



*The future runs on System z*

# System z Software - Positioning System z Strategy and Investments

**Ray Jones**  
WW Vice President, z Software



# System z Software Strategy

## Capitalize on Traditional System z Strengths

- Batch processing, Transaction processing, Messaging, Quality of Service, and Data Serving

## Extend Value Proposition to New and Mixed Workloads

- Systematic re-engineering of the software stack for SOA
- Integrate with Modern Application Development Environments
- Deliver extensive Data Management services
- Leverage the wave of workload consolidation; zLinux
- Simplify System z – make it easier to install and manage for better TCO
  - New faces of z
  - More end-to-end management capability from a z central point of control
  - Simplified labor intensive tasks

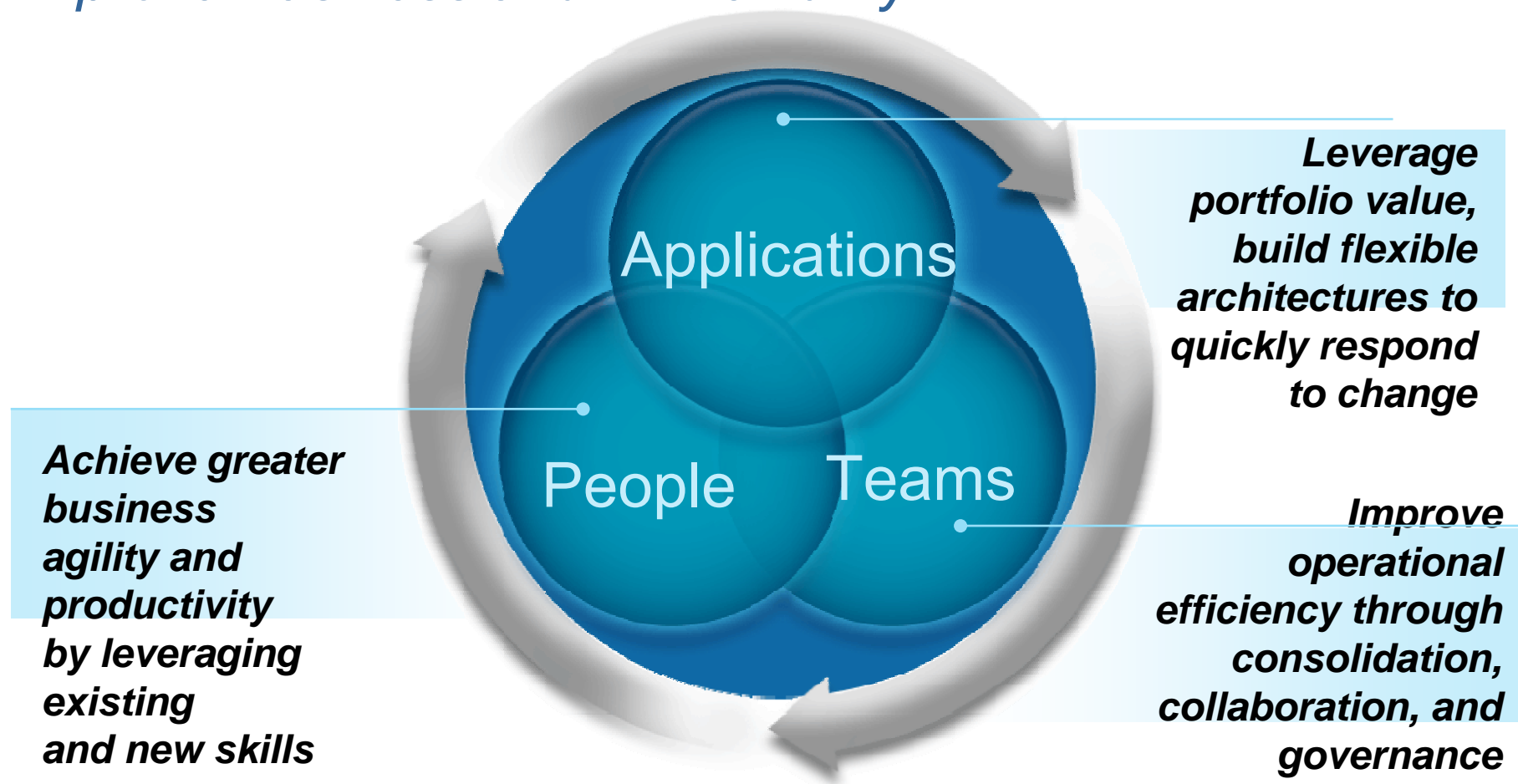


## Reinvigorate the System z Ecosystem

- Attract new System z customers and ISV application workloads
- Make System z relevant to the new IT generation

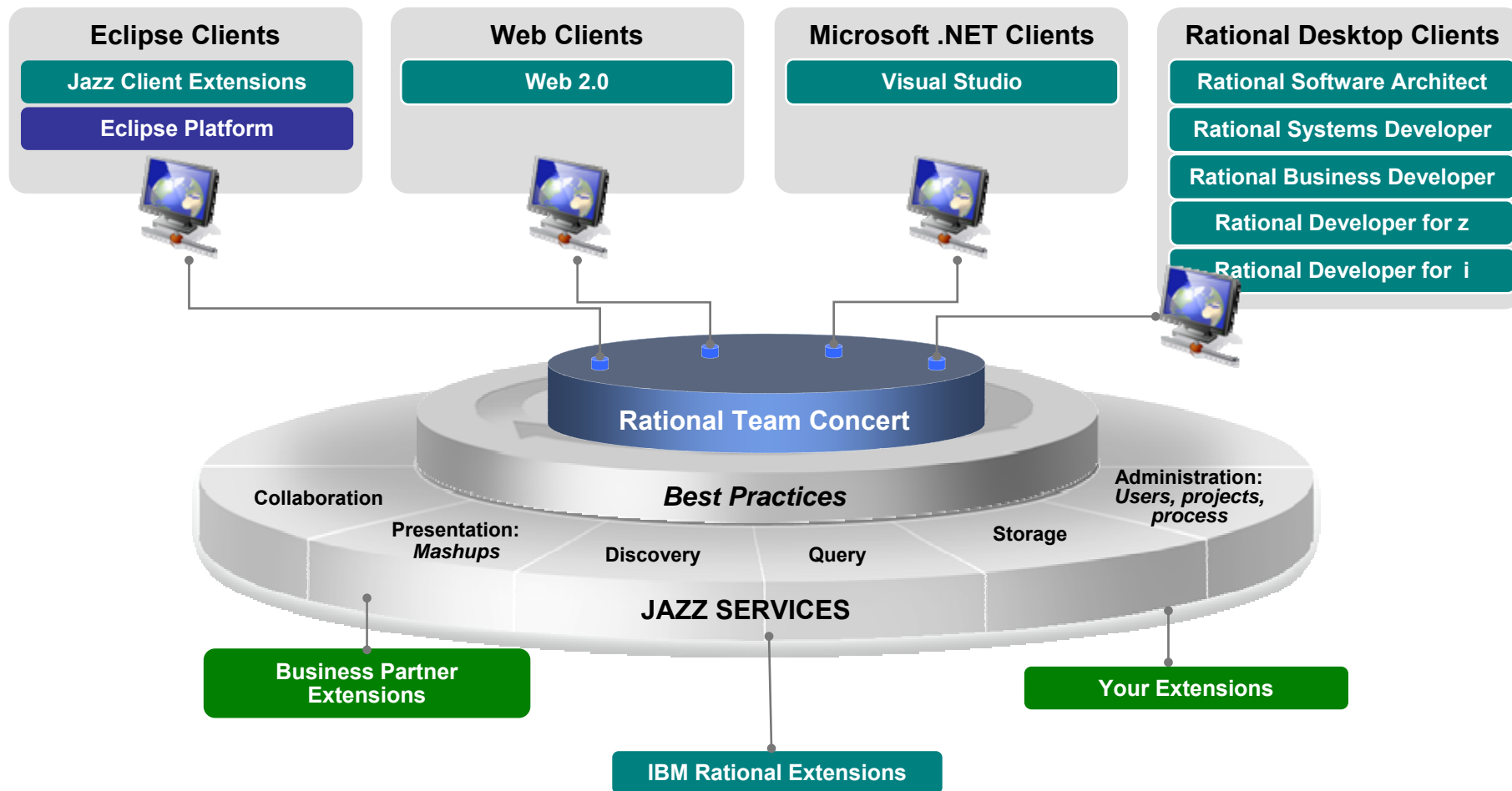
# Enterprise Modernization - Solution Overview

*Connecting Applications and People Across Teams to Improve Business and IT Flexibility*



[www.ibm.com/rational/modernization](http://www.ibm.com/rational/modernization)

# Rational Team Concert for System z: An open, extensible architecture *Supporting a broad range of clients, IDE's and languages*



# DB2 X for z/OS At a Glance

## *Addressing Corporate Data Goals*

<p>Application Enablement</p>	<ul style="list-style-type: none"> <li>• pureXML enhancements</li> <li>• Session variables, Generated columns</li> <li>• Temporal queries</li> <li>• Last Committed reads</li> <li>• SQL improvements that simplify porting</li> </ul>
<p>RAS, Performance, Scalability, Security</p>	<ul style="list-style-type: none"> <li>• Wide range of performance improvements</li> <li>• More online schema changes</li> <li>• Catalog restructure for improved concurrency</li> <li>• Fine grained access control</li> <li>• Hash access to data</li> <li>• New DBA privileges with finer granularity</li> </ul>
<p>Simplification, Reduced TCO</p>	<ul style="list-style-type: none"> <li>• Full 64-bit SQL runtime</li> <li>• Auto stats</li> <li>• Data compression on the fly</li> <li>• Query stability enhancements</li> <li>• Reduced need for REORG</li> <li>• Utilities enhancements</li> </ul>
<p>Dynamic Warehousing</p>	<ul style="list-style-type: none"> <li>• Moving sum, moving average</li> <li>• Many query optimization improvements</li> <li>• Query parallelism improvements</li> <li>• Advanced query acceleration</li> </ul>

## Preview: InfoSphere Warehouse Accelerator

### Product Overview

- A special purpose, network attached appliance that is an add-on to an IBM DBMS system, that offloads typical Data Warehouse / Business Intelligence queries resulting in predictable and orders-of-magnitude faster query response times while reducing overall TCO
- Combines IBM DBMS with high performance Data Warehouse query software, based on advanced in-memory scale-out cluster technologies, while keeping the complete system centrally managed with unchanged interfaces for Business Intelligence applications



### Highlights

- No changes to the applications
- DB2 transparently exploits the accelerator for application queries
- Significant price / performance and TCO improvements
- Improving performance of typical data warehouse queries 5 - 10x
- Achieving linear scalability with the number of CPUs
- Appliance-like form factor: user/reference guide assisted installation, initial configuration, hands free operation



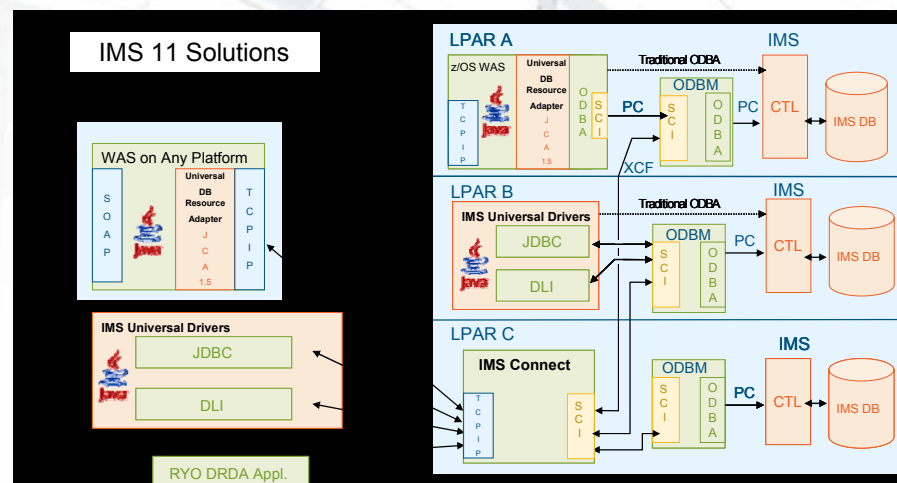


# IMS Version 11

## Delivering Unsurpassed Application and Data Serving

### IMS V11 Key Features Include:

- Open database access support allows any application on any platform to access IMS data directly and transparently; extended Web services and connectivity for SOA
- Enhanced commands and user exits that simplify installation & system management
- Enhanced application development tooling
- Fast Path 64-bit buffer management, expanded storage, & security enhancements that increase performance stability, and reliability as well as improve security



Open distributed IMS database access support

### Database Manager

- IMS Open Database
- Database Quiesce
- ACBLIB Usability
- Database RAS
- OLR Performance
- Fast Path 64-bit Buffer Management

### System

- IMS Connect Enhancements
- User Exit Interface
- Dump Formatter
- Syntax Checker & IVP
- LSQA Storage Reduction
- KBLA

### Transaction Manager

- Type-2 Query TM Commands
- OTMA Enhancements
- OTMA Type-2 Commands
- Transaction Expiration
- Shared Queues Affinity Routing

### DBRC

- BPE-Based DBRC
- Security Override for Non-Production RECON
- Unconditional deletion of PRILOG Information
- DBRC Migration / Coexist from IMS 9 & 10

# WebSphere Portal on System z

## Distributed Consolidation

### System z Linux

**Speedy deployment with QOS/integration.**

- Applications that scale out
- Large number of smaller apps
- Lowers TCO
- Speedy deployment
- Align with distributed WebSphere family
- Unrivaled virtualization
- Centralized management
- Web Serving
- Presentation Services
- Development Platform
- Test/Migration/Prototyping Platform

Lotus. software

## Integration Deployment

### z/OS

**High QOS and significant integration with CICS, IMS or DB2.**

- Applications that scale up
- Highest QoS production environment
- Full exploitation of zSeries and z/OS
- Tight integration with DB2, CICS, IMS
- Service level agreement management
- Dynamic load balancing
- Strict security requirements
- Highest availability
- Disaster recovery
- Dynamic I/O configuration
- Storage management
- Enterprise Modernization capability

Lotus. software

A self-managing server environment with the versatility and power to help integrate your business.





# IBM ILOG's Business Rules Management Solutions ..... on System z

Powerful  
**Business Rule  
Management  
System**

Efficient  
**Supply Chain  
Management Solutions**



Advanced  
**Optimization  
Tools**

Innovative  
**Visual  
Tools**

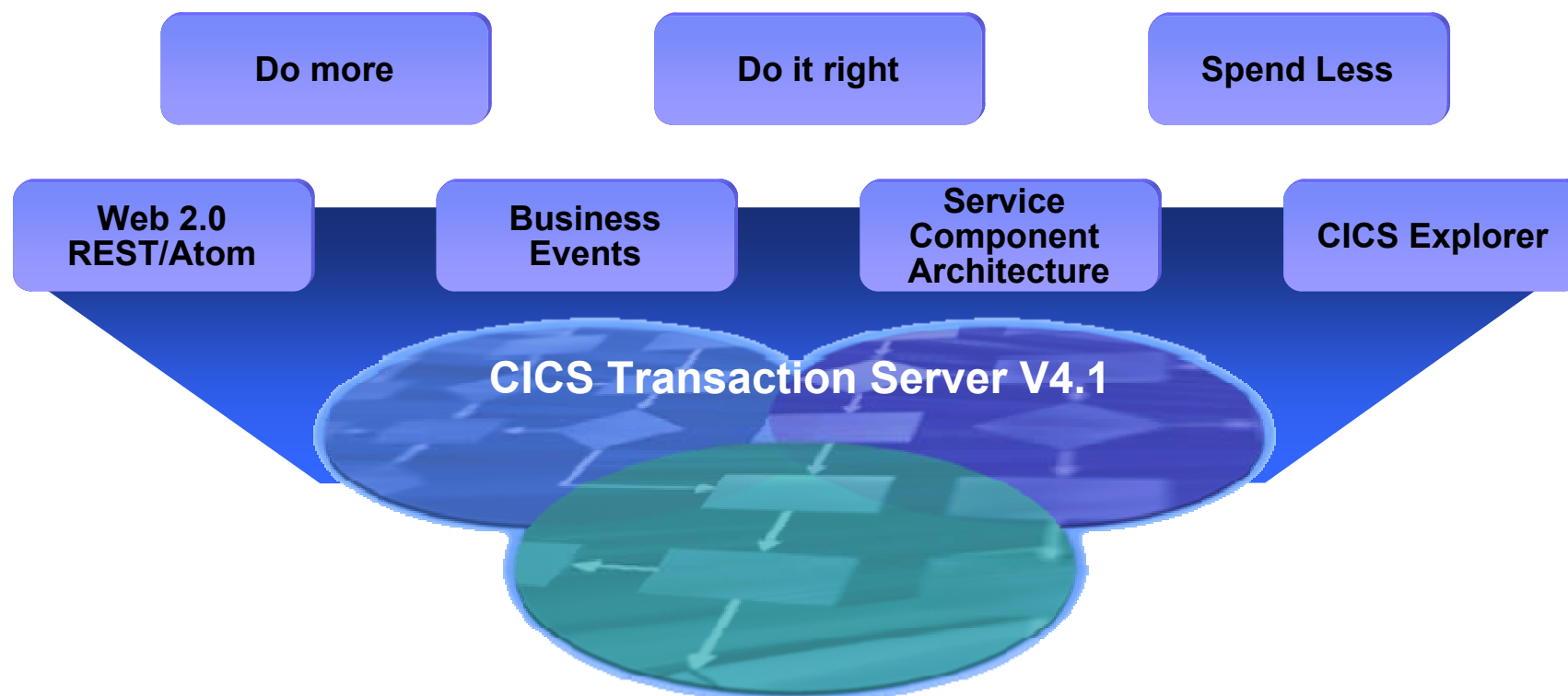
## BRMS System z options:

- **Rules for COBOL**
  - Provides the full benefits of JRules BRMS while retaining the existing COBOL architecture
  - Rules are generated as COBOL source for execution in IMS, CICS, batch
- **JRules on System z**
  - Provides BRMS for rule-based applications and extends your SOA strategy while leveraging your System z assets
  - Rules are deployed, executed and monitored in J2EE services



## Spotlight: CICS Transaction Server V4.1

- **Compete with insight into business processes and modify business applications quickly**
- **Comply with corporate, industry, and government policies to manage business risk**
- **Control costs by simplifying IT infrastructure and productivity through easier-to-use interfaces & functions**



# Extending leadership capabilities for the Dynamic Infrastructure

- **z/OS Version 1 Release 11\***
  - Synergies - with new IBM System Storage DS8000 Release 4.2
  - Trusted - the latest encryption technologies, centralized security certificates, and foundation for unified enterprise-wide identity and access management reduce risk of fraud.
  - Responsive - communications that improve network recoverability, availability, and reduce complexity and latency of transactions
  - Accountable - enhanced measurement to support comprehensive control, analysis, risk management, audit, and compliance plans
  - Smart - a system that learns heuristically from its own environment and is able to anticipate and report on potential issues for predictive analysis



**z/OS Version 1 Release 11\***

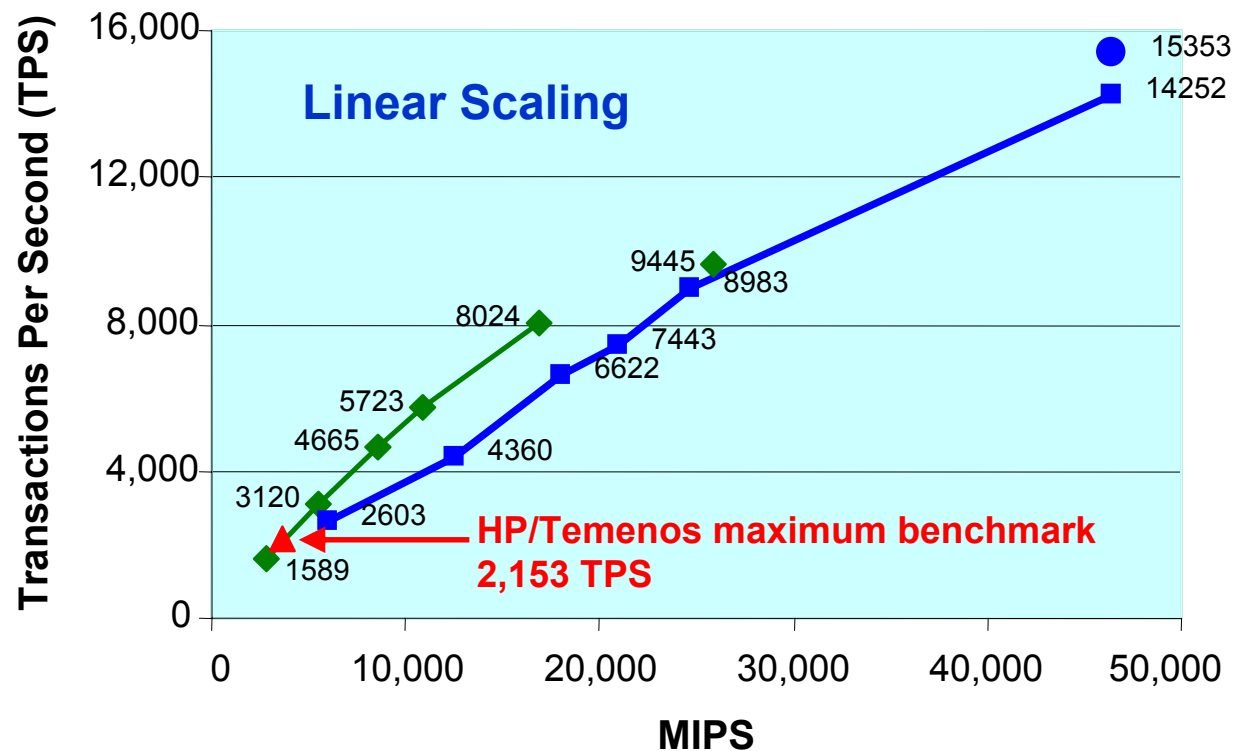
# System z With DB2 Scales Further Than Best HP Superdome Banking Benchmark

- Asian Bank
  - IBM System z9 and DB2
  - TCS BaNCS (Cobol)
  - 15,353 Transactions/second
  - 50 Million Accounts
  - IBM benchmark for customer

- Bank of China \*\*
  - IBM System z9 and DB2
  - TCS BaNCS (Cobol)
  - 8,024\*\*\* Transactions/second
  - 380 Million Accounts
  - IBM benchmark for customer

- HP/Temenos \*
  - HP Itanium
  - Temenos T24 (Java)
  - 2,153 Transactions/second
  - 13 Million Accounts
  - Largest banking benchmark performance claimed by HP

## System z and BaNCS Online Banking Benchmarks



\* SOURCE: TEMENOS BENCHMARKS; <http://h71028.www7.hp.com/enterprise/downloads/TemenosBenchmark.pdf>

\*\* SOURCE: <http://www.enterprisenetworksandservers.com/monthly/art.php?2976> Source: InfoSizing FNS BANCS Scalability on IBM System z – Report Date: September 20, 2006

\*\*\* Standard benchmark configuration reached 8,024 tps, a modified prototype reached 9,445 tps

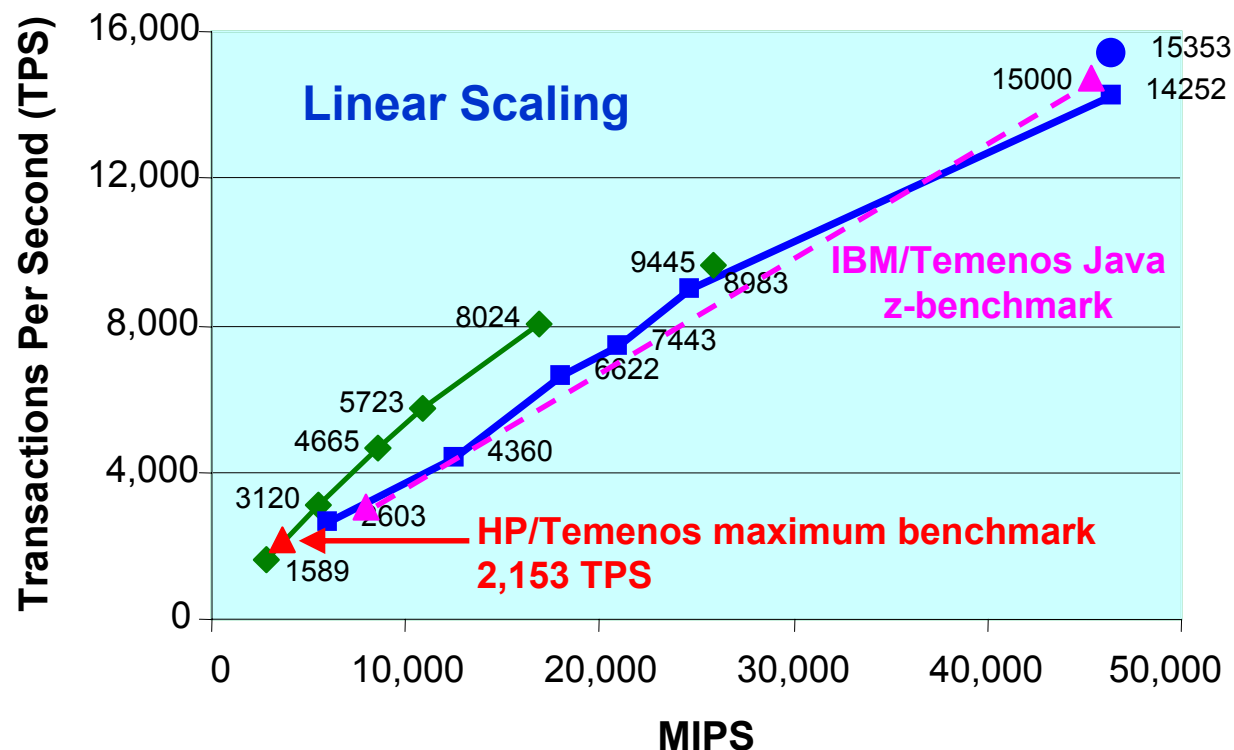
# System z With DB2 Scales Further Than Best HP Superdome Banking Benchmark, with Java

- Asian Bank
  - IBM System z9 and DB2
  - TCS BaNCS (Cobol)
  - 15,353 Transactions/second
  - 50 Million Accounts
  - IBM benchmark for customer

- IBM Benchmark
  - IBM System z10, WAS, DB2
  - Temenos TCB (Java)
  - Result of preliminary Temenos TCB optimization prototype

- HP/Temenos \*
  - HP Itanium
  - Temenos T24 (Java)
  - 2,153 Transactions/second
  - 13 Million Accounts
  - Largest banking benchmark performance claimed by HP

## System z and Temenos TCB Online Banking Benchmarks

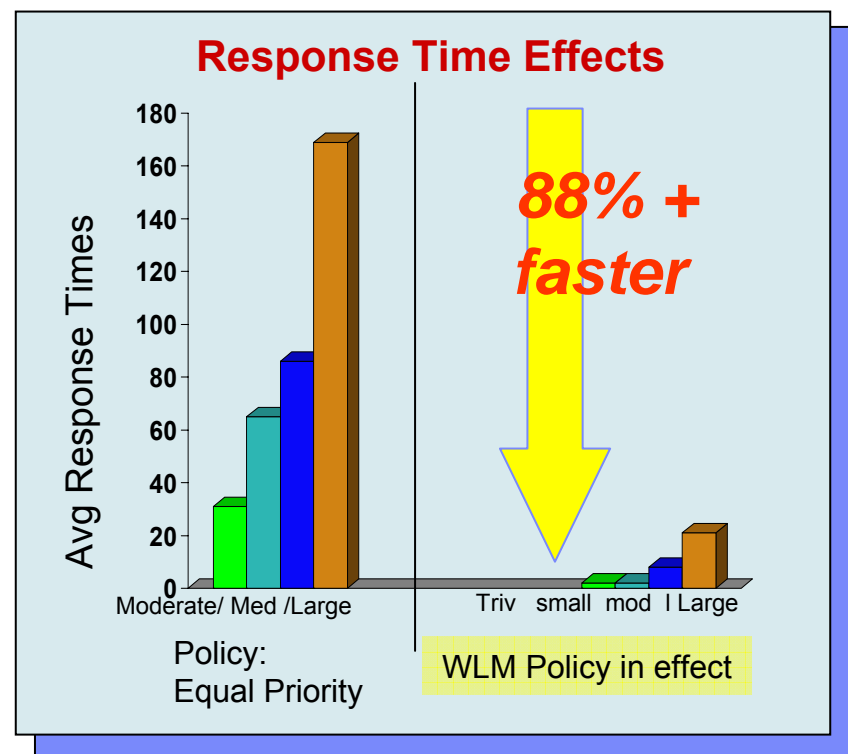
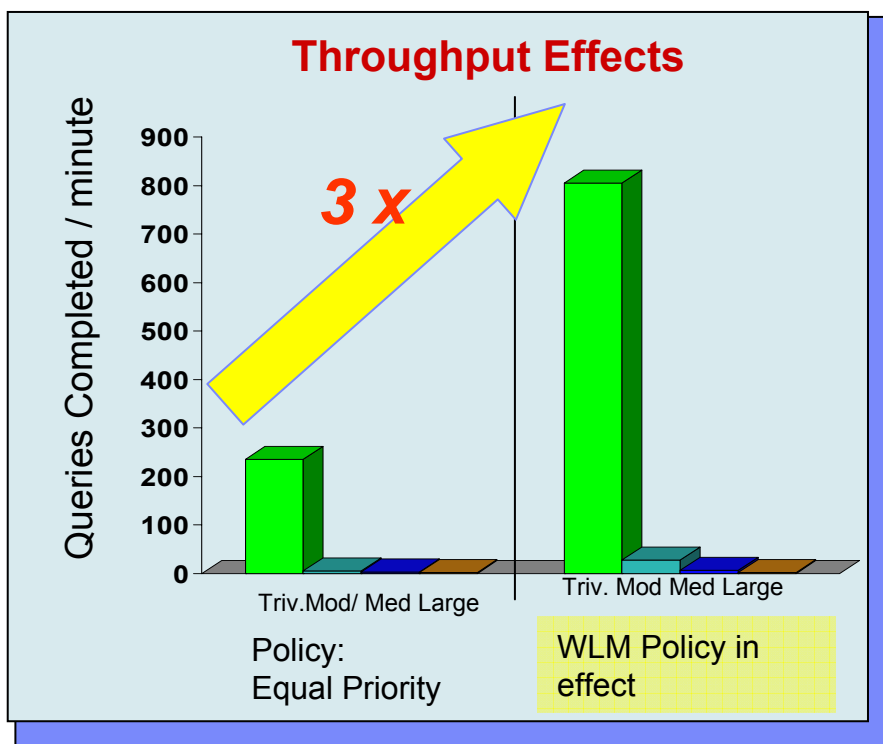


\* SOURCE: TEMENOS BENCHMARKS; <http://h71028.www7.hp.com/enterprise/downloads/TemenosBenchmark.pdf>

# Processing WLM Resources

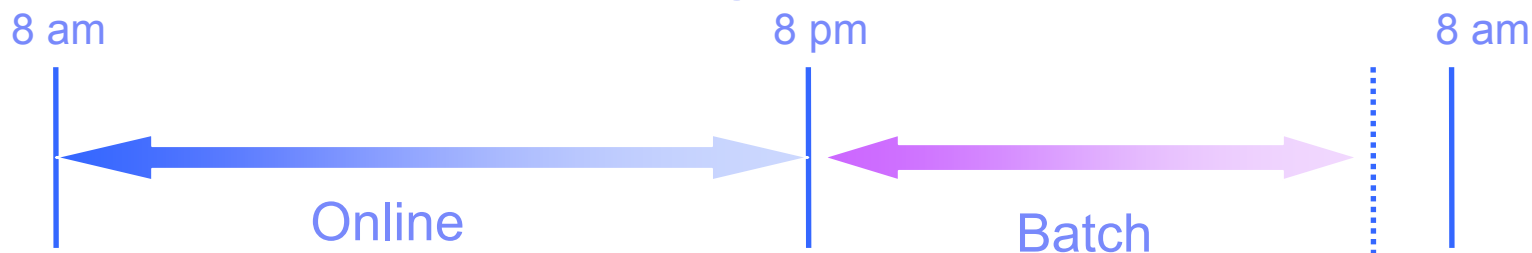
*Prevent large queries from monopolizing a system*

*Number of critical queries that completed: tripled,  
Response times for critical work improved 88% and more.*

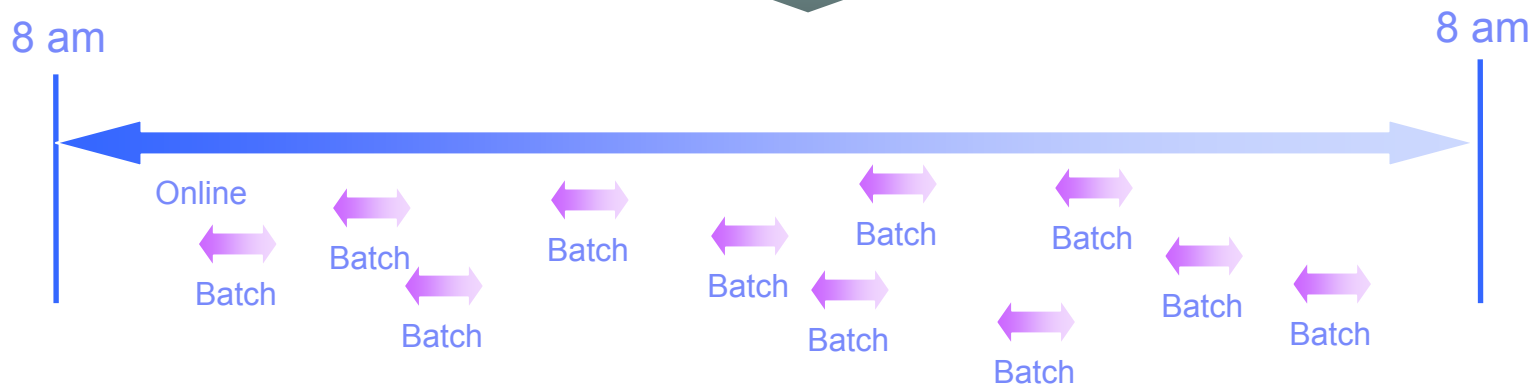
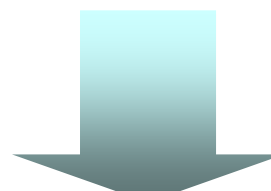




# Continuous Batch Processing



*Current Batch Processing Technique*

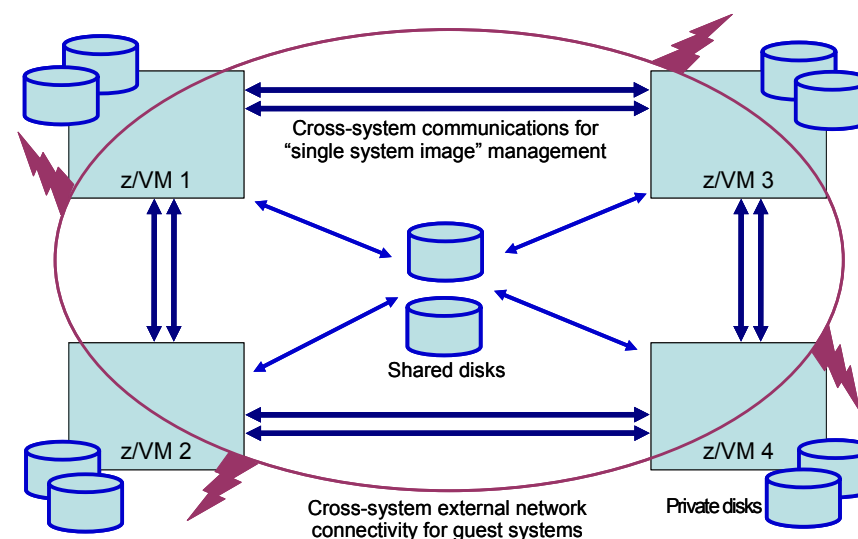


*Going forward, Batch Processing Techniques*

## z/VM Statements of Direction

### Clustered Hypervisor Support and Guest Mobility

- Provides shared resources for the z/VM systems and virtual machines
- Users can run z/VM system images on the same and/or different System z10 servers
- Simplifies systems management of a multi-z/VM environment
  - Single user directory
  - Cluster management from any system
- Clients can cluster up to four z/VM systems
- in a **Single System Image (SSI)**
  - Apply maintenance to all systems in the cluster from one location
  - Issue commands from one system to operate on another
  - Built-in cross-system capabilities
  - Resource coordination and protection: network and disks
- Dynamically move Linux guests from one z/VM system to another with **Live Guest Relocation**
  - Reduce planned outages; enhance workload management
  - Non-disruptively move work to available system resources **and** non-disruptively move system resources to work



Note: All statements regarding IBM's plans, directions, and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

# Fractional Availability Improvements Are Important

## Example: Financial Services Company

- \$300B assets, 2500+ branches, 15M customers
- Retail banking, loans, mortgages, wealth management, credit cards
- CRM System – branches, financial advisors, call centers, internet
- Number of users – 20,000+

	<b>Unix/ Oracle</b>	<b>System z DB2</b>
<b>Availability %</b>	<b>99.825 %</b>	<b>99.975%</b>
<b>Annual outage</b>	<b>15h 20m</b>	<b>2h 11m</b>
<b>Cost of Downtime</b>	<b>\$22.9M</b>	<b>\$3.3M</b>

Sources: ITG Value Proposition for Siebel Enterprise Applications, Business case for IBM System z & Robert Frances Group

## Financial Impact of Downtime Per Hour

<i>Industry segment</i>	<i>Cost</i>
Energy	<b>\$2,818K</b>
Telecommunications	<b>\$2,066K</b>
Manufacturing	<b>\$1,611K</b>
Financial	<b>\$1,495K</b>
Information Technology	<b>\$1,345K</b>
Insurance	<b>\$1,202K</b>
Retail	<b>\$1,107K</b>
Pharmaceuticals	<b>\$1,082K</b>
Banking	<b>\$997K</b>
Consumer Products	<b>\$786K</b>
Chemicals	<b>\$704K</b>
Transportation	<b>\$669K</b>

## Active/Active – Concept & Value

- The next generation of GDPS
- Differentiator for mainframe GDPS by leveraging software solution across IM, AIM, Tivoli, STG System z, and GTS
- Sites separated by unlimited distances, running same applications and having the same data to provide cross-site Workload Balancing and Continuous Availability / Disaster Recovery
- Customer data at geographically dispersed sites kept in sync via replication

GDPS/PPRC

Failover Model

Recovery Time  $\approx$  2 min

Distance < 20 km

GDPS/XRC or GDPS/GM

Failover Model

Recovery Time < 1 hour

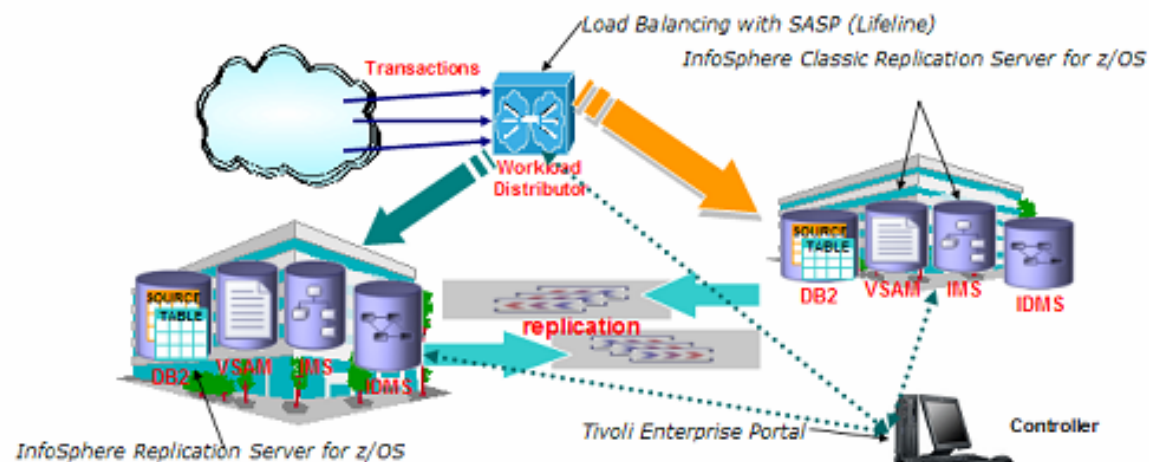
Unlimited distance

Active/Active

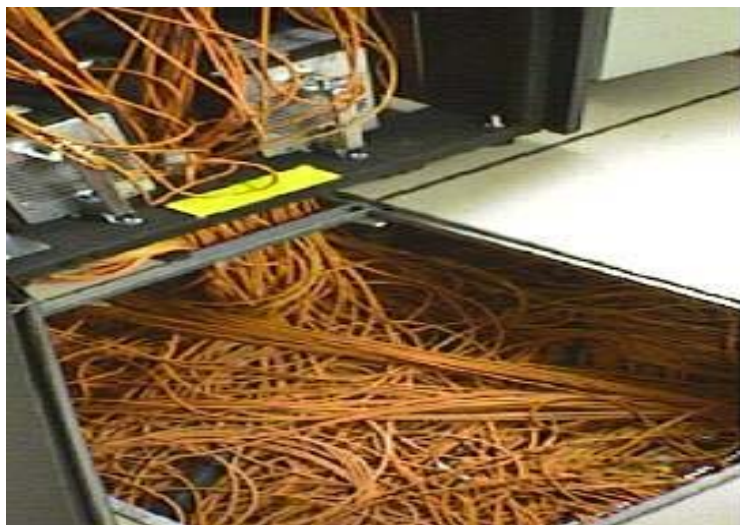
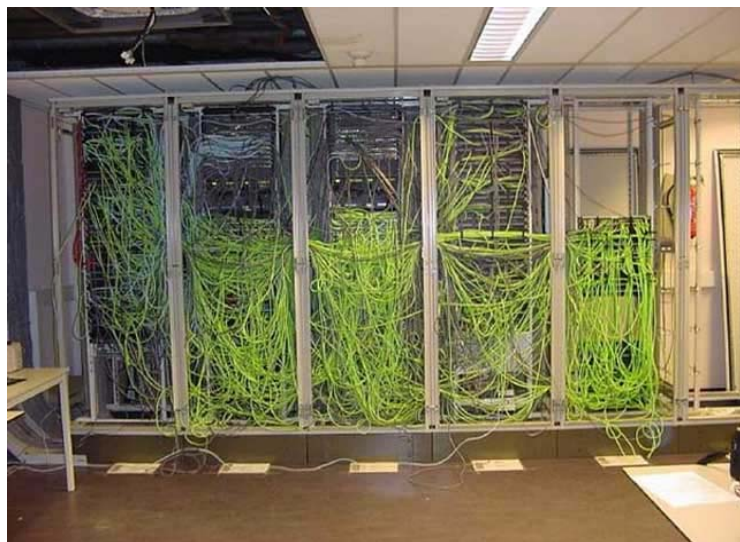
Continuous availability model

Recovery time < 1 minute

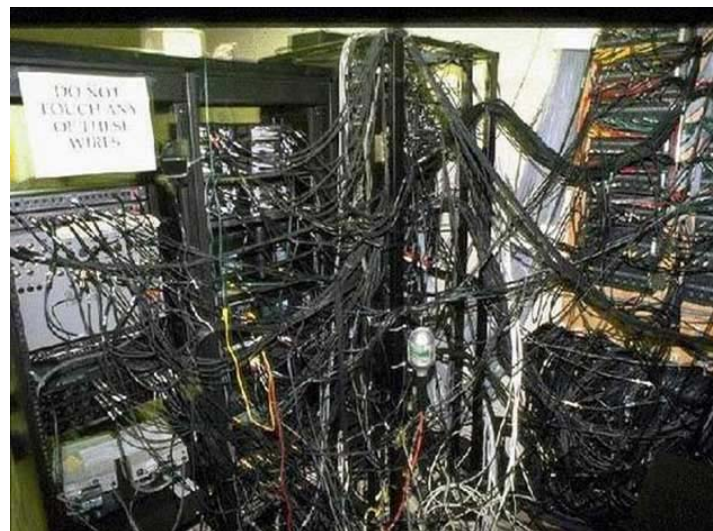
Unlimited distance sites



## Network Simplification




- **Consolidation replaces cables and routers with internal connections**
- **Better performance and security**





# Centralized policy-based networking

## *z/OS Communications Server*

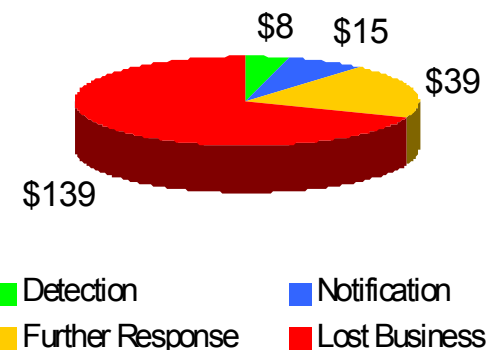
- Application Transparent -TLS (AT-TLS) and IPsec (1.7)
    - Simplified development and maintenance of security-rich Web apps – centralized configuration of AT-TLS and IPsec can help you secure the network data with no application modification.
    - Portions of IPsec eligible for zIIP (1.8/1.9)
    - AT-TLS for FTP and TN-3270 (1.9), for SASP Load balancing advisor (1.10), support for new SSL function and simplified configuration (1.11)
  - Quality of Services (QoS) & Intrusion Detection Services (IDS) (1.8)
    - QoS policies help maintain network traffic prioritization, improved workload mapping (1.11)
    - IDS policies help you detect and report suspicious network activities
  - Network Security Services (NSS) TCP/IP Policy-Based Routing (PBR) (1.9)
    - NSS provides single, centralized certificate storage, monitoring, and managing services for IPsec cross-systems or cross-sysplex
    - NSS for WebSphere® DataPower® appliance ID authentication and access checks (1.10), additional services (1.11)
    - PBR allows TCP/IP stack to make routing decisions based on job name, ports, protocol (TCP or UDP), source IP address, NetAccess security zone, and security label
  - Defensive filtering (1.10)
    - Defensive filters (temporary security policies) can be quickly deployed to defeat network attacks
- 



## High Cost of Security Breaches

- Average cost of security breaches continues to rise according to a 2008 Ponemon Security Study
- Average costs of a data breach: \$202 *per record*
  - ▶ Average total: \$6.6M *per breach*
  - ▶ Cost of lost business: on average \$4.59 M
  - ▶ Over 84% of organizations had over one breach
- Each breach involved paper notifications wasting energy and paper
  - Worst of all, damages company reputation

Costs per Breach



Notifications also consume at least one ton of paper!



**(You don't see System z cited on front page news covering security breaches.)**

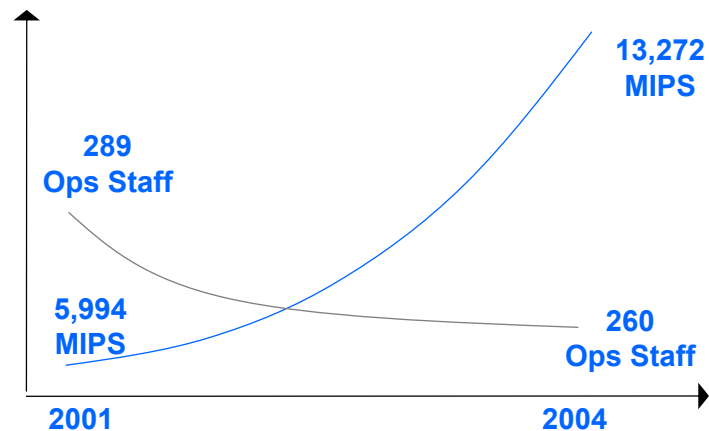
# System z – Advancing security

- *Application Intrusion Detection*
  - “Defense in depth” with improved network and application network security through network security services provided by z/OS
  - DataPower and ISS appliances leverage System z Security and Crypto services for improved threat detection and centralized controls
- *Continued focus on z/OS Health Checks to help maintain best practice configurations*
- *Continued focus on industry standard encryption algorithms and encryption standards*
  - Improved performance and security to address industry and compliance needs
  - FIPS evaluations expanded to include SW cryptography & protocols
- *Enterprise hub for key management*
  - System z cryptography & key management for heterogeneous servers and devices with open standards
- *Digital Certificate provisioning & management*
  - Centralized provisioning of certificates and keys with additional protocols to facilitate integration with applications and heterogeneous platforms
- *Improved Auditing and Compliance*
  - Reducing auditor workloads and Improved scope of enterprise-wide compliance reporting with end to end propagation of user identity for greater accountability
- *Cryptographic processing*
  - Increased scale and functionality to meeting emerging requirements

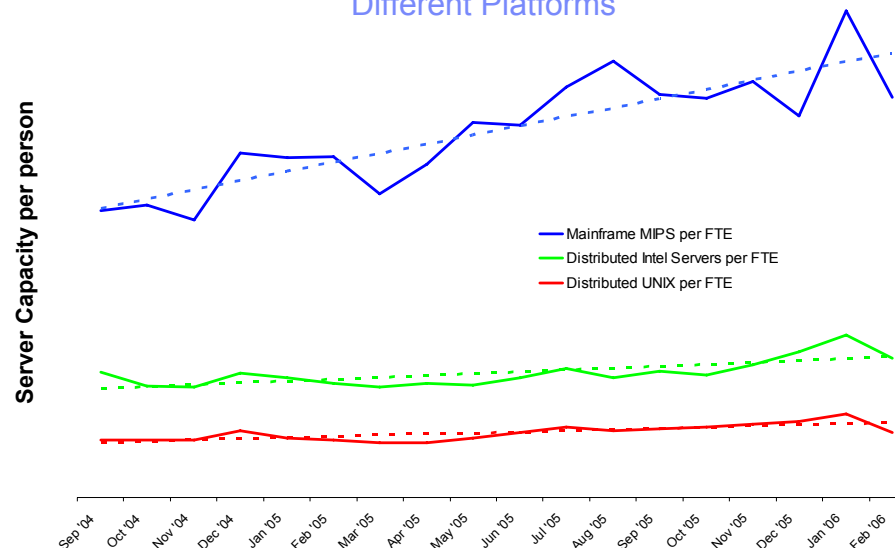


# Mainframe Labor Costs Are Going Down

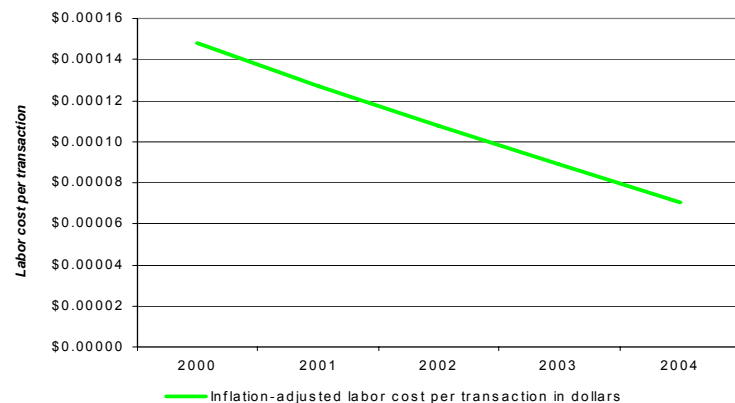
Data Center Staffing Levels for System z Have Not Increased Despite Large Increase in MIPS



Hardware Managed Per Person for Different Platforms



Labor Cost Per Transaction on System z is Decreasing



First National Bank of Omaha

	Servers	Reliability	Utilization	Staff
<b>First move:</b> Implemented distributed computing architecture that became <b>too difficult to monitor, maintain, upgrade and scale</b>	<ul style="list-style-type: none"> <li>30+ Sun Solaris servers</li> <li>560+ Intel servers</li> </ul>	Un-acceptable	12%	24 people growing at 30% year
<b>Next move:</b> Consolidated back on the mainframe	z990	Much improved	84% with additional reserve capacity <b>on-demand</b>	Reduced to 8 people

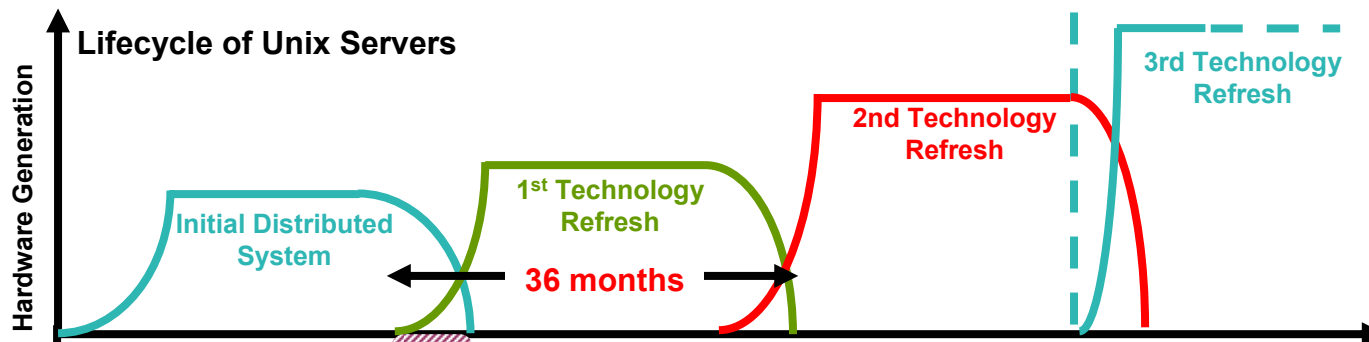
**Staff growth reversed by consolidating to the mainframe**

# IBM z/OS Management Facility V1.11

- The IBM z/OS Management Facility is a new product for z/OS that provides support for a Web-browser based management console for z/OS.
- **Helps system programmers to more easily manage and administer a mainframe system by simplifying day to day operations and administration of a z/OS system.**
- **More than just a graphical user interface, the z/OS Management Facility is the infrastructure for addressing the needs of your workforce**
  - Automated tasks can help reduce the learning curve and improve productivity.
  - Embedded active user assistance (such as wizards) guides you through tasks and helps provide simplified operations.



# New York Financial Services Company – Useful Lifetime Of 36 Month Lease



Observed at a large financial service customer

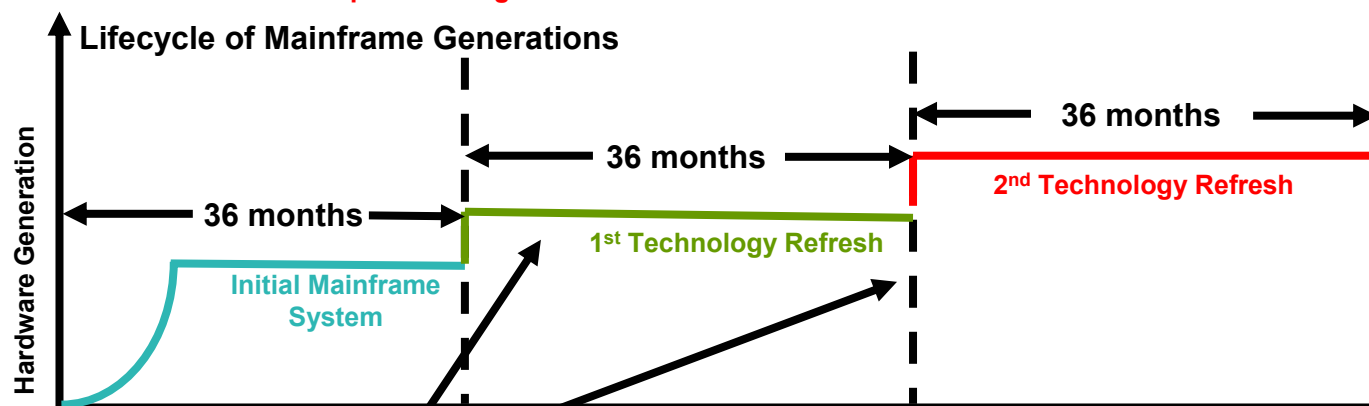
In each 36 month lease there are only 30 months production use



**30 months production**

**Setup and tear down 15 People, 5 full time**

Setup and tear-down time costs 25% more. Plus . . . 41 hours of FTE setup and tear down labor per server = \$3,075



Weekend upgrades performed by IBM

Capacity on demand pricing

**1 Weekend upgrading to new hardware and software levels**

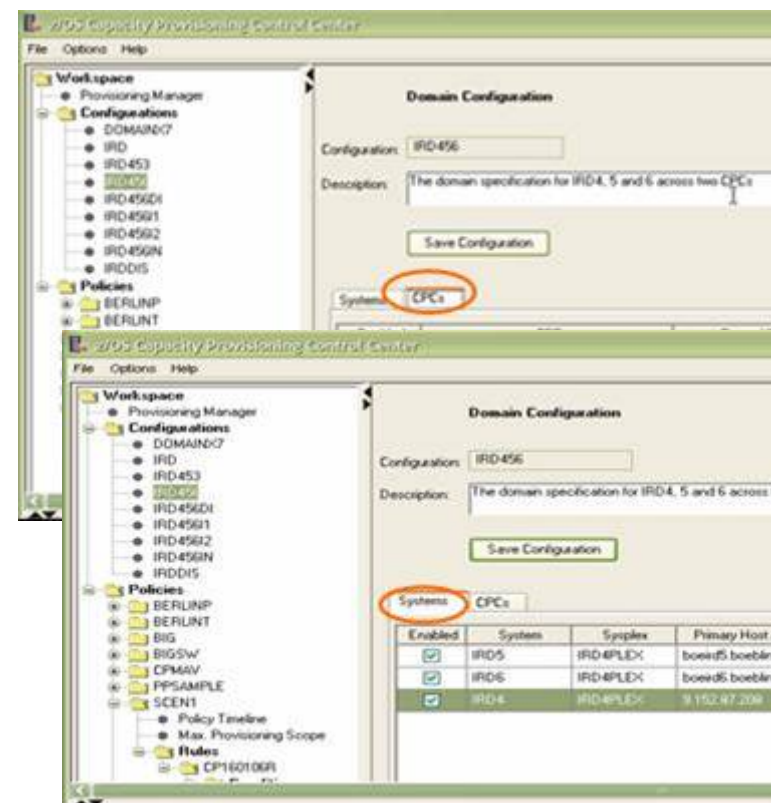
**36 months production**

**No need to retire the server, upgrade in place**

# System z10 Capacity Provisioning Manager

## *Efficient management of System z10 server capacity*

- **Unpredictable or recurring workload spikes may exceed System z10 server capacity**
  - You may need to use On/Off Capacity on Demand frequently
  - BUT ... manual processes may be slow, inefficient, or complex
- **The System z10 Capacity Provisioning Manager can help provide:**
  - Autonomic management - supplementing or replacing manual monitoring of OOCoD
  - Flexibility - can activate OOCoD incrementally even in combination with CBU
  - Efficiency - strict adherence to policies can provide capacity on demand
  - Familiarity – CPM uses:
    - WLM and RMF – similar to other WLM-based capabilities
    - Modern graphic interfaces
    - CIM to communicate with other elements and System z subsystems
    - Available on z/OS V1.9 and later





# Tivoli Service Automation Manager (TSAM)

- **Deploying & managing Cloud Services in a datacenter environment**
  - Dynamic instantiation and management of Cloud Services along their entire lifecycle
- **Raises the level of abstraction for Service Management in data centers from single LPARs, storage volumes, SW installations to Cloud Services as the units of management**
- **Integrated Management Solution**
  - Based on strategic Tivoli Process Automation Engine (TPAE)

**The holistic view  
of a service...**

...is more than the sum of its individual parts



## Summary

- We are delivering a New Generation of z software and hardware
- SOA and System z together, extend and leverage decades of massive business investments
- The z ecosystem now enables leap frogging to the Next Generation of Applications
- System z is being re-architected for Enterprise Data Serving
- It's all about the economies of scale and how System z capabilities and 'Quality of Service' makes a difference





*thank you!*





# WebSphere Application Server v7.0

## ▪ High Performance Foundation for SOA

- Performance leadership
- New Security Auditing
- New WebSphere Secure Proxy
- New WebSphere Multiple Security Domains
- Kerberos Enhancements
- Multi-Cell Support
- Application investment protection
- New Consolidated WebSphere and DataPower administration

## ▪ Simplification for Developers

- New and enhanced Standards: Java EE 5 certification, EJB3, Web Services
- Web 2.0
- Feature Pack Strategy
- New Rational Application Developer Support

## ▪ Intelligent Management

- New Flexible Management: Job, Agent
- New Runtime Provisioning
- New WebSphere Business Level Applications
- New Centralized Installation Manager

## ▪ Innovation That Matters

- Feature Pack for Web 2.

## z/OS Key Differentiation

### Performance

- ✓ Improvements in response time for static and dynamic content with Fast Response Cache Acceleration first availability in z/OS 1.9.
- ✓ Increased application runtime performance with focused analysis and code path improvement effort for JEE, Web Services and Connectors.

### High Availability and Reliability

- ✓ High Availability Manager based on Cross-System Coupling Facility (XCF).
- ✓ Thread Hang Recovery improves server reliability and performance.

### Consumability and Usability

- ✓ Redesigned data collection facility to improve chargeback capabilities.
- ✓ More unified install and configuration tasks (load modules in HFS).



## How the z Center of Excellence can partner with you

Proactive workshops & hands-on sessions

### Maximize TCO benefits by optimizing & tuning Java and CICS/COBOL applications

#### *Offerings:*

- Guidance for application tuning to optimally leverage the System z platform & speciality processors
- Hands on application optimization and performance tuning with our experts to achieve measurable savings by:
  - Reducing path length
  - Reducing response time
  - Increasing throughput

### Forecast Capacity Sizing

#### *Offerings:*

- Forecast capacity sizing for projected growth
  - Assessment of your current environment using tools and interviews to forecast growth for System z
  - Validate and optimize MIPS/MSU usage

### Leverage System z to achieve best price/performance for your Data Warehousing solutions

#### *Offerings:*

- Guidance for solving Data Proliferation problems by implementing Data Warehousing on System z
- Analyze usage of distributed and mainframe infrastructure for Data Warehousing
- Optimize price/performance with System z accelerators & speciality processors

### Accelerate projects to meet your enterprise business goals

#### *Offerings:*

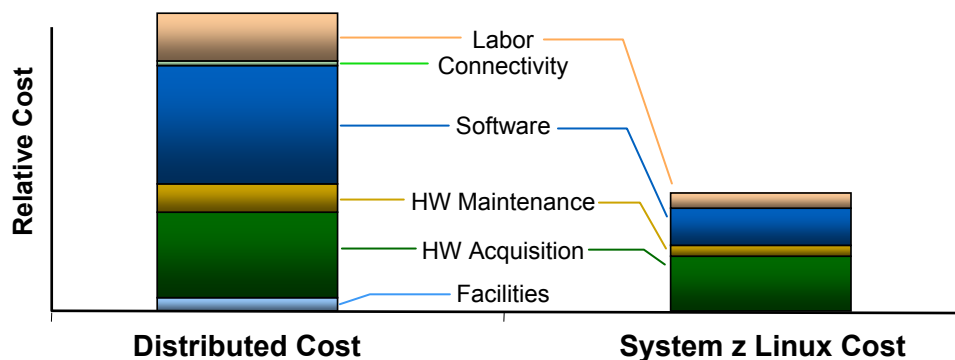
- Extend existing application investments with new technology to achieve business goals & accelerate adoption of modernization projects
- Architecture Workshop to review business goals, assess current environment, and recommend modernization techniques / architecture

Contact: Monica Hein (Director, Worldwide Center of Excellence)  
[mhein@us.ibm.com](mailto:mhein@us.ibm.com)

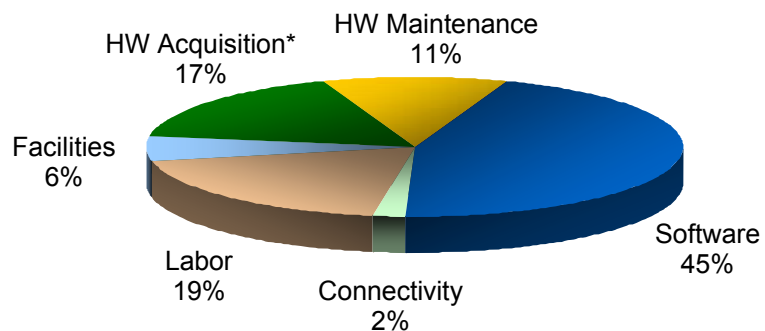


# Client View of TCO Comparison for Similar Distributed Workload vs. System z Linux results in Potential 60-75% Gross Costs Savings / 5 yrs

## Operating Cost: Distributed vs. Mainframe



## Potential Savings: Categories as a % of Gross Savings



\* HW Acquisition compares server/disk refresh of distributed environment to the cost of acquiring new mainframes/storage

## Dramatic Simplification

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%

Results will vary based on several factors including # of servers and work load types

## z/VM Version 6.1

### The Foundation for System z Virtualization Growth

- **New function and packaging in z/VM V6.1**
  - Exploitation of the System z10 server cache management instructions to help improve the performance of z/VM virtual networking
  - Better integration with IBM Systems Director by shipping the Manageability Access Point (MAP) agent with z/VM V6.1 for easier installation of the agent
- **Establishes a new z/VM technology base for IBM System z10 and future systems**
  - Acknowledges the highly attractive economics of workload consolidation on z10 servers
    - z/VM V6.1 only operates on z10 EC, z10 BC, and future generation servers
  - Allows optimization of z/VM function for greater business value on newer hardware
  - Support for FICON Express8 – designed to provide faster access to data with a link data rate of 8 Gigabits per second (Gbps)
  - Inclusion of several functional enhancements previously delivered in the z/VM V5.4 service stream
- **Preview announcement includes statements of direction for future z/VM support**