

Tendances Logicielles

L'architecture pour répondre aux besoins métier

Rodolphe Lezennec

Quelle solution ESB pour couvrir vos besoins ?





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Rodolphe Lezennec
Architect, WebSphere



Agenda

- What is “ESB Federation”
- Why do you care
- What are some of the challenges
- What IBM Products apply



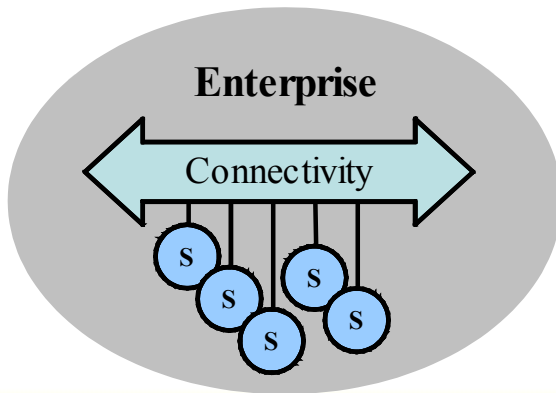
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The Role of the ESB in SOA

- SOA is about the **services** that allow an enterprise to achieve its business goals
- **Service reuse** is a key factor in the success of SOA
- **A Connectivity Infrastructure**
 - allows the services to **interact**
 - facilitates dynamic and flexible **service reuse**
- The ESB is one part of the Connectivity Infrastructure



Core Principles of the ESB Pattern



The ESB enables
decoupled connectivity
between requestor and provider

The ESB fulfils *two core principles* in support of *separation of concerns*:

Service Virtualization

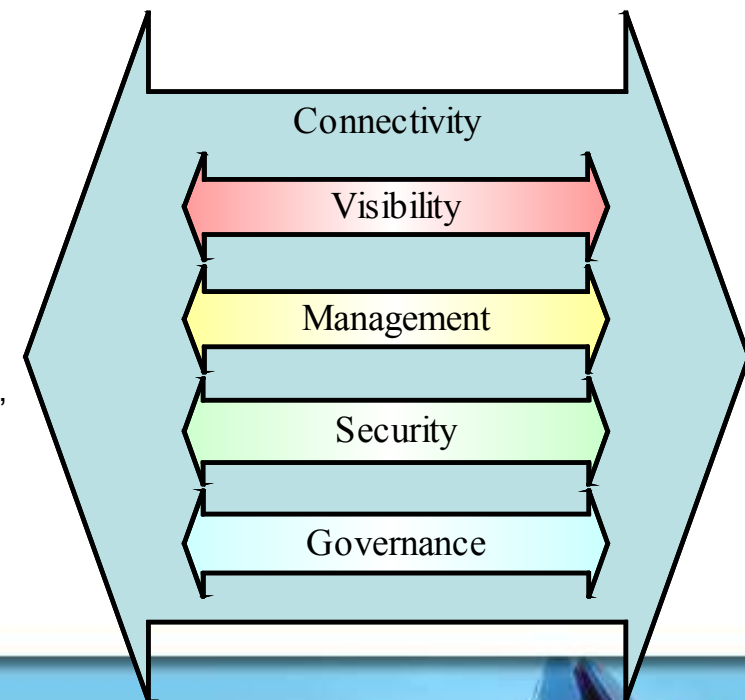
- *Protocol and Interaction Pattern* ... via conversion
- *Interface* ... via transformation
- *Identity* ... via routing

Aspect Oriented Connectivity

- *Security*
- *Management*
- *Logging*
- *Auditing*

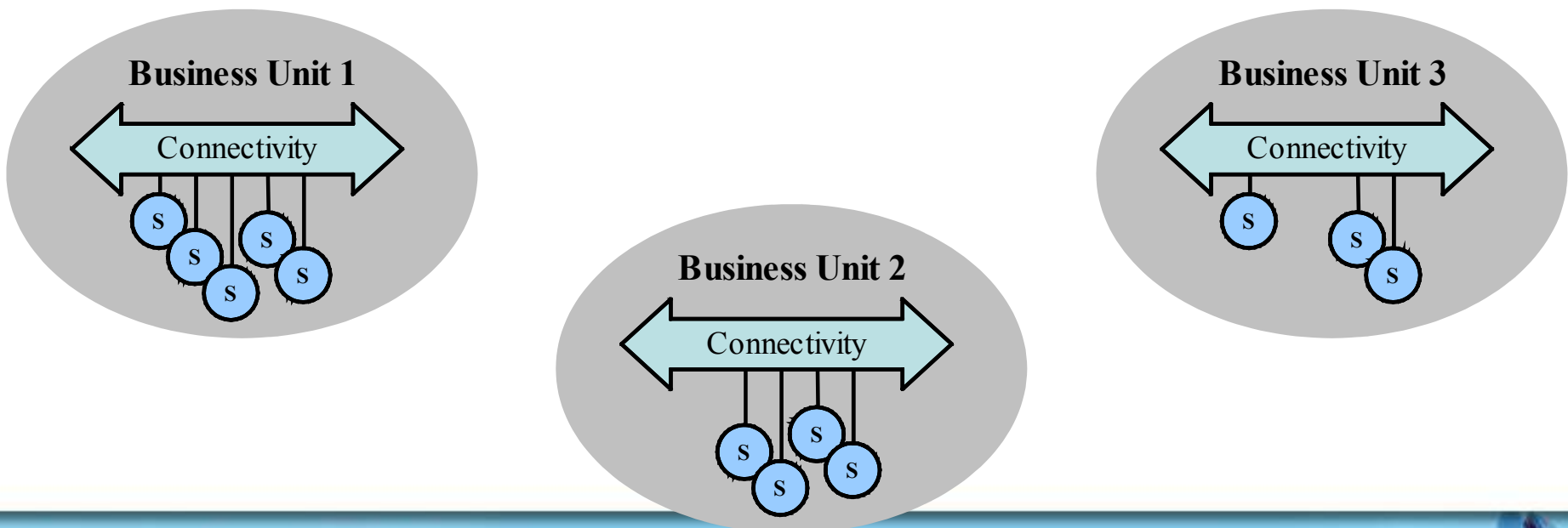
The Connectivity Infrastructure

- Comprises four different, but interacting facets
- **Service Visibility**
 - Allows a service consumer to interact with a service provider
 - Service registry and service bus (service virtualization)
- **Service Management (& Monitoring)**
 - Enables understanding of and dynamic adaptation to the changing service conditions
 - Management products, often facilitated by service registry and service bus (aspect-oriented connectivity)
- **Service Security**
 - Guards integrity by securing access to services
 - Security products, sometimes facilitated by service registry and service bus (aspect-oriented connectivity)
- **Service Governance**
 - Manages the configuration of the other parts of the Connectivity Infrastructure, supporting the connectivity goals of the enterprise
 - Derives from cooperative parts of the other infrastructures



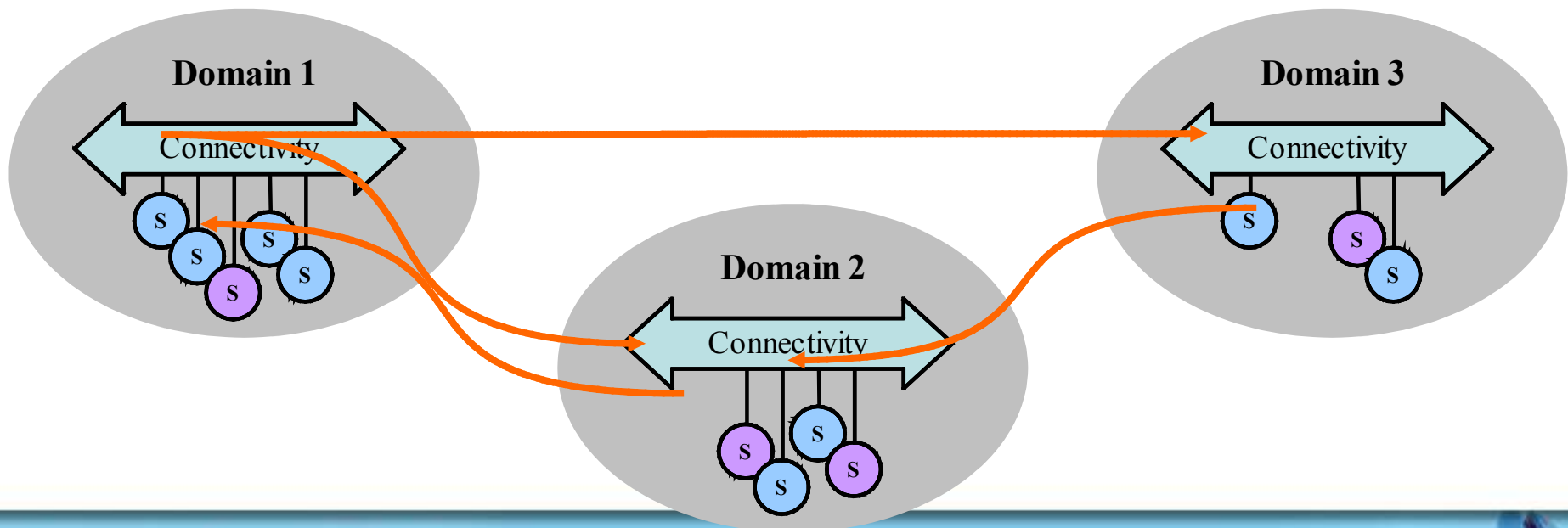
The Reality of Modern Enterprises

- Most are **not** monolithic, and have **multiple business units**
- Each business unit encapsulates services reused **within** the business unit boundaries via its connectivity infrastructure
- The business units often are isolated and autonomous
- The business units are in effect **service domains ... Islands of SOA**



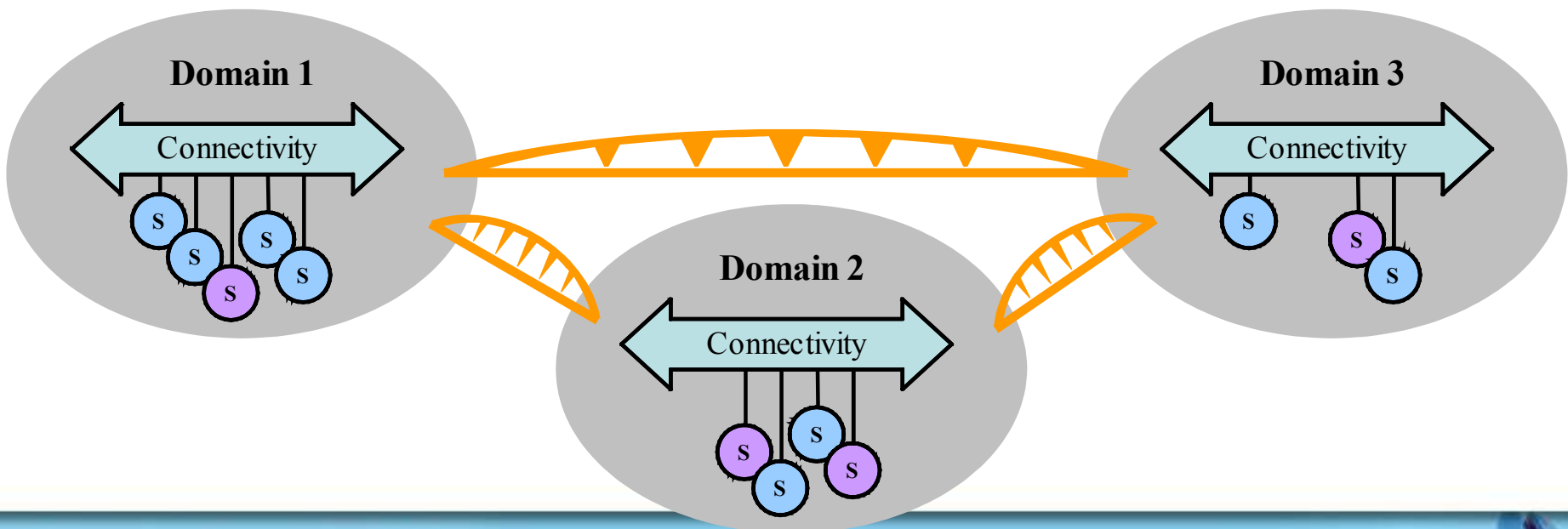
The Business Goal

- Maximize **service reuse** in the enterprise
- Allow service reuse to span domain boundaries
- ... **Federated Service Reuse**



The Solution ... Connectivity [ESB] Federation

- Must bridge **Connectivity** across domain boundaries
- Resulting in **Federated Connectivity ...**
- to achieve ... **Federated Service Reuse**



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What Drives the Reality of Multiple Domains?

Both historical reasons and explicit choices contribute

Mergers and acquisitions

Distributed
geographic
locations

Best practice
requirement to
isolate critical
environments

Decoupling to allow asynchronous
development and deployment

Business or funding models are
distributed -- multiple business units
each with own P&L

Differing internal
connectivity
requirements

Distributed
governance

Architectural choices –
decision for corporate-wide
shared services

Incremental adoption of SOA

Federated Connectivity – Analyst Views

ESB Adoption Trends - Gartner

“...half of all large companies will apply a systematic, federated approach to managing their disparate SOA domains ... in 2009. (0.7 probability)”

“80% of large companies will have ESBs or similar SOA infrastructure products from three or more vendors in 2009. (0.7 probability)”

– Roy Schulte, Gartner, “Succeeding With Multiple SOA Service Domains and Disparate ESBs”, May 2007

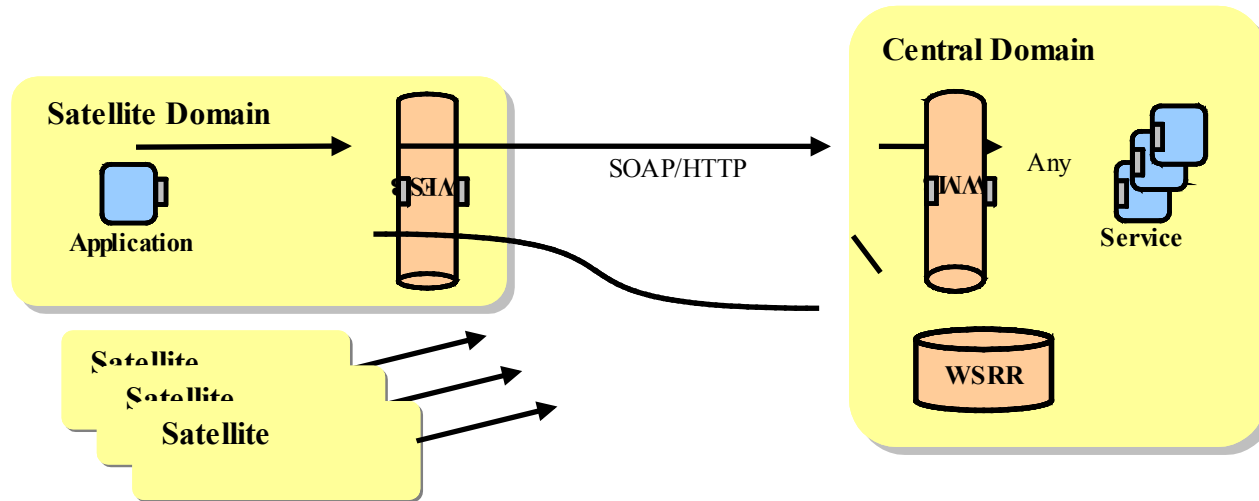
ESB Adoption Trends - Forrester

“Some of Forrester's most advanced clients got on the ESB bandwagon years ago and today find that they have an embarrassment of riches, with multiple ESBs. This outcome is almost inevitable for larger enterprises; no single ESB today can satisfy all requirements equally well across the whole of a large enterprise.”

– Larry Fulton, Forrester, “Shaping Your Middleware Strategy to Benefit from ESBs, May 2007

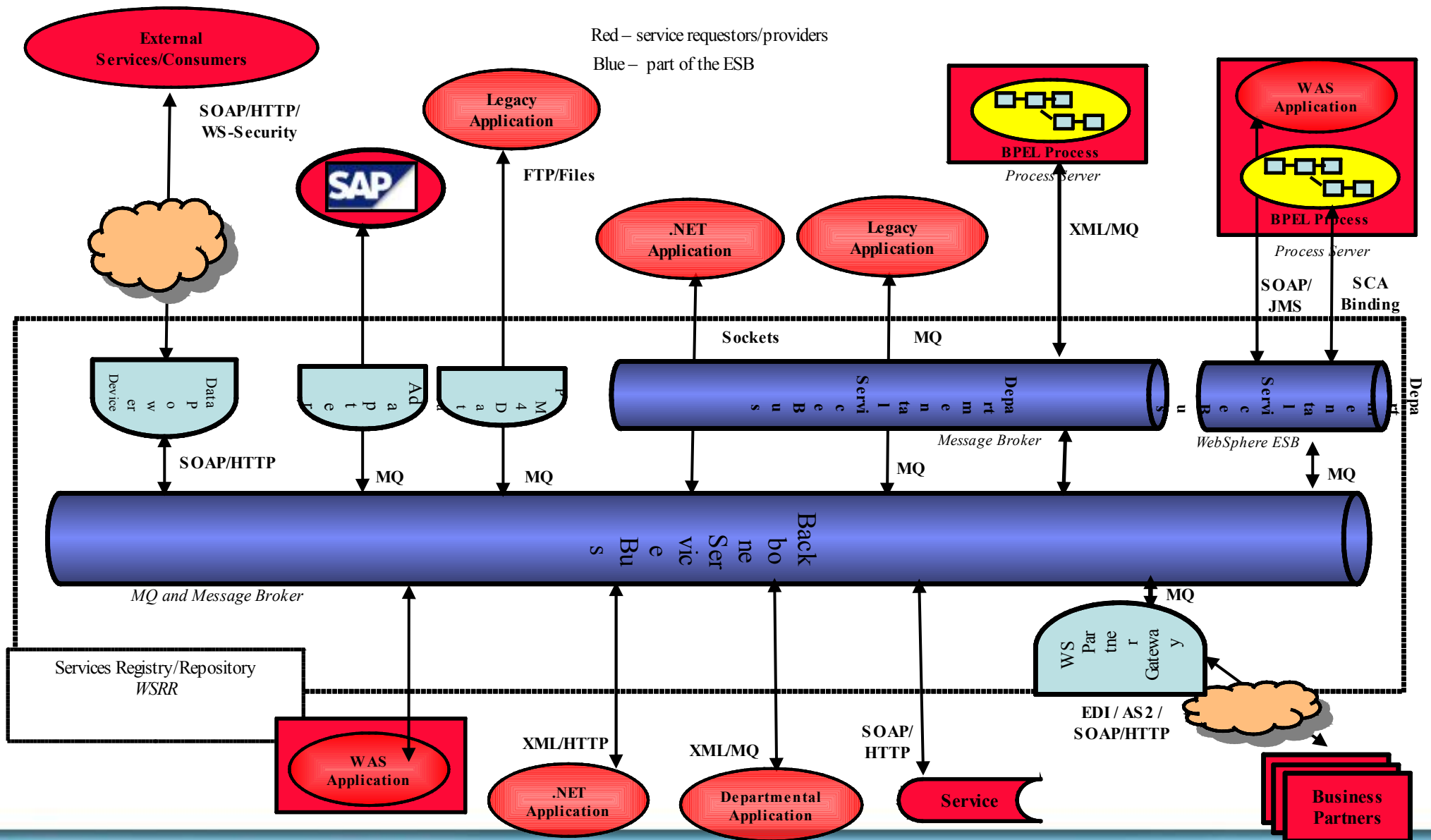


Federated Connectivity Example #1



- **Goals**
 - Match connectivity topology to multiple domain nature of Company
 - Allow replacement of service(s) in Central Domain without impact on other Domains
 - Loosely coupled, intelligent connectivity (dynamic routing) in all domains
- **Solution**
 - WebSphere Message Broker 6.0 matches skill set and future plans in Central Domain
 - Leverage existing WebSphere ESB in Satellite Domains
 - Extended use of WSRR

Federated Connectivity Example #2



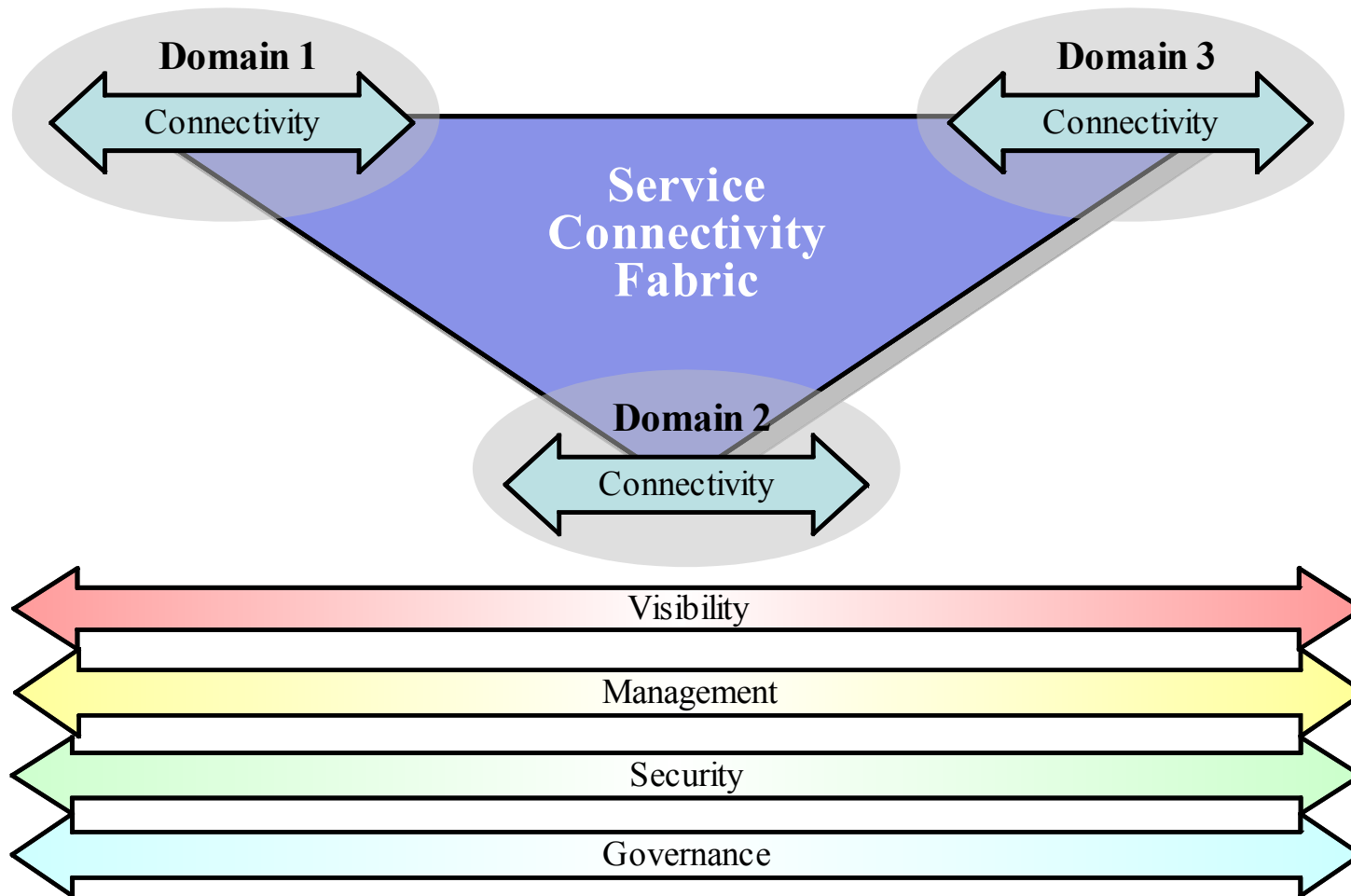
Objectives

- What is “ESB Federation”
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Connectivity is complex

- Enterprise-wide connectivity is more complex



Connectivity Challenges – How does one

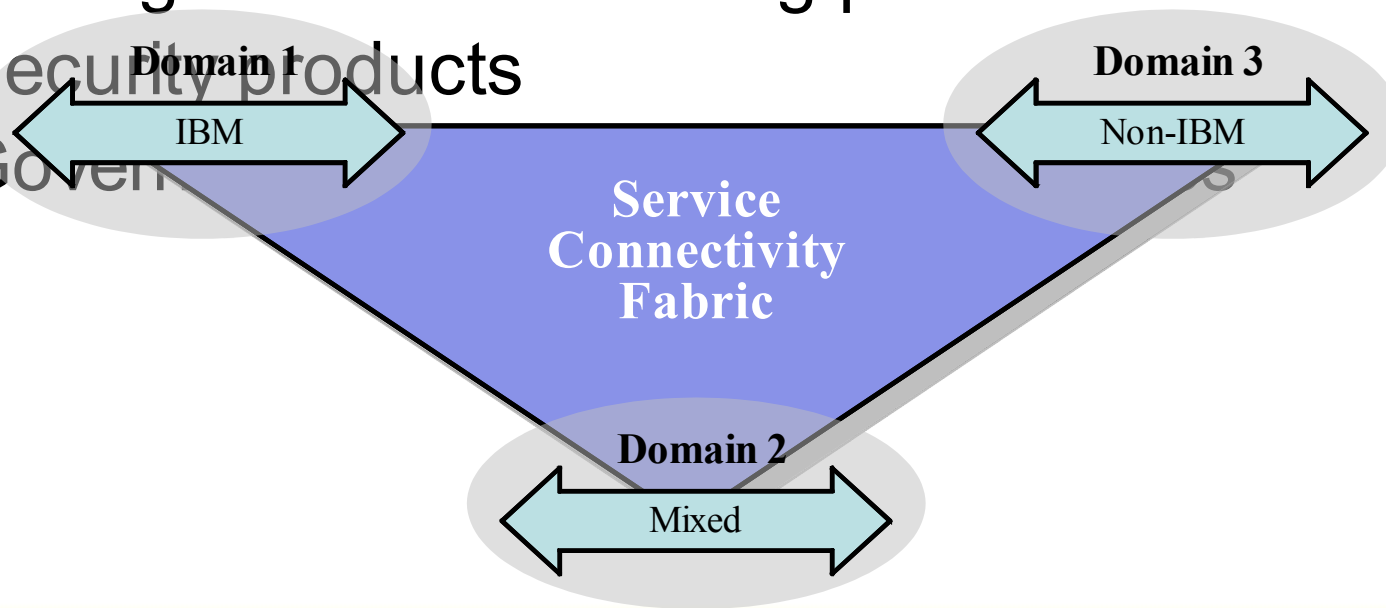
...

- **Visibility**
 - Establish basic interoperability between services in different domains
 - ‘Advertise’ services in different domains
- **Management**
 - Coordinate event management and monitoring for all domains
 - Provide business-relevant information about services performance in different domains
 - Detect performance and availability concerns in different domains before there is impact on business performance
- **Security**
 - Propagate, map and audit identities across domains
 - SOA opens up applications and data to greater use and therefore expose them to greater risk of malicious intent
- **Governance**
 - Increase service reuse across the enterprise
 - Help services in different domains interact efficiently and dynamically with each other
 - Enable enforcement of policies across all domains



An Enterprise is heterogeneous

- Federation must support IBM and non-IBM
 - ESBs, of various levels of complexity, from 'edgy' to appliance
 - Service registries, from file to extended UDDI to WSRR
 - Management & Monitoring products
 - Security products
 - Governance



Federation happens in different ways

- Reactive (bottom-up)
 - Federating existing domains that have grown in an enterprise because of mergers, independent decisions of business units, etc...
 - Objective is to enable interactions between the domains, to govern their configuration and manage & secure the interactions across domains, potentially with little control over the individual domains themselves
- Proactive (top-down)
 - Intentionally created Domains reflect organizational, geographical, governance, ... requirements in an enterprise
 - Objective is designing a federated connectivity infrastructure to share services among domains, typically with control over the individual domains
- Mixed (meet-in-the-middle)
 - Reality is rarely clean
 - A little Reactive and a little Proactive



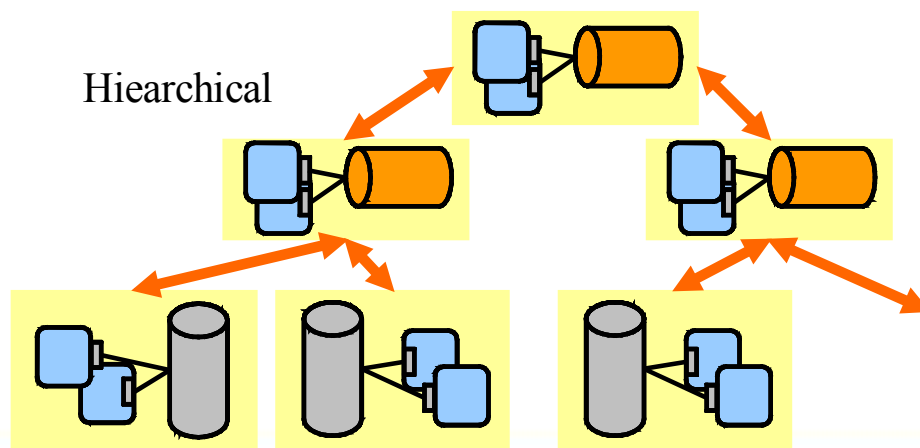
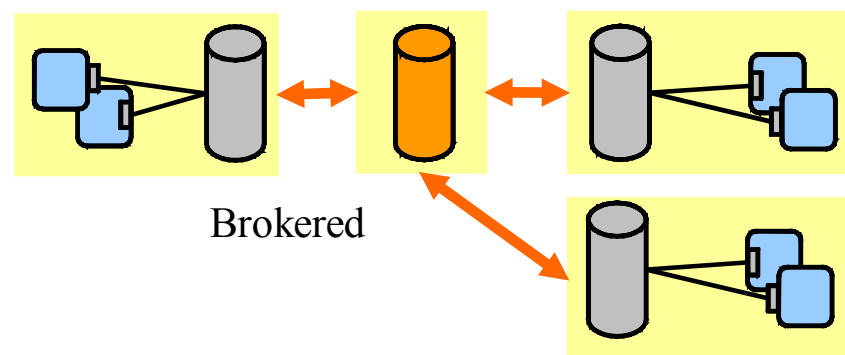
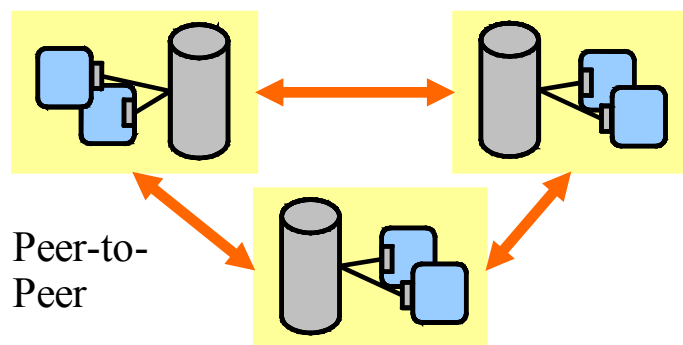
Domains differ

- Autonomy
 - Strong central control
 - Weak central control (influence)
 - No central control (facilitation)
 - ...
- Membership
 - Static
 - Dynamic
 - Ephemeral



Federation Topology Examples

- No one topology works for all enterprises (one size does not fit all)
- The topology can be fundamental to the success of the enterprise



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Service Visibility – Service Bus

IBM delivers the most complete ESB product portfolio



WebSphere ESB
*Built on WebSphere
 Application Server for an
 integrated SOA platform*



**WebSphere
 Message Broker**
*Universal connectivity and transformation
 in heterogeneous
 IT environments*

ESB Offerings from IBM WebSphere



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

- Common mediation patterns
- Common transformation capability
- Common standards support

- Common integration with IBM connectivity ecosystem
- Mission-critical qualities of service



WebSphere ESB

Build on WebSphere Application Server



 Enhanced!

WebSphere Enterprise Service Bus 6.1

- Built on WebSphere Application Server
 - Delivers business-critical qualities of service
 - Easily extended to WebSphere Process Server
 - Integrated solution for service mediation
- Delivers leadership in SOA standards for service composition, and leverages the embedded messaging and web services engines from WebSphere
- Integrates everything with WebSphere Adapters for enterprise applications, the breadth of the WebSphere ecosystem, and support for standard protocols
- Optimized for standard XML and web services formats with basic support for other common formats
- Provides business visibility with embedded event engine for Business Activity Monitoring solutions



WebSphere Message Broker

Built on WebSphere MQ



* Enhanced!

WebSphere Message Broker 6.1

- Delivers universal connectivity and transformation
 - Addresses a wide range of requirements heterogeneous IT environments
 - Optimized to accommodate heterogeneous IT environments
 - Offers unique quality of service and connectivity on z/OS
 - Exploits the unparalleled reach and reliability of the WebSphere MQ enterprise messaging backbone
 - Connects everything through standard protocols, WebSphere Adapters for enterprise applications, and specialized connectivity options
 - Enables transformation between a wide range of data formats, including XML, legacy, and industry standards, and custom formats
 - Optimized for high-volume processing and rapid time to value for complex mediation requirements with a robust set of pre-built mediation function
- Enhanced support for WS-Security and WS-Addressing
 - Simplified EIS query for key data structure discovery
 - Comprehensive record detection identification
 - Simplified message and database filter and route nodes



WebSphere DataPower XI50

Purpose-built appliance



*** Enhanced!**

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

WebSphere DataPower Integration Appliance XI50 3.6.1

- Support for WS-RX for guaranteed delivery of mission critical messages
- Improved Registry & Repository support for centralized access to service metadata & policies
- Streamlined multistep transaction processing

- Secures services on the network with sophisticated web services access control, policy enforcement, message filtering, and field-level encryption
- Optimized to bridge between leading standard protocols at wire-speed, including web services, messaging, files, and database access
- Enables transformation between a wide range of data formats, including XML, legacy, and industry standards, and custom formats
- Captures and emits events to facilitate web services management and enable business visibility in Business Activity Monitoring solutions



Service Visibility – Service Registry

WebSphere Service Registry and Repository

IBM WebSphere Service Registry and Repository

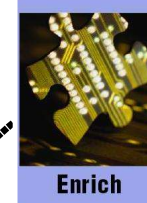


Publish

Find

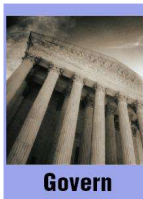
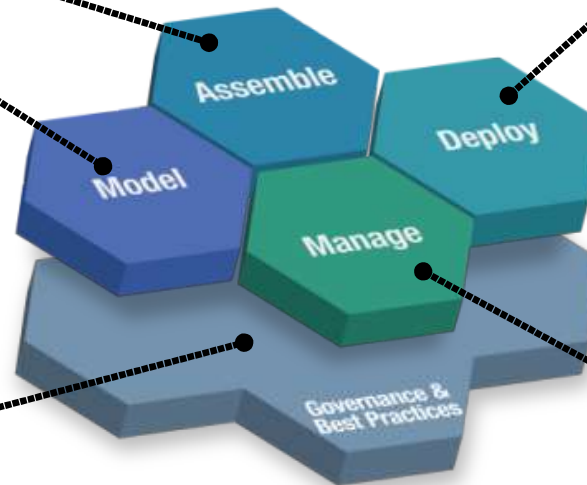
Promote Reuse

Find and reuse services for building new processes and applications.



Enrich

Enhance Connectivity
Enable dynamic and efficient interactions of services.



Govern

Enable Governance
Govern services throughout the service lifecycle.



Manage

Optimize Service Usage
Socialize health and performance information.

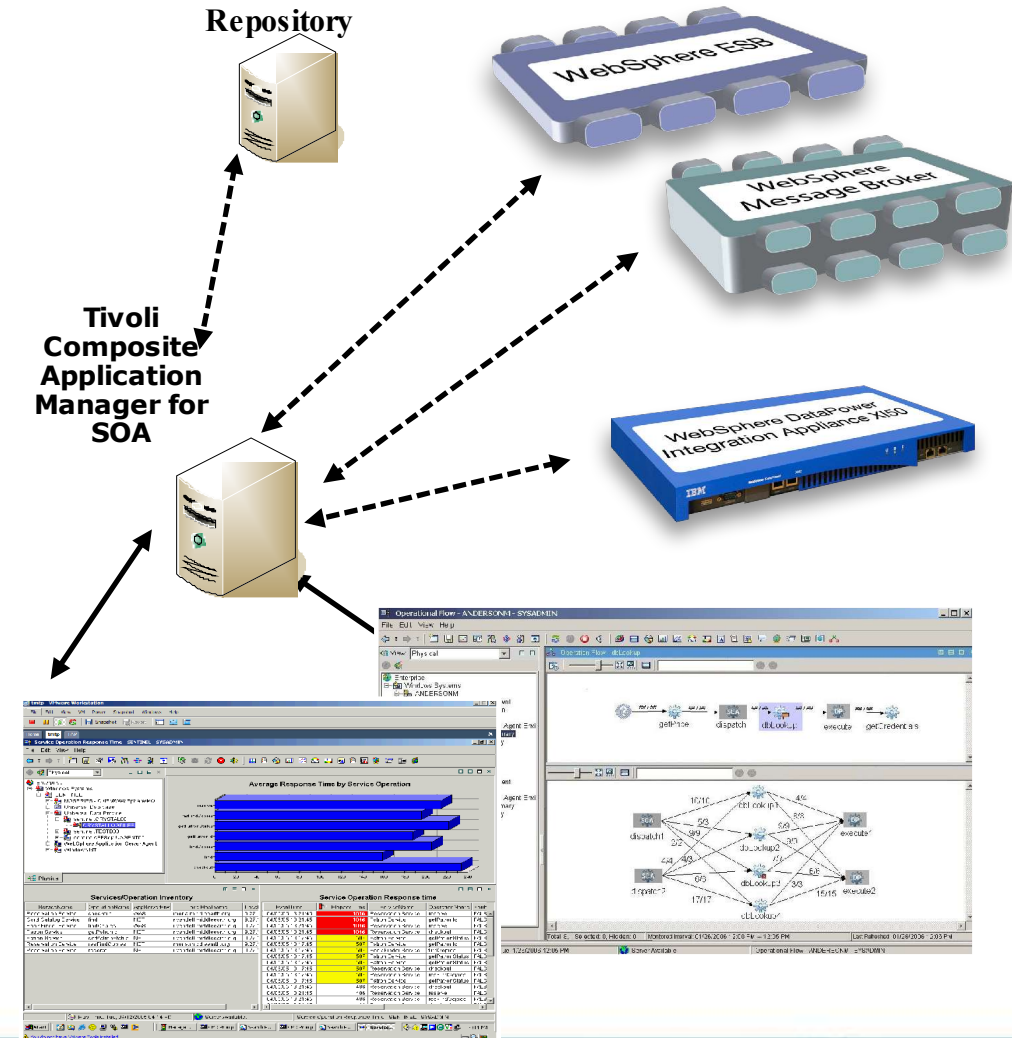


Service Management

Tivoli Composite Application Manager for SOA

- Service Discovery & Reconciliation
- Service Monitoring & Logging
- Service problem identification and resolution
- Service Management Automation
- Heterogeneous SOA Platform Support
- Integrated Console

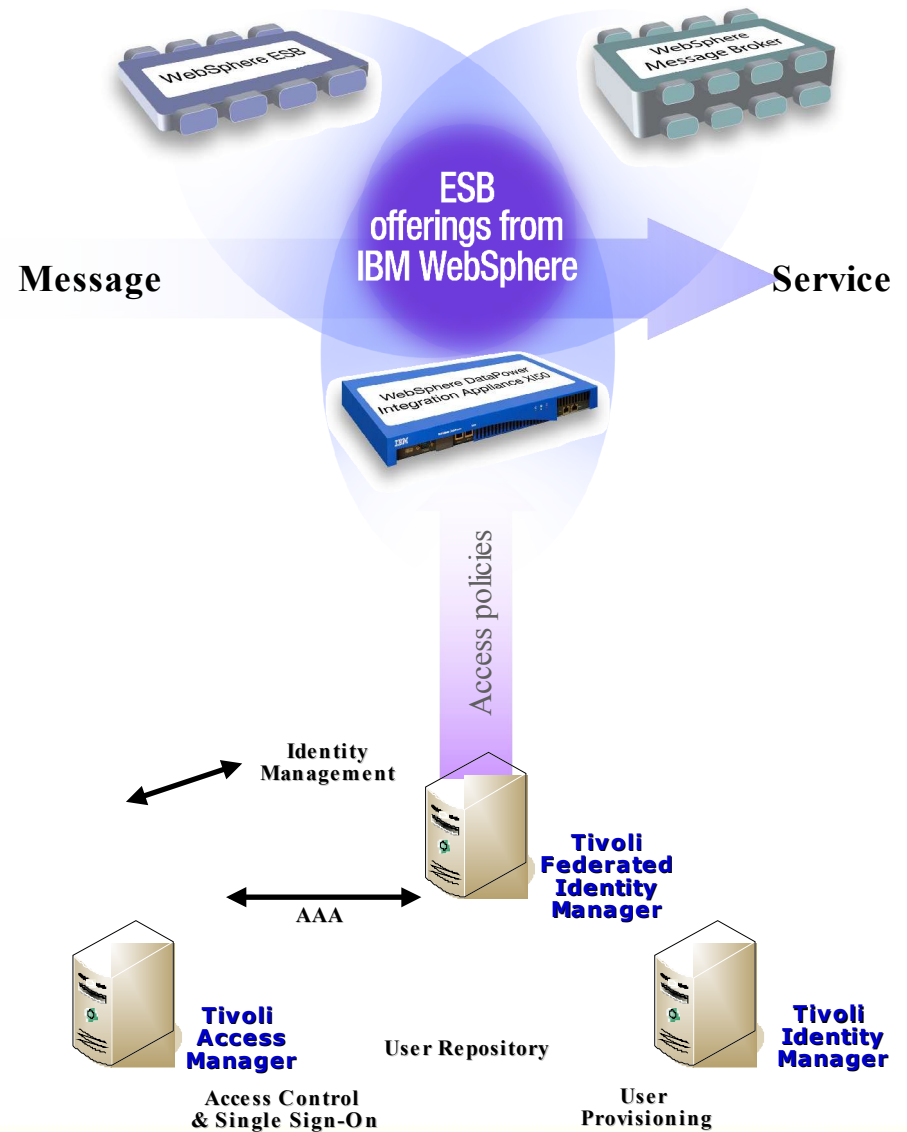
IBM WebSphere Service Registry and Repository



Service Security – Identity & Access

Tivoli Federated Identity Manager

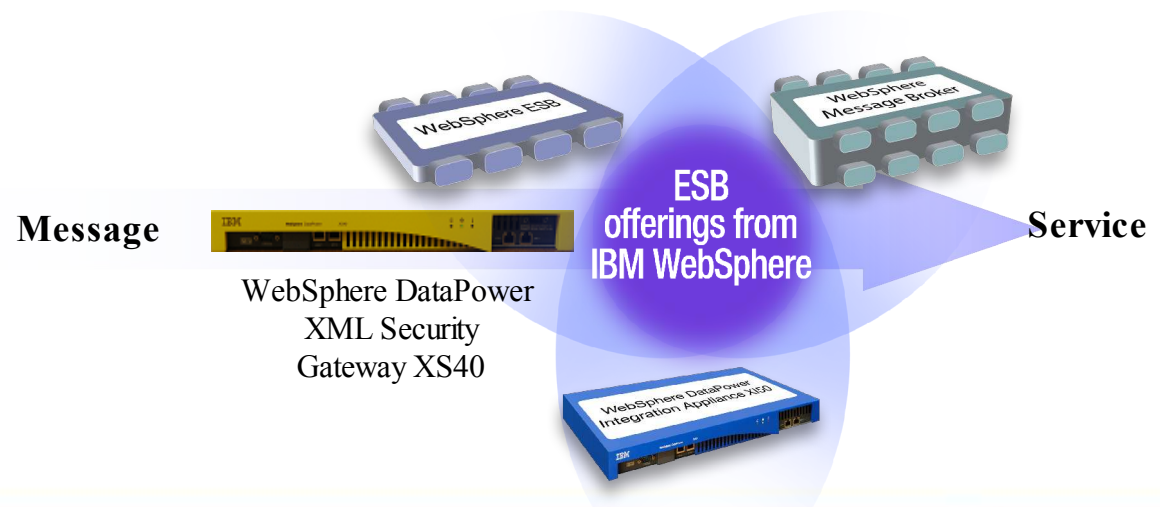
- Understands which users can connect to services and how they are connected to those services
- Provides a federated single sign-on capability using an identity trust management service
- Enables “identity aware” service bus
- Helps separation of concerns for access control management
- Helps meet compliance requirements by auditing identity access end-to-end
- Leverages open standards to support heterogeneity



Service Security – Gateway

WebSphere DataPower XML Security Gateway XS40

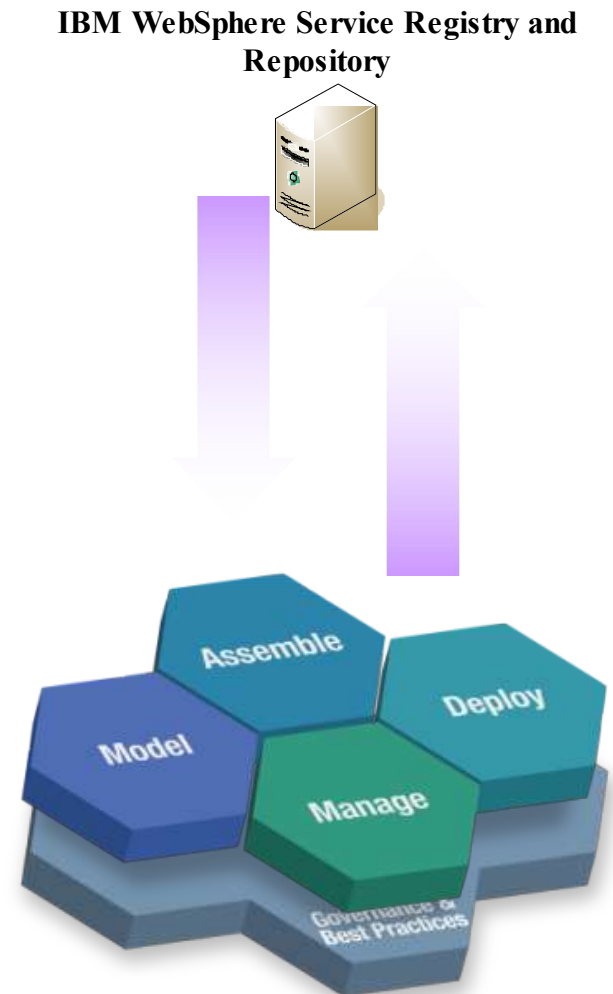
- SOA firewall, access control, services security, XML threat protection, encryption
- Drop-in policy enforcement
- Advanced standards support for heterogenous/3rd-party interoperability
- Configuration-driven interface reduces need for specialized SOA skill sets.



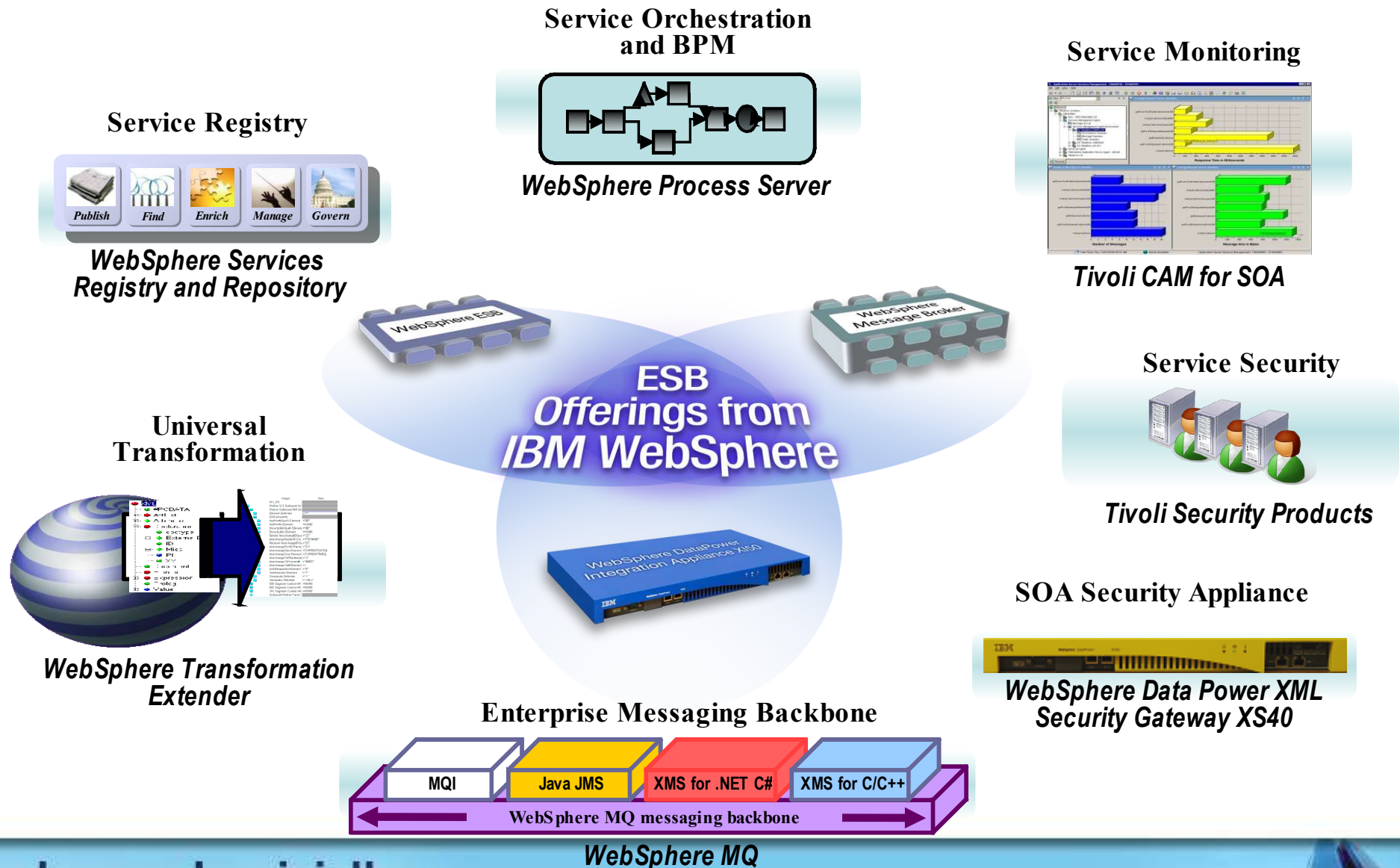
Service Governance

WebSphere Registry and Repository

- Promote reuse and eliminate redundancies
 - Publish and find services and related metadata through all stages of SOA
 - Integration with other registries and repositories
- Better control of SOA with governance
 - Facilitate service lifecycle with guards for state transitions
 - Analyze impacts of service introduction, deletion or alteration by maintaining relationships
 - Manage role-based access to services, changes, versioning and service retirement
 - Manage service interaction policies
 - Scoping and promotion of service endpoint visibility according to federated deployment and topology requirements
- Enrich SOA runtime interaction
 - Enable optimized access to service metadata
 - Enable dynamic service selection
 - Enable enforcement of policies



Connectivity Ecosystem from IBM WebSphere



Why IBM WebSphere for SOA Connectivity?

Nobody has the same breadth and depth

- Broad portfolio relied on by over 87,000 customers
- Extensive ecosystem – 2,500+ SOA partners and 3,150 active ISV solutions

Nobody invests more

- IBM investing over \$1B a year around SOA and Web services
- Over 6,700 IBM developers
- Over 10,750 IGS technical practitioners trained on WebSphere

Award-winning SOA products



IBM Overall Winner in Application Integration Middleware

-CRN Channel Champions Award (February 2006)

-CRN Channel Champions Award (March 2005)



IBM tops elite vendor list

-Intelligent Enterprise Editors' Choice Awards (April 2005)



IBM WebSphere MQ – voted best Java Messaging tool by JavaPro readers – May 2006



Benefits of Using IBM for Your ESB

*IBM application integration costs 2-4 times less than custom-built integration approaches**

- WebSphere MQ
 - The messaging backbone for your ESB
 - More than 500,000 MQ servers
 - Deployed by more than 10,000 different clients
 - 80+ supported platform configurations

- IBM ESB Offerings
 - Support for Web Services and more
 - Connects 3rd party JMS providers
 - Integrated with WebSphere platform
 - Scalable, with performance to match back-office transaction processing systems

