



The future runs on System z

System z Software – Maximizing your Returns on New and Legacy Software

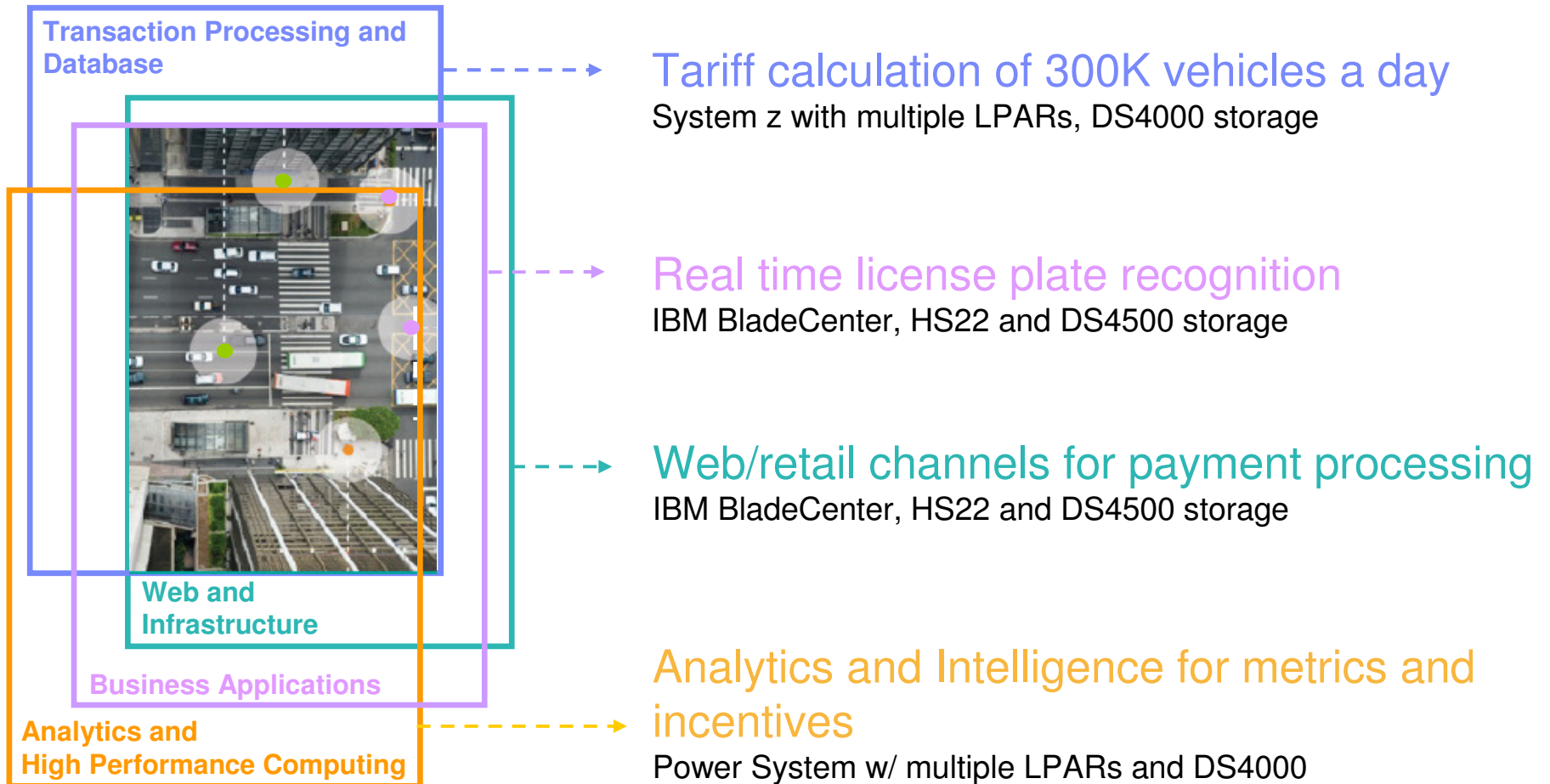
Ray Jones
WW Vice President, z Software



Data Centre on a truck



Smarter Traffic



“Smart World” solutions are often hybrid solutions

System z Software Strategy

Capitalize on Traditional System z Strengths

- Batch processing, Transaction processing, Messaging, Quality of Service, and Data Serving
- Optimize to the evolving System z Hardware design point

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

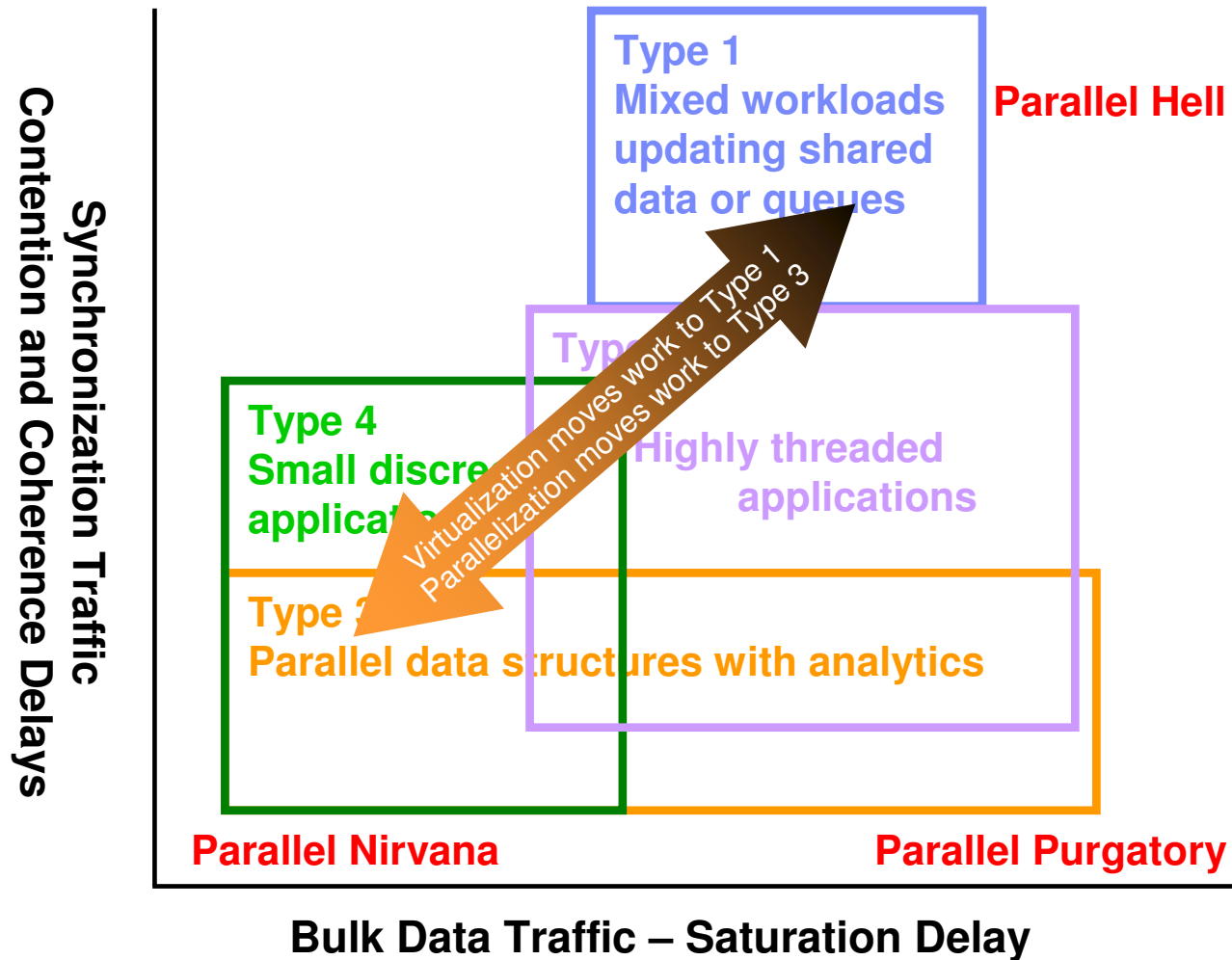


Reinvigorate the System z Ecosystem

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

Pfister's Paradigm is Useful for bridging from work to machines

From Greg Pfister: In Search of Clusters, The ongoing battle in lowly parallel computing, p461



Preview: Smart Analytics Optimizer

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

DB2 X for z/OS At a Glance

<p>Application Enablement</p>	<ul style="list-style-type: none"> • Versioned data biTemporal • pureXML enhancements • Last Committed reads • SQL improvements that simplify porting
<p>RAS, Performance, Scalability, Security</p>	<ul style="list-style-type: none"> • Wide range of performance improvements • Hash access to data • More online schema changes • Catalog restructure for improved concurrency • Row and column access control • Administrator privileges with finer granularity
<p>Simplification, Reduced TCO</p>	<ul style="list-style-type: none"> • 5 – 10 times more threads per DB2 image • Auto statistics • Data compression on the fly • Query stability enhancements • Reduced need for REORG • Utilities enhancements
<p>Dynamic Warehousing</p>	<ul style="list-style-type: none"> • Moving sum, moving average • Many query optimization improvements • Query parallelism improvements • Advanced query acceleration

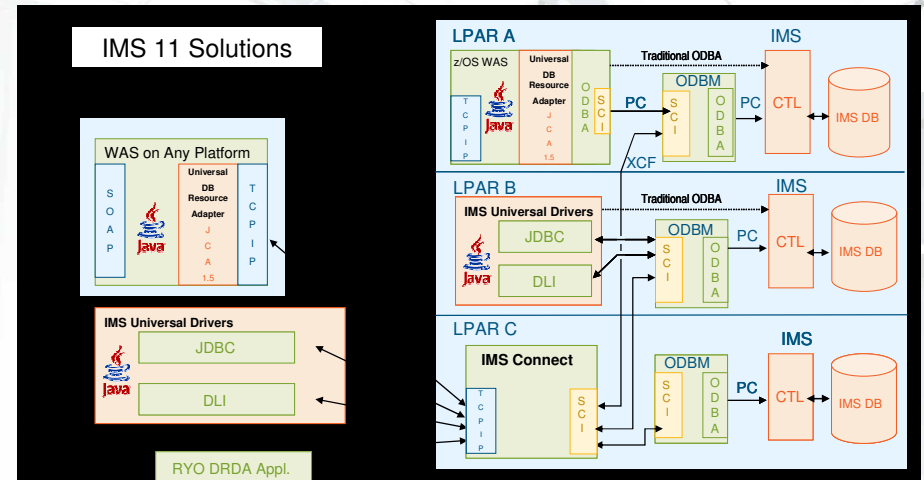


IMS Version 11

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



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

What's New with Rational on System z

Rational Developer for System z v7.6

- Consolidate and standardize on a single multi-language development environment
- Makes traditional development more attractive to next generation of developers
- Reduce host CPU usage up to 50% with workstation syntax checking and debugging
- New support for RTCz 2.0, CICS TS 4.1, IMS 11, IBM File Manager, and CA Endeavor®



Rational Team Concert for System z v2.0

- Cut costs with an agile and multiplatform team infrastructure for software delivery
- Reduce license, maintenance, and administration costs
- Automate and accelerate build and release processes across multiple platforms
- New integration with RDz 7.6

IBM Compilers for COBOL, PL/I and C/C++

- Increase capacity and performance without hardware upgrades
- Reduce cost of COBOL and PL/I XML parsing by offloading to specialty processors
- New Enterprise COBOL for z/OS v4.2
- New z/OS XL C/C++ v1.11
- New Enterprise PL/I for z/OS v3.9



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
- ✓ Increased application runtime performance with focused analysis and code path improvement effort for JEE, Web Services and Connectors.
- ✓ Bidirectional integration with CICS and DB2

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).

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**

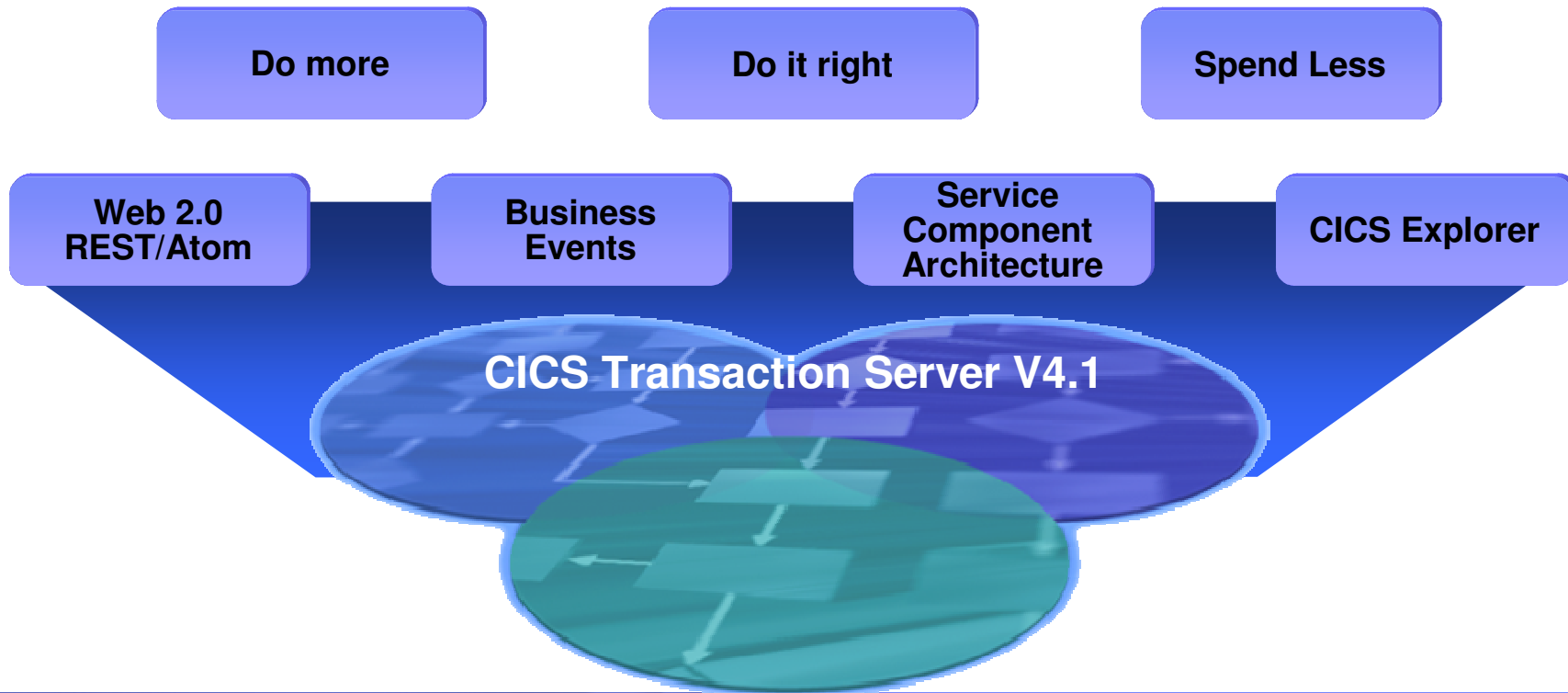
BRMS System z options:

- **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**



CICS Transaction Gateway 7.2



Secure, Scalable and Flexible Access to CICS

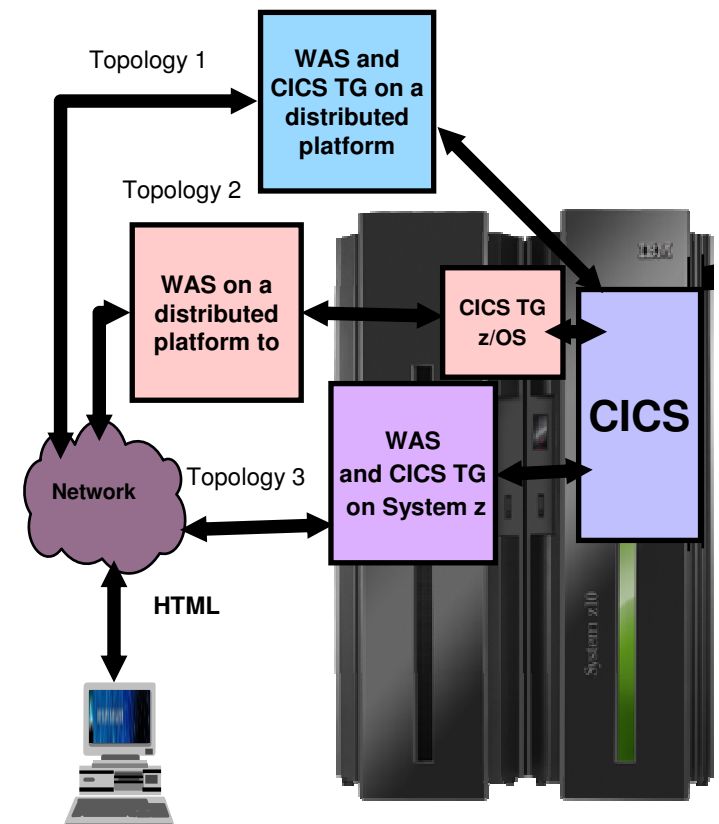
CICS Transaction Gateway is IBM's strategic connector from WebSphere to CICS, production proven in over a thousand customer environments

Key Characteristics:

- High performing, security-rich and scalable
- Standard JCA interface is strategic and provides best Qualifies of Service
- Minimal or no changes required for CICS applications to leverage value

Enterprise Application Server Connectivity

- CICS Transaction Gateway is commonly used as a strategic connector to application server environments
 - Optimised for IBM WebSphere Applications Server
 - Deployable in other J2EE Application Server environments
 - Provides exploitation in Microsoft .NET environments



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*
Planned availability September 2009

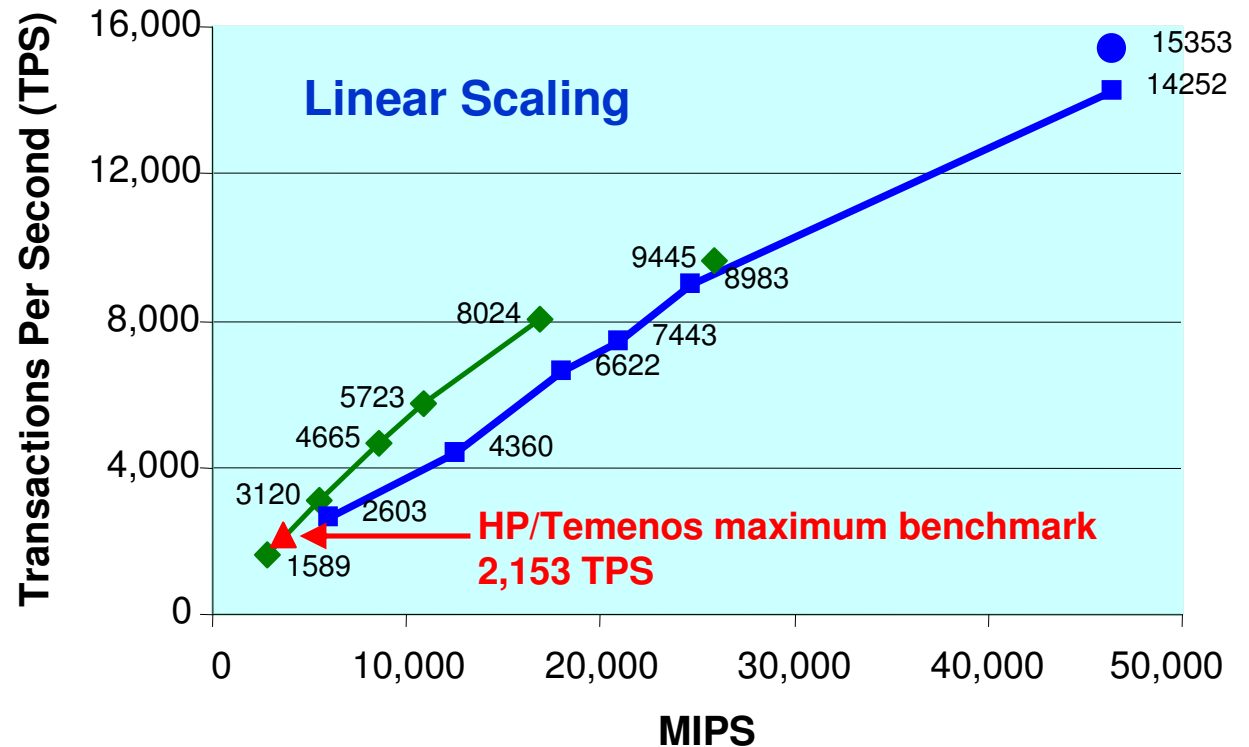
System z With DB2 Scales Further Than Best HP Superdome Banking Benchmark

- 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 BANGS 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

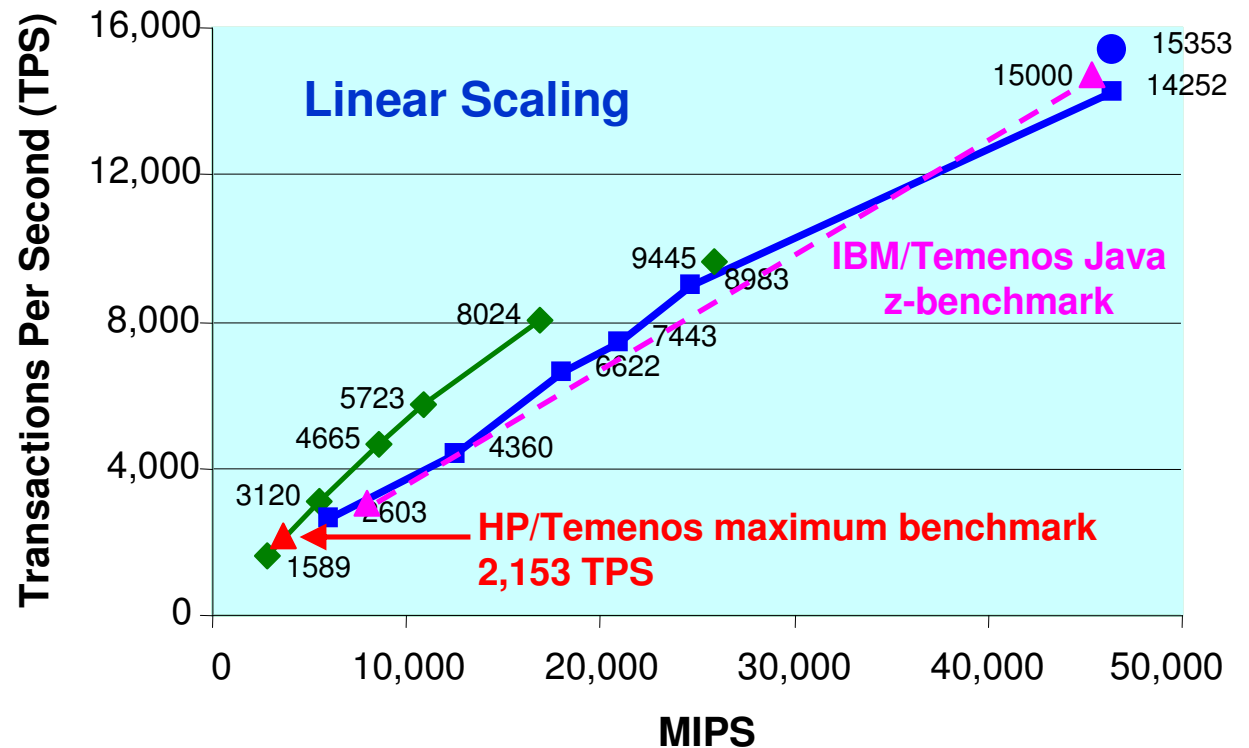
IBM Benchmark

- 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

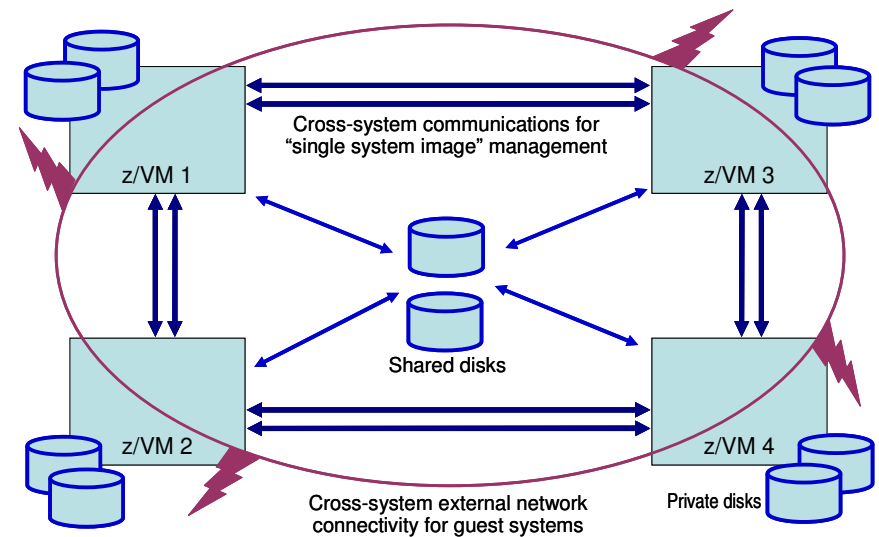


* SOURCE: TEMENOS BENCHMARKS; <http://h71028.www7.hp.com/enterprise/downloads/TemenosBenchmark.pdf>

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+

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

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	\$2,818K
Telecommunications	\$2,066K
Manufacturing	\$1,611K
Financial	\$1,495K
Information Technology	\$1,345K
Insurance	\$1,202K
Retail	\$1,107K
Pharmaceuticals	\$1,082K
Banking	\$997K
Consumer Products	\$786K
Chemicals	\$704K
Transportation	\$669K

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

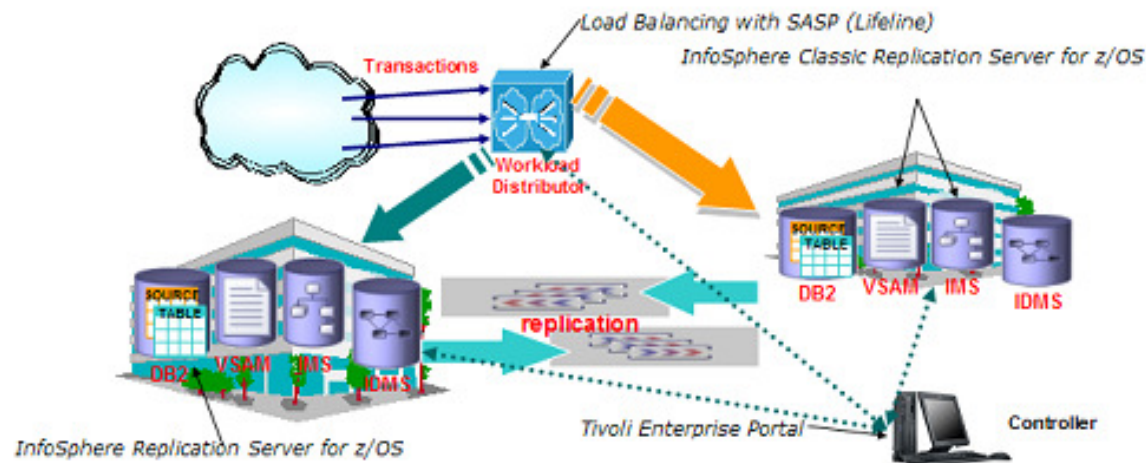
Unlimited distance

Active/Active

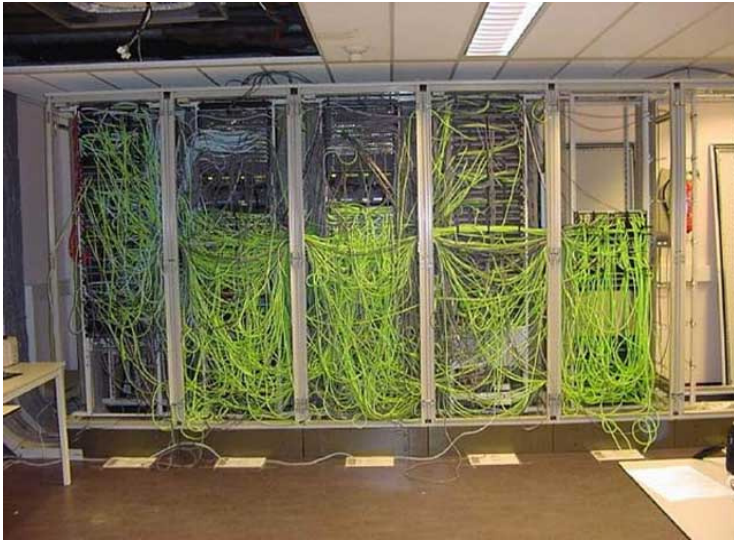
Continuous availability model

Recovery time < 1 minute

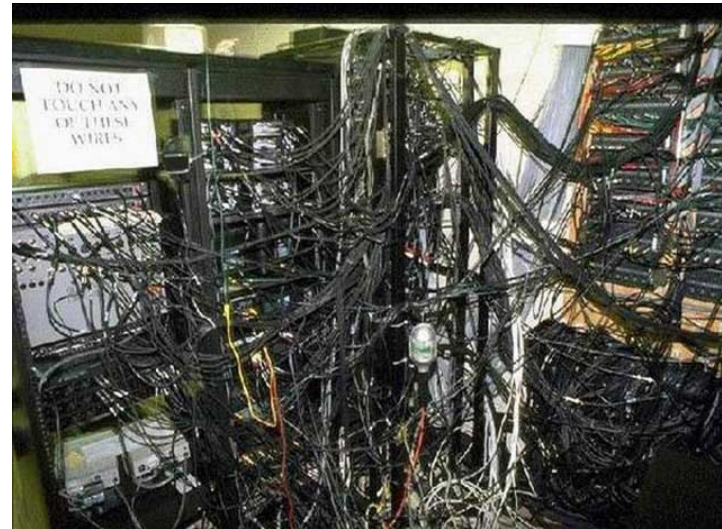
Unlimited distance sites



Network Simplification



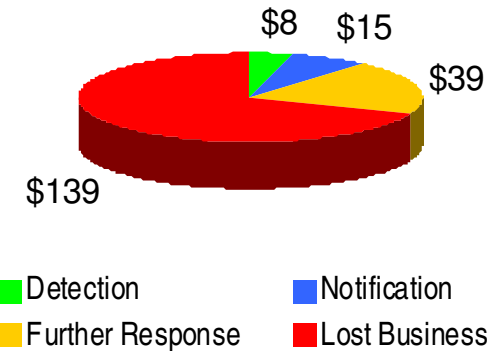
- **Consolidation replaces cables and routers with internal connections**
- **Better performance and security**



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.)

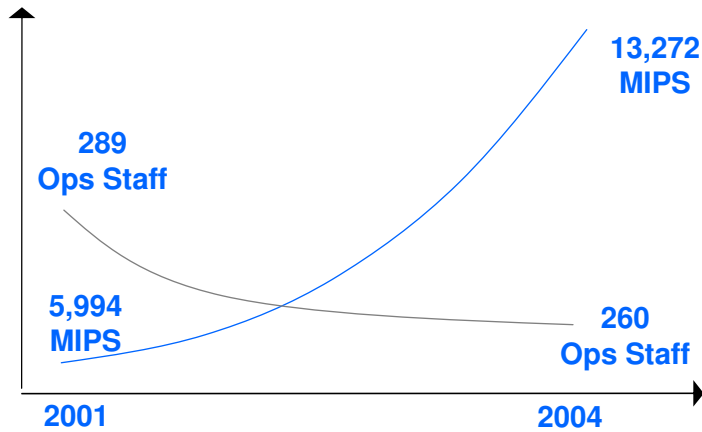
Centralized policy-based networking

z/OS Communications Server

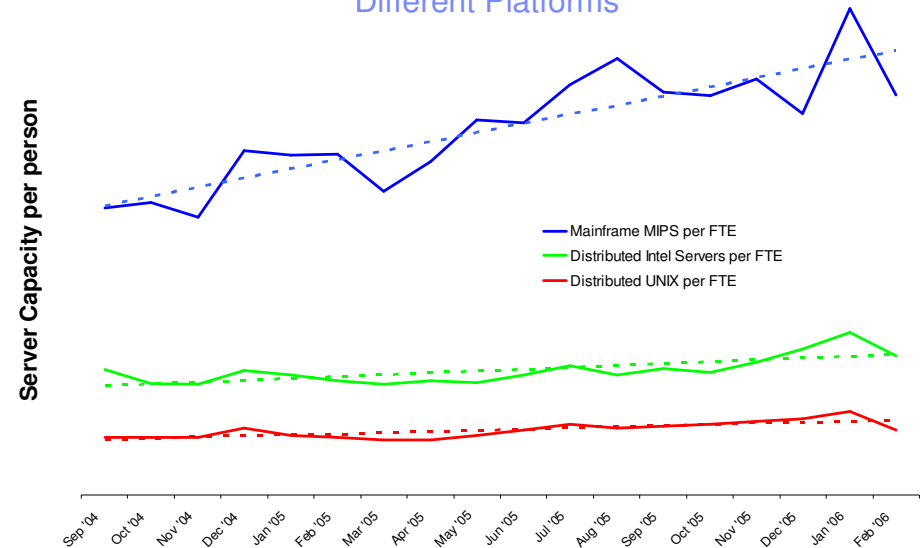
- Application Transparent -TLS (AT-TLS) and IPsec (1.7)
 - Simplified development and maintenance of security-rich Web apps – centralized configuration of AT-TLS and IPsec can help you secure the network data with no application modification.
 - Portions of IPsec eligible for zIIP (1.8/1.9)
 - AT-TLS 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

Mainframe Labor Costs Are Going Down

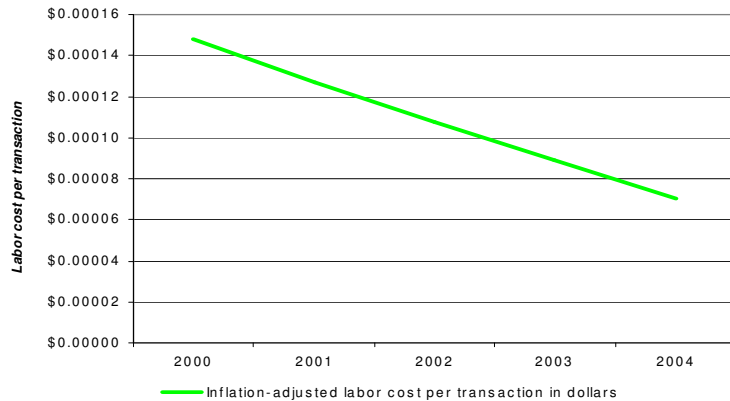
Data Center Staffing Levels for System z Have Not Increased Despite Large Increase in MIPS



Hardware Managed Per Person for Different Platforms



Labor Cost Per Transaction on System z is Decreasing



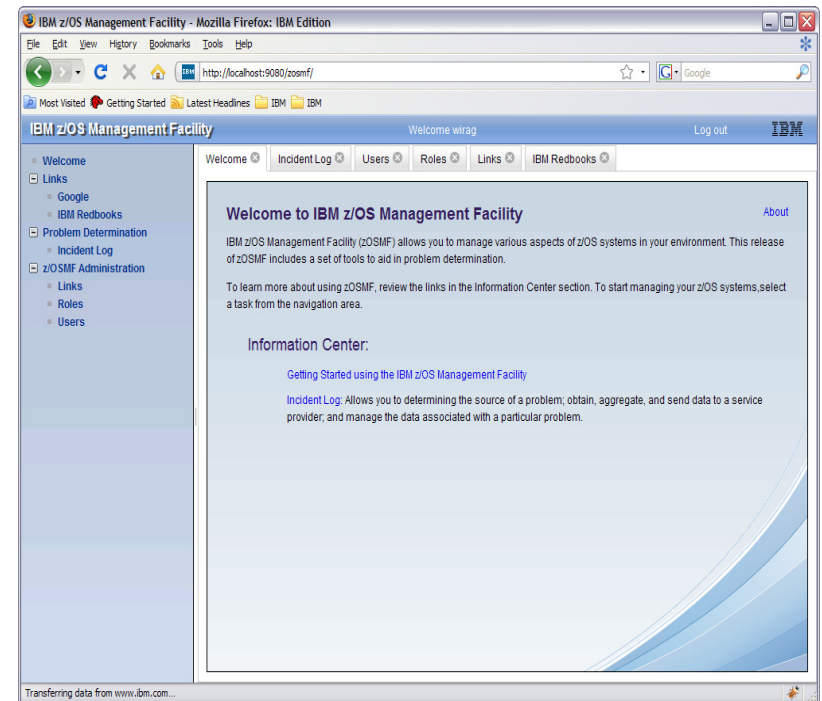
First National Bank of Omaha

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

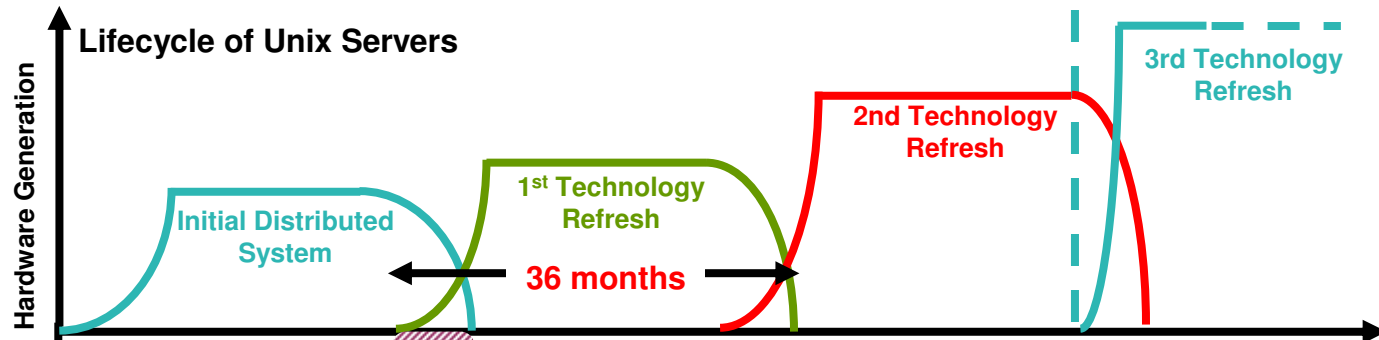
Staff growth reversed by consolidating to the mainframe

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

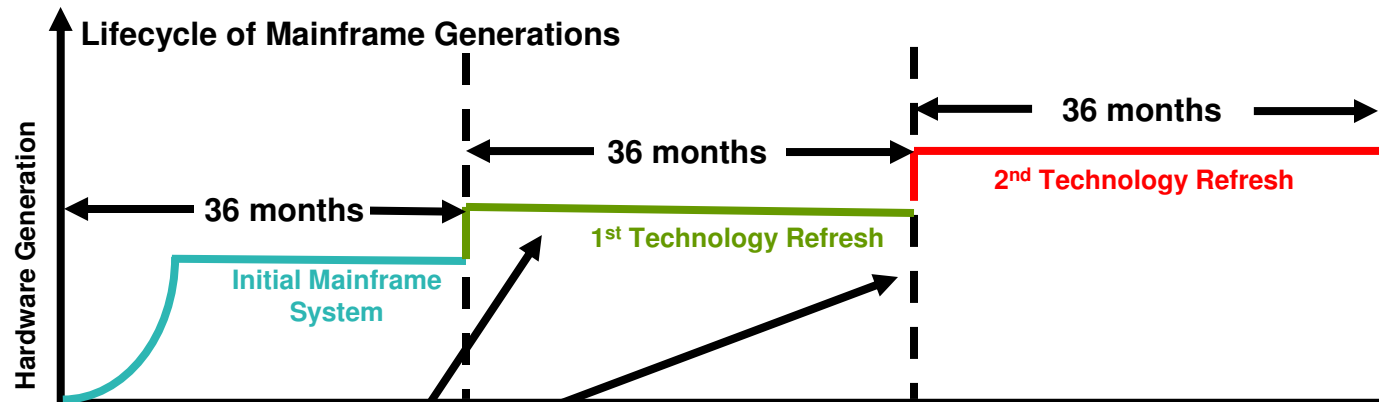


Observed at a large financial service customer

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

6 months provisioning
 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



1 Weekend upgrading to new hardware and software levels
 36 months production
 No need to retire the server, upgrade in place

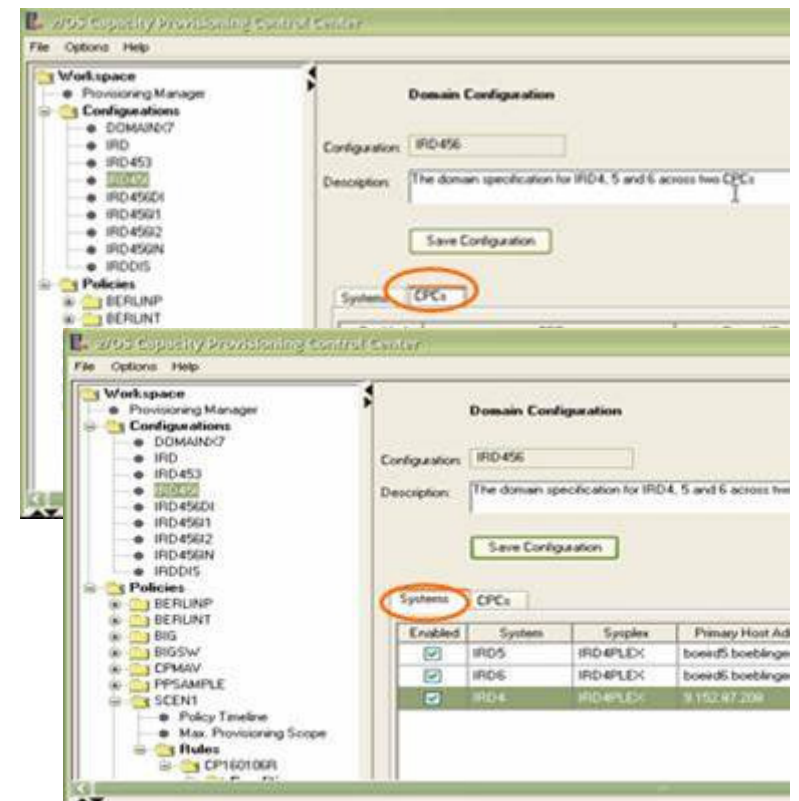
Weekend upgrades performed by IBM

Capacity on demand pricing

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

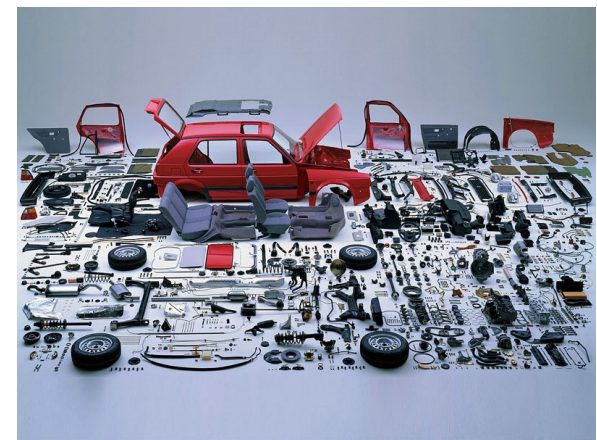


Tivoli Service Automation Manager (TSAM)

- **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)

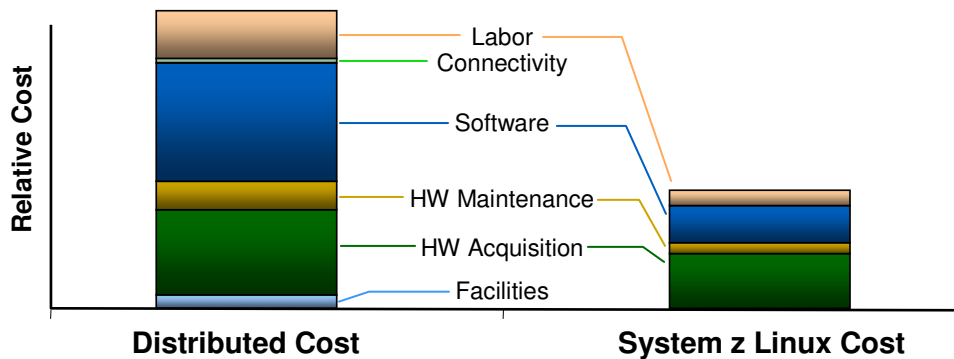
The holistic view of a service...

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

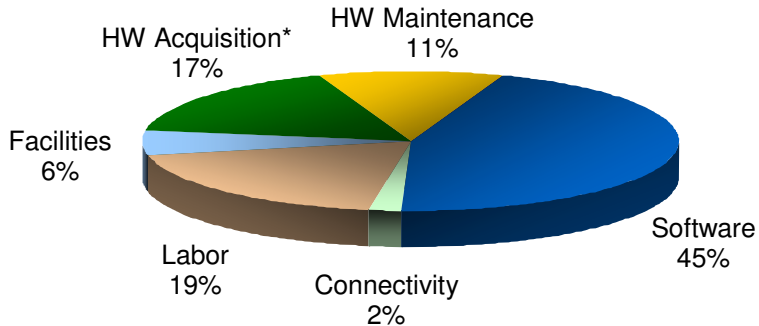


Client View of TCO Comparison for Similar Distributed Workload vs. System z Linux results in Potential 60-75% Gross Costs Savings / 5 yrs

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

Cloud Computing announcements for System z

October 6, 2009

- Solution Edition for Cloud Computing
 - Creates the foundation for cloud computing workloads in the enterprise with cloud service automation and management capabilities for a competitive price.
- IBM Smart Analytics Cloud for System z
 - A corporate Business Intelligence (BI) strategy and private cloud optimized for analytics deployment in a single offering.

November 16, 2009

- IBM Builds Massive Business Analytics Cloud for 200,000 Employees and Unveils Version for Clients – *both on System z*
 - The world's largest private cloud computing environment for business analytics, which will provide IBM sales teams and developers new levels of insight to better meet the needs of clients worldwide.
 - New solution for clients to build their own private cloud environments based on this architecture, called IBM Smart Analytics Cloud



Bringing mainframe qualities of service to cloud computing

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!



Academic Initiative System z Milestones

- ✓ 13 Student Contests in 13 countries with 14,672 students from 1,956 schools
- ✓ 608 schools, over 50,000 students in 61 countries worldwide
- ✓ IBM Student Opportunity System (Student resume database)
- ✓ Entry Level Mastery Test (Validate student skills)
- ✓ Community involvement (Roundtables, partnerships, hiring)
- ✓ Access to Mainframes worldwide for teaching (6 University hubs)
- ✓ 30 Courses available (foundational to advanced), Ongoing faculty education
- ✓ More educators and students are embracing IBM Enterprise Systems
- ✓ Students are getting jobs

[September 2009 Press Release](#)



“Master the Mainframe Contest’ helped me get a job at Bank of Montreal.”

Elizabeth Bell, Georgian College

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

