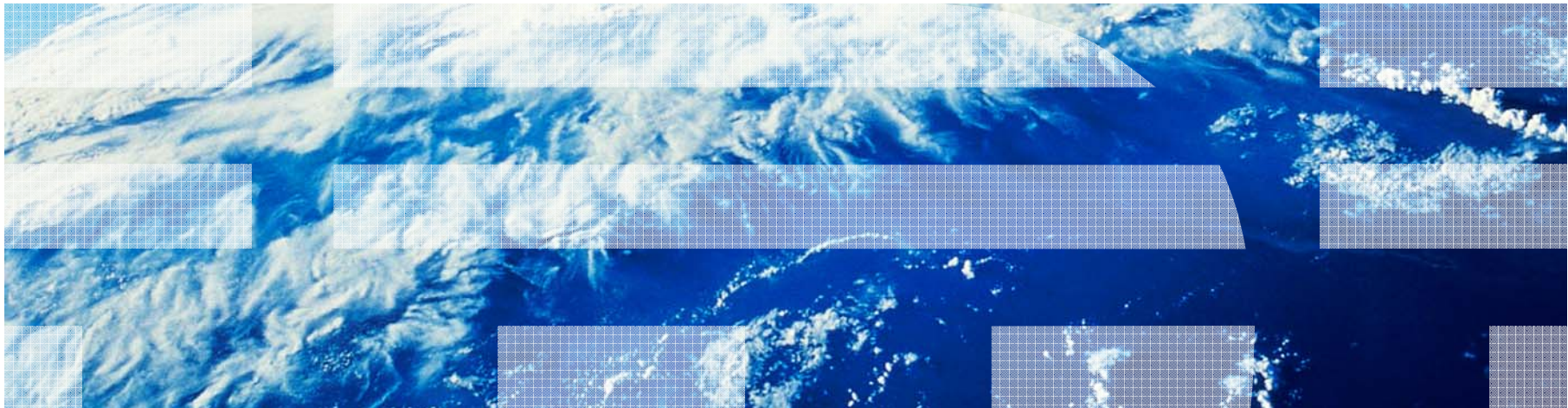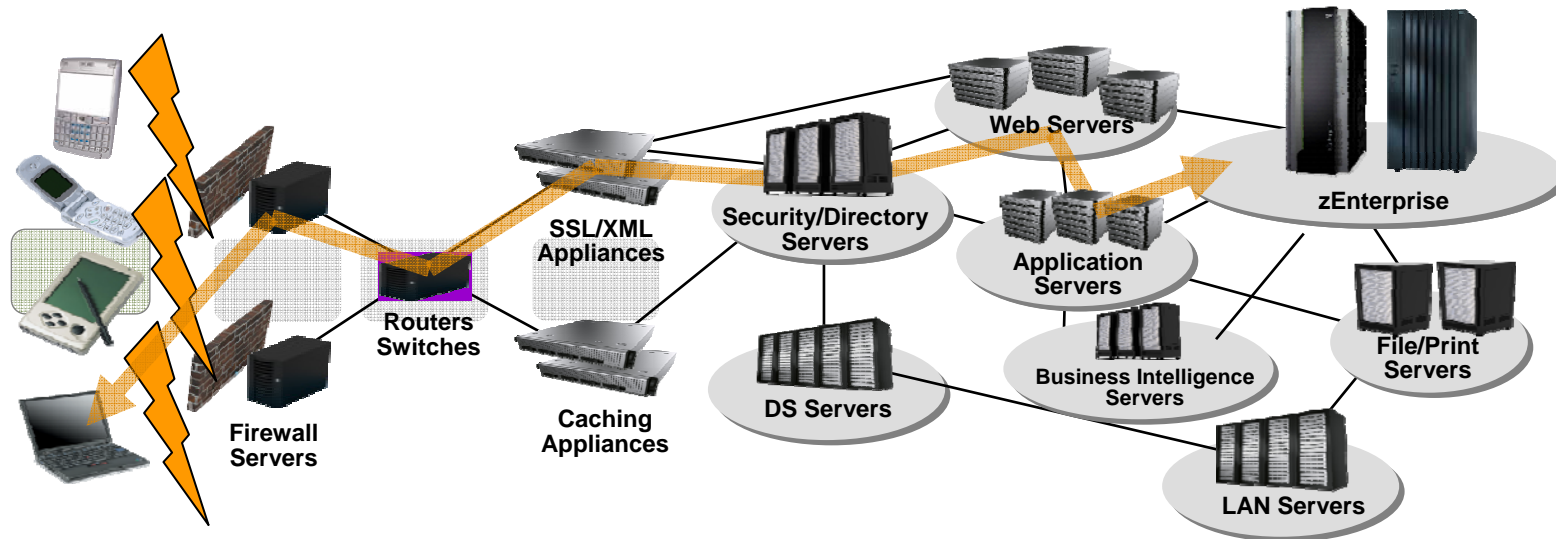IBM

Pinguine in schwarzen Anzügen
Linux bei Banken

Motivation for change / optimization in IT

- Server Sprawl Limitations
- Platform diversification
- Architecture diversification
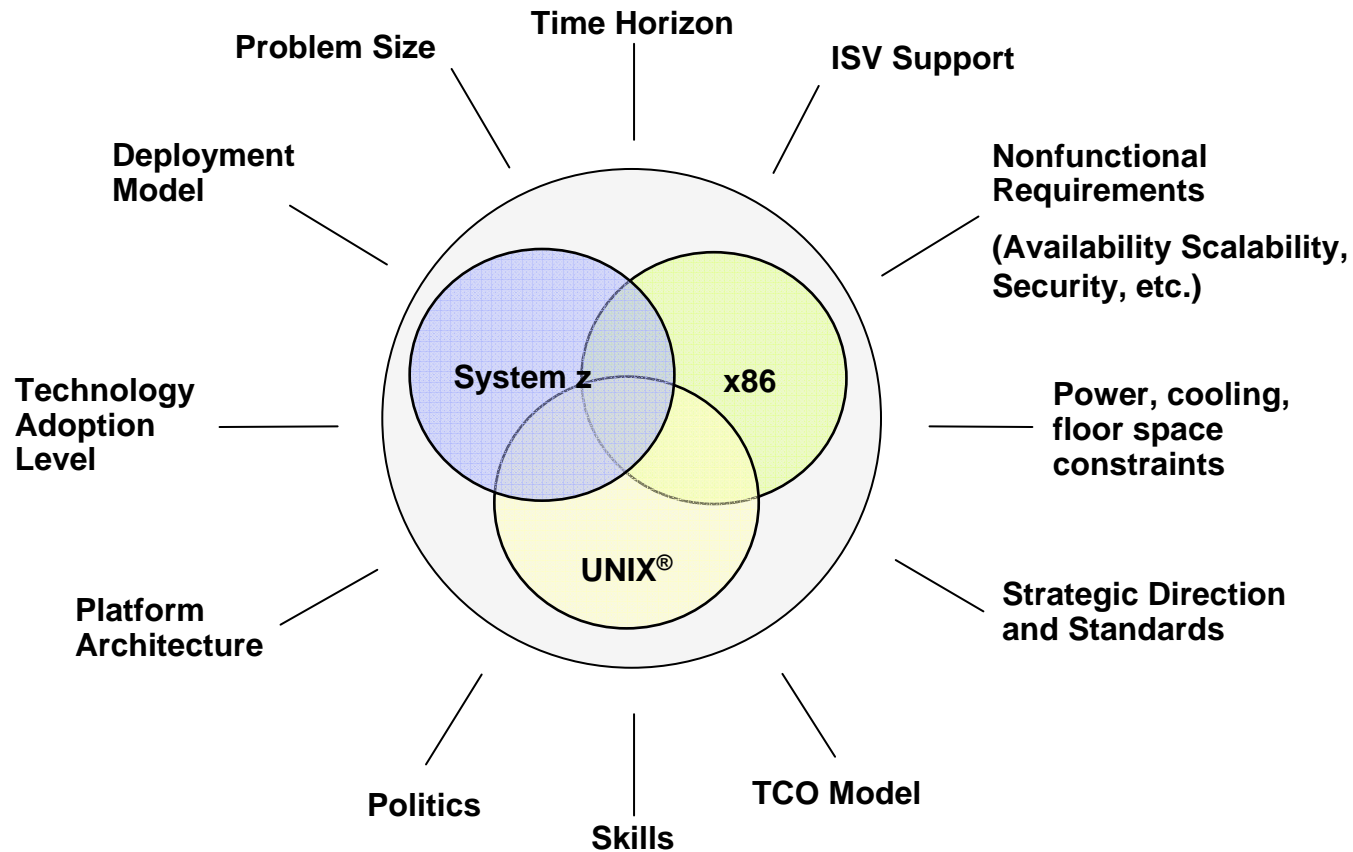- Operating Systems sprawl

- How many x86/Unix servers are deployed every month?
- How much data center space is available, or will it become a problem?
- How big is the energy consumption growing?
- How many additional people are required to maintain the constantly growing number of servers?
- How will the software license cost grow, including the virtualization software?
- How can IT availability be ensured, what happens in the case of a disaster?

Do you have to re-think your IT server strategy?

2

Platform Choice – dependent on Workload and Situation

Many factors influence a platform selection, making it difficult to present a simple selection matrix

Problem Size

Time Horizon

ISV Support

Deployment Model

Nonfunctional Requirements

(Availability Scalability, Security, etc.)

System z

x86

Power, cooling, floor space constraints

Technology Adoption Level

UNIX®

Platform Architecture

Strategic Direction and Standards

Politics

Skills

TCO Model

Some factors are specific to each business, others are common to all and can be generalized

Smarter Banking - Core Services

Infrastructure Management

zManager, zBX, zVM, zLinux
Monitoring, Automation,
WLM, HA/CO Resiliency

## Infrastructure Management

- Fundamentals on managing and monitoring online, batch and hybrid workloads across the zEnterprise System

Development

Code development, testing, virtualisation, modernisation, service integration

Development

- Development, testing and deployment of applications across new and existing channels

Back-office

Services
SOA & Process Management
Websphere / MQ / CICS / DB2
Batch

Back-Office

- Transformation of traditional components to leverage web services, event processing and enterprise service bus technologies

4
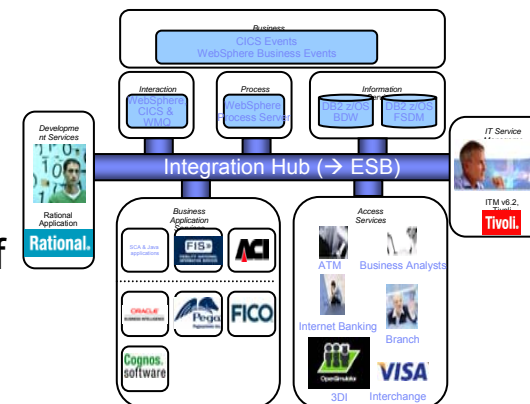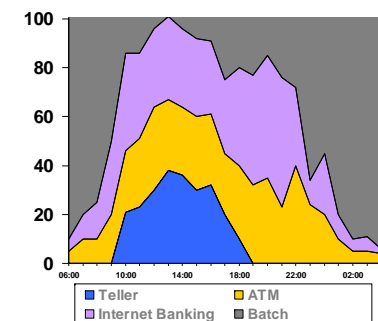
Payments and Analytics

Smarter Banking Analytics

Smarter Banking Analytics

Modelling, Analytics,
Reporting, Dashboards

- Utilisation of DB2 data warehousing, data federation and analytics services across platforms can enable a wide variety of business and technical reports to be supported

Risk & Fraud Management

Risk & Fraud Management

Real-time fraud detection
Scoring, Profiling
Liquidity Reporting
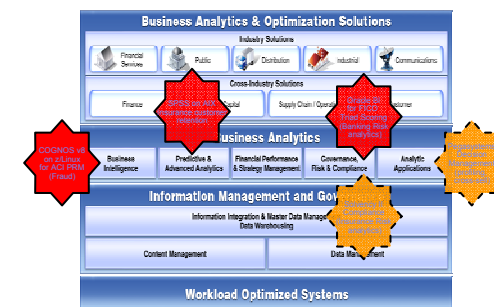
- Focusing on Basel II/III regulations, the use of advanced analytics to monitor the financial health of the Bank in real-time is key to risk assessment and in conjunction with the in-flight profiling and scoring of transactions is essential in fraud prevention

Retail Payments

Retail Payments
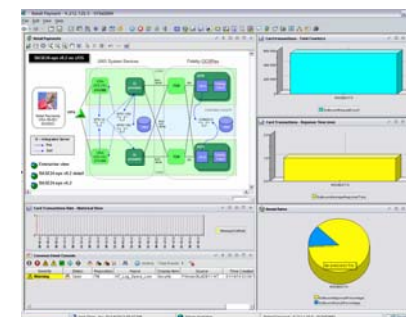
ACI Base24-eps
Channels / Monitoring
ACI PRM / COGNOS Reports

- The useof ACI BASE24-eps for ATM and POS acquiring and issuing transactions, along with the ACI PRM fraud detection product, all running on zEnterprise 196. Includes KPI executive reporting with Cognos

zEnterprise Hybrid Workloads

DataPower XI50z

Integration, Security Performance

Datapower XI50z

- Valueof the XI50z being deployed within the zEnterprise: simplification of XML parsing, integrated security and optimised web services

Multi-Tier Web Application

Predictive Analytics

Multi-Tier Web Application

- value of deploying hybrid web applications across various zEnterprise system components, applying the Fit-for-Purpose workload assessment process to identify the most efficient location for CPU, I/O and mixed workload requirements

Collaborative Banking

Web 2.0, OpenSim, Lotus Sametime, Contactless payments

Collaborative Banking Solutions

- Pervasive computing is leading Banks to incorporate social computing and mobile device services to attract the digitally conscious customers. This demonstration covers a number of the latest technologies incorporated into our showcase using hybrid systems
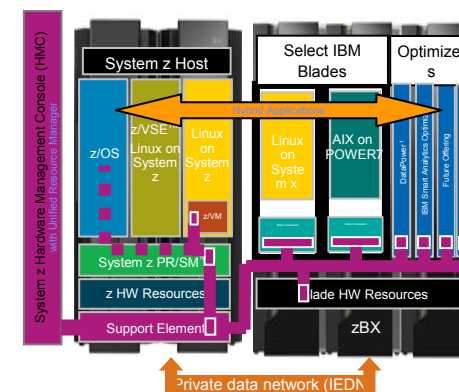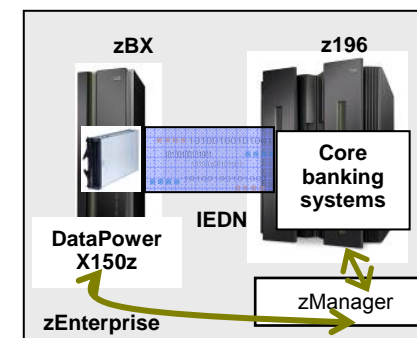
IBM zEnterprise
The integration of System z and distributed technologies into a revolutionary combination

IBM zManager (URM)

- **Unified Resource Manager**, (URM) unifies resources, extending System z qualities of service across the infrastructure
- Install, Monitor, Manage, Optimize, Diagnose & Service

IBM zEnterprise

- The industry's fastest and most scalable enterprise server
- Ideally suited for large scale data and transaction serving and mission critical enterprise applications

IBM zBX BladeCenter Extension

Application Server Blades

- Runs applications unchanged and supports what you know. Logical device integration between System z and distributed resources

Optimizers

- Workload specific accelerators to deliver significant performance and/or lower cost per transaction

7

Platform Management on zEnterprise with Blade Extension (zBX)
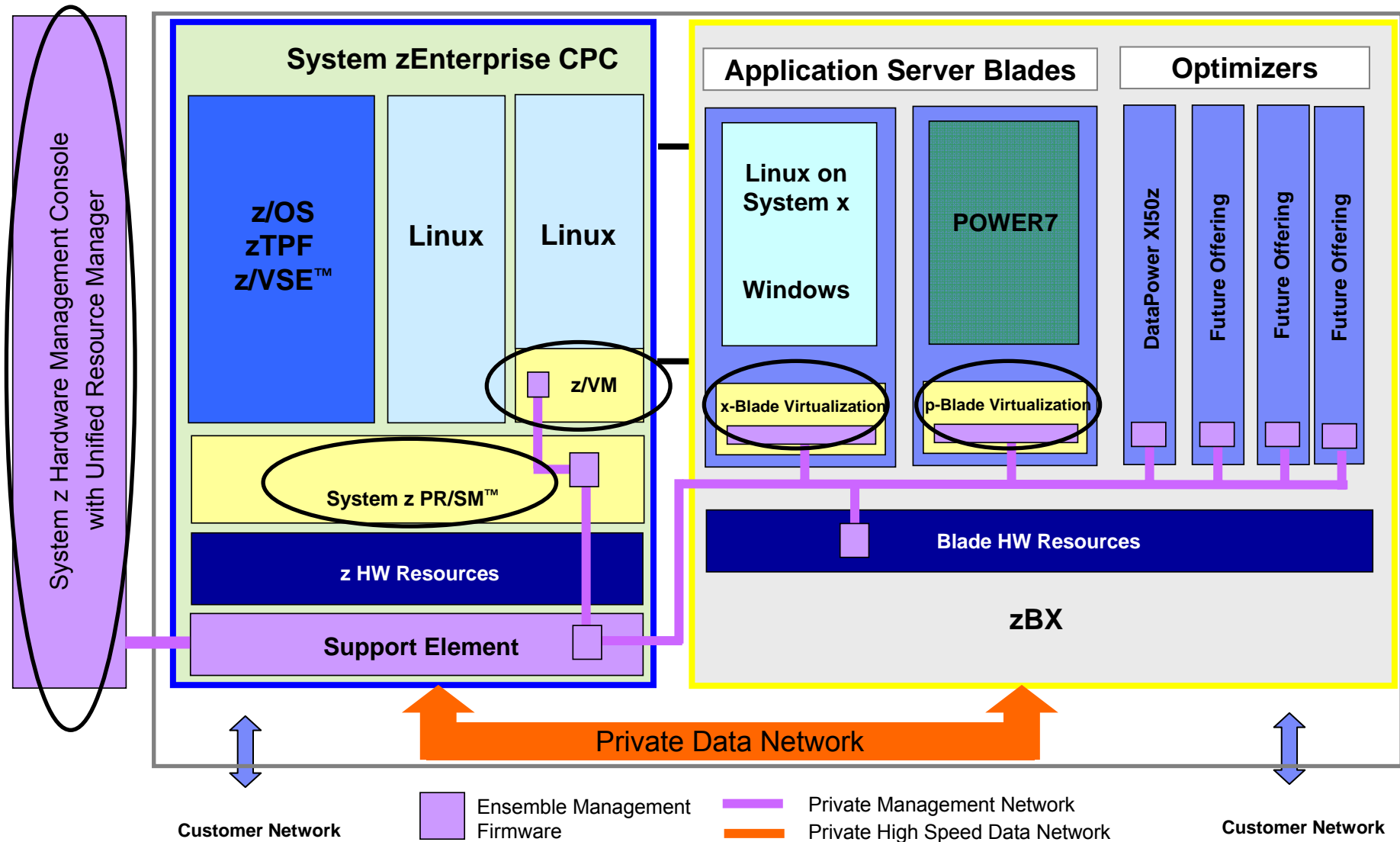
113 of top 120 banks by asset size choose System z…

To directly impact the bottom line
SMART IS
Reducing costs and serving the client

Caixa Galicia: Dramatic growth and national success, spurred by lean , efficient System z to deliver bank transaction costs 30% below Spain Average

To serve the customer
SMART IS
Business continuity, security and agility

Handelsbanken (Sweden): *"Customers entrust us with their hard earned savings so it's paramount that we select one of the industry's most powerful and secure servers - the IBM System z,"* said Roger Rydberg, technical manager at Handelsbanken. *"[System z] allows us to keep up with business climate changes because we can add or eliminate capacity any time based on customer demands. We can even make changes easily without having to stop any services."*

To deliver growth
SMART IS
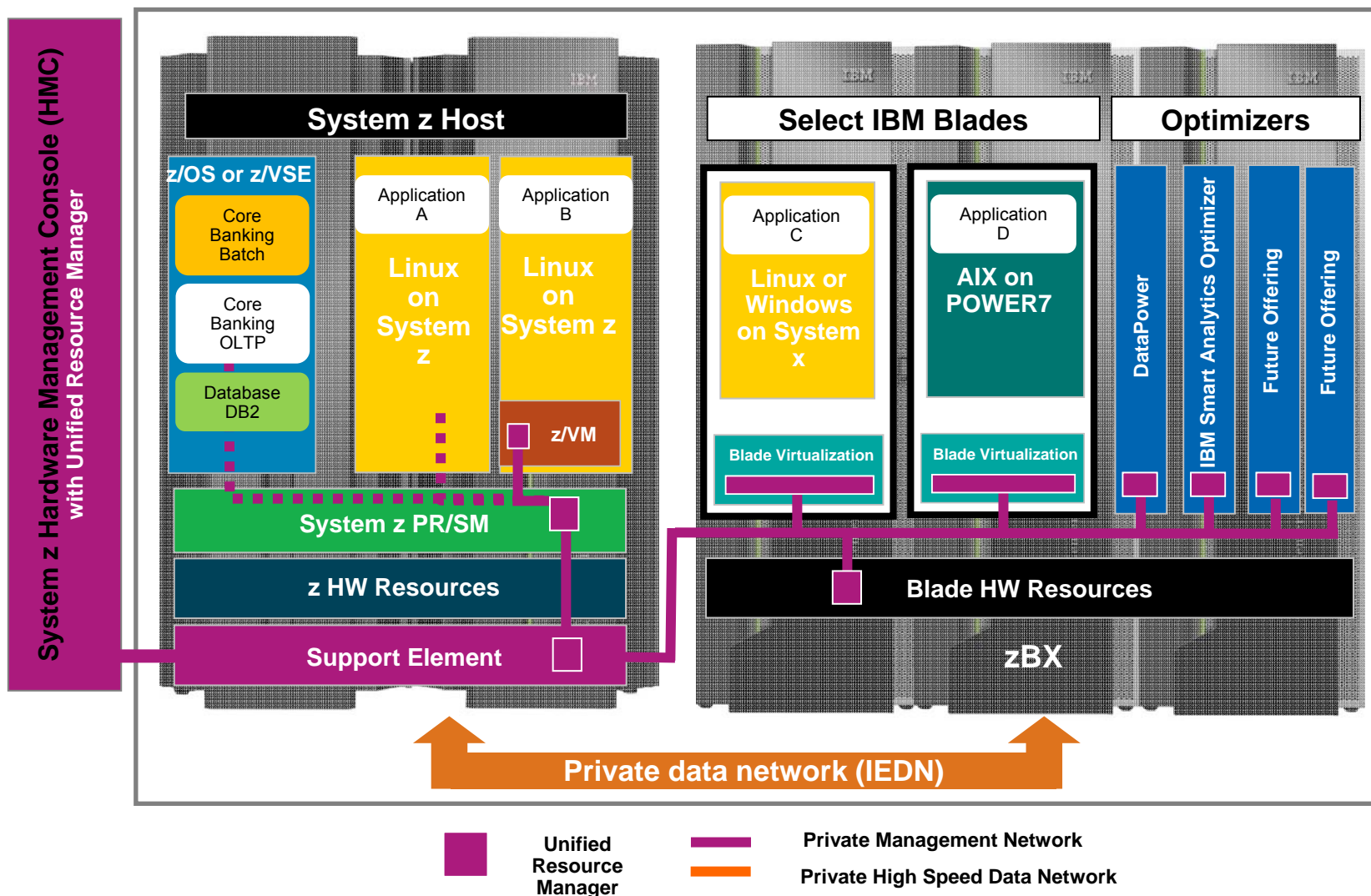Improved speed to market with integration

St Georges Bank: Integration of disparate systems and data to improve customer service, bringing new products to market. *"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."*

Core Banking Solutions on IBM System zEnterprise

System z Hardware Management Console (HMC) with Unified Resource Manager

System z Host

z/OS or z/VSE
- Core Banking Batch
- Core Banking OLTP
- Database DB2

Application A
Linux on System z

Application B
Linux on System z

z/VM

System z PR/SM

z HW Resources

Support Element

Select IBM Blades

Application C
Linux or Windows on System x

Blade Virtualization

Application D
AIX on POWER7

Blade Virtualization

Blade HW Resources

Optimizers

DataPower

IBM Smart Analytics Optimizer

Future Offering

Future Offering

zBX

Private data network (IEDN)

	Unified Resource Manager		Private Management Network
			Private High Speed Data Network

Virtualization in System z and zEnterprise
z/VM Technology: Share everything

- z/VM simulates the existence of a dedicated real machine, including processor functions, storage, and input/output resources.
- z/VM includes network Virtualization, high availability and integrated security between VMs
- It supports uniquely, over commitment on all levels.

z/VM can provision a virtual machine with a mix of virtual and real resources.

Linux   Linux   Linux   CMS   VSE   z/OS

Virtual

z/VM

I/O and Network (VLAN, VSwitch)

Memory

Processors

Dynamically add resources to z/VM LPAR
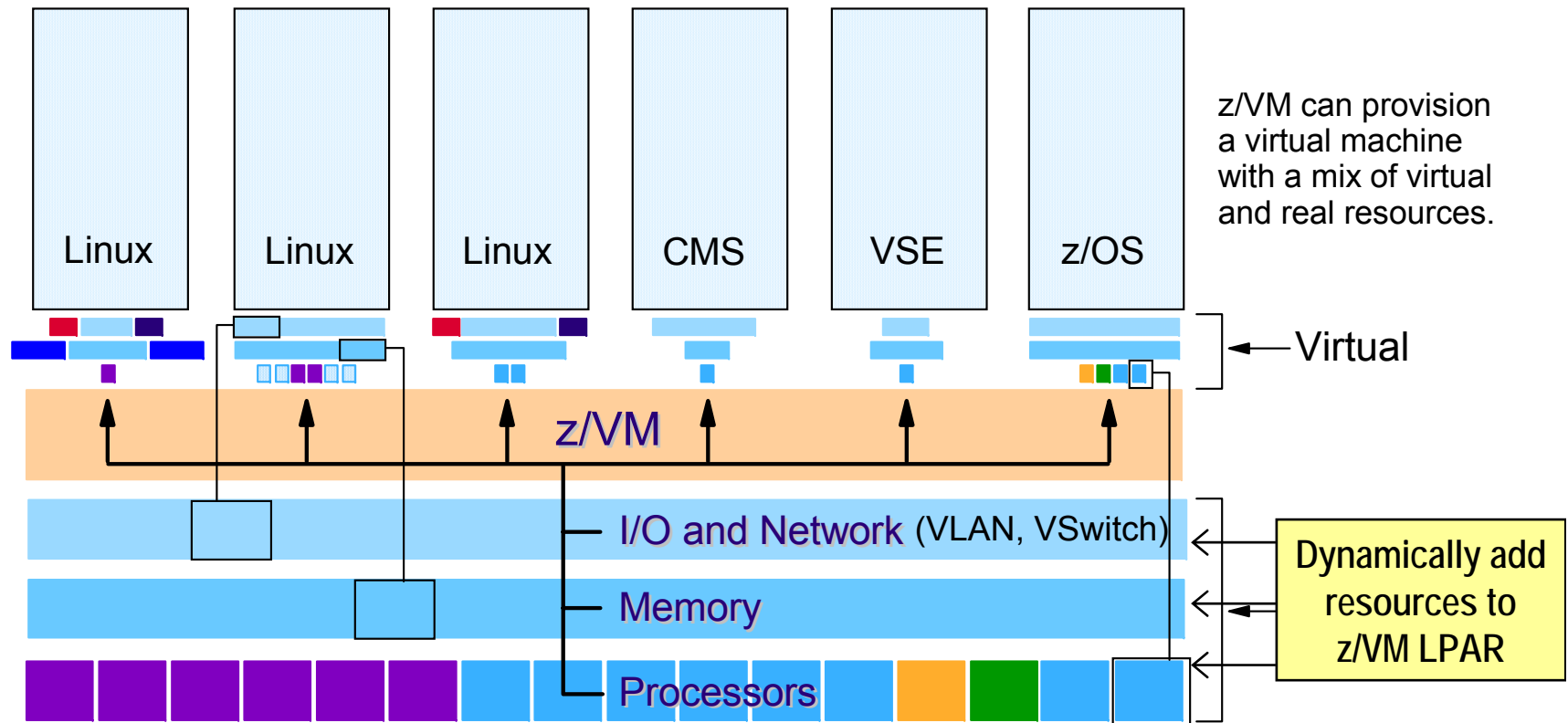
Linux on z/VM is the industry's most advanced virtual solution

Quotes and Case Studies

- "Our core banking modernization will place us well ahead of our competitors. The new architecture behind the SAP platform gives us the power to treat IT as a utility." - Michael Harte, chief information officer, Commonwealth Bank Group

- Montserrat Torres Torres, Computer Systems Manager, Banco Pastor says, "With the IBM z10 System servers, we resolved our issues of scalability, speed and cost. We have reduced our footprint by ten times, and minimized our overall business risks. The z10 servers are based in two separate sites and provide us with the utmost security by ensuring that even if there is a natural disaster we can maintain high availability.

- Thanks to the IBM System z platforms, virtualization technologies and the SUSE Linux Enterprise Server for System z operating system, EFiS EDI Finance Service AG successfully consolidated its environment while deploying hundreds of Linux instances to support its performance requirements.
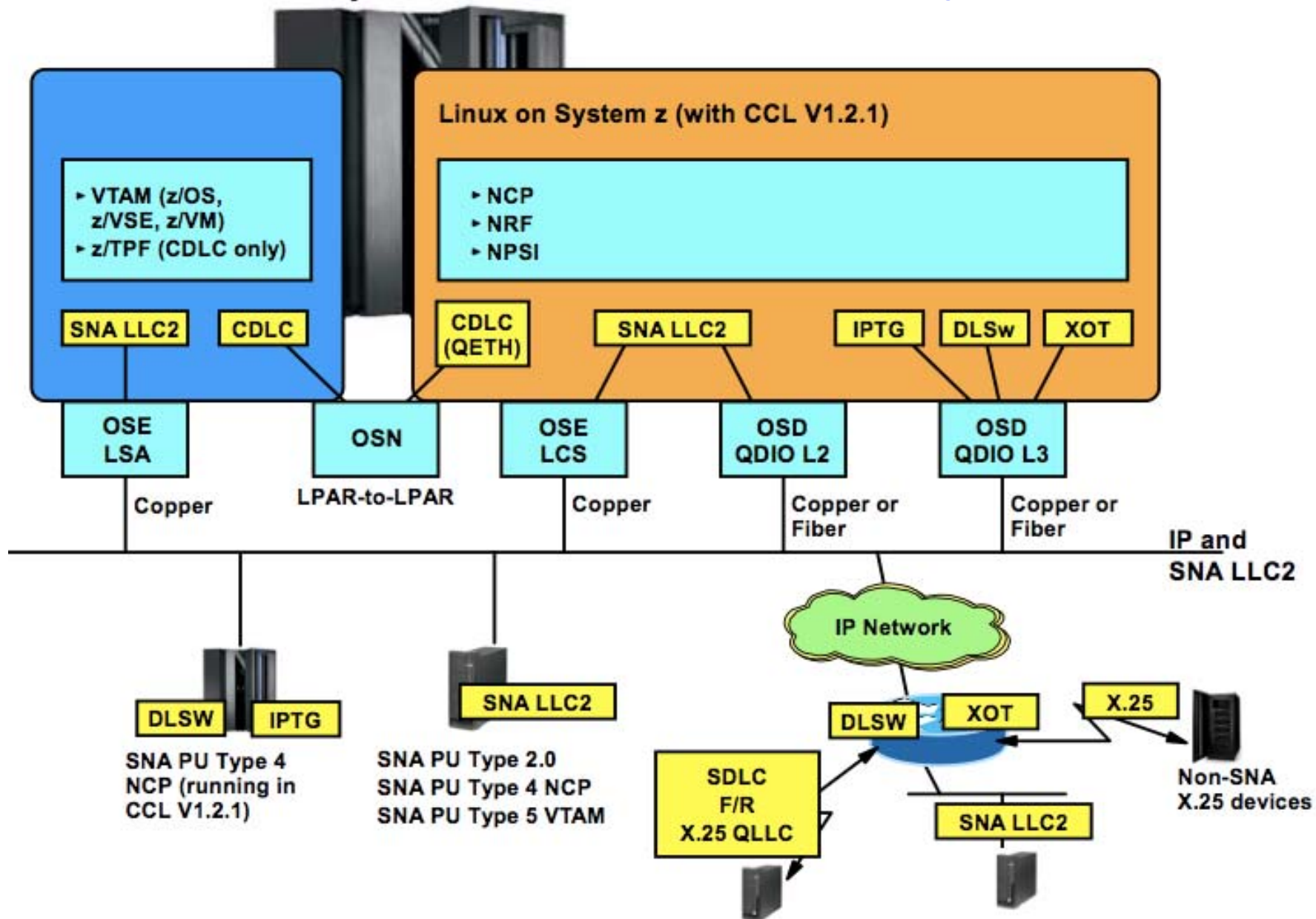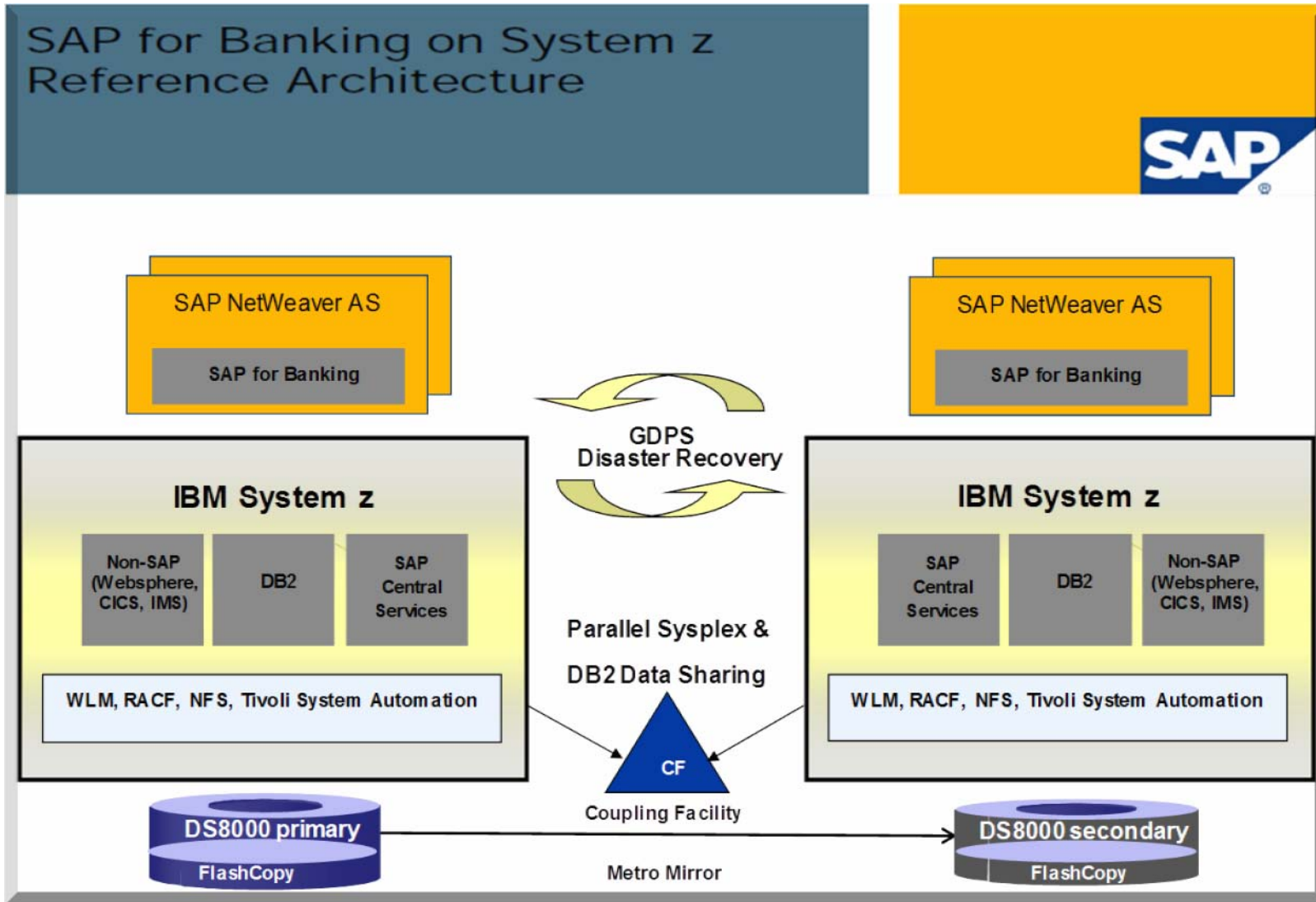
CLABBY ANALYTICS

Case Study

According to Ahmed Mohammed Anwar, Al Rajhi Bank's Head of Production, a move to distributed computers would not help the bank meet is processing goals in the timeframe the bank needs to meet them due to government mandated deadlines.

Al Rajhi Bank's 3000 MIP IBM Mainframe:
The Best Machine for the Job

IBM zEnterprise 114 and zBX

Replacement for SNA communication using
- Communication Controller for Linux on System z

VTAM (z/OS, z/VSE, z/VM)
- VTAM (z/OS, z/VSE, z/VM)
- z/TPF (CDLC only)

Linux on System z (with CCL V1.2.1)
- NCP
- NRF
- NPSI

| SNA LLC2 | CDLC | | CDLC (QETH) | SNA LLC2 | | IPTG | DLSw | XOT |

| OSE LSA | OSN | OSE LCS | OSD QDIO L2 | OSD QDIO L3 |

Copper — LPAR-to-LPAR — Copper — Copper or Fiber — Copper or Fiber

IP and SNA LLC2

IP Network

DLSW   IPTG

SNA LLC2

DLSW   XOT

X.25

SNA PU Type 4
NCP (running in
CCL V1.2.1)

SNA PU Type 2.0
SNA PU Type 4 NCP
SNA PU Type 5 VTAM

SDLC
F/R
X.25 QLLC

SNA LLC2

Non-SNA
X.25 devices

SAP for Banking on System z
Reference Architecture

SAP Banking Services 7 on DB2 10 and zEnterprise
150 Million Accounts Measurements

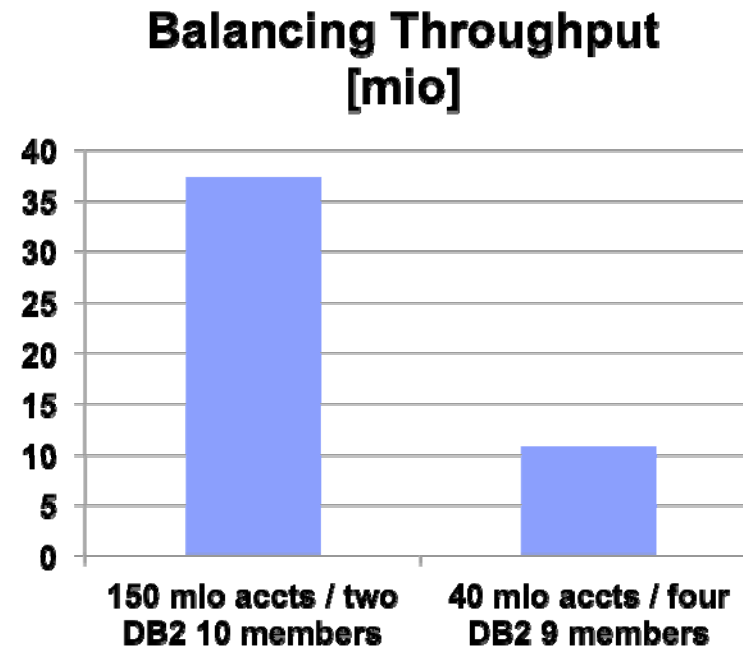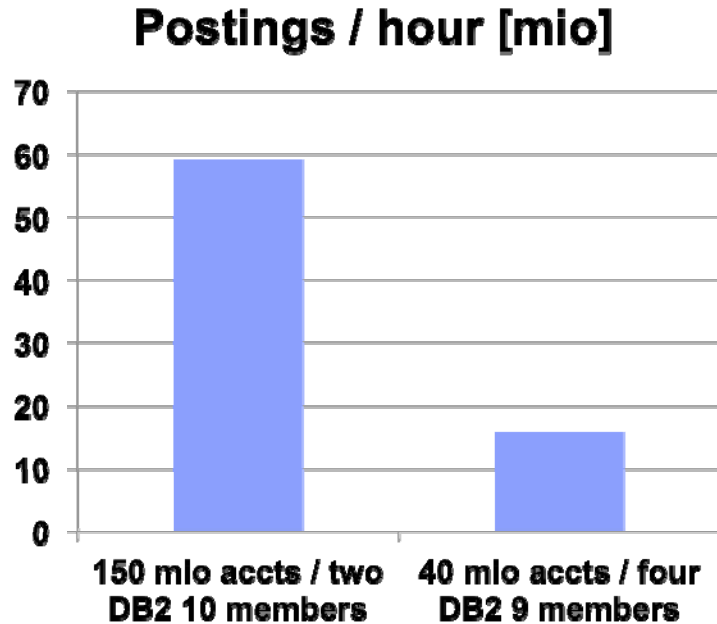- **Record-setting performance for SAP core banking workloads**

  - Bank postings

  - Balancing

  > **Large-scale project run in Poughkeepsie in 1H 2011 – see**
  > www.ibm.com/solutions/sap/us/en/news/zenterprise_system_scales_best.html

- **Number of accounts processed larger than ever before: 150 million**

  - Previously: 40 million

  ⟵ DB2 9 on z9 with older SAP TRBK4 banking release

Postings / hour [mio]

70	
60	
50	
40	
30	
20	
10	
0	

150 mio accts / two DB2 10 members   40 mio accts / four DB2 9 members

Balancing Throughput [mio]

40	
35	
30	
25	
20	
15	
10	
5	
0	

150 mio accts / two DB2 10 members   40 mio accts / four DB2 9 members

Vietin Bank

VietinBank.

Company description

Vietnam Joint Stock Bank for Industry and Trade (VietinBank) is one of the largest banking institutions in Vietnam. VietinBank was established in 1988. The bank's total asset accounts for over 20 percent of the entire Vietnamese banking industry. With headquarters in Hanoi Capital, the bank operates nearly 850 branches and transaction offices and nearly 1,200 Automatic Teller Machines (ATMs) throughout the 56 provinces and cities in Vietnam.

VietinBank selected an IBM mainframe to run a new operational risk management solution, which will enable the bank to deliver premium services to its customers.

Business Challenge

Scalability for business growth

Strengthen operational risk management

35% business growth past year (existing Sun distributed platform could not deliver)

Solution:

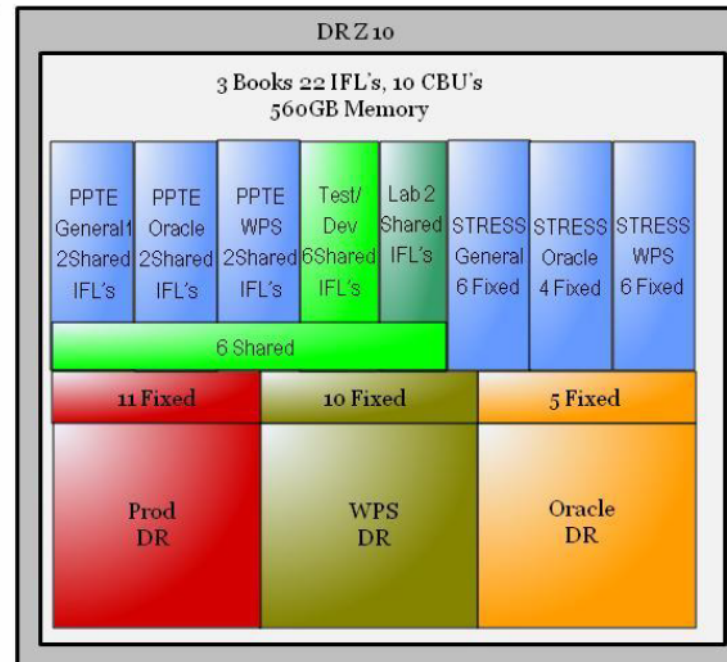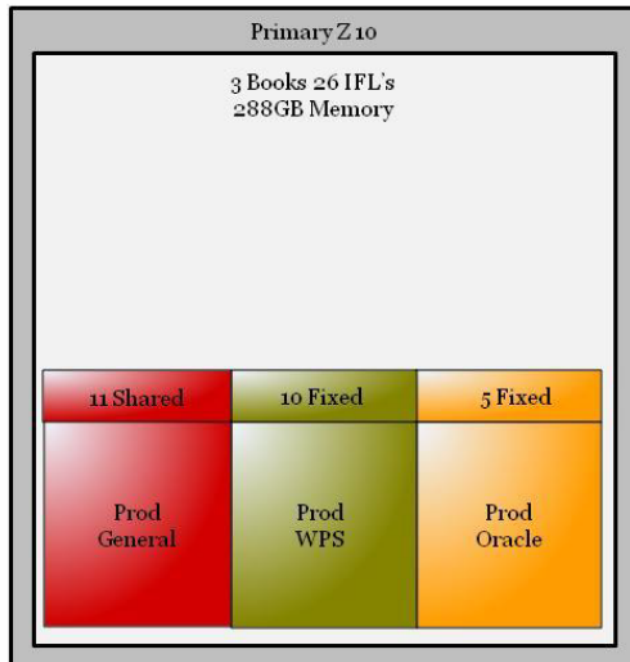System z10 BC, Linux on System z

> *"The IBM System z10 Business Class™ (z10 BC™) offered us more options than competing products because the system was designed to provide the world's highest levels of security while managing the world's highest amounts of transactions. We are proud to have System z to help us achieve our objective of providing continuous banking services to our customers"*
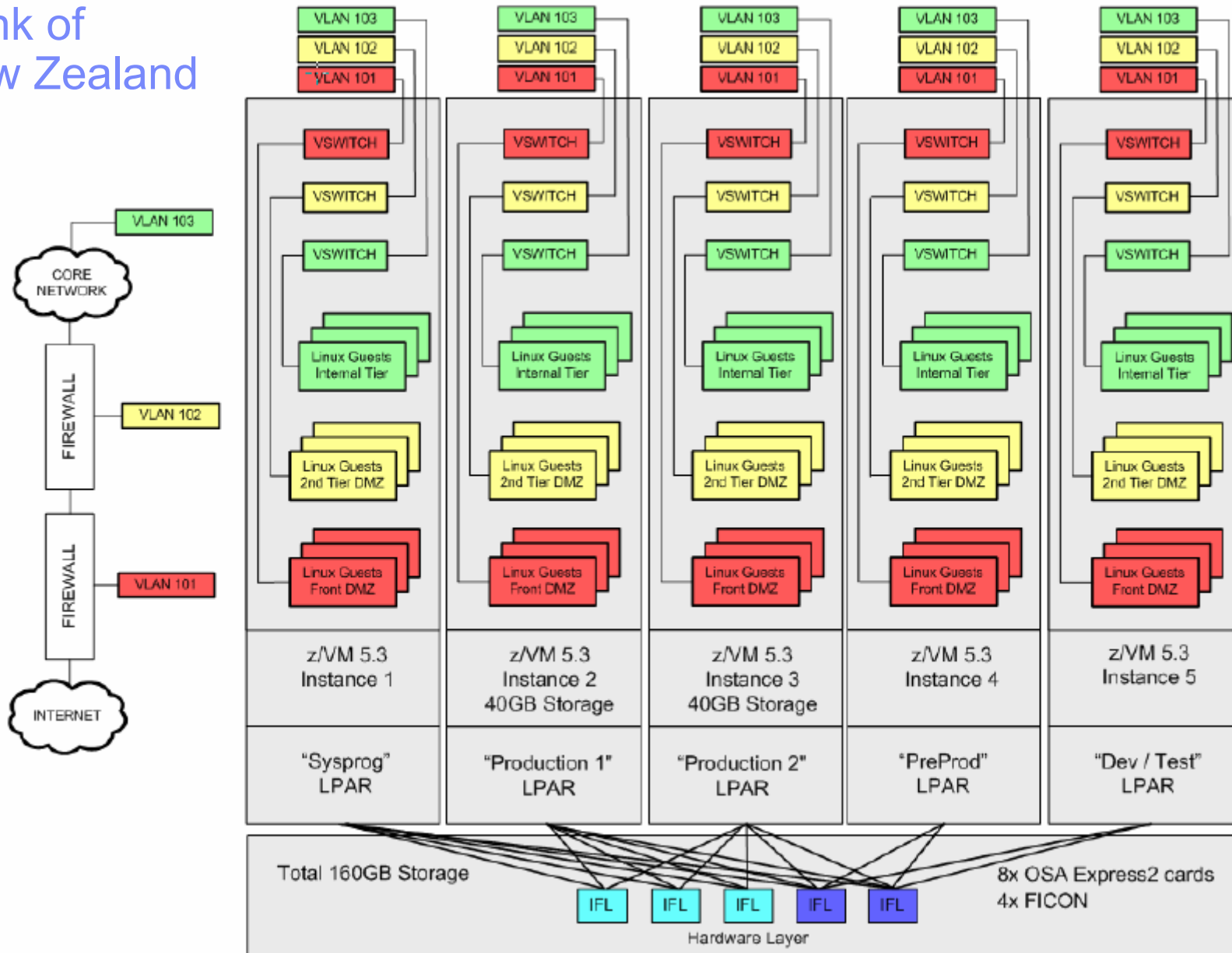>
> *Pham Anh Tuan,*
> *Deputy Director, VietinBank*

With this new IBM System z mainframe server, optimized for high transaction banking workloads, VietinBank will benefit from advanced systems management features including capacity management and security to protect the bank's data from potential risks as the country's appetite for traditional and more advanced banking services continues to grow.

Bank of New Zealand

- Consolidated 200 Sun servers down to one System z10 running Red Hat Enterprise Linux

- Reduced data center footprint by 30%, heat output by 33%, and power consumption by close to 40%

- Only one administrator needed per 200 virtual servers

- New environments are deployed in minutes, not days

Primary Z 10

3 Books 26 IFL's
288GB Memory

11 Shared	10 Fixed	5 Fixed
Prod General	Prod WPS	Prod Oracle

DR Z 10

3 Books 22 IFL's, 10 CBU's
560GB Memory

PPTE General1 2Shared IFL's	PPTE Oracle 2Shared IFL's	PPTE WPS 2Shared IFL's	Test/ Dev 6Shared IFL's	Lab 2 Shared IFL's	STRESS General 6 Fixed	STRESS Oracle 4 Fixed	STRESS WPS 6 Fixed

6 Shared

11 Fixed	10 Fixed	5 Fixed
Prod DR	WPS DR	Oracle DR

Bank of New Zealand

Svenska Handelsbanken
Building a modern data center on mainframe technology

Challenge

With the growth of both Internet banking and core banking systems, Svenska Handelsbanken wanted to consolidate as many systems as possible to a simple centralized infrastructure.

Solution

By running Linux, Java, and database workload alongside core banking systems on an IBM System z10, Handelsbanken benefits from a single easy-to-manage platform with rapid disaster recovery capabilities.

Benefits

- Runs hundreds of systems on a single physical machine

- Cuts Java workload costs by 15 percent per year

- Enables disaster recovery within seconds

Scalable infrastructure

Like most banks, Handelsbanken is a long-term user of IBM's mainframe technologies, which provide high availability and performance for its core banking services. Over the years—and particularly with the advent of Internet banking—Handelsbanken had also built a landscape of smaller, distributed servers, mostly running Microsoft Windows or Linux operating systems.

"We probably have about 2,500 servers in the distributed landscape, but we only need two IBM System z mainframes—one at each of our main data centers," says Roger Rydberg, manager of System z Platform. "The team that manages the mainframe environment can just log in to one server and work on all the systems running on it, while the team responsible for the distributed servers has to spend a lot more time on hardware maintenance, network management, and other low-level tasks."

Handelsbanken's first Internet banking solution was built in the distributed environment. The service was an instant success with customers, and user numbers grew much more quickly than Handelsbanken had anticipated.

"Scalability was a real challenge, because we had to keep buying more physical machines to act as Web servers," explains Sandström. "This was not only expensive, it also posed physical problems in terms of space in the data center, cabling, electricity, and air-conditioning requirements. So we immediately started thinking about the next generation of online banking, and whether we could create a more scalable infrastructure."

Svenska Handelsbanken
http://www.youtube.com/watch?v=t670upF1p9Y

EFiS EDI Finance Service AG
supporting mission-critical applications and services

EFiS FINANCIAL SOLUTIONS

Business need:
EFiS EDI Finance Service AG had been using a collection of x86-based servers running Linux software to support its mission-critical applications and processes. However, the servers were not meeting the company's performance or scalability requirements.

Solution:
PROFI Engineering Systems AG helped the company migrate its mission-critical applications from x86-based servers onto a single IBM Enterprise Linux Server (ELS) – an IBM System z9 Business Class platform running Novell SUSE Linux Enterprise Server for System z. The company then saw an opportunity to expand its IBM and Linux investments and improve the company's overall services by updating its data center and installing a new ELS, based on IBM System z10 Business Class hardware.

Benefits:

- Successfully consolidated IT environment while deploying hundreds of Linux instances to support its performance requirements.

- By retiring unnecessary and underperforming hardware, the company was able to double processing speeds and optimize its data center.

- The implementation of the SUSE Linux Enterprise Server software and System z technology enabled the company to optimize its fully realized disaster recovery plan.

> *The consolidated IBM System z9 BC and IBM System z10 BC servers successfully streamlined the data center to optimize maintenance and management processes and effectively reduce costs.*
>
> *The virtualized IBM System z environment offers much higher than average processor utilization levels, so a single IFL processor is able to handle workloads equivalent to a large number of x86 servers. This is particularly significant for software which is licensed on a per-processor basis, as is the case for many of the company's business-critical applications.*
>
> *As a result, the company was able to enjoy instant savings by migrating these applications to the SUSE Linux Enterprise Server solution.*

PROFI Innovative IT-Lösungen

Efficient Data Center with IBM Mainframe Technologies at EFiS http://www.youtube.com/watch?v=jK4_VFA99oU
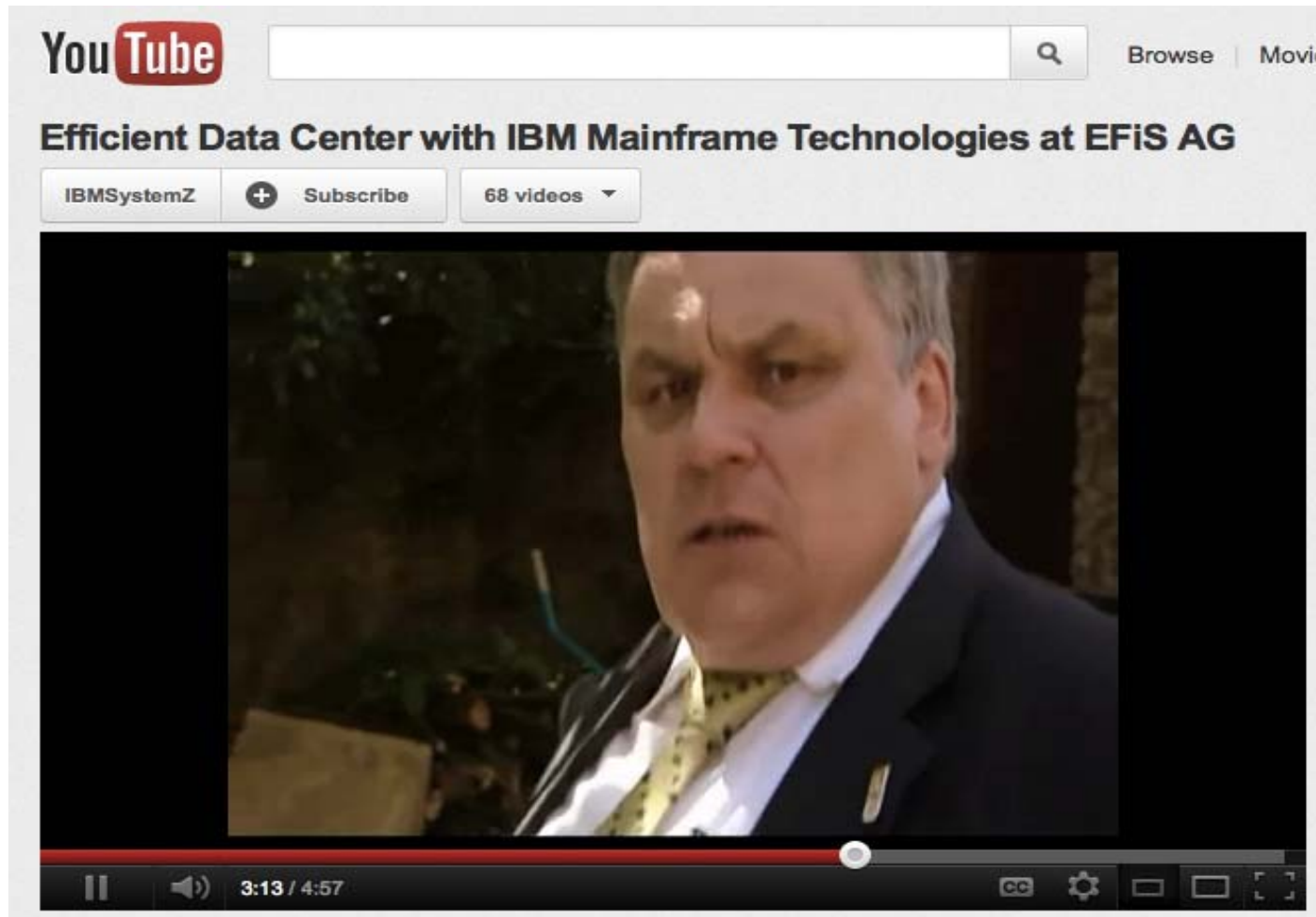
Sparda Datenverarbeitung eG

Selecting SUSE Linux Enterprise Server for System z enabled Sparda-Datenverarbeitung eG to combine the openness of Linux with the high performance of the mainframe. This enables the company to maintain superb availability and performance for mission-critical applications.

About Sparda Datenverarbeitung eG

Sparda-Datenverarbeitung eG (SDV) is the IT provider for the Sparda-Bank Group in Germany, which serves approximately 4.2 million customers. SDV develops secure and innovative IT solutions for retail banking, payment, distribution and financing. Its central core banking system 'MBS' manages customer data and is used by all the company's clients.

Challenge

SDV was one of the first companies in Germany to install the latest generation mainframe from IBM - the IBM zEnterprise 196 (z196). With business-critical applications such as those supporting its online banking system running on the mainframe, the company needed to maximise stability.

"SDV prides itself on being a consistently early adopter giving our clients the benefit of new features and developments as soon as possible," said Bernd Bohne, Department Head, Central Systems Technology, Sparda-Datenverarbeitung eG.

To be able to run all of its main business systems on one hardware platform, SDV needed a reliable and well-supported Linux distribution that would run on the IBM mainframe. For SDV, the business continuity capabilities of z/VM, z/OS and GDPS were among the key drivers for consolidating its business-critical open systems databases to the mainframe.

Novell Solution

Working with IBM, SDV deployed an IBM z196 at each of its two data centres, activating six Integrated Facility for Linux (IFL) engines on each box. IFLs are 'specialty engines'—processors exclusively dedicated to Linux workloads. The decision to run SUSE® Linux Enterprise Server for System z on IBM mainframes has been in place for some years at SDV, due mainly to the strong strategic partnership between IBM and Novell.

"When we had to decide which Linux operating system to run on our mainframe environment, we considered Red Hat Enterprise Linux, but SUSE Linux Enterprise Server had the better driver support for our needs," said Bohne. "The long-standing collaboration between Novell and IBM convinced us that even over the long term SUSE Linux Enterprise Server will be the ideal platform for our IBM mainframe."

SDV runs a number of very large databases within the virtualized Linux environments … The company also relies on SUSE Linux Enterprise Server to support online banking services for the Sparda Banking Group's 4.2 million customers.

Working with IBM, SDV deployed an IBM z196 at each of its two data centers, activating six Integrated Facility for Linux (IFL) engines on each box.

"Our online banking services process approximately 1,200 online transactions per second, so we simply cannot afford them to fail. SUSE Linux Enterprise Server, which is involved in a significant part of this workload, makes us confident that this will not happen.

Since deploying SUSE Linux Enterprise Server on the IBM z196 we have experienced over 99 percent availability.

This proves that Linux's reputation for stability and reliability is well and truly deserved.

We imagine the solution will play an integral role in SDV's infrastructure for some time to come."

- Bernd Bohne, Department Head, Central Systems Technology, Sparda-Datenverarbeitung eG

www.novell.com/success/sparda.html

Sparda Datenverarbeitung eG chooses IBM zEnterprise

"Over the years, the mainframe transformed from traditional workloads, quite simple, to a universal platform for new workloads as well.

And we see a lot of new applications that are coming to this platform.

Especially for Linux, it's perfect.

The z/Enterprise platform is perfect for consolidating Linux workloads because of the high I/O bandwidth, business continuity with capacity backup features."

"Oracle has been consolidated on this platform we are using right now only Oracle on the z196 platform,"
Bernd Bohne, Sparda-Datenverarbeitung e.G., Manager, Central Systems

Watch and listen to

- Bernd Bohne, Sparda-Datenverarbeitung e.G., Manager, Central Systems
- Marie Wieck, IBM, General Manager, Application Integration Middleware
- Steve Mills, IBM, Senior Vice President & Group Executive, Software & Systems
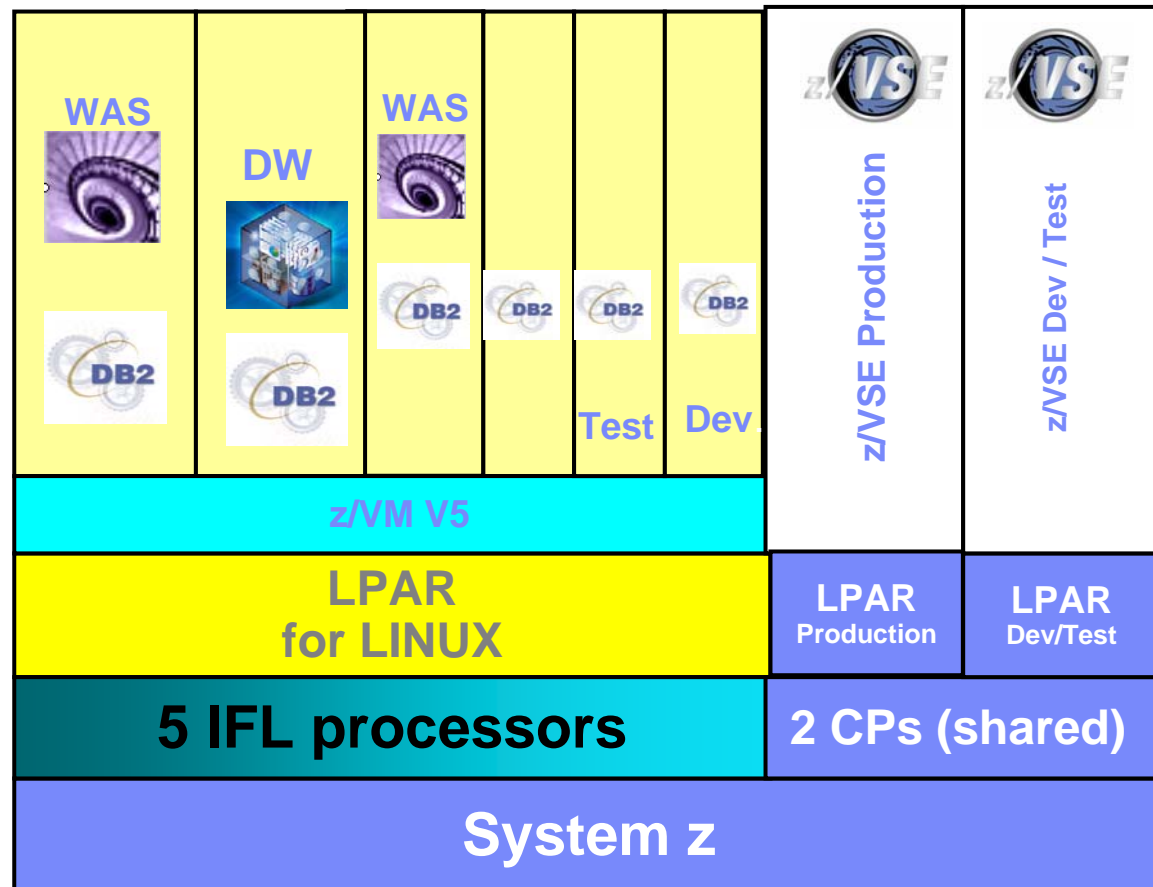
ibm.com/systems/z/resources/sparda_bank_video.html

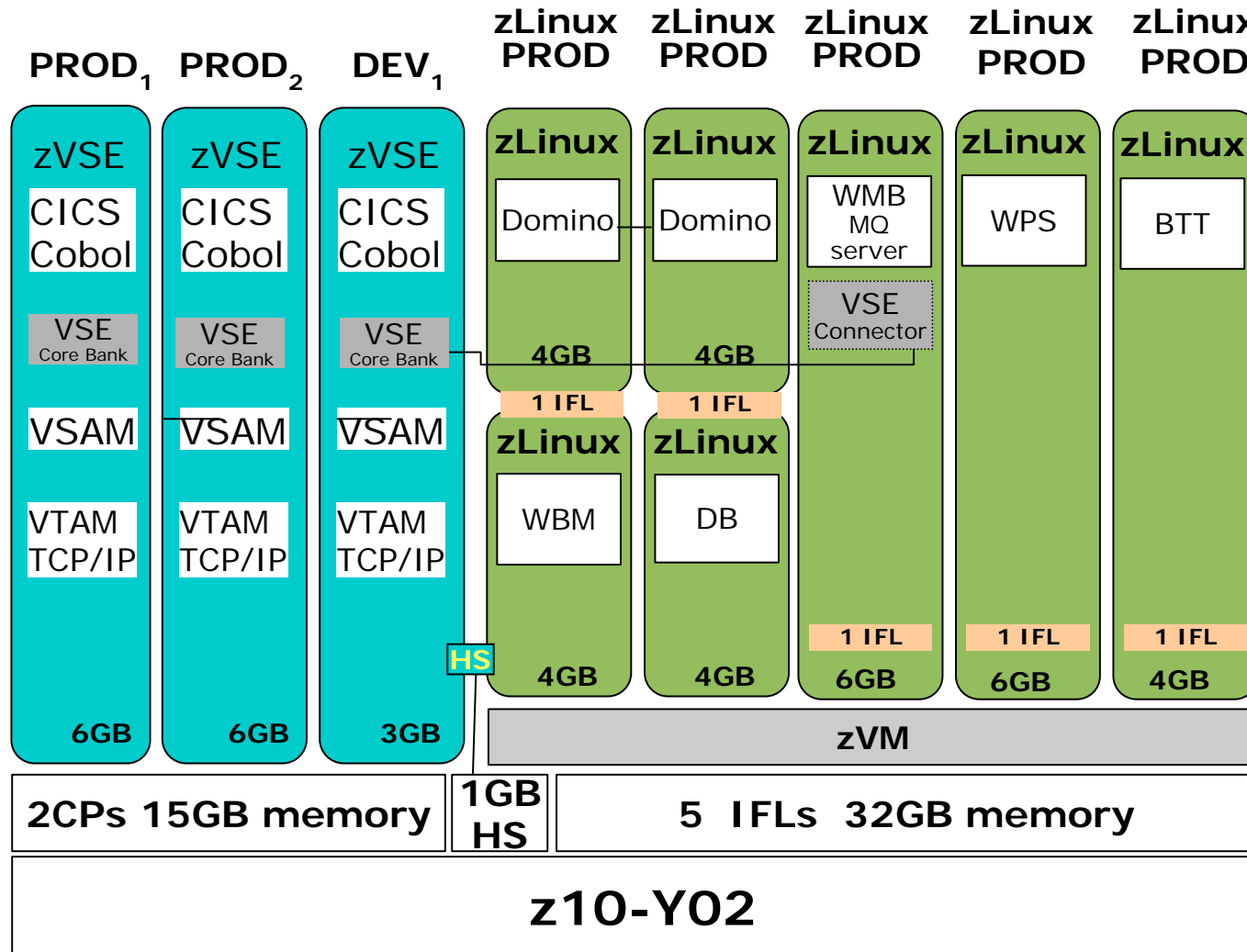# American Bank implementation

- Increased capacity on Linux on System z from 3 to 5 processors
- Web applications, DB2, Data Warehousing

Environment:

- 2 CPs with z/VSE with COBOL applications, core banking software

- 5 IFLs with Linux

  - 3 IFLs with DB2 data warehouse

  - 2 IFLs with WebSphere products
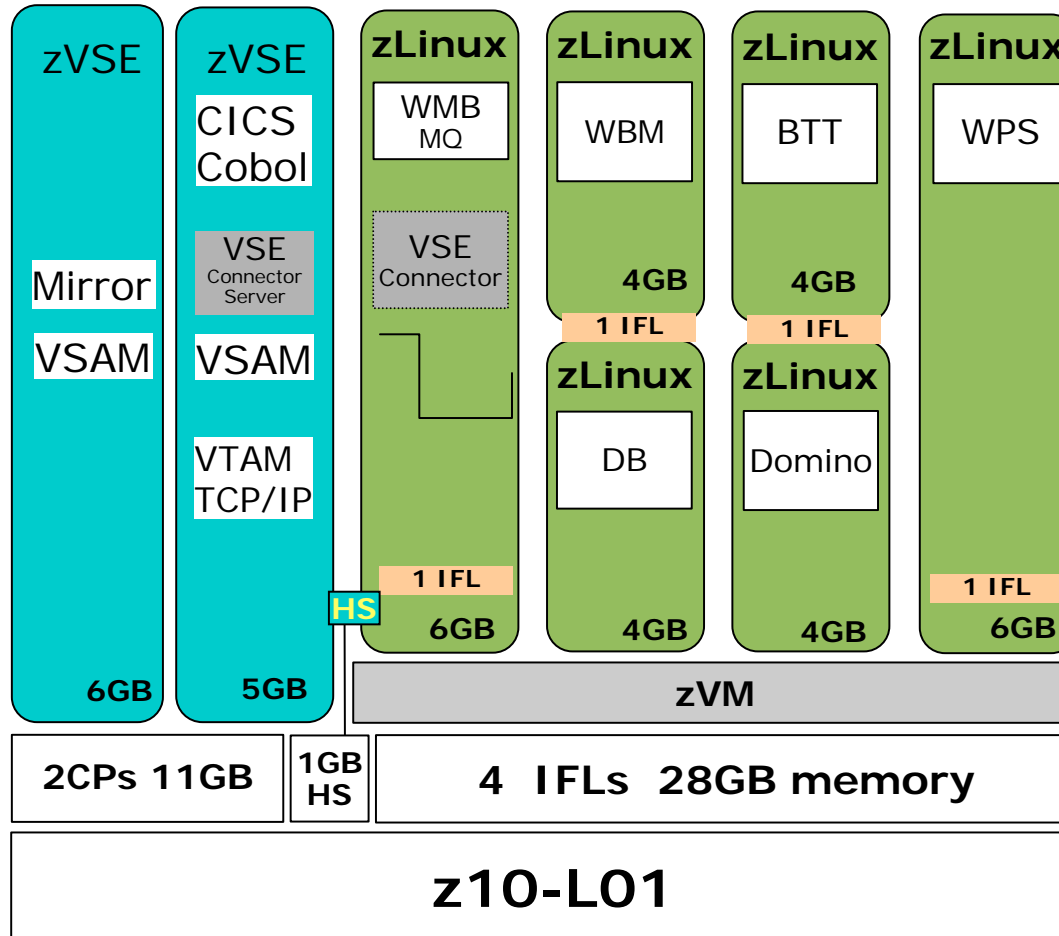
- Approx 50 SQL servers consolidated

WAS **DW** **WAS** **Test** **Dev**

z/VSE Production

z/VSE Dev / Test

z/VM V5

LPAR for LINUX

LPAR Production

LPAR Dev/Test

5 IFL processors

2 CPs (shared)

System z

Asian Bank implementation

Production Site Layout for SOA and Domino

PROD₁ **PROD₂** **DEV₁** **zLinux PROD** **zLinux PROD** **zLinux PROD** **zLinux PROD** **zLinux PROD**

zVSE	zVSE	zVSE	zLinux	zLinux	zLinux	zLinux	zLinux
CICS Cobol	CICS Cobol	CICS Cobol	Domino	Domino	WMB MQ server	WPS	BTT

VSE Core Bank / VSE Connector

4GB — 1 IFL — 4GB — 1 IFL

zLinux WBM — zLinux DB

VSAM · VTAM TCP/IP

HS

6GB · 6GB · 3GB

4GB · 4GB · 6GB · 6GB · 4GB

1 IFL · 1 IFL · 1 IFL

zVM

2CPs 15GB memory	1GB HS	5 IFLs 32GB memory

z10-Y02

HS - Hipersockets

Asian Bank implementation

IBM

DR Site Layout for SOA and Domino

PROD₁ **TEST₁**

zLinux TST/DEV **zLinux TST/DEV** **zLinux TST/DEV** **zLinux TST/DEV**

zVSE — 6GB

zVSE — CICS Cobol — VSE Connector Server — VSAM — VTAM TCP/IP — 5GB

zLinux — WMB MQ — VSE Connector — 1 IFL — 6GB

zLinux — WBM — 4GB — 1 IFL — zLinux — DB — 4GB

zLinux — BTT — 4GB — 1 IFL — zLinux — Domino — 4GB

zLinux — WPS — 1 IFL — 6GB

zVM

2CPs 11GB

1GB HS

4 IFLs 28GB memory

z10-L01

HS - Hipersockets

z/VSE Core Banking Solution
LPAR Configuration Summary

LPAR 1 XXX	LPAR 2 DEV	LPAR 3 SAVINGS	LPAR 4 LOANS	Xpress Suite WebSphere MQ/AS Prod	DB2 Prod	Xpress Suite WebSphere MQ/AS Dev	DB2 Dev	Xpress Suite WebSphere MQ/AS Test	DB2 Test
Z/VSE 4.2 Systematics Core Bank	Z/VSE 4.2 Systematics Core Bank	Z/VSE 4.2 Systematics Core Bank	Z/VSE 4.2 Systematics Core Bank	SLES 10	SLES 10	SLES 10	SLES 10	SLES 10	SLES 10

H I P E R S O C K E T S

CP CP   IFL IFL IFL IFL IFL IFL IFL

Linux on System z as a Backup Hup
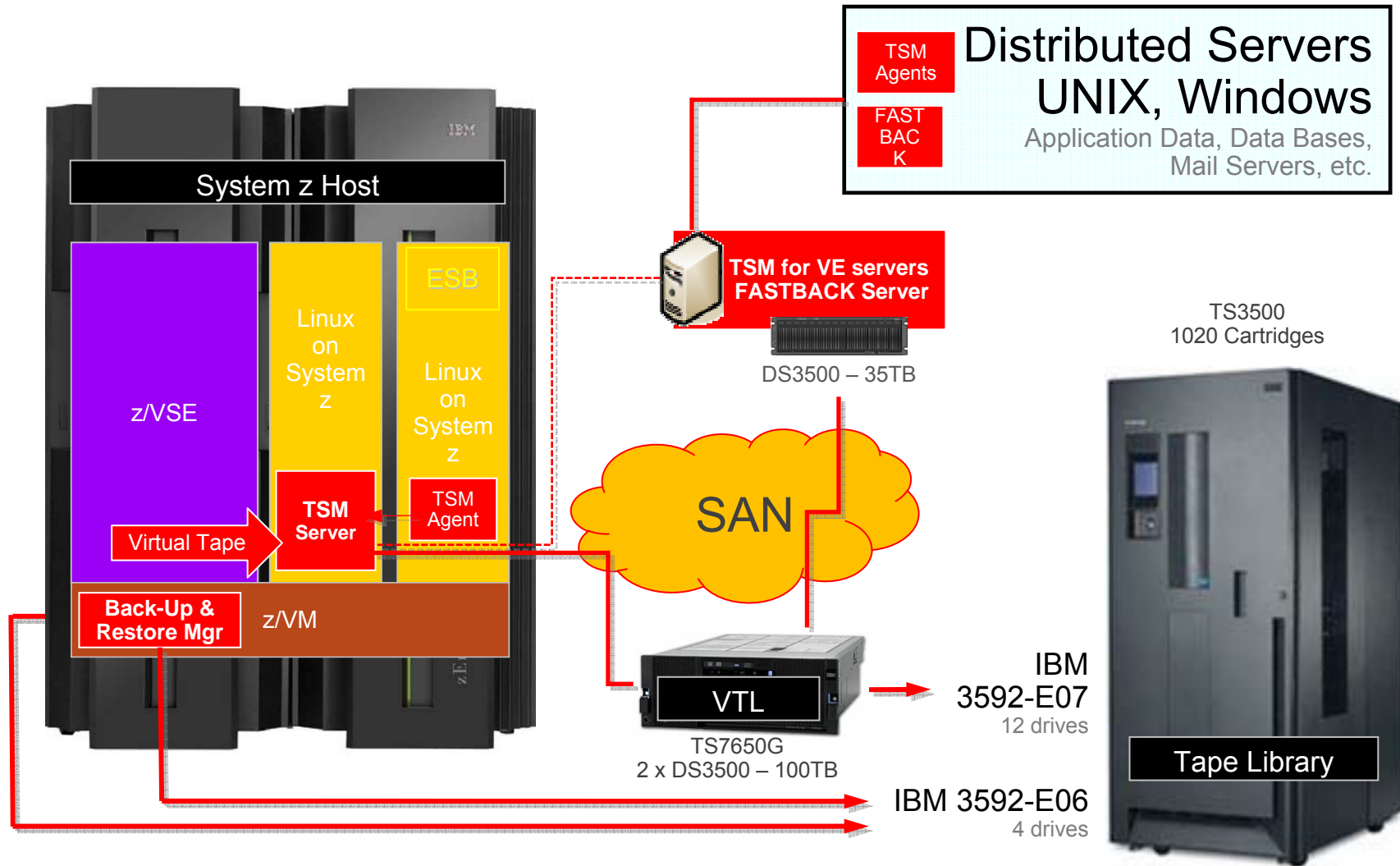
Banking Implemetation (Current Environment)

2x z196, 1 z10BC, 18.000 MIPS, 6 IFLS

SOFTWARE

▪Sun Solaris

▪Oracle Std Ed (no advanced features)

▪DR is Active/Passive

▪Sync with DR using TrueCopy (SAN level byte copy)

PRODUCTION

▪Sun M5000 (1 yr HW support left)

DISASTER/RECOVERY –site1

Sun V440 (lower spec than Prod, end of HW support)

DISASTER/RECOVERY –site2

Sun V440 (lower spec than Prod, end of HW support)

Customer Assessment

RISKS

- not of sufficient D/R capacity (limited to about 50 users at normal speed, more users leads to degraded performance)

- [….]

- Cost of out of warrant support

OPPORTUNITIES

- General direction at is to go Linux

- Need to significantly invest in existing architecture (would need at the very least about 4 boxes equal or better than the M5000)

- Difficult decision (flawless record of stability)

PROPOSED ARCHITECTURE

HARDWARE (upgrade of the existing System z10 systems)
    5 x z10 EC Integrated Facility for Linux (IFL)
    5 x z10 EC IFL Capacity Backup Upgrade (CBU)
    80 GB z10 EC memory
    5 x z/VM
    5 x Enterprise Linux Support

Proposed Architecture
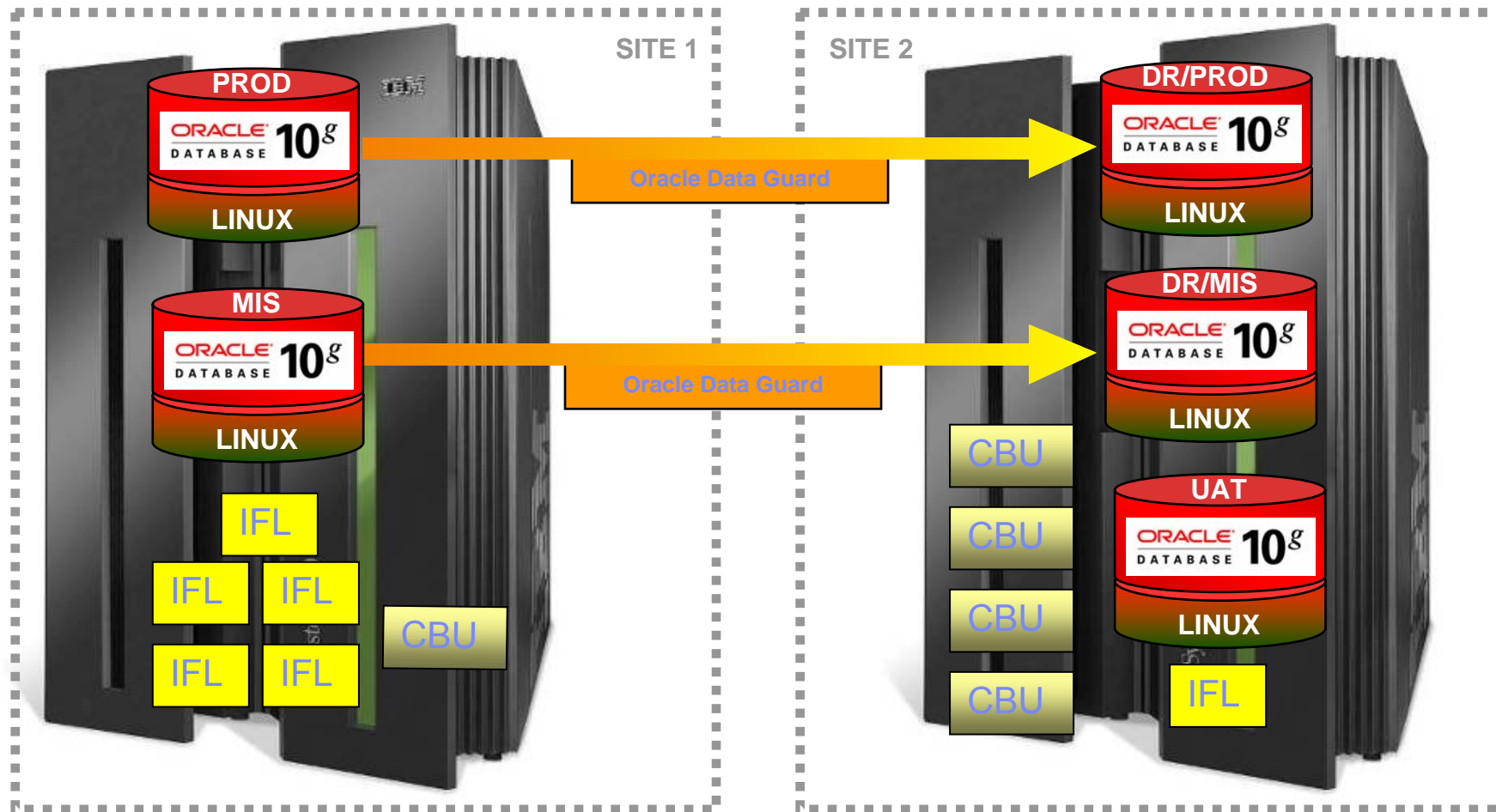
Customer Assesment: General Advantages

- **Protected investment**
  - Features previously purchased are carried over on upgrade

- **Green solution**
  - Reductions in power consumption - 40W/IFL
  - Lowest carbon footprint

- **Centralised data can be easier to manage**
  - Backup/recovery, new deployment, fewer operational mistakes

- **Shared capacity can smooth out peaks**
  - Real reduction in IT footprint
  - MEASURABLE reduction in Servers, storage, backup, network, licences

- **Rapid deployment**
  - A new LINUX VM including Oracle can be created in < 15 minutes
  - Standby / test & development systems occupy zero footprint until required

- **Server memory**
  - z/VM, LINUX and Oracle support shared executables and very efficient memory usage
  - Low overall memory footprint

- **Stability**
  - No need for disruptive swap out in the future.

Multi channel architecture

Teller   **Internet**   **Partners**   **ATM**   **Retail / POS**

Customer Avatars
Internet

Client /
http

Browser /
http

SOAP / https

ATM
protocol
TCP/IP

VISA
ISO8583
TCP/IP

Client /
http

Branch Servers
J2EE application
WAS cluster on z/Linux

3D Agencies
OpenSim z/Linux

XI50z

Internet Channel
Integration hub
WAS z/OS, WMQ, WPS, WBE

Retail Payments
BASE24-eps z/OS

Integrated Risk
Management
FICO Credit Risk z/OS
PRM Fraud Management
z/OS

BDW

DB2 z/OS

Systems Management
IBM Tivoli Monitoring, z/Linux

Core Banking System
Fidelity Corebank, CICS, DB2 z/OS (FSDM)

Business Intelligence
Cognos 8 BI z/Linux
Oracle BI AIX blade

zEnterprise

Browser or client / http

Browser or client / http

Browser or client / http

System Operations
LOB operations
Intranet

Bank Operations
Intranet

Management/Analysts
Intranet

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High Availability and Disaster Recovery and Backup with IBM zEnterprise

IBM
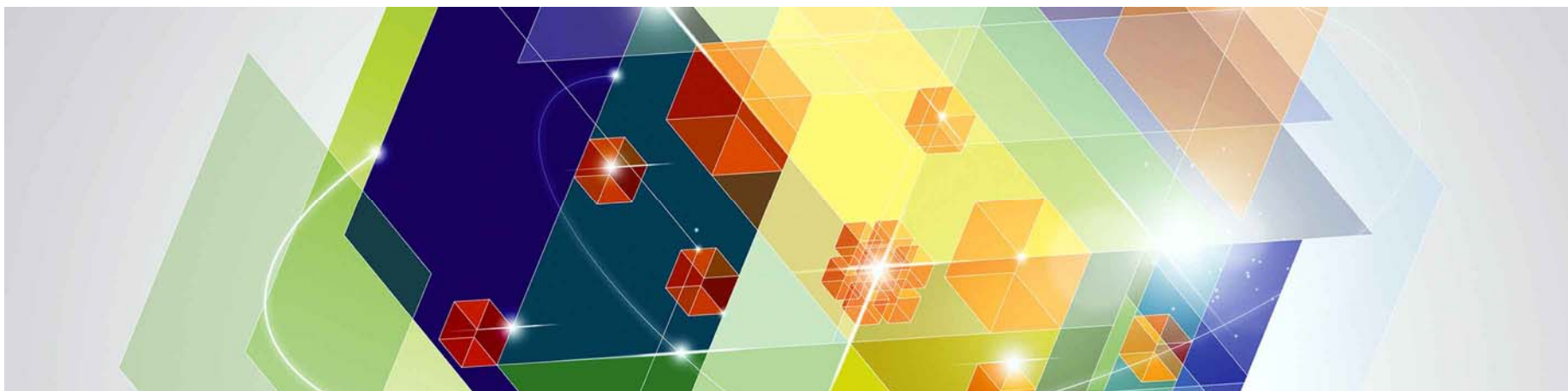
High level overview of the mainframe environment

Production + Test at two Sites (MF)

8 CP
15 zAAP
6 IFL

3 ICF

3 ICF

8 CP
15 zAAP
6 IFL

Datacenter 1

Datacenter 2

DR-Configuation (MF) – Capacity Backup

16 CP
30 zAAP
12 IFL
(3 ICF)

IBM z196 2817-M80

Total: 61 (from 80)

High availability and continuous operations - w/Linux
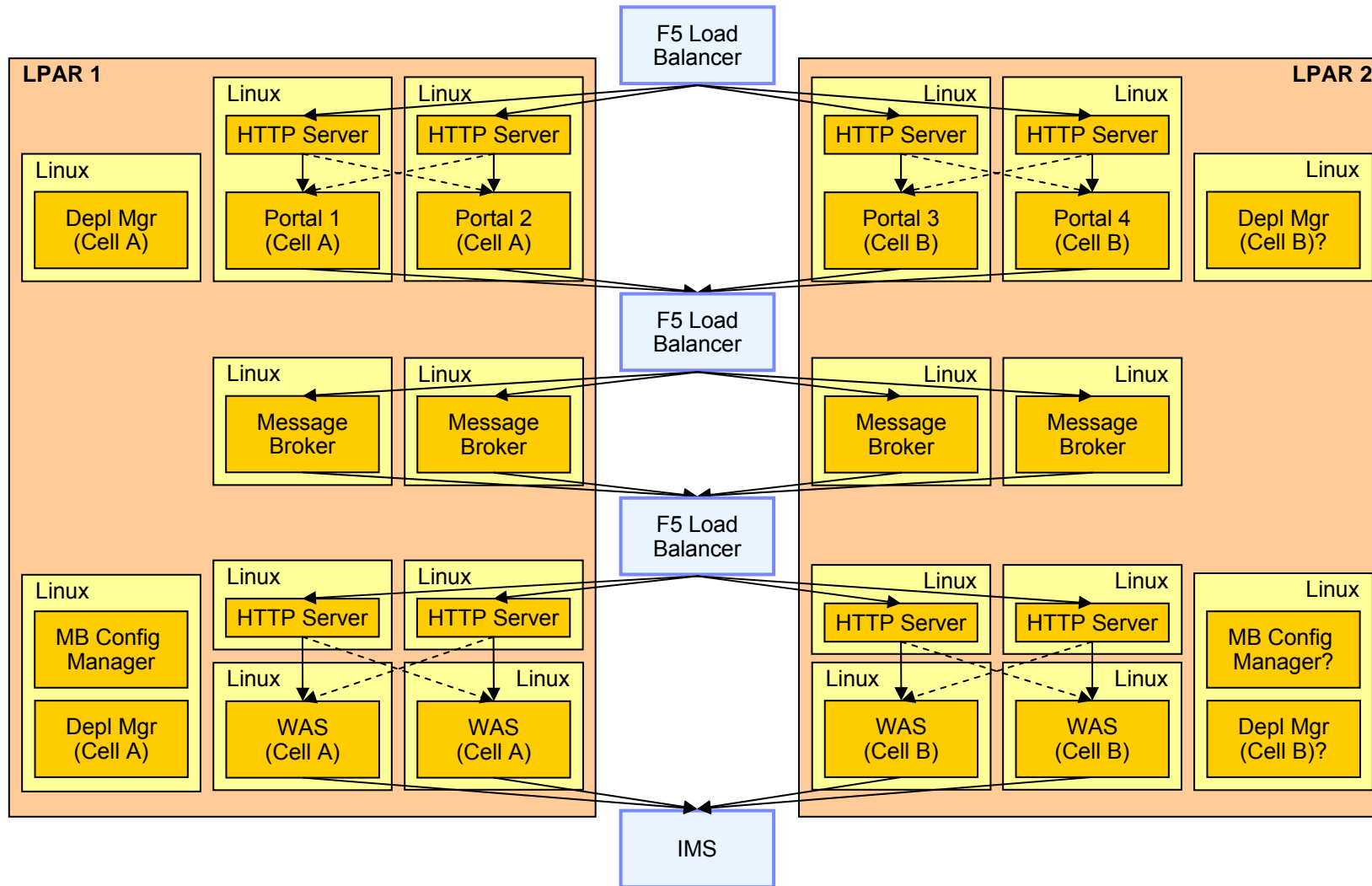
Components of HA with Linux on System z

Software Provided HA

- Web Srv.
- Appls.
- Database

→

- **HA Software**
- **Heartbeat**
- **Clustering**

- -

Operating System HA

- Linux → **Linux Clustering**
- z/VM → Mature Hypervisor
  Hardware assist for performance and recovery

- -

Hardware Provided HA

- System z →
  Spare CPUs

  N+1 power supplies

  Chip sparring in memory

  Concurrent Maintenance

- Storage (Disk) →
  Disk mirroring Global/Metro Mirrror

  Hyperswap

  Multipathing / Failover

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System z and zEnterprise – High Availability under the covers

Internal Batteries (redundant)

Power Supplies (redundant)

2 x Processor Drawers, Memory & HCAs

RAIM Memory
(Redundant Array of Independent Memory)

I/O Drawer (redundant)

PCIe I/O drawers (redundant)

2 x Support Elements

Rear View

Front View
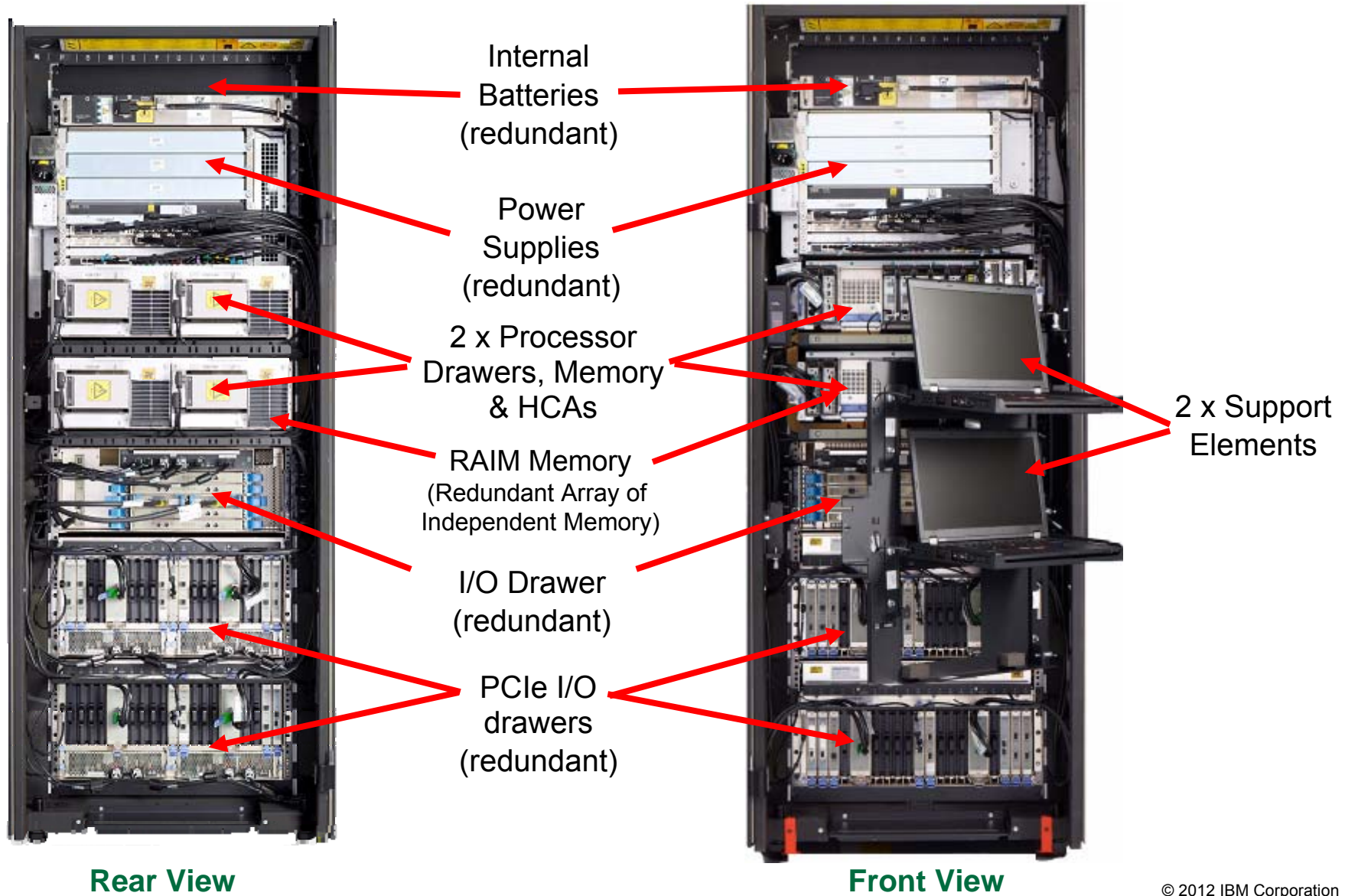
Global Virtualization – with System z and shared resources
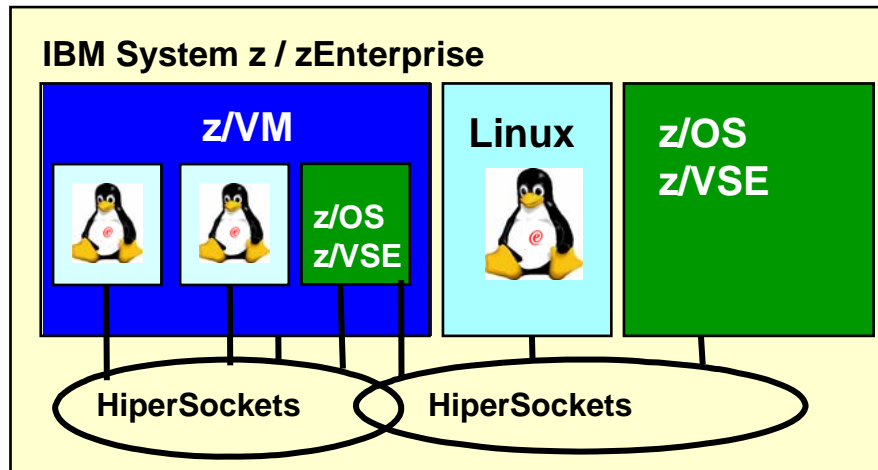
- **Network Virtualization**
- **Memory Virtualization**
- **Processor Virtualization**
- **System Virtualization**
- **Disk Virtualization**
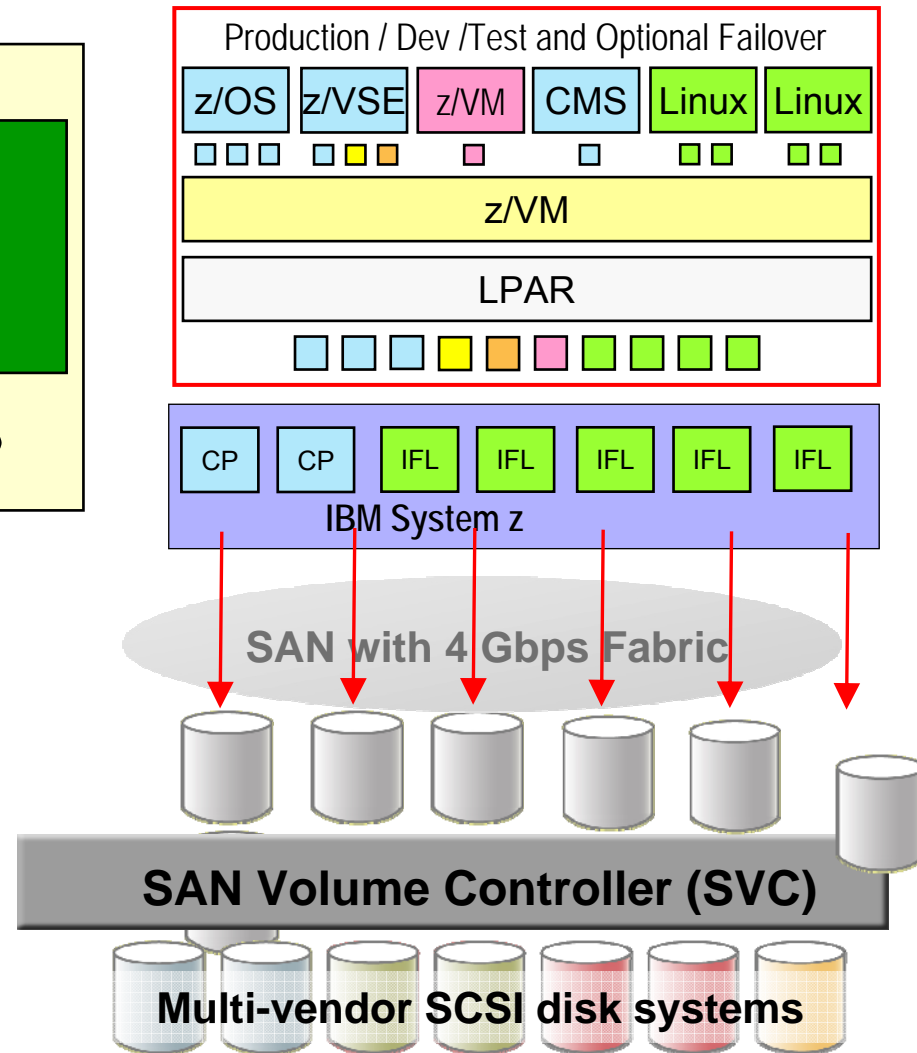
Implement TSM on Linux on System z as central Backup Hub
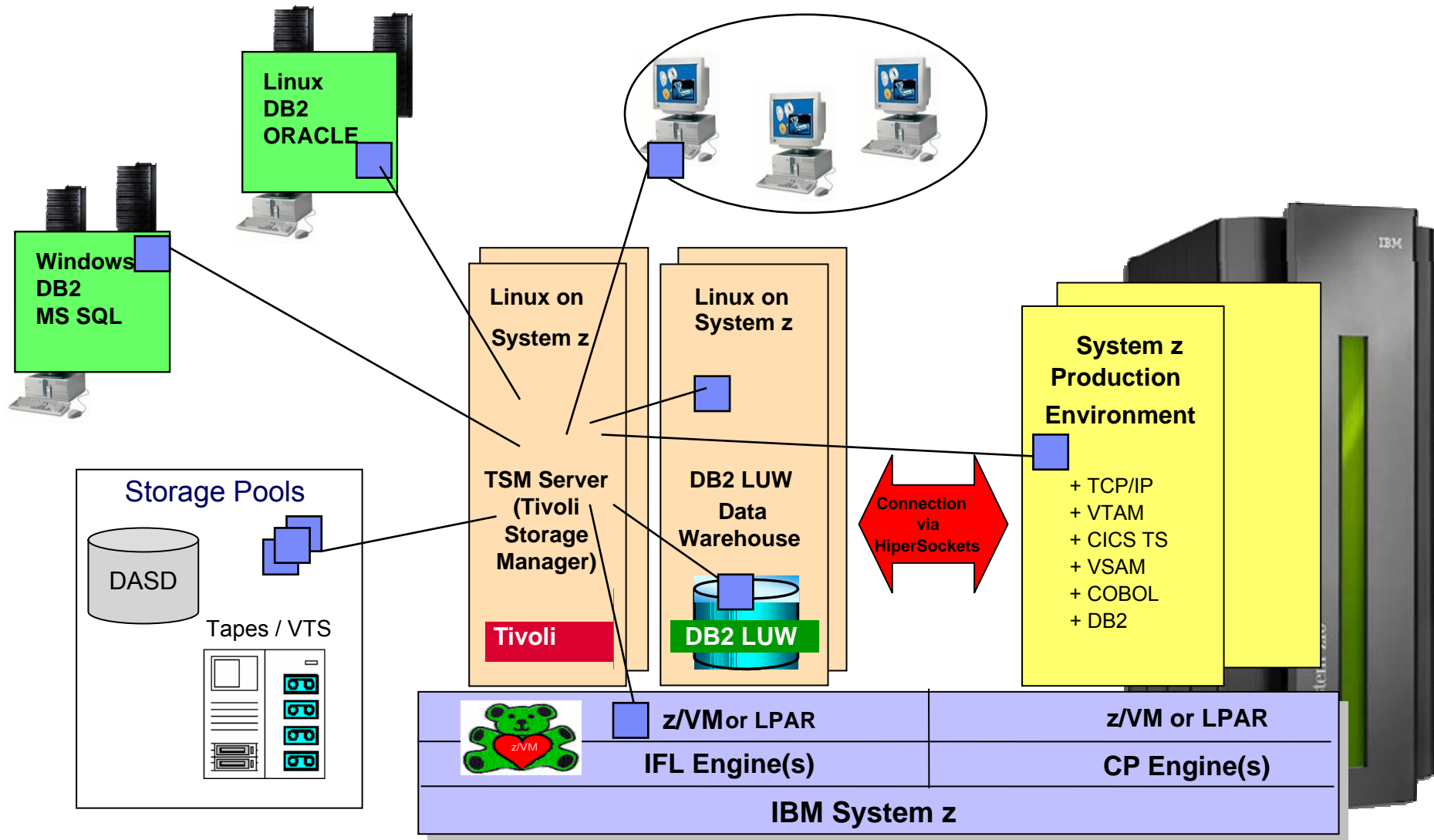
Why customers run Linux on System z

- Linux on System z inherits unique advantages over other architectures:
    - R**eliability: reliable hardware, robust I/O infrastructure**
    - A**vailability: transparent CPU sparing, integration in mainframe unique recovery scenarios**
    - S**erviceability: concurrent update of millicode / microcode / I/O adapter code**

- Management in highly virtualized environments
    - tight integration with hypervisors

- Large scale Linux applications
    - best SMP scalability; scale up and scale out in the box
    - I/O scalability and high sustained throughput
    - performance for memory intensive applications

- HiperSockets and internal virtualized network alternatives
    - **memory bus-based system internal secure networking**

- Highly scalable, high throughput and low latency

- Most of these capabilities consumable with Linux skills: common skill set

Linux on System z is the ideal platform for large and mission critical environments

Why customers run Linux on System z

- Linux on System z saves money

  - **efficient virtualization of multiple different workloads**
    - **Global virtualizatioin, Virtual CPUs, networks, memory**

  - **efficient use of shared resources**
    - **fast server provisioning**

  - **capable of handling high utilizations**
    - **High CPU utilization without service level degradation**

  - **reduced facility resources (power, cooling)**

  - **reduced complexity**
    - **reliable hardware, no need for redundant software setups**

  - **less software cost**
    - **application licenses apply to less cores compared to distributed environments**

Linux on System z is the ideal platform for large and mission critical environments

IBM zEnterprise can do IT all - Think inside the Box and/or think zBX !

Rational

Lotus.

Tivoli

WebSphere

COGNOS

Infrastructure Simplification

Linux on Sytem z

Tivoli Identity Mgmt, TSM, 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, Information Server, Cognos 8 BI

DB2 LUW

Connection via HiperSockets

z/VSE V4/V5 Production Environment
+ TCP/IP
+ VTAM
+ CICS TS
+ VSAM
+ COBOL
+ DB2 client
+ LDAP client

z/VSE V4/V5 Test/Dev Environment

z/VM-mode LPAR with z/VM V6

IFL Engine(s) | **CP Engine(s)**

IBM System z10, z196, or z114

Protect existing VSE investments

Integrate using middleware and VSE connectors

Extend with another platform to access new applications & solutions

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IBM zEnterprise

IBM zBX

z/VSE V5

AIX   Linux   Windows

Connectors

CICS Transaction Gateway ECI
DB2 Connect
WebSphere MQ Series
VSE e-business connectors
VSE Web Services

Tran/Data Services | **Business Services** | **Clients**

Private data network (IEDN)

Questions?

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