Oracle® Retail Service Backbone

Developers Guide 16.0.21 E86914-01

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Oracle® Retail Service Backbone Developers Guide, Release 16.0.21.

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Preface

This Developers Guide describes the integration and flow requirements of the Retail Service Backbone Product.

Audience

This guide is for:

- Developers
- Integrators and implementers

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Related Documents

For more information, see the following documents in the Oracle Retail Service Backbone documentation set:

- Oracle Retail Integration Console User Guide
- Oracle Retail Service Backbone Security Guide
- Oracle Retail Service Backbone Implementation Guide
- Oracle Retail Integration Cloud Service Release Notes
- Oracle Retail Service Backbone Installation Guide

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- Detailed step-by-step instructions to re-create
- Exact error message received
- Screen shots of each step you take

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ml

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ml

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Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

1

Getting Started with the RSB Developer Guide

This chapter provides an overview of types and styles of integration addressed by RSB and details of how to use this guide.

Introduction

RSB (Retail Service Backbone) is a web service based integration pattern implementation for Oracle Retail. RSB enables loose coupling between Oracle Retail and external applications and applications within Oracle Retail Suite. RSB is built on the top of Oracle Service Bus (OSB).

- RSB provides automated OSB configurations for web service deployment and security configurations
- RSB packages all of the Oracle Retail web services
- RSB provides tooling for the full life cycle management of OSB hosted Web Services (Development, Compilation, Deployment and Upgrades) and automatically adds instrumentation for runtime operations monitoring (using Retail Integration Console application)

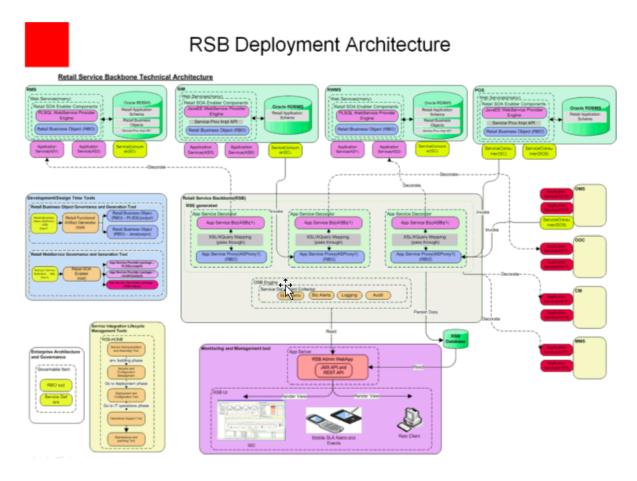
Developers often need to integrate third-party applications to Oracle Retail applications through RSB. This guide is intended to provide guidance on how to integrate third-party applications to RSB. This guide also provides insight to configure some of the RSB features to adapt to user requirements programmatically.

Types of Integrations Addressed by RSB

Oracle Retail uses three types of integration patterns:

- Request Reply
- Fire and Forget
- Bulk Data

Technical Architecture



2

Building RSB Integration Flows

This chapter introduces RSB integration flows and describes how to setup development and test environments.

Development Tools

The underlying infrastructure for RSB is built using OSB (Oracle Service Bus). Any RSB programming activity invariably involves OSB programming. The tools provided by OSB are the same tools used for RSB programming.

The primary recommended development tool for RSB programming is JDeveloper.

OSB Console vs JDeveloper

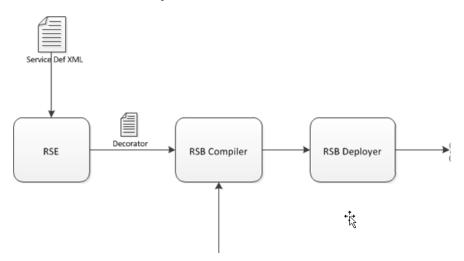
There are two ways to make programmatic changes to web services hosted in OSB server: OSB console and JDeveloper. However, OSB console is an operational tool and is not recommended as a programming tool, even though OSB console provides the feature to make programmatic changes. The recommended approach is to use JDeveloper for any programming changes to OSB/RSB components and use OSB console for operational changes to the OSB components. Also, it is important to note that when OSB projects/jars are re-deployed in OSB server, any operational changes made to the earlier version deployed in the server will be lost and these operational settings will need to be configured again in the new deployed projects.

Installing JDeveloper

Use this JDeveloper for your OSB/RSB programming tasks.

JDeveloper does not need to be installed in the same machine where RSB builder tool is located. JDeveloper can be installed in a development environment, and the RSB jars can be copied to that machine. After making changes to the jars, they can be copied back to RSB builder and then deployed. The complete development lifecycle is explained later in this chapter.

Introduction to RSB Decorator jar Files



RSB provides Decorator PAKs for Oracle Retail applications. There is one PAK for each Oracle Retail application. Each PAK contains a set of jar files which are OSB deployable jars and are also known as decorators in the RSB context. Decorators are generated using Retail SOA Enabler (RSE) tool. The RSE tool uses the service definition XML file as input for generating the decorators. RSE generates one decorator for each service defined in the service definition XML. The decorator jar contains OSB artifacts related to that service. Each decorator jar contains a proxy service and a business service which are related to the service for which the decorator jar is generated. For more information about RSB builder tool and how it is used to compile and deploy the decorators, see the *Oracle Retail RSB Implementation Guide*.

The list of all application service decorator PAKs in this release is provided in Appendix A.

Note: For more information, see *Oracle Retail SOA Enabler (RSE) Guide*.

Introduction to RSB Service Integration Flow jar Files

RSB Functional Integration Flows are OSB integration services that are not decorators. Decorators have one proxy service and one business service related to the application service but service integration flows are not tied to a specific service. The purpose of service integration flows is to provide capabilities that range across multiple application services.

RsbServiceIntegrationFlowPak16.0.21ForRibOmsToRsbOmsRouting_eng_ ga.zip is the only PAK available for this release. This PAK contains a proxy service which routes the data coming from RIB-OMS to various RSB decorator services.

How to Setup RSB Workbench

RSB workbench is a development area for integration developers who want to modify the existing RSB decorator projects for various purposes such as adding new functionality or integration with third-party applications.

Workbench area should be in the same machine where JDeveloper has been installed. In this document we will refer to that location as RSB_WORK_AREA.

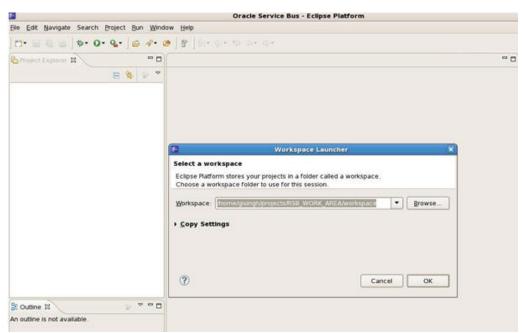
RSB has two types of OSB projects which can be customized: app service decorators and service integration flows. Therefore, it is recommended to have a directory for each type of project in RSB_WORK_AREA. The following is a screenshot of the recommended directory structure:

Image: Stop Imag	er Search	
Name	▼ Size Type	Date M
	1 item folder	Thu 05
	2 items folder	Thu 05
oms-CustomerOrder-AppServiceDecorator.jar	52.9 KB Java archive	Thu 05
oms-OrderReturn-AppServiceDecorator.jar	21.5 KB Java archive	Thu 05
	1 item folder	Thu 05
RibOmsToRsbOmsRouting-ServicesIntegrationFlow.jar	10.3 KB Java archive	Thu 05

As shown above, the app-service-decorators folder has an application specific folder which contains the decorator jars for that application. Service integration flows are not application specific, therefore those types of jars can be directly within that folder.

JDeveloper Workspace

When an OSB jar is imported in JDeveloper, it extracts the jar inside the JDeveloper workspace. The extracted folder will have all the OSB project related files that were packaged in the jar. You can create the workspace at any location in the machine. For this document purpose, we will create a workspace folder inside RSB_WORK_AREA. We will refer to that location as OSB_WORK_SPACE in this document.



To summarize, RSB_WORK_AREA is the location where jars are copied to and from the RSB builder location and OSB_WORK_AREA is the location where jars are imported as OSB projects and are worked upon.

Development Lifecycle

When working on modifying RSB decorator jars or service integration flow jars, it should follow a certain lifecycle. This lifecycle should work in conjunction with RSB lifecycle. For details about all the lifecycle phases, see Oracle Retail RSB documentation.

For development lifecycle, the decorator jars or service integration flow jars must be copied from rsb-home/service-assembly-home folder.

Following are the steps that should be followed in the order mentioned below:

- 1. Copy the decorator jar or service integration flow jar that you want to modify from rsb-home/service-assembly-home to an appropriate location in RSB_WORK_AREA. The folder structure for RSB_WORK_AREA has been shown above in the screenshot.
- **2.** Import the jar into JDeveloper where the JDeveloper workspace is OSB_WORK_SPACE. The steps for importing jar have been shown below.
- **3.** JDeveloper will extract the jar and create an OSB project. The extracted jar will be saved in OSB_WORK_SPACE. The steps in the next section will show a screenshot of how the extracted jar looks like.
- 4. Make changes to the OSB project as needed.
- **5.** Export the updated project as a jar to RSB_WORK_AREA. The name and location of the jar should be same as the jar that was imported.
- **6.** Copy the updated jar to rsb-home/service-assembly-home at the same location from where it was copied.
- **7.** Follow the RSB compilation and deployment process to deploy the modified jar in server.

Note: After copying modified jars into rsb-home/service-assembly-home, do not run the download-home/bin/check-version-and-unpack.sh script because that will overwrite the jars with the original jars from the PAKs.

How to Import RSB Decorator jar into JDeveloper

This section provides a step-by-step guide for how to import RSB decorator jar into JDeveloper workspace.

Creating a New Service Bus Application

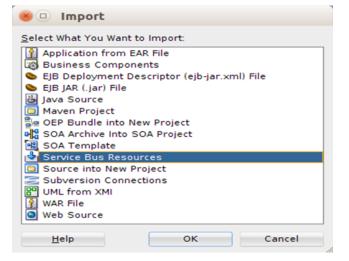
To create a new Service Bus Application, do the following:

- 1. Select File>New>Application>Service Bus Application.
- **2.** Provide Application Name and click **Finish** to create a new Service Bus Application.

This creates an OSB Configuration Project, in which you can import RSB decorator or service integration flow jar files.

Categories:	Items:	Show All Descriptions
Applications Connections Deployment Descriptors Deployment Profiles	Application from EAR File	
Diagrams Java Maven Projects UML XMI	Custom Application Custom Application Custom Application Custom Application Custom Application Custom Application	
Business Tier	CE OEP Application	
ADF Business Components Business Rules Contexts and Dependency I Data Controls EIB	Service Bus Application Create a new Service Bus application when a Service Bus application is nee Service Bus configuration jar.	
Enterprise Scheduler Metac	Service Bus Application with Service B	us Project

3. To import a decorator jar, select File>Import. The following screen is displayed:



4. Select Service Bus Resources and click OK.

уре				
Yype Source Configuration	Select the type of resource t © Configuration Jar © Besources from URL © Zipped Resources	io Import		

- **5.** Select Configuration jar and click **Next**.
- 6. Specify the path to the jar file that you want to import and click Next.

Import Service Bus Resources - Step 2 of 3								
Source								
Configuration	Select the Co Jar Source:	nfiguration Jar	to import.					
Help			< <u>B</u> ack	Next >	Einish	Cancel		

7. Click **Finish** to import decorator jar.

	Select the Configuration Jar to import.	
Las Source Configuration	Jar Source: https://work_AREA/app-service-decorators/oms-CustomerOrder-AppServiceDecorator.jad	c

The decorator jar will be imported into workspace, and the jar will be extracted inside the workspace. It will also show the project name in the Project Explorer window of JDeveloper. With this the workbench area is setup for the OSB project development. Any changes you make here will be saved in the workspace. After you finish making changes, you can export the project to a jar file.

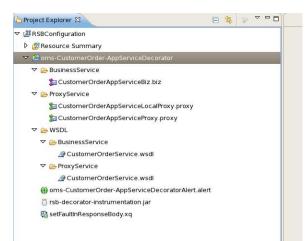
Note: While making changes to OSB projects, it may be cumbersome to copy the jar to rsb-home/service-assembly-home every-time and go through compilation and deployment phases to test the changes. Instead, you can test the OSB project by deploying the jar in a development OSB server environment and test that all the changes are working fine. Once the changes are working as desired, the jar file can be copied to rsb-home/service-assembly-home for final deployment.

Components of RSB Decorator Project

After importing a decorator jar into workspace, the directory structure looks like following:

```
<appName>-<ServiceName>-AppServiceDecorator
BusinessService
<ServiceName>AppServiceBiz.biz
ProxyService
<ServiceName>AppServiceLocalProxy.proxy
<ServiceName>AppServiceProxy.proxy
WSDL
BusinessService
<ServiceName>Service.wsdl
ProxyService
<ServiceName>Service.wsdl
<appName>-<ServiceName>-AppServiceDecoratorAlert.alert
rsb-decorator-instrumentation-<version>.jar
setFaultInResponseBody.xq
```

An example screenshot when oms-CustomerOrder-AppServiceDecorator.jar is imported is shown below.



Business Services

RSB Decorator projects include one business service by default. This business service is based on the WSDL which is available in WSDL BusinessService folder. By default, the WSDLs of Proxy and Business Services are similar. When customizing a decorator to work with an external service, the WSDL of that service should be copied in this folder. Following, is the naming convention for business service file: <ServiceName>AppServiceBiz

For example, in oms-CustomerOrder-AppServiceDecorator project, the name of business service will be CustomerOrderAppServiceBiz

Local and Remote Proxy Services

RSB Decorator projects include two proxy services by default. They have naming convention as follows:

- <ServiceName>AppServiceLocalProxy
- <ServiceName>AppServiceProxy

<ServiceName>AppServiceProxy: This proxy service is based on HTTP transport protocol. Clients invoking the service from remote JVM should invoke this proxy service. This service takes request from the web service client and routes it to <ServiceName>AppServiceLocalProxy service. This proxy service does not have any business logic, its only purpose is to allow invocation from remote clients and it is recommended to be kept that way.

<ServiceName>AppServiceLocalProxy: This proxy service is based on local transport. All the message processing takes place in this proxy service.

Why two proxy services in decorator jar? Every decorator project has two proxy services packaged inside it. The reason for that is to provide the flexibility to call the service either from remote or from local JVM. It also provides the flexibility to configure the security as needed. When a proxy service needs to invoke another proxy service, it can directly invoke the local proxy service which will save the overhead of processing security headers of that message.

WSDL files

Every decorator project has two WSDL files packaged in it.

Proxy Service WSDL: This WSDL is available under **WSDL>ProxyService folder**. The proxy services packaged in a decorator jar are based on this WSDL. This WSDL should never be modified as consumers invoke the decorator services based on this WSDL, any change to this WSDL will break the service contract.

Business Service WSDL: This WSDL is available under **WSDL>BusinessService** folder.

Alert Destination

Every decorator jar has an alert destination packaged in it. The filename of the destination follows the format:

<appName>-<ServiceName>-AppServiceDecoratorAlert.alert This is the default alert destination which logs the alert as well as sends the alert to default reporting JMS provider. Any pipeline or SLA alerts configured in decorator will be sent to this destination.

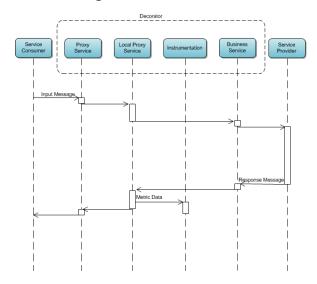
Instrumentation Jar File

A java archive file named rsb-decorator-instrumentation.jar is packaged in the decorator project. This jar contains java classes which contain the code for instrumentation purposes.

Fault XQuery File

There is an xquery file named setFaultInResponseBody.xq packaged in every decorator project. This xquery contains the code to build appropriate SOAP fault before returning it to the client.

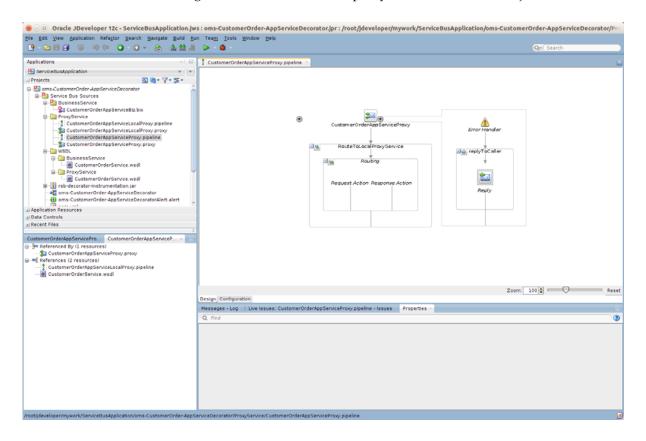
RSB Decorator Message Flow



Proxy Service client > Remote Proxy Service > Local Proxy Service > Business Service > Edge-app Application Service.

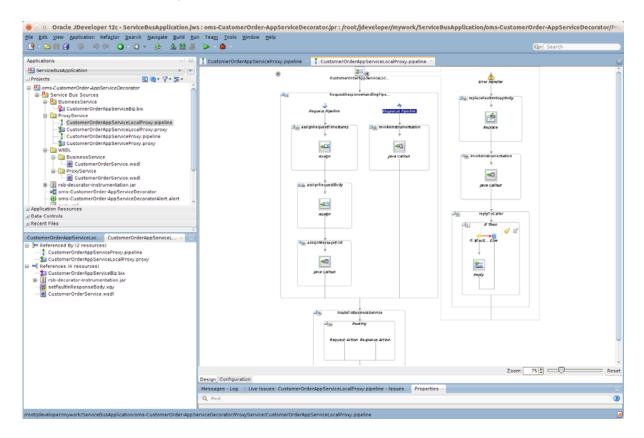
Message Flow in Remote Proxy Service

The following is a screenshot of remote proxy service of a decorator jar:



Message flow in Local Proxy Service

The following screenshot shows the message flow in a local proxy service of a decorator jar:



How to Export RSB Decorator Project

Once you have completed changes in a decorator project, you can export it back to the jar and deploy and test.

To export the decorator project to the jar do the following:

1. Select File > Export > Service Bus Resources and click OK.

😸 🗆 Export		
<u>S</u> elect What You War	nt to Export:	
Service Bus Res		
Subversion Con B UML as XMI	nections	
<u>H</u> elp	ок	Cancel

2. Select Configuration jar and click Next.

ype		
Type Source	Select the destination to export to: ② genfiguration jar ③ gerver	

3. Select resource, provide jar file location and click Finish.

Export Service	e Bus Resources - Step 2 of 2	
Source		
T Bource	Select the resources to export as an Service Bus Configuration Jar Export Level: ③ project ○ resource	
	BerviceBusApplication B	
	Conclude Dependencies	
	jar Pile:	•
	Security Settings	
	Passphrase	
	Confirm Passphrase	
Help	- Beth Next > Doubh	Cancel

4. Click **Yes**. It will update the jar file with latest changes. The export process is complete.

3

Integration with Third-Party Application Services

Oracle Retail application landscape of the customer has a variety of applications servicing different business functions. There is a legitimate need to integrate these applications. Customers may have one or more of these applications from vendors other than Oracle. Both Oracle and non-Oracle applications should be able to integrate as long as the interface requirements are met.

In this document we are describing the process and instructions to integrate a third-party application to an Oracle Retail application using RSB. We will be providing instructions and example to show how to integrate using RSB. For this purpose, we are assuming Order Management System (OMS) as the third-party application. OMS is only a representational application that implements retail order management functionality. Actual applications that will be used instead can be any third-party applications like Yantra, and so on.

Any third-party applications that can consume or provide SOAP based web-services can be integrated with Oracle Retail application through RSB. While there can be complex integration scenarios, this document describes only those where the services can be integrated by adapting the interfaces of the consumer and provider. This adaptation is done by modifying message in OSB layer.

Types of Customization

The web services you want to integrate to RSB is likely to be different from what the corresponding provided decorators expect. These differences can be broadly classified into two categories:

- Payload is different
- Service and operation names are different

How to Import WSDL into RSB Decorator Project

In order to integrate with third-party application services, first step is to import the WSDL file of third-party application service into the decorator project. Following are the steps:

1. Right-click WSDL >BusinessService.

9 🗅 🗑 🖉 🖉 🕬 🔍 🔾)- & 484	> 4	Q+(Search
pplications			Resources
ServiceBusApplication	· ·		😭 = Q= (Name
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ProvyService CustomerOrderAppServiceLocalPr CustomerOrderAppServiceLocalPr CustomerOrderAppServiceLocalPr CustomerOrderAppServiceProxy.p	oxy.praxy		Mare
CustomerOrderAppServiceProxy.p SC CustomerOrderAppServiceProxy.p WSDL			
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B Isb-decorator Service Bus	•		
Custome Some-Custome Some-C	Col+SNIDF9 Ab+SNIDF9		
Application Resources R Reformat Data Controls Organize Imports Recent Files Refector	Alt+ShiteF Col+Alt-0		
Compare With			
Replace With			
Restore from yoca			
SAP Adapter Migra	tion Taol		
jmport Export			
Current assection is not a valid Service	i Bux resource	Hessage:up Lue issues that Page issues Message:up Lue issues that Page issues Mail (Mail (Mai	
		Messages Extensions ···	∠ IDE Connections

2. Select Service Bus Resources and click OK.

😣 💷 Import	
Select What You Want to Import:	
S EJB JAR (.jar) File	A
🛗 Iava Source	
Maven Project	
DEP Bundle into New Project	
SOA Archive Into SOA Project	
SOA Template	
Service Bus Resources	
Source into New Project	
Subversion Connections	
图 UML from XMI	-
Help OK	Cancel

3. Select Resources from URL and click **Next**.

😣 💷 Import Servic	e Bus Resources - Step 1 (of 3			
URL Import					
URL Import Source Configuration	Select the type of resource to <u>C</u> onfiguration Jar <u>Resources from URL</u> <u>Zipped Resources</u>	import:			
<u>H</u> elp		< <u>B</u> ack	<u>N</u> ext >	<u>F</u> inish	Cancel

4. Select Resource Type as WSDL. Also provide the URL of the WSDL. Alternatively, if you have the WSDL downloaded to your local machine, you can browse to that location and select the WSDL file. Here open the WSDL and verify the WSDL can be successfully accessed.

URL Import	Specify source a	nd select an import destination.
Source	Resource Type:	WSDL
<u>Configuration</u>	Source URL:	http://localhost:7001/MyCustomerOrderService/MyCustomerOrderService?wsdl
	Resource Name:	MyCustomerOrderService
	Import Location:	$ice {\tt BusApplication/oms-CustomerOrder-AppServiceDecorator/WSDL/BusinessService}$

5. Click Next.

nfiguration			
ingurución			
URL Import	Select the resources to import.		
Source			
Configuration	Resource	Opera	URL
	□ - ♥ 🔁 ServiceBusApplication □ - ♥ 🛅 oms-CustomerOrder-AppServiceDecorator □ - ♥ 📄 WSDL □ - ♥ 📄 BusinessService		
	⊣ 🖉 🗑 MyCustomerOrderService.wsdl		http://localhost.7001/MyCustomerOrderService/MyCustomerOrderService?ws

6. Click Finish. The new WSDL file is added to the project.

) BES U 90 O O- A AB;	i > 0			Qui Gearch
picetions 8.	1			Ferources ×
ServiceDustpolication *				🛥 - Qri kama
hojesta 🔄 🖄 - 🌾 😓 -				- My Catalogs
🔄 ons-CastomerOrder-AppServiceDecorator 🗟 🛄 DusinessGendre				Link to trequently-used resources in a private bacorites list
Strandon Service bis E Providente				
Costonici OrderAppServiceDecalProxy provine CostonerOrderVopServiceDecaProxy proxy CostonerOrderAppServiceDecapDecap				
 Container of derepperiveer experime Container Orden) op ServiceProvy provy Work 				
Webb Section of deficence.				
MolustomenOrderService wool Encoderate				
 DustomerÖrderSendre wirdl Rouary 	J.			
E 👔 se-decorator-instrumentation (an				
CastomerOrder AppSerenceDecerator				
lopication Resources Sets Controls				
Recent Des				
rectore ServiceSexApplication.gay References -				
Corrent selection is not a valid Service Bus resource				
	Hessages Log Evensores, No Selection results			
	😋 e 🚣 e 🛁 e 🥥 e I 🙋 e I 🤌 - I		Q	
		No Issues		

7. Select new WSDL, right click and select Service Bus> Generate Business Service to modify the business service.

😣 💷 Create Busin	ess Service - S	itep 1 of 2				
Create Service						
Create Service	General Service N <u>a</u> me: Location: Description	MyCustomerOrderS iceBusApplication/or		rder-AppServiceDe	ecorator/BusinessS	Service Q
	•• Definition ••••	Order-AppServiceD Port: (Port) MyCust	ecorator/WSDL/ tomerOrderPort		MyCustomerOrder5	Service 🛍 🔅
	<u>M</u> essages:					
<u>H</u> elp			< <u>B</u> ack	<u>N</u> ext >	<u>F</u> inish	Cancel

8. Change the location to the Business Service folder and click Next.

😣 💷 Create Busin	ness Service -	Step 2 of 2	
Transport			
🔍 Create Service	Service Type	e: WSDL-based service	
Transport	<u>T</u> ransport	http	•
	Endpoint <u>U</u> RI:	http://localhost:7001/MyCustomerOrderService/MyCustomerOrderService	
		Format: http://host:port/someService	
<u>H</u> elp		< Back Next > Finish Cancel	

9. Click **Finish** to generate business service from new WSDL.

😸 🗆 🗉 Oracle JDeveloper 12c - ServiceBusApplication.jw	s : oms-CustomerOrder-AppServiceDecorator.jpr : /root/jdeveloper/mywork/ServiceBusApplication/oms-Custom	erOrder-AppServiceDecorator/Bus
Eile Edit View Application Refactor Search Navigate Build Bu	n Team Iools Window Help	
	► + ★ +	Q-(Search
Applications ×	🐉 MyCustomerOrderService.bix 🚳	Resources ×
🕞 ServiceBusApplication 🔹 👻	0	😭 • Q= Name
⊴ Projects 💽 🖓 • 🖓 • 🍃 •	General	I My Catalogs
CustomerOrderAppServiceDecorter DutinessService Dutiness DutinessService Dutiness Dutines Dutiness Dutines Dut	General Transport Transport The general configuration details of the sendce Message Handling Performance Policies Transport: Transport: http Service Type:: VSDL LyBL: WSDL LyBL: ome:CustomerOrder AppServiceDecorator/WSDL/BusinessService/MyCustomerOrder Port: MyCustomerOrder/Port	⊴ My Catalogs Unk to frequently-used resources in a private favorites list. Mare
	Configuration (
	Messages - Log Live Issues: MyCustomerOrderService.bix - Issues ×	
	No Issues	
		± IDE Connections
/root/jdeveloper/mywork/ServiceBusApplication/oms-CustomerOrder-AppS	erviceDecorator/BusinessService/MyCustomerOrderService.bix	

10. Select previous business service "CustomerOrderAppService.bix", right click and select **Delete**.

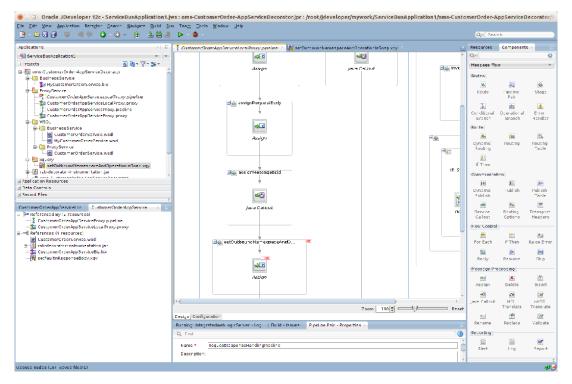
😣 🗆 Ca	onfirm Delete			
Are you sure you want to delete CustomerOrderAppServiceBiz.bix? /root/jdeveloper/mywork/ServiceBusApplication/oms-CustomerOrder-AppServiceDecorator/B usinessService/CustomerOrderAppServiceBiz.bix				
Show <u>I</u> elp	Einding Usages In: E ServiceBusApplication (Current Application)			

11. Click **Yes** to delete the previous business service.

How to Map Namespaces and Operation Names

When the business service is changed to use a new WSDL, then the SOAP request of proxy service will not work as-is with the new business service because the business service WSDL may have different namespaces and names for operations and services. So now the proxy service message flow will need to be modified to transform the incoming message to the expected format of business service. In order to do these transformations XQuery files can be used. A sample for making these changes in proxy service message flow is shown below.

1. The first step is to add a new stage in request pipeline of local proxy service message flow. To add a new stage, drag Stage component from Components window below assignMessageEcid stage. Enter the name of the stage as "setOutboundNamespaceAndOperation".



2. To create a new xquery file, you need to create a folder "xquery" where all the xquery files will be saved. To create the folder, right click the project name and select New > From Gallery > Folder. For Enter or select the parent folder, verify the AppServiceDecorator folder is selected (for example,

omsc-CustomerOrder-AppServiceDecorator). Enter xquery as the folder name.

🛞 💿 New Gallery		
<u>C</u> ategories:	Items:	Show All Descriptions
General Ant Applications Connections Deployment Descriptors Deployment Profiles Java Maven Projects	 Java Desktop Application Java Project File Folder Opens the Create Folder dialog empty directory. To enable this project or a folder within a pro Navigator. 	s option, you must select a
	Java Class	
<u>H</u> elp		OK Cancel

3. Right click the xquery folder and select New > Xquery File ver 1.0. Enter the name "setOutboundNamespaceAndOperationInBody".

8 🗆 Cr	😕 💷 Create XQuery Map Main module				
Enter details to create an XQuery Map main module. Specify source and target elements by selecting global elements defined in either an XSD or WSDL file.					
<u>F</u> ile Name:					
setOutbou	indNamespaceAndOperationInBody.xqy				
<u>D</u> irectory N	Name:				
eveloper/m	nywork/ServiceBusApplication/oms-CustomerOrder-AppServiceDe	corator/xquery 隆			
Function M	te Function Name:				
func					
NS URI:	URI: http://www.w3.org/2005/xquery-local-functions				
Prefix:	local				
Sources					
Parame	eter Sequence Type Definition				
Target					
	erate XQuery <u>v</u> ersion line schema type annotations				
<u>H</u> elp	ОК	Cancel			

4. Select Generate Function check box, and provide Function Name "setOutboundNamespaceAndOperationInSoap". Proivide NS URI (for example, http://tempuri.org/oms-CustomerOrder-AppServiceDecorator/xquery/setOutb oundNamespaceAndOperationInSoap/) and Prefix as xf. Click add in the Sources section.

Name		 	Set a	Namespace
NS URI:			 	
Prefix:				
Sequence	Туре	 		
		 	 	/

5. Enter Name as "soapBody" and click edit in Sequence Type section.

😣 🗆 Fun	ction parameter typ	be			
XML Schen	na Untyped				
Schema O	bject Reference:				
			6		
Possible S	Sequence Type Form:				
			•		
Schema L	ocation:		Prefix:		
Not Applica	ble		a Namespace		
NS URI:					
Prefix:					
Occurrence:	Exactly One		*		
Result XQue	ry Expression:				
Warnings &	Warnings & Notes:				
Press Browse button to select a Schema object first.					
Help		ок	Cancel		
P					

6. Select Untyped tab, select Element and click OK.

😣 💷 Function	😣 💷 Function parameter type			
XML Schema Untyped				
Element Item Node Text Comment Empty Sequence Document Node Processing Instruction				
Element Name –		Set	a Namespace	
Occurrence: Exa	actly One		•	
Result XQuery Exp	pression:			
element() Warnings & Notes	8:			
<u>H</u> elp		ОК	Cancel	

7. In the **Function parameter type** window, click **OK**.

😣 🗆 Cre	ate XQuery M	lap Main module					
	Enter details to create an XQuery Map main module. Specify source and target elements by selecting global elements defined in either an XSD or WSDL file.						
<u>F</u> ile Name:							
untitled1.xq	У						
<u>D</u> irectory Na	ame:						
veloper/my	work/ServiceBus/	pplication1/oms-CustomerOr	der-AppServiceDecorator/xq	uery 😤			
✓ Generate	Function						
Function N	ame:						
setOutbo	oundNamespace/	ndOperationInSoap					
NS URI:	er-AppServiceD	ecorator/xquery/setOutbound!	NamespaceAndOperationInS	oap/			
Prefix:	хf						
Sources							
Paramet	ter	Sequence Type Definition	4				
\$soapBo	ody	element()					
			>	<			
Townsh							
Target							
Options —							
Gener Gener	rate XQuery <u>v</u> ersi	on line					
Vse s	chema type anno	tations					
<u>H</u> elp			ок	ancel			

8. In the Create Xquery Map Main module window, edit the target by clicking edit.

🖲 🗆 Fun	ction result t	уре		
XML Schen	na Untyped			
Schema C)bject Reference:			Pa
Possible 5	Sequence Type F	orm:		
Schema L	ocation:			Prefix:
Not Applica	ble			Set a Namespace
NS URI:				•
Prefix:				
Occurrence:	Exactly One			•
Result XQue	ry Expression:			
Warnings &	Notes:			
Press Brow	se button to sele	ect a Schem	na object first.	
<u>H</u> elp			ОК	Cancel

9. In the Untyped tab, select the Element option and click **OK**.

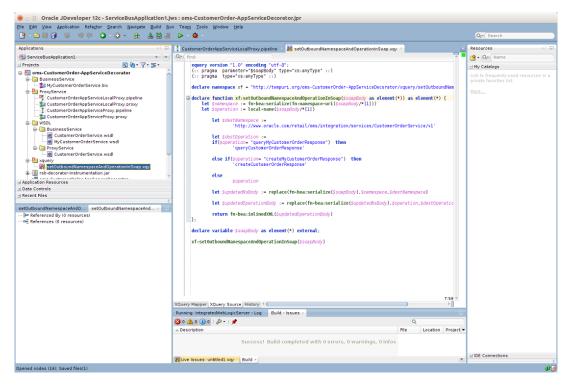
😣 💷 Function resu	ılt type						
XML Schema Untype	ed						
Element Item Node Text Comment Empty Sequence Document Node Processing Instruction							
Element Name							
Occurrence: Exactly One Result XQuery Expression: element()							
Warnings & Notes:							
<u>H</u> elp		ОК	Cancel				

10. Click **OK** on the **Create XQuery Map module** window.

😸 🗆 Cre	ate XQuery M	ap Main module					
	Enter details to create an XQuery Map main module. Specify source and target elements by selecting global elements defined in either an XSD or WSDL file.						
<u>F</u> ile Name:							
untitled1.xqy							
Directory Na	ame:						
veloper/my	work/ServiceBusA	pplication1/oms-CustomerOrder	-AppServiceDecorator/>	query 😤			
Generate Function N setOutbo NS URI: Prefix:	ame: oundNamespaceA	ndOperationInSoap corator/xquery/setOutboundNar	nespaceAndOperationIr	nSoap/▼			
Sources							
Paramet \$soapBo		Sequence Type Definition element()					
Target							
element()							
	rate XQuery <u>v</u> ersi chema type anno						
<u>H</u> elp			ок	Cancel			

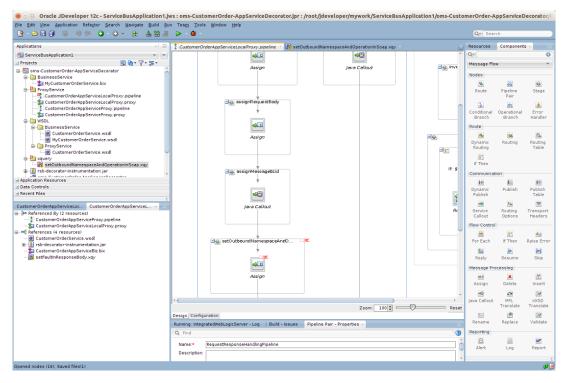
11. Click **OK**. In the source view of the file, enter the code as shown in the screenshot below. In this code, the variable \$namespace contains the namespace of the incoming request xml and \$operation contains the operation name in the incoming request. Further, we check for each incoming operation name and assign the corresponding outbound operation name in \$destOperation variable.

For example, when the incoming operation name is queryCustomerOrder, the outbound operation name needs to be queryMyCustomerOrder. The namespace is at service level, so we find the service namespace from the new business service WSDL and assign it to \$destNamespace variable. The sample xquery shown in the screenshot is listed in Appendix A. You can copy the code and make changes appropriate to your requirements.



12. Return to the stage in message flow and add an Assign action. Steps to add Assign action are:

Drag assign component from Message Processing section of Components window into "setOutboundNamespaceAndOperation" stage



13. In the Expression field of Assign action, click the **<Expression>** link and go to XQuery Expression Builder window:

🛞 💷 XQuery Expression Builder	
Build an expression by typing directly into the Expression field and/or insert fragments from the fragment editors below Expression field.	the
Expression: 🕨 🕼	D (3)
▲ Insert Into Expression	
	1 %
Content Preview:	
Description:	
No Description Available	
<u>Н</u> еlp ОК Са	ancel

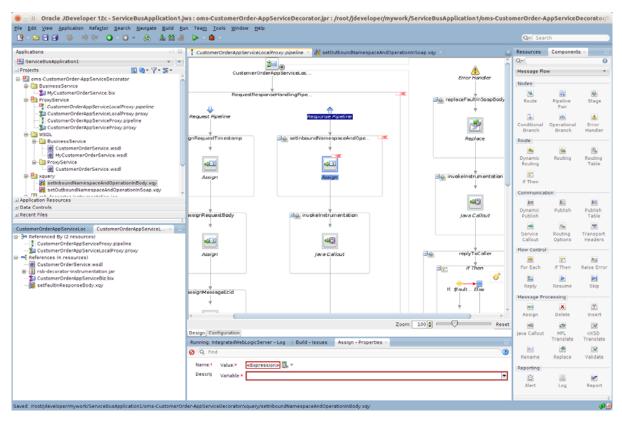
14. Enter \$body in the Expression field and click **OK**.

🛞 🗊 XQuery Expression Builder	
Build an expression by typing directly into the Expression field and/or insert fragments from the fra Expression field.	gment editors below the
Expression:	🕨 🕲 🔁
\$body	
▲ Insert Into Expression	
	+ / ×
B w w attachments B w w body C w body B w w header B w head	
Variables Functions Namespaces	
Content Preview:	
Description:	
No Description Available	
Help	OK Cancel

😸 🕘 💿 Oracle JDeveloper 12c - ServiceBusApplication1.ju								
jele gdit View Application Refagtor Search Navigate guild gu ♀						Qv(Sear	ch	
Applications ×	Custor	nerOrderAppServiceLocalProxy.pipeline 🚿 😹 setOutboundNamespaceAnd	OperationInSoap.xgy			Resources	Component	s × 🗖
ServiceBusApplication1					-	Q-		0
Projects Q & Y - S -					lav	Message Flor		-
🖃 😓 oms-CustomerOrder-AppServiceDecorator					Jav			
BusinessService		Ý				Nodes		
MyCustomerOrderService.bix B-B ProxyService		43					-	
CustomerOrderAppServiceLocalProxy.pipeline						Route	Pipeline	Stage
CustomerOrderAppServiceLocalProxy.proxy		Assign		-	rep	2	(ch)	٨
CustomerOrderAppServiceProxy.pipeline					⊡ ?=i	Conditional	Operational	Error
CustomerOrderAppServiceProxy.proxy SOL					- <u>-</u> -	Branch	Branch	Handler
BusinessService					↔ -	Route		
CustomerOrderService.wsdl					If: \$fault		<u>6</u>	<u>a</u>
MyCustomerOrderService.wsdl						Dynamic	Routing	Routing
CustomerOrderService.wsdl					*	Routing		Table
B-B xquery		40			2	21		
setOutboundNamespaceAndOperationInSoap.xqy		Java Callout				If Then		
rsb-decorator-instrumentation.jar		Java Calcue			Reply	Communicat	on	
Application Resources						300	E.	b TE
Data Controls A Recent Files						Dynamic Publish	Publish	Publish Table
A		+					-	
CustomerOrderAppServiceLoc CustomerOrderAppServiceL ×		Set0 utboundNamespaceAnd0				Service	Routing	Transport
Referenced By (2 resources)		*				Callout	Options	Headers
CustomerOrderAppServiceProxy.pipeline CustomerOrderAppServiceLocalProxy.proxy						Flow Control		
E-= References (4 resources)					ų	-		<u>Au</u>
CustomerOrderService.wsdl		Assign				For Each	if Then	Raise Error
() rsb-decorator-instrumentation.jar () rsb-decorator-instrumentation.jar () rsb-decorator-instrumentation.jar						2		b.t
setFaultinResponseBody.xgy						Reply	Resume	Skip
						Message Pro		
								*
					Ψ.	Assign	Delete	Insert
	L.C.		Zoom: 100		Reset			
	Decise C	onfiguration	200m. 100 .	~	Reset	Iava Callout	MEL.	nXSD
		IntegratedWebLogicServer - Log Build - Issues Assign - Properties ×				Java Callout	Translate	Translate
	Q Q F					-	1	
	-	nd				Rename	Replace	Validate
	Assign General	Value:* \$body 📆 👻				Reporting		
	Jeneral	Variable:* body			*	0		2
						Alert	Log	Report
Opened nodes (16): Saved files(1)								÷ •

15. In the Variable field of Assign action, enter the value as body.

16. Perform similar transformation of namespaces and operation names in the response pipeline but in the reverse order. This is because the response returned from business service must be converted to the response message format which conforms to the proxy service WSDL. To do this, add a new stage in response pipeline. Drag assign component to the response pipeline.



- 17. Enter the stage name as setInboundNamespaceAndOperation.
- **18.** Now we need to create an xquery file to do the mapping. Right click the xquery folder and select **New > XQuery File version1.0**.

🖲 🗆 Cre	😕 💷 Create XQuery Map Main module							
	Enter details to create an XQuery Map main module. Specify source and target elements by selecting global elements defined in either an XSD or WSDL file.							
<u>F</u> ile Name:								
setInboundN	lamespaceAndOperationInBody.xqy							
Directory Na	me:							
veloper/myw	ork/ServiceBusApplication1/oms-CustomerOrder-	AppServiceDecorat	or/xquery 😤					
🕑 Generate								
Function Na								
seunbour	ndNamespaceAndOperationInBody							
NS URI:	rder-AppServiceDecorator/xquery/setInboundNam	espaceAndOperatio	onInBody/					
Prefix:	xf							
Sources								
Paramete	er Sequence Type Definition							
Target								
	ate XQuery <u>v</u> ersion line :hema type annotations							
<u>H</u> elp		ОК	Cancel					

19. Enter file name as **setInboundNamespaceAndOperationInBody**. Select Generate Function checkbox. Enter NS URI (for example,

http://tempuri.org/oms-CustomerOrder-AppServiceDecorator/xquery/setInbou ndNamespaceAndOperationInBody/) and prefix (for example, xf). Click add in Sources section.

🖲 🗆 Fur	nction parame	ter		
Name			Set a	Namespace
NS URI:				-
Prefix:				
Sequence	Туре			/
<u>H</u> elp			ок	Cancel

20. Enter "soapBody" in the Name field. Click edit in Sequence Type section:

😕 💷 🛛 Fun	ction paramete	er type		
XML Schen	na Untyped			
Schema C	Object Reference:			
				6
Possible 9	Sequence Type For	m:		
				•
Schema L	ocation:			Prefix:
Not Applica	ible		Set	a Namespace
NS URI:				
Prefix:				
Occurrence:	Exactly One			•
Result XOue	ry Expression:			
Warnings &	Notes:			
Press Brow	se button to selec	t a Schema ob	ject first.	
Help			ок	Cancel

21. Navigate to the Untyped tab, select Element and click **OK**.

😕 🗆 Cre	eate XQuery M	lap Main module		
		uery Map main module. Specify elements defined in either an X		X
<u>F</u> ile Name:				
setinbound	NamespaceAndO	perationInBody.xqy		
Directory N	ame:			
veloper/my	work/ServiceBusA	pplication1/oms-CustomerOrder	r-AppServiceDecorato	or/xquery 😤
🗸 Generat	e Function			
Function N				
setInbou	undNamespaceAn	dOperationInBody		
NS URI:	rder-AppService	Decorator/xquery/setInboundNar	mespaceAndOperatio	onInBody/ 💌
Prefix:	xf			
Sources				
Parame	ter	Sequence Type Definition		
				-
Target				
				1
Options -				
🗸 Gene	rate XQuery <u>v</u> ersi	on line		
✓ Use s	schema type anno	tations		
Help			ок	Cancel

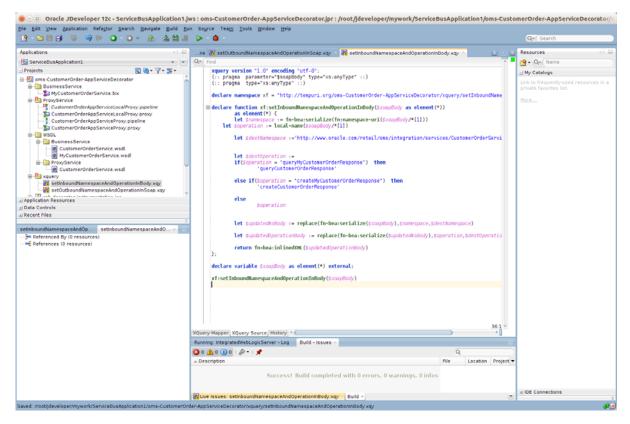
22. Click edit in the Target section.

😣 💷 Function result type		
XML Schema Untyped		
Schema Object Reference:		
		6
Possible Sequence Type Form:		
		-
Schema Location:		Prefix:
Not Applicable		
	Se	t a Namespace
NS URI:		
Prefix:		
Occurrence: Exactly One		*
Result XQuery Expression:		
Warnings & Notes:		
Press Browse button to select a Sch	ema object first.	
<u>H</u> elp	ОК	Cancel

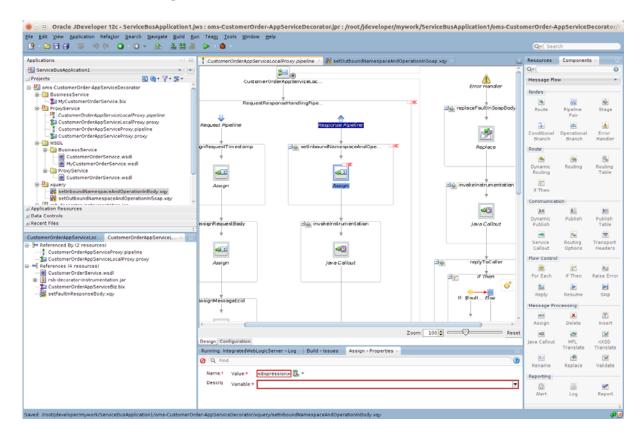
23. Navigate to the Untyped tab, select Element, and click **OK**.

😣 💷 Function	result type		
XML Schema	ntyped		
Element Attribute Processing In	 ○ Item ○ Node (○ Comment ○ Er ○ Document Node struction 	mpty Sequence	
Element Name		Set	a Namespace
Occurrence: Exac Result XQuery Expr	tly One ession:		
Warnings & Notes:			
<u>H</u> elp		ОК	Cancel

24. Navigate to the Source tab of the xquery file. Enter the code as shown below. In this code, the variable \$namespace contains the namespace of the response xml and \$operation contains the operation name in the response. Further, we check for each operation name and assign the corresponding proxy service operation name in \$destOperation variable. For example, when response operation name is queryMyCustomerOrderResponse then the new operation name needs to be queryCustomerOrderResponse. The namespace is at service level, so we find the service namespace from the proxy service WSDL and assign it to \$destNamespace variable. The sample xquery shown in the screenshot is listed in Appendix A. You can copy the code and make changes appropriate to your needs.



25. In the message flow, in the setInboundNamespaceAndOperation stage add an Assign action by dragging Assign component from Message Processing section of Components window.

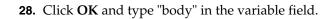


26. In the Properties window of Assign action, click the **Expression** link to open the Expression builder.

⊗ 💷 XQuery Expression Builder	
Build an expression by typing directly into the Expression field and/or insert fragments from the fragment editors below Expression field.	the
Expression: Description:	2
insert Into Expression	
	2 22
T ∂ T − (x) stachments	
tar w autochnencs ⊕−w body	
⊞ (x) header	
ter tot inbound	
ter or the second seco	
Variables Functions Namespaces	
Content Preview:	
Description:	
No Description Available	
Help OK Ca	ncel

27. Enter \$body in Expression field and click **OK**.

XQuery Expression Builder	
uild an expression by typing directly into the Expression field and/or insert xpression field.	fragments from the fragment editors below the
xpression:	De 🔊 😒 [
\$body	
🔥 Insert Into Expression	
	4 / 8
a toric body a toric header a toric inbound a toric operation a toric outbound	
Variables Functions Namespaces	
ontent <u>P</u> review:	
escription:	
No Description Available	
No Bascipton Available	
<u>H</u> elp	OK Cancel



😫 🙈 👻 🔍 🔍 🔍 🖉 🕹	🚢 🕨 🖕 🎍 🗧			Qr(Sear	ch	
Applications ×	CustomerOrderAppServiceLocalProxy.pipelin	e 🐣 😹 setOutboundNamespaceAndOperationInSo	sap.xqy ×	Resources	Component	ls ×
ServiceBusApplication1				Q+(
i Projects 🛛 🔕 💘 🖓 🛪 🖫 🔹	CustomerOrderAppServicel	06	<u> </u>	Message Flow	N	
🛛 😓 oms-CustomerOrder-AppServiceDecorator	â		Error Handler	Nodes		
DusinessService DusinessService.bix ParoyService ProvyService CustomerOrderAppServiceLocalProxy pipeline ScustomerOrderAppServiceLocalProxy proxy	RequestResponseHandlingF	npe	⊒⊜ replaceFaultinScapBody ↓	Route	Pipeline Pair	Stage
CustomerOrderAppServiceProxy.pipeline CustomerOrderAppServiceProxy.proxy B-D WSDL			<u></u>		Operational Branch	Error Handle
BusinessService	gnRequestTimestamp	hboundNamespaceAndOpe	Replace	Route		<u>a</u>
MyCustomerOrderService.wsdl MyCustomerOrderService.wsdl More CustomerOrderService.wsdl More Service.wsdl SestimboundNamespaceAndOperationInBody.xtp;	Assign	Assign:	a invokelnstrumentation	Dynamic Routing E If Then	Routing	Routing Table
SetOutboundNamespaceAndOperationInSoap.xgy	-		÷	Communicati	ion	
Application Resources				34	E	31
Data Controls Recent Files	ssignRequestBody	invokeInstrumentation	java Callout	Dynamic Publish	Publish	Publish Table
ustomerOrderAppServiceLoc CustomerOrderAppServiceL				Service Callout	Routing Options	Transpo Header
References (4 resources) CustomerOrderService.wsdl Berlin rsb-decorator-instrumentation.jar	Assign	java Callout	replyToCaller	E For Each	F. If Then	Aaise Er
CustomerOrderAppServiceBiz bix setFaultinResponseBody.xqy	verignM essageEcid		if: plault Else	E Reply	Resume	▶ Skip
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	Design Configuration			Java Callout	MFL Translate	nXSD Transla
	Running: IntegratedWebLogicServer - Log B	uild - Issues Assign - Properties ×				
	🖉 🔍 Find		3	Rename	Replace	Validat
	Assign Value:* \$body			Reporting		
	General Variable:			C	(12)	-
				Alert	Log	Repor

The above completes the steps for namespace and operation mapping.

How to do Payload Transformation

The proxy service request message payload types may be different from the payload types that are required by the new business service WSDL. Therefore we need to transform the incoming request payload to the format expected by the business service. For payload transformation, follow the steps as shown below:

 In our example, the proxy service payload is of type CustOrderDesc and the business service payload is of type MyCustOrderDesc. So first we need to create xquery files which transform the payload from CustOrderDesc to MyCustOrderDesc type. Right-click the xquery folder and select New > XQuery XQuery File Ver 1.0.

😣 💷 Create XQuery	Map Main module	
	XQuery Map main module. Specify source and target sal elements defined in either an XSD or WSDL file.	
<u>F</u> ile Name:		
CustOrderDescToMyCustO	OrderDescMapping.xqy	
Directory Name:		
veloper/mywork/ServiceBu	usApplication1/oms-CustomerOrder-AppServiceDecora	tor/xquery 😤
Generate Function Function Name: CustOrderDescToMyCu NS URI: rder-AppServ Prefix: xf1	istOrderDescMapping iceDecorator/xquery/setInboundNamespaceAndOperati	ionInBody/ 💌
Sources		
Parameter	Sequence Type Definition	
Target		
Options ✓ Generate XQuery <u>v</u> e ✓ Use schema type ar		
<u>H</u> elp	ОК	Cancel

- **2.** Enter file name as CustOrderDescToMyCustOrderDescMapping. Select Generate Function. Enter the NS URI and Prefix.
- **3.** In the Sources section, click add.

🛞 🗆 Function parameter	r
Name	Set a Namespace
NS URI:	
Prefix:	
Sequence Type	
<u>H</u> elp	OK Cancel

4. Enter "payload" in the Name field. Click edit in the Sequence Type section.

😣 💷 Fun	ction parameter	type		
XML Scher	na Untyped			
Schema (Object Reference:			
Possible S	Sequence Type Form:			
				-
Schema L	ocation:			Prefix:
Not Applica	ble			a Namespace
NS URI:				
Prefix:				
Occurrence:	Exactly One			
Result XQue	ry Expression:			
Warnings &	Notes:			
Press Brow	se button to select a	Schema obje	ect first.	
Help			ок	Cancel
Helb			UK	Cancer

5. Click browse to view schema object.

😕 💷 Type Chooser		
		2 🖻
🔍 Type Explorer		
🗈 🛅 XML Schema Simple Types		
Application Schema Files		
Application WSDL Files immediate of the second se		
B- B WSDL)1	
BusinessService		
ProxyService		
💼 🖉 CustomerOrderService.wsdl		
-		
Type:		
Type:		
		Cancel

6. Select CustOrderDesc element from ProxyService WSDL which is CustomerOrderService.wsdl and click **OK**.

	<pre>schema - http://www.oracle.com/retail/integration/base/bo/CustOrderkth.colvo/v1 schema - http://www.oracle.com/retail/integration/base/bo/DiscntLineDesc/v1 schema - http://www.oracle.com/retail/integration/base/bo/CustOrdItmRtColVo/v1 schema - http://www.oracle.com/retail/integration/base/bo/DiscntLineDesc/v1 schema - http://www.oracle.com/retail/integration/base/bo/CustOrdItmRtColVo/v1 schema - http://www.oracle.com/retail/integration/base/bo/CustOrdItmRtColVo/v1 schema - http://www.oracle.com/retail/integration/base/bo/CustOrdItmRtColVo/v1 schema - http://www.oracle.com/retail/integration/base/bo/CustOrdEnesc/v1 schema - http</pre>	
	🗉 🛃 schema - http://www.oracle.com/retail/integration/base/bo/CustOrdFulColDesc/v1	
(i schema - http://www.oracle.com/retail/integration/base/bo/ContactDesc/v1	
	Imported WSDL	
: {http://www.ora	acle.com/retail/integration/base/bo/CustOrderDesc/v1}CustOrderDesc	

- 7. On the Type Chooser window, click **OK**.
- 8. On the Function parameter type window, click **OK**.

😣 💷 Function parameter type		
XML Schema Untyped		
Schema Object Reference:		
CustOrderDesc		
Possible Sequence Type Form:		
Schema Element		•
Schema Location:		Prefix:
WSDL/ProxyService/CustomerOrderS	ervice.wsdl	nsl
Not Applicable		
	Se	t a Namespace
NS URI:		
Prefix:		
Occurrence: Exactly One		•
Result XQuery Expression:		
schema-element(ns1:CustOrder	Desc)	
Warnings & Notes:		
<u>H</u> elp	ОК	Cancel

9. Click edit in the Target section, in the Function Parameter Window.

😣 💷 Function param	ter	
Name payload	🗌 Set a Namespa	ce
NS URI:		
Prefix:		
Sequence Type schema-element(ns	:CustOrderDesc)	
<u>H</u> elp	OK Cance	1

10. Select MyCustOrderDesc element and click **OK**.

8 🗆 Type Chooser	
	28 🖻
Type Explorer Application Schema Files Application WSDL Files CustomerOrder-AppServiceDecorator WSDL BusinessService CustomerOrderService.wsdl CustomerOrderService.com/retail/integration/base/bo/CustOrdFulDesc/v1 CustomerOrderService.com/retail/integration/base/bo/CustOrdFulDesc/v1 CustomerOrderService.com/retail/integration/base/bo/DiscntLinePKVo/v1 CustomerOrderService.com/retail/integration/base/bo/CustOrdFulDesc/v1 CustomerOrderService.com/retail/integration/base/bo/CustOrdFulDesc/v1 CustomerOrderService.com/retail/integration/base/bo/CustOrdFulDesc/v1 CustomerOrderService.com/retail/integration/base/bo/CustOrdFulDesc/v1 CustomerOrderService.com/retail/integration/base/bo/CustOrdItmPkVo/v1 CustomerOrderService.com/retail/integration/base/bo/C	
) +
ype: Show Detailed Node Information	
-	
Help	Cancel

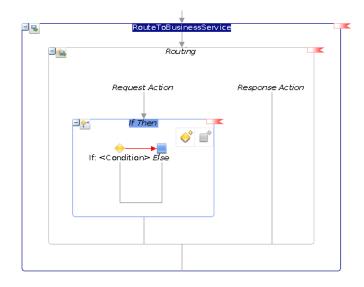
11. On the Function result type window, click **OK**.

😕 💷 Function result type		
XML Schema Untyped		
Schema Object Reference:		
MyCustOrderDesc		Pg
Possible Sequence Type Form:		
Schema Element		
Schema Location:		Prefix:
BusinessService/MyCustomerOrderS	ervice.wsdl	ns2
Not Applicable		
	Set	a Namespace
NS URI:		-
Prefix:		
Occurrence: Exactly One		•
Result XQuery Expression:		
schema-element(ns2:MyCustOrd	erDesc)	
Warnings & Notes:		
<u>H</u> elp	ок	Cancel

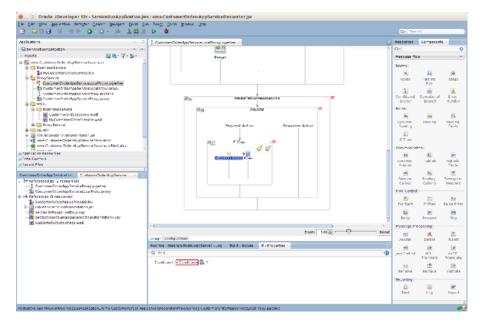
12. On the Create XQuery Map Main module window, click **OK**.

😣 💷 Creat	e XQuery M	ap Main module		
		uery Map main module. Specify s elements defined in either an XS		7
<u>F</u> ile Name:				
CustOrderDesc	:ToMyCustOrd	erDescMapping.xqy		
Directory Name	c.			
veloper/myworl	k/ServiceBusA	pplication1/oms-CustomerOrder	AppServiceDecorato	r/xquery 😤
Generate Fu				
Function Nam		and an Discontinue to a		
CustorderD	esciomycust)rderDescMapping		
NS URI: rd	er-AppService	Decorator/xquery/setInboundNam	espaceAndOperatio	nInBody/ 🔻
Prefix: xf1				
Sources				
Parameter		Sequence Type Definition		+
\$payload		schema-element(ns1:CustOrder	Desc)	
				×
]
Target				
_	lement(ns2	:MyCustOrderDesc)		
Options				
🖌 Generate	XQuery <u>v</u> ersi	on line		
🗸 Use sche	ma type anno	tations		
11-1-			011	0 mm l
<u>H</u> elp			ок	Cancel

- 13. Click OK.
- **14.** For the fields which are not auto-mapped, we need to map them manually. Drag and connect those fields one by one. You may have to write xquery functions for complex mapping. For more information, see the XQuery documentation.
- **15.** Once the mapping in xquery file is complete, navigate to the Routing node and in the Request pipeline, drag the "If Then" component, from Components window, to the request pipeline.



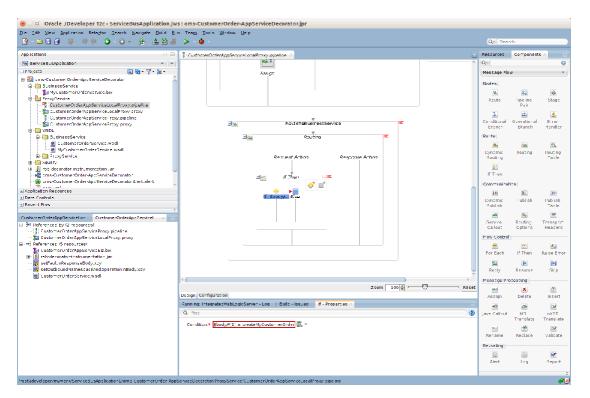
16. Navigate to the Properties window for the first "If" condition, in the If-Properties window.



17. Click the <Condition> link and navigate to the Condition Expression Builder window. Here we need to build the condition for payload mapping. We will check for operation name to build the condition. Enter local-name(\$body/*[1]) in the Operand field, which gives the operation name in request xml. Select = in the Operator field. In the value field, we need to enter operation name which we want to look for, enter 'createMyCustomerOrder'.

😣 💷 Condition Express	ion Builder			
Comparison Expression) Unary Expressi			
Operand	Operator	Value		Conjunction:
\$body /* [1]	₽.	<u>c</u> reateMyCustomer(Order 📴	And
				🔘 Or
	= •			Add Update
Condition Expression \$body/*[1] = createMyCustom	erOrder			 ➢ Up ➢ Down ➢ Remove
			/i.	
<u>H</u> elp			ок	Cancel

18. Click **OK** to add condition to the Condition Expression.



19. Add a Replace action for the first condition by dragging Replace component from components window.

🕘 💷 Oracle JDeveloper 12c - ServiceBusApplication.jw:	: oms-CustomerOrder-AppServiceDecorator.jpr : /root/jdeveloper/mywork/ServiceBusApplication/oms-Custo	merOrder-App	ServiceDer	corator/Pro
Die Edit View Application Relegtor Branch Kevigate Build Ru	Team Tools Window Lleip			
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Applications X	3 GustomerOrderAppServiceLocalPorty applice	Resources	Componente	•
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	incr	Message Flo	"	
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	Replace		Tranclate	Translate
	Location:*		2	2
	<xpatr> 🗟.</xpatr>	Rename	Replace	Validate
	Value:* kpression> D. *	Re. orling		
	Replace Uption: () Replace entire node	2		2
	() Replace mode contents	Alert	Log	Report
/restijdeveloper/mywork/ServiceBusApplicationL/oms_EustomerUnder App8	onviceDecarator/I/roxyServ.ce/OustomanOrderAppServ.ceLecall/roxy.appline			. 🖉

20. Click the XPath link under Location field of Replace Action. Here we need to provide xpath of the variable which we need to transform.

XQuery Expression Builder		
uild an expression by typing directly into the E xpression field.	expression field and/or insert fragments from	the fragment editors below the
xpression:		🕨 ଜ ହ
	📣 Insert Into Expression	
	20000000 🔻 🔺 20000000	
		+ / 2
🕀 👀 attachments		
ian (x) § body		
🗄 🗰 🗱 header		
🖶 🗰 🗰 👘 👘		
in (x) operation		
i≟(x)≹ outbound		
Variables Functions Namespaces		
	56556655 🔽 🔺 55565666	
Content <u>P</u> review:		
escription:		
	No Description Available	
Help		OK Cancel

21. Select CustOrderDesc and click **Insert into Expression** to add expression to Expression filed.

🛞 💷 XQuery Expression Builder
Build an expression by typing directly into the Expression field and/or insert fragments from the fragment editors below the Expression field.
Expression: 🕨 🔊 🕲 🗋
<pre>\$body/vl:createCustomerOrder/vll:CustOrderDesc</pre>
🔥 Insert Into Expression
+ / X
🕀 🏶 cancelNewCustomerOrderId
i in − ∰ createCustomerOrder · · · · · · · · · · · · · · · · · · ·
ian w soody - request
E CustorderDesc
Variables Functions Namespaces
Content Preview:
<pre>\$body/v1:createCustomerOrder/v11:CustOrderDesc</pre>
Description:
\$body/vl:createCustomerOrder/vl1:CustOrderDesc
sought concessioner of activity cases and activity cases
Help OK Cancel

22. Click **OK** to return to the main window. Then click browse under the Xquery Resources field. Here we need to provide xquery which will return the transformed payload.

😣 🗆 XQuery	Transformation Expression Builder	
Select an XQuery	resource for transformation and specify possible variable bindings.	
XQue <u>r</u> y Resource	2	
XQuery <u>V</u> ariables	8	
Name	Binding	
<u>H</u> elp	ОК	Cancel

- **23.** Click browse and select the xquery file.
- **24.** In the Binding field, we need to provide path of the input payload which needs to be transformed. Click Xquery Expression Builder link and select CustOrderDesc.

😣 🗆 XQuery	Transformation Expression Builder		
Select an XQuery	resource for transformation and specify possible	variable bindings.	
XQue <u>r</u> y Resource			
oms-CustomerOr	der-AppServiceDecorator/xquery/CustOrderDescT	MyCustOrderDes	cMapping 🔍
XQuery <u>V</u> ariables:			
Name	Binding		
payload			₽ x
Messages:			
⊗XQuery Variab	es:Variable bindings are not complete		
<u>H</u> elp		ОК	Cancel

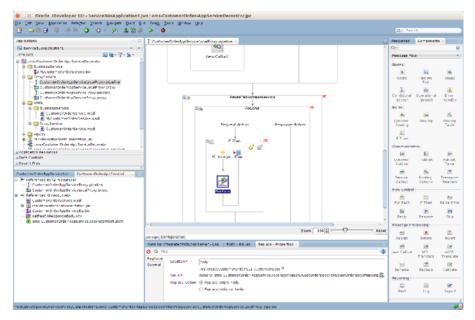
25. On the XQuery Expression Builder window, click **OK**.

😕 💷 XQuery Expression Builder	
Build an expression by typing directly into the Expression field and/or insert frag Expression field.	nents from the fragment editors below the
xpression:	D 🕲 🤇
<pre>\$body/vl:createCustomerOrder/vll:CustOrderDesc</pre>	
\land Insert Into Expression	
	B 20 A
	+ / 3
 → ☆ body → ☆ cancelNewCustomerOrderId → ☆ createCustomerOrder → ☆ \$body - request → ☆ createCustomerOrder → ☆ body - response → ☆ \$body - response 	
Variables Functions Namespaces	
\$body/v1:createCustomerOrder/v11:CustOrderDesc	
2escription:	
\$body/v1:createCustomerOrder/v11:CustOrderDesc	
<u>H</u> elp	OK Cancel

26. On the XQuery Transformation Expression Builder window, click **OK**.

😣 🗆 XQuery	Transformation Expression Builder	
Select an XQuery	resource for transformation and specify possible variable bindings.	
XQue <u>r</u> y Resource		
oms-CustomerO	rder-AppServiceDecorator/xquery/CustOrderDescToMyCustOrderDescMapping	•
Name	Binding	٦
payload	<pre>\$body/vl:createCustomerOrder/vll:CustOrderDesc</pre>	51
<u>H</u> elp	OK Cancel	5

You can add more Replace actions if conditions to transform payload for each operation type are added. You will need to write xquery files for each input payload to output payload transformation.

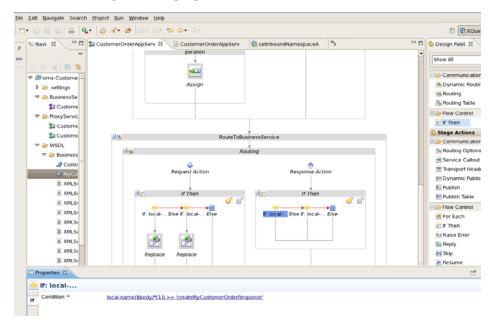


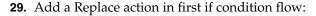
27. Similar transformations need to be performed, in reverse order, in the Response pipeline as well. This will transform MyCustOrderDesc to CustOrderDesc. To do this, write an xquery file which transforms MyCustOrderDesc to CustOrderDesc.

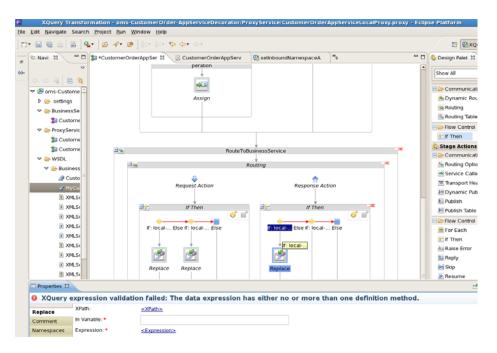
Note: The steps for creating xquery file will be exactly similar to the steps for creating CustOrderDescToMyCustOrderDescMapping file. The only difference will be that the source and target types will be reversed in this case. Here, the source type will be MyCustOrderDesc.

			- FQ	• 💿 •
	XQuery Con	dition Editor		
uery Condition Editor				
s page allows you to configure an XQuery condition usir	g XQuery text or using a condition	builder.		
ression Condition Builder				Vari
Comparison Expression O Unary Expression				Þ
				~
Operand	Operator	Value	Conjunction:	1
local-name(\$body/*[1])		'createMyCustomerOrderResponse'	And	
			⊖ Or	
=	>= \$	=	FĴAdd	
			🖗 Update	
			, 	
ndition Expression:				
ocal-name(\$body/*[1]) >= 'createMyCustomerOrderRes	nonse'		∲ Move Up	
carnane(pody) [1]) = createry castonicionacines	ponde		A Move Down	
			3% Remove	a
				6
			8	
	Cancel	Test OK		
			E Kesu	ume
Properties 🕱				

28. Click OK to go back to properties window.



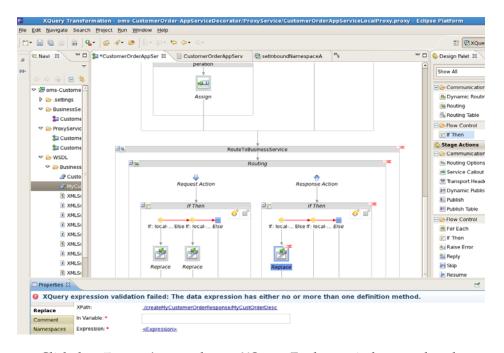




30. Click the **<xpath>** link. Here we need to enter the xpath of the element which needs to be transformed. Enter as shown below:

🗟 🗟 🗁 📓 💁 🖉 🛷	• 😕] 위 = 위 = 💠 수 • 수 •		🗈 🐯 XQu
🗄 Navi 😫 🦳 🗖 😫 •Cu	XPath Expression Editor		🕽 🚯 Design Palet 🕄
r ֎ E \$ Th	ath Expression Editor is page allows you to configure an XPath expression. pression , / createMyCustomer0rderResponse/MyCustOrderDesc	Variable Struct [№] 2 ▷ ③ attachments ▷ ④ body ▷ ④ header ▷ ④ inbound ▷ ④ operation ▷ ④ outbound	Show All Communicat Organic Reu Routing Routing Routing Routing Routing Routing Routing Routing Stage Actions Communicat Routing
XIMLS(XIMLS(XIMLS(Properties 33	(? Cancel Test OK dation failed: The data expression has either no or more than one	Add Remove	 For Each For Each Then Raise Error Reply Stop Resume

31. Click OK.



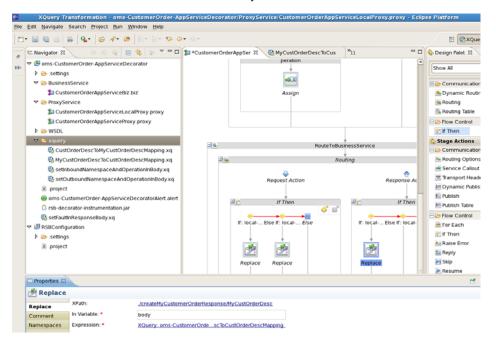
32. Click the **<Expression>** and go to XQuery Explorer window to select the xquery file. Select **MyCustOrderDescToCustOrderDescMapping** xquery file.

F	XQuery Tra	nsformation	- oms-	ustomerOrder-AppServiceDecorator/ProxyService/CustomerOrderApp	ServiceLocalProxy.proxy -	Eclip	se Platform
File	Edit Navigate S	earch Project	Bun	Select an XQuery Resource	3		
1	• 🖬 🛯 🖓 🖬	💁 😅	1- [🗈 🐯 XQue
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	Query ex	pression v	/alidat	on failed: The data expression has either no or more than	one definition method	ι.	
	Replace	XPath:		_/createMyCustomerOrderResponse/MyCustOrderDesc			
	Comment	In Variable: • Expression: •		<expression></expression>			

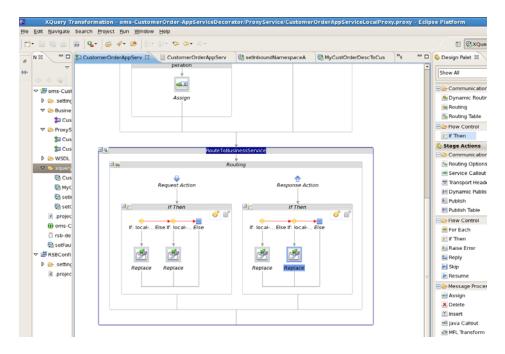
33. Click **OK**. In the binding field enter path to MyCustOrderDesc as that is the source payload for transformation:

XQuery T	ransformation ·	- oms-CustomerOrder-AppServiceDecorator/ProxyService/CustomerOrderA	ppServiceLocalProxy.proxy -	Eclip	se Platform
e <u>E</u> dit <u>N</u> avigate	Search Project	Bun Window Help			
5• 🖬 🖄 🗁	🔒 💁 😂 .	∦• @] 외· 항· ♥ Φ• Φ*			😰 🐯
6		XQuery/XSLT Expression Editor	×	• •	🗞 Design Palet
	xpression Edito s you to configure	>r an XQuery expression using XQuery text or an XQuery resource or an XSLT resource.			Show All
Expression XQu	ery Resources X	Variable Structures 22		Communic Dynamic F	
XQuery :		rder-AppServiceDecorator/xquery/MyCustOrderDescTbCustOrderDescMap)	▷ 🔯 attachments ▷ 🔯 body		Routing
	Variable Name	Binding	Þ 🔯 header		E Flow Contr
	myCustOrderDe	<pre>\$body/createMyCustomerOrderResponse/MyCustOrderDesc</pre>	Þ 🖸 inbound	H	1 If Then
		-	 operation outbound 		Stage Action
		¢			The Routing Op
					Service Ca
Bind Variables				۵	Transport F
				I H	E Publish
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				al.	E For Each
			Add Remove		💒 if Then
			Add		A Raise Error
		Cancel Test OK			Nip Skip
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Properties 😫	<hr/>			,	
Q XQuery	expression v	alidation failed: The data expression has either no or more the	an one definition method	a.	
Replace	XPath:	/createMyCustomerOrderResponse/MyCustOrderDesc			
Comment	In Variable:				
Namespaces	Expression: *	<expression></expression>			

34. Click OK. In Variable field enter body.



35. Add more replace actions for other if conditions in the if then flow:



This completes the steps for payload transformation in a message flow.

Introduction to Alerts

Alerts are generated by OSB monitoring framework and they help to diagnose problems when they occur. Oracle Service Bus provides two types of alerts:

- SLA Alerts
- Pipeline Alerts

Pipeline/Business Alerts

Pipeline alerts can be raised in the message flow of the proxy service. You can use alerts in a message flow for:

- Detecting business errors in a message flow.
- Indicating business occurrences.

SLA Alerts

SLA alerts are raised in Oracle Service Bus to indicate potential violation of the Service Level Agreements (SLAs). You can use SLA alerts for:

- Monitoring and generating email notification of WS-Security errors
- Monitoring the number of messages passing through a particular pipeline
- Detecting the violation of service level agreements with third-party products
- Detecting a non-responsive endpoint

Consider the following use case to verify the service level agreements:

Assume that a particular proxy service is generating SLA alerts due to slow response time. To investigate this problem, you must log in to the Oracle Service Bus Administration Console and review the detailed statistics for the proxy service. At this level, you can identify that a third-party web service invocation stage in the pipeline is taking a lot of time and is the actual bottleneck.

You can use these alerts as the basis for negotiating SLAs. After successfully negotiating SLAs with the third-party web service provider, you should configure alert metrics to track the web service provider's compliance with the new agreement terms.

There are different ways to add SLA alerts and Business alerts in RSB decorator projects. SLA alerts can be added from OSB console after the decorator has been deployed in a OSB server. Pipeline alerts can be added from either JDeveloper or from OSB console. It is recommended to add pipeline alerts in the JDeveloper and then export the decorator jar.

Default Alerts in RSB Decorator Projects

RSB decorator jars have a default SLA alert configured for each proxy and business service. The default alert rule name is ErrorCountRule. This alert is configured to generate an SLA alert whenever an error condition occurs in the message flow. This is just a sample SLA alert. It is recommended to delete this rule and create a new rule for the actual SLA criteria for that environment.

How to add new SLA alert

SLA alerts are operational settings and they can be added or modified only from OSB console. Follow the steps to delete the default alert rule and add a new rule:

1. Log in to OSB console and access the Projects page.

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		Create Discard					
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ources Admin	All Projects Definition						
C - 🝓 🖄 🕄	All Projects						
All Projects	View 🕶 % 💽 🖬 Detach						
cm-Customer-AppServiceDecorator	4	Al Types 🔄					
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In GlAccountValidation AppServiceDecorator	gs-ASNOutPublishing-AppServiceDecorator	Project					
igs-ASNInPublishing-AppServiceDecorator	igs-CurRatePublishing-AppServiceDecorator	Project					
[gs-ASNOutPublishing-AppServiceDecorator [gs-CurRatePublishing-AppServiceDecorator	g igs-FrtTermPublishing-AppServiceDecorator	Project					
Igs-FrtTermPublishing-AppServiceDecorator	igs-FulliOrdPublishing-AppServiceDecorator	Project					
igs-FulfiOrdPublishing-AppServiceDecorator igs-GLCOAPublishing-AppServiceDecorator	iss-GLCOAPublishing-AppServiceDecorator	Project					
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2. Click the project for which you want to modify SLA alert.

The steps to add or modify an SLA alert are same for both business service and proxy service. In this example, we will show steps for a business service. Browse to the business service and go to SLA Alert Rules tab of that service.

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3. Click **Create** in the Change Center to create a new section.

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4. Select the rule and click **Delete**. The rule is deleted.

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- 5. Click add to add a new rule.
- **6.** Enter appropriate values for Rule Name and Alert Summary fields. It is recommended to have a good summary of why this alert rule should be generated. Having proper description of all fields will be useful when looking at rules in RIC console and it will help better in diagnosing the issues.

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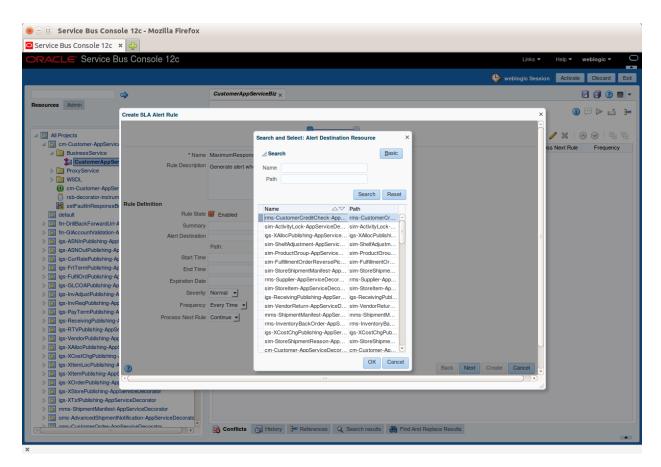
7. For Alert Destination, click browse.

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8. Click **Search** to display all alert destinations.

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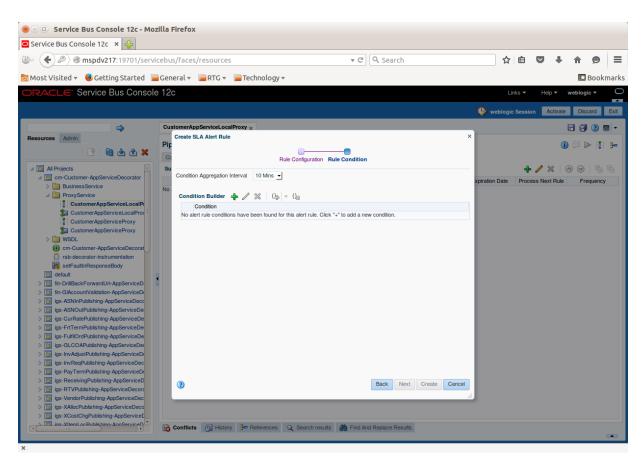
9. Select Alert Destination and click **OK**.



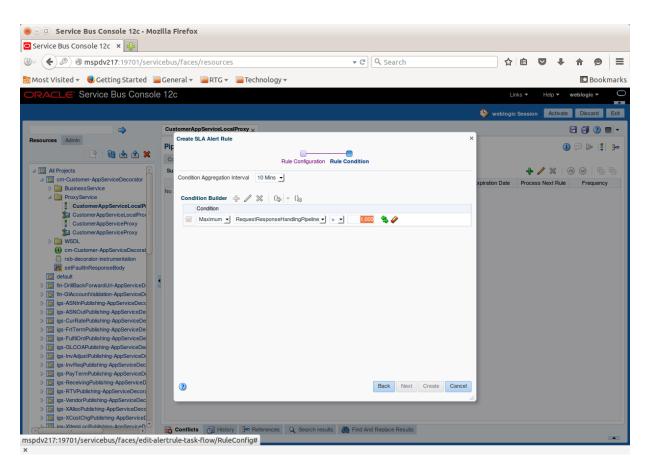
10. Click **Next**. You can build the expression which defines the criteria for alert rule on the next page.

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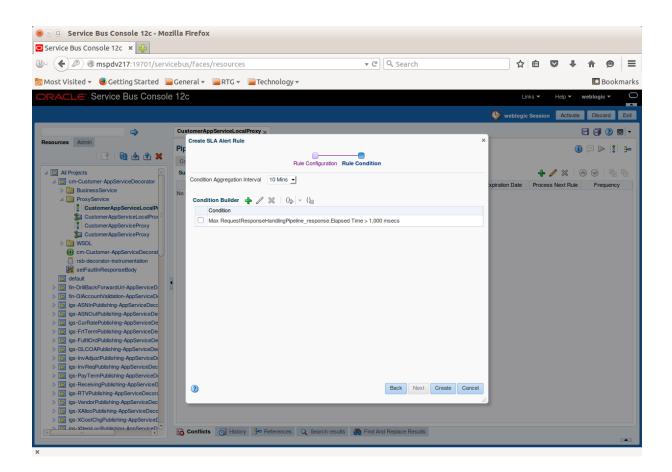
11. Now in the Condition Builder area, you can build the expression for which you want to generate SLA alert. In this example, we will build an expression to generate an SLA alert whenever the response time of business service is more than one second. Click add.



12. Select the appropriate values in the condition and click update.



13. You can build more complex expression using join and split condition buttons to build the rule. After the expression is build, select the condition and click **Create**.



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In the above page, you will see all the details about the new rule. We recommend that the condition expression is copied into the description filed as well, so that when the SLA alert is displayed in RIC, the exact condition of causing the alert is also displayed. The condition expression is not available in RIC, but the description field is available. Therefore we should have a good description for the alert. Follow the steps to copy the condition expression into the description field. To edit the rule and add the description, click edit.

14. Paste the condition expression into the Rule Description field and click Save.

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15. Click Activate and then Submit to commit the changes in server.

This completes the steps to create new SLA alert rule.

Note: SLA alerts are operational settings and can be added and modified only from OSB console. If the decorator jar is re-deployed on the server, remember that all the operational settings and SLA alerts will be lost. After deploying the new decorators, the SLA alerts will need to be created again.

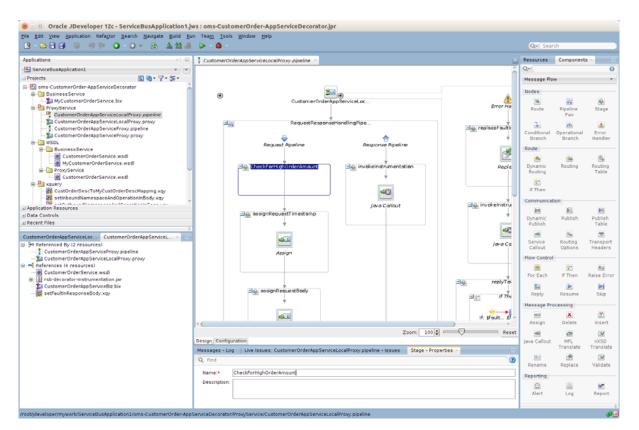
How to Add New Pipeline/Business Alert

Pipeline alerts are also called Business Alerts in RSB context. The reason for calling them business alerts is that they are used mostly to identify unusual business conditions or errors. For example, a customer may want to see an alert whenever a request is made with a very large amount.

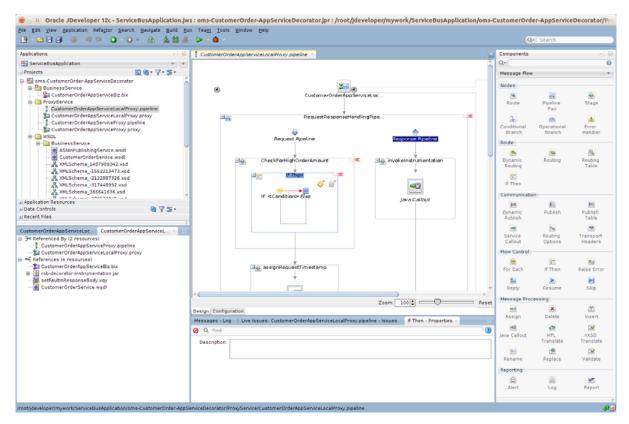
Pipeline alerts can be added in proxy services only. In RSB decorators, the message flow is defined in local proxy services. Therefore any new pipeline alerts should be added in local proxy service.

In this example, we will take an oms-CustomerOrderService where a business alert needs to be raised when grand total > 500000. The following steps are for adding a new pipeline alert:

1. Drag the Stage component from Components windows.



- 2. Enter appropriate name for the stage.
- **3.** In the stage, add a new If Then flow, drag the If Then component from the Components window to the newly added stage.
- **4.** For the first If condition, select the If condition and click the <Condition> link in If properties window to access Xquery access expression builder.



5. In this screen, you can build the expression for the alert rule. Select the request schema element body > createCustomerOrder > CustOrderDesc > grand_total for the operation:

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6. Click Insert into Expression to add to Expression field.

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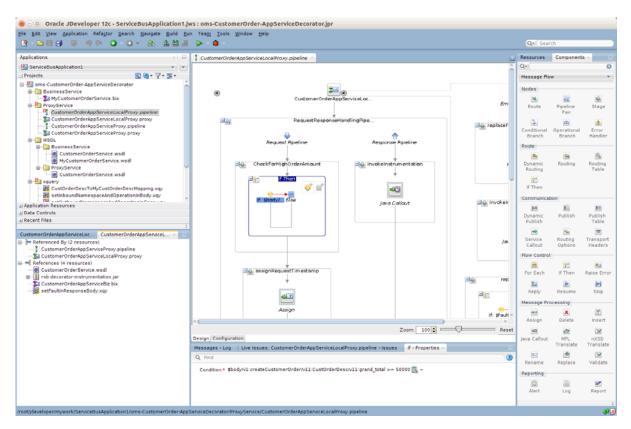
7. Click **OK**. Select Condition link from If variable window.

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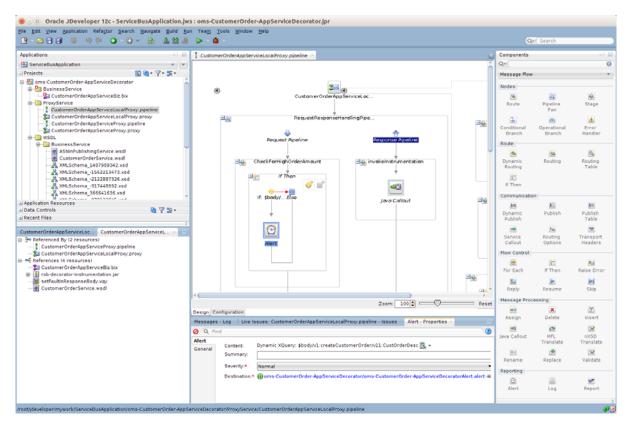
Click Launch Xquery expression builder link next to Operand field. Select body > createCustomerOrder > CustOrderDesc > grand_total and click Insert into Expression. Enter appropriate value in the Value field.

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- 9. Click **OK** and then click **Add** to add the condition.
- **10.** You can build more complex expression using the **And** and **Or** options. After building the condition expression, click **OK**.



- **11.** Now we need to add an Alert action for this If condition.
- **12.** The alert action gets added, right click the If condition added in the above steps, select **Insert Into > Alert**.



13. In the **Expression** field, you can enter the xml that you want to see in alert description when alert is generated. For example, you may want to see the whole SOAP body which caused the alert to be generated or a subset of the SOAP body. Click the **<Expression>** link in the Alert-Properties window to select the XML.

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escription:	
No Description Available	
Help	OK Cancel

14. In this example, we will add CustOrderDesc element to the expression.

😸 💷 XQuery Expression Builder	
Build an expression by typing directly into the Expression field and/or insert fragments from the frag Expression field.	ment editors below the
Expression:	🕨 🕼 🗋
Sbody/vl:createCustomerOrder/vl1:CustOrderDesc	
🔥 Insert Into Expression	
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Content Preview:	
<pre>\$body/v1:createCustomerOrder/v11:CustOrderDesc</pre>	
Description:	
\$body/vL:createCustomerOrder/vL1:CustOnderDesc	OK Cancel

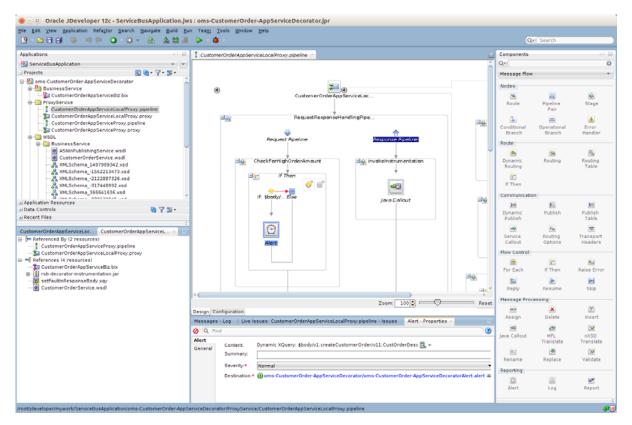
15. Drag CustOrderDesc to the Expression window.

😕 💷 XQuery Expression Builder	
Build an expression by typing directly into the Expression field and/or insert fragments from the fragments of field.	gment editors below the
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🙏 Insert Into Expression	
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B O createCustomerOrder	
CustOrderDesc	
B 🚯 \$body - response	-
Variables Functions Namespaces	
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Content Preview:	
\$body/v1:createCustomerOrder/v11:CustOrderDesc	
Description:	
\$body/v1:createCustomerOrder/v11:CustOrderDesc	
Help	OK Cancel

- 16. Click OK. In the Summary field, enter an appropriate name for the alert.
- **17.** Select Destination link from the Alert Properties window for the Alert. You should select the destination that was created by default in this project.

Resource Chooser	
oms-CustomerOrder-AppServiceDecorator	
() oms-CustomerOrder-AppServiceDecoratorAlert.alert	
0	
election:	
	OK Canc

18. Click **OK** to close the dialog box.



This finishes up the steps for adding new business alert to a message flow in a decorator.

How to add E-mail Notification for Alerts

The default alert destination created by RSB only sends alerts on OSB reporting provider JMS. The alert destination can also be configured to send email notifications; this will be useful to get immediate notifications for SLA alerts. For generating email notifications first step is to create SMTP server configuration in OSB server. You need

to have a SMTP server running and URL, port number information available. Following are the steps to create SMTP server configuration using OSB console:

- **1.** Create a new session in OSB console.
- 2. Go to System > SMTP Servers page.

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3. Right click SMTP Servers and select Create > Create SMTP Server.

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4. Create SMTP Server window is displayed.

Create SMTP Server	×
* Resource Name Description	
* Server URL * Port Number 25	
3	Create Cancel

- **5.** Provide a name and URL of the SMTP server. If the SMTP server is running on localhost, then the URL will be localhost.
- 6. Enter SMTP port number, generally it is 25.
- **7.** If it is secured, then provide username/password. Generally it is not required when running on localhost.
- 8. Click Save. Click Activate and Submit to commit changes to the server.
- **9.** This completes the steps for creating SMTP server configuration. Following is a screenshot of this:

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sim-ActivityLock-AppS		Server URL	localhost	
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sim-InventoryAdjustme		New Password		
im-ItemBasket-AppSe		Confirm Password		
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After creating SMTP server configuration, we need to update alert destination to use the SMTP server for sending notifications.

- 1. Create a new session in OSB console.
- 2. Go to **Project Explorer** tab and browse to the project for which you want to modify the alert destination. In this example, we will update cm-Customer-AppServiceDecorator project. When you click the project; it shows the list of files in that project. The default alert destination follows the naming convention as <appName>-<ServiceName>-AppServiceDecoratorAlert. So the file name here will be cm-Customer-AppServiceDecoratorAlert.
- **3.** Click the alert destination to go to alert destination configuration page.

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4 🖸 cm-Customer-AppServiceDecorator		
BusinessService		
ProxyService		
WSDL	Configuration Details	
rsb-decorator-instrumentation	SNMP Trap	
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4. In the e-mail Recipients section, click add. In the next page, you need to provide details about senders and receivers of e-mail notifications as shown below:

Add email Recipients	s X
* Mail Recipients	Mail Recipients format is user1@host[,user2@host]
SSL Required	
SMTP Server	
Mail Session	
From Name	None Available 💌
From Address	
Reply To Name	
Reply To Address	
Connection Timeout	0
Socket I/O Timeout	0
Request Encoding	iso-8859-1
2	Ok Cancel

- Mail Recipients: This needs the email addresses of the persons who should receive email notification.
- SMTP Server: Select the name of the SMTP server that was created earlier.
- From Name: The name of the person on whose behalf the notification is sent.

- From Address: Email address of the person on whose behalf the notification is sent.
- Reply To Name: Name of the person which should show in reply-to field of the email.
- Reply To Address: Email address which should show in reply-to field of email.

Add email Recipients	\$			×
* Mail Recipients	Mail Recipients format is us	er1@host[,user2@host]		
	receiver@host.com			
SSL Required				
SMTP Server	EmailServer -			
Mail Session	None Available 🛨			
From Name	EmailServer			
From Address	sender@host.com			
Reply To Name	EmailServer	The email address to reply to		
Reply To Address	sender@host.com			
Connection Timeout	0			
Socket I/O Timeout	0			
Request Encoding	iso-8859-1			
3			0	Ok Cancel

5. Click **OK** after entering all the values. Click **Activate and Submit** to commit changes to the server. This completes the steps required for setting up email notifications for alerts.

Introduction to Injector Service

Injector Service is a mechanism for external web services to subscribe data published in RIB topics. In the absence of this method, external applications will always have to subscribe directly to RIB JMS topics and parse the messages. With help of the injector service, RIB can now invoke external web services to send messages to those applications.

Injector Service Implementation in RSB

RSB has a service integration flow which is based on RIB injector service. The purpose of this service integration flow is to route messages from RIB-OMS application to RSB decorator services. This service integration flow is an OSB project and it is available in RsbServiceIntegrationFlowPak16.0.21ForRibOmsToRsbOmsRouting_eng_ga.zip PAK. The OSB jar packaged inside the PAK is

RibOmsToRsbOmsRouting-ServicesIntegrationFlow.jar.

This OSB jar contains a Proxy Service which is based on Injector Service WSDL. The name of the proxy service is RibOmsToRsbOmsRoutingService. The WSDL contains an operation named as injectMessage(). This operation requires four parameters: message family, message type, business object ID and payload. When RIB-OMS application receives a message on one of its topics, it builds the request message with appropriate values for the parameters and invokes injectMessage() method of the RibOmsToRsbOmsRoutingService proxy service. Business Object Id is an optional parameter and it may be null but rest of the parameters are required.

How to import RSB-OMS routing service in JDeveloper

1. Copy the RibOmsToRsbOmsRouting-ServicesIntegrationFlow.jar to RSB_WORK_ AREA/service-integration-flows folder. The directory structure looks like this:

🖕 Back	Forward	∂ Up	Stop	🤣 Reload		िति Home	D Computer	[Se	S arch	
	Location: /ho	me/gisingh/pr	ojects/RSB_	WORK_ARE	A/se	ervice-inte	gration-flows			
Name								•	Size	Туре
	RibOmsToRsbOmsRouting-ServicesIntegrationFlow.jar 10.3 KB Java archive					Java archive				

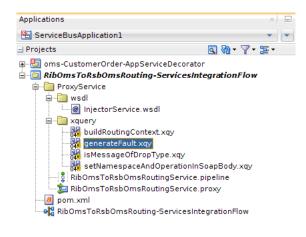
2. Now we need to import this jar in JDeveloper. To import the jar, select File > Import > Service Bus Resources.

😣 💿 Import Service Bus Resources - Step 2 of 3									
Source									
Source Configuration		onfiguration Jar (home/RSB_WO		-integration fl	ows/RibOmsToRs	bOmsRouting-Se	rvicesIntegrationF	low.jar	٩
<u>H</u> elp					< <u>B</u> ack	<u>N</u> ext >	<u>F</u> inish	Cancel	

- **3.** Click **Browse** and select the jar file.
- 4. Click Next. It will show all the files available in the jar.

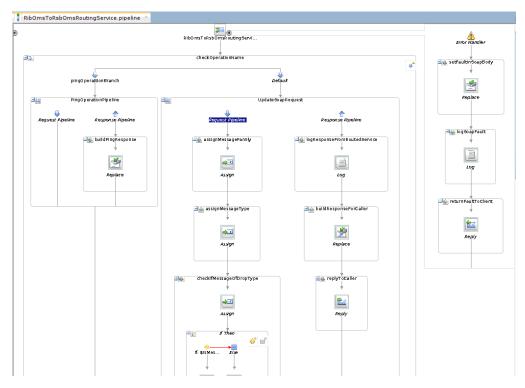
Configuration								
О, Туре	Select the resources to import and set parameters.							
Source								
Configuration	Resource Operation							
	V Include Dependencies							
	Passphrase:							
	Preserve Environment Settings							
	Preserve environment variable values							
	Preserve security and policy settings							
	Preserve credentials (username/password)							

5. Click **Finish**. The jar is imported as an OSB project and the project structure looks like the following:

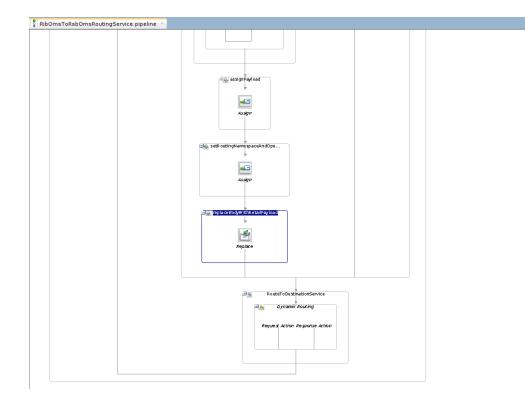


Message Flow in RSB-OMS Routing Service

The following diagrams show the message flow in the proxy service of the routing project. The whole message flow does not fit in once screenshot, so the first picture shows message flow at a high-level; it shows all the pipelines that define the message flow.



The next screenshot is of the remaining part of the updateSoapRequest pipeline-pair where most of the message processing takes place.



When RibOmsToRsbOmsRoutingService proxy service receives the request XML, it executes the message flow. The sequence of activities in the flow is explained below:

- The Message flow has a conditional branch, which checks for operation name in the SOAP request.
- The first condition is to check if operation invoked is ping. If operation name is
 ping, then the proxy service does not need to do further processing, it just builds a
 success response for ping method and returns the response to the client.
- If operation name is not ping, then the message goes to a Pipeline Pair which is named as updateSoapRequest. In request flow of that pipeline pair, these are the things that take place:
 - 1. Find the message family from the request and assign to a variable.
 - **2.** Find the message type from the request and assign to a variable.
 - **3.** Execute an xquery to check if the message needs to be dropped, that is, the proxy service should do nothing and return an appropriate response to the client. So if the message is of drop type, then it skips rest of the pipeline and returns an appropriate response to the client. Table 5-1 shows the combination of message family and message type which are dropped by the proxy service.
 - **4.** If the message is not of drop type, then it extracts the payload from the request and saves it to a variable.
 - **5.** Execute an xquery to set namespace and operation name in the outgoing request for the target decorator service.
 - 6. Build a new SOAP body with the payload that was stored in a variable.
- The proxy service uses dynamic routing to route the request to target decorator service. The dynamic routing action is based on an xquery file. This xquery builds route message context which is used by dynamic routing to route to the

appropriate service. The table 5-2 shows the mappings between message family, message type which are routed to decorator service URIs.

- Message is routed to the proxy service of the target decorator project.
- When the target decorator returns the response, then the response pipeline is executed. In the response pipeline, the response returned from decorator is logged. Finally a string with success response is returned to the proxy service client.
- If an error occurs in the RibOmsToRsbOmsRoutingService message flow, then the Service Error handler pipeline is executed. In this pipeline, an XQuery is used to build appropriate fault message. The fault is returned to the client with failure status.

The following table contains the combination of Message Family and Message Type that are dropped by routing service:

Message Family	Message Type
pendreturn	pendretcre
pendreturn	pendretmod
pendreturn	pendretdel
pendreturn	pendretdtlcre
pendreturn	pendretdtlmod
pendreturn	pendretdtldel
asnout	asnoutmod
receiving	appointcre
receiving	appointdel
receiving	receiptcre
receiving	receiptmod
receiving	appointdtlcre
receiving	appointdtldel
receiving	appointdtlmod
receiving	appointhdrmod

The following table contains the list of decorator service URI to which messages with combination of Message Family, Message type are routed:

Message Family	Message Type	Decorator Service URI
pendreturn	rtrnrcptnotify	oms-OrderReturn-AppServiceDecorator/ProxyService/O rderReturnAppServiceLocalProxy
pendreturn	rtrncomplete	oms-OrderReturn-AppServiceDecorator/ProxyService/O rderReturnAppServiceLocalProxy
sostatus	sostatuscre	oms-StockOrderStatus-AppServiceDecorator/ProxyServi ce/StockOrderStatusAppServiceLocalProxy
asnout	asnoutcre	oms-AdvancedShipmentNotification-AppServiceDecorat or/ProxyService/AdvancedShipmentNotificationAppSer viceLocalProxy

Message Family	Message Type	Decorator Service URI		
fulfilordcfm fulfilordcfmcre		oms-FulfillOrderConfirm-AppServiceDecorator/ProxySe rvice/FulfillOrderConfirmAppServiceLocalProxy		
fulfilordcfmcnc	fulfilordcfmcnccre	oms-FulfillOrderCancelConfirm-AppServiceDecorator/P roxyService/FulfillOrderCancelConfirmAppServiceLocal Proxy		
asnin asnincre		oms-VendorShipmentNotification-AppServiceDecorator/ ProxyService/VendorShipmentNotificationAppServiceLo calProxy		
asnin	asninmod	oms-VendorShipmentNotification-AppServiceDecorator/ ProxyService/VendorShipmentNotificationAppServiceLo calProxy		
asnin	asnindel	oms-VendorShipmentNotification-AppServiceDecorator/ ProxyService/VendorShipmentNotificationAppServiceLo calProxy		
receiving receiptordcre		oms-CustomerOrder-AppServiceDecorator/ProxyService /CustomerOrderAppServiceLocalProxy		

How to add new routing flow in RSB-OMS Routing Service

The table 5-2 contains the list of all decorator URIs services to which RibOmsToRsbOmsRoutingService routes the messages. It is also possible to add routing to a new decorator service by modifying XQuery files in the OSB project. This document covers only the RSB side of changes. For adding message flow for a new message family and message type from RIB, there are changes required in RIB side too. Please refer to RIB documents for changes in the RIB side. This document assumes that RIB-OMS application can invoke the RibOmsToRsbOmsRoutingService for a new message family and message type and now RibOmsToRsbOmsRoutingService needs to route those messages to the appropriate decorator. Follow the steps to achieve the same:

- 1. If the message needs to be just dropped by RibOmsToRsbOmsRoutingService and not to be processed further, the only change required in the project is to add the new message family and type in the isMessageOfDropType xquery file.
- **2.** If the message need not be dropped and should be routed to a decorator, then there are no changes required in isMessageOfDropType file. In this case, open the buildRoutingContext xquery file. This xquery builds the path to the target decorator service.
- **3.** For routing to a decorator service, the request message also needs to contain the operation name and namespace for the target service. To set new operation name and namespace in the request message, open the setNamespaceAndOperationInSoapBody xquery file and add appropriate code.

The changes to the three xquery files are all that is needed in OSB project. There is a properties file in rsb-home that also needs to be modified. This properties file is used by RSB builder tool to update RSB artifacts appropriately.

A Appendix

```
The following code snippet shows the content of
setOutboundNamespaceAndOperationInSoap xquery file:
xquery version "1.0" encoding "UTF-8";
(:: pragma parameter="$soapBody" type="xs:anyType" ::)
(:: pragma type="xs:anyType" ::)
declare namespace xf =
"http://tempuri.org/oms-CustomerOrder-AppServiceDecorator/xquery/setOutboundNamesp
aceAndOperationInSoap/";
declare function xf:setOutboundNamespaceAndOperationInSoap($soapBody as
element(*))
as element(*) {
   let $namespace := fn-bea:serialize(fn:namespace-uri($soapBody/*[1]))
   let $operation := local-name($soapBody/*[1])
let $destNamespace :=
'http://www.oracle.com/retail/oms/integration/services/CustomerOrderService/v1'
let $destOperation :=
   if($operation= "queryMyCustomerOrderResponse") then
        'queryCustomerOrderResponse'
   else if ($operation= "createMyCustomerOrderResponse") then
        'createCustomerOrderResponse'
   else
       $operation
let $updatedNsBody :=
replace(fn-bea:serialize($soapBody),$namespace,$destNamespace)
let $updatedOperationBody :=
replace(fn-bea:serialize($updatedNsBody),$operation,$destOperation)
return fn-bea:inlinedXML($updatedOperationBody)
};
declare variable $soapBody as element(*) external;
xf:setOutboundNamespaceAndOperationInSoap($soapBody)
```

B Appendix

```
The following code snippet shows the content of
setInboundNamespaceAndOperationInSoap xquery file:
xquery version "1.0" encoding "UTF-8";
(:: pragma parameter="$soapBody" type="xs:anyType" ::)
(:: pragma type="xs:anyType" ::)
declare namespace xf =
"http://tempuri.org/oms-CustomerOrder-AppServiceDecorator/xquery/setInboundNamespa
ceAndOperationInBody/";
declare function xf:setInboundNamespaceAndOperationInBody($soapBody as element(*))
as element(*) {
let $namespace := fn-bea:serialize(fn:namespace-uri($soapBody/*[1]))
   let $operation := local-name($soapBody/*[1])
let $destNamespace
:='http://www.oracle.com/retail/oms/integration/services/CustomerOrderService/v1'
let $destOperation :=
   if($operation = "queryMyCustomerOrderResponse") then
        'queryCustomerOrderResponse'
   else if($operation = "createMyCustomerOrderResponse") then
        'createCustomerOrderResponse'
   else
       $operation
let $updatedNsBody :=
replace(fn-bea:serialize($soapBody),$namespace,$destNamespace)
let $updatedOperationBody :=
replace(fn-bea:serialize($updatedNsBody),$operation,$destOperation)
return fn-bea:inlinedXML($updatedOperationBody)
};
declare variable $soapBody as element(*) external;
xf:setInboundNamespaceAndOperationInBody($soapBody)
```