



Oracle Service Bus Essential Concepts

ORACLE[®]

About This Course

- Discuss several SOA requirements that can be addressed using a Service Bus
- Explain the relationships between WSDL, XPath, XQuery, and ALSB
- List some of the capabilities of an OSB Proxy Service
- Describe the process of how OSB is configured and managed



Target Audience

- Anyone evaluating Service Bus technologies
- SOA project team members:
 - Project Managers
 - Enterprise and Project Architects
 - Service Developers
 - System Administrators
- Prior knowledge of fundamental SOA concepts recommended





Roadmap

1. Enterprise Service Bus

- Service Enablement
- Service Orchestration
- OSB Architecture

2. Service Bus Technologies

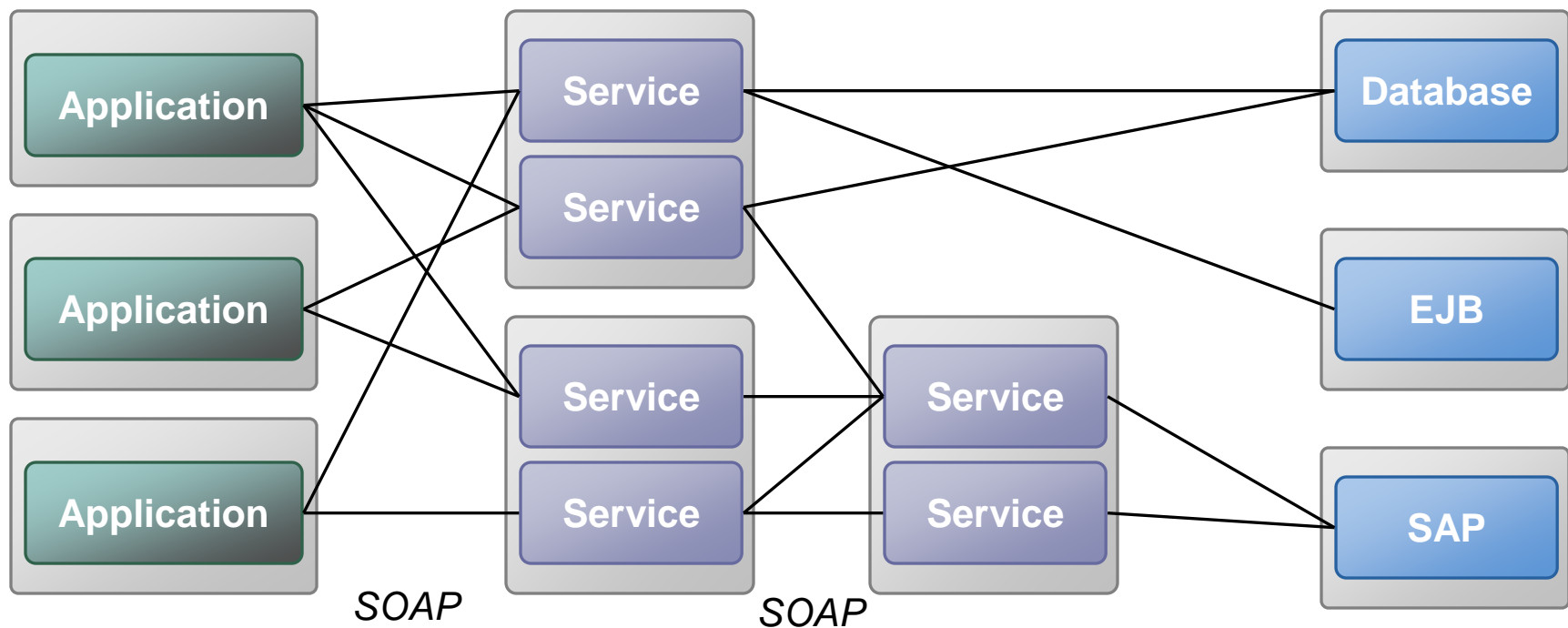
3. Proxy Service Development

4. Service Management and Monitoring



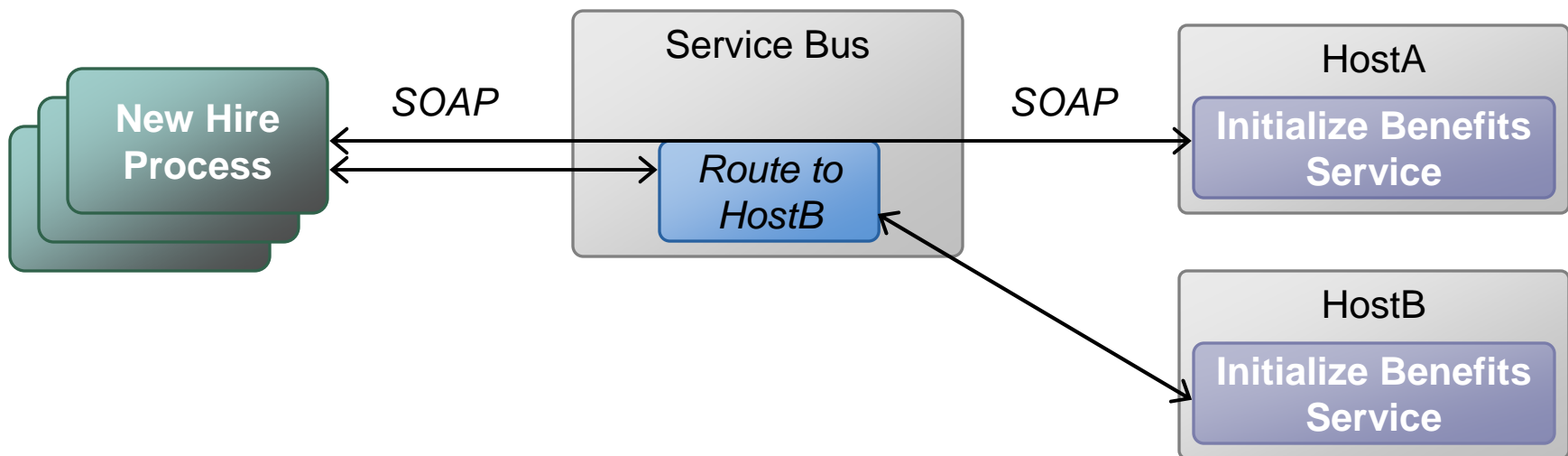
Why a Service Bus?

- The *Point-to-Point* problem



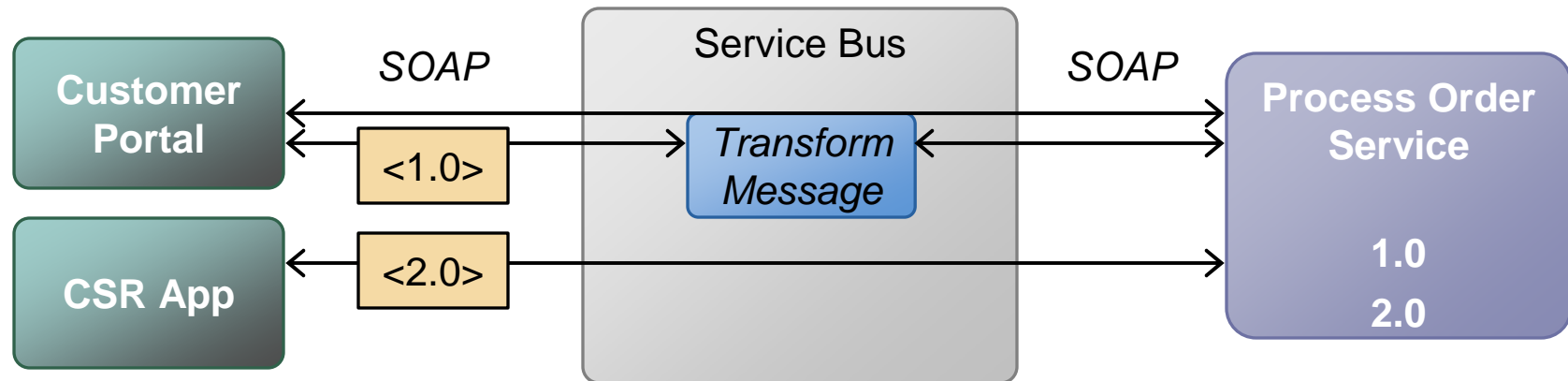
Location Transparency

- Isolate from changes to service location



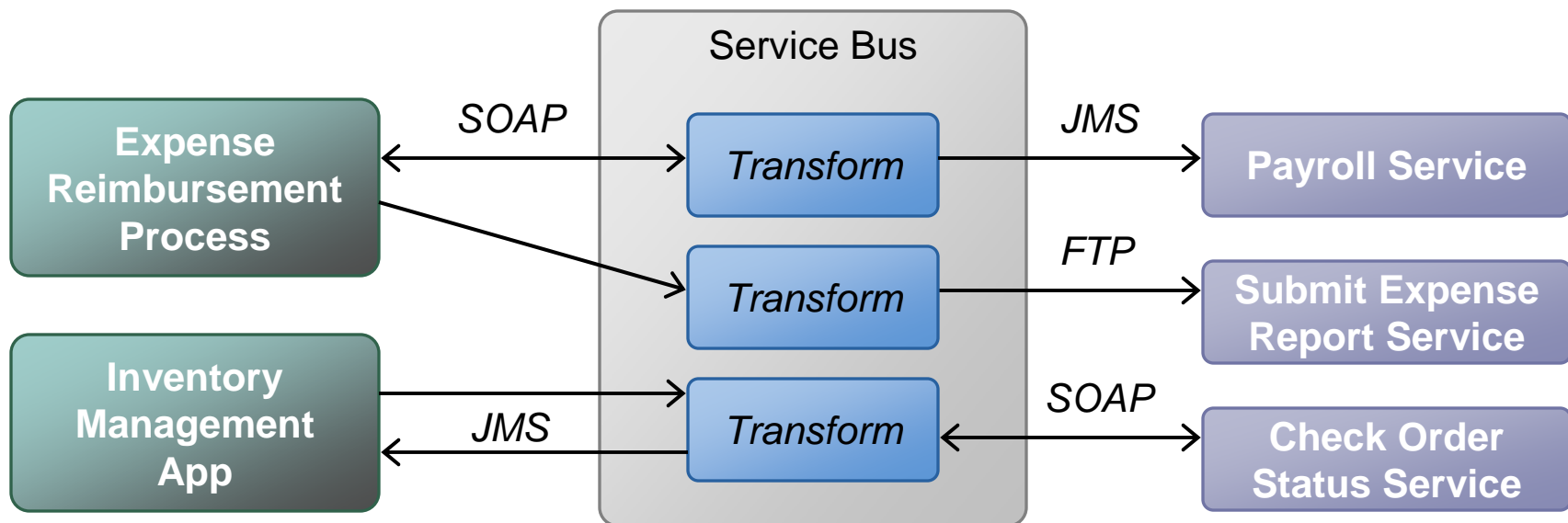
Backwards Compatibility

- Isolate from changes to service contract/interface



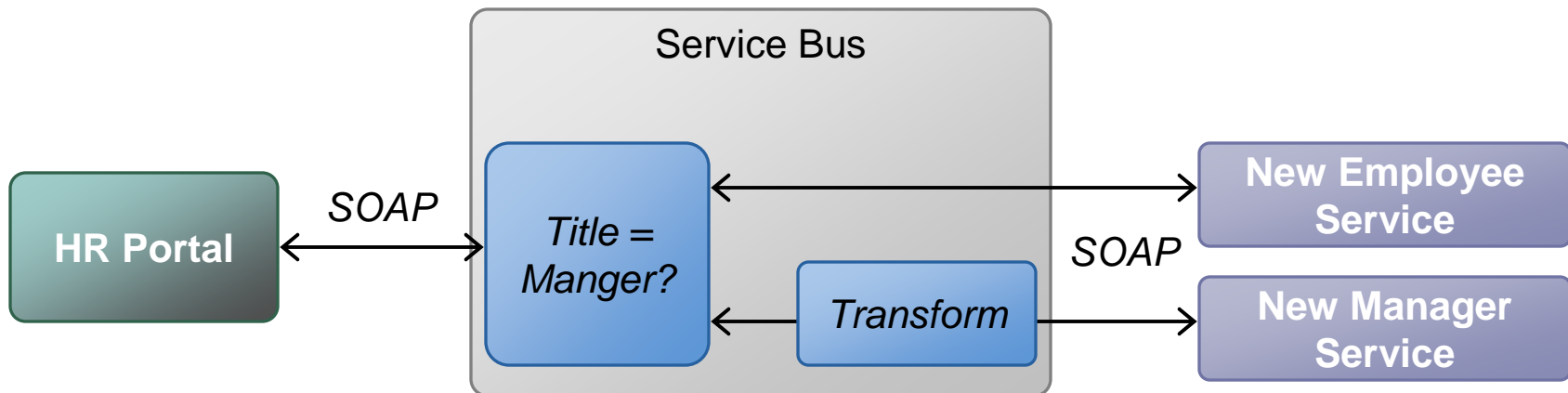
Service Enablement

- Allow multiple protocols/messages to participate in a SOA



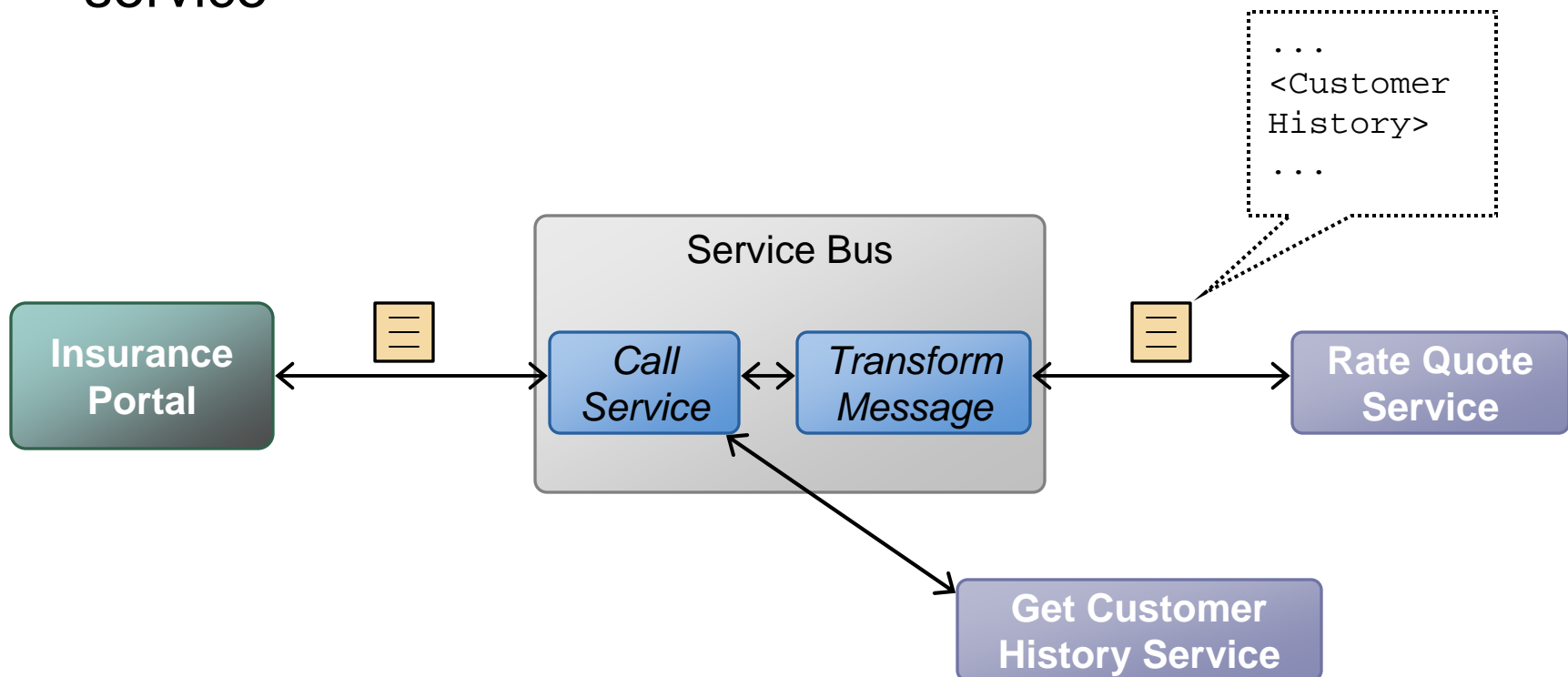
Dynamic Routing

- Use business rules to determine destination service



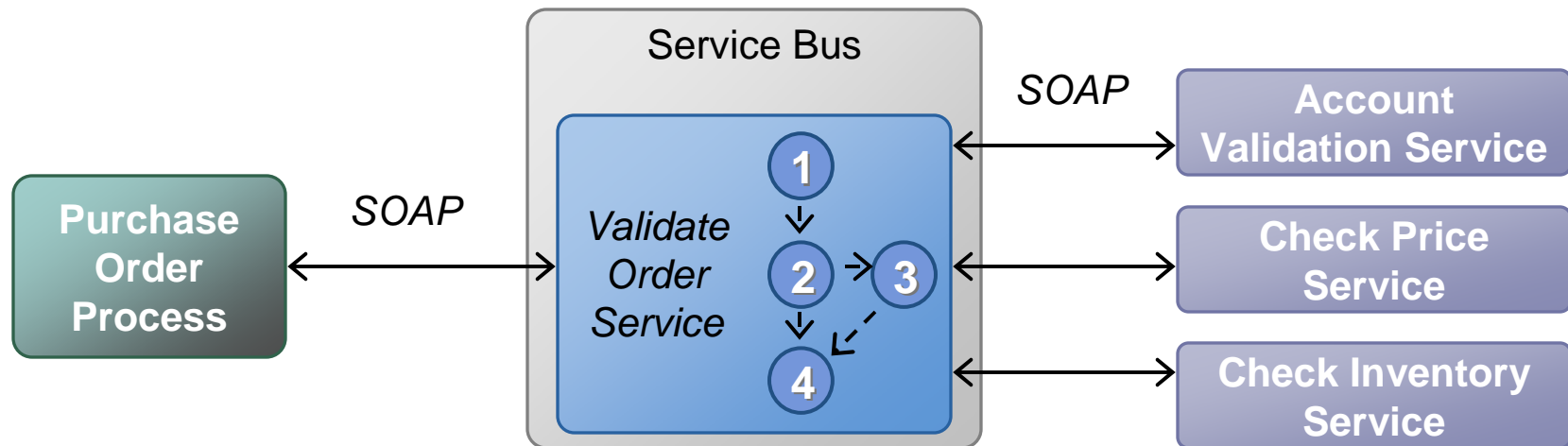
Message Enrichment

- Update message using the response from another service

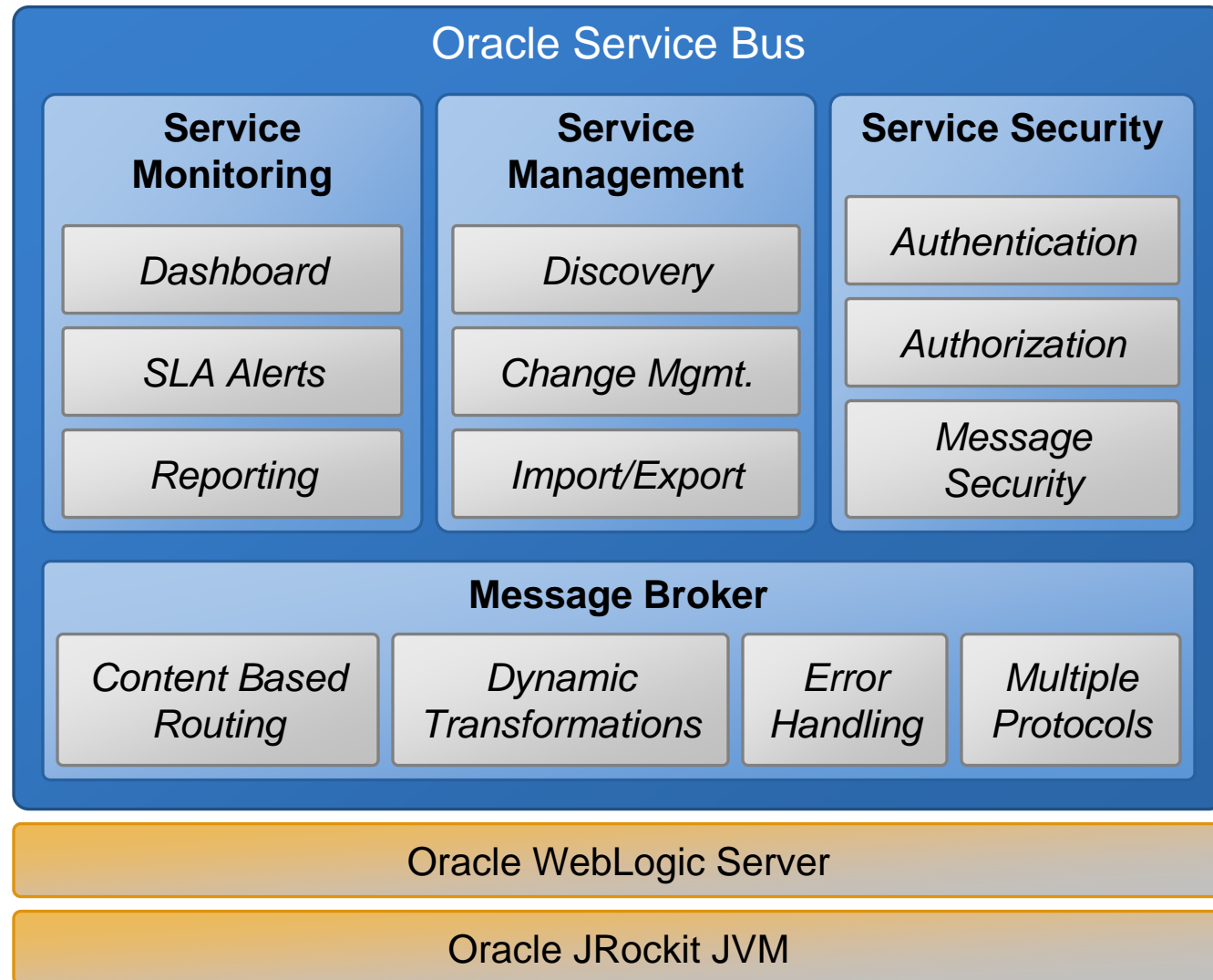


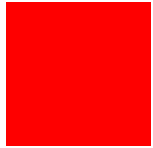
Service Orchestration

- Compose new services from existing ones



OSB to the Rescue





Service Bus Quiz





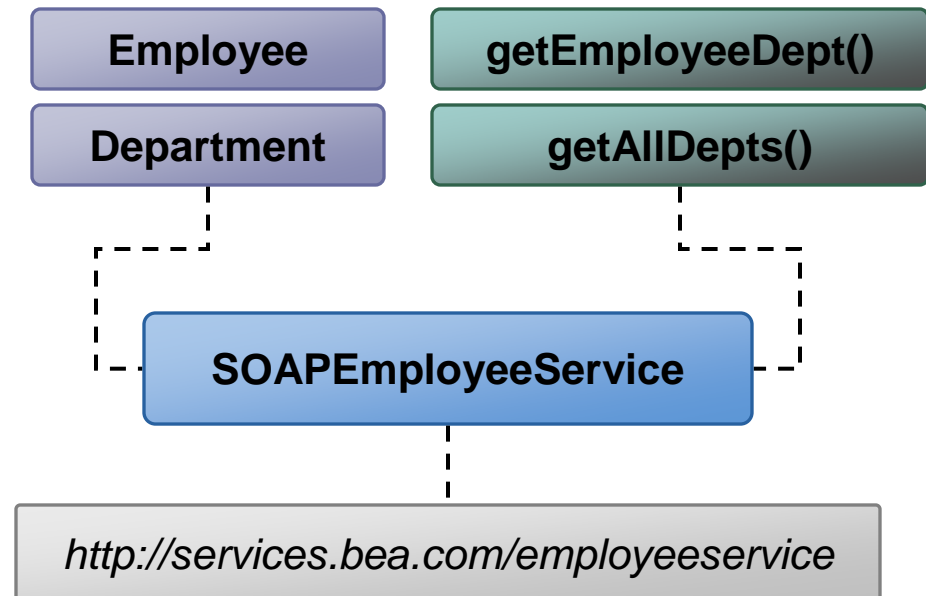
Roadmap

1. Enterprise Service Bus
2. **Service Bus Technologies**
 - Web Service Fundamentals
 - XML Fundamentals
3. Proxy Service Development
4. Service Management and Monitoring



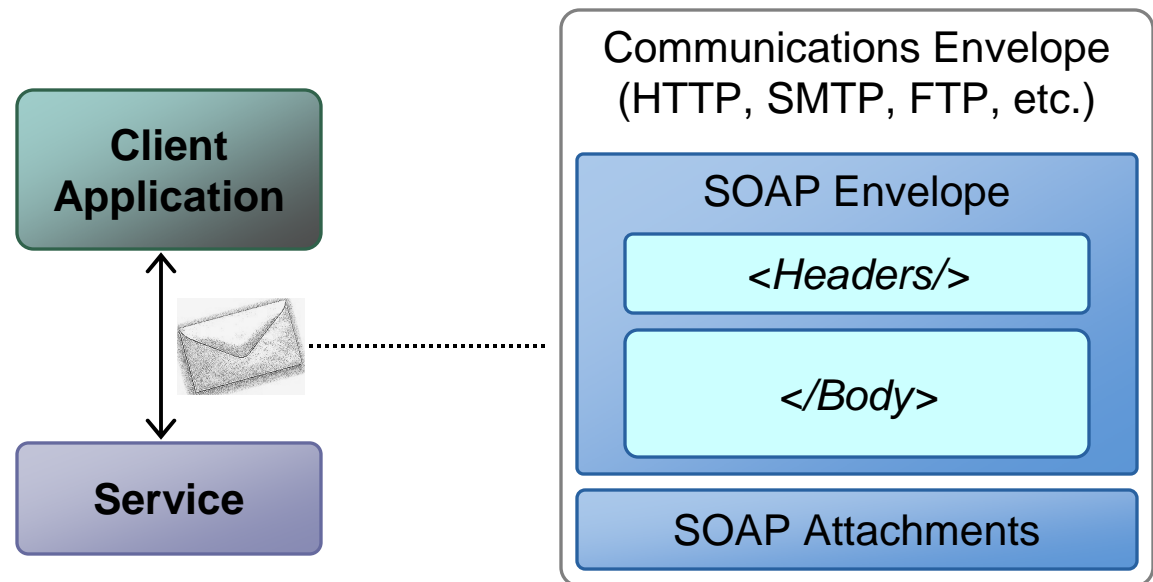
Web Service Description Language (WSDL)

- Is an XML document
- Generated by tools
- Acts as a Web Service *contract*.
 - Elements
 - Operations
 - Bindings
 - Ports ("endpoints")



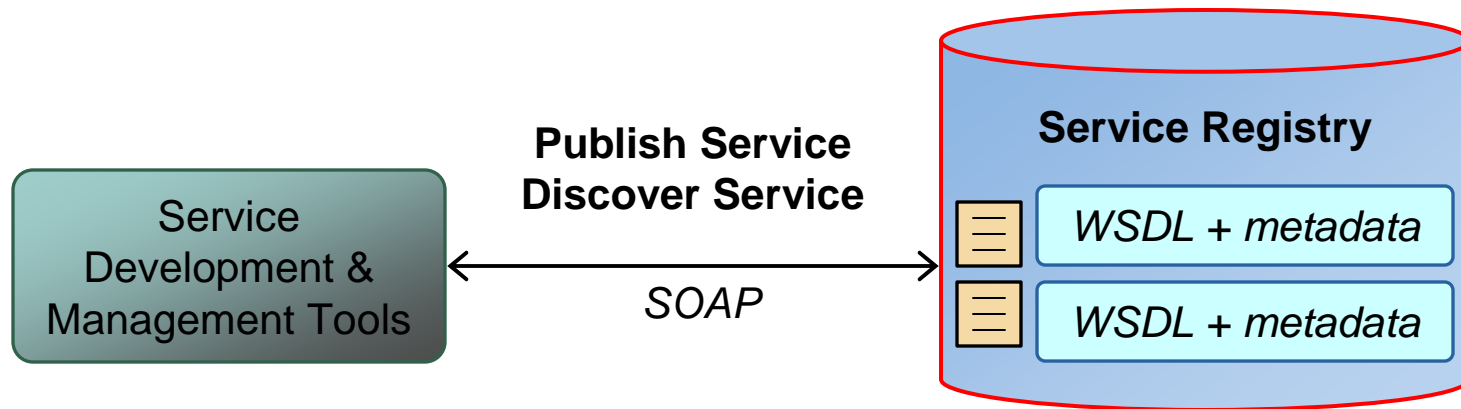
Simple Object Access Protocol (SOAP)

- Is a remote function protocol based on XML
- Used to invoke Web Services
- Wraps messages in an envelope protocol
- Supports headers and attachments



Universal Description, Discovery, and Integration (UDDI)

- Metadata structure to classify and catalog services
- SOAP interface to communicate with a *service registry* ("digital telephone book")



XML Schema

- Defines the structure of other XML documents
- Is itself an XML document
- Allows for faster message validation and processing
- Has a unique ID called a *namespace*

```
<xs:schema targetNamespace="http://schemas.bea.com/purchase"
  xmlns="http://schemas.bea.com/purchase"
  xmlns:po="http://schemas.bea.com/purchase"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">

  <xs:element name="PurchaseOrder">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="Location" type="xs:string"/>
        <xs:element name="Items" type="ItemList"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>

  ...
</schema>
```

XPath

- Is a standard XML expression language
- Used to identify or locate portions of an XML document
 - Attributes
 - Elements

//PurchaseOrder/Item/@line

//PurchaseOrder/Item/price

```
<PurchaseOrder>
  <Item line="1">
    <price>49.99</price>
    <quantity>3</quantity>
  </Item>
  <Item line="2">
    <price>9.49</price>
    <quantity>1</quantity>
  </Item>
</PurchaseOrder>
```

1
011

XQuery

- Structured language for working with XML documents:
 - Strongly typed
 - Variables, operators, conditions, loops
 - Library and custom functions
 - Relational database queries
- Supports XPath

```
return <items>

for $item in //PurchaseOrder/Item
order by $item/title
return <price>{$item/price}<price>

return </items>
```



```
<items>
  <price>49.99</price>
  <price>9.49</price>
</items>
```

Extensible Stylesheet Language Transformations (XSLT)

- Alternative to XQuery for XML transformations:
 - Loosely typed scripting language
 - Does not require XML Schema
 - More tolerant of malformed XML
- Supports XPath

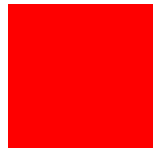
```
<xsl:stylesheet>

  <xsl:template match="//Item">
    <line id="{@line}">
      <xsl:value-of select="price"/>
    </line>
  </xsl:template>
</xsl:stylesheet>
```

```
<line id="1">
  49.99
</line>
<line id="2">
  9.49
</line>
```

Service Bus Technologies Quiz





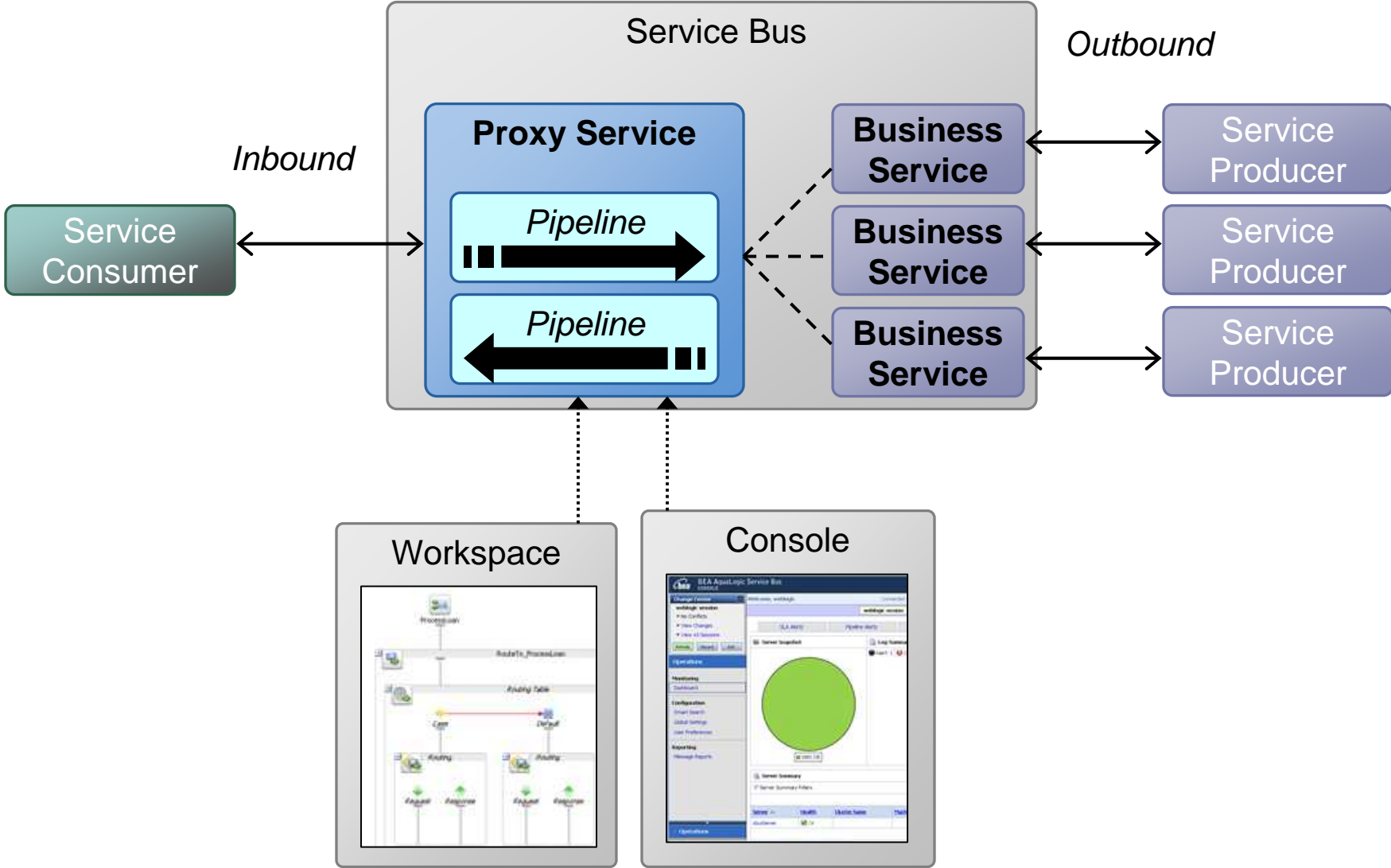
Roadmap

1. Enterprise Service Bus
2. Service Bus Technologies
- 3. Proxy Service Development**
 - Proxy Architecture
 - Workspace
 - Actions
 - Transformations
4. Service Management and Monitoring



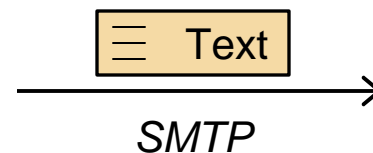
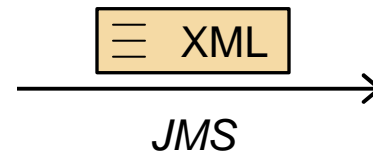
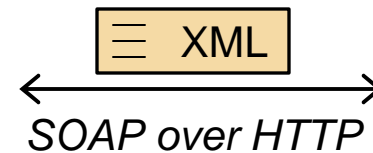


Proxy Services



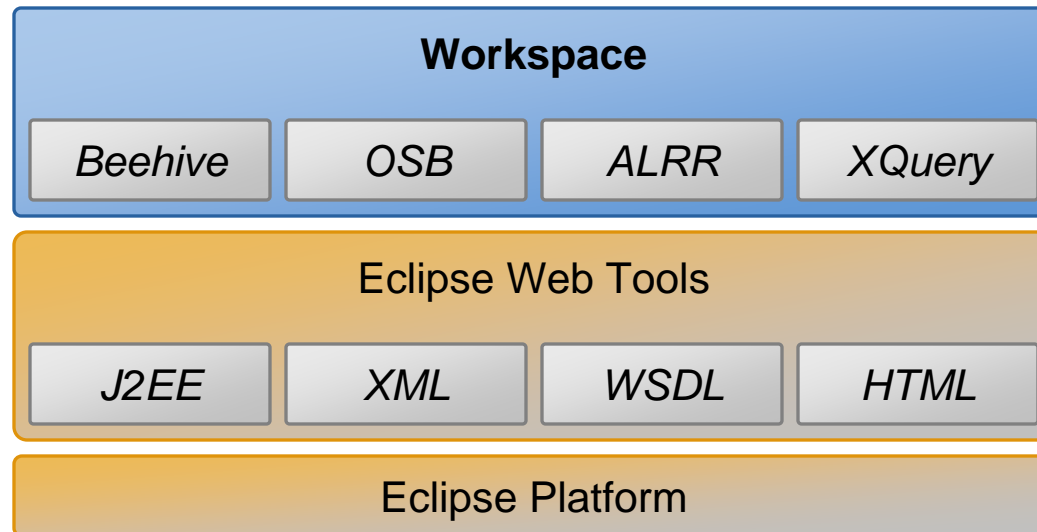
Supported Protocols

- Protocols
 - SOAP over HTTP/JMS
 - HTTP/S
 - JMS
 - RMI/IIOP (EJB)
 - Tuxedo, MQSeries
 - Email (SMTP/POP/IMAP)
 - FTP/Secure FTP
 - Custom
 - Oracle Adapters (framework + Adapters post 10gR3)
- Message Formats
 - XML
 - Text
 - Custom Binary (EDI, etc.)
- SmartConnect Adapters
 - SAP
 - PeopleSoft
 - Siebel
 - Oracle
 - SWIFT



Workspace

- Eclipse-based IDE
 - Define XML Schemas, WSDLs, and transformations
 - Configure business and proxy services
 - Track dependencies
 - Deploy to OSB server and test



OSB Perspective

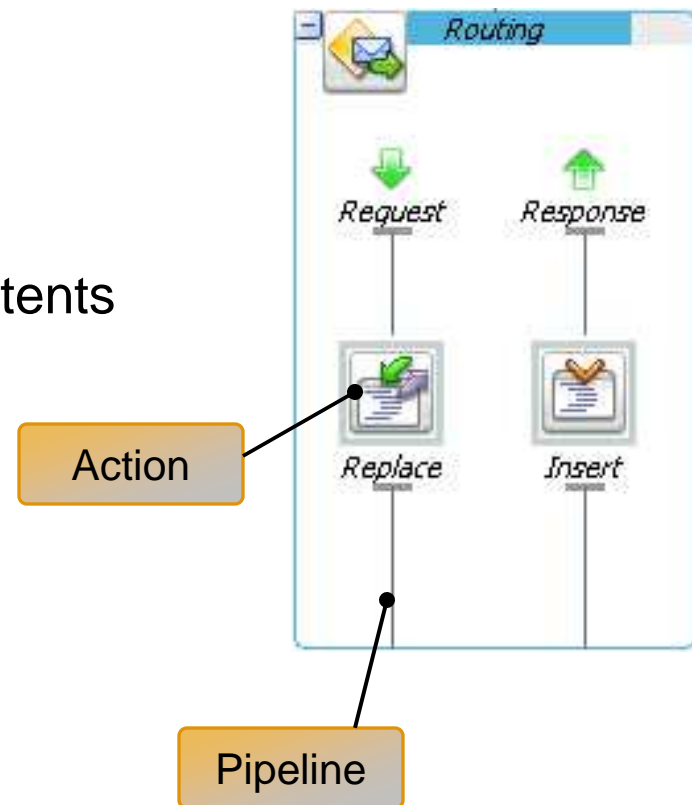
The screenshot displays the BEA Workshop for WebLogic OSB Perspective interface. The main window is titled "AquaLogic Service Bus - ProcessLoan.proxy - BEA Workshop for WebLogic". The interface is divided into several panels:

- Explorer:** Located on the top left, it shows a tree view of the project structure. A yellow box labeled "Explorer" is overlaid on this panel. The tree includes folders like "ALSB", "Finance", "Business Services", "Proxy Services", and "Transforms".
- Editor:** The central workspace shows a visual representation of a "Routing Table". A yellow box labeled "Editor" is overlaid on this panel. It displays a flow from a "Case" node to a "Default" node, with two "Routing" nodes below.
- Palette:** Located on the top right, it contains a list of components for the OSB design. A yellow box labeled "Palette" is overlaid on this panel. The list includes "ALSB Message Flow", "Nodes", "Route Actions", "Communication", "Dynamic Routing", "Routing", "Routing Table", "Flow Control", and "Stage Actions".
- Outline:** Located on the bottom left, it shows a hierarchical view of the current design. A yellow box labeled "Outline" is overlaid on this panel. It lists "ProcessLoan", "Route Based on Loan Amount", "Routing Table", "Case", "Routing", "Request", "Replace", and "Response".
- Properties:** Located at the bottom right, it displays the configuration for the selected "Routing Table". A yellow box labeled "Properties" is overlaid on this panel. The "Expression" field is highlighted with the text "\$body/ser:appro...".

A large grey arrow labeled "DRAG" points from the "Routing Table" component in the Palette to the "Routing Table" in the Editor, indicating the drag-and-drop action used to place the component into the design.

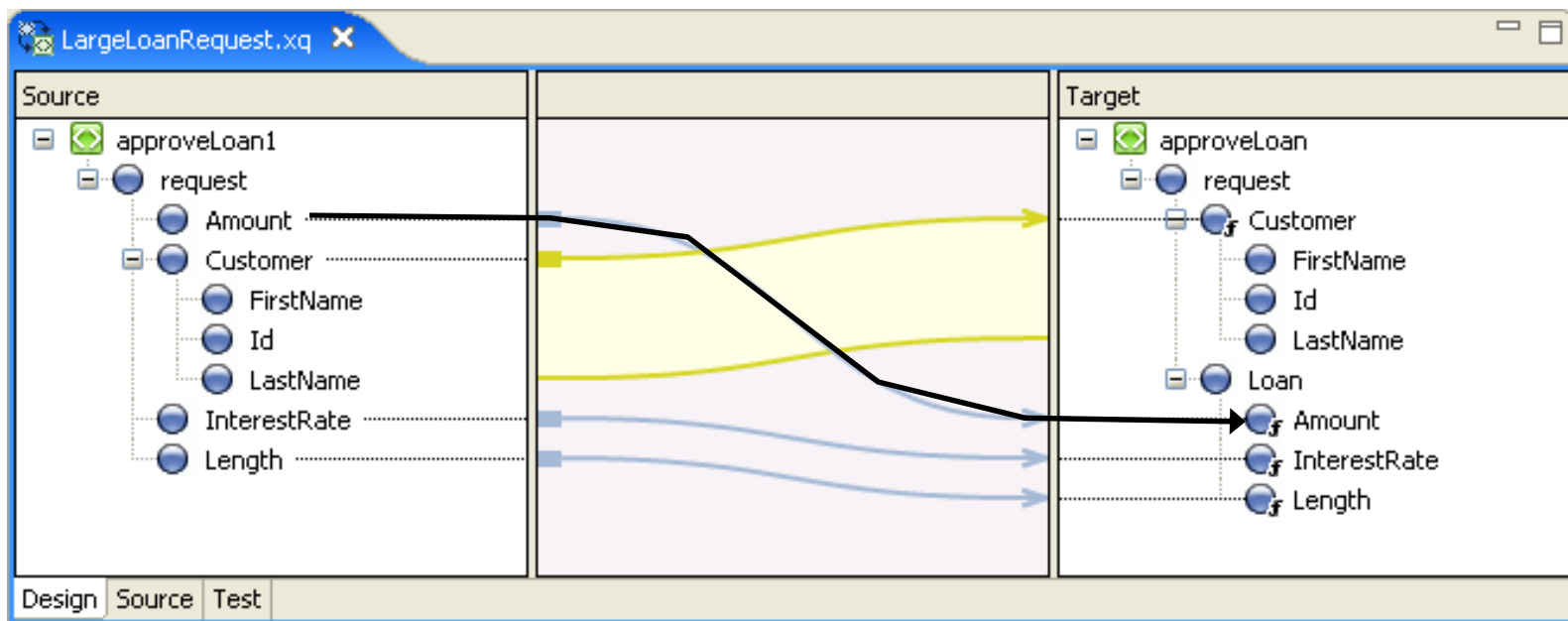
Message Flow

- Conditions/branches
- Routing destinations
- Request/response *Pipelines*
- *Actions*:
 - Update/replace/delete message contents
 - Update message headers
 - Call another service
 - Raise error on client
 - Generate a report or alert
 - Invoke a Java class or EJB
- Error handlers



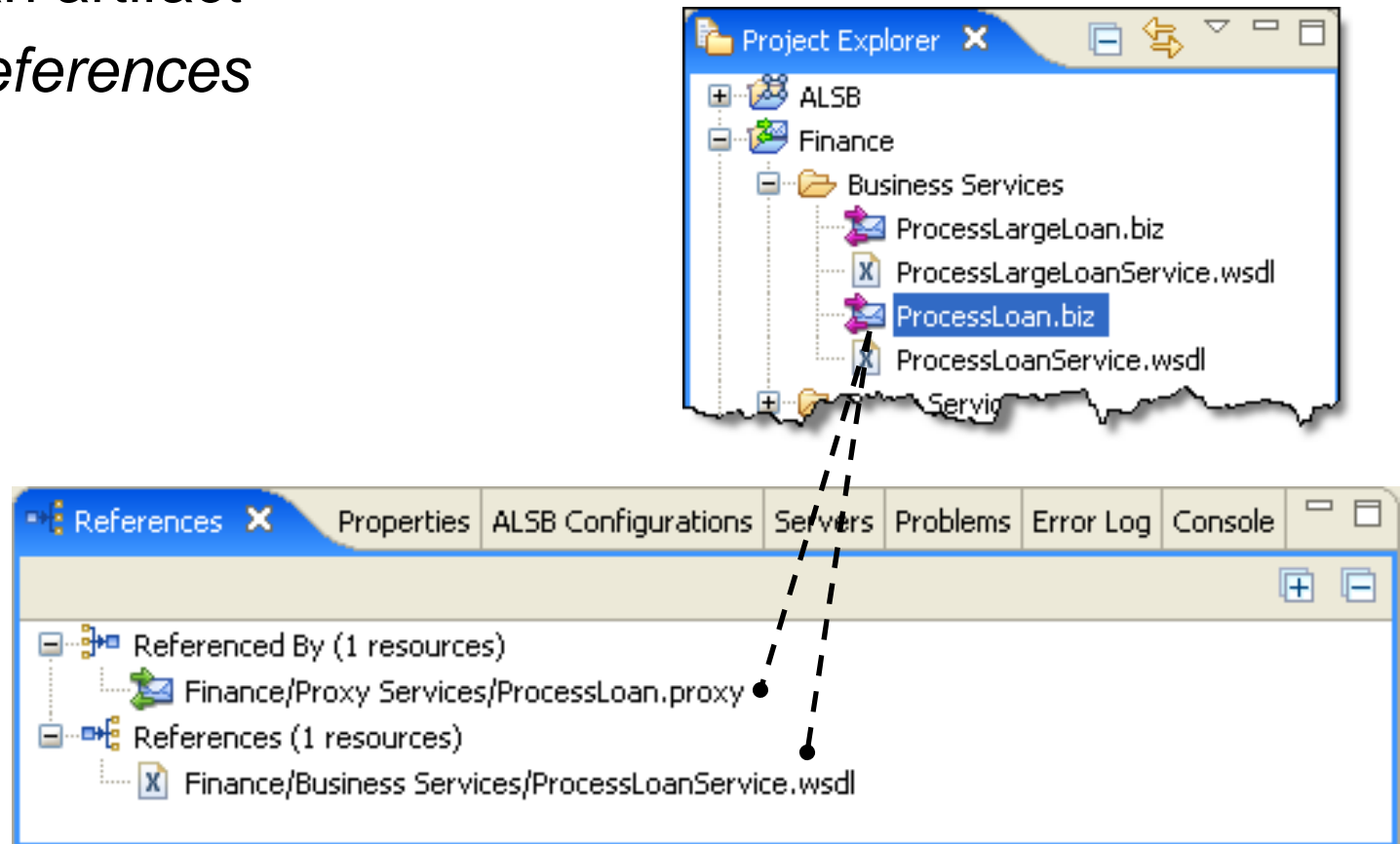
Transformations

- XML to XML (XQuery or XSLT)
- XML to Text/Binary (XQuery)
- Binary to Binary (MFL)

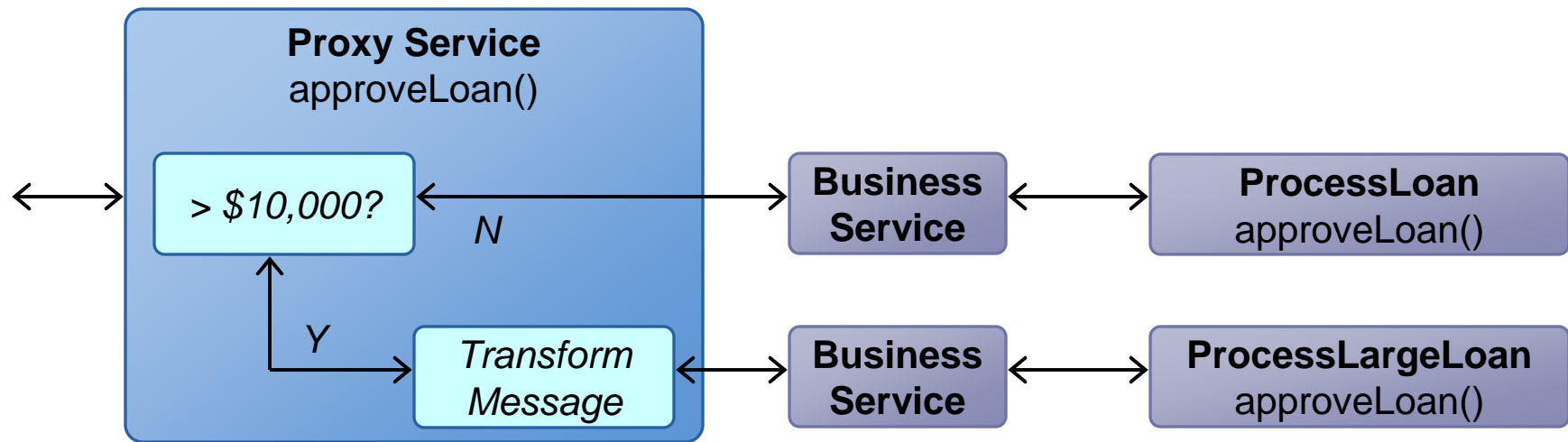


Dependency Tracking

- Select an artifact
- View *References*



Demonstration: Create a Proxy Service



*Please enable
browser pop-ups!*



Proxy Service Development Quiz



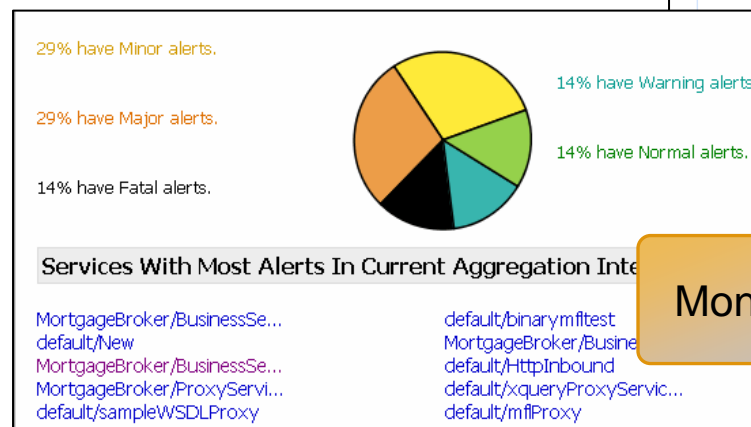
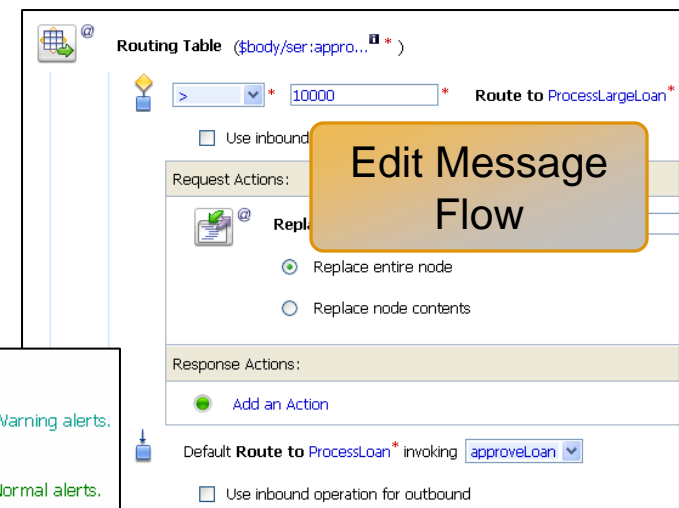
Roadmap

1. Enterprise Service Bus
2. Service Bus Technologies
3. Proxy Service Development
4. **Service Management and Monitoring**
 - OSB Console
 - Service Level Agreements
 - OSB Security
 - Advanced Routing
 - Product Interoperability



OSB Console

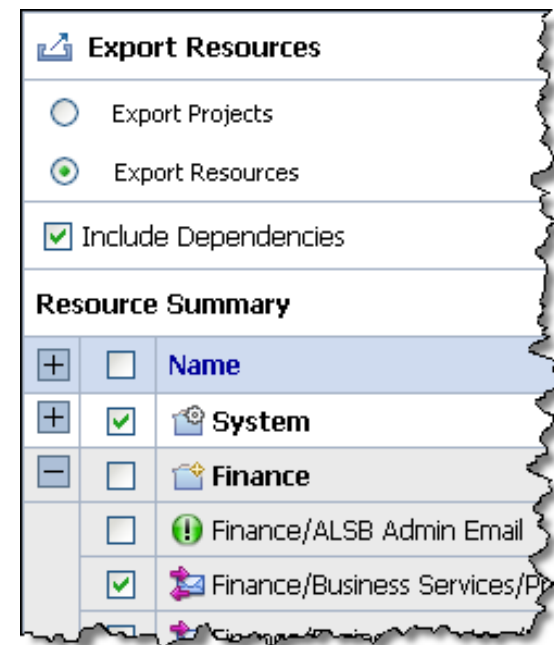
- Full Pipeline Design Capabilities
- Additionally:
 - Configure proxy service security
 - Monitor service health
 - Generate reports
 - Define SLAs that trigger alerts
 - Synchronize with a UDDI registry



Monitor Alerts

Configuration Management

- Change Center
 - Atomic sessions
 - View & resolve conflicts
 - Undo tasks
 - Audit changes
- Import/Export
 - Change propagation
 - Workspace synchronization
- Test Console
 - Validate changes



Monitoring Dashboard

- Gauge the current health of:
 - OSB servers
 - Proxy services/operations
 - Message flow components
- View custom reports
- Metrics include:
 - Response time
 - Message throughput
 - Error count
 - Alert count
 - Schema violations



Alerts

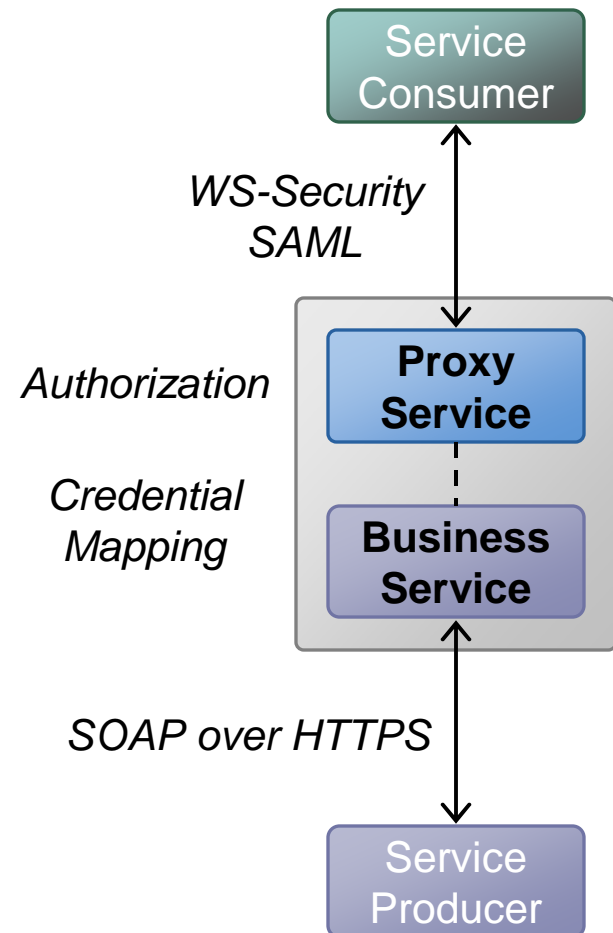
- *Service Level Agreements (SLAs)*
 - Guarantee a certain level of performance and/or quality
 - Trigger reports and *Alerts*
 - Email
 - SNMP
 - JMS
- Rules based on:
 - Response time
 - Message count
 - Success/failure ratio
 - Schema violations
 - Security violations

The screenshot displays the 'Alert History' interface. At the top, there is a summary bar with icons and counts for different alert severities: Fatal: 2, Critical: 0, Major: 0, Minor: 0, and Warning: 1. Below this is a table with columns for Alert Severity, Timestamp, Alert Rule Name, and Service. The table contains three rows of alert data. At the bottom of the interface, there are three buttons: Delete, Refresh, and Back.

<input type="checkbox"/>	Alert Severity ▾	Timestamp ▲	Alert Rule Name ▲	Service
<input type="checkbox"/>	Fatal	8/17/06 2:49 PM	Validation Failure	Mortgag
<input type="checkbox"/>	Fatal	9/13/06 2:00 PM	Validation Failure	Mortgag
<input type="checkbox"/>	Warning	8/17/06 2:55 PM	Service Degradation Alert	Mortgag

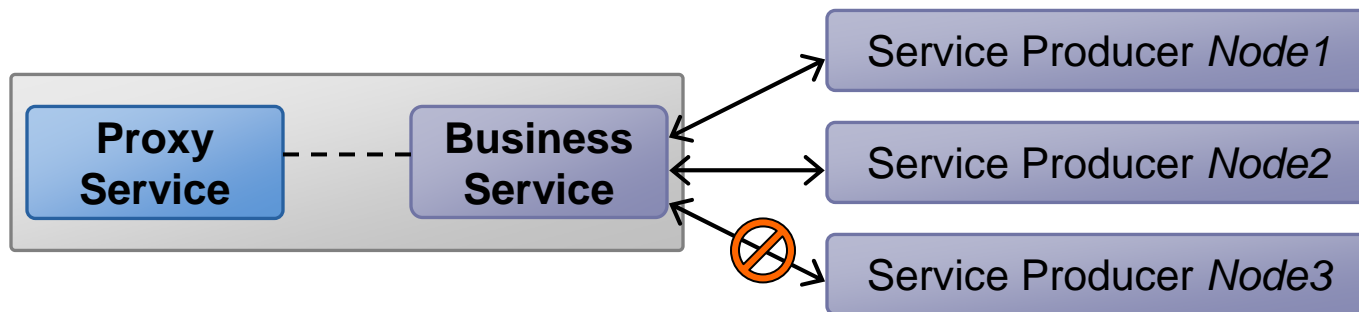
OSB Security

- Transport security (HTTP, JMS, etc.)
 - Basic authentication
 - SSL
- SOAP message security
 - WS-Security
 - WS-Policy
 - SAML
- Credential mapping
- Role-based authorization
- Delegated administration

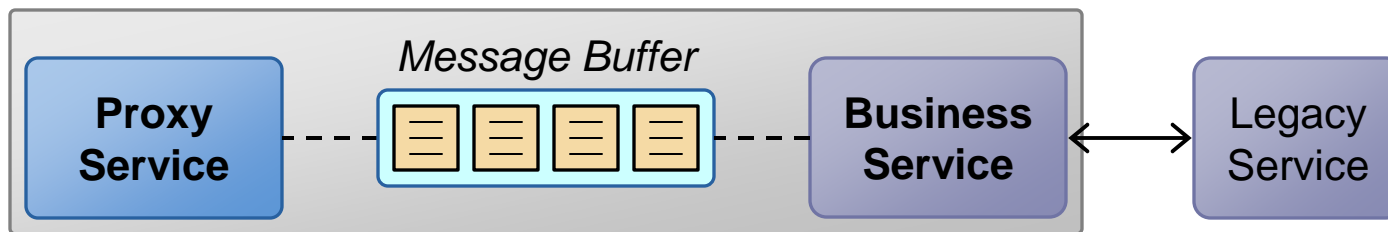


Advanced Mediation Policies

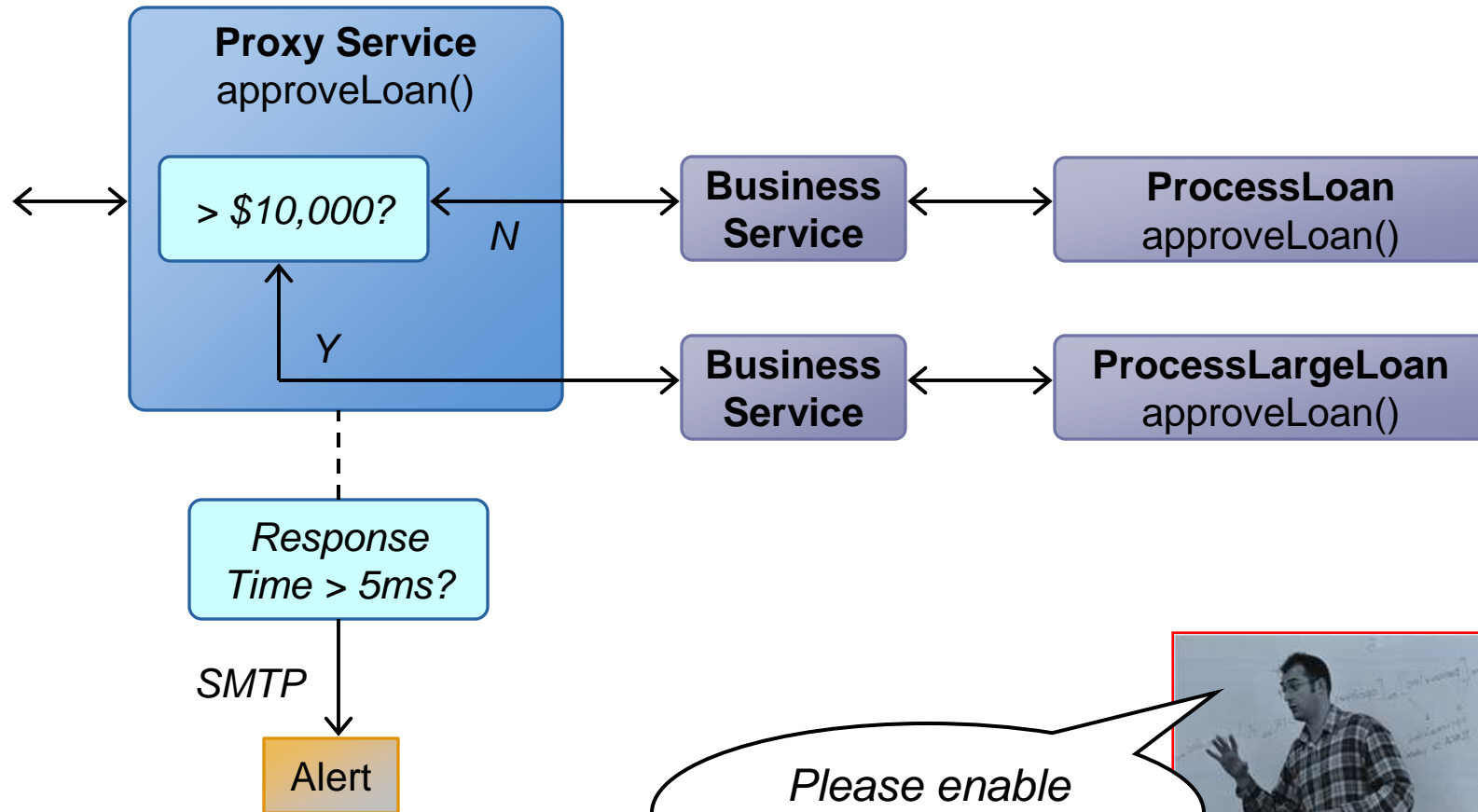
- Business Service Load Balancing & Failover



- Throttling



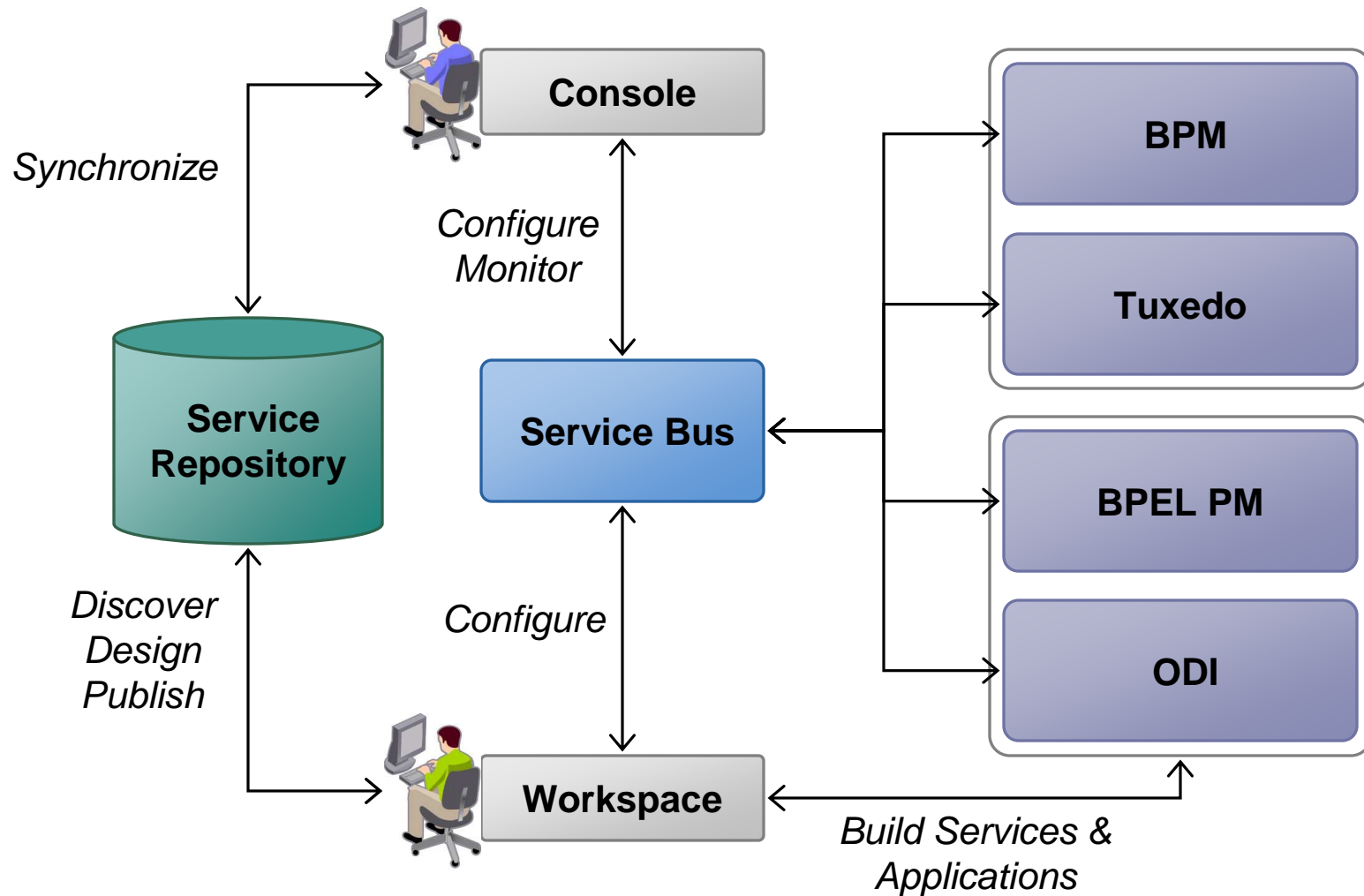
Demonstration: Manage a Proxy Service



Please enable browser pop-ups!



Product Interoperability





Have Licensing or technical questions?

- SOA FAQ
- OSB FAQ
- OESB FAQ
- All linked from their respective ias.us pages (start at <http://soa.us.oracle.com>)

- [Pricing & Licensing Info](#)

- [What is the price of SOA Suite / Oracle Service Bus / etc.](#)
- [What are the new names of the AquaLogic products after the acquisition?](#)
- [Is Oracle ESB still available to SOA Suite customers after the acquisition?](#)
- [Why bundle 2 ESB's in the Oracle SOA Suite?](#)
- [Is OSB \(formerly AquaLogic Service Bus\) available to customers who had](#)
- [When, if at all, should we stop selling the Oracle ESB to new customers?](#)
- [What is our recommendation for customers who have acquired Oracle ES](#)