Mainframe-Inspired Technologies Delivering Lower Customer Costs

Susan Whitney
General Manager
IBM eServer xSeries

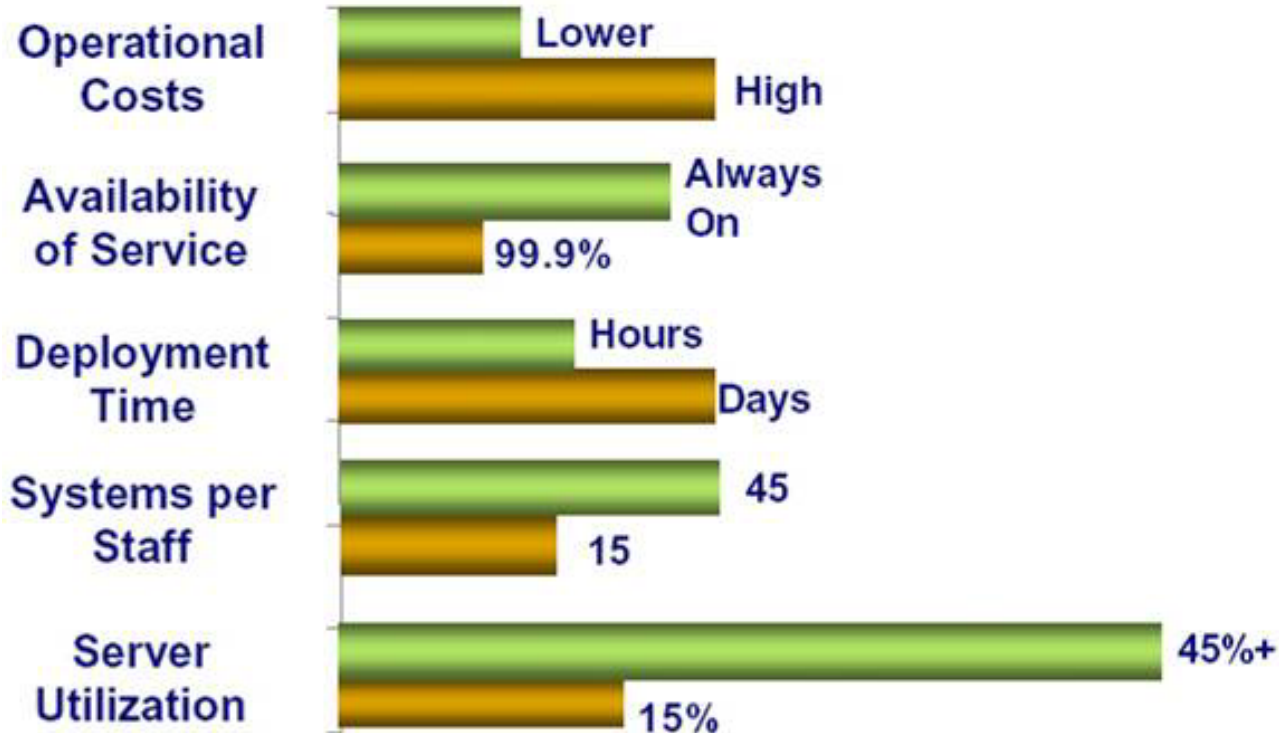ON DEMAND BUSINESS™

Intel Servers Fastest Growing Opportunity

- **Will represent 46% of server market by 2005**
- **Growth drivers**
  - ▶ UNIX low-end substitution
  - ▶ HPC clusters
  - ▶ Linux
  - ▶ Server consolidation
  - ▶ Enterprise applications
  - ▶ SMB >50% of Intel-based market
  - ▶ ISVs
- **High growth segments**
  - ▶ Blades: 55% revenue CAGR 2004-8
  - ▶ 8-way+: 29% revenue CAGR 2004-8
- **Capturing channel capacity**
  - ▶ Distributors and VARs balancing portfolio
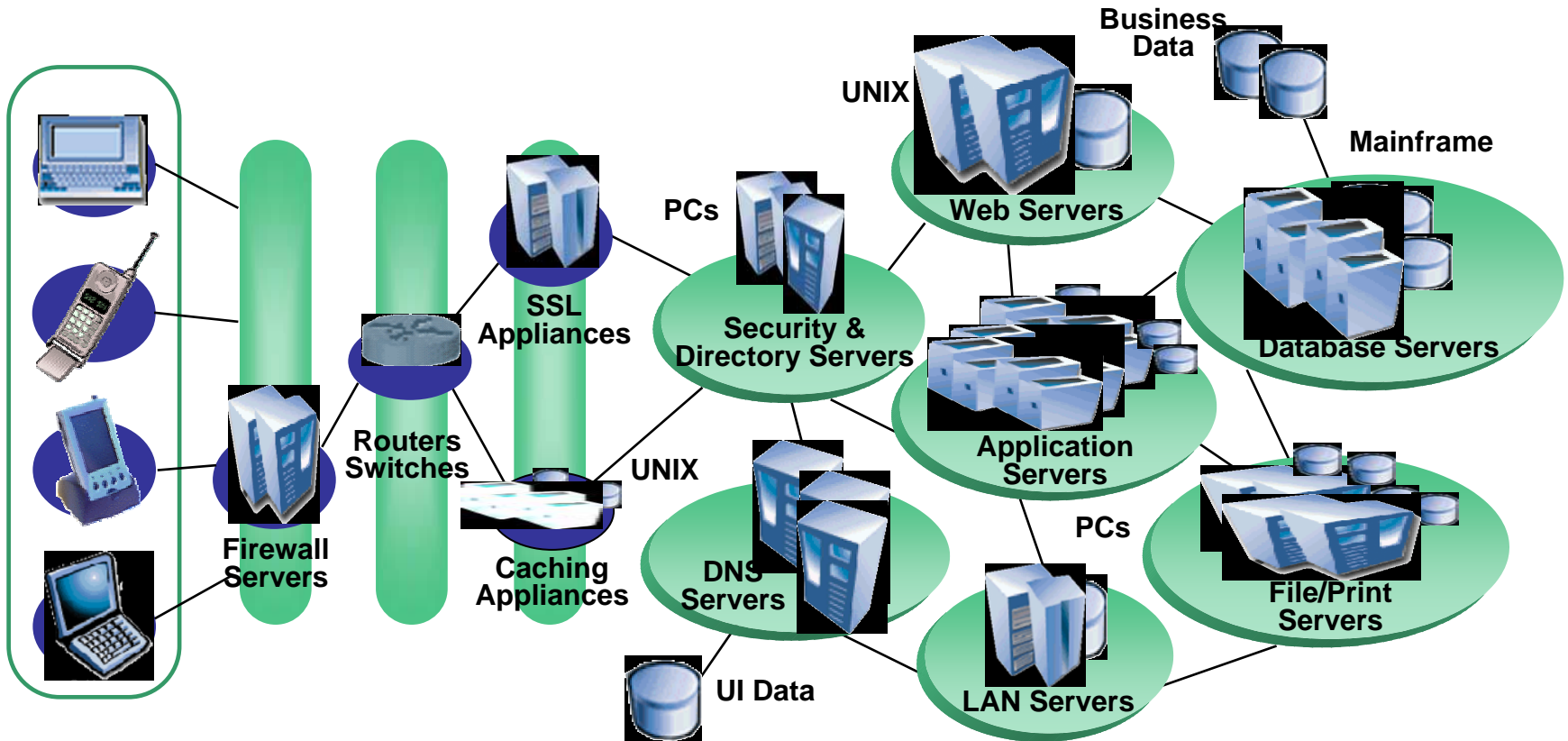 - ▶ CTO competitive capability

Server Market Opportunity

Legend: CISC, RISC, Intel

Intel Server Market Opportunity

Legend: Blades, 8-way+, 4/6-way, 1/2-way

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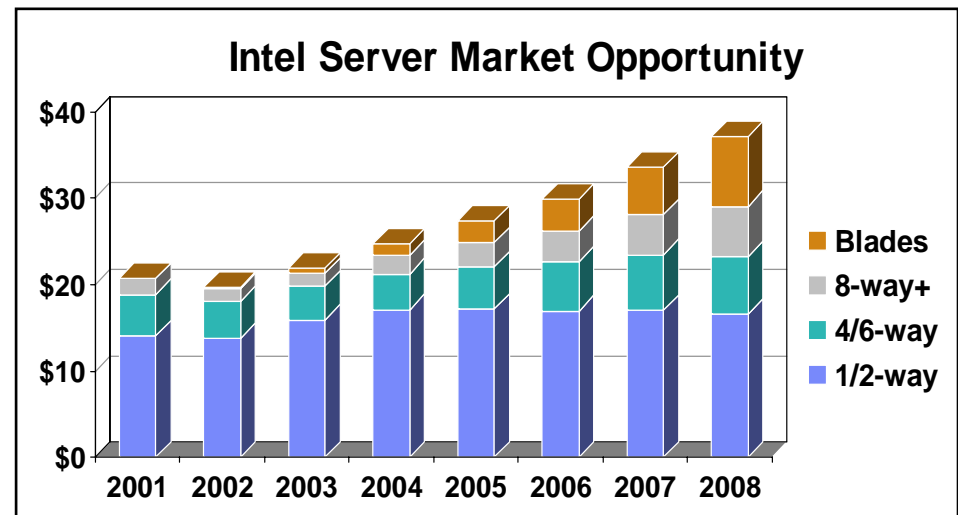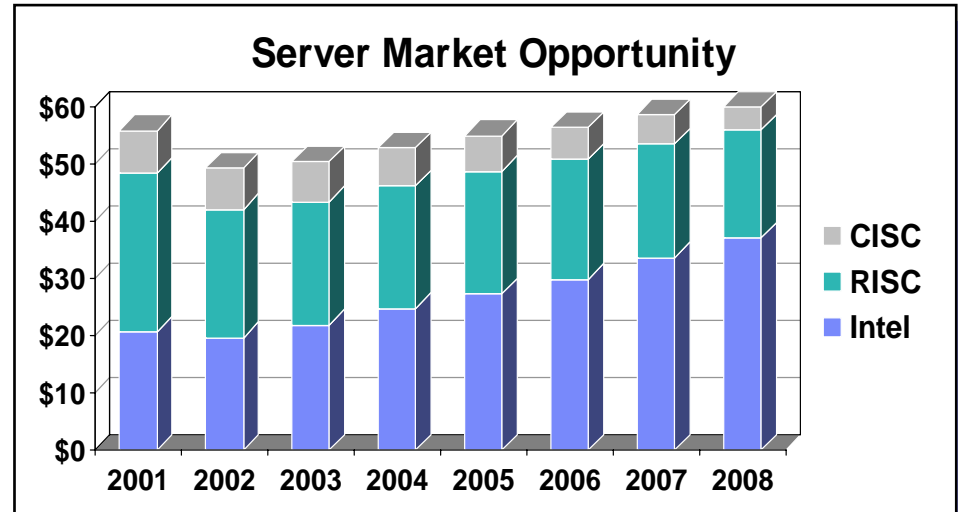
Message From CIOs

	2002	2006
Operational Costs	High	Lower
Availability of Service	99.9%	Always On
Deployment Time	Days	Hours
Systems per Staff	15	45
Server Utilization	15%	45%+

IDC
Analyze the Future
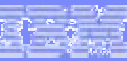
■ 2002   ■ 2006   Source: IDC 2003

ON DEMAND BUSINESS

Today's Infrastructure

Infrastructure Simplification

Storage

Scale Up Mainframe

Active

Reference

Archive

Scale Out BladeCenter

Linux Consolidation

Transaction Processing

Data Serving

Infrastructure

Application Serving

Web Tier

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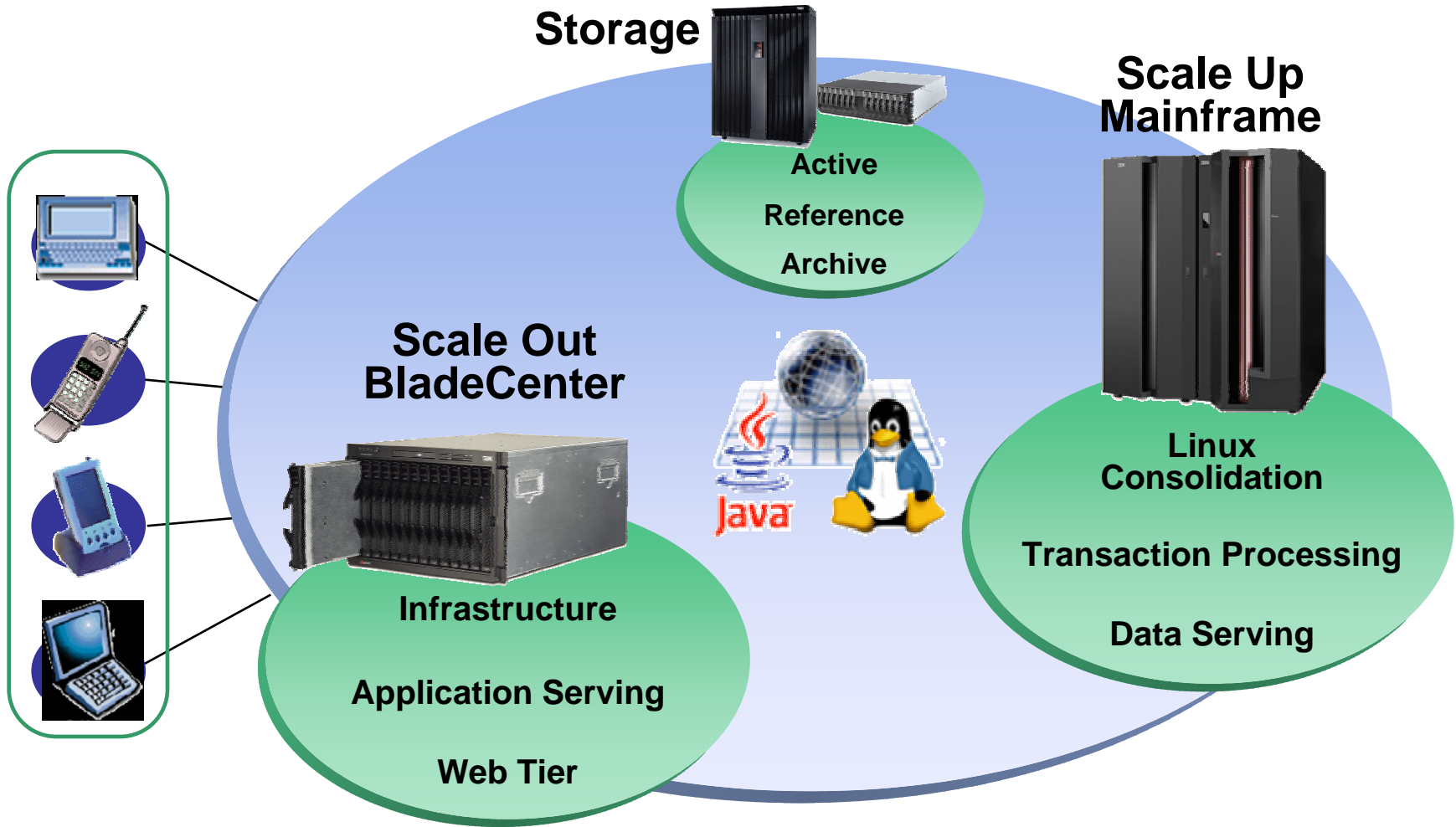
Simplification…

…Requires Breakthrough Technologies
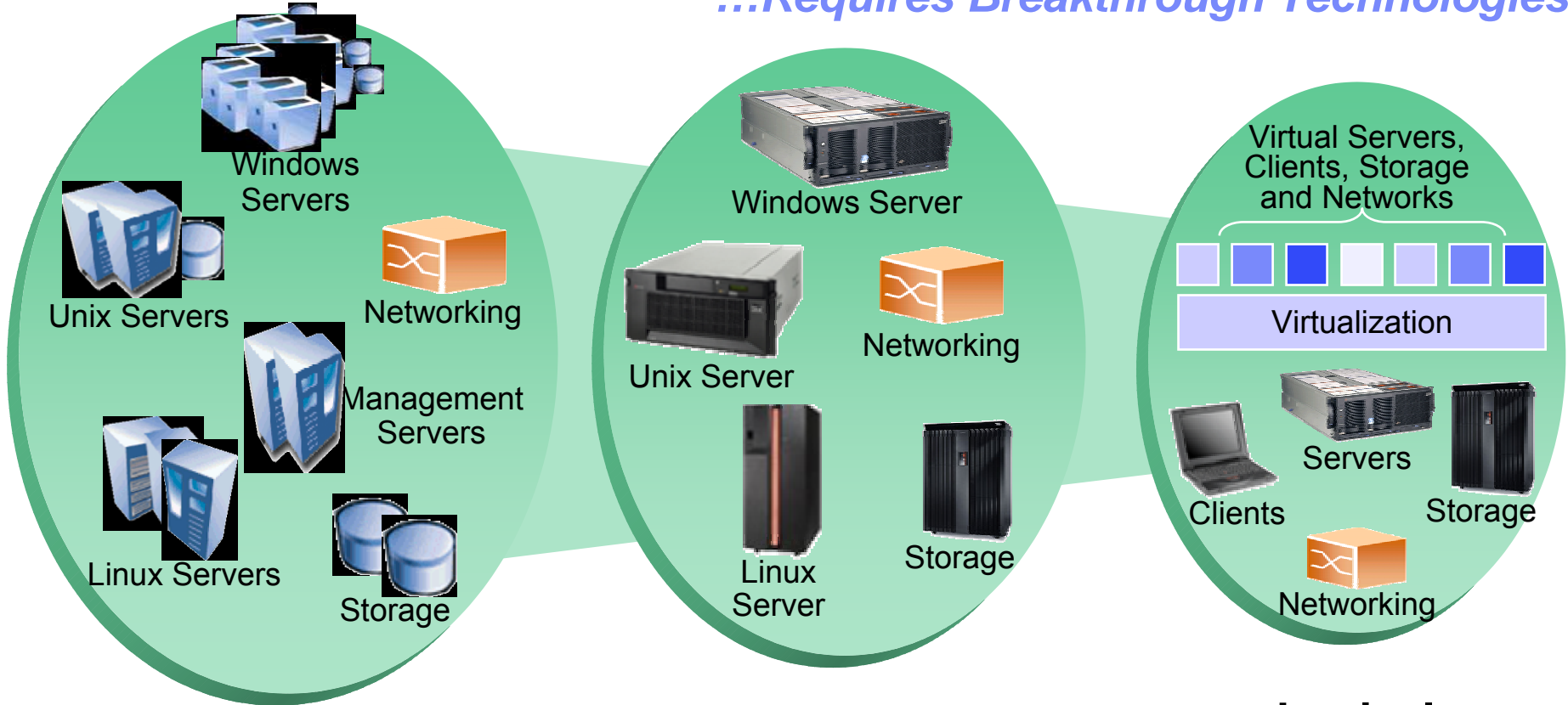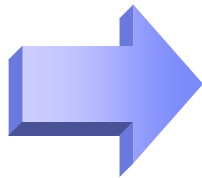

Complex
- 1 workload per server
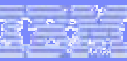- Disparate mgmt tools
- Manual provisioning

Physical Consolidation
- Fewer servers and licenses
- Disparate management tools
- Labor intense provisioning
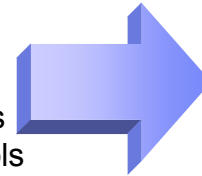
Logical Simplification
- Systems managed as one
- Multiple OSs per server
- Rapid provisioning
- Automatic workload mgmt

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The Customer Investment Base
Looking At Workloads

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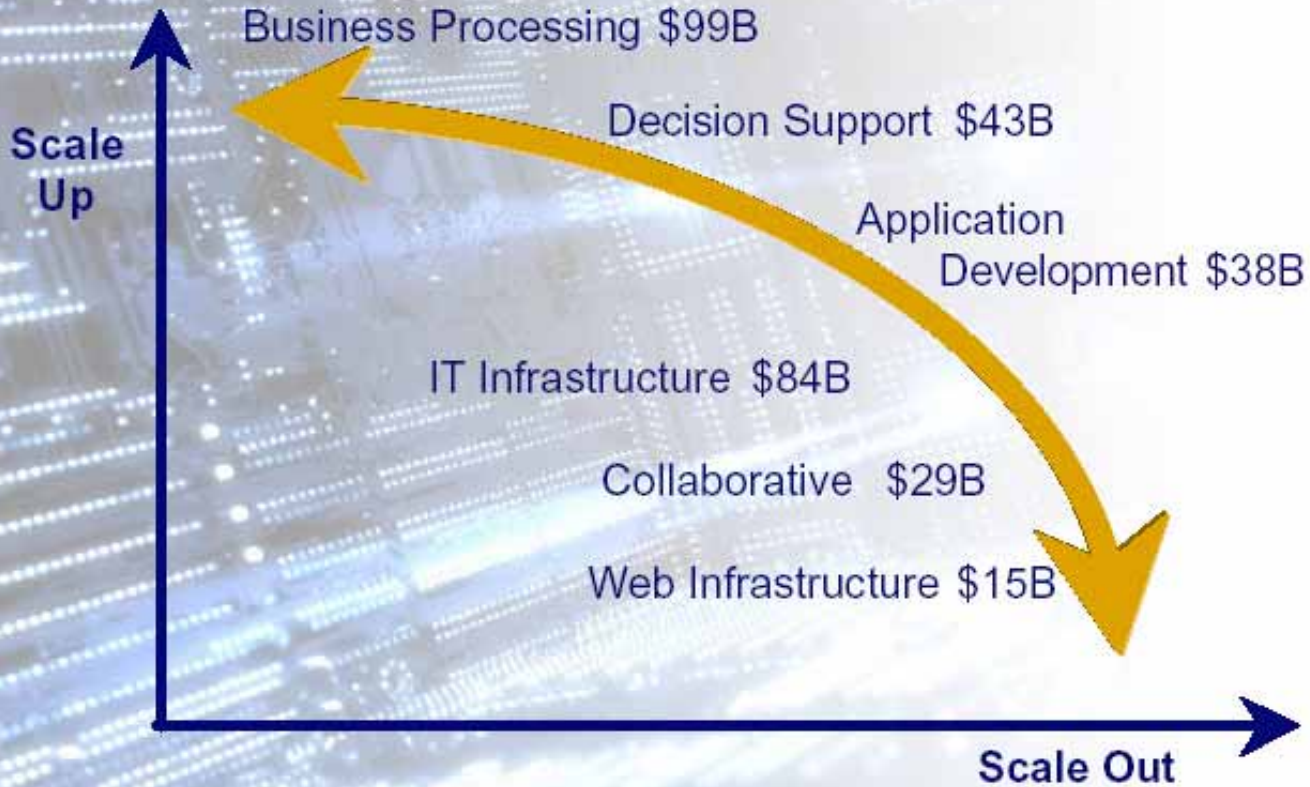
IBM eServer xSeries Directions

Large SMP

Clusters / Virtualization

Scale Up / SMP Computing

x445/x455

Database Servers
Mail / Apps Servers

High Density Rack Mount

Web Servers
Terminal Servers
File / Print Servers, DNS
Mail Servers

BladeCenter™

x336/e325

File/print servers
infrastructure

x206

Linux Clusters

Scale Out / Distributed Computing

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IBM Differentiators

Time to Market Leadership

Chart categories (top to bottom):
- Scalable to 16-way
- Rack Opt. 8-way
- Rack Opt. 4-way
- Rack Opt. 2U 2-way
- Rack Opt. 1U 2-way
- Rack Opt. 1U Uni
- Dept. 4-way
- Dept. 2-way
- Value 2-way
- Value Uni
- x86-64 2-way
- Blades 2-way

Legend: HP (orange), Dell (green)

X-axis: -5, 0, 5, 10, 15, 20, 25, 30

Hardware Design Innovation

Enterprise X-Architecture™

Memory ProteXion

XpandOnDemand™ Scalability

ON DEMAND BUSINESS™

IBM Differentiators

IBM eServer x445

IBM eServer x346

IBM eServer BladeCenter

IBM eServer x365

IBM eServer x336

Comprehensive Portfolio

IBM eServer x206

IntelliStation

Hardware Design Innovation

XEON

ITANIUM 2

POWER

AMD Opteron

ON DEMAND BUSINESS

IBM Differentiators

SMB Express Offerings

IBM eServer BladeCenter

Cluster 1350

Solution Enablement

Virtualization Engine

Comprehensive Portfolio

on demand

Hardware Design Innovation

Grids

ON DEMAND BUSINESS

IBM Differentiators

IBM Global Financing

IBM Global Services

IBM **CDAT**

Business Partner

Quality IBM
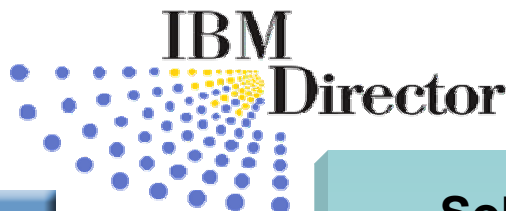
Client Experience

Solution Enablement

Comprehensive Portfolio

Hardware Design Innovation

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IBM Differentiators

Hardware Design Innovation

Xtended Design Architecture

Enterprise X-Architecture™

Leadership time to market

Comprehensive Portfolio

intel inside XEON.

POWER

intel inside pentium 4

intel inside ITANIUM 2

AMD Opteron

Client Experience

IBM Business Partner

Quality IBM
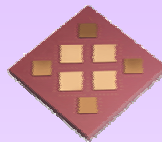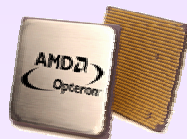
CDAT Consolidation

IBM Global Services

IBM Global Financing

Team IBM

Solution Enablement

BladeCenter

Cluster 1350

IBM Director

Virtualization Engine

Linux

SMB Express Offerings

On Demand

Grid

Comprehensive Ecosystem

ON DEMAND BUSINESS

IBM eServer Industry-Standard Portfolio: August 2, 2004

eServer xSeries

eServer

Enterprise Scale Up Servers
2-way to 16-way SMP

xSeries 445

xSeries 455

Scale Out Rack Optimized Servers
Uni to 4-way SMP
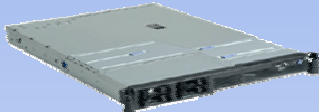
xSeries 382

xSeries 336

xSeries 365

xSeries 343
NEBs Solution

xSeries 306

xSeries 346

Distributed Tower Servers
Uni to 4-way SMP

xSeries 236

xSeries 255

xSeries 226

xSeries 206

IBM Director 4.2

Enterprise Scale Out Offerings
Uni to 4-way nodes, scalable clustering

eServer BladeCenter

eServer 325

IBM eServer Cluster 1350

IntelliStation Workstations
Uni to 2-way SMP 2D - 3D Graphics

A Pro

M Pro

Z Pro

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Market Trends
Inflection point for Intel server segment

1. **Market migration to 64-bit extensions**

2. **Performance far exceeds previous offerings**

3. **ROI pressures while IT demands increase**

4. **Intel servers proliferating throughout the enterprise**

5. **Power and thermal challenges in datacenters**

6. **Increasing clustered and scale out solutions**

Over time, the market has progressed as new technologies evolved. Business, and the way we do business, are also changing.

These changes present unique new challenges ... and opportunities.

Converting challenges into opportunities requires a trusted partner with experience, insight and a commitment to work with you for your business advantage.

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Client Needs Drive IBM Offerings

- **IBM extends capabilities of commoditized industry standard components**

- **IBM's technology innovation builds upon extensive heritage and the greatest 64-bit experience**

- **IBM client insight delivers business-focused solutions**

- **IBM offers an optimal combination of key features**

Performance	Availability	Manageability	Flexibility
▪ 64-bit extensions ▪ Enhanced memory expansion ▪ Faster I/O ▪ External app scalability	▪ Integrated RAID ▪ Memory mirroring and on-line spare ▪ Redundant & hot swap components ▪ Calibrated Vectored Cooling™	▪ Visible alerts ▪ Remote mgmt ▪ Quick serviceability ▪ Rapid deployment ▪ Mgmt tools	▪ Internal scalability ▪ Choice of 32- or 64-bit perf ▪ Modular server & storage solutions ▪ OS choices

Technology Leadership   **Client Insight**

Industry Standards

ON DEMAND BUSINESS™

IBM Delivers Xtended Design Architecture

- **Xtended Design Architecture combines these elements, providing our clients with competitive advantages**

Xtended Design Architecture for Business Advantage

Performance	Availability	Manageability	Flexibility
▪64-bit extensions	▪Integrated RAID	▪Visible alerts	▪Internal scalability
▪Enhanced memory expansion	▪Memory mirroring and on-line spare	▪Remote mgmt	▪Choice of 32- or 64-bit perf
▪Faster I/O	▪Redundant & hot swap components	▪Quick serviceability	▪Modular server & storage solutions
▪External app scalability	▪Calibrated Vectored Cooling™	▪Rapid deployment	▪OS choices
		▪Mgmt tools	

Technology Leadership   Client Insight

Industry Standards

ON DEMAND BUSINESS

The Formula for Business Advantage

- Optimized workloads
- Higher throughput

- Confidence
- Business continuity

- Lower cost of computing
- Less complexity
- Increased IT productivity

- Infrastructure simplification
- Pay as you grow
- Investment protection

Xtended Design Architecture for Business Advantage

Performance
- 64-bit extensions
- Enhanced memory expansion
- Faster I/O
- External app scalability

Availability
- Integrated RAID
- Memory mirroring and on-line spare
- Redundant & hot swap components
- Calibrated Vectored Cooling™

Manageability
- Visible alerts
- Remote mgmt
- Quick serviceability
- Rapid deployment
- Mgmt tools

Flexibility
- Internal scalability
- Choice of 32- or 64-bit perf
- Modular server & storage solutions
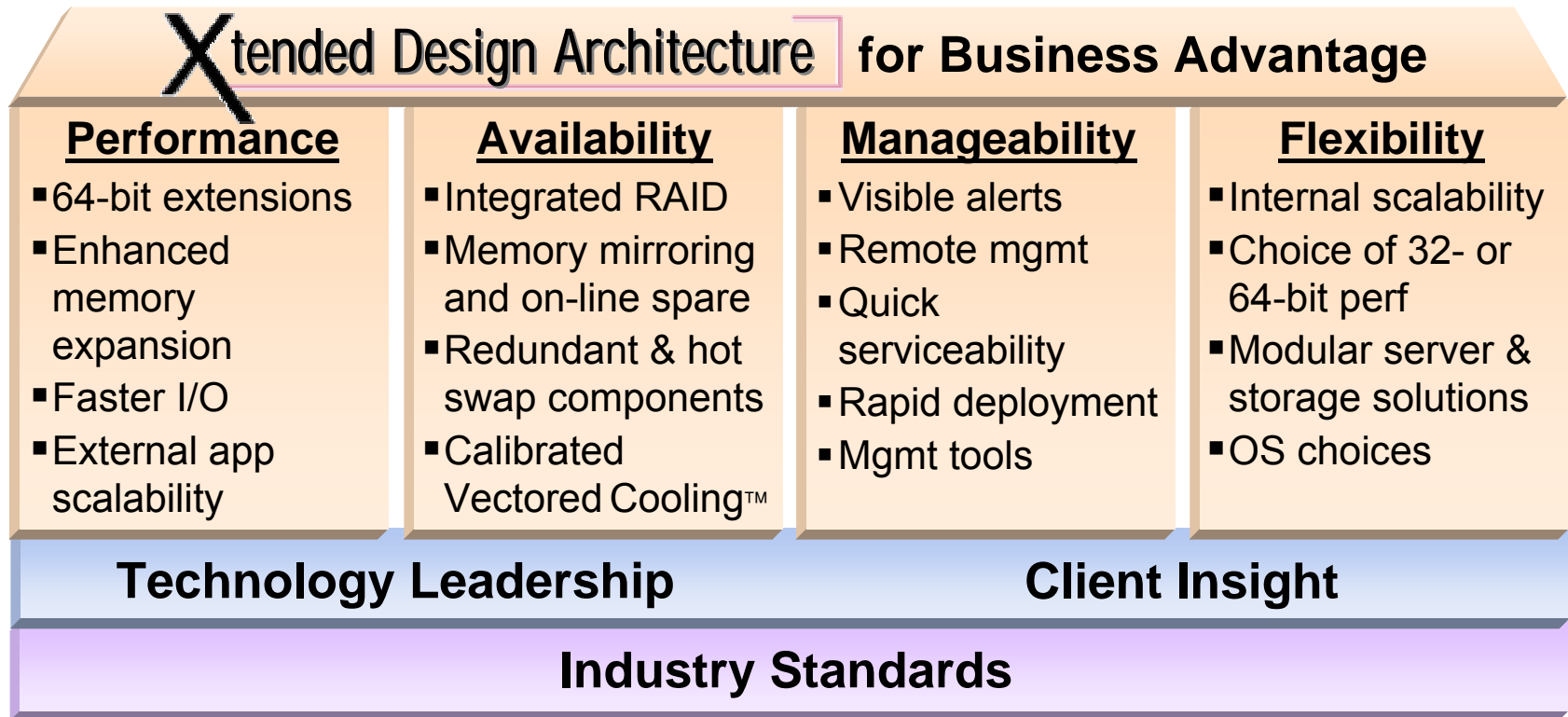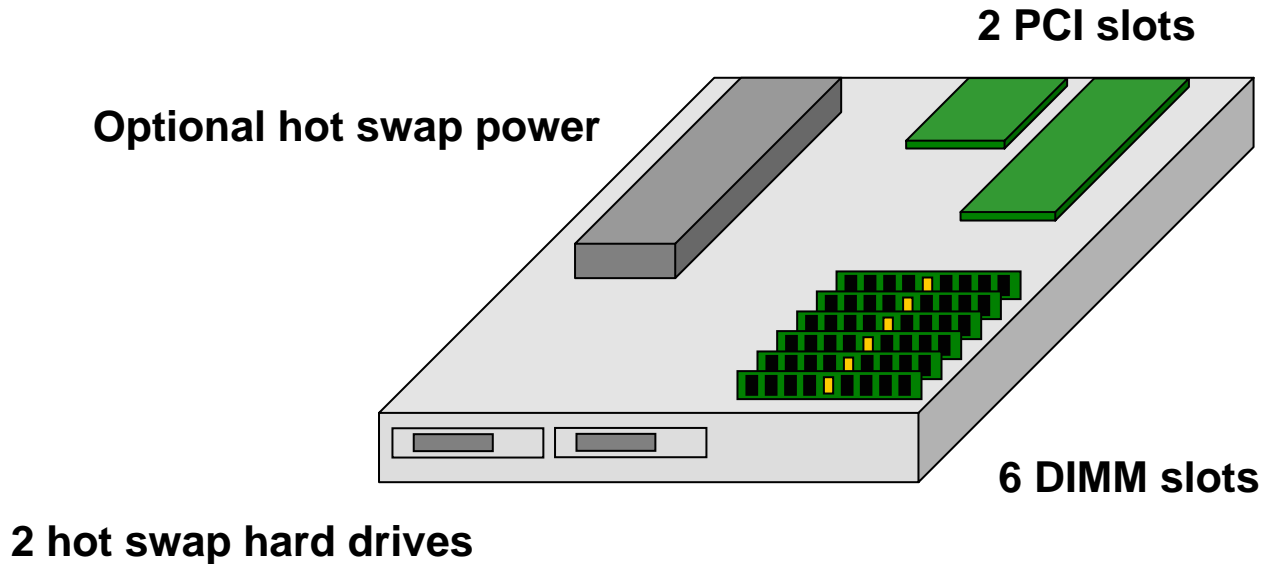- OS choices

Technology Leadership   **Client Insight**

Industry Standards

ON DEMAND BUSINESS™

Industry Standard 1U, 2-way Server
Scalability, Performance and Availability Features Limited by Thermal Envelope

2 PCI slots

Optional hot swap power

6 DIMM slots

2 hot swap hard drives

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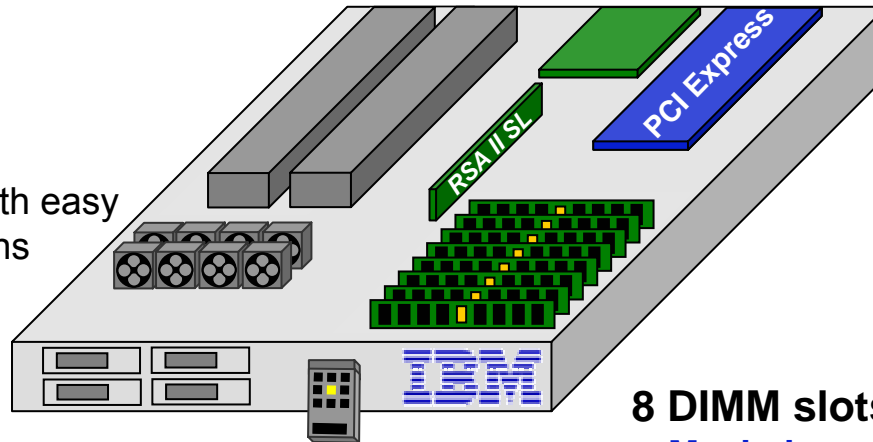
Xtended Design Architecture at Work

x336 high availability, high performance application server enabled by Calibrated Vectored Cooling™

Optional hot swap power
- **Maximize uptime** with rear access hot swap power for easy upgrades

2 PCI slots
- **Increase performance** with optional PCI-Express

Hot swap fans
- **Maximize uptime** with easy access redundant fans

Optional RSA II SlimLine
- **Preserve full PCI expandability and improve mgmt** with optional integrated systems mgmt controller
- IBM Director ships standard with every system

Up to 4 hot swap HDDs
- **Higher availability** with RAID 5 plus hot spare
- **Additional flexibility** with support for SCSI or SATA
- **Better performance** with more spindles

Drop down light path
- **Improves** in-rack manageability
- **Improve** uptime

8 DIMM slots
- **Maximize performance** with max memory
- **Maximum investment protection** by upgrading without parts on the floor
- **Higher availability**: protect more memory with mirroring and hot-spare
- **Save money** by using less expensive 2GB DIMMs to get to maximum memory

Labels in diagram: PCI Express, RSA II SL, IBM

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Replacing Fixed Drive the Industry Standard Way
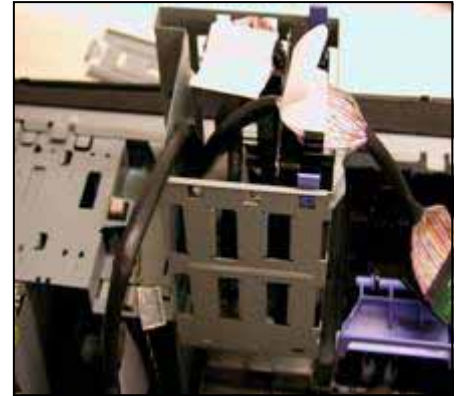
- **Remove cover to access drive (how long will this server be down?)**
- **Isolate drive and remove cabling (watch those wires!)**
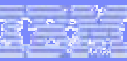- **Unscrew drive tray (bring your toolkit!)**

Xtended Design Architecture at Work

IBM eServer xSeries Servers with Simple Swap SATA Drives

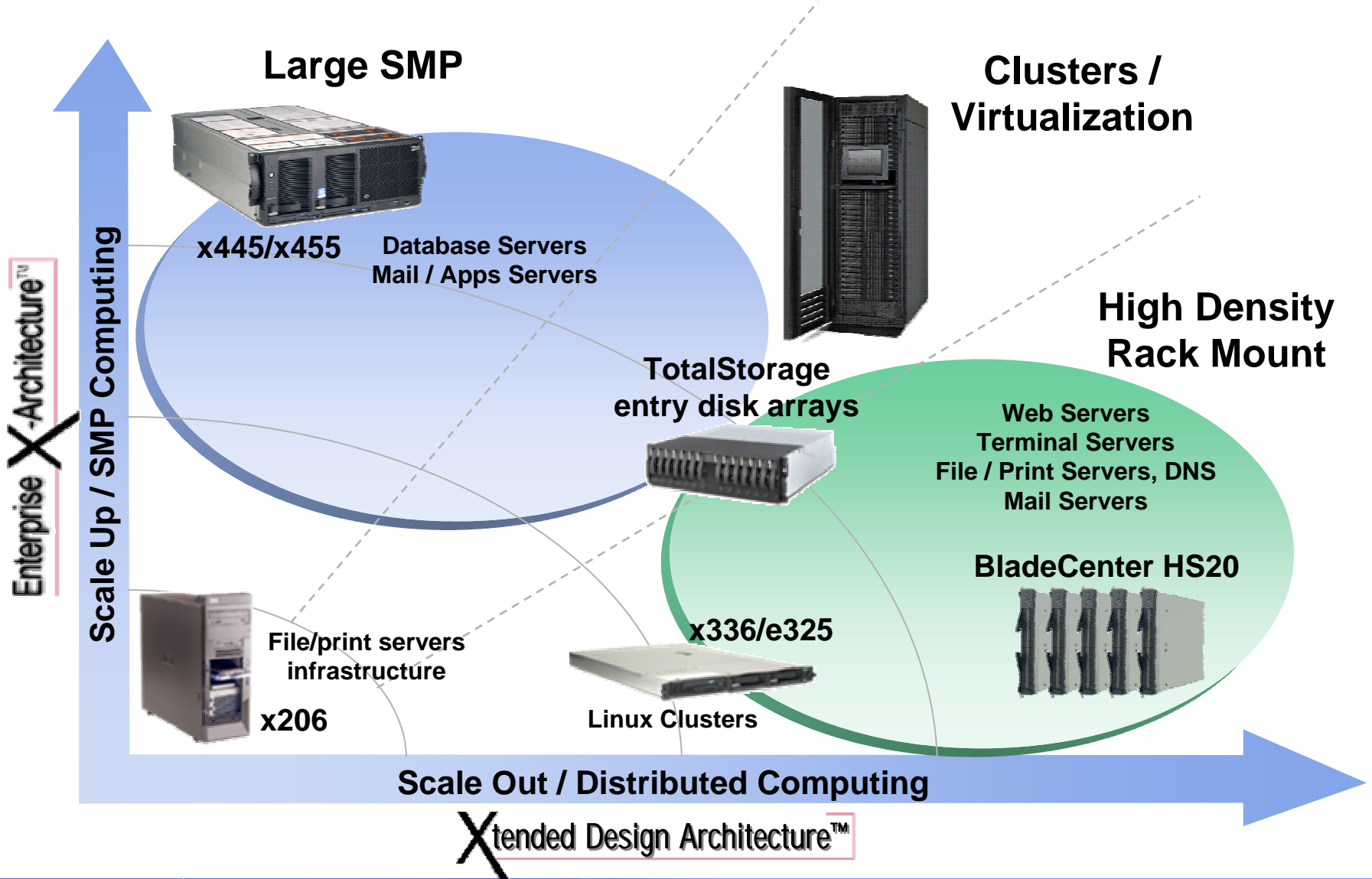**Remove front panel and security bar and slide out drive**
- **Increased uptime**
- **Easy, tool-free upgrades and serviceability**

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IBM eServer xSeries Portfolio

Large SMP

Clusters / Virtualization

High Density Rack Mount

Enterprise X-Architecture™

Scale Up / SMP Computing

x445/x455

Database Servers
Mail / Apps Servers

TotalStorage entry disk arrays

Web Servers
Terminal Servers
File / Print Servers, DNS
Mail Servers

BladeCenter HS20

File/print servers infrastructure

x206

x336/e325

Linux Clusters

Scale Out / Distributed Computing

Xtended Design Architecture™

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IBM Director Overview
Simply Smart Tools to Make IT Management Easier

- **Highlights**
  - ► Award-winning workgroup manager
  - ► Integrated suite of tools for consistent, single point of management
  - ► Automates IT tasks such as hardware detection / configuration, monitoring / alerting, maintenance / updates, and software deployment
  - ► Enables seamless upward integration into enterprise management products (ie. Tivoli, OpenView, UniCenter)

- **IBM Director 4.2 Enhancements**
  - ► Platform for cross-series management capabilities in the IBM Virtualization Engine
  - ► Expanded Linux support including system health
  - ► Convenient built-in subscription service to simplify delivery of the most current product updates
  - ► Server Plus Pack additions to further optimize server performance and availability

"What really impresses us, though, is the excellent IBM Director network-management software that comes with the server. Director allows central IT to manage remote networks."

PC Magazine, 5/26/04

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Xtended Design Architecture | Delivers Value

Control Costs
- **Buy fewer, more powerful servers**
- **Reduce hands-on maintenance – systems are easy to buy, configure, deploy, manage and service**
- **Increase density to reduce critical floor space**

Investment Protection
- **Run existing 32-bit software faster than ever, and upgrade to 64-bit when ready – without changing servers**
- **Expand memory to increase performance**
- **Pay as you grow**

Mission Critical Confidence
- **Run business-critical applications on reliable platform**
- **Maximize uptime in distributed, unstaffed environments**
- **Protect data and operations with redundant capabilities**

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August 2 Launch Press Coverage

"Innovation matters again – and we believe that it's not just the processor, but what resides around it."
-Stuart McRae

NEWSFACTOR

"That is what a **significant portion** of the market was waiting for."
-Susan Whitney

THE WALL STREET JOURNAL.

"Advanced cooling capabilities enable IBM to add some **pretty cool stuff** to these boxes."
-Alex Yost

NetworkWorld

"Customers are looking for something **more than just a very good distribution system."**
-Susan Whitney

INVESTOR'S BUSINESS DAILY

"'It's tough to know how any vendor can innovate on products like this that have such extremely thin margins.' **If anyone can do, though, it's IBM."**
-Charles King, Sageza

TechWeb

"IBM will … differentiate the systems with mainframe- style capabilities packaged under the name **Xtended Design Architecture."**

eWEEK

"commoditization for Intel servers is over, creating **new opportunities** for server vendors to garner more market share."

internet.com

ON DEMAND BUSINESS

Practical Innovation.

Critical Business.

Virtual Future.