



***The Modern Mainframe...  
At the Heart of Your Business***

Using SOA to Build Your Next Generation Solution



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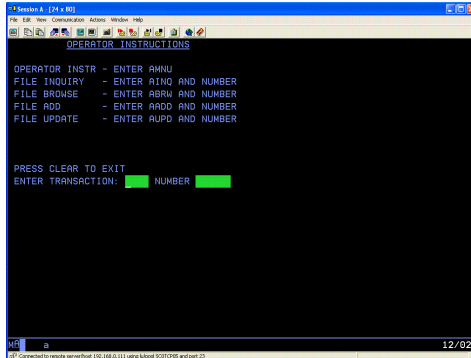
## **Service Oriented Finance's Business Problem**

**We want to increase revenue by selling our car loans through external Brokers**



**Service Oriented Finance  
CEO**

## Existing CICS Investment: SOF Customer Management System



We have invested millions of dollars in this asset



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Existing application consists of CICS programs accessed via "green screen" terminals.

How do we make this available to external Broker applications?

## Leverage Existing Investments

25% of the world's capital investment is in I/T\*. The only way to innovate in a cost-effective manner is to leverage these investments



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*"Many of the I/T assets required to enable an on-demand business already exist and have been supporting the business for years or even decades. Enabling these I/T assets to participate in integrated business processes is key to improving responsiveness".*

DH Brown Associates, Inc.  
Application Transformation: Leveraging Existing I/T Assets to Build Competitive Advantage (September 2004)

\* Does not include real estate or government assets

## Use SOA to Extend Your Mainframe Assets

We want to make portions of this application available to external Loan Brokers



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You can extend your existing assets using a Service Oriented Architecture



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## The Basics: What is SOA?

... a service?

A **repeatable business task** – e.g.,  
check customer credit;  
open new account



... **service oriented architecture (SOA)?**

An IT **architectural style** that supports  
integrating your  
business as linked  
services

"SOA impacts every aspect of IT and business."

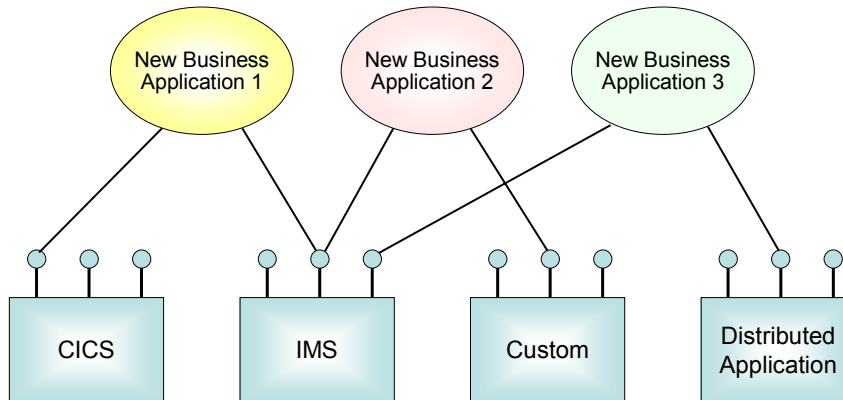
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## Steps to SOA

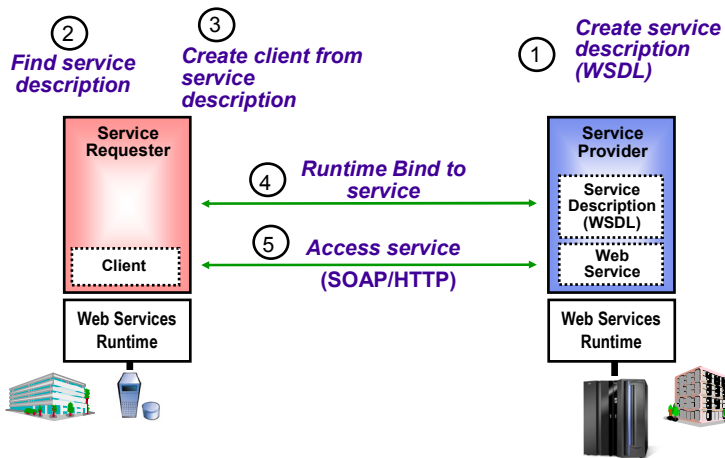
- Expose enterprise assets as services
- Create a rich environment for easy reuse
- Combine services to create new applications



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## Introduction to SOA: Web Services



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# Exposing CICS Applications as Web Services

So Web Services give me reusability and interoperability. But how do I get my CICS programs to talk Web Services?



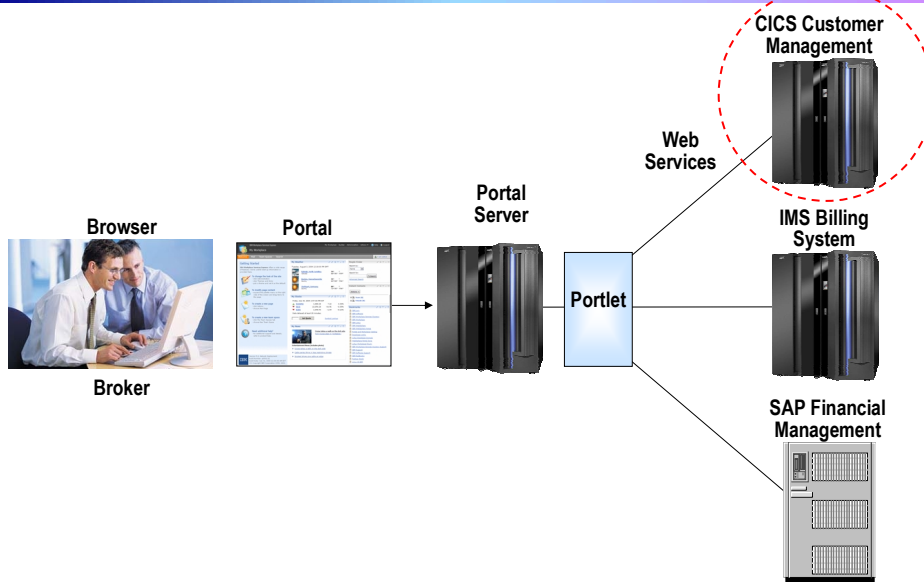
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CICS TS Version 3.1 has built-in capabilities to expose programs as web services

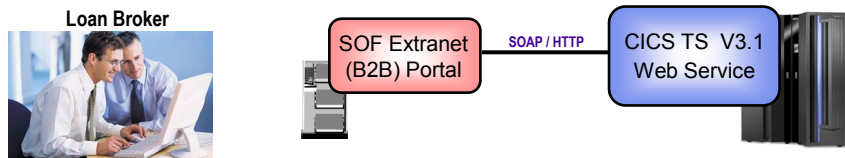


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# Service Oriented Finance Solution Picture



## DEMO: Broker Calls CICS Program Using Web Services

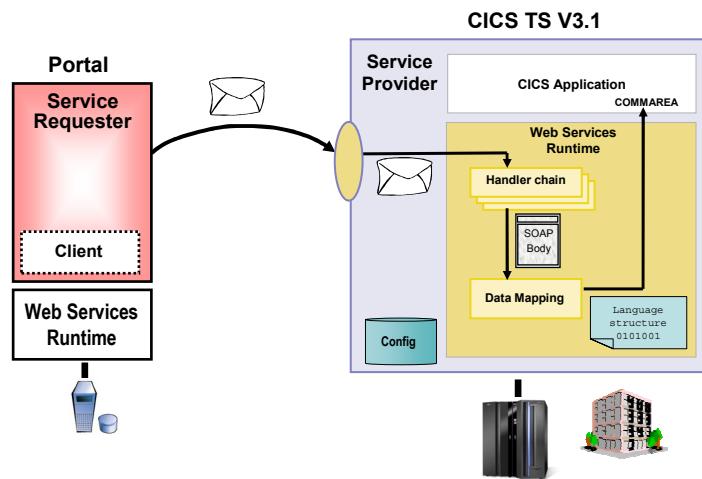


- Loan Brokers use the SOF Portal. The Portal talks to SOF's Loan application using web services

*Web Services expose CICS and IMS investments for a new generation of re-use.*

## How Did the CICS Web Service Work?

1. Receive SOAP request
2. CICS Web Services runtime handles the message
3. Handler chain processes SOAP headers
4. Data Mapping transforms XML into bytes, calls server app

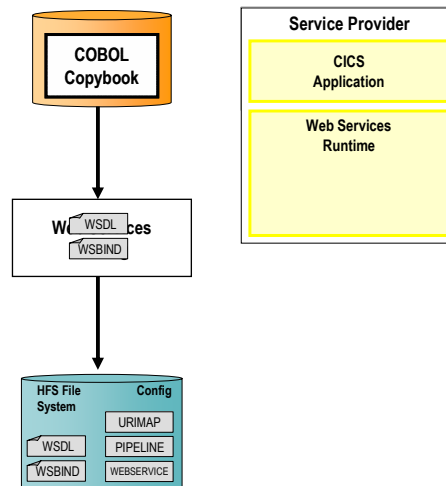


## CICS Web Services

- Native Web Services capability offered by CICS
  - ▶ A CICS application can now be a web service provider and requester
  - ▶ Fully integrated into CICS
    - Resource definition using CICS admin screen, problem determination, monitoring & statistics
    - New tooling support for easier application development
  - ▶ SOAP requests can flow over HTTP or WebSphere MQ transports
  
- Rich set of Web services standards supported
  - ▶ SOAP 1.1 and 1.2 to send and receive web service messages
  - ▶ WS-I Basic Profile 1.0 for interoperability with between providers and requesters
  - ▶ WS-Coordination transaction coordination
  - ▶ WS-AtomicTransaction
  - ▶ WS-Security for authentication and encryption of messages

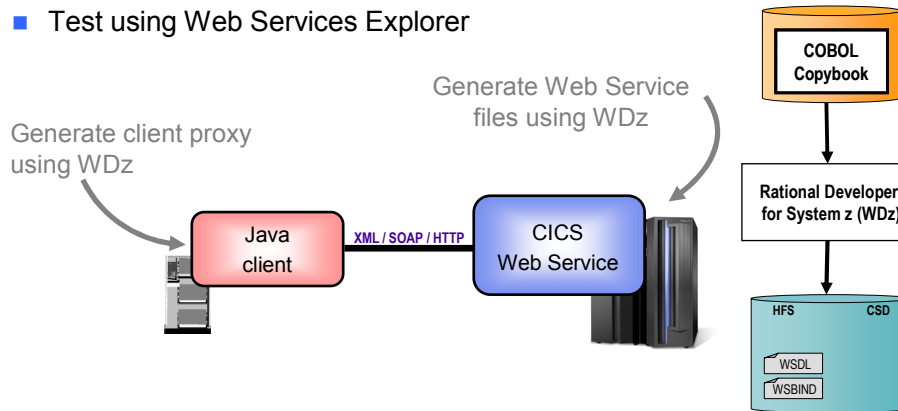
## Development Steps to Expose CICS Application as a Web Service Provider

1. Start with COBOL copybook
2. Generate WSDL from copybook
3. Copy files to host file system.
  1. Use standard CICS supplied PIPELINE definition
4. CICS automatically installs other related definitions
5. CICS application is now web service enabled



## DEMO: Use Rational Developer for System z to Expose CICS Program as Web Service

- Generate WSDL and WSBIND files
- Deploy files to host file system
- Test using Web Services Explorer



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## Bank of Montreal: Reuse Existing Services

**Challenge: Increase Efficiency and Customer Satisfaction**



### Delivering Business Value:

- Exposed CICS transactions as web services
- New front-end CRM application provided cross-sell and up-sell opportunities
- Revitalized customer relationship management across multiple banking channels

### Through greater IT flexibility:

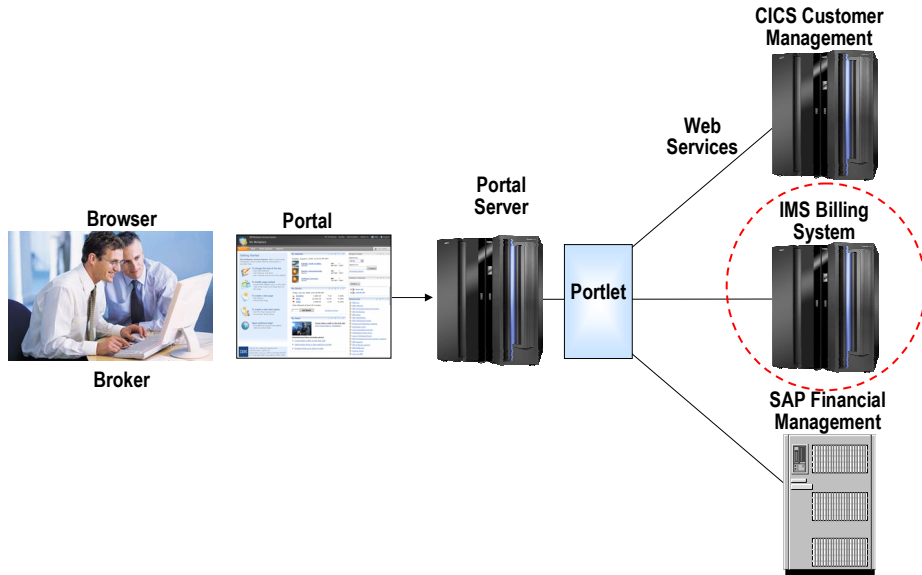
- Reused existing IT assets through service-enablement
- Modeled options for new system to support hundreds of transactions per second
- Built service-oriented applications more easily

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## Service Oriented Finance Solution Picture



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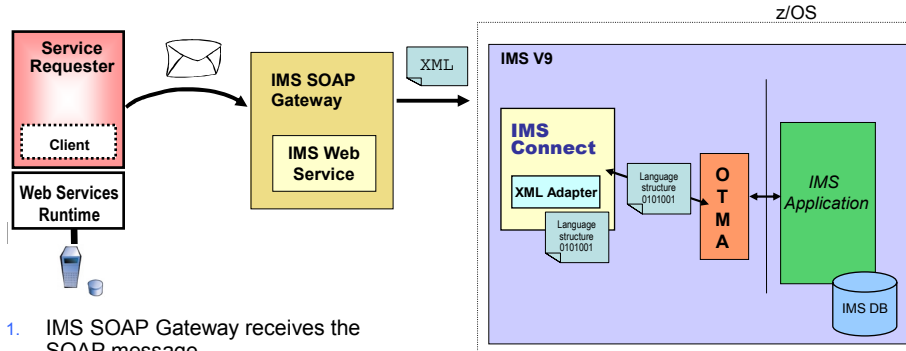
## What About IMS Assets? Use the IMS SOAP Gateway

- Integrates IMS assets into SOA by providing a standard Web Services interface
  - ▶ Expose your IMS application as a web service with easy deployment and configuration
    - No programming needed
- Tooling support
  - ▶ IBM Rational Developer for System z generates Web Service artifacts like WSDL and XML converters
    - From COBOL copybook of IMS application
- Transforms XML data without changing IMS application
  - ▶ IMS Connect XML Adapter transforms XML data
    - No need to modify the IMS application code

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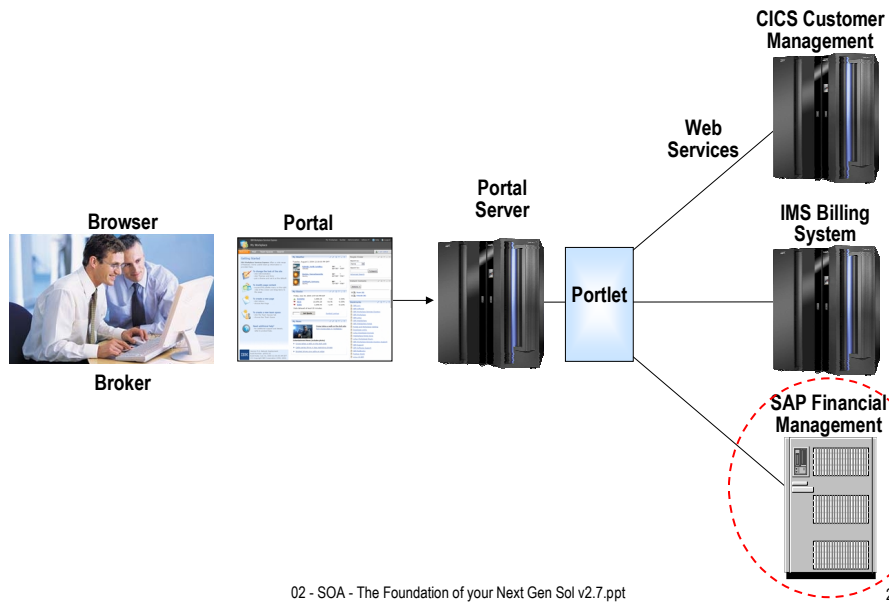
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## IMS SOAP Gateway – How It Works



1. IMS SOAP Gateway receives the SOAP message
2. Processes SOAP header, extracts XML payload, sends XML data to IMS Connect
3. IMS Connect invokes XML adapter to convert XML to bytes
4. Sends bytes to Open Transaction Manager Access (OTMA) server and the IMS application being invoked

## Service Oriented Finance Solution Picture



## What About Other Enterprise Assets without Native Web Services Capabilities?

How do we expose the functions of our other backend systems like SAP?



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IBM provides a comprehensive set of adapters.



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## What Do Adapters Provide?

- Provide a consistent framework for access to back-end systems and technologies
  - ▶ Translates an abstracted interface into target-specific protocols, APIs or data formats
  - ▶ Abstracted interface encapsulates business functions and events in the form of business objects
- Consistent configuration, deployment, and administration
- A standardized framework enables WebSphere development tools to generate code that would otherwise be manual with third party adapters

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# IBM Adapter Portfolio

Adapter Category			
Application	<ul style="list-style-type: none"> <li>• <b>Ariba Buyer</b></li> <li>• Clarify CRM</li> <li>• eMatrix</li> <li>• i2</li> <li>• JD Edwards OneWorld</li> </ul>	<ul style="list-style-type: none"> <li>• MetaSolv Applications</li> <li>• Oracle Applications</li> <li>• PeopleSoft Enterprise *</li> <li>• Portal Infranet</li> </ul>	<ul style="list-style-type: none"> <li>• SAP Exchange Infrastructure</li> <li>• SAP Software *</li> <li>• Siebel eBusiness Applications *</li> <li>• SunGard FRONT ARENA</li> </ul>
Technology	<ul style="list-style-type: none"> <li>• <b>COM</b></li> <li>• <b>CORBA</b></li> <li>• Complex Data</li> <li>• EDI</li> <li>• <b>Enterprise Java Bean</b></li> <li>• DTS</li> <li>• E-mail</li> <li>• Exchange</li> </ul>	<ul style="list-style-type: none"> <li>• Fix Protocol</li> <li>• <b>Flat Files *</b></li> <li>• Lotus Domino</li> <li>• Healthcare Protocols</li> <li>• HTTP</li> <li>• <b>i-Series</b></li> <li>• <b>JDBC *</b></li> <li>• JMS</li> </ul>	<ul style="list-style-type: none"> <li>• SWIFT</li> <li>• TCP/IP</li> <li>• <b>Web Services</b></li> <li>• WebSphere MQ</li> <li>• WebSphere Message Broker</li> <li>• WebSphere MQ Workflow</li> <li>• <b>XML</b></li> </ul>

Adapter development kit available for developing custom adapters

Notes:

Adapters in **bold** can introspect target application/technology

\* Both Java Connection Architecture (JCA) and Java Message Service (JMS) adapter versions provided

\*\* Only available as a Java Connection Architecture (JCA) adapter

# Business Problem Solved

We are getting hundreds of new customers through our external brokers



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SOA allowed us to quickly unlock our core application assets for reuse



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## Service Oriented Finance's Technical Challenges

1. How can Brokers access our existing car loan application?
2. How do I optimize the existing process so we are ready to handle a large increase in the number of car loan requests?

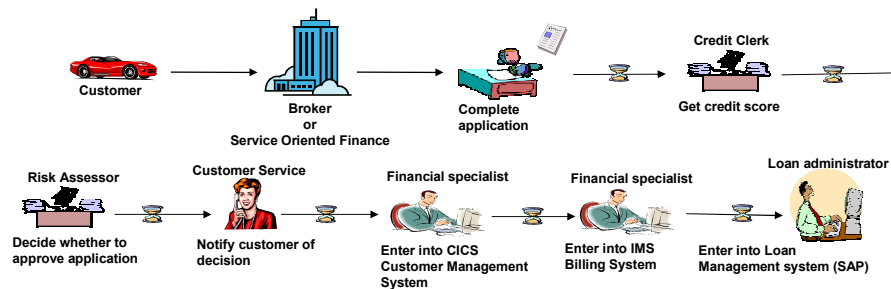


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## Current Process for New Car Loans



### Reasons current process isn't ready for increased amount of business:

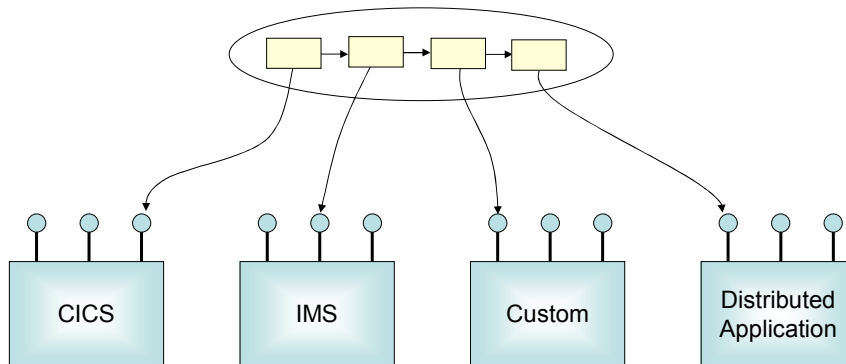
- Manual process won't scale
- Manual data entry results in errors
- Multiple manual steps makes it difficult to determine status of any particular loan request

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## Next Step to SOA

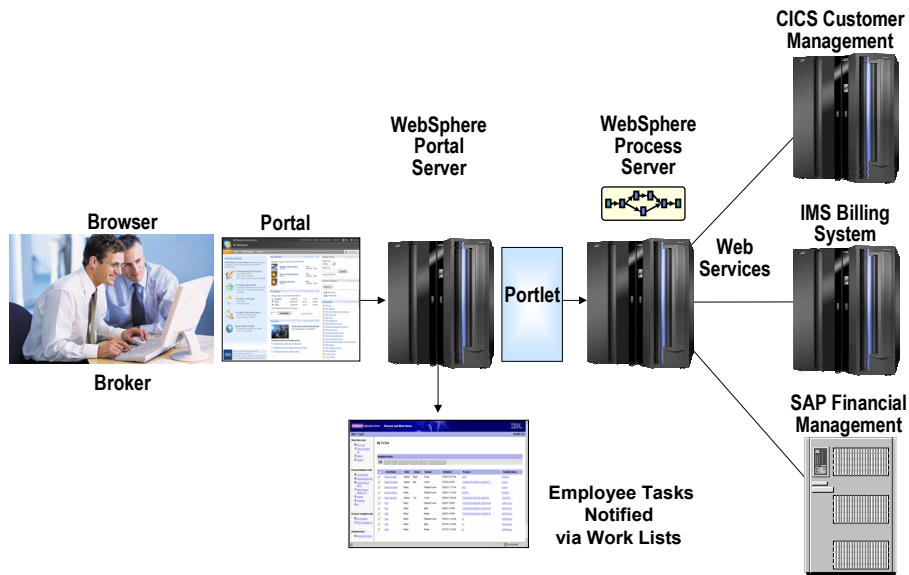
- Combine exposed services to innovate new cross-system business functions
- Use IBM Middleware to quickly implement next generation business process



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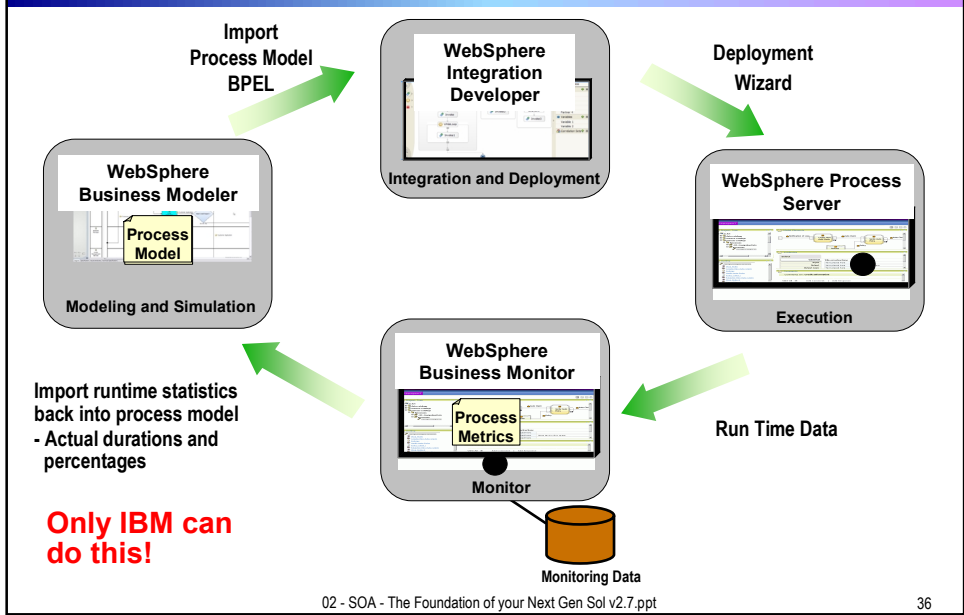
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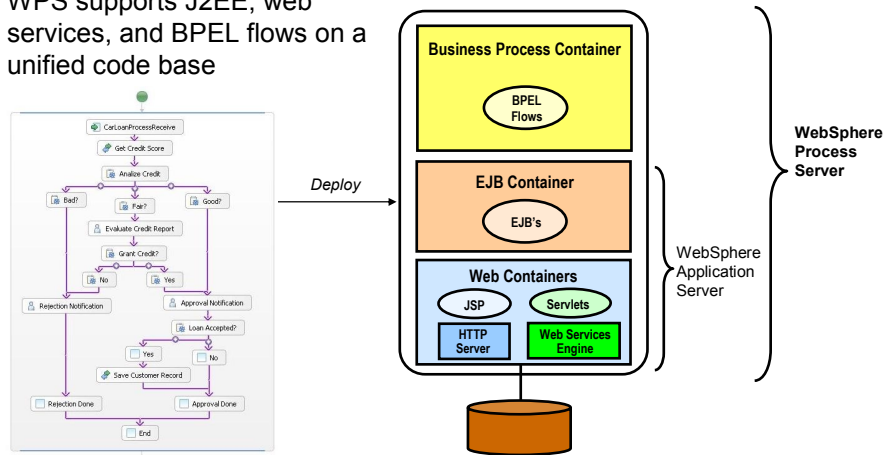
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# WebSphere Integrated Products for Business Process Management



# The Completed Process Runs on WebSphere Process Server (WPS)

- The completed BPEL process can be deployed easily to WPS
- WPS supports J2EE, web services, and BPEL flows on a unified code base



## Run the Process on System z

What platform should I use to run my Next Generation processes?



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System z is an ideal platform for your SOA infrastructure



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## Why SOA on System z?

### 1. Qualities of Service

- An effective SOA implementation requires very high Quality of Services (QoS) from the underlying environment
  - ▶ Continuous Availability/Disaster Recovery
  - ▶ Scalability and Clustering
  - ▶ Rock solid Security
  - ▶ Workload Management to handle peak demand
- *These are fundamental characteristics of System z, making it an ideal platform to deploy an SOA solution*
- IBM's core SOA framework runs on z/OS
  - ▶ WebSphere Application Server
  - ▶ WebSphere Process Server
  - ▶ WebSphere Portal Server
  - ▶ WebSphere Enterprise Service Bus

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## Why SOA on System z? 2. Co-location

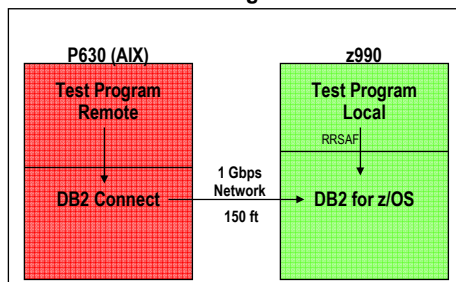
- Typically the mainframe already houses the core applications and data that provide a competitive advantage to the business
  - ▶ Quickly expose them as services, and continue the QoS the business depends on
  
- Having the Process Server and Enterprise Service Bus in close proximity to the assets they access provides better performance and throughput
  
- HiperSockets technology means less network overhead
  - ▶ Memory to memory communication

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## Consolidated Environments Maximize Throughput IBM study shows affects of network latency on SQL processing

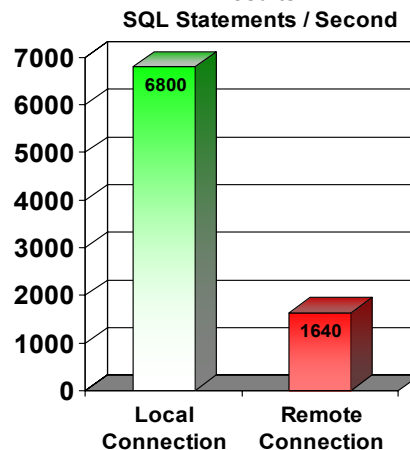
Test Configuration



### Why the big difference in SQL throughput?

- Elimination of network latency incurred by remote database connections increased SQL throughput **4x!**
- Hipersockets provide this benefit for consolidated applications on zLinux

Results:



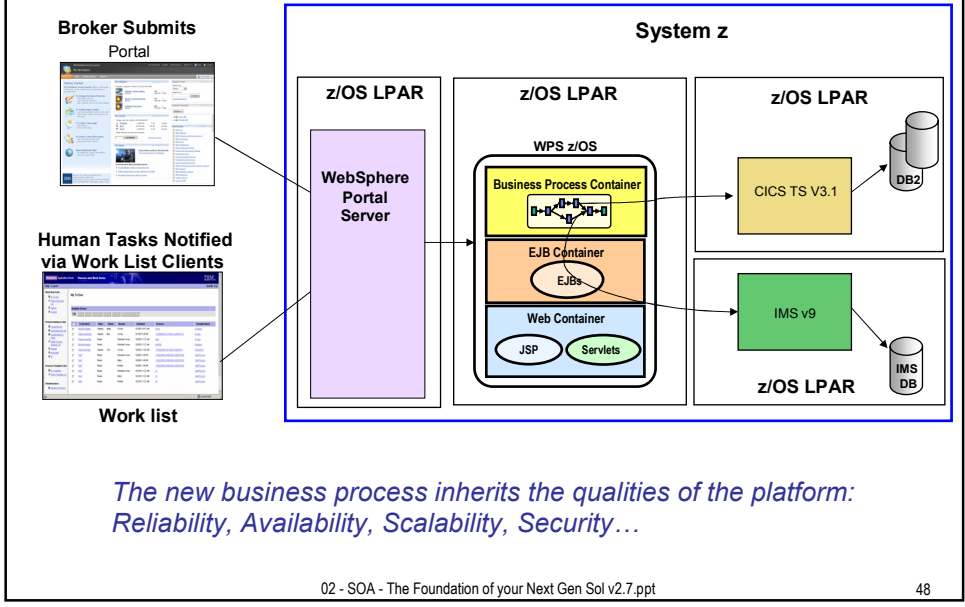
IBM Study: "Local versus Remote Database Access: A Performance Test", 2005

<http://publib-b.boulder.ibm.com/abstracts/redp4113.html>

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# Service Oriented Finance Runs its Next Generation SOA Solutions on System z



## Summary

Unlock the value of your System z assets using a Service Oriented Architecture.

System z is an ideal platform for implementing Next Generation SOA Solutions.



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