



# IBM System z Technical University



*October 4–8, 2010 — Boston, MA*

10 Years for the most successful  
partnership:  
z/VSE and Linux on System z

**Session ID: zDL01**

Wilhelm Mild, IBM

Authorized



**Training**



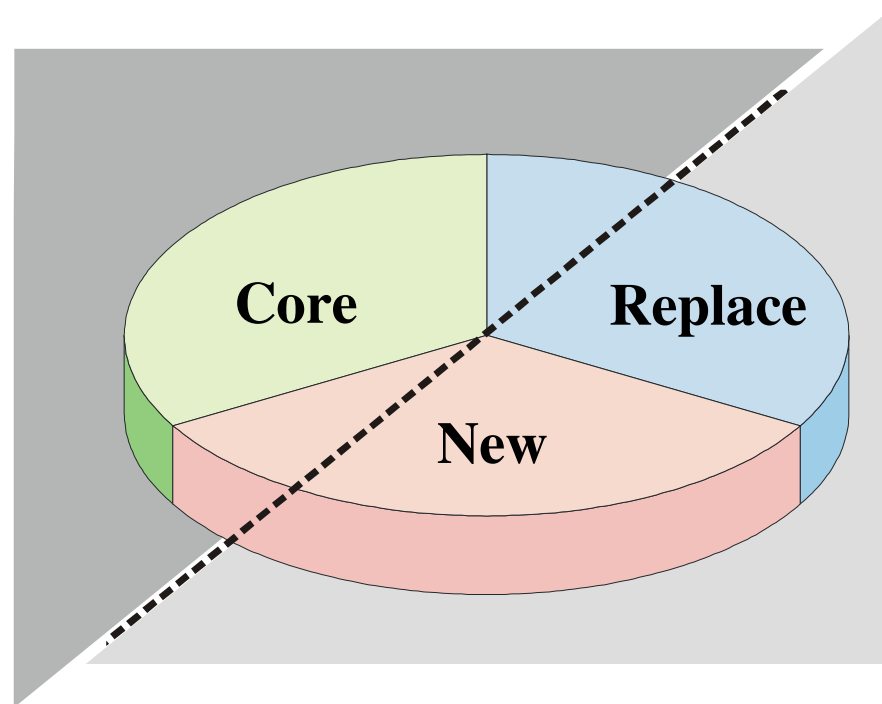
*Once in the data center...  
...not so long ago.*

## ■ Customer Survey Results

- ▶ What platforms are currently installed (System z , distributed)?
  - We found an average of 3.5 *types* of platforms per customer. There are no "VSE customers", only "customers with VSE"
- ▶ Are you growing your VSE workload? How and Why ?
  - Yes, Core VSE applications are mostly alive, well, and growing
- ▶ Will you move *some* VSE workload to another platform?
  - Customers are both:
    - growing core VSE applications and
    - implementing Replacement Apps on a variety of platforms

# VSE's Application Portfolio

System z  
 CICS  
 Cobol  
 VSAM  
 3270 Interface



Platform specific  
 'Client/Server'  
 C or C++  
 Relational  
 'GUI' Interface

Popular in open environments  
 WebSphere  
 Java  
 Relational  
 Browser basiertes Interface

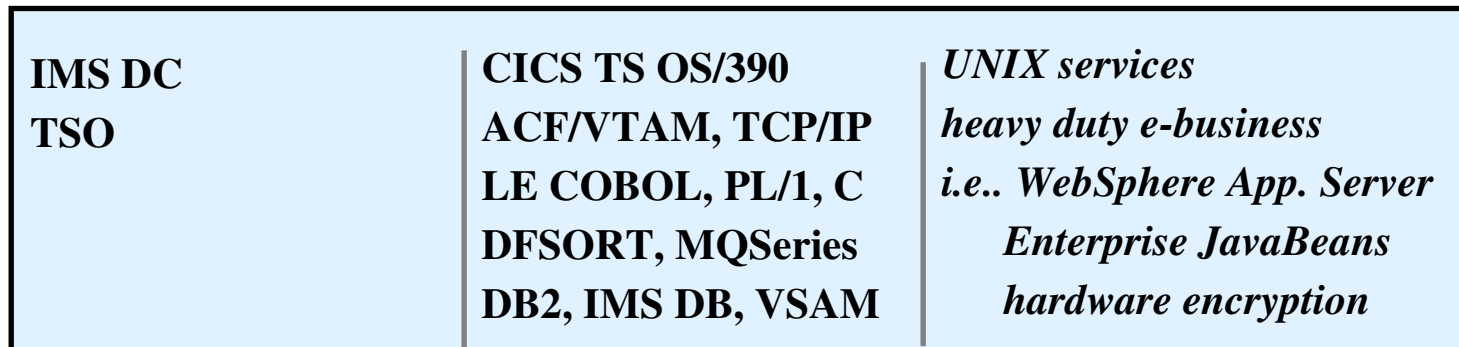
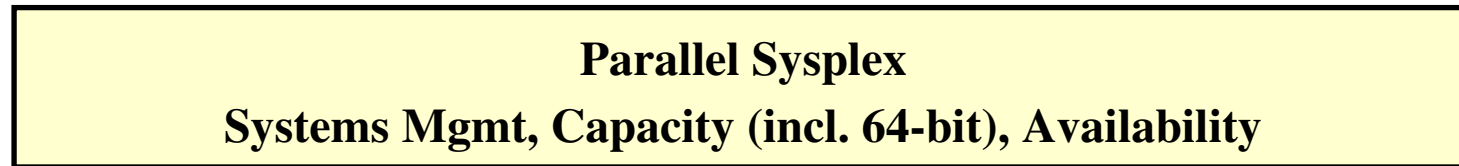
# Searching for a UNIX Platform for VSE

## Requirements:

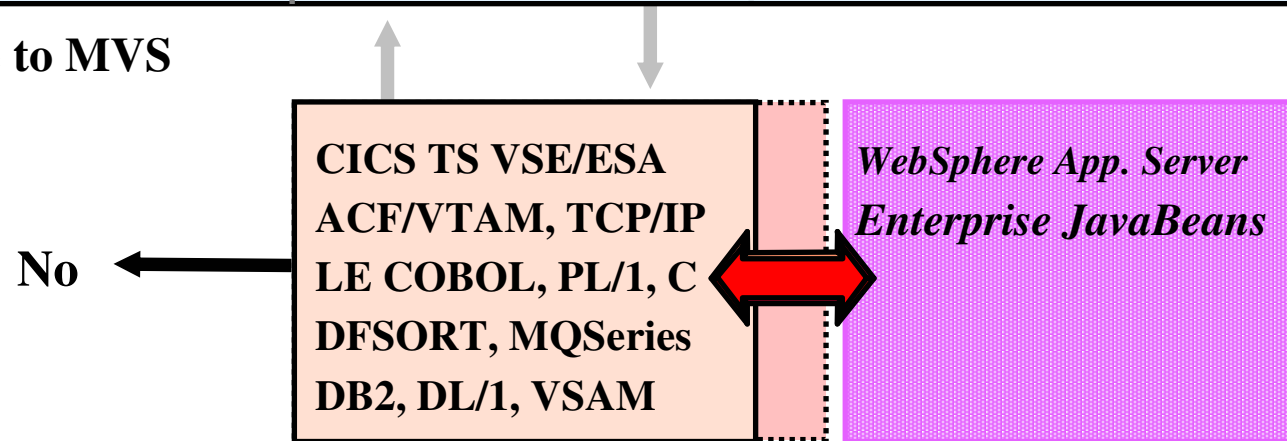
- ✓ a UNIX-like extension for VSE/ESA customer
- ✓ cost effective
- ✓ without prerequisites
- ✓ easy to integrate
- ✓ not proprietary

# Extending VSE

z/OS



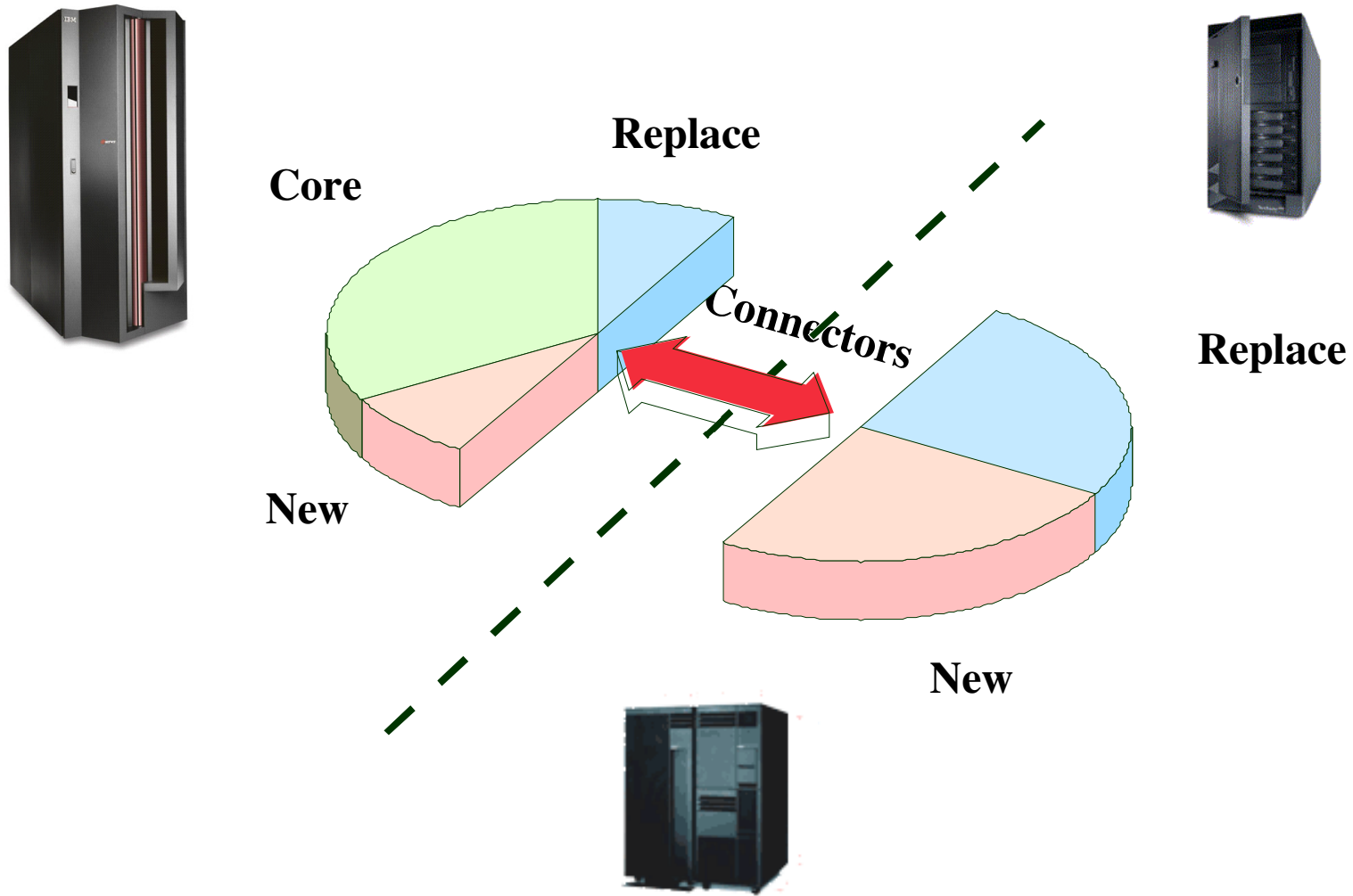
Unique to MVS



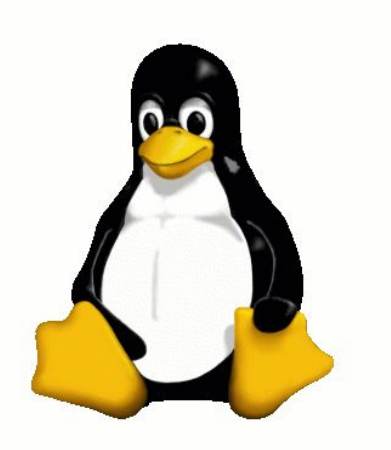
VSE

Alternate Platform

# Integrating z/VSE with hybrid Environments



# The solution found was Linux for System z



- ★ the UNIX Extension for VSE customers
- ★ born from within the VSE development team



## Timeline – 1999

### •January

–A splinter group begins work on a Linux on S/390 project in Böblingen, Germany. Their work is neither sanctioned nor budgeted and most likely cannot be found on any official charts.

### •October

–Embracing Linux at IBM became Sam Palmisano's bet while he was a senior vice president. *"The Internet has taught us all the importance of moving early, the advantage of being a first-mover,"* Palmisano said in an interview. *"We want to be riding that Linux momentum at the front, not trailing it."*

–First public discussion of IBM's Linux for S/390 port at WAVV by Dr. Strassemeier in his keynote address with a "secret" preview running on an IBM MP3000

### •December

–IBM publishes a collection of patches and additions to the Linux 2.2.13 kernel for System/390 to start a market evaluation, and creates excitement in the developer community.

# Linux and Mainframes – Worlds colliding?

## The Year 2000 Picture

### Linux

ASCII

VT Terminals

Controller-oriented I/O Paradigm

Commodity Hardware

'as is'

Open Source

### Mainframes

EBCDIC

3270 Terminals

Abstract I/O Subsystem

High-End Server

High Quality

Proprietary Source

# Extending VSE/ESA with Linux for zSeries

z/OS

**Parallel Sysplex**  
Systems Mgmt, Capacity (incl. 64-bit), Availability

<p>IMS DC TSO</p>	<p>CICS TS OS/390 ACF/VTAM, TCP/IP LE COBOL, PL/1, C DFSORT, MQSeries DB2, IMS DB, VSAM</p>	<p><i>UNIX services</i> <i>heavy duty e-business</i> <i>i.e.. WebSphere App. Server</i> <i>Enterprise JavaBeans</i> <i>hardware encryption</i></p>
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Unique to MVS

No

CICS TS VSE/ESA  
ACF/VTAM, TCP/IP  
LE COBOL, PL/1, C  
DFSORT, MQSeries  
DB2, DL/1, VSAM

VSE

WebSphere App. Server  
Enterprise JavaBeans

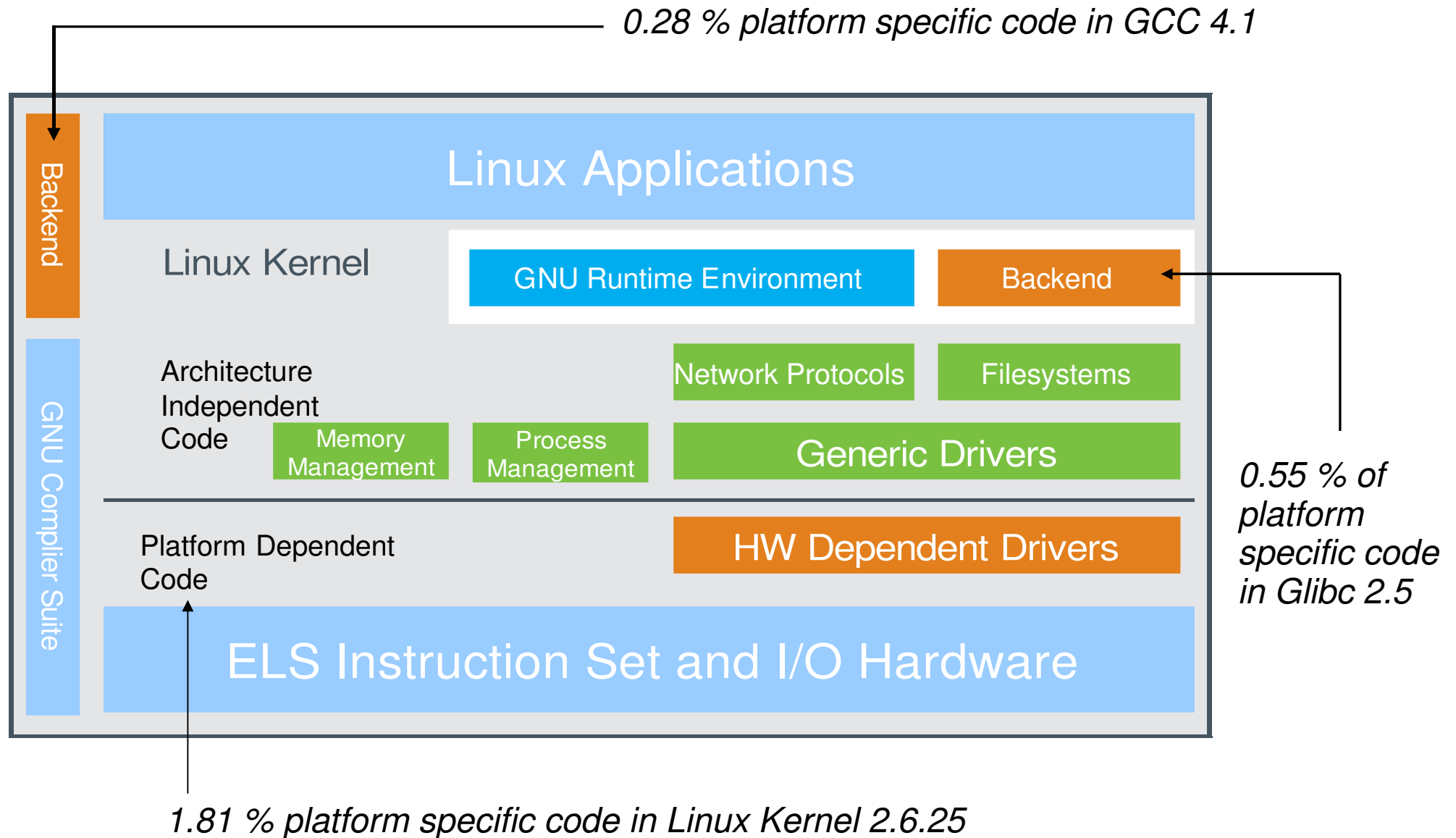


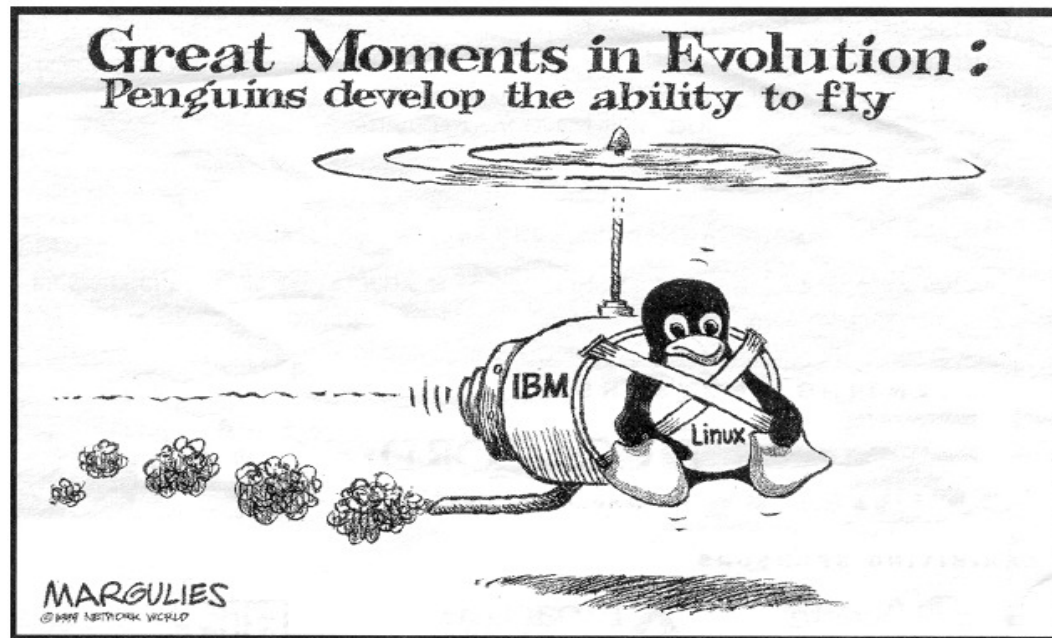
connectors Linux on zSeries

## What is Linux on System z?

- „Linux“ actually consists of
  - Linux: the Operating System kernel
  - System Environment, Libraries, Tools, Utilities, Applications: many of them GNU GPL-based
  - Distributions provide lots of application/tools packages
  
- Linux on System z
  - „Plain original Linux“ – tastes, smells, ... like Linux
  - Runs in LPAR and under z/VM
  - Takes advantage of System z platform and System z-specific enhancements
  - Developed and „maintained“ in Böblingen

# Platform Agnostic and Platform Specific Code Decomposition





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Innovation, Vision and Strategic Direction

***“Linux will do for applications,  
what the Internet did  
for networks”***

**Irving Wladawsky-Berger**

# z/VSE Strategy:

## Modern Solutions leveraging z/VSE, z/VM and Linux on System z

- P**rotect existing VSE investments
- I**ntegrate using middleware and VSE connectors
- E**xtend with Linux on IBM System z technology & solutions



**Infrastructure Simplification**

Linux on System z

Tivoli Identity Mgmt, TSM, IRMM, Print Serving, DNS, Firewall, etc.

**IBM Middleware**

Linux on System z

WebSphere Appl Server, Java, CTG, HOD/HATS, WS MQ, etc.

**Info on Demand**

Linux on System z

DB2 9 (64-bit UDB)



**z/VSE V4 Production Environment**

- + TCP/IP
- + VTAM
- + CICS TS
- + VSAM
- + COBOL
- + DB2 client
- + LDAP client

**z/VSE Test/Dev Environment**



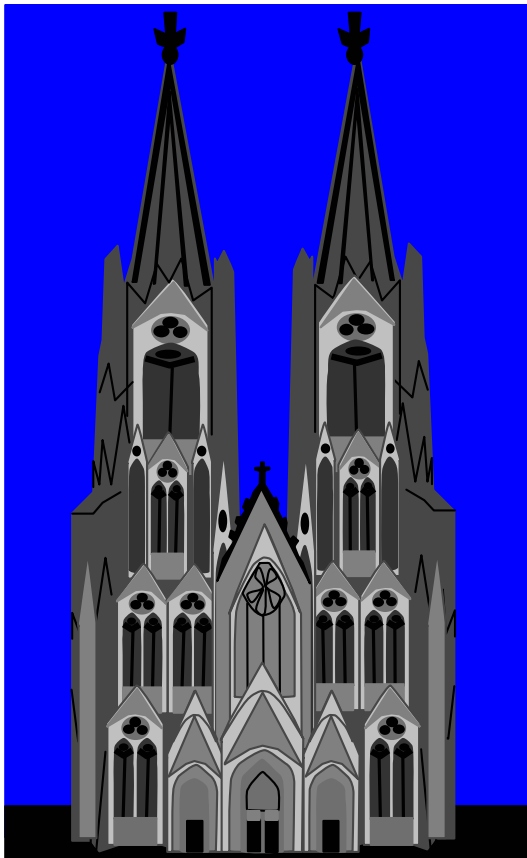
	<b>z/VM V5.4 (LDAP server/RACF)</b>	<b>z/VM or LPAR</b>	<b>z/VM or LPAR</b>
	<b>IFL Engine(s)</b>	<b>CP Engine(s)</b>	
<b>IBM System z10 EC, z9 EC, or z9 BC</b>			



# Worlds Colliding – development style ?

- Established development process: Cathedral-Style

Well defined scopes and time to deliver



- A different Culture: Bazaar

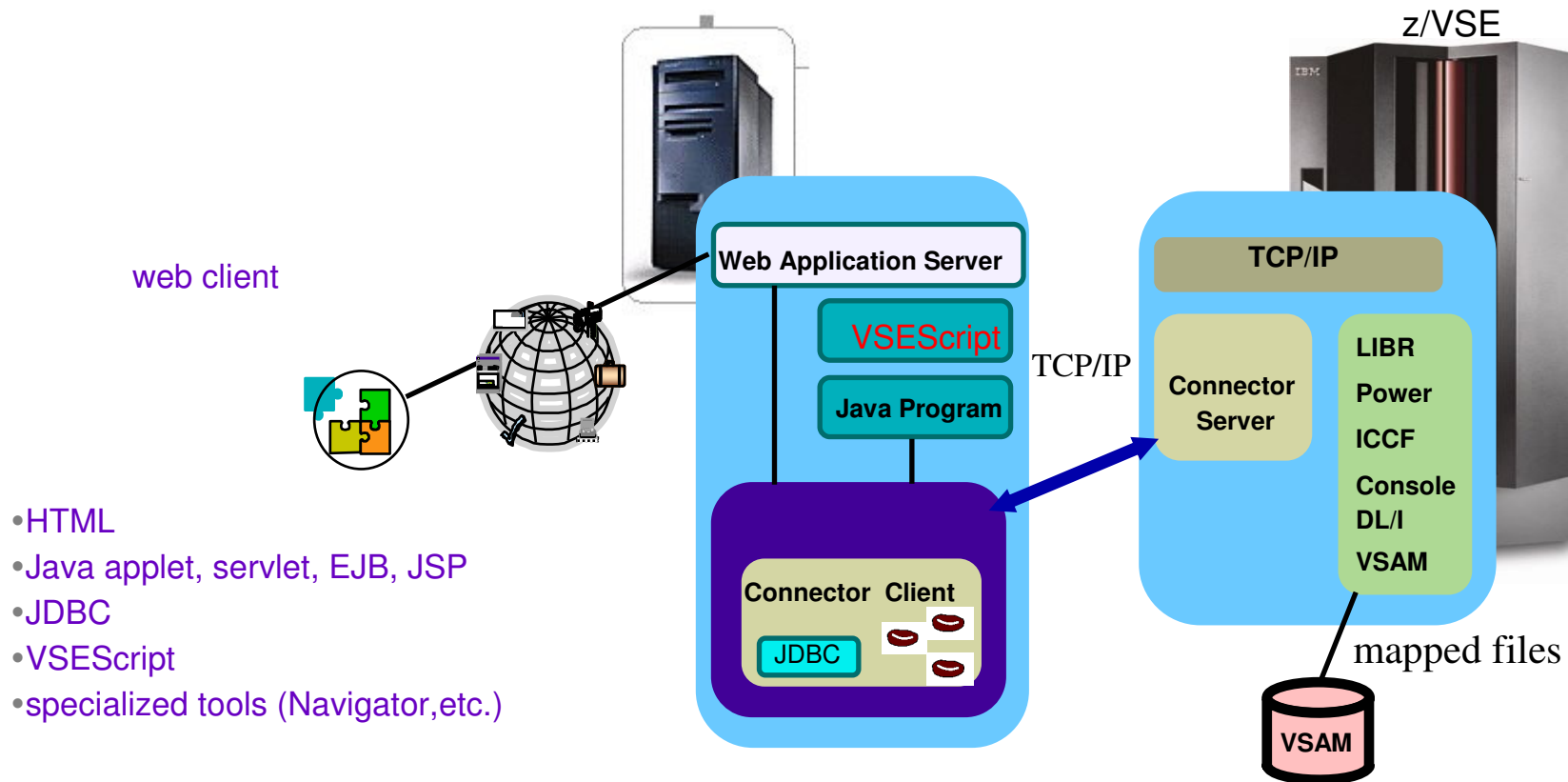
Open Source  
flexible (re-) organization  
dynamic processes  
many tasks in parallel  
design by participants  
little control



## Java access to z/VSE applications



# Real time access to VSE resources using the Java-Based Connector and Websphere (WAS)

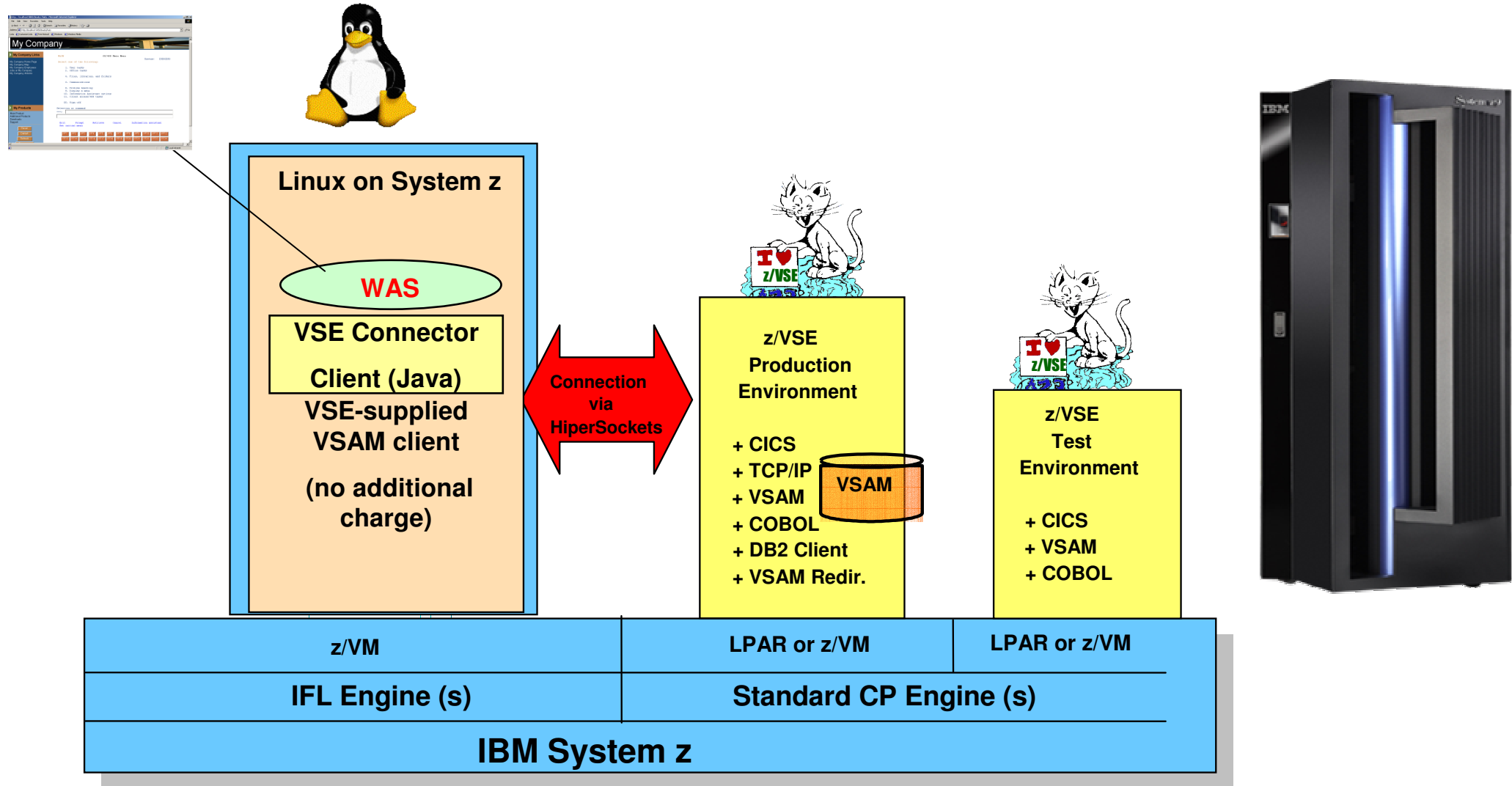


- HTML
- Java applet, servlet, EJB, JSP
- JDBC
- VSEScript
- specialized tools (Navigator,etc.)

- ▶ real time access to VSE resources from remote systems
- ▶ new possibilities for leveraging the VSE investment

# Development 1: z/VSE access from Java

Leverage VSE resources and data using VSE Connectors on Linux on System z



# z/VSE Navigator: Graphical interface to z/VSE

The screenshot shows the VSE Navigator - VSEFRAN2 application window. The interface includes a menu bar (File, Edit, Selected, Configuration, Functions, Help), a toolbar with various icons, and a main workspace divided into three panes.

**Left Pane (File Browser):** Displays a tree view of files and directories. The 'MAP' directory is selected, and a context menu is open over it. The menu options are: Display VSAM data, Export displayed data, Cut, Copy, Paste, Delete, Refresh, Rename, Add ..., Change map definition, Create view definition, Upload CSV data..., and Export map to XML.

**Center Pane (Table):** Displays a table of VSAM data with the following columns: STOREID, STORENAME, LOCSTREET, and LOCCITY. The table contains 46 rows of data. The row for STOREID 000020 (Cafe Jospin) is highlighted.

STOREID	STORENAME	LOCSTREET	LOCCITY
000002	Hotel Sacher	Hauptstr. 66	Wien
000003	Hugo	Hauptstr. 17	Wien
000010	Cafe Mueller	MARIENPLATZ 15	Munich
000011	McDonalds	Main Street 6	Melbourne
000012	Cafe Howard	Harbor Road 7	Sydney
000014	Cafe Dehaene	RUE DE SOL 4	Brussels
000015	Cafe Stojanow	Main Street 6	Sofija
000016	Cafe Chretien	Main Street 8	Toronto
000018	Cafe Rasmussen	Main Street 18	Copenhagen
000019	Cafe Lipponen	Main Street 77	Helsinki
000020	Cafe Jospin	Champs Elysees 66	Paris
000021	Cafe Simitis	Akropolis	Athens
000022	Strauss	Spiegelgasse 8	Vienna
000023	Cafe McAleese	Main Street 2	Dublin
000024	Cafe Aldo Moro	Main Street 5	Roma
000025	Cafe Jean	Main Street 6	
000026	Cafe Kok	Main Street 8	
000027	Cafe Harald V	Main Street 9	
000028	Cafe Guterres	Main Street 5	
000029	Cafe Kucan	Main Street 78	
000030	Cafe Juan Carlos	Main Street 12	
000031	Cafe Zampino	Main Street 1	
000032	Cafe Car Gustav	Main Street 5	
000033	Cafe Demirel	Main Street 12	
000034	Cafe Blair	Downing Stree	
000035	Cafe Clinton	White House 3	
000036	Cafe Woddy Allen	Wall Street 6	
000037	IBM Cafeteria	South Road	
000038	Cafe Gates	Main Street 18	
000039	Cafe Diegel	Main Street 77	
000040	Cafe Hemigway	Harbor Road 4	
010002	INGO FRANZKI	Reeperbahn 6:	
100002	INGO FRANZKI	Reeperbahn 6:	
111102	Hotel Sacher	Hauptstr. 13sc	
111111	Hotel Sacher	Hauptstr. 134	Wien
123456	Hotel Sacher	HAUPTSTR. xxx	Wien
123457	Hotel Sacher	Hauptstr. 13	Wien

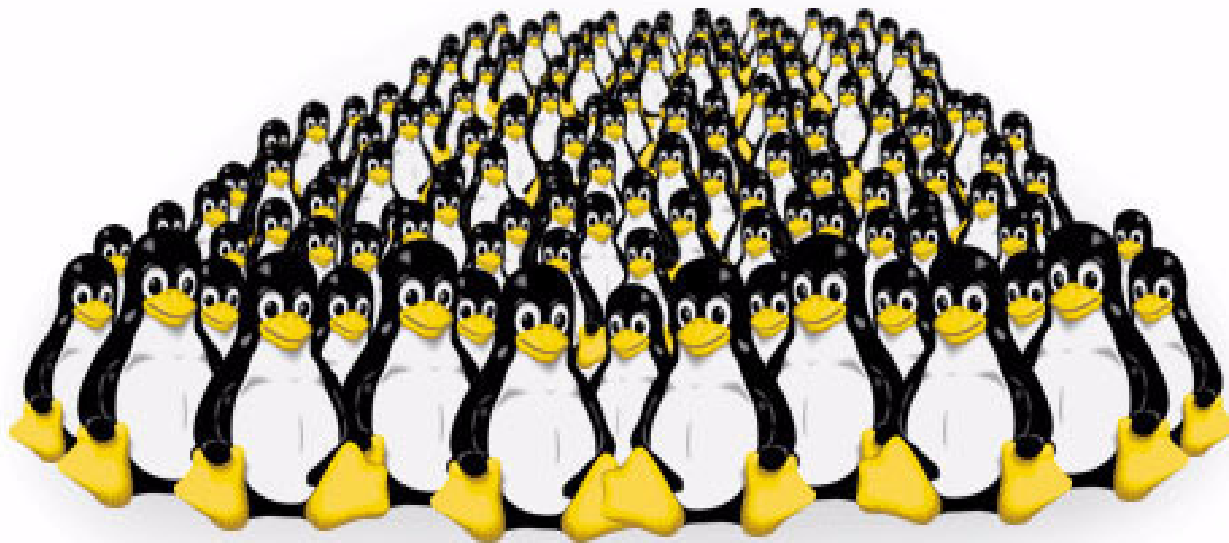
**Right Pane (Change VSAM Data Dialog):** A dialog box titled 'Change VSAM Data' is open, showing the details for the selected row (STOREID 000020). The fields and their values are:

- STOREID: 000020 (String(6))
- STORENAME: Cafe Jospin (String(25))
- LOCSTREET: Champs Elysees 66 (String(25))
- LOCCITY: Paris (String(25))
- LOCZIP: 10000 (String(10))
- LOCCOUNTRY: France (String(25))
- LOCREP: Hiler (String(20))
- SIGNINGS: 3000 (Unsigned(4))
- PROFIT: 1500 (Unsigned(4))
- LDATE: 1999-09-13 (String(10))
- WEBPIC1: Map.gif (String(20))
- WEBPIC2: Paris.jpg (String(20))
- ACODE: password (String(10))

At the bottom of the dialog, there is a message: 'Change data and press 'Change''. Below the message are three buttons: 'Change', 'Close', and 'Help'.

**Status Bar:** At the bottom left of the application window, it displays '46 row(s) received'.

Penguins got proud !  
..... And started multiply like Rabbits .



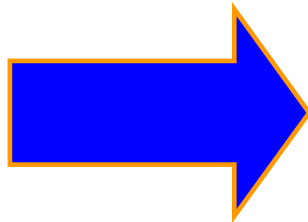
# Virtualization with new dimensions

## The Economy of a high-end Linux Server

“Green” penguins benefit from the IBM System z platform strengths

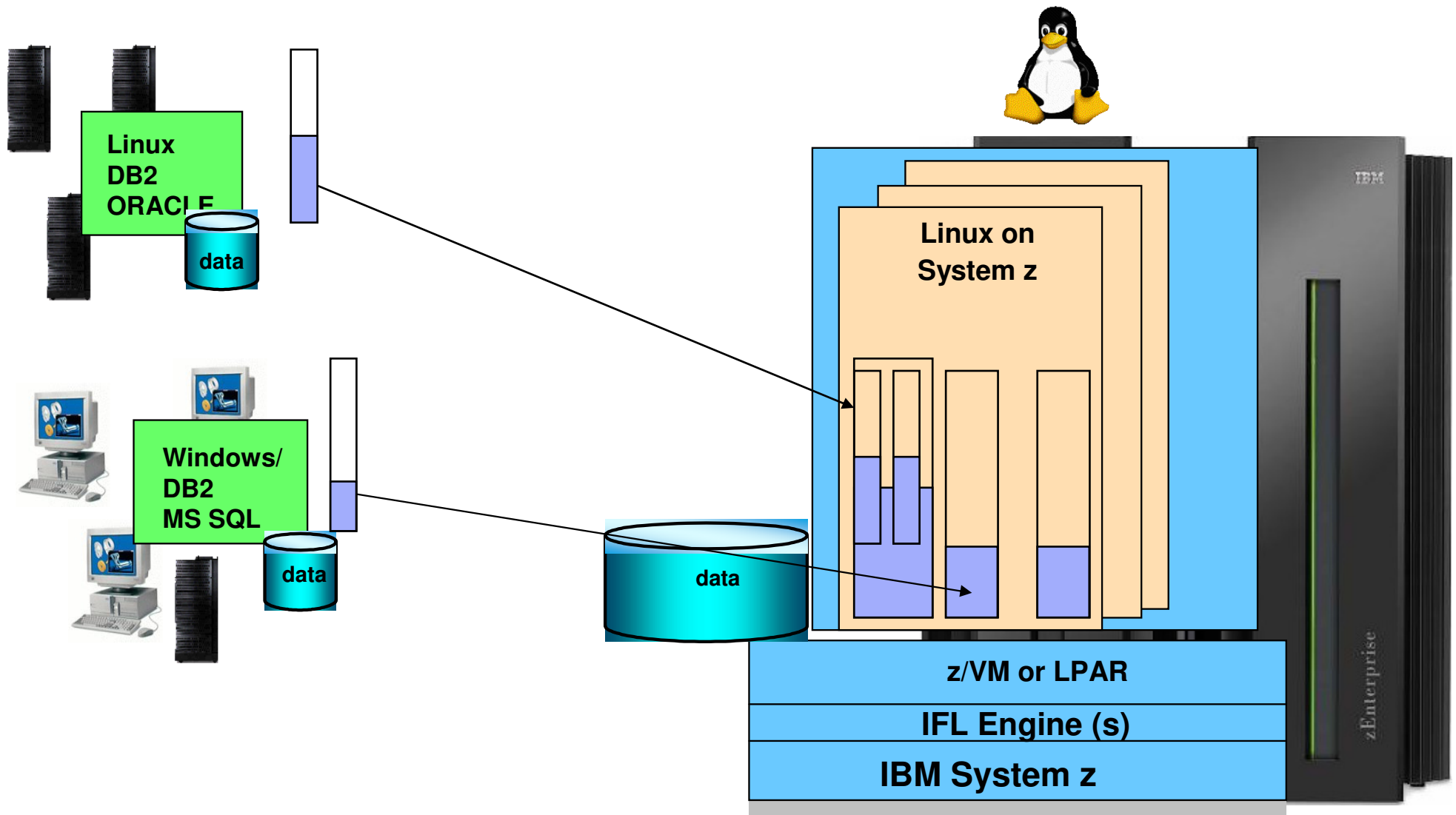
An example: **buildings**

The differences are quantum – many small houses versus a large building.



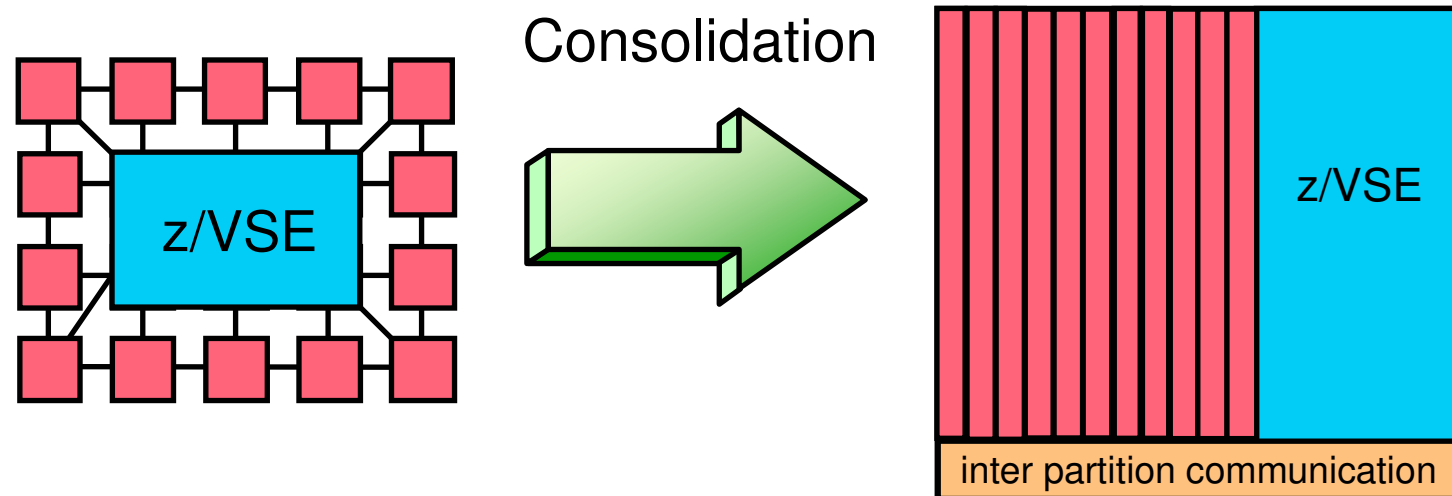
# Linux on System z as workload concentrator

Virtualize, Consolidate, Integrate





# Consolidation of workload Linux on System z



For z/VSE customers, Linux on System z opens new horizons:

- ◆ A big variety of standard applications
- ◆ The integration of existing applications and data using e-business Connectors
- ◆ Modern, scalable new solutions

# Consolidation on System z Meets the Challenge

## Centre de Services Partages du Quebec (CSPQ) on System z

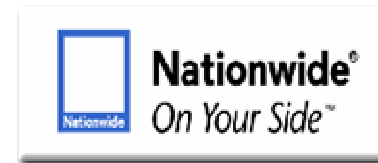
- ▶ 60 UNIX servers to 5 IFLs on z9
- ▶ Increased capacity by over 2.5X



Centre  
de services partagés  
Québec

## Nationwide Insurance on System z

- ▶ 250 Servers to 6 IFLs on z9
- ▶ Will save \$16M over next 3 yrs

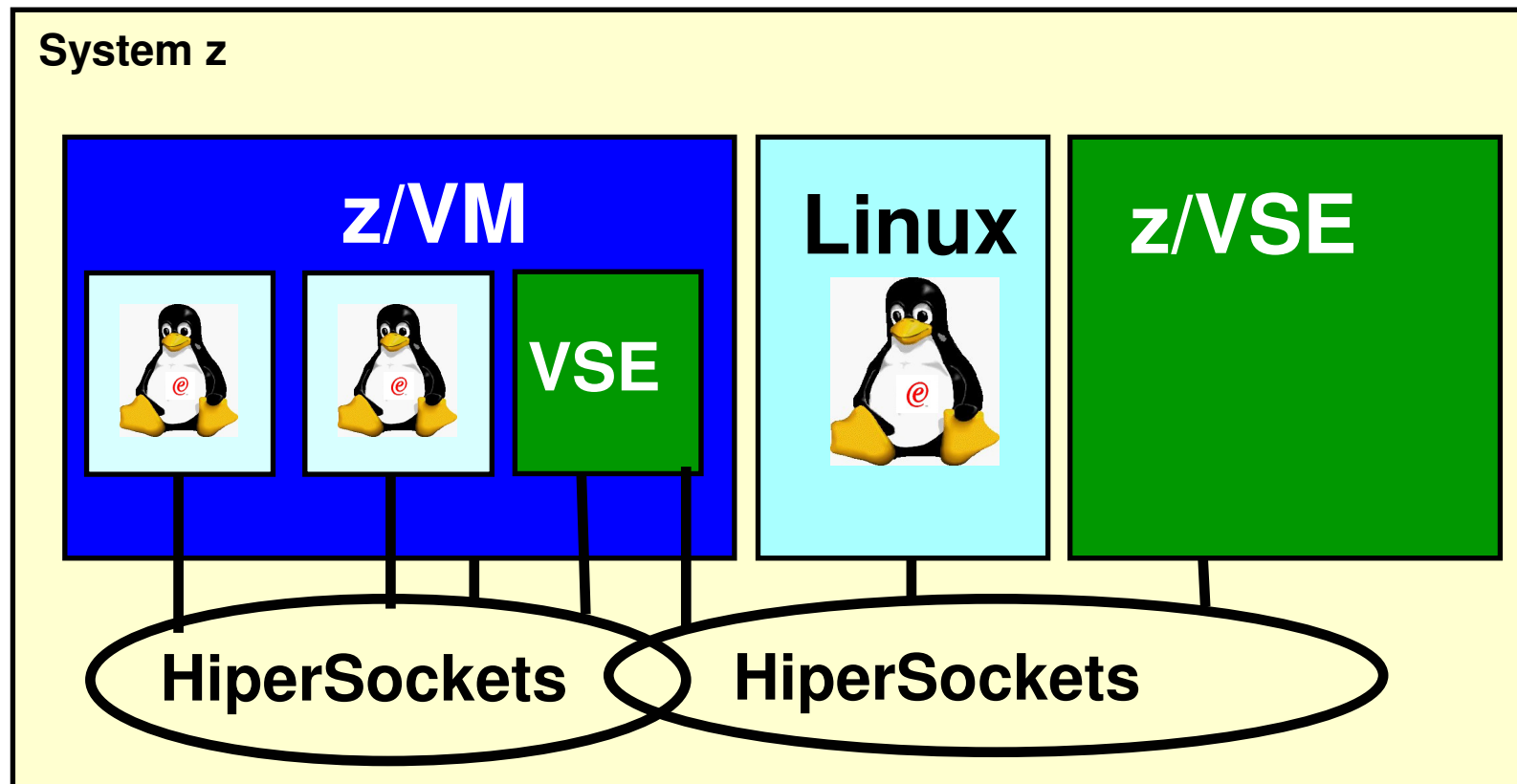


## Large Linux Environment on System z10

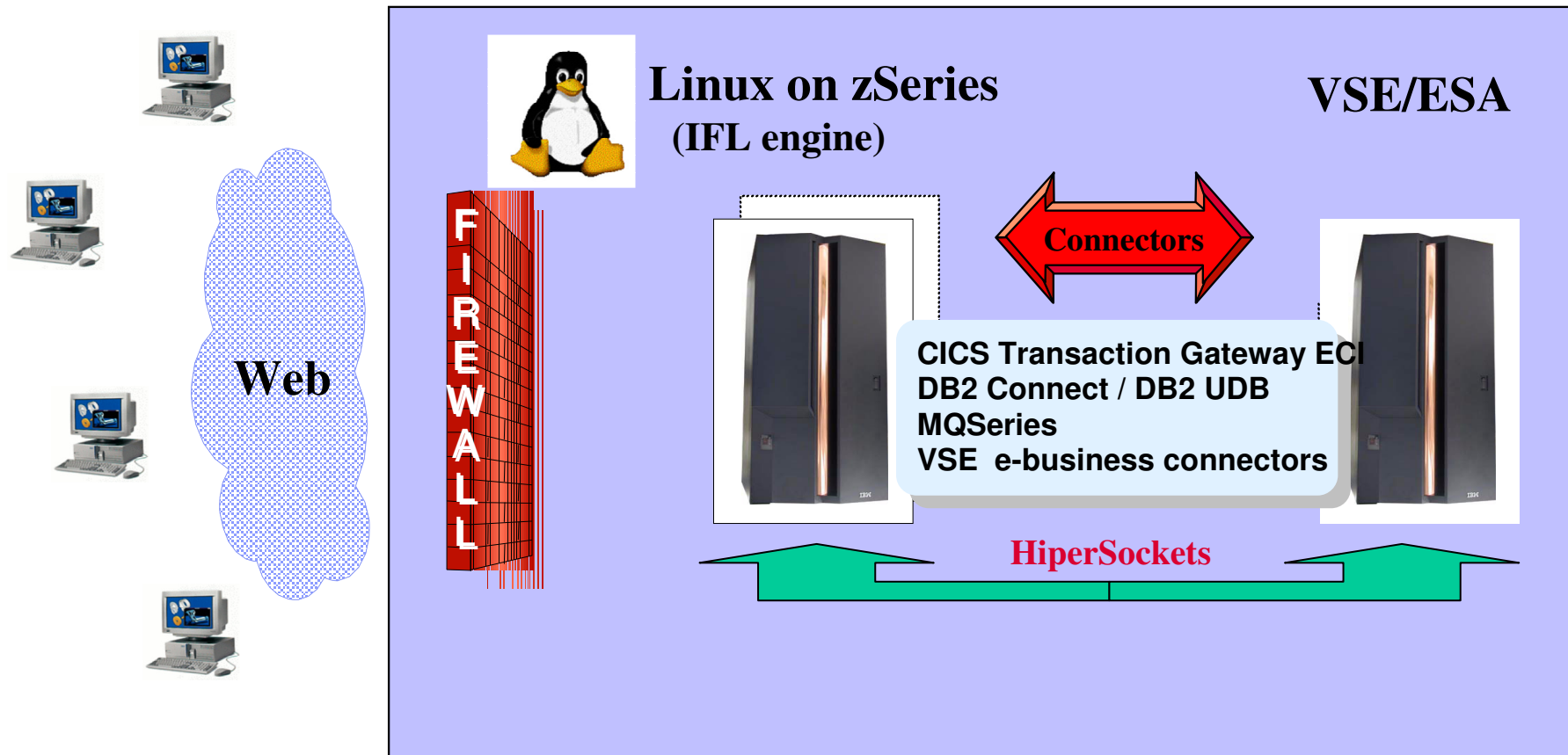
- ▶ 760 x/86 Servers to 26 IFLs
- ▶ Save up to 80% over 3 years
  - Up to \$30M in savings



System z – designs the internal network,  
Hipersockets - the Network in the box

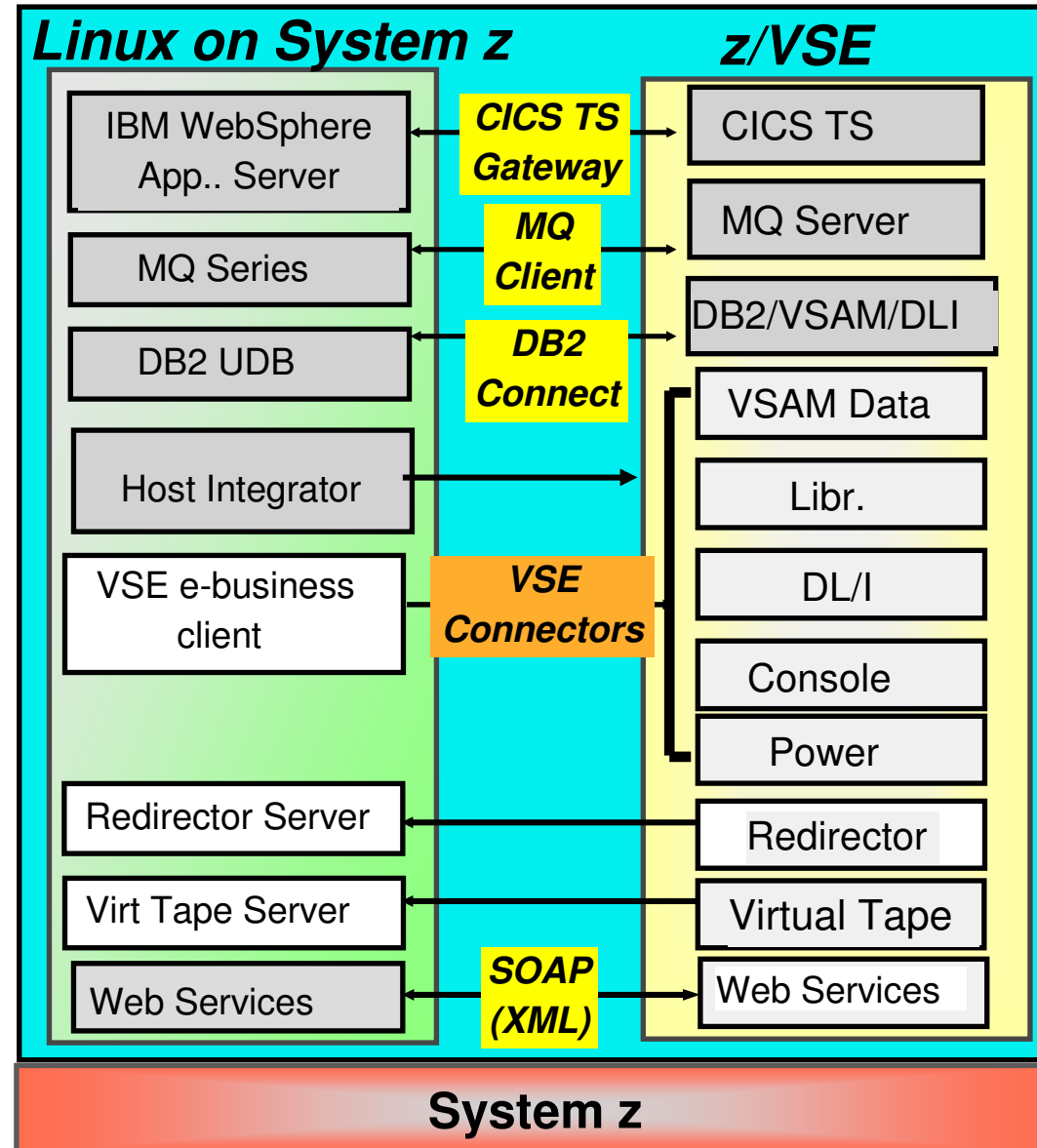


# Integration von VSE/ESA mit Linux for zSeries

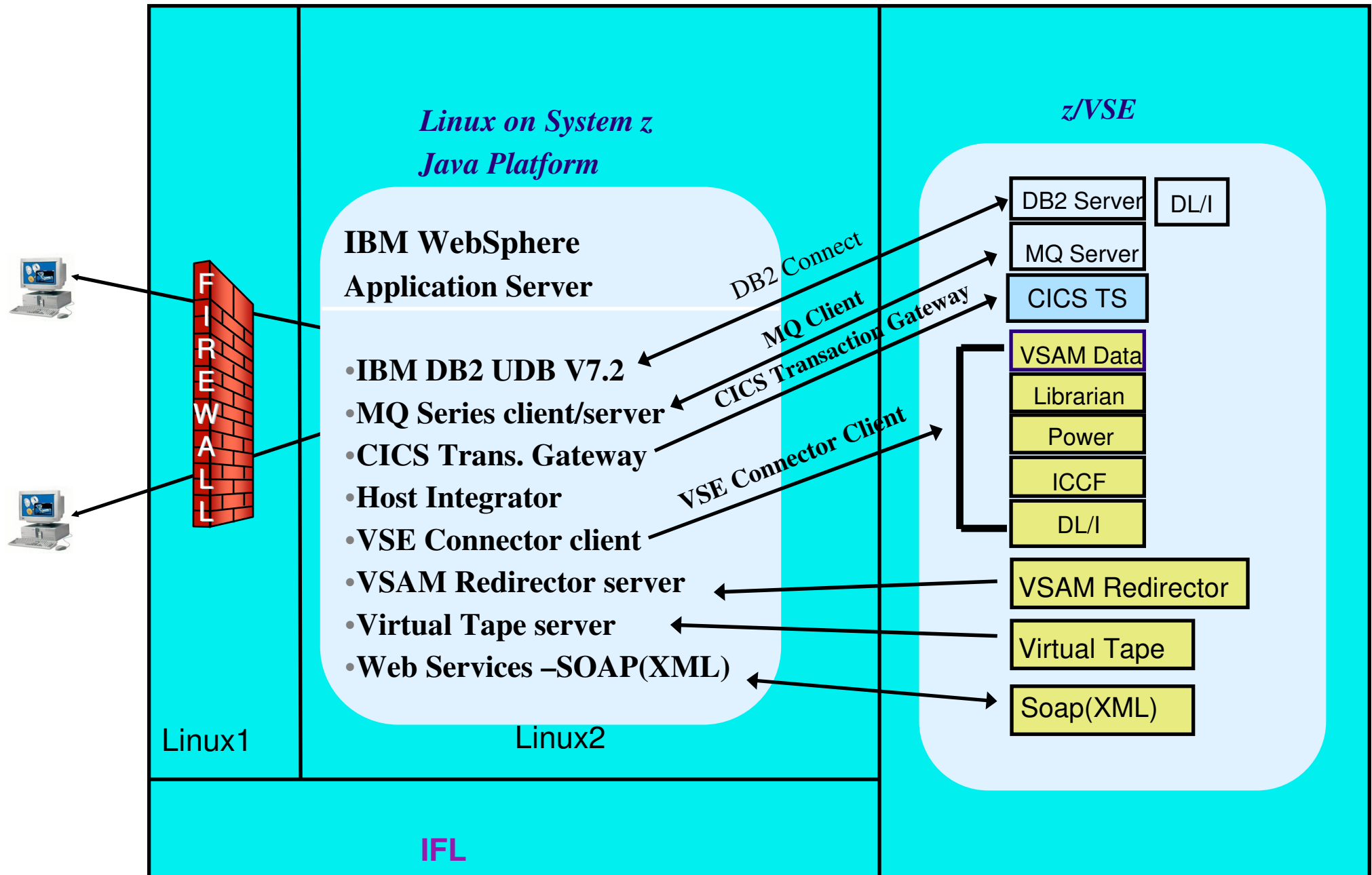


# Linux Connector Middleware Relations to z/VSE

- Modern Applications with Linux on System z
- Most modern technologies interact with z/VSE
- Modernized IT infrastructure with heterogeneous workload

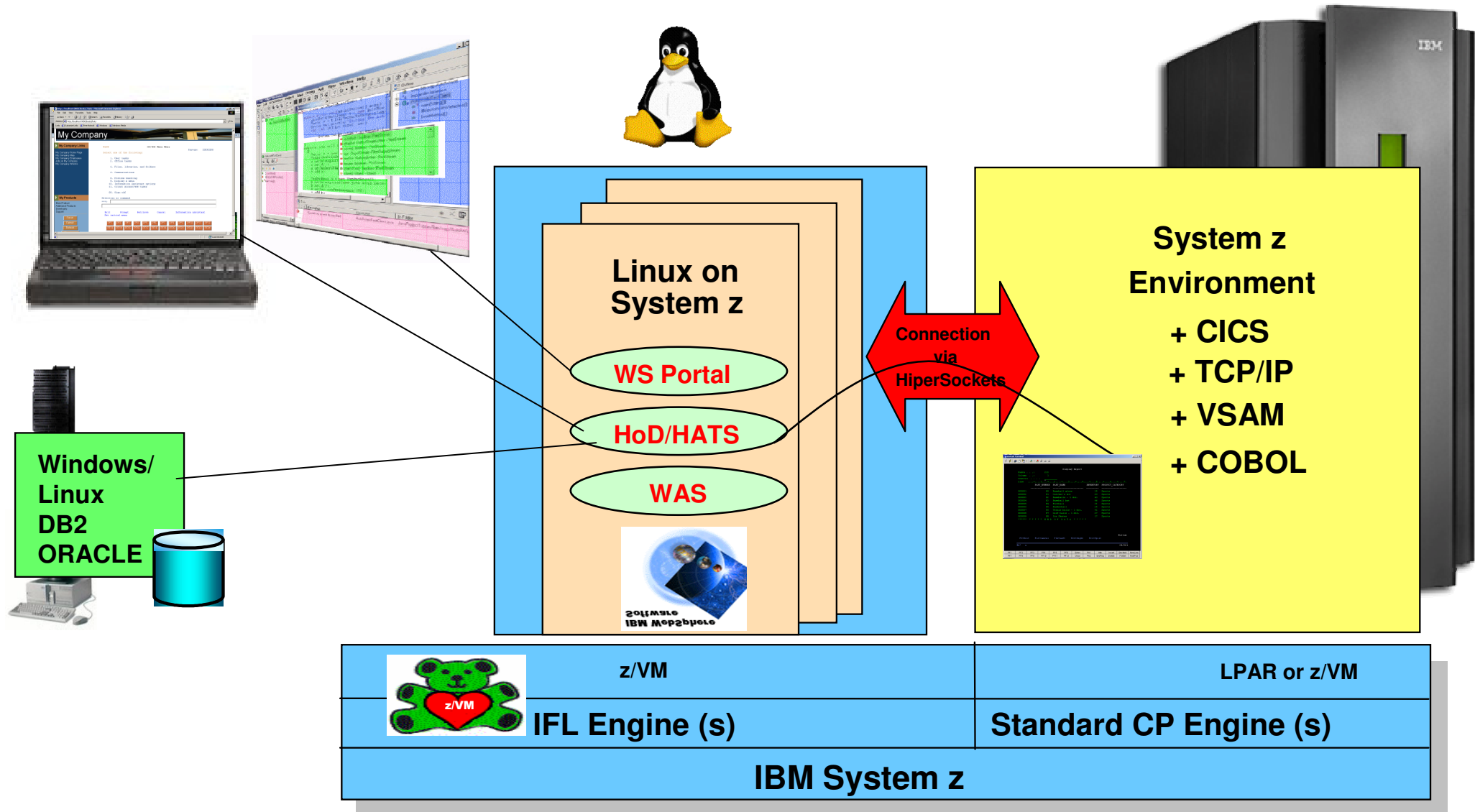


# Connectors to z/VSE



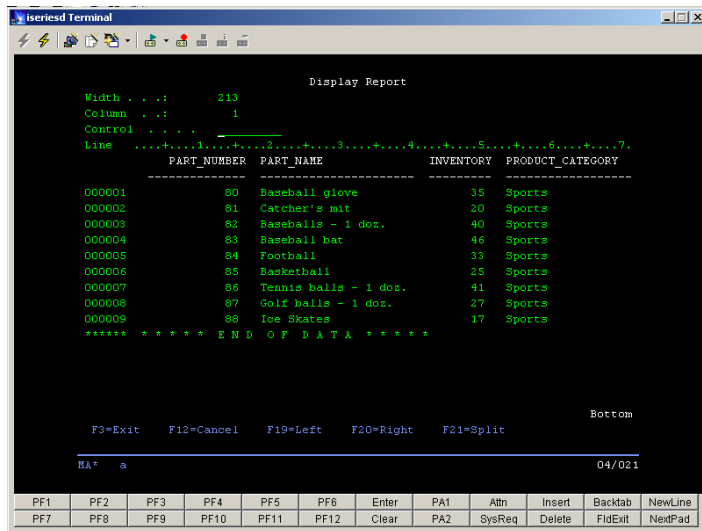
# Linux on System z as Enterprise Access point

Web enable, improve interface, simplify, extend existing applications



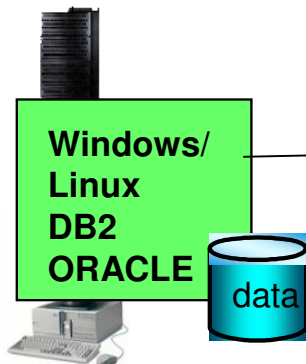
# Application Integration with Host Access Transformation Services (HATS)

- 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

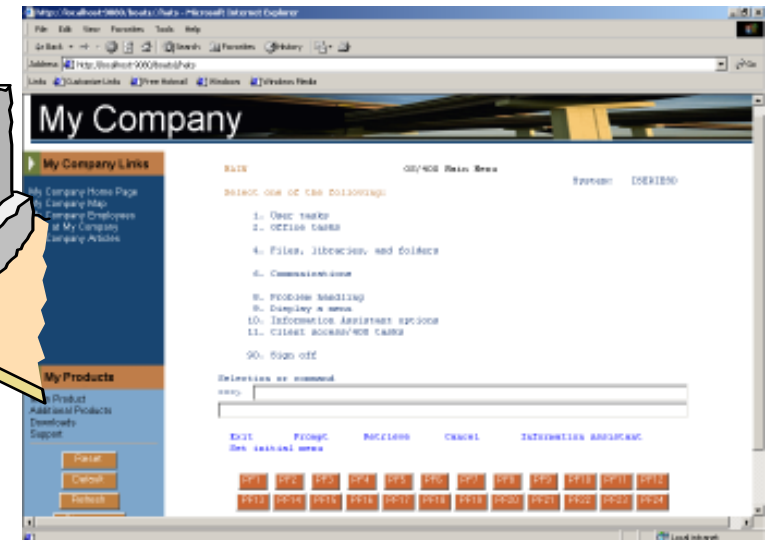
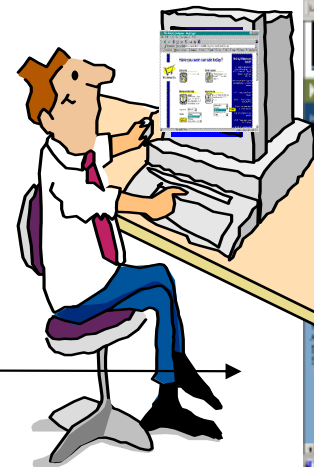


3270 or 5250  
data stream

HATS



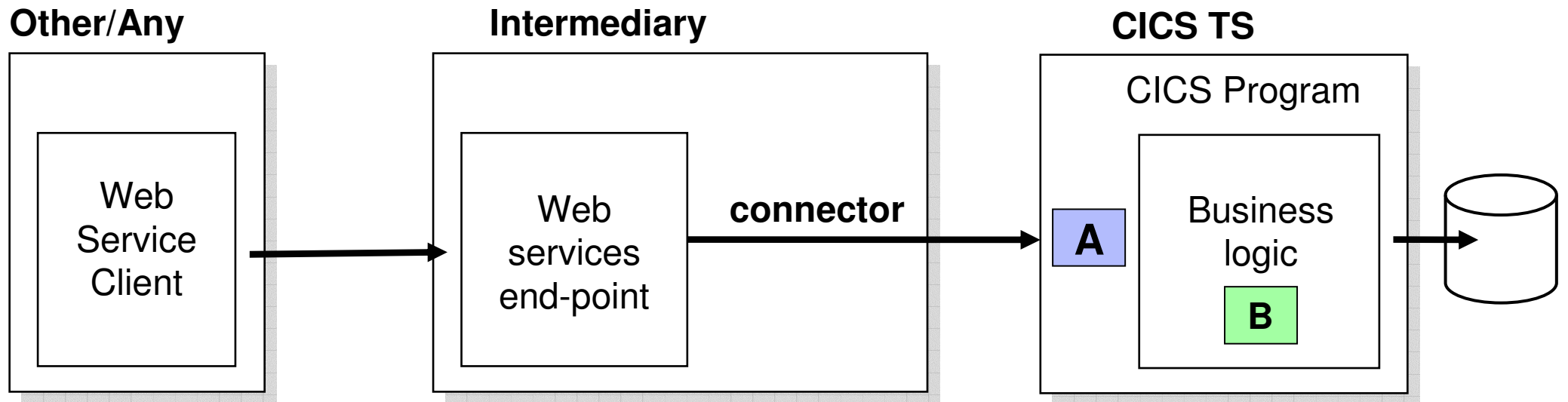
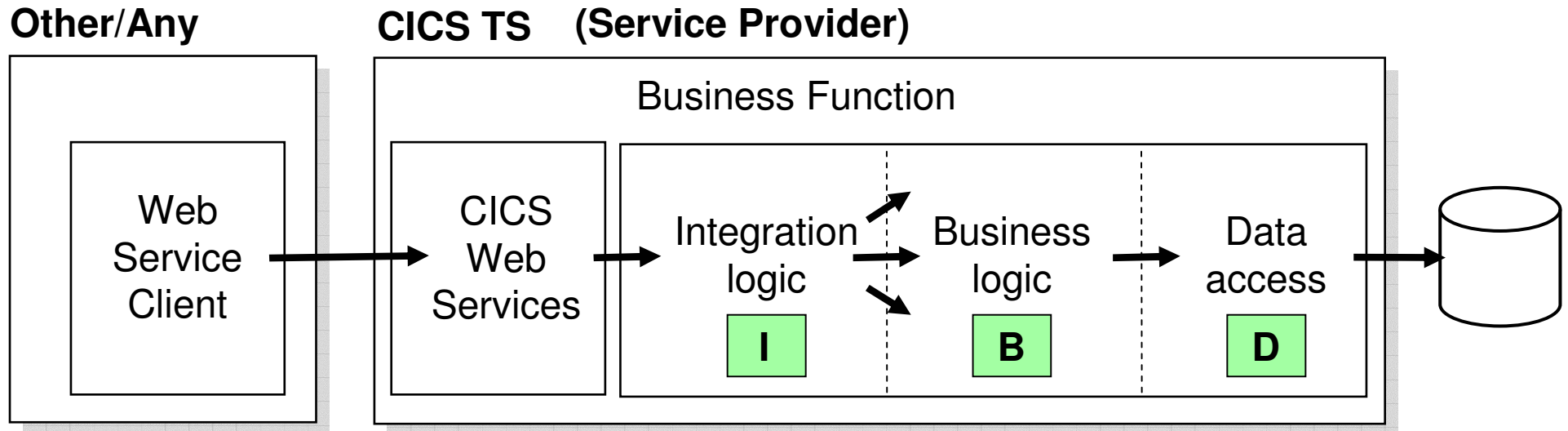
Screen transformation rules running on  
WebSphere Application Server



HTML in a Browser



# The Two Models of CICS Integration



## 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



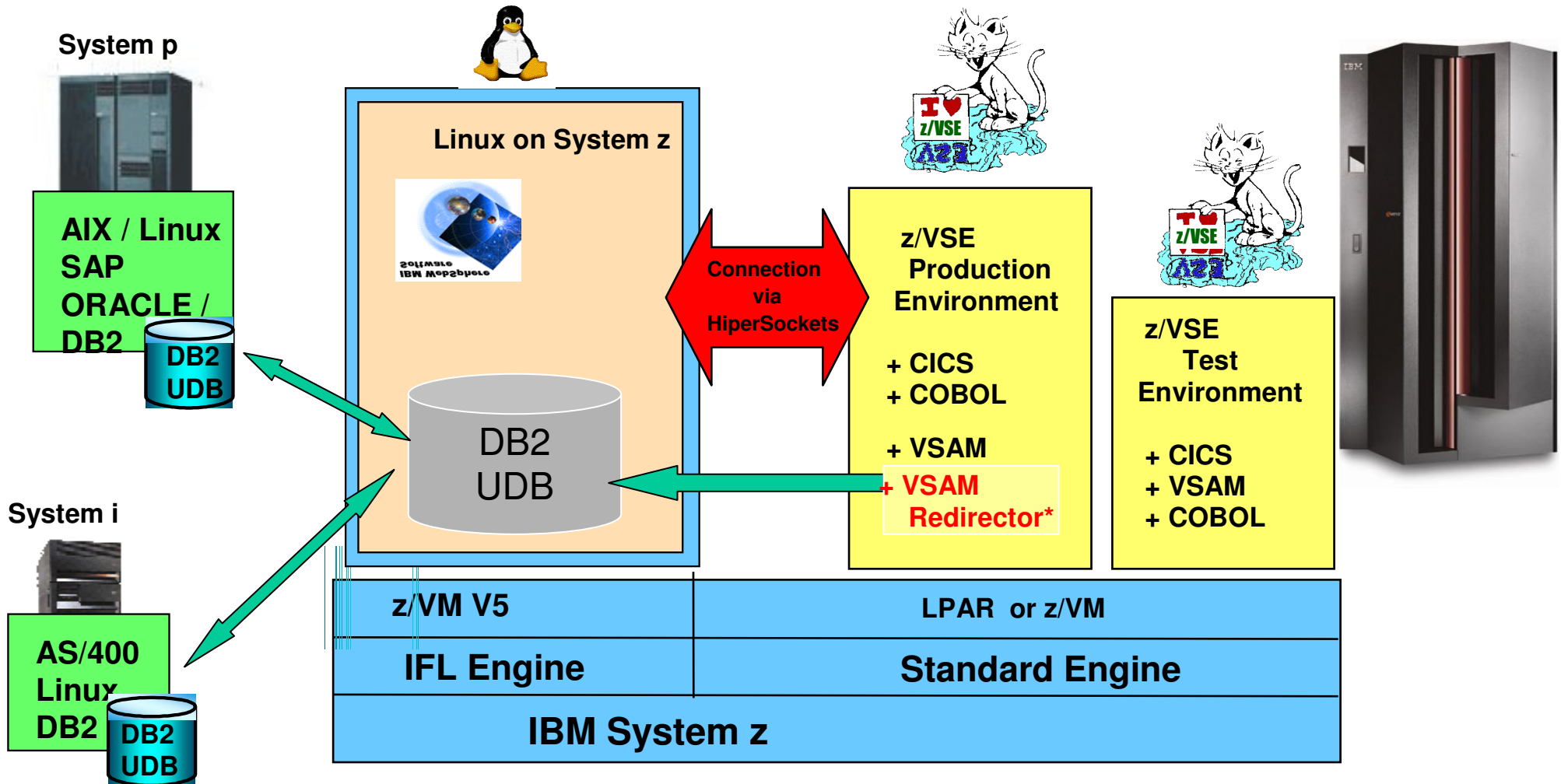
### Customer Quote

*“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.”*

## z/VSE applications transparently work with Linux databases



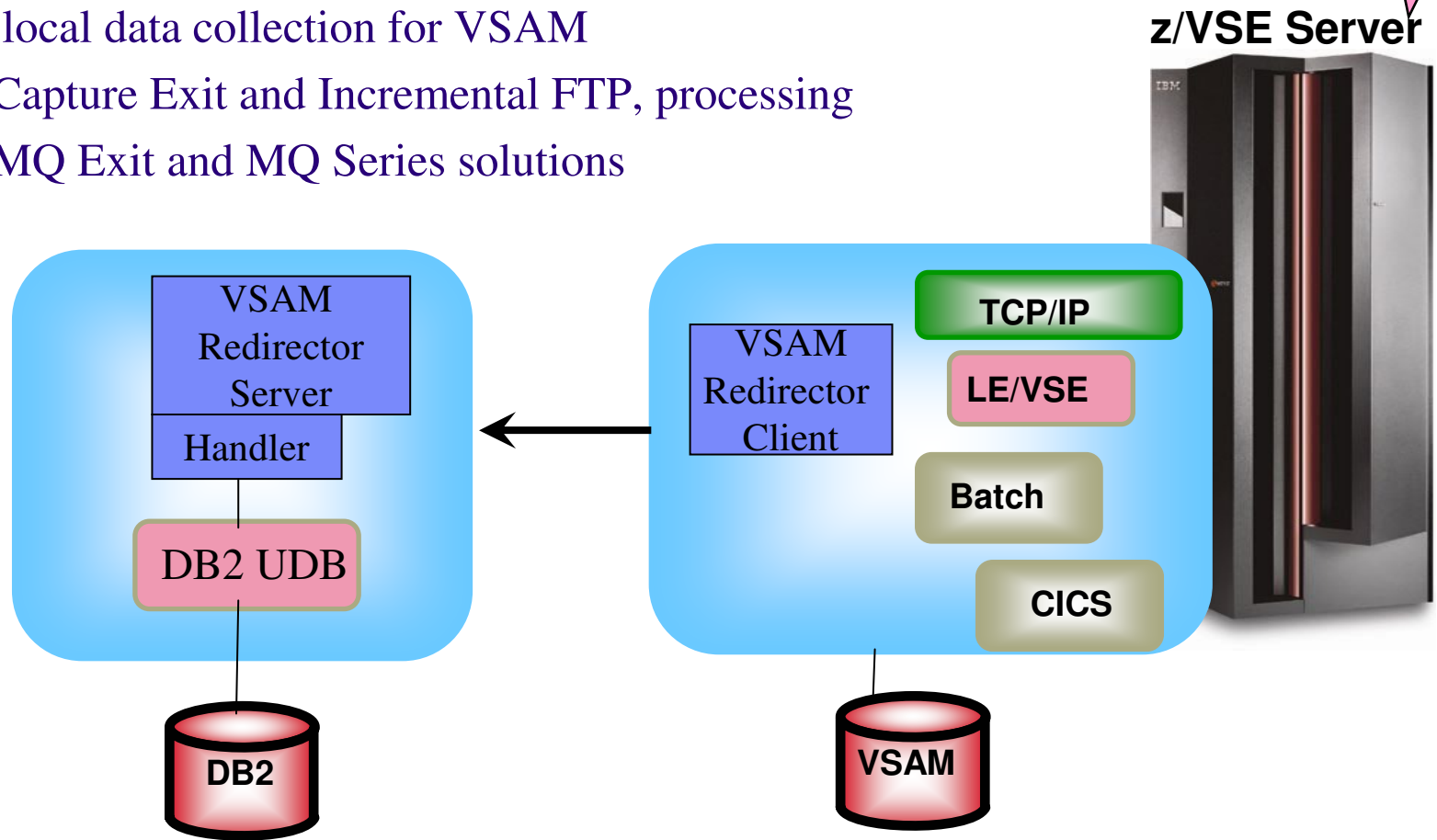
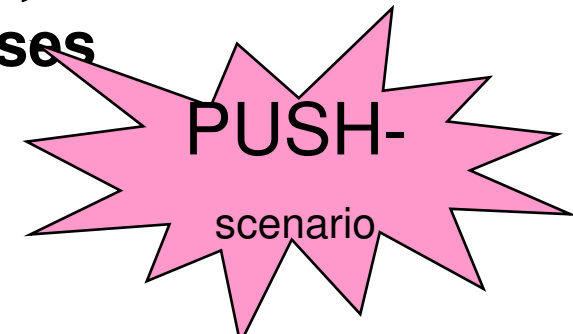
# Transparent access of VSAM Programs to DB2 UDB on Linux on System z



(\* ) VSAM Redirector – Common data store solution – with DB2 on Linux on zSeries Solutions without changes to VSAM programs

## PUSH scenario: VSE/VSAM applications, access remote relational databases

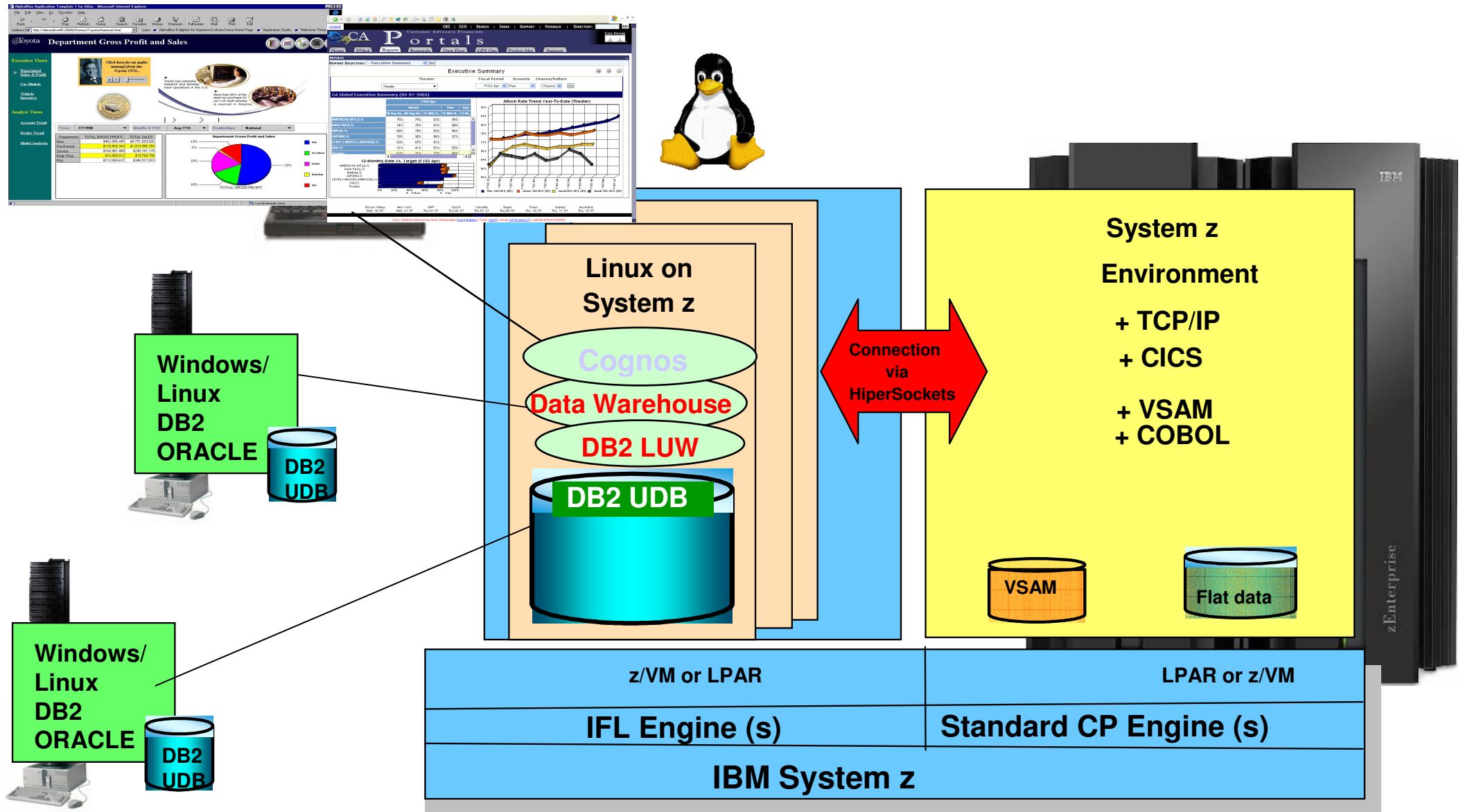
- (1) Real time access VSAM to relational databases
  - a) synchronization (two phase commit of VSAM and DB2)
  - b) Real time access to DB2 (no VSAM access anymore)
- (2) VSE local data collection for VSAM
  - a) Capture Exit and Incremental FTP, processing
  - b) MQ Exit and MQ Series solutions



# Scenario 2: Linux on System z as data hub



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





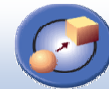
# Cognos on IBM System z with z/VSE



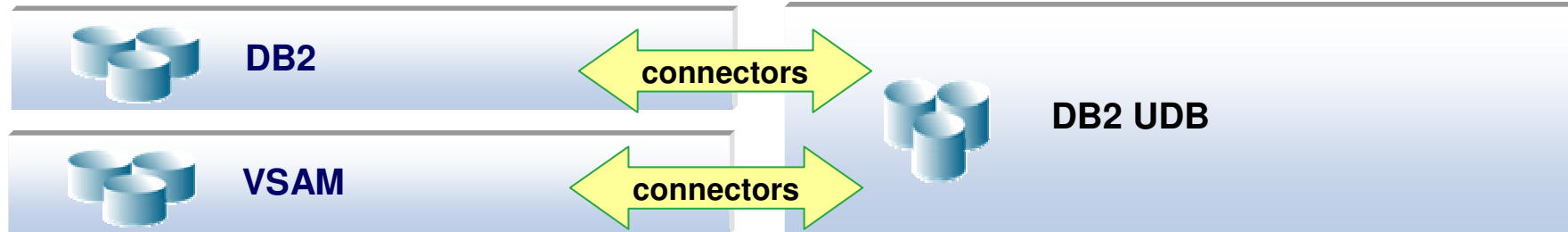
Connectors like *VSAM Redirector* enable a VSE application to store data on a remote system.

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 Bi V8.3



IBM Information Server



z/VSE



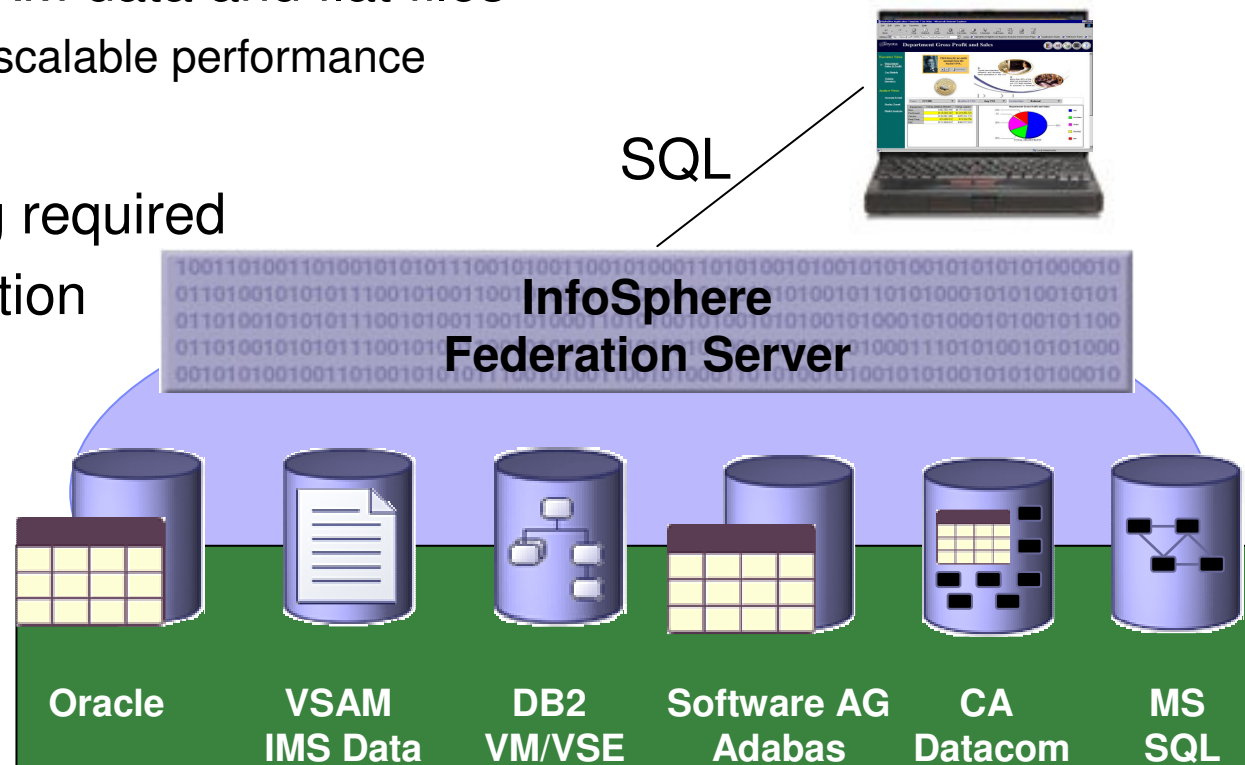
Linux on System z



# 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





# 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



## z/VSE application interact in distributed Linux processes



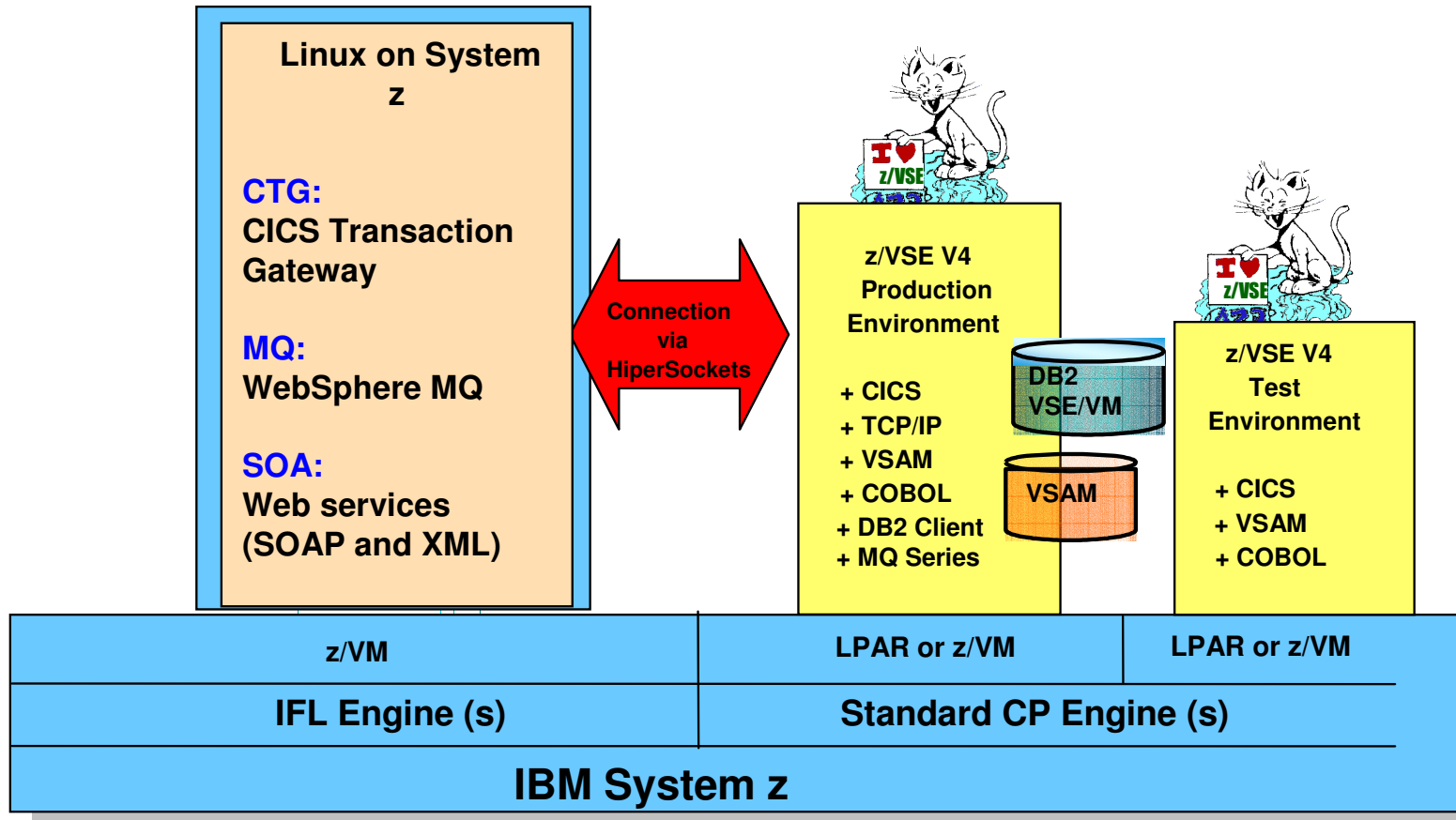
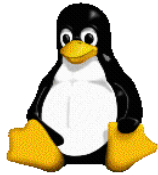
# Szenario 3: Integration of z/VSE Applications

Leverage VSE application logic using SOA or CTG

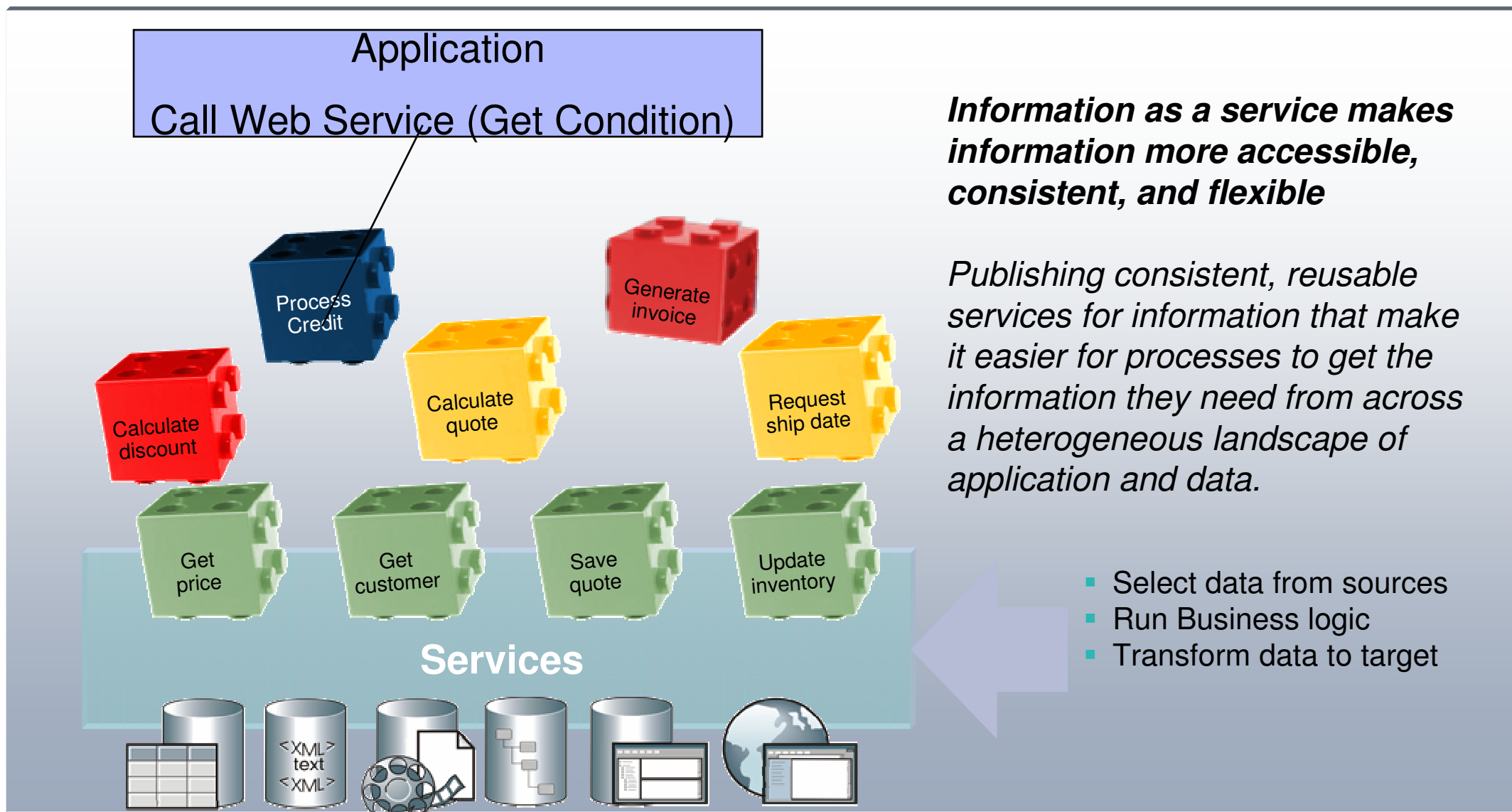
CTG: Access to CICS applications

SOA: Standard Integration of CICS applications

MQ: Asynchronous data distribution

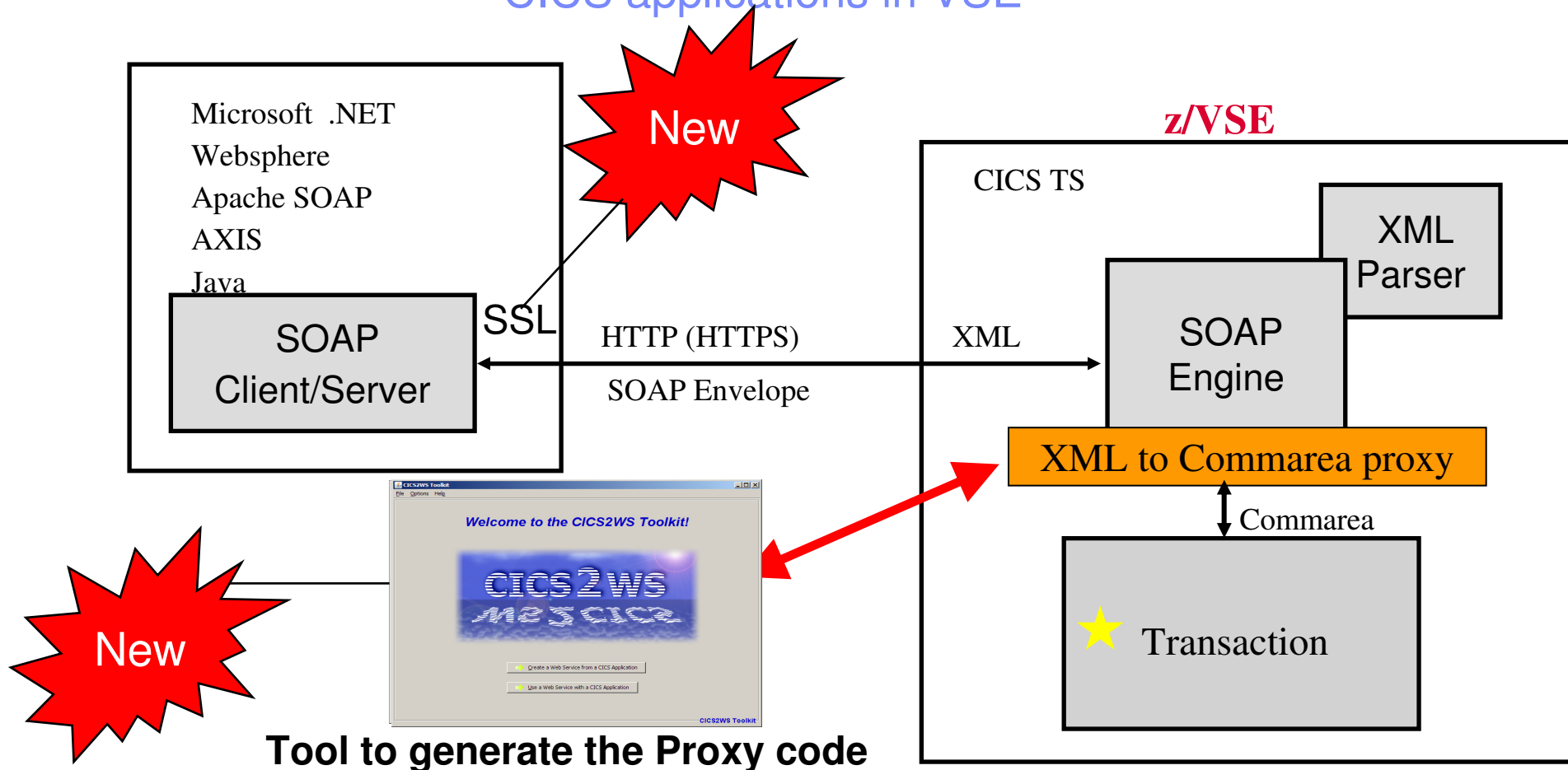


# SOA evolution - Integrating Logic across platforms



# Web Services with z/VSE

SOA and XML data interchange with CICS applications in VSE

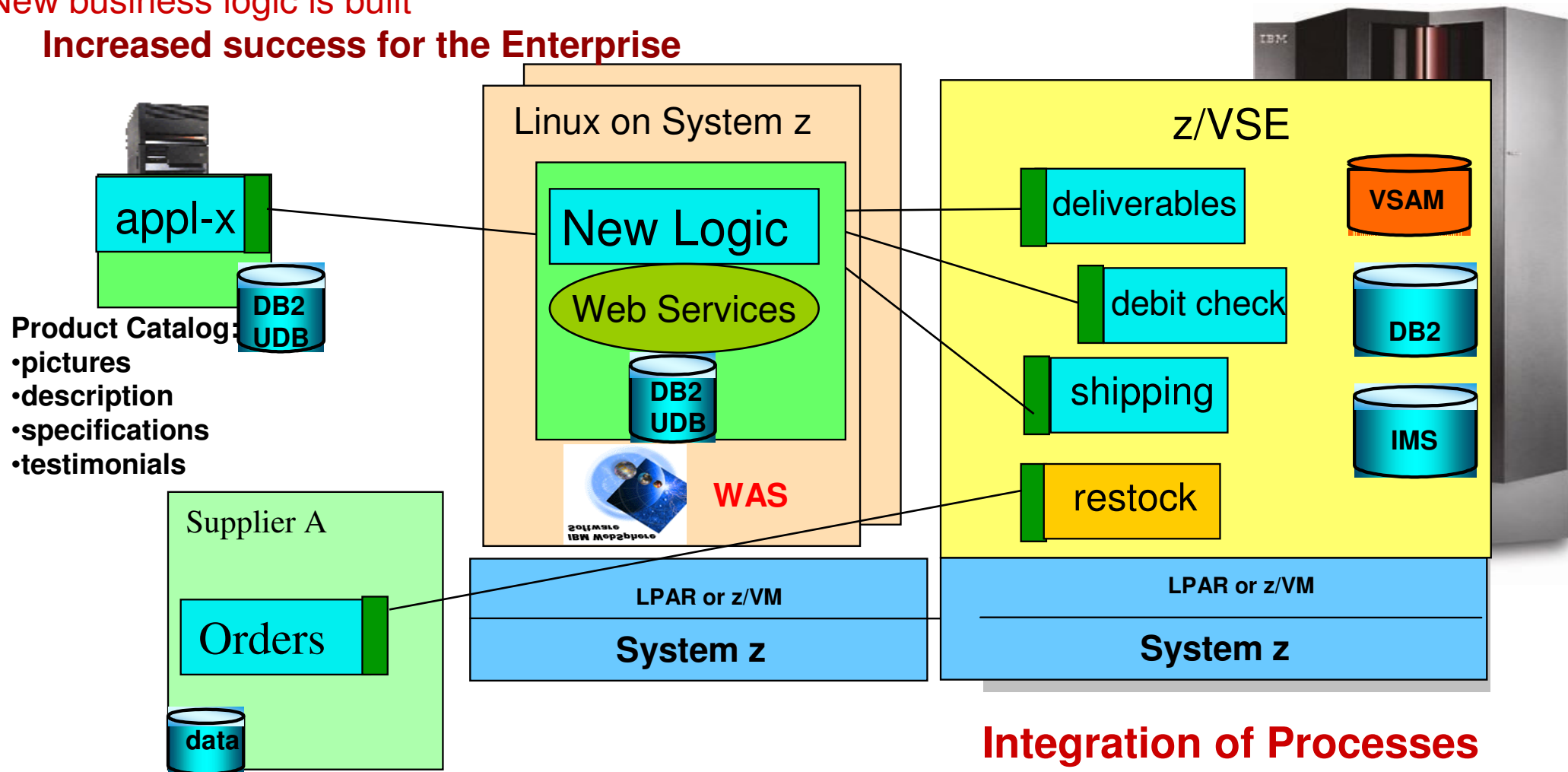


- ★ Existing VSE Transactions as Web Service
- ★ Existing Transactions can call a remote Web Service

# 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)
- New business logic is built

**Increased success for the Enterprise**



# 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 than 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



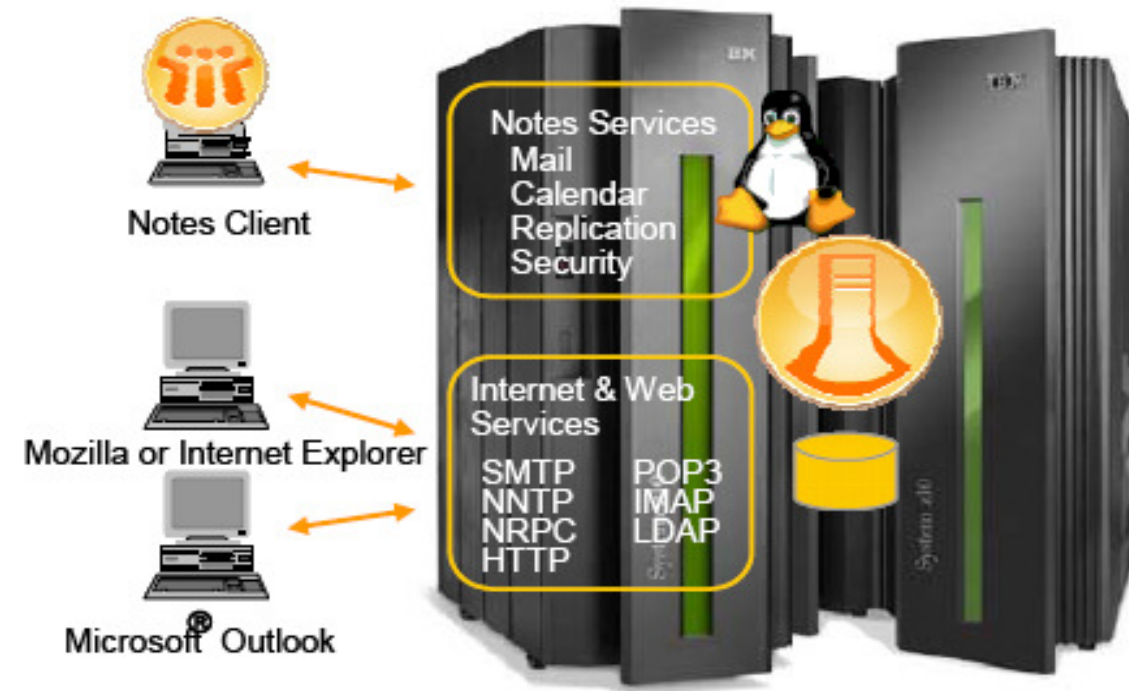
*“We no longer want to invest the time and resources in two or three year initiatives. Business is changing so fast these days that we can’t afford to roll something in production that represents the thinking of three years ago.”*



# Linux on System z as Mail and Collaboration Hub

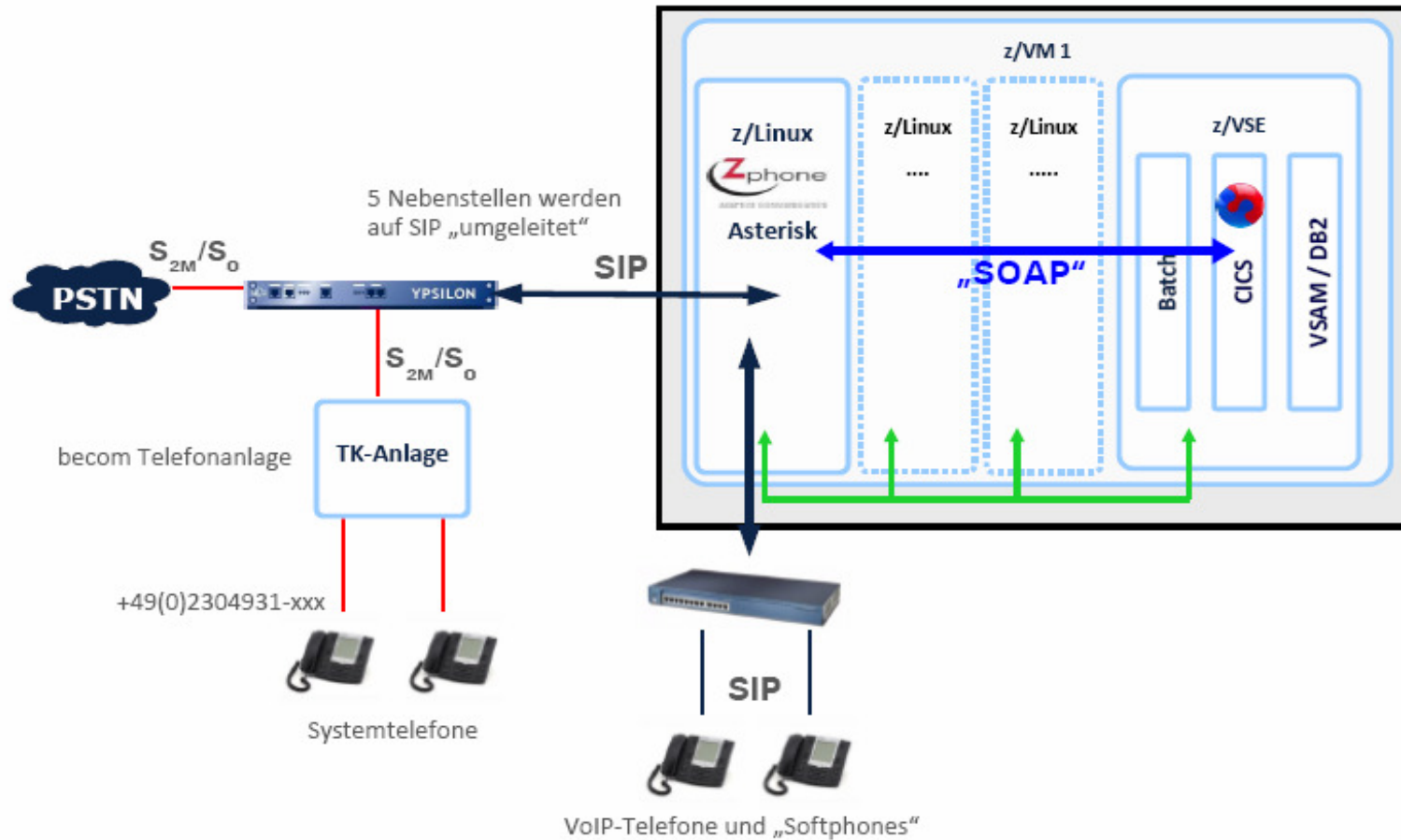
## ▪ Mail

- 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“*



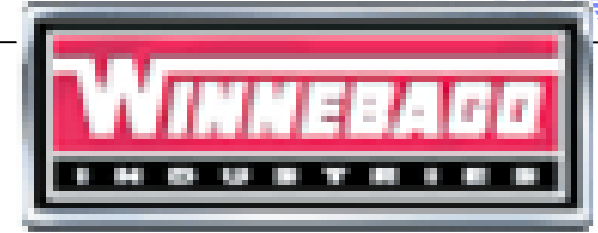
27.04.2009

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

# 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

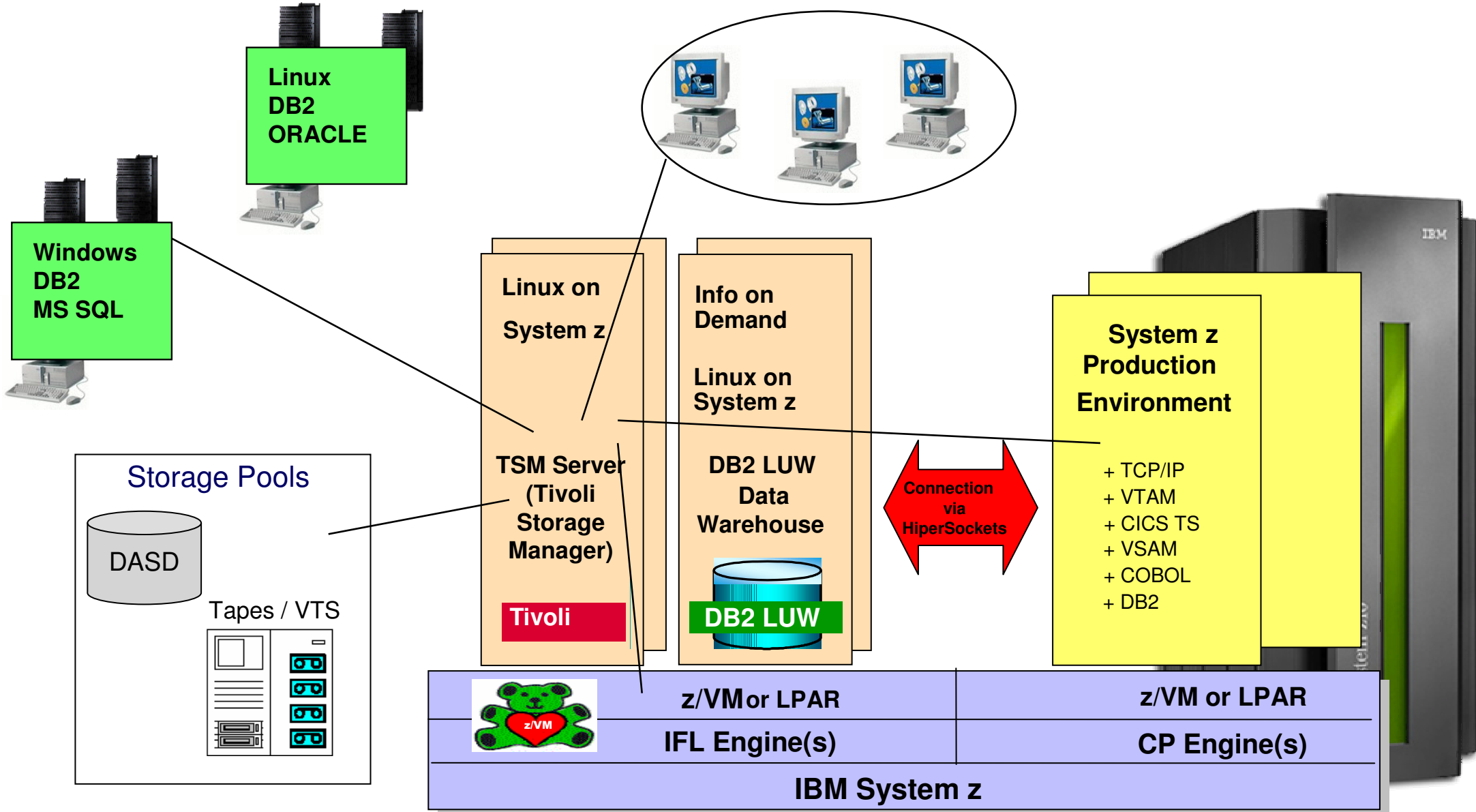
*“Winnebago Industries is a 24/7 shop so it's critical that their e-mail is up all the time — and that's where Linux really shines.”*

— Hyun Kim, President, Bynari, Inc



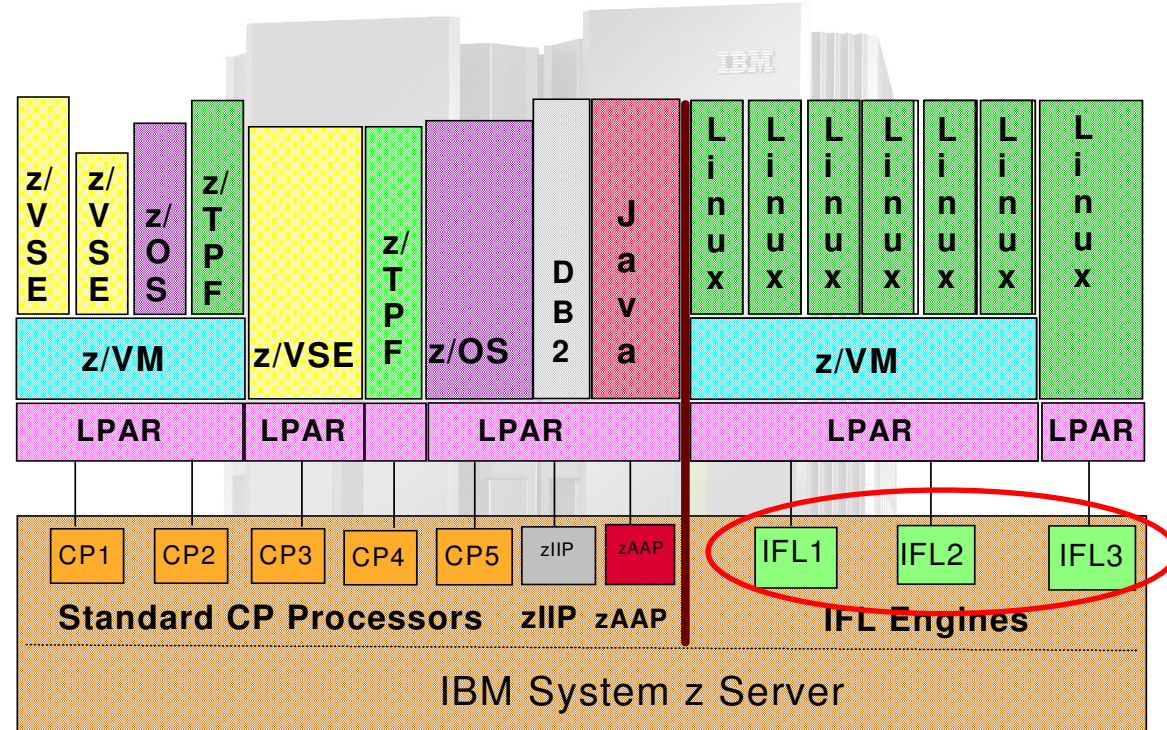
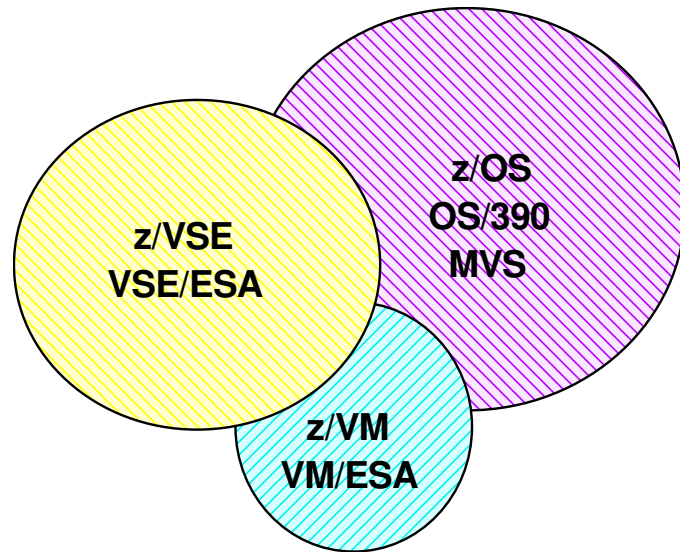
# Enterprise Backup with Linux on System z

## Implement TSM on Linux on System z as central Backup Hub



# Operating Systems on IBM System z

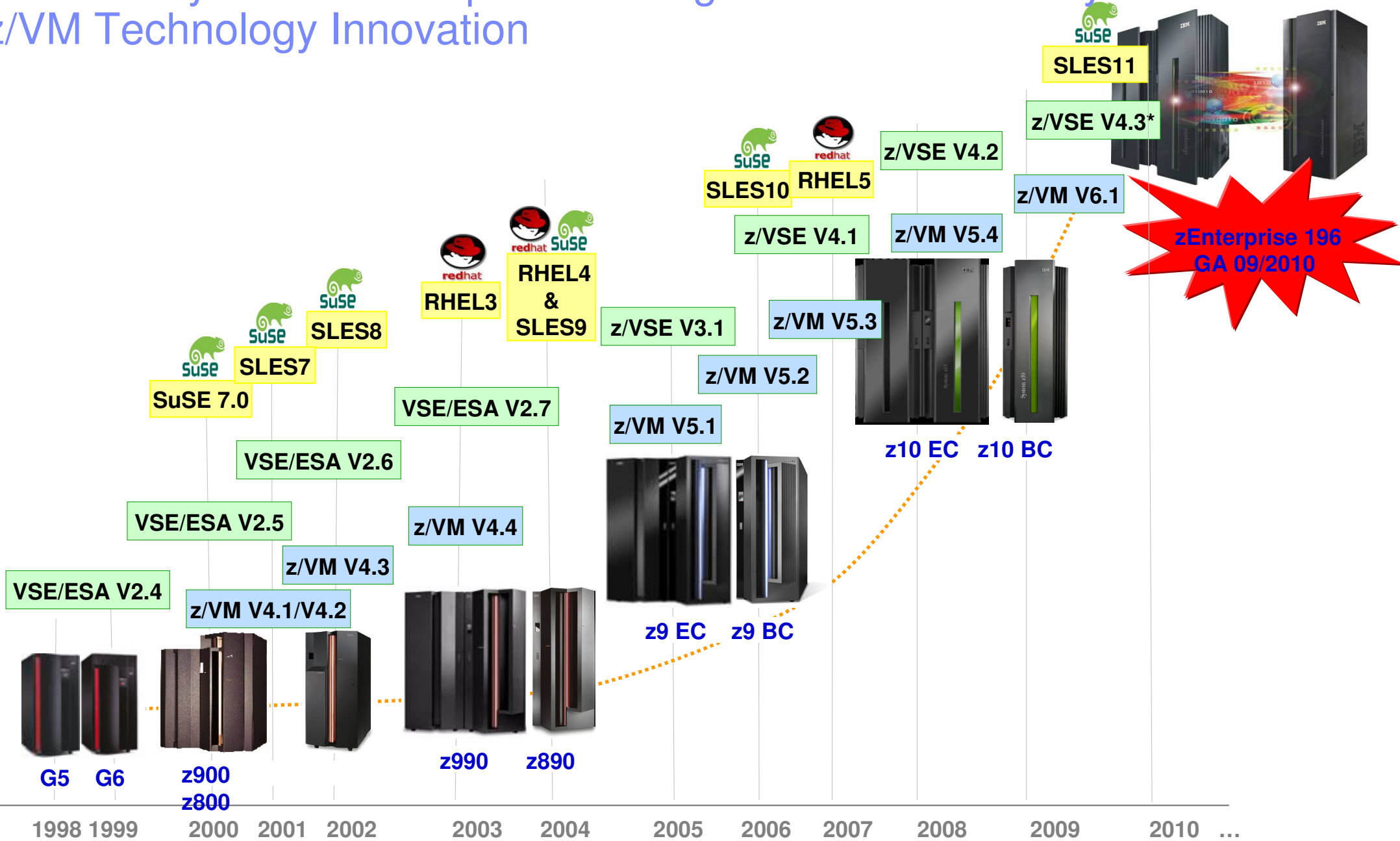
- ~ 1/3 traditional mainframe operating systems installed worldwide are VSE\*



- VSE\* distributed ~ 40% in Americas, 40% Europe, 20% Rest of World
- Worldwide ~ 50% run VSE under VM. Higher in Europe and higher for larger servers
- IFLs play an important role in z/VSE strategy
- zIIP/zAAP have no meaning to z/VSE

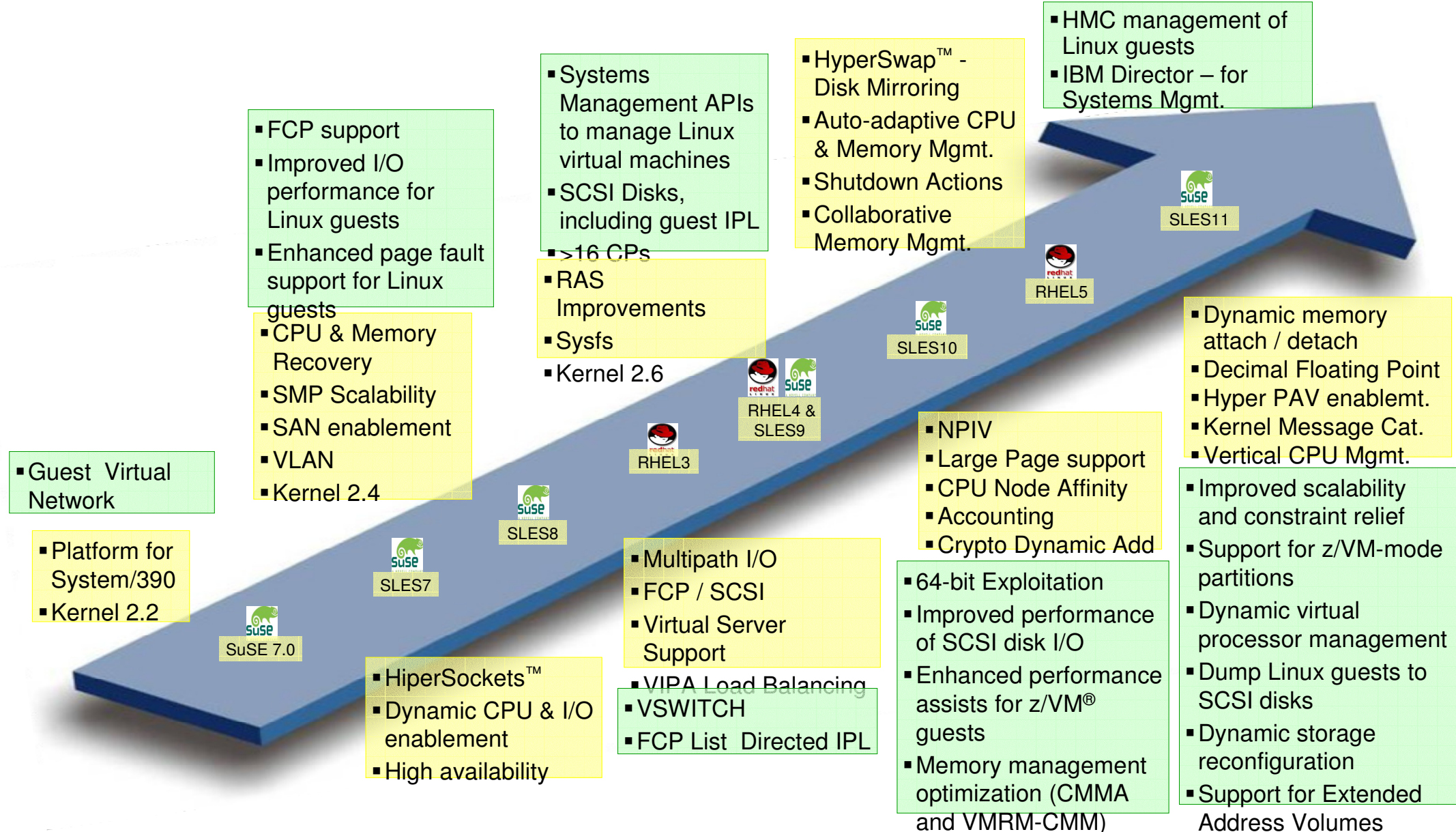
(\* ) The term "VSE" stands for both z/VSE & VSE/ESA .

# Linux on System z – Unique Advantages based on IBM System z and z/VM Technology Innovation





# Unique Linux Extensions to Leverage Powerful System z Technology Advantages



# IBM System z: Transforming our Clients' Datacenters



*Moved to System z from Lintel to deliver the availability and security their clients demand of their e-Procure-to-Pay SAAS, while supporting the strong growth the company is experiencing*



*Casas Bahia centralized operations on System z to support rapid growth and reduce IT costs*



*Consolidated Windows-based systems to Linux on z to achieve substantial cost efficiencies*



*Satyam has positioned the mainframe as a platform to reach the SMB audience in growth markets with hosted web business services*



*Entering provider space for cloud services for universities, schools systems and other public entities*



*Their massive-multi-player game and virtual world application middleware runs on System z10. (www.taikodom.com)*



# 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



# Nationwide

*Expect to save over \$15M over the next 3 years leveraging System z and IFLs for Linux*

## Key Benefits (Value Proposition)

- ✓ **Savings will be in cooling, maintenance, software and equipment costs**, said Guru Vasudeva, a Nationwide computer expert who is overseeing the technology's implementation
- ✓ **Lower middleware and application costs, 50% reduction in monthly charges for Web infrastructure 80% reduction in data center floor space utilization, optimized CPU utilization**
- ✓ **Greater operational and managerial efficiencies and lower cost per virtual server**
- ✓ **Building better capacity management processes and workload modeling to better assess which applications and workloads most appropriate to migrate to the z platform for additional cost savings**
- ✓ **Leveraged IBM services, server and software expertise for best practices in tuning and capacity management, better management and resource optimization to drive down costs**

## Solution

- ▶ **GTS Capacity Planning and Capacity Management Services**
- ▶ **IBM zSeries 990 IFLs with 136 GB memory and associated systems software licenses**
- ▶ **Novell SUSE Enterprise Linux 9**
- ▶ **IBM WebSphere**
- ▶ **IBM DB2 Universal Database™ (UDB)**
- ▶ **IBM WebSphere MQ**
- ▶ **SupportLine Linux support**



**Nationwide®**  
*On Your Side*

# 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



# Customer Example: Wessels & Müller AG (Car parts wholesale)

IBM Case Study



## Wessels+Müller AG: New opportunities with z/VSE, DB2 UDB and Linux on the IBM System z9



highest performance during peak demand, rather, above all, to benefit from reduced operating costs during the quieter times. Once the previously installed IBM zSeries® z890 had already reached about 80 percent capacity just handling daily operations, Wessels+Müller decided to opt for migration in order to have more capacity available in the future.

The IBM System z9® platform primarily functions as a pure data serving environment. By using highly scalable services, Wessels+Müller is able to consolidate and manage very large data volumes on one system. The flexible platform offers comprehensive support for open as well as industry standards. Numerous security functions, such as protected access, technologies for network-based and local encryption contribute to the first-class technology of the main frame. The operating system provides a special service. Johannes Schlentzek: "Over the course of the years, as the requirements became higher and higher, the z/VSE™ on the main frame proved itself as an absolutely reliable operating system that was both stable and secure and became easier and easier to administrate."

In close cooperation between Wessels+Müller, the IBM business partner Becom and IBM, migration to the z9 Business Class (BC) IBM System took place in just one weekend.

### The company

Wessels+Müller AG supplies its customers with original parts from brand name manufacturers. In doing so, it ensures punctual deliveries and a service that makes it possible for customers to concentrate more on the success of their businesses.

Johannes Schlentzek, IT Manager at Wessels+Müller: "Together with our employees, we intend to be one of the most high-performing companies in the field of parts supply and delivery and will do all we can to maintain this position. We are pursuing this goal by applying our company's greatest strengths and competencies. These include a comprehensive product assortment, powerful logistics, area-wide delivery capacity and, last but not least, the know-how, skills and the friendliness of our employees."

### Advancement thanks to the flexibility of the new solution

The company's main focus is on maximum flexibility in order to shape ongoing operations optimally at all times. The idea is not only to obtain the

### Overview

#### ■ The task at hand

To modernize existing warehouse management systems in order for IT to be able to respond to business fluctuations with maximum flexibility.

#### ■ The solution

IBM System z9® with z/VSE™ – via TCP/IP and connectors linked to the DB2® Universal Database™ (UDB) for Linux on system z™ – functions as the most modern DataHub® and allows Wessels + Müller AG to adapt to new business conditions based on demand.

#### ■ The benefits

Installing DB2 UDB for Linux on system z achieves maximum flexibility, the best data serving, the highest ever availability of applications and the dynamic rearrangement of resources. The simplified infrastructure reduces operating costs.

After migration, the applications as well as the databases (DB2/VM) were noticeably faster, which not only resulted in accelerated processing, but also optimal handling of the data load, even during transaction-intensive phases. The team even installed Linux on a separate Linux processor (IFL) and z/VM® V5.2 and also installed the DB2® Universal Database™ (UDB). The first applications have been in production at Wessels+Müller since May 2007. All data and applications are gradually being migrated to the UDB.

With the additional options, Wessels+Müller is able to maintain its competitive edge and to further build on it. The improved service is not only available to the company's 1,950 employees, but also to customers and partners. As an application and data server, the z/VSE functions as the company-wide information and ordering system on the Internet.

Under z/VM V5.2, five z/VSE systems operate in a logical partition (LPAR). In a second LPAR, which is assigned to a dedicated Linux processor, numerous Linux guests are installed under z/VM, which, in turn, serves as the carrier system for DB2 UDB.

#### Time is money

Wessels+Müller currently relies on z/VSE V3.1.2, but is preparing to upgrade to z/VSE V4.1. With the help of tools, pre-testing is being performed to see which additional options will be offered with the new functions such as workload pricing. In the second quarter of 2008, the 64-bit version of the operating system will be ready for use at Wessels+Müller.

#### Technical Data

IBM System z9® Business Class (BC), IFL-z/VSE™ V3.1.2, z/VM® V5.2, DB2® Universal Database™ (UDB), LPAR

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# Customer example: Supreme Court of Virginia

**WebSphere.** software

**State court serves timely information to protect public safety with IBM WebSphere software.**

## Overview

### ■ Challenge

Provide up-to-date, continuously available information to more than 400 magistrates across the state, enabling them to make more informed decisions on whether or not to hold suspects in jail, release them on bail and other post-arrest issues

### ■ Why IBM?

IBM provided a secure, scalable and resilient application infrastructure to meet the expanding information needs of magistrates and other officials, now and in the future

### ■ Solution

Online system for processing offenders and reviewing records of previous arrests statewide

### ■ Key Benefits

Improved public safety through more informed magistrate decisions and better ability to track and identify suspects across the state;



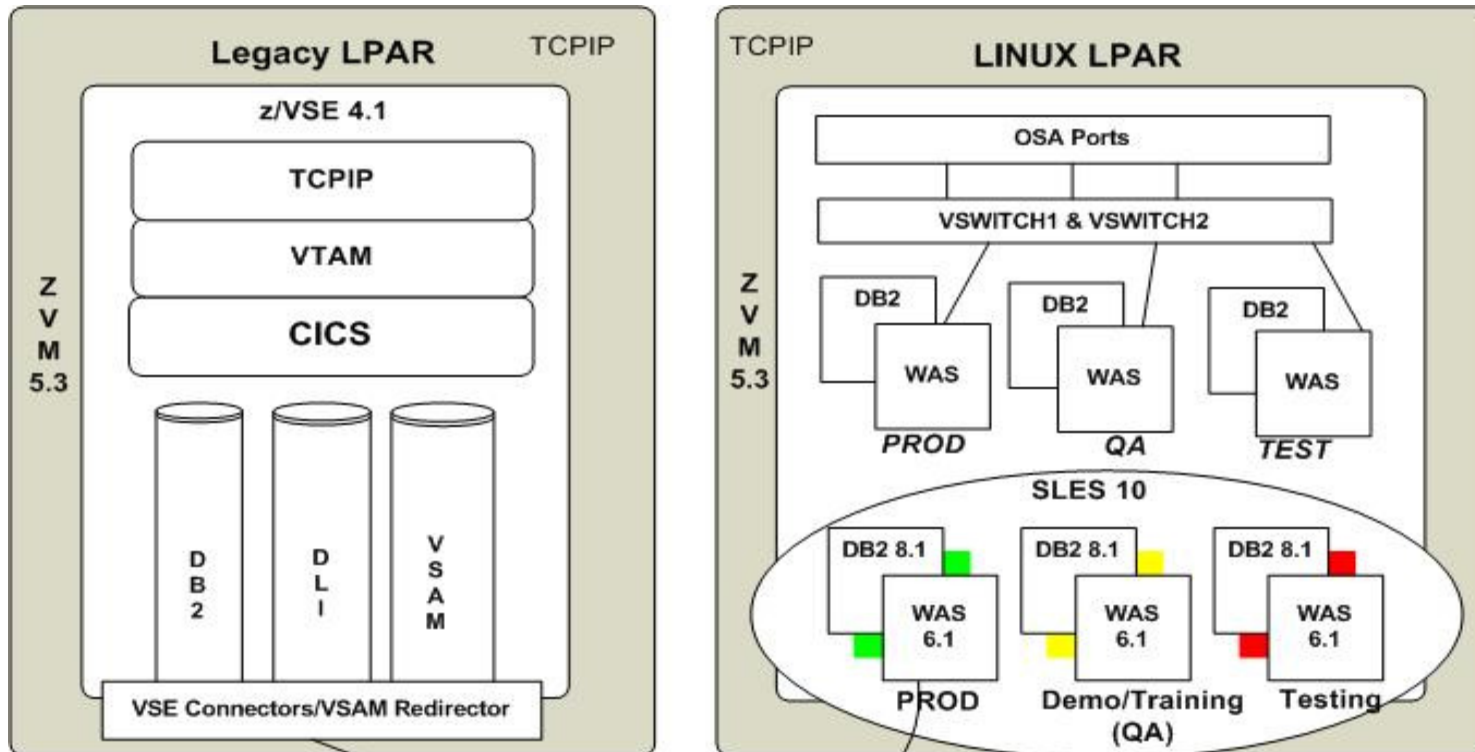
*IBM helped the court system of a large southern state.*

The Supreme Court of a large southern state is one of the oldest judicial bodies in the United States, with roots extending back to the seventeenth century. The court consists of seven justices whose primary role is to rule on appeals originating in the state's lower courts. In recent times, this high

## Expanding the application infrastructure for greater value

The court had previously installed its judicial case management records on the z890 server running the VSE operating system and IBM DB2 information management system. Using the scalable architecture of the System z, the IT group of the court created a second LPAR to host the new magistrate system. The group built a new centralized database of offenders drawn from local court systems across the state. To provide access to this database, the developers implemented WebSphere Application Server on the mainframe to field queries from users and retrieve information from the database. The application runs on multiple SUSE Linux Enterprise Server instances executing in the System z Virtual Machine (z/VM®) operating system.

# Supreme Court of Virginia (cntd.)



- ▶ 1 + 1 z9 BC
- ▶ 2 + 2 CPs
- ▶ 5 + 5 IFLs
- ▶ 48 + 32 GB memory
- ▶ 2 + 2 z/VM 5.3 LPARs
- ▶ 7 + 4 z/VSE 4.1 guests
- ▶ 41 + 14 SLES 10 guests

## ■ z9 BC for Court System (internal)

- ▶ Serves 325 courts, 5.000+ users, 4 million cases (2007)
- ▶ Integrating z/VSE, DB2/UDB and WebSphere applications
- ▶ eMagistrate\* system serves 125 locations, 2.800 trans per day

*\*2007 ComputerWorld Honors Program Laureate*

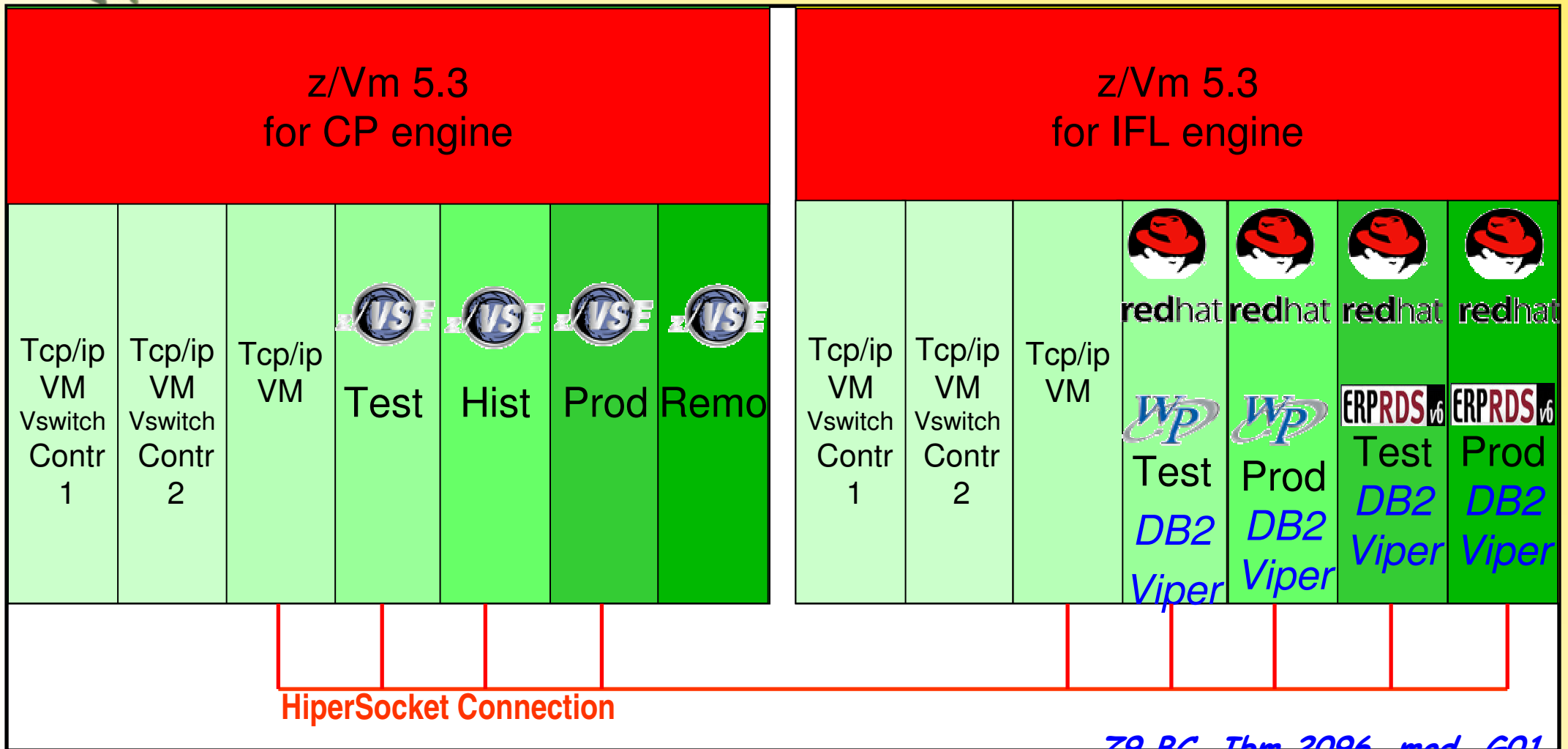
## ■ z9 BC for Internet

- ▶ eCommerce application integrating z/VSE and WebSphere apps





# Internal Connections



the leading producers of premium olive oil sold directly to consumers

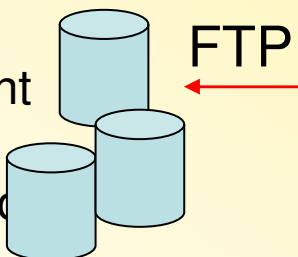


Email from batch or cics



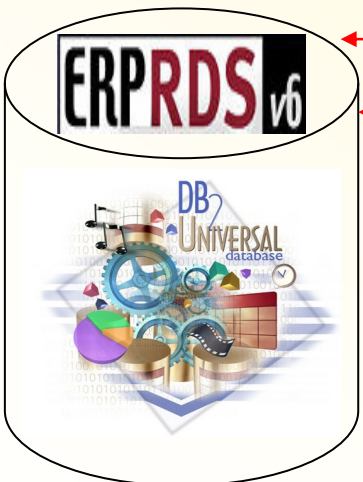
AFP / PSF via ipaddress

300 files every day transferred to different operating systems (Zlinux, linux, microso



FTP

Db2 udb z/linux applications



Vsam redirector Server via hipersocket to z/linux DB2 and via vswitch Osa QDIO to Sql Server



Production Environment

Tcp/ip 1.5.E

Tcp/ip 1.5.E only for telnet applications

Virtual Tape



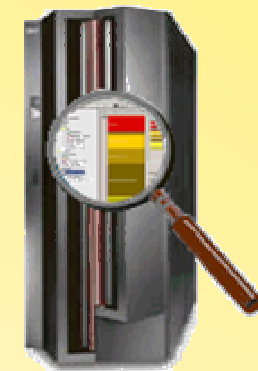
CICS TS web SOA via hipersocket



**redhat**  
version 5  
z/Linux  
Java Application running on Tomcat



Z/Vse Health checker



Every day 240,000 cics transactions from 400 telnet connections



# 10 Years Linux on IBM System z

## The momentum continues:

Shipped IFL engine volumes increased 35% from YE07

Shipped IFL MIPS increased 65% from YE07 to YE09

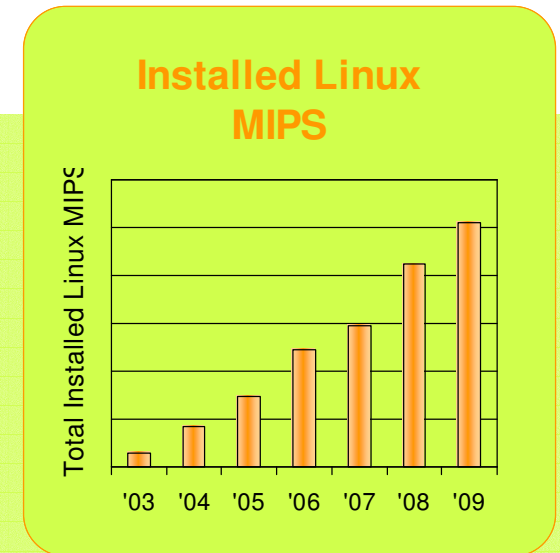
More than 3,100 applications available for Linux on z

Linux is 16% of the System z customer install base

70% of the top-100-System z-clients are running Linux on System z

Two Linux partners: Novell SUSE and Red Hat

Gold standard in virtualization with z/VM

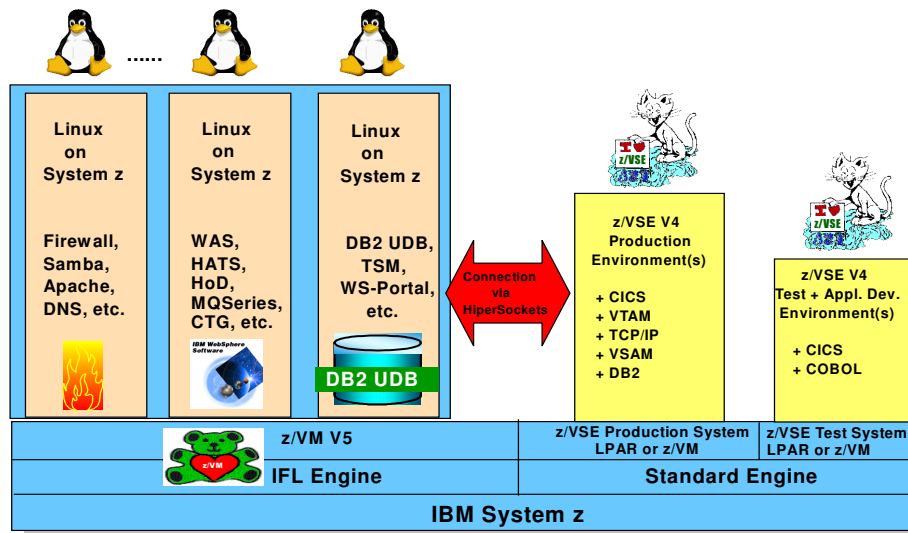


# 10 years of most successful pair

## z/VSE and Linux on System z

### 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

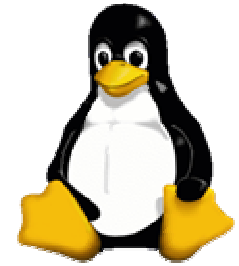


# 10 YEARS of Enterprise Linux on System z®

A Simple Idea That Changed the World

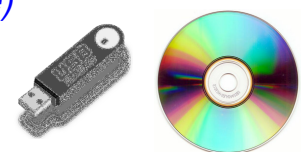


# The Role of Linux in IBM Products



## MCP based (Embedded Linux)

- True Embedded Devices (Controllers/Service Modules)
  - OS burned into Flash/ROM at manufacturing
  - System control/service stack must be operational at first boot
  - *Examples: FSP (System i/p/z), AMM (BladeCenter), IMM(System x)*
- Systems Management Devices
  - OS needs to be pre-installed
  - Management stack must be operational immediately
  - *Examples:HMC (Power & z), System z Service Element, SanVC (Storage)*
- Special Purpose Appliances
  - OS and software stack combination manufactured into device
  - Customer cannot install OS after system purchase
  - *Examples: RSS 4690(RSS), DataPower(SWG), Image Capture(GBS), XIV((Storage)*
- Diagnostics/Systems Deployment
  - Diagnostic image delivered as bootable CD, flash drive
  - Image cannot be created by customer to include OS and diagnostics
  - *Examples: ToolsCenter(System x), RSS Diags(RSS), Tivoli OS Provisioning(SWG)*



## Software Group Offerings

- OpenClient for Linux
- IBM Client for Smart Work
- Websphere Cloud Burst

