

WAVV 2010

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z/VSE applications and DB2 on Linux on System z

Wilhelm Mild

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Agenda

Data-consolidation – more important than ever

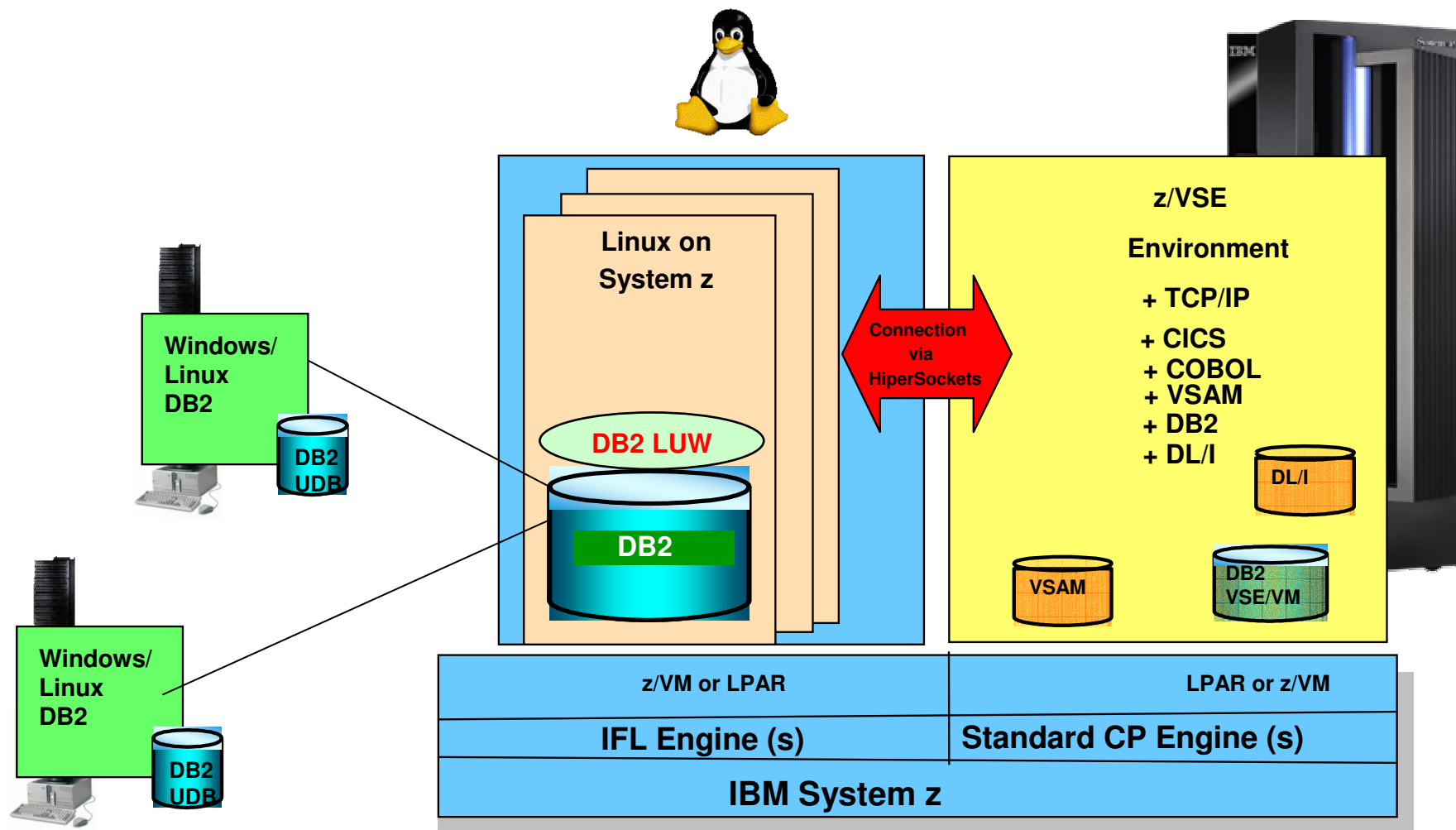
Decisions for a future oriented Data store

Experiences from last projects / Redbook

A good solution is not standard in detail

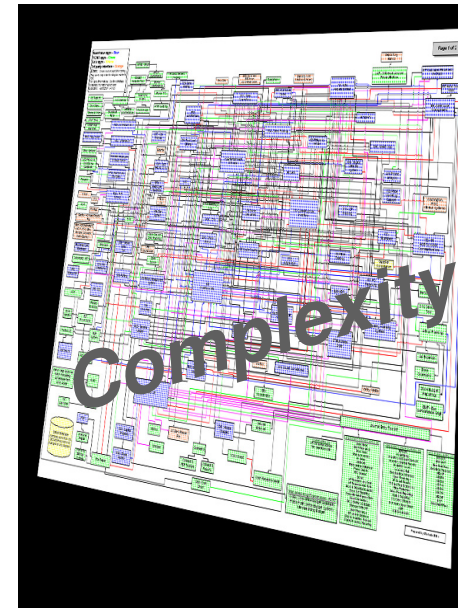
The big Data store

Data Integration – the Base for the future and BI



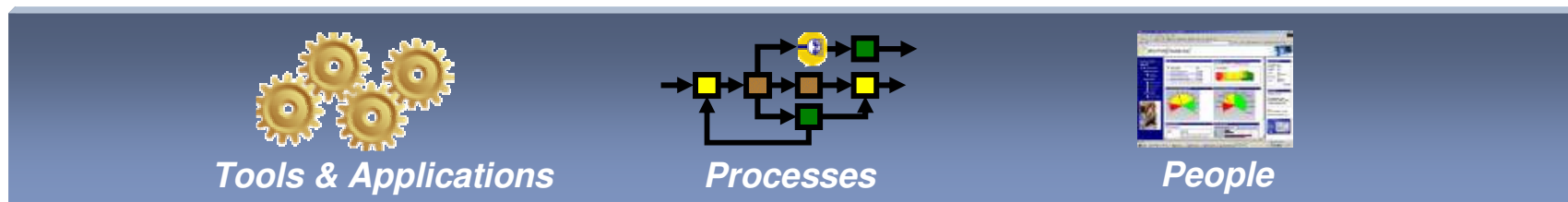
The road to information availability is filled with challenges

- What are the top business challenges?
 - Streamline and improve efficiency of business processes
 - Better understand and meet customer expectations
 - Increase employee productivity
- Key challenges to making information available:
 - **Volume:** Data & content are doubling each year
 - **Variety:** It's not just the transaction data, it's e-mails, document libraries, etc.
 - **Velocity:** The pace of business and business users who need information *now*, in real time
 - **Complexity:** The average \$1B company has 40 financial systems; 78% of all companies have 2 or more repositories, 25% have more than 15 repositories.



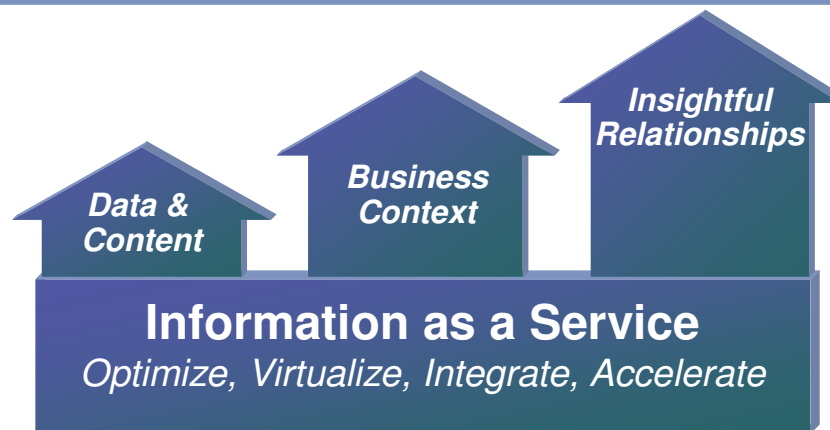
Information as a Service

From a project based approach to a Service Oriented Architecture based on business needs



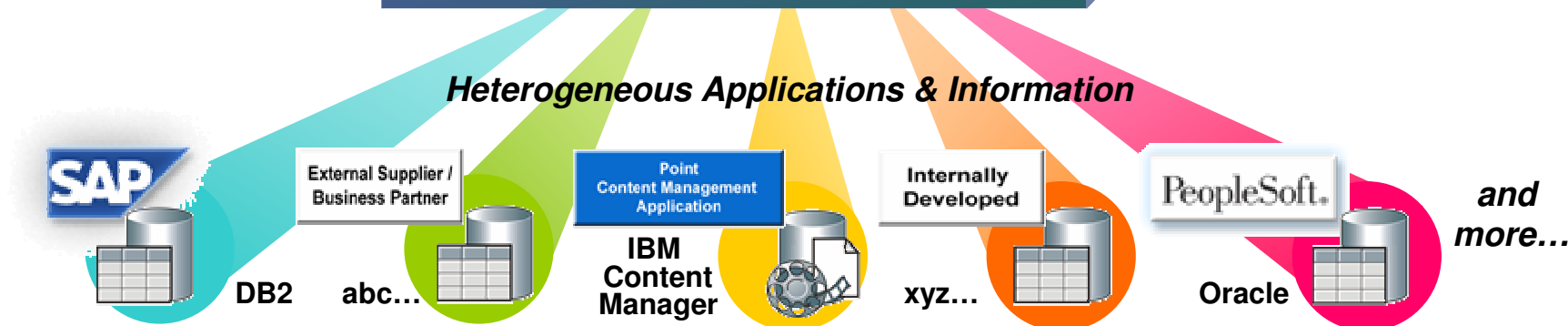
Standards-based

- SQL
- XQuery
- JCR
- JDBC
- Web Services...



Extracted or Real-time Insight

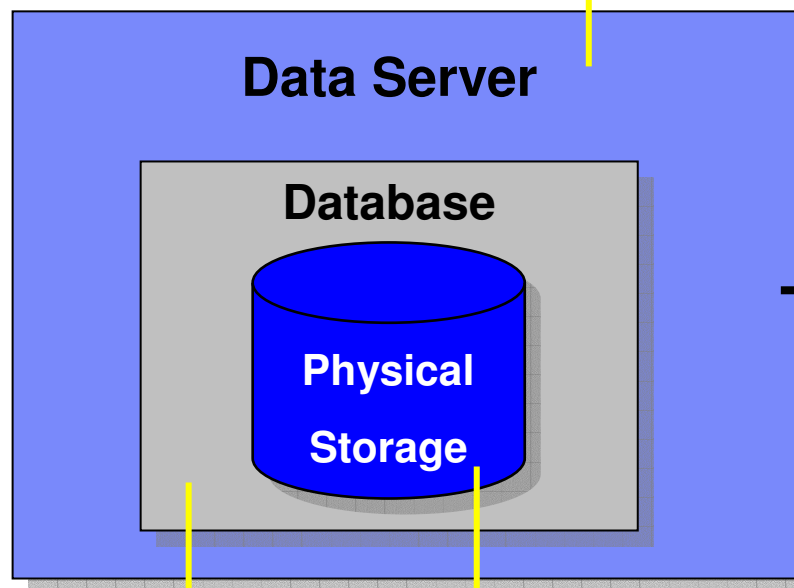
- Master Data
- Entity Analytics
- Information Warehouses
- Industry Data Models



A New Generation Data Server for A New Generation of Applications

Data Server

Services that manage, secure and provide access to the database.



Database

Logical View of storage

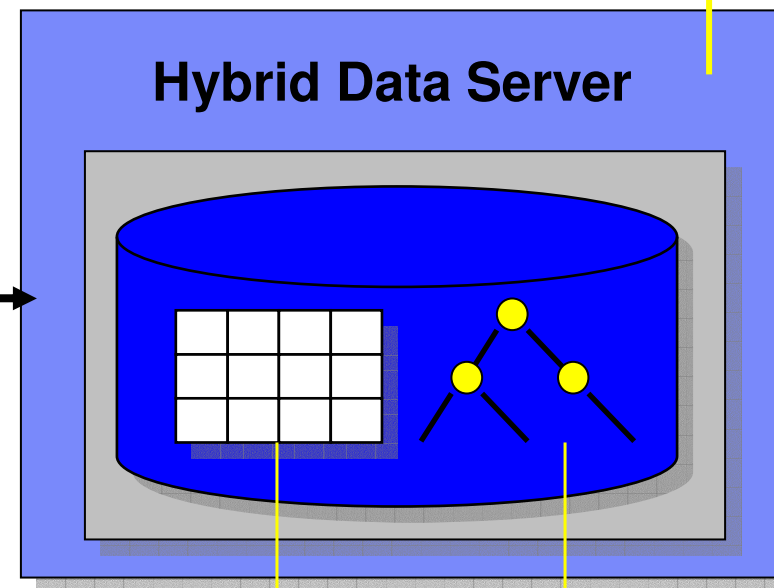
- *Tables*
- *Views*

Physical storage

Database Files

Hybrid Data Server

DB2 supports both relational and pureXML[®] storage and provides all the necessary services to support both data structures.



Relational Storage

Data stored in a row and column format

pureXML[®] Storage

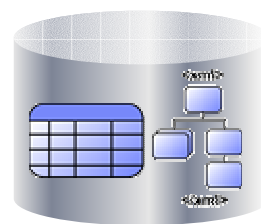
Data stored in a pre-parsed hierarchical format, not as a single text object (CLOB)

DB2 9 XML integration is seamless

Offers the Best to Both SQL and XML Worlds



SQL Person "I see a world class RDBMS that also supports XML"



DB2 with XML Support



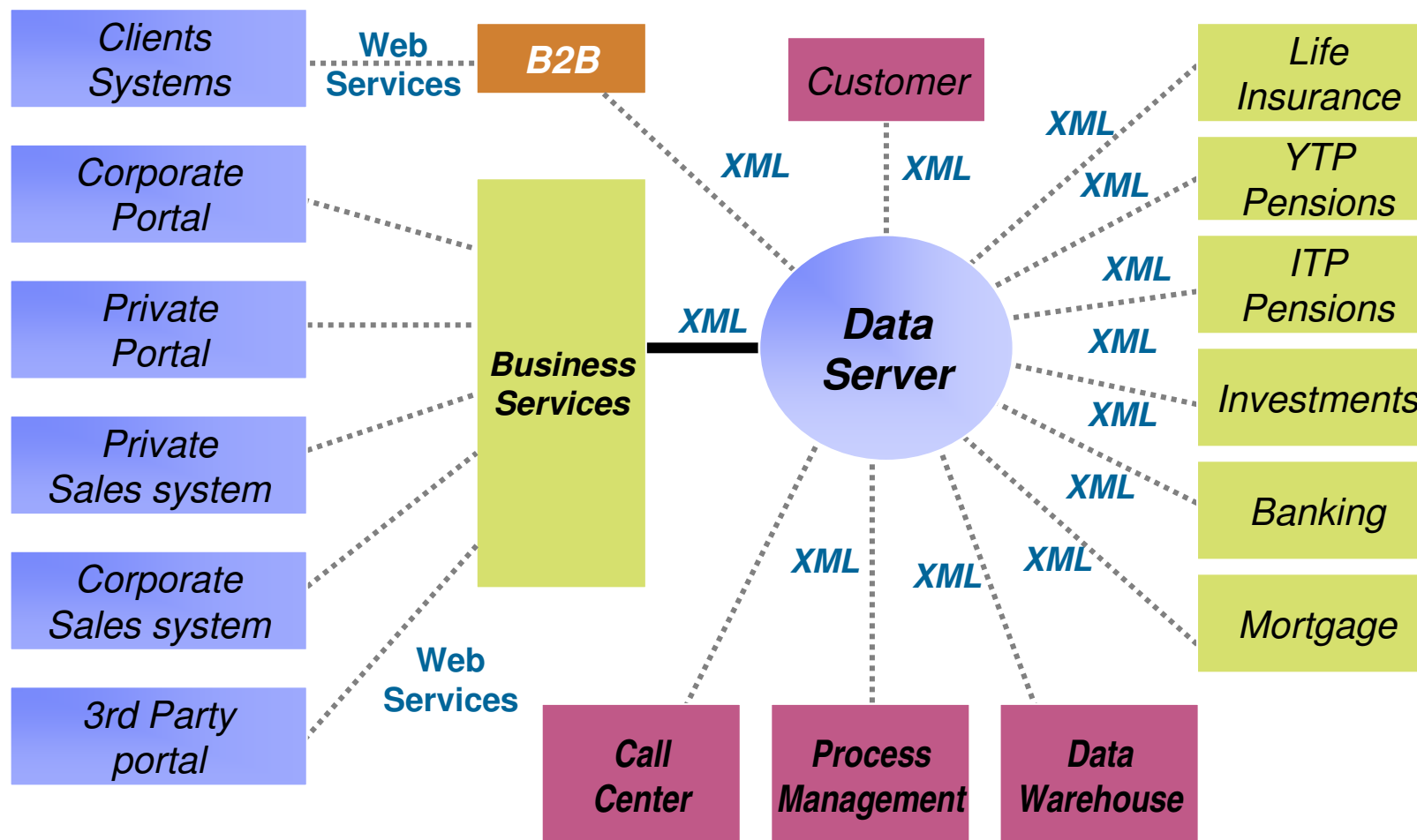
XML Person... "I see a world class XML repository that also supports SQL"

New XML applications benefit from:

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

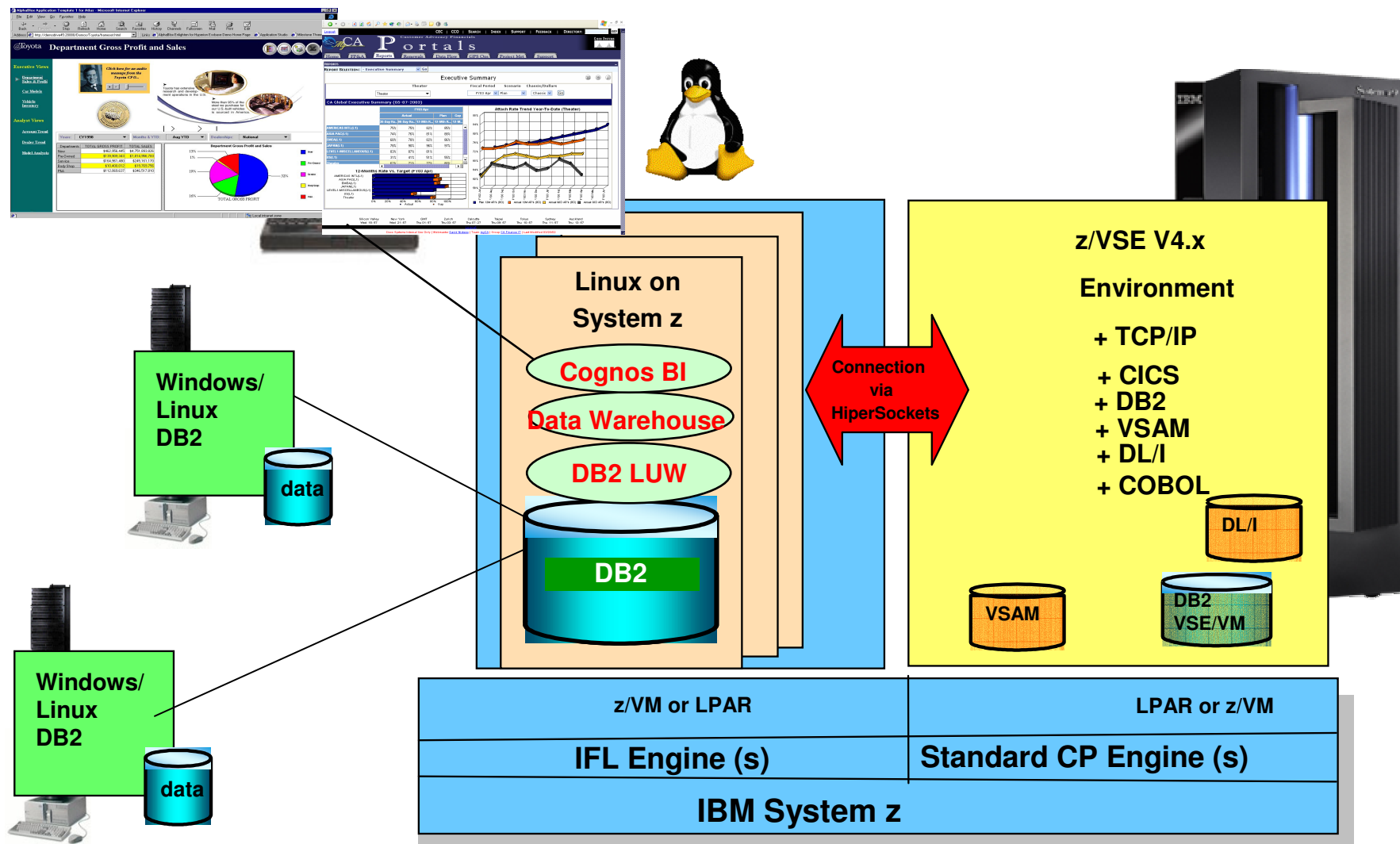
Powering a Flexible Approach

XML and SOA are the Keys



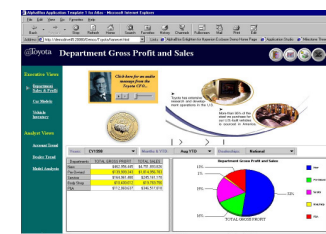
Top Scenario: Linux on System z as data hub

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

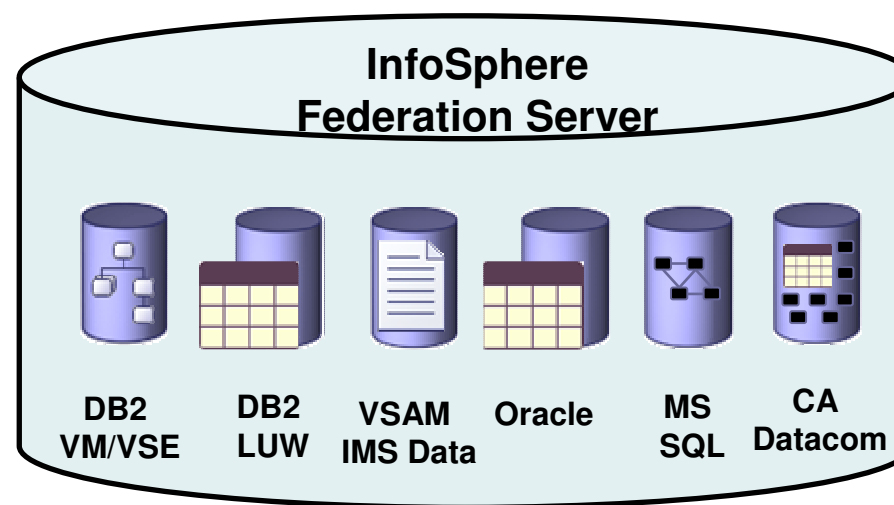


IBM InfoSphere Federation Server

- 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



Agenda

Data-consolidation – more important than ever


Decisions for a future oriented Data store

Experiences from last projects / Redbook

A good solution is not standard in detail

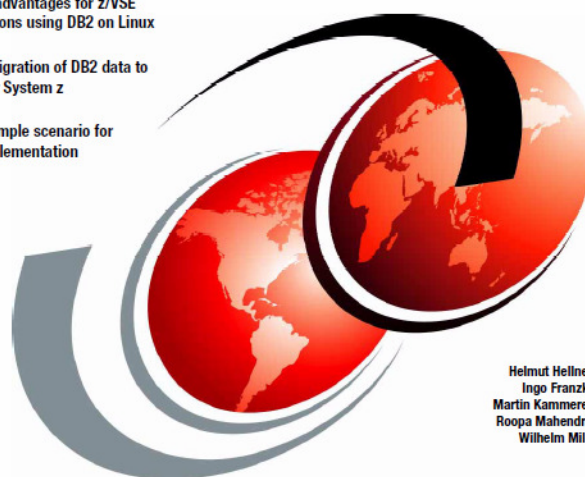
From Planning to the Implementation and tuning



Information Management software 

z/VSE Using DB2 on Linux for System z

- See the advantages for z/VSE applications using DB2 on Linux
- Plan a migration of DB2 data to Linux for System z
- Use a sample scenario for your implementation



Helmut Hellner
Ingo Franzki
Martin Kammerer
Roopa Mahendra
Wilhelm Mild

Redbooks

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SG24-7690

DB2 Redbook

- **Overview-**

- **Strategical Decision**
- **Advantages (Business Requirements)**
- **Possible architectures**
- **Technical overview(DB2 VM&VSE)**

- **Planning**

- **Capacity Planning**
- **Storage planning**
- **Network**
- **Database- DB2 Linux (LVM)- DB2 VM/VSE**
- **The Transition phase**

- **Setup and Customization**

- **DB2 Linux on System z**
- **DB2 VSE (AR, AS)**
- **DRDA Communication**

- **DBMS Migration**

- **Data Migration**
- **Packages Migration**
- **Application considerations**
- **Transition / Coexistence environment**

- **Monitoring and tuning**

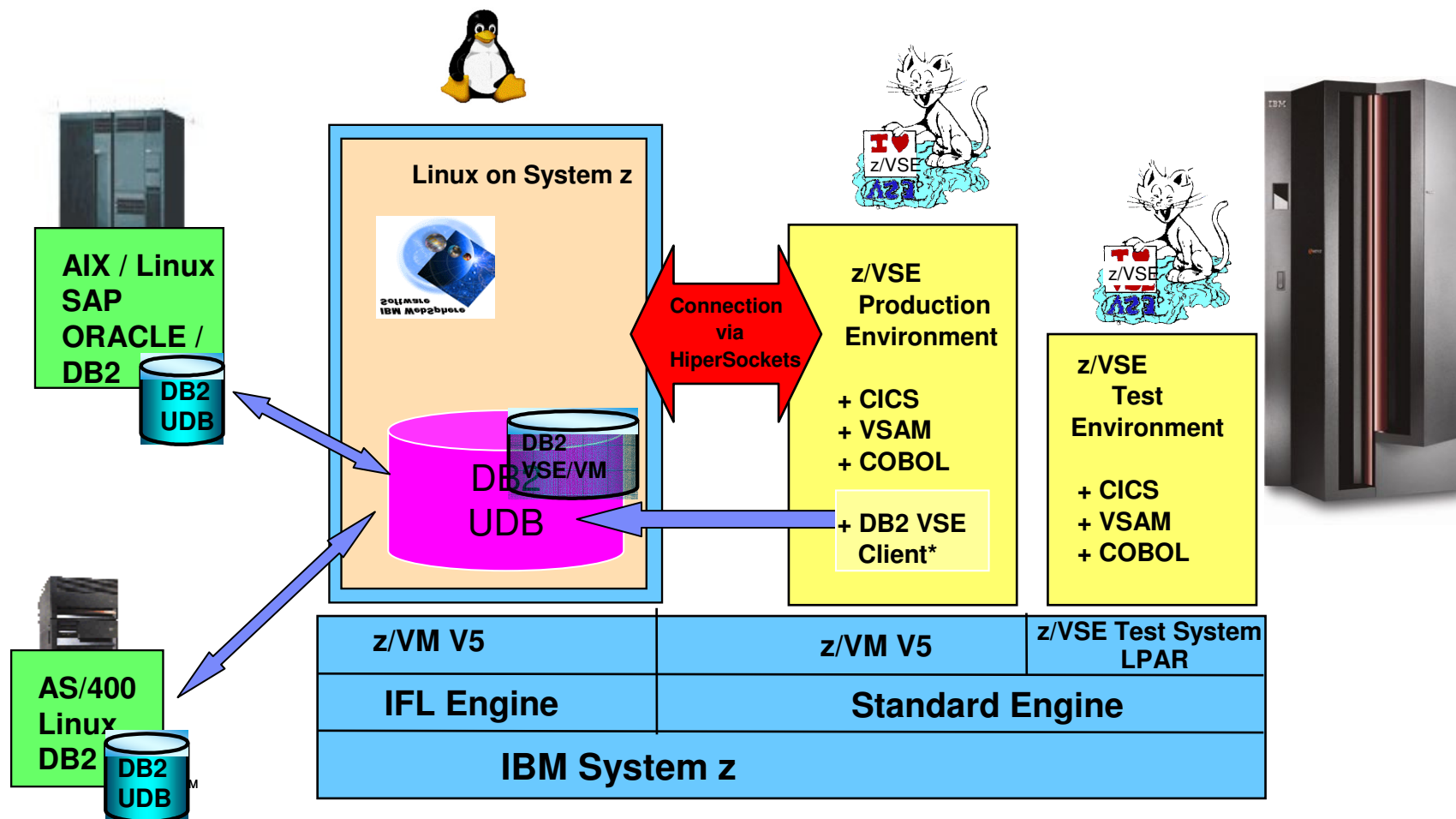
- **DB Monitoring**
- **AR VSE**
- **Appl. Monitoring (DB)**
- **Connections / Interfaces**
- **Network monitoring**
- **System monitoring/tuning**
- **Tuning considerations**

DB2 Redbook

■ Overview

- Strategic Decisions
 - The decision for a modern Data Management System can enhance your business value substantially
- Advantages (Business Requirements)
 - Business processes can be simplified a lot
- Possible architectures
 - Data stores can be homogenous or heterogeneous,
- Technical prerequisites
 - DB2 Server for VM&VSE (Server & Client)
 - DB2 Server for VM and VSE Client Editions

DB2 Szenarios – with DB2 LUW on Linux on System z



(*) DB2 VSE Client – the client functionality only, can be obtained with **DB2 Server for VSE & VM 7.5 Client Edition**

DB2 Redbook

▪ Planning

– Capacity Planning

- CPU load depends on many factors (parallel workload, IP traffic, application design)
- z/VM virtualization increases flexibility and connectivity

– Storage planning

- The most advanced possibilities of the System z Architecture
 - use LVM (in Linux) or striped storage function (in DS8000)
 - use ECKD for system and FCP/ SCSI disks for large databases
- High Availability
 - Mirroring / Redundant Connections

– Database Planning on Linux

- use LVM, Container Striping, PAV

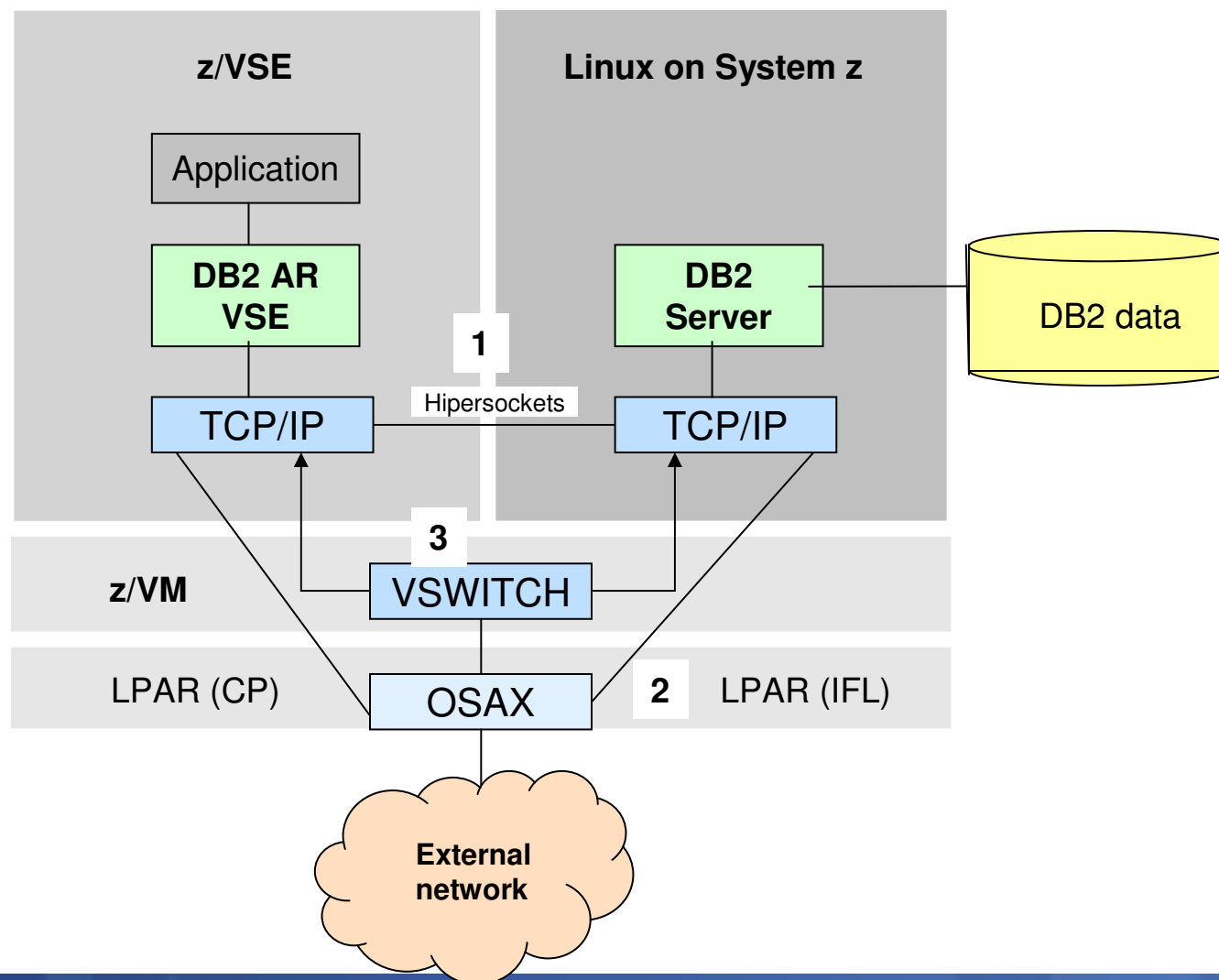
– Network

- Hipersockets the fast communications
- Shared OSA and VSWITCH the alternative Communication

– Transition Phase

- ‚Step by Step‘ always better instead of ‚Big Bang‘!

Network alternatives



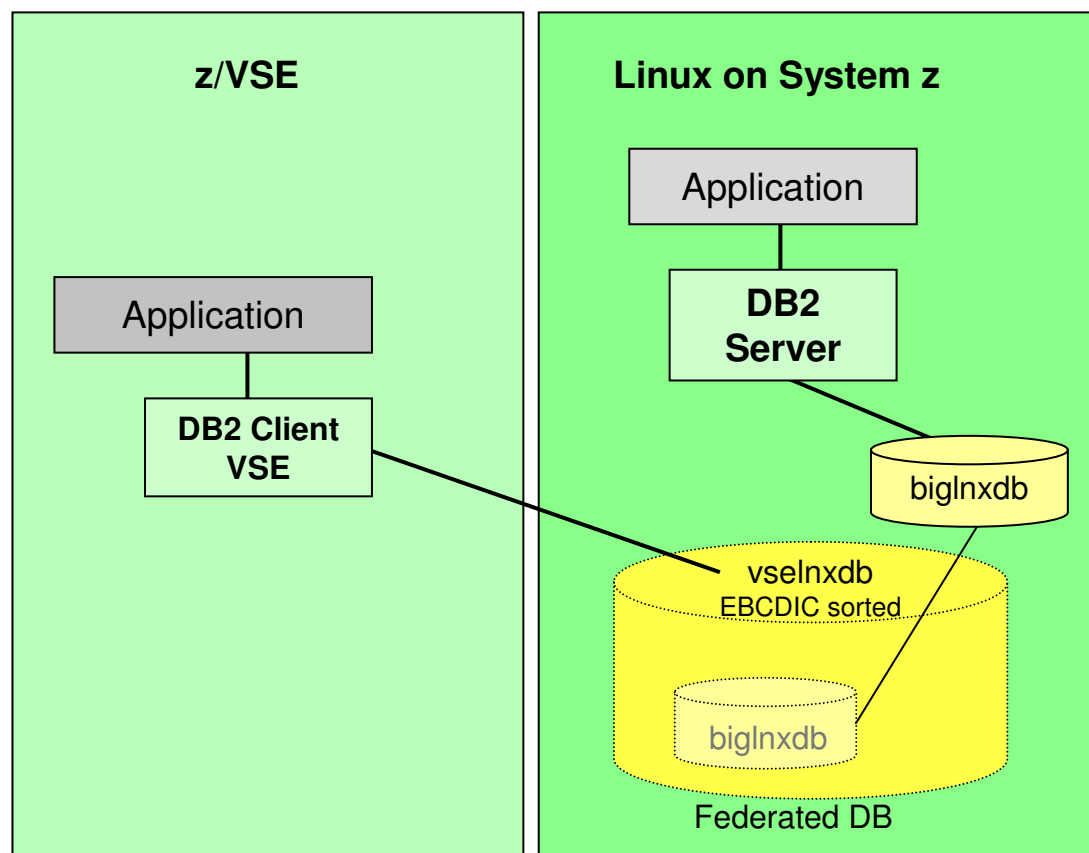
DB2 Redbook

■ Setup and Customization

- DB2 Linux on System z
 - Database-Definitions need to be adopted for the workload
 - Codepage (SBCS / Unicode)
 - EBCDIC versus ASCII Sort order 'Collating Sequence'
 - Federation to implement complex requirements
- DB2 VSE (Application Requestor)
 - Client Edition (AR only!) or Server & Client for VM/VSE ?
- DRDA Communication
 - DRDA Performance is dependant on the application
 - Connection Pooling / Buffered Insert helps
 - TCP/IP Setup tuning for the workload (MTU, Window size)

Federated access for EBCDIC considerations

- 1) Linux applications can access the database as ASCII database
- 2) z/VSE applications access the database via vselnxdb as EBCDIC collated database



DB2 Redbook

■ **DBMS Migration**

– Data Migration

- Data Migration: small effort / repeatable solution recommended
- Federation is very effective

– Package Migration

- Bind Files build! (CICS or ,Batch Binder‘)
- Export of DB2/VM&VSE Packages and Import in DB2 Linux possible (not recommended)

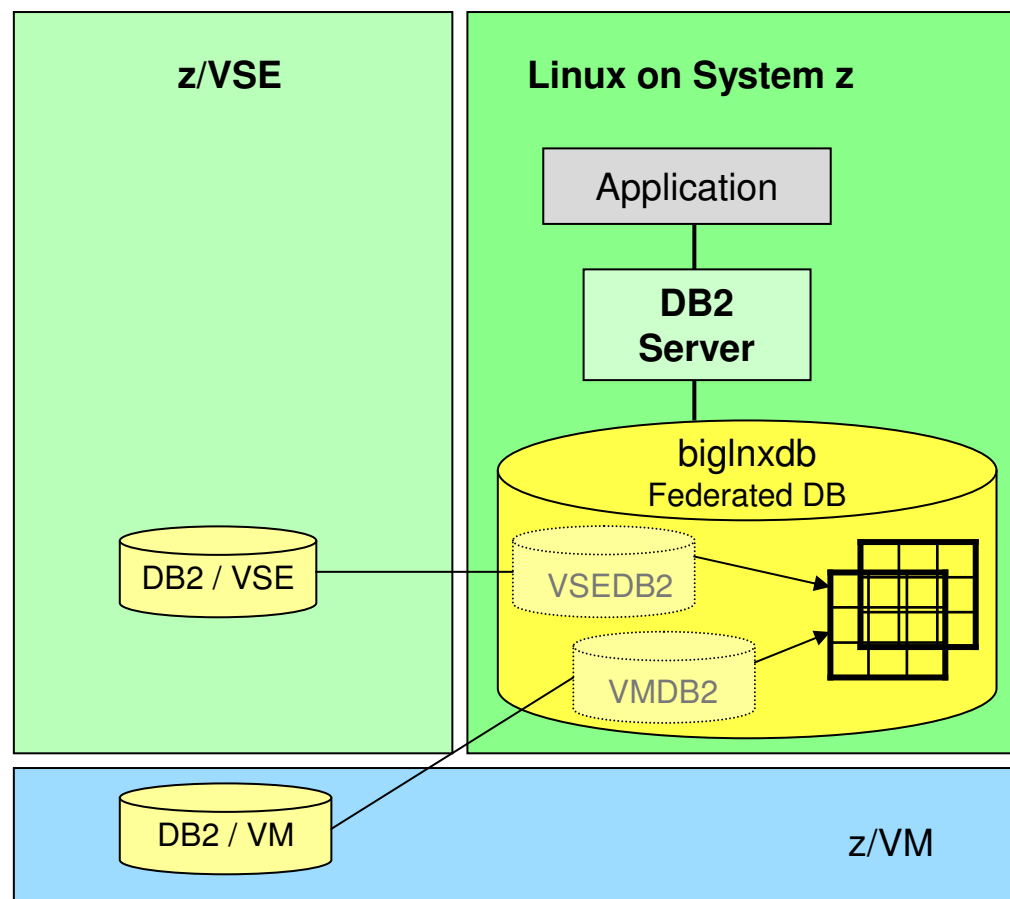
– Application Considerations

- Applications may need adaptations (ASCII-EBCDIC, HEX-Sort)
- Dynamic SQL uses functionality of the server

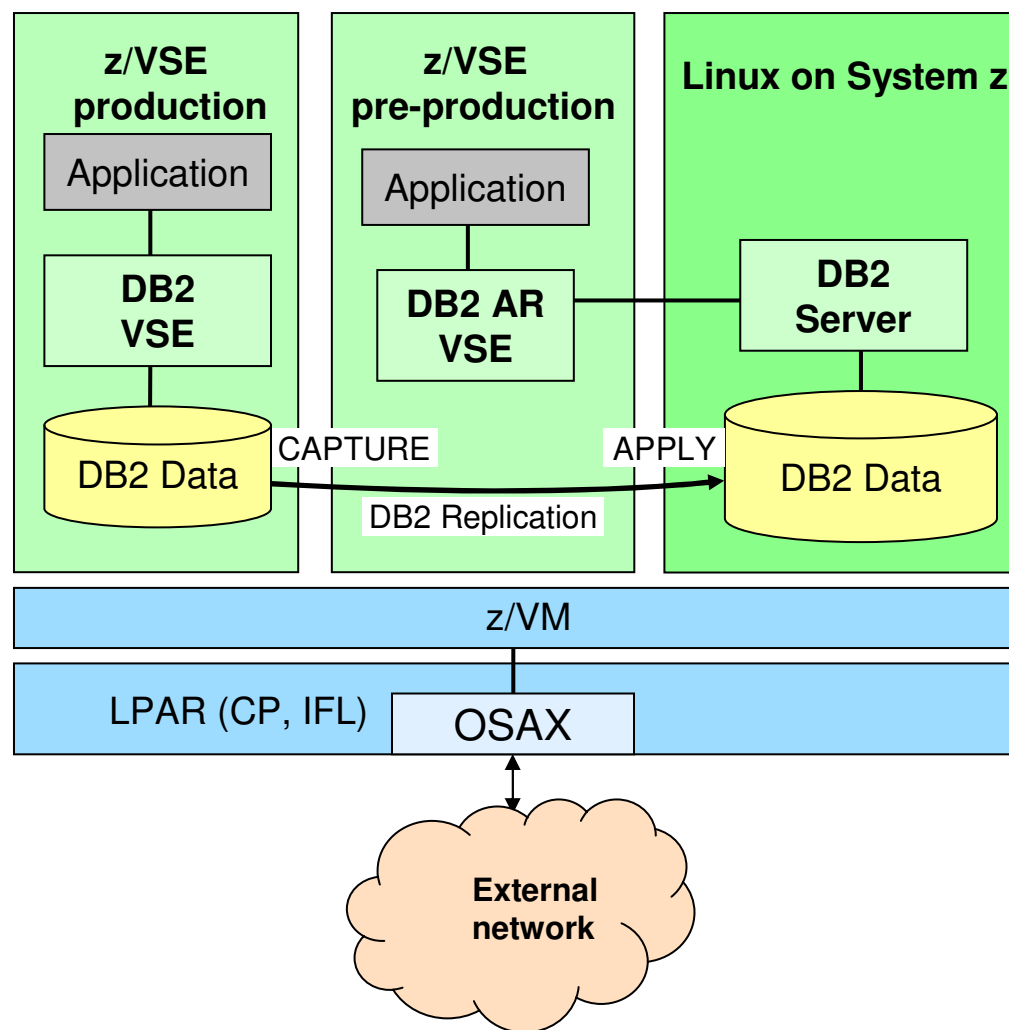
– Transition / Coexistence Environment

- with Replication or ,Federation‘, a coexistence is possible

Data migration to DB2 Linux with DB2 federation feature



DB2 Coexistence pre-production scenario



DB2 Redbook

■ **Monitoring and Tuning**

- Monitoring is prerequisite for Tuning
- DB Monitoring
 - Status-quo of the DB2/VM or DB2/VSE Servers !!!
 - Monitor–Tools necessary
 - DB2/Linux – Snapshots, DB2 Expert, Omegamon XE
- Application Monitoring (DB)
 - CICS Monitor is recommendable
- Network Monitoring
 - Network monitors help a lot
 - Troubleshooting – analyze DB2 behavior with Network tools

■ **Details in Session: z/VSE Performance Update**

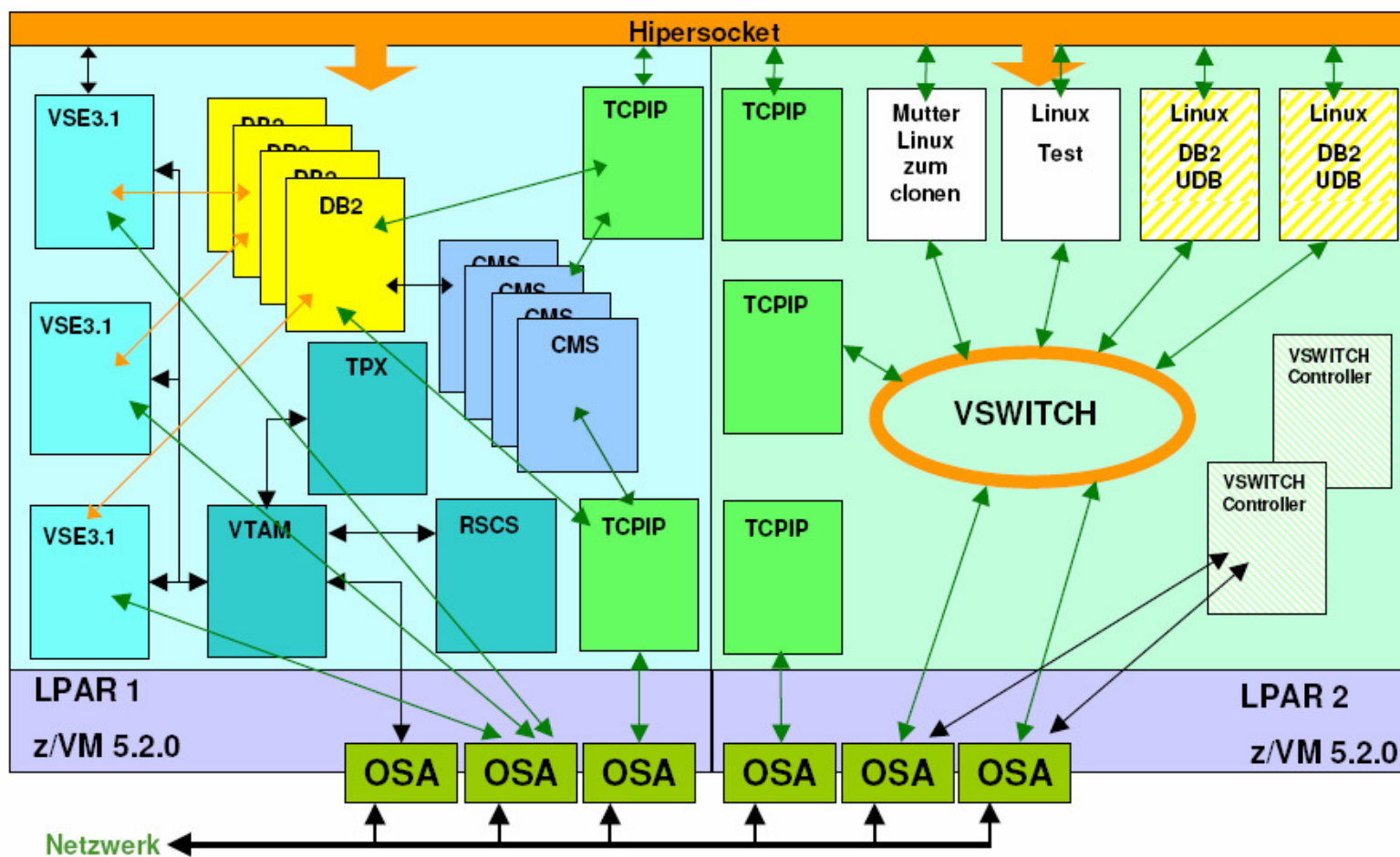
Customer success samples with DB2 on Linux on System z

- US:
 - Supreme Court of Virginia
- Germany:
 - Wessels & Müller
 - Public Sector
- Slovenia:
 - Impol / Alcad
- Belgium:
 - Securex
- Sweden:
 - Pulsen
- Italy:
 - Olio Carli.

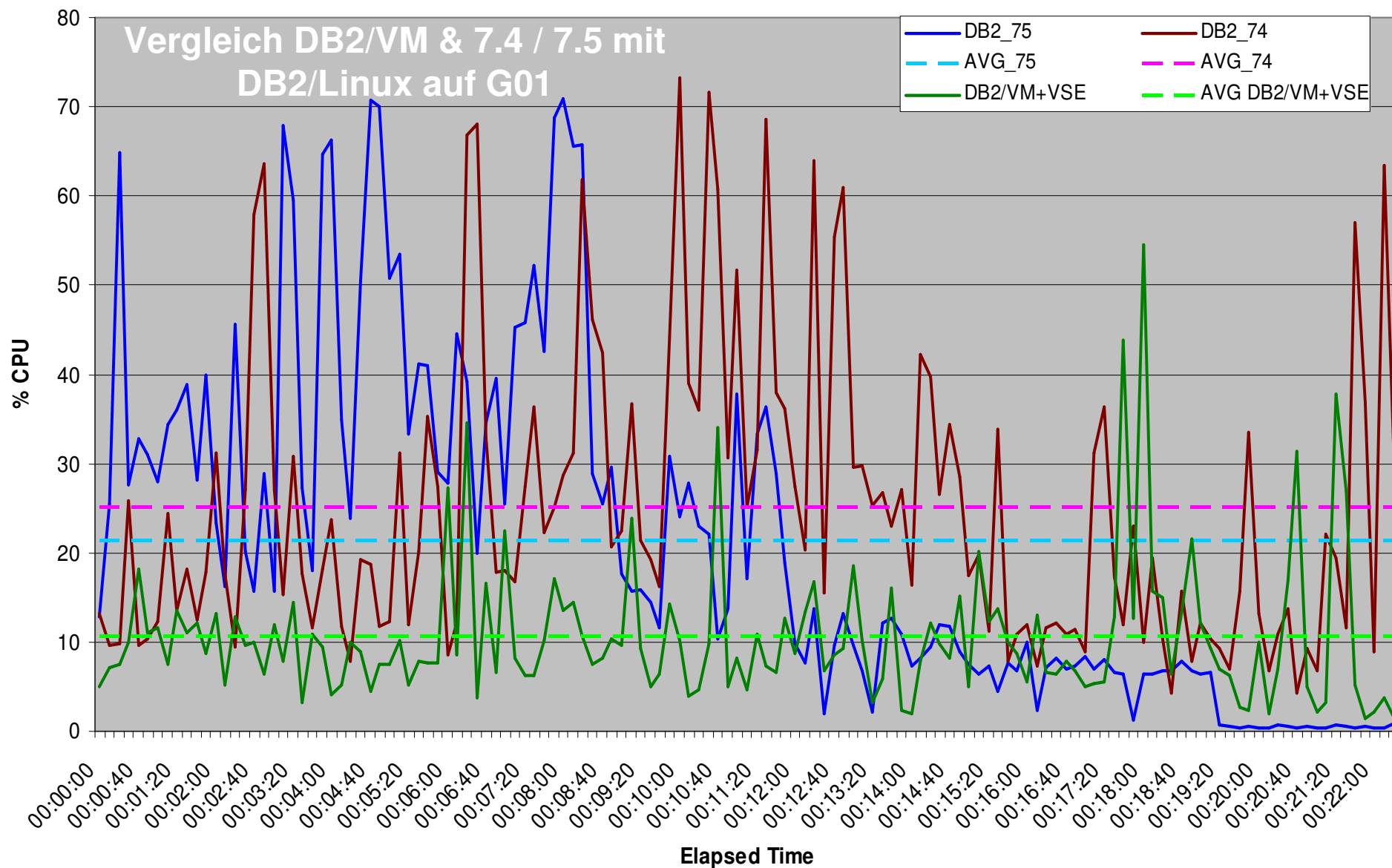
Customer implementation(1): Public sector customer, Germany

EDV-Umgebung

z9 BC (2096-G01)

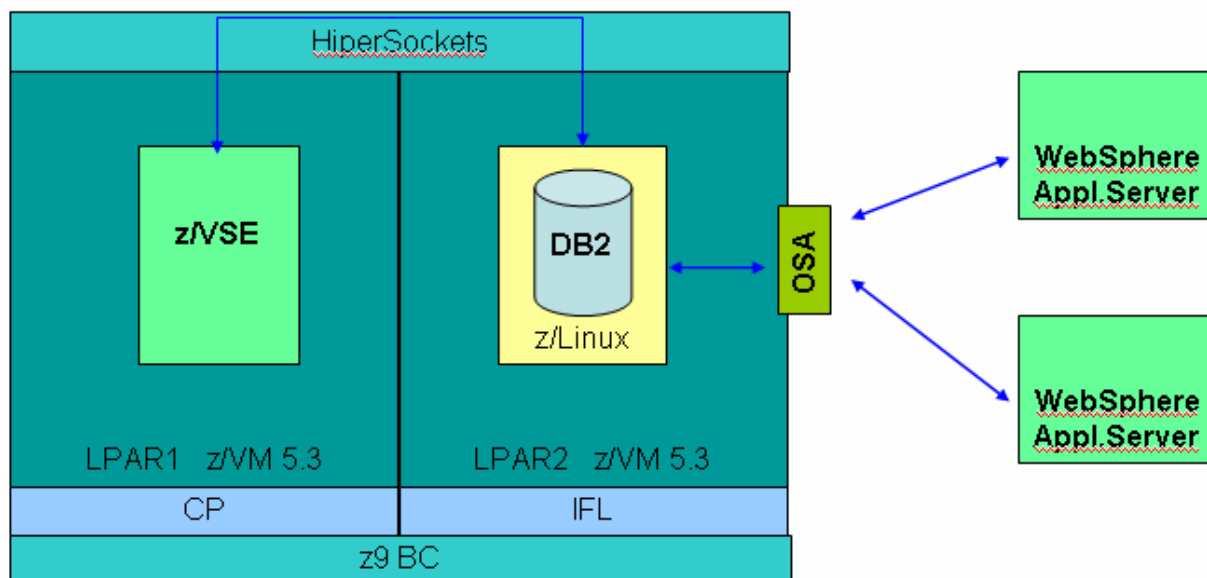


DB2/VM & VSE CPU Usage



Customer implementation(2): Internat. Publication distributor, Germ.

Ausschnitt der IT – Landschaft nach Beendigung des Projekts



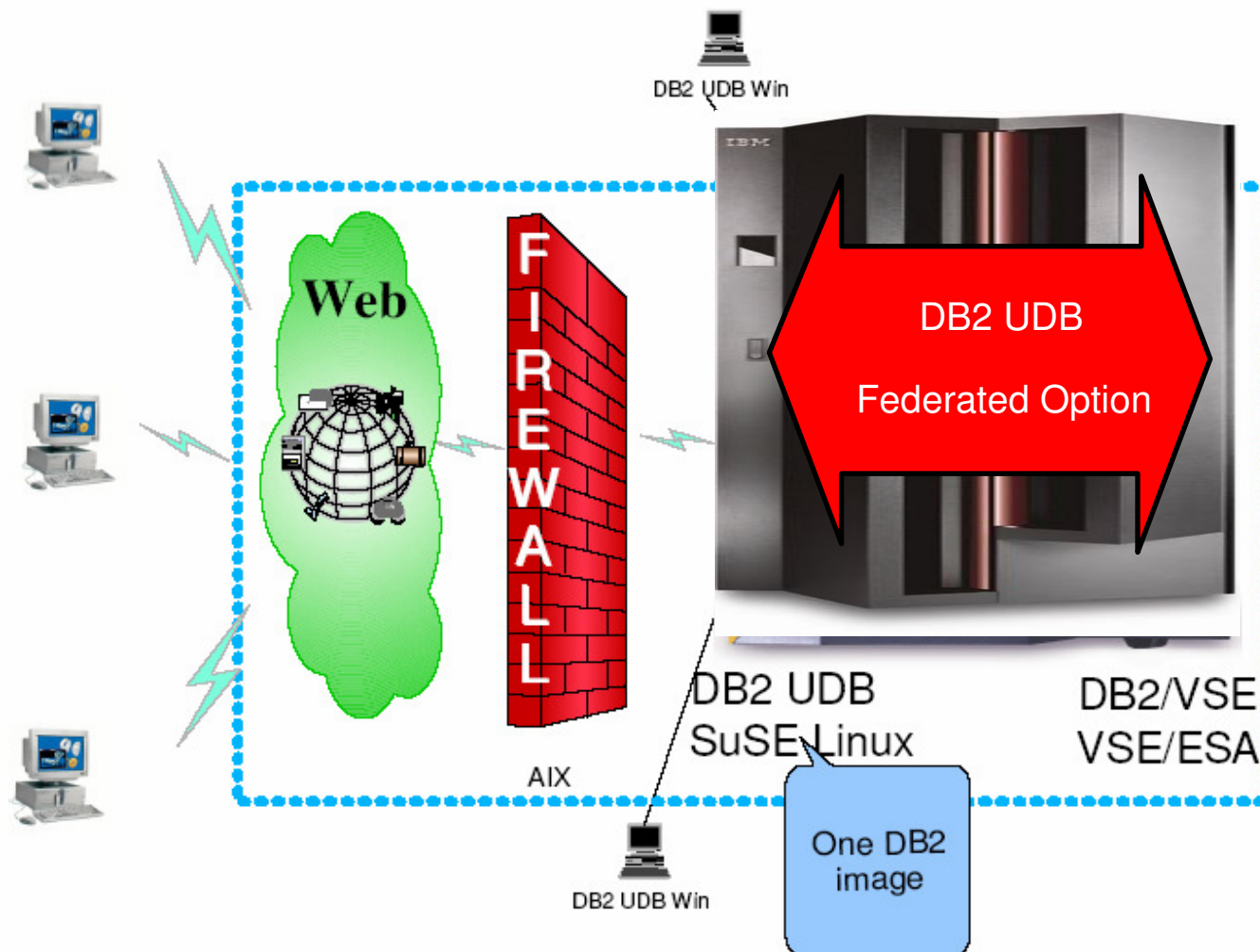
GSE Frühjahrstagung Bonn
 z/VSE mit CICS und DB2 / z/VM mit Linux on System z
 07.04. - 09.04.2008

VSE Customer References(1) Impol /ALCAD Slovenia

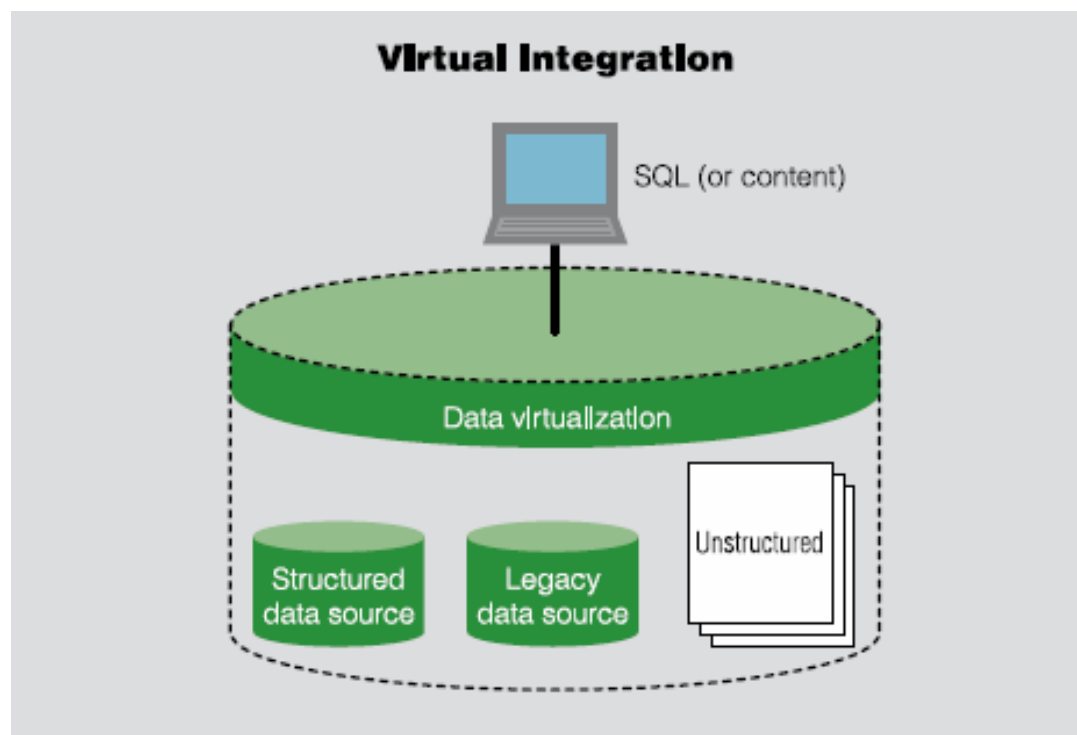
Design, Applications and Solutions



Database design



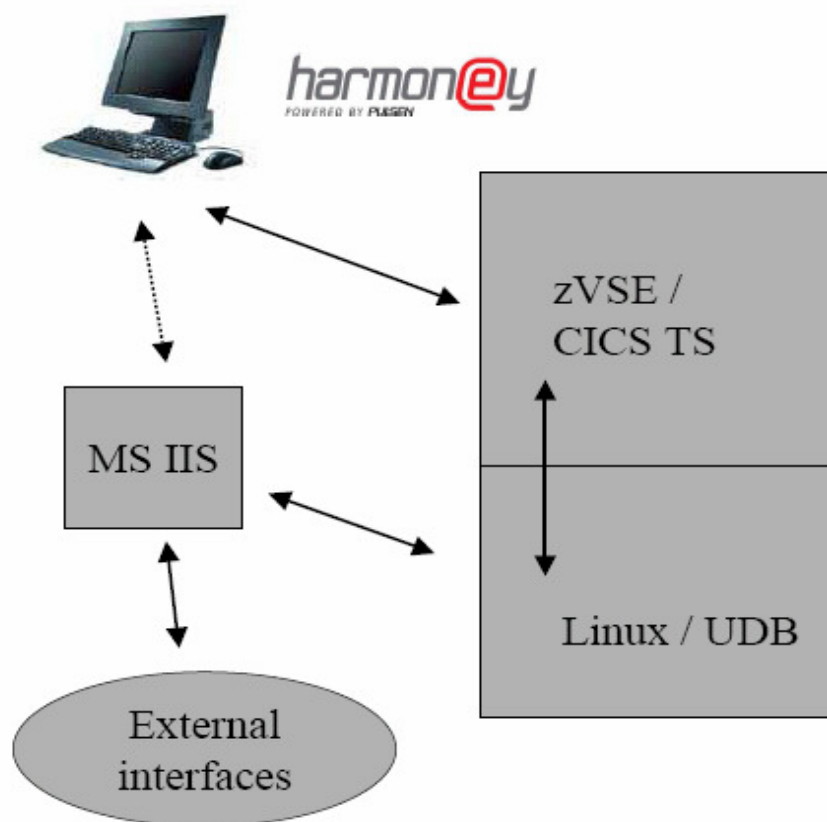
Federated Database design



Customer Reference (2): Pulsen, Sweden



Technical Platform



User interface – Windows/.Net

Data transfers between client and host in XML

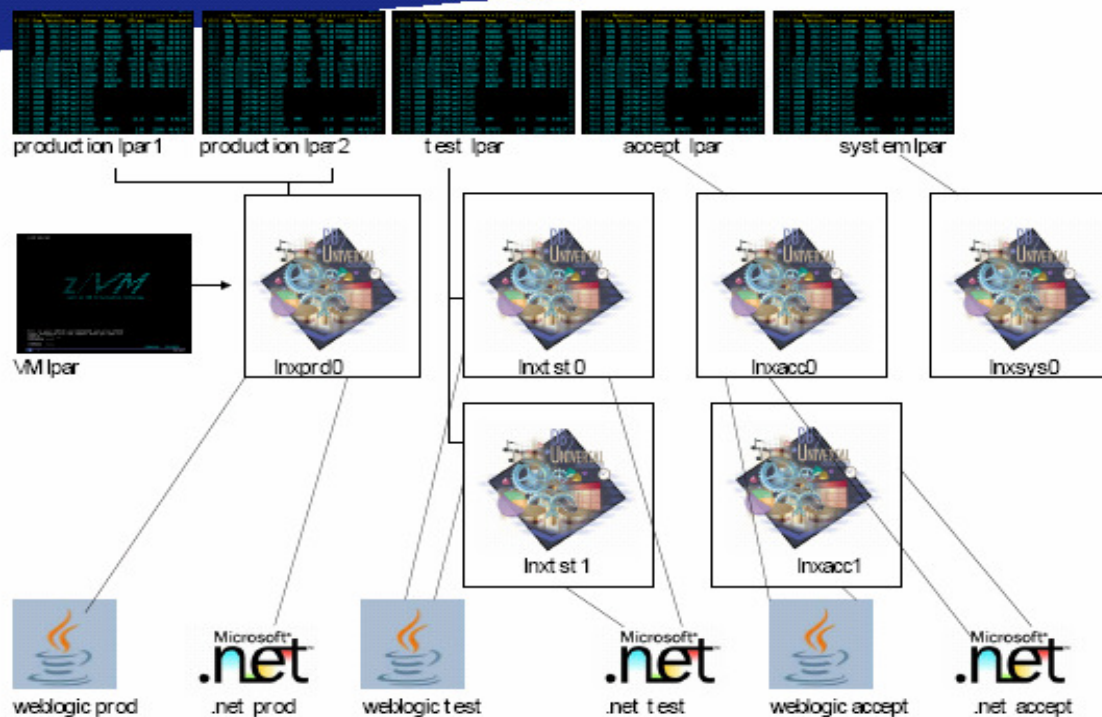
CICS Web Services

DBM - DB2 UDB under Linux

Business logic in z9BC, partly "traditional" PL/1 programs, partly Stored Procedures / UDFs in UDB

Customer Reference (3): Securex, Belgium

DB2 linux



Other





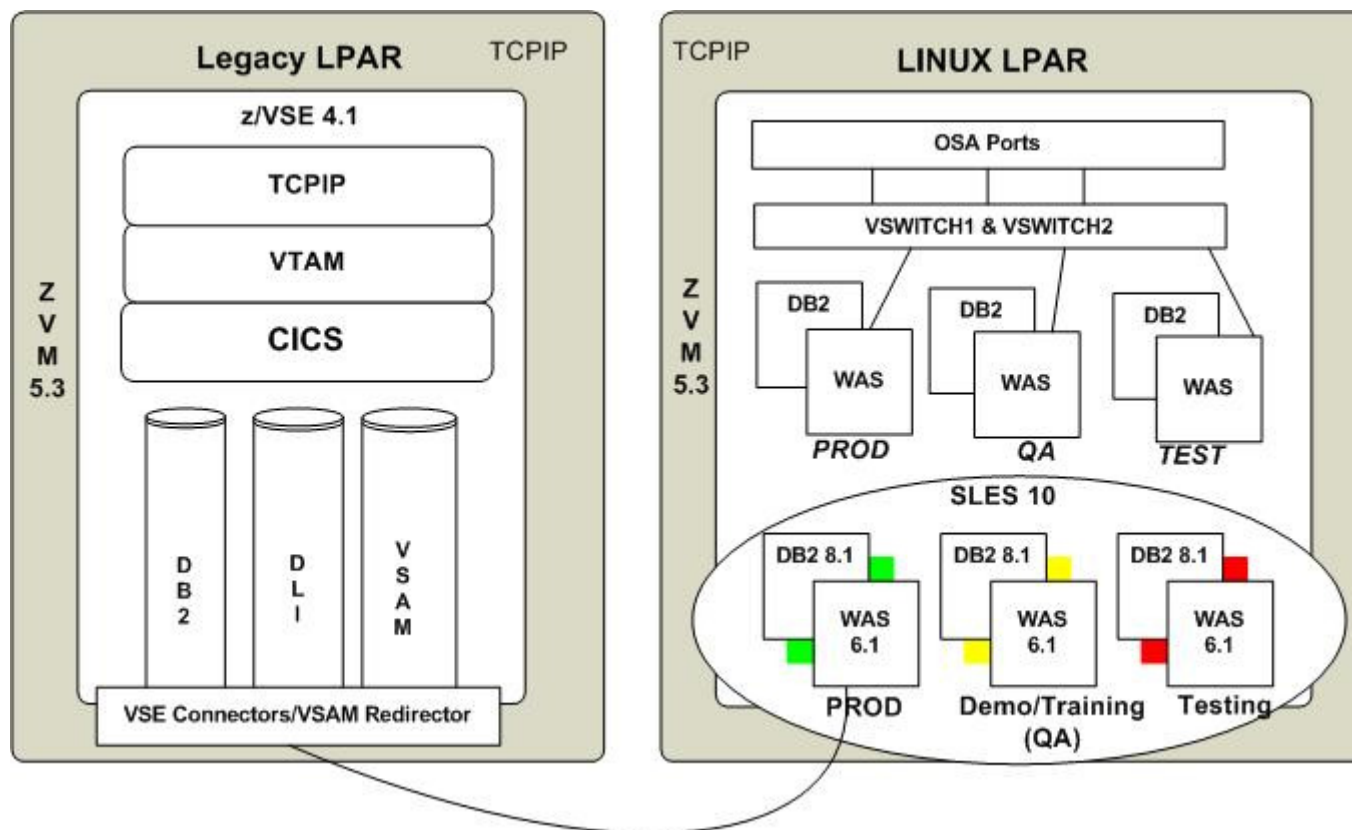
Kennzahlen der Produktion

- 50 – 100 CICS-Transaktionen pro Sekunde
- Bis 2,5 Millionen pro Tag
- Antwortzeiten < 0,1 Sekunden
- Datenbank (DB2) LUWs 2,5 – 3 Millionen
- File I/O pro Tag bis 100 Millionen (VSAM)
- ca. 2200 Sessions am CICS
- ca. 2800 aktive Programme
 - ▶ ca. 300 Online – 90% mit DB-Zugriff
 - ▶ ca. 2500 Batch – ca.1000 mit DB-Zugriff

WESSELS+MÜLLER
FAHRZEUGTEILE UND MEHR

Customer Reference (5): Supreme Court, USA

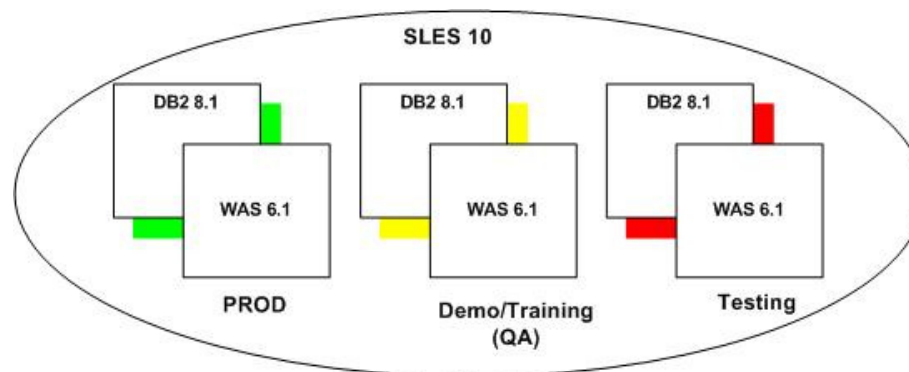
The Magistrate Environment Today



125 locations
2,800 processes per day
Direct interface with CMS application systems

The Lessons Learned (a work in progress)

- **Have a plan!** Linux on System z gets along well with everyone so long as you involve them.... Network, remote apps.....
- **Document and then document some more**
 - WAS settings
 - Passwords (root, wasadmin, wasmon, db2inst1 etc etc)
 - FAQs – build and maintain to help the next in line
- **Managing and controlling changes for application deployments and system fix packs?**
 - **Test / QA / Production – keeping things in sync**

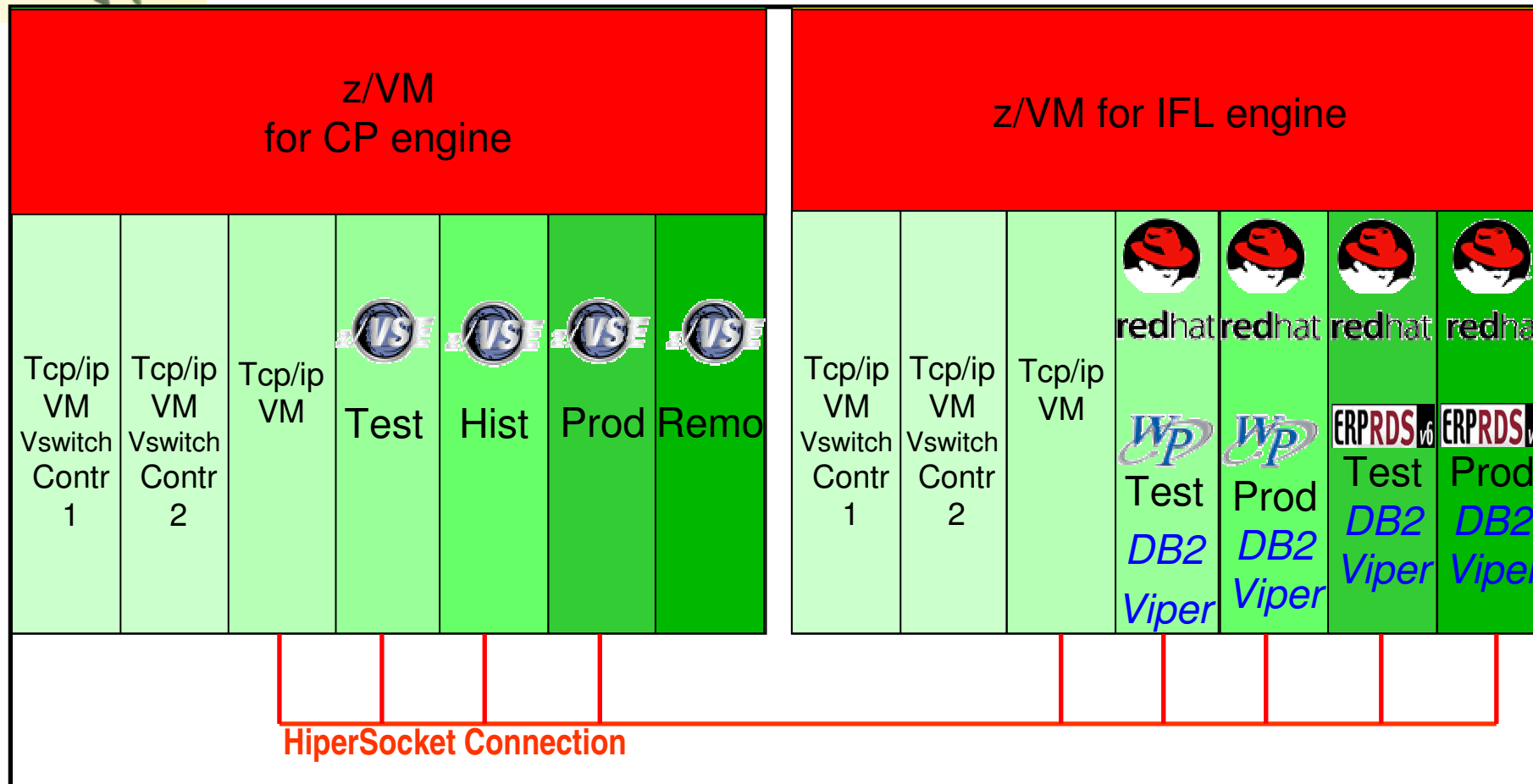


The Lessons Learned (con't)

- **Have a good monitor and know what it's telling you**
 - **Helps with sizing and tuning**
 - **Quickly pinpoints out potential or growing problems areas**
 - **Virtual Disk works great for swap volumes**
 - **Shows management they are getting their money's worth**

Customer Reference (6): Olio Carli, Italy

Internal Connections



More information

- DB2/Linux on System z

http://www.ibm.com/developerworks/linux/linux390/perf/tuning_rec_database.html

<http://www.ibm.com/developerworks/data/library/techarticle/dm-0509wright/>

- DB2 Server for VM and VSE

<http://www-01.ibm.com/software/data/db2/vse-vm/>

- Documentation

<http://www-01.ibm.com/software/data/db2/vse-vm/directory.html#VSE7.5>

<http://www-01.ibm.com/support/docview.wss?rs=71&uid=swg27009727>

- Redbook contributions:

mildw@de.ibm.com