



IBM System z Technical University



October 4–8, 2010 — Boston, MA

Linux on System z - the Enterprise hub

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Wilhelm Mild, IBM

Authorized

IBM. | **Training**

2-Oct-10

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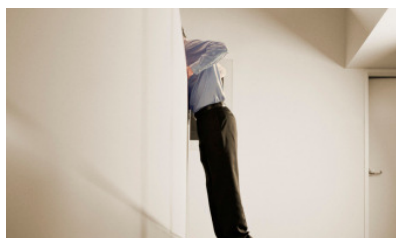
Global forces are driving a fundamentally different world



- * **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

The growth 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



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

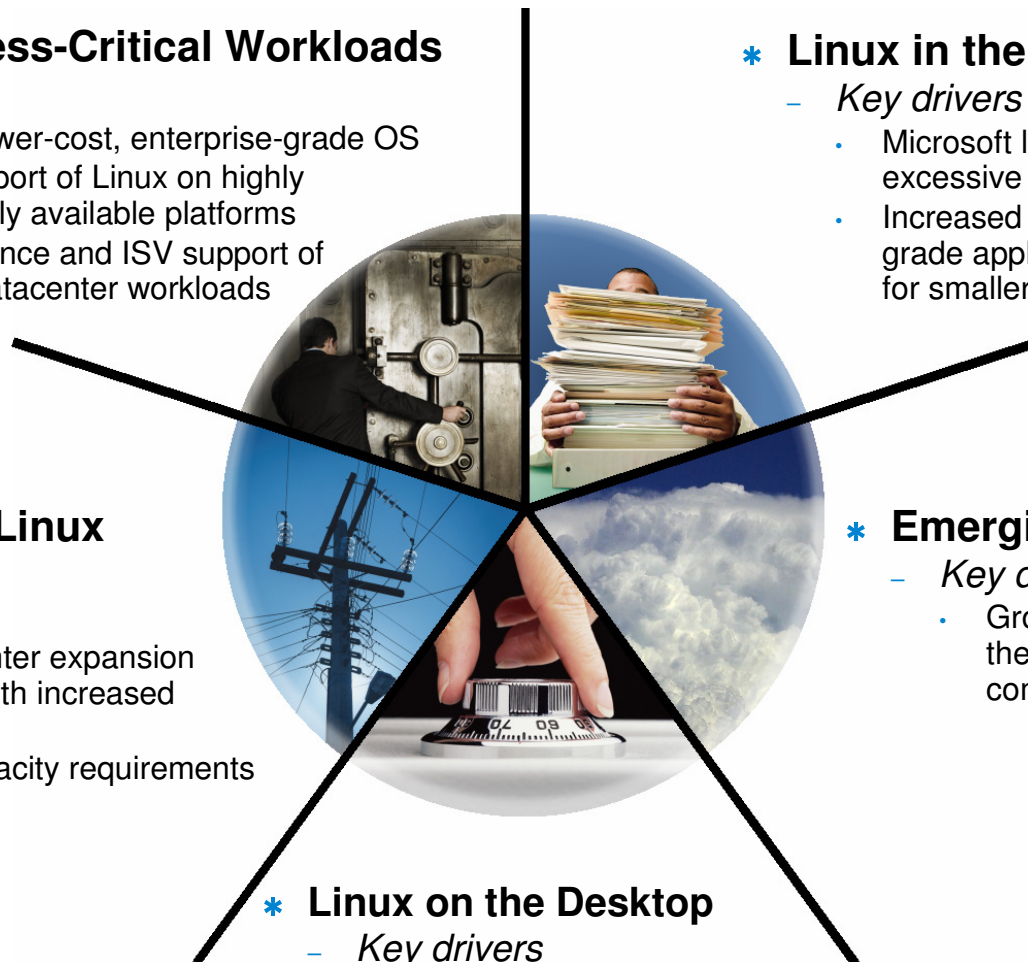
- *Key drivers*
 - Rising energy costs
 - Incremental datacenter expansion leading to sprawl, with increased management costs
 - Ever increasing capacity requirements

* 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 to reduce cost, manage risk, and improve service.

10 YEARS of Enterprise Linux on System z®

A Simple Idea That Changed the World





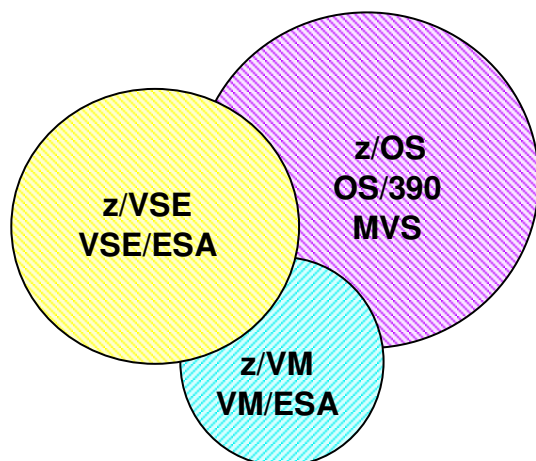
■ Agenda



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'

Operating Systems on IBM System z

Traditional Mainframe Operating Systems

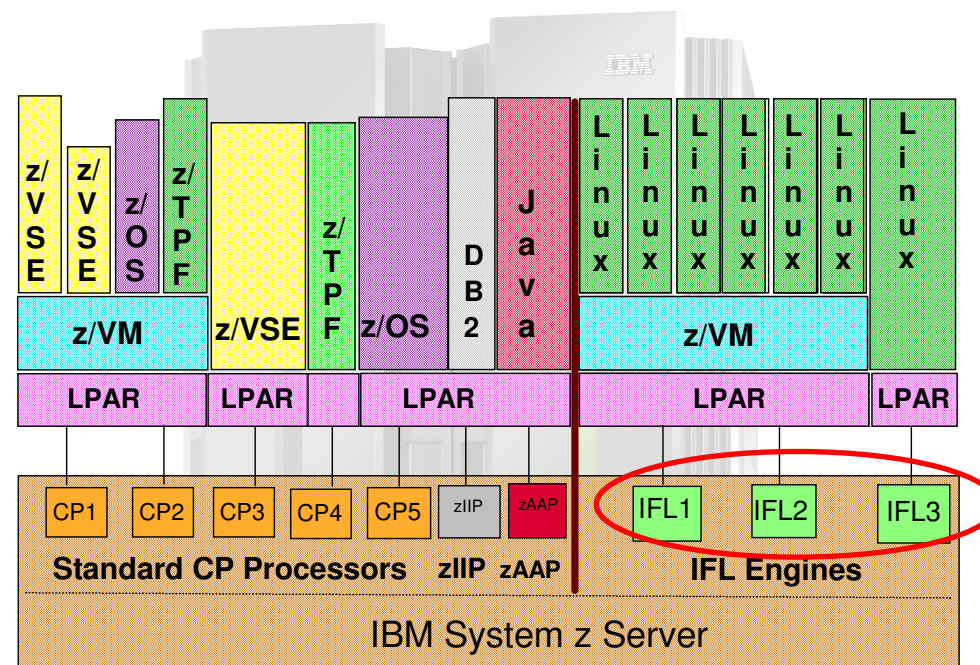


Standard Processors

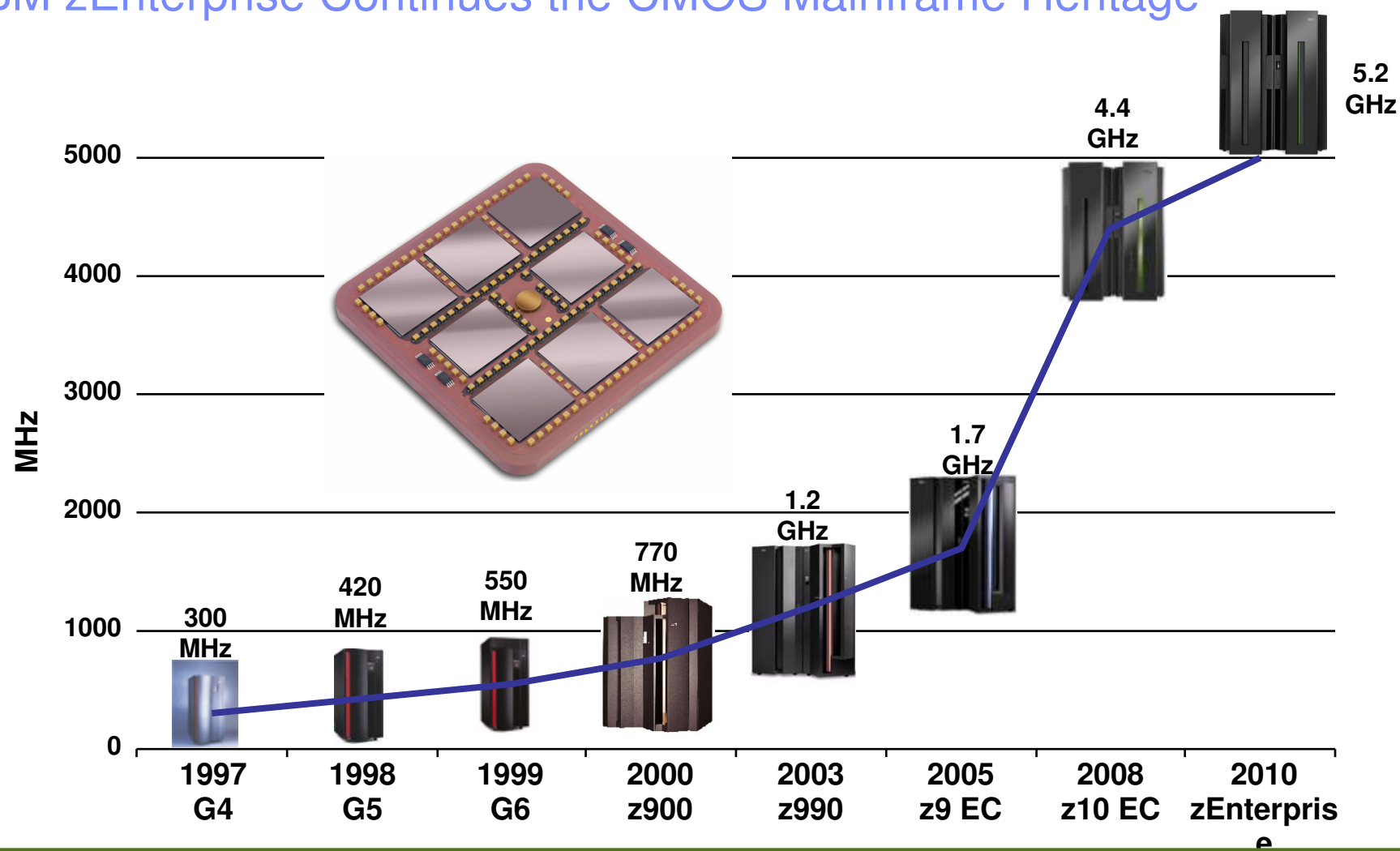
- CP
 - For z/OS, z/VSE, z/VM workloads

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



IBM zEnterprise Continues the CMOS Mainframe Heritage



- **G4** – 1st full-custom CMOS S/390®
- **G5** – IEEE-standard BFP; branch target prediction
- **G6** – Copper Technology (Cu BEOL)

- **z900** – Full 64-bit z/Architecture®
- **z990** – Superscalar CISC pipeline
- **z9 EC** – System level scaling

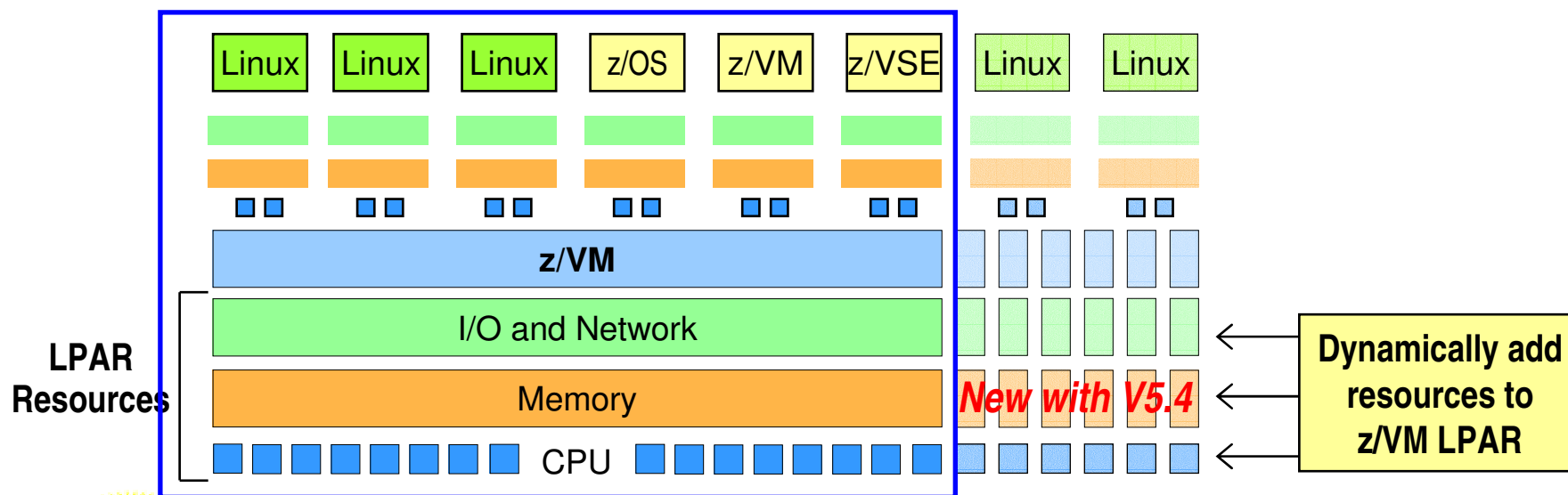
- **z10 EC** – Architectural extensions
- **zEnterprise** – Additional Architectural extensions

Virtualization – per Excellence

Virtualization for different workloads on the same layer

z/VM V5.4 and 6.1 Function Enhances System Availability

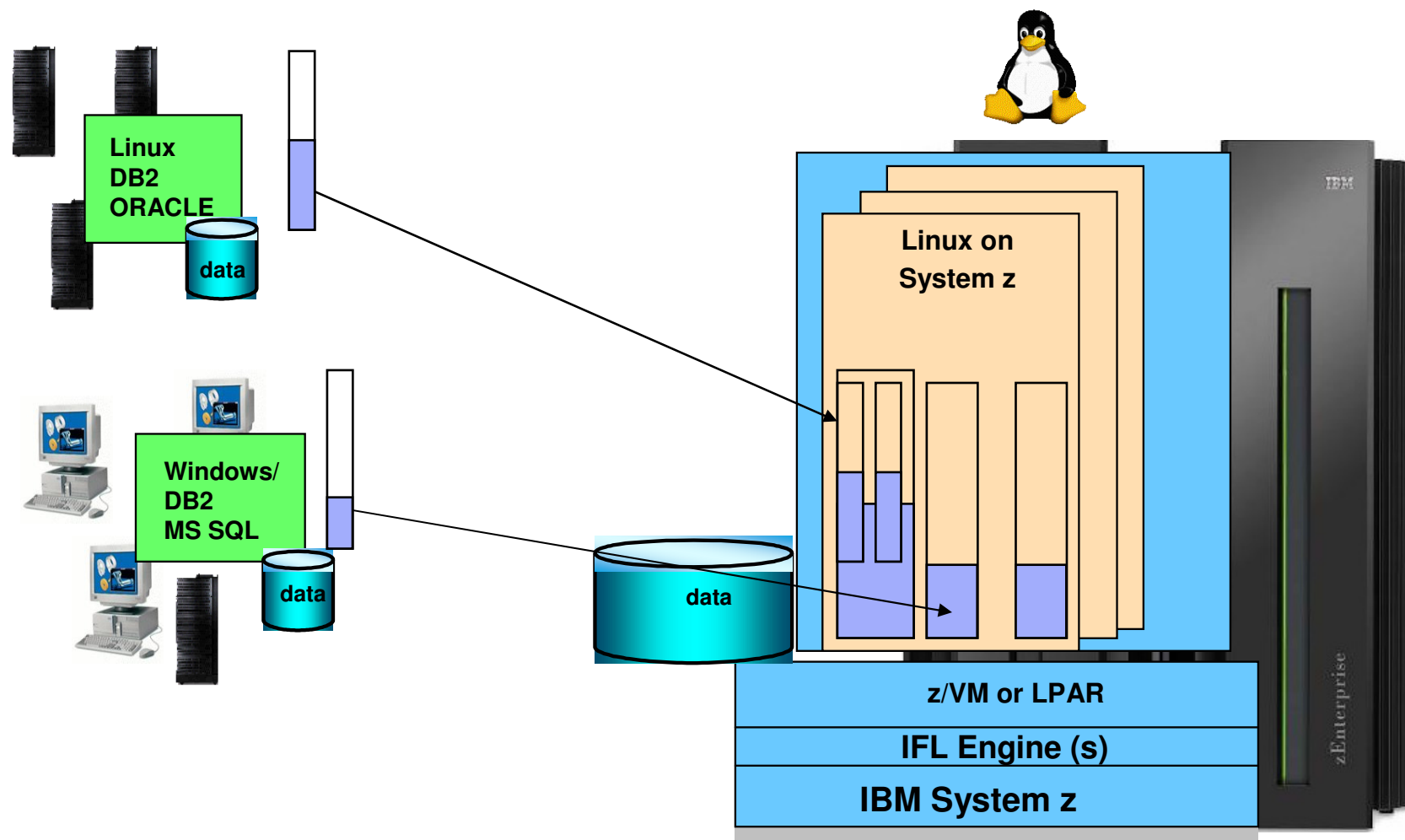
- **Users can non-disruptively add memory to a z/VM LPAR**
 - ▶ Additional memory can come from: a) unused available memory, b) concurrent memory upgrade, or c) an LPAR that can release memory
 - ▶ Memory *cannot* be non-disruptively removed from a z/VM LPAR
- **z/VM virtualizes this hardware support 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

Linux on System z as workload concentrator

Virtualize, Consolidate, Integrate



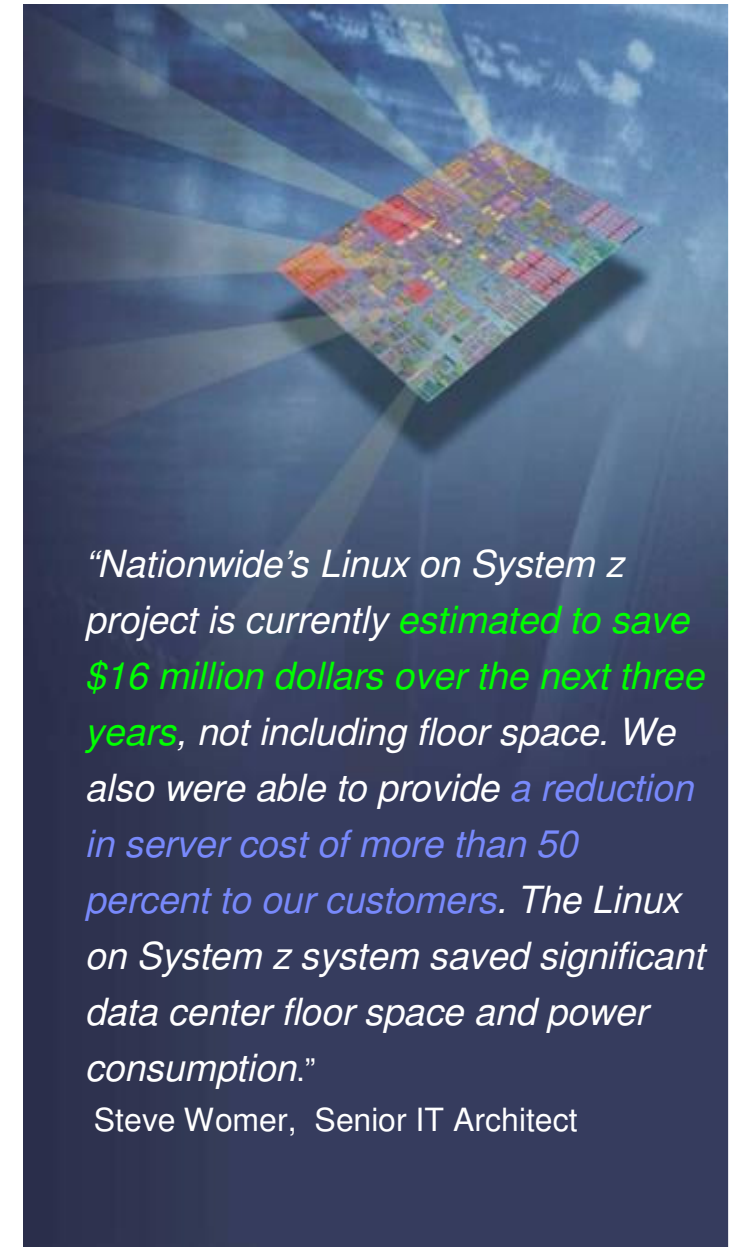


Nationwide®
On Your Side™

Key Benefits (Value Proposition)

- Expects to save \$16M over the next 3 years
- Initial phase consolidated 250+ Production, Development & Test servers to 6 IFLs
- Savings will be in cooling, maintenance, software and equipment costs
- Lower middleware and application software costs
- 50% reduction in monthly charges for Web infrastructure
- Dramatically improved server provisioning speed

IFLs reduced the space and power consumption by 80% vs. the alternative distributed server solution.

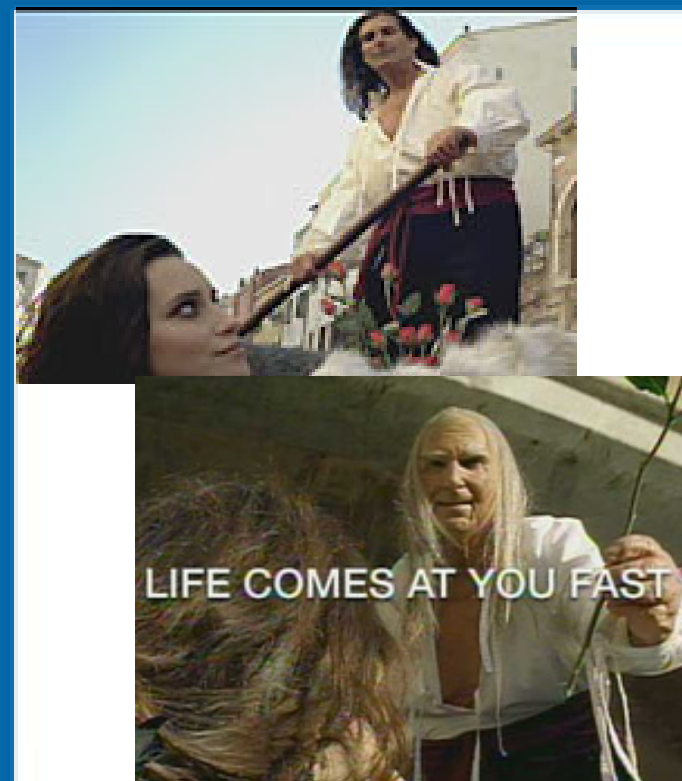


*“Nationwide’s Linux on System z project is currently **estimated to save \$16 million dollars over the next three years**, not including floor space. We also were able to provide a reduction in server cost of more than 50 percent to our customers. The Linux on System z system saved significant data center floor space and power consumption.”*

Steve Womer, Senior IT Architect

Upgrade Server “Hardware” on the fly

- Add IFLs and real memory to an LPAR non-disruptively.
 - Add virtual CPUs and virtual memory to a guest non-disruptively.
 - Create servers for a temporary project, then delete them when done.
- Nationwide.com runs on WebSphere on Linux for System z
 - Superbowl 2006 commercial -- anticipate 22X increase in traffic.
 - Rent 1 IFL for 2 weeks.
 - Test to anticipated load before superbowl.
 - Handle superbowl load for a few weeks.
 - After superbowl, returned the IFL.
 - Zero downtime during this process. Zero time spent acquiring/provisioning new servers. Zero time spent changing server configurations.



Nationwide®

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 end**
- 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*

Change to the solution based view !

<http://www-03.ibm.com/systems/z/solutions/editions/linux.html>

United States [change]

Home Solutions Services Products Support & downloads My IBM Welcome Mr. Wilhelm Mild [Not you?] [IBM Sign in]

IBM Systems > Mainframe servers > Solutions >

IBM System z Solution Edition for Enterprise Linux

z/Solution Editions

The primary goal of the System z Solution Edition for Enterprise Linux is to improve your return of investment (ROI) through server virtualization and workload consolidation on a single mainframe. At the same time, your infrastructure will evolve by standardizing on the platform that offers industry-leading virtualization, scalability, security, and reliability that your business needs.

The IBM System z platform has become well known for server virtualization and workload consolidating through its superior capabilities, thus providing the opportunity to minimize IT costs. The Linux environment on System z builds on the outstanding capabilities of the hardware technology and z/VM virtualization for optimal resource utilization, high flexibility, easy and fast provisioning, load-balancing and efficient systems management. System z is designed to run multiple and different workloads in parallel, providing a balanced system, internal networking, and unmatched levels of availability and security.

The *System z Solution Edition for Enterprise Linux* can add a set of Integrated Facility for Linux (IFL) processors, memory and I/O connectivity and z/VM virtualization software to an existing mainframe system. Flexible configurations are offered to extend your existing System z servers.

An *IBM Enterprise Linux Server* is offered as well, a standalone System z Linux server, equipped with IFLs, memory, I/O connections and the z/VM virtualization software.

Both solutions include 3 to 5 years hardware maintenance and 3 to 5 years subscription & support for the z/VM software.

Linux distribution partners Novell SUSE and Red Hat are partnering with IBM for the *Solution Edition for Enterprise Linux* and the *IBM Enterprise Linux Server*.

Please contact your IBM representative or IBM business partner to learn how this offering can help you standardize on a scalable, flexible virtual infrastructure to meet the requirements of your business.

Learn more

This new Linux solution makes the System z platform a great alternative for your virtualization and consolidation of distributed workloads and new Linux deployments for maximizing the strength of your business.

[Download PDF \(120KB\)](#)

Smarter Systems for a Smarter Planet

Success on a smarter planet demands smarter systems.

→ [Discover optimized, integrated, proven systems for your business](#)

Enterprise Linux Server

Leading virtualization, massive scalability and high resiliency.

→ [Learn more](#)

Linux on System z

Get to market faster with the advantages and flexibility of Linux and System z.

→ [Learn more](#)

In the news

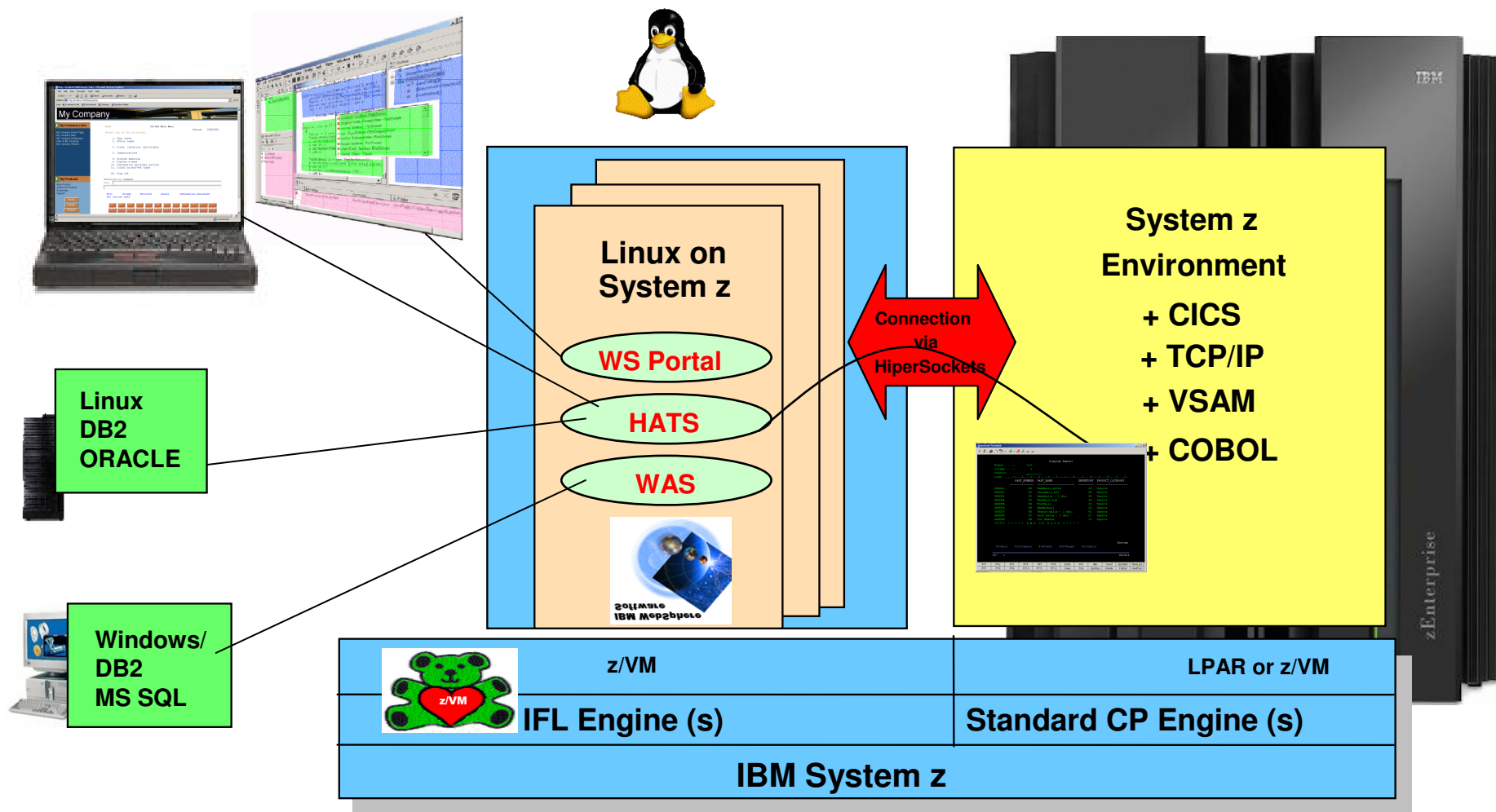


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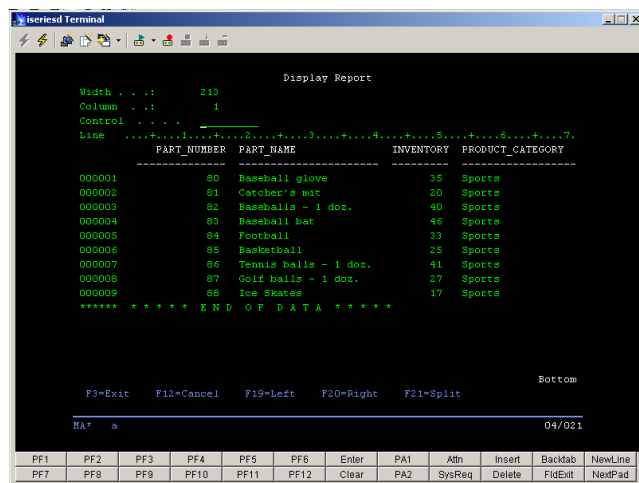
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Scenario 1: Linux on System z as Central Access Hub

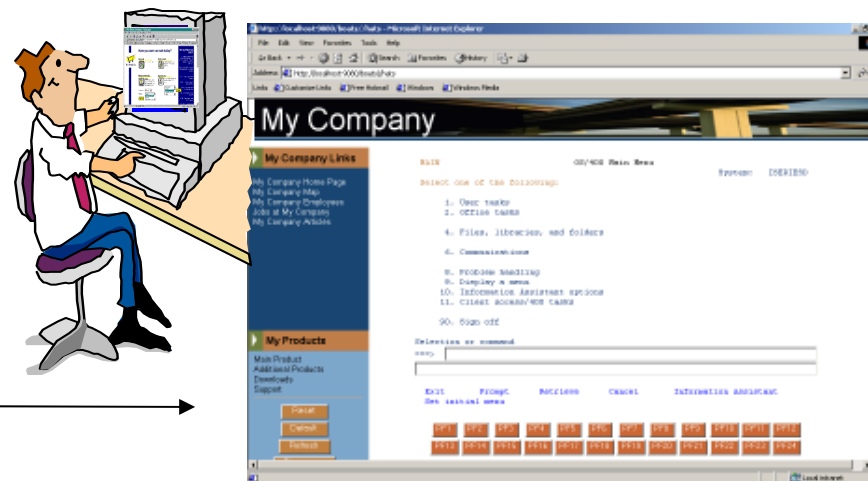
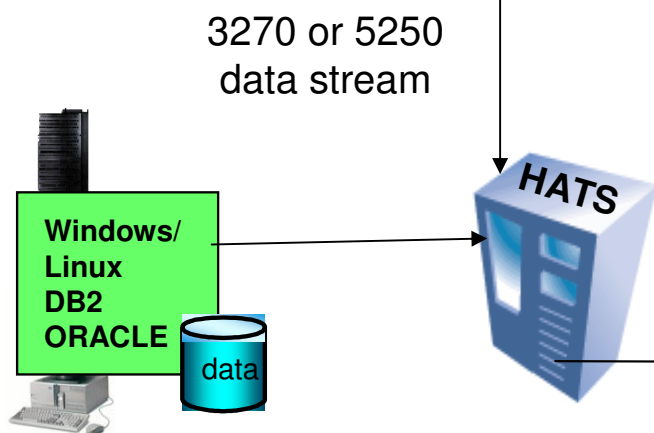
Web enable, improve interface, simplify, extend existing applications



Application Integration with Host Access Transformation Services (HATS)



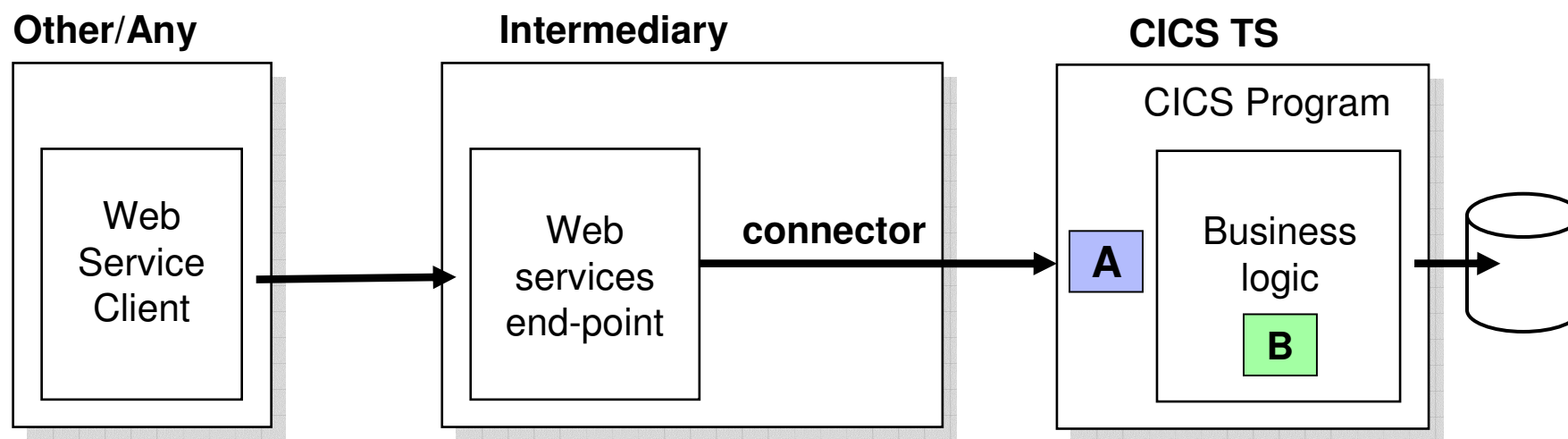
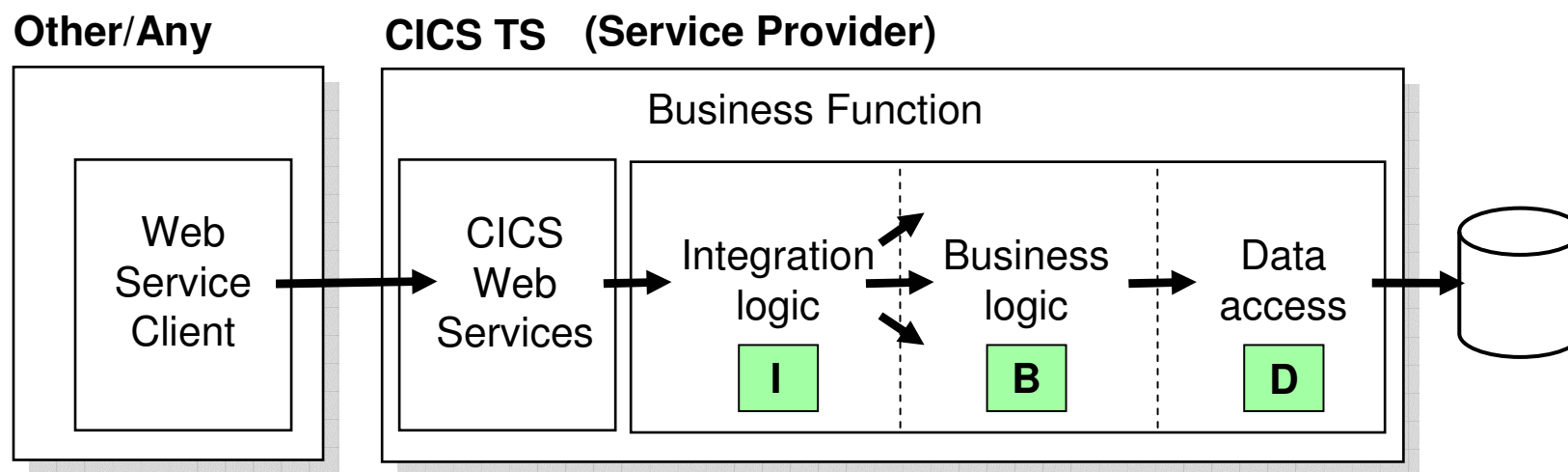
- No software download to the client
- Converts **green screens to Web GUI**
- **Integration with distributed applications**
- improves ease of use of host applications
- **Web Service** on the fly



Screen transformation rules running on WebSphere Application Server

HTML in a Browser

The Two Models of CICS Integration



Special Software offerings: WebSphere Application Servers and the Open Source Consolidation Package on System z10 BC Linux

WHAT IT IS: Package of products and services to consolidate open source application servers on System z10 BC running Linux, to lower TCO of hardware, software, and administrative costs

WebSphere Application Server Community Edition with Elite Support Offering
WebSphere Virtual Enterprise
WebSphere Application Server

A new Java EE application server built on open source Apache Geronimo technology and optimized for z10 virtualization capabilities



**Small Software
Foot Print**
(~60MB download)



**Java EE 5
Compatible**



**No WAS CE
Upfront
Costs**



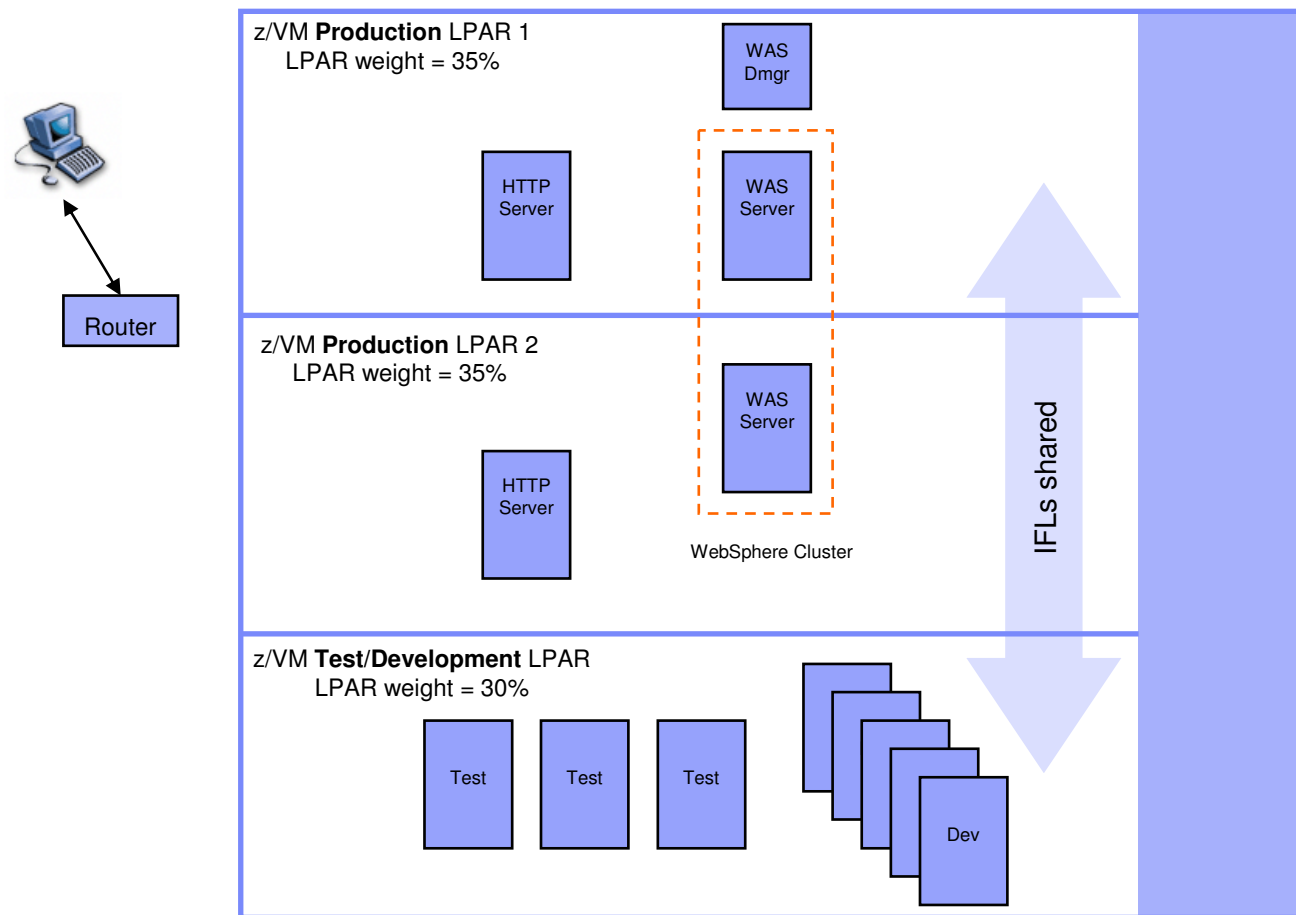
**World-class
Support Options**
(3 tiers)



The Apache Software Foundation
<http://www.apache.org/>

**Built on Apache technology - The
Gold Standard in Open Source**

Typical Recommended Solution on Linux on System z



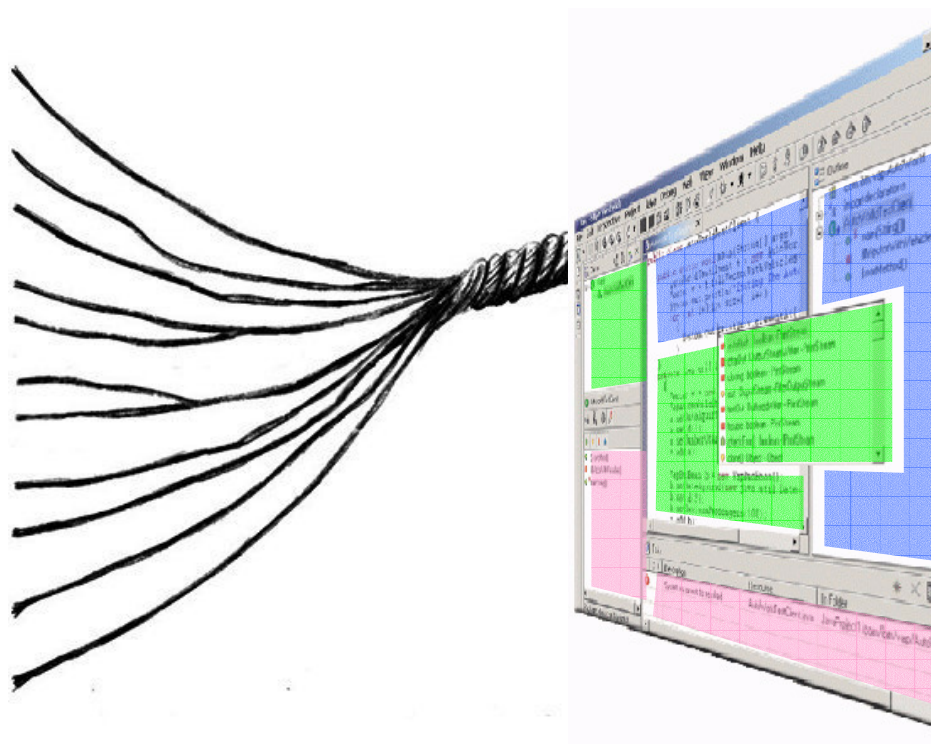
- All Linux virtual servers draw from a common pool of memory and IFLs.
- Resources from a failed server flow to surviving servers
- Small application clusters (Just enough nodes for failover)
- Smaller cluster reduces failure points
- Two LPARs run production workload.
- Applications run in clusters split between the prod LPARs.

Each blue box is a virtual Linux server.

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



Benefits with Linux on System z

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

State Court....

serves timely information to protect public safety with IBM WebSphere Software

Business Challenge

- State Supreme Court needed centralized system to provide magistrates and other agencies with up-to-date and around-the-clock access to offender information

Solution

- **Online system for processing offenders and reviewing records of previous arrests**
- **WebSphere Application Server on the mainframe fields queries from users and retrieves information from a new centralized database of offenders across the state**

Benefits

- Improved public safety through more informed magistrate decisions and better ability to track and identify suspects across the state
- Increased productivity among court staff
- Reduced application development time




Customer Quote

“WebSphere Application Server scales quickly and easily while also supporting the Java-based applications that represent our future direction. It gives us the foundation we need for new applications and services to come.”

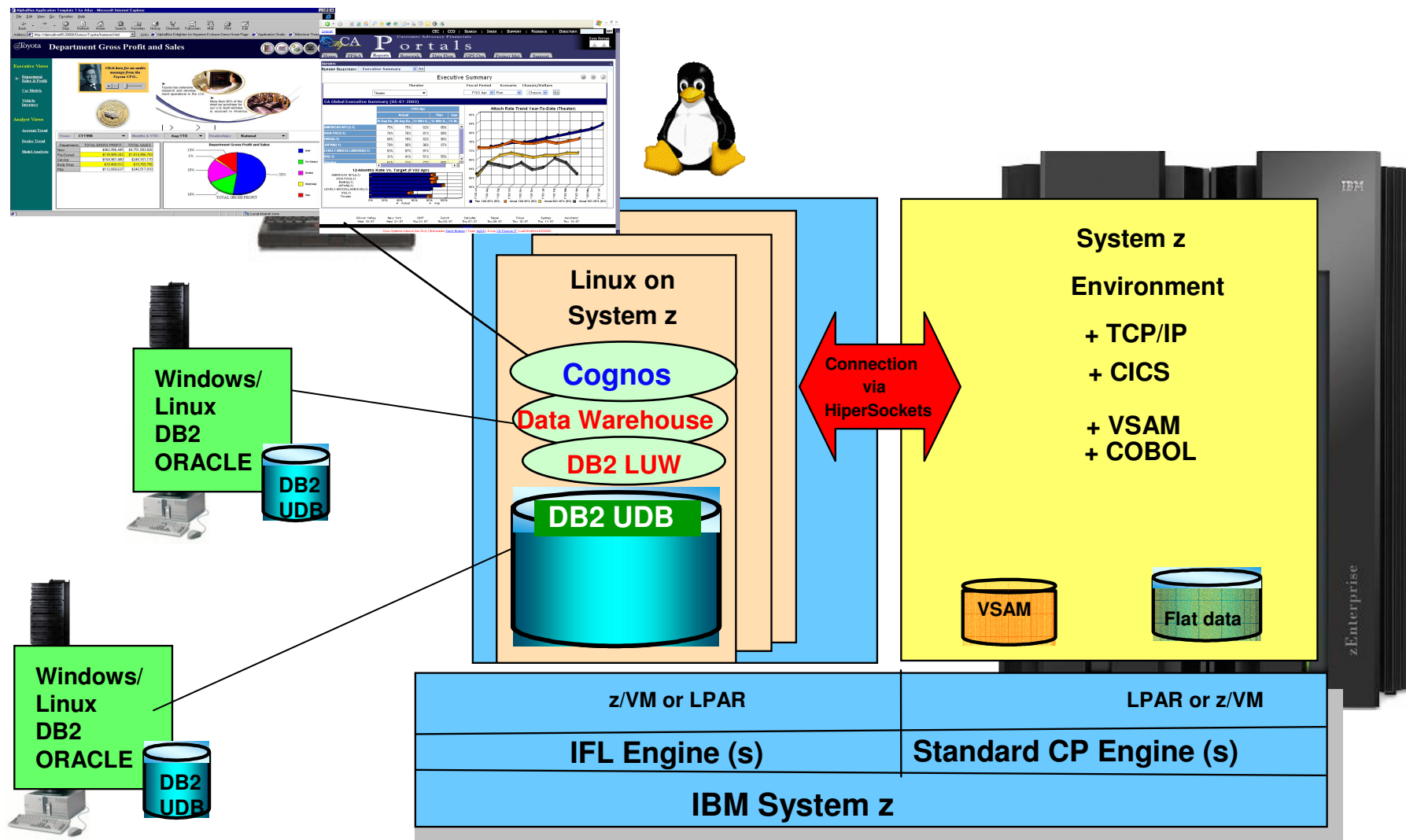


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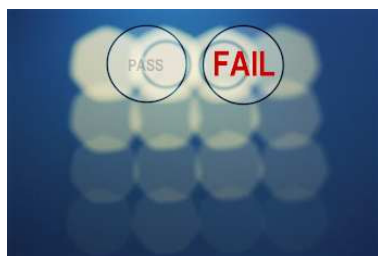
Scenario 2: Linux on System z as data hub

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



Bad Data Can be Costly

83% of data integration projects either overrun or fail



Scrap and rework
Increased costs



Lack of consumer confidence

Inaccurate or incomplete data is a leading cause of failure in business-intelligence and CRM projects



Lost opportunities

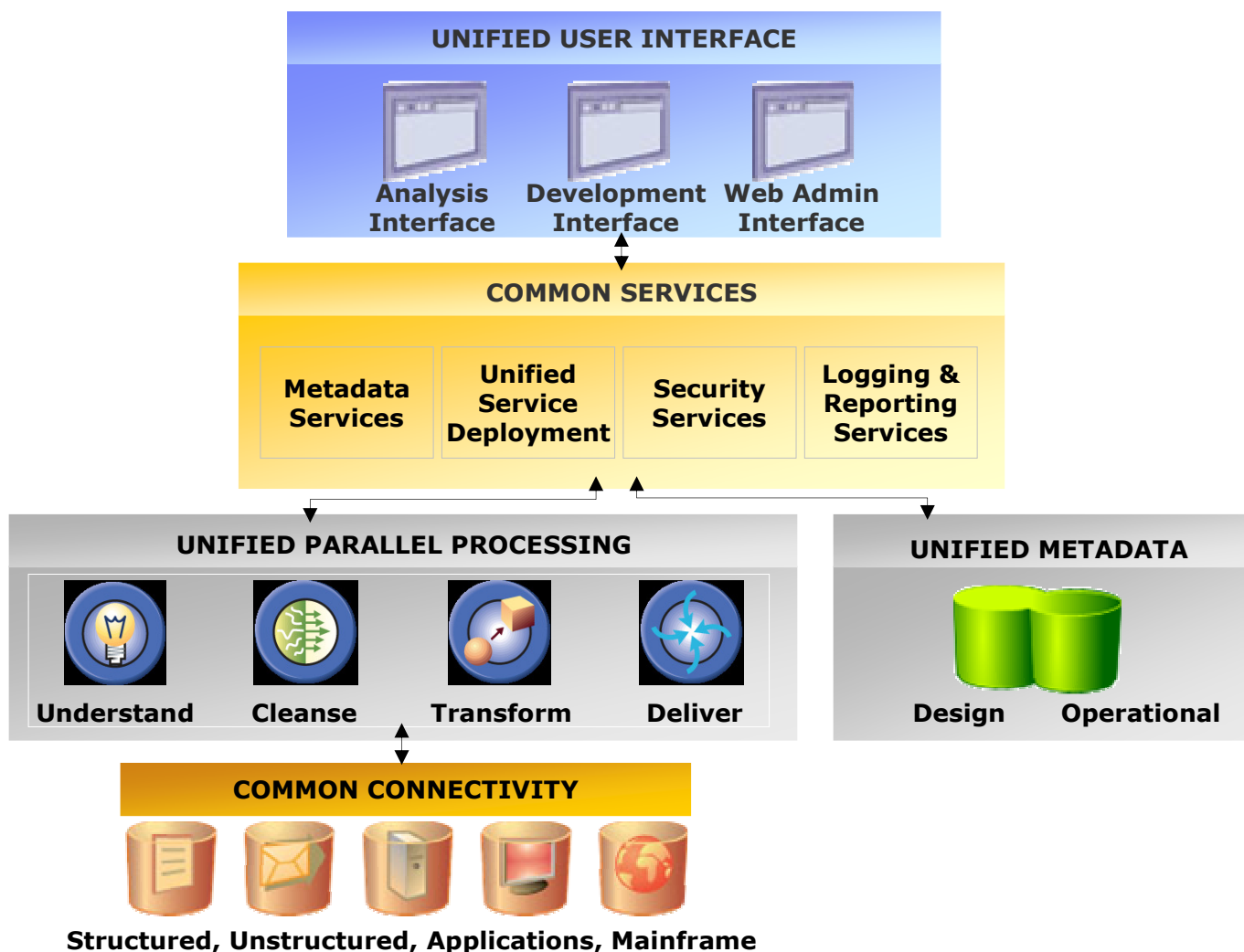
Low data quality costs companies \$611 billion annually

25% of time is spent clarifying bad data

Undetected defects will cost 10 to 100 times as much to fix upstream

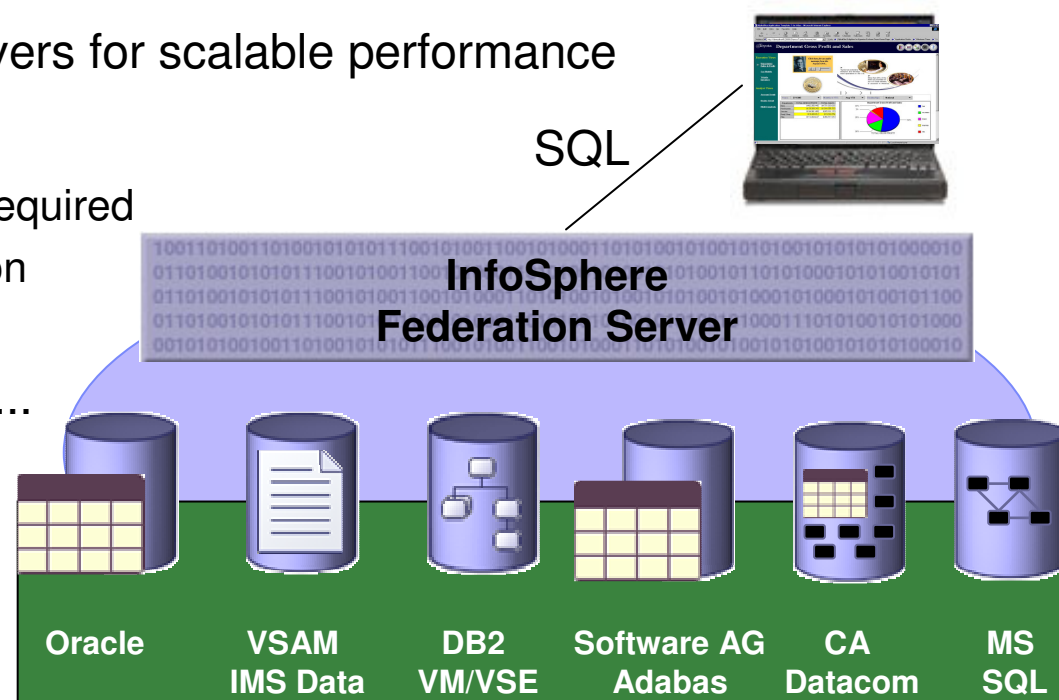
InfoSphere Information Server for Linux on System z

Operational Platform Architecture

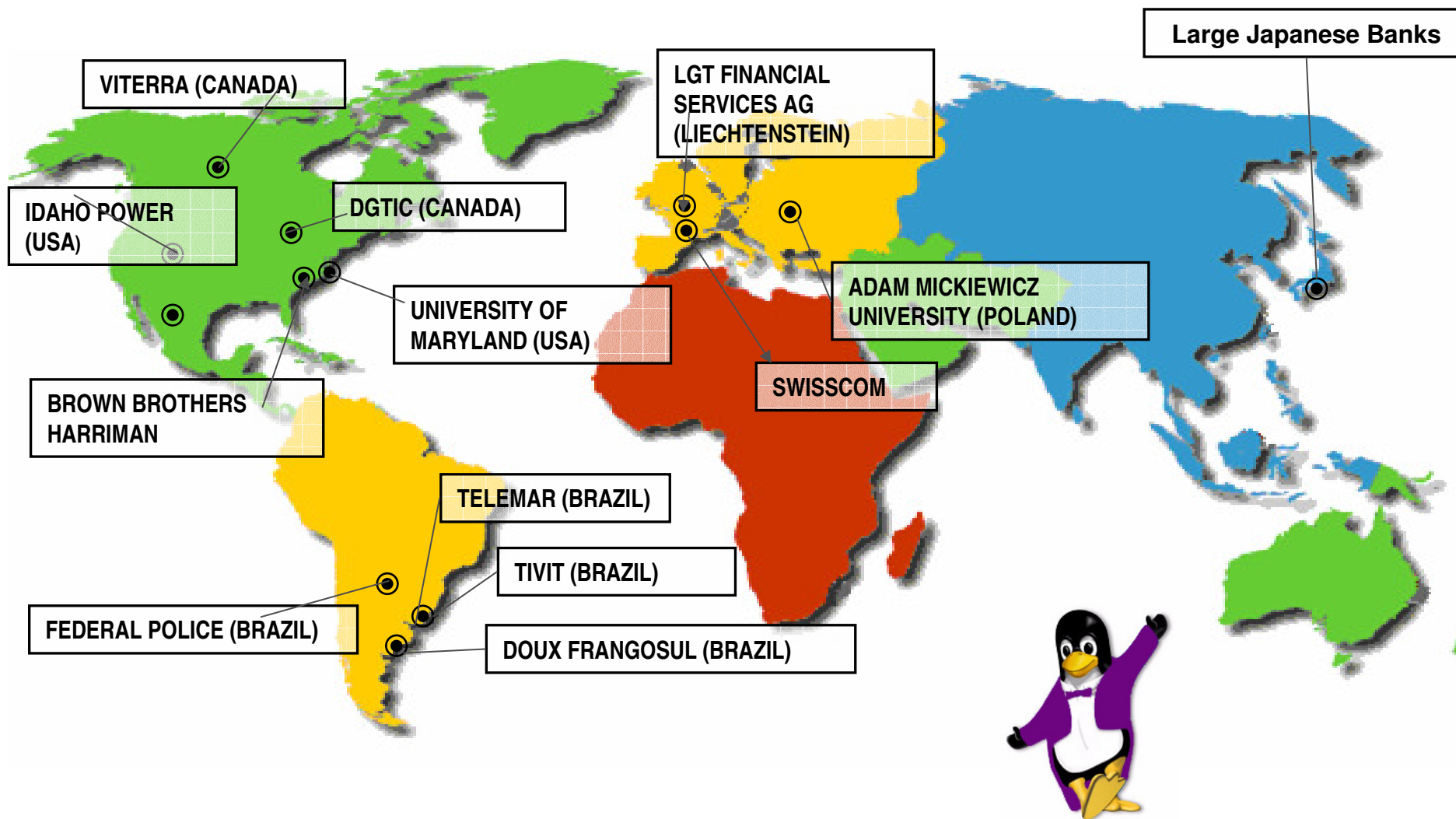


InfoSphere Federation Server on Linux on System z

- 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 mainframe VSAM data and flat files
 - 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



Sample of Customers Who Have Chosen *IBM System z running Linux with Oracle Database*



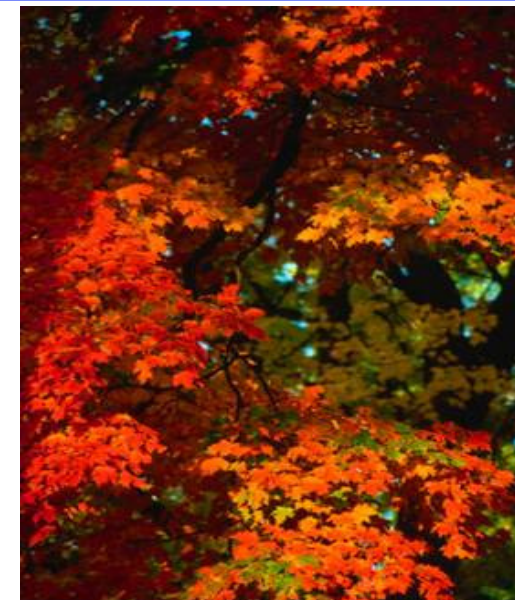
Benefits with Linux on System z

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

Province of Québec, Canada

Improves citizens' services while saving money and improving operation

- **Government of the province of Québec, Canada**
 - Relies heavily on large Web-based application environment to serve the needs of its citizens
 - DGTI (Direction generale des technologie de l'information) supports applications and underlying infrastructure
- **Situation:**
 - **Fast growth of applications and infrastructure (150+) distributed servers, staffing pressures**
- **Problems:**
 - Slow deployment of new applications, limited general manageability (including backup/recovery)
 - Rising software licensing costs, especially for the Oracle environment
- **Solution:**
 - IBM System z9™ Enterprise Class (z9 EC) was ideal choice: robust virtualization capabilities, proven high availability and ease of management
 - **Consolidated approximately 60 hard-to-manage distributed server environment (UNIX® servers) to single z9 EC server with 5 IFLs and 96GB of memory running SUSE Linux® Enterprise Server (SLES) operating system under z/VM®**
 - **80+ Oracle 9i and 10g database instances consolidated to the z9**
 - Consolidation from 60 servers down to 1 server resulted in significant reduction in Oracle licenses
 - Plan to move WebSphere Application Server and Domino instances as well



Results:

New application deployment time fell from several weeks to days
Saved CA\$1.2M (software licensing) & reduction in management cost
Drastic improvement in backup and recovery operations

Satyam

Achieving up to 88% faster response times

Business challenge:

Satyam has a strong presence in the IBM Cognos business intelligence space. **Its delivery of IBM Cognos software has been vital in helping its clients use information as a strategic asset for improved business performance and competitive advantage.** As its clients migrate business intelligence solutions to the IBM System z platform for outstanding performance and energy efficiency, Satyam sought to test performance of Cognos 8.3 BI for Linux on System z.

Solution:

Through the IBM Beta Testing Program for **Cognos 8.3 BI for Linux on System z, Satyam confirmed the seamless integration with IBM DB2 and IBM WebSphere Application Server software**; easy migration to the System z platform; exceptional application performance; and robust scalability. Staff found that often report response times on the System z platform were between 15% and 88% faster giving clients rapid access to business information through a single, real-time consolidated view.

Benefits:

- Better performance and throughput for up to an 88% decrease in report response times
- Gains a competitive edge through delivery of a proven and tested business intelligence environment
- Enables more effective decision making through a single, real-time and consolidated view of business information

“IBM Cognos 8 BI for Linux on System z is a powerful business intelligence solution on a mainframe platform which addresses all important parameters related to performance and scalability. This provides a single, real-time and consolidated view of business information to support operational processes and disperse information to the right teams across the company for more effective decision making.”

— Hemant Kulkarni, Head, BI Technology CoE, Satyam

Solution components:

- IBM Cognos® 8.3 BI for Linux® on System z™
- IBM DB2® 9.5
- IBM System z9® Business Class
- IBM WebSphere® Application Server 6.1




Business Transformation. Together.

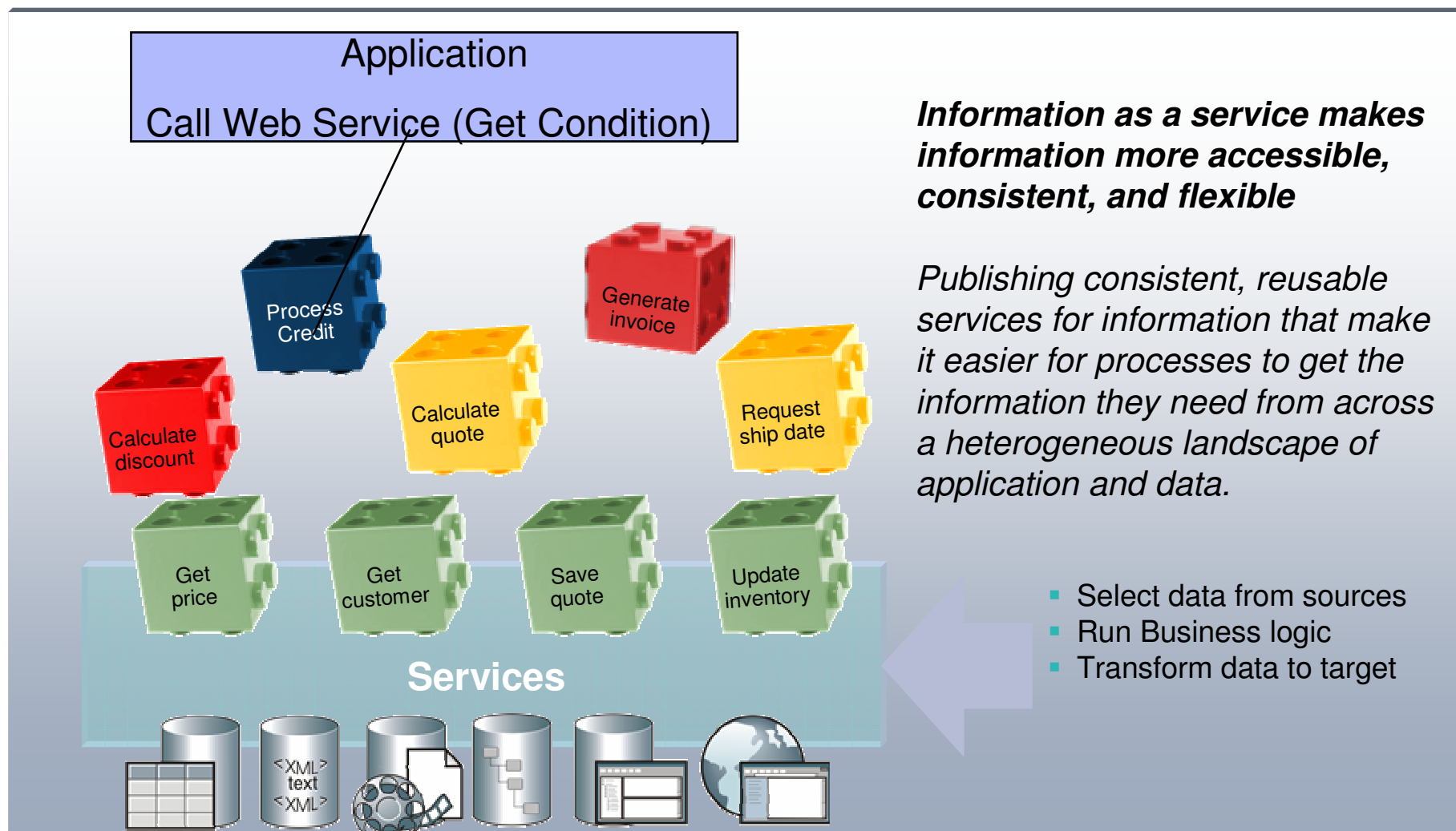
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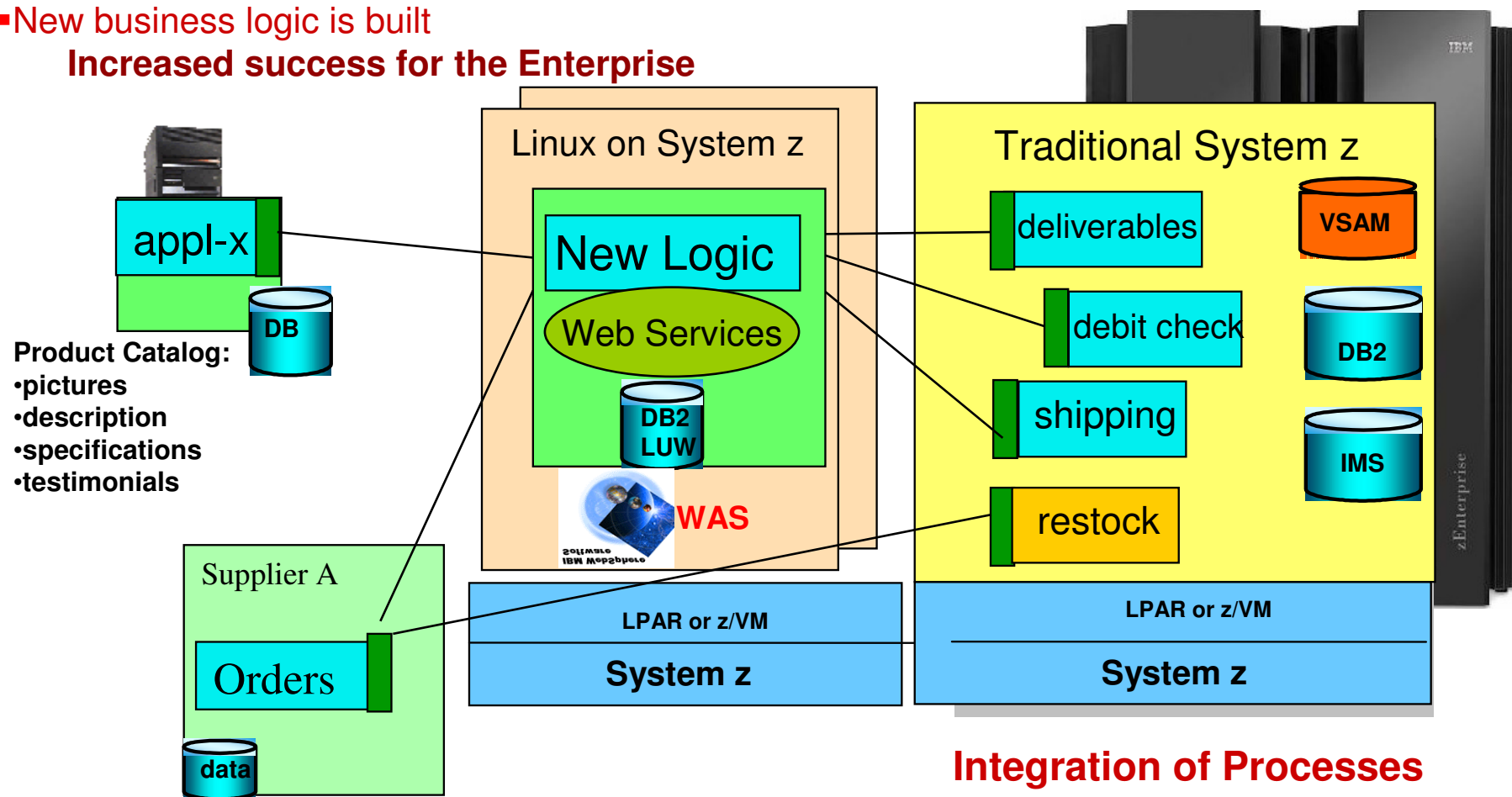
SOA evolution - Integrating Logic across platforms



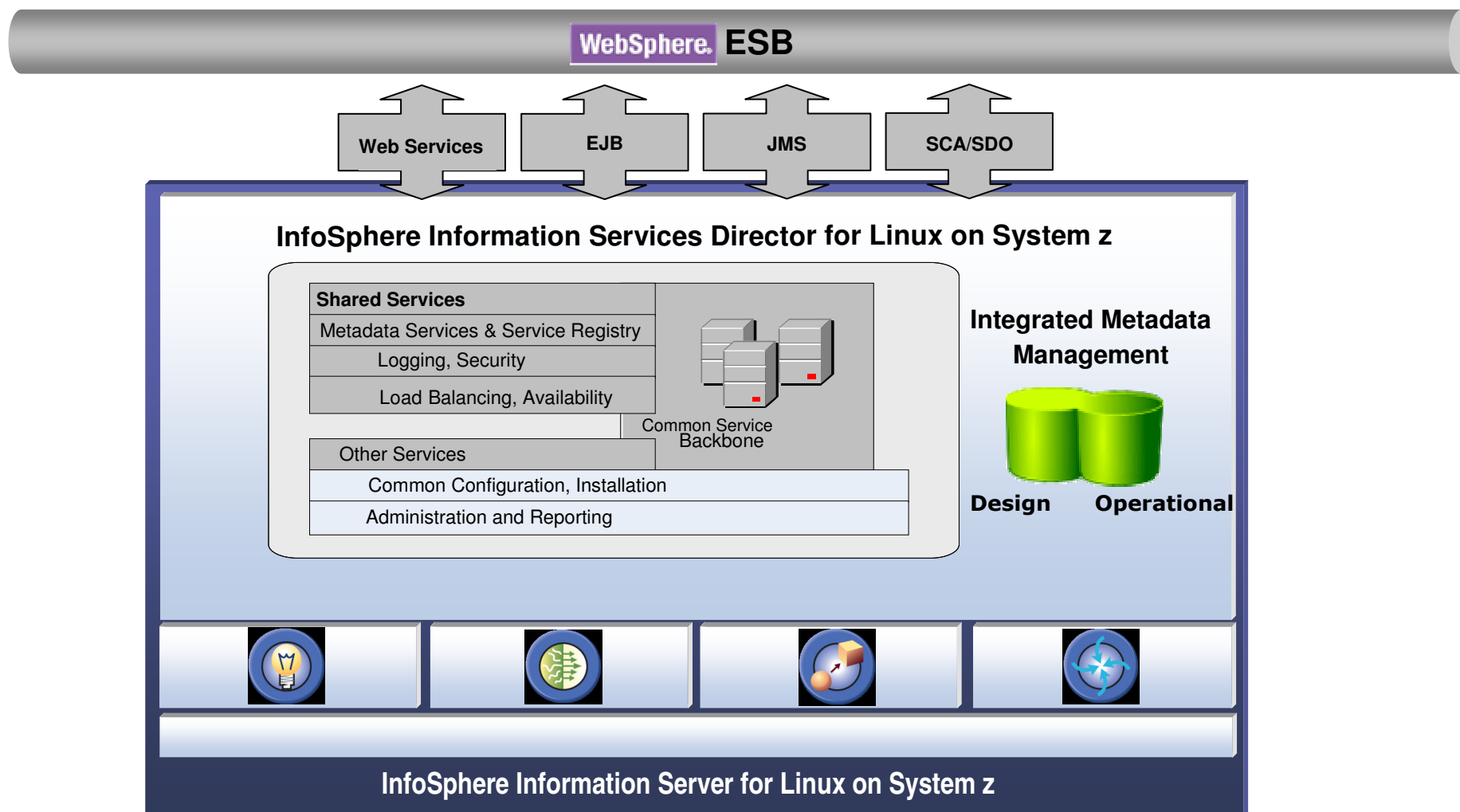
Service Oriented Architecture (SOA) – the way to new applications and processes

- 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



Common Programming Model



Benefits with Linux on System z

- High Scalability and effective Hub for applications
- Use of Standard SOA architecture and interfaces
- Very good possibility 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

St. George Bank

Saves \$15M USD through re-use of key business functions with SOA

Business Need

- Growth by acquisition of several regional banks
- Integrate multiple applications with disparate back-end systems

Solution

- *Service oriented architecture that re-uses business functions and loosely couples them to back-end systems with IBM messaging middleware*

Benefits

- Significant improvement in customer satisfaction
- Ability to present customized bundled offerings to cross-sell and drive more revenue.

"In our messaging layer, we have 200 services, which have completely opened up the core systems that the bank runs. And within those 200 services, we get 47% re-use. Some of them are used two or three times and some of them are being re-used up to 10 or 12 times. "


Greg Booker, Head of Group Architecture



"We no longer want to invest the time and resources in two or three year initiatives. Business is changing so fast these days that we can't afford to roll something in production that represents the thinking of three years ago."



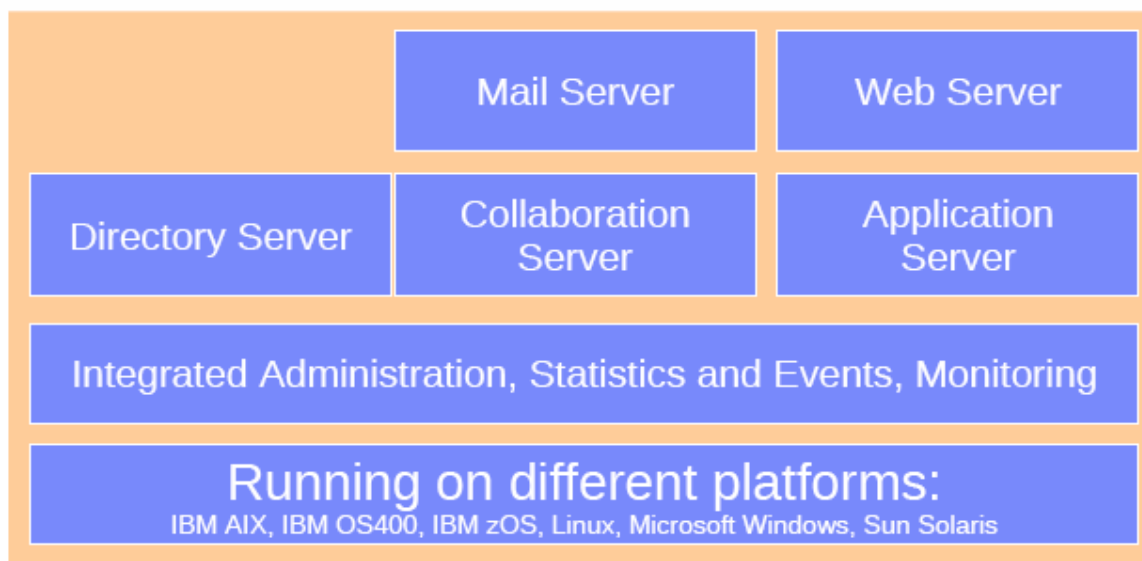
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Lotus Domino – more than just Mail server



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



Development Tools



High Availability of Lotus Domino

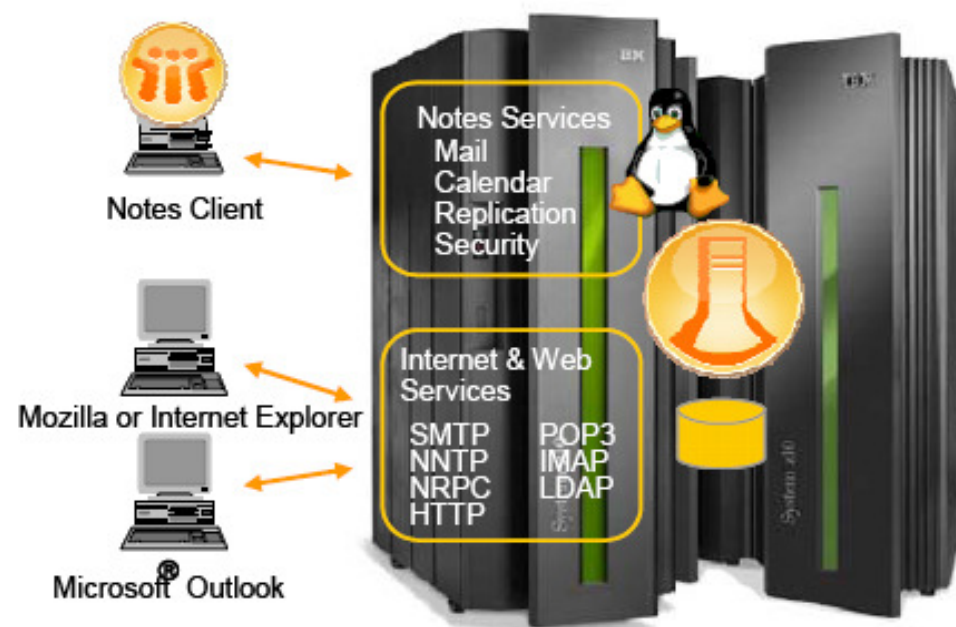
Domino Clustering

- 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

Linux on System z as Mail and Collaboration Hub

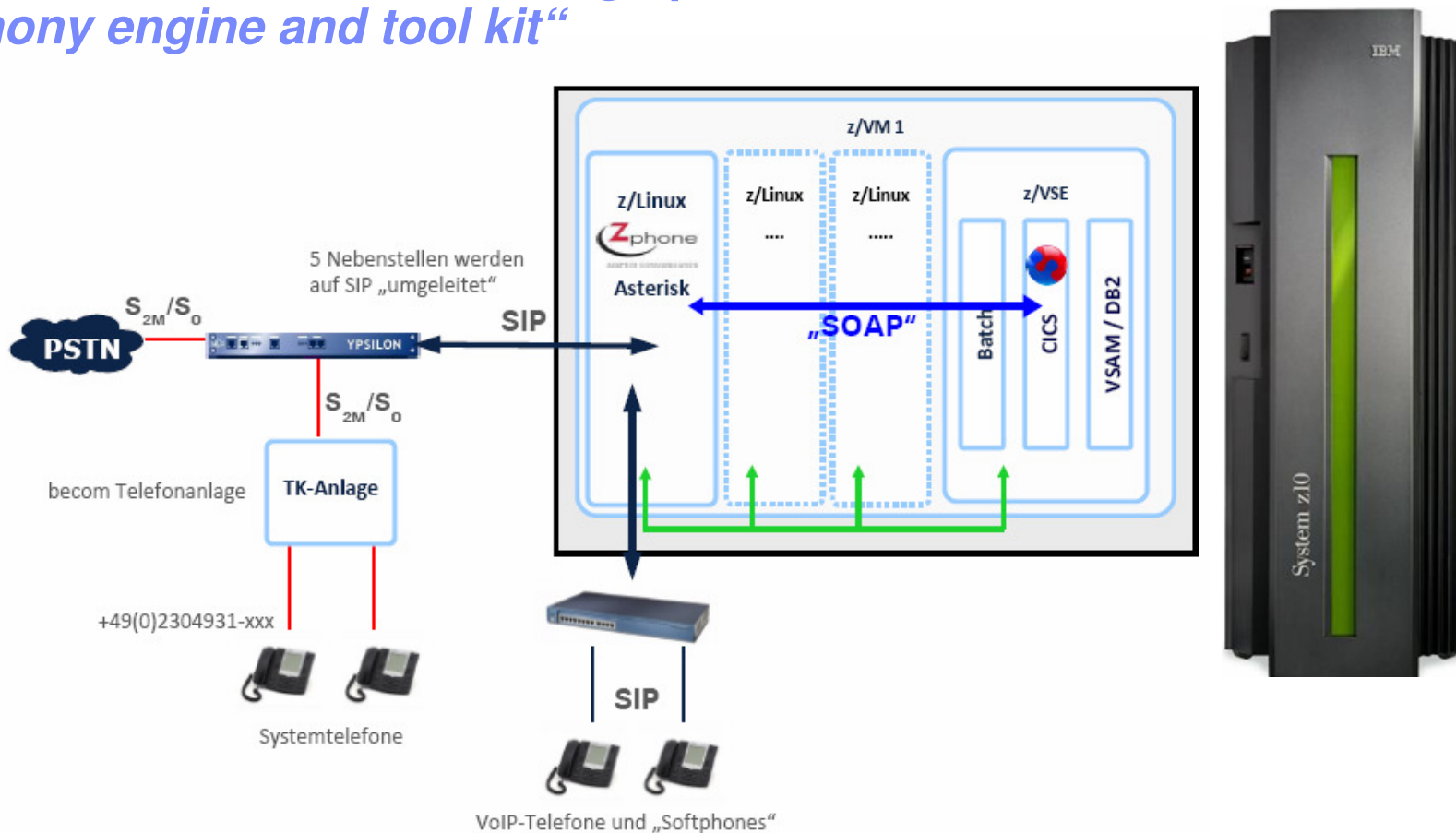
▪ Mail

- Lotus Domino for Linux on System z
- ISV products such as :
 - Bynari,
- Open source products:
 - Exchange4Linux, Evolution, Kroupware, OpenGroupware, Postfix, sendmail
- Asterisk- manages telephone calls, mails



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>)

Benefits with Linux on System z

- High Scalability for Mail servers
- Very good possibility for integrated solutions
- System z integration with mailing applications using standard interfaces

Winnebago Industries

Slashing e-mail costs and administration time



Business challenge

One of the country's leading manufacturers of recreational vehicles, Winnebago Industries, **was using an outdated e-mail system.**

Winnebago needed to replace its e-mail system with one that could handle thousands of users.

Solution

Winnebago Industries chose a solution from Bynari, Inc., an IBM Advanced Business Partner, Insight Server on the Linux operating system running on the company's existing IBM System z™ mainframe.

Insight Server is a [Linux operating system-based e-mail solution that runs on all IBM platforms and can handle thousands of users](#). It includes anti-spam and anti-virus protection, backup and recovery software and a complete statistics tool to monitor performance.

Benefits

- Slashed e-mail serving costs by 80 percent
- Reduced e-mail management time by 50 percent
- Enjoyed nearly 100 percent email availability

“Winnebago Industries is a 24/7 shop so it's critical that their e-mail is up all the time — and that's where Linux really shines.”

*— Hyun Kim, President,
Bynari, Inc*



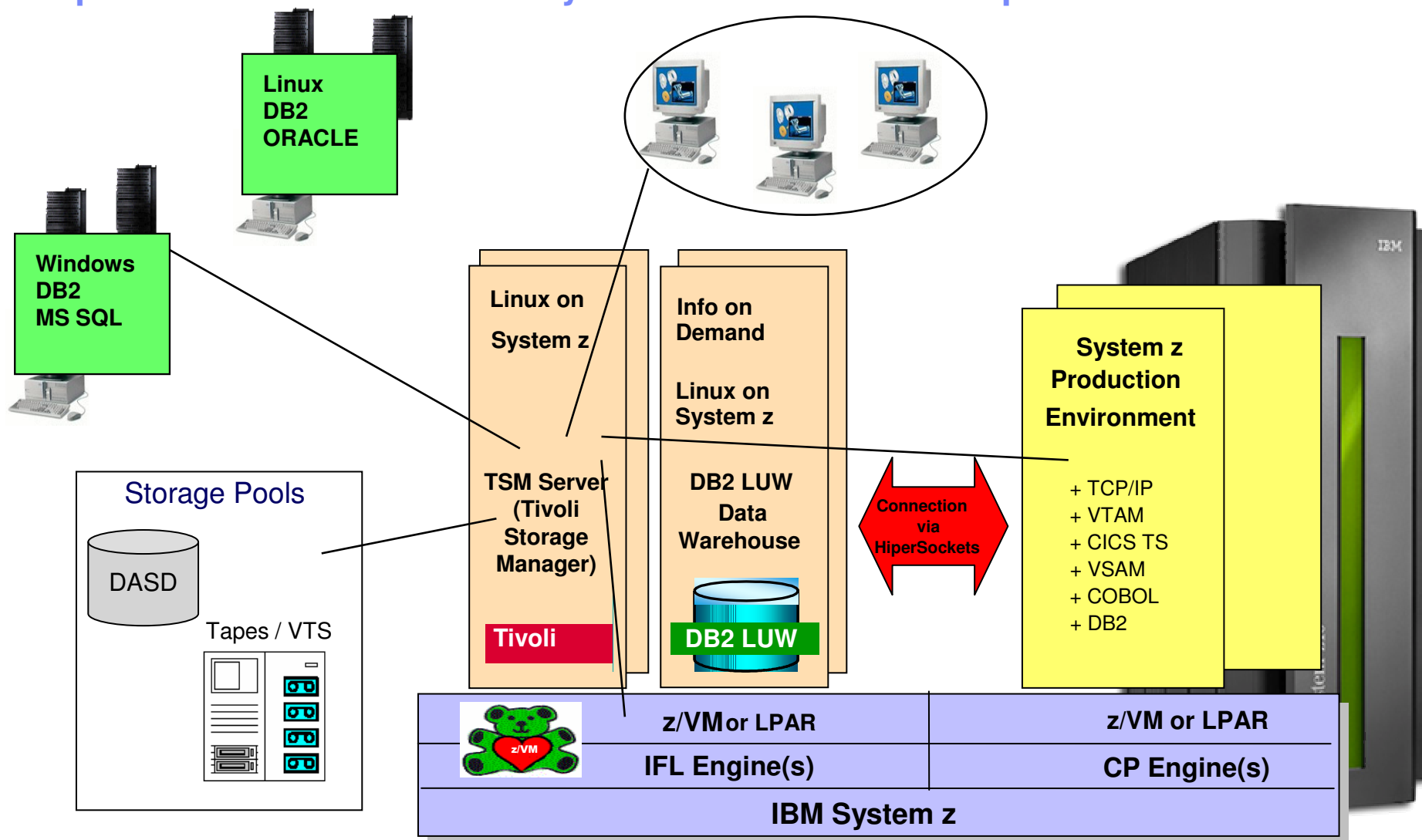


■ Agenda

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.

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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.

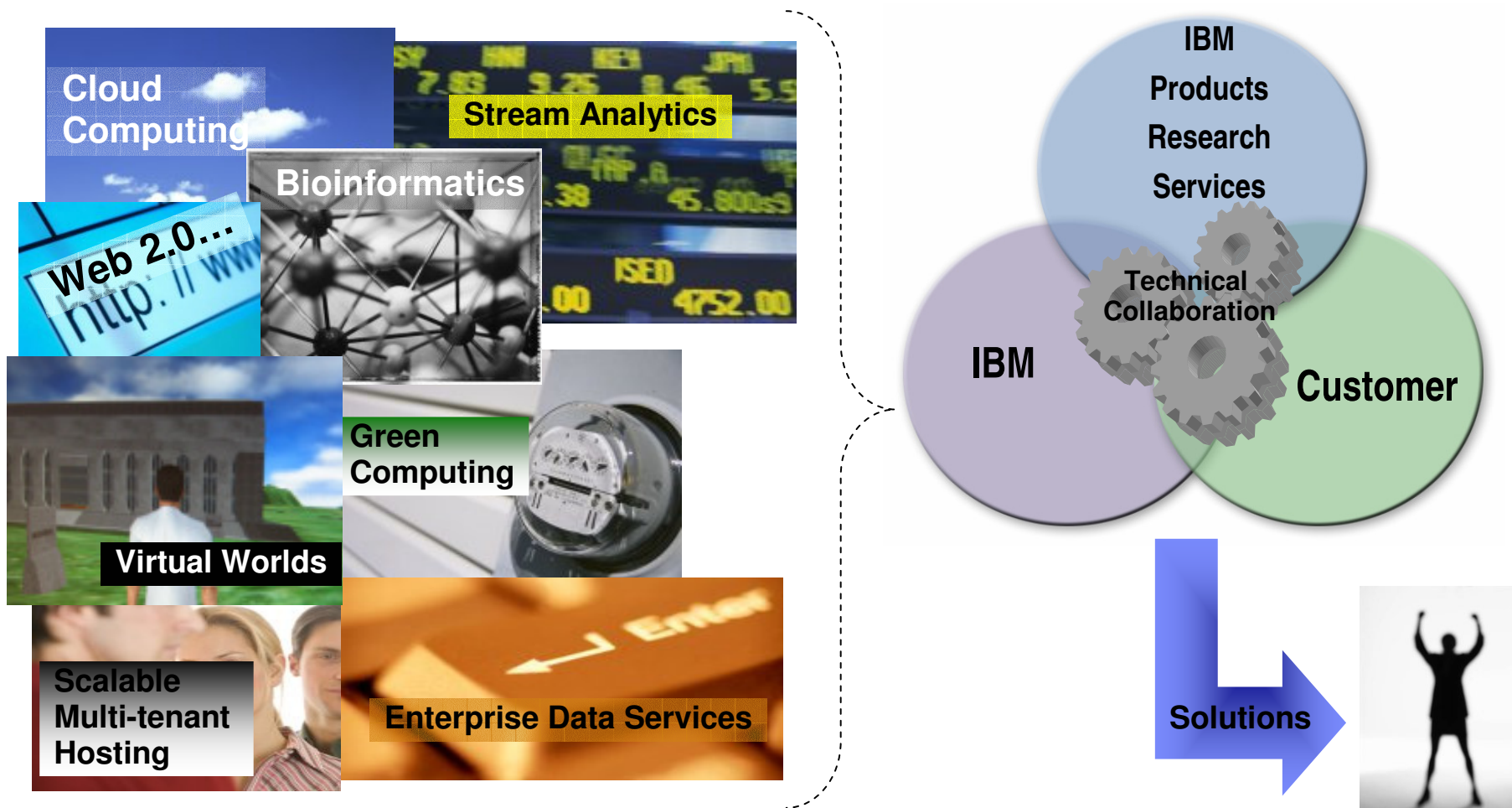
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Computer services

- [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.



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.**"*

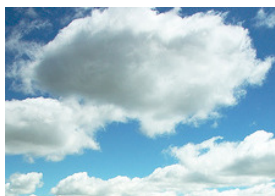
*"SUSE Linux Enterprise Server Priority Support for SAP gives us a **single point of contact** for our support issues."*

*"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*



Linux for Emerging Workloads: Enabling a smarter planet

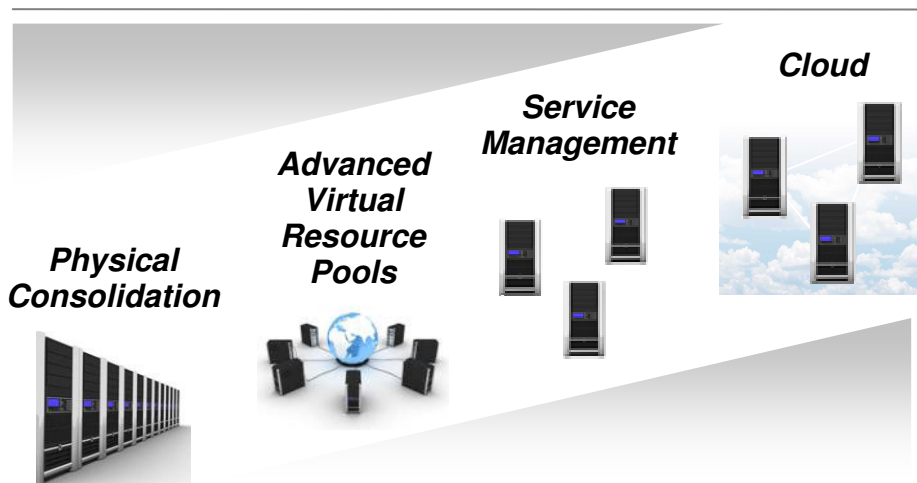


*** Providing innovative solutions to the complexity (and cost) problem**

- 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



<http://ibm.com/press/us/en/pressrelease/26642.wss>
<http://ibm.com/press/us/en/pressrelease/24482.wss>

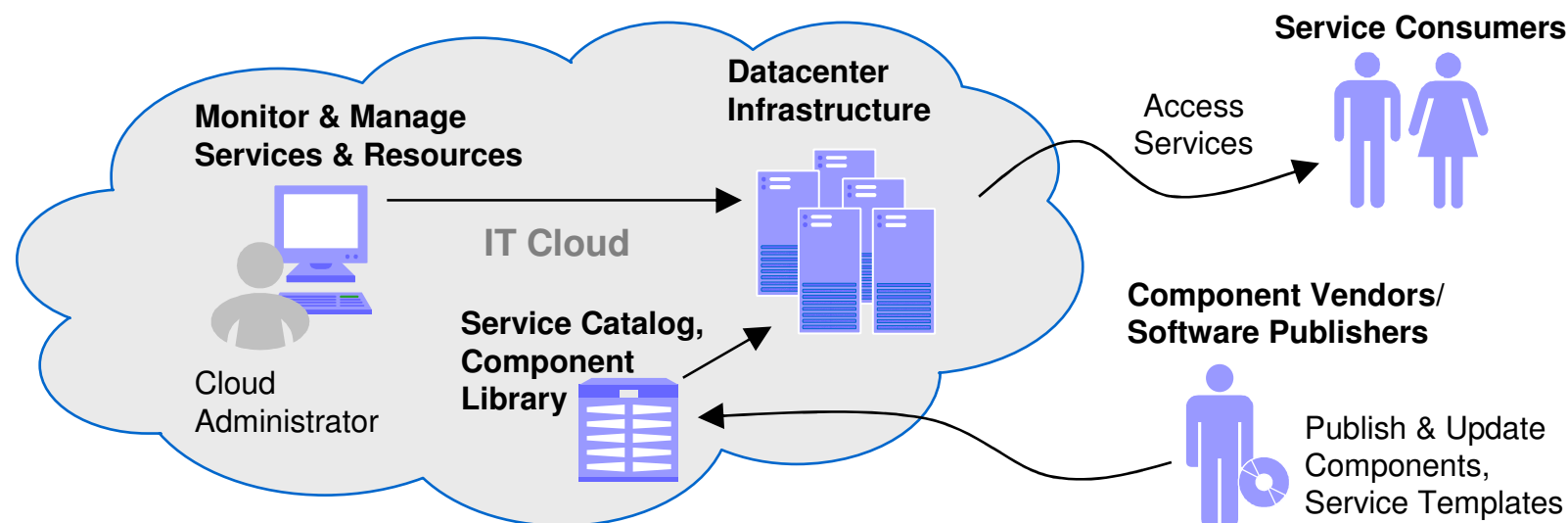
Linux perfect match: Cloud Computing

A user experience and a business model

- Cloud computing is an emerging style of IT delivery in which applications, data, and IT resources are **rapidly provisioned** and provided as **standardized offerings** to users over the web in a **flexible pricing model**.

An infrastructure management and services delivery methodology

- Cloud computing is a way of **managing** large numbers of highly **virtualized resources** such that, from a management perspective, they resemble a single large resource. This can then be used to deliver services with **elastic scaling**.

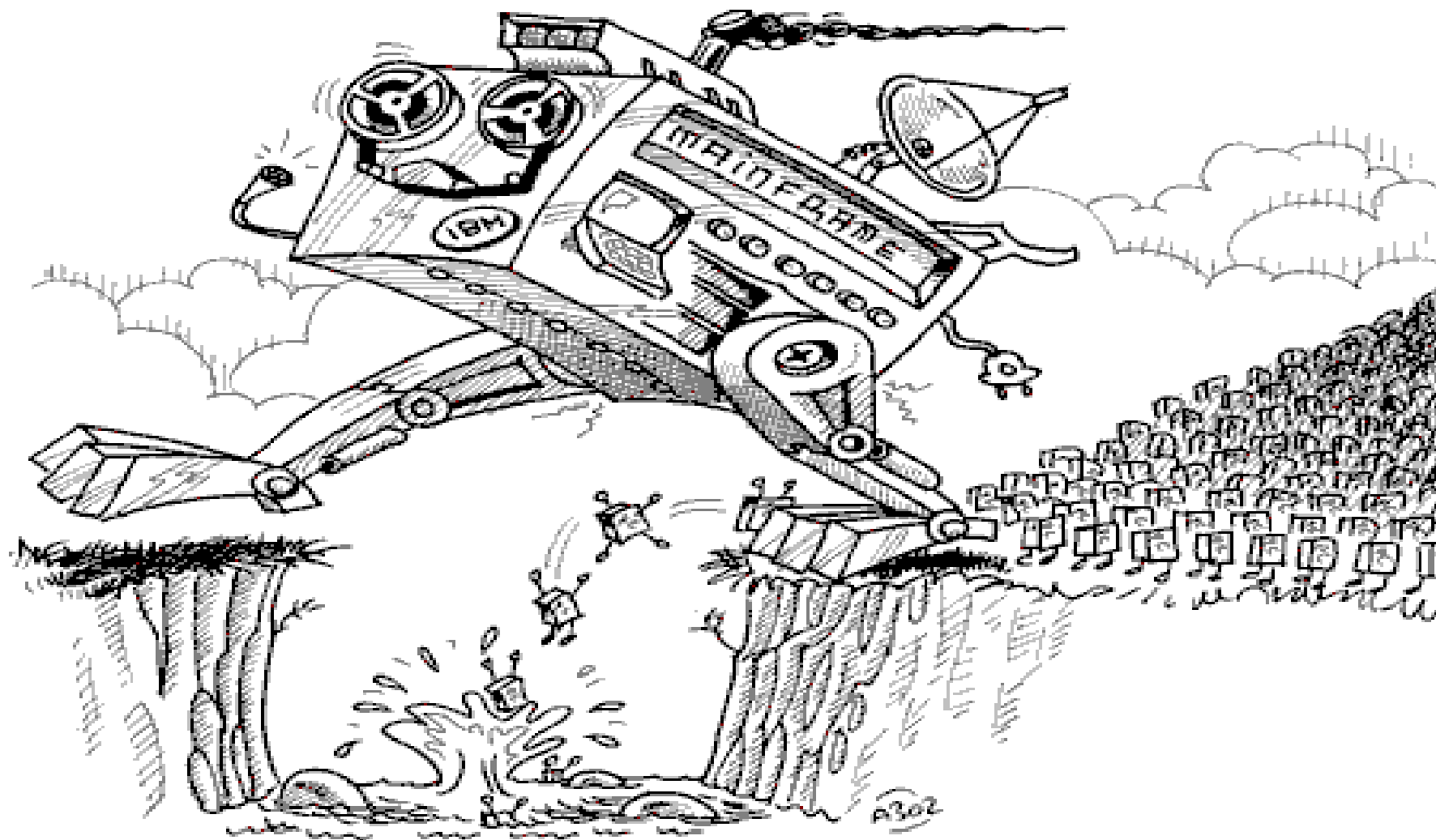


The Future runs on System z, the largest scalable server



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

Do you want to make bigger steps forward ?





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>

IBM Systems Consolidation Evaluation Tool:

<http://www-03.ibm.com/systems/migratetoibm/whyibm/campaigns/sconevalttool1.html>