Siegfried Langer

Business Development Manager z/VSE & Linux on Sys

Using **System z** for workloads
you would never have imagined five years ago

IBM®

Agenda

- § **System z Market Leadership**
- § **System z Solution Editions**
- § **Enterprise Linux Server**
- § **Cloud Computing**
- § **SAP**
- § **Data Warehouse**
- § **Business Intelligence**
- § **ACI**
- § **Systems Management**
- § **Oracle**
- § **and more…**

System z: The right technology…
45 years of market leadership

IBM System z

The world's most powerful enterprise computing platform

Improved price/performance

100s of Capacity choices for the right size server

Business Resilience

LOW COST OF OWNERSHIP

Leadership capabilities with IBM Systems software

The future runs on System z and the future begins today

World-Class Virtualization

Large scale consolidation for savings of up to 80% in total cost of ownership compared to distributed platforms

Deploy servers, networks, and solutions fast

Support for multiple operating systems

Dynamically optimize resources according to business priorities

Secure and Resilient

Mitigate the risk of security breaches

Dedicated cryptographic processors

Industry leadership capabilities and certification

Where mean time between failure is measured in decades

Just in Time Capacity

Permanent capacity for non-disruptive growth

Temporary capacity for fluctuating workloads

Interim capacity for continued operation

Policy based automation capabilities

Offerings can be replenished dynamically

And the industry agrees

Growth and Innovation

*"…IBM has reinvented the mainframe. The **pursuit of new workloads** has been a critical aspect of the resurgence, while at the same time protecting and nurturing the installed base. The introduction of **specialty engines** has been a catalyst to the growth but represents only the first step toward a significant change in architecture during the next five years."*
Source: Gartner Data Center Conference, Dec. 2008 (Gartner The IBM Mainframe Platform Ongoing Challenges, New Opportunities)

"IBM's z10 is the computer industry's pinnacle systems platform. Blow-away performance (fast quad-core processors), increased capacity (1.5 times greater than its predecessor), and expanded memory (three times greater than its predecessor) makes this system the absolute best scale-up architecture — bar none — in the computing industry." Joe Clabby, Clabby Analytics, February 26, 2008

Cost Effective and Modern

Simplifying IT

*"For those IT organizations that have seen the light and are moving their emphasis from the never-ending challenge of trying to optimize their IT infrastructure to the more important **optimizing of the delivery of IT services, nothing beats the mainframe**,"* Mike Kahn, The Clipper Group, February 2008

*System z remains a growing product line for IBM because, during the past decade, it has morphed historical strengths into new forms aligned with today's languages, operating environments, and computing standards. And, in fact, **System z strengths such as mitigating business risk** in many forms have once again shoved their way to the fore of many IT departments' priorities. This includes protecting against hardware and site failures, managing a company's security policies and credentials, acting as a focal point for integrating the myriad applications that make up a business process, and being able to adapt to sharp spikes in load.* Gordon Haff, Illuminata, January 2009

Manage Risk

The Mainframe Charter:
Continuing the Commitment

2003:

Mainframe charter announced

§ Innovation

§ Value

§ Community

Value Delivered:

MIPs growth of >20% CAGR fuelled by

§ Generation to generation price / performance gains

§ Unique value of specialty engines

§ Ability to reduce energy costs by up to 80%

Innovation that matters:

System z10™

§ Breakthrough performance

§ Massive Scale and capacity

§ Investment Protection

§ Just-in-time Capacity

§ Unprecedented resiliency and security

A Vibrant Community:

§ Academic Initiative includes >600 colleges and more than 50,000 students

§ Linux on System z matures with >2,900 applications

§ Total applications now > 6,000 from > 1,600 ISVs

§ Comprehensive middleware

§ IBM Destination z, hub of the community

Continuing the commitment

§ **New Solution Editions**

§ **Lower HW pricing for Linux**

§ **zFutures Roadmap**

§ **IBM Hiring "Next generation"**

§ **New ISVs**

System z Solution Editions

§ *Enterprise Linux Server*

§ *Data Warehousing*

§ *SAP*

§ *WebSphere®*

§ *Security*

§ *GDPS®*

§ *App. Development*

§ *ACI & Chordiant*

§ *Cloud Computing*

Special package pricing for our most popular new workloads

Ø z10™ hardware (standalone footprint or isolated LPAR)

Ø Prepaid hardware maintenance

Ø Comprehensive middleware stack

Ø Services and Storage (as needed)

Ø Competitive acquisition prices, leadership TCO

Unmatched Value, Competitively Priced

System z Solution Editions

§ *Enterprise Linux Server*

§ *Data Warehousing*

§ *SAP*

§ *WebSphere®*

§ *Security*

§ *GDPS®*

§ *App. Development*

§ *ACI & Chordiant*

§ *Cloud Computing*

Ø ***Enterprise Linux Server***

z/Solution Editions

Unmatched Value, Competitively Priced

Solution Edition for Enterprise Linux
Industry leading virtualization built with security and availability

Customer Pain Point

§ Physical server sprawl

§ Spending too much money on software license fees

§ Inefficient hardware utilization

§ Questionable security support

§ Poor capacity planning

§ Non-existent or untested disaster recovery support

Customer Value

§ Consolidate more servers in a single machine

§ Reduce software fees with higher server consolidation ratios

§ Run at 90% utilization or better

§ Rock solid system security

§ Monitor and manage system capacity with high degrees of certainty

§ Unmatched economical DR support

IBM System z and Linux deliver improved service at lower cost

Recent System z Linux examples

An advanced IT platform to support the explosive Internet growth

China Internet Network Information Center (CNNIC): CNNIC chose IBM's mainframe technology for its superior integration capability, as well as unmatched stability and security required for its IT infrastructure.

ibm.com/press/us/en/pressrelease/27768.wss

Strong business continuity, security and cost-efficiency

Handelsbanken (Sweden): The banks virtualized environment has helped to Lower costs by minimizing the need for additional systems that require more energy & space. Linux on System z benefits from scalability, performance, & reduced costs utilizing z/OS features

ibm.com/press/us/en/pressrelease/27282.wss

Cost savings through elimination of licensing costs, and boosted performance for the servers

Salt River Project (USA): "A key success for us is the ability to consolidate multiple workloads into one instance of Red Hat Enterprise Linux as opposed to running in our traditional environment, where each workload would have to run on a separate server; that's a huge benefit for us," said Kevin Masaryk, Senior Linux/UNIX Administrator.

ibm.com/software/success/cssdb.nsf/cs/JRDS-7S8NEV?OpenDocument&Site=corp&ref=crdb

Many clients are reducing cost with System z today by consolidating existing workloads

Customer	Distributed Cores	IBM System z Cores	Ratio of Distributed to System z cores*
Nationwide	450	21 IFLs on z9	21 to 1
Large bank	111	4 IFLs on z10	27 to 1
Government Agency	292	5 IFLs on z10	58 to 1

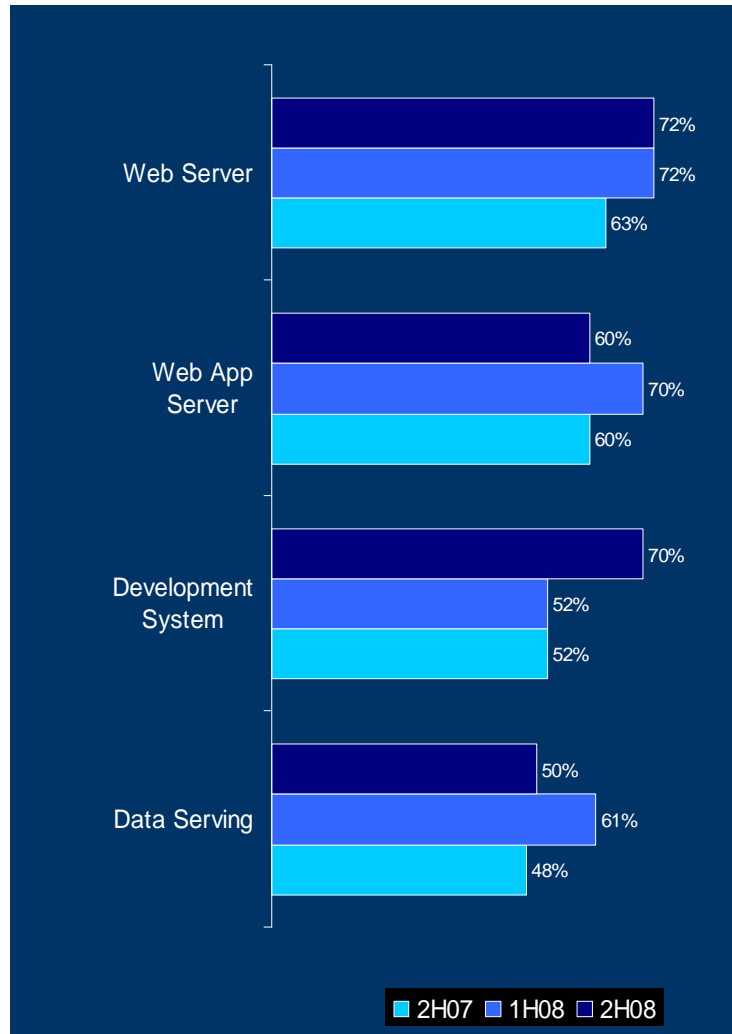§ Unique value of System z Virtualization

§ Extremely efficient

§ Superior availability and security

* Client results will vary based on each specific customer environment including types of workloads, utilization levels, target consolidation hardware, and other implementation requirements.

Source: zCPO

What are clients consolidating to System z?

Source: IBM Market Intelligence

Surveys indicate IBM System z® customers use Linux for:

§ Web Serving   Data Services
§ Web Application Serving   Systems Development

"Best Fit" Workloads for Linux on System z:
§ **Business connectors:** WebSphere® MQSeries®, DB2® Connect, CICS® Transaction Gateway, IMS™ Connect for Java®
§ **Business critical applications:** e.g. SAP
§ **Development of** WebSphere and Java™ applications
§ **WebSphere Application Server** (WAS)
§ **Email & collaboration:** Domino™, Web 2.0
§ **Network Infrastructure:** FTP, NFS, DNS, etc. and Comm Server and Communications Controller for Linux, CommuniGate Pro (VoIP)
§ **Data services:** Cognos®, Oracle, Informix®, Information Builders WebFOCUS
§ **Applications requiring top end disaster recovery model**
§ **Virtualization and Security Services**

It's cool to consolidate penguins

Consolidating 134 Linux servers to 5 IFLs Can save up to 50% over x86 w/ VMware

Oracle DB Workload, 3-Year Total IT Cost

Sun X2100 Single Core servers

Legend:
- Space
- Power
- People Cost
- Software Maint
- Software
- Maint
- Hardware

Dell Power Edge Quad Core servers & VMware

z/VM Linux on 5x z10 BC™ IFLs

| 134 x86 Cores | 48 x86 Cores | 5 z10 Cores |
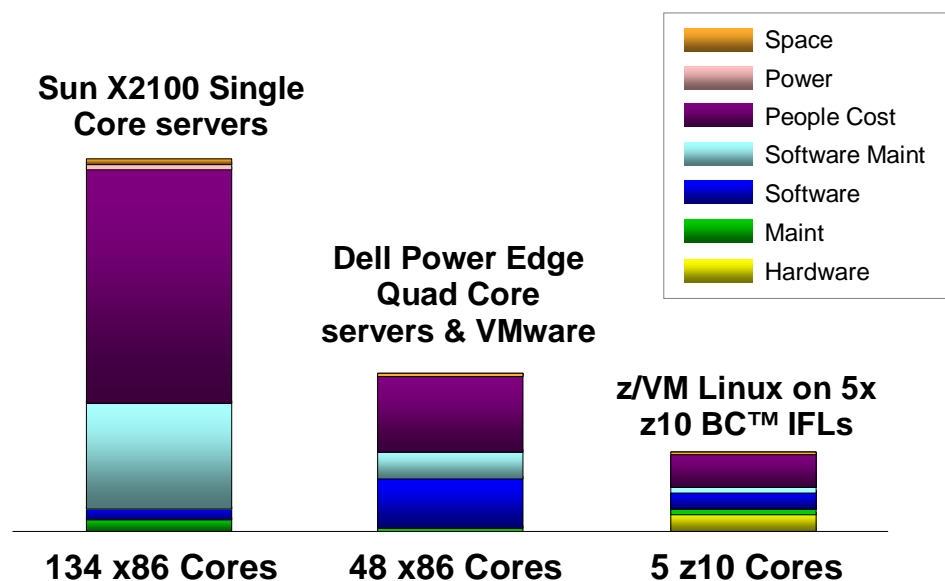
Your IT Cost may vary

Here's a cool example:
IBM will consolidate 3,900 servers to about 30 System z servers with expected reductions in energy consumption of over 80%

Consolidation:

Save up to 50% over x86 virtualization

IBM Consolidation Announcement Highlights

Project "Big Green"

Reduced Cost

§ IBM Consolidation Effort

- 3900 servers to 15 - z10 mainframes

- 80% savings in annual energy usage

- 85% savings in total floor space

- Labor: 54% reduction

- Software: 36% reduction

- Improved availability and DR

Think what we could do for you

IBM'S PROJECT BIG GREEN SPURS GLOBAL SHIFT TO LINUX ON MAINFRAME

Plan to shrink 3,900 computer servers to about 30 mainframes targets 80 percent energy reduction over five years

Optimized environment to increase business flexibility

ARMONK, NY, August 1, 2007 – In one of the most significant transformations of its worldwide data centers in a generation, IBM (NYSE: IBM) today announced that it will consolidate about 3,900 computer servers onto about 30 System z mainframes running the Linux operating system. The company anticipates that the new server environment will consume approximately 80 percent less energy than the current set up and expects significant savings over five years in energy, software and system support costs.

At the same time, the transformation will make IBM's IT infrastructure more flexible to evolving business needs. The initiative is part of Project Big Green, a broad commitment that IBM announced in May to sharply reduce data center energy consumption for IBM and its clients.

Nationwide®
On Your Side℠

Using virtualization as a foundation for innovation

Reduced Cost

Business need

Faced with the need to build a new, multimillion-dollar data center to cope with server proliferation and seeking to streamline application development and daily operations overall, Nationwide Insurance instead made a strategic decision to move to a flexible, virtualized IT environment.

Solution

Nationwide deployed two IBM System z mainframes running Linux. The solution is a cornerstone of Nationwide's strategy of moving all new development to virtualization and J2EE as a means of "future-proofing" its IT environment.

Benefits

- § Anticipated cost savings of US $15 million over three years
- § Enables server utilization of 85-90 percent
- § Reduces environmental costs by 80 percent
- § Lowers Web hosting costs by 50 percent
- § Leverages investments by using development/testing hardware for business continuity
- § Simplifies and speeds server provisioning, enabling developers to try out new ideas quickly

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

Steve Womer, Senior IT Architect

Erie 1 BOCES …

Builds a powerful portal with IBM WebSphere, System z and Linux

Business need

Erie 1 BOCES (Board of Cooperative Education Services) was interacting with its clients through a variety of channels including Web sites and paper-based communications. Erie 1 BOCES wanted to integrate its services into a single, highly-secure, user-friendly interface.

Solution

Worked with GlassHouse, an IBM Business Partner, to implement WebSphere Portal Extend running under SUSE Linux in IBM z/VM partitions on an IBM System z mainframe with two dedicated IFL engines. The portal delivers various applications including IBM Lotus Notes® to employees and schools across the western region of New York State. Erie 1 BOCES has also deployed IBM Tivoli Identity Manager and IBM Tivoli Access Manager to automate user management, helping to reduce staff workload and improve responsiveness.

"With WebSphere on the System z platform, Erie 1 BOCES has a highly automated, scalable and cost-effective solution which can support growth and promote development, providing a higher level of service to our customers."

Carol Troskosky, CIO, Erie 1 BOCES

Benefits

§ The IBM portal provides schools with a user-friendly one-stop shop for IT services

§ Running WebSphere on the mainframe offers low licensing costs, and helps simplify server management

Leveraging the values of a Dynamic Infrastructure:
Proven results in a dynamic infrastructure

VIRTUALIZATION	ENERGY EFFICIENCY	SECURY & RESILIENECY	AUTOMATION
Bank of Russia	**Dundee City Council**	**Wessels+Müller AG**	**gkd-el**
"Using virtualization to consolidate more than 200 distributed servers on just four IBM System z9 mainframes is a great advantage in terms of hardware licensing and energy costs", Mikhail Senatorov, Deputy Chairman	*"Instead of 50 under-utilised boxes, all with their own power supplies and air conditioning requirements, we have two physical machines hosting 50 virtual servers", Tim Simpson, IT Support Manager*	*"… the mainframe proved itself as an absolutely reliable operating system that was both stable and secure and became easier and easier to administrate", Johannes Schlentzek, IT Manager*	*"Despite the ever-increasing workload and the addition of new SAP functionality, we continue to require just 8 of our 84 employees to run the SAP landscape on IBM System z", Dieter Schiffer, head of IT*
Payment processing costs have been reduced by 95 percent, saving US$400 million per year.	*Reducing operational costs and carbon footprint.*	*The simplified infrastructure reduces operating costs.*	*Total cost of ownership has been reduced by 30 percent with the help of zIIP and IFL technology.*

Reduced Cost

System z Solution Editions

§ *Enterprise Linux Server*

§ *Data Warehousing*

§ *SAP*

§ *WebSphere®*

§ *Security*

§ *GDPS®*

§ *App. Development*

§ *ACI & Chordiant*

§ *Cloud Computing*

Ø *Cloud Computing*

z/Solution Editions

Unmatched Value, Competitively Priced

New Offerings for Cloud computing

§ **Solution Edition for Cloud Computing**
  – Creates a foundation for cloud computing workloads in the enterprise
  – Delivers an infrastructure management stack for cloud computing

§ **IBM Smart Analytics Cloud for System z**
  – Access and analyze data from different sources
  – Enables knowledge dissemination in the enterprise
  – Moving enterprise quality workload to the cloud

SMART IS: Delivering Business Intelligence with greater efficiency across the corporation

IBM CIO OFFICE:

"Our commitment to informed decision making led us to consider private cloud delivery of Cognos via System z, which is the enabling foundation that makes possible >$20M savings over 5 years."

Using System z for workloads you would never have imagined five years ago

Solution Edition for Cloud
A service automation and management framework for System z

Customer Pain Point

§ High cost of delivery and provisioning of IT assets in the enterprise

§ Lack of flexible options to meet diverse user requirements

§ Need for greater elasticity to meet variable workload demand

§ Improved speed to market for delivery of new IT services

§ Need for high availability, security, and integrity of IT assets

Customer value

§ Faster ROI

§ Self service access to IT assets

§ Reduced operations and labor expenses

§ Internet scale

§ Rapid provisioning of workloads

§ Enterprise qualities of service for cloud workloads

IBM System z and Tivoli Services Automation & Management deliver a solid foundation for deploying Cloud services

System z clouds achieve operational efficiency through economies of scale

Dramatic Simplification through Virtualization

Unit	Distributed	System z Linux	% Reduction
Software Licenses	26,700	1,800	93%
Ports	31,300	960	97%
Cables	19,500	700	96%
Physical Network Connections	15,700	7,000	55%

Cost Per Image for Linux Workloads (5 Yr TCO)

Cost per Workload/Image

Buy Standalone Servers	$375K
Public Cloud (Amazon)	$277K
Private Cloud VMware	$62.2K
Private Cloud zLinux Add IFL's To z10 EC	$47.6K
Private Cloud zLinux Buy New z10 BC	$61.3K

Private cloud delivered at substantial savings over public cloud

System z Solution Editions

§ **Enterprise Linux Server**

§ **Data Warehousing**

§ **SAP**

§ **WebSphere®**

§ **Security**

§ **GDPS®**

§ **App. Development**

§ **ACI & Chordiant**

§ **Cloud Computing**
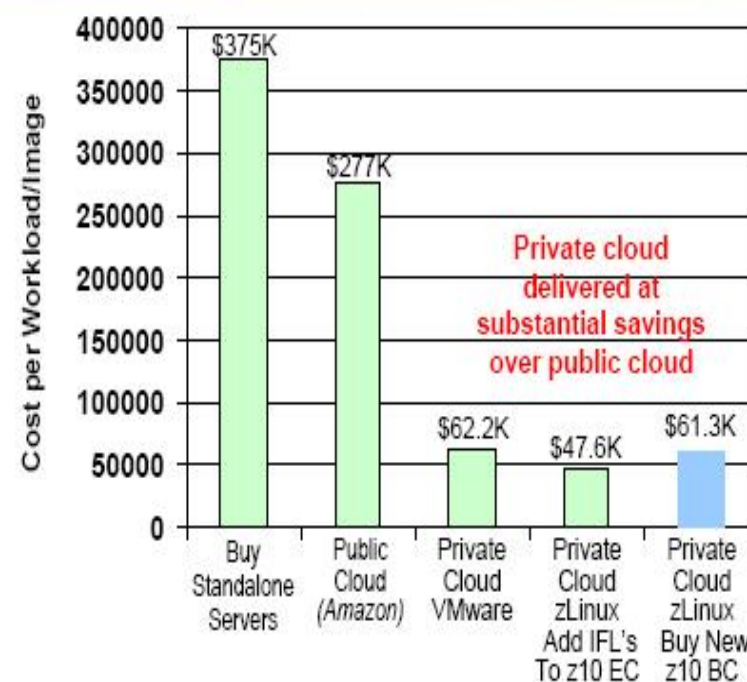
Ø **SAP**

z/Solution Editions

Unmatched Value, Competitively Priced

Examples of Enterprises running SAP on System z

Over 1200 SAP on z systems world wide

SAP Architecture and Infrastructure

SAP DB Server

Enqueue Server

Enqueue Server

SAP AS

Availability requirements +/−

z/OS

SAP DB Server

System z value

SAP Critical components

Linux on System z

SAP AS

− CPU Intensive Requirements +
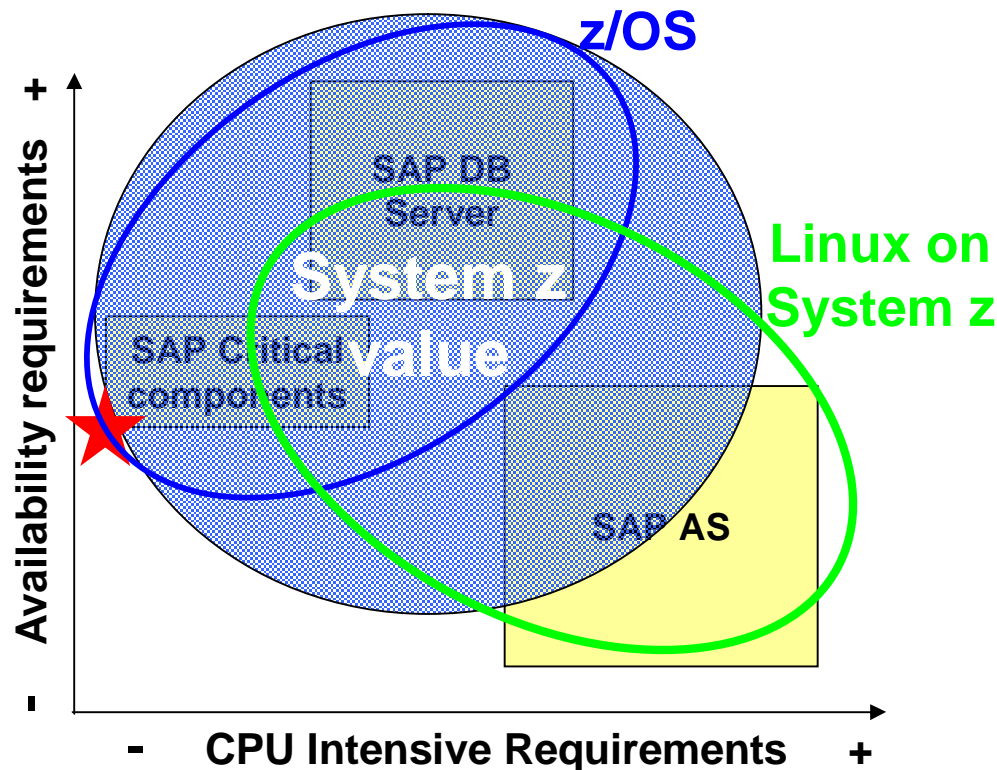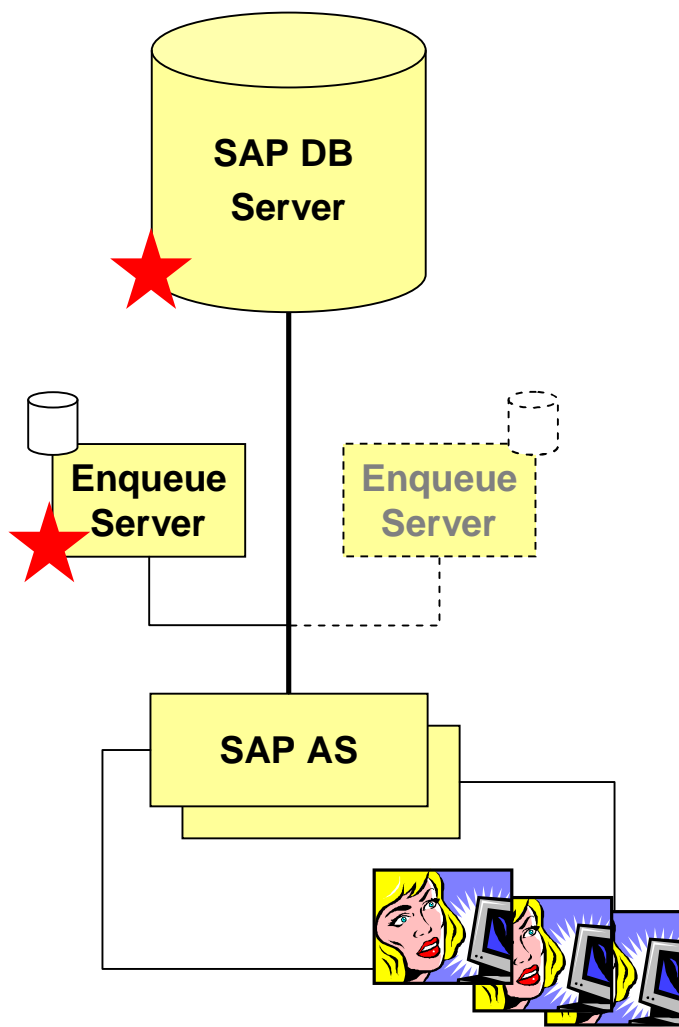
§ **Production, test, development, and training environments**
§ **Continuous availability requirements**
§ **Disaster recovery**

Blue Cross Blue Shield of Minnesota

BCBSM improved customer service and IT system scalability when it consolidates 20 Hewlett-Packard servers onto one IBM System z9 Enterprise Class mainframe using Linux.

Customer Objectives:

§ **Improve customer service**

§ **Replace existing HP SAP landscape to reach higher levels of availability**

§ **Desired continuous availability of data – eliminate planned outages**

§ **Manage growth without server and database proliferation**

Solution / Benefits:

§ **Migrated SAP R/3 to DB2 on z/OS**

§ **Completed the migration on time and within budget**
   – **Minimum system down time**

§ **Strategic investment to move retail apps to SAP retail**

§ **Superior Reliability and availability**

§ **Integrated disaster recovery**

BlueCross BlueShield Association

With SAP on System z, Blue Cross Blue Shield 's service to our customers has improved dramatically.

We have eliminate all the outages that we had been experiencing in our SAP implementation prior to System z. The reliability and continuous operations of this platform for SAP are unprecedented.

We learned the hard way…..and wish we would have implemented SAP on System z originally.

Today we enjoy the added security of knowing we have a disaster recovery plan that can cope in any emergency.

Running SAP on System z

"I can host my warehouse, my business applications, and my DB2® database all on the same machine. This gives me huge performance advantages".

Mr. Andrea Coccia, CIO Colacem S.p.A.

Colacem believes that deploying SAP on Linux on a mainframe makes excellent business sense.

"We continue to require just eight of our 84 employees to run the SAP landscape on IBM System z® [technology]. This is only possible with the ease of administration that comes with using a centralized server on Linux for System z and [IBM] DB2® for [IBM] z/OS® software."

— Dieter Schiffer, gkd-el

"Migration of SAP application servers to zLinux produced immediate increase in performance, made it easier to manage and maintain our systems. Consolidation to a single platform has helped us manage our growing user base without increasing headcount . We have gone from 2,000 SAP users to 3,700, using the same IT resources as before.

"The entire project was implemented on time and on budget. By implementing the IBM Systems solution for SAP BI Accelerator, query performance has improved significantly. One query that used to take 30 minutes to process now runs successfully within two minutes."

System z Solution Editions

- § *Enterprise Linux Server*
- § *Data Warehousing*
- § *SAP*
- § *WebSphere®*
- § *Security*
- § *GDPS®*
- § *App. Development*
- § *ACI & Chordiant*
- § *Cloud Computing*

z/Solution Editions

Ø *Data Warehousing*

Ø *Business Intelligence*

Unmatched Value, Competitively Priced

Information-Led Transformation
Leveraging information and analytics is now the top priority for CIOs, and organizations that do so outperform their peers…

Business Analytics	**83%**
Virtualization	76%
Risk Management and Compliance	71%
Mobility Solutions	68%
Customer & Partner Collaboration	68%
Self-service Portals	66%
Application Harmonization	64%
Business Process Management	64%
SOA / Web Services	61%
Unified Communications	60%
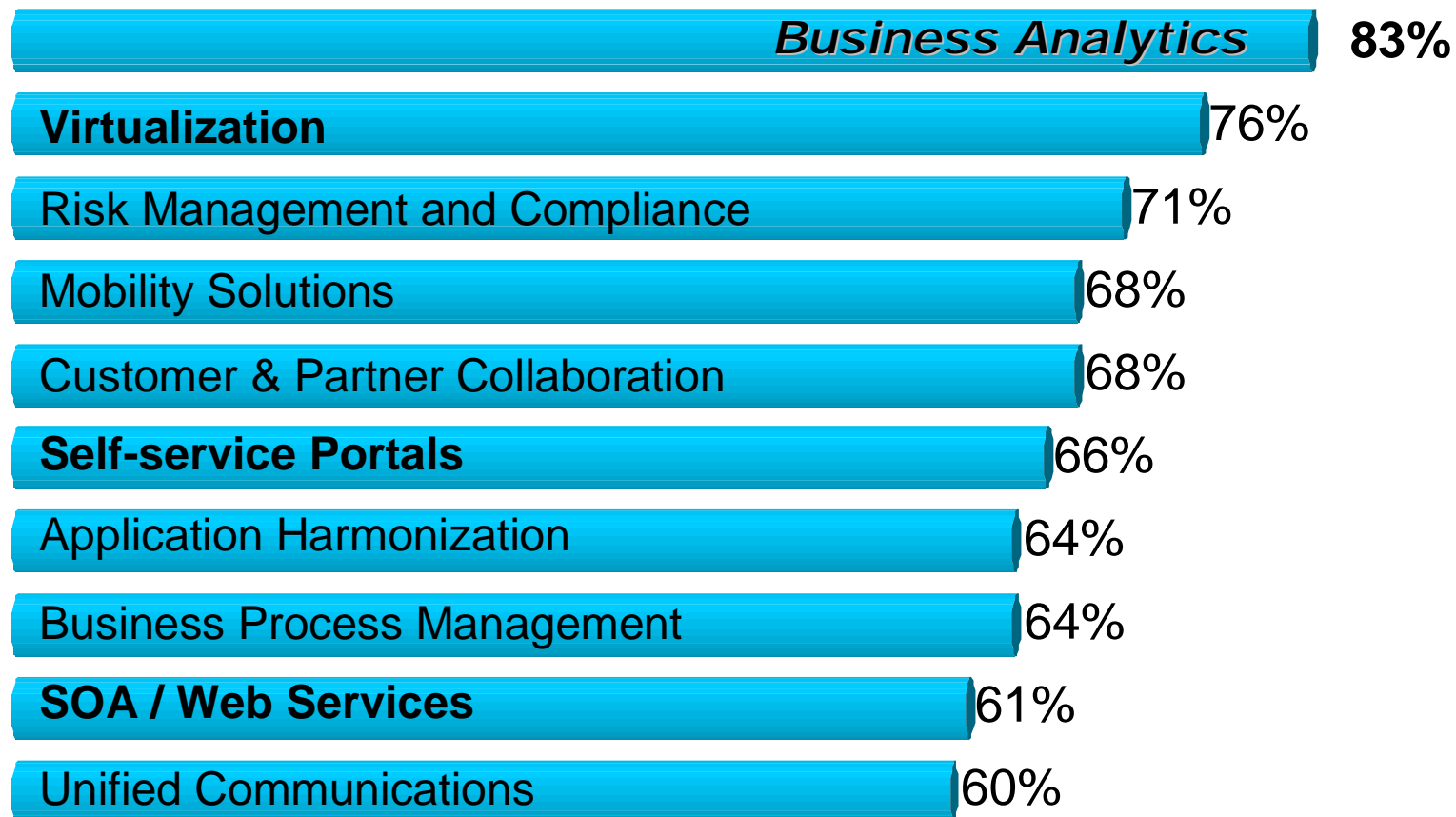
Source: IBM Global CIO Study 2009, n = 2345,

Data Warehousing and Business Intelligence Trends

§ **Enterprises are becoming Information on Demand businesses**

 Information as a strategic asset

 Right-time information for decision making

§ **Co-locating data with operational systems**

 Minimizes data duplication and movement

 Improves control and availability for critical business information

§ **Operational Business Intelligence**

 Requires rapidly turning raw data into business information

§ **Information as a service (SOA) initiatives**

 Data delivered to operational applications & tools

 Requires "utility class" reliability and availability

§ **BI platform standardization**

 Reduce loose collection of individual BI tools

 BI platform accessed via a browser-based client

High Value Dynamic Warehousing

System z

Cognos® 8 BI

InfoSphere™ Warehouse

DB2® Warehouse

Cubing Services

Cognos. software

Implementation Services

ELT

DB2 for z/OS VUE

DB2 Utilities Suite

Operational Source Systems
Structured/ Unstructured Data
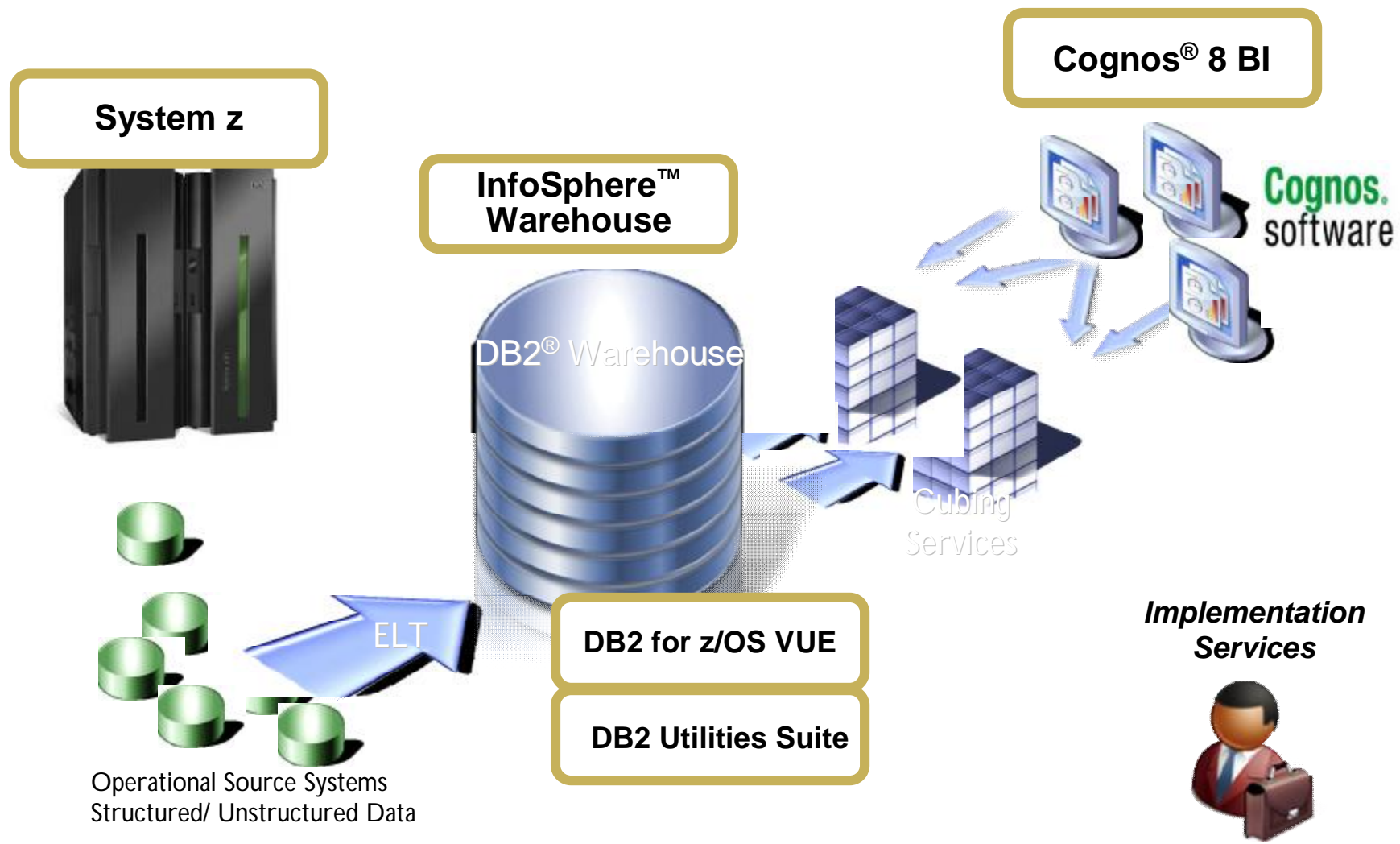
IBM / Cognos Business Intelligence Solution
Fully SOA Compliant

Scorecards / Metrics

Dashboards

Reports & Analysis

COGNOS®

Insightful Relationships

Standards-based

Business Context

Data & Content
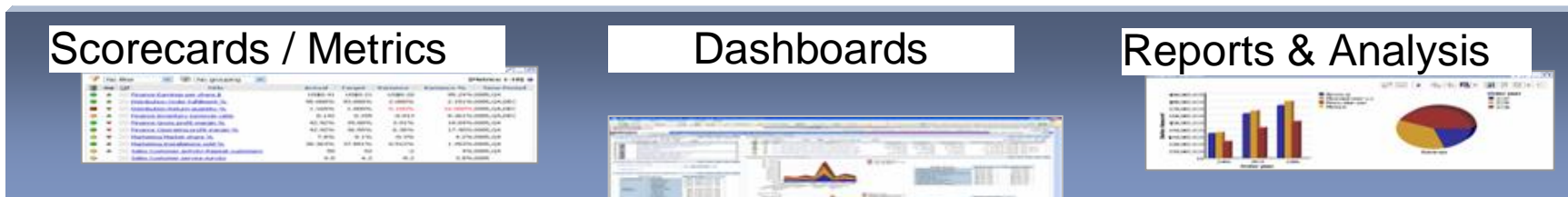
e.g., XQuery, JSR170, JDBC, Web Services...

Information as a Service
Optimize, Virtualize, Integrate, Accelerate

Extracted or Real-time

Heterogeneous Applications & Information

External Supplier / Business Partner

Point Content Management Application

Internally Developed

DB2

abc…

IBM Content Manager

xyz…

Distributed Databases

and more…

Using System z for workloads you would never have imagined five years ago

IBM Cognos 8 Go! Mobile for Linux on System z

NEW! in v4!

Prompt Support

Scheduler integration

Optimized viewing

Single Authoring

Interactive

- § Delivers IBM Cognos 8 BI content to mobile users
- § Leverages the Cognos 8 platform, including security
- § Rich native client, purpose-built

NEW! in v4!

- § Enhanced prompt support
- § Location aware content
- § Fully integrated with IBM Cognos 8 scheduler – including the ability to burst reports to multiple mobile users
- § Support for IBM Cognos 8 BI on Linux on System z

IBM Smart Analytics System – 9600

Building an end-to-end BI environment on System z

IBM Smart Analytics System -z

InfoSphere Warehouse

Cognos 8.4 BI

DB2 for z/OS z/OS

LPAR or stand alone

DB2 Warehouse Database

DS8700
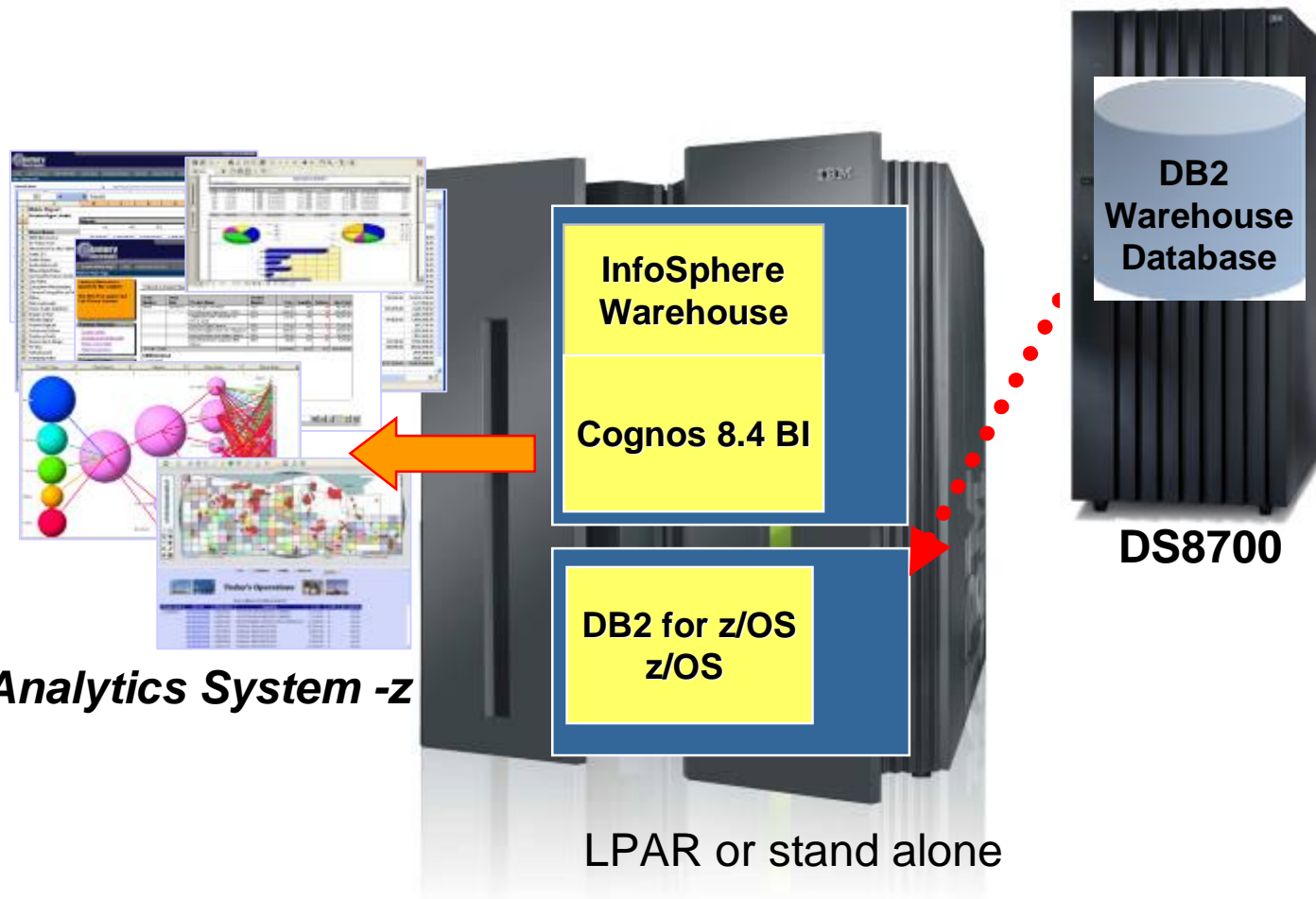
An Integrated Solution Centralized data serving and Business Intelligence on System z

§ **Better than the sum of the parts:**

- Execute queries according to business priority to deliver consistent improved service

- Reduce cost by integrating on a cost effective single, flexible platform

- Faster service to users through high speed access to data

- More accurate and timely service to users through information based on real time data

- Manage risk by extending strengths of System z and z/OS to your BI infrastructure

- Minimize costs, delay and risks of external networking

Helping customers:

- *Reduce Cost*
- *Manage Risk*
- *Improve service*

System z Solution Editions

§ *Enterprise Linux Server*

§ *Data Warehousing*

§ *SAP*

§ *WebSphere®*

§ *Security*

§ *GDPS®*

§ *App. Development*

§ *ACI & Chordiant*

§ *Cloud Computing*

Ø *ACI*

Ø *Chordiant*

Ø *Banking & Financial Services*

z/Solution Editions

Unmatched Value, Competitively Priced

Solutions for Financial Institutions from ACI

§ **Base24-eps** – Enterprise payment system

§ **Proactive Risk Manager** (PRM)
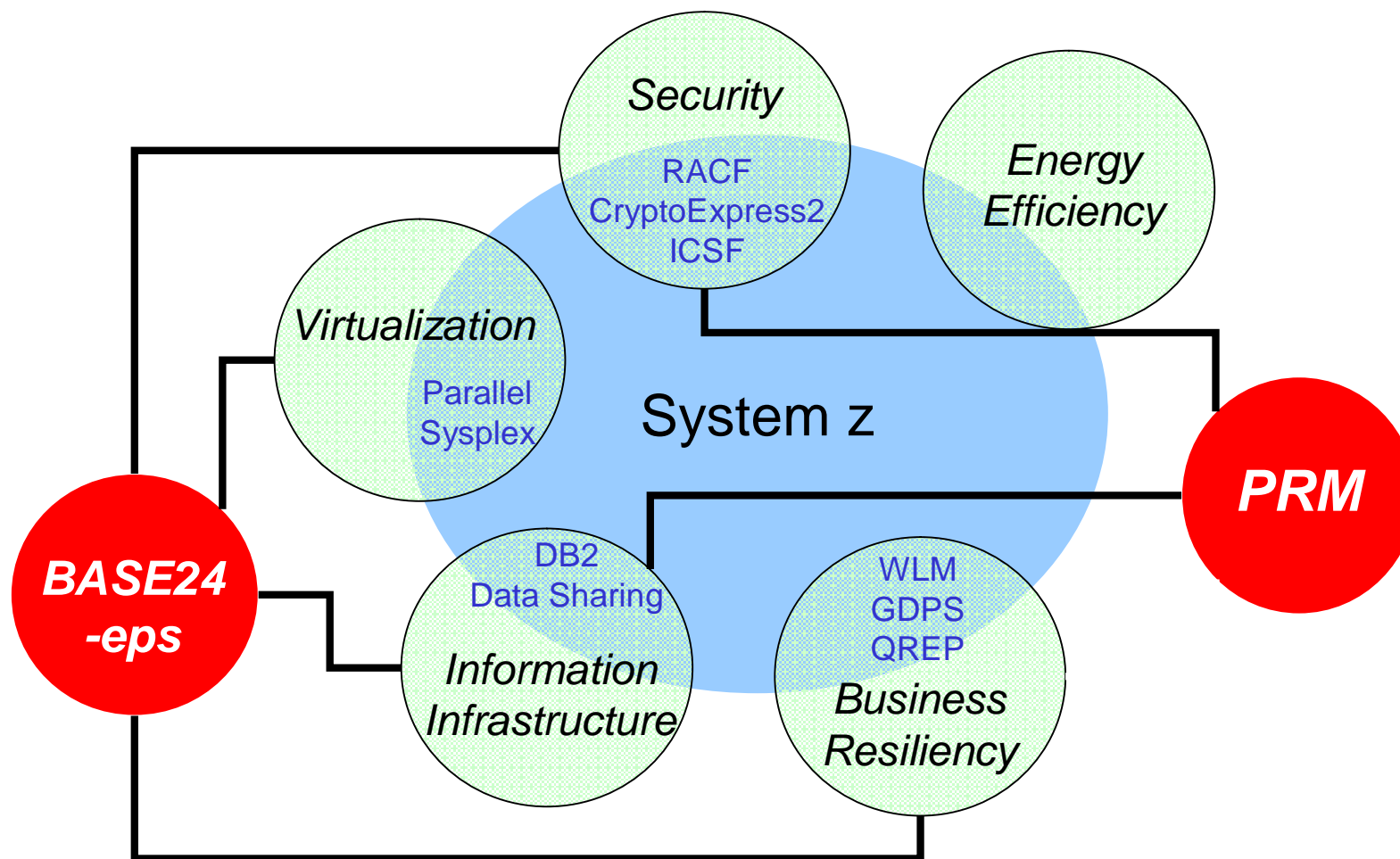
Without Enterprise Risk Management

Channel

Access Vehicles

Bank Host Systems

Silo'd Risk Management Systems

Networks
- Visa
- MasterCard
- Pulse
- STAR
- NYCE

Web

Branch

Credit Card

ATM & Debit Card

Check

Teller / Deposit

ATM

Online

Wire

Phone

Retail
- Switching
- Routing
- Authorizations
- Host

Corporate
- Switching
- Routing
- Authorizations
- Host

Credit Cards

ATM / PIN

Signature POS

Check

Online Banking

Wire

AML
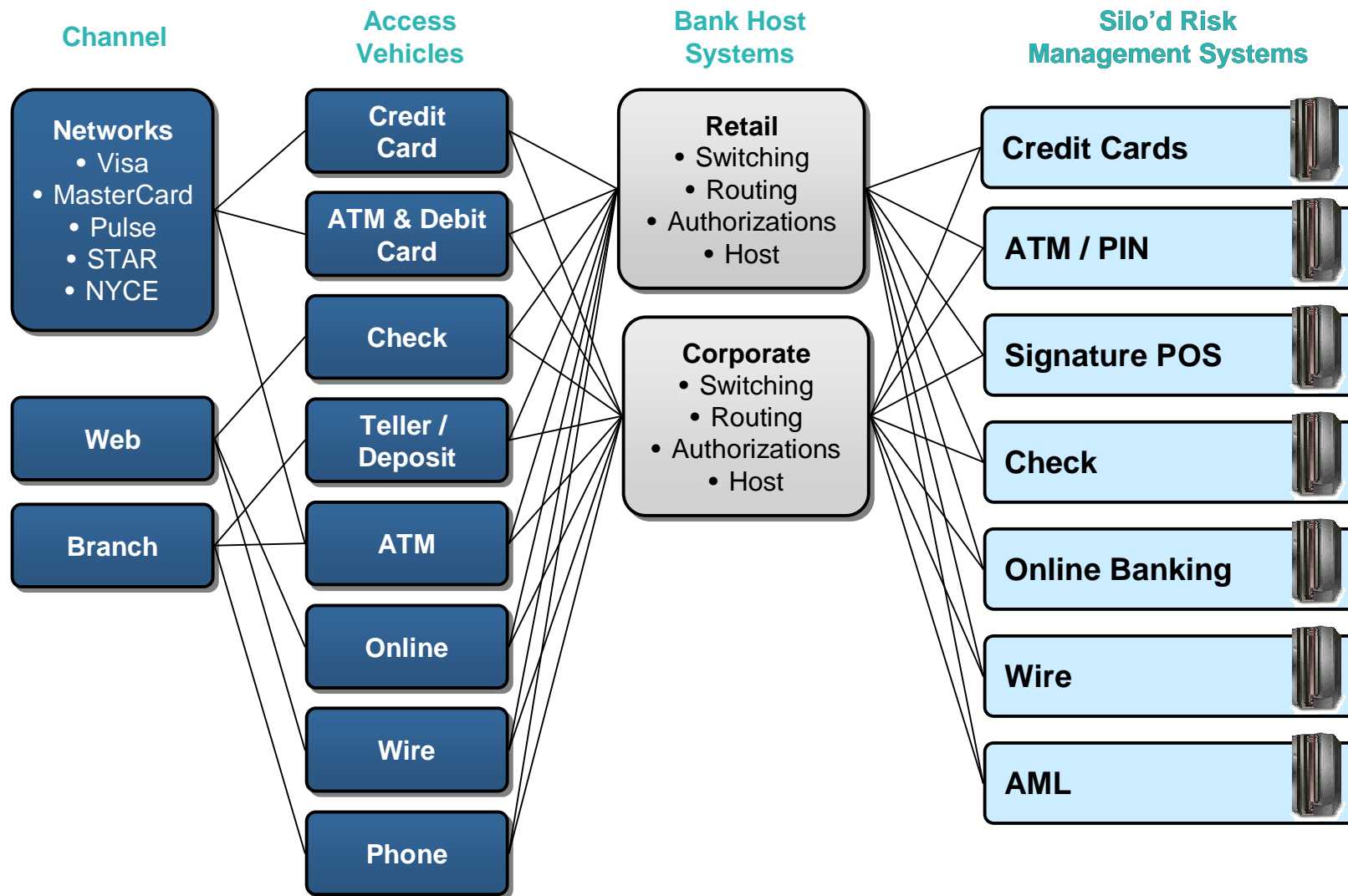
Enterprise Risk Management – With ACI

Channel

Access Vehicles

Bank Host Systems

Customer-Centric Risk Management

Networks
- Visa
- MasterCard
- Pulse
- STAR
- NYCE

Web

Branch

Credit Card

ATM & Debit Card

Check

Teller / Deposit

ATM

Online

Wire

Phone

Retail
- Switching
- Routing
- Authorizations
- Host

Corporate
- Switching
- Routing
- Authorizations
- Host

ACI's Enterprise Risk Management System

- Flexible Data Input
- Predictive Analytics
- Flexible Rules-based Filtering
- Suspicious Activity Alerts User Interface
- Back-end Case Management

Benefits:
- Better / faster fraud decisions reduces losses
- Operational savings / efficiency gains
- Better customer service / reduced reliance on irritating multi-factor authentication

Core banking transformation depends on solid middleware components and key partner applications …

… riding on a strong dynamic infrastructure foundation.

Core Banking Business Partners

POLARIS power of precision

MISYS

FIS»

SAP

EARNIX

TATA — TCS Financial Solutions

Thaler BANKING SOLUTIONS

TEMENOS The Banking Software Company

Finacle

ARGO

ORACLE

Oracle Financial Services Software Ltd. (OFSS) (formerly "iFlex")

| Service Management | Asset Management | Security | Virtualization | Energy Efficiency | Business Resiliency | Information Infrastructure |

DYNAMIC INFRASTRUCTURE

System z Solutions

- § **Enterprise Linux Server**
- § **Data Warehousing**
- § **SAP**
- § **WebSphere®**
- § **Security**
- § **GDPS®**
- § **App. Development**
- § **ACI & Chordiant**
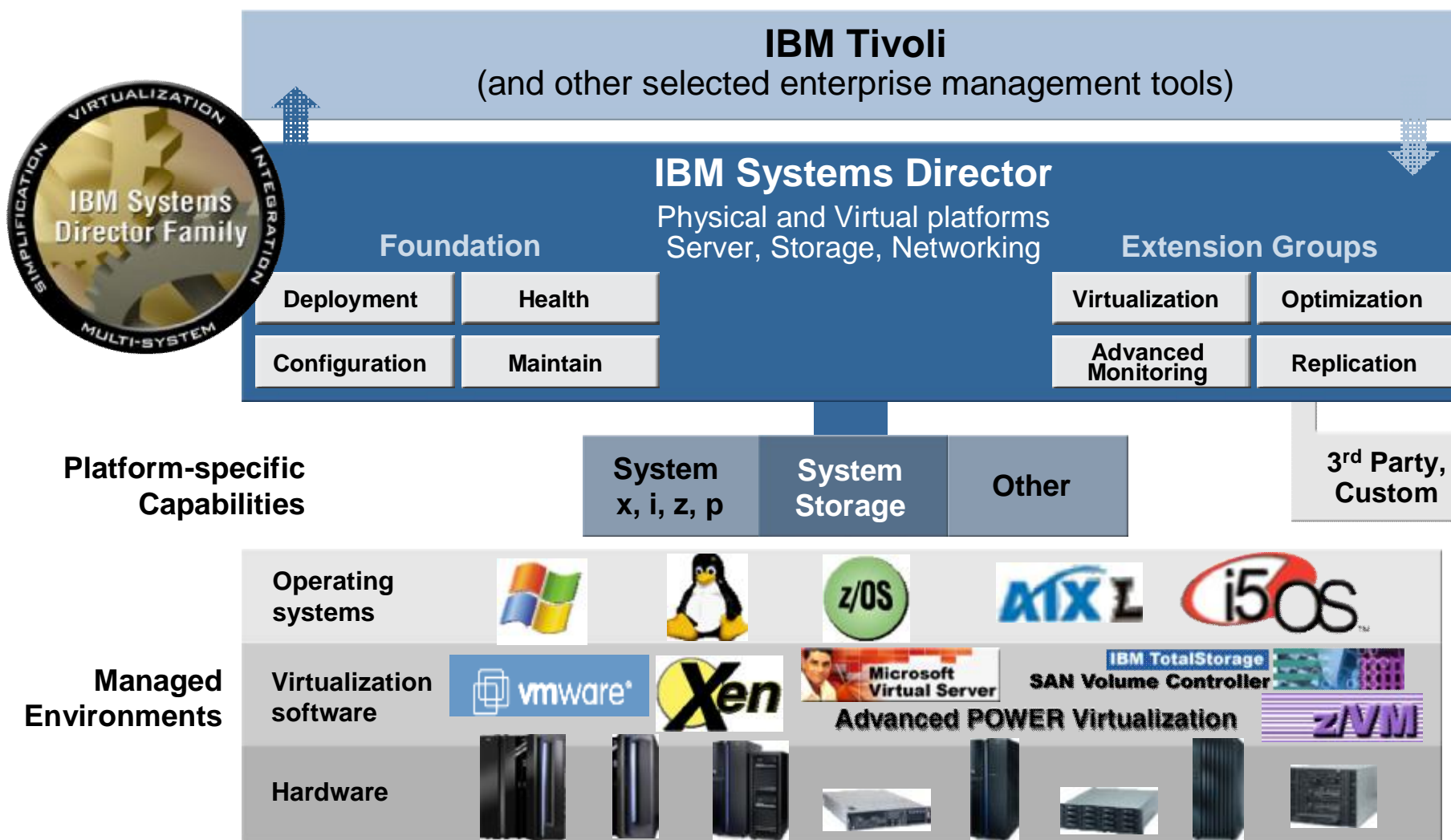- § **Cloud Computing**

Ø *Systems Management*

Ø *Oracle*

Ø *and more…*

Unmatched Value, Competitively Priced

IBM Systems Director

End-to-End Management Approach

IBM Tivoli
(and other selected enterprise management tools)

IBM Systems Director
Physical and Virtual platforms
Server, Storage, Networking

Foundation

| Deployment | Health |
| Configuration | Maintain |

Extension Groups

| Virtualization | Optimization |
| Advanced Monitoring | Replication |

Platform-specific Capabilities

| System x, i, z, p | System Storage | Other |

3rd Party, Custom

Managed Environments

Operating systems

Virtualization software

Hardware

A new high-performance platform for Oracle and Linux

"Our customers are rapidly adopting server virtualization and grid computing as a way to save space, energy and other costs. Oracle sees a growing number who are incorporating Oracle software with Linux virtual servers on System z as part of that strategy," says Robert Shimp, Oracle vice president, Global Technology Business Unit. "With this announcement the IBM System z10 becomes an even more attractive platform for deploying Oracle Database, Oracle Fusion Middleware and the Oracle E-Business Suite."

ORACLE®

Data Center Virtualization
with System z, z/VM & Linux
Oracle Grid
Oracle Fusion Middleware

High Availability
with System z, z/VM & Linux
Oracle Maximum
Availability Architecture

Oracle Applications
with System z & Linux
Oracle E-Business Suite, Peoplesoft, Siebel and iFlex

Modernization
with System z & Linux
Oracle Fusion SOA Services Oracle Business Intelligence

Large Bank Consolidates From HP and Sun Saving Power Costs and Gaining Disaster Recovery Protection

	FROM …	TO …
Current hardware infrastructure	HP Proliant; Sun Fire, pSeries	z10 EC
Footprints	18	2 (2 separate sites)
Cores	63	3 IFLs
Peak Utilization	3% to 15% SURF data	74%
DB	Oracle	Oracle
OS	HP-UX, Windows	Linux + z/VM
Energy and floor space savings		$28,000 per year

Summary of Benefits:

§ Energy savings

§ Disaster recovery capability

§ Better utilization

Using System z for workloads you would never have imagined five years ago

Oracle on zLinux – a solution providing superior consolidation characteristics

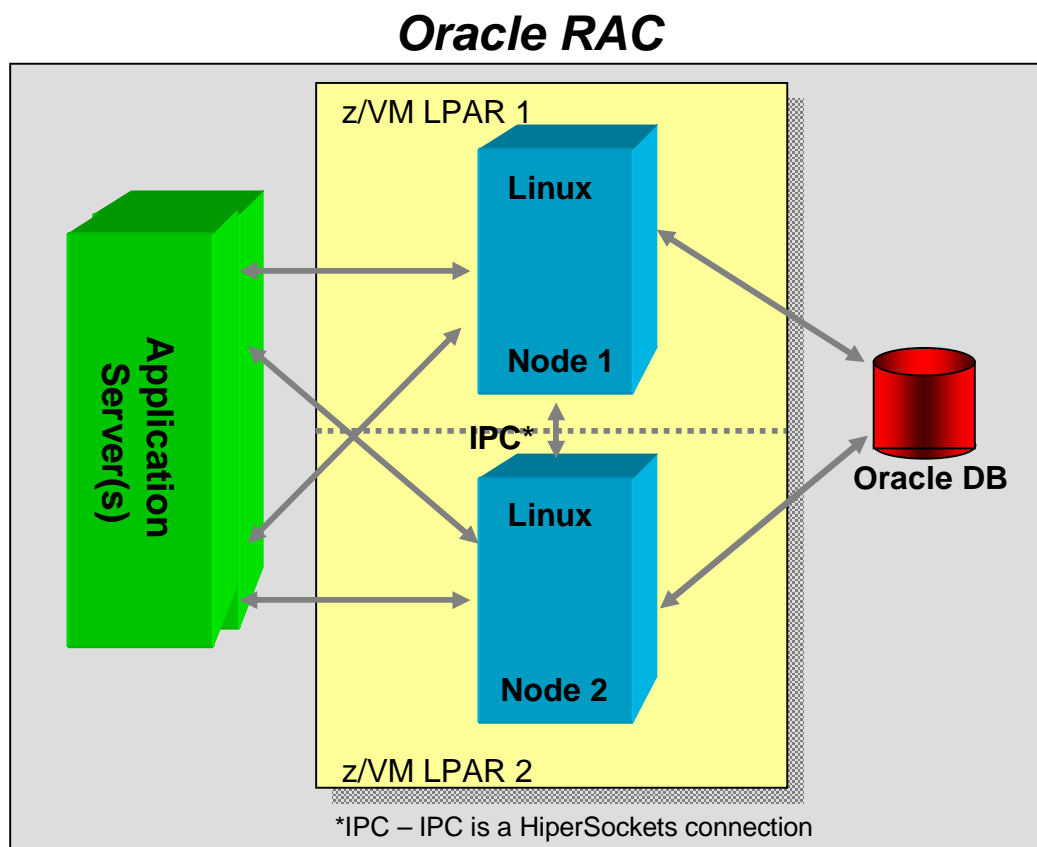"Nomura adopted solutions rebuilding the backend mission critical database servers by Linux, IBM mainframe, and Oracle Real Application Clusters…
…the system shows the performance to process 1,000 transactions per second now."

Mr. Toru Kanazawa, Managing, Director, Group IT Strategy Department - *LinuxWorld Japan 2006*

Oracle HA with System z

Oracle RAC

z/VM LPAR 1

Application Server(s)

Linux

Node 1

IPC*

Linux

Node 2

z/VM LPAR 2

Oracle DB

*IPC – IPC is a HiperSockets connection

Server provided HA

Oracle ➡
- RAC
- Data Guard
- Flashback
- CRS
- Grid Control

Operating system HA

Linux ➡ • Linux Clustering

z/VM ➡
- Mature Hypervisor
- Hardware assist

Hardware provided HA

System z ➡
- Spare CPUs
- N+1 power supplies
- Chip sparring in memory
- Concurrent maintenance
- 50 years MTBF (system fail.)

§ Guards against Linux failure, LPAR failure, z/VM failure, Oracle instance failure, LPAR maintenance

§ Can be: Active/active, active/passive

§ Not limited to two nodes

Hoplon Infotainment SA

"We were amazed with the power and flexibility of our new z10. Compared to the cores on our test Intel server, only half as many IFLs were needed to host the Live version of our massive game *Taikodom*, surpassing even the most optimistic estimates of our Lead Programmer. Web services were also 50% faster on average.

Now we have plenty of room to grow as the player base expands, simply by adding more IFLs to the production environment. Meanwhile, those same IFLs can be used for tests and development, and because we are also offloading an increasing number of math intensive operations to our Cell/B.E. processors, there is no foreseeable limit to the number of simultaneous players our z10 will be able to handle.
The z10 also proved itself very easy to install, and it's Java compatibility worked better than expected, making it possible for us to move the whole *Taikodom* environment - including it's web portal and *Bitverse* middleware - to it's new server in only 12 hours, with downtime limited to 3 hours."

Tarquinio "Tarq" Teles, CEO
Hoplon Infotainment SA

Bank of Tokyo-Mitsubishi UFJ

Customer Profile:

§ Bank of Tokyo-Mitsubishi and UFJ Bank were merged in 2006 to form Bank of Tokyo-Mitsubishi UFJ, Japan's largest bank.

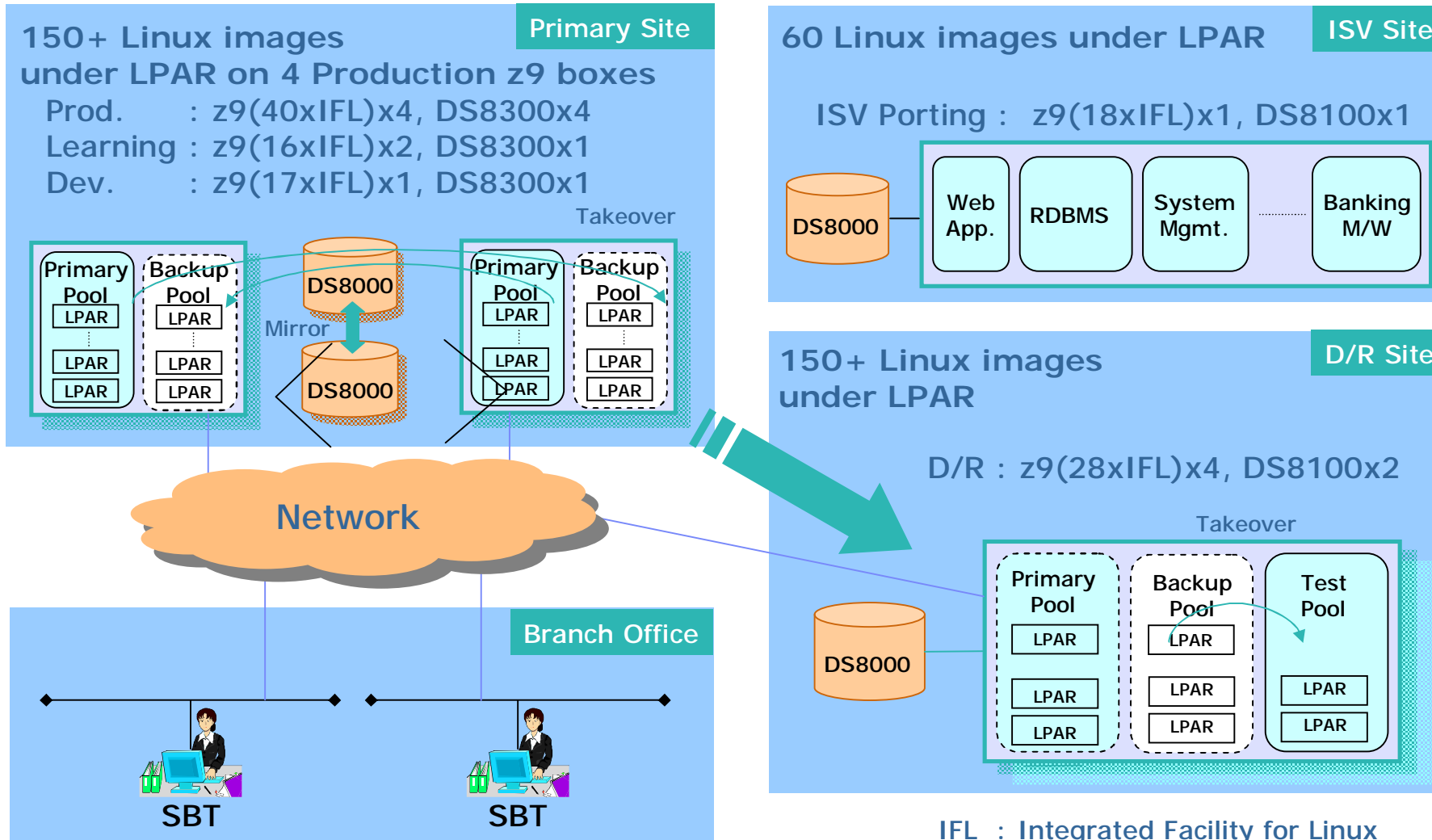| Accounts	Branch Network	Financial Status (March 2007)
Retail : 60M Corporate : 400K	Domestic : 672 Overseas: 113	Asset : $1.74 trillion Capital Stock : $13 billion

Customer Issues & Requirements:

§ Branch servers (i.e. system infrastructure for tellers to input and query various transactions such as payment, transfer, bill of exchange, etc.) were based on Windows NT and reached the end of support

§ About 800 servers constantly causing troubles

§ Lower TCO by consolidating servers on a stable & reliable system

§ Core banking applications, developed and maintained by Fujitsu, needed easily to be ported to new platform

§ Needed Disaster Recovery solution

BTMU: IBM's Solution Overview

Bank of Tokyo-Mitsubishi UFJ

MUFG

Primary Site

**150+ Linux images
under LPAR on 4 Production z9 boxes**
   Prod.   : z9(40xIFL)x4, DS8300x4
   Learning : z9(16xIFL)x2, DS8300x1
   Dev.   : z9(17xIFL)x1, DS8300x1

Takeover

Primary Pool
   LPAR
   LPAR
   LPAR

Backup Pool
   LPAR
   LPAR
   LPAR

DS8000

Mirror

DS8000

Primary Pool
   LPAR
   LPAR
   LPAR

Backup Pool
   LPAR
   LPAR
   LPAR

Network

Branch Office

SBT   SBT

ISV Site

60 Linux images under LPAR

   ISV Porting : z9(18xIFL)x1, DS8100x1

DS8000

Web App.   RDBMS   System Mgmt.   Banking M/W

D/R Site

**150+ Linux images
under LPAR**

   D/R : z9(28xIFL)x4, DS8100x2

Takeover

DS8000

Primary Pool
   LPAR
   LPAR
   LPAR

Backup Pool
   LPAR
   LPAR
   LPAR

Test Pool
   LPAR
   LPAR

IFL : Integrated Facility for Linux
SBT : Super Banking Terminal

BTMU: IBM's Solution Summary

Bank of Tokyo-Mitsubishi UFJ
MUFG

Category	# of z9	# of IFL	Memory (GB)	# of LPAR	# of DS8000	Disk (TB)
Production	4	160	1536	138	4	300
D/R	4	112	1280	180	2	60
Training	2	32	416	42	1	13
Development	1	17	128	15	1	4
Porting	1	18	128	60	1	6
Total	12	339	3488	435	9	383

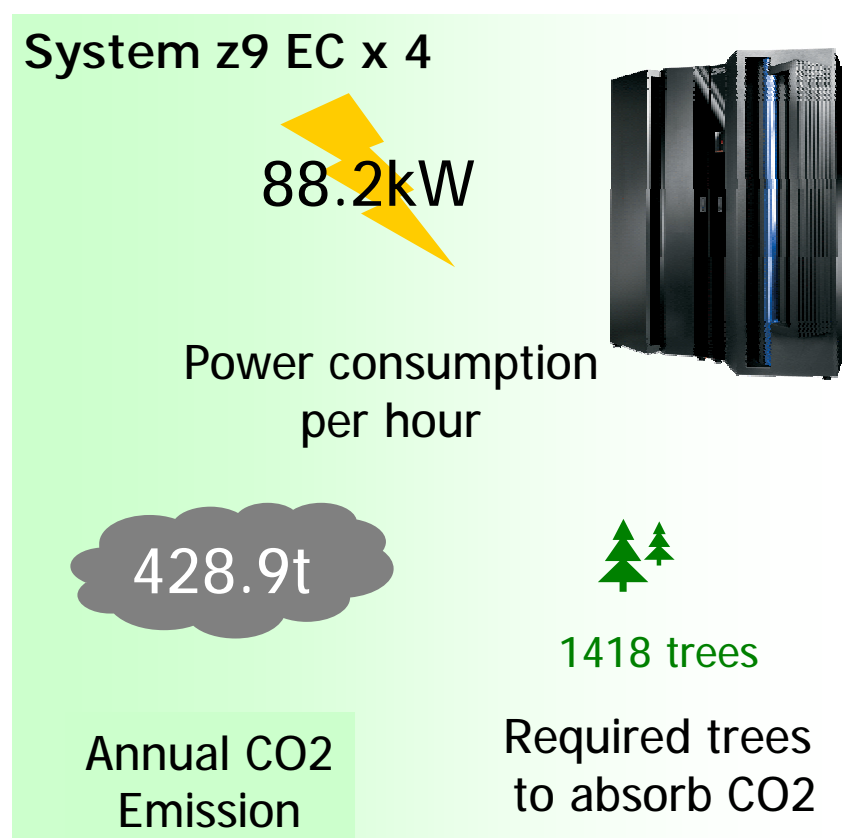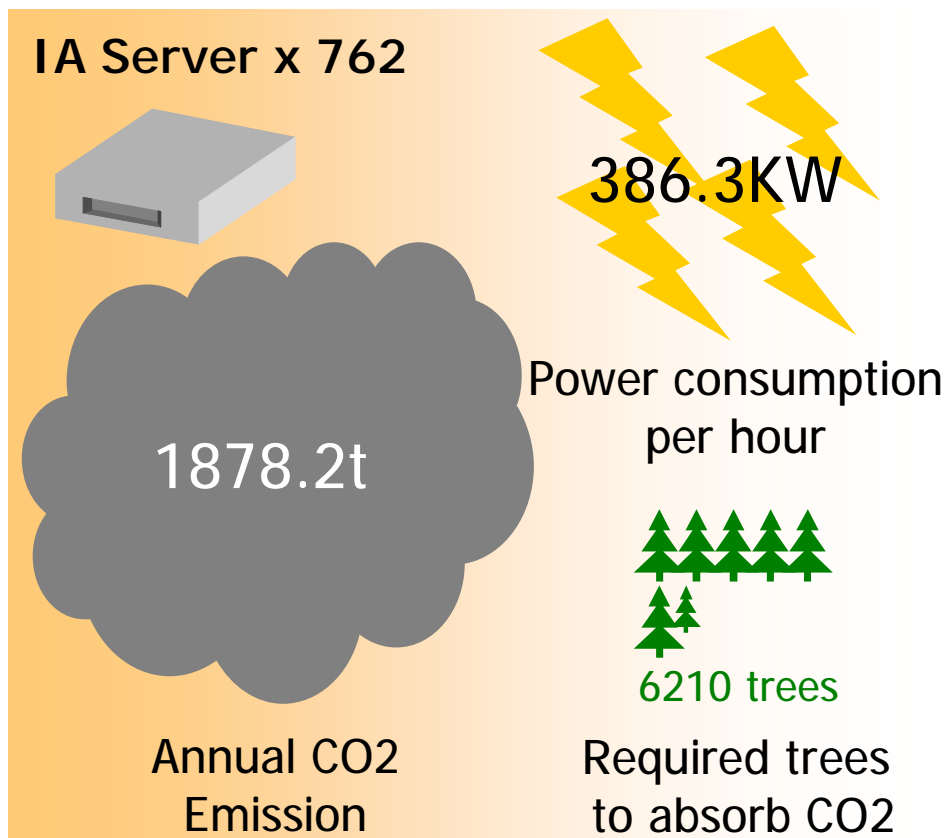**Probably the largest Linux on System z installation in the world!**

BTMU: The "Green Effect"

Bank of Tokyo-Mitsubishi UFJ
MUFG

IA Server x 762

386.3KW

Power consumption per hour

1878.2t

6210 trees

Annual CO2 Emission

Required trees to absorb CO2

System z9 EC x 4

88.2kW

Power consumption per hour

428.9t

1418 trees

Annual CO2 Emission

Required trees to absorb CO2
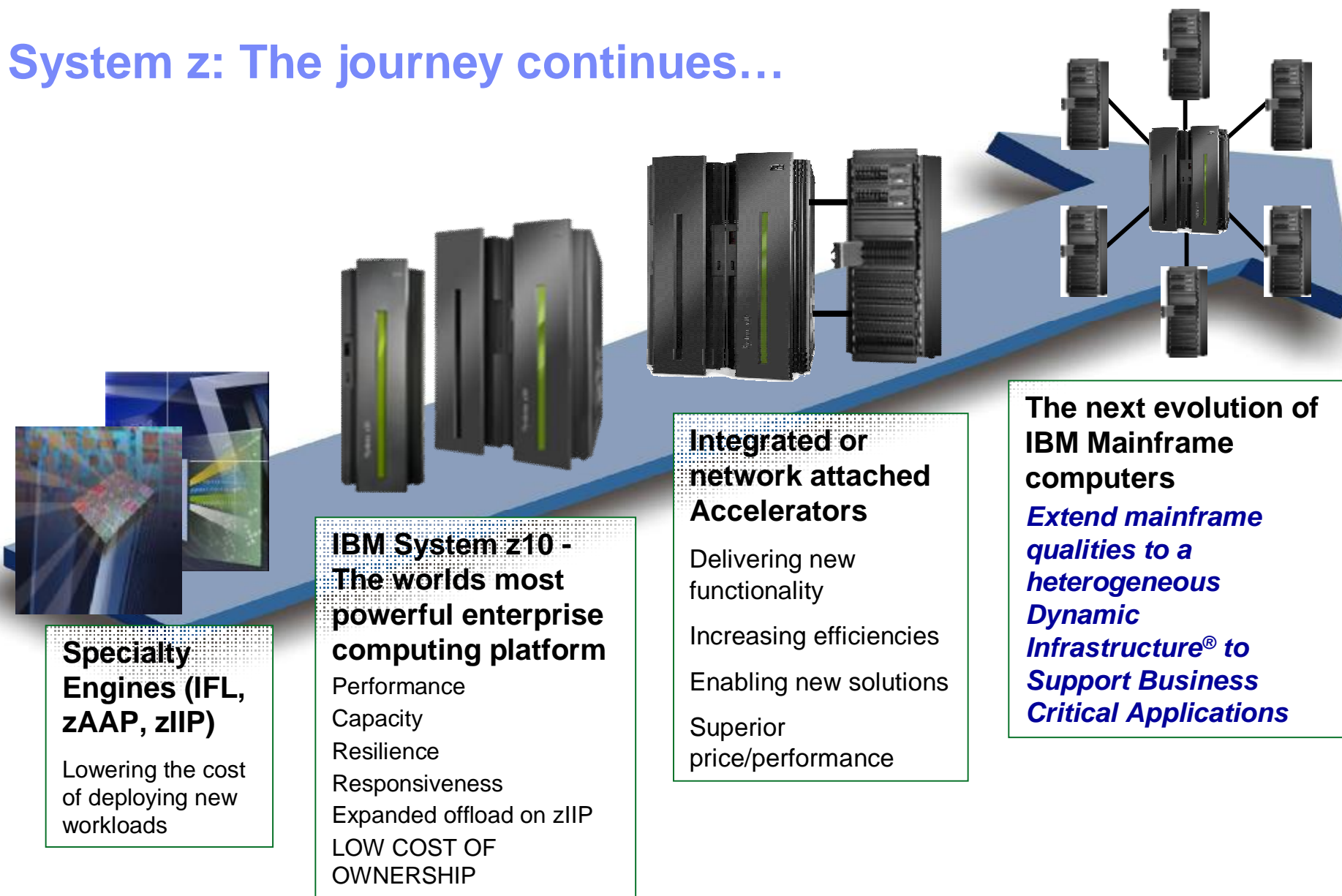
§   Zodiac study shows huge green effect through this consolidation.

§   More effect can be expected with the consolidation of UFJ servers.

System z: The journey continues…

Specialty Engines (IFL, zAAP, zIIP)

Lowering the cost of deploying new workloads

IBM System z10 - The worlds most powerful enterprise computing platform

Performance

Capacity

Resilience

Responsiveness

Expanded offload on zIIP

LOW COST OF OWNERSHIP

Integrated or network attached Accelerators

Delivering new functionality

Increasing efficiencies

Enabling new solutions

Superior price/performance

The next evolution of IBM Mainframe computers

Extend mainframe qualities to a heterogeneous Dynamic Infrastructure® to Support Business Critical Applications

System z ISV Ecosystem

Dramatic growth responding to market demand

§ 142 ISVs added to the System z portfolio in 2009

§ 900 New System z applications & tools 2009

§ 1,700 + ISVs developing for our System z Ecosystem

§ 3,500 + applications available for z/OS

§ 3,100 + applications available for Linux on System z

§ 6,300 + applications available for System z

Using System z for workloads you would never have imagined five years ago