Positioning System z
Software Value and Investments

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Vice President, System z Software

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The z Software Strategy

Capitalize on Traditional System z Strengths

- Batch processing, Transaction processing, Messaging, Quality of Service, and Data Serving

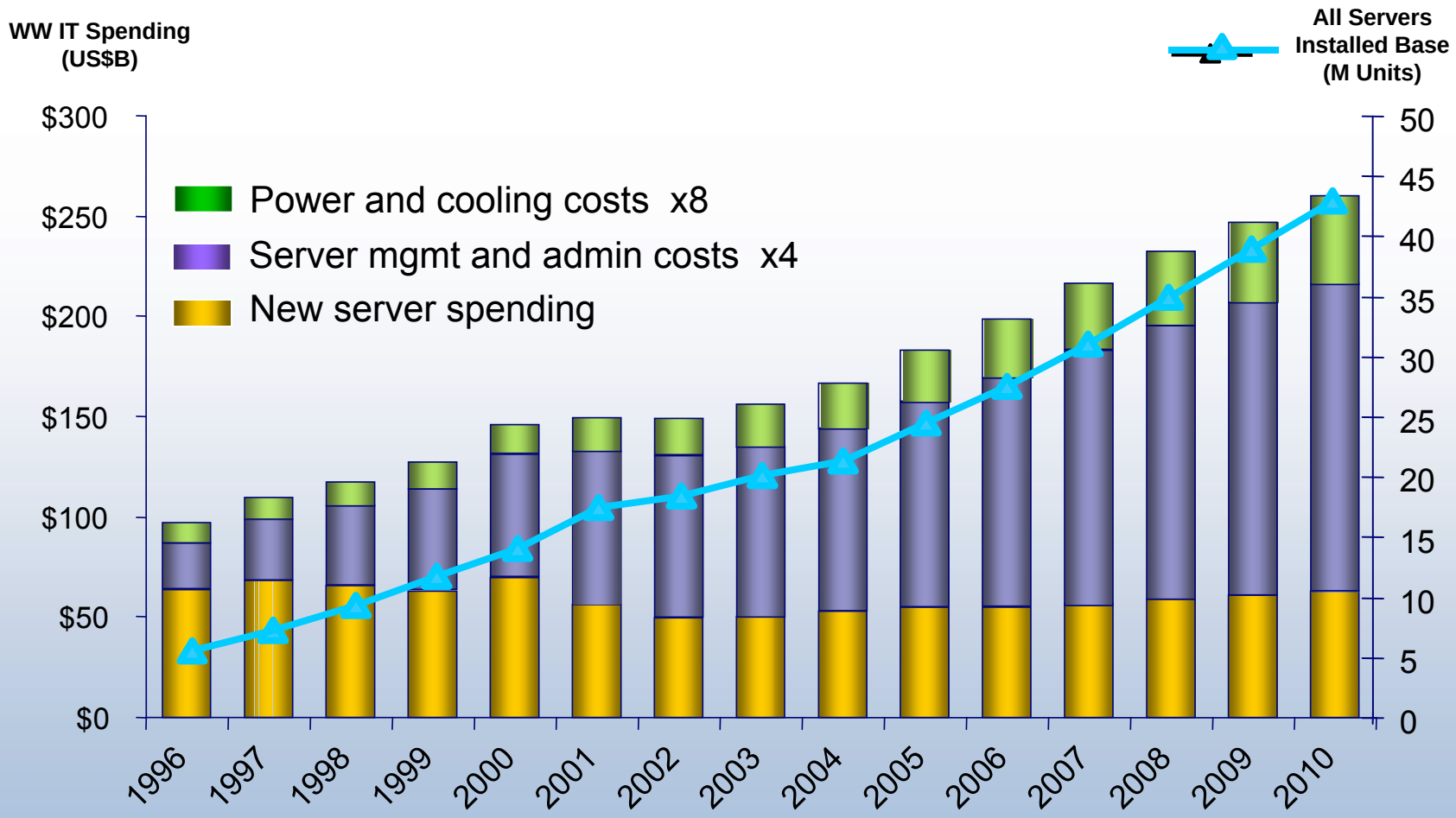
Extend Value Proposition to New and Mixed Workloads

- Systematic re-engineering of the software stack for SOA
- Integrate with Modern Application Development Environments
- Deliver extensive Data Management services
- Leverage the wave of workload consolidation; zLinux
- Simplify System z – make it easier to install and manage for better TCO
  - New faces of z
  - More end-to-end management capability from a z central point of control
  - Simplification of labor intensive tasks

Reinvigorate the System z Ecosystem

- Attract new System z customers and ISV application workloads
- Make System z relevant to the new IT generation

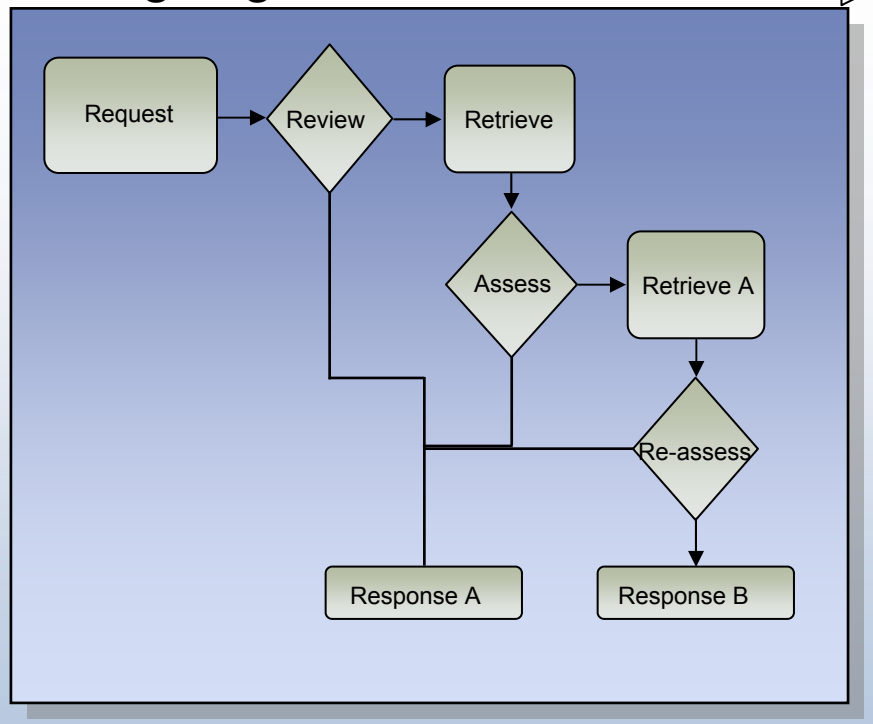
The previous method of meeting new business demand resulted in an explosion of new applications and servers and increased cost that has proved to be unsustainable.



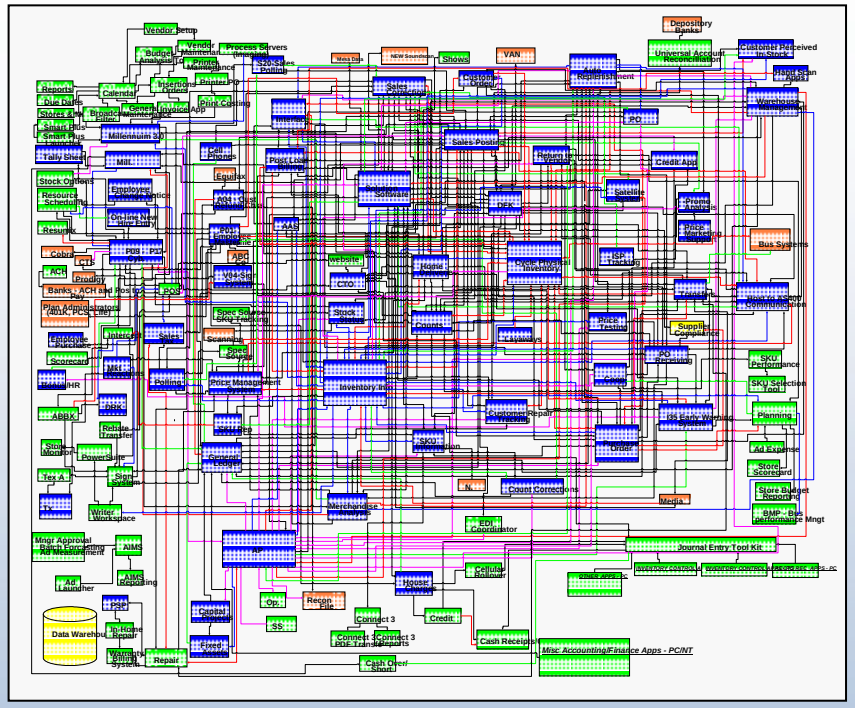
Source: IDC, Virtualization 2.0: The Next Phase in Customer Adoption, Doc #204904, Dec 2006

Users find themselves dealing with an established IT environment of hard-coded, rigid applications that, though tried and true, is not conducive to change.

Strong Logic Flow ….



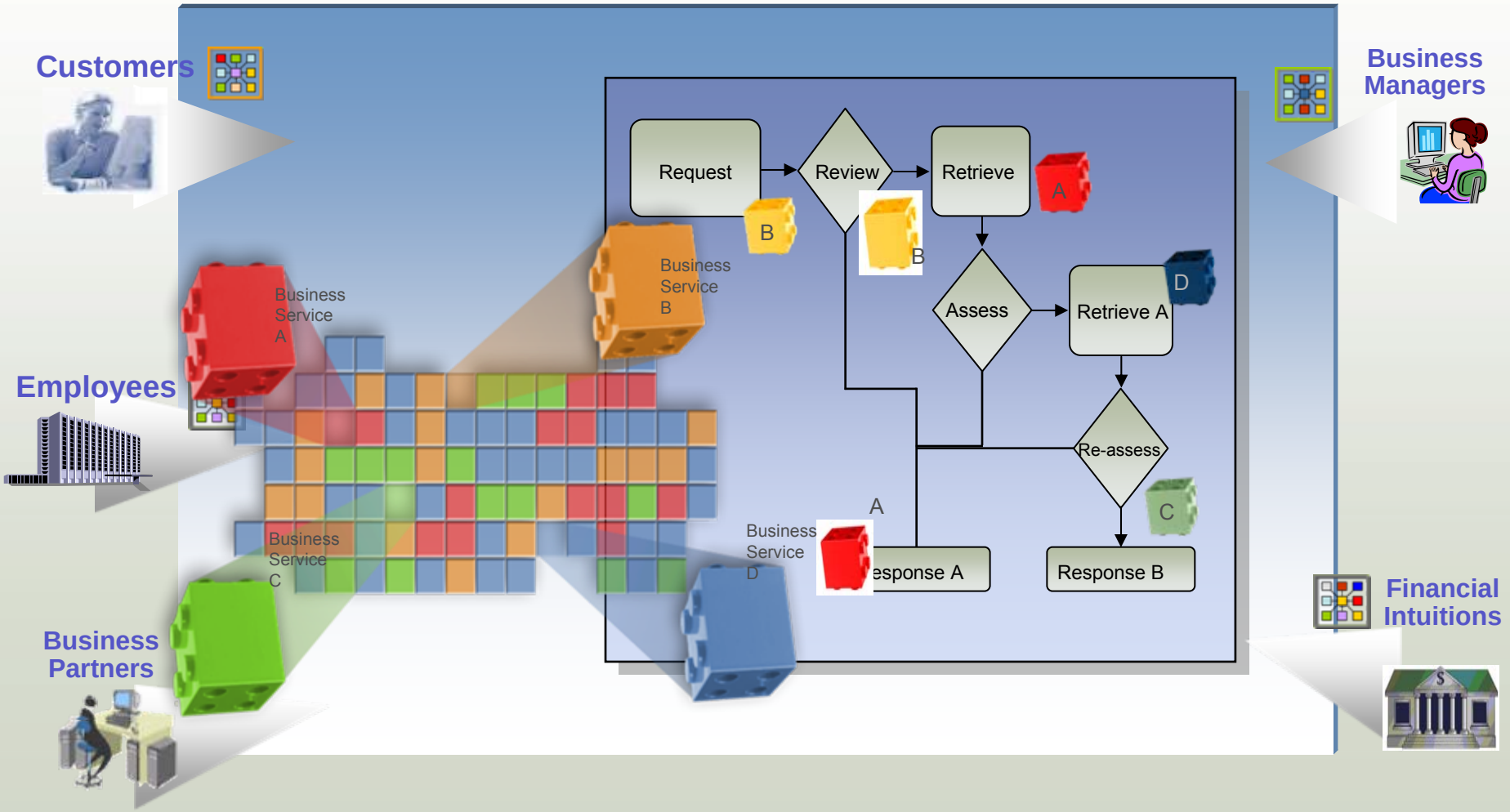
…. but tough to maintain and change



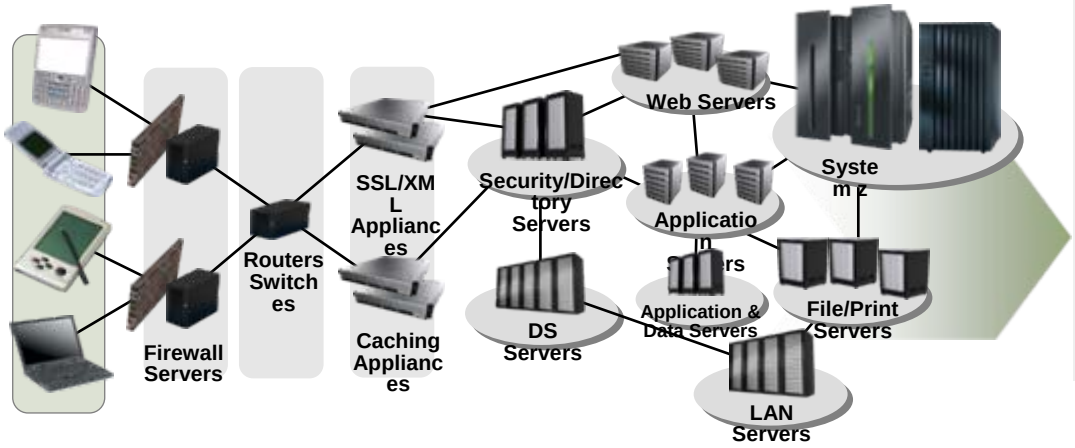
- Tested
- Locked Down
- Tuned
- Secured

- Complex
- Inflexible
- Not Documented
- Stabilized

SOA offers a new approach - rendering applications as services…and their delivery as **changeable** workflows.



To successfully respond to the challenges and demands defined by the Enterprise of the Future; IT must evolve to a new model for the data center and computing - . Introducing DYNAMIC INFRASTRUCTURE



Dynamic

Improve service. Reduce cost. Manage risk.

Linux on System z is also matching the attributes of a dynamic infrastructure **- exploiting the outstanding virtualization, automation, availability and security capabilities of the System z**

Reality of Today's Challenges

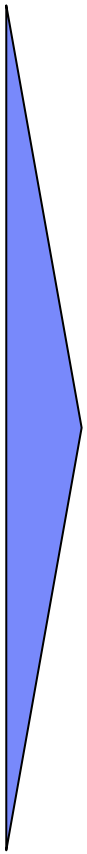
- **Rising costs of systems and networking operations**
- **Explosion of data and information requirements**
- **Difficulty in deploying new applications and services**
- **Landslide of compliance & security requirements**
- **Systems and applications need to be available**
- **Rising energy costs & demand**

Reality of Tomorrow's Needs

- Business agility
- Dynamic service management
- Protected & secured data
- Personnel focused on business vs. operations
- Seamless deployment of solutions

Golden Rule: An optimized dynamic infrastructure is heterogeneous

- Optimized infrastructures
  - **best "fit for purpose" technologies across the application tiers**
  - **Appropriate cost and service levels**
  - **Highly Virtualized to reduce management cost and risk**
- Cloud computing is a delivery model for a Dynamic Infrastructure



- System z is an intersection point of:
  - **Workload Optimized System Stacks**
  - **Cloud services**
  - **Capabilities for a dynamic infrastructure**
  - **Heterogeneous platform virtualization to minimize the complexity of heterogeneous workload-optimized stacks (future)**

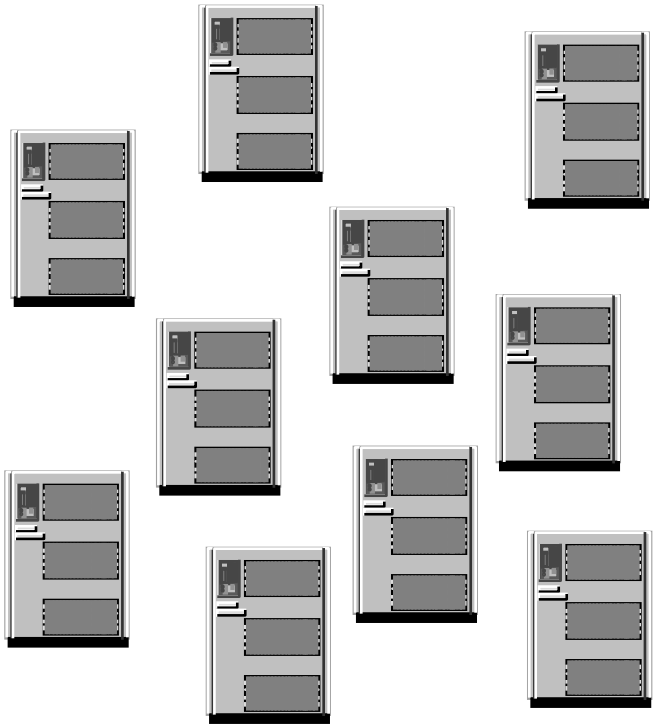
System z delivers the benefits of workload optimized systems while eliminating the risks, costs, and complexity typically associated with heterogeneous multi-tier environments.

Within I/T environments…

MF = “Stabilized”

Why?

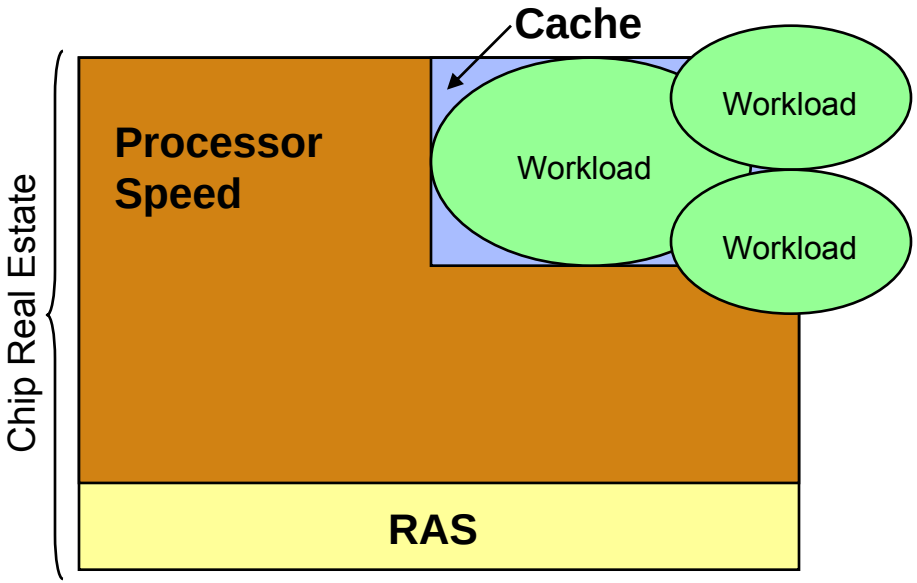
Distributed = “New Investment”



Chip Design Affects Virtualization Capabilities

DISTRIBUTED SYSTEM

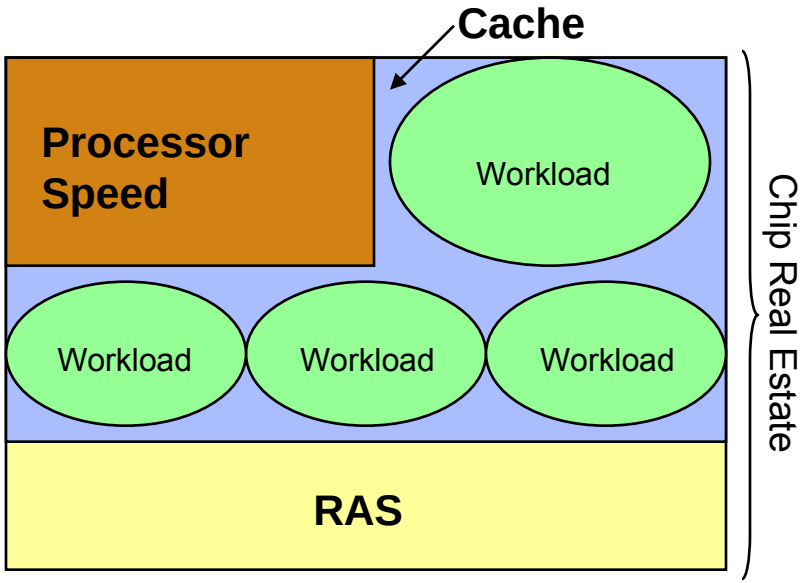
Replicated Server Chip Design



- Mixed workloads stress cache usage, requiring more context switches
- Working sets may be too large to fit in cache
- “Fast” processor speed is not fully realized due to cache misses

SYSTEM Z

Consolidated Server Chip Design



- System z cache is able to contain more working sets
- Z10 EC 4.4 GHz Processor speed is optimized by increased cache usage
- Additional RAS function is beneficial for mixed application workloads

Note: System representations are not to scale, proportions may vary based on generation of chip and model

New System z Solution Editions for z/OS:

Legendary Mainframe quality, security, availability, and scale….. priced to be competitive with UNIX alternatives

- **Special package pricing for our most popular solutions**
  - z10 HW (standalone footprint or isolated LPAR)
  - Prepaid HW maintenance
  - Comprehensive middleware stack (including S&S)
  - Services and Storage (as needed)
- **Legendary Mainframe quality:**
  - Unparalleled quality, security, availability and scale
  - Integration of applications with corporate data
  - Industry leading virtualization, management and resource provisioning
  - Unparalleled Investment protection
- **Competitive acquisition prices, leadership TCO**

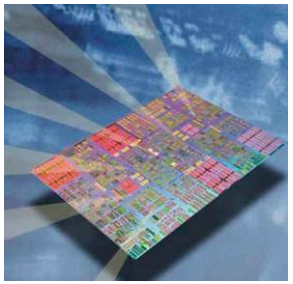
Unmatched Value, Competitively Priced

Specialty Engines: Optimizing Price Performance

- **Can help improve TCO of New Workloads on System z**
- **Lowering the cost of future growth with 'extra capacity at no extra cost'** ***(carried forward with server upgrades)***
- **Technology investment protection**

Internal Coupling Facility (ICF) 1997

Integrated Facility for Linux (IFL) 2000



System z Application Assist Processor (zAAP) 2004

Eligible for zAAP:

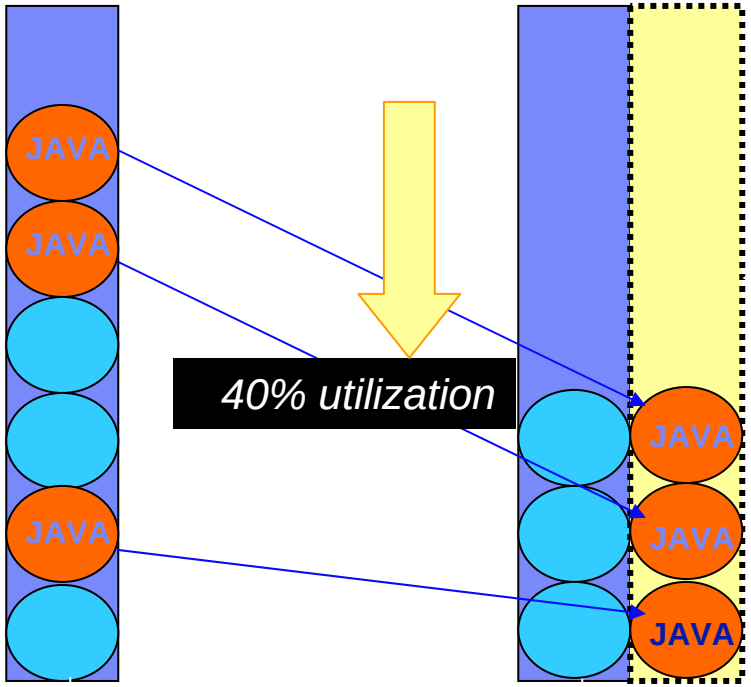
- **Java™ execution environment**
- **z/OS XML System Services**

System z9 Integrated Information Processor 2006

- **Eligible for zIIP:**
- **DB2® remote access and BI/DW**
- **ISVs**
- **New! IPSec encryption**
- **z/OS XML**

How zAAP eases constraints on growth – for Java

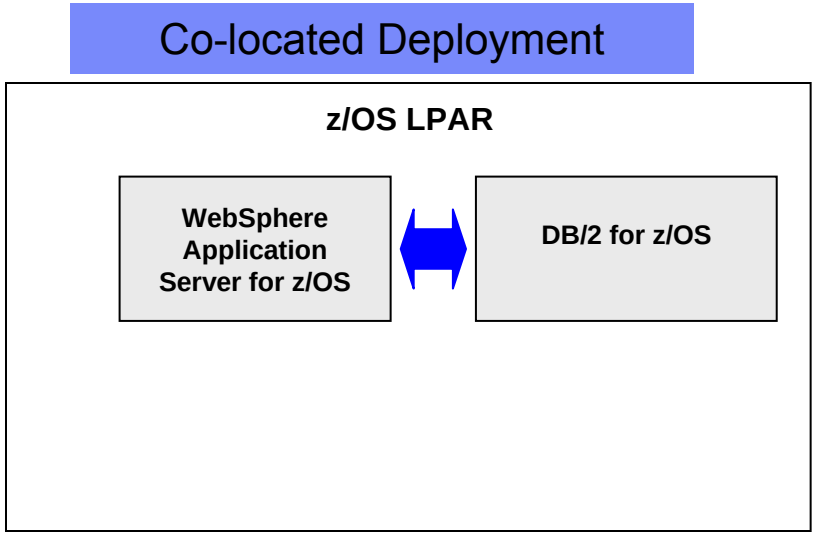
Consider a WebSphere Application on z/OS that is transactional in nature and requires 1000 MIPS today on System z

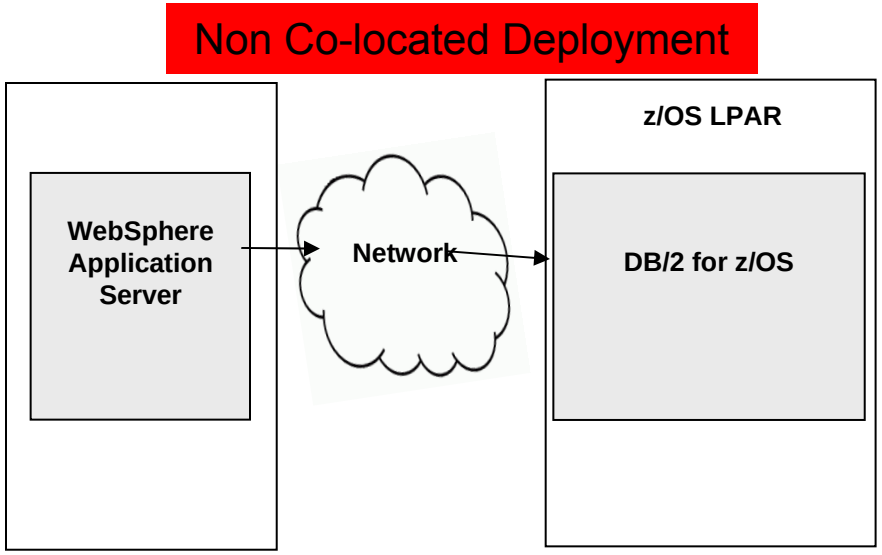


In this example, with zAAP, we can reduce the standard CP capacity requirement for the Application to 500 MIPS or a 50% reduction*

** For illustrative purposes only*

WAS for z/OS Co-location with DB2 z/OS





- High throughput, reduced overall CPU utilization due to cross-memory data transfer, reduced latency
  - Operation benefits include identity assertion, high availability, fail over, Workload management….
- Lower TCO for Enterprise deployments due to reduced complexity of managing overall Enterprise architecture

- Network latency adversely impacts performance
- Operational overheads further erode performance due to
  - Serialization of objects, Query parameters
  - Threads Switching
  - Multiple points of failure and controls
  - XA less efficient than RRS
- Higher TCO due to higher operational cost

On-line Banking Benchmark Demonstrates Performance Advantages of Co-location with DB2 z/OS

① Separate Machines

4 CPUs (32% busy)

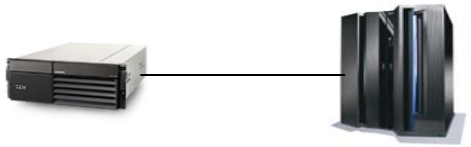
WAS 6.1

Linux

4 CPUs (98%)

DB2 8.1

z/OS



Power System

System z

150 tps

② Separate LPARs

8 CPUs in shared pool (91%)

(40%)	(51%)
WAS 6.1	DB2 8.1
z/OS	z/OS

System z

160 tps

③ Same LPAR

8 CPUs (91%)

WAS 6.1
DB2 8.1
z/OS

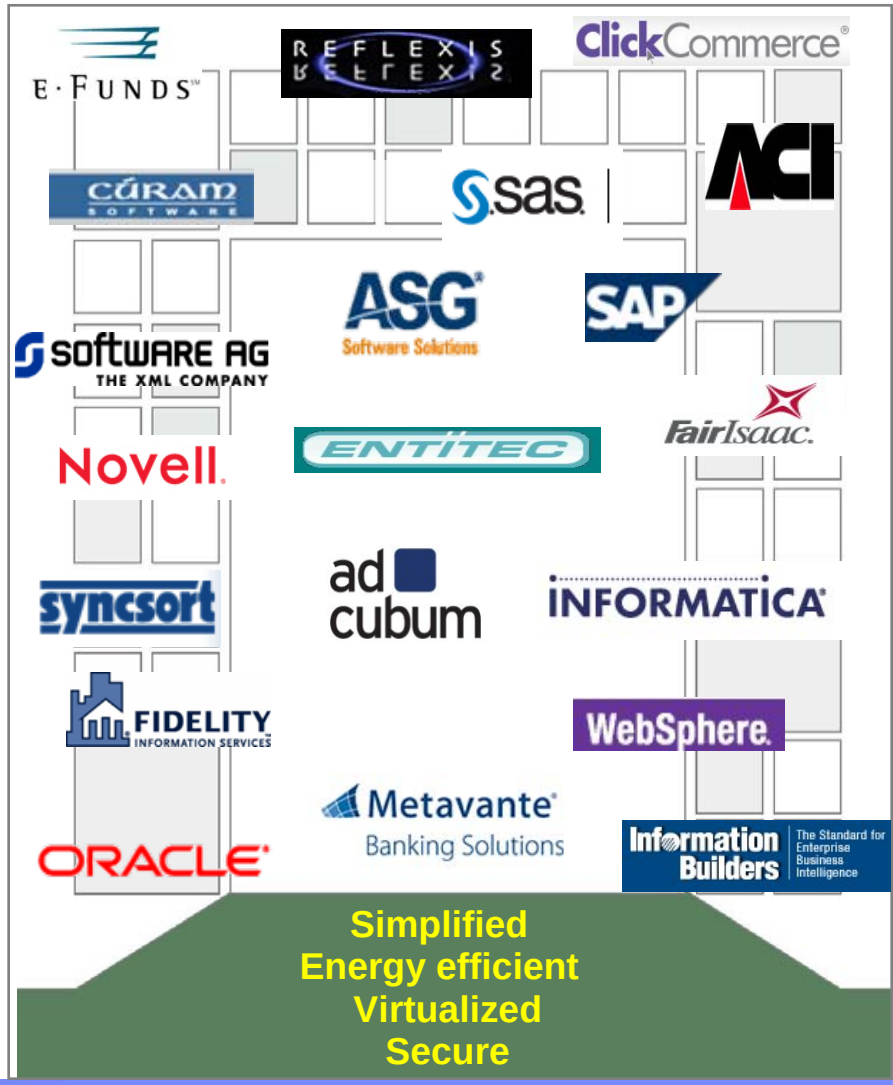
System z

243 tps

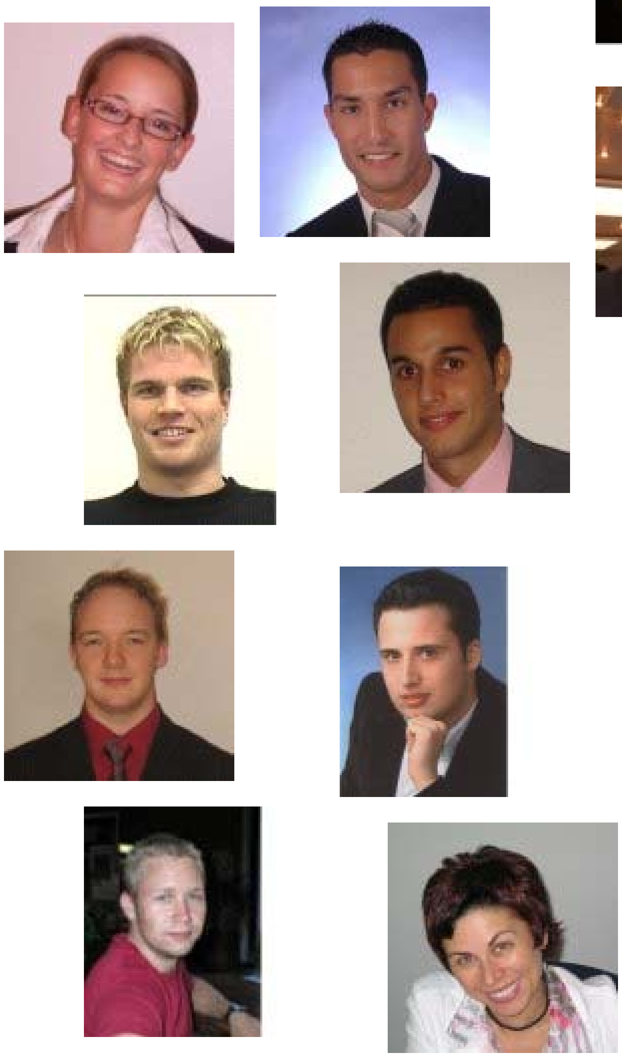
52% more throughput with co-located workload

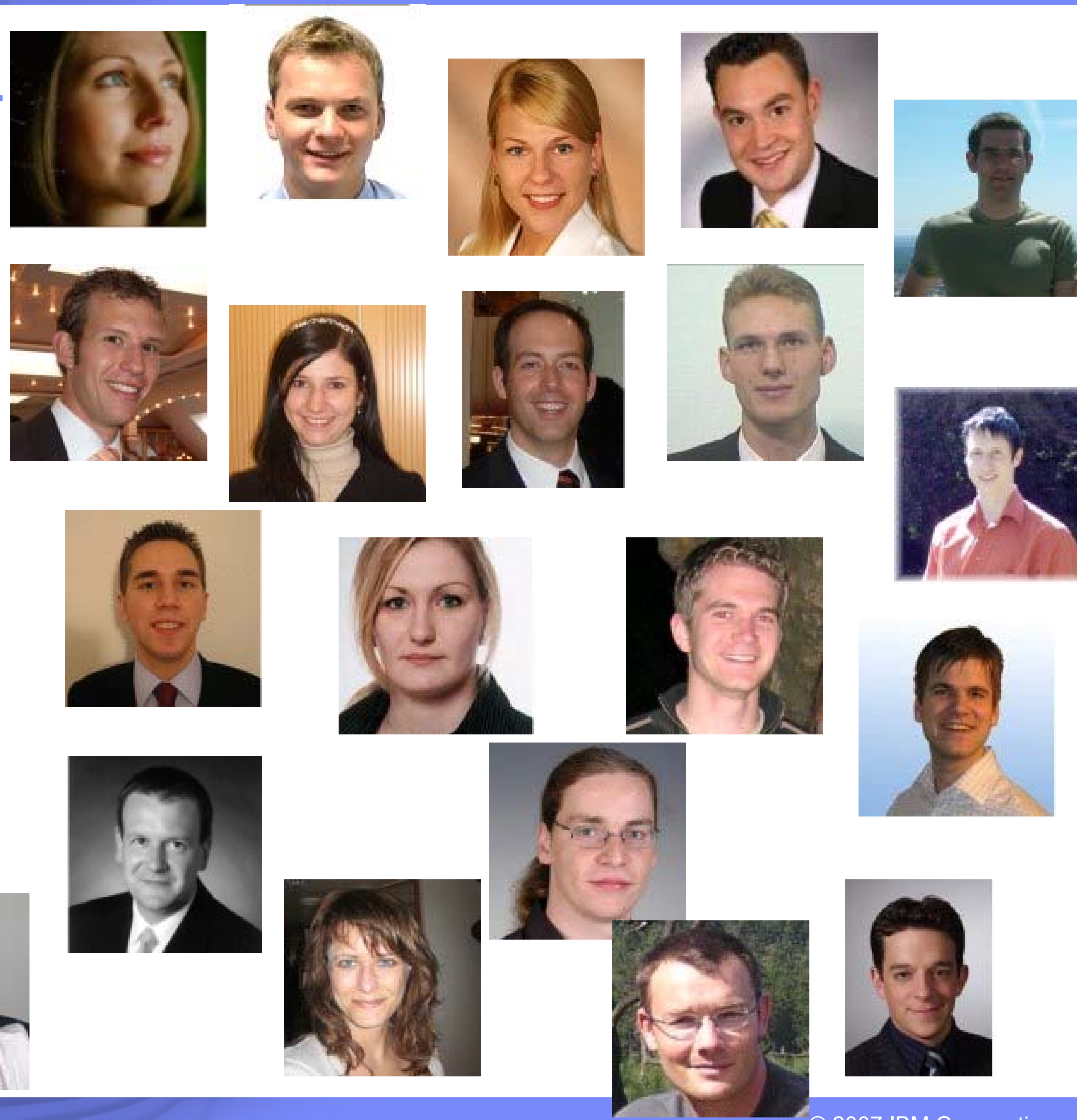
The expanding System z community

- Continued growth on the System z platform since 2008
  - Over 150 new ISV partners and 1,000 new applications
  - 174 new/upgraded WebSphere Application Server, DB2, CICS® and IMS™ application/tools on z/OS
  - More than 500 new Linux applications added
- ISV Partner loyalty
  - Over 1,500 ISVs building applications for System z
  - Over 1,800 applications on z/OS 1.8 and above (over 3,500 for all z/OS releases)
  - 2,800+ applications for Linux on System z
  - 86% of our ISVs maintain OS currency
- Academic Initiative delivering mainframe skills:
  - More than 600 schools participating
  - More than 50,000 students trained
  - 30 courses and more to come
  - Student MF Contests
  - System z Skills Help Desk
  - Over 200 System z IBM Mainframe ambassadors

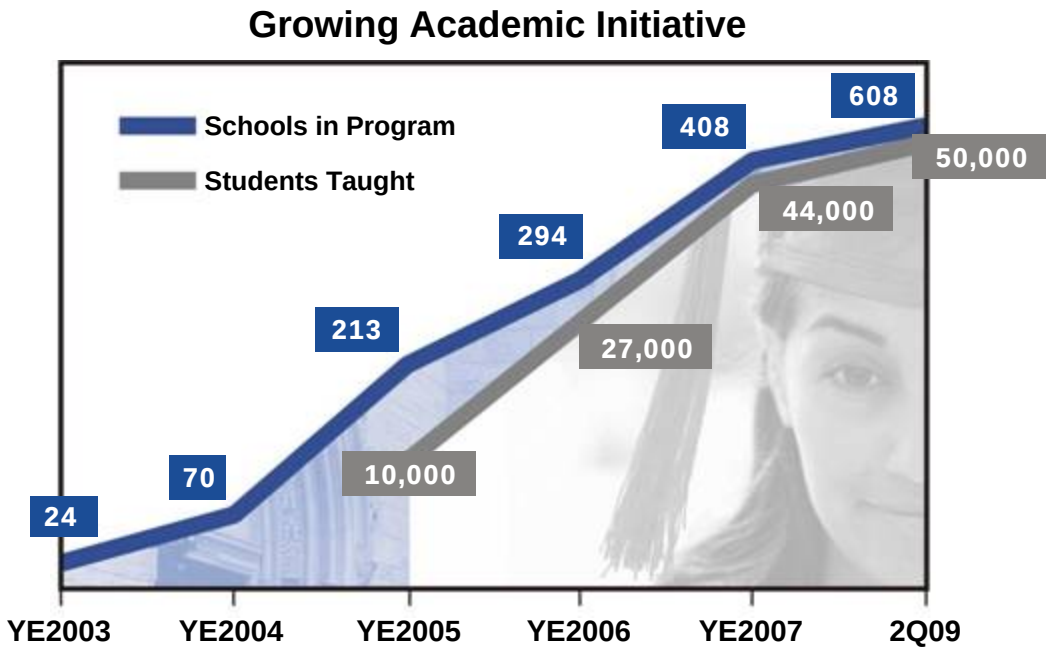


The new Faces of Z..





Schools teaching the mainframe



- **IBM Academic Initiative, System z: ibm.com/university/systemz**
  - Participation **– 608 schools, >50,000 students attended mainframe education**
    – 2379 schools participating in overall IBM Academic Initiative (all brands)
    – Course downloads - Rational 3283, Websphere 1492, DB2 563, Tivoli 300
  - z Community **– 38 z Roundtable events in US with Clients / Schools / ISVs / BPs**
  - Student Mainframe Contests **– 13 countries, 14,672 students, 1,956 schools**

Important web sites and contacts

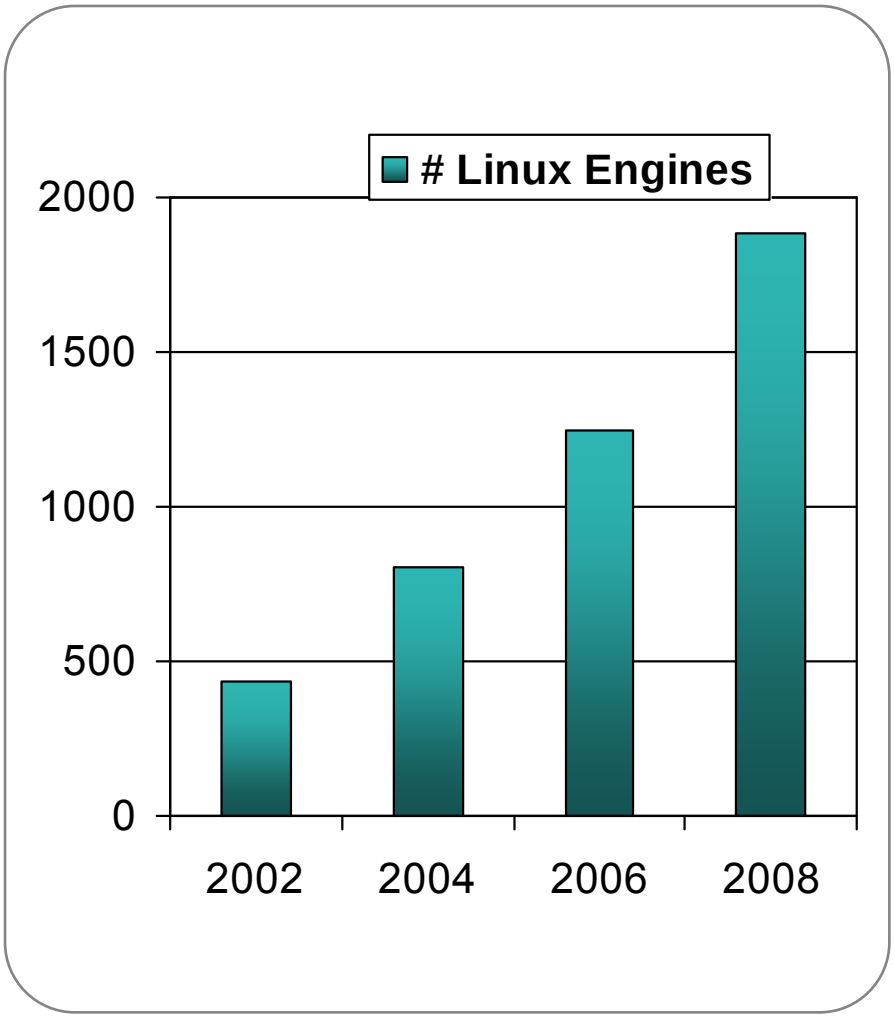
- **Academic Initiative for the Mainframe**
  - www.ibm.com/university/systemz
- **Assisting the z community – send note to:**
  - zskills@us.ibm.com
  - http://www-03.ibm.com/systems/z/destinationz/academia/zskills.html
- **z/OS Entry Level Mastery Exam & DB**
  - ibm.com/certify/mastery_tests/ovrZ01.shtml
  - http://www-03.ibm.com/certify/
- **zNextGen Project**
  - http://www.znextgen.org/
- **Enhanced skills portal for z Community**
  - ibm.com/systems/z/about/charter/skills.html

Academic Initiative System z Skills Leader

Don Resnik, resnik@us.ibm.com

System z Linux: accelerating momentum

- **2008 System z Linux MIPS:**
  - SW Europe: 150% YTY growth
  - N.A. 126% YTY growth
  - A.P. 124% YTY growth
- **New System z Clients**
  - 22 of 54 new clients installed Linux
- **~1,300 System z customers are now using Linux on z**
- **Linux is 15% of the customer z install base (MIPS)**



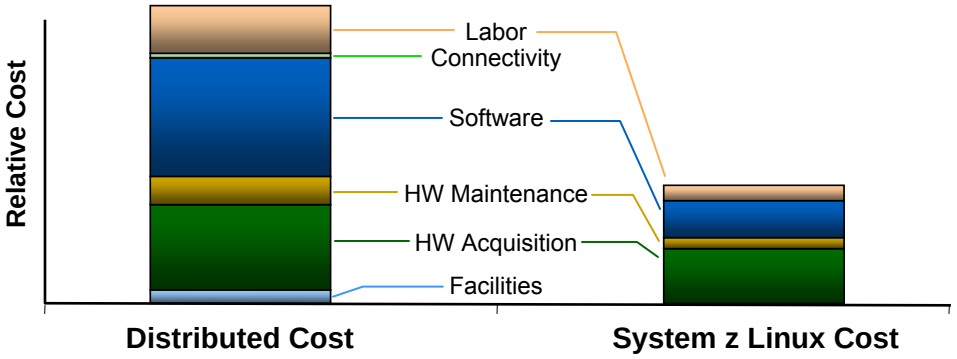
Example: Choices To Run A Banking Workload

	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

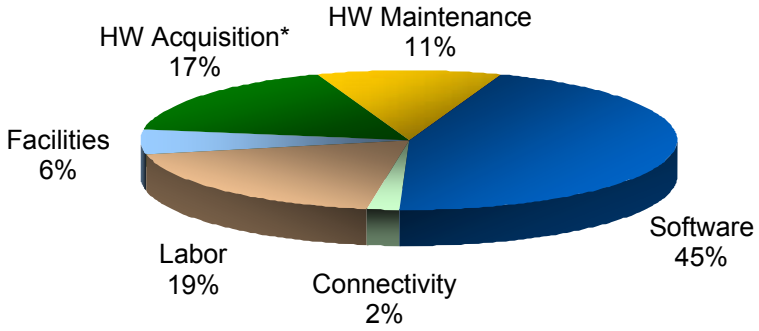
5 to 7 millions annual operational savings with System z

Client View of TCO Comparison for Similar Distributed Workload vs. System z Linux results in Potential 60-75% Gross Costs Savings / 5 yrs

Operating Cost: Distributed vs. Mainframe



Potential Savings: Categories as a % of Gross Savings



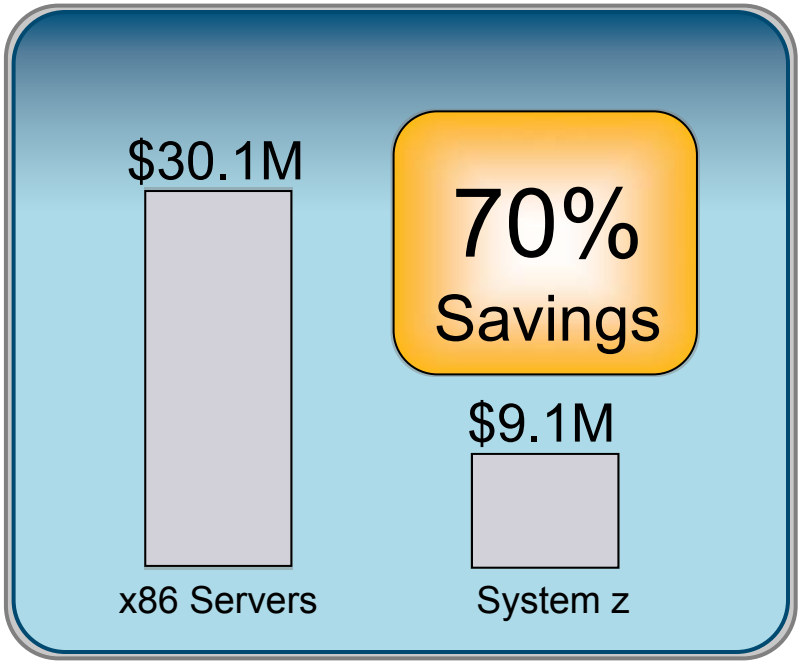
* HW Acquisition compares server/disk refresh of distributed environment to the cost of acquiring new mainframes/storage

Dramatic Simplification

Unit	Distributed	System z Linux	% Reduction
Software Licenses	26,700	1,800	93%
Ports	31,300	960	97%
Cables	19,500	700	96%
Physical Network Connections	15,700	7,000	55%

Results will vary based on several factors including # of servers and work load types

A government organization consolidates applications and data to drive down costs of hardware, software and management by 70%!



Top three reasons for savings

- Consolidated 292 Oracle servers to one System z
- System administration costs reduced 90%
- Subscription and support licenses reduced over 95%

A regional North American government organization

Other benefits:
Superior Resiliency & Security
Single administrator productivity
Infrastructure simplification
Lower Energy Costs

Fractional Availability Improvements Are Important

- Example: 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	***System z DB2***
Availability %	99.825%	99.975%
Annual outage	**15h 20m**	**2h 11m**
Cost of Downtime	$22.9M	$3.3M

Sources: ITG Value Proposition for Siebel Enterprise Applications, Business case for IBM System z & Robert Frances Group

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**

IBM WebSphere® Portal software

One Platform...

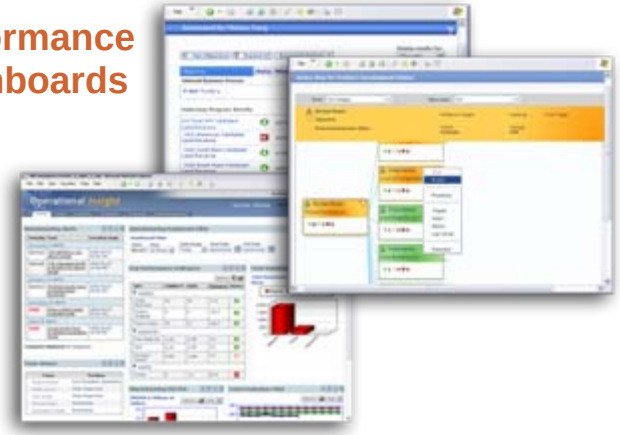
For Many Different Composite Application Business Needs

Partners

Customers

Company Intranets

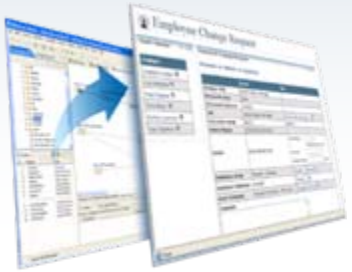
Employee & Manager Self-Service



Performance Dashboards

IBM WebSphere Portal for System z

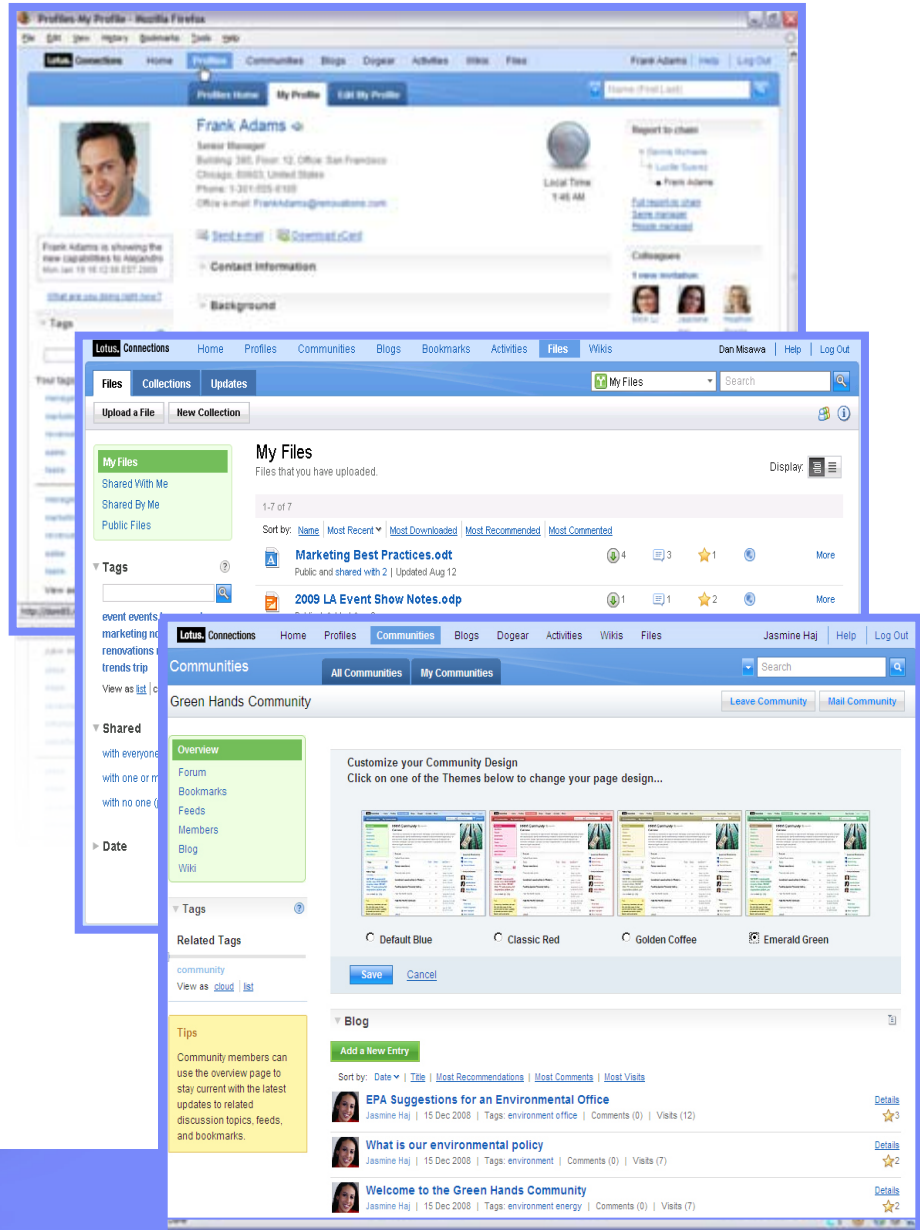
- **Helping Organizations to Rapidly Respond to Change**
  - Integrates the applications, transactions & data to deliver business value faster
  - Transform Mainframe Applications by providing a new and exceptional user experience
- **System z – Complement to the Portal environment**
  - Portal on z Platform provides a high Quality of Service for those mission critical applications
  - Having the Portal closer in proximity to the data, you are able to achieve better performance and response time
  - System z provides a highly secure, available, and reliable application delivery platform
- **Tight integration with CICS, IMS, DB2, MQ, Websphere Application Server, and Host Access Transformation Services**



The characteristics that a mission critical PORTAL require are the same characteristics that z Platform was designed for…

Social Collaboration helps people Work Smarter

- Find the right people to help solve my problem now
- Share your personal files
- Join a community to gather, exchange ideas and learn from others
- Quickly create new content with others
- Share ‘best practices’ across the organization
- Socially complete individual and team project work



Lotus Connections
Social Collaboration on 'System z'

- The security of System z, your employee information is protected
- z Platform provides up to 2X improved performance due to robust I/O management and high bandwidth access to social data stores
- Enterprise SOA architecture provide robust application integration environment
- Dynamic allocation of virtual computing resources insures superior response times while driving down admin costs and lower power consumption

Information On Demand

Financial Risk Insight

Workforce Optimization

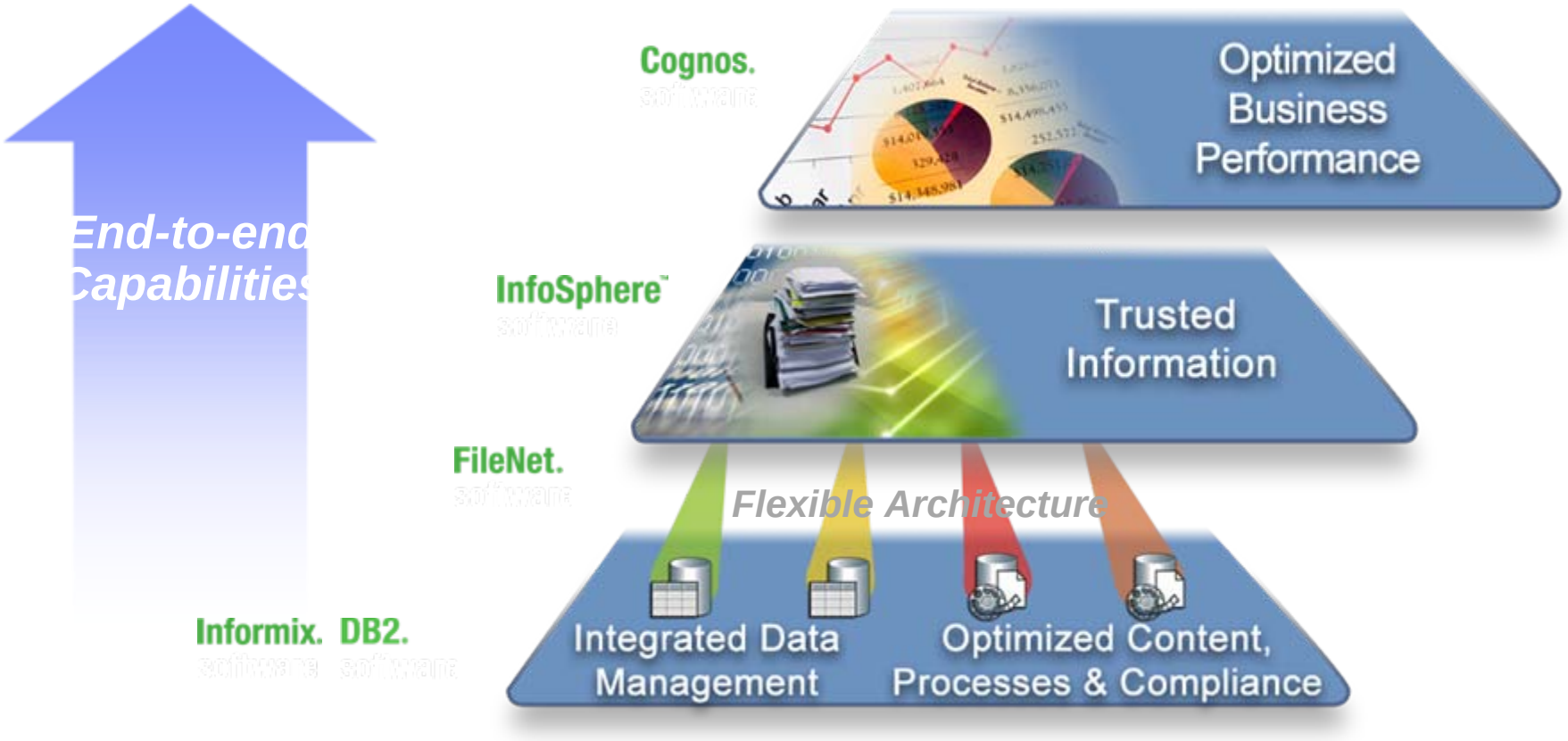
Dynamic Supply Chain

Smarter Business Outcomes

Customer & Product Profitability

Business Optimization

Multi-channel Marketing



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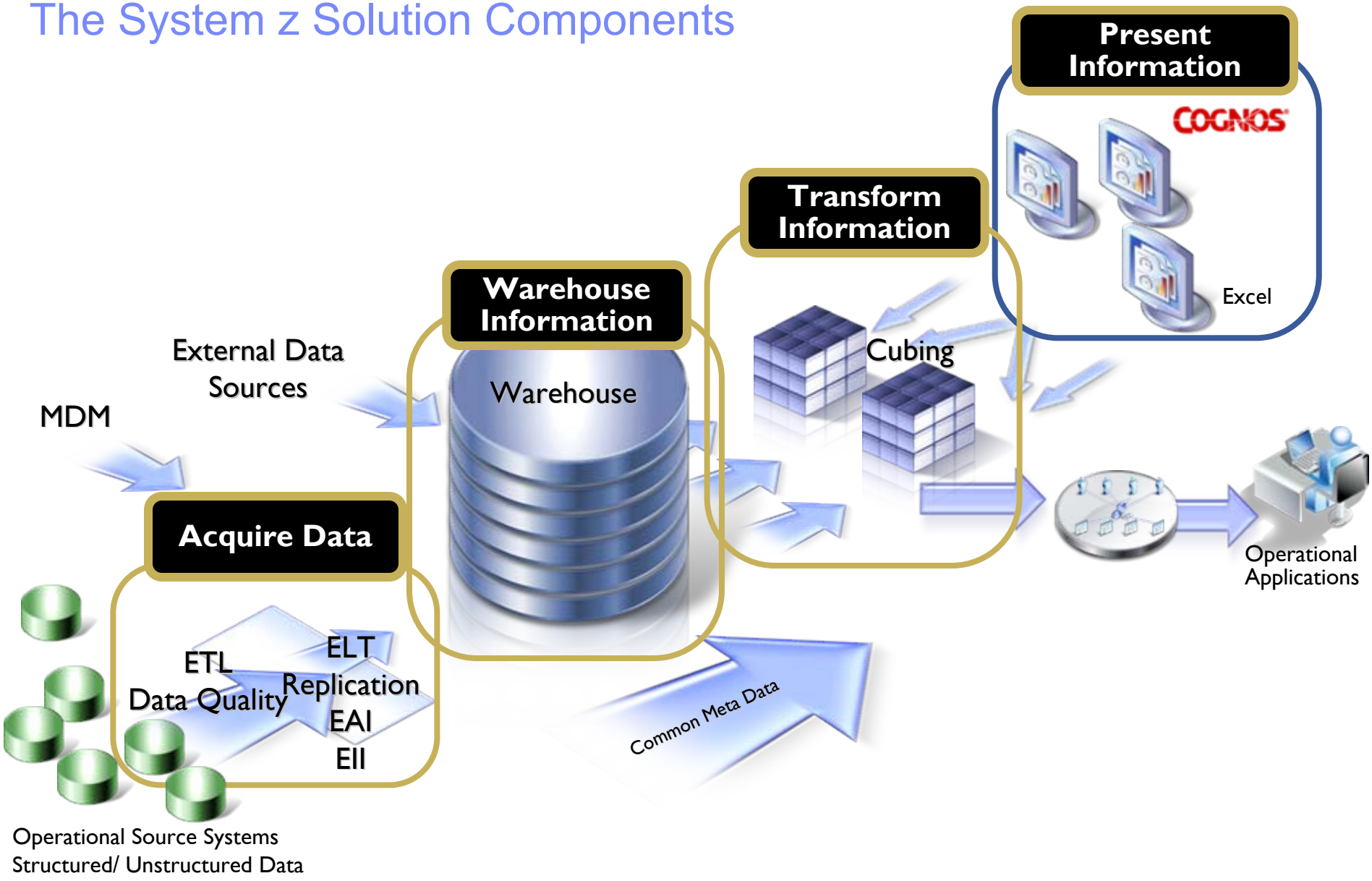
The System z Solution Components



Why customers are moving to the strengths of System z for Data Warehousing and Business Intelligence?

Many System z customers already use System z for warehouse and BI

IBM is responding to customer demand with new DB2 features, new software offerings and improved hardware performance and efficiency.

Customers want to leverage their existing System z infrastructure

Costs can be reduced through the utilization of existing processors, people, Practices.

Cost savings may also be achieved through a consolidation approach.

New BI trends map well to the strengths of DB2 for z/OS and System z

Distinction is blurring between warehouse and OLTP databases due to new trends like Dynamic Warehouse and Operational BI, driving the need for:

- Increased reliability, availability, security, and compliance in a DWH
- Very current warehouse data and/or collocation of warehouse and operational data

Specialty processors and the new z10 provide additional ways to optimize TCO

zIIPs and IFLs are driving down hardware and software costs; DWH/BI can make excellent use of these processors, ultimately driving TCO advantages.

The new processors are delivering excellent speeds and feeds, making CPU horsepower less of an Issue.

IBM Smart Analytics Optimizer (SAO) – Technology Preview

What is it?

- ✓ A high performance extension that easily integrates with IBM data systems, delivering predictable, order-of-magnitude faster, analytic query response times, while lowering operating costs

How is it different

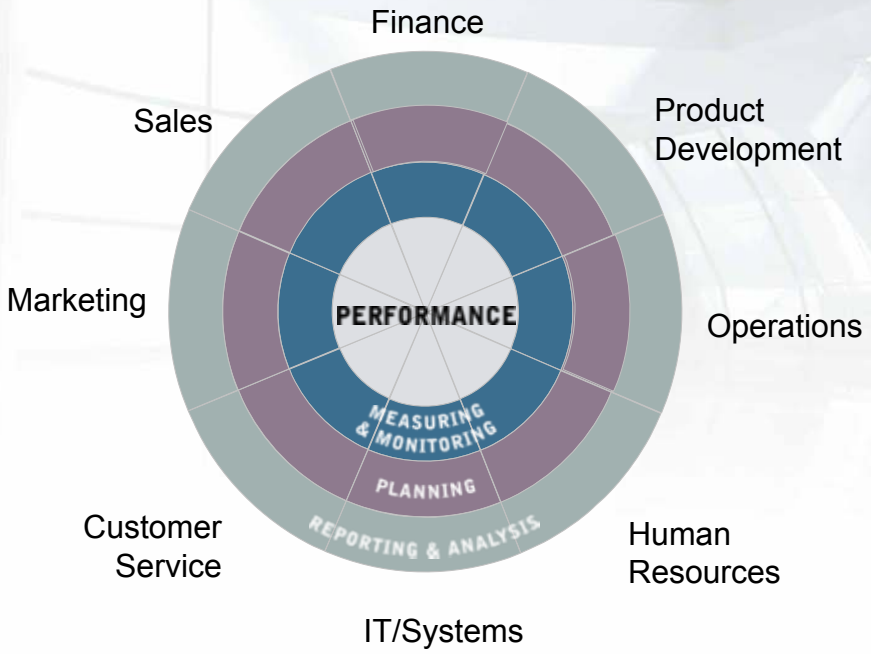
- ✓ Deep integration with IBM data management systems
- ✓ High performance query software, based on advanced data in-memory technologies
- ✓ Leveraging existing data system investment and values without any changes to applications
- ✓ For System z, extends gold-standard manageability, security, and availability to high-performance analytic applications

Cognos 8 Business Intelligence for System z

Unlock the Business Value of Information to Make Better Decisions

A Complete BI Management Platform for System z

- **Cognos 8 BI for System z enables businesses to gain a competitive advantage from their business data**
- **Improved decision making by combining the targeted information delivery and analysis capabilities of Cognos 8 BI with the power and reliability of System z.**
- **Addresses fundamental business questions such as:**
  - How are we doing?
  - Why?
  - What should we be doing?



IMS SOA Program – 3 Steps

STEP 1 - 1 Day Regional Multi-Customer Seminar

- *IMS SOA Overview*
- *Awareness and High-level Education – Process and tools*
- *CTA: On-site workshop*

STEP 2
1 Day On-site Customer Workshop

- *Cross BU Awareness and Education*
  MF and Open Systems A/D teams
- *Answer their specific questions*
- *CTA: Identify SOA Project*

Education

Step 3+
Support IMS SOA Project

Consulting Svcs

- *Design, develop and deploy new services quickly*
- *Advocates keep in touch*
- *CTA: Customer reference*

IMS 11

Increased business flexibility for SOA environments

- **Open Database Support**
  - Allows any application on any platform to access IMS data directly and transparently
- **Enhanced Application Development Tooling**
  - Easier application development and modernization
- **Autonomic Computing Capabilities**
  - Relieve skill constraints
- **Raising the Performance Bar Again**
  - Extreme performance with greater than 22,000 tps

New Offerings for Cloud Computing

- Solution Edition for Cloud Computing
  - Creates the foundation for cloud computing workloads in the enterprise with cloud service automation and management capabilities for a competitive price.
- IBM Smart Analytics Cloud for System z
  - A corporate Business Intelligence (BI) strategy and private cloud optimized for analytics deployment in a single offering.

Bringing mainframe qualities of service to cloud computing

Summary

- IBM has invested billions, and continues to invest in the modernization of the mainframe and mainframe software
- The IBM mainframe is an open system
- SOA preserves and extends your investment in mainframe systems
- Save money and resources by implementing a Green Datacenter
- Consolidate your workloads to System Z for great savings