System z Software Strategy and Technology Update

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Today's mainframe

Four Enterprise-wide Roles of the Mainframe

- Enterprise business resilience manager
- Enterprise security manager
- Enterprise workload manager
- Enterprise hub for data & SOA

If data is the life blood of the business . . .

then your data server is the heart of your SOA

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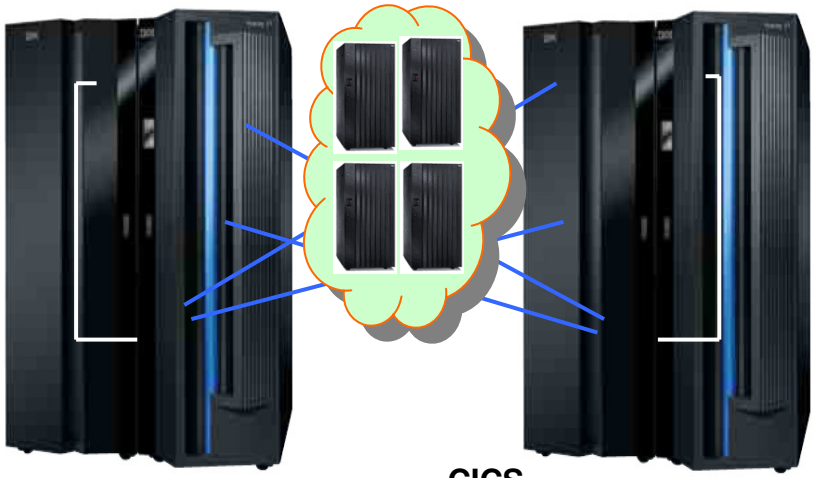
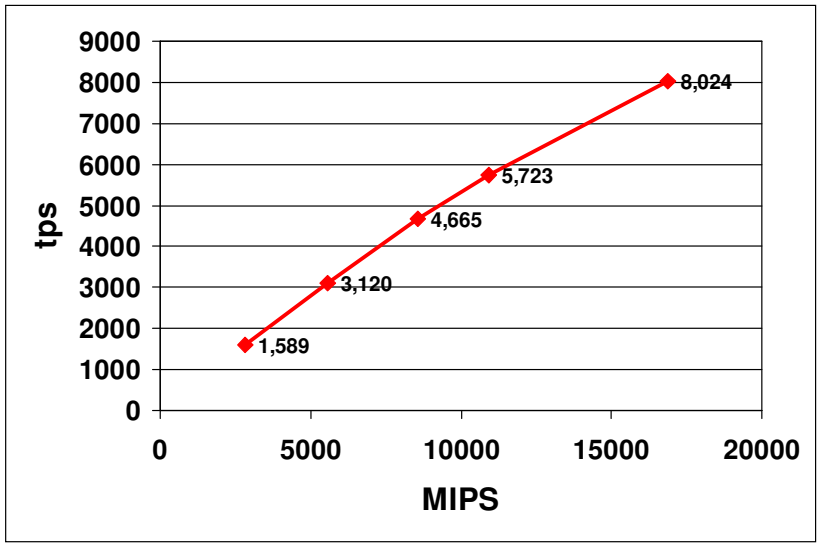
FNS and IBM Deliver Record-breaking Banking Benchmark Performance

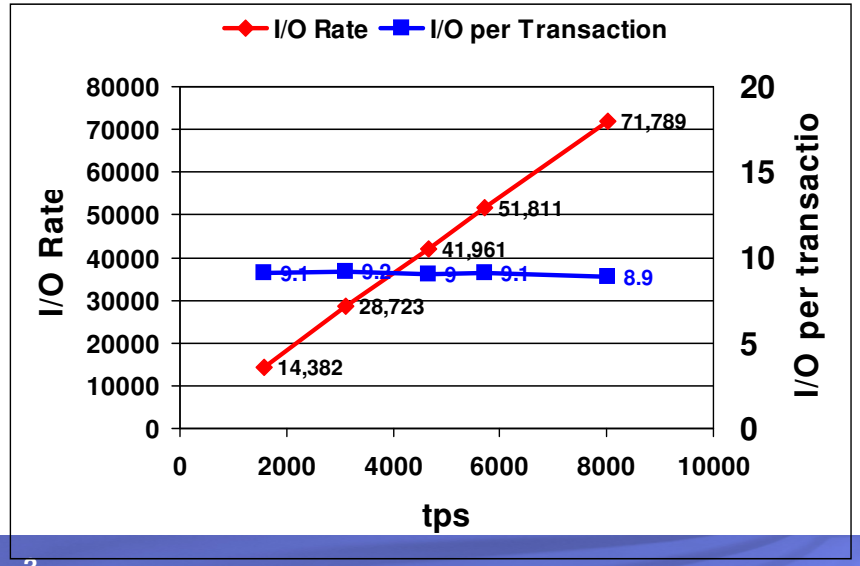


2 54-way z9
52 TB Storage
380 Million Accounts

CICS
DB2
3 Billion Transaction Histories



9,445 tps at 85% utilization



"FNS and IBM have delivered an outstanding core banking benchmark result which highlights FNS's ability to deliver a core banking platform that will attain high levels of availability, scalability and robustness for the largest banks in the world."

Tony Ward, CEO Financial Network Services

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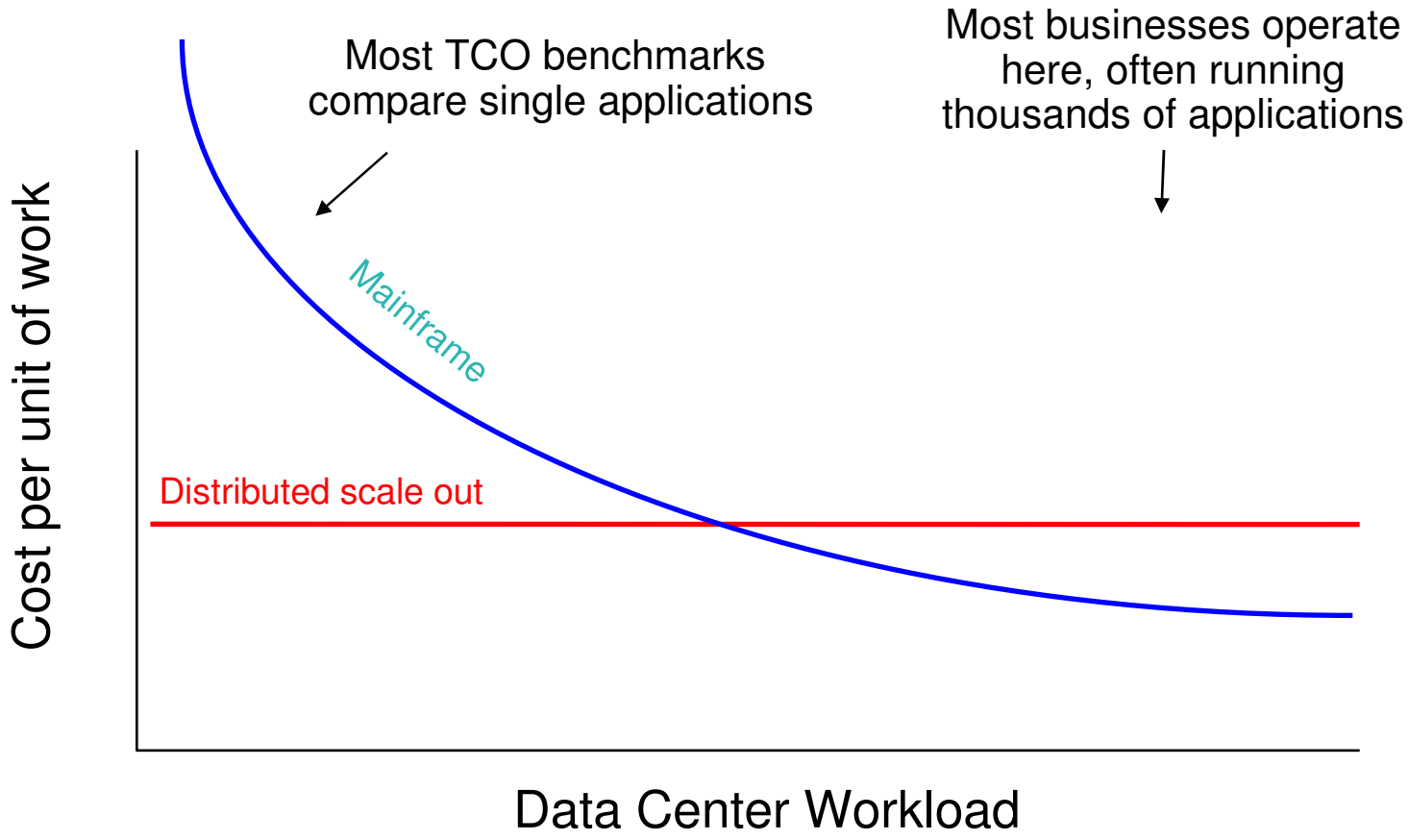
Mainframe Cost/Unit of Work Decreases as Workload Increases



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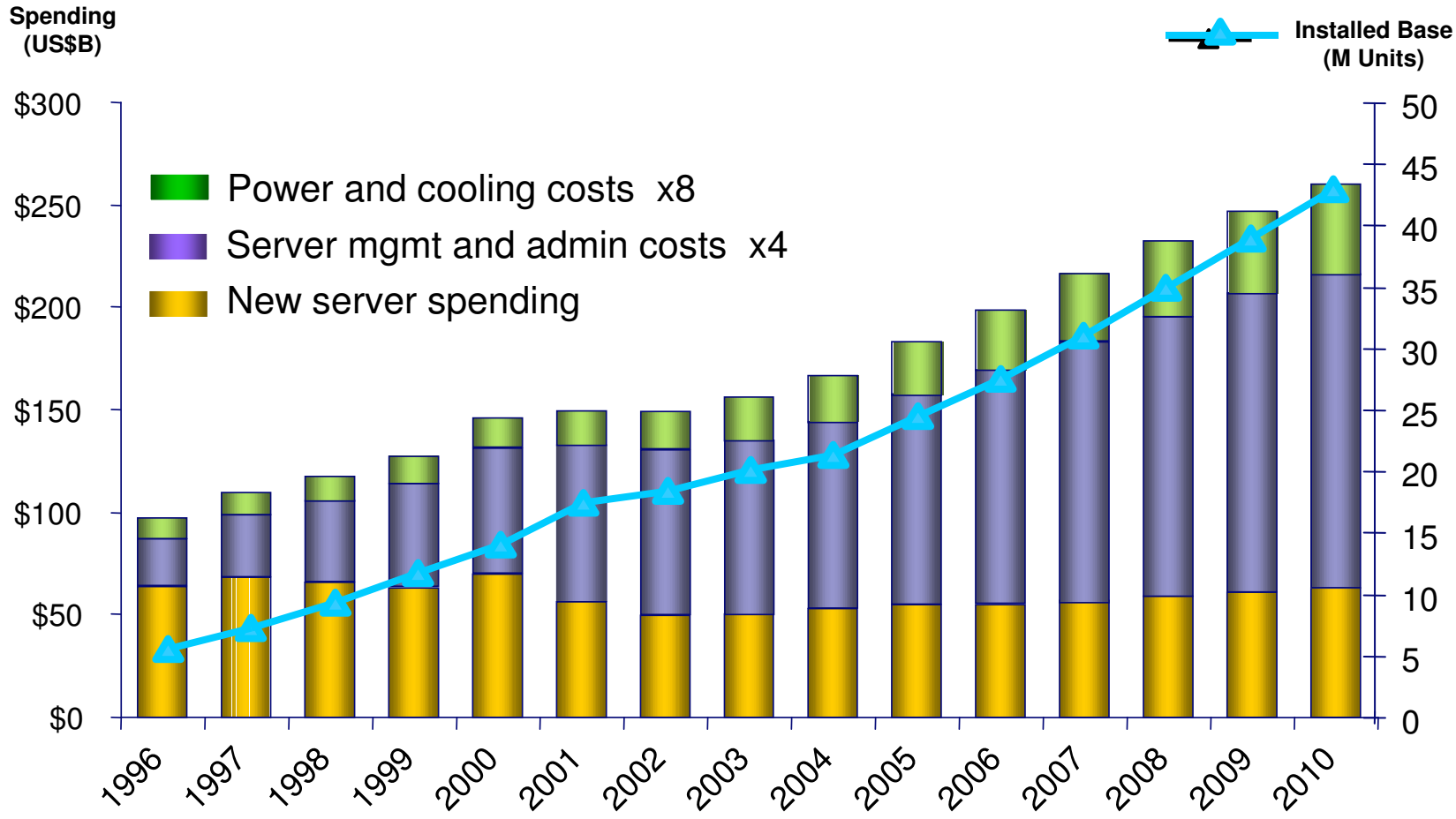
Worldwide IT spending trend



Source: IDC, Virtualization 2.0: The Next Phase in Customer Adoption, Doc #204904, Dec 2006

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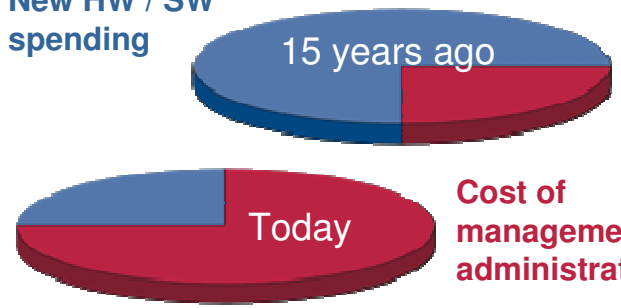
Why System z Now?

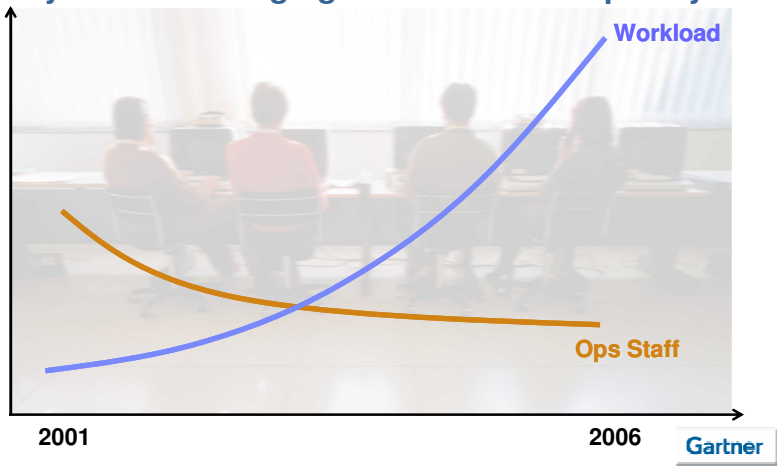
New HW / SW spending

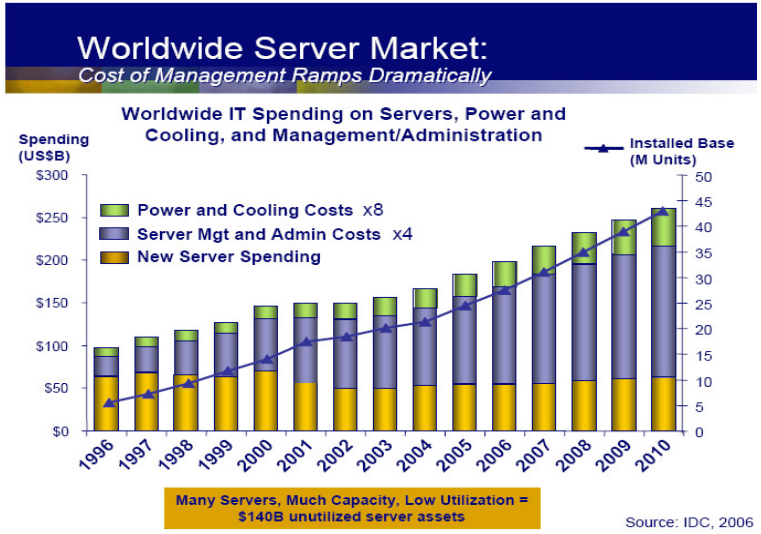


Cost of management & administration

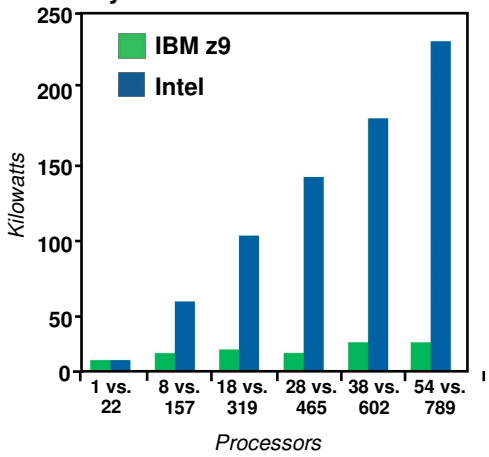
Source: Tony Picardi, IDC
Economist.com: Make it simple. October 28th, 2004
From The Economist print edition

System z9 Managing Growth and Complexity

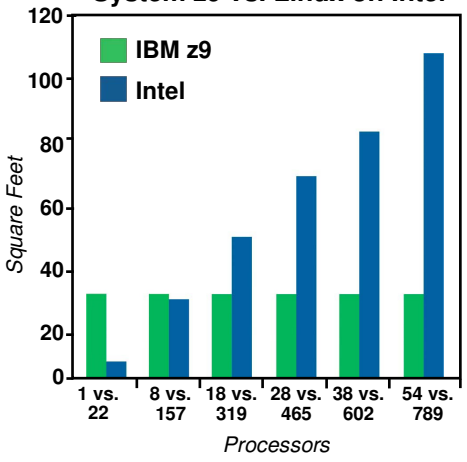




POWER:
System z9 vs. Linux on Intel



SPACE:
System z9 vs. Linux on Intel



The Linux on Intel servers selected in this example are functionally eligible servers considered for consolidation to a System z running at low utilization such that the composite utilization is approximately 5%. The utilization rate assumed for System z EC is 90%. This is for illustration only actual power and space reductions, if any, will vary according to the actual servers selected for consolidation.

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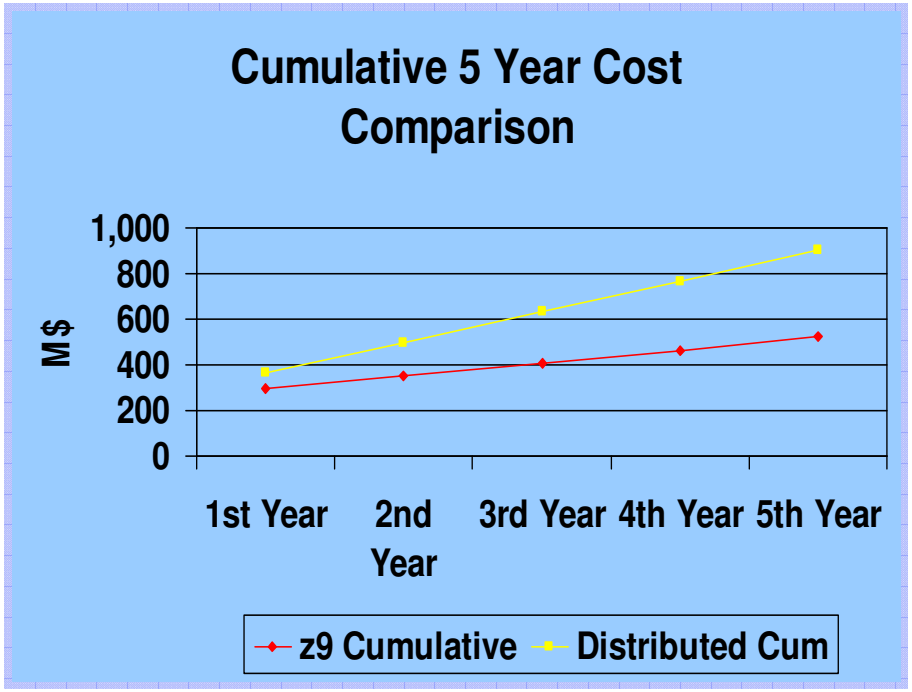
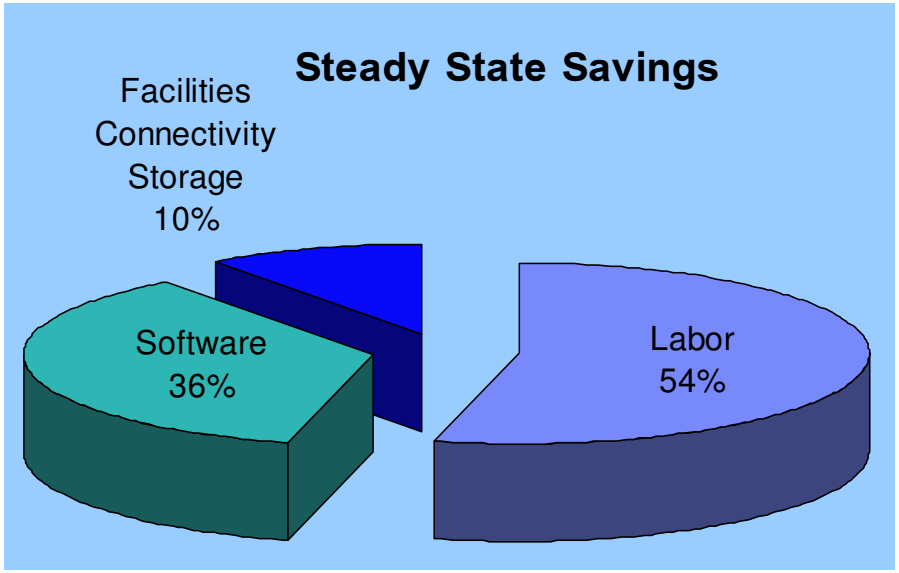
IBM Consolidation to System z

- 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%**

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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
  - 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

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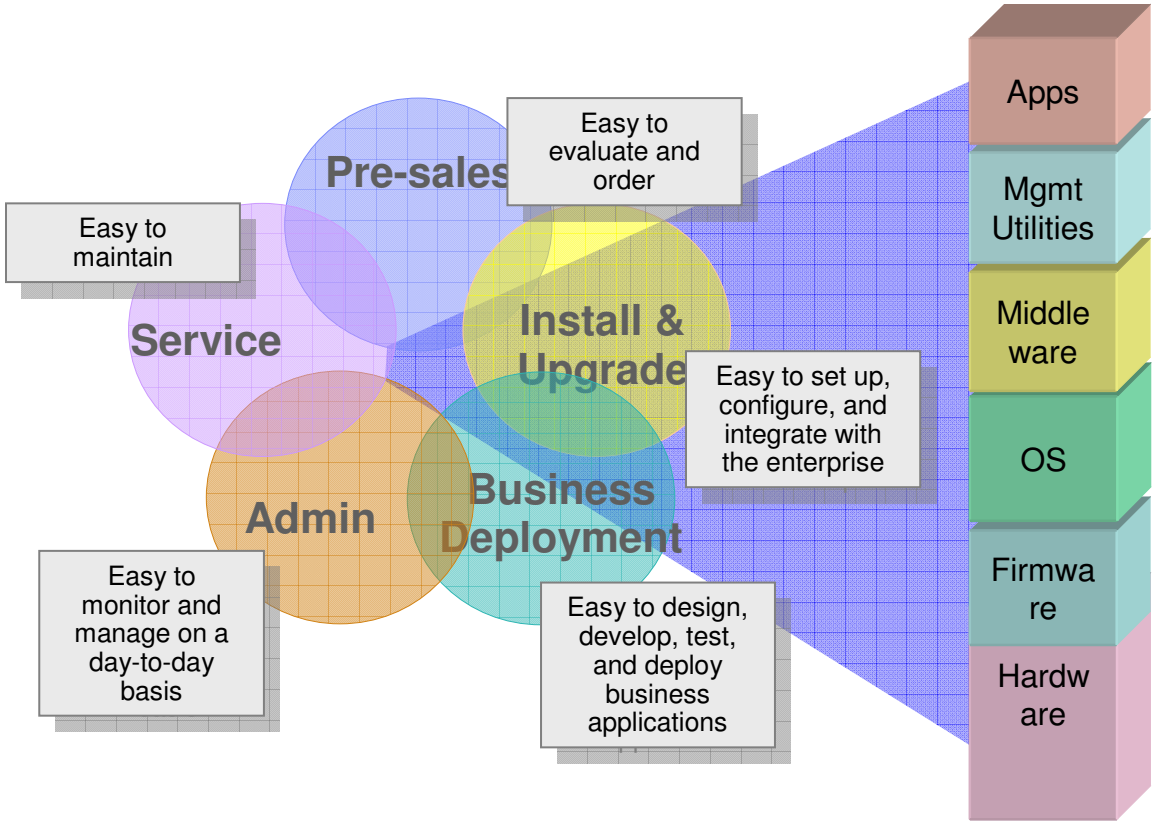
zOS Simplification Scope:
The Total Customer Experience



- All aspects of System z will be managed consistently.
- The management framework will be integrated – always there.
- Capabilities can grow with value-added extensions from IBM and 3rd parties.
- Basic management functions upwardly integrate into Tivoli enterprise management
- Backed by a Statement of Systems Integrity

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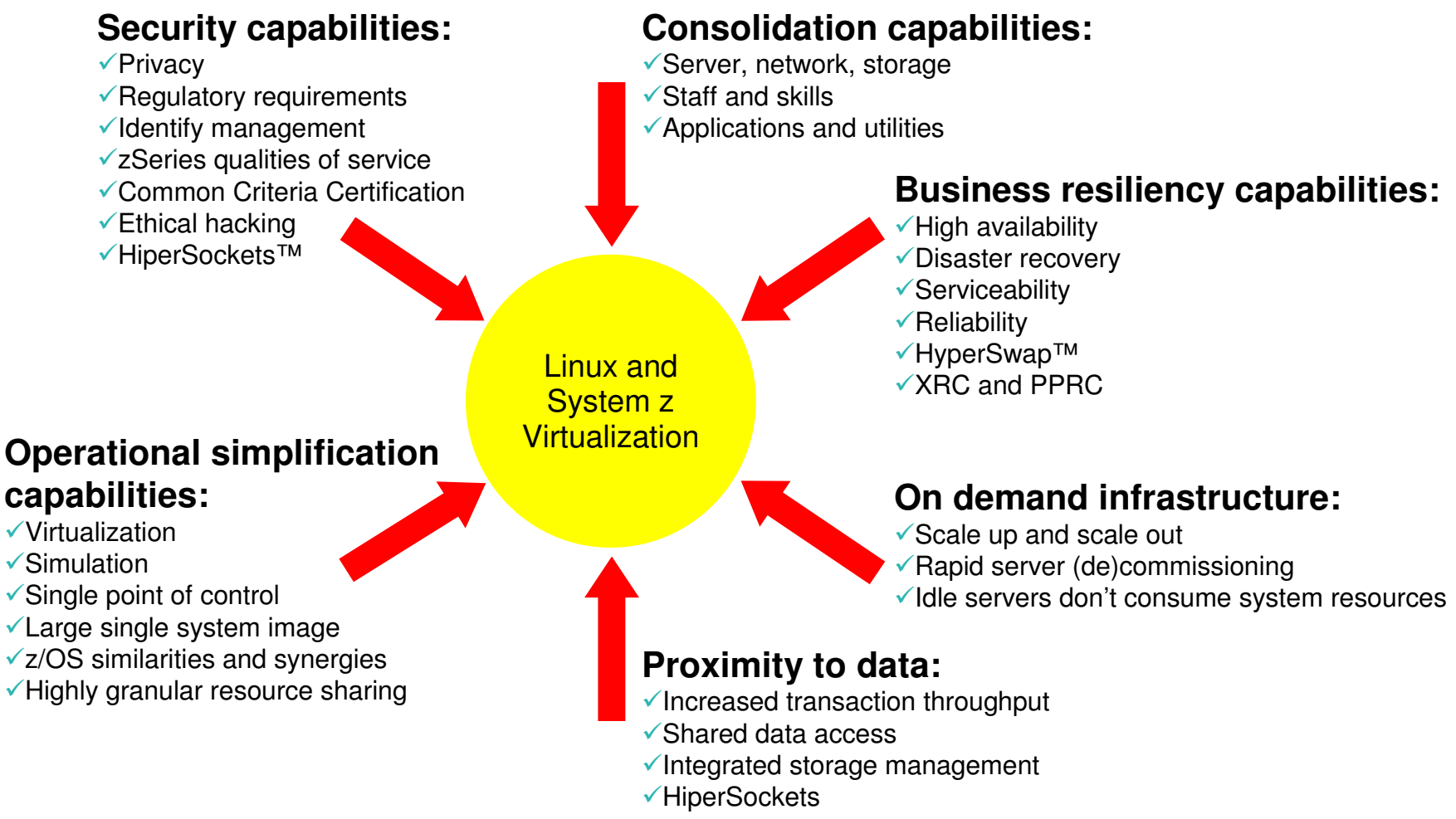
Linux and z/VM on System z

Providing Value Propositions for Linux Workloads



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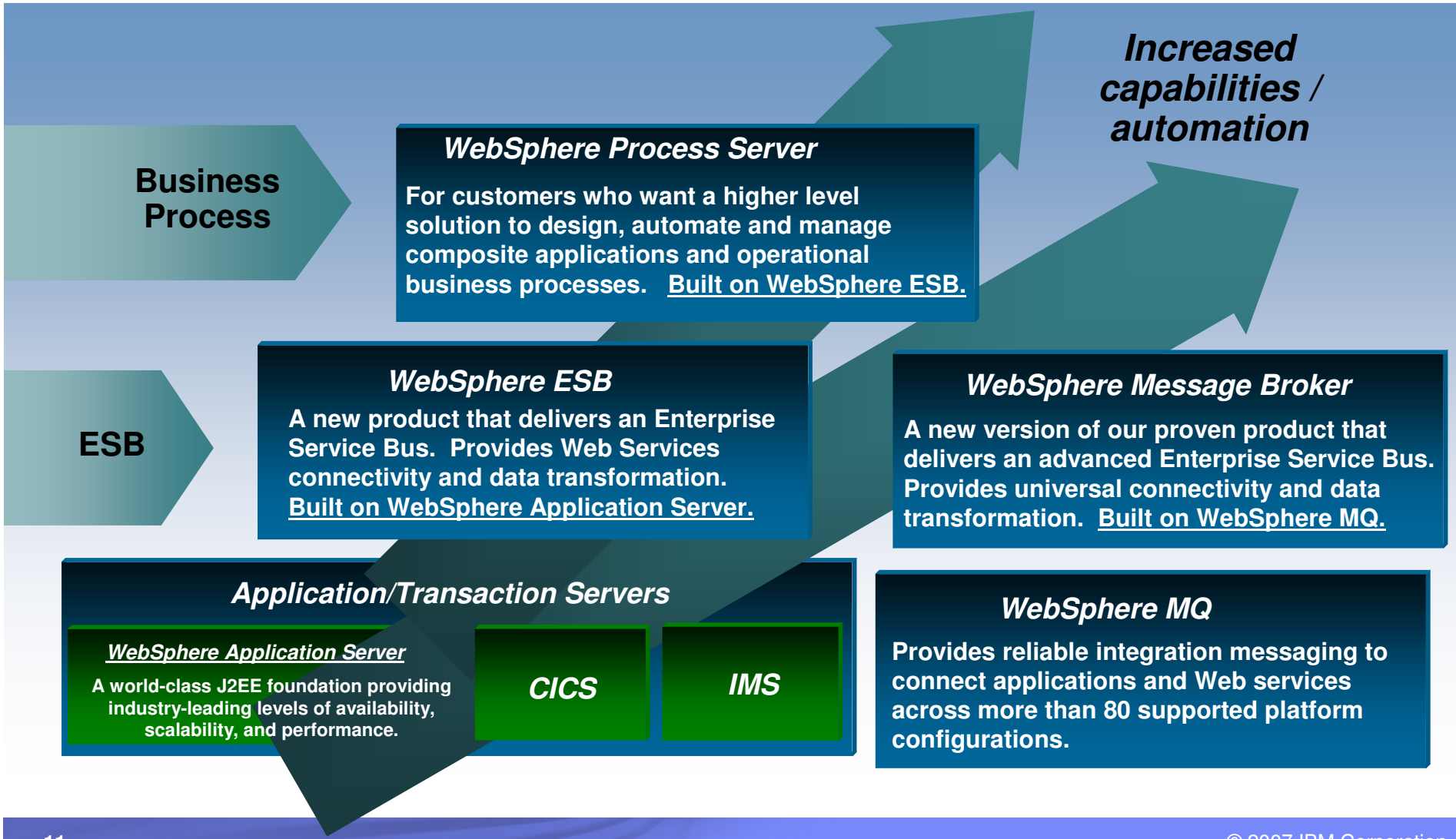
z flexible deployment options for an SOA environment



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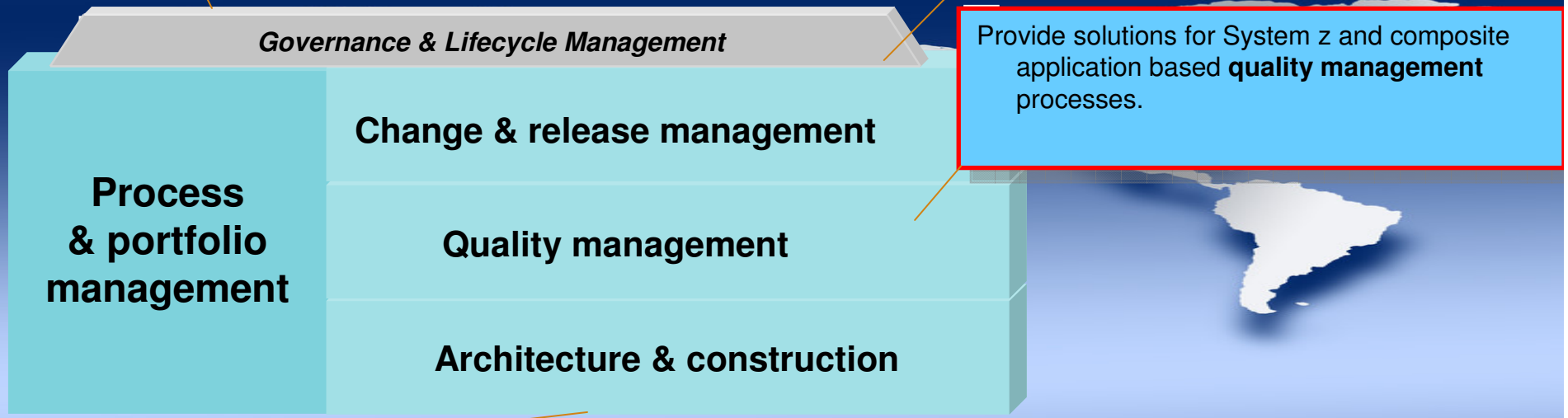
IBM Rational Software Delivery Platform

Focus for System z

Help customers to implement **asset management** of existing applications and assets, from the practitioner level to the CIO level. .

Provide seamless change, build, and release management, as well as **team collaboration** for modern composite applications that cross System z and other system boundaries.



Provide solutions for System z and composite application based **quality management** processes.

Embrace industry architectural standards & technologies.

Simplify delivery of modern, **SOA** based composite applications.

Emphasize uniquely valuable elements of System z platform…and make them easy to leverage in our tools.

Ensure that customers have **enterprise modernization** solutions that transition them to a strategic destination.

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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 systems for an IP environment.
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

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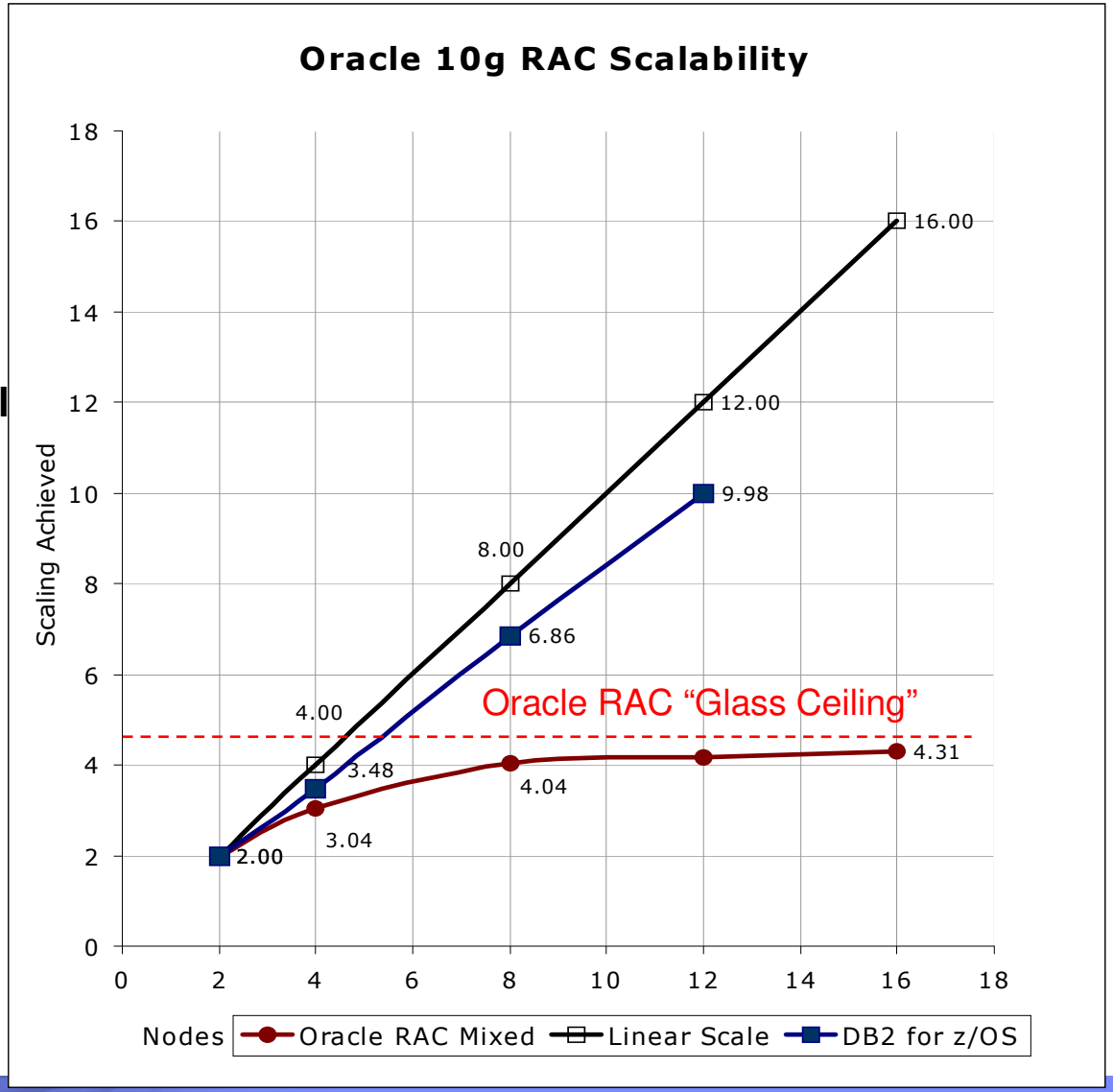
DB2 Scalability

- **DB2 for z/OS provides near-linear scalability with relatively little overhead as nodes are added**
- **With Oracle RAC, overhead increases rapidly as additional nodes are added and performance degrades after only 4 to 6 nodes**



Oracle RAC source: "Scale-up versus scale-out using Oracle 10*g* with HP StorageWorks", Hewlett-Packard, 2005

DB2 for z/OS source: "Enterprise Data Base Clustering Solutions" ITG, October 2003

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Fractional Availability Improvements Are Important

Example 1: 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	***Systemz DB2***
Availability %	**99.825%**	**99.975%**
Annual outage	**15h 20m**	**2h 11m**
Cost of Downtime	$45.188M	$3.591M

Sources: ITG Value Proposition for Siebel Enterprise Applications, Business case for IBM eServer zSeries, 2004 & Robert Frances Group, 2005

Financial Impact of Downtime Per Hour

Industry segment	*Cost*
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**

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DB2 for z/OS Technology Themes

- ✓ **Extend the lead in transaction processing availability, scalability and performance**
- ✓ **Reduce cost of ownership and System z-specific skill needs**
- ✓ **Enable high-volume transaction processing for next wave of applications**
- ✓ **Improve data warehousing and OLTP reporting**

DB2 9 for z/OS delivers on more than 225 requirements submitted by customers, business partners, and worldwide user group communities

Next DB2 release will continue driving these themes

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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

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New Tools to address TCO in 2007

- **DBA Time = Money**
  - Managing application changes
  - Tuning for performance
  - Optimizing repetitive tasks
  - Managing Complexity
  - Complying with regulations and audit

- **Time savers**
  - DB2 Change Management Expert
    - Automates and simplifies the most time consuming DBA task
  - Omegamon DB2 Performance Expert
    - Tunes DB2 systems
    - Finds performance problems
    - Eliminates bottlenecks
  - DB2 Optimizer Expert
    - Optimizes query performance
  - DB2 Utilities enhancements
    - V8 zIIP exploitation
    - vNext volume based utilities
  - IMS Sysplex manager
    - Simplifies complex IMS sysplex management
  - DB2 Thread Expert
    - Manages DB2 Threads
  - DB2 Audit Management Expert & IMS Audit Management Expert
    - Enables fast auditing of DB2 and IMS users and data
  - DB2 Regulatory Compliance Suite
    - Combines 4 tools, including Audit Expert into a single compliance offering

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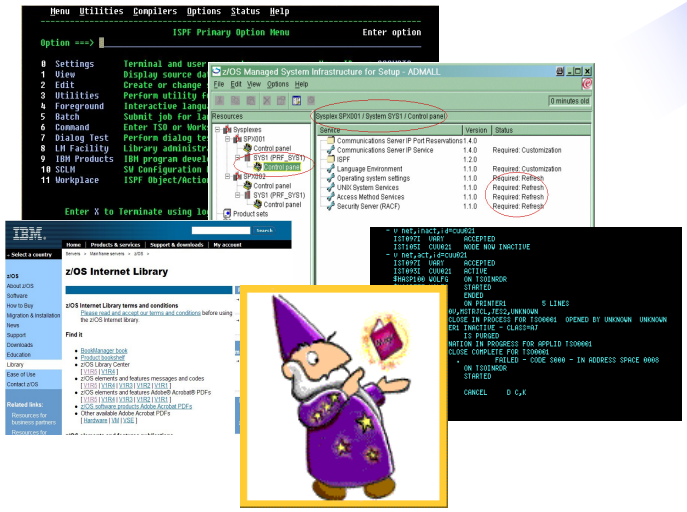
Modernizing the “Face” of z/OS

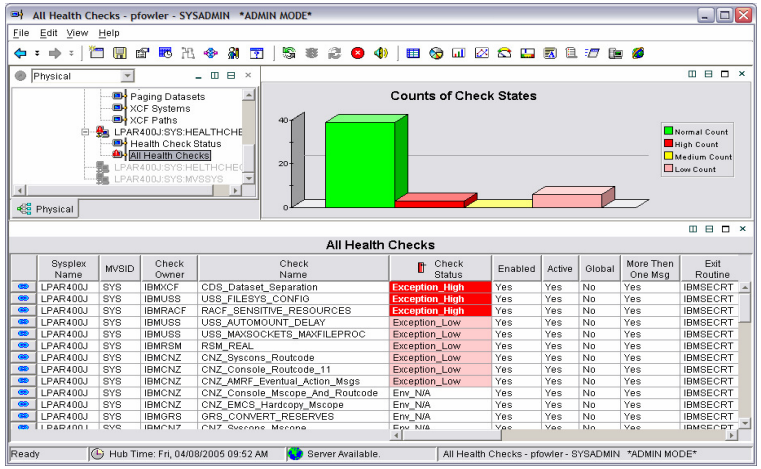
Old



Expert-friendly, long learning curve for people new to platform

- Multiple, inconsistent UIs – no central system management portal
- Many interfaces foreign to those new to platform
- Manual tasks requiring extensive documentation

New



- ✓***Modern*** look & feel; more familiar to those new to platform
- ✓Focus on ***customer goals***
- ✓***Optional*** for those who prefer traditional interfaces
- ✓***Simplified***, ***automated*** task-oriented mgmt interface, with integrated user assistance
- ✓***Central*** z/OS management portal with deep integration with zOS

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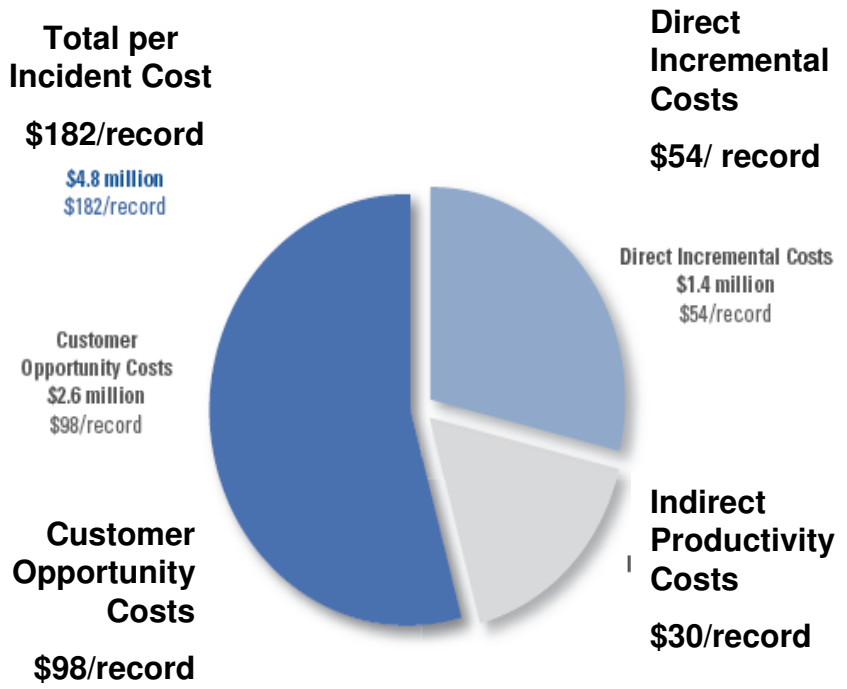
Security Breaches: Immediate Costs plus Lost Customers

- Total per-incident costs **including average direct, indirect, and opportunity costs:**
  - $182 per record
  - $4.8 million per company
  - Company costs ranged from $226,000 to $22 M
  - Total of $148 M in costs across 31 companies
- **Average opportunity loss was 2 % customer lost, but this ranged as high as 7%**



Ponemon Study: 2006 Survey Cost of a Data Breach

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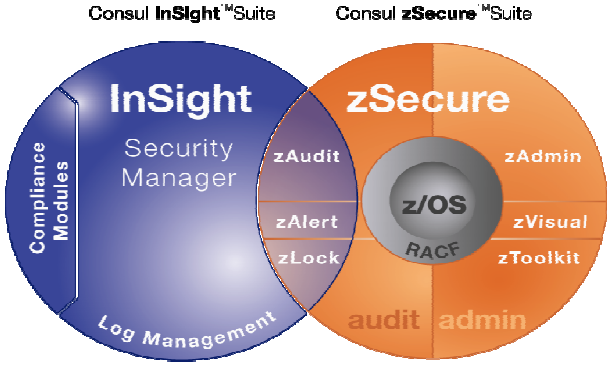
Consul Overview



- **zSecure suite offers:**
  - Audit and monitoring
  - Real-time alerts
  - Policy enforcement
  - RACF administration
  - CICS interface

- **InSight suite offers:**
  - User-focused monitoring and audit
  - Exception reporting
  - Dashboard
  - Reports designed to assist in compliance efforts related to standards, laws and regulations
  - Basic security event module
  - Log management
  - Reporting only, no remediation

- **Differentiators:**
  - True heterogeneous audit and reporting solution encompassing z-based data and distributed platforms
  - Significant intellectual capital in making best practice recommendations intended to assist in compliances efforts related to various standards, laws and regulations
  - Easy start, bottoms up approach to monitoring and auditing events
  - Comprehensive list of configuration settings that can be used for enabling particular endpoints to deliver logs / events to InSight.

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Destination z founding members

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System z in Academia

Our Goal: 20,000 additional mainframe educated students in marketplace by 2010

Academic Initiative:

- >27,000 students worldwide educated to date – reported by professors
- School enrollments grew 900% in 2 years, Over half outside of US
- 20 courses available to all schools
- Student Mainframe Contests
  4,500 students from 500 schools
- 6 University HUB systems actively sharing academic mainframe resources worldwide
- zNextGen community kicked off with SHARE/IBM
- Over 200 IBM mainframe ambassadors assisting schools

What's next?

- Student Mainframe Contest
- Faculty Education Seminars ongoing
- More Majors and Certifications
- Faculty Awards
- Matching schools with clients

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Summary

- We are delivering a New Generation of Software on z
- 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
- Simplification of IT Management is the Next Large Step
- Its All About the Economies of Scale and How z Capability and Quality of Service makes a Difference

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