



Websphere - Smarter Software For A Smarter Planet

**Build a Flexible Application Infrastructure
Environment – WebSphere Connectivity
Solutions**

Service Oriented Finance Payment Systems - Connectivity Requirements

■ **Extend the reach of the payment network**

- ▶ Connect to any enterprise resource, using any protocol
- ▶ Integrate with existing departmental connection solutions
- ▶ Use existing applications, regardless of data format

■ **High performance**

- ▶ Support increasing demand

■ **Transactional**

- ▶ Maintain data integrity

■ **Use service lookups for resilient business operations**

- ▶ End points are sometimes not available or not responsive
- ▶ Dynamically select alternatives

Business Challenge

Our payments business is growing fast, our payments network needs to keep up!



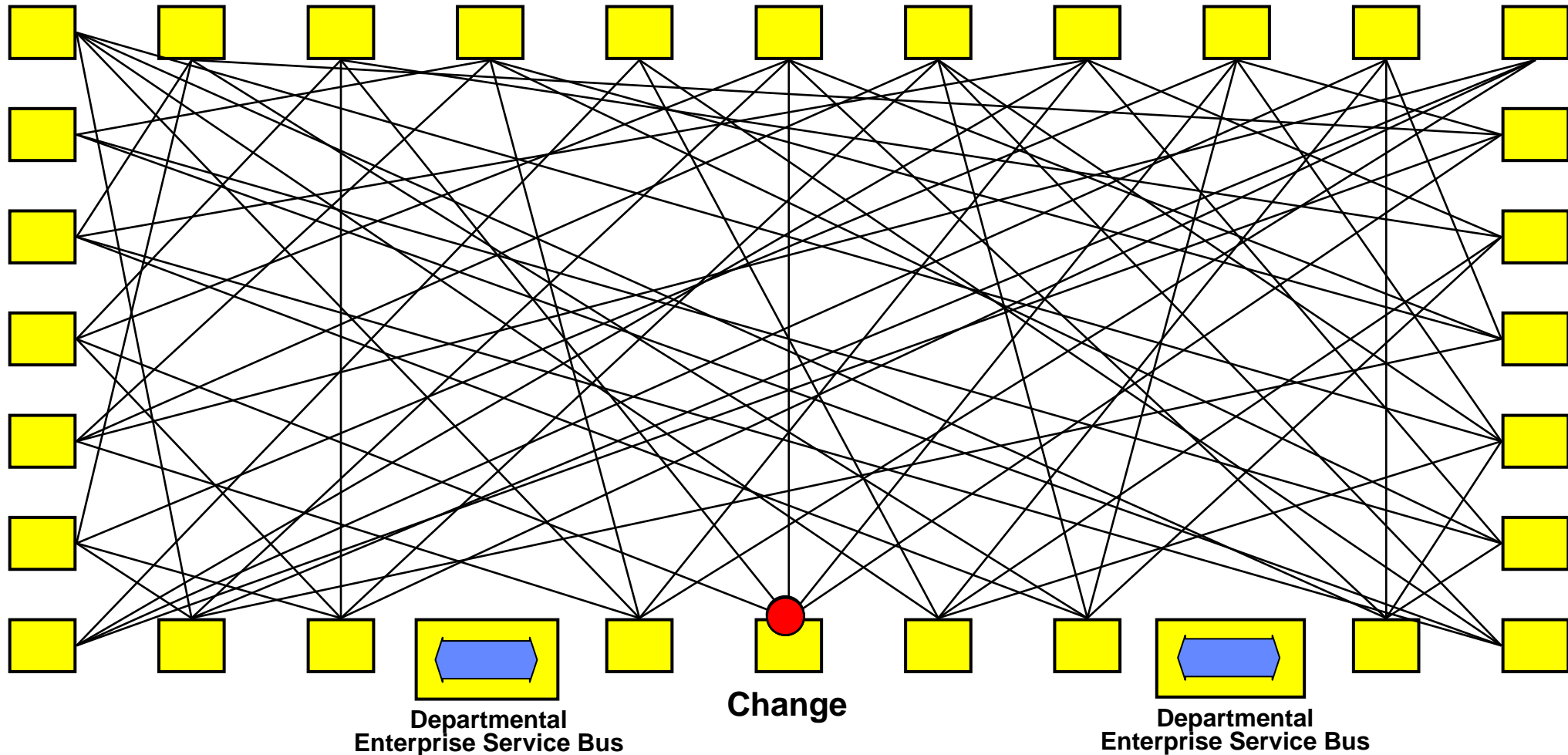
**Service Oriented Finance
CIO**

Your payments network is too brittle, making it difficult and costly to improve.



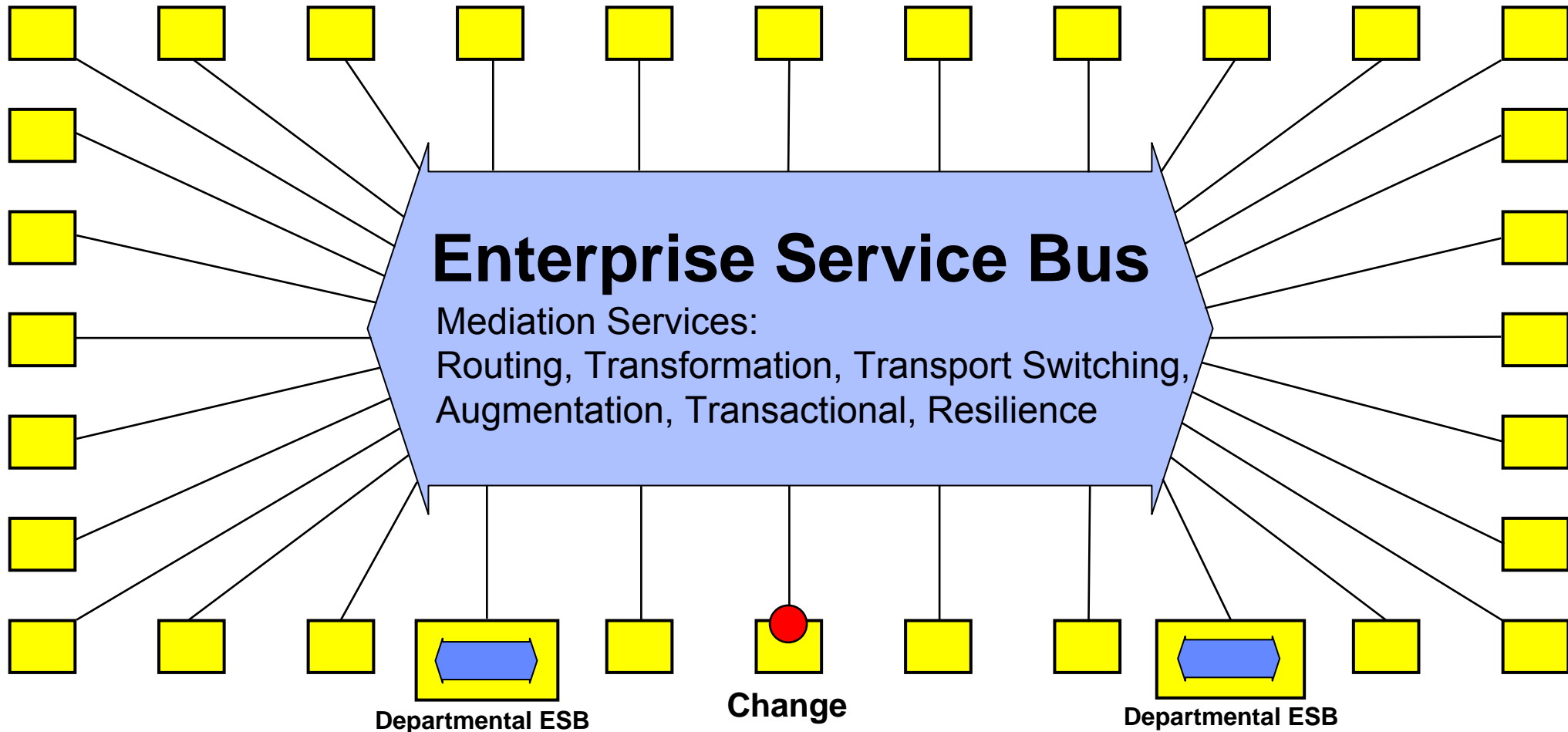
IBM

Current Service Oriented Finance Payment Network Is Not Flexible



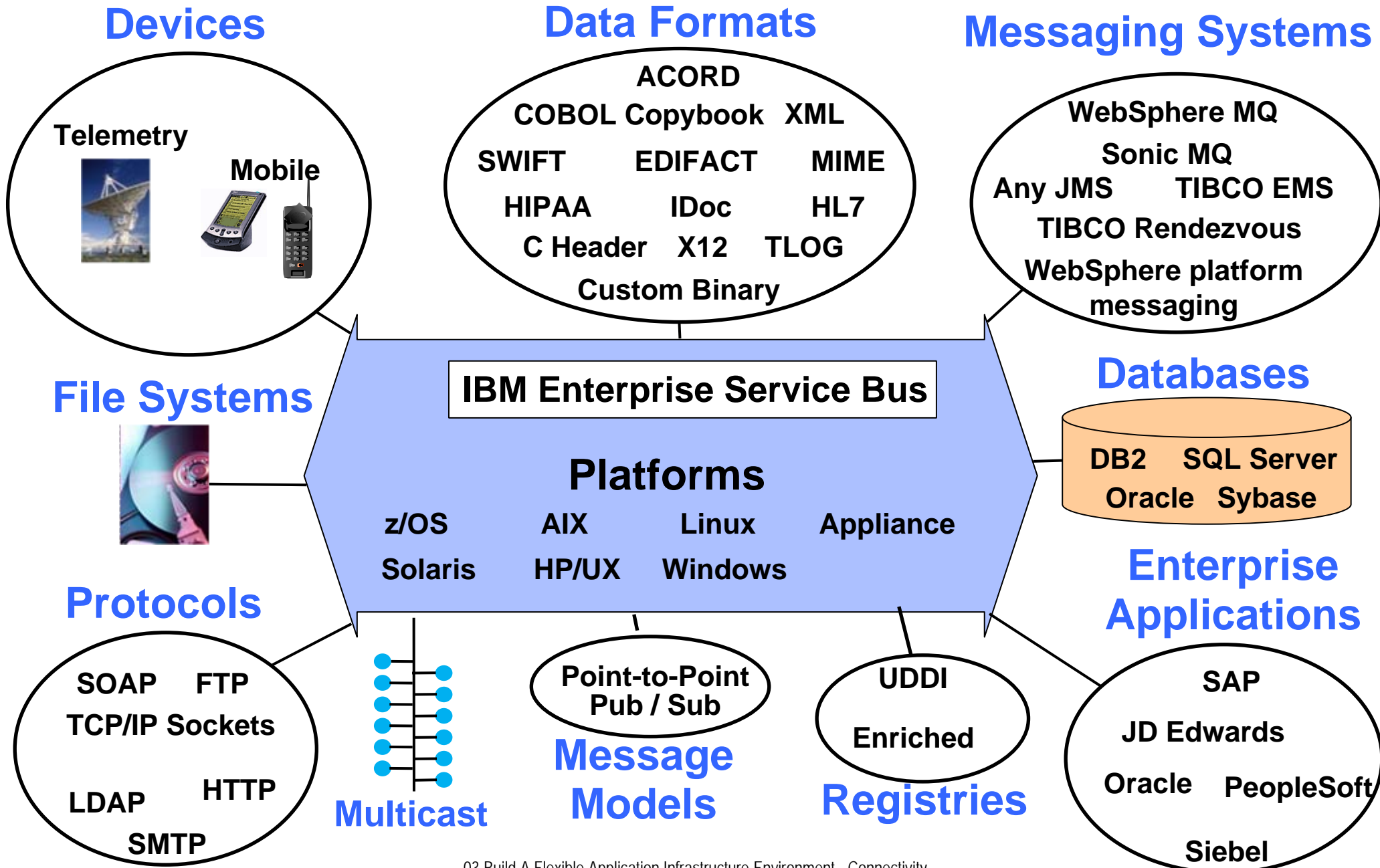
- Many point-to-point connections between applications
- Connectivity logic is coded into applications
- One change requires many other changes
- Existing departmental connection solutions are not integrated

Vision For A New, Flexible Service Oriented Finance Payment Network

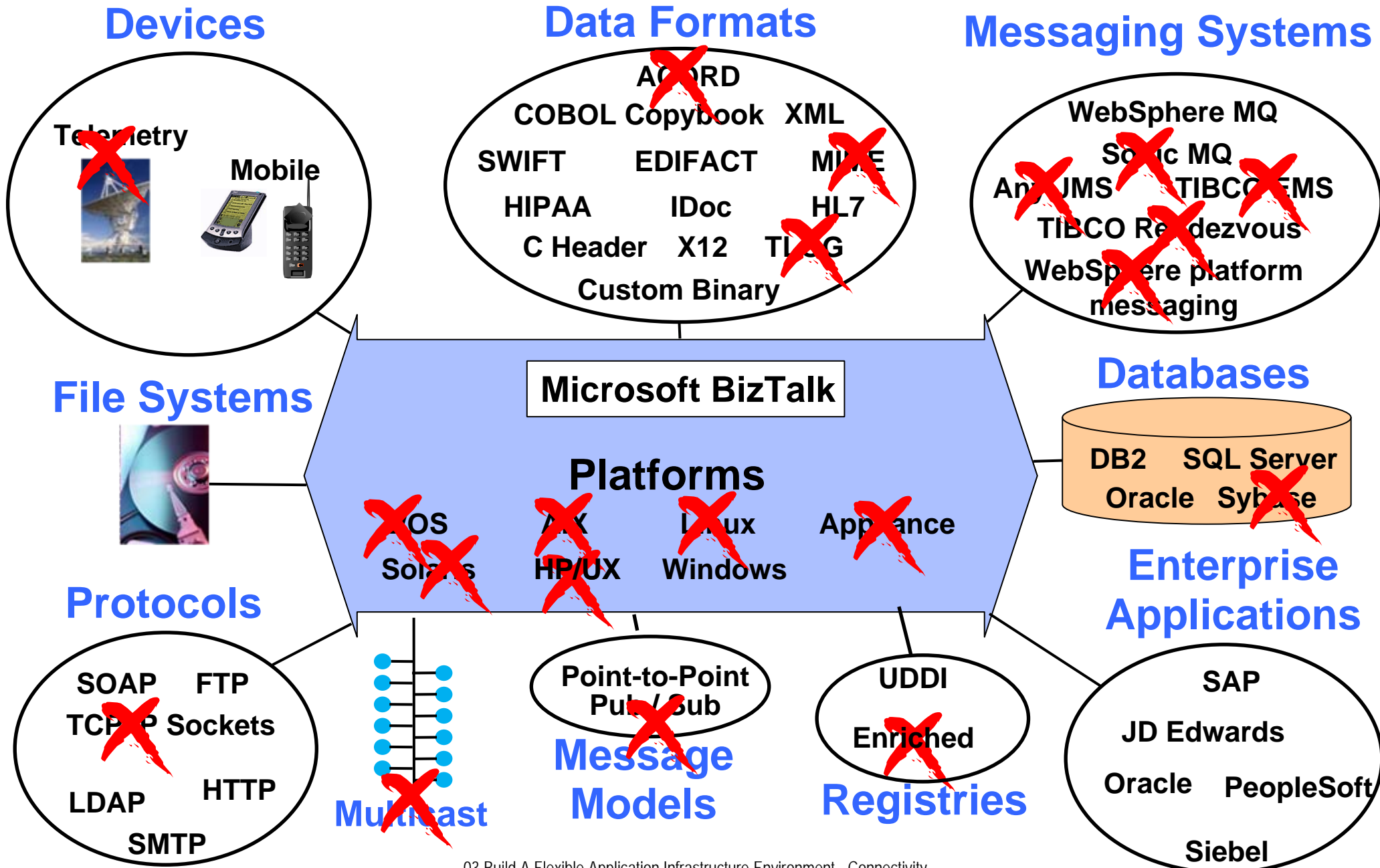


- Connect anything to anything using fewer connections
- Use existing applications
- Fewer changes as requirements change
- Work seamlessly with existing departmental ESB solutions

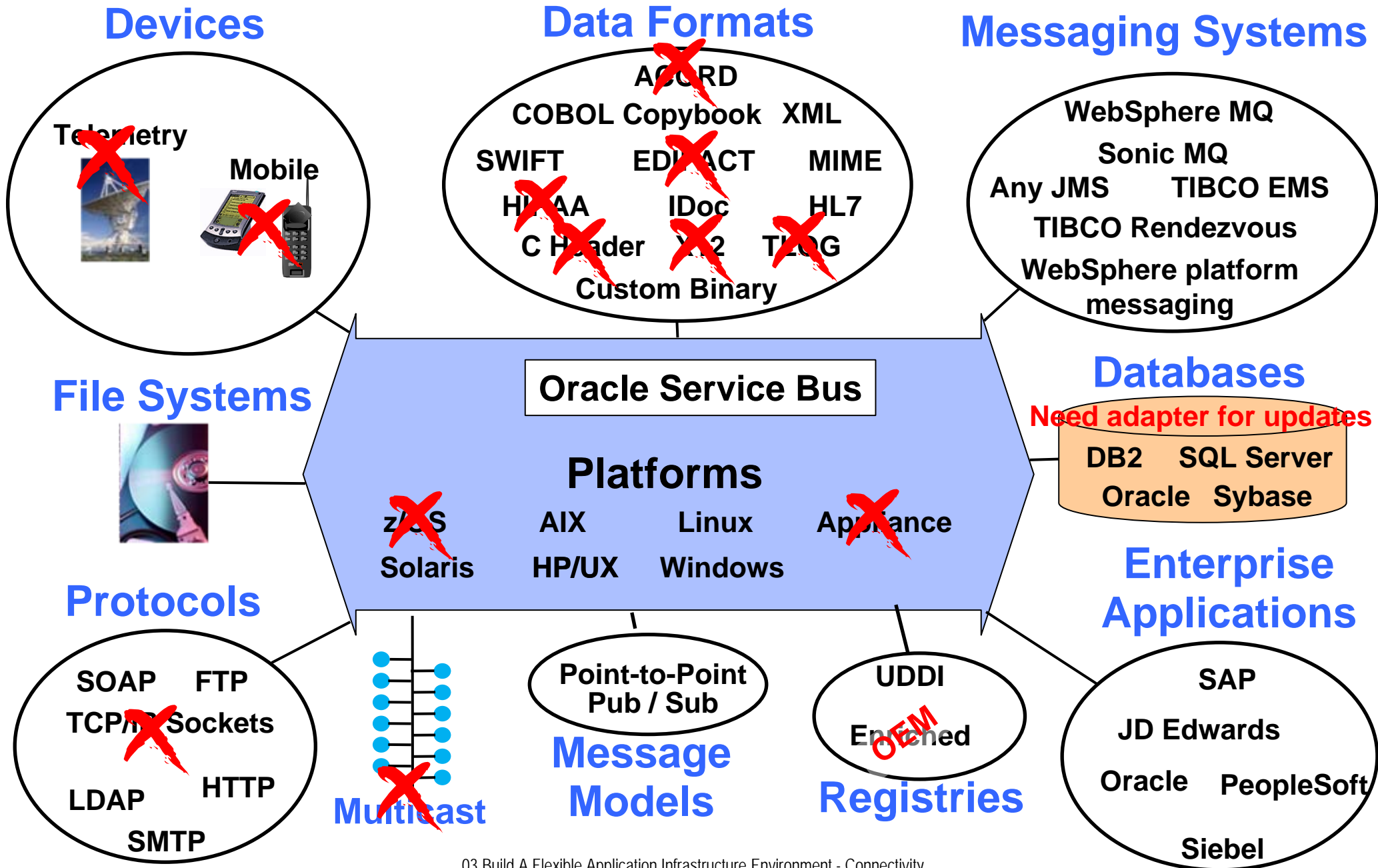
IBM Enterprise Service Bus Extends Reach By Connecting To Your Entire Enterprise



Microsoft BizTalk Server Has Limited Reach

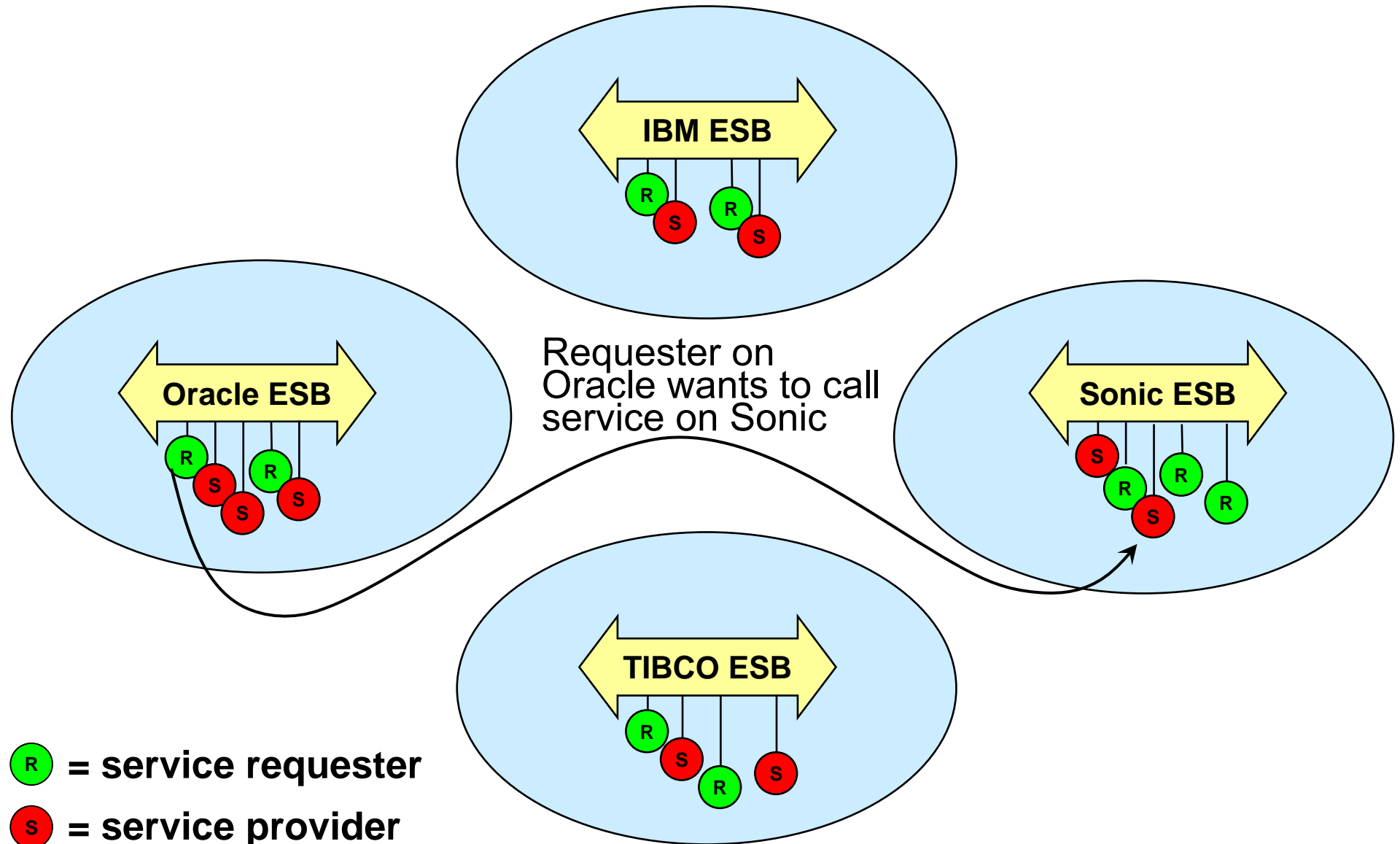


Oracle Service Bus Has Limited Reach



Many Enterprises Have “Islands” With Multiple ESBs Deployed

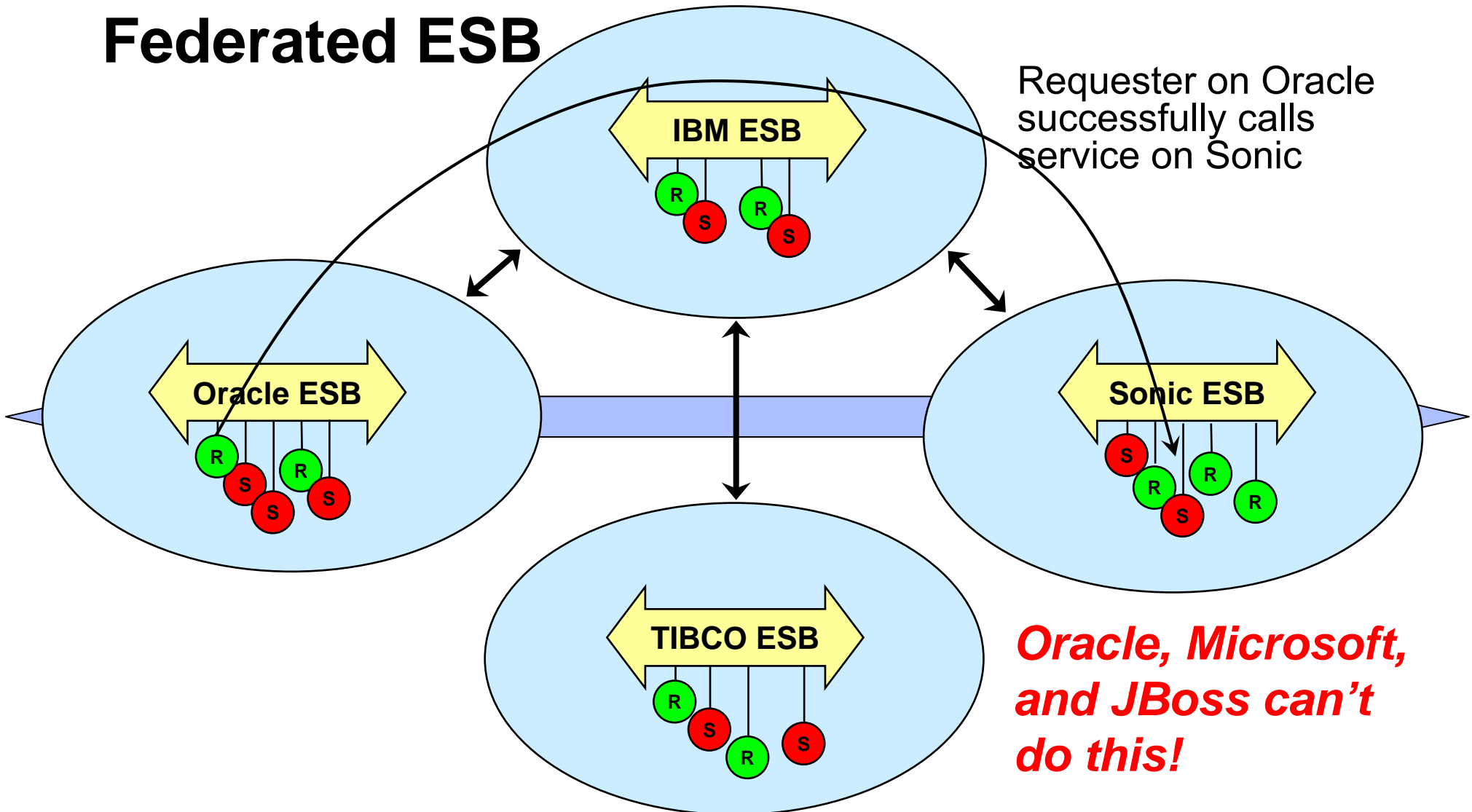
Requesters cannot easily call service providers on other ESB islands



IBM Extends Reach By Federating Multiple ESBs Into A Single, Logical ESB

Provides any-to-any connectivity between ESB islands

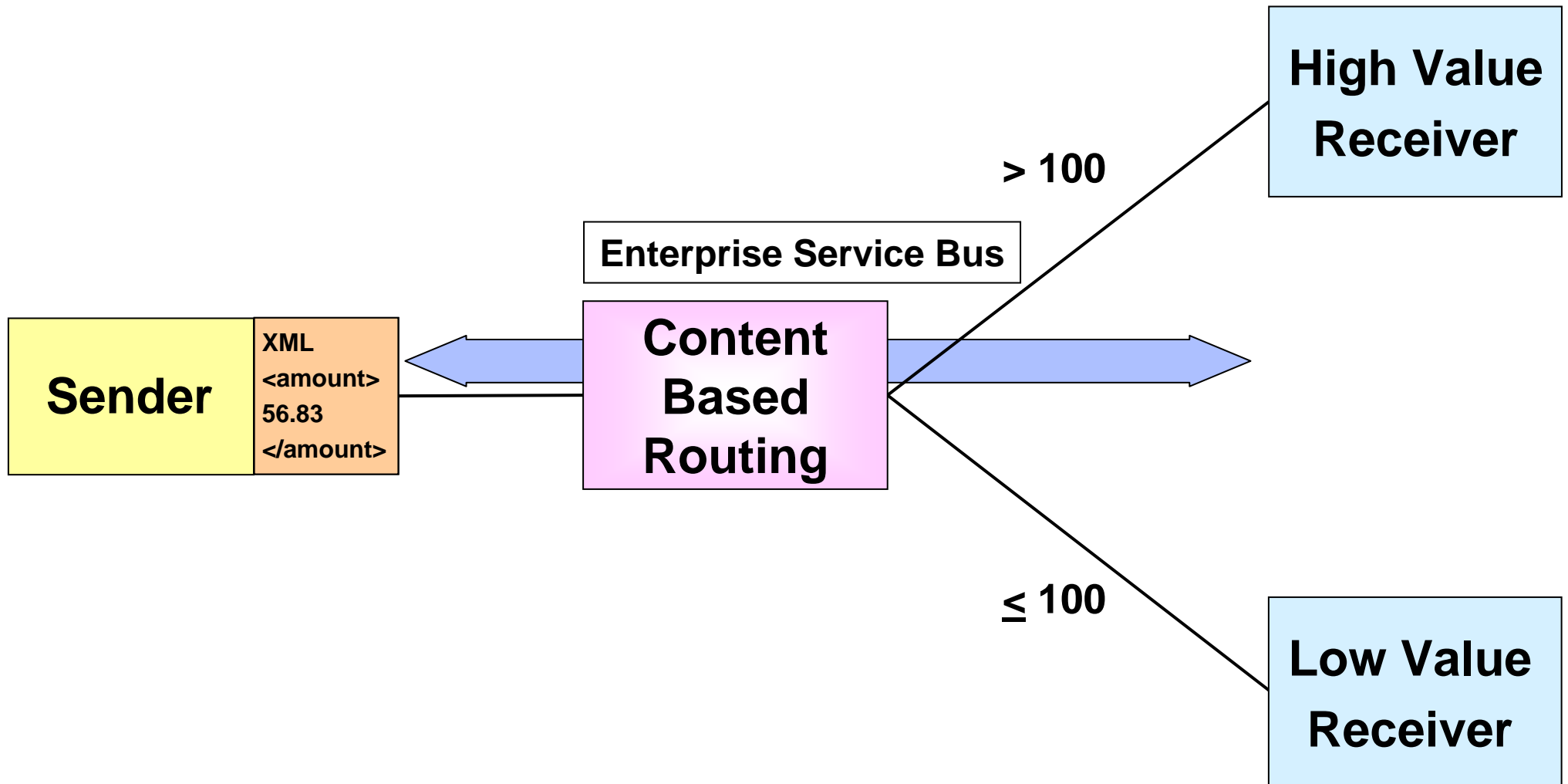
Federated ESB



**Oracle, Microsoft,
and JBoss can't
do this!**

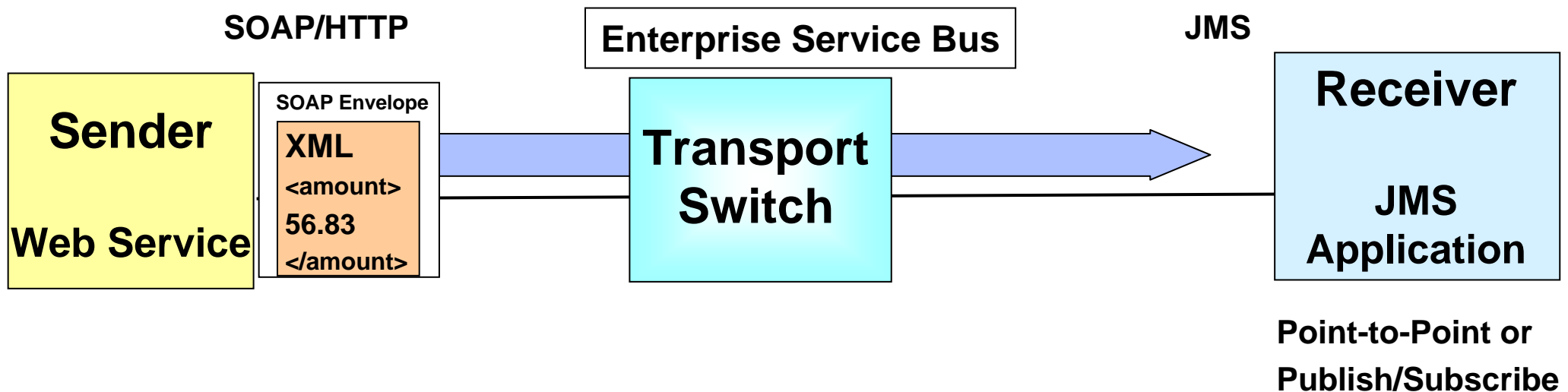
Content-Based Routing Mediation Service

Example: Route payment based on payment amount



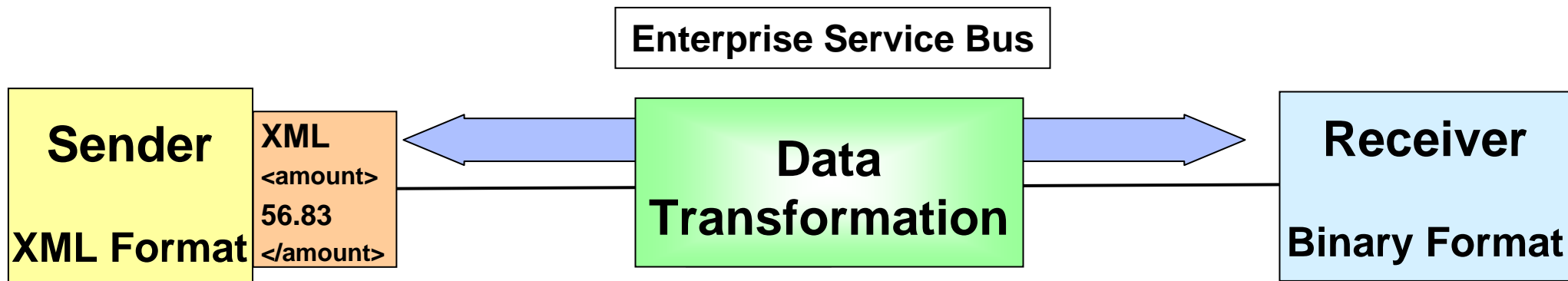
Transport Switching Mediation Service

Example: Switch from SOAP/HTTP to a JMS message



Transformation Mediation Service

Example: Transform XML to Automated Clearing House format



- Transform message format into any other format
- No changes to existing sender or receiver applications
- Transformations are centralized and re-usable

WebSphere Transformation Extender Vertical Product Packs Provide Industry Standard Formats

Financial Services



SWIFTNet FIN
SWIFTNet Funds
SEPA
FIX
NACHA
ACORD

Health Care

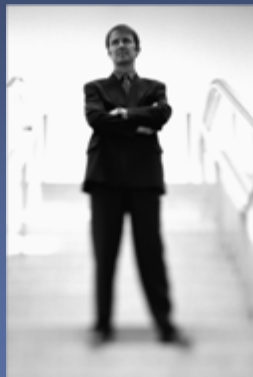
HIPAA
NCPDP
HL7

Services Solutions

- HealthCare Hub
- Payment Processing
- Clearing House Processing



EDI



X12
EDIFACT
TRADACOMS
ODETTE
EANCOM

Enterprise Applications



SAP
PeopleSoft
Siebel

IBM Leads In ESB Data Transformation

- Built-in graphical mapping tools for typical data transformation requirements
- Optional WebSphere Transformation Extender add-on
 - ▶ For advanced data transformation requirements
 - ▶ Industry Packs provide **16 standard industry data formats**
 - ▶ Plugs into IBM ESB Eclipse design tool
- **Oracle provides only basic data transformation**
 - ▶ Must use either external XQuery tool or self-built XSLT files
 - ▶ Only SWIFT, FIX, and SEPA industry data formats
- **Microsoft provides only basic data transformation**
 - ▶ Simple graphical mapping tool, not appropriate for advanced transformations
 - ▶ Only SWIFT, RosettaNet, HL7, and HIPAA industry data formats

Implementing An IBM Enterprise Service Bus Depends Upon Your Requirements



Requirements	WebSphere ESB	WebSphere Message Broker	WebSphere DataPower
Built on WebSphere Application Server	✓		
Rack-Mountable Appliance			✓
Available on Wide Range of Platforms	✓	✓	
Federates Other ESBs	✓	✓	✓
WebSphere Transformation Extender Option	✓	✓	✓
Transactional Mediation Flows	✓	✓	✓
Dynamic Service Lookup at Run Time	✓	✓	✓
Adapters for Enterprise Applications	✓	✓	
Database Read/Write	✓	✓	✓
Non-IBM JMS Messaging Systems	✓	✓	✓
TIBCO Rendezvous		✓	
Multicast Output (Native)		✓	✓

ESB Offerings From IBM WebSphere Deliver A Common Set Of ESB Capabilities



ESB
offerings from
IBM WebSphere

- Mediations to enable common patterns
- Transformation of common data formats
- Connectivity via common protocols
- Support for WebSphere Service Registry and Repository

- Leading web services standards
- First class interoperability
- Mission-critical qualities of service
- Transactional integrity



DataPower Models Provide Powerful ESB Capabilities



- **Business to Business (B2B) Appliance XB60**
 - ▶ All capabilities of XI50, plus ...
 - ▶ Standalone B2B Gateway with support for AS2, AS3 and Web Services
 - ▶ Trading Partner Management for B2B Governance

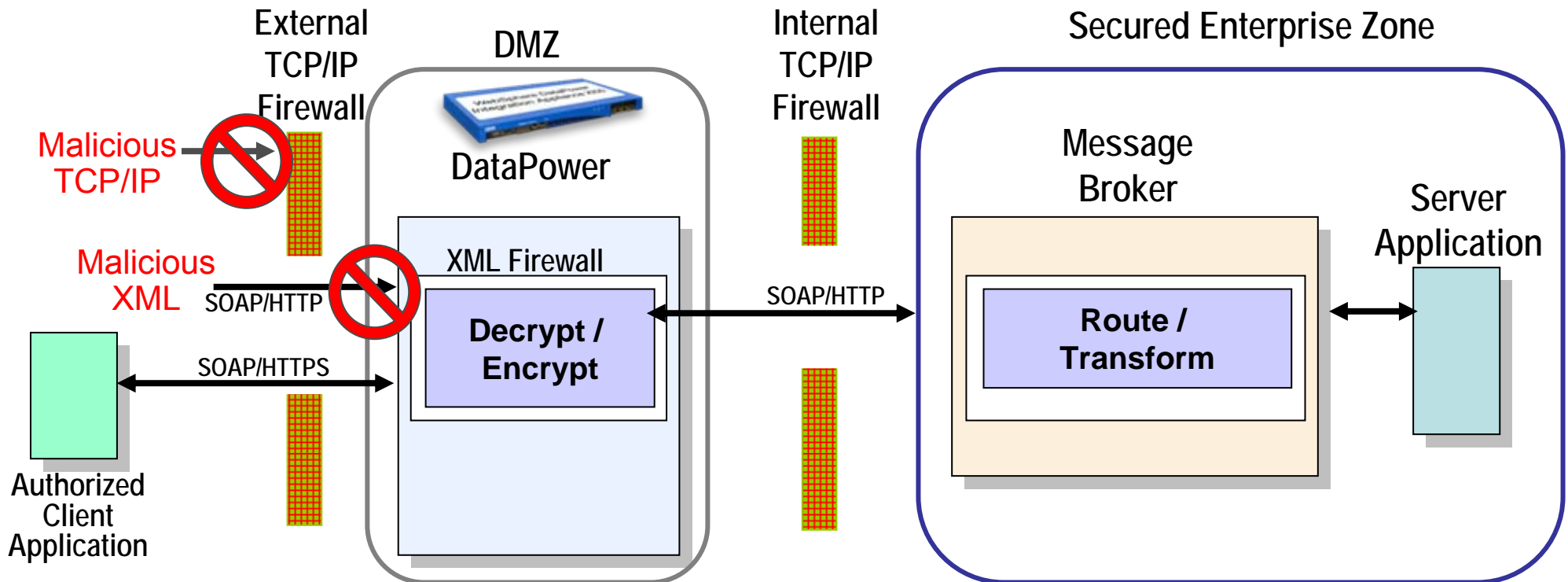


- **Integration Appliance XI50**
 - ▶ All capabilities of XS40, plus ...
 - ▶ Optimized to bridge between leading standard protocols at wire speed
 - ▶ Enables transformation between a wide range of data formats
 - ▶ Captures and emits events to facilitate web services management



- **XML Security Gateway XS40**
 - ▶ Web service threat protection and message security
 - ▶ Validates XML schemas and messages, providing advanced XML threat protection
 - ▶ Enables encryption and decryption and signing and verification of entire messages or individual XML fields
 - ▶ Supports fine-grained access controls

Typical Deployment Pattern For DataPower



- A requesting application communicates to DataPower using SOAP over HTTPS with the message body encrypted using WS-Security
- The DataPower appliance decrypts the body of the message and this content is then passed to WebSphere Message Broker
- Message Broker receives the SOAP message and transforms it and routes it to the final application

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ESB Performance Is An Important Consideration

We process a lot of payments every hour. How well does your ESB perform?



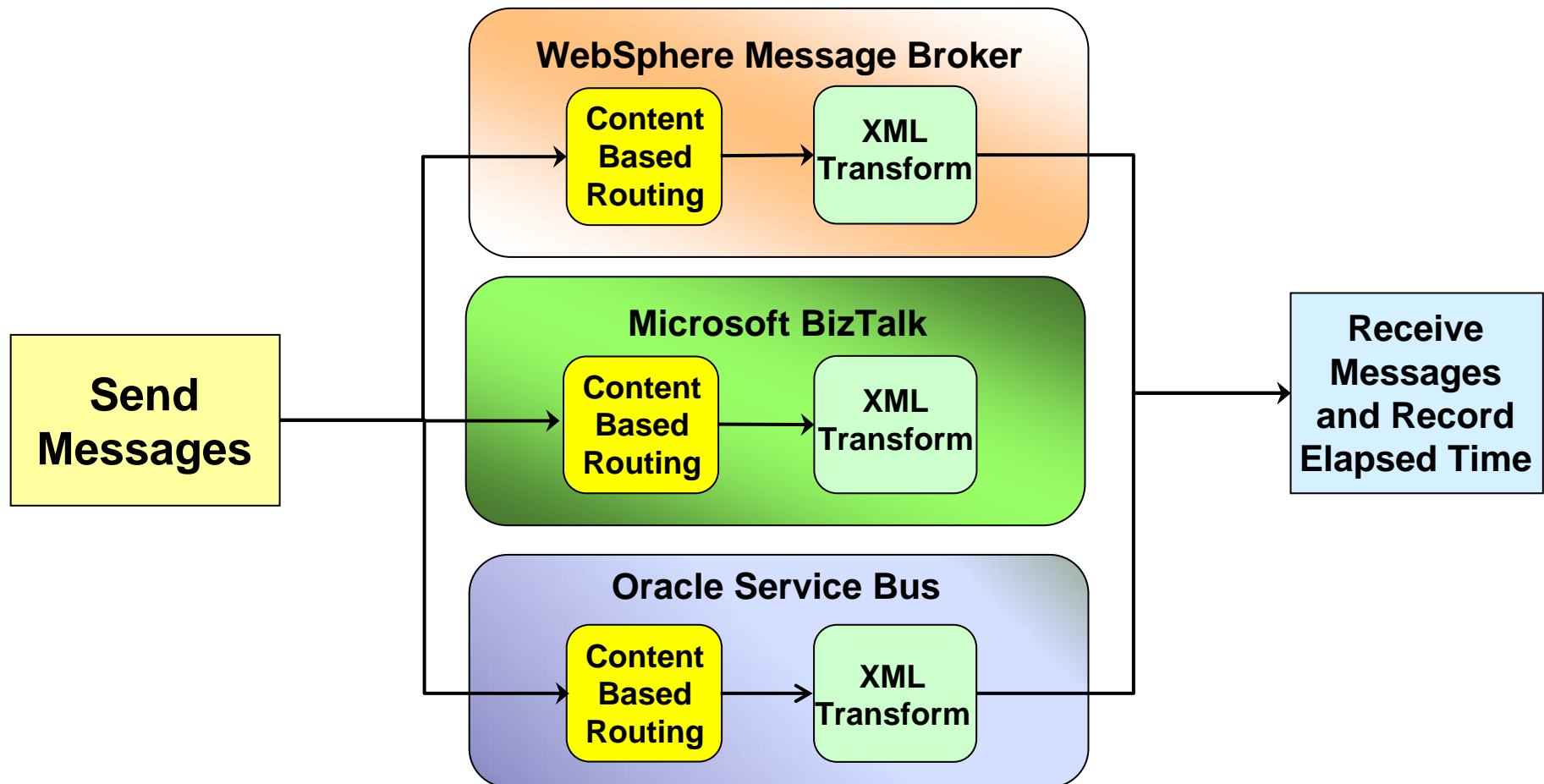
**Service Oriented Finance
CIO**

We offer the fastest ESB in the industry. This allows you to process more payments on the same hardware compared to other ESB offerings.



IBM

DEMO: WebSphere Message Broker vs. Oracle Service Bus And Microsoft BizTalk Performance



- Send 100 messages to ESB
- ESB routes and transforms messages
- Receiver displays elapsed time for 100 messages

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A Transactional ESB Connection Assures Data Integrity

Our payments are logged for audit purposes.
Our logs must be accurate!



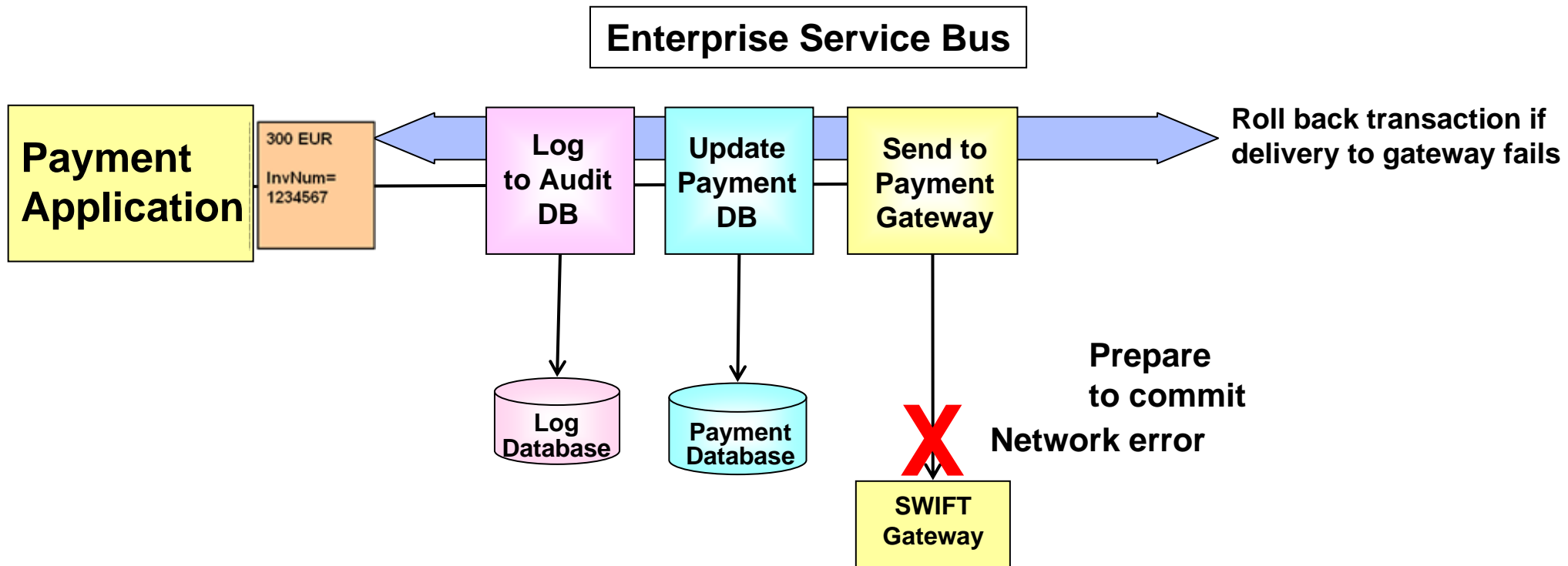
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Our ESB can execute mediation flows as distributed transactions. This assures data integrity.



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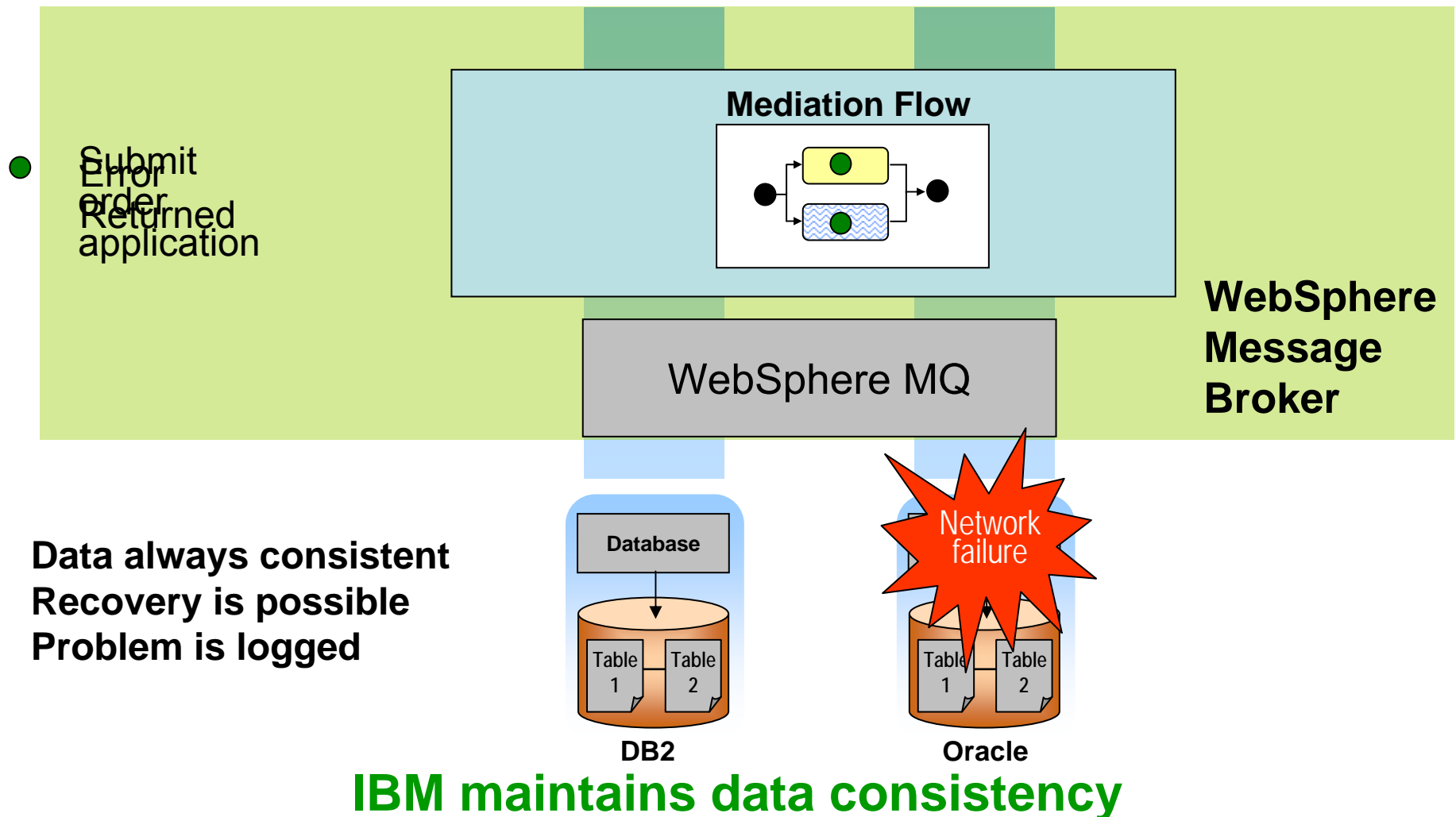
Transactional ESB Mediation Flow Assures Data Integrity



- All updates are either committed or rolled back within a single transaction
 - ▶ Including database and messaging operations
- Oracle Service Bus transactional scope excludes many end points
- Microsoft BizTalk transactional scope does not include any end points

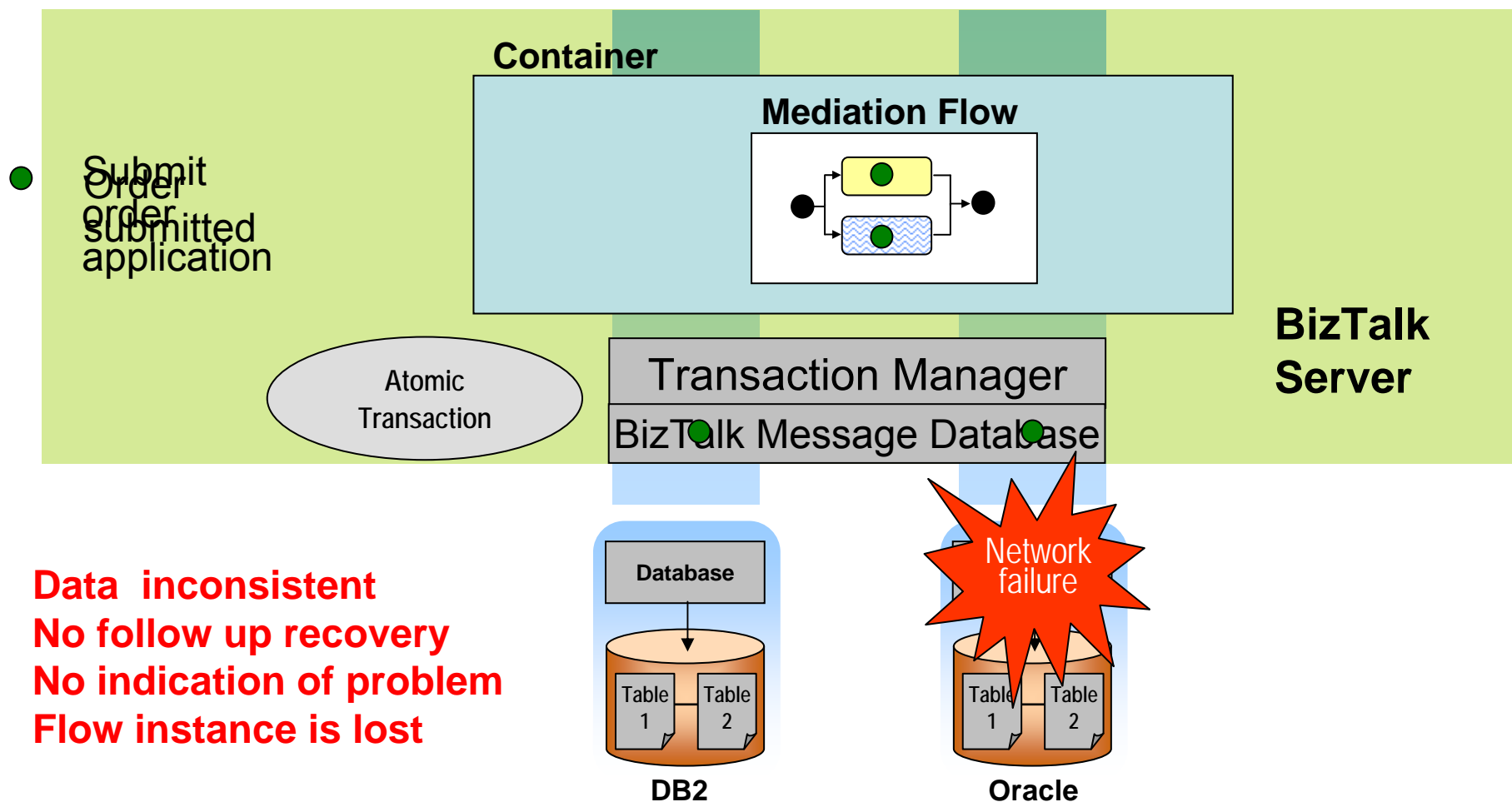
DEMO: IBM Transactional Mediation Flow With Network Failure

- WebSphere MQ is the transaction coordinator
- Databases are updated using the two-phase commit protocol



DEMO: Microsoft Transactional Mediation Flow With Network Failure

- BizTalk's Atomic Transaction support refers to update of its internal message database
- Downstream messages are sent asynchronously, with no follow up tracking or recovery



Data inconsistent
No follow up recovery
No indication of problem
Flow instance is lost

Microsoft fails to maintain data consistency

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Service Lookups Ensure Resilient Operation

Our payments network must have resiliency in the event of service outages.



**Service Oriented Finance
CIO**

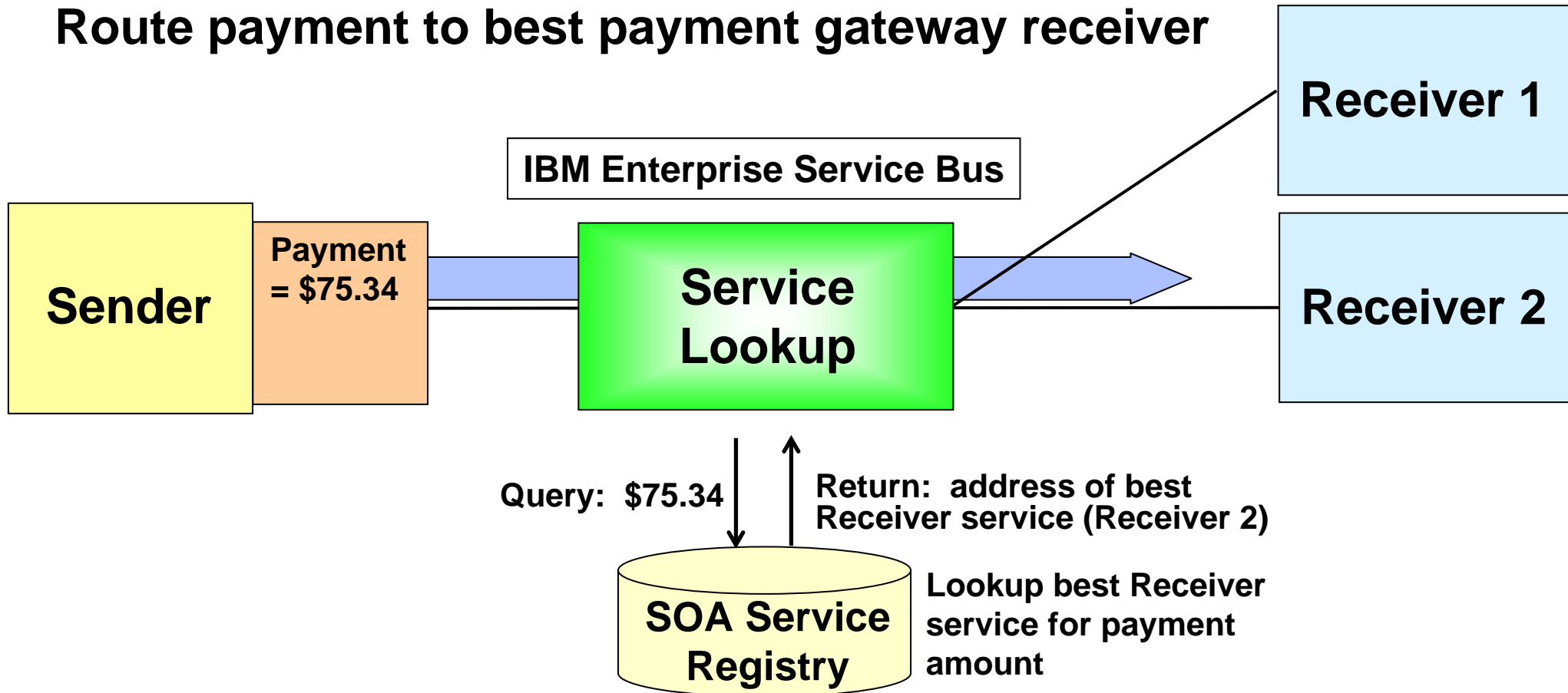
Our ESB can dynamically route payments based on information about each end point.



IBM

Service Lookup Dynamically Routes Messages To Registered End Point Services

Route payment to best payment gateway receiver



- Payments are not routed to fixed end point destinations
- ESB dynamically selects the best end point service by comparing message content with information about registered end point services
- Fewer mediation design changes are needed as end points change

WebSphere Service Registry And Repository (WSRR) Is The IBM SOA Registry

WSRR provides five capabilities for managing your end point services



Publish

Publish completed services to a common registry



Find

Find services based on search criteria



Enrich

Enables selection of services based on service metadata



Manage

Service classification and versioning



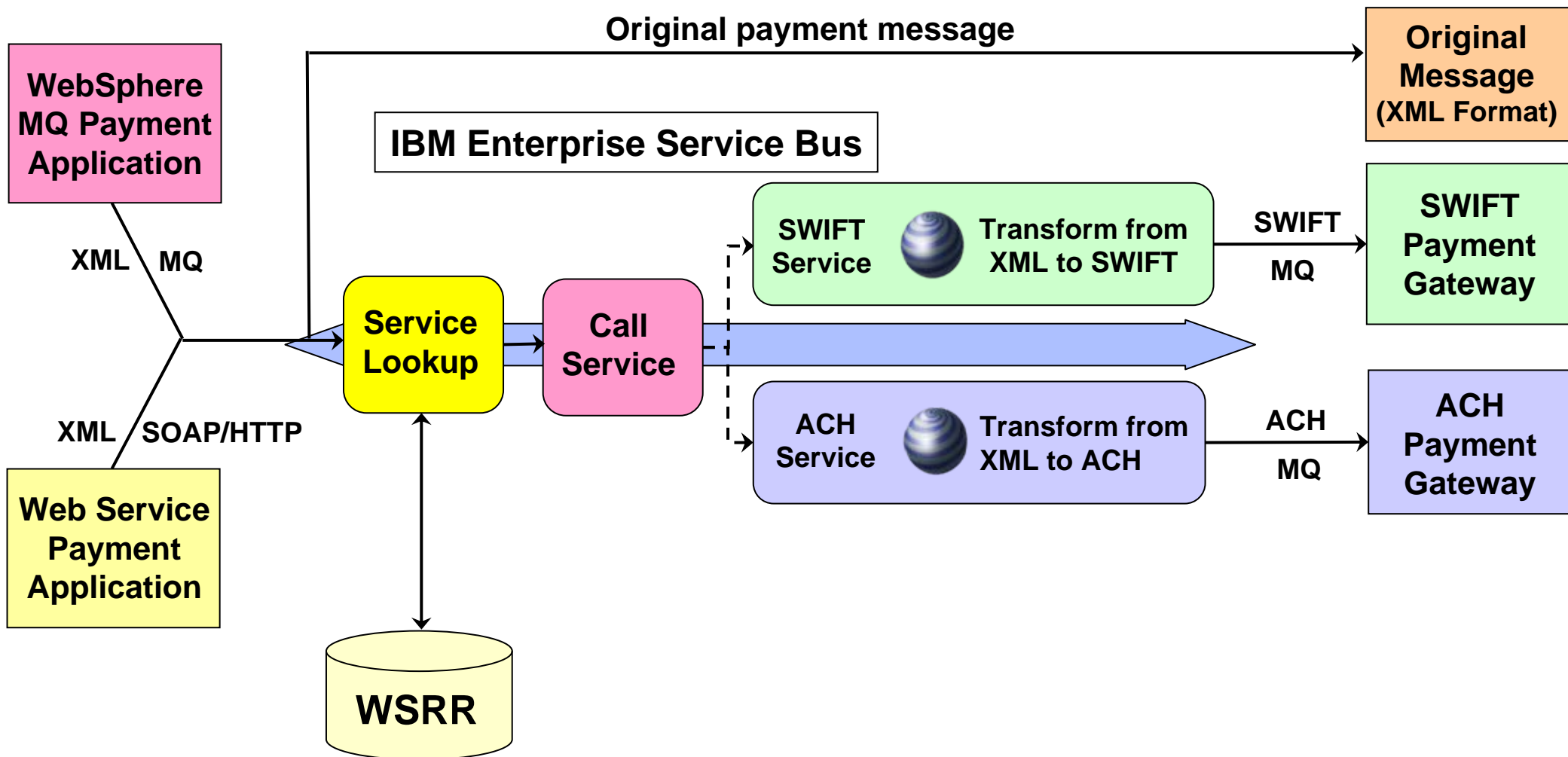
Govern

Govern transitions in service life cycle

IBM Enterprise Service Bus Integrates With WebSphere Service Registry And Repository

- Design Time
 - ▶ Find published end point services in WSRR
 - Search WSRR from within ESB design tool
 - Import service documents (WSDL, XSD, etc.) into design tool
 - ▶ Publish ESB mediations as services to WSRR
- Run Time
 - ▶ Connection from ESB run time engine to WSRR
 - ▶ Lookup information about an individual end point service
 - ▶ Query service metadata for all matching end point services
 - ▶ Receives end point information for matching services
 - ▶ Query results can be cached for higher throughput
- Oracle Service Bus and Oracle Service Registry are not integrated at run time
- Microsoft BizTalk does not integrate with any UDDI registry at run time

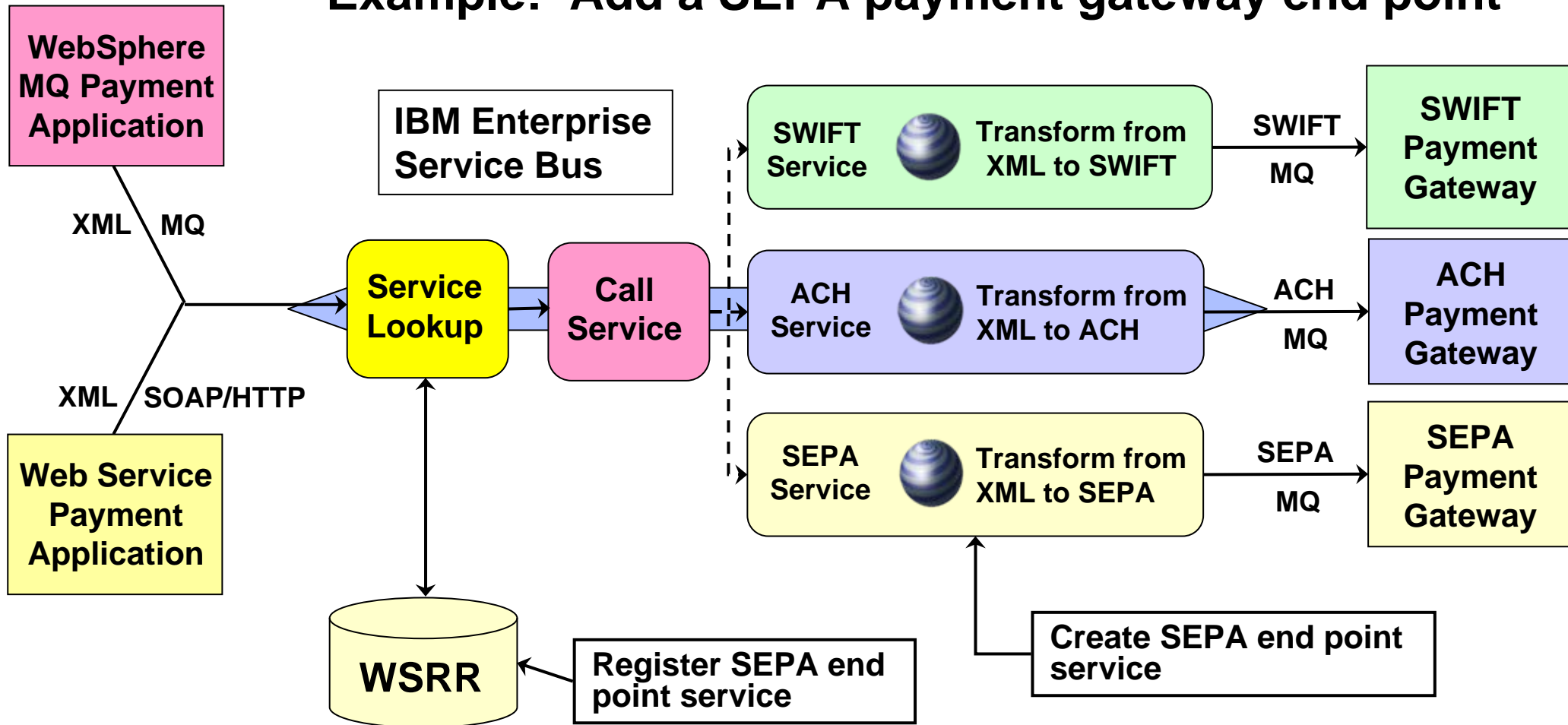
DEMO: Dynamic, Flexible Routing And Transformation Of Payments Using Service Lookup



- Payments are dynamically routed to end point services by comparing payment amount to payment limits stored in WSRR service metadata
- Transformation from XML to SWIFT and ACH formats using WebSphere TX maps
- Payments are processed exactly the same for both a WebSphere MQ payment application and web service payment application

Adding Or Removing An End Point Requires Minimal Changes

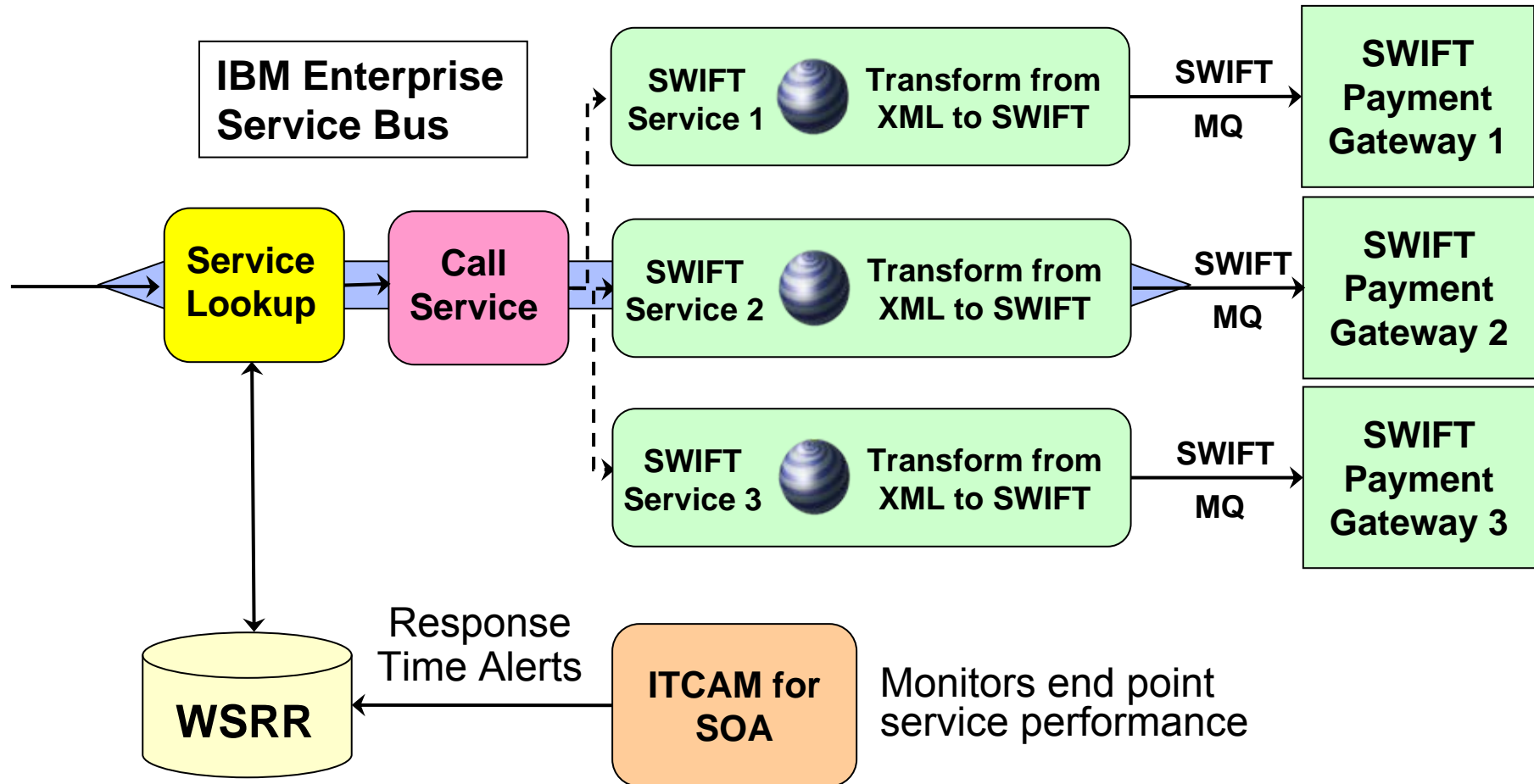
Example: Add a SEPA payment gateway end point



- Adding an end point only requires a new end point service and registry change. No code or design changes
- Removing an end point requires no code or design changes
- **Neither Microsoft nor Oracle have dynamic service lookup**

Integration With Service Monitoring Assures That Only Responsive End Points Are Called

Example: Multiple SWIFT payment gateway end points



- Service Lookup only returns responsive end point services
- Can use other WSRR service metadata to select from multiple returns
- Oracle and Microsoft do not have monitoring integration with ESB




Use Response Time Alert Information In WSRR To Improve Throughput

End Point	Response Time Alert Information in WSRR	Priority	Service Lookup
SWIFT Service 1	Response Time Critical 15.87 sec. response time	1	Not Returned
SWIFT Service 2	None	2	Returned
SWIFT Service 3	None	3	Returned

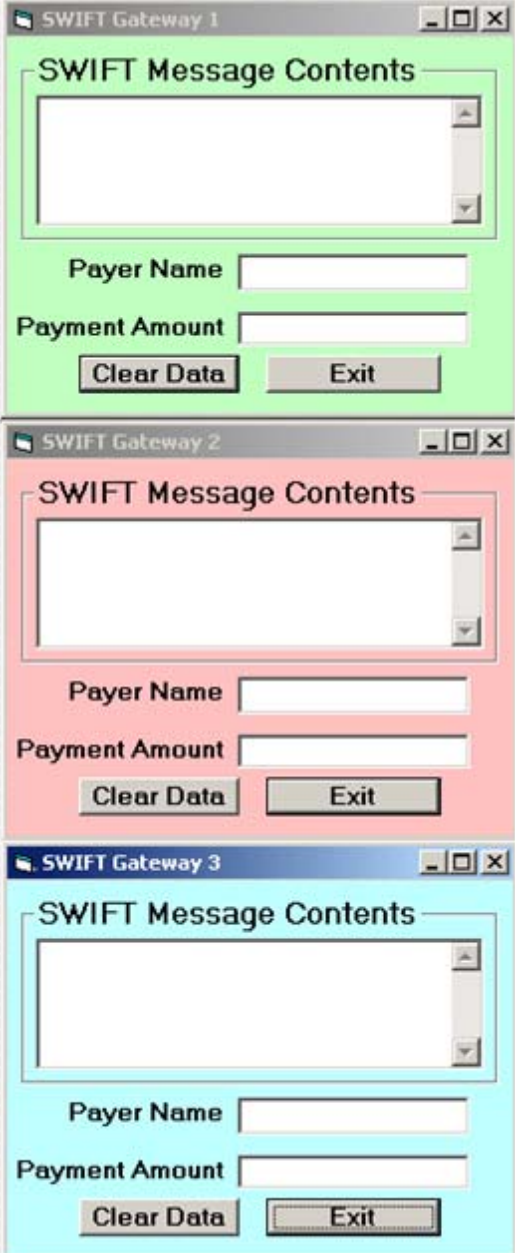
- Only SWIFT Service 2 and SWIFT Service 3 end point services are returned
- Mediation flow design can then select which end point service to call
 - ▶ Example: select end point with highest priority

DEMO: Service Lookup Based On Response Time Alerts

ITCAM for SOA - Event Emitter

SWIFT Payment Providers	Priority	Status
<input type="checkbox"/> SWIFT Gateway 1	1	
<input type="checkbox"/> SWIFT Gateway 2	2	
<input type="checkbox"/> SWIFT Gateway 3	3	

- Route payments only to end point services without response time alerts from ITCAM for SOA monitoring
- If multiple end point services are returned, select service with highest priority (lowest priority number)
- An end point can be added or deleted without changing the ESB mediation flow design



SWIFT Gateway 1

SWIFT Message Contents

Payer Name

Payment Amount

SWIFT Gateway 2

SWIFT Message Contents

Payer Name

Payment Amount

SWIFT Gateway 3

SWIFT Message Contents

Payer Name

Payment Amount

IBM Provides Superior Connectivity Solutions For Smarter Planet Solutions

- **Reach** – Connect Anything to Everything
- Best **Performance**
- Best **Transaction Integrity**
- **Resiliency** – Dynamic End Point Detection

