Oracle® Fusion Middleware

Integration Adapter for SAP R/3 User's Guide for Oracle WebLogic Server

12c Release (12.2.1.3.0)

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August 2017 Provides information on how to integrate with SAP R/3 systems and develop applications.



Oracle® Fusion Middleware Integration Adapter for SAP R/3 User's Guide for Oracle WebLogic Server, 12c Release (12.2.1.3.0)

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Content

Content.		iii
Preface		ix
Audier	1000	<i>ix</i>
Docun	nentation Accessibility	<i>ix</i>
Relate	d Documents	ix
	ntions	
conver		
1 Under	standing of the Adapter for SAP	1-1
1.1	Overview	1-1
1.2	Business Design Using Adapter for SAP	1-1
1.3	Adapter Components	1-2
1.4	Supported Versions and Platforms	1-2
1.5	Supported SAP ABAP Technologies	
2 Worki	ng with Adapter for SAP	
2.1	Prerequisites	
2.1.	· · · · · · · · · · · · · · · · ·	
2.1. ²	(
2.1.	, , , , , , , , , , , , , , , , , , , ,	
2.1.	·····	
2.1.		
2.2 2.2.	SAP Connection Configuration Parameters	
	2.2.1.1 Direct Connection	
_		
2.2.		
2.2.		
2.2.		
2.2.		
2.2.		
2.2.		
2.2.	Create a Composite in Design-time	
2.3	Setting up JNDI for Adapter for SAP at Run-time	
2.4	Deployment of the Composite on Run-time Environment	

2.5.1	Create Application Server in JDeveloper	
2.5.2	How to Deploy	
2.6	Testing the Deployed Projects	
3 Support	ed SAP Interfaces	
3.1	Business Application Programming Interfaces (BAPI)	
3.1.1	Standard BAPI	
3.1.2	Custom BAPI	
3.2	Remote Enabled Function Modules (RFCs)	
3.2.1	Standard RFC	
3.2.2	Custom RFC	
3.3	Intermediate Document (IDoc)	3-24
3.3.1	Standard IDoc	
3.3.2	Custom IDoc	
3.3.3	Extended IDoc	
4 SAP Jay	va Connector 3.x	4-26
	Supported Systems and Platforms	
4.2 4.2.1	Performance Connection Management	
4.2.1	Connection Pooling	
4.2.3	Caching of Metadata	
	RFC Server Threads	
	Trace Level Parameter	
4.5 .	JCo Supported SAP Data types	
5 Oracle A	Adapter for SAP Features	
5.1	tRFC/qRFC/bgRFC Support	
5.1.1	Modeling the tRFC SAP Endpoint:	
5.1.2	Testing the tRFC SAP Endpoint	
5.1.3	Modeling the qRFC SAP Endpoint	
5.1.4	Testing the qRFC SAP Endpoint	
5.1.5	Modeling the bgRFC SAP Endpoint	
5.1.6	Testing the bgRFC SAP Endpoint	
	Design-Time Test Functionality	
5.2.1	Using the Design-Time Test Functionality	
5.3	Exception Filter	
5.3.1	Create an Exception Filter Project	
5.3.2	Testing the Exception Filter Project	
	Schema Validation	
5.4.1	Create a Project with Schema Validation:	
5.4.2	Testing the Schema Validation Project:	
5.5	AutoSYSTAT Feature for RFC	
5.5.1	Creating a Project with AutoSYSTAT01 Property	

	5.5.2	Test the Project with AutoSystat Property	5-58
	5.6	Encode IDoc	
	5.6.1		
	5.6.2	Test the Flat File IDoc Project	5-61
	5.7	Generic IDoc Support	
	5.7.1	Create Generic IDoc Inbound Endpoint	5-63
	5.7.2	Test the Generic IDoc Inbound Endpoint	
	5.7.3	Create Generic IDoc Outbound Endpoint	5-65
	5.7.4	Test the Generic IDoc Outbound Endpoint	
	5.8	Revision IDoc Support	5-67
	5.9	Sharing Program ID Feature	5-68
	5.9.1	Create a Sharing Program ID Project:	5-68
	5.10	Multiple IDoc Support	
	5.10	1 Create a project for Multiple IDoc Support:	
	5.11	Credential Mapping for Oracle SOA Suite (BPEL, Mediator, BPM or OSB)	5-70
	5.11		
	5.11.		
	5.	11.2.1 Creating SOA Project for Credential Mapping	
	5.12	Stateful Interaction	
	5.12		
	5.12	· ·	
	5.13	Error Handling	5-83
	5.14	SOA Debugger Support	5-84
	5.14.		
	5.14	2 SOA Debugger for Outbound	
	5.15	Non_Xml Characters Handling Feature	5-95
	5.16	Error Document Support	
	5.17	Payload Threshold Support	5-99
	5.17.	1 Inbound Project with payloadSizeThreshold support	5-99
	5.17.	2 Outbound Project with payloadSizeThreshold Support	5-101
	5.18	TID Backstore Support	5-104
	5.19	Large payload support-AsAttachment	5-106
	5.20	Resiliency Support	5-111
	5.20.	1 Inbound Project with Resilience support	5-111
	5.21	Segment Release Design Time and Runtime Support	5-115
	5.22	Special Character Support for Inbound IDoc	5-116
	5.23	Dynamic RFC Cache Update	5-116
6	Comple	ete Walkthrough of the Adapter Configuration Wizard	6-118
	6.1	Overview	
	6.2	The Adapter Wizard in JDeveloper	

	6.3	Specifying the Service Name	6-119
	6.4	Connecting to SAP	6-119
	6.4.1	Define a Connection Name	6-121
	6.4.2	Define the Connection Parameters to the Connection Name	6-121
	6.4.3	Connect to a Defined SAP connection	6-124
	6.5	Select SAP Objects from Objects Selection	
	6.5.1	Object Panel	
	6.5.2	Selected BAPI /RFC functions or IDoc messages panel	6-141
	6.5.3	Definition panel	6-142
	6.6	JCA Properties Page	6-143
	6.6.1	Interaction of JCA Properties (Outbound to the Adapter)	6-144
	6.6.2	Activation of JCA Properties (Inbound to the Adapter) ControlCharacter	6-146
	6.6.3	Generation of Corresponding (JCA) Artifacts (WSDL/XML Schemas)	6-147
	6.7	Finishing with Adapter Configuration Wizard	6-147
7	Configu	uring the Adapter Run-Time Parameters on the WebLogic Server	
	7.1	Adapter Integration with Oracle WebLogic Server	7-149
	7.1.1	Configure Run-time Parameters for the Adapter for SAP	
8	Integra	tion Scenarios in Oracle SOA Suite	8-154
	8.1	Integration Overview	8-154
	8.2	The Adapter Integration With SOA Service Components	8-154
	8.2.1	Create a New Application Server Connection	
	8.2.2		
	8.2.3	Design an Outbound BPEL Process for BAPI/RFC/IDOC	
	8.2.4	Design an Inbound BPEL Process for BAPI/RFC/IDoc	
	8.2.5	Deploy the Composite with Inbound BPEL Process	
	8.2.6		
	8.2.7	Define an Outbound Mediator Process	8-198
	8.2.8	Define an Inbound Mediator Process	
	8.2.9	Deployment of Inbound Mediator Process	
	8.2.1		
	8.3	The Adapter Integration with BPM Service Components	
	8.3.1	Deployment of Adapter	
	8.3.2	Create an Empty Composite for BPM	8-222
	8.3.3	Define a BPM Outbound Process	8-224
	8.3.4	Design a BPM Inbound Process	8-243
	8.4	The Adapter Integration with Oracle Service Bus (OSB)	
	8.4.1	Create an Empty Composite for OSB	
	8.4.2	Define an OSB Outbound Process	
	8.4.3	Define an OSB Inbound Process	8-275
	8.5	Deploy the Defined Process	8-292
	8.6	Test the Deployed Process	
	8.6.1	Test the Outbound Process	
	8.	5.1.1 Invoking the Input XML Document in the Oracle Enterprise Manager Console	8-299

8.6.	2 Test the Inbound Process	
8	3.6.2.1 Generate an Event in SAP R/3	
9 Adapt	er for SAP Performance Tuning	
9.1	Tuning and Performance	
9.1.	6	
	0.1.1.1 SAP JCo Parameter Tuning	
	0.1.1.2 BPEL Infrastructure Tuning Parameters (These are provided a	t Enterprise Management (EM)
9.1.	evel): 9-1 2 System Configuration	0.3
	0.1.2.1 Oracle Linux Server	
	0.1.2.2 Hardware	
9.1.	3 Outbound Performance	
9	0.1.3.1 Performance Summary	
9	0.1.3.2 Enhanced Performance	
9.2	Inbound Performance	
9.2.	•	
10 SOA	Reports Integration	
10.1	Adapter Health Report	10-8
10.1		
1	0.1.1.1 EIS Connectivity	
10.1	1.2 Monitoring reports	
10.1	1.3 Snapshot Reports	
11 Trou	bleshooting and Error Messages	
11.1	Log file Information	
11.2	Oracle Adapter for SAP Design-Time JDeveloper	
11.3	Oracle Adapter for SAP Run-Time	11-15
11.4	SAP R/3	11-17
11.5	Known Issues	11-18
12 Migr	ation Support	
12.1	Migration of SAP Endpoints in SOA Projects	
12.2	Migration of SAP Endpoints in OSB Projects	
12.3	Deploying the Adapter Migrated Project	
12.4	Updating JCA file in Migrated Projects	
12.5	Execution Steps for Deployed Migrated Projects	
12.5	5.1 Inbound Project	
12.5	5.2 Outbound Project	
A SAP S	ystem Configurations for Remote Processing	1
A.1 Ro	oles and Authorizations	1
A.2 RF	FC Authorization Object	1

A.3 SAP Inbound Communication	2
A.3.1 Configure a Logical System	
A.3.2 Configure a Partner Profile	6
A.3.3 Configure Inbound Process Code	7
A.3.4 Configure a Distribution Model	
A.4 SAP Outbound Communication	
A.4.1 Configure RFC Destination and Program ID	10
A.4.2 Configure a Port	12
A.4.3 Configure a Logical System	
A.4.4 Configure a Distribution Model	14
A.4.5 Configure Partner Profile	14
A.5 SAP User Authorizations for Adapter	16
A.6 SAP BGRFC Configuration	17
Glossary	20
Index	21

Preface

- Audience
- Documentation Accessibility
- Related Documents
- Conventions

Audience

Oracle Fusion Middleware User's Guide for Adapter for SAP is intended for anyone who is interested in using these adapters.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

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http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing
impaired.

Related Documents

For more information, see the following documents in the Oracle Fusion Middleware 12c Release (12.2.1.0.0) documentation set:

- Oracle Fusion Middleware Programming Resource Adapters for Oracle WebLogic Server
- Oracle Fusion Middleware Adapter for Oracle Applications User's Guide
- Oracle Fusion Middleware Developer's Guide for Oracle SOA Suite
- Oracle Fusion Middleware Administrator's Guide
- Oracle Fusion Middleware Administrator's Guide for Oracle SOA Suite and Oracle Business Process Management Suite
- Oracle Fusion Middleware Administrator's Guide for Oracle Service Bus

• Oracle Application Server Installation Guide for Legacy Adapters

Conventions

The following text conventions are used in this document:

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

Understanding of the Adapter for SAP

This chapter provides an introduction to the Oracle Integration Adapter for SAP R/3. It contains the following topics:

- Section 1.1, "Overview"
- Section 1.2, "Business Design Using Adapter for SAP"
- Section 1.3, "Adapter Components"
- Section 1.4, "Supported Versions and Platforms "
- Section 1.5, "http://www.oracle.com/technetwork/middleware/fusionmiddleware/documentation/fmw-122120-certmatrix-3254735.xlsx
- Supported SAP ABAP Technologies"

1.1 Overview

The Adapter for SAP is used for the integration of Oracle products with SAP Enterprise to exchange the real-time data. It is developed in the Oracle JCA framework. It is based on the SAP Java Connector 3.0 (SAP JCo) and is used for the inbound and outbound interaction with SAP using message types RFC/BAPI/IDOC.

- Outbound interaction: When an application uses the Adapter for SAP to invoke an SAP R/3 business object or business operation, the interaction is termed as Outbound interaction.
- Inbound interaction: When an SAP R/3 system triggers an event and the event is listened by an application using Adapter for SAP as a result of which the application receives SAP R/3 data, the interaction is termed as Inbound interaction.

Adapter for SAP allows different types of connection methods including secure connection and message server communication method, with both Unicode and Non-unicode SAP systems.

It offers organizations a service-oriented approach to unlock the information assets that have evolved in most IT environments. It provides tighter integration with both the design-time and run-time components of SOA suite and also with other Oracle products which helps customer for better business data integration.

1.2 Business Design Using Adapter for SAP

Adapter for SAP provides seamless integration between SAP R/3 systems and non-SAP systems. It supports xml communication as standard business message format which is useful in integrating different platforms. Adapter run-time provides access to an SAP System and control secure communication, connection management and function execution. Adapter design-time

module comes as an integral part of Oracle SOA Suite and OSB products. This helps you to design business integration scenarios with SAP R/3 systems.

Adapter for SAP run-time supports bi-directional communication to an SAP system. You can add, update or receive business data to and from SAP. The Adapter for SAP supports multiple SAP interfaces like BAPI/RFC/IDoc to perform such operations. As an end user, you only need to know which RFC/IDoc/BAPI of SAP system would be used and which type of communication would be required in the business use case. Security and connection management is handled by the adapter itself. Before starting integration with Adapter for SAP, you should have SAP user credentials for communication. The SAP user should have minimum required permissions to execute BAPI/RFC/IDOC. To receive any data from SAP system, you should take help of SAP admin to define logical systems in SAP side.

Adapter for SAP encapsulates most of the complex data types supported by SAP R/3 systems in the form of xml standard type which ease the integration for end user by avoiding the complexity of data mapping at the time of process design.

1.3 Adapter Components

Components of Adapter for SAP are defined in two parts:

- 1. Design-time Component (JDeveloper extension)
- 2. Run-time Component (WebLogic application)

Design-time component for Adapter comes with Oracle JDeveloper as a part of SOA, OSB, and BPM Oracle integration products. Adapter design-time provides wizard based design flow which contains pages categorized to support step-by-step procedure to create an SAP reference/service in the SOA/OSB composites. JCA artifacts are created as a result of the Adapter design.

The Adapter Run-time component comes with Oracle SOA/OSB release as a JCA connector. This component is implemented using j2EE Connector Architecture Framework. Adapter run-time must be deployed to the WebLogic Server as a resource adapter before deploying any SOA/OSB projects using Adapter for SAP. This adapter component executes a native call to SAP and sends back result as an xml in case of outbound execution. It takes care of the native call to SAP and creates abstraction of SAP related execution complexities from the user.

1.4 Supported Versions and Platforms

Oracle Integration Adapter for SAP R/3 supports the below mentioned versions of the interacting/underlying systems:

Operating System (OS) Versions:

Oracle Integration Adapter for SAP R/3 supports all the versions of operating systems that are supported by SAP JCo 3.0. Below is the list of the OS platforms.

For more information about the versions supported by SAP JCo 3.x, refer to SAP Note #1077727 in the SAP service Market Place.

- Windows (2008 R2)
- Linux (Oracle Linux 6 and Redhat Linux 6)

SAP Versions:

- SAP R/3 4.7
- SAP ECC 5.0
- SAP ECC 6.0
- SAP ECC 6.0 EhP 6
- SAP ECC 6.0 EhP 7

JAVA Versions:

 Oracle Integration Adapter for SAP R/3 supports all java version supported by SAP JCo 3 API

JCo Versions:

SAP JCo 3.X

Oracle SOA Versions:

• Oracle Fusion Middleware 12.2.1

For more information on the Adapter Certification Matrix, refer the below link:

http://www.oracle.com/technetwork/middleware/adapters/documentation/index.html

For more information on the Oracle Fusion Middleware Certification Matrix, refer the below link:

http://www.oracle.com/technetwork/middleware/fusion-middleware/documentation/fmw-122120certmatrix-3254735.xlsx

1.5 Supported SAP ABAP Technologies

Oracle Integration Adapter for SAP R/3 provides access to the following SAP ABAP interfaces:

- **1.** RFC (Remote Function Call)
- 2. BAPI (Business Application Programming Interface)
- 3. IDocs (Intermediate Documents)

Remote Function Call (RFC) is a standard SAP interface for communication within SAP systems and with external non-SAP systems. RFC calls a function to be executed in a remote system.

Business Application Programming Interfaces (BAPIs) are defined as API methods of SAP business object types. A BAPI is implemented as a function module that is stored and described in the Function Builder. BAPIs are remotely enabled functions which mean that these can be invoked from remote programs like standalone Java programs or Web services. This attribute of the BAPIs help to facilitate the integration of third-party systems with the SAP proprietary R/3 products. BAPI is usually a self-contained business function.

Intermediate Document (IDoc) is an SAP document format for business transaction data transfers. As the name suggests, these documents act as intermediate storage of information, which can be sent bi-directionally for exchange of data between SAP R/3 and non-R/3 systems.

An IDoc is made up of the following parts:

- **Control record:** This section contains control information regarding the IDoc. Its constituents are Sender's name, Receiver name, Message type, and IDoc type. The format of the control record is similar for all the IDoc types.
- Data records: It consists of a header that contains the identity of the IDoc. Its constituents include a sequential segment number, a segment type description, and field containing the actual data of the segment.
- Status records: The status record shows the information regarding already processed stages and remaining processing stages of the IDoc. It has an identical format for each IDoc type.

2

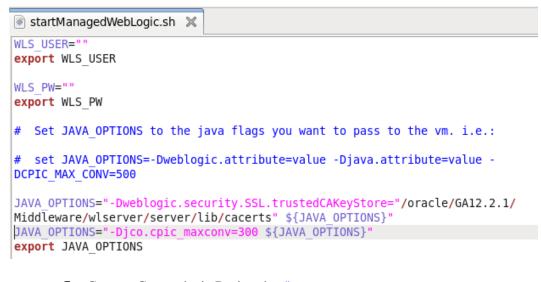
Working with Adapter for SAP

This section provides a quick start guide to use the Oracle Integration Adapter for SAP R/3. This chapter contains the following topics:

- Section 2.1, "Prerequisites"
- Section 2.2, "SAP Connection Configuration Parameters"
- Section 2.3, "Additional JCO Connection Properties
- The user can increase the cpi max jco parameter by adding the below parameter in the startManagedweblogic.sh file of all managed servers, changes will affect after the managed server restart.

JAVA_OPTIONS="-Djco.cpic_maxconv=300 \${JAVA_OPTIONS}" Export JAVA_OPTIONS

Figure 2-8 startManagedweblogic.sh file



- Create a Composite in Design-time"
- Section 2.4, "Setting up JNDI for Adapter for SAP at Run-time"
- Section 2.5, "Deployment of the Composite on Run-time Environment"
- Section 2.6, "Testing the Deployed Projects"

2.1 Prerequisites

This section lists the prerequisites for using Adapter for SAP in design-time and run-time environment.

2.1.1 JDeveloper

Installation of the appropriate version of JDeveloper is required for developing the components at design-time. For more information on installation steps of JDeveloper, refer to *Oracle Fusion Middleware Installation Guide for Oracle JDeveloper*.

2.1.2 SAP Java Connector (JCo)

SAP JCo is a middleware component which is used for communication between the Adapter and the SAP system. This component has to be installed in both design-time and run-time environments of Adapter for SAP. Below are the details which will help you to install and validate the SAP JCo.

- JCo version supports SAP Java Connector 3.x. The latest version available is SAP JCo 3.0.13. More details on the supported operating systems and platforms, is provided in chapter SAP Java Connector 3.x". The Adapter does not support the platforms which are not supported by the SAP JCo 3.x.
- 2. JCo Files: Below are the required SAP JCo installation files:
 - i. Microsoft Windows
 - a. sapjco3.jar
 - b. sapjco3.dll
 - c. sapidoc3.jar
 - ii. Linux
 - a. sapjco3.jar
 - b. libsapjco3.so
 - c. sapidoc3.jar
- **3.** Source for SAP JCo files:

These files are provided by SAP administrator or you can download the installation files from SAP service market place under service.sap.com/connectors.

Verify Path and ClassPath for SAPJCo files :

For Windows :

- 1. SAPJCo3 library should be in CLASSPATH and PATH variable .
- 2. Extract SAPJCO zip in a folder location and now this folder should contain sapjco3.jar,sapjco3.dll and sapidoc3.jar
- 3. Provide this folder location in to the PATH
- 4. Provide location of sapjco3 and sapidoc3 jars in to CLASSPATH

For Linux :

- 1. SAPJCo3 library should be in CLASSPATH and PATH variable
- 2. Extract SAPJCO in a folder location like /oracle/SAPJCo3 and now this folder should contain sapjco3.jar, libsapjco3.so and sapidoc3.jar
- 3. Keep libsapjco3.so file in to LD_LIBRARY_PATH or make sure libsapjco3.jar is installed as system library
- 4. LD_LIBRARY_PATH can be set using following command Export LD_LIBRARY_PATH=/oracle/SAPJCo3
- 4. Check for the compatibility:

After downloading the SAP JCo files, place it in the directory of the system where these libraries need to be validated. Perform the following steps to validate SAP JCo:

- i. Navigate to the directory where the *sapjco3.jar* file is located.
 - a. On Windows:
 - Right-click the **sapjco3.jar** file.
 - Select Open with and then click Java 2 Platform Standard Edition binary. Or

Run sapjco3.jar file from command prompt, as shown in Figure 2-1.

Figure 2-1 Run Command Screen



b. On Linux:

- Execute the command from the command prompt java -jar sapjco3.jar
- ii. Execute the above command in respective OS. A popup window appears, as shown in Figure 2-2. If the popup opens successfully, it implies that JCo installation is successful.

Figure	2-2	Popup	window	of OS
riguic	~ ~	i opup	maon	0,00

	SAP Java Connector _ ×
	THE BEST-RUN E-BUSINESSES RUN SAP
	SAP Java Connector
	Copyright (c) 2000–2015 SAP SE. All rights reserved.
Java Runtime	
Operating System:	Linux 2.6.39-200.24.1.el6uek.x86_64 for amd64
Java VM:	1.8.0_25 Oracle Corporation
Default charset:	ISO-8859-1
Versions	
JCo API:	3.0.13 (2015-04-27)
JCo middleware:	JavaRfc 2.2.15
JCo library:	721.510
Library Paths	
Path to JCo archive:	/oracle/stage17_OSB/Middleware/user_projects/domains/osb_domain/lib/sapjco3.jar
Path to JCo library.	/oracle/stage17_OSB/Middleware/user_projects/domains/osb_domain/lib/libsapjco3.so
Manifest	
	Manifest-Version: 1.0 Implementation-Vendor: SAP SE, Walldorf Ant-Version: Apache Ant 1.6.4 Implementation-Title: com.sap.conn.jco Implementation-Version: 20150503 2116 [3.0.13 (2015-04-27)] Implementation-Vendor-Id: com.sap Specification-Vendor: SAP SE, Walldorf Specification-Title: SAP Java Connector v3

- iii. Another way of validation is to check the path of JCo library and path of JCo archive property in screen. If they are showing correct library and archive (jar) file, it means that JCo library is correct for your Operating System.
- 5. JCo file location for the Adapter for SAP.
 - In Design-time environment, place the files at below path:
 <ORACLE_HOME>/soa/plugins/jdeveloper/integration\adapters/lib
 - In Run-time environment, place the files at below path: <ORACLE_HOME>/user_projects/domains/soa_domain/lib
- 6. Update the Global variables:

We need to update the path of the JCo library installed in the PATH of the Global variables.

i. Windows:

In the Windows Operating systems, the environment variables have to be updated as mentioned in the below steps.

- a. Go to My Computer properties.
- b. Navigate to Advanced Properties -> Environment variables, and update the PATH and CLASSPATH variables as below:

- PATH=\$PATH; <ORACLE_HOME>\soa\plugins\jdeveloper\integration\adapters\lib
- ii. Linux:

In the Linux Operating systems, the environment variables have to be updated as mentioned in the below steps.

a. Navigate to the Bash profile with the below command, using the same SOA Installation.

vi ~/.bash_profile

- b. Press "i" for insertion and add the below entries in the bash_profile file
 - PATH=\$PATH; <ORACLE_HOME>\soa\plugins\jdeveloper\integrati on\adapters\lib
- c. Press <Esc> and then press <Ctrl+Shft+x> to save.

2.1.3 Verify WebLogic and SOA

After installation of WebLogic and SOA, verify that the servers are in the **Running** state and **Health** is **OK** as shown in Figure 2-3.

Figure 2-3 Summary of Servers

figuration Control			
server is an instance of WebLogic S	Server that runs in its own J	ava Virtual Machine (JVM) an	d has its own configuration.
his page summarizes each server th	hat has been configured in th	e current WebLogic Server d	lomain.
Fustomize this table			
Customize this table	ne Eviet)		
Customize this table ervers (Filtered - More Column New Clone Delete	ns Exist)		
ervers (Filtered - More Colum	ns Exist)	Cluster	Machine
ervers (Filtered - More Column		Cluster	Machine
ervers (Filtered - More Column New Clone Delete	Туре	Cluster new_Cluster_1	

2.1.4 Adapter Components

1. **Design-time:** After installing the Adapter for SAP in design-time of the build provided, create or open an existing SOA project in JDeveloper and check for the Adapter icon in the Component palette of JDeveloper, as shown in the Figure 2-4.

Components ×				
Q.		0		
SOA		-		
DILLITOCC33	Duaineaa Nuic	numun ruak		
*	N	&		
Mediator	Spring	Subprocess		
Technology				
ی		R		
ADF-BC	AQ	B2B		
1	**	÷		
BAM 11g	Coherence	Database		
\$	<u>6</u>			
Direct	EJB	File		
£	° <mark>=</mark> 1	5		
FTP	Healthcare	HTTP		
<u>8</u>	鬱	1 <u>G</u>		
JMS	LDAP	MFT		
÷	4	1		
MQ	MSMQ	REST		
\$	6			
SOAP	Socket	UMS		
Applications				
£ <mark>6</mark>	÷	e		
E-Business	JDE World	SAP R/3		
Suite		Adapter		
Custom/Third F	Party			
*				
Third Party				

Figure 2-4 Adapter Icon in the Component Palette of JDeveloper

2. **Run-Time:** After installation of Adapter run-time in the WebLogic console, verify the status of the Adapter to be **Active** and checked **OK**, as shown in Figure 2-5.

Summ	ary o	f Deployments						
Cont	rol	Monitoring						
sto	This page displays a list of Java EE applications and stand-alone application modules that have been installed to this of stopped, updated (redeployed), or deleted from the domain by first selecting the application name and using the c To install a new application or module for deployment to targets in this domain, click the Install button.							
De Cus	stomi	ze this table						
Dep	loym	ents						
Ins	stall	Update Delete Start - Stop -						
	□ Name State Health							
	□ 👼 state-management-provider-memory-rar Active ✔ OK							
	Coherence-transaction-rar Active 🗸 OK							
	ø	APAdapter	Active	🖋 ок				
	□ □ □ Active ✓ OK							

Figure 2-5 Summary of Deployments

2.1.5 Update the Default JNDI with the SAP Login Parameters

Update the default JNDI with the SAP Login parameters in the below path of console.

1. Home →Summary of Servers →Summary of Deployments →Adapter for SAP, as shown in Figure 2-6.

Figure 2-6 Se	tting for	Adapter	for	SAP
---------------	-----------	---------	-----	-----

Overview	Deploymer	nt Plan	Configuration	Security	Targets	Control	Testing	Monitor
<u>General</u>	Properties	Outbo	ound Connection	Pools A	dmin Object	ts Work	load Ir	nstrumentai
				menace an	o ine insian	ces are list	ed by th	eir INDI nar
instance below.	within an Out	tbound (onnection factory i Connection Pool gr Configuration Ta	oup. Click t				
Outboun	within an Out	bound (Connection Pool gr	oup. Click t				to configu
Outboun New Gro Gro	within an Out d Connection Delete ups and Ins	on Pool	Connection Pool gr	oup. Click t				

2. Click on **eis/SAP/FMWDEMO**. The **Outbound Connection Properties** page is displayed, as shown in Figure 2-7.

Figure 2-7 Properties Tab

Settings f	ettings for javax.resource.cci.ConnectionFactory					
General	Properties	Transaction	Authentication	Connection Pool	Logging	

This page allows you to view and modify the configuration properties of this outbound connection pool. Properties yo

Outbound Connection Properties

Save		
Property Name 🔗	Property Type	Property V
DestinationDataProvider_JCO_ALIAS_USER	java.lang.String	
DestinationDataProvider_JCO_ASHOST	java.lang.String	10.30.0.26
DestinationDataProvider_JCO_CLIENT	java.lang.String	800
DestinationDataProvider_JCO_CODEPAGE	java.lang.String	
DestinationDataProvider_JCO_CPIC_TRACE	java.lang.String	
DestinationDataProvider_JCO_DEST	java.lang.String	
DestinationDataProvider_JCO_EXPIRATION_PERIOD	java.lang.String	
DestinationDataProvider_JCO_EXPIRATION_TIME	java.lang.String	
DestinationDataProvider_JCO_GETSSO2	java.lang.String	
DestinationDataProvider_JCO_GROUP	java.lang.String	

2.1.6 SAP Login Parameters

You need to have SAP R/3 logon parameters for making the connection to the SAP system from DT wizard or RT (JNDI). These are provided by the SAP System Administrator. Below ia the list of mandatory connection parameters which are required for making a simple outbound connection to the SAP system.

- **1.** Client: This is the client number of the SAP system. This is a 3 digit numeric character. For example, Client = 100.
- **2.** User name: This is the SAP user. Dialog or Communication type of SAP user can be used here.
- 3. Password: Password of SAP user.
- 4. Language: SAP Logon language. The language provided here should be one of the installed languages provided by the SAP administrator. In case of language dependent data, the response data text is returned based on the language passed in this parameter. This is a 2 digit character. For example, 'EN', 'DE'.
- 5. Application Server: A fully qualified domain name or IP of the SAP Application Server.
- 6. System Number: Instance number of the Application Server.

There are various other SAP Connection Parameters which are part of connection configuration and used for the inbound and outbound connection to SAP. Below is the list of different type of parameters. For more information, refer to the section "SAP Connection Configuration Parameters".

- 1. Direct Application Server Connection parameters.
- 2. Message Server Connection parameters.
- 3. Server parameters for inbound.
- 4. Tracing parameters.
- 5. Connection pool parameters.
- 6. SAP secured connection parameters.
- 7. Additional connection parameters.

2.2 SAP Connection Configuration Parameters

This section contains the SAP R/3 logon parameters, which are used to configure a connection to SAP R/3 using the Oracle Application Adapter.

2.2.1 Login Parameters

Table 2-1 lists and describes user login parameters

Table 2-1	Login	Parameters
-----------	-------	------------

Parameter	Description	Example	Comment
Client (DestinationDataProvi der_JCO_CLIENT)	Identifies the SAP client.	800	In organizational, commercial, and technical terms, a self-contained unit in an SAP system with separate master records and its own set of tables. It is a mandatory parameter.
User name (DestinationDataProvi der_JCO_USER)	SAP login ID.	JCA _DEV	User type for dialog-free communication between systems. It is a mandatory parameter.
Password (DestinationDataProvi der_JCO_PASSWD)	Confidential authentication information	JCA _111@D	Password for logging in to the SAP system. This is a protected word or string of characters that identifies or authenticates a user for access to an SAP system. It is a mandatory parameter.
Language (DestinationDataProvi der_JCO_LANG)	A language key. EN (English) is the default.	EN	The current logon language of SAP. It is a mandatory parameter.
alias_user (DestinationDataProvi der_JCO_ALIAS_US ER)	Logon user alias	JCA _ALIAS	Specifies the alias user name for the SAP user login. It is an optional parameter.
mysapsso2 (DestinationDataProvi der_JCO_MYSAPSS O2)	Indicates whether or not to use the specified SAP Cookie Version 2 as the login ticket instead of user ID and password.		Login with single sign-on is based on secure network connection (SNC) encryption and can only be used in combination with an SNC. It is an optional parameter.
x509cert (DestinationDataProvi der_JCO_X509CERT)	Indicates whether or not to use the specified X509 certificate as the login certificate instead of user ID and password.		Login with X509 is based on Secure Network Connection (SNC) encryption and can only be used in combination with an SNC. It is an optional parameter.

2.2.1.1 Direct Connection

Table 2-2 lists and describes Direct Connection parameters.

 Table 2-2
 Direct Connection parameters

Parameter	Description	Example	Comment
Application Server (DestinationDataProvide r_JCO_ASHOST)	Connects to an ABAP application server.	10.30.XX. XX	To obtain meta data information, a connection to a single application server is required. Application programs in an R/3 System are run on application servers.
System Number (DestinationDataProvide r_JCO_SYSNR)	Identifies a unique instance on the application server.	00	An application server may have different system numbers.

2.2.1.2 Load Balanced

Table 2-3 lists and describes Load Balanced Connection parameters

 Table 2-3
 Load Balanced Connection Parameters

Parameter	Description	Example	Comment
Message Server (DestinationDataProv ider_JCO_MSSERV)	Connects to an ABAP message server.		Application servers from one SAP system are usually configured in logon groups (For load balancing purposes), where each group serves a particular kind of user. The message server is responsible for communication between the application servers. It passes requests from one application server to another within the system. It also contains information about application server groups and the current load balancing within them. It uses this information to choose an appropriate server when a user logs onto the system.
Message Host (DestinationDataProv ider_JCO_MSHOST)	Connects to an ABAP message Host.		The IP of message server host.
R/3 Name (DestinationDataProv ider_JCO_R3NAME)	Identifies a unique instance on the application server.		Symbolic SAP system name used to identify the system.
Server Group (DestinationDataProv ider_JCO_GROUP)	Identifies the logon group.	PUBLIC	Logon group that the user ID belongs with.
Router (DestinationDataProv ider_JCO_SAPROU TER)	SAP Route String describes a connection required between two hosts		To be able to connect to an SAP server from the internet, one uses SAP router as a proxy between the SAP GUI and the SAP server.
			Note: Program ID having special characters is not getting handled as of now.

2.2.2 Server Parameters (for Inbound)

Table 2-4 lists and describes SAP Gateway Server parameters.

Table 2-4SAP Gateway Server Parameters

Parameter	Description	Example	Comment
SAP Gateway Host (ServerDataProvider_ JCO_GWHOST)	Enter the name of an SAP Gateway server.	"isdsrv2"	The SAP Gateway carries out CPI- C services within the SAP world, which are based on TCP/IP. These services enable SAP Systems and external programs to communicate with one another.
SAP Gateway Service (ServerDataProvider_ JCO_GWSERV)	Enter the service name (usually a compound of the service name and system number).	Sapgw00	Service name on the gateway host.
Program ID (ServerDataProvider_ JCO_PROGID)	A program identifier that has been specified on the SAP Gateway Server (case sensitive).	"S1PROG"	Program ID is a unique identifier for your communication session specified by your system administrator. The value entered in this field must match the one exposed on the gateway.

2.2.3 Trace Parameters

Table 2-5 lists and describes Trace parameters.

Table 2-5 Trace Parameters

Parameter	Description	Example	Comment
SAP trace (DestinationDataProvi der_JCO_TRACE)	Enables the SAP Java connectors trace behaviour.	0 / 1	Off default - only hard errors are recorded in a trace file (dev rfc.trc) in append mode. ON - individual rfc*.trc and JCO*.trc are written for each request. Useful in finding errors, not recommended in a productive system.
Trace level (DestinationDataProvi der_JCO_CPIC_TRAC E)	Indicates the level of detail in the SAP traces.	03	Select a value that ranges from 0 through 10 from the list.

2.2.4 Connection Pool Parameters

Table 2-6 lists and describes Connection Pooling parameters.

Parameter	Description	Example	Comment
Pool Capacity (DestinationDataProvider_J CO_POOL_CAPACITY)	Maximum number of connections which will be kept open by the pool for possible reuse. These connections will be automatically closed if they cannot be reused for more than the Connection Timeout period. A value of 0 has the effect that there is no connection pooling, i.e. connections will be closed after each request.	3	3 Connections will be kept open by the pool for reuse.
Peak Limit (DestinationDataProvider_J CO_PEAK_LIMIT)	Maximum number of connections which can be allocated from the pool. This enables the user to create more connections as specified by the Peak limit parameter, for example for temporary peak usage times. If the value for Maximum connections is less than the value of the parameter Peak limit , the parameter will automatically be reset to the value of Peak limit . All allocated connections exceeding the Peak limit will be closed immediately, if they are released from the application to the pool again.	10	Maximum 10 connections can be allocated from the pool.
Max Wait (DestinationDataProvider_J CO_MAX_GET_TIME)	Defines the maximum time to wait to obtain a requested connection. If the connection pool is exhausted (that means that the Maximum Connections limit is reached) and another thread is requesting an additional connection, this is the time that is being waited for some connection to be released by another thread so that that one can be handed out to the waiting thread.	30 s	The default value for the Maximum Waiting time is 30 seconds.
Expiration Time (DestinationDataProvider_J CO_EXPIRATION_TIME)	Time in ms after which the connections held by the internal pool can be closed.	10,000	The connections will be closed after 10 seconds.
Expiration Period (DestinationDataProvider_J CO_EXPIRATION_PERIO D)	This is interval in ms with which the timeout checker thread checks the connections in the pool for expiration.	5,000	The timeout checker will check the connections every 5 seconds.

Table 2-6 Connection Pooling Parameters

For more information on parameters, see Table 4-1.

2.2.5 SAP Connection Security Parameters (SNC)

Table 2-7 lists and describes SNC parameters.

Table 2-7 SNC Parameters

Parameter	Description	Example	Comment
SNC mode (DestinationDataProvider_J CO_SNC_MODE)	Flag for activating SNC .	1 (on)	This is a required parameter.
SNC Partner (DestinationDataProvider_J CO_SNC_PARTNERNAM E)	Specifies the application server's SNC name	p:CN=ABC , O=MyCom pany C=US	User can find the application server's SNC name in the profile parameter snc/identity/as.
SNC level (DestinationDataProvider_J CO_SNC_QOP)	Specifies the level of protection to use for the connection.	Selection, see the next column.	 Authentication only Integrity protection Privacy protection (default) Use the value from snc/data protection/use on the application server Use the value from snc/data_protection/max on the application server Default value = 3
SNC Name (DestinationDataProvider_J CO_SNC_MYNAME)	Specifies SNC name.	p:CN=SAP J2EE O=MyCom pany, C=US	This parameter is optional, but set it to ensure that the correct SNC name is used for the connection. Note : This is an optional field, but it is recommended to be passed for security purpose.
SNC library Path (DestinationDataProvider_J CO_SNC_LIBRARY)	Specifies the path and file name of the external library.	C:\SAP J2EE_ Engine\SA PCry ptolib\sa pcrypto.dll	The default is the system-defined library as defined in the environment variable SNC LIB.

2.2.6 Additional Connection Parameters

Table 2-8 lists and describes Additional Connection parameters.

Table 2-8Additional Connection Parameters

Parameter	Description	Example	Comment
Type (DestinationDa taProvider_JC O_TYPE)	Type of remote host	2 = R/2, 3 = R/3, E = External	Remote host used to connect to RFC Destination.
CodePage (DestinationDat aProvider_JCO _CODEPAGE)	Initial codepage in SAP notation	8400	Uniquely identifying the logon language and Extracts the text data according to the logon language.

Parameter	Description	Example	Comment
Repository_des tination (DestinationDat aProvider_JCO _DEST)	Specifies which destination should be used as repository.	10.32.32.XX	SAP Repository destination to connect.
Repository User (DestinationDat aProvider_JCO _REPOSITOR Y_USER)	If repository destination is not set, and this property is set, it will be used as user for repository calls. This allows using a different user for repository lookups.	MYSAPREPO	Repository user having only access to connect to specified SAP Repository only.
Repository Password (DestinationDat aProvider_JCO _REPOSITOR Y_PASSWD)	The password for a repository user. Mandatory, if a repository user should be used.	MYPASS	Connect to the destination successfully with valid repository user and Repository Password .

Note: If the user is a Repository user and has no authorization on particular RFC/BAPI/IDoc. The returned error message will not be Repository specific.

2.2.7 Additional JCO Connection Properties

The user can increase the cpi max jco parameter by adding the below parameter in the startManagedweblogic.sh file of all managed servers, changes will affect after the managed server restart.

JAVA_OPTIONS="-Djco.cpic_maxconv=300 \${JAVA_OPTIONS}" Export JAVA_OPTIONS





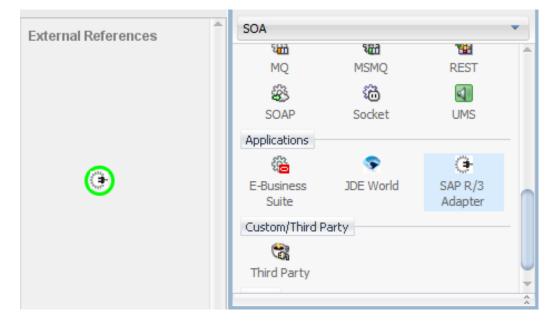
2.3 Create a Composite in Design-time

1. Open the JDeveloper installed from the below path:

<ORACLE_HOME>/jdeveloper/jdev/bin /jdev

- 2. Create a new SOA application and corresponding project. For more information, refer to the section "Create an Empty Composite for SOA".
- 3. Drag and drop the Adapter to the External Reference, as shown in Figure 2-8.

Figure 2-9 Adapter Component



- 4. The configuration wizard for the Adapter appears.
- 5. Provide the required details in the wizard respectively. For more information, refer to the section "Adapter Wizard in JDeveloper".

- **6.** Configure the BPEL process. For more information, refer to the section "Define an Outbound BPEL Process".
- 7. Outbound Composite created at the end of the process will look as shown in Figure 2-9.

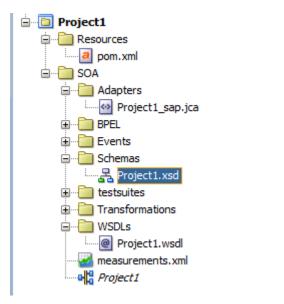
Figure 2-10 Outbound Composite

Project1 ×					
🛷 🧌 🌌 🗶 🖏 i 🚯 🧕		Project1			
Exposed Services	Components External Refer	rences			
Delprocess1_client Operations: process	BPELProcess1				
Design Source History					
Messages - Log		× 🗖			
Messages-Log Jun 18, 2014 11:47:04 AM oracle.tip.adapter.sap.share.connection.SapConnector ping WARNING: SAP client Connected successfully destination Con with properties:{jco.destination.auth_type=CONFIGURED_USER, jco.client.user=JCA_DEV, jco.client.1 Jun 18, 2014 11:47:28 AM oracle.mds NOTIFICATION: MDS-11031: Content option mapping for (Path = "/persdef/query/savedSearches/", Namespace Restrictio Jun 18, 2014 11:47:28 AM oracle.mds NOTIFICATION: MDS-11031: Content option layer "adfshare" from MDS Component Config in jar:file:/C:/Oracle/Middlewa					
Messages Extensions × SO	A ×				

- **8.** Below artifacts are created as a part of Adapter outbound composite creation. You can find those artifacts in the left side pane under the project node. As shown in Figure 2-10.
 - PROJECT1_sap.jca
 - PROJECT1.xsd
 - PROJECT1.wsdl

(Where PROJECT1 is the name of the Adapter reference name provided in the adapter wizard)

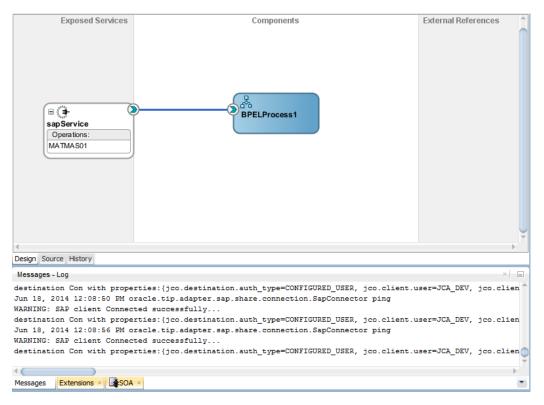
Figure 2-11 Created Artifacts as part of Adapter Outbound Composite



9. Follow the similar steps to create an inbound Adapter composite. In this case, drag the Adapter to **Exposed Services** swim lane. For more information, refer to the section "Define an Inbound BPEL Process".

10. Inbound Composite created at the end of the process will look as shown in Figure 2-11.

Figure 2-12 Created Inbound Composite



2.4 Setting up JNDI for Adapter for SAP at Run-time

This section describes how to configure JNDI connection parameters which consists of the following steps:

1. Update the default JNDI with the SAP Login parameters in the below path of console.

Home \rightarrow Summary of Servers \rightarrow Summary of Deployments \rightarrow Adapter, as shown in Figure 2-12.

Figure 2-13 Update JNDI with Connection Parameters

Home >Summary of Servers >Summary of Deployments >SAPAdapter								
Settings for javax.resource.cci.ConnectionFactory								
Overview	Deployment Plan	Configuration S	Security Targ	ets Cor	ntrol Test	ing Monitoring	Notes	
General	Properties Outb	ound Connection P	ools Admin (bjects	Workload	Instrumentation		

This page displays a table of Outbound Connection Pool groups and instances for this resource adapter. The top level entries in the table represent Outbouni connection factory interface and the instances are listed by their JNDI names. Expand a group to obtain configuration information for a Connection Pool insta name of a group or instance to configure it. Automatically generated Connection Pools are not displayed in the table below.

Outbound Connection Pool Configuration Table

Ne	New Delete						
	Groups and Instances 🗞	Connection Factory Interface					
	□ javax.resource.cci.ConnectionFactory	javax.resource.cci.ConnectionFactory					
	eis/Chinese	javax.resource.cci.ConnectionFactory					
	eis/DECDAT	javax.resource.cci.ConnectionFactory					
	eis/FMW2SAP	javax.resource.cci.ConnectionFactory					
	eis/French	javax.resource.cci.ConnectionFactory					
	eis/German	javax.resource.cci.ConnectionFactory					
	eis/SAP/FMWDEMO	javax.resource.cci.ConnectionFactory					

Once clicked on eis/SAP/FMWDEMO, below screen appears, as shown in Figure 2-13.

Figure 2-14 Outbound Connection Properties

	Home >Summary of Servers >Summary of Deployments >SAPAdapter						
-	Settings for javax.resource.cci.ConnectionFactory						
	General	Properties	Transaction	Authentication	Connection Pool	Logging	

This page allows you to view and modify the configuration properties of this outbound connection pool. Properties you modify here are saved to a

Outbound Connection Properties

Save					
Property Name 🗞	Property Type	Property Value			
DestinationDataProvider_JCO_ALIAS_USER	java.lang.String				
DestinationDataProvider_JCO_ASHOST	java.lang.String				
DestinationDataProvider_JCO_CLIENT	java.lang.String	800			
DestinationDataProvider_JCO_CODEPAGE	java.lang.String				
DestinationDataProvider_JCO_CPIC_TRACE	java.lang.String				
DestinationDataProvider_JCO_DEST	java.lang.String				
DestinationDataProvider_JCO_EXPIRATION_PERIOD	java.lang.String				
DestinationDataProvider_JCO_EXPIRATION_TIME	java.lang.String				
DestinationDataProvider_JCO_GETSSO2	java.lang.String				
DestinationDataProvider_JCO_GROUP	java.lang.String				

- **2.** Save the JNDI.
- **3.** Select the Adapter in the summary of deployments. Click **Update** button and follow wizard, as shown in Figure 2-14, to update the connection configuration.

Figure 2-15 Update Applicat	ion Assistant
Update Application Assistant	
Back Next Finish Ca	ncel
Locate new deployment file	S
You have elected to update th	e SAPAdapter application.
OUpdate this application in	place with new deployment plan changes. (A deployment plan
Deployment plan path:	/oracle/stage9/Middleware/soa/soa/Plan.xml Change Path
Redeploy this application	using the following deployment files:
Source path:	/oracle/stage9/Middleware/soa/soa/connectors/SAPAdapter.rar
Deployment plan path:	/oracle/stage9/Middleware/soa/soa/Plan.xml Change Path
Back Next Finish Ca	ncel

4. The updated connection information will be applicable for the projects which deployed after update. Now the projects can be deployed for execution.

2.5 Deployment of the Composite on Run-time Environment

The developed Adapter project has to be deployed to the Application Server Connection which is already created in the JDeveloper. Below are the steps which include the creation and deployment of the application server.

2.5.1 Create Application Server in JDeveloper

Perform the following steps for creating the new application server:

- 1. Go to the Application Server tab and right-click on the parent node of application server.
- 2. Select the type of server. Standalone is the default.
- 3. Provide the connection name and credentials in the nextscreens respectively.
- 4. Test the connection and finish the wizard if it is successful.

For more information on creation of Application Server Connection, refer to the section "Create a New Application Server Connection".

2.5.2 How to Deploy

Perform the following steps for deploying the project:

- 1. Select the project.
- 2. Right-click and select **Deploy**.
- **3.** From the list, select the server on which you need to deploy.
- 4. Click on Next and then Finish.

For more information on deployment of the project, refer to the section "Deploy the Defined Process".

2.6 Testing the Deployed Projects

Refer to the section "Test the Deployed Process" for the details on how to test the Outbound and Inbound Endpoints in EM.

Supported SAP Interfaces

Adapter for SAP provides access to SAP R/3 interfaces such as Remote Enabled Function Modules (RFC), Business Application Programming Interfaces (BAPI) and Intermediate Documents (IDoc).

This section contains the following topics:

- Section 3.1, "Business Application Programming Interfaces (BAPI) "
- Section 3.2, "Remote Enabled Function Modules (RFCs) "
- Section 3.3, "Intermediate Document (IDoc) "

3.1 **Business Application Programming Interfaces (BAPI)**

BAPI's (Business Application Programming Interface) are a set of interfaces to object-oriented programming methods in SAP. They enable a programmer to integrate third-party software into the proprietary R/3 product from SAP. These interfaces can be used by external applications developed by customers and complementary software partners as well as by other SAP applications. For specific business tasks such as uploading transactional data, BAPIs are implemented and stored in the R/3 system as Remote Function Call (RFC) modules.

BAPIs provide the client with an object-oriented view of the application objects without needing to know the implementation details. BAPIs are always developed by defining scenarios which are used to map and implement system-wide business processes.

Note: Online BAPIs(which call SAP screens) were not supported by Adapter for SAP.

3.1.1 Standard BAPI

Some BAPIs and methods provide basic functions and can be used for most SAP Business Objects. Such BAPIs are known as Standardized BAPIs. For example, Some BAPIs are used for replicating business object instances: They enable specific instances of an object type to be copied to one or more different systems. These BAPIs are used mainly to transfer data between distributed systems within the context of Application Link Enabling (ALE).

A number of service BAPIs provide basic help functions. Service BAPIs provide information or services for the BAPIs from Individual Business Components. Service BAPIs are created in the Business Object Repository (BOR) under the application component hierarchy shown below:

- Cross-Application Components
- Business Framework Architecture

There are some parameters that can be created for various BAPIs because they contain the same or equivalent data in all BAPIs. Such parameters are known as "standardized parameters". They should be implemented in the same way in all BAPIs.

Return Parameters: Each BAPI must have an export return parameter for returning messages to the calling application. To provide application programmers with a consistent error handling process for BAPI calls, all Return Parameters must be implemented in the same standardized way.

Change Parameters: For the BAPIs that cause database changes (for example, Change and Create BAPIs), you must be able to distinguish between parameter fields that contain modified values and parameter fields that have not been modified. This diffrentiationis made through the use of standardized parameters.

3.1.2 Custom BAPI

Though SAP provides a bunch of ready-to-use BAPI's but you can also create your own BAPI(s) easily if required.

Custom BAPIs can be created as per the business requirement of the Customer / Project. Generally, the option of using the Standard BAPIs is explored to see if the requirement can be satisfied, otherwise Custom BAPI can be used.

Custom BAPI's code can always be updated according to the business requirements, at any point of time, unlike Standard BAPI's which you cannot change. Information about the updated BAPI can be retrieve by Adapter for SAP at any point of time.

3.2 Remote Enabled Function Modules (RFCs)

RFC is the protocol used by SAP for remote communication, that is, for communications between remote (independent) systems.

A Remote Function Call (RFC) is the call or remote execution of a Remote Function Module in an external system.

RFC is used for communications between two independent SAP systems, or for communications between an SAP system and a non-SAP system, such as an external application. It can also be used for communications between modules on the same system.

Using the RFC interfaces, you can extend the functionality of R/3 applications from an external program.

Compared to using the GUI interfaces, using RFC interfaces requires more knowledge of the business logic of the R/3 applications with which you are integrating the external application.

RFC is the standard SAP interface for communication between SAP systems. RFC calls a function to be executed in a remote system.

Note: The Oracle Adapter for SAP supports all datatype and parameter types including Import, Export, Table and Changing Parameter.

3.2.1 Standard RFC

SAP provides a range of ready-to-use RFCs based on different business requirements. Standard RFC can be called and executed remotely by an external system like Adapter for SAP. For example, RFC_READ_TABLE is a standard SAP function module available within R/3 SAP systems. This returns the details of the fields present within an SAP table.

3.2.2 Custom RFC

If Standard RFCs are not enough to meet business/customer requirements then Custom RFCs are created. You can later update the custom RFC according to the requirement. Adapter for SAP can then use the updated custom RFC.

3.3 Intermediate Document (IDoc)

Intermediate Document (IDoc) is a standard SAP document format. IDocs enable the connection of different application systems using a message-based interface. The use of IDocs has three main aims:

- Structured exchange and automatic posting of application documents.
- Reduction of the varying complex structures of different application systems to one simple structure. For example, the structure of an SAP application document and the structure of the corresponding Electronic Data Interchange (EDI) message according to the UN/EDIFACT standard.
- Detailed error handling before the data is posted in the application. IDocs can be regarded and defined on two levels: On a technical level and on an application level. The technical level enables the support of cross-application functions such as routing and technical error handling.

Intermediate Documents (IDocs) are the "logical messages" that correspond to different business processes. They enable different application systems to be linked by a messagebased interface. The IDoc type indicates the SAP format to use to transfer the data for a business transaction. An IDoc is a real business process in the form of an IDoc type that can transfer several message types.

3.3.1 Standard IDoc

Standard IDocs are available in SAP for meeting most of the business requirements. Standard IDocs can be used for exchanging and automatic posting of application documents. For example, MATMAS01 is a standard IDoc available in the SAP Form Material Master data.

3.3.2 Custom IDoc

Custom IDocs are created according to the special business/customer requirements for which standard IDoc is not already available. If later some changes are required in IDoc, it can be done in Custom IDocs. The Adapter for SAP will be able to use the latest updated IDoc.

3.3.3 Extended IDoc

When the Standard IDocs provided by SAP are not sufficient for a business process, you can use Extended IDoc. Extension of an IDoc can take place whenever dictionary table has a new structure appended, as required by the business process.

Extension of an IDoc takes place when extra fields are required for the business process. For instance, when you already have a predefined IDoc type say "*INVOIC02*", but the requirement is to transfer additional structure containing VBRK-KTGRD (Account assignment group for this customer) and VBRK-MANSP (Dunning block). To meet the requirement, you will have to create a segment structure by adding segment with two additional fields as an extension to the existing IDoc type '*INVOIC02*'. Thus IDoc extension is adding extra functionality to the existing message type.

<u>4</u>

SAP Java Connector 3.x

This chapter describes the SAP JCo 3.x library. SAP Java Connector 3.x is a standalone java library to connect with any SAP R/3 system. SAP JCo supports communication with the AS ABAP (Application server for ABAP) in both directions: Inbound (Java calls ABAP) and Outbound calls (ABAP calls Java).

You can find further information on the communication between SAP Java applications and the ABAP environment in the SAP Library: http://help.sap.com

The section contains the following topics:

- Section 4.1, "Supported Systems and Platforms"
- Section 4.2, "Performance"
- Section 4.3, "RFC Server Threads"
- Section 4.4, "Trace Level Parameter"
- Section 4.5, "JCo Supported SAP Data types "

4.1 Supported Systems and Platforms

SAP JCo 3.0 is supported by SAP JVM 5 and 6 versions as well as for Java 5, 6, and 7 Standard Editions of the corresponding platform vendor. You should use the SAP JVM 5 or 6, because it adds further diagnostic support features and it is also not subject to the end-of-maintenance restrictions of the JVMs of other vendors.

The JCo 3.0 release is supported for the operating systems mentioned in the following link (SAP Note #1077727) in combination with the SAP JVM 5 or Java 5 Standard Edition of the corresponding platform vendor.

SAP R/3 does not support the particular JVM if that is not included in the list of supported JVMs.

Generally a new patch level is downwards compatible to the previous patch levels of the same release. So the files of an old JCo 3.0 installation may simply be replaced with the latest ones. SAP JCo 3.0 is replacing SAP JCo 2.0 and SAP JCo 2.1 and is released for Java 5, 6, and 7 version.

SAP JCo 3 with combination of SAP JVM 5/6 or JAVA 5/6 supports 64 and 32 bit operating system. From SAP JCo 3 onwards, it does not support 32 bit UNIX system.

4.2 Performance

This section describes the Connection configuration in detail like Connection pooling and thread related management and caching of metadata for faster performance.

4.2.1 Connection Management

SAP JCo 3 initiate many useful changes in Connection Management rather than just creating direct connections to the SAP system. SAP JCo provides connection pooling and thread related management. This Pool is managed by JCo; JCo is responsible for creating and removing connections from pool. This improves JCo throughput performance.

This allows reusing of connections without having to go through the expensive logon process again. If a connection that is not part of the internal array is returned to the pool. (This is only possible if maximum connection is larger than maximum pool size).

Make connection peak limit large enough so that the limit is never reached. An exception to this would be the small pools used for individual named user. Here a small maximum connection is a suitable way to ensure that the same user does not have an inordinate number of sessions with the SAP system.

4.2.2 Connection Pooling

In SAP JCo 3.0, the connection setup is no longer implemented explicitly using a single or pooled connection, Instead the type of connection is determined only by the connection properties (properties) that define a single or pooled connection implicitly. Besides making direct connection, you can use pool connection to make it available instead of creating a connection every time. There is a limit to the maximum number of connections that can be active in pool and their timeout in JCo Destination connection parameters. Below are the parameters that are defined to configure connection pool, as shown in Figure 4-1.

O Edit SAP R/3 Connection	×
Connection Name: DefaultClient	<u>I</u> mport
User Connection Management	
Connection Management Parameters: (Optional)	
Pool Capacity:	
Pe <u>a</u> k Limit:	
Max Wait (ms):	
Expir_ation Time (ms):	
Expiration Period (ms):	
Server Security Trace Management Additional	Test Connection
	<u></u>
	•
Help	OK Cancel

Figure 4-1 Management Tab

Table 4-1 lists and describes the JCo parameters used in connection management.

Table 4-1 JCo Parameters

Parameter	Description
jco.destination.peak_limit	Maximum number of active connections that can be created for a destination simultaneously.
jco.destination.pool_capacity	Maximum number of idle connections kept open by the destination. A value of 0 has the effect that there is no connection pooling that is connections will be closed after each request.
jco.destination.expiration_time	Time in milliseconds after that the connections hold by the internal pool can be closed.
jco.destination.expiration_chec k_period	Interval in milliseconds with which the timeout checker thread checks the connections in the pool for expiration.

jco.destination.max_get_client_	Maximum time in milliseconds to wait for a connection, if
time	the maximum allowed number of connections is allocated by
	the application.

Note: The Management tab is not supported for the current release, it will be introduced in the future releases.nline BAPIs(which call SAP screens) were not supported by Adapter for SAP.

4.2.3 Caching of Metadata

SAP Java connector API cache repository metadata into local cache to avoid number of calls to the SAP system. This feature improves performance of SAP JCo. Metadata for functions and parameters will be fetched at the first request and will be stored in the repository cache. SAP JCo 3 handles object caching itself and hence the developers do not need to take care of that. API provides some method to clear cached metadata.

4.3 RFC Server Threads

SAP JCo 3.0 provides RFC Server module that helps to run an RFC function module on non-SAP system. The SAP ABAP program can invoke this function module. These java programs register using a program ID in SAP R/3 Gateway using server threads.

After connection, these RFC programs wait for incoming calls from the SAP system. Server threads listen for any incoming messages from the SAP system on a particular program ID. For this, the program ID should be registered with the SAP system. If RFC Connection once interrupted, JCo server automatically registers itself again with the SAP Gateway.

Configuration parameters can be used to make the throughput more efficient. This configuration can be changed in the Adapter through the WebLogic console.

If program ID with the same name is registered multiple times from different RFC servers, IDoc sent on that program ID from SAP system get transferred to one of the registered RFC server based on default **Load Balancing** scenarios. You can modify load balancing scenario based on your requirement. For modification, consult with your SAP system administrator.

4.4 Trace Level Parameter

SAP JCo 3 uses the RFC and CPIC API. Traces generated by these components include JCo API calls, RFC traces, and CPIC traces. You can trace JCo API calls by enabling the JCo traces and setting the appropriate trace level in the Adapter configuration.

The Trace level property specifies the level of detail in the traces produced by JCo. The amount of trace data increases with trace level, and each level contains all of the trace data from the lower levels. If you choose one of the higher trace levels, you need to ensure that you have enough free disk space available.

SAP JCo 3 provides trace configuration to trace information. JCo 3 defines parameters for different type of logging. *jco.client.trace* parameter is used to define logging level for RFC logs. Possible values are 0 (disable) or 1(enable). *jco.client.cpic_trace* parameter is used for CPIC trace logs. Possible values for CPIC trace is given in Table 4-2.

Table 4-2 CPIC Trace Value

Parameter	Description
-1	Take over environment value
0	No trace
1	Errors
2	Errors and warnings
3	Info messages, errors and warnings

jco.server.trace parameter is used for JCo RFC Server level logging. Possible values are 0 (enable), 1 (disable).

dev_jrfc.trc is always created when an RFC error occurs, even if traces are turned off.

JCo tracing can be turned on using *jco.trace_level* property as an environment variable. This enables logging for all API and communication happening in JCo. Possible values and their description are given in Table 4-3.

Table 4-3JCo Trace Value

Parameter	Description
0	Nothing
1	Errors
2	Errors and warnings
3	Info messages, errors and warnings
4	Execution path, info messages, errors and warnings
5	Verbose execution path, info messages, errors and warnings
6	Verbose execution path, limited data dumps, info messages, errors and warnings
7	Full execution path, data dumps with metadata, verbose info messages, errors and warnings
8	Full execution path, full data dumps with metadata, verbose info messages, errors and warnings

Note that the trace file can be find at {jdev_home}\jdev\bin.

4.5 JCo Supported SAP Data types

The Adapter for SAP allows all JCo supported SAP data types that can be used in data exchange between SOA composites and SAP applications. Table 4-4 shows the mapping between basic ABAP data types used in SAP application and JCo java data types.

ABAP Type	Description	Data Type
С	Character	String
Ν	Numerical Character	String
Х	Binary Data	Byte ()
Р	Binary Coded Decimal	Big Decimal
Ι	4-byte Integer	Int
В	1-byte Integer	Int
S	2-byte Integer	Int
F	Float	Double
D	Date	Date
Т	Time	Date
decfloat16	Decimal floating point 8 bytes (IEEE 754r)	BigDecimal
decfloat34	Decimal floating point 16 bytes (IEEE 754r)	BigDecimal
G	String (variable length)	String
Y	Raw String (variable length)	Byte ()

Table 4-4Mapping between basic ABAP data types used in SAP application and JCojava data types

Additional ABAP data types are handled as follows:

- Type h (Hierarchical) supported, as JCo tables.
- Nested supported, record within record.
- Deep supported, if referenced type is supported.

5

Oracle Adapter for SAP Features

The latest 12.2.1 Release provides new features for the Oracle Adapter for SAP, which is described in this chapter. This chapter contains the following sections:

- Section 5.1, "tRFC/qRFC/bgRFC Support"
- Section 5.2, "Design-Time Test Functionality"
- Section 5.3, "Exception Filter"
- Section 5.4, "Schema Validation"
- Section 5.5, "AutoSYSTAT Feature for RFC "
- Section 5.6, "Encode IDoc "
- Section 5.7, "Generic IDoc Support "
- Section 5.8, "Revision IDoc Support"
- Section 5.9, "Sharing Program ID Feature "
- Section 5.10, "Multiple IDoc Support"
- Section 5.11, "Credential Mapping for Oracle SOA Suite (BPEL, Mediator, BPM or OSB)"
- Section 5.12, "Stateful Interaction"
- Section 5.13, "Error Handling"
- Section 5.14, "SOA Debugger Support"
- Section 5.15, "Non-XML Characters Handling Support"
- Section 5.16, "Error Document Support"
- Section 5.17, "Payload Threshold Support"
- Section 5.18, "TID Backstore Support"

5.1 tRFC/qRFC/bgRFC Support

These are the SAP communication methods which are supported by the Adapter for SAP in the outbound processing.

Transactional RFC (tRFC): This is an asynchronous communication method that manages to execute the called function in the target system only once. The listener to the port need not to be available at the time when the RFC client program SAP is executing a tRFC. The tRFC component stores the called RFC function together with the corresponding data, in the SAP database under a unique transaction ID (TID).

Queued RFC (qRFC): This is also an asynchronous communication method which guarantees that multiple requests are processed in the order, specified by the sender. tRFC can be serialized using queues (inbound and outbound queues). In simple, the tRFC requests which are serialized using the inbound/outbound queues in SAP, are called queued RFC (qRFC). qRFC is therefore an extension of tRFC. It processes and request only if it has no predecessors in the same queue. You can use qRFC if requirement is to guarantee that several requests are processed in a defined order. This section provides the details of modeling and testing of an endpoint in the tRFC/qRFC communication method as mentioned below:

- Modeling the tRFC SAP Endpoint
- Testing the tRFC SAP Endpoint
- Modeling the qRFC SAP Endpoint
- Testing the qRFC SAP Endpoint

Background RFC (bgRFC): bgRFC is an asynchronous communication method supported by SAP ERP to support recording of the transactions at called application side which can be executed later. User can submit execution of multiple function unit to SAP ERP in single transaction. However, it must be verified that those function units should be independent to each other. bgRFC Support execution in two modes:

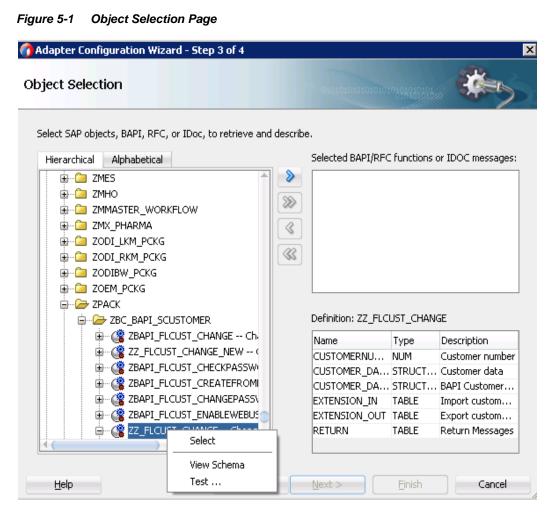
Type t: If bgRFC with exactly once execution is required

Type q: If bgRFC with order of execution of function unit is required

5.1.1 Modeling the tRFC SAP Endpoint:

- 1. To create a tRFC SAP Endpoint, create an outbound RFC project. (For more information, refer to the section "Design an Outbound BPEL Process").
- 2. In the Object Selection page, right-click on any RFC and then click on Select, as shown in Figure 5-1.

The selected RFC appears in the Select BAPI/RFC functions or IDOC messages area.



3. Right-click on the selected RFC and select RFC Options, as shown in Figure 5-2.

Figure 5-2	Selected RFC				
🕜 Adapter C	onfiguration Wizard - Ste	p 3 of 4			>
Object Sel	lection				-
	objects, BAPI, RFC, or IDoc,	to retrieve and descri		- 6	
Hierarchi			· · · ·		or IDOC messages:
	ZMES		ZZ_FLCUST_C		Thange Elight Custo
- E - C				_	RFC Options
) ZMMASTER_WORKFLOW) ZMX PHARMA				
	ZODI LKM PCKG	8			
	ZODI_RKM_PCKG				
 	ZODIBW_PCKG				
÷2	ZOEM_PCKG		+() >
	→ ZPACK				
É	- 🗁 ZBC_BAPI_SCUSTOMER	u	Definition: ZZ_FLC	UST_CHAN	GE
	🗄 🎯 ZBAPI_FLCUST_CH		Name	Туре	Description
	E CLARK		CUSTOMERNU	NUM	Customer number
	E COST_CH		CUSTOMER_DA	STRUCT	Customer data
	B ZBAPI_FLCUST_CR		_		BAPI Customer
	B ZBAPI_FLCUST_CH		EXTENSION_IN	TABLE	Import custom
	E ZBAPI_FLCUST_EN		EXTENSION_OUT		Export custom
	E CLARK	se Chang	RETURN	TABLE	Return Messages
4		P			
Help		< <u>B</u> ack	<u>N</u> ext >	<u>F</u> inish	Cancel

The Configure RFC Option window appears.

- 4. Select the **tRFC** radio button, as shown in Figure 5-3.
- 5. Click OK.

Figure 5-3 Configure RFC Option

RFC (synchrono	us)		
) tRFC (transactio	nal)		
gRFC (queued)	Queue Name:	OSAQUEUE	
BGRFC			

6. Click Finish.

The jca file of the project looks like as shown in Figure 5-4.

Figure 5-4 JCA File

<pre>adapter-config name="sapReference" adapter="sap" wsdlLocation="/WSDL</pre>
<connection-factory location="eis/SAP/FMWDEMO" operation="ZZ_FLCUST</pre></th></tr><tr><th><pre>interaction-spec className=" oracle.tip.adapter.sap.outbound.sapint<="" pre="" sapreference_pt"="" uiconnectionname="Defa</th></tr><tr><th><pre>endpoint-interaction portType="></connection-factory>
<property name="Interaction" value="stateless"></property>
<property name="ExceptionFilter" value="off"></property>
<property name="SchemaValidation" value="off"></property>
<property name="RFC" value="ZZ FLCUST CHANGE"></property>
<property name="Type" value="TRFC"></property>
<pre><endpoint-interaction interaction"="" operation="OSA_CMD_C</pre></th></tr><tr><th><pre></th></tr><tr><th><property name=" porttype="sapReference_PT" value="stateless"></endpoint-interaction></pre>
<property name="ExceptionFilter" value="off"></property>
<property name="SchemaValidation" value="off"></property>
<property name="RFC" value="OSA_CMD_CONFIRM_TID"></property>
<property name="Type" value="CMD"></property>

5.1.2 Testing the tRFC SAP Endpoint

- 1. Deploy project. (For more information, refer to the section "Deploy the Defined Process").
- **2.** Test deployed the project by sending the request messages while providing a TID value, as shown in Figure 5-5.

Figure 5-5 tRFC Endpoint

3. Make sure the TID value provided, is unique every time a new request is sent to SAP, else the RFC execution will not happen.

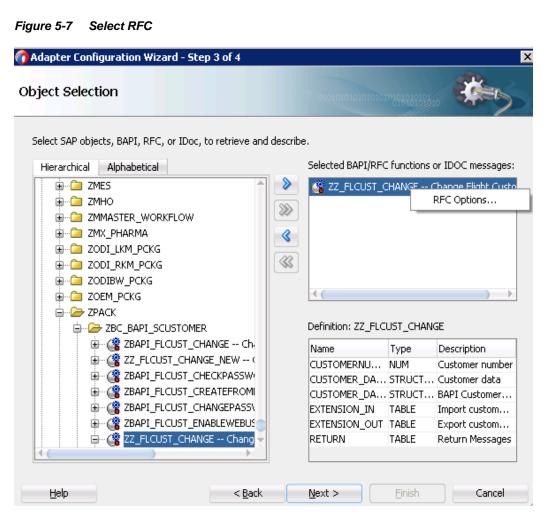
5.1.3 Modeling the qRFC SAP Endpoint

- **1.** To create a qRFC SAP Endpoint, create an outbound RFC project. (For more information, refer to the section "Design an Outbound BPEL Process").
- 2. In the **Object Selection** page, right-click on any RFC and then click on **Select**, as shown in Figure 5-6.

The selected RFC appears in the Selected BAPI/RFC functions or IDOC messages area.

Figure 5-6 Object Selection Page				
👩 Adapter Configuration Wizard - Step 3 of 4				×
Object Selection		0101010101010101	°89898988	*
Select SAP objects, BAPI, RFC, or IDoc, to retrieve a	nd describe	Selected BAPI/RFC	functions o	or IDOC messages:
ZMES ZMHO ZMMASTER_WORKFLOW ZMX_PHARMA ZODI_LKM_PCKG ZODI_RKM_PCKG ZODIBW_PCKG ZOEM_PCKG ZOEM_PCKG ZOEM_PCKG ZOEM_PCKG		Definition: ZZ_FLCI	UST_CHAN(ΞE
ZBAPI_FLCUST_CHANGE Ch ZZ_FLCUST_CHANGE_NEW (ZZ_FLCUST_CHANGE_NEW (ZBAPI_FLCUST_CHECKPASSW ZBAPI_FLCUST_CREATEFROMI ZBAPI_FLCUST_CHANGEPASSN ZZ_FLCUTT_CHANGEPASSN Select Select View Schema		EXTENSION_OUT	STRUCT STRUCT TABLE	
Help Test		<u>N</u> ext >	Einish	Cancel

3. Right-click on the selected RFC and select RFC Options, as shown in Figure 5-7.



The Configure RFC Options window appears.

- 4. Select the **qRFC** radio button, as shown in Figure 5-8.
- 5. Enter the queue name in the Queue Name field. This queue should exist in the SAP system.
- 6. Click OK.

Figure 5-8 Configure RFC Option

RFC (synchronou tRFC (transaction		
qRFC (queued)	OSAQUEUE	

7. Click Finish.

The jca file of the project looks like as shown in Figure 5-9.

Figure 5-9 JCA File



5.1.4 Testing the qRFC SAP Endpoint

- 1. Deploy project. (For more information, refer to the section "Deploy the Defined Process").
- **2.** Test deployed the project by sending the request messages while providing a TID value, as shown in Figure 5-10.

Figure 5-10 Test qRFC Endpoint

S0 AP	Re	equest 1
٠	+	🛔 💱 🖸 🗖 🛱 🛢 🛛 http://10.30.32.116:7005/soa-infra/services/default/QRFC_OL
XML		<soapenv:envelope 678hgjk"="" xmlns:soapenv="http://schemas.xmlsoap.org/soa</th></tr><tr><th></th><th></th><th><soapenv:Header/></th></tr><tr><th>Raw</th><th></th><th><soapenv:Body></th></tr><tr><th>ď</th><th></th><th><pre><urn:ZZ_FLCUST_CHANGE tid="></soapenv:envelope>
		<pre><urn:customernumber>00000453</urn:customernumber></pre>
		<urn: customer="" data=""></urn:>

- **3.** Make sure that the TID value provided is unique every time a new request is sent to SAP, else the RFC execution will not happen.
- 4. The request message can be seen in the SAP queue with SMQ2 tcode, as shown in Figure 5-11.

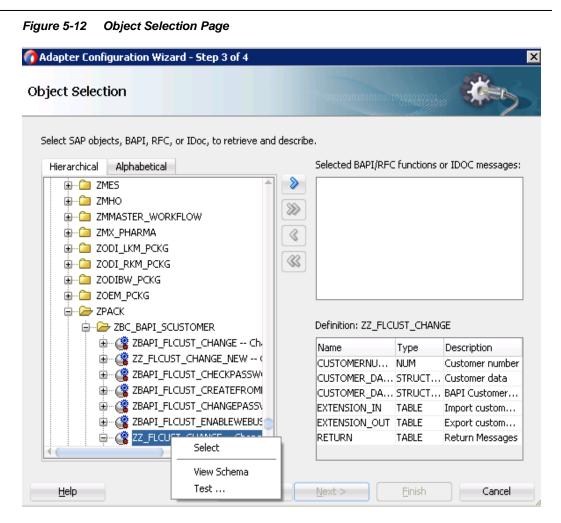
Figure 5-11 qRFC Monitor

② 4 目 ② ③ ▲ 編載 2 2 2 むむ 回回 ◎ 編 <i>qRFC Monitor (Inbound Queue)</i>								
î I	🕽 &r 🕒 😒							
сı.	User	Function Module	Queue Name	Date	Time	StatusText	TID	Original
800	JCA_DEV	STOP	OSAQUEUE	10.10.2014	11:50:15	Transaction recorded	QLOCKSIN111111111111111	
800	JCA_DEV	ZZ_FLCUST_CHANGE_RATE	OSAQUEUE	10.10.2014	11:50:51	Transaction recorded	0A1E202A18B454377AC30FFC	13344545

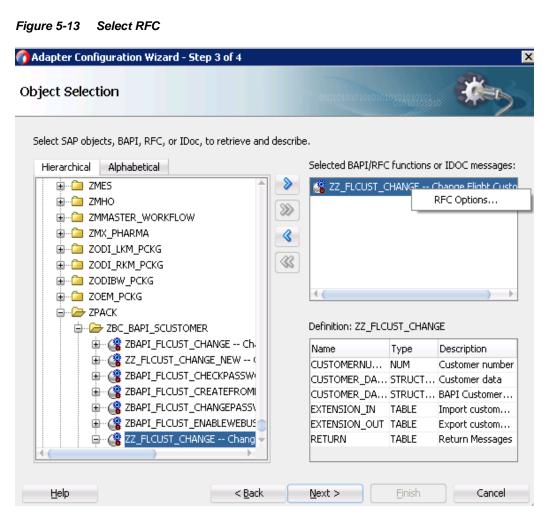
5.1.5 Modeling the bgRFC SAP Endpoint

- 1. To create a bgRFC SAP Endpoint, create an outbound RFC project. (For more information, refer to the section "Design an Outbound BPEL Process").
- 2. In the **Object Selection** page, right-click on any RFC and then click on **Select**, as shown in the Figure below.

The selected RFC appears in the Selected BAPI/RFC functions or IDOC messages area.



3. Right-click on the selected RFC and select RFC Options, as shown in the Figure below.



The Configure RFC Options window appears.

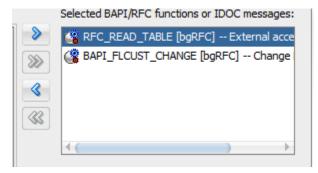
4. Select the **bgRFC** radio button, as shown in Figure 5-8.

Figure 5-14 Configure RFC Option

O Configure RFC Options	×
 RFC (synchronous) tRFC (transactional) qRFC (queued) Queue Name: 	OSAQUEUE
● BGRFC	
<u>H</u> elp	OK Cancel

- 5. Click OK.
- 6. You can set more than one RFC as an bgrfc mode as show in Figure below

Figure 5-15 Configure RFC Option



- 7. Click Next. At Properties page you can specify the queues that you want to use in bgRFC Type q execution, you can skip this if bgRFC of Type t execution is required.
- 8. Click on the Add button as shown below.

Figure 5-16 Configure RFC Option

CA Properties	01010101010101010404040
Specify the Name and Value of all JCA A	apter Properties.
roperties	-+
lame	Value
nteraction	stateful
xceptionFilter	off
chemaValidation	off
a.retry.count	9
a.retry.interval	1
a.retry.backoff	2
a.retry.maxInterval	120

9. You can choose BGRFCQueues property from the drop-down and can choose value for that as shown in figure below

Figure 5-17 Configure RFC Option

JCA Properties	0101010101010101010101036
Specify the Name and Value of all JCA A	dapter Properties.
Properties	
Name	Value
Interaction	stateless
ExceptionFilter	off
SchemaValidation	off
jca.retry.count	9
jca.retry.interval	1
jca.retry.backoff	2
jca.retry.maxInterval	120
-	
1	

10. Click on the appeared row, a drop-down menu appears with the properties list .Select BGRFCQueues property from the option as shown in the figure below.

Figure 5-18 Configure RFC Option

Properties		
Name	Value	
Interaction	stateless	
ExceptionFilter	off	
SchemaValidation	off	
jca.retry.count	9	
jca.retry.interval	1	
jca.retry.backoff	2	
jca.retry.maxInterval	120	
ErrorDocument	•	
ErrorDocument		
BGRFCQueues		

11. Provide queue names in the Value columns as shown in the figure below.

JCA Properties	
Specify the Name and Value of all JCA A	dapter Properties.
Properties	4 ×
Name	Value
Interaction	stateless
ExceptionFilter	off
SchemaValidation	off
jca.retry.count	9
jca.retry.interval	1
jca.retry.backoff	2
jca.retry.maxInterval	120
BGRFCQueues	ZBG1,ZBQueue2,ZBGQueue3

Figure 5-19 Configure RFC Option

12. Click Finish.

The jca file of the project looks like as shown in the Figure below.

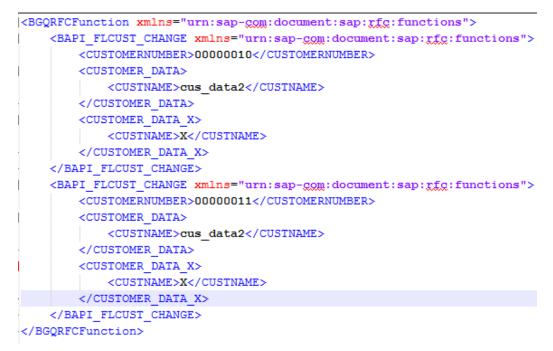
Figure 5-20 JCA File

2	connection-factory UIConnectionName="sdjb" location="eis/SAP/FMNDEMO"/>
¢	endpoint=interaction portType="sapReference_2_PT" operation="BGQRFCFunction">
	<pre><interaction-spec ;<="" classname="oracle.tip.adapter.sap.outbound.SAPInteractionSpecImpl" pre=""></interaction-spec></pre>
Ī	<property name="BGRFCQueues" value="2BG1,2BQueue2,2BGQueue3"></property>
	<property name="Interaction" value="stateless"></property>
	<property name="ExceptionFilter" value="off"></property>
	<property name="SchemaValidation" value="off"></property>
	<property name="RFC" value="RFC READ TABLE, BAPI FLCUST CHANGE, "></property>
	<property name="Type" value="BGRFC"></property>
<	/endpoint-interaction>

5.1.6 Testing the bgRFC SAP Endpoint

- **1.** Deploy the project. (For more information, refer to the section "Deploy the Defined Process").
- 2. Test the deployed project by sending the request messages, as shown in the Figure below.





3. You can add more data to BAPI_FLCUST_CHANGE as it is unbounded defined in the schema.

5.2 Design-Time Test Functionality

The design-time test functionality, available in Adapter, is used to test any SAP object in the design-time itself. It returns the result of the execution in the Adapter wizard. This feature is applicable only for outbound testing of RFC and BAPI objects, but not for IDocs.

5.2.1 Using the Design-Time Test Functionality

1. On **Object Selection** page in the Adapter Configuration Wizard, right-click on any objects (BAPI/RFC) and then click **Test** button, as shown in Figure 5-22.

Adapter Configuration Wizard - Step 3 of 4	
bject Selection	01010101010101010404040404
Select SAP objects, BAPI, RFC, or IDoc, to retrieve and d	
Hierarchical Alphabetical	Selected BAPI/RFC functions or IDOC messages:
Cross-Application Components Customer Service Enterprise Controlling Enterprise Portal Environment, Health and Safety Financial Accounting Accounts Payable	BusinessArea.GetDetail [BAPI_BUSINESSAR]
Accounts Receivable Acset Accounting	
Asset Accounting Bank Accounting	Definition: GetDetail
Contract Accounts Receivable and	Name Type Description
General Ledger Accounting	BUSINESSAREAID CHAR Business area
🕀 🗁 Special Purpose Ledger	LANGUAGE CHAR Language
⊞…22 Travel Management	LANGUAGE_ISO CHAR Language acco
🛱 💮 🕘 BusinessArea	BUSINESSAREA STRUCT Business area
ExistenceCheck	RETURN STRUCT Return code
VIEW DUICING	

Figure 5-22 Adapter Configuration Wizard

2. Provide the necessary inputs and click **Run Test** button, as shown in Figure 5-23.

Test Input Test Outpu Name	Value	Description
📲 GetDetail	Value	Business Area Details
	1500	Business area
	E	Language
LANGUAGE_ISO	E	Language according to IS.

Figure 5-23 Test Dialog

This shows result of the BAPI/RFC executed, as shown in Figure 5-24.

Figure 5-24 Test Output

🗊 Test SAP RFC/BAPI Method	×
Test Input Test Output	
<pre><?xml version = '1.0' encoding = 'UTF-8' standalone = 'yes'?> <bapi_businessarea_getdetail> <input/> </bapi_businessarea_getdetail></pre>	Î
<businessareaid>1500</businessareaid> <language>E</language>	
<language_iso>E</language_iso>	
<output> <businessarea detail=""></businessarea></output>	
<bus area="">1500</bus>	
<pre><bus_ar_des>Consumer Products: Food</bus_ar_des></pre>	
<cons ba="">1500</cons>	
<return></return>	
<type></type>	
<code></code>	
<message></message>	
<log_no></log_no>	
<log_msg_no>000000</log_msg_no>	
<message_v1></message_v1> <message_v2></message_v2>	
<message v3=""></message>	_
Help Run Test	Done

The BAPIs which takes structure or table as an input , needs to follow the below steps to run the design time functionality test.

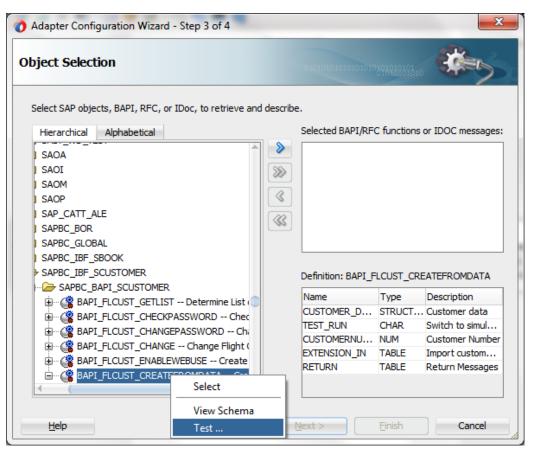


Figure 5-25 Result Dialog

Right-click on the CUSTOMER_DATA, click on Expand to expand the structure.



Test SAP RFC/BAPI Method		
Test Input Test Output	Value	Description
BAPI_FLCUST_CREATEFROMDATA Cre		Description
CUSTOMED DATA	ate N	Create New Flight Customer Customer data
COSTON Expand Extensi Add Row Return Remove		Switch to simulation mode Import customer enhancem Return Messages
11-1-		Due Test
Help		Run Test Done

Now give the required input as mentioned below , then Click on ${\bf Run\ Test}$ button.

Test Input	Test Output	
Name	Value	Description
😤 BAPI_FLO	UST_CREATE	Create New Flight Custo
	OMER_DATA	Customer data
- <u> </u>	USTNAME 1234	Customer name
	ORM	Form of address
🗋 s	TREET	Street
🗋 P	OBOX	PO Box
- D P	OSTCODE	Postal Code
🗋 o	ITY	City
- D C	OUNTR	Country Indic.
- D C	OUNTR_ISO	ISO country code
🗋 R	EGION	Region
🗋 P	HONE	Telephone number of fli
E E	MAIL	Customer e-mail address
- C C	USTTYPE	Customer type
🗋 D	ISCOUNT	Discount rate
- D L	ANGU	Language Key
i	ANGU_ISO	ISO language code

5.3 Exception Filter

The Adapter for SAP provides a JCA interaction spec property, "ExceptionFilter", to enable the adapter to filter outbound exceptions using an exception filter class. A default implementation, *oracle.tip.adapter.sap.exception.SAPExceptionFilter*, is included with the Adapter for SAP. It filters the JCO exceptions into PCRetriableResourceException (a remote fault) or PCResourceException (a binding fault), supported by the Oracle Fault handling and rejection framework. The default exception filter can be replaced with a custom filter by changing the className attribute of <exception-filter> element in the generated JCA file.

5.3.1 Create an Exception Filter Project

Perform the following steps to create an SAP Endpoint with Exception Filter feature:

1. Create an outbound BAPI/RFC/IDoc endpoint using the Adapter for SAP.

(For more information, refer to the section "Configure the Adapter Component" under BPEL Outbound Process)

2. Set "ExceptionFilter" property to on in the JCA Properties page, as shown in Figure 5-28.

Adapter Configuration Wizard - Step 4 of 5				×
JCA Prop <mark>e</mark> rties				*
Specify the Name and Value of all JCA Adapter Propert	ies.			
Properties			4	• ×
Name	Value			
Interaction	stateless			
ExceptionFilter	on			
SchemaValidation	off			
jca.retry.count	9			
jca.retry.interval	1			
jca.retry.backoff	2			
jca.retry.maxInterval	120			
Help < Ba	ick <u>N</u> e;	«t >	Einish	Cancel

Figure 5-28 Exception Filter Property

5.3.2 Testing the Exception Filter Project

Remote Fault: PCRetriableResource Exception

To test the Exception Filter Project:

- 1. Deploy the project with exception filter **on**. (For more information, refer to the section "Deploy the Defined Process").
- 2. Simulate an exception by disconnecting the WebLogic server from SAP, for example, lock the SAP user.
- **3.** Execute the outbound project.
- 4. The output fails with an error message.
- 5. Check the SOA server diagnostic log.

It contains an exception as given below and shown in Figure 5-29.

```
oracle.tip.adapter.sap.exception.SAPExceptionFilter@301155b3.appl
yFilter(): javax.resource.ResourceException:
com.sap.conn.jco.JCoException: (103) JCO_ERROR_LOGON_FAILURE:
User is locked. Please notify the person responsible on
```

10.30.32.42 sysnr 00 linked to class com.sap.conn.jco.JCoException wrapped with oracle.tip.adapter.api.exception.PCRetriableResourceException

Figure 5-29 SOA Server Diagnostic Log Screen

Proot@JCADEV2:/oracle/stage9/Middleware/user_projects/domains/soa_domain/servers/soa_server1/logs
ap] [tid: [ACTIVE].ExecuteThread: '5' for queue: 'weblogic.kerne
tuning)'] [userId: <anonymous>] [ecid: 61423db6-eccf-4297-90c4-)</anonymous>
bad8,0] [APP: soa-infra] [J2EE_APP.name: soa-infra] [J2EE_MODULI
WEBSERVICE.name: bpelprocess1_client_ep] [WEBSERVICE_PORT.name:
racle.soa.tracking.FlowId: 1806838] [oracle.soa.tracking.Instan
<pre>racle.soa.tracking.SCAEntityId: 80028] [oracle.soa.tracking.Faul</pre>
<pre>posite_name: EXFILTER_RETRY!1.0] [FlowId: 0000KC9Px1CFS8w_wDp2it</pre>
acle.tip.adapter.sap.exception.SAPExceptionFilter@15243067.appl
resource.ResourceException: com.sap.conn.jco.JCoException: (103)
_FAILURE: User is locked. Please notify the person responsible (
nr 90 linked to class com.sap.conn.jco.JCoException wrapped with
ter.api.exception.PCRetriableResourceException
[2013-12-19T11:24:52.452+05:30] [soa_server1] [ERROR] [] [oracle
<pre>id: [ACTIVE].ExecuteThread: '5' for queue: 'weblogic.kernel.Def</pre>
)'] [userId: <anonymous>] [ecid: 61423db6-eccf-4297-90c4-0c8d03</anonymous>
] [APP: soa-infra] [J2EE_APP.name: soa-infra] [J2EE_MODULE.name
VICE.name: bpelprocess1 client epl [WEBSERVICE PORT.name: EXFIL

This confirms that the exception has been captured.

Binding Fault: PCResource Exception

To test the Exception Filter Project:

- 1. Create an outbound endpoint for the RFC object BAPI_MATERIAL_GET_DETAIL, exposed as a proxy service.
- 2. Deploy the project with exception filter **on**. (For more information, refer to the section "Deploy the Defined Process").
- 3. Execute the outbound project.
- 4. The output fails with an error message.
- 5. Check the SOA server diagnostic log, as shown in Figure 5-30.

Figure 5-30 SOA Server Diagnostic Log Screen

```
teThread: '75' for queue: 'weblogic.kernel.Default (self
00cd575,0:2] [APP: soa-infra] [J2EE_APP.name: soa-infra]
ICE_PORT.name: sapReference_PT_pt] [oracle.soa.tracking.
AEntityId: 70034] [composite_name: SOA_RFC!1.0] [FlowId:
tionFilter@3a2cc38.applyFilter(): javax.resource.Resourc
material 1234 does not exist or is not activated linked
ception PCResourceException
soa_server1 diagnostic 16.log: [2013-12-27T06:35:35.614+0
teThread: '189' for queue: 'weblogic.kernel.Default (sel
000cd5cc,0:2] [APP: soa-infra] [J2EE_APP.name: soa-infra
VICE_PORT_name: sapReference_PT_pt] [oracle_soa_tracking
```

Testing RetryCount Property of the Adapter

With RetryCount property, user can set the number of times the Adapter will try to connect to SAP in case of failure in SAP connection.

1. Deploy the project with the property **jca.retry.count** in the JCA Properties page of the Adapter wizard set to the number of times you want the Adapter for SAP to try and connect to SAP. For example, jca.retry.count = 9, as shown in Figure 5-31.

Figure 5-31 JCA Properties Page

👩 Adapter Configuration Wizard - Sl	tep 4 of 5			×
JCA Properties				*
Specify the Name and Value of all JCA Ad	Japter Properties.			
Properties			÷	×
Name	Valu	ie		
Interaction	stat	eless		
ExceptionFilter	on			
SchemaValidation	off			
jca.retry.interval	1			
jca.retry.maxInterval	120			
jca.retry.count	9			
jca.retry.backoff	2			
Help	< <u>B</u> ack	<u>N</u> ext >	Einish	Cancel

- 2. Simulate an exception by disconnecting the WebLogic server from the SAP, for example, lock the SAP user.
- **3.** Execute the outbound project.
- 4. The output fails with an error message.
- 5. Check the SOA server diagnostic log.

It will show that Adapter for SAP is retrying about 9 times as there will be entries like:

- Waiting 1 second before retry #1
- Waiting 1 second before retry #2
- Waiting 4 seconds before retry #3 And so on, as shown in Figure 5-32.

Figure 5-32 SOA Server Diagnostic Log Screen

bpelprocessi client epj [WEBSERVICE PORT.name: EXFILT PT pt] [
<pre>ing.FlowId: 1806838] [oracle.soa.tracking.InstanceId: 5290530] [</pre>
<pre>ing.SCAEntityId: 80028] [oracle.soa.tracking.FaultId: 40009] [co</pre>
<pre>FILTER_RETRY!1.0] [FlowId: 0000KC9Px1CFS8w_wDp2iW1Ig07q0001ew] J</pre>
<pre>ILTER_RETRY:EXFILT [EXFILT_PT::BAPI_COMPANYCODE_GETDETAIL(param</pre>
] Waiting 64 seconds before retry #7

If while retrying, the WebLogic server is connected to SAP again by unlocking the user then there will be no more retry entries in the diagnostic log and the result of the execution will be received successfully.

Note: Manual editing of JCA properties file (.jca file) to change the value of Exception Filter property from "**on**" to "**off**" or vice-versa is not supported and the changes will not be reflected.

5.4 Schema Validation

The SchemaValidation property is used to validate the input xml during run-time execution against the xsd created for the SAP Object. You need to set the property SchemaValidation in the **JCA Properties** page to "**on**", so that the input xml is validated before sending a request. If this property is not in compliance to xsd, you will get an error message.

5.4.1 Create a Project with Schema Validation:

- 1. Create an outbound project. (For more information, refer to the section "Configure the Adapter Component" under BPEL Outbound Process)
- Set the SchemaValidation property in JCA Properties page to "on", as shown in Figure 5-33.

😚 Adapter Configuration Wizard - Step 4 of 5	5 ×
JCA Properties	01010101010101010101010101010
Specify the Name and Value of all JCA Adapter Prop	perties.
Properties	수 ×
Name	Value
Interaction	stateless
ExceptionFilter	off
SchemaValidation	on
jca.retry.count	9
jca.retry.interval	1
jca.retry.backoff	2
jca.retry.maxInterval	120
Help <	: <u>B</u> ack <u>N</u> ext > Einish Cancel

Figure 5-33 Schema Validation Property

3. Click Next and then Finish.

5.4.2 Testing the Schema Validation Project:

- 1. Deploy the project having schema validation on. (For more information, refer to the section "Deploy the Defined Process").
- 2. Enter any invalid payload input xml.
- 3. It will then give the error message as given below:

<faultcode>env:Server</faultcode>

<faultstring>Exception occurred when binding was invoked.

Exception occurred during invocation of JCA binding: "JCA Binding execute of Reference operation 'HOLIDAY_CHECK_AND_GET_INFO' failed due to: javax.resource.ResourceException: Invalid Input XML".

The invoked JCA adapter raised a resource exception.

Please examine the above error message carefully to determine aresolution.</faultstring>

```
<faultactor/>
<detail>
<exception>Invalid Input XML</exception>
</detail>
</env:Fault>
</env:Body>
```

</env:Envelope>

5.5 AutoSYSTAT Feature for RFC

The Adapter for SAP is able to send SYSTAT01 upon a successful reception of an IDoc message. For this, the AutoSYSTAT01 property in the **JCA Properties** page must be set to "**yes**". The Adapter for SAP is able to auto return SYSTAT01, based on the successful message receiving status in SAP.

5.5.1 Creating a Project with AutoSYSTAT01 Property

- 1. Create Inbound Endpoint for IDOC. For more information, refer to the section "Design an Inbound BPEL Process".
- 2. In the JCA Properties page, set the AutoSYSTAT01 property to "yes", as shown in Figure 5-34.

Adapter Configuration Wizard - Step 4 o	of 5			>
JCA Prop <mark>erties</mark>				*
Specify the Name and Value of all JCA Adapter F	roperties.			
			4	× 1
Properties				
Name	Val			
AutoSYSTAT01	yes			
EncodeIDOC	flat	file		
ProgramID				
jca.retry.count	9			
jca.retry.interval	1			
jca.retry.backoff	2			
jca.retry.maxInterval	120)		
Help	< <u>B</u> ack	<u>N</u> ext >	Einish	Cancel

Figure 5-34 AutoSystat Property

3. Complete the project.

5.5.2 Test the Project with AutoSystat Property

- 1. Deploy the project with AutoSystat property set to "yes". (For more information, refer to the section "Deploy the Defined Process").
- 2. Send an IDoc from SAP. For example, a COSMAS IDoc sent through BD16 tcode, as shown in Figure 5-35.

Figure 5-35 Send Cost Center			
Send cost center			
Image: A state of the state		31111111111111111111111111111111111111	💥 🚬 🕜 ⊑
Send cost center			
Ð			
Controlling area	1000	to	
Cost center	3040	to	
Message type	COSMAS		
Target system	ORACLESAP		
Parallel processing			
Server group			
Cost centers per process	20		

- **3.** Navigate to tcode WE02 of SAP.
- **4.** It will show the status IDoc coming from the Adapter as an acknowledgement of receiving the COSMAS IDoc, as shown in Figure 5-36.

Figure 5-36 SAP IDoc Display

IDoc display IDoc 000000000857171 Control Rec. Data records Total r Status records Total r Ressage type STATUS Partner No. ORACLESAP Partn. Type LS Port A000000068	💀 🖹 SAP			
Iboc 000000000857171 Control Rec. Data records Total r Status records Total r Basic type SYSTATOL Extension Message type STATUS Partner No. ORACLESAP Partn. Type LS Port A000000068			_	
Control Rec. Direction 2 Inbox Current status 53 CO Basic type SYSTATOL Extension Message type STATUS Partner No. ORACLESAP Partn.Type LS Port A000000068 Content of selected segment Fld name Fld cont.			Technical short	: info
Data records Total r Current status 53 Status records Basic type Status records Basic type Status records Basic type Basic type STATUS Partner No. ORACLESAP Partn. Type LS Port A000000068 Content of selected segment			Direction	2 Inbox
Extension Extension Extension Message type STATUS Partner No. ORACLESAP Partn.Type LS Port A000000068 Content of selected segment Fid name Fid cont.		Total r	Current status	53 00
Message type STATUS Partner No. ORACLESAP Partn.Type LS Port A000000068 Content of selected segment Fld name Fld cont.	👂 🧰 Status records		Basic type	SYSTAT01
Partner No. ORACLESAP Partn.Type LS Port A000000068 Content of selected segment			Extension	
Partn.Type LS Port A000000068 Content of selected segment			Message type	STATUS
Port A000000068 Content of selected segment			Partner No.	ORACLESAP
Content of selected segment			Partn.Type	LS
Fld name Fld cont.			Port	A00000068
Fld name Fld cont.				
			Content of sele	cted segment
			Fld name Fld	cont.
				•

Figure 5-35 Send Cost Center

5.6 Encode IDoc

SAP uses a non-XML text-based format, called 'flat file IDoc format' for serializing IDoc messages to/from the file system. In a flat-file IDoc, all IDoc records including control and data are stored in lines of text separated by a line delimiter.

In SAP, file-based RFC destinations are used to read/write flat file IDoc. Oracle Adapter for SAP provides support for accepting flat file IDoc from non-JCO based input streams, e.g., file system. This feature helps in the integration scenarios where SAP or third-party generated flat file IDoc are used for inbound/outbound data.

For receiving IDocs in flat file format from SAP, you have to set the **encodeIDOC** property in the **JCA Properties** page.

5.6.1 Create a Project for Flat File IDoc

- 1. Create an Inbound Endpoint for IDoc. For more information, refer to the section "Design an Inbound BPEL Process" A file adapter can be used to receive the IDoc in flat file format.
- 2. In the JCA Properties page set the EncodeIDOC property to flatfile, as shown in Figure 5-37.

Adapter Configuration Wizard - Ste	p 4 of 5	×
JCA Properties	0101010101	
Specify the Name and Value of all JCA Ada	apter Properties.	
Properties		÷ 🗙
Name	Value	
AutoSYSTAT01	no	
EncodeIDOC	flatfile	
ControlCharacter	encode	
ProgramID	ORAQA1	
jca.retry.count	9	
jca.retry.interval	1	
jca.retry.backoff	2	
jca.retry.maxInterval	120	
Help	< Back Next >	Einish Cancel

Figure 5-37 Encode IDoc

3. Click Next and then Finish.

5.6.2 Test the Flat File IDoc Project

- 1. Deploy the project. For more information, refer to the section "Deploy the Defined Process".
- 2. Test deployed project by sending an IDoc from SAP, for example, a MATMAS IDoc can be sent from BD10 tcode of SAP, as shown in Figure 5-38.

Figure 5-38 Send Material

Send Material				
	🕒 🔂 😡 🖴 🕼	1 (13 21 C) 🗘 🕄 🕱 🚺	🕐 🖬
Send Material				
🕀 🔁 🖪				
Material	40-110C	to		*
Class		to	2	•
Message Type (Standard)	MATMAS			
Logical system	ORACLESAP			
Send material in full				
Parallel processing				
Server group				
Number of materials per proces	20			

3. Check the received file. It will be in a flatfile format instead of XML, as shown in Figure 5-39.

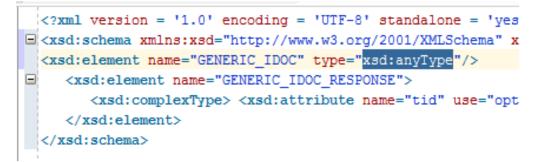
Figure 5-39 FlatFile Format

EDI_DC SAPHR9	8000000000	00063275	0620 30	MATMAS01	1FILEP	ORTJ 1	LSORACLESAP	
LST90CLNT	090							
E2MARAM00	58000000000	00063275	0000001	E2MARAMO	050000	00020	005MB03 20031002B	INS
EA					000			
LBR1.000	FTQ	00	001		0	0	0.000	
0.000	0.0	00	0	0.00.0	0	0	0 0	0
000000000	0000000							
0.0								В
E2MAKTM00	18000000000	00063275	0000002	E2MAKTMO	010000	01030	0051ANNE KLEIN (MAXWELL) t? ZH	l I
E2MAKTM00	18000000000	00063275	0000003	E2MAKTMO	010000	01030	0053Toothpaste (C&D)	
E2MAKTM00	18000000000	00063275	0000004	E2MAKTMO	010000	01030	0056540 (Euro)	
E2MAKTM00	18000000000	00063275	0000005	E2MAKTMO	010000	01030	0057 900 MHz Wireless Telephon	e
E2MAKTM00	18000000000	00063275	0000000	E2MAKTMO	010000	01030	0058Watches & FJ	
E2MAKTM00	18000000000	00063275	0000007	E2MAKTMO	010000	01030	0059Alarms - Argo	
E2MAKTM00	18000000000	00063275	0000008	E2MAKTMO	010000	01030	005AFoodSaver Vac 1075 (Tilia)	
E2MAKTM00	18000000000	00063275	0000009	E2MAKTMO	010000	01030	005BPT15 P-touch	
E2MAKTM00	18000000000	00063275	0000010	E2MAKTMO	010000	01030	005DLucent Fibers (Thor Labs)	
E2MAKTM00	18000000000	00063275	0000011	E2MAKTMO	010000	01030	005EMAB Product 3	
E2MAKTM00	18000000000	00063275	0000012	E2MAKTMO	010000	01030	005FDasani (Coke)	
E2MAKTM00	18000000000	00063275	0000013	E2MAKTMO	010000	01030	005IPorcelain (Mannington)	
E2MAKTM00	18000000000	00063275	0000014	E2MAKTMO	010000	01030	005JCore Switching (Lucent)	
E2MAKTM00	18000000000	00063275	0000015	E2MAKTMO	010000	01030	005K014795 R&W BEEF NOODLE 0.2	5
E2MAKTM00	18000000000	00063275	0000016	E2MAKTMO	010000	01030	005NBacardi Light 750ml (char	mer
E2MAKTM00	18000000000	00063275	0000017	E2MAKTMO	010000	01030	005SMedig - ACS	
E2MAKTM00	18000000000	00063275	0000018	E2MAKTMO	010000	01030	005UWound Care (J&J)	
E2MAKTM00	18000000000	00063275	0000019	E2MAKTMO	010000	01030	005WConsulting (Novadigm)	
E2MAKTM00	18000000000	00063275	0000020	E2MAKTMO	010000	01030	005aLIds	
E2MAKTM00	18000000000	00063275	0000021	E2MAKTMO	010000	01030	005bSingulair (Merck)	
E2MAKTM00	18000000000	00063275	0000022	E2MAKTMO	010000	01030	005cIndustrial (Aceto)	
E2MARCM00	48000000000	00063275	0000023	E2MARCMO	040000	01030	0053000VEB MAB	
0.000	0.000		0		00000	000	0.00	0
0.0	0000000002	0.00	0.000	0	.00			
0	0000	001					00	000

5.7 Generic IDoc Support

The Adapter for SAP provides a generic IDoc message type to enables you to receive\send different native IDoc message type of SAP system by selecting single message type GENRIC_IDOC in design-time of the Adapter. For GENERIC_IDOC support, Adapter for SAP creates schema structure with element type "anyType", as shown in Figure 5-40.





This feature enables dynamic run-time changes on the content of IDoc message type at the SAP server without requiring to re-deploy/re-configure the SOA project. The downstream processing function can cast the IDoc message and processor can route it according to the correct IDoc message type.

Note: In case you are directly using the standard IDOCs and not as a GENERIC IDOC message type, any structure changes to the IDOC will need a reconfigure/re-deployment of the SOA project to take effect.

5.7.1 Create Generic IDoc Inbound Endpoint

- 1. Create Inbound Endpoint for IDoc. For more information, refer to the section "Design an Inbound BPEL Process for BAPI/RFC/ID" A file adapter can be used to receive the IDoc.
- 2. In the Object Selection page of the Adapter wizard, select Generic IDOC, as shown in Figure 5-41.

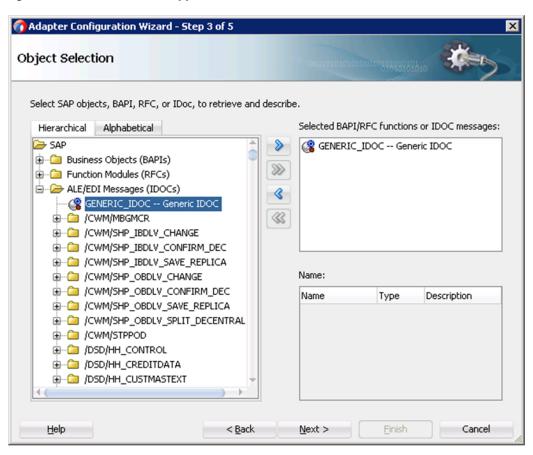
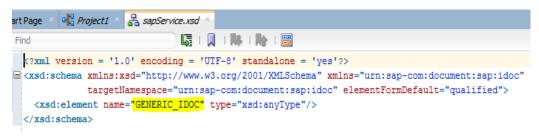


Figure 5-41 Generic IDoc Support

The XSD of the Generic IDoc look like as shown in Figure 5-42.

Figure 5-42 XSD of the Generic IDoc



3. Click Next and then Finish the project.

5.7.2 Test the Generic IDoc Inbound Endpoint

- 1. Deploy the project. For more information, refer to the section "Deploy the Defined Process".
- **2.** Test deployed project by sending an IDoc from SAP. For example, a MATMAS IDoc can be sent from BD10 tcode of SAP.
- **3.** Check the IDoc received through file adapter. The received xml will look like as shown in Figure 5-43.

GENERIC IDOC xmlns="urn:sap-com:document:sap:idoc"> <CREMAS05 tid="0A1E202A182C5187BCFF0034"> <IDOC BEGIN="1"> <EDI DC40 SEGMENT="1"> <TABNAM>EDI DC40</TABNAM> <MANDT>800</MANDT> <DOCNUM>00000000892785</DOCNUM> <DOCREL>700</DOCREL> <STATUS>30</STATUS> <DIRECT>1</DIRECT> <OUTMOD>2</OUTMOD> <IDOCTYP>CREMAS05</IDOCTYP> <MESTYP>CREMAS</MESTYP> <SNDPOR>SAPEQ6</SNDPOR> <SNDPRT>LS</SNDPRT> <SNDPRN>T90CLNT090</SNDPRN> <RCVPOR>A00000070</RCVPOR> <RCVPRT>LS</RCVPRT> <RCVPRN>ORADEVUT</RCVPRN> <CREDAT>20130506</CREDAT> ne acceso - commune ric_idoc 🔻 e History

5.7.3 Create Generic IDoc Outbound Endpoint

Figure 5-43 XML File Format

- 1. Create Outbound Endpoints for IDoc. For more information, refer to the section "Design an Outbound BPEL Process for BAPI/RFC/IDOC".
- 2. In the **Object Selection** page of the Adapter wizard, select **Generic IDOC** and click **Next** button, as shown in Figure 5-44.

			-
escribe.			
	Selected BAPI,	(RFC function	s or IDOC messages:
>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	Name:		
ſ		Turne	Description
	INGING	Type	Pescipuon
	>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	Selected BAPI,	Selected BAPI/RFC function

Figure 5-44 Object Selection Page

3. Click Next, Next and then Finish for the subsequest screens.

It will create an SAP endpoint with XSD/WSDL for Generic IDoc.

5.7.4 Test the Generic IDoc Outbound Endpoint

- 1. Deploy the Generic IDoc project. For more information, refer to the section "Deploy the Defined Process".
- 2. Send a Generic IDoc (for example: matmas01) to SAP system.
- **3.** The received IDoc status can be checked in SAP system through tcode WE02, as shown in Figure 5-45.

igure 5-45 SAP IDoc Display					
SAP					
8	•	日日日	2113	A & I 🗶 🗷 I 🕜 🕻	
🕫 🗎 SAP					
Doc display 7 😋 IDoc 000000000855447		Technical	short in	_	
Control Rec.		Direction		2 Inbox	
Data records	Total r	Current s	tatus	53 00	
Image: Status records		Basic type	e	MATMAS01	
		Extension			
		Message ty	уре	MATMAS	
		Partner No	o.	T90CLNT090	
		Partn.Typ	e	LS	
		Port		SAPEQ6	
		Content of	selecte	d segment	
		Fld name	Fld con	it.	
				▲	
				•	
				▲	
				• •	

Figure 5-45 SAP IDoc Display

This shows the IDoc was successfully received by SAP.

5.8 Revision IDoc Support

Idoc-ecmrev01 is an IDoc type, which contains object management record for an object (material or document) which is marked by a revision level. This data is necessary in order to correctly make, change and delete a revision level within engineering change management.

IDocs of this type are automatically sent when:

- An object (material or document) is distributed which is marked by the revision level.
- Distribution starts with a change indicator for an Integrated Distributed PDM Solution (ID PDM).

Note: Adapter for SAP supports this feature dynamically with the help of Generic IDoc functionality.

5.9 Sharing Program ID Feature

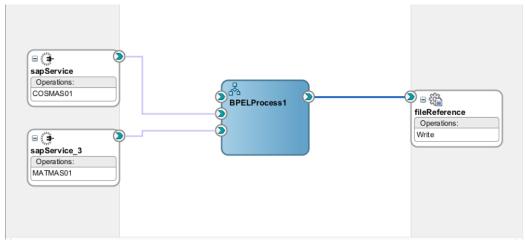
The Adapter for SAP enables multiple inbound IDoc message types to share an SAP connection using the same program ID. You can generate a WSDL port Type with multiple operations to receive individual IDoc message type.

The Adapter for SAP enables a program ID to be shared for different inbound data. For example, two or more IDoc types can be sent to the same program ID used by SOA inbound endpoints.

5.9.1 Create a Sharing Program ID Project:

- 1. Create Inbound Endpoint for IDoc. For more information, refer to the section "Defining an inbound BPEL Process".
- 2. Create multiple Inbound endpoints for different message types, as shown in Figure 5-46.

Figure 5-46 Multiple Inbound Endpoints



3. Deploy project. For more information, refer to the section 7.6 "Deploy the Defined Process".

4. Test Program ID registration using transaction sm59 in SAP GUI, as shown in Figure 5-47.

Figure 5-47 Connection Test

RFC Destination		ORAQA1		
Connection Type	T	TCP/IP Connection	Description	
Description				
Description 1	Des	tination for QA		
Description 2	1			
Description 3				

5. Send IDocs that were selected in the projects from SAP.

5.10 Multiple IDoc Support

Adapter for SAP enables the selection of multiple IDocs within single inbound endpoint of the Adapter. The Adapter once creates JCA, WSDL and xsd files for all selected IDocs.

5.10.1 Create a project for Multiple IDoc Support:

- 1. Create inbound IDoc project. For more information, refer to the section "Defining an inbound BPEL Process".
- 2. Select multiple IDoc while creating the Adapter inbound endpoint, as shown in Figure 5-48.

bject Selection	01010101010101010101010
Select SAP objects, BAPI, RFC, or IDoc, to retrieve and d Hierarchical Alphabetical	lescribe. Selected BAPI/RFC functions or IDOC messag
SAPSLL/CUS_PED SAPSLL/CUS_PRL SAPSLL/CUS_SCIPED SAPSLL/CUS_SCWPED SAPSLL/CUS_STA SAPSLL/CUS_VZAV SAPSLL/CUS_VZL SAPSLL/CUS_WAT SAPSLL/CUS_WAT SAPSLL/DEBMAS_SLL SAPSLL/DEBMAS_SLL	MATMAS01 Material Master MATMAS02 Material Master MATMAS03 Material Master
SAFSLI/MATMAS_SLL MATMAS01 Material Master MATMAS02 Material Master MATMAS02 Material Master MATMAS03 Material Master MATMAS03 Material Master MATMAS03 Material Master MATMAS03 Material Master	Name CU_CS Description

Figure 5-48 Select Multiple IDoc

3. JCA file of the project will look like as shown in Figure 5-49.

Figure 5-49 JCA File Screen



- 4. Deploy project. For more information, refer to the section "Deploy the Defined Process".
- **5.** Test deployed project by sending multiple IDocs from SAP. Adapter for SAP receives all different, selected IDocs using a single SAP endpoint.

5.11 Credential Mapping for Oracle SOA Suite (BPEL, Mediator, BPM or OSB)

Credential mapping is the process whereby a remote system's authentication and authorization mechanisms are used to obtain an appropriate set of credentials to authenticate users to a target resource. In the WebLogic Server security architecture, a Credential Mapping provider is used to provide credential mapping services and bring new types of credentials into the WebLogic Server environment. To pass user credentials to the Adapter for SAP, create a credential map from the Oracle WebLogic Server user credentials to the EIS user credentials (SAP R/3 adapter). Then associate a credential policy with a BPEL, Mediator, BPM or OSB Web service and invoke the Web service using Oracle WebLogic Server user credentials. These credentials are mapped to the EIS user credentials and then passed to the J2CA container, which uses them to connect with the EIS adapter (SAP R/3).

5.11.1 Setup Credential Mapping for the Adapter

Credential mapping consists of the following steps:

- 1. Install the Adapter for SAP. For more information, refer to the section Configuring the Adapter Run-Time Parameters on the WebLogic Server".
- 2. Create Mapping.

In WebLogic console, you can map the credentials of WebLogic user with SAP user credentials.

a. In the **Domain Structure** section in the left pane, click **Deployments**. The Deployments page is displayed in Figure 5-50.

Domain Structure soa_domain -Environment -Servers -Clusters -Coherence Clusters -Machines -Virtual Hosts -Work Managers -Startup and Shutdown Classes -Deployments -Services -Security Realms -Interoperability -Diagnostics

Figure 5-50 Domain Structure Section

b. Select the Adapter from the list, as shown in Figure 5-51.

Figure 5-51 Deployments list

Depl	oyments					
Ins	tall Update Delete Start - Stop -					
	Name					
	State-management-provider-memory-rar					
coherence-transaction-rar						
SAPAdapter						
🔲 🗉 📑 b2bui						
	■ Default ToDo TaskFlow					
	FileAdapter					

- c. Click on Security tab and then click on Outbound Credential Mapping tab.
- d. Click New button to create a new credential map, as shown in Figure 5-52.

Figure 5-52	Outbound C	Credential	Mapping
-------------	------------	------------	---------

Settings fo	r sapa	dapter									
Overview	Deplo	yment Plan	Configuration	Secur	ity	Targets	Control	Te	esting	Mon	itori
Roles Outbound Credential Mappings Inbound Principal Mappings Principals											

Outbound credential mappings let you map WebLogic Server usernames to usernames in the Enterprix adapter. You can use default outbound credential mappings for all outbound connection pools in the individual connection pools. This page contains the table of outbound credential mappings for this rest

Customize this table

Outbound Credential Mappings

New Delete		
🔲 WLS User 🗞	EIS User	Outbound Con
	'	There are no items to dis
New Delete		

e. Select one of the Connection pool for which you are creating the credential mapping, as shown in Figure 5-53.

Figure 5-53 Create a New Security Credential Mapping

Back Next	Finish	Cancel
-----------	--------	--------

Outbound Connection Pool

Which Outbound Connection Pool would you like the credential map to be associa Connection Pools in this resource adapter. Each Outbound Connection Pool can th

Customize this table

Create a New Security Credential Map Entry for:

	Outbound Connection Pool		
	eis/SAP/FMWDEMO		
	Resource Adapter Default		
Back	Next Finish Cancel		

f. Select **Configured User Name** radio box and enter your WebLogic username, as shown in Figure 5-54.



Create a New Security Credential Mapping					
Back	Next	Finish	Cancel		

WebLogic Server User

Select the WebLogic Server User that you would like to map an EIS user to. Selecting initial connections when the resource adapter is first started. Selecting 'Default User' v user that does not have a credential mapping specifically for them. Selecting 'User for WebLogic Server user. If you select 'Configured User' you must type in the WebLogic

- User for creating initial connections
- Default User

Unauthenticated WLS User

Configured User Name

Webberghe Commenter Manager

.

WebLogic Server User Na	me:	

Back	Next	Finish	Cancel
the second se			

weblogic

g. Enter the SAP username and password and click Finish, as shown in Figure 5-55.

Create a New Security Credential Mapping	
Back Next Finish Cancel	
EIS User Name and Password	
Configure the EIS User Name and Password that you * Indicates required fields	would like to map the WebLogic Ser
Enter the EIS User Name:	
* EIS User Name::	SAP_USER_NAME
Enter the EIS Password:	
* EIS Password::	•••••
* Confirm Password::	••••••
Back Next Finish Cancel	

Figure 5-55 Create a New Security Credential Mapping

Credential mapping setup is done. Now you can use the same mapping in SAP SOA/OSB projects.

5.11.2 Setup Credential Mapping for SOA

To pass the user credentials to the SAP resource adapter, create a credential map from the Oracle WebLogic Server user credentials to the EIS user credentials (SAP R/3 adapter). For more information, refer to the section "Setup Credential Mapping for the Adapter". Now associate a credential policy with a Web service and invoke the Web service using Oracle WebLogic Server user credentials. These credentials are mapped to the EIS user credentials and then passed to the Adapter container, which uses them to connect with the EIS adapter (SAP R/3).

5.11.2.1 Creating SOA Project for Credential Mapping

To create SOA project for credential mapping, follow the provided steps:

- 1. Create the Adapter outbound endpoint. For more information, refer to the section "Design an Outbound BPEL Process".
- 2. Deploy the project. For more information, refer to the section "Deploy the Defined Process".
- 3. Attach policy with project:

a. Open EM console and navigate till your deployed project, as shown in Figure 5-56.

Target Navigation	Test_ZBAPI_ALLDAT [1.0] (1)			
View View Application Deployments SOA SoA Control Soa Soa - infra (soa_server 1) Control Gefault Control Gefault	Active Retire Shut Down Test Settings Dashboard Composite Definition Flow Instances Unit Tests Policies Components Name BPELProcess1 Services and References Name Name			
	Spelprocess 1_client_ep			

b. Click on **Policies** tab, as shown in Figure 5-57.

Figure 5-57 Policies Tab

Active	Retire	Shut Dov	vn	Test	Setting	s 🔻	50	
Dashboard Composite Definition Flow Insta				nces Un	it Tests	Policies		
Policy Name			Attached To			Policy Reference Status	Category	
				Allauneu n	0		Status	Category

c. Click on **Attach To/Detach From** drop-down and select **bpelprocess1_client_ep** to attach the policy.

This navigates to the policy selection page, as shown in Figure 5-58.

Figure 5-58	Policies Tab
-------------	--------------

Active R	etire	Shut Dov	wn	Test	Setting]s ▼	9
Dashboard	Composite	e Definition	Flow Ins	stances	Unit Tests	Policies	
You can vie	w and mana	ige the list of	f policies a	ttached	to the web se	rvice binding	gs and components of thi
View 🕶	Attack	n To/Detach	From 🔻				
Policy Nam	BPELP	rocess 1		Attach	ed To		Policy Reference
No policies	Chopelor	ocess1_clier	nt_ep				Status
NO POICIES	a 🎲 sapRe	ference					

d. Search policy with name **oracle/wss_username_token_service_policy** in the policy page.

The **oracle/wss_username_token_service_policy** policy appears in the search result area, as shown in Figure 5-59.

Figure 5-59 Search Policy

<	III			
Directly Attached Policies				
Name		Category	Enabled	Description
oracle/wss_username_token_service_policy		Security	~	This policy
Available Policies			Detach	
View 👻 🛃 Detach				
oracle/wss_username_token_service_policy				
oracle/wss_username_token_service_policy Name		Category	Status	Description

- e. Select the searched policy and click Attach to button.
- f. Click Ok button.
- g. Click **Test** button to start testing this project, as shown in Figure 5-60.

gure 5-60 CompCo			0						
SOA Comp		selitol	U					Page Refres	ned
Active Re	etire	Shut Dov	wn	Test	Setting	gs 🔻	9		
Dashboard	Composite	Definition	Flow Ins	tances (Unit Tests	Policies			
	Detach Fron		e the list o	f attached		service bin	dings and	l components	of
Policy Nam	Q.			Attached	То		Poli	cy Reference Status	C
a se ala luvaa	_username_t		ca paliar	A haslas			1	Disable	Se

h. Click on **Request** tab and select **Security**, as shown in Figure 5-61.

Figure 5-61 Request Tab

Rec	quest	Respons	e		
\triangleright	Securi	ity			
\triangleright	Quality	y of Serv	rice		
\triangleright	HTTP I	leader			
\triangleright	Additi	onal Tes	t Options		
	Input	Argume	nts		
	Tree V	iew 💌	Enable Validation		
5	SOAP B	ody			
	Name			Туре	
	⊳ * pa	rameters		parameters	

i. Select **OWSM Security Policy** radio button and select **oracle/wss_username_token_client_policy** from **Other Client Policies** table, as shown in Figure 5-62.

Request Response	
Security	
OWSM Security Policies OHTT	TP Basic Auth 🔍 Advanced 🔍 None
Compatible Client Policies	Other Client Policies
🖉 All	All
No policy found	
	 oracle/wss_saml20_token_over_ssl_client_policy oracle/wss_saml_token_bearer_over_ssl_client_policy
	oracle/wss_saml_token_over_ssl_client_policy
	<pre>oracle/wss_username_token_client_policy</pre>
	oracle/wss_username_token_over_ssl_client_policy
Configuration Properties	
	JKS Keystore
* Username weblogic	Location
* Password	JKS Keystore Password
	Passworu
Advanced Options	
> Quality of Service	
> HTTP Header	
> Additional Test Options	
Input Arguments	
Tree View Enable Validation	Image: A state of the state

Figure 5-62 Request Tab

- j. Under **Configuration Projects**, enter Username and Password (that you mapped with SAP user credential in the credential mapping).
- k. Click **Test Web Service** button to test the service, as shown in Figure 5-63.



			. or WADL and dick Pars that you want to test. S		
ALLDAT/bpelproce	ss1_dient_ep?WSDL	9	Parse WSDL or WADL		
		-			
OAT/bpelprocess	Edit Endpoint URL				

5.12 Stateful Interaction

Stateless interaction

A server processes requests based solely on information provided with each request and does not rely on information from earlier requests. The server does not need to maintain state information between requests.

Stateful interaction

A server processes requests based on both the information provided with each request and information stored from earlier requests. The server needs to access and maintain state information generated during the processing of an earlier request. This is in case when update /Insertion of data needs to be done in SAP with standard BAPIs

The Adapter for SAP has a design-time property "Interaction", stateless / stateful, as shown in Figure 5-64.

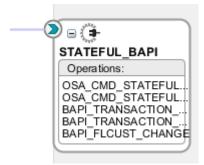
Adapter Configuration Wizard - Ste	o 4 of 5
JCA Properties	0101010101010101010101010
Specify the Name and Value of all JCA Ad	pter Properties.
Name	Value
Interaction	stateful
ExceptionFilter	off
SchemaValidation	off
jca.retry.count	9
jca.retry.interval	1
jca.retry.backoff	2
jca.retry.maxInterval	120
Help	< <u>B</u> ack <u>N</u> ext > Einish Cancel

Figure 5-64 JCA Property Page

When stateful property is set in the JCA properties page of the Adapter wizard, the following operations are automatically created, as shown in Figure 5-65.

- OSA_CMD_STATEFUL_OPEN
- SELECTED_BAPI
- BAPI_TRANSACTION COMMIT
- BAPI TRANSACTION ROLLBACK
- OSA_CMD_STATEFUL_CLOSE

Figure 5-65 Stateful BAPI



This ensures when the selected BAPI is executed, upon successful execution, automatically an explicit commit is called using bapi_transaction_commit to commit the changes done to SAP database, else a transaction rollback happens using bapi_transaction_commit. The operation osa_cmd_stateful open and osa_cmd_stateful_close ensure that all the operations happen in the same session.

This feature is useful for BAPIs that do not contain an implicit commit statement which will commit the changes done to SAP database table.

All outbound Endpoints are stateless by default.

5.12.1 Create a Stateful BAPI project

- 1. Create an outbound endpoint. (For more information, refer to the section "Configure the Adapter Component" under BPEL Outbound Process).
- 2. Select a BAPI in the object selection page of the Adapter wizard, which does not have internal commit in it. For example, Flight_Customer. Change (BAPI_FLCUST_CHANGE).
- 3. Set the Interaction property in JCA Properties page to "stateful", as shown in Figure 5-66.

CA Properties		Rideo Carlos
pecify the Name and Value of all JCA .	Adapter Properties.	
roperties		÷ 🗙
Name	Value	
nteraction	stateful	
xceptionFilter	off	
chemaValidation	off	
ca.retry.count	9	
a.retry.interval	1	
ca.retry.backoff	2	
ca.retry.maxInterval	120	

4. Click Next and then Finish.

Figure 5-66 Stateful Property

- 5. It creates an SAP endpoint with 5 operations, as mentioned below:
- OSA_CMD_STATEFUL_OPEN
- OSA_CMD_STATEFUL_CLOSE
- BAPI_TRANSACTION_COMMIT
- BAPI_TRANSACTION_ROLLBACK
- BAPI_FLCUST_CHANGE
- **6.** Create a BPEL process and add:
 - A receive activity for BAPI_FLCUST_CHANGE
- An invoke to invoke OSA_CMD_STATEFUL_OPEN
- Create the SID variable to store the session ID
- An assign to copy session ID (SID) from response to a SID variable
- An assign to copy SID to BAPI_FLCUST_CHANGE request
- An invoke to invoke BAPI_FLCUST_CHANGE request
- An assign to copy SID to BAPI_TRANSACTION_COMMIT request
- An invoke to invoke BAPI_TRANSACTION_COMMIT request
- An assign to copy SID to OSA_CMD_STATEFUL_CLOSE request

- An invoke to invoke OSA_CMD_STATEFUL_CLOSE request
- A reply to return BAPI_FLCUST_CHANGE response.
- 7. Finish and save the project.
- 8. The jca file of the project looks like as shown in Figure 5-67.

Figure 5-67 JCA File

```
<connection-factory location="eis/SAP/FMWDEM0" UIConnectionName="DefaultClient"/>
<endpoint-interaction portType="STATEFUL BAPI PT" operation="BAPI TRANSACTION COMMIT">
  <interaction-spec className="oracle.tip.adapter.sap.outbound.SAPInteractionSpecImpl">
    <property name="Interaction" value="stateful"/>
<property name="ExceptionFilter" value="off"/>
    cproperty name="RFC" value="BAPI TRANSACTION COMMIT"/>
    <property name="Type" value="RFC"/>
  </interaction-spec>
</endpoint-interaction>
<endpoint-interaction portType="STATEFUL_BAPI_PT" operation="BAPI_TRANSACTION_ROLLBACK":
  <interaction-spec className="oracle.tip.adapter.sap.outbound.SAPInteractionSpecImpl">
    <property name="Interaction" value="stateful"/>
    <property name="ExceptionFilter" value="off"/>
    <preperty name="RFC" value="BAPI TRANSACTION ROLLBACK"/>
    <property name="Type" value="RFC"/>
  </interaction-spec>
</endpoint-interaction>
<endpoint-interaction portType="STATEFUL_BAPI_PT" operation="BAPI_FLCUST_CHANGE">
  <interaction-spec className="oracle.tip.adapter.sap.outbound.SAPInteractionSpecImpl">
    <property name="Interaction" value="stateful"/>
    <property name="ExceptionFilter" value="off"/>
    <preperty name="RFC" value="BAPI_FLCUST_CHANGE"/>
    <property name="Type" value="BAPI"/>
    <property name="BAPI" value="FlightCustomer.Change"/>
  </interaction-spec>
</endpoint-interaction>
<endpoint-interaction portType="STATEFUL_BAPI_PT" operation="OSA_CMD_STATEFUL OPEN">
  <interaction-spec className="oracle.tip.adapter.sap.outbound.SAPInteractionSpecImpl">
    <property name="Interaction" value="stateful"/>
    <property name="ExceptionFilter" value="off"/>
     cproperty name="RFC" value="OSA CMD STATEFUL OPEN"/>
     <property name="Type" value="CMD"/>
   </interaction-spec>
 </endpoint-interaction>
 <endpoint-interaction portType="STATEFUL_BAPI_PT" operation="OSA_CMD_STATEFUL CLOSE">
   <interaction-spec className="oracle.tip.adapter.sap.outbound.SAPInteractionSpecImpl">
     <property name="Interaction" value="stateful"/>
     <property name="ExceptionFilter" value="off"/>
     cproperty name="RFC" value="OSA CMD STATEFUL CLOSE"/>
     <property name="Type" value="CMD"/>
   </interaction-spec>
 </endpoint-interaction>
</adapter-config>
```

Note: In case of exception, session will not get closed automatically. In this case, User needs to implement rollback mechanism to close the session.

5.12.2 Test the Stateful BAPI Project:

- 1. Deploy the project having Interaction property as "stateful".
- 2. Enter a value for the inputs to the BAPI, also provide a session ID variable number and execute.
- **3.** You can see that the changes are reflected in the corresponding SAP database table. For example, the changes for BAPI "bapi_flcust_change" is reflected in SAP table 'scustom' in SE11 tcode.

5.13 Error Handling

When an adapter raises an exception during run-time, the SOAP agent produces a SOAP fault element in the generated SOAP response. The SOAP fault element contains fault code and fault string elements. The fault string contains the native error description from the adapter target system. Since adapters use the target system interfaces and APIs, whether an exception is raised depends on how the target systems interface or API treats the error condition. If a SOAP request message is passed to an adapter by the SOAP agent and that request is invalid based on the WSDL for that service, then the adapter may raise an exception yielding a SOAP fault.

Figure 5-68 shows the sample of SOAP Fault.

<env:Fault> <faultcode>env:Server</faultcode> <faultstring> Exception occurred when binding was invoked. Exception occurred during invocation of JCA binding: "JCA Binding execute of Reference operation 'BAPI COMPANYCODE GETDETAIL' failed due to: com.sap.conn.jco.JCoException: (126) JCO ERROR ABAP EXCEPTION: Company code 1212 does not exist". The invoked JCA adapter raised a resource exception. Please examine the above error message carefully to determine a resolution. </faultstring> <faultactor/> <detail> <exception>Company code 1212 does not exist</exception> </detail> </env:Fault>

Figure 5-68 SOAP Fault

5.14 SOA Debugger Support

You can test and debug SOA composite applications with the SOA debugger in Oracle JDeveloper. The SOA debugger reduces the development cycle for an SOA composite application by providing a troubleshooting environment within the Oracle JDeveloper. This implies that you do not need to build an SOA composite application in Oracle JDeveloper, deploy it to the SOA Infrastructure, launch a console to test or view audit trails and flow traces, and then return to Oracle JDeveloper to repeat the ercise. Instead, you can set breakpoints in Oracle JDeveloper for troubleshooting on the following components:

- Binding components and service components in SOA composite applications.
- Synchronous and asynchronous BPEL processes.
- BPM processes.

Note the following guidelines when using the SOA debugger:

- Debugging is limited to design view in Oracle JDeveloper.
- You cannot debug cross-language features, such as a Java ec activity, XSLT and XQuery transformations, and so on.
- You can debug SOA composite applications on servers where Oracle SOA Suite is installed. For example, if Oracle SOA Suite runs on managed servers, clients must connect using the managed server host and port.
- Only one client at a time can connect to the debugger.
- Multiple instances of a SOA composite application cannot be debugged. Only a single instance can be debugged.
- Adapter endpoint errors are not displayed in the SOA debug.

5.14.1 SOA Debugger for Inbound

Perform the following steps for SOA debugger for inbound endpoint:

1. Click on the **Debug** icon on JDeveloper toolbar and use the default, as shown in Figure 5-69.

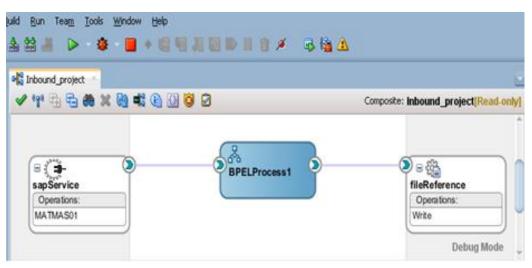
<u>Navigate Build R</u> un Tea <u>m</u>		
	* · · · · · · · · · · · · · · · · · · ·	
♥ <mark>\$</mark> Project1 × ✔ ♥₽ 🕢 🗶 🕷 🚺 🤯		Denis atd
Exposed Services	Components External References	Project1
sapService Operations: MATMAS01	BPELProcess1	
	SOA Debugger Connection Settings Host: 10.30.32.80 Port: 5004	Ų
Design Source History	Imeout: 5	
Debugging: Project1.jpr - Log	Skip this dialog next time	×

Figure 5-69 SOA Debugger for Inbound

2. Enter the Host IP and click OK.

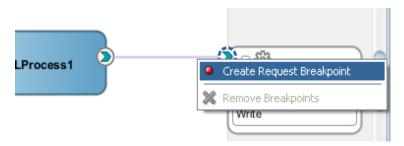
JDeveloper deploys the SOA project for debugging, Once JDeveloper connected to SOA debugger running on SOA run-time, it shows several SOA debugger windows, as shown in Figure 5-70.





3. Right-click on the endpoint connector to show breakpoint options, once selected, breakpoint icons will be added, as shown in Figure 5-71.





4. Trigger the inbound from SAP that hits the breakpoint. To proceed to the next breakpoint, click on the step over, as shown in Figure 5-72.

Figure 5-72 Breakpoint Options

Be Edit Yew Application Reflector Search Navigate (• J 0 0 0 1 0 ≠ 13 6 4	۵.
Applications Application Servers	abound project	tep Over in Inbound_project.jpr (P8)	
8) I X	🗸 🕂 🗄 🖶 🗰 🛪 😫 🖬 🖉	00	Composite: Inbound_project[Read-only]
Application Servers Application Servers Application Servers Application Servers Deplyments Deplyments	Common: Matthasson Denion: Matthasson Denion: Denion	BPELProcess 1	Coperations: Wite Debug Mode
Inbound_project [Default 1.0]		tohes Data - Smart Data Breakpoin	
Web Services			
	Name (X) ecid	Value 3de2e9e6-05e6-40ft	-a/0a-03c/95096/8a3-00000928
Inbound_project - Structure > Stack	⊖ (x) nativePayload ⊕ Obdy		4
B	= 0 IDOC		
Services Forforences Test Subes	eren Began eren	weblogic, Administrat chonelo	छ छ ७४

It hits the next breakpoint, as shown in Figure 5-73.

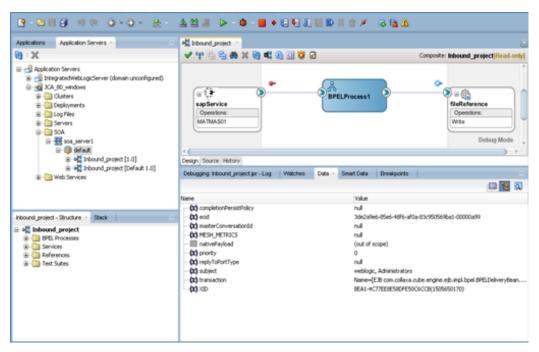
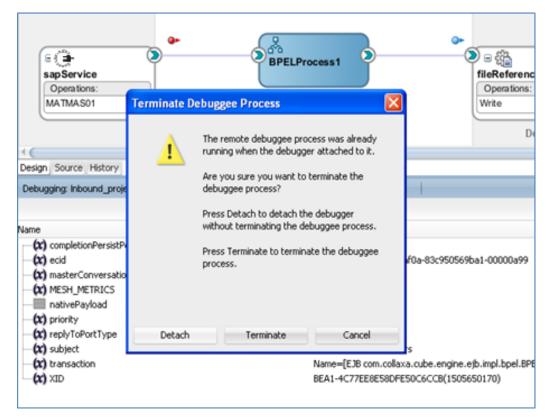


Figure 5-73 Breakpoint Options

5. Click on **Detach** button to detach the debugger, as shown in Figure 5-74.

Figure 5-74 Detach Debugger



5.14.2 SOA Debugger for Outbound

Perform the following steps for SOA debugger for outbound endpoint:

1. Click on the **Debug** icon on JDeveloper toolbar and use the default, as shown in Figure 5-75.

lavigate <u>B</u> uild <u>R</u> un Tea <u>m</u> Iools <u>W</u> indow ✓ 🏔 🍰 🕌 瀳 🕨 – 🅸 – 🔲 - ♦ (Q- Search
: Project1 × ▶ 🖓 🖬 🗶 🖏 1 🕢 🦁 🙆 1 🐁 🖶 🏟 🚱		
Exposed Services	Components	External References

Figure 5-75 SOA Debugger for Outbound

6. Enter the Host IP and click OK.

JDeveloper deploys the SOA project for debugging.Once JDeveloper gets connected to SOA debugger running on SOA run-time, it shows several SOA debugger windows, as shown in Figure 5-76.

Cutbound_project × 🛃 sapReference.xsd × 🛛 test.xml ×	Connection Outhound availability of a lab
1 11 12 12 10 10 10 10 10 10 10 10 10 10 10 10 10	Composite: Outbound_project[Read-only
BPELProcess1	Set Set SapReference Operations: RFC_GET_MATERIAL_,
esign Source History	Debug Mode
esign_Source_History_ ebugging: Outbound_project.jpr - Log × Watches Data Smart Data	Debug Mode

Figure 5-76 SOA Debugger Windows

Debuggee process virtual machine is SOA Debugger.

7. Right-click on the endpoint connector to see the breakpoint options, as shown in Figure 5-77.

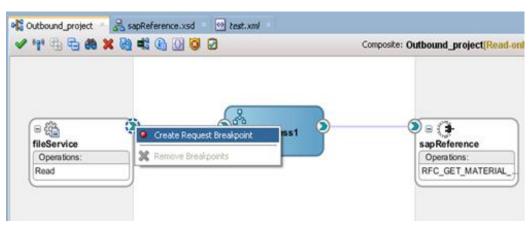


Figure 5-77 Breakpoint Options

8. Right-click on the endpoint connector to see breakpoint options, as shown in Figure 5-78.

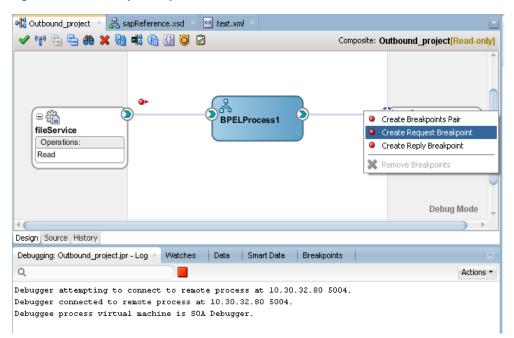
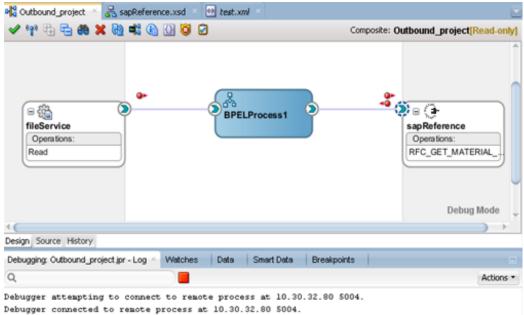


Figure 5-78 Breakpoint Options

Once selected, the breakpoint icons will be added, as shown in Figure 5-79.

Figure 5-79 Breakpoint Options



Debuggee process virtual machine is SOA Debugger.

9. Send test message and the debugger will break at, e.g., the request message, as shown in Figure 5-80.

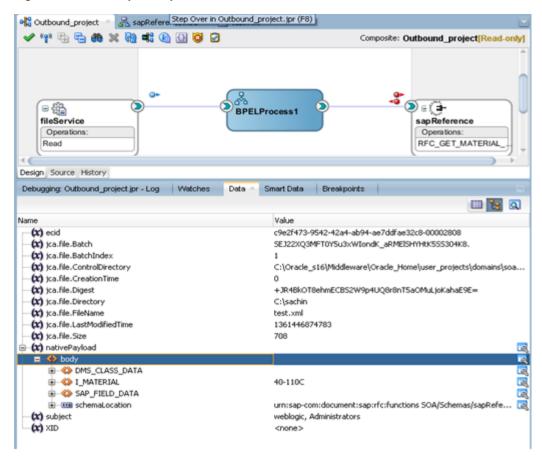


Figure 5-80 Breakpoint Options

10. Click on the step over to proceed to the next breakpoint, as shown in Figure 5-81.

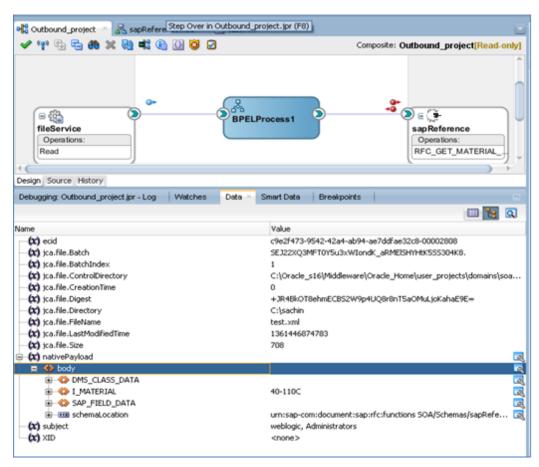


Figure 5-81 Breakpoint Options

It will hit the next breakpoint, as shown in Figure 5-82.

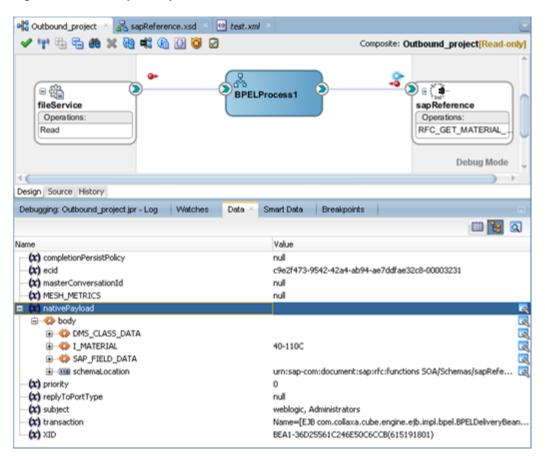
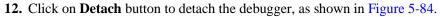


Figure 5-82 Breakpoint Options

11. It will hit the Response Breakpoint, as shown in Figure 5-83.

Composite: Outbound_p	project[Read-only]
	^
BPELProcess1	
fileService sapRefer	
Operations: Read Operations: Read	ns: T_MATERIAL_
	Debug Mode 🔍
Design Source History) →
Debugging: Outbound_project.jpr - Log Watches Data × Smart Data Breakpoints	
Deuxigging, Oktobulu project jar - Log Matches Data - Smart Data Dreakpoints	
	💷 🔡 🔍
Name Value	
(x) ecid c9e2f473-9542-42a4-ab94-ae7ddfae32c8-000032	31
😑 🗱 nativePayload	C23
⊡- 🎲 body	<u> </u>
DMS_CLASS_DATA	
E_MESSAGE Material 40-110C does not exist	
⊕ 🎲 E_RETURN 99	
⊕ -	
- (x) subject weblogic, Administrators	
- (x) transaction Name=[EJB com.collaxa.cube.engine.ejb.impl.bpel	I.BPELDeliveryBean
(x) XID BEA1-36D25561C246E50C6CCB(615191801)	

Figure 5-83 Response Breakpoint



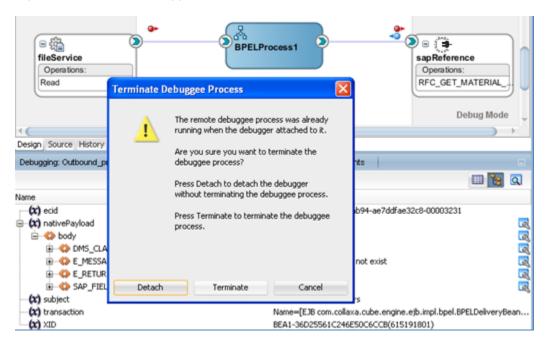


Figure 5-84 Detach Debugger

5.15 Non_Xml Characters Handling Feature

The Adapter for SAP provides Non-Xml character handling for the data that is coming from SAP system to the Adapter. XML does not support all characters defined in Unicode. For example, control characters, some of the control character not supported by XML 1.0.

Unicode code points in the following ranges are valid in XML 1.0 documents:

- U+0009, U+000A, U+000D: these are the only C0 controls accepted in XML 1.0.
- U+0020–U+D7FF, U+E000–U+FFFD: this excludes some (not all) non-characters in the BMP (all surrogates, U+FFFE and U+FFFF are forbidden).
- U+10000–U+10FFFF: this includes all code points in supplementary planes, including noncharacters.

The preceding code points ranges contain the following controls which are only valid in certain contexts in XML 1.0 documents, and whose usage is restricted and highly discouraged:

 U+007F–U+0084, U+0086–U+009F: this includes a C0 control character and all but one C1 control.

Any character in payload if not supported by XML 1.0, either can be removed or can be escaped. The Adapter for SAP provides one of the JCA property "ControlCharacter" as JCA property, which have following option to be operated on non-xml character. This property is available in case of Inbound Project.

- **remove:** This will remove character from payload.
- **space:** This will replace character with space.
- **encode:** This will encode character with its decimal format.

In Outbound project case in request payload, if any XML character already escaped, will be unescaped before sending payload to the Adapter for SAP.

You can see **ControlCharacter** property in SAP design-time in the properties page, as shown in Figure 5-85. This property is included in the JCA properties in case of Inbound project.

Adapter Configuration Wizard - Step 4	of 5			×
JCA Properties		01010101010	0101010101010101	*
Specify the Name and Value of all JCA Adapte	er Properties.			
Properties			- 	*
Name	١	/alue		
AutoSYSTAT01	r	10		
EncodeIDOC	r	10		
ControlCharacter		encode		-
ProgramID	6	encode		
jca.retry.count	r	emove		
jca.retry.interval	5	space		
jca.retry.backoff	2	2		
jca.retry.maxInterval	1	120		
Help	< <u>B</u> ack	Next >	<u> </u>	Cancel

Figure 5-85 ControlCharacter Property

Note that encoding of the control characters like (ctrl+shift+underscore) is not supported and hence for such characters, **ControlCharacter** property has to be set to either "**remove**" or "**space**".

Note: Control Character Translation option is only applicable to XML payload not the Flat file. When the encoded IDoc option is selected, property ControlCharacter is not available to select any operation.

5.16 Error Document Support

This feature provides feasibility of returning xml payload instead of throwing error when SAP returning Type E as response in outbound scenario. This feature is configurable and can be updated at design-time.

Perform the following steps to create an SAP Endpoint with Error Document feature:

1. Create an outbound BAPI/RFC endpoint using the Adapter for SAP.

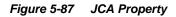
(For more information, refer to the section "Configure the Adapter Component" under BPEL Outbound Process)

- 2. Set "ErrorDocument" property to **ON** in the JCA Properties page.
- **3.** In the JCA Properties page add new property using add button as shown in the Figure below.

Figure 5-86 JCA Property

JCA Properties		DIOTOSPANASSING
Specify the Name and Value of all JCA A	dapter Properties.	
Properties		수 🗙
Name	Value	
Interaction	stateful	
ExceptionFilter	off	
SchemaValidation	off	
jca.retry.count	9	
jca.retry.interval	1	
jca.retry.backoff	2	
jca.retry.maxInterval	120	

4. Click on the newly appeared row in the JCA Properties table as shown in the Figure below.



1111 B
} ×

5. Select Error Document from the drop-down menu as shown in the Figure below. *Figure 5-88 JCA Property*

Specify the Name and Value of all JCA A	dapter Properties.	
Properties		ት 🗶
Name	Value	
Interaction	stateless	
ExceptionFilter	off	
SchemaValidation	off	
jca.retry.interval	1	
jca.retry.maxInterval	120	
jca.retry.count	9	
jca.retry.backoff	2	
ErrorDocument	-	
ErrorDocument		
BGRFCQueues		

6. Set the value to ON as shown in the Figure below.

Figure 5-89 JCA Property

JCA Properties	0101010101010101010101010	5
Specify the Name and Value of all JCA Ad	lapter Properties.	
Properties	-+	8
Name	Value	
Interaction	stateless	
ExceptionFilter	off	
SchemaValidation	off	
jca.retry.interval	1	
jca.retry.maxInterval	120	
jca.retry.count	9	
jca.retry.backoff	2	
ErrorDocument	on	

7. Click Finish.

5.17 Payload Threshold Support

The Adapter for SAP enables payloadSizeThreshold support wherein the processing can be controlled based on the Response Message/Payload size.

Here, for the response message size more than payloadSizeThreshold set, the response is rejected and for response message size less than threshold, the flow is completed successfully.

5.17.1 Inbound Project with payloadSizeThreshold support

To create an Inbound Project with payloadSizeThreshold support, perform the following steps:

 Create Inbound Endpoint for IDoc. For more information, refer to the section 8.2.4, 'Design an Inbound BPEL Process for BAPI/RFC/IDoc'. A file adapter can be used to receive the IDoc.

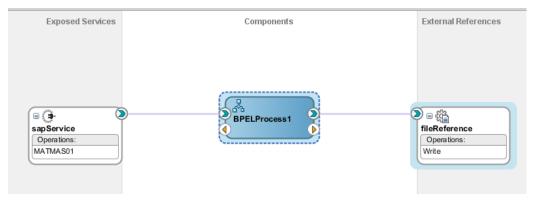


Figure 5-90 JCA Property

2. Open Composite.xml and add following property under binding.jca, as shown in Figure 5-91.

<property name="payloadSizeThreshold" type="xs:string" many="false" override="may">24000</property>

Figure 5-91 JCA Property

E	<pre>import namespace="http://xmlns.oracle.com/pcbpel/adapter/file/SOA_STG12/Threshold_Inbound/fileReference"</pre>
	<pre>location="WSDLs/fileReference.wsdl" importType="wsdl"/></pre>
E	<pre>S<service name="sapService" ui:wsdllocation="WSDLs/sapService.wsdl"></service></pre>
	<interface.wsdl <="" interface="http://xmlns.oracle.com/pcbpel/adapter/sap/SOA_STG12/Threshold_Inbound/sapService" td=""></interface.wsdl>
E	<pre></pre>
	<pre><pre>cyroperty name="payloadSizeThreshold" type="xs:string" many="false" override="may">24000</pre></pre>
	<pre><pre>cyroperty name="useRejectedMessageRecovery" type="xs:string" many="false" override="may">true</pre></pre>
	<property many="false" name="jca.retry.count" override="may" type="xs:int">3</property>
	<property many="false" name="jca.retry.interval" override="may" type="xs:int">1</property>

3. Deploy the project. For more information, refer to the section "Deploy the Defined Process".

Testing

Test deployed project by sending an IDoc from SAP. For example, a MATMAS IDoc can be sent from BD10 tcode of SAP. IDoc sent should have size greater than the payloadSizeThreshold specified in composite.

Send Material		
🕒 🔁 🚺		
Material	100-100	
Class		to
Message Type (Standard)	MATMAS	
Logical system	ORAQA2	

Figure 5-92 JCA Property

This IDoc is not processed/rejected and error is encountered with the message being sent to the rejected Message folder.

Check the Flow instance in EM console - Error is encountered as shown in Figure below.

Figure 5-93 JCA Property

ow Trace ^③ s page shows the flow of the message through various cor	nposite and component i	nstances.	
ults Composite Sensor Values Composites			
Error Message	Fault Owner	Fault Time	Recovery

Check the 'rejmsgs' Folder in SOA - the Message is sent to the rejected Message Folder as shown in Figure below.

Figure 5-94 JCA Property

/oracle/Stage12/Middleware/user_projects/domains/base_domain/rejmsgs/soa_server1			
Name Ext	Size	Rights	Owner
unitary and a second se		rwxr-x rwxr-x	oracle oracle

5.17.2 Outbound Project with payloadSizeThreshold Support

This section explains the steps to create an Outbound Project with payloadSizeThreshold support.

Perform the following steps to create an SAP Endpoint for payloadSizeThreshold support:

1. Create an outbound BAPI/RFC endpoint using the Adapter for SAP.

For more information, refer to the section 8.2.3, 'Configure the Adapter Component'' under BPEL Outbound Process'.

2. Capture the Output in a file using File Adapter

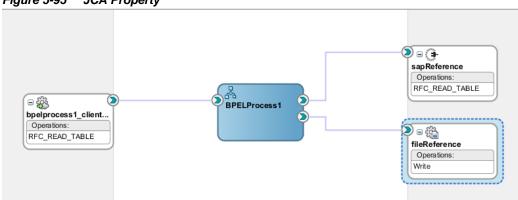


Figure 5-95 JCA Property

3. Open Composite.xml and add following property under reference as shown in Fig --

<property name="payloadSizeThreshold" type="xs:string" many="false" override="may">24000</property>

Figure 5-96 JCA Property

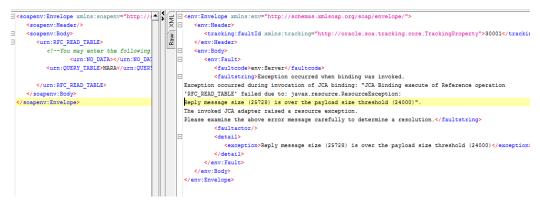
	•
<reference r<="" td=""><td>name="sapReference" ui:wsdlLocation="WSDLs/sapReference.wsdl"></td></reference>	name="sapReference" ui:wsdlLocation="WSDLs/sapReference.wsdl">
<interface< td=""><td>:.wsdl interface="http://xmlns.oracle.com/pcbpel/adapter/sap/SOASTG11/ThresholdChkOUT/sapReference#wsdl</td></interface<>	:.wsdl interface="http://xmlns.oracle.com/pcbpel/adapter/sap/SOASTG11/ThresholdChkOUT/sapReference#wsdl
<binding.j< td=""><td><pre>jca config="Adapters/sapReference_sap.jca"/></pre></td></binding.j<>	<pre>jca config="Adapters/sapReference_sap.jca"/></pre>
<property< pre=""></property<>	<pre>name="jca.retry.count" type="xs:int" many="false" override="may">9</pre>
<property< td=""><td><pre>name="jca.retry.interval" type="xs:int" many="false" override="may">1</pre></td></property<>	<pre>name="jca.retry.interval" type="xs:int" many="false" override="may">1</pre>
<property< pre=""></property<>	<pre>name="jca.retry.backoff" type="xs:int" many="false" override="may">2</pre>
<property< td=""><td><pre>name="jca.retry.maxInterval" type="xs:int" many="false" override="may">120</pre></td></property<>	<pre>name="jca.retry.maxInterval" type="xs:int" many="false" override="may">120</pre>
<property< pre=""></property<>	<pre>name="payloadSizeThreshold" type="xs:string" many="false" override="may">24000</pre>
	>

Testing payloadSizeThreshold support for Outbound

Deploy the project. For more information, refer to the section "Deploy the Defined Process".

Execute the outbound project with input whose output size is greater than the payloadSizeThreshold specified in the composite.xml.

Figure 5-97 JCA Property



Check the Flow instance in EM console - Error is encountered as shown in Figure below.

Flow Tr This page	ace ^① shows the flow of the message through various composite and component instances.	
Faults	Composite Sensor Values Composites	
Recov	er 🔻 View 💌	
TOT N	Message Fault Owner	
→ 6. • • • • • • • • • • • • •	 Service System Fault Occurred May 5, 2015 4:14:38 PM Fror Message BINDING.JCA-12563 Exception occurred when binding was invoked. Exception occurred during invocation of JCA binding: "JCA Binding execute of Reference operation 'RFC_READ_TABLE' failed due to: javax.resource.ResourceException: Reply message size (25728) is over the payload size threshold (24000)".	ate) Failed
	Please examine the above error message carefully to determine a resolution. This fault is Nonrecoverable.) Failed ∦) Failed
	Fault Details	

Same error message can be seen in the diagnostic log as well, as shown in Figure 5-99.

Figure 5-99 Diagnostic Log

** Audit Message: Faulted while invoking operation "RFC READ TABLE" on provider "sapReference".
** Audit Detail: <messages><input/></messages>
<pre></pre> (Invoke1_RFC_READ_TABLE InputVariable> <pre>part name="parameters" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"></pre> RFC_READ_TABLE xmlns:urn="urn:sap -com:document:sap:rfc:functions" xmlns="urn:sap-com:document:sap:rfc:functions">
<urn:query table="">MARA</urn:query>
<fault></fault>
<pre><pre>cbpelFault>>faultType><pre>complements.org</pre></pre></pre>
Exception occurred during invocation of JCA binding: "JCA Binding execute of Reference operation 'RFC_READ_TABLE' failed due to: javax.resource.Resour ceException: Rebly message size (3933) is over the pavload size threshold (24000)".
The invoked JCA adapter raised a resource exception.
Please examine the above error message carefully to determine a resolution.
<part name="code"><code>null</code></part> <part name="detail"><detail>Reply message size (39334) is over the payload size threshold (24000)</detail></part> <fault>fault>ype></fault>
<message>0</message>
** Audit Frant Attributes.

Note: In case of OSB, this property need to be added as Dynamic Property and size should be provided in Bytes. Moreover, the user must set this property in the Bix file for outbound and in proxy for Inbound as shown in Figure 5-100.

General Transport	JCA Transport Configuration Use this page to configure the transport information for this service)						
Transport Details Message Handling	JCA File	€ THRESHFILE/Resources/sapReference_sap.jca	<i>I</i>				
Performance	Adapter Name	MySAP Adapter					
Policies	Adapter Type sap						
	Dispatch Policy	SBDefaultResponseWorkManager					
	JNDI Service Account	<not selected=""> 🔍 🖉</not>					
EndPoint Properties					+ ×		
		property		value	-		
		jca.retry.backoff		2			
		jca.retry.count		9			
		jca.retry.maxInterval		120			
		jca.retry.interval		1			
					///		
	Dynamic EndPoint Properties				+ X		
		property		value	•		
		payloadSizeThreshold		1400			
					//		
	• J C.W						

Figure 5-100 JCA Transport Configuration

5.18 TID Backstore Support

TID Backstore avoids duplicate execution of the same transaction if abrupt network failure occurs in middle of the execution. The data sent from SAP system is identified by the TID (Transaction ID) which is unique in nature. Tracking of TID in SOA is possible which helps in case of any intermediate failure and the same transaction once recorded, need not to be send again. This functionality records the data in SOA database once IDoc message is received from SAP.

For this, create a table to store TID in persistent store with the following fields:

CREATE USER TIDUSER IDENTIFIED BY TIDUSER;

ALTER USER TIDUSER DEFAULT TABLESPACE users

QUOTA UNLIMITED ON users;

ALTER USER TIDUSER TEMPORARY TABLESPACE temp;

GRANT create session

, create table

- , create procedure
- , create sequence
- , create trigger
- , create view

, create synonym

, alter session

TO TIDUSER;

CONNECT TIDUSER/TIDUSER

CREATE TABLE TIDSTORE

(

TID CHARACTER (100), CREATED_ON CHARACTER (50), PROGRAMID CHARACTER (50),

TIDSTATE CHARACTER(50)

);

Table entries shows whether the final status is EXECUTED or FAILED along with the Program ID and Date/Time, indicating if the Transaction needs to be retried in case of failure.

Figure 5-101 Statu	is of IDoc
--------------------	------------

)uer	y Result X					
	🔞 🌆 SQL Fetched 50 rows in 0).052 s	econds			
	∯ TID		TIDSTATE	PROGRAMI	D	ALAST_UPDATED_DATE
10	0A1E021E42D854DB30C75F7D		EXECUTED	ORAQA1		11-02-2015 08:50:10
11	0A1E021E42D854DB30C65F7C		EXECUTED	ORAQA1	<mark>.</mark>	11-02-2015 08:50:10
12	0A1E021E42D854DB30C55F7B		EXECUTED	ORAQA1		11-02-2015 08:50:09
13	0A1E021E42D854DB30C55F7A		EXECUTED	ORAQA1		11-02-2015 08:50:07
14	0A1E020D17A454DB3064036E		EXECUTED	ORAQA1		11-02-2015 08:48:29
1.41 × 1	0A1E020D17A454DB3002036C		FAILED	ORAQA1		11-02-2015 08:46:50

Create a JDBC data source for the database where you have created this table and specify this JDBC data source in the JNDI \rightarrow property DataSourceName as shown in figures below:

Figure 5-102 JDBC Data Source

eate a New JDBC Data Source				
Test Configuration Back Next	t Finish Cancel			
Test Database Connection				
Test the database availability and t	he connection properties you provided.			
What is the full package name of JDB	3C driver class used to create database connections in the connection pool?			
Note that this driver class must be in	n the dasspath of any server to which it is deployed.)			
Driver Class Name:	oracle.jdbc.xa.client.OracleXADataSource			
What is the URL of the database to (connect to? The format of the URL varies by JDBC driver.			
URL:	jdbc:oracle:thin:@//10.30.32.110:1521/PDBORCL			
What database account user name c	o you want to use to create database connections?			
	to you want to use to create database connections?			
Database User Name:				
Database User Name: What is the database account passw	TIDUSER			
Database User Name: What is the database account passw	TIDUSER			

Figure 5-103 DataSourceName

Settings fo	Settings for javax.resource.cci.ConnectionFactory					
eneral	Properties	Transaction	Authentication	Connection Pool	Loggin	

This page allows you to view and modify the configuration properties of this outbound connection pool. Properties you modify here are saved to a deployment

Outbound Connection Properties

Save				
Property Name 🔅	Property Type	Property Value		
DataSourceName	java.lang.String	jdbc/TIDUSER		
DestinationDataProvider_JCO_ALIAS_USER	java.lang.String			

Status of the Transaction is recorded in the database. Hence, the need to retry the transaction is identified easily. This concept helps developer eliminate data redundancy and would greatly reduce the overall workload by identifying the transaction completion status on time.

5.19 Large payload support-AsAttachment

Large Payload Support (AsAttachment) feature in SAP Adapter provides support for transferring large files as attachments. This option opaquely transfer large IDocs as an

attachment without processing their content. This feature provides a faster way to post IDocs from sender to receiver.

AsAttachment support for Inbound

Perform the following steps to create an SAP Endpoint for Large payload support:

- 1. Create an Inbound Idoc endpoint using the SAP Adapter for SAP.
- 2. For more information, refer to the section 8.2.4, "Design an Inbound BPEL Process for BAPI/RFC/IDoc".
- **3.** While configuring SAP Adapter, add 'AsAttachment' property from JCA properties page after selecting IDoc.

Figure 5-104 Select IDoc and proceed to JCA properties page

	be.		
fierarchical Alphabetical	Selected BAP	I/RFC function	ns or IDOC mess
SAPSLL/CUS_EXP_EVI SAPSLL/CUS_EXP_MAT SAPSLL/CUS_EZL SAPSLL/CUS_FIN SAPSLL/CUS_INBOUND SAPSLL/CUS_INBOUND SAPSLL/CUS_PCS SAPSLL/CUS_PED SAPSLL/CUS_PRL SAPSLL/CUS_SCIPED		501 Material	Master
	Name:		
	Name	Type	Description
(SAPSLL/CUS_VZL			
. Carsul/Cus_WAT			
- Carlo /SAPSLL/DEBMAS_SLL			
- C /SAPSLL/MATMAS_SLL			

Figure 5-105 JCA Properties

CA Properties	01010101010101010104040404040	
pecify the Name and Value of all JCA A	apter Properties.	
roperties	÷	×
Name	Value	
IncodeIDOC	no	
ControlCharacter	encode	
AutoSYSTAT01	no	
ProgramID	ORAQA2	
ca.retry.interval	1	
ca.retry.maxInterval	120	
ca.retry.count	9	
ca.retry.backoff	2	
AsAttachment	true	
	true	
	false	

4. Complete SAP Adapter configuration and verify the jca file for 'AsAttachment' as shown in the figure below.

Figure 5-106 AsAttachment added in JCA file

	<connection-factory location="eis/SAP/FMWDEMO" uiconnectionname="IB1"></connection-factory>
į.	<endpoint-activation operation="sapService" porttype="sapService_FT"></endpoint-activation>
į.	<activation-spec classname="oracle.tip.adapter.sap.inbound.SAPActivationSpecImpl"></activation-spec>
	<property name="EncodeIDOC" value="no"></property>
	<property name="AsAttachment" value="true"></property>
	<property name="ControlCharacter" value="encode"></property>
	<property name="AutoSYSTAT01" value="no"></property>
	<property name="ProgramID" value="ORAOA2"></property>
	<property name="IDOC" value="MATMAS01"></property>
	<property name="Type" value="IDOC"></property>
Į.	

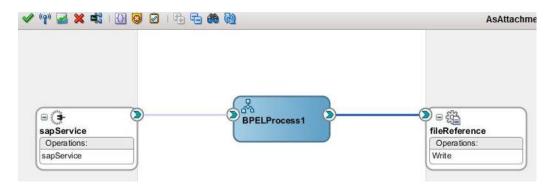
5. After successful configuration of SAP Adapter, Configure file Adapter and select schema as shown below.



7 FILE Adapter Configurati	on Wizard - Step 6 of 7	AsAtt
Messages		
that defines the messages in t	rite File operation. Specify the Schema File Location and select the Schema Element the outgoing files. Use the Browse button to find an existing schema definition. If you en you do not need to specify a Schema.	
Message Schema	is not required (Schema is Opaque)	
Schema Element	•	
1 m	Type Chooser	
	Type Explorer Project Schema Files Project WSDL Files Project WSDL Files Project WSDL Schemas WSDL Schemas Schema - http://xmlns.oracle.com/pcbpel/adapter/file MSDL Schemas Project WSDL MSDL Schemas Project WSDL Project WSDL	/attachment/
Help		

6. Configure BPEL Process





- 7. Add recive and invoke activity as shown below.
- 8. Add assign activity to map 'href_id' field of sender with the 'href_id' of reciever as shown in below figure

Figure 5-109 Add assign activity

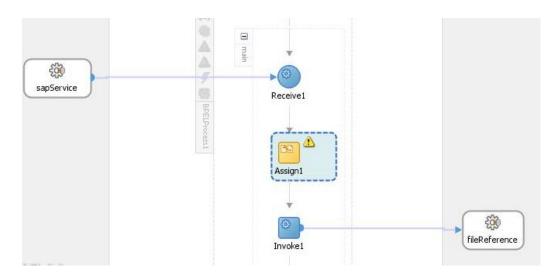
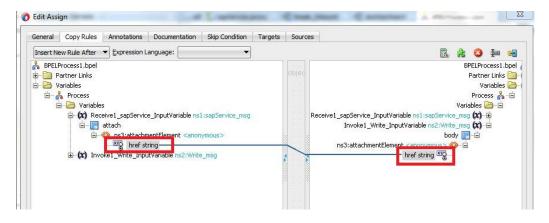
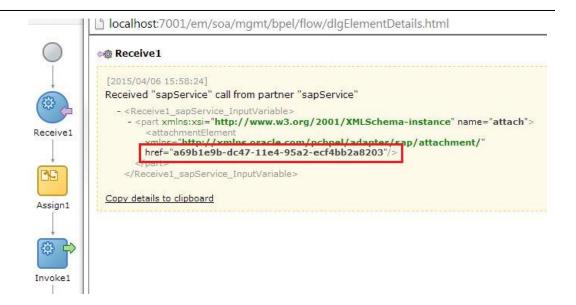


Figure 5-110 Open assign activity and Map 'href_id'



- **9.** After project creation, deploy the respective composite to the server and trigger IDoc from SAP.
- **10.** After receiving IDoc as an attachment successfully, check the flow instance and verify 'href_id' of the attachment.

Figure 5-111 Flow Instance



5.20 Resiliency Support

Resilience is a generic feature supported by SAP Adapter for Oracle SOA Suite 12C. Main goal of the resiliency project is to make the SOA server more robust and to better handle overload and failure situations.

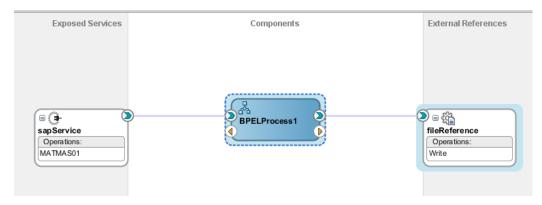
Resiliency-Failure: Gracefully handle downstream endpoint failures to prevent faults from building up in the system/error hospital by shutting down incoming requests for the flow.

5.20.1 Inbound Project with Resilience support

To create an Inbound Project with Resilience support, perform the following steps:

 Create Inbound Endpoint for IDoc. For more information, refer to the section 8.2.4, 'Design an Inbound BPEL Process for BAPI/RFC/IDoc'. A file adapter can be used to receive the IDoc.

Figure 5-112 Design of Composite



2. Deploy the project. For more information, refer to the section 2.5.2, 'How to Deploy'.

Testing

Test deployed project by sending an IDoc from SAP. For example, a MATMAS IDoc can be sent from BD10 tcode of SAP.

Figure 5-113 Test Deployed Project

Send Material			
🕀 🔁 🚹			
Material	100-100		
Class		to	
Message Type (Standard)	MATMAS		
Logical system	ORAQA2		
Send material in full			

Note: Considering the case where IDoc is written into file and file has no write permission in Linux environment

This IDoc is not processed/rejected and error is encountered because of no writing permission. Check the Flow instance in EM console – It will be in recovery mode.

Configuring Resilience from Enterprise Manager.

1. From EM, Go to SOA → soa_infra(soa_server1) → SOA Depoyment → Resiliency Configuration

Figure 5-114 Test Deployed Project

Target Navigation						
View 💌			=			
 Application [SOA 	Deployments		Server			
⊿ <u>∰ soa-i</u> *** ₀ @ o	Home	Þ	Name Admin			
🖌 🛅 WebLogic	Monitoring	Þ	Host TDCVI			
🖌 📑 base	Logs	Þ	Listen Port 7017			
A s	SOA Deployment	►	Common Properties			
Coherenc	Manage Partitions		BPEL Properties C			
🕨 🛅 Metadata	Work Manager Groups		Mediator Properties			
User Mes	Resequencing Groups		Workflow Properties			
	Service Engines	•	Cross References			
	Services and References		Token Configurations			
	Business Events		Auto Purge			
	SOA Administration	►	Resiliency Configuration			
	Security	Þ				
	Administration	►				
	Target Siteman					

2. Enable Resilience by checking the Resiliency checkbox and specify the parameters as given in figure, i.e., when 3 or more error appear within 1 minute.

Figure 5-115 Resiliency Configuration

Resiliency	🕑 Enab	led						
Failure Rate	3	^	~	errors in	1	^	~	minutes
Retry Interval	5	^	~	minutes	🗌 Disat	ole A	uto I	Retry
Add Notifications								

Failure Rate: Number of errors that need to be captured in given amount of time.

Retry interval: Time in minutes for retry to occur from EM level.

3. After configuration, click Apply button located at right side of the Resilience configuration panel.

Figure 5-116 Apply button at Resilience Configuration Panel

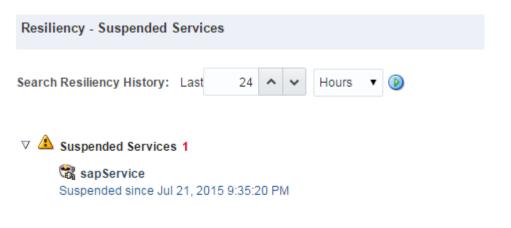
4. Click OK for confirmation.



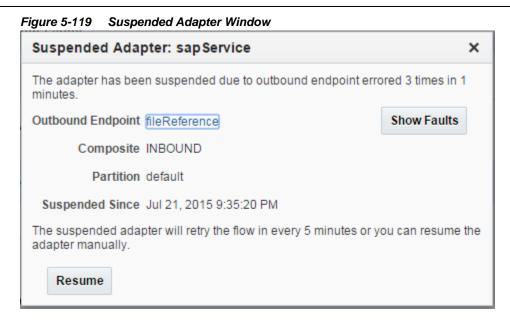
Confirmation	
Resiliency configuration have be	en saved successfully.
	ок

5. If any error is encountered then service will be seen suspended at the dashboard.

Figure 5-118 Resiliency Suspended Services



Since this endpoint is suspended, no more requests would be processed for this endpoint. Endpoint would be resumed when resume option is clicked from "Suspended since Jul 21.2015 9:35:20PM" Hyperlink.



After giving the permissions, suspended service can be resumed and hence, it is written into a file.

5.21 Segment Release Design Time and Runtime Support

SAP adapter supports segment release option for IDoc. At the time of SAP adapter configuration, you can either choose user input or the default version.

If you choose user input, you need to provide a value for segment release version.

Figure 5-120 Segment release version (User input)

ICA Properties	010101010101010	21039493932340 · · · · · · · · · · · · · · · · · · ·
Specify the Name and Value of all JCA Adapt	er Properties.	÷ 🗙
Properties Name	Value	
AutoSYSTAT01	no	
EncodeIDOC	no	
ControlCharacter	encode	
Segment release provider	User input	
ProgramID	ober inpor	
jca.retry.count	9	
jca.retry.interval	1	
jca.retry.backoff	2	
jca.retry.maxInterval	120	
Segment release version	30cl	

If you choose the default SAP release version, the SAP adapter will fetch the latest release version.

ICA Properties		1747474540
Specify the Name and Value of all JCA Adap	ter Properties.	
Properties		÷ ×
Name	Value	
AutoSYSTAT01	no	
EncodeIDOC	no	
ControlCharacter	encode	
Segment release provider	Default SAP release	
ProgramID	Default SAP release	
jca.retry.count	User input	
jca.retry.interval	1	
jca.retry.backoff	2	
jca.retry.maxInterval	120	

Figure 5-121 Adapter Configuration Wizard

5.22 Special Character Support for Inbound IDoc

The SAP adapter supports valid as well as invalid characters, which include special characters emoji's and all HTML characters in ASCII format.

5.23 Dynamic RFC Cache Update

If any changes occur in an SAP object, you can reflect those changes in composites or projects without restarting the SOA/OSB servers.

Steps for SAP side configuration:

- **1.** Edit the required SAP object.
- 2. After completing the required changes, activate the object.

Note: In case of IDoc, the object needs to be released again using set release option.

Perform the following steps to update SAP objects' cache dynamically in run time:

- 1. Restart JDeveloper.
- 2. Reconfigure the SAP adapter endpoints with updated SAP object in JDeveloper.
- 3. Reconfigure any other endpoints such as DB and File in composite that depend on schema/WSDL of the SAP endpoint.

- 4. Save and refresh the SOA project.
- 5. Deploy the edited project in the server without restarting it.

<u>6</u>

Complete Walkthrough of the Adapter Configuration Wizard

This chapter explains how to configure an Adapter for SAP in design-time. It contains the following topics:

- Section 6.1, "Overview"
- Section 6.2, "The Adapter Wizard in JDeveloper "
- Section 6.3, "Specifying the Service Name"
- Section 6.4, "Connecting to SAP"
- Section 6.5, "Select SAP Objects from Objects Selection"
- Section 6.6, "JCA Properties Page"
- Section 6.7, "Finishing with Adapter Configuration Wizard"

6.1 Overview

The design-time plug-in enables you to access the SAP server, browse SAP repository, and generate SCA artifacts such as XSD, WSDL, and JCA properties for SAP endpoints directly within the composite designer of JDeveloper for SAP RFC, BAPI, and IDoc objects. It also enables you to test BAPI and RFC directly in the JDeveloper.

6.2 The Adapter Wizard in JDeveloper

To use Adapter for SAP in JDeveloper Composite, open Oracle JDeveloper and drag and drop the **Adapter** from **Component** to the **Composite** either on **Exposed Services** pane or **External Reference** pane, as shown in Figure 6-1.

OR

Right-click on **Exposed Services** pane or **External Reference**, Select **Insert** and select the **Adapter for SAP** from the list available.

Figure 6-1 Adapter Component



6.3 Specifying the Service Name

When the Adapter for SAP is drag and dropped to the Composite, the first page appears for the Adapter configuration wizard, as shown in Figure 6-2.

Figure 6-2 Adapter Configuration Wizard

👩 Adapter Configuration Wizard -	Step 1 of 3			×
SAP Adapter Service			10101029498989898	Ø ang
Welcome to the Adapter C	Configuration Wi	zard		
This wizard helps you create a service define an operation for the service.	using a SAP Adapter, Y	ou will be asked to s	pecify configuration p	arameters and
Enter a Service Name.				
Name: sapService				
Help	< <u>B</u> ack	Next >	Einish	Cancel

Provide a service name and when the wizard completes defining an adapter service, a WSDL file by this name will appear in the Application Navigator.

6.4 Connecting to SAP

A Connection Information page opens up next to define the SAP connection for the adapter. This page enables you to create a new connection or update/edit an existing connection. Connection summary with JNDI name is displayed on the page, as shown in Figure 6-3.

Use the default Java Naming and Directory Interface (JNDI) name or specify a custom name. This connection enables you to configure the adapter during design-time and to connect to the SAP server during run-time.

Figure 6-3	Connection Information Page
------------	-----------------------------

Connectio	n Information				
	nection is required to config ate a New Connection.	gu <mark>re this adapter. Se</mark>	ect a SAP R/3 conr	ection already def	fined in your
Connection:	DefaultClient				+/×
Client:	800				
Applicati	on Server: 10.30.32.42			Add	Edit Delet
System I	Number: 00				
JNDI Name:	eis/SAP/FMWDEMO				9

Edit SAP Connection: Edit SAP Connection button can be used to edit SAP connection details, as shown in Figure 6-4. You can also use **Import** button to set connection parameters. Refer to the section "Note" mentioned in the section.

Figure 6-4 Import Button

0	Edit SAP R/3 Co	onnection	x
	Connection Name	e: DefaultClient Import	
	User Conne	ection	
	User Logon Pa	arameters:	
	User Name:		
	Password:		
	Client:	800	
	Language:	en	

Delete SAP Connection: Delete SAP Connection button can be used to delete any existing connection from the Connection list. Once clicked, it shows **Delete SAP R/3 Connection** page, as shown in Figure 6-5.

Figure 6-5 Delete SAP R/3 Connection

Connectio	n Information		
	nection is required to configur ate a New Connection.	re this adapter. Select a SAP R/3 connection alrea	ady defined in your
Connection:	DefaultClient		- +/×
Client: Applicatio	800 Delete SAP	R/3 Connection	
System N JNDI Name:	eis/SAP/FMW	Delete SAP connection: DefaultClient ?	<u> </u>
		OK Cancel	

6.4.1 Define a Connection Name

To create a new SAP R/3 connection, click on the + icon. A new connection dialog appears where user needs to provide **Connection Name** or can use default name, as shown in Figure 6-6.

Figure 6-6 Create New SAP R/3 Connection Page

Create SAP K/3 Connection	
Connection Name: DefaultClient	<u>I</u> mport
User Connection	
User Logon Parameters:	

6.4.2 Define the Connection Parameters to the Connection Name

Provide the **SAP User Logon Parameters** (Username, Password, Client, and Language) in the **User** tab, as shown in Figure 6-7.

- User Name: The user name on the SAP system, this value is case sensitive. The Adapter for SAP preserves the case of the value that the user enters for the user name when it opens a connection on the SAP system.
- Password : The password for the user on the SAP system, this value is case sensitive. The Adapter for SAP preserves the case of the value that the user enters for the password when it opens a connection on the SAP system.
- Client : The SAP system client ID. Default is 800.
- Language : The current logon language of SAP. Default is English.

Figure 6-7 User Logon Parameters

0	Create SAP R/	3 Connection	ζ
	Connection Nan	ne: DefaultClient Import	
	User Conr	nection	
	User Logon P	Parameters:	
	User Name:	JCA_DEV	
	Password:	••••••	
	Client:	800	
	Language:	en	

Note: User can import the connection parameters from a properties file by selecting the **Import** button and can test the connection. In that case, default connection name would be same as properties file name, as shown in Figure 6-8.

Open	ction			×
Location:	Server_connection ver.txt	٤ 🖄		
File <u>N</u> ame: File <u>T</u> ype:	DevServer.txt All Files		Open	Cancel

Figure 6-8 Import Button

If you click on **Open** button, it will set the values of properties file, as shown in Figure 6-9.

Figure 6-9 Set the Values of Properties File

0	Edit SAP R/3 Co	onnection	x
	Connection Name	e: DevServer Import]
	User Conne	ection	_
	User Logon Pa	arameters:	
	User Name:	JCA_DEV	
	Pass <u>w</u> ord:		
	Client:	800	
	Language:	en	

6.4.3 Connect to a Defined SAP connection

SAP Connection can be defined in the **Connection** tab by selecting either of **Direct Connection** or **Load Balanced** option.

- Direct Connection: For direct connection to a single application server. Direct connection is by Default.
- Load Balanced Connection: For connecting the Adapter with load balance.

Direct Connection

When connecting using **Direct Connection** option, you need to provide following parameters, as shown in Figure 6-10.

- Application Server: Define system application server (Host name or IP Address of SAP system).
- **System Number:** It is SAP instance of the SAP application server. This property should be used when you are not using SAP load balancing.

Figure 6-10 Direct Connection

SAP Connection Parameters:				
Connection Type:	Direct Connection	🔿 Load Balanced		
Application Server:	10.30.32.42			
System Number:	00			

Load Balanced Connection

When connecting using **Load Balanced** connection option for load balancing, you need to provide following parameters, as shown in Figure 6-11.

- Message Host: Message Host is the IP of message server host.
- Message Service: Message Service is the service name of the load balancer service.
- **R/3 Name:** R/3 Name is the System ID/Name of SAP system.
- Server Group: Select any one of logon group to which you want to connect. This is the name of the group that is logging in to the SAP system.

Figure 6-11 Load Balanced

SAP Connection Par	ameters:	
Connection Type:	O Direct Connection	Load Balanced
Application Server:	10.30.32.42	
System Number:	00	
Message Host:		
Message Service:		
<u>R</u> /3 Name:		
Server Group:		

SAP Route String

In addition, there is an option for **SAP Route String**, as shown in Figure 6-12, which describes a connection required between two hosts using one or more SAP routers.

To connect to an SAP server from the internet, one uses SAP router as a proxy between the SAP GUI and the SAP server.

Note: Load balancing enables the administrator to distribute logins evenly between several application servers. It also allows configuring a bigger system landscape transparently, since the client does not need to know the address of all application servers, but only the address of the message server (load balancer).

Primarily used when you want more than one user to be able to log in to the SAP system.

Test Connection

A Test Connection button is also available on Connection tab, as shown in Figure 6-12. The **Test Connection** button test the connection to SAP with the Specified parameters.

Figure 6-12 Connection Tab

Connection Type:	Direct Connection Load Balanced	
Application Server:	10.30.32.42	
System Number:	00	
Message Host:		
Message Service:		
<u>R</u> /3 Name:		
Server Group:		
SAP Route String:	ty 🗌 Trace 🗌 Management 🗌 Additional	Test Connection
Server V Securit		

Optional tabs can be added by selecting the corresponding check bos:

- Server tab (Note: In case of outbound adapter, this tab is disable.)
- Security tab
- Trace tab
- Management tab
- Additional tab

Server Tab

This tab appears in case of Inbound adapter. Parameters available in this tab is useful in inbound communication with SAP, as shown in Figure 6-13.

🕐 Create SAP R/3 Conne	ection	×
Connection Name: De	faultClient	Import
User Connection	Server	
Server Parameters:(Only required when accepting SAP input)	
Gateway Host:		
Gateway Service:		
Program ID:		
Connection Count:		
Repo Destination:		
Server Security	/ Trace Management Additional	Test Connection
<u>H</u> elp		OK Cancel

Figure 6-13 Server Tab

Table 6-1 lists the parameters available in Server tab.

Table 6-1

Element	Description
Gateway Host	Enter Gateway host name of the sender system.
Gateway Service	Gateway service of the sender system. This can be the numeric description of the service port in the sender system or the alphanumeric equivalent (e.g., sapgwXX, where XX is the system number of the sender system).
Program ID	Program ID of the registered server program in SAP. The selected program ID must uniquely describe the RFC sender channel in the configured gateway (Application Server (Gateway) and Application Server Service (Gateway) parameters).
Connection Count	Number of initial connections required between sender system and adapter.
Repo Destination	The repository used by the server to lookup the definitions of an incoming function call.

Note: The server tab is not supported in the current release. This will be implemented for future releases.

Trace Tab

Trace Parameters (Optional)

To change the logging level of SAP JCo using following parameters, specify trace level based on JCo level or individual level like RFC Trace Level, CPIC Trace Level or Server Trace Level, as shown in Figure 6-14.

onnection Name: ER7		Import
User Connection Trace		
Trace All Connections:		
JCO Trace Level:	1	
Logging Path :	Browse	
Trace Individual Connection:		
RFC Trace Level:	0 -	
CPIC Trace Level:	0 👻	
Trace Server Connections:		
Server Trace Level:	0 💌	
(*) Note: select 0 to disable to	race	
Server Security 🗸 Tra	ce 🗌 Management 🗌 Additional	Test Connection

Figure 6-14 Trace Tab

JCo Trace Level

Use this procedure to trace JCo calls coming from the SAP systems. The JCo Traces write information about the invocated methods and the data passed through the underlying communication layers throughout the call.

Note: The activation of JCo Traces significantly slows down the communication. Therefore, you must only activate them if necessary

Trace level of 0 means disabled and 1 means enabled.

JCo Trace Level: Select values from 0 or 1.

User need to provide the Logging Path to generate the trace file for desired location in case path is not given, default location for the trace file would be \$jdev_home/jdev/bin

Figure 6-15 JCo Trace Level

User Connection Trace			
Trace All Connections:			
JCO Trace Level:	4		
Logging Path :	C:\jDev_Traces	Browse	
Trace Individual Connection:			

Figure 6-16 JCo Trace Level

OS (C	:) ▶ jDev_Traces			
rary 🔻	Share with 🔻 🛛 Burn 🔹 New folder			
	Name	Date modified	Туре	Size
	JCO20150721_133336554.trc	21-07-2015 13:33	TRC File	7 KB
	► JC020130721_135550334.0C	21-07-2013 15:55	The file	71

RFC Trace Level

Using the RFC trace, users can track which remote calls application or the SAP System triggers and on which instance these calls are executed. Users can display and further analyze the trace records logged in the trace file.

From the time users turn on the RFC trace function, to the time they turn it off again, all RFC calls occurring either for a specific user or for a user group are recorded.

From the recorded trace, user can deduce:

- Which function modules have been called remotely by the program to be analyzed.
- Whether the RFC was executed successfully.
- The total time used to process the remote call.
- The marking of the RFC communication (RFC client or RFC server).
- On which instance the remote call was executed.
- With which technical parameters this instance is characterized.
- The number of bytes sent and received during the RFC.

RFC Trace Level: Select this if user wants the RFC level trace to be either 0 or 1.

CPIC Trace Level

Common Programming Interface - Communication (CPIC) tracing. This is the communication layer under JRFC (or JCo). You can choose a trace level from 0 to 3, where 3 is the highest and most detailed level of tracing.

Since JCo is internally using the RFC and CPIC libraries, the related traces of these components are also sometimes required for an error analysis.

CPIC Trace Level: Select one of the given trace level for CPIC tracing from 0 to 3.

Management Tab

Management Parameters (Optional)

This tab provides parameters that help in managing the connection life. You can define connection pool size and other parameters to ensure connection life, as shown in Figure 6-17.

Figure 6-17 Management Tab

Create SAP R/3 Connection	X
Connection Name: DefaultClient User Connection Server Security Trace Management	<u>I</u> mport
Connection Management Parameters: (Optional) Pool Capacity: Pegk Limit: Max Wait (ms): Expiration Time (ms): Expiration Period (ms):	
Server Security Trace Management Additional	Test Connection
Help	Cancel

- 1. **Pool Capacity:** Maximum number of connections which will be kept open by the pool for possible reuse. These connections will be automatically closed if they cannot be reused for more than the **Connection Timeout** period. A value of 0 has the effect that there is no connection pooling, i.e. connections will be closed after each request.
- 2. Peak Limit: Maximum number of connections which can be allocated from the pool. This enables the user to create more connections as specified by the Peak Limit parameter, e.g. for temporary peak usage times. If the value for Maximum connections is less than the value of the parameter Peak Limit, the parameter will automatically be reset to the value of Peak Limit. All allocated connections exceeding the Peak Limit will be closed immediately, if they are released from the application to the pool again.
- **3.** Max Wait (ms): Defines the maximum time to wait to obtain a requested connection. If the connection pool is exhausted (that means the Maximum Connections limit is reached) and another thread is requesting an additional connection, this is the time that is being waited for some connection to be released by another thread so that that one can be handed out to the waiting thread. If the maximum waiting time is reached, and no connection became available in the mean time, then a JCO.Exception with the key *JCO_ERROR_RESOURCE* is thrown. The default value for the Maximum Waiting Time is 30 seconds (30,000 ms).
- 4. Expiration Time (ms): Time in ms after which the connections held by the internal pool can be closed.
- 5. Expiration Period (ms): Enter expiration period in milliseconds, this is the interval in ms with which the timeout checker thread checks the connections in the pool for expiration.

Note: The Management tab is not supported in the current release. This will be implemented for future releases.

Security Tab

SAP Security Parameters

The Adapter for SAP uses the Java Connector (JCo) to communicate with the SAP. You can have the SNC connection in the case of both inbound and outbound. The JCo needs the information as mentioned below to be able to use SNC for the connection.

Prerequisite for SNC Communication (Inbound or Outbound)

You have an SNC communication between the client server (Adapter for SAP) and the SAP, only once the SNC configuration is done on both the partner sides and the required certificates are exchanged according to the procedure mentioned by SAP.

SNC parameters for Outbound

SNC Parameters required for Outbound Connection to the SAP Server, as shown in Figure 6-18.

Create SAP R/3 Connection	×
Connection Name: DefaultClient	<u>I</u> mport
User Connection Server Security Trace	
Security Parameters:(Optional)	
SNC Mode:	
SNC Level: 1	
SNC Name:	
SNC Partner:	
SNC Library:	
Server Security Parameters:(Optional)	
SNC Level: 1	
SNC Name:	
SNC Lib <u>r</u> ary:	
Server Security Trace Management Additional	Test Connection
	î
	Ţ
<u>H</u> elp OK	Cancel

Figure 6-18 Security Tab

Table 6-2 lists the parameters available in **Security** tab.

 Table 6-2
 Parameter Available in Security Tab

Parameter	Description
SNC mode (Required field)	This is a flag for activating SNC . Check the checkbox for enabling and uncheck for disabling the SNC connection.
SNC library	This specifies the path and file name of the external library (SAP Cryptographic library file downloaded from the SAP). The sample path is 'C:\SAPNW_AS_Java\SAPCryptolib\sapcrypto.dll'.
SNC Level	 This specifies the level of protection to use for the connection. Default value is 3. Possible values of this field are as mentioned below: 1: Authentication only. 2: Integrity protection. 3: Privacy protection (default). 8: Use the value from profile parameter '<i>snc/data_protection/use</i>' maintained on the SAP server.

	9: Use the value from profile parameter ' <i>snc/data_protection/max</i> ' maintained on the SAP server.
Parameter	Description
SNC Name	This specifies the SNC name of the environment where user is testing SNC communication. The sample name is 'p:CN=AS Java, O=MyCompany, C=US'.
	Although this parameter is optional, use it to make sure that the correct SNC name is used for the connection.
SNC Partner	This specifies the AS ABAP 's SNC name. The sample name is 'p: CN=EQ6, OU=I0020070395, OU=SAP Web AS, O=SAP Trust Community, C=DE'.

SNC Parameters for Inbound

Prerequisite for Inbound SNC Communication

Inbound SNC communication after defining the RFC options for the Program ID that you have used for the connection and enabling the SNC by activating the same in the corresponding RFC destination. This can be done in the tcode SM59. The parameters to be passed in the 'SNC options' are as follows:

- 1. In the **RFC Destination**, select the **SNC** button in the **Logon & Security** tab. Pass the below values:
 - **QoP**: Select any of the values of 1,2,3,8 & 9 as displayed in the drop-down box. This specifies the level of protection to use for the connection.
 - PartnersPartners: The RFC server program's SNC name has to be specified here. For e.g., 'p: CN=RFC, OU=IT, O=CSW, C=DE'.
 - Save the parameters.
- **2.** Activate the SNC by selecting the radio button **Active** in the **Logon & Security** tab of the RFC destination.

Table 6-3 shows the SNC Parameters required for Inbound Connection to the SAP Server:

Element	Description
SNC Level	This specifies the level of protection to use for the connection for the inbound
(Optional field)	connection from SAP. Default value is '3'.
	Possible values of this field are as mentioned below:
	1: Authentication only.
	2: Integrity protection.
	3: Privacy protection (default).
	8: Use the value from profile parameter 'snc/data_protection/use' maintained on
	the SAP server.
	9: Use the value from profile parameter 'snc/data_protection/max' maintained on
	the SAP server.

Element	Description
SNC Name (Optional field)	This Specifies the SNC name of the environment where user is testing SNC communication.
	The sample name is 'p:CN=AS Java, O=MyCompany, C=US'. Although this parameter is optional, set it to make sure that the correct SNC name is used for the connection.
SNC library (Optional field)	This Specifies the path and file name of the external library (SAP Cryptographic library file downloaded from the SAP). The sample path is 'C:\SAPNW_AS_Java\SAPCryptolib\sapcrypto.dll'.

Table 6-3 SNC Parameters required for Inbound Connection Continues

The Properties in the WebLogic console can be used for run-time SNC communication of Adapter for SAP. The corresponding parameters in the DT and RT are given in the Table 6-4.

Table 6-4 Parameters in the DT and RT

Parameters in Design-Time	Corresponding Parameters for Run-time			
Client Security Parameters:				
SNC mode	DestinationDataProvider_JCO_SNC _MODE			
SNC library	DestinationDataProvider_JCO_SNC _LIBRARY			
SNC Level	DestinationDataProvider_JCO_SNC _QOP			
SNC name	DestinationDataProvider_JCO_SNC _MYNAME			
SNC Partner	DestinationDataProvider_JCO_SNC _PARTNERNAME			
Server Security Parameters:				
SNC Level	ServerDataProvider_JCO_SNC _QOP			
SNC name	ServerDataProvider_JCO_SNC _MYNAME			
SNC library	ServerDataProvider_JCO_SNC _LIBRARY			

Additional Tab

This tab enables you to provide extra JCo connection parameters that are not defined in the other tabs of the Connection page in the wizard. In **Property Name** provide JCo property and in **Property Value** column provide value of that particular JCo parameter.

When these properties are defined in the Additional tab, the same is used for connection. These properties and corresponding values are also reflected while checking the parameters through **Test Connection** button, as shown in Figure 6-19.

Note: The additional tab is not supported in the current release. This will be implemented for future releases.

Add Remove	nnection Name: DefaultClient	<u>I</u> mport
Property Name Property Value jco.client sknjdnfkiwsndfsandsnkodnfksndnknfskndskjdnks Add Remove Server Security Trace Management Additional Test Connection rest connection successful w/parameters: ico.client.user=JCA_DEV, co.client.lang=en, sap.connection.name=DefaultClient, test test	Jser Connection Management A	Additional
jco.client sknjdnfkiwsndfsandsnkodnfksndnknfskndskjdnks Add Remove Add Remove Server Security Trace Management ✓ Additional Test Connect Test connection successful w/parameters: Security Trace Security Trace ✓ Management ✓ Additional Test connection successful w/parameters: Security Security Security Trace ✓ Management ✓ Additional Test connection successful w/parameters: Security Security Trace Security Trace ✓ Management ✓ Additional Test Connection Test connection successful w/parameters: Security Security Test Connection Security Trace ✓ Management ✓ Additional Test Connection Test connection successful w/parameters: Security Security Test Connection Security Test connection Test connection Test connection Security Test connection Security Test connection Security Test connection Test connection Test connectio	Additional Parameters:(Optional)	
Add Remove Server Security Trace Management Additional Test Connect Server Security Trace Management Additional Test Connect Test connection successful w/parameters: Security Trace Management Additional Test Connect Test connection successful w/parameters: Security Security Trace Management Management Security Test connection successful w/parameters: Security Security Trace Security Security <t< td=""><td>Property Name</td><td>Property Value</td></t<>	Property Name	Property Value
Server Security Trace ✓ Management ✓ Additional Test Connect Test connection successful w/parameters: Security Trace ✓ Management ✓ Additional Test connection successful w/parameters: Security Trace ✓ Management ✓ Additional Test connection.user=JCA_DEV, Security Trace ✓ Management ✓ Additional Security Trace ✓ Management ✓ Additional Test Connectional Test connection.user=JCA_DEV, Security Test Connection.name=DefaultClient, Security	jco.client	sknjdnfkiwsndfsandsnkodnfksndnknfskndskjdnks
Test connection successful w/parameters: fjco.client.user=JCA_DEV, co.client.lang=en, ap.connection.name=DefaultClient,		
fjco.client.user=JCA_DEV, co.client.lang=en, ap.connection.name=DefaultClient,	Add Remove	
co.client.lang=en, ap.connection.name=DefaultClient,		agement ☑ Additional
	Server Security Trace Mana est connection successful w/parameters:	agement ☑ Additional <u>T</u> est Connec
	Server Security Trace Mana est connection successful w/parameters: co.client.user=JCA_DEV, o.client.lang=en,	agement 🔽 Additional <u>T</u> est Connec
	Server Security Trace Mana est connection successful w/parameters: co.client.user=JCA_DEV, o.client.lang=en, up.connection.name=DefaultClient,	

Figure 6-19 Additional Tab

6.5 Select SAP Objects from Objects Selection

Once connected to an SAP server using the connection definition, the **Object Selection** page appears which enables you to select SAP BAPI, RFC, or IDoc objects.

This wizard has three panels, as shown in Figure 6-20.

- 1. Object panel.
- 2. Selected BAPI /RFC functions or IDoc messages panel.
- 3. Definition panel.

rigule 0-20 Object Selection rage	Figure 6-20	Object Selection Page
-----------------------------------	-------------	------------------------------

ect Selection	1	(2	
lect SAP objects, BAPI, RFC, or IDoc, Hierarchical Alphabetical SAP Business Objects (BAPIs) Function Modules (RFCs) ALE/EDI Messages (IDOCs)	> 39 3	Selected BAP	I/RFC function	ns or IDOC messag
	3	Name: Name	Туре	Description

6.5.1 Object Panel

The Object Panel shows two tabs, that is, Hierarchical and Alphabetical .

Hierarchical : This tab shows all the SAP Objects (RFC /BAPI /IDoc) available in that SAP system in hierarchical form, as shown in Figure 6-21.

For each of the root notes BAPI/RFC/IDoc, The hierarchy is arranged with the Application Components, Subcomponents, Business Object types, Business Objects, Methods with the levels of hierarchy directed from the root node to leaf node.

Figure 6-21 Hierarchical Tab

Alphabetical	1
ss Objects (BAP	PIs)
counting - Gene	eral
plication Platfo	rm
to-ID Infrastru	cture
sis Components	5
ntrolling	
oss-Application	Components
stomer Service	
terprise Contro	Iling
terprise Portal	
vironment, Hea	alth and Safety
ancial Accounti	ing
ancial Services	
ancial Services	
ancials	
vestment Mana	gement
	ss Objects (BAF counting - Gene plication Platfoo to-ID Infrastru sis Components ntrolling oss-Application stomer Service terprise Contro terprise Portal vironment, Hea ancial Account ancial Services ancial Services ancials

• Alphabetical : This tab shows all the Business Objects available in that SAP system in the

alphabetical form(A to Z), as shown in Figure 6-22.

igure 6-22	Alphabetical	Tab	
Hierarchical	Alphabetical		
≽ sap		-	
🖨 🗁 Busine	ess Objects (BAPI	s)	
🕀 🙆 🕀			
🖶 🗀 B			
🕒 🗀 C			
🕒 🙆 D			
🕀 🙆 E			
🖶 🗠 🔁 F			
🕀 🗀 G			
🗎 🕀 🙆 Н			
🖻 🗀 I		-	
🛓 🖶 🔁 🕽			
🖻 🗀 K			
🖶 🔂 L			
🖶 🗀 M			
🖶 🗀 N			
Ē ⊡ 0		-	
1		1.00	

You can select any option for browsing the SAP business objects. This can be done by clicking on + icon that establish a connection to SAP and displays all the objects of the expanded node as shown in Figure 6-23.

Figure 6-23 Expanded Node

Adapter Configuration Wizard - Step 3 of 4		
bject Selection		
Select SAP objects, BAPI, RFC, or IDoc, to retri		functions or IDOC message
Hierarchical Alphabetical	Selected bAP1/IV C	runcions or 1000 message
Business Objects (BAPIs)		
Please wait	>>	
Function Modules (RFCs) ALE/EDI Messages (IDOCs)	8	
	33	
Oconnecting		
Connecting to SAP	8	
Connecting to ske		
		escription
Help <	Back Next >	Einish Cancel

Once the SAP connection is established and all objects are displayed, you can search and select the desired object using **Search SAP Repository** and providing exact or pattern matched string.

To search the object, select the required object, right-click and select **Search** option as shown in Figure 6-24.

Figure 6-24 Search Option

🗁 SAP	
🖨 🗁 Business Objects	(BAPIs)
🗄 🗀 🔁 Accounting	
🕀 🙆 Application	Select
🕀 🙆 Auto-ID In 📗	Search
🕀 🙆 🖪 Basis Comp	Test
🕀 🙆 Controlling	

The object can be searched by two ways, Name or Description, as shown is Figure 6-25.

- Name : If you select the Name radio button, the search occurs only on the basis of name of the object.
- **Description :** If you select the **Description** radio button, the search occurs only on the basis of description of the object.

To search any object, the search criteria needs to be passed in the **Find** field. Once you provide the criteria and click on **Search** button, the objects matching the search criteria is displayed in the text area just below to the **Find** field.

Once the objects are displayed in the text area, you can select the objects by clicking on OK button.

Figure 6-25 Search SAP Repository

Adapter Configuration Wizard - Step 3 of	1	23	inboundTes
bject Selection	energianonanon-analyticion	*	ces
Select SAP objects, BAPI, RFC, or IDoc, to Hierarchical Alphabetical SAP Business Objects (BAPIs) Controlling - Accounting - General Controlling Controlling Controlling Controlling Customer Service Customer Service Customer Service	Search SAP Repository Search SAP Repository Find: COMPANY* CompanyCode.ExistenceCheck [BAPI_COMPAN CompanyCode.GetDetail [BAPI_COMPAN CompanyCode.GetPeriod [BAPI_COMPAN CompanyCode.GetPeriod [BAPI_COMPAN Company.ExistenceCheck [BAPI_COMPANY_Company.GetDetail [BAPI_COMPANY_COMPA	ANYCODE_GETDETAIL] IYCODE_GETLIST] PANYCODE_GET_PERIOD] PANY_EXISTENCECHECK]	Search
Carl Enterprise Portal Drain Environment, Health and Safet Drain Environment, Health and Safet Drain Financial Services Drain Financial Services Drain Financials Drain Environment Management	Company.GetList [BAPI_COMPANY_GE	OK Cancel	Cancel

Once the desired object is selected, it is moved to **Selected BAPI /RFC functions** or **IDoc messages** panel.

After identifying the required object in the Hierarchy/Alphabetical list, below three operations can be performed on object, as shown in Figure 6-26.

Select the required object, right-click and select Select, View Schema, or Test option.

Select: Once Select is clicked, the selected object is added to the Selected BAPI /RFC functions or IDoc messages panel.

Hierarchical Alphabetical		Selected BAPI/RF	C functions	or IDOC message
	^ >	BAPI_COMP	ANYCODE_	GETDETAIL Com
L_ORG_UNITS	8			
PLANNING	00			
_STATKEYFIGURE	3			
		1		
DP_XI_PROXY				
CORE		4.0)
LOSING				
CRC		Definition: BAPI_(ODE_GETDETAIL
5		_	1.00	-
S SCORE		Name	Туре	Description
SCORE D002		Name COMPANYCOD	Type CHAR	Description Company Code
S SCORE 0002 BAPI_COMPANYCODE_GET_PERIOD For Co		Name COMPANYCOD COMPANYCOD	Type CHAR STRUCT	Description Company Code
S SCORE 0002 BAPI_COMPANYCODE_GET_PERIOD For Col BAPI_COMPANYCODE_GETLIST List of Comp	Re .	Name COMPANYCOD COMPANYCOD	Type CHAR STRUCT	Description Company Code
CRC S SCORE 0002 BAPI_COMPANYCODE_GET_PERIOD For Co BAPI_COMPANYCODE_GETLIST List of Comp BAPI_CCODE_GET_LASTDAY_FYEAR For Co	n l	Name COMPANYCOD COMPANYCOD	Type CHAR STRUCT	Description Company Code Company Code Company Code
S SCORE D002 BAPI_COMPANYCODE_GET_PERIOD For Col BAPI_COMPANYCODE_GETLIST List of Comp BAPI_CCODE_GET_LASTDAY_FYEAR For Co BAPI_COMPANYCODE_GETDETAIL Company	n 	Name COMPANYCOD COMPANYCOD	Type CHAR STRUCT	Description Company Code Company Code Company Code
SCORE SCORE SCORE SCORE SAPI_COMPANYCODE_GET_PERIOD For Col BAPI_COMPANYCODE_GETLIST List of Comp BAPI_CCODE_GET_LASTDAY_FYEAR For Co BAPI_COMPANYCODE_GETDETAIL Company	n l	Name COMPANYCOD COMPANYCOD	Type CHAR STRUCT	Description Company Code Company Code.
S SCORE D002 BAPI_COMPANYCODE_GET_PERIOD For Col BAPI_COMPANYCODE_GETLIST List of Comp BAPI_CCODE_GET_LASTDAY_FYEAR For Co BAPI_COMPANYCODE_GETDETAIL Company A	n 	Name COMPANYCOD COMPANYCOD COMPANYCOD RETURN	Type CHAR STRUCT	Description Company Code Company Code. Company Code.

Figure 6-26 Select, View Schema, and Test

- View Schema: You can view the created xsd schema of the object in the **Definition** panel, as shown in Figure 6-27.
- **Test :** You can test the created schema by this option. This feature is supported only for BAPI and RFC .

Hierarchical Alphabetical	Selected BAPI/RFC functions or IDOC messages:
😥 🕼 Post	AcctngBilling.CheckReversal [BAPI_ACC_BIL]
🕀 🦉 Reverse	AcctngBilling.Post [BAPI_ACC_BILLING_POS
🖨 - 🕢 AcctngBilling	
😥 🖓 Check	S S
CheckDewarcal	
Select 🗲	
View Schema	
Pos Test	
🖓 DOCUMENTHEADER	<xsd:simpletype></xsd:simpletype>
🗭 OBJ_KEY	<xsd:restriction base="xsd:string"></xsd:restriction>
🕼 OBJ_SYS	<xsd:maxlength value="10"></xsd:maxlength>
OBJ_TYPE	
	()→

Figure 6-27 Select and View Schema Result

Once the **Test** option is clicked, a popup window appears, with **Test Input** and **Test Output** tabs, as shown in Figure 6-28.

- 1. Test Input: Test Input tab has three columns as mentioned bellow:
 - Name : Name of the object.
 - Value : Value is given by the user as an input to test the created schema of the selected object.
 - **Description :** Description of the each field of the object.

Figure 6-28 Test Input Tab

Test SAP RFC/BAPI Method		
Test Input Test Output		
Name	Value	Description
BAPI_COMPANYCODE_GETDE	TAIL (Company Code Details
COMPANYCODEID	1000	Company Code

2. Test Output: Once you have provided the input and clicked on **Run Test**, this option tests the created schema of the selected object and displays the result in the text area of the **Test Output** tab, as shown in Figure 6-29.

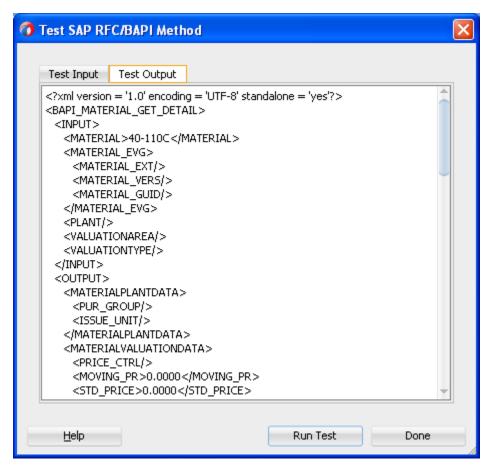


Figure 6-29 Test Output Tab

You can close the test window by clicking on **Done** button.

6.5.2 Selected BAPI /RFC functions or IDoc messages panel

This panel contains the selected BAPI/RFC functions or IDoc messages, as shown in Figure 6-30. Once you select the desired object, the selected object can be added or removed from the **Selected BAPI/RFC functions or IDoc messages** panel by clicking on the icons mentioned in Table 6-5.

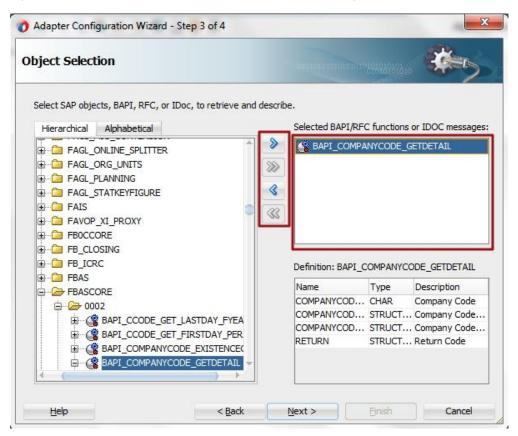
lcon	Description
8	This icon gets enabled when you select only one object to shifts into the selection panel.
8	This icon gets enabled when you select only one object to remove from the selection panel.
>>>	This icon gets enabled when you select more than one object to shift into the selection panel.
	This icon gets enabled when you select more than one object to remove from the selection panel.

Table 6-5 Add/Remove Object Icon

Once any corresponding object is selected in the **Search** window, it will be automatically added to this panel.

Note: If you select the RFC Object while creating an outbound endpoint, an option is available to define type (sRFC, tRFC, qRFC, bgRFC) of RFC connection you wanted to use while executing this object. A popup window appears, where you can choose the RFC type when you right-click on the selected RFC Object.

Figure 6-30 Selected BAPI /RFC functions or IDoc messages panel



6.5.3 Definition panel

This panel contains the further definition of the selected object. Object Schema Details are visible in this panel. Definition panel has three columns: **Name**, **Type**, and **Description** which defines the fields of the selected object, as shown in Figure 6-31.

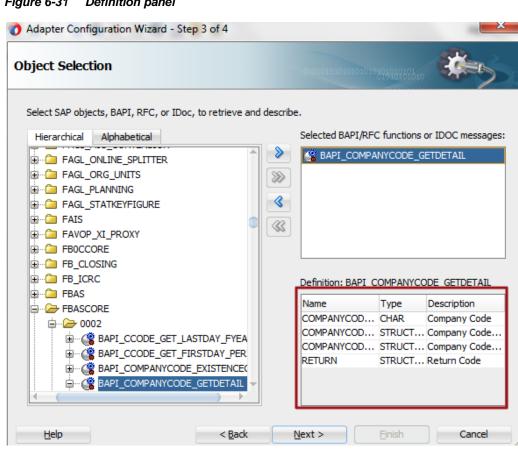


Figure 6-31 Definition panel

6.6 **JCA** Properties Page

JCA properties page enables the user to define JCA properties of the SAP endpoint. This page has two tabs i.e. + (ADD) and x (REMOVE). You can Add, Delete and Update the properties and respective values, as shown in Figure 6-32.

Figure 6-32	JCA	Properties
-------------	-----	------------

Specify the Name and Value of all JCA Adapter Pr Properties Name Interaction ExceptionFilter	Value 🔀
Name Interaction	Value
Interaction	
ExceptionFilter	stateless
	off
SchemaValidation	off
jca.retry.count	9
jca.retry.interval	1
jca.retry.backoff	2
jca.retry.maxInterval	120

6.6.1 Interaction of JCA Properties (Outbound to the Adapter) Interaction

Stateless

This treats each request as an independent transaction that is unrelated to any previous request so that the communication consists of independent pairs of requests and responses. This does not require the server to retain session information or status about each communications partner for the duration of multiple requests. Note that the default value is **Stateless**.

Stateful

The state of the session is maintained in the session ID for the duration of the conversation between the client and the stateful session. If user selects **Interaction pattern** as stateful then the following extra operations automatically get added.

This is required in case you are creating or changing data in SAP through Standard/Custom BAPI/RFC which does not support an internal commit to database.

ExceptionFilter

On

This property enables the user to set a custom exception filter class that implements the interface:

oracle.tip.adapter.api.exception. ExceptionFilter

The exception filter is supported only for outbound processes. This class name is defined in the .jca file to filter the generated exceptions and categorizes them into the following categories:

- PCRetriableResourceException A remote fault.
- PCResourceException A binding fault.

This exception can then be handled by the SOA composite fault policy files.

Off

In this case, no exception filter class is added in the .jca file and no exceptions like *PCRetriableResourceException/PCResourceException* are thrown in case of remote or binding faults. Note that the default Value is **off**.

SchemaValidation

On

SchemaValidation **ON** is used to validate the Input XML document with the schema in the WSDL document during run-time. On failure, the XML record is rejected with the error **Invalid Input Xml**. This can be configured in a .jca file.

Off

No Validation of Input XML is done with the xsd. Anything wrong in the input XML is rejected with the JCO exception. Note that the default value is **off**.

Queue Name

Queue Name needs to be specified to serialize the data that is being sent, like function modules which depend on each other (such as update and then change) i.e. Queued RFC (QRFC) connections are used to transport outbound messages to SAP through the queue. This queue needs to be configured in SAP first, and is given in the **Queue name** field of the configuration wizard.

Note that the default value is blank. This is applicable for IDOCs.

jca.retry.interval

This property specifies the time interval between each retry.

jca.retry.maxInterval

This property specifies the maximum value of retry interval, i.e. a cap if backoff>1.

jca.retry.count

This property specifies the number of times that user wants the retry to be carried out.

jca.retry.backoff

This property specifies the retry interval growth factor (positive integer). The user have to wait for increasing periods of time between retries 9 attempts with a starting interval of 1 and a back off of 2 will lead to retries after 1, 2, 4, 8, 16, 32, 64, 128, and 256 (28) seconds.

6.6.2 Activation of JCA Properties (Inbound to the Adapter) ControlCharacter

The Adapter for SAP provides Non-Xml character handling for the data that is coming from SAP system to the adapter. XML does not support all characters defined in Unicode. For example, control characters, some of the control character not supported by XML 1.0.

encode

Any character in payload if not supported by XML 1.0, will encode character with its decimal format.

remove

Any character in payload if not supported by XML 1.0, will remove character.

space

Any character in payload if not supported by XML 1.0, will replaces the character with space.

AutoSYSTAT01

Yes

In this case, Adapter for SAP is able to auto return the sent SYSTAT01 IDoc back to SAP with a positive response (code 53) upon a successful reception of an IDoc message.

■ No

In this case, nothing is sent back to SAP by the Adapter upon a successful reception of an IDoc message. Note that the default value is **No**.

EncodelDoc

Flatfile

SAP uses a non-XML text-based format, called the Flatfile IDoc format, for serializing IDoc messages to file system. In a Flatfile IDoc, all IDoc records including control record and data record are stored in lines of text separated by a line delimiter.

No

SAP uses the XML format to send IDoc records the field names and complete data.

Note that the default value is No.

programID

The programID specified at the DT level overrides with RT.

6.6.3 Generation of Corresponding (JCA) Artifacts (WSDL/XML Schemas)

SCA artifacts such as XSD, WSDL, and JCA properties are generated for SAP endpoints directly within the composite designer of JDeveloper. The .xsd defines the schema definition for the selected object whereas .jca file contains all the JCA properties for that project like ConnectionFactory JNDI name UIConnectionName, portType operation and various properties like ExceptionFilter, SchemaValidation, QueueName, and object type along with the respected values, as shown in Figure 6-33.

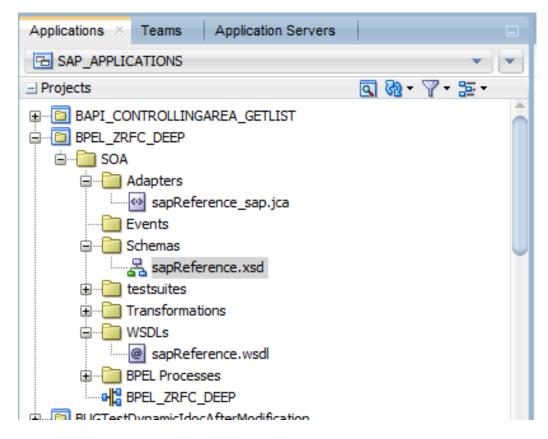


Figure 6-33 Generation WSDL/ XML Schemas Screen

6.7 Finishing with Adapter Configuration Wizard

The finish page provides a summary of the SAP endpoint definition and location of generated interface files, as shown in Figure 5-34.

Figure 6-34 Finish Page

Adapter Configuration Wizard	- Step 5 of 5			×
Finish				*
You have finished definir When you dick Finish, the wizard will D:\jdev_RC3_mywork\mywork\Stage directory.	create the			
Help	< <u>B</u> ack	Next >	Einish	Cancel

7

Configuring the Adapter Run-Time Parameters on the WebLogic Server

This chapter describes the procedure to configure the Oracle Adapter for SAP on the Oracle WebLogic Server. This chapter contains the following topics:

Section 7.1, "Adapter Integration with Oracle WebLogic Server"

Prerequisites:

- The WebLogic Application server is running.
- SAP JCo jars and library is installed in the WebLogic application server.

7.1 Adapter Integration with Oracle WebLogic Server

Oracle Adapter for SAP is deployed within an Oracle WLS container during installation. All client applications run within the Oracle WLS environment. In a run-time service scenario, an Enterprise Java Bean, servlet, or Java program client makes the Common Client Interface (CCI) calls to resource adapters. The adapters process the calls as requests and send them to the EIS. The EIS response is then sent back to the client.

7.1.1 Configure Run-time Parameters for the Adapter for SAP

1. To configure run-time parameters for the Adapter, navigate to the setting page of the deployed adapter. This page displays basic information about this resource adapter, as shown in Figure 7-1.

Settings for SAPAdapter								
Overview	Deployment Plan	Configuration	Security	Targets	Control	Testing	Monitoring	Notes
Save								
This page displays basic information about this resource adapter deployment.								
Name:				SAP/	Adapter			
Source Pat	Source Path: / oracle / Oracle / SAPAdapter. rar							
Deployme	Deployment Plan: (no plan specified)							
Staging Mo	Staging Mode: (not specified)							
Plan Staging Mode: (not specified)								
Security M	Security Model: DDOnly							
街 Deploy	Beployment Order: 100							
🕂 Deploy	ment Principal Na	me:						

2. Open the SAP JCA Adapter Configuration panel and select Outbound Connection Pools tab, a default javax.resource.cci.ConnectionFactory is available, as shown in Figure 7-2.

Figure 7-2 Outbound Connection Pools Tab

	Settings for SAPAdapter										
	Overview Deployment Plan			Configuration	Security	/ Target	s C	ontrol	Test	ing	Monitoring
General Properties Outbound Connection					Pools	Admin Obj	ects	Workl	oad	Inst	rumentation

This page displays a table of Outbound Connection Pool groups and instances for this resource adapter. The connection factory interface and the instances are listed by their JNDI names. Expand a group to obtain cont name of a group or instance to configure it. Automatically generated Connection Pools are not displayed in the

Outbound Connection Pool Configuration Table

New Delete									
	🔲 Groups and Instances 🗞								
		javax.resource.cci.ConnectionFactory							
New Delete									

- 3. Click New to create a new outbound connection.
- 4. Select Outbound Connection Group in which user want to create outbound connection group.
- Select *javax.resource.cci.ConnectionFactory* and click on Next button, as shown in Figure 7-3.

Figure 7-3 Create a New Outbound Connection

reate	e a New Outbound Connection								
Back Next Finish Cancel									
Out	bound Connection Group								
In w	hich outbound connection group do you want to create an instance?								
Out	bound Connection Groups								
	Outbound Connection Group 🗞								
۲	javax.resource.cci.ConnectionFactory								
	1								
Back	Next Finish Cancel								

6. Enter a JNDI name, e.g., *eis/FMW2SAP* in the JNDI Name field and then click on Finish button, as shown in Figure 7-4.

Create a New Outbound Connection							
Back Next Finish Cancel							
JNDI name for Outbound Connection Instance							
Enter the JNDI name that you want to use to obtain the new connection instance * Indicates required fields							
The Outbound Connection instance represents a connection pool.	The JNDI name can be used to obtain the						
🏀 * JNDI Name:	eis/FMW2SAP						
Back Next Finish Cancel							

Figure 7-4 Create a New Outbound Connection

- 7. Click **OK**.
- 8. Click Save.
- 9. Click the *eis/FMW2SAP* ConnectionFactory, as shown in Figure 7-5.

Figure 7-5 Outbound Connection Properties

Settings for javax.resource.cci.ConnectionFactory

Gener	Properties	Transaction	Authentication	Connection Pool	Logging

This page allows you to view and modify the configuration properties of this outbound connection pool. Properties yo

Outbound Connection Properties

Save							
Property Name 🗞	Property Type	Property V					
DestinationDataProvider_JCO_ALIAS_USER	java.lang.String						
DestinationDataProvider_JCO_ASHOST	java.lang.String	10.30.0.26					
DestinationDataProvider_JCO_CLIENT	java.lang.String	800					
DestinationDataProvider_JCO_CODEPAGE	java.lang.String						
DestinationDataProvider_JCO_CPIC_TRACE	java.lang.String						
DestinationDataProvider_JCO_DEST	java.lang.String						
DestinationDataProvider_JCO_EXPIRATION_PERIOD	java.lang.String						
DestinationDataProvider_JCO_EXPIRATION_TIME	java.lang.String						
DestinationDataProvider_JCO_GETSSO2	java.lang.String						
DestinationDataProvider_JCO_GROUP	java.lang.String						

10. You have to update the mandatory connection properties:

For Outbound connection:

- DestinationDataProvider_JCO_ASHOST
- DestinationDataProvider_JCO_CLIENT
- DestinationDataProvider_JCO_LANG
- DestinationDataProvider_JCO_PASSWD
- DestinationDataProvider_JCO_PEAK_LIMIT
- DestinationDataProvider_JCO_POOL_CAPACITY
- DestinationDataProvider_JCO_SYSNR
- DestinationDataProvider_JCO_USER

For Inbound connection(apart from above):

- ServerDataProvider_JCO_CONNECTION_COUNT
- ServerDataProvider_JCO_GWHOST
- ServerDataProvider_JCO_GWSERV
- ServerDataProvider_JCO_PROGID
- **11.** Click **Save** to save the connection configuration and then return and click on the **Deployments** panel.
- **12.** Select the **Adapter** from the list and click **Update** to redeploy the SAP JCA adapter with updated configuration, as shown in Figure 7-6.
- 13. Plan.xml would be updated with the latest connection configuration parameters.

Figure 7-6 Updated Application Assistant

Update Application Assistant							
Back Next Finish Cancel							
Locate new deployment files							
You have elected to update th	You have elected to update the SAPAdapter application.						
igodoldoldoldoldoldoldoldoldoldoldoldoldol	igodoldoldoldoldoldoldoldoldoldoldoldoldol						
Deployment plan path:	/oracle/stage9/Middleware/soa/soa/Plan.xml Change Path						
Redeploy this application	using the following deployment files:						
Source path:	/oracle/stage9/Middleware/soa/soa/connectors/SAPAdapter.rar						
Deployment plan path: /oracle/stage9/Middleware/soa/soa/Plan.xml Change Path							
Back Next Finish Cancel							

The Adapter for SAP is now configured for desired connection in the WebLogic Application Server.

8

Integration Scenarios in Oracle SOA Suite

This chapter demonstrates how to create composites to perform Inbound and Outbound communication with SAP using the Adapter for SAP. The different components used in this chapter are BPEL, Mediator, OSB, and BPM. You will use different components for orchestration, transformation and routing, and interact with SAP using the The Adapter for SAP to create the end-to-end processes.

This chapter contains the following topics:

- Section 8.1, "Integration Overview"
- Section 8.2, "The Adapter Integration with SOA Service Components"
- Section 8.3, "The The Adapter Integration with BPM Service Components"
- Section 8.4, "The Adapter Integration with Oracle Service Bus (OSB)"
- Section 8.5, "Deploy the Defined Process"
- Section 8.6, "Test the Deployed Process"

8.1 Integration Overview

The Oracle Adapter for SAP enables middleware components to interact and exchange data with the SAP R/3 system. Similar to other WebLogic adapters and applications, the Adapter should be deployed in WebLogic console under Deployments. SOA/OSB can be successfully deployed to SOA/OSB server after deployment WSDL is generated in JDeveloper which is used for both inbound and outbound communication. After deployment to server, the application can be controlled from EM/Console.

8.2 The Adapter Integration With SOA Service Components

Tool required for the design-time configuration of an Oracle SOA process:

Oracle JDeveloper 12.2.1.

8.2.1 Create a New Application Server Connection

Follow the below steps to create a new Application Server connection in Oracle JDeveloper 12.2.1.

- **1.** Open Oracle JDeveloper 12.2.1.
- 2. Click Window from the menu bar and select Application Servers to view the Application Server Navigator pane on the JDeveloper IDE, as shown in Figure 8-1.

Figure 8-1 Application Server Navigator

a <u>m</u>	<u>T</u> ools	Window Help						
\triangleright	- 🍅	Application Servers	Ctrl+Shift-G					
		Phications	Ctrl+Shift-A					
RJ_R	EQUIRE	Bookmarks	Ctrl+Shift-K					
		Breakpoints	Ctrl+Shift-R					
	versio	Components	Ctrl+Shift-P					
	PO REL	Database						
		D <u>e</u> bugger						

The Application Server tab is displayed, as shown in Figure 8-2.

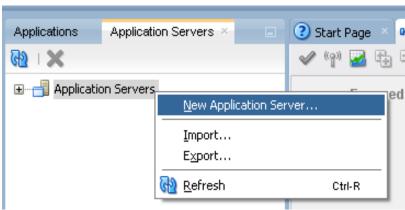


Figure 8-2 Application Server

3. Right-click **Application Servers** and select **New Application Server.** A pop-up wizard appears which will help you to create an Application Server Connection, as shown in Figure 8-3.

Export... Refresh Ctrl-R Application Servers and select New Application Server. A pop-up ich will help you to create an Application Server Connection, as show

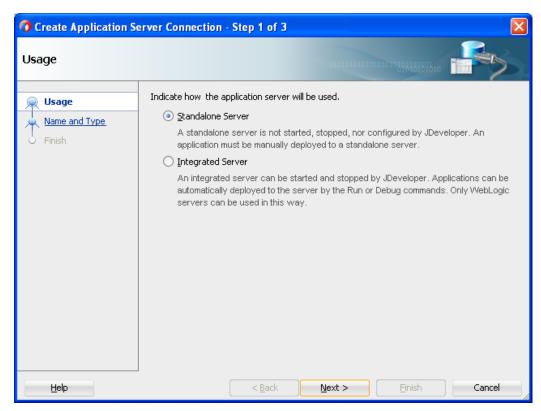


Figure 8-3 Create Application Server Connection Wizard

4. Leave the default selection on the wizard screen. Click Next, as shown in Figure 8-4.

Figure 8-4 Name and Type Page

Treate Application	Server Connection - S	tep 2 of 3			
Name and Type					-
Name and Type	Specify a unique name Create connection in: Connection Name: Machine_Name Connection Type: WebLogic 12.x			name must be a val	id Java identifier.
Help		< <u>B</u> adk	Next >	Einish	Cancel

5. The Name and Type screen appears, as shown in Figure 8-5.

Figure 8-5 Name and Type Window

Treate Application	Server Connection - Step 2 of 3
Name and Type	
Name and Type	Specify a unique name and type for the connection. The name must be a valid Java identifier. Create connection in: IDE Connections Connection Name: Machine_Name Connection Type: WebLogic 12.x
Help	< Back Next > Einish Cancel

6. Give the name to the connection server and set connection type as WebLogic12.x and click **Next**. The Authentication page is displayed, as shown in Figure 8-6.

Authentication					-
LUSage	Specify a usernam	e and password to a	suthenticate the co	nnection.	
Name and Type	Username:				
Authentication	weblogic				
Configuration	Password:				
Test	•••••				

Figure 8-6 Authentication Page

- 7. Enter a valid user name and corresponding password for the application server connection that you have mentioned during installation. This will be used to connect to the application server.
- 8. Click Next. The Configuration page is displayed, as shown in Figure 8-7.

Create Application S	erver Connection - Step	4 of 6			X
Configuration				39393939393 🚹	Fy.
Usage Name and Type Authentication Configuration Test Finish	WebLogic Server connection Domain of the target will be WebLogic Hostname (Administration localhost Port: 7001 Always use SSL WebLogic Domain: base_domain	e verified		blish a connectio	n. The
Help		< <u>B</u> ack	Next >	<u>F</u> inish	Cancel

Figure 8-7 Configuration Page

- **9.** Enter the host name of the machine where Oracle WebLogic server has been installed. Provide the Port and Domain name as defined during the WebLogic installation and configuration process.
- 10. Click Next. The Test page is displayed as shown in Figure 8-8.

Figure 8-8 Test Page

est		
Usage Name and Type Authentication	Click Test Connection to determine if the in connection with the application server. Test Connection	formation specified successfully establishes a
Einish	Testing J3R-160 Runtime Testing J3R-160 DomainRuntime Testing J3R-160 DomainRuntime Testing HTTP Testing HTTP Authentication Testing J3R-88 Testing J3R-88-LOCAL Testing App Controller Testing J3R-88-DEP-MGR Testing J3R-88-DEP-MGR-LOCAL 12 of 12 tests successful.	SUCCESS SUCCESS SUCCESS SUCCESS SUCCESS SUCCESS SUCCESS SUCCESS SUCCESS SUCCESS

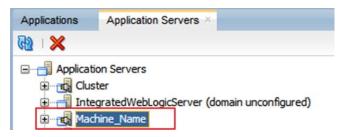
- **11.** Click on the **Test Connection** button.
- 12. The status should return Success for all tests.
- **13.** This completes the connection configuration for a new Application Server Connection in JDeveloper 12.2.1. Click **Next**. The Finish page is displayed as shown in Figure 8-9.

Figure 8-9 Finish Page

Treate Application	Server Connection - Step 6 of 6
Finish	
Usage Name and Type Authentication Configuration <u>Test</u>	You have completed creating the connection. To open your connection, expand the connection node in the Application Server Navigator.
Help	< Back Next > Einish Cancel

- 14. Click on the **Finish** button.
- **15.** The New Application Server is listed under the Application Servers tab as shown in Figure 8-10.

Figure 8-10 New Application Server Connection



8.2.2 Create an Empty Composite for SOA

Perform the following steps to create an empty composite for SOA:

- 1. You can either use an existing SOA Application or create a new SOA application. To create a new SOA Application, click on **File** tab from the JDeveloper menu.
- 2. Select File > New > Application as shown in Figure 8-11.

Figure 8-11 New Application Page

1)racle	JDeve	loper 12c	MModule	e.jw	s : I	PRJ_PO_F	RELASE	_REL	INF0.j	pr
<u>F</u> ile	Edit	<u>V</u> iew	Application	Refactor	Sea	rch	<u>N</u> avigate	Build	Run	Tea <u>m</u>	Tools
	New				4	Ар	plication				
	Open		Ctr	1-0	۵	Pro	oject				

The New Gallery page is displayed, as shown in Figure 8-12.

Figure 8-12 New Gallery Page

🔿 New Gallery	
Q	
Categories:	Items: Show All Descriptions
OEP Files	Business Indicator
Service Bus Tier	SOA Application
Services Interfaces	Creates a SOA (service-oriented architecture) application. The application consists of
	one SOA project for the SOA composite, components, and adapters.
Security	G SOA Composite
·····Utility	SOA Project
System	SOA Project
SOA Tier	
Interfaces	
·····Service Components	
Tests	
·····Transformations/Translations	
JSF	
·····JSF/Facelets	
JSP Servlets	
·····Serviets	
Help	OK Cancel

3. From the listed items, select SOA Application and click OK as shown in Figure 8-13.

👩 Create SOA Applicati	ion - Step 1 of 3	X
Name your application	on 01010101010101010101010101010101010101	B
A and a straight and	Application Name:	
Application Name	testApp	
Project Name	Directory:	
 Project SOA Settings 	D:\oracle_stage11\middleware\jdeveloper\testApp	Browse
	Application <u>Package Prefix:</u>	
Help	< Back Next > Finish	Cancel

Figure 8-13 Name Your Application Page

4. Enter a name for the SOA Application. You may choose the source directory for the application by clicking on the **Browse** button. By default it chooses the default workspace of the JDeveloper. Click **Next.**

TheName your project page is appears, as shown in Figure 8-14.

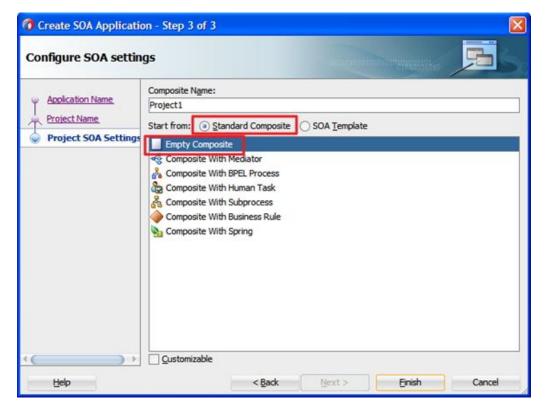
👩 Create SOA Applicati	ion - Step 2 of 3	
Name your project	01	B
Application Name Project Name	Project Name: Project1 Directory: D:\oracle_stage 11\middleware\jdeveloper\testApp\Project1	Bro <u>w</u> se
Project SOA Settings	Project Features: SOA Suite SOA Suite is a suite of tools to model SOA(Service Oriented Architecture) appli	cations.
Help	< <u>B</u> ack <u>N</u> ext > <u>F</u> inish	Cancel

Figure 8-14 Name Your Project Page

5. Enter a project name of your choice and click Next.

The Configure SOA settings page appears, as shown in Figure 8-15.

Figure 8-15 Configure SOA Settings Page



 Enter a Composite Name of your choice. A list of templates is displayed on the wizard screen. From the Standard Composite template list, select Empty Composite and click Finish.

8.2.3 Design an Outbound BPEL Process for BAPI/RFC/IDOC

This section describes how to design an outbound BPEL process, which consists of the following stages:

- **1.** Create an Empty Composite
- 2. Configure an Adapter Component.
- 3. Configure an Outbound BPEL Process Component.

Create an Empty Composite

To create an empty composite, you can follow the same procedure that is described in "Create an Empty Composite"

Configure an Adapter Component

- **1.** Open JDeveloper.
- 2. Click on the Application created in previous section "Create an Empty Composite". Click on the SOA project created under this application.
- **3.** Double-click on the composite.xml for this project. The Design space for the composite appears in the JDeveloper.
- 4. Drag and drop the Adapter component from the **Application Adapters** pane to the **External References** pane, as shown in Figure 8-16.

Figure 8-16 Adapter Component

External References	SOA			•
	SOAP	Socket	UMS	-
	Applications			- 11
		÷	<u></u>	
(a)	E-Business	JDE World	SAP R/3	
	Suite		Adapter	
	Custom/Third	Party		- 11
	3			
	Third Party			
	Cloud			-
	- Cing			

The Welcome page of the Adapter configuration wizard is displayed, as shown in Figure 8-17.



Figure 8-17 Adapter Configuration Wizard

5. Enter a reference name for the Adapter reference in the Name field and then click Next.

The Connection information page is displayed, as shown in Figure 8-18.

Connectio	n Information				*
	nection is required to confi ate a New Connection.	gure this adapter. S	elect a SAP R/3 con	nection already d	efined in your
Connection:	DefaultClient				- 🕈 / 🗙
Client:	800				
Applicatio	on Server: 10.30.32.42				
System N	lumber: 00				
JNDI Name:	eis/SAP/FMWDEMO				9
Help		< Back	Next >	Finish	Cancel

Figure 8-18 Connection Information Page

6. On the **Connection Information** page, click + icon which is located to the right of the **Connection** field, to create a new connection, as shown in Figure 8-19.

Note: Use the default JNDI name.

Figure 8-19 Create New SAP Connection



The Create SAP R/3 Connection page is displayed, as shown in Figure 8-20.

O Create SAP R/3	Connection	×
Connection Nam	e: DefaultClient	Import
User Conn	ection	
User Logon P	arameters:	
User Name:	JCA_DEV	
Pass <u>w</u> ord:		
Client:	800	
Language:	en	
Server	Security Trace Management Additional	Test Connection
Test connection	successful w/parameters:	
{jco.client.user jco.client.lang=	en,	-
	name=DefaultClient, management.checkbox=false,	-
<u>H</u> elp		OK Cancel

Figure 8-20 Create SAP R/3 Connection Page

- 7. Under the User tab, enter a user name for the SAP connection.
- 8. Enter a password for the SAP connection in the **Password** field.
- 9. Enter the SAP system client ID in the **Client** field.
- 10. Select language. Default is en (English).
- **11.** Click on **Connection** tab on the wizard screen. Enter the Application Server host details, as shown in Figure 8-21.
- 12. Enter a connection name as DefaultClient in the Connection Name field.

User Connection			
SAP Connection Par	ameters:		
Connection Type:	 Direct Connection 	O Load Balanced	
Application Server:	xx.xx.xx		
System Number:	00		
Message Host:			
Message Service:			
<u>R</u> /3 Name:			
Server Group:			
SAP Route String:			
SAP Route String.			
Server Securit	ty 🗌 Trace 🗌 Manager	nent 🗌 Additional	Test Connection

Figure 8-21 Create SAP R/3 Connection Page

- 13. Enter a value for the System Number.
- 14. Test the SAP connection by clicking the Test Connection button.
- 15. On successful connection test, click OK.

You are returned to the Connection Information page, as shown in Figure 8-22.

	nection is required to config te a New Connection.	ure this adapter. S			
Competing			select a SAP R/3 con	nection already de	efined in your
Lonnecuon:	DefaultClient				- 🕂 🖊 🗙
Client:	800				
Application	n Server: 10.30.32.42				
System Nu	umber: 00				
INDI Name:	eis/SAP/FMWDEMO				Q .
		< Back	Next >	Finish	Cancel

Figure 8-22 Connection Information Page

16. Click Next.

The Object selection page is displayed, as shown in Figure 8-23.

o Adapter Configuration Wizard - Step 3	3 of 4			
Object Selection				*
Select SAP objects, BAPI, RFC, or IDoc, to retrie Hierarchical Alphabetical SAP Carbon Business Objects (BAPIs) Carbon Modules (RFCs) Carbon ALE/EDI Messages (IDOCs)	eve and descri		I/RFC function	s or IDOC messages:
		Name: Name	Туре	Description
Help	: <u>B</u> ack	Next >	Einish	Cancel

Figure 8-23 Object Selection Page

17. Click the Hierarchical tab, and then click on + icon to expand the node.

This tab shows all the SAP Objects (RFC/BAPI/IDoc) available in the SAP system that you are connected to, in a hierarchical form, as shown in Figure 8-24.

Figure 8-24 Hierarchical Tab

Hierarchical	Alphabetical		
🗁 SAP			1
🖨 🗁 Busine	ss Objects (BAP	Is)	
🚊 🗠 🧰 🗛	counting - Gene	eral	
🖶 🧰 🗛	plication Platfor	m	
🖶 🗀 Au	ito-ID Infrastruc	ture	
🕀 🧰 Ba	sis Components		
🕀 🗀 Co	ntrolling		
🕒 🗁 Cr	oss-Application	Components	
🚊 🗀 Cu	stomer Service		-
📋 💼 🛅 En	terprise Control	lling	
🕀 🗀 En	terprise Portal		

18. Select one or more Business Object from the list and click on > or >> icon to move the selected object(s) from 'Select SAP objects, BAPI, RFC, or IDoc, to retrieve and

describe' pane to '**Selected BAPI/RFC functions or IDOC messages'** pane as shown in Figure 8-25. You will see that the definition of the selected BAPI appears on the lower right of the Object Selection page.

Adapter Configuration Wizard - Step 3 of 4		23	Maunasus	_ My Cata
Object Selection	ata1010101010101010101010101010		ices	Link to fre favorites
Select SAP objects, BAPI, RFC, or IDoc, to retrieve	Search SAP Repository		2	More S3
Hierarchical Alphabetical	Search SAP Repository		💿 Name 🔵 Descrip	ption
	Find:		Searc	zh
Basis Components Controlling Cross-Application Components				
Customer Service Enterprise Controlling				
-				
Financial Services Financial Services				
⊕ ☐ Financials ⊡				
Help < Back	Help		ок с	ancel

Figure 8-25 Objects Selection Page

19. Retain the defaults and Click Next.

The JCA Properties page is displayed, as shown in Figure 8-26.

ICA Properties		*
Specify the Name and Value of all JCA A	lapter Properties.	
Properties	4	• ×
Name	Value	
Interaction	stateful	
ExceptionFilter	off	
SchemaValidation	off	
ca.retry.count	9	
ca.retry.interval	1	
ca.retry.backoff	2	
ca.retry.maxInterval	120	
Help	< Back Next > Finish	Cancel

Figure 8-26 JCA Properties Page

20. Click Next.

The Finish page is displayed, as shown in Figure 8-27.



Adapter Configuration Wizard	- Step 5 of 5			×
Finish				*
You have finished definir When you dick Finish, the wizard will D:\jdev_RC3_mywork\mywork\Stage directory.	create the		-	
Help	< <u>B</u> ack	Next >	<u>F</u> inish	Cancel

21. Click Finish.

For more information on how to configuring an Adapter Component, refer to the section "Using the Adapter for SAP in JDeveloper Composite".

Configure an Outbound BPEL Process Component

Perform the following steps to configure an Outbound BPEL Process Component:

In the design window for the same composite created and used above in section ("Create an Empty Composite"). Drag and drop the BPEL Process component from the Service Components -> SOA pane to the Components pane, as shown in Figure 8-28.

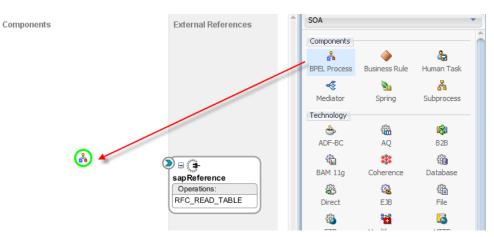


Figure 8-28 BPEL Process Component

The Create BPEL Process dialog is displayed, as shown in Figure 8-29.

Figure 8-29 Create BPEL Process Dialog

🕜 Create BP	EL Process	
business pro	s tess is a service orchestration, based on the BPEL specification, used to describe/execute a bocess (or large grained service), which is implemented as a stateful service.	1
Name:	BPELProcess1	
Namespace:	http://xmlns.oracle.com/MModule/Project4/BPELProcess1	
Directory:	D:\oracle_stage11\middleware\jdeveloper\mywork\Project4\SOA\BPEL	۹.
Template:	Base on a WSDL	- 0
Service Name:	bpelprocess1_client	Base
	Expose as a SOAP service	Create
	WSDL URL:	9
	Port Type:	
	Callback Port Type:	
Help	OK Ca	incel

- 2. Enter a name for the new outbound BPEL process component in the Name field.
- 3. The Namesapce is automatically generated as you type the name of the BPEL process.
- 4. Choose a **Directory** for the new BPEL process component by clicking on **Browse**. The default Directory would be the workspace of the JDeveloper.
- 5. Select Base on a WSDL from the Template drop-down list.
- 6. To select WSDL URL, click the Browse icon as shown in Figure 8-30. You need to select a WSDL from the project source directory,

Figure 8-30 Select WSDL URL

	- 22		
WSDL URL:		6	

- Click on File System, expand the SOA\WSDLs folder and select the WSDL of the Adapter reference, sapReference created above in section Configure an Adapter Component, as shown in Figure 8-31.
- 8. Click OK.

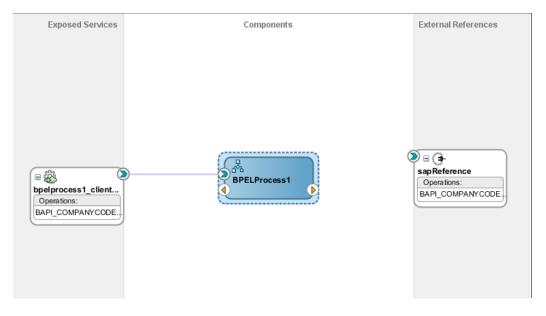
You are returned to the Create BPEL Process dialog, as shown in Figure 8-32. The **Port Type** is automatically filled from the chosen WSDL. Click **OK**.

Figure 8-31	Create	BPEL	Process	Dialog
-------------	--------	------	---------	--------

🕜 Create BPE	L Process		x					
A BPEL pro	BPEL Process A BPEL process is a service orchestration, based on the BPEL specification, used to describe/execute a business process (or large grained service), which is implemented as a stateful service.							
BPEL 2.0 S	pecification 🔘 BPEL	1.1 Specification						
<u>N</u> ame:	BPELProcess1							
Namespace:	http://xmlns.oracle.	com/Application1/Project3/BPELProcess1						
Directory:	C:\JDEVs\stage10_	withoutSAP\mywork\Application1\Project3\SOA\BPEL	_ 🔍					
Template:	🔞 Base on a WSD	L	• 3					
Ser <u>v</u> ice Name:	bpelprocess1_client							
	Expose as a SOA	AP service						
	T <u>r</u> ansaction: requir	ed	- 3					
	WSDL URL:	utSAP\mywork\Application1\Project3\SOA\WSDLs\sapReference.wsdl	۵					
	Port Type:	sapReference_PT						
	<u>C</u> allback Port Type:	No Callback						
Help		OK	Cancel					

You are returned on the below screen, as shown in Figure 8-32.

Figure 8-32 Create BPEL Process Dialog



9. Create a connection between the BPELProcess1 component and sapReference component, as shown in Figure 8-33.

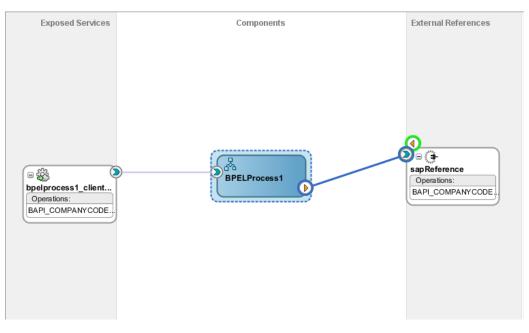
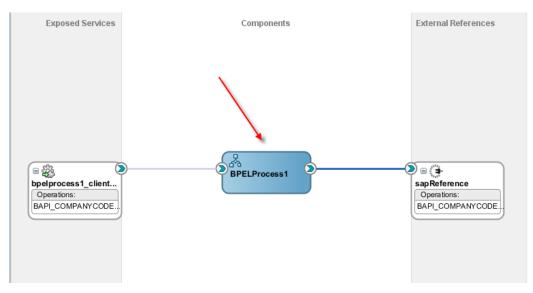


Figure 8-33 Wiring BPELProcess1 to sapReference

10. Double-click the outbound BPEL process component in the Components pane, as shown in Figure 8-34.





 Drag and drop the Invoke activity component to the Components pane and place it between the receiveInput activity component and the replyOutput activity component, as shown in Figure 8-35.

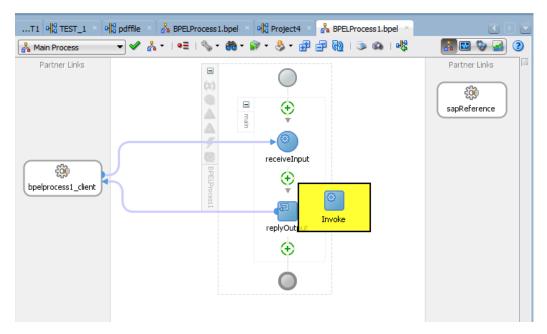
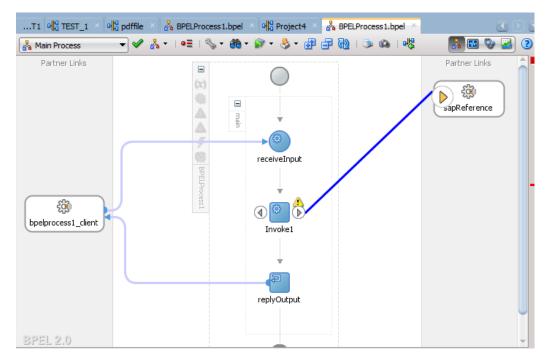


Figure 8-35 Adding Invoke Activity

12. Create a connection between the new Invoke activity component (Invoke1) and the sapReferenc component, as shown in Figure 8-36.

Figure 8-36 Wiring Invoke activity to sapReference



The Edit Invoke dialog is displayed, as shown in Figure 8-37.

eaders Doc	umentation	Skip Condition	Targets	Sources	
General	Correlations	Propertie	es A	ssertions	Annotations
lame:	Invoke 1				
onversation ID	:				
etail Label:					
	Invoke a	as Detail			
 Interaction 	Type: 🔞 Pa				
Partner <u>L</u> ink:	sapReference	e			Q,
Port <u>Type</u> :	🖏 sapRefe	rence_PT			•
Operation:	BAPI_CO	OMPANYCODE_GE	TDETAIL		•
Input Ou	Itput				
Argumen	ts <u>M</u> apping) <u>I</u> nput Variable			2
Input: Invo	oke1_BAPI_CO	OMPANYCODE_GE	IDETAIL_I	nputVariable	_ + 🔍

Figure 8-37 Edit Invoke Dialog

13. Under the **Input** tab, click on the **Input Variable** radio button. To configure a new input variable, click '+' icon located to the right of the **Input** field. The **Create Variable** pop-up appears, as shown in Figure 8-38.

Figure 8-38 Create Variable

🕜 Create	Variable
<u>N</u> ame:	Invoke1_BAPI_ACC_BILLING_CHECK_InputVariable
<u>Type</u> :	{http://xmlns.oracle.com/pcbpel/adapter/sap/SOA_NLS/SOA_NLS/sapRe
Help	OK Cancel

14. Accept the default values and click **OK**. You are returned to the Edit Invoke dialog, as shown in Figure 8-39.

Edit Invoke Headers Doc	mentation Skip Condition Targets Sources	X
General	Correlations Properties Assertions Annotations	s
<u>N</u> ame:	Invoke 1	
Conversation ID		$f_{\mathbf{x}}$
<u>D</u> etail Label:		
	Invoke as Detail	
	ype: 🔞 Partner Link 💌	
Partner <u>L</u> ink:	sapReference	
Port <u>Type</u> :	sapReference_PT	
Operation:	BAPI_COMPANYCODE_GETDETAIL	
Input Ou	put	
	s Mapping Output Variable Output Variable 	
O <u>u</u> tput: In	oke1_BAPI_COMPANYCODE_GETDETAIL_OutputVariable 🛛 🖶 🔍	
Help	Apply OK Cano	el

Figure 8-39 Edit Invoke Window Dialog

15. Click on Output tab.

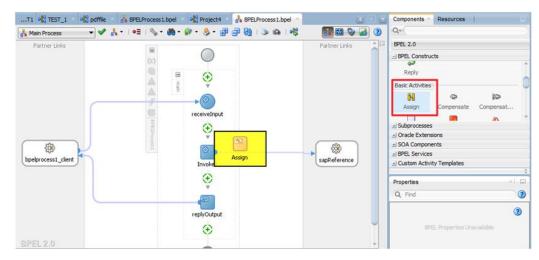
16. Click on the Output Variable radio button. To configure a new output variable, click the '+' icon, which is located to the right of the **Output** field. The Create Variable dialog is displayed, as shown in Figure 8-40.

Figure 8-40 Create Variable

🕜 Create	Variable 🛛 💌
<u>N</u> ame:	Invoke1_BAPI_ACC_BILLING_CHECK_OutputVariable
Type:	{http://xmlns.oracle.com/pcbpel/adapter/sap/SOA_NLS/SOA_NLS/sapRe
	Global Variable Local Variable
Help	OK Cancel

- 17. Select the default values and click OK. You are returned to the Edit Invoke dialog.
- **18.** Click **Apply** and then **OK**.
- **19.** Drag and drop the Assign activity from under the **BPEL Constructs** in the **Component** pane between the **Receive** activity (receiveInput) and the **Invoke activity** (Invoke1), as shown in Figure 8-41.





20. Double-click the new Assign activity (Assign1). The **Edit Assign** dialog is displayed, as shown in Figure 8-42.

x 👩 Edit Assign General Copy Rules Annotations Documentation Skip Condition Targets Sources Insert New Rule After 🗒 📩 Ìm œ Ø 🔏 BPELProcess1.bpel BPELProcess1.bpel 🗄 📄 Partner Links Partner Links 🚞 🛓 🔁 Variables Variables 🔁 🖮 💑 Process Process 💑 🚊 Variables 눧 🗄 🖮 🔁 Variables inputVariable ns1:BAPI_COMPANYCO PANYCODE_GETDETAIL_RESPONSE_MSG (X) 🕀 🖮 📄 parameters 🗄 🚸 ns2:BAPI_COMPANYCODE_(🖁 :BAPI_COMPANYCODE_GETDETAIL_MSG 😭 🛁 parameters 📑 🖻 image: state of the sta Invoke1_BAPI_COMPANYCODE_GET CODE_GETDETAIL <anonymous> Invoke1_BAPI_COMPANYCODE_GET PANYCODEID <anonymous> 《》 PANYCODE_GETDETAIL_RESPONSE_MSG (x)-14

- **21.** Expand **InputVariable** and then select **ns2.COMPANYCODEID**, which is available under **Variables** in the left pane.
- **22.** Drag and map the selected inputVariable element ns2.COMPANYCODEID on the left pane over to the selected Invoke1_GetDetail_InputVariable element ns2.COMPANYCODEID. A wire shows the mapping between the two selected elements.
- 23. Click Apply and then OK.
- **24.** Drag and drop the Assign activity from BPEL Constructs from the Component Pane between the Invoke activity (Invoke1) and the Reply activity (replyOutput), as shown in Figure 8-43.

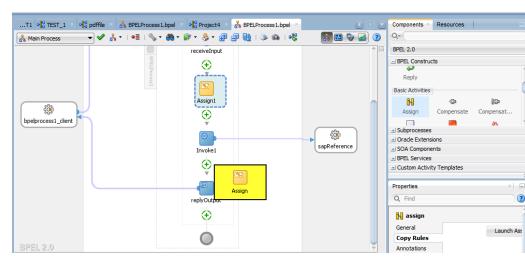


Figure 8-43 Assign Activity Component

25. Double-click the new Assign activity (Assign2), as shown in Figure 8-44.

Figure 8-42 Edit Assign Dialog

.T1 📲 TEST_1 × 📲 pdffle	× 💑 BPELProcess1.bpel × 🙀 Project4 × 💑 BPELProcess1.bpel			Components ×			
Main Process 🔹 🗸	₩ • I • Ξ I Ø • 66 • № • Ø • ₩ - D 62 I 0 00 I 0	ç 🔝 🖼 🖉 🖉					
	receiveInput			BPEL 2.0			
	EPEL/Precover 1			BPEL Construct	ts		
	Proc			Reply			
				Basic Activities			
	Assign1			N	(2)	KÞ.	
				-	Compensate	Compensat	
	Ť			+ Subprocesses	-	٨	
÷		(🔅)		Oracle Extension	ons		
opelprocess1_client	Invoke1	sapReference		H SOA Componer	nts		
				+ BPEL Services			
	•		-		y Templates		
						×	
				Properties			
	Ast assign			Q Find			0
			U	N assign			
	*			General			
	a			Copy Rules		Launch	As
BPEL 2.0				copy Rules			

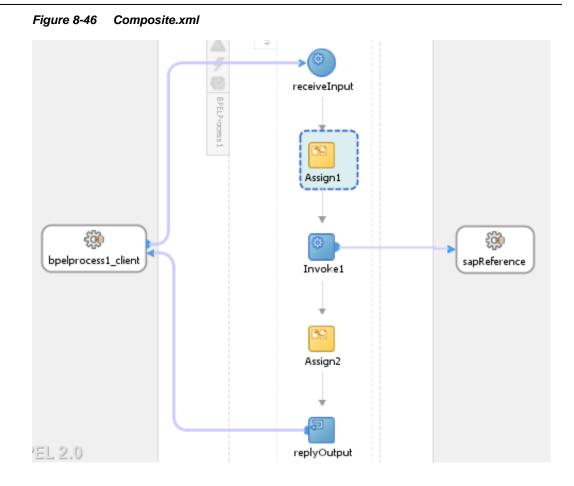
Figure 8-44 New Assign Activity

The Edit Assign dialog is displayed, as shown in Figure 8-45.

Figure 8-45 Edit Assign Dialog

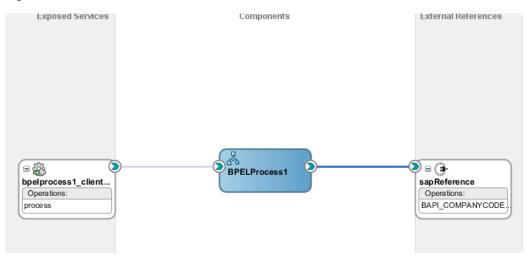
Edit Assign	an Chant Chant Area	X
General Copy Rules Annotations Documenta	tion Skip Condition Targets Sources	
Insert New Rule After 💌	🔜 🚵 🙆 🏣	c de la compañía de la
BPELProcess1.bpel	BPELProc	ess1
😥 💼 Partner Links	Partner	Link
🖮 🗁 Variables	Vari	iable:
🖮 💑 Process	Proces	is Å
🖃 🗁 Variables	Variables 🔁)
inputVariable ns1:BAPI_COMPAN	C s1:BAPI_COMPANYCODE_GETDETAIL_MSG 😭 🖷	3
🗄 🗘 outputVariable ns1:BAPI_COMPA	NY MPANYCODE_GETDETAIL_RESPONSE_MSG 😭 🖷	
🖶 🕱 Invoke1_BAPI_COMPANYCODE_	E parameters 📑 🖻	
🖮 🗱 Invoke1_BAPI_COMPANYCODE_	E DETAIL_RESPONSE <anonymous> 🚷 🕀</anonymous>	
🖮 📰 parameters	s1:BAPI_COMPANYCODE_GETDETAIL_MSG (x)	1
🗄 🚸 ns2:BAPI_COMPANYCOE	E_ MPANYCODE_GETDETAIL_RESPONSE_MSG 🗱	•
20000		P
	4 ¥ 🌣	л
		1

- **26.** Expand Invoke1_BAPI_COMPANYCODE_OutputVariable, and then select ns2:BAPI_COMPANYCODE_GETDETAIL_RESPONSE, which is available under **Variables** in the left pane.
- **27.** Expand outputVariable under the right side variable list and select ns2:BAPI_COMPANYCODE_GETDETAIL_RESPONSE.
- **28.** Drag and map left side ns2:BAPI_COMPANYCODE_GETDETAIL_RESPONSE to right ns2:BAPI_COMPANYCODE_GETDETAIL_RESPONSE.
- 29. Click OK. The below screen appears, as shown in Figure 8-46.



30. From the JDeveloper menu bar, click the **Save All** icon to save the new outbound BPEL process, as shown in Figure 8-47.

Figure 8-47 Save All Icon



You are now ready to deploy the BPEL outbound process.

Deploy the BPEL Outbound Process

To deploy the BPEL outbound process, you can follow the same procedure which is described in "Deploy the Defined Process".

Test the BPEL Outbound Process

After deploying the BPEL outbound process, you are ready to test the BPEL outbound process. To test the process, you should follow the same procedure that is described in "Test the Deployed Process".

8.2.4 Design an Inbound BPEL Process for BAPI/RFC/IDoc

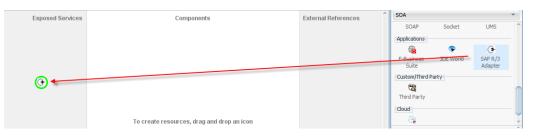
This section describes how to design an inbound BPEL process, which consists of the following two stages:

- 1. Configure an Adapter Service Component
- 2. Configure an Inbound BPEL Process Component

Configure an Adapter Service Component

1. Drag and drop the Adapter component from the **Application Adapters** SOA component palette to the **Exposed Services** pane, as shown in Figure 8-48.

Figure 8-48 Adapter Component



The Welcome page of the Adapter configuration wizard is displayed, as shown in Figure 8-49.

O Adapter Configuration Wizard	Step 1 of 3			×
SAP Adapter Service				*
Welcome to the Adapter Con This wizard helps you create a service usin define an operation for the service.	-		cify configuration	parameters and
Enter a Service Name.				
Help	< <u>B</u> ack	<u>N</u> ext >	Einish	Cancel

Figure 8-49 Adapter Configuration Wizard

2. Enter a service name for the Adapter Service component in the Name field and then click Next.

The Connection information page is displayed, as shown in Figure 8-50.

Figure 8-50	Connection Information Page
-------------	------------------------------------

👌 Adapter Co	onfiguration Wizard - Ste	p 2 of 3			×
Connection	n Information				*
	nection is required to config te a New Connection.	ure this adapter. S	elect a SAP R/3 co	nnection already de	fined in your
Connection:	DefaultClient				- 🕂 🖊 🗶
Client:	800				
Applicatio	n Server: 10.30.32.42				
System N	umber: 00				
JNDI Name:	eis/SAP/FMWDEMO				
<u>H</u> elp		< <u>B</u> ack	<u>N</u> ext >	Einish	Cancel

3. On the **Connection Information** page, click + icon, which is located to the right of the **Connection** field, to create a new connection, as shown in Figure 8-51.

Note: Use the default JNDI name.

Figure 8-51 Create New SAP Connection

👌 Adapter Co	onfiguration Wizard - Step 2 of 3	X
Connectio	n Information	
1000 0000 000 000 000 0000	nection is required to configure this ada ate a New Connection.	pter. Select a SAP R/3 connection already defined in your
Connection:	DefaultClient	

The Create SAP R/3 Connection page is displayed, as shown in Figure 8-52.

Create SAP R/3	Connection	×
Connection Nam	e: DefaultClient	Import
User Conne	ection	
User Logon Pa	arameters:	
User Name:	JCA_DEV	
Pass <u>w</u> ord:	•••••	
Client:	800	
Language:	en	
Server	Security 🗌 Trace 🗌 Management 🗌 Additional	Test Connection
Help		OK Cancel

Figure 8-52 Create SAP R/3 Connection Page

- 4. Enter a connection name as DefaultClient in the Connection Name field.
- 5. Enter a user name for an SAP system (for example JCA_DEV) in User Name field.
- 6. Enter a password for an SAP system (for example ORACLEABCD) in the **Password** field.
- 7. Enter the SAP system client ID in the **Client** field.
- 8. Select language. Default is en (English).
- 9. Click on Connection tab.
- 10. Enter Application Server details and System Number, as shown in Figure 8-53.

SAP Connection Para Connection Type:	ameters: Direct Connection Load Balanced 	
Application Server:		
System Number:	00	
System Number:		
Message Host:		
Message Service:		
R/3 Name:		
Server Group:		
SAP Route String:		
		Test Connection
Server Securit	ty Trace Management Additional	Test Connection
Server Securit	ty Trace Management Additional	_est connection
] Server 🔲 Securit	ty 🗌 Trace 🗌 Management 🗌 Additional	<u>rest connection</u>

Figure 8-53 Create SAP R/3 Connection Page

11. After entering the details, you can click on the **Test Connection** button to test if the SAP connection is successful.

12. Click OK.

You are returned to the Connection Information page, as shown in Figure 8-54.

Connectio	n Information				10 m
	nection is required to configu ate a New Connection.	ure this adapter. S	elect a SAP R/3 conr	nection already defir	ned in your
Connection:	DefaultClient			•	🕂 🥖 🗙
Client:	800				
Application	on Server: 10.30.32.42				
System N	Number: 00				
JNDI Name:	eis/SAP/FMWDEMO				Q
	8				

Figure 8-54 Connection Information Page

13. Click Next.

The **Object Selection** page is displayed, as shown in Figure 8-55.

🗿 Adapter Configuration Wizard -	Step 3 of 4					×
Object Selection					*	
Select SAP objects, BAPI, RFC, or IDoc, t Hierarchical Alphabetical SAP Gradient Solution Solutions (BAPIs) Hierarchical Business Objects (BAPIs) Hierarchical Construction Modules (RFCs) Hierarchical ALE/EDI Messages (IDOCs)	to retrieve and	» »		FC functions	or IDOC messages:	
ALE/EDI Messages (IDOCS)		\$ \$	Name:			
			Name	Туре	Description	
Help	< <u>B</u> ack		Next >	Einish	Cancel	

Figure 8-55 Object Selection Page

14. Click the Hierarchical tab, and then click on + icon to expand the node.

This tab shows all the SAP Objects (RFC/BAPI/IDoc) available in that SAP system in hierarchical form, as shown in Figure 8-56.

λ.

Figure 8-56 Hierarchical Tab

Hierarchical	Alphabetical	
🗁 SAP		
🖨 🗁 Busine	ss Objects (BAP	Is)
🛓 🗀 Ac	counting - Gene	eral
🕀 🧰 🖨	plication Platfor	m
🕀 🗀 Au	to-ID Infrastrue	ture
🕀 🗀 Ba	sis Components	
🕒 🗀 Co	ntrolling	
🕀 🙆 Cr	oss-Application	Components
🗄 🗀 Cu	stomer Service	
🕀 🧰 En	terprise Control	lling
🕀 🗀 En	terprise Portal	

15. On the Object Selection page, expand the ALE/EDI Messages (IDOCs) node and search MATMAS01, as shown in Figure 8-57.

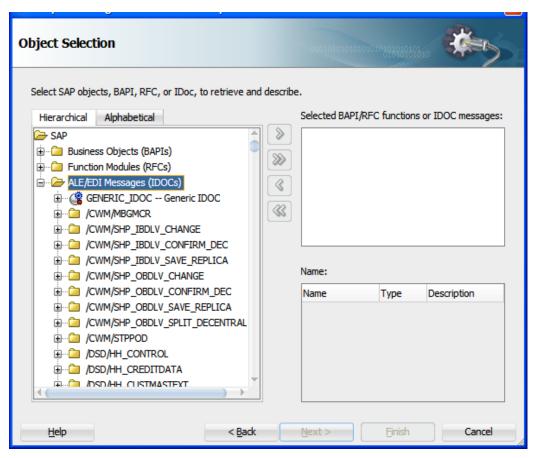


Figure 8-57 Object Selection Page

16. Right-click on ALE/EDI Messages (IDOCs) node and select Search, as shown in Figure 8-58.

Figure 8-58 Search Page

Hierarchical Alphabe	tical
🗁 SAP	4
🗄 🖆 ն Business Objects	(BAPIs)
🗄 🖆 🖆 Function Modules	(RFCs)
🗄 🗁 🗁 ALE/EDI Messa	Select
	XC
🕀 🖄 /CWM/MB	Search
🗄 🖓 🖄 /CWM/SHF	Test
🗄 🖆 /CWM/SHP_I	BDLV_CONFIRM_DEC

17. In the Search window, search for matmas01, as shown in Figure 8-59.

Figure 8-59 Search SAP Repository Page

🕜 Adapter Configuration Wizard - St	👌 Search SAP Repository	X
Object Selection	Search SAP Repository	Name Description
Select SAP objects, BAPI, RFC, or IDo Hierarchical Alphabetical SAP Grant Business Objects (BAPIs) Function Modules (RFCs) ALE/EDI Messages (IDOCs) ALE/EDI Messages (IDOCs) CWM/SHP_IBDLV_COAN CWM/SHP_IBDLV_COAN CWM/SHP_OBDLV_CAAN CWM/SHP_OBDLV_CAAN CWM/SHP_OBDLV_CAAN CWM/SHP_OBDLV_CAAN CWM/SHP_OBDLV_CAAN CWM/SHP_OBDLV_CAAN CWM/SHP_OBDLV_CAAN CWM/SHP_OBDLV_CAAN CWM/SHP_OBDLV_CAAN CWM/SHP_OBDLV_CAAN	 MATMAS01 Material Master MATMAS01 AII Material IDoc MATMAS01 MATMAS01 Master Material for SDM MATMAS01 Material master MATMAS01 Material master MATMAS01 Material Master MATMAS01 Material Master MATMAS01 PFS master material MATMAS01 MATMAS01 Material Master MATMAS01 Material Master 	OK Cancel

18. Select MATMAS01-Material Master from the search result, and click OK.

You are returned to the **Object Selection** page, as shown in Figure 8-60.

Figure 8-60 Object Selection Page

ect Selection	010101010101010101010101010
elect SAP objects, BAPI, RFC, or IDoc, to retr	eve and describe. Selected BAPI/RFC functions or IDOC message
SAPSLL/CUS_EAP_ENT SAPSLL/CUS_EXP_MAT SAPSLL/CUS_EZL SAPSLL/CUS_FIN SAPSLL/CUS_INBOUND SAPSLL/CUS_PCS SAPSLL/CUS_PED SAPSLL/CUS_PRL SAPSLL/CUS_SCIPED SAPSLL/CUS_SCIPED SAPSLL/CUS_SCWPED	MATMAS01 Material Master
SAPSLL/CUS_STA SAPSLL/CUS_STA SAPSLL/CUS_VZAV SAPSLL/CUS_VZL SAPSLL/CUS_WAT SAPSLL/DEBMAS_SLL SAPSLL/DEBMAS_SLL SAPSLL/MATMAS_SLL MATMAS01 Material Master	Name Type Description

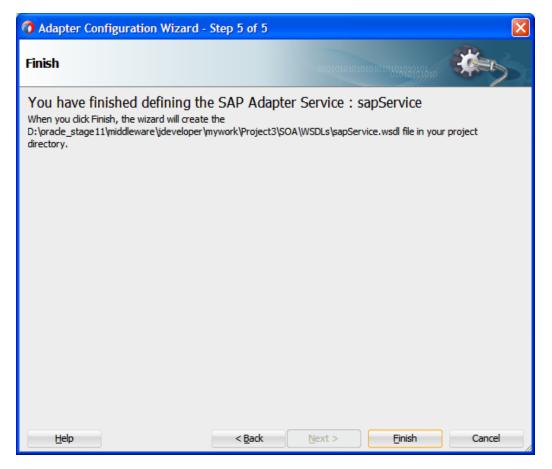
- **19.** Click '>' icon to move the object to the right side under the **Selected BAPI/RFC functions or IDOC messages**.
- 20. Click Next. The JCA Properties page is displayed, as shown in Figure 8-61.

Adapter Configuration Wizard - St	ep 4 of 5	×
JCA Properties		
Specify the Name and Value of all JCA A	dapter Properties.	
Properties		ት 🗶
Name	Value	
AutoSYSTAT01	no	
EncodeIDOC	no	
ControlCharacter	encode	
ProgramID		
ca.retry.count	9	
ca.retry.interval	1	
ca.retry.backoff	2	
jca.retry.maxInterval	120	
Help	< <u>B</u> ack <u>N</u> ext >	Einish Cancel

Figure 8-61 JCA Properties Page

21. Click Next, the Finish page is displayed, as shown in Figure 8-62.

Figure 8-62 Finish Page



22. Click Finish.

The Adapter for SAP is created and displayed in the **Exposed Services** pane, as shown in Figure 8-63.

Expos	sed Services
sap Servic	ce
sapServio	
	ns:

Figure 8-63 Adapter Component

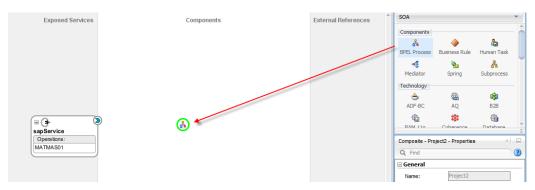
You are now ready to configure an inbound BPEL process component.

Configuring an Inbound BPEL Process Component

Perform the following steps to create an inbound BPEL process component:

- 1. Create an Empty composite. Refer to section "Create an Empty Composite"
- 2. Drag and drop the **BPEL Process** component from the **SOA Components** palette to the **Components** pane in the composite, as shown in Figure 8-64.

Figure 8-64 BPEL Process Component



The Create BPEL Process dialog is displayed, as shown in Figure 8-65.

Figure 8-65 Create BPEL Process Dialog

🕜 Create BF	EL Process	x			
BPEL Process A BPEL process is a service orchestration, based on the BPEL specification, used to describe/execute a business process (or large grained service), which is implemented as a stateful service.					
③ BPEL 2.0	Specification O BPEL 1.1 Specification				
<u>N</u> ame:	BPELProcess1				
Namespace:	http://xmlns.oracle.com/BAPI_BPEL/Project5/BPELProcess1				
Directory:	X:\oracle_stage11\middleware\jdeveloper\mywork\BAPI_BPEL\Project5\SOA\BPEL	_ 🔍 🛛			
Template:	Define Service Later	- 0			
	Define Service Later An empty BPEL process will be created.	.No interface			
Help	OK	Cancel			

- **3.** Enter a name in the **Name** field to identify the new inbound BPEL process component (for example, matmas_inbound).
- 4. Click OK.

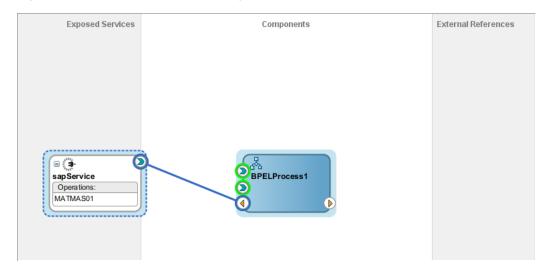
The Inbound BPEL process component is created and displayed in the Components pane, as shown in Figure 8-66.

Figure 8-66 BPEL Process Component

Exposed Services	Components	External References
••	BPELProcess1	
SapService Operations:	BPELProcess1	
MATMAS01	T T	

5. Create a connection between the Adapter Service component (MATMAS01) and the Inbound BPEL process component (matmas_inbound), as shown in Figure 8-67.

Figure 8-67 Create Connection Dialog



8.2.5 Deploy the Composite with Inbound BPEL Process

To deploy the Composite with Inbound BPEL Process, you can follow the same procedure as described in "Deploy the Defined Process".

8.2.6 Generate an Event in SAP R/3 and Process It by the SOA Composite

Once an event message is triggered through SAP GUI, it invokes the Adapter Service which inturn initiates a BPEL process instance. BPEL process invokes the File Adapter Service and the input received from the SAP event is written as the output XML in a file in the location that was specified for the File adapter service component. For more information on Generate events in SAP R/3, refer to the section "Generate an Event in SAP R/3".

8.2.7 Define an Outbound Mediator Process

This section describes how to define an Outbound Mediator process, which consists of the following stages:

- 1. Create an Empty Composite for SOA
- 2. Configure an Adapter Component
- 3. Configure an Outbound Mediator Process Component
- 4. Configure the Routing Rules

Create an Empty Composite

To create an empty composite, you can follow the same procedure as described in "Create an Empty Composite"

Configure an Adapter Component

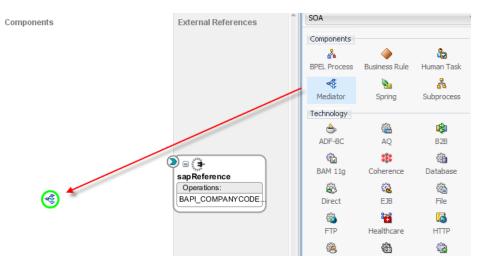
For more information, refer to the section "Configure an Adapter Component" as described in "Define an outbound BPEL Process".

Configure an Outbound Mediator Process Component

Perform the following steps to configure an Outbound Mediator process component:

- 1. Open the composite created above in JDeveloper 12.2.1.
- 2. Drag and drop the **Mediator Process** component from the **SOA Components** palette to the **Components** pane, as shown in Figure 8-68.

Figure 8-68 Mediator Process Component



The Create Mediator dialog is displayed, as shown in Figure 8-69.

🕜 Create	e Mediator					
	Mediator Component Create a mediator component to perform routing, filtering, and transformations.					
<u>N</u> ame:	Mediator 1					
Directory:	D:\orade_stage11\n	niddleware\jdeveloper\mywork\Project4\SOA\Mediators	Q			
Template:	懮 Interface Defini	tion from WSDL	▼ 0			
	Expose as a SOA	P service	Interfac Creates a			
	WSDL URL:		۵ 🕼			
	Port Type:		-			
	<u>C</u> allback Port Type:		•			
			Port type name for the			
Help		0	K Cancel			

Figure 8-69 Create Mediator Dialog

- **3.** Click the drop-down icon to the right of **Template** field and select **Interface Definition** from WSDL.
- 4. Click the Find existing WSDLs icon, which is located to the right of the WSDL URL field.
- 5. Select an inbound WSDL file from the following directory:

Project path directory\SOA\WSDLs, as shown in Figure 8-70.

WSDL Chooser	×
Application Server File System Oracle Acadia Server UDDI	WSIL III
Location: D:\oracle_stage11\middleware\jdeveloper\mywork\Project4\SOA\WSDLs	O O 🕞 😭 🗉
SapReference.wsdl Work Project Application	
File Name: sapReference.wsdl	
Home File Type: Web Service Definition Files (*.wsdl)	▼
$\underline{S} election: [file:/D:/oracle_stage 11/middleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/m$	
Help	OK Cancel

Figure 8-70 WSDL Chooser Dialog

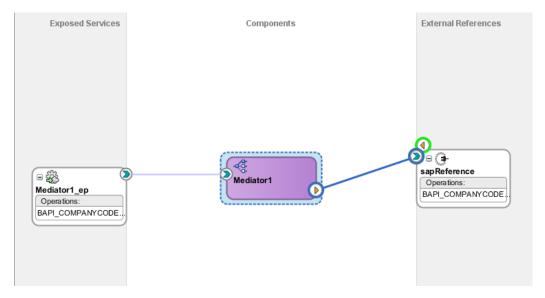
6. Click OK. You are returned to the Create Mediator dialog, as shown in Figure 8-71.

Figure 8-71 Create Mediator Dialog

7 Create	Mediator							
Mediator Component Create a mediator component to perform routing, filtering, and transformations.								
<u>N</u> ame:	Mediator 1							
Directory:	D:\oracle_stage11\	niddleware\jdeveloper\mywork\Project4\SOA\Mediators						
<u>T</u> emplate:	emplate: 🔞 Interface Definition from WSDL 🔹 🥥							
Expose as a SOAP service								
	WSDL URL:	lleware\jdeveloper\mywork\Project4\SOA\WSDLs\sapReference.wsdl 🔞 🔅						
	Port Type:	sapReference_PT						
	Callback Port Type:	No Callback						
Help		OK Cancel						

- 7. Click OK.
- **8.** Create a connection between the Outbound Mediator process component (CompanyCode_GetDetail) and the Adapter Service component (GetDetail), as shown in Figure 8-72.

Figure 8-72 Create Connection Dialog



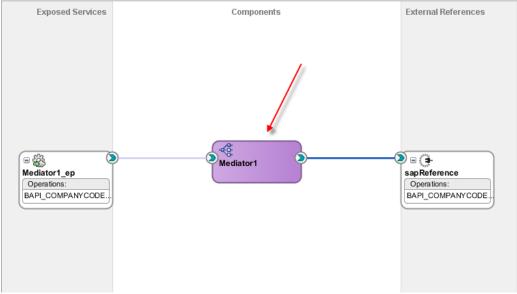
You are now ready to configure the routing rules.

Configuring the Routing Rules

Perform the following steps to configure the routing rules for the Outbound Mediator process component:

1. Double-click the Outbound Mediator process component (CompanyCode_GetDetail) in the Components pane, as shown in Figure 8-73.

Figure 8-73 Mediator Process Component



The Routing Rules dialog is displayed, as shown in Figure 8-74.

Translate From Native	< <no needed="" translation="">></no>	>				
Callout To	< <java callout="" class="">></java>					
<	ession>>	9	8	SapReference::BAPI_COMPANYCODE_GETDETAIL	0	Sequential
		Validate Ser	nantic	A	8	
		Translate To M	Native	< <no needed="" translation="">></no>	1	Ĩ.
		Transform Using		< <transformation map="">>> parameters •</transformation>	8	1
		Assign	/alues		3	1
		Override	Using		-	
						-
Synchr	onous Reply		-	*Initial Caller *:: BAPI_COMPANYCODE_GETDETAIL:output	0	
		Transform	Using	< <transformation map="">>> parameters</transformation>	8	
		Assign \	Values	-	60	1

Figure 8-74 Routing Rules Dialog

2. In the <<Filter Expression>> area, click the icon to the right of the Transform Using field.

The Request Transformation Map dialog is displayed, as shown in Figure 8-75.

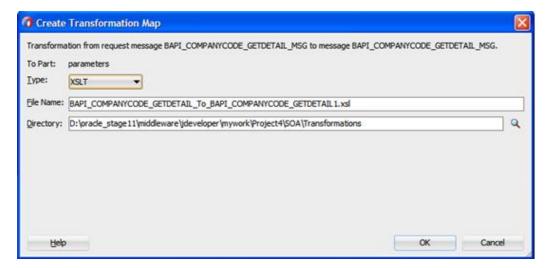
Figure 8-75 Request Transformation Map Dialog

🕜 Request	Transformation Map	X
	n from request message BAPI_COMPANYCODE_GETDETAIL_MSG to message BAPI_COMPANYCODE_GETDETAIL_MS parameters	ig.] 🔍 🕂 🥢 💥
Help	OK	Cancel

3. Click on '+' to create a new Transformation map.

The Create Transformation Map page is displayed, as shown in Figure 8-76.

Figure 8-76 Create Transformation Map



The Request Transformation Map dialog is displayed, as shown in Figure 8-77.

Figure 8-77 Request Transformation Map

🗿 Request	🕽 Request Transformation Map 🛛 🛛 🔀			
Transformatio	on from request message BAPI_COMPANYCODE_GETDETAIL_MSG to message BAPI_COMPANYCODE_	GETDETAIL_MS	G.	
To Part:	parameters		_	
Mapper File:	Transformations/BAPI_COMPANYCODE_GETDETAIL_To_BAPI_COMPANYCODE_GETDETAIL1.xsl		م 🕂 🖌 🔍	
Help		OK	Cancel	

5. Click OK.

The following Mapping page is displayed, as shown in Figure 8-78.

Figure 8-78 Mapping Page

ml 🛛 untitled2.xml × 🖓 <i>Project4</i> × 🍕 Medi		
XSLT map	xsl:stylesh xsl:template(match=/) hs0xBAPI_COMPANYCODE_GETDETAIL &	_ - <u></u>
unables	ns0:COMPANYCODEID 🥎—	

6. Map the **CompanyCode.GetDetail** source element to the **CompanyCode.GetDetail** target element.

The Auto Map Preferences dialog is displayed, as shown in Figure 8-79.

Figure 8-79 Auto Map Preferences Dial	Figure 8-79	Auto	Мар	Preferences	Dialo
---------------------------------------	-------------	------	-----	-------------	-------

🔿 Auto Map Preferences 🛛 🛛 🕅		
Con <u>fi</u> rm Auto Map Results <u>Prompt for Preferences before Auto Map</u>		
Mode: Basic 🔻		
During Auto Map:		
 Match Elements with Similar Names Match Elements with Exact Names 		
 Match Elements with Exact Types Match Elements Considering their Ancestor Names 		
Insert xsl:if: <u>N</u> ever Check source node exists		
Check source node is not empty		
Show Dictionaries >>		
💌 Enable Auto Map		
Help OK Cancel		

7. Retain the default values and click OK.

You are returned to the Mapping page, as shown in Figure 8-80.

Figure 8-80 Mapping Dialog

ml 📴 untitled2.xml 🛛 📲 Project4 🗸 🍕 Mediator1.mplan 🔺 🔀 BAPI_COMPANYCODE_GETDETAIL_To_BAPI_COMPANYCODE_GETDETAIL1.xxl 🐣 📃 💽 🔄				
XSLT map 🔹 🕂 🖌 😵 🖾 🗌	Q Search XSLT Map XSLT			
sources>	xsl:stylesheet 🔊			
	xsl:template(match=/) 🛄🖨			
INDEXECTION ANYCODEID	ns0:BAPI_COMPANYCODE_GETDETAIL 🚫 📋			
····· 🗋 Variables	ns0:COMPANYCODEID 🚷			

- 8. Select Save All from the menu bar to save and close the mapping.xsl file.
- 9. In the Synchronous Reply area, click the icon to the right of the Transform Using field, as shown in Figure 8-81.

BAPI_COMPANYCODE_GETDETAIL Priority 4 💭 🗌 Validate Syn	ntax (XSD) 🔷 🗢 🎽
Translate From Native < <no needed="" translation="">></no>	
Callout To < <java callout="" class="">></java>	
E < <filter expression="">> S</filter>	Reference::BAPI_C(
Validate Semanti	· <u> </u>
Translate To Native	e < <no neede<="" td="" translation=""></no>
Transform Using	🤉 < < Transformation 🕶 🔣
Assign Values	s 💽 🔻 🔞
Override Using	→
Synchronous Reply 🛶	Caller*::BAPI_COMPAN
Transform Using	g < <transformation td="" 🔀<="" 🕶=""></transformation>
Assign Value:	s 🗾 👻

Figure 8-81 Synchronous Reply Dialog

The Reply Transformation Map dialog is displayed, as shown in Figure 8-82.

Figure 8-82 Reply Transformation Map

🕜 Reply Tr	ransformation Map		×
	on from reply message BAPI_COMPANYCODE_GETDETAIL_RESPONSE_MSG to message INYCODE_GETDETAIL_RESPONSE_MSG.		
To Part:	parameters		
Mapper File:		•	∖ ╋ ∥ Ж
<u>H</u> elp		ОК	Cancel

10. Click on + to create the new target mapping file.

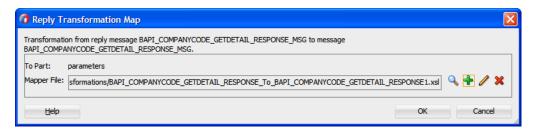
The following Create Transformation Map page is displayed, as shown in Figure 8-83.

Figure 8-83	Create	Transformation Map
-------------	--------	--------------------

🕜 Create	Transformation Map	
	ation from reply message BAPI_COMPANYCODE_GETDETAIL_RESPONSE_MSG to message PANYCODE_GETDETAIL_RESPONSE_MSG. parameters	
Eile Name:	BAPI_COMPANYCODE_GETDETAIL_RESPONSE_To_BAPI_COMPANYCODE_GETDETAIL_RESPONSE1.xsl	
Directory:	D:\orade_stage11\middleware\ideveloper\mywork\Project4\SOA\Transformations	Q
Indude	Request in the Reply Payload	
Help	OK	Cancel

You are returned to the Reply Transformation Map dialog, as shown in Figure 8-84.

Figure 8-84 Reply Transformation Map



12. Click OK.

You are returned to the Mapping page, as shown in Figure 8-85.

Figure 8-85 Mapping Page

ml 📲 Project4 × 🦑 Mediator 1.mplan × 🕅 BAPI_COMPANYCODE_GET	DETAIL_RESPONSE_To_BAPI_COMPANYCODE_GETDETAIL_RESPONSE1.xsl 🗵 🚺 💟
XSLT map 🔹 🕂 🔹 🔝 😨	Q Search XSLT Map XSLT
🚼 <sources></sources>	xsl:stylesheet 🔯
ms0:BAPI_COMPANYCODE_GETDETAIL_RESPONSE	xsl:template(match=/) 🌅 🛁
ms0:COMPANYCODE_ADDRESS	asD:BAPI_COMPANYCODE_GETDETAIL_RESPONSE 《》 🛕 👘
Iso:COMPANYCODE_DETAIL	ns0;COMPANYCODE_ADDRESS
🗄 🖓 ns0:RETURN	ns0:COMPANYCODE_DETAIL ()
Variables	ns0:RETURN

13. Drag and map the ns0:BAPI_COMPANYCODE_GETIDETAIL_RESPONSE variable from left pane to the ns0:BAPI_COMPANYCODE_GETIDETAIL_RESPONSE variable in the right pane, as shown in Figure.

The Auto Map Preferences dialog is displayed, as shown in Figure 8-86.

Figure 8-86 Auto Map Preferences Dialog

🗿 Auto Map Preferences 🛛 🛛 🔀
Con <u>fi</u> rm Auto Map Results Prompt for Preferences before Auto Map
Mode: Basic
During Auto Map:
 Match Elements with Similar Names Match Elements with Exact Names
 Match Elements with Exact Types Match Elements Considering their Ancestor Names
Insert xsl:if: <u>N</u> ever Check source node e <u>x</u> ists
Check source node is not empty
Show Dictionaries >>
💌 Enable Auto Map
Help OK Cancel

14. Retain the default values and Click OK.

The mapping is completed, as shown in Figure 8-87.

Figure 8-87 Completed Mapping

ml 📲 Project4 × 🍕 Mediator I.mplan × 🔀 BAPI_COMPANYCODE_GETDETAIL_RESPONSE_To_BAPI_COMPANYCODE_GETDETAIL_RESPONSE1.xsl 🗠 💽 💽			
XSLT map 🔹 🕂 🕈 🖓 😨 🛛	Q Search XSLT Map XSLT		
sources>	xsl:stylesheet 🐼		
ns0:BAPI_COMPANYCODE_GETDETAIL_RESP	xsl:template(match=/) 🛄 🖃		
[49] ns0:COMPANYCODE_ADDRESS	ns0:BAPI_COMPANYCODE_GETDETAIL_RESPONSE 🔇		
(w) ns0:COMPANYCODE_DETAIL	xslif 🧼 🖷		
	xsl:if 🍑 - 🗄		
Variables	xsl:if 🍑 - 🕀		

15. Click the **Save All** icon in the menu bar to save the new outbound Mediator process component that was configured.

You are now ready to deploy the Outbound Mediator process.

Deploy the Mediator Outbound Process

To deployment the Mediator Outbound Process, you can follow the same procedure that is described in "Deploy the Defined Process".

Test the Mediator Outbound Process

After deploy the Mediator Outbound Process, you are ready to test the Mediator outbound process, you can follow the same procedure that is described in "Test the Deployed Process".

8.2.8 Define an Inbound Mediator Process

This section describes how to define an Inbound Mediator process, which consists of the following stages:

- 1. Configuring an Adapter Component
- 2. Configuring an Inbound Mediator Process Component With a File Adapter
- 3. Configuring the Routing Rules

Configuring an Adapter Component

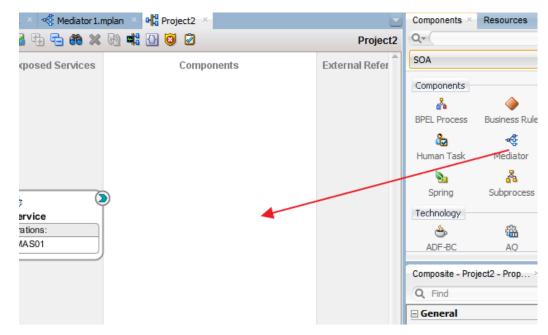
For more information on how to configure an Adapter Component for SAP, refer to the section "Configure an Adapter Component" under "Defining an inbound BPEL Process".

Configuring an Inbound Mediator Process Component with a File Adapter

Perform the following steps to configure an Inbound Mediator process component with a File adapter.

1. Drag and drop the Mediator Process component from the Service Components pane to the Components pane, as shown in Figure 8-88.

Figure 8-88 Mediator Process Component



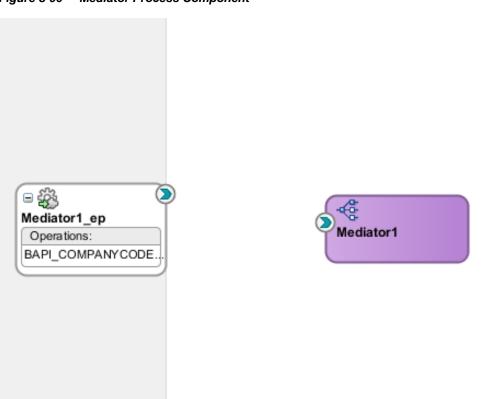
The Create Mediator dialog is displayed, as shown in Figure 8-89.

Treate Mediator		
Mediator Component Create a mediator component to perform routing, filtering, and transformations.		
Name: Mediator 1		
Directory: D:\oracle_stage11\middleware\jdeveloper\mywork\Project3\SOA\Mediators		۹.
Template: Define Interface Later		• 0
Help	ОК	Cancel

Figure 8-89 Create Mediator Dialog

- 2. Click the drop-down icon to the right of **Template** field and select **Define Interface Later**.
- 3. Click OK.

The new Mediator process component is added to the Components pane, as shown in Figure 8-90.



4. Drag and drop the **File Adapter** component from the Service Adapters pane to the External References pane.

The File Adapter Configuration Wizard is displayed, showing the Service Name page, as shown in Figure 8-91.

Figure 8-90 Mediator Process Component

O FILE Adapter Configuration Wiza	ard - Step 1 of	4					
File Adapter Reference				*			
Welcome to the File Adapter Configuration Wizard This wizard helps you create a File Adapter. You will be asked to specify configuration parameters and define an operation for the adapter.							
Enter a Reference Name.							
Name: fileReference							
Help	< <u>B</u> ack	<u>N</u> ext >	Einish	Cancel			

Figure 8-91 Adapter Configuration Wizard

5. Type a name for the new File adapter in the **Name** field and click **Next**.

The Adapter Interface page is displayed, as shown in Figure 8-92.

Figure 8-92 Adapter Interface Page

O FILE Adapter Configuration Wiz	ard - Step 2 of	4				
Adapter Interface				i -		
The adapter interface is defined by a wsdl that is generated using the operation name and schema(s) specified later in this wizard. Optionally, the adapter interface may be defined by importing an existing WSDL.						
Interface: ③ Define from operation and s	chema (specified la	iter)				
Import an existing WSDL						
WSDL URL:				1		
Port Type:				-		
Operation:				-		
Help	< <u>B</u> ack	<u>N</u> ext >	Einish	Cancel		

- 6. Ensure that the **Define from operation and schema** (specified later) option is selected.
- 7. Click Next.

The Operation page is displayed, as shown in Figure 8-93.

Figure 8-93 Operation Page

🚺 FILE Adapter Configuration Wizard - Step 4 of 7						
Operation	0101010101010101010101010					
The File Adapter supports five operations. There is a Read File operation that polls for incoming files in your local file system, a Write File operation that creates outgoing files, a Synchronous Read File operation that reads the current contents of a file, a List Files operation that lists file names in specified locations, and a Chunked Read operation that synchronously reads file data in chunks and can be used ONLY with BPEL. Only one operation per Adapter Service may be defined using this wizard.						
Operation Type:	○ <u>R</u> ead File					
	<u>Write File</u>					
	O Synchronous Read File					
	◯ List Files					
	Chunked Read					
Operation Name:	Write					
Add Output H	leader					
<u>H</u> elp	< Back Next > Einish Cancel					

- 8. Select Write File from the list of **Operation Type** options and specify an **Operation Name** (for example, Write).
- 9. Click Next.

The File Configuration page is displayed, as shown in Figure 8-94.

🗿 FILE Adapter Configuratio	on Wizard - Step 5 of 7			×
File Configuration				*
Specify the parameters for the Writ	e File operation.			
Directory specified as <u>Phy</u> Directory for Outgoing Files (physic /oracle/Outbound_Results)	ysical Path <u>L</u> ogical Name al path):			Browse
	%.txt): Output.xml			Diowse
File Naming Convention (po_%SEQ	%.txt): Output.xiii			
Append to existing file				
Write to output file when any of t				
Number of Messages Equals:	1			_
Elapsed Time Exceeds:	1		minutes	-
File Size Exceeds:	1000	▼	kilobytes 🔻	

Figure 8-94 File Configuration Page

- 10. Specify a location on your file system where the output file is written.
- 11. In the File Naming Convention field, specify a name for the output file.
- 12. Click Next.

The Messages page is displayed, as shown in Figure 8-95.

Figure 8-95 Messages Page

FILE Adapter Configuration	n Wizard - Step 6 of	7		
Messages				*
Define the message for the Write File defines the messages in the outgoing 'Schema is Opaque', then you do not	g files. Use the Browse bu	tton to find an exis		
Message Schema				
Native format translation is not r	required (Schema is Opaq	ue)		
URL				Q 😳
Schema Element				browse for
Help	< <u>B</u> ack	Next >	Einish	Cancel

13. Click Browse, which is located to the right of the URL field.

The Type Chooser dialog is displayed, as shown in Figure 8-96.

Type Chooser	
	案 🙋
Type Explorer Project Schema Files SapService.xsd MATMASOL Project WSDL Files	
Image: Type: {urn:sap-com:document:sap:idoc}MATMAS01 Show Detailed Node Information	
Help	OK Cancel

Figure 8-96 Type Chooser Dialog

- **14.** Expand Project WSDL Files and select the available schema.
- 15. Click OK.

You are returned to the Messages page, as shown in Figure 8-97.

Figure 8-97 Messages Page

🗿 FILE Adapter	Configuration Wiza	ard - Step 6 of	7				
Messages					*		
Define the message for the Write File operation. Specify the Schema File Location and select the Schema Element that defines the messages in the outgoing files. Use the Browse button to find an existing schema definition. If you check 'Schema is Opaque', then you do not need to specify a Schema.							
_[Message Schema							
Native <u>f</u> ormat	translation is not required	d (Schema is Opaq	ue)				
URL	/Schemas/sapService.	xsd			🔍 🧔 🖉		
Schema Element	MATMAS01				•		
Help		< <u>B</u> ack	<u>N</u> ext >	Einish	Cancel		

16. Click Next.

The **Finish** page is displayed, as shown in Figure 8-98.

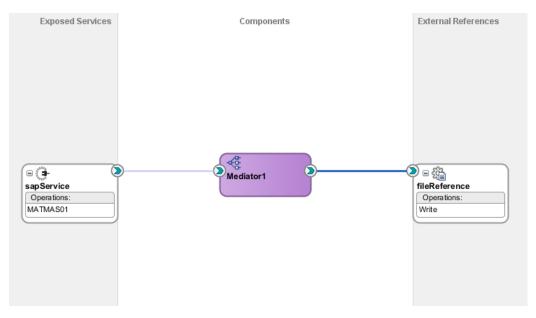
7 FILE Adapter Configuration Wize	ard - Step 7 of	7		×
Finish				*
You have finished defining th When you dick Finish, the wizard will create D:\oracle_stage11\middleware\jdeveloper\ directory.	the			ur project
Help	< <u>B</u> ack	Next >	Finish	Cancel

Figure 8-98 Finish Page

17. Click Finish.

- **18.** Create a connection between the Inbound Mediator process component and the SAP service component.
- **19.** Create a connection between the Inbound Mediator process component and the File adapter component, as shown in Figure 8-99.

Figure 8-99 Created Connection



You are now ready to configure the routing rules.

Configuring the Routing Rules

Perform the following steps to configure the routing rules for the Inbound Mediator process component:

1. Double-click the Inbound Mediator process component in the Components page, as shown in Figure 8-100.

Figure 8-100 Inbound Mediator Process Component

	С	omp	oner	nts			
-	€ Med	iator	1		0	<u> </u>	
U					J		

The **Routing Rules** dialog is displayed, as shown in Figure 8-101.

Figure 8-101 Routing Rules Dialog

Operations						-
MATMAS01	Bri	iority 4	Ualidate Syntax (XSD)		▽]	+ \$
Translate From Native < <no ne<="" th="" translation=""><th>eeded>></th><th></th><th>.</th><th></th><th></th><th></th></no>	eeded>>		.			
Callout To < <java callout="" clas<="" td=""><td>\$>></td><td></td><td></td><td></td><td></td><td></td></java>	\$>>					
Resequence Off						
Resequence Off	88-	• fileReferen	ce::Write		0	Sequenti
	Validate Semantic [● fileReferen	ce::Write	•	@ &	Sequenti
7/ 100	Validate Semantic		ce::Write		© 	Sequenti
	Validate Semantic	< <no td="" translati<=""><td></td><td>•</td><td>8</td><td>Sequenti</td></no>		•	8	Sequenti
	Validate Semantic	< <no td="" translati<=""><td>on Needed>></td><td></td><td>8</td><td>Sequentia</td></no>	on Needed>>		8	Sequentia

2. In the <<Filter Expression>> area, click the icon to the right of the **Transform Using** field.

The **Request Transformation Map** dialog is displayed, as shown in Figure 8-102.

Request Transformation Map	X
Transformation from request message MATMAS01_MSG to message Write_msg.	
To Part: body Mapper File:	Q + / X
Help	OK Cancel

Figure 8-102 Request Transformation Map Dialog

- 3. Click '+' icon to create a new transformation map and then click OK.
- 4. Give the name to the mapping file, as shown in Figure 8-103.

Figure 8-103 Create Transformation Map

Treate Transformation Map		
Transformation from request message MATMAS01_MSG to message Write_msg.		
To Part: body		
Iype: XSLT		
Eile Name: MATMAS01_To_MATMAS011.xsl		
Directory: D:\prade_stage11\middleware\jdeveloper\mywork\Project3\SOA\Transformations		۹.
Help	ОК	Cancel

5. Click **OK** by accepting the default name, as shown in Figure 8-104.

Figure 8-104 Request Transformation Map

Request	Transformation Map	X
Transformatio	n from request message MATMASO1_MSG to message Write_msg.	
	body Transformations/MATMAS01_To_MATMAS011.xsl	Q 🖶 🖊 🗙
<u>H</u> elp		OK Cancel

6. Click OK.

The mapping page is displayed.

7. Map the MATMAS01 source element to the MATMAS01 target element, as shown in Figure 8-105.

Figure 8-105 Mapping Page

TE 🙆 untitled1.xml 🛛 🙆 untitled2.xml 🖄	🖓 Project4 × 🦑 <i>Mediator 1.mplan</i> × 🍕 Mediator 1.mplan	🔹 🔣 MATMASO1_To_MATMASO11.xsl 🗵 💽 💟
XSLT map 🔹 🕂 🔬 💀 🖁		Q Search XSLT
🔮 <sources></sources>	Î Î	xsl:stylesheet 👸
🖨 🚸 ns0:MATMAS01		xsl:template(match=/) 🛄 🛁
<u>×r⊗</u> tid		
i⊞[i] <choice></choice>		tid 🚾 🖓
Variables		ns0:IDOC-ENCODED
		ns0:IDOC 🎇 🗄

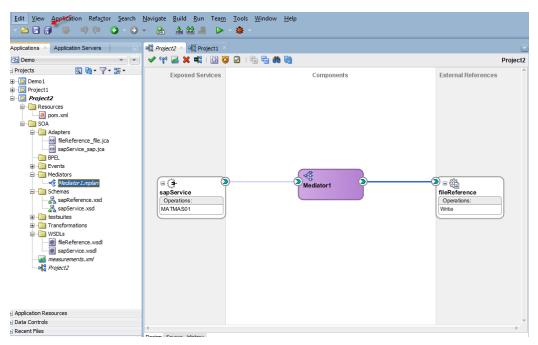
The Auto Map Preferences dialog is displayed, as shown in Figure 8-106.

Figure 8-106 Auto Map Preferences Dialog

🔿 Auto Map Preferences 🛛 🔀
Confirm Auto Map Results Prompt for Preferences before Auto Map
Mode: Basic 💌
During Auto Map:
Match Elements with Similar Names
Match Elements with Exact Names
 Match Elements with Exact Types Match Elements Considering their Ancestor Names
Insert xsl:if:
O Never
 Check source node exists Check source node is not empty
Show Dictionaries >>
✓ Enable Auto Map
Help OK Cancel

- 8. Click OK.
- **9.** Click the **Save All** icon in the menu bar to save the new Inbound Mediator process component that was configured, as shown in Figure 8-107.

Figure 8-107 Save All



You are now ready to deploy the Inbound Mediator process.

8.2.9 Deployment of Inbound Mediator Process

To deploy the Inbound Mediator process, you can follow the same procedure as described in "Deploy the Defined Process".

8.2.10 Generate an Event in SAP R/3 for Testing Mediator Inbound and Outbound Process

Once event messages are triggered through SAP GUI, output XML is received in the location that was specified for the File adapter component. For more information on Generate events in SAP R/3, see "Generate an Event in SAP R/3".

8.3 The Adapter Integration with BPM Service Components

Oracle Integration Adapter for SAP R/3 seamlessly integrates with Business Process Management (BPM) to facilitate the Web Service integration. Oracle BPM is based on the Service-Oriented Architecture (SOA). It consumes the adapter services that are exposed as Web Service Definition Language (WSDL) documents.

8.3.1 Deployment of Adapter

Oracle Integration Adapter for SAP R/3 should be deployed on soa_server in the WebLogic console under deployments.

The following tools are required to complete your outbound design-time configuration:

• Oracle JDeveloper BPM Designer (JDeveloper) or Eclipse

8.3.2 Create an Empty Composite for BPM

Perform the following steps to create an empty composite for BPM:

1. Create a new BPM application, as shown in Figure 8-108.

Figure 8-108 New Gallery Page

2				
ategories:	!	Items: Show All Description		
Service Bus Tier		Association (ADF Business Components)		
Services Interfaces		👪 BAM Connection (Connections)		
Transformations		📙 Bean Data Control (Data Controls)		
Security Utility		Bean Form (Swing/AWT)		
System		🚳 beans.xml (Contexts and Dependency Injection) (Contexts and Dependency Inj		
Faults		🐻 BPA Server Connection (Connections)		
Interfaces Service Components		BPEL 2.0 Subprocess (Service Components)		
·····Tests		A BPEL Process (Service Components)		
·····Transformations/Translations		🔁 BPM Application (Applications)		
·····HTML ·····JSF		Creates a BPM application. The application consists of one BPM project. This project has also SOA technology		
JSF/Facelets JSP		🐨 BPM Model Simulation (Simulation)		
Servlets		😚 BPMN 2.0 Process (Business Components)		
All Items		BPM Project (Projects)		

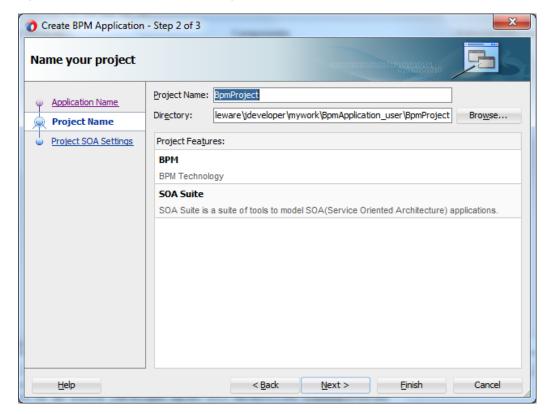
2. Enter a name for the new BPM application and click Next, as shown in Figure 8-109.

O Create BPM Application	- Step 1 of 3	×
Name your application	01010101010101010101010101010101010101	5
Application Name Project Name Project SOA Settings	Application Name: BpmApplication_user Directory: C:\BPM\middleware\jdeveloper\mywork\BpmApplication_user Application Package Prefix:	B <u>r</u> owse
Help	< <u>B</u> ack <u>N</u> ext > <u>Finish</u>	Cancel

Figure 8-109 Name Your Application Page

The Name your project page is displayed, as shown in Figure 8-110.

Figure 8-110 Name Your Project Page



3. Enter a Composite Name (for example, BpmProject) and click **Next**. The **Configure SOA settings** page is displayed, as shown in Figure 8-111.

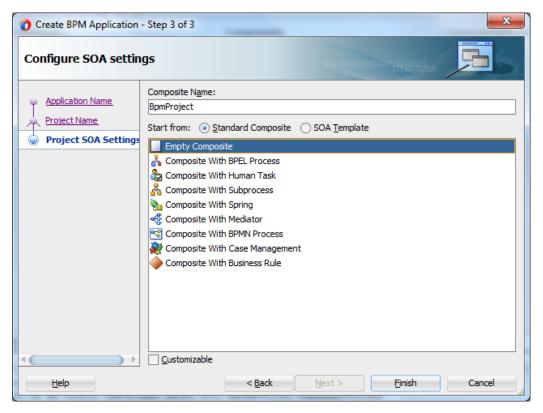


Figure 8-111 Configure SOA Settings Page

4. From the Composite Template list, select Empty Composite and click Finish.

8.3.3 Define a BPM Outbound Process

This section describes how to define a BPM outbound process, which consists of the following stages:

- 1. Configure an Adapter Component
- 2. Configure an Outbound BPM Process Component

Configure an Adapter Component

For more information, refer to the section "Configure an Adapter Component" that is described in "Define an Outbound BPEL Process".

Configuring an Outbound BPM Process Component

Perform the following steps to configure an Outbound BPM process component:

1. Drag and drop the **BPMN Process** component from the **Service Components** pane to the **Components** pane, as shown in Figure 8-112.

BpmProject ×			Components	
ð 📫 🚯 💆 🔂		Composite: BpmProject		
	Components	External References	SOA	
			Components	
			BPEL Process	BPMN Process
		۵. (۲	Real Case	b Human Tasi
	3	sapReference	Properties	
	J	Operations: BAPI_COMPANYCODE	Q Find	
			Catalog	_

Figure 8-112 BPMN Process Component

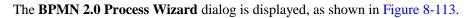
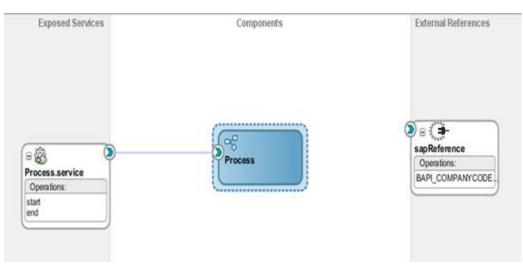


Figure 8-113	BPMN 2.0 Process Wizard
--------------	--------------------------------

O BPMN 2.0 Process Wizard				x
BPI	MN 2.0 Process W	izard		
	Definition	Name:	Process	۲
Y	Arguments	Description:		۲
Ý	Initial Implementation			
Ó	Advanced			
		Directory:	are\jdeveloper\mywork\BpmApplication_user\BpmProject\SOA\processes] 🔍
		Creates	a process with an asynchronous interface definition	Î
	Help		< <u>Back</u> <u>Next</u> <u>Finish</u> Cano	el

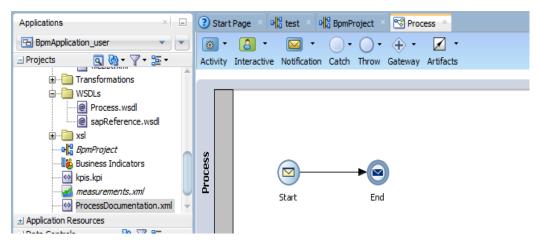
2. Select the default option that is selected under **Type** area (Asynchronous Service) and click **Finish**. The BPMN Process component is created, as shown in Figure 8-114.

Figure 8-114 BPMN Process Component



3. Double-click the BPMN Process component in the Components pane. The BPMN process is displayed, as shown in Figure 8-115.

Figure 8-115 BPMN Process



4. Click the Activity icon, as shown in Figure 8-116.

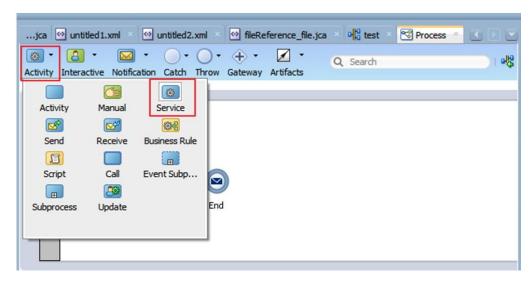
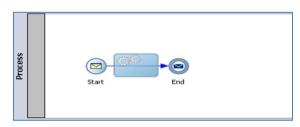


Figure 8-116 Activity Icon

5. Click on Activity icon from the menu bar and drop the Service icon on the wire between the Start and End event components, as shown in Figure 8-117.

Figure 8-117 Activity Icon



The Properties – Service Task dialog is displayed, as shown in Figure 8-118.

Properties -	ServiceTask		×
Basic Implemen	tation		
^ي	Name:	ServiceTask	
٩ 🏈	Description:	:	
	Is Draft:		
	🗄 Sampling	g Point	
Help		ОК	Cancel

Figure 8-118 Properties – Service Task

- 6. Click the **Implementation** tab, as shown in Figure 8-119.
- Figure 8-119 Implementation Tab

🕜 Pro	perties - ServiceTa	isk		
Basic	Implementation			
Mess	nentation Type: 📷 Se rce commit after execut sage Exchange e: [] Not Implemented	on		•
	ata Associations essage Headers	Correlations Service Properties	E Log Handlers	
Help			OK	Cancel

- 7. Select Service task from the Implementation Type list.
- 8. Select Service Call from the Type list, as shown in Figure 8-120.

Figure 8-120 Properties – Service Task Dialog

Properties - ServiceTa	ask	
Basic Implementation		
Implementation Type: 🔯 Se	ervice task	•
Force commit after execut	ion	
Type: 🐼 Service	Call	•
Conversation: Default (Service Call Service: Operation: Default (Default (Message Headers	Advanced Correlations Service Properties	Log Handlers
Help		OK Cancel

9. Click the **Browse** icon to the right of the **Service** field, as shown in Figure 8-121.



Properties - ServiceT	ask	
Basic Implementation		
Implementation Type: SS Service Perce commit after execut Message Exchange Type: Service Conversation: O Default Service Call	Call	• •
Service:		<u> </u>
Operation:		Browse
Data Associations Message Headers	Service Properties	Log Handlers
Help		OK Cancel

- 10. Select the SapReference that has been created from Service field and click OK.
- **11.** Select the input operation (for example, bapicompanucodegetdetail) from **Operation** drop-down.
- **12.** Click on the **Data Associations** link, as shown in Figure 8-122.

Basic Implementation Implementation Type: Servi Force commit after execution Message Exchange Type: Service Ca Conversation: Default Service Cal	A	
Force commit after execution Message Exchange Type: Conversation: Default Service Cal	A	•
Message Exchange Type: Service Ca Conversation: Default Service Cal	1	•
Conversation: Default Service Call		•
Service Call	Advanced	
Service: SapReference		٩. 🏈
Operation: bapicompanycoc	degetdetail	•
Data Associations Message Headers	Correlations	Log Handlers
Help		OK Cancel

Figure 8-122 Data Associations Link

The Data Associations Dialog is displayed, as shown in Figure 8-123.

Input Output	
	🖳 🔜 🕅
Process Data Objects Predefined Variables	ServiceTask 👔 Arguments 🧰 🖨 bapicompanycodegetdetail 🏹 🕀
From	

Figure 8-123 Data Associations Dialog

13. Right-click on Data Objects and create input object.

The Create Data Object is displayed, as shown in Figure 8-124.

Figure 8-124 Create Data Object

😚 Create Data Object 🛛 🔀		
Name:	InputDO	
Type:	abc string	-
	📎 boolean	-
	99E double	
Help	1999 decimal	
	🖄 dateTime	6

- **14.** Enter a name in the **Name** field (for example, InputDo) and then click the drop-down button in the **Type** field and select <Component> from the list.
- 15. Select Browse option and choose the input.
- 16. Click OK.

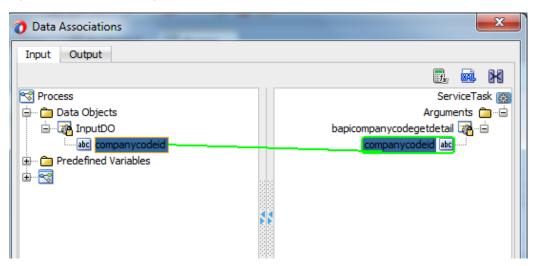
The Data Associations dialog, as shown in Figure 8-125.

O Data Associations	X
Input Output	
S Process	ServiceTask 👼
🖨 🚰 Data Objects 🖨 🌠 InputDO	Arguments 🛅 🚊 bapicompanycodegetdetail 🙀 🚊
abc companycodeid	companycodeid abc
🕀 🗠 🛅 Predefined Variables	
5555555	
	+ ≫ ☆ 尋
From	То
Validate target after assigning input data association	ons
Help	OK Cancel
	Contraction Contraction

Figure 8-125 Data Associations Dialog

17. Map the InputDO created in the above step. To map it, select Companycode under InputDO node in the left pane and drag it to the Companycodeid input on the right side, as shown in Figure 8-126.

Figure 8-126 Map Dialog Box



The Service Task is created between the Start and End Event components, as shown in Figure 8-127.

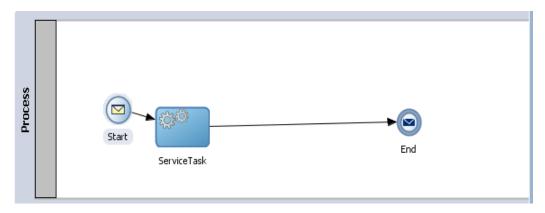


Figure 8-127 Service Task

19. Double-click on Start point.

The **Properties-Start** dialog is displayed, as shown in Figure 8-128.

Figure 8-128 Properties-Start Dialog

1 Properties - Start		×
Basic Implementation	1	
Implementation Type:	Message	•
Message Exchange		
Type: 😡 D	efine Interface	•
Conversation: Def 	fault () Advanced	
Define Interface		
Arguments Definition	n	₽ ∕ ×
Name	👩 Edit Argument 🛛 🛛	
	Name: Input	
	Type: BAPI_COMPANYCODE_GETDETAIL	
Operation Name: s		
	Help OK Cancel	
2010 Data Associations	Descriptions	andlers
* Message Headers	Service Properties	
Help	[OK Cancel

- **20.** Click the **Implementation** tab.
- 21. Select Define Interface from the Type list.
- 22. Click the '+' icon to the right of the Arguments Definition field.
- **23.** Enter a name in the **Name** field, click the drop-down button in the **Type** field and browse the input operation.
- 24. Click OK.
- 25. Click on the Data Associations Link.
- **26.** Drag the **Input Argument** from the left pane to the **Data Object** to the right pane, created during the service task configuration, as shown in Figure 8-129.

Figure 8-129 Data Associations Dialog

🗿 Data Associations	
Output	
 Start 	Drag-objects here Data Objects Companycodeid
Euriperiytudeu 	Predefined Variables 📬 G
Copy From: Input.companycodeid	📆 To: InputDO.companycodeid 🗒 🕂 🗙 🍲 🖑
From	
abc Input.companycodeid	atc InputDO.companycodeid
Validate target after assigning output data associations	
Help	OK Cancel

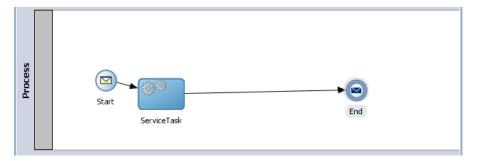
You are returned to the Properties-Start dialog, as shown in Figure 8-130.

🕜 Pro	perties - Start			×
Basic	Implementation			
Mess Type Conv Def	nentation Type: @ age Exchange :: @ Defi versation: @ Defau fine Interface guments Definition	ine Interface		•
N	ame		Туре	
	put peration Name: star	rt	BAPI_COMPANYCODE_GETDETAIL	
₿\$\$ <u>Da</u>	ata Associations 🧳	Correlations	s Eog Handlers	
	essage Headers	Service Pro	perties	
Help			ОК	Cancel

Figure 8-130 Properties-Start Dialog

Service Task dialog is displayed, as shown in Figure 8-131.

Figure 8-131 Service Task Dialog



29. Double-click on the Service Task point.

The Data Associations dialog is displayed, as shown in Figure 8-132.

O Data Associations	X
Input Output	
S Process ☐ ☐ Data Objects ☐ 172100	Drag objects here ServiceTask 🗃 Arguments 👝 🖨 bapicompanycodegetdetail 🖓 🙃
Impanycodeid I	companycodeid ac
From: InputDO.companycodeid	📆 To: bapicompanycodegetdetail.company 🗒 🕂 🗙 🎓 🦫
From	То
abc InputDO.companycodeid	abc bapicompanycodegetdetail.companycodeid
Validate target after assigning input data associations	
Help	OK Cancel

Figure 8-132 Data Associations Dialog

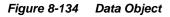
30. Click on the **Output** tab, as shown in Figure 8-133.

31. Create the Data Object on the right side to hold the response.

Figure 8-133 Output Tab

Data Associations		
3 ServiceTask		Process 🗺
🖓 🦳 🚰 Arguments	Drag objects here:	Data Ob 💊 New
🖃 🙀 bapicompanycodegetdetailresponse		InputDQ
		Predefined Varia Expand
🖃 🔤 companycode_detail		BpmProject
🕀 🙀 return		
Process		

32. Right-click the **Data Object** node and select **New** from the context menu, as shown in Figure 8-134.





The Create Data Object dialog is displayed, as shown in Figure 8-135.

Figure 8-135 Create Data Object Dialog

🕜 Cr	reate Data Object	×
Name:	: OutputDO	
Type:	BAPI_COMPANYCODE_GETDETAIL_RESPO	NSE
	✓ Auto initialize	
Help	lp OK Cancel	

- **33.** Enter a name in the **Name** field (for example, OutputDO) and then click the drop-down button in the **Type** field and select BAPI_COMPANYCODE_GETDETAIL_RESPONSE from the list.
- 34. Click OK.

You are returned to the Data Associations dialog, as shown in Figure 8-136.

Figure 8-136 Data Associations Dialog

O Data Associations		
Input Output		
👸 ServiceTask		Process 🗺
🖨 🗠 🧰 Arguments	þje	Data Objects 🛅 🖷 🖨
🖮 🎆 bapicompanycodegetdetailresponse		InputDO 🙀 🕀
		OutputDO 🙀 🖷
		companycode_address 💦 🕀
⊞		companycode_detail 💦 🖽
		return 💦 🕀
_	8 8	Predefined Variables 🛅 🖽

35. Drag the bapicompanycodegetdetailresponse to the OutputDO, as shown in Figure 8-137.

Figure 8-137 Data Associations Dialog

		1 . 1 .
ServiceTask		Process
🖳 🧰 Arguments	Drag objects here	Data Objects 🧰
🖮 🙀 bapicompanycodegetdetailresponse —		InputDO 🙀 👾
🚊 🔏 companycode_address		OutputDO 🙀 🗄
🖅 💦 companycode_detail		companycode_address 💦 🕀
🗄 🗝 👗 return		companycode_detail 🛃 🕀
Process		return 🛃 🖽
	× · · · · · · · · · · · · · · · · · · ·	Predefined Variables 🛅
		BpmProject 🔜
	👔	_



You are returned to the **Properties-ServiceTask** dialog, as shown in Figure 8-138.

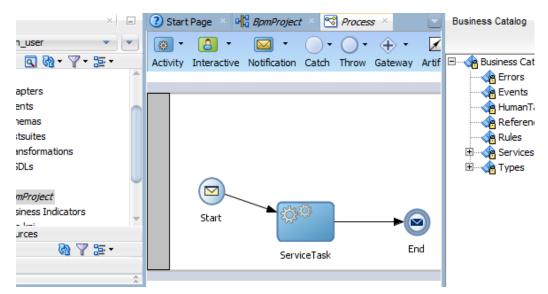
Figure 8-138 Properties - ServiceTask Dialog

Properties - ServiceTas	ik	
Basic Implementation		
Implementation Type: Service Commit after execution Message Exchange Type: Service Conversation: Default Conversa	n all) Advanced	
8x8 <u>Data Associations</u> Image: Provide the second secon	Correlations Service Properties	E Log Handlers
Help		OK Cancel

37. Click OK.

You are returned to the Process Workspace area, as shown in Figure 8-139.

Figure 8-139 Process Workspace Area



38. Double-click on **End** icon.

The Properties-End dialog is displayed, as shown in Figure 8-140.

Figure 8-140	Properties-End Dialog
--------------	-----------------------

Properties - End
Basic Implementation
Implementation Type: S Message
Force commit after execution
Message Exchange
Type: Verifie Interface
Conversation: Default Advanced
Define Interface
Arguments Definition 4 🖓 🕺
Name Type
Asynchronous O Synchronous
Callback Operation Name: end
2014 Associations Definitions Definitions
Message Headers Service Properties
Help OK Cancel

- **39.** Click on **Implementation** tab, as shown in Figure 8-141.
- **40.** Click the + icon to the right of the **Arguments Definition** field, the **Create Argument** dialog is displayed.
- **41.** Enter a name in the **Name** field (as Output) and then click the drop-down button in the **Type** field and select BAPI_COMPANYCODE_GETDETAIL-RESPONSE from the list.
- 42. Click OK.

O Properties - End	×
Properties - End Basic Implementation Implementation Type: Force commit after execution Message Exchange Type: Define Interface Conversation: Default Advanced Define Interface Conversation: Definition Definition Message Exchange Type: Define Interface Conversation: Definition Definition Message Exchange Type: Define Interface Conversation: Definition Definition Message Exchange Type: Definition Definition Message Exchange Type: Definition Definition Output Type: Definition	-
Image: Service Properties Help OK	

Figure 8-141 Implementation Tab

43. Click on Data Associations link.

You are returned to the Data Associations dialog, as shown in Figure 8-142.

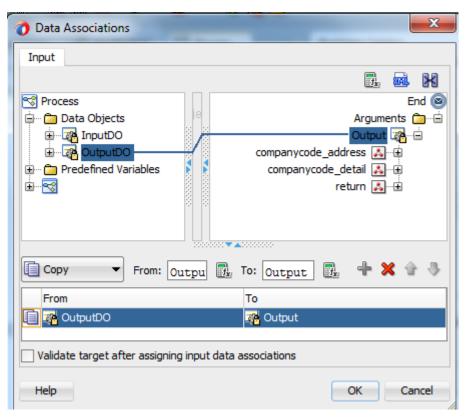


Figure 8-142 Data Associations Dialog

44. Drag the OutputDO node in the left pane to the Output node in the right side.45. Click OK.

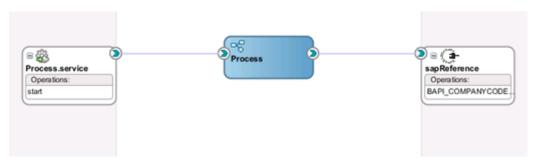
You are returned to the Properties - End dialog, as shown in Figure 8-143.

1 Properties - End	
Basic Implementation	
Implementation Type: S Message	•
Force commit after execution	
Message Exchange	
Type: 😡 Define Interface	-
Conversation: Default Advanced 	
Define Interface	
Arguments Definition	+ / ×
Name	Туре
Output	BAPI_COMPANYCODE_GETDETAIL_RESPONSE
Asynchronous Synchronous	
Callback Operation Name: end	
🗱 Data Associations 🧳 🛛 🕅 Derrelati	ons 📃 Log Handlers
Carrier Message Headers	Properties
Help	OK Cancel

Figure 8-143 Properties - End Dialog

- 46. Click OK.
- **47.** Click the **Save All** icon in the menu bar to save the new outbound BPM process component that was configured, as shown in Figure 8-144.

Figure 8-144 BPM Process Component



8.3.4 Design a BPM Inbound Process

This section describes how to define an Inbound BPM Process, which consists of the following stages:

- 1. Creating an Empty Composite for BPM
- 2. Defining a BPM Inbound Process

Create an Empty Composite for BPM

For more information, refer to the section "Create an Empty Composite for BPM".

Define a BPM Inbound Process

This section describes how to define a BPM inbound process, which consists of the following stages:

- 1. Configuring an Adapter Service Component
- 2. Configuring an Inbound BPM Process Component

Configuring an Adapter Service Component

For more information, refer to the section "Configure an Adapter Component" that is described in "Define an inbound BPEL Process".

Configuring an Inbound BPM Process Component

Perform the following steps to configure an inbound BPM process component:

1. Drag and drop the **BPMN Process** component from the Service Components pane to the Components pane, as shown in Figure 8-145.

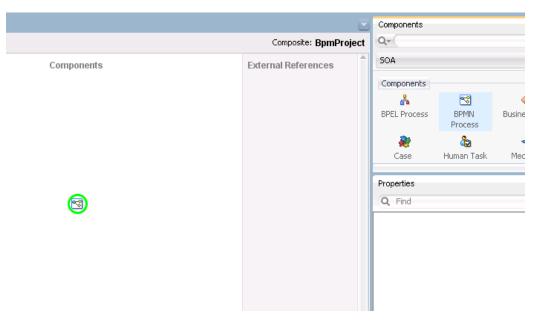


Figure 8-145 BPMN Process Component

The BPMN Process wizard is displayed, as shown in Figure 8-146.

👩 B	PMN 2.0 Process W	'izard		
BPI	MN 2.0 Process W	fizard		
Ģ	Definition	Name:	Process	۲
-9-0-0	Arguments Initial Implementation Advanced	Description:		۲
		Directory:	jdeveloper\mywork\BPM_Test_Project\BpmInboundProject\SOA\processes	
			s a process with an asynchronous interface definition	
		Synchro	Drous Service	-
	<u>H</u> elp		< Back Next > Finish Cano	el

Figure 8-146 BPMN Process Wizard

2. Click Next. The Arguments page is displayed, as shown in Figure 8-147.

Figure 8-147 Arguments Page

O BPMN 2.0 Process W	izard				
Arguments					
<u>Definition</u> Arguments	Input Output Arguments Definition				₽ ⁄×
Advanced	Name		Туре		
Help	L	< <u>B</u> ack	<u>N</u> ext >	<u>F</u> inish	Cancel

3. Click Next. The Initial Implementation page is displayed, as shown in Figure 8-148.

😚 BPMN 2.0 Process Wi	zard			X
Initial Implementation	n			
Q Definition				🕂 🗘 🕹 🗙
Arguments	Name	Description	Implementation Type	Role
Initial Implementati				
<u>Advanced</u>				
(\longrightarrow)				
Help		< Back	Next > Finish	Cancel

Figure 8-148 Initial Implementation Page

4. Click Next. The Advanced Settings page is displayed, as shown in Figure 8-149.

O BPMN 2.0 Process Wi	zard
Advanced Settings	
Definition Arguments Initial Implementation Advanced	Advanced Process Sampling Points: Inherit project default Generate for Interactive(s) only Generate for All activities Do Not generate Is Primary Process Suspend instance on data association failure Service namespace: http://xmlns.orade.com/bpmn/bpmnProcess/Process
Help	< Back Next > Finish Cancel

Figure 8-149 Advanced Setting Page

5. Click Finish.

The following screen appears, as shown in Figure 8-150.

Figure 8-150 BPMN Process

	-	ct × 😪 Pr 🖂 🗸 Notification	0.0		Q Search	ک پھر ا
Process		Start	• (End		

6. Double-click on the Start icon. The Properties - Start dialog is displayed, as shown in Figure 8-151.

🗿 Proper	ties - Start		
Basic In	plementation		
Name:	Start]	a
Description	12		9
Is Draft:			
Help		ОК Са	ancel

Figure 8-151 Properties - Start Dialog

- 7. Click the **Implementation** tab.
- 8. Select Use Interface from the Type list.
- 9. Click on the **Browse** icon to the right of the **Reference** field, under **Use Interface** section, as shown in Figure 8-152.

Properties - Start	×
Basic Implementation	
Implementation Type: 💿 Message	▼]
Message Exchange	
Type: 🙀 Use Interface	-
Conversation: Default Advanced 	
Use Interface	
Reference:	م 🔦
Operation:	-
Data Associations De Correlations	Log Handlers
Message Headers	
Help	OK Cancel

Figure 8-152 Implementation Tab

The Service dialog is displayed, as shown in Figure 8-153.

- 10. Select **SapService** from Search Results.
- 11. Click OK.
- Figure 8-153 Service Dialog

Service	
Search:	
L	
Search Results:	
····· @ SapService	
Help	OK Cancel
Tiep	Cancer

You are returned to the **Properties - Start** dialog.

19. Click on the **Data Associations** link.

The Data Associations dialog is displayed, as shown in Figure 8-154.

Figure 8-154 Data Associations Dialog

Start → → Arguments → → → → → → → → → → → → → → → → → → →		Process 🔁 Data Objects 🧰
Process		Predefined Variables 💼 -8 BpmInboundProject 📆 -8
		+ × 4 3
From	То	

20. Create the Data Object as shown in Figure 8-155.

Figure 8-155 Create Data Object

🚺 Data Associations		
Output		
		B. 🖬 K
Start		Process 😒
🚊 🗠 🛅 Arguments	Drag objects here	Data Obji 🔮 New
ia matmas01		Predefined Variables
E Process		BpmInboundProject 😽 🕀
_		

21. Right-click on Data Object and select New.

The Create Data Object dialog is displayed, as shown in Figure 8-156.

22. Enter a name in the **Name** field (for example, InputDO) and then click the drop-down button in the **Type** field and select **MATMAS01** from the list.

Figure 8-156 Create Data Object Dialog

🕜 Cre	ate Data Object		
Name:	InputDO		
Type:	AMATMAS01		-
	🗸 Auto initialize		
Help)	ОК	Cancel

23. The InputDO is created, as shown in Figure 8-157.

Figure	8-157	Data	Object
--------	-------	------	--------

5. 🛋 K
Process 😪
Data Objects 🛅 🚊
InputDO 🚁
idoc] 🚷 🗄
idocencoded 📓
tid abc
Predefined Variables 🛅 🖳
BpmInboundProject 🔜 🗄

24. Drag the **matmas01** argument of the start to the **InputDO** of the Process, as shown in Figure 8-158.

Figure 8-158 Data Association Dialog

		🖪 🛋 K
💿 Start		Process 😪
🖨 🖞 🧰 Arguments	Drag objects here	Data Objects 🍙 🚊
🖨 🖓 matmas01		InputDO 🎪 🗄
idoc]		idoc] 🔇 🕀
idocencoded		idocencoded 📓 …
abc tid		tid abc
🗄 🐨 Process		Predefined Variables 🛅 🕀
		BpmInboundProject 😽 🕁

25. Click OK.

26. Double-click on the **End** icon.

The Properties - End dialog is displayed, as shown in Figure 8-159.

🕜 Ргој	perti	ies - End						×
Basic	Imp	lementation						
Name:		End			۲			6
Descrip	otion:							-
Is Draf	ft:							
Help						ОК	Cancel	

Figure 8-159 Properties - End Dialog

27. Click the **Implementation** tab.

28. Select None from the Implementation Type list, as shown in Figure 8-160.

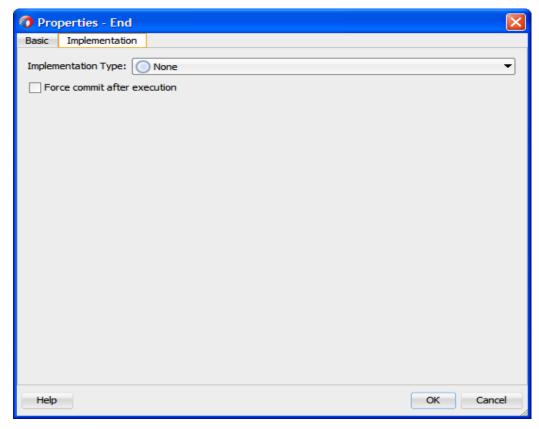
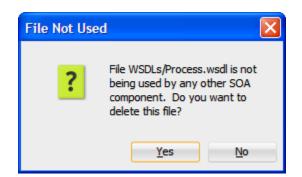


Figure 8-160 Implementation Type

29. Click OK.

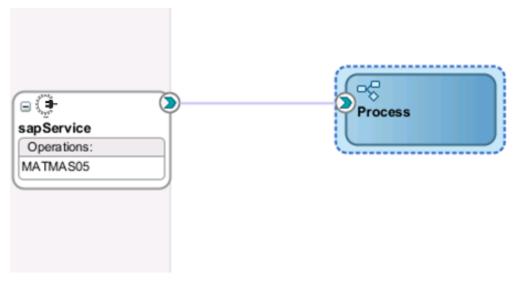
The File Not Used dialog is displayed, as shown in Figure 8-161.

```
Figure 8-161 File Not Used Dialog
```



- 30. Click Yes.
- **31.** Click the **Save All** icon in the menu bar to save the new inbound BPM process component that was configured, as shown in Figure 8-162.

Figure 8-162 Inbound BPM Process Component



You are now ready to deploy the Inbound BPM Process.

Deployment Inbound BPM Process

To deployment the Inbound BPM Process, you can follow the same procedure as described in "Deploy the Defined Process".

8.4 The Adapter Integration with Oracle Service Bus (OSB)

The Oracle Integration Adapter for SAP R/3 seamlessly integrates with Oracle Service Bus (OSB) to facilitate the Web service integration. OSB is based on the Service-Oriented Architecture (SOA). It consumes the adapter services that are exposed as Web Service Definition Language (WSDL) documents.

8.4.1 Create an Empty Composite for OSB

Perform the following steps to create an empty composite for OSB:

1. Create a new OSB application, Select File > New > Application, as shown in Figure 8-163.

Figure 8-163 New Application Page

() ()racle	JDeve	loper 12c	- MModule	e.jws : I	PRJ_PO_F	RELAS	_REL	INFO.j	pr
<u>F</u> ile	Edit	<u>V</u> iew	Application	Refactor	<u>S</u> earch	<u>N</u> avigate	Build	<u>R</u> un	Tea <u>m</u>	Tools
	New				🔁 Ap	plication				
	Open		Ctr	1-0	D Pro	oject				

The New Gallery page is displayed as shown in Figure 8-164.

Q service bus	8	
Categories:	 Items:	Show All Description
Service Bus Tier Services Interfaces		pplications) cation without a project. Useful when a Service Bus port of a Service Bus configuration jar.
·····Transformations ····Security	Service Bus Application with Ser	
SOA Tier	Service Bus Configuration (Depl	
Faults Interfaces	Service Bus Project (Projects)	

2. Enter a name for the new SOA Application and click **Next**, as shown in Figure 8-165.

Figure 8-165	Name	Your	Application
--------------	------	------	-------------

Figure 8-164 New Gallery Page

Create Service Bus App	ication - step 1 of 1				
lame your application	on			1010101010101 010101010101	5
	Application Name:				
Application Name	ServiceBusApplication3				
	Directory:				
	C:\JDeveloper\mywork\	ServiceBusApplica	tion3		Browse
	Appli Refreshackage Pref				
		17.5			
Help		< Back	Next >	<u>F</u> inish	Cancel

3. Create a new OSB application, Select File > New > Project, as shown in Figure 8-166.

2, service bus	×	
ategories:	Items:	Show All Description
Service Bus Tier Services Interfaces Transformations	Service Bus Application (Application Generation Service Bus Application with Service Service Bus Configuration (Deployn	e Bus Project (Applications)
·····Security ·····Utility	Service Bus Project (Deployment Pr	rofiles)
SoA Tier Faults	Service Bus Project (Projects) Create a new Service Bus Project)
Interfaces Service Components Tests		
Transformations/Translations		
·····JSF ·····JSF/Facelets ·····JSP		
Servlets All Items	1	

Figure 8-166 New Project Page

4. The Name Your Project page is displayed, as shown in Figure 8-167.

🕜 Create Service Bus Proje	ect - Step 1 of 1	-			×
Name your project			0101010	01010101010101010101	
Reference Project Name	Project Name: Dir <u>e</u> ctory:		work\ServiceBusAp	plication3\SBProject1	Bro <u>w</u> se
	Project Featur	res:			
	mediate, and	a proven, lightweig manage interaction	s between heterog	platform. It is designed eneous services, legacy across an enterprise-wic	applications,
Help		< <u>B</u> ack	Next >	Einish	Cancel

Figure 8-167 Name Your Project Page

5. Click Finish.

8.4.2 Define an OSB Outbound Process

This section describes how to define an OSB outbound process, which consists of the following stages:

- 1. Configure the Component of Apdapter for SAP.
- 2. Configure an Outbound OSB Process Component.

Configure the Component of Adapter for SAP

- 1. Open JDeveloper.
- 2. Drag and drop the Component of Apdapter for SAP from the **Resources Components** pane to the **External Service** pane, as shown in Figure 8-168.

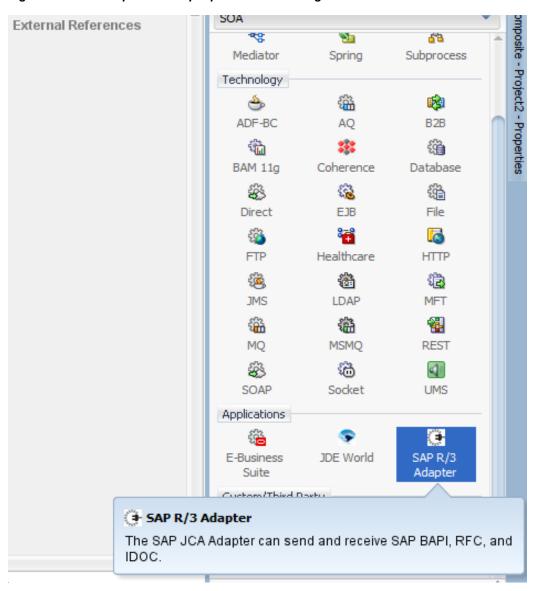


Figure 8-168 Component of Apdapter for SAP Configuration Wizard

The **Welcome** page of the Adapter configuration wizard is displayed, as shown in Figure 8-169.

igure 8-169	Welcome Page				
Adapter Config	guration Wizard - Step	o 1 of 3			×
SAP Adapter	Reference		0101010101010	01010101010101	*
	the Adapter Con	-		······································	
	ou create a service usin ation for the service.	g a SAP Adapter.	You will be asked to s	specity configurati	on parameters
Enter a Reference	Name.				
<u>N</u> ame:	sapReference				
Service <u>D</u> irectory:	C:\JDeveloper\mywork	\ServiceBusApplica	ation3\SBProject1		Q
Help		< <u>B</u> ack	Next >	Finish	Cancel

3. Enter a reference name for the Adapter for SAP reference in the **Name** field and then click **Next**.

The Connection information page is displayed, as shown in Figure 8-170.

-	Connection Info	-			×
Connection	n Information		010101010101	01010101010101	*
	nection is required to confi te a New Connection.	igure this adapter. S	Select a SAP R/3 con	nection already de	fined in your
Connection:	jco			•	• 🕂 🥢 🗙
Client :	800				
Applicatio	n Server: 10.30.32.42				
System N	umber: 00				
JNDI Name:	eis/FMW2SAP				Q
<u>H</u> elp		< <u>B</u> ack	<u>N</u> ext >	<u>F</u> inish	Cancel

- 4. On the Connection Information page, select the connection to use and the default JNDI name.
- 5. Click Next.

The **Object Selection** page is displayed, as shown in Figure 8-171.

bject Selection	0101010101010101010404040404
Select SAP objects, BAPI, RFC, or IDoc, to retrieve an Hierarchical Alphabetical	Id describe. Selected BAPI/RFC functions or IDOC messages
Business Objects (BAPIs) Function Modules (RFCs) Please wait ALE/EDI Messages (IDOCs)	
Connecting Connecting to SAP	Description

Figure 8-171 Object Selection Page

6. Click the **Hierarchical** tab and then click on + icon to expand the node.

This tab shows all the SAP Objects (RFC/BAPI/IDoc) available in that SAP system in hierarchical form, as shown in Figure 8- 172.

Figure 8-172 Hierarchical Tab

Hierarchical	Alphabetical
🔁 SAP	
🖨 🗁 Busine:	ss Objects (BAPIs)
🗄 🧰 Ac	counting - General
🕀 🧰 Ap	plication Platform
🕀 🧰 Au	to-ID Infrastructure
🕀 🧰 Ba	sis Components
🗄 🗀 Co	ntrolling
🕀 🙆 Cr	oss-Application Components
🗄 🙆 Cu	stomer Service
🕀 🙆 En	terprise Controlling
🕀 🧰 En	terprise Portal
🕀 🗀 En	vironment, Health and Safety
🕀 🧰 Fir	ancial Accounting
🕀 🗀 Fir	ancial Services
🕀 🧰 Fir	ancial Services
🕀 🙆 Fir	ancials
🕀 🗀 🖬	vestment Management

Select business object from the list and click on > or >> icon to move the selected object(s) from Select SAP objects, BAPI, RFC, or IDoc, to retrieves and describe field to Selected BAPI/RFC functions or IDOC messages field, as shown in Figure 8- 173.

ject Selection				0101010101010101010	¢
elect SAP objects, BAPI, RFC, or IDoc, to retrieve and d	describe	2.			
Hierarchical Alphabetical		Selected BAPI/RFC function	ons or IDOC mes	sages:	
LEDGER_CUST ILEDGER_CUST MIG_CONVERSION ONLINE_SPLITTER ORG_UNITS PLANNING PLANNING STATKEYFIGURE	> >>> <	BAPI_COMPANYCOD	_		
CLOSING CRC		Name	-	Deseriation	
		COMPANYCODEID	Type CHAR	Description Company Code	
SCORE		COMPANYCODE ADD		Company Code Addre	
002		COMPANYCODE DETAIL		Company Code Detail	
BAPI_COMPANYCODE_GET_PERIOD For Com		RETURN	STRUCTURE	Return Code	
BAT_COMPANYCODE_GETLIST List of Compa BAPI_COMPANYCODE_GETLIST List of Compa BAPI_COMPANYCODE_GETDETAIL Company					

Figure 8-173 Object Selection Page

- 8. Click Next.
- 9. The JCA Properties page is displayed, as shown in Figure 8-174.

CA Properties	
pecify the Name and Value of all JCA Adapter	roperties. 令 X
Vame	Value
interaction	stateless
ExceptionFilter	off
SchemaValidation	off
ca.retry.count	9
ca.retry.interval	1
ca.retry.backoff	2
ca.retry.maxInterval	120

Figure 8-174 JCA Properties Page

10. Click Next.

The Finish page is displayed, as shown in Figure 8-175.



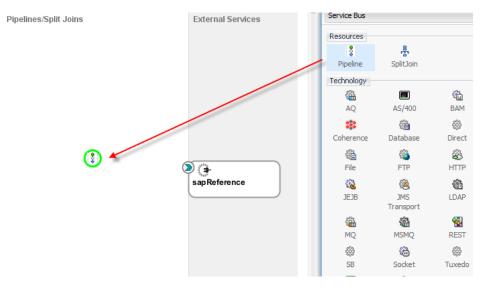
Adapter Configuration Wizard - Step 5 of 5				— X
Finish				*
You have finished defining the SAP Adapte When you dick Finish, the wizard will create the C:\JDeveloper\ file in your project directory.			oject1\Resources\s	apReference.wsd
Help	< Back	Next >	Finish	Cancel

Configure an Outbound OSB Process Component

Perform the following steps to configure an Outbound OSB Process Component:

1. Drag and drop the **Pipeline Process** component from the **Resources Components** pane to the **Pipelines/Split Joins** pane, as shown in Figure 8- 176.

Figure 8-176 Pipeline Component



The Create Pipeline Service dialog is displayed, as shown in Figure 8-177.

Figure 8-177 Create Service Page

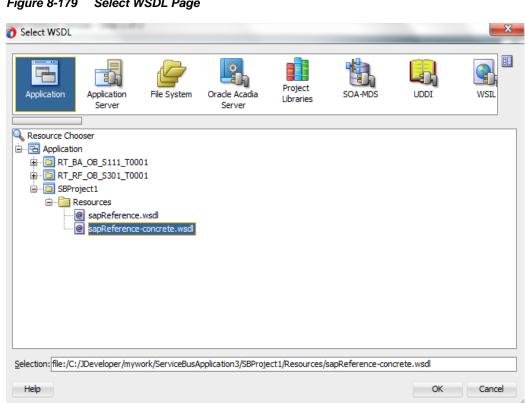
e - Step 1 of 2			-	_	
			01010101010	0.619191919191	
General Service N <u>a</u> me: Location: Description	Pipeline C:\JDeveloper\myn	work\ServiceBusApplicat	ion3\SBProject1		q
Definition	e				C
	General Service Name: Location: Description	General Service Name: Pipeline Location: C:\/Developer\/myn Description	General Service Name: Pipeline Location: C: \JDeveloper \mywork\ServiceBusApplicat Description	General Service Name: Pipeline Location: C:\JDeveloper\mywork\ServiceBusApplication3\SBProject1 Description	General Service Name: ipeline Location: C: \JDeveloper \mywork\ServiceBusApplication 3\SBProject 1 Description

- 2. In the Service Name field, enter a name to identify the pipeline name and select the corresponding location of the project.
- 3. Click Next and select the Service Type as WSDL, as shown in Figure 8-178.

уре		01	ŧ
Create Service	Service Type: V	VSDL-based service	1
		Binding:	-
	O Any SOAP:	SOAP 1.1	-
	◯ Any <u>X</u> ML		
	O Messaging:	Reguest:	-
		Response:	-]
	✓ Expose as a	Proxy Service	
	Proxy Name:	PipelineProxyService	
	Proxy Location:	C:\JDeveloper\mywork\ServiceBusApplication3\SBProject1	9
	Proxy <u>T</u> ransport:	http]
	Messages:		

Figure 8-178 Type Page

- **4.** Click **Browse** icon, which is located to the right of the WSDL URL to select WSDL from file system.
- 5. Select the appropriate WSDL file from the Application -> Resources, as shown in Figure 8-179.



6. Click OK.

The selected WSDL and corresponding binding is displayed, as shown in Figure 8-180. Figure 8-180 Type Page

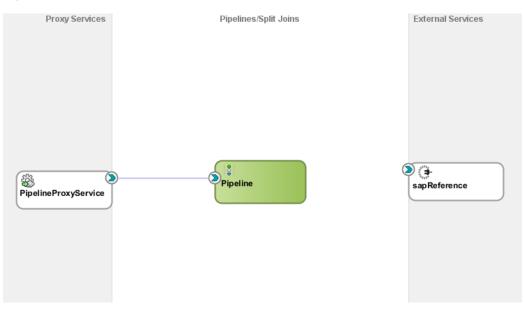
уре			ŧ
Create Service	Service Type: W	VSDL-based service	
🕽 Туре	() WSDL:	SBProject1/Resources/sapReference-concrete	1
		Binding: sapReference_PT-binding -	
	O Any SOAP:	SOAP 1.1	
	◯ Any <u>X</u> ML		
	O Messaging:	Reguest:]
		Response:]
	✓ Expose as a	Proxy Service	
	Proxy Name:	PipelineProxyService]
	Proxy Location:	C:\JDeveloper\mywork\ServiceBusApplication3\SBProject1] 🔍
	Proxy <u>T</u> ransport:	http]
	Messages:		
Help		< Back Next > Finish C	ancel

Figure 8-179 Select WSDL Page

- 7. Select checkbox for Expose as a Proxy Service.
- 8. Select Proxy Transport as http.
- 9. Click Finish.

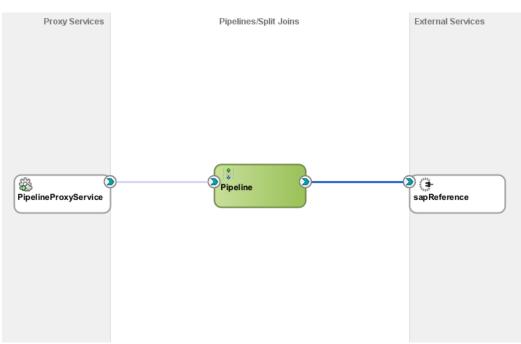
The Pipeline component is displayed as shown in Figure 8-181.

Figure 8-181 Pipeline Component



10. Connect sapReference to the Pipeline, as shown in Figure 8-182.

Figure 8-182 Pipeline Component



11. Open the pipeline which shows the default routing. Verify the service and corresponding operation is displayed in the **Routing-Properties**, as shown in Figure 8- 183.

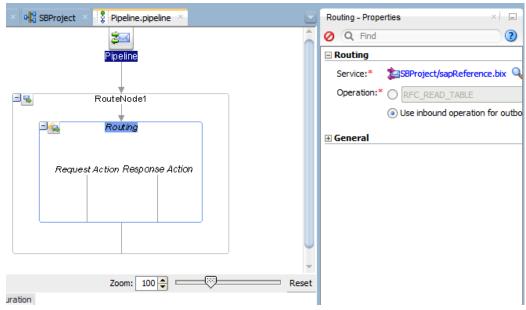


Figure 8-183 Routing Properties

-1

The outbound endpoint is ready to be deployed.

Deployment Outbound OSB Process

Perform the following steps to deploy the outbound OSB Process:

1. Select the project and **Deploy to Service Bus Server**, as shown in Figure 8-184.

Figure 8-184 Deployment Action Page

Deploy ServiceBusApplication3_Project1_ServiceBusProjectProfile			
Deployment Action			
Deployment Action	Select a deployment action from the list below.		
Summary	Deploy to Service Bus Server Deploy to Service Bus Server Deploy a Service Bus project to a Weblogic server which includes a Service Bus runtime.		
Help	< Back Next > Finish Cancel		

2. Select the already configured Application Server and click Next, as shown in Figure 8-185.

Figure 8-185 Select Server Page

Deploy ServiceBusApplication3_Project1_ServiceBusProjectProfile					
Select Server					
Deployment Action Select Server Summary	Application Servers 110_STAGE6_OSB IntegratedWebLog server-80	_7065	inconfigured)		• *
	Overwrite modu	les of the same na			
<u>H</u> elp		< <u>B</u> ack	<u>N</u> ext >	Einish	Cancel

3. Check the deployment summary and click **Finish**, as shown in Figure 8-186.

Figure 8-186	Summary	Page
--------------	---------	------

Deploy ServiceBusApp	lication3_Project1_ServiceBusProjectProfile
Deployment Action Select Server	Deployment Summary Service Bus Deployment Summary Server Name: 110_STAGE6_OSB_7065 Server Platform: Weblogic 12.x Service Bus Application Deployment Settings Preserve Environment Settings: No Preserve Security Settings: No Preserve Credentials Settings: No Discard Session if activation fails: Yes Session name: SB_Publish Session description: Publish from Service Bus IDE. Deployment customization file: {0} Keystore file: {0}
Help	< Back Next > Finish Cancel

4. The Project is successfully deployed, as shown in Figure 8-187.

Figure 8-187 Success Message Page



The successfully deployed project can be tested from service bus console.

5. Open the Service Bus Console and enter User ID (weblogic) and Password (welcome1), as shown in Figure 8-188.

Figure 8-188	Service Bus Console		
		SIGN IN TO SERVICE BUS CONSOLE 12C	
		weblogic	
		Sign in	
			ORACLE

6. All the deployed projects are displayed under All Projects, as shown in Figure 8-189.

Figure 8-189 Service Bus Console

Create Discard Exit	sole 12c		Search for resources by name	Links 🔻 weblogic 👻 🔹
All Projects	sapReference × Business Service D General	sfinition		- D - C
∡ BSProject1 ▶ Resources ↓ Pipeline ↓ PipelineProxyService	Description		h	
‡∎ sapReference ▶ 🛅 System	ACOA	Based Service - SOAP 1.1		
		DL SBProject1/Resources/sapReference-concrete ng sapReference_PT-binding		

7. Open the deployed project and click on sapReference, as shown in Figure 8-190.

Figure 8-190 Business Service Definition

Fe 🖻 🕹 🖢 🗕 –	▼ sa	pReference ×			
🔺 🛅 All Projects	Business Service Definition				
 default Outbound_Simple 	×	General			
 ▲ SBProject1 ▶ Call Resources ↓ Planting 	₽Į	Description			
💈 Pipeline 🎥 Pipeline 🎥	\mathcal{A}				
apReference	≥%	Transport	jca		
System	~	Service Type	WSDL Based Service - SOAP 1.1		
			WSDL SBProject1/Resources/sapReference-concrete		
			Binding sapReference_PT-binding		

8. Option for **Launch Test Console** (Green arrow button) is displayed for testing the outbound endpoint, as shown in Figure 8-191.

Figure 8-191 Launch Test Console

	Links	Ŧ	weblogic	Ŧ	
Search for resources by name	0	%	Designer	м а А	dmin
			_	_	
			E 🕨	i -	8

 Launching Test Console opens new window displaying Business Service and the operation to test along with Execute, Execute-Save, Reset and Close button, as shown in Figure 8-192.

Figure 8-192 Business Service Testing Page

🕽 Oracle Service Bus Console 12c : Business Service Testing - sapReference - Google Chrome
10.30.32.110:7065/lwpfconsole/testdialog.portal?_nfpb=true&_pageLabel=ServiceTestDialogPage&ServiceTestDialogPortletref_fullname=SBProject1%2
Business Service Testing - sapReference Help
Execute Execute-Save Reset Close
© Service Operation
Operation: BAPI_COMPANYCODE_GETDETAIL •
Request Document
Form XML
SOAP Header: <pre><soap:header xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"> </soap:header></pre>
* Payload: Choose File No file chosen
<urr> term:BAPI_COMPANYCODE_GETDETAIL xmlns:urn="urn:sap-com:document:sap:rfc:functions"> <urn:companycodeid>1500</urn:companycodeid> </urr>

Request Document section contains the Request Payload.

10. Provide the input and click on **Execute** button.

This would send the payload to SAP and the response is displayed under **Response Document** section, as shown in Figure 8-193.

Business Service Testing - sapReference Back Cose Request Document soapenv:Envelope xmins:soapenv="http://schemas.xmisoap.org/soap/envelope/"> soapenv:Envelope xmins:soapenv="http://schemas.xmisoap.org/soap/envelope/"> soapenv:Body> cum:BAPI_COMPANYCODE_GETDETAIL.xmins:um="um:sap-com:document:sap:rfc:functions"> cum:CMPANYCODE_GETDETAIL.xmins:um="um:sap-com:document:sap:rfc:functions"> cum:CMPANYCODE_GETDETAIL.xmins:um="um:sap-com:document:sap:rfc:functions"> cum:CMPANYCODE_GETDETAIL.xmins:um="um:sap-com:document:sap:rfc:functions"> cum:CMPANYCODE_GETDETAIL.xmins:um="um:sap-com:document:sap:rfc:functions"> cum:CMPANYCODE_GETDETAIL.xmins:um="um:sap-com:document:sap:rfc:functions"> cum:CMPANYCODE_GETDETAIL company:Envelope xmins:soap-env="http://schemas.xmisoap.org/soap/envelope/"> comp	10.30.32.110	:7065/lwpfconsole/testdialog.portal?_nfpb=true&_windowLabel=ServiceTestDialogPortlet8
Request Document Soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"> <soapenv:envelope xmlns:soape="http://schemas.xmlsoap.org/soap/envelope/"> <soapenv:body> </soapenv:body></soapenv:envelope>	🍃 Business Se	ervice Testing - sapReference
<pre></pre>	Back	Close
<pre><soap:header xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"> </soap:header> <th>🕂 Request Do</th><th>cument</th></pre>	🕂 Request Do	cument
<pre><soap-env:envelope xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"> <soap-env:body> <bapi_companycode_getdetail_response xmlns="urn:sap-com:document:sap:rfc:functions"> <companycode_address> <addr_no>0000065853</addr_no> <formofaddr>Firma</formofaddr> <name_ides ag<="" name=""> <name_2>Martin Steiner, Kathrin Walther,</name_2> <name_3>Bernd Zecha, Dondogmaa Lchamdondog</name_3> <name_4>IDES intern</name_4> <c_0_name></c_0_name> <city>Frankfurt</city> <district></district> <city_no></city_no> <postl_cod1>60441</postl_cod1> <postl_cod2>60070</postl_cod2> <postl_cod3></postl_cod3></name_ides></companycode_address></bapi_companycode_getdetail_response></soap-env:body></soap-env:envelope></pre>	<soap:head </soap:head <soapenv:b <urn:e < <td><pre>ler xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"> der> lody> sAPI_COMPANYCODE_GETDETAIL xmlns:urn="urn:sap-com:document:sap:rfc:functions"> urn:COMPANYCODE_GETDETAIL xmlns:urn="urn:sap-com:document:sap:rfc:functions"> BAPI_COMPANYCODE_GETDETAIL > BAPI_COMPANYCODE_GETDETAIL > BAPI_COMPANYCODE_GETDETAIL > Body> </pre></td></urn:e </soapenv:b 	<pre>ler xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"> der> lody> sAPI_COMPANYCODE_GETDETAIL xmlns:urn="urn:sap-com:document:sap:rfc:functions"> urn:COMPANYCODE_GETDETAIL xmlns:urn="urn:sap-com:document:sap:rfc:functions"> BAPI_COMPANYCODE_GETDETAIL > BAPI_COMPANYCODE_GETDETAIL > BAPI_COMPANYCODE_GETDETAIL > Body> </pre>
<soap-env:body> <bapi_companycode_getdetail_response xmlns="urn:sap-com:document:sap:rfc:functions"> <companycode_address> <addr_no>0000065853</addr_no> <formofaddr>Firma</formofaddr> <name>Ides AG</name> <name_2>Martin Steiner, Kathrin Walther,</name_2> <name_3>Bernd Zecha, Dondogmaa Lchamdondog</name_3> <name_4>IDES intern</name_4> <c_0_name></c_0_name> <c_0_name></c_0_name> <city>Frankfurt</city> <district></district> <city_no></city_no> <postl_cod1>60441</postl_cod1> <postl_cod2>60070</postl_cod2> <postl_cod3></postl_cod3></companycode_address></bapi_companycode_getdetail_response></soap-env:body>	🕂 Response D	ocument
<pre><bapi_companycode_getdetail_response xmins="urn:sap-com:document:sap:rfc:functions"> <companycode_address> <addr_no>0000065853</addr_no> <formofaddr>Firma</formofaddr> <name>Ides AG</name> <name_2>Martin Steiner, Kathrin Walther,</name_2> <name_3>Bernd Zecha, Dondogmaa Lchamdondog</name_3> <name_4>IDES intern</name_4> <c_0_name></c_0_name> <city>Frankfurt</city> <district></district> <city_no></city_no> <postl_cod1>60441</postl_cod1> <postl_cod2>60070</postl_cod2></companycode_address></bapi_companycode_getdetail_response></pre>		
<companycode_address> <addr_no>0000065853</addr_no> <formofaddr>Firma</formofaddr> <name>Ides AG</name> <name_2>Martin Steiner, Kathrin Walther,</name_2> <name_3>Bernd Zecha, Dondogmaa Lchamdondog</name_3> <name_4>IDES intern</name_4> <c_0_name></c_0_name> <c_0_name></c_0_name> <city>Frankfurt</city> <district></district> <city_no></city_no> <postl_cod1>60441</postl_cod1> <postl_cod2>60070</postl_cod2> <postl_cod3></postl_cod3></companycode_address>		
<pre><addr_no> O000065853</addr_no> <formofaddr>Firma</formofaddr> <name>Ides AG</name> <name_2>Martin Steiner, Kathrin Walther,</name_2> <name_3>Bernd Zecha, Dondogmaa Lchamdondog</name_3> <name_4>IDES intern</name_4> <c_0_name></c_0_name> <c_0_name></c_0_name> <city>Frankfurt</city> <district></district> <district></district> <city_no></city_no> <postl_cod1>60441</postl_cod1> <postl_cod2> <postl_cod3></postl_cod3></postl_cod2></pre>		
<pre><formofaddr>Firma</formofaddr> <name>Ides AG</name> <name_2>Martin Steiner, Kathrin Walther,</name_2> <name_3>Bernd Zecha, Dondogmaa Lchamdondog</name_3> <name_4>IDES intern</name_4> <c_0_name></c_0_name> <c_0_name></c_0_name> <city>Frankfurt</city> <district></district> <city_no></city_no> <postl_cod1>60441</postl_cod1> <postl_cod2>60070</postl_cod2> <postl_cod3></postl_cod3></pre>		-
<name>Ides AG</name> <name_2>Martin Steiner, Kathrin Walther,</name_2> <name_3>Bernd Zecha, Dondogmaa Lchamdondog</name_3> <name_4>IDES intern</name_4> <c_0_name></c_0_name> <city>Frankfurt</city> <district></district> <city_no></city_no> <postl_cod1>60441</postl_cod1> <postl_cod2>60070</postl_cod2> <postl_cod3></postl_cod3>		
<name_2>Martin Steiner, Kathrin Walther,</name_2> <name_3>Bernd Zecha, Dondogmaa Lchamdondog</name_3> <name_4>IDES intern</name_4> <c_0_name></c_0_name> <city>Frankfurt</city> <district></district> <city_no></city_no> <postl_cod1>60441</postl_cod1> <postl_cod2>60070</postl_cod2> <postl_cod3></postl_cod3>		
<name_3>Bernd Zecha, Dondogmaa Lchamdondog</name_3> <name_4>IDES intern</name_4> <c_0_name></c_0_name> <city>Frankfurt</city> <district></district> <city_no></city_no> <postl_cod1>60441</postl_cod1> <postl_cod2>60070</postl_cod2> <postl_cod3></postl_cod3>		
<name_4>IDES intern</name_4> <c_0_name></c_0_name> <city>Frankfurt</city> <district></district> <city_no></city_no> <postl_cod1>60441</postl_cod1> <postl_cod2>60070</postl_cod2> <postl_cod3></postl_cod3>		
<city>Frankfurt</city> <district></district> <city_no></city_no> <postl_cod1>60441</postl_cod1> <postl_cod2>60070</postl_cod2> <postl_cod3></postl_cod3>		
<district></district> <city_no></city_no> <postl_cod1>60441</postl_cod1> <postl_cod2>60070</postl_cod2> <postl_cod3></postl_cod3>		<c_o_name></c_o_name>
<city_no></city_no> <postl_cod1>60441</postl_cod1> <postl_cod2>60070</postl_cod2> <postl_cod3></postl_cod3>		<city>Frankfurt</city>
<postl_cod1>60441</postl_cod1> <postl_cod2>60070</postl_cod2> <postl_cod3></postl_cod3>		
<postl_cod2>60070</postl_cod2> <postl_cod3></postl_cod3>		
<postl_cod3></postl_cod3>		
		<postl_cod3></postl_cod3> <po_box>160529</po_box>

8.4.3 Define an OSB Inbound Process

This section describes how to define an OSB Inbound process, which consists of the following stages:

- 1. Configure the Component of Apdapter for SAP.
- 2. Configure an Inbound OSB Process Component

Configure the Component of Apdapter for SAP

- 1. Open JDeveloper.
- 2. Drag and drop the Component of Apdapter for SAP from the **Resources Components** pane to the **Proxy Services** pane, as shown in Figure 8- 194.

Figure 8-193 Request Document Page

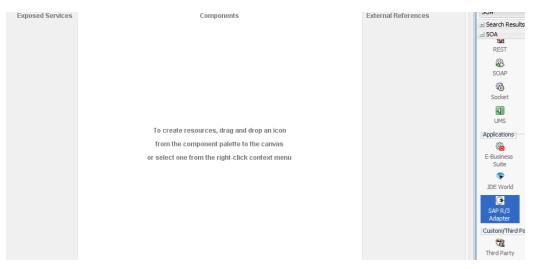


Figure 8-194 Adapter for SAP Configuration Wizard

The **Welcome** page of the Adapter Configuration Wizard is displayed, as shown in Figure 8-195.

Figure 8-195 Welcome Page

Adapter Configuration Wizard - Step 1 of 3				×
SAP Adapter Service			orestoleteroro	
Welcome to the Adapter Configuration Wiz This wizard helps you create a service using a SAP Adapter. You operation for the service.		pe <mark>ci</mark> fy configuration	parameters and def	îne an
Enter a Service Name.				
Name: sapService				
Service Directory: C:\JDeveloper\mywork\ServiceBusApplication	on3\Inbound_Proje	ct		٩
Help	< <u>B</u> ack	<u>N</u> ext >	Einish	Cancel

3. Enter a service name for the Adapter for SAP reference in the **Name** field and then click **Next**.

The **Connection Information** page is displayed, as shown in Figure 8-196.

Figure 8-196	Connection Inform	nation Page			
🕐 Adapter Co	onfiguration Wizard - Ste	p 2 of 3			×
Connection	n Information		01010101010	10101919191919191	*
	nection is required to config te a New Connection.	ure this adapter. S	elect a SAP R/3 cor	nection already de	fined in your
Connection:	jco				- 🕂 🥢 🗶
Client :	800				
Applicatio	n Server: 10.30.32.42				
System N	umber: 00				
JNDI Name:	eis/FMW2SAP				
<u>H</u> elp		< <u>B</u> ack	Next >	Einish	Cancel

- **4.** On the **Connection Information** page, select the connection to use and the default JNDI name.
- 5. Click Next.

The Object selection page is displayed, as shown in Figure 8-197.

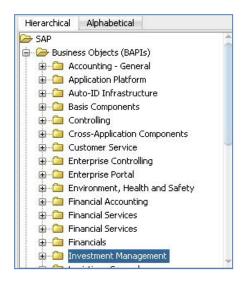
ject Selection			
elect SAP objects, BAPI, RFC, or IDoc, to retrieve and des		PI/RFC functions or IDC)C messages:
	Name:		
CWM/SHP_OBDLV_CONFIRM_DEC CWM/SHP_OBDLV_SAVE_REPLICA CWM/SHP_OBDLV_SPLIT_DECENTRAL CWM/STPPOD CWM/STPPOD CWM/STPPOD CWM/STPPOD CWM/STPPOD CWM/STPPOD CWM/STPPOD CWM/STPPOD CWM/STPAH_CONTROL CWM/STPAH_CREDITDATA CWM/STPAH_DDTVERMAST CMM/STPAH_DDTVERMAST CMM/STPAH_DDTVERMAST CMM/STP/SHP/SHP/SHP/SHP/SHP/SHP/SHP/SHP/SHP/SH	Name	Туре	Description

Figure 8-197 Object Selection Page

6. Click the **Hierarchical** tab and then click on + icon to expand the node.

This tab shows all the SAP Objects (RFC/BAPI/IDoc) available in that SAP system in hierarchical form, as shown in Figure 8-198.

Figure 8-198 Hierarchical Tab



7. On the Object Selection page, expand the ALE (IDOCs) node and search CREMAS05.

Select business object from the list and click on > or >> icon to move the selected object(s) from Select SAP objects, BAPI, RFC, or IDoc, to retrieves and describe field to Selected BAPI/RFC functions or IDOC messages field, as shown in Figure 8- 199.

Adapter Configuration Wizard - Step 3 of 4					×
Object Selection			0101010101	01	*
SAPMP/MBGMCR_CLASS SAPMP/PPCC2PRETE SAPMP/PPCC2PRETE_CLA SAPMP/PPCC2PRETE_CLA SAPMP/PPCC2PRETT SAPMP/PPCC2PRETT_CLA SAPMP/ROUTING	escribe	Selected BAPI/F	RFC functions or	IDOC messages: ndor master	
		Name:			
SAPSLL/CCECUS		Name	Туре	Description	
SAPSLL/CREMAS_SLL GREMAS01 Distribute vendor master GREMAS02 Distribute vendor master GREMAS03 Distribute vendor master GREMAS05 Distribute vendor master GREMAS05 Distribute vendor master					
Help		< <u>B</u> ack	<u>N</u> ext >	Einish	Cancel

Figure 8-199 Object Selection Page

- 9. Click Next.
- 10. The JCA Properties page is displayed, as shown in Figure 8-200.

Adapter Configuration Wizard - St	ep 4 of 5
ICA Properties	010101010101010101010404040540
Specify the Name and Value of all JCA A	lapter Properties.
Name	Value
AutoSYSTAT01	no
EncodeIDOC	no
ControlCharacter	encode
ProgramID	
ca.retry.count	9
ca.retry.interval	1
ca.retry.backoff	2
ca.retry.maxInterval	120
· •	
Help	< Back Next > Einish Cancel

Figure 8-200 JCA Properties Page

11. Click Next.

The **Finish** page is displayed, as shown in Figure 8- 201.

Adapter Configuration Wizard - Step			-
Finish			-
You have finished defining the When you dick Finish, the wizard will creat file in your project directory.		roject1\Resources\s	apReference.wsd

Figure 8-201 Finish Page

The Adapter for SAP is created and displayed in the **Proxy Services** pane, as shown in Figure 8- 202.

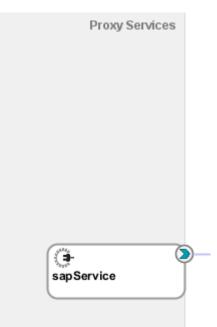


Figure 8-202 Adapter for SAP

12. Drag and drop the **Pipeline** component in **Pipeline/Split Joins** lane, as shown in Figure 8-203.

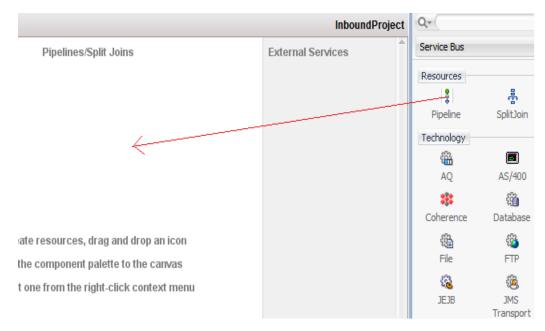


Figure 8-203 Drop Pipeline in Pipeline/Split

13. Provide appropriate service name in the Service Name field, as shown in Figure 8-204.

Figure 8-204 Crea	te Service Page
-------------------	-----------------

O Create Pipeline Servic	e - Step 1 of 2					×
Create Service					210294967495a	-
Create Service	General Service Name: Location: Description	Pipeline C:\JDeveloper\mywr	ork\ServiceBusApplica	tion3\Inbound_Project		
	From <u>T</u> emplate					
Help			< <u>B</u> ack	Next >	Einish	Cancel

- 14. Click Next and select the Service Type as WSDL.
- **15.** Click on the **Browse** icon, which is located to the right of the **WSDL** field to select WSDL from file system, as shown in Figure 8- 205.

/pe			-	
Create Service	Service Type: V	VSDL-based service		
Туре	() <u>W</u> SDL:		6	
		Binding:		
	O Any SOAP:	SOAP 1.1		
	◯ Any <u>X</u> ML			
	O Messaging:	Reguest:		
		Response:		
	<u>Expose</u> as a	Proxy Service		
	Proxy Name:	PipelineProxyService		
	Proxy Location:	C:\JDeveloper\mywork\ServiceBusApplication3\Inbound_Project	Q	
	Proxy <u>T</u> ransport:	http 💌		
	Messages:			

 Select the appropriate WSDL file from Application -> Resources folder, as shown in Figure 8- 206.

Figure 8-206	Select WSDL	

Figure 8-205 Type Page

Application Application File System Oracle Acadia Server Server Server UDDI	WSIL
Resource Chooser	
appendices aspervice. wsdl	
sapService-concrete.wsdl	
Der PRJ_CREMAS05_IN	
⊕ ⊡ RT_BA_OB_S110_T0001	
⊕ - □ RT_BA_OB_S111_T0001 ⊕ - □ RT_RF_OB_S301_T0001	
B - C SBProject1	
Selection: file:/C:/JDeveloper/mywork/ServiceBusApplication3/Inbound_Project/Resources/sapService-concrete.wsdl	
Help OK	Cancel

17. Click OK.

The selected WSDL and corresponding binding is displayed, as shown in Figure 8-207. *Figure 8-207 Type Page*

🕜 Create Pipeline Servi	ice - Step 2 of 2	_	-		х
Туре				P	5
<u>Create Service</u>	Service Type: V	VSDL-bas	ed service		
🔘 Туре	() <u>W</u> SDL:	Inbound	Project/Resources/sapService-concrete	@	$\langle \rangle$
		Binding:	sapService_PT-binding		
	O Any SOAP:	SOAP 1.			
	◯ Any <u>X</u> ML				
	O Messaging:	Reguest:	•		
		Response			
	Expose as a	Proxy Se	rvice		
	Proxy Name:	PipelineP	oxyService		
	Proxy Location:	C:\JDeve	loper\mywork\ServiceBusApplication3\Inbound_Project	Q	
	Proxy <u>Transport</u> :	http			
	Messages:				
Help			< Back Next > Finish Ca	ancel	

18. Pipeline is displayed connected to **sapService**, as shown in Figure 8- 208.

Figure 8-208 Pipeline Component

Proxy Services	Pipelines/Split Joins
()	Pipeline
sapService	

Configuring the File Adapter

Perform the following steps to configure the File Adapter:

 Drag and drop the File Adapter component from the Technology Adapters pane to the External Services pane. The FILE Adapter Configuration Wizard is displayed, showing the File Adapter Reference page, as shown in Figure 8- 209.

Figure 8-209 Welcome Page

👌 FILE Adapter	r Configuration Wizard - Step 1 of 7		23
File Adapter	r Reference	01	*
	o the File Adapter Configuration Wizar s you create a File Adapter. You will be asked to specify		ation for the
Enter a Referen	ice Name.		
<u>N</u> ame:	fileReference		
Service <u>D</u> irector	y: C:\JDeveloper\mywork\ServiceBusApplication3\Inbo	und_Project	Q,

2. Type a name for the new file adapter in the Name field and click Next.

The Adapter Interface page is displayed, as shown in Figure 8-210.

Figure 8-210 A	dapter Interface	Page
----------------	------------------	------

FILE Adapter Configuration Wizard - Step 2 of 7	X
Adapter Interface	01010101010101010101010
The adapter interface is defined by a wsdl that is generate Optionally, the adapter interface may be defined by import	d using the operation name and schema(s) specified later in this wizard. ting an existing WSDL.
Interface: Define from operation and schema (specified) 	Jlater)
Import an existing WSDL	
WSDL URL:	b
Port Type:	Ţ
Operation:	

- 3. Ensure that the **Define from operation and schema** (specified later) option is selected.
- 4. Click Next.

The File Server Connection page is displayed, as shown in Figure 8-211.

Figure 8-211	File Server	Connection	Page
--------------	-------------	------------	------

ile Server Connection	
Specify the JNDI name for the File Adapter. The deployment descriptor for INDI name with a set of configuration properties needed by the File Adapte	

5. Click Next.

The **Operation** page is displayed, as shown in Figure 8- 212.

Figure 8-212 Operation Page

Operation	01010101010101010101010101010101010101
operation that cru that lists file nam	supports five operations. There is a Read File operation that polls for incoming files in your local file system, a Write File eates outgoing files, a Synchronous Read File operation that reads the current contents of a file, a List Files operation es in specified locations, and a Chunked Read operation that synchronously reads file data in chunks and can be used Only one operation per Adapter Service may be defined using this wizard.
Operation Type:	○ <u>R</u> ead File
	<u>W</u> rite File
	○ <u>S</u> ynchronous Read File
	○ <u>Li</u> st Files
	○ Chun <u>k</u> ed Read
Operation Name:	Write
Add Output H	eader

- 6. Select Write File from the list of **Operation Type** options and specify an **Operation Name** (for example, Write).
- 7. Click Next.

The File Configuration page is displayed, as shown in Figure 8-213.

FILE Adapter Configuration W	lizard - Step 5 of 7				23
File Configuration					*
Specify the parameters for the Writ	te File operation.				
Directory specified as Directory for Outgoing Files (physic /oracle/Check_Inbound	ysical Path OLogical Nam al path):	le		Br	owse
File Naming Convention (po_%SEQ	%.txt): Inbound_crem	as05.xml			
Append to existing file					
_F Write to output file when any of t	hese conditions are met —				
✓ Number of Messages Equals:	1	[▲ ▼		
Elapsed Time Exceeds:	1		minutes	-	
File Size Exceeds:	1000	(kilobytes	-	
Help		< <u>B</u> ack	<u>N</u> ext >	Einish	Cancel

Figure 8-213 File Configuration Page

- 8. Specify a location on your file system where the output file is written.
- 9. In the File Naming Convention field, specify a name for the output file.
- 10. Click Next.

The Messages page is displayed, as shown in Figure 8-214.

Figure 8-214 Messages Page

Define the message for the Write File operation. Specify the Schema File Location and select the Schema Element that defines the messages in the outgoing files. Use the Browse button to find an existing schema definition. If you check 'Schema is Opaque', then you do not need to specify a Schema.

Message Schema ————————————————————————————————————		
Native <u>format</u> translation is not required (Schema is Opaque)		
<u>U</u> RL	Q	٢
Schema Element		

11. Click Browse icon, which is located to the right of the URL field.

The Type Chooser dialog is displayed, as shown in Figure 8-215.



🚺 Type Chooser		×
		28 🖻
Type Explorer Application Schema Files Inbound_Project SapService.xsd PRJ_CREMASO5_IN PRJ_CREMASO5_IN RT_BA_OB_S110_T0001 RT_BA_OB_S111_T0001 RT_RF_OB_S301_T0001 SBProject1 Application WSDL Files		
Type: {urn:sap-com:document:sap:idoc}CREMAS05		
Show Detailed Node Information		
Help	ОК	Cancel

12. Expand Project WSDL Files and Select the available schema.

13. Click OK.

You are returned to the Messages page, as shown in Figure 8-216.

Figure 8-216 Messages Page

Define the message for the Write File operation. Specify the Schema File Location and select the Schema Element that defines the messages in the outgoing files. Use the Browse button to find an existing schema definition. If you check 'Schema is Opaque', then you do not need to specify a Schema.

Message Schema		
Native <u>f</u> ormat	translation is not required (Schema is Opaque)	
URL	sapService.xsd	Q 🥋
Schema Element	CREMAS05	

14. Click Next.

The Finish page is displayed, as shown in Figure 8-217.

Figure 8-217 Finish Page

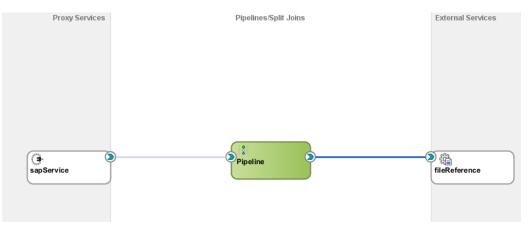
FILE Adapter Configuration Wizard - Step 7 of 7	×
Finish	
You have finished defining the File Adapter Serv When you click Finish, the wizard will create the C:\JDeveloper\mywork\ServiceBusApplication3\Inbound_Project\Resou	

15. Click Finish.

The File Adapter service is created in the External Services pane, as shown in Figure 8-218.

16. Join Pipeline to fileReference

Figure 8-218 File Adapter Service



17. Open the pipeline which shows the routing. Verify the service and corresponding operation, in the **Routing-Properties**, as shown in Figure 8- 219.

× 📲 SBProject × 🕴 Pipeline.pipeline ×	Routing - Properties
	0 Q Find 3
Pipeline	Routing
	Service:* 🔁 SBProject/sapReference.bix 🔍
RouteNode1	Operation:* O RFC_READ_TABLE
+	 Use inbound operation for outbo
De Routing	⊞ General
Request Action Response Action	
v	
Zoom: 100 🖨 🔅 Reset	
uration	

Figure 8-219 Routing Properties Page

18. Select the project and deploy to Service Bus Server.

Deploying Inbound OSB Process

You are now ready to deploy the inbound OSB process. You can follow the same procedure as described in "Deployment Outbound OSB Process".

Generate an Event in SAP R/3 for Inbound OSB

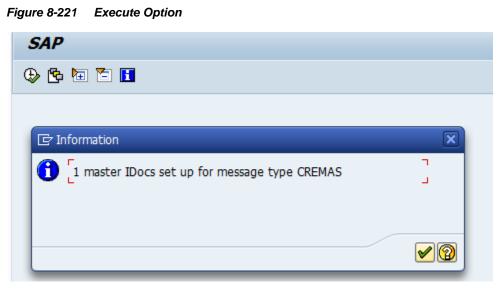
Perform the following steps to generate an event in SAP R/3 for Inbound OSB:

- **1.** Start the SAP Workbench.
- 2. Log in to the SAP R/3 system and run the transaction **BD14** to send Vendor, as shown in Figure 8- 220.

Figure 8-220 Send Vendor

 • 	4 📙	😋 🙆 🚷		121日	00	1 🕄	🛒 🗾 🔞 📑
Send vendor							
⊕ E							
Account number of vendor		3510		to			>
Class				to			
Message type		CREMAS					_
			_				

- **3.** Specify **Account number of the vendor**, **Message type** and **Target system** where the Vendor record is sent to the target (Program ID configured for destined Server project)
- 4. Click the Execute button or press F8 key, as shown in Figure 8-221.



Confirmation dialog is displayed, as shown in Figure 8-222.

Figure 8-222 Confirmation Dialog



5. Navigate to the Server Directory where the output was destined and verify the created file, as shown in Figure 8- 223.

Figure 8-223 Server Directory

🚺 Check_Inboun 👻 🚰 🔽 🗢 🔹 👘 🔂 🏠 🏠 🚰 Find Files 🔒					
📲 Download 🙀 📝 Edit 🗙 🛃 🕞 Properties i 🛅 🕞 🕂 🖃 🔽					
/oracle/Check_Inbound					
Name Ext	Size	Changed	Rights	Owner	
Le Inbound_cremas05.xml	2,329 B	01-10-2013 01:24:51 01-10-2013 01:24:51	rwxrwxrwx rw-r	oracle oracle	

8.5 Deploy the Defined Process

Perform the following steps to deploy the process.

1. Right-click the project name in the left pane, select **Deploy** and then select project name, as shown in Figure 8-224

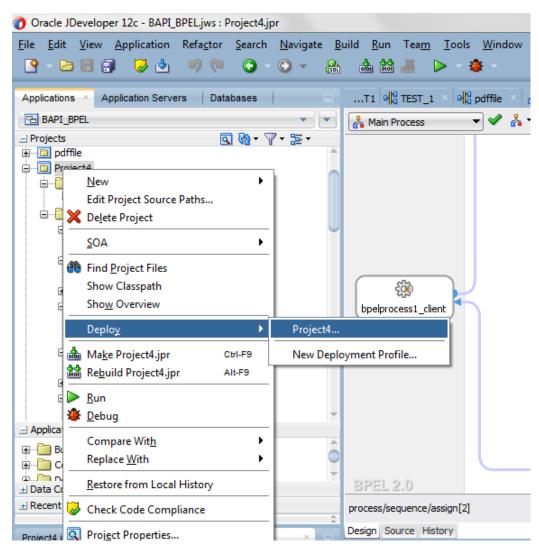


Figure 8-224 Navigation Screen

The Deployment Action page is displayed, as shown in Figure 8-225.

Deploy Project4	×
Deployment Action	
Deployment Action	Select a deployment action from the list below.
Summary	Deploy to Application Server Deploy to SAR Deploy to sarchive to SOA configured Application server(s)
Help	< Back Next > Finish Cancel

Figure 8-225 Deployment Action Page

- 2. Select Deploy to Application Server.
- 3. Click Next.

The Deploy Configuration page is displayed, as shown in Figure 8-226.

Deploy Project4		×
Deploy Configuration		
Deployment Action	Project4	
Deploy Configuration	Composite Revi	sion ID
Select Server	Project:	Project4
O Summary	Current Revision ID:	1.0
	New Revision ID:	1.0
	🗄 SOA Configurati	ion Plan
	Mark composite revisi	ion as default.
		g composites with the same revision ID.
		A configuration plan for all composites:
		Browse
		DIOWSE
Help		< Back Next > Einish Cancel

Figure 8-226 Deploy Configurations Page

4. Click Next with the default values.

The Select Server page is displayed, as shown in Figure 8-227.

Deploy Project4			X
Select Server			
C Deployment Action	Application Servers:		4- 6 0
Deploy Configuration Select Server	APP 116 duster 132 IntegratedWebLogicServer (domain unconfigured	i)	
SOA Servers Summary	SOA110_stag6 SOA110_stage8		
	✓ Overwrite modules of the same name		
Help	< <u>B</u> ack <u>N</u> ext >	> <u>F</u> inish	Cancel

Figure 8-227 Select Server Page

5. From the list of application servers configured, select the respective SOA server to deploy and click **Next**.

The SOA Servers page is displayed, as shown in Figure 8-228.

Figure 8-228 SOA Servers Page

Deploy Project4				×
SOA Servers				
C Deployment Action	Choose the target SOA ser this archive.	rver(s) and corresp	ponding partitions to w	hich you want to deploy
Deploy Configuration	SOA Server:	Partition:	Status:	Server URL:
Select Server	✓ 器 soa_server1	default		http://10.30.32.110
Son Servers				
Help	<	Back N	ext > <u>F</u> ini	ish Cancel

6. Select a target SOA server and click Next.

The Summary page is displayed, as shown in Figure 8-229.

Figure 8-229 Summary Page

Deploy Project4		×
Deployment Action Deploy Configuration Select Server SOA Servers Summary	Deployment Summary: 	
Help	< Back Next > Finish	Cancel

- 7. Review and verify all the available information of the project and click Finish.
- **8.** The successful compilation message is displayed in the Messages-log, once the process is deployed successfully, as shown in Figure7-230.

Figure 8-230 Successful Deployment Message

Design Source History	
Build - Issues Messages - Log ×	
Compilation of project 'Project4.jpr' finished. Check	
'X:\oracle_stage11\middleware\jdeveloper\mywork\BAPI_BPEL\Project4\SOA\SCA-INF\classes\scad	.log' for
[11:15:25 AM] Successful compilation: 0 errors, 0 warnings.	
(Messages	
Messages ABPEL × Extensions × SOA × Deployment ×	•

8.6 Test the Deployed Process

This section describes the procedure for testing the deployed Outbound and Inbound Process.

8.6.1 Test the Outbound Process

Perform the following steps to test the Outbound Process.

8.6.1.1 Invoking the Input XML Document in the Oracle Enterprise Manager Console

Perform the following steps to invoke the input XML document in the Oracle Enterprise Manager console.

1. Login to the Oracle Enterprise Manager console using the link: http://localhost:port/em, as shown in Figure 8-231.

Figure 8-231 Oracle Enterprise Manager Console

	e Ma	anager Fusion Middleware Control 12c				
base_domain (i)						
📲 WebLogic Domain 👻						
Servers		Administration Server				
2 Up		Name AdminServer				
		Host	Host TDCVM14S07			
		Listen Port	7011			
Clusters		Servers				
0	•	View 🔻 🎯 Create 🛛 💥 Delete	💽 Star	rt 🕕 Resume	Suspend v	Shutdown 👻 🗔 Re
Clusters		Name	Status	Cluster	Machine	State
		AdminServer(admin)	1		new_Machine_1	Running
Deployments		soa_server1	ſ		new_Machine_1	Running
1 Unknown 25 Up	•	Columns Hidden 33				
~						
📓 sbconfig.jar 🔹						

2. After clicking the highlighted tab, expand SOA to get list of deployed projects.

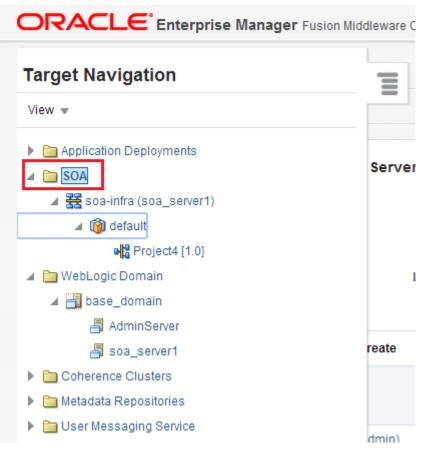


Figure 8-232 Expanding the SOA project list

- 3. Select the outbound deployed project (for example, Project4).
- 4. Click Test button, as shown in Figure 8-233.

Figure 8-23	3 Test Button
OR/	ACLE Enterprise Manager Fusion Middleware Control 12c
-	Project4 [1.0] 🛈
	🖁 SOA Composite 🔻
Active	Retire Shut Down Test Settings 🔻 💁
Dashbo	ard Composite Definition Flow Instances Unit Tests Policies
	omponents
Nam	
🖧 BF	PELProcess1
.⊿ S	ervices and References
Nam	e
Sa bp	elprocess1_client_ep
R sa	pReference

5. A new pop-up is displayed. Click the **Request** tab, as shown in Figure 8-234.

Figure 8-234	Request Tab
--------------	-------------

Request Response			
Security			
Quality of Service			
HTTP Header			
Additional Test Options			
Input Arguments			
Tree View Enable Validation	Load Payload Choose File	e No file chosen	Save Payload
SOAP Body			
View 💌 📄 Detach			
Name	Туре	Value	
* parameters	parameters		
Request Response			

6. Enter the input values in the Value field, as shown in Figure 8-235.

```
Figure 8-235 Request Tab
```

Request	Response			
▶ Sec	urity			
▶ Qua	lity of Service			
► HTT	P Header			
▶ Add	itional Test Options			
🔺 Inpu	at Arguments			
Tree Vie	ew Enable Validation	Load Payload Choose Fi	e No file chosen	Save Payload
SOAP B	ody			
View 💌	Detach			
Name		Туре	Value	
⊿ * par	rameters	parameters		
	* COMPANYID	string		

7. Click **Test Web Service** button, as shown in Figure 8-236.

Figure 8-236 Test Web Service Button

WebLogic Domain 🔻	🚟 SOA Infrastructure 👻	weblogic 💌 🚥	
	Logged in as weblo	ogic 🛛 🗐 TDCVM14S0)7
	Apr 28, 2	015 8:48:12 PM IST 🖒	
arse WSDL or WADL. When the neters, and click Test Web Serv	page refreshes with the WSDL (b Service or WADL	

The output response is received in the Oracle Enterprise Manager console, as shown in Figure 8-237.

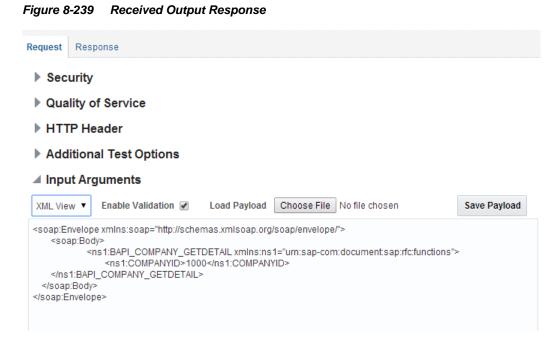
Figure 8-237 Output Respon	se		
Request Response			
Test Status Requ	uest succ	essfully rec	eived.
Response Time (ms) 301			
Tree View 🔻			
A new flow instance was ger	nerated.	Launch F	low Trace
Name	Туре		Value
▲ parameters	paramet	ers	
COMPANY_DETAIL	BAPI001	4_2	
▶ RETURN	BAPIRE	TURN	

Perform the following steps to invoke the input XML document using XML View:

- a. Select XML View from the list, as shown in Figure 8-238.
- Figure 8-238 Input Arguments List

Request	Response		
	Test Status	Request suc	ccessfully rece
Respons	se Time (ms)	579	
Tree Vie	ew 🔻		
Tree Vie			Laurah Ela
A XML Vie	w lance w	as generated	Launch Flo
Name	XML View	Туре	١

- b. Enter the input XML document in the Input Arguments area and click Test Web Service button.
- c. The output response is received in the Oracle Enterprise Manager console, as shown in Figure 8-239.



d. Click on Response tab, below screen appears, as shown in Figure 8-240.

Figure 8-240 Response Tab

Request	Response			
	Test Status	Request succ	essfully received.	
Respons XML Vie	se Time (ms) w ▼	441		
A new flo	w instance w	as generated.	Launch Flow Trace	
	COMPANYCOD COMPANYCODE <addr_no: <formofau <name>Ide <name_2>M <name_3>E <name_4>I <c_0_name <city>Fran <district <br=""><city_no :<="" td=""><th>_ADDRESS> >0000000121DDR>Firmas AG</th></city_no></district></city></c_0_name </name_4></name_3></name_2></name> Martin Steiner, Kath lernd Zecha, Dondo DES internE/> kfurt ><th>DR_NO> IOFADDR> ogmaa Lchamdondog_4></th><th>om:document:sap:rfc:function ME_3></th></formofau </addr_no: 	_ADDRESS> >0000000121DDR>Firmas AG	DR_NO> IOFADDR> ogmaa Lchamdondog_4>	om:document:sap:rfc:function ME_3>

8.6.2 Test the Inbound Process

Perform the following steps to test the Inbound Process.

8.6.2.1 Generate an Event in SAP R/3

Events are generated in SAP by some activity, for example, updating the material in SAP as in case of matmas.

The below section describes how to trigger an event in SAP R/3 and verify event integration using Oracle Integration Adapter for SAP R/3.

To trigger an event in SAP R/3:

1. Logon to the SAP R/3 system, as shown in Figure 8-241.

Figure 8-241 Workbench

면 Menu Edit Favorites Extr <u>a</u> s System <u>H</u> elp	
♥ [] ◀ 🗏 ♥ ♥ ♥ ⊒ ₩ ₩ 웹 ♥ ₽	\$1 🐹 🗾 🕜 📭
SAP Easy Access	
🎒 🔄 🏷 📇 Other menu 🛛 😹 😁 🥢 🔻 🔺 🚱 Create role 👘	🕼 Assign users 🛛 🗟 Documentation
• ☐ Favorites ▼ ☐ SAP menu	
C Office Cross-Application Components	
Collaboration Projects Collaboration Projects Collaboration Projects	
Accounting	
Human Resources Differentiation Systems	
Tools	

2. Run the bd10 transaction, a popup window appears, as shown in Figure 8-242.

Figure 8-242 Send Material Window

로 <u>P</u> rogram <u>E</u> dit <u>G</u> oto S <u>y</u> stem	<u>H</u> elp			
Ø 🔹 🗸 🛛	🗘 🙆 😫 🗎		39002	💥 🖉 🔞 📑
Send Material				
Material	40-110C	to		
Class		to		_
Message Type (Standard)	MATMAS			
Logical system	ORAQA2			
Send material in full				
Parallel processing				
Server group				
Number of materials per proces	20			

Enter the following information in the Send Material window:

- In the Material field, enter a material number (e.g., 40-110C), as shown in Figure 8-243.
- In the Logical system field, enter the logical system (i.e. Program ID) that you are using with SAP R/3.
- 3. Use **F8** to execute the process.

Figure 8-243 Execute Option

🔄 Information	×
1 communication IDoc(s) generated for message type MATMAS	L
	 ✓ ②

Material master data is sent to the logical system specified.

Verifying the Results

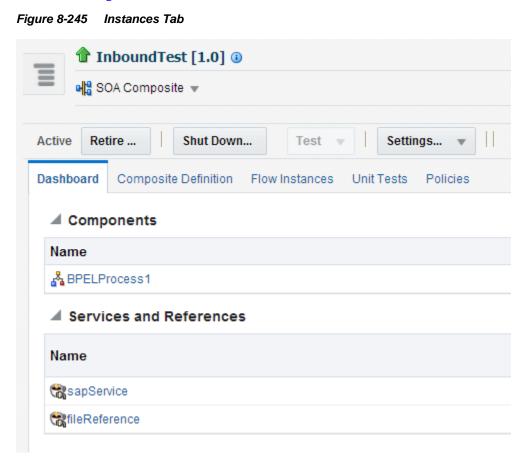
To verify your results:

- 1. Logon to the Oracle Enterprise Manager console by using the following URL: http://localhost:7001/em
- 2. Expand your domain in the left pane followed by the SOA folder.
- **3.** Select an available inbound BPEL process (for example, InboundTest), as shown in Figure 8-244.

Figure 8-244 Available Inbound BPEL Process

ORACLE Enterprise Manager Fusion	Middleware Control 12c	
Target Navigation	Ξ	
View 💌	-	
 Application Deployments SOA 	Server	
⊿ 🚟 soa-infra (soa_server1)	Name	AdminServer
✓ (資) default ■ InboundTest [1.0]	Host	TDCVM14S07
₽ ⁰ Project4 [1.0]	Listen Port	7011
RT_RF_BP_S325_T0002 [1.0]		

4. Recently received run-time event messages are displayed under **Services and References**, as shown in Figure 8-245.



Audit trail looks like as shown in Figure 8-246.

Figure 8-246 Audit Trail

Flow Trace > Instance of BPELProcess1 Instance of BPELProcess1 This page shows BPEL process instance details Payload for Activity: Receive1					
Audit Trail Flow Ser	Find	4	⊳	60	Gc
View View Highlight Fa	2 <part x<br="">3 4 <idoc begi<br="">5 <edi dc40<br="">6 <tabnam>EI 7 <mandt>800 8 <docnum>00 9 <docrel>70 10 <status>30 11 <direct>1 12 <outmod>2 13 <idoctyp>M 14 <mestyp>MA</mestyp></idoctyp></outmod></direct></status></docrel></docnum></mandt></tabnam></edi></idoc></part>	SEGMENT="1"> DI DC40DC7000000174674 D0000000174674 D000CREL> D C/DIRECT>	tp:// "urn: AM> 46CTYP:	/www. sap-	w3.c com

Notes:

- Inbound scenario is currently not working in the Integrated weblogic hybrid domain environment as after receiving the IDoc, it is goes to the rejection folder.
- In this release, generation of Concrete WSDL with multiple objects (IDoc or, BAPI or RFC) in OSB is currently not working.

9

Adapter for SAP Performance Tuning

This section provides SOA as well SAP JCo 3.0 tuning parameters. The section defines the tuning and performance environment and result of the same. These are the sample tuning parameters that can be used and compared with the result given in the result section.

This chapter contains the following topics:

- Section 9.1, "Tuning and Performance"
- Section 9.2, "Inbound Performance"

9.1 Tuning and Performance

This section describes about the performance consideration of Adapter for SAP. Tuning is required to make sure that the components involved should maximize the performance of Adapter for SAP.

9.1.1 Tuning Parameters

Tuning parameters should be defined to make sure that the environment components deliver maximum performance. These parameters are not fid and the values will depend on various factors and the systems involved in the integration scenario. Few factors to be looked for are: server configurations, load expected by the system – peak and non-peak, payload sizes, etc.

9.1.1.1 SAP JCo Parameter Tuning

These JCo properties should be modified in Outbound ConnectionPools of Adapter for SAP. SAP JCO is tuned differently for inbound and outbound integration scenarios. In case of outbound from the Adapter for SAP, you should tune the following parameters.

JCO_PEAK_LIMIT - 300 JCO_POOL_CAPACITY - 50

In case of inbound to Adapter for SAP, you should tune the following JCo parameters:

 $JCO_CONNECTION_COUNT = 3$

9.1.1.2 BPEL Infrastructure Tuning Parameters (These are provided at Enterprise Management (EM) level):

Table 9-1 lists and describes tuning parameters.

Table 9-1	Tuning Parameters	;
-----------	-------------------	---

SOA Infrastructure Parameter	Old Value	New Value	Component
DispatcherEngineThreads	30	300	BPEL
DispatcherInvokeThreads	20	250	BPEL
DispatcherSystemThreads	2	50	BPEL
MaxNumberOfInvokeMessagesInCache	100000	2500000	BPEL
DispatcherMaxRequestDepth	600	1000	BPEL
AuditLevel	Inherit	Off	SOA-INFRA
LargeDocumentThreshold	100000	100000	BPEL

These properties can be modified in Enterprise Manager. For this, go to **BPEL Service Engine Properties** page in EM, as shown in Figure 9-1.

Figure 9-1 BPEL Service Engine Properties Page

_	🕈 soa-infra 🛈			
Ξ	🚟 SOA Infrastructure 👻			
BPEL Service Engine Properties				
Luit prop	* Audit Level	Inberit 🔻		
		innen. •		
	* Audit Trail Threshold (Byte)	50000		
* La	rge Document Threshold (Byte)	100000		
	* Payload Validation	0		
* Disal	ble BPEL Monitors and Sensors			
More BP	EL Configuration Properties			

Logger level tuning parameters

Logging is a very expensive activity when it comes to added performance overheads. Logging should be at the minimal level or off in order to enhance performance of the system. Recommended level for logging is ERROR:1 (SEVERE). You can modify logger level of Adapter for SAP in the following section of Enterprise Manager, as shown in Figure 9-2.

g Levels Log Files			
	and become active when a particular feature area is I of a Runtime Logger, your change will not persist		
ew Runtime Loggers	•		
Search All Categories 🔹 sap		•	
Logger Name	Oracle Diagnostic Logging Level (Java Level)	Log File	Persistent Log Level Stat
⊿ oracle.soa.adapter.sap	ERROR:1 (SEVERE)	odl-handler	
oracle.soa.adapter.sap.connectior	NOTIFICATION:1 (INFO) [Inherite 🔻	odl-handler	
oracle.soa.adapter.sap.inbound	NOTIFICATION:1 (INFO) [Inherite 🔻	odl-handler	

Figure 9-2 Logger level Tuning Parameters

JCoParameter Tuning

- Outbound performance:
 - JCO_MAX_GET_TIME = 2000ms
 - JCO_PEAK_LIMIT =100
 - JCO_POOL_CAPACITY = 40

9.1.2 System Configuration

9.1.2.1 Oracle Linux Server

This is the configuration of the system where the WebLogic server is running.

- Release 6.3
- Kernel linux 2.6.39-200.24.1.el6uek.x86_64

9.1.2.2 Hardware

- As performance is dependent on various factors including the size of the system on which a process or an application runs, the hardware information here serves as a measuring gauge to help identify actual performance tuning criteria. These are the hardware level details of the system for which the above tuning settings are made. Memory : 31.5 GiB
- Processor 0 to 8 : Quad-Core AMD OpteronTM processor 2356

9.1.3 Outbound Performance

This section describes how to configure the environment to calculate the performance of the Adapter for SAP in case of outbound requests from adapter. This summary is based on BPEL project which is used to send an outbound call to SAP (Inbound to SAP system).

9.1.3.1 Performance Summary

The Adapter for SAP was subjected to high loads to test performance for two types of operations on an SAP system. One operation was to fetch information from SAP system and another was to insert information to the SAP system, both being outbound to SAP system from Adapter for SAP.

Further sections provide a summary of the performance of the server against the Fetch and Insert scenario.

Fetch Scenario

Individual performance of the adapter is tested for the fetch operation with 1 kb request and 43 kb of response under different user loads. Please note that the response times and transactions processed per second may vary with different system configuration and network speeds.

Apart from calculating the response times and tps (transactions per second), system and hardware parameters: CPU, Disk IO, Heap, GC, threads, Network IO was monitored for the server.

Execution Summary For Fetch Scenario

Table 9-2 lists and describes the execution summary.

Table 9-2 Execution Summary

	onse)		I
#	User Load	Average response time(sec) Vs User Load	Transactions Per second
1	50	1.106	43.9
2	100	2.395	40.9
3	200	4.796	38.7
4	300	6.782	41.1
5	500	10.521	43.6
6	1000	19.901	44.6

Insert Scenario

Individual performance of the adapter is tested for the insert operation with 5 kb request and 26 kb response under different user loads.

Execution Summary for Insert Scenario

Table 9-3 lists and describes the execution summary.

Table 9-3	Execution Summary for Insert Scenario
-----------	---------------------------------------

Respo	nse Time Vs Us	er Load -Insert Scenario (7kb	request and 26 kb response)
#	User Load	Average response time(sec) Vs User Load	Transactions Per second
1	50	1.797	26.8
2	100	4.245	22.1
3	200	8.971	21.4

9.1.3.2 Enhanced Performance

The performance of the overall process using the Adapter for SAP can be enhanced by modifying various parameters on SOA as discussed in <u>section 9.1.1</u>. Post tuning the SOA layer and Adapter for SAP, the performance of the process increased. Table 9.4 shows the results after modifying the SOA parameters.

Table 9-4 lists and describes the execution summary

Table 9-4 Execution Summary for Insert Scenario

TPS V	s User Load - Fetch Sce	enario (1kb request and 43 kb response)
#	User Load	Transactions per Second
1	100	77.5
2	200	67.5
3	300	64.2
4	400	64.1
5	500	63.9

9.2 Inbound Performance

This section describes how to measure Adapter performance for Inbound calls. This summary is based on the BPEL project which is used to receive an inbound call from SAP (Outbound to SAP system).

Note: You can look at configuring different work managers to increase throughput. The properties for work manager

SOAInternalProcessing_maxThread can be optimized for performance tuning as it will adjust the max number of threads available to the work manager.

To increase this value, go to WebLogic console-> Environment-> Work Managers-> SOAInternalProcessing_maxThreads and increase the value of **Count**, as shown in the Figure 9-

3. Similarly for SOAIncomingRequests_maxThreads, go to WebLogic console-> Environment-> Work Managers-> SOAIncomingRequests_maxThreads and increase the value of Count.

Figure 9-3 Increase the value of	of Count
🛍 Home Log Out Preferences 🔤 Record	l Help
Home >Summary of Environment >Summary of Managers > SOAInternalProcessing_maxTh	of Deployments >SAPAdapter >Summary of Environment >Summary of Work Managers >SC reads
Settings for SOAInternalProcessing_ma	xThreads
Configuration Targets Notes	
Save	
Use this page to configure properties for th	e selected maximum threads <u>constraint</u> .
街 Name:	SOAInternalProcessing_maxThreads
Count:	32
🤁 Data Source:	
Save	

F

9.2.1 **Performance Summary**

Adapter Inbound performance summary in this environment:

Execution Summary

Table 9-5 lists and describes the execution summary.

Table 9-5Execution Summary

Property	Value
Total Number of iterations	50000
Event Output XML size	6kb
Configuration	Inbound BPEL Process
Adapter	SAP (JCA)
EIS Server Version	
IDoc	ALE(iDOCs) ->Material Management-> MATMAS Material master -> MATMAS01

Result:

Table 9-6 lists and describes the results.

Table 9-6 Results

Name	Avg TPS	No of Concurrent IDOCs
SAP	25	208

10 SOA Reports Integration

This section describes the Reports integration of the Adapter for SAP. Reports are useful in realtime monitoring of the Adapter for SAP. This feature comes up with Oracle Enterprise Manager. Using Oracle Enterprise Manager, you can see real-time adapter health report and connection monitoring, such as closed and open(ed) connections on particular session. You can see health of any deployed SAP endpoint connection created for that and which messages through this integration.

This chapter contains the following topics:

Section 10.1, "Adapter Health Report"

10.1 Adapter Health Report

You can check real-time monitoring statistics of SAP Endpoint in Adapter health report.

Perform the following steps to open Adapter health report:

- 1. Open Enterprise Manager.
- **2.** Go to **SOA** \rightarrow **soa-infra**.
- 3. Select the deployed Adapter project that you want to see.

The Adapter Report tab is displayed as shown in Figure 10-1.

4. Select SAP service / reference.

gure 10-1 Adapte	er Report Tab				
SOA Composite 🔻					
🖏 RFC_OUTBOU	ND (Custom Ada	pter) 🔋			
Dashboard Policies	Properties Adapte	r Reports			
Diagnosibility Rep	orts 🕞 🔽 Ena	able reports			
∠ S Configuration	_				
	inteports				
EIS Connectivity					
	Jnc	diName eis/SAP/FMWD	EMO		
Destinatio	onDataProvider_JCO_(CLIENT 800			
ServerDataProvider	_JCO_CONNECTION_(COUNT 2			
DestinationDa	taProvider_JCO_PEAK	LIMIT 10			
	ionDataProvider_JCO_				
	erDataProvider_JCO_P				
Server	DataProvider_JCO_GV	VHOST 10.30.32.42			
	tionDataProvider_JCO	-			
Destina	tionDataProvider_JCO	_USER JCA_DEV			
Monitoring R	eports				
The table below display	s real-time monitoring	statistics for this endpo	int. (If an EIS conne	ection is down, click the s	tatus io
		Managed Con	nections		
Node	Currently Open	Average Number Used	Currently Free	Maximum Pool Size	Li
📑 soa_server1	200.0	0.0	200.0	400	

10.1.1 Configuration Report

Configuration reports contain the information of ConnectionFactory, activation and binding properties for the SAP endpoint. ConnectionFactory summary provides information about JCo parameters defined for run-time as well as JNDI name and pooling information. It also shows SOA binding properties.

Perform the following steps to see configuration report:

- 1. Go to **SOA** \rightarrow **soa-infra** and select your project.
- 2. Select SAP service / reference.
- **3.** Click on **Adapter Reports** tab. To enable report, select **Enable Reports** check box, as shown in Figure 10-2.

Figure 10-2 Enterprise Manager Console

OR/	ACLE [®] Enterprise Manager Fusion Middleware Control 12c
Ξ	Project4 [1.0] 🛈
	SOA Composite 👻
🖑 sa	pReference (SAP Adapter)
Dashbo	oard Policies Properties Adapter Reports
Diagn	osibility Reports 💿 🕢 Enable reports
► &	Configuration Reports
•	Monitoring Reports
Þi	Snapshot Reports

10.1.1.1 EIS Connectivity

You can see ConnectionFactory configuration in **EIS Connectivity** section of health report. EIS Connectivity lists all properties of connection, as shown in Figure 10-3.

Figure 10-3 EIS Connectivity

iagnosibility Reports 💌 Enable report	S	
EIS Connectivity		
JndiName	eis/SAP/FMWDEMO	
ServerDataProvider_JCO_GWHOST	10.30.32.120	
DestinationDataProvider_JCO_CLIENT	811	
DestinationDataProvider_JCO_ASHOST	10.30.32.120	

Service/Reference Properties

Service properties tab lists all SOA properties that are used with this composite, as shown in Figure 10-4.

Figure 10-4 Service Properties Tab

Reference Properties

Definition Properties Tuning Properties

SchemaValidation off

10.1.2 Monitoring reports

Health report displays real-time connectivity status of the adapter with EIS. This gives current connection status, incaseif it is connected to EIS, total open connections from pool, peak load, pool size etc. You can see connectivity report in monitoring reports, as shown in Figure 10-5.

🖉 Configura	ation Reports				
Monitorir	ig Reports				
table below dis	plays real-time monito	oring statistics for thi	s endpoint. (If an EIS	6 connection is down	, click the status icon for stack
		Managed C	onnections		
Node	Currently Open	Managed C Average Number Used	onnections Currently Free	Maximum Pool Size	Last Message Publication

10.1.3 Snapshot Reports

This report shows how many messages have been consumed by this adapter instance, maximum size, average message size etc. You can also get historical data based on date selection, so you can define the time boundaries to get the message statistics, as shown in Figure 10-6.

Figure 10-6 Snapshots Reports

Diagnosibility Reports 💿 🕑 Enable reports

- Configuration Reports
- Monitoring Reports

🔺 💷 Snapshot Reports

Snapshot reports aggregate historical data over a selected period of time.

Server Name	Average Message Siz	Maximum Message Size	Minimum Message Size
	(bytes)	(bytes)	(bytes)

Troubleshooting and Error Messages

The Adapter for SAP enables the configurable logging for debugging connection and other related issues.

The Adapter for SAP supports the adapter diagnostic framework for reporting and alerting. This provides run-time adapter diagnostic information as read only reports in EM console. The framework also provides some alerting functionality.

The Adapter for SAP collects and provides reporting data per service/reference endpoint for each composite. Endpoint reports capture useful information like EIS connectivity, transaction, message, fault, downtime statistics etc.

The diagnostic reporting is configurable. There are knobs to turn it off when required. There is a generic alerting framework for sending normal alerts and rules based alerts. The Adapter for SAP provides design-time and run-time support to use the alerting framework.

This chapter mentions the possible errors that could occur while using the Adapter for SAP. These areas of error messages include SAP side error messages, Adapter Design-time issues and Adapter Run-time issues.

This chapter contains the following topics:

- Section 11.1, "Log file Information"
- Section 11.2, "Oracle Adapter for SAP Design-time JDeveloper"
- Section 11.3, "Oracle Adapter for SAP Run-time"
- Section 11.4, "SAP R/3"

11.1 Log file Information

Log file information that can be relevant in troubleshooting can be found in the following locations based the adapter installation:

For Oracle SOA Suite:

```
<ORACLE_HOME>\soa\user_projects\domains\${soa_server
domain}\servers\${soa_server name}\logs\soa-server diagnostic.log
```

For OSB:

```
<ORACLE_HOME>\soa\user_projects\domains\${osb_server
domain}\servers\${osb_server name}\logs\osb-server_diagnostic.log
```

The Oracle Adapter for SAP trace information can be found under the following directory:

For JCO trace at server level:

<ORACLE_HOME>\user_projects\domains\\${domain name}\tracename.trc

11.2 Oracle Adapter for SAP Design-Time JDeveloper

Table 11-1 shows the common errors faced while using Adapter for SAP in JDeveloper.

Error	Solution
SAP JCo library is not accessible.	The relevant SAP JCo jars should be kept in the design-time: <oracle_home>\soa\plugins\jd eveloper\integration\adapter s\lib folder and restart JDeveloper.</oracle_home>
Test connectionFAILED w/parameters: com.sap.conn.jco.JCoException: (103) JCO_ERROR_LOGON_FAILURE: Name or password is incorrect (repeat logon) on {IP ADDRESS} sysnr XX.	Check the SAP logon credentials and ensure correct parameters are entered.
ERROR partner {I.P. ADDRESS} not reached Exception Key = JCO_ERROR_COMMUNICATION Exception String = com.sap.conn.jco.JCoException: (102) JCO_ERROR_COMMU NICATION: Connect to SAP gateway failed Connection parameters: TYPE=A DEST=DefaultClient ASHOST= {I.P. ADDRESS} SYSNR=XX PCS=X.	Ensure that your SAP system is up and running and give correct credentials.
JCO_ERROR_LOGON_FAILURE: Client 080 is not available in this system on {I.P. ADDRESS}sysnr XX.	Check client number in the connection page of the Adapter wizard.
Parameter logon language ('lang') code 'enn' is invalid.	Check language entered in the connection page of the Adapter wizard.
SAPConnector: missing or invalid property.	Check whether you have missed out any mandatory field value in the connection page.
JCO_ERROR_COMMUNICATION: Connect to message server host failed.	Check message server credentials.
JCO_ERROR_COMMUNICATION: Connect to message server host failed ERROR service 'SFVSDD' unknown.	Check message service name in connection page.
JCO_ERROR_COMMUNICATION: Connect to message server host failed. ERROR Group PUBLI not found	Check your server group name in connection page.

Table 11-1 Adapter for SAP in JDeveloper

Table 11-1 Adapter for SAP in JDeveloper Continues

Erre	or	Solution

Object selection page fails to load the SAP objects with error "Failed to connect to SAP R/3 system".	Check whether connection to SAP is successfully established using test connection.
RFC_ERROR_PROGRAM: Configuration of destination DefaultClient is incomplete: Parameter SNC partner name ('snc_partnername') is missing.	Check your SNC name and the partner name.

Failed to connect to SAP R/3 system at the Object Selection window of the design-time, as shown in Figure 11-1. This is because SAP is not reachable at the given connection credentials on the Connection Information page of design-time.

Figure 11-1 Failed to Connect to SAP R/3 System Error

	•
Select SAP obje	ects, BAPI, RFC, or IDoc, to retrieve and
Hierarchical	Alphabetical
SAP	17/1
	ess Objects (BAPIs)
- Fa	ailed to connect to SAP R/3 system.
🕀 🧰 Functi	on Modules (RFCs)
	DI Messages (IDOCs)

11.3 Oracle Adapter for SAP Run-Time

Table 11-2 shows the common errors faced in the SOA server Run-time.

Table 11-2 Error in SOA server Run-time

Error	Solution
Client 080 is not available in this system on {IP ADDRESS} sysnr XX	Enter correct DestinationDataProvider_JCO_CLIENT .in the WebLogic console-JNDI properties.
Connect to SAP gateway failedConnection parameters: TYPE=A DEST=dummyFactory ASHOST= {I.P ADDRESS}SYSNR=XX PCS=X	Enter correct DestinationDataProvider_JCO_ASHOST in the WebLogic console –JNDI properties.
<pre><exception>Select one of the installed languages on {I.P ADDRESS} sysnr XX</exception></pre>	Enter correct DestinationDataProvider_JCO_LANG in the WebLogic console - JNDI properties.

Table 11-2 Error in SOA server Run-time Continues

Error	Solution	

No credential provided	Check that the JNDI name is correct while deploying the project.
<exception>Name or password is incorrect (repeat logon) on {I.P ADDRESS} sysnr XX</exception>	Enter correct DestinationDataProvider_JCO_PASSWD or DestinationDataProvider_JCO_USER in the WebLogic console - JNDI properties
<pre><exception>ZRFC_EC_BD14 not found in SAP.</exception></pre>	Check whether the object exists in SAP.
Error deploying the composite on soa_server1: Composite with same revision ID already exists: default/ANCD!1.0.	Check whether the project is already deployed on the server.
java.net.ConnectException: Connection refused: connect; No available router to destination.	Check whether the SOA server is up and running.

Note: In BAPIs and RFCs, if the Sap Object is returning a record with error code 'E' in the in the export(return) table, then the BAPI will fail at runtime by throwing the error message. This is applicable even if the Sap Object returns the error message along with the output data.

In the scenario, where the SAP Object (RFC/BAPI) returns an exception and data, Adapter for SAP returns only data in runtime. But in design time test functionality, only exception is thrown.

In the scenario, where the SAP Object (RFC/BAPI) returns only exception without any data in output tables, Adapter for SAP throws the exception both in runtime and designtime

Note: For some BAPIs we need to pass internal versions of the inputs as these BAPIs will execute some conversion routines to convert the input values to their internal versions (like adding the required no. of zeroes.) and these routines do not get executed when they are called externally via Adapter.

For the SAP Object (RFC/BAPI) , if any meta data changed in SAP side , then need to restart the server to reflect the changes in current Adapter instance.

When the user is posting multiple IDOC in one request, the Adapter will split those individual IDOCs and post in SAP. User should pass multiple Idocs in such format like, each control record has to be followed by its corresponding data record.

The Adapter for SAP doesn't support SAP custom objects with optional table structure .User needs to change from optional to mandatory.All SAP standard objects only support table structure as mandatory parameter.

If the user is processing the data by using queue and the queue is not existing at SAP side ,the message will not get processed , since the queue will be created in SAP system but has to be activated manualy each time to reprocess the data .

11.4 SAP R/3

Table 11-3 shows the common errors returned back from SAP JCo and can be seen in the SOA server logs:

Table 11-3	Error in SOA Server Logs
------------	--------------------------

Error	Solution
com.sap.conn.jco.JCoException: (103) JCO_ERROR_LOGON_FAILURE: Client XXX is not available in this system on {I.P ADDRESS} sysnr XX".	Enter correct DestinationDataProvider_JCO_CLIENT in the WebLogic console-JNDI properties.
com.sap.conn.jco.JCoException: (102) JCO_ERROR_COMMUNICATION: Connect to SAP gateway failed	Connection parameters: TYPE=A DEST=dummyFactory ASHOST= {I.P. ADDRESS} SYSNR=XX PCS=X Enter correct DestinationDataProvider_JCO_ASHOST

Table 11-4 shows the loss of message issues commonly faced in case of inbound and outbound processing:

Error	Solution
IDoc's triggered from SAP are not received by SOA or the Adapter.	To verify ALE configuration, Check in we02 to verify for the IDoc status to be in Status 03 and validate the port, partner,
IDoc's are successfully sent with status 03 in we02, and still the IDoc's are not received by SOA.	Perform the connection test of the RFC Destination where the program ID is assigned and check if it is successful.
IDoc status is we02 is 03 and Connection test is successful. But still the IDoc's are not received by SOA.	Go to SMGW, check for number of servers which are connected to the program ID. If there are multiple servers connected to same Program ID, then the IDocs might be going to different server.
IDoc status is we02 is 03 and Connection test is successful and also there is only one server has registered to that program ID. But still the IDoc's are not received by SOA.	Check in SM58, if the IDoc's stuck in the transactional pool.

11.5 Known Issues

1. No Help content appear in Japanese Language for Adapter Design Time screens: When JDevelper is configured to work with Japanese language, all help content appears in English instead of Japanese. Awaiting Translation Resource Bundle.

12 Migration Support

The SOA and OSB projects with iWay SAP Endpoints can be migrated over to Oracle Adapter for SAP using a migration utility within JDeveloper.

This chapter contains the following topics:

- Section 12.1, "Migration of SAP Endpoints in SOA Projects"
- Section 12.2, "Migration of SAP Endpoints in OSB Projects"
- Section 12.3, "Deploying the Adapter Migrated Project"
- Section 12.4, "Execution Steps for Deployed Migrated Projects"

Prerquisites:

- The iWay projects to be migrated should have WSDL location in the JCA file. Absence of this will cause incorrect migration.
- The iWay project to be migrated should be working on the 12c environment. If the input project is incorrect, the migrated project will be malformed too.

Note: Although the migration tooling does not report all possible errors in the input iWay projects but it performs a basic check and reports errors detected in the migration or deployment process. For e.g., JCA or any other files not migrated with correct/required value or a WSDL file missing during deployment etc.

12.1 Migration of SAP Endpoints in SOA Projects

The Adapter for SAP must provide tooling to assist the user converting from the OEM version of iWay SAP Endpoints in SOA composite application to ones based on the Oracle Adapter for SAP.

Given an existing SOA project with iWay generated SAP endpoints, the migration tooling must help to the user convert SAP endpoints in the SOA composite. After the conversion, the migrated project must:

- Reuse iWay generated XSD and WSDL files to minimize component interface changes required within the SOA composite.
- Generate a new JCA property file to replace the iWay SAP endpoint in the SOA composite.
- Work in the SOA run-time without the iWay adapter.

Steps to migrate iWay Adapter into The Adapter for SAP from JDeveloper:

1. Open iWay project in to 12.1.3 JDeveloper, as shown in Figure 12-1.

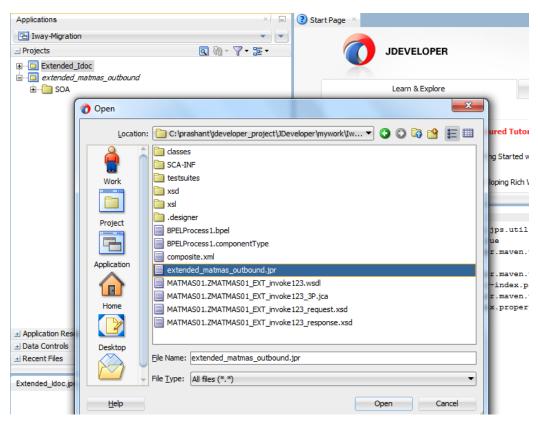
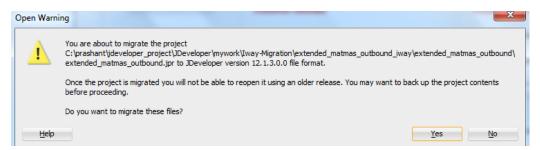


Figure 12-1 Open iWay project in 12.1.3 JDeveloper

2. Once you click **Open** button, JDeveloper will try to migrate 11g project to 12.1.3 format. JDeveloper will popup a confirmation window, as shown in Figure 12-2.

Figure 12-2 Open Warning



3. After 12.1.3 migration, JDeveloper will show up a migration summary pop-up, as shown in Figure 12-3.

Figure 12-3 Migration Status



4. After 12.1.3 migration, now you can migrate this 12.1.3 iWay format project in to the Adapter project using **Adapter Migration Tool** from context menu highlighted by red rectangle, as shown in Figure 12-4.

Figure 12-4 Migration Tool

🔁 Iway-Migration	• •	🖌 🖓 🌌 🗶 📫 I 🚺	🧿 🙆 i 🖏	두 🏟 砲
Projects Q Q Q ✓ C Extended_Idoc G extended_matmas_outbound [Exposed Service	s	Components
SOA SoA SoA SoA Sohemas Sohemas Sohemas Sohemas Sohemas Sohemas Sobemas Transformations SoB S	Delete Proj <u>SOA</u> Find Projec <u>Show</u> Clas <u>Show</u> Over <u>Deploy</u> <u>Find Usage</u> Make exter	t Files ;path view	Ctrt+Alt-U Ctrt+Alt-U Ctrt-F9 Alt-F9	To create resources, drag and drop an icon from the component palette to the canvas or select one from the right-click context menu
Application Resources Data Controls	Co <u>m</u> pare V Replace W		۲ ۲	
± Recent Files	Restore <u>f</u> ro	m Local History		
extended_matmas_outboun × Th	S <u>A</u> P Adapt 🛷 Chec <u>k</u> Coo	er Migration Tool e Compliance		pace and store definition in Iway-Migration/.adf/META-I for the following file(s): stmas_outbound\extended_matmas_outbound\extended_matmas

5. Once you clicked on **SAP Adapter Migration Tool** from context menu, confirmation window appears, as shown in Figure 12-5.

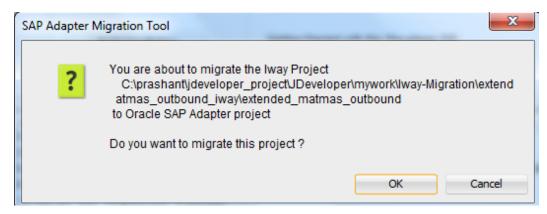


Figure 12-5 Confirmation Window

6. Once you confirmed the migration, project will migrate into the Adapter for SAP with a summary, as shown in Figure 12-6.

Figure 12-6 Migration Successful Message Window



7. Now your project is migrated successfully in to the Adapter project.

Notes:

- Adapter for SAP does not support migration of the projects that used the data types in XML-CDATA-ENVELOPED format.
- The Migrated projects do not have the jca property ProgramID at the design time level unlike the adapter projects.
- Changing/modifying the migrated project is not supported. The user can only deploy/run with the adapter in SOA run-time. If such a change is needed, the user need to remodel the project from scratch using Oracle's Adapter for SAP.

12.2 Migration of SAP Endpoints in OSB Projects

The OSB 11g projects consisting of an iWay adapter need to be migrated to 12.2.1 Adapter for SAP explicitly. The iWay adapter files in the project need to be updated to point to the new interaction specs and libraries pertaining to the Adapter for SAP in 12.2.1.

You can create a single configuration jar from OSB 11g sbconsole for multiple projects. The configuration jar for multiple projects can also be created using the Eclipse OEPE for OSB in 11g. This configuration jar when imported into 12.2.1 JDeveloper will import all projects and create directory structures for each.

Perform the following steps to migrate OSB 11g iWay projects to 12.2.1:

1. Create an 11g OSB configuration jar for the project (s) to be migrated, as shown in Figure 12-7.

Change Center	🔊 Welco	ome,	weblogic	Connected to : osb_domain	🟠 Home	Oracle WLS Console	Logout	Help
View Changes								
View All Sessions	4	Export Resources						
Create Discard Exit	•	Ехро	ort Projects					
Create Distanti Exit		Expo	ort Resources					
System Administration	In	nclude	e Dependencies					
Import/Export	Res	ourc	e Summary					
Import Resources	+		Name			1	Гуре	
Export Resources	+		🔮 System			1	Project	
	+		😭 AQandSAP			1	Project	
UDDI	+	V	誻 ImportOrders05			1	Project	
UDDI Registries	+	V	RT_BA_OB_S9020_TC0001			1	Project	
Import from UDDI	+	V	RT_BA_OB_S9020_TC0003			1	Project	
Auto-Import Status	+		RT_ID_OB_S18010_TC0001			1	Project	
Publish to UDDI	+	V	RT_ID_OB_S18011_TC0001			1	Project	
Auto-Publish Status	+		RT_ID_OB_\$18012_TC0001			1	Project	
	+		RT_ID_OB_S18013_TC0001			1	Project	
Global Resources	+		RT_ID_OB_S18013_TC0002			1	Project	
JNDI Providers	+		RT_ID_OB_\$18013_TC0003			1	Project	
SMTP Servers	+		RT_ID_OB_S18013_TC0004			1	Project	
Proxy Servers	+		RT_ID_OB_S18014_TC0001				Project	

Figure 12-7 Create an 11g OSB configuration jar

2. Create a new Service Bus Application in JDeveloper 12.2.1. Alternatively, you can also use an existing Service Bus Application, as shown in Figure 12-8.

Figure 12-8 Create new Service Bus Application

🕥 New Gallery	×
Q,	
Categories:	Items: Show All Descriptions
·····Projects	OEP Project
Business Tier	Project from Existing Source
·····ADF Business Components ·····Business Rules	Project from WAR File
Contexts and Dependency Injecti	Roject Template
EJB Enterprise Scheduler Metadata	REST Web Service Project
Security	Service Bus Project
TopLink/JPA	Create a new Service Bus Project
Web Services	SOA Project
Client TierADF Desktop Integration	SOAP Web Service Project
Extension Development	D UML Project

- **3.** Import the configuration jar in JDeveloper 12.2.1 into the Service Bus Application created. It creates OSB project directories under the application. These directories and files conform to the 12.2.1 structure.
 - a. Click on File menu and select Import.
 - b. Select Service Bus Resources from list and then click OK as shown in Figure 12-9.

Import Select What You Want to Import: OEP Bundle into New Project SOA Archive Into SOA Project SOA Template Source into New Project Subversion Connections WAR File Help OK

Import Window

Figure 12-9

- c. Select a type of resource to import. Click Next.
- d. Browse for the Service Bus source by clicking on the Search icon.
- e. Select the service bus source and then click **Open**, as shown in Figure 12-10.

Figure 12-10 Select an Service Bus Configuration Jar

👩 Select ar	Service Bus Configuration J	ar file				×
Location:	🖄 sbconfig 🔹 👻	£	<u>à</u>	*	D-D- D-D-	8-
SB11	gProjects_sbconfig.jar					
File <u>N</u> ame:	OSB11gProjects_sbconfig.jar					
File <u>T</u> ype:	jar file					•
				0	pen	Cancel

f. Select the resources to be imported and click Finish, as shown in Figure 12-11.

Configuration			
Source Source Configuration	Select the resources to import and set parameters. Resource ServiceBusApplication AdapterArtifacts ORDERS05_invoke_v1.jca ORDERS05_invoke_v1_request.xsd ORDERS05_invoke_v1_response.xsd	Operation Create Create Create Create Create	₩ ₹
	Include Dependencies Passphrase:	Create Create Create	
	Preserve Environment Settings Preserve environment variable values Preserve security and policy settings Preserve credentials (username/password)		

Figure 12-11 Select the Resources to Import

You would see the iWay related specifications in the jca file, as shown in Figure 12-12.

Figure 12-12 Specifications in jca

Import	Seventeduptication v v red ind in view red in ane-rutritisos' adapter "miline-"http://platform.inte propertor deros in protocheros in protocheros in protocheros in rtp. Dog. SMBJ. TCODI in rtp.	ServiceBusApplication		Comp Re ×
<pre>Providerable Sources Service Sources</pre>	Brework-wolds Service-adapter classing-rest and for the function of classing-rest for the function		9 9 Find 🐺 1 🗓 1 🕪 1 🐘 1 🗃	- Q. Name
adapter config = management adapter 20200 =		Provident 25 Control of the Sarats Control of the Sarats	<pre>creasures=adapter classime="consuppretruits.effolds:NUCCINGEGEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE</pre>	Link to frequently-us resources in a private favorities list. More-us JIDE Connections resource-adapt
	adapter-config = resource-adapter 2:83/50 =			
Source History (Messages - Loo X)				_

4. After migration, now you can migrate this iWay format project into the SAP Adapter project using SAP Adapter Migration Tool from the context menu.

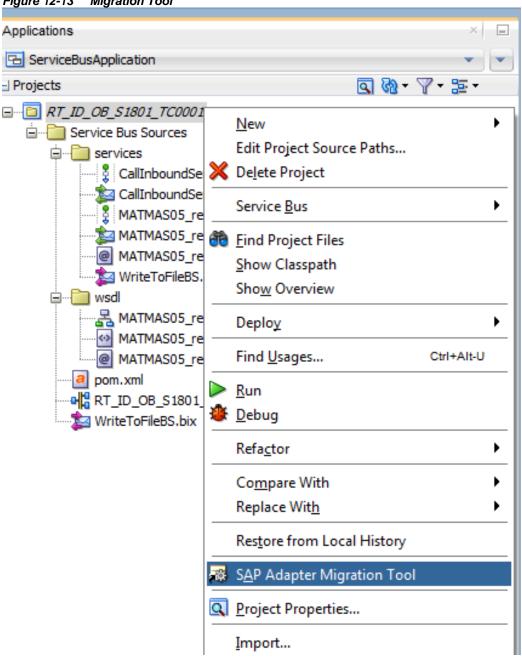
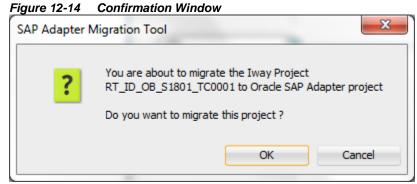


Figure 12-13 **Migration Tool**

5. Once you clicked on SAP Adapter Migration Tool from context menu, the Confirmation Window appears.



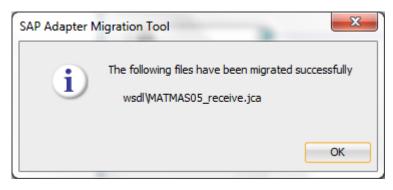
6. Once the user click on OK, give the appropriate JNDI name.

Figure 12-15 JNDI Naming Window

SAP Adapter Mi	gration Tool			×
?	JNDI Name: eis,	/SAP/FMWDEMO		Q
			ОК	Cancel

7. Once you confirmed the JNDI name, project will migrate into the SAP Adapter with a summary.

Figure 12-16 Confirmaion Window



8. The project is successfully migrated into the SAP Adapter project.

Note: After deploying the project, if the user observes any entry related to eis/OracleJCAAdapter/DefaultConnection JNDI in the diagnostic log, JDeveloper clean is required. After cleaning the JDeveloper, redeploy the project.

12.3 Deploying the Adapter Migrated Project

To deploy the Adapter project, you can follow the same procedure asdescribed in section 7.6 "Deploy the Defined Process".

12.4 Updating JCA file in Migrated Projects

The user can add the below Segment Release property to the JCA file in migrated projects.

<property name="SegRelease" value="value"/>

For example,

<property name="SegRelease" value="30c"/>

12.5 Execution Steps for Deployed Migrated Projects

Perform the following steps to execute the deployed migrated projects.

12.5.1 Inbound Project

After deploying the migrated projects, you are ready to test the migrated projects. You can follow the same procedure as described in section 7.7.2 "Test the Inbound Process".

12.5.2 Outbound Project

After deploying the migrated projects, you are ready to test the migrated projects. You can follow the same procedure as described in section 7.7.1 "Test the Deployed Process".

<u>A</u>

SAP System Configurations for Remote Processing

The Oracle's Adapter for SAP can communicate with SAP system using three SAP message types: BAPI, RFC, and IDoc. Each user in SAP has set of authorization profiles associated with them. These authorization profiles represent the roles that the person undertakes in their day-to-day work. For example, an Accounts Payable clerk would have an authorization profile for making payments to vendors. This authorization profile consists of a number of SAP authorizations. Typically, a user would have several roles and hence have several authorization profiles. This is often described as the user profile.

This chapter explains the user roles and authorizations required to make an RFC communication.

It also describes the detailed steps for all the SAP side configurations required for communication with the adapter.

This appendix contains the following topics:

- Section A.1, "Roles and Authorizations"
- Section A.2, "RFC Authorization Object"
- Section A.3, "SAP Inbound Communication"
- Section A.4, "SAP Outbound Communication"
- Section A.5, "SAP User Authorizations for Adapter"
- Section A.6, "SAP bgRFC Configuration"

A.1 Roles and Authorizations

SAP users are assigned access to the system using a "role" or "roles" that are based on the tasks they perform in their departments. A user's role includes the access he/she has in the components of SAP.

When remote call happens for a function module in SAP an authorization check is performed if the profile parameter auth/rfc_authority_check is set to 1.

The authorization object S_RFC is used to check whether the user defined in the destination has RFC authorization for the function group.

A.2 RFC Authorization Object

If you want to create a user in the SAP system, you can use the existing TR or you can use the below authorization table.

0	Object	Descriptio	Fieldname	Value	
		n			

S_RFC	The basic authorizati on object used to secure RFC access is	ACTVT	16
		RFC_NAME	SYST,RFC1,SDIFRUNTIME,SDTX,EDIMEXT,EDIN,AR FC,ERFC,
		RFC_TYPE	FUGR
S_TABU_D IS	Individual tables may be secured from access by using the following authorizati on object	DICBERCLS(Authoriza tion Group)	Table: MARA is in group "MA"
		ACTVT	03(Display)

Object	Description	Fieldname	Value
B_ALE_RECV ALE/EDI:	Receiving IDocs via RFC		
S_IDOCCTRL			
		ACTVT	03,16
S_IDOCDEFT	Permitted activity	ACTVT	03
	Permitted Extension	EDI_CIM	11
	Permitted IDOC Type	EDI_DOC	MATMAS01,MATMAS02,MATMAS05
	Executed Transaction	EDI_TCD	WE30

A.3 SAP Inbound Communication

In case of SAP inbound communication, Adapter for SAP acts as a client sending requests to SAP system.

Prerequisites:

Following entries need to be updated in the system where the Weblogic server is running:

1. Hosts File of the system (maintained in the 'etc' folder) should have the following entry:

<IP> <Hostname> <Hostname with domain name>

2. Service File of the system (maintained in the 'etc'folder) should have the following entries:

sapgw <sysnr></sysnr>	33 <sys no="">/tcp</sys>
sapdp <sysnr></sysnr>	32 <sys no="">/tcp</sys>

Here 'sysnr' is the system number of the SAP server.

To connect to SAP using Message server, following information need to be maintained in the Services File (maintained in the 'etc' folder) in addition to the above two entries:

sapms<SID> 36<sysnr>/tcp

Here SID is the system ID of SAP server.

ALE Inbound Configurations in SAP:

The following steps are required for inbound IDoc processing:

- A.3.1 Configuring a Logical System.
- A.3.2 Configuring a Partner Profile.
- A.3.3 Configuring Inbound Process Code.
- A.3.4 Configuring a Distribution Model.

A.3.1 Configure a Logical System

Prerquisites:

1. To connect to SAP using hostname, following entries need to be maintained in the Hosts file:

<IP> <Hostname> <FQ Hostname>

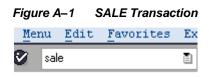
2. To connect to SAP using MS, following info needs to be maintained in the Service file:

Sapms<SID>36<sysnr>/tcp

Logical system is used to identify an individual client in a system, for ALE communication between SAP systems.

To define a logical system:

1. From SAP easy access screen, navigate to the SALE transaction, as shown in Figure A-1.



2. Open the basic settings and then the Logical systems node, as shown in Figure A–2.

Figure	A–2	Basic	Settings
. igaio	/ · · -	Daoio	ooungo

♡ Basic Settings
🛃 🕀 IDoc Administration
🔜 🕁 Inbound SOAP for IDoc: Register Service
🔜 🕀 Perform Automatic Workflow Customizing
🔜 🕀 Activate event receiver linkage for IDoc inbound
🗢 🔜 Logical Systems
🔜 🕀 Define Logical System
🔜 🕁 Assign Logical System to Client
🔜 Convert Logical System Names in Application Tables
D

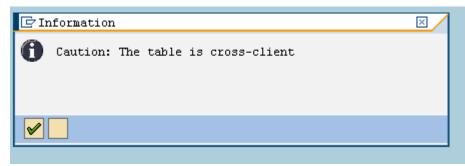
3. Click on Define Logical Systems, as shown in Figure A–3.

Figure A–3	Define Logical Systems
------------	------------------------

🕒 Define Logical System

A popup window appears with the message, Caution: The table is cross-client, as shown in Figure A–4.

Figure A–4 Caution Window



4. Click on Enter button.

5. Click on New Entries, as shown in Figure A–5.

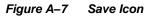
```
Figure A–5 New Entries Window
```

6. Enter the Logical System name and description, as shown in Figure A–6.

Figure A–6 Logical System Window

New Entri	ies:	Overview	of	Added	Entri	es
🦅 🗳 🖪 🖪	F					
Logical Syst	tems					
Log.System N	Jame					
ORACLESAP 0)racle :	SAP adapter				
	2				•	

7. Click on Save icon, as shown in Figure A–7.





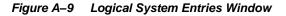
8. A popup window appears for saving the objects in a transport request, as shown in Figure A-8.

Figure A–8 Prompt for Workbench Request Dialog

🗗 Prompt for Workbench request				
View Maintenance: I V_TBDLS				
Request	EQ6K900874	Juorkbench request		
Short Description tr request for SAP adapter				
🖌 🕼 🖸 🚺 Own R	equests 🗙			

9. Press Enter.

10. The entry for Logical System will now be visible in the table, as shown in Figure A–9.



Change V	/iew "Logical Systems": Overview
🖅 New Entr	cies 🗈 🖶 🔊 🖪 🖪 🖪
Logical Sy	stems
Log.System	
ORACLESAP	Oracle SAP adapter 📃
ORACLESAP1	Oracle SAP adapter

A.3.2 Configure a Partner Profile

In SAP, all partners systems involved in a distribution model have a profile. There exist several profile types such as customer's profiles, vendor's profiles, but this distinction between profiles is generally not necessary and you will create in most cases your partners profiles using a generic Logical System type.

To Creating a Partner Profile:

1. Run the we20 transaction, as shown in Figure A-10.

Figure A–10	we20 Transaction
-------------	------------------

we20 🖺

2. Click on, Partner Type LS, as shown in Figure A-11.

Figure A–11 Partner Type LS

🖓 🔂 Partner Type LS

3. Click on Create icon, as shown in Figure A–12.

Figure A–12 Create Icon



4. Enter the partner no. which is the logical system name that was created earlier, as shown in Figure A–13.

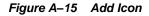
Figure A–13 Partner Profiles

Partner profiles					
8		C C Q 🗅	日間日	44 🕄 🗶 🗶 🕄 🖓 🖬	
Partner profiles					
		1			
Partner	D	Partner No.	ORACLESAP	Oracle SAP adapter	
IWAY_IN	ALE 🔺	Partn.Type	LS	Logical system	
L23CLNT800	L23 👻	- rar car. rype	10	hogical system	
LOCAL	•				
M13CLNT800	M13	Post pro	cessing: perm	itted agent	
MDM55	MDM	1000 010	ccooring. perm		
MDM_001	MDM				
MDM_002	MDM	Ty.	0	🔲 Organizational unit	
MDM_003	MDM	Agent	50010120	EDI Department	
MDM_004	MDM			-	
MDM_005	MDM	Lang.	EN	English	

5. Click on Save icon, as shown in Figure A-14.

Figure A–14 Save Icon

6. Add the inbound parameters using Add icon, as shown in Figure A-15.





For a sender partner system (inbound parameters are filled in), following important settings are set per message type in the partner profile:

- A process code used to indicate which function module will be used to convert the IDoc data to SAP data.
- The time of input of the IDoc: as soon as the IDoc is created in the system or on request (using program RBDAPP01).
- The post processing agent who will have to treat the data input errors if need be. The post processing agent may be either a user or any other HR organizational unit.
- **9.** Enter the message types which need to be received from the partner systems, as shown in Figure A–16.

Figure A–16 Message Type

In	Inbound parmtrs.						
	Partner R_	Message Type	Message va	MessageFun	Test		
		COSMAS					
		CREMAS					
		DEBMAS					
		INVOIC					

Multiple IDocs(Collected IDocs)

When using collected IDocs on any platform during inbound processing (service mode), if the DOCNUM field does not have a unique document number for each IDoc, the system creates an IDoc for each header record in the collected IDoc file and duplicates the data for each IDoc. Make sure the DOCNUM field is included in the EDI_DC40 structure and that each IDoc has a unique sequence number within the collected IDoc file

A.3.3 Configure Inbound Process Code

The process code contains the details of the Function Module that are used for IDoc processing. Message Type can be linked to the Process code.

To define the process code:

- 1. Click on the message type in inbound parameters.
- 2. Click on the process code and press F4 to get the process codes available in SAP system.
- 3. Choose the appropriate process code for that particular message type.
- 4. Check the Trigger Immediately radio button and Cancel processing after syntax error check box, as shown in Figure A–17.

Partner profiles: Inb	ound parameter	S	
1			
Partner No. ORACLESAP	Oracle SAP adapter		
Partn.Type LS	Logical system		
Partner Role			
黃 Message type COSMAS	М	aster cost center	
Message code			
Message function	Test		
Inbound options / Post proces	sing: permitted agent	Telephony	
indicated operations indice process	bing. permitted agene	rerepionz	
Process code COSM	☐ Inbound Process C	ode (1) 46 Entries found	
Cancel Processing After Syntax		de (1) 40 Enclies Louid	
Cancer Frocessing Arcer Syncax	E Restrictions		
		<u>V</u>	
Processing by Function Module	🖌 🖂 🗖 🖽 🛱 🕯		
OTrigger by background program	Process code	Description of process	
Trigger Immediately	APLI	Inbound IDoc: Individual Processing	
	APLM	Inbound IDoc: Mass Processing	
	BAPI_MDM_MATERIAL_RT		
	BAPP	Inbound BAPI IDoc: Package Processing	
	BBPC		
	CATT	Application for Automatic Tests	
	CMS_LINKGEN		
	COSM	COSMAS Cost center master data	_
	DOLMAS	DOLMAS Object Linking	
	ECM_UPS	Change Management with UPS	
	EDOO	Display IDoc Using Work Item	
	ED00_XML ED08	Display IDoc using work item (XML) Forward IDoc	

Figure A–17 Partner Profiles, Inbound Parameters

5. Click on Save button.

A.3.4 Configure a Distribution Model

Distribution model determines the sender and receiver of the IDoc's and defines the transfer rules.

To create a distribution model:

1. Run the **bd64** transaction, as shown in Figure A–18.

```
Figure A–18 bd64 Transaction
```

bd64 🔳

2. Click Edit icon, as shown in Figure A–19.

Figure A–19 Edit Icon



3. Click on the Create model view button, as shown in Figure A-20.

Figure A–20 Create Model View Icon

🗋 Create model view

4. Enter the distribution model name and description, as shown in Figure A–21.

Figure A–21 Distribution Model Name and Description

🗗 Create Model V	iew	⊠∕
Short text	Oracle JCA SAP Model View	
Technical name	ZORACLESAP	
Start date	19.11.2013	
End Date	31.12.9999	
✓ ×		

5. Highlight the model view created, as shown in Figure A-22.

Figure A–22 Model View

🔀 Oracle JCA SAP Model View

ZORACLESAP

- 6. Click on the Add message type button.
- 7. Enter the **Sender** (Logical system maintained for that SAP system), **Receiver** (logical system name for partner system), and the **Message Type** which has to be sent to the partner system, as shown in Figure A–23.

Figure A–23 Add Message Type

🗗 Add Message T	уре	⊠ ∕
Model view	ZORACLESAP	
Sender	T90CLNT090	
Receiver	ORACLESAP	
Message Type	MATMAS	
✓ ×		

- **8.** Add all required message types.
- **9.** After adding all required message type, the model view will be look like, as shown in Figure A–24.

T Manual Table All Manual Manual	2021 01 201 2
🗢 🔀 Oracle JCA SAP Model View	ZORACLESAP
🗢 🌅 IDES ALE Central system (client 800)	T90CLNT090
🗁 🌄 Oracle SAP adapter	ORACLESAP
D 📴 ALEAUD	ALE: Confirmations for Inbound IDocs
🖻 📴 COSMAS	Master cost center
🖻 🤖 CREMAS	Vendor master data distribution
🕑 🛅 DEBMAS	Customer master data distribution
🕑 🛅 ECMREV	Revision level
🖻 🛅 MATMAS	Material master
🔁 STATUS	Message about status information transmission
🔁 ZCOSMAS_EXIN	Logical Message type for ZCOSMASO1_EXT
р ZMATMASO1_MSG	Message type for IDoc type ZMATMASO1
	Logical Message type for ZMATMASO1_EXT
C ZSALES_ORDER_MSG	Message type for Sales Order Informatiom

Figure A–24 Oracle JCA SAP Model View

A.4 SAP Outbound Communication

In SAP outbound communication, the Adapter for SAP act as a server receiving requests from SAP System.

Configurations:

For outbound SAP communication following configurations are required:

- A.4.1 Configuring an RFC Destination and Program ID.
- A.4.2 Creating a Port.
- A.4.3 Configuring a Logical System.
- A.4.4 Configuring a Distribution Model.
- A.4.5 Configuring Partner Profile.

A.4.1 Configure RFC Destination and Program ID

An RFC destination may be seen as a set of settings necessary to connect to a system using the RFC protocol. These settings include the address and type of the partner system along with connection information such as the user ID and password to use.

The RFC destinations of all partners systems must be defined on all systems to include in the distribution model. The transaction to use for this purpose is SM59.

To define an RFC destination:

1. Navigate to the SM59 transaction, as shown in Figure A–25.

Figure A–25	SM59 Transaction

sm59		Ē

2. Click on TCP/IP connections, as shown in Figure A–26.

Figure A–26 TCP/IP Connections

\bigtriangledown	TCP/IP connections	
	CRAQA7	
	1A_PRODUCTION	
	🖹 ALEMANU	
	AL_RFC2.1	

3. Click on Create icon, as shown in Figure A–27.

Figure A–27 Create Icon



4. Enter the RFC destination name and description along with program ID and click on **Registered Server Program**, as shown in Figure A–28.

Figure A–28 RFC Destination ORACLESAP

RFC Destination ORACLESAP	
	18 S C C S 🕱 🗖 🕈 🖬 -
RFC Destination ORACLESAP	
Connection Test Unicode Test	
RFC Destination ORACLESAP]
Connection Type T TCP/IP Connection	Description
Description	
Description 1 Destination for Oracle JCA	
Description 2	
Description 3	
Activation Type O Start on Application Server @Register O Start on Explicit Host O Start on Front-End Work Station	Security MDMP & Unicode
Registered Server Program	
Program ID ORACLESAP	
Start Type of External Program <pre></pre>	
Default Gateway Value Remote Execution Remote Shell	

An RFC server program registers itself under the Program ID.

5. Enter the Gateway Host and Gateway Service name, as shown in Figure A–29.

Figure A–29 Gateway Options

Gateway Host bcora008 Gateway service sapgw20	Gateway Options		
Gateway service <mark>sapgw20</mark>	Gateway Host	bcora008	
	Gateway service	sapgw20	

6. Click on Save, as shown in Figure A–30.

Figure A–30 Save Icon

The RFC destination is now configured.

Note: Program ID is Case Sensitive. For e.g., ORAQA1 is not same as oraqa1.

A.4.2 Configure a Port

IDoc Port contains the information about the way data is sent between the source or target system. The type of port defines the information contained within the port. For port type "Internet" Port will contain IP address of the target system. For port type "file", directory or file name information is maintained. "tRFC" port contains information about the RFC destination of the target system. For IDoc transmission using ALE "tRFC" ports are used.

To creating a tRFC port:

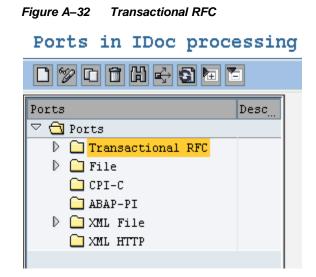
1. Run the we21 transaction, as shown in Figure A–31.

Ē)

Figure A–31 we21 Transaction

we21

2. Click on transactional RFC, as shown in Figure A–32.



3. Click on Create icon, as shown in Figure A–33.

Figure A–33 Create Icon



4. Click on **Generate port name** radio button or click on **own port name** radio button and enter your own port name, as shown in Figure A–34.

1	Figure A–34 Create tRFC Port
	🔄 Create tRFC port 🛛 🖂
	◉ Generate port name
	⊖own port name
	Name

5. Enter the description in the **Description** field and the **RFC destination**, as shown in Figure A–35.

Ports in IDoc pro	cessir	ıg	
8	↓ 🔒	😌 🔁 🕲 I 🖴 🛗	🖧 20 40 40 40 1 💥 🔽 20 🖬
Ports in IDoc pro	cessir	ıg	
0 🏏 0 0 0 4 🕂 3 🗖	1		
Ports	D	Port	A00000068
A00000031 A00000032	SRM 🖵	Description	Port for ORACLESAP
A00000033	Kaba		
A00000034	BC_(Version	
A00000035	L23	O Thos yes type	s SAP Release 3.0/3.1
A00000036	DMK,		
A00000037 A00000038	ID3 DMJ.	O IDOC recora t	ypes SAP Release 4.x
A00000040	Proc		
A000000041	Proc		
A00000042	Tar	RFC destination	ORACLESAP
A00000043	IDT		
A00000044	DEJ(
A00000045	TDO		
A00000047 A00000048	ID3 DMU		
A000000048 A000000050	DSD		

Figure A–35 RFC Destination

6. Click on Save.

A.4.3 Configure a Logical System

Configuration of Logical System is same as described in "Configure a Logical System" sections.

A.4.4 Configure a Distribution Model

Configuring a Distribution Model is same as described in "Configure a Distribution Model" sections.

A.4.5 Configure Partner Profile

For a receiver partner system (outbound parameters are filled in), following settings are specified in the partner profile:

- The receiver port to which the data will be sent.
- The sending method: one IDoc at a time or by packets.
- The IDoc type that will be sent to that partner. For a given message type, the IDoc type sent may vary depending on the receiver system. Indeed you may have different versions of SAP in your system landscape.

Create partner profile as described in "Configuring Partner Profile" section and follow the below steps:

1. Enter the outbound parameters by clicking on the Add icon, as shown in Figure A-36.

Figure A–36 Outbound Parameters

н

00	utbound parm	atrs.			
	Partner R	Message Type	Message va	MessageFun	Test
		ECMREV			
		MATMAS	6		
		STATUS			
		SYNCH			
	• •				
Q					

2. Enter the **Message Type**, **Port name** and the **Basic type** for the particular message type, as shown in Figure A–37.

Figure A–37 New Entries: Overview of Added Entries Window

Partner profiles:	Outbound p	parameters		
<i>"</i> ?				
Partner No.	ORACLESAP	Oracle SAP adapter		
Partn.Type	LS	Logical system		
Partner Role				
불 Message Type	MATMAS		Material master	
Message code				
Message function		Test		
Outbound Options	Message Control	Post Processing: P	Permitted Agent 🛛 Tel 📗 🖳 🕒	96
Dessiver and	200000000	Transactional RFC	Port for ORACLESAP	
Receiver port Pack, Size	A00000068	I ransactional RFC	PORT FOR OKACLESAP	
	1			
Queue Processing Output Mode				
Transfer IDoc Immed.			Output Mode 2	
Collect IDocs			Output Mode 2	
Collect IDocs				
IDoc Туре				
Basic type	MATMAS01		Material Master	
Extension]	
View				
Cancel Processing Afte	r Syntax Error			
Seg. release in IDoc type		Segment Appl.	Rel.	

3. Click on Save.

The Inbound and Outbound configurations are now ready for IDoc exchange.

Now upon sending or receiving IDocs from SAP, you can see the inbound and outbound IDocs and their status in SAP tcode WE02, as shown in Figure A-38.

	899 8	口 份 6	8 8	9 49 4	8	* 7	0 🖪						
AP							9 -0						
1 🖻 🛰 🗎													
ocs	0 4 7 1	743 52 1	5					in ID					
C Selected IDocs			_						00				
🗢 🗋 Outbound IDocs	Selected	IDoce	5										
ADRMAS	IDoc Number	Semue	Sta	Sta	Partne	er	Basic type	Date	Time	Messg.	Direct	Port	
COSMAS	000000001742918	17	03	000	LS/	/ORAOA2		17.11.2013	00:01:48	ZMATMAS	Outbox	A00000074	
CREMAS	0000000001742919			000		/ORAQA2	MATMAS01	17.11.2013				A00000074	
DEBMAS	000000001742920			000		ORAQA2	MATMASO1	17.11.2013				A00000074	
ECMREV	000000001742923	. 17		000		ORAQA2	MATMAS01	17.11.2013	00:09:38	ZMATMAS	Outbox	A00000074	
Intersity of the second sec	000000001742922	17		000		ORAQA2	MATMAS01	17.11.2013		-		A00000074	
I ORDERS	000000001742923	17		000		ORAQA2	MATMAS01	17.11.2013				A00000074	
ZCOSMAS EXTN	000000001742924	1 5		000		/ORAQA2	ADRMAS03	17.11.2013			Outbox	A00000074	
ZHATHAS EXTN	00000000174292	5 4	03	000	LS/	/ORAQA2	CREMAS05	17.11.2013	00:39:54	CREMAS	Outbox	A00000074	
ZSALES ORDER MSG	000000001742926	17	03	000	LS/ ,	/ORAQA2	MATMAS01	17.11.2013	00:42:23	ZMATMAS	Outbox	A00000074	
ZVISTAPM	00000000174292	17	03	000	LS/	ORAQA2	MATMAS01	17.11.2013	00:44:54	ZMATMAS	Outbox	A00000074	
🗢 🔁 Inbound IDocs	000000001742928	3 17	03	000	LS/	/ORAQA2	MATMAS01	17.11.2013	00:47:25	ZMATMAS	Outbox	A00000074	
COSMAS	000000001742929	17	03	000	LS/	ORAQA2	MATMAS01	17.11.2013	00:50:27	ZMATMAS	Outbox	A00000074	
CREMAS	000000001742930	22	03	000	LS/	ORAQA2	MATMAS01	17.11.2013	00:53:23	MATMAS	Outbox	A00000074	
DEBMAS	00000000174293	. 22	03	000	LS/	/ORAQA2	MATMAS01	17.11.2013	01:20:51	MATMAS	Outbox	A00000074	
MATMAS	000000001742933	22	03	000	LS/ ,	/ORAQA2	MATMAS01	17.11.2013	01:23:28	MATMAS	Outbox	A00000074	
MATMASGEN	000000001742933	22	03	000	LS/	/ORAQA2	MATMAS01	17.11.2013	01:26:32	MATMAS	Outbox	A00000074	
STATUS	000000001742934	1 22	03	000	LS/	/ORAQA2	MATMAS01	17.11.2013	01:30:18	MATMAS	Outbox	A00000074	
XA123	00000000174293	5 5	03	000	LS/	/ORAQA2	ZVISTAPM01	17.11.2013	01:35:15	ZVISTAP	Outbox	A00000074	
Imathas_extn Imathas_extn Imathas_extn	000000001742936	5 5	03	000	LS/ ,	/ORAQA2	ZVISTAPM01	17.11.2013	01:38:08	ZVISTAP	Outbox	A00000074	
V L 2VIDIAM	00000000174293	7 5	03	000	LS/ ,	/ORAQA2	ZVISTAPM01	17.11.2013	01:41:14	ZVISTAP	l Outbox	A00000074	
	000000001742938	8 5	03	000	LS/ ,	/ORAQA2	ZVISTAPM01	17.11.2013	01:44:39	ZVISTAP	l Outbox	A00000074	
	000000001742939	10	51	000	LS/ ,	T90CLNTO	DEBMAS05	17.11.2013	11:06:45	DEBMAS	Inbox	SAPEQ6	
	000000001742940	22	53	000	LS/ .	T90CLNTO	MATMAS01	17.11.2013	17:02:55	MATMAS	Inbox	SAPEQ6	
	00000000174294			\mathbf{m}	1.97	ORACLESS.	SASTFUL I	17 11 2013	17.02.56	SILTATIS	Outhox	¥00000068	
	Status Message f	or Sele	ted]	IDoc									
	Status Text:												
	T100 Text:												

Figure A–38 Inbound IDocs Window

A.5 SAP User Authorizations for Adapter

The user must be having authorizations to execute RFC, BAPI, and IDoc from the Adapter for SAP. Some of the SAP tcodes and the corresponding authorizations required for them are listed in Table A-1.

	SAP tcodes and the Corresponding Authorizations										
1	SE38	DISPLAY	S_TCODE	TCD	se38	Run/Edit ABAP programs					
			S_DEVELOP	ACTVT	3						
2	SE80	DISPLAY	S_TCODE	TCD	se80	Object Navigator (SAP Development workbench, most development functionality is available from this transaction)					
			S_DEVELOP	ACTVT	3						

 Table A-1
 SAP Tcodes and the Corresponding Authorizations

3	SE11	DISPLAY	S_TCODE	TCD	SE11	ABAP Dictionary Maintenance
			S_DEVELOP	ACTVT	3	
4	SE16	DISPLAY	S_TCODE	TCD	SE16	Data Browser
			S_TABU_DIS	ACTVT	3	
5	SE37	DISPLAY	S_TCODE	TCD	SE37	ABAP Function Module
			S_DEVELOP	ACTVT	3	

Table A-1 SAP Tcodes and the C	orresponding Authorizations Continues
--------------------------------	---------------------------------------

	SAP tcodes and the Corresponding Authorizations										
6	SM59	CREATE, EDIT,DIS PLAY	S_TCODE	TCD	SM59	RFC Destinations					
			S_RFC_ADM	ACTVT	01,02,03						
			S_ADMI_FC D	S_ADMI _FCD	No Authoriza tion						
			S_RFC	ACTVT	*						

A.6 SAP BGRFC Configuration

Before using BGRFC communication, following configuration needs to be done :

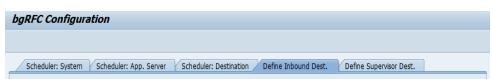
1. Run the sbgrfcconf transaction, as shown in Figure A-39.

Figure A–39 sbgrfcconf Transaction

sbgrfcconf 🔹

2. Click on the Define Inbound Dest. Tab.

Figure A–40	Define Inbound Destination
-------------	----------------------------



3. Click on the Create icon, as shown in Figure A–41.

Figure A–41 Create Icon



4. Give Inbound Destination Name, Logon Server Group, Add Queue Prefix and press Add as shown in Figure A–42.

🕞 Configure Inbound	Destination			×
Inb. Dest. Name	ZORACLE_SAP			
Logon/server group	562		Previously Used Queue Prefixes	
			EQ6_1	-
Queue Prefixes		••••	EQ6_2	-
		*	EQ6_3	
		*	IWCNT_WF	
			IWFND_CNP	
			PRASHANT	
			ZBG	
			ZBG1	
			ZBG11	
			ZBG12	
			ZBG13	
			ZBG14	
			ZBG2	
			ZBG3	
			ZBG4	
			ZBG99	
			ZBGPK	
		-	ZBH	
4 F	4	L F	ZEQ1	
			ZEQ2	-
			4 2	
Add Queue Prefix ZORACLE1 Add			8 B B B	
				ve X

Figure A–42 Configure Inbound Destination

5. Click on the Save button as shown in Figure A–43.

•			Previously Used Queue Prefixes EQ6_1 EQ6_2 EQ6_3 IWCNT_WF IWFND_CNP PRASHANT 2BG 2BG1		
Queue Prefixes ZORACLE1		•	EQ6_2 EQ6_3 IWCNT_WF IWFND_CNP PRASHANT ZBG		
•		•	EQ6_3 IWCNT_WF IWFND_CNP PRASHANT ZBG		
ZORACLE1			IWCNT_WF IWFND_CNP PRASHANT ZBG		
		•	IWFND_CNP PRASHANT ZBG		
			PRASHANT ZBG		
			ZBG		
			7BG1		
			2001		
			ZBG11		
			ZBG12		
			ZBG13		
			ZBG14		
			ZBG2		
			ZBG3		
			ZBG4		
			ZBG99		
			ZBGPK		
		•	ZBH		
< ►	4 F		ZEQ1		
			ZEQ2		
Add Queue Prefix			4 1	4 Þ	

Figure A–43 Configure Inbound Destination

6. Click on Save icon as shown in Figure A–44.

Figure A–44 Save Icon



7. Now upon sending BGRFC calls to SAP, you can see the inbound BGRFC units in SAP tcode SBGRFCMON, as shown in Figure A–45.

Figure A–45 Monitor for bgRFC Units

Monitor for bgRFC Units							
ଶ୍ମ							
Scenario/Destination/Unit Type Difficund Outbound	Status	Change Status/Error Message	C A C A C A C A C A C A C A C A C A C A	Transaction Code	Date	Time	M D Tim

Adapter

Provides universal connectivity by enabling an electronic interface to be accommodated (without loss of function) to another electronic interface.

Agent

Supports service protocols in listeners and documents.

ChannelChannel

Represents configured connections to particular instances of back-end systems. A channel binds one or more event ports to a particular listener managed by an adapter.

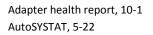
ListenerListener

A component that accepts requests from client applications.

PortPort

Associates a particular business object exposed by the adapter with a particular disposition. A disposition is a URL that defines the protocol and location of the event data. The port defines the end point of the event consumption.

Index



B

А

BAPI, 1-3

С

Configuration report, 10-2 Connection Management, 4-2 Connection pool, 4-2 Connection Pooling, 2-11 Control Character, 5-57 CPIC, 6-11 Credential mapping, 5-34 Custom BAPI, 3-2 Custom IDocs, 3-3 Custom RFC, 3-2

D

Ε

I

Design-time component, 1-2

ExceptionFilter, 5-17 Expiration Period, 6-13 Expiration Time, 6-12 Extended IDoc, 3-3

IDoc, 1-3, 3-3

J

JCo Traces, 6-10

Μ

Max Wait, 6-12

0

Р

OSB, 8-94

Outbound Mediator process, 8-41

Peak Limit, 6-12



qRFC, 5-1

R

Remote Function Call, 1-3 RFC trace, 6-11 Run-time component, 1-2

S

SAP Connection Parameters, 2-7 SAP JCo, 2-1 SAP RFC authorization object, 1 SAP Route String, 6-7 SchemaValidation, 5-20 SNC parameters, 2-12 Standard IDocs, 3-3 Standard RFC, 3-2 Standardized BAPI, 3-1 stateful, 5-42 stateless, 5-42

Т

Test Connection button, 6-7 Trace level, 4-4 Trace parameters, 2-11 tRFC, 5-1 Tuning parameters, 9-1