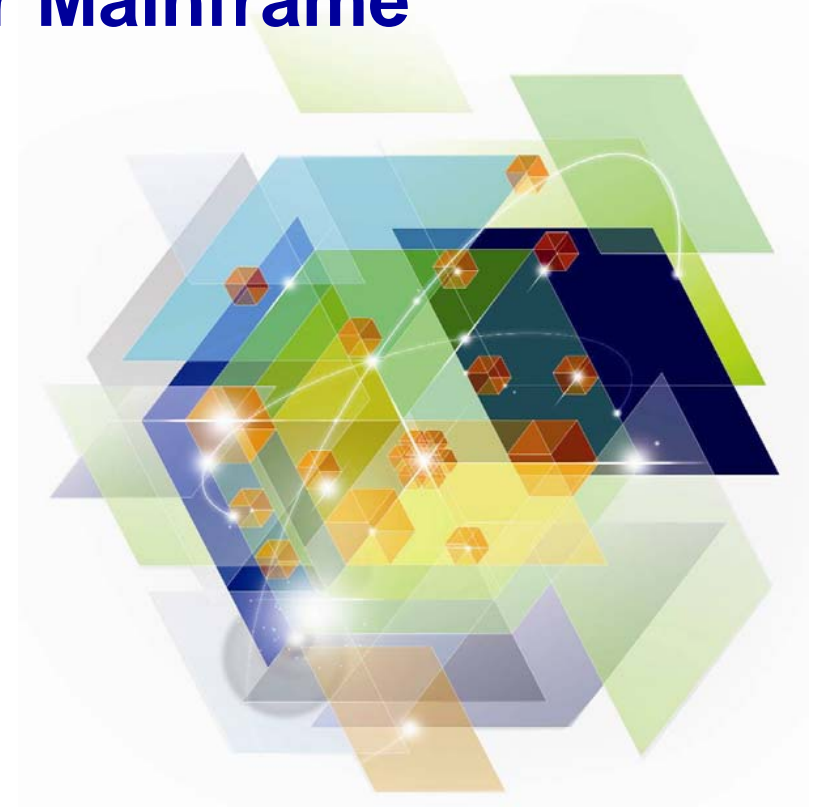




IBM zEnterprise Software Strategy and Direction - Exploiting the Value of your Mainframe Software

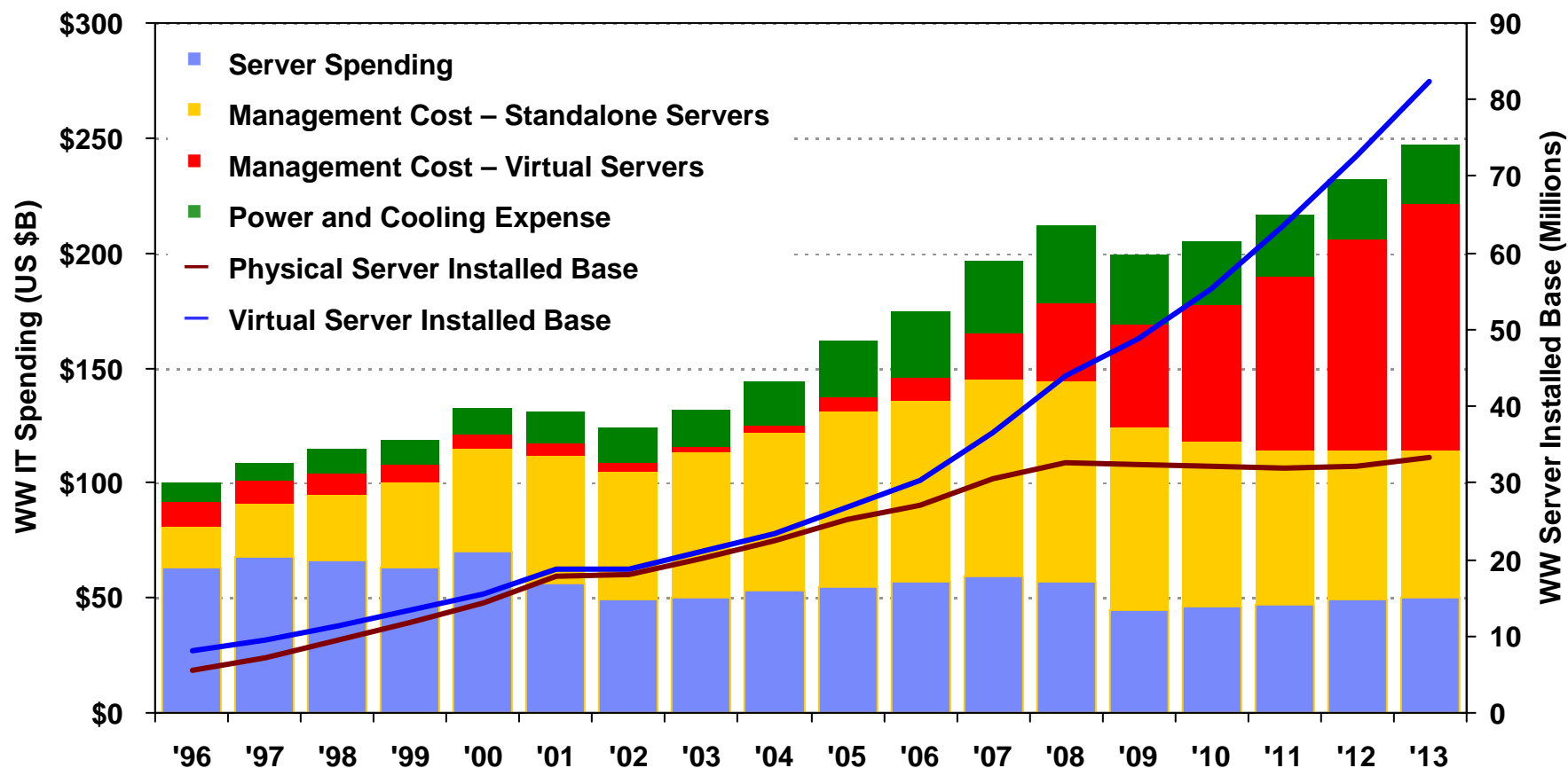
Ray Jones, Vice President,
Worldwide System z Software
IBM Software Group

March 20,2012



New economic model for the datacenter

Management costs shift to virtualized servers



Source: IDC – “Three Data Centers – One Vision?”

The complete system of systems

The IBM zEnterprise System Family

z/OS
z/VM
z/VSE
z/TPF
Linux

AIX
Linux

IBM BladeCenter HX5 (7873)

zEnterprise

zEnterprise

zEnterprise

IBM DB2 Analytics Accelerator V2.1

IBM DataPower XI50z

IBM BladeCenter HX5 (7873)

IBM BladeCenter PS701

IBM Software for System z

Smart Computing for Smart Businesses

Scalability	Availability	Security	Flexibility
			
<p>On Dec 23rd, 2010, VisaNet processed on System z an average of almost 24,000 transactions a second during the busiest minute of the year</p>	<p>IBM solutions enabled Fiserv to grow and meet our business needs without paying a lot to support that infrastructure. Other platforms can grow but cost a lot more, and in terms of availability they are still trying to catch up with System z</p>	<p>The intelligence and flexibility gained with a new fraud solution has dramatically improved Westpac New Zealand's ability to identify—and ultimately neutralize—new fraud schemes as they emerge</p>	<p>As a result of the solution, local businesses have decreased time-to-market, minimized transportation costs, and can quickly and accurately assess demand, increase profits and avoid waste.</p>

z/OS Release 13 – Scalable and Secure

z/OS V1.13

- Shorter batch windows
- Faster application programming
- Early warning for system issues
- Improved I/O performance
- Scalable encryption
- Better control for system backups

z/OS Management Facility V1.13

- Easy and fast image deployment
- Better storage management
- Easy to maintain secure network connections

z/OS - Most scalable and secure operating system on the planet



Increased visibility and faster problem determination with redesigned OMEGAMON monitoring and management family

Modernize and strengthen OMEGAMON product line with reduced resource usage and increased information available for higher quality service management

- **Enhanced 3270 User Interface provides single resource view across systems and sub-systems**
- **New features:**
 - **Built-in Problem Solving Scenarios designed to allow SMEs to avoid service outages and meet SLAs**
 - **Easier Configuration and Maintenance capability with Parmgen and Self-Describing Agents**
 - **Usage of zIIP specialty servers for decreased resource usage**
 - **zEnterprise visibility support to allow for discovery and monitoring across all components, including z/BX**
 - **Delivered first with OMEGAMON for z/OS, and CICS**



Advanced storage management, audit, and reporting with *Tivoli Advanced Storage Management Suite for z/OS*

Consolidated offering of four key IBM Tivoli z/OS storage management, audit, and reporting products

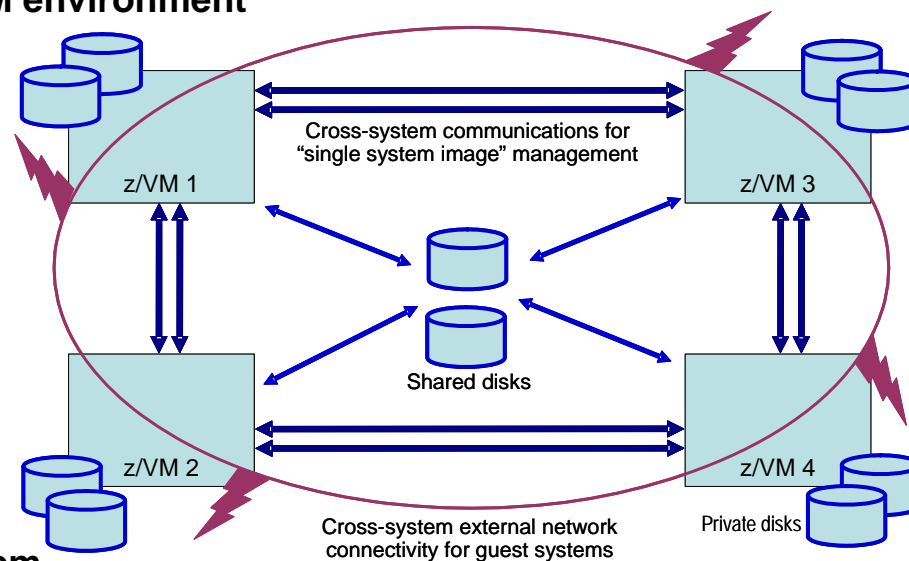
- Allocation Management
- **Monitor and maintain z/OS storage management with strong, flexible policy-based allocation controls**
- Reporting and Management for DFSMSHsm
- **Optimize DFSMSHsm to prevent and recover from costly space-related abends**
- Catalog Management for z/OS
- **Reorganize, repair, split, and merge catalogs while they are open**
- Audit for DFSMSHsm
- **Audit and automatically correct errors to reduce outages**
- ***Combining this offering with OMEGAMON XE for Storage on z/OS will provide a powerful efficient overall z/OS Storage management capability***



z/VM V6 R2

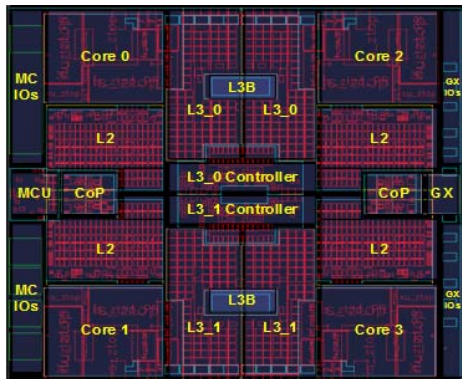
Clustered Hypervisor Support and Guest Mobility

- Clients can cluster up to four z/VM systems in a **Single System Image (SSI)**
- Provides a set of shared resources that can be used by both z/VM and hosted virtual machines, with full awareness of sharing by the clustered z/VM systems – be they on the same and/or different z10 servers
 - Directory, minidisks, spool files, Virtual Switch MAC addresses
- Helps simplify systems management for a multi-z/VM environment
 - Single user directory
 - Cluster management from any system
 - 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
 - Service consolidation: run one copy of service virtual machines for the cluster
 - Resource coordination and protection: network and disks
- Dynamically move Linux guests from one z/VM system to another in the cluster via **Live Guest Relocation**
 - Helps reduce planned outages; enhances workload management
 - With z/VM: dynamically move work to available resources and dynamically move resources to work



IBM Compilers Exploit System z for Maximum Performance

- Compilers exploit new hardware instructions introduced by System z
- Code generated by the compilers is highly tuned for System z
- Boost in performance of applications running on System z



z/OS XL C/C++

Enterprise COBOL for z/OS

Enterprise PL/I for z/OS

135 new / changed instructions

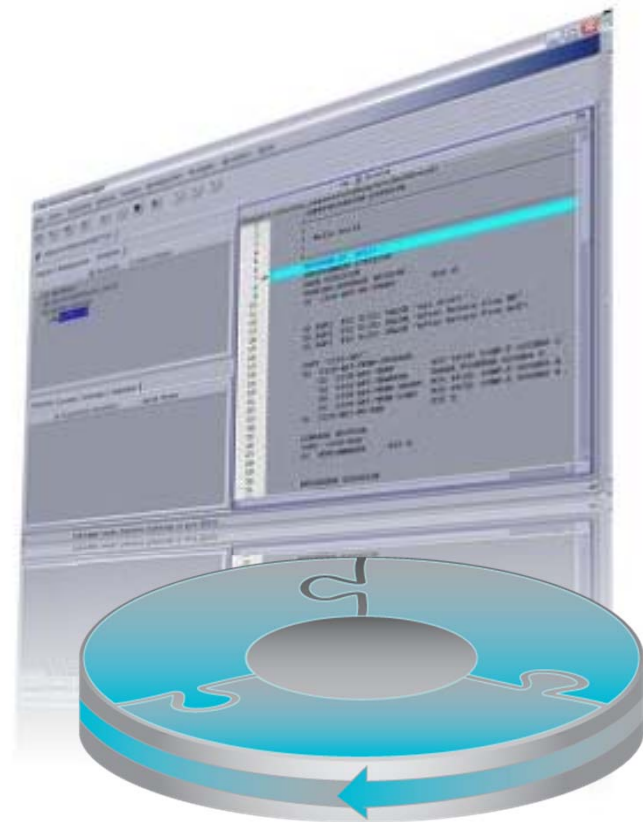
NEW! z/OS XL C/C++

- Up to 5% improvement on applications
- Metal C optimization
- Portability enhancements for multiple languages
- Productivity enhancements for complex applications

Modernizing Enterprise COBOL infrastructure

COBOL Vnext Beta Compiler

- Improve delivery of z/Architecture exploitation
- Incorporate leading-edge optimization and code-generation technology to Enterprise COBOL for z/OS
 - Improve performance, maximize machine utilization, and reduce cost of ownership
 - Provide solid foundation to support new hardware features (e.g. decimal floating point, 64 bit...), and future System z processors
- Source and binary compatibility
 - No need to recompile old code
 - Support linking together of “old” and “new” code for correct programs
 - Plan to remove some old/obsolete syntax and report if old syntax is found

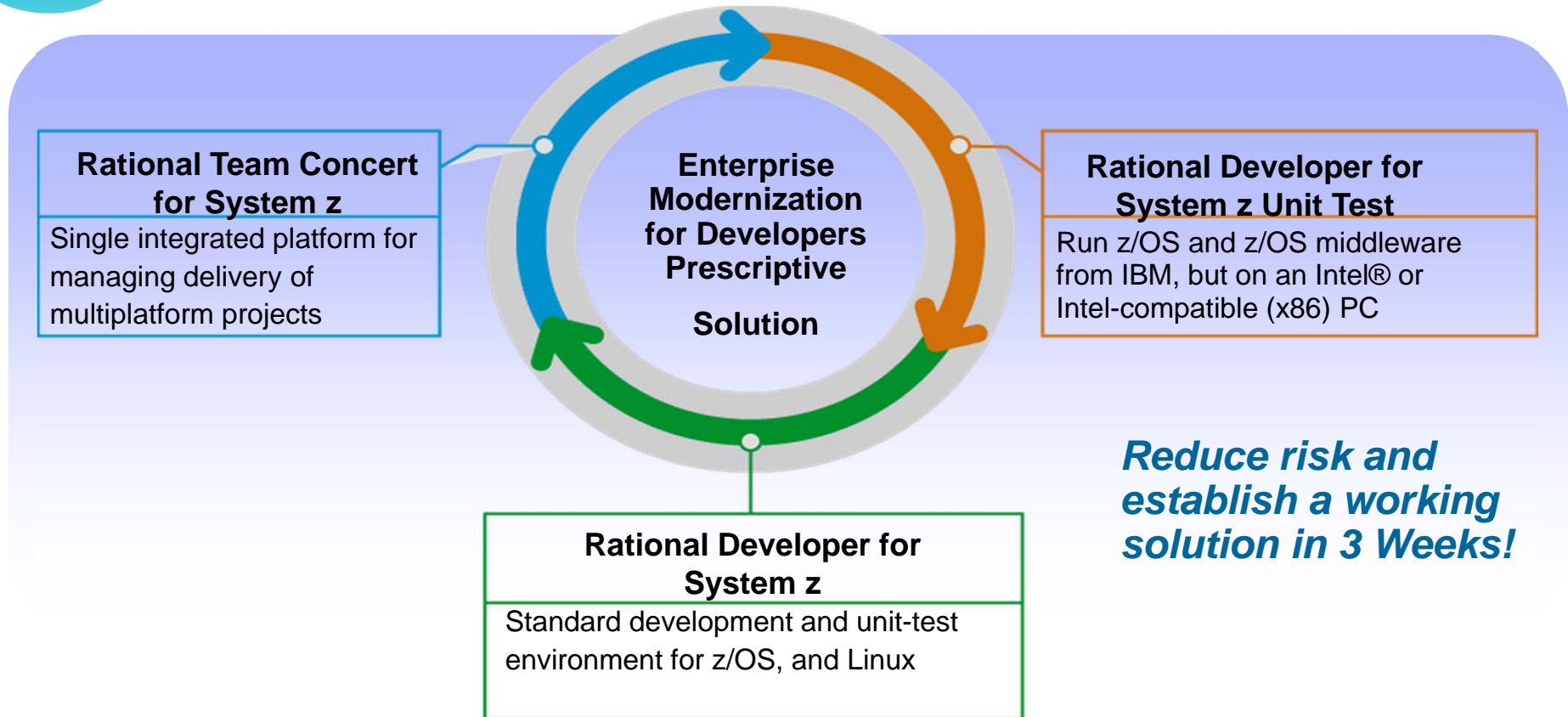


Closed beta – contact rkoo@ca.ibm.com if interested in participating

Enterprise Modernization for Developers Prescriptive Solution Service Offering

New!

Establishing a modern, integrated, and collaborative application lifecycle management infrastructure



- ✓ Establish a modern, high-productivity development platform
- ✓ Simplify initial install and configuration via specific project plan and check lists
- ✓ Common use case scenarios & integrations.
- ✓ Implements a field-tested usage model, targeting a small, focused team of developers to ensure successful deployment

Simplify IT with Application Portfolio Management

Shift cost from maintenance and operations to innovation and new business development

Employ a cyclical process using information and analytics that produces objective and transparent decisions around investing, consolidating, modernizing, or replacing applications.

- Provides an understanding of application cost, value, risk and enhancement potential
- Provides out-of-the box workflows, role-based views, collaborative decision support, financial analysis and analytics to guide decisions
- Defines as-is and to-be architectures, architectural alternatives and roadmaps.
- Drives actionable decisions by defining and managing application and project roadmaps.



NEW!

- Entry points: Focal Point (FP) only, or FP + System Architect (SA)
- Rational Team Concert integration
- Added scenarios: Consolidation, Modernization, Investment Management, SLA Optimization.





*Using application portfolio management, customer found a payback time of **13 months**, a 3-year ROI in excess of **100%**. and savings on average **\$1.5M** in a very short time ¹*

¹Forrester TEI Study

DB2 10

Customers seeing reduced costs, simplified workloads through proven technology

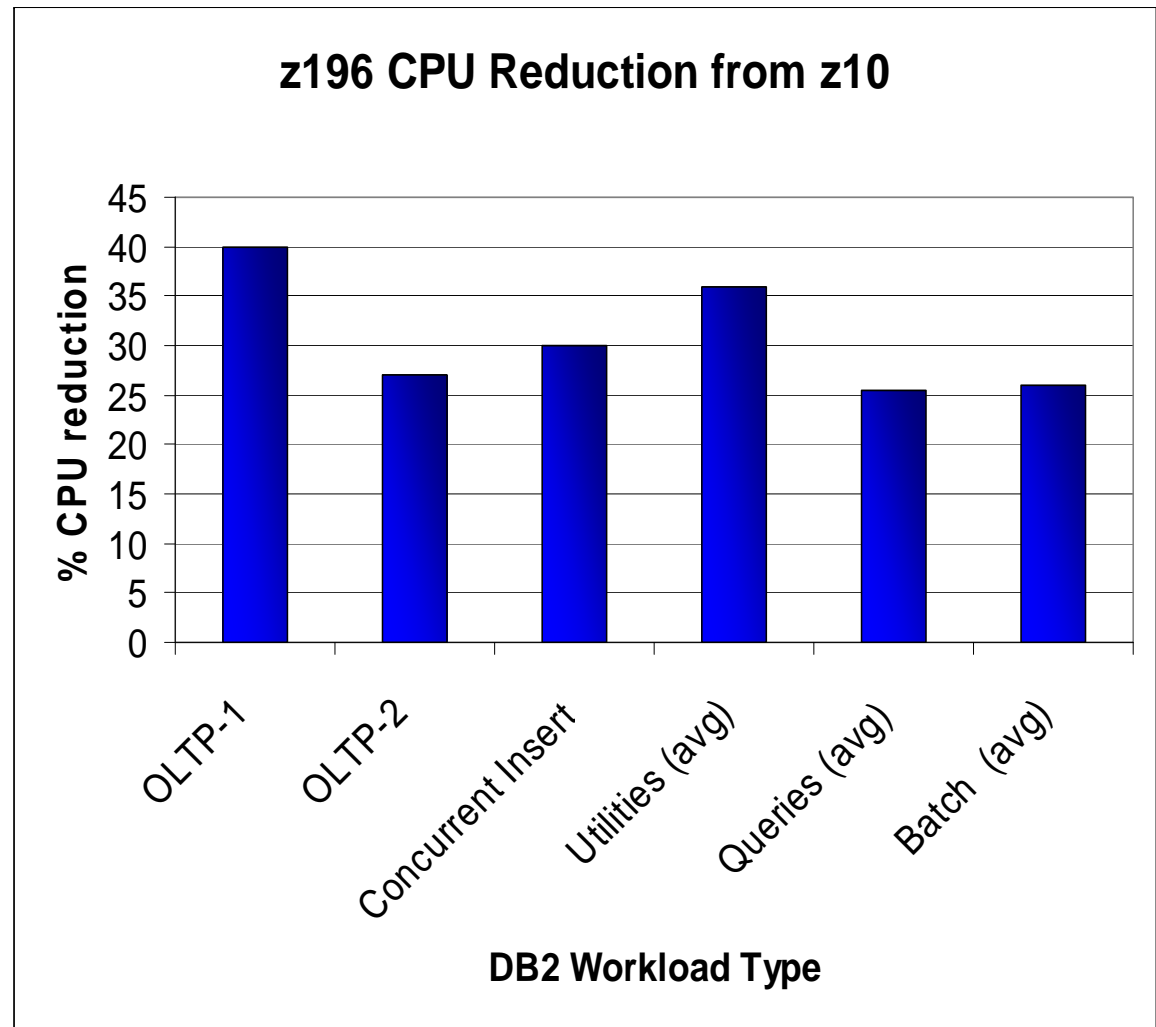


Reduced Costs	Simplified Workloads	Proven Technology
<p>“Based on the performance metrics from our controlled test environment, we see a significant amount of CPU and Elapsed time savings. This release has many features that will help bring down our operating costs.”</p> <p>Morgan Stanley DB2 Team</p> 	<p>“With DB2 10 able to handle 5-10 times as many threads as the previous version, the upgrade will immediately give the bank some much-needed room for future workload growth while simultaneously reducing their data sharing overhead.”</p> <p>Paulo Sahadi - Senior Production Manager, Information Management Division at Banco do Brasil</p> 	<p>“Every single SQL statement we have tested has been better or the same as our current optimal paths – we have yet to see any significant access path regression. We had to spend a lot of time tuning SQL with DB2 9, but we expect that to disappear when we upgrade to DB2 10.”</p> <p>Philipp Nowak, BMW DB2 Product Manager</p> 
<p>“The new temporal functionality in DB210 for z/OS will allow us to drastically simplify our date-related queries. In addition, we’ll be able to reduce our storage costs by using cheaper storage for inactive rows and reduce our processing cost by having DB2 handle data movement more efficiently than the custom code we’ve written to do the same work in the past”</p> <p>Large Insurance Company - DB2 10 Beta Customer</p>	<p>The biggest improvement for us was the enhancement regarding SAVE DATA support. We force customers to run their CPU-intensive queries in batch and in prior releases they failed after running for hours just because the table already existed and there were minor differences in the column definition”.</p> <p>Walter Janissen- ITERGO Informationstechnologie GmbH</p> 	<p>The new audit capabilities in DB2 10 will allow tables to be audited as soon as they are created, which is an obvious benefit for the business and will reduce costs and simplify our processes”</p> <p>Gunter Schinkel -Postbank Systems AG</p> 

For more customer references visit

DB2 and zEnterprise 196

- **CPU reduction in all types of DB2 workloads**
 - Larger processor cache (1.5MB L2 per core, 24MB L3 per chip, 129MB L4)
 - Various types of DB2 9 and 10 workloads show 20% to 40% DB2 CPU reduction compared to z10 processors.



DB2 Utilities: Delivering Day 1 Support and more !

Significant reductions in CPU and elapsed time with more zIIP offload

Using leading-edge technology to break performance barriers

- *Virtual elimination of CPU & elapsed time through use of FlashCopy technology*
- *Complete elimination of CPU & elapsed time through improved utility avoidance techniques in engine & IBM's DB2 Tools*
- *DB2 Sort can cut CPU cost & elapsed time by over 33%*
- *Customers can address one of their biggest cost challenges – utility ISV costs*
- *More features to come, more customers re-evaluating how to save \$\$\$*

Swiss Re



Ameriprise
Financial



IBM DB2 Analytics Accelerator

Capitalizing on the best of both worlds – System z and Netezza

Blending System z and Netezza technologies to deliver unparalleled, mixed workload performance for complex analytic business needs.



- **Leverages the strengths of System z and Netezza**
- **Extreme Performance for complex analytics**
- **Breakthrough technologies - hardware acceleration**
- **Tightly integrated into DB2 for z/OS**
- **Creates a highly secure environment for sensitive data analysis**
- **Reduced cost and complexity**
- **Summary: Performance, availability and scalability**

Accelerating decisions to the speed of business

IBM DB2 Analytics Accelerator

Accelerating decisions to the speed of business



Blending System z and Netezza technologies to deliver unparalleled, mixed workload performance for complex analytic business needs.

			DB2 Only		DB2 with IDAA		Times Faster
Query	Total Rows Reviewed	Total Rows Returned	Hours	Sec(s)	Hours	Sec(s)	
Query 1	2,813,571	853,320	2:39	9,540	0.0	5	1,908
Query 2	2,813,571	585,780	2:16	8,220	0.0	5	1,644
Query 3	8,260,214	274	1:16	4,560	0.0	6	760
Query 4	2,813,571	601,197	1:08	4,080	0.0	5	816
Query 5	3,422,765	508	0:57	4,080	0.0	70	58
Query 6	4,290,648	165	0:53	3,180	0.0	6	530
Query 7	361,521	58,236	0:51	3,120	0.0	4	780
Query 8	3,425,29	724	0:44	2,640	0.0	2	1,320
Query 9	4,130,107	137	0:42	2,520	0.1	193	13

“We had this up and running in days with queries that ran over 1000 times faster”

“We expect ROI in less than 4 months”

Queries run significantly faster with DB2 Analytics Accelerator

Actual customer results, October 2011

IMS: Powering the World's Large Enterprises



IBM Announces IMS 12

Reduced Costs

Up to 5% out of the box MIPS savings
Up to 30% savings on network support

Improved Productivity

Up to **50%** faster deployment of IMS
resource definitions and changes

Improved Performance

Database logging up to
2x faster

.....and
much
more...

2 billion
production
transactions
running daily

Great new offer!

IMS 11 customers can get IBM
Mashup Center Version 2 for free

"IMS Callout, ODBM, and the SOAP Gateway allow us to keep data in distributed systems in sync with that in the legacy IMS systems, helping maintain inventory control."
– Steve Clanton, IT Transactional Services, Caterpillar

IMS 11: Open for enterprise-scale business



IMS and Data Power Integration

IMS integration with Data Power provides :

Network-level connection spraying

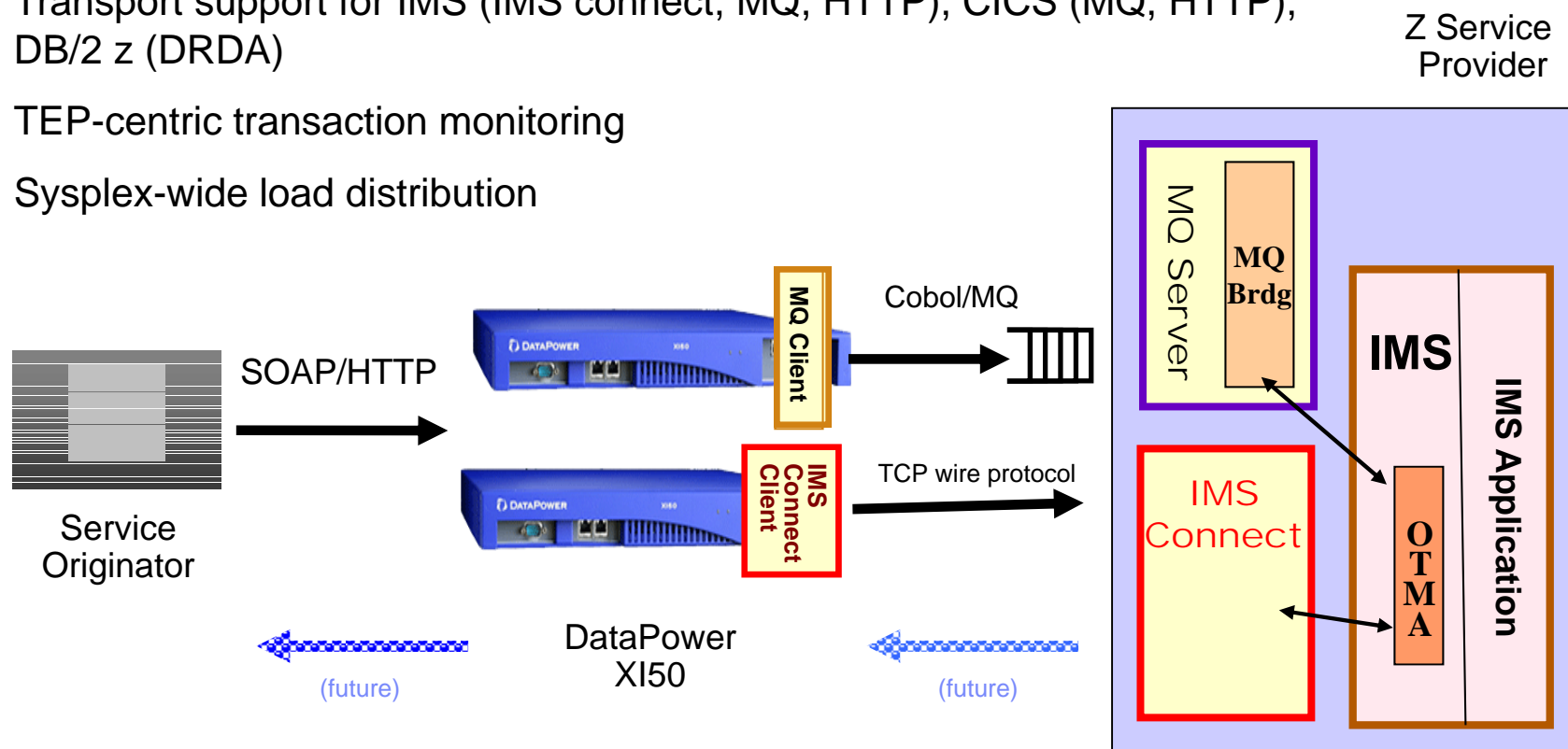
RACF authentication and authorization

WTX and Data Studio tooling for binary transformations

Transport support for IMS (IMS connect, MQ, HTTP), CICS (MQ, HTTP), DB/2 z (DRDA)

TEP-centric transaction monitoring

Sysplex-wide load distribution



CICS Trends and Directions

- CICS has a history of supporting the latest developments in the computing industry
- One of the biggest trends in the IT industry today is the emergence of cloud computing
- CICS already supports many cloud principals, but that is only going to get better...

The cloud claims...



Doing more with less
Reduce capital expenditures and operational expenses



Reducing risk
Ensure the right levels of security and resiliency across all business data and processes

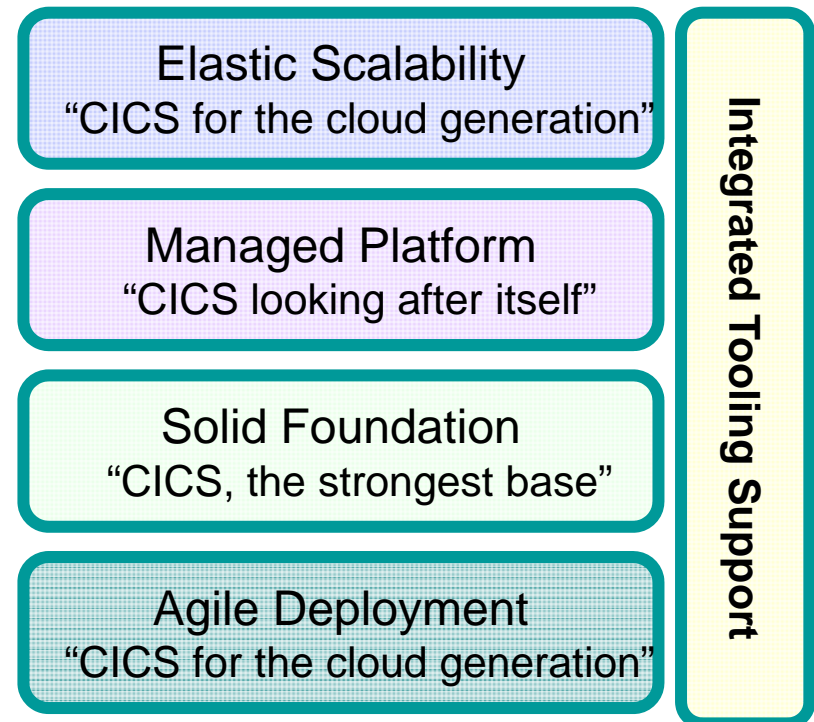


Higher quality services
Improve quality of services and deliver new services that help the business grow and reduce costs



Breakthrough agility
Increase ability to quickly deliver new services to capitalize on opportunities while containing costs and managing risk

CICS futures



...Watch this space for more information

Evaluate CICS Transaction Server for z/OS with a new trial version

Save valuable time and resources

- CICS TS V4.2. to assess the value that could be gained from a CICS TS upgrade
 - ‘**Try-before-you-buy**’ edition of Fully functional offering that cover the complete set of CICS TS V4.2 capabilities
 - Zero cost license charge
 - Ordering, installing, and using in a non-production environment will not initiate any Single Version Charging (SVC) period.
 - Explore CICS with Rational Developer for System z Unit Test - a dedicated, low-cost System z environment



During a recent month a large credit card company in the U.S. used CICS and exceeded **one million transactions** for the first time. Availability during the month was **100 percent with no incidents and no performance-related issues** in handling the volume.

Scaling with Java Applications

Java 6.0.1

zEnterprise and Java 6.0.1: Engineered Together

- Up-to 2.1x improvement to Java throughput
- Reduced footprint
- Tighter integration with z/OS facilities
- Improved responsiveness in application behavior
- Extends Enterprise applications to mobile devices

J9 R2.6 Virtual Machine

- Significant enhancements to JIT optimization technology
- zEnterprise exploitation of instructions and new pipeline
- New Balanced GC policy to reduce max pause times
- Default GC policy changed to gencon

z/OS Unique Enhancements

- JZOS 2.4.0
- z/OS Java unique security enhancements

Performance

- **2.1x** improvement to multi-threaded workload
- **1.93x** improvement to CPU-intensive workload



WebSphere Profile for System z

- **The WAS for z/OS Liberty profile is a composable application server profile of WAS with *optional* extensions for z/OS**
 - New architecture from prior version, full profile still available to allow for all existing apps to run
 - Liberty is not full WAS, the rest will come over the next few years, initial focus Web Apps
 - Applications written for Liberty run in full profile unchanged
 - Simplified and reduced configuration for both WAS and zOS
 - Getting new applications up and running on WAS for zOS now much quicker
 - Greater consistency enables improved internal development for SWG and STG products building on Liberty, an example is zOS Management Facility
- Significantly improved performance
- Continued exploitation of System Z and z/OS through ***optional*** extension to components (WLM, HA, Security)
 - Server startup time for simple applications is < 5 seconds
 - Projected throughput for simple web-apps +20%
 - Significantly reduced real storage and disk requirements
 - ~20-25 MB disk footprint
 - ~50-75MB real storage per server
- Expected use cases for Liberty on zOS:
- **Test of Web Applications using zOS Resources (DB2, IMS(future), CICS(future))**
 - **Lightweight production**
 - **Cloud production where server density matters**
 - **Imbed Servers**

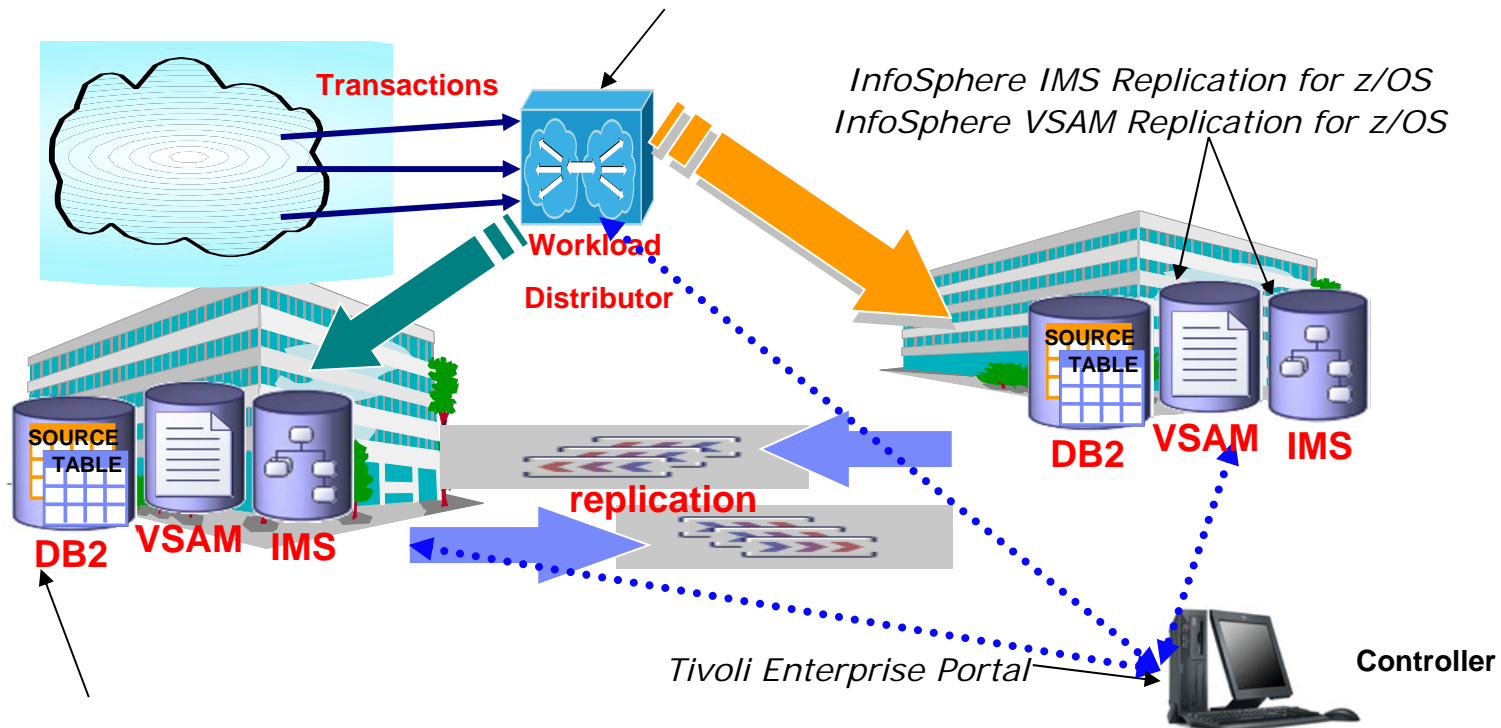
Customer feedback after viewing demos

“It has to be a demo trick, it can’t start that fast. Its like the moon landing, it never happened”

I can see how I can include WAS for zOS in my cloud now”

NEW! IBM GDPS/Active-Active for Continuous Availability

- Provides continuous availability for *two or more sites separated by unlimited distances*
 - Planned workload switch - **20** seconds from active site to standby site
 - Unplanned workload switch - **120** seconds from active site to standby site
 - Planned site switch - (9 * CICS-DB2 and 1 * IMS workloads) **20** seconds
 - Unplanned workload switch - **150** seconds



Equens Italia improves business performance and achieves near-continuous systems availability with zEnterprise

Targets 100% systems uptime with zEnterprise with zBX, DS8000 and GDPS



Processes annually 9.7 billion payments and 3.9 billion POS and ATM transactions

- **High operating costs** due to management of many distributed Intel servers
- Needed to **eliminate a disaster recovery scenario** by running all applications in parallel among two data centers with 0% impact to users

Benefits:

- ✓ With GDPS automation, **parallel applications ran immediately and less than 30 minutes** for the others that were not candidates to run in parallel
- ✓ **Eliminated funding for the deployment of new hardware and reduced operational cost** by moving systems and applications to the zBX
- ✓ **Freed up square footage and reduced energy usage in the data centers** by reducing distributed systems and moving to zBX
- ✓ **Significant performance gains** due to the fast network connection to the zEnterprise with zBX

zBx customers are merging Distributed workloads with Mainframe workloads

BG Phoenixics



Phoenixics

zBX enabled them to manage multi-tier applications running on completely different architectures as if it were a single workload.

Nova Ljubljanska Banka



zBX + ISAO enabled them to dramatically speed up the processing times of financial data

Marriott



Plans to use zBX to manage virtualized resources

EuroControl



zBx enables them to create single private cloud in which all applications can run with a guaranteed service level for computing capacity and availability for lowest TCO.

Volvo



zBX+ z196 enabled them to consolidate workloads and data centers while increasing performance and lowering cost.

Canada Dept. of National Defence



Plans to use zBX to run appropriate AIX and other workloads as part of a planned cloud-like environment.

ZZZS

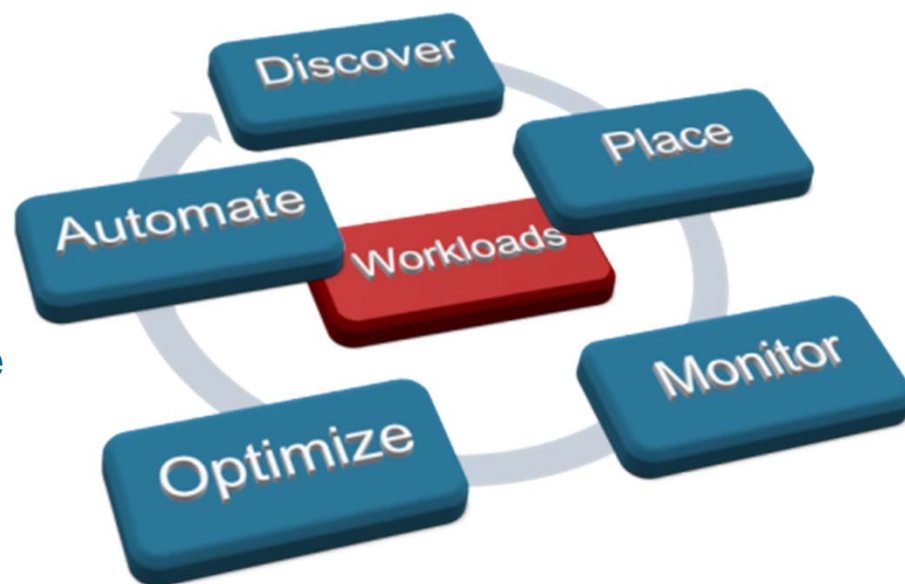


zBx + DataPower will ensure a secure communication channel between the healthcare provider and insurer.

Virtualization and Optimization - NEW APIs

Consolidation, virtualization and energy efficiency to reduce cost, complexity and help align IT resources

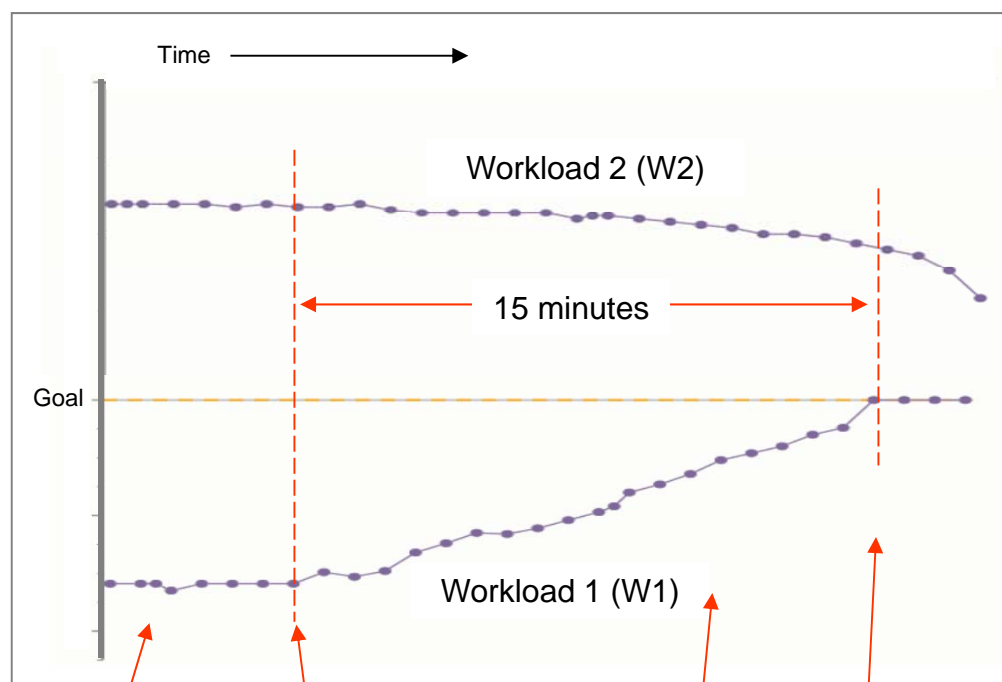
- **Statement of Direction¹ - Application Program Interfaces (APIs) for Unified Resource Manager**
 - Provide access to the same underlying functions that support the Unified Resource Manager user interface
- **Statement of Direction¹ - Tivoli Integrated Service Management for zEnterprise API Support**
 - Today, Tivoli products provide significant functionality that supports zEnterprise environments. Tivoli intends to provide additional capabilities made possible with Unified Resource Manager APIs.



¹ All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represents goals and objectives only.

Performance Manager Lab Test

Automatic Allocation Of CPU Resource



1. No performance management. W1 is underperforming, and W2 is overperforming.

2. Performance Manager is turned on. zManager detects W1 is underperforming.

3. Over time, zManager adjusts CPU resources, taking from W2 and giving to W1.

4. W1 reaches performance goal.

- zManager monitors virtual machine performance and automatically adjusts CPU resources as needed
- Considers priority and performance relative to service level agreement goals
- Reduces the need to over-provision CPU resources

Hypervisor Setup And Configuration Lab Test Do-It-Yourself vs. Unified Resource Manager

DIY Tasks (per Blade)	Elapsed Time	Labor Time
Initial communication setup & education	6 min 26 sec	6 min 26 sec
Boot VIOS disc & install (creates LPAR for VIOS automatically)	37 min 59 sec	36 min
Configure VIOS networking	2 min 49 sec	2 min 49 sec
Create new storage pool for LPARs	35 sec	35 sec
Install VIOS service fixpacks	61 min 5 sec	20 sec
TOTAL TIME	1 hr 48 min 52 sec	46 min 10 sec

zManager Tasks (per Blade)	Elapsed Time	Labor Time
Add entitlement for a blade	90 min	92 sec
TOTAL TIME	1 hr 30 min	1 min 32 sec

97% reduction
in labor time

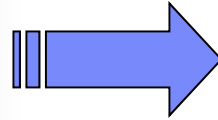
Italian Utility Company Using SAP

The Current: z10 + Power systems with DB2 for z/OS database, 60K bills per hour



Client Requirement

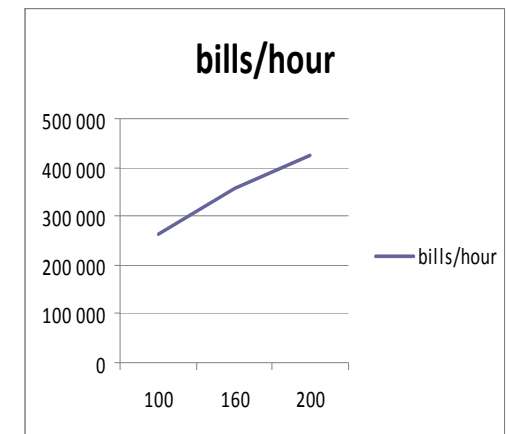
- Expect to add up to 30 million customers in the next 18 months
- Require throughput greater than 150,000 bills / hour



- z196 and zBX with POWER7 blades
 - Unified Resource Manager with dedicated network
 - Latest functionality in DB2 V10
- ✓ Results: up to 426,000 bills per hour

Hybrid Computing Benefits:

- ✓ Over **600%** improvement in current configuration
- ✓ Hardware setup: implementation of zBX Power Blades in only **2 days**
- ✓ Very good linear **scalability** either on scale-up for DB2 on z, or scale out on pBlades on zBX
- ✓ **Low latency** due to the dedicated IEDN network



System z – 45+ years in the making

- The world's most trusted transaction processing and data server for business critical applications
- The world's most cost-efficient platform for data center consolidation and virtualization
- The world's most dependable and scalable hardware and middleware platform for new business applications
- A thoroughly modern application environment for traditional and Cloud delivery models



The zEnterprise 196 is the world's fastest and most scalable enterprise system. (50 BIPS)

Based on 5.2GHz core processor speed

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CICS*	Lotus*	System z10	
Cognos*	NetView*	Tivoli*	
DataPower*	OMEGAMON*	WebSphere*	
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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.

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