

**WebSphere** Software



# IBM WebSphere Service Registry and Repository

## Technical Overview

*SOA on your terms and our expertise*

Soudabeh Javadi, WebSphere Software  
IBM Canada Ltd  
[sjavadi@ca.ibm.com](mailto:sjavadi@ca.ibm.com)

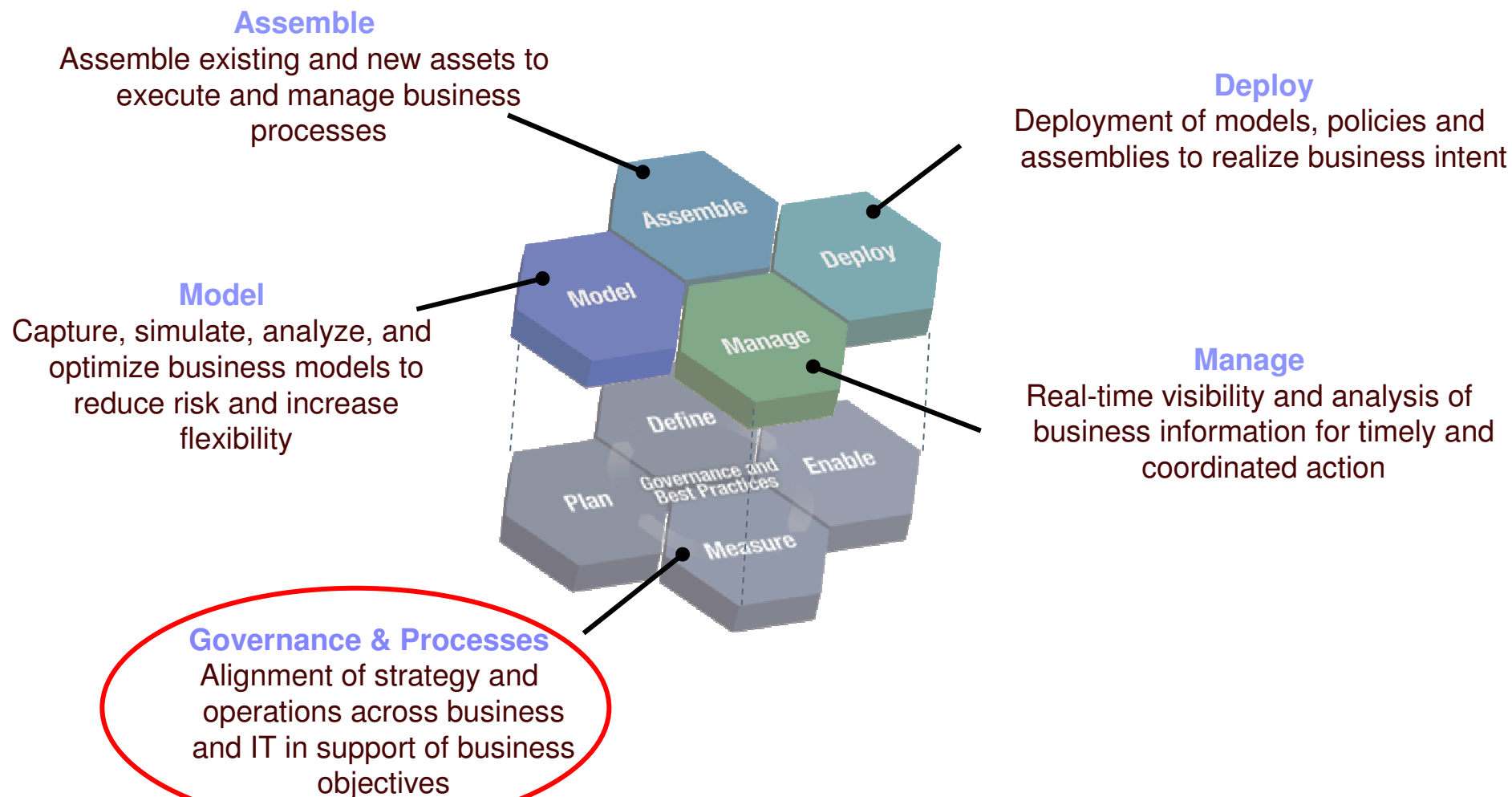


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# Agenda

- Introduction
- Capabilities
  - Publish and Find
  - Enrich
  - Manage
  - Govern
  - Extend
- Development process and Roadmap

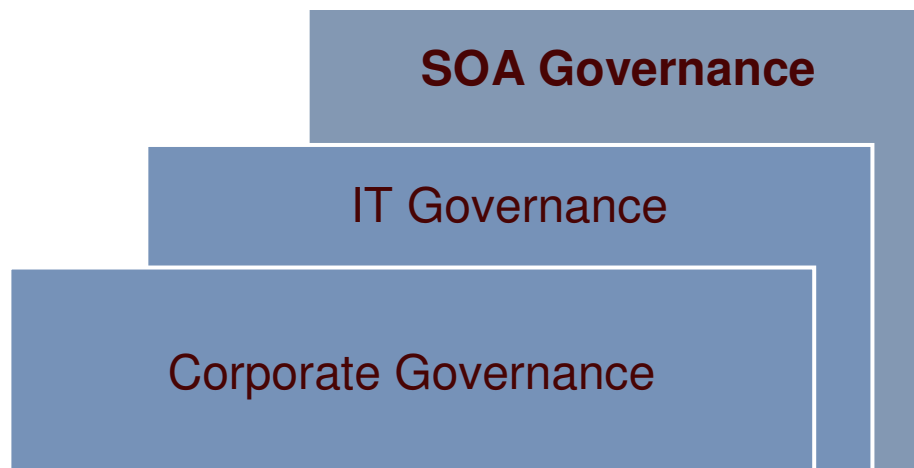
# Service Oriented Architecture Lifecycle



# What is SOA Governance?

*There are different aspects of Governance, based on the process(es) that are going to be governed*

*SOA Governance is an extension of IT Governance*



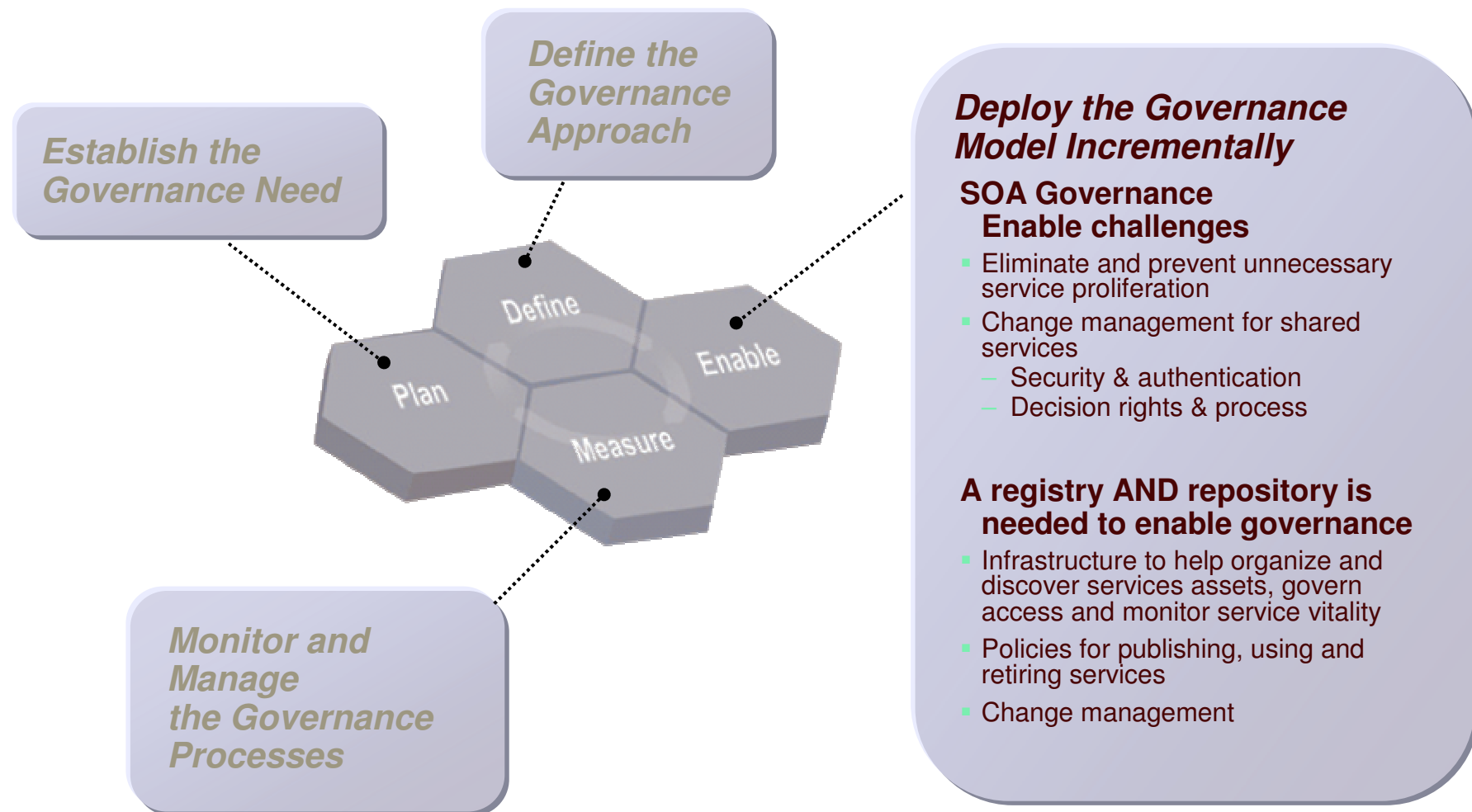
*SOA Governance:  
examples of candidate governed processes*

- service funding
- service ownership
- service creation
- service reuse
- composite application design

*IT Governance:  
examples of candidate governed processes*

- requirements management
- portfolio management
- change management
- data design
- architectural design
- release management

# SOA needs a registry and repository to enable governance



# What is a registry ... a repository?



## Registry?

**Contains Service Metadata**



## Repository?

**Stores Service Artifacts**

***An integrated Registry / Repository Solution  
is needed govern and manage SOA for maximum value***



**Business  
process vitality**



**New value  
through reuse  
of assets**



**Improved  
connectivity**



**Closer  
alignment of IT  
to business**



**Business  
Flexibility**

# WebSphere Service Registry & Repository

## *Crossing multiple SOA Entry Points*

*WebSphere Service Registry & Repository delivers...*

- Integrated service metadata registry and repository to govern services and manage service lifecycle promoting visibility, consistency and reducing redundancy in your SOA
- Seamless publish and find capabilities across all phases of SOA fostering reuse of services, enriching connectivity with dynamic and efficient interactions between services at runtime

### *New feature highlights*

- Publish and find services and related metadata through all stages of SOA
- Integration and federation with other standard registries and repositories
- Enable optimized access to service metadata
- Manage service interactions and policies
- 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, versions and service retirement

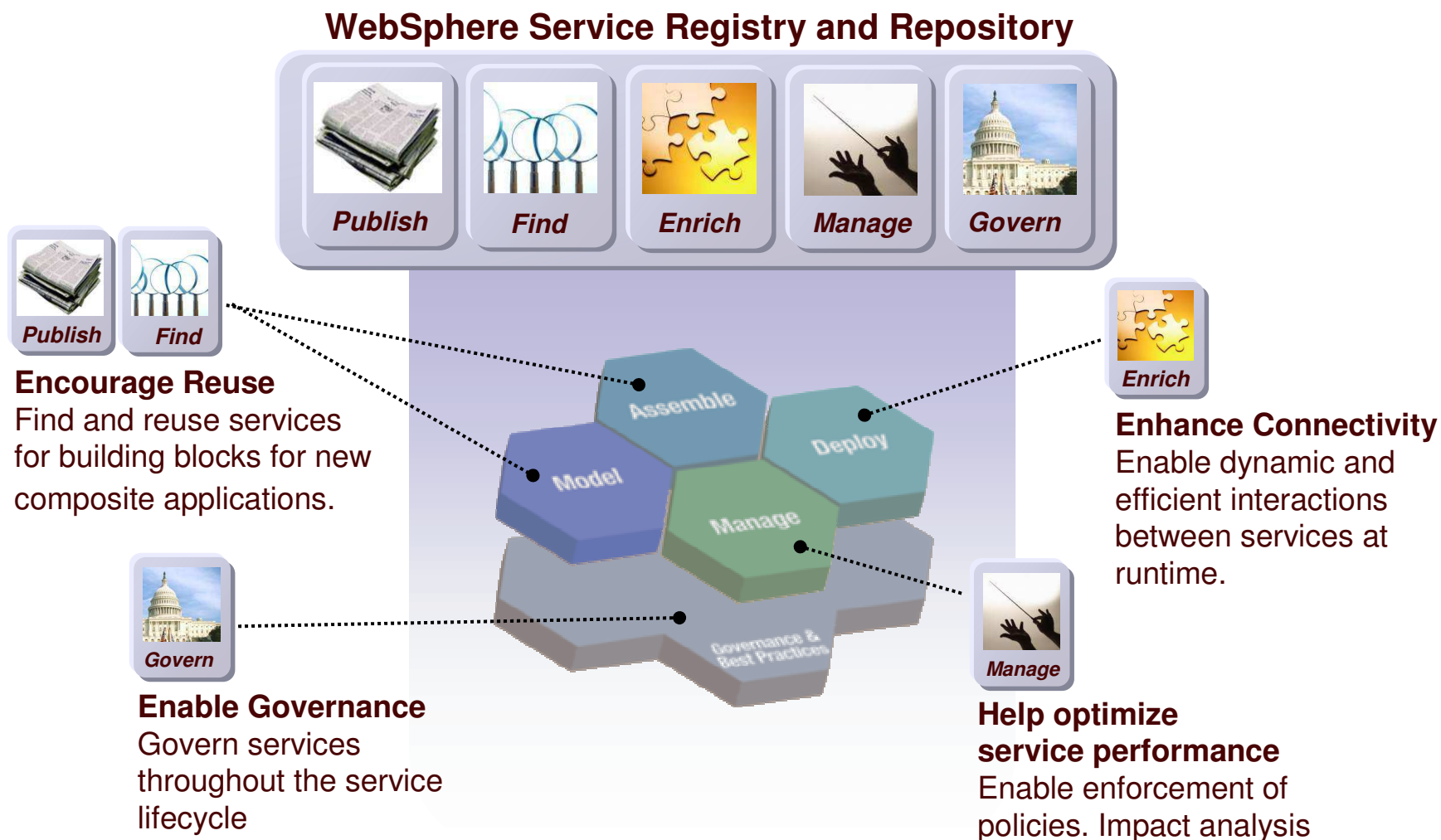
### *Key benefit*

Promote reuse and eliminate redundancies

Enrich SOA runtime interaction

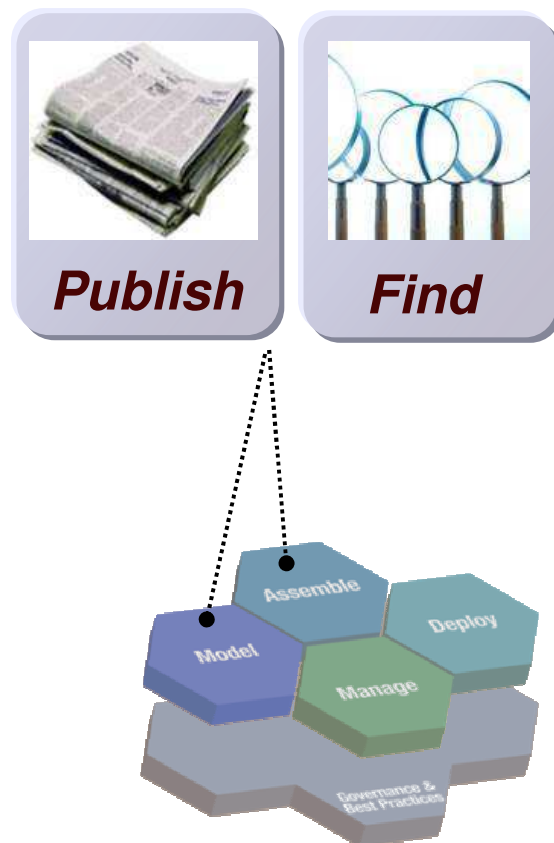
Better control of SOA with governance

The WebSphere Service Registry and Repository provides value throughout the SOA lifecycle





## IBM WebSphere Service Registry and Repository Capabilities



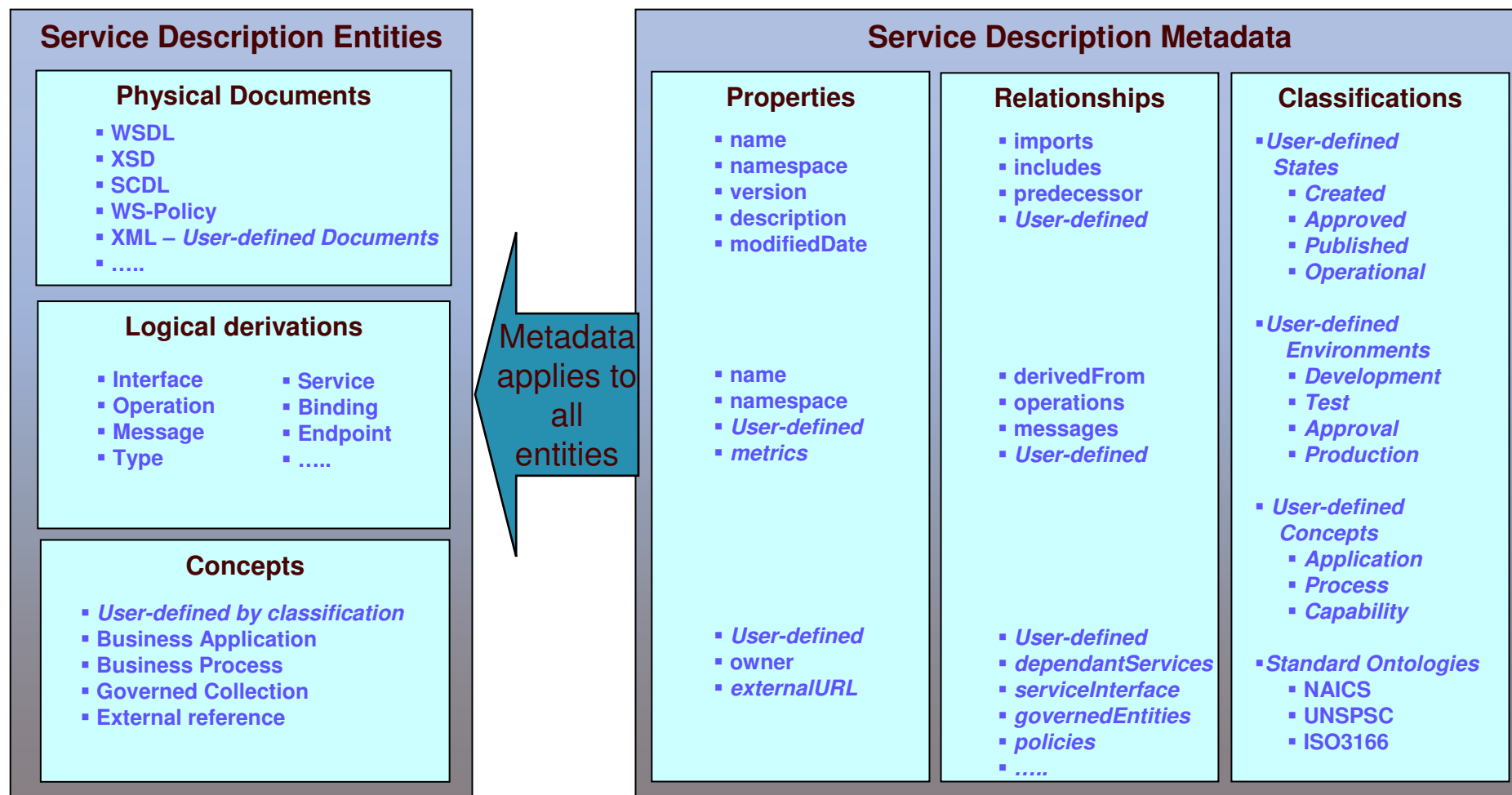
### ***Encourage Greater Reuse***

Find and reuse services for building blocks for new composite applications.

### ***Publish and find...***

- **Services descriptions and capabilities**
- **Service interactions, dependencies and redundancies**
- **Service lifecycle stage**
- **Policies for service usage**

# WebSphere Service Registry & Repository Content



# IBM WebSphere Service Registry and Repository Makes It Easy..... To Publish using Web UI

The screenshot displays the IBM WebSphere Service Registry and Repository Web UI. It features three overlapping windows:

- Preparing to load the document:** A dialog box with the text "Specify the file to load." and a section titled "Path to the service document." with an "OK" button at the bottom.
- WSDL Document:** A main window titled "WSDL Document" showing details for "Echo.wSDL". It has tabs for "Details", "Content", "Impact Analysis", and "Governance". The "Details" tab is active, showing "General Properties" (Name: Echo.wSDL, Location: Echo.wSDL) and "Additional Properties" (Port types, Bindings, Services, Custom properties, Relationships). The "Custom properties" link is circled in red.
- Properties:** A sub-window titled "Properties" showing details for a new custom property. It has tabs for "Details" and "General Properties". The "General Properties" tab is active, showing "Key" (MyCustomProperty) and "Value" (My Custom Value). It includes "Apply", "OK", "Reset", and "Cancel" buttons.

# IBM WebSphere Service Registry and Repository Makes It Easy..... To Find using Web UI

Queries

Use this wizard to run a query.

→ Enter details

Summary

Enter details for the query. Empty fields are not used in the query.

Query: WSDL Documents

Use all of the following (AND) ▼

Name  
\*Service

Namespace

Property key

Property value

Classifications  
☒ Match children  
Published

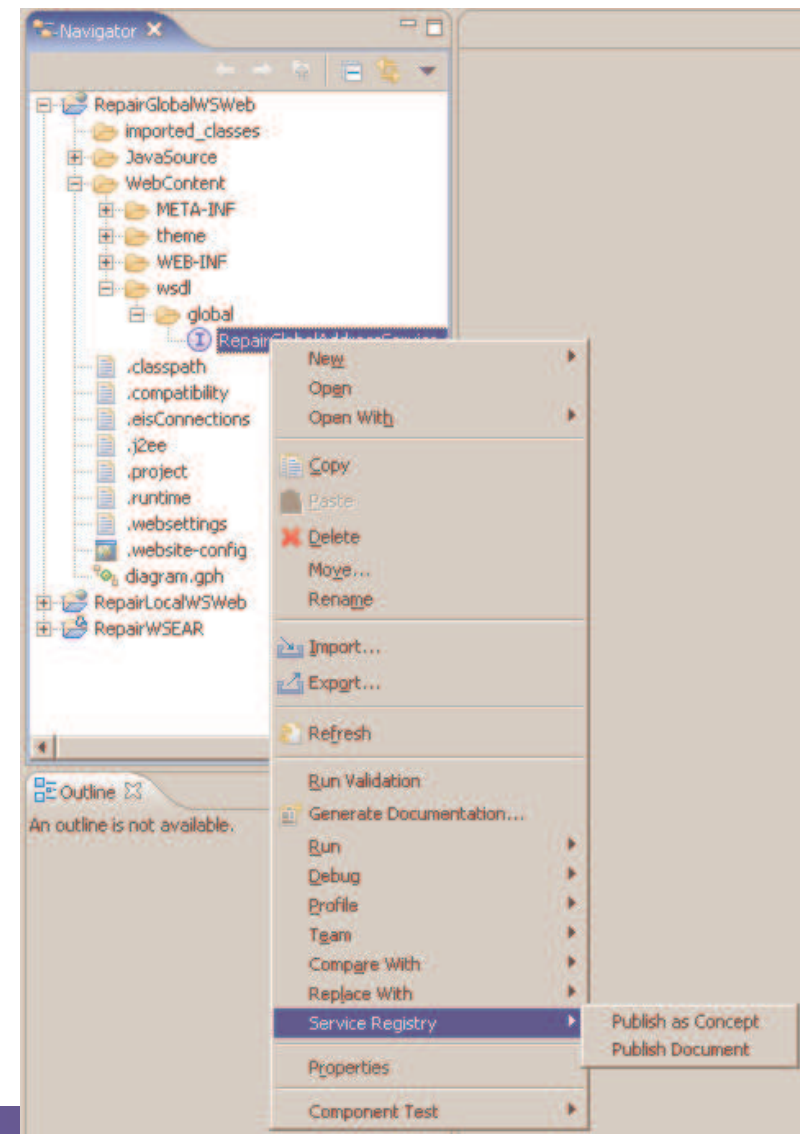
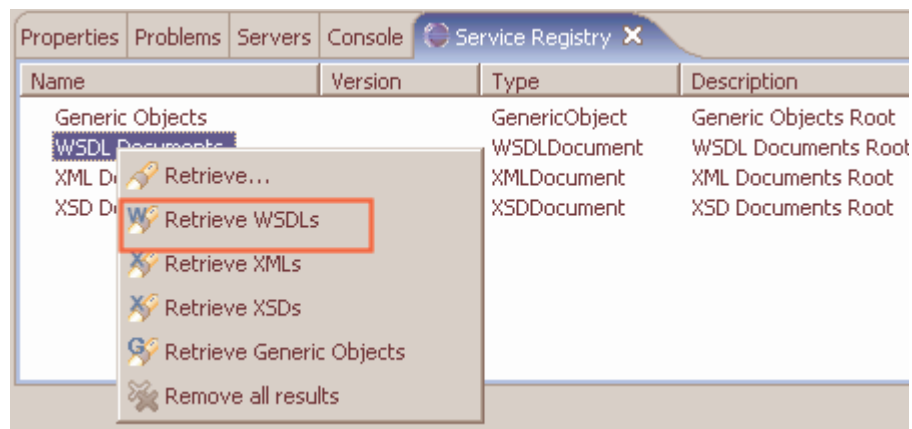
Choose

Next Cancel

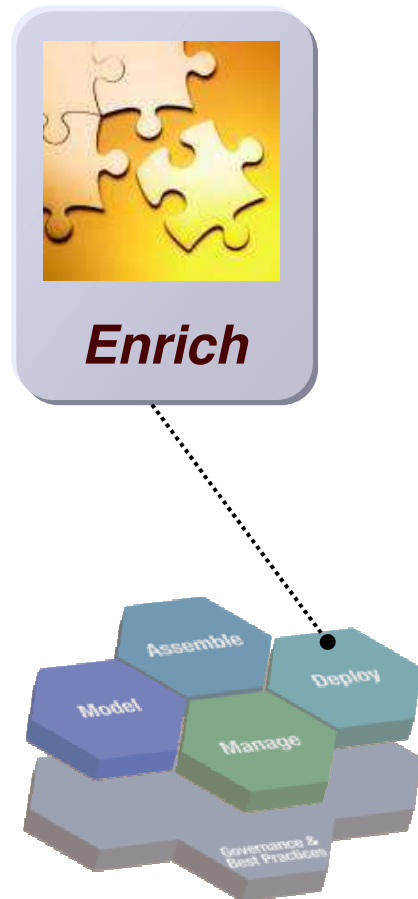
Search

\*Service Go

# IBM WebSphere Service Registry and Repository Makes It Easy..... To Publish and Find using Eclipse Plug-In



# IBM WebSphere Service Registry and Repository Capabilities



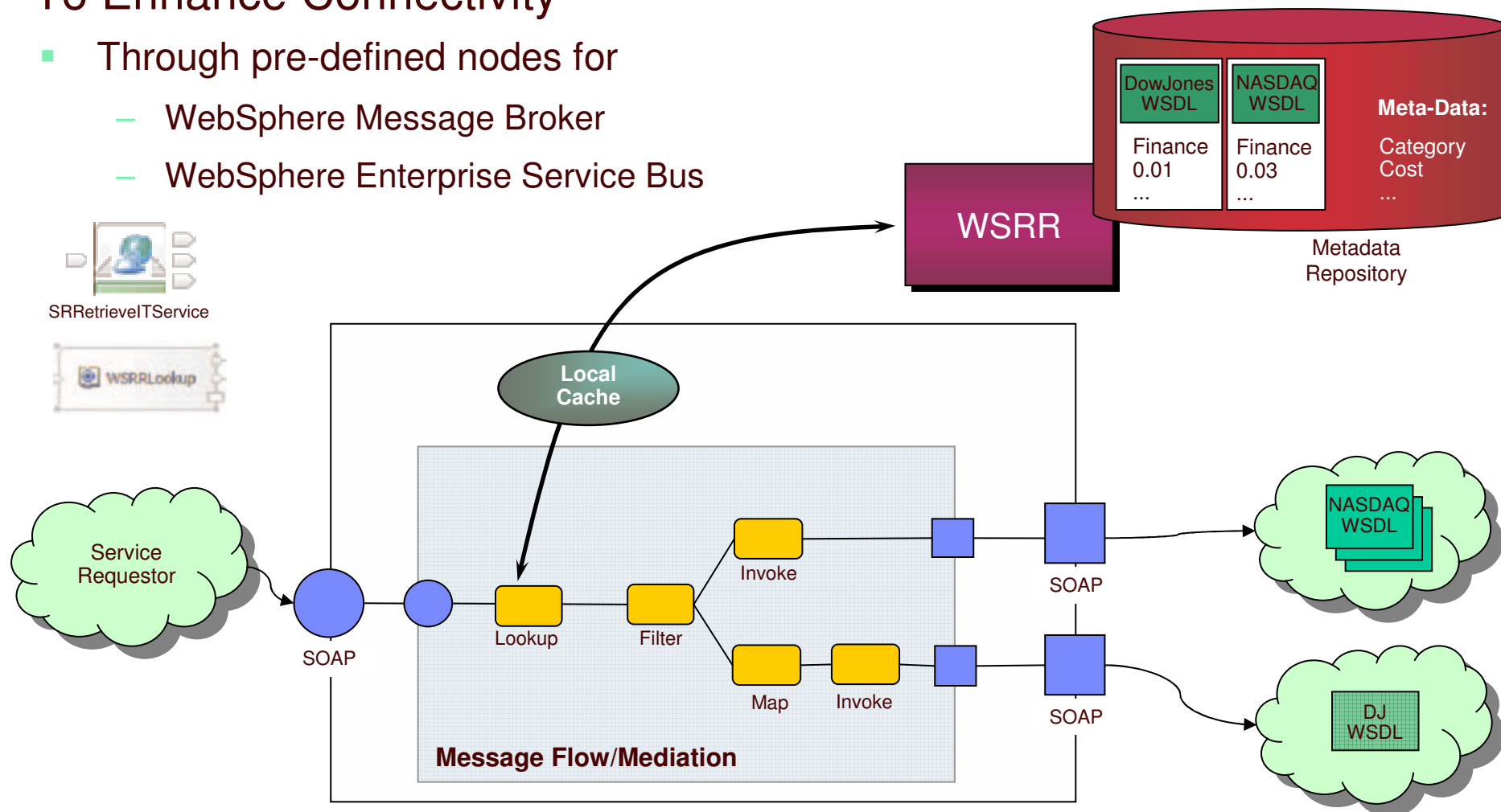
## ***Enhance Connectivity***

Enable dynamic and efficient interactions among services at runtime.

- **Manage dynamic and efficient access to services information by runtimes**
  - **Service endpoint selection**
  - **Service availability management**
  - **Policy enforcement**
- **Identify users of metadata**
- **Notify users of changes**
- **Securely transmit service information**

# IBM WebSphere Service Registry and Repository Makes It Easy..... To Enhance Connectivity

- Through pre-defined nodes for
  - WebSphere Message Broker
  - WebSphere Enterprise Service Bus



# Endpoint Lookup Mediation Primitive

- Endpoint Lookup mediation primitive
  - Can be configured to search for service endpoints using various selection criteria
  - Utilizes the WebSphere Service Registry and Repository as the registry
- Supports of Dynamic Endpoints enhancement
  - Primitive does the lookup, Dynamic Endpoints needed to actually call it
- WESB/WPS runtime provides a cache for registry lookups
  - Intended to boost performance for registry lookups

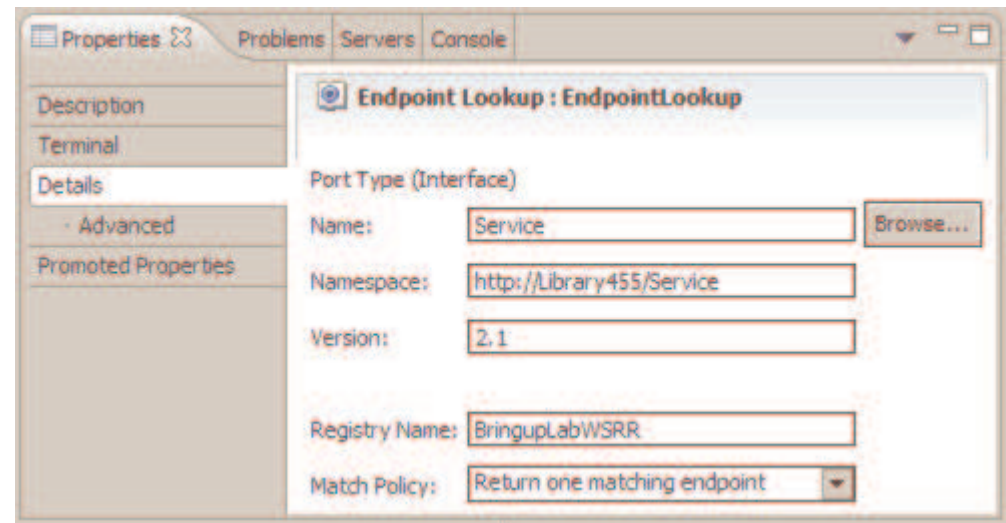
## Benefits:

- Enable registry lookup of service endpoints at runtime
  - Endpoints can be managed using WebSphere Service Registry and Repository
  - Mediation flow can be easily configured to perform registry lookups
  - Capabilities of registry for service selection enable new application scenarios
- More flexibility in managing mediation flows without requiring redeploy



# Endpoint Lookup – Properties

- Properties define search criteria for endpoint selection
- Name
  - Port type name
  - Typically matches the Interface on the Reference for the dynamic callout
- Namespace
  - Port type namespace
- Version
  - A freeform string used to represent the version of the port type
  - This is matched with a version field associated with the port type in WSRR
  - There is no equivalent of this in WID
- Registry Name
  - Identifies the registry against which to do the lookup
  - Registries are administratively defined in the server runtime at the cell level
  - Leaving this blank results in use of the registry designated as the default
- Match Policy
  - Return one matching endpoint – arbitrarily select one returned endpoint to place in the SMO
  - Return all matching endpoints – place all returned endpoints in the SMO



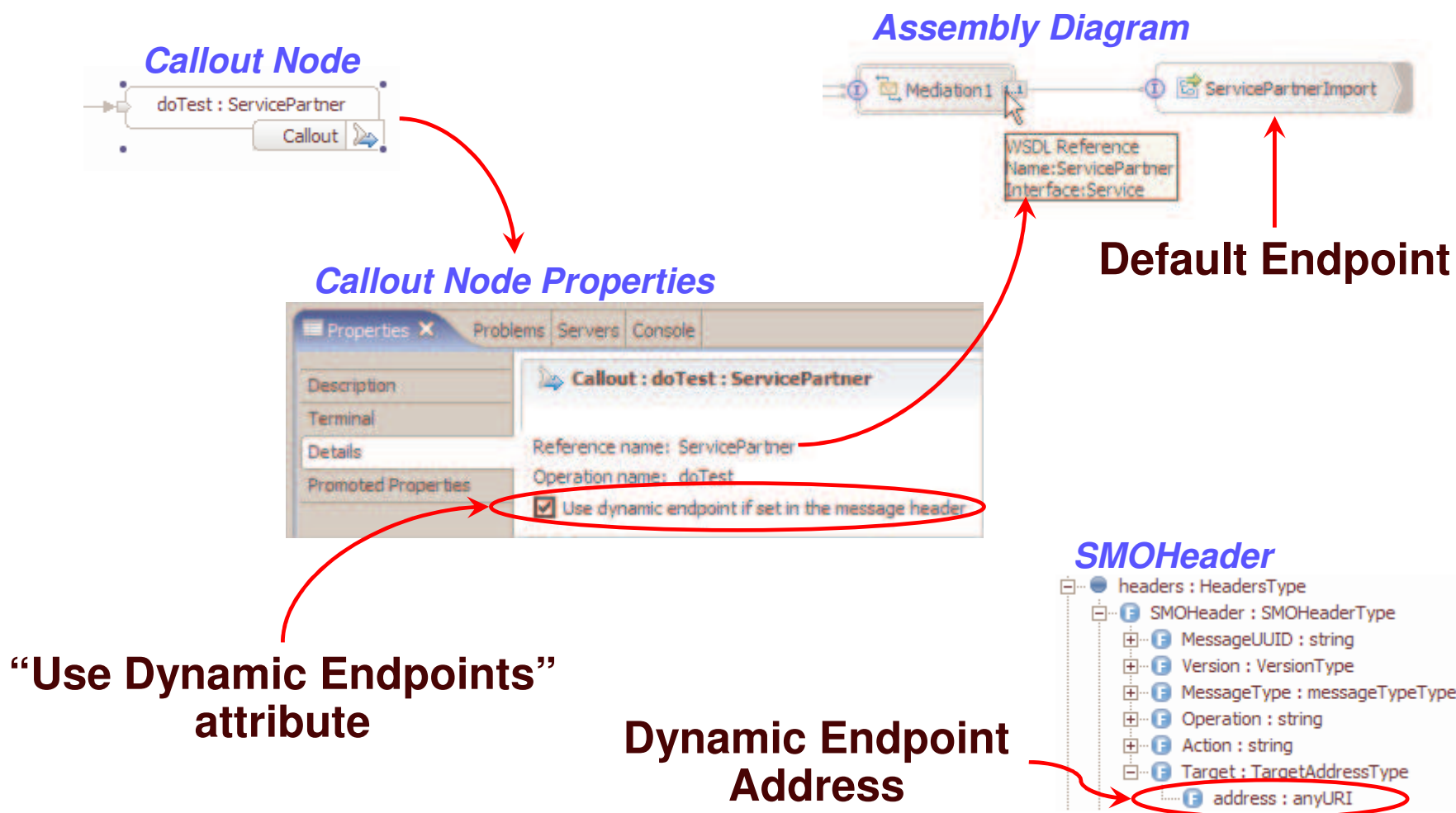
## Dynamic End-point Selection

- Provide enhanced callout nodes to allow for dynamicity
  - Boolean attribute on callout node to indicate if dynamicity of endpoint is allowed
  - SMO header enhanced to allow with a target address element

### Benefit:

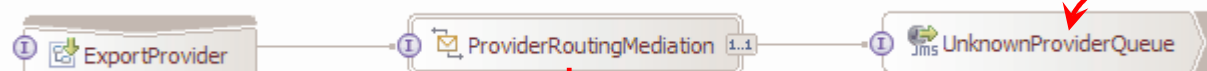
- Enable selection of service endpoints at runtime
  - Mediation flow has greater influence on dynamic routing
  - Endpoint address can be constructed and/or looked up by the mediation flow
  - Target endpoint does not have to be predefined in the mediation flow
- More flexibility in managing mediation flows without requiring redeploy
- Enables integration with WebSphere Service Registry and Repository

## Tooling Support – Dynamic Endpoint



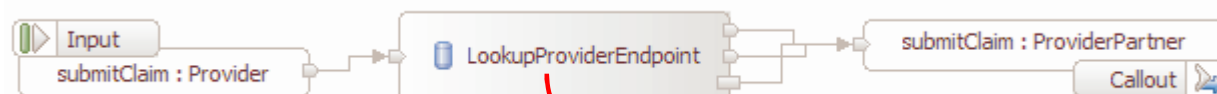
# Usage Scenario – Routing Insurance Claims

## Assembly Diagram



**Default Endpoint –  
Queue for Unknown  
Providers**

## Mediation Flow



## Database Lookup Properties

**Database Lookup : LookupProviderEndpoint**

Data source name: \* jdbc/InsuranceProviderDB

Table name: \* PROVIDER\_INFO

Key column name: \* PROVIDER

Key path: \* /body/submitClaim/claimDetails/insuranceProvider Custom XPath...

☐

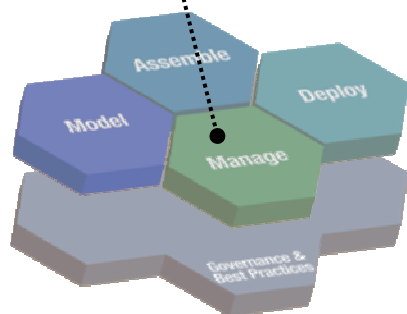
	Value column name	Message value type	Message element
	ENDPOINT	String	/headers/SMOHeader/Target/address

**Provider name used as  
key to DB lookup**

**Provider name obtained  
from body of SMO**

**Endpoint address set into  
SMOHeader target address**

# IBM WebSphere Service Registry and Repository



## Help optimize service usage and performance

- Manage service interactions, dependencies, relationships and redundancies
- Classify services into meaningful groupings based on business objectives
- Manage policies for service usage and governance
- Manage change and versioning of services
- Analyze services usage, history and business impact
- Promote and encourage optimal services usage

## IBM WebSphere Service Registry and Repository Makes It Easy..... To Manage relationships

- Through automatic discovery of relationships

- Imported WSDLs
- Included schemas
- SCA

### Built-in Relationships

Derived entity reference to its source document  
WSDL or XSD document to imported XSD document  
WSDL or XSD document to included XSD document  
WSDL or XSD document to redefined XSD document  
WSDL document to imported WSDL document  
Entity reference to classification  
Entity relationship to predecessor  
Non-derived entity reference to its template  
WSDL service to WSDL port  
WSDL port to WSDL binding  
WSDL port to SOAP address  
WSDL binding to SOAP binding  
WSDL binding to WSDL port type  
WSDL port type to WSDL operation  
WSDL operation to fault WSDL message  
WSDL operation to input WSDL message  
WSDL operation to output WSDL message  
WSDL message to WSDL part  
WSDL part to XSD type  
WSDL part to XSD element declaration  
SCA module entity reference to SCA import document  
SCA module entity reference to SCA export document  
SCA module entity reference to XML schema definition document  
SCA module entity reference to WSDL document  
SCA module entity reference to SCA module document  
SCA module to SCA import entity  
SCA module to SCA export entity  
SCA import or export entity reference to SCA interface  
SCA import entity to SCA import binding  
SCA export entity to SCA export binding  
SCA import binding entity reference to SCA export binding entity  
SCA web service import binding to WSDL port  
SCA WSDL port type reference to WSDL port type  
XSD complex type reference to a local attribute

# IBM WebSphere Service Registry and Repository Makes It Easy..... To Manage relationships...

- Through manual definition:

The screenshot displays the 'Create relationship' wizard in the IBM WebSphere Service Registry and Repository. The wizard is titled 'Concept' and shows 'Details' for the 'Repair Address Service' concept. The 'General Properties' tab is active, showing fields for Name, Description, Namespace, Owner, Version, and Last modified. The 'Relationships' section on the right has a red circle around 'Custom relationships'. Red boxes and arrows highlight the 'RepairAddressService' and 'RepairGlobalAddressService' entities in the 'Select target entities' step.

**RepairAddressService**

**RepairLocalAddress Service**

**RepairGlobalAddress Service**

**Concept**

**Concepts > Repair Address Service**

Details of the Repair Address Service Concept.

Details Impact Analysis Governance

**General Properties**

Name: Repair Address Service

Description: repairs the customer address

Namespace: http://www.jkenterprises.com

Owner: UNAUTHENTICATED

Version: 1.0

Last modified: Wednesday, January 24, 2007 6:31:35 PM

**Additional Properties**

Custom properties

**Relationships**

Custom relationships

Classifications

Apply OK Reset Cancel

# IBM WebSphere Service Registry and Repository Makes It Easy..... To Manage Impact Analysis

**WSDL Document**

[WSDL documents](#) > [RepairGlobalAddressService.wsdl](#)

Details of the RepairGlobalAddressService.wsdl WSDL document.

[Details](#) [Content](#) [Impact Analysis](#) [Governance](#)

**Impact analysis results**

[Concepts](#) > [Repair Address](#) > **Impact analysis results**

This is the collection of entities that may be impacted by changes to the entity concept Repair Address .

⊕ Preferences

Name	Description	Object Type	Version	Impact Relationship	Relationship Name	Originating Object
<a href="#">Repair Local Address Service</a>	Updates the customer local address	concept	1.0	Depends on	serviceDependencies	Repair Address
<a href="#">Repair Global Address Service</a>	Updates the customer global address	concept	1.0	Depends on	serviceDependencies	Repair Address
<a href="#">Businessitems.xsd</a>	JK Enterprises business objects	XML schema definition document	1.0	Depends on	serviceDependencies	Repair Address

Total: 3

Entity reference to classification  
Entity relationship to predecessor  
Non-derived entity reference to its template  
WSDL service to WSDL port  
WSDL port to WSDL binding  
WSDL port to SOAP address  
WSDL binding to SOAP binding

serviceDependencies  
providedInterface  
availableEndpoints  
serviceDependencies  
endpointReference  
definingWSDL  
serviceDependencies



# IBM WebSphere Service Registry and Repository Makes It Easy..... To Manage Classifications

The screenshot displays the IBM WebSphere Service Registry and Repository interface. The main window is titled 'WSDL Document' and shows details for the 'Echo.wSDL' document. The 'Details' tab is selected, showing a breadcrumb path: 'WSDL documents > Echo.wSDL'. Below this, there are tabs for 'Details', 'Content', 'Impact Analysis', and 'Governance'.

Overlaid on this is the 'Classifications' dialog box. The dialog box has a title bar 'Classifications' and a breadcrumb path: 'WSDL documents > RepairGlobalAddressService.wSDL > Browse classifications'. It contains the following elements:

- Navigation and Instructions:** A breadcrumb path and a paragraph: 'Navigate the tree on the left to select classifications to be added to the WSDL document: RepairGlobalAddressService.wSDL. Click the Add button to add the selected classifications to the list.'
- Classification Tree:** A tree view on the left with a 'Select' column and a 'Classification tree' column. It shows a hierarchy: 'DefaultLifecycle' (expanded), 'JK Enterprises Taxonomy' (expanded), 'Visibility' (expanded), 'External' (selected), and 'WSRR Core Ontology' (expanded).
- Buttons:** 'Add >>>' and 'Remove' buttons are located between the tree and the list.
- Classification List:** A list box on the right titled 'Classification list' containing the item 'External'.
- Details Section:** A section titled 'Details for the selected classification. To see the details for an item, select the classification from the list.' containing a table with columns 'System', 'Name', and 'URI'. The table has one row with the value 'None' in the 'System' column.
- Buttons:** 'Apply', 'OK', 'Reset', and 'Cancel' buttons are at the bottom of the dialog box.

On the right side of the 'WSDL Document' window, there are two sections:

- Additional Properties:** A list of links: 'Port types', 'Bindings', 'Services', and 'Custom properties'.
- Relationships:** A list of links: 'Imported schemas', 'Included schemas', 'Imported WSDLs', 'Custom relationships', and 'Classifications' (which is circled in red).

# IBM WebSphere Service Registry and Repository Makes It Easy..... To Manage Notification

- Through Subscription and Notification
  - Email based and JMS based notification
- Extensible notification framework
- Granularity
  - Per entity
  - By classification
  - By operation ... create, update, delete
  - By transition

Subscriptions

[WSDL documents](#) > Create a subscription

Details of a subscription.

Details

Name  
Low Touch Claim Service Update

Description  
hen the low touch claim service is updated

Owner

E-mail address  
sachdeva@us.ibm.com

Entity list  
LowTouchClaimProcessProductionService.wsdl (WSDL document)

Classifications

Choose

Operations

☐ Create ☒ Update ☐ Delete ☐ Transition

Transitions

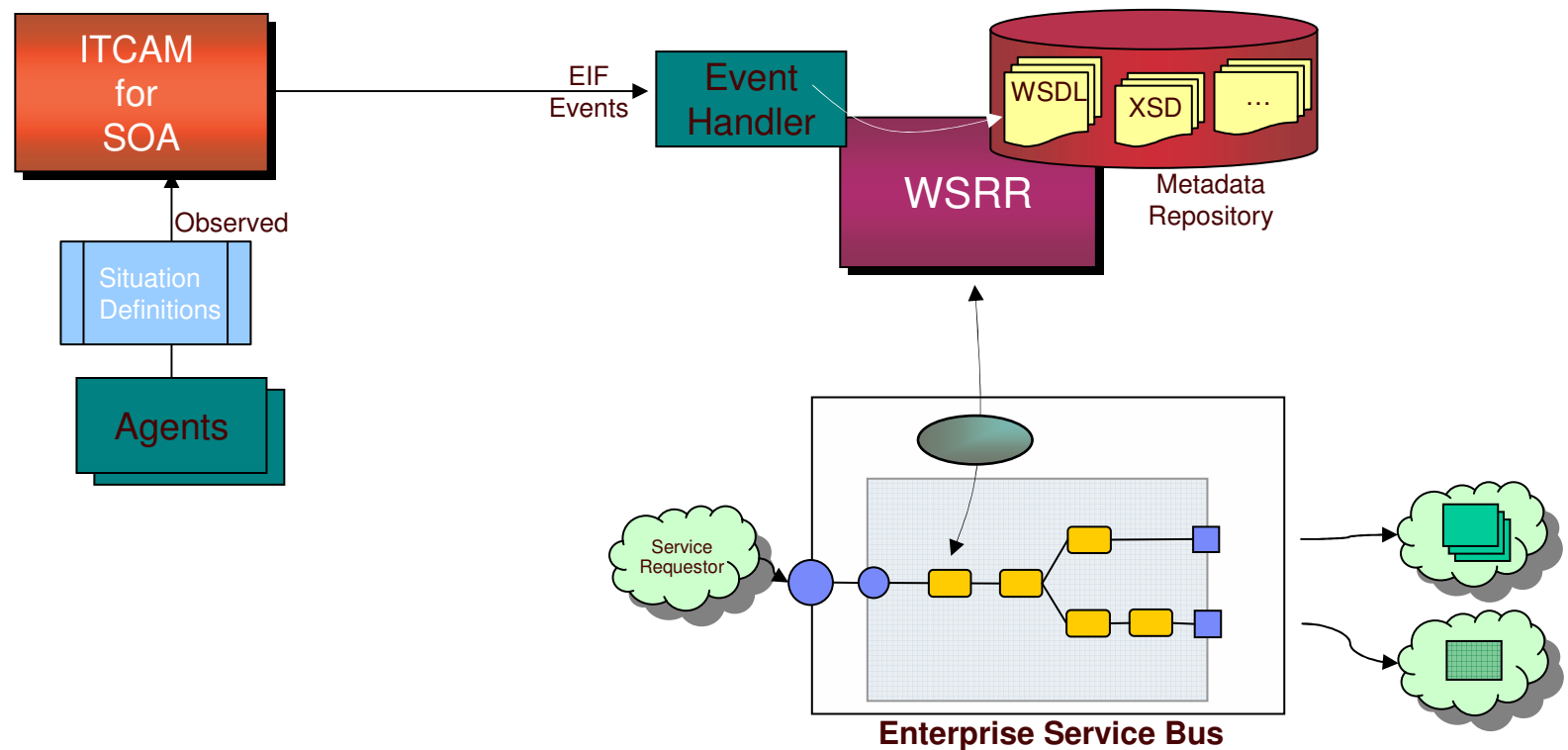
Fund  
Activate  
Provision  
Test  
Deactivate

Preferred e-mail language  
English

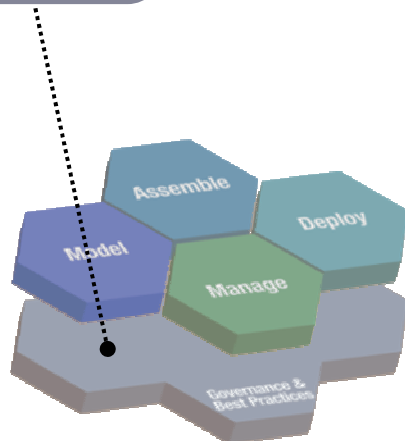
Apply OK Reset Cancel

# IBM WebSphere Service Registry and Repository Makes It Easy..... To Manage

- Through integration with ITCAM for SOA



# IBM WebSphere Service Registry and Repository

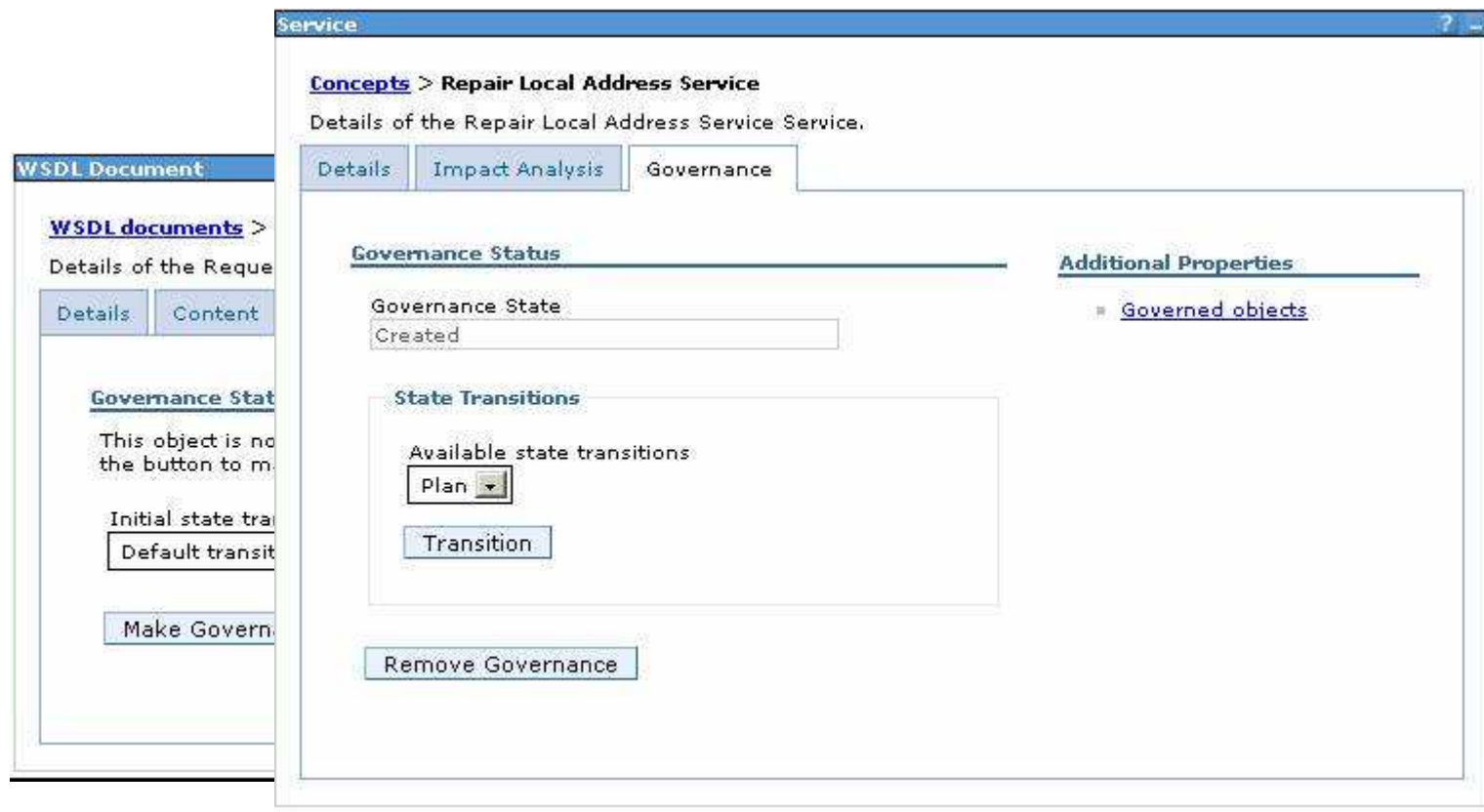


## ***Enable Governance***

Govern services throughout the service lifecycle

- Infrastructure to help organize and discover services assets, govern access and monitor service vitality
- Classification of services by lifecycle phase
- Policies for publishing, using and retiring services
- Roles based access

# IBM WebSphere Service Registry and Repository Makes It Easy..... To Govern



# IBM WebSphere Service Registry and Repository Makes It Easy..... To Extend

- T
- T
- T
- T

**Shared Libraries > New**

Specifies a container-wide shared library that can be used by deployed applications.

Configuration

**General Properties**

\* Name  
SampleWSRRPlugin

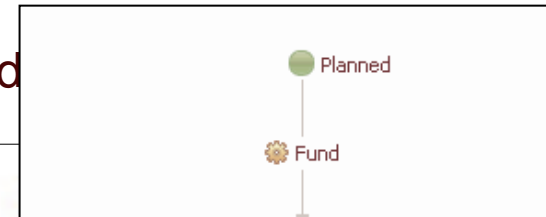
Description  
An example WSRR plugin shared library

\* Classpath  
C:\WSRR\Plugins\lib\sample.jar

Native Library Path

Apply OK Reset Cancel

source based  
e finance  
ed Finance



**Enterprise Applications > Service Registry > Library Reference > New**

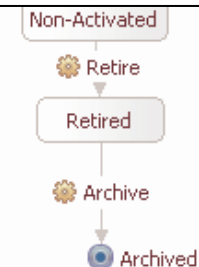
A library reference specifies a shared library file used by this application. Define a library reference for each library file that your application uses.

Configuration

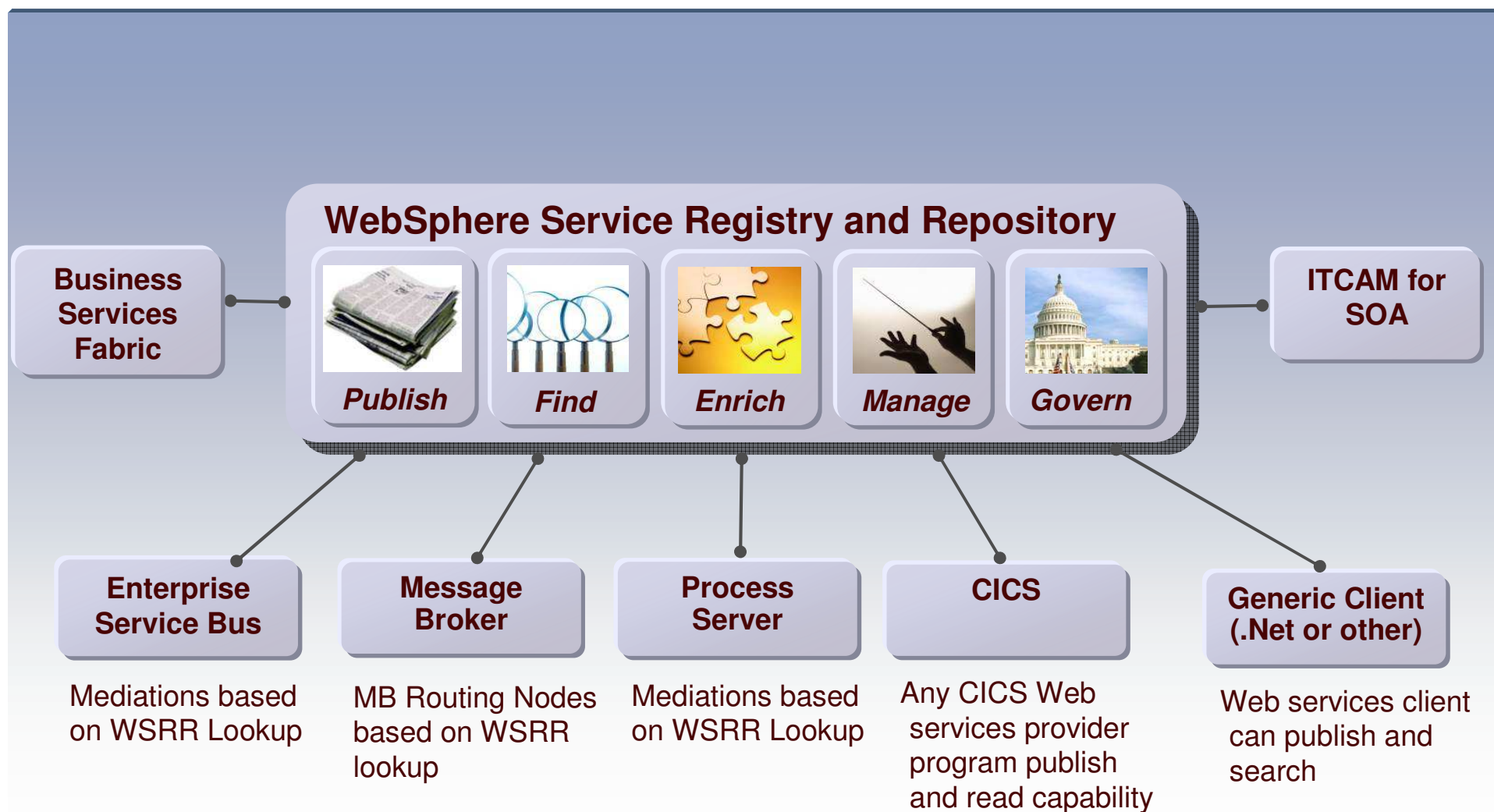
**General Properties**

Library name  
SampleWSRRPlugin  
ASB Shared Library  
SampleWSRRPlugin

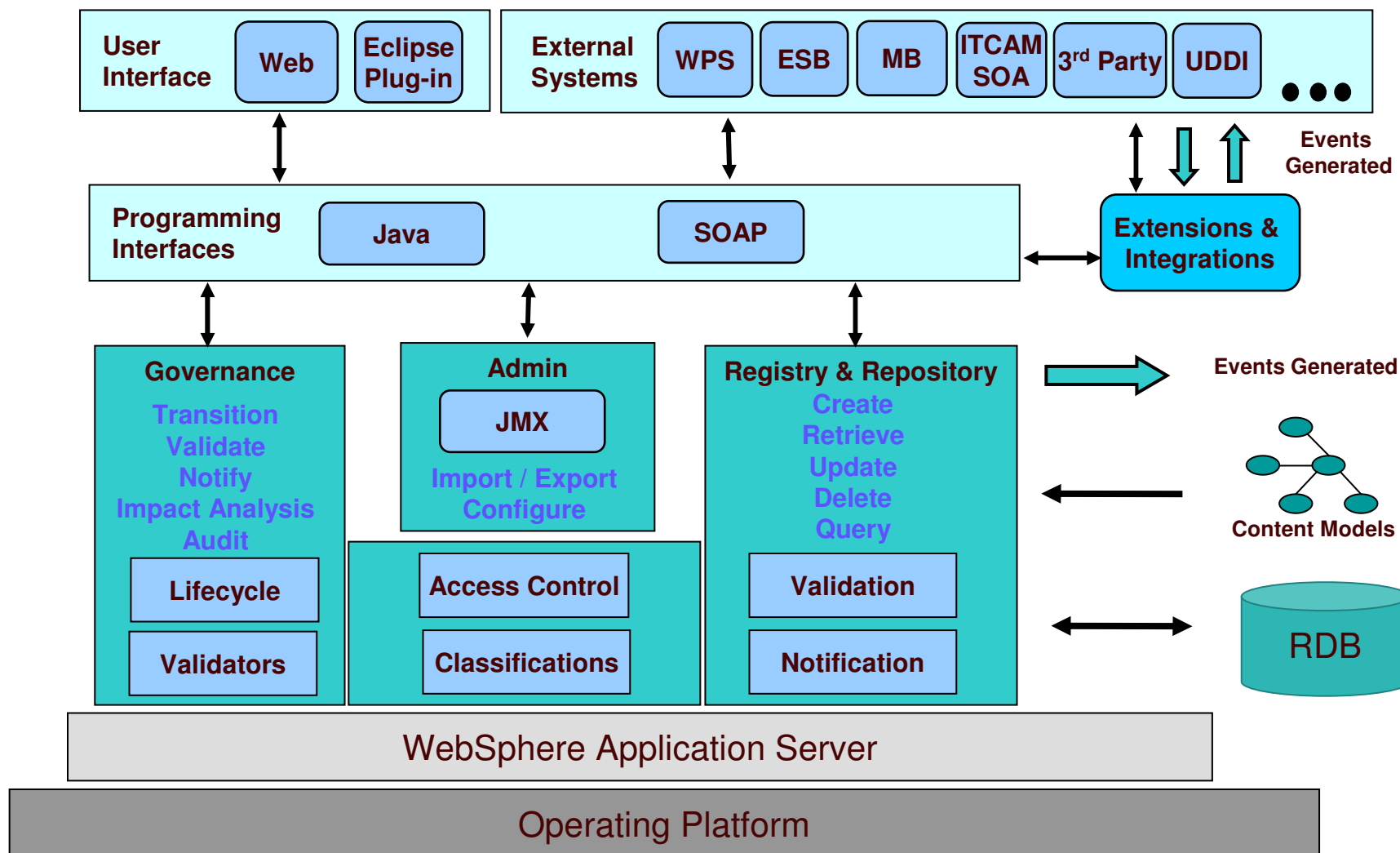
Apply OK Reset Cancel



## WebSphere Service Registry & Repository Runtime Integration



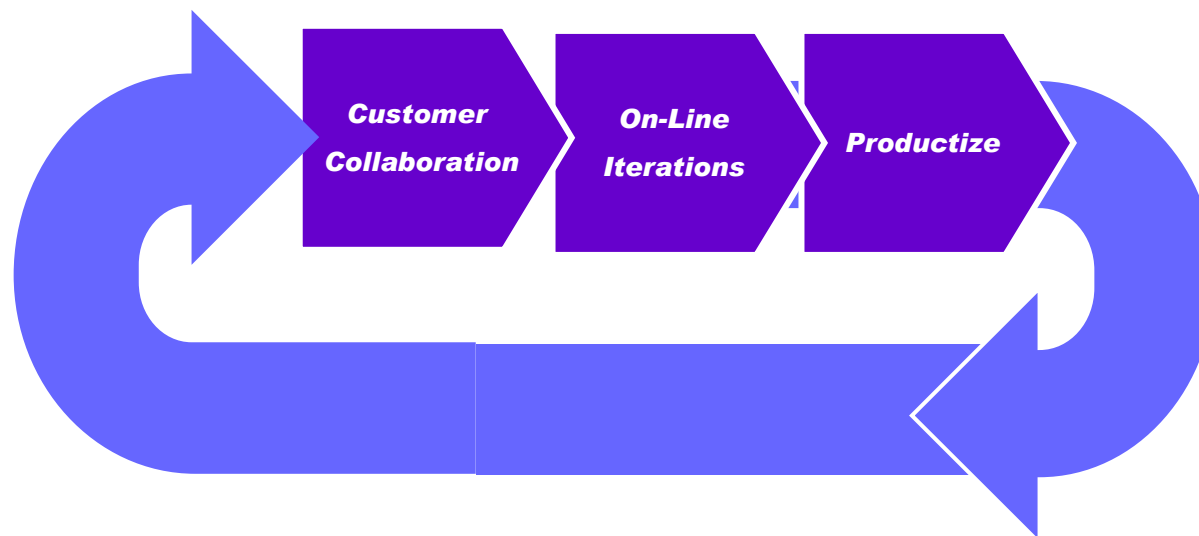
# WebSphere Service Registry & Repository Architecture





## WebSphere Service Registry & Repository – Continued Innovation through Iterative Development process

- The Approach:
  - Incremental development process
    - Field-based development model and Iterative code availability
    - Very effective in releasing ready for prime time product with 8 iterations for Release 1 (Version 6.0)
  - Linkage across SWG for key components and integration
    - First class consumption and exploitation across the SOA Foundation
  - **Early Access Program continues**
    - Effective and customer focused requirements



## Features Summary of WebSphere Service Registry and Repository

- User role based browser perspectives
- Standards based service metadata documents support
- “Shredding” documents into meaningful and optimized organization
- Query
  - Keyword and wizard based search
- Classification
  - OWL based ontologies
  - Customization enabling governance capabilities, state transitions, lifecycle actions
- Eclipse based toolset integrating into Eclipse 3.0.x based IDEs
- Java and Web services API
- Command line utilities
- Subscription and Notification support
- Impact Analysis
  - Service Relationships



*Thank you!*