Which ESB on System z?

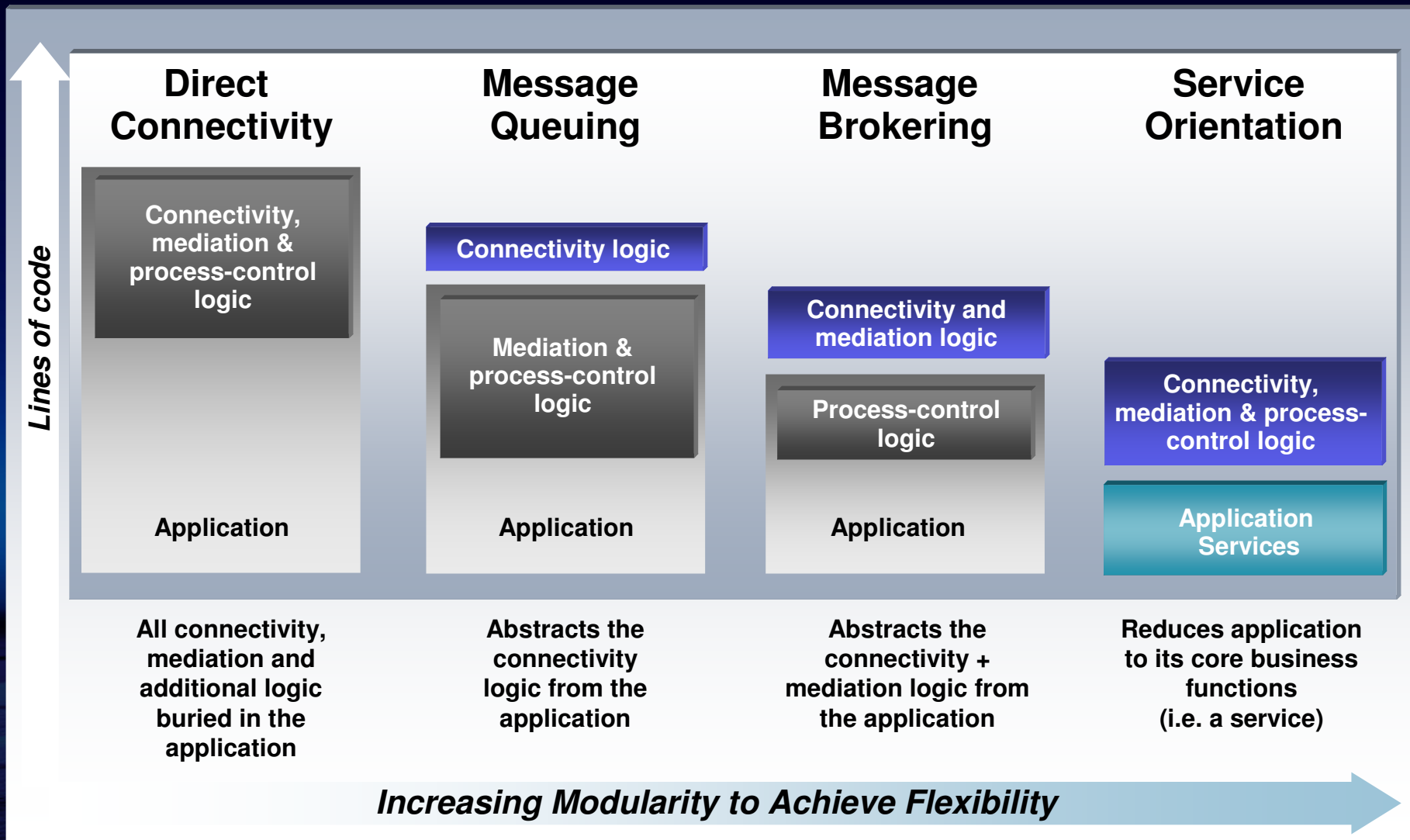
IBM ESB Product Overview

Chris Vavra, Product Manager, WebSphere ESB
Mark Verplaetse, Product Manager, WebSphere Message Broker
Gari Singh, Product Manager, WebSphere DataPower SOA Appliances

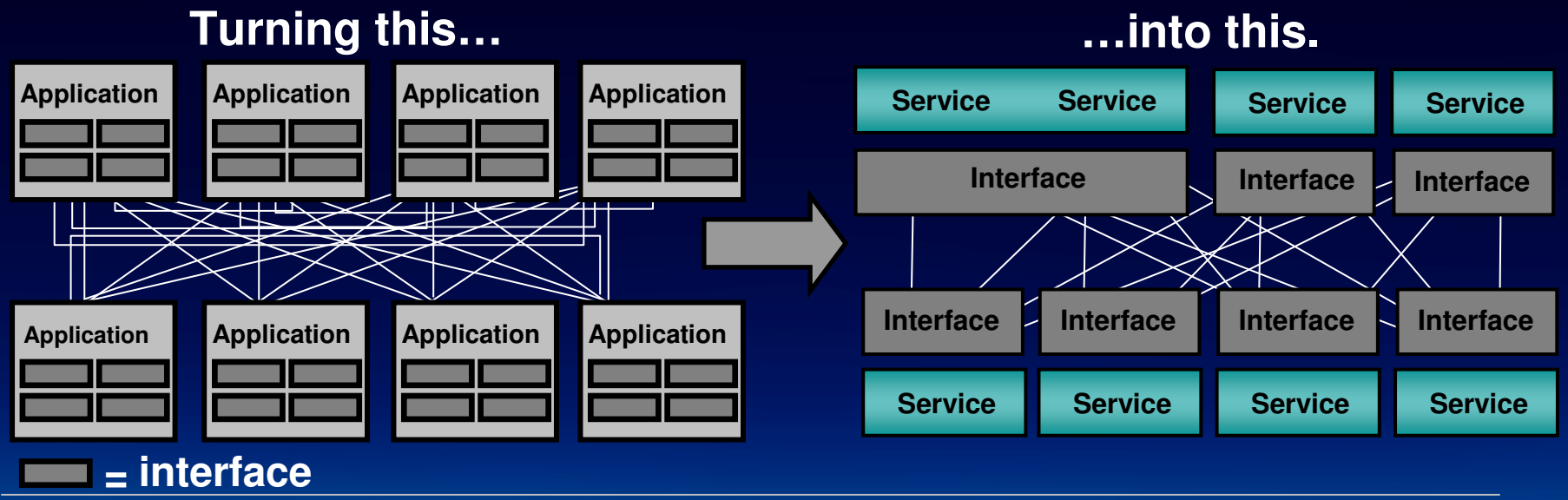
Overview

- Why an ESB?
- Why IBM?
- WebSphere Enterprise Service Bus
- WebSphere Message Broker
- WebSphere DataPower Integration Appliance XI50
- Q&A

SOA is an Evolution of the Connectivity Challenge



SOA – on its own – can simplify interfaces…

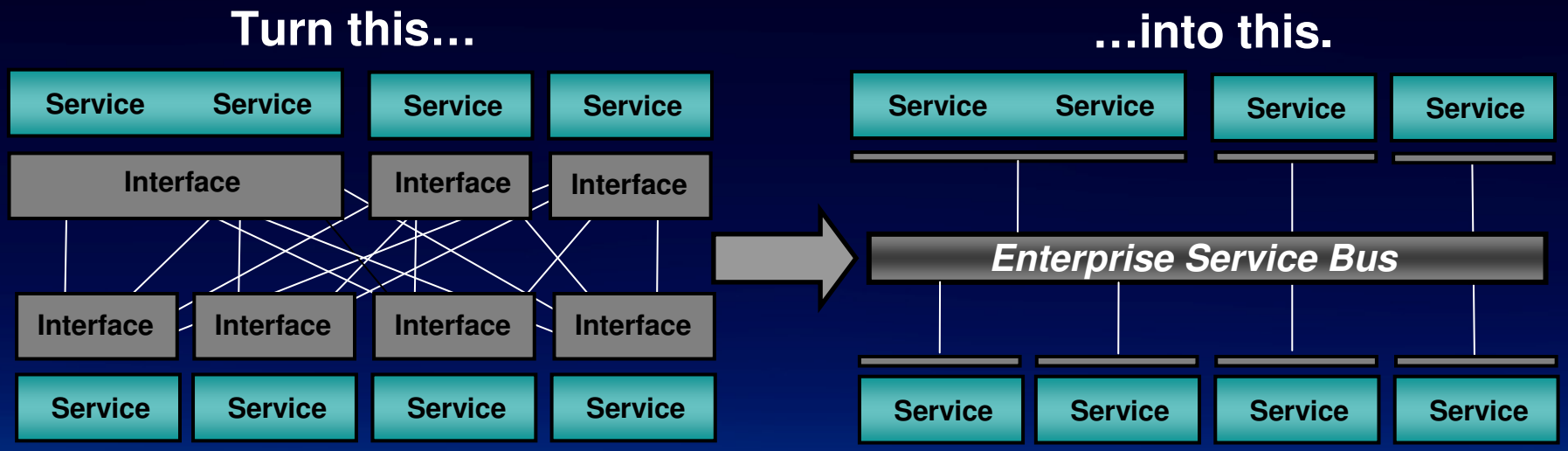


SOA:

- ✓ Introduces rich business abstractions to describe the application interface.
- ✓ Decouples the interfaces from the business applications.
- ✓ Reduces the number and technical complexity of interfaces.
- ✓ Enables re-use of both the business applications and their interfaces.

…but you still need to know what service to connect to, where it is, how to connect to it, and how to interpret it.

…but to get value from SOA you need an ESB.



The ESB:

- ✓ Connects you to the appropriate service without requiring a unique connection.
- ✓ Communicates using the appropriate protocols.
- ✓ Customizes the communications so that the target application understands.
- ✓ Logs and manages the interaction and correlates events.

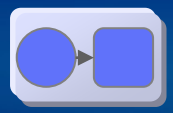
The ESB → Virtualizes access to those services.

The Enterprise Service Bus

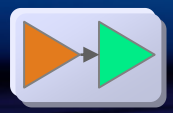
An Enterprise Service Bus (ESB) is a flexible connectivity infrastructure for integrating applications and services.

An ESB performs the following between requestor and service

MATCHES & ROUTES
communications between services



CONVERTS
between different transport protocols



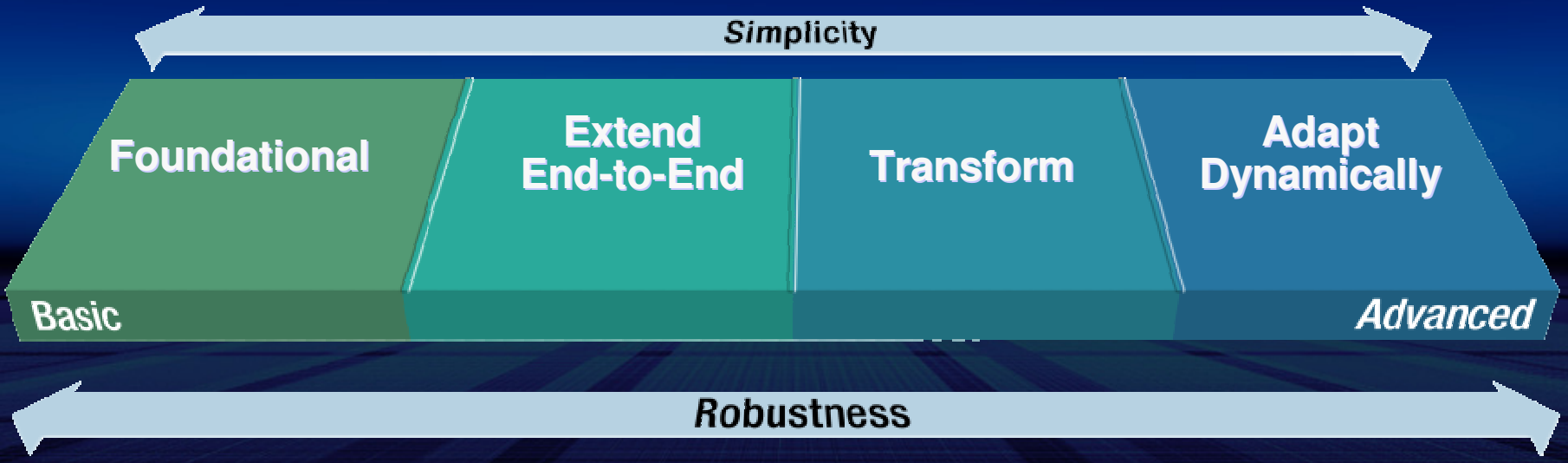
TRANSFORMS
between different data formats

IDENTIFIES & DISTRIBUTES
business events

Shape = Transport protocol
Color = Data format

IBM Delivers . . . a Smart Approach to SOA Adoption

Aligning service-oriented approaches

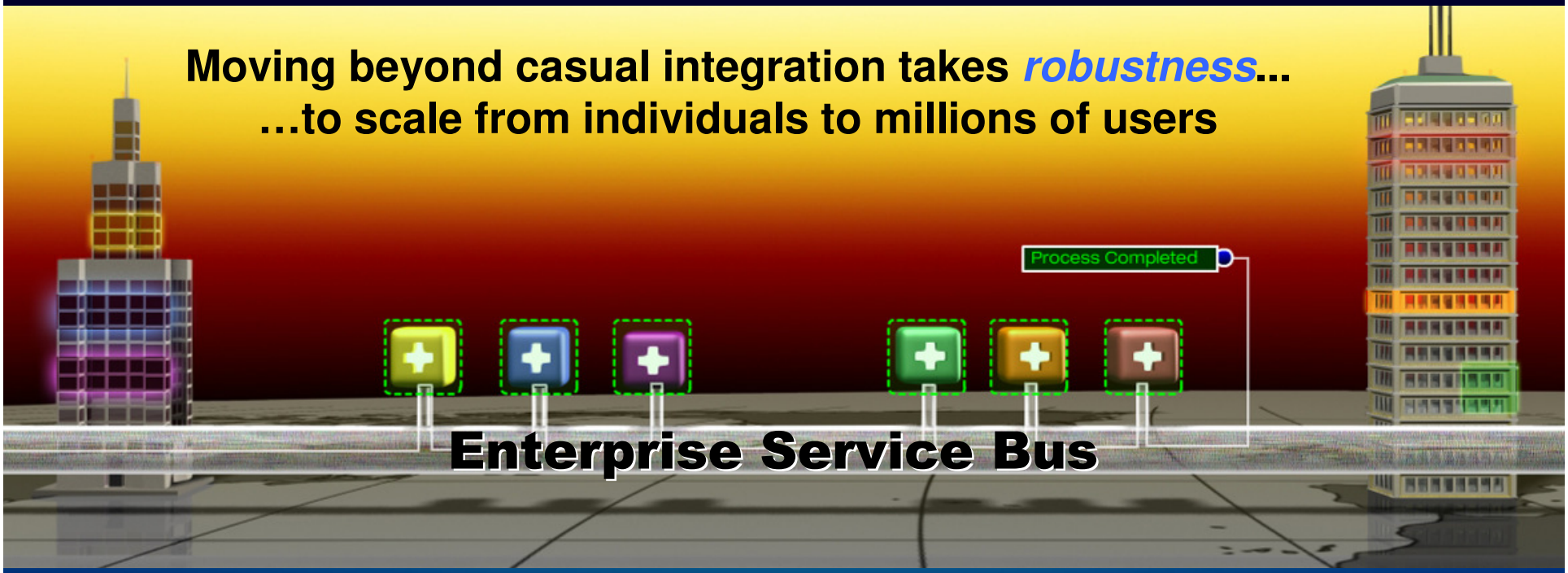


A set of guiding principles to help extend the business value of deployments

IBM ESB – Process Integrity In Action

ESB enables end-to-end business processes on a global scale

Smart SOA



Major European Telecom
14,000 service calls/min
100,000 completed orders/day

Leading North American Banks
All ATM & Treasury transactions
USD Billons per month

Leading Payroll Administrator
Core enrollment and processing

Major Online/Mail-Order Pharmacy
Notifications and orders
Handles monthly surges

Major US Financial Institution
Critical system on Unix
Very fast response times
13 million transactions/day, Peak 425/sec

Major Credit Card Processor
Peak >2 million transactions/hour
>10 million transactions/day

IBM ESB – Process Integrity In Action

ESB enhances the quality of service for service interactions

- **Service virtualization / pooling** – routes across multiple services to support horizontal scaling
- **Service prioritization** – allocates processing to critical transactions and users
- **Service throttling** – limits load to critical services
- **Event sequencing** – ensures proper ordering of interdependent events
- **Service retry / failover** – helps ensure client requests are fulfilled even if services are temporarily unavailable
- **SLA optimization and enforcement** – used together with service management and service registry solution, selects best available service, and identifies threshold breaches and takes corrective action

IBM ESB – Connect Everything

Leading breadth and depth of connectivity

SOAP, WSDL, WS-I Basic Profile, WS-I Basic Security Profile, WS-I Reliable Secure Profile, WS-Security, WS-Notification, WS-BaseNotification, WS-R…tion, WS-ReliableMessaging, WS-Addressing, WS-BusinessActivity, WS-AtomicTransaction, WS… Conversation, MTOM, XOP, SOAP w/Attachments, UDDI, WSD… RC, JAX-WS, J… S-Trust, SAML, X… AP, SWIFTNet FIN, SV… FIX, EDIFACT, X12, TRADACOMS, ODE… , NCPDP, EANCO… Rendezvous, Microsoft MQ (MSMQ), Tele… e, Multicast, File, FTP, TCP/… OP3, IMAP, HTTP, JDBC, OD… IOP, RMI/IIOP, XML, XSD, DTD, Tagged, Delimited, CSV, Fixed-length, COBOL Copybook, C header, J… C++, .Net/C#, COM/DCOM, MS Visual Basic, Assembler, LotusScript, Oracle PL/SQL, PL/1, REXX, RP… dem TAL, AppleTalk, DECNet, NetBios, SNA/LU6.2, SP… /DB, IMS/TM, 3270, SAG-Adabas, CA-IDMS, CA-Datacom, VSAM, Sequential Files, PDS, 5250, ILE a… S), DB2, Oracle, SQL Server, Sybase, Informix, MySQL, SAP… ss Suite, Siebel Busine… DEdwards En… esoft, Amdocs CRM, Amdoc… , Baan, Broadvision, Business Objects, Clarify Clea… ect:Direct, eTimeMachine, Doc… mingbird DM, i2, Intentia Movex, JD Edwards World, Kalix, … Lawson, LiveLink, MediTech, QAD MFG/PRO, Manugistics, Microsoft CRM, Microsoft Exchange, Passport, PragmaCAD, P3e Primavera, Remedy, Retek (Oracle), Tumbleweed

Web Services Standards

WebSphere Adapters for Enteprise Applications

WebSphere TX for Industry Formats

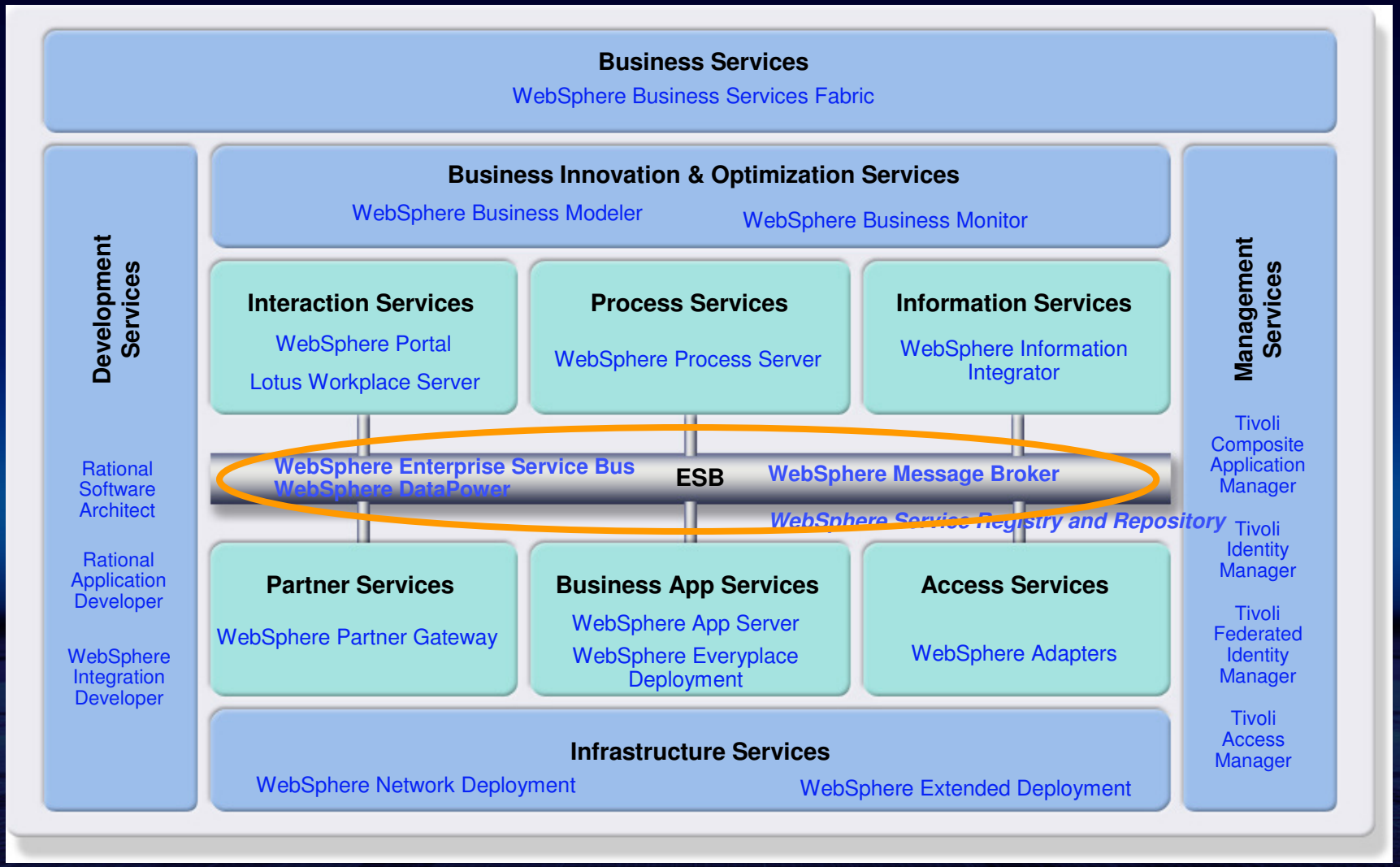
Mainframe Connectivity

Transport Protocols

Data Formats

Partner Adapters

SOA and BPM Platform

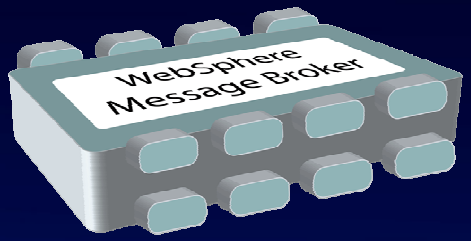


ESB offerings from IBM WebSphere

WebSphere delivers the most complete ESB solution

WebSphere ESB

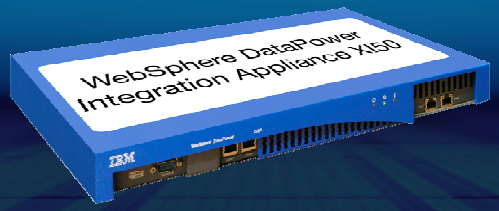
Built on WebSphere Application Server for an integrated SOA platform



WebSphere Message Broker

Built for universal connectivity and transformation in heterogeneous IT environments

ESB offerings from IBM WebSphere



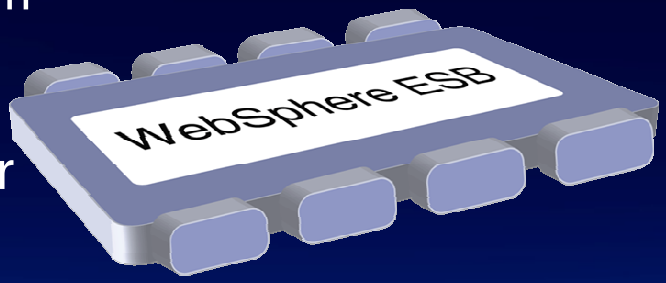
WebSphere DataPower Integration Appliance

Purpose-built hardware ESB for simplified deployment and hardened security

WebSphere ESB

Built on WebSphere Application Server for an integrated SOA platform

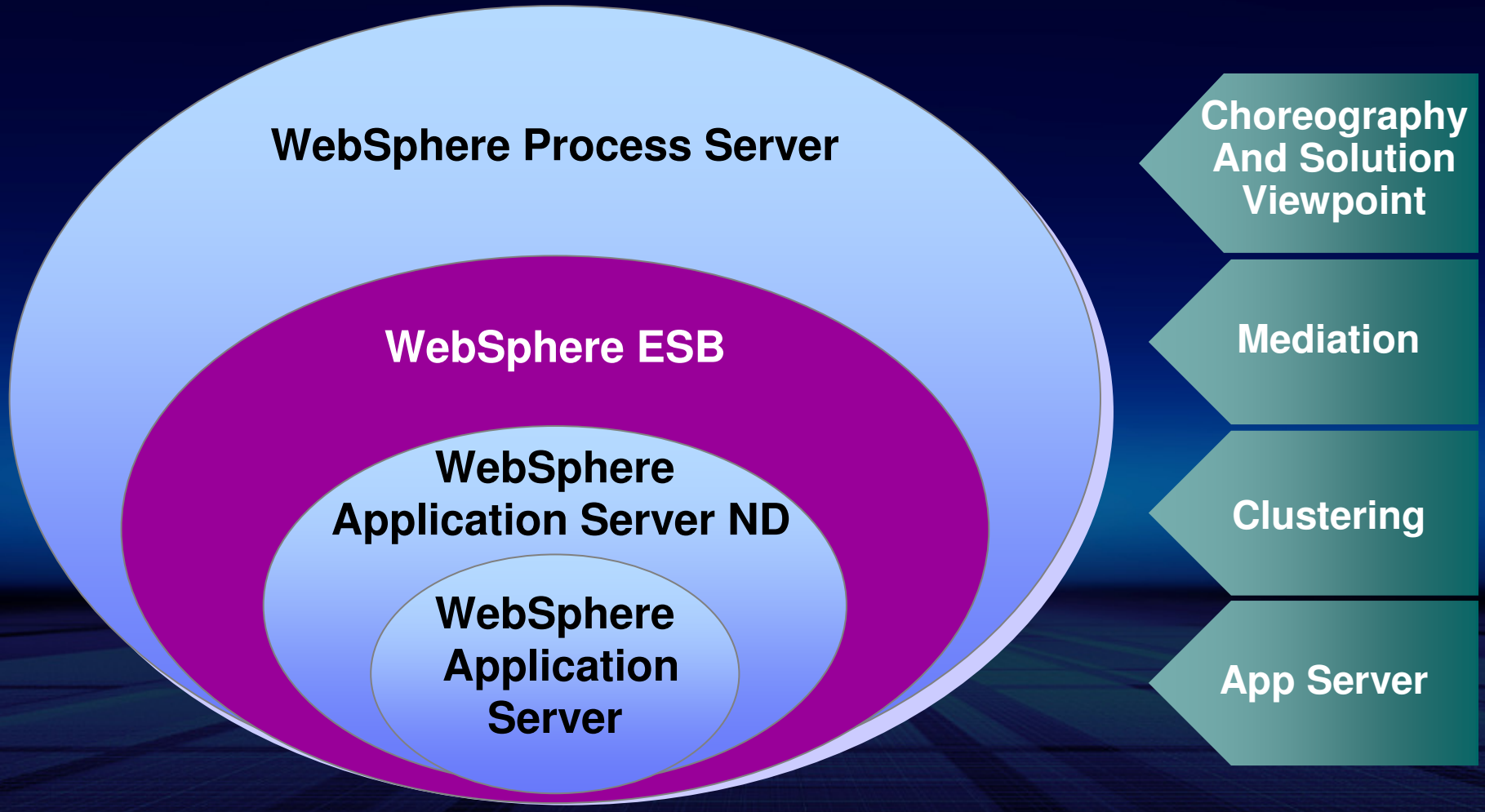
- Integrates seamlessly with WebSphere platform
- Delivers business-critical qualities of service
- Easily extended to WebSphere Process Server
- Integrated solution for service mediation and hosting



Consider WebSphere ESB When You:

- ✓ *Have WebSphere Application Server skills*
- ✓ *Plan to develop business processes using Process Server*
- ✓ *Are focused on standards based interactions -- XML, SOAP, Java, JEE, SCA and Web Services*
- ✓ *Want to mediate between Web services and existing systems using JMS, MQ and WebSphere Adapters*
- ✓ *Want to host both application and ESB services in a single runtime environment*

WebSphere Application Server, ESB, and Process Server



WebSphere ESB

Smart SOA

Adapters

Flat File
JDBC
SAP R/3
Siebel Business Applications
Email
FTP
JD Edwards
Oracle E-Business Suite
PeopleSoft

Messaging

Any JMS 1.1
WebSphere MQ
HTTP

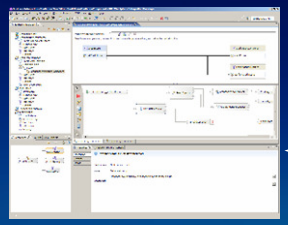
WebSphere TX Integration

WebSphere ESB

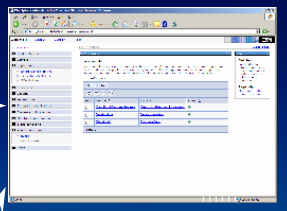
XSLT
WSRR Endpoint Lookup
Message Logger
DB Lookup
Set Msg Type
Service Retry
Msg Element Setter
Message Router
CEI
ITCAM Mgmt
Message Splitter
Message Aggregation
Custom

WebSphere Application Server

AIX, HP-UX (PA-RISC, Itanium), i5/OS, Linux (Intel, p-Series, zLinux)
Solaris (SPARC, X86-64), Windows, z/OS



WebSphere Integration Developer



WebSphere Admin Console

Web Services:

SOAP/ HTTP
SOAP/ JMS
UDDI Registry 3.0
WS-*

SCA Programming Model

SCA
SDO
SMO

WebSphere ESB for z/OS –
Extends the value of WebSphere Application Server for z/OS

- Clustering support for fault tolerance, scalability
- Java platform with zAAP offload
- Native application integration
  - WebSphere MQ for z/OS (including CICS)
  - WebSphere TX integration
  - CICS Transaction Gateway (JCA)
  - IMS Connect (JCA)
  - DB2 – DB2 Universal JDBC Provider, IBM Application Connectivity to DB2 for z/OS Feature
  - PDS files
  - WebSphere Classic Federation Server for z/OS integration - ADABAS, Datacom, VSAM, IDMS, others
- IBM z/OS Security Server support
- …

WebSphere ESB v6.1 – What's New!

- 4Q 2007 Release
  - Supports a broader set of mediation patterns including message splitting and aggregation patterns
  - New WebSphere TX integration
  - New WS-Notification support
  - New generic HTTP support
  - Enhanced 3rd party JMS support
  - Updated to WAS 6.1 runtime
  - Focus on consumability and usability across the solution lifecycle
- Latest Developments
  - New data handlers to ease integration for COBOL Copybooks, JSON, Delimited, Fixed length
  - Toleration of WAS v6.1 Feature Pack for Web Services delivering WS-ReliableMessaging, WS-SecureConversation, SOAP 1.2, MTOM, others

Ball State University

Ball State University bridges disparate systems and solves key administrative issue with IBM SOA solution.

Industry: *Education*
URL: *http://cms.bsu.edu/*

"SOA has been such a gift to us. It enables us to embrace a new technology that provides services at a level that we couldn't even imagine before."
–Dr. O'Neal Smitherman

CHALLENGE

- Coordinate 40 name and address systems to streamline administrative processes and ensure information integrity for users

SOLUTION

- SOA with Enterprise Service Bus to connect siloed applications without hand-coding individual API calls (WESB, CICS TS, System z)

BENEFITS

- Ability to develop and implement services in an SOA environment for resolving name and address discrepancies in 10 months, as opposed to several years for hand-coding individual application connections
- Confidence that IBM solution can lead to wider use of SOA to further streamline administrative business processes
- Services created here can be reused in later SOA efforts

WebSphere Message Broker

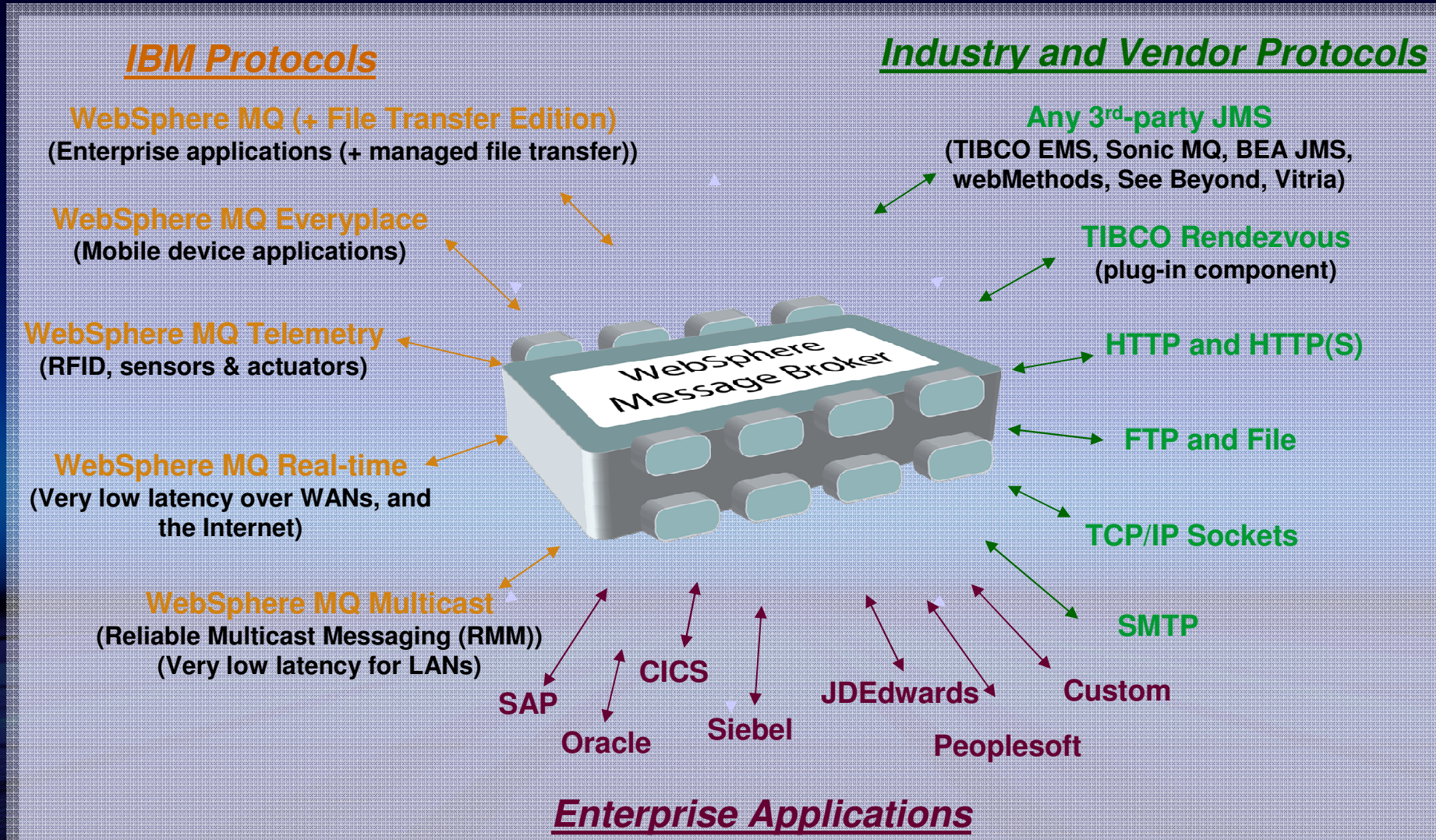
Built for universal connectivity and transformation in heterogeneous IT environments

- Delivers universal connectivity and transformation
- Provides a flexible solution to address a wide range of requirements
- Optimized to accommodate any IT environment
- Offers unique quality of service and connectivity on z/OS

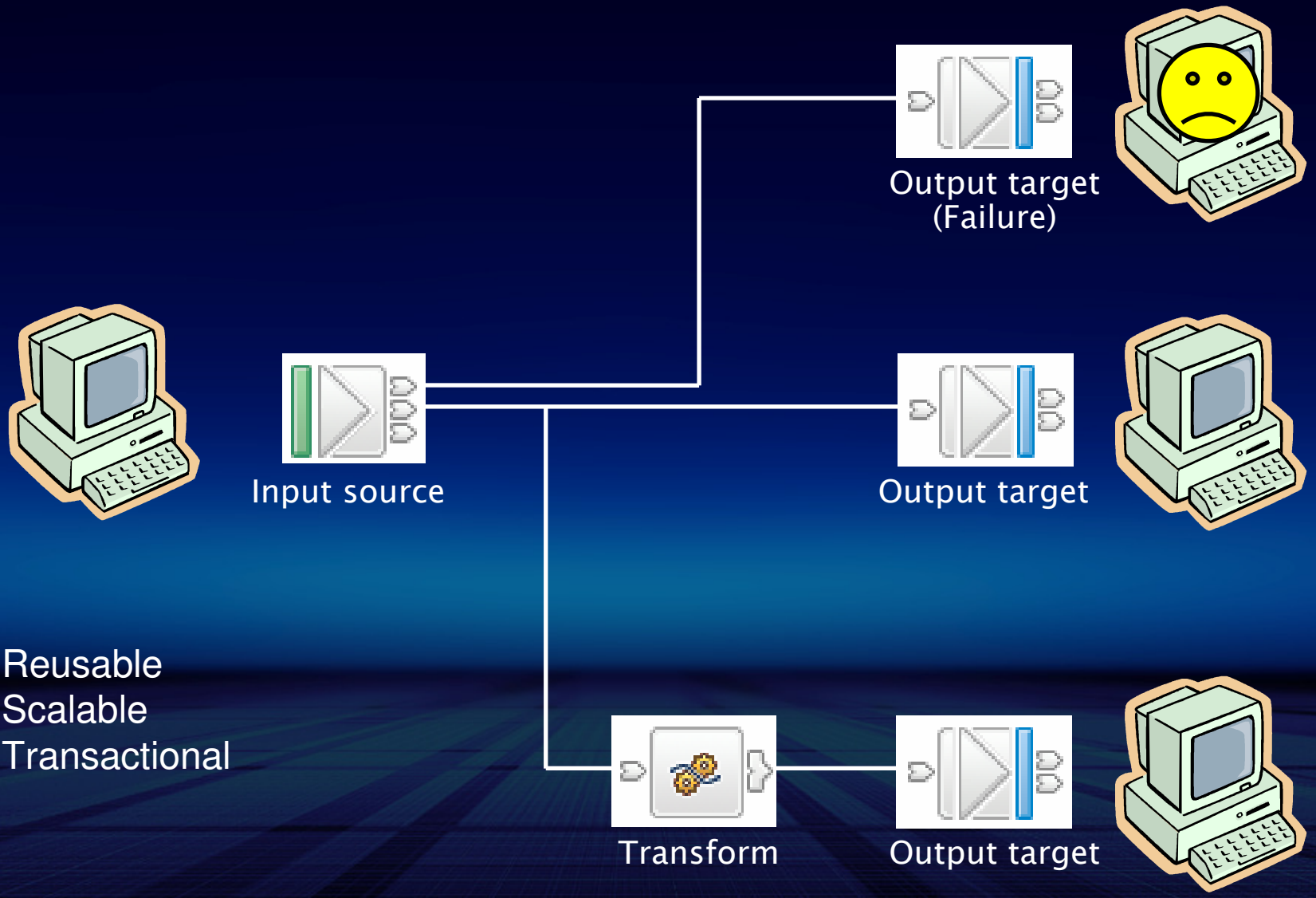
Consider WebSphere Message Broker When You:

- ✓ *Have extensive heterogeneous infrastructures, including both standard and non-standards-based applications, protocols, and data formats*
- ✓ *Have extensive MQ skills and infrastructure*
- ✓ *Are connecting to Web services using SOAP, and optionally WS-Security, WS-Addressing and Attachments*
- ✓ *You need extensive pre-built mediation support*
- ✓ *You have complex transformation needs*

WebSphere Message Broker – Protocols and Applications

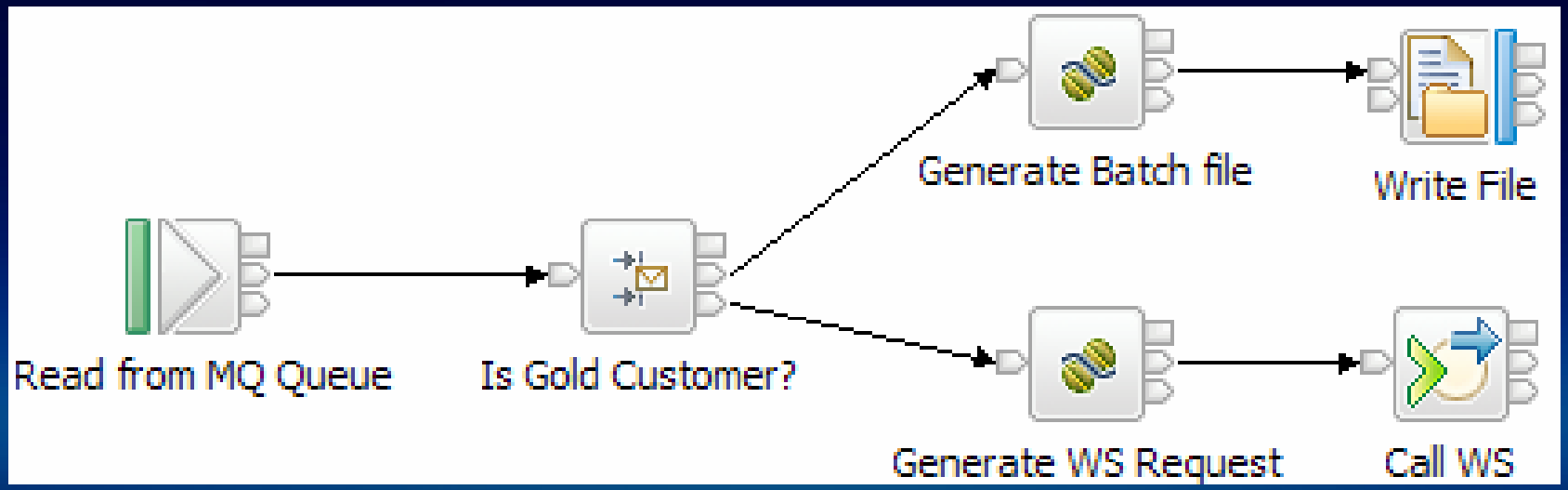


Message Flows



- Reusable
- Scalable
- Transactional

Message Flow Example



WebSphere Message Broker v6.1 – What's New!

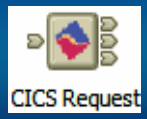
- 4Q 2007 Release
  - Built in nodes for EIS access: SAP, Siebel, PeopleSoft
  - Native support for very large file processing, including FTP; New SMTP node
  - New WS-security and WS-Addressing support
  - Enterprise wide identity, authentication and authorization with Tivoli Federated Identity Manager and LDAP
  - Out of the box integration with WSRR and DataPower SOA appliances
  - Enhanced consumability and productivity
- 2Q 2008 Release
  - Two new attractively priced deployment options
  - Enhanced WebSphere TX support
  - New TCP/IP nodes and TLOG Sample
  - Common Event Infrastructure support enabling WebSphere Business Monitor integration

New! **WebSphere Message Broker for Remote Adapter Deployment**

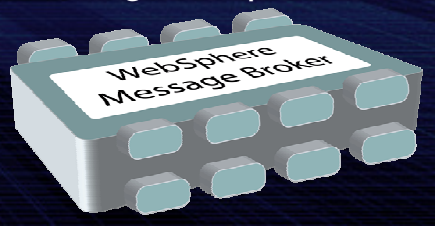
New! **WebSphere Message Broker Starter Edition**

Why run WMB on z/OS? The golden rules…

1. WMB on z/OS takes full advantage of the z/OS Sysplex
   - The only platform supporting MQ Shared Queues for high-availability and optimized “pull” load-balancing with the very best in scalability
2. WMB on z/OS utilizes many of the other inherent features of z/OS
   - ✓ RACF security
   - ✓ WLM resource optimisation
   - ✓ SMP/E installation control
   - ✓ SMF performance recording
   - ✓ RRS transaction management for speed and reliability
   - ✓ ARM restart
3. WMB on z/OS offers several specific interfaces to the z/OS platform
   - CICSRequest, QSAM and VSAM nodes



   - Using WMB on z/OS will typically be much more efficient if some of the interfaced applications are co-located on z/OS
4. Running on the z/OS and System z platform brings all the security and robustness of the the mainframe platform
   - Looking for the highest scalability and high-availability for a strategic corporate ESB



St. George Bank

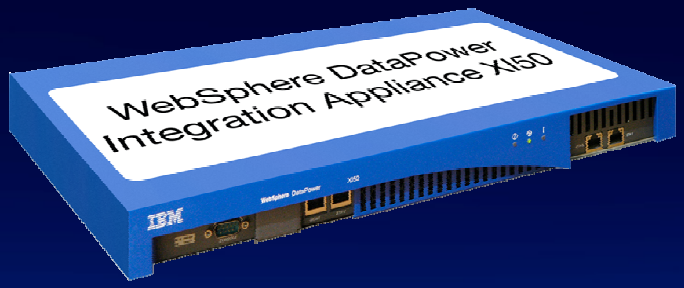
- **St. George is Australia‘s fifth largest bank, primarily known for retail banking.**
- **Running WMB on z/OS to implement an SOA for improved time to market with key applications and minimizing service loss.**
- **Return on investment estimated as less than 1 year for new personal lending application. St. George observed a customer satisfaction increase from from 55% to 75%, which they consider due to this strategic application.**
- **Over 200 services defined, with an estimated 47% reuse.**

“If we had to build point-to-point solutions rather than re-using services, it would have cost us an extra 15 million USD in development costs, and that doesn’t even take into account the time to market and the complexity that we would be dealing with.”
—Greg Booker, St.George

WebSphere DataPower Integration Appliance XI50

Purpose-built hardware ESB for simplified deployment and hardened security

- Redefines the boundaries of middleware with specialized hardware
- Many functions integrated into a single device
- Simplified deployment and ongoing management



Consider WebSphere DataPower When You:

- ✓ *Have ease of use as a pre-dominant consideration*
- ✓ *Are transforming between XML-and-XML or XML-and-any other format*
- ✓ *Are using WS-Security extensively*
- ✓ *Require use of advanced Web services standards*
- ✓ *Are doing extensive XML processing combined with high performance requirements*
- ✓ *Must be in production very quickly*

Why an Appliance for SOA

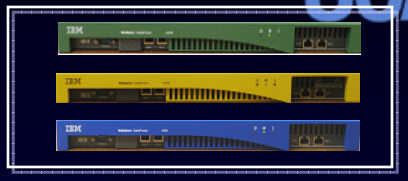
- Hardened, specialized hardware for helping to integrate, secure & accelerate SOA
- Many functions integrated into a single device
- Higher levels of security assurance certifications require hardware
  - Example: government FIPS Level 3 HSM, Common Criteria
- Higher performance with hardware acceleration
  - Impact: ability to perform more security checks without slow downs
- Addresses the divergent needs of different groups
  - Example: enterprise architects, network operations, security operations, identity management, web services developers
- Simplified deployment and ongoing management
  - Impact: Reduces need for in-house SOA skills & accelerates time to SOA benefits

WebSphere DataPower Integration Appliance XI50

Middleware Appliance Purpose-Built for Application Integration

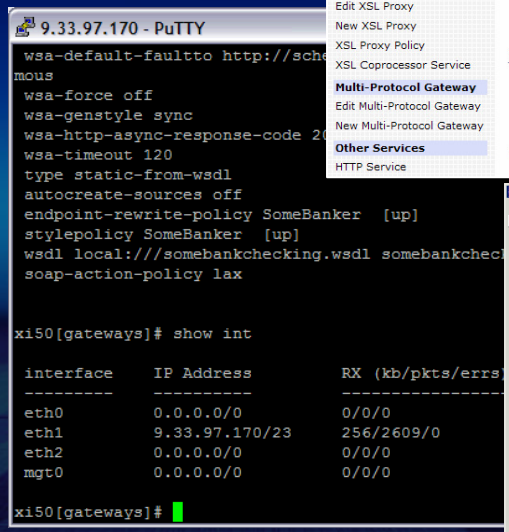
- **DataGlue "Any-to-Any" Transformation Engine**
- **Content-based Message Routing**
  - Message Enrichment
- **Protocol Bridging (HTTP, MQ, JMS, FTP, etc)**
  - Request-response and sync-async matching
- **XML/SOAP Firewall -** Filter on any content, metadata or network variables
- **Data Validation -** Approve incoming/outgoing XML and SOAP at wirespeed
- **Field Level Security-** WS-Security, encrypt & sign individual fields, non-repudiation
- **XML Web Services Access Control/AAA -** SAML, LDAP, RADIUS, etc.
- **MultiStep -** Sophisticated multi-stage pipeline
- **Web Services Management –** Centralized Service Level Management, Service Virtualization, Policy Management
- **Easy Configuration & Management -** WebGUI, CLI, IDE and Eclipse Configuration to address broad organizational needs (Architects, Developers, Network Operations, Security)

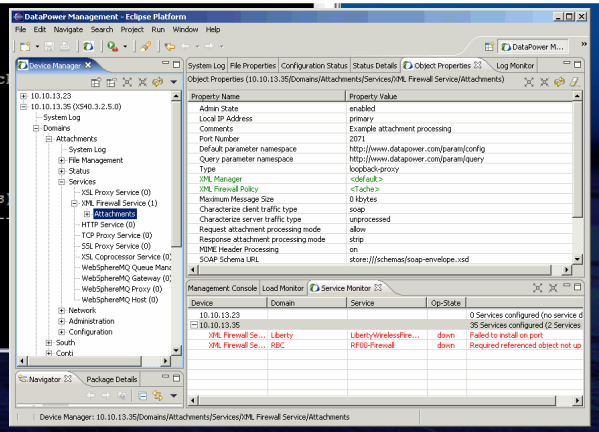
Simple Appliance Configuration for Complex Functionality



Fits into your existing environment

- Address broad organizational needs *(Architects, Developers, Network Operations, Security)*
- Complete Configuration from GUI or CLI interface
- IDE integration / Eclipse plug-in
- XPath / XML config files
- SNMP
- SOAP management interface





DataPower and System z Integration

- Web Services enablement and security for CICS and IMS applications

- DataPower XI50 acts as a services gateway to host-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)

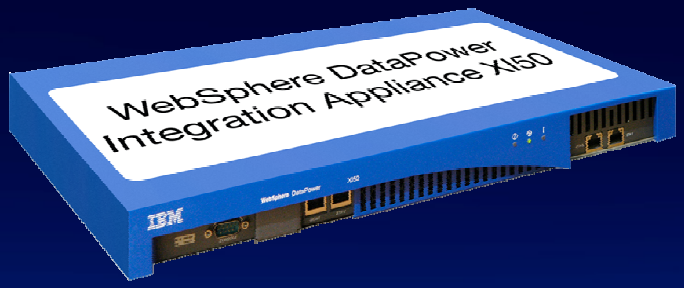
DataPower for CICS and IMS Web Services

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

- Content-based Message Routing
- Protocol Bridging (HTTP, MQ, JMS, FTP, etc.):Request-response and sync-async matching
- XML/SOAP Firewall: Filter on any content, medata or network variables
- Data Validation: Approve incoming/outgoing XML and SOAP at wirespeed
- Field Level Security: WS-Security, encrypt & sign individual fields, non-repudiation
- XML Web Services Access Control/AAA: SAML, LDAP, RADIUS, etc.
- Web Services Management: Centralized Service Level Management, Service Virtualization, Policy Management
- Easy Configuration & Management:
  - WebGUI, CLI, IDE and Eclipse configuration to address broad organizational needs (Architects, Developers, Network Operations, Security)

WebSphere DataPower Integration Appliance XI50 v3.6.1 – What's New!

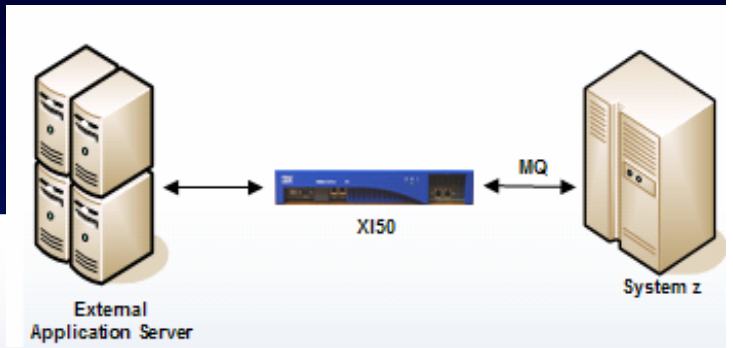
- Expanded integration and connectivity
  - Enhanced MQ support
  - Full support for WS-ReliableMessaging (WS-RX)
  - Enhanced support for WSRR and UDDI v3 registries
  - Full support for SOAP 1.2, WS-Security 1.1 updates
- Enhanced governance capabilities
  - Dynamic Web Services policy framework (WS-Policy and WS-Security Policy)
  - WS-I Basic Profile and Basic Security Profile support
- Ease of use enhancements
  - Streamlined Multi-step Transaction Processing



MIB Group, Inc.
SOA Security & Integration

Challenge
- Difficult to modify home-grown custom software application
- Adopt SOA to enable an online Web service to greatly increase revenues, while reducing costs & increasing the security of the service

Solution
- Deployed WebSphere DataPower Integration Appliance XI50 for SOA security and to transform & route messages
- Acts as a gateway by forwarding messages to System z mainframe to be checked against database
- Integrates ACORD XML services with existing WebSphere MQ
- Integrates SchemaTron validate to generate XSLT to load the generated XSLT onto the XI50 for runtime execution & filtering



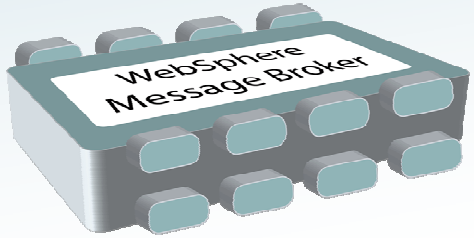
- **WebSphere DataPower Integration Appliance XI50**
- **WebSphere MQ**
- **System z**

Benefits
- More than 10 times faster than internally developed custom software
- Fraud-protection processes are faster, more secure & less error prone
- Web service allows MIB to offer more services to customers while reducing overhead cost

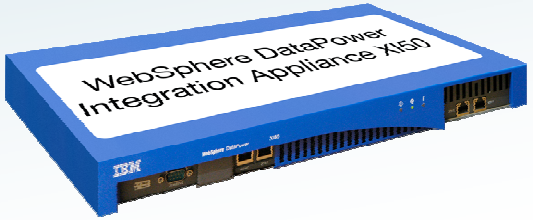
ESB offerings from IBM WebSphere

- **WebSphere ESB**
  built on WebSphere Application Server for an integrated SOA platform

- **WebSphere Message Broker**
  built for universal connectivity and transformation in heterogeneous IT environments



- **WebSphere DataPower Integration Appliance XI50**
  purpose-built hardware ESB for simplified deployment and hardened security



Reference Information

- New! Redpaper - IBM Connectivity Reviewer's Guide http://www.redbooks.ibm.com/redpapers/pdfs/redp4434.pdf
- ESB Portfolio Trifold

  ftp://ftp.software.ibm.com/software/websphere/integration/wbimessagebroker/esb_trifold_0103A.pdf

- Other teleconferences
  - Strategic options for extending CICS to an SOA - this supports the 'Strategic options' http://www-306.ibm.com/software/os/systemz/telecon/23apr/
  - z/OS and Linux for System z: Selecting the best SOA platform for you

    http://www-306.ibm.com/software/os/systemz/telecon/9jul/
  - IBM ESBs at the heart of Smart SOA on System z with new capabilities
  - http://www-306.ibm.com/software/os/systemz/telecon/23jan/

Questions & Answers