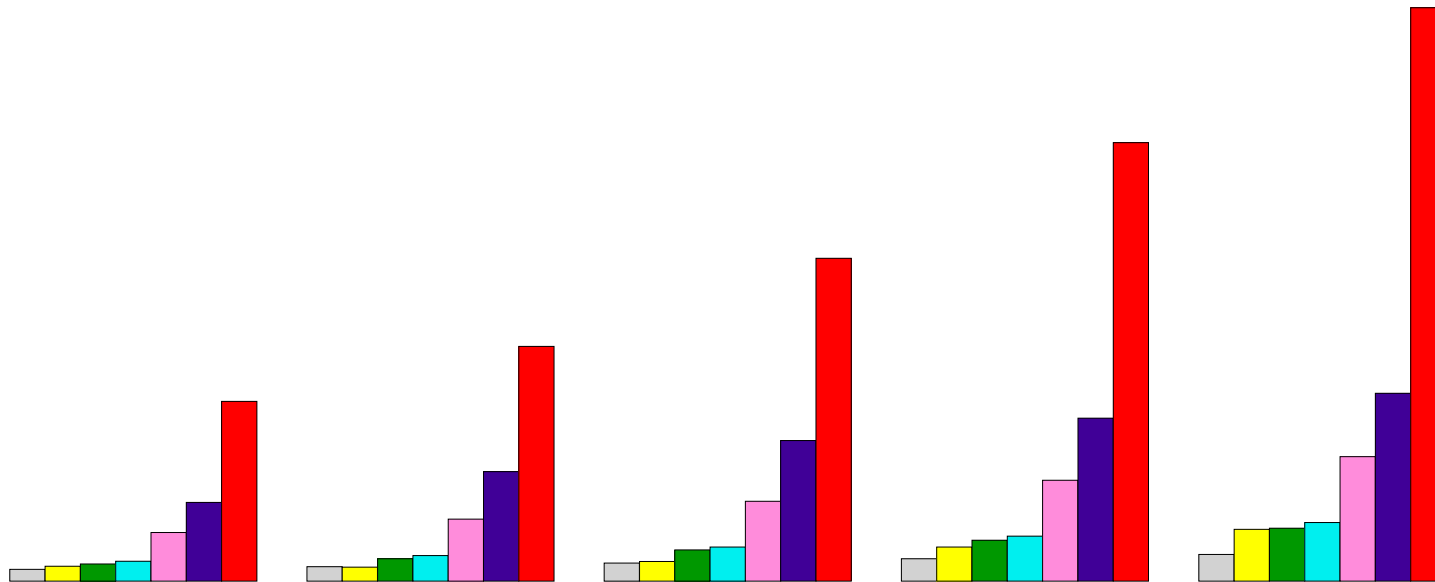# iSeries. mySeries.

The POWER of Linux on iSeries

…. Migrating Windows Workloads to Linux

Craig Johnson

iSeries Product Marketing

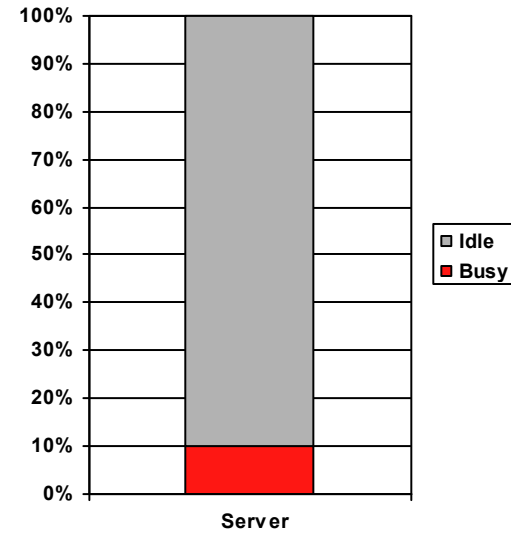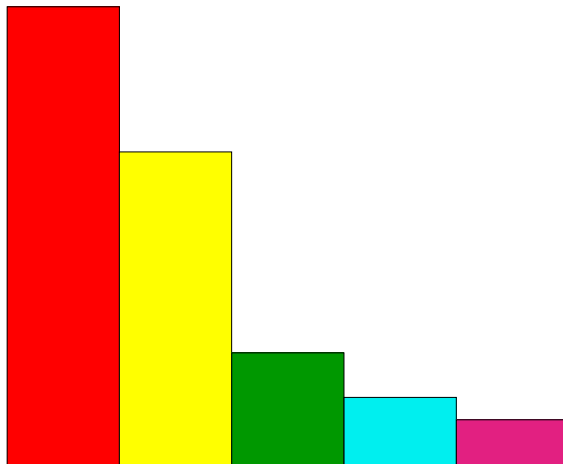johnsonc@us.ibm.com

Linux Server Spending by Workload

Infrastructure Continues to be the largest
category - $2B in 2004

Source IBM GMV 2Q03

iSeries. mySeries.

Windows to Linux Market Place
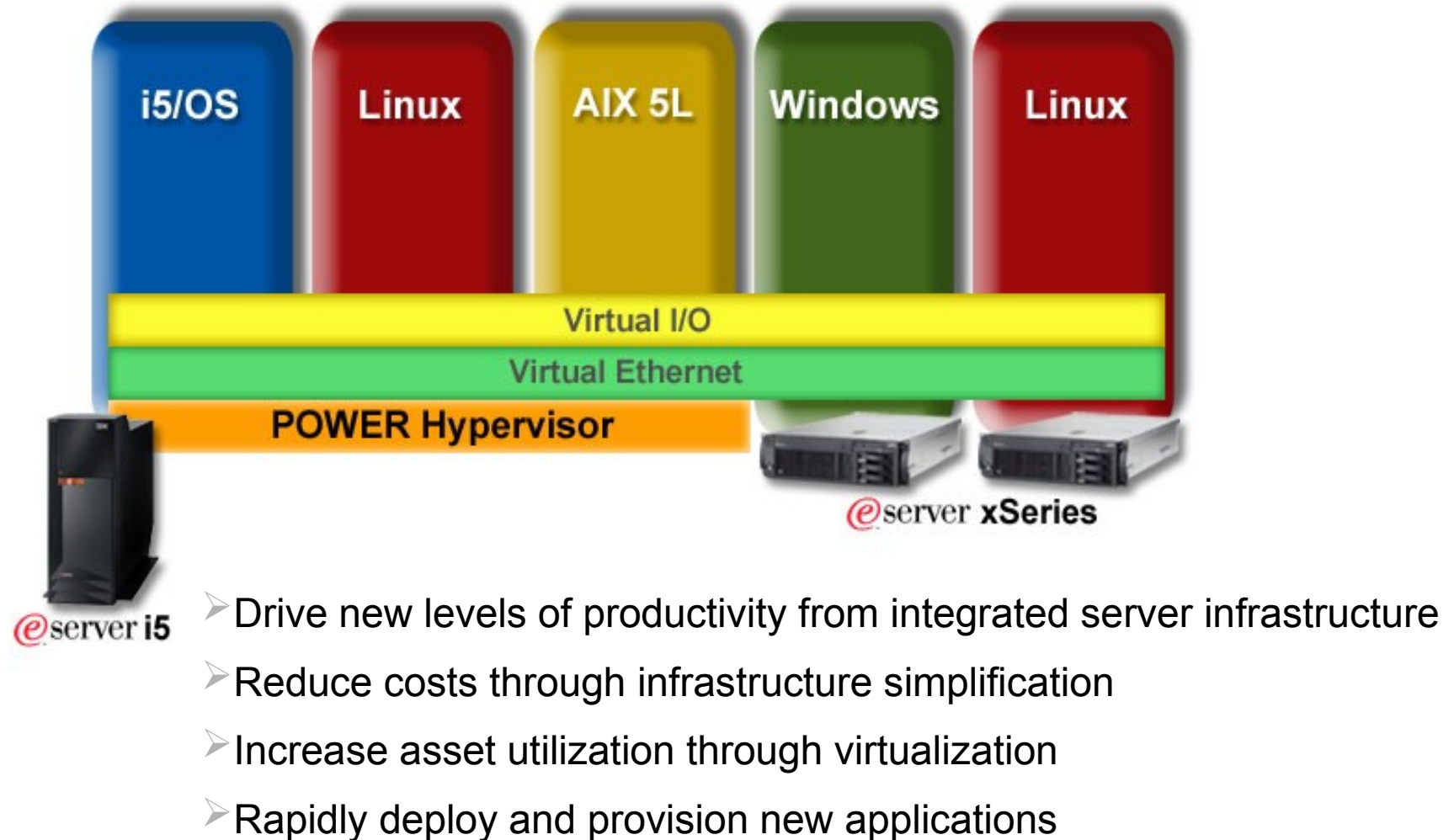
Windows Server Utilization

•A review of over 12,000 Wintel platforms at more than 350 customer locations shows that the average machine CPU utilization is less than 10%.

Source IBM IT Trends 2Q03

Solitaire Interglobal 11/12/03
http://www.sil-usa.com/Papers/QueryResponses/QUERY_RESPONSE_20031575.pdf

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IBM eServer i5: Simplify Your Infrastructure

- ➤ Drive new levels of productivity from integrated server infrastructure
- ➤ Reduce costs through infrastructure simplification
- ➤ Increase asset utilization through virtualization
- ➤ Rapidly deploy and provision new applications

iSeries. mySeries.

POWER Linux on eServer i5

- **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

- **Common Linux distribution for POWER5 servers**
  - Red Hat Enterprise Linux 3
    - Next Quarterly Update*
  - SUSE LINUX Enterprise Server
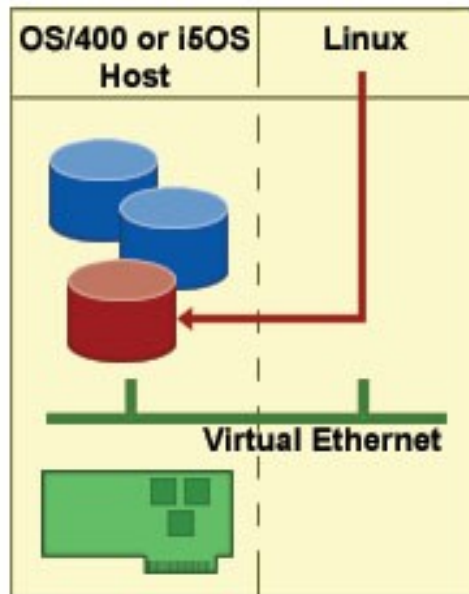   - Next version*

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

POWER Linux Virtual Storage

Linux I/O Flexibility

Virtual I/O

OS/400 or i5OS Host	Linux

Virtual Ethernet

- Leverage iSeries or i5 resources
- OS/400 or i5/OS management

Direct I/O

OS/400 or i5OS	Linux
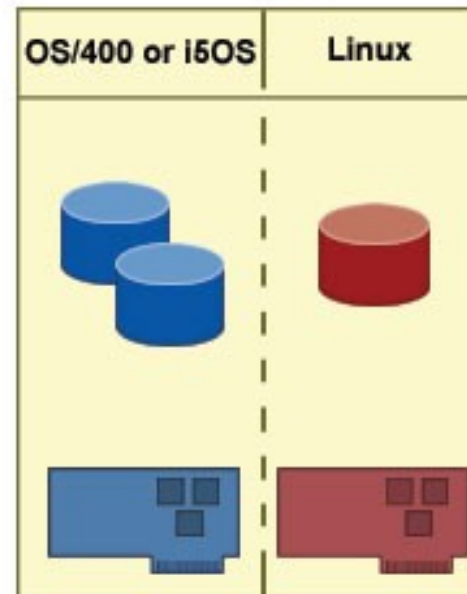
- Dedicated resources
- Linux management

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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
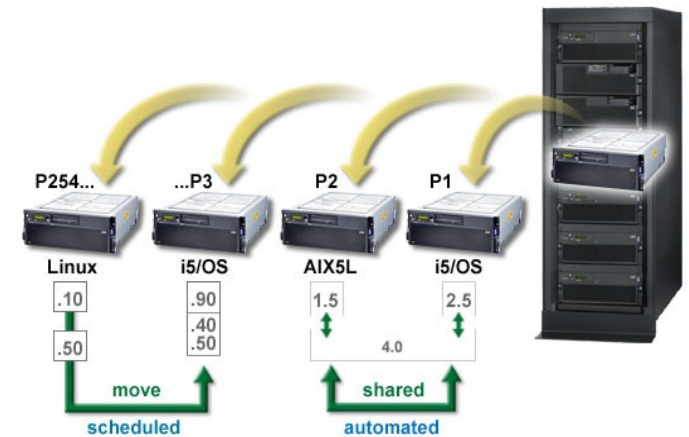
IBM Virtualization Engine
Systems Technologies

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2004 iSeries Product Line

- **Support for new servers**
  - Shared processor, Dynamic movement
  - Virtual Storage and Ethernet
- **Capacity Upgrade on Demand**
  - Permanent and Temporary
  - i825, i870, i890
- **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
- **Service Vouchers**
  - Included in Enterprise Edition for i810, i825, i870, i890
  - Valid for iSeries Linux Integration QuickStart
- **IBM Software**
  - DB2 UDB Workgroup Edition, WebSphere Application Server, Tivoli Storage Manager included with Enterprise Edition

iSeries 800
- ƒ 1 Processor
- ƒ Up to 9 Linux Partitions

iSeries 810
- ƒ 1-2 Processors
- ƒ Up to 19 Linux Partitions

iSeries 825
- ƒ 3-6 Processors
- ƒ Up to 31 Linux Partitions

iSeries 870
- ƒ 5-16 Processors
- ƒ Up to 31 Linux Partitions

iSeries 890
- ƒ 16-32 Processors
- ƒ Up to 31 Linux Partitions

iSeries. mySeries.

2004 eServer i5 Product Line

520

- **Logical Partitions**

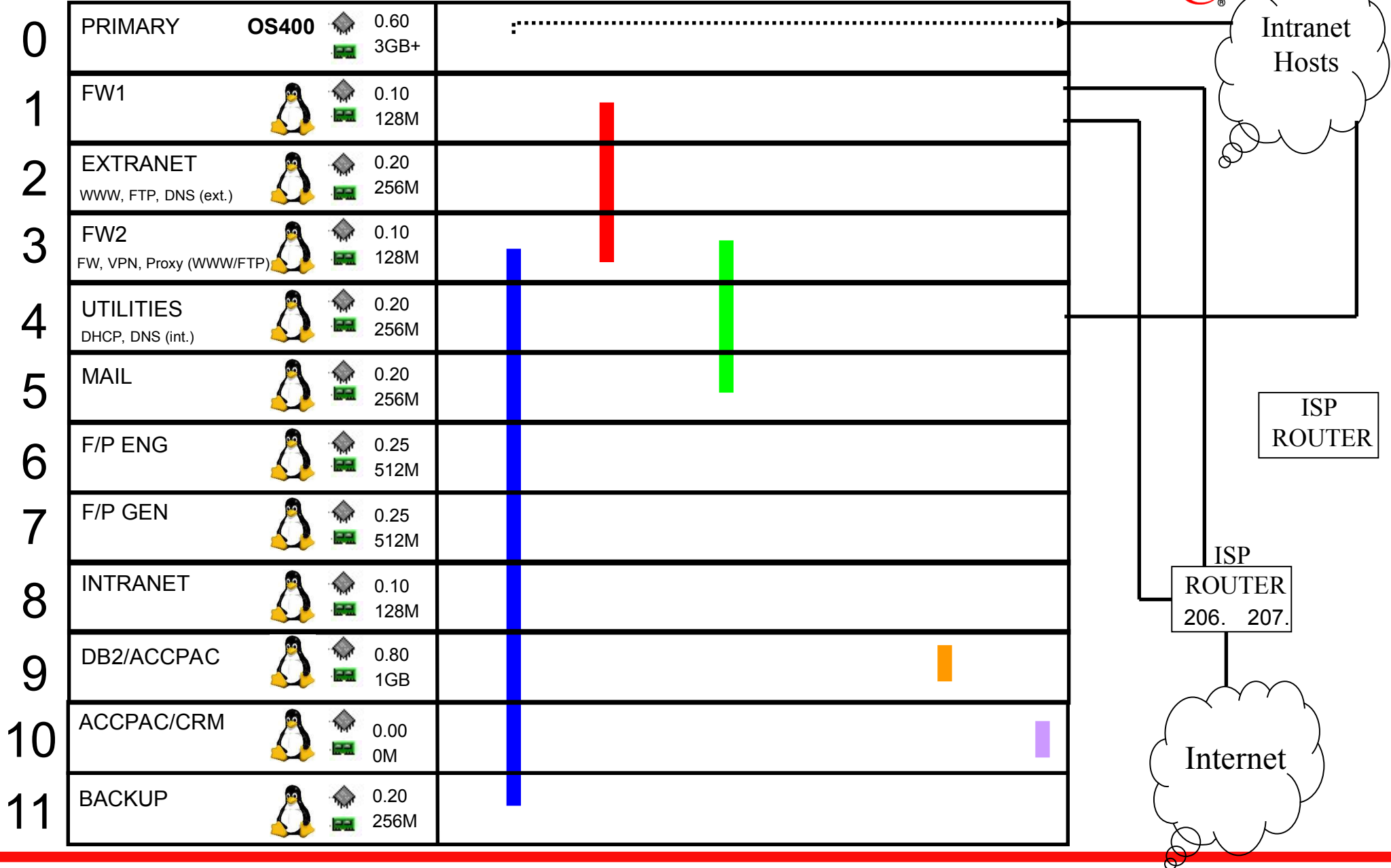|	520	520	520	520	520	570
Number of Processors	1	1	1	1	2	1/2 2/4
CPW	500	1000	2400	3300	6000	3300/ 11,700
Maximum # of Partitions	2	4	10	10	20	10-40

570

- **i5/OS Enterprise Edition**
  - 520: Services Voucher – can be performed by qualified Business Partners
  - 570: Services and Education (3) Voucher
  - 570: Includes Extra processor for Linux or AIX 5L
  - 570: Includes Integrated xSeries Server

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Linux Partitions

IBM

	Partition		Type	CPU	Memory		
0	PRIMARY		**OS400**	0.60	3GB+		Intranet Hosts
1	FW1			0.10	128M		
2	EXTRANET WWW, FTP, DNS (ext.)			0.20	256M		
3	FW2 FW, VPN, Proxy (WWW/FTP)			0.10	128M		
4	UTILITIES DHCP, DNS (int.)			0.20	256M		
5	MAIL			0.20	256M		ISP ROUTER
6	F/P ENG			0.25	512M		
7	F/P GEN			0.25	512M		
8	INTRANET			0.10	128M		ISP ROUTER 206. 207.
9	DB2/ACCPAC			0.80	1GB		
10	ACCPAC/CRM			0.00	0M		
11	BACKUP			0.20	256M		Internet

VLAN 0   VLAN 2   VLAN 4

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Architecture Examples

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Open Source Applications

SAMBA	Open-source file server supporting same protocol (SMB) as windows file servers (including NT4 style domain authentication and Windows 2K ADS authentication)
NetFilter	Open-source firewall providing packet-level filtering.
Apache	Open-source web server supporting standards such as HTML, Proxy caching, SSL, CGI scripts, and password authenticated web pages
bind	Open-source name server (Domain Name Server)
FreeSwan	Open-source VPN server.
LVM	Logical Volume Manager – Provides ability to build large flexible file systems by combining multiple "disks" (including iSeries Virtual Disks) into a single file system.
krb5	Kerberos. Provides support for Linux to be a kerberos server/client and to exchange kerberos tickets with other kerberos servers (including Windows ADS servers)

Moving Authenticated Windows-Based File Serving to Linux – Domain Controllers

Environment Before Migration

- Windows Servers
  - NT4 – Primary Domain Controller
  - NT4 – Backup Domain Controller
  - NT4 – File Server

Environment After Migration

- iSeries 825
  - Linux Partition with SAMBA configured as Primary Domain Controller and providing file server functions*
  - Second Linux Partition with SAMBA configured as Backup Domain Controller

Pain Points

- Reliability of Intel Systems
- Growth of file server limited

Realized Benefits

- Improved availability for end users

*Logical Volume Manger (LVM) used in Linux to provide a large/flexible data store that can grow as needed without downtime.

Moving Authenticated Windows-Based File Serving to Linux – Active Directory Server

Environment Before Migration

- Windows Servers
  - W2K - ADS
  - W2K - File Server

Environment After Migration

- iSeries 825
  - Linux Partition – File Server configured to authenticate against ADS server
  - W2K on IXS – provides ADS authentication across virtual disk**

Pain Points

- Existing file server storage limitations

Realized Benefits

- Improved availability / performance
- Ability to implement new solutions
- Cost savings

*Logical Volume Manger (LVM) used in Linux to provide a large/flexible data store that can grow as needed without downtime.

**Authentication against existing WinTel based ADS is also supported

Moving Intel-Based Linux Solutions to PPC Linux

Environment Before Migration

- Intel Systems
  - Firewall
  - Intranet
  - Document Imaging
  - Internet
  - DHCP / Name Serving
  - Virtual Private Network

Environment After Migration

- iSeries 820 Linux Partitions
  - Document Imaging
  - Firewall (NetFilter)
  - Intranet (Apache)
  - Internet (Apache)
  - DHCP / Name Serving (bind)
  - Virtual Private Network (freeswan)

Pain Points

- IT staff overload
- Aging Intel hardware – reliability issues

Realized Benefits

- Reduced IT management
- Ability to implement new solutions with existing IT staff

Other Migration Scenarios

www.linux.org

- **SpamAssassin**
  - Open-source mail filter that uses a wide range of heuristic tests on mail headers and body text to identify spam.

- **Clam AntiVirus**
  - Open-source anti-virus toolkit for Linux that integrates with mail servers and provides attachment scanning.

- **Snort Intrusion Detection**
  - Open-source lightweight network intrusion detection system, capable of performing real-time traffic analysis and packet logging on IP networks.

- **Squid Proxy Server**
  - Open-source high performance Web proxy cache

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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
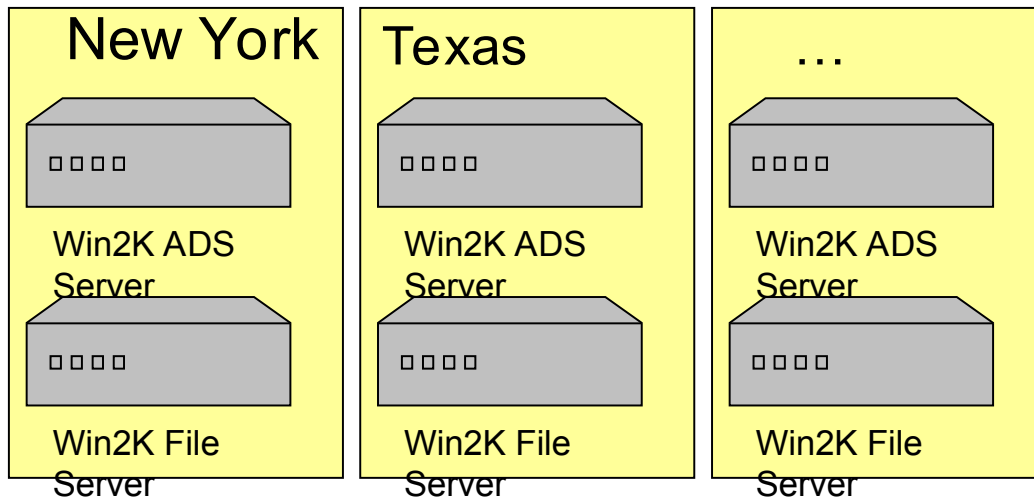   - 1 - Test/Development/Hot spare
    - 2 - Growth

"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

#	Partition	CPU	Memory
0	PRIMARY	0.60	3GB+
1	FIREWALL (External)	0.10	128M
2	EXTRANET — WWW, FTP, DNS (ext.)	0.20	256M
3	FIREWALL (Internal) — FW, VPN, Proxy (WWW/FTP)	0.10	128M
4	UTILITIES — DHCP, DNS (int.)	0.20	256M
5	BYNARI MAIL	0.20	256M
6	FILE/PRINT (Eng)	0.25	512M
7	FILE/PRINT (General)	0.25	512M
8	INTRANET	0.10	128M
9	DB2/ACCPAC	1.00	1GB
10	FUTURE	0.00	0M
11	BACKUP	0.20	256M

Small Manufacturing Company

Environment After Migration

Environment Before Migration

New York | Texas | …

Win2K ADS Server

Win2K ADS Server

Win2K ADS Server

Win2K File Server

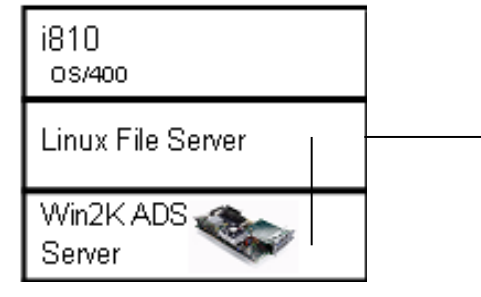Win2K File Server

Win2K File Server

i810
OS/400

Linux File Server

Win2K ADS Server

Pain Points

- 10 Locations, 20 Servers
- Geographically disparate servers hinders IT management activities
- Reduce reliance on Microsoft products and Microsoft licensing

Realized Benefits

- Centralized storage reduces IT overhead and improves service levels
- Centralized backup of all data provides improved restore capabilit
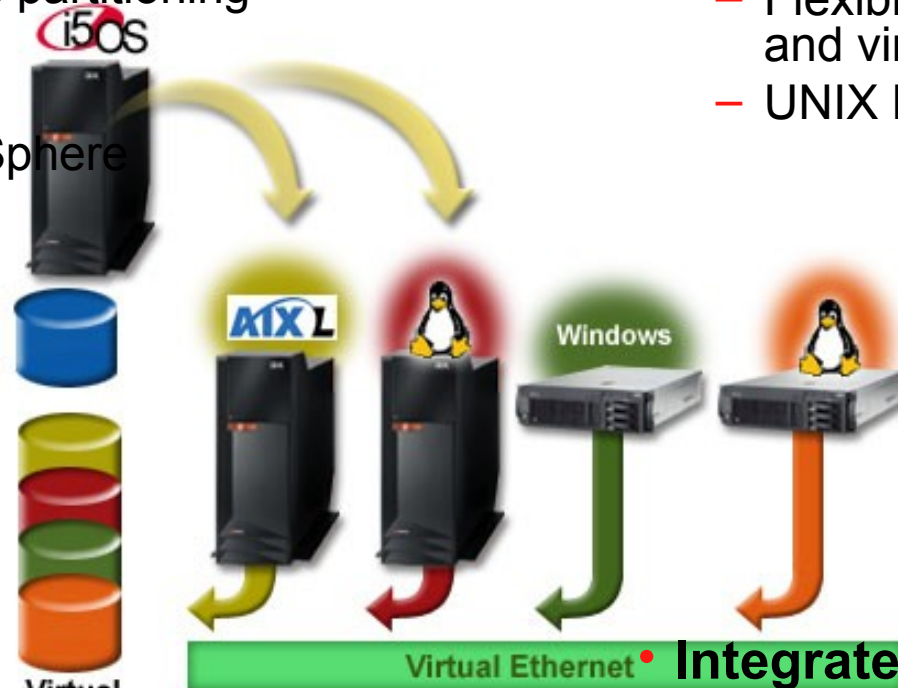- Reduction in Microsoft licenses

Infrastructure Simplification Offerings

- **i5/OS**
  - Flexible, automatic partitioning and virtualization
  - Integration
  - Domino and WebSphere scalability

- **AIX 5L**
  - Flexible, automatic partitioning and virtualization
  - UNIX Migrations to AIX portfolio

i5OS

AIX L

Windows

Virtual Ethernet

Virtual Storage

- **Linux on POWER**
  - Flexible, automatic partitioning and virtualization
  - Premier Linux Offering

- **Integrated xSeries Solutions**
  - xSeries delivers leading Intel server performance
  - Virtual Storage and Virtual Ethernet
  - When solution requires Intel servers

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Simplify Your Infrastructure

- Reduce costs by increasing asset utilization
- Redeploy talent to manage your business, not your infrastructure
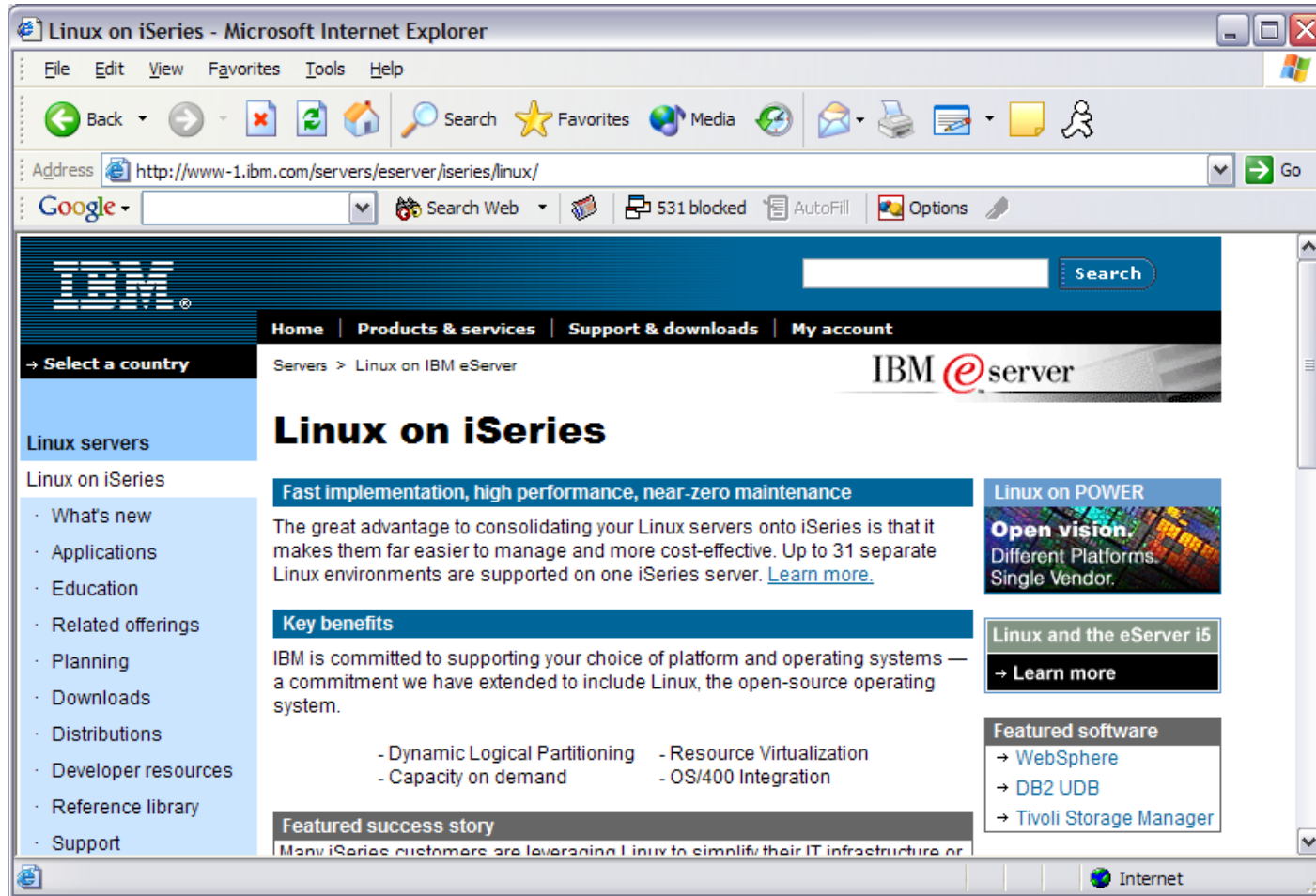- Rapidly provision new servers
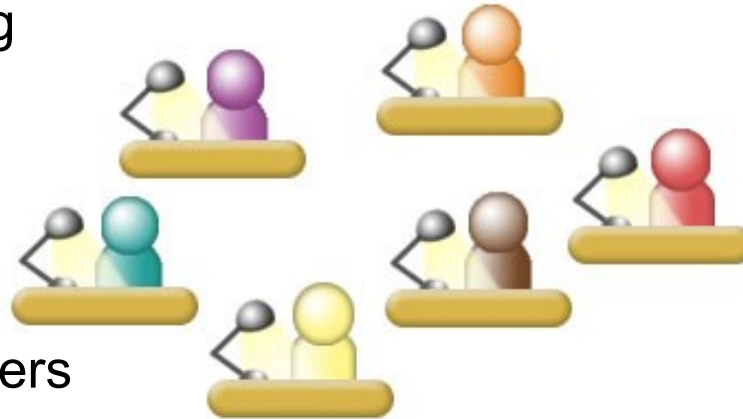
""We have taken major steps to simplify our infrastructure by leveraging virtualization technologies with POWER Linux and Integrated xSeries Solutions on the iSeries. Prior to our server consolidation we spent 95% of our time just keeping our systems and network running. Now we spend 5%."

Nigel Fortlage, VP of Information Technology, GHY International

Database

Application

Web

DNS

File/Print

Email

Firewall

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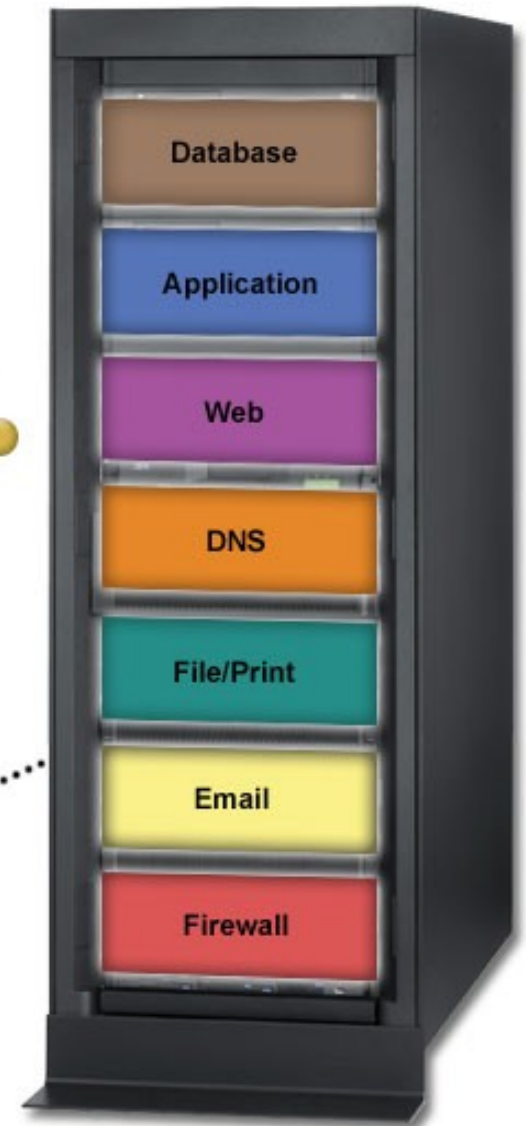
For more information

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