Positioning System z Strategy and Investments

Ray Jones
Worldwide Vice President,
System z Software

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

Comprehensive Software Leveraging the Strengths of the z10

Development Tools
Compilers C/C++
Exploits new z10 instructions
And Floating Decimal Point

Transaction Management
IMS, CICS, WAS

DB2

Software Lifecycle Management Tools

Systems Management
Omegamon
Workspaces for z10
Tivoli Service Center
for System z

Rational. WebSphere. Information Management Lotus. Tivoli.

z/OS integration with the z10 EC

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

... 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] in one z/OS image
- 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]

... networking and connectivity

- Policy-based networking helps create a network responsive to your application needs[1]

...availability

- Basic HyperSwap – for high availability disk[3,5]
- Continued Parallel Sysplex clustering and GDPS enhancements

... simplified operations

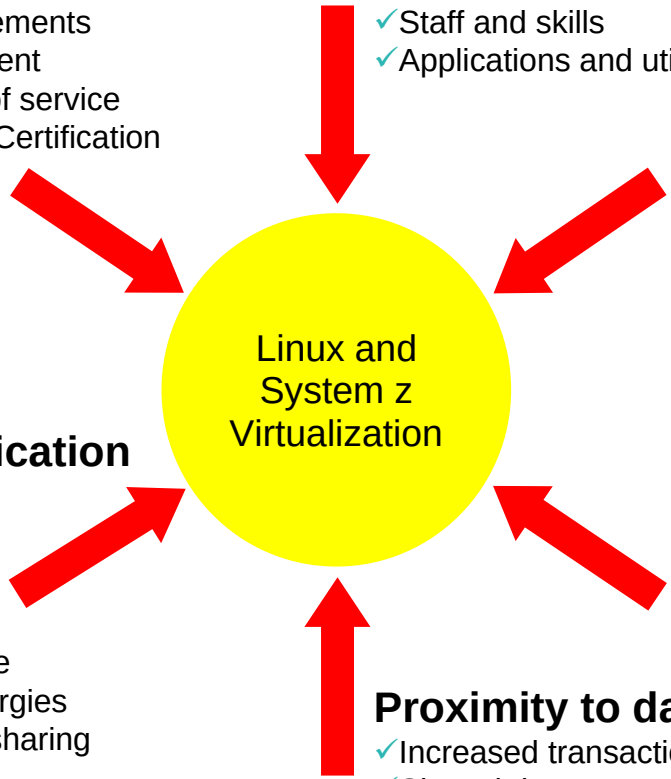
- New z/OS Management Facility – support for a single, modern, Web-browser based management console for z/OS, intended to simplify day to day operations and administration of a z/OS system. [1]

....improved economics

- Additional 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

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



Security capabilities:
- ✓Privacy
- ✓Regulatory requirements
- ✓Identify management
- ✓zSeries qualities of service
- ✓Common Criteria Certification
- ✓Ethical hacking
- ✓HiperSockets™

Consolidation capabilities:
- ✓Server, network, storage
- ✓Staff and skills
- ✓Applications and utilities

Business resiliency capabilities:
- ✓High availability
- ✓Disaster recovery
- ✓Serviceability
- ✓Reliability
- ✓HyperSwap™
- ✓XRC and PPRC

Operational simplification capabilities:
- ✓Virtualization
- ✓Simulation
- ✓Single point of control
- ✓Large single system image
- ✓z/OS similarities and synergies
- ✓Highly granular resource sharing

On demand infrastructure:
- ✓Scale up and scale out
- ✓Rapid server (de)commissioning
- ✓Idle servers don't consume system resources

Proximity to data:
- ✓Increased transaction throughput
- ✓Shared data access
- ✓Integrated storage management
- ✓HiperSockets

Java6 and WAS Enhancements in 2008

- **IBM Java6 JDK next refresh leverages new zHE 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 zHE 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 zHE 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.

Transaction Processing Infrastructure
CICS

University of Florida uses Web-service enabled CICS TS 3 to develop administrative framework for packaged student health education program that also needed to integrate with existing student record system. Developers loosely coupled requests for services without coding point-to-point integration between applications.

Benefits

- lower total cost of ownership than any other implementation on campus
- extremely quick implementation
- sub-second response times even when processing more that 1,000,000 transactions a day

2007 Enhancements

- **CICS TS for z/OS V3.2**
  - **Application Connectivity**
    - Web services standards
  - **Application Reuse**
    - Large Messages
    - Data mapping
  - **Service Management**
    - On-line management of libraries
    - Support of Enterprise Workload Management
  - **Architectural Enhancements**
    - Thread safe
    - VSAM ESDS >4GB
    - Shared data tables >2GB
- **Ongoing CICS Tools Enhancements**

Websphere MQ VNext Summary

- **WMQ V7 is a significant offering that will primarily address support of standards-based messaging via the following features -**
  - Fully integrated Publish/Subscribe capability and administration across all platforms
    - This will provide significant improvements in both consumability and performance of JMS and XMS and will demonstrate IBM's commitment to standards-based messaging.
    - Allied with the JCA support already delivered, this will position WMQ as the JMS provider of choice for both J2EE and non-J2EE environments
    - Native support (via the MQ API) of Publish/Subscribe will enable access from non-Java environments – such as CICS and IMS
- **Additionally the following major features will be provided –**
  - Extended Message Properties will enable the flowing of additional non-user data to enable improved end-to-end transaction monitoring
  - SQL92 syntax support for enhanced message selection by properties that will provide both new features for non-Java applications and will provide enhanced performance for JMS and XMS applications
  - Improved Client performance for both MQ and JMS/XMS clients

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

Announcement highlights

New and enhanced offerings to help accelerate your path to reuse and modern architectures

New and Enhanced!

Transform 3270 screen-based transactions to reusable services

- Access to web, with lower cost and lower risk
- Improve appearance, usability and productivity
- Reduce transaction costs, training costs and employee turnover

Host Access Transformation Services (HATS) for multi-platform

Extend core business functions as services

- Expose key z/OS transaction capabilities as services
- Meet highest QOS requirements
- Reduce time to market and increased responsiveness

Rational Transformation Workbench

Rational Developer for System z

Enterprise COBOL & PL/I for z/OS

Accelerate Web and SOA application development

- Apply existing "business-knowledgeable" and new staff on multi-platform projects
- Break skills silos
- Reduce retraining costs
- Accelerate adoption of modern architectures and technologies such as Web 2.0

Rational Business Developer

An IBM solution to help organizations increase business flexibility and development efficiency by accelerating deployment of new workloads on System z

IBM Data Studio

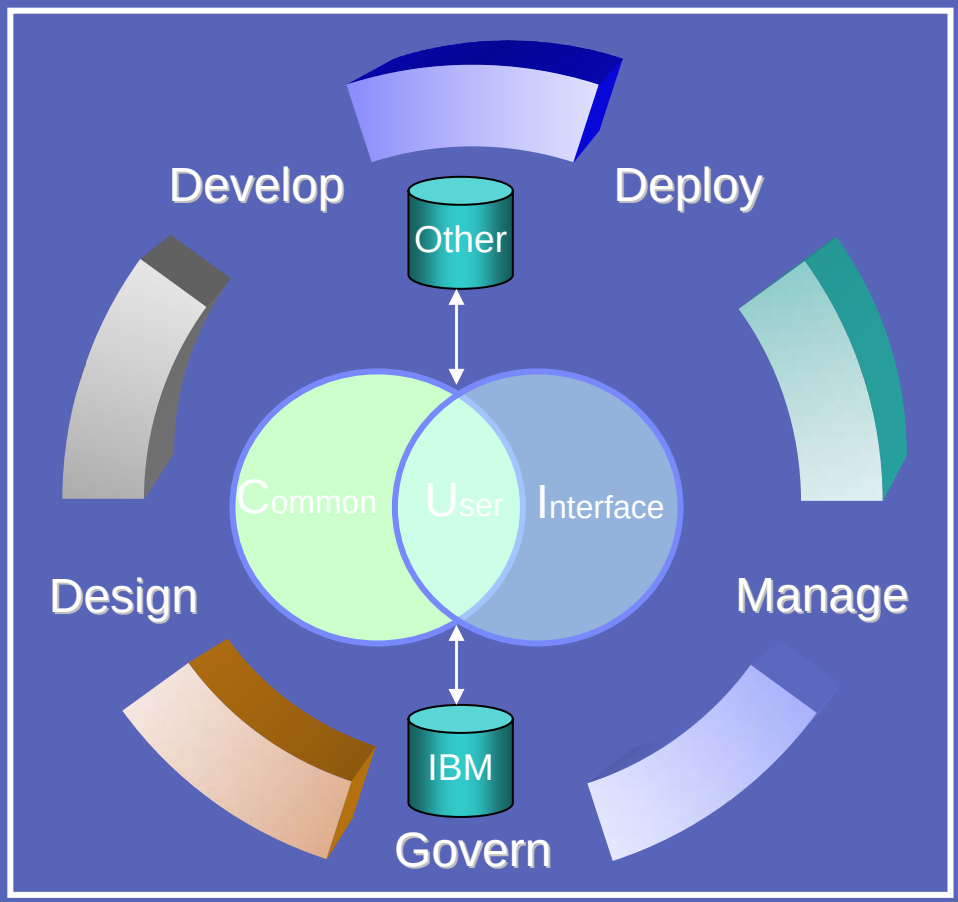
Data Architect

Design
- Logical Modeling
- Physical Modeling
- Integration Modeling

Develop
- Coding
- Debugging
- Teaming
- Testing
- Tuning

Database Developer

Application 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

Data Studio - What Univar USA Tells Us…

Developer Productivity

"IBM Data Studio enables us to bridge the gap between object-oriented design and relational database technology, so we can speed the development of high quality applications and **improve developer productivity by** between 25 and 50 percent."

XML Application Development

"Historically, it has been quite tricky to import and work with XML documents in a relational database. The pureXML technology of **IBM Data Studio turns this painful process into a mundane task** so we can more rigorously and thoroughly test applications."

Using pureQuery

"The pureQuery capability of IBM Data Studio encourages developers to really explore how workload is being executed without the performance and usability challenges they encountered with other tools. And because it associates SQL statements with the application that generates them, **developers and DBAs can more easily collaborate** to get to the bottom of an issue quickly."

- Kevin Campbell, Application Architect, Univar USA

DB2 for z/OS with the z10

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

... scalability and performance

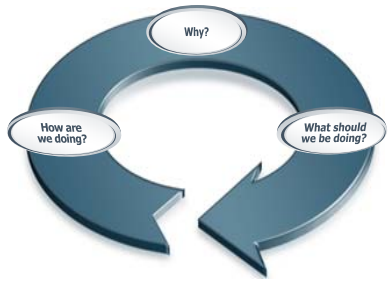
- z10 CPUs, memory, I/O and network bandwidth means:
  - Significantly improved SQL performance
    - Up to 30% decrease in CPU time for OLTP workloads
    - Up to 50% decrease in CPU time for data warehouse queries
  - Improved connectivity for remote apps, especially batch inserts for large queries
- 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

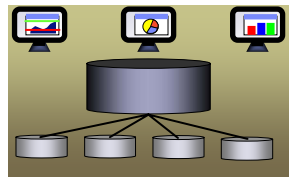
Now Available

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

Coming!

More effectively manage high-value operational information

- Customers, suppliers, partners, product materials and employees

Addresses and solves the root cause of master data complexity

Information on Demand Software Stack in now on System z

IMS: The Continuing Journey … with IMS V10

Easing Integration with New Technology for a Service Oriented Architecture

- Enhancing IMS XML and Web Services Connectivity
- Integrating Operations across Subsystems/Platforms

Simplifying Installation and Management

- Defining Resources Dynamically
- Easing Operations Management
- Easing Systems Management

Providing High Performance, Scalable, Available, Reliable and Secure Solutions

- Providing More Parallelism in DB Recovery Control
- Widening Bandwidth for Multiple Systems Coupling
- Enhancing Security

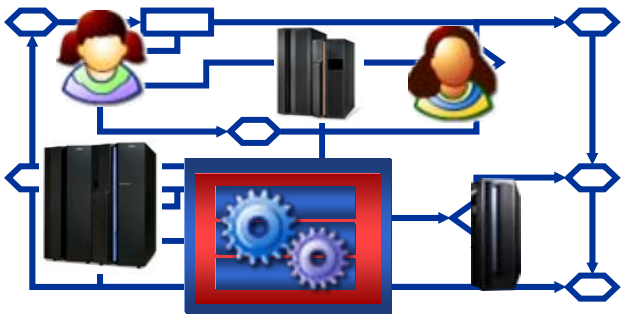
IBM Tivoli Service Management Center for System z

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

- *Incident & Problem Management*
- *Change & Release Management*
- *Business Continuity Management*
- *Business Service Management*
- *Discovery & Relationship Mapping*
- *Federated Configuration Archive*
- *Process Automation Engine*
- *Monitoring*
- *Operations & Production Control*
- *Financial Management*
- *Security*



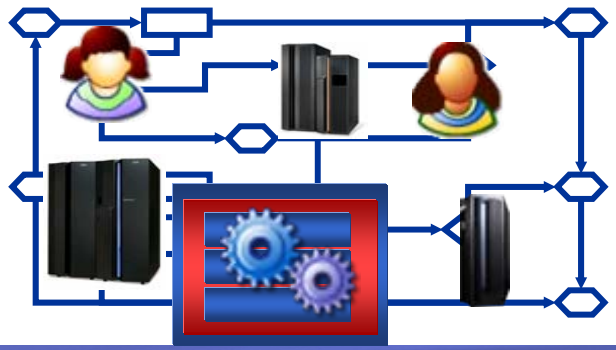
Introducing IBM Tivoli Service Management Center for System z

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*



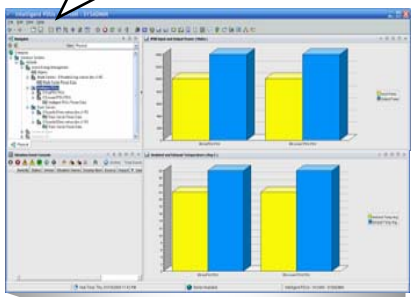
System z in the Green Data Center

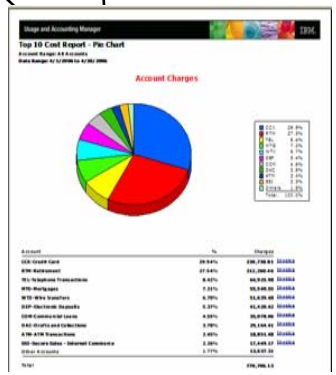
ITM Green Energy Agent augments performance data traditionally collected from performance managers and the OS with power and temperature data. All of these data are aggregated for consumption by **Tivoli Enterprise Portal** and **Tivoli Data Warehouse**.

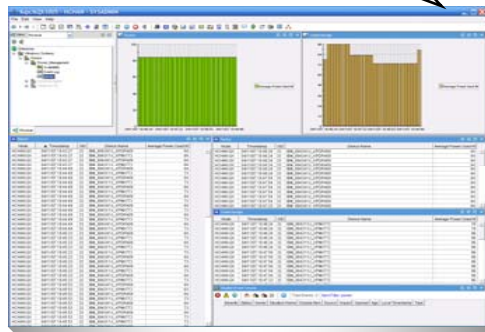
Tivoli Enterprise Portal: Visibility and Control for Energy Management

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

New System z Skills Available - the Academic Initiative

A new generation of mainframe experts is forming!

Launch Activities:

- Highlight Academic Initiative Success:
  - 407 schools **enrolled globally as of October 2007; 900% growth in 2 years; 50%+ outside of US**
  - 47,000 students **educated worldwide**
  - **20 courses, labs, textbooks, faculty education, and mainframe access available to enrolled schools**
  - Opening job opportunities for mainframe students with mainframe clients and IBM:

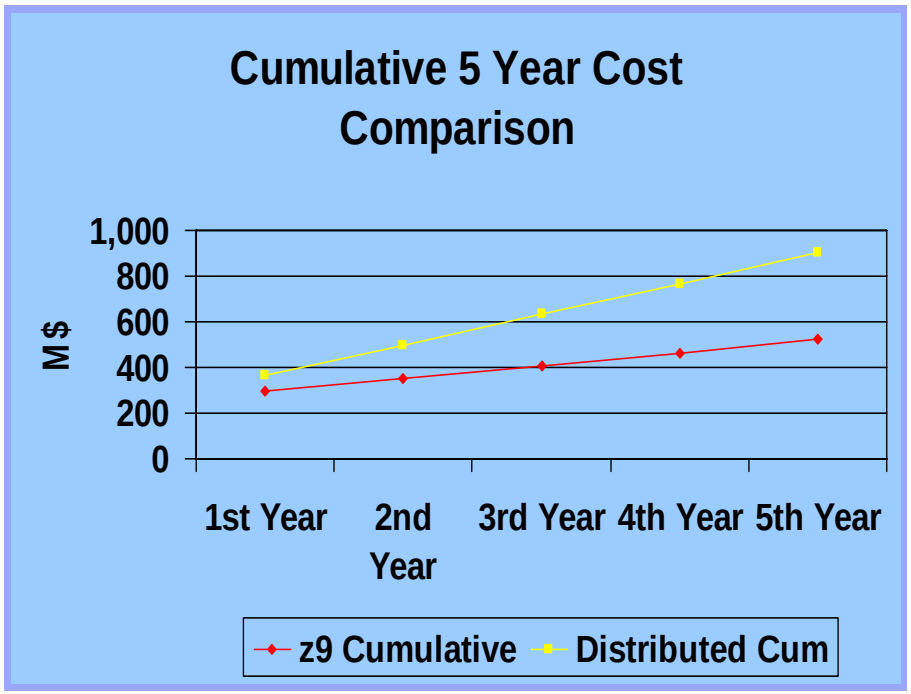
    "My participation and successful completion of Part One (I'm still working on Part Two) of the IBM Master the Mainframe contest helped to get me a job at BMO working as an Associate Systems Software Analyst. This position has never been offered to a student before and I never would have been able to secure it without all that I have learned so far in the contest."

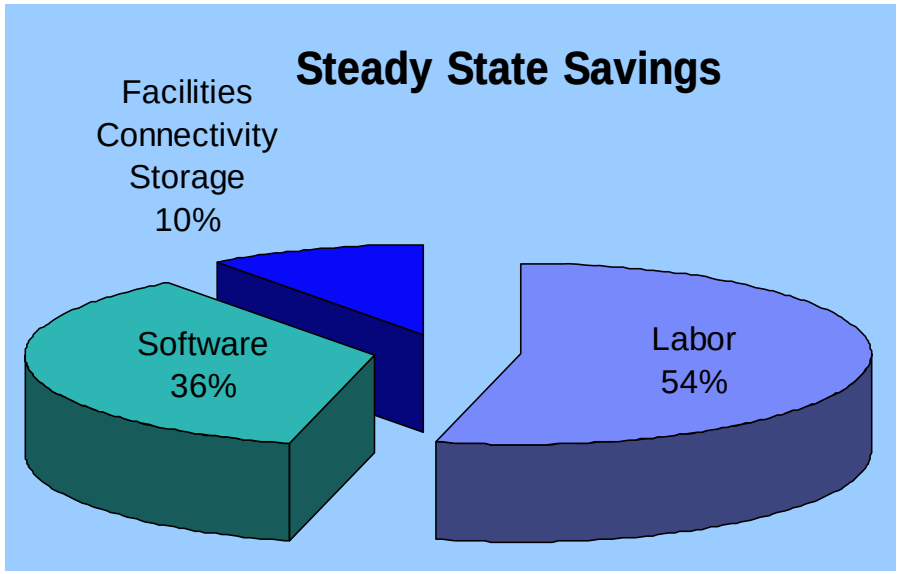
    Elizabeth Bell, Age 23,
    Georgian College, Canada
- Mainframe 'cool kids' at launch events plus videos for all event usage
- Educator and 'cool kids' podcast & video
- Systems Magazine Supplement Leverage

- ➔ **Mainframe companies join IBM at z roundtables on campus**
- ➔ **Message:** Teach Large Systems Thinking
- ➔ **Web site:** www.**ibm.com**/university/systemz

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 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.

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**