Powering business agility through platform exploitation

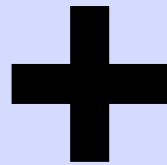**IBM Vision at a Glance…**

Smarter Planet

- instrumented
- interconnected
- intelligent

- people
- companies, institutions, industries
- man-made systems
- nature's systems

Today's Imperatives Are…

Cost Optimization

to slash operational and maintenance expense and maximize efficiency necessary for all economic climates

+

Agility

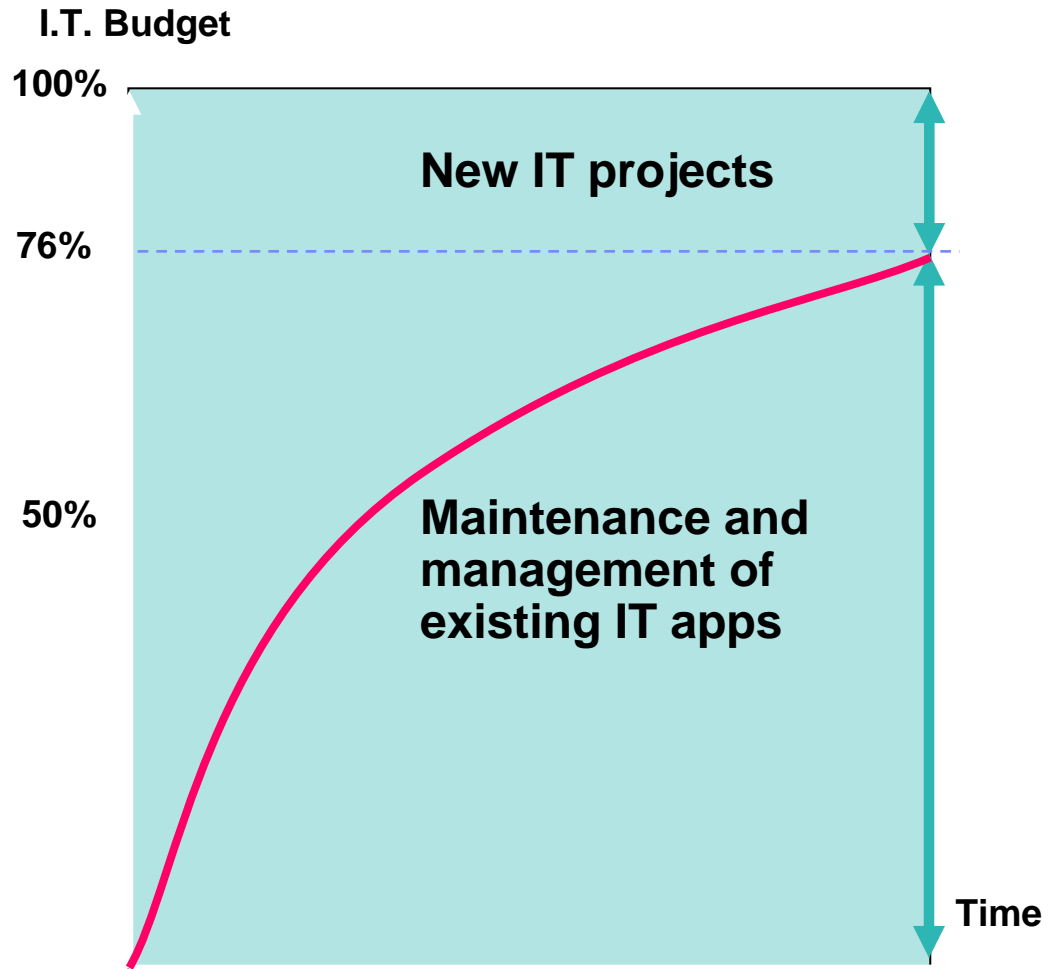to take advantage of new revenue opportunities and address competitive threats

To Survive… To Succeed!

Where are you spending your IT Budgets?

*"**76%** of I.T budgets are spent on* **MAINTENANCE,** *leaving only* **24%** *for* **NEW INVESTMENTS."**
--- Forrester Research

I.T. Budget

100%

New IT projects

76%

50%

Maintenance and management of existing IT apps

Time

IBM's Smart SOA
Powers Smarter Business Outcomes Across a Continuum

Business

Foundational	Extend End-to-End	Transform	Adapt Dynamically

Basic   *Advanced*
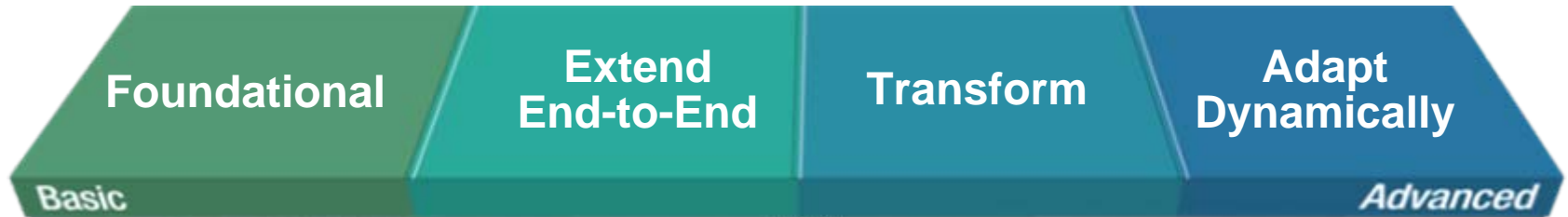
IT

SOA Application Infrastructure delivers the foundation for building, deploying and managing all types of applications, ensuring they deliver on business objectives regardless of the situation

The Power of a Smart SOA Application Foundation

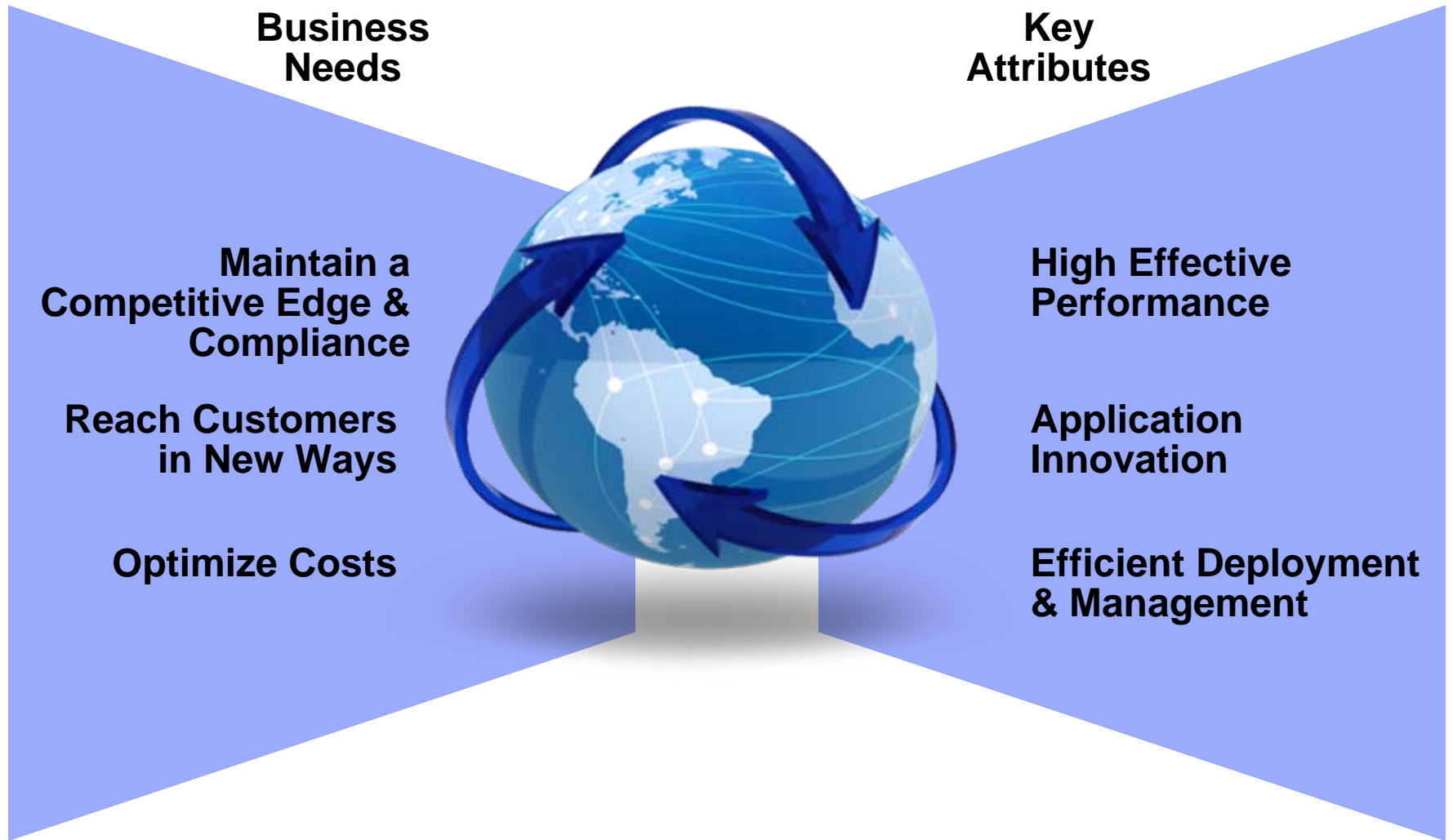|		
Modernize applications		**Expand client offerings using existing business data with Web 2.0**
Execute high volume transactions		**Reduce business risks with highly available, secure applications**
Capitalize on dynamic situations		**Timely insight with low cost situational applications**
Manage worldwide operations		**Rapidly introduce new capabilities throughout the business with centralized administration**

Address your critical business needs with
Smart SOA Application Foundation

Business Needs

Key Attributes

Maintain a Competitive Edge & Compliance

Reach Customers in New Ways

Optimize Costs

High Effective Performance

Application Innovation

Efficient Deployment & Management

Two Questions We'll Answer Today …

ibm.com WebSphere page …
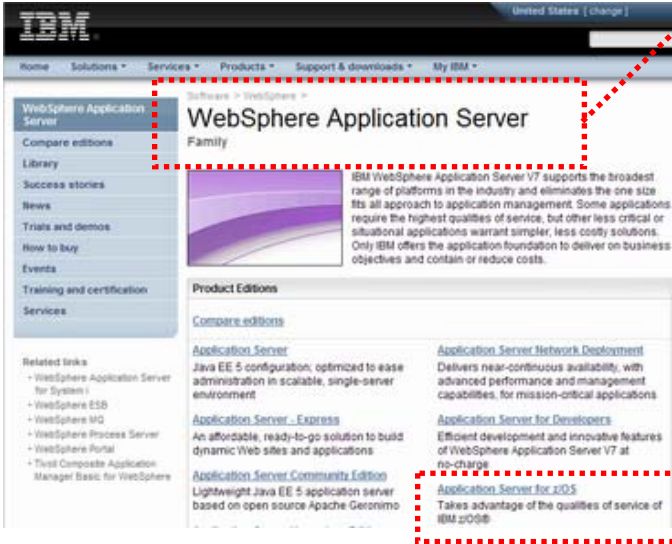
WebSphere Application Server
Family

WebSphere. software

> *How does WebSphere Application Server address your business imperatives?*

Application Server for z/OS

Takes advantage of the qualities of service of IBM z/OS®

> *What is meant by "Takes advantage of the qualities of service of IBM z/OS?"*

The WebSphere Application Server Family

An industry-leading open standard application server platform, with powerful business functionality

Manage Cost

- **Common standards across all platforms**

- **Common tooling across all platforms**

- **Many of the same skills across all platforms**

Enhance Agility

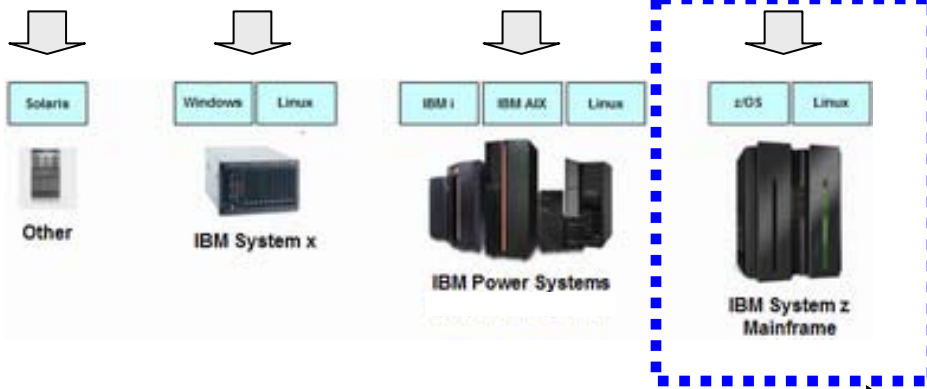- **Rapid development and deployment model**

- **Many dynamic runtime elements**

Common business applications runtime across the enterprise … development, test, production

Common Standards Across Family of Platforms

Java Application ● ● ● **Java Application**

Common specification support above the line

Open Standard Specification Interfaces

Solaris | Other

Windows | Linux

IBM System x

IBM i | IBM AIX | Linux

IBM Power Systems

z/OS | Linux
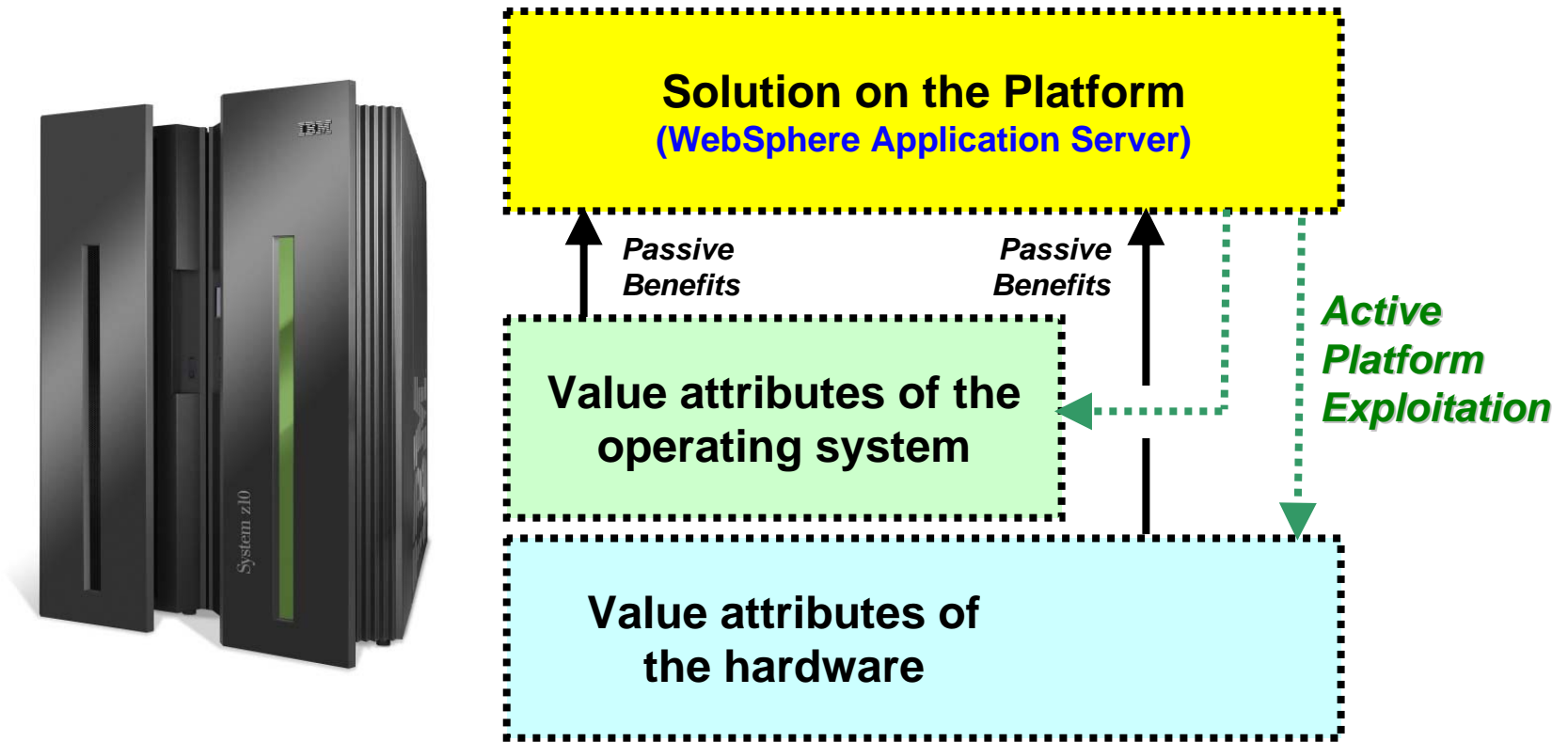
IBM System z Mainframe

Platform exploitation takes place below the specification line

It's all about the System z and z/OS platform and the way WAS z/OS exploits the platform

Passive and Active Exploitation

Solution on the Platform
(WebSphere Application Server)

Passive Benefits

Passive Benefits

Active Platform Exploitation

Value attributes of the operating system

Value attributes of the hardware
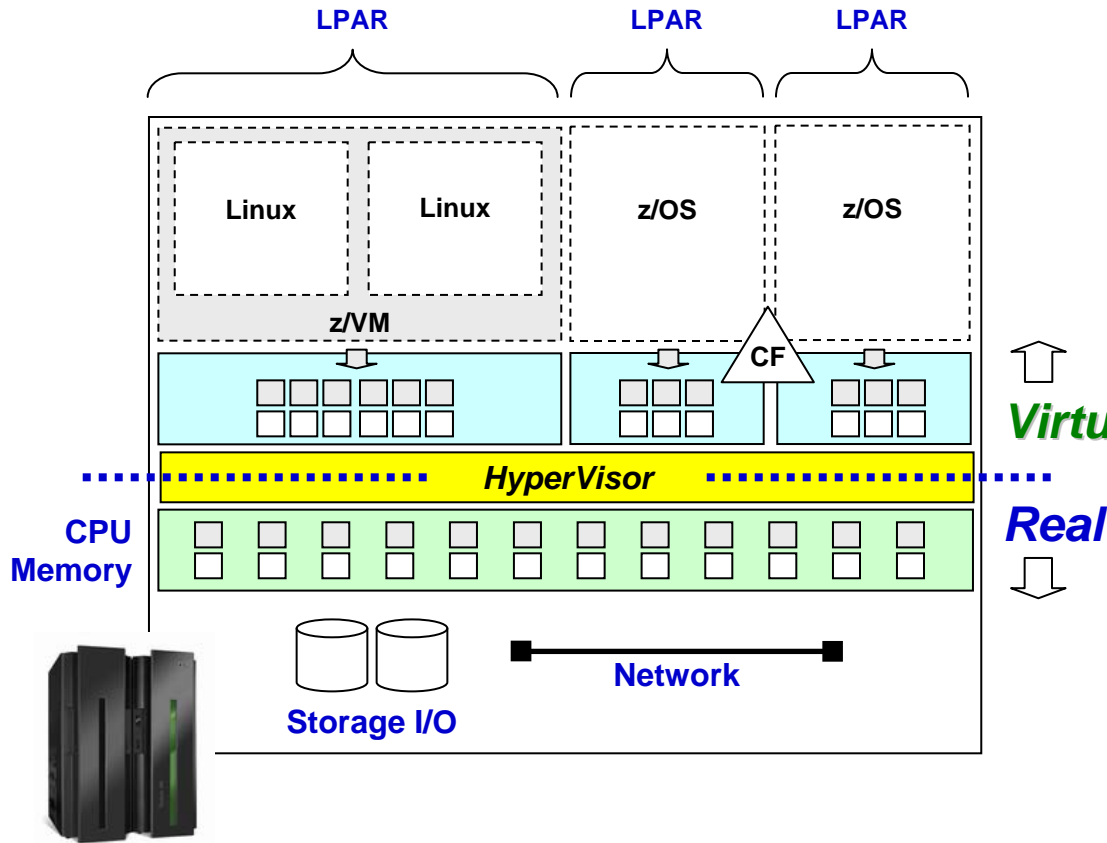
WebSphere Application Server z/OS benefits from both

Industry-Leading Virtualization Technology
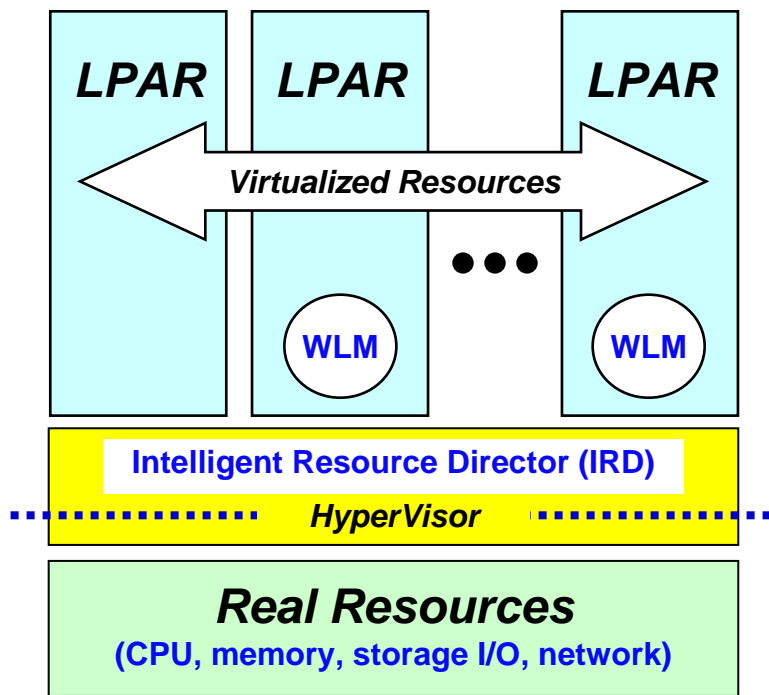

Not merely "like" the mainframe

It *is* the mainframe

Proven enterprise quality virtualization technology

Not all virtualization technologies are the same

Dynamic Resource Re-Allocation Between LPARs

Add CPU non-disruptively

Re-allocate CPU non-disruptively

IRD intelligently balances
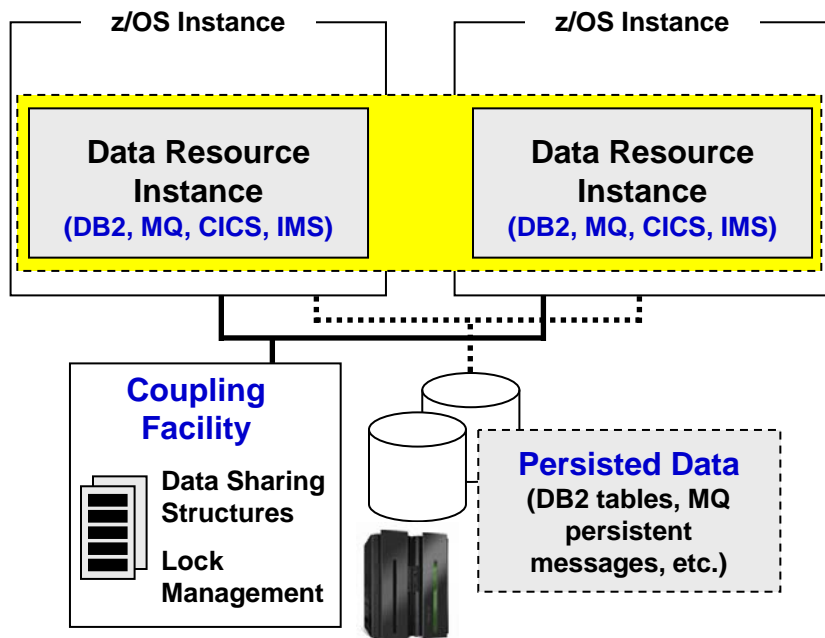
Vary I/O capacity dynamically

WLM advise IRD

Virtualization technology that evolved in the enterprise

Solid, stable and proven

True Data Sharing From Multiple Resource Instances

z/OS Instance

z/OS Instance

Data Resource Instance
(DB2, MQ, CICS, IMS)

Data Resource Instance
(DB2, MQ, CICS, IMS)

Coupling Facility

Data Sharing Structures

Lock Management

Persisted Data
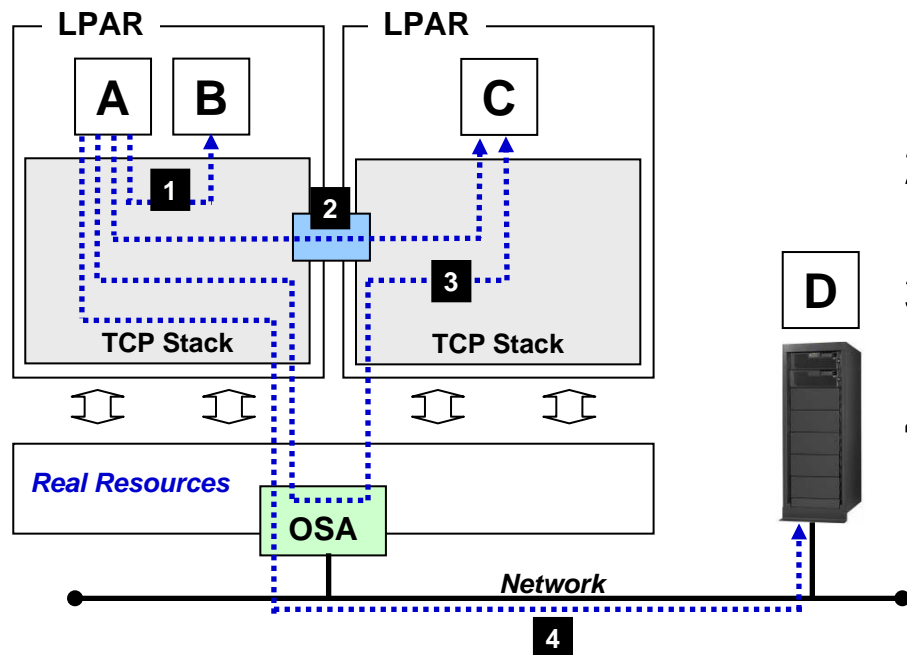**(DB2 tables, MQ persistent messages, etc.)**

- **Parallel Sysplex provides clustered z/OS instances**

- **Shared data, lock management, coordinated time management, high-speed data transfer**

- **Mature, stable, reliable**

- **Unbeatable availability**

Provides scalability and availability … to levels used throughout the world for critical activity

Intelligent TCP/IP

1. **Same LPAR**
   No network … cross memory … *ultra* fast

2. **Different LPAR, HiperSockets**
   No network … cross memory … very fast

3. **Different LPAR, *not* HiperSockets**
   No wire … just adapter card … fast

4. **Off System z**
   Traditional networking here

When throughput and scalability is important, network delays can add up

TCP/IP on z/OS is very aware and optimizes its path to reduce overhead and benefit your business

Key Areas of *Active* Platform Exploitation by WAS z/OS

Java Application

Open Standard Specification Interfaces

Implementation Layers

1. **Specialty Engines**

2. **WLM**

3. **SAF and Crypto**

4. **RMF and SMF**

5. **Cross Memory Communications**

All exclusive to z/OS
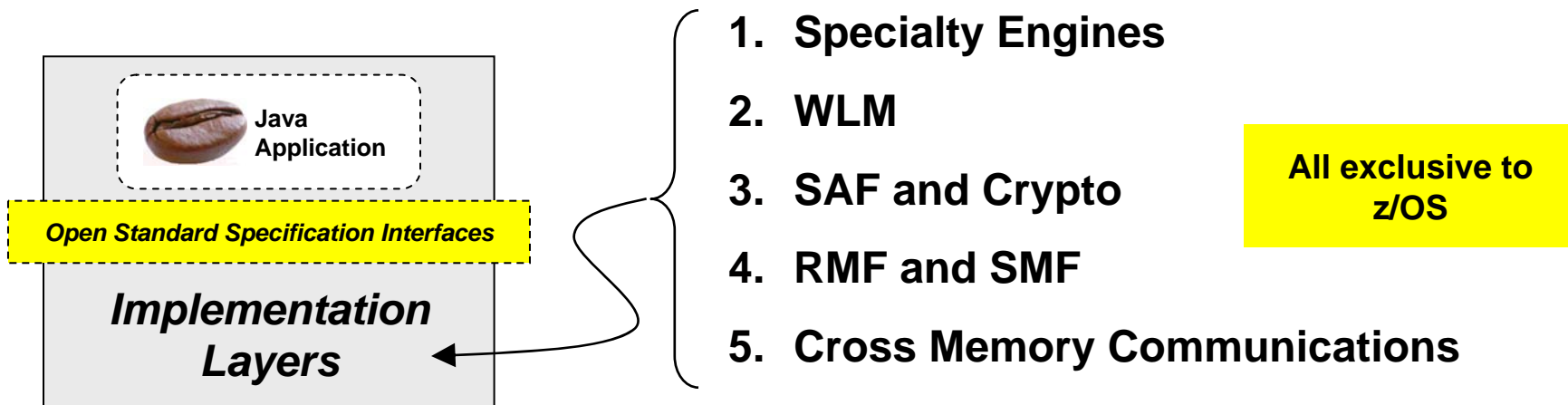
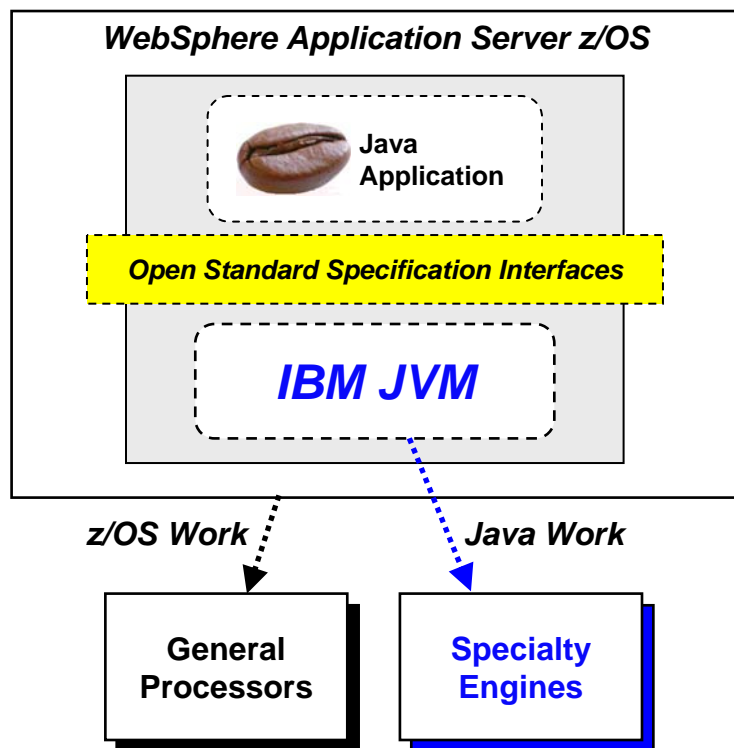**WebSphere Application Server is "platform aware" on all platforms**

WebSphere Application Server for z/OS knows about key z/OS value attributes

It reaches out and exploits them to your advantage

Let's see what that means to you …

Specialty Engine Exploitation

WebSphere Application Server z/OS

Java Application

Open Standard Specification Interfaces

IBM JVM

z/OS Work   *Java Work*

General Processors   **Specialty Engines**

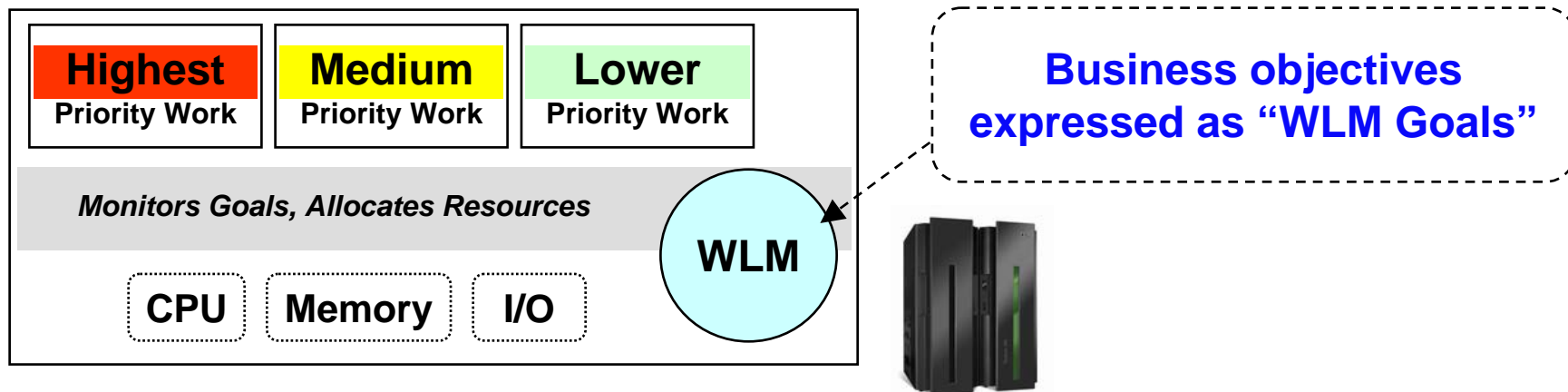- **Offload Java work to financially attractive specialty engines**

- **Completely transparent process to applications**

- **Greater general processor capacity for non-Java work**

- **Lower software licensing costs, and/or the avoidance of additional costs**

Works for Java offload, Linux on System z offload and certain DB2 processing offload

A feature enthusiastically embraced by many System z and z/OS customers!

Workload Manager (WLM) Exploitation

Highest	Medium	Lower
Priority Work	**Priority Work**	**Priority Work**

Monitors Goals, Allocates Resources

CPU **Memory** **I/O**

WLM

Business objectives expressed as "WLM Goals"

Benefits to you and your business:

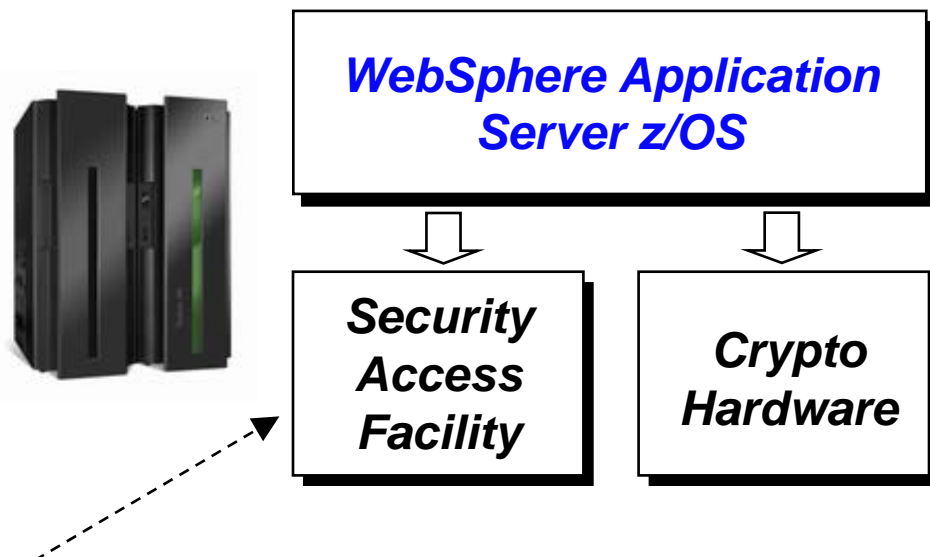- **Intelligent control of resources towards meeting *your* goals**
- **Very efficient resource sharing can be accomplished**
- **Critical work gets the resources, less critical held off temporarily**
- **Intelligent routing of work based on WLM monitoring of system**

Manage costs -- very efficient utilization of asset investment

Provide agility -- intelligent and dynamic allocation to meet goals

SAF and Crypto Hardware

WebSphere Application Server z/OS

Security Access Facility

Crypto Hardware

- **Highest level of security for storage of private keys**

- **Very fast encryption and decryption**

- **Enhances security**

- **System interface for security products (IBM = RACF)**

- **Single, integrated security facility for tighter process control**

- **Define many classes of security profiles, including digital certificates**
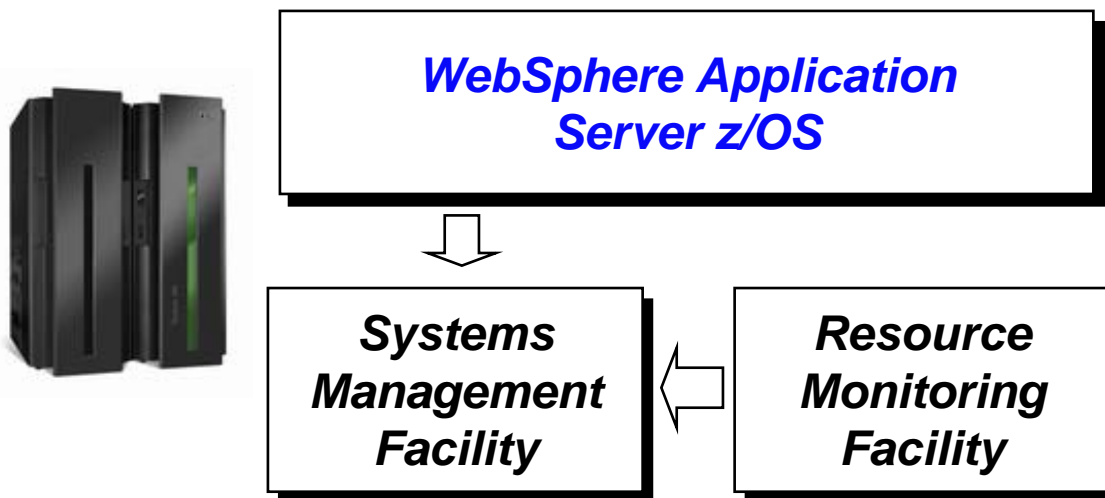
Security breaches are very disruptive and very expensive

Protecting secure data is a business imperative

SAF has proven itself to be secure and trusted

SMF and RMF -- Measuring and Reporting on Activity

WebSphere Application Server z/OS

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Systems Management Facility ⬅ **Resource Monitoring Facility**

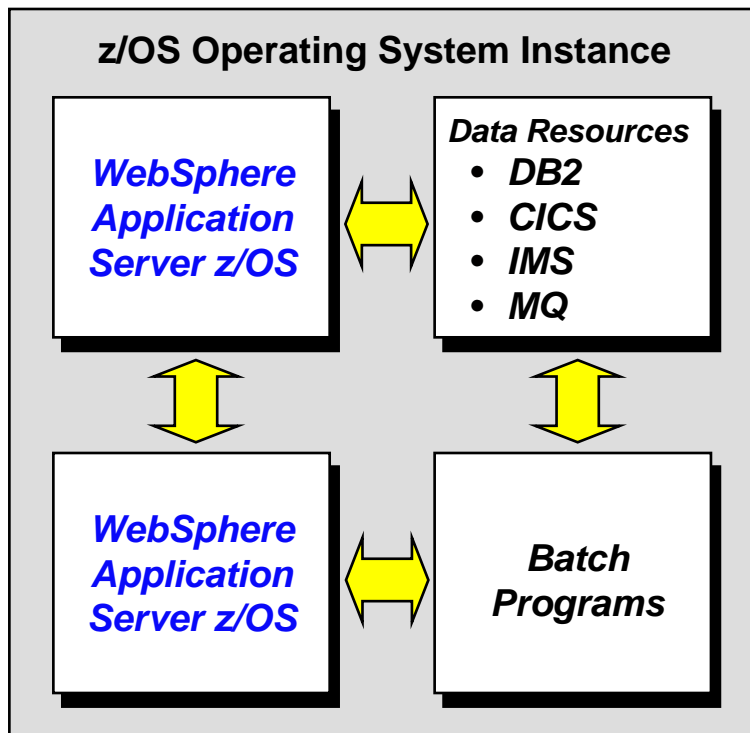- Achieve very accurate and customized reporting of system activity

- Perform very precise capacity measurement and planning

- Capture who is using what resources and when

- Allows finer-grained accounting and chargeback

- Many tools on the shelf to do analysis and reporting

Have a clear view of your resource investment and utilize is as fully as you can with the information you can gather

Collocation Benefits

z/OS Operating System Instance

WebSphere Application Server z/OS

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Data Resources
- DB2
- CICS
- IMS
- MQ

⬍ ⬍

WebSphere Application Server z/OS

⬌

Batch Programs

- *Extremely* **fast data transfer**
- **Tightly controlled by z/OS authorization processes**
- **Eliminate need to serialize and deserialize data and objects**
- **Eliminate need for encryption overhead**
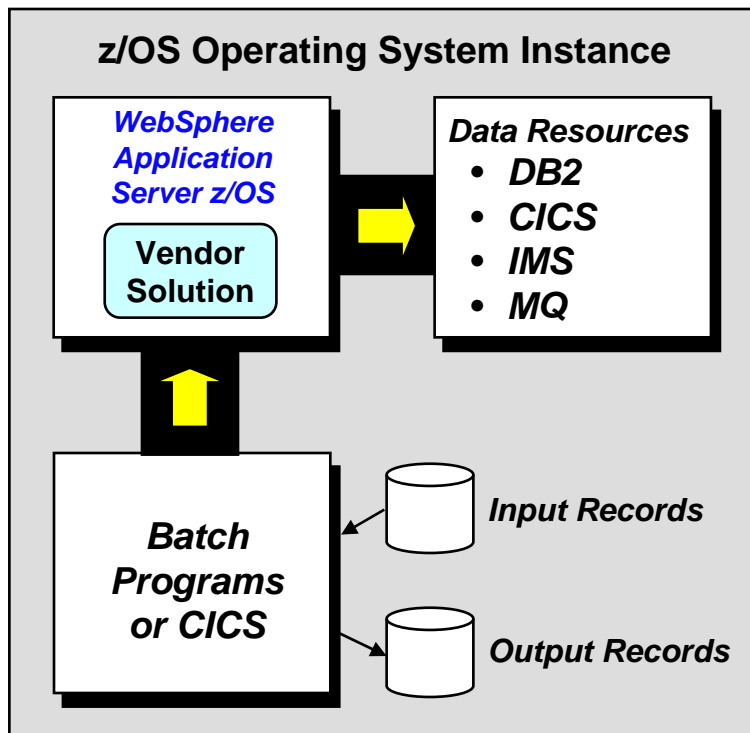- **Propagate several forms of user identity**

Efficient -- very low overhead so scalability can be addressed

Secure -- no network, can't be sniffed or hacked

Fast -- for very high volume workloads

Example: Leveraging Vendor EJB Solutions from Batch

z/OS Operating System Instance

WebSphere Application Server z/OS

Vendor Solution

Data Resources
- **DB2**
- **CICS**
- **IMS**
- **MQ**

Batch Programs or CICS

Input Records

Output Records

Advantages:

- *Very* low overhead
- *Very* high throughput
- Exploit data assets in DB2, CICS, IMS or across MQ using their local connectors
- Maintain transaction integrity with RRS

- **Increasingly we see ISVs creating solutions using Java EE EJBs**

- **Challenge becomes how best to drive *into* WebSphere Application Server to take advantage of vendor solutions**

- *WebSphere Optimized Local Adapter (WOLA) -- z/OS exclusive -- an extremely efficient bi-directional cross-memory mechanism*
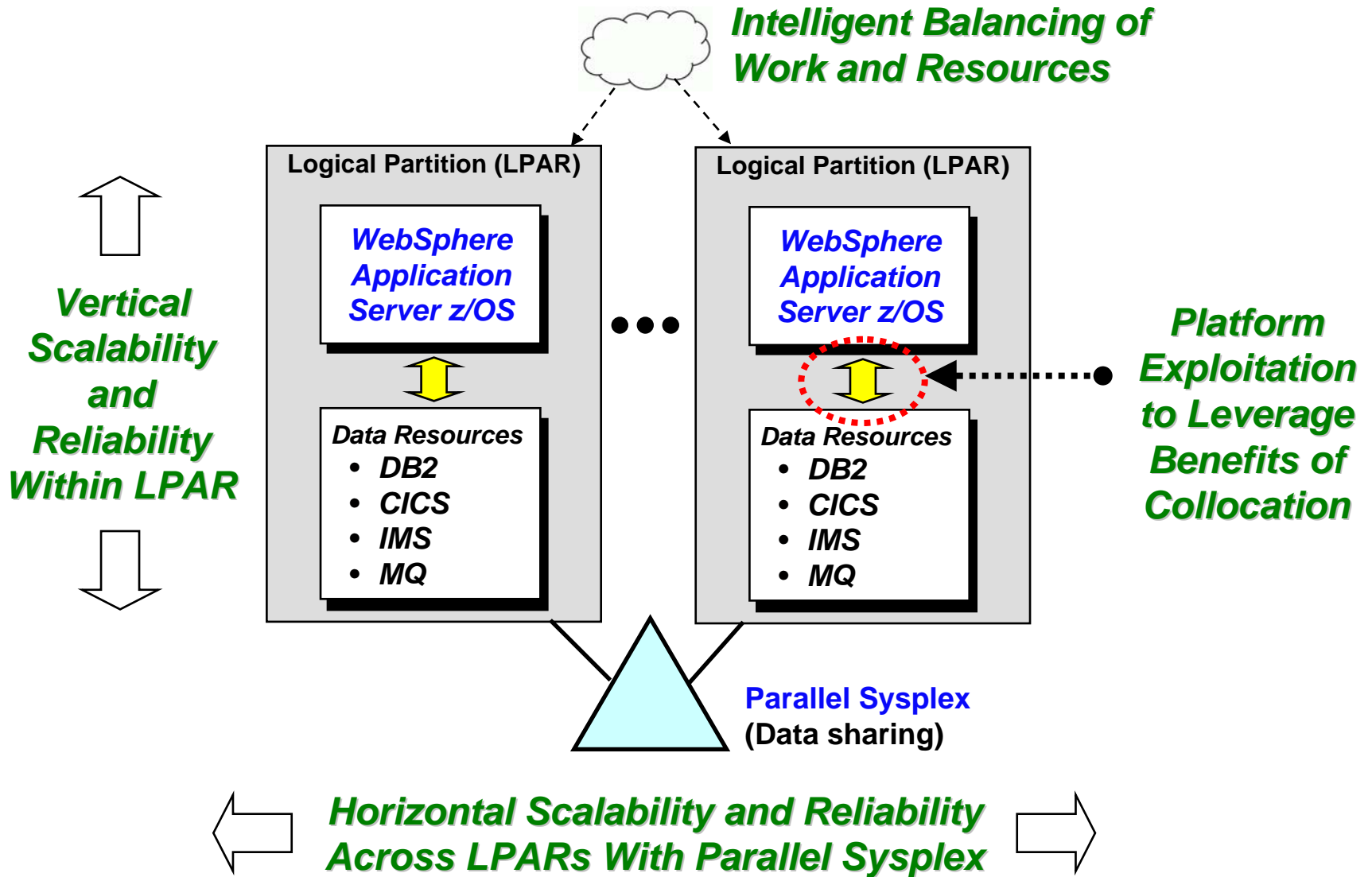
Leveraging the platform's capabilities to address your business needs

Collocation, Scalability *and* High Availability

Intelligent Balancing of Work and Resources

Logical Partition (LPAR)

WebSphere Application Server z/OS

Data Resources
- *DB2*
- *CICS*
- *IMS*
- *MQ*

Logical Partition (LPAR)

WebSphere Application Server z/OS

Data Resources
- *DB2*
- *CICS*
- *IMS*
- *MQ*

Vertical Scalability and Reliability Within LPAR

Platform Exploitation to Leverage Benefits of Collocation

Parallel Sysplex
(Data sharing)

Horizontal Scalability and Reliability Across LPARs With Parallel Sysplex

Building Up Solutions -- Leveraging the AppServer

We call these "stack products" -- solutions that use the power of WebSphere Application Server as its base. Example: "Compute Grid"

IBM WebSphere Compute Grid

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IBM WebSphere Application Server

⇩ ⇩ ⇩ ⇩

IBM System z, z/OS and Parallel Sysplex
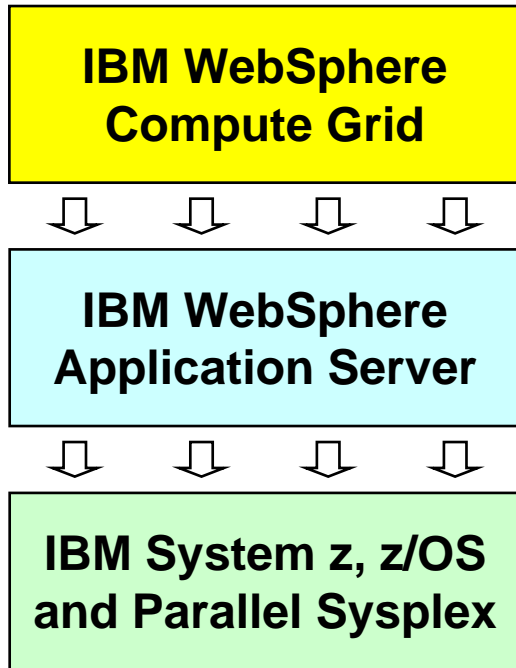
Challenge:

Perform business critical batch processing using Java and enterprise data located on the mainframe

What we've seen:

The challenges of enterprise batch quickly overwhelm simple Java batch solutions:
- *Checkpointing and restarts*
- *Job suspend and restart*
- *Clustering and dividing work across servers*
- *Development tooling to support all this*

Solution:

IBM WebSphere Compute Grid
- **Enterprise-strength Java batch environment**
- **Supported with batch development tooling**
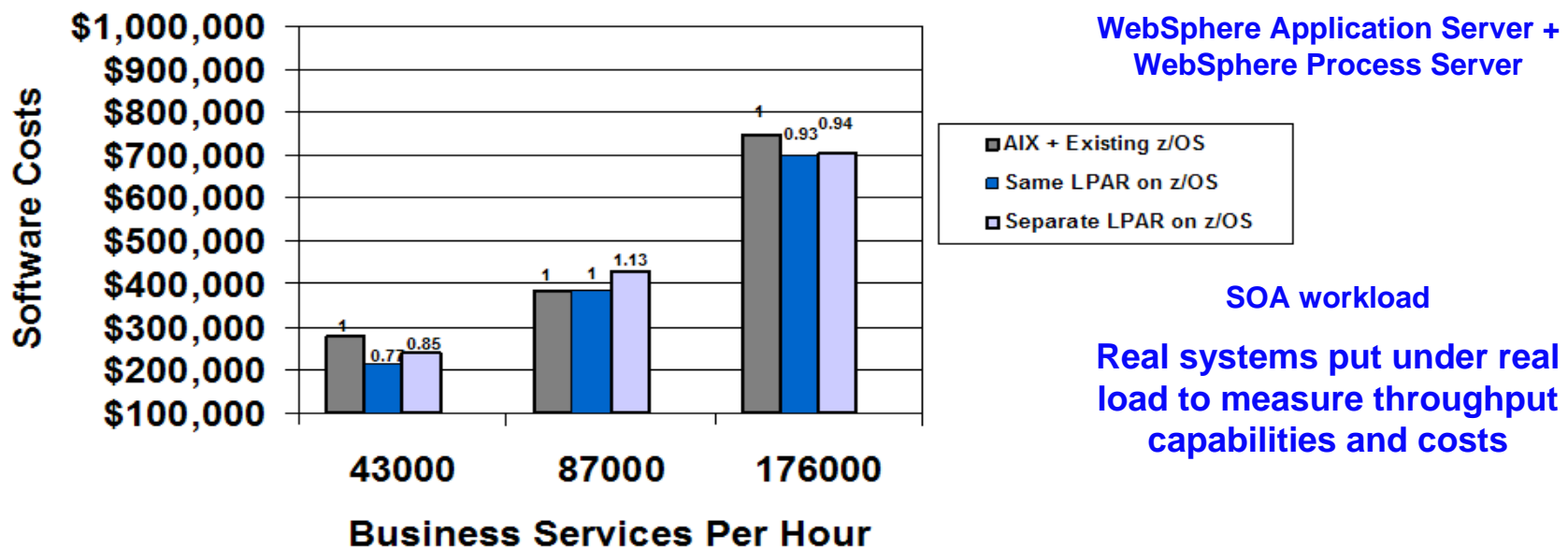- **Makes full use of WebSphere Application Server z/OS features**

The challenges of Java batch addressed with IBM solution that exploits WebSphere Application Server, which as we've seen exploits System z and z/OS

Mainframe Software is Expensive?

We did a benchmark[1] comparing three different BPM solution use-case scenarios -- distributed, different LPAR, collocated same LPAR:

3-Year Total Software Cost Comparison Summary

WebSphere Application Server + WebSphere Process Server

- AIX + Existing z/OS
- Same LPAR on z/OS
- Separate LPAR on z/OS

SOA workload

Real systems put under real load to measure throughput capabilities and costs

To achieve the same level of business services per hour, the total software cost is less when the solution is collocated with data on System z and z/OS

[1] http://www.ibm.com/software/tivoli/systemz-advisor/2009-11/websphere-for-zOS.html
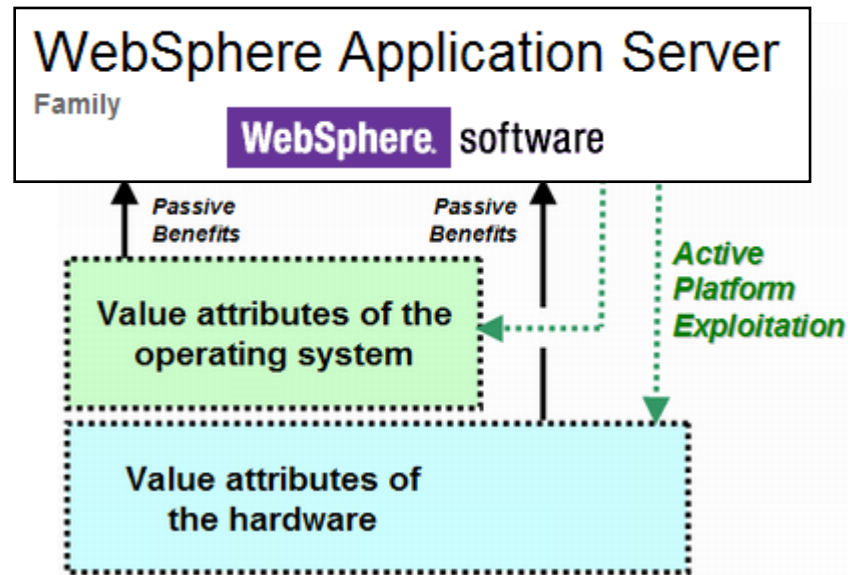
Not *Just* About Technology

Gee Whiz!

That's not how IBM approaches things

The B in IBM stands for "Business," and that means a focus on *results* … not just technology

Technology is merely a tool; meeting your business goals is the true objective of this

Summary -- Integrated System, Active Exploitation

WebSphere Application Server
Family
WebSphere software

Passive Benefits | Passive Benefits | **Active Platform Exploitation**

Value attributes of the operating system

Value attributes of the hardware

Hardware designed to be reliable and scalable

z/OS operating system tightly integrated with hardware

WebSphere Application Server for z/OS designed to exploit the platform

Efficient use of assets, optimized costs, flexible and agile because of open standards and common tooling across platforms

System z + z/OS + WebSphere Application Server

Impact 2010 Highlights

Impact 2010 - The Premier Conference for Business and IT Leaders

Discover new innovative ways to work smarter and achieve business agility now. Impact 2010 provides a unique setting to bring company executives and technologists together at a single event providing a unique opportunity for them to discover how to align business objectives with IT, interact with technology and business leaders and experts from around the world and ultimately optimize their business performance and results.

A new Business Program that will focus on:

- **optimizing business processes**
- **improving decision management**
- **empowering the changing workforce, and globalization**

An enhanced Smart SOA and BPM Technology Program:

- **Dedicated with tailored workshops and hands on labs**

A bigger focus on your industry!

- **300+ industry leading experts on site**

A new Interactive Symposium

- **Bringing LOB and IT together in consultative sessions**

A new Product Technology Center offering:

- **Open labs, tech zones, and product demos**

A new and improved Track structure with:

- **200+ client speakers,50 Birds of a Feather sessions, & free certification testing**

A state-of-the art Solution Showcase Center!

Join us in Las Vegas
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Let's Build a Smarter Planet on System z