

2009 System z Expo

October 5 – 9, 2009 – Orlando, FL



Session Title: Linux on System z, the Enterprise Hub

Session ID: ZLG08

Speaker Name: Wilhelm Mild

Authorized

IBM. | **Training**

28-Sep-09

© 2009 IBM Corporation

Trademarks

Trademarks

The following are trademarks of the International Business Machines Corporation in the United States and/or other countries. For a complete list of IBM Trademarks, see www.ibm.com/legal/copytrade.shtml: AS/400, DBE, e-business logo, ESCO, eServer, FICON, IBM, IBM Logo, iSeries, MVS, OS/390, pSeries, RS/6000, S/30, VM/ESA, VSE/ESA, Websphere, xSeries, z/OS, zSeries, System z, z/VM, z/VSE, Linux on System z

The following are trademarks or registered trademarks of other companies

Lotus, Notes, and Domino are trademarks or registered trademarks of Lotus Development Corporation
Java and all Java-related trademarks and logos are trademarks of Sun Microsystems, Inc., in the United States and other countries
LINUX is a registered trademark of Linux Torvalds
UNIX is a registered trademark of The Open Group in the United States and other countries.
Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation.
SET and Secure Electronic Transaction are trademarks owned by SET Secure Electronic Transaction LLC.
Intel is a registered trademark of Intel Corporation

* All other products may be trademarks or registered trademarks of their respective companies.

NOTES:

Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

IBM hardware products are manufactured from new parts, or new and serviceable used parts. Regardless, our warranty terms apply.

All customer examples cited or described in this presentation are presented as illustrations of the manner in which some customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics will vary depending on individual customer configurations and conditions.

This publication was produced in the United States. IBM may not offer the products, services or features discussed in this document in other countries, and the information may be subject to change without notice. Consult your local IBM business contact for information on the product or services available in your area.

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

Information about non-IBM products is obtained from the manufacturers of those products or their published announcements. IBM has not tested those products and cannot confirm the performance, compatibility, or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

Prices subject to change without notice. Contact your IBM representative or Business Partner for the most current pricing in your geography.

References in this document to IBM products or services do not imply that IBM intends to make them available in every country.

Any proposed use of claims in this presentation outside of the United States must be reviewed by local IBM country counsel prior to such use.

The information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

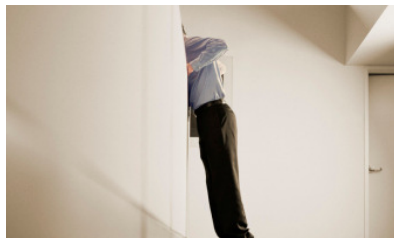
Global forces are driving a fundamentally different world



- * **Global financial crisis is changing business priorities – and the IT that supports them**
 - New incentives to reduce cost
 - Financial crisis putting new lens on TCO claims



- * **The business landscape is evolving, and IT must evolve with it**
 - Increased M&A activity in a tight economy requires rapid integration



- * **Government IT priorities are increasingly aligned with those of business**
 - Major stimulus packages include both funding for IT infrastructure – and increased scrutiny



- * **Technology has enabled solutions that weren't feasible in the last downturn**
 - Bandwidth has evolved, providing greater capacity and reliability at much lower costs

Linux enables a smarter planet

Explosion of information driving 54% growth in storage shipments per year, at 15 petabytes per day.

Cars in one small business district of Los Angeles burned 47,000 gallons of gas looking for parking.

Electronic health records could save 100,000 lives a year in the US alone.

Green

- *Linux virtualization and consolidation on IBM Systems*
- *Full cross-platform support reduces cost with skill reuse*
- *Tivoli Active Energy Manager*
- *Blue Cloud*

Dynamic Infrastructure

- *Dynamic cpu / memory allocation*
- *SELinux for security*
- *RAS on all platforms*
- *Unparalleled scalability*
- *Live partition migration*

Working smarter

- *Linux for the enterprise desktop*
- *Heterogeneous productivity tools*
- *Virtual Linux desktop*

New Intelligence

- *Cognos BI on Linux*
- *Real-time Linux*
- *Linux for HPC in commercial applications*

The growth and expansion of Linux for business-critical workloads



Linux continues to enable new ways of doing business

Edge and Web Infrastructure

- Community Driven
- Internet Enabled
- Worldwide Volunteers

Application and Data Serving

- Open Industry Driven
- Open elements of IT industry join existing community
- Linux adoption in the enterprise accelerates

Business-Critical Enterprise Workloads

- Competition Driven
- Accepted as mature, open, lower-cost alternative for hosting DB, BI, ERP, CRM in business-critical environments
- Linux is a permanent presence in the datacenter

Typical Applications

- E-mail Servers
- Apache
- Lightweight database
- DHCP
- HPC

- e-Business Applications
- Application Servers
- Mission critical database
- Dynamic Business Models

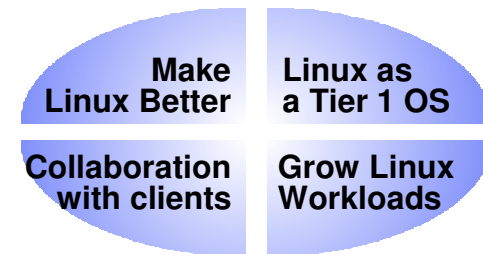
- Next-generation workloads
- Virtualization / consolidation
- Cloud and dynamic infrastructure
- New business models

1991 – 2004

2005 – 2006

2007 – 2009

IBM collaborates with the Linux community



- * ...has been an active participant since 1999
- * ...is one of the leading commercial contributors to Linux
- * ...has over 600 full-time developers working with Linux and open source

Who Has Contributed to Linux?
(2005 – 2009)

Company Name	Number of Changes	Percent of Total
None	26,644	18.2%
Red Hat	17,981	12.3%
Unknown	11,164	7.6%
IBM	11,151	7.6%
Novell	11,046	7.6%
Intel	7,782	5.3%
Consultant	3,657	2.5%
Oracle	3,513	2.4%
Linux Foundation	2,345	1.6%
SGI	2,317	1.6%
Parallels	1,939	1.3%
Renesas Technology	1,925	1.3%
Academia	1,712	1.2%
Fujitsu	1,592	1.1%
MontaVista	1,564	1.1%
MIPS Technologies	1,537	1.1%
Analog Devices	1,467	1.0%
HP	1,415	1.0%
Freescale	1,375	0.9%
Google	1,261	0.9%

Linux Kernel & Subsystem Development

- Kernel Base Architecture Support
- GNU
- Security
- Systems Management
- RAS
- Virtualization
- Special Projects
- Filesystems, and more...

Expanding the Open Source Ecosystem

- Apache & Apache Projects
- Eclipse
- Mozilla Firefox
- OpenOffice.org
- PHP
- Samba, and more...



Foster and Protect the Ecosystem

- Software Freedom Law Center
- Free Software Foundation (FSF)
- Open Invention Network, and more...

Promoting Open Standards & Community Collaboration

- The Linux Foundation
- Linux Standards Base
- Common Criteria certification
- Open Software Initiative, and more...

<http://www.linuxfoundation.org/publications/whowriteslinux.pdf>

IBM's Linux strategy is aligned with our clients' needs

* Linux for Business-Critical Workloads

- *Key drivers*
 - Demand for a lower-cost, enterprise-grade OS
 - Demand for support of Linux on highly reliable and highly available platforms
 - General acceptance and ISV support of Linux for core datacenter workloads

* Linux in the Mid-Market

- *Key drivers*
 - Microsoft license agreements drive excessive cost for small business
 - Increased need for enterprise-grade applications and middleware for smaller businesses

* Project Big Green Linux

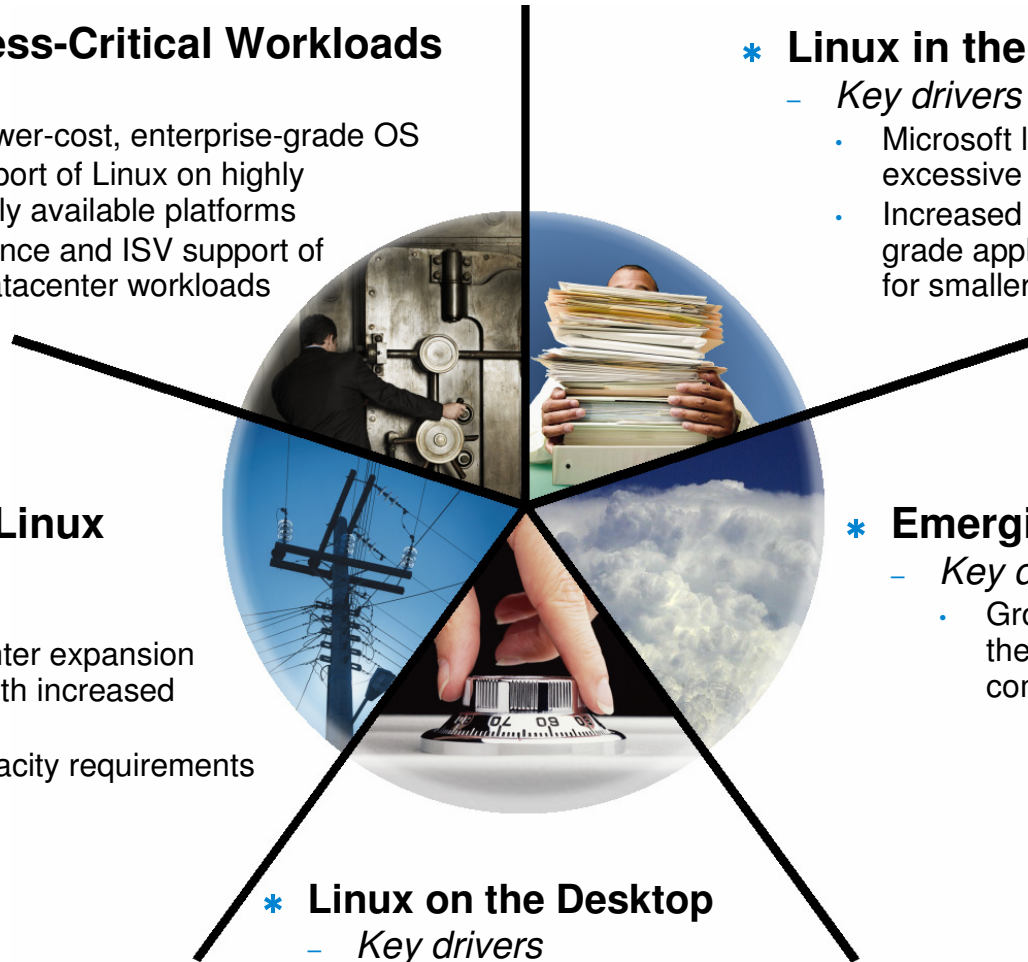
- *Key drivers*
 - Rising energy costs
 - Incremental datacenter expansion leading to sprawl, with increased management costs
 - Ever increasing capacity requirements

* Emerging Technologies

- *Key drivers*
 - Growing need for solution to the complexity problem, as complexity is a key driver of cost

* Linux on the Desktop

- *Key drivers*
 - Need for cost reduction but increased productivity
 - Usage paradigms outgrowing one-size-fits-all approach



The Future runs on System z, the largest scalable server



... System z delivers extreme business value by helping you reduce cost, manage risk, and improve service.



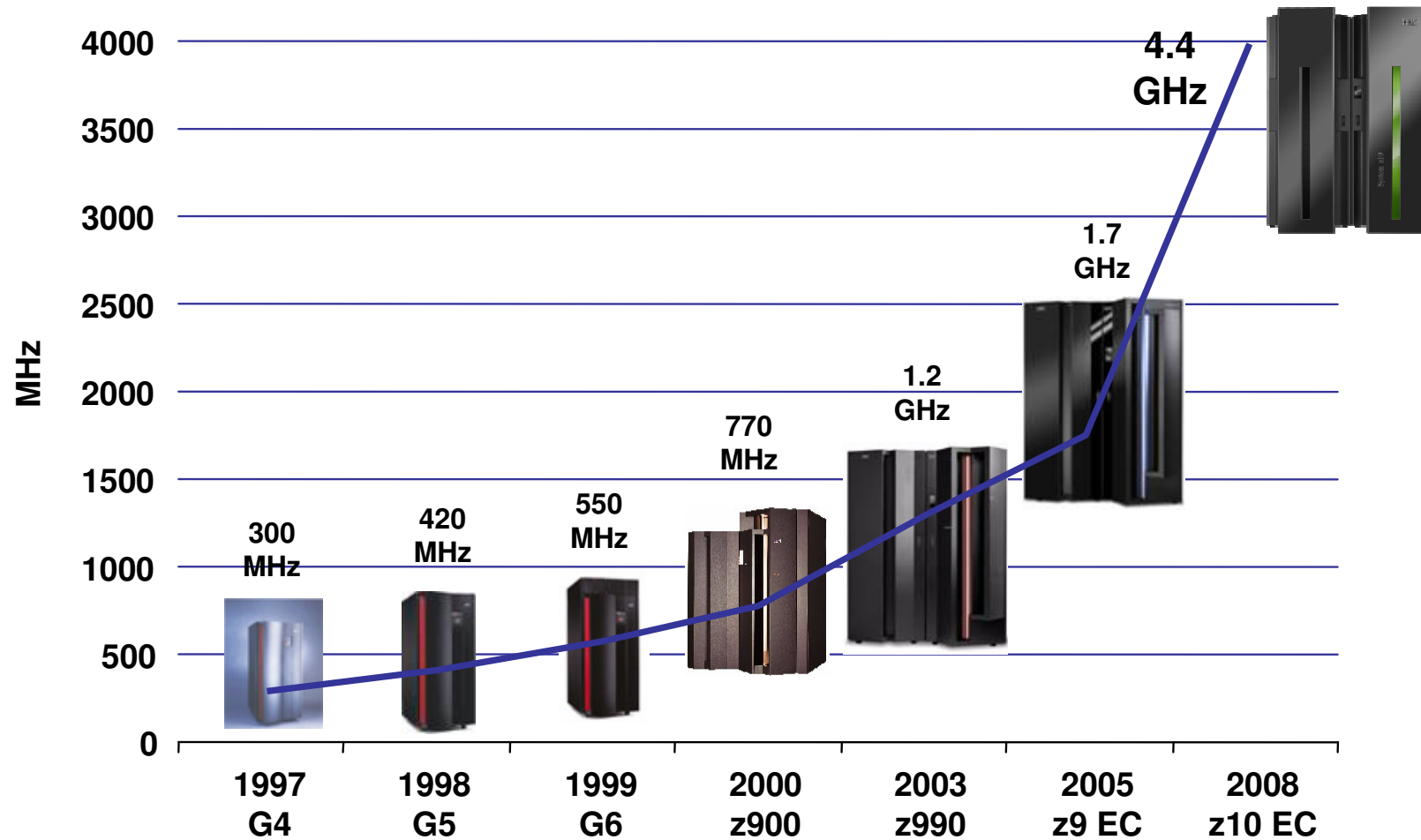
■ Agenda



1. The Role of Linux on System z
2. Linux on System z as 'Central Portal'
3. Linux on System z as 'Data Hub'
4. Linux on System z as 'SOA Hub'
5. Linux on System z as 'Mail and Collabor
6. Linux on System z as 'Recovery Hub'



IBM System z10 Enterprise Class – Large scalable server

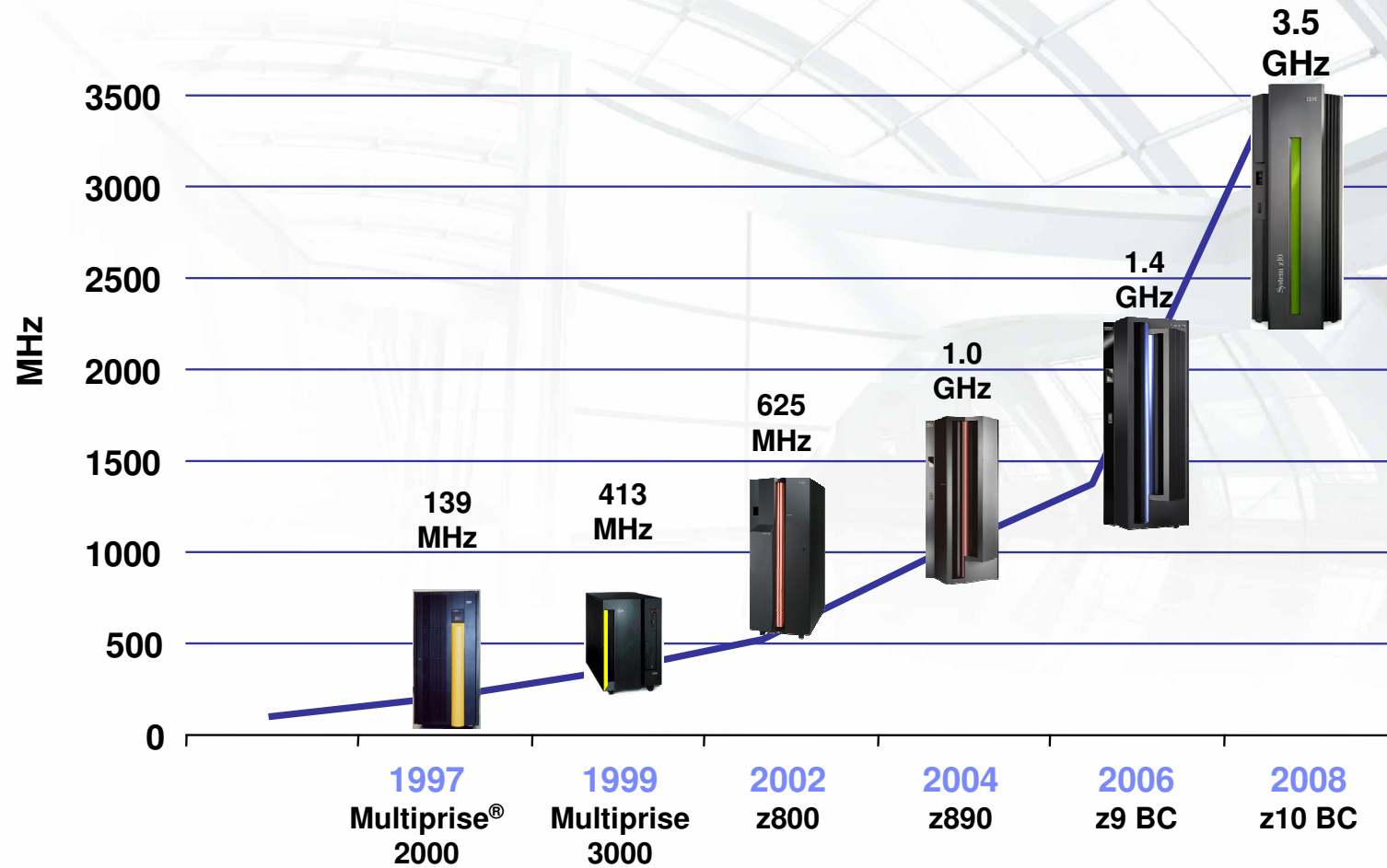


- G4 - 1st full-custom CMOS S/390®
- G5 - IEEE-standard BFP; branch target prediction
- G6 - Cu BEOL

- IBM eServer™ zSeries® 900 (z900) - Full 64-bit z/Architecture®
- IBM eServer zSeries 990 (z990) - Superscalar CISC pipeline
- z9 EC - System level scaling

- z10 EC - Architectural extensions

IBM System z10 Business Class – Large scalable server



- Multiprise 2000 - 1st full-custom CMOS S/390[®]
- Multiprise 3000 – Internal disk, IFL introduced on midrange

- IBM eServer™ zSeries[®] 800 (z800) - Full 64-bit z/Architecture[®]
- IBM eServer zSeries 890 (z890) - Superscalar CISC pipeline
- z9 BC - System level scaling

- z10 BC - Architectural extensions
- Higher frequency CPU

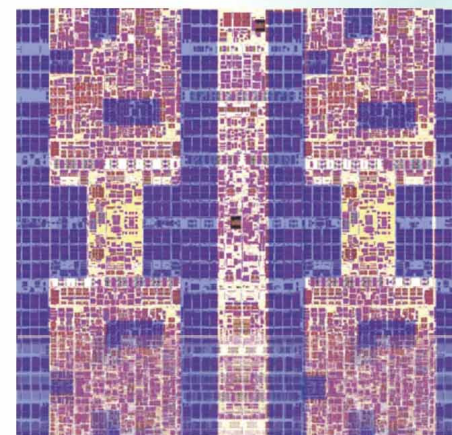
Making high performance a reality

Designed for the next evolution of Enterprise applications

- **New Enterprise Quad Core z10 processor chip**
 - 4.4 / 3.5 GHz - additional throughput means improved price/performance
 - Cache rich environment optimized for data serving
 - 50+ instructions added to improve compiled code efficiency
 - Support for 1 MB page frames

- **Hardware accelerators on the chip**
 - Hardware data compression
 - Cryptographic functions
 - Hardware Decimal Floating point

- **CPU intensive workloads get performance improvements from new core pipeline design**



**Enterprise Quad Core
z10 processor chip**

Focused performance boost

Hardware Decimal Floating Point

Up to 10X improvement
in decimal floating point
instructions*

- Decimal arithmetic widely used in commercial and financial applications
- Integrated on **every z10 core to deliver a performance boost** to execution of decimal arithmetic
- Growing industry support for hardware decimal floating point standardization
 - Java BigDecimal, C#, XML, C/C++, GCC, **DB2® V9**, Enterprise PL/1, Assembler
 - Open standard definition led by IBM



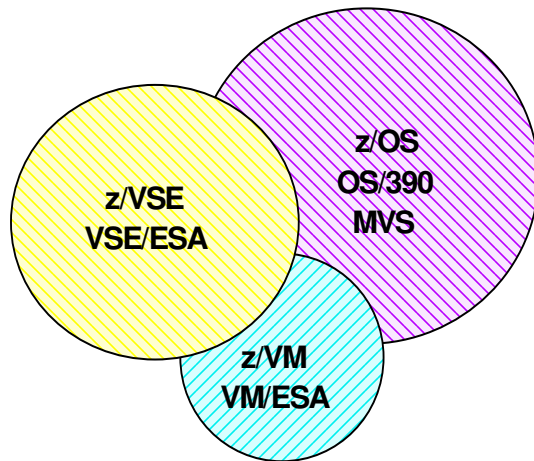
**Bringing high performance computing benefits
to commercial workloads**



* All performance information was determined in a controlled environment.

Operating Systems on IBM System z

Traditional Mainframe Operating Systems

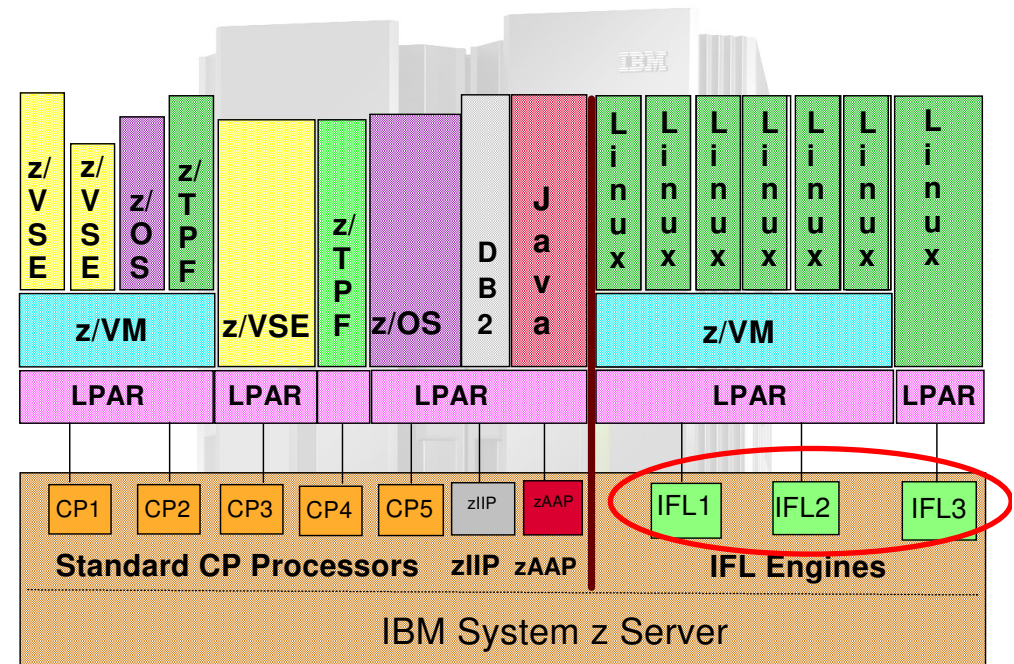


Standard Processors

- CP
 - For z/OS, z/VSE, z/VM workloads

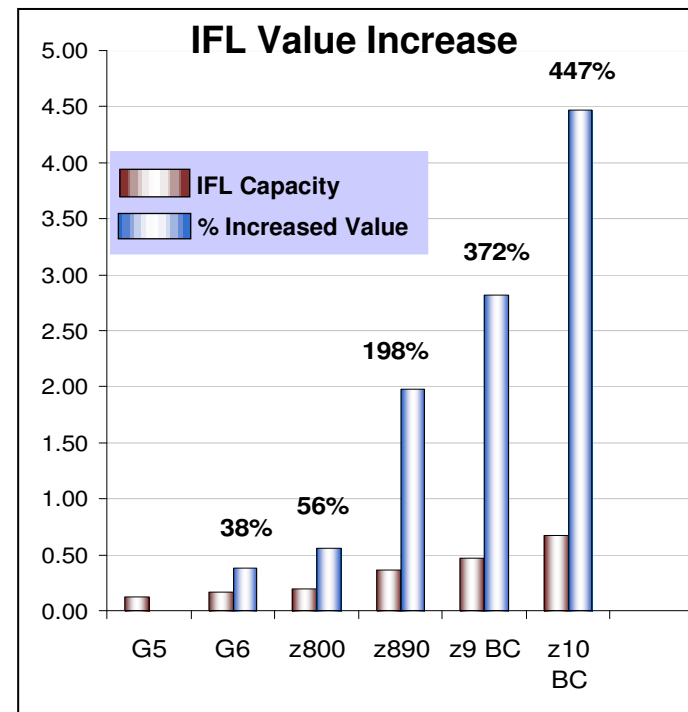
Specialty Processors

- CF (Coupling Facility)
 - For Parallel Sysplex with z/OS
- IFL (Integrated Facility for Linux)
 - For Linux and Linux applications
- zAAP (zSeries Application Assist Processor)
 - For offload of Java applications from z/OS
- zIIP (System z9 Integrated Information Processor)
 - For z/OS offload of DB2 distributed requests



Harness the Unique Value of Specialty Engines

- Specialty engine Prices have remained constant yet deliver more capacity
 - Up to 40% more capacity on single PU from z9 BC!!!
- Specialty engine upgrades to z10 BC typically move with NO charge
 - exception for all IFL server and short path upgrades
- New lower memory costs for specialty engine enabled workloads,
- Distributed Server model over same time:
 - 3 Technology Refreshes (New Hardware)
 - 3 System migrations



* Price may vary by country. Internal Coupling Facilities (ICFs) not included



Specialty Engines:

The investments that continues to deliver value generation to generation

1 - Prices in USD, may vary by country, 2 – Limited to 16GB per engine, 3 – Does not include Internal Coupling Facilities (ICFs)

z/VM Virtualization Leadership: *The Value of Scaling on a Single Hypervisor*

- Grow virtual server workloads without linearly growing energy costs
- Enhance staff productivity with a single point of control at the hypervisor level
- Dynamically add and remove physical resources in a single machine to optimize business results
- Exploit hypervisor automation tools with higher degrees of integration and optimization

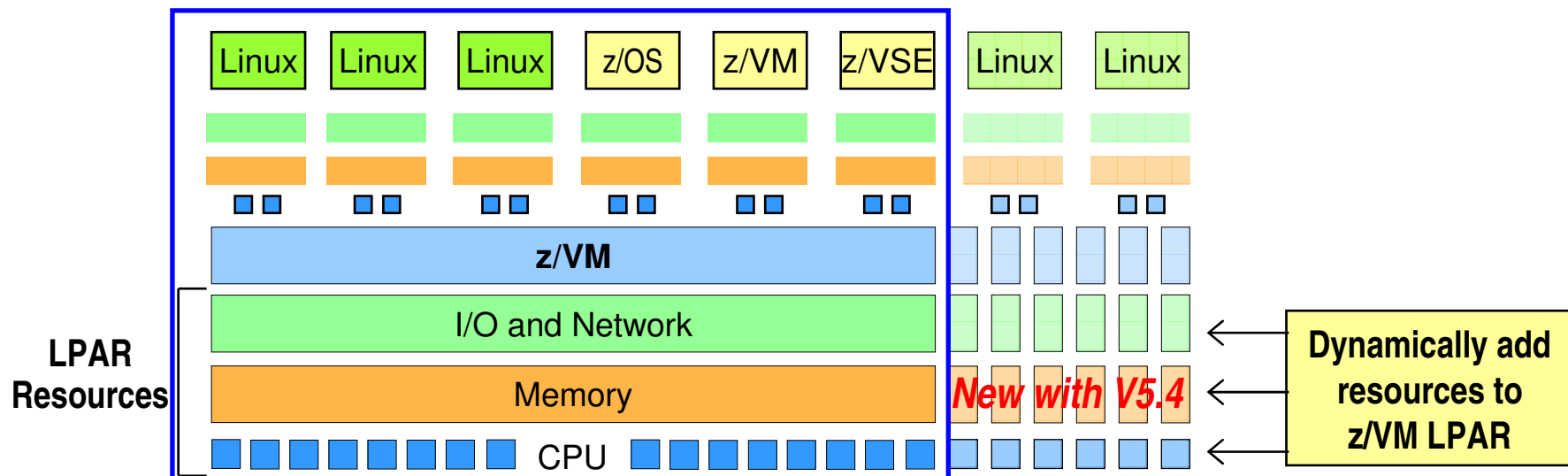


Virtualization – per Excellence

Virtualization for different workloads on the same layer

New z/VM V5.4 Function Enhances System Availability

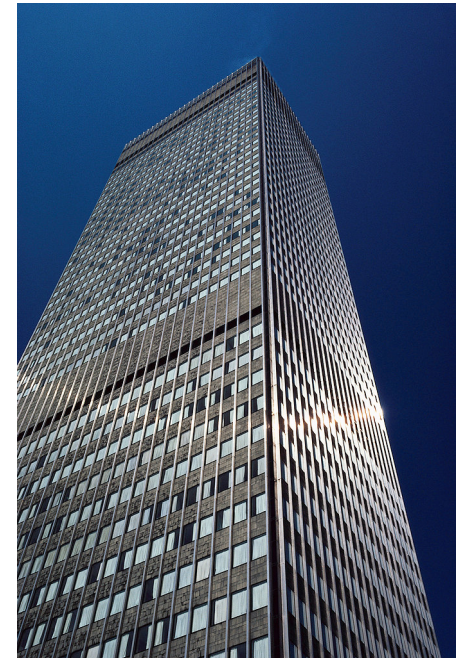
- **Users can non-disruptively add memory to a z/VM LPAR**
 - ▶ Additional memory can come from: a) unused available memory, b) concurrent memory upgrade, or c) an LPAR that can release memory
 - ▶ Memory *cannot* be non-disruptively removed from a z/VM LPAR
- **z/VM virtualizes this hardware support for *guest machines***
 - ▶ Currently, only z/OS and z/VM support this capability in a virtual machine environment
- **Complements ability to dynamically add CPU, I/O, and networking resources**



Smart economics: non-disruptively scale your z/VM environment by adding hardware assets that can be shared with every virtual server

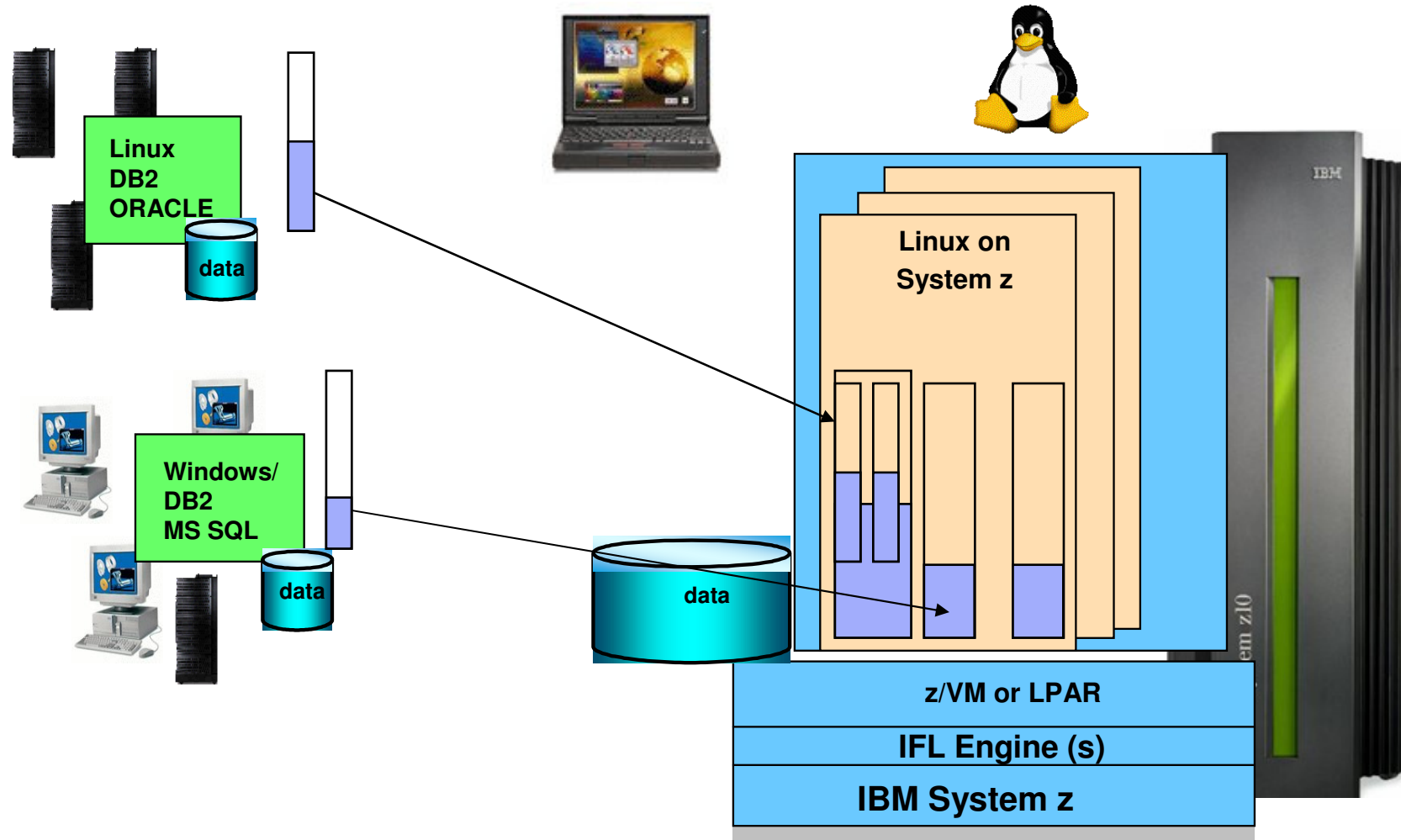
Implement Virtualization on System z: LPAR and z/VM, when to use what

- **z/VM Virtualization**
 - **Vertical virtualization** - Grow workloads without linearly growing number of virtual guest machines
 - one guest can be increased by allocating more resources (CPUs, memory)
 - **Horizontal virtualization** – for isolation between servers
 - isolation of guests in a network
 - Redundancy for application high availability
 - **Dynamically** add, remove and shift physical resources to optimize business results
- **LPAR Virtualization**
 - High Isolation with fixed resources
 - Direct attached I/O devices for max bandwidth



Linux on System z as workload concentrator

Virtualize, Consolidate, Integrate



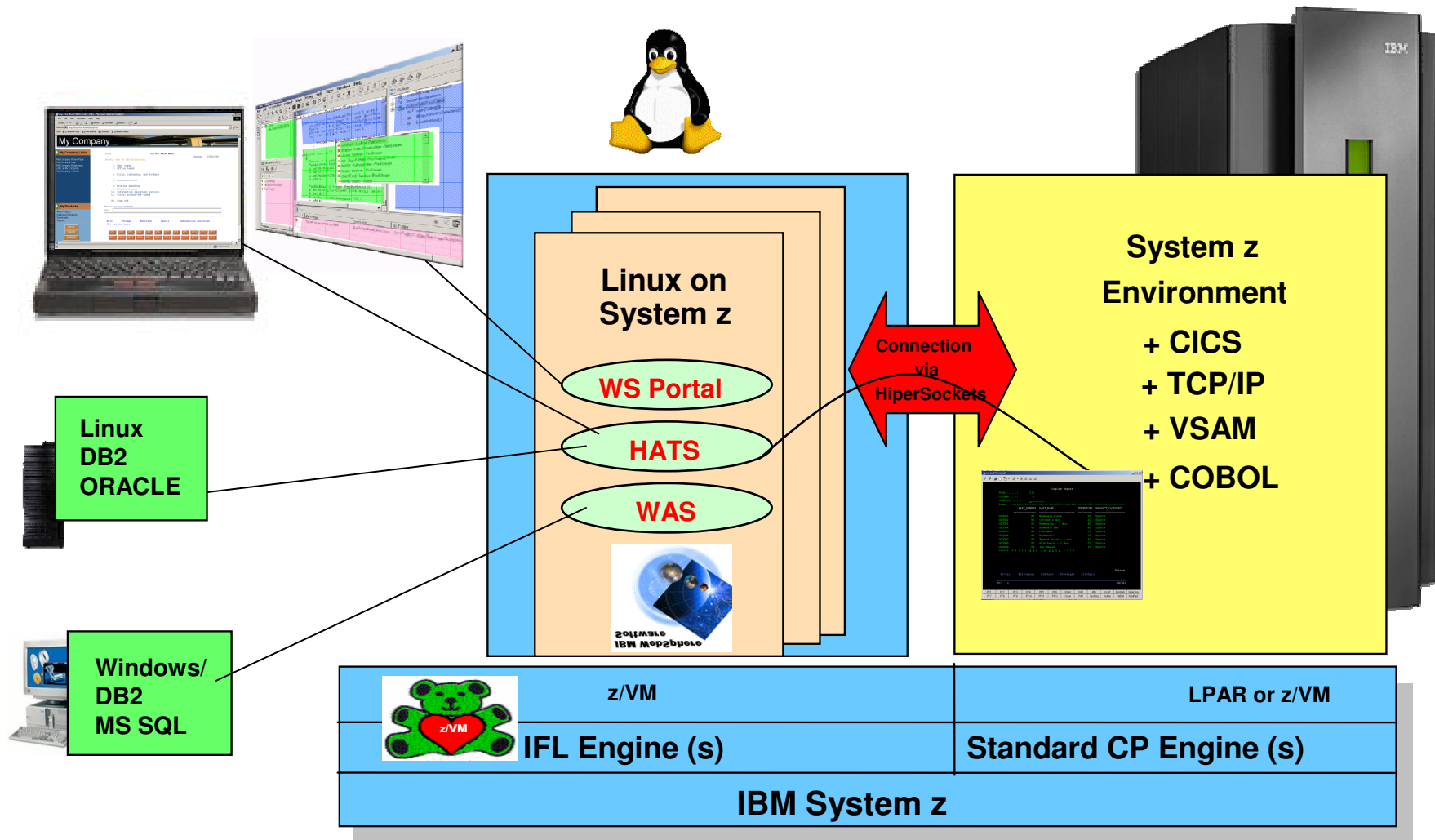


■ Agenda

1. The Role of Linux on System z
- ➔ 2. Linux on System z as 'Central Access Hub'
3. Linux on System z as 'Data Hub'
4. Linux on System z as 'SOA Hub'
5. Linux on System z as 'Mail and Collaboration Hub'
6. Linux on System z as 'Recovery Hub'

Scenario 1: Linux on System z as Central Access Hub

Web enable, improve interface, simplify, extend existing applications



Application Integration with Host Access Transformation Services (HATS)

```

Display Report

Width . . . : 219
Column . . . : 1
Control . . . :

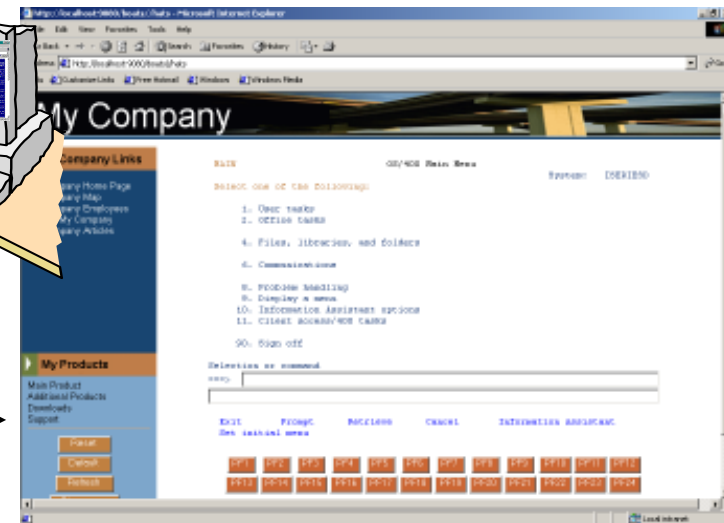
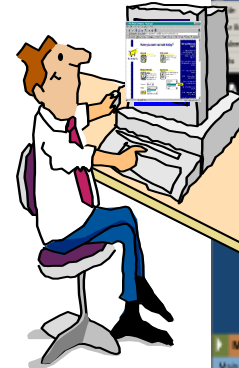
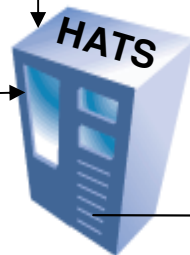
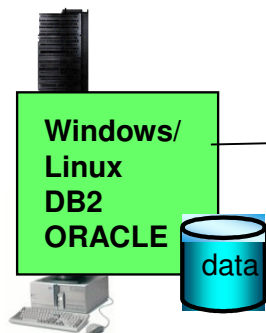
Line .....1.....2.....3.....4.....5.....6.....7.....
PART_NUMBER  PART_NAME          INVENTORY  PRODUCT_CATEGORY
-----
000001         80  Baseball glove          35  Sports
000002         81  Catcher's mit           20  Sports
000003         82  Baseballs - 1 doz.     40  Sports
000004         83  Baseball bat           46  Sports
000005         84  Football               33  Sports
000006         85  Basketball             25  Sports
000007         86  Tennis balls - 1 doz.  41  Sports
000008         87  Golf balls - 1 doz.    27  Sports
000009         88  Ice Skates              17  Sports
***** * * * * E N D   O F   D A T A   * * * *

Bottom

F9=Exit  F12=Cancel  F19=Left  F20=Right  F21=Split

MA* a 04/021
  
```

3270 or 5250
data stream

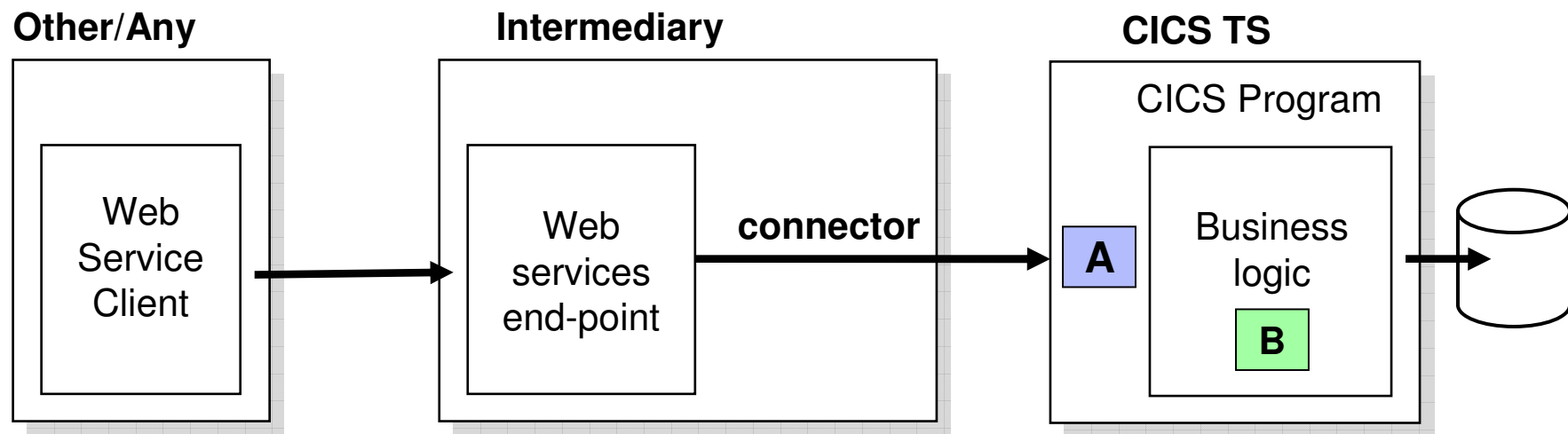
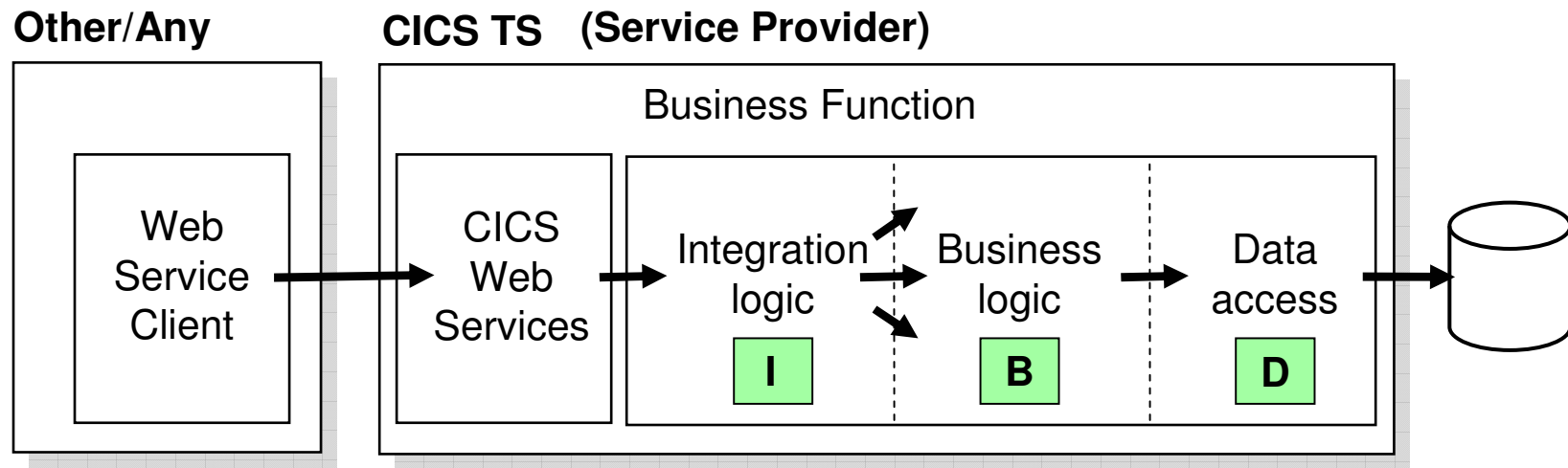


HTML in a Browser

Screen transformation rules running on
WebSphere Application Server

- No software download to the client
- Converts **green screens to GUI**
- **Integration with distributed applications**
- improves ease of use of host applications
- **Web Service** on the fly

The Two Models of CICS TS Integration



.NET application run on Linux on System z

- 03/2009 Announcement Novell / SUSE
 - New Version of MONO runs .NET applications

- High scalable Web environment possible with Linux on System z

- Centralization on a large scalable platform on Linux

Novell's Mono Gets Faster and More Visual

Novell delivers new releases of Mono and MonoDevelop, making .NET on Linux easier and Windows-based development for Linux deployment faster.

March 31, 2009

By Sean Michael Kerner: [More stories by this author.](#)

Novell is making it easier for a Microsoft .NET developer to develop applications on Linux, whether they develop their applications on Linux, with the release of Mono 2.4.

Mono is a .NET on Linux implementation and the new version, Monday, promises greater compatibility and better performance deploying .NET apps on Linux. Also, Novell is also releasing Mono an improved IDE ([define](#)) for building .NET applications.

All told, the two new releases continue Novell's push to ensure Linux remains a viable platform choice for .NET applications. The new Mono on the heels of Novell's SUSE Linux Enterprise Server 11 release includes for the first time commercial support for Mono.

"MonoDevelop 1.x was the basic foundation, but we knew it was missing many features," Miguel de Icaza, vice president of development at Novell (NASDAQ:NOVL) and leader of the Mono project told *InternetNews.com*. "The editing experience now is night and day."

RELATED ARTICLES

- > [Is .NET on Linux Finally Ready?](#)
- > [Novell SUSE Linux 11 Everywhere?](#)
- > [.NET Goes Open Source and Catches Mono](#)
- > [Open Source Mono Gets Visual Basic](#)

For more stories on this topic:

GO

De Icaza explained that MonoDevelop 2.0 rebuilt the editor from the ground up. MonoDevelop 2.0 now includes an integrated debugger, trackable changes and code templates. Additionally, MonoDevelop 2.0 now uses the same msbuild file format for project code that is used by Microsoft's Visual Studio.

Visual Studio integration

While MonoDevelop offers Linux developers a way of natively developing .NET application on Linux, Windows developers tend to use Microsoft's Visual Studio. Making Mono a more attractive deployment target for Visual Studio developers is also part of De Icaza's plans.

LATEST NEWS

- > [Microsoft Claims WebSphere Best on Windows](#)
- > [FTC Red Flags Rule Enforcement Starts Friday](#)
- > [Acer Looks to Build on Netbook Gains](#)
- > [IBM Gives Developer Site a Social Network Feel](#)
- > [Open Source Eucalyptus Cloud Goes Commercial](#)

He commented that for developers that are comfortable with Visual Studio today, they should keep using it and just publish to Linux for deployment instead of a Windows Server.

"Today's story for Visual Studio is pretty good, you just have to hit the publish button and it will give you a site that will run on Mono," De Icaza

said. "But we want to do a lot more integration points. We are working on a Visual Studio plug-in but we're not announcing that today. That will do more than what we can do today."

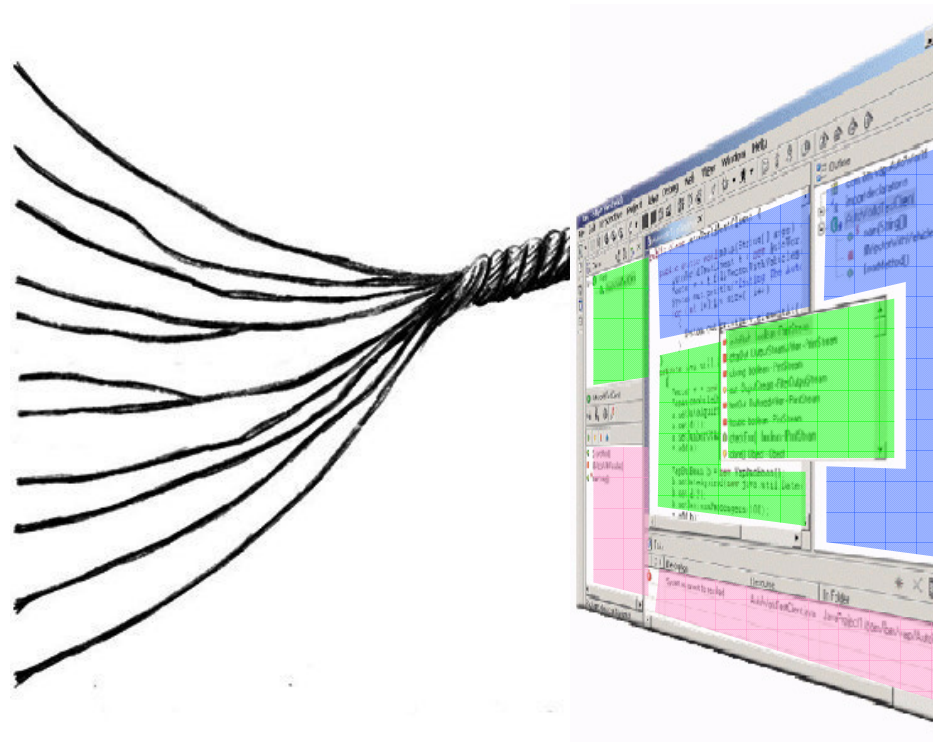
The new plug-in when available will allow for more integrated Visual Studio to mono debugging and control than what is currently available.

<http://www.internetnews.com/dev-news/article.php/3812851/Novells+Mono+Gets+Faster+and+More+Visual.htm>

Application integration with Portal

A single point of personalized interaction with applications, content, processes and people

- Enterprise Applications
- Messaging
- Search
- Collaboration
- E-meetings
- Web Content
- People Finder
- Knowledge Management
- Business Intelligence
- Document management
- Host systems




Solution Benefits with Linux on System z

- High Stability – inherits from System z
- Highly Scalable horizontally and vertically
- Very flexible environment with Virtualization z/VM
- Use of Standard interfaces and applications
- Very effective integration with existing applications

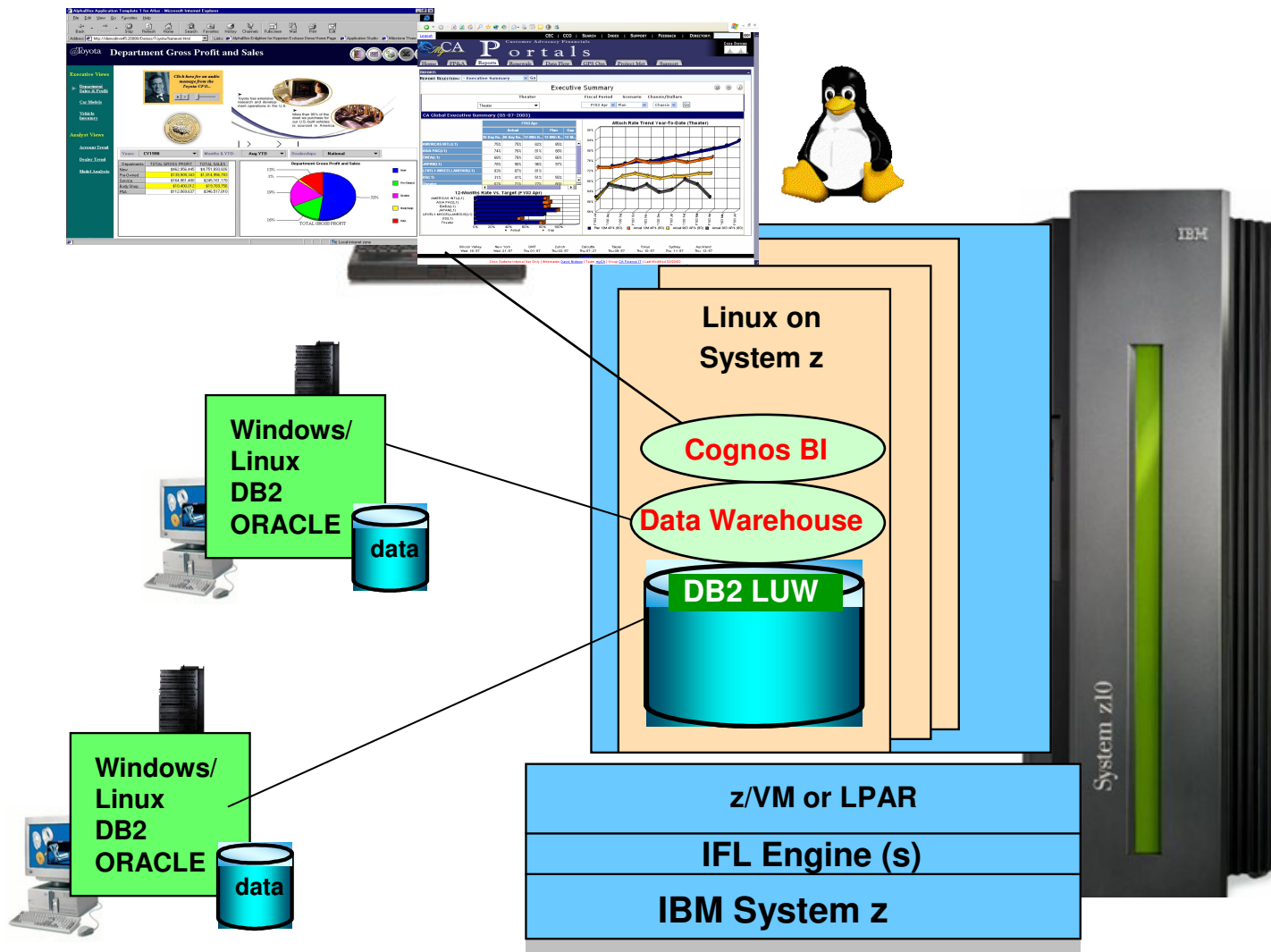


■ Agenda

1. The Role of Linux on System z
2. Linux on System z as 'Central Portal'
-  3. Linux on System z as 'Data Hub'
4. Linux on System z as 'SOA Hub'
5. Linux on System z as 'Mail and Collaboration Hub'
6. Linux on System z as 'Recovery Hub'

Scenario 2: Linux on System z as data hub

Consolidate, Integrate, Evaluate, Decide,
Base for Business Intelligence (BI)



DB2 9 with pureXML feature – A Hybrid Data Server

XML Developer
"I see a sophisticated XML repository that also supports SQL."



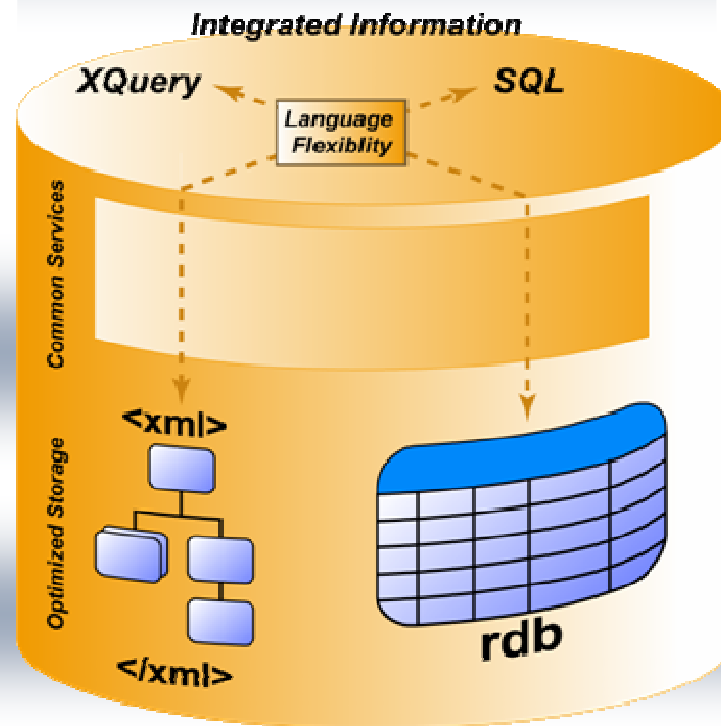
Familiar Programming Models



SQL Developer
"I see a sophisticated RDBMS that also supports XML."

Mature Services

Optimized Storage Models



Familiar Tooling

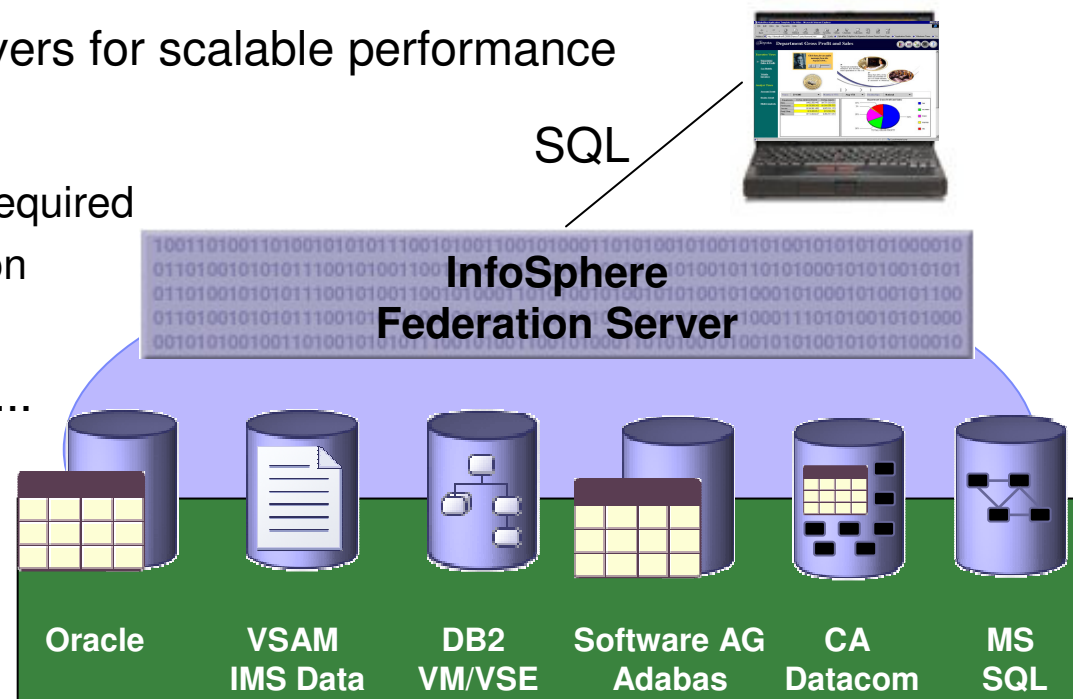
Optimized Performance & Scale

New XML applications benefit from:

- Ability to seamlessly leverage relational investment
- Proven Infrastructure that provides enterprise-class capabilities

InfoSphere Federation Server

- Integrating at the data layer – Federation of data
 - Read from and write to federated mainframe data sources using SQL
 - Standards-based access via JDBC, ODBC, or Call Level Interface
 - Including for VSAM
 - Multithreaded with native drivers for scalable performance
 - Metadata-driven means...
 - No mainframe programming required
 - Fast installation & configuration
 - Ease of maintenance
 - Works with existing and new...
 - Mainframe infrastructure
 - Application infrastructure
 - Toolsets




Solution Benefits with Linux on System z

- High Availability, Stability – inherits from System z
- High Scalability of Databases
- Very flexible environment with z/VM
- Use of Standard ASCII databases
- Very effective consolidation and federation
- Excellent possibilities for centralized data analysis
- Rapid decisions with BI solutions
- Centralized point for data management



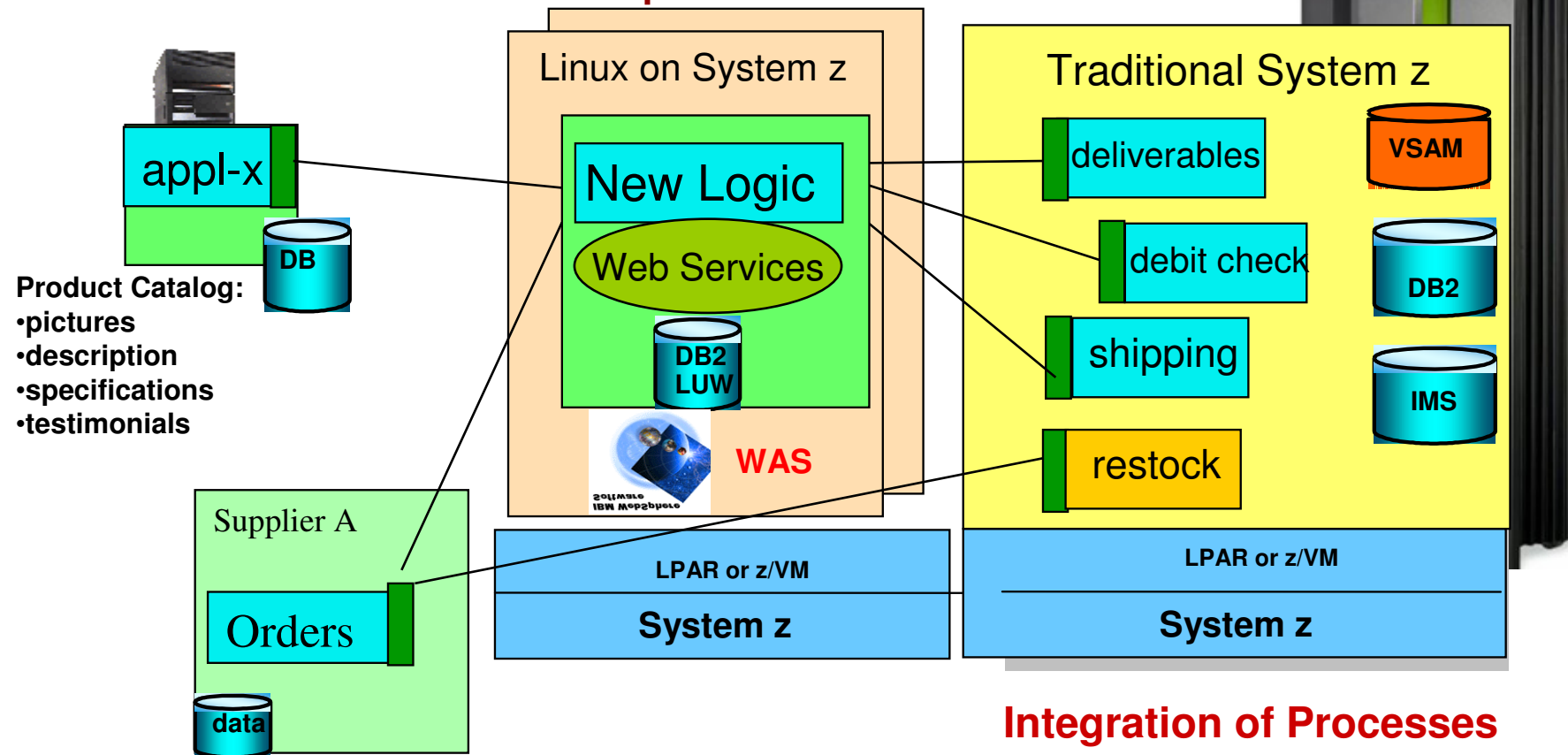
■ Agenda

1. The Role of Linux on System z
2. Linux on System z as 'Central Portal'
3. Linux on System z as 'Data Hub'
-  4. Linux on System z as 'SOA Hub'
5. Linux on System z as 'Mail and Collaboration Hub'
6. Linux on System z as 'Recovery Hub'

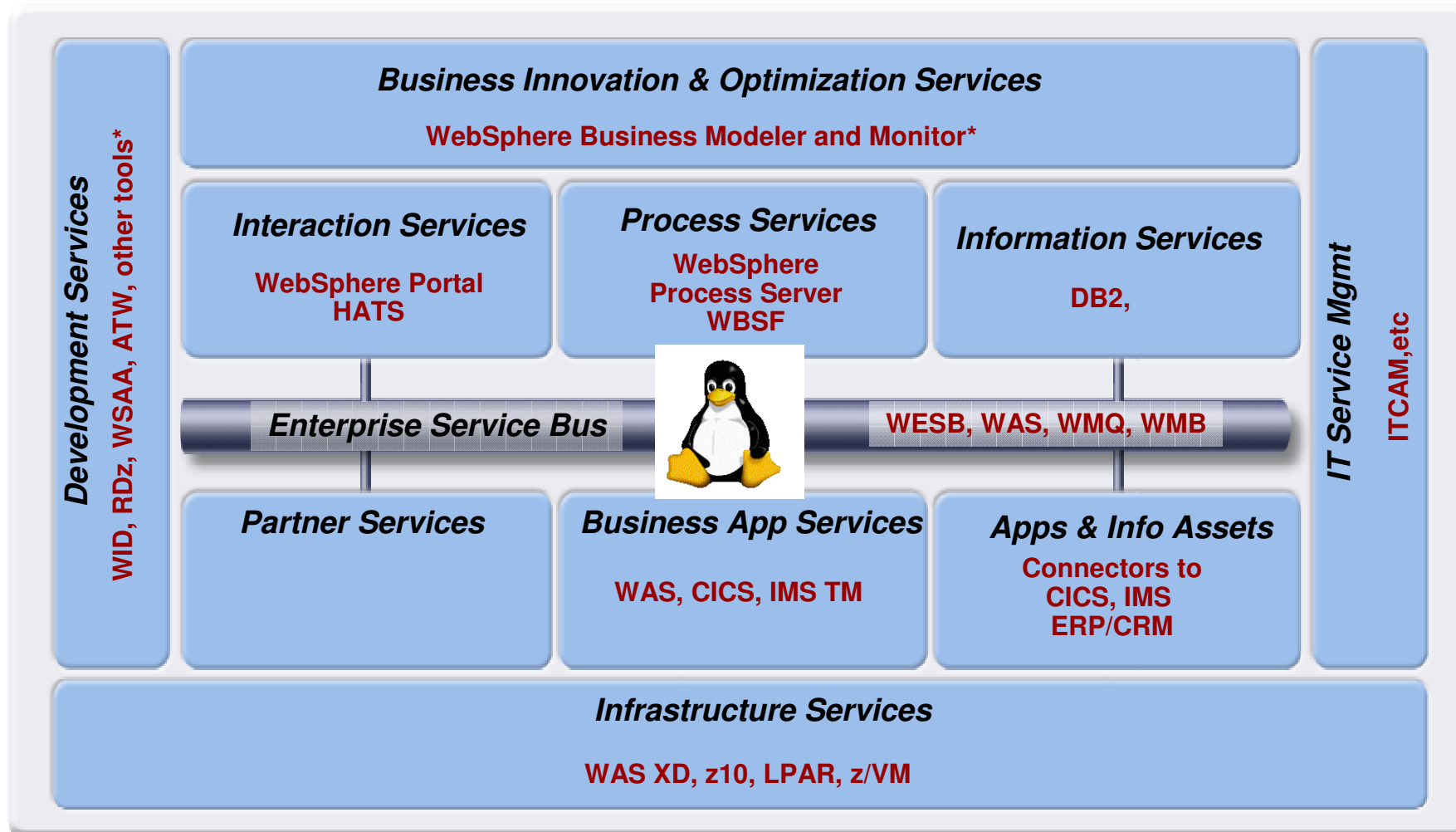
SOA – the way to new applications and processes

- Applications look the same for all users
- Core applications can be enhanced with an interface (independent of their language, COBOL, ASM, PL/I, Java, C#)
- New business logic is built

Increased success for the Enterprise



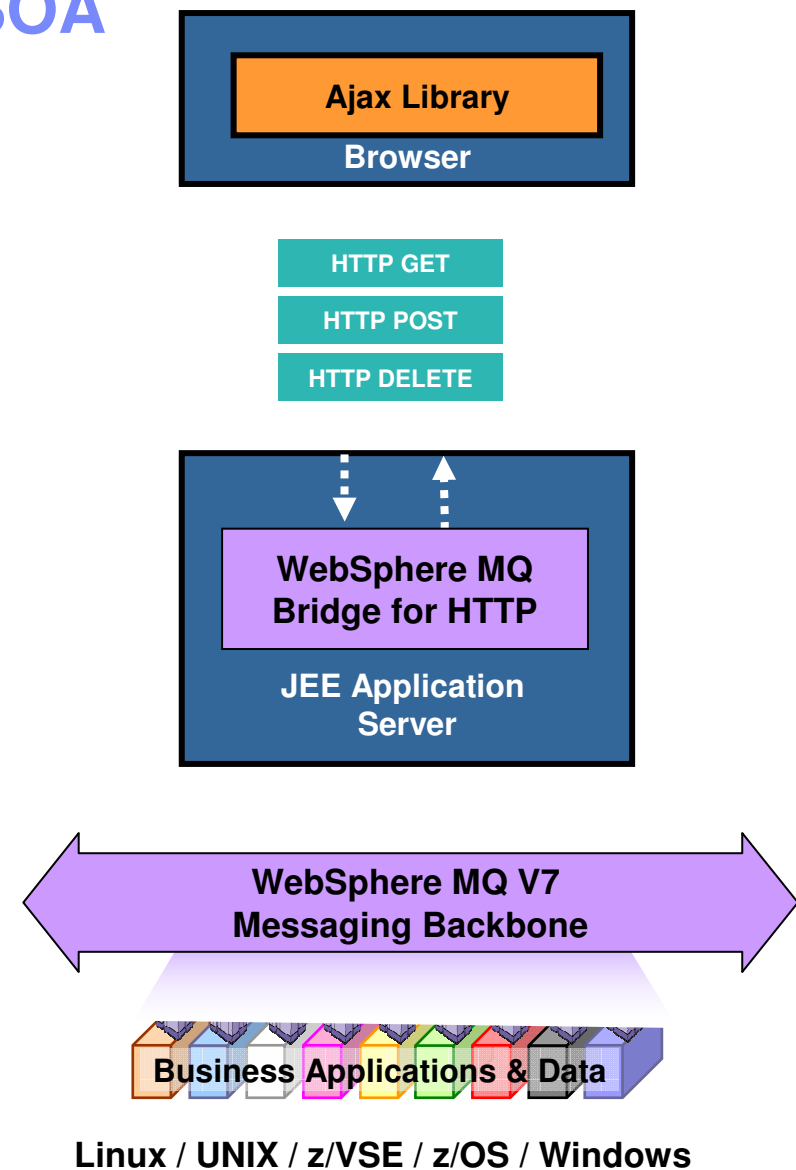
SOA Reference Architecture with z SW Products



Web 2.0 Connectivity for IBM's SOA

WebSphere MQ goes Web 2.0!

- Helps enrich Web 2.0 applications with real business data
- Developer needs no MQ skills
 - Uses Ajax and simple interface to access data by URIs
- Helps simplify deployment and maintenance of large scale distributed applications
 - Enables simple access to MQ without need to install MQ clients




Solution Benefits with Linux on System z

- High Scalability and effective Hub for applications
- Use of Standard SOA architecture and interfaces
- Very good possibilities for new solutions
- High performance integration with transactional load
- System z integration with distributed applications using standard interfaces
- High scalable ESB using WMQ or WebSphere ESB



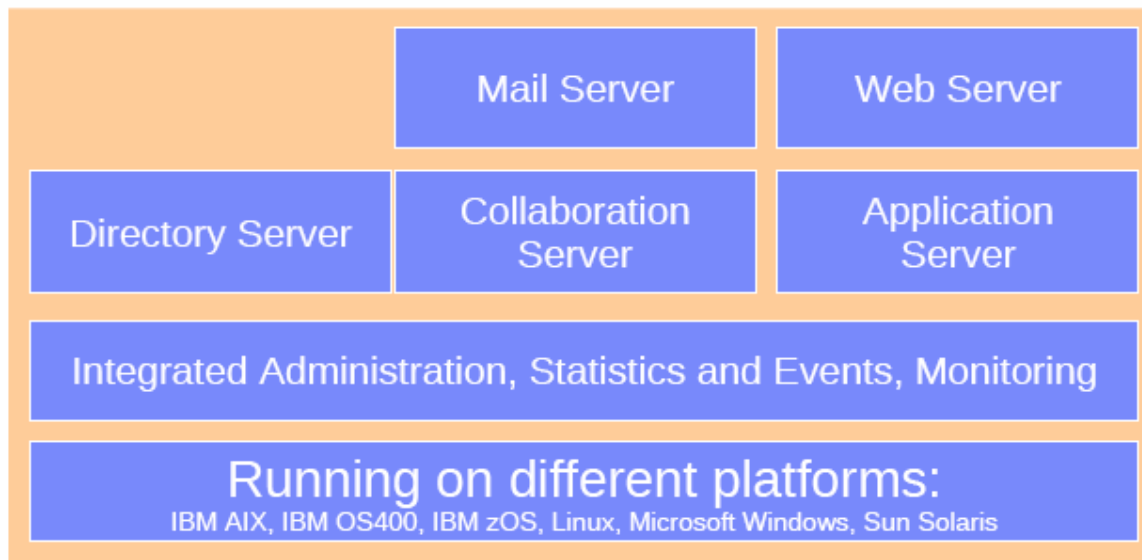
■ Agenda

1. The Role of Linux on System z
2. Linux on System z as 'Central Portal'
3. Linux on System z as 'Data Hub'
4. Linux on System z as 'SOA Hub'
-  5. Linux on System z as 'Mail and Collaboration Hub'
6. Linux on System z as 'Recovery Hub'

Lotus Domino – more than just Mail server



Choose your Client: Lotus Notes (Windows, Linux und Mac), Domino Web Access, POP3/IMAP, Mobile Devices, MS Outlook



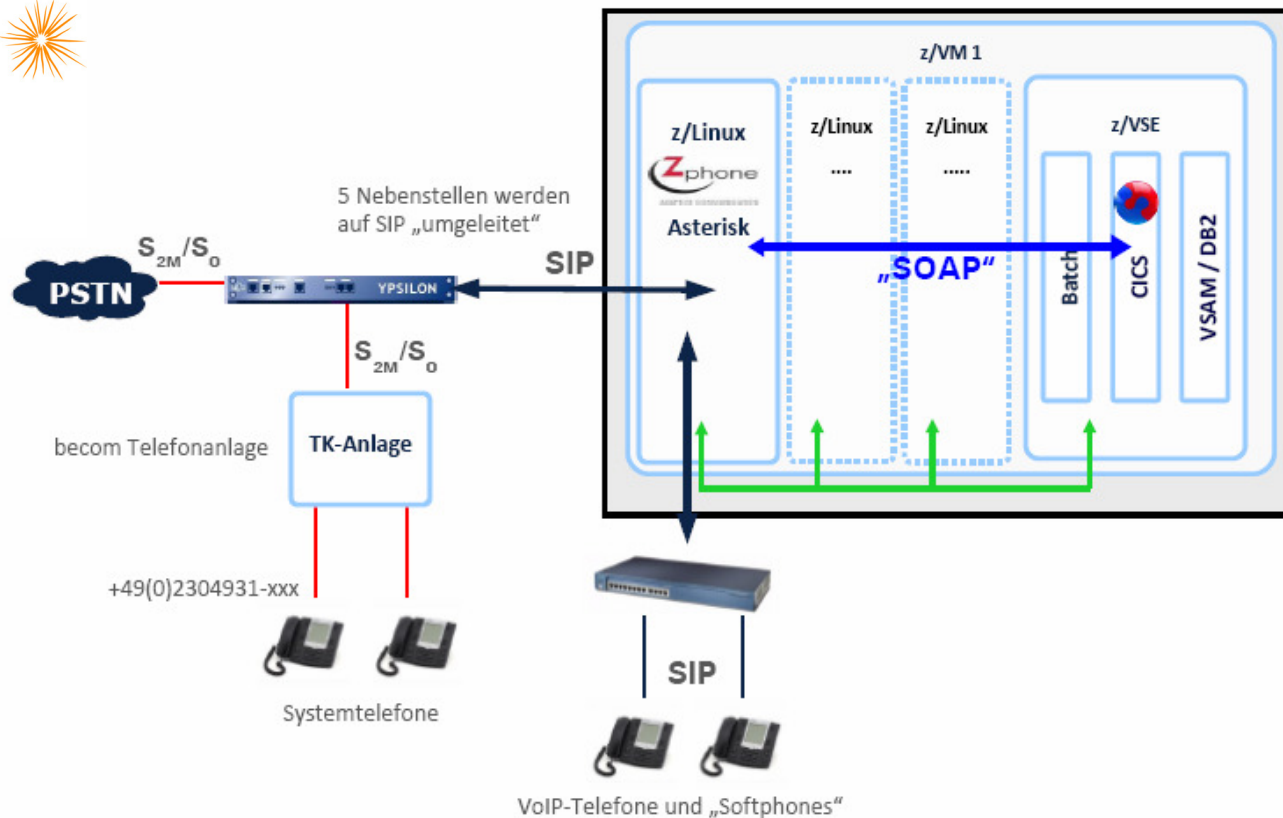
High Availability of Lotus Domino

Domino Clustering

- High Availability of critical databases (mail and applications)
- Fail over and Workload Balancing
 - Active/Hot-Standby
 - Active/Active
- Supported by Domino Utility Server and Enterprise Server
- Use of any supported hardware and operating system
- Can be combined with operating system cluster

IBM System z – the next generation **voice** Hub! – more than a simple Phone Server

„Asterisk® is the world’s leading open source telephony engine and tool kit“



27.04.2009

© TDMi 2009

(<http://www.asterisk.org/support/about>)

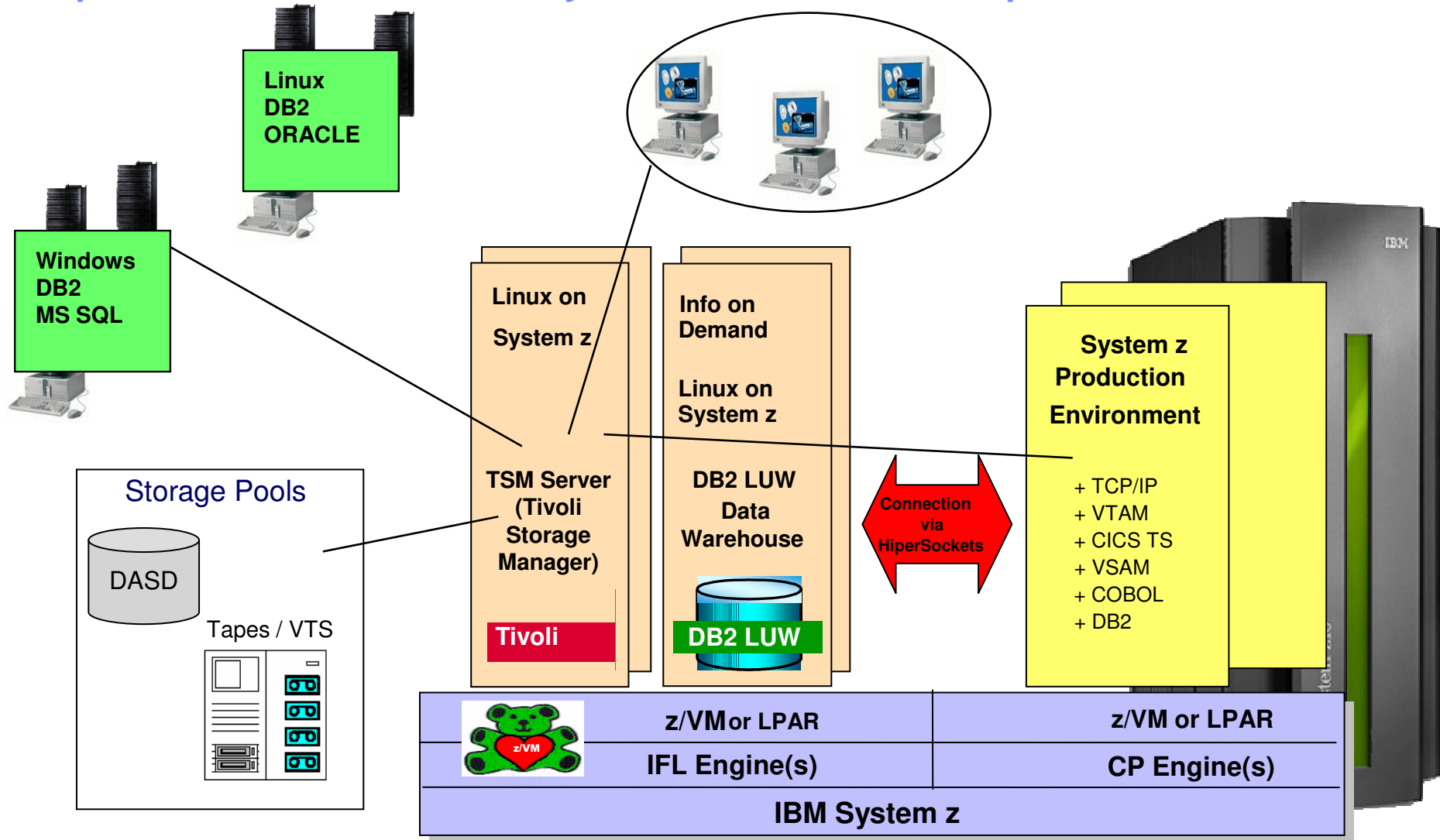


■ Agenda

1. The Role of Linux on System z
2. Linux on System z as 'Central Portal'
3. Linux on System z as 'Data Hub'
4. Linux on System z as 'SOA Hub'
5. Linux on System z as 'Mail and Collaboration Hub'
- ➔ 6. Linux on System z as 'Recovery Hub'

Enterprise Backup Hub

Implement TSM on Linux on System z as central Backup Hub



Solution Benefits with Linux on System z

- Centralized Backup procedure for the enterprise
- One central tool for System z and distributed backups and archives
- Use of Stability of System z for Recovery and High availability

Success Stories

<http://www-03.ibm.com/systems/z/os/linux/success/>

IBM Systems > Mainframe servers > Operating systems > Linux >

Linux
About Linux on IBM System z
Solutions
Software
Success stories and references
Services
Security
Technical support
Library
Education

Success stories and references

Think beyond what you'd expect from IT. Focus on what you need. Virtualization & consolidation - transform businesses of all sizes, all over the world. Learn how clients have put Linux on System z (z10, z9, zSeries) to work for them to lower cost and reduce energy consumption.

Featured success story

Bank of New Zealand Reduces Carbon Footprint on the Mainframe

The Bank of New Zealand has significantly reduced its hardware footprint, power consumption, heat and carbon emissions and costs, including an expected 20 percent cost reduction over the life of the platform. The bank migrated its systems to Linux running under z/VM on the mainframe. Today, BNZ utilizes both IBM System z10 and z9 systems to power the bank's customer-facing banking systems, including Internet banking and teller platforms.

Success stories by industry

- ↓ Banking / Financial Services
- ↓ Chemicals & Petroleum
- ↓ Computer services
- ↓ Education
- ↓ Government
- ↓ Healthcare
- ↓ Industrial Products
- ↓ Insurance
- ↓ Media & Entertainment
- ↓ Professional Services
- ↓ Retail
- ↓ Travel and transportation
- ↓ Wholesale Distribution & Services
- ↓ Success Stories of Novell SUSE and Red Hat

Banking

- [Bank of Russia saves US\\$400 million per year by consolidating to IBM System z9](#)
The Bank's new infrastructure is an excellent example of what IBM terms the "new enterprise data center": an efficient, simplified, virtualized, highly resilient set of shared resources capable of responding dynamically to business demands. "Using virtualization to consolidate more than 200 distributed servers on just four IBM System z9 mainframes is a great advantage in terms of hardware licensing and energy costs, and decommissioning the 74 existing data centers was another major saving", says Mikhail Senatorov, Deputy Chairman, Bank of Russia.
- [IZB Informatik-Zentrum delivers a flexible, highly secure application infrastructure on IBM System z](#)
According to IZB Informatik-Zentrum, faster development cycles have been a major benefit of migrating to the IBM System z infrastructure. Today, IZB Informatik-Zentrum uses IBM WebSphere Application Server in a 64-bit mode and has successfully deployed Enterprise JavaBeans applications running under z/OS. The company is using Linux on IBM System z under IBM z/VM to serve several different Web applications, including Beta Web Enabler from BetaSystems, MediaWiki and IBM WebSphere Studio Application Monitor software.

[↑ Back to top](#)

Chemicals & Petroleum

- [Univar extends computing capabilities with IBM System z9](#)
Our business was really taking off at an exponential rate. The ability to respond to growth from an architectural perspective was a major challenge," Dean Schultz, Univar USA's Manager of Technical Services. "A couple of year ago we started testing the idea of running Linux machines on IFLs as part of our virtualization effort. At last count, we have about 40 Linux machines running in development and production." Greg Mueller, Systems Programmer for Univar USA. The IBM z/VM operating system enables the virtualization of these applications, which include the company's e-commerce applications, an FTP server and IBM Domino and IBM WebSphere software.

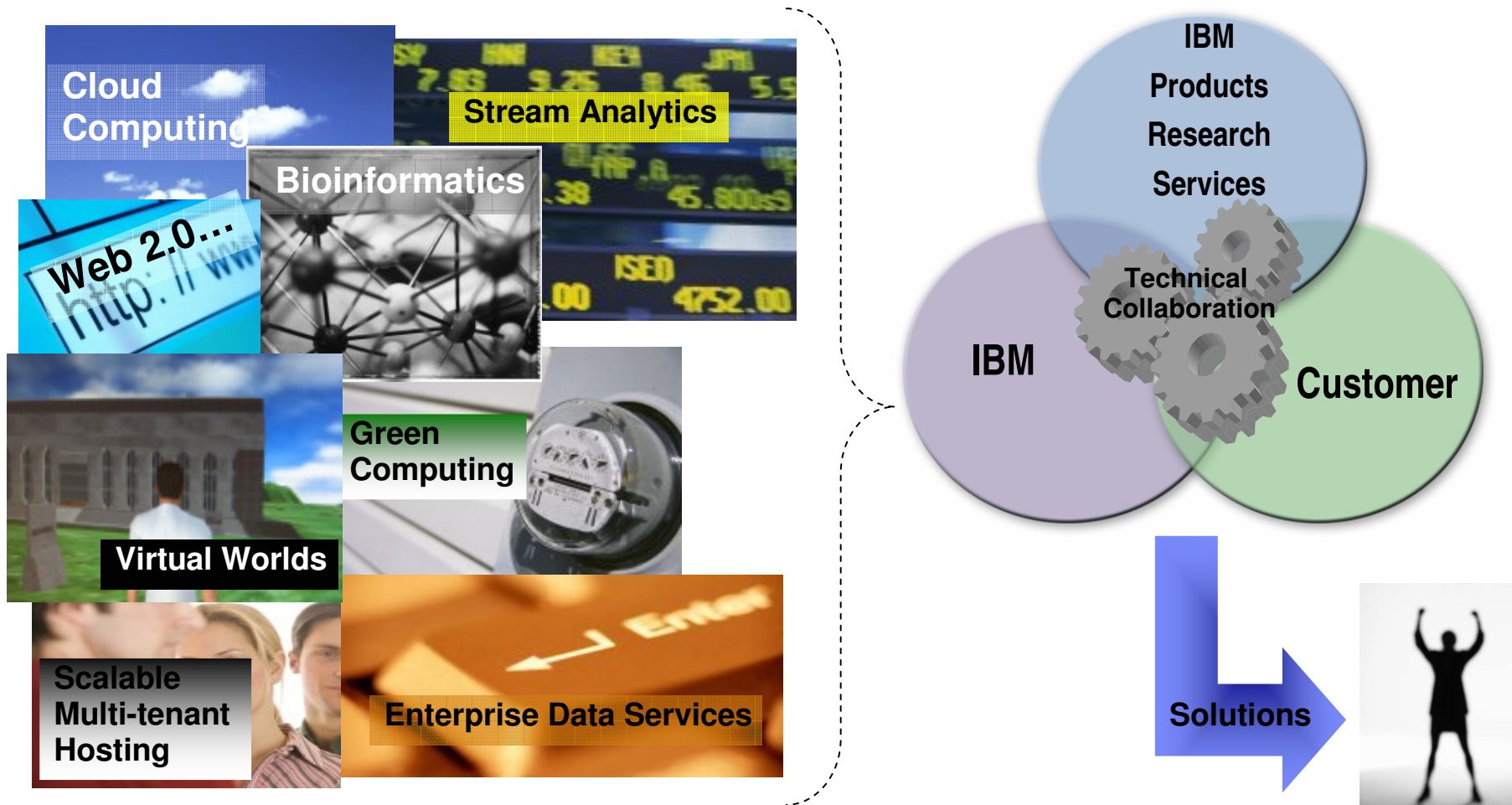
[↑ Back to top](#)

Computer services

- [IT service provider BRZ Deutschland reduces data processing times](#)
The System z9 technology offered the flexibility to run the z/VSE operating system while also allowing the company's Linux® applications to coexist. Leveraging the z/VSE environment, three Virtual Storage Extended (VSE) systems run in a logical partition (LPAR), with the System z9 BC server acting as the data hub.

Linux on IBM for Next Generation Workloads

We accelerate the availability of innovative solutions for the next generation of IT challenges.



Project Big Green Linux: Reducing consumption, reducing cost



* Addressing rising energy infrastructure costs

- Linux is enabled to utilize advanced features on all IBM Systems, helping to avoid other costs
 - Virtualize workloads on new or existing systems that are more efficient than before
 - Increase utilization rates with RAS and virtualization features on large systems
 - Consolidation can reduce floorspace or avoid costly datacenter expansion
 - IBM offers middleware to manage energy use

* Reducing the cost of heterogeneous hardware environments during M&A

- Linux empowers users to choose the platform that makes sense
 - Linux as a common denominator can drive faster integration of disparate platforms

* Reducing OS license costs

- Manage more with less using Linux
 - Standardizing on Linux can reduce the amount of skill needed to manage multiple OS environments when resources are tight
- Reduce OS license costs, avoid upgrade penalties
 - Subscription model guarantees that OS license costs remain predictable and smooth over time
 - Directly avoid costs by eliminating the need to pay for CALs, in addition to end-user licenses



Bank of New Zealand

A bank uses Red Hat Enterprise Linux on System z10 to reduce their carbon footprint, and address datacenter cost and capacity concerns

The Bank of New Zealand reduce their datacenter footprint by 30%, heat output by 33%, carbon footprint by 39%, and expects a 20% ROI

* The Challenge

- A datacenter with 200 Sun servers was at capacity
- Bank of New Zealand needed to grow, reduce emissions and costs, become more open, and seeks to become carbon-neutral by 2010

* The Solution

- Consolidate 200 Sun servers down to just 1 IBM System z10 mainframe running Red Hat Enterprise Linux

* The Benefit

- Bank of New Zealand reduced power consumption by close to 40%, heat output by 33%
- Just one administrator is needed per 200 virtual servers
- New environments are deployed in minutes, not days

“Deploying IBM mainframes with Red Hat Enterprise Linux to address our carbon footprint and cost savings concerns was a very big deal, especially at the senior management level.”

*Lyle Johnston
Infrastructure Architect
Bank of New Zealand*

Univar USA

An international chemical company turns to Linux and IBM System z for a simplified, virtualized, and more powerful operating environment

* The Challenge

- Incremental responses to rapid growth led to an increasingly complex IT infrastructure
- A successful acquisition increased data processing requirements

* The Solution

- System z9 with zIIP to support ERP, CRM, data warehousing, and zAAP for Web 2.0 workloads
- IFLs running Linux for Java workloads

* The Advantage

- Univar has implemented a mixed Linux and z/OS virtualized environment, meeting their growth needs
- Univar reports a simplified infrastructure, improved disaster recovery capabilities, and lower CPU utilization per transaction

One of the problems we've had over the last decade is that we were looking for a new box every 15 to 18 months. We wanted something that would stay with us for a while. The IBM System z9 Enterprise Class fit this requirement."

Greg Mueller, Univar USA

"Sirius met every commitment they made to us ... we're an unequivocally satisfied customer at this point."

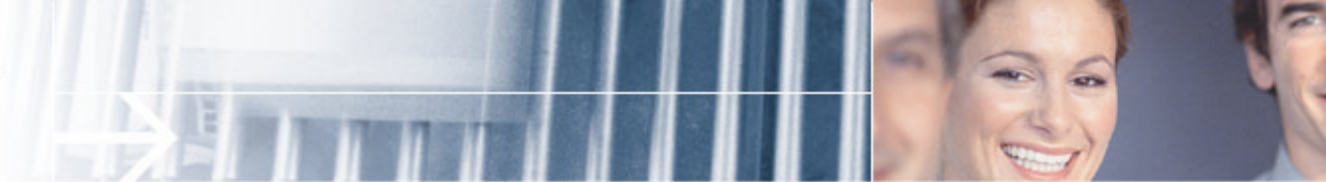
Dean Schultz, Univar USA



Novell.

**"We're attempting to try to leverage virtualization on all of our platforms."
Greg Mueller, Univar USA**

<http://www-01.ibm.com/software/success/cssdb.nsf/CS/DLAS-7CFMG8>



IT-Informatik moves into SAP application hosting with IBM Power Systems running Linux

Business challenge:

Hosting on a robust platform that supports Linux applications and allows for dynamically responding to a growing customer base

Benefits:

- Reduce costs - Saved more than 65% of the data center space required for a non-virtualized environment.
- Improved service - New logical partitions can be created within minutes, making it 80% quicker to set up new customer environments.
- Reduce risks - Divided CPUs into logical partitions so there is total security for each of the SAP instances and SUSE Linux environments.

“Power Systems Linux virtualization is highly effective for hosting multiple SAP landscapes. One of the biggest benefits is that when we win a new client, instead of ordering new physical servers, we simply create a new LPAR in a matter of minutes.”

Achim Schütz,
Team Leader at
IT-Informatik

Power = Openness + Flexibility

<http://www-03.ibm.com/solutions/sap/us/detail/resource/D486959X32831D01.html>

Linux for Business-Critical Workloads: A lower cost alternative



*** The same business-critical workloads at lower cost than proprietary solutions**

- Linux provides features that support business-critical workloads at a lower cost
 - IBM middleware is consistent across platforms
 - Native enterprise virtualization / consolidation
 - Government-certified security
 - Natively inheriting reliability and availability functionality built into the underlying platform
 - Industry-leading performance across multiple platforms

*** Enabling mixed environments**

- Optimal solutions are often a gradient
 - Linux support for all IBM systems enables open and other OSs to commingle on the same hardware, reducing costs
 - IBM offers a blend of open and other solutions on Linux for maximum flexibility

*** Reducing risk by improving hardware choices with cross-platform Linux support**

- Business-critical workloads should run on reliable platforms
 - Linux certification on all IBM Systems enables workload optimization by platform capability
 - Reduce the risk (and costs) of downtime by replacing physical hardware with virtual Linux

ConAgra Foods®

running



Department of Fisheries and Oceans



<http://ibm.com/software/success/cssdb.nsf/cs/STRD-77PKK2>
http://www.novell.com/success/baldor_electric.html

ConAgra Foods

“The IBM and Intel solution delivers a reduction in total cost of IT operations of around 75 per cent.” - Tim Darnall, VP Shared Application Services

* The Challenge

- Focus upon sustainable, profitable growth
- Rapidly growth through acquisitions resulted in a decentralized Sun Solaris infrastructure that was difficult, complex, and expensive to manage
- ConAgra Foods needed to consolidate, standardize, and expand its SAP environment to improve financial reporting

* The Solution

- 200 IBM Sytem x3650 servers
- IBM BladeCenter with HS20 and HS21 blades
- SUSE Linux Enterprise Server
- SAP NetWeaver BI, SAP R/3

* The Advantage

- Performance enhancement of 600% at 25% of the cost
- Simpler architecture helps keep systems online 24x7
- Servers are reprovisioned from bare metal in 24 minutes

“Running the SAP applications under SUSE Linux on the Intel-based System x platform has delivered a six-fold improvement in performance.”

Chris Nitchals
SAP Principal
ConAgra Foods

“BIA was our first foray into an IBM, Intel, and Linux environment, and we were impressed with its potential.”

Gerrit Schutté
Senior Vice President
Information Systems and Services



Bank of Russia

The central bank for the Russian Federation discovers cost saving consolidation opportunities and saves \$400m per year with Linux on System z



*Payment processing costs have been reduced by 95 percent,
Workload for technical staff has been reduced by 85 percent.*

* The Challenge

- Local payment processing systems running on over 200 servers in 74 datacenters across 11 time zones
- 50% of all payments and 60% of Russia's money pass through the bank, requiring improved security and reliability
- Solution must scale to 18m payments/day in 2013

* The Solution

- Four System z EC mainframes, running Linux and z/OS
- WebSphere MQ and Tivoli OMEGAMON

* The Benefits

- Reduced per-transaction costs from 11 rubles to 50 kopeks, a 95% reduction, saving \$400m/year
- Initial plan to consolidate into 5 datacenters was accelerated further into just two sites
- Highly available mirroring configuration between two datacenters which are over 1,000 km apart reduces risk

"With IBM System z, instead of buying an oversized server and growing into it over the years, we only need to pay for what we use."

As volumes increase, we can ask IBM to activate more processors within the mainframe to deal with the demand."

*Mr. Mikhail Senatorov
Deputy Chairman, Bank of Russia*

Baldor Electric

An international electrical equipment manufacturer slashes ongoing management costs and drastically improves flexibility with SAP and Linux on the mainframe

* The Challenge

- Over 8,000 employees in 28 facilities across the globe, rapidly expanding business, overworked IT staff
- UNIX and Windows environment sprawling fast and difficult to manage, driving 5-8 outages per year
- Downtime cost Baldor hundreds of thousands of dollars

* The Solution

- A single System z10 mainframe, with 50 virtual servers
- Consolidated 6,000 ft² of data center to just 900 ft²
- Novell SUSE Linux Enterprise Server

* The Benefits

- Baldor estimates the solution paid for itself in months by avoiding the cost of planned and unplanned outages
- Overall IT spend slashed by 45%
- Reduced energy consumption by 80%

*"We chose Linux over UNIX or Microsoft Windows because we wanted to **standardize on an operating platform that would run on any kind of hardware.**"*

*"SUSE Linux Enterprise Server Priority Support for SAP gives us a **single point of contact** for our support issues."*

*"It's clear that we made the right decision to move to a mainframe environment and we find that **SAP runs much better on Linux than any other platform.**"*

*Mark Shackelford,
Vice President of Information Services
Baldor Electric*



http://www.novell.com/success/baldor_electric.html

<http://www-306.ibm.com/software/success/cssdb.nsf/CS/DNSD-6K9H7V>

Linux on the Desktop: Providing choice, reducing costs



* Linux enables reduced cost end-user work environment choices

- Having choice of solutions ensures cost saving opportunities
 - Linux is a viable alternative, making cost comparisons meaningful
- Linux-based alternatives to Microsoft save on desktop and server licensing
 - Reducing spending on client licenses can address budget cutbacks
 - Migrating 1 (or 10,000) desktops to Linux from Windows provides immediate license cost avoidance
 - Eliminating CALs saves on can free up 40% or more of the cost of a Microsoft enterprise agreement
 - Clear market demand for free productivity suites

* Cost savings beyond licenses

- Virtual Linux desktop solutions can help reduce desk-side and help desk support costs
 - Instant client updates, rapid problem resolution, simplified application deployment and backup
 - Significantly reduced threat of data loss through component failure or theft
- The ability to work from anywhere from multiple devices is reshaping the workplace by letting workers define their own productive spaces
 - Consistency across platforms helps clients adopt Linux and other solutions at their own pace



Linux for the Midmarket: Leveraging Linux, less complexity



**Mid-market solutions
should enable applications
to be managed like
devices**

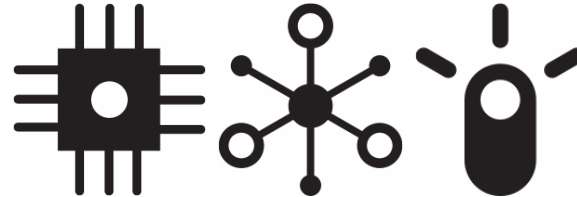
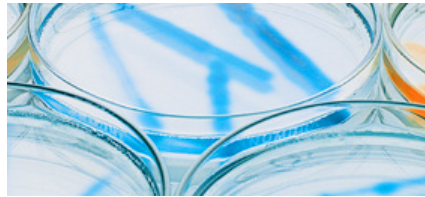


- * **Hiring additional IT staff can drive up TCO**
 - Linux appliances can help reduce the cost of deploying, managing, and supporting applications
 - IBM Lotus Foundations, built upon Linux, provides functionality that does not require a distinct IT staff
- * **Medium-sized business need to position themselves for growth**
 - Enterprise-quality offerings built on Linux can enable scalability without sacrificing flexibility
 - Linux-based open hosting models can provide a first step towards utility computing

THE SAN MIGUEL SCHOOL
of
Camden New Jersey
A vital presence of Catholic education in Camden

Murak &
Associates, LLC

Linux for Emerging Workloads: Enabling a smarter planet

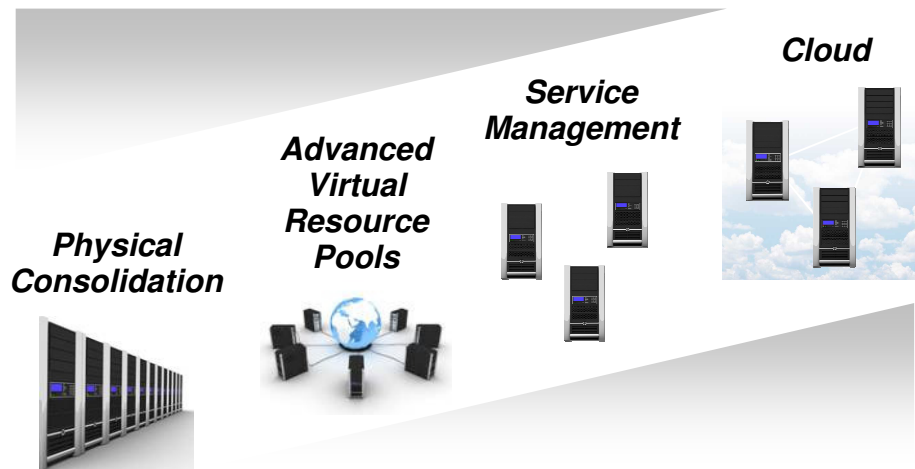


*** Providing innovative solutions to the complexity (and cost) problem**

- IBM is a leader with Linux in cloud computing
 - Established a dedicated cloud organization
 - 9 IBM Cloud Labs around the world
 - 9 private cloud implementations
 - 2 academic alliances

*** IBM helps Linux users reduce cost by providing flexible utility computing**

- Pay-as-you-go utility computing enables users to smooth IT expenditures over time
 - Replacing periodic capital expenditures with a predictable billing cycle reduces uncertainty
 - Add or remove incremental capacity without introducing sprawl or maintaining idle resources
- IBM enables others to resell cloud services
 - Consulting
 - Implementation
 - Cloud Delivery
- Private clouds can revolutionize IT budgets
 - Principles of utility computing – such as accurate measurement and billing – can transform IT from a cost center into a cost recovery center



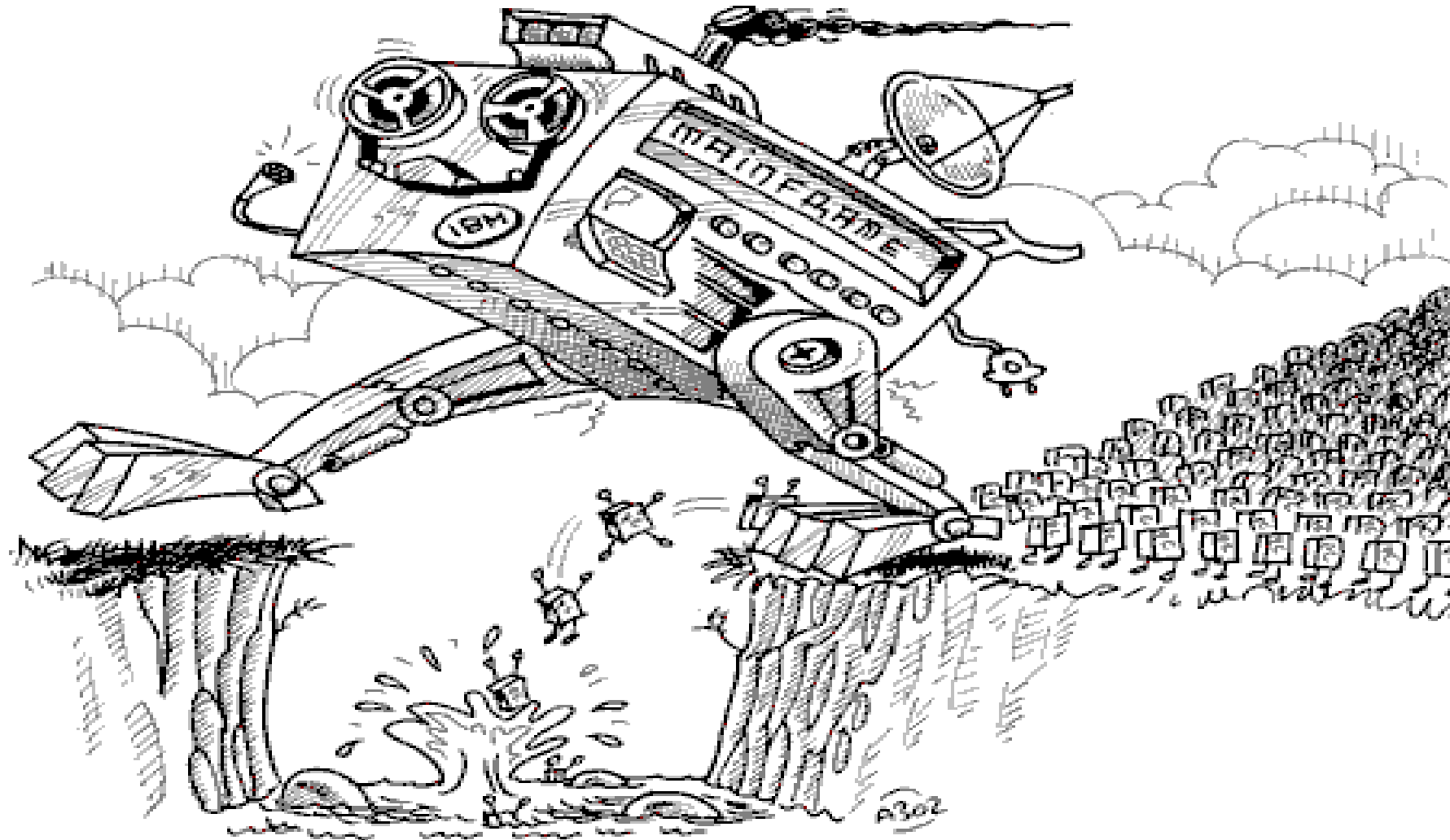
Elizabeth Arden



<http://ibm.com/press/us/en/pressrelease/26642.wss>

<http://ibm.com/press/us/en/pressrelease/24482.wss>

Do you want to make bigger steps forward ?



Thank You!





More Information about Linux on System z

Linux on System z in IBM:

<http://www-03.ibm.com/systems/z/os/linux/>

Linux on System z at Developerworks:

<http://www.ibm.com/developerworks/linux/linux390>

Tuning Linux on System z:

<http://www.ibm.com/developerworks/linux/linux390/perf/index.html>