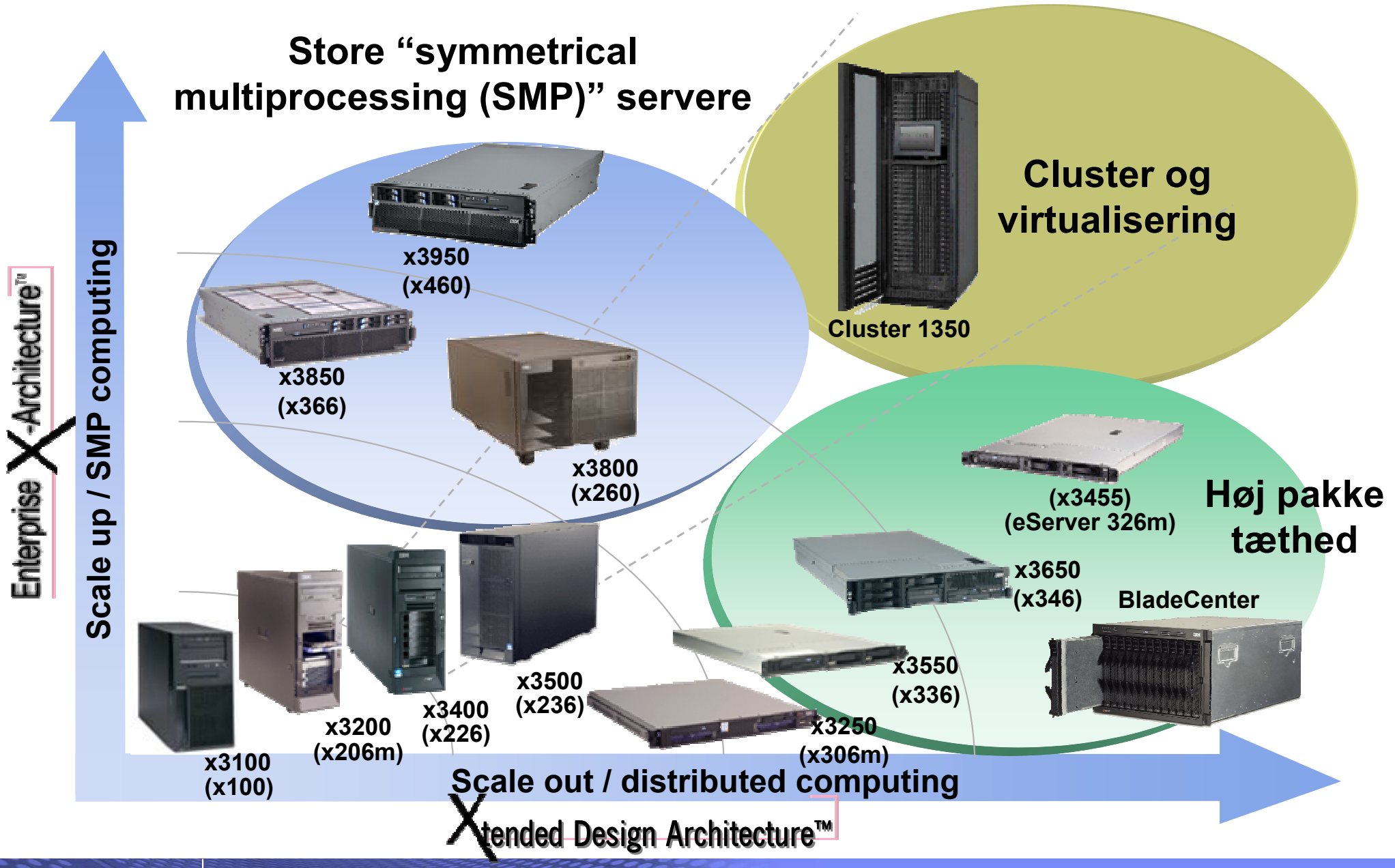
IBM System x oversigt



2 socket System x Rack Servers

x3455

High Performance Compute Node

1U, 2 Socket

- **Cluster / HPC**
- Modeling & Simulation
- Academia & Government Research
- Financial Market Modeling
- Digital Rendering
- **Electronic Design**

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x3550

Application density for power managed datacenters

1U, 2 Socket

- Database
- ERP/SCM/CRM/PLM
- E-mail collaboration
- File & Print
- Branch Office
- Security
- Web serving

Available Today!

x3650

Stable Business Critical application server

2U, 2 Socket

- Business Continuity
- Database
- E-mail/Collaboration
- File & Print
- Grid Computing
- Hosted Client
- Virtualization & SCON
- Branch Office
- Content / Doc Management

Available Today!

x3655

Business Performance Server

2U, 2 Socket

- **Business Intelligence**
- Business Continuity
- Database
- **Digital Media (IPTV/VoD)**
- Grid Computing
- Security
- Virtualization & SCON
- **Web Serving**
- ERP/SCM/CRM/PLM

Announce 10/03

4 socket System x Rack Servers

x3755 - AMD

HPC Large memory compute node

4U, 4 Socket

- Cluster / HPC
- Modeling & Simulation
- Academia & Government Research
- Financial Market Modeling
- Digital Rendering
- Electronic Design

x3850 - INTEL

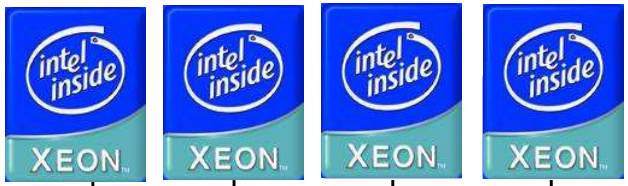
Commercial Enterprise & Mid-market

3U, 4 Socket

- Database
- ERP/SCM/CRM/PLM
- E-mail collaboration
- File & Print
- Branch Office
- Security
- Web serving

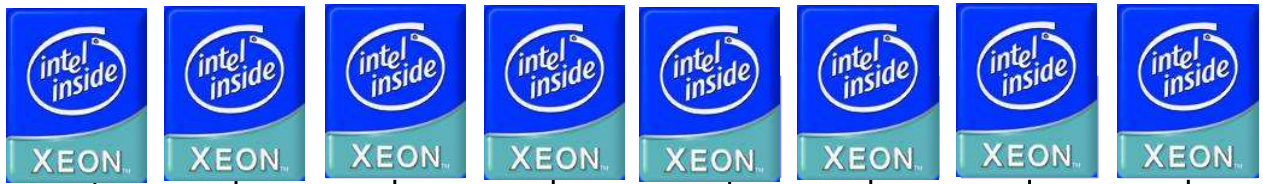
Processor opbygning - traditionel

Processorer



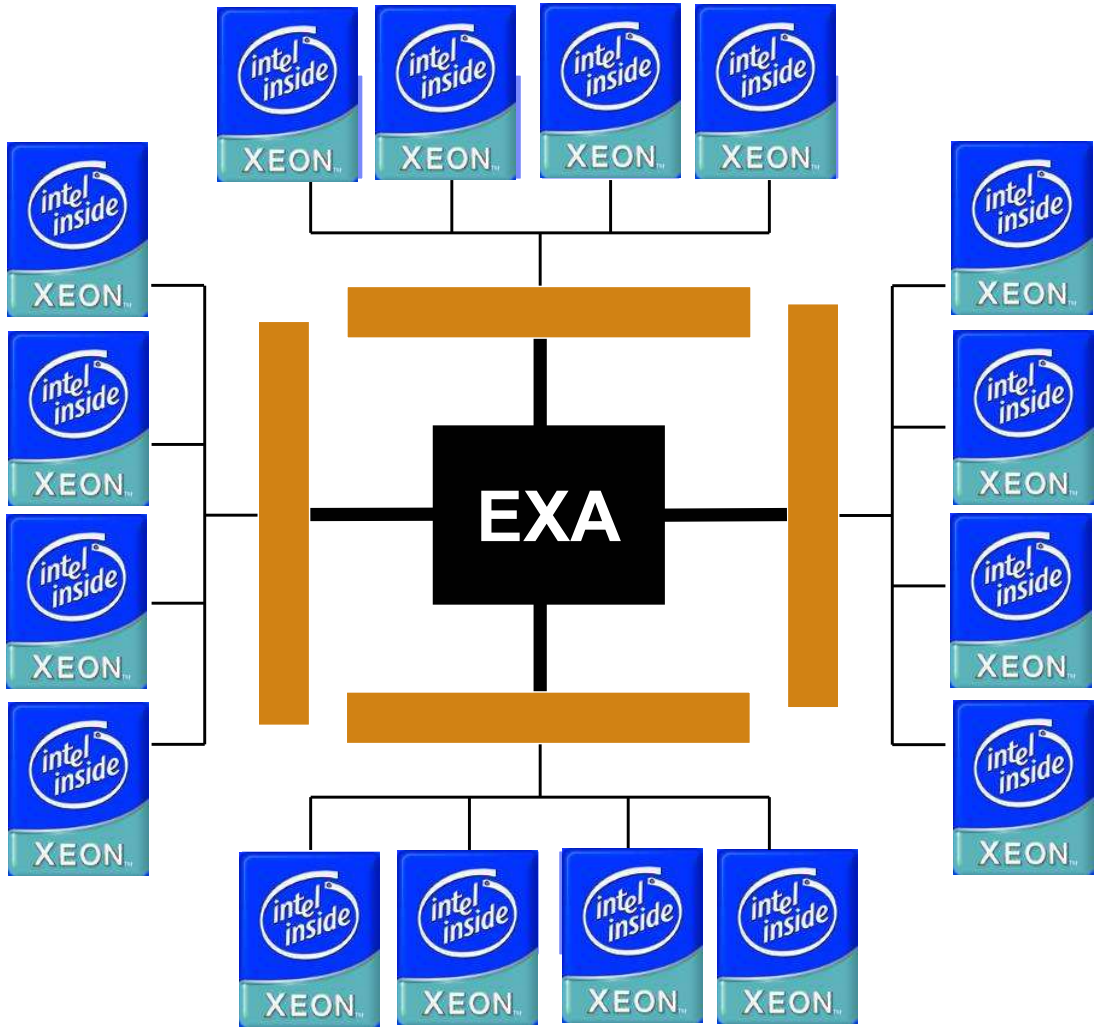
Hukommelse

Processorer



Hukommelse

Processor opbygning – IBM System x3



IBM definerer High-end Industry-Standard servere

1. generation: 2001

- **x360: 6-måneder tidligere på markedet ifht konkurrenterne. Mindste 4-way server (3U)**
- **x440: 12-måneders forspring, mindste 8-way server (4U), 35 første pladser omkring performance benchmark.**
- **XpandOnDemand Scalability op til 16-way plus Remote I/O**
- **Industry-førende High Availability teknologier: Active Memory & Memory ProteXion**

2. generation: 2003

- **x365: Videreudvikling af x360 og stadig (3U). Selvfølgelig endnu hurtigere !**
- **x445: Den hurtigste industri-standard server i historien, 20 flere førstepladser**
- **x455: Samme arkitektur som x445, men med Itanium2 for ægte 64-bit**
- **XpandOnDemand Scalability op til 32-way plus Remote I/O**
- **"Standard" serveren for VMware kunder**

3. generation: 2005

- **x366: Markedets første 4-way server med 64-bit Xeon MP**
- **x460: xSeries 32-way flagskib optimeret for skalerbarhed og virtualisering med 100%+ højere performance**
- **x260: Indfører EXA i 4-way tower markedet. Ideel for SMB kunder**
- **64-bit Extensions giver højere performance, applikations fleksibilitet (32-bit & 64-bit) og investerings beskyttelse**

IBM definerer High-end Industry-Standard servere

3. generation: 2005 – 64-bit

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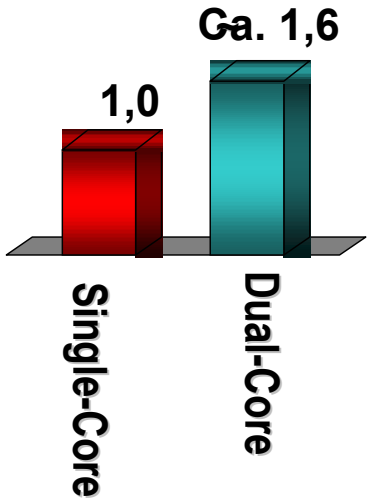
November 2005:

Intel dual-core versioner af Xeon MP processoren.

Java Application Server MP SPECjbb[1]



i want an i.

XpandOnDemand™ skalerbarhed

x460 + (7) MXE-460
8 chassis 32-way (64 core)
Op til 512GB hukommelse

Modulær byggeklods princip eliminerer behovet for fysisk udskiftning af servere såfremt behovet for mere performance opstår.

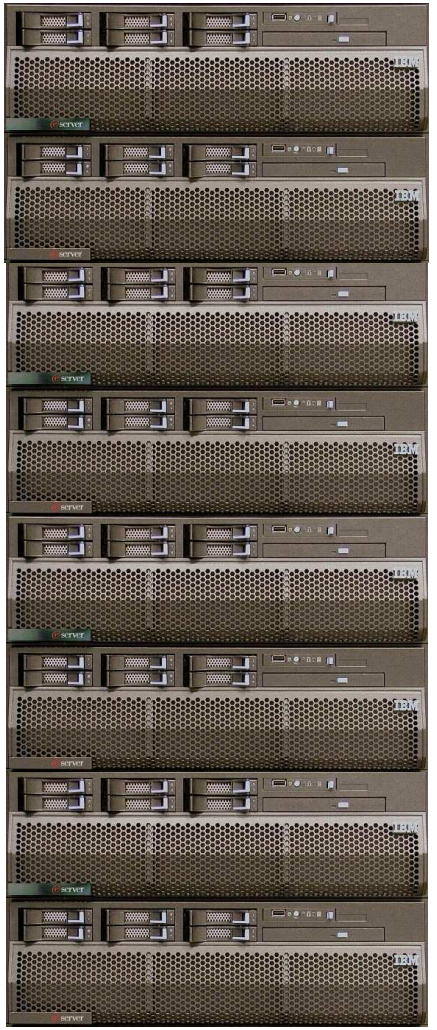
Perfekt til:

Microsoft SQL Server
DB2
vmware AN EMC COMPANY
ORACLE

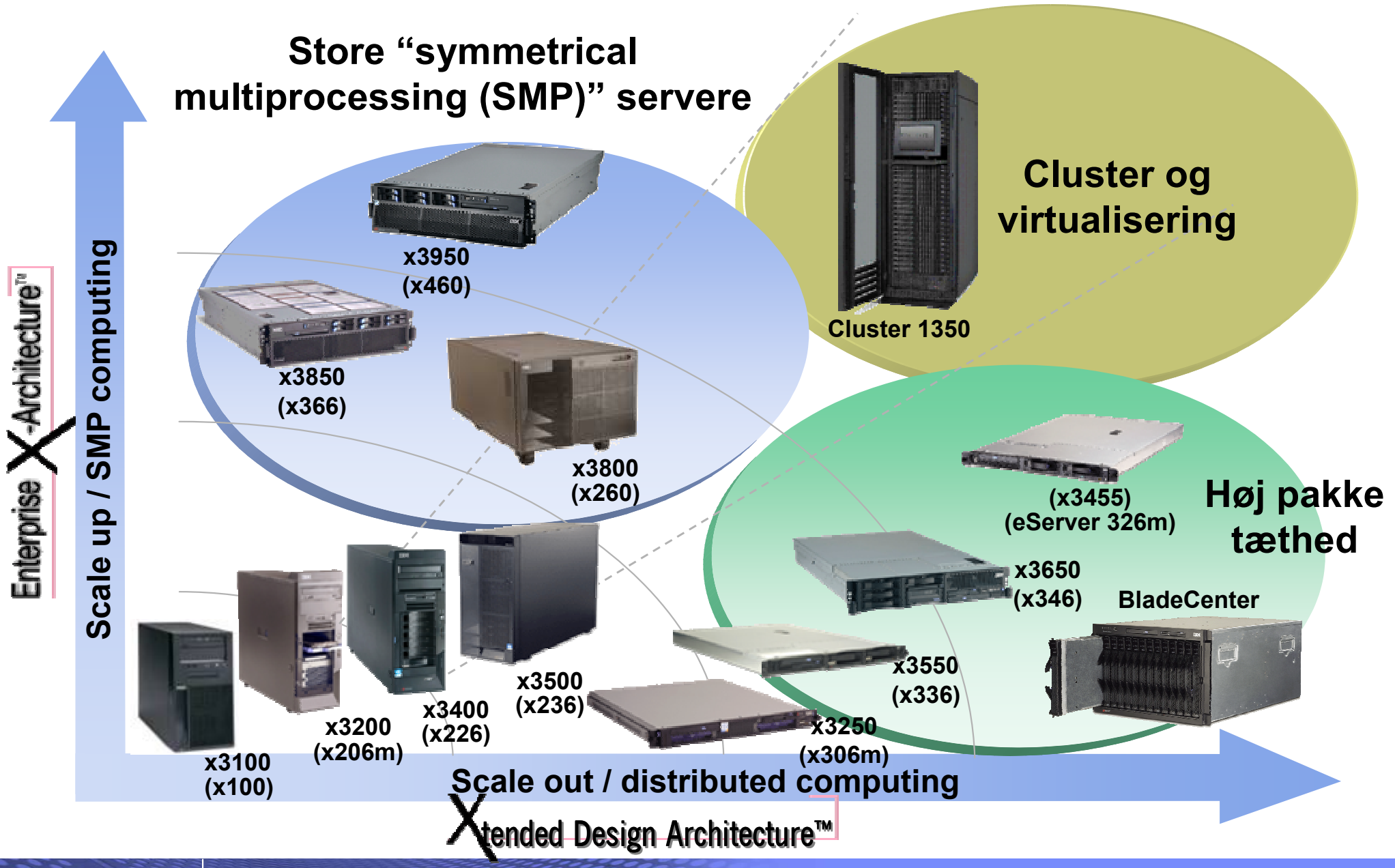
x460 + (3) MXE-460
4 chassis 16-way (32 core)
Op til 256GB hukommelse

x460 + (1) MXE-460
2 chassis 8-way (16 core)
Op til 128GB hukommelse

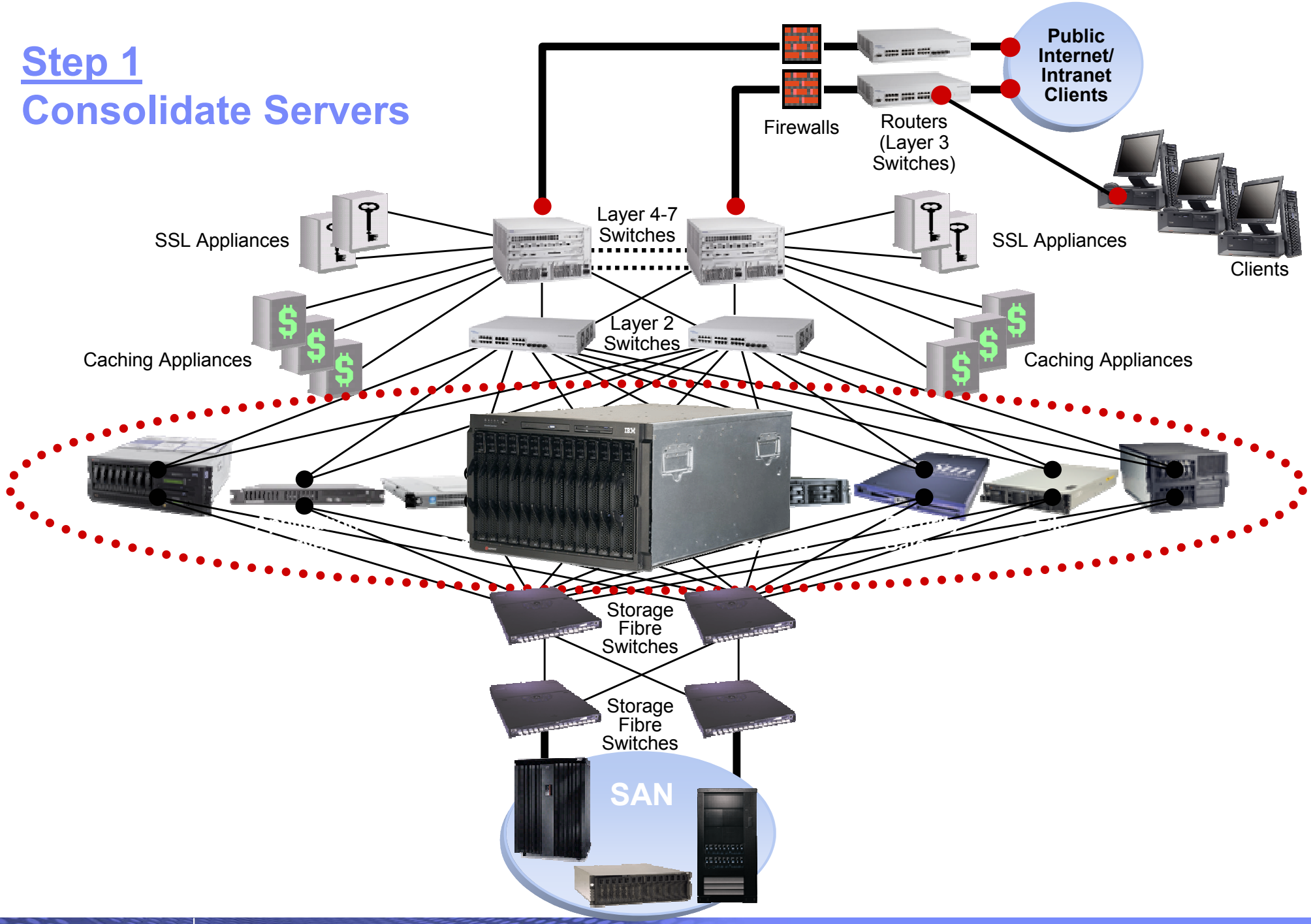
x460 4-way (8 core)
Op til 64GB hukommelse



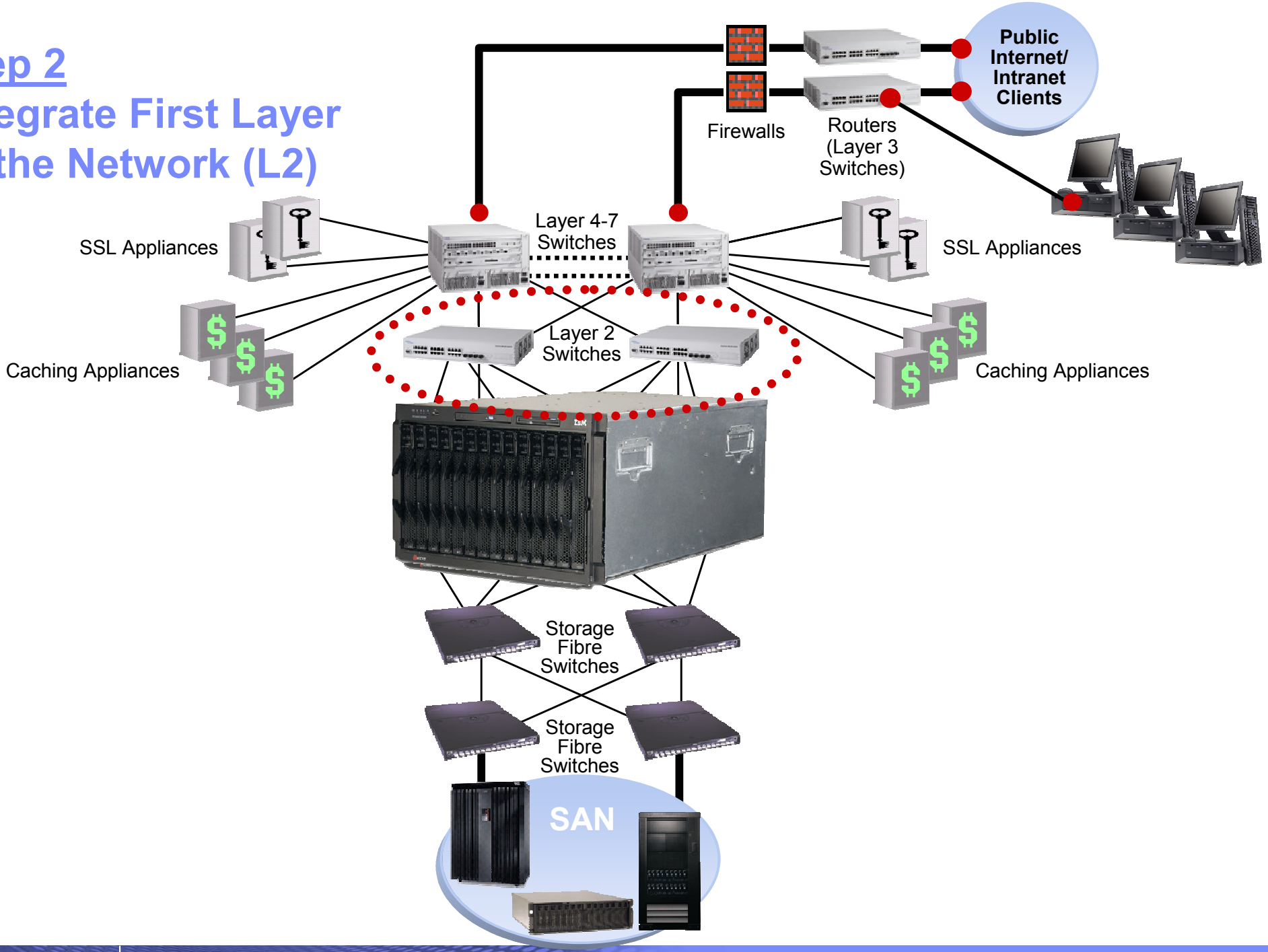
IBM System x oversigt



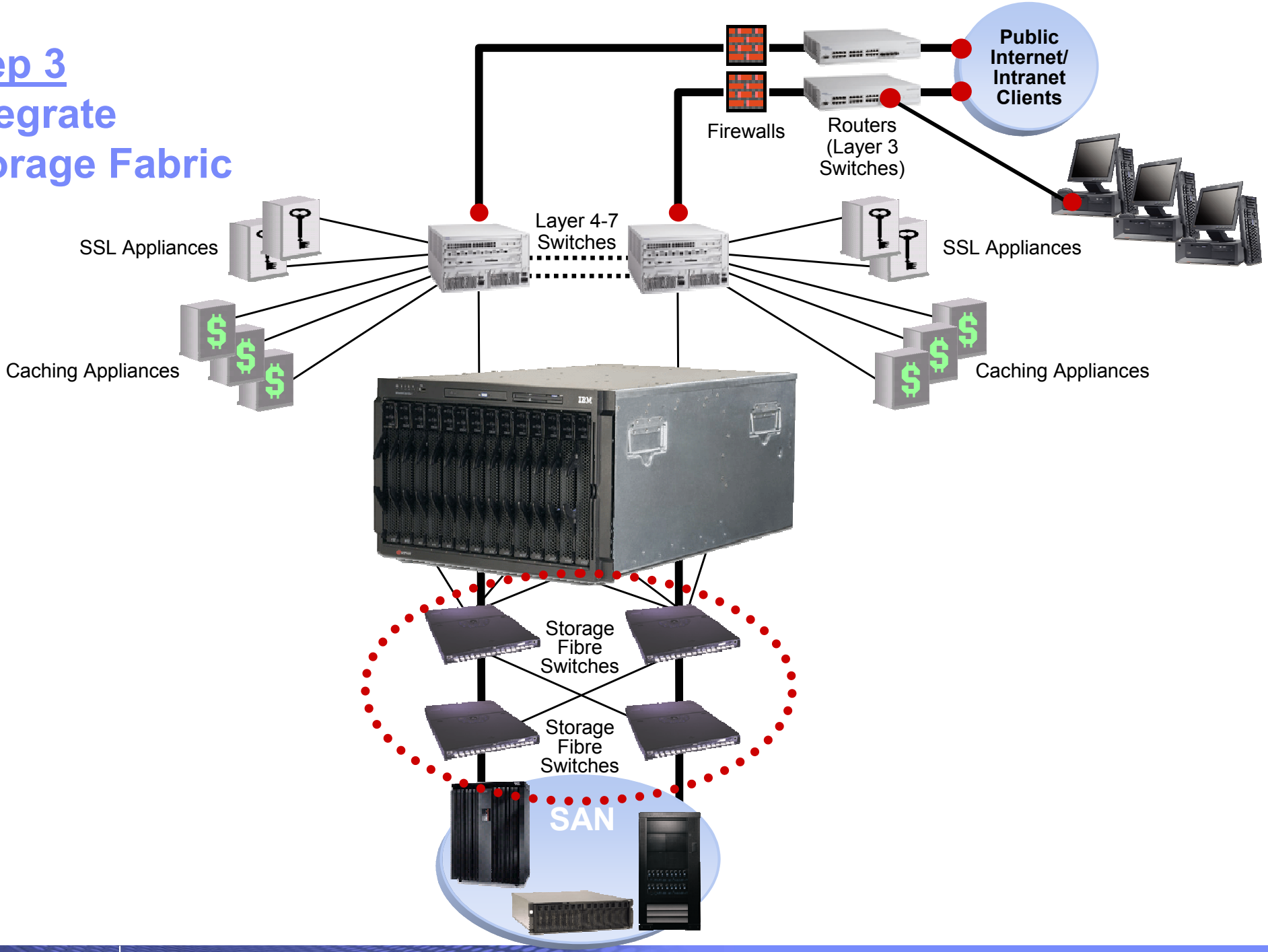
Step 1
Consolidate Servers



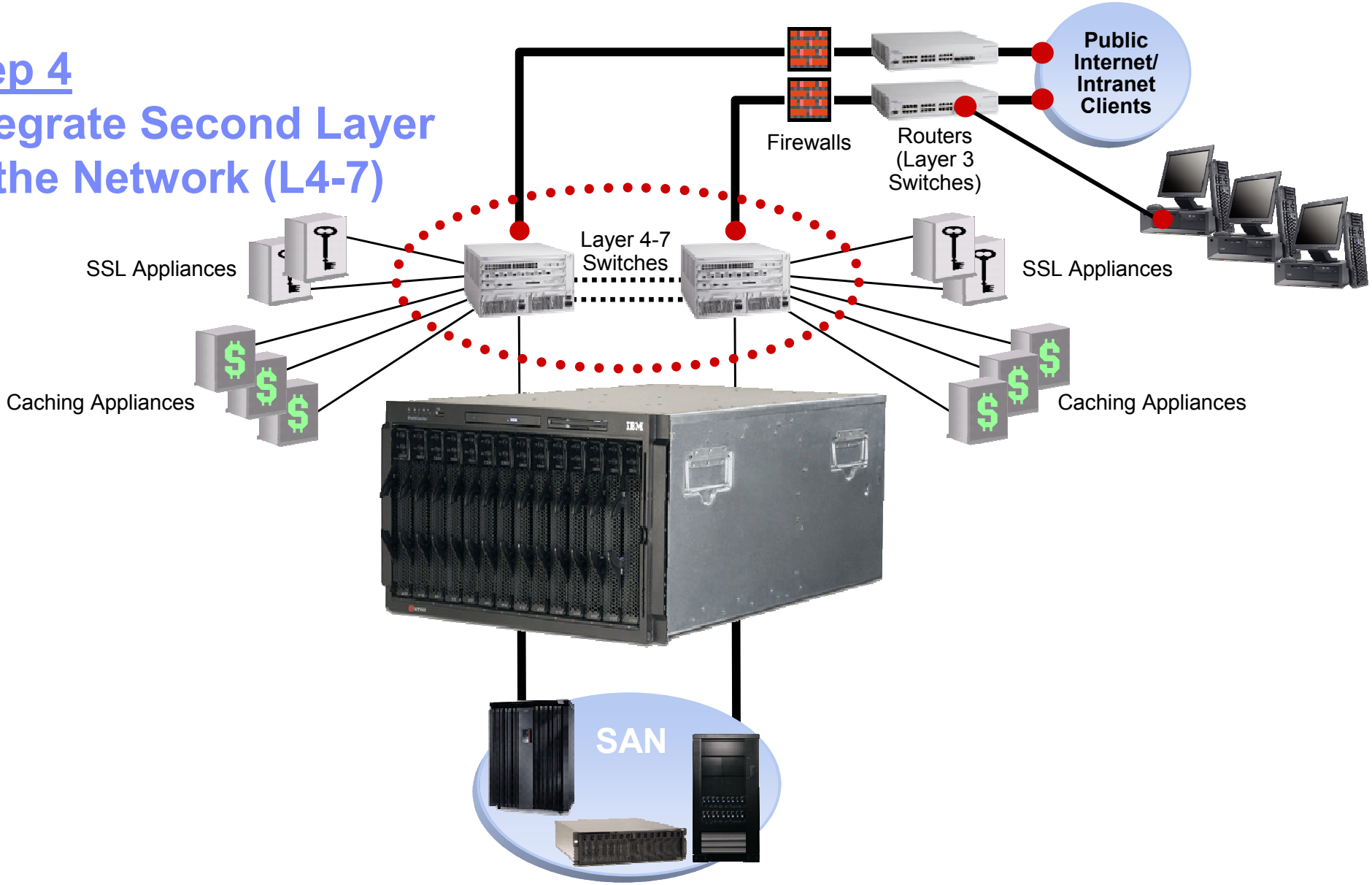
Step 2
Integrate First Layer of the Network (L2)



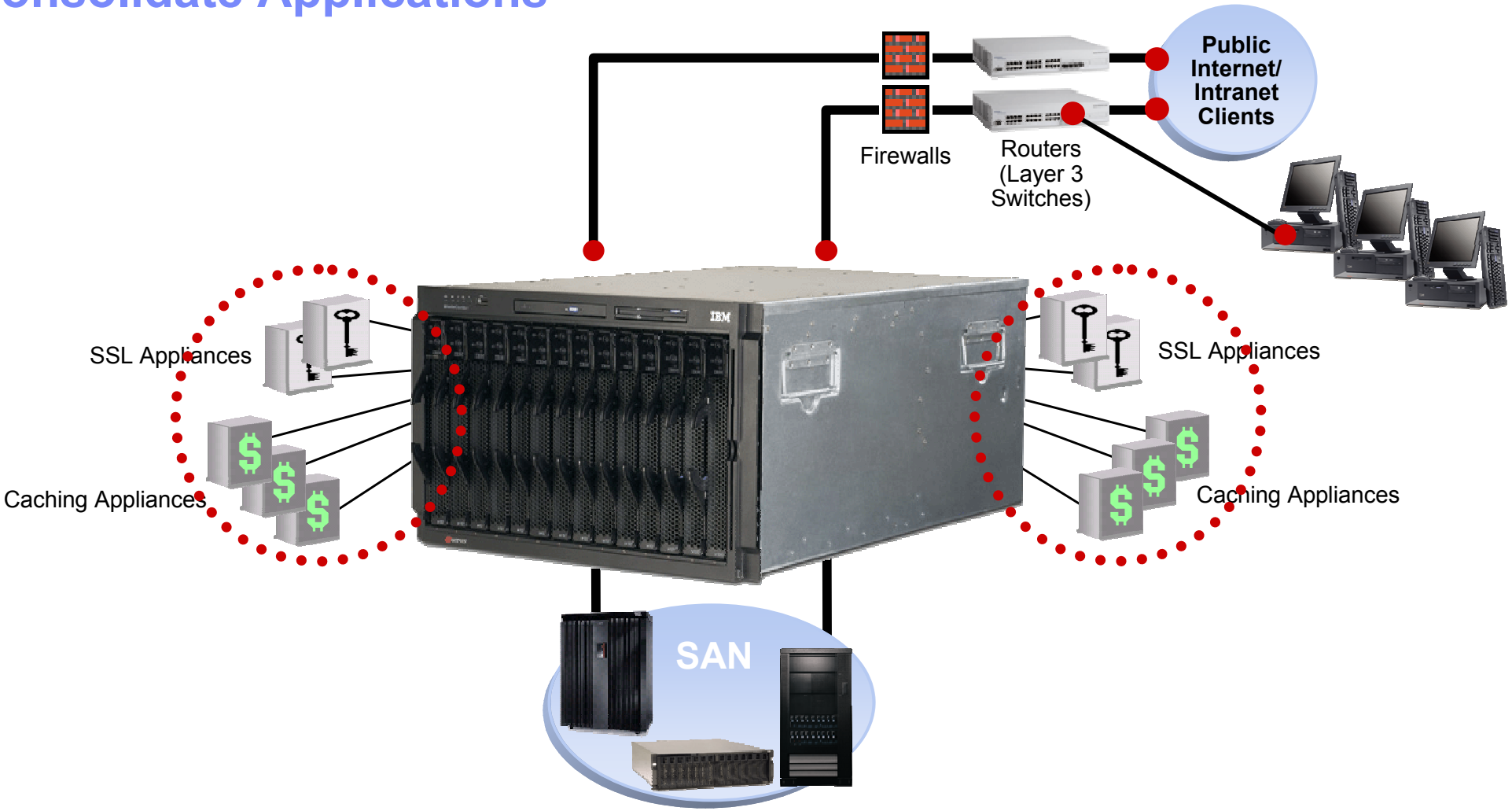
Step 3
Integrate Storage Fabric



Step 4
Integrate Second Layer of the Network (L4-7)



Step 5
Consolidate Applications



Ideen med Bladeservere….

En "server på et kort" - Hvert "Blade" har separat:

- Processor
- Ethernet
- Hukommelse
- Evt. disk
- etc.

IBM Blade

I chassis'et deler man:

- Skærm, mus, tastatur
- Strømforsyning
- Blæsere og køling
- Netværks switch
- SAN switch
- CD-ROM enhed
- Diskette enhed
- USB-tilslutning

IBM BladeCenter chassis - 7U rackable

IBM BladeCenter

2 eller 4 processorer per bladeserver

Op til 14 (2-socket) bladeservere eller Op til 7 (4-socket) bladeservere

= 28 sockets/Chassis

Op til seks 7U chassis per rack

= 168 sockets/rack

1U server (2-socket) i et 42U rack = 84 sockets/rack

IBM's BladeCenter bruger mindre strøm

- **BladeCenter anvender op til 45% mindre strøm end 1U servere**
- **BladeCenter giver mere processorkraft per watt**

	1U server	IBM BladeCenter
Max Konfig/rack	84 Xeon DP 3.2Ghz	168 Xeon DP 3.2Ghz
Effekt forbrug	45,912W (100%)	
Genereret varme	54,260 BTU (100%)	30,255 BTU (55%)

Mindre strøm → **Mindre varme** → **Mindre køling** → **Lavere omkostninger**

Mere processorkraft

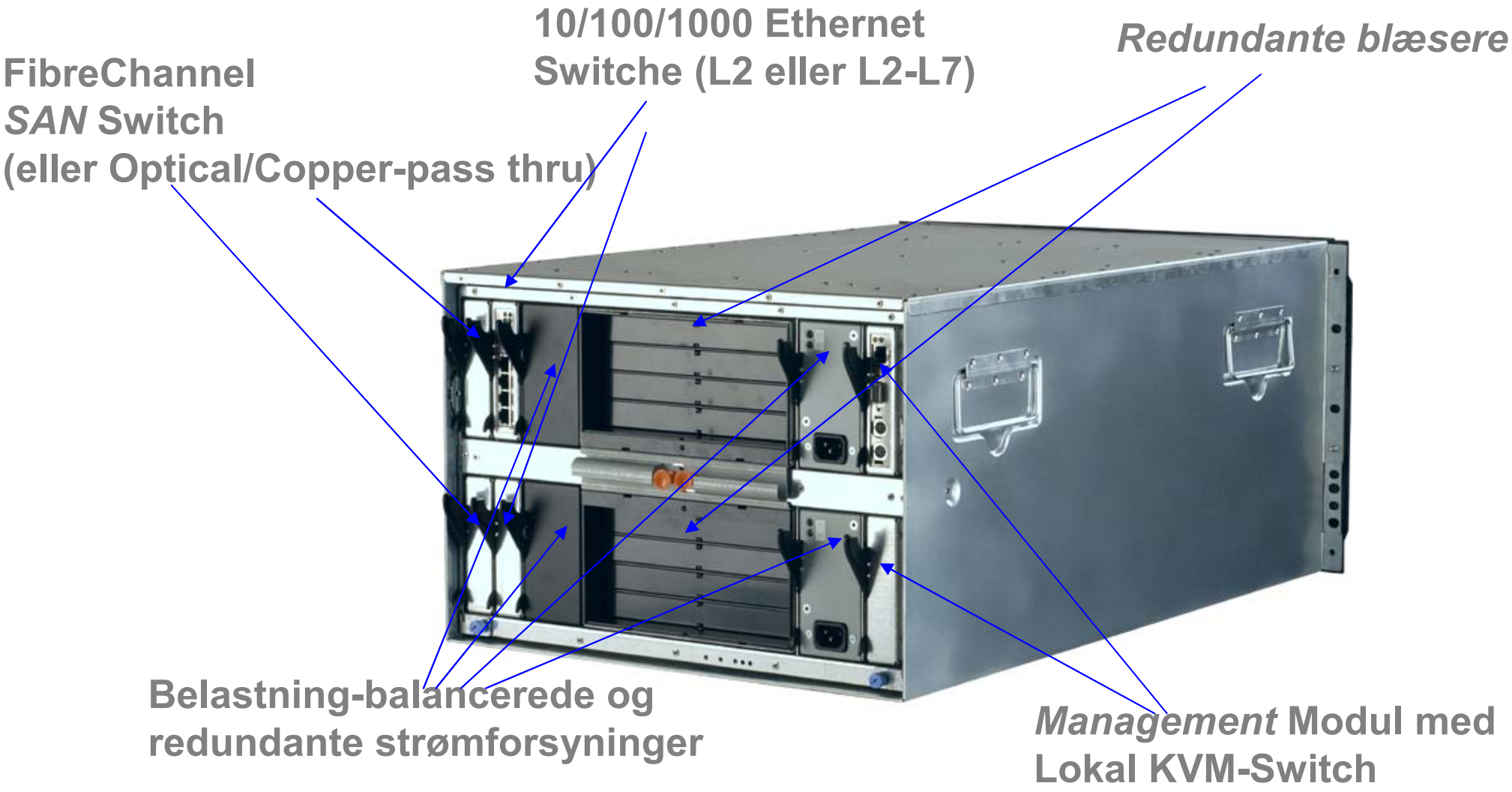
Lavere investeringer

Lavere driftsomkostninger

LV processorer giver yderligere 32% lavere strømforbrug

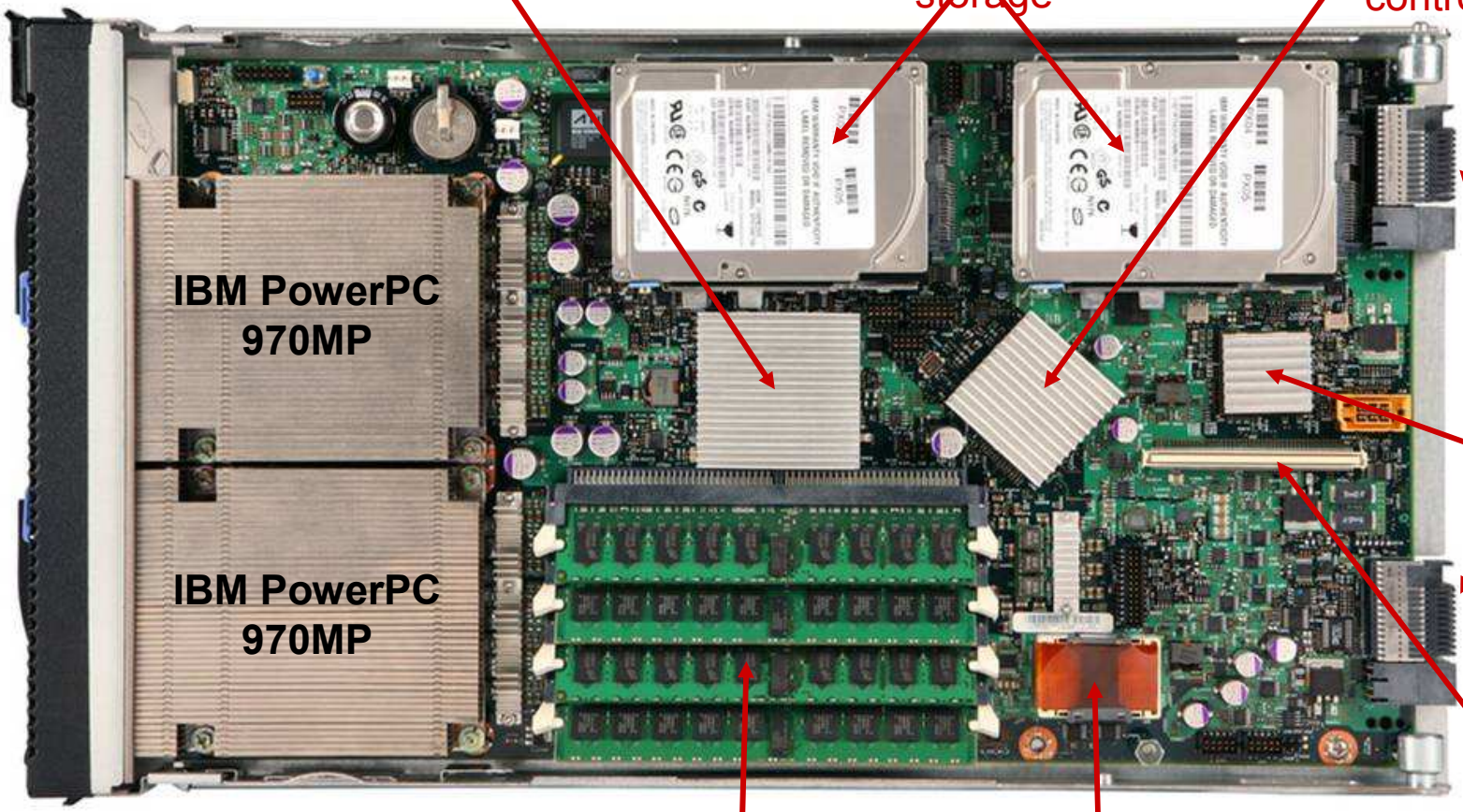
[1]Electrical Requirements for Blade Servers. Written by Jane Wright (G00120690) released April 24, 2004. Available from Gartner Research.
[2]Comparison was done on similar dual 3.2Ghz servers, with 4GB memory, Fibre connectivity, and dual ethernet switching.

IBM Bladecenter



Alle enheder kan gøres redundante og Hot-Swap

IBM JS21 blade



2 & 4 Socket BladeCenter Servers: Target Applications

HS20 ULP

Performance without the Power

- Customers with power and cooling constraints
- Branch Office
- Email / Collaboration
- Hosted Client
- File & Print

Available Today!

HS21

General Purpose Enterprise Server

- Business Continuity
- Content & Document Management
- E-mail collaboration
- File & Print
- Hosted Client
- Web Serving

Available Today!

LS21

High Performance Blade Server

- **Cluster / HPC**
- Digital Media
- Security
- Virtualization & SCON
- Web Serving
- Modeling & Simulation

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LS41

Scalable Enterprise Performance Blade Server

- Business Continuity
- Cluster / HPC
- Virtualization & SCON
- **Business Intelligence**
- **ERP / SCM / CRM / PLM**
- Modeling & Simulation

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JS21

High Performance Blade with Native Virtualization

- AIX / Linux Applications
- Business Continuity
- Cluster / HPC
- Security
- Grid Computing
- Virtualization & SCON

Available Today!

IBM BladeCenter familie = *investeringsbeskyttelse*

BladeCenter
Annonceret Dec. 2002

14 Blades, 7U

Enterprise & SMB Chassis

BladeCenter T
Annonceret Apr. 2004

8 Blades, 8U

"Ruggedised" Chassis

Telco, Military

BladeCenter H
Annonceret Feb. 2006

14 Blades, 9U

Ekstrem I/O (>10GB) for data intensive installationer

Fælles blades og fælles switche

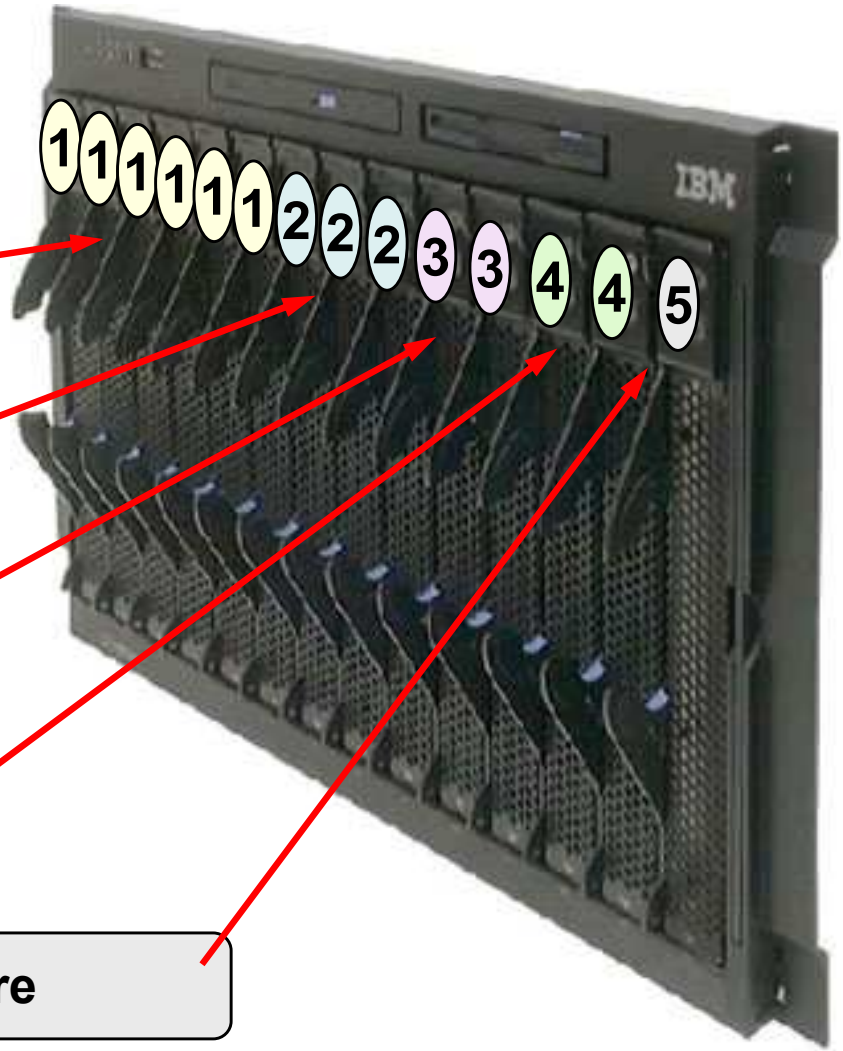
Eksempel på BladeCenter konfiguration

1. Web Solution (6 Blades)
- Caching appliance Blade
- Load balancing appliance Blade
- Linux Apache Blades
- AIX WebSphere
- App Server Blades

2. Collaboration Solution (3 Blades)
- Windows 2000 Domino Blades

3. Terminal Serving Solution (2 Blades)
- Windows 2000 Citrix MetaFrame Blades

4. File Serving Solution (2 Blades)
- Novell Netware V6 Blade
- Storage Blade



5. Spare

Genialt kombineret med "boot-fra-SAN", iSCSI og System i

IBM Director - fælles systems management

Converged Systems Management

- Single Web-baseret management konsol
- Konsistent "look and feel"
- One-stop shopping for alle administrative opgaver

IBM eServer & TotalStorage

WebSphere DB2 Lotus Tivoli Rational software

IBM Director

Ensartede end-to-end management komponenter

Fælles cross-platform infrastruktur

IBM eServer BladeCenter

System z

System i

System p

System x

IBM System Storage

Delivering business value with innovation at all levels

Infrastructure

Information on Demand — *SOA* — *Infrastructure Solutions*

Capacity on Demand — *Grid Computing* — *Supercomputing Capacity on Demand*

IBM Director

IBM Virtualization Engine

IBM Self-Managing Autonomic Technology

Product Families

Mainframe

Midrange

x86

Blades

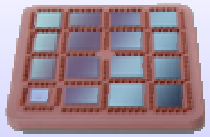
Storage

Technology & Packaging

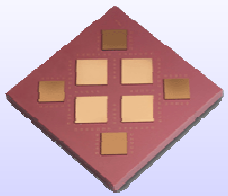
z/OS

AIX L

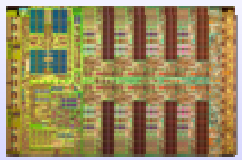
i5OS



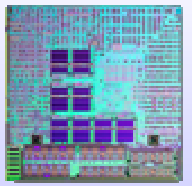
IBM z/Architecture™



Power Architecture™



Cell Broadband Engine™



X-Architecture™