



IBM eServer iSeries

IBM [®] e_®server™ & TotalStorage™
UNIVERSITY 2003

Selling Linux and Workload Consolidation

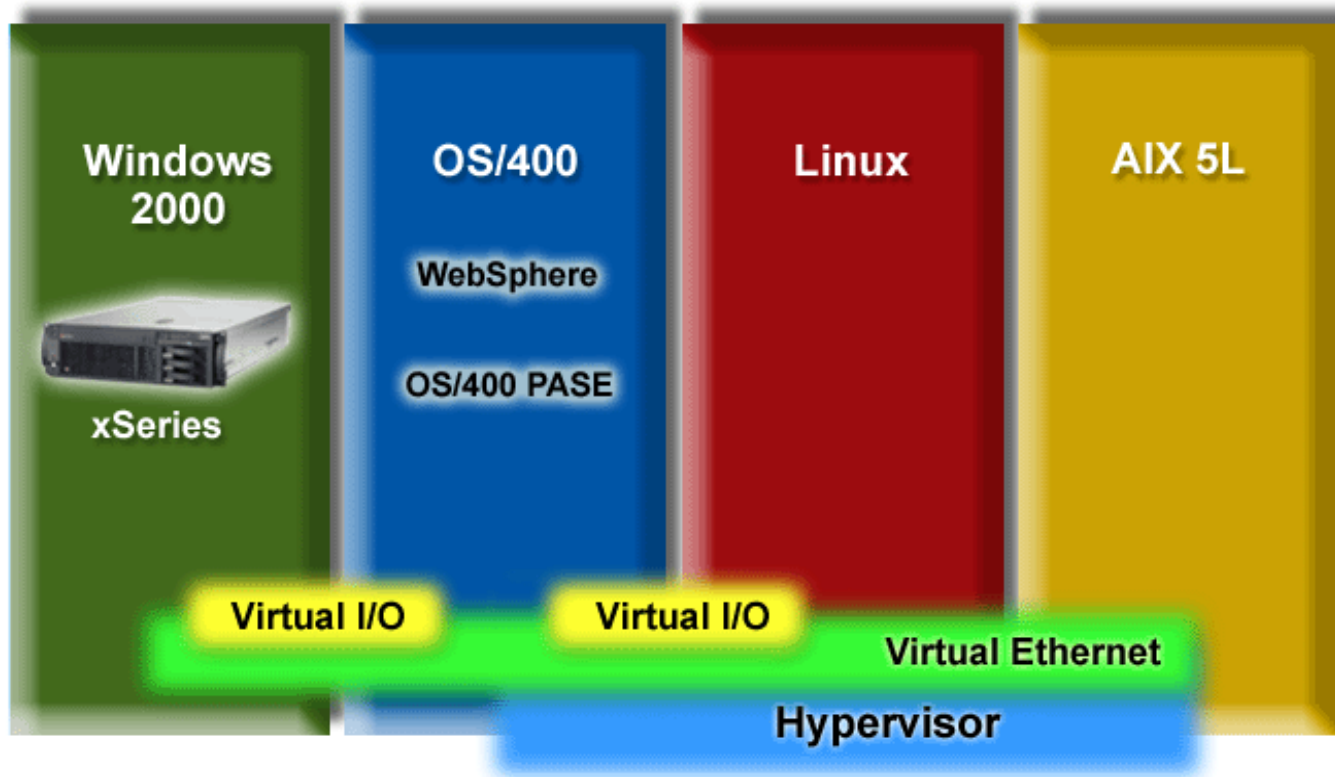
Product Update

ITSO iSeries Technical Forum
LP01

IT Consolidation Drivers

- **Reduce costs and dramatically improve TCO**
- **Improve service levels, simplify systems management and enhance resources utilization**
- **Establish a foundation for future growth around new applications**
- **Enable data sharing, provides interoperability**
- **Increase business continuity and recoverability**

iSeries Server Consolidation



iSeries offers application flexibility

iSeries innovative technology can lower cost of management

iSeries makes enterprise IT management simple

*Statement of Direction: This presentation contains IBM plans and directions. Such plans are subject to change without notice.

iSeries Logical Partitioning

■ Mainframe Class Partitioning

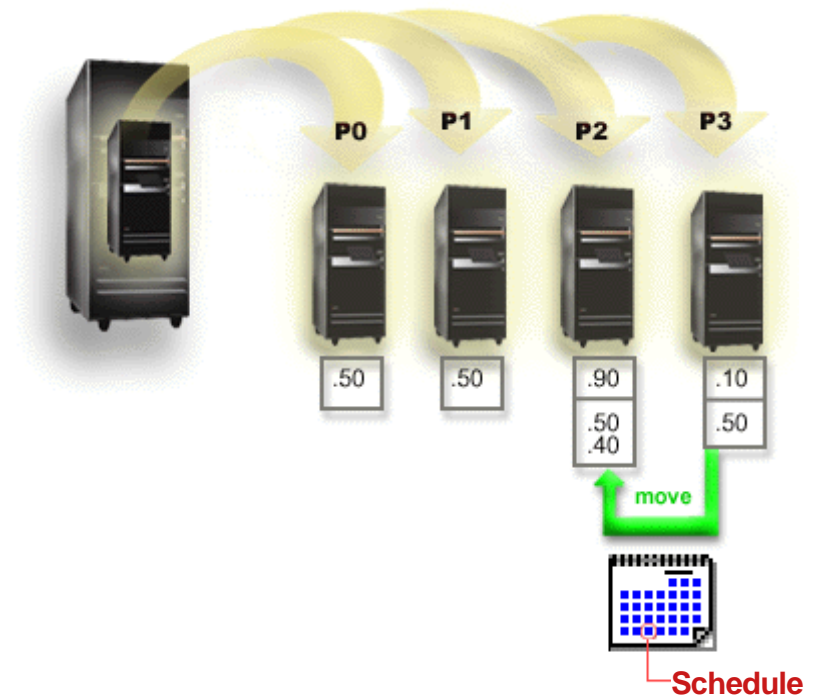
- ▶ Shared Processor
- ▶ Dynamic Resource Movement
- ▶ Virtual Ethernet
- ▶ Heterogenous OS Support
- ▶ Uni-processor partitioning
- ▶ Graphical management

■ Customer Benefits

- ▶ Quick consolidations
- ▶ Run multiple, yet independent workloads
- ▶ Maximize I/T investments
- ▶ Implement High Availability Solutions

■ Success

- ▶ 3000+ LPAR Installations
 - 60% on 1-4 processor servers
- ▶ 48% of i840s use LPAR



LPAR: What is New

- **Support for New Servers**
 - ▶ Shared Processor
 - ▶ Dynamic Resource Movement
 - ▶ OS/400 and Linux

- **Support for More OS/400 Partitions**
 - ▶ 10 Partitions per Processor
 - ▶ Requires OS/400 V5R2 Primary
 - ▶ Supported on i825, i870, and i890

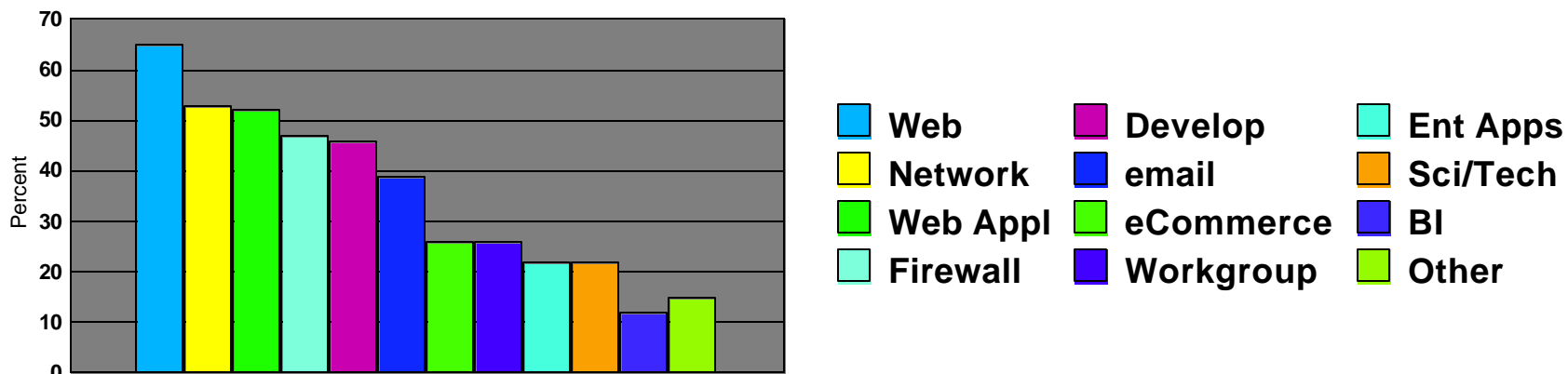


# of Processors in Server*	Old Maximum # of OS/400 Partitions	New V5R2 Maximum # of OS/400 Partitions
2	8	20
3	12	30
4	16	32
8 and >	32	32

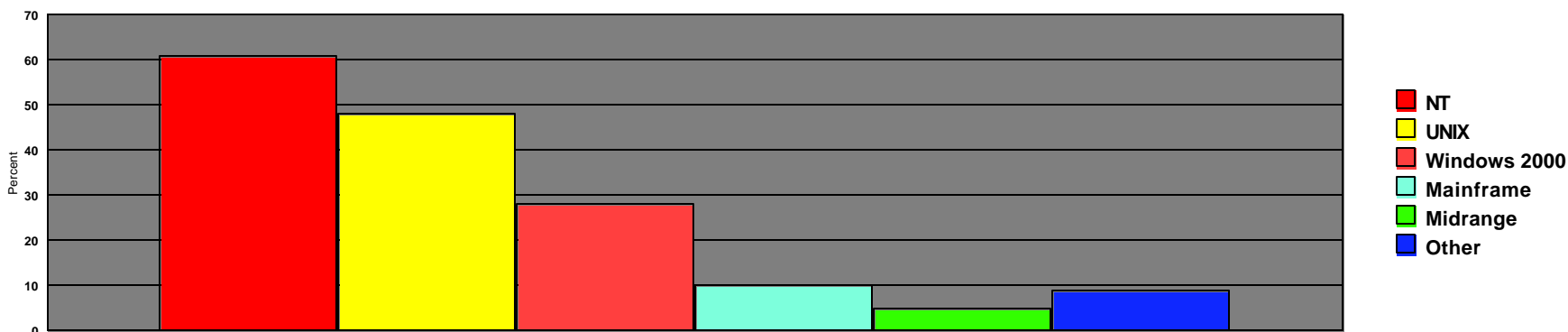
* Applicable for iSeries servers with Power4 Processors only

Linux Market

Linux Application Use



Platform of Origin for Linux Consolidation

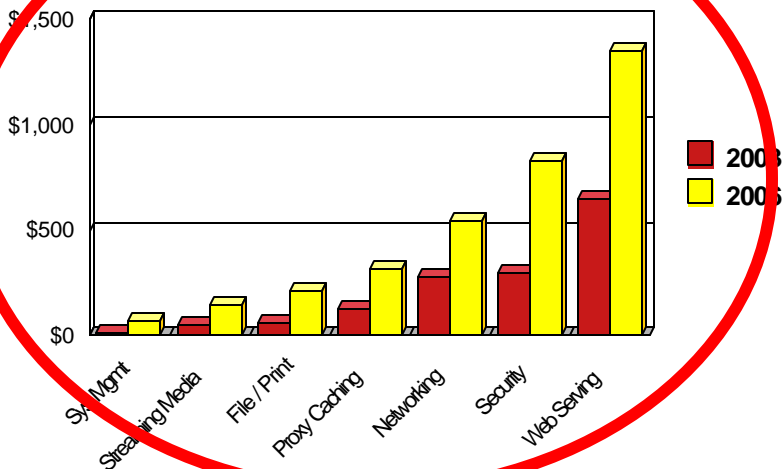


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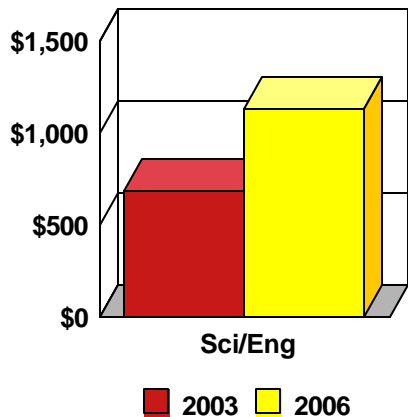
Server Brand Image Tracking: 2Q02 G7 Countries

Worldwide Linux Server Opportunity

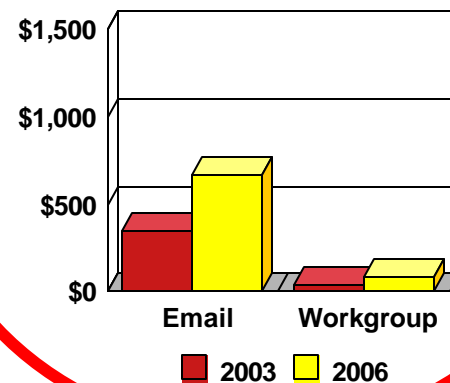
WW Infrastructure Workloads (\$M)



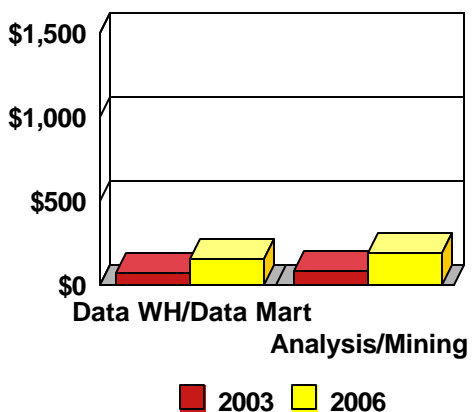
WW Technical Workloads (\$M)



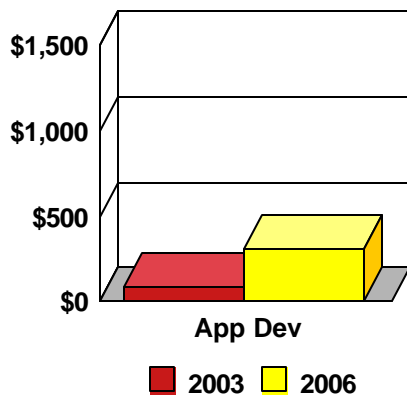
WW Collab Workloads (\$M)



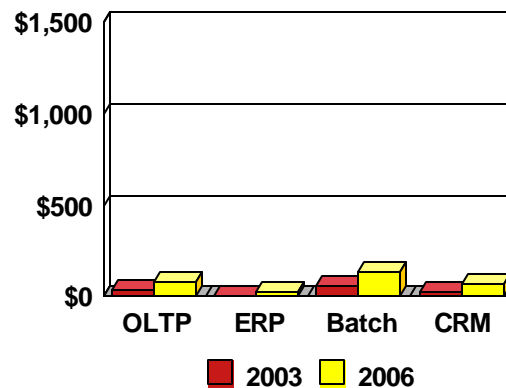
WW Dec Supp Workloads (\$M)



WW App Dev Workloads (\$M)



WW Bus Proc Workloads (\$M)



Source: 2H02 IBM GMV

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Linux and iSeries

■ What does Linux Bring to iSeries

▶ Applications

- Open Source
- Solution Providers

▶ Resources and Skills

- Virtual world-wide development team
- Broad skill base
- IBM investments in Linux

■ What does iSeries Bring to Linux

- ▶ On Demand Virtualization
- ▶ Integration
- ▶ Reliability
- ▶ Scalability
- ▶ Low Cost of Ownership

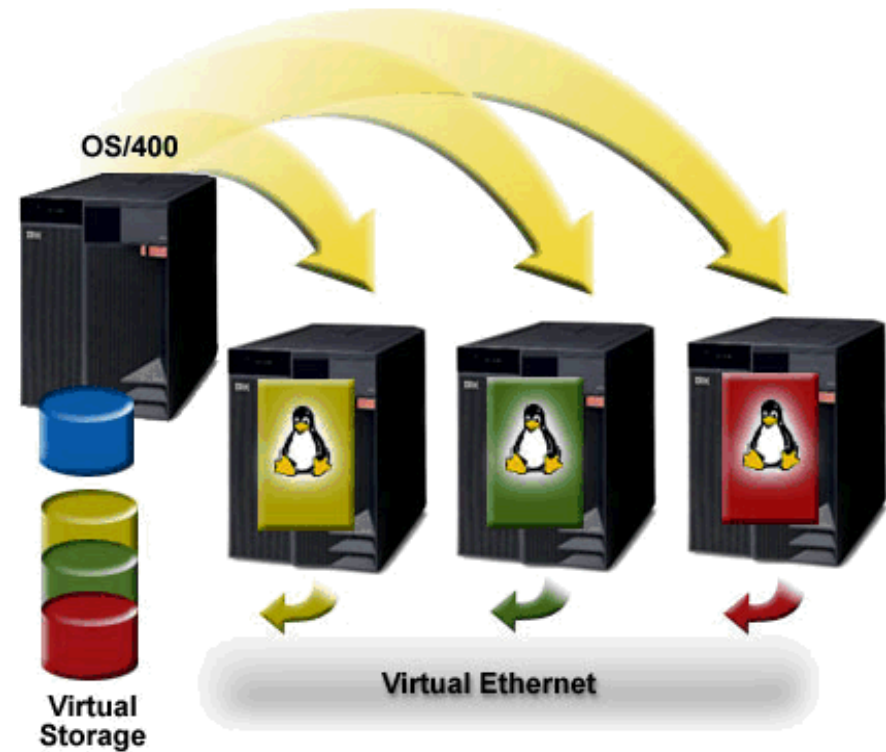


IBM eServer iSeries Wins "Best of Show"

LinuxWorld
San Francisco, CA
August 28-30, 2001

Linux on iSeries

- **On Demand Virtualization**
 - ▶ Shared processor support
 - ▶ Dynamic resource movement
 - ▶ Virtual Storage
 - ▶ Virtual Ethernet
- **Integration**
 - ▶ Application
 - ▶ Management



www.ibm.com/eserver/iseries/linux

Linux and LPAR V5R1

- **Shared Processor Support***
 - ▶ Linux shares processors with other OS/400 and Linux partitions
 - Up to 4 partitions per processor
 - Minimum 0.10 processor in a partition
- **Resource Movement**
 - ▶ Processor, Memory and I/O resource movement requires the Linux partition to be stopped and restarted
 - Minimum processor movement: 0.01*
 - Minimum memory movement: 1 MB
- **Independent Resource Movement**
 - ▶ Processor, Memory, and I/O can be moved independently

OS/400 V5R1 Primary Partition

# of Processors in Server	Maximum # of Linux Partitions*
1	3
2	7
4	15
8	31
12	31
24	31
32	31

* Shared processor is supported on iSeries servers with SStar processors. Servers with IStar processors require a dedicated processor for Linux

Linux and LPAR V5R2

- **Shared Processor Support***
 - ▶ Linux shares processors with other OS/400 and Linux partitions
 - Up to 10 partitions per processor
 - Minimum 0.10 processor in a partition

- **Dynamic Resource Movement**
 - ▶ **Shared Processor Units***
 - Minimum processor movement: 0.01
 - Moved to/from Linux or OS/400 V5R2 partitions
 - Immediate, scheduled, or under program control
 - ▶ **Virtual storage spaces**
 - Added to Linux partitions

- **Independent Resource Movement**
 - ▶ Processor, Memory, and I/O
 - ▶ Dedicated Processors, Memory and I/O
 - Requires the Linux partition to be stopped and restarted
 - Minimum memory movement: 1 MB

OS/400 V5R2 Primary Partition

# of Processors in Server	Maximum # of Linux Partitions*
1	9
2	19
3	29
4 and up	31

* Shared processor is supported on iSeries servers with SStar and Power4 processors. Servers with IStar processors require a dedicated processor for Linux

Linux: What is New

- **Support for new servers**
 - ▶ Shared processor, Dynamic movement
 - ▶ Virtual Storage and Ethernet
- **Capacity Upgrade on Demand**
 - ▶ Permanent and Temporary
- **Enhanced Direct I/O Support**
 - ▶ New 10/100/1000 Ethernet Adapter
 - ▶ New Storage IOAs
 - ▶ Raid 5 Support for Storage IOAs
- **Linux Processor Activation**
 - ▶ Included in Enterprise Edition for i870 and i890
 - ▶ Extra Processor Activation for Linux
- **Education Vouchers**
 - ▶ Included in Enterprise Edition for i825, i870, i890
 - ▶ Valid for Linux on iSeries Implementation Class (AS36)
- **Service Vouchers**
 - ▶ Included in Enterprise Edition for i825, i870, i890
 - ▶ Valid for iSeries Linux Integration QuickStart

OS/400 V5R2 Primary Partition

	# of Processors	Max Number of Linux Partitions
iSeries 800	1	9
i810	1-2	9 -19
i825	3 -> 6	29 - 31
i870	8 ->16	31
i890	16 ->32	31

Integrated Education & Services for iSeries

...helping customers take the first step

■ Getting Started with Linux for iSeries

▶ Integrated Services

- Installation & Configuration
 - Configure required Logical Partition (LPAR)
 - Install & Configure Linux for iSeries distribution
- Configuration of File or Web Services
- Linux Solution Readiness Review

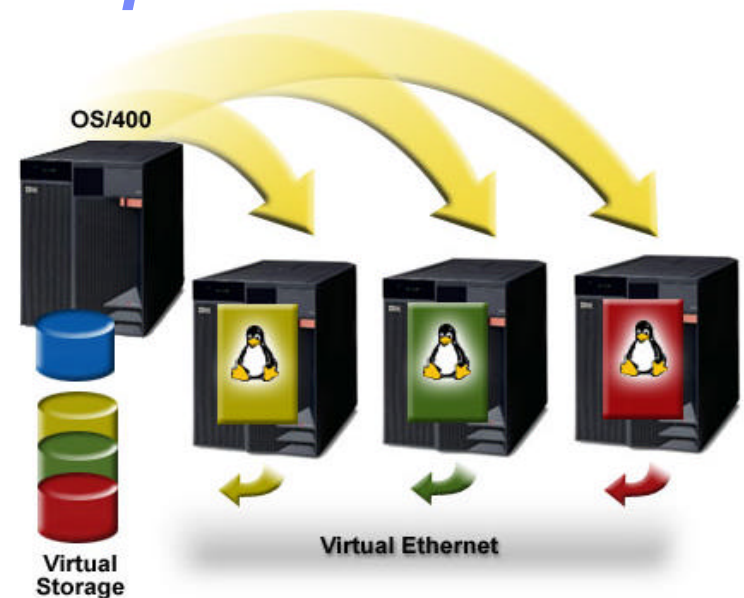
■ Integrated Education

- ▶ i825 – 1 voucher / i870 – 3 vouchers / i890 – 5 vouchers
- ▶ AS36/S6226 - Linux on iSeries - 3 days

- Learn how to plan, implement, and provide basic management for a Linux partition on an iSeries system. Learn about all aspects of Linux on iSeries in this hands-on course. Load multiple distributions of Linux in the different operating systems supported by the environments on the iSeries system: hosted, non-hosted, and a mixture of both.

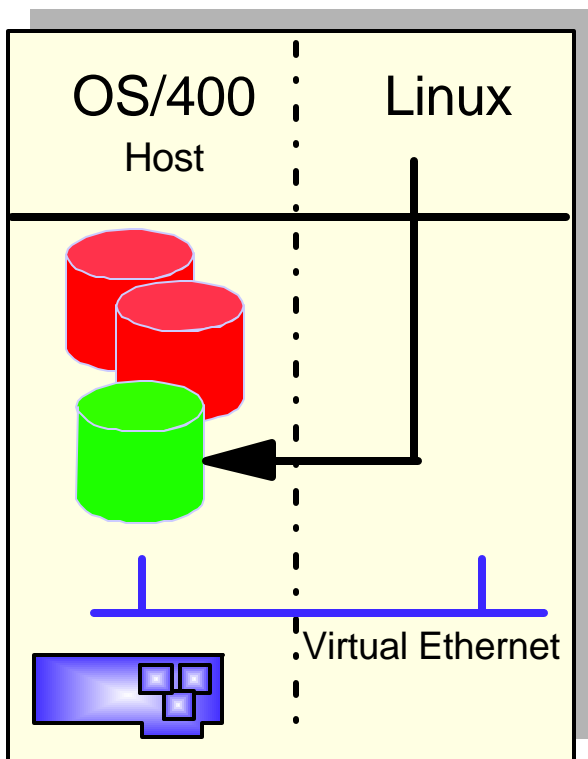
■ For more information:

- ▶ www.ibm.com/eserver/series/hardware/packages



Linux I/O Flexibility

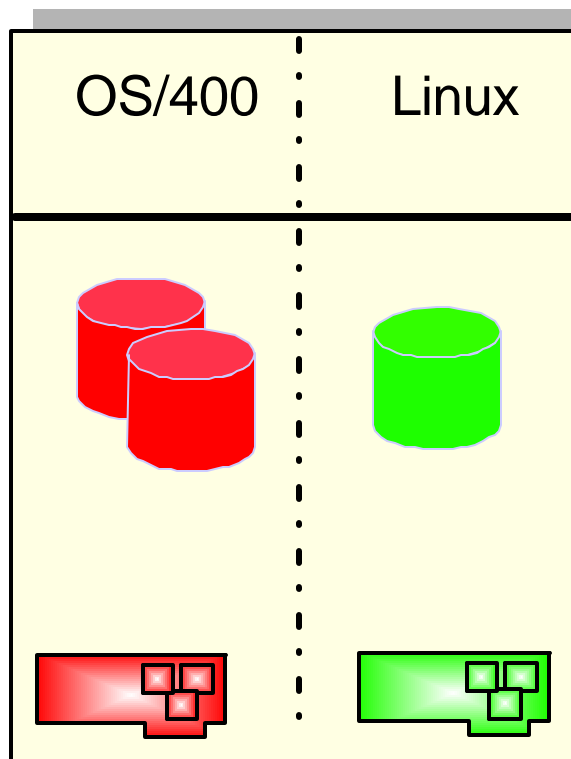
Virtual I/O



- ▶ SCSI Disk
- ▶ Fibre ESS
- ▶ Tape
- ▶ LAN
- ▶ CD, DVD

- Leverage iSeries resources
- OS/400 management

Direct I/O

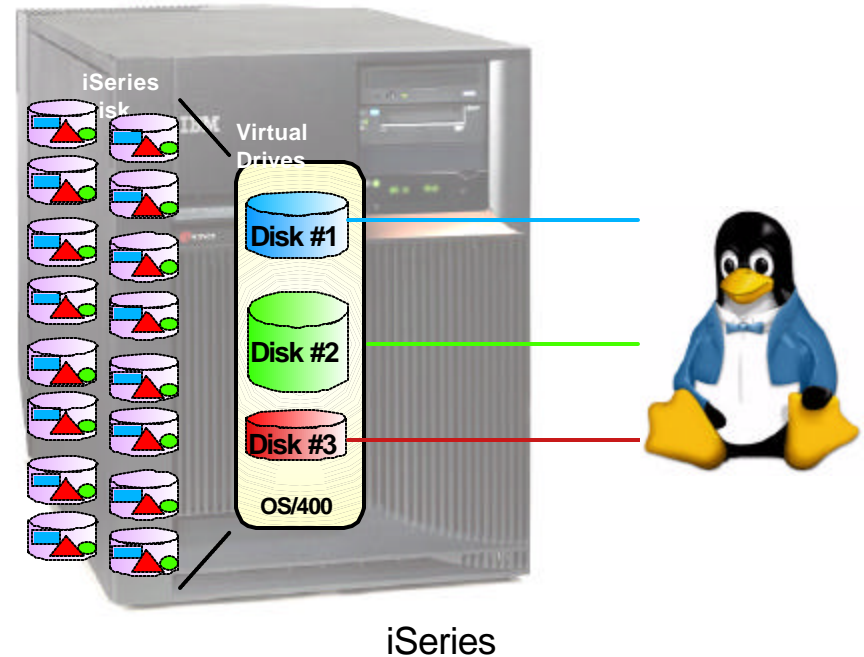


- ▶ SCSI Disk
- ▶ Fibre ESS
- ▶ Tape
- ▶ LAN
- ▶ WAN
- ▶ CD, DVD

- Dedicated resources
- Linux management

Storage Virtualization

- **Storage spaces created from OS/400**
 - ▶ 1 MB to 64 GB each
 - ▶ Up to 20 per Linux partition
- **Dynamically added to Linux**
 - ▶ Requires V5R2 Primary and Host
- **Shared Storage**
 - ▶ Storage spaces can be read from multiple partitions



- **Enables Linux to Leverage Advanced iSeries Storage Architecture**
 - ▶ Data automatically spread and protected
 - ▶ More disk arms for better performance
 - ▶ Consolidated Backup of OS/400 and Linux
 - ▶ Flexible Storage Management
 - ▶ Easy setup of multiple Linux environments

Linux Direct I/O Support

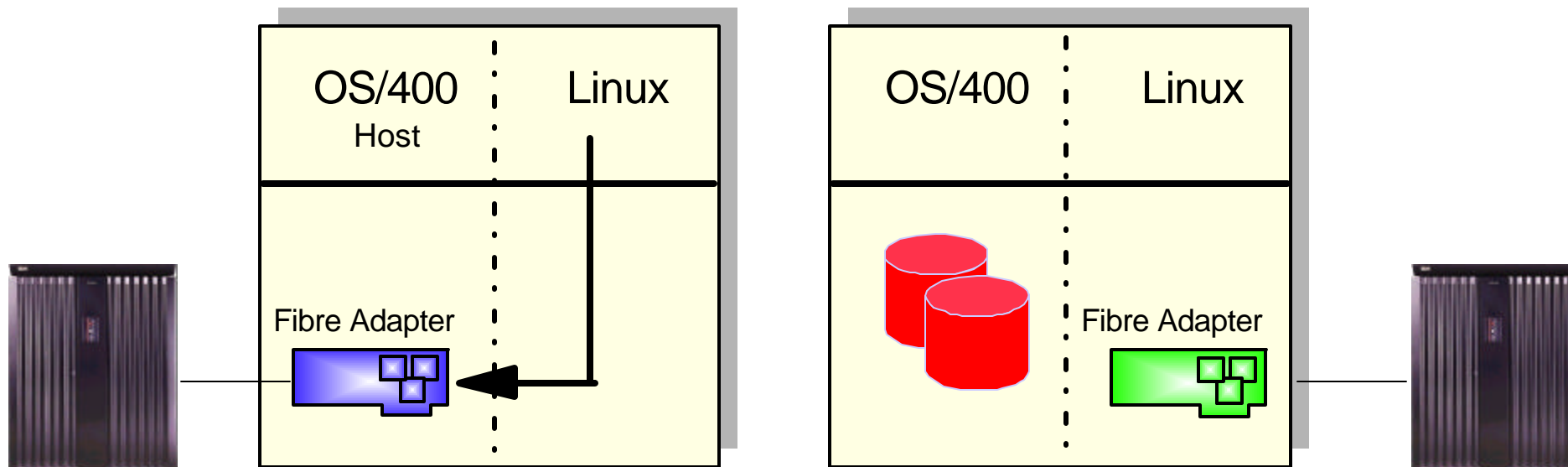
Linux Partition Specify Feature Code 0142 Required

Type	CCIN	Feature Number	Description	
Ethernet	2743	0601	1 Gbps Fibreoptical	
	2760	0602	1 Gbps Twisted Pair	
	2838	0607	10/100 Mbps	
	2849	0623	10/100 Mbps	
	New	5700	0620	10/100/1000 Mbps Fiberoptical
New	5701	0621	10/100/1000 Mbps Twisted Pair	
Token Ring	2744	0603	100/16/4 Mbps	
Storage	2748	0605	Ultra-2 SCSI (3 buses; 26 MB write cache; RAID 5*; extended adaptive read cache; supporting internal disk and tape units, CD-ROM, and DVD-RAM)	
	2763	0604	Ultra-2 SCSI (2 buses; 10 MB write cache; RAID 5*; supporting internal disk and tape units, CD-ROM, and DVD-RAM)	
	2778	0606	Ultra-2 SCSI (3 buses; 78 MB write cache; RAID 5*; extended adaptive read cache; supporting internal disk and tape units, CD-ROM, and DVD-RAM)	
	New	5702	0624	Ultra-3 SCSI(2 buses; no write cache; no hardware RAID; supporting internal disk and internal or external tape units, CD-ROM, and DVD-RAM)
	New	2757	0618	Ultra-3 SCSI (4 buses; 757 MB maximum compressed write cache; hardware RAID 5*; supporting internal disk and tape units, CD-ROM, DVD-RAM, and DVD-ROM)
	New	2782	0619	Ultra-3 SCSI (2 buses; 40 MB write cache; hardware RAID 5*; supporting internal disk and tape units, CD-ROM, DVD-RAM, and DVD-ROM)
	Fibre	2766	0612	Shortwave fibre channel adapter (point-to-point or arbitrated loop topologies; supporting ESS attachment for Linux)
WAN	2745	0608	2-line WAN with 2 RVX ports supporting multiple communication protocols	
	2772	0609/0610	2-line WAN with 2 RJ11 modem ports supporting V.90 56k Async PPP; Feature code 0609 is non-CIM, 0610 is CIM.	
	2742	0613	2-line WAN with 2 RVX ports supporting multiple communication protocols	
	2793	0614/0615	2-line WAN with 1 RVX port supporting multiple protocols and 1 RJ11 modem port supporting V.92 56k Async PPP, V.92 data modem, V.44 data compression, V.34 FAX modem and FAX functions; Feature code 0614 is non-CIM, 0615 is CIM	
	2805	0616/0617	4-line WAN with 4 RJ11 modem ports supporting V.92 56k Async SLIP/PPP and V.34 FAX functions; Feature code 0616 is non-CIM, 0617 is a CIM	

IBM's TotalStorage Enterprise Storage Server (ESS)

Virtual I/O

Direct I/O



OS/400 Stores Data on ESS

- ▶ #2766 Fibre Adapter in OS/400 hosting partition
- ▶ OS/400 V5R1 or V5R2

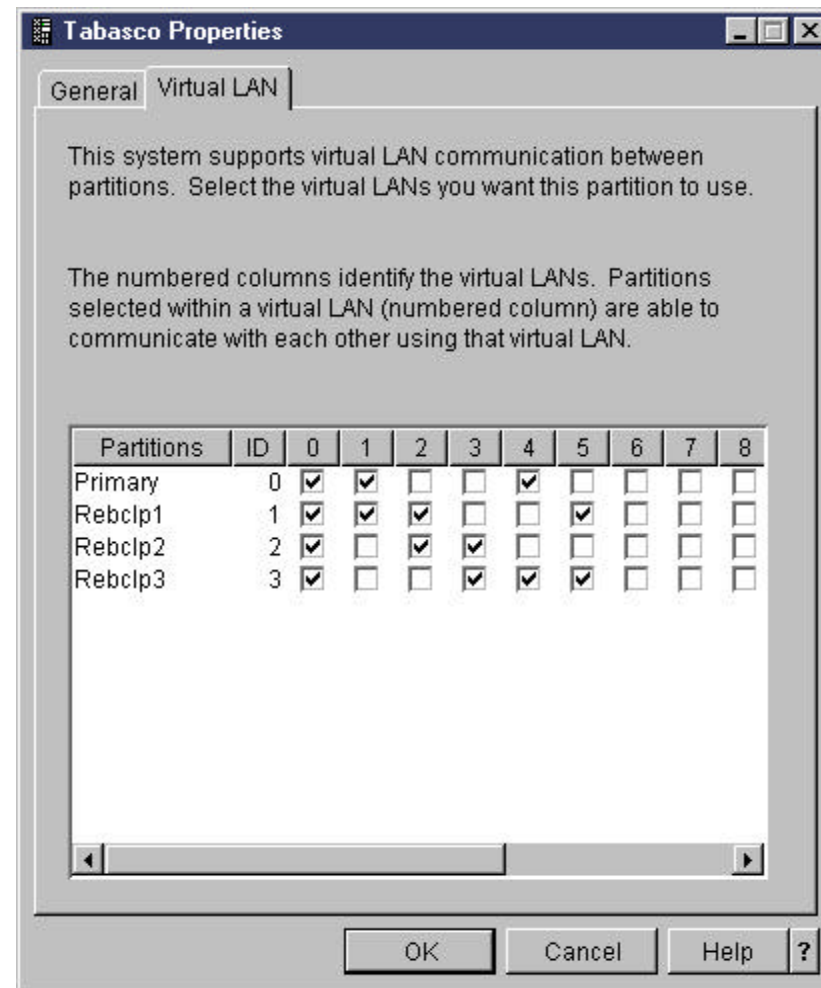
Linux Stores Data on ESS

- ▶ #0612 Fibre Adapter in Linux partition
- ▶ OS/400 V5R1 or V5R2
- ▶ Support included in SuSE SLES 7 Refresh 2 for iSeries or via download
 - www.ibm.com/eserver/series/linux/fibre_channel.html

Enables Linux partitions to participate in a heterogeneous storage consolidation with ESS

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 iSeries memory bus
 - ▶ No additional hardware required
- **Supports communications between**
 - ▶ OS/400 to OS/400
 - ▶ Linux to OS/400
 - ▶ Linux to Linux
 - ▶ Linux to Windows
- **Included with OS/400 V5R1 and V5R2**



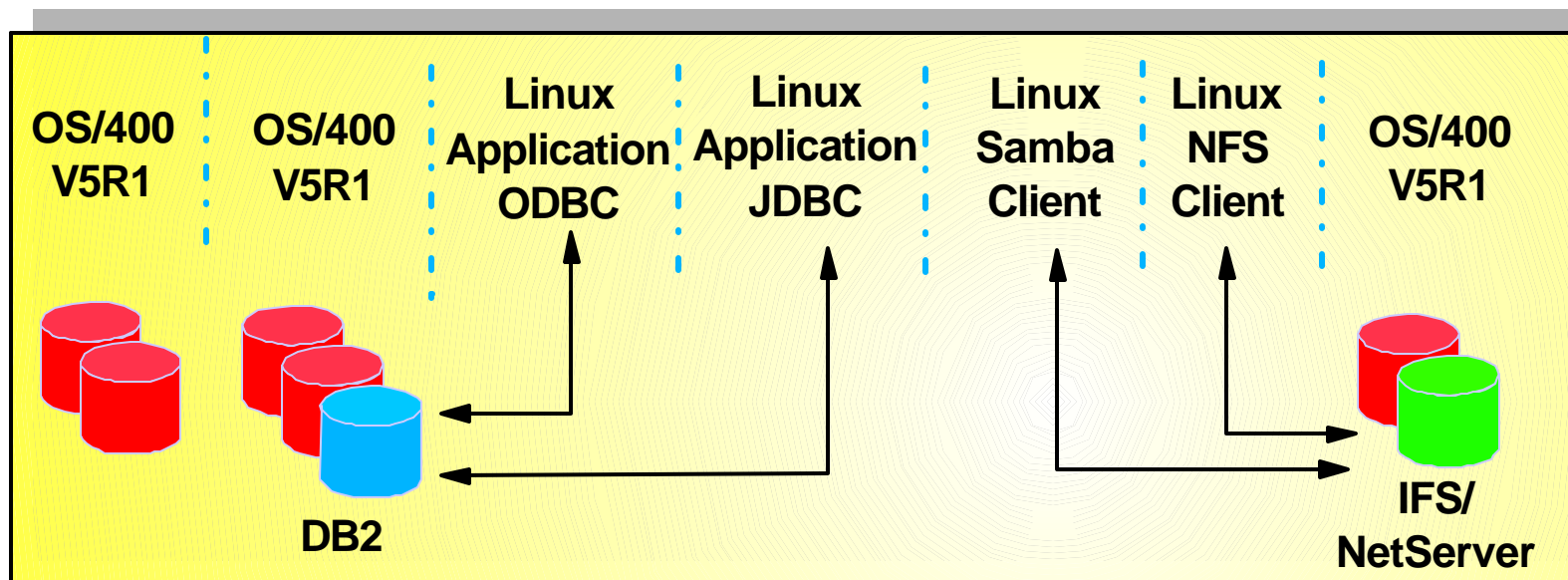
Linux and OS/400 Application Integration

■ Database Access

- ▶ **Linux can access DB2 UDB for OS/400**
 - JDBC (IBM Toolbox for Java)
 - ODBC for DB2 UDB for OS/400

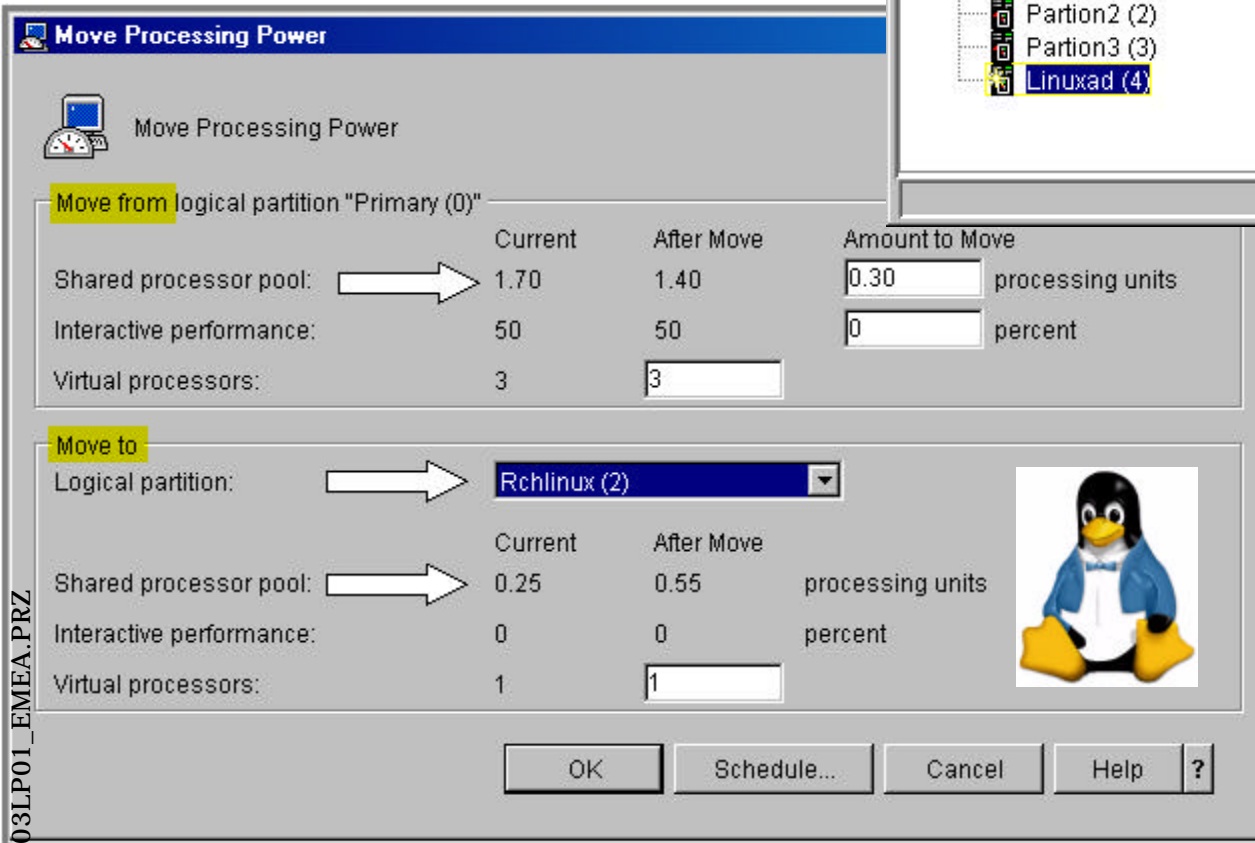
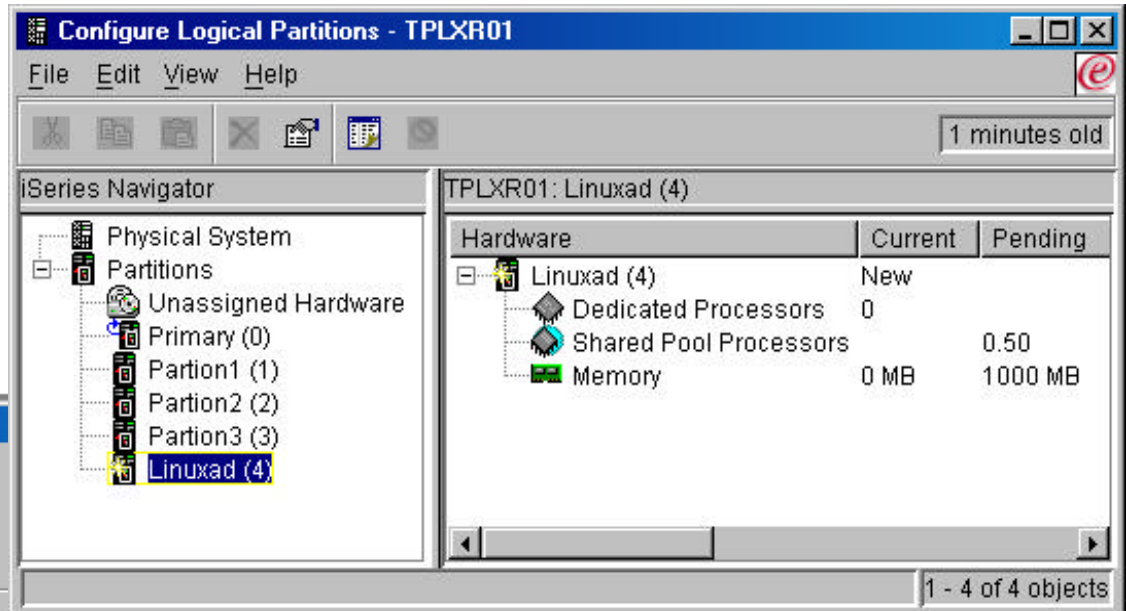
■ File and Print Serving

- ▶ **Linux can access OS/400 files**
 - OS/400 NetServer Support for Samba
 - NFS
- ▶ **Linux can print to OS/400 printers**
 - OS/400 NetServer Support for Samba



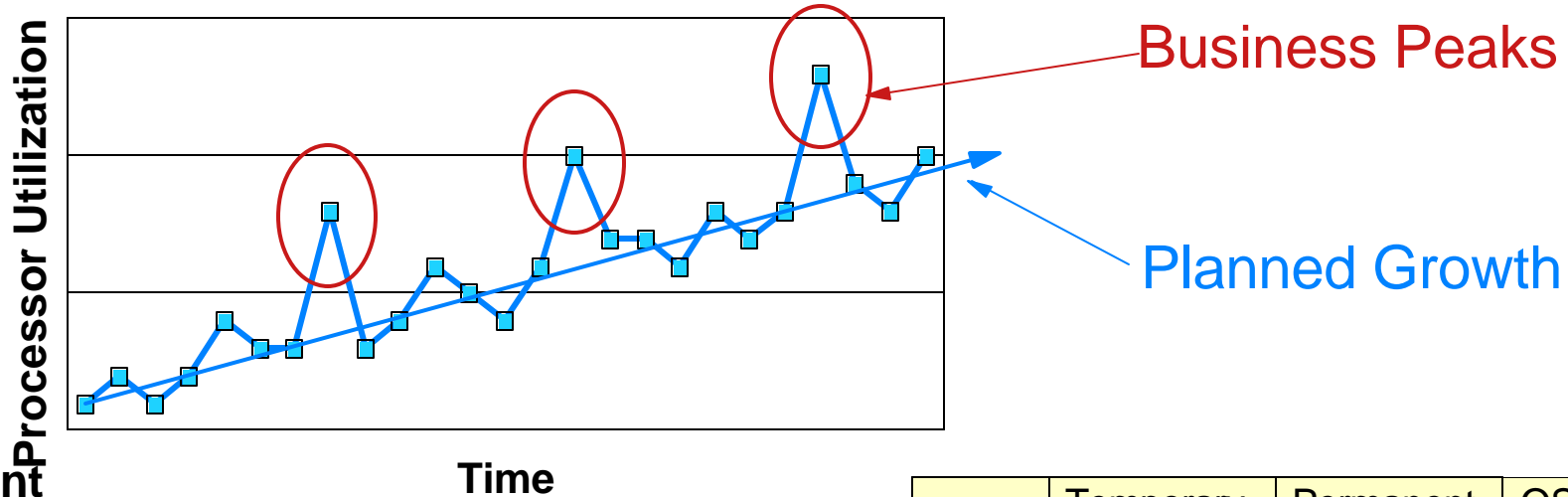
Linux Partition Management

- V5R2 iSeries Navigator
 - ▶ Create Partition Wizard
 - ▶ Create, Delete Partitions
 - ▶ Move Processor Resources



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Capacity Upgrade on Demand



- **Permanent**

- ▶ Planned Growth (pay when purchased, no premium)
- ▶ Can pay for Processor Activation without an OS/400 license

- **Temporary**

- ▶ Business Peaks (pay after use, break even is ~20 days ... **turn it on / off**)
- ▶ 14 bonus days included with Standard and Enterprise Packages

	Temporary CUoD One Processor Day (K)	Permanent Hardware Activation (K)	OS/400 License per Processors (K)
i825	\$1.1	\$20	\$30
i870	\$1.2	\$25	\$30
i890	\$1.3	\$30	\$30

- **Available on i825, i870, and i890**

Linux Kernel

- **Linux consists of source tree that is compiled for a specific hardware platform to generate a kernel**
- **IBM has contributed modifications for the Linux PowerPC kernel**
 - ▶ **2.4, 64-bit and 32-bit Kernels**
 - ▶ **Architecture Independent Code - no changes**
 - ▶ **Architecture Dependent Code - some changes**
 - Device drivers to direct and virtual iSeries I/O
 - Get Time of Day from iSeries
 - ▶ **These kernel modifications are Open Source**
 - ▶ **These modifications are available on Linux PowerPC web sites**
 - <http://linuxppc64.org/>
 - ▶ **These modifications now included in the Linux kernel for PowerPC**

Linux Distributors

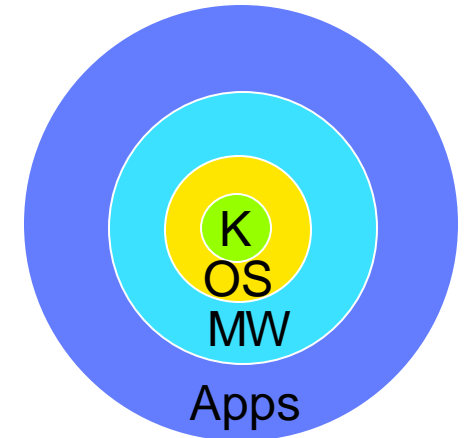
- ▶ Use PowerPC Linux kernel
- ▶ Add 100s of Operating System, Middleware, and Application components
- ▶ Add iSeries integration features
- ▶ Create Installation Documentation

Functions included in Typical Distribution

Functions	Key Middleware and Applications
Web Serving	Apache, Tomcat
Mail Server	SMTP(postfix), POP3, IMAP, Sendmail MTA
Print Server	Samba
File Server	Samba, NFS
Proxy Server	Squid
Security	NetFilter firewall, VPN, OpenSSL
Name server	DNS, DHCP, WINS, FTP
Directory	OpenLDAP
Database	MySQL, Postgres
Languages	C, C++, PHP, Pearl
Desktop	KDE, Gnome

The things that most people are using Linux for come with the distribution

Distribution



**Kernel +
Operating System +
Middleware +
Applications =
Distribution**

Linux Distributions for iSeries

SuSE

- ▶ **SuSE Linux Enterprise Server 8**
 - 64-bit kernel, 64 and 32-bit applications
 - Available December, 2002
- ▶ **SuSE Linux Enterprise Server 7**
 - 64-bit kernel, 32-bit applications
 - Available January, 2002



Turbolinux

- ▶ **Turbolinux Enterprise Server 8 for iSeries**
 - 64-bit kernel, 64 and 32-bit applications
 - Planned Available March 2003
- ▶ **Turbolinux Server 7 for iSeries**
 - 64-bit kernel, 32-bit applications
 - Available, April 2002



Red Hat

- ▶ **Red Hat Linux 7.1 for iSeries (64-bit)**
 - 64-bit kernel, 32-bit applications
 - Available, January 2003
- ▶ **Red Hat Linux 7.1 for iSeries**
 - 32-bit kernel
 - Available February 2002



Linux Distributions for iSeries

	SuSE SLES 8 for iSeries	Turbolinux TLES 8 for iSeries	Red Hat 7.1 for iSeries (64 bit)
Kernel type/version	64bit (supports 64 and 32 bit application) Vers 2.4.19	64bit (supports 64 and 32 bit application) Vers 2.4.19	64bit (supports 32 bit application) Vers 2.4.9
Languages	English, German, French, Italian, Spanish, Portuguese (Brazilian), Simplified Chinese, Japanese	English, German, French, Italian, Spanish, Portuguese (Brazilian), Simplified Chinese, Japanese	English, German, Japanese
GLIBC version	Vers 2.2.5	Vers 2.2.5	Vers 2.2.4
GCC	Vers 3.2	Vers 3.2	Vers 2.96.75
iSeries ODBC Driver for Linux	Vers 5.1.0.0.12	Vers 5.1.0.0.12	See Note 3
JTOpen	Vers 3.1-24	Vers 3.1-24	See Note 2
IBM Developer Kit for Linux, Java 2 Technology Edition	Vers 1.3.1SR3 via Download See Note 1	Vers 1.3.1SR3 via Download See Note 1	Vers 1.3.1 via Download See Note 1
ibmsis Linux Storage device driver Supported SCSI controllers - 2748, 2763, 2778, 2757, 2782, 5702	Vers 1.18.9	Vers 1.18.9	See Note 4
Journal File System (JFS)	Vers 1.0.24	Vers 1.0.24	See Note 5
icom (serial device drivers) Supported adapters - 2745, 2771, 2772, 2742, 2793, 2805	Vers 1.1.0	Vers 1.1.0	Not included
Power4 Support	Yes	Yes	Yes

Note 1: Available for Download (<http://www-106.ibm.com/developerworks/java/jdk/linux140/>)

Note 2: Available for Download (<http://www-1.ibm.com/servers/eserver/series/toolbox/>)

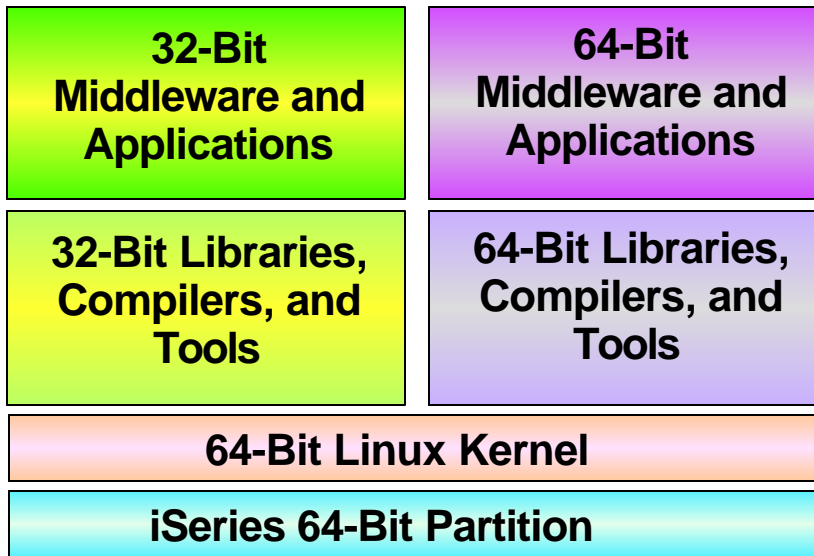
Note 3: Available for Download (<http://www-1.ibm.com/servers/eserver/series/linux/odbc/>)

Note 4: Available for Download (<http://www6.software.ibm.com/dl/linuxsdd/linuxsdd-p>)

Note 5: Available for Download (<http://www-124.ibm.com/developerworks/oss/jfs/index.html>)

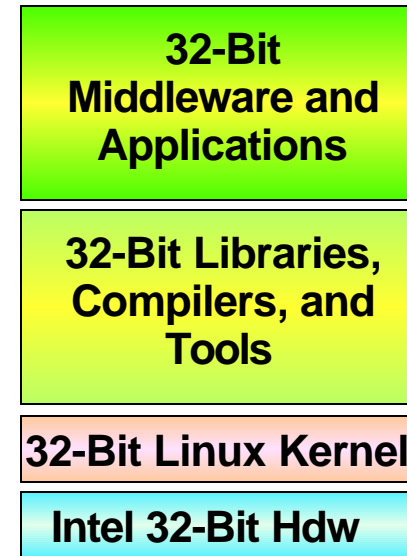
64-Bit Linux on iSeries

64/64 Linux Environment



- **64-Bit kernel supports 64 and 32 bit applications**
- **64-Bit applications can leverage large address spaces and memory**
 - ▶ Memory - 256 GB available on iSeries
 - ▶ Addressability - 2 TBs

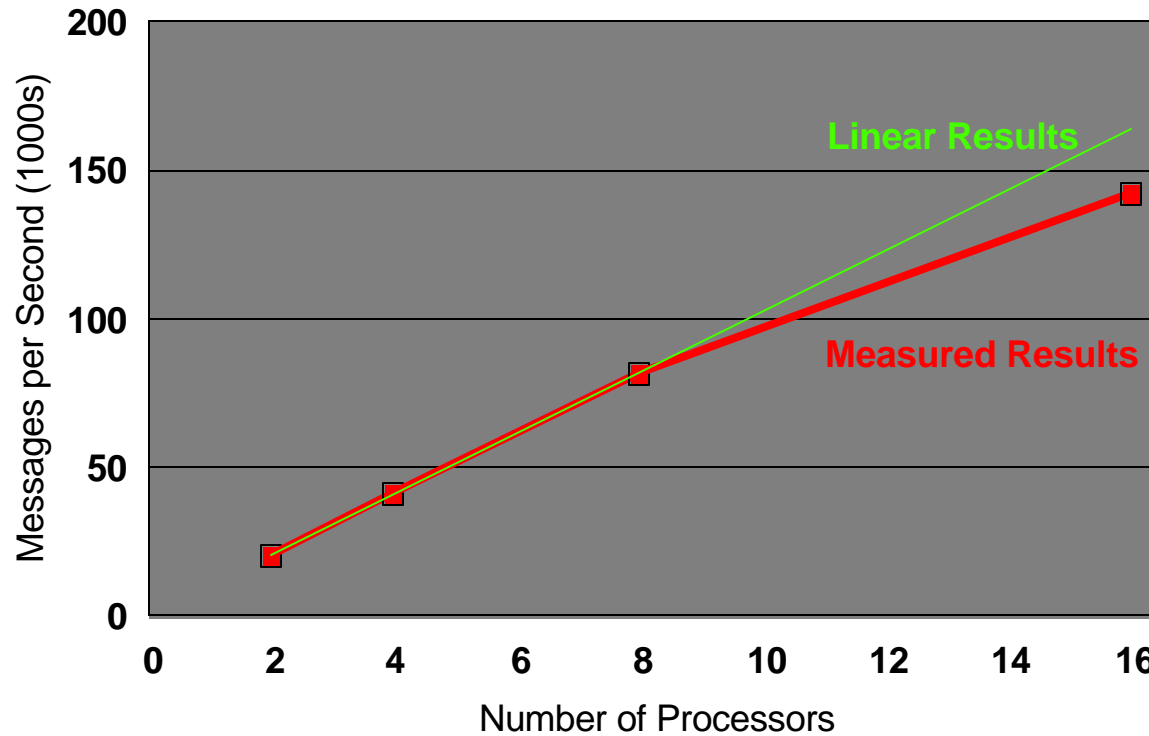
Intel 32 Linux Environment



- **32-Bit kernel supports 32 bit applications**
 - ▶ Memory: 4 GB is practical limit
 - ▶ Addressability - 3 GB

Linux on iSeries Scalability

VolanoMark Benchmark Results



# of Processors	Messages Per Second
2	20,535
4	41,508
8	81,772
16	142,222

Configuration

- ▶ i890 with OS/400 V5R2
 - N-way Partition of 2GB RAM on i890. The host i890 machine has 32 1.3GHz Power4 processors and 64GB of main memory.
- ▶ SuSE Enterprise Server 8 for iSeries
 - SuSE SLES8 (PPC) Version 8.1, Linux version 2.4.19-ul1-iSeries64-SMP (root@iSeries.suse.de) (gcc version 3.2) #1 SMP Wed Nov 13 18:23:44 UTC 2002

Benchmark Details

- ▶ Volano LLC's VolanoMark™ Version 2.1.2.
- ▶ Server - java -Xms512m -Xmx512m COM.Volano.Main
- ▶ Client - java -Xms512m -Xmx512m COM.Volano.Mark -count 1000 (2- and 4-way) java -Xms512m -Xmx512m COM.Volano.Mark -count 2000 (8- and 16-way)
- ▶ Java(TM) 2 Runtime Environment, Standard Edition (build 1.3.1) Classic VM (build 1.3.1, J2RE 1.3.1 IBM build cxppc32131-20020706 (JIT enabled: jitc))

Linux Distribution Pricing

■ SuSE SLES 8

▶ Based on iSeries Model

– Media - Required

- 4 CDs

– Annual Maintenance - Required

- patches, bug fixes and security updates

– Annual Support

- Standard - Mo-Fri: 9am - 6pm CET
- Premium - 24x7, 2 Hour response

■ Red Hat Linux 7.1 (64-bit)

▶ Subscription per server per year

– Standard

- Red Hat Support (12x5), 1 day response
 - ◆ Installation, Configuration, and Defect
- Software Maintenance - upgrades and enhancements through Red Hat Network

– Premium

- Red Hat Support (24x7), 1 hour response
- Software Maintenance - upgrades and enhancements through Red Hat Network

■ Turbolinux TLES 8

▶ To be announced

iSeries Model	SLES 8 Media	Maintenance (Annual)	Support (Annual) (up to 5 Partitions*)
iSeries 800, i810, i270	\$149	\$1,120 per system	Std: \$940 Pre: \$2150
i825, i820	\$149	\$1,440 per 2 CPU block	Std: \$1180 Pre: \$2690
i870, i890, i830, i840	\$149	\$2,520 per 2 CPU block	Std: \$2120 Pre: \$4840

* Additional support options are available for more partitions

Standard Pricing with Full Red Hat Support

Red Hat	Less Than 4 Processors	4 and More Processors
Standard	\$3500	\$5250
Premium	\$4000	\$6900

Red Hat Promotion Through 3/31/03

Red Hat	Less Than 4 Processors	4 and More Processors
Standard L3	\$1050	\$1575
Premium L3	\$1200	\$2085

Requires IBM Linux Support Linux Contract for L1/L2 Support

Support for Linux on iSeries

- **Support is available for Linux on iSeries from distributors**
 - ▶ **SuSE**
 - ▶ **Turbolinux**
 - ▶ **Red Hat**

- **Support for Linux on iSeries from IBM Global Services**
 - ▶ **IBM Support Line provides answers to usage questions and suspected Linux code defects**
 - ▶ **Requires Linux SupportLine contract**

- **Support for the Integration of iSeries, OS/400 and Linux on iSeries**
 - ▶ **Asking questions regarding OS/400 logical partitioning and reporting suspected defects in the OS/400 implementation of logical partitions are included within the IBM Support Line OS/400 offering contract.**
 - ▶ **The OS/400 Support Line representative will attempt to answer basic Linux on iSeries installation questions.**

IBM Middleware

- **Java™**
 - ▶ **IBM Developer Kit for Linux, Java 2 Technology Edition**
 - 1.3.1 Available for download at <http://www6.software.ibm.com/dl/dklx130/dklx130-p>
 - Certified for Red Hat 7.1 for iSeries (64-bit) and SLES 8
 - ▶ **iSeries Toolbox for Java provides access to DB2 UDB and OS/400 Services**

- **DB2 UDB for Linux**
 - ▶ **Technology Preview started 1st quarter 2002**
 - ▶ **Statement of Direction April 29, 2002**
 - ▶ **Beta of DB2 UDB 8 January, 2003**

- **WebSphere Application Server for Linux**
 - ▶ **Technology Preview started 1st quarter 2002**
 - ▶ **Statement of Direction April 29, 2002**



Application Sources

- **Linux Distributions**
 - ▶ **Contain popular Open Source Applications**
 - Apache, Samba, Sendmail MTA, Netfiler
- **Open Source Applications**
 - ▶ **Download and compile for PowerPC**
 - Tomcat for Java Servlets and Java Server Pages <http://java.sun.com/products/jsp/tomcat/>
 - OpenOffice - Productivity Suite www.openoffice.org
- **PowerPC Linux applications**
 - ▶ **Will run out of the box**
 - ▶ **iSeries, pSeries, Apple PowerBook,,,**
- **Intel Linux applications**
 - ▶ **Need to be compiled for PowerPC**
- **ISVs**
 - ▶ **PartnerWorld is working with ISVs to enhance iSeries application portfolio**

Linux on iSeries: Key Solutions

Included with Distributions

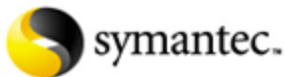
- ▶ Samba - file server
- ▶ Apache - web server
- ▶ Squid - proxy server
- ▶ DNS/DHCP
- ▶ MySQL - database
- ▶ ...

Open Source

- ▶ Tomcat - web application server
- ▶ OpenOffice - office suite
- ▶ ...

ISVs

- ▶ Symantec - Enterprise Firewall
- ▶ eOne - Commerce
- ▶ Sage - business applications
- ▶ Bynari - mail server
- ▶ MAPICS - ERP
- ▶ Dimensional Insight - BI
- ▶ Vision Solutions - HA
- ▶ Cybozu - workgroup



More<http://www-1.ibm.com/servers/eserver/series/linux/apps.html>

Linux for iSeries Opportunities

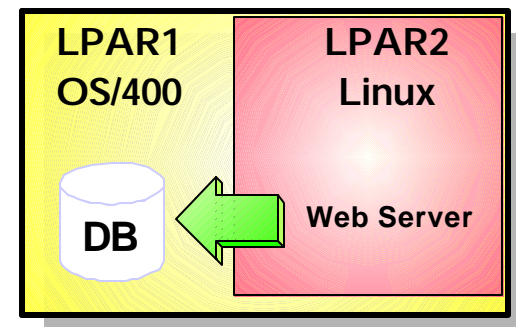
- **Consolidation**

- ▶ Replace Windows or Linux Infrastructure servers
- ▶ Run multiple Linux servers in partitions
- ▶ Consolidation Lowers Cost of Computing



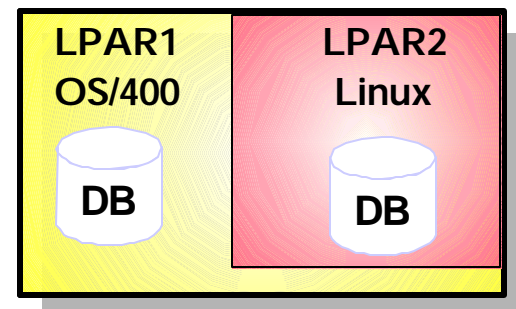
- **Integration**

- ▶ Extend OS/400 applications with Linux Applications
- ▶ Run Linux applications on same server as OS/400
- ▶ Integration Lowers Cost of Computing



- **Application Flexibility**

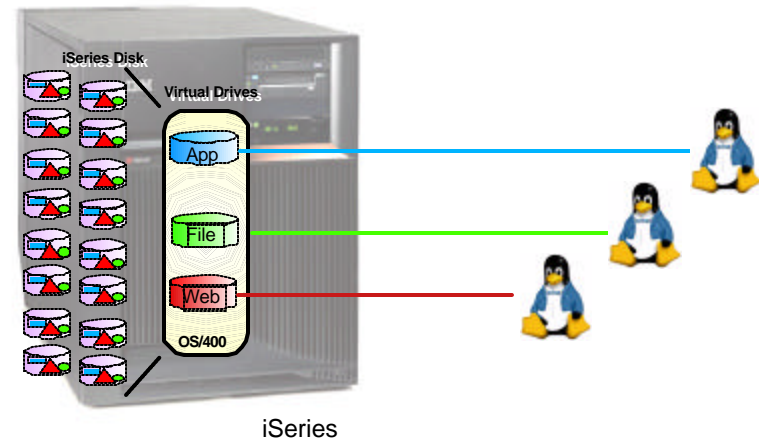
- ▶ Leverage Linux LOB application portfolio
- ▶ Run Linux applications on iSeries
- ▶ Flexibility Lowers Cost of Computing



Linux on iSeries Advantages

- **Run multiple Linux images on one Server**
 - ▶ Up to 31 Linux partitions
- **Dynamic Resource Movement**
 - ▶ 1/100th of a processor
 - ▶ Virtual storage spaces
 - ▶ Capacity Upgrade on Demand
- **Storage Virtualization**
 - ▶ Linux shares resources with OS/400 and other Linux partitions: disk, tape, CD, DVD
 - ▶ Simple to duplicate servers
- **Virtual Ethernet for safe/fast communications**
 - ▶ Up to 16 networks under the covers
- **Linux to OS/400 Application Integration**
 - ▶ ODBC and JDBC access to DB2/400
 - ▶ Samba and NFS for file access
- **Management Integration**
 - ▶ LPAR and Storage

# of Processors in Server	Maximum # of Linux Partitions*
1	9
2	19
4 and >	31



Server Consolidation Scenario

Customer Scenario:

- ▶ Five Infrastructure Intel Servers Installed
- ▶ Customer facing increased complexity and outages
- ▶ Servers coming off of maintenance

(4) HP ProLiant Servers

- (2) HP ProLiant DL360G2
 - 1 processor
 - 1 GB Memory
 - Tape
- (5) 17 GB Drives /ea.
- (2) HP ProLiant DL360G2
 - 2 processors
 - 2 GB Memory
 - Tape
- (5) 17 GB Drives/ea.

Windows Server Software
 Win2K Servers(4)
 Win2K Clients (100)
 Upgrade Protection
 Limited Support *

~~\$76,794~~

New iSeries with xSeries

- iSeries 800 Value
- 300 CPW
- (1) IXS
- (2) IXA
- (2) xSeries x235
 - Dual Processor
 - 2GB Memory
- Standard Edition
- OS/400
- DB2 UDB for iSeries

Windows Servers Software
 Win2K Servers (2)
 Win 2K Clients (100)
 Upgrade Protection
 Limited Support*

\$70,707

New iSeries w/ Linux Partition Solution

- iSeries and Linux LPAR
- i810
- 1470 CPW
- 2 GB Memory
- (12) 17GB Drives
- SW Standard Package
- OS/400
- DB2 UDB for iSeries
- SuSE SLES 8

Better Price Plus:

- Centralized Storage Management
- Operations Simplified
- Outages Reduced
- Dynamic Resource Allocation (LPAR)
- Reduced SW costs (open source)
- Simple Server Duplication
- Higher Availability with Test Partitions

\$56,726

* Microsoft support - 3 calls/yr per server

Linux on iSeries

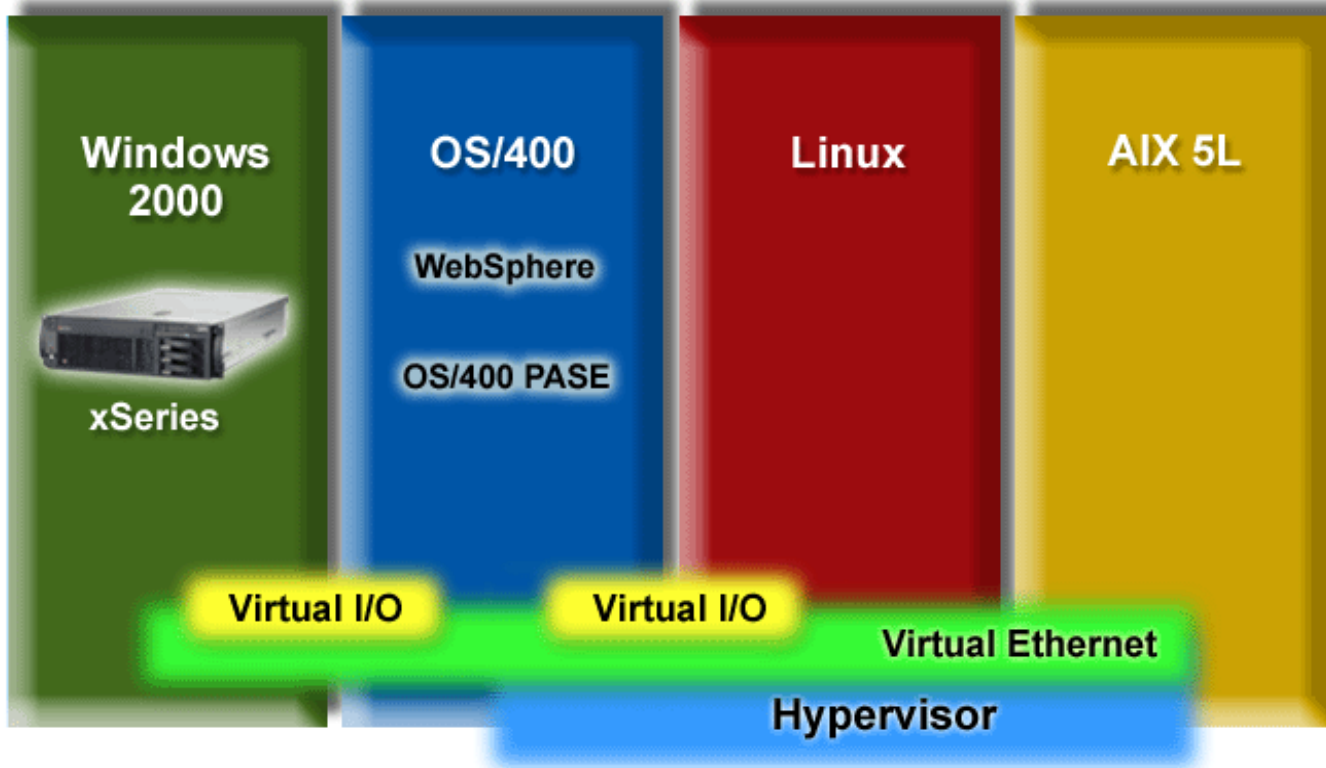
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Linux for iSeries Summary

- **Linux for iSeries is available from leading distributors**
- **iSeries offers On Demand Virtualization and Integration**
- **With Linux customers can consolidate their infrastructure and extend their OS/400 applications**

www.ibm.com/eserver/series/linux

iSeries Server Consolidation



"IBM's iSeries minicomputers provide its customers with perhaps the best overall platform for server consolidation."

ENTmag.com Server Consolidation Primer <http://entmag.com/news/print.asp?EditorialsID=5626> 12/9/02

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