Oracle® Fusion Middleware

Using the SAP R/3 Integration Adapter for Oracle WebLogic Server

12c Release (12.2.1.4.0)

E97289-02

May 2023 Provides information on how to integrate with SAP R/3 systems and develop applications.



Oracle® Fusion Middleware Using the SAP R/3 Integration Adapter for Oracle WebLogic Server, 12c Release (12.2.1.4)

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Preface

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Audience

Using the SAP R/3 Integration Adapter for Oracle WebLogic Server is intended for anyone who is interested in using these adapters.

Documentation Accessibility

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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 <u>Oracle Fusion Middleware 12c Release (12.2.1.4)</u> documentation on the Oracle Help Center.

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	
italic	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.

monospaceItalic type indicates book titles, emphasis, or placeholder variables for which you supply
particular values.Monospace type indicates commands within a paragraph, URLs, code in examples, text
that appears on the screen, or text that you enter.

1

Understanding 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, "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 Oracle Fusion Middleware Certification Matrix, refer to:

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

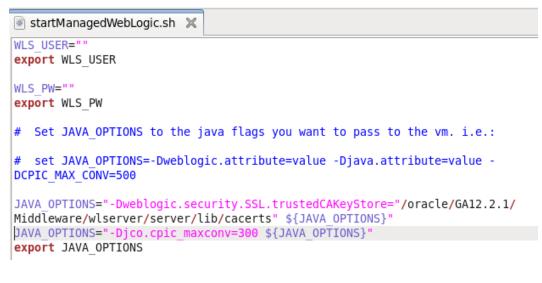
Working with Adapter for SAP

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

4	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						
A server is an instance of WebLogic Server that runs in its own Java Virtual Machine (JVM) and has its own configuration.						
s page summarizes each server t	hat has been configured in the	e current WebLogic Server	domain.			
ζ2						
istomize this table						
rvers (Filtered - More Colum	nns Exist)					
	nns Exist)					
rvers (Filtered - More Colum	nns Exist)	Cluster	Machine			
rvers (Filtered - More Colum		Cluster	Machine			
rvers (Filtered - More Colum lew 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		×	1
Q.		Θ	1
SOA		-	l
DILETTOCC33	Duaineaa Kuie	numuri ruak	
*	D	&	I
Mediator	Spring	Subprocess	I
Technology			
ی	÷	1	I
ADF-BC	AQ	B2B	I
÷	**	÷	I
BAM 11g	Coherence	Database	I
\$	<u> 6</u>		
Direct	EJB	File	
£	÷	5	
FTP	Healthcare	HTTP	
<u>8</u>	ä	1 <u>2</u>	
JMS	LDAP	MFT	
÷	400	1	
MQ	MSMQ	REST	
\$\$	50 S	4 0	
SOAP	Socket	UMS	
Applications			
£ <mark>6</mark>	Ş	e	
E-Business	JDE World	SAP R/3	
Suite		Adapter	
Custom/Third P	arty		
**			
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.

Summary of Deployments								
(Control Monitoring							
This page displays a list of Java EE applications and stand-alone application modules that have been installed to this 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.								
Þ	Cus	tomize this table						
	Depl	pyments						
Install Update Delete Start - Stop -								
Name				Health				
		👼 state-management-provider-memory-rar	Active	🖋 ОК				
Coherence-transaction-rar Active								
		SAP Adapter	Active	🖋 ок				
			Active	🖋 ок				

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	Setting for	or Adapter	for SAP
--	------------	-------------	------------	---------

Overview	iew Deployment Plan Configuration Security Targets Control T		Testi	ing	Monitor				
General	Properties Outbound Connection Pools Admin Objects Workload In				Inst	rumenta			
groups. Groups are listed by connection factory interface and the instances are listed by their JNDI nan instance within an Outbound Connection Pool group. Click the name of a group or instance to configur below. Outbound Connection Pool Configuration Table New Delate									
below.			Connection Pool gr	oup. Click t					
below. Outboun New	d Connectio	on Pool	Connection Pool gr	oup. Click t) configu
below. Outboun New Gro	d Connectio Delete ups and Ins	on Pool tances	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	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 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

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 2-8
 Additional 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 Figure 2-8 startManagedweblogic.sh file



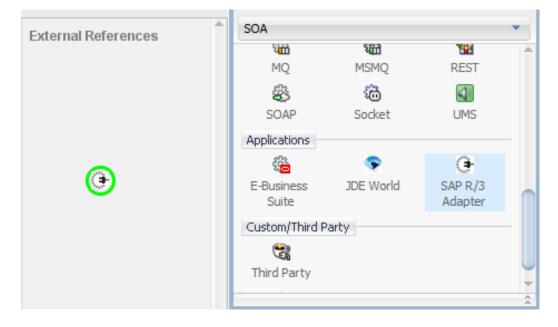
2.3 Create a Composite in Design-time

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.

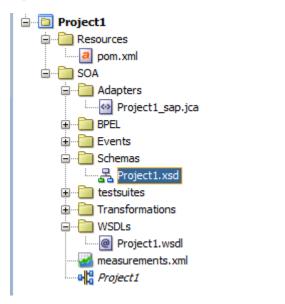
Figure 2-10	Outbound Composite	е
-------------	--------------------	---

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-11022: Customization layer "adfshare" from MDS Component Config in jar:file:/C:/Oracle/Middlewa	Project1 ×		
Design Source History MARNING: SAP client Connected successfully destination Con with properties: (jcc.destination.auth_type=CONFIGURED_USER, jcc.client.user=JCA_DEV, jcc.clientl Jun 18, 2014 11:47:28 AM oracle.mds NOTIFICATION: MDS-11022: Customization layer "adfshare" from MDS Component Config in jar:file:/C:/oracle/Middleve	🖌 🕼 🌌 🗶 🖏 i 🕅 🧕		Project1
BPELProcess1 Operations: process BAP1_BUSINESSAREA. BAP1_BUSINESSAREA. BAP1_BUSINESSAREA. Bap1_BUSINESSAREA. Design_Source History Messages-Log Jun 18, 2014 11:47:04 AM oracle.tip.adapter.sap.share.connection.SapConnector ping NARNING: 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-11022: Customization layer "adfshare" from MDS Component Config in jar:file:/C:/Oracle/Middlewa	Exposed Services	Components	External References
<pre>Messages-Log X I A oracle.tip.adapter.sap.share.connection.SapConnector ping MARNING: SAP client Connected successfully destination Con with properties:{jco.destination.auth_type=CONFIGURED_USER, jco.client.user=JCA_DEV, jco.client.l 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-11022: Customization layer "adfshare" from MDS Component Config in jar:file:/C:/Oracle/Middlewa </pre>	bpelprocess1_client Operations:		sapReference Operations:
<pre>Messages Log X Messages Log Jun 18, 2014 11:47:04 AM oracle.tip.adapter.sap.share.connection.SapConnector ping MARNING: SAP client Connected successfully destination Con with properties:{jco.destination.auth_type=CONFIGURED_USER, jco.client.user=JCA_DEV, jco.client.l 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-11022: Customization layer "adfshare" from MDS Component Config in jar:file:/C:/Oracle/Middlewa NOTIFICATION: MDS-11022: Customization layer "adfshare" from MDS Component Config in jar:file:/C:/Oracle/Middlewa</pre>	Design Source History		•
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-11022: Customization layer "adfshare" from MDS Component Config in jar:file:/C:/Oracle/Middlewa	Messages - Log		×
Messages Extensions × Soa ×	Jun 18, 2014 11:47:04 AM WARNING: SAP client Conne destination Con with prop Jun 18, 2014 11:47:28 AM NOTIFICATION: MDS-11031: Jun 18, 2014 11:47:28 AM	<pre>cted successfully exties:(jco.destination.auth_type=CONFIGURED_USER, jco.client. oracle.mds Content option mapping for (Path = "/persdef/query/savedSearch oracle.mds</pre>	⊥user=JCA_DEV, jco.client.l es/", Namespace Restrictio
	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)

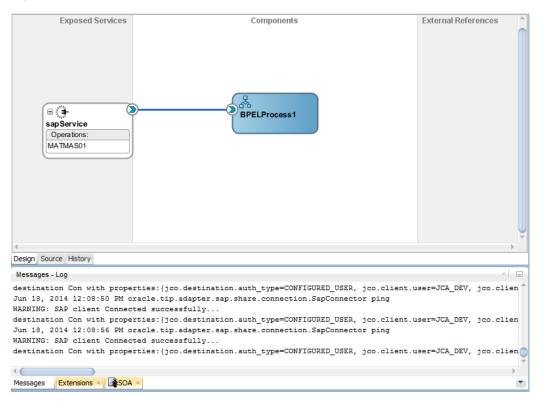
Figure 2-11 Created Artifacts as part of Adapter Outbound Composite



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 >Sur	Home >Summary of Servers >Summary of Deployments >SAPAdapter								
Settings for javax.resource.cci.ConnectionFactory									
Overview	Deployment Plar	n Configuration	Securit	y Targets	Control Tes	ting I	Monitoring	Notes	
General	Properties Out	tbound Connection	Pools	Admin Objects	Workload	Instru	mentation		

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 App	lication Assistant
Update Application Assist	ant
Back Next Finish	Cancel
Locate new deploymen	t files
You have elected to upda	te the SAPAdapter application.
OUpdate this application	on in place with new deployment plan changes. (A deployment plar
Deployment plan path:	/oracle/stage9/Middleware/soa/soa/Plan.xml Change Path
Redeploy this application	tion 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

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.

Tedit SAP R/3 Connection	X
Connection Name: DefaultClient	Import
User Connection Management	
Connection Management Parameters: (Optional)	
Pool Capacity:	
Pe <u>a</u> k Limit:	
Max Wait (ms):	
Expiration Time (ms):	
Expiration Period (<u>m</u> s):	
Server Security Trace V Management Additional	Test Connection
	-
	_
Help	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_ time	Maximum time in milliseconds to wait for a connection, if 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
-1	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"
- Section 5.19, "Large Payload Support (AsAttachment)"
- Section 5.20, "Resiliency Support"
- Section 5.21, "Segment Release Design Time and Runtime Support"
- Section 5.22, "Special Character Support for Inbound iDoc"
- Section 5.23, "Dynamic RFC Cache Update"

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:

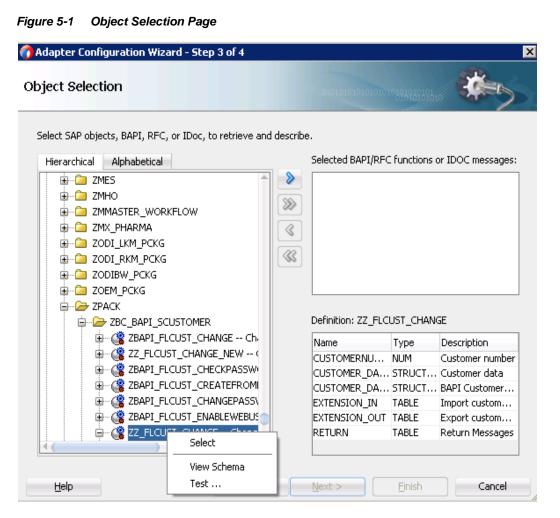
Type t: If bgRFC with exactly once execution is required

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.

Adapter Configuration Wizard - Step 3 of 4 Object Selection Select SAP objects, BAPI, RFC, or IDoc, to retrieve and describe. Hierarchical Alphabetical Carcel Alphabetical Carcel SAPI/RFC functions or IDOC messages: Carcel SAPI/RFC options Carcel SAPI/RFC option: Carcel SAPI/RFC option: Carcel SAPI/RFC option: Carcel SAPI/RFC functions or IDOC messages: Carcel SAPI/RFC option: Carcel SAPI/RFC	Figure 5-2	Selected RFC				
Selet SAP objects, BAPI, RFC, or IDoc, to retrieve and describe.	🕜 Adapter C	onfiguration Wizard - Ster	p 3 of 4			2
Hierarchical Alphabetical Image: ZMES ZMES Image: ZMHO Image: ZMES Image: ZMHO Image: ZMES Image: ZMMASTER_WORKFLOW Image: ZMES Image: ZODI_LKM_PCKG Image: ZODI_RKM_PCKG Image: ZODI_RKM_PCKG Image: ZODI_RKM_PCKG Image: ZODI_RKM_PCKG Image: ZODI_RKM_PCKG Image: ZODI_RKM_PCKG Image: ZODI_RKM_PCKG Image: ZODI_RKM_PCKG Image: ZDE_RAPI_SCUSTOMER Image: ZDE_RAPI_FLCUST_CHANGE_NEW +-(Image: ZZ_FLCUST_CHANGE_NEW +-(Image: ZZ_FLCUST_CHANGE_NEW +-(Image: ZZ_FLCUST_CHANGE_NEW +-(Image: ZDAPI_FLCUST_CHECKPASSW Image: ZDAPI_FLCUST_CHANGE_NEW +-(Image: ZDAPI_FLCUST_CHANGE_NEW +-(Image: ZDAPI_FLCUST_CHANGE_NEW +-(Image: ZDAPI_FLCUST_CHANGE +- Change Image: ZDAPI_FLCUST_CHANGE +- Change <t< th=""><th>Object Se</th><th>lection</th><th></th><th></th><th></th><th>*</th></t<>	Object Se	lection				*
Image: State of the second state of			co retrieve and descril		- functions	
Image: Contract of the contract				·		
Image: Summaster_workFLow		-		ZZ_FLCUST_C		
 ZMX_PHARMA ZODI_LKM_PCKG ZODI_RKM_PCKG ZODIBW_PCKG ZOEM_PCKG ZEC_BAPI_SCUSTOMER ZEAPI_FLCUST_CHANGE Ch ZEAPI_FLCUST_CHANGE_NEW (ZBAPI_FLCUST_CHECKPASSW(ZBAPI_FLCUST_CHECKPASSW(ZBAPI_FLCUST_CHANGEPASS(ZBAPI_FLCUST_CHANGEPASS(ZBAPI_FLCUST_CHANGEPASS(ZBAPI_FLCUST_CHANGE Changepass(ZEAPI_FLCUST_CHANGE Changepas					_	
Image: Construction of the second		—	1			
Image: Contract of the contract						
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Image: Construction of the construc	Ē			Definition: ZZ_FLC	UST_CHAN	GE
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Image: Construction of the construc		· · · · · · · · · · · · · · · · · · ·	_	CUSTOMERNU	NUM	Customer number
Image: Construction of the construc				_		
EXTENSION_OUT TABLE Export custom RETURN TABLE Return Messages				_		
RETURN TABLE Return Messages						
Help < Back Next > Finish Cancel				NETOKNI	INDLE	Recurr messages
Help < Back Next > Finish Cancel						
	Help		< Back	Next >	Finish	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

Configure RFC Options	-	Σ
RFC (synchronous)		
tRFC (transactional)		
O qRFC (queued) Queue Name:	AQUEUE	
⊖ BGRFC		
		Cancel
Help	OK	

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 portType="sapReference_PT" operation="OSA_CMD_C</pre>
<pre> <interaction-spec classname="oracle.tip.adapter.sap.outbound.SAPInt </pre></th></tr><tr><th><property name=" interaction"="" value="stateless"></interaction-spec></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

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/enve
<soapenv:Header/>
<soapenv:Body>
<urn:Z2_FLCUST_CHANGE tid="678hgjk">
</--Fou may enter the following 6 items in any order-->
<urn:CUSTOMERNUMBER>00000453</urn:CUSTOMERNUMBER>
<urn:CUSTOMER_DATA>
<urn:CUSTNAME>xyz</urn:CUSTNAME>
```

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.

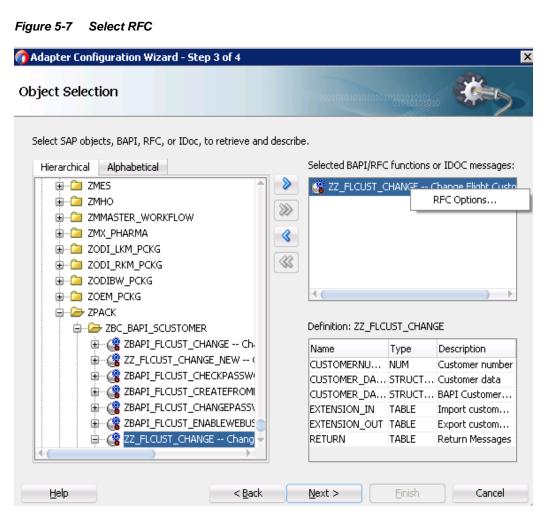
5.1.3 Modeling the qRFC SAP Endpoint

- 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		01010101010101010	9393939355	*
Select SAP objects, BAPI, RFC, or IDoc, to retrieve and	l describe		6	TROC
Hierarchical Alphabetical		Selected BAPI/RFC	. runctions t	or iboc messages:
	8			
🗄 🗀 ZODI_LKM_PCKG				
DODI_RKM_PCKG				
🕀 🖆 ZODIBW_PCKG				
E ZPACK		_ ~		
B ZBC_BAPI_SCUSTOMER		Definition: ZZ_FLC	UST_CHANG	эЕ
B C Ch		Name	Туре	Description
B C ZZ_FLCUST_CHANGE_NEW (CUSTOMERNU		Customer number
B-C ZBAPI_FLCUST_CHECKPASSW		CUSTOMER_DA		
ZBAPI_FLCUST_CREATEFROMI		CUSTOMER_DA		
			TABLE	Import custom
		EXTENSION_OUT	TABLE	Export custom
		RETURN	TABLE	Return Messages
View Schema				
Help Test		Next >	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 (synchronol tRFC (transactio		
qRFC (queued)	OSAQUEUE]
0		

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.

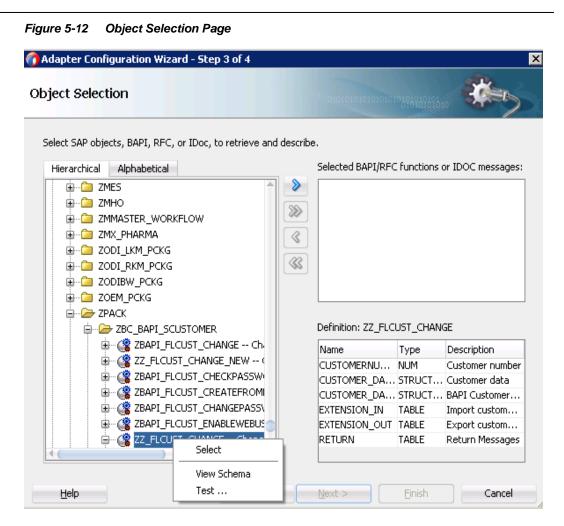
Figure 5-11 qRFC Monitor

Er Queue Edit Soto Information System Heb Ø								
	FC Monitor	r (Inbound Queue)						
		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	133445453

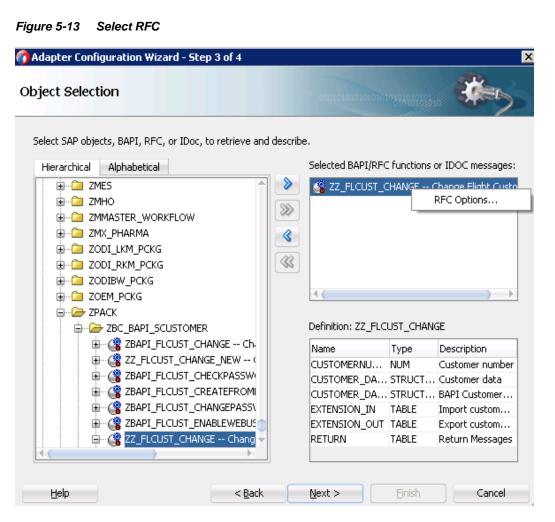
5.1.5 Modeling the bgRFC SAP Endpoint

- 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.

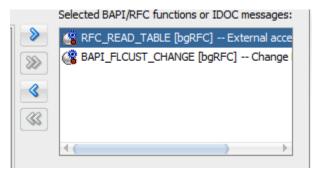
4. Select the **bgRFC** radio button, as shown in Figure 5-8.

Figure 5-14 Configure RFC Option

Oconfigure RFC Options	×
 RFC (synchronous) tRFC (transactional) qRFC (queued) Queue Name: OSAQUE BGRFC 	UE
Help	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

Adapter Configuration Wizard - Ste	ep 4 of 5	×
JCA Properties	01	*
Specify the Name and Value of all JCA Ad	apter Properties.	
Properties		ት 🗙
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

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	01010101010101010101010				
Specify the Name and Value of all JCA Adapter 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	0101010101010101010404040404
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
BGRFCQueues	ZBG1,ZBOueue2,ZBGQueue3

Figure 5-19 Configure RFC Option

12. Click Finish.

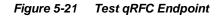
The jca file of the project looks like as shown in the Figure below.

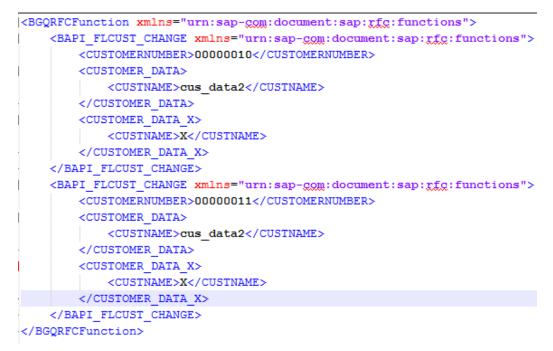
Figure 5-20 JCA File

<	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>
Γ	<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 Output	Value	Description	
😤 GetDetail		Business Area	Details
BUSINESSAREAID	1500	Business area	
language	E	Language	
LANGUAGE_ISO	E	Language acco	rding 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> resc duput resc output (?xml version = '1.0' encoding = 'UTF-8' standalone = 'yes'?> <bapi_businessarea_getdetail></bapi_businessarea_getdetail></pre>	
<log_msg_no>000000</log_msg_no>	
<message_v1></message_v1>	
<message_v2></message_v2> <message_v3></message_v3>	_
_ ·	
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.

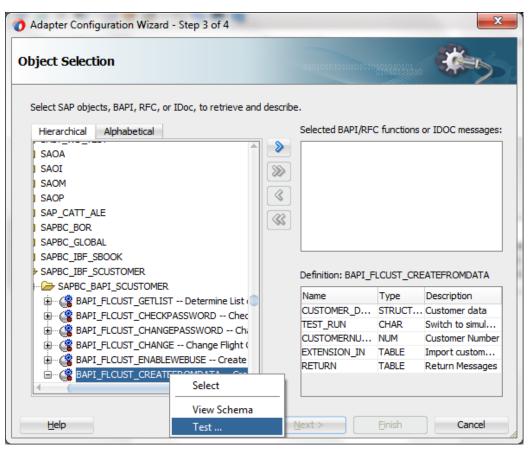


Figure 5-25 Result Dialog

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



Test SAP RFC/BAPI Method		×
Test Input Test Output		
Name	Value	Description
BAPI_FLCUST_CREATEFROMDATA	Create N	Create New Flight Customer
	1	Customer data
TEST_RI Expand		Switch to simulation mode
Add Row		Import customer enhancem
RETURN Remove		Return Messages
Help		Run Test Done

Now give the required input as mentioned below , then Click on **Run Test** button.

Test Input	Test Output	
Name	Value	Description
(BAPI_FLCI	JST_CREATE	Create New Flight Custo
🖶 🐗 Custo	MER_DATA	Customer data
α	JSTNAME 1234	Customer name
	DRM	Form of address
🗋 ST	REET	Street
🗋 PC	DBOX	PO Box
	OSTCODE	Postal Code
CI CI	TY	City
	DUNTR	Country Indic.
C CC	DUNTR_ISO	ISO country code
🗋 RE	GION	Region
🗋 PH	IONE	Telephone number of fli
	IAIL	Customer e-mail address
Δ α	JSTTYPE	Customer type
🗋 DI	SCOUNT	Discount rate
🗋 LA	NGU	Language Key
🗋 LA	NGU_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_MODUL]
WEBSERVICE.name: bpelprocess1 client ep] [WEBSERVICE PORT.name:
racle.soa.tracking.FlowId: 1806838] [oracle.soa.tracking.Instand
racle.soa.tracking.SCAEntityId: 80028] [oracle.soa.tracking.Fau
<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
id: [ACTIVE].ExecuteThread: '5' for queue: 'weblogic.kernel.Defa
)'] [userId: <anonymous>] [ecid: 61423db6-eccf-4297-90c4-0c8d03d</anonymous>
] [APP: soa-infra] [J2EE_APP.name: soa-infra] [J2EE_MODULE.name
VICE.name: bpelprocess1 client ep] [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 - Ste	ep 4 of 5			×
JCA Properties				*
Specify the Name and Value of all JCA Ada	pter Properties.			
Properties			4	×
Name	Va	lue		
Interaction	sta	ateless		
ExceptionFilter	on			
SchemaValidation	off	:		
jca.retry.interval	1			
jca.retry.maxInterval	12	0		
jca.retry.count	9			
jca.retry.backoff	2			
11-la	< Pack	March 2	Finish	Canaal
<u>H</u> elp	< <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	s X
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 of 5	5
JCA Properties	0101010101010101010101010
Specify the Name and Value of all JCA Adapter Prop	operties.
Properties	수 🗙
Name	Value
AutoSYSTAT01	yes
EncodeIDOC	flatfile
ProgramID	
jca.retry.count	9
jca.retry.interval	1
jca.retry.backoff	2
jca.retry.maxInterval	120
Help <	< Back Next > 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.

rigure 5-55 Send Cost Center	
Send cost center	
8 E	
Send cost center	
•	
Controlling area Cost center	1000 to 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

SAP SAP		
IDoc display ▽ ☐ IDoc 000000000857171	Total r	Technical short info Direction 2 Inbox Current status 53 CO Basic type SYSTAT01
		Extension Message type STATUS Partner No. ORACLESAP Partn.Type LS Port A000000068
		Content of selected segment

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 - Step 4 of 5	×
JCA Properties	article to
Specify the Name and Value of all JCA Adapter 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
<u>H</u> elp < <u>B</u> ack	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			
	🕒 🔂 😡 🖴 🕻	100 (C)) &) 🐹 🗾 🕐 🖬
Send Material			
🕂 🔁 🖬			
Material	40-110C	to	•
Class		to	•
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.

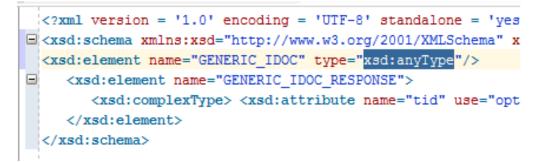
Figure 5-39 FlatFile Format

EDI_DC SAPHR9	8000000000	0063275062	0 30MATMASO	11FILEPC	RTJ	LSORACLESAP	
LST90CLNT	090						
E2MARAM00	580000000000	0063275000	0001E2MARAM	00500000	0020	005MB03 20031002B	INS
EA				000			
LBR1.000	FTQ	0001		00)	0.000	
0.000	0.00	0	0.00.0	0	0	0 0	0
000000000	0000000						
0.0						1	В
E2MAKTM00	180000000000	0063275000	0002E2MAKTM	00100000	1030	0051ANNE KLEIN (MAXWELL) t? ZH	
E2MAKTM00	180000000000	0063275000	0003E2MAKTM	00100000	1030	0053Toothpaste (C&D)	
E2MAKTM00	180000000000	0063275000	0004E2MAKTM	00100000	1030	0056S40 (Euro)	
E2MAKTM00	180000000000	0063275000	0005E2MAKTM	00100000	1030	0057 900 MHz Wireless Telephone	e
E2MAKTM00	180000000000	0063275000	0006E2MAKTM	00100000	1030	0058Watches & FJ	
E2MAKTM00	180000000000	0063275000	0007E2MAKTM	00100000	1030	0059Alarms - Argo	
E2MAKTM00	180000000000	0063275000	0008E2MAKTM	00100000	1030	005AFoodSaver Vac 1075 (Tilia)	
E2MAKTM00	180000000000	0063275000	0009E2MAKTM	00100000	1030	005BPT15 P-touch	
E2MAKTM00	180000000000	0063275000	0010E2MAKTM	00100000	1030	005DLucent Fibers (Thor Labs)	
E2MAKTM00	180000000000	0063275000	0011E2MAKTM	00100000	1030	005EMAB Product 3	
E2MAKTM00	180000000000	0063275000	0012E2MAKTM	00100000	1030	005FDasani (Coke)	
E2MAKTM00	180000000000	0063275000	0013E2MAKTM	00100000	1030	005IPorcelain (Mannington)	
E2MAKTM00	180000000000	0063275000	0014E2MAKTM	00100000	1030	005JCore Switching (Lucent)	
E2MAKTM00	180000000000	0063275000	0015E2MAKTM	00100000	1030	005K014795 R&W BEEF NOODLE 0.2	5
E2MAKTM00	180000000000	0063275000	0016E2MAKTM	00100000	1030	005NBacardi Light 750ml (charr	men
E2MAKTM00	180000000000	0063275000	0017E2MAKTM	00100000	1030	005SMedig - ACS	
E2MAKTM00	180000000000	0063275000	0018E2MAKTM	00100000	1030	005UWound Care (JsJ)	
E2MAKTM00	180000000000	0063275000	0019E2MAKTM	00100000	1030	005WConsulting (Novadigm)	
E2MAKTM00	180000000000	0063275000	0020E2MAKTM	00100000	1030	005aLIds	
E2MAKTM00	180000000000	0063275000	0021E2MAKTM	00100000	1030	005bSingulair (Merck)	
E2MAKTM00	18000000000	0063275000	0022E2MAKTM	00100000	1030	005cIndustrial (Aceto)	
E2MARCM00	480000000000	0063275000	0023E2MARCM	100400000	1030	0053000VEB MAB	
0.000	0.000	0		000000	00	0.00	0
0.0	0000000002	0.00 0.0	00	0.00			
0	0000	01				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 re-configure/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.

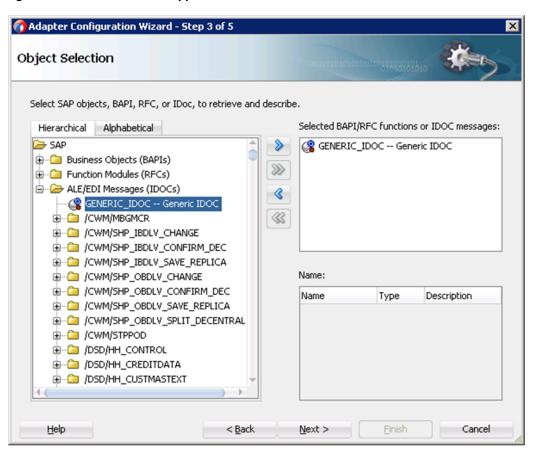


Figure 5-41 Generic IDoc Support

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.



Figure 5-43 XML File Format

5.7.3 Create Generic IDoc Outbound Endpoint

- 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.

Adapter Configuration Wizard - Step 3 of 5	
oject Selection	010101010101010101010101010
Select SAP objects, BAPI, RFC, or IDoc, to retrieve and des	scribe.
Hierarchical Alphabetical	Selected BAPI/RFC functions or IDOC message:
ALE/EDI Messages (IDOCs)	Seneric IDOC Generic IDOC
CWM/SHP_OBDLV_CONFIRM_DEC CWM/SHP_OBDLV_SAVE_REPLICA CWM/SHP_OBDLV_SAVE_REPLICA CWM/SHP_OBDLV_SPLIT_DECENTRAL CWM/STPPOD CMM/STPPOD CMM/STPPOD CMM/STPOD CMM	Name Type Description
Help < Back	Next > Enish Cancel

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				
🕑 🚺 🗧 🔛	000	日日日	20	₼ \$1 🕱 🗷 🕜 🕻
🕫 🗈 SAP				
Doc display			• • •	-
7 🔁 IDoc 000000000855447		Technical		
Control Rec.		Direction		2 Inbox
👂 🛄 Data records	Total r	Current s		53 000
👂 🧰 Status records		Basic typ	e	MATMAS01
		Extension		
		Message t	уре	MATMAS
		Partner N	o.	T90CLNT090
		Partn.Typ	e	LS
		Port		SAPEQ6
		Content of	selecce	a segment
		Fld name	Fld con	nt.
				_
				.
				_
			_	

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.

🗆 (🗲 (Σ) sapService Operations: COSMAS01 Σ) = ∰ BPELProcess1 fileReference \odot Operations: 5 \bigcirc Write 🗆 (🗲 sapService_3 Operations MATMAS01

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	
Select SAP objects, BAPI, RFC, or IDoc, to retrieve and o Hierarchical Alphabetical	describe. 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/DEBMAS_SLL SAPSLL/DEBMAS_SLL	MATMAS01 Material Master MATMAS02 Material Master MATMAS03 Material Master
MATMASO1 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-ran							
coherence-transaction-rar							
	SAPAdapter						
□							
	DefaultToDoTaskFlow						
	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 Credential Mapping
-------------	-----------------------------

Settings for SAPAdapter								
Overview Deployment Plan Configuration Security Targets Control Testing Monito								itori
Roles Policies 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 resc

Customize this table

Outbound Credential Mappings

WLS User EIS User	Outbound Con
There	e 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

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.

Figure 5-54	Create a l	New Securit	ty Credent	ial Mapping
-------------	------------	-------------	------------	-------------

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

De	fa	u	t	Us	er
				U U	

Unauthenticated WLS User

Configured User Name

Webberghe Commenter March

.

webLogic Server	User Name:

.

weblogic

Back	Next	Finish	Cancel
the second se			

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 would * Indicates required fields	l like to map the WebLogic Se
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] ③
View Application Deployments Application Deployments SOA ASSociation Sociation Application Deployments ADD Sociation ADD Sociation	Active Retire Shut Down Test Settings Active Retire Shut Down Test Settings Dashboard Composite Definition Flow Instances Unit Tests Policies Components Name Services and References 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	IS 🔻	5	
Dashboar	d Composite	Definition	Flow Ins	tances	Unit Tests	Policies		
	-			Attache	d To		Policy Reference Status	Category
Policy N								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.

Active Ret	ire Shut Dov	vn	Test	Setting	s 🔻	9
ashboard	Composite Definition	Flow In:	stances	Unit Tests	Policies	
Policy Name	BPELProcess 1		Attach	ed To		
Daliau Mana	Attach To/Detach BPELProcess 1	From 🔻	1	- J T-		Policy Reference
No policies a	S bpelprocess 1_clien	t_ep				Status
	sapReference					

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

ategory	Enabled	Description
curity	~	This policy
	7 Detach	
).
ategory	Status	Description
8	▼ ategory	

- 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.

ure 5-60 CompCo	•		•						
SOA Comp								Page Refres	ned
Active Re	etire	Shut Dov	wn	Test	Settin	igs 🔻	9		
Dashboard	Composite	Definition	Flow Ins	stances	Unit Tests	Policies			
	Detach Fron		e the list o	of attache		service bin	dings and	d components	of
Policy Nam	Q.		FIOIT	Attached	d To		Pol	icy Reference Status	(
	_username_t			-					

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

Figure 5-61 Request Tab

Rec	quest	Respons	e				
\triangleright	> Security						
\triangleright	Quality of Service						
\triangleright	> HTTP Header						
\triangleright	Additi	onal Test	Options				
	Input Arguments						
	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 \bigcirc HTT	TP Basic Auth 🔍 Advanced 🔍 None
Compatible Client Policies	Other Client Policies
All	I AI
No policy found	<pre>oracle/wss_saml20_token_over_ssl_client_policy oracle/wss_saml20_token_over_ssl_client_policy oracle/wss_saml_token_bearer_over_ssl_client_policy</pre>
	oracle/wss_saml_token_over_ssl_client_policy
	oracle/wss_username_token_client_policy oracle/wss_username_token_over_ssl_client_policy
* Username weblogic	JKS Keystore Location
* Password	JKS Keystore Password
Advanced Options	rassivia
Quality of Service	
> HTTP Header	
Additional Test Options	
Input Arguments	
Tree View Enable Validation	X

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.

Figure 5-63 Test Web Service

				Test Web Service When the page refreshes with parameters, and click Test Web
ALLDAT/bpelproce	ess1_dient_ep?WSDL	Q	Parse WSDL or WADL	
)AT/bpelprocess	Edit Endpoint URL			
		5		

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.

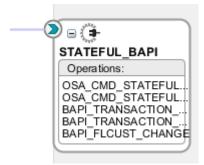
Adapter Configuration Wizard - Step 4	4 of 5	×
JCA Properties	01	*
Specify the Name and Value of all JCA Adapte	ter Properties.	×
Name	Value	
Interaction		
	stateful off	
ExceptionFilter SchemaValidation	off	
jca.retry.count	9	
jca.retry.interval	1	
jca.retry.backoff	2	
jca.retry.maxInterval	120	
Help	< Back Next > 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.

Specify the Name and Value of all JCA Adapter Prop	erties.	
		ф ж
roperties		
Name	Value	
nteraction	stateful	
xceptionFilter	off	
chemaValidation	off	
ca.retry.count	9	
ta.retry.interval	1	
ca.retry.backoff	2	
ca.retry.maxInterval	120	

- 4. Click Next and then Finish.
- 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">
    operty 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.

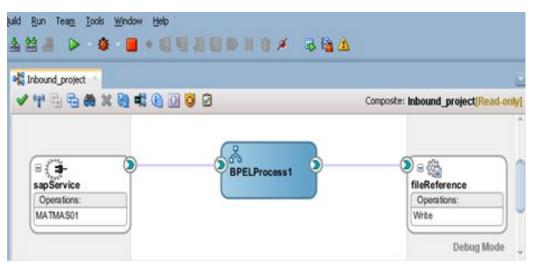
Navigate <u>B</u> uild <u>R</u> un Tea <u>m</u> Iools - 🙈 🚵 🕍 騗 🕨 👰	<u>W</u> indow <u>H</u> elp		
ାର୍ଣ୍ଣ Project1 × ✔ ୩୩ 🗟 💥 📫 । 🚺 🧿 🖄 ।	B 🔁 🏟 🔞		Project1
Exposed Services	Components	External References	
Design Source History Debugging: Project1.jpr - Log	SOA Debugger Connection Settings Hgst: 10.30.32.80 Port: 5004 Imeout: 5 Skip this dialog next time Help OK		×

Figure 5-69 SOA Debugger for Inbound

2. Enter the Host IP and click OK.

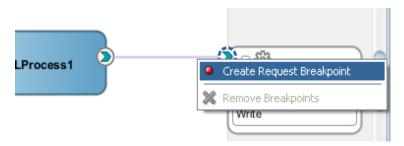
JDeveloper deploys the SOA project for debugging, Once JDeveloper connected to SOA debugger running on SOA run-time, it shows several SOA debugger windows, as shown in Figure 5-70.

Figure 5-70 SOA Debugger Windows



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 Relation Search Hawipate Buld Bun Team Tools Window Halp 					
Applications Application Servers	Step 0	Over in Inbound_project.jpr (P6)			
8) I X	🗸 🕂 🗄 🖶 99 X 🚳 式 🕲 🖾 🔘	Composite: Inbound_project(Read-only)			
Application Servers Application Servers Application Servers Application Servers Applications Applic	E Service Operations: MATMA 501	BPELProcess1			
web Services	Debugging Inbound_project.jpr - Log Watches	s Data Smart Data Breakpoints			
	Namo	1 🖬 🕲			
inbound_project - Structure - Stack -	C(X) eod G(X) nativePayload G(X) body	3de2a9e6-85e6-4855-a93a-83c/9505676a3-00000928			
Bell Processes Berlen Services Berlences Text Subes	E SP 1000 SP 000 EEEN SP 00 EDLAAAA SP 00 EDLACKO SP 000 EDLACKO SP 000 EDLACKO SP 000 EDLACKO SP 000 EDLACKO SP 000 EEEN SP	k co weblogic, Administrators chones			

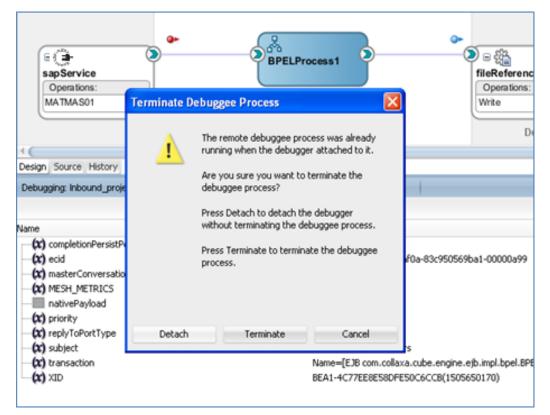
It hits the next breakpoint, as shown in Figure 5-73.

· ≥ = = = = = • • • • • • • • •	▲월글 ▷ � ■ • 0 월 8	EDDII:: ≠ 3-6 <u>6</u> Δ
Applications Application Servers -	4월 Inbound_project ↔ ✔ 1일 전: 월 등 48 32 8일 4일 6일 6일 6일 6일	Compositer Inbound project/Read only
Acketable Servers Casters Cas	E 2	BPELProcess 1
B Control Web Services	Debugging inbound_project.jpr - Log Watches Name	Dets - Smart Data Breakpoints
hound project - Stuck Stock Stock Stock Stock Stock Stock Stock Stock Stock Stock Stock Stock Stock Stock Stock Stock Stock Stock Stock Stock Stock Stock Stock Stock Stock Stock Stock St	CQ completionPersistPolicy CQ completionPersistPolicy CQ masterConversationId CQ PressUPETRICS ImativePayload CQ printly TellorTtype CQ repl/TellorTtype CQ subject CQ subject	null 3de3atles5-8565-4855-af0a-83c950569ba8-00000a99 null (out of sospe) 0 null webbiogs, Administrators Name=[E38.com.colaxa.cube.engine.etb.impl.bpel.BPELDeliveryBean BEA1=#C77EE8E586PES0C6CCB(1505650170)

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.

davigate Build Run Tea <u>m</u> Iools Wir · 🙈 🎄 🕍 😹 🕨 - 🅸 - 📕	.dow Help - + € Ч # 20 ₩ ₩ 🕆 🗡	Q- Search
Project 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.

와 Outbound_project × 응 sapReference.xsd × · · ≥ test.xm/ × ✔ 약 · · · · · · · · · · · · · · · · · ·	Composite: Outbound_project[Read-only]
	Debug Mode
Debugging: Outbound_project.jpr - Log × Watches Data Smart Data Breakpoin	ts
۹ 📕	Actions *
Debugger attempting to connect to remote process at 10.30.32.80 50 Debugger connected to remote process at 10.30.32.80 5004.	04.

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.

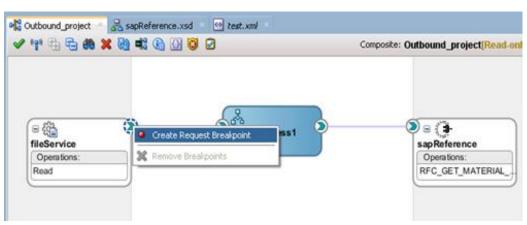


Figure 5-77 Breakpoint Options

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

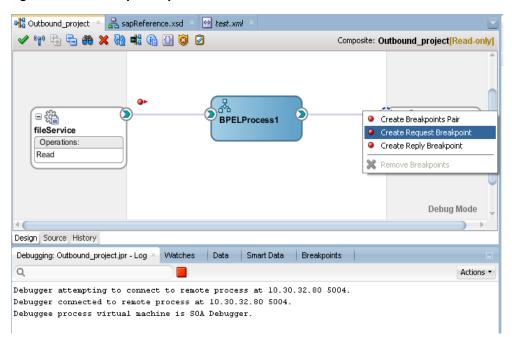
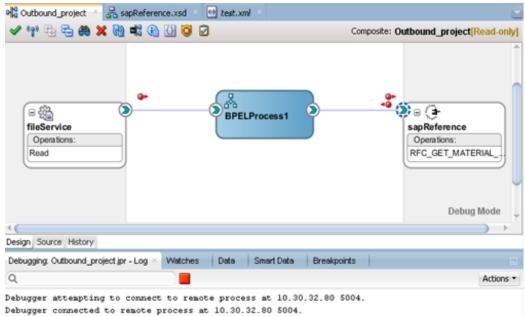


Figure 5-78 Breakpoint Options

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.

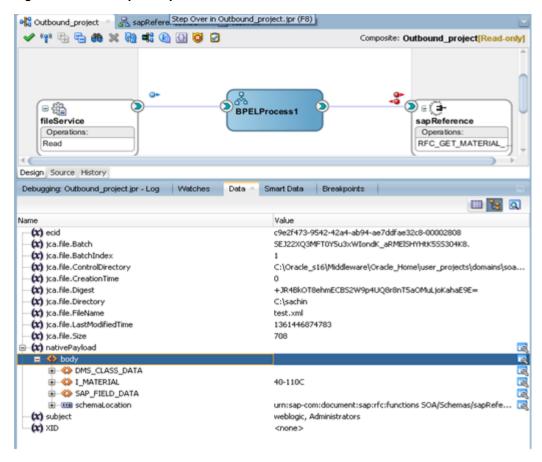


Figure 5-80 Breakpoint Options

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

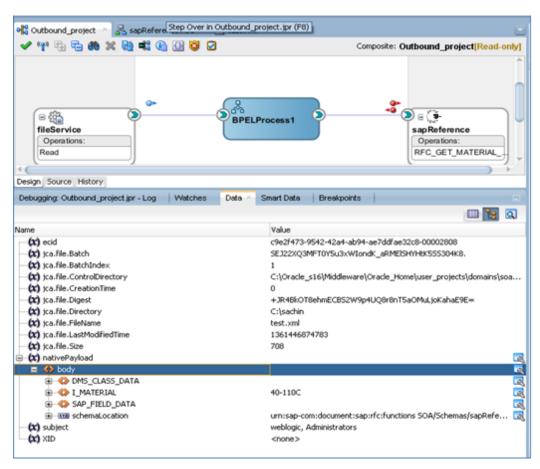


Figure 5-81 Breakpoint Options

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

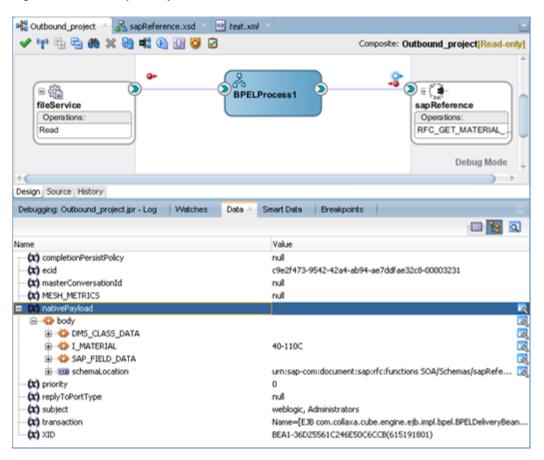
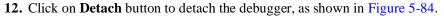


Figure 5-82 Breakpoint Options

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

📲 Outbound_project 🐣 🔗 sapReference.xsd	× 🕺 test.xml ×	
🖌 🖓 🗄 🖶 🤲 🗶 🔞 🛋 🕼 🖸 🕻	0	Composite: Outbound_project[Read-only]
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Å	* » = (*
Ge ∰ Description	BPELProcess1	sapReference
Operations: Read		Operations: RFC_GET_MATERIAL_
10		Debug Mode
Design Source History		
Debugging: Outbound_project.jpr - Log Watch	nes Data × Smart Data E	Breakpoints
		💷 📴 🔍
Name	Value	
(x) ecid	c9e2f473-9542	2-42a4-ab94-ae7ddfae32c8-00003231
(a) nativePayload     (a) - (b) body     (b) - (c) DMS_CLASS_DATA		বে বে OC does not exist বে বে বে বে
€ WESSAGE	Material 40-11	0C does not exist
B-OPE_RETURN	99	
SAP_FIELD_DATA		
-(x) subject	weblogic, Adm	
(x) transaction	-	m.collaxa.cube.engine.ejb.impl.bpel.BPELDeliveryBean 51C246ES0C6CCB(615191801)
fel on	00A1-3002330	xxxx TOLOOLOGUEQUEQUE 710017

Figure 5-83 Response Breakpoint



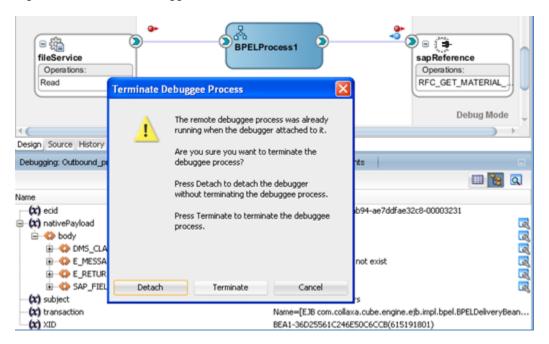


Figure 5-84 Detach Debugger

# 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			- <del>-</del>	*
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		0173939393939494
Specify the Name and Value of all JC	Adapter 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.

### Figure 5-87 JCA Property

JCA Properties	01010101010101010101010
Specify the Name and Value of all JCA Ad	lapter 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
<b>*</b>	
1	

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 Ac	lapter Properties.	
Properties		수 🗙
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	<b>•</b>	
ErrorDocument		
BGRFCQueues		

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

Figure 5-89 JCA Property

JCA Properties		*
Specify the Name and Value of all JCA A	Japter Properties.	
Properties		<del>}</del> ×
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.

Exposed Services	Components	External References
	BPELProcess1	
sapService		fileReference
Operations: MATMAS01	· · · · · · · · · · · · · · · · · · ·	Operations: Write

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

🖃 <import <="" namespace="http://xmlns.oracle.com/pcbpel/adapter/file/SOA_STG12/Threshold_Inbound/fileReference" th=""></import>
<pre>location="WSDLs/fileReference.wsdl" importType="wsdl"/&gt;</pre>
<pre>Service name="sapService" ui:wsdlLocation="WSDLs/sapService.wsdl"&gt;</pre>
<interface.wsdl adapters="" interface="http://xmlns.oracle.com/pcbpel/adapter/sap/SOA_STG12/Threshold_Inbound/sapService&lt;/td&gt;&lt;/tr&gt;&lt;tr&gt;&lt;td&gt;&lt;pre&gt;     &lt;binding.jca config=" sap.jca"="" sapservice=""> </interface.wsdl>
<property many="false" name="payloadSizeThreshold" override="may" type="xs:string">24000</property>
<property many="false" name="useRejectedMessageRecovery" override="may" type="xs:string">true</property>
<pre><pre>cyproperty name="jca.retry.count" type="xs:int" many="false" override="may"&gt;3</pre></pre>
<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	
Send material in full		

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

<b>How Trace </b> ③ his page shows the flow of the message through various composite and component instances.				
Fault Owner	Fault Time	Recovery		
sapService	May 7, 2015 5:43:25 PM	Nonrecoverable		

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	
🛃 ]] Threshold_Inbound		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

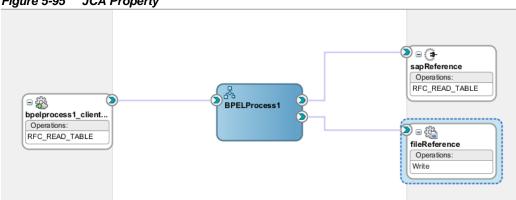


Figure 5-95 JCA Property

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

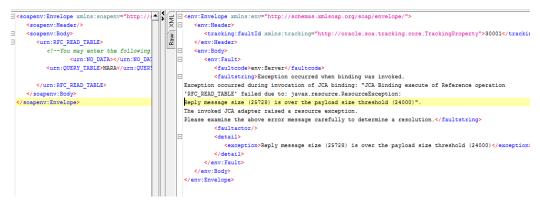
<pre><reference name="sapReference" ui:wsdllocation="WSDLs/sapReference.wsdl"></reference></pre>
<interface.wsdl adapters="" interface="http://xmlns.oracle.com/pcbpel/adapter/sap/SOASTG11/ThresholdChkOUT/sapReference#wsdl.&lt;/td&gt;&lt;/tr&gt;&lt;tr&gt;&lt;td&gt;&lt;pre&gt;&lt;binding.jca config=" sapreference_sap.jca"=""></interface.wsdl>
<property many="false" name="jca.retry.count" override="may" type="xs:int">9</property>
<property many="false" name="jca.retry.interval" override="may" type="xs:int">1</property>
<property many="false" name="jca.retry.backoff" override="may" type="xs:int">2</property>
<pre><pre>cproperty name="jca.retry.maxInterval" type="xs:int" many="false" override="may"&gt;120</pre></pre>
<pre><pre>cproperty name="payloadSizeThreshold" type="xs:string" many="false" override="may"&gt;24000</pre></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.

low Tra	<b>ce ()</b> shows the flow of the message through various composite a	nd component instances.	
aults	Composite Sensor Values Composites		
Recove	View V		
ror M	essage	Fault Owner	
) 6			Ma
	🔇 Service System Fault		
4	Occurred May 5, 2015 4:14:38 PM		
ace	Error Message		
r	BINDING.JCA-12563 Exception occurred when binding was invoked.		
ïew 🔻	Exception occurred during invocation of JCA binding: Reference operation 'RFC_READ_TABLE' failed due		
Instar	javax.resource.ResourceException: Reply message s		ate
⊿ 🧧	payload size threshold (24000)". The invoked JCA adapter raised a resource exceptior		) Failed
	Please examine the above error message carefully to	determine a resolution.	) Failed
			🥖 🕴 Failed
	This fault is Nonrecoverable.		
	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

** Aus <invok -com:d <bpelf n bind Except: ceExcep The in Please 24000) <messai< th=""><th>udii Message: Failted while invoking operation "RFC_READ_TABLE" on provider "sapReference". Udit Detail: {messages&gt;{input&gt; detail: {messages&gt;{input&gt; detail: {messages&gt;{input&gt; detail: {messages&gt;{input&gt; detail: {messages&gt;{input&gt; com:input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input&gt;{input}{input&gt;{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{inp</th></messai<></bpelf </invok 	udii Message: Failted while invoking operation "RFC_READ_TABLE" on provider "sapReference". Udit Detail: {messages>{input> detail: {messages>{input> detail: {messages>{input> detail: {messages>{input> detail: {messages>{input> com:input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input>{input}{input>{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{input}{inp

**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	눌 JCA Transport Configuratio				
Transport Details	Use this page to configure the trans	port information for this service}			
Message Handling	JCA File	THRESHFILE/Resources/sapReference_sap.jca	2, 🤣		
Performance	Adapter Name	MySAP Adapter			
Policies	Adapter Type	sap			
	Dispatch Policy	SBDefaultResponseWorkManager			
	INDI Service Account				
	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	
					/i.
	Dynamic EndPoint Properties				🕂 🗙
		property		value	•
		payloadSizeThreshold		1400	
	Advanced Cettings				

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 Status of IDoc

	y Result X							
		).052 s	econds					
			1 TIDSTATE	PROGRAMI	D	ALAST_UPDATED_DATE		
10	0A1E021E42D854DB30C75F7D		EXECUTED	ORAQA1		11-02-2015 08:50:10		
11	0A1E021E42D854DB30C65F7C		EXECUTED	ORAQA1	•••	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		
	0A1E020D17A454DB3002036C		FAILED	ORAOA1		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 Nex	t Finish Cancel
Test Database Connection	he connection properties you provided.
	3C driver class used to create database connections in the connection pool?
Note that this driver class must be i	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.
JRL:	jdbc:oracle:thin:@//10.30.32.110:1521/PDBORCL
What database account user name c	lo you want to use to create database connections?
Database User Name:	TIDUSER
What is the database account passw	ord to use to create database connections?
Note: for secure password manage	ment, enter the password in the Password field instead of the Properties field below
	•••••
Password:	

# 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 deployment

#### **Outbound Connection Properties**

Save						
Property Type	Property Value					
java.lang.String	jdbc/TIDUSER					
java.lang.String						
	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

ject Selection	11	1103941416	<b>*</b>
elect SAP objects, BAPI, RFC, or IDoc, to retrieve and de Hierarchical Alphabetical		RFC function	is or IDOC messag
Car / SAPSLL/CUS_FIN     Car / SAPSLL/CUS_INBOUND     Car / SAPSLL/CUS_PCS     Car / SAPSLL/CUS_PED     Car / SAPSLL/CUS_PRL	MATMASO	1 Material	Master
SAPSLL/CUS_SCIPED      SAPSLL/CUS_SCWPED	Name:		
SAPSIL/CUS_STA     SAPSIL/CUS_STA     SAPSIL/CUS_VZAV     SAPSIL/CUS_VZL     SAPSIL/CUS_WAT     SAPSIL/DEBMAS_SIL     SAPSIL/DEBMAS_SIL     SAPSIL/MATMAS_SIL     SAPSIL/MATMAS_SIL     MATMAS_SIL	Name	Туре	Description

Figure 5-105 JCA Properties

CA Properties		
pecify the Name and Value of all JCA A	apter Properties.	
roperties	<del>ት</del>	×
Vame	Value	
ncodeIDOC	no	
ControlCharacter	encode	
AutoSYSTAT01	no	
rogramID	ORAQA2	
ca.retry.interval	1	
ca.retry.maxInterval	120	
ca.retry.count	9	
ca.retry.backoff	2	
AsAttachment	true	
	true	
	false	
	<b></b>	

**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

	dpoint-activation portType="sapService FT" operation="sapService">
1	
<	activation-spec className="oracle.tip.adapter.sap.inbound.SAPActivationSpecImpl">
	<property name="EncodeIDOC" value="no"></property>
E E	<property name="AsAttachment" value="true"></property>
	<property name="ControlCharacter" value="encode"></property>
	<property name="AutoSYSTAT01" value="no"></property>
	<property name="ProgramID" value="ORAQA2"></property>
	<property name="IDOC" value="MATMAS01"></property>
	<property name="Type" value="IDOC"></property>
<	/activation-spec>
<td>ndpoint-activation&gt;</td>	ndpoint-activation>

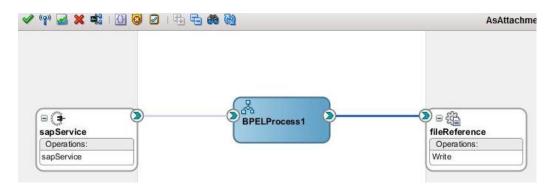
**5.** After successful configuration of SAP Adapter, Configure file Adapter and select schema as shown below.



<b>7</b> FILE Adapter Configuration	on Wizard - Step 6 of 7	<u></u>	AsAtt
Messages		5	
that defines the messages in I	rite File operation. Specify the Schema File Location and select the Schema Elem he outgoing files. Use the Browse button to find an existing schema definition. If n you do not need to specify a Schema.		
Message Schema			
URL	is not required (Schema is Opaque)	<b>\$</b>	
Schema Element	•		
	👌 Type Chooser		L
	Type Explorer Project Schema Files Project WSDL Files SapService.wsdl MSDL Schemas WSDL Schemas Schema - http://xmlns.oracle.com/pcbpel/ada	pter/file/att	tachment/
Help			

6. Configure BPEL Process

Figure 5-108 Configured 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

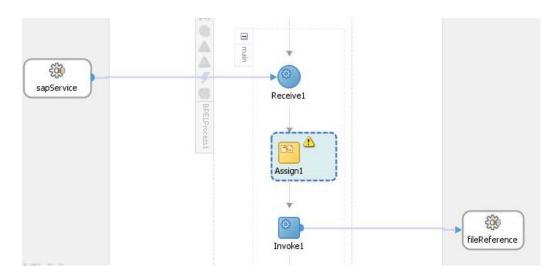
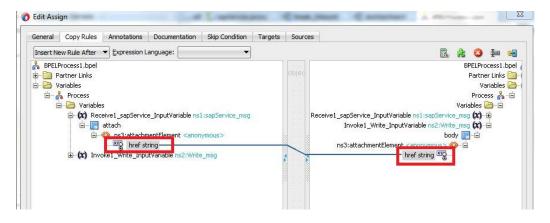
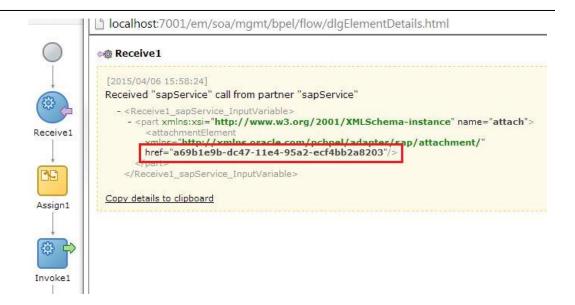


Figure 5-110 Open assign activity and Map 'href_id'



- **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.

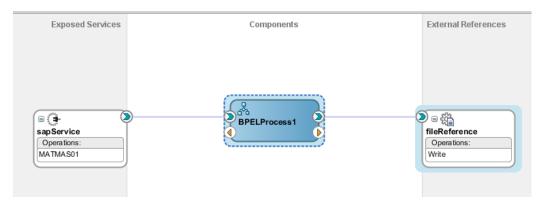
Resiliency-Failure: Gracefully handle downstream endpoint failures to prevent faults from building up in the system/error hospital by shutting down incoming requests for the flow.

# 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.

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

Figure 5-114 Test Deployed Project

Target Navig	gation		Ξ
View <b>v</b>			-
<ul> <li>Application I</li> <li>SOA</li> </ul>	Deployments		Server
⊿ <u>∰ soa-i</u> ** ₀ @ o	Home	Þ	Name Admin:
🔺 🛅 WebLogic	Monitoring	Þ	Host TDCVI
🖌 📑 base	Logs	Þ	Listen Port 7017
/ 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	Þ	
	Target Sitemap		

**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
Tunure Nute			•	Chorsin	•		•	minutes
Retry Interval	5	^	~	minutes	Disal	ble 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

Reply	l Revert	

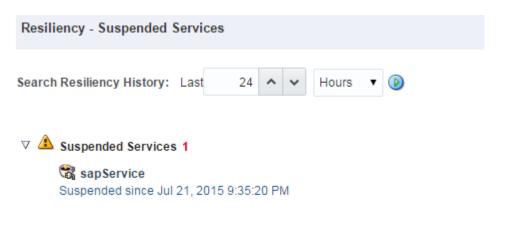
4. Click OK for confirmation.



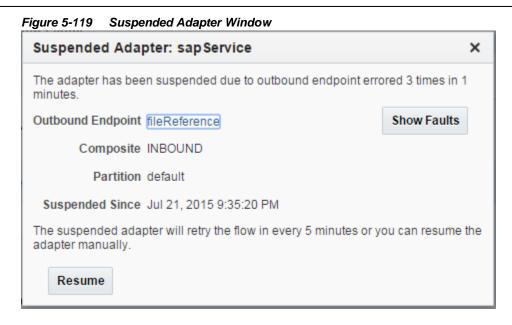
Resiliency cont	figuration have b	een saved succ	essfully.
			ок
			_

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)

JCA Properties		0101039494940346
Specify the Name and Value of all JCA Ada	pter Properties.	
Properties		<del>ት</del> 🗶
Name	Value	
AutoSYSTAT01	no	
EncodeIDOC	no	
ControlCharacter	encode	
Segment release provider	User input	
ProgramID		
jca.retry.count	9	
jca.retry.interval	1	
jca.retry.backoff	2	
jca.retry.maxInterval	120	
Segment release version	30c	
Help	< Back Next >	Finish Cancel

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

CA Properties	010101010	angeleterenene
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	e 🔻
ProgramID	Default SAP release	
ca.retry.count	User input	
ca.retry.interval	1	
ca.retry.backoff	2	
ca.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

AP Adapter Service				and the second s
				-
Welcome to the Adapter Configura	tion Wiz	ard		
This wizard helps you create a service using a SAP / Jefine an operation for the service.	Adapter. Yo	ou will be asked to s	pecify configuration	on parameters and
Inter a Service Name.				
Jame: sapService				
Help	Back	Next >	Finish	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				1 -
	nection is required to config ate a New Connection.	gu <mark>re this adapter. Se</mark>	elect a SAP R/3 con	nection already defi	ned in your
Connection:	DefaultClient			-	+1×
Client:	800				
Applicati	on Server: 10.30.32.42			Add	dit Delete
System I	Number: 00				
JNDI Name:	eis/SAP/FMWDEMO				Q

**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	- Statistics - Costatador	100
	nection is required to ate a New Connection	configure this adapter. Select a SAP R/3 connection already d	efined in your
Connection:	DefaultClient		- +/×
Client: Applicatio	800 Del	ete SAP R/3 Connection	
System N JNDI Name:	lumber: 00 eis/SAP/FMWI	Pelete SAP connection: DefaultClient ?	<b>Q</b>
		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	3 Connection	X
	Connection Nam	ne: DefaultClient Import	
	User Conn	ection	
	User Logon P	Parameters:	
	User Name:	JCA_DEV	
	Pass <u>w</u> ord:	••••••	
	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.

Create SAP R/3 Connection Connection Name: DefaultClient	Import
Open	×
Location: 🗀 Server_connection 🔻 🖆 🏠	
DevServer.txt	
File Name: DevServer.txt	
[ File Type: All Files	
	n Cancel
Help	K 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

🕐 Edit SAP R/3 C	Connection	x
Connection Nam	ne: DevServer Import	
User Conn	nection	_
User Logon Pa	Parameters:	
User Name:	JCA_DEV	
Password:	••••••	
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 Para	ameters:	
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:		
Server 🔽 Securit	y 🗌 Trace 🗌 Management 🗌 Additional	Test Connection

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 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	7 Trace Management Additional	Test Connection
Help		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.

Edit SAP R/3 Connection	X
Connection Name: ER7 User Connection Trace	Import
Trace All Connections:	
JCO Trace Level:	
Logging Path : Browse	
Trace Individual Connection:	
RFC Trace Level: 0	
CPIC Trace Level:	
Trace Server Connections:	
Server Trace Level:	
(*) Note: select 0 to disable trace	
Server Security V Trace Management Additional	Test Connection
Help OK	Cancel

### 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			
orary 🔻	Share with 🔻 🛛 Burn 🔹 New folder			
	Name	Date modified	Туре	Size
	JCO20150721_133336554.trc	21-07-2015 13:33	TRC File	7 KB

### **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	Import
User Connection Server Security Trace Management	
Connection Management Parameters:(Optional)	
Pool Capacity:	
Pe <u>a</u> k Limit:	
Max Wait (ms):	
Expi <u>r</u> ation Time (ms):	
Expiration Period ( <u>m</u> s):	
Server Security Trace Management Additional	Test Connection
	Test Connection

- 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	<b>X</b>
Connection Name: DefaultClient	Import
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:	
SNC Name:	
SNC Lib <u>r</u> ary:	
Server Security V Trace Management Additional	Test Connection
	¥
<u>Н</u> еlp ОК	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	<ul> <li>This specifies the level of protection to use for the connection.</li> <li>Default value is 3.</li> <li>Possible values of this field are as mentioned below:</li> <li>1: Authentication only.</li> <li>2: Integrity protection.</li> <li>3: Privacy protection (default).</li> <li>8: Use the value from profile parameter '<i>snc/data_protection/use</i>' maintained on the SAP server.</li> </ul>

	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:

#### Table 6-3 SNC Parameters required for Inbound Connection

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 ' <i>snc/data_protection/max</i> ' 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 6-4Parameters 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.

Connection Name: DefaultClient	Import
User Connection Management	Additional
Additional Parameters:(Optional)	
Property Name	Property Value
jco.dient	sknjdnfkiwsndfsandsnkodnfksndnknfskndskjdnks.
Add Remove	
Add Remove	nagement ☑ Additional <u>T</u> est Connecti
Server Security Trace ✓ Ma Test connection successful w/parameters: {jco.client.user=JCA_DEV, jco.client.lang=en, sap.connection.name=DefaultClient,	
Server Security Trace Ma Test connection successful w/parameters: {jco.dient.user=JCA_DEV, jco.dient.lang=en,	

#### 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.

Figure 6-20 Object Sel	lection 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)	o retrieve and descri		I/RFC function	ns or IDOC messag
	3	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

Hierarchical	Alphabetical	1
🔁 SAP		
🖨 🗁 Busine	ss Objects (BAP	PIs)
🕀 🧰 🛆	counting - Gene	eral
🕀 🧰 Ap	plication Platfo	rm
🕀 🧰 AL	ito-ID Infrastru	cture
🕀 🗀 Ba	sis Components	5
🕀 🧰 Co	ontrolling	
🕀 🗀 Cr	oss-Application	Components
🚊 🗀 Ci	istomer Service	
🗄 💼 En	terprise Contro	lling
🕀 🖓 🛅 En	terprise Portal	
🕀 🗀 En	vironment, Hea	alth and Safety
🕀 🗀 Fir	nancial Accounti	ing
🕀 🗀 Fir	nancial Services	
🕀 🗀 Fir	nancial Services	
🕀 🙆 Fir	nancials	
🗄 🗀 🚺	vestment Mana	gement
I LAN	1 (r) (r) (r)	

• 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		4
🖨 🗁 Busine	ess Objects (BAPI	s)
🛓 🗀 🛆 A		
🖶 🗀 B		
🚊 🗀 C		
🖶 🙆 D		
🖶 🗀 E		
🛓 🖶 🗠 🔁 F		
🕀 🗀 G		
😐 🗀 н		
🛓 🕀 🗀 I		
🛓 💮 📋 🕽		
🛓 💼 K		
🖶 🗠 🔁 L		
🚊 🕀 🗀 M		
🖨 🗠 🔁 N		
🛓 🗄 🙆 O		-
1 4 ~ ~		

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 ret		functions or IDOC message
SAP Business Objects (BAPIs) Please wait Function Modules (RFCs) ALE/EDI Messages (IDOCs)	>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	
Connecting Connecting to SA	Ρ	escription
Help		Finish 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

bject Selection			es
Select SAP objects, BAPI, RFC, or IDoc, to Hierarchical Alphabetical SAP Business Objects (BAPIs) Application Platform Application Platform Auto-ID Infrastructure Basis Components Controlling Controlling Controlling Customer Service Customer Service Customer Service Customer Service Customer Service Customer Service Financial Accounting Financial Accounting Financial Services	Search SAP Repository Search SAP Repository Find: COMPANY* CompanyCode.ExistenceCheck [BAPI_ CompanyCode.GetDetail [BAPI_COMPAN CompanyCode.GetPeriod [BAPI_COMPANY Company.Code.GetPeriod [BAPI_COMPANY_ Company.ExistenceCheck [BAPI_COMPANY_C Company.GetDetail [BAPI_COMPANY_C Company.GetList [BAPI_COMPANY_C Company.GetList [BAPI_COMPANY_C Company.GetList [BAPI_COMPANY_C Company.GetList [BAPI_COMPANY_C Company.GetList [BAPI_COMPANY_C Company.GetList [BAPI_COMPANY_C COMPANY_C Company.GetList [BAPI_COMPANY_C COMPANY_C Company.GetList [BAPI_COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C COMPANY_C C COMPANY_C C C C C C C C C C C C C C	ANYCODE_GETLETAIL] IYCODE_GETLIST] ANYCODE_GET_PERIOD] PANY_EXISTENCECHECK] GETDETAIL]	Search
Financial Services      Financials      Investment Management	Help	ОК	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 messages
ONLINE SPLITTER	- »	BAPI_COMP	ANYCODE_(	GETDETAIL Comp
 ORG_UNITS	8			
	00			
_STATKEYFIGURE	3			
DP_XI_PROXY				
CORE		10		) )
CLOSING				
CRC		Definition: BAPI_		ODE_GETDETAIL
CRC		_		-
5		Name	Туре	Description
SCORE		Name COMPANYCOD	Type CHAR	Description Company Code
GCORE 0002 BAPI_COMPANYCODE_GET_PERIOD For	A REAL PROPERTY OF A REAL PROPER	Name COMPANYCOD COMPANYCOD	Type CHAR STRUCT	Description Company Code Company Code
GCORE GCORE BAPI_COMPANYCODE_GET_PERIOD For BAPI_COMPANYCODE_GETLIST List of C	sqmo	Name COMPANYCOD COMPANYCOD	Type CHAR STRUCT	Description Company Code Company Code Company Code
CRC S SCORE 0002 BAPI_COMPANYCODE_GET_PERIOD For BAPI_COMPANYCODE_GETLIST List of C BAPI_CCODE_GET_LASTDAY_FYEAR For	ompa r Con	Name COMPANYCOD COMPANYCOD	Type CHAR STRUCT	Description Company Code . Company Code
S SCORE 0002 BAPI_COMPANYCODE_GET_PERIOD For BAPI_COMPANYCODE_GETLIST List of C	ompa r Con	Name COMPANYCOD COMPANYCOD	Type CHAR STRUCT	Description Company Code Company Code Company Code
G GCORE 0002 BAPI_COMPANYCODE_GET_PERIOD For BAPI_COMPANYCODE_GETLIST List of C BAPI_CCODE_GET_LASTDAY_FYEAR For	ompa r Con	Name COMPANYCOD COMPANYCOD	Type CHAR STRUCT	Description Company Code Company Code Company Code
GCORE GCORE BAPI_COMPANYCODE_GET_PERIOD For BAPI_COMPANYCODE_GETLIST List of C BAPI_CCODE_GET_LASTDAY_FYEAR For	ompa r Con	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     Reverse     AcctngBilling     Check     Check     Select     Select     View Schema	AcctngBilling.CheckReversal [BAPI_ACC_BIL AcctngBilling.Post [BAPI_ACC_BILLING_POST AcctngBilling.Post [BAPI_ACC_BILLING_POST AcctngBilling.Post [BAPI_ACC_BILLING_POST AcctngBilling.Post [BAPI_ACC_BILLING_POST AcctngBilling.Post [BAPI_ACC_BILLING_POST AcctngBilling.Post [BAPI_ACC_BILLING_POST AcctngBilling.Post [BAPI_ACC_BILLING_POST]
Pos Test DOCUMENTHEADER OBJ_KEY OBJ_SYS OBJ_TYPE ACCOUNTGL ACCOUNTRECEIVABLE ACCOUNTTAX CRITERIA	<pre><xsd:simpletype></xsd:simpletype></pre>

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_GETD	ETAIL (	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.

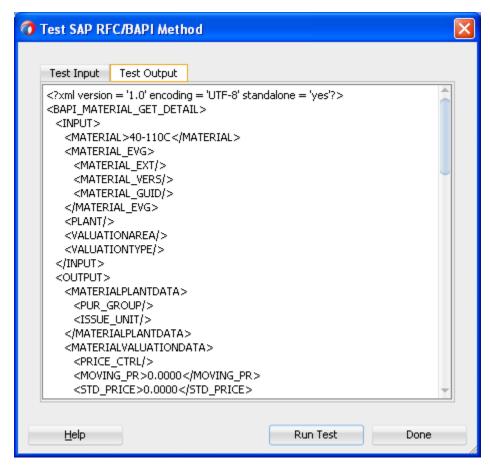


Figure 6-29 Test Output Tab

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.

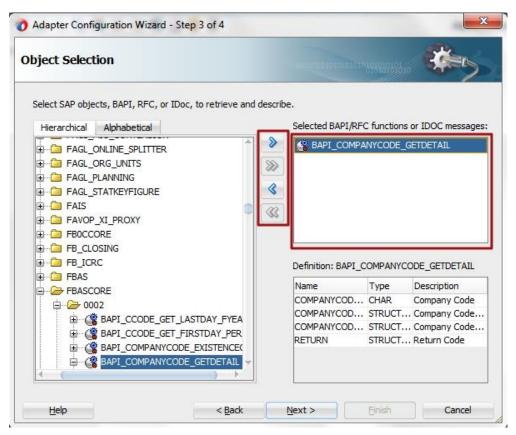
lcon	Description
8	This icon gets enabled when you select only one object to shifts into the selection panel.
8	This icon gets enabled when you select only one object to remove from the selection panel.
>>>	This icon gets enabled when you select more than one object to shift into the selection panel.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

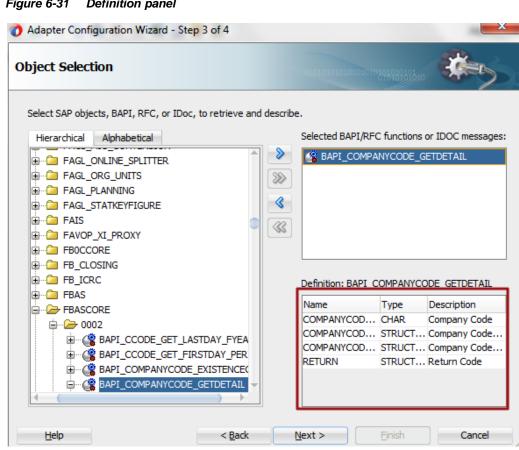
**Note:** If you select the RFC Object while creating an outbound endpoint, an option is available to define type (sRFC, tRFC, qRFC, bgRFC) of RFC connection you wanted to use while executing this object. A popup window appears, where you can choose the RFC type when you right-click on the selected RFC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

JCA Properties		TOTO BRADADASA
Specify the Name and Value of all JCA A	dapter Properties.	
Properties		<b>4</b>
Name	Value	
Interaction	stateless	
ExceptionFilter	off	
SchemaValidation	off	
jca.retry.count	9	
jca.retry.interval	1	
jca.retry.backoff	2	
jca.retry.maxInterval	120	
l		

# 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.

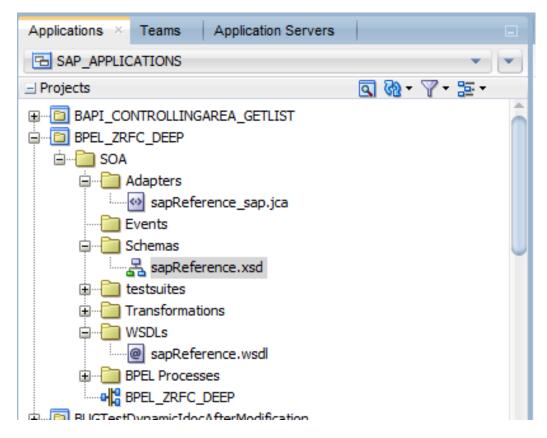


Figure 6-33 Generation WSDL/ XML Schemas Screen

# 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.



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

<b>.</b>	gg-							
Settings for	SAPAdapter							
Overview	Deployment Plan	Configuration	Security	Targets	Control	Testing	Monitoring	Notes
Save This page displays basic information about this resource adapter deployment.								
inis page a			source doup		inciric.			
Name:				SAP	Adapter			
Source Pat	th:			/ ora	de/ Oracle	/ SAPAdap	ter. rar	
Deploymer	Deployment Plan: (no plan specified)							
Staging Mo	Staging Mode: (not specified)							
Plan Stagir	ng Mode:			(not	specified)			
Security M	odel:			DDO	nly			
街 Deploy	ment Order:			10	0			
街 Deploy	ment Principal Na	me:						

Figure 7-1 Setting Page

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 fo	r SAPAdapt	er						
	Overview	Deploymen	t Plan	Configuration	Security	/ Targets	Control	Testing	Monitoring
	General	Properties	Outb	ound Connection	Pools	Admin Objec	ts Workl	oad Inst	trumentation

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**

Ne	W Delete
	Groups and Instances 🖚
	∃ javax.resource.cci.ConnectionFactory
Ne	w 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

Create	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
	·
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 co * Indicates required fields	nnection instance
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

ansaction Authentication Connection Pool Loggin	roperties Transaction Authentication	General
-------------------------------------------------	--------------------------------------	---------

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 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 plar
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

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	<u>W</u> indow <u>H</u> elp	
$\triangleright$	- 🐠	Application Servers	Ctrl+Shift-G
		Phications	Ctrl+Shift-A
RJ_R	EQUIRE	Bookmarks	Ctrl+Shift-K
		Breakpoints	Ctrl+Shift-R
-		Components	Ctrl+Shift-P
	versio PO REL	Database	
F1_	PO_REL	D <u>e</u> bugger	

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

Figure 8-2 Application Server

Applications	Application Servers ×		?	5tart I	Page	×
K   S			V	((p))	2	
	n Servers <u>N</u> ew Applicat	tion Serv	/er		_	ed
	<u>I</u> mport					-
	E <u>x</u> port					-11
	🔂 <u>R</u> efresh	_		Ctr	I-R	4

**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.

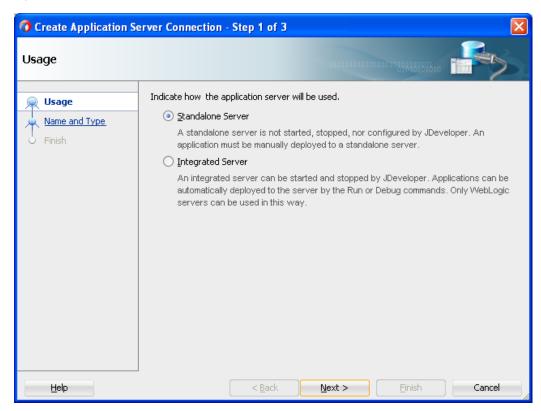


Figure 8-3 Create Application Server Connection Wizard

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 va	ld Java identifier.
Help		< <u>B</u> ack	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	
Visage 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			rollomoralarasana 📍	R.
LUsage	Specify a username and passv	word to authenticate 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 Sector	erver Connection - Step	o 4 of 6			
Configuration				194949494e	Fy.
Usage Name and Type Authentication Configuration Test Finish	WebLogic Server connecti Domain of the target will b WebLogic Hostname (Adm localhost Port: 7001 Always use SSL WebLogic Domain: base_domain	e verified		ablish a connectio	on. The
Help		< <u>B</u> ack !	<u>N</u> ext >	<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     Conference on a	Click Test Connection to determine if the in connection with the application server. Test Connection	formation specified successfully establishes a
<u>Configuration</u> <u>Test</u> <u>Finish</u>	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 Server MBeans Model Testing J3R-88-DEP-MGR Testing J3R-88-DEP-MGR Testing J3R-88-DEP-MGR-LOCAL 12 of 12 tests successful.	Success Success Success Success

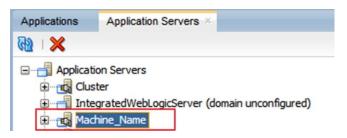
- **11.** Click on the **Test Connection** button.
- 12. The status should return Success for all tests.
- **13.** This completes the connection configuration for a new Application Server Connection in JDeveloper 12.2.1. Click **Next**. The Finish page is displayed as shown in Figure 8-9.

Figure 8-9 Finish Page

o Create Application	a 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.
Нер	< 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	Oracle	JDeve	loper 12c	MModule	e.jw	s : I	PRJ_PO_F	RELAS	_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	٥	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
·····Transformations	one SOA project for the SOA composite, components, and adapters.
Security	매입 SOA Composite
Utility System	SOA Project
SOA Tier	
Faults Interfaces	
Service Components	
Tests	
Transformations/Translations	
JSF	
JSF/Facelets JSP	
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	×
Name your application	0101010101010101010101010101010101010101	B
Analization Norma	Application Name:	
Application Name	testApp	
Project Name	Directory:	
<ul> <li>Project SOA Settings</li> </ul>	D:\orade_stage11\middleware\jdeveloper\testApp	Browse
	Application Package Prefix:	
Help	< <u>B</u> ack <u>N</u> ext > <u>F</u> inish	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.

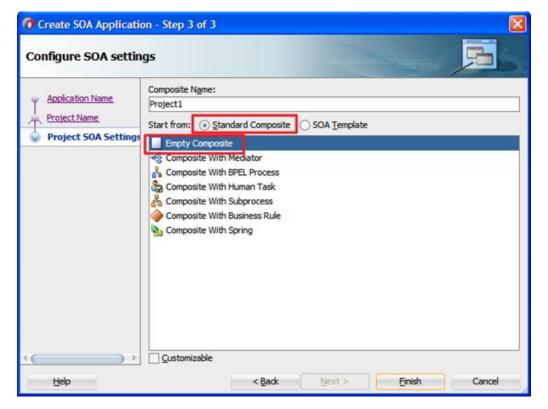
👩 Create SOA Applicati	ion - Step 2 of 3	
Name your project	0101010101010101010101010101010101010101	5
Application Name     Project Name	Project Name:       Project1         Directory:       D:\oracle_stage 11\middleware\jdeveloper\testApp\Project1	Bro <u>w</u> se
Project SOA Settings	Project Features: SOA Suite SOA Suite is a suite of tools to model SOA(Service Oriented Architecture) appli	ications.
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



6. 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 Refe	rences	SOA			•
		SOAP	Socket	UMS	-
		Applications			- 11
		£ <mark>66</mark>	÷	<b>e</b>	
( <del>)</del>	•	E-Business Suite	JDE World	SAP R/3 Adapter	
				Adapter	
		Custom/Third P	Party		- 11
		<b>3</b>			
		Third Party			
		Cloud			- 11
		<u> </u>			

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 conn	ection already de	fined in your
Connection:	DefaultClient				- + / ×
Client:	800				
Applicatio	on Server: 10.30.32.42				
System N	lumber: 00				
JNDI Name:	eis/SAP/FMWDEMO				9
				in the second se	
Help		< <u>B</u> ack	Next >	Einish	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:	<ul> <li>Direct Connection</li> </ul>	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.

Connectio	n Information				1 -
	nection is required to confi <u>c</u> ite a New Connection.	gure this adapter. S	Select a SAP R/3 cor	nnection already d	efined in your
Connection:	DefaultClient				- 🕂 🖊 🗙
Client:	800				
Applicatio	n Server: 10.30.32.42				
System N	umber: 00				
INDI Name:	eis/SAP/FMWDEMO				Q.
				C mail	Cancel
Help		< 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		
🖨 🗁 Busine	ss Objects (BAP	Is)
🚊 🗀 Ac	counting - Gene	ral
🖶 🗀 Ap	plication Platfor	m
🕀 🗀 Au	to-ID Infrastruc	ture
🕒 🔁 Ba	sis Components	
🕒 💼 🗀 Co	ntrolling	
🕒 🖨 🗁 Cr	oss-Application (	Components
📋 🗄 🗀 Cu	stomer Service	
📄 🕀 🗀 En	terprise Control	ling
📄 🗄 🗁 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	
Dbject Selection	สายมากกลายการเกิดสายการ	*	ces	<u> </u>
Select SAP objects, BAPI, RFC, or IDoc, to retrieve	Search SAP Repository			More
Hierarchical Alphabetical	Search SAP Repository		Name O Descrip	otion
Accounting - General     Application Platform     Auto-ID Infrastructure	Find:		Searc	th.
Auto-10 Infrastructure     Basis Components     Controlling				
Cross-Application Components     Gross-Application Components				
Enterprise Controlling     Enterprise Portal				
Environment, Health and Safety     Environment Accounting				
Financial Services      Financial Services      Financial Services      Financials				
Help < Ba	Help		OK Ca	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.

Figure 8-27 Finish Page

Adapter Configuration Wizard - Ste	p 5 of 5			×
Finish				
You have finished defining the When you click Finish, the wizard will creat D:\jdev_RC3_mywork\mywork\Stage20_R directory.	te the			
Help	< <u>B</u> ack	Next >	<u>F</u> inish	Cancel

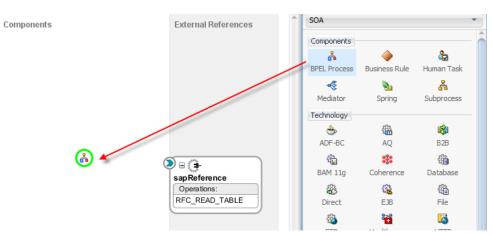
#### 21. Click Finish.

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	security of the security of th	<b>1</b>
Name:	BPELProcess1	
Namespace:	http://xmlns.oracle.com/MModule/Project4/BPELProcess1	
Directory:	D:\orade_stage11\middleware\jdeveloper\mywork\Project4\SOA\BPEL	] 🔍
Template:	Base on a WSDL	• •
Service Name:	bpelprocess1_client	Base
	Expose as a SOAP service	Create
	WSDL URL:	0
	Port Type:	
	Callback Port Type:	
Help	OK Ca	ncel

- 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

	- 17	-	
WSDL URL:		0	0
		_	

- 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.

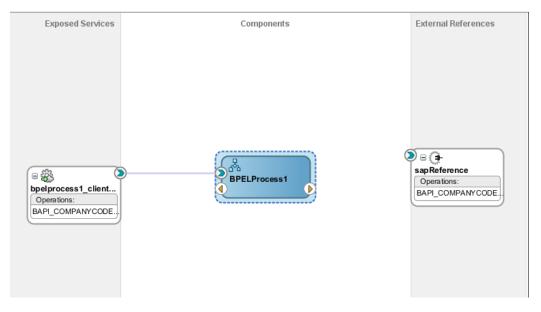
You are returned to the Create BPEL Process dialog, as shown in Figure 8-32. The **Port Type** is automatically filled from the chosen WSDL. Click **OK**.

Figure 8-31	Create BPE	L Process	Dialog
-------------	------------	-----------	--------

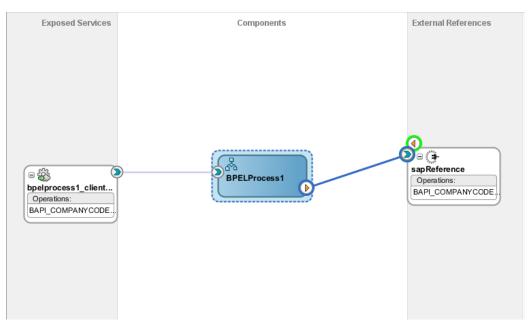
🕜 Create BPE	L Process	Company (Sec.	x				
A BPEL proc	BPEL Process A BPEL process is a service orchestration, based on the BPEL specification, used to describe/execute a business process (or large grained service), which is implemented as a stateful service.						
BPEL 2.0 Sp	pecification () BPEL	1.1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

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

Figure 8-32 Create BPEL Process Dialog



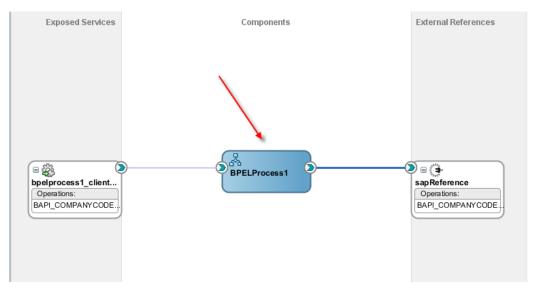
**9.** Create a connection between the BPELProcess1 component and sapReference component, as shown in Figure 8-33.



#### 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.

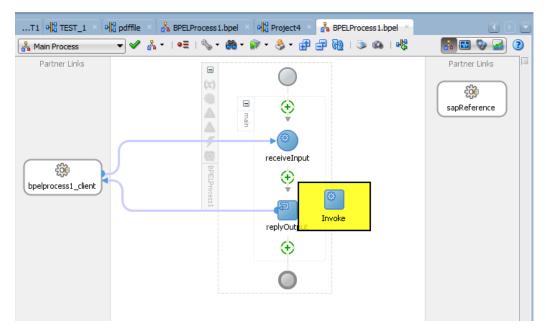
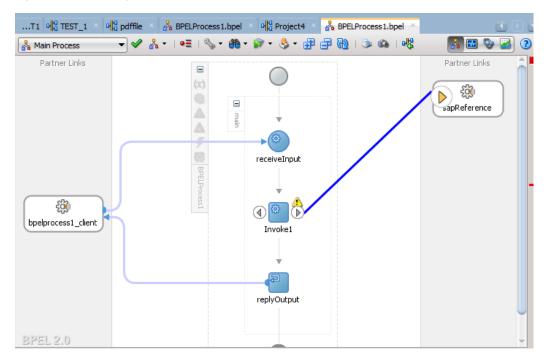


Figure 8-35 Adding Invoke Activity

**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	Properti	es A	ssertions	Annotations
lame:	Invoke 1				
onversation ID	:				
etail Label:					
	<u>I</u> nvoke a	s Detail			
_ <u>I</u> nteraction	Type: 🔞 Pa	rtner Link 🔻			
Partner Link:	sapReferenc	e			Q
Port <u>T</u> ype:	apRefe				•
Operation:	BAPI_CO	MPANYCODE_GE	TDETAIL		•
Input Ou	utput				
Argumen	ts <u>M</u> apping 🧿	) <u>I</u> nput Variable			0
Input: Inv	oke1_BAPI_CC	MPANYCODE_GE	TDETAIL_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
	Global Variable     Local Variable
<u>H</u> elp	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	<b>×</b>
Headers Docu	mentation Skip Condition Targets Sources
General	Correlations Properties Assertions Annotations
<u>N</u> ame:	Invoke1
Conversation ID:	
Detail Label:	
	Invoke as Detail
<u>I</u> nteraction T	ype: 🔞 Partner Link 🔻
Partner Link:	sapReference
Port <u>Type</u> :	SapReference_PT
Operation:	BAPI_COMPANYCODE_GETDETAIL
Input Ou	tput
	es Mapping <ul> <li>Output Variable</li> </ul>
Output: Inv	/oke1_BAPI_COMPANYCODE_GETDETAIL_OutputVariable
<u>H</u> elp	<u>A</u> pply OK Cancel

Figure 8-39 Edit Invoke Window Dialog

15. Click on Output tab.

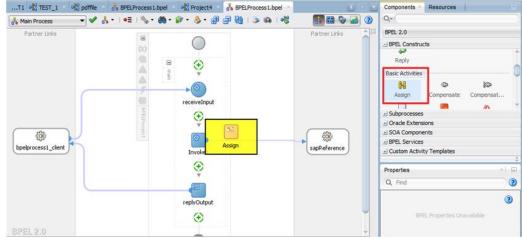
16. Click on the Output Variable radio button. To configure a new output variable, click the '+' icon, which is located to the right of the **Output** field. The Create Variable dialog is displayed, as shown in Figure 8-40.

Figure 8-40 Create Variable

🕜 Create	Variable
<u>N</u> ame:	Invoke1_BAPI_ACC_BILLING_CHECK_OutputVariable
<u>Type</u> :	{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.



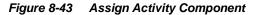


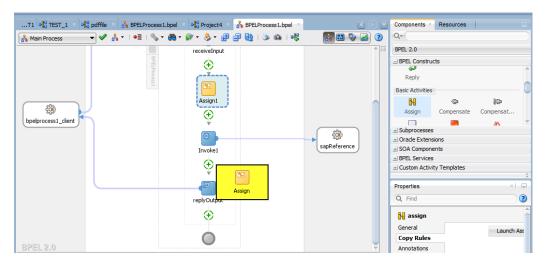
**20.** Double-click the new Assign activity (Assign1). The **Edit Assign** dialog is displayed, as shown in Figure 8-42.

x 👩 Edit Assign Copy Rules Annotations Documentation Skip Condition Targets Sources General Insert New Rule After 🗗 📩 Ì œ 🔏 BPELProcess1.bpel BPELProcess1.bpel 🗄 📄 Partner Links Partner Links 🚞 🛓 🔁 Variables Variables 🔁 🖮 💑 Process Process 💑 🚊 Variables 눧 🗄 🚊 🔁 Variables inputVariable ns1:BAPI_COMPANYCOME_SETDETAIL_MSG 😭 🖷 PANYCODE_GETDETAIL_RESPONSE_MSG (X) 🕀 🖮 📄 parameters 🗄 🚸 ns2:BAPI_COMPANYCODE_( BAPI_COMPANYCODE_GETDETAIL_MSG 🗱 🖨 parameters 📑 🗄 Invoke1_BAPI_COMPANYCODE_GET CODE_GETDETAIL <anonymous> 《》—🖨 PANYCODEID <anonymous> 《》 Invoke1_BAPI_COMPANYCODE_GET PANYCODE_GETDETAIL_RESPONSE_MSG (x)-14

Figure 8-42 Edit Assign Dialog

- **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.





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

Main Process 👻 🗸	옮 ㅋ ㅣ •ㅌ ㅣ % ㅋ @ ㅋ @ ㅋ 👶 ㅋ 🗗 🗗 🔞 ㅣ 👁 🙆 ㅣ 🤻	ا 🐷 🗞 🔝 🚼	?	Q.+ (		
	receiveInput			BPEL 2.0		
	BPELProcess 1			- BPEL Constructs		
	Proc			Reply		
				Basic Activities		
	Assign1			14		
				Assign Com	pensate Compensat.	t
	*				🗖 AA	
tên 🔰				Subprocesses     Oracle Extensions		
elprocess1_client		sapReference		SOA Components		
	Invoke1			+ BPEL Services		
				+ Custom Activity Tem	plates	
	(-*			- ·	,	
	<b>B</b>			Properties		×
	Ase			Q Find		
	Assassign					-
		,	-	🙌 assign		
	· ·			General	Laun	nch .
				Copy Rules	2001	
PEL 2.0	replyOutput		-	Annotations		

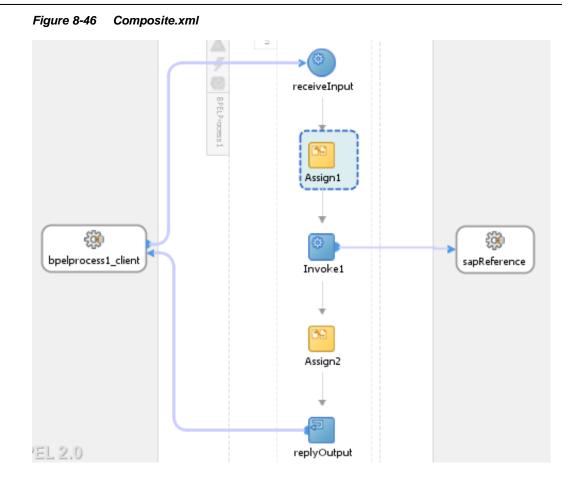
Figure 8-44 New Assign Activity

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

#### Figure 8-45 Edit Assign Dialog

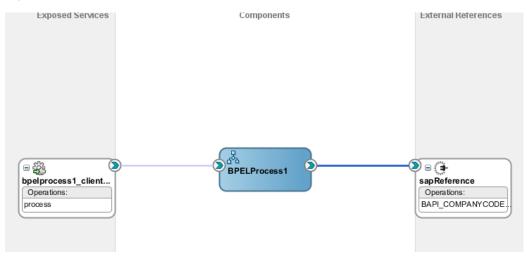
Edit Assign	
General Copy Rules Annotations Documentation	Skip Condition Targets Sources
Insert New Rule After 💌	🔜 📩 🙆 🚋
A BPELProcess1.bpel	BPELProcess1
🖮 🚞 Partner Links	Partner Links
🗄 🗝 🔁 Variables	Variables
🖮 💑 Process	Process 💑
🛓 🗁 Variables	Variables 🗁 📥
inputVariable ns1:BAPI_COMPANYC	s1:BAPI_COMPANYCODE_GETDETAIL_MSG 🗱 👜
outputVariable ns1:BAPI_COMPANY	MPANYCODE_GETDETAIL_RESPONSE_MSG 🗱 😑
🖶 🔅 Invoke1_BAPI_COMPANYCODE_GE	parameters 📄 🛁
Invoke1_BAPI_COMPANYCODE_GE	DETAIL_RESPONSE <anonymous></anonymous>
🖨 📄 parameters	s1:BAPI_COMPANYCODE_GETDETAIL_MSG
⊡	MPANYCODE_GETDETAIL_RESPONSE_MSG
20000000	
	+ 🗙 🕁 🤴

- **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

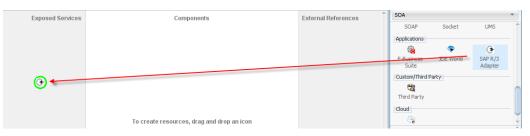
This section describes how to design an inbound BPEL process, which consists of the following two stages:

- 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.

<b>O</b> Adapter Configuration Wizard	Step 1 of 3			X
SAP Adapter Service				*
Welcome to the Adapter Con This wizard helps you create a service usin define an operation for the service.	-		ify configuration	parameters and
Enter a Service Name. <u>N</u> ame: sapService				
Help	< <u>B</u> ack	<u>N</u> ext >	Finish	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	nfigur <mark>ati</mark> on Wizard - Ste	p 2 of 3			×
Connection	n Information				*
	nection is required to config te a New Connection.	jure this adapter. S	elect a SAP R/3 conr	nection 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				
Help		< <u>B</u> ack	<u>N</u> ext >	Finish	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	
	nection is required to configure this ac ate a New Connection.	dapter. 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: <ul> <li>Direct Connection</li> <li>Load Balanced</li> </ul>	
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 🔲 <b>Securit</b>	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				*
	nection is required to configu ate a New Connection.	ure this adapter. Se	elect a SAP R/3 con	nection already defi	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			D	<
Object Selection		0101010101010		*	
Select SAP objects, BAPI, RFC, or IDoc, t Hierarchical Alphabetical SAP Comparison Solution Solution (BAPIs) Comparison Modules (RFCs) ALE/EDI Messages (IDOCs)	o retrieve and desc	Selected BAPI/R	FC functions	s or IDOC messages:	
		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.

Figure 8-56 Hierarchical Tab

Hierarchical	Alphabetical	
🗁 SAP		
🖨 🧁 Busine	ss Objects (BAPIs)	
🕀 🧰 🔁 Ac	counting - General	
🕀 🗀 Ap	plication Platform	
🕀 🗀 Au	to-ID Infrastructure	2
🕀 🗀 Ba	sis Components	
🕒 🗀 Co	ntrolling	
🕒 🙆 Cr	oss-Application Com	ponents
🗄 💼 🗀 Cu	stomer Service	
🕀 🗀 En	terprise Controlling	
🗄 🗀 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.

Object Selection	0101010101010	01939393939	*
Select SAP objects, BAPI, RFC, or IDoc, to retrieve and Hierarchical Alphabetical SAP Generation Modules (RFCs) ALE/EDI Messages (IDOCs) GENERIC_IDOC Generic IDOC CWM/SHP_IBDLV_CHANGE CWM/SHP_IBDLV_CONFIRM_DEC CWM/SHP_IBDLV_CONFIRM_DEC CWM/SHP_OBDLV_CONFIRM_DEC CWM/SHP_OBDLV_CONFIRM_DEC CWM/SHP_OBDLV_CONFIRM_DEC CWM/SHP_OBDLV_CONFIRM_DEC CWM/SHP_OBDLV_CONFIRM_DEC CWM/SHP_OBDLV_SAVE_REPLICA CWM/SHP_OBDLV_SAVE_REPLICA CWM/SHP_OBDLV_SAVE_REPLICA CWM/SHP_OBDLV_SAVE_REPLICA CWM/SHP_OBDLV_SAVE_REPLICA CWM/SHP_OBDLV_SAVE_REPLICA CWM/SHP_OBDLV_SAVE_REPLICA CWM/SHP_OBDLV_SAVE_REPLICA CWM/SHP_OBDLV_SAVE_REPLICA CWM/SHP_OBDLV_SAVE_REPLICA CWM/SHP_OBDLV_SAVE_REPLICA CWM/SHP_OBDLV_SAVE_REPLICA		FC function:	s or IDOC messages:
Help < Back	Next >	Finish	Cancel

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	A .
🗄 🖄 Business Objects	(BAPIs)
🗄 🖄 Function Modules	s (RFCs)
🗄 🗁 🗁 ALE/EDI Messa	Select
	KC
i⊒ · 🗀 /CWM/MB(	Search
🗄 🖆 /CWM/SHF	Test
🕀 🖄 /CWM/SHP_1	BDLV_CONFIRM_DEC

17. In the Search window, search for matmas01, as shown in Figure 8-59.

Figure 8-57 Object Selection Page

Figure 8-59 Search SAP Repository Page

Adapter Configuration Wizard - St	🔿 Search SAP Repository	8
Object Selection	Search SAP Repository	Name ○ Description
Select SAP objects, BAPI, RFC, or IDC Hierarchical Alphabetical SAP Gamma Business Objects (BAPIs) Function Modules (RFCs) ALE/EDI Messages (IDOCS) GENERIC_IDOC Gene CWM/SHP_IBDLV_CON CWM/SHP_IBDLV_CON CWM/SHP_IBDLV_CON CWM/SHP_OBDLV_CAA Gamma CWM/SHP_OBDLV_CAA CWM/SHP_OBDLV_CAA CWM/SHP_OBDLV_SAVI CWM/SHP_OBDLV_SAVI CWM/SHP_OBDLV_SAVI CWM/SHP_OBDLV_SAVI CWM/SHP_OBDLV_SAVI CWM/SHP_OBDLV_SAVI	MATMAS01 Material Master MATMAS01 AII Material IDoc MATMAS01 MATMAS01 Material for SDM MATMAS01 Material master MATMAS01 Material Master MATMAS01 Material Master MATMAS01 PFS master material MATMAS01 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

Adapter Configuration Wizard - Step 3 of 5	
bject Selection	01010101010101010101010101
Select SAP objects, BAPI, RFC, or IDoc, to retrieve and d	lescribe. Selected BAPI/RFC functions or IDOC messages:
	MATMAS01 Material Master
SAPSLL/CUS_STA     SAPSLL/CUS_VZAV     SAPSLL/CUS_VZL     SAPSLL/CUS_VZL     SAPSLL/CUS_WAT     SAPSLL/DEBMAS_SLL	Name: Name Type Description
Help < Back	Next > Finish Cancel

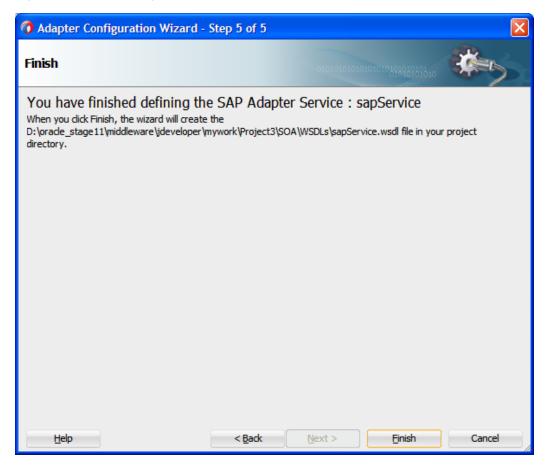
- **19.** Click '>' icon to move the object to the right side under the **Selected BAPI/RFC functions or IDOC messages**.
- 20. Click Next. The JCA Properties page is displayed, as shown in Figure 8-61.

CA Properties	01010101010	
pecify the Name and Value of all JCA A	lapter Properties.	
roperties		4 ×
Name	Value	
AutoSYSTAT01	no	
incodeIDOC	no	
ControlCharacter	encode	
ProgramID		
ca.retry.count	9	
ca.retry.interval	1	
ca.retry.backoff	2	
ca.retry.maxInterval	120	

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.

Exposed Servi	ces
(= ( <b>-</b>	- <b>&gt;</b>
sapService	
Operations:	
MATMAS01	

Figure 8-63 Adapter Component

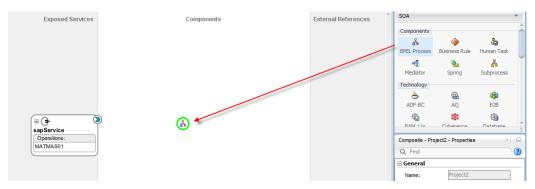
You are now ready to configure an inbound BPEL process component.

# **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	PEL Process	x			
A BPEL pr	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	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:	Contraction Contra	• 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.

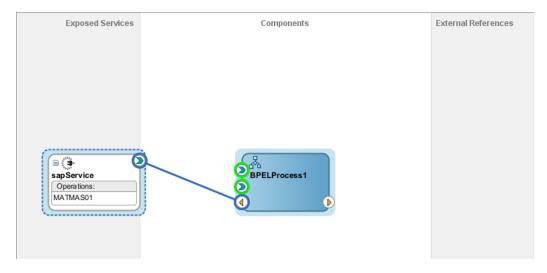
The Inbound BPEL process component is created and displayed in the Components pane, as shown in Figure 8-66.

Figure 8-66 BPEL Process Component

Exposed Services	Components	External References
	BPELProcess1	
SapService Operations:	BPELProcess1	
MATMAS01		

**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**

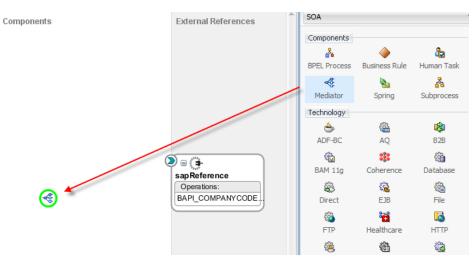
For more information, refer to the section "Configure an Adapter Component" as described in "Define an outbound BPEL Process".

## **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     Image: Create a mediator component to perform routing, filtering, and transformations.					
<u>N</u> ame:	Mediator 1					
Directory:	D:\orade_stage11\n	iddleware\jdeveloper\mywork\Project4\SOA\Mediators	Q			
Template:	懮 Interface Defini	ion 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			OK 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/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/mywork/Project4/SOA/WSDLs/sapReference.wsdleware/jdeveloper/m$	
Help	OK Cancel

Figure 8-70 WSDL Chooser Dialog

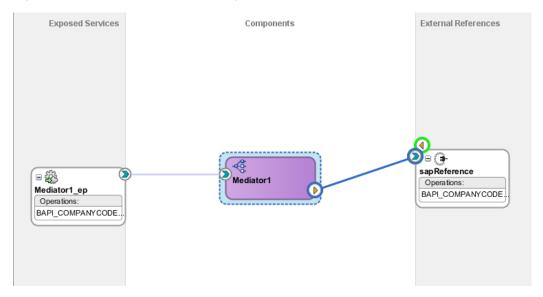
6. Click OK. You are returned to the Create Mediator dialog, as shown in Figure 8-71.

Figure 8-71 Create Mediator Dialog

🕜 Create	e Mediator				
	r Component a mediator componer	nt to perform routing, filtering, and transformations.			
<u>N</u> ame:	Mediator 1				
Directory:	D:\oracle_stage11\	niddleware \jdeveloper \mywork \Project4\SOA \Mediators			
Template:	懮 Interface Defini	tion from WSDL 🔹 🥥			
Expose as a SOAP service					
	WSDL URL:	lleware \jdeveloper \mywork \Project4\SOA \WSDLs \sapReference.wsdl  🐞 🌼			
	Port Type:	sapReference_PT			
	<u>Callback Port Type:</u>	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



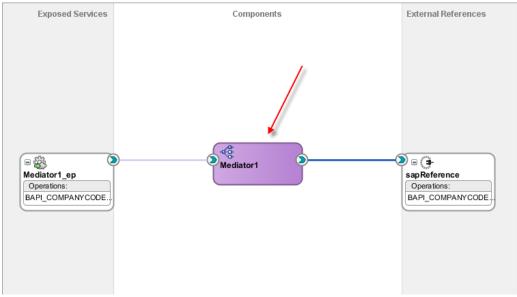
You are now ready to configure the routing rules.

# **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="">&gt;</no>	>			1		
Callout To	< <java callout="" class="">&gt;</java>						
E < <filter expre<="" td=""><td>ssion&gt;&gt;</td><td>9</td><td>sapRefere</td><td>nce::BAPI_COMPANYCODE_</td><td>GETDETAIL</td><td>٢</td><td>Sequent</td></filter>	ssion>>	9	sapRefere	nce::BAPI_COMPANYCODE_	GETDETAIL	٢	Sequent
		Validate Sema	ntic		A	8	
		Translate To Na	tive < <no td="" translat<=""><td>tion Needed&gt;&gt;</td><td></td><td>-</td><td></td></no>	tion Needed>>		-	
		Transform U	sing < <transforma< td=""><td>ation Map&gt;&gt;&gt; parameters</td><td>•</td><td>88</td><td>1</td></transforma<>	ation Map>>> parameters	•	88	1
		Assign Val	ues		•	30	<b>1</b>
		Override U	sing			-	
Synchro	nous Reply		• *Initial Caller*	::BAPI_COMPANYCODE_GET	DETAIL:output	0	
		Transform U	sing < <transforma< td=""><td>ation Map&gt;&gt;&gt; parameters</td><td>•</td><td>89</td><td></td></transforma<>	ation Map>>> parameters	•	89	
		Assign Val	ues		•	80	

#### 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.

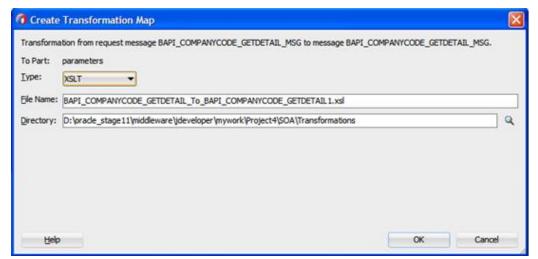
#### Figure 8-75 Request Transformation Map Dialog

🕜 Request	Transformation Map	
	on from request message BAPI_COMPANYCODE_GETDETAIL_MSG to message BAPI_COMPANYCODE_GETDETAIL_MS	5G.
Mapper File:	·	] � ╋ ∥ Ж
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 Transformation Map 🛛 🛛 🔀				
Transformatio	Transformation from request message BAPI_COMPANYCODE_GETDETAIL_MSG to message BAPI_COMPANYCODE_GETDETAIL_MSG.			
To Part:	parameters			
Mapper File:	Transformations/BAPI_COMPANYCODE_GETDETAIL_To_BAPI_COMPANYCODE_GETDETAIL1.xsl		a 🖶 🥢 🗙	
<u>H</u> elp		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 × 📲 Project4 × 🔩 Mediator XSLT map 🔹 🗣 🔹 🎎 🚱 📓 📓	
	xsl:stylesheet or xsl:template(match=/) 니- 년 ts9xBAPI_COMPANYCODE_GETDETAIL 《소스· 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.

🕜 Auto Map Preferences 🛛 🛛 🔀		
Confirm Auto Map Results		
Prompt for Preferences before Auto Map		
Mode: Basic		
During Auto Map:		
<ul> <li>Match Elements with Similar Names</li> </ul>		
Match Elements with Exact Names		
<ul> <li>Match Elements with Exact Types</li> <li>Match Elements Considering their Ancestor Names</li> </ul>		
Insert xsl:if:		
○ Never		
Check source node exists		
Check source node is not empty		
Show Dictionaries >>		
✓ Enable Auto Map		
Help OK Cancel		

Figure 8-79 Auto Map Preferences Dialog

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.xml 🐣 💽 💽			
XSLT map 🔹 🕂 🖌 😵 🖾 🗌	Q Search XSLT Map XSLT		
sources>	xsl:stylesheet 🔊		
	xsl:template(match=/) 🛄🖨		
Sector And Analysia	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	Ualidate Synt	tax (XSD)	▽ ] •	÷ 🕺
Translate From Native < <no needed="" translation="">&gt;</no>	<b>•</b> ••			
Callout To < <java callout="" class="">&gt;</java>	<b>(</b>			
<li></li> <	8 8	Reference::BAPI_CC	٩	Sequential
	Validate Semantic	•	8	
	Translate To Native	< <no neede<="" td="" translation=""><td>-</td><td></td></no>	-	
	Transform Using	< <transformation< td=""><td>×</td><td></td></transformation<>	×	
	Assign Values	-	89	
	Override Using		->	
Synchronous Reply		Caller*::BAPI_COMPAN	0	
	Transform Using	< <transformation td="" •<=""><td>ж</td><td></td></transformation>	ж	
	Assign Values		69	

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

Transformation Map	
Transformation from reply message BAPI_COMPANYCODE_GETDETAIL_RESPONSE_MSG to message BAPI_COMPANYCODE_GETDETAIL_RESPONSE_MSG.	
To Part: parameters	
Mapper File:	< + / ×
Help	OK Cancel

**10.** Click on + to create the new target mapping file.

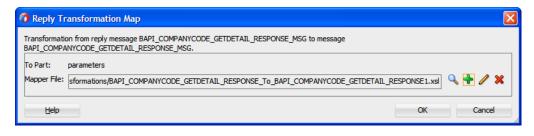
The following Create Transformation Map page is displayed, as shown in Figure 8-83.

Figure 8-83	Create	Transformation	Мар
-------------	--------	----------------	-----

👩 Create	Transformation Map	
BAPI_COM	tion from reply message BAPI_COMPANYCODE_GETDETAIL_RESPONSE_MSG to message PANYCODE_GETDETAIL_RESPONSE_MSG. parameters XSLT	
File Name:	BAPI_COMPANYCODE_GETDETAIL_RESPONSE_To_BAPI_COMPANYCODE_GETDETAIL_RESPONSE1.xsl	
Directory:	D:\orade_stage11\middleware\jdeveloper\mywork\Project4\SOA\Transformations	٩
_ <u>I</u> ndude	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.

😚 Auto Map Preferences 🛛 🛛 🗙				
Con <u>fi</u> rm Auto Map Results <u>P</u> rompt for Preferences before Auto Map				
Mode: Basic				
During Auto Map:				
Match Elements with Similar Names				
$\bigcirc$ 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 >>				
💌 <u>E</u> nable 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 1.mplan 🗧 🖁 BAPI_COMPANYCODE_GETDETAIL_RESPONSE_To_BAPI_COMPANYCODE_GETDETAIL_RESPONSE 1.xsl 💉 💽 💽			
XSLT map 🔹 🕂 🔸 🔹 🖾 🛐	Q Search XSLT		
🚼 <sources></sources>	xsl:stylesheet 🕺		
SOUTHER THE REPAIR STREAM AND A STREAM AND	xsl:template(match=/)		
Ins0:COMPANYCODE_ADDRESS	ns0:BAPI_COMPANYCODE_GETDETAIL_RESPONSE 🚸 🖷		
Is0:COMPANYCODE_DETAIL	xskif 🏈 🕀		
Iso:RETURN	xstif 💊 🗄		
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

💉 🧏 Mediator 1.mplan	× 📲 Project2 ×		Components ×	Resources
4 🔁 🔁 🏶 🗶 🕅	端 🚯 🔕 🖉	Project2	Q.	
cosed Services	Components	External Refer	SOA	
			Components	
			*	
			BPEL Process	Business Ru
			8	*
			Human Task	Mediator
				<u>Å</u>
,			Spring	Subprocess
ervice			Technology	
ations:			ی	
/AS01			ADF-BC	AQ
			Composite - Pro	ject2 - Prop
			Q Find	
			🗆 General	

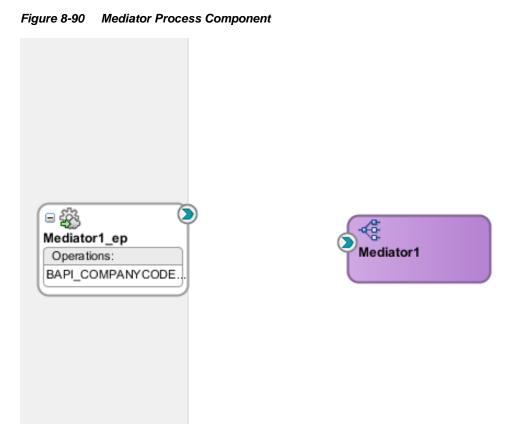
The Create Mediator dialog is displayed, as shown in Figure 8-89.

O Create Mediator		
Mediator Component Create a mediator component to perform routing, filtering, and transformations.		4
Name: Mediator1		
Directory: D:\oracle_stage11\middleware\jdeveloper\mywork\Project3\SOA\Mediators		<u> </u>
Template: 💭 Define Interface Later		• @
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.

<b>O</b> FILE Adapter Configuration Wize	ard - Step 1 of	4		
File Adapter Reference				*
Welcome to the File Adapter (	-			
This wizard helps you create a File Adapter. operation for the adapter.	You will be asked	to specify configura	ation parameters a	nd define an
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
```

<b>O</b> FILE Adapter Configuration W	izard - Step 2 of 4	
Adapter Interface	01010101010	
	Il that is generated using the operation na face may be defined by importing an exist	
Interface: <ul> <li>Define from operation and</li> </ul>	schema (specified later)	
Import an existing WSDL		
WSDL URL:		2
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 Adapte	er Configuration Wizard - Step 4 of 7	<
Operation	0101010101010101010101010	
system, a Write F contents of a file	supports five operations. There is a Read File operation that polls for incoming files in your local file File operation that creates outgoing files, a Synchronous Read File operation that reads the current , a List Files operation that lists file names in specified locations, and a Chunked Read operation that ads file data in chunks and can be used ONLY with BPEL. Only one operation per Adapter Service may this wizard.	
Operation Type:	○ <u>R</u> ead File	
	<u>W</u> rite File	
	O Synchronous Read File	
	◯ List Files	
	Chunked Read operation is a synchronous read file	
Operation Name:	Write	]
Add Output H	leader	
Help	< <u>B</u> ack <u>N</u> ext > <u>F</u> inish 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.

<b>O</b> FILE Adapter Configuration Wiz	ard - Step 5 of 7			X
File Configuration				*
Specify the parameters for the Write File o	peration.			
Directory for Outgoing Files (physical path)	ath OLogical Name			_
/oracle/Outbound_Results				Browse
File Naming Convention (po_%SEQ%.txt):	Output.xml			
Append to existing file				
Write to output file when any of these co	onditions are met			
✓ Number of Messages Equals: 1		9		
Elapsed Time Exceeds:		9	minutes	-
File Size Exceeds: 1000			kilobytes 💌	
Help	< <u>B</u> ack	<u>N</u> ext >	Einish	Cancel

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 Configurat	ion Wizard - Step 6 of	7		
Messages				*
Define the message for the Write defines the messages in the outgo 'Schema is Opaque', then you do	bing files. Use the Browse bu	tton to find an exis		
Message Schema				
Native format translation is n	ot required (Schema is Opaq	ue)		
URL				Q (0)
Schema Element				browse for
Help	< Back	Next >	Finish	Cancel
<u>Ticib</u>	< Back	INEXC >	Entern	Calicei

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	
	絮 🐿
Type Explorer Project Schema Files SapService.xsd MATMASOI Project WSDL Files	
<u>Type:</u> {urn:sap-com:document:sap:idoc}MATMAS01 <u>S</u> how 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					*
defines the messag	e for the Write File opera es in the outgoing files. U , then you do not need t	Jse the Browse bu	tton to find an exis		
Message Schema					
Native <u>f</u> ormat	translation is not required	l (Schema is Opaq	ue)		
URL	/Schemas/sapService.	xsd			🔍 🧔
Schema Element	MATMAS01				-
<u>H</u> elp		< <u>B</u> ack	<u>N</u> ext >	<u>F</u> inish	Cancel

16. Click Next.

The **Finish** page is displayed, as shown in Figure 8-98.

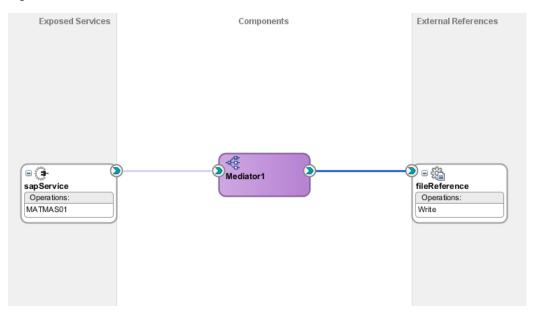
FILE Adapter Configuration Wize	ard - Step 7 of	f 7		×
Finish				*
You have finished defining th When you dick Finish, the wizard will create D:\oracle_stage11\middleware\jdeveloper\ directory.	e the			bur project
Help	< <u>B</u> ack	Next >	Einish	Cancel

#### 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

	Co	mpor	ients			
5	🤶 Aedia	tor1		6	)	
Ľ	neula			J		

The Routing Rules dialog is displayed, as shown in Figure 8-101.

Figure 8-101 Routing Rules Dialog

Operations				eg.
MATMAS01	Priority	4 Validate Syntax (XSD)		-
Translate From Native < <no need<="" td="" translation=""><td>ded&gt;&gt;</td><td><b>B</b>-<b>3</b></td><td></td><td></td></no>	ded>>	<b>B</b> - <b>3</b>		
Callout To < <java callout="" class=""></java>	>			
Resequence Off				
Resequence Off	¶ B → file	Reference::Write		Sequenti
	Validate Semantic			Sequent
		Reference::Write		
	Validate Semantic Translate To Native	Reference::Write		
	Validate Semantic Translate To Native	Reference::Write	•	

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		
Transformatio	n from request message MATMAS01_MSG to message Write_msg.		
	body		
Mapper File:			] � ╋ ∥ Ж
Help		ОК	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

O Create Transformation Map		X
Transformation from request message MATMAS01_MSG to message Write_msg.		
To Part: body		
Iype: XSLT		
Eile Name: MATMAS01_To_MATMAS011.xsl		
Directory: D:\orade_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 $\odot$ untitled1.xml $\times$ $\odot$ untitled2.xml $\times$ $\mathbf{P}_{Q}^{O}$ Project4 $\times$	🖑 Mediator 1. mplan 💉 🍕 Mediator 1. mplan	× 🔀 MATMASO1_To_MATMASO11.	xs/ 🐣 🛛 💽 🔁
XSLT map 🔹 🗣 🔹 歳 😨 🛛		Q Search XSLT	Map XSLT
Sources>           → 00:MATMAS01-           → 00:MATMAS01-		ns0:IDOC-ENC	xsl:stylesheet ate(match=/) △ △ △ △ △ △ △ △ △ △ △ △ △

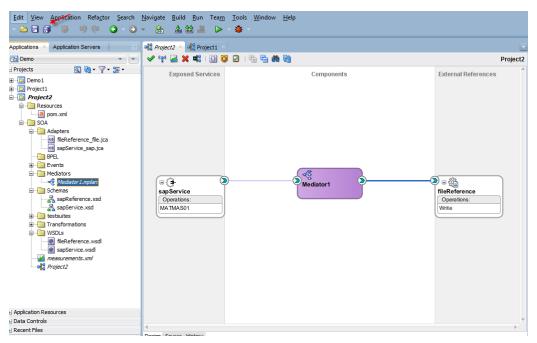
The Auto Map Preferences dialog is displayed, as shown in Figure 8-106.

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
<ul> <li>Match Elements with Exact Types</li> <li>Match Elements Considering their Ancestor Names</li> </ul>
Insert xsl:if:
O Never
<ul> <li>Check source node exists</li> <li>Check source node is not source to be a source of the source of</li></ul>
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)				

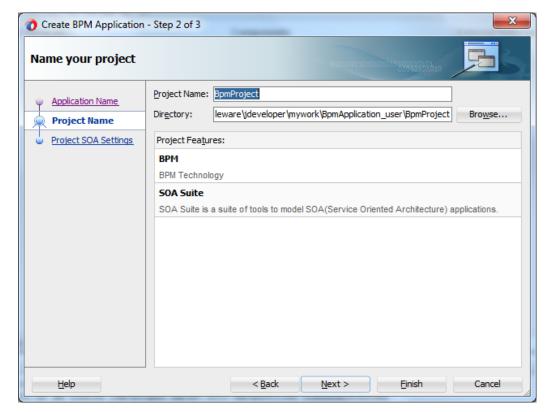
2. Enter a name for the new BPM application and click Next, as shown in Figure 8-109.

O Create BPM Application	- Step 1 of 3	×
Name your application	o10101010101010101010101010101010101010	
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>F</u> inish	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.

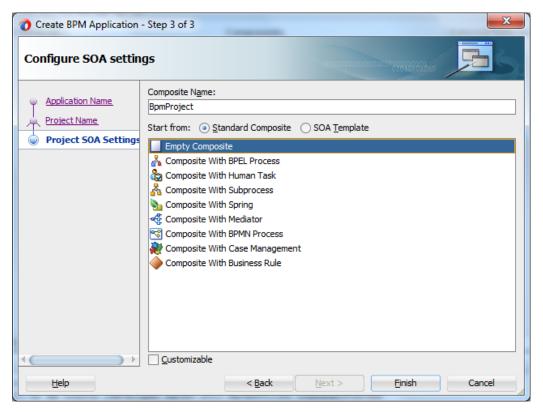


Figure 8-111 Configure SOA Settings Page

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		
ed 📫 🚯 💆 🗃		Composite: BpmProject	a Q.+		
	Components	External References	SOA		
			Components		
			BPEL Process	BPMN Process	
		۵. (۴	Reference and a conservation of the conservati	tuman Tas	
	3	sapReference	Properties		
		Operations: BAPI_COMPANYCODE	Q, Find		
		Y	Catalog		

Figure 8-112 BPMN Process Component

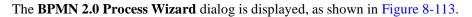
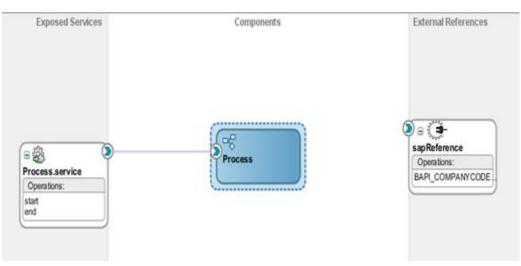


Figure 8-113	BPMN 2.0 Process Wizard
--------------	-------------------------

BPMN 2.0 Process Wizard							
BP	MN 2.0 Process W	fizard					
<b></b>	Definition	Name: Process					
Ψ	Arguments	Description:	۲				
0	Initial Implementation						
Ó	Advanced						
		Directory: vare\jdeveloper\mywork\BpmApplication_user\BpmProject\SOA\processes	] 🔍				
		Type: Start End					
	Help	< <u>B</u> ack <u>N</u> ext > <u>F</u> inish Cano	el				

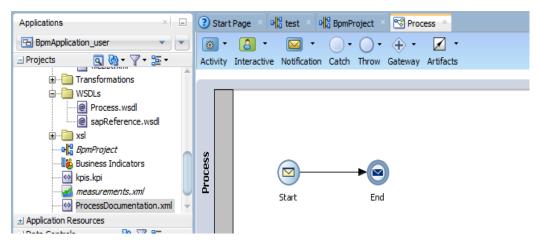
2. Select the default option that is selected under **Type** area (Asynchronous Service) and click **Finish**. The BPMN Process component is created, as shown in Figure 8-114.

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



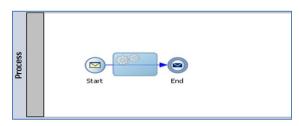
4. Click the Activity icon, as shown in Figure 8-116.

						<b>,</b> , , , , , , , , , , , , , , , , , ,	. IN		
	.jca 🗠 unti	tied 1. xml	🗠 untitled2.xm		fileRe	ference_file	.jca × 🖓 d tes	st 🐣 😒 Process	
3	3 - 🙆	• 🖂	0		÷ •	•	Q Seard	1	
Ac	tivity Intera	ctive Notific	ation Catch Th	row Ga	teway	Artifacts			
	Activity	Manual	Service						
		<b>5</b>							
	Send	Receive	<b>Business Rule</b>						
	I								
	Script	Call	Event Subp						
	<b>E</b>	<b>29</b>							
	Subprocess	Update		End					

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.

👩 Properti	ies - ServiceTask		
Basic Imp	lementation		
:0:F	Name:	ServiceTask	٩
	Description:	:	
	Is Draft:		
	∃ Sampling	g Point	
Help		ОКС	Cancel

Figure 8-118 Properties – Service Task

6. Click the **Implementation** tab, as shown in Figure 8-119.

Figure 8-119 Implementation Tab

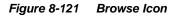
🕜 Pro	perties - ServiceTa	isk		
Basic	Implementation			
Mess	nentation Type: Se rce commit after execut rage Exchange e: [] Not Implementer	on		•
	ata Associations essage Headers	Service Properties	E Log Handlers	
Help			OK	Cancel

- 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 - ServiceT	ask	
Basic Implementation		
Implementation Type: 🔯 S	ervice task	•
Force commit after execu	tion	
Type: 🥳 Service	: Call	-
Conversation:  Default Service Call Service: Operation: Default 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 - ServiceTa	sk	
Basic Implementation		
Implementation Type: Security Security Security Service Call Service:	on Call	▼ ■ Browse
Operation:	Correlations	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	4	•
Conversation:   Default  Service Call		•
Service Call	Advanced	
Service: SapReference		۹. 🧳
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

🕜 Cre	eate Data Object	×
Name:	InputDO	
Type:	abc string	-
	📎 boolean	-
	99E double	
Help	1999 decimal	
	🖄 dateTime	

- **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.

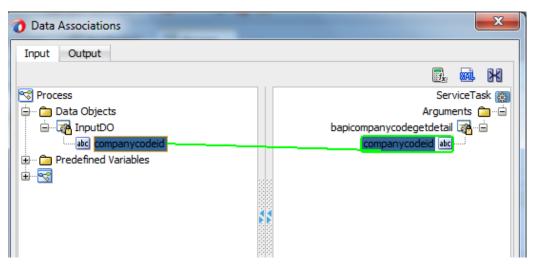
The Data Associations dialog, as shown in Figure 8-125.

🕐 Data Associations	X
Input Output	
😪 Process 🖨 🗠 🧰 Data Objects	ServiceTask 👸 Arguments 🧰 🖻
🖃 🖓 InputDO	bapicompanycodegetdetail 🌉 🖷
empanycodeid	companycodeid abc
	+ × 4 3
From	То
Validate target after assigning input data association	15
Help	OK Cancel

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.

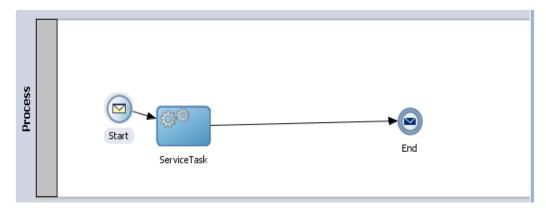


Figure 8-127 Service Task

19. Double-click on Start point.

The **Properties-Start** dialog is displayed, as shown in Figure 8-128.

Figure 8-128 Properties-Start Dialog

🗿 Properties - Start		×
Basic Implementation	1	
Implementation Type:	Message	•
Message Exchange		
Type: 😡 D	efine Interface	•
Conversation: <ul> <li>Def</li> </ul>	fault 🔿 Advanced	
Define Interface		
Arguments Definition	n	<b>₽</b> / ×
Name	🔞 Edit Argument 🛛 🛛	
	Name: Input	
	Type: BAPI_COMPANYCODE_GETDETAIL	
Operation Name: s	Help OK Cancel	
Stata Associations		andlers
Message Headers	Service Properties	
Help		OK Cancel
	l	un un reci

- **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	
	E. 🛋 🔀
<ul> <li>Start</li> <li></li></ul>	Drag objects here Drag objects here Data Objects InputDO companycodeid
Euripariyeudeu ⊕-S Process	Predefined Variables 🗁 🕀 BpmProject 😒 😨
Copy From: Input.companycodeid	🔃 To: InputDO.companycodeid
From	То
ac Input.companycodeid	atc InputDO.companycodeid
Validate target after assigning output data associations	
Help	OK Cancel

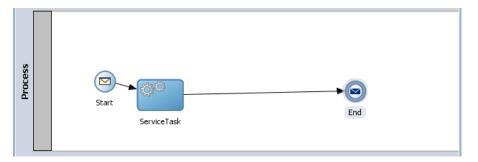
You are returned to the **Properties-Start** dialog, as shown in Figure 8-130.

🕜 Pro	perties - Start				×
Basic	Implementation				
Mess Type Conv	nentation Type: age Exchange e: versation: Define Interface	nterface		•	
Ar	guments Definition			💠 // 💥	
N	ame		Туре		
	put peration Name: start		BAPI_COMPANYCOD	E_GETDETAIL	
₿≈å <u>D</u> a	ata Associations 🧳	D <u>Correlations</u>	L	Log Handlers	
• 🗍 Me	essage Headers	E Service Prop	<u>perties</u>		
Help				OK 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.

1 Data Associations	X
Input Output	
প্ত Process 亩 – ☐ Data Objects 亩 – ফ্রি InputDO	ServiceTask 🗃 Drag objects here Arguments 🦳 🖨 bapicompanycodegetdetail 🚮 🖶
	companycodeid at
From: InputDO.companycodeic	d 🗓 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		
ServiceTask		Process 😒
- 🗁 Arguments	Dragtobjects here: 1 1	Data Ob 💊 New
🖮 🌆 bapicompanycodegetdetailresponse		InputDo
companycode_address		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	eate Data Object	×
Name:	OutputDO	
Type:	BAPI_COMPANYCODE_GETDETAIL_RESPO	NSE
	✓ Auto initialize	
Help	P 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

🕐 Data Associations		
Input Output		
👸 ServiceTask		Process 🗺
🖨 🗠 🧰 Arguments	þje	Data Objects 🛅 🖷 🖨
🚊 🖓 bapicompanycodegetdetailresponse		InputDO 🙀 🕀
🚊 🖓 companycode_address		OutputDO 🙀 🖂
🖃 🖓 companycode_detail		companycode_address 🔏 …⊕
🗄 🖳 💦 return		companycode_detail 💦 🕀
🕀 🐨 🐨 Process		return 🔼 🗉 🖬
	8 8	Predefined Variables 🛅 🖽
		_

35. Drag the bapicompanycodegetdetailresponse to the OutputDO, as shown in Figure 8-137.

Figure 8-137 Data Associations Dialog

🗿 ServiceTask		Process
🖳 🧰 Arguments	Drag objects here:	Data Objects 🛅
🖮 🙀 bapicompanycodegetdetailresponse —		InputDO 🙀 👾
🛓 📈 companycode_address		OutputDO 🙀 🖷
		companycode_address 🛃 🕀
🗄 🖓 return		companycode_detail 🔜 🖽
Process		return 🛃 🕀
_		Predefined Variables 🛅
		BpmProject 🔜
	🗿	



You are returned to the **Properties-ServiceTask** dialog, as shown in Figure 8-138.

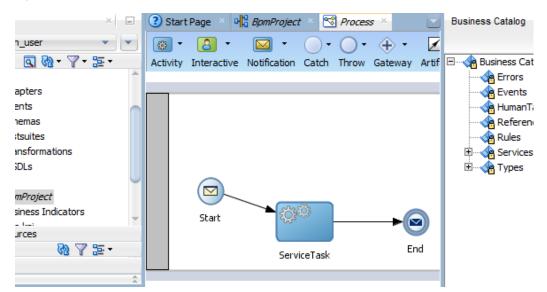
Figure 8-138 Properties - ServiceTask Dialog

Properties - ServiceTas	k	X
Basic Implementation		
Implementation Type: Service Conversation:      Service Call     Service: SapReference     Operation: bapicompanyco	n all Advanced	• •
State Associations 🞸	Correlations Service Properties	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:  Message Force commit after execution Message Exchange Type:  Define Interface Conversation:  Default  Advanced Define Interface Arguments Definition
Name Type
Asynchronous      Synchronous Callback Operation Name: end
Data Associations Decorrelations
Message Headers Ervice 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.

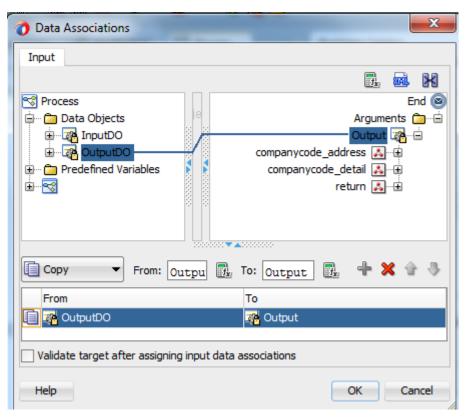


Figure 8-142 Data Associations Dialog

44. Drag the OutputDO node in the left pane to the Output node in the right side.45. Click OK.

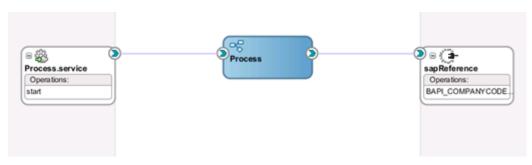
You are returned to the Properties - End dialog, as shown in Figure 8-143.

Properties - End	
Basic Implementation	
Implementation Type: S Message	▼
Force commit after execution	
Message Exchange	
Type: 😡 Define Interface	▼
Conversation: <ul> <li>Default</li> <li>Advanced</li> </ul>	
Define Interface	
Arguments Definition	🕂 / 💥
Name	Туре
Output	BAPI_COMPANYCODE_GETDETAIL_RESPONSE
Asynchronous      Synchronous	
Callback Operation Name: end	
🗱 Data Associations 🥔 🛛 🕪 Correlation	ons 📃 Log Handlers
Carrier Message Headers	roperties
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

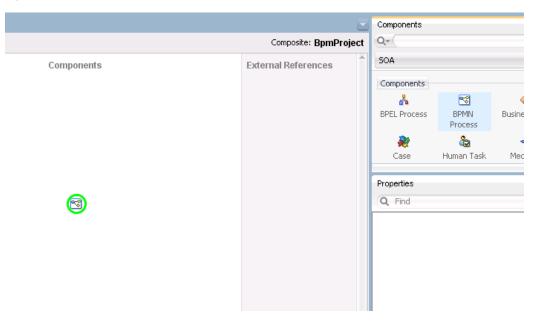
### **Configuring an Adapter Service Component**

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>О</b> В	PMN 2.0 Process W	'izard		
BPI	MN 2.0 Process W	fizard		
Ģ	Definition	Name:	Process	۲
9	Arguments Initial Implementation	Description:		۲
Ĵ	Advanced			
		Directory:	ideveloper\mywork\BPM_Test_Project\BpmInboundProject\SOA\processes	٩
			hronous Service s a process with an asynchronous interface definition	Ô
			Start End	
			onous Service	
	<u>H</u> elp	🖓 Manual	Cance	1

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	ʻizard				×
Arguments					
<u>Definition</u> Arguments	Input Output Arguments Definition				<b>₽</b> ⁄ X
Advanced	Name		Туре		
Help		< <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.

O BPMN 2.0 Process Wi:	zard			×
Initial Implementation	1			
Q Definition				🕂 🗘 🕹 🗙
Arguments	Name	Description	Implementation Type	Role
Initial Implementati				
Advanced				
$( \longrightarrow )$				
Help		< <u>B</u> ack	Next > Einish	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	<b>•</b> (	End		

6. Double-click on the Start icon. The Properties - Start dialog is displayed, as shown in Figure 8-151.

🕜 Prope	erties - Start		
Basic 1	Implementation		
Name:	Start	۲	٩
Descriptio	on:		
Is Draft:			
Help		ОК Са	ncel

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.

1 Properties - Start	
Basic Implementation	
Implementation Type: 💿 Message	▼]
Message Exchange	
Type: 🙀 Use Interface	-
Conversation: <ul> <li>Default</li> <li>Advanced</li> </ul>	
Use Interface	
Reference:	🔍 🧳
Operation:	
Search 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:	
Search Results:	
····· @ SapService	
Help	OK Cancel

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     Graguments     Grage matmas01     Grage Process	Drag objects here	Image: Process       Imag
		<b>+ X</b> 4 4
From	То	

**20.** Create the Data Object as shown in Figure 8-155.

Figure 8-155 Create Data Object

Data Associations		X
Output		
		R. 🔜 N
Start     Group Arguments     Home Mathematical Argument	Drag objects here:	Process S Data Obj New Predefined Variabies BpmInboundProject S

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

👩 Create Data Object	
Name: InputDO	
Type: 🙀 MATMAS01	-
🗸 Auto initialize	
Help	OK Cancel

23. The InputDO is created, as shown in Figure 8-157.

Figure 8-157 Data Objec	Figure 8	8-157	Data	Objec
-------------------------	----------	-------	------	-------

D. 🛋 🔀
Process 😪
Data Objects 🛅 🚊
InputDO 🚁
idoc] 《》···庄
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

		R. 🛋 🔀
Start		Process 😪
🖨 🗠 🧰 Arguments	Drag objects here	Data Objects 🛅 🖷
🖨 🖓 matmas01		InputDO 🚜 🗄
🖶 🚸 idoc 🛛		idoc] 🚷 🗄
idocencoded		idocencoded 🔢 ·····
abc tid		tid abc
🗄 🐨 🌄 Process		Predefined Variables 🛅 🕀
		BpmInboundProject 😽 🗄
	A. M.	_

## 25. Click OK.

**26.** Double-click on the **End** icon.

The Properties - End dialog is displayed, as shown in Figure 8-159.

🕜 Pro	perti	ies - End						X
Basic	Imp	lementation						
Name:		End	 		۲		6	
Descrip	otion:							
Is Draf	t:							
Help						ОК	Canc	el

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.

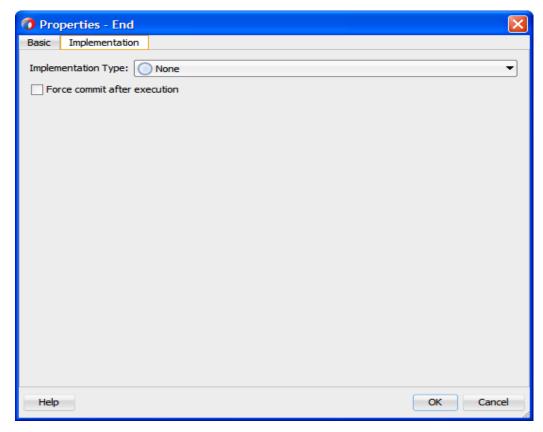
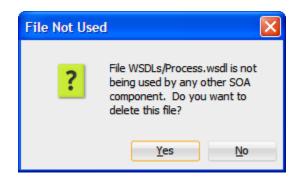


Figure 8-160 Implementation Type

### 29. Click OK.

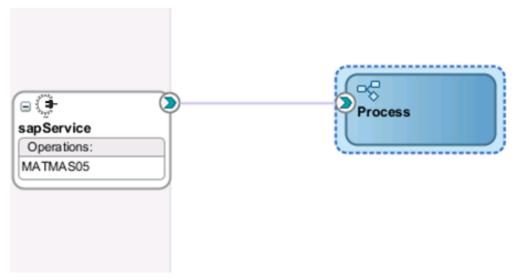
The File Not Used dialog is displayed, as shown in Figure 8-161.

```
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

0	Oracle	JDeve	loper 12c	MModule	e.jws	:	PRJ_PO_F	RELASE	_REL	INFO.j	pr
<u>F</u> ile	Edit	<u>V</u> iew	Application	Refactor	Sear	h	Navigate	Build	<u>R</u> un	Tea <u>m</u>	Tools
	New				5	Ар	plication				
	Open		Ctr	1-0		Pro	oject				

The New Gallery page is displayed as shown in Figure 8-164.

Q service bus	×	
Categories:	Items:	Show All Description
Service Bus Tier     Services     Interfaces     Transformations     Security		tion without a project. Useful when a Service Bus ort of a Service Bus configuration jar.
Utility System SOA Tier Faults	Service Bus Configuration (Deploy	

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	lication - Step 1 of 1			
lame your application	n			
	Application Name:			
Application Name	ServiceBusApplication3			
	Directory:			
	C:\JDeveloper\mywork\Service	eBusApplication3		Browse
	Appli Refreshickage Prefix:			
	Application Eckage Frenx:			
Help	< Bac	k Next	> <u>F</u> inish	Cancel
Tich			<u>d</u> illish	Cancel

3. Create a new OSB application, Select File > New > Project, as shown in Figure 8-166.

Q service bus	8	
ategories:	Items:	Show All Description
Service Bus TierServicesInterfacesTransformationsSecurity	Service Bus Application (Application Service Bus Application with Serv Service Bus Configuration (Deplo	vice Bus Project (Applications)
	<ul> <li>Service Bus Project (Deployment</li> <li>Service Bus Project (Project Create a new Service Bus Project</li> </ul>	ts)
FaultsInterfacesService ComponentsTestsTransformations/Translations		x
Web Tier HTML JSF JSF/Facelets		
JSP Servlets All Items		

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		0101	0101010101010101010101010101010101010101	
Reproject Name	Project Name: Dir <u>e</u> ctory:	SBProject1 C:\JDeveloper\mywork\ServiceBus	Application3\SBProject1	Bro <u>w</u> se
	Project Featu	es:		
	mediate, and	a proven, lightweight SOA integrai manage interactions between hete nterprise service bus (ESB) instanc	rogeneous services, legacy	applications,
Help		< <u>B</u> ack <u>N</u> ext >	<u> </u>	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.

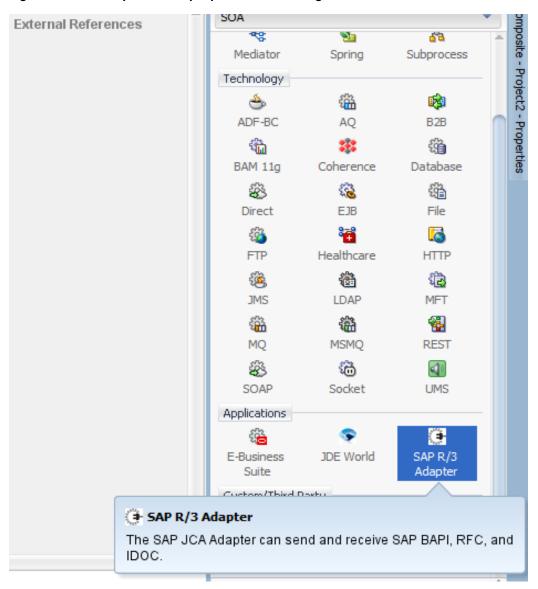


Figure 8-168 Component of Apdapter for SAP Configuration Wizard

The **Welcome** page of the Adapter configuration wizard is displayed, as shown in Figure 8-169.

igure 8-169 Welcom	e Page			
Adapter Configuration V	Vizard - Step 1 of 3			×
SAP Adapter Referen	ice	010101010	101010101020101010101	*
Welcome to the Ada This wizard helps you create a and define an operation for the	a service using a SAP Ada		to specify configurati	on parameters
Enter a Reference Name.				
Name: sapRefere	ence			
Service <u>D</u> irectory: C:\JDevel	oper\mywork\ServiceBus	Application3\SBProject:	1	Q
Help	< <u>B</u> ac	k <u>N</u> ext >	Einish	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.

Figure 8-170	Connection Info	ormation Page			
🕜 Adapter Co	nfiguration Wizard - S	itep 2 of 3			×
Connectior	1 Information		010101010101		*
	nection is required to con te a New Connection.	figure this adapter. S	Select a SAP R/3 con	nection already de	fined in your
Connection:	јсо			•	- 🕂 🖊 🗶
Client :	800				
Application	n Server: 10.30.32.42				
System Nu	umber: 00				
JNDI Name:	eis/FMW2SAP				9
<u>H</u> elp		< <u>B</u> ack	<u>N</u> ext >	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 8-171.

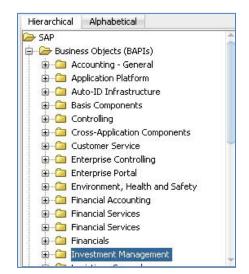
Object Selection		
Select SAP objects, BAPI, RFC, or IDoc, to retrieve Hierarchical Alphabetical SAP Consecting ALE/EDI Messages (IDOCs)	Selected BAPI/RFC fu	Description
		_

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



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			1010101010104040404040	ř.
elect SAP objects, BAPI, RFC, or IDoc, to retrieve and desc	ibe.			
Hierarchical Alphabetical	Selected BAPI/RFC functi	ons or IDOC mes	sages:	
_LEDGER_CUST	BAPI_COMPANYCOD	E_GETDETAIL	Company Code Details	
_MIG_CONVERSION				
_ONLINE_SPLITTER				
_org_units				
_PLANNING				
_STATKEYFIGURE				
P_XI_PROXY				
F_AI_FROAT				
CORE				
	Definition: BAPI_COMPAN	VCODE_GETDET	AIL	
CORE	Definition: BAPI_COMPAN	VCODE_GETDET	Description	
CORE	_	-		
CORE	Name	Type CHAR	Description	
CORE LOSING CRC	Name COMPANYCODEID	Type CHAR STRUCTURE	Description Company Code	
CORE LOSING CRC CORE 1002	Name COMPANYCODEID COMPANYCODE_ADD	Type CHAR STRUCTURE	Description Company Code Company Code Addre	
CORE LOSING CRC CORE	Name COMPANYCODEID COMPANYCODE_ADD COMPANYCODE_DETAIL	Type CHAR STRUCTURE STRUCTURE	Description Company Code Company Code Addre Company Code Detail	

Figure 8-173 Object Selection Page

- 8. Click Next.
- 9. The JCA Properties page is displayed, as shown in Figure 8-174.

Specify the Name and Value of all JCA Adapter		
roperties	Properties.	4 ×
Name	Value	
interaction	stateless	
exceptionFilter	off	
chemaValidation	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.



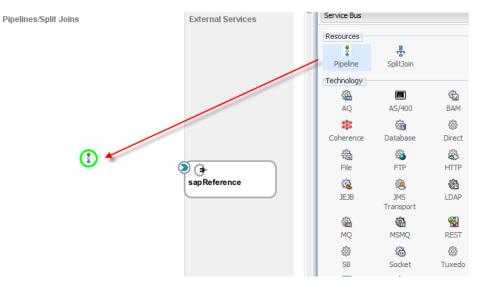
Adapter Configuration Wizard - Step 5 of 5				<b>X</b>
Finish				*
You have finished defining the SAP Adapte When you dick Finish, the wizard will create the C:\JDeveloper\ file in your project directory.			oject1\Resources\s	apReference.wsd
Help	< Back	Next >	Finish	

### **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

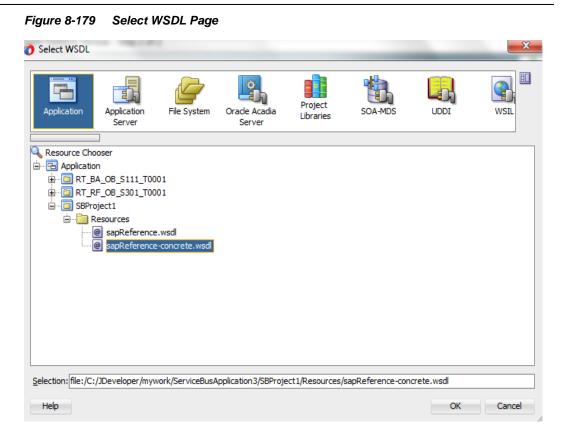
Create Pipeline Servic	e - Step 1 of 2			_		×
Create Service						
Create Service	General					
U Type	Service N <u>a</u> me: Location: Description	Pipeline C:\JDeveloper\mywoi	rk\ServiceBusApplicat	ion3\SBProject1		Q
	Definition	te				Q
Help			< Back	Next >	Finish	Cancel

- 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			-
Create Service	Service Type: V	VSDL-based service	
) Туре	() <u>W</u> SDL:		0
		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	Q
	Proxy <u>T</u> ransport:	http •	•]
	Messages:		

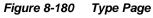
Figure 8-178 Type Page

- **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.

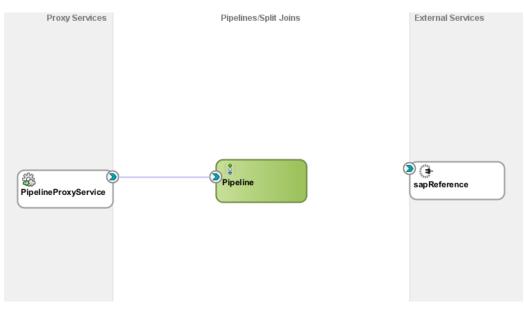


Гуре			4
<u>Create Service</u>	Service Type: V	5DL-based service	
🔵 Туре	• WSDL:	SBProject1/Resources/sapReference-concrete	ا ا
		inding: sapReference_PT-binding	•
	O Any SOAP:	SOAP 1.1	-
	O Any XML		
	O Messaging:	leguest:	-
		lesponse:	-
	Fypose as a	roxy Service	
	revease as a		
	Proxy Name:	- PipelineProxyService	
	Proxy Name:	PipelineProxyService	_ _ Q •
	Proxy N <u>a</u> me: Proxy <u>L</u> ocation:	PipelineProxyService C:\JDeveloper\mywork\ServiceBusApplication3\SBProject1	Q ▼
	Proxy N <u>a</u> me: Proxy Location: Proxy <u>T</u> ransport:	PipelineProxyService C:\JDeveloper\mywork\ServiceBusApplication3\SBProject1	
	Proxy N <u>a</u> me: Proxy <u>L</u> ocation:	PipelineProxyService C:\JDeveloper\mywork\ServiceBusApplication3\SBProject1	 ● ●

- 7. Select checkbox for Expose as a Proxy Service.
- 8. Select Proxy Transport as http.
- 9. Click Finish.

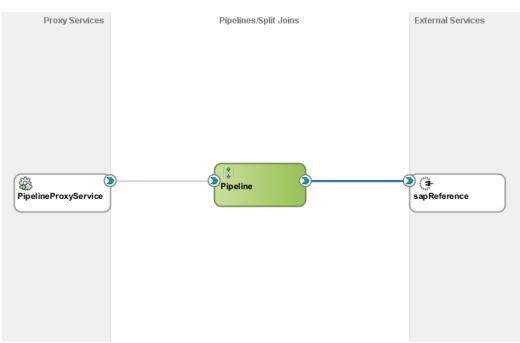
The Pipeline component is displayed as shown in Figure 8-181.

### 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.

× 📲 SBProject × 🕴 Pipeline.pipeline ×	Routing - Properties ×
	0 Q Find 3
Pipeline	🖃 Routing
	Service:* 🔊 🖾 SBProject/sapReference.bix 🔍
RouteNode1	
	<ul> <li>Use inbound operation for outbo</li> </ul>
	± General
Request Action Response Action	
•	
Zoom: 100 🖨 🔤 Reset	
uration	

Figure 8-183 Routing Properties

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 a Service Bus project to a Weblogic server which includes a Service Bus runtime.				
Help	< Back Next > Einish Cancel				

2. Select the already configured Application Server and click Next, as shown in Figure 8-185.

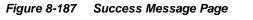
Figure 8-185 Select Server Page

Deploy ServiceBusAppli	cation3_Project1_Se	rviceBusProjectP	rofile		×
Select Server					
Deployment Action     Select Server     Summary.	Application Servers 110_STAGE6_OSB IntegratedWebLog server-80	_7065	inconfigured)		🕼 🗳 🛖
Help	O <u>v</u> erwrite modu	iles of the same na < <u>B</u> ack	ime Next >	Einish	Cancel

3. Check the deployment summary and click **Finish**, as shown in Figure 8-186.

Select Server       Deployment Summary:         Summary       Service Bus Deployment Summary         Server Name: 110_STAGE6_OSB_7065       Server Platform: Weblogic 12.x         Server Platform: Weblogic 12.x       Server Platform: Weblogic 12.x         Preserve Environment Settings: No       Preserve Security Settings: No         Preserve Security Settings: No       Preserve Credentials Settings: No         Discard Session if activation fails: Yes       Session description: Publish         Session description: Publish       Session description: Publish from Service Bus IDE.         Deployment customization file: {0}       Keystore file: {0}	Summary	
	Select Server	<ul> <li>Service Bus Deployment Summary</li> <li>Server Name: 110_STAGE6_OSB_7065</li> <li>Server Platform: Weblogic 12.x</li> <li>Service Bus Application Deployment Settings</li> <li>Preserve Environment Settings: No</li> <li>Preserve Security Settings: No</li> <li>Preserve Credentials Settings: No</li> <li>Discard Session if activation fails: Yes</li> <li>Session name: SB_Publish</li> <li>Session description: Publish from Service Bus IDE.</li> <li>Deployment customization file: {0}</li> </ul>

4. The Project is successfully deployed, as shown in Figure 8-187.





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	nsole 12c	Search for resources by name	Links 🔻 weblogic 👻 🚥
		Jeaun for resoluces of name	
토 C 산 쇼 —	▼ sapReference >		
▲ I Projects I default	Business Serv	ice Definition	- 🕨 🗎 🔻 🕑
Goulden     G	🔀 General		
Resources     Pipeline	Descriptio		
a PipelineProxyService	ß	ĥ	
a sapReference	Transpo	t jca	
System	Service Typ	WSDL Based Service - SOAP 1.1	
		WSDL SBProject1/Resources/sapReference-concrete	
		Binding 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						
<ul> <li>default</li> <li>Outbound_Simple</li> </ul>	×	General					
<ul> <li>SBProject1</li> <li>Carlos Resources</li> <li>Pipeline</li> </ul>	<b>*</b> 1	Description					
PipelineProxyService	<i>↓</i> <i>⊠</i> *	Transport	ira				
▶ 🔁 System	~		WSDL Based Service - SOAP 1.1				
			WSDL SBProject1/Resources/sapReference-concrete				
	4		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	5 💌	weblogic	Ŧ	
Search for resources by name	0	%	Designer	🖍 Ad	lmin
				<b>i</b> •	8

**9.** 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
Description - SapReference Help
Execute Execute-Save Reset Close
© Service Operation
Operation: BAPI_COMPANYCODE_GETDETAIL •
Request Document
Form XML
SOAP Header: <pre></pre>
* Payload: Choose File No file chosen
<urr><urr:eapi_companycode_getdetail xmlns:urn="urn:sap-com:document:sap:rfc:functions"><urr:companycodeld>1500</urr:companycodeld></urr:eapi_companycode_getdetail></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.

10.30.32.110:	7065/lwpfconsole/testdialog.portal?_nfpb=true&_windowLabel=ServiceTestDialogPortlet&
🍃 Business Sei	vice Testing - sapReference
Back	Close
🔁 Request Doo	ument
<soap:head </soap:head  <soapenv:bo <urn:b <br=""><u< td=""><td>dy&gt; .PI_COMPANYCODE_GETDETAIL xmlns:urn="urn:sap-com:document:sap:rfc:functions"&gt; rn:COMPANYCODEID&gt;1500 API_COMPANYCODE_GETDETAIL&gt; ody&gt;</td></u<></urn:b></soapenv:bo 	dy> .PI_COMPANYCODE_GETDETAIL xmlns:urn="urn:sap-com:document:sap:rfc:functions"> rn:COMPANYCODEID>1500 API_COMPANYCODE_GETDETAIL> ody>
🕂 Response Do	ocument
<soap-env:envelo< td=""><td>pe xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"&gt;</td></soap-env:envelo<>	pe xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/">
<soap-env:envelo <soap-env:b< td=""><td>pe xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"&gt; ody&gt;</td></soap-env:b<></soap-env:envelo 	pe xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"> ody>
<soap-env:envelo <soap-env:b <bapi_< td=""><td>pe xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"&gt; bdy&gt; COMPANYCODE_GETDETAIL_RESPONSE xmlns="urn:sap-com:document:sap:rfc:functions"&gt;</td></bapi_<></soap-env:b </soap-env:envelo 	pe xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"> bdy> COMPANYCODE_GETDETAIL_RESPONSE xmlns="urn:sap-com:document:sap:rfc:functions">
<soap-env:envelo <soap-env:b <bapi_< td=""><td>pe xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"&gt; ody&gt; COMPANYCODE_GETDETAIL_RESPONSE xmlns="urn:sap-com:document:sap:rfc:functions"&gt; OMPANYCODE_ADDRESS&gt;</td></bapi_<></soap-env:b </soap-env:envelo 	pe xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"> ody> COMPANYCODE_GETDETAIL_RESPONSE xmlns="urn:sap-com:document:sap:rfc:functions"> OMPANYCODE_ADDRESS>
<soap-env:envelo <soap-env:b <bapi_< td=""><td>pe xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"&gt; ody&gt; COMPANYCODE_GETDETAIL_RESPONSE xmlns="urn:sap-com:document:sap:rfc:functions"&gt; OMPANYCODE_ADDRESS&gt; <addr_no>0000065853</addr_no></td></bapi_<></soap-env:b </soap-env:envelo 	pe xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"> ody> COMPANYCODE_GETDETAIL_RESPONSE xmlns="urn:sap-com:document:sap:rfc:functions"> OMPANYCODE_ADDRESS> <addr_no>0000065853</addr_no>
<soap-env:envelo <soap-env:b <bapi_< td=""><td>De xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"&gt; Ddy&gt; COMPANYCODE_GETDETAIL_RESPONSE xmlns="urn:sap-com:document:sap:rfc:functions"&gt; OMPANYCODE_ADDRESS&gt; <addr_no>0000065853</addr_no> <formofaddr>Firma</formofaddr></td></bapi_<></soap-env:b </soap-env:envelo 	De xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"> Ddy> COMPANYCODE_GETDETAIL_RESPONSE xmlns="urn:sap-com:document:sap:rfc:functions"> OMPANYCODE_ADDRESS> <addr_no>0000065853</addr_no> <formofaddr>Firma</formofaddr>
<soap-env:envelo <soap-env:b <bapi_< td=""><td>pe xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"&gt; ody&gt; COMPANYCODE_GETDETAIL_RESPONSE xmlns="urn:sap-com:document:sap:rfc:functions"&gt; OMPANYCODE_ADDRESS&gt; <addr_no>0000065853</addr_no> <formofaddr>Firma</formofaddr> <name>Ides AG</name></td></bapi_<></soap-env:b </soap-env:envelo 	pe xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"> ody> COMPANYCODE_GETDETAIL_RESPONSE xmlns="urn:sap-com:document:sap:rfc:functions"> OMPANYCODE_ADDRESS> <addr_no>0000065853</addr_no> <formofaddr>Firma</formofaddr> <name>Ides AG</name>
<soap-env:envelo <soap-env:b <bapi_< td=""><td>De xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"&gt; Ddy&gt; COMPANYCODE_GETDETAIL_RESPONSE xmlns="urn:sap-com:document:sap:rfc:functions"&gt; OMPANYCODE_ADDRESS&gt; <addr_no>0000065853</addr_no> <formofaddr>Firma</formofaddr></td></bapi_<></soap-env:b </soap-env:envelo 	De xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"> Ddy> COMPANYCODE_GETDETAIL_RESPONSE xmlns="urn:sap-com:document:sap:rfc:functions"> OMPANYCODE_ADDRESS> <addr_no>0000065853</addr_no> <formofaddr>Firma</formofaddr>
<soap-env:envelo <soap-env:b <bapi_< td=""><td>be xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"&gt; bdy&gt; COMPANYCODE_GETDETAIL_RESPONSE xmlns="um:sap-com:document:sap:rfc:functions"&gt; OMPANYCODE_ADDRESS&gt; <addr_no>0000065853</addr_no> <formofaddr>Firma</formofaddr> <name>Ides AG</name> <name_2>Martin Steiner, Kathrin Walther,</name_2></td></bapi_<></soap-env:b </soap-env:envelo 	be xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"> bdy> COMPANYCODE_GETDETAIL_RESPONSE xmlns="um:sap-com:document:sap:rfc:functions"> OMPANYCODE_ADDRESS> <addr_no>0000065853</addr_no> <formofaddr>Firma</formofaddr> <name>Ides AG</name> <name_2>Martin Steiner, Kathrin Walther,</name_2>
<soap-env:envelo <soap-env:b <bapi_< td=""><td>be xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"&gt; bdy&gt; COMPANYCODE_GETDETAIL_RESPONSE xmlns="um:sap-com:document:sap:rfc:functions"&gt; OMPANYCODE_ADDRESS&gt; <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></td></bapi_<></soap-env:b </soap-env:envelo 	be xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"> bdy> COMPANYCODE_GETDETAIL_RESPONSE xmlns="um:sap-com:document:sap:rfc:functions"> OMPANYCODE_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>
<soap-env:envelo <soap-env:b <bapi_< td=""><td>be xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"&gt; bdy&gt; COMPANYCODE_GETDETAIL_RESPONSE xmlns="um:sap-com:document:sap:rfc:functions"&gt; OMPANYCODE_ADDRESS&gt; <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></td></bapi_<></soap-env:b </soap-env:envelo 	be xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"> bdy> COMPANYCODE_GETDETAIL_RESPONSE xmlns="um:sap-com:document:sap:rfc:functions"> OMPANYCODE_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>
<soap-env:envelo <soap-env:b <bapi_< td=""><td><pre>be xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"&gt; bdy&gt; COMPANYCODE_GETDETAIL_RESPONSE xmlns="um:sap-com:document:sap:rfc:functions"&gt; OMPANYCODE_ADDRESS&gt;</pre></td></bapi_<></soap-env:b </soap-env:envelo 	<pre>be xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"&gt; bdy&gt; COMPANYCODE_GETDETAIL_RESPONSE xmlns="um:sap-com:document:sap:rfc:functions"&gt; OMPANYCODE_ADDRESS&gt;</pre>
<soap-env:envelo <soap-env:b <bapi_< td=""><td><pre>be xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"&gt; bdy&gt; COMPANYCODE_GETDETAIL_RESPONSE xmlns="um:sap-com:document:sap:rfc:functions"&gt; OMPANYCODE_ADDRESS&gt;</pre></td></bapi_<></soap-env:b </soap-env:envelo 	<pre>be xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"&gt; bdy&gt; COMPANYCODE_GETDETAIL_RESPONSE xmlns="um:sap-com:document:sap:rfc:functions"&gt; OMPANYCODE_ADDRESS&gt;</pre>
<soap-env:envelo <soap-env:b <bapi_< td=""><td>De xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"&gt; bdy&gt; COMPANYCODE_GETDETAIL_RESPONSE xmlns="um:sap-com:document:sap:rfc:functions"&gt; OMPANYCODE_ADDRESS&gt; <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></td></bapi_<></soap-env:b </soap-env:envelo 	De xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"> bdy> COMPANYCODE_GETDETAIL_RESPONSE xmlns="um:sap-com:document:sap:rfc:functions"> OMPANYCODE_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>
<soap-env:envelo <soap-env:b <bapi_< td=""><td><pre>be xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"&gt; bdy&gt; COMPANYCODE_GETDETAIL_RESPONSE xmlns="urn:sap-com:document:sap:rfc:functions"&gt; OMPANYCODE_ADDRESS&gt;</pre></td></bapi_<></soap-env:b </soap-env:envelo 	<pre>be xmlns:soap-env="http://schemas.xmlsoap.org/soap/envelope/"&gt; bdy&gt; COMPANYCODE_GETDETAIL_RESPONSE xmlns="urn:sap-com:document:sap:rfc:functions"&gt; OMPANYCODE_ADDRESS&gt;</pre>

## 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

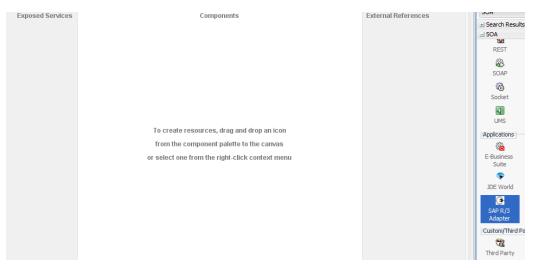


Figure 8-194 Adapter for SAP Configuration Wizard

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	_		-	x
SAP Adapter Service				*
Welcome to the Adapter Configuration Wiz This wizard helps you create a service using a SAP Adapter. Yo		pe <mark>cify configuratio</mark>	n parameters and de	fine an
operation for the service.				
Enter a Service Name.				
Name: sapService				
Service Directory: C:\JDeveloper\mywork\ServiceBusApplicati	on3\Inbound_Proje	ct		Q
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	0101919191919101	*
	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 : Applicatio System N	800 n Server: 10.30.32.42 umber: 00				
JNDI Name:	eis/FMW2SAP				<b>Q</b>
Uala		< Pack	Neut	Finish	Cancel
<u>H</u> elp		< <u>B</u> ack	<u>N</u> ext >	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.

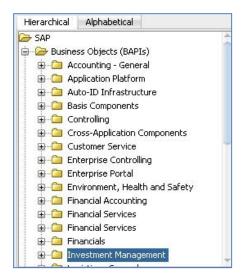
ject Selection			
elect SAP objects, BAPI, RFC, or IDoc, to retrieve and des		PI/RFC functions or IDC	)C messages:
	Name:		
CWM/SHP_OBDLV_CONFIRM_DEC  CWM/SHP_OBDLV_SAVE_REPLICA  CWM/SHP_OBDLV_SPLIT_DECENTRAL  CWM/STPPOD  CWM/STPPOD  CWM/STPPOD  CWM/STPPOD  CWM/STPPOD  CWM/STPPOD  CWM/STPPOD  CWM/STPPOD  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		0101010101010	101010101010101	*
Select SAP objects, BAPI, RFC, or IDoc, to retrieve and desc		RFC functions or ID(	DC messages:	
	CREMASO	5 Distribute vendo		
Image: SaPSLL/CCECUS         Image: SaPSLL/CCEMAS_SLL         Image: SaPSLL/CCEMASO1 Distribute vendor master         Image: SaPSLL/CCEMASO2 Distribute vendor master         Image: SaPSLL/CCEMASO3 Distribute vendor master	Name	Туре	Description	
Help	< <u>B</u> ack	<u>N</u> ext >	Finish	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	010101010101010	
Specify the Name and Value of all JCA A	dapter Properties.	
Properties		4 ×
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	
jca.retry.maxInterval	120	

#### Figure 8-200 JCA Properties Page

#### 11. Click Next.

The **Finish** page is displayed, as shown in Figure 8- 201.

Adapter Configuration Wizard - St			
Finish			-
You have finished defining When you click Finish, the wizard will cre file in your project directory.		oject1\Resources\s	apReference.wsc
			Cancel

Figure 8-201 Finish Page

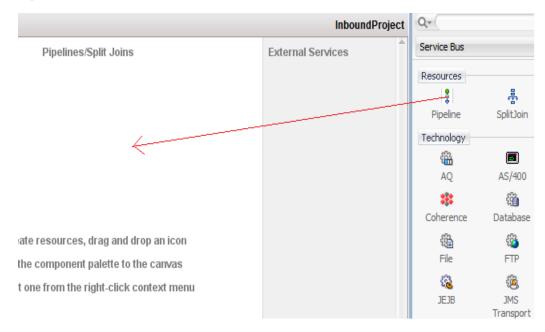
The Adapter for SAP is created and displayed in the **Proxy Services** pane, as shown in Figure 8- 202.



Figure 8-202 Adapter for SAP

	Proxy Service	s
( 1 ²¹ 2		
		Ŷ
sapSer	vice	

**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	Create Service Page
--------------	---------------------

O Create Pipeline Servic	e - Step 1 of 2			-	25
Create Service				Malaka /	
Create Service	General Service N <u>a</u> me: Location: Description	work\ServiceBusApplici	ation3\Inbound_Project		
Help		< <u>B</u> ack	Next >	inish Can	cel

- 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.

уре			Ţ
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:	
	<b><u>Expose</u> as a</b>	Proxy Service	
	Proxy Name:	PipelineProxyService	
	Proxy Location:	C:\JDeveloper\mywork\ServiceBusApplication3\Inbound_Project	Q
	Proxy <u>T</u> ransport:	http 💌	
	Messages:	irce must be specified.	

16. Select the appropriate WSDL file from Application -> Resources folder, as shown in Figure 8-206.

Figure 8-206 Select WSDL

👌 Select WSDL	_	×
Application Application Server File System Oracle Acadia Server SOA-MDS	UDDI	WSIL
Resource Chooser		
🛱 🛅 Inbound_Project		
sapService.wsdl		
PRJ_CREMAS05_IN		
B RT_BA_OB_S110_T0001		
B SBProject1		
Selection: file:/C:/JDeveloper/mywork/ServiceBusApplication3/Inbound_Project/Resources/sapService-con	crete.wsdl	
	ere cerman	
Help	OK	Cancel

Figure 8-205 Type Page

#### 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		-		x
Туре			01010101010101010101010101	ł	5
<u>Create Service</u>	Service Type: V	VSDL-bas	ed service		
💩 Туре	() WSDL:	Inbound	Project/Resources/sapService-concrete	e	٢
		Binding:	sapService_PT-binding		
	O Any SOAP:	SOAP 1.	1		
	O Any XML				
	O Messaging:	Reguest:	<b>▼</b>		
		Response	::		
	Expose as a	Proxy Se	rvice		
	Proxy Name:	PipelineP	roxyService		
	Proxy Location:	C:\JDeve	loper \mywork \ServiceBusApplication 3 \Inbound_Project	Q	
	Proxy <u>T</u> ransport:	http	Ţ		
	Messages:				_
Help			< Back Next > Einish C	ancel	

**18.** Pipeline is displayed connected to **sapService**, as shown in Figure 8- 208.

#### Figure 8-208 Pipeline Component

Proxy Services	Pipelines/Split Joins
sap Service	Pipeline

#### **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 Configuration Wizard - Step 1 of 7	23
File Adapter Reference	0101010101010101010101010
Welcome to the File Adapter Configuration Wiza	ard
This wizard helps you create a File Adapter. You will be asked to specif adapter.	fy configuration parameters and define an operation for the
Enter a Reference Name.	
Name: fileReference	
Service Directory: C:\JDeveloper\mywork\ServiceBusApplication3\Inb	oound_Project

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	lapter Interface	Page
----------------	------------------	------

FILE Adapter Configuration Wizard - Step 2 of 7	×
Adapter Interface	
The adapter interface is defined by a wsdl that is generated Optionally, the adapter interface may be defined by importing	using the operation name and schema(s) specified later in this wizard. g an existing WSDL.
Interface: <ul> <li>Define from operation and schema (specified la <ul> <li>Import an existing WSDL</li> </ul> </li> </ul>	ater)
WSDL URL:	<u></u>
Port Type:	<b>v</b>
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 H	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	er to access the File Server at runtime.

5. Click Next.

The **Operation** page is displayed, as shown in Figure 8-212.

Figure 8-212 Operation Page

Operation	
operation that cre that lists file name	supports five operations. There is a Read File operation that polls for incoming files in your local file system, a Write File vates outgoing files, a Synchronous Read File operation that reads the current contents of a file, a List Files operation is 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> <u> </u> </u>
	Synchronous Read File
	◯ List Files
	◯ Chunked Read
Operation Name:	Write
Add Output He	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.

Figure 8-213	File	Configuration	Page
--------------	------	---------------	------

FILE Adapter Configuration Wizard - Step 5 of 7				23
File Configuration				*
Specify the parameters for the Write File operation.				
Directory specified as <u> P</u> hysical Path <u>Logical Nam</u> Directory for Outgoing Files (physical path): /orade/Check_Inbound	ne		Br	owse
Eile Naming Convention (po_%SEQ%.txt): Inbound_crem	as05.xml			
Append to existing file				
_[ Write to output file when any of these conditions are met —				
✓ Number of Messages Equals: 1				
Eapsed Time Exceeds: 1	▲ ▼ ↓		<b></b>	
File Size Exceeds: 1000	(T	kilobytes		
Help	< <u>B</u> ack	<u>N</u> ext >	Einish	Cancel

- 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 format translation is not required (Schema is Opaque)		
<u>U</u> RL	۹.	۵
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 Resources Resource.xsd PRJ_CREMAS05_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		
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.

r Message Schema				
Native format translation is not required (Schema is Opaque)				
URL	sapService.xsd	۵ 🖗		
Schema Element	CREMAS05			

#### 14. Click Next.

The Finish page is displayed, as shown in Figure 8-217.

Figure 8-217 Finish Page

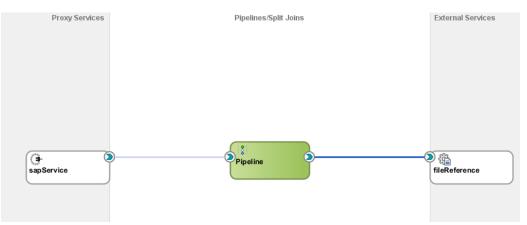


#### 15. Click Finish.

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
+	<ul> <li>Use inbound operation for outbo</li> </ul>
De Routing	⊞ General
Request Action Response Action	
<b>v</b>	
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

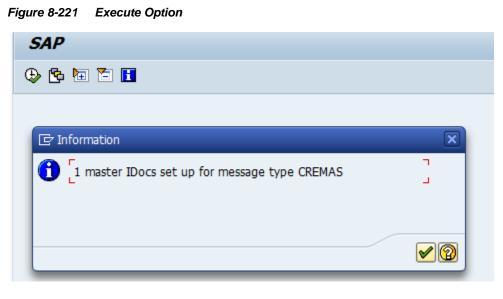
Perform the following steps to generate an event in SAP R/3 for Inbound OSB:

- 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

<ul> <li>•</li> </ul>	📙   🗞 🚱 🌚 🗎 🛛	1 K   2 U	D 🕄   💥	2   🕜 🖪
Send vendor				
⊕ <b>6</b> -				
Account number of vendor	3510	to		<b>=</b>
Class		to		
Message type	CREMAS			
Target system	ORAQA4			

- **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 🗙 🛃 🕞 Prope	erties 📔 🔓			
/oracle/Check_Inbound				
Name Ext	Size	Changed	Rights	Owner
۰۰ 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

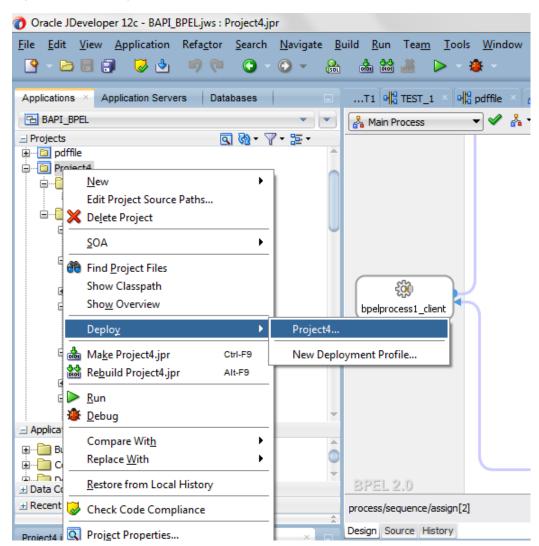


Figure 8-224 Navigation Screen

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				
Peployment Action	Project4			
Deploy Configuration	Composite Revi	ision ID		
Select Server	Project:	Project4		
U Summary	Current Revision ID:	1.0		
	New Revision ID:	1.0		
	🗄 50A Configurati	ion Plan		
	Mark composite revisi	ion as default.		
Overwrite any existing composites with the same revision ID.				
	Use the following SO/	A configuration plan for all composites:		
$( \longrightarrow )$		Browse		
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					ĸ
Select Server					
C Deployment Action	Application Servers:			4 te G	<u>ə</u>
Deploy Configuration	APP 116 duster 132				
Select Server	IntegratedWebLogicServer (domain uncor	nfigured)			
SOA Servers	SOA110_stag6 SOA110_stage8				_
	$\checkmark$ Overwrite modules of the same name				
<u>H</u> elp	< <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				
R Deployment Action	Choose the target SOA ser this archive.	ver(s) and corres	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
Summary				
<u>H</u> elp	<	Back N	lext > <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		x
Deployment Action     Deploy Configuration     Select Server <u>SOA Servers</u> Summary	Deployment Summary: 	
Help	< Back Next > Finish Cance	<u>e</u> l

- 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 I	History	
Build - Issues	Messages - Log ×	
Compilation (	of project 'Project4.jpr' finished. Check	
'X:\oracle_s	tage11\middleware\jdeveloper\mywork\BAPI_BPEL\Project4\SOA\SCA-INF\classes\scac.log'	for
[11:15:25 AM	Successful compilation: 0 errors, 0 warnings.	Ç
•	Messages	
Messages 🔒	BPEL × 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.

н

# 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 ()						
📕 WebLogic Domain 👻						
Servers		Administration Server				
<b>2</b> Up	Þ	Name	AdminServer			
		Host	TDCVM14S07			
		Listen Port	7011			
Clusters		Servers				
0		View 🔻 🎯 Create 🛛 💥 Delete	Start	∭≥ Resume	🛛 Suspend 🔻 🗌	Shutdown 👻 🗔 Re
Clusters		Name	Status C	luster	Machine	State
		AdminServer(admin)	<b>a</b>		new_Machine_1	Running
Deployments		soa_server1	<b>a</b>		new_Machine_1	Running
1 Unknown 25 Up	Þ	Columns Hidden 33				
~						
🔊 sbconfig.jar 🔹						

2. After clicking the highlighted tab, expand SOA to get list of deployed projects.

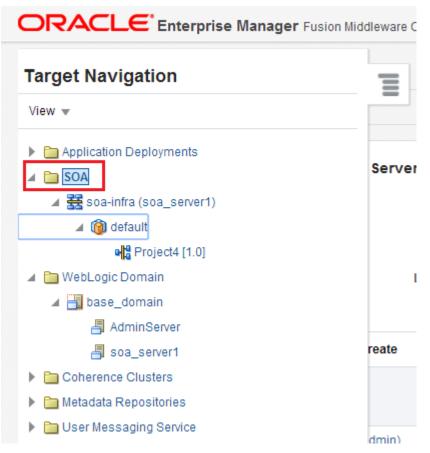


Figure 8-232 Expanding the SOA project list

- 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	e
🖧 BF	PELProcess1
⊿ Se	ervices and References
Nam	e
🧙 bp	elprocess1_client_ep
Rsa	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	it Arguments			
Tree Vie	Enable Validation	Load Payload Choose File	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 🛛 🖪 TDCVM14	S07
	Apr 28, 2	015 8:48:12 PM IST (	5
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.

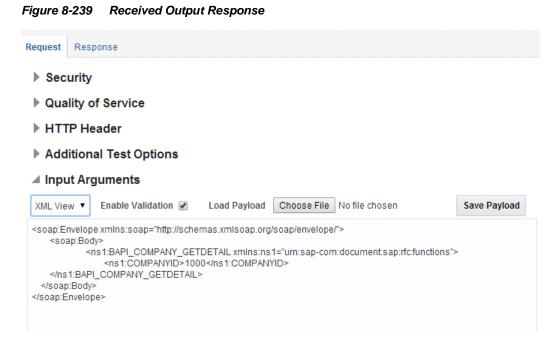
Figure 8-237 Output Respon	se		
Request Response			
Test Status Requ	uest succ	essfully rec	ceived.
Response Time (ms) 301			
Tree View 🔻			
A new flow instance was ger	nerated.	Launch F	low Trace
Name	Туре		Value
▲ parameters	paramet	ers	
COMPANY_DETAIL	BAPI001	4_2	
▶ RETURN	BAPIRE	TURN	

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 su	iccessfully rece
Respons	e Time (ms)	579	
Tree Vie	ew 🔻		
Tree Vie			
A XML Vie	w tance w	as generated	d. Launch Flo
Name	XML View	Туре	1

- **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 wa	as generated.	Launch Flow Trace	
	COMPANYCODE COMPANYCODE <addr_no> <formofad <name>Ides <name_2>M <name_3>Be <name_4>ID <c_0_name <city>Frank <district></district> <city_no></city_no></city></c_0_name </name_4></name_3></name_2></name></formofad </addr_no>	ADDRESS> 0000000121DR>FirmaAG artin Steiner, Kath ernd Zecha, Dondo IES intern/> furt	DR_NO> 10FADDR> ogmaa Lchamdondog_4>	n:document:sap:rfc:functions"> IE_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

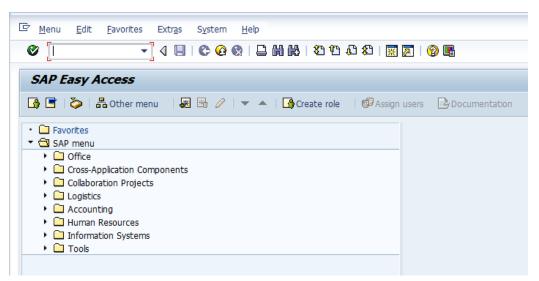
Events are generated in SAP by some activity, for example, updating the material in SAP as in case of matmas.

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



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 System	<u>H</u> elp
V - 4	i 🛠 🚱   🛃    🖓 🕮 🖏 🖆 🕼 🔛 🔜 😵 🚱 I
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 L
	<b>V</b> 🕲

Material master data is sent to the logical system specified.

#### Verifying the Results

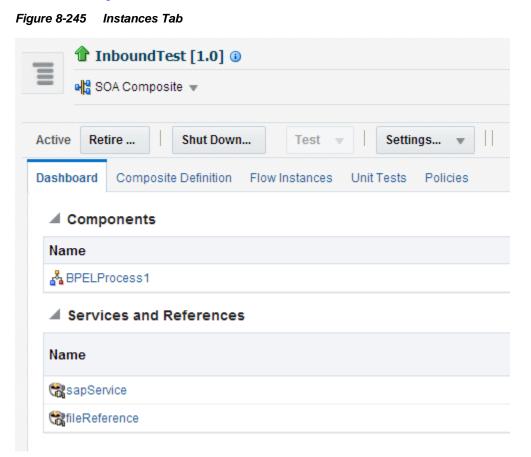
To verify your results:

- 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 Fusio	n Middleware Control 12c	
Target Navigation	Ξ	
View 💌	-	
<ul> <li>Application Deployments</li> <li>SOA</li> </ul>	Server	
🔺 🧱 soa-infra (soa_server1)	Name	AdminServer
▲ () default ■ InboundTest [1.0]	Host	TDCVM14S07
ela 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 BPE Instance of BPEL This page shows BPEL pro-	Process1 ③	
Audit Trail Flow Ser	Find	🜗 🕨 🍓 Go
View View Highlight Fa	2 <part xr<br="">3 <math 4 <idoc begin<br="">5 <edi dc40="" s<br="">6 <tabnam>EDO 7 <mandt>800 9 <docrel>700 0 <status>30 11 <direct>1&lt; 12 <outmod>2</outmod></direct></status></docrel></mandt></tabnam></edi></idoc></math </part>	SEGMENT="1"> I DC40 <7MANDT> 00000001746746 0  /DIRECT> /OUTMOD> MATMAS01 TMAS

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 👻	
	. Service Engine Pro	perties
Edit prope	erty values and click Apply.	
	* Audit Level	Inherit 🔻
	* Audit Trail Threshold (Byte)	50000
* La	rge Document Threshold (Byte)	100000
	* Payload Validation	
* Disat	ble BPEL Monitors and Sensors	0
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.

og Levels Log Files			
untime Loggers are created during runtime and bec odule is deployed. If you change the log level of a Re ersist if the component is restarted.			
iew Runtime Loggers 🔹			
Search All Categories 🔻 sap		•	
Logger Name	Oracle Diagnostic Logging Level (Java Level)	Log File	Persistent Log Level State
▲ oracle.soa.adapter.sap	ERROR:1 (SEVERE)	odl-handler	
oracle.soa.adapter.sap.connection	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

Response Time and TPS Vs User Load - Fetch Scenario (1kb request and 43 kb response)					
#	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
-----------	---------------------------------------

Resp	Response Time Vs User 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	TPS Vs User Load - Fetch Scenario (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.

ngure 9-3 increase the value of	Si Count
🔒 Home Log Out Preferences 🔤 Record	i Help
Home >Summary of Environment >Summary of Managers > <b>SOAInternalProcessing_maxTh</b>	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
街 Data Source:	
Save	

# Figure 9-3 Increase the value of Count

# 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.

SOA Compo	osite 🔻					
🖑 RFC_	оитвоі	JND (Custom A	dapter) 🛈			
Dashboard	Policies	Properties Ada	pter Reports			
Diagnosil	-	ports 📼 🗹 on Reports	Enable reports			
EIS Cor	nectivity					
			JndiName eis/SAP/FM	WDEMO		
		tionDataProvider_JC	-			
		er_JCO_CONNECTIO	-			
D		ataProvider_JCO_PI	-			
		tionDataProvider_J	-			
		_	PROGID ORADEV2	-		
		ationDataProvider_JCO	_GWHOST 10.30.32.4	2		
		_	ICO_USER JCA_DEV			
Mor	nitoring	Reports				
The table b	elow displa	ys real-time monitor	-		ection is down, click the s	tatus i
				Connections		
No	de	Currently Ope	n Average Number Used	Currently Free	Maximum Pool Size	L
	server1	200.	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.



# 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

gnosibility Reports 💌 🗹 Enable reports				
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.

-	eports 💌 🗹 E	nable reports			
Monitorir	Ig Reports	oring statistics for thi	o opdaoist /If op EIS	Connaction in down	dial-the status ison for stack
e table below dis	ays real-time monitoring statistics for this endpoint. (If an EIS connection is down, on Managed Connections				, click the status icon for stack
Node	Currently Open	Average Number Used	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.

Retrieve Data	Recent time period 🔻 La	ust* 24 ^ ¥ Hours	•	
	Server Name	Average Message Size (bytes)	Maximum Message Size (bytes)	Minimum Message Size (bytes)
No data found				

# **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"
- Section 11.5, "Known Issues"

# 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.

Table 11-1Adapter 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.		

Error	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	124
🕀 🗁 Busine	ess Objects (BAPIs)
	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.
<exception>Select one of the installed languages on {I.P ADDRESS} sysnr XX</exception>	Enter correct DestinationDataProvider_JCO_LANG in the WebLogic console - JNDI properties.

Error	Solution           Check that the JNDI name is correct while deploying the project.		
No credential provided			
<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		
<exception>ZRFC_EC_BD14 not found in SAP.</exception>	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.		

### Table 11-2 Error in SOA server Run-time Continues

**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.
- **2.** Error When Processing Payload for Extended IDOCs (Intermediate Documents): The following error occurs while processing payload for an extended IDOC.

```
oracle.cloud.cpi.common.core.CpiException:
oracle.tip.adapter.sa.impl.fw.ext.org.collaxa.thirdparty.apach
e.wsif.WSIFException:
file:/home/oracle/oic connection agent/agenthome/agent/data/f4
68bd10-d06e-431e-b24e-
63ab1f6dac2c/Send Worker to SAP REQUEST.wsdl
[Send Worker to SAP REQUEST PT::HRMD A09.ZHRMD A09(parameters,
parameters) ] - WSIF JCA Execute of operation
'HRMD A09.ZHRMD A09' failed due to:
SAP-IDC-O-INV-PL-1.
Adapter Exception: Payload processing error.
; nested exception is:
BINDING.JCA-00001
SAP-IDC-O-INV-PL-1.
AdapterException: Payload processing error.
The payload does not correspond with the selected Idoc fault.
```

**Solution**: When you map an IDOC that is to be send to SAP from Oracle Integration, ensure that you map all mandatory fields. In Mapper, map the source **CIMTYP**, **MESTYP**, and **IDOCTYP** to the target **CIMTYP**, **MESTYP**, and **IDOCTYP**. Ensure that you add/pass the value to the **CIMTYP** for payloads. In addition, ensure that values are passed as follows:

- Standard IDOC type for **IDOCTYP**
- Extended IDOC for **CIMTYP**
- A standard message type for **MESTYP**

See the below examples for matmas (IDOCs) and HRMD_A09 (IDOCs) groups.

```
<urn:IDOCTYP>MATMAS01</urn:IDOCTYP>
<!--Optional:-->
<urn:CIMTYP>ZMATMAS01_EXT</urn:CIMTYP>
<!--Optional:-->
<urn:MESTYP>MATMAS</urn:MESTYP>
<urn:IDOCTYP>HRMD_A09</urn:IDOCTYP>
<!--Optional:-->
<urn:CIMTYP>ZHRMD_EXT</urn:CIMTYP>
<!--Optional:-->
<urn:MESTYP>HRMD_A</urn:MESTYP>
```

# **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, "Updating the JCA File in Migrated Projects"
- Section 12.5, "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.

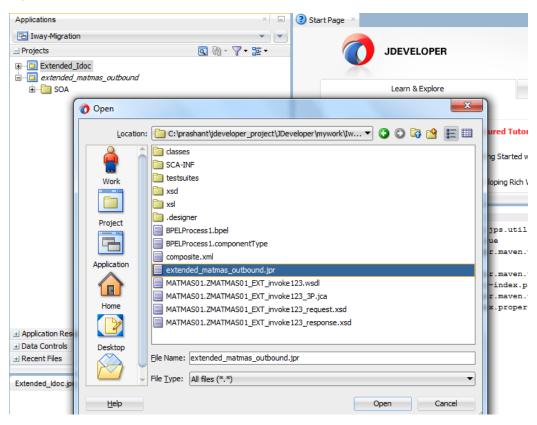
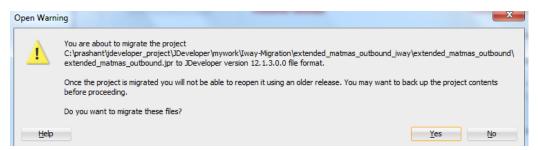


Figure 12-1 Open iWay project in 12.1.3 JDeveloper

**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

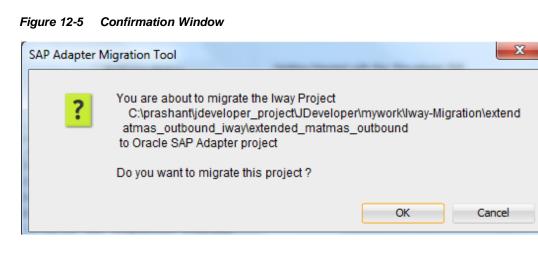
👌 Migratio	on Status	×
i	Migration successfully completed for the following file(s): C:\prashant\jdeveloper_project\JDeveloper\mywork\Jway-Migration\extended_matmas_outbound_iway\extended_m	atmas_outbound\exten
		ОК

**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

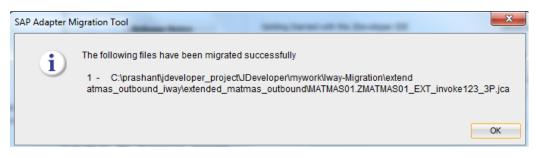
🔁 Iway-Migration	• •	🖌 🕼 🏹 🕺 👘	🧕 🗹 i 🖏	두 🏟 砲
-] Projects	'• ‱ •	Exposed Service	s	Components
testsuites     Transformations     Transf	Delete Proj <u>S</u> OA     Find Projec Show Class Show Over Deploy     Find Usage Make exter Rebuild ext     Bun Debug	t Files path view	Ctrl+Alt-U Ctrl+Alt-U Ctrl+S	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 + Recent Files	Refa <u>c</u> tor Co <u>m</u> pare V Replace W <u>i</u>		•	
extended_matmas_outboun × Tr	-	r Migration Tool		oace and store definition in Iway-Migration/.adf/META-: for the following file(s): *tmas_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.



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	Welcome	Welcome, weblogic		Connected to : osb_domain	🟠 Home	Oracle WLS Console	Logout	Help
View Changes								
View All Sessions	Ex Ex	cport I	Resources					
Create Discard Exit	• Ex	xport Pr	rojects					
	О Ех	xport Re	Resources					
System Administration	Inclu	ude De	ependencies					
Import/Export	Resour	irce Si	ummary					
Import Resources	+	_	•				Гуре	
Export Resources			System				Project	
		1 14	AQandSAP			1	Project	
UDDI	+ 🗸	1	ImportOrders05				Project	
UDDI Registries	+ 🗸	2 😭	RT_BA_OB_\$9020_TC0001			1	Project	
Import from UDDI	+ 🗸	7 😭	RT_BA_OB_\$9020_TC0003			1	Project	
Auto-Import Status	+ 🗸	7	RT_ID_OB_S18010_TC0001			1	Project	
Publish to UDDI	+ 🗸	7 😭	RT_ID_OB_S18011_TC0001			1	Project	
Auto-Publish Status	<b>H</b>	1	RT_ID_0B_S18012_TC0001			1	Project	
		1	RT_ID_OB_S18013_TC0001			1	Project	
Global Resources	<b>H</b>	1	RT_ID_0B_S18013_TC0002			1	Project	
JNDI Providers	± 🗆	1	RT_ID_OB_S18013_TC0003			1	Project	
SMTP Servers	<b>H</b>	1	RT_ID_OB_S18013_TC0004			1	Project	
Proxy Servers	<b>H</b>	1	RT_ID_OB_\$18014_TC0001			1	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	
<u>C</u> ategories:	Items: Show All Descriptions
Projects	OEP Library Project
UML	OEP Project
Business Tier	Project from Existing Source
ADF Business Components	Droject from WAR File
Contexts and Dependency Injecti	Project Template
·····Data Controls ·····EJB	REST Web Service Project
Enterprise Scheduler Metadata	Service Bus Project
Security TopLink/JPA	Create a new Service Bus Project
Web Services	SOA Project
🛱 ··· Client Tier	COAD Web Coming Desired
ADF Desktop Integration	SOAP Web Service Project
Extension Development	📴 UML Project
Curica la MIT	

- **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 Service Bus Resources Source into New Project Subversion Connections WAR File Help OK Cancel

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 an	Service Bus Configuration Jar file		×
Location:	🖆 sbconfig 💌 🛍		0 0
SB11	gProjects_sbconfig.jar		
File <u>N</u> ame:	OSB11gProjects_sbconfig.jar		
File <u>T</u> ype:	jar file		<b></b>
	·	0	Grand
		<u>O</u> pen	Cancel

f. Select the resources to be imported and click Finish, as shown in Figure 12-11.

Configuration			
Type     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	<b>₩</b> ₹
	Include Dependencies         Passphrase:	Create Create Create	
	Preserve Environment Settings  Preserve environment variable values  Preserve security and policy settings  Preserve credentials (username/password)		

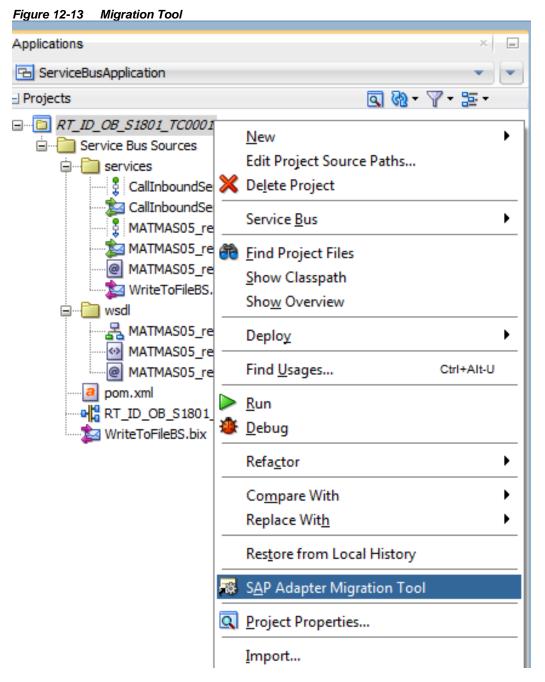
Figure 12-11 Select the Resources to Import

You would see the iWay related specifications in the jca file, as shown in Figure 12-12.

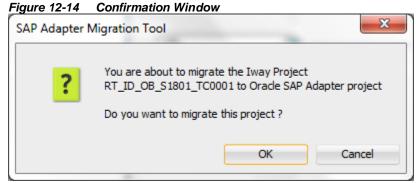
Figure 12-12 Specifications in jca

Eile Edit View Application Refactor Sear 🎱 🗁 🗐 🗊 🖐 🥡 🔍 🕥	nh Navigate Build Bun Soyrce Team_ Iools Window Help 🖸 🕶 🍓 🟡 🏯 🎎 🕌  🕨 🀲	Q+ Search
Applications	🐨 🔞 Start Page 🗧 🏤 SYS130 🚽 🔤 MATMASOS_receive.jca 🐣	Comp Re ×
Generodiuskopkatson     Projects     mont/ordens5     file True Due Storres     file True True True True True     file True True True True True True     file True True True True True True True Tru	<pre>cressure-adapter classilase="Exa-Mirgorithmicedsfpils"HitkMirdorMirgorithmicedsfpils" commetion-factory losation="cir/Virget"cytestributil/commetion*/so castivation-spec classidam="com.improtume.stgraits.URDFracLeActivationSpec"&gt; castivation-spec classidam="com.improtume.stgraits.URDFracLeActivationSpec"&gt; castivation-spec classidam="com.improtume.stgraits.URDFracLeActivationSpec"&gt; castivation-spec classidam="com.improtume.stgraits.URDFracLeActivationSpec"&gt; castivation-spec classidam="com.improtume.stgraits.URDFracLeActivationSpec"&gt; castivation-spec classidam="com.improtume.stgraits.URDFracLeActivationSpec"&gt; castivation-spec: castivation-spec: castivation-spec: castivation-spec: castivation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation-spec: cativation</pre>	"platform.inte → Qer Name → My Cablogs Unit to fearundy case resources in a private favortes list. Morti
→ mid     → MATMAGS (receive (request.ad     → MATMAGS)(receive (request.ad	 	⊴ IDE Connections resource-stagt
) Application Resources	Source Heldowy (C)	2:83/50 ↔
Recent Files	A Messaces Extensions *	*

**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.



**5.** Once you clicked on SAP Adapter Migration Tool from context menu, the Confirmation Window appears.



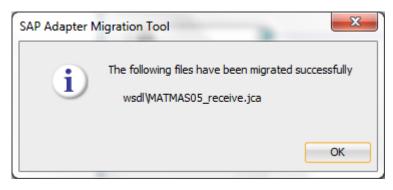
6. Once the user click on OK, give the appropriate JNDI name.

Figure 12-15 JNDI Naming Window

SAP Adapter Mi	gration Tool		×
?	JNDI Name: eis/SAP/FMWDEMO	1	<b>Q</b>
		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 the 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.

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>

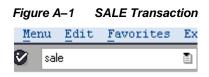
2. To connect to SAP using MS, following info needs to be maintained in the Service file:

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.

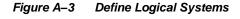


2. Open the basic settings and then the Logical systems node, as shown in Figure A-2.

Figure	A–2	Basic	Settings
i igui c	~ ~	Duolo	ocungo

$\bigtriangledown$	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
<b>D</b>	

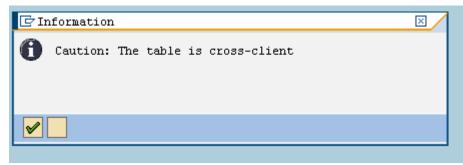
3. Click on Define Logical Systems, as shown in Figure A–3.



🕁 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
```

🎾 New Entries 🔹 🖬 🛃 🖍	
-----------------------	--

6. Enter the Logical System name and description, as shown in Figure A–6.

### Figure A–6 Logical System Window

New Entr	ies:	Overview	of	Added	Entr	ies
12 B B B	l					
Logical Sys	stems					
Log.System	Name					
ORACLESAP	Oracle	SAP adapter				
	g					

7. Click on **Save** icon, as shown in Figure A–7.





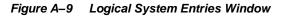
8. A popup window appears for saving the objects in a transport request, as shown in Figure A-8.

Figure A–8 Prompt for Workbench Request Dialog

🗗 Prompt for Workbenc	🗗 Prompt for Workbench request				
View Maintenance: I V_TBDLS					
Request	EQ6K900874	Workbench request			
Short Description tr request for SAP adapter					
🖌 🚱 🖸 Own Requests 🛛 💥					

# 9. Press Enter.

**10.** The entry for Logical System will now be visible in the table, as shown in Figure A–9.



Change View "Logical Systems": Overv	lew
🎾 New Entries 🗈 🖶 🖍 🖶 🖪 🖪	
Logical Systems	
Log. System Name	
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.

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

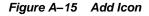
Partner profiles		
	🗄   😋 😧 😫 🛗 🕻	18 1 8
Partner profiles		
Partner IWAY_IN L23CLNT800 L0CAL M13CLNT800 MDM55 MDM_001 MDM_002 MDM_003 MDM_004 MDM_005	ALE Partn.Type LS M13 MDM MDM MDM MDM Ty. 0	CLESAP Oracle SAP adapter Logical system ng: permitted agent . Organizational unit 10120 EDI Department English

5. Click on Save icon, as shown in Figure A–14.

Figure A–14 Save Icon

Ы

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	$\boxtimes$
Short text	Oracle JCA SAP Model View	
Technical name	ZORACLESAP	
Start date	19.11.2013	
End Date	31.12.9999	
<ul><li>✓ ×</li></ul>		

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	ype	$\times$
Model view	ZORACLESAP	
Sender	T90CLNT090	
Receiver	ORACLESAP	
Message Type	MATMAS	
<ul><li>✓ ×</li></ul>		

- 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.

	DIGENCIA
	RACLESAP
🗢 🌄 IDES ALE Central system (client 800) T90	OCLNT090
🖓 🌄 Oracle SAP adapter 🛛 🛛 🖓 🖓 🖓 🖓 🖓 🖓 🖓 🖓 🖓 🖓 🖓 🖓 🖓	ACLESAP
D 🖞 ALEAUD ALE	E: Confirmations for Inbound IDocs
D 👸 COSMAS Mas	ster cost center
🖻 📴 CREMAS Ven	ndor master data distribution
D 🔁 DEBMAS Cus	stomer master data distribution
D 🔁 ECMREV Rev.	vision level
D 🗓 MATMAS Mat	terial master
n STATUS Mes	ssage about status information transmission
ng ZCOSMAS_EXIN Log	gical Message type for ZCOSMASO1_EXT
ng ZMATMASO1_MSG Mes	ssage type for IDoc type ZMATMASO1
ng zmatmas_extn Log	gical Message type for ZMATMASO1_EXT
CALLES_ORDER_MSG Mes	ssage 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 🔳

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	
8 · · · · · · · · · · · · · · · · · · ·	2   🕐 🖬 🛛
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	
Administration Technical Settings Logon & Security MDMP & Unic	ode 🔹 🕨
Activation Type	
○Start on Application Server	
OStart on Explicit Host	
OStart on Front-End Work Station	
Registered Server Program	
Program ID ORACLESAP	
Start Type of External Program	
ODefault Gateway Value	
ORemote Execution	
ORemote Shell	
O Secure 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 Options					
	Gateway Host	bcora008				
Gateway service sapgw20	Gateway service	sapgw20				

6. Click on Save, as shown in Figure A–30.

Figure A–30 Save Icon

# Θ

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.

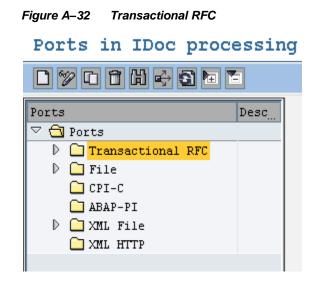
To creating a tRFC port:

1. Run the we21 transaction, as shown in Figure A–31.

### 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.

Figure A–34	Create tRFC Port
📴 Create	tRFC port 🖂 🛛
🖲 Generate	e 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 processing									
Ø 1	< ■	C 🖸 🐼   🖴 🕅	🛗   22 42 42 42 1 🐺 🗾   22 🖷						
Ports in IDoc pro	Ports in IDoc processing								
0 🏏 0 6 6 4 5 5									
Ports	D	Port	A00000068						
A00000031 A00000032	SRM 🖵	Description	Port for ORACLESAP						
A000000032	Kaba								
A00000034	BC (	Version							
A00000035	L23								
A00000036	DMK,		s SAP Release 3.0/3.1						
A00000037	ID3	IDoc record t	ypes SAP Release 4.x						
A00000038	DMJ,								
A00000040 A00000041	Proc Proc								
A000000041 A000000042	Tarc	RFC destination	ODACLECAD						
A000000042		RFC descination	ORACLEJAP						
A00000044	DEJ(								
A00000045									
A00000047	ID3								
A00000048	DMU								
A00000050	DSD								



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

Ou	tbound parm	atrs.			
	Partner R	Message Type	Message va	MessageFun	Test
		ECMREV			
		MATMAS	7		
		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		
W				
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 🗋 💽	ÞQ
Receiver port	A00000068	Transactional RFC	Port for ORACLESAP	
Pack. Size	1			
Queue Processing				_
Output Mode				-
<ul> <li>Transfer IDoc Immed.</li> </ul>			Output Mode 2	
○Collect IDocs				
IDoc Type				
Basic type	MATMAS01		Material Master	
Extension				
View				
Cancel Processing After	er Syntax Error			
Seg. release in IDoc type	e 🗌	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.

E 🖉 🖉	8 6 6 8 8	3 (H) (H	3   XD 1	0.0	8   🗶 🖊	0 🖬					
۱P											
h 🔁 % 🗈											
ics				1				_			
Selected IDocs	3 8 7 6	第一人に		<b>7</b> 2		2) T 💷 T	🚺 👘 ID	oc			
V Outbound IDocs	Selected I	Docs									
ADRMAS	IDoc Number	C	Sta St		rtner	Basic type	Dette	Time	Messa.	Direct	Port
🖻 🧀 COSMAS	000000001742918	зедше <u></u> 17			/ /ORAQA2		17.11.2013		×		A00000074
CREMAS	000000001742918	17		LS.			17.11.2013			•	A000000074
DEBMAS	000000001742919	17		D LS							A000000074
ECMREV				-			17.11.2013			•	
🕨 🧰 matmas	000000001742921	17		LS.		MATMASO1	17.11.2013			•	A00000074
ORDERS	000000001742922	17		LS.			17.11.2013			•	A00000074
Image: Status	000000001742923	17		LS.			17.11.2013			•	A00000074
D COSMAS_EXTN	000000001742924	5		C LS			17.11.2013			Outbox	A00000074
Imathas_extn	000000001742925	4		C LS			17.11.2013			Outbox	A00000074
ZSALES_ORDER_MSG	000000001742926	17		D LS			17.11.2013				A00000074
D ZVISTAPM	000000001742927	17		LS.			17.11.2013			•	A00000074
V 🔁 Inbound IDocs	000000001742928	17		LS.			17.11.2013			•	A00000074
COSMAS	000000001742929	17		LS.		MATMAS01	17.11.2013			•	A00000074
CREMAS	000000001742930	22		D LS		MATMAS01	17.11.2013	00:53:23	MATMAS	Outbox	A00000074
DEBMAS	000000001742931	22	03 🗙	🖸 LS	/ /ORAQA2	MATMAS01	17.11.2013	01:20:51	MATMAS	Outbox	A00000074
MATMAS	000000001742932	22	03 🔿	🖸 LS	/ /ORAQA2	MATMAS01	17.11.2013	01:23:28	MATMAS	Outbox	A00000074
MATMASGEN	000000001742933	22	03 📿	🖸 LS	/ /ORAQA2	MATMAS01	17.11.2013	01:26:32	MATMAS	Outbox	A00000074
TATUS	000000001742934	22	03 🔿	LS.	/ /ORAQA2	MATMAS01	17.11.2013	01:30:18	MATMAS	Outbox	A00000074
XA123	000000001742935	5	03 🔿	LS.	/ /ORAQA2	ZVISTAPM01	17.11.2013	01:35:15	ZVISTAP	Outbox	A00000074
Imathas_extn Imathas_extn Imathas_extn	000000001742936	5	03 🗙	LS.	/ /ORAQA2	ZVISTAPM01	17.11.2013	01:38:08	ZVISTAP	Outbox	A00000074
V CZYISTAPM	000000001742937	5	03 🔿	🖸 LS	/ /ORAQA2	ZVISTAPM01	17.11.2013	01:41:14	ZVISTAP	Outbox	A00000074
	000000001742938	5	03 🗙	🖸 LS	/ /ORAQA2	ZVISTAPM01	17.11.2013	01:44:39	ZVISTAP	Outbox	A00000074
	000000001742939	10	51 🗶	D LS	/ /T90CLNTO	DEBMAS05	17.11.2013	11:06:45	DEBMAS	Inbox	SAPEQ6
	000000001742940	22	53 CC	LS.	/ /T90CLNT0:	MATMAS01	17.11.2013	17:02:55	MATMAS	Inbox	SAPEQ6
	000000001742941	1	03 00	<b>10</b> L.S	/ /ORACLESA	SVSTATOI	17 11 2013	17.02.56	STATUS	Outhox	100000068
	Status Message fo	r Selec	ted IDo	C							
	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 Corresponding 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.

bgRFC Configuration	
Scheduler: System V Scheduler: App. Server V Scheduler: Destination V Define Inbound Dest. V Define Sup	pervisor Dest.

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			5
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 1		4 F	ZEQ1	-
			ZEQ2	Ţ
			4 > 4 >	
Add Queue Prefix			<u>9908</u>	
			Sav	e X

Figure A–42 Configure Inbound Destination

5. Click on the Save button as shown in Figure A–43.

ogon/server group 562 Queue Prefixes ZORACLE1	1		Previously Used Queue Prefixes EQ6_1 EQ6_2 EQ6_3 IWCNT_WF IWFND_CNP PRASHANT ZBG ZBG1 ZBG11		
•		<b>□</b> •	EQ6_1 EQ6_2 EQ6_3 IWCNT_WF IWFND_CNP PRASHANT ZBG ZBG1		-
•	1	•	EQ6_3 IWCNT_WF IWFND_CNP PRASHANT ZBG ZBG1		
ZORACLE1		_	IWCNT_WF IWFND_CNP PRASHANT ZBG ZBG1		
		•	IWFND_CNP PRASHANT ZBG ZBG1		
			PRASHANT ZBG ZBG1		
			ZBG ZBG1		
			ZBG1		
			ZBG11		
			ZBG12		
			ZBG13		
			ZBG14		
			ZBG2		
			ZBG3		
			ZBG4		
			ZBG99		
			ZBGPK		
		•	ZBH		
4 Þ	Þ.		ZEQ1		
			ZEQ2		-
			4 1	4 1	

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									
<u> </u>									
Scenario/Destination/Unit Type  C Inbound  Outbound	Status	Change Status/Error Message	C A C A A A A A A A A A A A A A A A A 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.

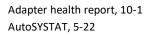
### ListenerListener

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.

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