Positioning System z Strategy and Investments

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The z Software Strategy

- **Reinvigorate the System z Ecosystem:**
  - Attract New System z Customers and Application Workloads
  - Retain and Grow Existing System z customers
  - Make the Mainframe Relevant to a new IT Generation
- **Platform Modernization and Simplification are key:**
  - Evolve to an SOA Server
    - Systematic Reengineering of the Software Stack
    - More Open Standards Compliant and Common Middleware
    - Integration with the z Platform for Added Functions
    - Accelerate innovation on System z with new Application Development Capabilities
  - Deliver Extensive Data Management Services
    - Leading Edge Relational Function
    - Reinvigorated Data Warehousing Competitiveness
    - Autonomic Tooling to Augment Human Expertise
  - Make System z Easy to Install and Manage for Better TCO
    - New Faces of z
    - Simplified Labor Intensive Tasks
    - More End to End Management Capability from a z Central Point of Control

Summary Comprehensive Software Leveraging the Strengths of the zNext

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
Tivol Service management Center for System z
System z for the Green Data Center

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
Lifecycle management Tools
Performance improvements of C, C++, COBOL, PL/I, Java language applications

Rational. WebSphere. Information Management Lotus. Tivoli.

z/OS V1.10 Preview - Integration with the z10

... scalability and performance

- HiperDispatch for intelligent dispatching of work for optimized performance[1]
- Up to 1TB of real memory[2] and 64 processors (zIIPs, zAAPs, and CPs) [3] per LPAR
- Extended Address Volume (EAV) capability for large storage volumes, improved storage managemement[4,5]
- Large (1 MB) pages expected to reduce memory management overhead for exploiting applications[3]
- Support for Hardware Decimal Floating Point enables high performance computing for your commercial workloads[3]
- Support for InfiniBand Coupling Links[1,6]

... networking and connectivity

- Policy-based networking helps create a network responsive to your application needs[1]
- Automatic intrusion defense capabilities[4]

...availability

- Basic HyperSwap – for high availability disk[3,*]
- Parallel Sysplex and GDPS enhancements

... simplified operations

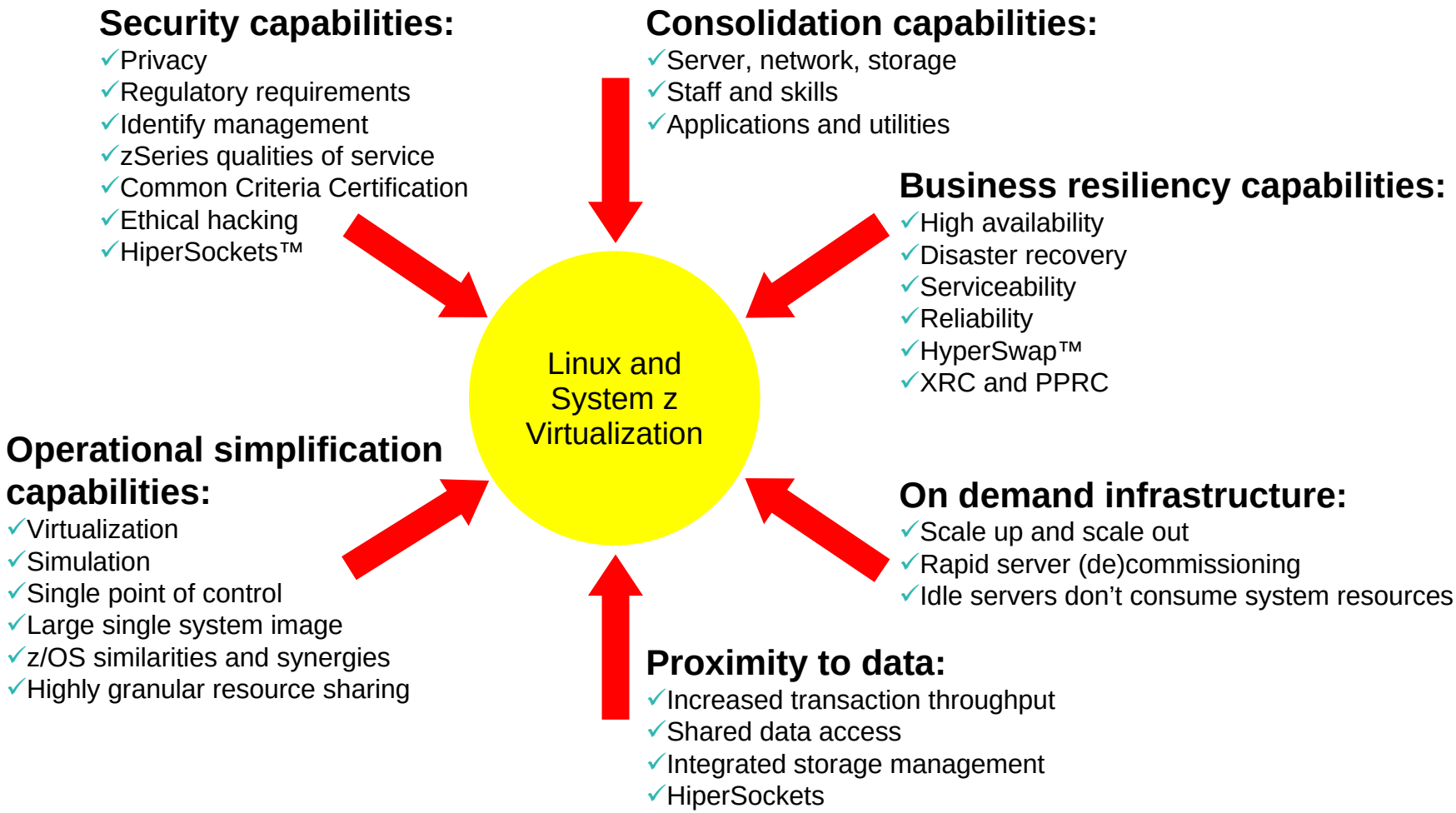
- Capacity Provisioning Manager can monitor and dynamically activate/deactivate capacity[3]
- New z/OS Management Facility – planned – a single, modern, Web-browser based management console for z/OS, intended to simplify day to day operations and administration of a z/OS system. *

....improved economics

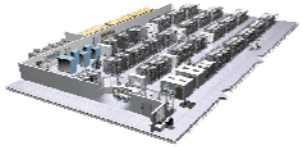
- Added XML exploitation of specialty engines[3]
- zIIP assisted z/OS Global Mirror (XRC) [3]

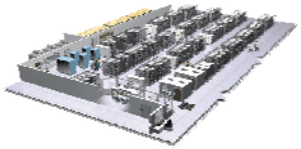
(1) available with z/OS V1.7 with appropriate maintenance
(2) available with z/OS V1.8 and appropriate maintenance, 1TB memory on z10 E56 and E64 only
(3) available with z/OS V1.9 and appropriate maintenance
(4) planned for z/OS V1.10
(5) with appropriate storage
(6) Planned availability 2Q08
(*) All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represents goals and objectives only

Linux and z/VM on System z
Providing Value Propositions for Linux Workloads



Choices To Run A Banking Workload





	HP Servers	HP Servers with VMWare	System z10
Server Model	**DL145**	**DL585**	**System z**
# of Servers	**350**	**45**	**1**
Cores	**700**	**360**	**24**
Memory GB	**700**	**720**	**352**
Software Licenses	**742**	**352**	**40**
System Administrators	**35**	**18**	**5**
Floor Space (m^2)	**12.5**	**7**	**5**
Utility (kWh/Year)	**3.2M**	**697K**	**127K**
	2,466,450 rated capacity	1,263,555 rated capacity	**14,238 MIPS**
	Low Utilization	**Medium Utilization**	**High Utilization**

5 to 7 millions annual operational savings with System z

Java6 and WAS Enhancements in 2008

- **IBM Java6 JDK next refresh leverages new z10 hardware (April 2008)**
  - Large page support and compare-and-trap for managing heap
  - Significant use of new z6 instruction set by JIT
  - Use of Decimal Floating Point hardware by Java BigDecimal class
  - Promises to provide improved performance (testing/tuning work still in progress)

- **Getting Started Pricing for WAS 6.1.0.16 (April 2008)**
  - Significantly lowers the entry cost for smaller WAS customers

- **WAS enhancements for z/OS (2H08)**
  - Uses IBM Java6
  - Fast Response Cache Acceleration (FRCA) support
    - Significantly improves response time for static and dynamic content
  - High Availability Manager (HAM) based on Cross-System Coupling Facility (XCF)
    - Significantly reduces overhead of HAM function on z/OS
    - Improves integrity of recovery by closing all timing windows
  - Thread Hang Recovery - option for the server to recover a thread that appears to be hung
    - Improves server reliability and performance by avoiding recycling of servants
  - New SMF 120 records
    - Reduces overhead of collecting data
    - Improves chargeback capabilities by consolidating all needed data including zAAP time

Compiler Optimizations & Performance

- **Maximize Exploitation of z10 Hardware Architecture1**
  - Exploit latest hardware without need of expert knowledge of architecture
    - Enables users to exploit performance edge of hardware without source code changes
  - Exploit 36 NEW z10 instructions from the General-Instructions-Extension facility
  - Exploit IEEE 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
  - Maximize application performance using new & innovative optimization technologies
    - Reduces total cost of ownership
    - Up to 10-25% Performance Improvements2

[1] Individual features in the content list may not be applicable to all IBM compiler languages. Check specific language documentation for details.

[2] Performance improvement results based on select benchmarks. Results will vary depending on application.

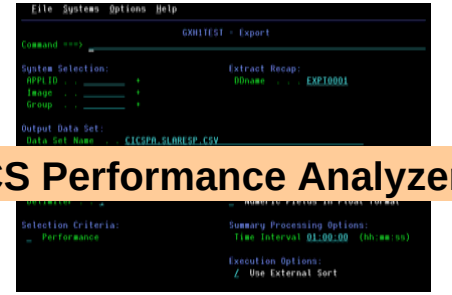
CICS Transaction Server for z/OS V3.2

Increased Ease of Integration	• **Maturing the Web Services capabilities and SOAP standards** • **Wider support of other payload format (XOP & MTOM)** • **Optimization of the HTTP Transport to give better performance, robustness and manageability** • **Delivering a consistent approach between CICS**
Enhanced Application Transformation	• Conforming with WSDL 2.0 • More extensive Web Services support for COBOL data types • Improved Application Deployment • Exploitation of 64-bit storage for channels and containers. Used by Web services requests.
Improved Operational Efficiency	▪ Enterprise wide workload management – ARM correlator ▪ CPSM Integrated install and definition & CPSM WUI enhancements ▪ JDK 1.4.2 JVM management and PD improvements ▪ Remove capacity restraints relating to Data ▪ Continued enhancements to OTE enabling some File Control configurations and the MQ Bridge Adapter

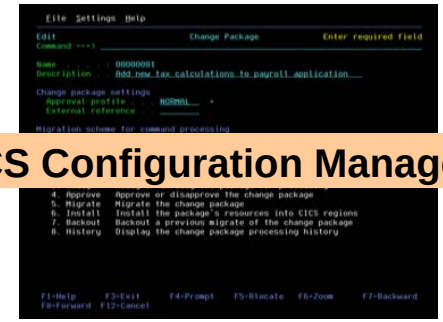
Explorer Trends and Directions with CICS Tools

Available Today…

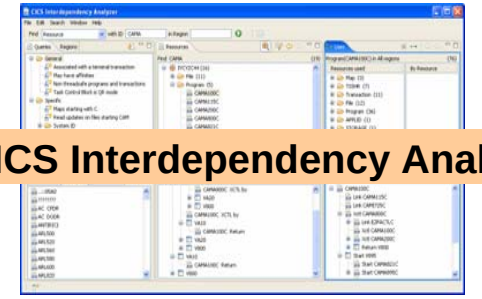
CICS TS V3.2



CICS Performance Analyzer



CICS Configuration Manager



CICS Interdependency Analyzer

Runtime

Performance

CSD Management

Discovery

In The Works…

CICS Explorer
(Available to CICS TS V3 users)

Task features (plug-ins) for

CICS Transaction Server V3

CICS Performance Analyzer

CICS Configuration Manager

CICS Interdependency Analyzer

What is the CICS Explorer?
A new user interface to reduce the skills required to develop, deploy and manage CICS applications. The CICS Explorer will be incorporated in current and future releases of CICS Transaction Server as a strategic point of integration between the run-time and add-on tools, extensible by IBM, business partners and clients.

Powerful eclipse-based user interface

Announcing WebSphere MQ for z/OS V7.0

- **Latest Evolution of IBM's Universal Messaging Backbone for z/OS**
  - Enabling reliable connectivity from z/OS to virtually any other commercial IT system
  - Providing the messaging transport layer to underpin SOA, Web 2.0 and your ESB
- **New Publish and Subscribe support for z/OS**
  - Provides flexible, dynamic routing of messages based on topics or keywords helping reduce time needed for solution changes
  - Supports native MQ Interface and JMS API
- **Enhanced Ease of Use**
  - Remote, graphical configuration of JMS and Publish-and-Subscribe
  - Via Eclipse-based MQ Explorer now enabled for up to 5 connections without need for Client Attach Feature license
- **Enhanced JMS performance**
  - Increasing JMS listener throughput by up to 220%*
- **New MQI verbs providing greater flexibility for:**
  - Selecting messages for processing via SQL queries
  - Adding custom properties to messages
  - Automatically notifying apps when messages arrive
- **Client Enhancements**
  - Heart-beat monitoring of client connections
  - Pre-emptive delivery for increased throughput
  - New Quality-of-Service that avoids waiting for confirmation of delivery – enables "receipts" to be received later
- **WebSphere MQ goes Web 2.0!**
  - Helps enrich Web 2.0 applications with real business data from z/OS applications
  - Web 2.0 developer needs no MQ skills to use
    - *Uses Ajax and simple RESTful interface to access data by URIs*
  - Helps simplify deployment and maintenance of large scale distributed applications
    - *Enables simple access to MQ without need to install MQ clients*

* Preliminary results observed on pre-release level code.
For the latest performance information please click on *Performance Reports* at www.ibm.com/webspheremq/support

Accelerating Software Innovation on System z

Rational. software

- Discover application knowledge and assets for new levels of business value, labor optimization and innovation
- Increase productivity and eliminate skill silos by simplifying the development & delivery process
- Reduce time to value and mitigate risk by reusing existing assets to deliver new solutions
- Improve team efficiency and lower costs by optimizing processes, tools, and infrastructures

Unleash the value of enterprise software assets and skills

IBM Data Studio

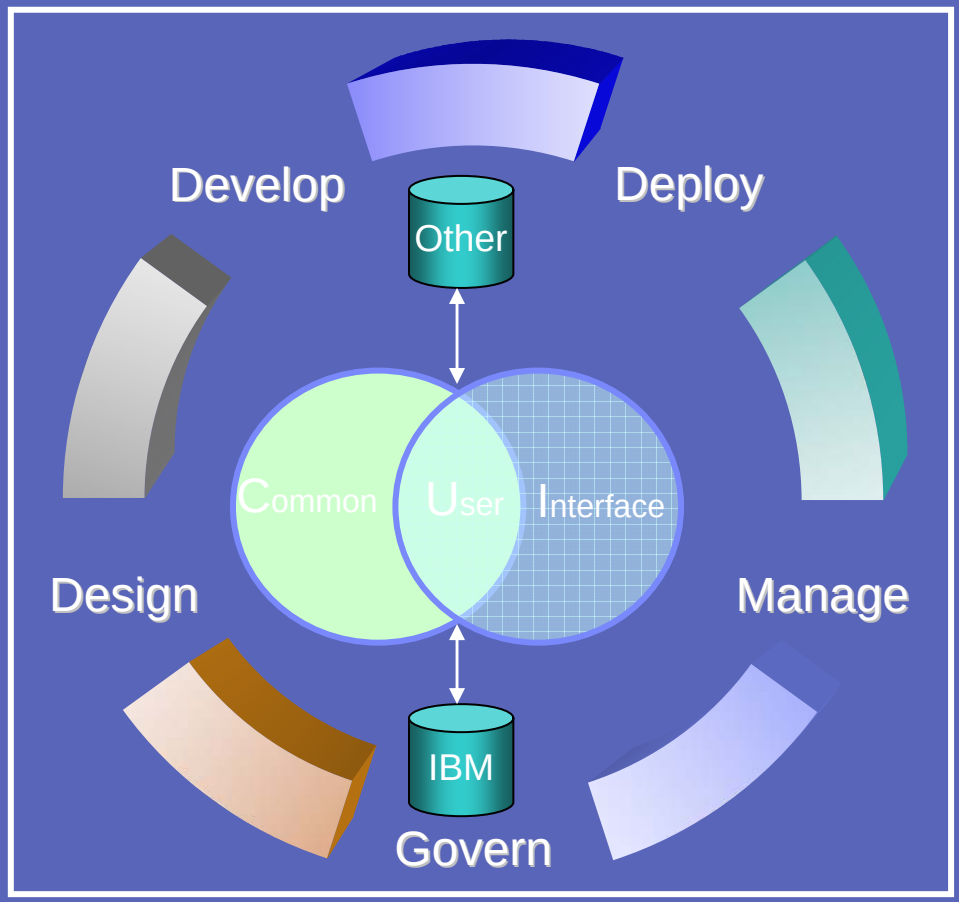
Data Architect

Design
- Logical Modeling
- Physical Modeling
- Integration Modeling

Develop
- Coding
- Debugging
- Teaming
- Testing
- Tuning

Application Developer

Database Developer



Database Administrator

Manage
- Database Administration
- Data Management
- Change Management
- Recovery Management
- Storage Management
- Performance Management

Govern
- Security Access
- Security Analysis
- Data Auditing
- Data Archiving
- Data Masking
- Data Encryption

Security Administrator

A Consistent and Integrated Solution

DB2 for z/OS with the z10

Supporting System z innovation, and taking System z to the next level of...

... scalability and performance

- z10 CPUs, memory, I/O and network bandwidth means:
  - Significantly improved SQL performance
    - Up to 30% decrease in CPU time for OLTP workloads
    - Up to 50% decrease in CPU time for data warehouse queries
  - Improved connectivity for remote apps, especially batch inserts for large queries
- More efficient disk usage minimizes disk constraints
- More efficient XML parsing
  - Up to 30% performance improvement
  - Up to 100% XML parsing on zIIP / zAAP
- Hash DSAB Searches brings faster startup/restart
- Improved decimal float data type performance efficiency
- Reduced allocation and catalog overhead

New Information On Demand Software for System z

Better business decisions, faster and with a lower overall TCO

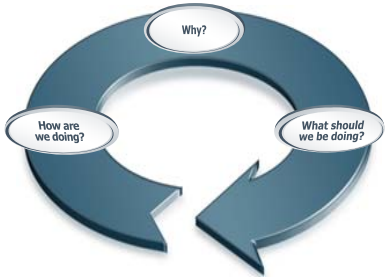
Cognos 8 Business Intelligence for System z

Coming!

Single solution for reporting, analysis, dashboards and scorecards

Delivers a competitive advantage for organizations with operational information on System z

Accepting participants for a beta program on Cognos 8 for Linux on System z.



DB2 for z/OS Value Unit Edition

Now Available

New one-time-charge offering that simplifies the deployment of new application workloads

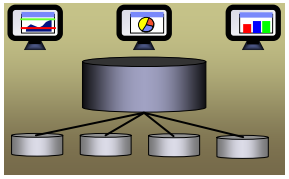
Strengthens the role of System z as a cornerstone for key business initiatives such as SOA, DW, BI & SAP

Delivers pureXML which optimizes information availability in the New Enterprise Data Center

Data Warehousing on System z

More than 50 new features in the last two releases of DB2 for z/OS supporting warehousing

Information Server for System z - brings new scalability, information consistency and performance to System z customers



InfoSphere Master Data Management Server for System z

More effectively manage high-value operational information

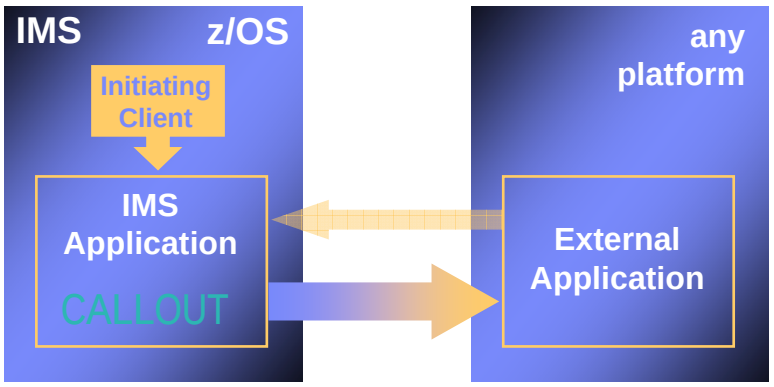
- Customers, suppliers, partners, product materials and employees

Coming!

Addresses and solves the root cause of master data complexity

Information on Demand Software Stack in now on System z

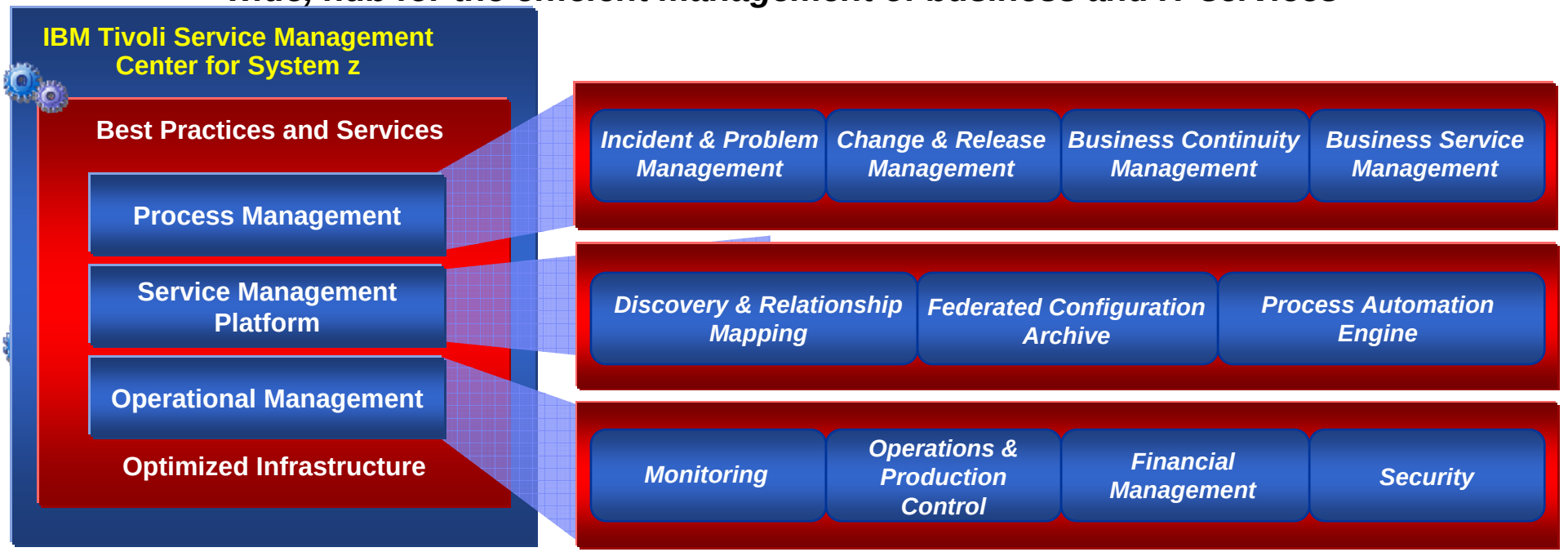
IMS for Web Services and SOA

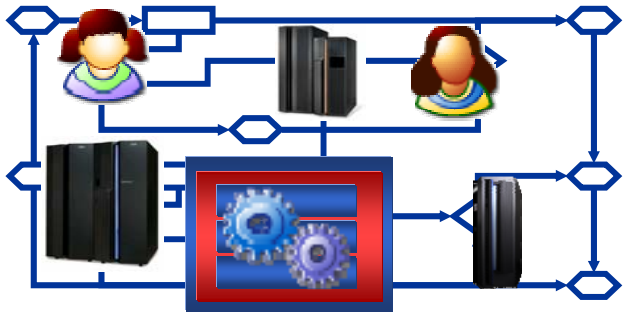


- **IMS applications can access other environments and data**
- **IMS 10 enables IMS applications as clients to interoperate with web services outside IMS**
  - Better integration of IMS applications for SOA
- **IMS 10 enhances integration of IMS transactions as Web services for conversational composite business applications**
  - Maximizes re-use of IMS applications for rapid business innovation and reduced costs

IBM Tivoli Service Management Center for System z

Enabling clients to strategically use their System z as an integrated, enterprise-wide, hub for the efficient management of business and IT services





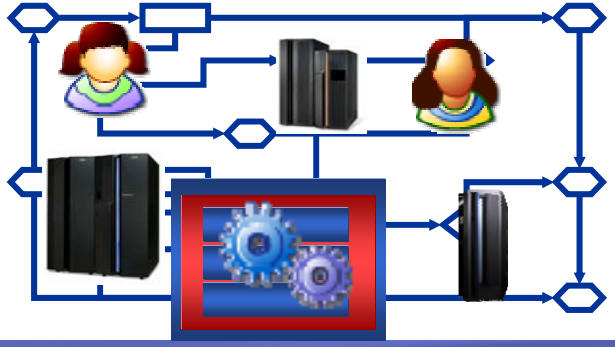
Introducing IBM Tivoli Service Management Center for System z

Enabling clients to strategically use their System z as an integrated, enterprise-wide, hub for the efficient management of business and IT services

IBM Tivoli Service Management Center for System z

- **Best Practices and Services**
- **Process Management**
- **Service Management Platform**
- **Operational Management**
- **Optimized Infrastructure**

IBM Tivoli Service Request Manager	*IBM Tivoli Change & Release Management*	*IBM Tivoli Business Continuity Process Manager*	*IBM Tivoli Business Service Manager*
IBM Tivoli Application Discovery and Dependency Manager (TADDM)	*IBM Tivoli Change and Configuration Management Database (CCMDB)*	*IBM Tivoli Service Request Manager*	
IBM Tivoli Netview for z/OS, OMEGAMON, IBM Tivoli Composite Application Manager	*IBM Tivoli System Automation & IBM Tivoli Workload Automation*	*IBM Tivoli Accounting & Usage Manager*	*IBM Tivoli Identify Manager, IBM Tivoli Access Manager and zSecure*



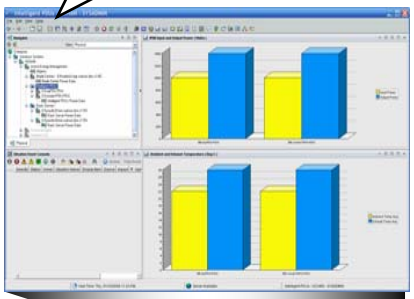
System z in the Green Data Center

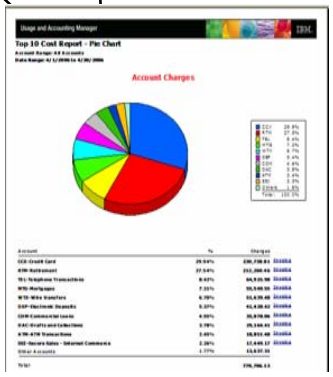
ITM Green Energy Agent augments performance data traditionally collected from performance managers and the OS with power and temperature data. All of these data are aggregated for consumption by **Tivoli Enterprise Portal** and **Tivoli Data Warehouse**.

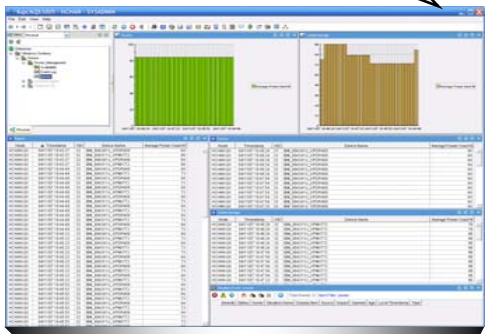
Tivoli Enterprise Portal: Visibility and Control for Energy Management

Tivoli Usage and Accounting Manager supports chargeback and provides accounting reports that help reduce energy costs

Tivoli Business Service Manager: Ensure service levels are maintained while optimizing energy consumption







Power Temp Metrics & Controls

IBM Tivoli Monitoring

Tivoli Data Warehouse

The new Face of Z...



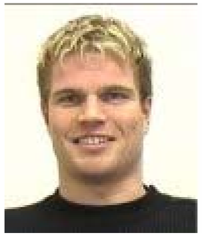




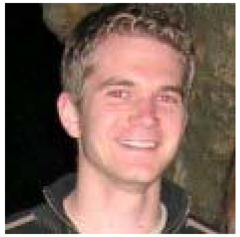




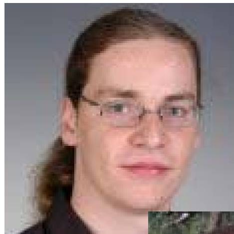




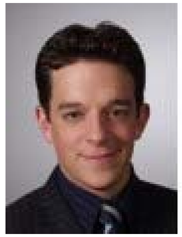






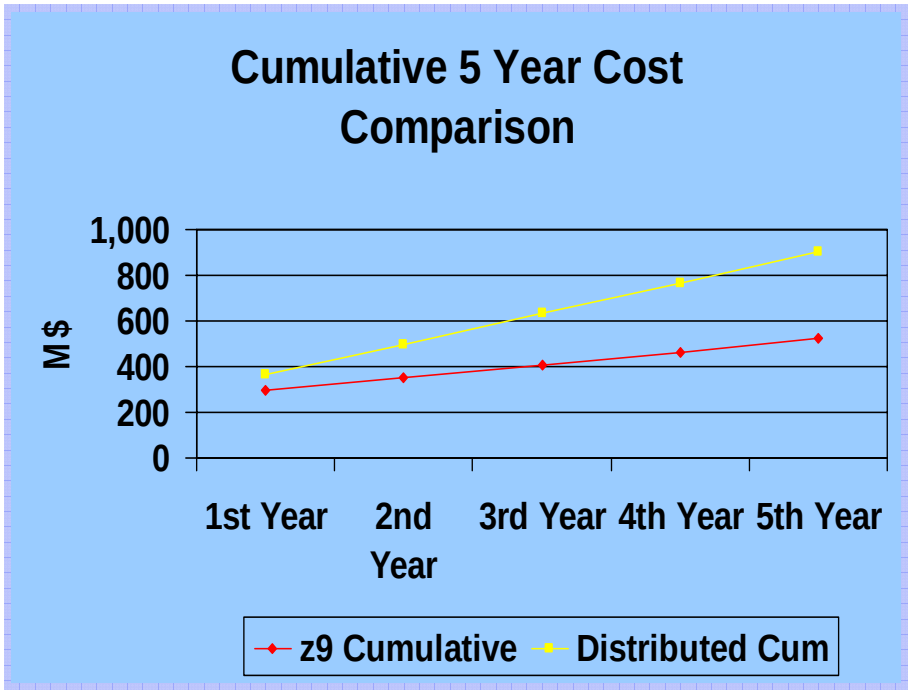



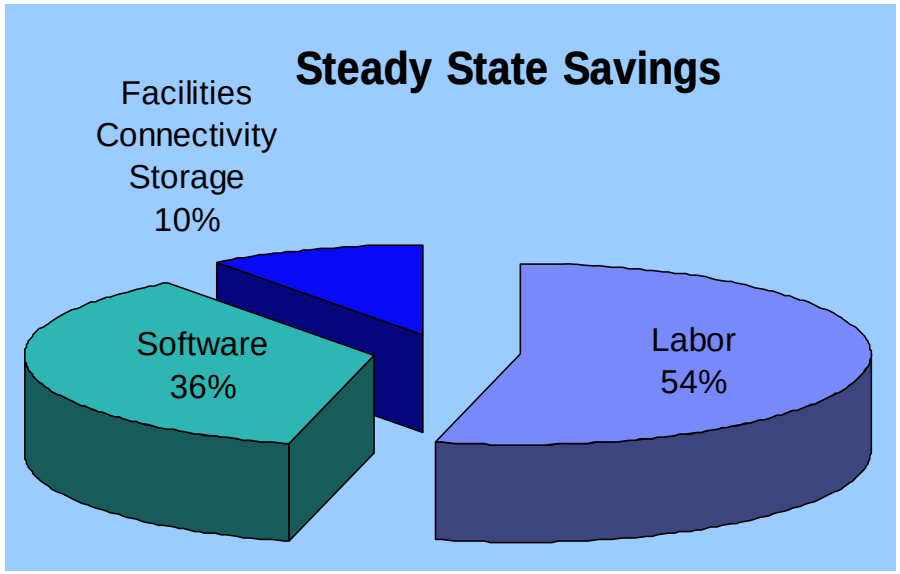


IBM Consolidation to System z

- **Performed TCO and consolidation assessment on IBM portfolio**
  - Cross-IBM effort: System z, SW Migration Services, TCO Academy, Migration Factory
  - Analysis considers today's environment vs. "to be" environment





Identified substantial savings opportunity

- Annual Energy Usage reduced by 80%
- Total floor space reduced by 85%

IBM Expected Results with z10

Reduce operational complexity with significantly less hardware

- 3,900 distributed servers going to approximately 30 System z9
- Significant increases in average utilization

- **Reduce labor cost through virtualization**
- **Reduce software expense**
- **85% reduction in IT Data Center square footage for consolidated servers or more**
- **80% reduction in energy utilization associated with consolidated servers or more**
- **Increase in new applications deployed to System z**

If using all new System z10 ECs, the number of machines could be cut nearly in half … for even greater savings in IT operational cost

Summary

- **We are delivering a New Generation of z Software and Hardware**
- **SOA and 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 Rearchitected for Enterprise Data Serving**
- **Its All About the Economies of Scale and How z Capability and Quality of Service makes a Difference**