z9 Executive Software Briefing
Software Strategy and Directions

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What is an IBM Mainframe?
A server designed for the processing power business needs

IBM eServer zSeries

Dinosaur

Enterprise Servers

System z

Large Systems

Processor

S/390

Big Iron

IBM System z -- a reliable, virtualized platform – designed from the microprocessor up for better intelligent workload management, security and business integration.

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

z/OS 1.9 Preview

Meeting the Future challenges of on demand business*

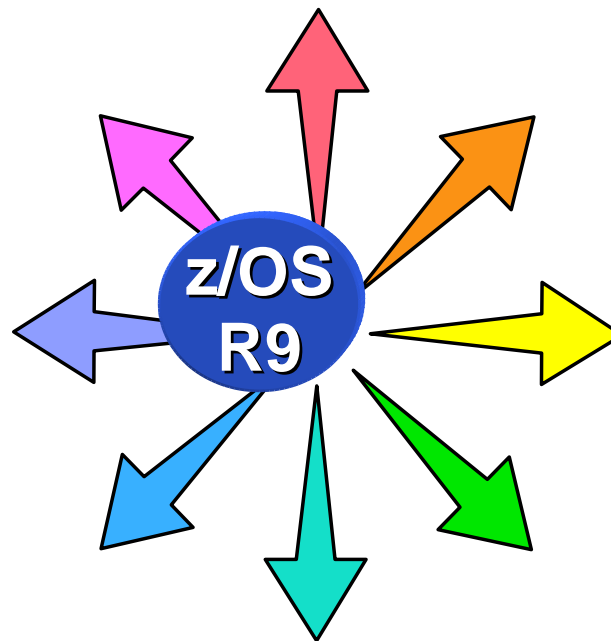**Scalability & Performance**

Improving Usability and Skills

Improving Availability

Integrating new Applications and Supporting Industry and Open Standards

Self Managing Capabilities
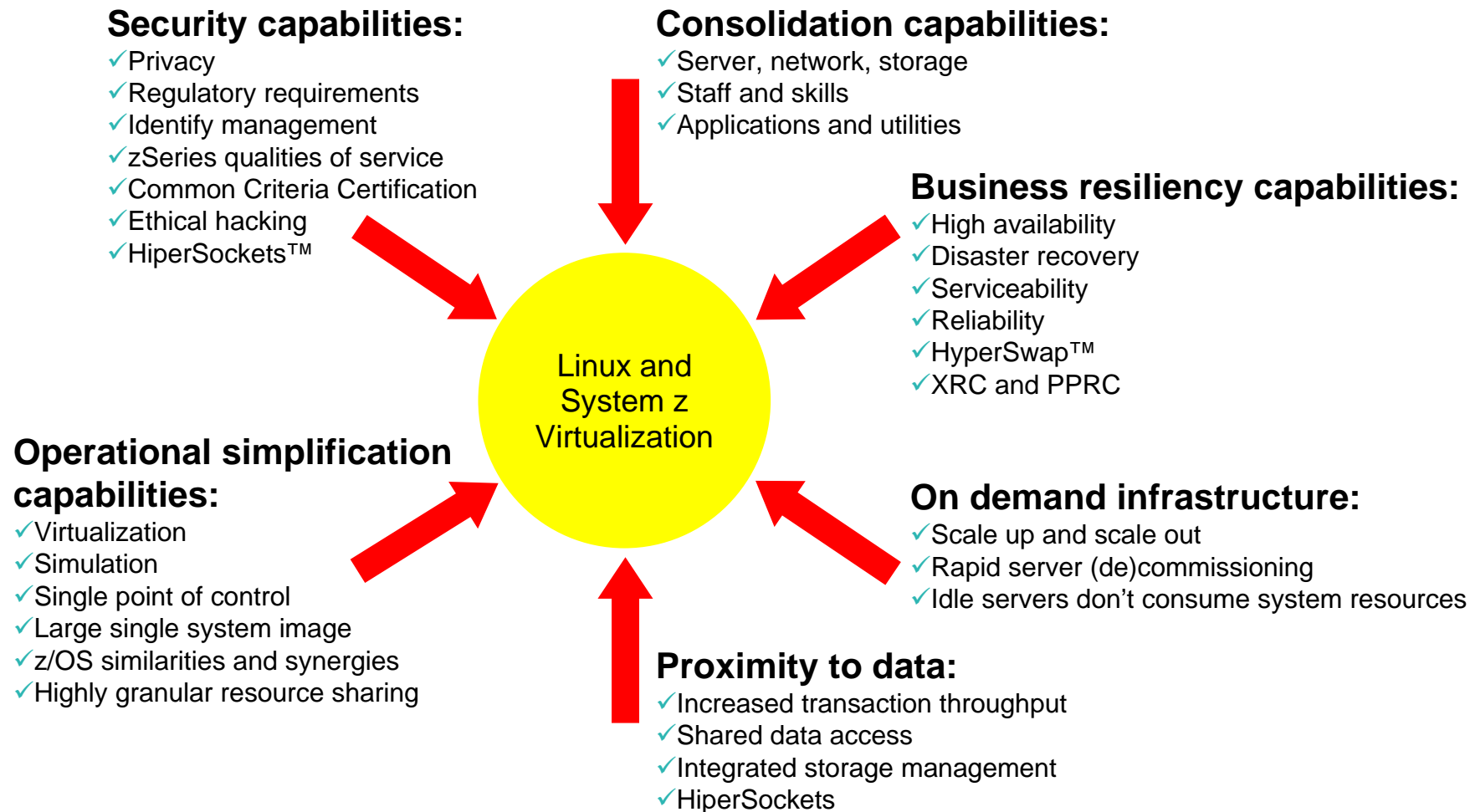
z/OS R9

Extending the Network

Enhancing Security

Enterprise-Wide Roles

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

Linux and System z Virtualization

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

SOA Promises to Un-Bundle the "IT Hairball"

- IT assets are described and exposed as standards-based Web services
- Composite Business Service (CBS) are loosely coupled, distributed apps built on IT assets typically already available to the organization and exposed as services
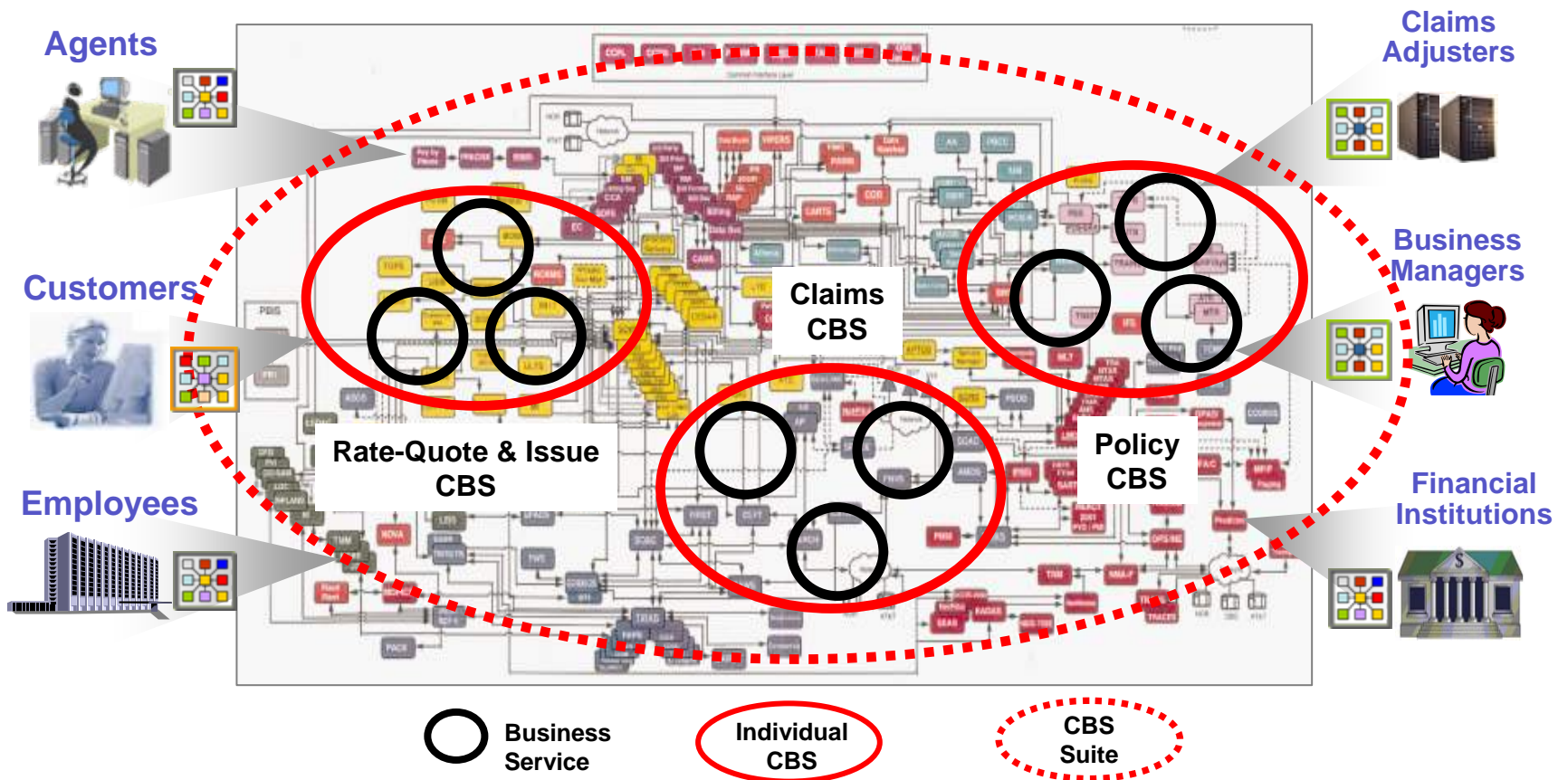
SOA, WAS z/OS, & the Mainframe

Recent data indicates that 41% of mainframe customers are building or deploying new applications on System z - up from 31% a year ago.

WebSphere is the key to unlocking & reusing many core assets and extending their value, and the mainframe is at the heart of many SOA customers.

- **Commitment to open standards**
  - ▶ **J2EE**
  - ▶ **JMS support**
  - ▶ **XML support**
  - ▶ **Advanced Web services**
- **Commitment to SOA**
  - ▶ **SCA & futures**
- **WebSphere security**
- **WebSphere high availability**
- **Engine for WebSphere expansion products on z/OS**

WebSphere Application Server for z/OS

CICS, IMS, & DB2

- **Platform integration**
  - ▶ **z/OS WLM**
  - ▶ **Automatic Restart Mgr**
  - ▶ **Parallel Sysplex**
  - ▶ **Security (RACF)**
- **Asset integration**
  - ▶ **Local DB2 connections**
  - ▶ **IMS & CICS integration**

WebSphere Application Server V6.1

Generally available

Focus on innovation not implementation

- J2SE support (JDK 5.0)
- Application Server Toolkit enhancements
- Installation factory
- Portlet support
- JSF widget library

Standards and security driven SOA runtime

- Security configurations out of the box
- Web Services security enhancements
- Government standards
- Performance improvements

Deliver key function in new ways

- Flexibility through new Web services
- Session Initiation Protocol (SIP) servlets
- Flexibility with your messaging backbone

Administration enhancements and ease of use

Web server for z/OS, powered by Apache

- 64 bit enablement for WebSphere for z/OS

Internet access to WMQ

queues/Qmgr/myQ

Web
Browser

Javascript
AJAX

http://mq.com:1415/

MQPUT() | MQGET()

HTTP to WMQ Bridge

**HTTP POST | GET |
DELETE**
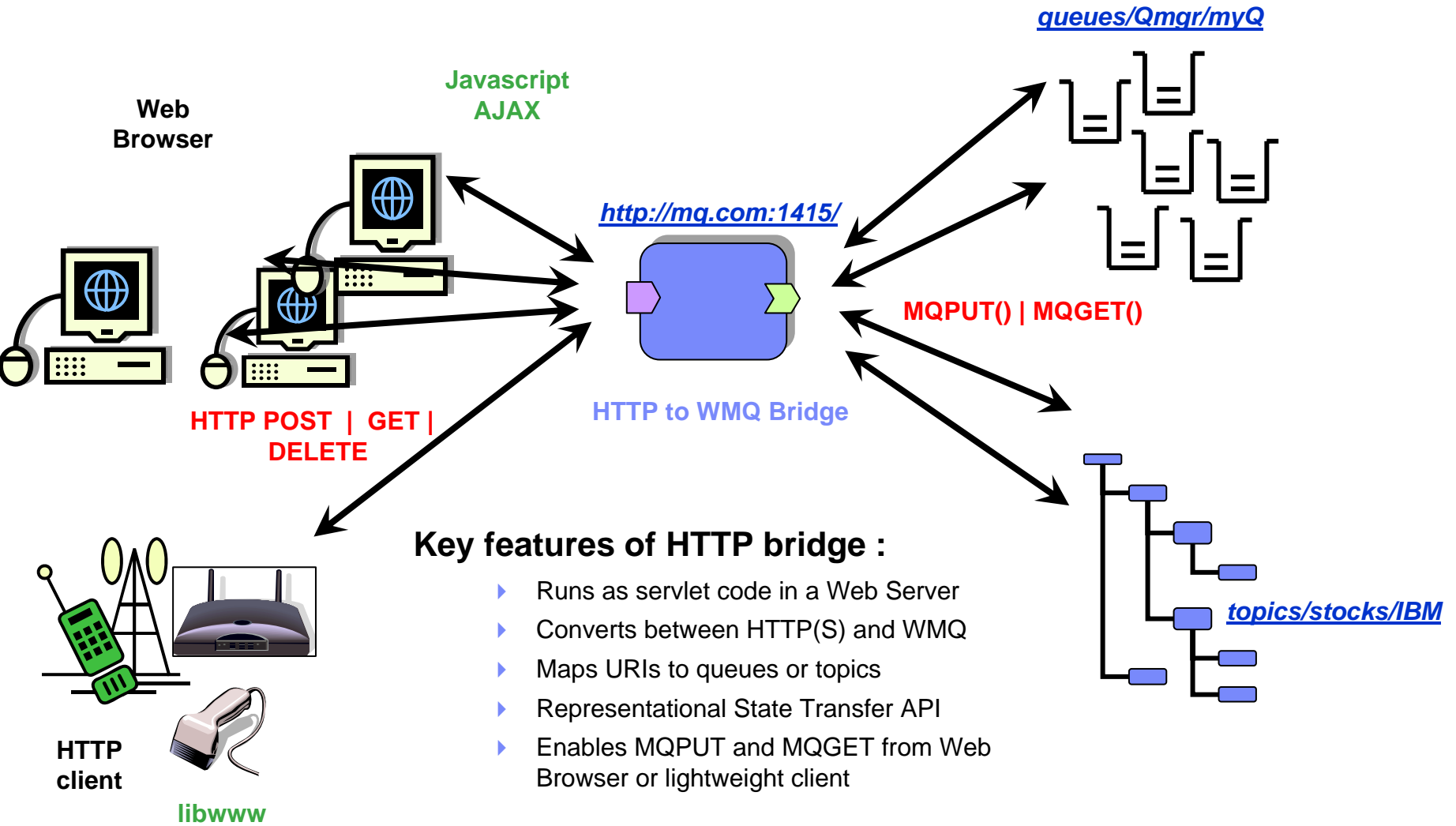
Key features of HTTP bridge :

▸ Runs as servlet code in a Web Server

▸ Converts between HTTP(S) and WMQ

▸ Maps URIs to queues or topics

▸ Representational State Transfer API

▸ Enables MQPUT and MQGET from Web
  Browser or lightweight client

topics/stocks/IBM

**HTTP
client**

libwww

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

COBOL V4

Delivers major enhancements in the following key areas

SOA and XML
- Significant enhancements to XML processing supporting batch, CICS, IMS, and DB2
- Brings COBOL in line with Java, C, and other key "modern" languages

Integration
- DB2 V9 exploitation (including support for new SQL syntax such as XML based data and queries)
- Debug Tool V8
- File Manager integration supporting copybook processing in non COBOL Ipar's

Usability
- Enhanced support in listings facilitates developer productivity
- Process very large DFSMS based datasets supports mission critical high power processing
- Enhanced DB2 coprocessor usability

Platform Currency
- zArchitecture instruction exploitation improves performance of COBOL applications (including Unicode performance)
- CICS 3.2, IMS V10
- **With SOD to provide incremental 64 Bit improvements in coordination with key runtimes**

WebSphere Developer for zSeries

Eclipse-based integrated development environment for developing enterprise-level, multi-tier applications (composite applications)
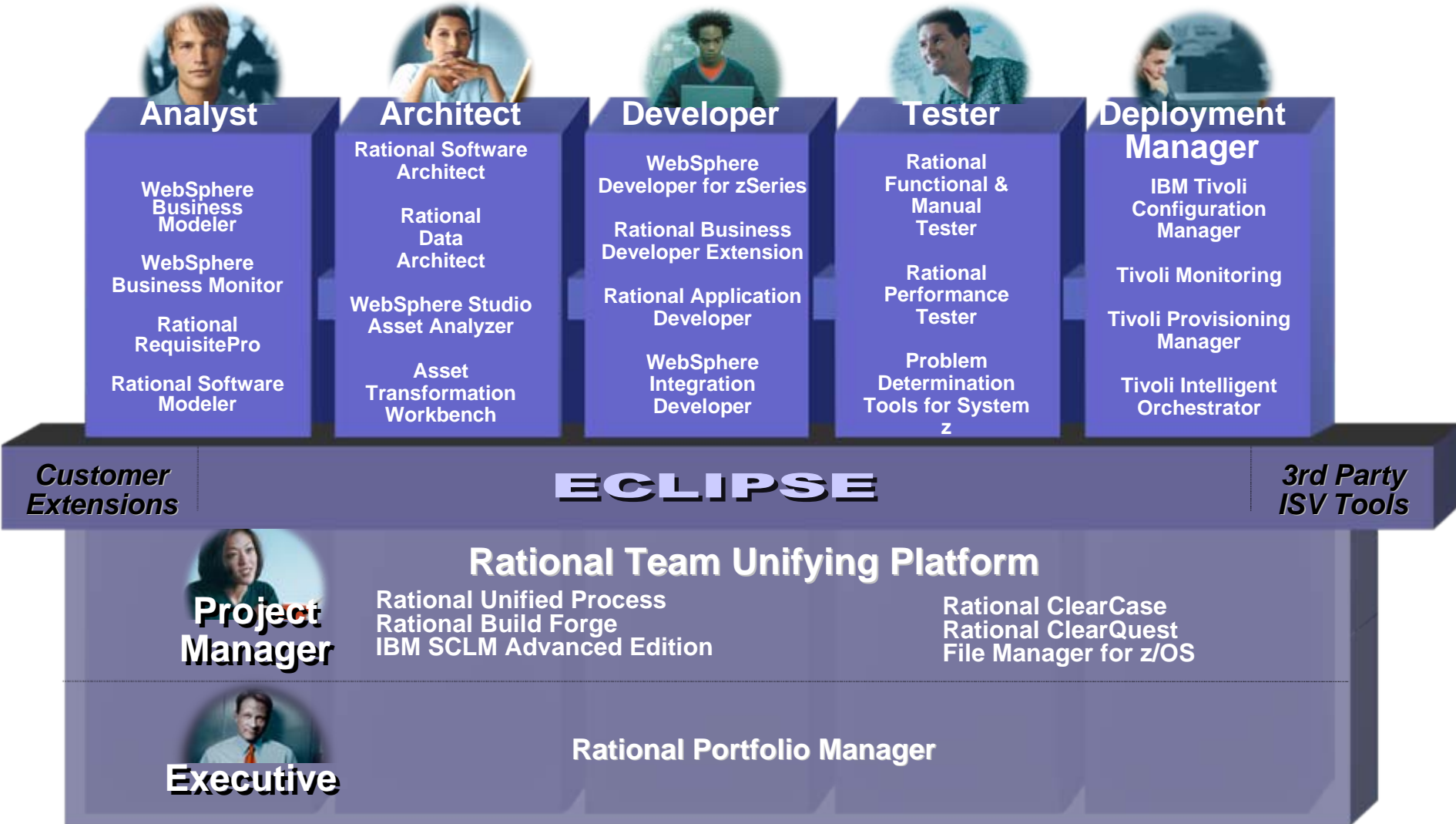
- **Builds z/OS applications**
  - COBOL, PLI, HLASM
  - TSO/Batch, CICS, IMS, DB2
  - DB2 Stored Procedures – COBOL, PLI, Java, SQL

- **Creates COBOL/CICS/JSF/Java/J2EE Multi-tier apps**
  - Built on Rational Application Developer
    - Includes all of the J2EE web development tools
  - Generate JSF/EGL/J2EE web front ends
  - COBOL back ends running on zSeries

- **Enables CICS and IMS applications for Web services and SOA**
  - Provides tooling to make it easy to integrate existing applications into an SOA

- **Supports the full application lifecycle**
  - Model, Architect, Develop, Test, Deploy, and Manage

The IBM Software Development Platform – A New Face for z
Integrated and role-specific tools

Analyst

WebSphere Business Modeler

WebSphere Business Monitor

Rational RequisitePro

Rational Software Modeler

Architect

Rational Software Architect

Rational Data Architect

WebSphere Studio Asset Analyzer

Asset Transformation Workbench

Developer

WebSphere Developer for zSeries

Rational Business Developer Extension

Rational Application Developer

WebSphere Integration Developer

Tester

Rational Functional & Manual Tester

Rational Performance Tester

Problem Determination Tools for System z

Deployment Manager

IBM Tivoli Configuration Manager

Tivoli Monitoring

Tivoli Provisioning Manager

Tivoli Intelligent Orchestrator

Customer Extensions

ECLIPSE

3rd Party ISV Tools

Rational Team Unifying Platform

Project Manager

Rational Unified Process
Rational Build Forge
IBM SCLM Advanced Edition

Rational ClearCase
Rational ClearQuest
File Manager for z/OS

Executive

Rational Portfolio Manager

DB2 9 for z/OS: Raising the Bar
Addressing Business and Infrastructure Goals

Now in Beta

Faster, Lower Cost Development and Porting

- pureXML simplifies access to XML data
- SQL improvements that simplify porting
- Native SQL procedural language
- Default databases and table spaces
- Automatic unique indexes to support primary keys

Decrease Complexity and Cost

- Enhanced Compression and Optimization
- Fast table replacement and append
- Partition, range, multi dimensional clustering & hashing
- Volume-based COPY/RECOVER using FlashCopy
- Optimization Service Center
- DB2 managed optimistic locking

Streamline Compliance Efforts

- Network trusted security context & database roles
- Instead of Triggers
- Improved auditing capabilities
- SSL
- New encryption of key DB2 resources

Information Led Business Innovation

- Support for both relational & integrated pureXML data
- WebSphere integration
- Data Warehousing on System z
- SAP optimized with 40+ specific features

DB2 zIIP Exploitation
Optimizing Costs with New Specialty Engines

- **Significant Value, Available Now**
  - Improved Response Times
  - Improved TCO
  - Flexible Configuration
    - Multiple LPARs, Applications across Systems and Platforms, DRDA Support

- **Tests Show Multiple Workloads Can Benefit**
  - SAP OLTP
    - *40% better response time*
    - *Regular CP time reduced*
    - *49.8% LPAR redirected*
  - BI Batch Workloads
    - *Better response times*
    - *CPU time reduced*
  - SAP Business Warehouse
    - *43% better response time*
    - *50.1% LPAR redirected*
  - Utilities
    - *Up to 60% of workload redirected*

zIIP Data Server Specialty Engine

zAAP Application Specialty Engine
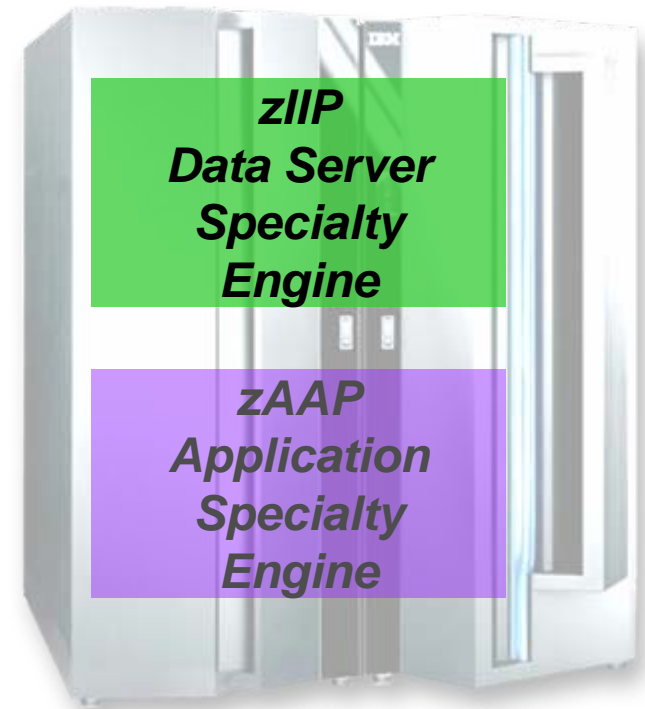
New Tools to address TCO in 2007

- 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

Looking Beyond DB2 9 –Autonomics and Transparency

- **Reduce the need for z specific skills**
  - Advanced autonomics
  - Reduced administration
- **Continued cost/performance improvements**
  - Table scan acceleration
- **New application improvements**
  - Even more XML
- **Extend the lead in availability, scalability & performance**
  - Deeper SW, HW, OS, disk management integration
- **Continued leadership for security & data compliance**

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

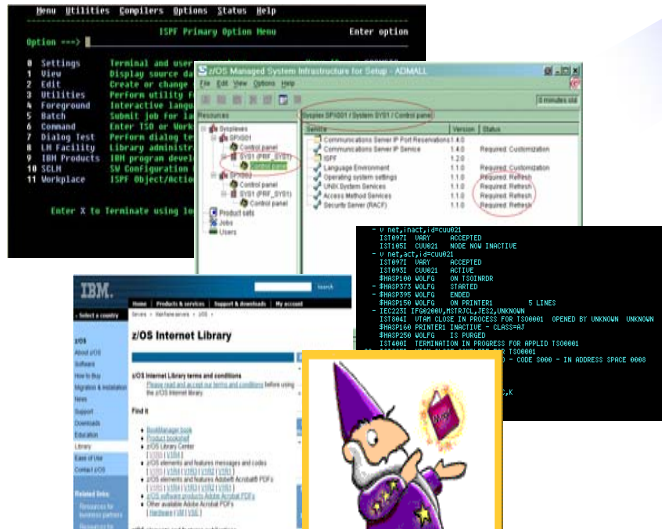**Providing High Performance, Scalable, Available, Relia and Secure Solutions**

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

Modernizing the "Face" of z/OS

Old

New
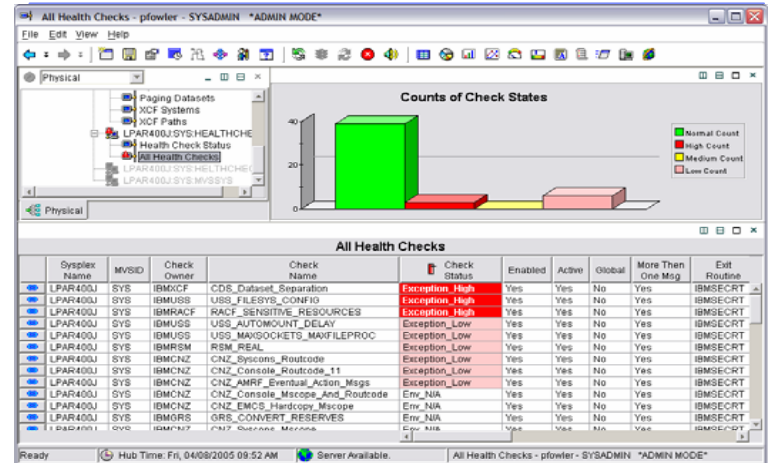
Expert-friendly, long learning curve for people new to platform
•Multiple, inconsistent UIs – no central system management portal
•Many interfaces foreign to those new to platform
•Manual tasks requiring extensive documentation

✓*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

z/OS Health Checks in the Management Console

The Health Checker examines configuration values for deviations from best practices

Health check exceptions are highlighted in the zMC

IT staff can open a report for details and recommended corrective actions
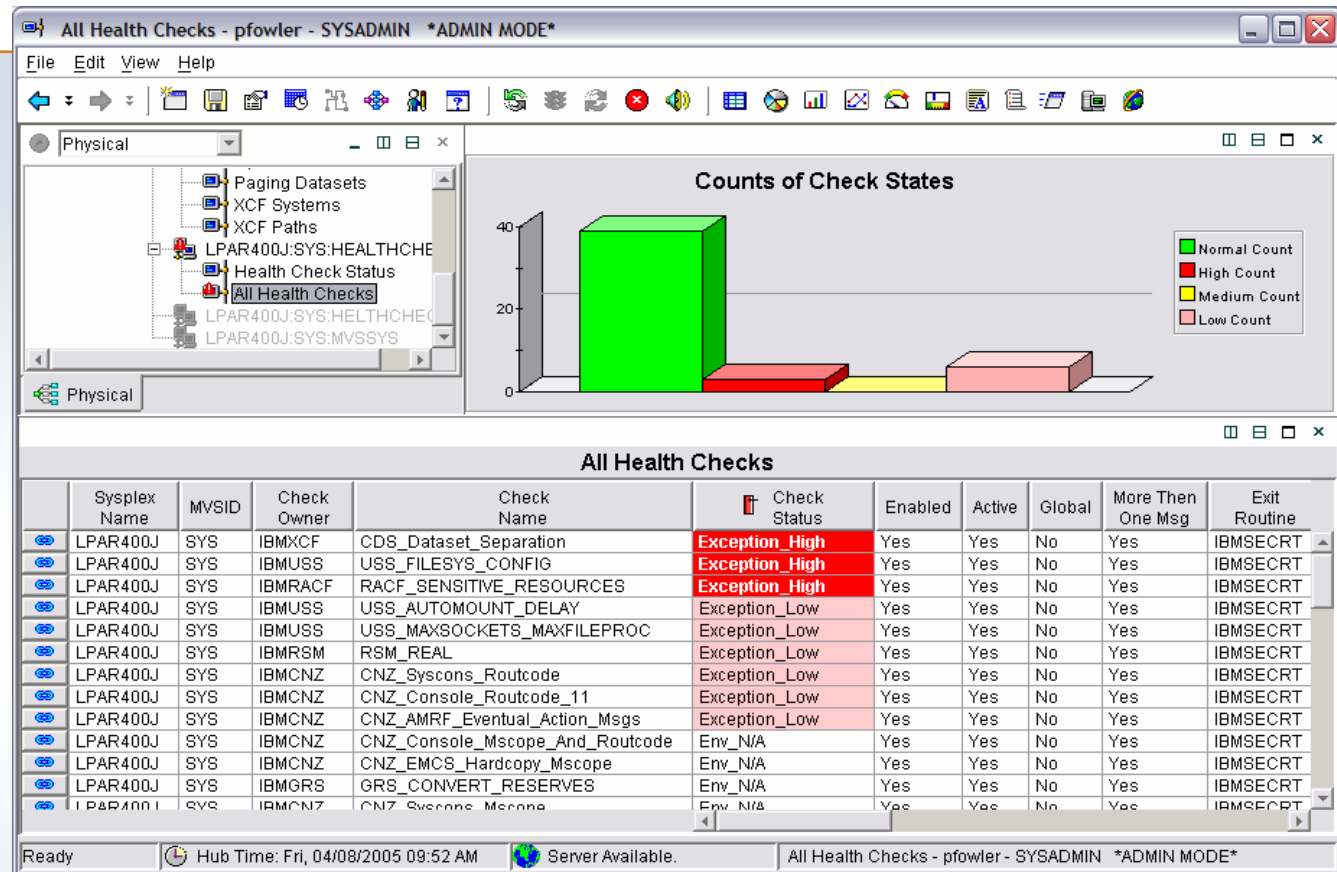
Health Checker integration is a unique feature of the IBM OMEGAMON z/OS Management Console (zMC)

CCMDB – Discovery, Application Mapping & Topology

- Application Infrastructure Mapping
- Software and Hardware Components
  - Servers, networks, storage & software
- Component configuration details

Sensors

- Web Servers
- Application Servers
- Databases
- Network Services
- Hosts/OS
- Network Devices
- Storage Devices
- Third Party Configuration Providers
- Packaged Applications
- Monitoring and Event Management Applications

Discovery Library Adapters

- NetView for z/OS
- Information Manager for z/OS
- Tivoli Provisioning Manager
- Tivoli Business System Manager
- Tivoli Service Level Advisor
- z/OS & the Tivoli infrastructure
- Tivoli Composite Application Manager for Response Time Tracking
- …
- Other Discovery Tools
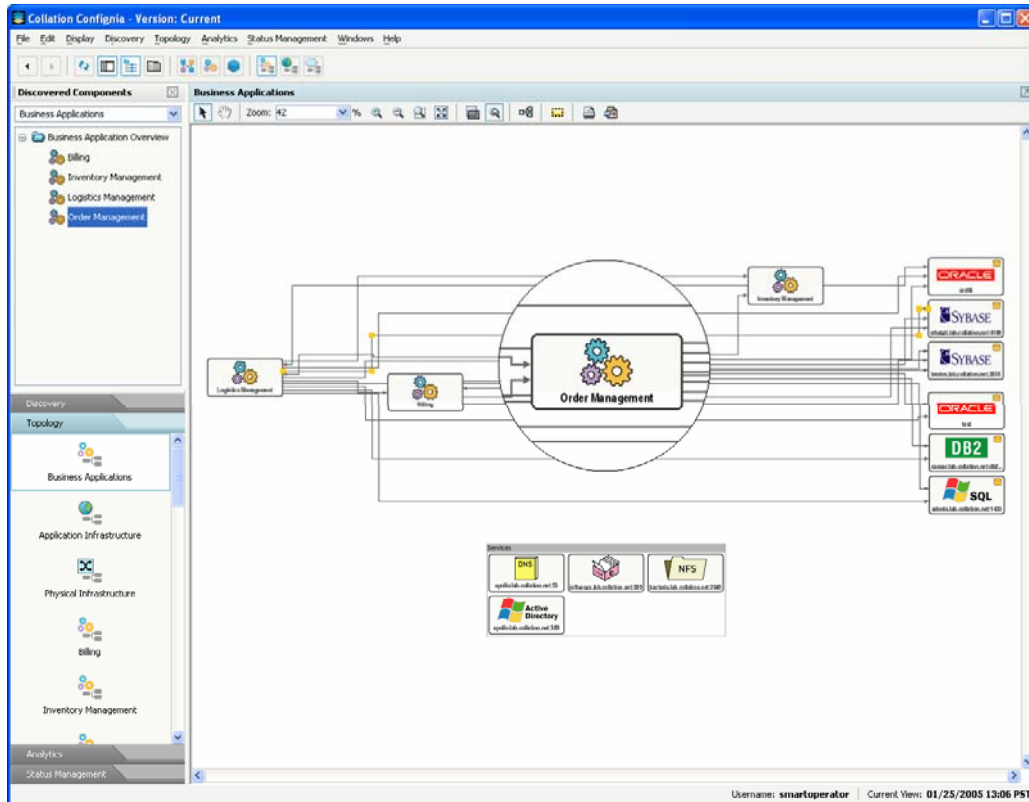
CCMDB Extends System z Coverage in Early 2007

- **Relationships for CCMDB Topology Views**
  - ▶ Linking distributed with z/OS subsystems
  - ▶ Linking z/OS subsystem to z/OS subsystems (extending distributed to z/OS further)
    e.g. WAS to CICS to DB2

- **Attributes for CCMDB Detail, Comparison & Change Views**

z/OS	Link list datasets, Parmlib datasets, Proclib datasets, Volumes etc
Address Space	Dataset Allocations etc
IMS	Transactions, Programs, Databases etc
CICS	Transactions, Programs, Files etc
DB2 for z/OS	Databases, Tablespaces, Tables, Views etc
MQ for z/OS	Channels, Queues etc
WAS for z/OS	Comprehensive coverage via the CCMDB WAS sensor. This sensor currently supports distributed WAS only and will be enhanced to support WAS on z/OS. The z/OS DLA will discover the WAS Soap Port to seed this discovery.

Complete View Of Application Performance

A Dynamic Role-based Policy Workspace for Integrating IT Operations Silos

Tivoli Enterprise Portal (TEP)
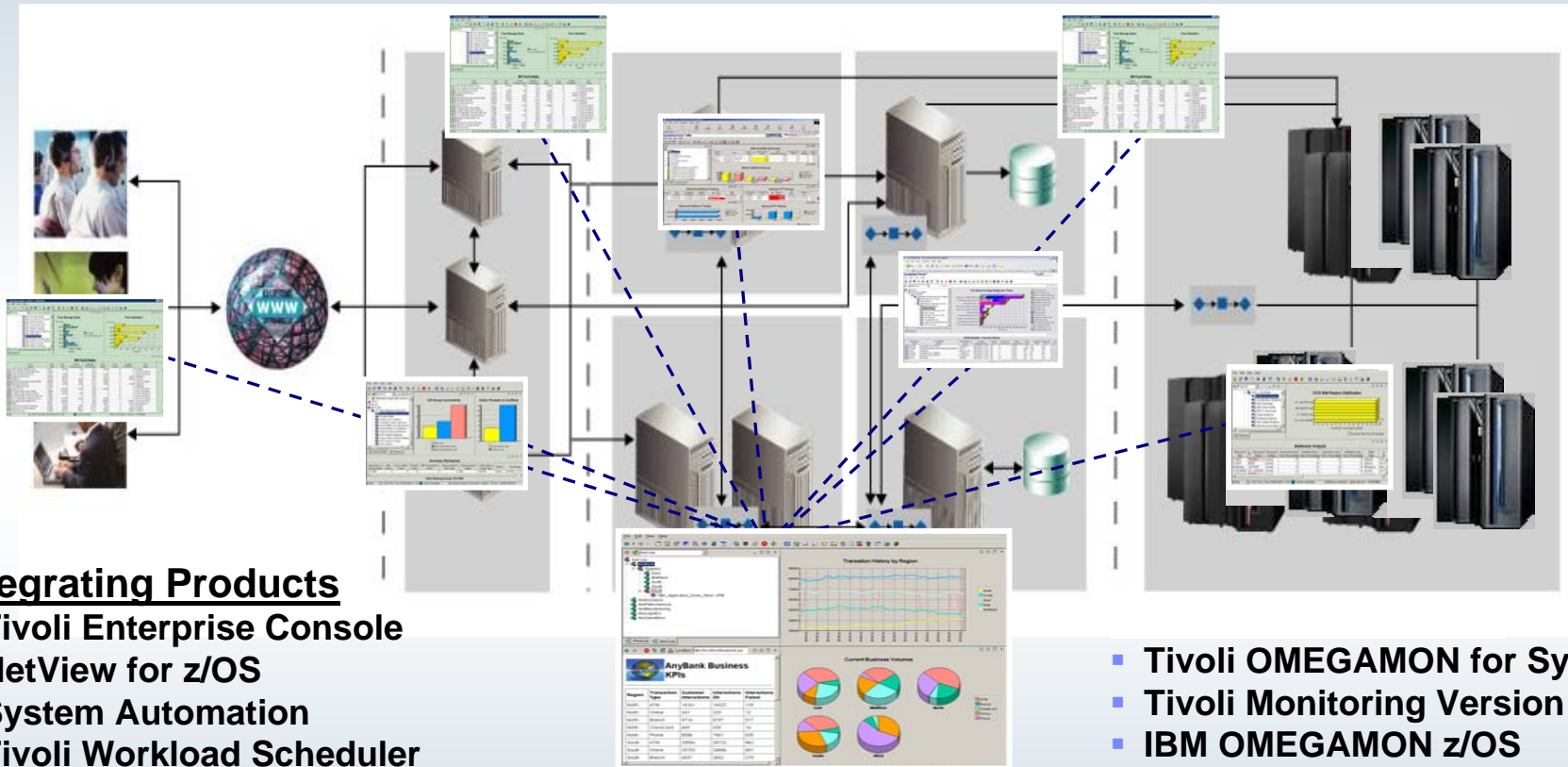
Integrating Products

- **Tivoli Enterprise Console**
- **NetView for z/OS**
- **System Automation**
- **Tivoli Workload Scheduler**
- **Tivoli Monitoring Version 5**
- **Tivoli Service Level Advisor**
- **Tivoli Business Systems Manager**
- ***Netcool OMNIbus Active Event List***

- **Tivoli OMEGAMON for System z**
- **Tivoli Monitoring Version 6**
- **IBM OMEGAMON z/OS Management Console**
- **Tivoli Composite Application Manager Family**

How is security different on the Mainframe?
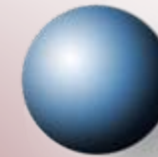
Information & Applications

Supports a variety of encryption standards to help keep **current with industry and government security regulations**

A highly secure business environment that complies with standards to help build industry credibility and gain consumer trust

People

Manage access to critical data through **Multiple Level Security**
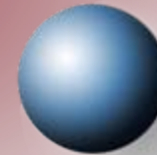
Data Protection

Provides **end-to-end protection** that helps keep data uncorrupted and uncompromised

Networks

Integrates security with the network with built-in technology **resistant to hackers**

Operating System

Architected for security from within to **reduce risk** and **defend against viruses**

*"The **IBM mainframe** is the **only** computing system to earn the **highest level of industry security** certification, EAL5."*

*EAL (Evaluation Assurance Level) = International standard to define security requirements in computer systems.

Consul Overview

Consul InSight™Suite   Consul zSecure™Suite

- **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
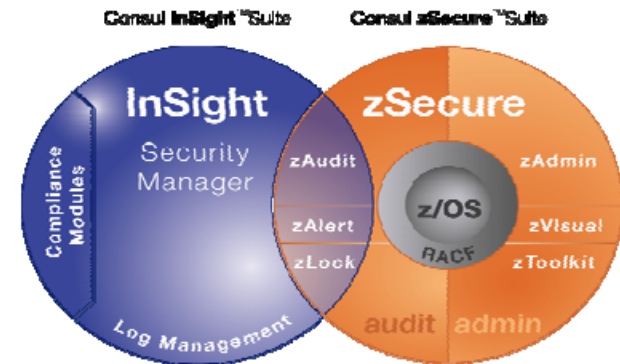
- **Differentiators:**
  - ▶ True heterogeneous audit and reporting solution encompassing z-based data and distributed platforms
  - ▶ Significant intellectual capital in making best practice recommendations intended to assist in compliances efforts related to various standards, laws and regulations
  - ▶ 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.

Comprehensive IBM System z Storage Management

IBM service management

- **Process management**
- **Service management platform**
- **Operational management**

Best practices and services

Storage Infrastructure management

IBM Data Facility Product (DFSMSdfp)

IBM Tivoli OMEGAMON XE for Storage v4.1

IBM Tivoli Advanced Catalog Managment v1.1

IBM Tivoli Allocation Optimizer v1.2

Allows administrators to manage data and a broad range of devices such as switches, tape, removable media and storage servers

Business Continuity

IBM Data Set Services (DFSMSdss)

IBM Backup and Restore Manager for z/VM v1.2

IBM Tivoli Advanced Backup & Recover for z/OS v1.1

IBM z/OS Global Mirror v1.1

Minimizes operational risk by ensuring business data meets backup and recovery objectives

Data Retention

IBM Hierarchical Storage Manager (DFSMShsm

IBM Tivoli Advanced Audit for DFSMShsm v1.1

IBM Archive Manager for z/VM v1.1

Helps control storage growth and control costs for data requiring long retention periods.

Resource Virtualization

IBM Removable Media Manager (DFSMSrmm)

IBM Tivoli Tape Optimizer v1.2

IBM Tape Manager for z/VM V1.2

IBM Tivoli Automated Tape Allocation Manager V2.2

Increases flexibility and improves resources optimization

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