IBM eServer™ iSeries™

IBM ~ ® i5 and i5/OS™ V5R3

About this presentation

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What types of things does the future hold?

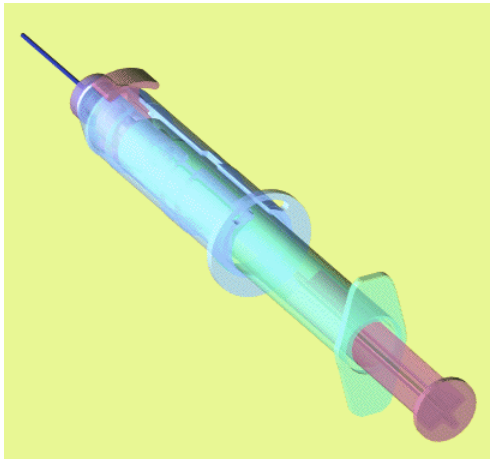
Possible Prominent Technologies for 2005

Top strategic technologies for 2005

By *Dan Farber*, Tech Update
April 22, 2004

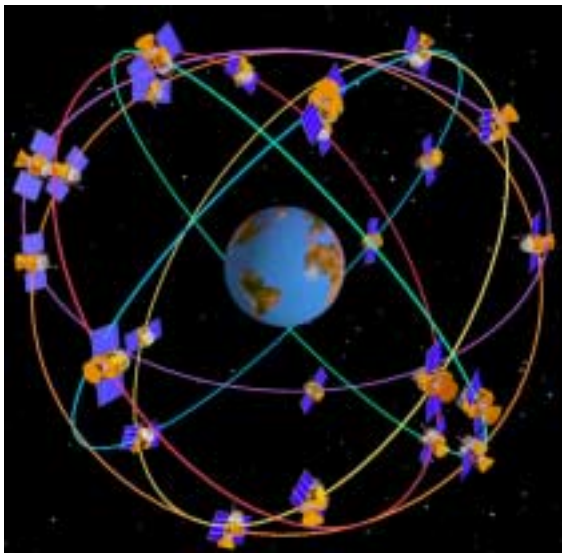
CIOs and other IT executives are faced with a broad array of technologies that could have a material impact on competitiveness and the bottom line. Determining which new or existing technologies align with the business goals and are ripe for exploitation can be a difficult undertaking. As a starting point, Gartner has selected ten top strategic technologies for 2005.

What do these have in common?



RFID

GPS



Security, Access, Awareness, Privacy, Shopping

Under-the-skin ID chips move toward U.S. hospitals

By Michael Kanellos
CNET News.com
July 27, 2004, 12:47 PM PT
URL: http://zdnet.com.com/2100-1103-5285815.html

VeriChip, the company that makes radio frequency identification--RFID--tags for humans, has moved one step closer to getting its technology into hospitals.

The Federal Drug Administration issued a ruling Tuesday that essentially begins a final review process that will determine whether hospitals can use RFID systems from the Palm Beach, Fla.-based company to identify patients and/or permit relevant hospital staff to access medical records, said Angela Fulcher, vice president of marketing and sales at VeriChip.

VeriChip sells 11-millimeter RFID tags that get implanted in the fatty tissue below the right tricep. When near one of Verichip's scanners, the chip wakes up and radios an ID number to the scanner. If the number matches an ID number in a database, a person with the chip under his or her skin can enter a secured room or complete a financial transaction

Under-the-skin ID chips move toward U.S. hospitals

Sensors Everywhere

In 2015: sensors everywhere, computers invisible

By *Dan Farber*, Tech Update
March 30, 2004

Ten years from now, the computer as we know it today will be an anachronism, a device consigned to museums, dumpsters and garages. Instead, according to Gartner analysts, the digital information and services once delivered via conventional computers will be available through almost everything we touch-—kiosks, airplane seats, newspapers and a broad array of new devices.

At the heart of this next generation of computing is the network. It will be pervasive and personal, and you'll pay for the services that you consume, said Gartner Fellow Tom Austin during the analyst firm's Symposium/ITxpo 2004.

The amount of information, delivered by billions if not trillions of RFID sensors, or smart dust, functioning as self-organizing and managed networks, will explode, requiring an event-driven model that Gartner calls a "tera" architecture. "A tera architecture must be capable of processing terabytes of data every second," Austin said. The tera architecture combination of smart sensor networks and an event-driven data will be common in five years and pervasive within 10 years.

However, managing a world with sensors scattered about like grains of sand will require a new class of operating system that can auto-discover and organize networks, Austin said. The TinyOS, for example, is designed for very small networked sensors running low power CPUs with a few kilobytes of RAM.

In the future, sensor networks will transform businesses and supply chains, ranging from healthcare to transportation. For example, today RFID is used to track cargo on container ships, but over time sensors could be embedded in every object, monitoring temperature, vibration, spoilage and other factors that could determine the pricing of food or manufactured goods as they move from transport to warehouse to store shelves.

With the future comes a host of…..

- **Moral**
- **Ethical**
- **Privacy**
- **Security**

Questions People ask when Buying technology

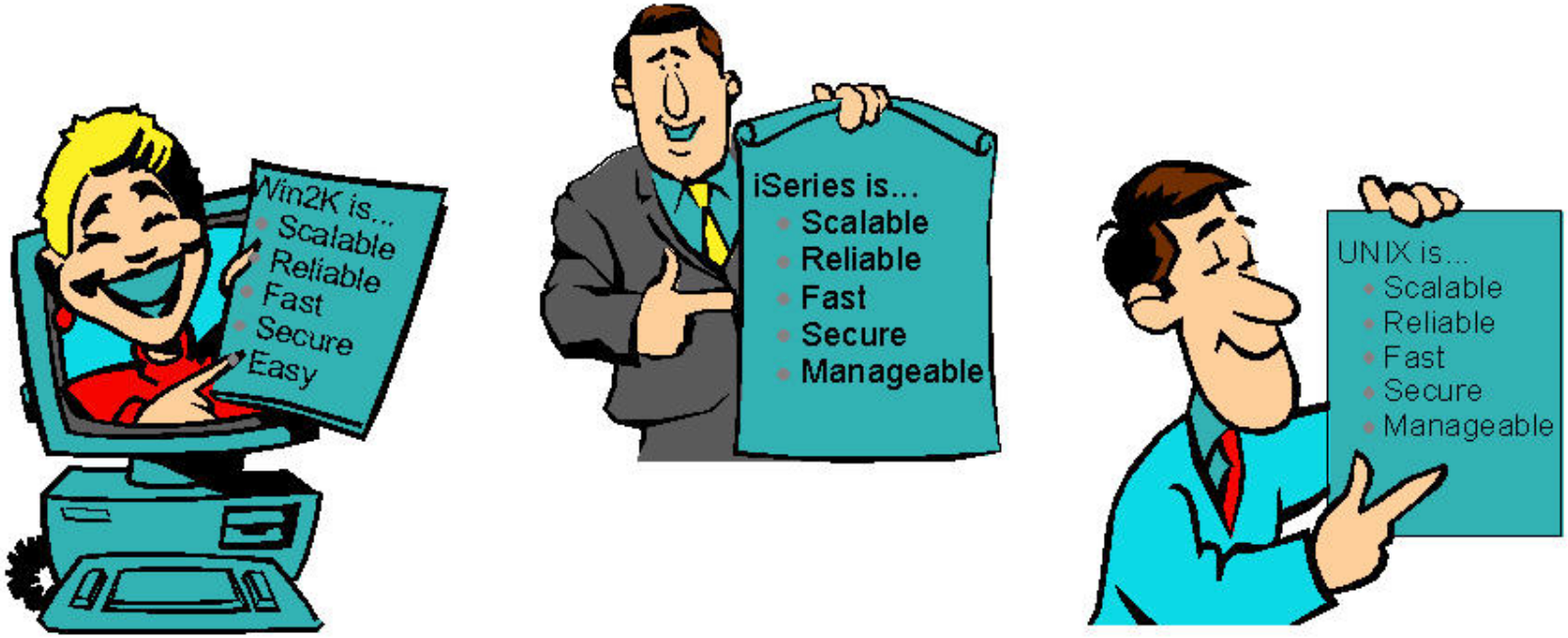
- **Will the technology be around for the long haul?**
- **Can you grow without adding staff?**
  - **Add capacity?**
  - **Add workloads?**
- **Can you count on it to be available?**
- **Can you easily accommodate new technologies?**
- **Will your information be safe?**
- **Will it be compatible with new solutions?**

How good is your crystal ball?

Who could have foreseen...

- **the "dot com" explosion?**
- **...the "dot bomb" implosion?**
- **...e-mail would become mission critical?**
- **...the rapid acceptance of Linux?**
- **...the resurgent role of mainframes?**
- **...cyberterrorists?**
- **...a wireless world?**

They all claim to be the same



Scalable? Understand the impact of adding workloads.

Reliable? Determine how it holds up under stress.

Easy to manage? Find out if it takes an army.

Fast? Ensure it performs with your business applications.

Secure? Identify the scope of protection.

eServer i5 – *"The"* Flexible Server

Solutions

BI/CRM

Lotus Domino

Web Enabled e-business

eServer i5 Business Solutions

Application Porting Consolidation / ASP

Integrated xSeries Server

PASE (UNIX) Runtime

Linux

AIX 5L v5.2 & v5.3

Interconnected for application enhancement

Enablers

Security
- Kerberos
- Passphrase
- Certificates
- Virtual Private Networks
- Integrated SSL
- Hardware Cryptography

Database
- DB2 UDB
- JDBC Interoperability
- ODBC Interoperability
- XML and Text Extenders
- Net Server

Sys Mgmt
- Single System, Multi workload
- Multi system
- Management Central
- Wireless Access

Java
- Java Virtual Machine
- WebSphere
- Just In Time Compiler
- Integrated Memory Management

Cluster Support
- Independent ASPs
- Switchable Disk
- Replication
- Cluster Services

Across a scalable, secure and reliable platform

eServer i5 delivers recognized value!

- ***Over 245,000 clients*** run their businesses on an iSeries or AS/400
- ***More than 400,000*** iSeries and AS/400 servers are being used ***in over 100 countries*** around the world
- ***99% of the 2002 Fortune 100*** companies have utilized iSeries and AS/400 systems in their businesses
- **7 out of 10** of all IBM Customers have iSeries
- In 2003….

  2500+ new clients came to iSeries

  35% increase in computing power shipped

  sixth consecutive year, **iSeries was ranked *number one* in Nikkei Computer's *Customer Satisfaction* Survey**

  fifth consecutive year*, iSeries swept all midrange sub-categories and emerged as the *VARBusiness ARC winner

- **$500 Million investment over the next 2 year**

IDC Analyze the Future

LinuxWorld.com

VARBUSINESS ARC ANNUAL REPORT CARD

eServer i5 investment areas

- Innovative Technology

  Systems Management, New SOI Processors, High Speed Link OptiConnect, Switchable Disk Clusters, Fibre Channel, SAN, CoD
- Application Flexibility

  LPAR, Linux, Windows™, Domino, Application Development, AIX Applications
- New Tools to Manage e-business

  B2B Integration Framework, XML, Security, Networking, Web Serving, Database, Client Access, Java™, Printing, Extreme Support Personalized

Servers with simplicity, scalability, flexibility

Single solution to complex needs

Applications that mean business

Simplicity in an on demand world

Gartner Group on iSeries

- **“If any IBM server has benefited from the convergence of IBM’s server divisions, it’s the iSeries.”**
- **“IBM solved the issue of maintaining hardware investment in the iSeries by moving the product over to the same hardware technology as used in its pSeries Unix servers.”**
- **“The investment in the OS/400 operating system continues as strongly as ever.”**
- **“In terms of IBM’s commitment, the iSeries continues as a “safe” platform for clients to invest in for the 5-year time-span covered by Gartner’s typical forecast period (i.e., to 2008).”**

IBM eServer: Meeting Customers' Needs

- **World's most advanced technology**
  - ***3,415*** patents in 2003 – #1 in patent generation for 11th consecutive year
  - ***25,772*** patents since 1993 – surpassing the *combined* total awarded to 10 of the largest U.S.-based companies in the IT industry during the last decade

xSeries
Affordable, Linux and NT-ready servers with mainframe inspired reliability technologies

eServer p5
Most powerful, technologically advanced UNIX servers

eServer i5
Flexible, high performance integrated business servers

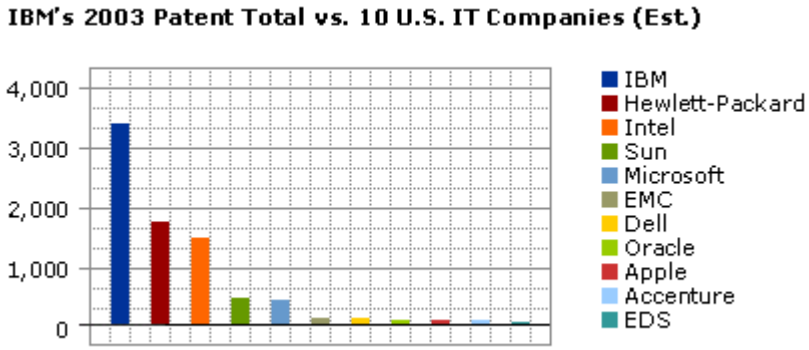
zSeries
Reliable, mission critical database & transaction servers

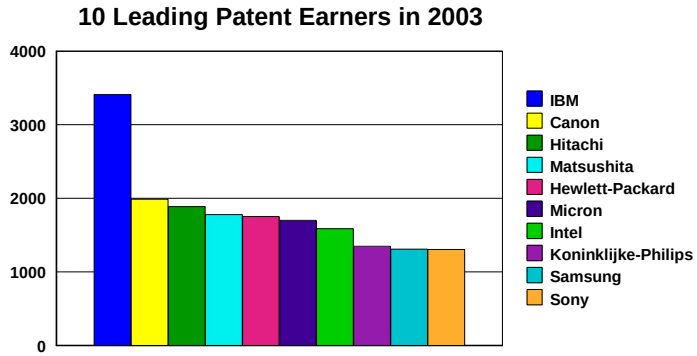
Technology

Flexibility

Integration

IBM Patents – Over A Decade of Innovation

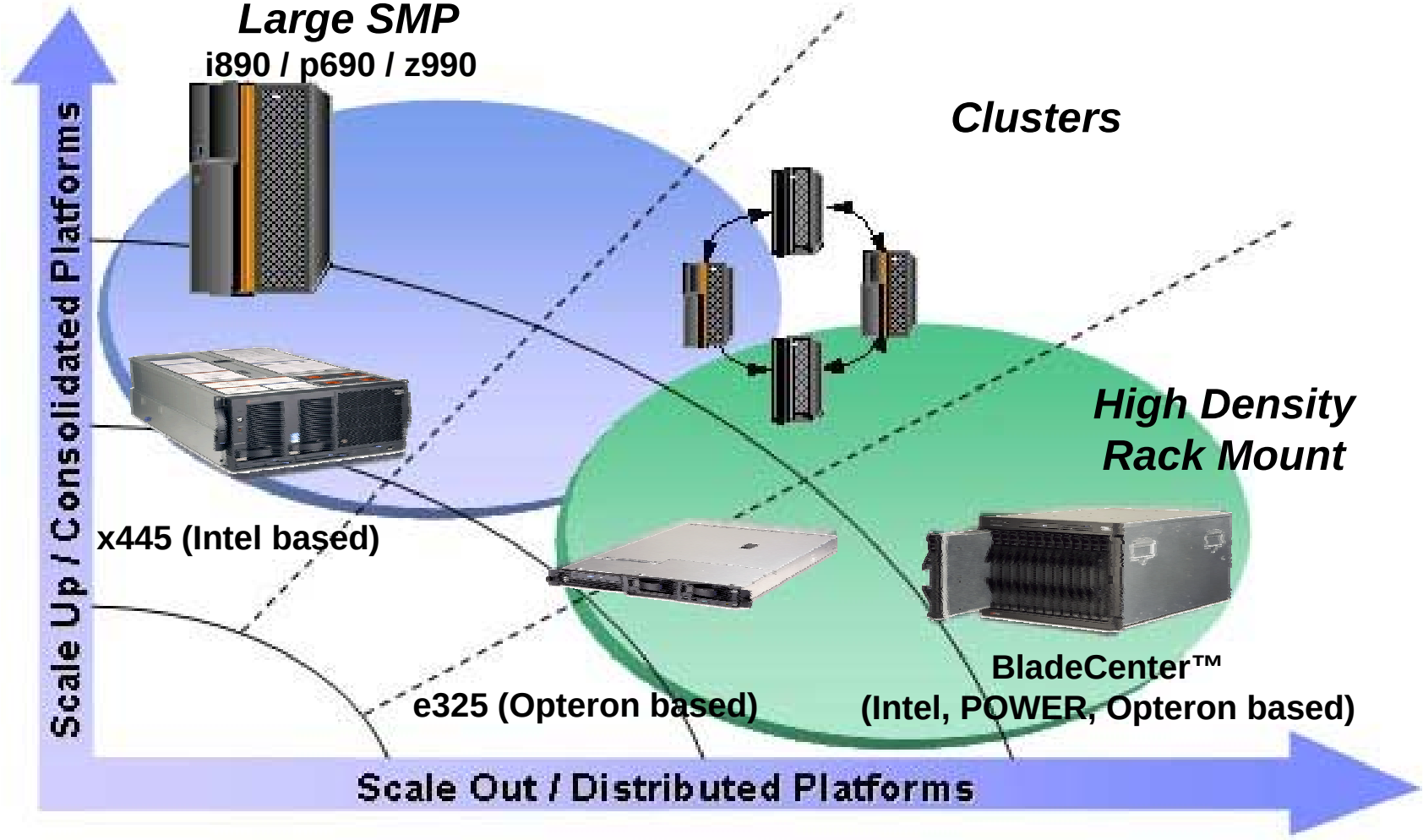




Patent facts for 2003:

- ***3,415*** patents awarded to IBM in 2003
- ***25,772*** in the last 11 years
- 11th consecutive year of patent leadership
  - 1,400 more than our nearest competitor
  - 13, 000 in the last 3 years -- 7,000 more than 2nd place
  - Average 9 patents day
- ~$11 billion in intellectual property royalties during the past decade

Flexible Growth Through Technology Innovation



IBM ^ : Innovative Technology


zSeries™


pSeries™


iSeries™


xSeries™

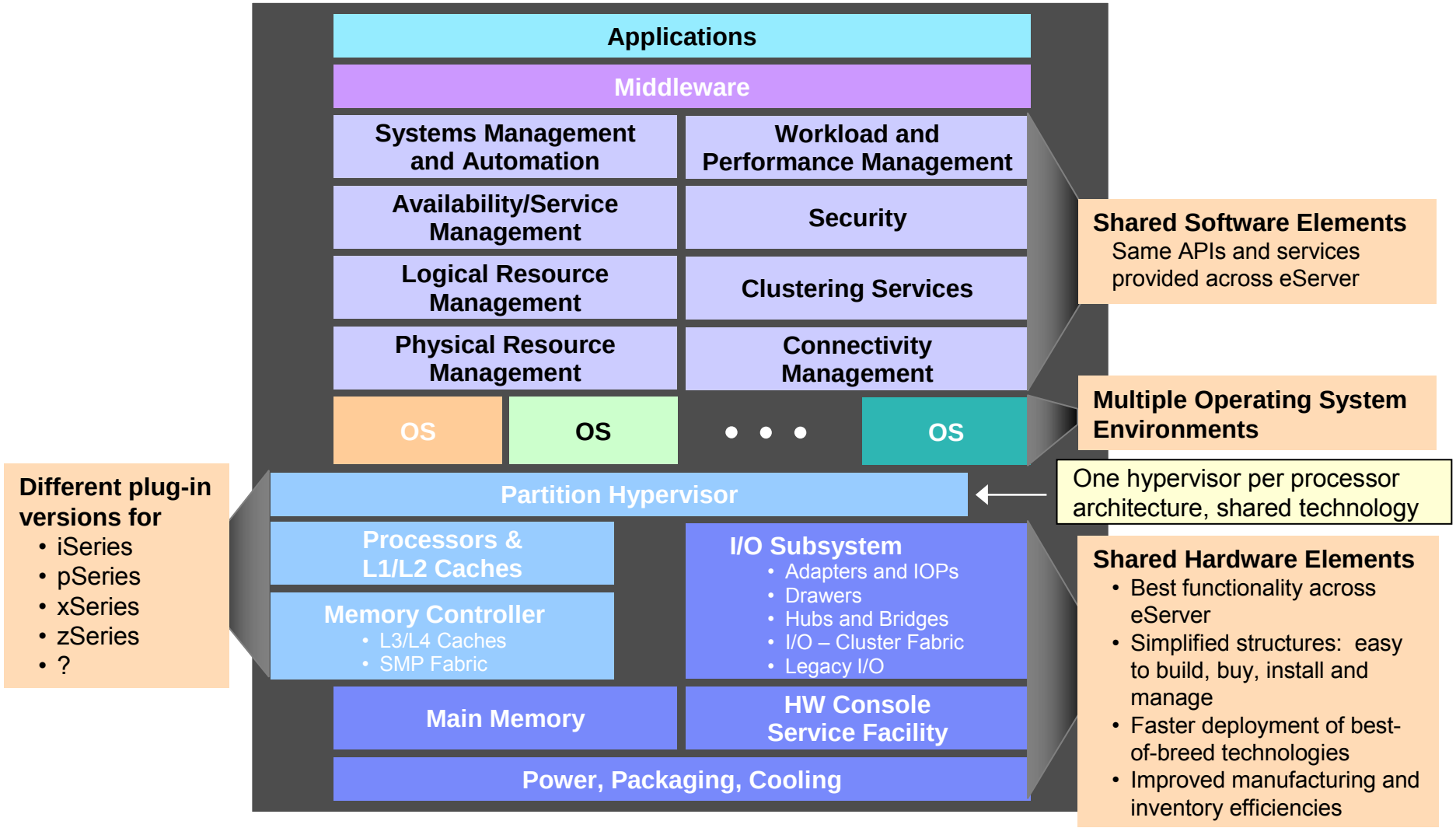

Enterprise Storage Server™

Autonomic Computing	**Workload Manager, Virtualization, Partitioning, Security, Systems Management**
Series Unique Technologies	**z/OS, AIX 5L, OS/400, Linux Operating System**
Shared Components	**Processors, I/O Power, Adapters, Hardware Console, Switches, Power/Mechanical frames**

What this means:

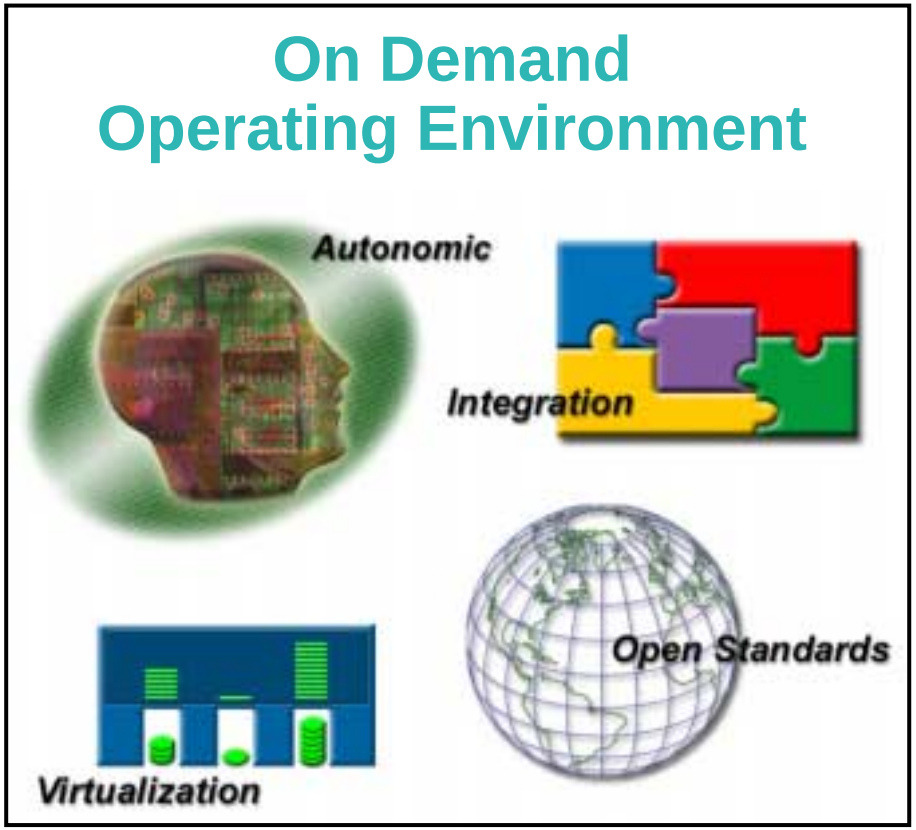
- IBM's Best Technology
- Shared Innovation
- Faster Servers
- Improved Availability
- Faster to Market
- Investment Protection

IBM eServer – Future Components

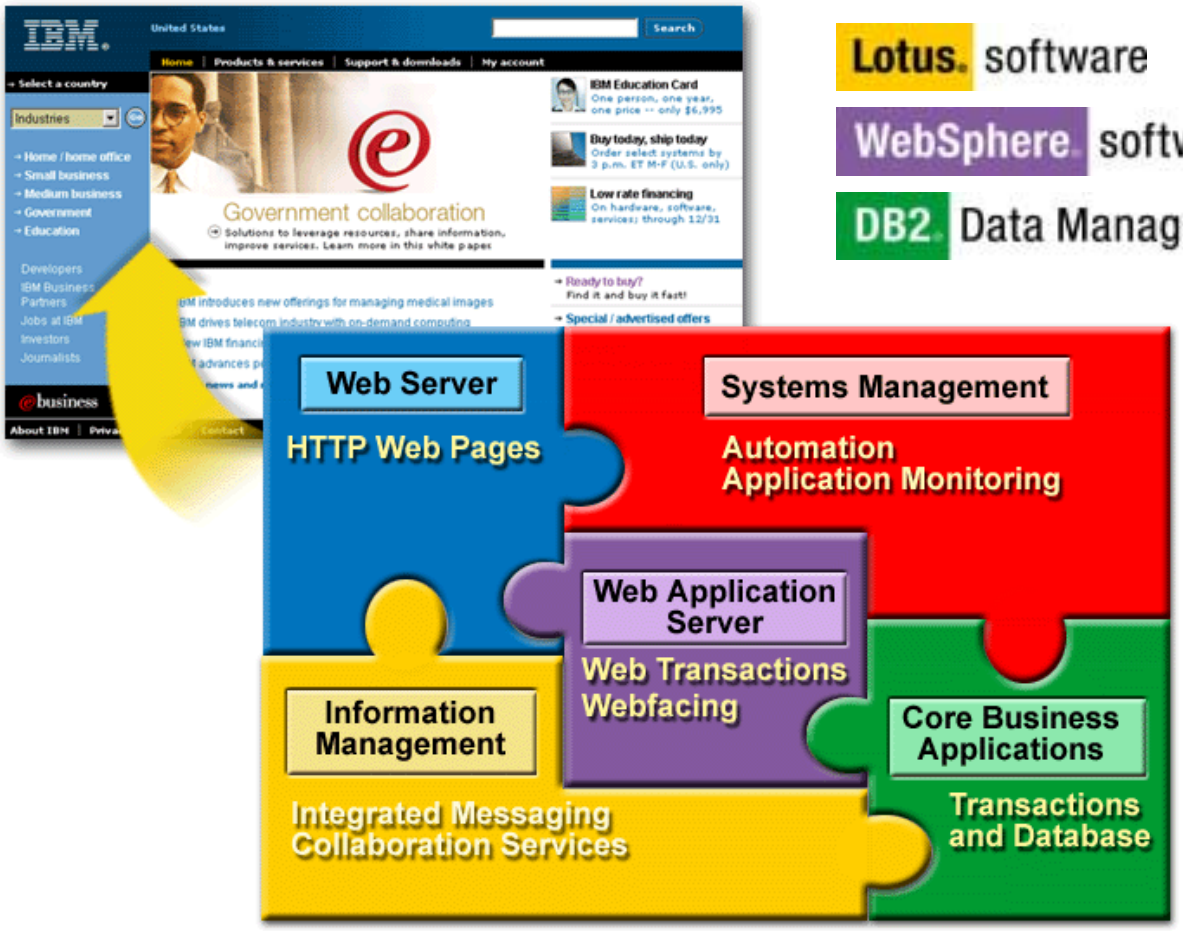


The next generation eServer i5 …
… simplicity in an on demand world

- **e-business Adoption**
  - Access
  - Enterprise integration
  - On demand
- **On Demand Businesses**
  - Responsive in real-time
  - Require variable cost structures
  - Focused on core competencies
  - Resilient to challenges



Integration: People – Process – Information

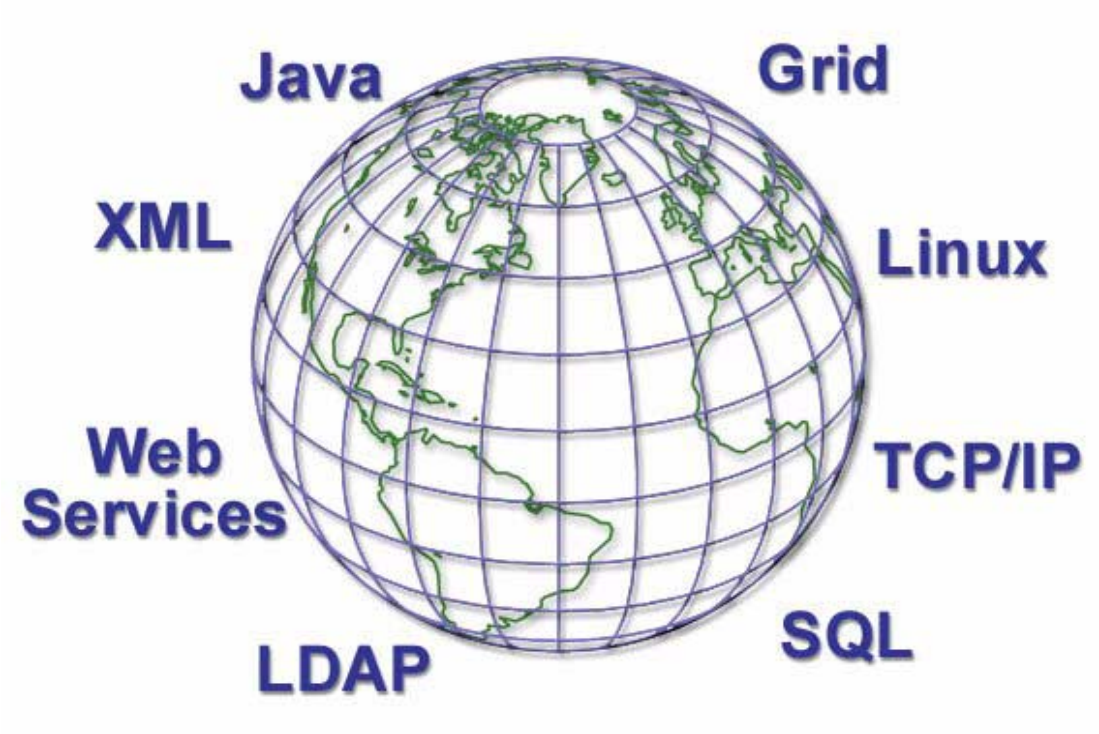


Lotus. software

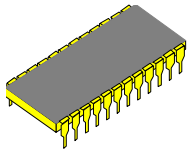
WebSphere. software

DB2. Data Management Software

Open Standards

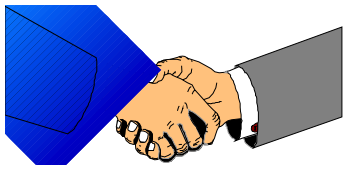


Open Systems is About...



Compatibility

Technology Independence

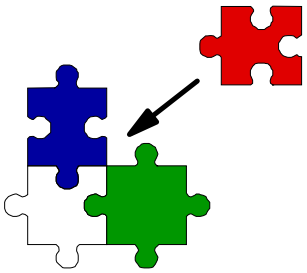


Interoperability

Work With Anything

Usability

Client of Choice

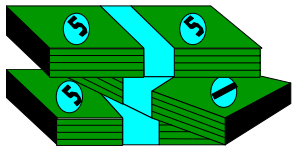


Portability

Solutions of Choice

Scalability

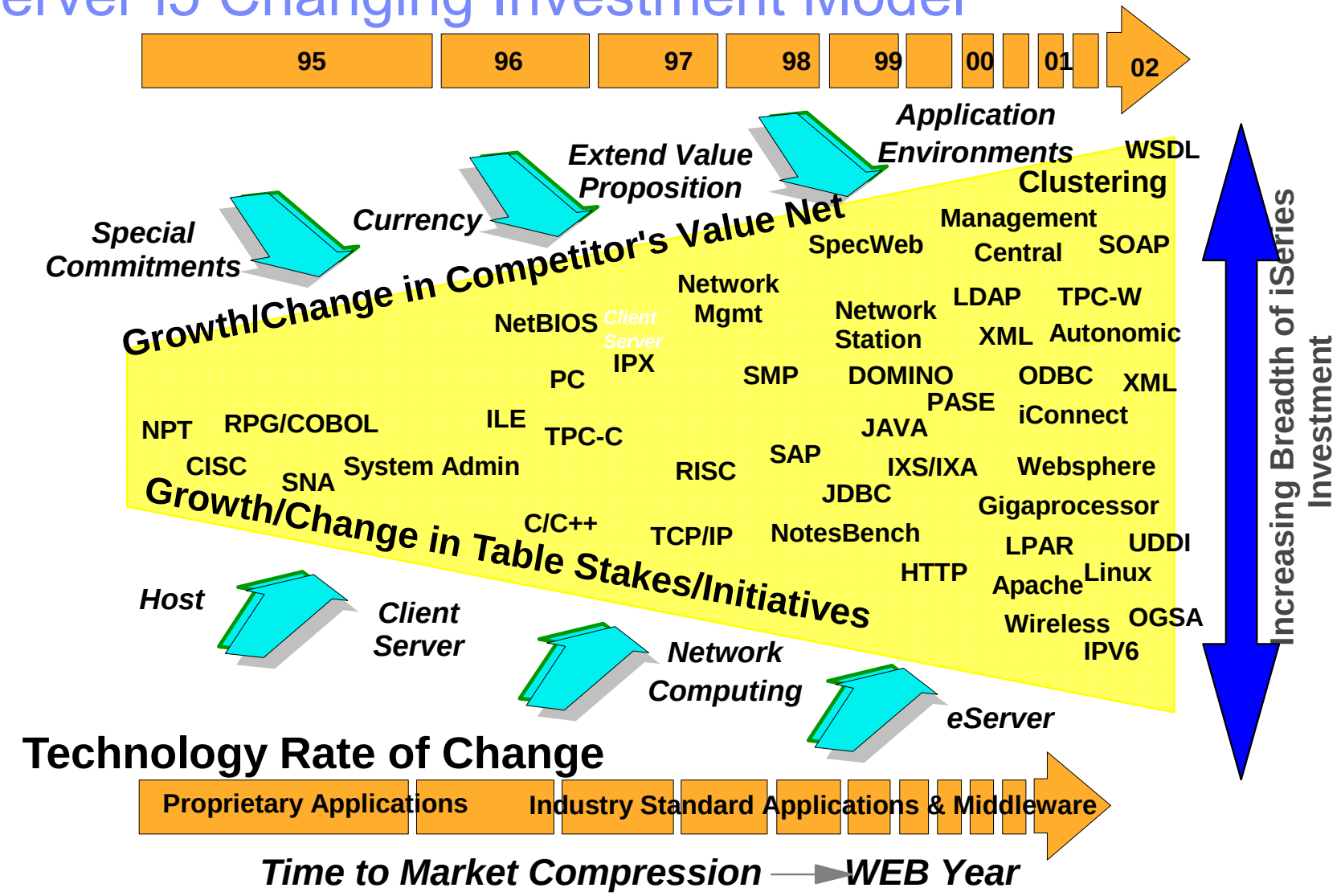
Full Range of Models



Affordability

Low Total Cost Of Ownership

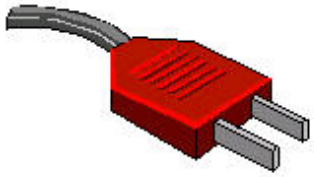
eServer i5 Changing Investment Model



eServer i5 The Freedom to Choose...

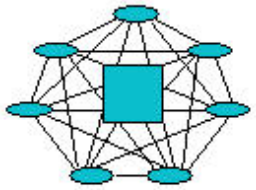
Interfaces

- Wireless LAN
- Cellular/Packet Data
- Token Ring
- Ethernet 10/100MBPS
- Twinax
- ISDN
- X.25 (SVC & PVC)
- X.25 over ISDN
- DDI - fiber or stp
- V.35
- X.21
- Async
- AppleTalk
- BSC/BSCEL
- SDDI/FDDI
- Frame Relay
- ATM
- 3270 Remote Attach
- 3270 Emulation
- ASCII Attach
- Finance Terminals
- Retail Terminals
- Programmable IOP
- Dial on demand
- IP multilink balancing
- Hardware cryptography FIPS 140-1



Protocols & Services

- TCP/IP
- UDP
- Netstat
- PING
- ARP
- FTP/Anon FTP
- NFS
- Proxy ARP
- ICMP
- SNMP
- SMTP
- HTTP, HTTPS
- SSL
- BOOTP
- SNA
- APPN/APPC
- LPR/LPD
- OSI
- IPX/SPX
- Telnet, TTY
- RJE/NJE
- AnyNet
- DCE
- POP3
- MIME
- LDAP
- MAPI
- SNA/DS
- X.400, X.500
- DNS
- DHCP
- PPP
- SLIP
- LU 0, 2, 5, 7
- Proxy Server
- Socks Server
- RIP V1 & V2
- TME
- Netfinity
- VPN
- Kerberos
- XML
- UDDI
- WSDL
- SOAP



Any System, Any Data, Anywhere

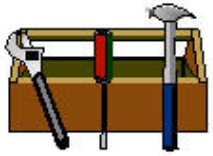
... eServer i5 The Freedom to Choose

Data Access

- SQL
  - ANSI X.3.135.1992
  - ISO 9075-1992
  - FIPS 127-2
- SQL/J
- ODBC 2.0
- ADO, OLE-DB
- RDO, DAO
- CDE (Oracle)
- IFS
- Data Queues
- File Transfer
- Client Exits
- JDBC, JNI, JNDI
- DIA. DCA
- X3.159
- X3J11/90-013
- FIPS 151-2
- Notes NSF
- Notes Pump
- Notes @db functions
- Referential integrity
- Triggers
- BLOBS
- UDF, UDT
- Datalinks
- Stored Procedures (3GL & SQL)
- Euro font, glyph & keyboard support

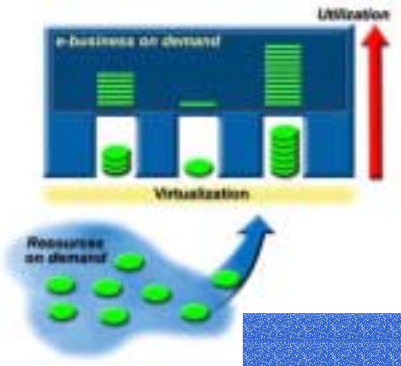
Programming Languages & Interfaces

- RPG
- RM COBOL
- ANSI COBOL
- FORTRAN
- BASIC
- PASCAL
- PL/1
- Java
- C-ANSI
- C++
- SmallTalk
- REXX
- Net.data
- CPI-C
- HTML
- DCE RPC
- BSD Sockets
- POSIX
- XPG4 Base subset
- SVR4 subset
- Single Unix Spec
- REXEC
- Persistent CGI
- Threads



Interoperability

- CORBA
- MQ Series
- DRDA 2.0
- CDE (Oracle)
- DCE
- DAL
- OSI
- DFS
- DAL
- CICS
- Tuxedo
- Windows 3.1
- Windows 95
- Windows NT
- Macintosh
- OS/2
- UNIX
- DOS

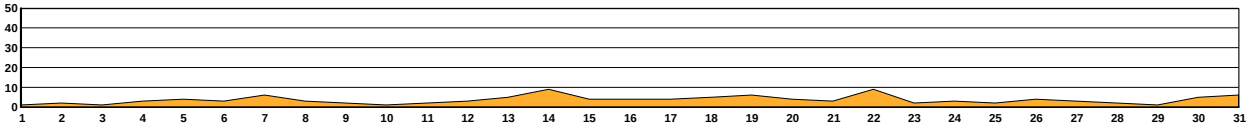


Virtualization

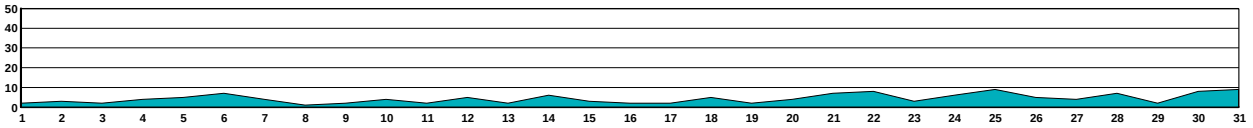
	Peak-hour Utilization	Prime-Shift Utilization	24-hour Period Utilization
Mainframes	85-100%	70%	60%
iSeries	80-98%	70%	60%
UNIX	50-70%	10-15%	<10%
Intel-based	40%	5-10%	2-5%

Consolidation Candidates

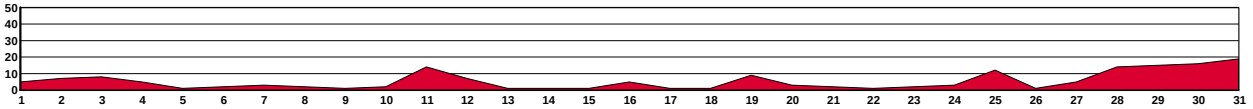
E-Mail



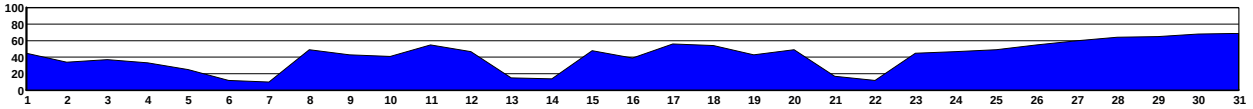
File/Print



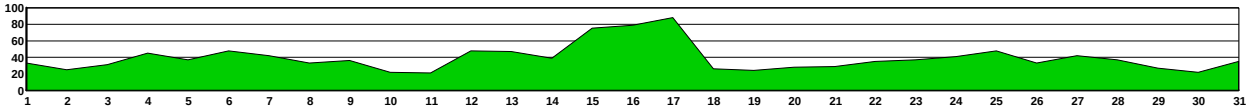
Website



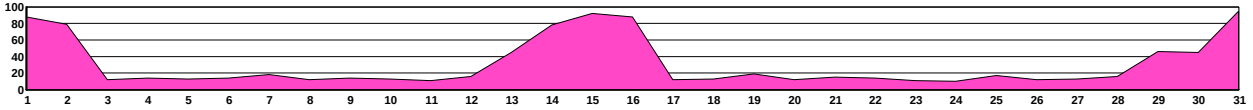
System 1



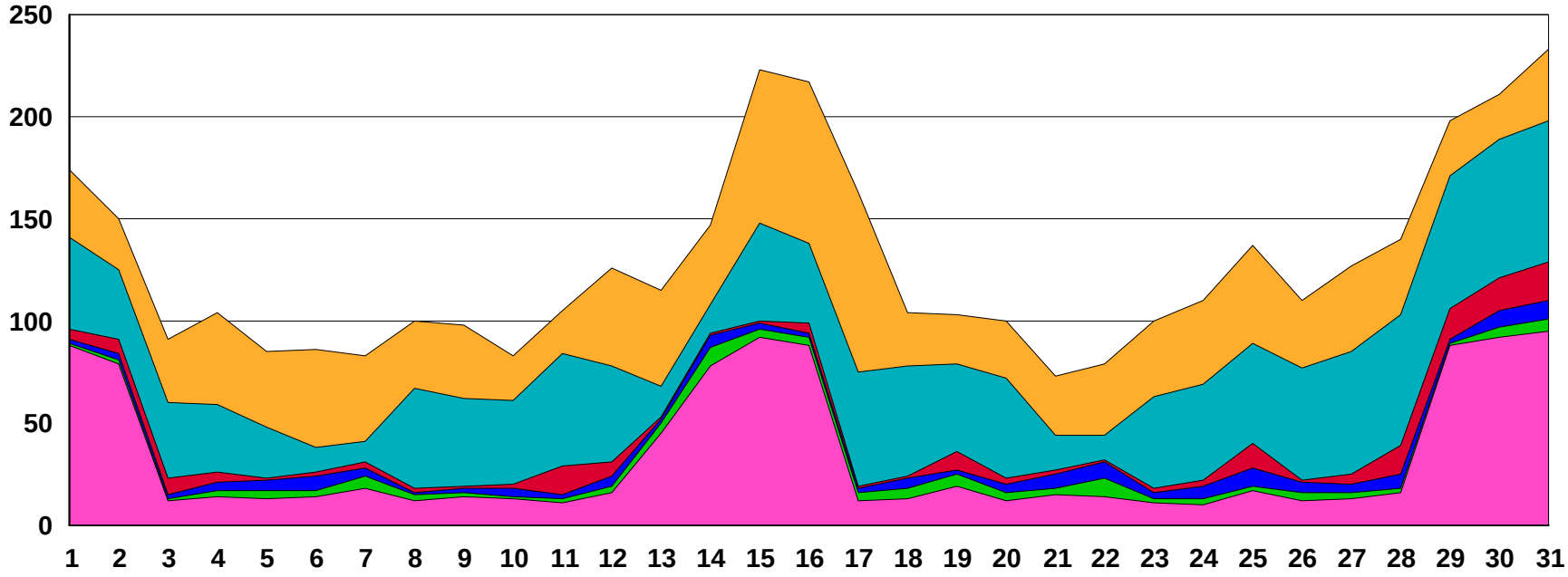
System 2



Data Warehouse

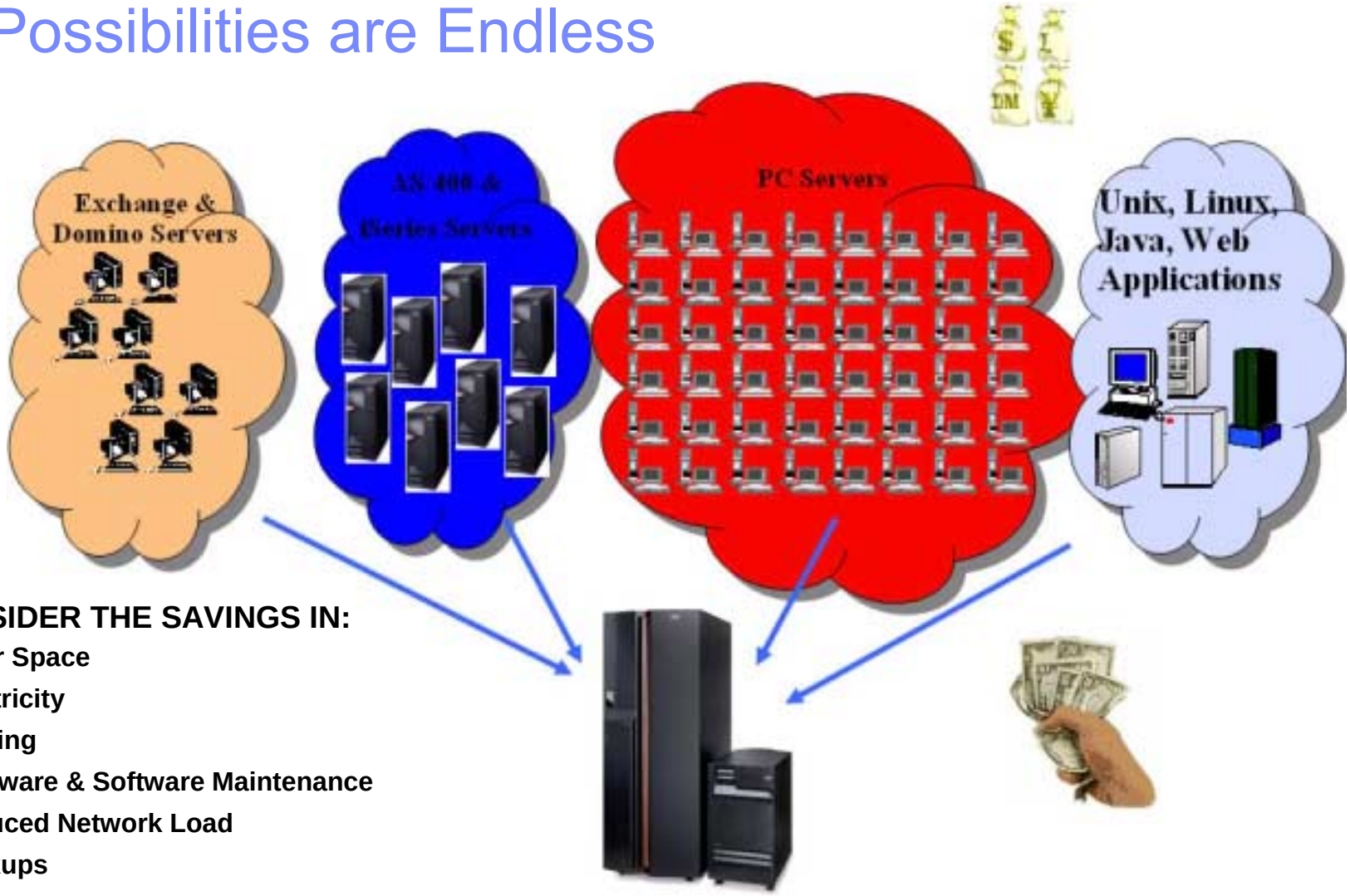


Consolidation Results



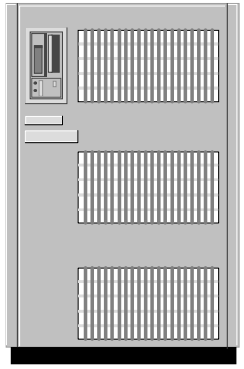
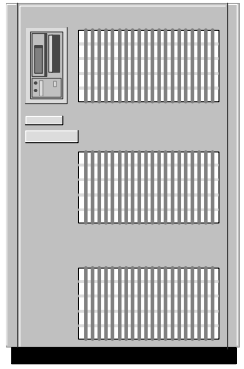
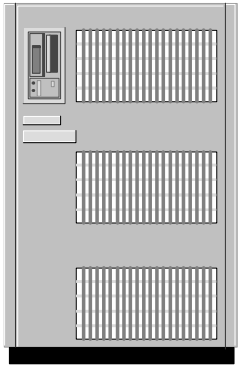
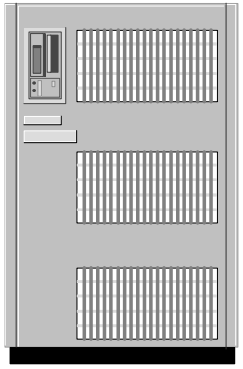
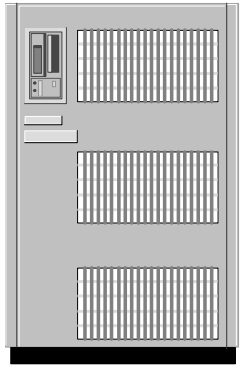
- **LPAR capabilities for workload management**
- **Temporary CUoD for peak workloads**
- **High Availability/Disaster Recovery**

The Possibilities are Endless



- **CONSIDER THE SAVINGS IN:**
  - **Floor Space**
  - **Electricity**
  - **Cooling**
  - **Hardware & Software Maintenance**
  - **Reduced Network Load**
  - **Backups**
  - **Redundant Hardware**

e-business Infrastructure Typical Components

Line of Business
- Application and Data

Web Application Server
- Extending Reach of Line of Business Applications
- Java programs

Firewall
- Protects Applications and Data

Web Server
- Serves Web Pages

External Firewall
- Protects Web Server

Can be complex to design, install, and implement

Configuration Alternatives (there are many more)

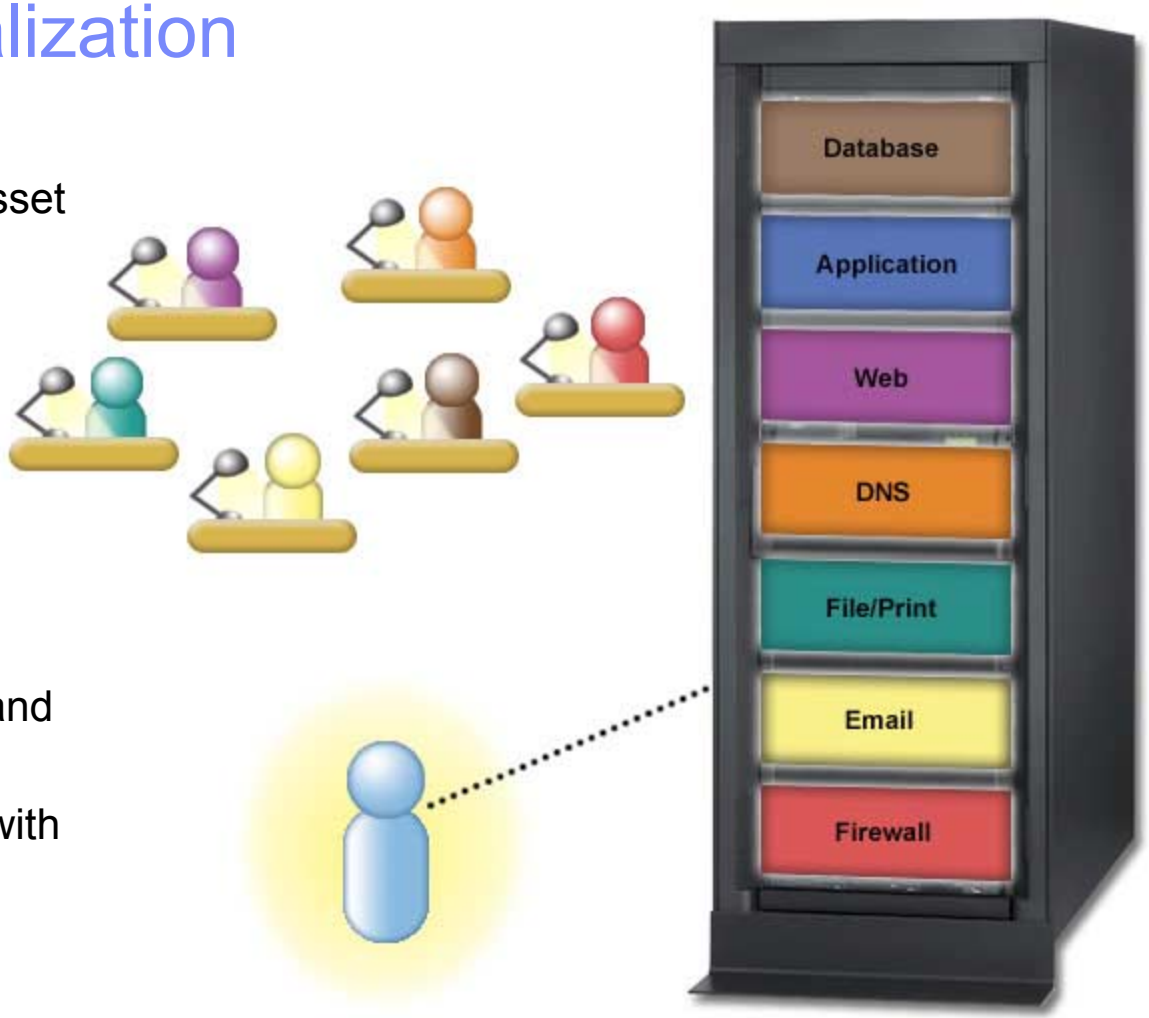
	Line of Business	WebSphere	Firewall	Web Server	Firewall
Common Infrastructure	OS/400 	Intel 	Intel 	Intel 	External 
2nd iSeries for WebSphere	OS/400 	OS/400 	Intel 	Intel 	External 
2nd OS/400 Partition for WebSphere	OS/400 	OS/400 	Intel 	Intel 	External 
Multiple OS/400 Partitions and IXS	OS/400 	OS/400 	Windows - IXS 	OS/400 	External 
3 Linux Partitions (Integrated Platform)	OS/400 	Linux 	Linux 	Linux 	External 

Integrated Platform is designed to simplify a complex process: design, order, install, config, test

- Can cut implementation time by 75%

The Value of Virtualization

- Reduce costs by increasing asset utilization
- Redeploy talent to manage your business, not your infrastructure
- Rapidly provision new servers
- Drive new levels of IT staff productivity
- Consolidate storage & backup
- Simplify server management and operations
- Communicate more securely with virtual Ethernet

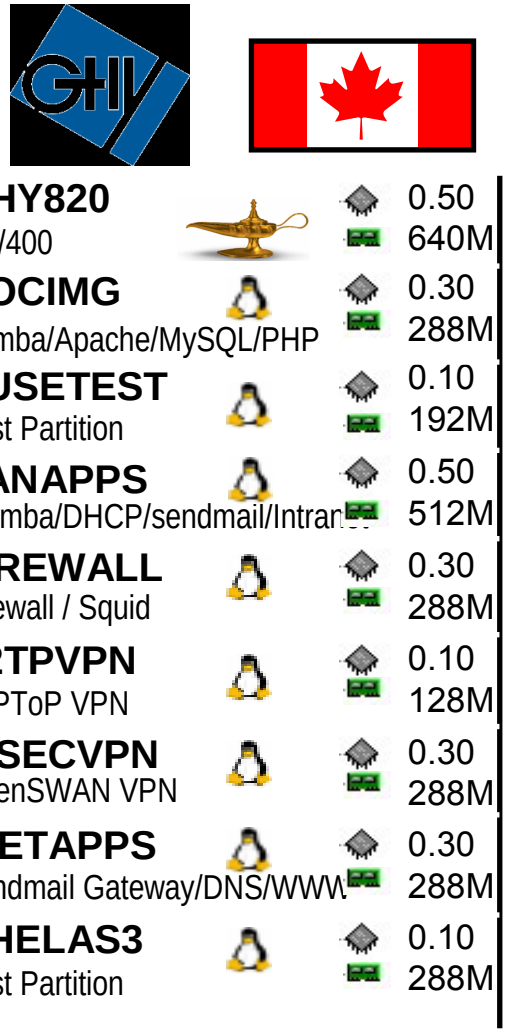


Simplify Your Infrastructure

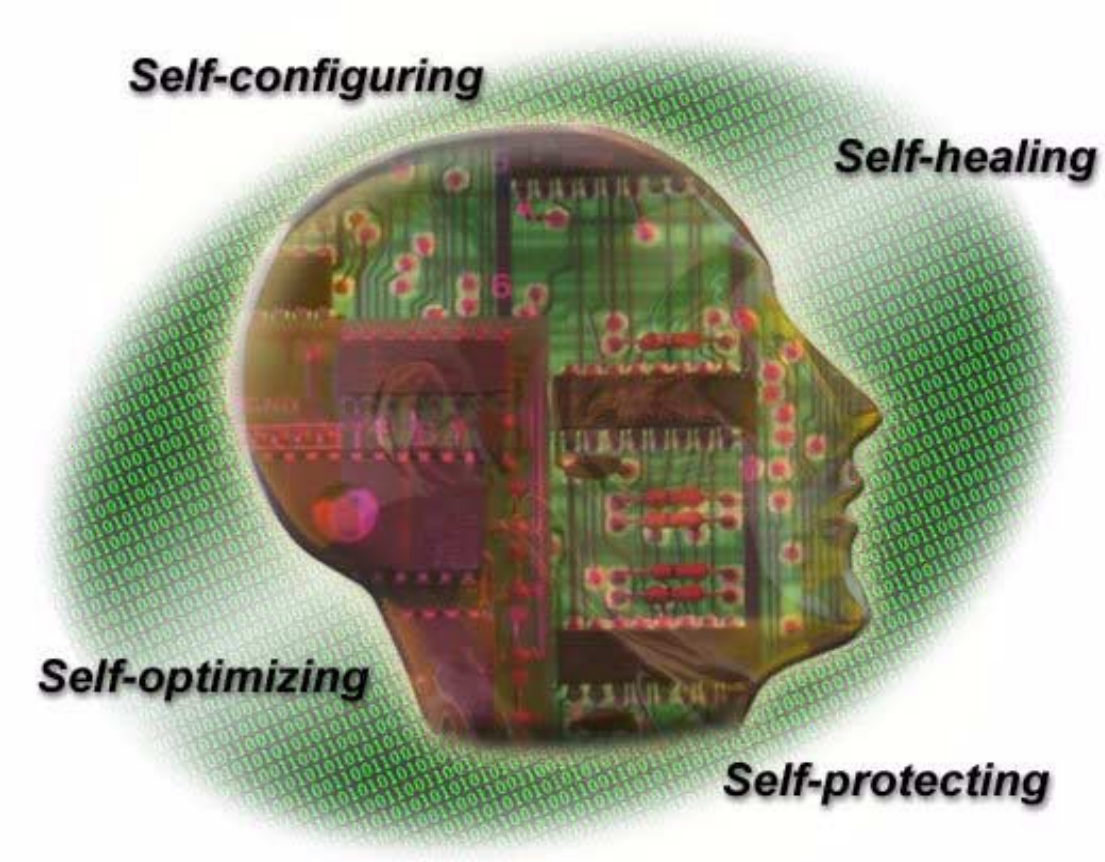
"We selected Linux on the iSeries because it was such a compelling alternative to the cost and complexity of managing nine separate Intel-based servers."

""We have taken major steps to simplify our infrastructure by leveraging virtualization technologies with POWER Linux and Integrated xSeries Solutions on the iSeries. Prior to our server consolidation we spent 95% of our time just keeping our systems and network running. Now we spend 5%."

Nigel Fortlage, VP of Information Technology, GHY International



Automation



IBM eServer i5 Announcements

- **Part 1: May 4, 2004** (GA June 11)

  Delivering the industry's first POWER5™ based servers

  Exploiting a common eServer platform with eServer p5

  Extending the vision of an on demand operating environment

  Introducing the first implementation of the IBM Virtualization Engine

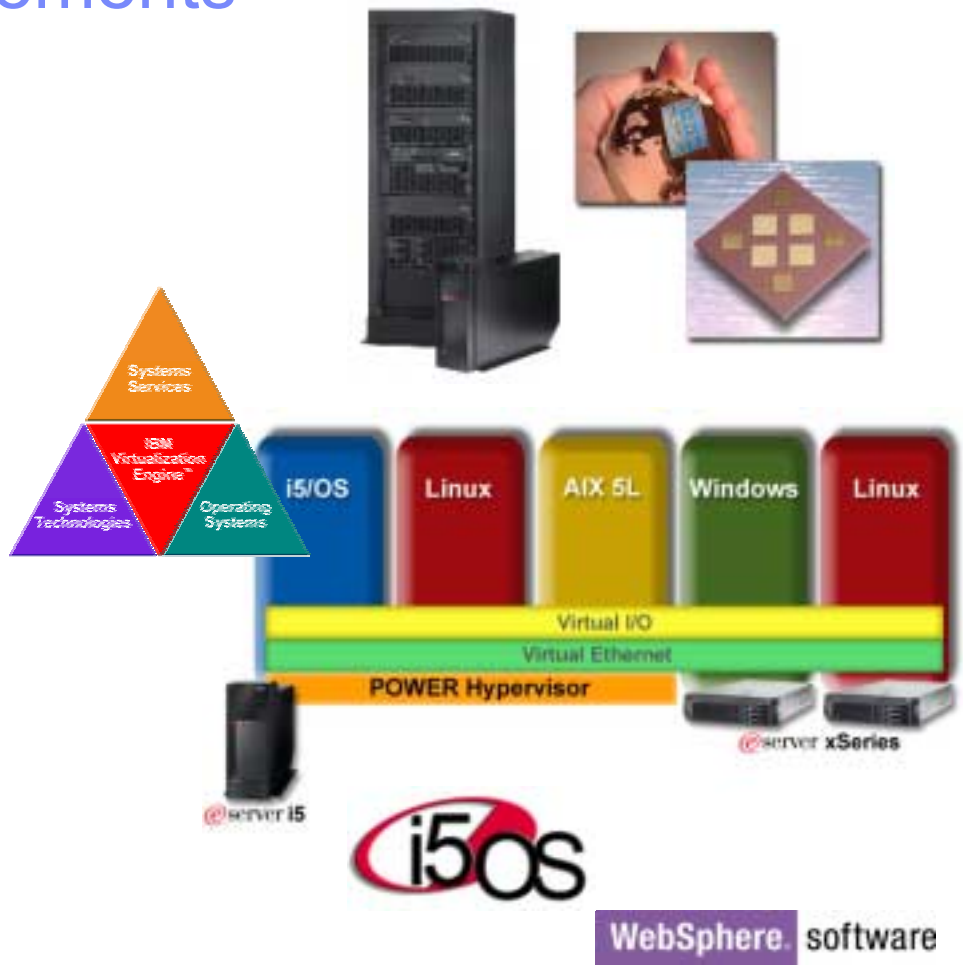
  Extending the value of open integration with i5/OS and WebSphere®

- **Part 2: July 13, 2004** (GA August 31)

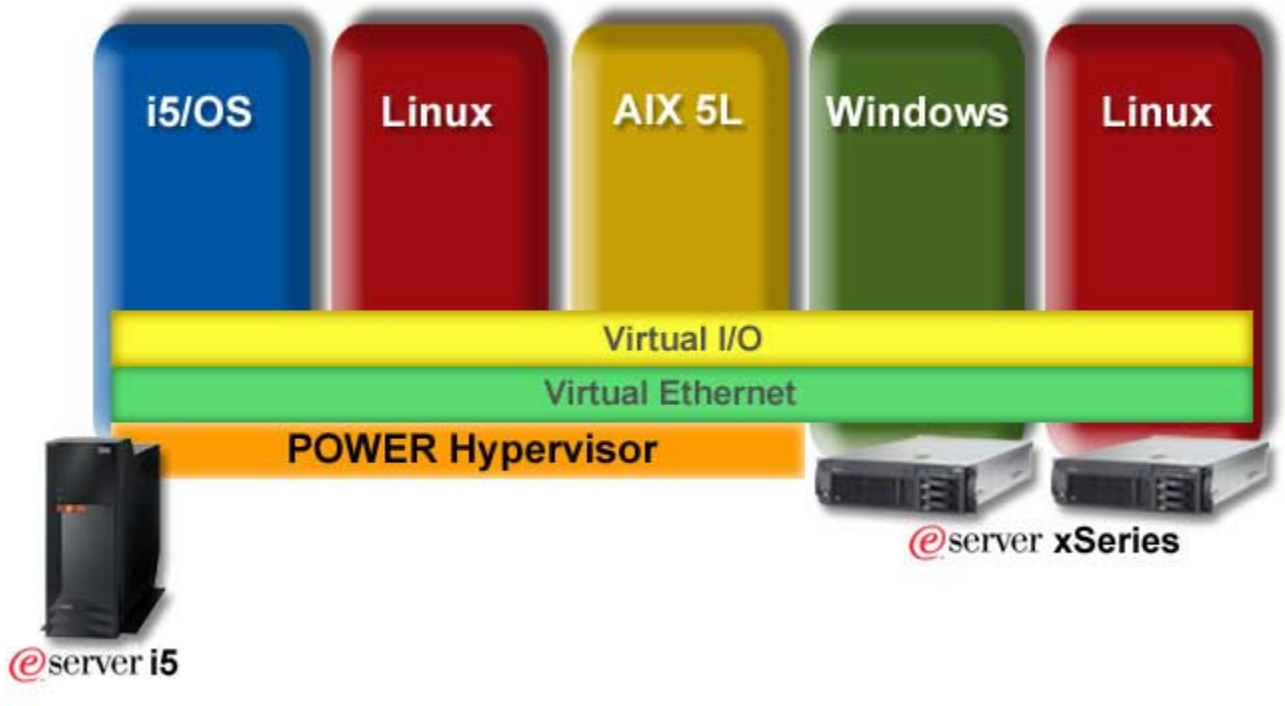
  AIX 5L™ 5.3 and Linux™

  CoD Enhancements

  POWER5 scalability with 16-way 570



IBM ~ i5 On Demand Operating Environment

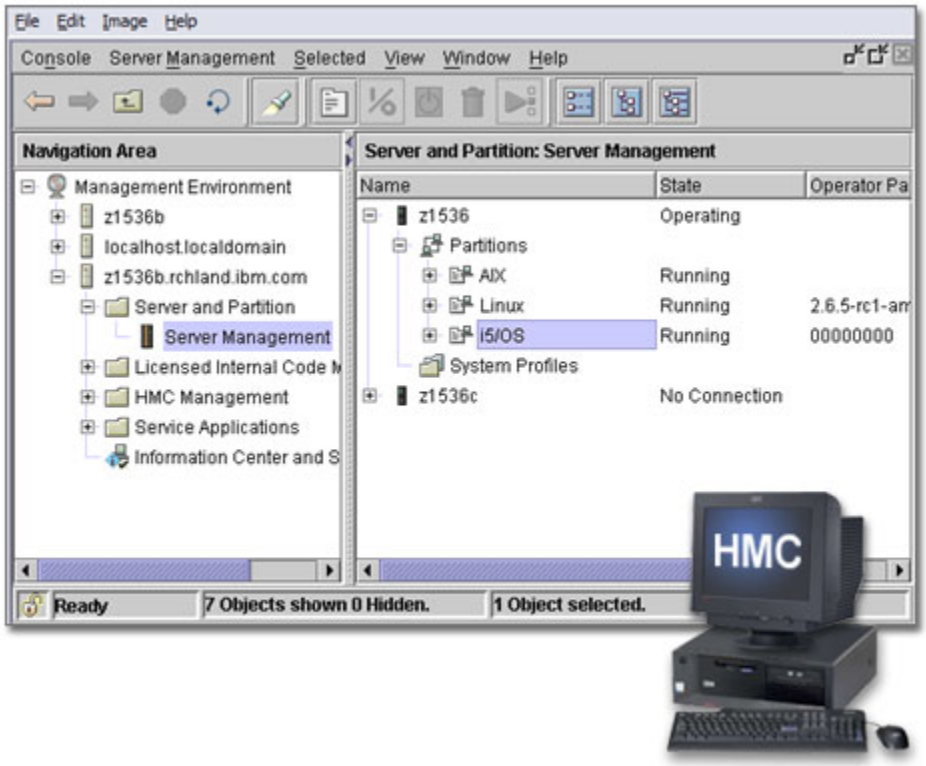


*Statement of Direction: IBM plans to support AIX in a logical partition in the future.

This presentation contains information about IBM's plans and directions. Such plans are subject to change without notice.

Hardware Management Console (HMC)

- Single console for POWER5 servers
  - Pre-installed Linux-based workstation
  - Ethernet, desktop or rack mount
  - Supports local consoles, including 5250
  - Web-based System Manager enables local or remote management for HMC control and status
- LPAR and CoD
  - Now configured via HMC
- Replaces primary partition and improves system resiliency
- Dynamic creation of new partitions



Power Architecture™: A Platform for Innovation

"Power Architecture is more than just a technology, but rather a movement for change. It's time for an architecture that enables innovation to flourish. It's time for Power Everywhere™."

Nick Donofrio, IBM Senior Vice President

IBM Technology & Manufacturing

IBM Wins Playstation 3 Contract

Wired http://www.wired.com/news/games/0,2101,61065,00.html

IBM eserver

XBox to Switch to PowerPC

BBC News http://news.bbc.co.uk/1/hi/business/1216551.stm

Apple G5

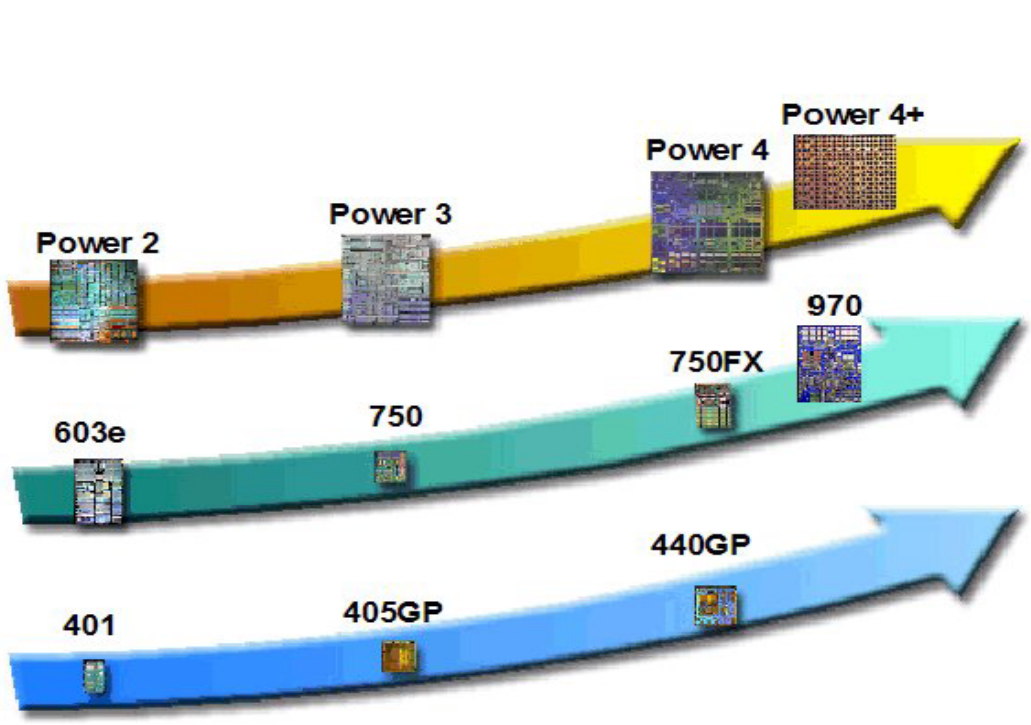
Apple iBook

IBM Powers Mars Exploration

http://w3-3.ibm.com/technology/news/2004/0129-mars.html

POWER Technology is Not Just in Servers

IBM shipped over 18 million processors in 2002

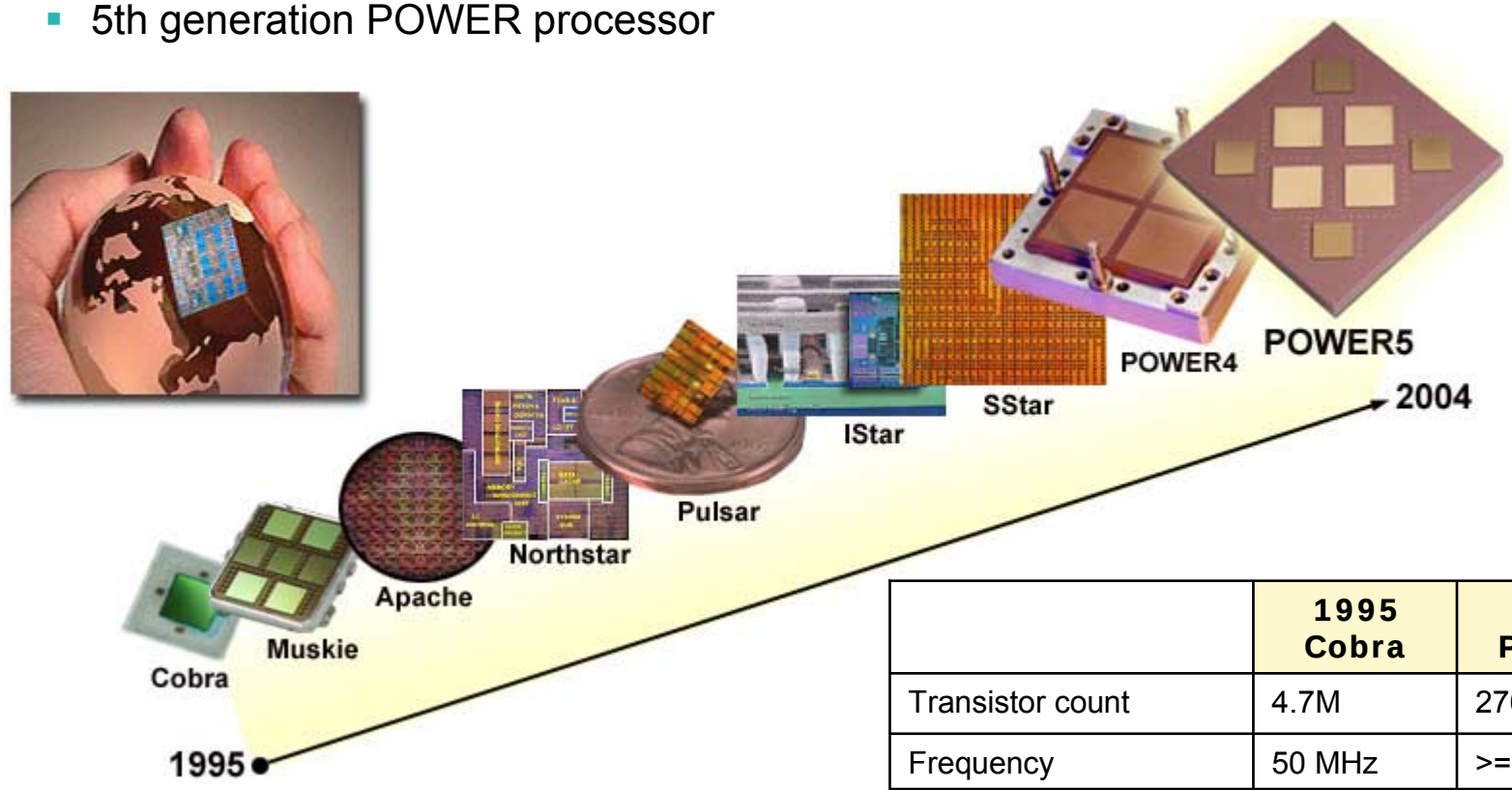


- Servers
- Workstations
- PCs
- Gaming Consoles
- Embedded

* All statements regarding IBM's future, direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

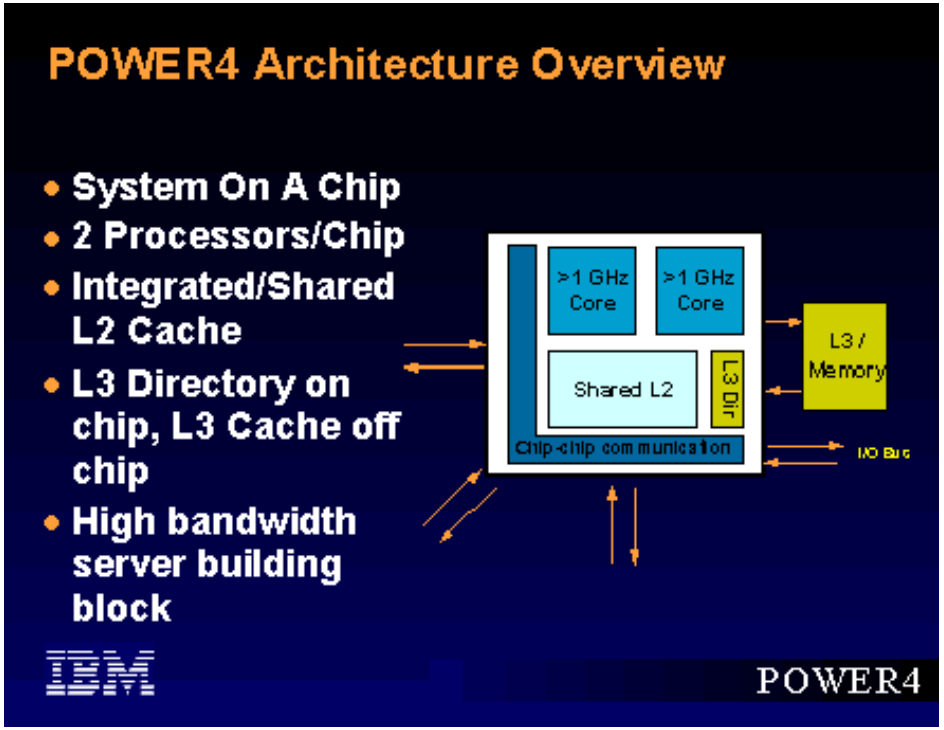
A Decade of 64-bit Microprocessor Excellence

- 9th generation 64-bit processor
- 5th generation POWER processor



	1995 Cobra	2004 POWER5
Transistor count	4.7M	276M
Frequency	50 MHz	>= 1.5 GHz
Logical Partitions	None	Up to 254

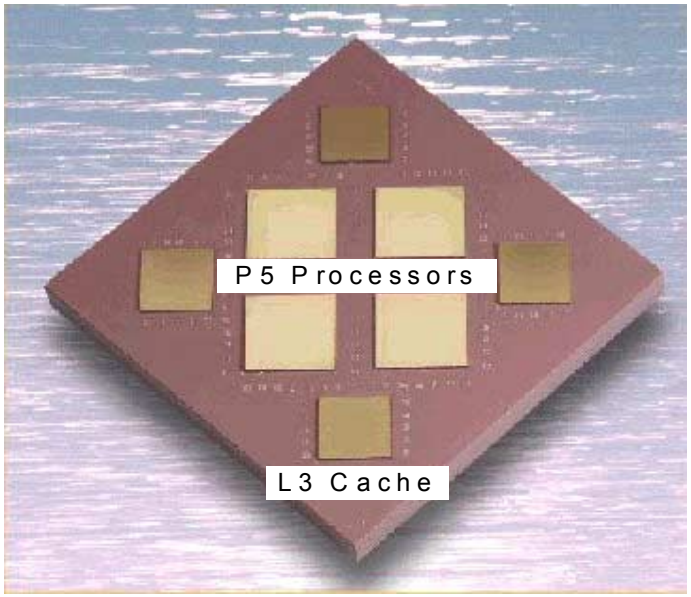
Power4 Technology



- **IBM's next generation chip contains more than 170 million transistors and runs at more than 1GHz. For the first time ever, two 1GHz processors with a second-level cache reside on a single chip. With this configuration, the POWER4 chip has the ability to deliver more than 100GB -- or the rough equivalent of 20 full-length DVD movies -- from the second-level cache to the processor in one second. That's an amazing combination of clock speed and bandwidth. POWER4 redefines what a system is.**

Power 5 Technology

- Dual core chip - 0.13 micron
- 1.5 GHz processor speed
- Multithreaded CPU
  - Behaves like four processors/chip
- Self Healing circuitry - autonomic
- Lower power consumption
- Hardware sub-processor partitioning
- Supports AIX 5.2, AIX 5.3, i5/OS V5R3, Linux



* Mark Papermaster IBM Dir. of Microprocessor Design - siliconstrategies.com, 2/24/2003

IBM ^ i5

iSeries servers ^ i5 servers

i890

i870

i825

Medium to Large Enterprises

570

i810

iSeries 800

Small to Medium Enterprises

520

IBM ^ i5 model 520

IBM ^ i5 model 520

- Flexible configuration options
  - Desk side or rack mount
  - 1-way or 2-way POWER5 processor
- Highly scalable growth options
  - Starts at 500 CPW, up to 6000 CPW
  - Up to 32 GB memory
  - Up to 19 TB disk storage
- Features Express, Value, Standard and Enterprise Edition options*
- Upgrades from i810 and i820

Rack mount

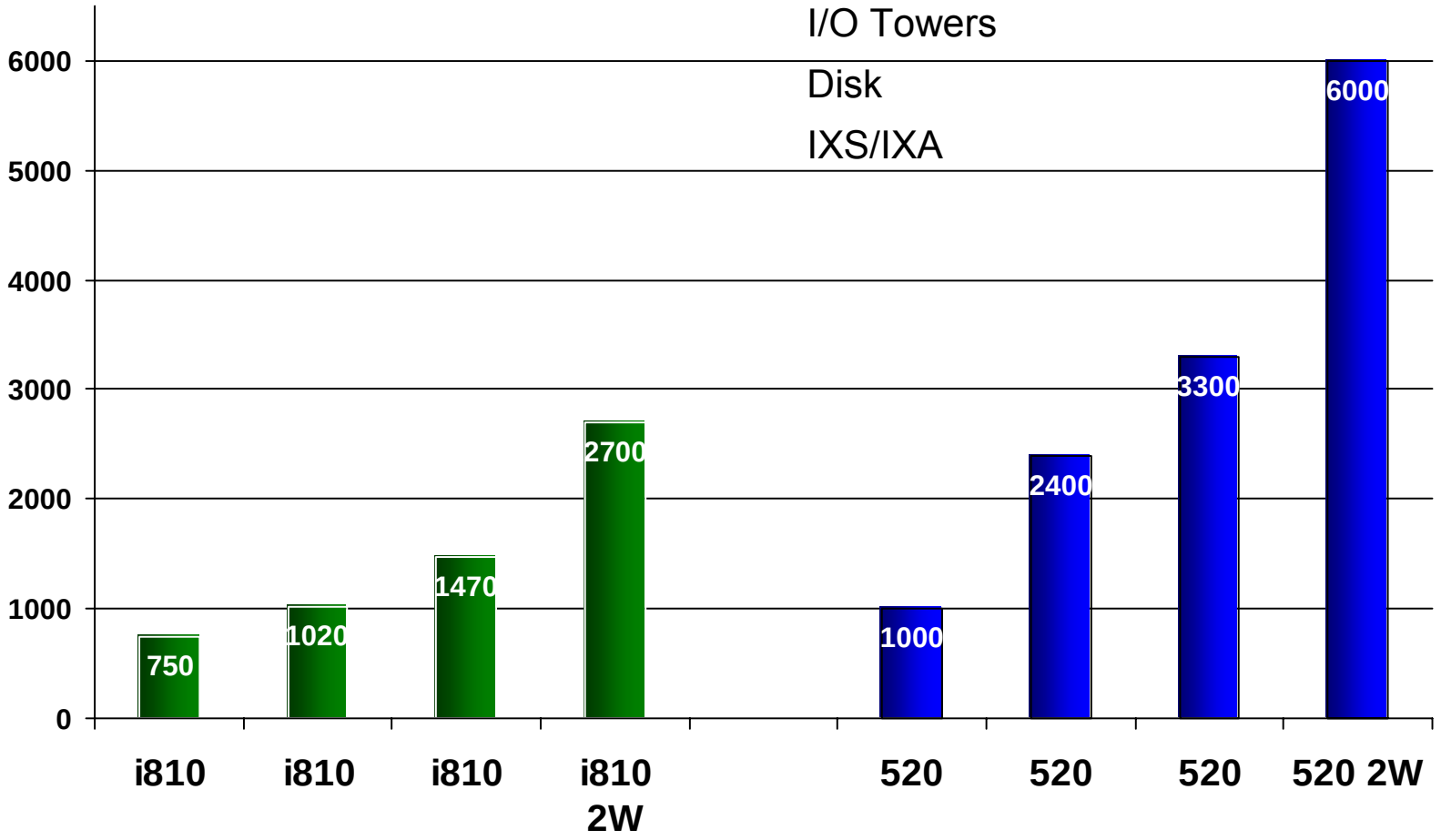
Desk side

*HA Edition planned for 3Q'04

This presentation contains information about IBM's plans and directions. Such plans are subject to change without notice.

520 Positioning

- POWER5
- 2x memory
- 2x CPW growth
- Expanded
  - I/O Towers
  - Disk
  - IXS/IXA



IBM ^ i5 model 570

IBM ^ i5 model 570

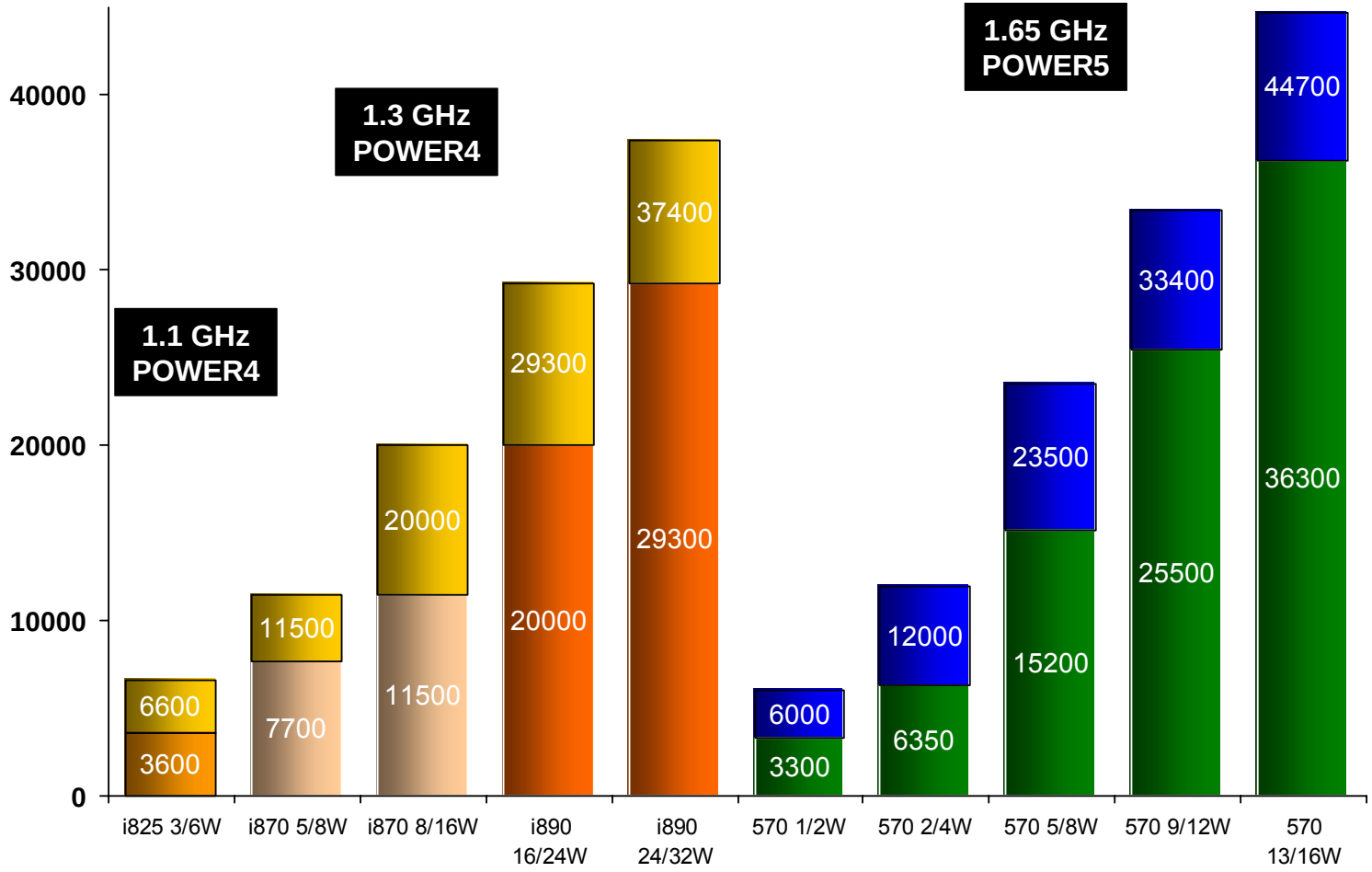
- Flexible configuration options
  - Rack mount, featuring Capacity on Demand options
  - 1/2-way, 2/4-way, 5/8-way, 9/12-way, 13/16-way POWER5
- Highly scalable growth options
  - 3300 – 44700 CPW
  - Up to 512 GB memory
  - Up to 96 TB disk storage
- Features Standard, Enterprise, High Availability and Capacity Backup Editions
- Upgrades from i810, i820, i825, i830, i840, i870 & i890

Building Blocks Enable Balanced Growth

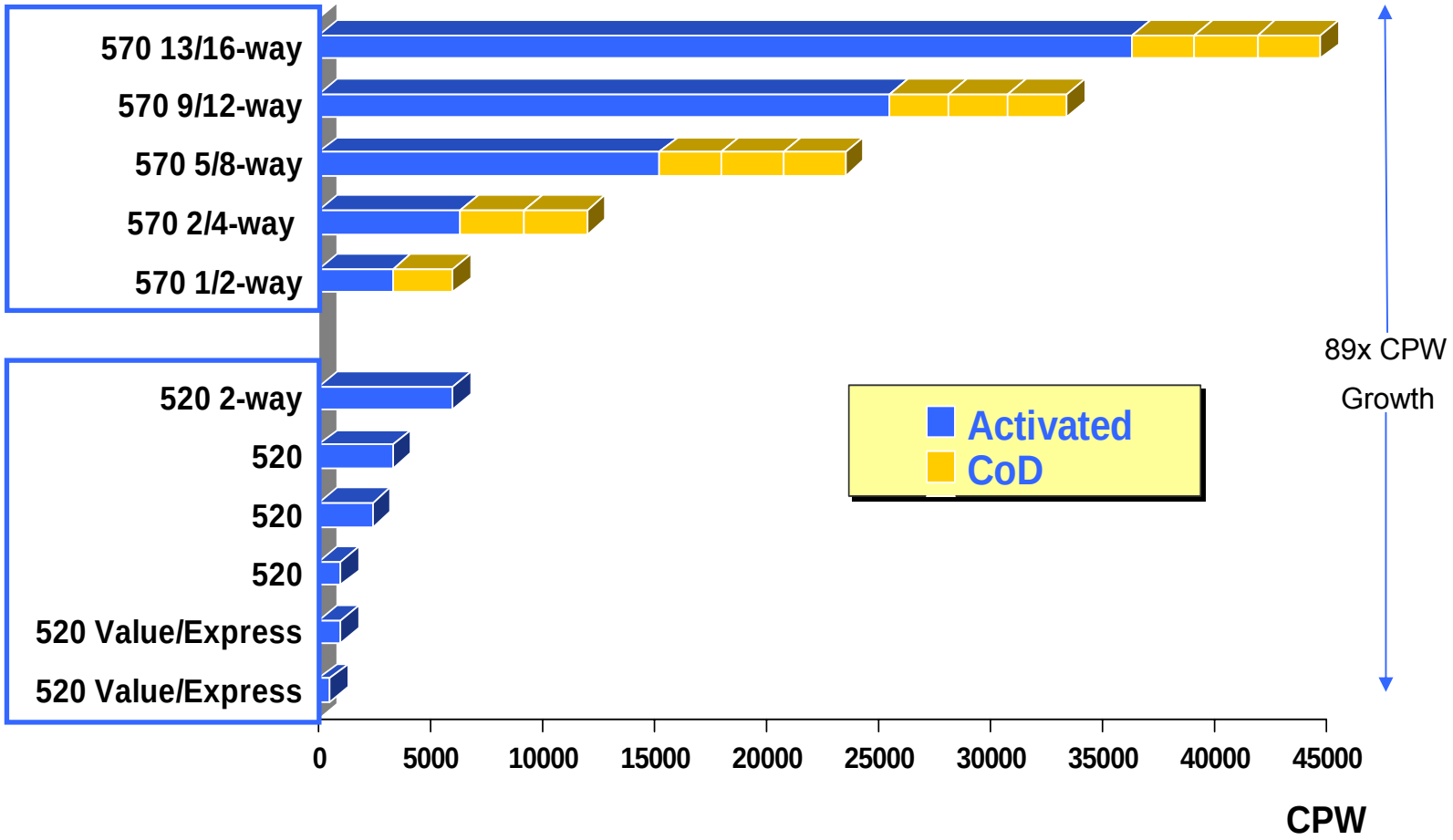
- Pay as you grow SMP architecture
- Rack optimized building block design enables balanced upgradeability through a single model with more than 13x CPW growth
  - *Each additional 4-way building block extends the system's I/O capabilities proportionately*
- Provides full memory compatibility across 570
- Simplifies upgrades

IBM eServer i5 570 Positioning

3300 → 44700 CPW replaces 3 POWER4 models



IBM eServer i5



Maximize Your iSeries Investments

- Upgrade servers from i810 and above
- Upgrade I/O towers

  Support current HSL I/O towers**
- Upgrade storage

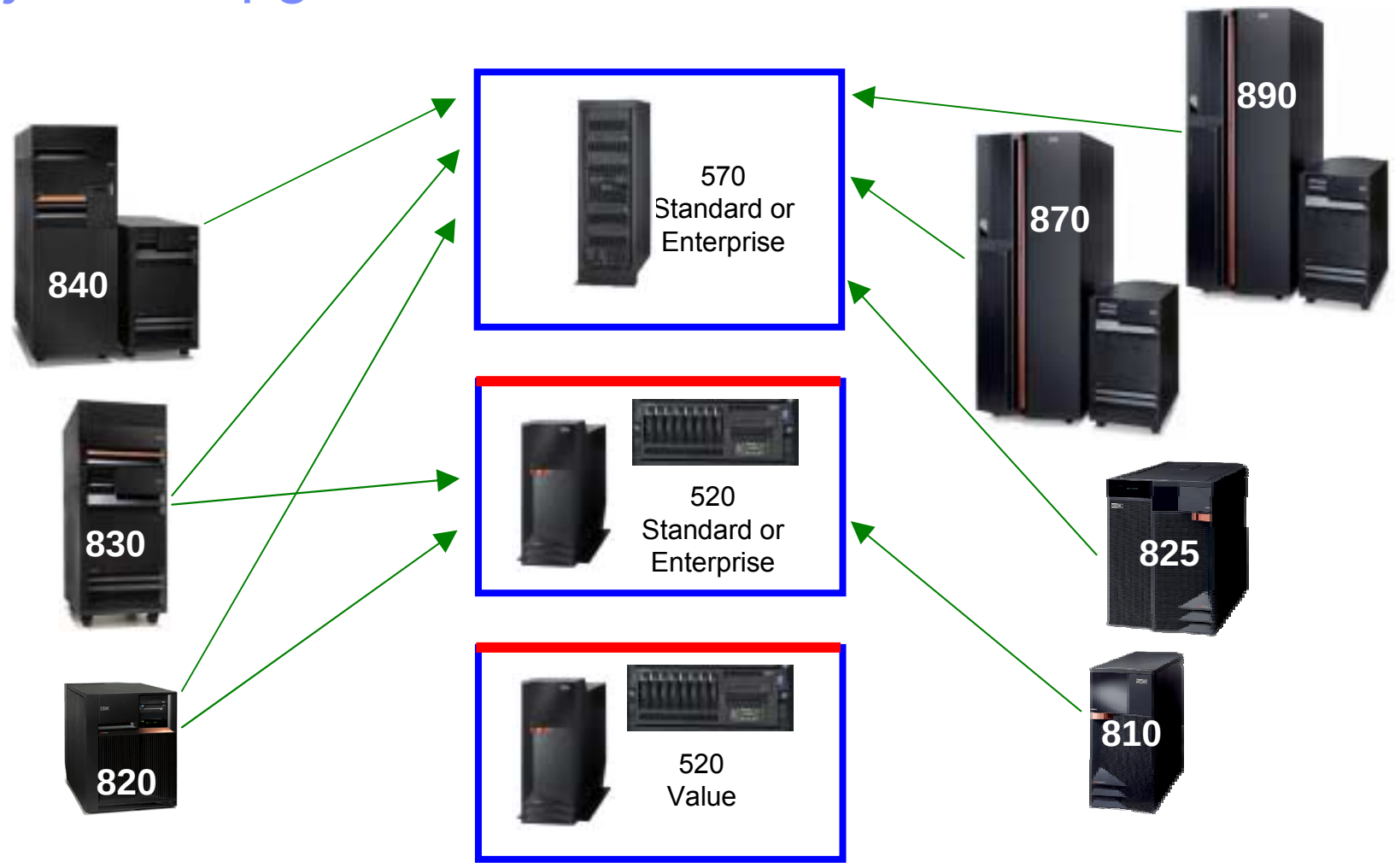
  All 10K & 15K rpm disks are supported on POWER5 processor-based servers
- Upgrade from OS/400 V5R2 and V5R1 to i5/OS

** Except 5078 / 5075

http://www-1.ibm.com/servers/eserver/iseries/support/planning/nav.html

http://www-1.ibm.com/servers/eserver/support/iseries/planning/migrationupgrade.html

Projected Upgrade Paths



Editions Continue to Realign Price With Value

Enterprise Edition

Includes maximum on demand capabilities

- Multiple operating environments
  Optimized for IBM WebFacing
- Virtualization Engine systems technologies
  i5/OS, WAS-Express and DB2 licenses

Standard Edition

Aggressively priced for e-business workloads

- Multiple operating environments
  Optimized for IBM WebFacing
- Virtualization Engine systems technologies
  i5/OS, WAS – Express, and DB2 licenses

+

- License for popular e-business & datacenter management software
- Maximum interactive 5250 CPW
- Processor activation for Linux or AIX 5L
  Integrated xSeries Server
- Education and Services to accelerate deployment of new workloads

Note: [1] Edition contents vary by model. Example shown here is for . ^ WAS-Express = WebSphere Applicatoin Server – Express for iSeries

The New Economic Model

New Economic Model Realigns Price with Value

- Common price for common hardware

  Same price as pSeries for memory, disk, processor activations etc

- Capture value of i5/OS and IBM middleware with Editions

  Aggressive price/performance improvements on Editions

- Attractive new entry prices target new customer growth with 520 Express Editions

- Price actions on existing iSeries products provide attractive alternatives for customers that require V5R2

Tivoli software

Lotus software

WebSphere software

DB2 Data Management Software

i5/OS

Common Prices for Common Hardware

Memory	iSeries Price 1Q/2004	Common Price 2Q/2004	Change
Low end	$3.15 per MB	$1.26 per MB	- 60%
Midrange	$7.20 per MB	$1.34 per MB	- 80%

Disk	iSeries Price 1Q/2004	Common Price 2Q/2004	Change
35 GB 10K	$1,960	$1,359	- 30%
35 GB 15K	$2,350	$1,875	- 20%

*Prices subject to change until announcement

New Economic Model Drives Price Actions

- Numerous actions to maintain consistency between eServer i5 & eServer p5
- Improve eServer i5 competitive position and rebalance price to value

Memory	2Q/2004	3Q/2004	Change
Low end – 2GB	$1.29 per MB	$.85 per MB	- 35%
Midrange – 2GB	$1.38 per MB	$1.34 per MB	- 6%

Disk	2Q/2004	3Q/2004	Change
35 GB 10K	$1,359	$750	- 45%
35 GB 15K	$1,875	$1,771	- 6%

570 Proc Activation	2Q/2004	3Q/2004
Proc Activation	$4,400	$7,700
2/4-way Std Edition	$133k	$127k

US Prices as of 7/13/04, prices actions may not apply in all countries

Editions Price/Performance

i820	35	70	120	240	560	1050	2000
3700	$240K	$268K	$320K	$395K	$555K	$770K	$1065K
2350	$155K	$183K	$235K	$310K	$470K	$685K	
1100	**$77K**	**$105K**	**$157K**	**$232K**	**$392K**		
600	$41K	$69K	$121K	$196K			
370	$23K	$51K	$103K	$178K			

2003

i810	Enterprise
1020	$78 K

2004

520	Enterprise
1000	$48 K

*Prices subject to change until announcement

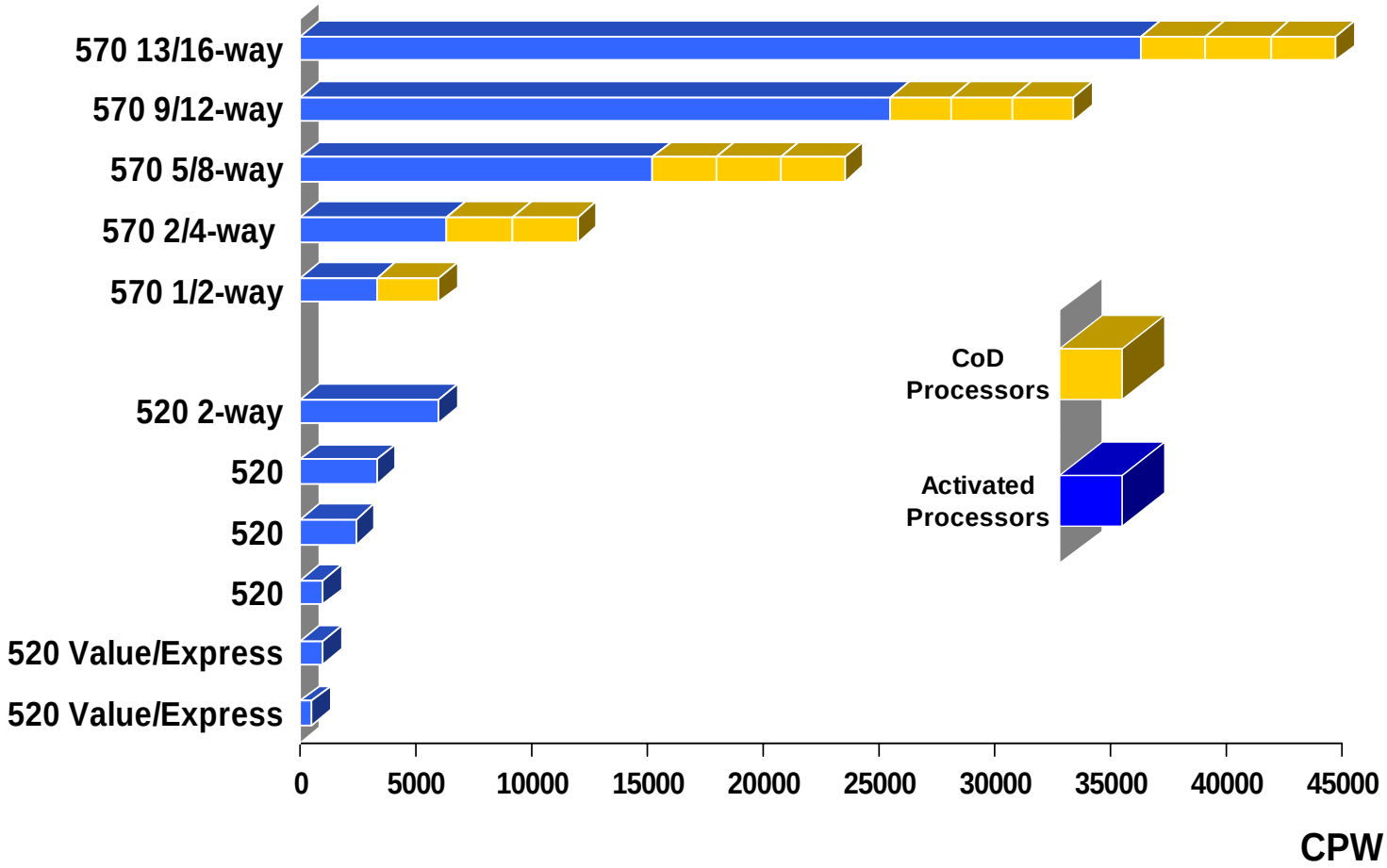
Introducing Flexible On Demand Pricing

- eServer i5 is the industry's most flexible server, running multiple operating systems including i5/OS, AIX 5L, Linux and Windows® System Server
- New, flexible on demand pricing establishes a new economic model for running mixed workloads in an on demand operating environment
- Introduces new value and flexibility for clients running i5/OS with mixed application workloads
- Clients can choose the applications they need for their business
- Clients can buy what they need and pay as they grow

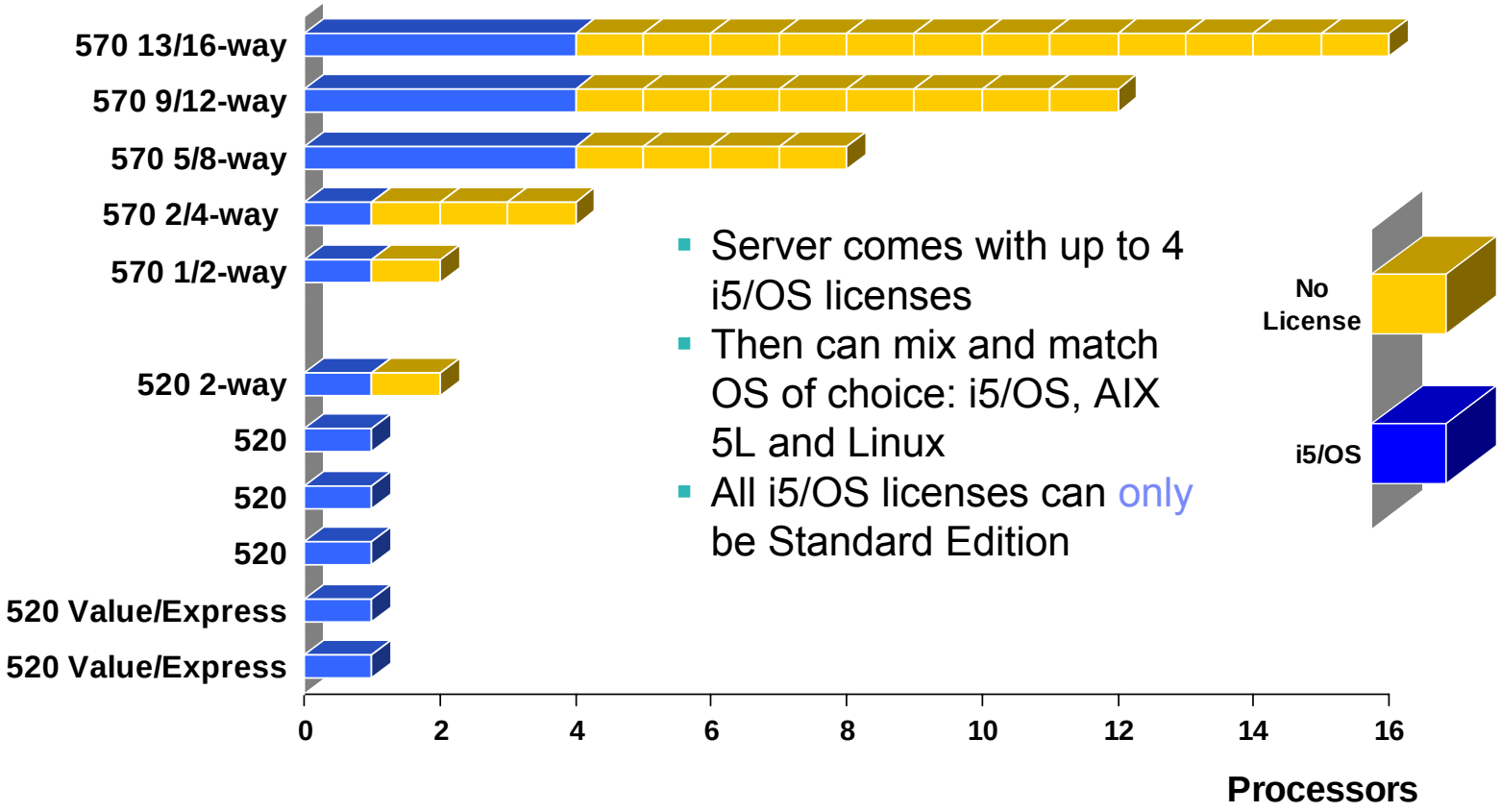
New Concepts

- **Mix and match i5/OS, AIX 5L and Linux workloads**
  - Fewer i5/OS licenses are required on high end 570 and 520 servers
    - e.g. Can buy a 13/16-way server with only 4 i5/OS licenses
  - Number of hardware activations may not equal i5/OS licenses
- **Enterprise now enabled by processor**
  - Enterprise Edition now includes Enterprise Enablement Feature/s
  - Enterprise Enablement Feature authorizes use of 5250 CPW per processor
- **Mix and match i5/OS application workloads**
  - Add i5/OS licenses without 5250 CPW to an Enterprise Edition server

IBM eServer i5 - Hardware

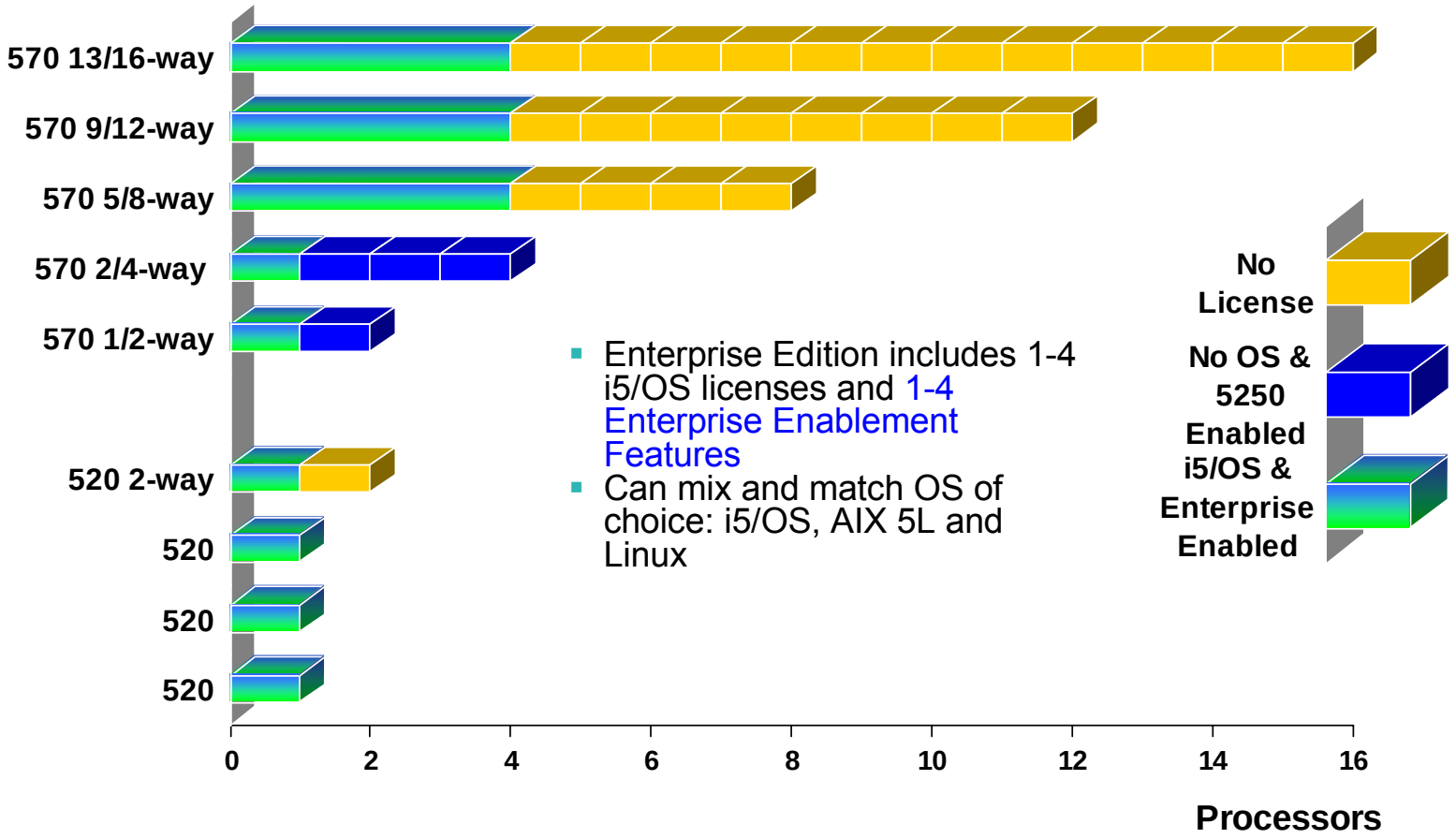


IBM eServer i5 – Standard Edition & i5/OS



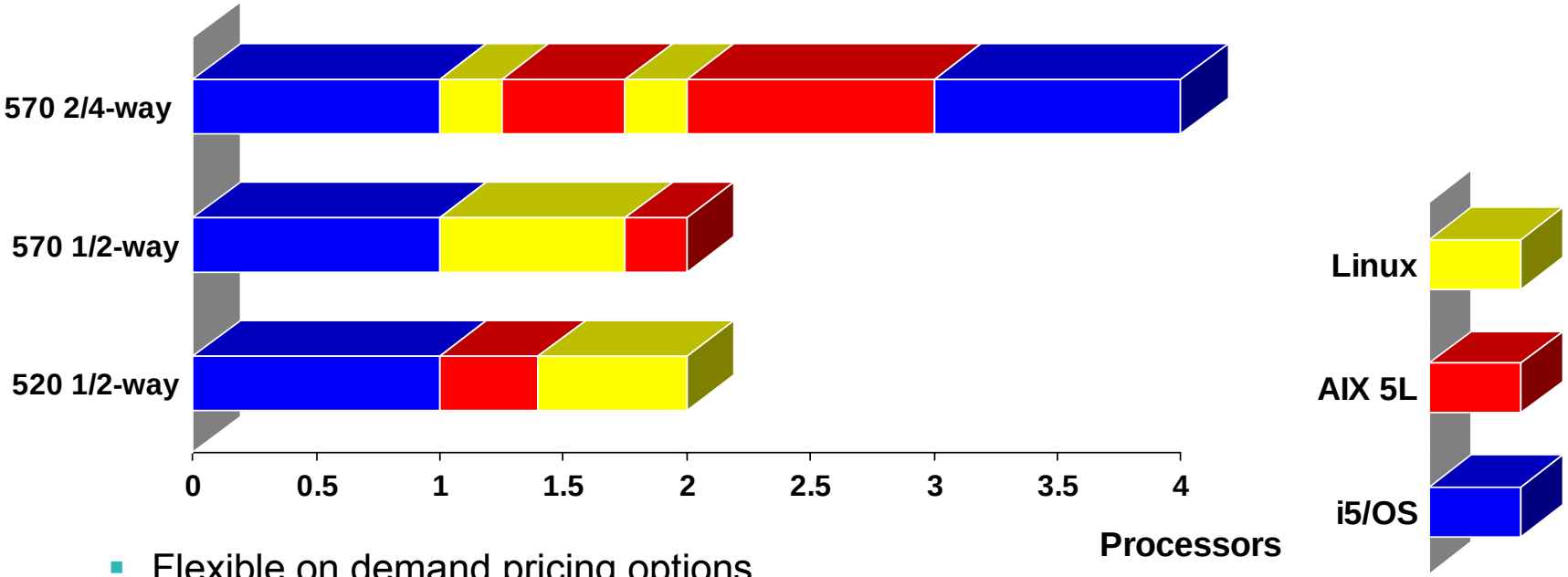
- Server comes with up to 4 i5/OS licenses
- Then can mix and match OS of choice: i5/OS, AIX 5L and Linux
- All i5/OS licenses can only be Standard Edition

IBM eServer i5 – Enterprise Edition & i5/OS



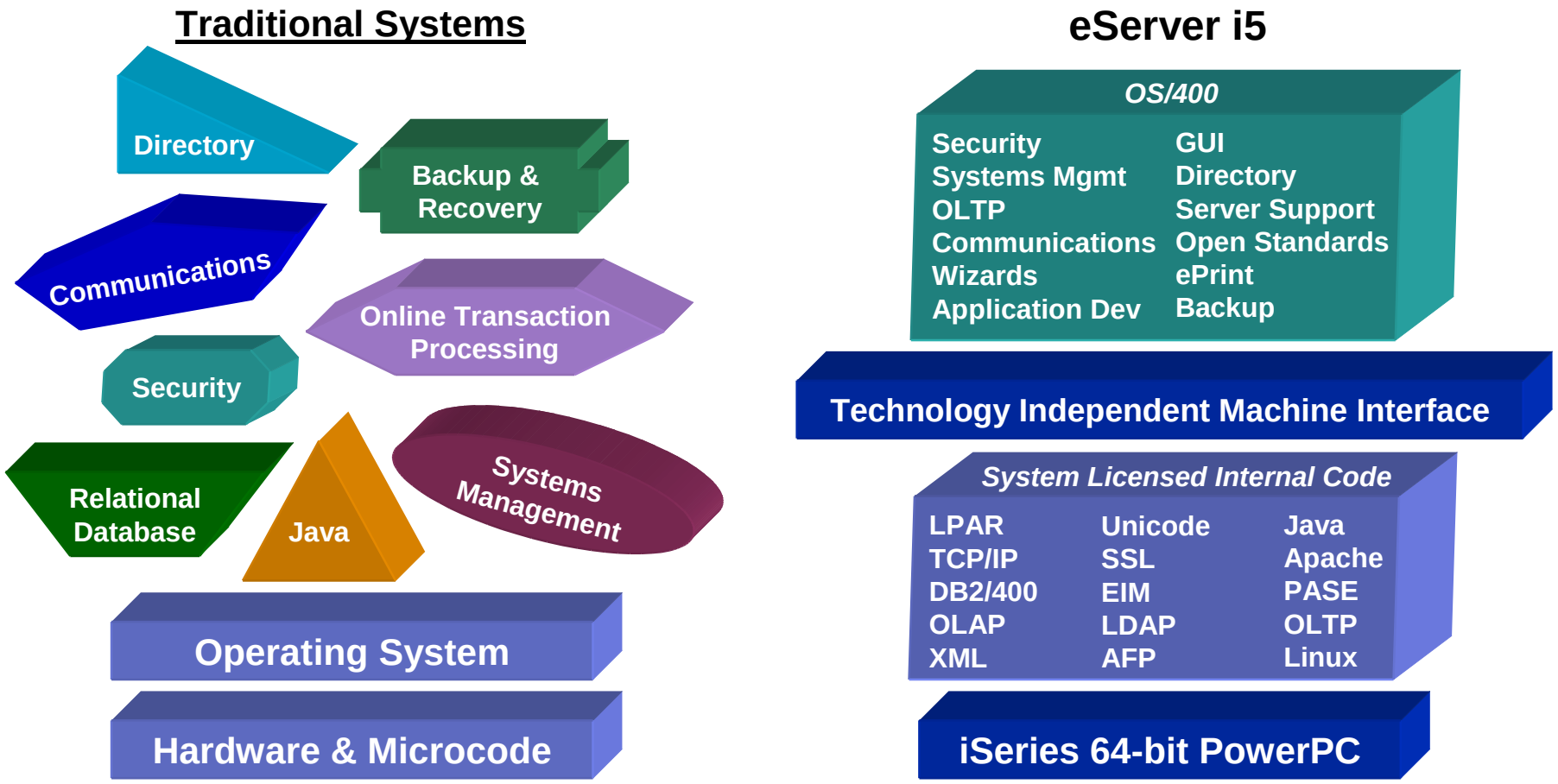
- Enterprise Edition includes 1-4 i5/OS licenses and 1-4 Enterprise Enablement Features
- Can mix and match OS of choice: i5/OS, AIX 5L and Linux

Standard Edition Example
Infrastructure Simplification

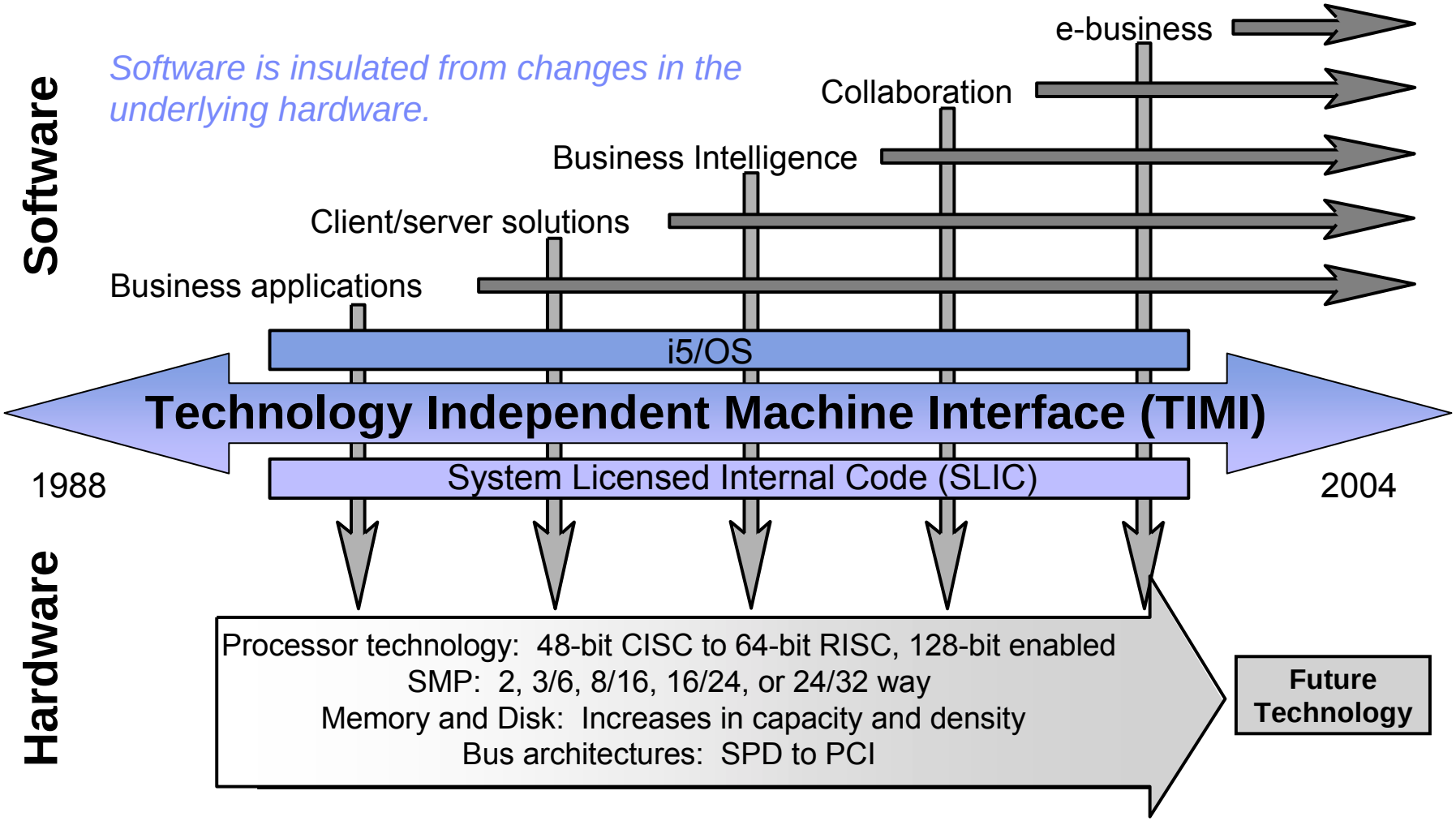


- Flexible on demand pricing options
- Mix workloads in an on demand operating environment
- Mix infrastructure and core business applications

iSeries – The Enduring Architecture



Innovative technology

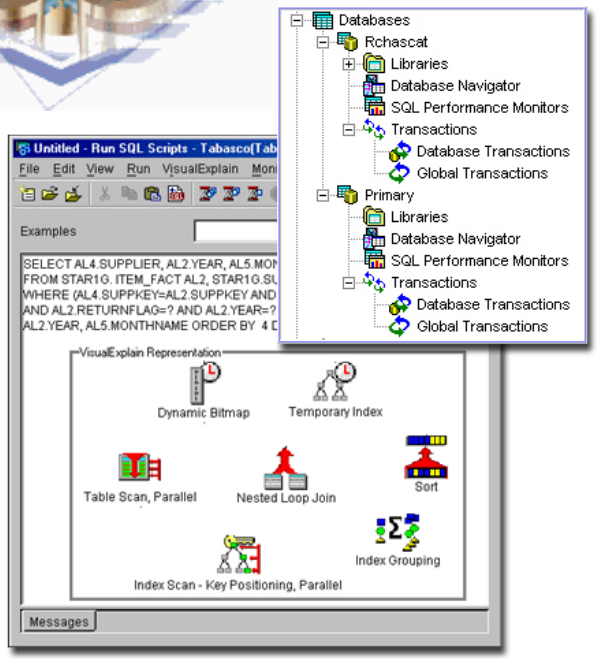


Those who truly understand this don't want anything else.

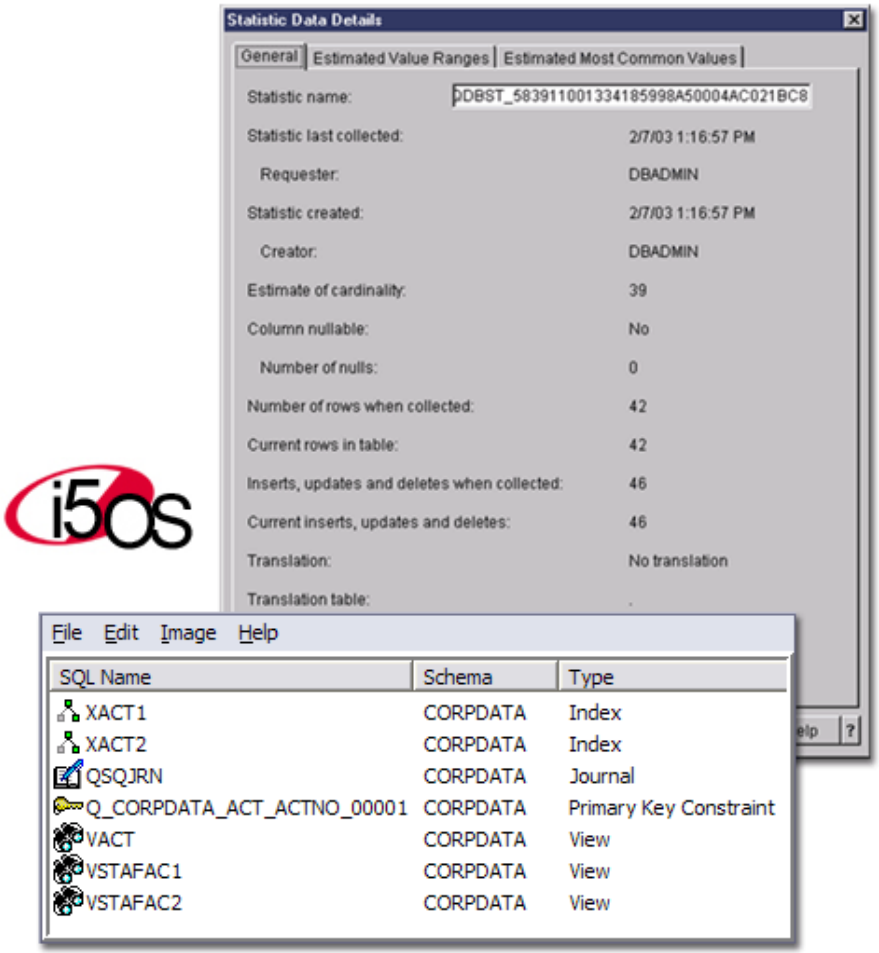
DB2® UDB for eServer i5

- Reduce DBA costs with extensive automation and integration of database
- Graphical management
- Supports all major database functions
- Supports standards bases application and end user interfaces

  OLTP, OLAP, MOLAP for BI and Transaction processing
- At the forefront of SQL and XML database open standards compliance
- Cross platform support - SQL
- Multiple independent name spaces
- Improve DBA productivity with self-optimizing queries, autonomic index advisor
- Exploit processor scalability with DB2 SMP parallelism
- Single table size increased to 1.7 TB



DB2® UDB for eServer i5



- Deliver enhanced functionality with improved performance and ease of use for data warehouse and queries
  - Star Join Recognition
  - Result set caching for re-run of same queries
  - Preview Materialized Query Table
- Extend development interfaces
  - Enhance SQL standards leadership and DB2 family compatibility
  - Support Rational XDE Modeler
  - Deliver Unicode enhancements
  - Enable .NET Managed Provider
- Single table size increased to 1.7 TB

The Power of DB2 UDB for eServer i5

Category	DB2 UDB for iSeries	DB2 UDB V8	Oracle 10g	SQLSrv 2000
64 bit	Yes	Yes on selected platforms	Yes	On Itanium**
Operating Systems	OS/400, i5/OS	Windows,Linux, Unix, PDAs	Windows, Linux, PDAs	Windows, Win CE
RPG Native DB I/O	Yes	No	No	No
Java and .NET	Yes	Yes	Yes	Yes
Stored Procedures	Standard SQL	Standard SQL	Proprietary PI/SQL	Proprietary Transact SQL
XML	Yes	Yes	Yes	Yes
Web Services	Yes	Yes	Yes	Yes
DBA Support***	Low	Medium	High	Medium
Vertical Scaling	SMP – 32 Way	SMP – 32 Way	128-way	64-way Claims
Horizontal Scaling	MPP	MPP	RAC	Clustering
SQL 2003 Standard: Core Element Support	98%	73%	72%	62%
EVIs	Yes	No	Partial	No
AST/MQTs	Partial	Yes	Yes	No
Dynamic Resource Allocation Across Partitions	Yes	Near Term	No	No

Technical Story

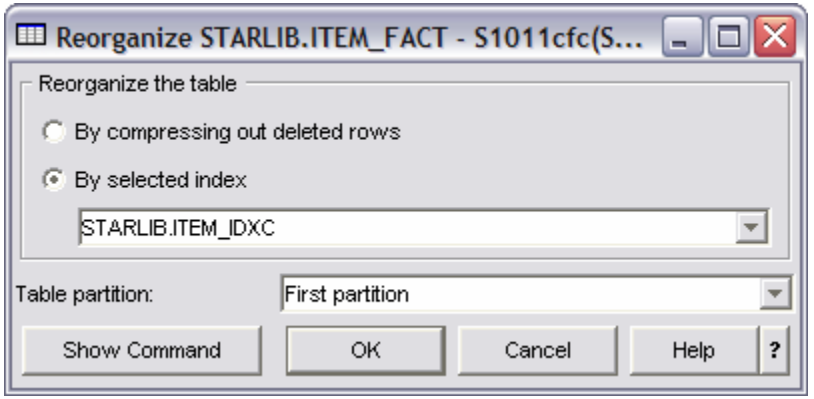
Business Story

DB2 UDB for eServer i5 Compelling Price

- **DB2 Included with i5/OS**
- **Higher Reliability**
  - **Security**
  - **Availability with simplicity**
- **Lower Support Costs**
  - **Reduced DBA Costs**
  - **Self Managing**
- **Scale with Ease**
  - **Vertical scaling**
  - **On/Off Capacity Upgrade on Demand**
  - **Technology transitions without pain**
- **Single RDBMS, Multiple IDEs**
  - **Native OS/400; Websphere; .NET; and many more**

**No support for DTS, Query Analyzer, SQL Profiler, and 32 bit apps have limitations
http://www.microsoft.com/sql/64bit/productinfo/SQL64bitAdvantages.asp
*** Derived from DH Brown report, SQLServer vs. DB2, 12/2003 and Market Magic Reseach report “Database Comparitve Cost of Ownership,” 1/2003

Non Disruptive Operations

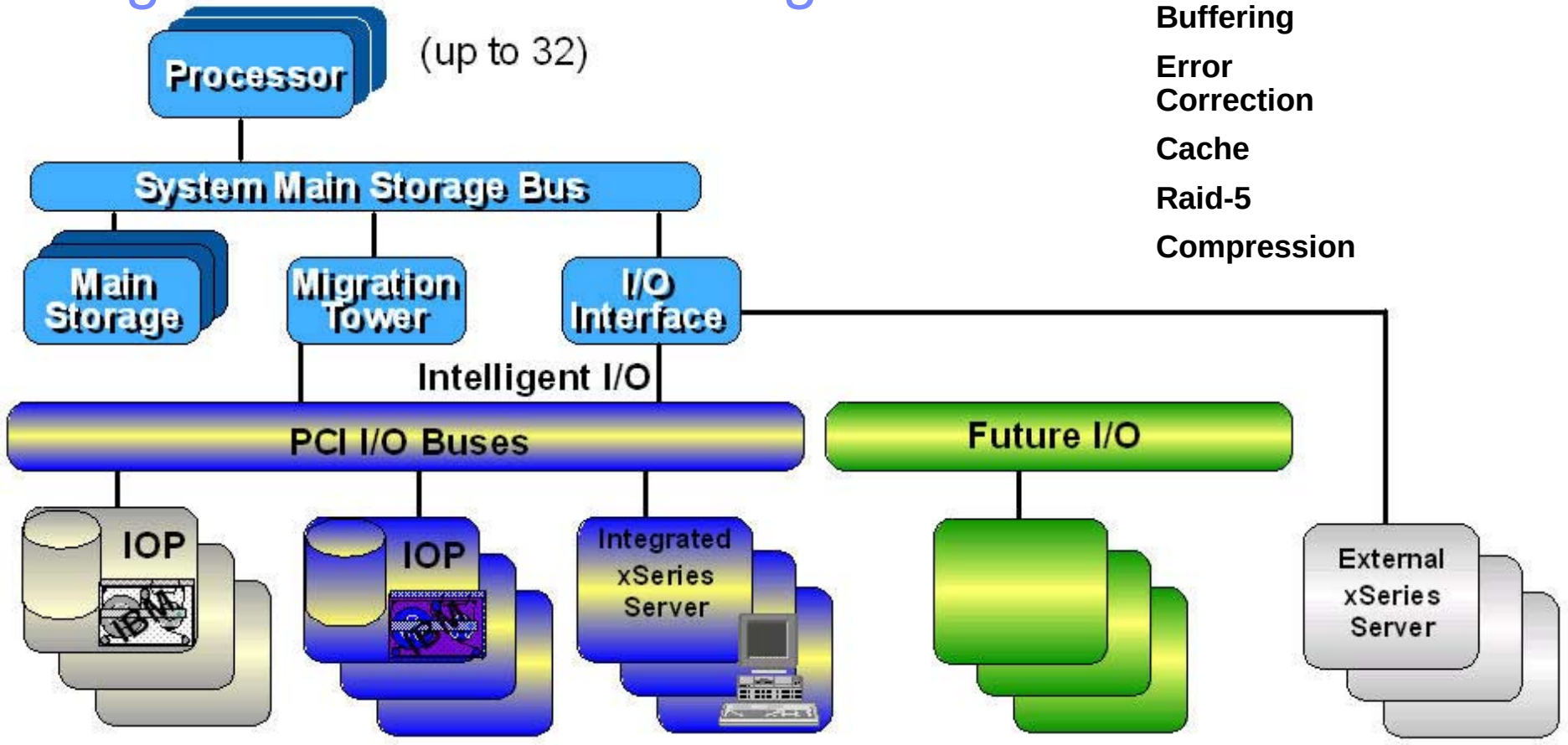


- Database reorganization
  - Improved performance with parallelism
  - Restart & monitoring improve operational flexibility
- Rapid Checkpoint Save-While-Active
  - New save-while-active option improves performance when applications have open commitment control transactions
  - Enables files to be saved with pending record level changes
- RAID 5 across SCSI buses extends fault tolerance
- Concurrent I/O tower and IXA add/remove*
- Automatic conversion of IFS directories to improve performance

i5OS

* Product Preview. Planned availability 3Q 2004 This presentation contains information about IBM's plans and directions. Such plans are subject to change without notice.

Intelligent I/O structure.... magic

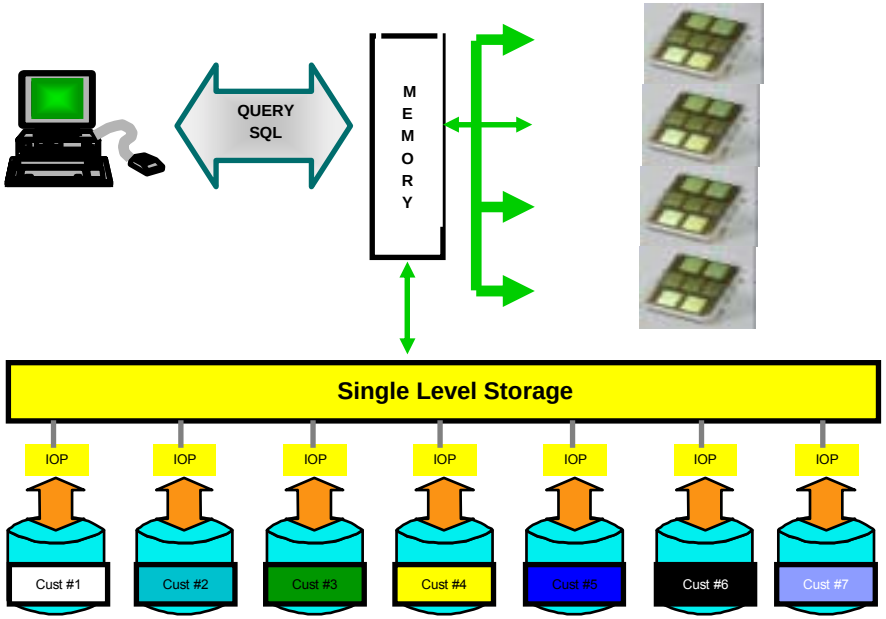


Intelligent I/O

- **Buffering**
- **Error Correction**
- **Cache**
- **Raid-5**
- **Compression**

eServer i5 DB SMP Parallelism (DB2 SMP)

•Expands on the parallel capabilities of DB2 for i5/OS for iSeries
•Allows a single database operation to run on multiple processors at the same time or, in other words, in parallel
•This additional processing power allows some operations to run dramatically faster.



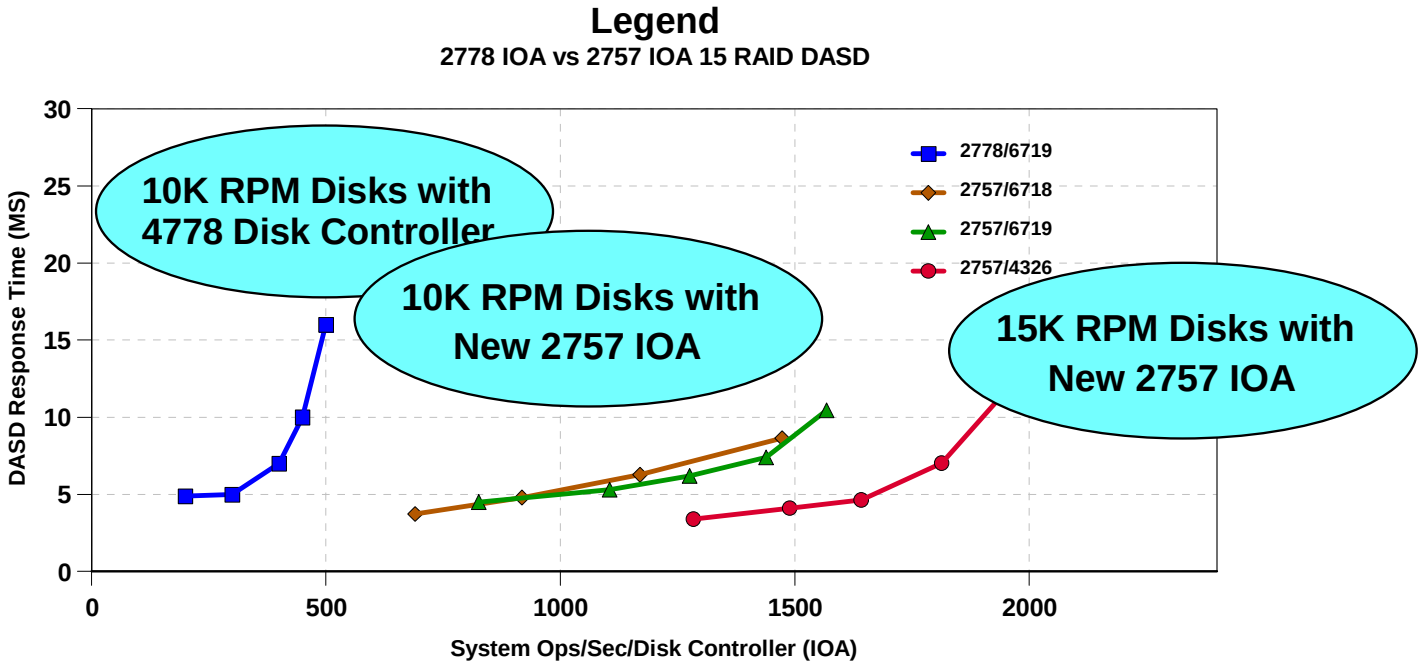
- Shared everything parallelism
- Partitioning not necessary
- Parallel Methods
  - *Parallel table and index scan*
  - *Parallel hash join*
  - *Parallel hash group by*
  - *Parallel index build*
  - *Parallel data load*
  - *Parallel index ANDing/ORing of dynamic bit maps*
  - *Parallel index maintenance*
  - *Parallel Encoded Vector Index*
  - *Parallel I/O and parallel recovery*
  - *Parallel reorganize*

High Performance Direct Attach Storage Options

- Achieve up to 3X throughput improvements with enhanced PCI-X I/O options
- Improve performance with IBM's 3 disk optimized RAID-5
- New 35GB and 70GB 15K RPM disk drives
- New PCI-X I/O towers with rack mount options

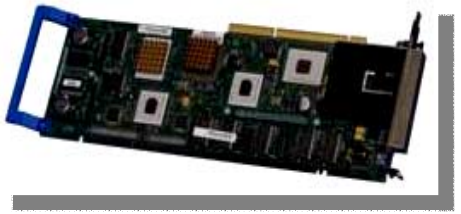
New PCI-X Ultra RAID Disk Controllers	Write-Cache (Max)	Min / Max drives per RAID set
High performance – 2757	**757 MB**	**3 / 18**
Low cost alternative for SME servers – 2782	**40 MB**	**3 / 12**

New Disk Controllers and 15K rpm Disks



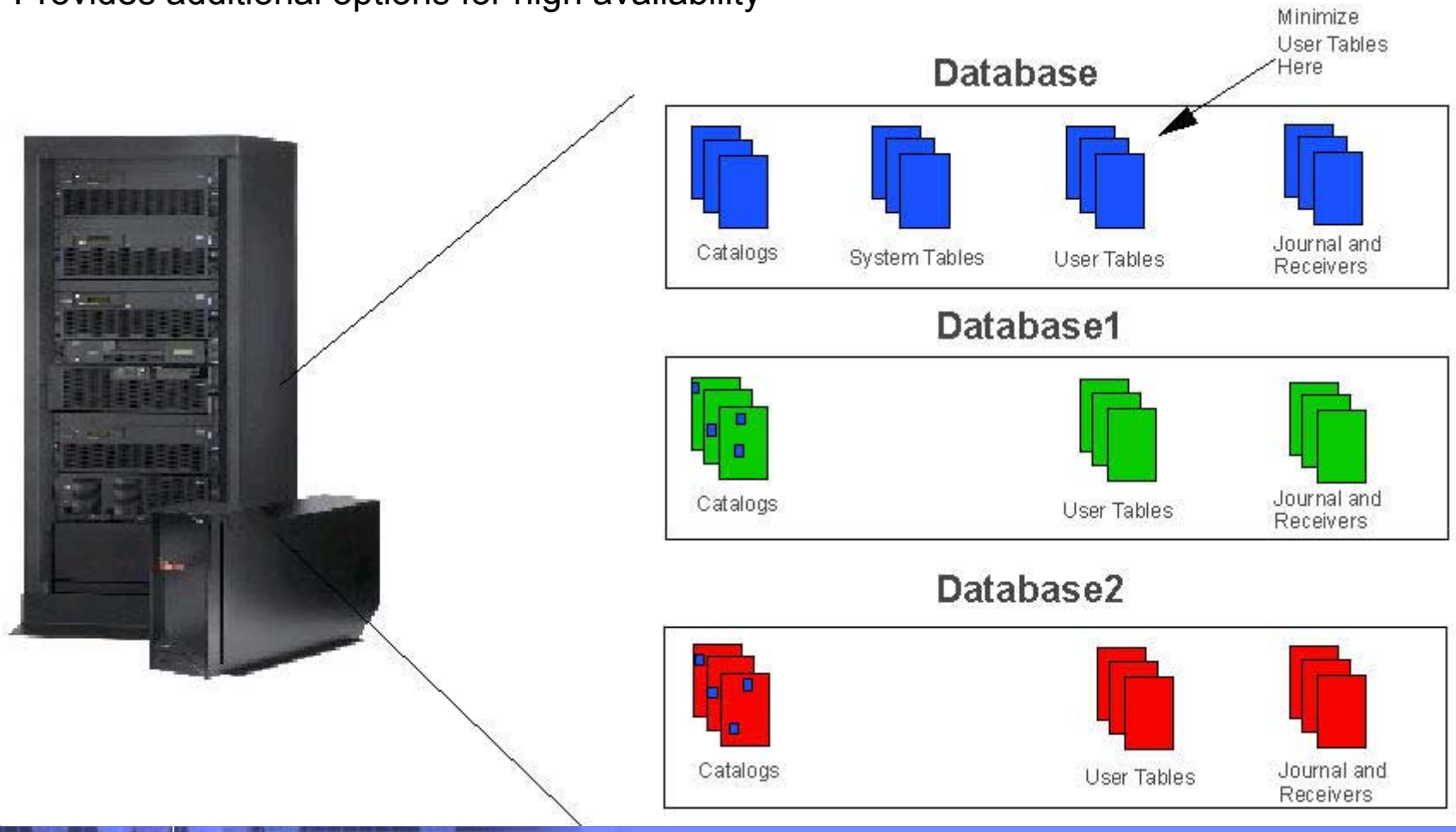
Enhanced Disk Controller

- #2780 PCI-X Ultra4 RAID Disk controller
  - Same price & 757MB write cache as #2757 controller
  - Improves performance for sequential read workloads with 1GB read cache
- Improves resiliency with concurrent battery maintenance
- For eServer i5 520, 570 with i5/OS V5R3



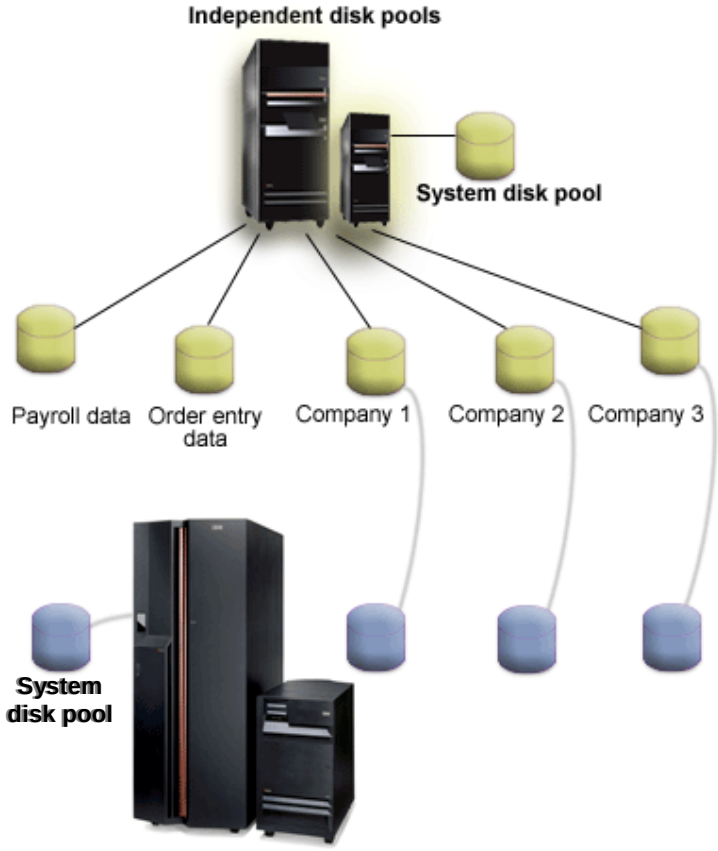
Independent ASPs

- Allows multiple relational databases on a single eServer i5
- Each relational database (IASP) can be switched to another eServer i5
- Provides additional options for high availability



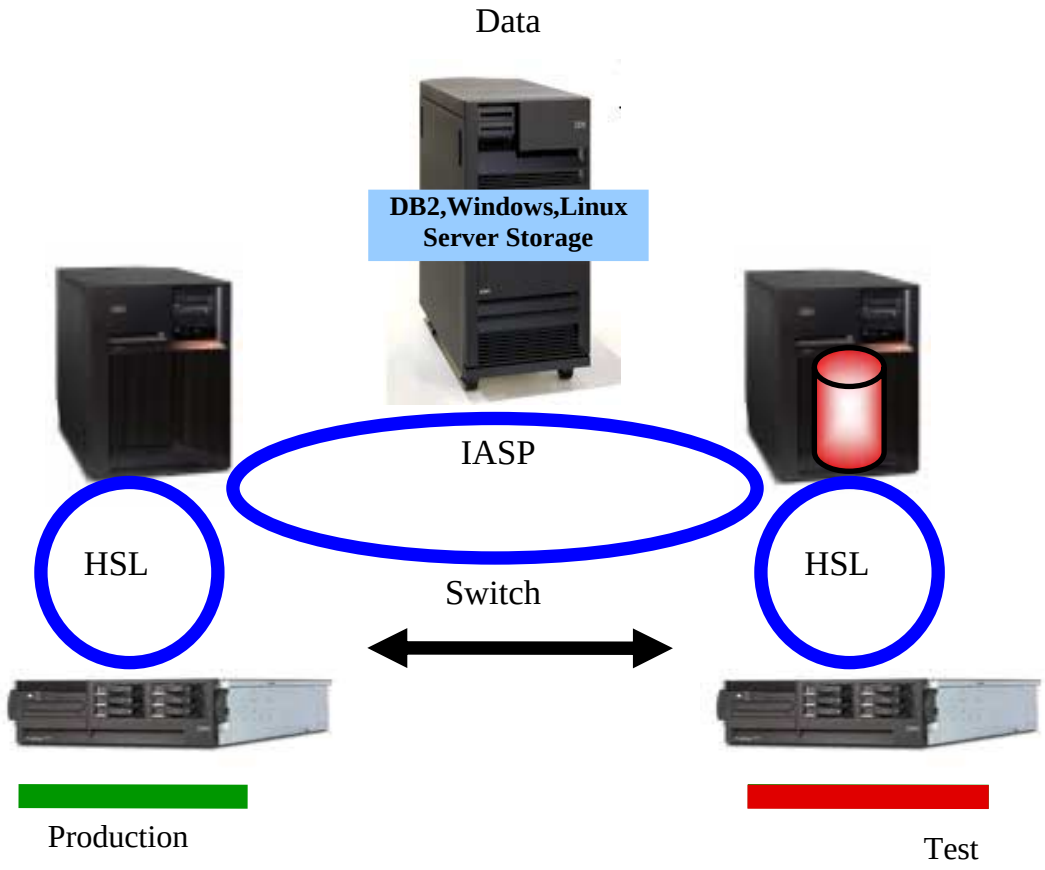
Switchable Disk for High Availability & Clustering

- Multiple system environment
- Independent disk pools can be switched between servers in a cluster in two ways
  - External tower on the same HSL
  - IOP in a logical partition
- Data accessible by one system at a time
- Improved availability for scheduled or unscheduled outages

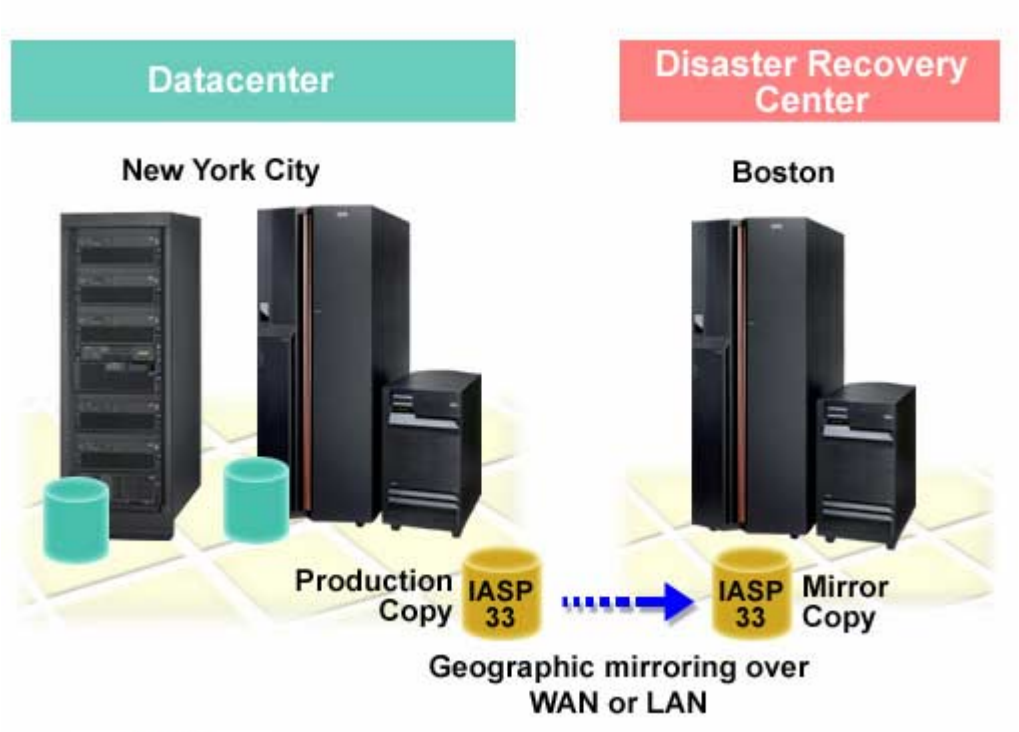


Availability - One Computer Room

- Problem
  - Providing an effective and efficient availability solution
- Solution
  - eServer i5 switch disk support with Independent ASP
- Benefit
  - Solution for planned or unplanned server outages



Cross Site Mirroring (XSM)



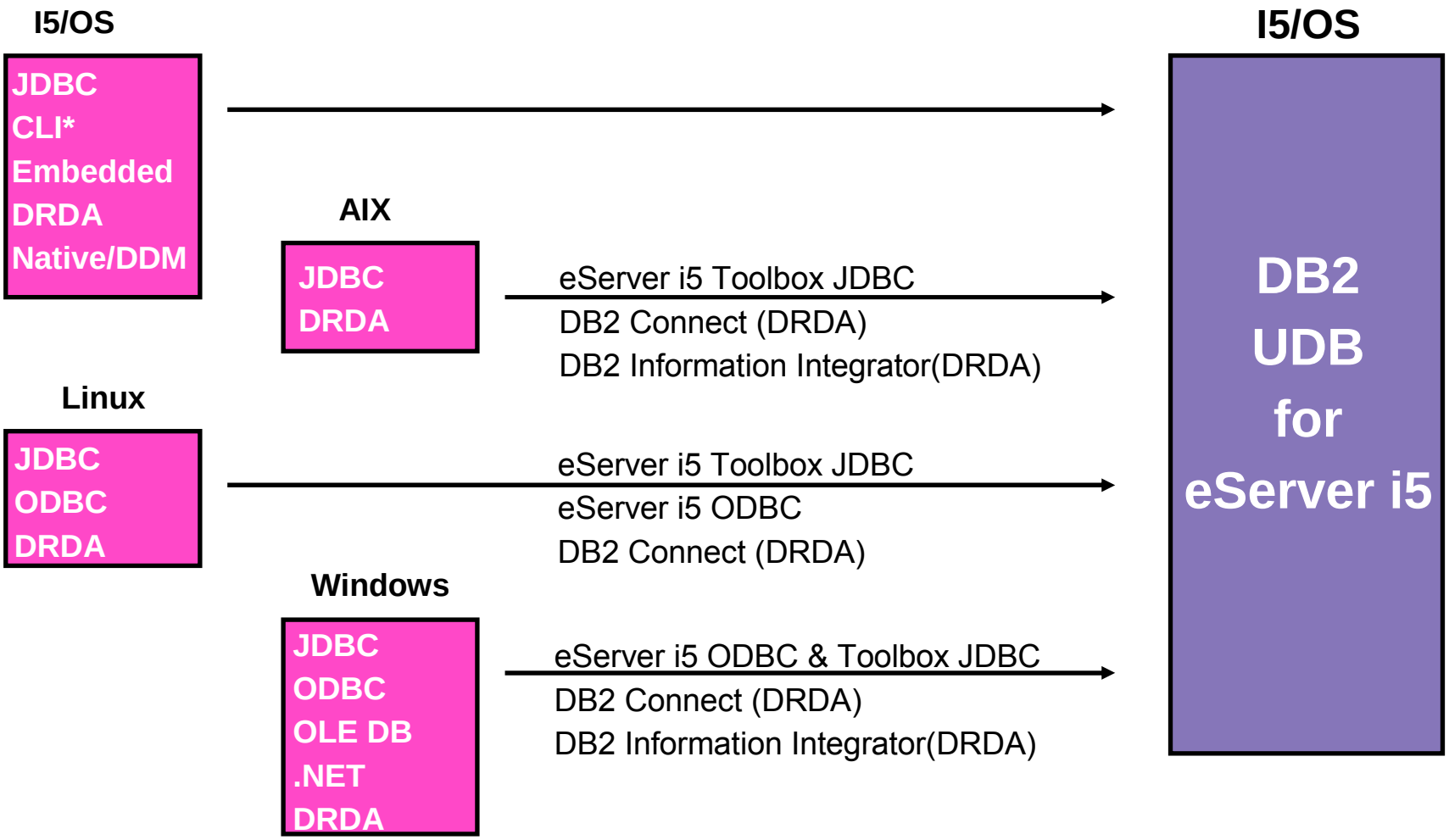
- Create a simpler disaster recovery or high availability (HA) solution
  - Should be combined with an HA solution in the datacenter
- Mirrors all objects in an Independent Auxiliary Storage Pool (IASP)
- New support for spool files in IASP

IASP Object Support

Supported		
*ALRTBL	*IGCDCT	*QMFORM
*BLKSF	*JOBD	*QMQRY
*BNDDIR	*JRN	*QRYDFN
*CHTFMT	*JRNRCV	*SBSD
*CHRSF	*LIB	*SCHIDX
*CLD	*LOCALE	*SPADCT
*CLS	*MEDDFN	***SPLF** **new**
*CMD	*MENU	*SQLPKG
*CRQD	*MGTCOL	*SQLUDT
*CSI	*MODULE	*SRVPGM
*DIR	*MSGF	*STMF
*DTAARA	*MSGQ	*SVRSTG
*DTADCT	*NODGRP	*SYMLNK
*DTAQ	*NODL	*TBL
*FCT	***OUTQ** **new**	*USRIDX
*FIFO	*OVL	*USRQ
*FILE	*PAGDFN	*USRSPC
*FNTRSC	*PAGSEG	*VLDL
*FNTTBL	*PDG	*WSCST
*FORMDF	*PGM	
*FTR	*PNLGRP	
*GSS	*PSFCFG	

Not Supported	
*AUTL	*IPXD
*CFGL	*JOBQ
*CNNL	*JOBSCD
*COSD	*LIND
*CRG	*MODD
*CSPMAP	*M36
*CSPTBL	*M36CFG
*CTLD	*NTBD
*DDIR	*NWID
*DEVD	*NWSD
*DOC	*PRDAVL
***DSTMF** **alert**	*PRDDFN
*EDTD	*PRDLOD
*EXITRG	*RCT
*FLR	*SOCKET
*IGCSRT	*SSND
*IGCTBL	*S36
*IMGCLG	*USRPRF

I5/OS & DB2 UDB as the Server

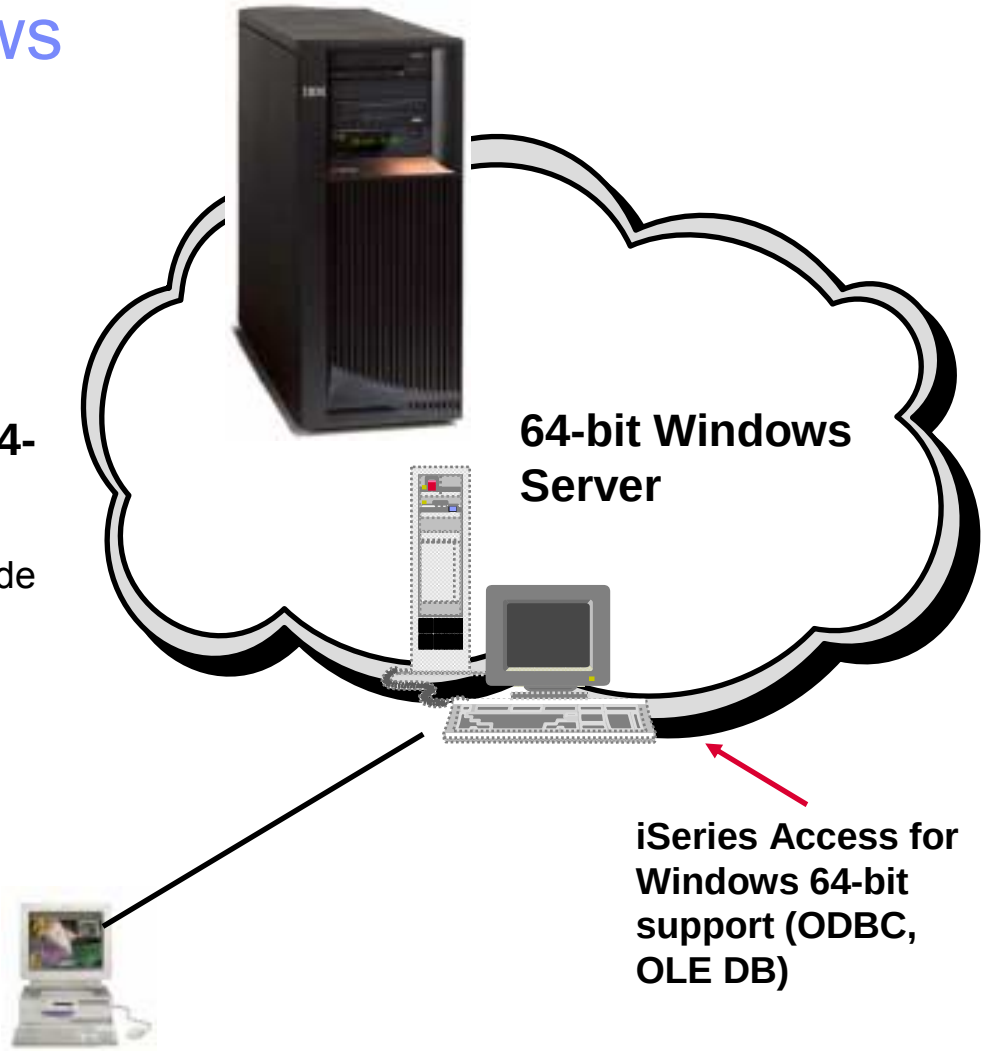


* PASE only supports CLI

Support for 64-bit Windows

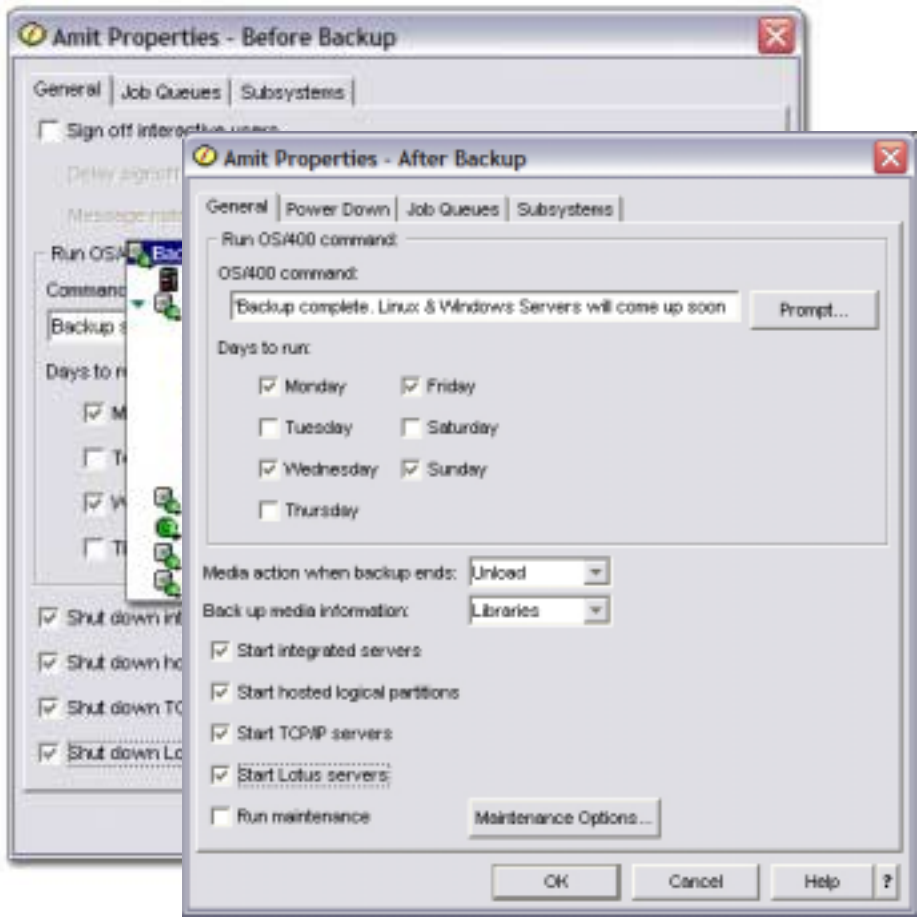
Intel Itanium hardware

- **The ODBC and OLE DB components have been ported to run natively on 64-bit Windows**
  - Most other components will run in 32-bit mode on 64-bit hardware (print drivers and SSL support will not run with 64-bit applications).



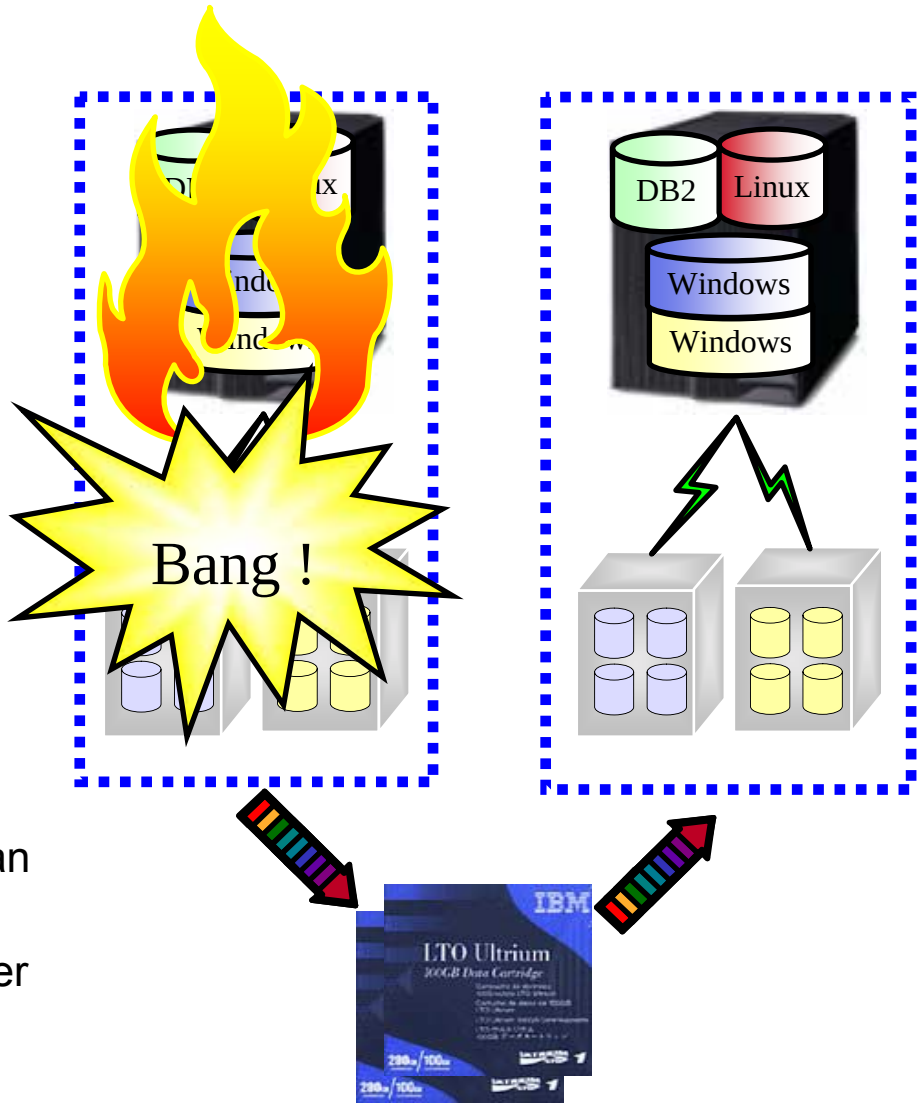
Backup Recovery Automation with BRMS

- Automate backup for i5/OS hosted Windows, Linux, AIX 5L and Domino servers
- Simple Backup Policy Creation
  - Before: Shut down Hosted Partitions
  - During: What, When, Where
  - After: Start Hosted Partitions
- New reclaim media wizard condenses and reorganizes data to optimize tape utilization and save media cost
- Perform unattended system save (SAVSYS)
  - No need to start console monitor
- Included in eServer i5 Enterprise Edition



Recovery

- Problem
  - Recovery is complex, prone to error and time consuming in a multi-tier application environment
- eServer i5 Solution
  - eServer i5's architecture and integration enables customers to build a complete infrastructure that is easily backed up and rapidly restored
- Benefit
  - Can reduce the time and complexity of an infrastructure restore
  - Can reduce the impact a disaster or other unplanned outages



eServer i5 – *"The"* Flexible Server

Solutions

BI/CRM

Lotus Domino

Web Enabled e-business

eServer i5 Business Solutions

Application Porting Consolidation / ASP

Integrated xSeries Server

PASE (UNIX) Runtime

Linux

AIX 5L v5.2 & v5.3

Interconnected for application enhancement

Enablers

Security
- Kerberos
- Passphrase
- Certificates
- Virtual Private Networks
- Integrated SSL
- Hardware Cryptography

Database
- DB2 UDB
- JDBC Interoperability
- ODBC Interoperability
- XML and Text Extenders
- Net Server

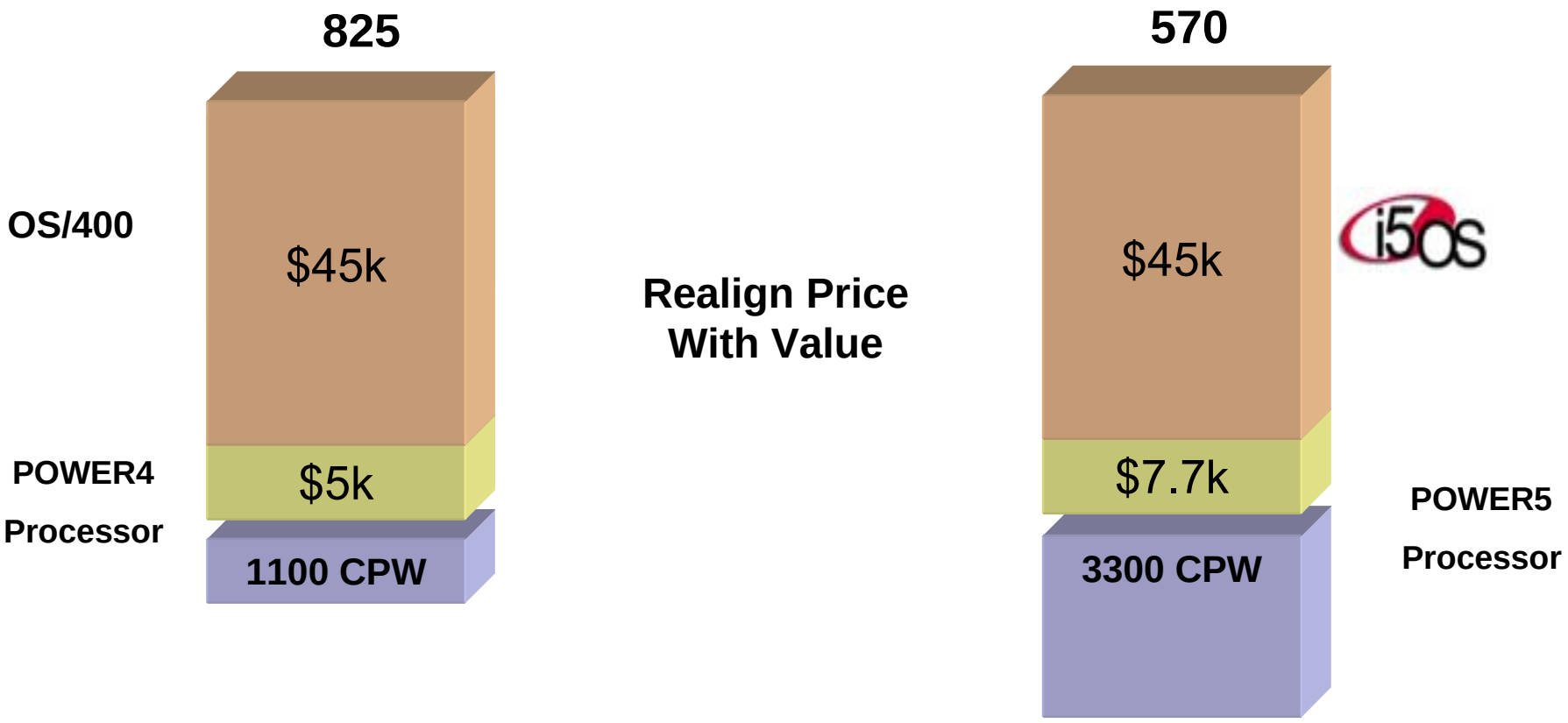
Sys Mgmt
- Single System, Multi workload
- Multi system
- Management Central
- Wireless Access

Java
- Java Virtual Machine
- WebSphere
- Just In Time Compiler
- Integrated Memory Management

Cluster Support
- Independent ASPs
- Switchable Disk
- Replication
- Cluster Services

Across a scalable, secure and reliable platform

Processor & i5/OS Activations



*Prices subject to change until announcement

What is the cost of a system fully “Clothed”?

Storage Management

$

DB

Virtualization

Virtualization

£

File System

Scatter/Stripe/SAN

Availability

€

Transaction Management

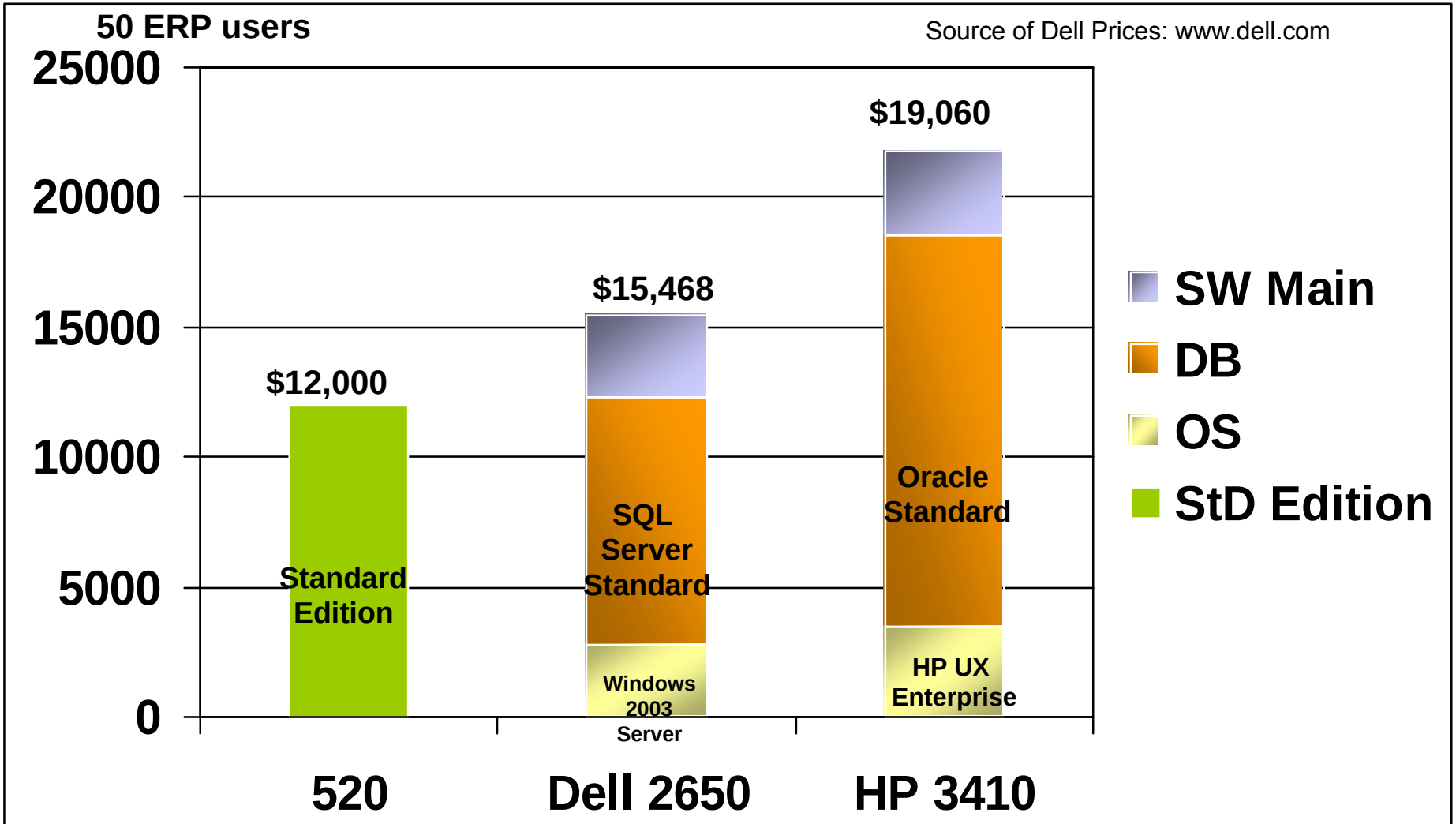
Multiple desktop support

¥

Security, Virus Protection

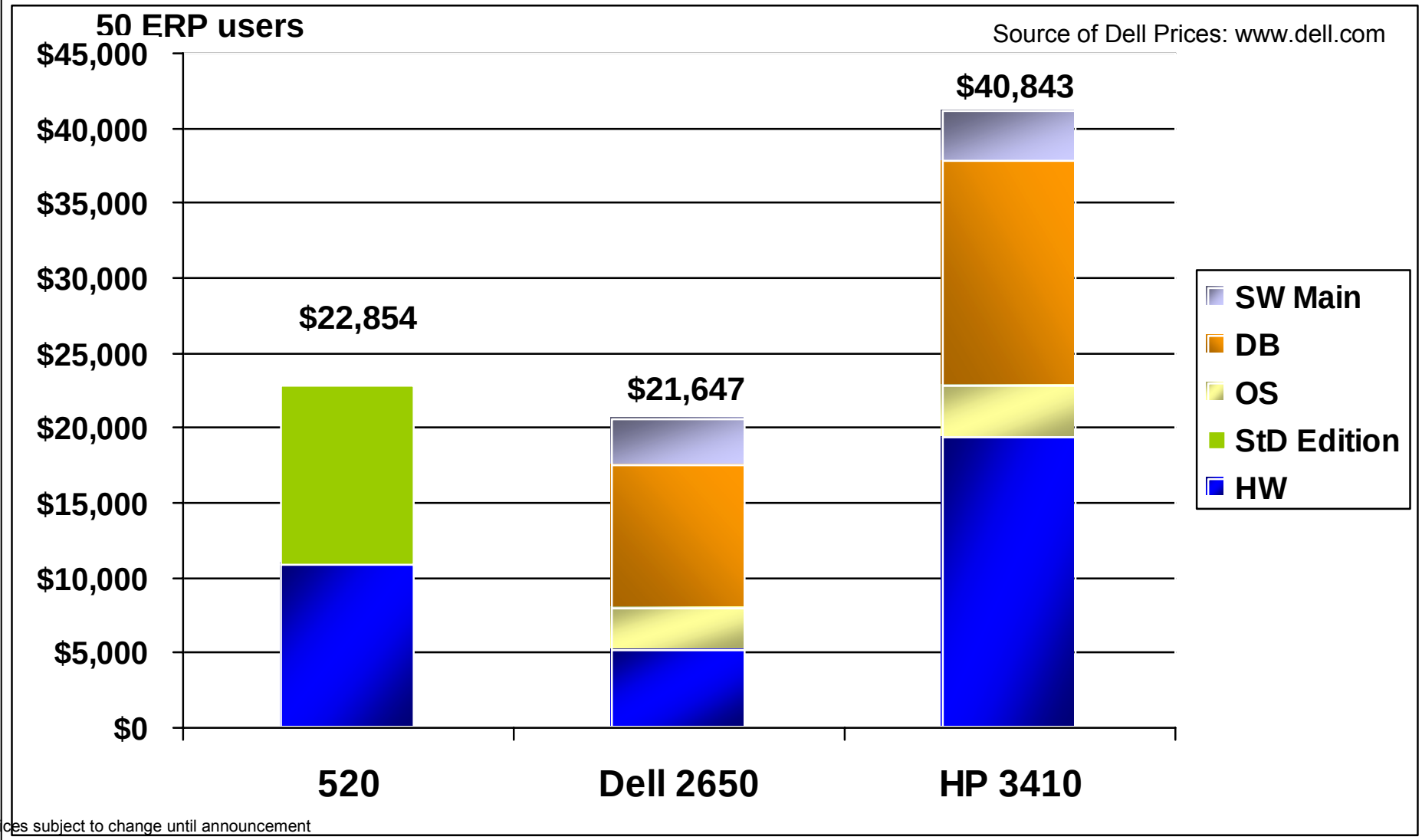
System Management

520 1-way vs Dell & HP - SW Stack Compare



*Prices subject to change until announcement

520 1-way vs Dell & HP - Total Solution Compare



*Prices subject to change until announcement

Simplify Your Infrastructure

i5/OS and WebSphere - Express for iSeries

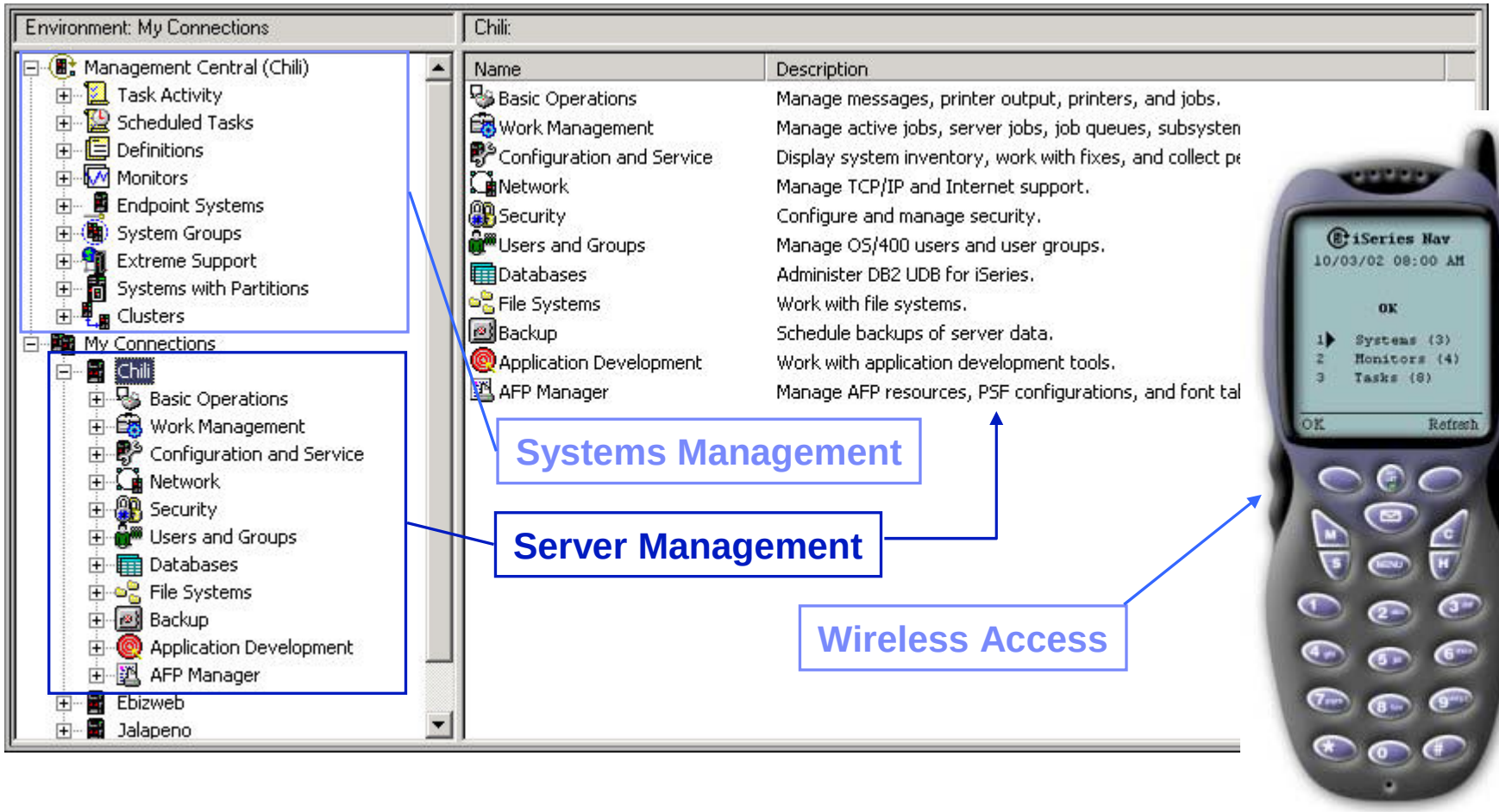
- i5/OS V5R3 is an integrated operating system that builds on and extends the capabilities of OS/400 V5R2
- i5/OS V5R3 runs on IBM ^ i5 servers, IBM ^ iSeries servers and IBM AS/400® models 720, 730, 740, 170
- WebSphere - Express for iSeries now integrated and shipped with all i5/OS
- Upgrades to i5/OS V5R3 are available from OS/400 V5R2 and V5R1

WebSphere. software

* Number of user licenses will vary based on iSeries system model and Enterprise Edition entitlements

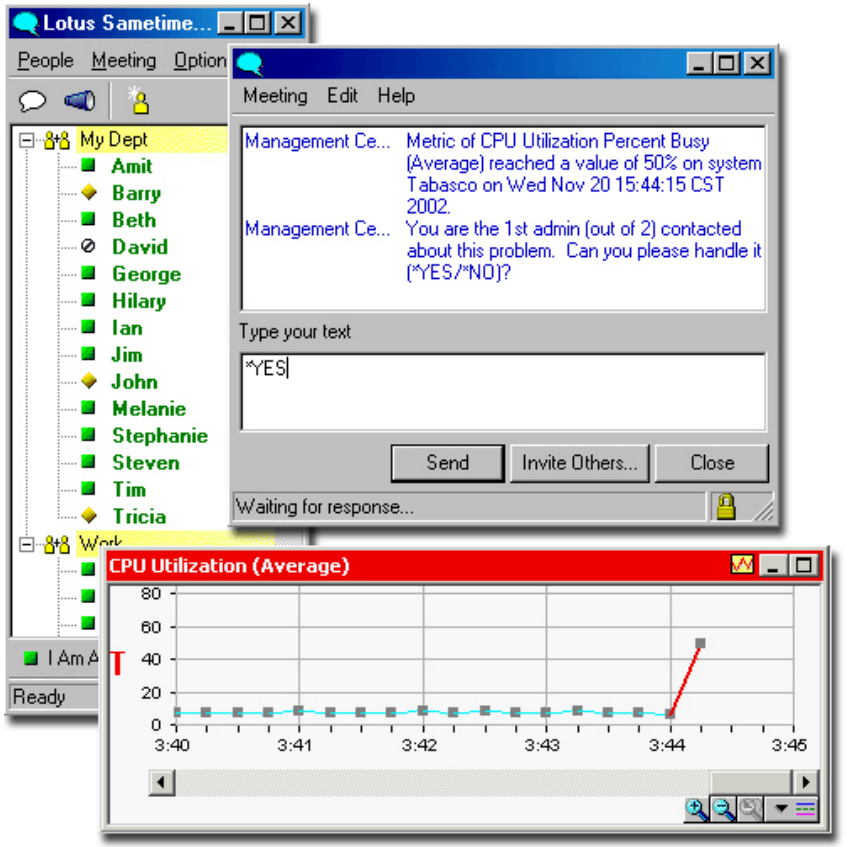
iSeries Navigator

Simple, graphical administration and management



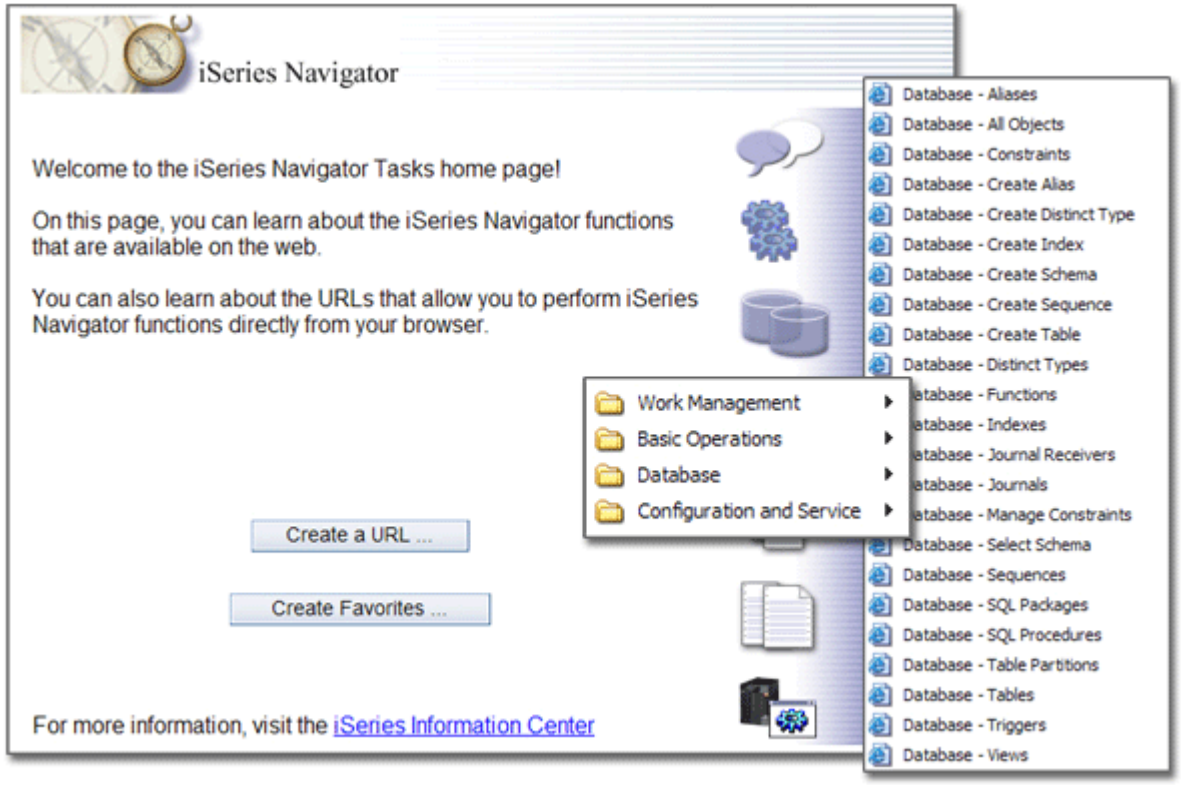
Lotus Sametime & iSeries Navigator

- Improves operator productivity with instant message response to system events
- Integrates i5/OS monitoring with Sametime instant messaging
- Assures response with automatic event delegation through hierarchy of designated operators

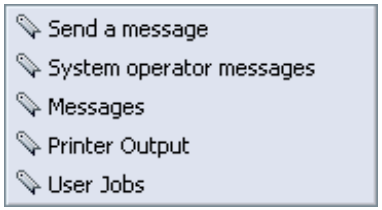


Browser-Based iSeries Navigator Tasks

- Enable access to a subset of management tasks from a Web browser
- Creating a URL enables direct access to a specific system task
- Enables tasks to be embedded into Web applications

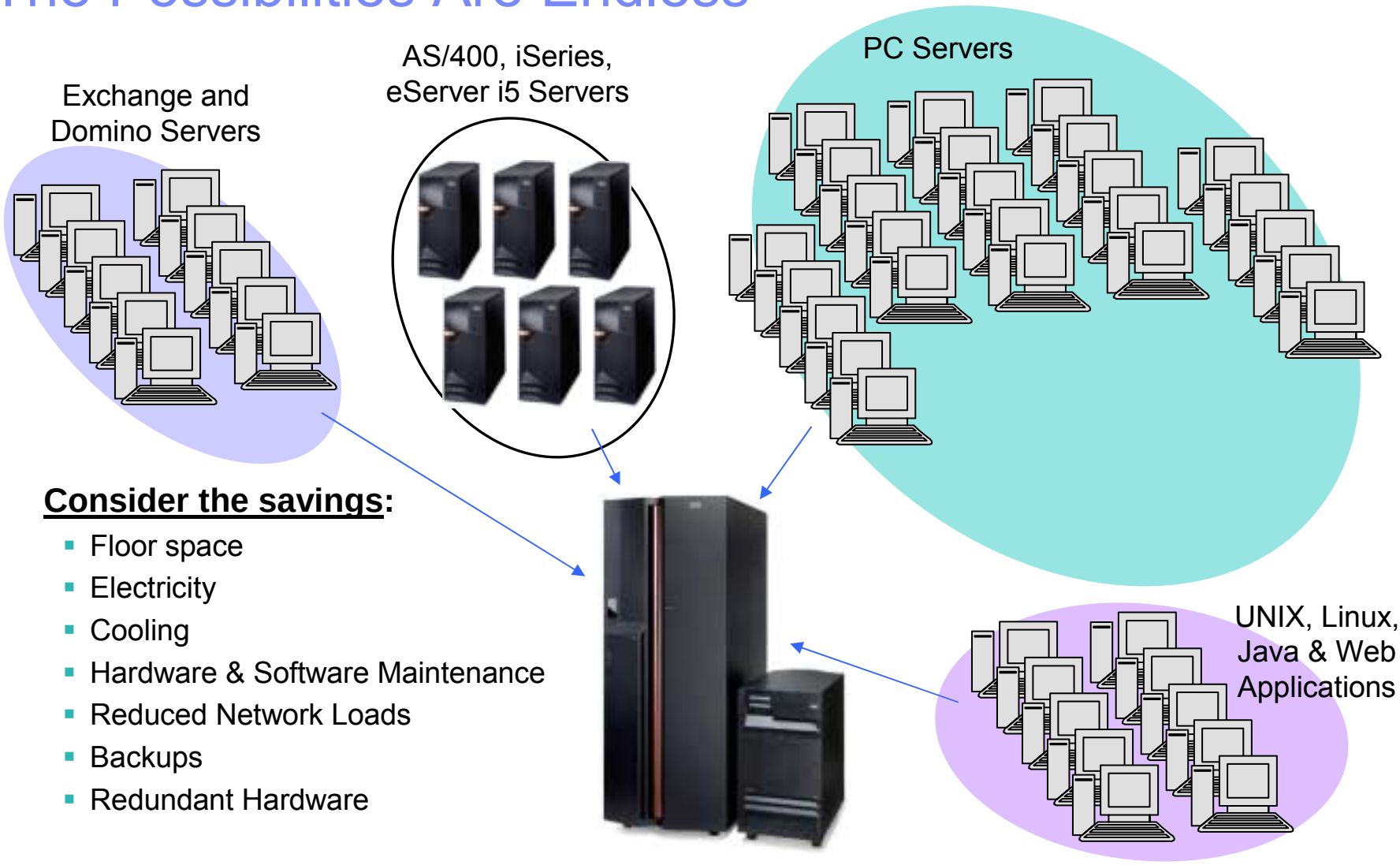


iSeries Navigator Tasks from the Web



- Subset of iSeries Navigator

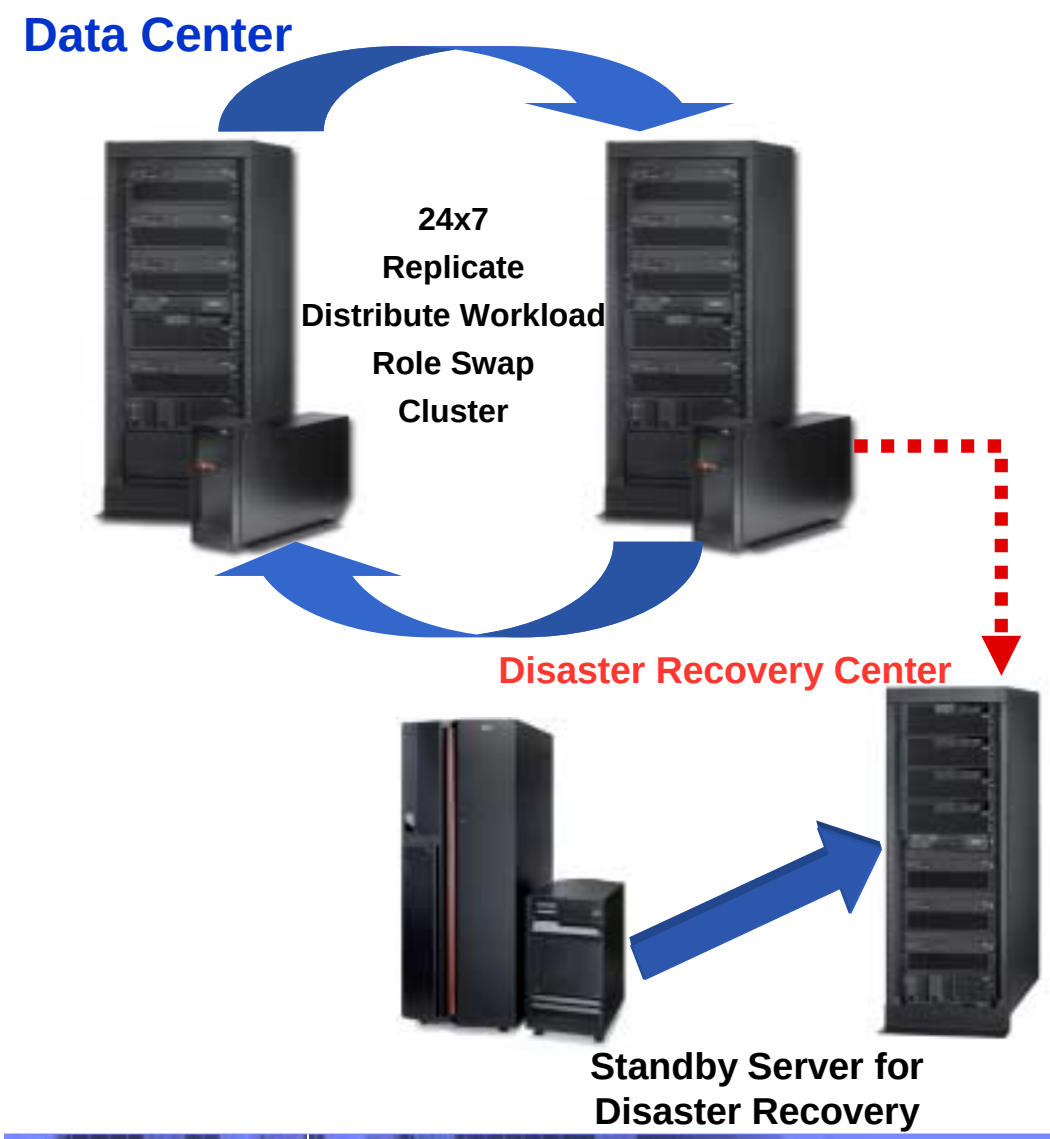
The Possibilities Are Endless



Consider the savings:

- Floor space
- Electricity
- Cooling
- Hardware & Software Maintenance
- Reduced Network Loads
- Backups
- Redundant Hardware

Flexible Business Continuity Options

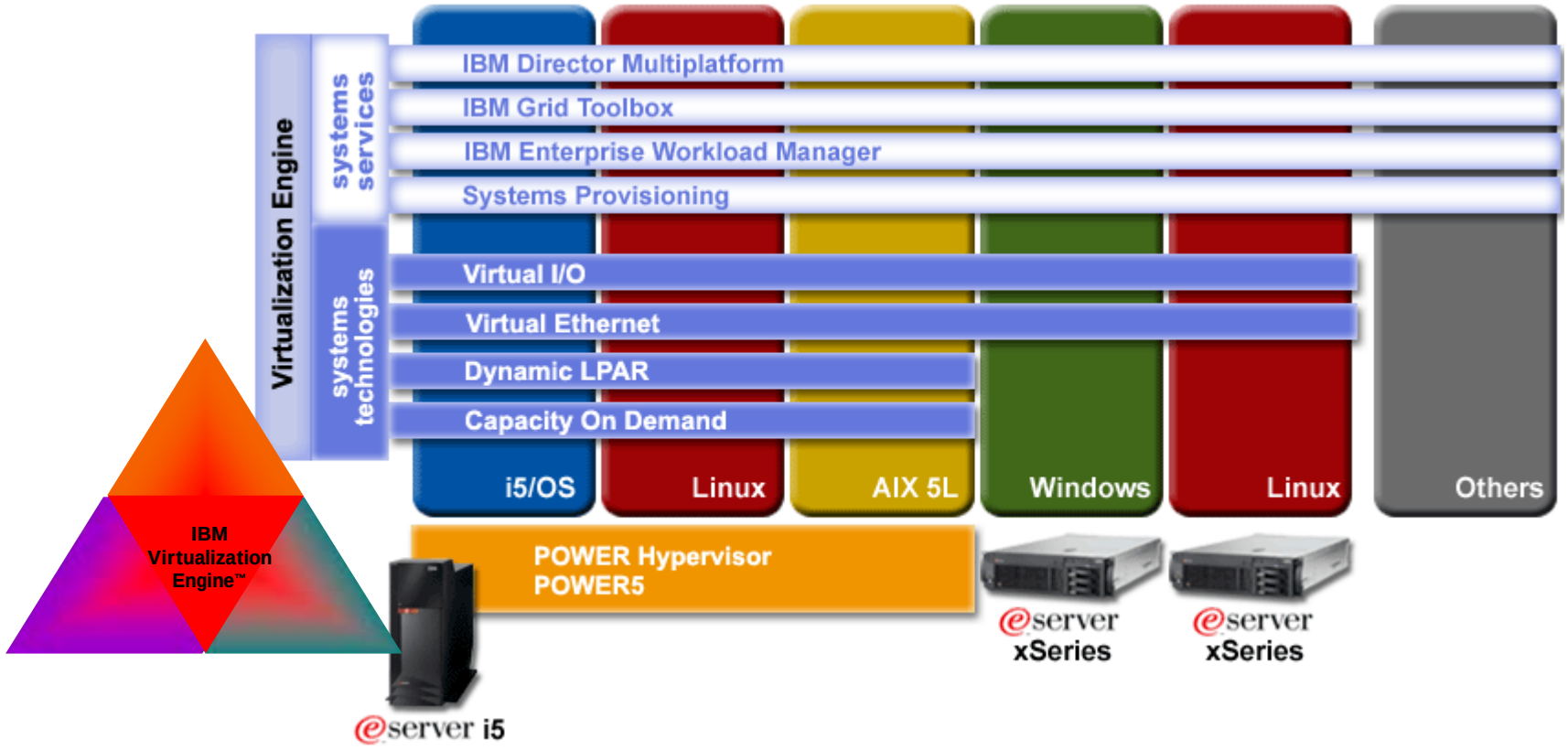


Available 8/31/04

- Deploy mission critical 24x7 environments with High Availability Edition
  - *Extended to include model 520 and model 570*
- Enable disaster recovery with Capacity Backup Edition
  - *Now available with 2/16-way model 570*

Simplify Your Infrastructure

IBM Virtualization Engine and ^ i5

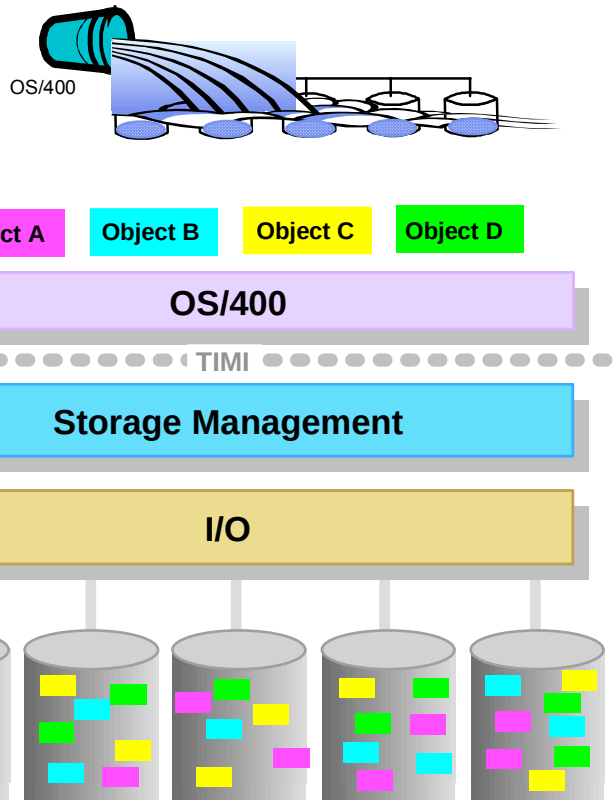


This presentation contains information about IBM's plans and directions. Such plans are subject to change without notice.

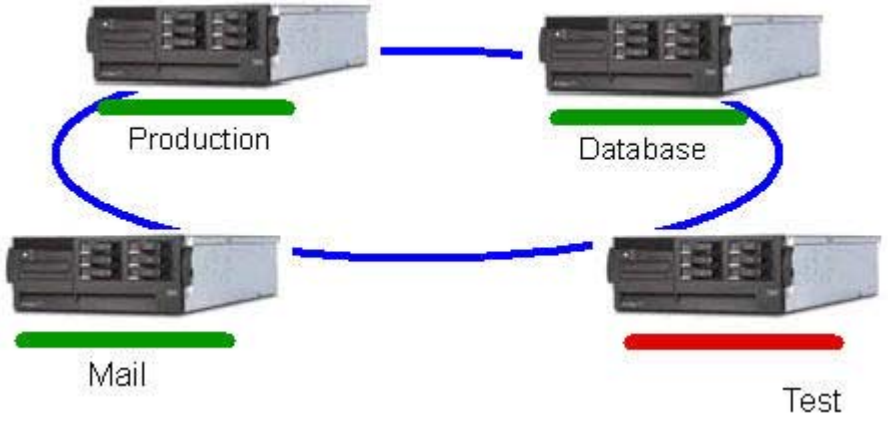
eServer i5 Storage Architecture

Designed for Ease-of-Use / Self-Management

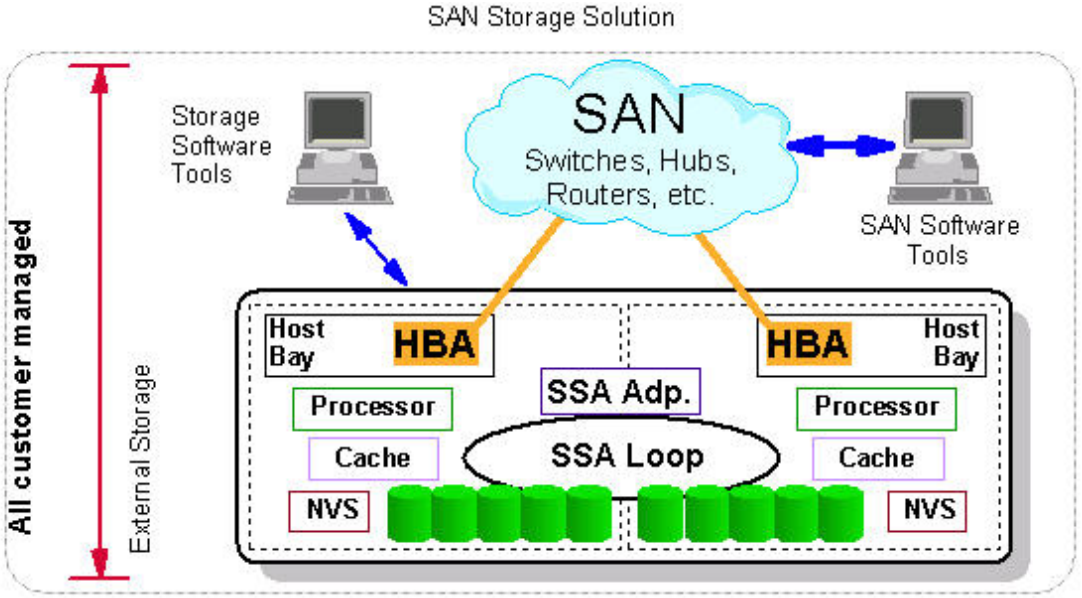
- **Data is scattered across all disks in Disk Pool**
  - **Good performance due to Parallel I/O**
  - **Disks fill evenly**
    - **no manual data placement**
    - **no individual "disk full" conditions to handle**
    - **Capacity balancing**
  - **Newly added disk capacity is utilized automatically**
  - **No continuous disk performance monitoring**
  - **Expert Cache**



The Way Operations Can Change

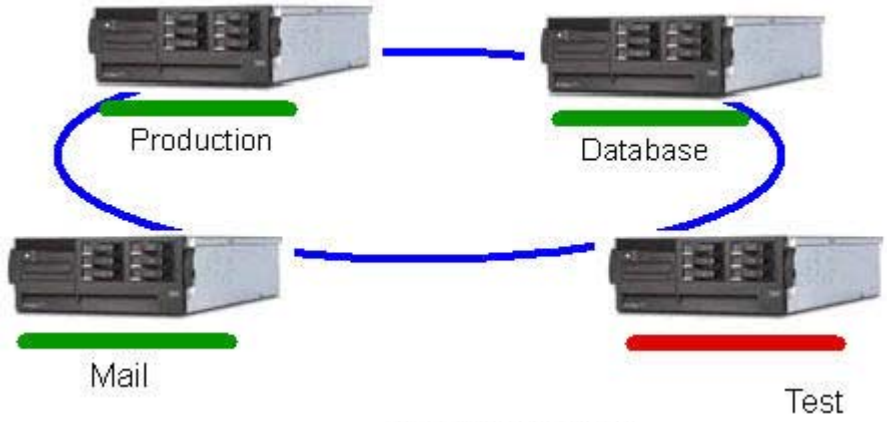


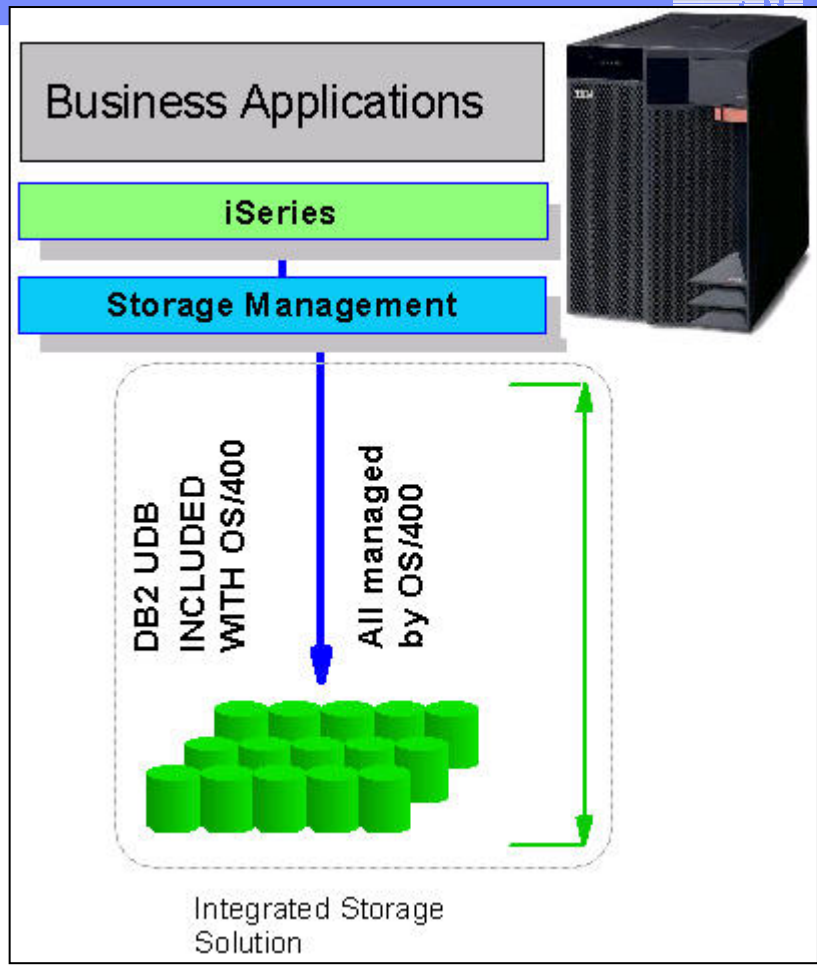
- As things expand they bring with them:
  - New complexities
  - New management tasks
  - New Planning requirements
  - New skills and resource requirements



Ease of Management

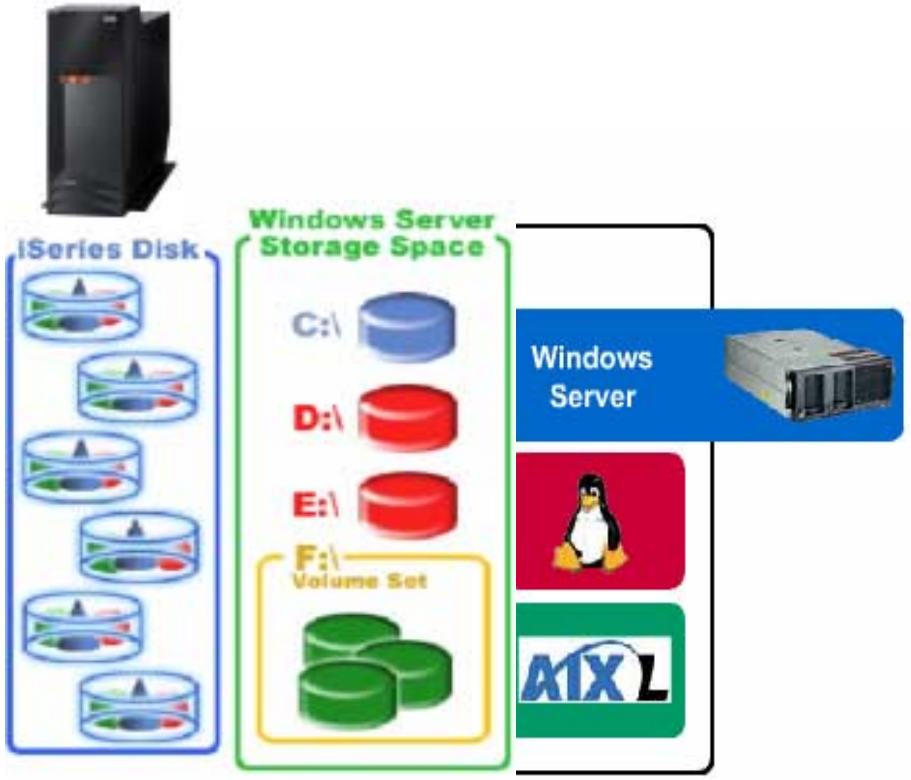
eServer i5 can provide the SAN without the complexity





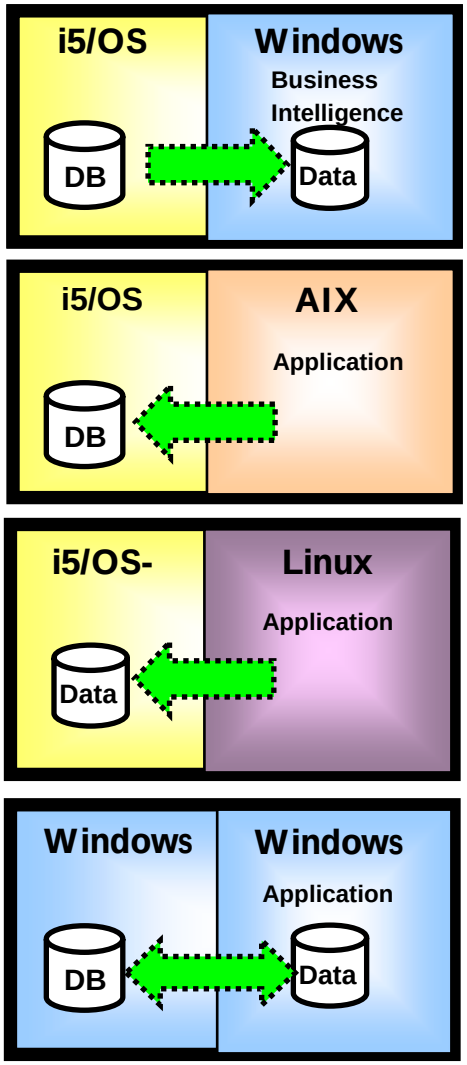
i5/OS V5R3 Storage Virtualization

- **Storage spaces created from i5/OS**
  - 1 MB to 1TB each
  - Up to 32 per Integrated xSeries Solution
  - Up to 64 per Linux partition (AIX Future)
  - Can be dynamically added
- **Enables other OSs to Leverage Advanced eServer i5 Storage Architecture**
  - Data automatically spread and protected
  - More disk arms for better performance
  - Automatic balancing of storage across drives
  - Consolidated Backup
  - Flexible Storage Management
  - Easy setup of multiple environments



Virtual Ethernet

- For fast, secure, reliable application communication between partitions
- Up to 16 high speed TCP/IP connections between partitions
  - Emulates 1 Gb Ethernet Adapters
  - Selective communications paths between partitions
  - Utilizes eServer i5 memory bus
  - No additional hardware required
- V5R1 & V5R2 Support communications between
  - OS/400, Power Linux, Windows
- V5R3
  - Adds support for AIX & Linux on Intel
  - Increases number of connections to 4094



Memory Experts

- **Background**

  Memory Experts International, is a leading-edge multinational provider of Memory and Hard Drive Subsystems

- **Objectives**

  Modernization of architecture, with the goal of cost reduction and improvements in security and service levels

  Consolidation of 13 Intel servers

  Bring email back in house

  Reduce administrative burden on their highly over worked IT administrator, and enable implementation of new functionality

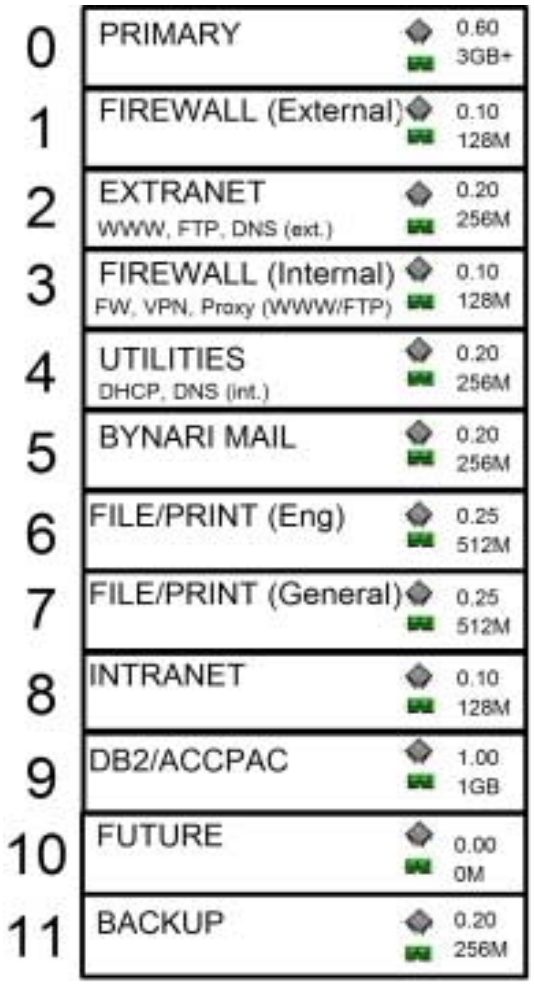
- **Solution**

  i825 - 4 processors

  10 Linux Partitions

  8 Integrated xSeries Servers for Windows

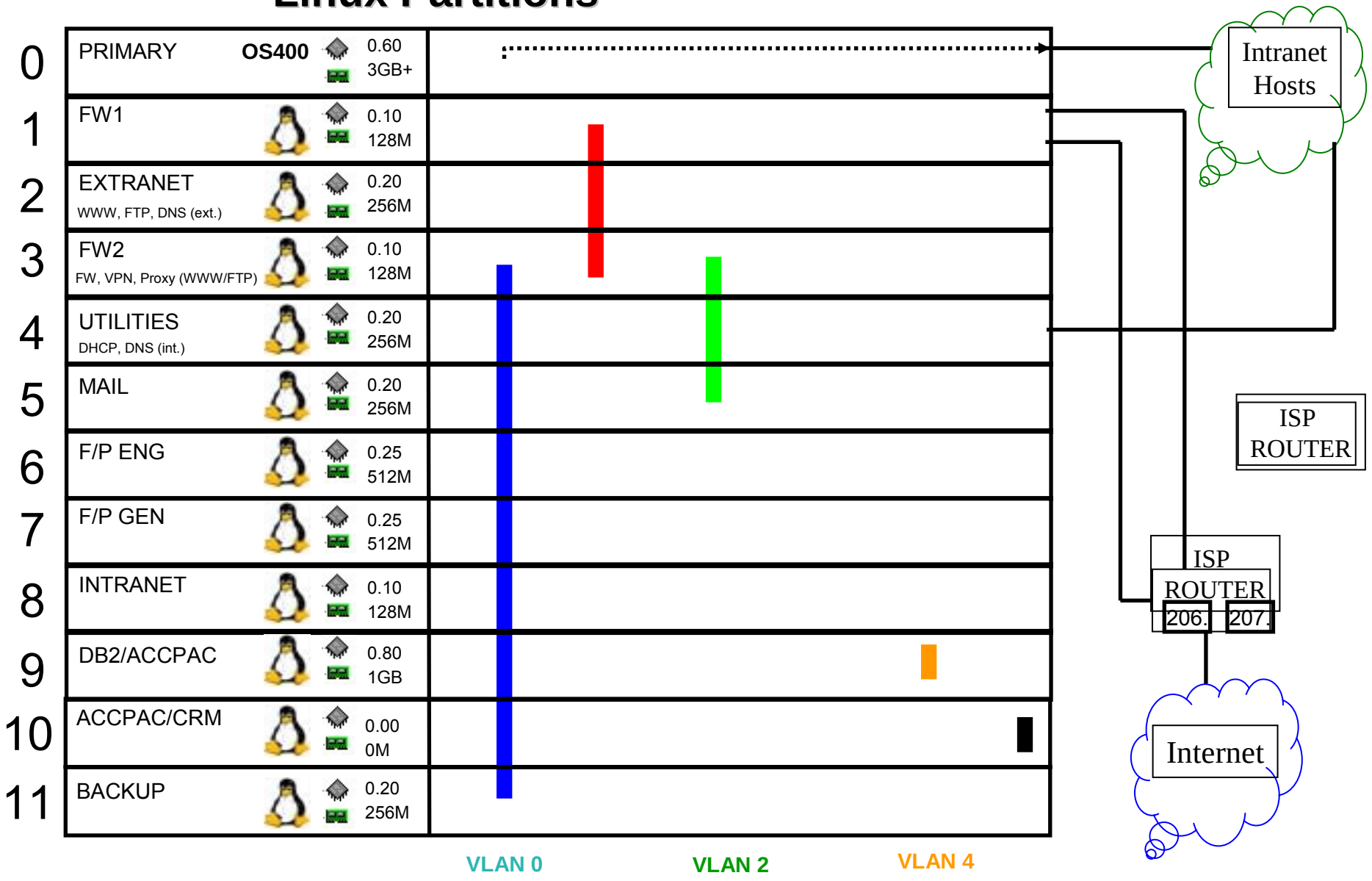
  - 4 - Terminal Server Clusters
  - 1 - Accpac CRM application
  - 1 - Test/Development/Hot spare
  - 2 - Growth



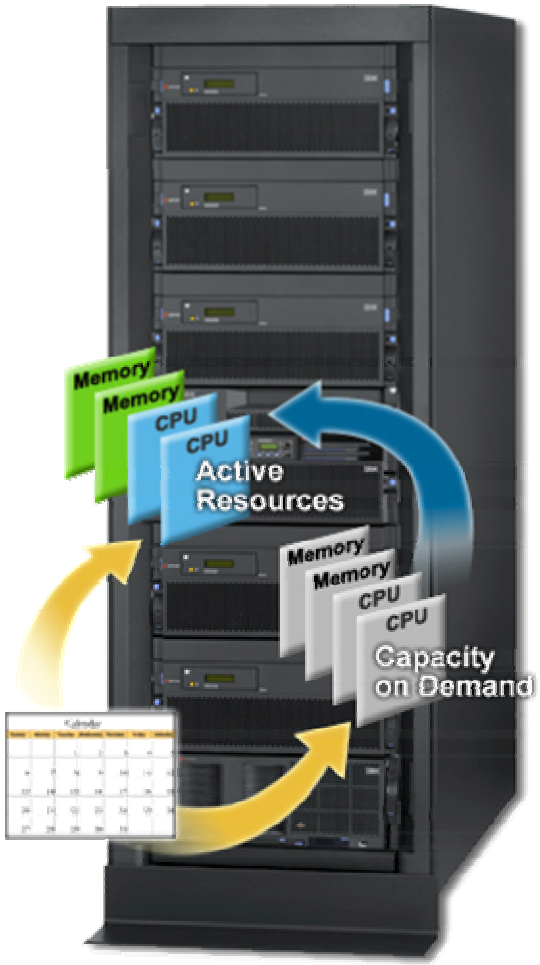
"We looked at rack mount, blade and VMWare Intel solutions, but found the iSeries to be a proven architecture that delivered both a technical leap over competition and a more compelling financial case in our cost of ownership calculation."

John McGuinness, VP Finance

Linux Partitions



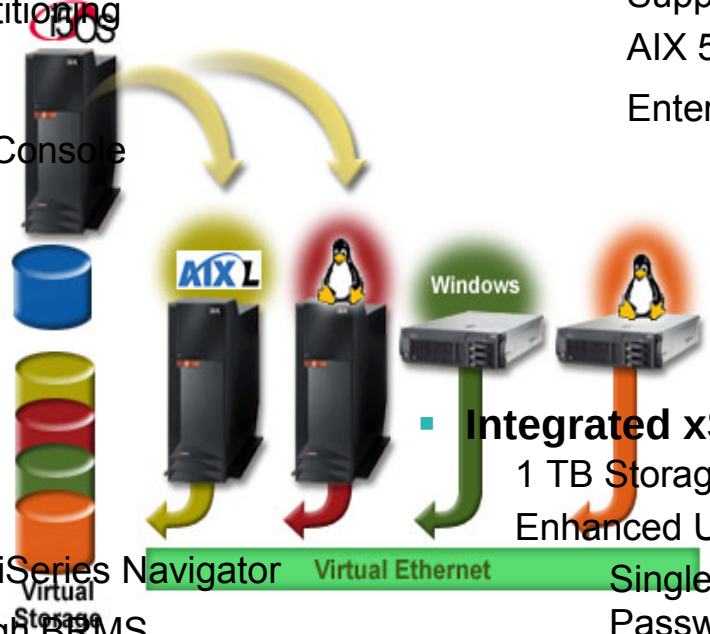
Optimize IT Resources to Changing Business Needs



- Memory Capacity on Demand
  - 4/8GB memory & 1GB activation features
    - Capacity Upgrade on Demand (permanent) or On/Off Capacity on Demand
- Reserve Capacity on Demand
  - Purchase blocks of 30 processor days
  - No contracts or usage reporting required
  - Automatically used by server when utilization hits 100%
- Trial Capacity on Demand
  - 30 consecutive days at no charge
  - Opportunity to test proposed capacity
  - Inactive processors and memory enabled
  - One-time use … reset after processor upgrade or processor activation
- Note: CoD processor activation and Edition prices have been rebalanced to be consistent with eServer p5 processor activation price

What is New?

- **IBM Virtualization Engine**
  - 3rd Generation of Logical Partitioning
    - Up to 254 Partitions
    - Uncapped partitions
    - Hardware Management Console
  - IBM Director Multiplatform



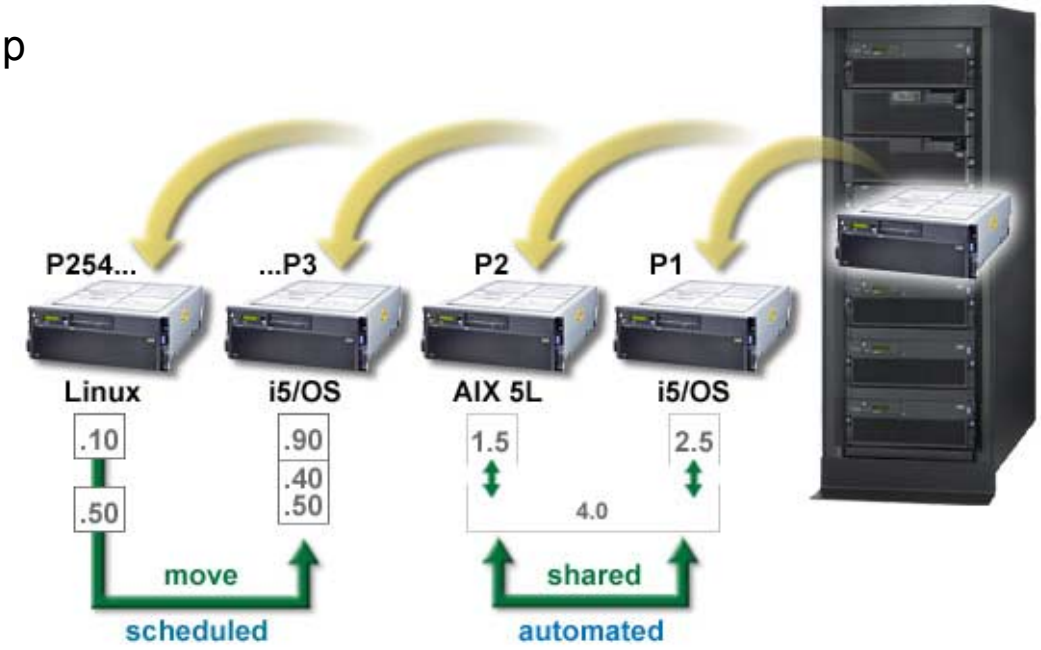
- **AIX 5L**
  - Supported Across eServer i5
  - AIX 5L v5.2 & v5.3
  - Enterprise Edition

- **Linux on POWER**
  - Storage Management via iSeries Navigator
  - Backup Automation through BRMS
  - New Distribution for eServer i5
    - Red Hat Enterprise Linux AS 3
    - SUSE LINUX Enterprise Server

- **Integrated xSeries Solutions**
  - 1 TB Storage Spaces
  - Enhanced User Integration with EIM
    - Single Sign-on support
    - Password management from Windows
  - Product Preview
    - New Integrated xSeries Server
    - **Linux support**

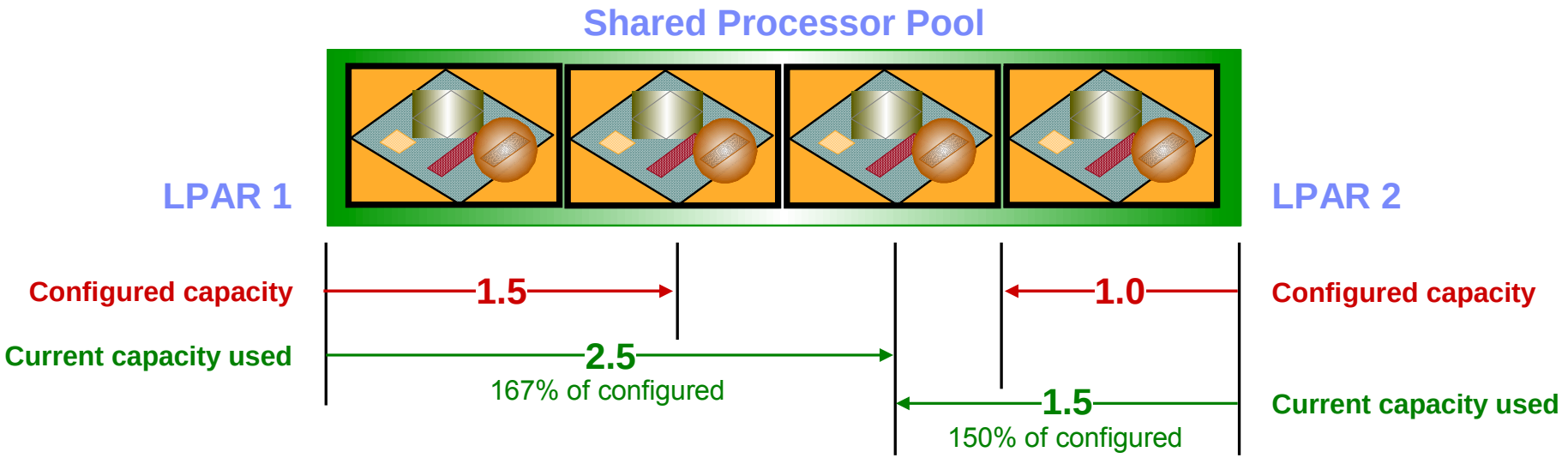
i5/OS V5R3 Dynamic Logical Partitioning

- Features IBM POWER Hypervisor™ supporting i5/OS, AIX 5L and Linux and up to 254* partitions
- Improve server utilization rates across multiple workloads
  - Automatic processor balancing with uncapped partitions
- Improve fault tolerance and lower partition management costs
  - Primary partition replaced by Hardware Management Console (HMC)
- An IBM Virtualization Engine systems technology
- eServer i5 570 16-way supports:
  - 160 Partitions
  - 64 i5/OS partitions



Uncapped Processors in V5R3

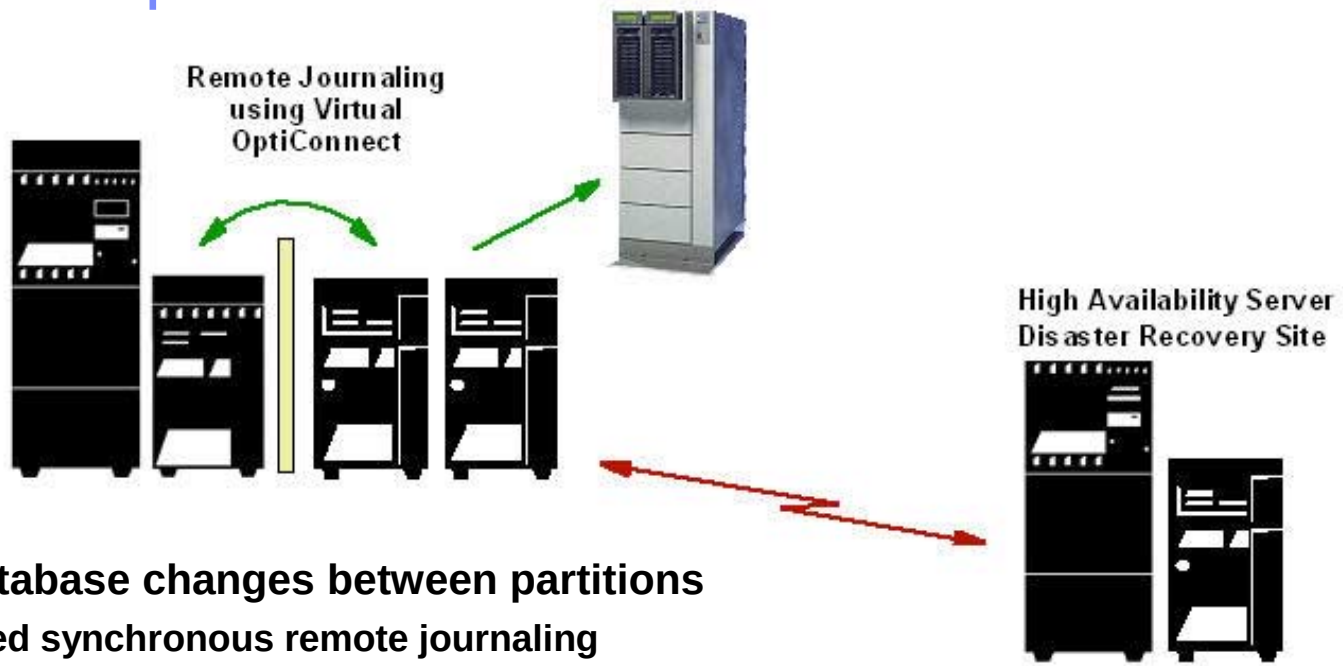
Allow a logical partition to utilize processor capacity in excess of the configured processor capacity, if there is unused capacity in the shared processor pool.



Example with 2 partitions sharing 4 processors

In V5R2, the processing capacity of a shared processor logical partition was limited (capped) by the number of virtual processor units (VPs) configured

Minimize Backup Window

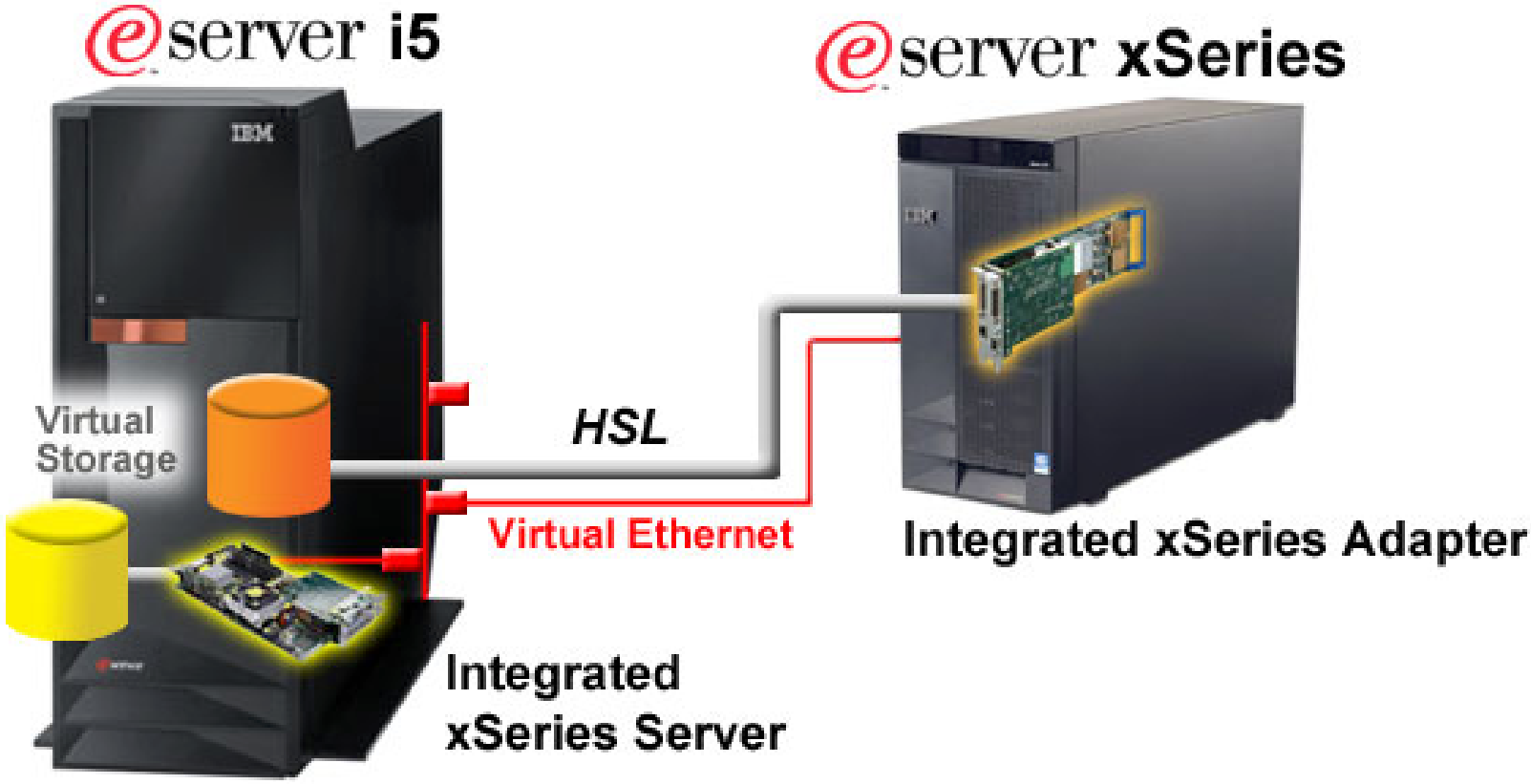


- **Journal database changes between partitions**
  - **High speed synchronous remote journaling**
- **Use secondary partition for read-only operations**
  - **Save operations**
  - **Query execution**
  - **Reporting**
  - **Data transformation for business intelligence**

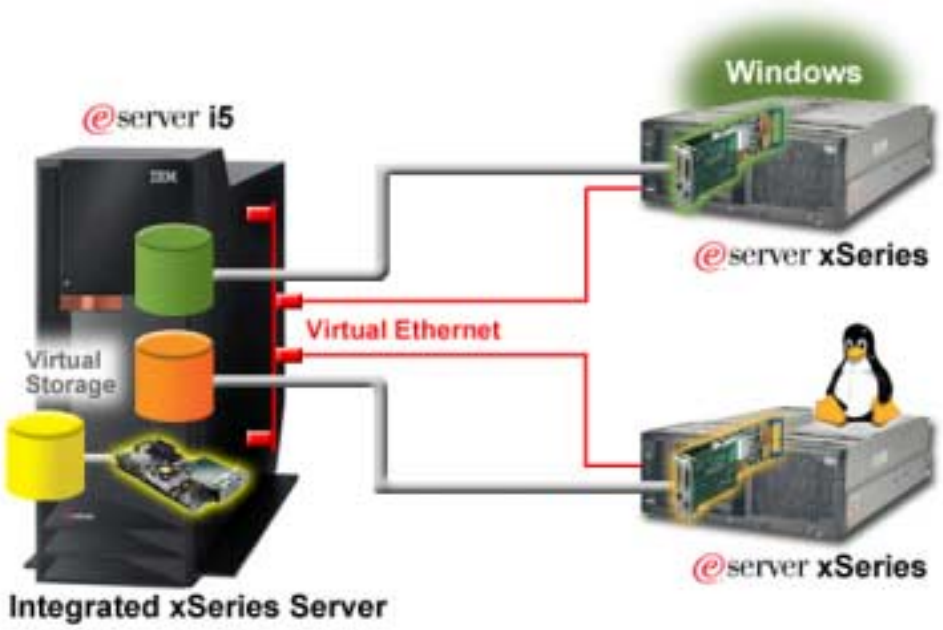
Virtualization Enhancements for POWER5

	iSeries	eServer i5
Maximum # of partitions	32	254
Partitions per Processor	Up to 10	Up to 10
Processor Movement	Static Dynamic	Static Dynamic Automatic
Maximum # of Virtual Ethernets	16	4094
Maximum Virtual Disk per partition	2 TB	64 TB
Partition Management	Primary	HMC
Operating Systems	i5/OS OS/400 Linux	i5/OS Linux AIX 5L

Windows Server Management



Integrating Intel Linux Servers

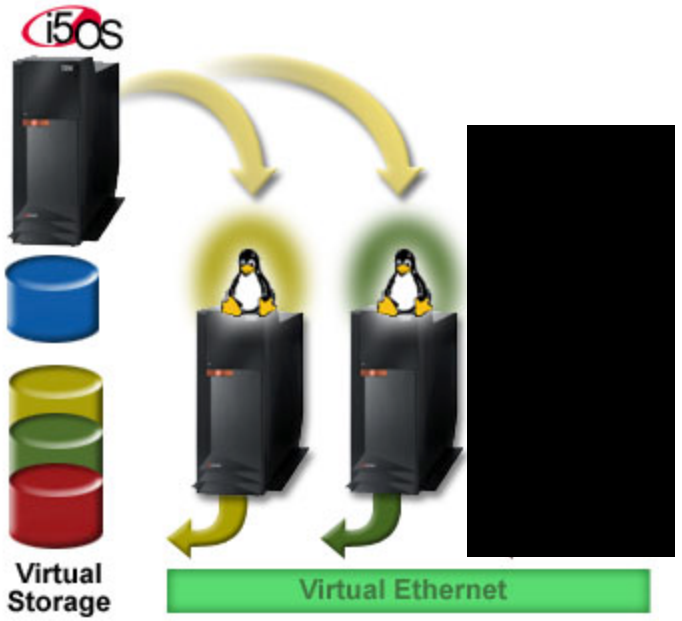


- Linux
  - IBM intends to provide support on selected IXS and xSeries servers attached to eServer i5 via the IXS/IXA*
  - Extends Linux application options
- IBM Director Multiplatform provides management & monitoring tools

* Product Preview. Planned availability 3Q 2004 This presentation contains information about IBM's plans and directions. Such plans are subject to change without notice.

Linux on POWER

- **Simplify your Infrastructure**
  - Consolidate aging Intel servers
  - Extend i5/OS with complementary Linux applications
- **Optimize your Investments**
  - Share processor and memory resource
  - Move resources to where they are needed
  - Exploit i5/OS storage architecture and resources
  - Leverage Skills and Best Practices
- **Across eServer i5 servers**
  - Common Linux distribution for POWER5 servers
    - Red Hat Enterprise Linux AS for POWER ™ Version 3*
    - SUSE LINUX Enterprise Server 9 for POWER ™**
  - Enterprise Edition
    - Extra Processor Activated(570) and Service(520 and 570), and Education (570) Voucher



redhat

simply change suse

* Update 3 Available September 30, 2004

** Available August 31, 2004

Linux and IBM ^ i5*

- Common Linux distribution for POWER5 processor – based servers
  - Up to 254 Logical Partitions
  - Automatic processor balancing with uncapped partitions
- Extended SAN and enterprise storage connectivity options
  - IBM LTO, FAStT, 3592 offerings
- iSeries Navigator V5R3 enhancements
  - Start up, shut down Linux servers
  - Create/manage virtual storage spaces
- IBM Director Multiplatform provides management & monitoring tools

Planned availability 3Q 2004 This presentation contains information about IBM's plans and directions. Such plans are subject to change without notice.

AIX 5L on eServer i5

- **Simplify your Infrastructure**
  - Consolidate UNIX servers
  - Extend with complementary AIX 5L applications
- **Optimize your Investments**
  - Share processor and memory resource
  - Move resources to where they are needed
  - Exploit i5/OS storage subsystem
  - Leverage skills and best practices
- **Across eServer i5 servers**
  - AIX 5L 5.3*
    - Micro-partitioning, up to 10 per processor
    - Virtual Storage and Virtual Ethernet
  - AIX 5L v5.2*
    - 1 processor per partition
    - Supports variety of direct I/O devices

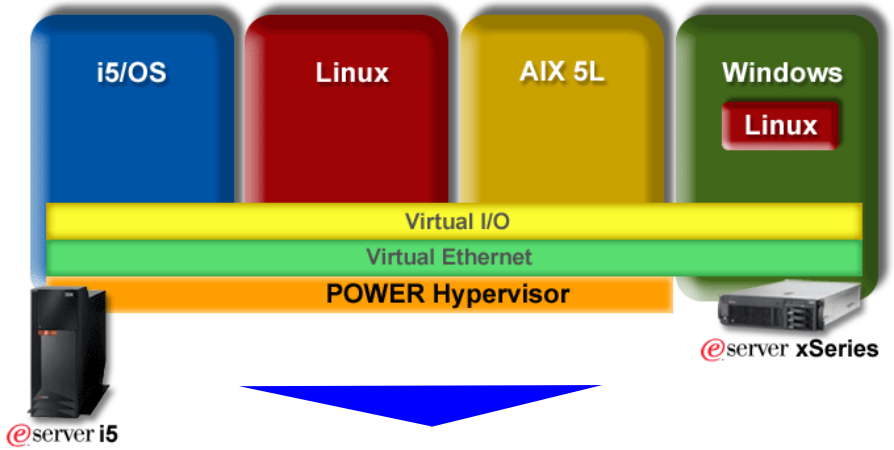
*Available August 31, 2004

OS Support for Virtualization on eServer i5

	i5/OS 5.3	AIX 5L 5.3	AIX 5L 5.2	Linux SLES 9	Linux RHEL 3 U3
Micro-Partitioning	Yes	Yes	No	Yes	Yes
Uncapped Partitions	Yes	Yes	No	Yes	Yes
Dynamic LPAR					
- Processor	Yes	Yes	No	Yes	No
- Memory	Yes	Yes	No	No	No
- I/O	Yes	Yes	No	Yes	No
Virtual I/O Hosting	Yes	No	No	No	No
Virtual I/O Client					
- Storage	No	Yes	No	Yes	Yes
- Ethernet	Yes	Yes	No	Yes	Yes
- CD/DVD	No	No	No	Yes	Yes
- Tape	No	No	No	Yes	Yes

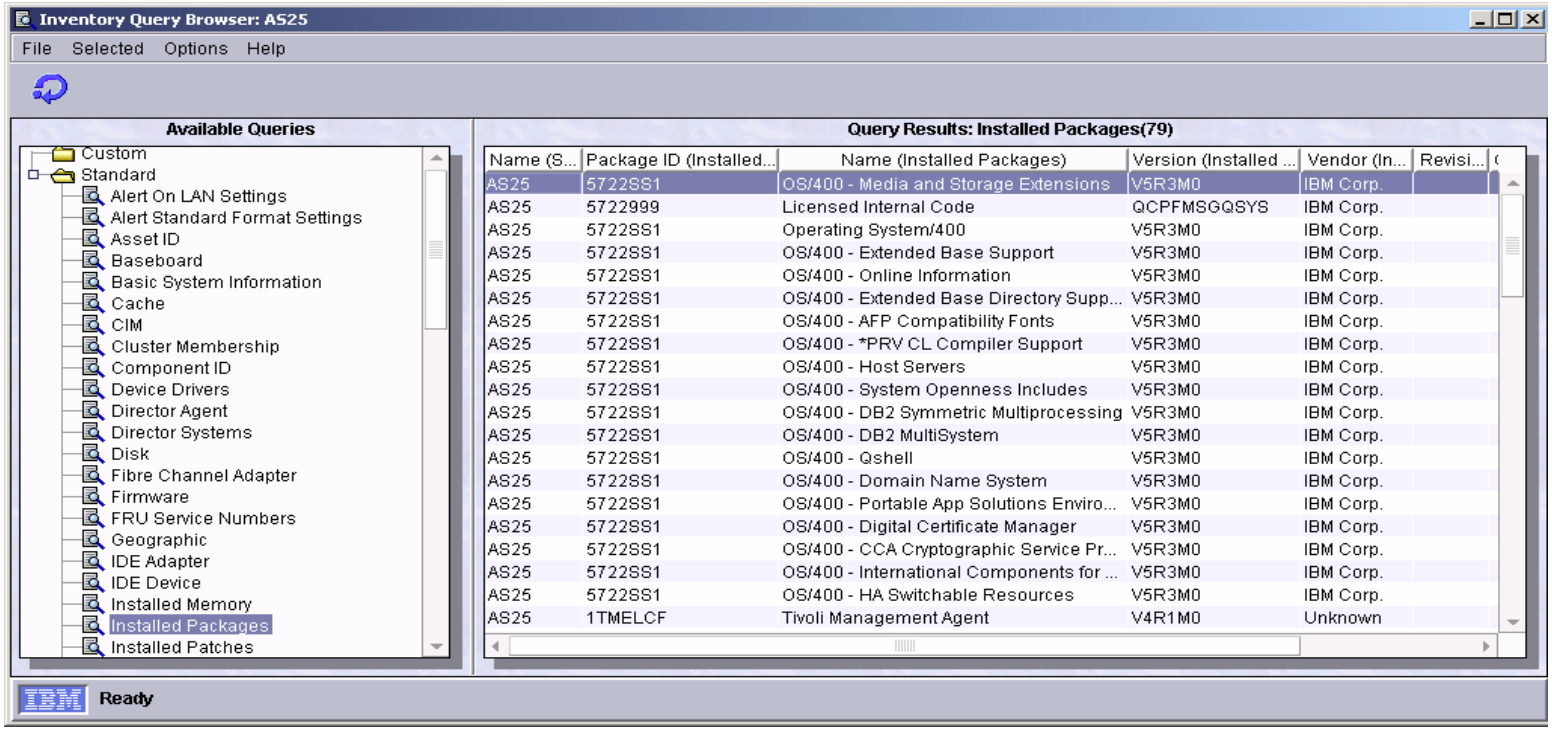
IBM Director Multiplatform*

- Provides Centralized Management Across Heterogeneous Servers
  - Collect inventory
  - Establish Monitors
  - Set Alerts
  - Take automatic actions
- Expanded to support additional operating systems
  - Server: i5/OS V5R3, Windows, Intel Linux
  - Agents: Servers + POWER Linux, AIX 5L, ….
- Integrated with PM iSeries for collecting and reporting multi-OS CPU utilization and capacity planning
- Complements iSeries Navigator
- IBM Virtualization Engine Systems Service

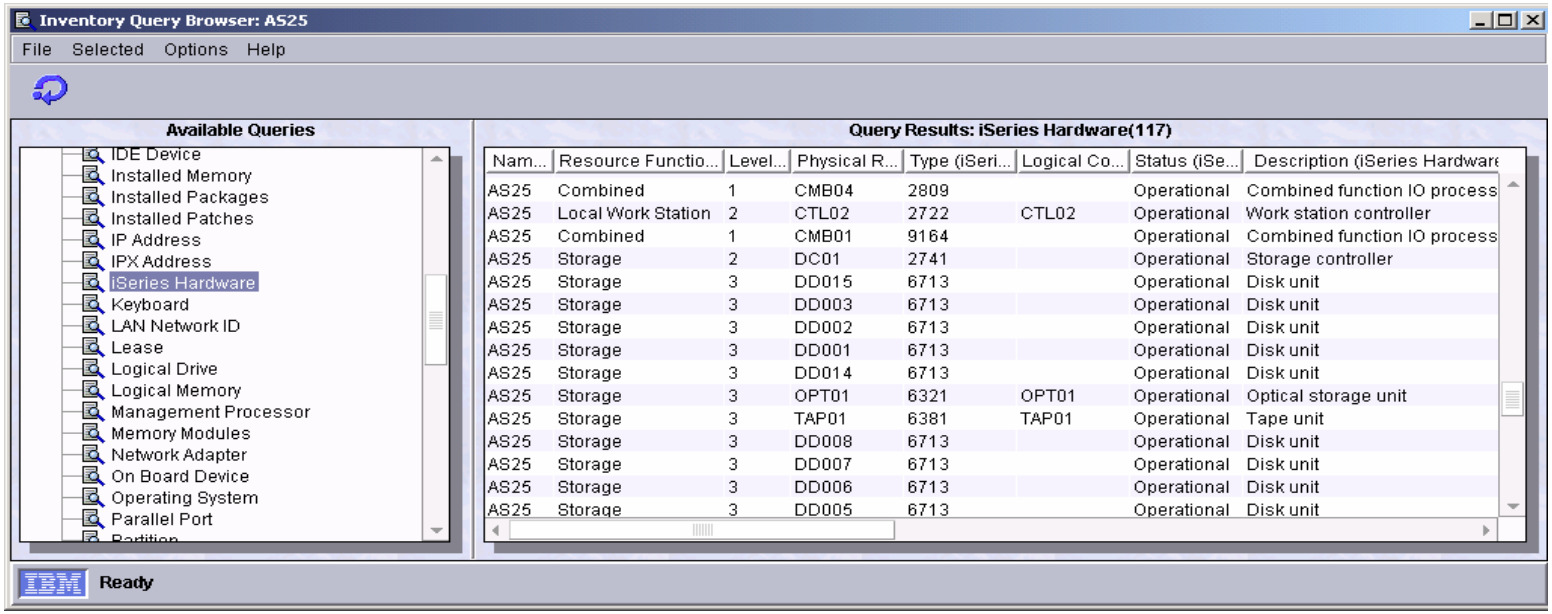


* Product Preview: Planned Availability 2H 2004

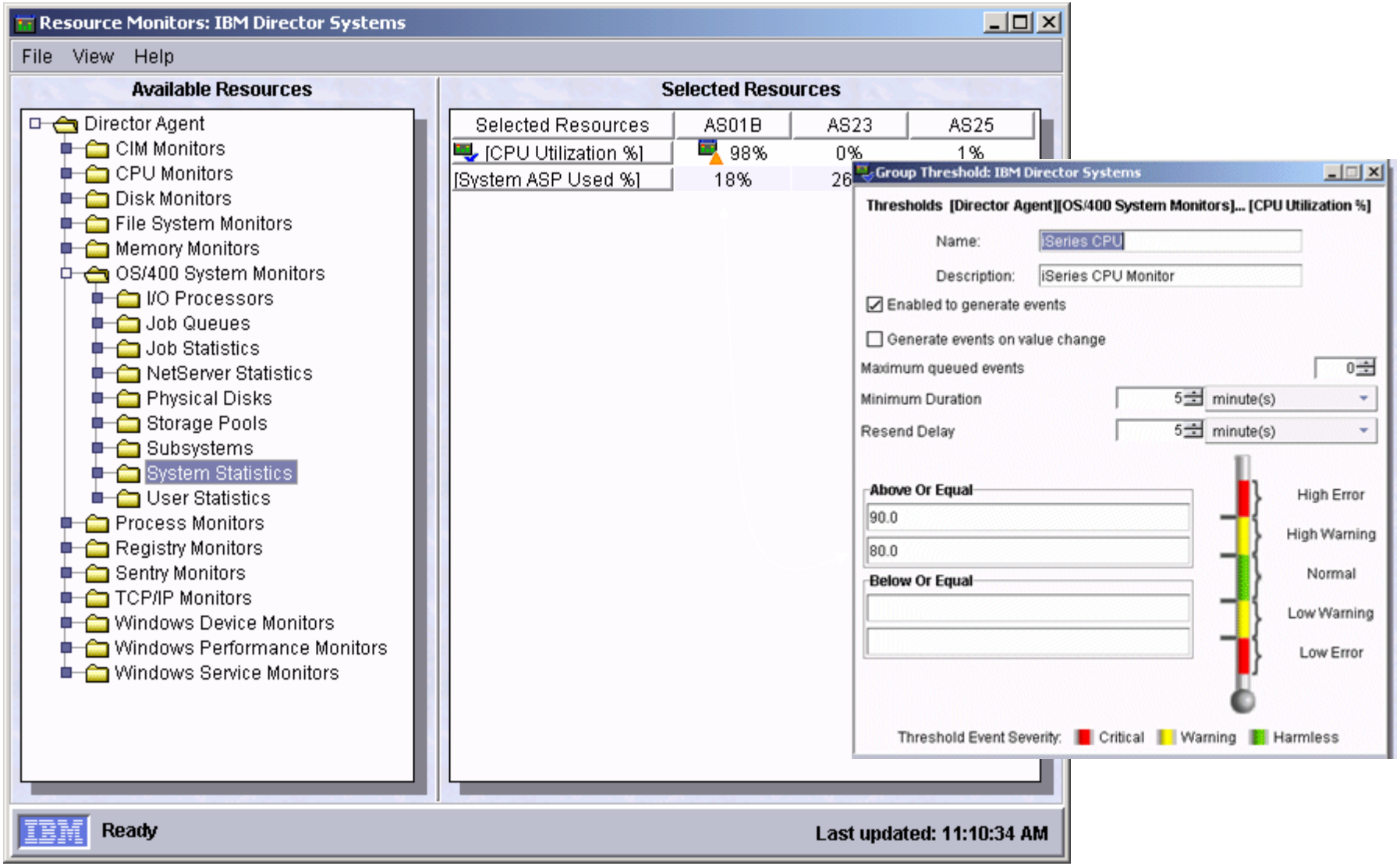
eServer i5 Inventory Query: Installed Packages



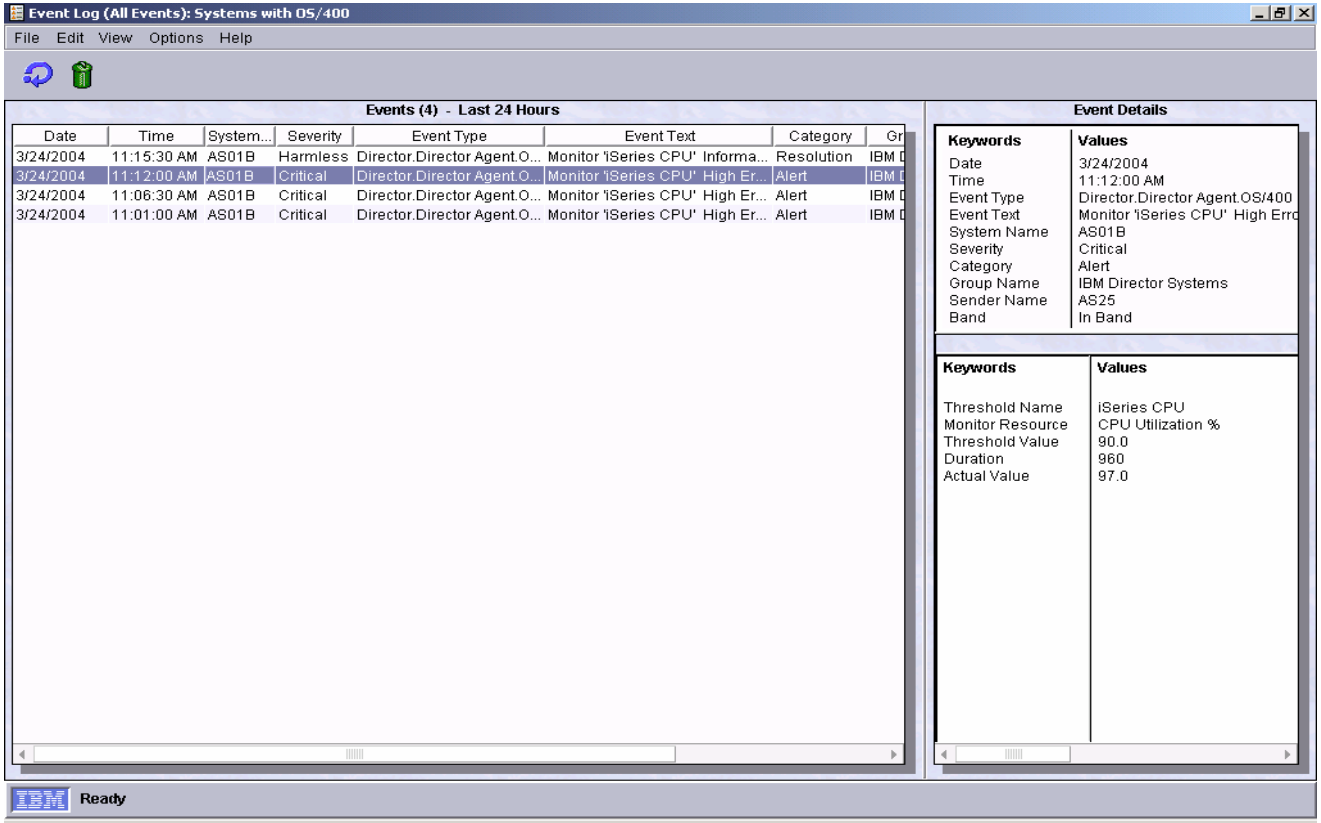
eServer i5 Inventory Query: Hardware



eServer i5 Resource Monitors



Event Logs



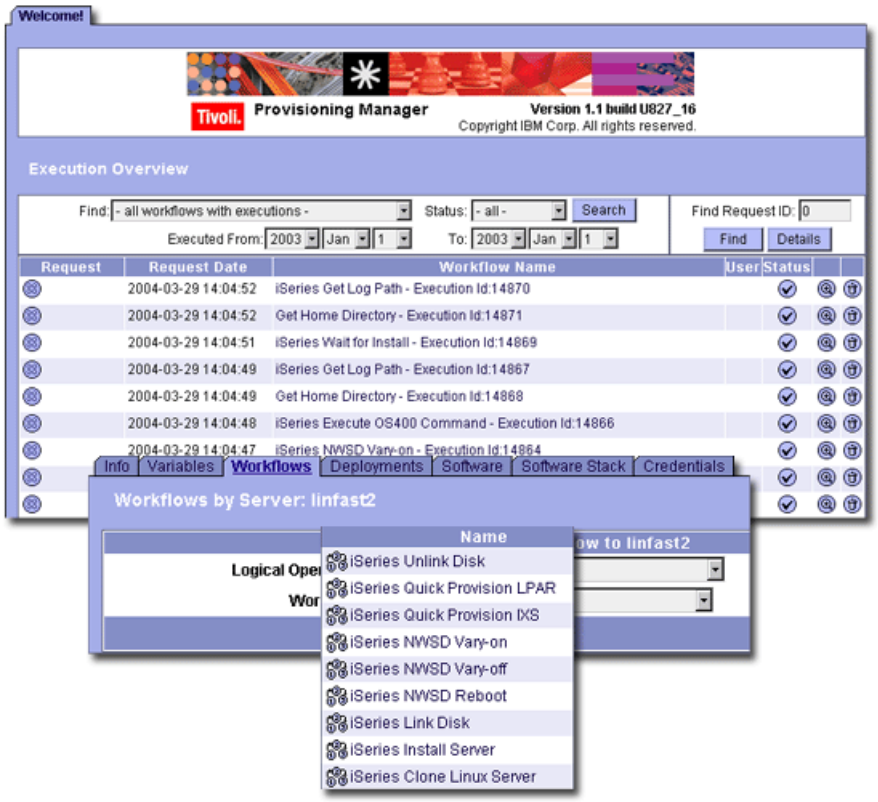
IBM Enterprise Workload Manager (EWLM)*

- Provides cross platform end-to-end view of goal oriented performance management for enterprise applications
- i5/OS V5R3 enables monitoring of applications instrumented with Application Response Measurement (ARM) standards
  - WebSphere Application Server
  - IBM HTTP Server (Powered by Apache)
  - DB2 UDB
- *An IBM Virtualization Engine systems service*

* Product Preview. Planned availability 3Q 2004 This presentation contains information about IBM's plans and directions. Such plans are subject to change without notice.

Systems Provisioning

- Simplifies the deployment of multiple infrastructure servers
- Automates the installation Linux and selected Windows servers
- Provisions hot spare IXA/IXS failover, and Linux on POWER cloning
- Supports deployment of Windows on IXS/IXA and Linux on POWER
- *An IBM Virtualization Engine systems service*



* Product Preview. Planned availability 3Q 2004 This presentation contains information about IBM's plans and directions. Such plans are subject to change without notice.

Integrate to Innovate

Domino 6.5.1 – the Unifying Release

Latest Lotus products can be run together on eServer i5 in a single LPAR

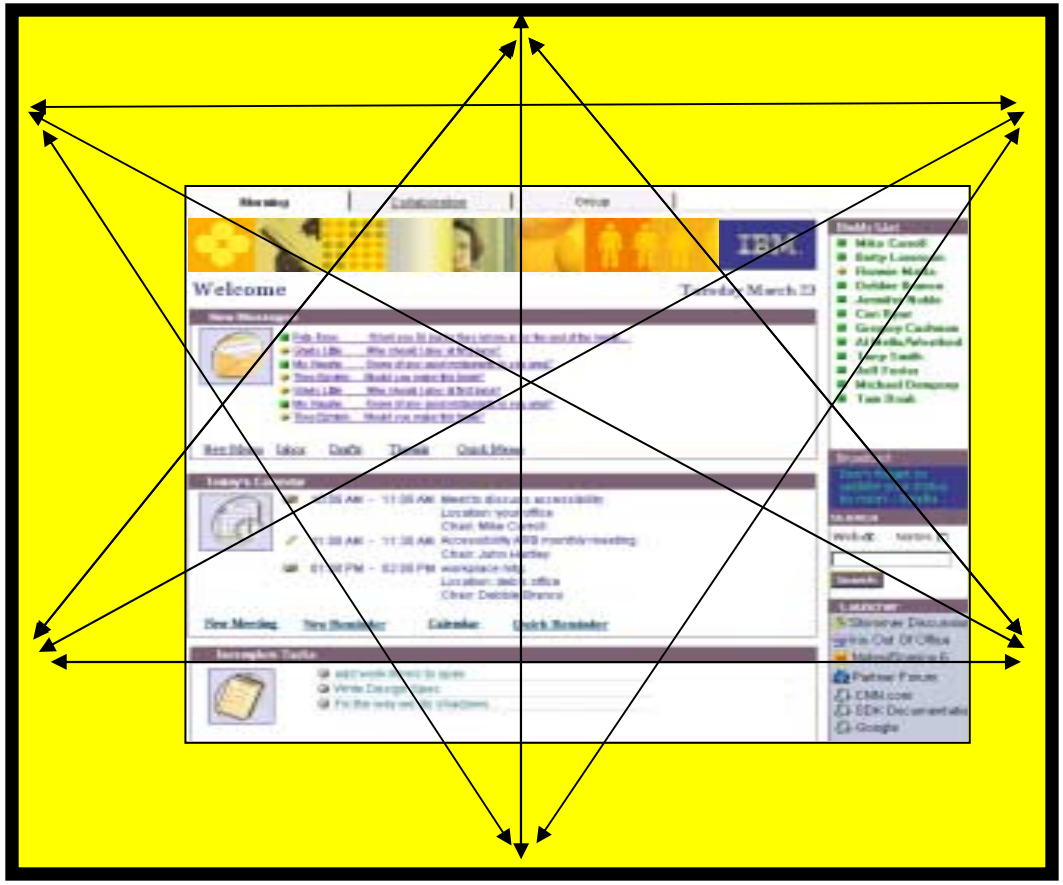
Lotus. software

IBM Lotus Instant Messaging and Web Conferencing (Sametime)

IBM Integrated Domino Fax for iSeries

IBM Lotus Document Manager (Domino.Doc)

IBM Lotus Domino



Lotus Notes

IBM Lotus Team Workplace (QuickPlace)

IBM Lotus Enterprise Integrator (LEI)

IBM Lotus Workflow

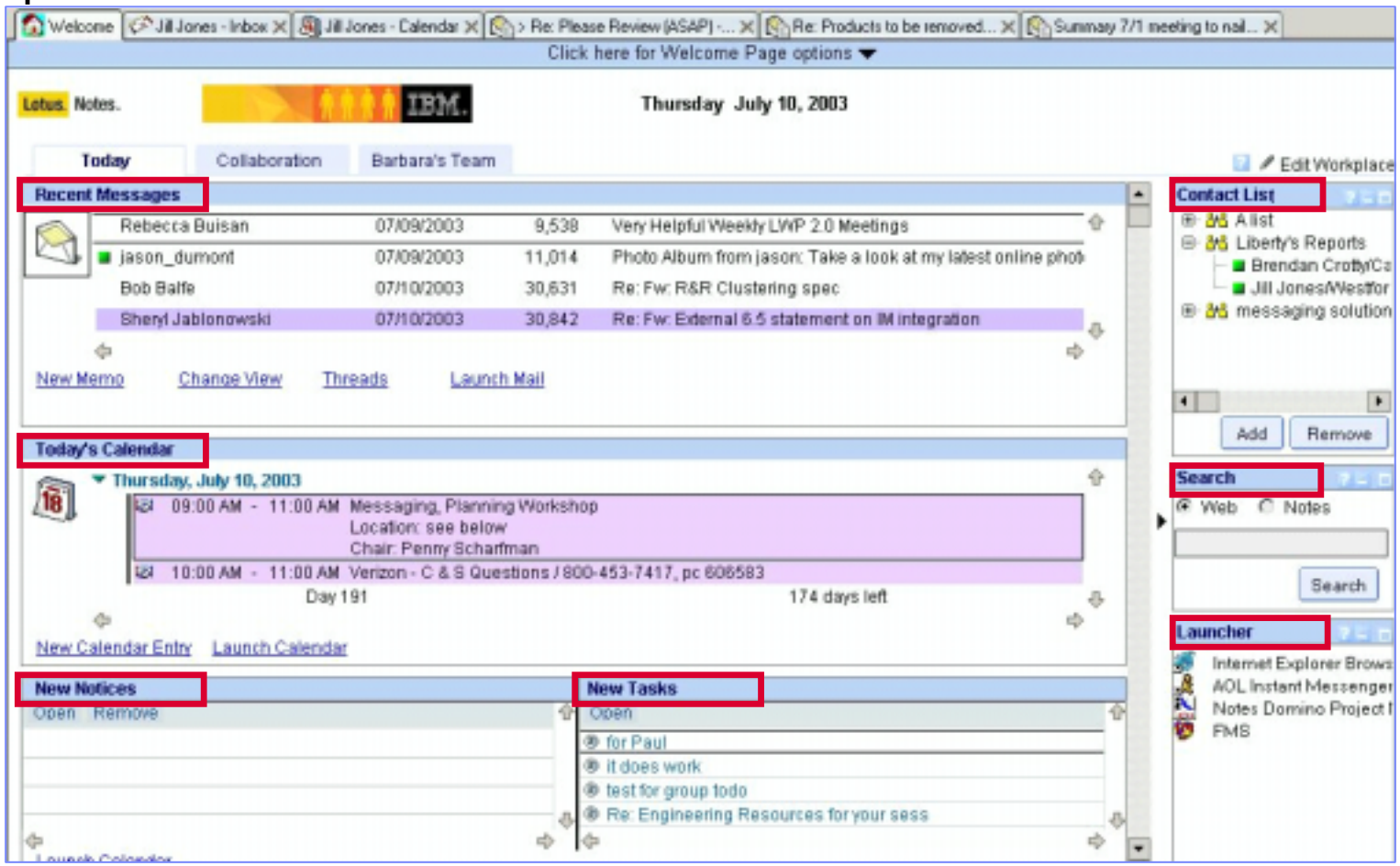
Multiple clients

- **Lotus Notes**
- **Domino Web Access (Internet Explorer and Mozilla)**
- **Domino Access for Microsoft Outlook**

All running in a single i5/OS LPAR

Enhanced Interface Integration example

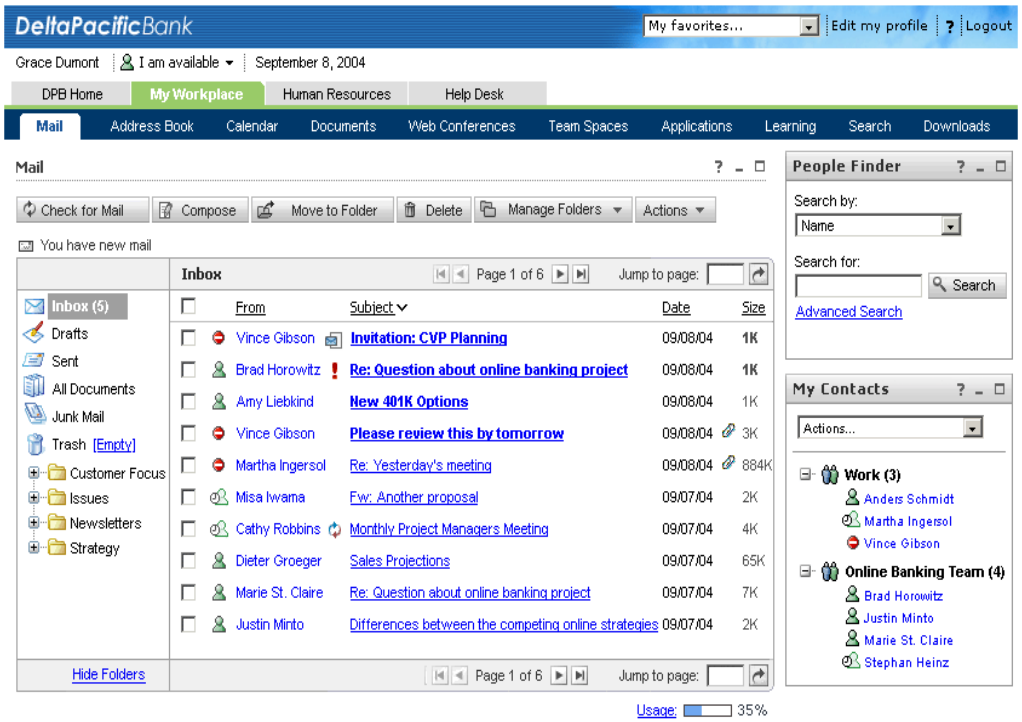
"portlets"



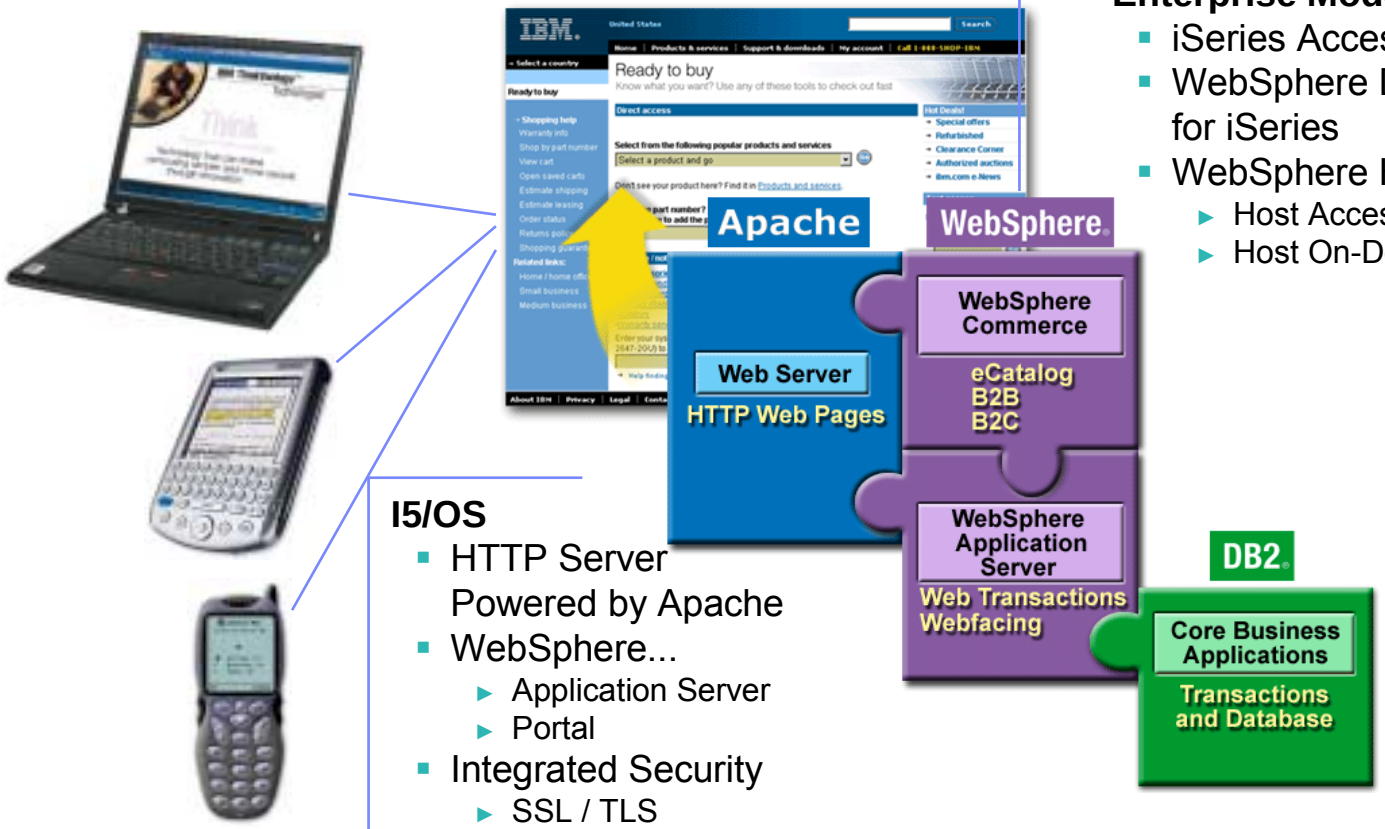
Lotus Workplace 2.0

Lotus. software

- New for eServer i5 and iSeries
- Lotus Workplace is a family of integrated collaborative applications that can be used individually or in any combination
- Built on Portal and J2EE technology



Business Integration Solutions



Enterprise Modernization Solutions

- iSeries Access for Web
- WebSphere Development Studio for iSeries
- WebSphere Host Integration Solution
  - Host Access Transformation Services
  - Host On-Demand

I5/OS

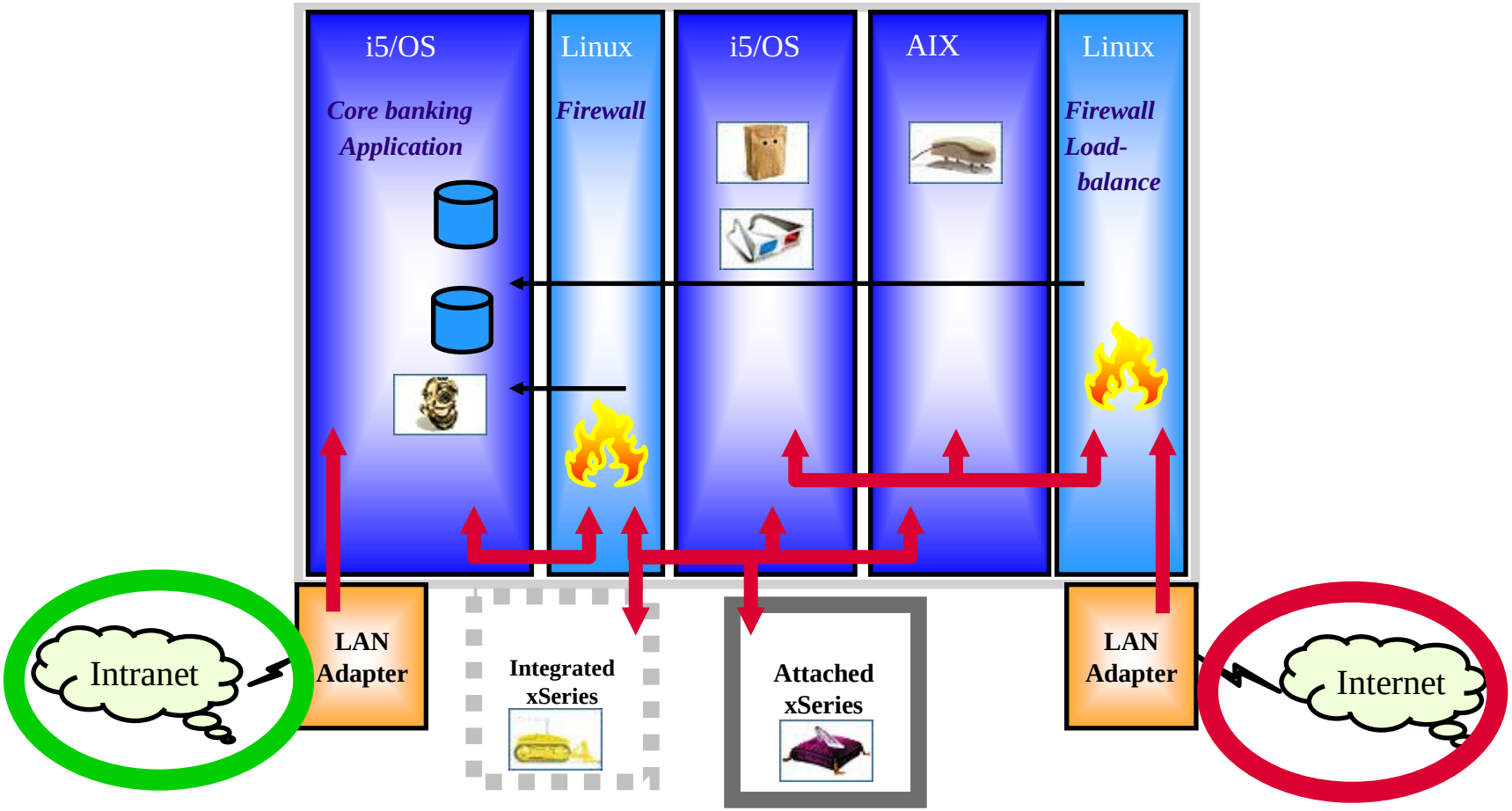
- HTTP Server Powered by Apache
- WebSphere...
  - Application Server
  - Portal
- Integrated Security
  - SSL / TLS
  - VPN
  - Digital Certificates

Infoprint Designer
Infoprint Server

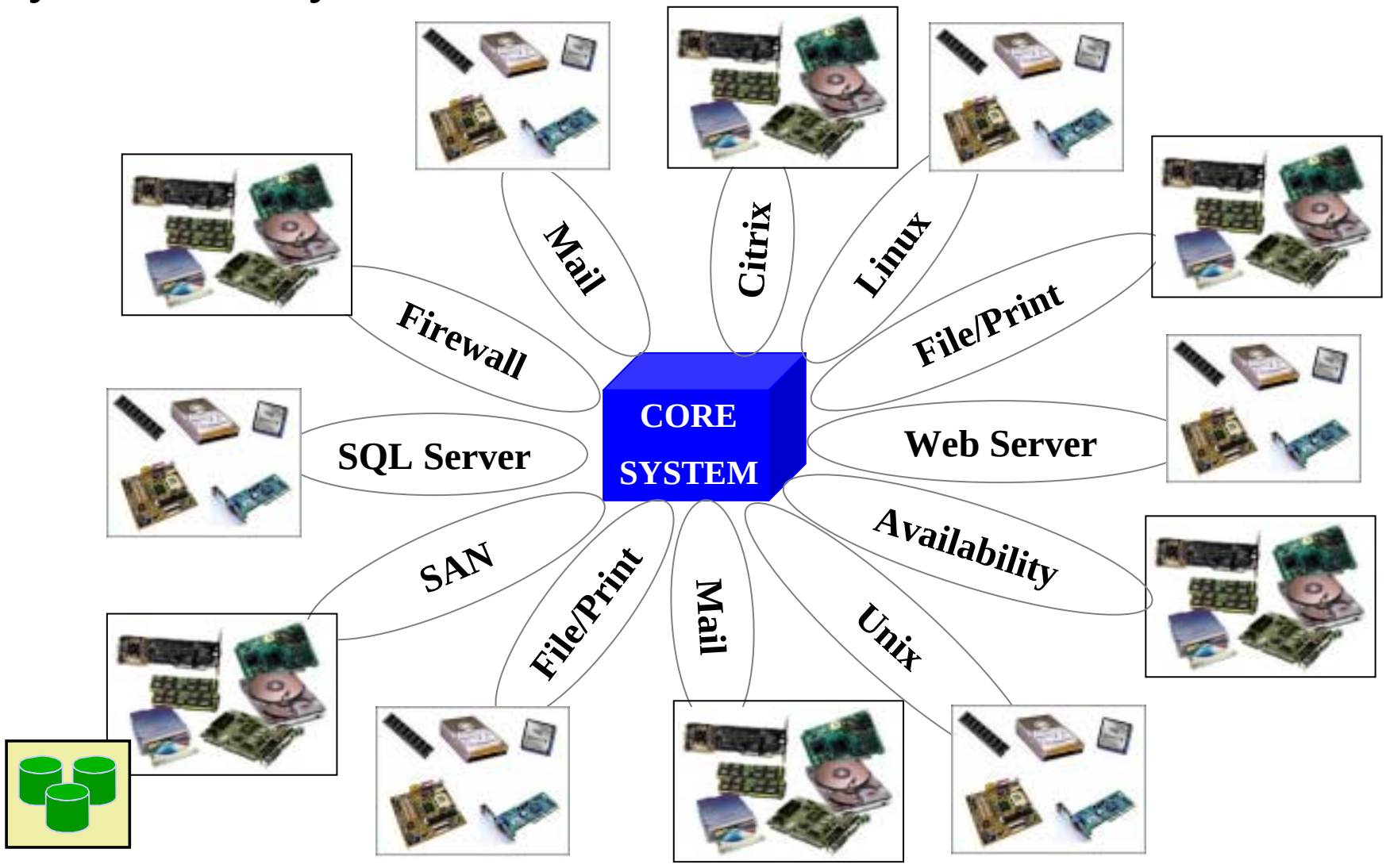
i5/OS V5R3 Capabilities by Platform

I5/OS Feature	~ i5	8xx iSeries	7xx AS/400
LPAR	**HMC Control**	**Primary Partition Required**	**Full Processors Only**
	i5/OS, Linux, AIX (future)	**OS/400, Linux**	**OS/400**
	Automated Processor Balancing	***3rd. Party SW***	***n/a***
	Uncapped Processor Partitioning	***n/a***	***n/a***
	Up to 10/proc. Max 254	**Up to 10/proc. Max 32**	***1/proc.***
DB2 SQL Enhancements	YES	YES	YES
Database Reorg. Enhance	YES	YES	YES
iSeries Nav. from Web Browser	YES	YES	YES
Extended Windows Disk supt.	YES	YES	YES
AIX in LPAR with virtual stg & eNet	YES	***NA***	***NA***
Simplified Linux spt. w/iSeries Nav.	YES	YES	***NA***
Cross Site Mirroring w/IASPs	YES	YES	***NA***
Concurrent I/O tower maint..	YES	**NO**	***NA***
Multi-path I/O to SAN Storage	YES	YES	***NA***
Journalling perf. Enhancements	YES	YES	YES
IFS Real time Virus Scanning	YES	YES	YES

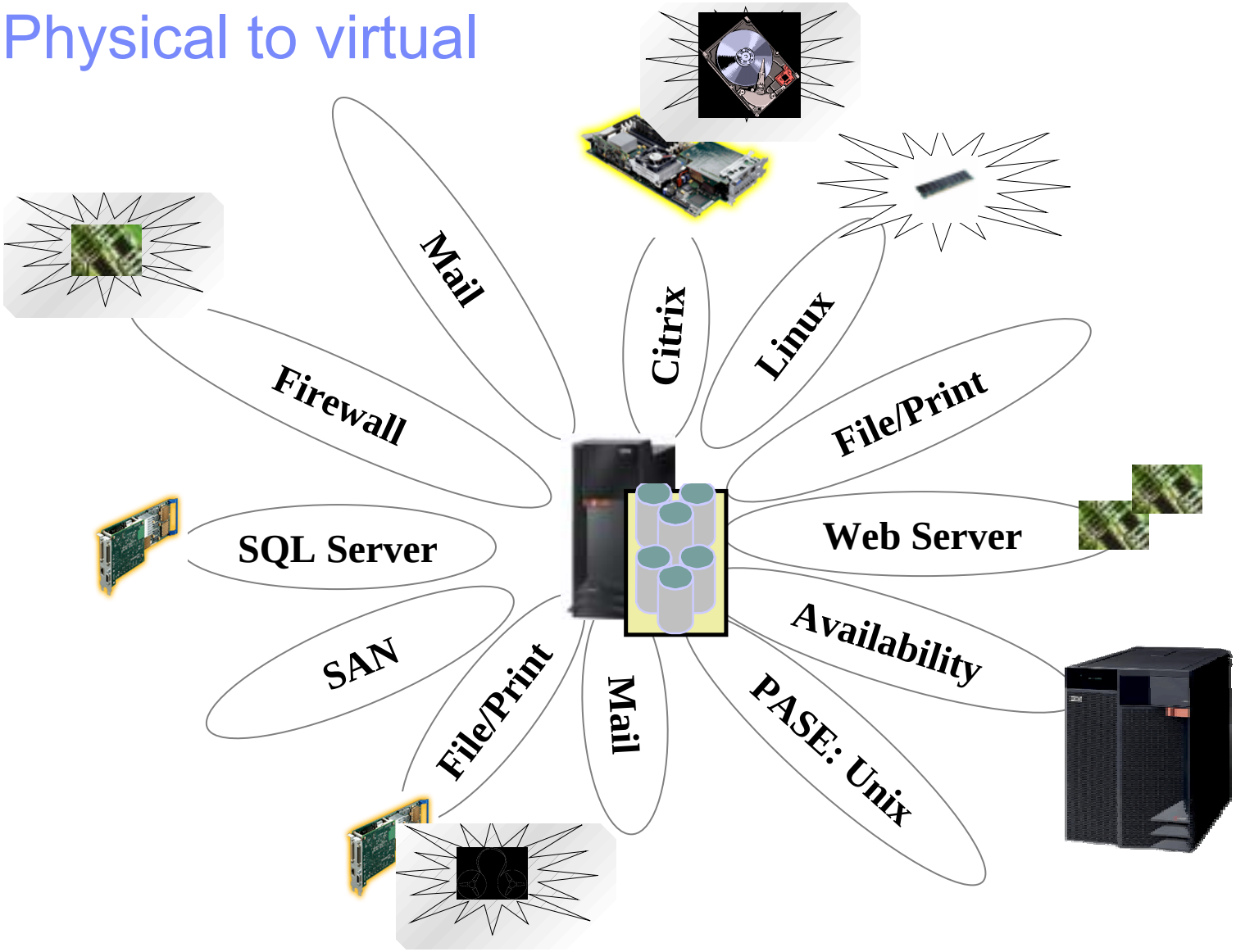
Simplify and Optimize Your IT Infrastructure with eServer i5



Physical today.....



From Physical to virtual



eServer i5 Offers Choices to Consolidate

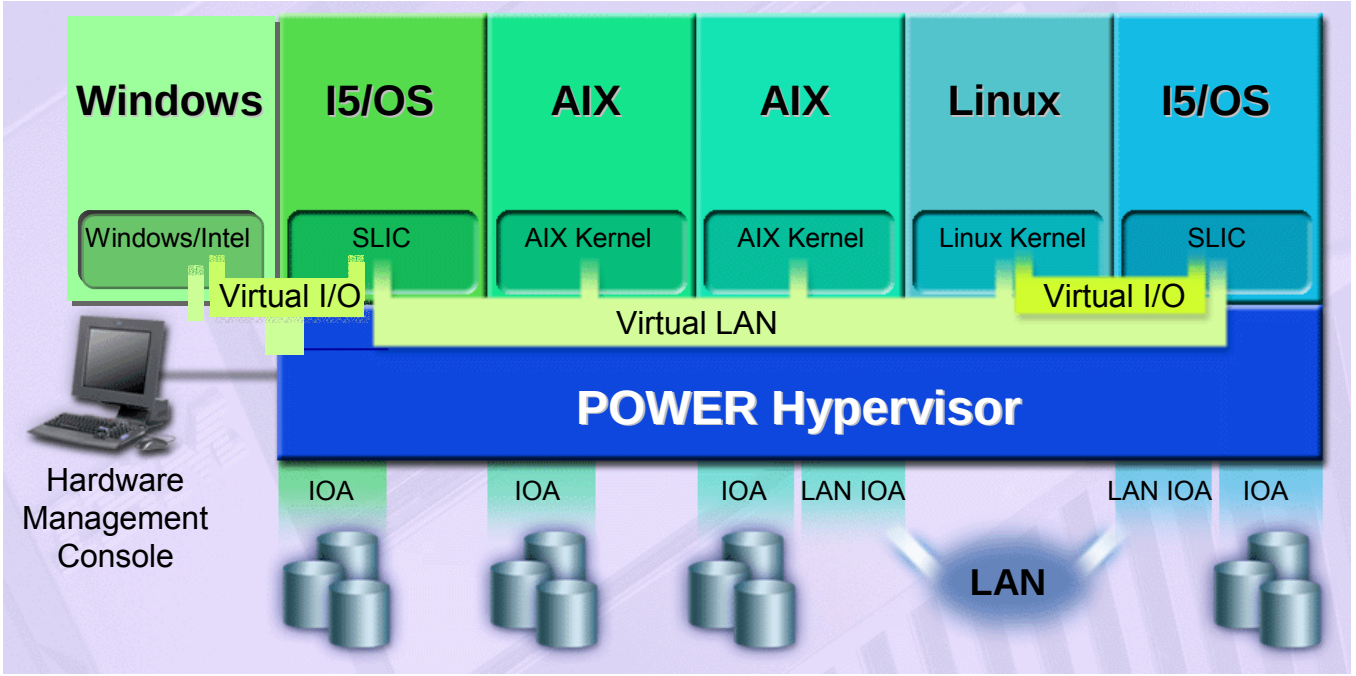
- **iSeries Windows Integration Offerings Can Provide a Better Windows Environment**
  - Choice of servers to meet workload requirements
  - Advanced Storage, User, and Server Management
  - Standard Windows software
- **Linux offers an Alternative**
  - Open Source Solutions
  - Partitioning support with virtual storage
  - Linux from Leading Distributors
- **I5/OS**
  - Supports standards: TCP/IP servers, File and Print Server, Apache
  - Expand with DB2, Java™, or Domino

Application Alternatives

Windows Application	Linux Alternative	i5/OS Alternative
Windows File and Print Server	Samba	I5/OS NetServer
Microsoft IIS	Apache WebSphere	Apache WebSphere
DNS/DHCP	DNS/DHCP	DNS/DHCP
Exchange	Bynari	Domino iNotes
SQL Server	MySQL DB2 UDB	DB2 UDB
Citrix Metaframe		
ISA Server (Proxy)	Squid	i5/OS
Firewall from 3rd Party	Netfilter	

Benefits of Server & Workload Consolidation

- Workload surge protection
- Reduced network latency
- Mixed workloads
- Simplified systems management
- Consolidation
- Improved utilization
- Best of breed partition support
  - Micro-partitioning
  - Uncapped processors
  - Virtual resources



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