# Rapid ROI with Smart SOA
## *A Cost-Effective ESB Solution for Connecting Z*

Matt McLarty
Worldwide Technical Sales Manager
WebSphere Connectivity & DataPower

# The Permanence of System z

- **System z has an incomparable legacy**

- **Its core values have never been duplicated**

- **Usage of System z is increasing**

## *In a down economy, companies…*

- **…are less likely to undertake application migration projects**
- **…are looking for maximum platform stability and efficiency**
- **…have a lower risk tolerance in general**

### *Reality: System z is a mission critical fixture*

# Economic Conditions change IT Budgets

*Economic Upturns: Business drivers for projects focus on top-line growth and strategic investments*
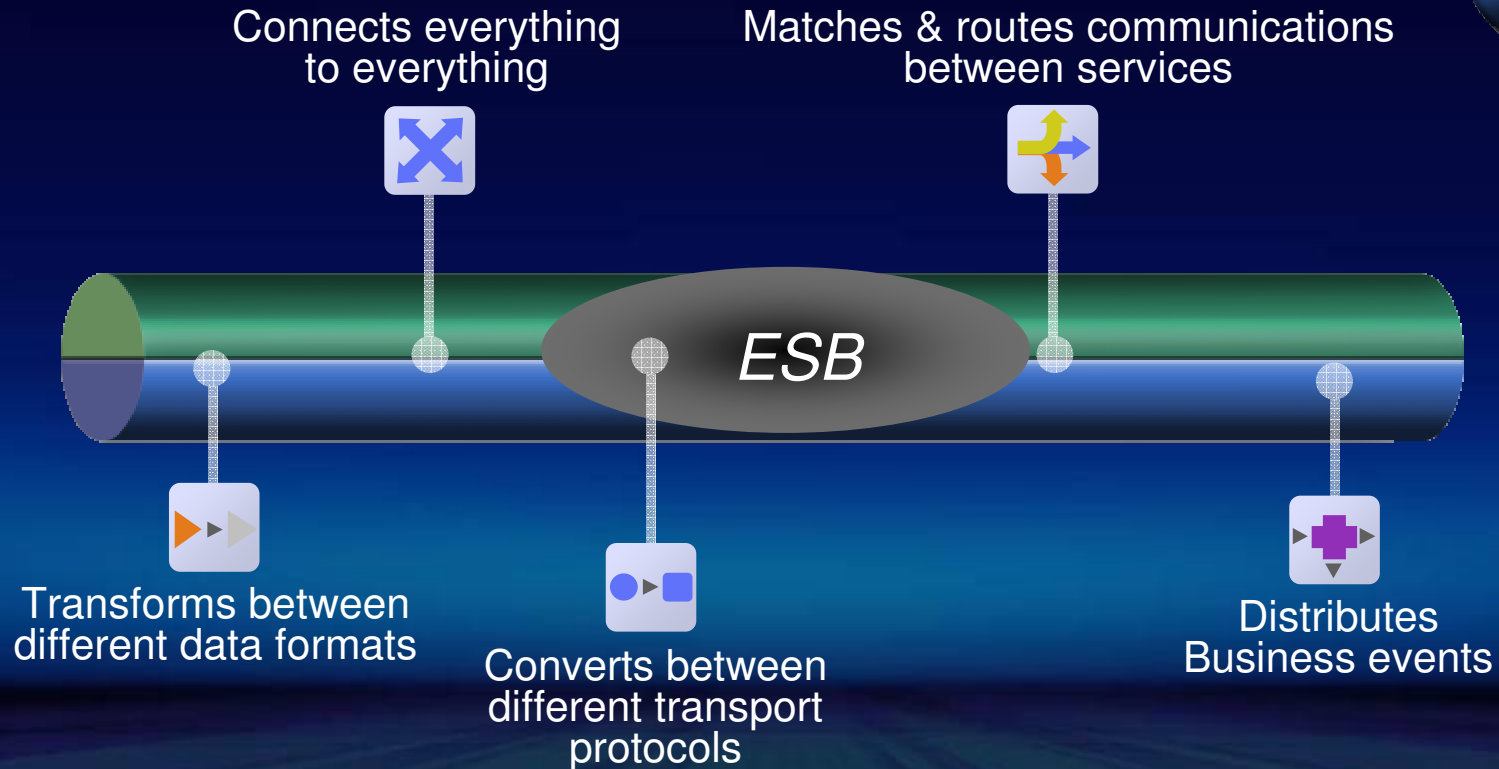
*Economic Downturns: Business drivers for projects focus on operational efficiency and compliance*

Ray Wang, principal analyst at Forrester Research

*Opportunity: ESBs address ALL economic climates*

# Agile Connectivity Begins with Integration
*The Enterprise Service Bus (ESB)*

Connects everything
to everything

Matches & routes communications
between services

ESB

Transforms between
different data formats

Converts between
different transport
protocols
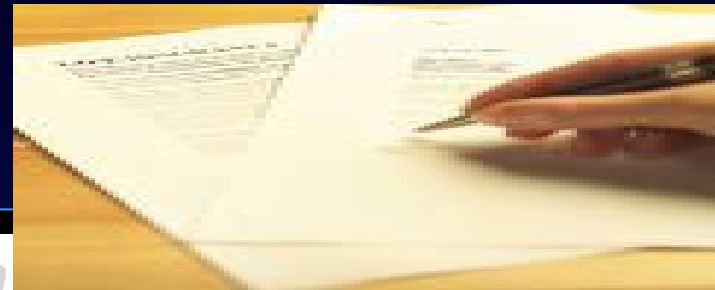
Distributes
Business events

*An ESB enables flexible SOA connectivity for integrating
business applications, services and processes **through re-use***

**Allows you to maximize the return on your existing IT investments!**

# ESB Messaging and Enrichment allows for Smart Work

Banks - move huge amounts of data dynamically responding to customer needs.

Insurance companies - move from batch claim processing to real-time processing to accelerate payment

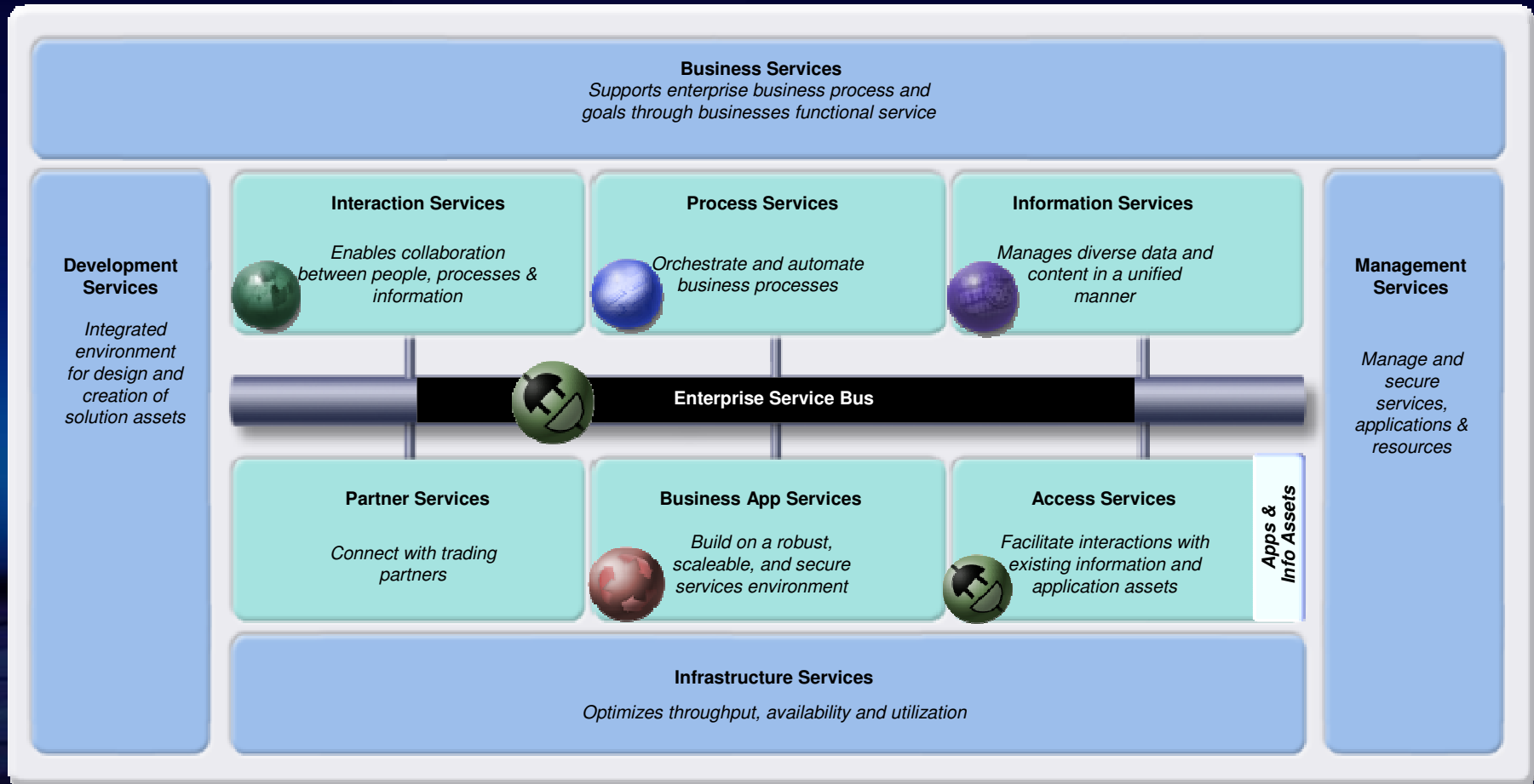Automobile manufacturers - get a better yield rate for car production

Airlines - gain operational efficiency and reduce Sabre transaction fees,

*ESB Messaging and Enrichment enables a Smarter Planet*

# ESB Messaging is core to your SOA environment
## *SOA Reference Architecture*

**Business Services**
*Supports enterprise business process and goals through businesses functional service*

**Development Services**

*Integrated environment for design and creation of solution assets*

**Interaction Services**

*Enables collaboration between people, processes & information*

**Process Services**

*Orchestrate and automate business processes*

**Information Services**

*Manages diverse data and content in a unified manner*

**Enterprise Service Bus**

**Partner Services**

*Connect with trading partners*

**Business App Services**

*Build on a robust, scaleable, and secure services environment*

**Access Services**

*Facilitate interactions with existing information and application assets*

*Apps & Info Assets*

**Management Services**

*Manage and secure services, applications & resources*

**Infrastructure Services**

*Optimizes throughput, availability and utilization*

# Key ESB Scenarios

- Create a Flexible Infrastructure to Support Change

- Extend the reach of existing applications

- Provide a Policy Enforcement Point for secure application connectivity

- Business Activity Monitoring and Event Intelligence

- Make an application inventory and governing processing with a registry

- Getting the most from Packaged Applications

- Combine File-based and On-line Processing

# A Choice of ESBs
## *Solutions to Meet Any and Every Demand*

**ESB offerings from IBM WebSphere**

Optimized with WebSphere Application server for an integrated SOA platform

Built for universal connectivity and transformation in heterogeneous IT environments

Purpose-built hardware for simplified deployment and hardened security

Service Enrichment

Messaging

# WebSphere DataPower Appliances

**Software**

**Assemble**

**Model**

**Deploy**

**Manage**

**Governance & Processes**

**Skills & Support**
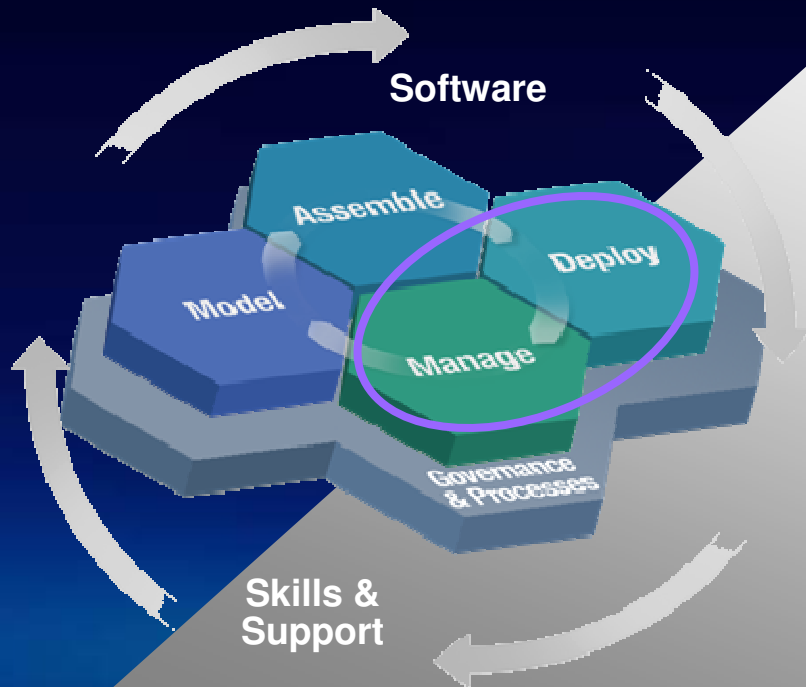
*A dedicated Appliance…*

**Creates customer value through connectivity, performance and security**

- **Simplifies** SOA and messaging. Accelerates time to value
- **Helps Secure** infrastructure and access points
- **Governs** and enforces runtime policies

WebSphere DataPower Appliances have a **low TCO**, and help customers **increase their ROI** with specialized, consumable, dedicated appliances that combine superior performance and hardened security.

# The Evolution of WebSphere DataPower SOA Appliances
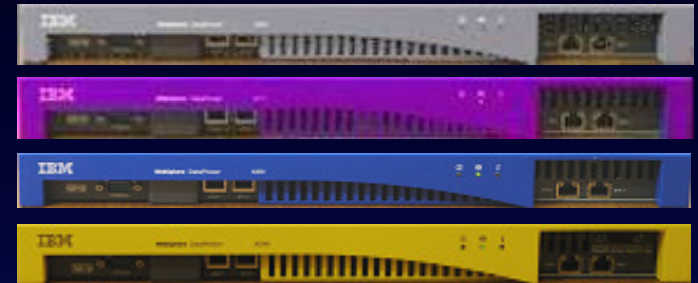
- **DataPower has a legacy of innovation**
  - Virtually created an industry (XML Appliances)
  - XA35 XML Accelerator (2001) was the first XML Appliance in the industry
  - XS40 XML Security Gateway (2002) has won numerous awards, including …
  - XI50 Integration Appliance (2005) is a unique Hardware ESB that has no competing products in the marketplace
- **DataPower shares the core values of System z**
  - Hardware reliability and availability (approximate 90,000 hour MTBF)
  - Wirespeed performance and exceptional scalability
  - Hardened security with industry certifications (FIPS 140-2, EAL4 evaluation)
- **DataPower usage is increasing rapidly**
  - Over 3000 appliances deployed, 100% year-over-year growth
  - Many of the world's largest companies are using DataPower for the delivery of their mission critical services

# DataPower and System z Synergies
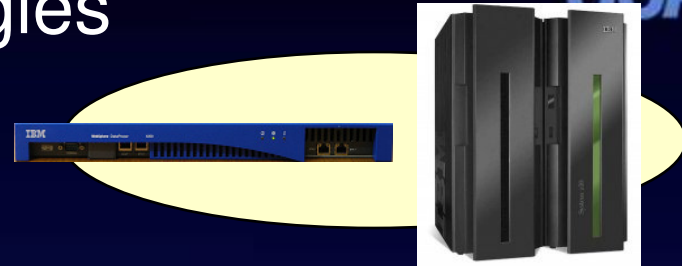
- **Those core values again…**
  - Allowing distributed access to z assets means that your SLA's will be subject to the "lowest common denominator" in the infrastructure
  - In other words, if your service relies on a distributed platform to integrate with z, your SLA is only as good as the availability of the distributed platform
  - Since DataPower shares the non-functional characteristics of System z, using DataPower to access z assets will not degrade the SLA's
- **The economies of scale…**
  - Due to their high scalability and mission critical design, the value propositions for both System z and DataPower increase with the size of the deployment
  - This is proven by real-life success stories
- **System z simplifies the data centre, DataPower simplifies SOA…**
  - Together, they give customers a competitive advantage in adopting SOA
  - DataPower's ease of configuration allows z-centric resources to become effective at using SOA concepts and technologies quickly

# IBM WebSphere DataPower Integration Appliance XI50

*Purpose-built hardware ESB for simplified deployment and hardened security*

- **Specialized hardware** that redefines the boundaries of middleware

- **Drop-in integration** for simplified deployment and ongoing management

- **Many functions** integrated into a single device

- **Continued Innovation:**
  - Delivers new security capabilities
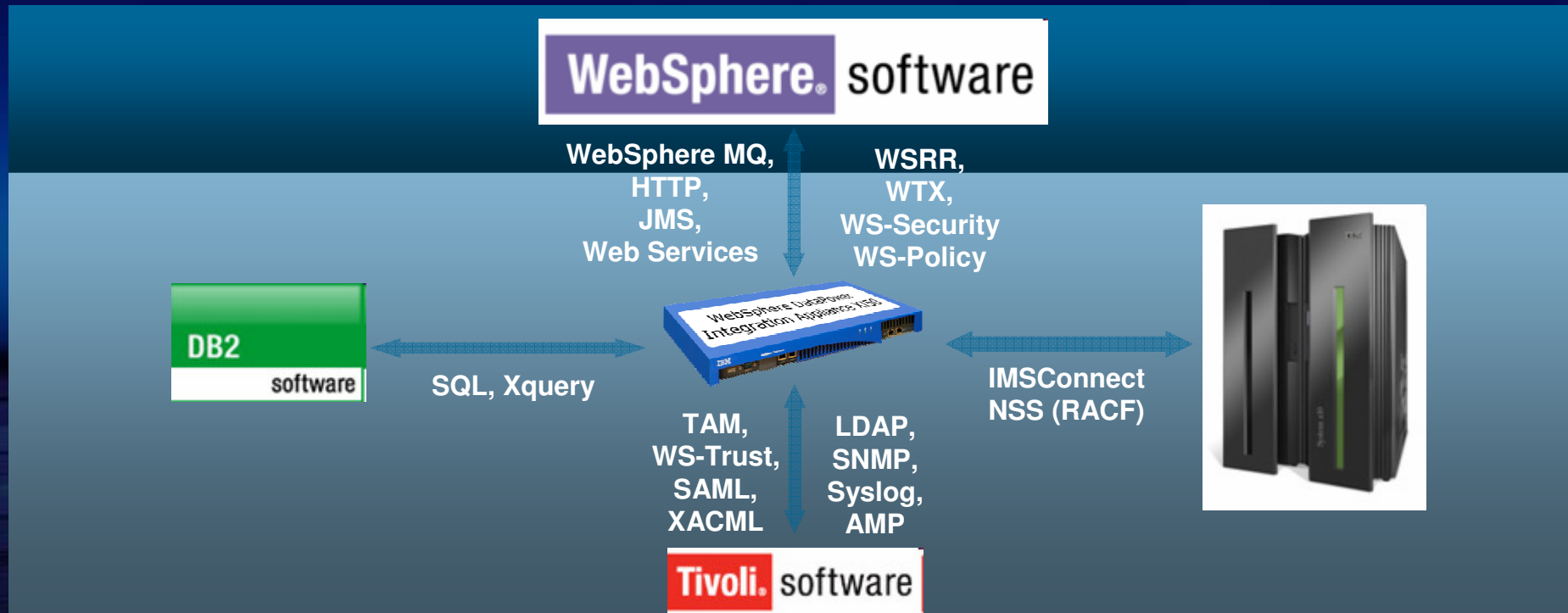  - Enhanced interoperability with IBM and 3rd party products
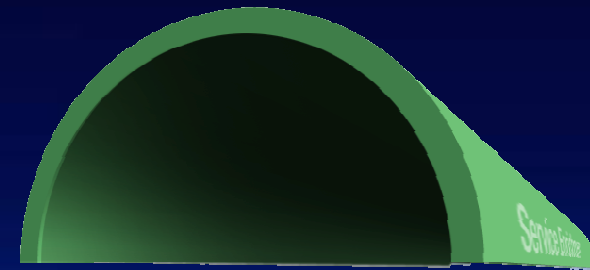
# Integration within the IBM Software Portfolio

- Mature integration within WebSphere software portfolio
  - *WebSphere MQ with WebSphere DataPower: 4+ years*
  - *Industry-leading SOA Runtime Governance with WSRR + DataPower*
  - *Limitless ESB: Support for WTX for data maps, WS-Security for WMB*
- Complete SOA Security and Management solution with Tivoli products
- Robust enterprise integration through native DB2 and IMSConnect

**WebSphere. software**

**WebSphere MQ, HTTP, JMS, Web Services**

**WSRR, WTX, WS-Security WS-Policy**

**DB2 software**

**SQL, Xquery**

**TAM, WS-Trust, SAML, XACML**

**LDAP, SNMP, Syslog, AMP**

**IMSConnect NSS (RACF)**

**Tivoli. software**

# Integration with Third Party vendors

- Standards-based integration with third party vendors
- Tight integration with some notable vendors
- No platform dependencies – hardware or software
- Exceptional interoperability through industry profiles and testing
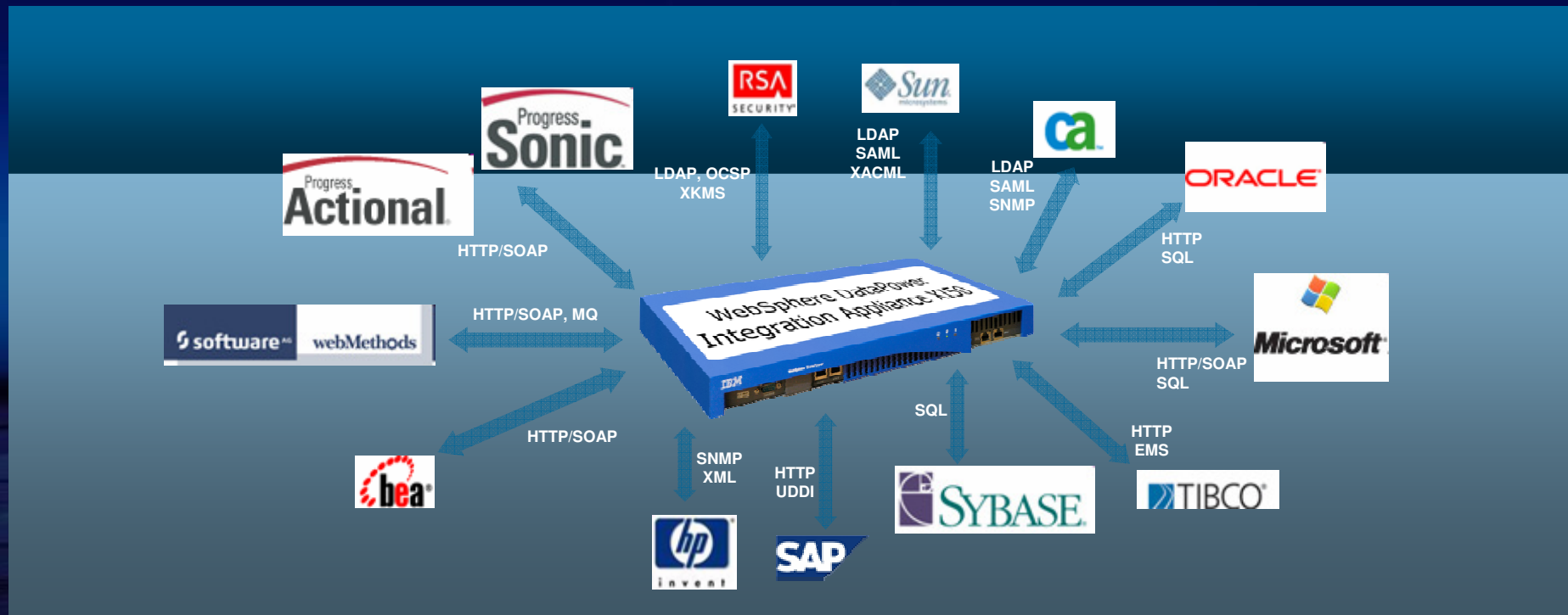
# Content-based Routing
*Select destination based on transaction metadata*

- **Dynamically determine route from transaction context and/or message content**
  - Analyze originating URL, protocol headers, transaction attributes, etc.
  - Analyze legacy or XML content
- **Leverage a routing table for real-time decisions**
  - Quickly deploy routing changes, including protocol conversions
- **Retrieve routing information from other systems**
  - E.g., databases, web servers, file servers, etc.

Routing Policy

Unclassified Requests

DB

Message enrichment

Service Providers

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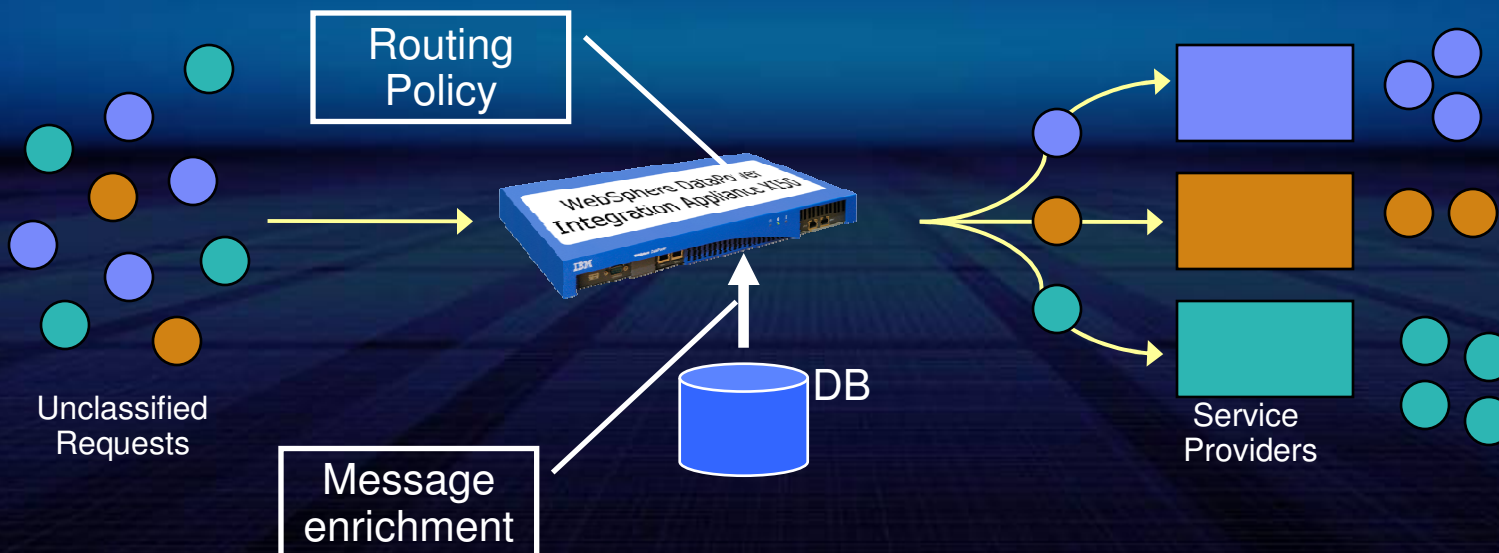
# Message Transformation
*"DataGlue" processes any-to-any transformations*

- **Transform between varying data formats (XML, Text, Binary, etc.)**
- **Use the same WebSphere TX mapping definitions in all IBM ESBs**
- **Message transformation promotes Smart SOA**
  - Exposes data across previously siloed systems
  - Simplifies reuse and connectivity of existing systems
  - Promotes loose coupling
- **Transformation of data on the wire enables integration without coding**



Input Message → WebSphere DataPower Integration Appliance XI50 → Output Message

? `<XML/>` `TEXT` `binary`

? `<XML/>` `TEXT` `binary`

# WebSphere Transformation Extender (WTX)

- **Comprehensive DataGlue Engine improvements**
  - Performance optimization
  - Support for multiple **WTX Map Modes**
  - New **DPA Map Type** for map files that were compiled in WTX using DataPower mode.

- **Compatibility with WTX Version 8.2**
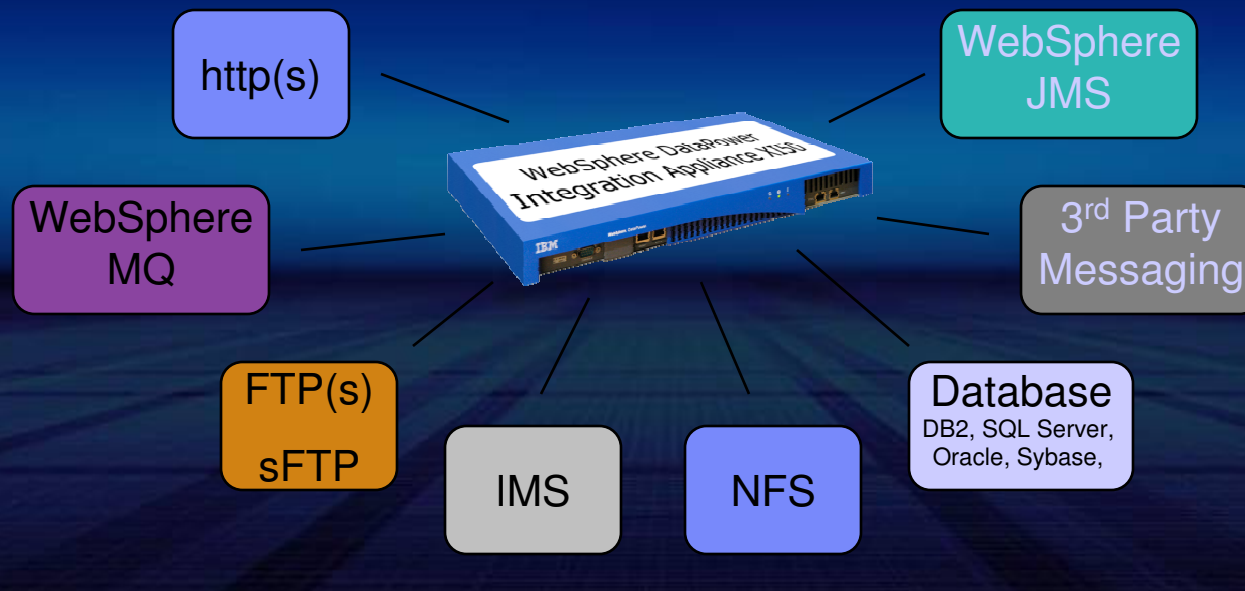  - Improved conformance and expanded capability in WTX Design Studio "DataPower Mode"

*New in 3.7.2*

WebSphere software

# Protocol Mediation
*Independently bridge inbound and outbound protocols*

- First-class support for message and transport protocol bridging
- Protocol mediation with simple configuration:
  - HTTP ←→ MQ ←→ WebSphere JMS ←→ FTP ←→ Tibco EMS
- Request-response and sync-async matching
- Configurable for fully guaranteed, once-and-only-once delivery

http(s)

WebSphere JMS

WebSphere MQ

WebSphere DataPower Integration Appliance XI50

3rd Party Messaging

FTP(s) sFTP

IMS

NFS

Database
DB2, SQL Server, Oracle, Sybase,

DB2
Oracle
Sybase

# WMQ/System z Integration: SOA Gateway

- **Web Services enablement and security for CICS and IMS applications**
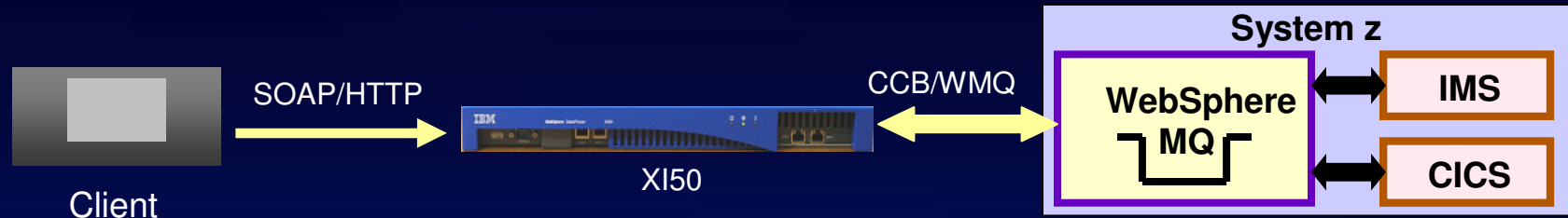


- **DataPower XI50 acts as a services gateway to z-based applications**
  - Web Services and XML security
  - Web Services management and service level agreements
  - Tight integration with WebSphere MQ on Z for connectivity and reliability
  - Any-to-any transformation (e.g. SOAP/XML to Cobol Copy Book) for simplified legacy integration
  - Protocol mediation and bridging – variety of inbound/outbound protocols – HTTP, HTTPS, MQ, WAS JMS, Tibco EMS, FTP, FTP/SSL, NFS, Database
  - Easy Configuration & Management:
    - WebGUI, CLI, IDE and Eclipse configuration to address broad organizational needs (Architects, Developers, Network Operations, Security)

# DataPower System z Integration: Web Service Proxy

- **Web Services Security and Management for CICS and IMS web services**



Client — SOAP/HTTP(S) → IBM DataPower — SOAP/HTTP ↔ System z (IMS SOAP Gateway, CICS Web Services)

- **DataPower XI50 acts as a proxy between Web Service consumers and CICS/IMS Web Service Providers**
  - Web Services and XML security
  - Web Services management and service level agreements
  - SOA Runtime Governance through WSRR/UDDI and ITCAM for SOA integration
  - XML-to-XML transformation loose coupling data formats
  - SSL Termination
  - Easy Configuration & Management:
    - WebGUI, CLI, IDE and Eclipse configuration to address broad organizational needs (Architects, Developers, Network Operations, Security)

# DataPower and IMS Integration: SOA Gateway

- Remove MQ requirement of WS-enablement of IMS
  - IMS has few alternatives (IMS SOAP Gateway is an entry-level solution)
- Implement an "IMS Connect Client" on DataPower that natively connects to IMS Connect using its custom request/response protocol w/ well-defined header structure
  - Highly consumable for the common case
  - Highly extensible and integrates well with DataPower model
  - Accepts output from a mapping mediation
    - (e.g. SOAP-to-Cobol copybook)
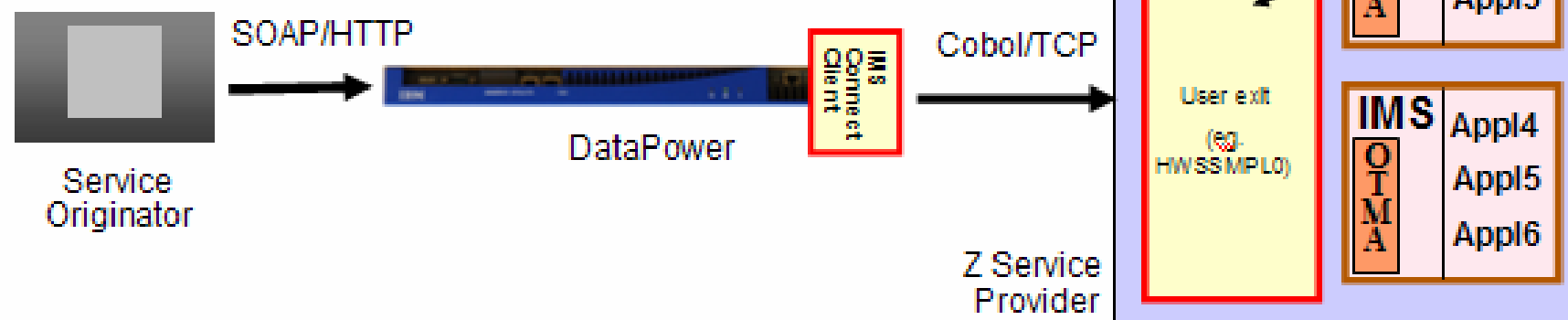
# IMS Connect Configuration in the XI50

**IMS Connect Handler**

Apply  Cancel

| | | |
|---|---|---|
| Name | | * |
| Admin State | ◉ enabled ○ disabled | |
| Comments | | |
| Local IP Address | 0.0.0.0 | Select Alias  * |
| Port Number | 3000 | * |
| SSL Proxy | (none)  ▼ + | |
| Persistent Connections | ◉ on ○ off | |
| EBCDIC Input Header Encoding | ○ on ◉ off | |
| Access Control List | (none) ▼ + ... | |

IMS Connect Front Side Protocol Handler for accepting IMS-based client requests passing through a MultiProtocol Gateway

**Configure IMS Connect**

Main    Default Headers

IMS Connect

Apply  Cancel

| | | |
|---|---|---|
| Name | | * |
| Admin State | ◉ enabled ○ disabled | |
| Comments | | |
| Host | | |
| Port | | |
| EBCDIC Header Conversion | ○ on ◉ off | |
| Generate Client ID Prefix | | |

IMS Connect object for basic connection configuration values. Note Default Header tab for critical connection values.

**Back side settings**

Backend URL

http://9.33.97.170:8080  *

MQHelper   TibcoEMSHelper
WebSphereJMSHelper   IMSConnectHelper

**User Agent settings**

Match            Property

https://9.33.97.170:9090 - URL Builder - Micr...

**DATAPOWER | URL Builder**

**Build an IMS Connect URL**

IMSConnect Config:
[none] ▼ + ...  *

Transaction Name:

Data Store ID:

Build URL

MPGW IMS Destination URL with URL Builder help.  Uses IMS Connect object.

# DataPower for DB2 on System z

- **Simply, secure and accelerate Web Services processing**
- **Helps establish DB2 on z as the data hub for the enterprise**
- **Compute cycle intensive XML and security-related processing (especially re Crypto)**
- **Additional processing capabilities: XML firewalling and threat protection, web services management , service level management, protocol bridging**
- **Appliance model: improved consumability**
- **High performance Web Services processing and mapping to SQL/CALL**
- **DataPower communicates with DB2 via DRDA**
- **DB2 and DataPower tooling support**

**Web Services Consumers**

**DataPower DB2 WebServices Appliance**

WebSphere DataPower
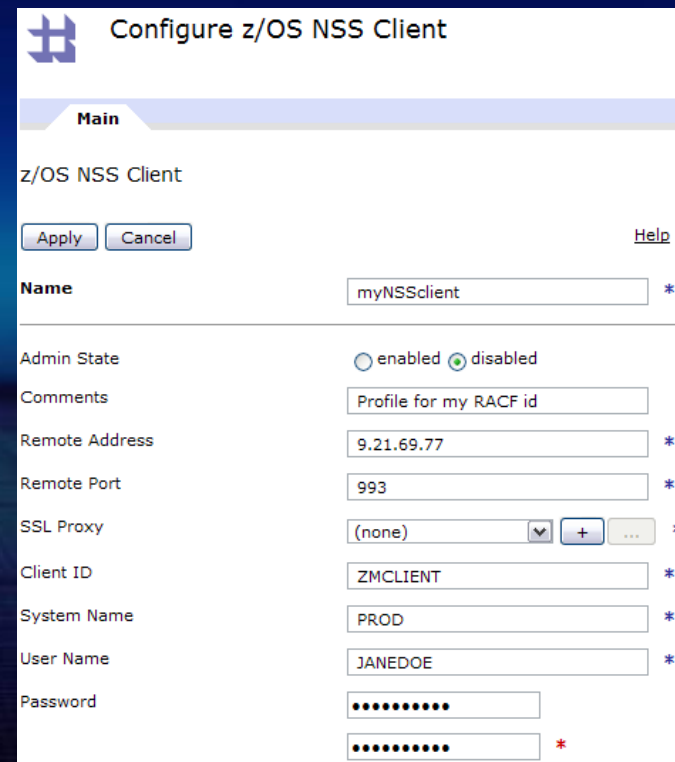Integration Appliance X150

IBM

**SOAP/REST**

**DRDA**

**DB2 on z**

# RACF Support

- RACF (Resource Access Control Facility) is a security system that provides access control and auditing functionality for the z/OS and z/VM operation systems.
- DataPower version 3.7.2 includes adds support for RACF, the IBM implementation of the Security Authorization Facility (SAF). RACF provides authentication and authorization through z/OS® Network Security Services (NSS).
  - RACF authentication is available using:
    - AAA policy
    - Extension functions
    - RBM
  - RACF authorization is available using:
    - AAA policy
    - Extension functions
  - Firmware 3.7.2 is compatible with:
    - z/OS Communications Server, V1R10

Configure z/OS NSS Client

**Main**

z/OS NSS Client

Apply    Cancel                                         Help

**Name**                    myNSSclient                    *

Admin State                 ○ enabled ⦿ disabled
Comments                    Profile for my RACF id
Remote Address              9.21.69.77                     *
Remote Port                 993                            *
SSL Proxy                   (none)              ▼  + ...   *
Client ID                   ZMCLIENT                       *
System Name                 PROD                           *
User Name                   JANEDOE                        *
Password                    ●●●●●●●●●●●
                            ●●●●●●●●●●●          *

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# DataPower and Message Broker on System z



- **Exploit DataPower for Web Services security**
  - Single tool and security policy description
  - Security best practices
  - Built-in service level management
  - Scale as volumes increase
- **Administration User Experience**
  - Operational reconfiguration only
  - Applications and Message Flows unchanged
  - DataPower now performs WS-Security processing and forwards processed request to WMB
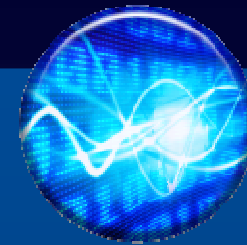
# WebSphere DataPower XI50's continued success

**Smart SOA**

Service Enrichment
Messaging

*Financial Services*

*Government*

- Deployed by numerous government agencies at the federal, state, and municipal level in the US and abroad

*"IBM definitely offered a performance and scalability capability that was far superior to anything else we had. The different protocols that it could handle with respect to connectivity made the DataPower appliance a leader in that space."*

Director of Integration Services, International Bank

# International Investment Firm
## *Web Services Gateway and ESB*

### Challenge

- 1) Replace existing ESB/RR Bus & 2) New Web services security for internal and external applications
- Current homegrown ESB (Called RR Bus) had become unmanageable. Had 22 servers in production with the expectation of growing to 44 by end of 2007
- Increased load expected though 2007-2008 as Internet traffic moves to the RR Bus infrastructure

### Solution

- Implemented WebSphere DataPower Integration Appliance XI50 and WebSphere DataPower XML Security Gateway XS40.
- RR Bus – 4 DataPower XI50 Integration appliances replaced 22 existing servers
- Web Services Security – 2 DataPower XS40 XML Security Gateway Appliances to provide standards base web services security for Internet and intranet applications

### Benefits

- Simplification of the home grown routing solution – easier to support and maintain 4 appliances vs. 22 servers
- Proved real ROI with break even mid way through year one
- Real time routing of transactions to mainframe
- Offered new service to customers: Web Services Security
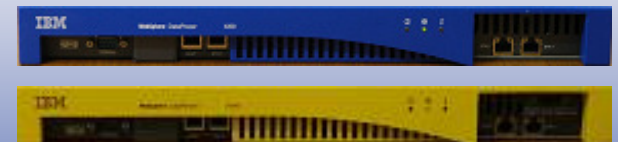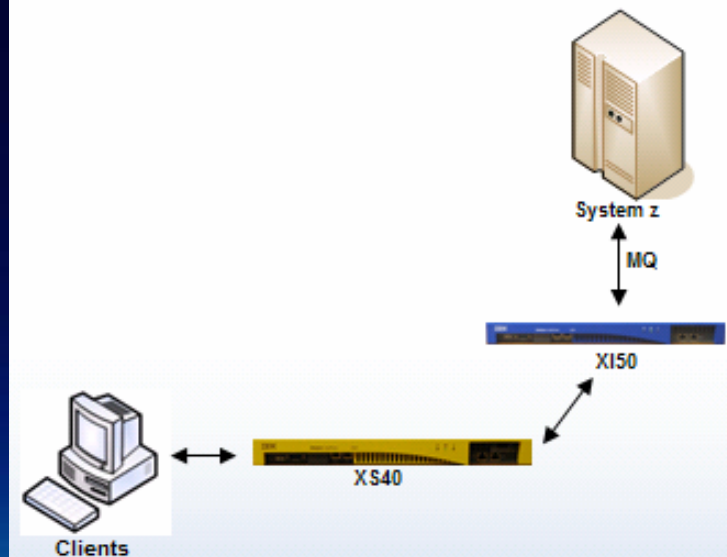


- **WebSphere DataPower Integration Appliance XI50**
- **WebSphere DataPower XML Security Gateway XS40**
- **WebSphere MQ**

# International Insurer
## *Secure SOA Integration of Web Services and Legacy Systems*
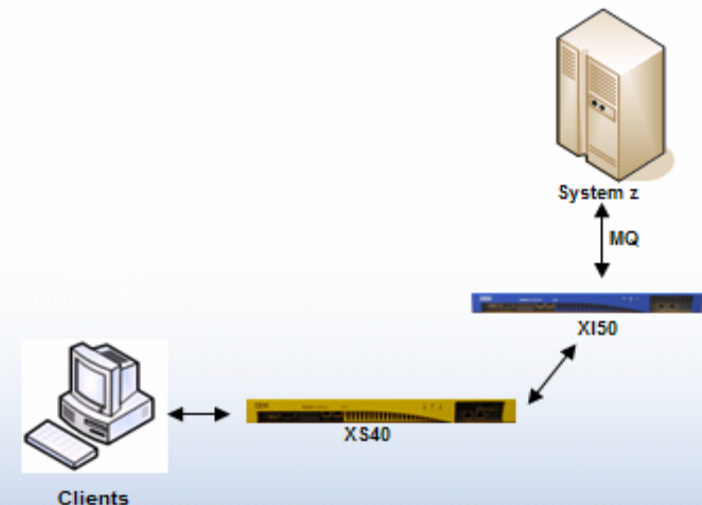
### Challenge
- Implementing an SOA to share mission-critical applications with affiliated offices & direct customers opens numerous vulnerabilities if not properly secured
- Security method based on SSL encryption contained security flaws that exposed unauthorized external access & XML threats

### Solution
- Implemented WebSphere DataPower Integration Appliance XI50 performing as an ESB for simple orchestration, transformation & routing of XML messages to WebSphere MQ
- Implemented WebSphere DataPower XML Security Gateway XS40 to increase the security XML Web services transactions.

### Benefits
- Substantially increased security of SOA without causing any throughput issues
- Cost savings by reducing size of existing application server farm

- **WebSphere DataPower Integration Appliance XI50**
- **WebSphere DataPower XML Security Gateway XS40**
- **WebSphere MQ**

# Regional Retail Bank
## ESB Infrastructure in a Heterogeneous Environment

### Challenge

- Introducing SOA capabilities
- Enhancing current heterogeneous IT infrastructure
- Existing point-to-point home built solution connected enterprise web applications via WebSphere Message Broker

### Solution

- Implemented WebSphere DataPower Integration Appliance XI50 for message routing, transformation, logging and security
- WebSphere Message Broker used as z-based Service Bus
- Use WebSphere Transformation eXtender for any-to-any data mapping

### Benefits

- Enabled quicker time to value for business initiatives
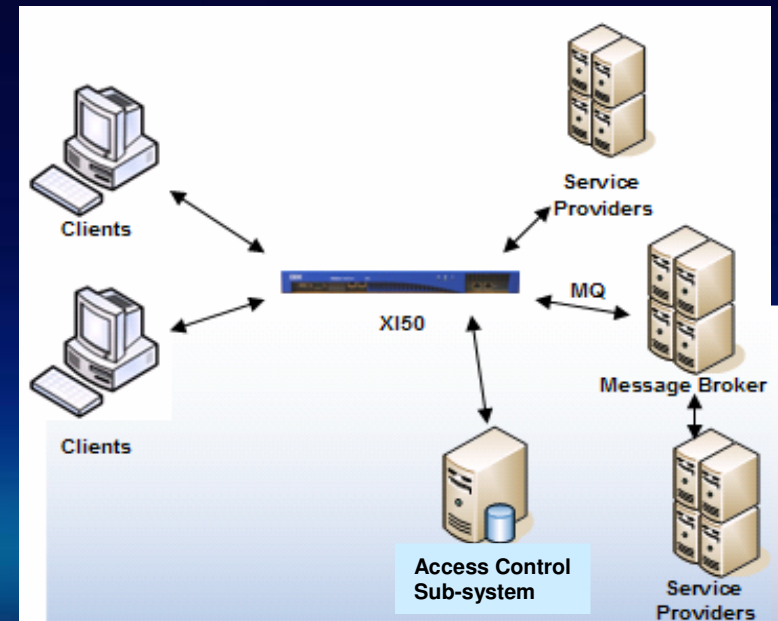


- **WebSphere DataPower Integration Appliance XI50**
- **WebSphere MQ**
- **WebSphere Message Broker**

# Summary

- **The ESB value proposition and System z are both well-suited to the current economic climate**

- **SOA and ESB adoption can deliver quick wins**

- **WebSphere DataPower SOA Appliances offer good synergies with System z**

- **DataPower appliances combined with System z have a track record of providing customers with rapid ROI and strategic success**

# Need more information?

- **IBM Product Websites**
  ibm.com/software/websphere/products/appintegration/
  http://www-
  01.ibm.com/software/integration/datapower/library/data_sh
  .html

- **IBM WebSphere DataPower SOA Appliances**
  http://www-
  01.ibm.com/software/integration/datapower/index.html
  http://www-01.ibm.com/software/integration/datapower/xi5
  http://www-01.ibm.com/software/integration/datapower/library/data_sheets.htm

- **Developerworks**
  IBM.com/developerworks

- **Redbooks**
  redbooks.IBM.com

- **Proofs of Technology**

Let's Build a Smarter Planet