IBM Software Group

Application Infrastructure Positioning on System z

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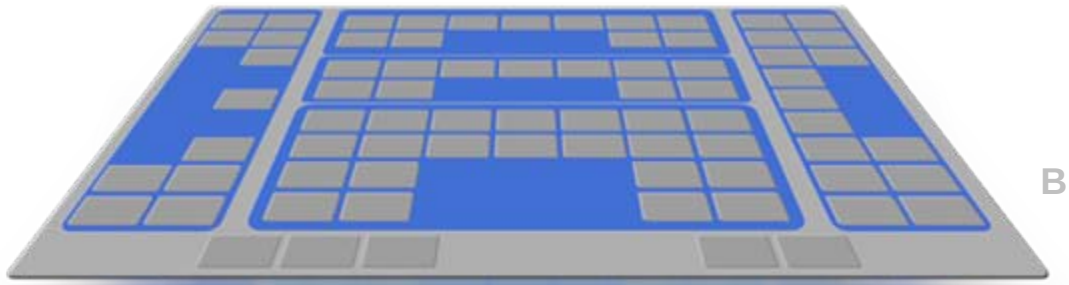
Agenda

- Introduction
- Business and IT challenges
- SOA and System z
  - Customer Information Control System (CICS)
  - Information Management System (IMS)
  - WebSphere Application Server on System z (WASz)
  - WebSphere Extended Deployment (WS XD)
  - z/Transaction Processing Facility (zTPF)
- Conclusion

Three Main Points

1. You are facing extraordinary business and IT challenges
2. You expect IBM to provide responsive solutions and leadership to help you meet those challenges
3. The demonstrated business and industry successes, as well as exponential market growth, confirm the value of System z as the hub of your SOA

The alignment of Business and IT with SOA



Business Process Model

Application Infrastructure Positioning on System z

Reference Architecture

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What you're telling us about your business and IT

Growing pressures

- Speed of change
- Market place challenges
- Competitors

Demanding business issues

- Regulation
- Compliance
- Security
- Accountability
- Legal

Challenging financial objectives

- Increase revenue
- Increase profitability
- Reduce costs
- Manage total costs of acquisition (TCA)
- Manage total costs of operation (TCO)

Increasing demands on your applications and IT infrastructure

- Global operations
- Internet and/or web based
- 24 x 7 x 365 availability expected

Operational complexities

- Applications numbering hundreds, thousands, even tens of thousands
  - Some monolithic
  - Some isolated
  - Some designed and performing well in meeting current business objectives, some not

The combined business and IT creates implementation challenges

1) Pressure for faster time to market for new business applications
2) Expectation to design easy and quick ways to deploy web services
3) Required support of increasing numbers of business transactions
4) Need to reduce connectivity complexities and costs
5) Increase reliability and regulatory compliance
6) Connect multiple applications and extend their value
7) Feeling paralyzed by isolate applications that can not be thrown away but longer align to the business mission
8) Inability to change applications and processes rapidly enough to make effective decisions, gain insights or take actions
9) Knowing the “winning strategy” but still being “beaten to the punch” by competitors
10) Avoiding attractive business projects be of the disproportionate risk of failure
11) Disruption to the business due to supporting IT infrastructure weaknesses

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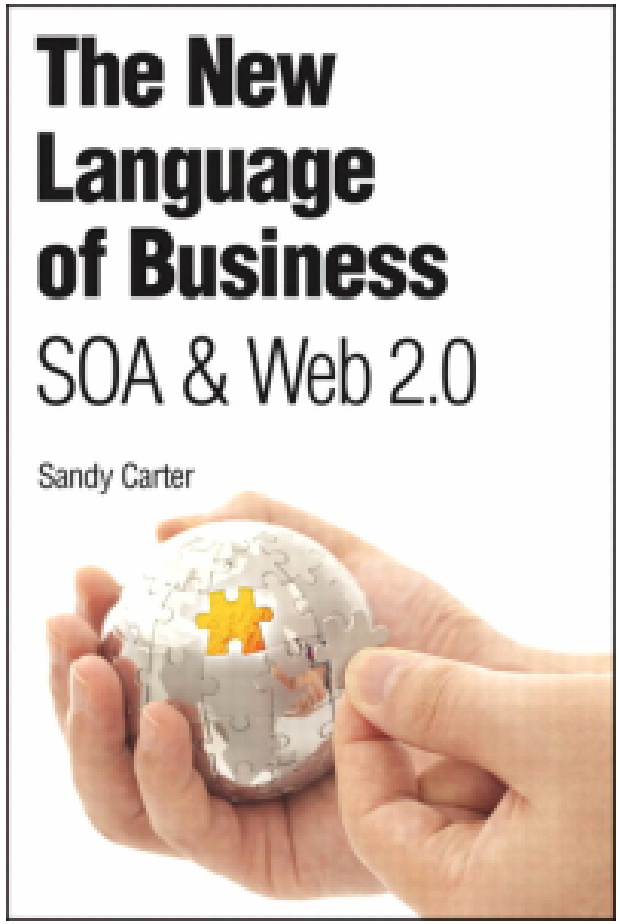
The business growth of SOA

"Innovation in IT structures is so revolutionizing that the proven successes of SOA's have enabled this segment to grow to a worldwide market opportunity of $60.3 billion in 2006.

This is a 75% increase in growth compared to 2005, when the market was estimated at $34.6 billion."

Moreover, the SOA market is expected to skyrocket, with an anticipated 54% compound annual growth through 2008, to reach $143 billion."

- The New Language of Business: SOA & Web 2.0, Sandy Carter, Pearson PLC IBM Press, 2007, p.43.



From your business and IT starting point

Business Objectives

Innovation	Top line growth	Increase efficiency	Reduce costs	Gain market share

- Complex processes and systems
- Complex applications and interfaces
- Difficult to adapt quickly
- Large portion of IT budget spent on maintenance, not on new value add investments

Resources and IT Assets

Legacy Claims Database	Auto Claims System	Home Claims System	Life Insurance Claims	Business Partner Claims System	…

SOA entry points help getting started

Both Business Centric and IT Focused

Information

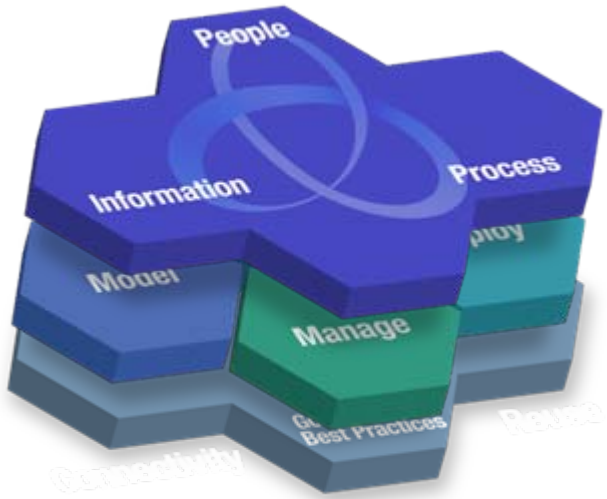
Manage the data that is at the heart of your mission critical and core business processes

People

Provide people with the access, tools and applications that optimize their results

Process

Optimize the flow and utility of business information and data throughout your organization



Connectivity

Share information and data seamlessly among your business partners, employees, contractors, applications, systems and platforms

Reuse

Service enablement to extract financial and operational value from existing applications by reusing them for web services

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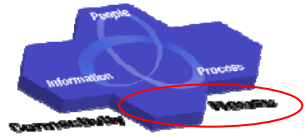
CICS Transaction Server

Rock-solid deployment platform,100% aligned with SOA technologies



CICS Transaction Server

- Build Web services with no change to existing applications
- Highest levels of data integrity and security
- Optimized throughput and performance
- Simple and intuitive management
- New SOA Statement of Direction
  - Extended integration of CICS Service Flow Runtime with WebSphere Process Server
  - CICS support of WebSphere Service Registry/Repository
  - Support for Event Driven Applications

- 30 years and $1 trillion invested in CICS applications (IDC)
- 20,000+ CICS/mainframe licenses worldwide
- 14,000+ CICS customers worldwide
- Used by 490+ of IBM's top 500 customers
- 30 million end users of CICS applications
- 150,000 concurrent users/systems
- 5,000 CICS software packages from 2,000 independent software vendors (ISV's)
- 950,000 programmers working with CICS
- CICS handles more than 30 billion transactions per day valued at over $1 trillion per week

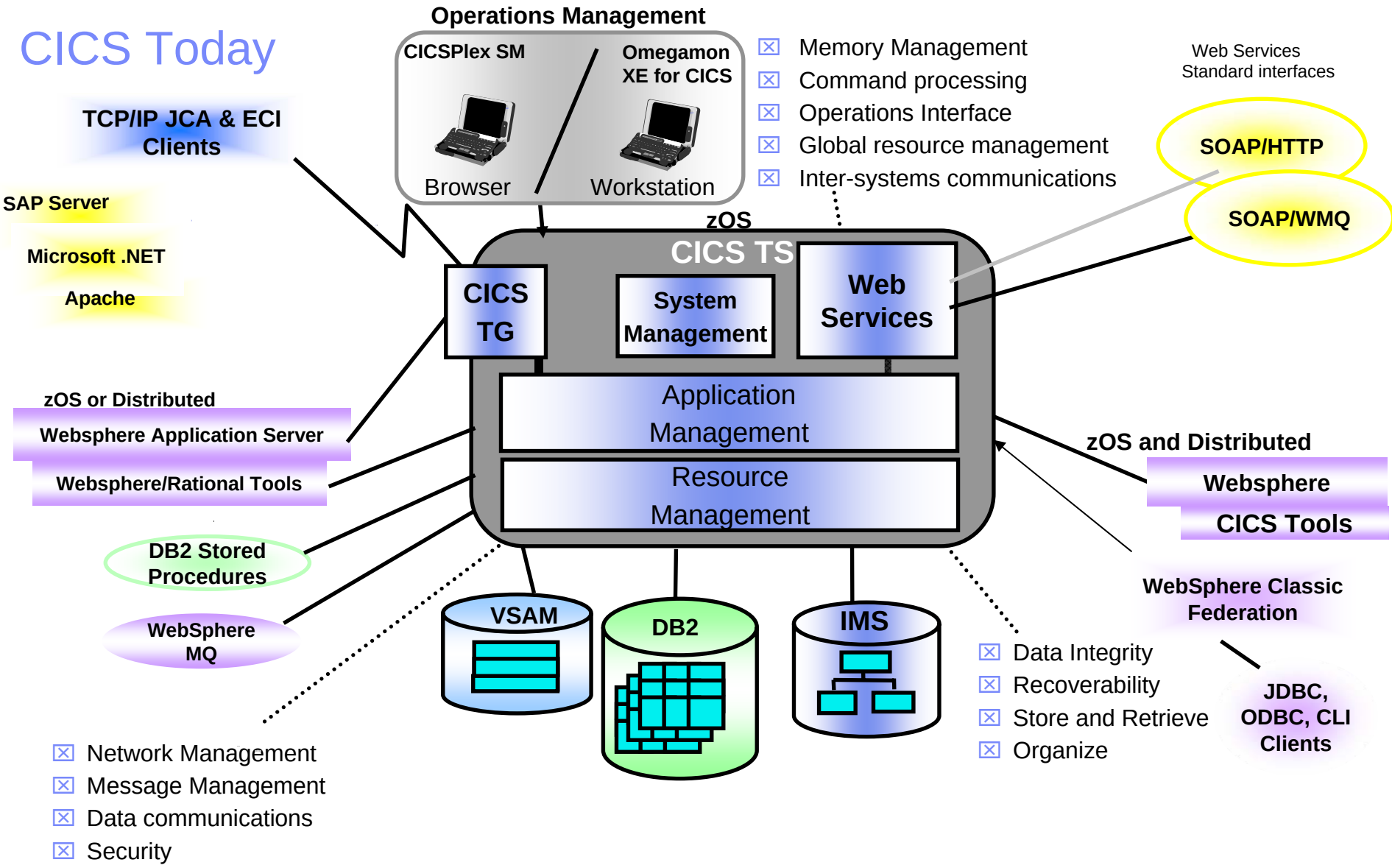
SOA Web Services Journal
http://webservices.sys-con.com/read/39850.htm

CICS is IBM's premier transaction processor for the z/OS that provides:

- An efficient and optimized runtime for the extension and reuse of existing CICS applications
- Services to easily develop applications that exploit new technologies by building on CICS skills
- First class management and support of mixed application types and workloads

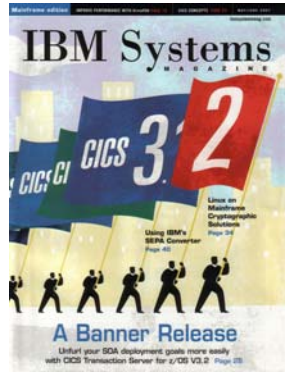
CICS TS V3.2 will be available 29 June 2007

CICS Today



CICS Transaction Server for z/OS V3.2

Delivering on the Promise



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Application Connectivity

Enables extending existing applications beyond their original designs to support integrated business processes via standard APIs and protocols

- Maturing the Web Services capabilities and SOAP standards
- Wider support of binary payload format (XOP & MTOM)
- Conforming with WSDL 2.0
- Optimization of the HTTP Transport to give better performance, robustness and manageability
- Providing a new option for uniform CICS connectivity using TCPIP

Application Reuse

Enables the creation of components from existing applications which are more flexible & configurable for use in new applications.

- Exploitation of 64-bit storage for channels and containers
- More extensive Web Services support for COBOL data types
- Service Flow Feature - Easier installation and management; Invoke web services from a flow; Support for channels and containers

Service Management

Enables effective management of large runtime configurations via modern user interfaces, so that demanding service level and IT governance objectives can be met

- Continued enhancements to OTE enabling some File Control configurations and the MQ Bridge Adapter
- Remove capacity restraints relating to Data
- Enterprise wide workload management
- CPSM Integrated install and definition & CPSM WUI enhancements
- JDK 1.4.2 JVM management and PD improvements

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Powering SOA On Demand Solutions

IMS Runs the World

Eases Integration with New Technology

- Reuse/ modernize IMS applications/data
  - Reduce costs/cycle times
  - Expand access
  - Increase flexibility/competitiveness
- Ease new development
  - XML, SOAP, JAVA Tools/Standards

Simplifies Installation and Management

- Single Systems Image/Operations control
- Tools to ease/automate systems

Reduces cost of computing, ensuring ultra-high performing, available, scalable, reliable, secure solutions

- Integrated high performance access
- Network, Message, Data Sharing
- Integrated High Availability Large DB

Most Corporate Data Managed by IMS

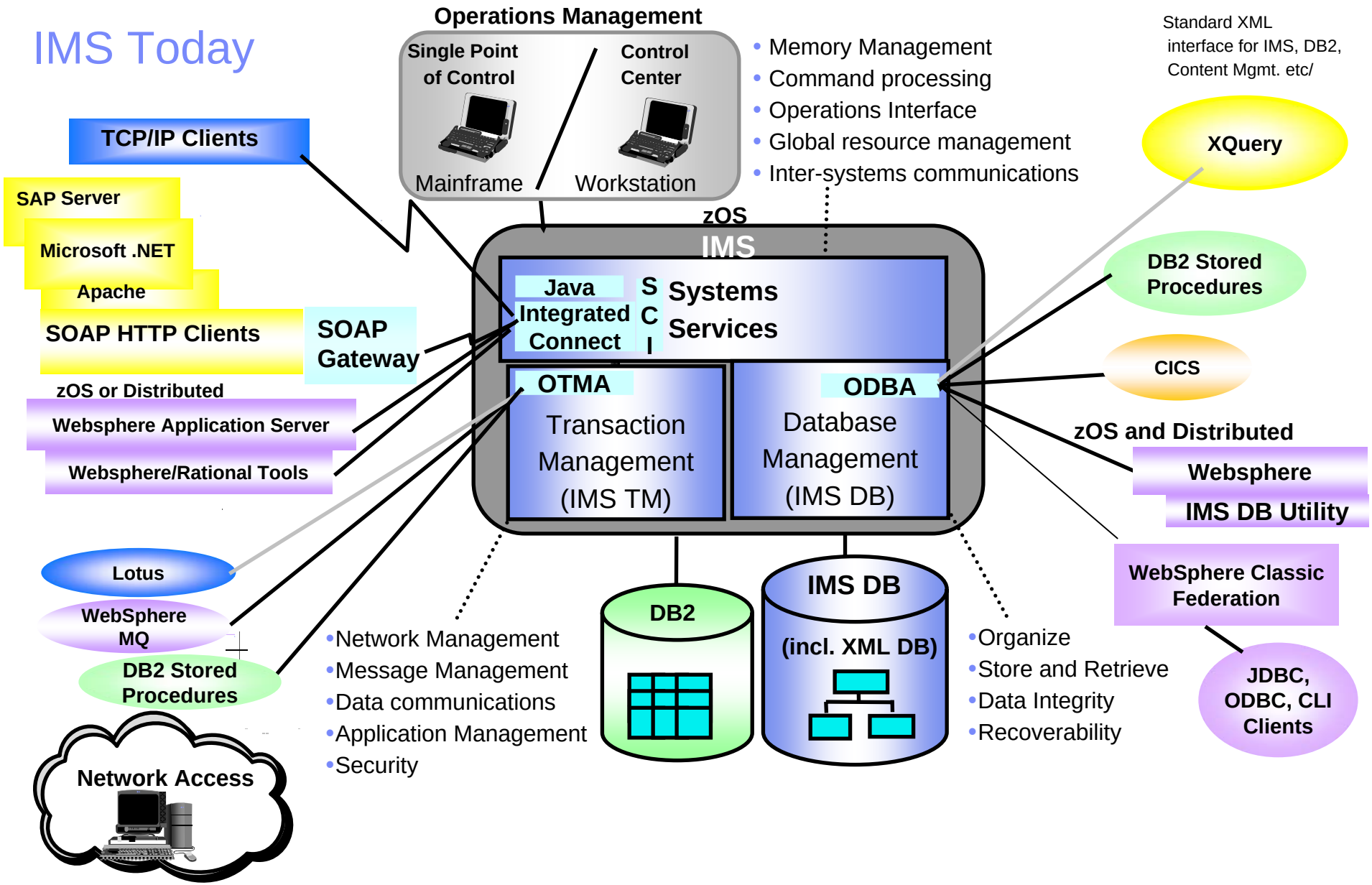
>95% of top Fortune 1000
>15 Million GBs Production Data
>$3 Trillion/day transferred by customer

>50 Billion Trans/Day run through IMS

>200 Million Users a Day
>100 Million Trans/day/system handled
>10,000 Trans/sec via TCP/IP to 1 IMS with 1 connect instance
>21,000 Trans/sec (2 Bil/day) to 1 IMS with data update
>10 years without an outage

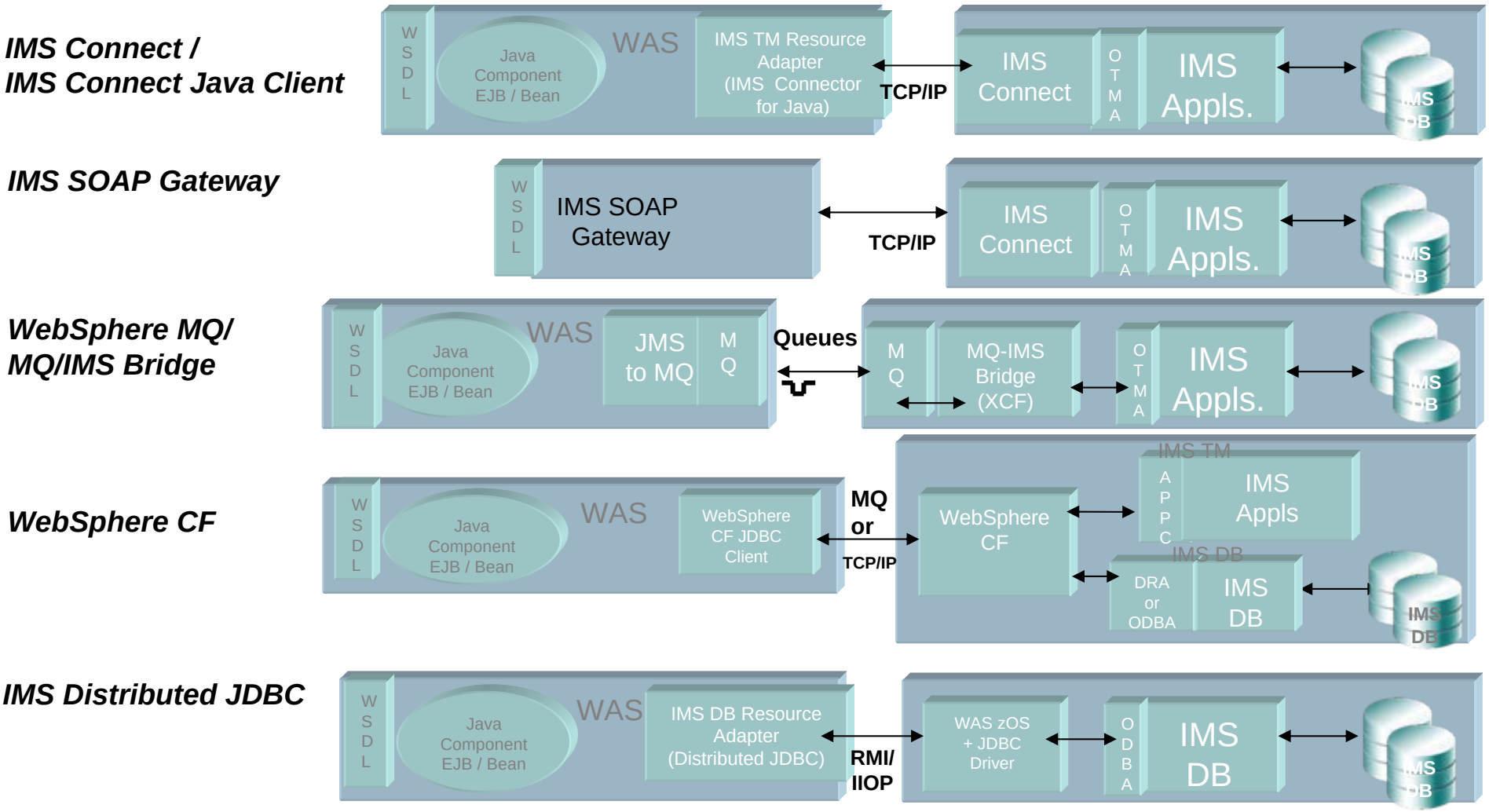
"Rock-solid reputation of a transactional workhorse for very large workloads. Successfully proven in large, Web-based applications. Unmatched, platform to implement very large OLTP systems. Foundation for a new generation of Web-based, high-workload applications." Gartner

IMS Today



IMS Integration approaches for Web Services/SOA

Leveraging IMS applications/data for reduced cost, business transformation, and integration with partners, suppliers, and customers:



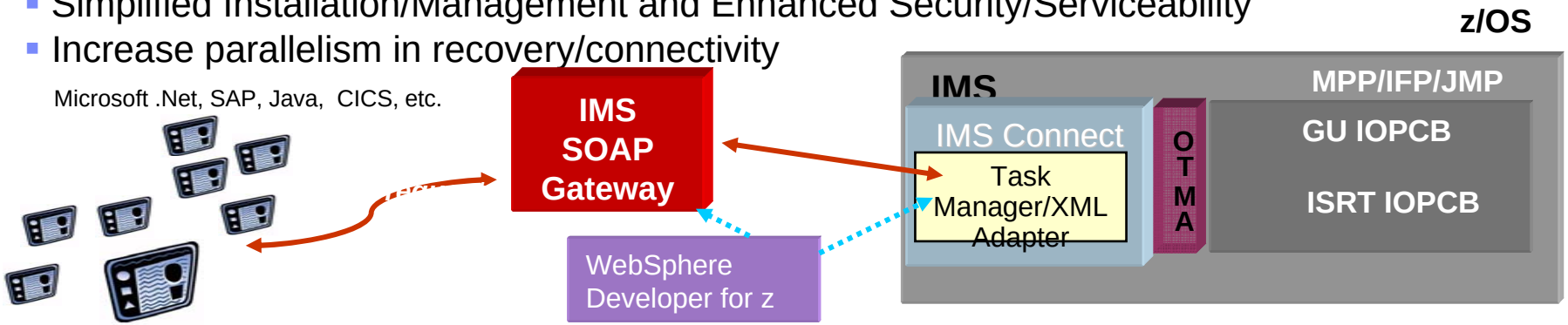
IMS SOA Solutions

IMS 9

- Unchanged IMS Transactions/data as Web Services for better business integration
- Enhanced JCA, MFS Web, 64 bit WAS, JDK 5 leverage standards
- Integrated Connect function for high performance access
- SOAP XML Adapter for broadened application access and reuse
- IMS XML DB support for universal information exchange
- Integrated HALDB Online Reorganization to maximize Availability

IMS 10

- XQuery & Enhanced XML/Web Services for B2B data interchange
- IMS as Client enhance client interoperation
- Enhanced SOA Composite Business applications
- Simplified Installation/Management and Enhanced Security/Serviceability
- Increase parallelism in recovery/connectivity



IMS SOAP Gateway 9.2 downloadable at www.ibm.com/ims
IMS Connect Task Manager/XML Adapter viaIMS V9 service stream

IMS - Helping Customers Build their SOA

- **Simplify access and integration**
  - Seamlessly integrate distinct enterprises
  - WebSphere and J2EE compliant application server
  - Designed to support open integration technologies
  - Support collaboration among IMS and other components, within and beyond enterprise boundaries
- **B2B data exchange**
  - Modernizing IMS Transactions and data
  - XML, SOAP/Web Services access to IMS
  - IMS XML data storage
  - Distributed access to IMS data
- **Skills**
  - IMS Information at http://www.ibm.com/ims
  - IMS Connectivity In an On Demand Environment Redbook
  - Education, Migration/Skills Transfer, Customized Offerings available at ibmdds@us.ibm.com

XML, SOAP & Web Services = Open Integration Technologies

JDBC, ODBC = Interoperability for Application Developers

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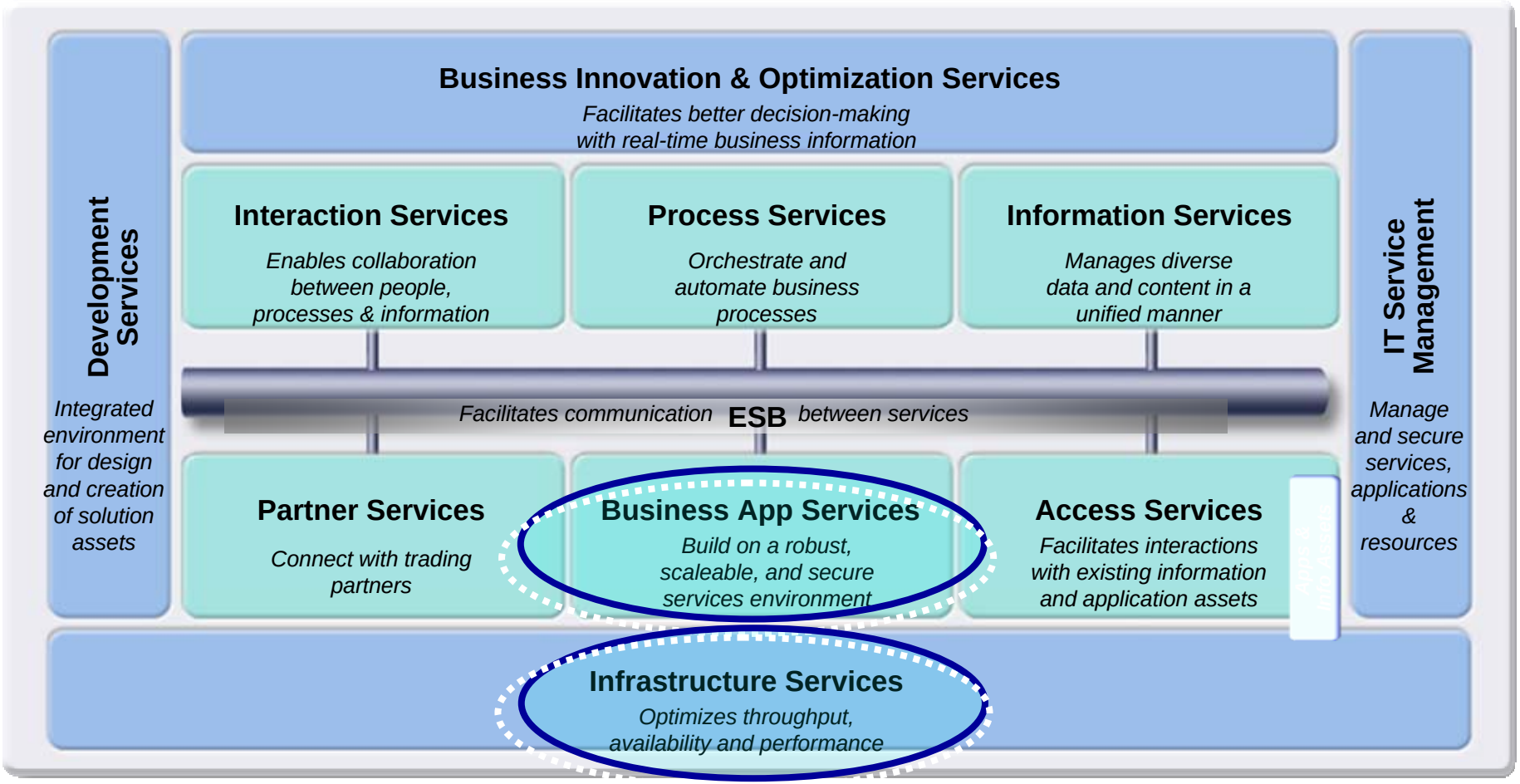
Application Infrastructure is the cornerstone of an SOA deployment



WebSphere Application Server

Powering your SOA for the Ultimate in Business Flexibility

Standards Based and Open

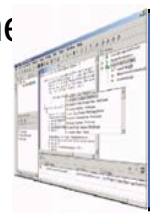
- J2SE 5.0
- Web services standards
  - WS-Interop Basic Security
  - WS-Notification
  - WS-BusinessActivity
- JSR168 Portlets
- JSR116 SIP Servlets

Platform Capability

- Proxy Server Enhancements
- Integrated User Registry
- Government Standards

Consumability

- Common code base for application portability and consolidation to System z
- Application Server Toolkit, including automation tools and Command Assistance
- Simplified Administration
  - Steps for many tasks reduced +50%
- Simplified SSL Key/Certificate Management
- Security enhancements
- IHS administration enhanceme
- Integrated Support Assistant
- Install Factory



WebSphere Application Server

Why IBM Application Infrastructure?

" WebSphere Application Server is one of the most popular J2EE platforms: It has been on the market for many years, enjoys vast industry support and has an impressive installed base…"

Gartner

*Gartner Magic Quadrant for Enterprise Application Servers, 2Q06. By Yefim V. Natis, Massimo Pezzini, Kimihiko Iijima, Michael Barnes, August 2006

WAS V6.1 for z/OS

Bringing Software Development Efficiencies

1. Modern development environment
2. Connector technology to abstract z/OS based assets into components
3. Technologies for interoperability and flexibility of the infrastructure
4. Common programming model

Unlocks the business value on the z/OS platform.
Allows additional value brought in new ways

WAS V6.1 for z/OS

Integrated into the fabric of the z/OS operating environment

1. Replicated Server cluster provide a mechanism to leverage shared data for scale and availability
2. Workload management allows WebSphere to work with existing subsystem for optimal access to existing assets.
3. No single points of failure, integrated with z/OS recovery mechanisms
4. Integrated with local SAF security, applications isolated from system for additional integrity
5. Integrated with z/OS automation capabilities for superior manageability

Hardware, operating system, and middleware working together to bring true 99.999% application availability to your business critical services.

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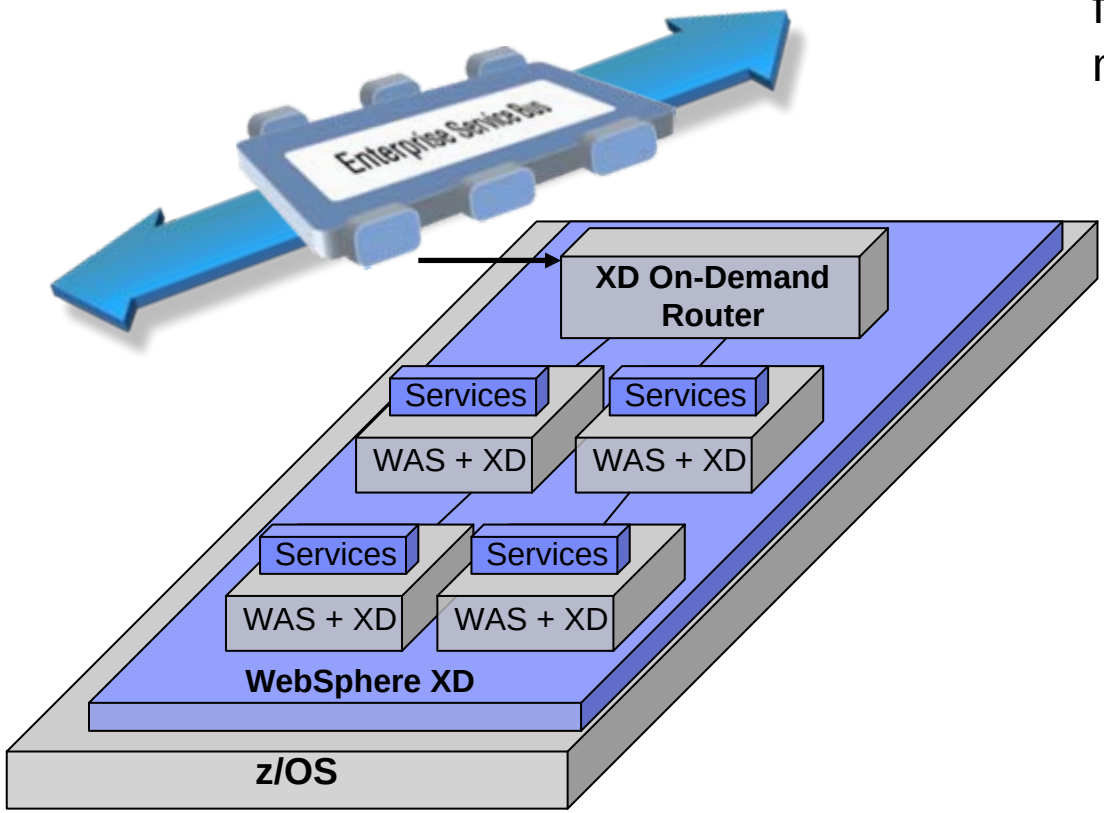
Managing your SOA



- WebSphere Extended Deployment for z/OS delivers enhanced manageability features for your SOA

➢ **Innovative application patterns**

- Java Batch, Compute-intensive, native
- Workload classification
- z/OS Integration with Workload Management
- Application Versioning

➢ **Automatic sense & respond management**

- Health Management Framework
- Operational Management
- Configuration Checkpointing
- Monitoring WebSphere Workloads

Batch and SOA

" business function used in online transactions may be the same business function used in batch processes, so organizations should think about their IT modernization strategy and consider SOA as a standardized application integration mechanism"

- Gartner Research

- **Reusing business services is a fundamental principle of SOA**
- **Batch workloads are an integral part of any IT infrastructure**
- **XD Compute Grid delivers an Enterprise Java Batch infrastructure…**
  - Share business logic across OLTP and Batch
  - zAAP-Eligible
  - Keeps business logic in close proximity to the data for performance and security
  - Advanced execution models and System-Z Integration
    - Leverage traditional z/OS Batch Facilities
    - Collocate native batch applications (COBOL, C, C++, etc) with XD Compute Grid
  - Leverages System-Z and WebSphere z/OS Qualities of Service

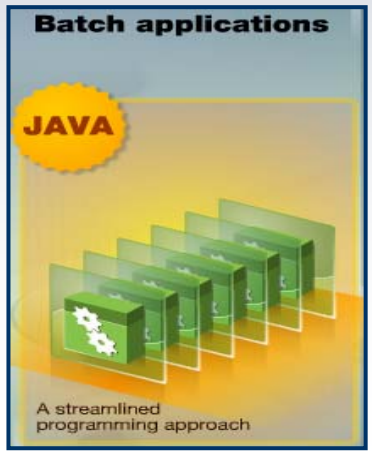
Transactional Batch

Drivers

- ◇ Simplifying batch programming so that developers can focus on business logic and less on transactional semantics and the associated infrastructure
- ◇ Use Java for batch programming for development consistency across OLTP and batch environments to achieve a streamlined & optimized development environment
- ◇ Move towards a single code base supporting both services and batch execution

WebSphere XD Compute Grid provides a Java / JEE transactional batch programming model which allows developers to use Java and to focus their development efforts on business logic and services

- **Availability to WebSphere System Services:**
  - Transactions, security, high availability, etc.
- **The XD Batch Container provides services such as**:
  - **Check pointing** – the ability to resume batch work at a selected interval
  - **Result processing** – the ability to intercept step and job return codes and process them using any JEE facility
  - **Batch data stream management** – the ability to handle reading and positioning data streams to files, relational databases, and many other input & output sources



Manage Multiple Application Versions

Challenges:

- I want to support different versions of my applications for my users or customers for continuous availability
- I need a more agile production deployment process, where I can quickly back-off new application versions to prevent loss of service
- I'd like to better support iterative development; and potentially use my free resources in my production environment for application testing

Solution → **Application Edition Manager**

Dynamically introduce, run, and manage multiple versions of the same application in your infrastructure

- Coordinates the activation of application editions **and the routing of requests to the application**
- Validation Mode **enables final pre-production testing of an application edition by a select group of users**
- Routing Rules **allow intelligent routing to multiple application editions in production**

Automatic Sense and Respond Management

Challenges:

- Provide operational control so that my IT staff can easily manage my environment
- Gain insight into the performance and operations of applications & servers across my entire heterogeneous (and distributed) application server infrastructure
- Proactively address and correct issues before they cause IT and business impacts
- Give me the information I need to do historical analysis, capacity planning, and chargeback for resource usage
- Decrease management and administration costs

WebSphere XD contains comprehensive and integrated management capabilities

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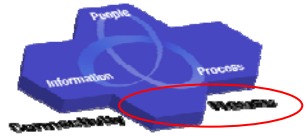
z/Transaction Processing Facility (z/TPF)

x-treme transaction processing around the clock



z/TPF V1.1

- z/TPF takes the established power and performance of TPF4 to a whole new level:
  - **Service Oriented Architecture (SOA)**
  - **Open development environment (Linux) opening it to a broad development community**
  - **64-bit architecture – allowing for the exploitation of large memory spaces**

TPF Characteristics	Market Benefit	Market Value
System availability	24 x 7 x 365 with 99.999% availability	Reduced exposure to loss of income or customer satisfaction Dependable service
Extreme transaction rates	500 - 25,000+ transactions per second	On-demand capacity Handle high volume, low margin efficiently
Rapid response time	Averages less than 0.2 seconds (with network 1 -3 seconds)	Increased productivity ▪ People ▪ Systems
Single contiguous database	Less complexity, more reliable	Reduce exposure to data corruption or multiple customer views
Interoperability	Investment protection	Flexibility and growth
Application enablement tools	Shortened cycle times	Rapid time to market Commodity skills
Low cost per transaction	Measured at less than two-tenths of a cent per transaction	Lower costs and higher profits for customers charging by transaction

SPEED

RELIABILITY

AVAILABILITY

SCALABILITY

Why is z/TPF a key component in IBM's overall SOA strategy?

Increase Revenue

Create new routes to market, create new value from existing systems, Offer new services to customers without having to worry about the underlying IT infrastructure

Improve Flexibility

Develop flexible business models ("services") react to market changes more quickly; move to plug and play appliance model to provide immediate business flexibility

Service-Oriented Architecture

A Service-Oriented Architecture is an enterprise-scale IT architecture for linking resources on demand. These resources are represented as business-aligned services which can participate and be composed in a value-net, enterprise, or line of business to fulfill business needs. The primary structuring element for SOA applications is a service as opposed to subsystems, systems, or components.

Integrate across the enterprise

Integrate historically separate systems, facilitate mergers and acquisitions of enterprises

Increase efficiency

Reduce cycle times, enable dynamic sourcing for external business partners by moving from manual to automated transactions

Drive down cost

Eliminate duplicate systems, build once and leverage, improve time to market, reduce customization, combine and reuse pre-built service components for rapid application development and deployment

Reduce risk and exposure

Improve visibility into business operations, minimize investment risk (e.g., preserve, extend and leverage legacy Investments), ensure compliancy by facilitating auditing

What are the unique z/TPF technical capabilities that support the SOA business model?

For customers who are operating in the world of SOA and web services, a primary characteristic of this complex environment is a loose coupling among solutions. z/TPF was built to excel among loosely coupled systems and applications, in the world of SOA.

Efficiency

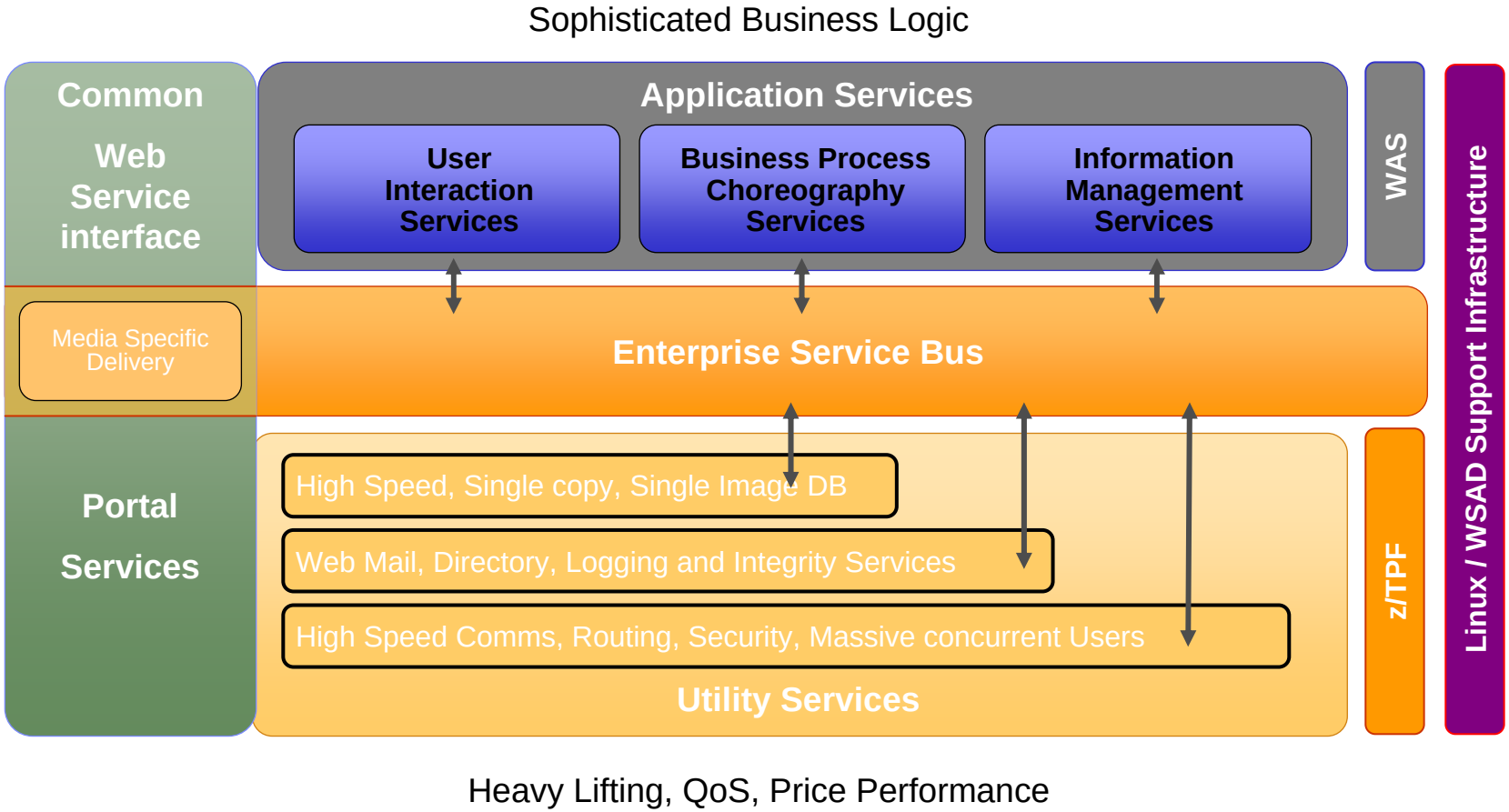
z/TPF is uniquely optimized for speed and efficiency. It uses transaction-driven processing for short, small, simple and rapid data interactions. This “light-weight process” (part of the z/TPF extended kernel) is often associated with “stateless” processing in contrast to “heavy-weight process” system which maintain the “stateful” process.

Each transaction flowing into z/TPF will cause the creation of a process. Each process has its own memory space and cannot access or corrupt another process. Processes are created and destroyed so quickly in z/TPF that it is the equivalent of recycling a server thousands of time a second.

Stateful versus stateless

Using an air travel as an example, building a passenger name record (PNR) is “stateful”. It requires the system to remember on the next message what was learned on the previous message. Applications developed to run on z/TPF do maintain the “stateful” information, while z/TPF is optimized for “statelessly” moving small, simple and rapid data among expectant applications. For SOA and web services, SOAP, XML and HTTP are simply newer ways of connecting “stateless” information - connections which z/TPF is especially capable of handling for web services and SOA deployments.

How can z/TPF be deployed to supercharge SOA and web services technologies?



*WAS – WebSphere ® Application Server

z/TPF SOA Enablement

Now :

- **SOAP Provider**
  - Lightweight SOAP Handler
  - Transport neutral
- **B2B XML scanner**
  - High performance non-validating XML scanner
- **TPF XML APIs**
  - Parsing XML
  - 20 APIs to raise the level of abstraction

Upcoming:

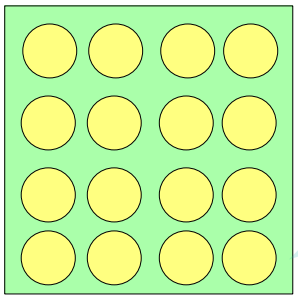
- **http client**
  - Options for http
- **SOAP provided enhancements**
  - Web Services Wrappers : XML isolation
  - SOAP Message Handlers : WS-* infrastructure
  - SOAP Bridge Support
- **Deployment Mechanism**
  - Deployment Descriptors
  - Operator Commands to deploy/undeploy all or individual resources
- **WS-I conformance checking**
- **Tooling in TPF Toolkit**
  - Eclipse Web Tools Platform + customer tools added to TPF Toolkit

Moving from TPF 4.1 to SOA with z/TPF - why are customers embracing z/TPF and how is z/TPF protecting their investment?

1

Today, TPF 4.1 is a monolithic code base whose processes and data are locked up, which is cost prohibitive to replace, and too hard to pull apart

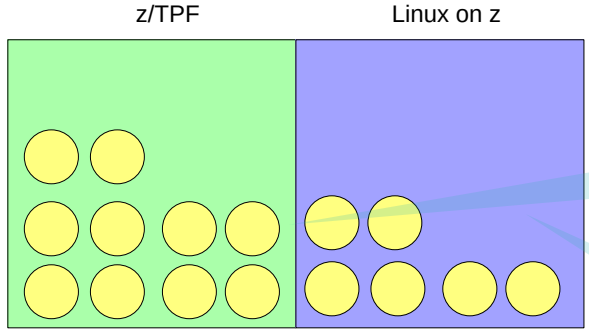
2



z/TPF allows TPF code to become SOA ready

Legacy code/assembler can be repackaged into reusable components/services for use throughout the enterprise

3

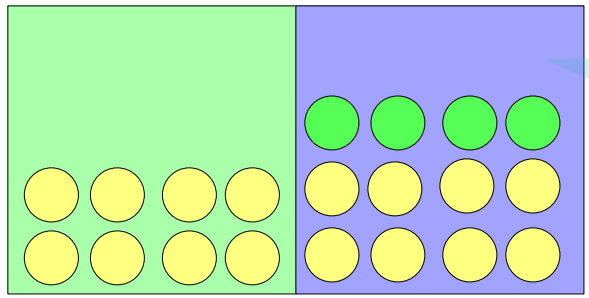


New components/services can now be redistributed to application servers for use throughout the enterprise and participate in the customers' SOA plans

z/TPF SOA support

With z/Linux near zero latency

4



New business functions can then be added to the application server and utilize z/TPF for data and processes

WebSphere Business Value
Linux commodity cost and skill base
z/TPF speed
reliability
scalability

z/TPF : For More Information

- **IBM Redbook:**
  - z/TPF and WebSphere Application Server in a Service Oriented Architecture (SG24-7309)
  - IBM's TPF Website
    - http://www.ibm.com/tpf

Agenda

- Introduction
- Business and IT challenges
- SOA and System z
  - Customer Information Control System (CICS)
  - Information Management System (IMS)
  - WebSphere Application Server on System z (WASz)
  - WebSphere Extended Deployment (WS XD)
  - z/Transaction Processing Facility (zTPF)
- Conclusion

Three Main Points

1. Your business requires resiliency, flexibility and, above all, innovation

2. IBM is making investments in software portfolio and delivering them to you as solutions

3. The rapid deployment of solutions and the focus on industries, reference architectures, ease of use as well as consumability, confirm the value of System z as the hub of your SOA

Questions
and
Answers

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