New Workloads on System z

Colin Page
System z Enterprise Architect
IBM Software Group
cjpage2@uk.ibm.com
+44 (0)1962 815071

The Future Runs on System z

IBM Systems

Trademarks

The following are trademarks of the International Business Machines Corporation in the United States and/or other countries.

IBM*	**IBM eServer**	**IBM logo***	**BladeCenter***
CICS*	**DB2***	**Enterprise Storage Server***	**Lotus***
Lotus Notes*	**OMEGAMON***	**Parallel Sysplex***	**RACF***
System p	**System Storage**	**System z**	**System z9***
System z10	**Tivoli***	**WebSphere***	**z/OS***
z/VM*	**zSeries***		

* Registered trademarks of IBM Corporation

The following are trademarks or registered trademarks of other companies.

Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation in the United States, other countries, or both.

Java and all Java-based trademarks and logos are trademarks of Sun Microsystems, Inc., in the United States, other countries or both.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Microsoft, Windows, Windows NT and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

Red Hat, the Red Hat "Shadow Man" logo, and all Red Hat-based trademarks and logos are trademarks or registered trademarks of Red Hat, Inc., in the United States and other countries.

SET and Secure Electronic Transaction are trademarks owned by SET Secure Electronic Transaction LLC.

* All other products may be trademarks or registered trademarks of their respective companies.

Notes:

Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

IBM hardware products are manufactured from new parts, or new and serviceable used parts. Regardless, our warranty terms apply.

All customer examples cited or described in this presentation are presented as illustrations of the manner in which some customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics will vary depending on individual customer configurations and conditions.

This publication was produced in the United States. IBM may not offer the products, services or features discussed in this document in other countries, and the information may be subject to change without notice. Consult your local IBM business contact for information on the product or services available in your area.

All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

Information about non-IBM products is obtained from the manufacturers of those products or their published announcements. IBM has not tested those products and cannot confirm the performance, compatibility, or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

Prices subject to change without notice. Contact your IBM representative or Business Partner for the most current pricing in your geography.

What's new in '*New Workloads*' ?

work·load (wûrk l d)
n.
1. The amount of work assigned to or expected from a worker in a specified time period.
2. The amount of work that a machine produces or can produce in a specified time period.

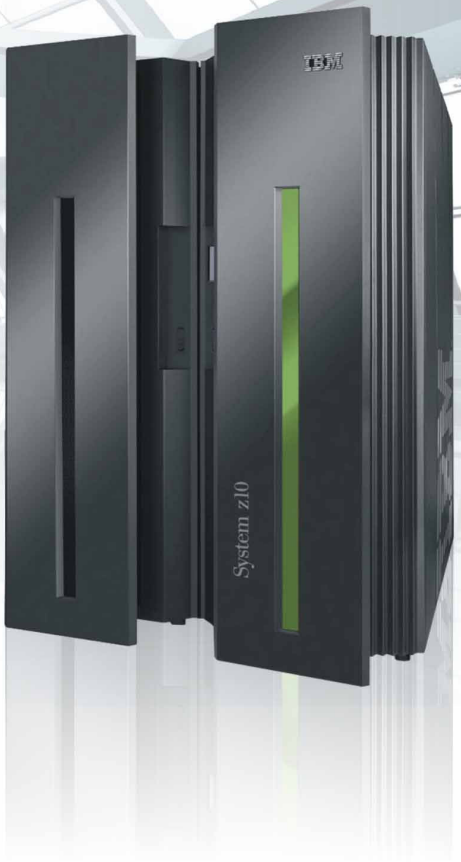
System z10 EC and BC machines bring together key Qualities of Service to drive the best out of the hardware and software capabilities. Exploiting those Qualities in new and innovative ways is ***New Workload***.

Today's presentation describes how innovation and exploitation can be applied to both new and existing solutions to derive value add to your business.

This can be achieved in 4 easy steps..

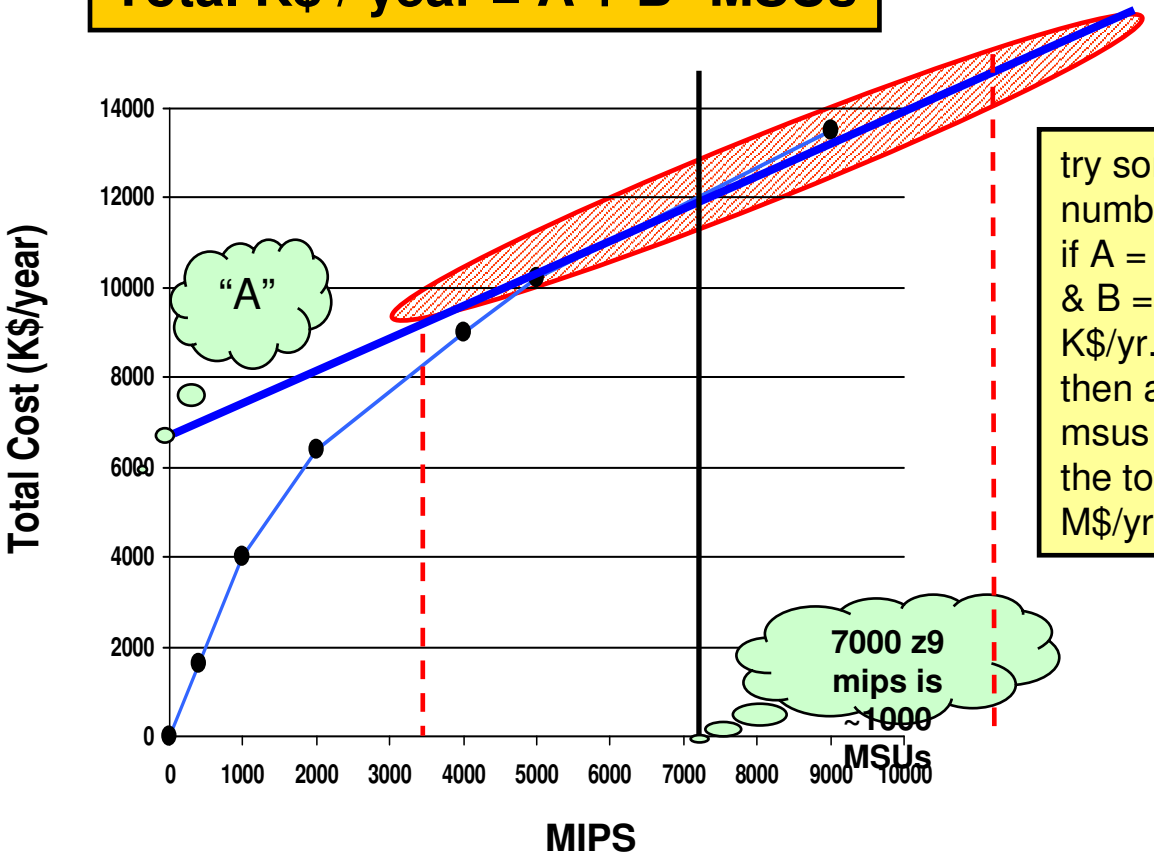
Lesson 1: Why choose the mainframe for *New Workload*
Lesson 2: Leveraging *new features & functions* of the hardware
Lesson 3: *Exploiting applications* designed for high availability, scalability and usability
Lesson 4: *Consolidating* and *Virtualising* workloads from other platforms

Lesson 1: Why choose the mainframe for New Workload ?



Do the Maths add up?

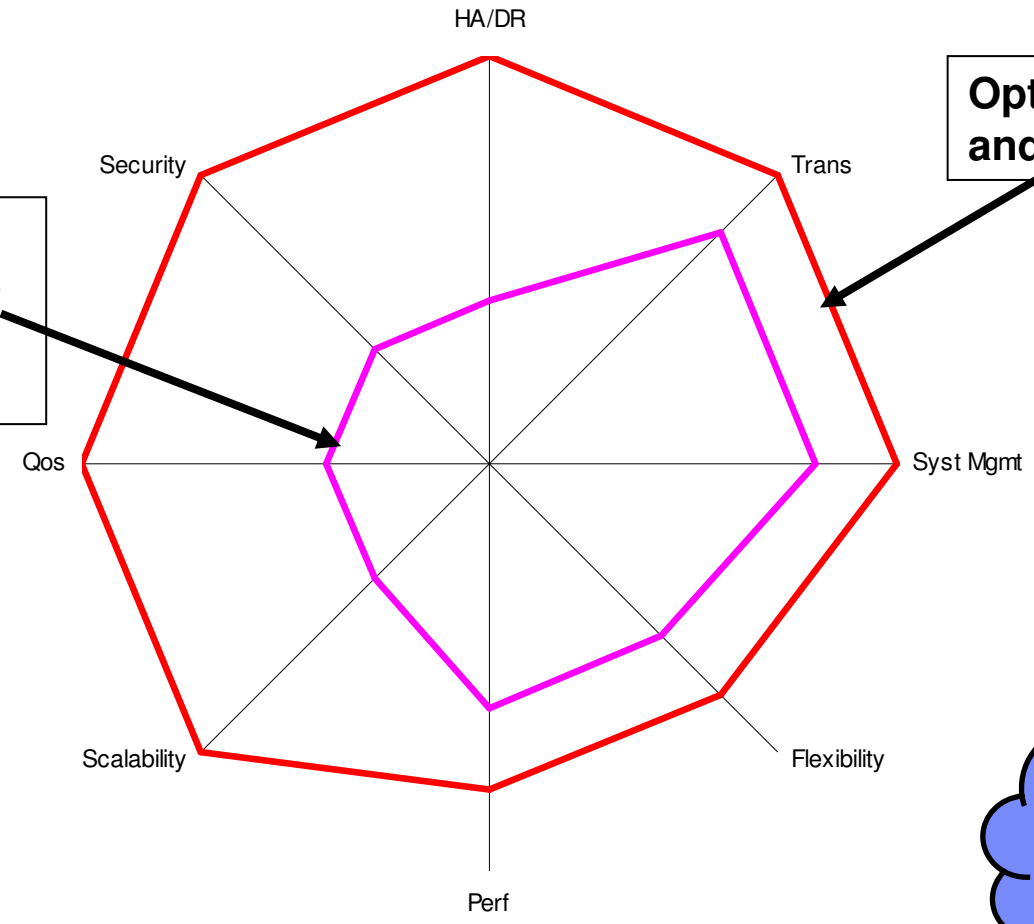
Total K$ / year = A + B* MSUs



try some numbers:
if A = 6 M$/yr.
& B = 6 K$/yr./msu
then at 1000 msus
the total is 12 M$/yr.

Incremental Cost of Ownership?

Non-functional requirements ?



Option 1 – AIX WAS on System p + AIX Oracle on System p

Option 2 – z/OS WAS and DB2 on System z

Qualities of Service?

Source: IBM EMEA Products & Solutions Support Center, Montpellier

Database Selection ?

High Availability and Disaster Recovery (HA/DR)

- •Parallel Sysplex DB2 Data Sharing availability much better than on DB2 UDB on AIX (see radar chart)
- •Very fast and automated recoveries to any point in time
- •DB2 online utilities
- •WMQ highly available on z/OS through the shared queuing capabilities in a Sysplex environment
- •GDPS / Hyperswap & GDPS (0 data lost for Disaster Recovery)

Transactionality

- •DB2 and z/OS integration supports (Two phase commit on z/OS using RRS)

System Management

- •Superior, policy based disk and tape management (virtualization over the external storage resources)
- •Dynamic Workload management: z/OS WLM exploitation by DB2 enables consolidating workloads with different Service Level Agreements (SLA)
- •Hardware Data compression (less storage, faster Backups and Batch Performance)

Flexibility

- •Virtual Networks / Hipersockets
- •Less Routers and Switches needed

Performance & Scalability

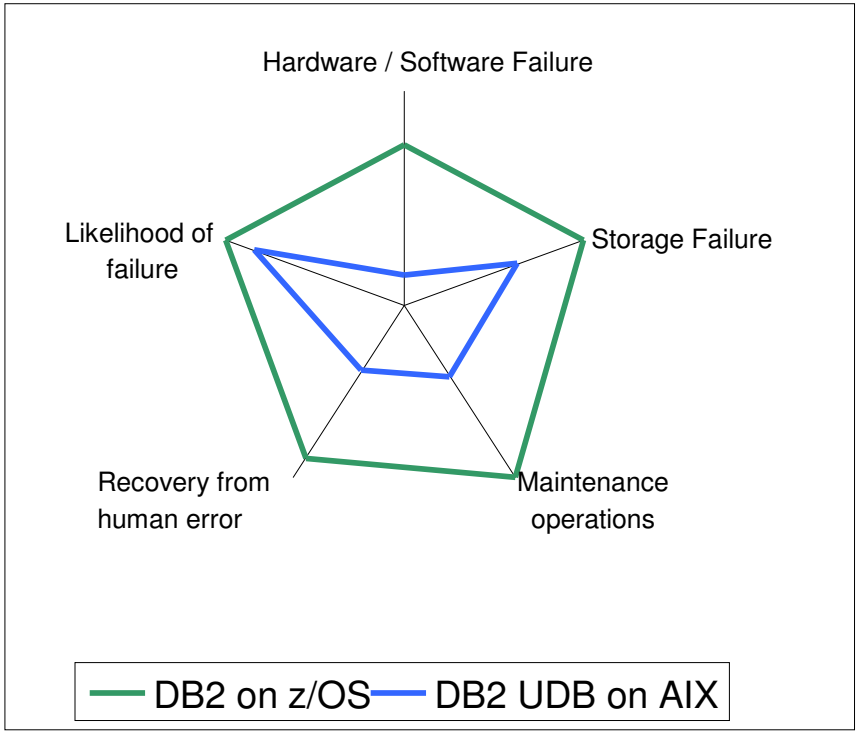
- •Excellent scalability of DB2 data sharing
- •Virtual Networks / Hipersockets performance
- •Hardware Data compression (for batch and backup activities)

Quality of service (QoS)

- •DB2 and z/OS integration supports (Two phase commit on z/OS using RRS)
- •Automated DB2 recoveries to any point in time

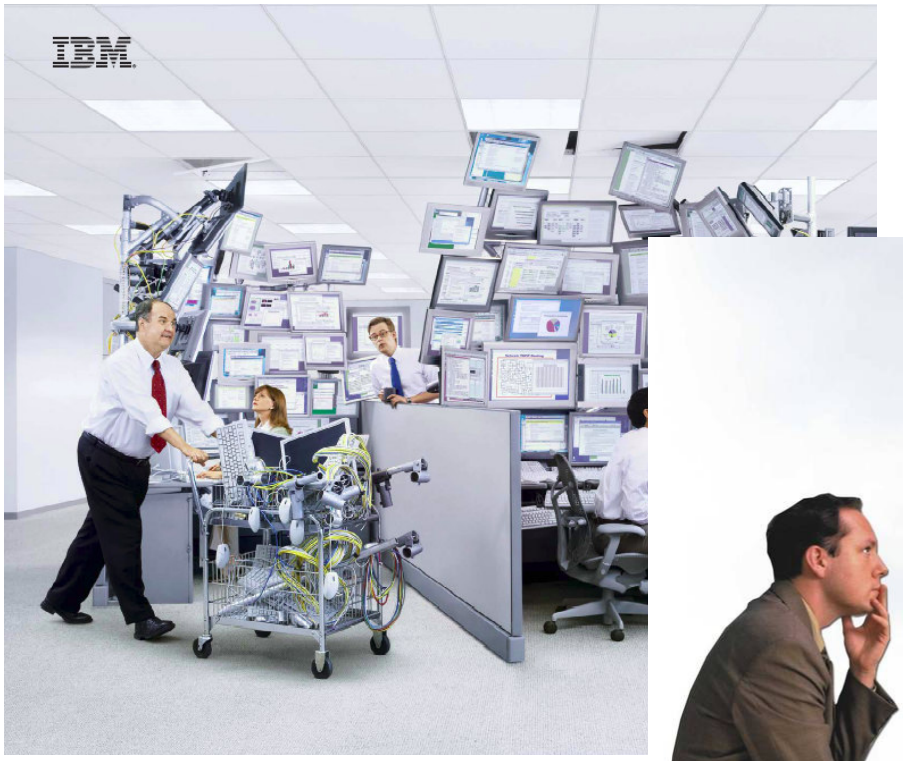
Security

- •z/OS Security Server (RACF) and DB2 internal authorization and security mechanisms (Multi-Level Security)
- •Data Encryption using cryptographic features



Disaster Recovery & Operational Concerns?

A Mainframe is a small, low-cost server…



Too big for your needs?

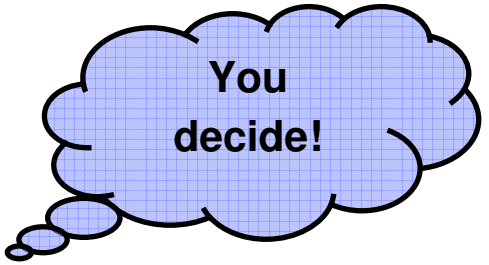
… that delivers cost-effective service

Or are you worried about your ISVs..?

What the customers are saying..?

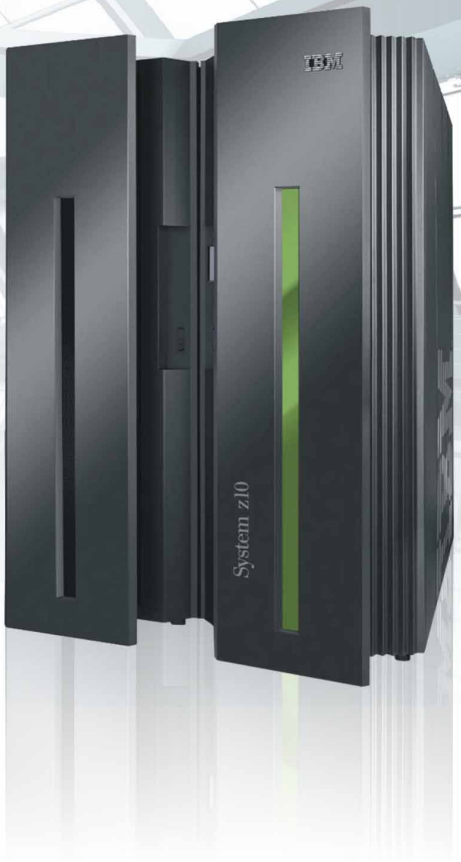
"that the per transaction cost is really very modest"

Kevin Campbell, Chief Application Architect, Univar USA



Mainframe Costs	Distributed Costs
The cost of running incremental workload on the mainframe goes down as the total workload grows	The cost of running additional workload on distributed servers goes up more linearly
Labour costs hold steady as workload grows	**Labour is now the highest cost element in distributed environments** **Administrative staff costs increase in proportion to the number of servers**
Mainframe design & pricing favor the addition of more workload	**New workload requires additional servers and licenses**
Highly Efficient Power and Cooling – Small Footprint	**Energy and Space cost is more linear**
Lower software costs per transaction as workload grows – and PRA can lower ISV tool costs	**Cost of software licenses is more linear**
High Availability and Security Translate into low cost	**Fractionally less Availability and Security can drive Significant downstream costs**
Customers have learned that mainframes deliver economies of scale, especially as the workload grows	Result – scale out strategies do not deliver equivalent economies of scale as the workload grows

Lesson 2: Leveraging new features & functions of the hardware



IBM System z10 Enterprise Class

Innovative Enterprise Systems Solutions, Now and in the Future

IBM System z10™ Enterprise Class enables clients to **consolidate and virtualize** their server environment…

to **reduce costs and simplify** their IT infrastructure…

with high performance, **energy efficient green technologies**,…

providing the most **resilient and secure** system to support business innovation and growth.

Technology Evolution with Mainframe Specialty Engines

Building on a strong track record of technology innovation with specialty engines, IBM introduced the System z9 Integrated Information Processor

IBM System z9 Integrated Information Processor (IBM zIIP) 2006

- Designed to help improve resource optimization for eligible data workloads within the enterprise

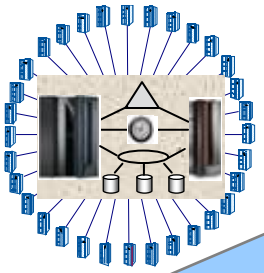
System z9 Application Assist Processor (zAAP) 2004

- Incorporation of JAVA into existing mainframe solutions

Integrated Facility for Linux (IFL) 2001

- Support for new workloads and open standards

Centralized data sharing across mainframes



Internal Coupling Facility (ICF) 1997

zAAPs and zIIPs

More application technology exploiters, more benefits

- **zAAPs and zIIPs are designed to help implement new application technologies on System z and to integrate them with core applications and data.**
  - Java eligible for zAAP– lowering the cost of computing for WebSphere Application Server and other Java technology-based applications
  - Centralized data serving eligible for zIIP - workloads such as BI, ERP, and CRM applications running on distributed servers with remote connectivity to DB2 V8
  - Network encryption on zIIP - zIIP becomes an IPSec encryption engine helpful in creating highly secure connections in an enterprise (with z/OS V1.8)

Available 6/07

  - z/OS XML System Services eligible for zAAP and zIIP - helps make hosting XML data and transactions on System z more attractive. DB2 9, Enterprise Cobol V4.1, and XML Toolkit for z/OS V1.9 are first IBM exploiters (introduced with z/OS V1.9 and rolled back to V1.8 and V1.7)

Available starting 9/07

  - Remote mirror on zIIP – zIIP assisted z/OS Global Mirror function (zGM, formerly XRC) Most of the System Data Mover (SDM) processing eligible for zIIP offload. Helps reduce server utilization at recovery site (with z/OS V1.9)

new!

  - ISV exploitation of zIIPs

IBM System z10 Integrated Information Processor and IBM System z9 Integrated Information Processor

IBM System z10 Application Assist Processor and IBM System z9 Application Assist Processor

* Statements regarding IBM future direction and intent are subject to change or withdrawal, and represents goals and objectives only.

DB2 for z/OS exploitation of IBM zIIP value add

- **Portions of the following DB2 for z/OS v8 & v9 workloads may benefit from zIIP*:**

1 - ERP, CRM, Business Intelligence or other enterprise applications

- Via DRDA over a TCP/IP connection (enclave SRBs, not stored procedures or UDFs)

+ Specialty Engine

2 - Data warehousing applications*

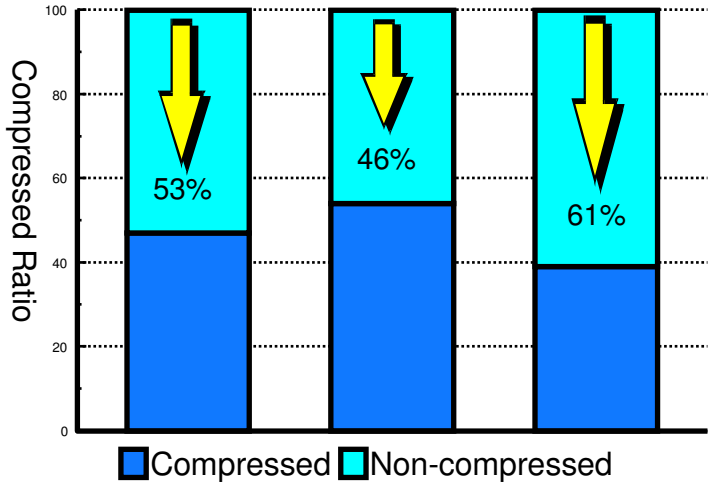
- Requests that utilize parallel queries

3 - DB2 for z/OS v8 & v9 utilities LOAD, REORG & REBUILD*

- DB2 utility functions used to maintain index maintenance structures

*** The zIIP is designed so that a program can work with z/OS to have all or a portion of its enclave Service Request Block (SRB) work directed to the zIIP. The above types of DB2 V8/9 work are those executing in enclave SRBs, of which portions can be sent to the zIIP.**

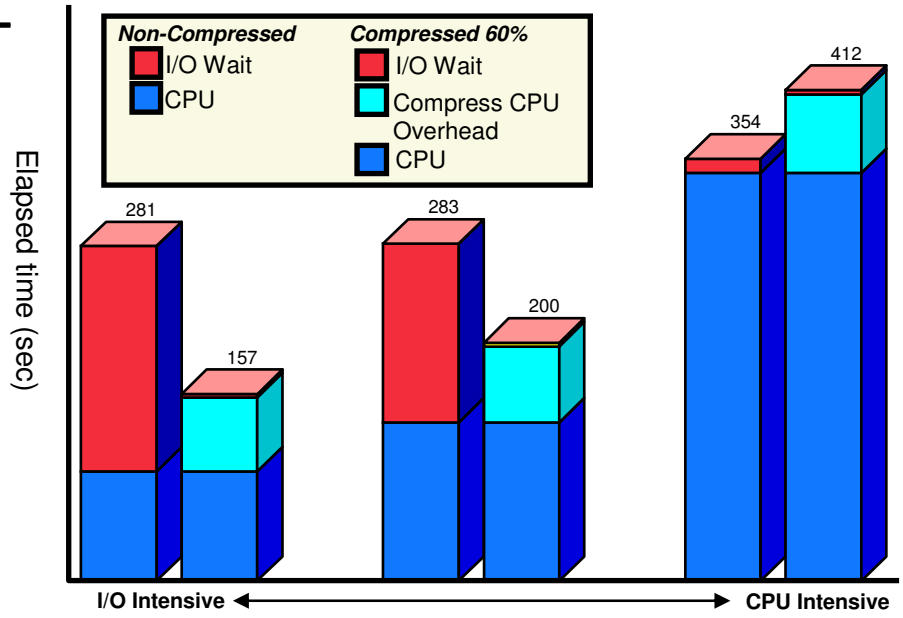
Hardware-assisted data compression



Compression Ratios Achieved

In V9 Indexes Can also be compressed

Effects of Compression on Elapsed Time



Consolidation & Virtualization Server Optimization and Integration Services for System z10

Customer Needs

- Stop server sprawl
- Reduce energy and related facility costs
- Improve security and reliability
- Increase flexibility for changing business needs
- Get control of workload/systems management

System z Value Proposition

- Allows customers to rely on GTS consolidation experts skilled on System z10 platform technologies to assess current IT deployment, design and implement changes
- Measure and document improvements and related cost savings
- Gives customers the assistance needed for consolidation projects

. . . The Power of many

. . . The Simplicity of ONE

GTS Services on System z10

- Based on internally developed assessment tools combined with GTS subject matter expertise and System z skills offered to clients on a custom basis tailored to their specific enterprise needs

Solution Components

- System z10 with z/VM®, Linux
- Services that include:
  - assessment,
  - planning,
  - design,
  - implementation

Software Leveraging the Strengths of the z10

Compiler Optimization and Performance

Decimal Floating-Point (DFP)

Exploit Additional Floating-Point Registers (AFP)

Exploit 64-bit instruction set and registers even in 32-bit code

Support IEEE Binary Floating-Point which eases platform portability

DB2 for z/OS

More, faster CPUs, more memory, network bandwidth means significantly improved SQL performance

Improved connectivity for remote apps, especially batch inserts for large queries

More efficient disk usage minimizes disk constraints

More efficient XML parsing

Hash DSAB Searches brings faster startup/restart

Improved decimal float data type performance efficiency

Reduced allocation and catalog overhead

Systems Management

OMEGAMON XE for z/OS 4.1.0 XE workspaces and Classic commands view of HiperDispatch

Transaction Management

HiperSockets™ Multi Write Facility

More, faster CPUs, More memory, More network bandwidth

Potential for significant performance

z Specific Java and WAS enhancements

z/OS

64-way support for a single z/OS image

HiperDispatcher

Up to 4 TB Real Memory

Hardware Decimal Floating Point

Capacity Provisioning

Large (1 MB) Page support improves performance

HiperSockets Multi Write Facility

Crypto Exploitation

Parallel Sysplex support for InfiniBand Coupling links

SDM offload to zIIP

OSA-Express3 10 Gbps – CHPID OSD

Development Tools

Rational Developer for System z performance improvements of C, C++, COBOL, PL/I, Java language applications

Rational. WebSphere. Information Management Lotus. Tivoli.

Project ‘Big Green’

Double compute capacity with no increase in consumption or impact by 2010

IBM to reallocate $1 billion each year

- To accelerate “green” technologies and services
- To offer a roadmap for clients to address the IT energy crisis while leveraging IBM hardware, software, services, research, and financing teams
- To create a global “green” team of almost 1,000 energy efficiency specialists from across IBM

Re-affirming a long standing IBM commitment

- Energy conservation efforts from 1990 – 2005 have resulted in a 40% reduction in CO2 emissions and a quarter billion dollars of energy savings
- Annually invest $100M in infrastructure to support remanufacturing and recycling best practices

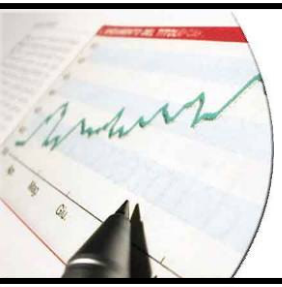
Major proof point for Project Big Green

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

ARMONK, NY, August 1, 2007

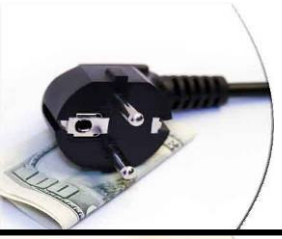
- *IBM will consolidate and virtualize thousands of servers onto approximately 30 IBM System z™ mainframes*
- *Substantial savings expected in multiple dimensions: energy, software and system support costs*
- *The consolidated environment will use 80% less energy and 85% less floor space*
- *This transformation is enabled by the System z sophisticated virtualization capability*

Enterprise Business Value – Expectations



Business case

- Early modeling identified **significant potential for savings** through zLinux virtualization
- Performed **TCO virtualization assessment** on IBM portfolio as cross-IBM effort
  - System z, SW Migration Services, STG Lab Services, IBM Academy, ITO Migration Factory
- **Identified substantial savings opportunity**
  - Energy
  - Floor space
  - Labor
  - Software



Energy savings

- **Annual energy usage to be reduced by 80%**
- **Total floor space to be reduced by 85%**
  - 11,045 square feet for distributed solution
  - 1,643 square feet for System z solution

Quality service

- Leverages maturity of System z stack products - **high availability, resiliency**
- Reduces complexity and increases stability, centralizes **service mgmt**
- Potential for faster provisioning speed (months → days)
- **Dynamic allocation** of compute power
- Provides world-class **security**

Comparison of Annual Energy Usage for Workloads

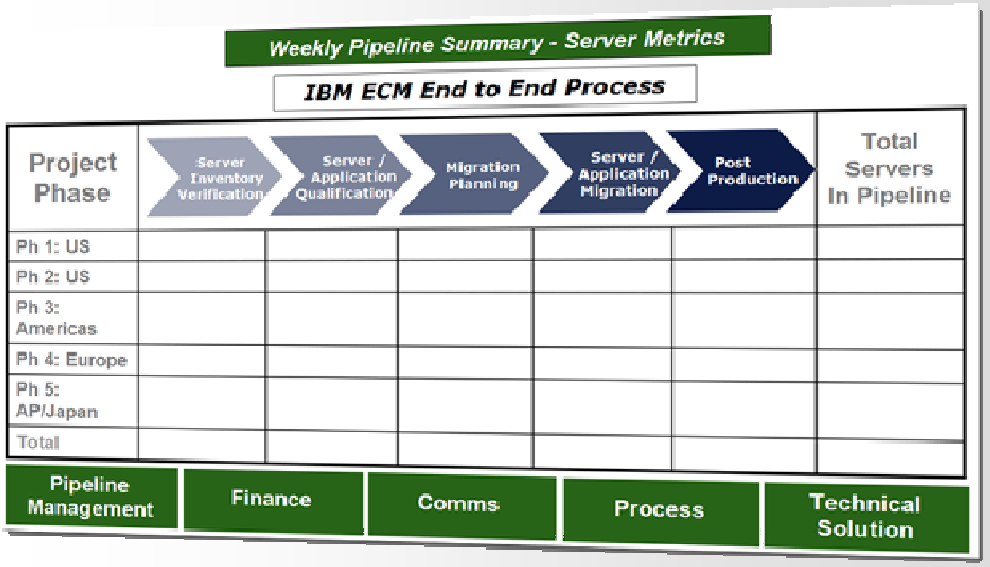
	Distributed Solution		System z Solution	
	Kilowatt hours (K)	Cost* ($K)	Kilowatt hours (K)	Cost* ($K)
Power	24,000	$2,400	4,796	$479
Cooling**	14,400	$1,440	2,877	$287
Total Energy	38,400	$3,840	7,673	$767

* Electrical cost calculated at rate of .10 per kW ** Cooling is 60% of power cost

IBM is Using a 'Work in Process' Approach to Manage the Migration

Management Approach and Reporting

- Process approach borrowed from factory line management
- Metrics for each process and sub-process
- Quality measured with process fallout – tracked by cause
- Daily status calls for issue resolution
- Weekly status reporting for CIO and management team



Decommission Process Overview

Server available as a result of virtualization efforts

Server Ready

Check for technical viability and asset value to determine if h/w is a redeployment candidate

If redeployed

Request completed to coordinate shipping and update property control

If not redeployed

Complete Machine List Database and ship to GARS*

Apply to Neuwing for energy efficiency certificates

Tracking tool is updated to reflect disposition of the assets in the project

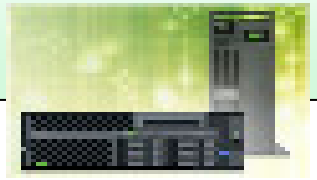
Capture savings in business plan and business case

****IBM Global Asset Recovery Services***

Enterprise Approach to Workload Migration

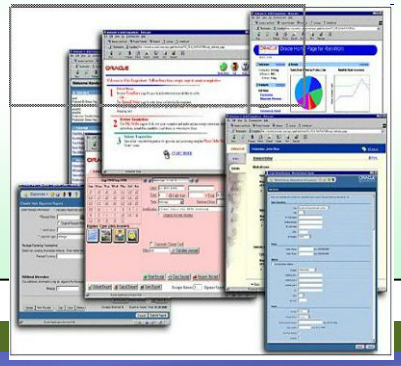
Location View
Boulder
Poughkeepsie
Portsmouth
Raleigh
Rochester
Southbury

Environment View
Managed 'Offerings'
Development
Intranet
BU Environments



Migration Candidates Sourcing

Application View
Business Unit Partnership

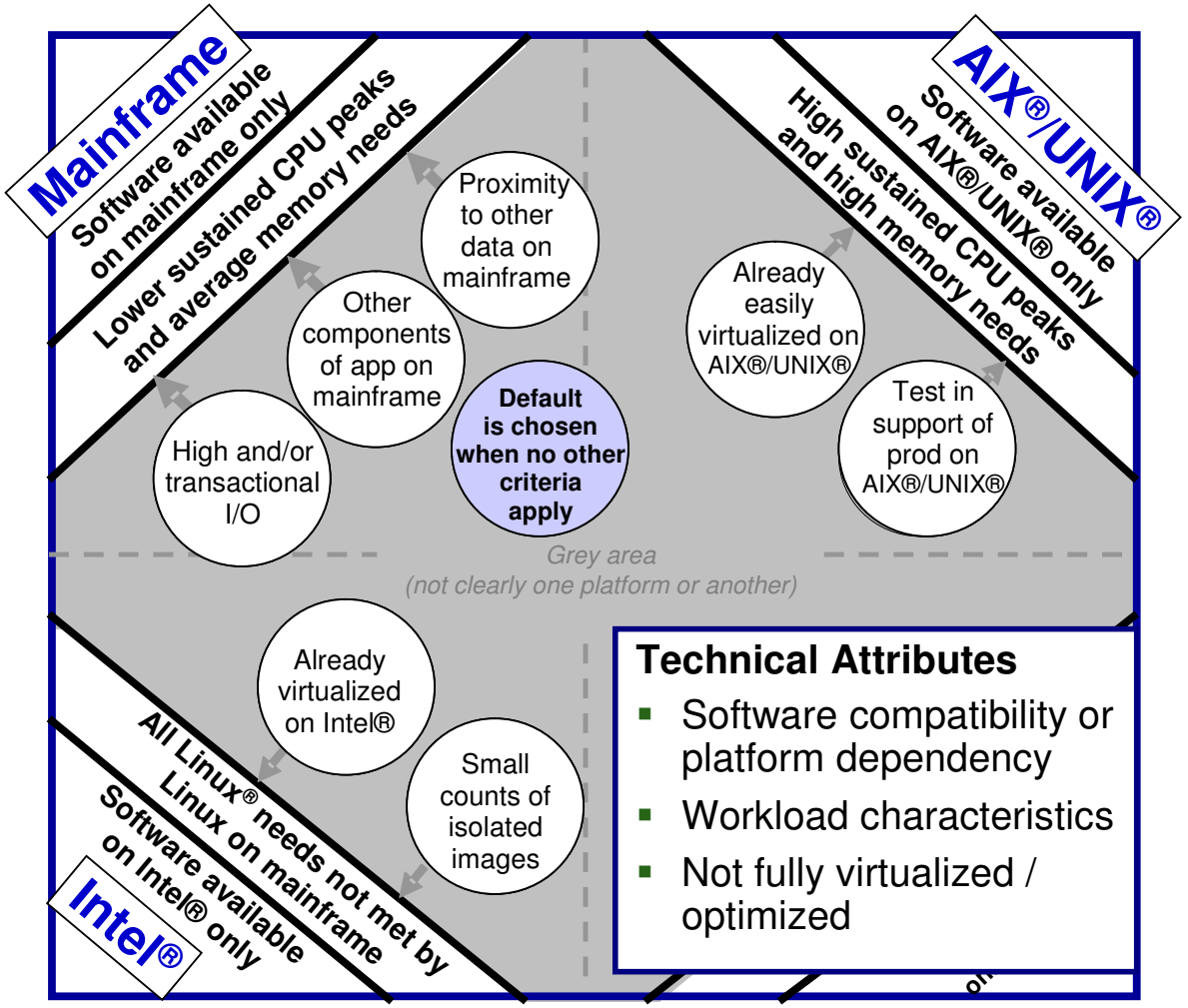


Technology View
Domino
Email
Static Web
DB2
Linux on x86

Each Workload is Evaluated for Suitability Based on Technical Attributes

Priority Workloads for Consolidation:

- WebSphere® applications
- Domino® Applications
- Selected tools: Tivoli®, WebSphere® and internally developed
- WebSphere MQ
- DB2® Universal Database™

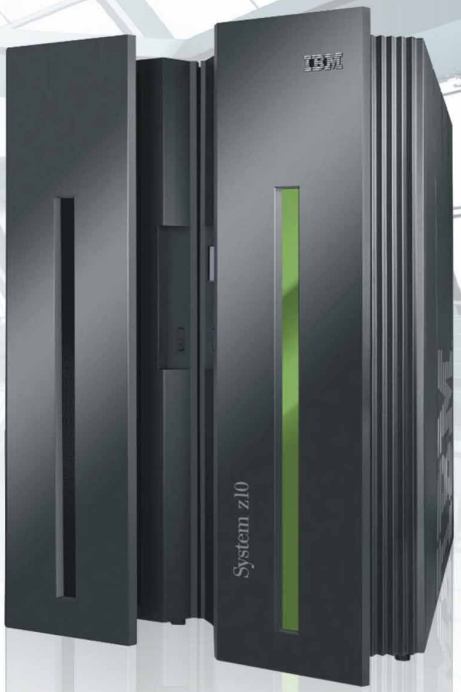


Operationally, the goal is to minimize change while leveraging the capability of System z

The distributed and mainframe support teams collaborated with IBM's Design Center to develop the reference architecture and the basis for the operational approach

- **Approach:**
  - Adapt existing UNIX® team processes
  - Engage z team to operate System z and z/OS®
  - Broaden the VM/mainframe knowledge of the mid-range team through training, to assist in support of VM Hypervisor (z/VM®) and Linux
  - Use existing monitoring and operational tools, i.e.
    - Tivoli Monitoring and Enterprise Portal
    - VM Resource Manager
    - Monitor and Performance Toolkit
    - Administer Capacity, OS Provisioning and Software Distribution Tools

Lesson 3:
Exploiting applications
designed for high availability, scalability and usability



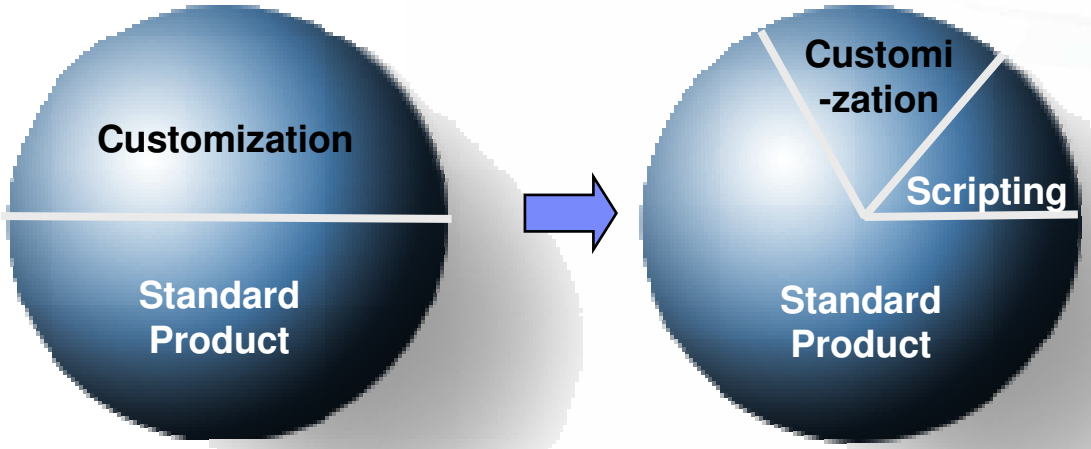
System z10 Designed for New Customer Workloads

New System z10 based solutions for workloads and Industry processes that leverage the full power of System z10

- ACI BASE24-eps and ACI Proactive Risk Manager on System z10
- Data Warehousing on System z10
- Real-time Enterprise Business Intelligence on System z10
- Encryption Authentication - Digital Certificate Authority on System z10
- SAP Solution Edition on System z10

ACI BASE24-eps on System z has capabilities to improve the product development process by 50% to realise revenue quicker

ACI's Improvements to Products



First Generation Products

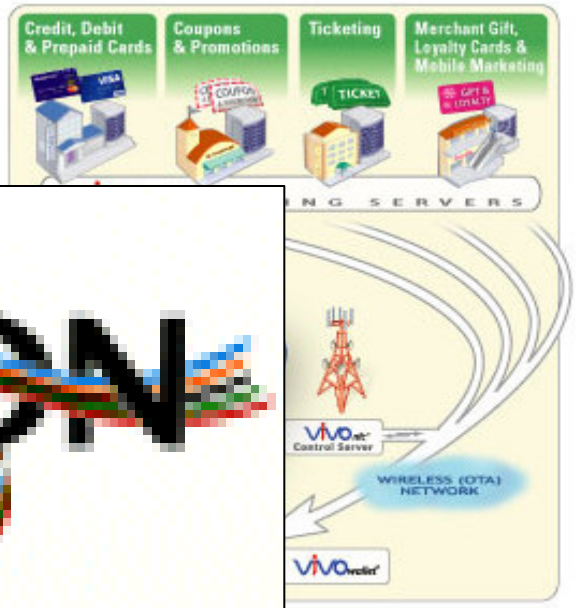
BASE24-eps on System z10

BASE24-eps can

- Improve speed to market for new product functions and features
- Eliminate existing barriers to new product development

BASE24—eps' advanced transaction location capabilities enable mobile proximity payments using NFC mobile devices

- **E-Wallet:** Customers can use their mobile devices as electronic wallets by downloading credit and debit card applications
- **Targeted Marketi** coupons and prom tapping on a smar marketing
- **Loyalty Program** programs can be h
- **Ticketing:** Chips c for transit or other
- **Enhance Security** security and can be remotely disabled in realtime. At the same time, handset manufacturers are building in security features such as biometrics (e.g. Kyocera Wallet)



Mobile User taps smart posters for promotions

Mobile User uses phone as wallet

However… improving payments services increases fraudulent activity

Fraud fears rise as Faster Payments takes off

Author: Karl Flinders
Posted: 17:19 08 Jul 2008

BOOKMARK

More than £2bn has already been sent through theFaster Payments clearing system since its introduction at the end of May.

By 27 June, exactly one month after the launch of Faster Payments, banks had completed over four million banking transactions, worth a total of £2.26bn

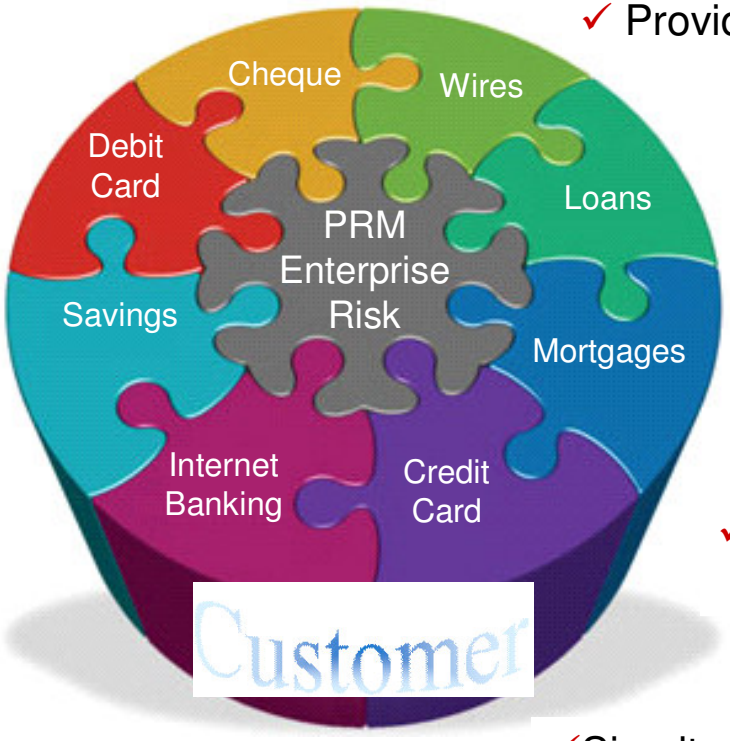
Faster Payments allows banks to clear payments in hours rather than the three days needed for Bacs payments.

But the system has also attracted the attention of fraudsters who see an opportunity to steal and get away with money before they are detected. The banks have recognised the need to upgrade their anti-fraud systems in response.

"Security technology has always been a high priority," said a Barclays spokesperson. "For the Faster Payments project it is a particularly relevant concern because the high volumes of payments and the speed at which the funds are transferred could potentially allow fraudsters to take advantage of this system and transfer [money] away quickly."

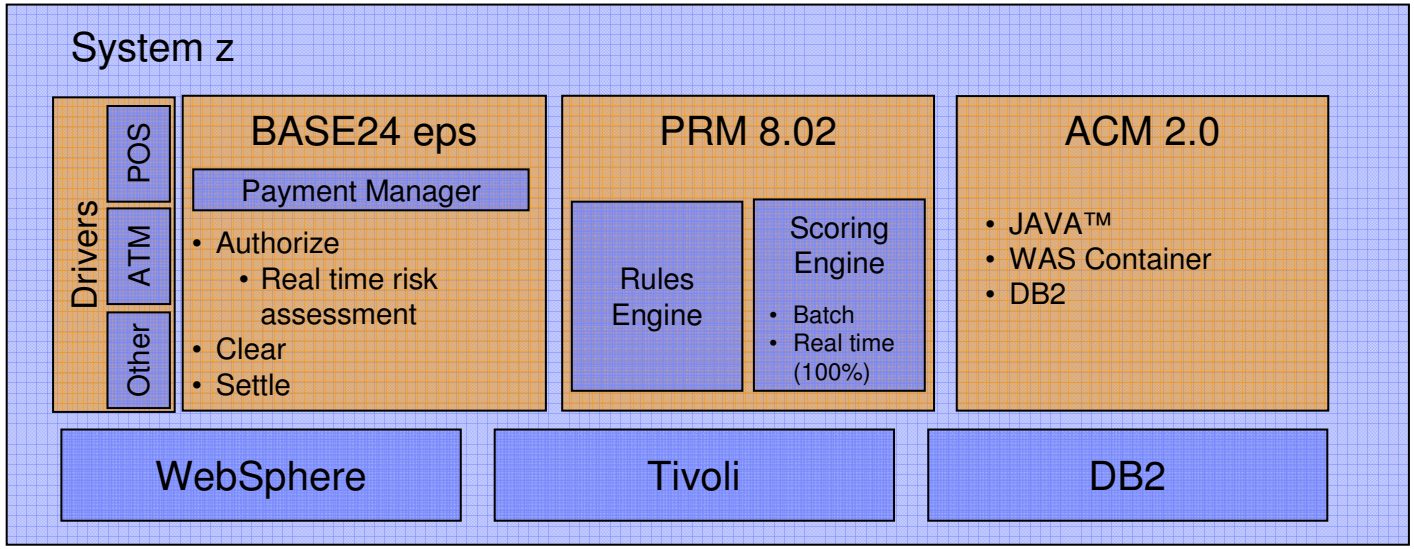
ComputerWeekly.com

ACI Proactive Risk Manager (PRM) provides holistic financial crime protection – fraud detection for credit, check, debit products across multiple channels including wire transfer, the branches, point of sale and ATMs



- ✓ Provides a holistic approach to fraud management
- ✓ Scalable to protect fraud on all products
- ✓ Monitors at a customer level
- ✓ Allows rapid detection of all fraud types, financial crime and compliance
- ✓ Simultaneous cross payment and product monitoring

IBM System z: The Reference Platform for BASE24-eps – IBM and ACI products are tightly integrated to achieve scalability, flexibility and efficiencies



PRM=Proactive Risk Manager

ACM=Automated Case Management

Key Advantages of z platform

- Shared hardware, software, support personnel, and processes
- PRM/CRM shares common database results in benefits in
  - Data integration
  - Operational efficiency
  - Long-term cost of ownership based on total transaction volume

➲ ***Integration on System z offers reduced overall complexity and therefore improved business flexibility and time to market***

System z10 Designed for New Customer Workloads

New System z10 based solutions for workloads and Industry processes that leverage the full power of System z10

- ACI BASE24-eps and ACI Proactive Risk Manager on System z10
- Data Warehousing on System z10
- Real-time Enterprise Business Intelligence on System z10
- Encryption Authentication - Digital Certificate Authority on System z10
- SAP Solution Edition on System z10

Dynamic Warehousing with System z
Mission-critical analysis of operational data

Agility

Performance

Rapid and secure user-access to data analysis

- ***Interactive executive dashboards and information portals***

Improved query and reporting optimizations

- ***SQL Procedures may be run on zIIP***

Up to 50% reduction of storage for indexes

- ***Improved index compression***

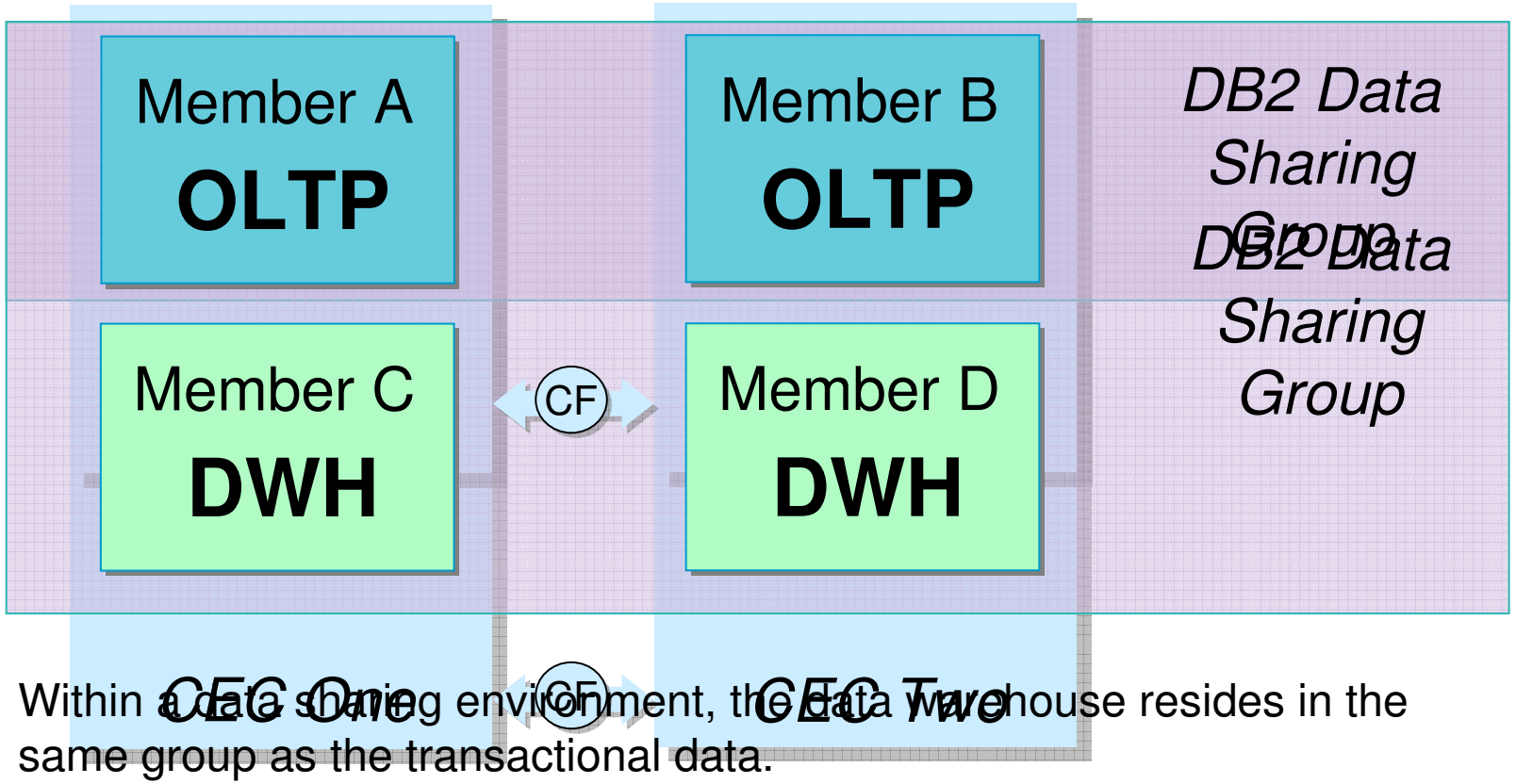
Up to 50% reduction of CPU utilization

- ***Across most utilities***

Over 1 Billion per Hour

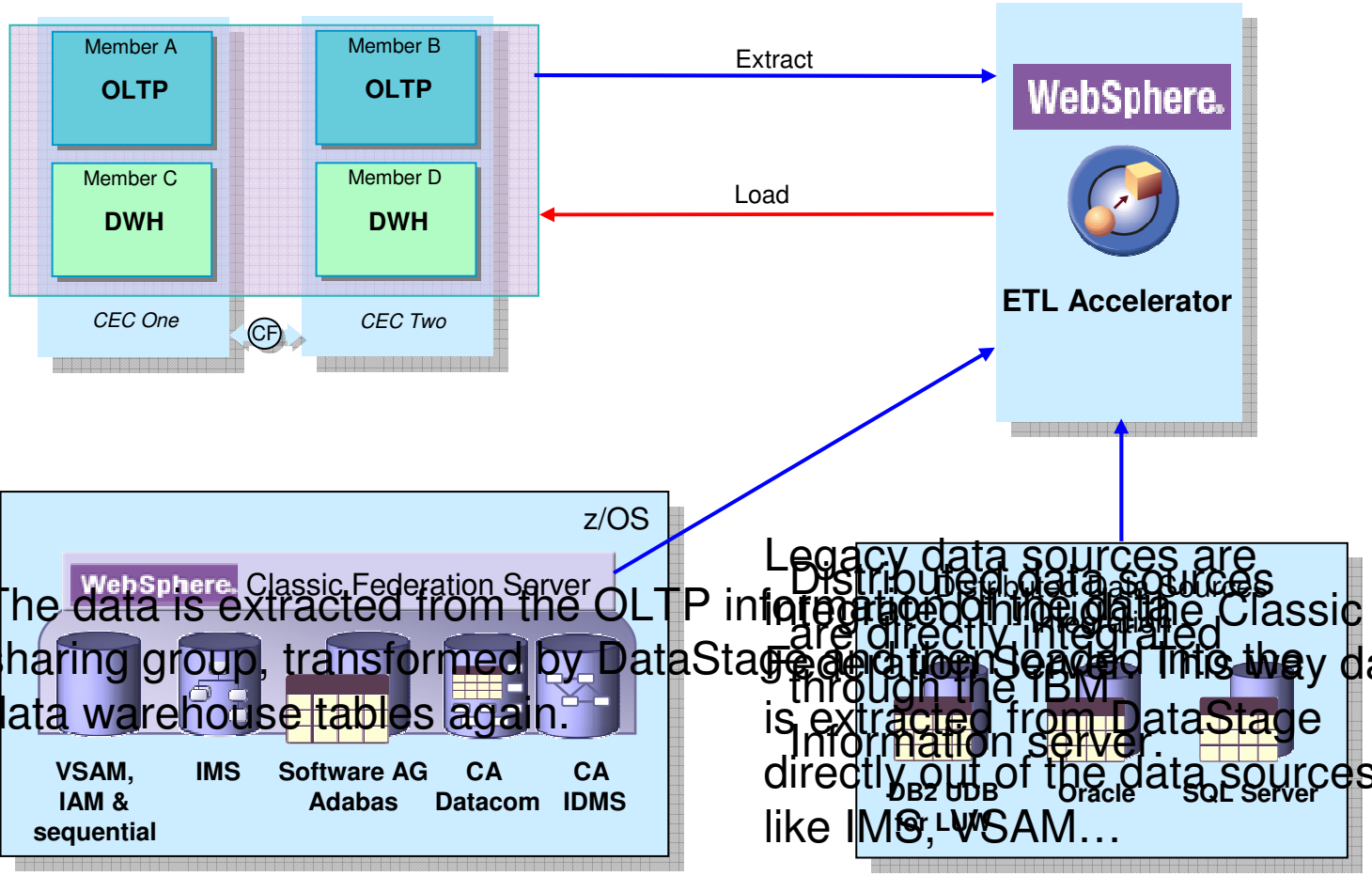
UPS runs DB2 for z/OS to support the world's largest known peak database workload - 1.1 Billion SQL statements per hour! (1)

Best Practice: Solution Architecture on System z



Within a data sharing environment, the data warehouse resides in the same group as the transactional data.

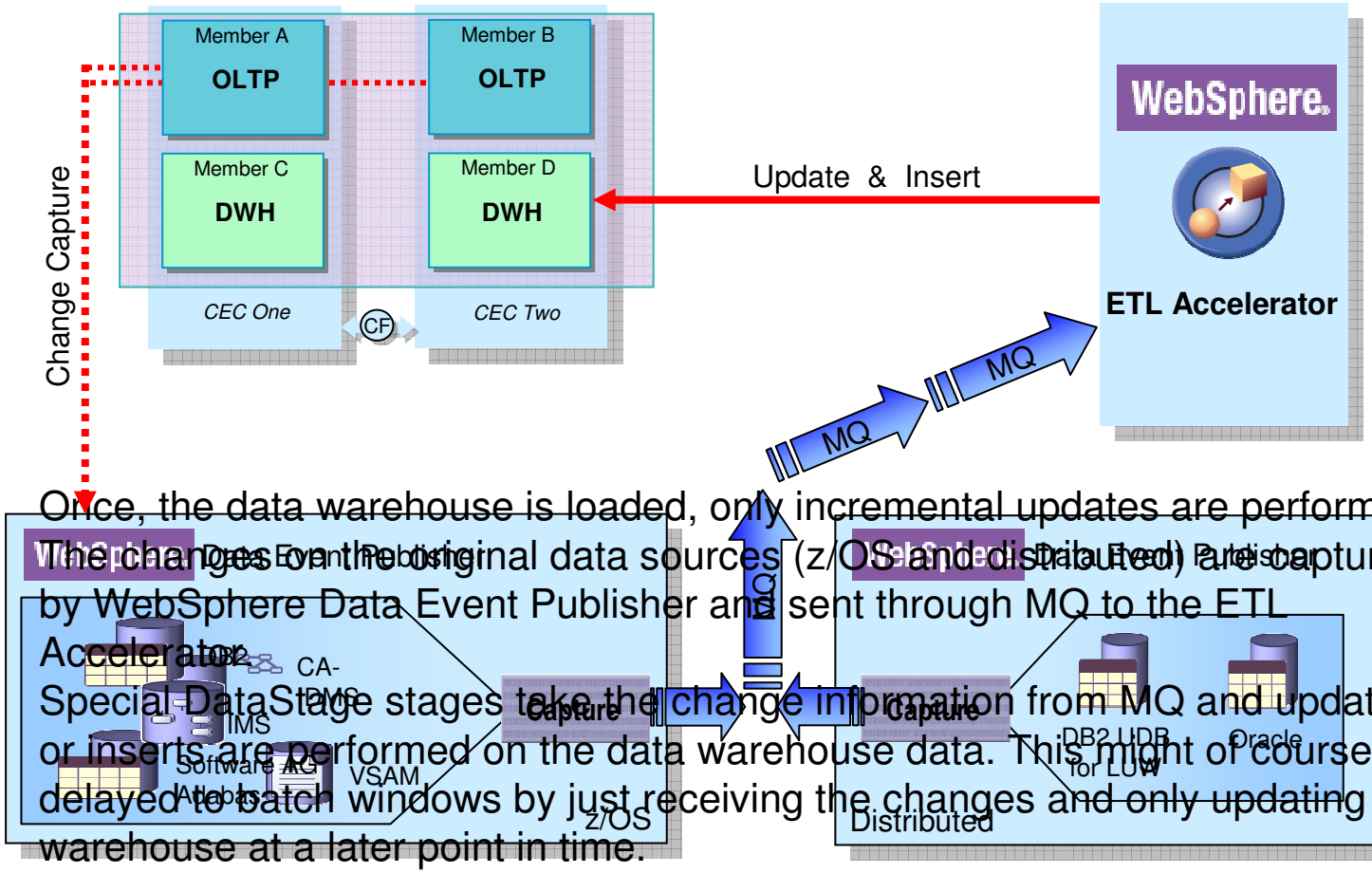
Best Practice: Initial load of the Data Warehouse



The data is extracted from the OLTP information data sharing group, transformed by DataStage and loaded into the data warehouse tables again.

Legacy data sources are integrated into the Classic Federation Server. This way data is extracted from DataStage directly out of the data sources like IMS, VSAM…

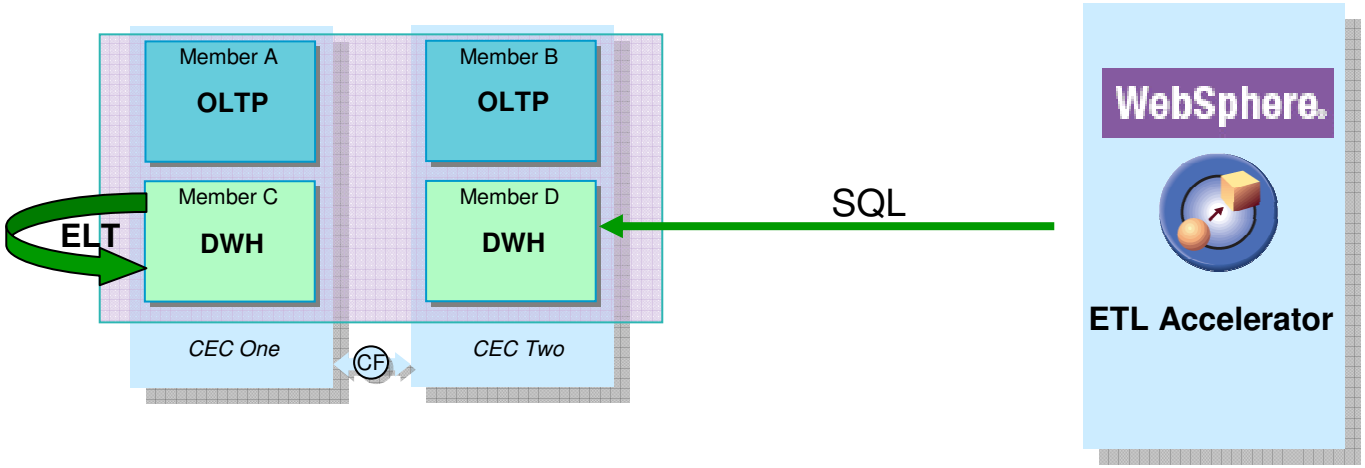
Best Practice: At runtime, DWH is updated incrementally



Once, the data warehouse is loaded, only incremental updates are performed. The changes on the original data sources (z/OS and distributed) are captured by WebSphere Data Event Publisher and sent through MQ to the ETL Accelerator.

Special DataStage stages take the change information from MQ and updates or inserts are performed on the data warehouse data. This might of course be delayed to batch windows by just receiving the changes and only updating the warehouse at a later point in time.

Best Practice: DB ELT is triggered by DataStage



Wherever possible, “In Database” transformations (ELT) are used to spare the transport of the data to the accelerator. But the used SQL is still sent from the ETL Accelerator to the database to have one place of documentation for all ETL steps.

This can also be used to shift the data up the hierarchy within the Layered Data Architecture.

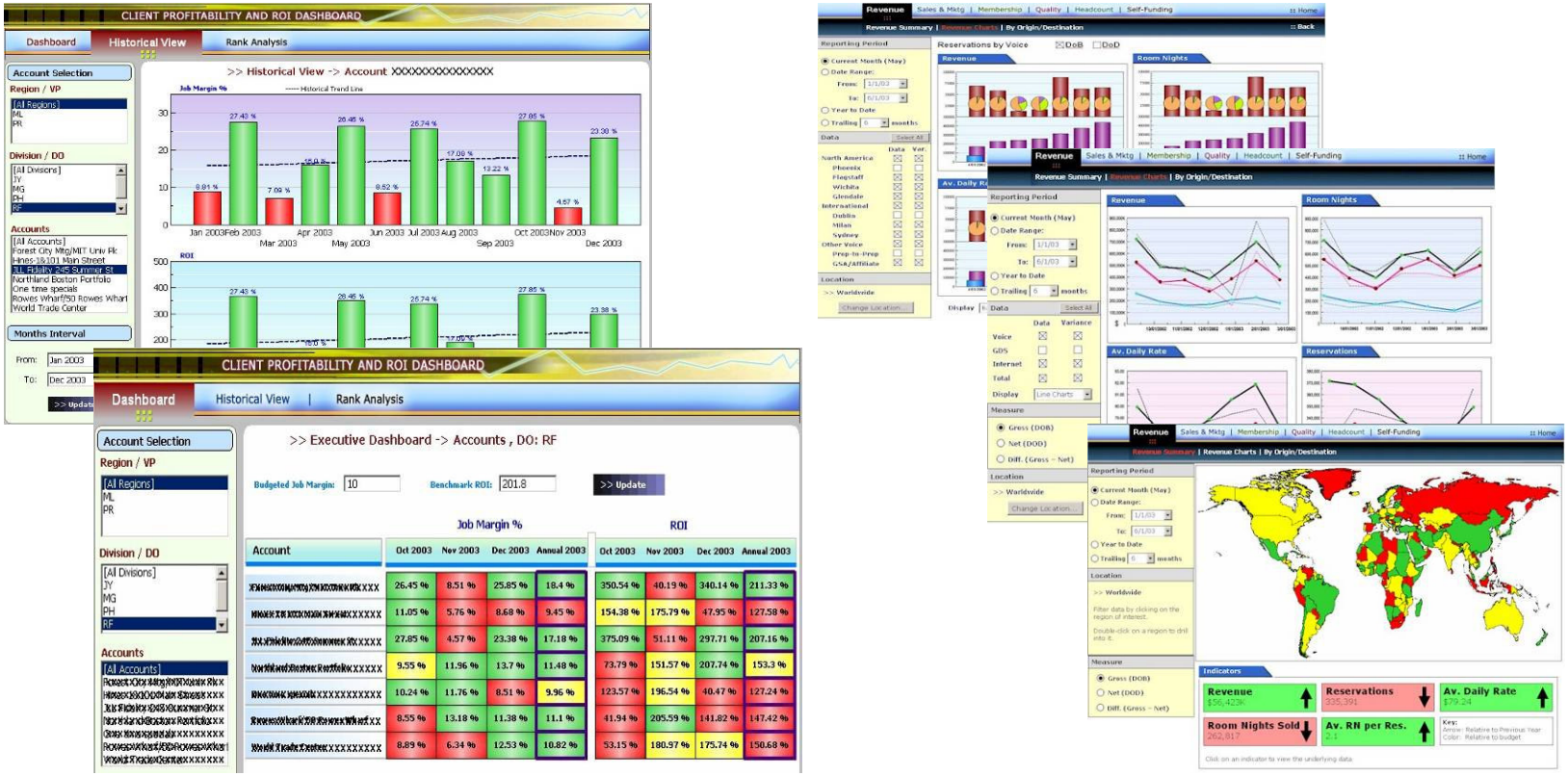
Simple example:

```
-- Aggregate by salary by department into AGGRSALARY
INSERT INTO AGGRSALARY ( DEPTCODE, AVGBAND, AVGSALARY )
  SELECT DEPTCODE, AVG( BAND ) AS AVGBAND, AVG( SALARY ) AS AVGSALARY
  FROM STAFF
  GROUP BY DEPTCODE
```


Summary

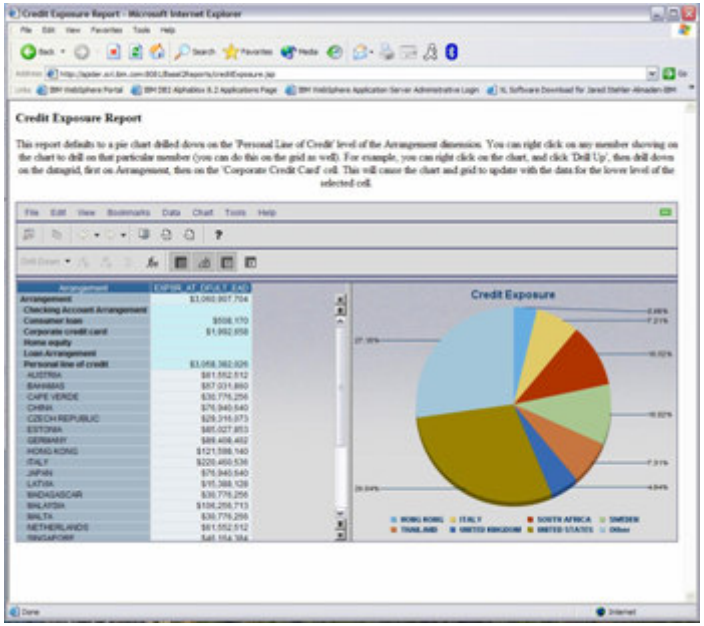
DataQuant – Visualisation of Data

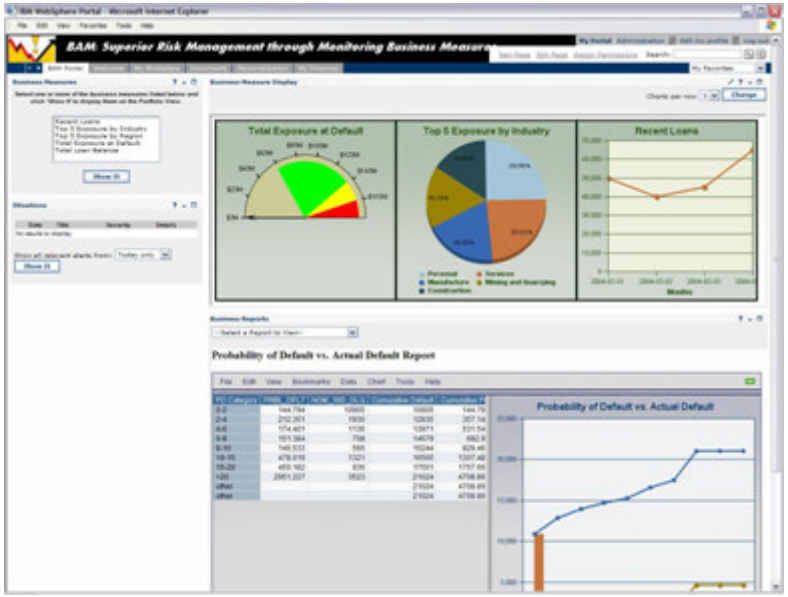
- Adds compelling new Warehouse/Business Intelligence component to DWH on z
- Visual Dashboards, Enhanced Graphical Reporting, Security and Personalization, SOA Layer, Enhanced Analytics, access to most relational databases
- Offers a “thick” client with DataQuant for Workstation, or a pure HTML, browser based client with DataQuant for WebSphere



IBM DB2 Alphablox – **data analytics directly via zLinux**

- Provide reporting and dashboard capabilities on key indicators
- Leverage operations such as ranking, ordering, filtering, trending, and other sophisticated statistical functions and calculations
- Drive data analysis from multiple data sources, both relational and multidimensional





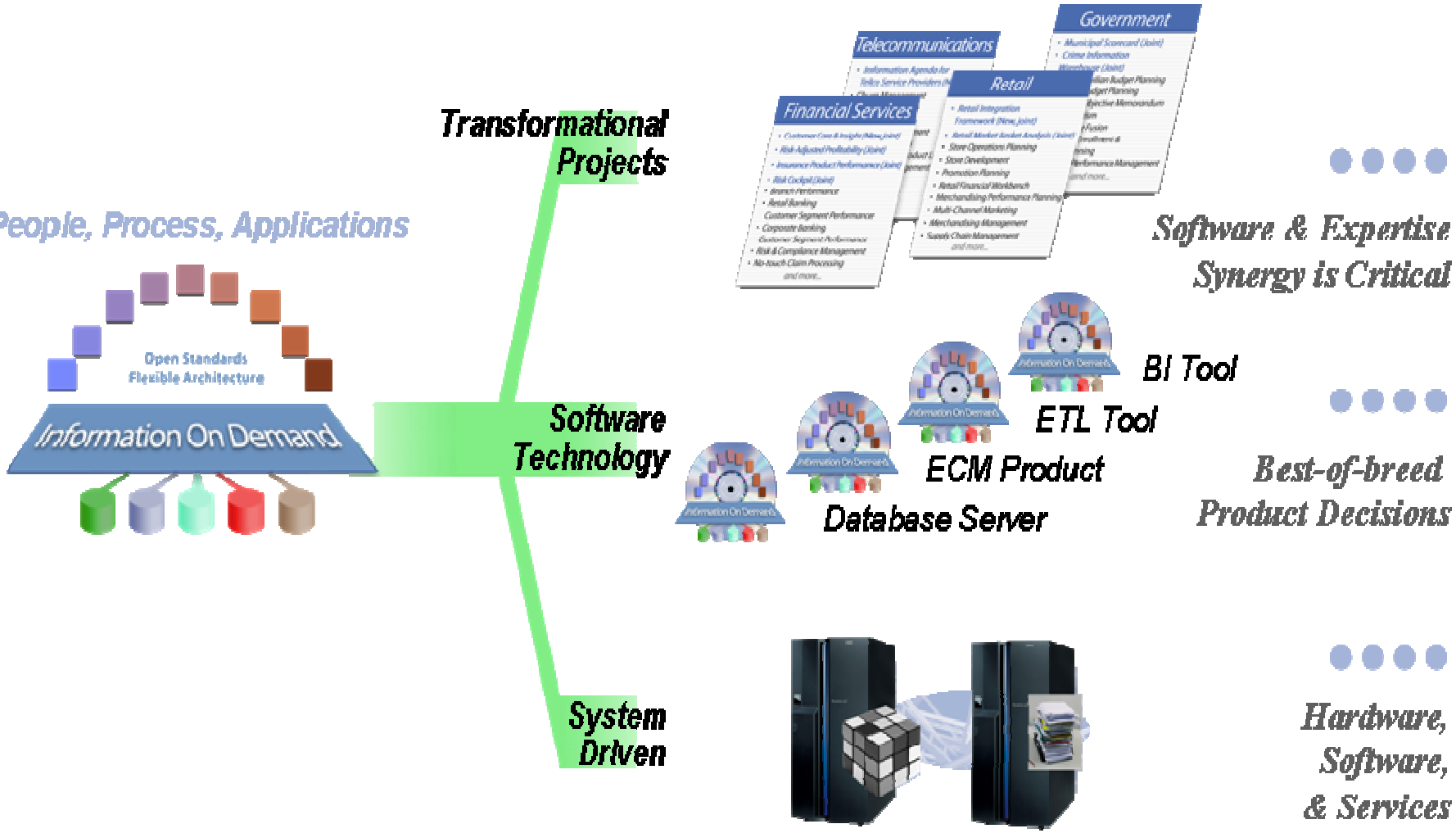
System z10 Designed for New Customer Workloads

New System z10 based solutions for workloads and Industry processes that leverage the full power of System z10

- ACI BASE24-eps and ACI Proactive Risk Manager on System z10
- Data Warehousing on System z10
- Real-time Enterprise Business Intelligence on System z10
- Encryption Authentication - Digital Certificate Authority on System z10
- SAP Solution Edition on System z10

Companies Buy BI Technology in Multiple Ways

IBM Addresses them All…With Cognos



One Platform, One Architecture

USER

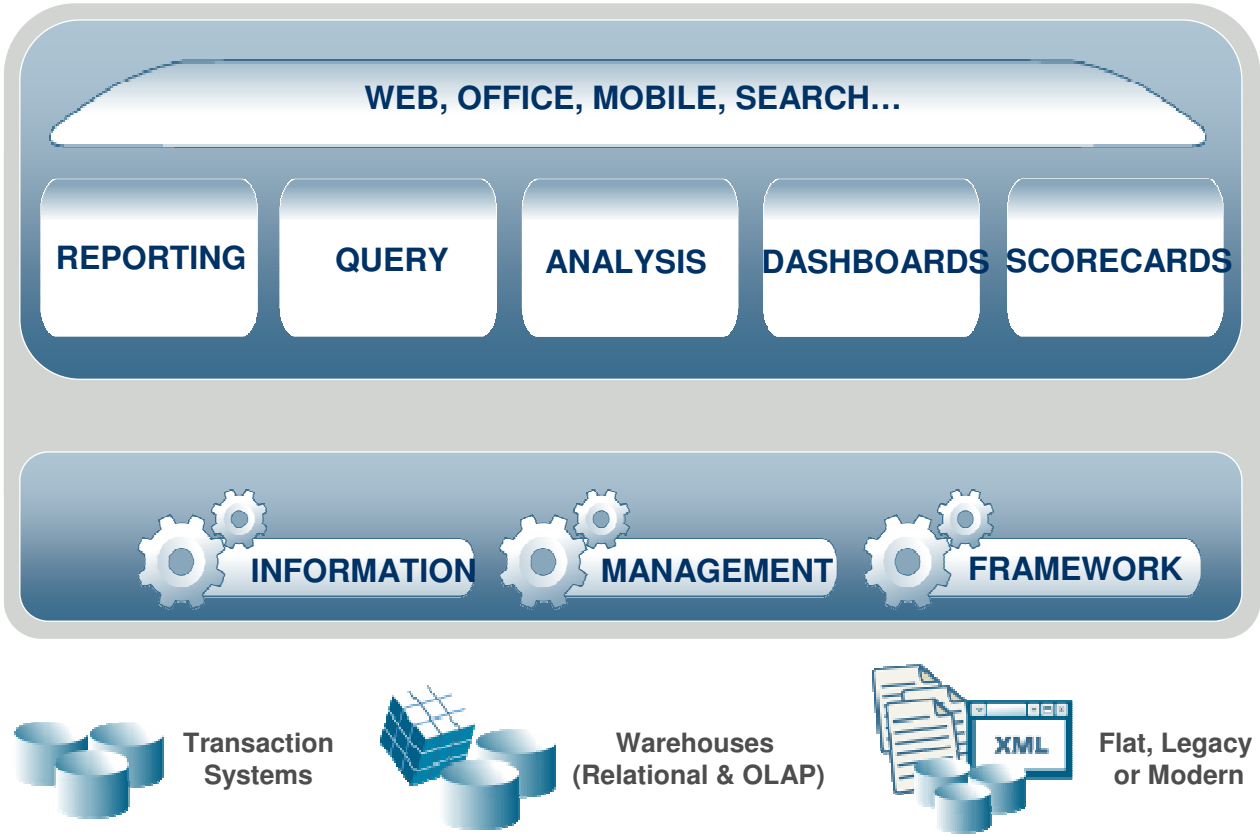
Zero Footprint
Task-Based Interfaces

SERVICES

Purpose-Built Web Services Architecture

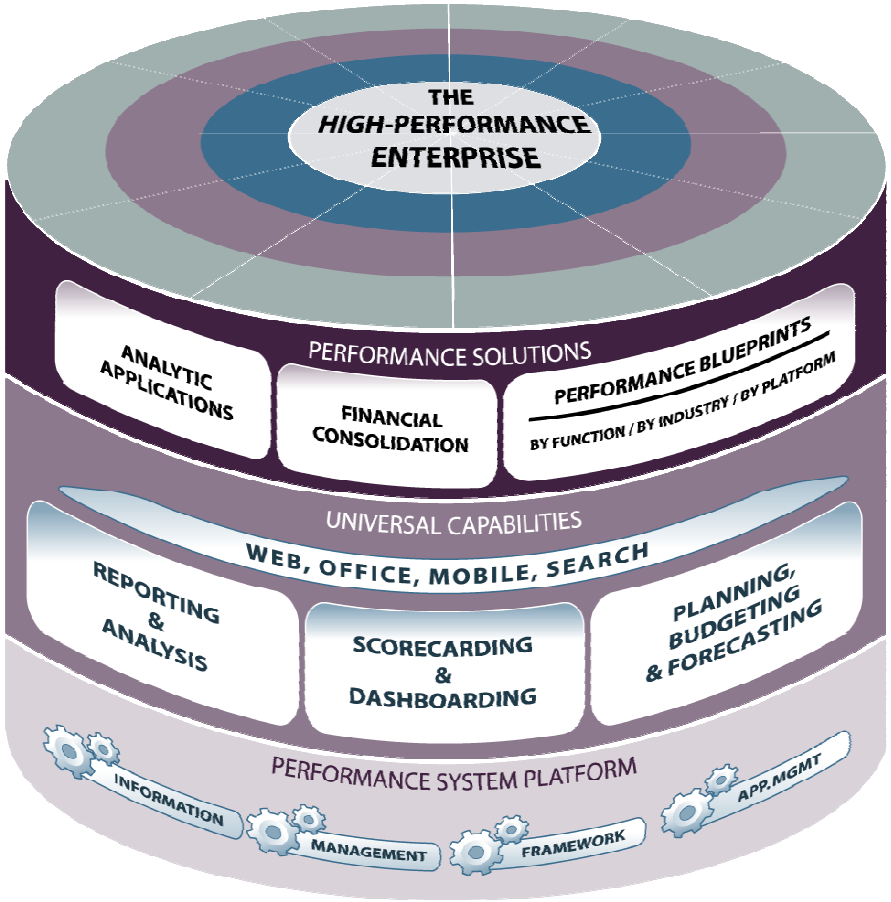
DATA

Open Data Access



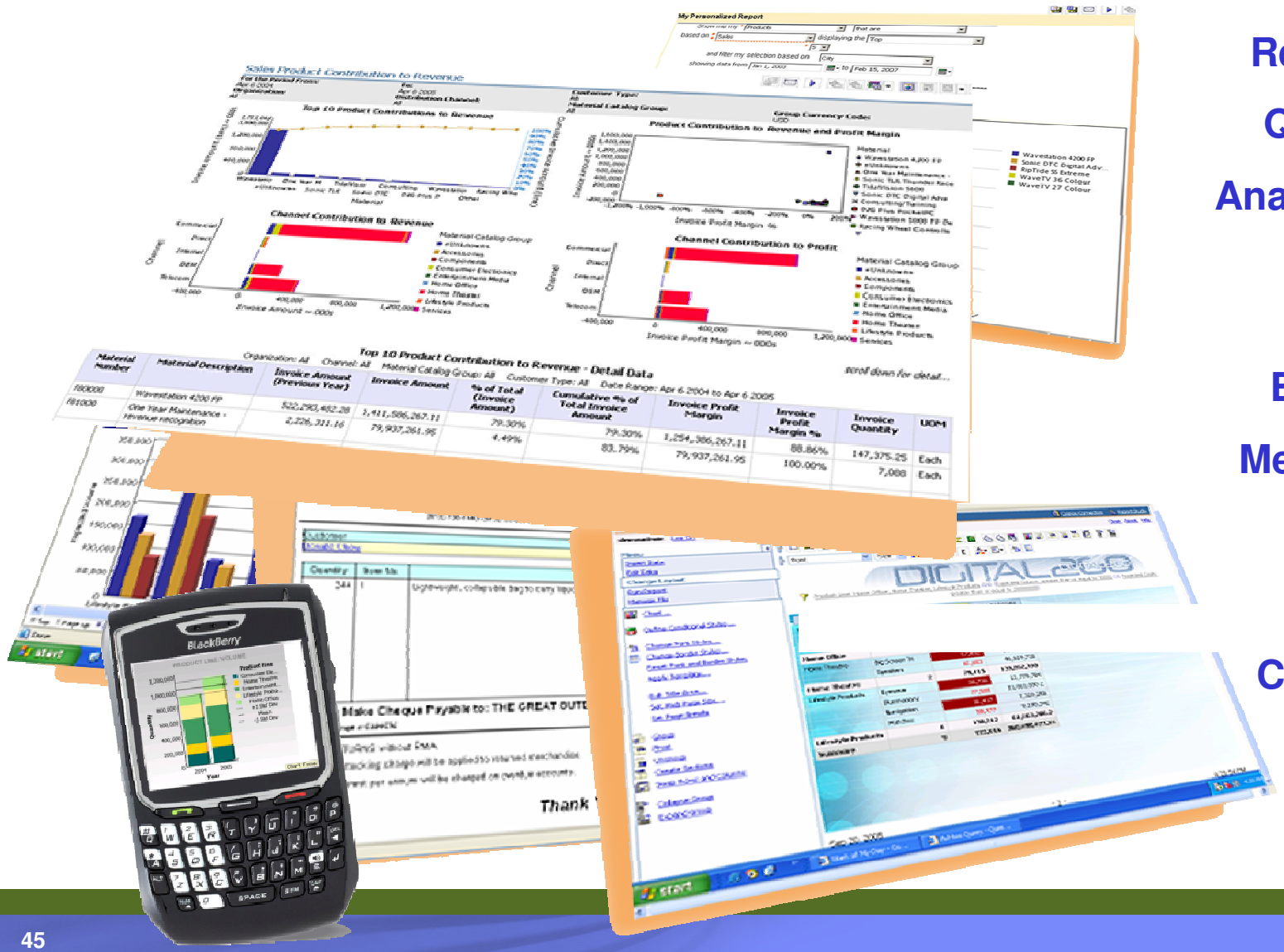
Cognos 8 BI from IBM

Cognos 8 Performance Management Platform



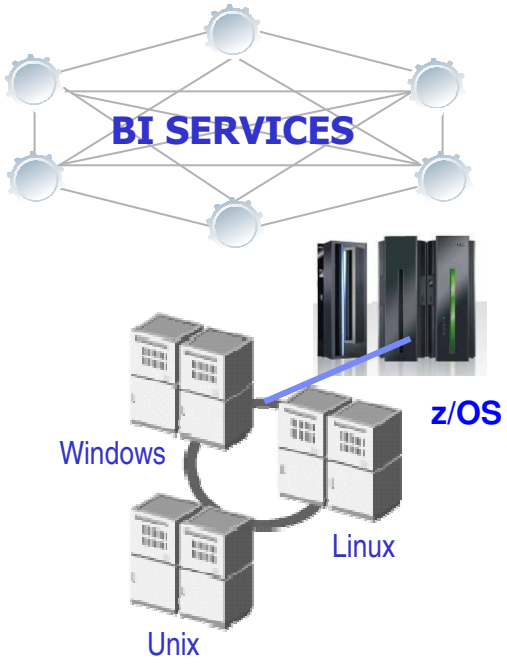
Cognos 8 BI for System z Linux

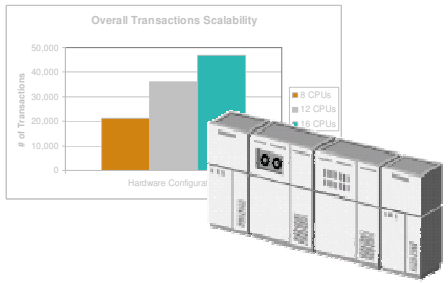
Cognos 8 BI Portfolio



- Report Studio
- Query Studio
- Analysis Studio
- PowerPlay Studio
- Event Studio
- Metrics Studio
- Go! Search
- Go! Mobile
- Cognos Now!

Cognos 8 – Enterprise Architecture





- Minimize risk on mission-critical deployments
  - **Peer-to-peer services provide infinitely flexible distribution with zero duplication and zero inter-dependency for full fault tolerance**
- Gain high performance AND IT agility
  - **Intelligent load balancing for optimized performance. Configurable rules eliminate manual tuning and easily adapt to change**
- Best leverage existing infrastructure
  - **Location transparency across heterogeneous operating environments – now and in the future**
- Confidently rollout to thousands of users
  - **Linearly scalability ensures predictability as user volumes and demands grow**

System z10 Designed for New Customer Workloads

New System z10 based solutions for workloads and Industry processes that leverage the full power of System z10

- ACI BASE24-eps and ACI Proactive Risk Manager on System z10
- Data Warehousing on System z10
- Real-time Enterprise Business Intelligence on System z10
- Encryption Authentication - Digital Certificate Authority on System z10
- SAP Solution Edition on System z10

Encryption Authentication – Digital Certificate Authority on System z10

Customer Needs

- Deploy secure transactions and network connections
- Securely exchange encryption keys
- Manage the lifecycle of digital certificates

System z Value Proposition

- Save thousands to millions of dollars by replacing third party hosting of digital certificates
- Full certificate life cycle management
- Highly available and highly secure

Saving costs

- Relatively low MIPS to drive thousands of certificates using no-cost feature of z/OS

Industry certification

- Certified by Identrust, a global leader in trusted identity solutions recognized by global financial institutions, government agencies and businesses

System z robustness

- Leverages resiliency and disaster recovery features
- Highly secure using mainframe access and audit controls and encryption features
- Services available to accelerate

New ISV support

- Venafi™ solutions for centralized digital certificate management now support z/OS Certificate Authority

System z10 Designed for New Customer Workloads

New System z10 based solutions for workloads and Industry processes that leverage the full power of System z10

- ACI BASE24-eps and ACI Proactive Risk Manager on System z10
- Data Warehousing on System z10
- Real-time Enterprise Business Intelligence on System z10
- Encryption Authentication - Digital Certificate Authority on System z10
- SAP Solution Edition on System z10

Today, a dynamic global economy poses significant challenges for delivering information across a business:

Pain Points

Delivering current information, in a 24x7 economy

- Globally dispersed organizations
- Data fragmented into geographies, time zones, and applications
- Outages impact overall business

Secure business data from intrusions

- Data breaches continue
- Identity information is the data at risk

Balance data center efficiency, against growing business needs

- Power cost and consumption are a real concern
- Redundant servers and components escalate costs

In the 21st Century, data availability is everything

What's new for SAP?
Introducing SAP Solution Edition for System z

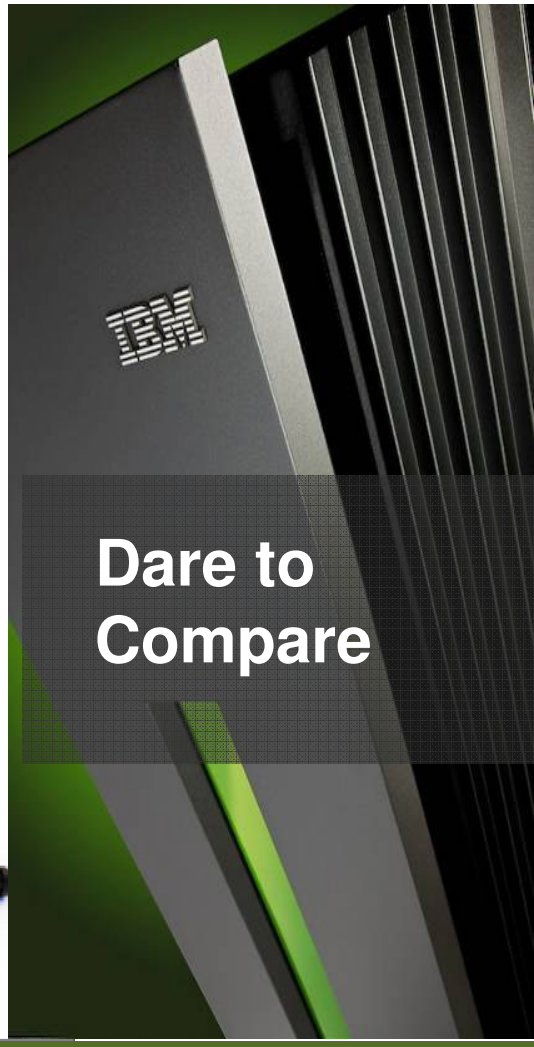
Delivering mission critical availability at a price that will surprise you

Offering a new pricing model:

- Bottom-line pricing
- Competitively priced
- Low cost of entry, with low cost growth

Leveraging the latest technology enhancements:

- Enhanced processor speeds
- Improved technology costs
- DB2 database enhancements



IBM SAP Solution Edition for System z10

New Pricing Model

- Bottom-line pricing
- Competitively priced
- Low cost of entry, with low cost growth

System z Value Proposition

Bringing new levels of Value for SAP on System z

- Continuous Availability
- Unlimited Scalability
- Security
- Manageability
- Workload Consolidation
- Total Cost of Ownership

Provides

Current information, in a 24x7 economy

- Globally dispersed organizations
- Data fragmented into geographies, time zones, and applications
- Outages impact overall business

Resolves

Secure business data from intrusions

- Data breaches continue
- Identity information is the data at risk

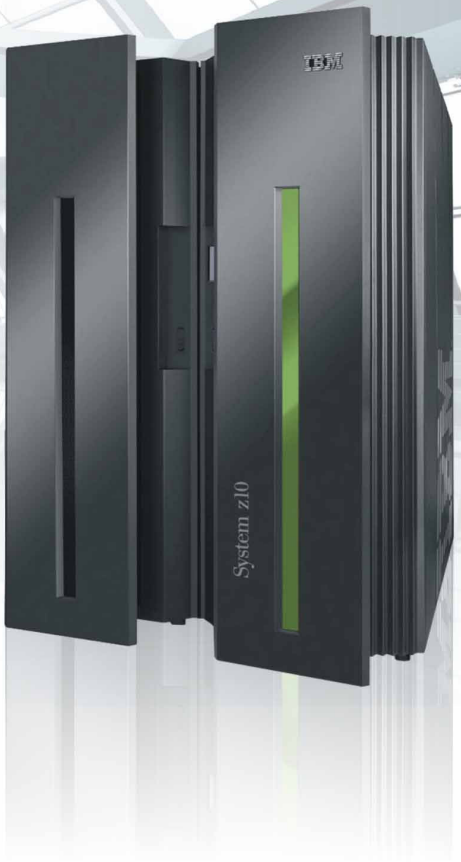
Delivers

Balance data center efficiency, against growing business needs

- Power cost and consumption are a real concern
- Redundant servers and components escalate costs

Lesson 4:

Consolidating and *Virtualising* workloads from other platforms



Service Oriented Architecture and Industry Specific Solutions

Powered on System z10

Banking and Payments

- ACI Worldwide's BASE24-eps for Banking Payments
- EFD Data Navigator for Banking Payments
- Core Banking Renovation with SmartBank SOA Solutions
- Enterprise Payments Platform powered by System z
- SAS Fraud Management

Insurance Industry

- Life Insurance SOA on System z

Public Sector

- *Informs* Student Information System (SIS^{J2K})
- Integrated Case Management with Cúram Software

Automotive Industry

- Supplier Parts Quality on System z

Payments Solutions leveraging the strengths of System z

Customer Needs

- Reduce fraud exposure
- Comply with new standards and regulations
- Enhance customer service
- Achieve a single view of the customer relationship
- Improve operational effectiveness

System z Value Proposition

- Robust and flexible platform for enterprise payments processing
- Performance, scalability and reliability supporting high-volume and highly available transaction processing

ACI Worldwide's BASE24-eps

- Supports payment transaction flexibility
- A major UK bank is implementing on mainframe to meet requirements for real-time funds transfer between retail bank accounts

EFD DataNavigator®

- Enables a real-time enterprise-wide view of all consumer transactions.
- DataNavigator forms the transaction management layer of EFD's Enterprise Payments Framework.

SAS® Fraud Management

- Enables real-time protection against credit and debit card fraud using sophisticated analytic intelligence
- HSBC leverages mainframe to manage card portfolio and reduce fraud

Core Banking and Insurance Solutions Leveraging the SOA Strengths of System z

Customer Needs

- Address consumer demands for more personalized service and product flexibility
- Respond to regulatory pressures
- Extend the functionality of existing core systems
- Improve operational effectiveness

System z Value Proposition

- The solutions, which address key business processes, showcase the mainframe's strengths as the SOA and data integration hub for insurance and banking core systems

Life Insurance SOA Solutions

- System z based IBM middleware and ISV solution components include DB2, WebSphere Process Server, WebSphere Customer Center, Workplace Forms and Tivoli Enterprise Monitoring; LIDP, Allfinanz, Mapinfo, and Informatica.

Core Banking SOA Solutions

- System z based IBM middleware and ISV solution components include WebSphere Process Server, MQ, CICS® Transaction Server, DB2 and Tivoli; Fidelity Information Systems, and ACI

Enterprise Payments Platform (EPP) powered By System z

- System z based IBM middleware and ISV solution components include WebSphere Process Server, Message Broker, MQ, DB2 and WebSphere Transformation Extender; ACI and Intercope.

Public Sector Solutions leveraging the value of System z10

Customer Needs

- Cut costs and increase operational efficiency
- Allow students access to their own data over the Internet
- Respond quickly to clients needs and changes in government policies

System z Value Proposition

- Flexible and resilient platform for student information systems and integrated case management across the enterprise
- Advanced security features for controlling system access and ensuring confidentiality

Informs Student Information System (SIS^{J2K})

- Web-based Student Information System developed by Information Management Specialist, Inc. (*Informs*)
- System z solution components include WebSphere Application Server and DB2. SIS^{J2K} can run on either the z/OS or Linux® operating Systems.

Integrated Case Management with Cúram Software

- Cúram Business Application Suite™, designed for social enterprises enables an integrated service delivery model
- System z solution components include z/OS, DB2, DB2 Content manager for z/OS, and MQ.
- Utah Department of Human Services implemented on mainframe to integrate service delivery and improve eligibility determination.

Automotive's Supplier Parts Quality Solution on System z10

Customer Needs

- Today, manufacturers from a variety of industries, especially automotive, face a number of major supplier quality issues, including maintaining the quality of the overall product while outsourcing (direct and indirect) many of the materials and parts used in the manufacturing process.

System z Value Proposition

- Provides business insights into parts quality to avoid excessive warranty costs and issues related to manufacturing.

Solution Composition

- DB2
- Alphablox
- Data Warehouse Edition
- WebSphere
- GBS Customized assets

System z Helping to Meet Automotive Needs

- The automotive industry has experienced significant increases in warranty claims that have been tied to an increase in supplier (sub-tier) components – where 67% of warranty costs are parts related, and 33% are labor related.


IBM
The Future Runs on System z

System z and z/OS Security

- ISS
- Global Services: Security & Privacy Consulting
- IBM Services: Ethical Hacking

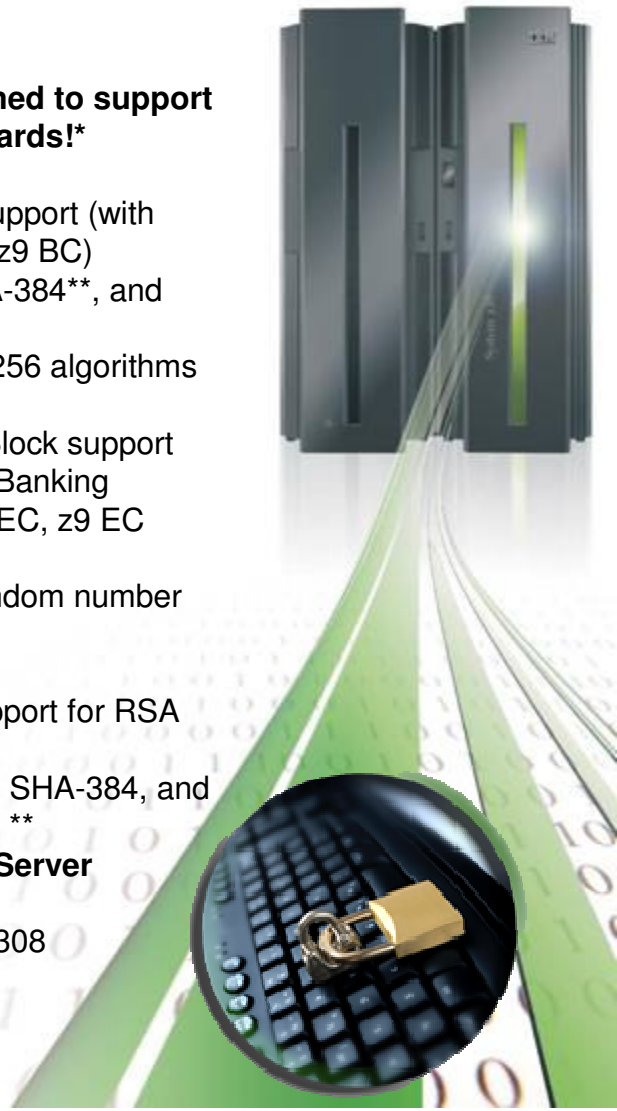
- z/OS CommServer (IDS)
- System zAlerts
- SMF & Tivoli zSecure
- z/OS Healthchecker
- DB2 Audit Tool

- Robust Encryption Infrastructure
- Tape encryption
- DB2 & IMS Encryption & Test Tools
- z/OS Encryption Facility V1.2 (Jan 2007)
- Network encryption: SSL/TLS, IPSec, AT-TLS, OpenSSH, NSS
- ISO Format 3 Pin Block (1.9)

- System Integrity
- RACF MLS
- z/OS PKI Services
- Tivoli Identity Manager (TIM)
- Tivoli Federated Identity Manager (TAM)
- Tivoli zSecure

- EAL 5 for z9 LPAR
- EAL(1.8) & FIPS Certifications
- Linux on System z as DMZ
- z/OS CommServer Security

- **With z/OS V1.10, designed to support industry security standards!***
- **ICSF**
  - 4096-bit RSA key support (with z10 EC, z9 EC and z9 BC)
  - IBM: SHA-224, SHA-384**, and SHA-512**
  - AES-192 and AES-256 algorithms **
  - ISO Format-3 PIN Block support (meets ISO 9564-1 Banking standard) (with z10 EC, z9 EC and z9 BC)
  - ALSO in ICSF - Random number callable service
- **System SSL**
  - Utilize hardware support for RSA digital signature **
  - SHA-224, SHA-256, SHA-384, and SHA-512 algorithms **
- **z/OS Communications Server**
  - IPV6 standards RFCs 4301-4305, 4308

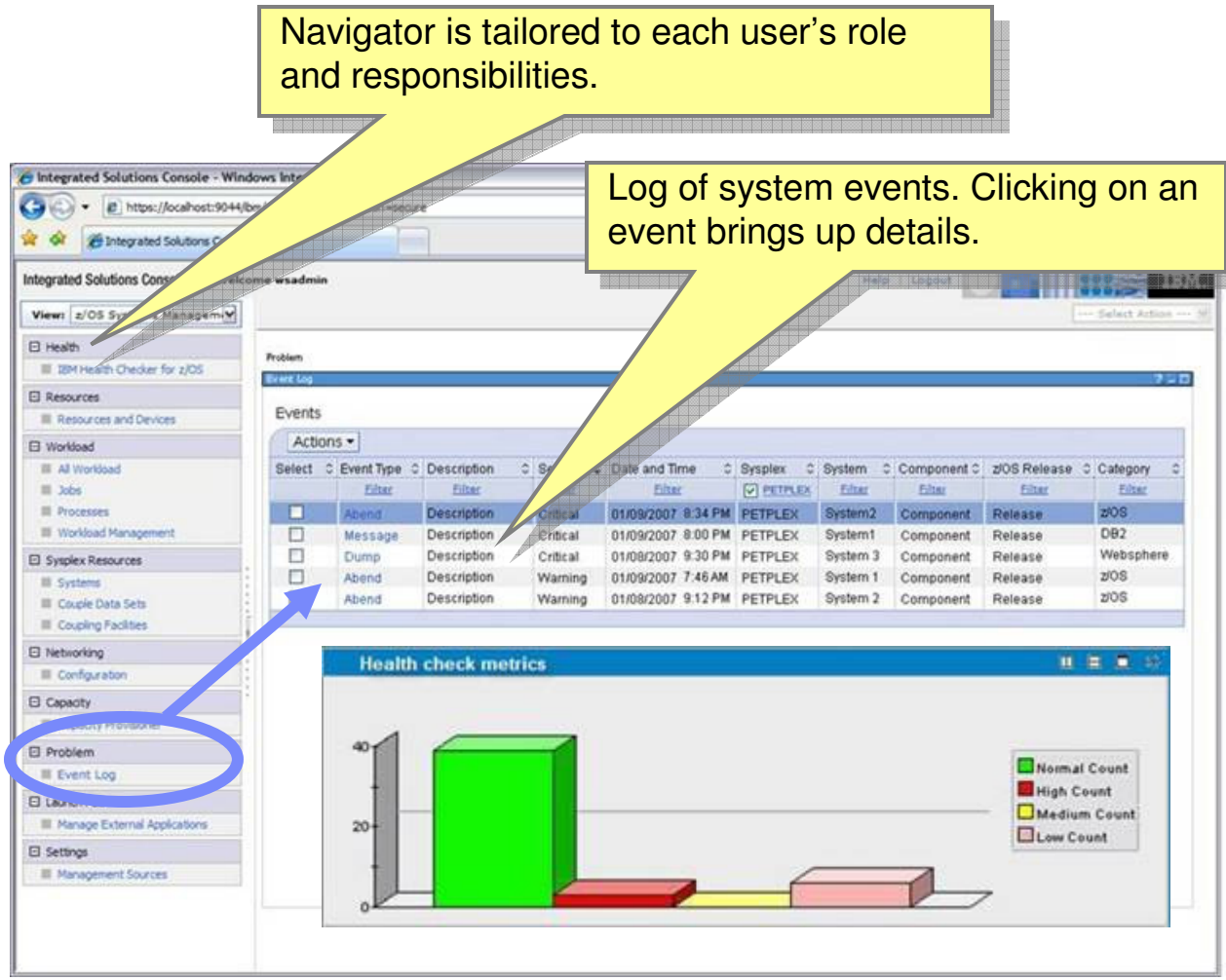


* Statements regarding IBM future direction and intent are subject to change or withdrawal, and represents goals and objectives only.
**With appropriate HW

A z/OS Management Facility *

A Web-browser based management console for z/OS

- **Designed to provide the infrastructure, services, and interfaces to support a browser based graphical user interface needed to support a management console for z/OS.**
- **This initial release of the z/OS Management Facility plans to provide job and process management and Parallel Sysplex management support.**



* Statements regarding IBM future direction and intent are subject to change or withdrawal, and represents goals and objectives only.

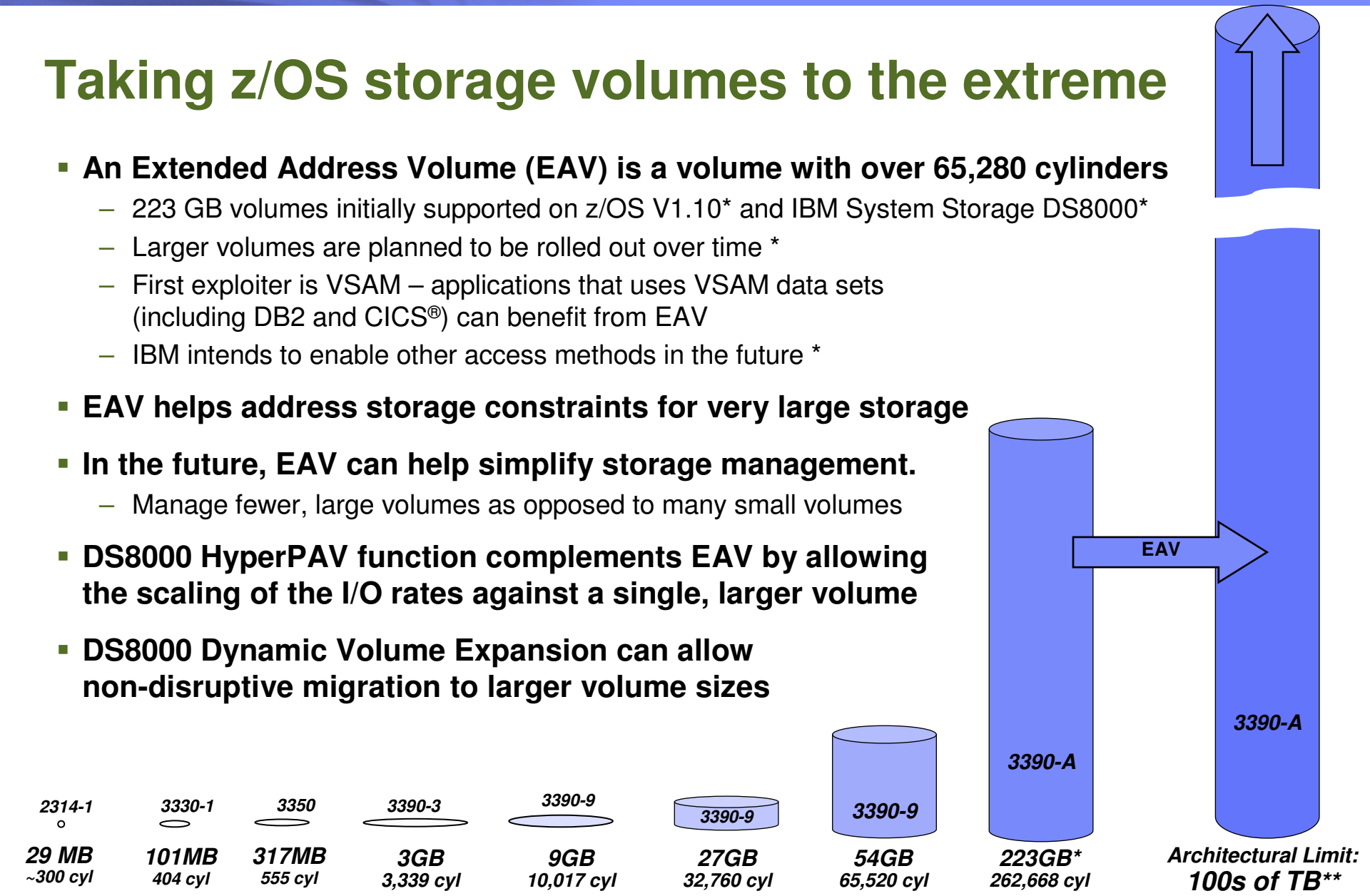
z/OS optimization and management*
Announced/Previewed with z/OS with z/OS V1.10

- **Policy based Capacity Provisioning for System z10**
  - A new Capacity Provisioning Manager planned for z/OS V1.10 (and z/OS V1.9 with PTF) plans to monitor System z10 servers and manage z/OS 1.9 and 1.10 systems and add /remove temporary capacity automatically.
  - In the future, z/OS will allow authorized applications to query, change, and perform basic operational procedures against the installed System z hardware base - efficiently deploying server resources when needed*
- **z/OS Workload Manager:**
  - Improved Contention Management
    - Longer promotion, will now promote resource holders to the priority of the highest-priority waiter
  - WLM to manage more address spaces in service class SYSTEM:
    - XCFAS, GRS, SMSPDSE, SMSPDSE1, CONSOLE, IEFSCHAS, IXGLOGR, SMF, and CATALOG (in addition to *MASTER* and WLM)
  - More Performance Block (PB) delays
    - Up to 15 from 5
    - Applications can specify names to replace the default names
  - zIIP CPU management = Manage zIIPs like CPs and zAAPs

* Statements regarding IBM future direction and intent are subject to change or withdrawal, and represents goals and objectives only.

Taking z/OS storage volumes to the extreme

- **An Extended Address Volume (EAV) is a volume with over 65,280 cylinders**
  - 223 GB volumes initially supported on z/OS V1.10* and IBM System Storage DS8000*
  - Larger volumes are planned to be rolled out over time *
  - First exploiter is VSAM – applications that uses VSAM data sets (including DB2 and CICS®) can benefit from EAV
  - IBM intends to enable other access methods in the future *
- **EAV helps address storage constraints for very large storage**
- **In the future, EAV can help simplify storage management.**
  - Manage fewer, large volumes as opposed to many small volumes
- **DS8000 HyperPAV function complements EAV by allowing the scaling of the I/O rates against a single, larger volume**
- **DS8000 Dynamic Volume Expansion can allow non-disruptive migration to larger volume sizes**



* When available z/OS V1.10 GA planned to be 3Q 2008, DS8000 function planned 2H 2008
Statements regarding IBM future direction and intent are subject to change or withdrawal, and represents goals and objectives only.

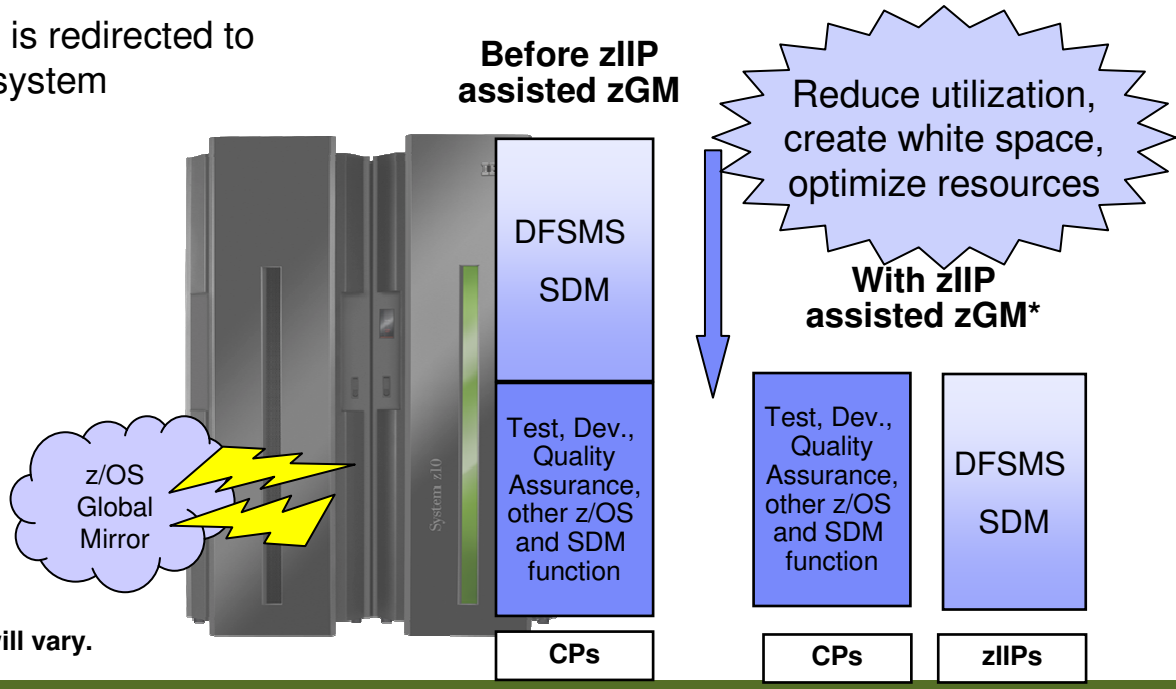
zIIP Assisted z/OS Global Mirror: a cost effective mirroring solution

- **z/OS Global Mirror (formerly Extended Remote Copy, XRC) is enabled for the zIIP**
  - z/OS DFSMS™ allows a part of System Data Mover (SDM) processing to be eligible for the zIIPs
  - Most SDM processing associated with zGM/XRC is made eligible to run on the zIIP.

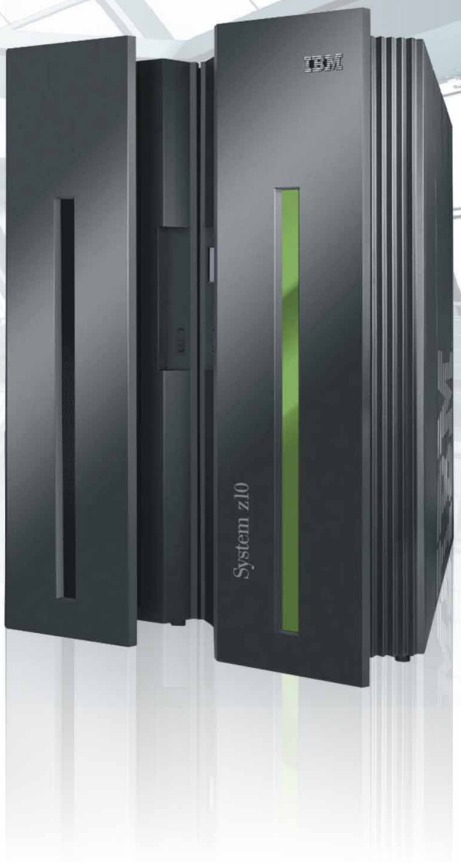
- **zIIP assisted z/OS Global Mirror function, can help provide better price performance and improved utilization of resources at the mirrored site.**
  - A part of DFSMS SDM processing is redirected to a zIIP processor which can lower system utilization at the mirrored site.

- **Available with:**
  - z/OS V1.10 (when available), or z/OS V1.9 and V1.8 with PTF for APAR OA23174
  - IBM System Storage DS8000, or any storage controller supporting z/OS Global Mirror
  - IBM System z9 or z10 server

* **For illustrative purposes only, your results will vary.**



What our ISV's are doing..?



What our ISVs are saying about System z

CÚRAM® SOFTWARE	*"Offering Cúram for deployment on Linux for IBM System z underscores our commitment to providing customers with the widest possible range of implementation choices," said Ronan Rooney, chief technology officer, Cúram Software. "The mainframe's mature and powerful industry leading virtualization technology has allowed IBM to continue to improve energy efficiency, add capacity dynamically and provide platform flexibility. Cúram applications deployed on Linux on System z will help our customers to further simplify their IT infrastructure and ultimately lower costs without sacrificing reliability - this is critical to the success of any software implementation."*
sas	*"BM's mainframe systems are important to the SAS Enterprise Intelligence Platform. IBM's new System z10 Business Class mainframe enables SAS customers to execute business intelligence and advanced analytic functions at an enterprise level on state-of-the-art hardware. By working together to ensure critical BI and analytic applications can operate effectively on the mainframe – which helps significantly reduce energy, space and cooling costs – SAS and IBM are actively enabling their mutual customers to support their own corporate sustainability efforts. "– Craig Rubendall, Director, Research and Development*
software AG	*"The demands being placed on core transactional systems, such as trading platforms, continue to grow to unprecedented levels. What hasn't grown are the budgets required to support these mission-critical systems," said Joe Gentry, Software AG's Chief Technology Officer for the Enterprise Transaction Systems division. "By moving aggressively to support new and emerging platforms such as [zMR], Software AG is helping customers take advantage of faster and more efficient systems to meet these requirements*
innovation group	*"As critical as product and service differentiation is in the global Property & Casualty Insurance Industry, business interruption is inexcusable. Innovation Group clients deploying our enterprise software solutions on System z leverage the mainframe's unparallel performance and bullet-proof reliability to gain competitive advantage in this highly competitive industry."* **Andrew Labrot, Jr., CTO, Innovation Group**

What our ISVs are saying about System z

bmcsoftware	*"BMC Software and IBM are committed to ensuring that the mainframe remains the most scalable, reliable and secure platform for commercial applications", said Bill Miller, senior vice president and general manager of BMC's Mainframe Service Management business unit. With our 'day one' support of IBM's zOS V1 Release 10, BMC Software is further demonstrating its ability to provide service optimization and efficiency improvements across the mainframe whenever our customers are ready to deploy the latest technologies. BMC's recent mainframe industry survey indicated that the platform will continue to grow and attract new workloads and BMC's support of zOS Release 10 is just one more way we can demonstrate our leadership in technology innovation and give our customers superior support for their demanding and critical environments." - Bill Miller, Senior Vice President and General Manager, Mainframe Service Management*
ca	**"CA's comprehensive solutions for System z enable IT organizations to maximize the scalability, security, and reliability that continue to make the mainframe both the greenest and most cost-effective choice for hosting business-critical IT services." - Chris O'Malley, Executive Vice President and General Manager, Mainframe Business Unit** *Customer quote from CA:* *"As the volume and complexity of our IBM System z mainframe workloads keep growing, we need management tools that ensure our ability to keep pace—despite the resource constraints we face in IT," said Rich Resnick, Manager of Systems and Operations, University Community Hospital, a not-for profit community hospital network strategically represented throughout the Tampa, Fla. Metropolitan area. "By continuing to add high-value features and functionality to its already-rich management solutions portfolio, CA has demonstrated its ongoing commitment to fulfilling this need."*
Computer Corporation of America	"The IBM mainframe has always been the platform of choice for the large scale enterprises that choose Model 204 as their strategic database platform. The ever increasing capacity, flexibility and reliability of the System z mainframes ensures that this platform will support the growth of their businesses. The new, entry-level machines will enable smaller enterprises to plan for growth with confidence." - Chris Ramsdale, Director of Strategic Product Planning
DataDirect Technologies	"Designed to meet the evolving integration needs of System z mainframe customers, DataDirect Shadow provides a single, industry standard architecture to streamline legacy data access and mainframe SOA enablement, allowing organizations to more rapidly develop and deploy new business services with reduced complexity and cost. Shadow's patent-pending technology can exploit the zIIP and zAAP specialty engines across a wide range of workloads and target systems for lower mainframe TCO and improved performance." - Gregg Willhoit, Chief Software Architect, DataDirect Technologies.

What our ISVs are saying about System z

	"Our customers tell us they need 24 x 7x 365 availability, the capability to sustain application growth, meet privileged information protection responsibilities and contain cost. And that is exactly the features we see IBM providing in the new IBM z10 processors and z/OS 1.10 operating system". -Thomas J Meehan, Vice President
	"T-REX ensures the health of your ICF catalogs and TMC which are critical to data availability, integrity, recoverability. Xtinct ensures security standards are met by permanently and irrevocably deleting the original data. " - Murray Kruger, CEO
	"DTS Software is committed to enhancing the mainframe platform by providing the most up to date software to meet the needs of our customers with support for z/OS 1.10 and EAV on GA of z/OS 1.10." - Don Thimsen, President
	"Our flagship mainframe SOA product, Ivory Service Architect, is designed for the System z, exploiting many of its key architectural strengths. GT Software is a leading mainframe SOA solution provider, with our products optimized for System z. In my opinion, the System z will continue to grow and emerge as the dominant server for mainframe Web services." - Steve Able, Vice President of R&D

What our ISVs are saying about System z

	"Our clients are able to achieve significant cost reductions and compliance improvements when using eventACTION and ussACTION to assist them in managing their mainframe environments.“ Gord Tomlin, Action Software International (a division of Mazda Computer Corporation)
	“RealTime Defrag (RTD) installations optimize use of their mainframe DASD space in real-time while ensuring SLAs are met and energy costs are reduced.” Howard Kirby, Director International Operations
	“I/S Management Strategies, Ltd.'s LPAR Capacity and Software Usage Analysis (LCS) is ready on Day 1 to assist sites in auditing and managing their IBM software charges on all levels of z/OS and any System z hardware.” Al Sherkow, I/S Management Strategies, Ltd
	“Clients use our mainframe printing, debugging, and productivity software tools to deliver robust, reliable and secure mainframe applications to their end users and business units.” Mike Marler, President, MacKinney Systems, Inc.

What our ISVs are saying about System z

NEON Enterprise Software, Inc.	"NEON Enterprise Software, Inc. is committed to providing value-add solutions which utilize and exploit the power of IBM's System Z technology. We are partners in helping our combined customers understand that with its reliability, security, scalability, and overall lower TCO, there is no better source for business application computing than System Z."
PHOENIX Software International	"(E)JES customers agree that robust spool and system management is one of the qualities of service that help make z/OS and System z their first choice for deployment of new business applications." – Amy Gilbert, Marketing Manager
OpenTech Systems, Inc.	"OpenTech Systems Inc. is a leading provider of Comprehensive Solutions for Disaster Recovery, Data and Storage Management, Encryption and Tape Data Migration for IBM z/OS centric data centers. From infrastructure backup and critical application data identification to virtual tape backup and migration, OpenTech Systems provides a suite of products for Disaster Recovery Assurance and compliance. OpenTech products are used worldwide to automate DR processes, lower tape media and hardware expenses while reducing backup windows and administrative requirements." - Terry Siegrist, Vice President.
PATHPOINT	"Complex threads of application processing invoke hundreds of programs in typical mainframe legacy applications. For the analyst who is changing or enhancing one of these applications, success is dependent upon understanding these complex threads. Ironically, traditional approaches to analysis (tools or manual) are program-oriented not application-oriented. PathPoint materializes these complex threads of application processing by tracing and capturing user-entered business transactions of interest - without any change to source code. Understand how legacy applications "really" work on System z – with PathPoint." - Tom Cushing

What our ISVs are saying about System z

PROGINET enterprise software	CFI: "By deploying CyberFusion Integration Suite™ (CFI) for managed file transfer, on the IBM mainframe, our clients can integrate all major computing platforms in their organization while securely automating the movement of key data across enterprise systems, platforms, and applications." SecurAccess: "SecurAccess™, from Proginet, is a single sign-on solution for the IBM mainframe that enables users to access corporate resources and applications using a single, secure password. SecurAccess™ can be combined with hardware tokens to provide two-factor authentication." SecurForce: "By deploying SecurForce™ for Sync and Reset, on the mainframe, clients have reported up to 90 percent reduction in password-related help desk costs – resulting in rapid ROI, and significant productivity and efficiency gains." – Kevin Bohin, CIO
RAI	"Our enterprise clients view System z as the best platform for their high volume batch processing. As they progress towards continuous operation in a global, shared data environment, our System z customers must endow their batch applications with restart capability so they can better tolerate abends and downtime. Smart/RESTART from RAI enables z/OS batch applications to restart from near the point of failure after abends, recompiles, even system IPLs -- with all resources in a consistent state. Often without changes to application source code. RAI's active support of System z ensures Smart/RESTART customers can exploit the latest z/OS enhancements (such as Extended Address Volumes - EAV), contemporaneous with their IBM General Availability dates." - Carl Feinberg, CEO
SELECT BUSINESS SOLUTIONS	"Select Business Solution, with its many years of experiece and support of the mainframe (System z) environment, provides efficient, real-time, reporting access to critical business data enabling our clients to improve service, productivity and overall decision making." - Roger Cox, Sr. Product Marketing Manager
syncsort	"SyncSort for z/OS goes beyond mere compatibility with System z technology, exploiting zIIP, MIDAW and PAV functionality to deliver significant performance benefits." - Ken Cooper, Manager, Product Engineering

What our ISVs are saying about System z

SINE NOMINE ASSOCIATES	"Providing Linux and OpenSolaris for System z technology on the same System z processor allows customers to put their amassed skills from both the open systems and traditional mainframe world together for the optimum match in software and hardware technology." - David Boyes, President/CTO
Voltage security	"Voltage SecureData allows z/OS customers to easily encrypt Personally Identifiable Information, both "at rest" (in the databases where it resides) and "in motion" (as it traverses the network), thus protecting against identity theft and improving compliance with PCI DSS, Sarbanes-Oxley, FACTA "Red Flag", HIPAA, SB 1386, European and Japanese privacy regulations, et al. With Voltage's transparent stateless key server that links data to identities, groups, and roles, traditional key management headaches are avoided; and with Format Preserving Encryption, the data can remain encrypted throughout the lifecycle of a transaction, with complete or partial decryption only at the final destination as appropriate—all without changes to database schema or middleware. The same technology can also be applied to mask data for QA/testing, thus avoiding data leaks while providing realistic test environments." - Phil Smith III

SAS

“IBM's new System z server provides a robust, flexible environment for delivering our enterprise intelligence solutions such as SAS Fraud Management for Card Portfolios, SAS Enterprise Business Intelligence, SAS Enterprise Miner and SAS IT Resource Management. The substantial enhancements in processing and memory capacity support the demanding workloads for business intelligence and analytics applications to quickly deliver business insights across the enterprise. We are encouraged by IBM's continued commitment to the System z platform as we continue to develop new workloads to support our System z customers. Our enterprise intelligence solutions on System z deliver the performance and energy efficiencies that customers demand, enabling significant reductions in data center carbon footprint. IBM is clearly taking lead to establish its System z servers as excellent choice for green IT computing.“

- Craig Rubendall, Director, Research and Development, SAS
  www.sas.com, http://www.sas.com/partners/directory/ibm/index.html

NOTE: *In addition to approval to use quote, Craig agrees to serve as a media reference for IBM*

The Future runs on System z…
…The Future begins today

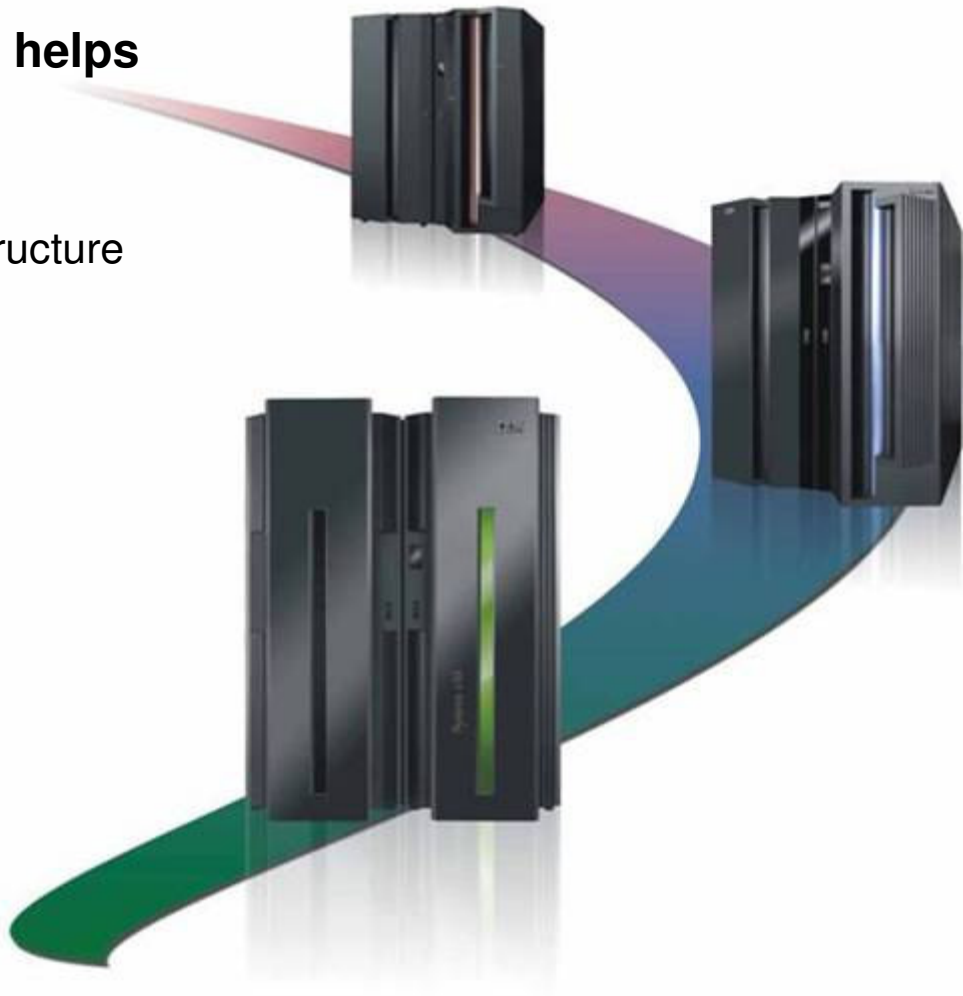
The System z10 Enterprise class

"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 on System z Linux virtual servers 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

Thank you!

- **IBM's commitment to the mainframe helps deliver:**
  - Extreme scalability, and availability
  - Reduced costs and simplified IT infrastructure
  - High performance and energy efficient technologies
  - a resilient and security rich system



Backup

IBM Systems