

Getting Started with Oracle Service Bus Applications

Objectives

After completing this lesson, you should be able to:

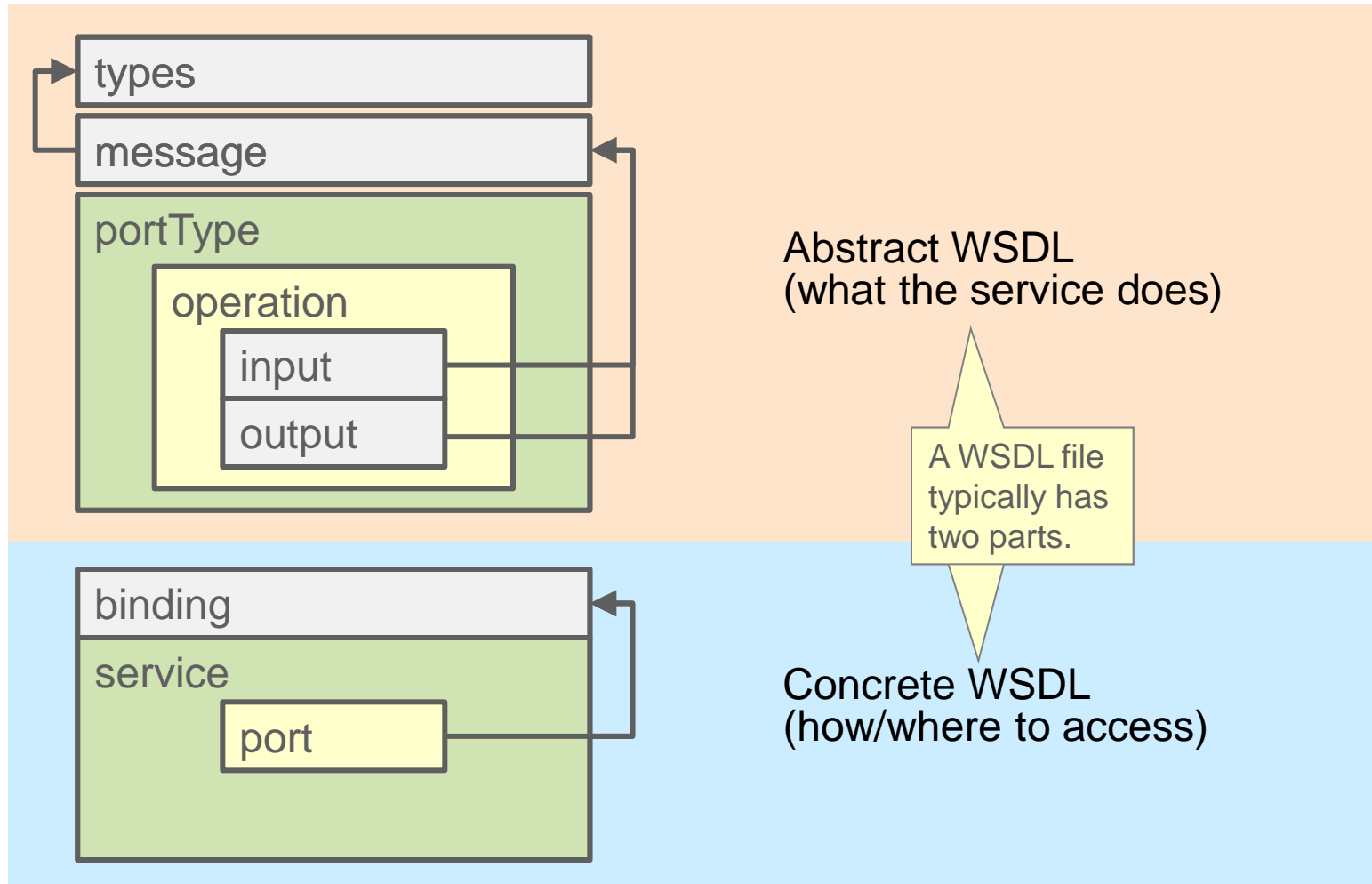
- Describe the basics of WSDL and XSD
- Create a simple Service Bus application
- Describe the differences between JDeveloper and Service Bus Console in terms of development task support
- Populate MDS repository with source data



Agenda

- Basics of WSDL and XSD
- OSB components
- Creating a simple OSB application
- Features for developers

Web Services Description Language (WSDL)



Abstract WSDL

```
<?xml version= '1.0' encoding= 'UTF-8' ?>
<wsdl:definitions
  name="ReceiveData"
  targetNamespace="http://oracle.com/sca/soapservice/Basics/HelloWorld/ReceiveData"
  xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
  xmlns:inp1="http://www.example.org/ns/porder"
  xmlns:tns="http://oracle.com/sca/soapservice/Basics/HelloWorld/ReceiveData"
>
  <wsdl:types>
    <schema xmlns="http://www.w3.org/2001/XMLSchema" >
      <import namespace="http://www.example.org/ns/porder" schemaLocation="xsd/po.xsd" />
    </schema>
  </wsdl:types>
  <wsdl:message name="requestMessage">
    <wsdl:part name="part1" element="inp1:PurchaseOrder"/>
  </wsdl:message>
  <wsdl:portType name="execute_ptt">
    <wsdl:operation name="execute">
      <wsdl:input message="tns:requestMessage"/>
    </wsdl:operation>
  </wsdl:portType>
</wsdl:definitions>
```

1

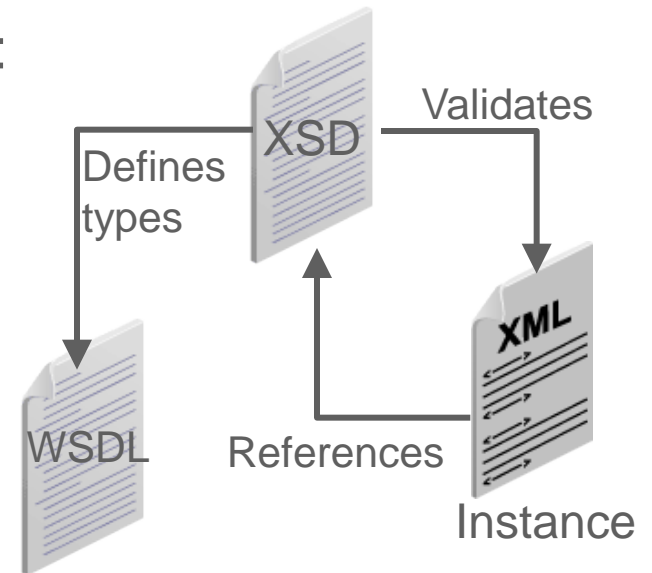
2

3

XML Schema Definition (XSD)

XML schema is used to define the message structure of a service interface (in WSDL). XSD:

- Is an XML language that defines and validates the structure of XML documents
- Defines elements and types, such as:
 - Simple type definitions
 - Complex type definitions
 - Element declarations
 - Attribute declarations
- Supports XML namespaces and built-in simple and complex data types



XSD: Example

```
<ns0:item>
  <ns0:productId>SKU301</ns0:productId>
  <ns0:name>Music Player 1Gb</ns0:productName>
  <ns0:price>45</ns0:price>
  <ns0:quantity>3</ns0:quantity>
</ns0:item>
```

XSD describes XML.

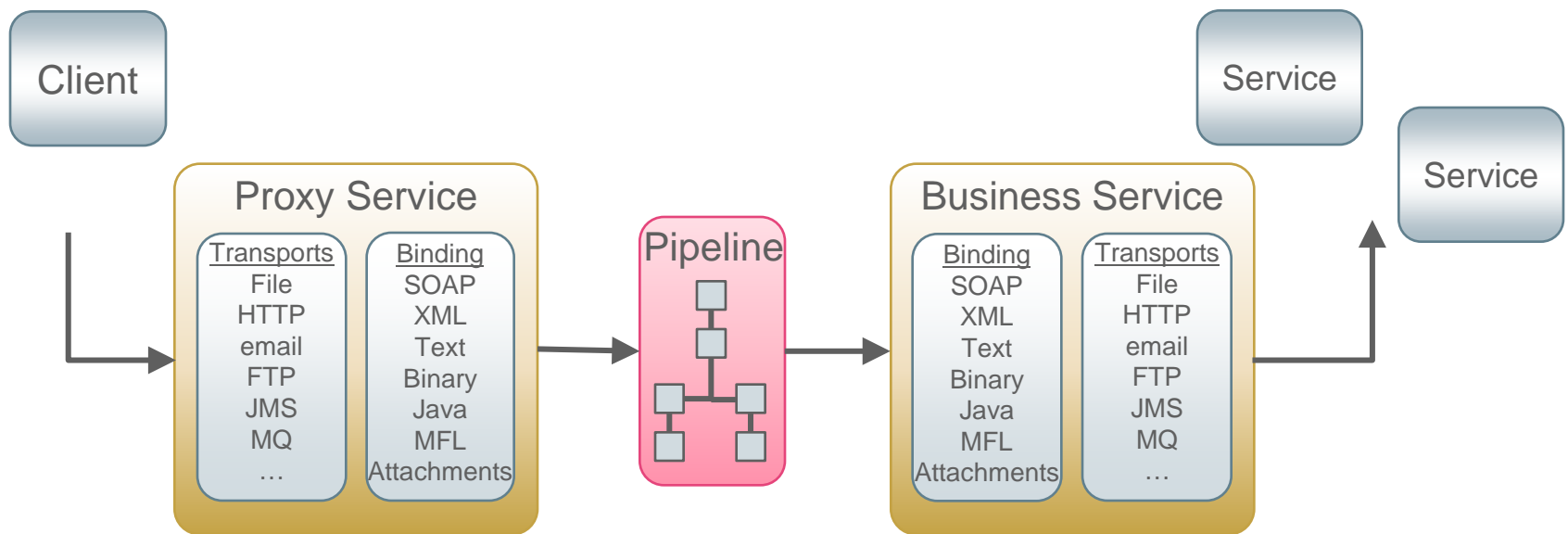
```
<xsd:complexType name="OrderItemType">
  <xsd:sequence>
    <xsd:element name="productId" type="xsd:string" minOccurs="1"/>
    <xsd:element name="name" type="xsd:string" minOccurs="1"/>
    <xsd:element name="price" type="xsd:decimal" minOccurs="1"/>
    <xsd:element name="quantity" type="xsd:int" minOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>
```

Agenda

- Basics of WSDL and XSD
- **OSB components**
- Creating a simple OSB application
- Features for developers

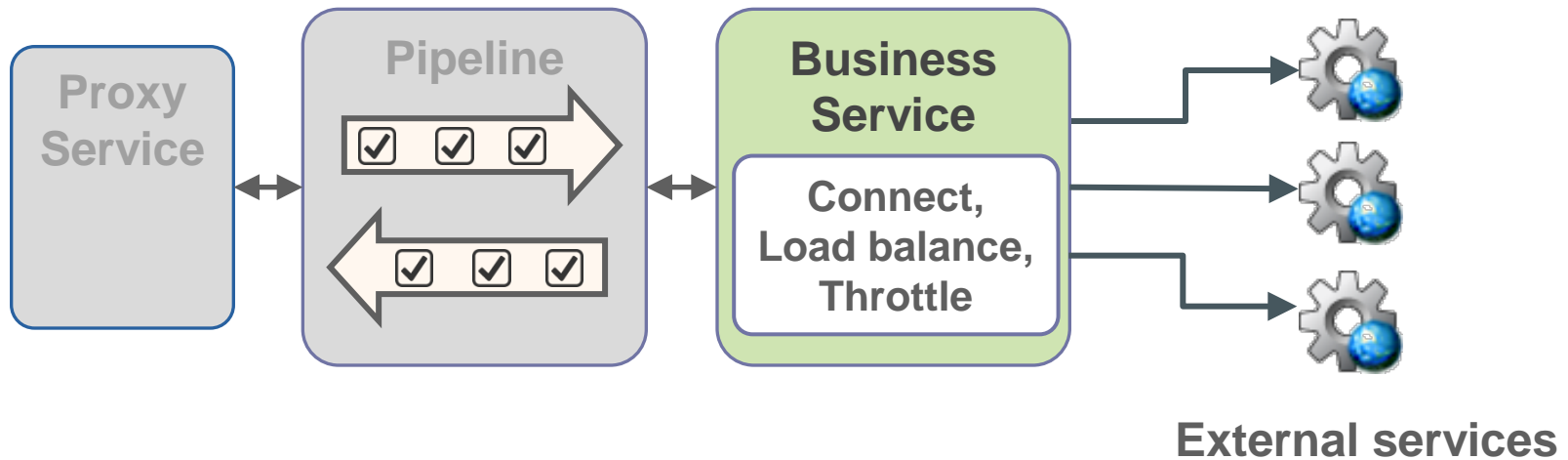
OSB Components

- Business services
- Proxy services
- Pipelines/split-join



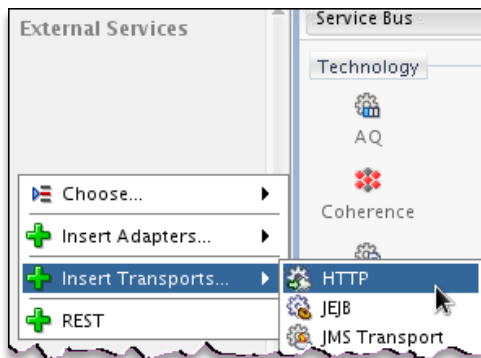
Business Services

- Act as a wrapper of the external services
- Provide an abstraction layer that enables functionalities like load balancing, service throttling, and service pooling
- Defined by whether they are based on a WSDL web service or an OSB transport



Service Types for Business Services

- Transport-typed business service can have one of the following service types:
 - WSDL-based service
 - Any SOAP service
 - Any XML service
 - Messaging service
 - REST service
- The available types are restricted based on the transport used to communicate with the external service.
- Example of business service using HTTP transport:



Service Type: Any XML

☐ WSDL:

Binding / Port:

☐ Any SOAP: SOAP 1.1

☒ Any XML

☐ Messaging: Request:

Response:

Business Service Configuration

Business Service configuration, defining the interface it implements, includes:

- Communication interface
- Type of transport
- Message handling
- Performance tuning
- Security requirements
- SLA alert rules

The screenshot shows the 'Transport' configuration page for a business service. On the left is a sidebar with tabs: General, **Transport**, Transport Details, Message Handling, Performance, and Policies. The main area is titled 'Transport Configuration' with a sub-header 'Use this page to configure the transport information for this service'. It contains fields for 'Protocol' (set to 'http') and 'Load-balancing Algorithm' (set to 'round-robin'). Below these is a table for 'Endpoint URIs' with two columns: 'Endpoint URI' and 'Endpoint Weight'. The table has two rows: the first with 'http://host:port/someService' and an empty weight; the second with 'http://localhost:7101/soa-infra/services/default/ValidatePayment/validat ...' and an empty weight. At the bottom, the 'Retries' section includes 'Retry Count' (0), 'Retry Iteration Interval' (30 Seconds), and 'Retry Application Errors' (unchecked).

Transport Configuration	
Use this page to configure the transport information for this service	
Protocol:	http
Load-balancing Algorithm:	round-robin
Endpoint URIs:	
http://host:port/someService	Endpoint Weight
http://localhost:7101/soa-infra/services/default/ValidatePayment/validat ...	
Retries	
Retry Count:	0
Retry Iteration Interval:	30 Seconds
Retry Application Errors:	<input type="checkbox"/>

Proxy Services

- Act as a gateway for applications and services to access Service Bus
- Define the interface for consumers
- Defined by whether they are based on a WSDL web service or an OSB transport

Proxy Service Configuration

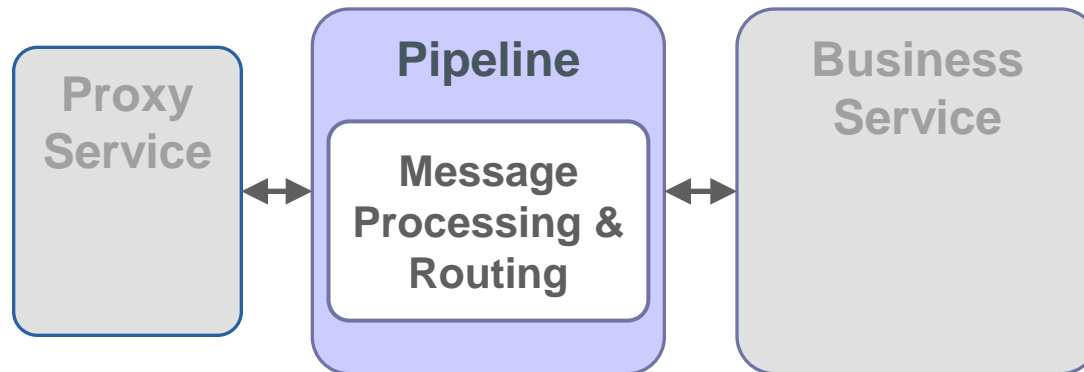
- Communication interface
- Type of transport
- Transport settings
- Message handling
- Security settings

The screenshot shows a web console interface for configuring a proxy service. On the left is a sidebar with a tree view containing the following items: General, Transport, **Transport Details** (highlighted), Message Handling, Policies, and Security. The main content area is titled "HTTP Transport Configuration" with a sub-header "Use this page to configure the transport information for this service}". Below this, there are several configuration options: "HTTPS required" with an unchecked checkbox; "Authentication" with four radio buttons (None is selected, followed by Basic, Client Certificate, and Custom Authent); "Dispatch Policy" with a dropdown menu showing "default"; "Request Encoding" with an empty text input field; "Response Encoding" with an empty text input field; and an "Advanced Settings" section containing "Authentication Header" and "Authentication Token Type", each with an empty text input field.

General	HTTP Transport Configuration Use this page to configure the transport information for this service}
Transport	
Transport Details	HTTPS required <input type="checkbox"/>
Message Handling	Authentication <input checked="" type="radio"/> None <input type="radio"/> Basic <input type="radio"/> Client Certificate <input type="radio"/> Custom Authent
Policies	Dispatch Policy <input type="text" value="default"/>
Security	Request Encoding <input type="text"/>
	Response Encoding <input type="text"/>
	Advanced Settings
	Authentication Header <input type="text"/>
	Authentication Token Type <input type="text"/>

Pipelines

- Define message routing and transformation logic, as well as message handling options
- Allow actions to be performed on a message
- Defined in XML



Quiz



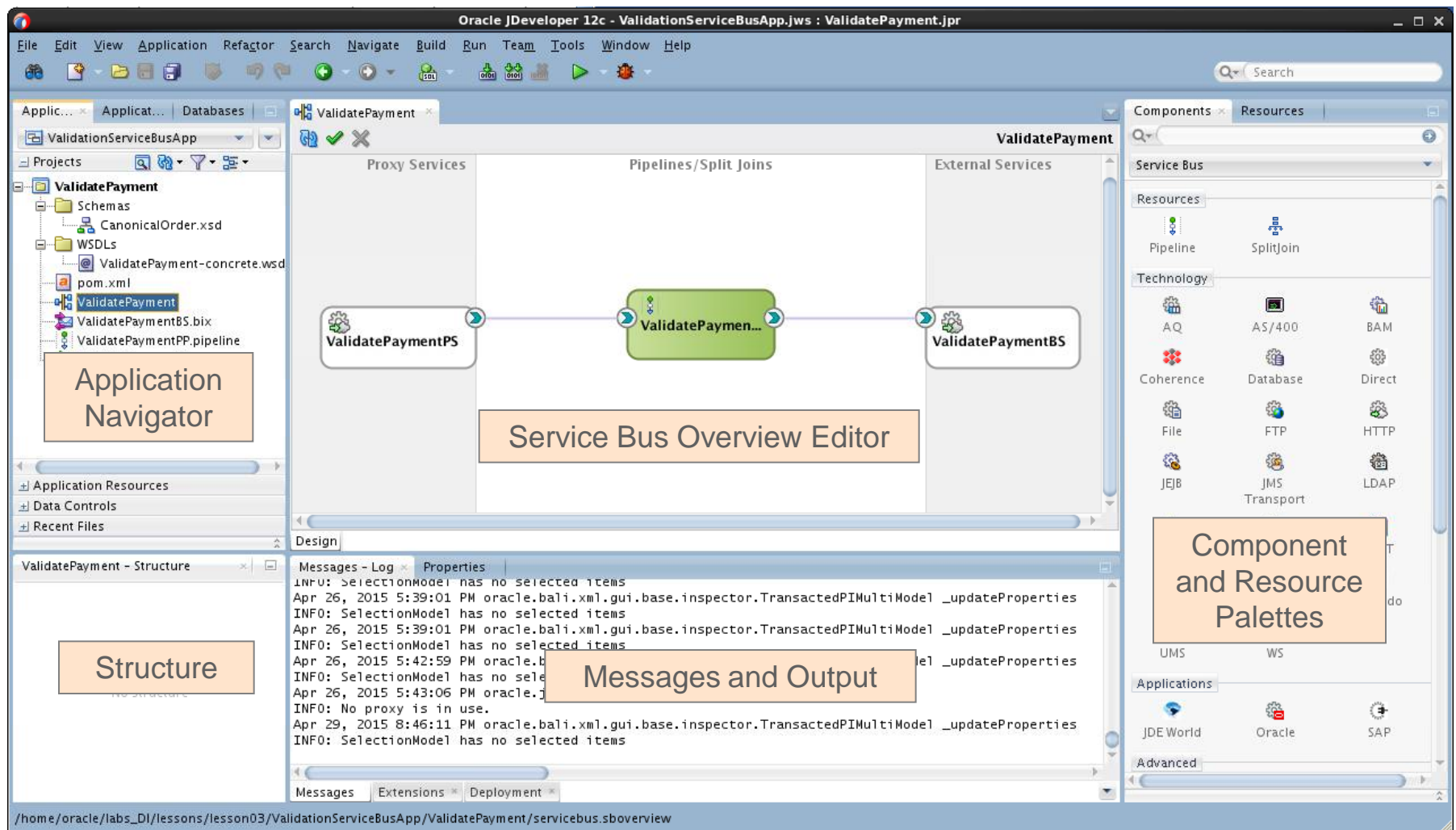
Which service should be used for connecting to a target system?

- a. Proxy service
- b. Pipeline service
- c. Business service
- d. Split-join service

Agenda

- Basics of WSDL and XSD
- OSB components
- **Creating a simple OSB application**
- Features for developers

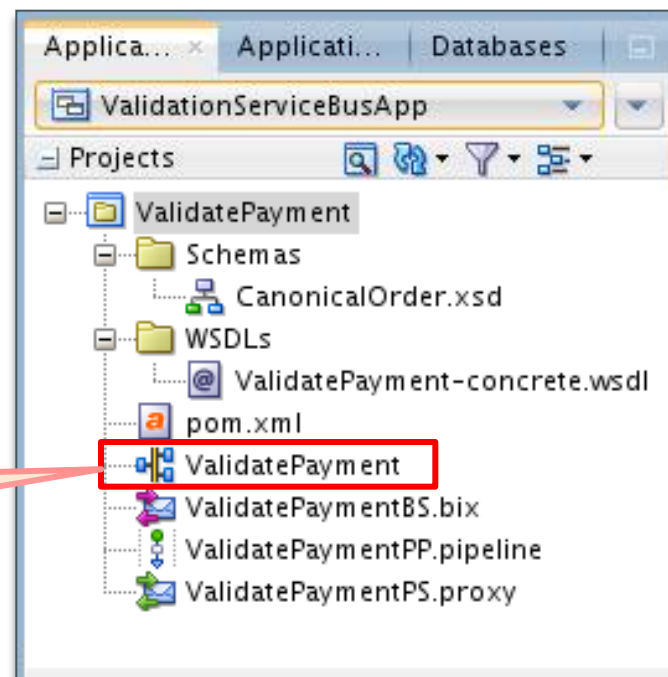
Developing Service Bus in JDeveloper



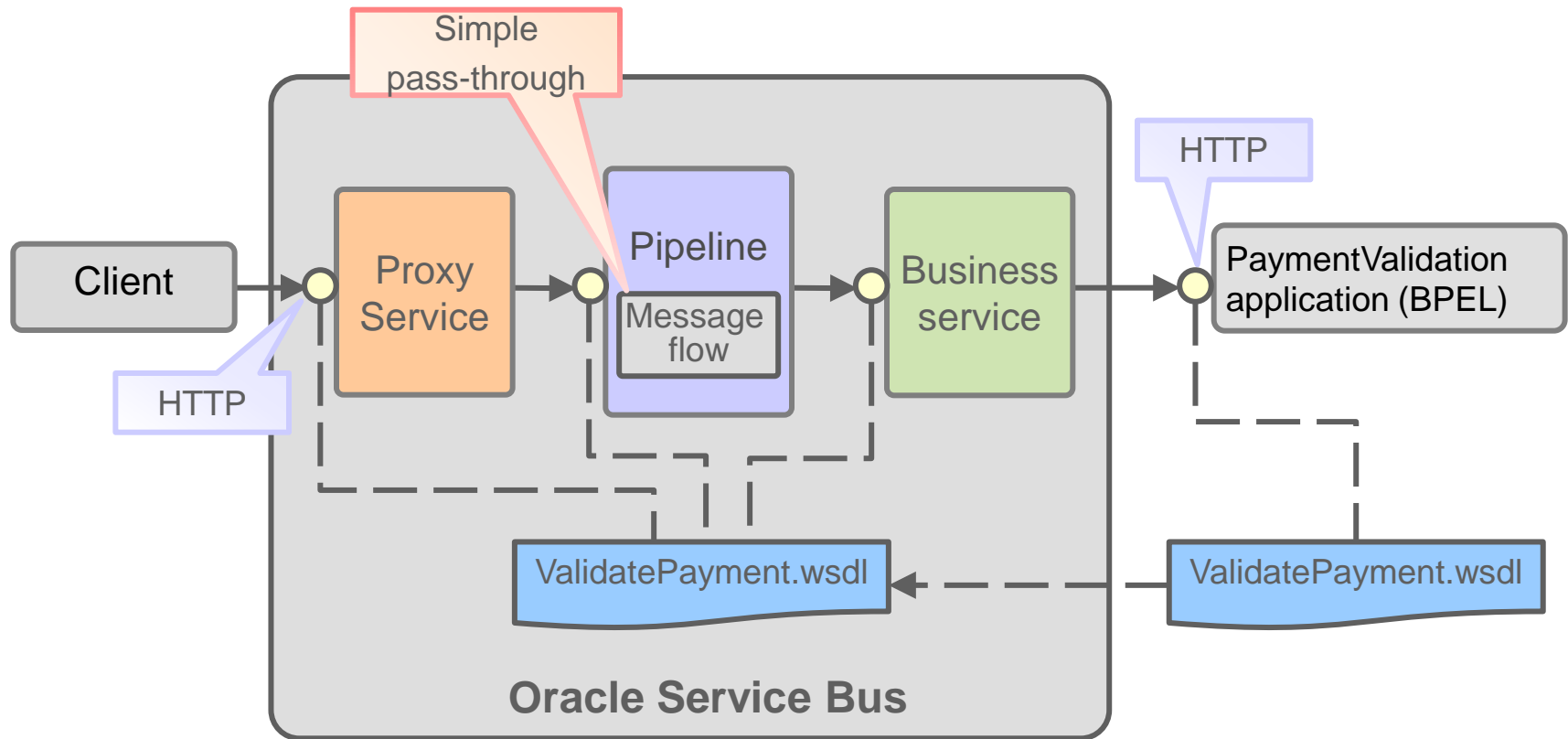
Projects and Resources

- An OSB project is a container for resources.
- Various resources can be created within a project:
 - Project overview file
 - Proxy services
 - Business services
 - Pipelines
 - XML schemas
 - WSDLs
 - Transformations

Project overview file
(servicebus.sboverview)



A Basic Service Bus Application



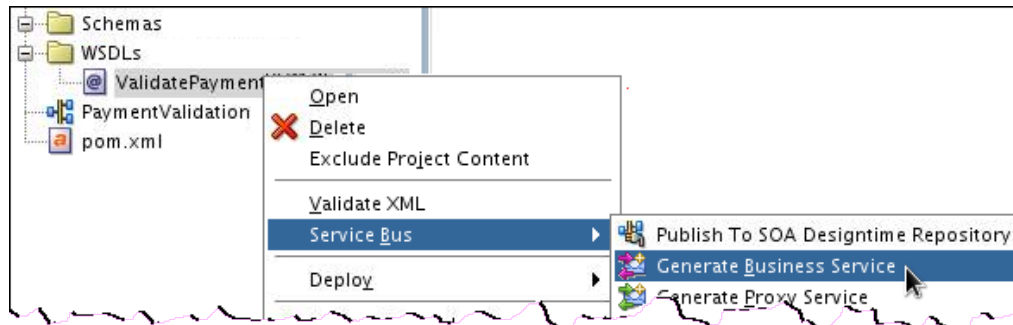
High-Level Steps of Creating a Service Bus Application

1. Create a project folder.
2. Define the folder structure.
3. Register the WSDL of the service that you want to virtualize.
4. Create (or register) the Business Service.
5. Create the Proxy Service.
6. Define the message flow (optional).

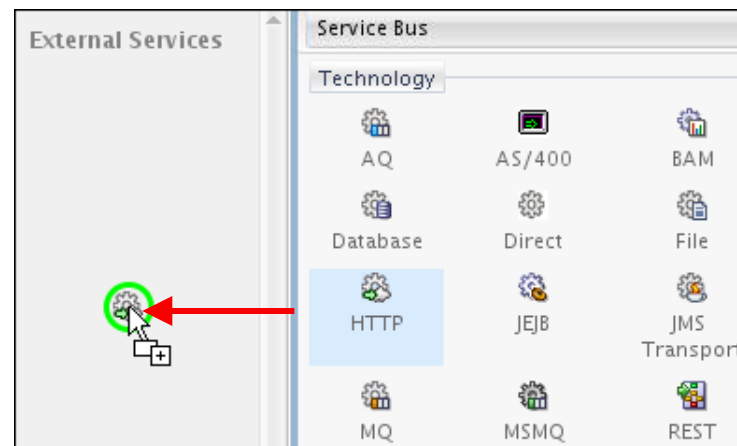
Creating a Business Service

A Business Service can be created:

- From a WSDL service definition document



- By dragging and dropping either an adapter or a transport from the component palette



Creating a Business Service

- Selecting a service type

Create Business Service - Step 2 of 3

Type

Create Service
Type
Transport

Service Type: WSDL-based service

☒ **WSDL:** PaymentValidation/WSDLS/ValidatePayment-concrete
Binding: (Binding) validatePaymentBinding

☐ Any SOAP: SOAP 1.1

☐ Any XML

☐ **Messaging:** Request:
Response:

Help < Back Next > Finish Cancel

Creating a Proxy Service

A Proxy Service can be created:

- From a WSDL service definition document
- By dragging and dropping either an adapter or a transport from the component palette
- By exposing a pipeline or split-join

The screenshot shows the 'Type' dialog box in Oracle Service Bus. The 'Service Type: Any XML' section is active, with 'Any XML' selected. The 'Expose as a Proxy Service' checkbox is checked and highlighted with a red box. Below this, the 'Proxy Name' is 'DemoPipelineProxyService', the 'Proxy Location' is 'ssons/lesson04/PaymentValidation_Log_ServiceBusApp/PaymentValidation_Log', and the 'Proxy Transport' is 'http'. The 'Finish' button is highlighted in yellow.

Type

Create Service
Type

Service Type: Any XML

☐ WSDL:
Binding:

☐ Any SOAP: SOAP 1.1

☒ Any XML

☐ Messaging: Request:
Response:

☒ Expose as a Proxy Service

Proxy Name: DemoPipelineProxyService

Proxy Location: ssons/lesson04/PaymentValidation_Log_ServiceBusApp/PaymentValidation_Log

Proxy Transport: http

Help < Back Next > Finish Cancel

Agenda

- Basics of WSDL and XSD
- OSB components
- Creating a simple OSB application
- Features for developers

Features for Developers

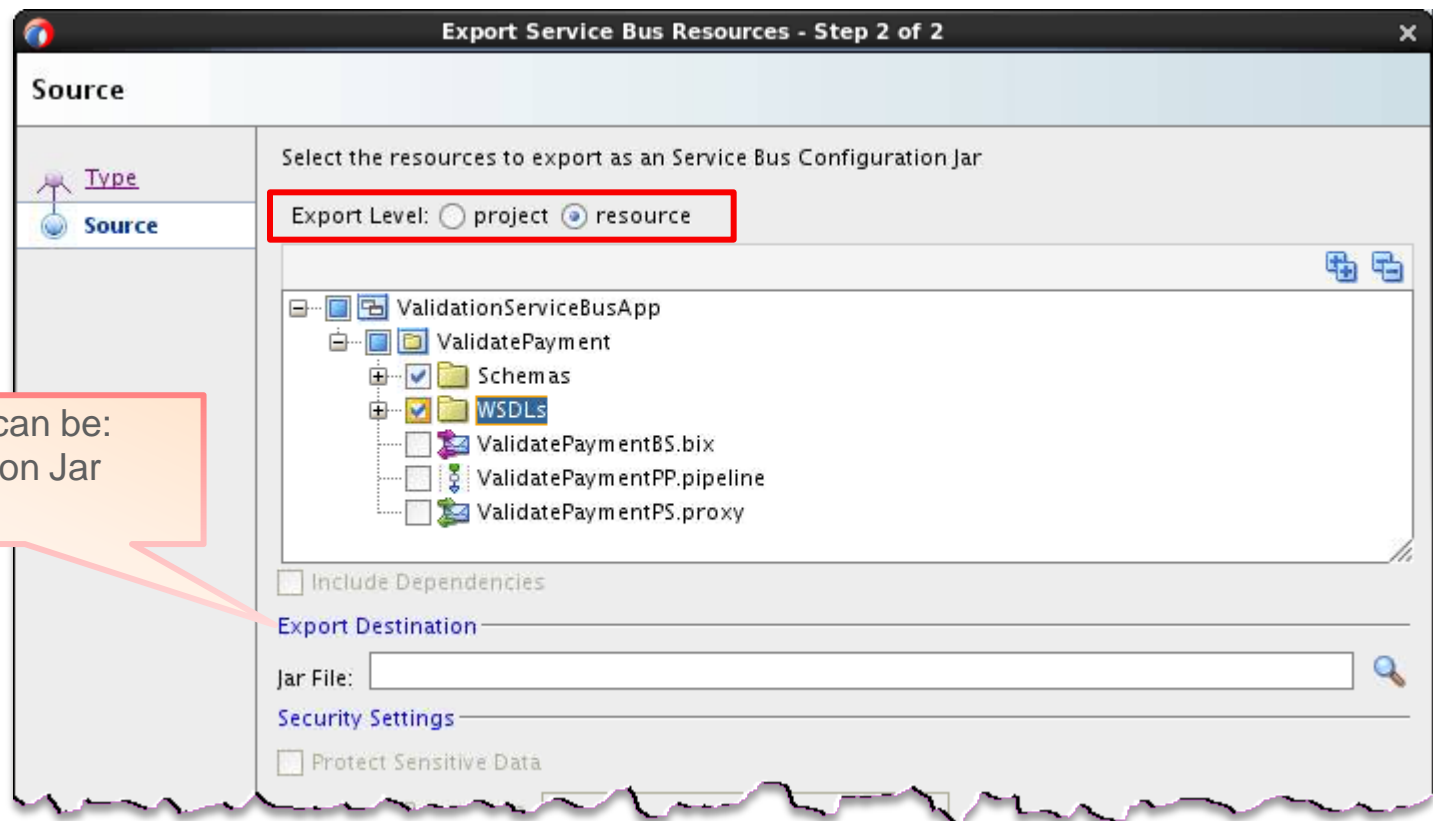
- Quick Start to develop
- Reusability
 - Import and export projects and resources
 - MDS
 - Pipeline templates
- Debugging and testing
- Continuous integration with Maven



Import and Export Resources

Propagation resources between:

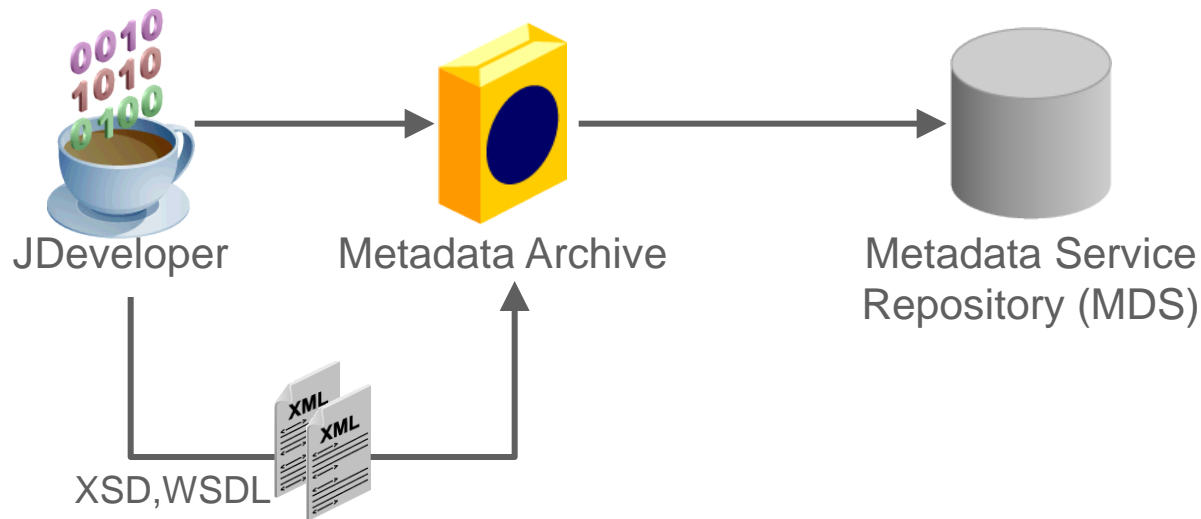
- Development, testing, and production environments
- Development tools: JDeveloper, Service Bus Console



Share Artifacts with MDS

Metadata services (MDS)

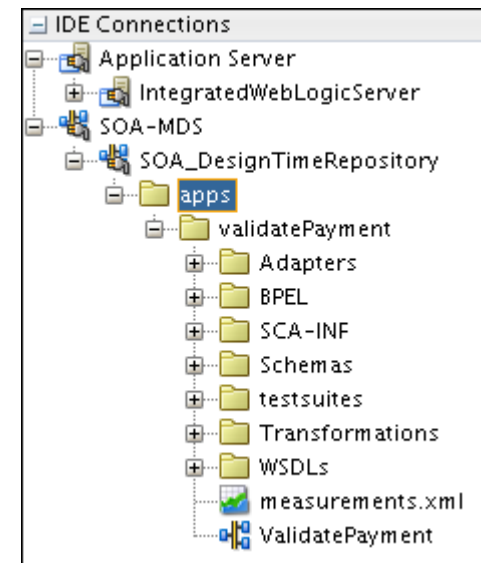
- A repository for sharing reusable artifacts such as WSDLs and schemas
- Support both design-time and runtime MDS
- Share artifacts between SOA and Service Bus projects



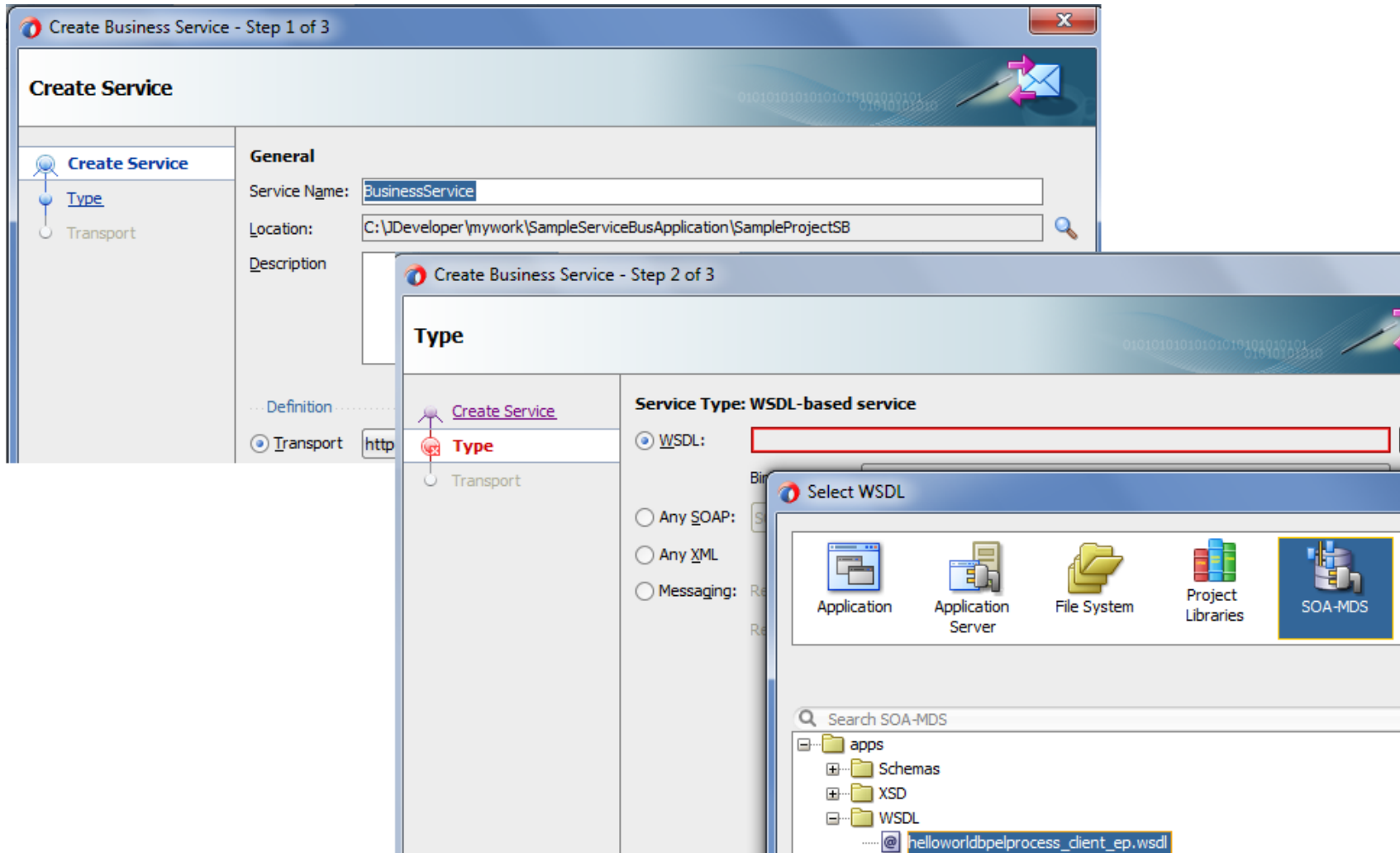
Populating Shared Data with File-Based MDS

How does it work:

- A file-based, design-time MDS repository connection is automatically included when you create a SOA composite application.
- `/apps` is the folder recognized by SOA/OSB for shared data.
- Operations supported:
 - Export (JAR file)
 - Import (JAR file)
 - Transfer

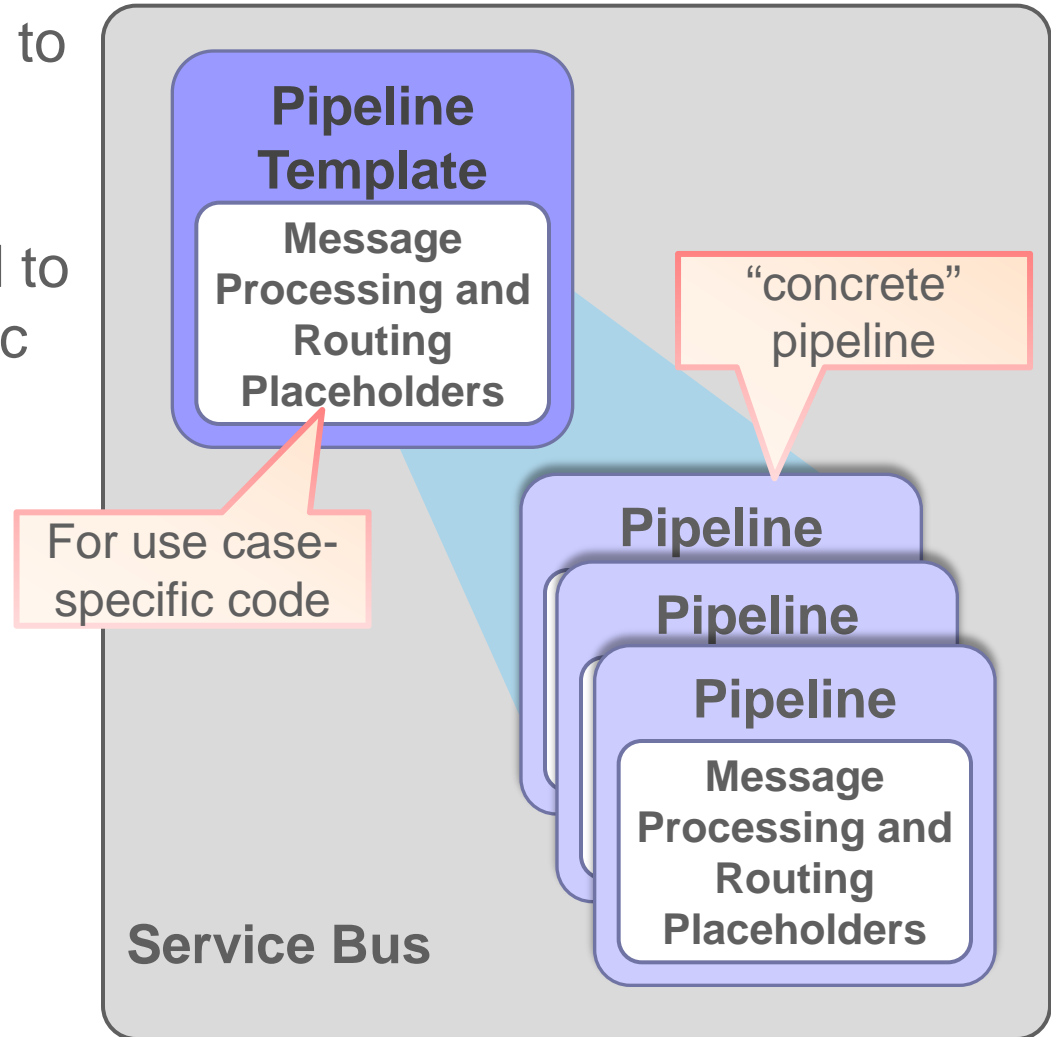


Using Shared Data in MDS



Promote Reusability and Best Practices with Pipeline Template

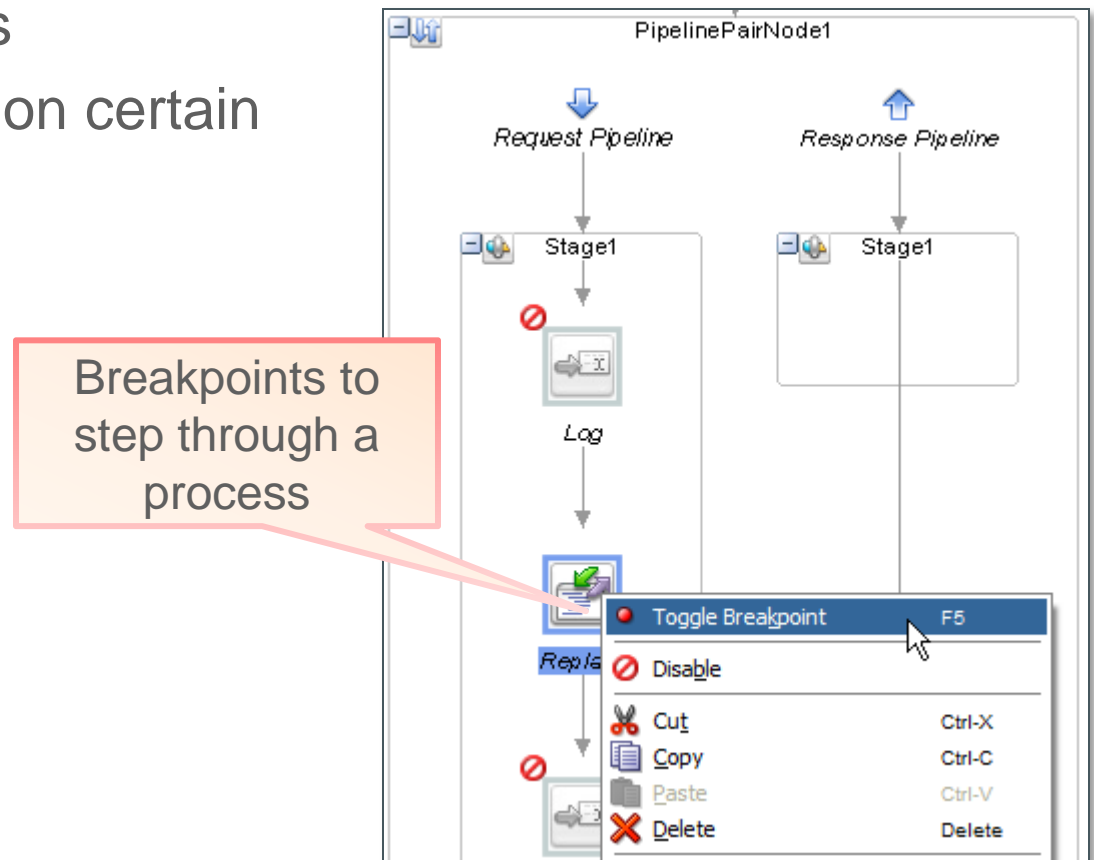
- Use Pipeline Templates to create and provide best-practice patterns.
- Placeholder is designed to protect use case-specific code from template updates.



Test and Debug Integrations

Use the integration debugger to step through a pipeline as it executes for:

- Identifying problems
- Validating behavior on certain conditions



OSB Maven Support

- OSB provides:
 - A plug-in for pulling or downloading all required libraries and plug-ins into a local repository
 - A plug-in to package and deploy an OSB project
 - An archetype to create an OSB project
- Service Bus Maven plug-in goals:
 - `package`
 - `deploy`

Oracle Service Bus Console

The screenshot displays the Oracle Service Bus Console 12c interface. The top navigation bar includes the Oracle logo, 'Service Bus Console 12c', and links to 'Links', 'Help', and 'weblogic'. Below this, a 'weblogic Session' bar contains 'Activate', 'Discard', and 'Exit' buttons. The main interface is divided into a left sidebar and a central workspace.

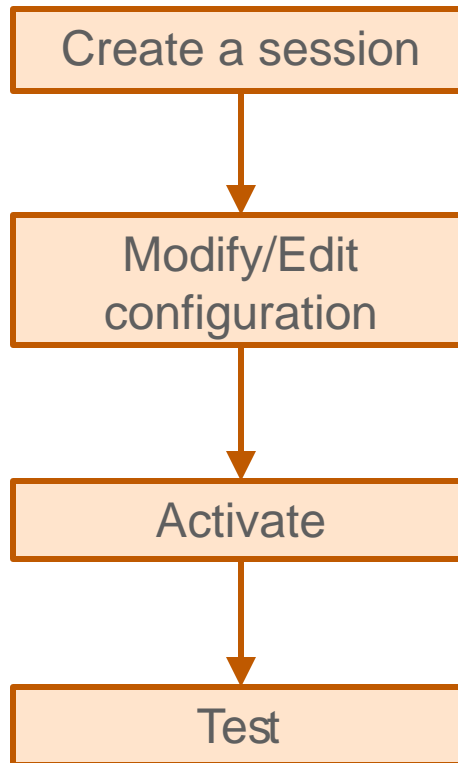
Left Sidebar: Labeled 'Resources' and 'Admin', it contains a tree view of the project structure. A red dashed box highlights the 'System' folder, which contains 'JNDI Providers', 'Proxy Servers', 'SMTP Servers', and 'UDDI'. A callout bubble labeled 'Global resources' points to this box.

Central Workspace: The title bar shows 'ValidatePaymentBS x'. The main area is titled 'Business Service Definition' and has tabs for 'Configuration', 'Security', and 'SLA Alert Rules'. The 'Configuration' tab is active, showing a 'General' section with a left-hand menu (Transport, Transport Detail, Message Handling, Performance) and a right-hand details pane. The details pane shows: Transport: http, Service: WSDL Based Service - SOAP 1.1, Type: WSDL, WSDL: ValidatePayment/WSDLs/ValidatePayment-concrete, and Port: validatePaymentPort. A red dashed box encloses the entire workspace area, with a callout bubble labeled 'Resource Definition Editor' pointing to it.

Top Right of Workspace: A toolbar contains icons for information, comments, execution, and other actions. A red dashed box highlights this toolbar, with a callout bubble labeled 'Tools specific to resource' pointing to it.

Bottom Bar: Contains buttons for 'Conflicts', 'History', 'References', 'Search results', and 'Find And Replace Results'.

Working with Sessions



Test Console

- Test services
- Trace pipelines

Proxy Service Testing - ValidatePaymentPS [Help](#)

Service Operation

Operation:

Request Document

SOAP Header:

*** Payload:**

```
<soas:PaymentInfo xmlns:soas='http://www.oracle.com/soasample'>
  <soas:CardPaymentType>3</soas:CardPaymentType>
  <soas:CardNum>stringstringstri</soas:CardNum>
  <soas:ExpireDate>stri</soas:ExpireDate>
  <soas:CardName>string</soas:CardName>
  <soas:BillingAddress>
    <soas:FirstName>string</soas:FirstName>
    <soas:LastName>string</soas:LastName>
    <soas:AddressLine>string</soas:AddressLine>
    <soas:City>string</soas:City>
    <soas:State>string</soas:State>
    <soas:ZipCode>string</soas:ZipCode>
    <soas:PhoneNumber>string</soas:PhoneNumber>
  </soas:BillingAddress>
  <!--Optional:-->
  <soas:AuthorizationDate>2008-09-29T01:49:45</soas:AuthorizationDate>
  <!--Optional:-->
  <soas:AuthorizationAmount>1.051732E7</soas:AuthorizationAmount>
</soas:PaymentInfo>
```

Monitoring and Administering in EM Console

ORACLE Enterprise Manager Fusion Middleware Control 12c

WebLogic Domain

Target Navigation

- Application Deployments
- SOA
 - service-bus (DefaultServer)**
 - apps
 - default
 - ProcessOrderSB
 - SharedSB
 - SummitOrders
 - ValidatePayment
 - soa-infra (DefaultServer)
- WebLogic Domain
 - DefaultDomain
 - DefaultServer
- Metadata Repositories
- User Messaging Service

service-bus ⓘ

Service Bus

Logged in as weblogic | slc07fhi.us.oracle.com

Page Refreshed Mar 25, 2014 7:40:11 AM PDT

Dashboard | Alert History | Service Health | Resequence Messages | Operations | Global Settings

Alerts | Pipeline Alerts | Alerts History Duration: 1 year

Pipeline

Alert Severity	Percentage
Normal	61.22%
Warning	14.29%
Critical	24.49%

Services With Most Alerts

Service
No Services Found.

Alert History Show More

Timestamp	Alert Summary	Alert Severity	Service	Service Type
Mar 25, 2014 7:36:21 AM	Normal processing with approved resu	Normal	ValidatePayment/ValidatePP	Pipeline
Mar 25, 2014 7:36:21 AM	Oracle Service Bus Alert	Warning	ValidatePayment/ValidatePP	Pipeline
Mar 25, 2014 7:36:19 AM	Normal processing with approved resu	Normal	ValidatePayment/ValidatePP	Pipeline
Mar 25, 2014 7:36:19 AM	Oracle Service Bus Alert	Warning	ValidatePayment/ValidatePP	Pipeline
Mar 25, 2014 7:36:18 AM	Normal processing with approved resu	Normal	ValidatePayment/ValidatePP	Pipeline

Services With Most Errors Show More

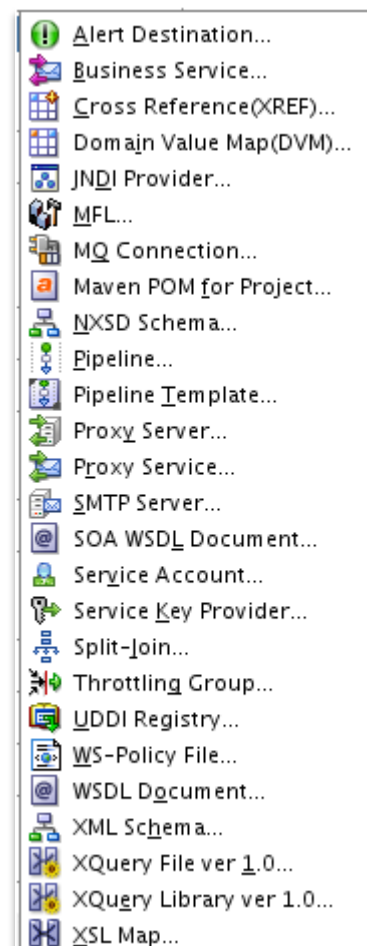
Service Health Snapshot Table | Current Aggregation Interval | Server: DefaultServer

Name	Path	Type	Aggr Interval(min.)	Avg. Resp. Time(msecs)	Messages	Errors	SLA Alerts
No Services Found.							

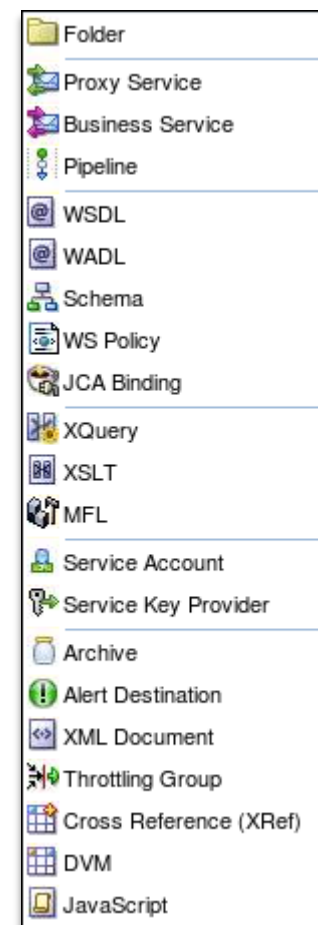
Development Tasks Support

Topic	JDeveloper	Console
Import & Export resources & projects	Y	Y
Modeling messages	Y	Y
Adapters	Y	N
Pipeline Template	Y	N
Split-Join	Y	N
Expression Builder	Y	Y
XQuery/XSLT Mapper	Y	N
Debugging	Y	N
REST enablement	Y	N

JDeveloper



Console



Quiz



Which of the following web-based consoles allow you to create and modify Service Bus resources?

- a. EM console
- b. Test console
- c. WebLogic Server Admin console
- d. Service Bus console

Summary

In this lesson, you should have learned how to:

- Describe the basics of WSDL and XSD
- Create a simple Service Bus project in JDeveloper and Service Bus Console
- Describe the differences between JDeveloper and Service Bus Console in terms of development task support
- Populate MDS repository with source data



Practice 3: Overview

- 3-1: Deploying and Testing a SOA Composite
- 3-2: Virtualizing Service with Service Bus
- 3-3: Populating MDS Repository with Source Data