Linux on zSeries

The Point of Consolidation

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Linux Planning Mgr & VSE Program Mgr

WAVV 2002

Agenda

Linux on zSeries

- **Product overview**
  - ►**Why Linux?**
  - ►**What is Linux on zSeries?**
  - ►**Hardware**
  - ►**Integrated Facility for Linux**
  - ►**Linux Distribution Partners**
  - ►**IBM Middleware**
  - ►**Middleware and Applications from ISVs**
  - ►**Services and Support from IBM Global Services**
  - ►**Development Focus**

- **What customers are doing with Linux on zSeries**
  - ►**Application deployment**
  - ►**Workload scenarios**
  - ►**Reference Customers**

Key Challenges for IT Executives

- **Cost**
  - ► **Escalating cost of the IT Infrastructure**
  - ► **Difficulty of linking IT to business plans**

- **Speed**
  - ► **Ability for IT infrastructure to react quickly to business & market changes**

- **Skills**
  - ► **Difficulty of attracting and retaining skilled people**

The Answer is...

- **Drive automation and simplicity into the IT Infrastructure**

- **Provide competitive advantage**
  - ► **Reduced time to market**
  - ► **Increased availability**

- **Optimize IT resources**
  - ► **Strategic positioning of future application growth**
  - ► **Consolidation of existing servers**

➡ *Need a "game changer"*

The Linux Operating System

- **Growing Marketplace Acceptance**
  - ► The continual compound growth of Linux deployments and large skill pool attests to the market acceptance.

- **Industry wide Initiative**
  - ► Linux is the first operating system that the entire industry has rallied around. Not just selected vendors.

- **Multi-platform**
  - ► Linux runs on every platform, there is no other operating system with this characteristic.

- **Basis of Innovation**
  - ► Because of its open nature, Linux is the basis for new and innovative uses of technology.

Open Source

No single vendor
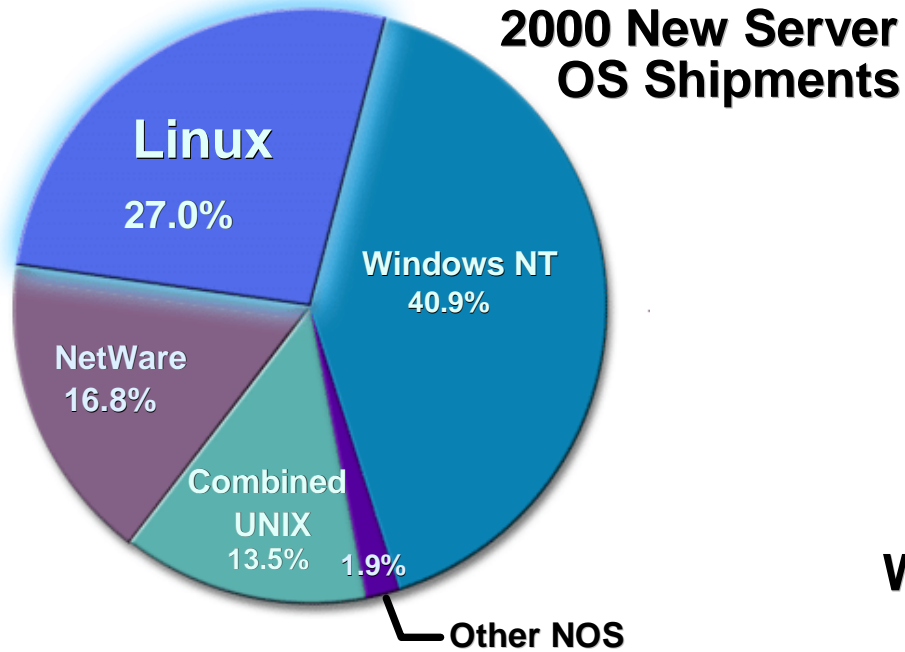
Coexistence

Born on the web

Small and modular

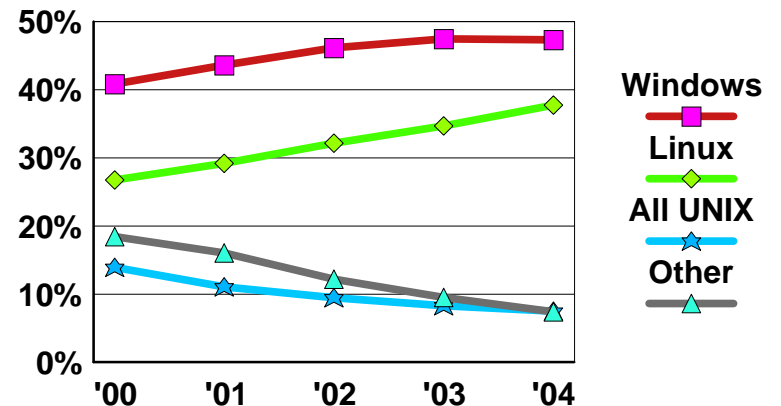Community developed and owned

Unix heritage

Linux Momentum

2000 New Server OS Shipments

Linux
27.0%

Windows NT
40.9%

NetWare
16.8%

Combined UNIX
13.5%

1.9%

Other NOS

**Linux
23.6% Growth**

WW Server OS License Share (units)

Windows

Linux

All UNIX

Other

'00 '01 '02 '03 '04

50%
40%
30%
20%
10%
0%

Why Linux on zSeries?

1. **Increased number of solutions on zSeries through Linux application portfolio**

2. **Large number of highly skilled programmers familiar with Linux**

3. **Integrated business solutions**

   ► **Data richness from zSeries**

   ► **Wide range of Linux applications**

4. **Industrial strength environment**

   ► **Flexibility and openness of Linux**

   ► **Qualities of service of zSeries**

5. **Unique ability to easily consolidate large number of servers**

What is Linux on zSeries ?

The Point of Consolidation - Where Linux Ascends to the Mainframe

- **Pure Linux, an ASCII environment**

- **Exploits IBM S/390 hardware, including IEEE floating point, HiperSockets, 31-bit and 64-bit, ...**

- **Design Principles**
  - ► No changes to Linux - not a unique version of Linux
  - ► No changes to Look+Feel for Linux on zSeries
  - ► No replacement for any other IBM zSeries operating system

Linux Application			
Linux Kernel	GNU RTL	GNU Binutils	GNU Compiler
	IBM developed Code		
IBM developed Code			
S/390 or zSeries Hardware			

Delta below 1%

	Total LOC	S/390 LOC	% of Code
Linux Kernel	2,200,000	45,000	2.0
gcc	1,700,000	9,000	0.5
gdb	1,500,000	8,000	0.5
glibc	1,200,000	5,000	0.4
binutils	800,000	6,000	.75
strace	41,000	200	.5

Linux is Linux

IBM ~ zSeries Award winning Servers

Multiprise 3000
Best in Show
Anual Linux Showcase
Atlanta, GA, October, 2000

9672 G5/G6 Series
Best in Show
Linux Business Expo
Sydney, Australia, March, 2001

z900 Server
Best Hardware
Linux World Conference & Expo
New York City, NY, January, 2001

- **Add processing power for Linux in an economic way with Integrated Facility for Linux (IFL) engines, available for all series (MP3000, G5/G6, z900/z800)**

- **zSeries Virtualization Technology (z/VM) for large numbers of virtual Linux servers on all models**

- **z900 and z800 support both, 31- & 64-bit operating environments, G5/G6 and Multiprise 3000 series support 31-bit operating environments**

- **Add capacity on demand on G5/G6 series and z900/z800 servers**

- **Hardware assisted cryptography available on G5/G6 series and z900/z800 servers**

- **HiperSockets™ available on z900/z800 servers**

IBM zSeries Offering for Linux

z800: The first mainframe ...
## ... designed from the ground up for server consolidation

- **z800 Hardware - dedicated to Linux**
  - ► 1 to 4 Integrated Facility for Linux engines
  - ► Memory pre-configured to match enabled processor configuration
  - ► Includes FICON™ and OSA Connectivity

- **zSeries Virtualization Technology**
  - ► z/VM Version 4

- **zSeries Maintenance**
  - ► 3 years hardware maintenance (first year is warranty)
  - ► 3 years z/VM Subscription and Support License

- **Attractive Package Price**

- **TOTAL Solution Financing - optional**
  - ► Financing options available from IBM® Global Finance

- **IBM Global Services - optional, e.g.**
  - ► IBM Support Line Software Services for Linux
  - ► IGS Linux Rapid Deployment Solution
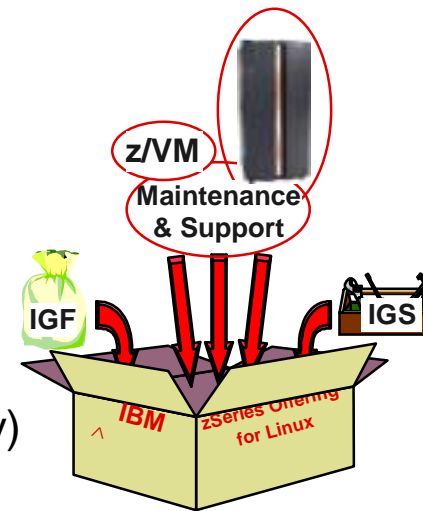
Integrated Facility for Linux (IFL)

- **Additional processing capacity exclusively for Linux workloads**
  - ►For zSeries: z900, z800, IBM 9672 G5/G6, Multiprise 3000 (Mod H30+H50)

- **Lower price than for standard engine**

- **Pricing concept is supported by**
  - ►IBM S/390 and zSeries Opering System Software and Middleware
    e.g. z/VM, DB2, WebSphere, Tivoli, ...
  - ►Independent Software Vendors (ISVs)
    e.g. BMC, CA, Compuware, ...

- **IFL is based on PR/SM LPAR technology**
  - ►no sharing with regular (i.e. traditional workload) processors

Test	CICS DB2		App
VSE	**VSE**		**Linux**
LPAR	**LPAR**		**LPAR**
Proc.1	**Proc.2**		**Proc.3** / **IFL**
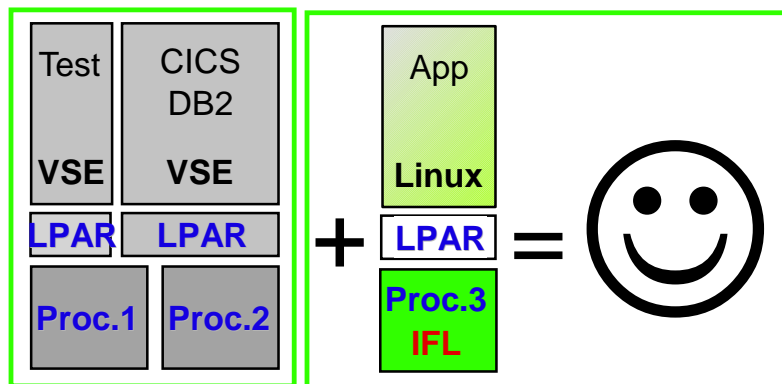
Traditional S/390 software charges unaffected

Where can I get Linux for zSeries ?

- **From an IBM Linux Distribution Partner**

  - www.redhat.com/software/linux/s390

  - www.suse.com/us/products/suse_business/sles/sles_s390

  - www.turbolinux.com/products/s390

- **From another Linux distributor**

  - ► e.g. Millenux, Thinking Objects, Marist College, etc.

- **Build your own**

  - ► Get platform specific patches
  - ► Get Linux kernel

Linux for zSeries Distribution Partners

■ SuSE

- ► SuSE Linux Enterprise Server (SLES) 7.0 for S/390 and zSeries
- ► 31-bit version w/ kernel 2.2.16 is available and IBM certified
- ► 31-bit version w/ kernel 2.4.7 is available and IBM certified
- ► 64-bit version w/ kernel 2.4.17 will be available in May 2002, IBM certification currently under way
- ► Evaluation copies of SLES 7 for S/390 are available

■ Turbolinux

- ► Turbolinux Server 6.5 for zSeries and S/390 - Media Kit
- ► Turbolinux Server 6.5 for zSeries and S/390 - Full Distribution
- ► 31-bit version w/ kernel 2.2.19 is available and IBM certified

■ Red Hat

- ► Red Hat Linux 7.2 for S/390 - Standard Edition
- ► Red Hat Linux 7.2 for S/390 - Premium Edition
- ► 31-bit version w/ kernel 2.4.9 is available, not IBM certified
- ► 64-bit version w/ kernel 2.4.9 will be available shortly, IBM certification planned
- ► Trial versions of Red Hat Linux 7.2 for S/390 are available

IBM Middleware for Linux on zSeries

- **Connectors**
  - ▶ DB2 Connect™, Version 7.1
  - ▶ MQSeries® client, Version 5.2
  - ▶ CICS® Transaction Gateway, Version 4.0
  - ▶ IMS™ Connect, Version 7

- **WebSphere® Family**
  - ▶ WebSphere Application Server Advanced Edition, Version 4.0
    - – Including Java™ Development Kit, Version 1.3.0 & JIT
  - ▶ WebSphere Personalization, Version 3.5
  - ▶ WebSphere Commerce Suite, Version 5.1
  - ▶ WebSphere Host on-Demand, Version 5.0.3

- **Data Management**
  - ▶ DB2® Universal Database™, Version 7.2
  - ▶ DB2 Intelligent Miner™ Scoring, Version 7.1
  - ▶ DB2 Net Search Extender, Version 7.2

- **Tivoli®**
  - ▶ Tivoli Storage Manager Client 4.2
  - ▶ Tivoli Enterprise Console 3.7.1
  - ▶ Tivoli Software Distribution 4.0
  - ▶ Tivoli Distributed Monitoring 4.1
  - ▶ Tivoli Workload Scheduler 8.1

- *SW license cost consistent with Linux on other platforms*

- *SW licence cost are per engine*

- *SW products are on same product level as on other platforms*

Just published a brand-new Red Book:

"e-Business Intelligence: Data Mart Solutions with DB2 for Linux on zSeries", SG24-6294-00

ISVs supporting Linux on zSeries

ERP, Production Planning, Logistics
- ▶ ABAS Software AG
- ▶ SAP

Database
- ▶ Oracle 9i
- ▶ Software AG Tamino (XML Database)

Application & e-business Integration
- ▶ Tibco
- ▶ Iona
- ▶ BEA WebLogic Server
- ▶ Aeonware (B2B/B2C)

Systems Management
- ▶ BMC Patrol
- ▶ BMC Mail Server Knowledge Agent
- ▶ BMC Web Server Knowledge Agent
- ▶ Computer Associates

Windows migration, ASP
- ▶ Halcyon Software

Stock tracking
- ▶ RTS Realtime Systems

Core Banking Applications
- ▶ Sanchez

Mail & Calender Server
- ▶ Sendmail
- ▶ Bynari

Print server
- ▶ Macro4

Development & Test Tools
- ▶ Logics Software
- ▶ Lattwein
- ▶ Rational Software
- ▶ Roguewave Software
- ▶ Dignus
- ▶ ACTS (testing)

Backup Software
- ▶ Computer Associates

Firewall
- ▶ zGuard

More than 160 applications from 78 vendors available today!

... and more Applications coming

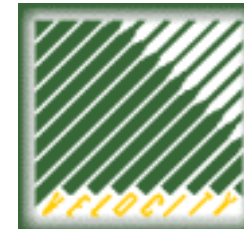BEA

Candle

IONA

OpenConnect Systems

The Workstation Group

Tibco

Uneclipse Software Systems

Velocity Software

View22

...

ISVs are constantly releasing applications for Linux on zSeries.

Get the most current information from the Developer Products for Linux for zSeries Web page at:

➜ **ibm.com/servers/eserver/zseries/solutions/s390da/linuxisv.html**

Open Source Software

postfix cyrus, Sendmail

INND

Samba

File Server

Samba

Internet News Server

ipchains

Mail Server

Firewall Server

Print Server

openSSL

Security Server

WUftpd

Tomcat blackdown-JDK

ftp Server

Jabber

Application Server

Messaging Server

Domain Name Server

mySQL postgreSQL

BIND

Web Server

Apache

Database Server
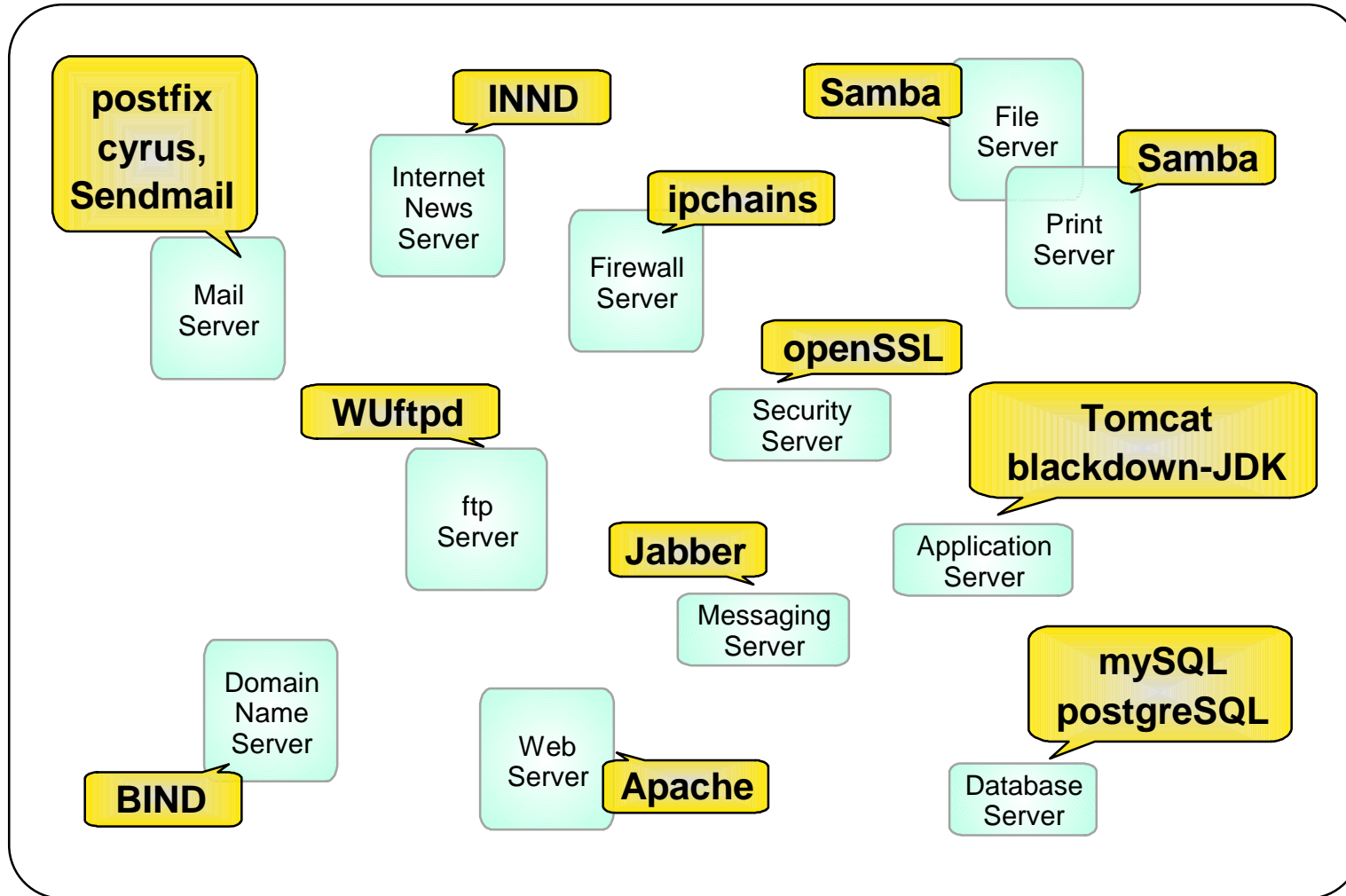
IBM Global Services

IBM Global Services locally delivered services:

- **Linux Solution for e-business**
  - ▶ Quickly establish an e-business environment on Linux for S/390 and/or zSeries

- **Server Consolidation Services for Linux on zSeries**
  - ▶ Consolidation of distributed workloads to Linux on zSeries

- **Middleware Enablement Services for Linux**
  - ▶ DB2, MQ Series, Websphere, ISVs like Bynari, Oracle

- **IBM Learning Services**
  - ▶ Linux Basics - An S/390 Perspective
  - ▶ Linux Implementation for S/390
  - ▶ z/VM Basics for Linux

IBM Global Services remotely delivered services:

- **IBM Support Line**
  - ▶ Fee based service for How To / Usage questions and defect reporting

Brand-new Announcement, dated 03/27/02:
Worldwide agreement between IBM and SuSE to jointly offer a full range of Linux services for the enterprise.
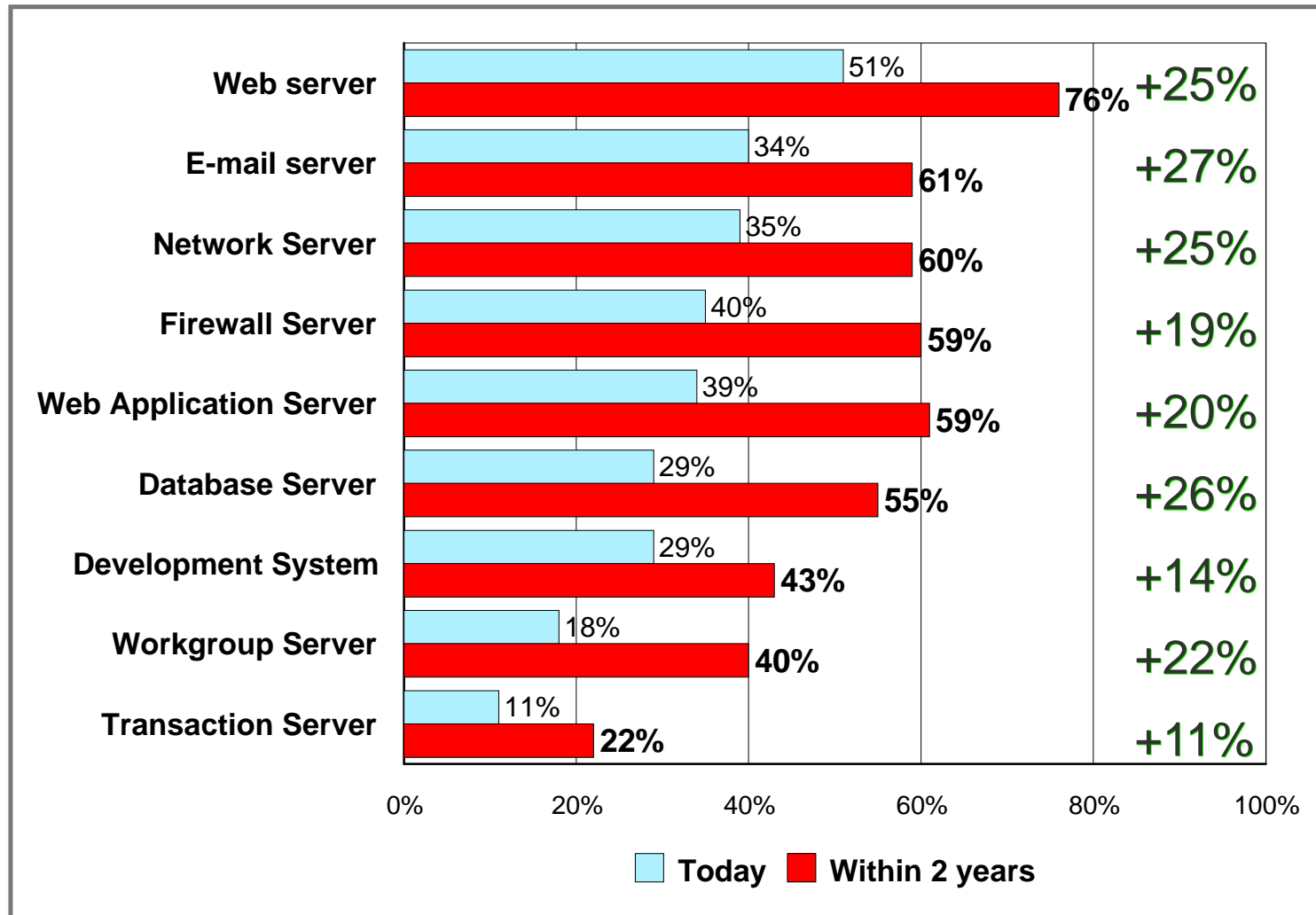
Development Focus 2001/2002

- **ISV / Middleware enablement**
- **Networking**
  - ➜ **HiperSockets**
    - Cross partition communication at "memory speeds"
  - ➜ **High Speed Token Ring**
- **IRD (Intelligent Resource Director)**
  - ➜ **WLM world to Linux**
- **Storage**
  - ➜ **z/OS compatible disk layout**
  - ➜ **Enhanced Shark support**
  - ➜ **Tape support**

- **Demo at LinuxWorld, NYC 01/2002**
  - ➜ **SCSI/FCP on z800**
    - with ESS disks, DVD-ROM, CD-RW, 3580 LTO tape drive
- **Statement of Direction**
  - ➜ **SCSI/FCP on z900**

- **Enhanced Security Exploitation**
  - ➜ **Enablement of H/W Cryptography**
- **Enhanced RAS**
  - ➜ **Dynamic I/O**
  - ➜ **DASD error recovery**
  - ➜ **Dump, dump analysis, trace tools**
- **Compiler optimizations**
- **64-bit Linux distributions**

What Customers are doing with Linux on zSeries ...

Linux Application Deployment

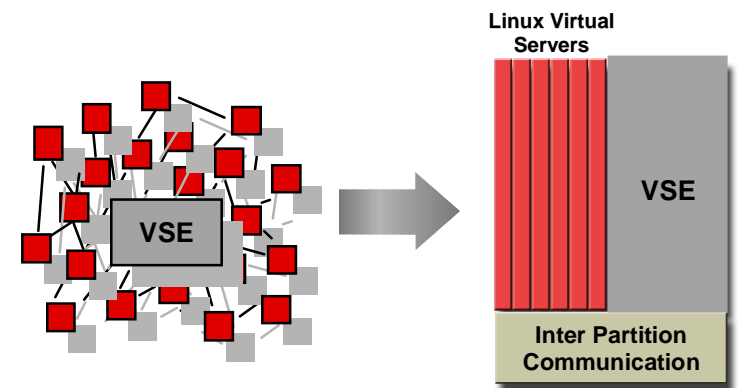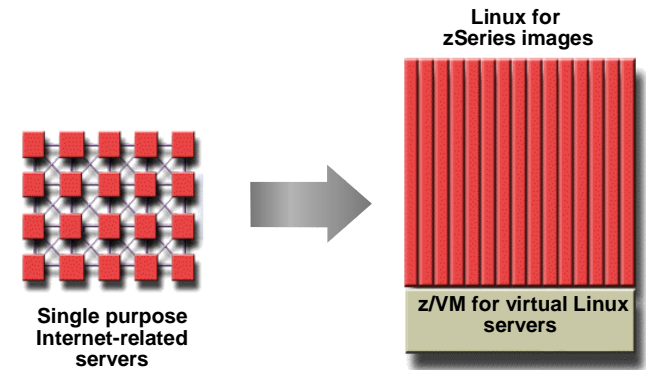|	Today	Within 2 years	
Web server	51%	76%	+25%
E-mail server	34%	61%	+27%
Network Server	35%	60%	+25%
Firewall Server	40%	59%	+19%
Web Application Server	39%	59%	+20%
Database Server	29%	55%	+26%
Development System	29%	43%	+14%
Workgroup Server	18%	40%	+22%
Transaction Server	11%	22%	+11%

IBM Market Research, February 2001

Server Consolidation and Business Integration

- **Goals**

  - ► Consolidation of independent application servers into a centralized environment

  - ► Standardization of multi-platform environments

  - ► Integration of existing business applications

Linux for zSeries images

Single purpose Internet-related servers

z/VM for virtual Linux servers

- **Advantages**

  - ► Cost reduction, management efforts, administration efforts, floor space, ...

  - ► Application portfolio

  - ► Time to market

  - ► Performance, scalability

  - ► Availability

  - ► Skill

Linux Virtual Servers

VSE

VSE

Inter Partition Communication

Integration of Application Server

WAS
BEA

Web Appl.
Server

DB2
Oracle
Informix

Database
Server

CICS DB2	Other apps.	
z/OS VSE	z/OS VSE	Linux
zSeries platform		

WCS

e-Commerce
Server

CTG
DB2, MQ
IMS

Connection
Server

SAP
RTS
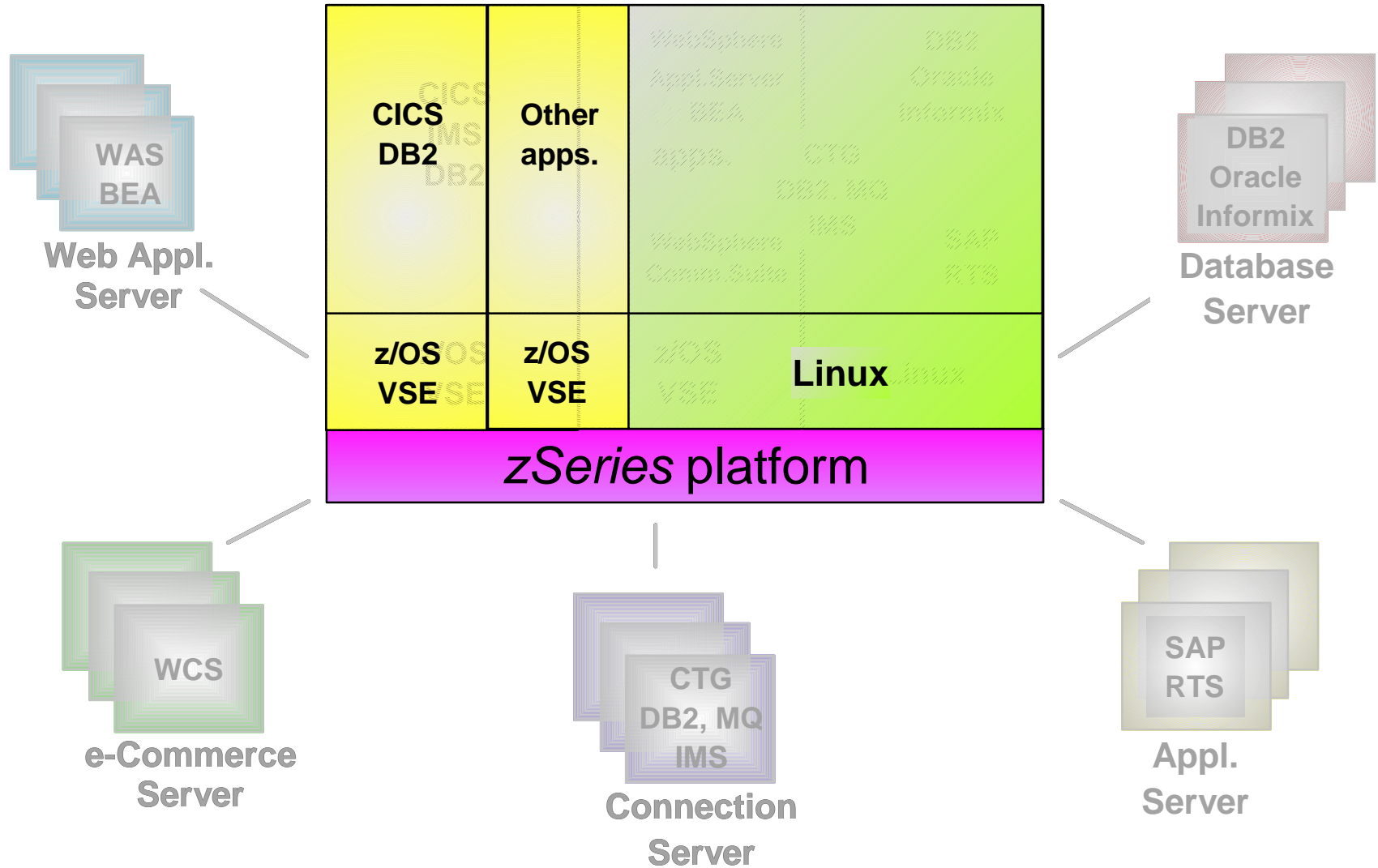
Appl.
Server

Consolidation of Infrastructure Servers

e.g. z800

Internet

| TSM server

z/OS or VM | CICS IMS DB2

z/OS or VSE | Apache Web Server

Linux | CICS Tr Gateway IMS or DB2 connect | WebSphere Web Appl servers

Linux | Samba File/Print servers

Linux | TSM client

Linux | Apache web servers

Linux | Firewall Server

Linux |

z/VM

| **LPAR 1** | **LPAR 2** | **LPAR 3** | **LPAR 4** | **LPAR 5** |

High speed internal communication (HiperSockets)

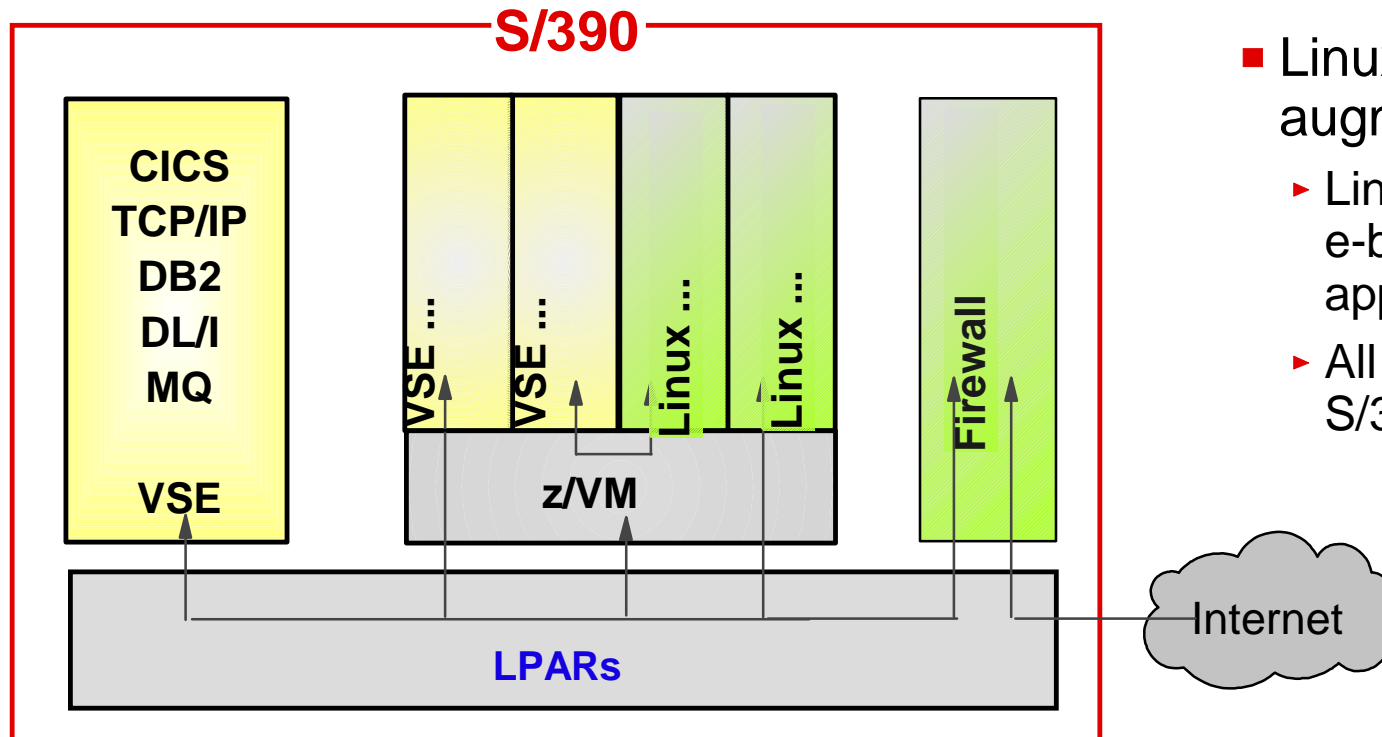| **Proc 1** | **Proc 2** | **Proc 3**
IFL | **Proc 4**
IFL |
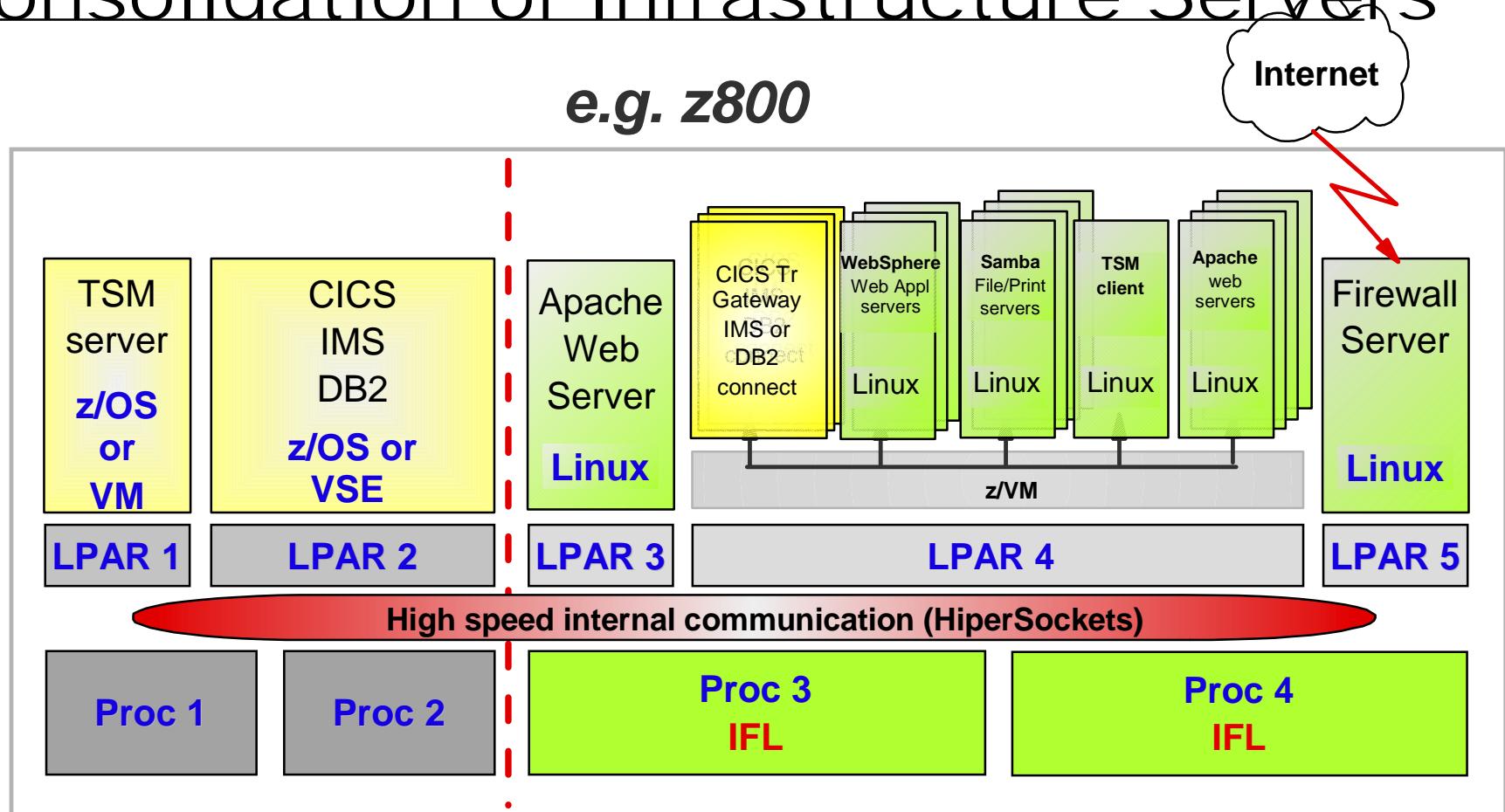
- **Integrated solution**
  - ▶ Linux applications provide front-end to DB2, CICS, IMS
  - ▶ 3-tier architecture on 2-tier hardware
  - ▶ High speed communication between virtual servers

Linux & VSE Integration Solutions

- Linux for S/390 augments VSE
  - ▶ Linux provides key e-business tools and applications
  - ▶ All runs on the same S/390 machine

.... a perfect fit to VSE's strategy.

Linux & VSE Connectors

- **VSE Connectors**
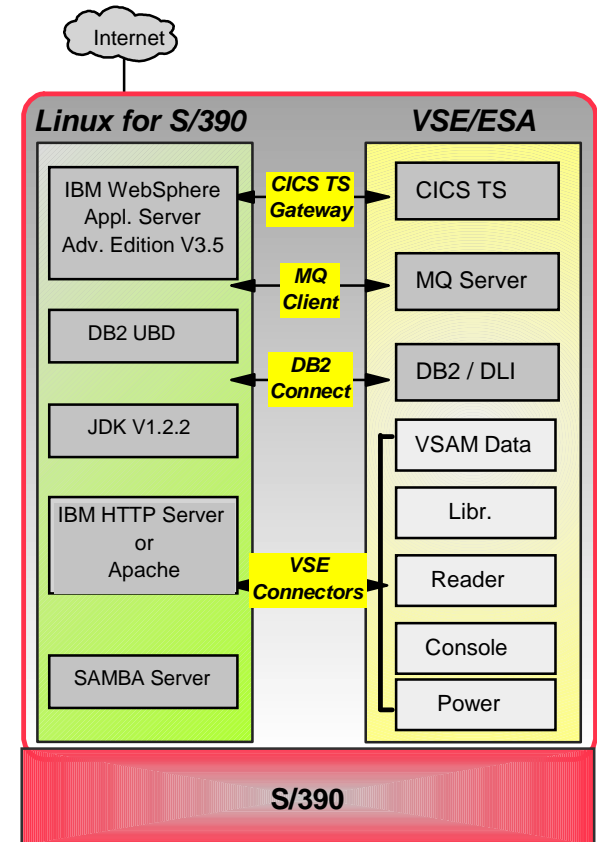 - ‣ **Java-based connector**
    - – Connectivity via TCP/IP
    - – Implemented as long running partition
    - – JavaBeans on Web Application Server
    - – Access to: VSAM, POWER, Librarian, ICCF, console
  - ‣ **DB2-based connector (using DRDA)**
    - – Connectivity via TCP/IP or SNA
    - – Implemented as DB2 stored procedures
    - – Standard JDBC/ODBC calls on Web Application Server
    - – Access to VSAM and DL/I - as well as DB2
- **Java-based Solutions**
  - ‣ VSE Navigator
  - ‣ JConVSE (Java console for VSE)
  - ‣ JDataMig (Java data migration)

Internet

Linux for S/390   **VSE/ESA**

IBM WebSphere Appl. Server Adv. Edition V3.5	CICS TS Gateway	CICS TS
DB2 UBD	MQ Client	MQ Server
JDK V1.2.2	DB2 Connect	DB2 / DLI
IBM HTTP Server or Apache	VSE Connectors	VSAM Data
		Libr.
		Reader
SAMBA Server		Console
		Power

S/390

VSE is an excellent back-end system partner.

Customer References

TeliaNet

Linux for S/390 - Server hosting

Server farms

Linux for S/390 images

Consolidation
e-business

z/VM

Single purpose
Internet-related
servers

In ASP/ISP environments Linux provides:
  The operating system of choice for many new
    dot com's and Internet startups
  Highly stable Open Source operating system
  Large selection of applications
  Large numbers of trained administrators & programmers
S/390 provides Linux with
  The ability to run many Linux instances on a single S/390
  Secure isolation of user workload and data
  Upgradability without repurchase
  Reliability and availability

TELIA

Röda Sidorna

Gå in på våra julsidor. Här kan du ta del av
julerbjudanden, lägga bud på julauktionen,
spela, tävla och få rimtips.

I julkalendern kan du följa Tomtens
strapatser fram till jul. Bakom varje lucka
väntar nya överraskningar. Var med och
tävla!

Till Röda Sidorna >>

▸ Privat

Mina Sidor

Användarnamn

Logga in privat

ⓒ Privat ⃝ Sm

Läs mer och reg

Logga in som för
organisationskur
MegaCom eller T

Läs mer och reg

Företag

Bredband   Even

- **TeliaNet operates independently of other Telia companies in Denmark**
- **Bought a S/390 G6 (12-way) and Shark ESS to run 1.500+ virtual Linux**
  servers to host customer web sites
- **Displaced 70 Sun servers**
- **Telia is able to set up a Linux for S/390 server in less than 5 minutes as**
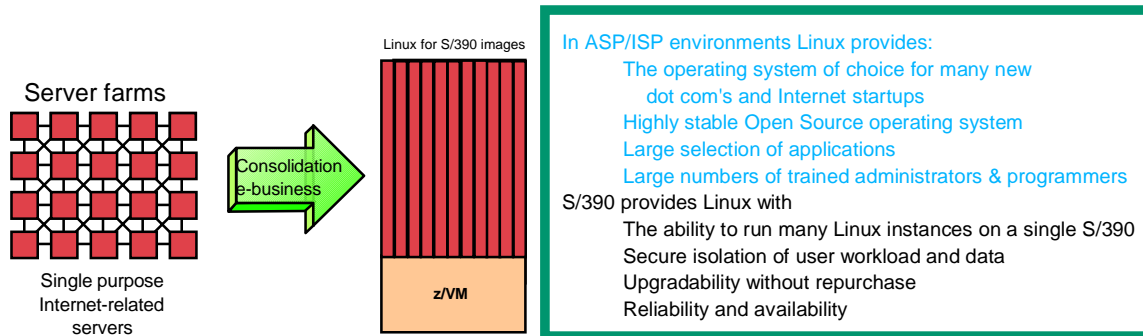 **opposed to 5 hours with Sun**

"This new S/390 ZZ7 running Linux allows us to rethink our total pricing structure for Internet
services and to offer customers a more affordable web application service than ever before"
Henrik Wulff Riedl, CFO, TeliaNet."

Sonera Entrum

Linux for S/390 - Server hosting

Linux for S/390 images

Server farms

Single purpose
Internet-related
servers

Consolidation
e-business

z/VM

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S/390 provides Linux with
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- Secure isolation of user workload and data
- Upgradability without repurchase
- Reliability and availability

- **Sonera Entrum is the leading broadband Internet provider in Finland**
- **Provides high-speed Internet access for 500,000 private and 70,000 corporate subscribers**
- **Uses z900 and Linux to run 500 virtual servers on a single zSeries Server**
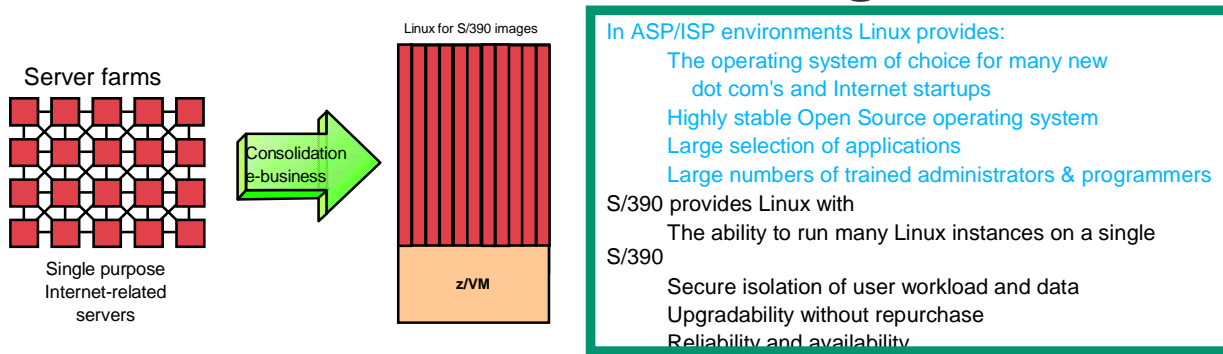- **Uses ESS (SHARK) and both, Red Hat and SuSE Linux**

"By consolidating all of our services onto one high availability IBM zSeries server running Linux we are saving resources, space and energy. It also makes systems management and maintenance significantly easier",
Jukka Kämäri, managing director, Sonera Entrum.

Aleos
Linux for zSeries - Server hosting

Server farms

Single purpose
Internet-related
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Consolidation
e-business

Linux for S/390 images

z/VM

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S/390
   Secure isolation of user workload and data
   Upgradability without repurchase
   Reliability and availability

- French ISP specializing in hosting services for professional Internet users
- Selected IBM ^ zSeries and Shark as an alternative to a traditional server farm
- Uses z/VM Virtualization Technology to support multiple, secure Linux instances operating concurrently
- Key attributes for zSeries win:
  - Legendary reliability
  - Virtual network replaces complex and costly physical network
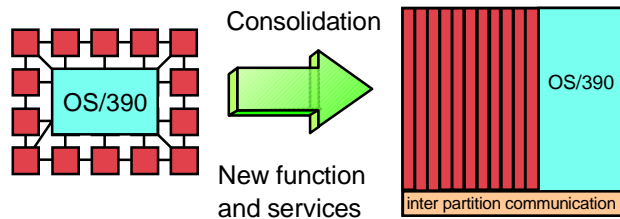 - Time to bring a server on line is measured in minutes - not days

"Combining zSeries with Linux allows us to benefit from the most reliable infrastructure available today and also lets us offer customers the most cost effective services on the market."
Mathieu Chambon-Cartier - Chairman, Aleos

L.L. Bean
Linux for zSeries - Infrastructure servers consolidation

Consolidation →

OS/390

New function
and services

OS/390

inter partition communication

Linux provides OS/390 users with the ability to extend
  and enhance their S/390 infrastructure by providing
  utility functions and rapidly deployable applications
  that run on S/390
S/390 provides Linux with
  Fast connection to OS/390 managed data
  Reliability and availability
  An economical alternative to stand alone servers
  Simplified systems management
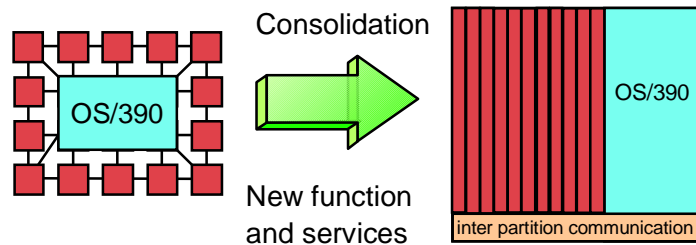
- Direct merchant with over $1 billion yearly sales
- Replaced e-mail system for high priority applications
  with <u>Sendmail</u> / SuSE solution on zSeries
- 5X performance improvement over older system
- Sendmail is easier to use and more flexible than older system
- Mainframe reliability and scalability come to high
  priority e-mail application
- Software costs for traditional software running on
  same system unaffected due to use of IFL

*"We've seen a dramatic increase in the volume of Internet e-mail as well as an increase in the criticality of that
e-mail. Sendmail running on Linux for S/390 provided the increased performance and reliability we needed to
meet the ever increasing importance of Internet e-mail."*
Donna Lamberth, Senior Manager for IS at LL Bean

Banco Mercantil

MERCANTIL
BANCO UNIVERS

Linux for S/390 - Infrastucture servers consolidation

Consolidation

OS/390

New function
and services

OS/390

inter partition communication

Linux provides OS/390 users with the ability to extend
and enhance their S/390 infrastucture by providing
utility functions and rapidly deployable applications
that run on S/390

S/390 provides Linux with
Fast connection to OS/390 managed data
Reliability and availability
An economical alternative to stand alone servers
Simplified systems management

- Venezuelan Banking institution with375 branches
- Linux for S/390 replaced 30 Microsoft NT servers
  - File Servers
  - DNS Servers
  - Firewall
 - Customer online account inquiry
- Uses SuSE distribution

"Linux on the IBM mainframe allows us to consolidate in a very cost effective way. In addition to these applications running on the mainframe, we have higher availability and reliability, and better performance. Consolidation also means that we have far fewer individual servers to administer."

Isaac Arismendi, IT Infrastructure Manager, Banco Mercantil.

University of Geneva

Linux for S/390 - Infrastucture servers consolidation

Linux Virtual Servers

OpSys

Inter Partition Communication

OpSys
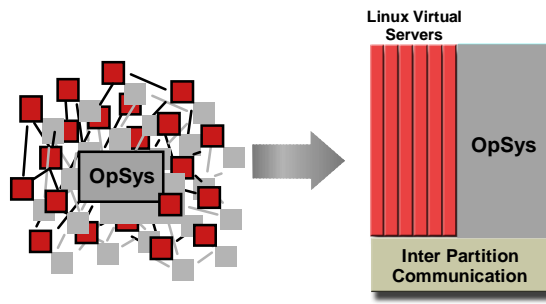
Business needs:

- Emergence in academic and research environment of Linux and open source as driving force of innovative computing
- Need to enhance teaching at CUI, leveraging computing trends such as Linux
- Desire to continue a mainframe platform, while controlling maintenance costs

- Expanded UNIX/Linux computer science capabilities
- Linux virtual machines are potentially accessible to all students
- Small Fortran benchmark test result:
  - Compiler generates code twice as fast on Linux on zSeries
- Runs on Multiprise 3000

The University of Geneva is one of the largest university campuses in Switzerland, with more than 12,000 students of all disciplines. It is one of the oldest universities in Europe, founded in 1559. Computing resources required for teaching and learning activities are distributed among all faculties. Computing Sciences are grouped into the Centre Universitaire d'Informatique (CUI), which belongs to the Faculty of Sciences and the Faculty of Economics.

Boscov's Department Stores

Linux for zSeries - Infrastructure servers consolidation
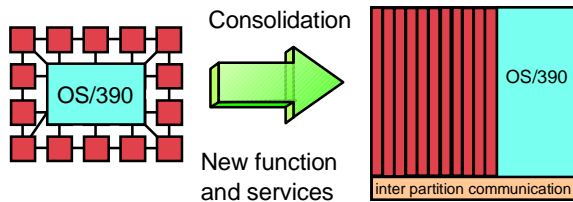
Consolidation

OS/390

New function and services

OS/390

inter partition communication

Linux provides OS/390 users with the ability to extend and enhance their S/390 infrastructure by providing utility functions and rapidly deployable applications that run on S/390

S/390 provides Linux with
- Fast connection to OS/390 managed data
- Reliability and availability
- An economical alternative to stand alone servers
- Simplified systems management

- 37 Department Store Chain in Eastern U.S.A.
- Runs <u>file/print servers</u> on Linux for zSeries
- Currently working toward Websphere Commerce Suite on Linux for zSeries to improve web site capabilities
- Boscov's can consolidate up to 44 servers in their server farm without increasing **z900** capacity or increasing z/OS & ISV software costs
- Uses SuSE distribution

"Boscov's Department Stores chose to move ahead with the z900 processor because it provided the business with a robust platform that could meet our expected growth in S/390 transactions, as well as an unparalleled platform for consolidation of our server farm on Linux virtual servers. "
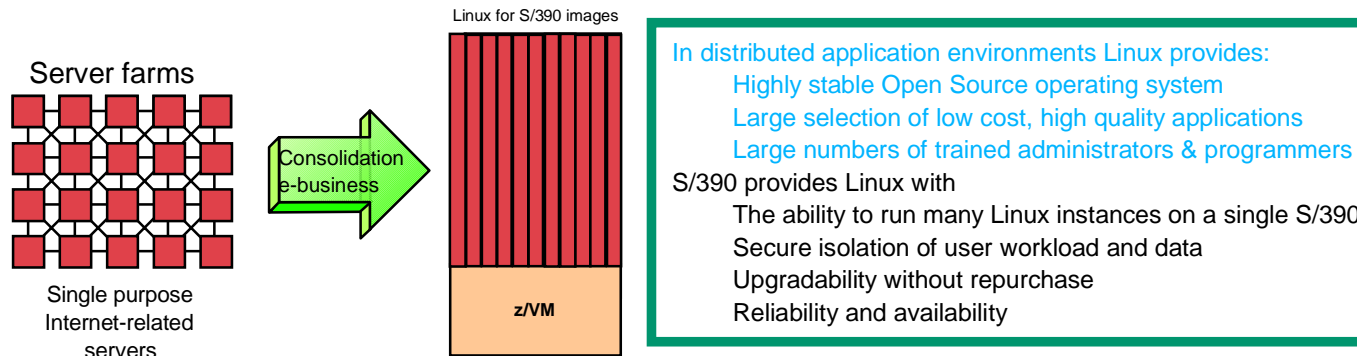
Harry Roberts, Chief Information Officer, Boscov's Department Stores LLC

Winnebago Industries

Linux for zSeries - Distributed application server

Linux for S/390 images

Server farms

Consolidation e-business

z/VM

Single purpose Internet-related servers

In distributed application environments Linux provides:
- Highly stable Open Source operating system
- Large selection of low cost, high quality applications
- Large numbers of trained administrators & programmers

S/390 provides Linux with
- The ability to run many Linux instances on a single S/390
- Secure isolation of user workload and data
- Upgradability without repurchase
- Reliability and availability

- Recreational Vehicle Manufacturer
- Replaced Microsoft Mail and Novell servers with Bynari Insight Server
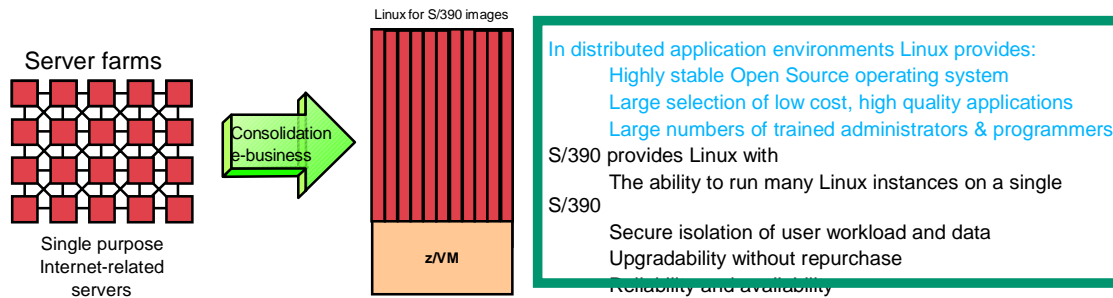- Users can still use Microsoft Outlook e-mail client
- Runs on MP3000

"Upgrading to Microsoft Exchange or Novell GroupWise would cost Winnebago about $100,000. We expect Bynari Insight Server to cost a third or even a quarter of that, because Winnebago will be able to make use of excess capacity on the company's IBM Multiprise 3000 mainframe. The mainframe is our industrial-strength system that stays up, and that's where our expertise is."
Dave Ennen - Technical Support Manager - Winnebago Industries

Securities Industry Automation Corp. (SIAC)
Linux on S/390 - Distributed application server

Linux for S/390 images

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Single purpose
Internet-related
servers

- **Technology partner of the New York Stock Exchange (NYSE) and the American Stock Exchange**
- **Moved ARTMAIL application to Linux for S/390**
- **Delivers daily activity reports to brokers and member firms**
- **Application was moved from Sun servers**
- **SIAC is evaluating moving other applications to Linux for zSeries**

SIAC Securities Industry Automation Corporation
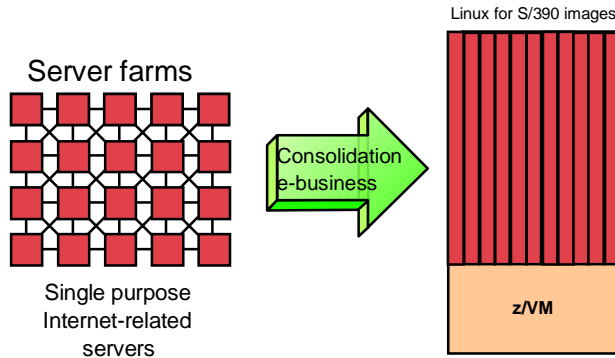
NYSE.
Amex.

"All US stock exchanges and markets depend on SIAC to process their trades, which total approximately 4 to 5 billion shares per day, resulting in 15 to 20 million buy/sell side transactions that have to be processed, examined and reported."
Steve Romano, senior vice president, SIAC

Korean Air

Linux for S/390 - Distributed application server

Linux for S/390 images

Server farms

Single purpose
Internet-related
servers

Consolidation
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- South-Korean airline
  - Serves 77 cities in 29 countries with 111 airplanes
- <u>Flight crew scheduling</u> application on Linux for zSeries
- Under development:
  - Accounting system
  - Daily revenue Accounting System using Websphere and Java
- Runs on z900 server

"A single IBM ^ z900 running Linux can do the work of an entire server farm. Multiple copies of Linux can run side by side on a server allowing for highly scalable and manageable environments that can handle unpredictable spikes in internet activity"

Yong-Seung Hwang - Chief Information Officer - Korean Air

Getting Started

with running Linux applications on zSeries

- **Pick a Linux distributor**

- **Install Linux on zSeries**

- **Start with a non-critical business application**
  - ►File / Print serving
  - ►e-mail serving
  - ►News / Discussion Group serving
  - ►Web serving
  - ►Domain Name serving, etc.

- **Consolidate other servers on Linux on zSeries**
  - ►Initiate a Server Consolidation study
  - ►Select candidates for consolidation based on apps
  - ►Consolidate for simplicity and scalability

- **Port a specific Linux or Unix application**
  - ►Porting UNIX applications to Linux - Hints and Tips (GM13-0115-00)

- **Add new e-business applications connecting to existing S/390 applications/data**
  - ►ISV software
  - ►IBM middleware

Linux Community Dev System (LCDS)

- **LCDS is a "Service" provided by IBM**

  ► The Service provides you with access to a Linux on S/390 environment for the purpose of providing the Open Source community with a platform to develop, port and/or test drive your products or applications on this platform.

  ► **The LCDS started up in May 2001**

    – Hardware - 9672 G6 Model ZX7 (10 way processor) is located at an IBM site in Endicott, NY

    – DASD - Shark 2105-F20 (2.1 terabytes)

    – Network - Network configuration is a direct Internet connection with open access to the Linux guest machines from the WWW

    – Software - The LCDS mainframe is supported by an IBM Virtual Machine, z/VM, established to support a large number of guest systems. With registration approval, you are given access to a guest system to accommodate your Linux project.

- **To register or review the terms and conditions:**

  ► **http://ibm.com/eserver/zseries/os/linux/lcds/**

Linux on zSeries - Summary

*The point of consolidation - where
Linux ascends to the mainframe*

- **Flexible design**

- **IBM support and services**

- **Distribution Alliances**

- **IBM middleware**

- **ISV applications**

- **Open Source applications**

... a perfect fit to VSE's strategy.