Linux on System z als zentrale Schaltstelle

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THE *Open* GROUP

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Certified IT Architect

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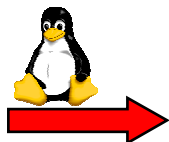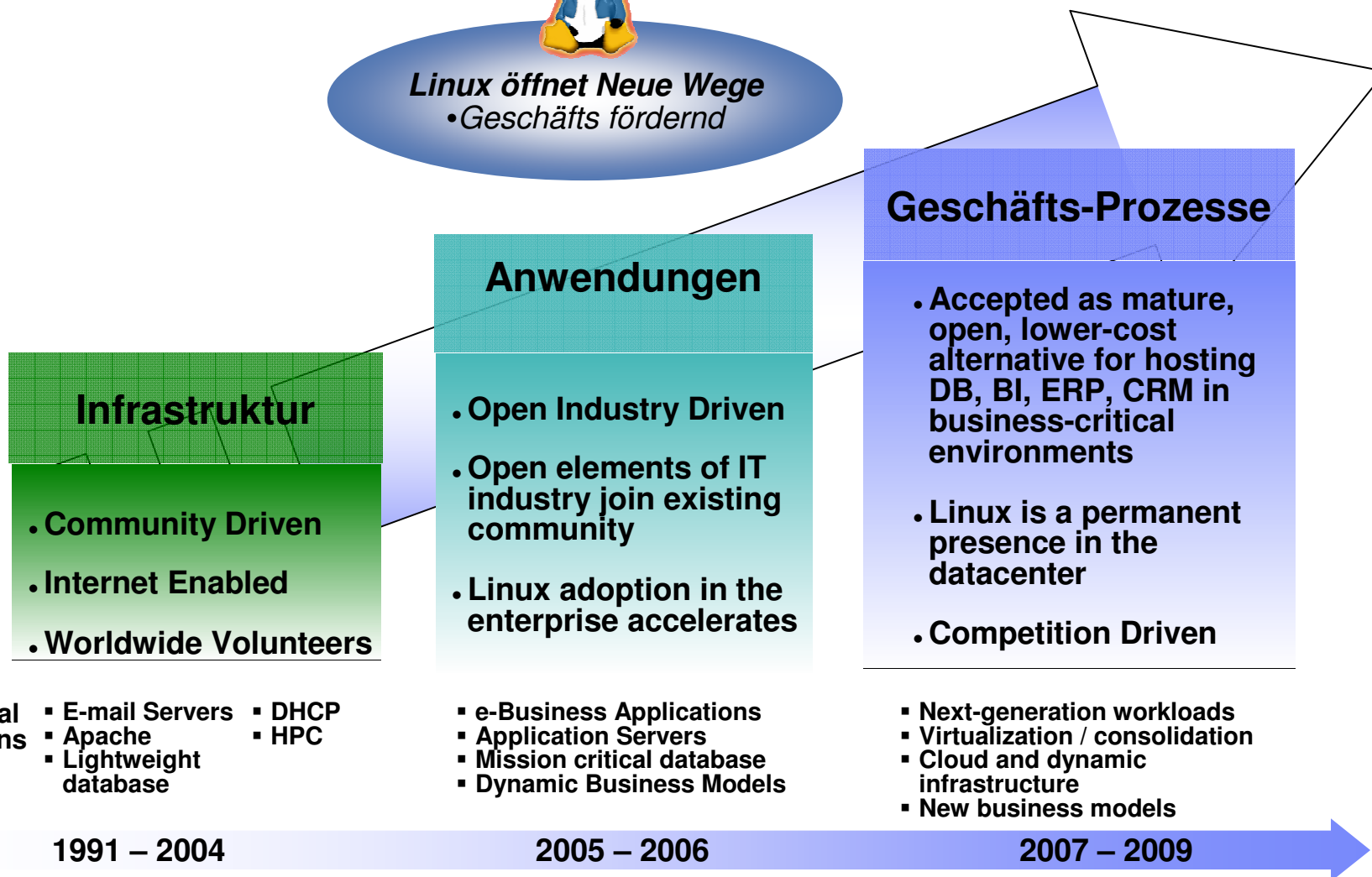
Agenda

1. Die Pinguine im großen Stall

2. Tor der Burg

3. Datenspeicher

4. Spinnennetz

5. Kommunikationsrohr

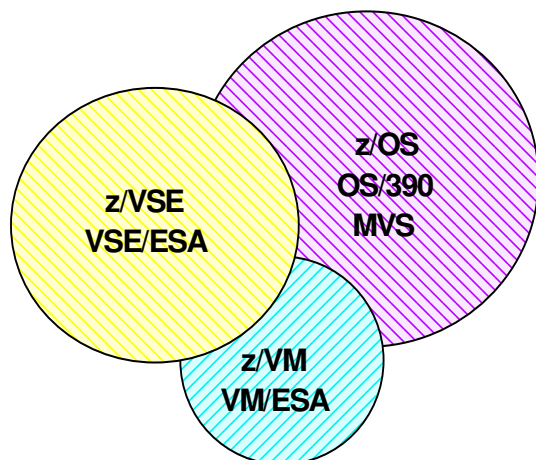6. Tresor

Wachstum der Pinguine für lebenswichtige Aufgaben

Linux öffnet Neue Wege
•*Geschäfts fördernd*

Geschäfts-Prozesse

- 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

- Competition Driven

Anwendungen

- Open Industry Driven

- Open elements of IT industry join existing community

- Linux adoption in the enterprise accelerates

Infrastruktur

- Community Driven

- Internet Enabled

- Worldwide Volunteers

Typical Applications				
▪ E-mail Servers	▪ DHCP	▪ e-Business Applications	▪ Next-generation workloads	
▪ Apache	▪ HPC	▪ Application Servers	▪ Virtualization / consolidation	
▪ Lightweight database		▪ Mission critical database	▪ Cloud and dynamic infrastructure	
		▪ Dynamic Business Models	▪ New business models	

1991 – 2004   **2005 – 2006**   **2007 – 2009**

IFL – Laufsteg für Pinguine

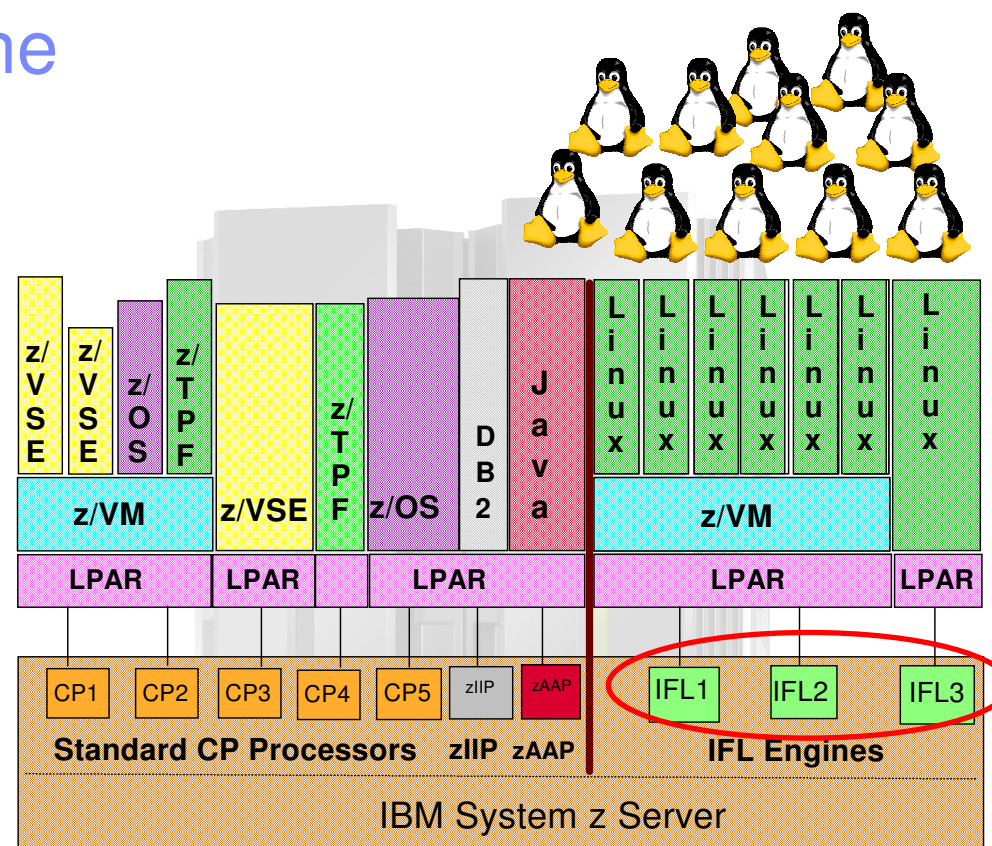**Traditional Mainframe Operating Systems**

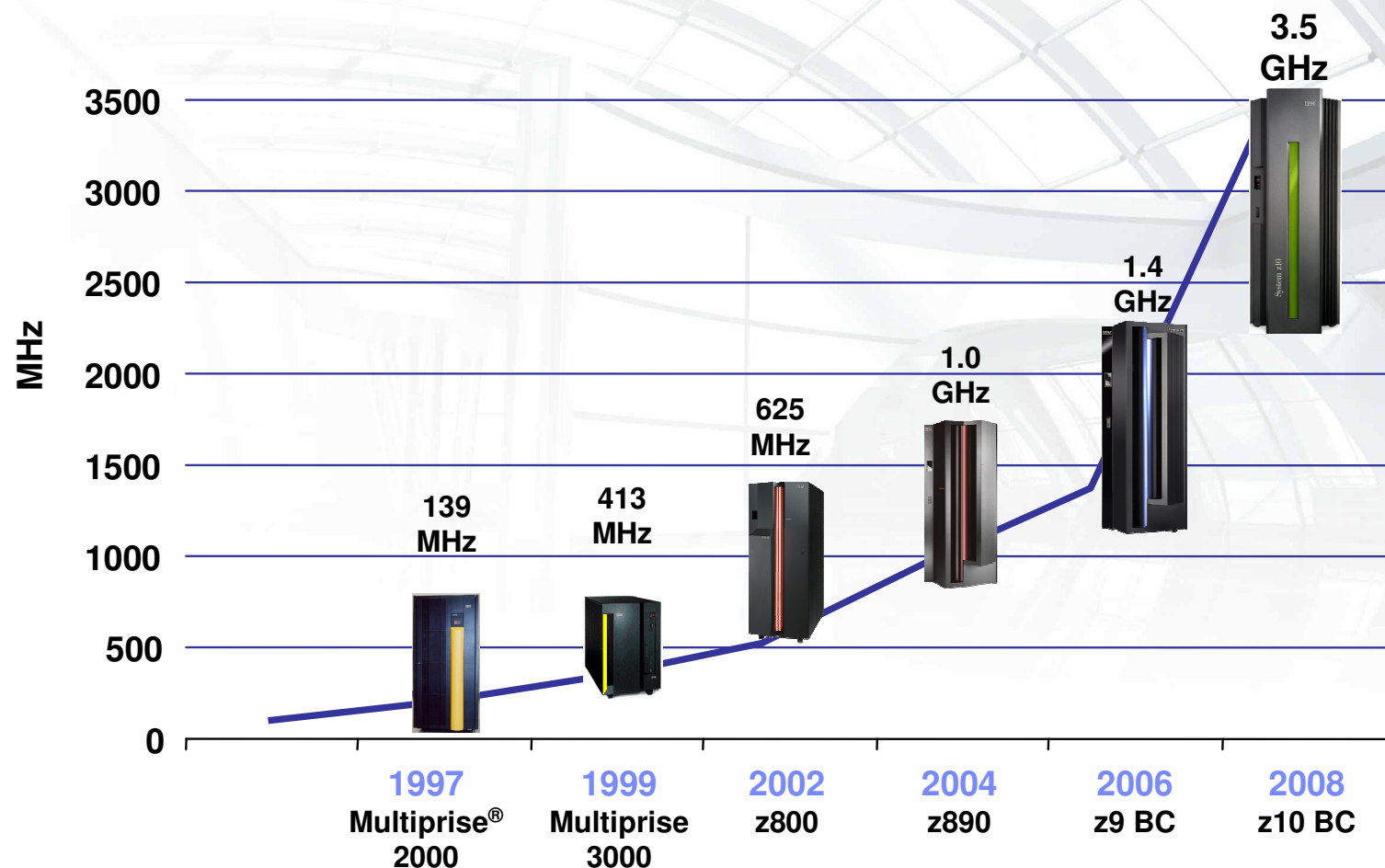## Standard Processors

- **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

Mit voller Kraft auf - IBM System z10 Business Class

MHz

- **3.5 GHz** — 3500
- **1.4 GHz**
- **1.0 GHz**
- **625 MHz**
- **413 MHz**
- **139 MHz**

1997	1999	2002	2004	2006	2008
Multiprise® 2000	Multiprise 3000	z800	z890	z9 BC	z10 BC

- 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

Hoher Performance Schub
Hardware Decimal Floating Point

- **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.

Deutschland [ändern]

Suchen

Home   Lösungen ▾   Services ▾   Produkte ▾   Support & Downloads ▾   Meine IBM ▾   Willkommen [IBM Anmeldung] [Registrieren]

Enterprise Linux Server

System z10

Enterprise Linux Server (ELS) – Konsolidierung für Jedermann

Serverkonsolidierung ist längst nicht mehr nur eine Herausforderung für große Unternehmen. Der Enterprise Linux Server (ELS) bietet Ihnen eine vollständige Infrastrukturkonsolidierung und -vereinfachung für jede Unternehmensgröße und -art. Dabei kombiniert er das Leistungsspektrum der Mainframetechnologie mit der Flexibilität der Virtualisierungtechnologie und einem kosteneffektiven Linux-Betriebssystem.

Schneller. Besser. Größer.

In der IT wird alles schneller, besser und größer. Dadurch können Gesamtbetriebskosten, Komplexität, Energieverbrauch, Kosten für Betriebssysteme, Wartungskosten und Risiken deutlich reduziert werden.

Virtualisierung - besser als je zuvor

Durch den direkten Betrieb der Virtualisierungssoftware wird die Leistung der virtuellen Server maximiert und das Management vereinfacht. Der Betrieb von Linux ermöglicht Kunden eine große Auswahl an Anwendungen und stellt zudem eine hochleistungsfähige Lösung zu günstigen Konditionen dar.

Einfachheit weiter gedacht

Enterprise Linux Server (ELS) bietet Unterstützung bei der vollständigen Durchführung des Virtualisierungsprozesses. Dadurch können Sie die benötigte Serverzahl auf ein Minimum reduzieren, das Management der Serverinfrastruktur vereinfachen und profitieren zudem von der Benutzerfreundlichkeit des Linux-Betriebssystems.

IBM System z10 BC ermöglicht es mittelständischen Unternehmen, ihre Kosten für den Betrieb und die Unterstützung von Anwendungen deutlich zu senken ohne dabei die Zahl an Applikationen zu reduzieren. Dies wird in erster Linie durch die Kombination der Leistung und Verfügbarkeit der Mainframe-Hardware mit der Flexibilität und Kosteneffizienz von Linux erreicht.

Kontakt

Haben Sie noch Fragen? Wir helfen Ihnen gerne.

➜ E-Mail an IBM

Oder melden Sie sich telefonisch bei uns:
0800-784 3977
Montag bis Freitag von 9.00 - 17.00 Uhr

Weitere Informationen

➜ SUSE Linux Enterprise Server für IBM System z

➜ Red Hat Enterprise Linux auf IBM z10 BC

➜ YouTube: Die Wahrheit über Mainframes

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**
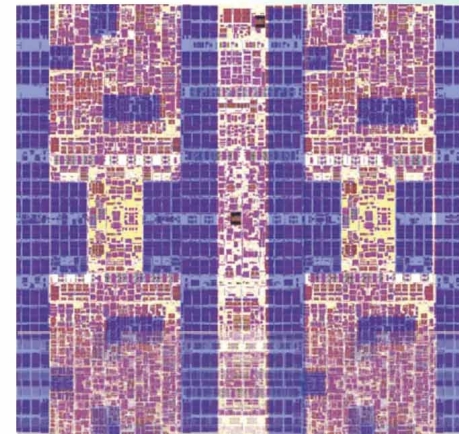
Enterprise Quad Core z10 processor chip

Hausung der Pinguine
Räumlichkeiten mit großem Wachstum
Virtualisierung mit System z

- **z/VM Virtualization**
    - **Vertical virtualization** - Grow workloads without linearly growing number of virtual guest machines (by allocating more CPUs, memory)

    - **Horizontal virtualization** – isolation of guests in a network for high availability of applications

    - **Dynamically** add, remove and shift capacity and physical resources to optimize workload results

- **LPAR Virtualization**
    - High Isolation with fixed resources
    - Direct attached I/O devices for max bandwidth
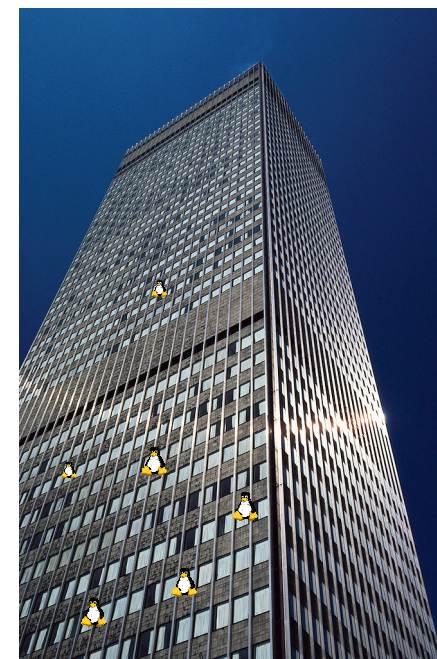
Virtualization – per Excellence
Virtualization for different workloads on the same layer

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 <u>dynamically</u> add CPU, I/O, and networking resources**

LPAR Resources

Linux Linux Linux z/OS z/VM z/VSE Linux Linux

z/VM

I/O and Network

Memory *New with V5.4*

CPU

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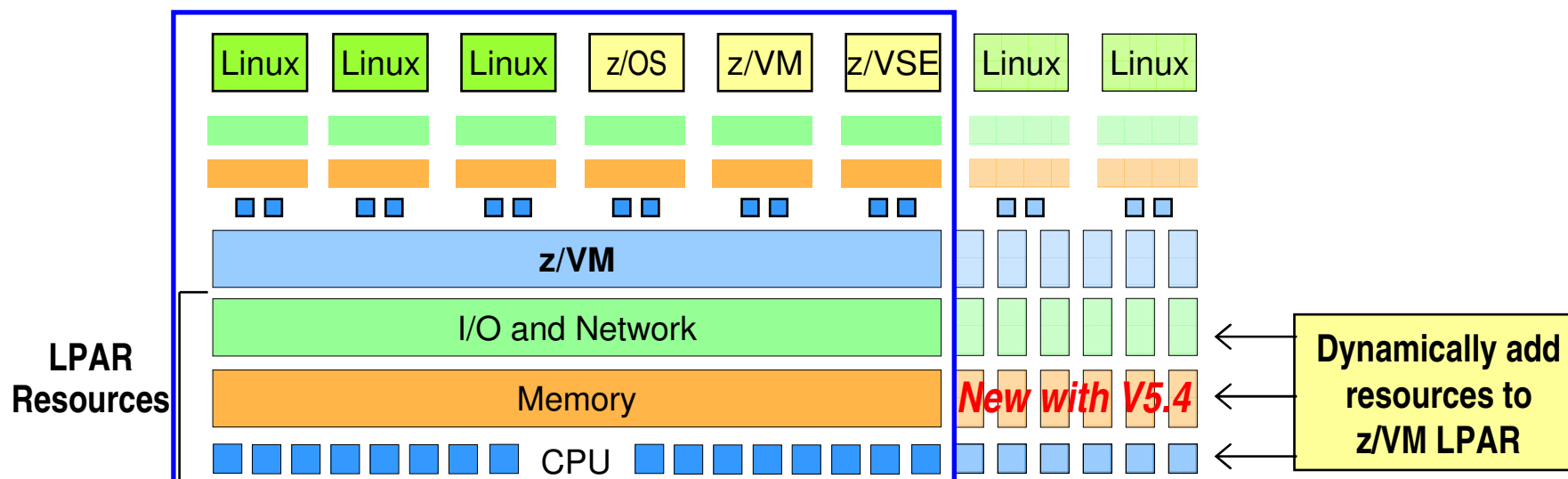
Smart economics: non-disruptively scale your z/VM environment by adding hardware assets that can be shared with every virtual server

Der Stall ist groß, dehnbar, beheizbar und abtrennbar

Virtualize, Consolidate, Integrate
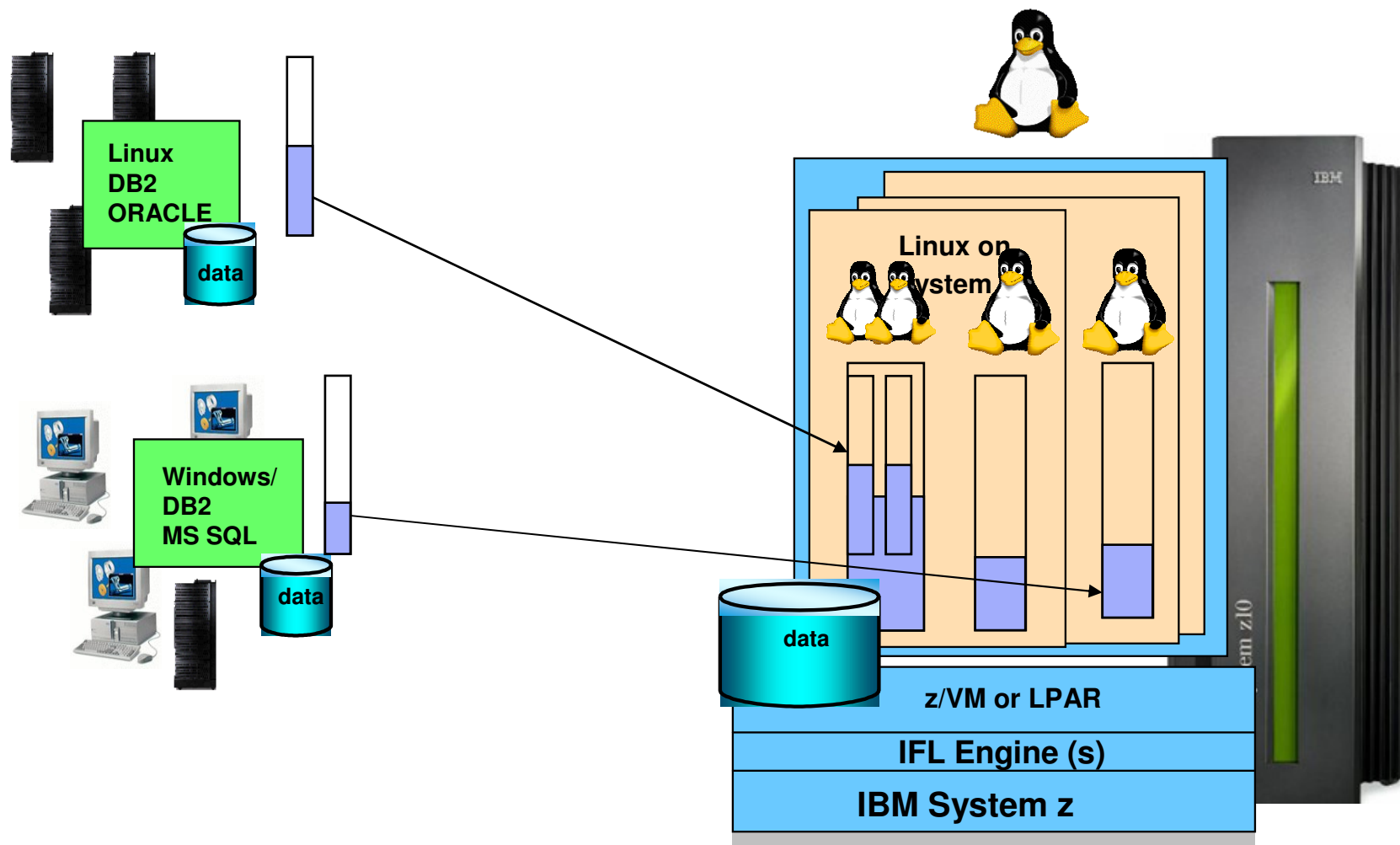
Linux
DB2
ORACLE

data

Windows/
DB2
MS SQL

data

Linux on
System z

data

z/VM or LPAR

IFL Engine (s)

IBM System z

- **Agenda**

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4. Spinnennetz

5. Kommunikationsrohr

6. Tresor

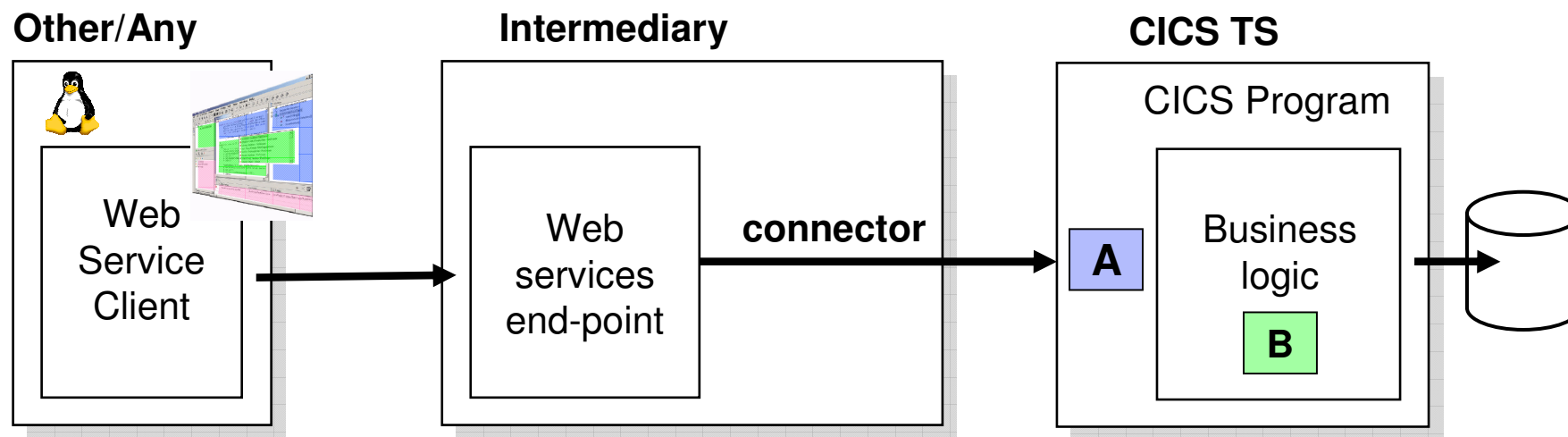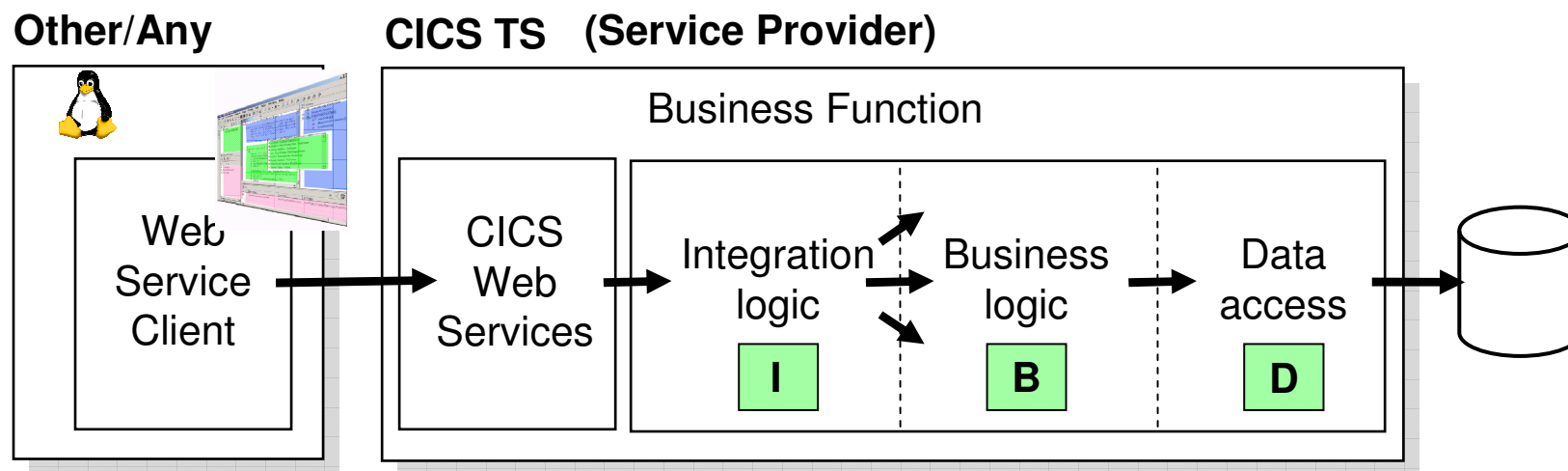# Dunkele Kammern der Burg erstrahlen in neuem Licht
Host Access Transformation Services (HATS)

- Moderne Anwendungen
- Integration mit verteilten Anwendungen
- Web Service im Flug

3270 or 5250
data stream

HATS

Windows/
Linux
DB2
ORACLE

data
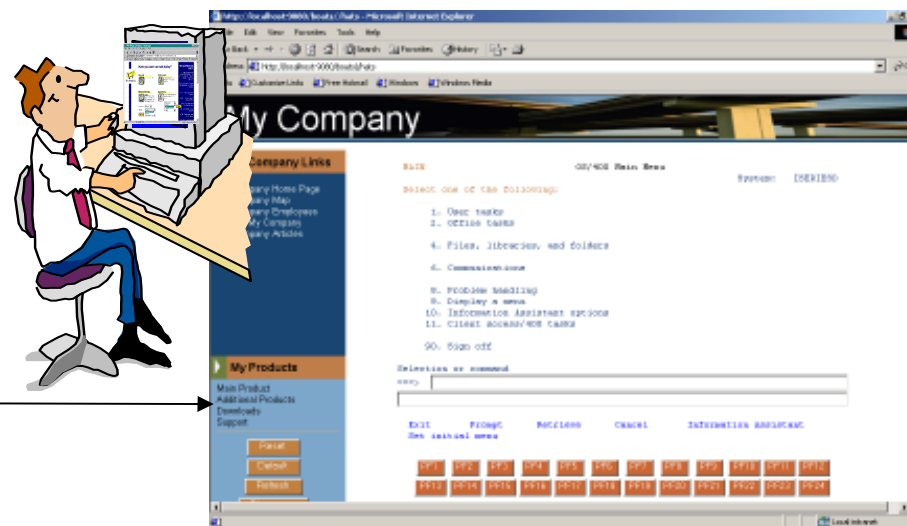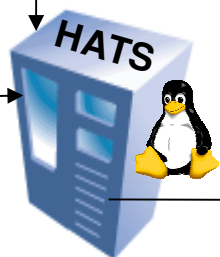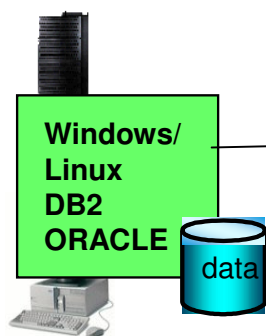
HTML im Browser

Transaktionen bekommen Gesichter

Other/Any　　　　　**CICS TS**　　(Service Provider)

Business Function

Web Service Client → CICS Web Services → Integration logic **I** → Business logic **B** → Data access **D** →

Other/Any　　　**Intermediary**　　　　　**CICS TS**

CICS Program

Web Service Client → Web services end-point —**connector**→ **A** Business logic **B** →

.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**

'Kleinweich' im Pinguin Stall

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 de[...]
applications on Linux, whether they develop their application[...]
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 performan[...]
deploying .NET apps on Linux. Also, Novell is also releasing M[...]
an improved IDE (underline define) for building .NET applications.

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

"MonoDevelop 1.x was the basic foundation, but we knew it [...]
many features," Miguel de Icaza, vice president of developme[...]
Novell (NASDAQ:NOVL) and leader of the Mono project told *Ir[...]*
"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 expla[...]
rebuilt the edit[...]
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

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› 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

Das Portal vereint sie alle

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
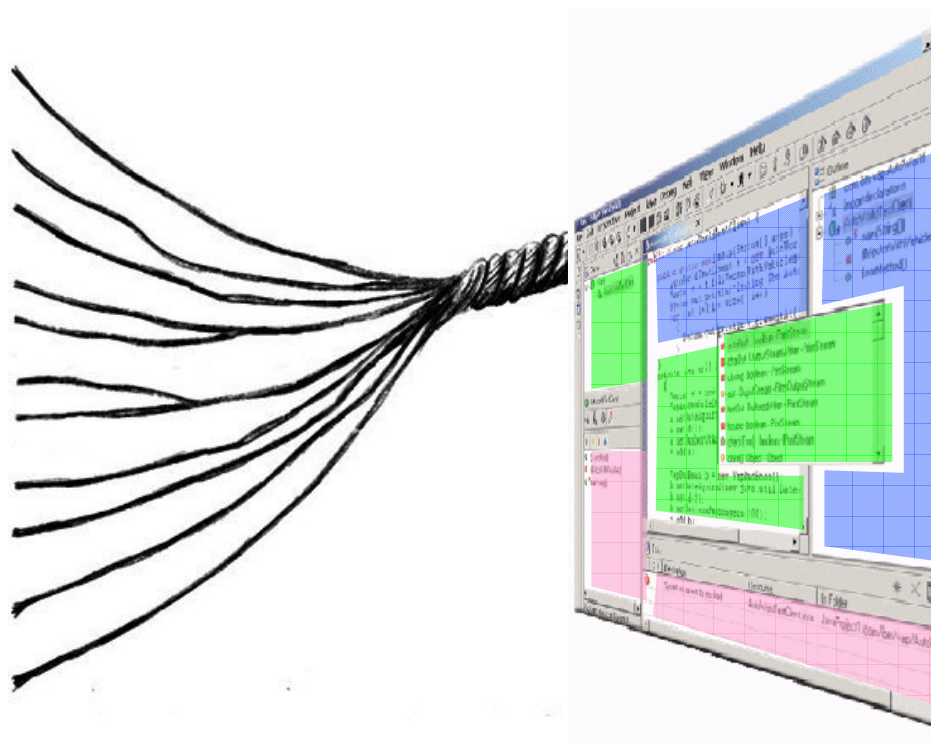
Linux on System z als Zentrales Eingangstor

**Web enable, improve interface, simplify, extend existing applications**
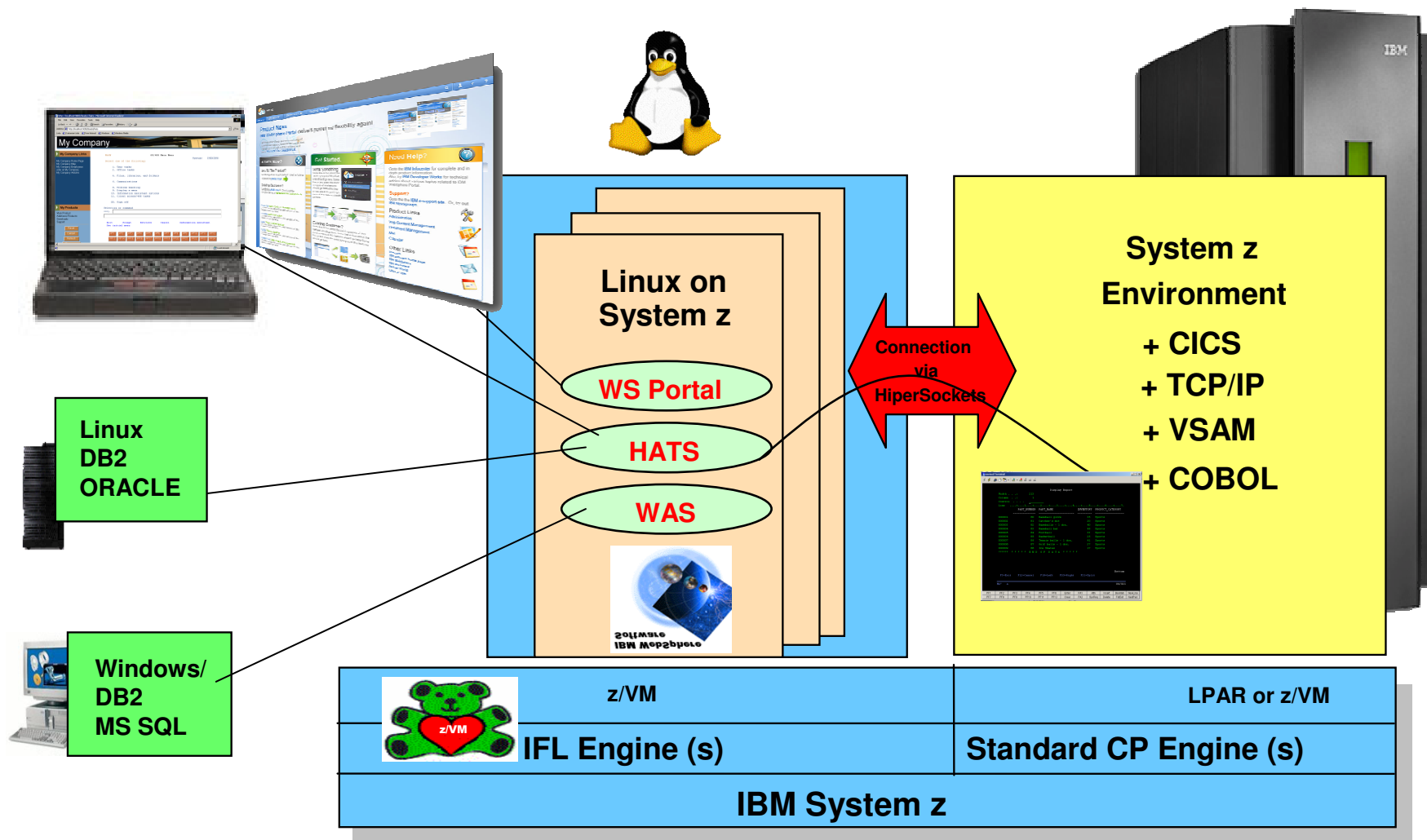
Solution Benefits with Linux on System z

- 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

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3. Datenspeicher

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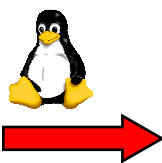
DB2 9 with pureXML feature – A Hybrid Data Server

XML Developer

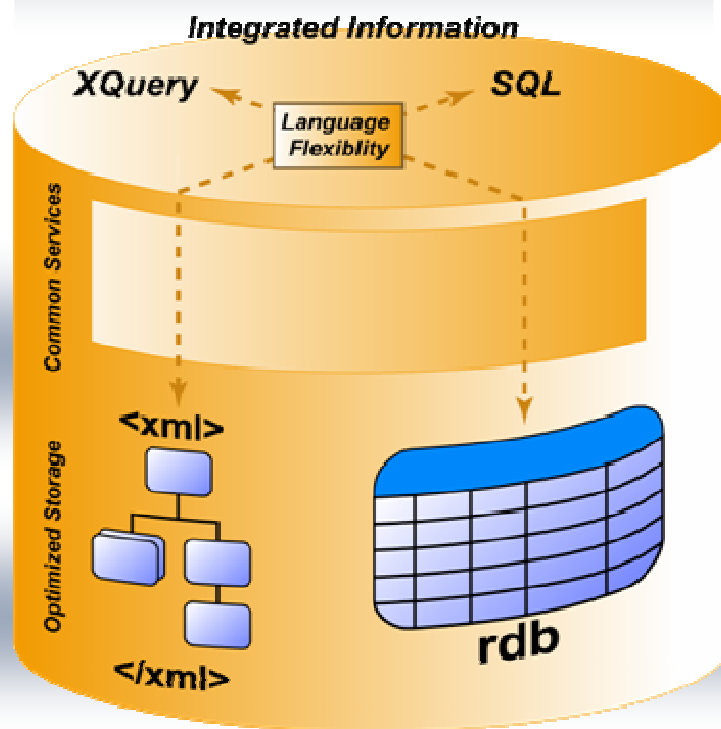*"I see a sophisticated XML repository that also supports SQL."*

Familiar Programming Models

SQL Developer

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

Integrated Information

XQuery   SQL

Language Flexiblity

Common Services

Optimized Storage

Mature Services

Familiar Tooling

<xml>

rdb

</xml>

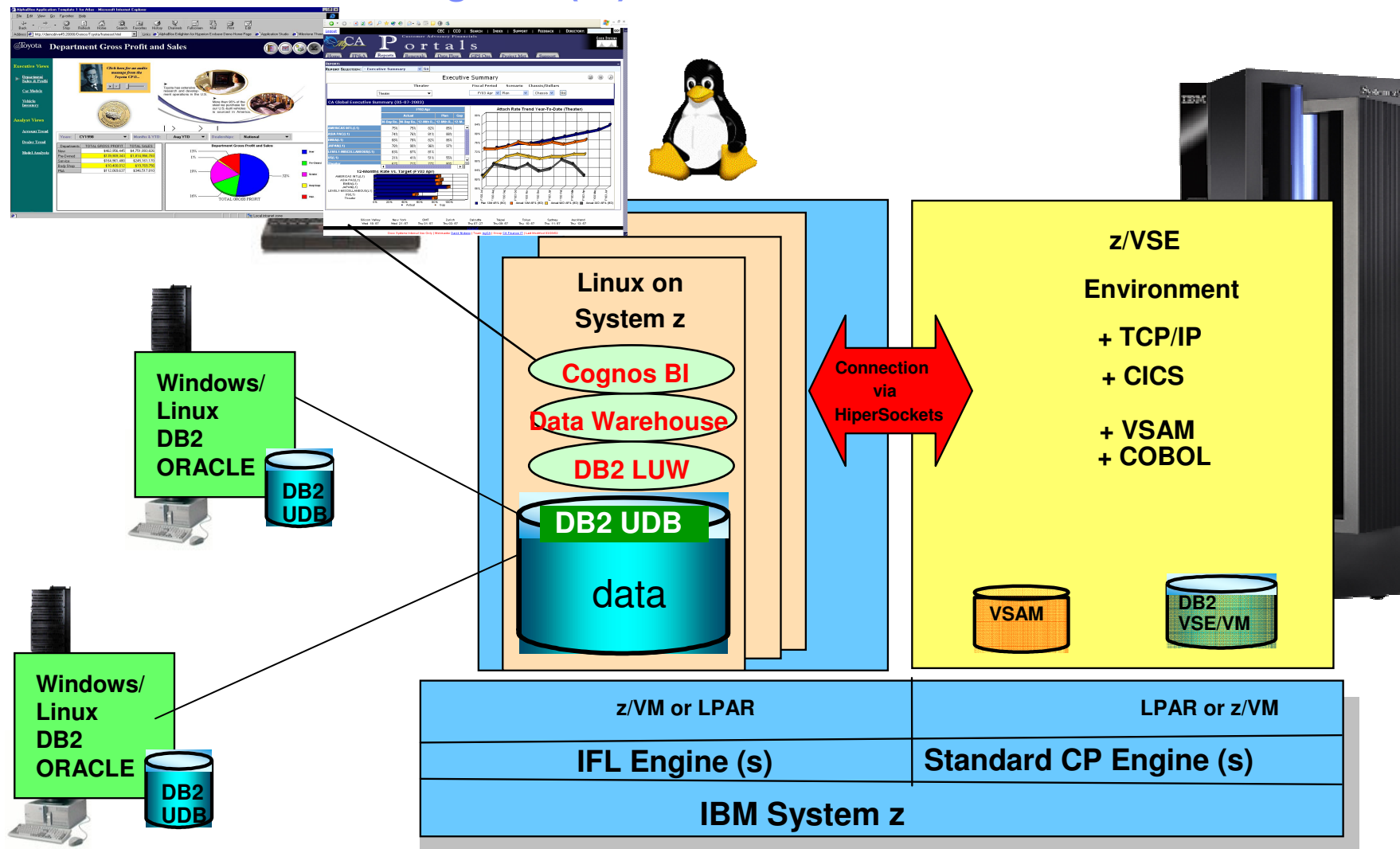*Optimized Storage Models*

Optimized Performance & Scale

New XML applications benefit from:
- Ability to seamlessly leverage relational investment
- Proven Infrastructure that provides enterprise-class capabilities

Scenario 1: Linux on System z als zentraler Datenspeicher
Consolidate, Integrate, Evaluate, Decide, Base for Business Intelligence (BI)

Windows/ Linux DB2 ORACLE — DB2 UDB

Windows/ Linux DB2 ORACLE — DB2 UDB

Linux on System z
- Cognos BI
- Data Warehouse
- DB2 LUW

DB2 UDB

data

Connection via HiperSockets

z/VSE

Environment

+ TCP/IP

+ CICS

+ VSAM
+ COBOL

VSAM

DB2 VSE/VM

z/VM or LPAR	LPAR or z/VM
IFL Engine (s)	Standard CP Engine (s)
IBM System z	

Cognos on IBM System z with z/VSE

Connectors like *VSAM Redirector* enable a VSE application to store data on a remote system.

The VSE program doesn't need any change. Working with a remote relational database (i.e. IBM DB2 UDB), a real time synchronization between VSAM data and the database can be done.

COGNOS Cognos Bi V8.3

IBM Information Server

DB2 ⟷ **connectors** ⟷ DB2 UDB

VSAM ⟷ **connectors** ⟷

z/VSE

Linux on System z

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

SQL

**InfoSphere
Federation Server**

| Oracle | VSAM
IMS Data | DB2
VM/VSE | Software AG
Adabas | CA
Datacom | MS
SQL |
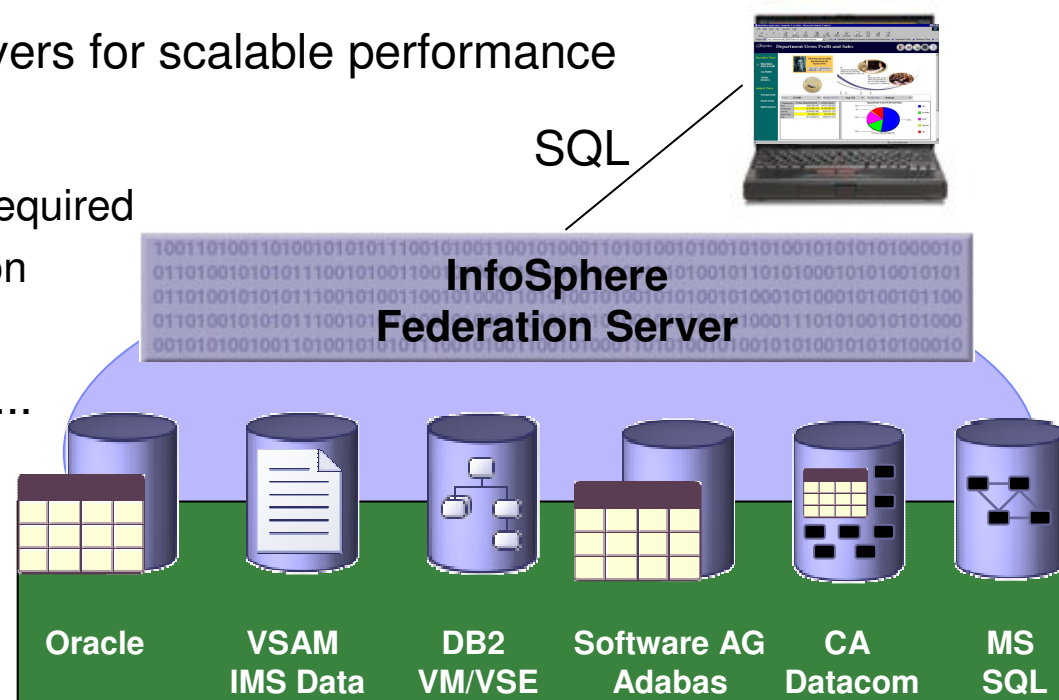
Solution Benefits with Linux on System z

- 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

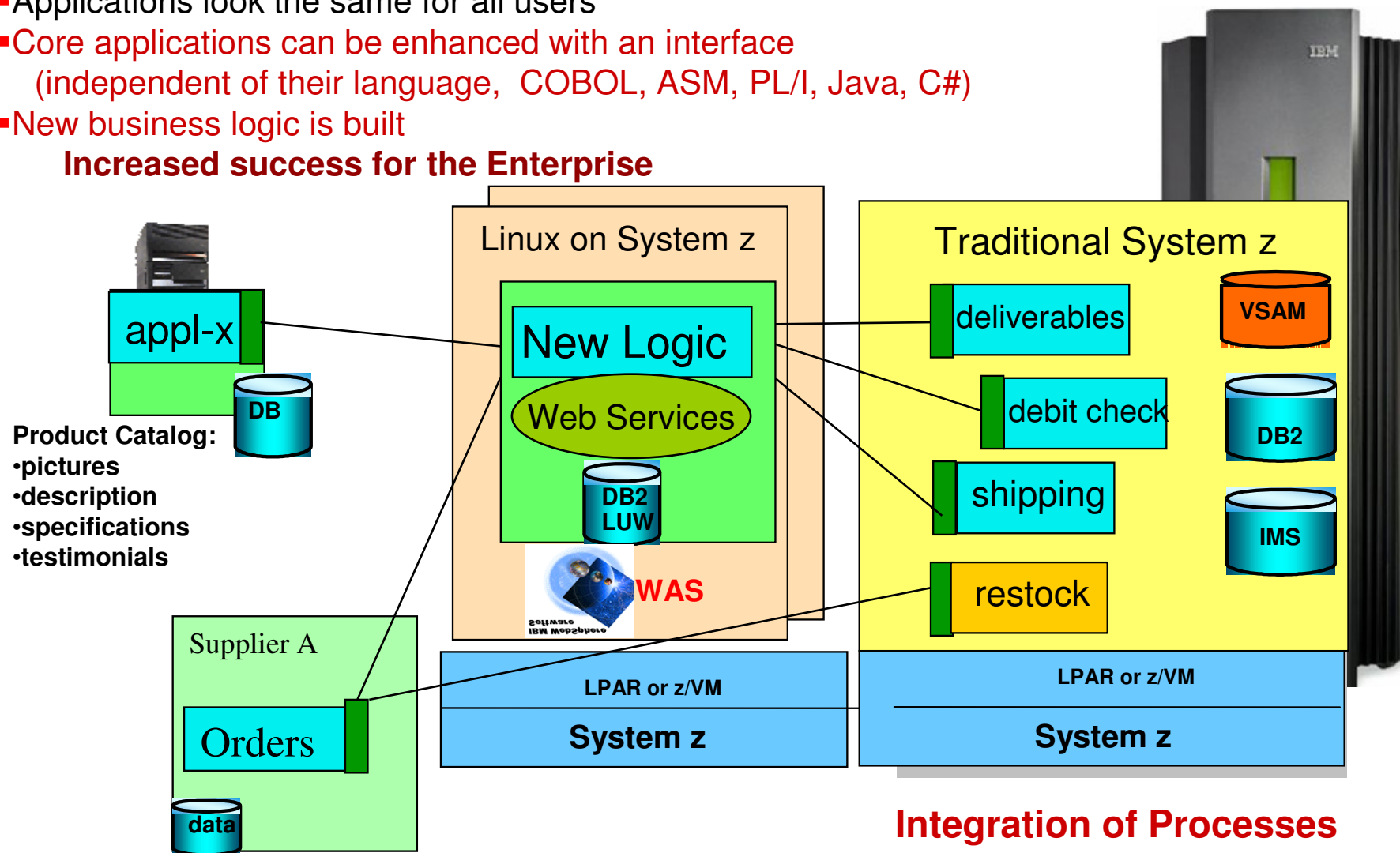- Centralized point for data management

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SOA – das Spinnennetz für neue Lösungen

- 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

Product Catalog:
- pictures
- description
- specifications
- testimonials

appl-x

DB

Linux on System z

New Logic

Web Services

DB2 LUW

WAS

Software
IBM WebSphere

Supplier A

Orders

data

LPAR or z/VM

System z

Traditional System z

deliverables

debit check

shipping

restock

VSAM

DB2

IMS

LPAR or z/VM

System z

Integration of Processes

Durch eine serviceorientierte Architektur (SOA) kann sich ein Unternehmen immer wieder effizient und optimal auf veränderte Bedingungen einstellen und anpassen.

Analogie zum Fussballspiel:

Spieler = Service ●

Spielfeld = SOA Infrastruktur

SOA = flexibles Zusammenstellen und Aufstellen der einzelnen Spieler zu einem Team, abh. von Anforderungen und Bedürfnissen

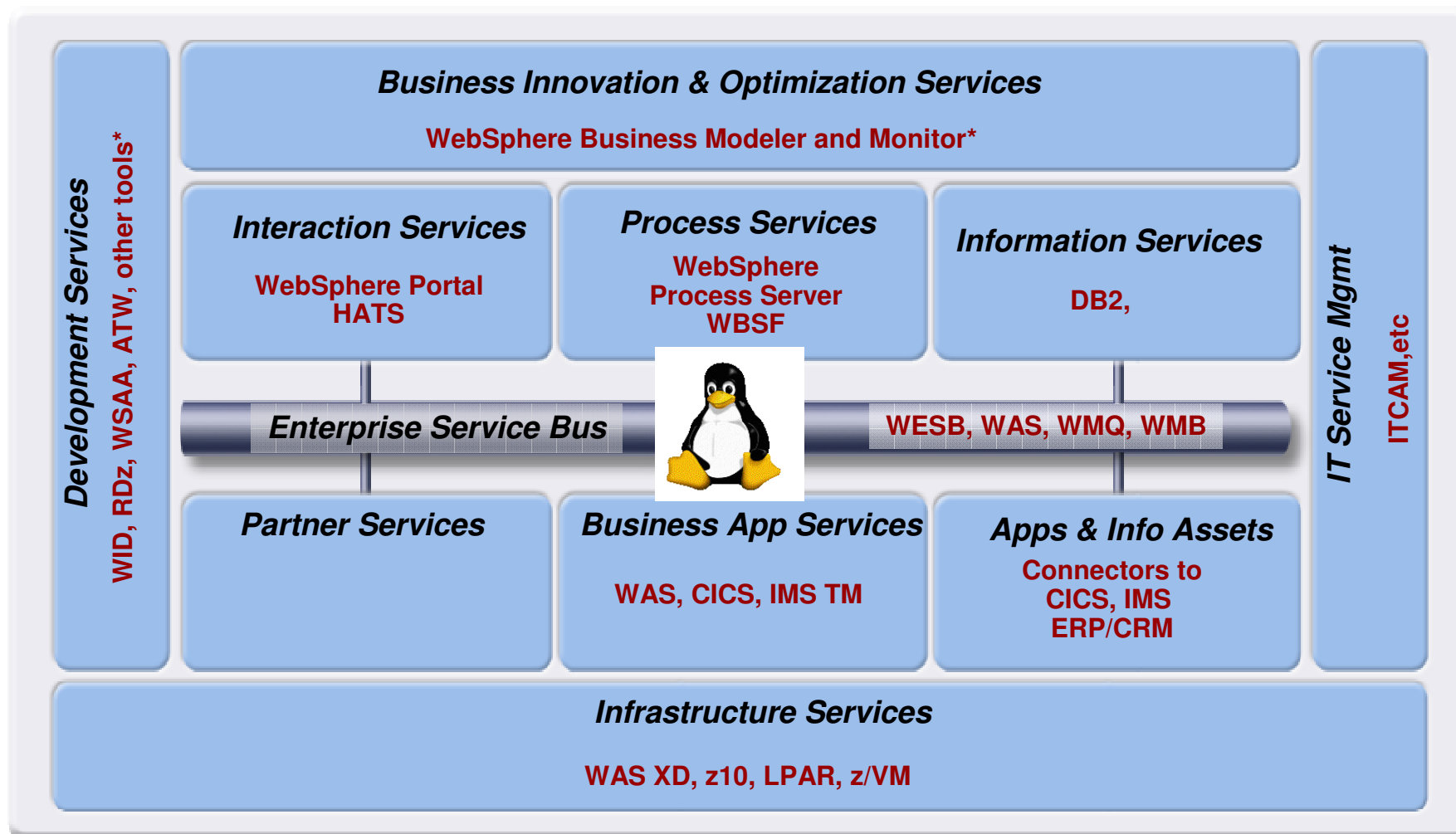**4-3-3**   **4-4-2**   **3-5-2**   **3-6-1**

SOA Reference Architecture with z SW Products

Business Innovation & Optimization Services

WebSphere Business Modeler and Monitor*

Development Services

WID, RDz, WSAA, ATW, other tools*

Interaction Services

WebSphere Portal
HATS

Process Services

WebSphere
Process Server
WBSF

Information Services

DB2,

Enterprise Service Bus

WESB, WAS, WMQ, WMB

Partner Services

Business App Services

WAS, CICS, IMS TM

Apps & Info Assets

Connectors to
CICS, IMS
ERP/CRM

IT Service Mgmt

ITCAM,etc

Infrastructure Services

WAS XD, z10, LPAR, z/VM

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

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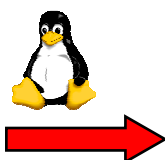
Linux on System z das Kommunikationsrohr
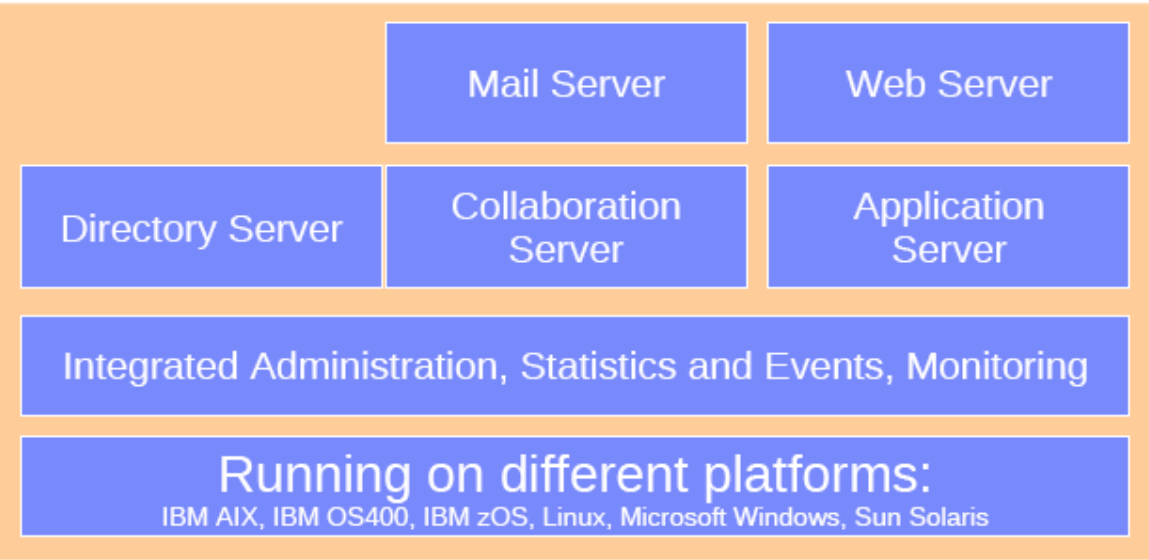
- **Mail**

  - **Lotus Domino for Linux on System z**

  - **ISV products such as :**

    - **Bynari,**

  - **Open source products:**

    - **Exchange4Linux, Evolution, Kroupware, OpenGroupware, Postfix, sendmail**

  - **Asterisk- manages telefone calls, mails**

- **Reference:** Winnebago Industries slashes e-mail costs and administration time with solution from Bynari, IBM and Linux on System z
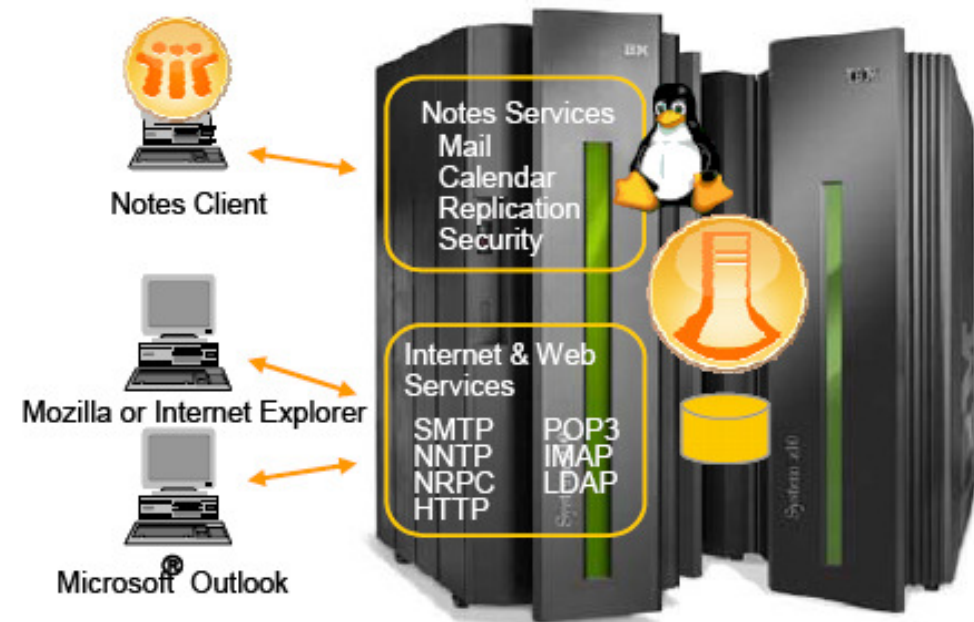
Lotus Domino – more than just Mail server

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

Mail Server	Web Server

Directory Server	Collaboration Server	Application Server

Integrated Administration, Statistics and Events, Monitoring

Running on different platforms:
IBM AIX, IBM OS400, IBM zOS, Linux, Microsoft Windows, Sun Solaris

Development Tools

High Availablility 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
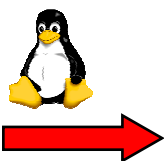- Can be combined with operating system cluster
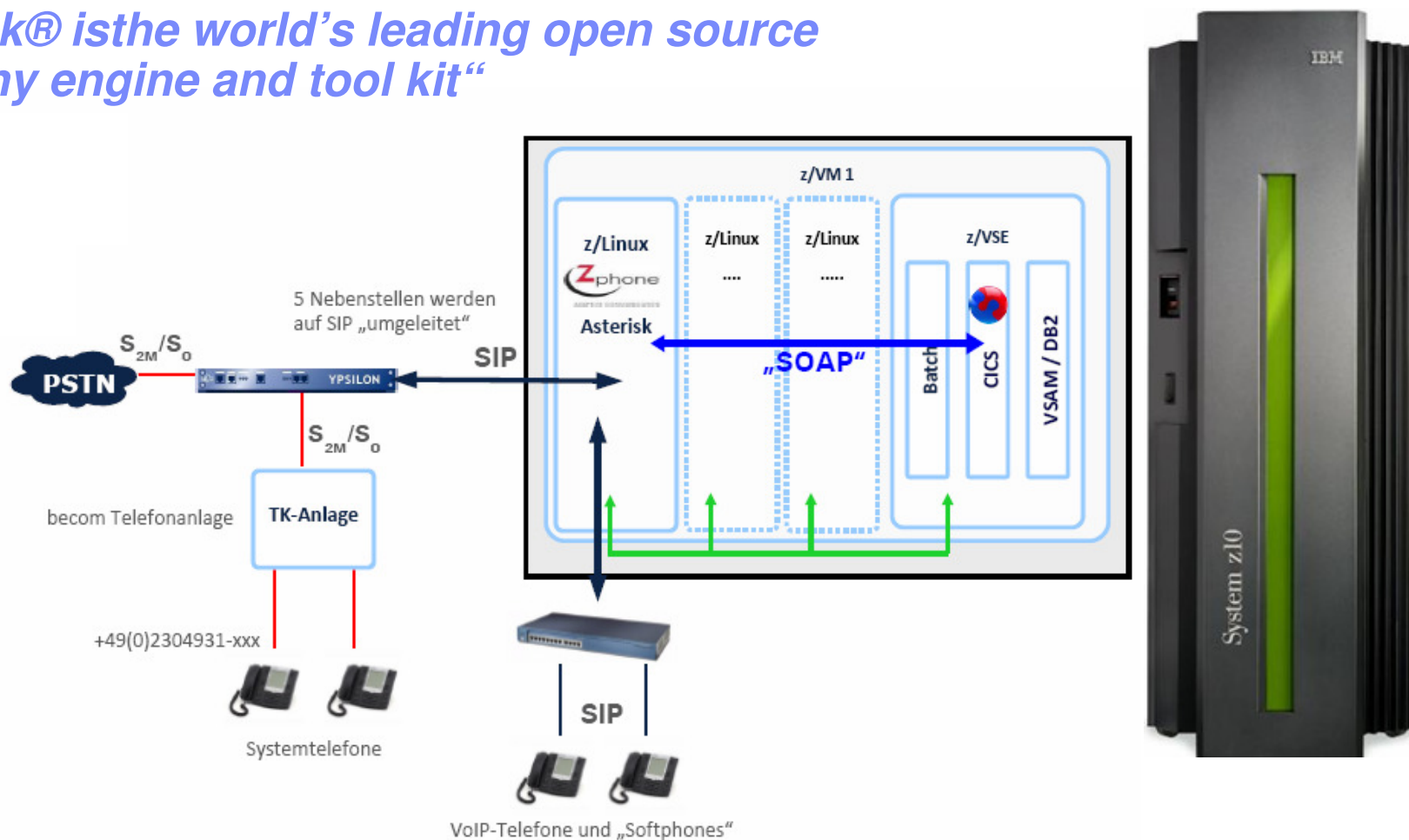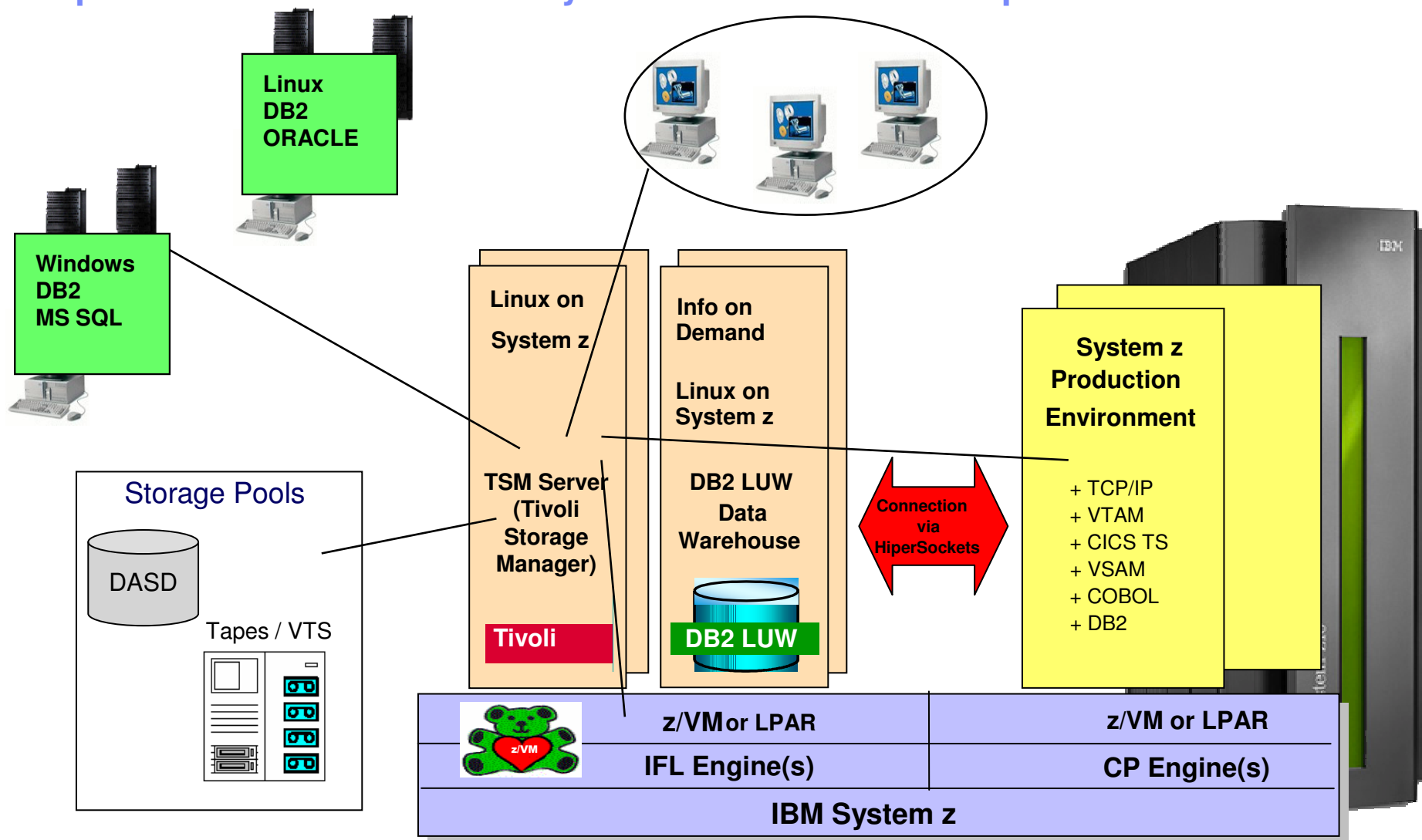
- **Agenda**

  1. Die Pinguine im großen Stall

  2. Tor der Burg

  3. Datenspeicher

  4. Spinnennetz

  5. Kommunikationsrohr

  6. Tresor

Linux als Tresor - Enterprise Backup

Implement TSM on Linux on System z as central Backup Hub

Linux
DB2
ORACLE

Windows
DB2
MS SQL

Storage Pools

DASD

Tapes / VTS

Linux on

System z

**TSM Server
(Tivoli
Storage
Manager)**

Tivoli

**Info on
Demand**

**Linux on
System z**

**DB2 LUW
Data
Warehouse**

DB2 LUW

**Connection
via
HiperSockets**

**System z
Production
Environment**

+ TCP/IP
+ VTAM
+ CICS TS
+ VSAM
+ COBOL
+ DB2

z/VM or LPAR

z/VM or LPAR

z/VM

IFL Engine(s)

CP Engine(s)

IBM System z

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/

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

IBM Systems > Mainframe servers > Operating systems > Linux >

Success stories and references

Linux

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

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.

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.
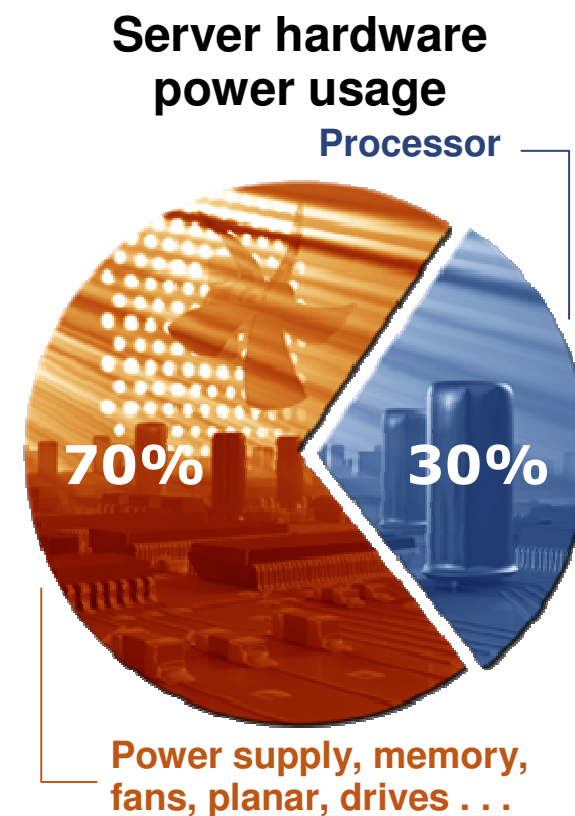
↑ Back to top

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.

Project Big Green Linux

Cooperatively addressing energy consumption and management issues

- **Linux kernel community efforts**
  - Expanding support for scaling CPU clock speed and voltage
  - Keeping idle CPUs in a 'tickless,' low-power state longer
  - Power monitoring built into the kernel through PowerTOP
  - Create power-aware applications and policies
  - Linux Foundation Green Linux Workgroup

- **IBM's "Project Big Green" includes consolidation on Linux**
  - 3,900 internal servers consolidating onto Linux on System z
  - Estimate reduction in annual energy usage by 80%, reduce floorspace by 85%

- **Enabling our Customers to realize savings and efficiency**
  - IBM's Server consolidation factories enable smoother transitions to more efficient highly-virtualized platforms

Server hardware power usage

Processor

70%   30%

Power supply, memory, fans, planar, drives . . .

KILOWATTS

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

UNIVAR

http://ibm.com/press/us/en/pressrelease/26621.wss
http://ibm.com/software/success/cssdb.nsf/CS/DLAS-7CFMG8

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

http://www.ibm.com/press/us/en/pressrelease/26621.wss

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

"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

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*

http://www-01.ibm.com/software/success/cssdb.nsf/CS/STRD-7KNCM7

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 ft^2 of data center to just 900 ft^2

- Novell SUSE Linux Enterprise Server

✳ **The Benefits**

- Baldor estimates the solution paid for itself <u>in months</u> 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

IBM **Novell.**

http://www.novell.com/success/baldor_electric.html
http://www-306.ibm.com/software/success/cssdb.nsf/CS/DNSD-6K9H7V

Internal Connections

z/Vm 5.3 for CP engine

Tcp/ip VM Vswitch Contr 1	Tcp/ip VM Vswitch Contr 2	Tcp/ip VM	Test	Hist	Prod	Remo

z/Vm 5.3 for IFL engine

Tcp/ip VM Vswitch Contr 1	Tcp/ip VM Vswitch Contr 2	Tcp/ip VM	Test DB2 Viper	Prod DB2 Viper	Test DB2 Viper	Prod DB2 Viper

HiperSocket Connection

Z9 BC   Ibm 2096   mod. G01
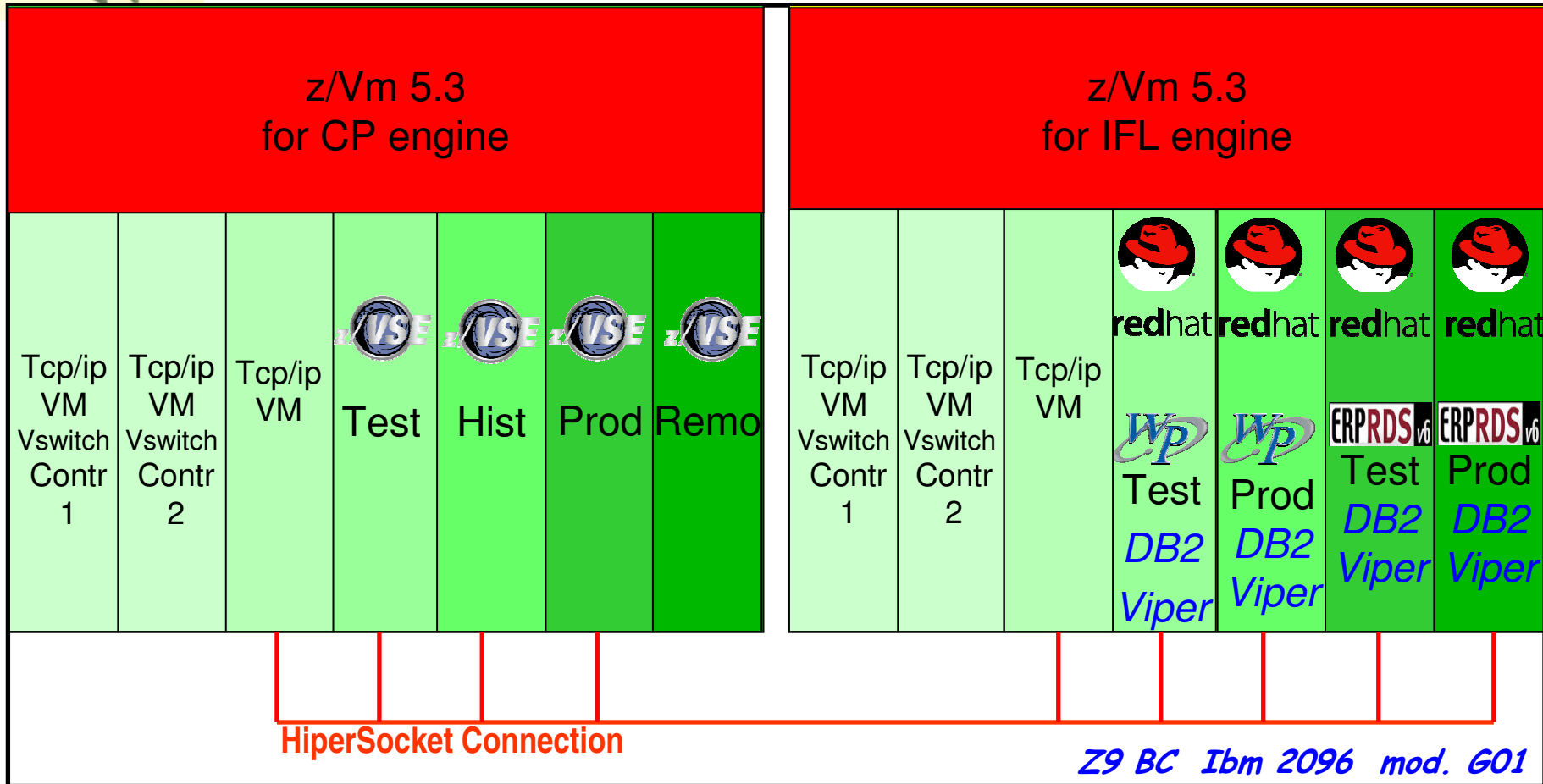
the leading producers of premium olive oil sold directly to consumers

Customer Refrence: Supreme Court, USA

The Magistrate Environment Today
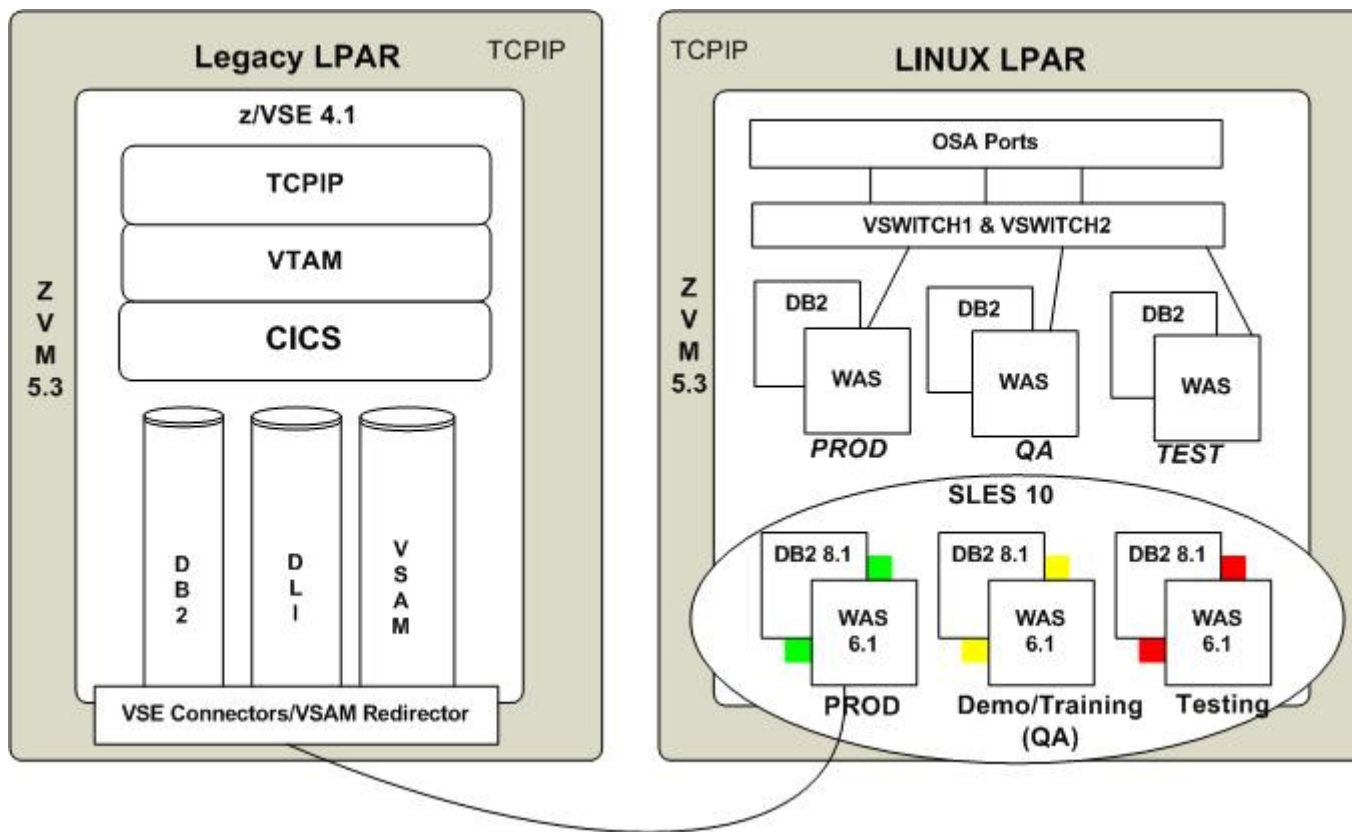
125 locations
2,800 processes per day
Direct interface with CMS application systems

Peter Hahn

IBM Systems enrich performance, availability and flexibility

Business challenge:

Peter Hahn, a European clothier, was growing rapidly and needed to improve data availability. With call centers operating 24/7, they could not accommodate any downtime. They also faced challenges with database performance and downtime required for backups.

Solution:

With the help of IBM and IBM Premier Business Partner COMPAREX, Peter Hahn upgraded their legacy IBM zSeries® mainframe to IBM System z9®. Peter Hahn then migrated their IBM DB2® database with IBM z/VSE™ applications to a Linux® environment. To enable automated backups, they installed IBM System Storage™ DS8100, connected to the company network by IBM System Storage SAN Volume Controller.

Benefits:

- Improves availability and performance of the IT environment
- Provides flexibility and capacity for the DB2 database
- Reduces risk by enabling automated backups with zero downtime

"The change was like switching to a Porsche without having to modify our applications for this purpose."

> — *Holger Sch*ö*nenmann, department manager of the computer center at Peter Hahn*

Solution components:

- IBM System z9 with Integrated Facility for Linux
- IBM System Storage DS8100
- IBM SAN Volume Controller
- IBM DB2

ZSC03048-USEN-00

Ein Kunde im Einklang der Natur

* Using the Enterprise Linux Server, EFiS managed to reduce cost, risk and resources while increasing the efficiency and ecology at the same time.

* Migrating x86 servers from various vendors to one IBM System z9 BC (Linux only machine), EFiS managed to optimize their data center back in 2008. The fact that fewer server had to be managed, lead to an easier control and operation of the existing environment.

* With the update of the current production z9 to a z10 based Enterprise Linux Server, EFiS can continue to optimize their IT-infrastructure to the constantly changing business requirements

* The consolidation of distributed servers to one Enterprise Linux allows EFiS not only to save space in their data center. Instead they no longer need an air condition. Using water from a spring nearby, this customer can operate his data center at a temperate of 27 C without any active cooling, which results in additional savings.

* A video (in German) about the data center at EFiS is available at the following URL:

  http://www.youtube.com/watch?v=8flF9WUx5gA&feature=player_embedded

Summary
z/VSE Strategy enables and supports customer growth
with IBM System z, IBM System Storage, and IBM Middleware
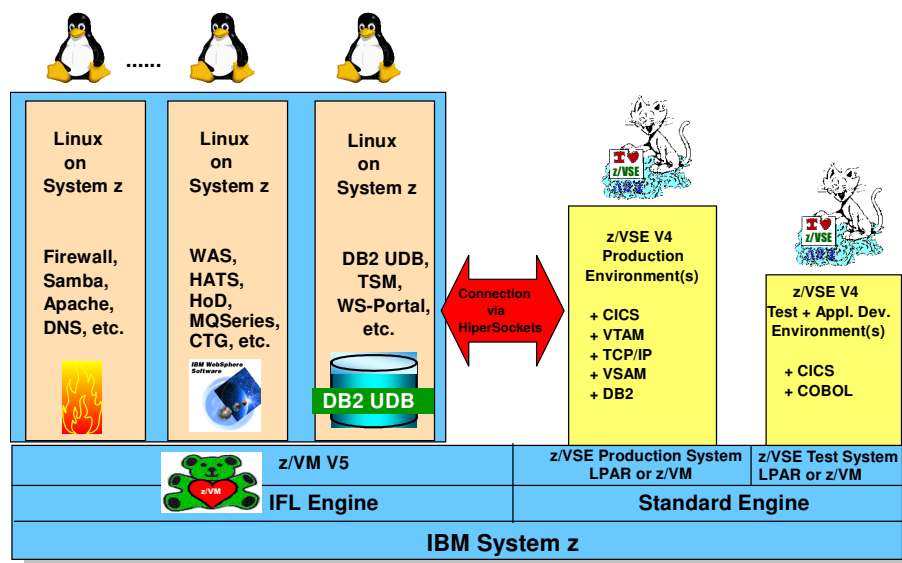
- **z/VSE V4**
  - ►Protect core IT investments through PIE
  - ►Robust, secure enterprise server
  - ►Cost-effective solutions
  - ►Interoperability with network / servers
  - ►Highly improved price / performance

- **z/VM V5**
  - ►Highly flexible, industrial strength
  - ►Advanced virtualization
  - ►Multiple z/VSE and Linux images
  - ►Designed to exploit System z9

- **Linux on System z**
  - ►Large portfolio of new applications
  - ►Platform for IBM middleware
  - ►Infrastructure Simplification
  - ►Massive scalability / consolidation
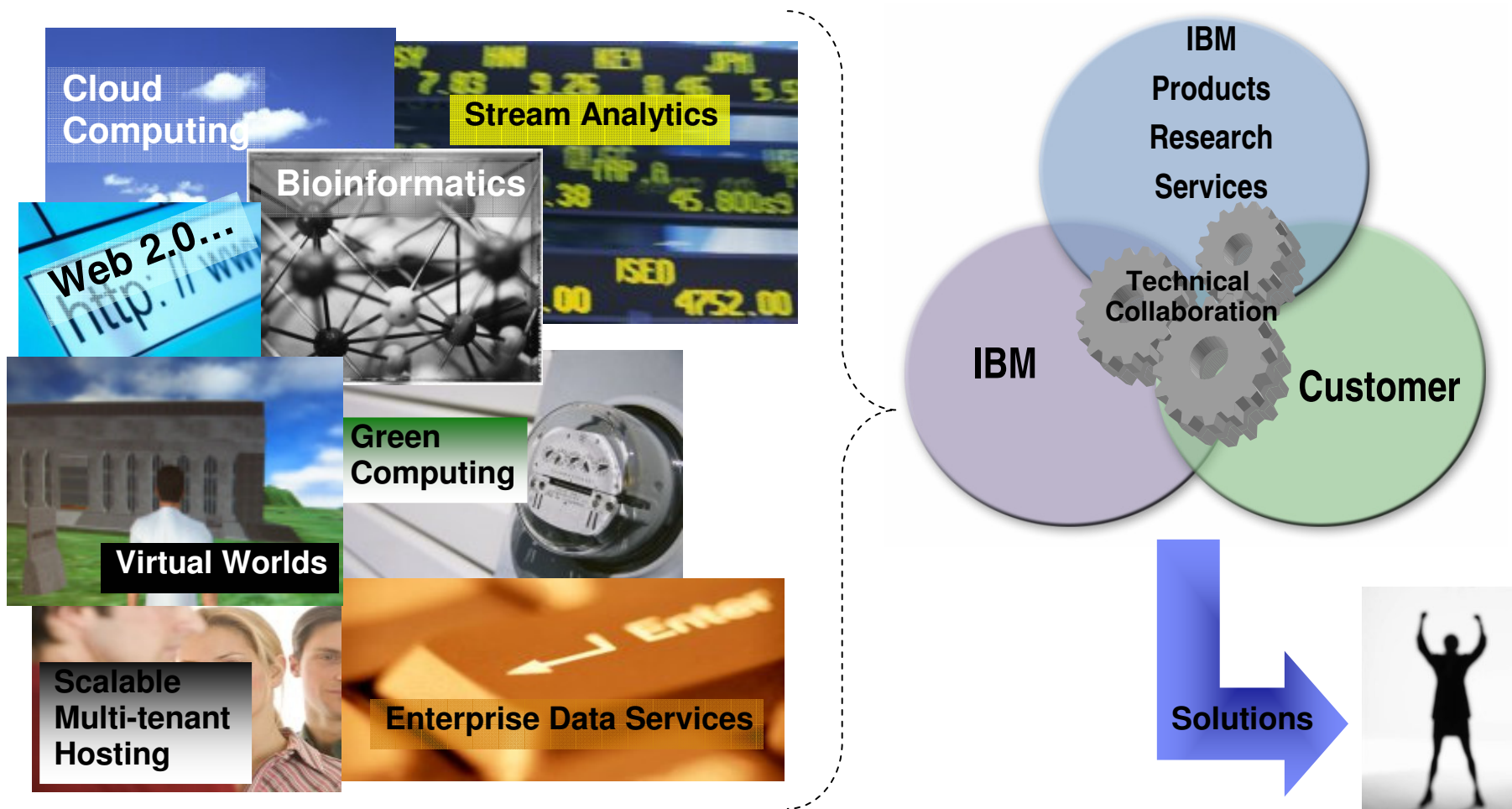
The Future runs on System z, the largest scalable server
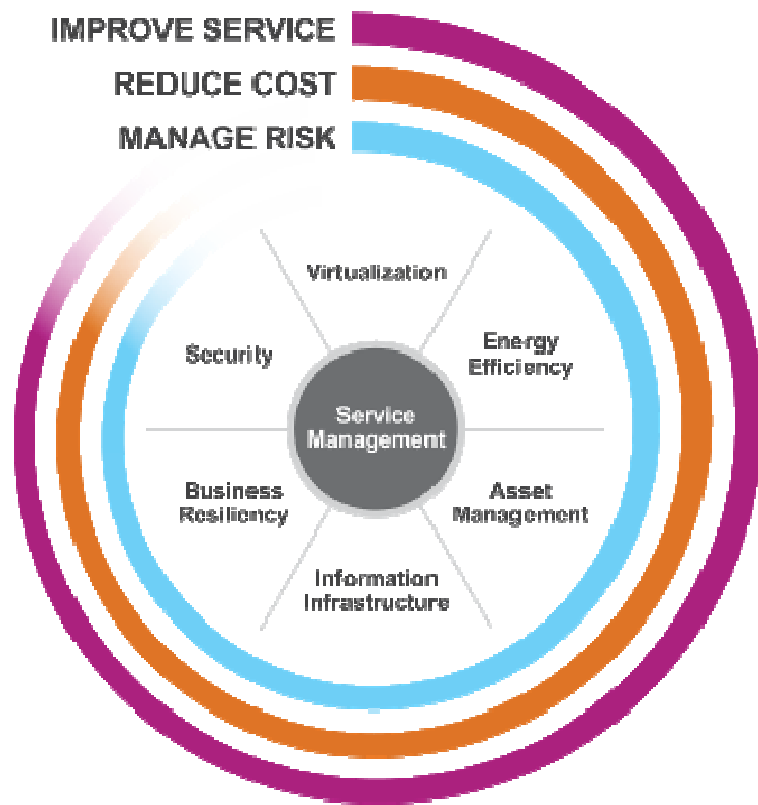
… System z delivers extreme business value by helping you reduce cost, manage risk, and improve service.

Erfahren Sie Aktuelles: http://www.twitter.com/IBMzVSE
Werden Sie 'Follower' und über die distribution list bekommen Sie letzte Neuigkeiten über z/VSE

Mit IBM System z einen Schritt voraus !
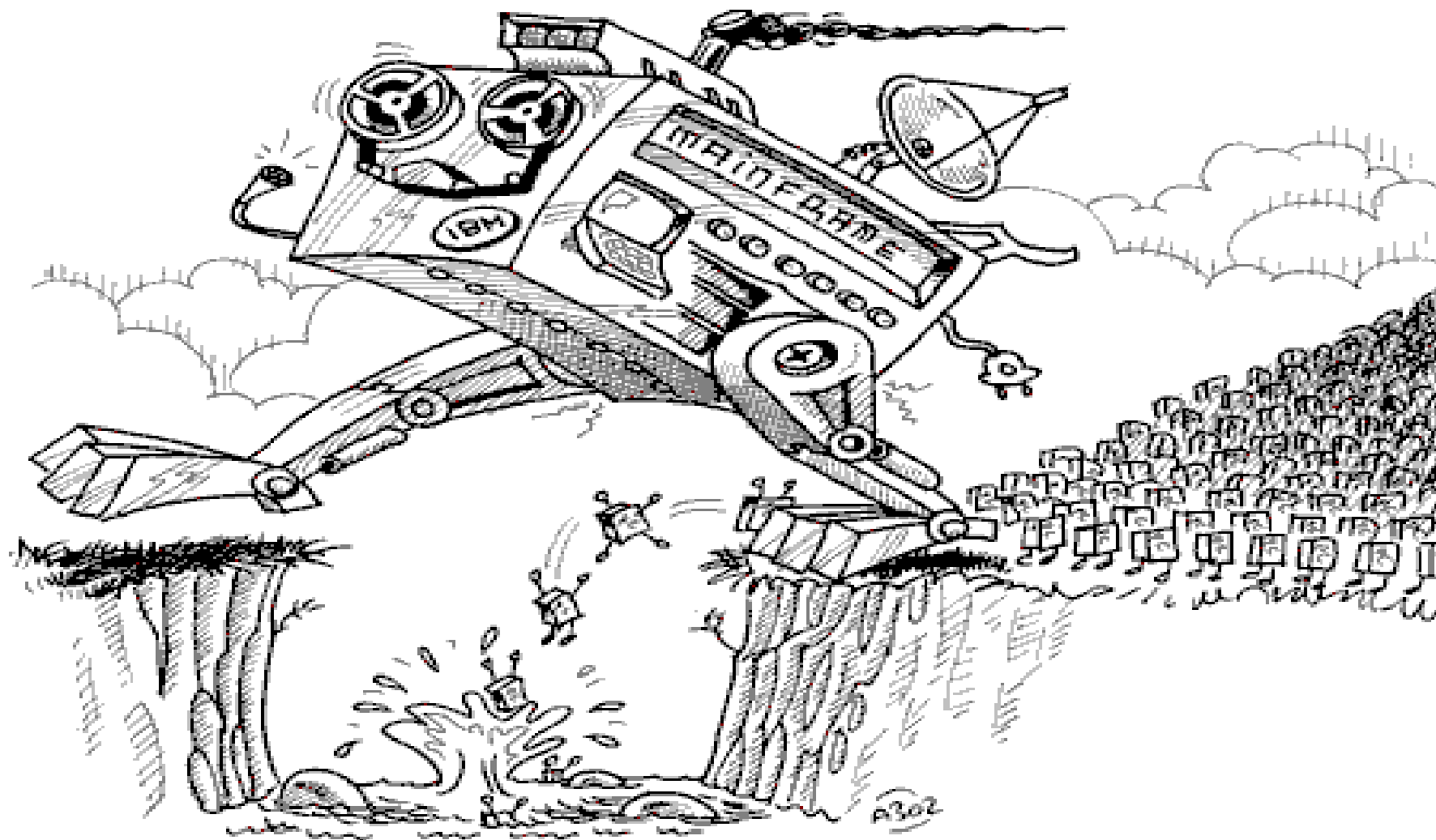
More Information about Linux on System z

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