

Oracle® Fusion Middleware

Application Adapter for SAP R/3 (SAP JCo 3.0) User's Guide for
Oracle WebLogic Server

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Oracle Fusion Middleware Application Adapter for SAP R/3 (SAP JCo 3.0) User's Guide for Oracle WebLogic Server, 11g Release 1 (11.1.1.4.0)

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Primary Author: Stefan Kostial

Contributing Authors: Sunil Gopal, Marian Jones, Vikas Anand, Sunil Wadhwa, Vishal Saxena, Vimmika Dinesh

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Preface

Oracle Fusion Middleware Application Adapter for SAP R/3 (SAP JCo 3.0) User's Guide for Oracle WebLogic Server describes how to provide connectivity and integrate with SAP R/3.

Audience

Oracle Fusion Middleware Application Adapter for SAP R/3 (SAP JCo 3.0) User's Guide for Oracle WebLogic Server is intended for those who integrate with SAP R/3 systems and develop applications.

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Related Documents

For more information, see the following documents in the Oracle Enterprise Repository 11g Release 1 (11.1.1.4.0) documentation set:

- *Oracle Fusion Middleware Application Adapters Installation Guide for Oracle WebLogic Server*
- *Oracle Fusion Middleware Application Adapter Upgrade Guide for Oracle WebLogic Server*
- *Oracle Fusion Middleware Application Adapter Best Practices Guide for Oracle WebLogic Server*
- Oracle's Unified Method (OUM)

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Conventions

The following text conventions are used in this document:

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

Introduction

Oracle WebLogic Server connects to a SAP R/3 system through Oracle Application Adapter for SAP R/3. Oracle Application Adapter for SAP R/3 provides connectivity and carries out interactions on a SAP R/3 system. This chapter contains the following topics:

- [Section 1.1, "Adapter Features"](#)
- [Section 1.2, "Classical SAP Technologies for ABAP"](#)
- [Section 1.3, "Integration with SAP R/3"](#)
- [Section 1.4, "Adapter Architecture"](#)
- [Section 1.5, "BSE Versus Oracle Adapter J2CA Deployment"](#)

1.1 Adapter Features

Oracle Application Adapter for SAP R/3 using SAP Java Connector (SAP JCo) 3.0 is a remote function call adapter that provides a means to exchange real-time business data between SAP Enterprise Central Component (ECC) 5.0/6.0 systems and other application, database, or external business partner systems. The **adapter** enables external applications for inbound and outbound processing with SAP R/3. Oracle Application Adapter for SAP R/3 can be deployed as a J2EE Connector Architecture (J2CA) version 1.0 resource adapter. This deployment is referred to as Oracle Adapter J2CA. It can also be deployed as a Web services servlet and is referred to as Oracle Adapter Business Services Engine (BSE).

Oracle Application Adapter for SAP R/3 uses XML messages to enable non-SAP R/3 applications to communicate and exchange transactions with SAP R/3 using services and events. The role of services and events is outlined. Services and events are described as follows:

- **Services** (also known as outbound processing): Enable applications to call an SAP R/3 business object or business operation.
- **Events** (also known as inbound processing): Enable applications to access SAP R/3 data only when an event occurs.

To support event functionality, channels are supported. A **channel** represents configured connections to particular instances of back-end or other types of systems.

The channel is the adapter component that receives events in real time from the EIS application. The channel component can be a File reader, an HTTP listener, a TCP/IP listener, or an FTP listener. A channel is always EIS specific. The adapter supports multiple channels for a particular EIS, which enables the user to choose the optimal

channel component based on deployment requirements. In the case of this adapter, the channel is an RFC server.

Oracle Application Adapter for SAP R/3 provides:

- Support for bidirectional message interactions.
- Oracle Adapter Application Explorer (Application Explorer), a GUI tool which uses SAP R/3 object repository metadata to build XML schemas and Web services to handle adapter requests or event data.
- Support for Remote Function Calls (RFC), Business Application Programming Interfaces (BAPI), and Intermediate Documents (IDoc) interfaces to SAP R/3.
- XML schemas and WSDL files for the J2CA 1.0 and J2CA 1.5 resource adapter.
- Web services for BSE.

Data Type Limitation: Data types `h` and `g` are not supported. Type `h` represents a deep structure. Type `g` represents a variable length string. `RFCTYPE_XSTRING` and `RFCTYPE_XMLDATA`, as defined in `SAPRFC.H`, are not supported due to a limitation in the RFC Protocol.

See Also: *Oracle Application Server Adapter Concepts Guide*

1.1.1 Supported Versions and Platforms

The following SAP R/3 platforms are supported by Oracle Application Adapter for SAP R/3:

- SAP R/3 Enterprise 47x100
- SAP R/3 Enterprise 47x200
- mySAP ERP Central Component (ECC) 5.0, deployed on SAP NetWeaver 2004
- mySAP ERP Central Component (ECC) 6.0, deployed on SAP NetWeaver 2004s
- SAP Java Connector (SAP JCo) Version 3.0.

For the current release status of the SAP Java Connector, refer to SAP Note #549268 in the SAP Service Marketplace.

Note: Release versions may vary by product component. In addition, SAP functions may vary by SAP product version and support package.

1.2 Classical SAP Technologies for ABAP

Oracle Application Adapter for SAP R/3 is designed to provide standard access to SAP R/3 interfaces such as Remote Function Call (RFC) modules, BAPIs (Business Application Programming Interfaces), and IDocs (Intermediate Documents), that are used to support existing business processes.

The adapter only supports Enterprise Central Components (ECC) that are accessed by classical SAP technologies. If you require support for additional SAP functionality and components, then contact your iWay Software Sales Representative.

These business components and methods are available to the adapter as requests of SAP R/3 and to the event adapter when SAP invokes its remote requests and work in the following ways:

- Business Application Programming Interfaces (BAPIs) are interfaces within the business framework that are used to link SAP components to one another or to third-party components. BAPIs are called synchronously and return information.
- Remote Function Call (RFC) Modules are SAP application interfaces that enable clients to invoke SAP technologies and receive responses.

Note: Depending on the release or service pack installed, certain RFCs, for example, RFC_CUSTOMER_GET, may not exist in your particular SAP R/3 system. Therefore, the examples included in this document may not be relevant to your system. If this is the case, then you should use the examples as a general reference for adapter functionality and choose an RFC that exists within your SAP R/3 application environment.

As described in SAP Release Note 109533, SAP Function Modules (RFCs) can be delivered with different release statuses. SAP supports only RFCs that are awarded with the Released for Customer status. There is no claim to the release independencies of the interfaces and the continued existence/functionality of the modules. For more information on the status of a specific function module, consult the SAP Service Marketplace.

- Intermediate Documents (IDocs) are the “logical messages” that correspond to different business processes. They enable different application systems to be linked by a message-based 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. An IDoc type is described by the following components:
 - Control records. A control record contains data that identifies the sender, the receiver, and the IDoc structure. An IDoc contains one control record.
 - Data records. A data record consists of a fixed administration part and a data part (segment). The number and format of the segments can be different for each IDoc type.
 - Status records. A status record describes the processing stages through which an IDoc passes. The following scenario is an example of IDoc functionality and its components:

Purchase order number 4711 was sent to a vendor as IDoc number 0815. IDoc number 0815 is formatted in IDoc type ORDERS01 and has the status records “created” and “sent.” The purchase order corresponds to the “logical” message ORDERS.

1.3 Integration with SAP R/3

You can use Oracle Application Adapter for SAP R/3 to initiate a SAP R/3 business process, such as add/update account, or you can use the adapter as part of an integration effort to connect SAP R/3 and non-SAP R/3 systems.

All functions are processed synchronously, but all content in ALE IDocs is asynchronous..

In service mode, the Oracle Application Adapter for SAP R/3 can send requests to SAP using the BAPI, RFC, or ALE interfaces.

The adapter quickly and easily integrates your SAP R/3 IDocs, RFCs, and BAPIs with mission critical SAP R/3 system applications and other enterprise applications. The benefits of the adapter include:

- Elimination of the requirement for custom coding.
- Consistent data representation.
Provides a standard XML representation of event data and request/response documents for SAP R/3.
The developer is freed from the specific details of the SAP R/3 interface (BAPI, RFC, IDoc) and the specific configuration details of the target SAP R/3 system.
- Adherence to SAP R/3 ABAP serialization rules and SAP R/3 Interface Repository standards published by SAP AG.

During event processing, the adapter receives RFCs and IDocs directly from SAP R/3. The SAP R/3 system can be configured to send an IDoc or RFC to a logical system when a certain event occurs, in this case to the adapter. The output sent by SAP R/3 can be in any of the following forms:

- An RFC request, for example, RFC_SYSTEM_INFO
- A BAPI request, for example, BAPI_COMPANYCODE_GETLIST
- An IDoc

1.4 Adapter Architecture

Oracle Application Adapter for SAP R/3 uses Application Explorer with the following components:

- Oracle Adapter Business Services Engine (BSE)
- Enterprise Connector for J2EE Connector Architecture (J2CA)

Application Explorer (used to configure SAP connections and create Web services and events) can be configured to work in a Web services environment with BSE. When working in a J2CA environment, the connector uses the Common Client Interface (CCI) to provide integration services using adapters instead of Web services.

Oracle Adapter Business Services Engine (BSE) Architecture

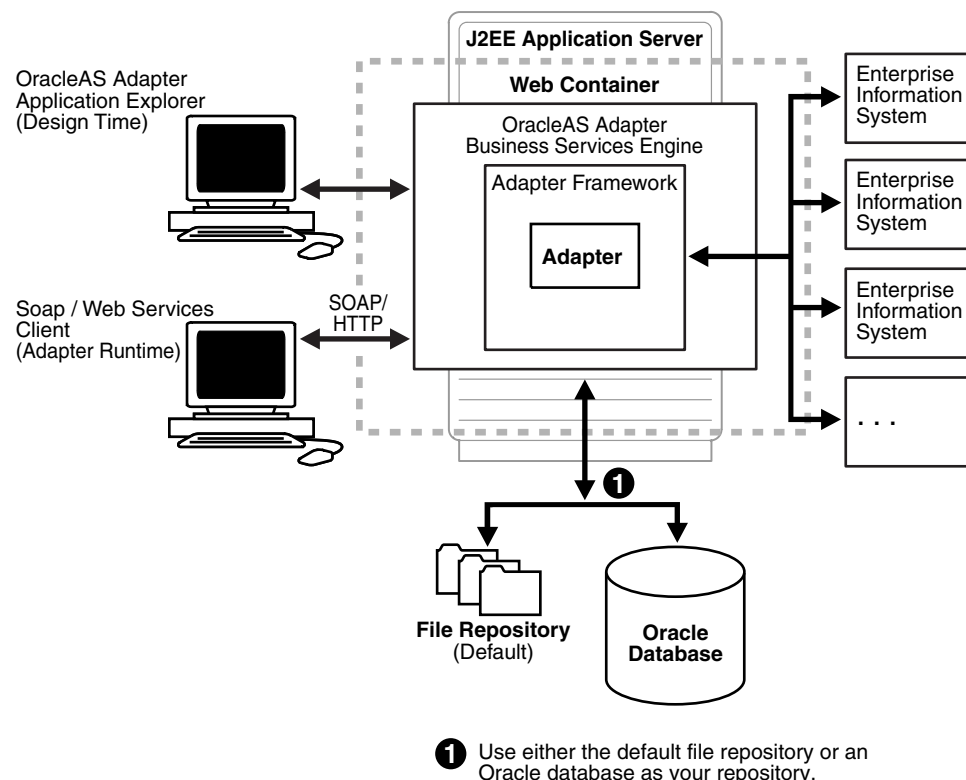
Figure 1–1 shows the generic architecture for BSE for packaged applications. The adapter works with BSE, as deployed to a Web container in a J2EE application server.

Application Explorer, a design-time tool deployed along with BSE, is used to configure adapter connections, browse EIS objects, configure services, and configure listeners to listen for EIS events. Metadata created while you perform these operations are stored in the repository by BSE.

BSE uses SOAP as a protocol for receiving requests from clients, interacting with the EIS, and sending responses from the EIS back to clients.

BSE supports both a file-based and an Oracle database repository. The BSE repository stores the EIS connection information and the Web Service Definition Language (WSDL) for adapter services. A single instance of BSE can connect to multiple EIS applications.

Note: Do not use a file repository for BSE in production environments.

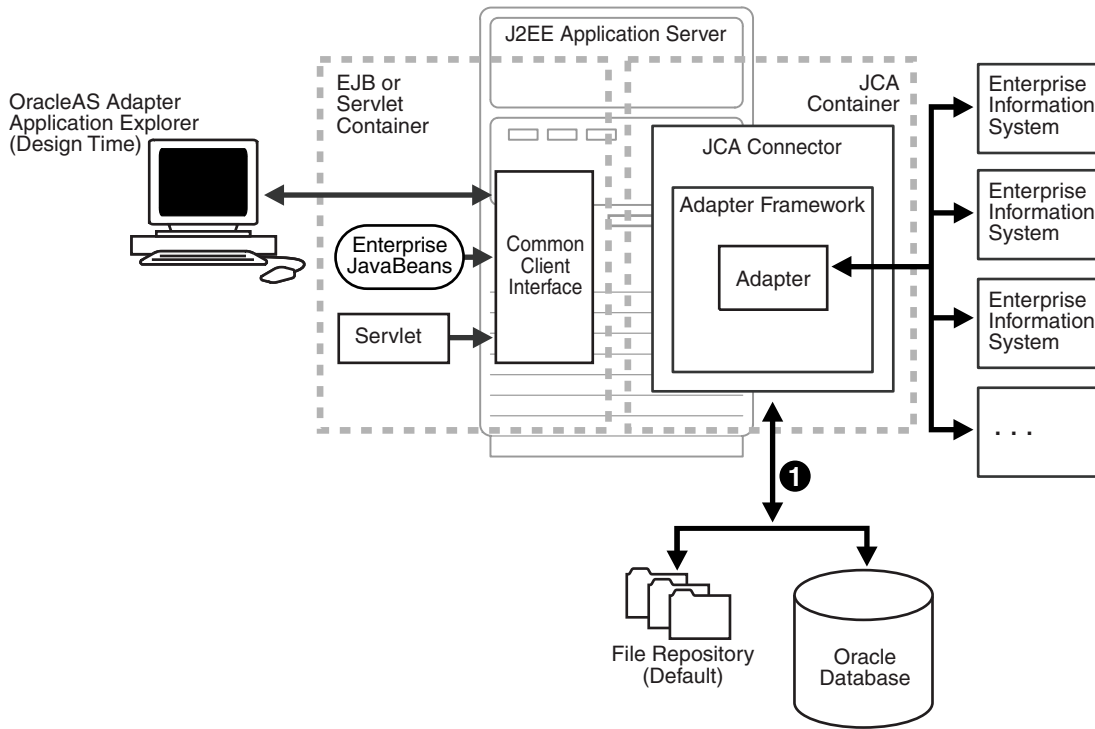
Figure 1–1 Oracle Adapter Business Services (BSE) Architecture

Oracle Adapter J2CA Architecture

Figure 1–2 shows the generic architecture for Oracle Adapter J2CA for packaged applications. This is a pure J2CA 1.0 resource adapter deployed in managed mode to the Oracle WebLogic Server. It is a universal adapter. One adapter can connect to many EIS applications.

The Oracle Adapter J2CA repository contains the list of EIS connection names and the associated connection parameters. The repository can be a file system or an Oracle database. It is deployed as a RAR file and has an associated deployment descriptor called `ra.xml`. You can create multiple connector factories by editing the Oracle WebLogic Server deployment descriptor `ra.xml`. For more information, see [Chapter 5, "Oracle WebLogic Server Deployment and Integration"](#).

Figure 1–2 Oracle Adapter J2CA Architecture



1 Use either the default file repository or an Oracle database as your repository.

See Also:

- *Oracle Application Server Adapter Concepts Guide*
- *Oracle Fusion Middleware Application Adapters Installation Guide for Oracle WebLogic Server*

1.5 BSE Versus Oracle Adapter J2CA Deployment

If you are using Oracle Application Adapter for SAP R/3 with Oracle SOA Suite components (for example, BPEL, Mediator, BPM, or OSB), then note that:

- Only Oracle Adapter J2CA deployment supports inbound integration (event notification) with Oracle SOA Suite components.
- Oracle Adapter J2CA and BSE deployments support outbound integration (request-response service) with Oracle SOA Suite components.

The following two factors explain the differences between deploying BSE and Oracle Adapter J2CA. Understanding these factors can help in selecting a deployment option.

1. BSE has the following advantages:
 - Can be deployed in a separate instance of Oracle WebLogic Server.
 - Provides better distribution of load.
 - Conforms more closely to the Service Oriented Architecture (SOA) model for building applications.

2. Oracle Adapter J2CA does provide slightly better performance than BSE.

Getting Started

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

- [Section 2.1, "Verifying the SAP Java Connector \(SAP JCo\)"](#)
- [Section 2.2, "Identifying SAP R/3 Logon Parameters"](#)

2.1 Verifying the SAP Java Connector (SAP JCo)

Once you have installed the SAP Java Connector (SAP JCo), as a best practice, you can verify the connector to make sure it is installed correctly and that all the required SAP JCo library files are available.

2.1.1 Verifying SAP JCo on Windows Platforms

Perform the following steps to verify SAP JCo on Windows:

1. Navigate to the directory where the sapjco3.jar file is located.
2. Right-click the sapjco3.jar file, select Open With from the context menu, and click Java 2 Platform Standard Edition binary.

The SAP Java Connector (JCo) dialog is displayed, as shown in [Figure 2-1](#).

Figure 2–1 SAP Java Connector (JCo) dialog



All the required information that pertains to the SAP Java Connector on your Windows platform is provided.

3. Once you have reviewed the SAP Java Connector files, click **Close**.

2.1.2 Verifying SAP JCo on UNIX Platforms

Perform the following steps to verify SAP JCo on UNIX:

1. Navigate to a UNIX command prompt.
2. Execute the following command:

```
$ java -jar sapjco3.jar -stdout
```

All the required information that pertains to the SAP Java Connector on your UNIX platform is provided, as shown in the following example.

```
-----
| SAP Java Connector (JCo) |
| Copyright (c) 2000-2007 SAP AG. All rights reserved. |
| Version Information |
```

```

-----
Java Runtime:
Operating System: SunOS 5.7 for sparc
Java VM: 1.4.0-beta3 Sun Microsystems Inc.
Java Codepage: ASCII
Versions:
JCo API: 3.0.5 (2010-03-03)
JCo middleware: 3.0.5 (2010-03-03)
JCo library: 3.0.5 (2010-03-03)
RFC library: 640.0.165
Paths:
JCo classes: /u4/fpgjpr/iWay55sm/lib/sapjco3.jarJCo library:
/u4/fpgjpr/iWay60/lib/libsapjcorfc.so
RFC library: System-defined path
-----

```

```
| Manifest |
```

```

-----
Manifest-Version: 1.0
Ant-Version: Apache Ant 1.6.4
Created-By: 1.3.1_18-b01 (Sun Microsystems Inc.)
Specification-Title: SAP Java Connector
Specification-Version: 3.0.5
Specification-Vendor: SAP AG, Walldorf
Implementation-Title: com.sap.mw.jco
Implementation-Version: 20070108 2139 [3.0.5 (2010-03-03)]
Implementation-Vendor-Id: com.sap
Implementation-Vendor: SAP AG, Walldorf
Main-Class: com.sap.mw.jco.About
-----

```

```
$
```

3. Review the information for the SAP Java Connector on your UNIX platform.

2.2 Identifying SAP R/3 Logon Parameters

This section identifies the SAP R/3 logon parameters, which are used to configure a connection to SAP R/3 using the Oracle Application Adapter for SAP R/3. This information can be used as a reference.

2.2.1 User Parameters

The following table lists and describes User parameters.

Table 2-1

Parameter	Description	Example	Comment
Client	Identifies the SAP client.	800	In commercial, organizational, and technical terms, a self-contained unit in an SAP system with separate master records and its own set of tables. A client can, for example, be a corporate group.
User	SAP login ID.	"abc123"	User type for dialog-free communication between systems.
Password	Confidential authentication information.	"xyz999"	A protected word or string of characters that identifies or authenticates a user for access to an SAP system.

Table 2–1 (Cont.)

Parameter	Description	Example	Comment
Language	A language key. EN (English) is the default.	EN	
Codepage	A character code page value.	Cp1252	
Authentication Mode	How the connection is validated.	Selection, see the next column.	Password - use the value in the supplied field. The password parameter that is mentioned here refers to the Password parameter field in Application Explorer.

2.2.2 System Settings (Application Server) Parameters

The following table lists and describes System Settings (Application Server) parameters.

Table 2–2

Parameter	Description	Example	Comment
Application Server	Connects to an ABAP application server.	iwjpsap	Application programs in an R/3 System are run on application servers. To obtain meta data information, a connection to a single application server is required.
System Number	Identifies a unique instance on the application server.	00	An application server may have different system numbers. Use the one provided by your administrator.

2.2.3 System Settings (Message Server) Parameters

The following table lists and describes System Settings (Message Server) parameters.

Table 2–3

Parameter	Description	Example	Comment
Message Server	Connects to an ABAP message server.	iwjpsap	For load balancing purposes, application servers from one SAP system are usually configured in logon groups, 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.
R/3 Name	Identifies a unique instance on the application server.	P47	Symbolic SAP system name used to identify the system.

Table 2–3 (Cont.)

Parameter	Description	Example	Comment
Server Group	Identifies the logon group		Logon group that the user ID belongs with.

2.2.4 Connection Pool Parameters

The following table lists and describes Connection Pool parameters.

Table 2–4

Parameter	Description	Example	Comment
Connection Pool Size	Maximum number of connections for the pool.	2	Sets the maximum number of connections that can be allocated from the pool.
Connection Timeout	Maximum time to keep open a free connection (in minutes).	10	Connections that have not been used for at least the connection timeout interval are closed.
Connection Wait Time	Maximum wait for a free connection.	30 (seconds)	Sets the maximum time to wait in a connection request for a free connection. If the pool is exhausted, and there is still no connection available after the specified time, then a JCO exception with the key JCO_ERROR_RESOURCE is generated. The default value is 30 seconds.

2.2.5 SAP Gateway Parameters

The following table lists and describes SAP Gateway parameters.

Table 2–5

Parameter	Description	Example	Comment
SAP Gateway Host	Enter the name of a 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	Enter the service name (usually a compound of the service name and system number).	Sapgw00	Service name on the gateway host.
Program ID	A program identifier that has been specified on the SAP Gateway server (case sensitive).	"S1PROG"	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.

2.2.6 ALE Parameters

The following table lists and describes ALE parameters.

Table 2–6

Parameter	Description	Example	Comment
EDI Version	Specifies the ALE version of the target system.	3	Version "3" (Release 4.0 onwards) should be selected in the port description for all R/3 partner systems with Release 4.0 or higher. Version "2" (release 3.0/3.1) must be set in the port description for all R/3 partner systems with releases lower than 4.0.
IDOC Release	Specifies the version in which the IDOC definition was released.	Blank or a specific SAP release version, for example, "46C".	You can assign segment definitions from previous releases to an IDoc type in the current release. This may be necessary if, for example, the partner is using an older release which supports your current IDoc type but not your current segment definitions.
IDOC Release Provider	Specifies where the adapter receives the release information.	Selection, see the next column.	IDOCDOREL uses the information in the IDOC header. SAP release gets the information from the user account logon. USERINPUT uses the IDOC release field above to get the information.

2.2.7 Global Processing Parameters

The following table lists and describes Global Processing parameters.

Table 2–7

Parameter	Description	Example	Comment
Error Handling	Specifies the error handling method of the adapter.	Selection, see the next column.	Creates error document writes an exception document with the full error text to the output destination. Throws exception creates a java exception, this may or may not display the full error text depending on the underlying component error.
Commit with Wait	Specifies the commit behavior.	Selection, see the next column.	Off - default Sends Commit Request to Application Server in the document. If there is a commit error, then it is not reflected back (Optimal performance). On (checked) - waits for a full database server commit in the document before returning. Commit errors are reflected back to the adapter level (slowest performance). For the recommended setting, see your SAP administrator.

Table 2-7 (Cont.)

Parameter	Description	Example	Comment
SAP trace	Enables the SAP Java connectors trace behavior.	Selection, see the next column.	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	Indicates the level of detail in the SAP traces.	5	Select a value that ranges from 0 through 10 from the list.

2.2.8 SNC Parameters

The following table lists and describes SNC parameters.

Table 2-8

Parameter	Description	Example	Comment
SNC mode	Flag for activating SNC.	1 (on)	Required.
SNC Partner	Specifies the application server's SNC name	p:CN=ABC, O=MyCompany C=US	You can find the application server's SNC name in the profile parameter snc/identity/as.
SNC level	Specifies the level of protection to use for the connection.	Selection, see the next column.	1: Authentication only 2: Integrity protection 3: Privacy protection (default) 8: Use the value from snc/data protection/use on the application server 9: Use the value from snc/data_protection/max on the application server Default value = 3
SNC Name	Specifies SNC name.	p:CN=SAPJ2EE O=MyCompany, C=US	Although this parameter is optional, we do recommend setting it to ensure that the correct SNC name is used for the connection.
SNC library path	Specifies the path and file name of the external library.	C:\SAP J2EE_Engine\SAPCryptolib\sapcrypto.dll	The default is the system-defined library as defined in the environment variable SNC LIB.

SAP Java Connector 3.0 Considerations

This chapter describes the new usage considerations of the Oracle Application Adapter for SAP R/3 that are associated with SAP Java Connector (SAP JCo) 3.0. It contains the following topics:

- [Section 3.1, "Supported Platforms"](#)
- [Section 3.2, "Connection Management"](#)
- [Section 3.3, "Connection Pooling"](#)
- [Section 3.4, "Server Threads"](#)
- [Section 3.5, "Single Server Support"](#)
- [Section 3.6, "Changing Parameters and Table Parameters"](#)
- [Section 3.7, "Trace Level Parameter"](#)

3.1 Supported Platforms

SAP JCo 3.0 removes 32-bit support on Unix platforms. Only Linux (with Intel processors) and Windows (with Intel processors) now support the 32-bit SAP JCo. All other platforms require true 64-bit processing throughout. Some JVM settings cause the JVM to read as "mixed mode", which is not compatible with SAP JCo. Some platforms require a specific flag of `-d64` to enable complete 64-bit processing in the JVM.

For more information on supported platforms with SAP JCo 3.0, see *Oracle Fusion Middleware Application Adapters Installation Guide for Oracle WebLogic Server*.

For supported JVM information that corresponds to each operating system, refer to SAP Note #1077727 in the SAP Service Marketplace. If a specific JVM is not included on the list of supported JVMs, then it is not supported by SAP R/3.

Note: The Oracle JRockit JVM is not supported by SAP JCo 3.0.5.

3.2 Connection Management

SAP JCo 3.0 introduces changes in connection management whereby the JCo is now the connection manager, rather than the connection facilitator. These changes are described in the following section for the client (into SAP R/3) and server (outbound from SAP R/3) roles.

3.3 Connection Pooling

SAP JCo 3.0 introduces changes to the connection methodology that is used by the client (connections to SAP R/3). Instead of connecting directly to the SAP R/3 server, clients now open a connection to a logical destination on the SAP JCo, which handles all SAP R/3 connection and pooling tasks. Connection pooling is now done per iWay target destination. However, the total number of all open connections count towards the SAP R/3 open connection limit. The *Connection pool size* parameter value in the destination target is the maximum number of peak connections that can be opened by the logical destination. The SAP JCo does not allocate connections in advance, instead the initial request opens the first connection. Only if this first connection is busy when the next request arrives does another connection open, up to the peak limit.

If the limit is reached, then the *Connection wait time* parameter value marks the time when all connections are in use, and another connection request arrives, before a “resource allocation” exception is generated.

In addition, the *Connection timeout* parameter value is the maximum amount of time for a connection to remain active, whether in use or not. If there are longer running requests, then consider increasing this parameter value. If a number of very short requests are run, then decrease this parameter value for maximum performance and resource utilization.

3.4 Server Threads

The SAP R/3 outbound Gateway creates one active connection per RFC destination for non SAP R/3 systems. For maximum throughput, the *Thread count* parameter is set to three (three server threads per RFC destination). This parameter can be found in the Advanced tab of Application Explorer when configuring channels. Usually, this leaves one thread to listen for requests, one thread to process a current request, and one thread to clean up from processing. In cases where a large amount of traffic on a particular RFC destination is required, there are a few SAP R/3 techniques that can be used for these situations. When more than one Program ID with the same name is registered for one SAP Gateway, the Gateway can be enabled for a “load balancing” scenario, depending on the parameters in the Gateway profile on the SAP R/3 system. It is recommended to consult your SAP R/3 system administrator for more information, but the profile will either be set to 0 (no load balancing), 1 (lowest counter), or 2 (lowest load). Your SAP R/3 system administrator can provide you with the required information on how to configure your destinations to take advantage of each situation.

In addition to Gateway load balancing, the amount of SAP Gateway threads can be increased as well. Consult your SAP R/3 system administrator for more information. If the amount of threads is increased, then try and keep the ratio of Gateway threads to server threads at the same 1:3 ratio. For example, if the Gateway has 3 active threads for destination “X”, on the outbound server channel side, the server thread count is now 9.

If load balancing is not enabled and you register multiple server channels with the same Program without performing Oracle schema validation, then it is possible to receive IDocs in the wrong channel because there is no routing on the channels or destinations.

3.5 Single Server Support

SAP JCo 3.0 introduces a fundamental design change in the way JCo servers are implemented and run. A single instance of a JCo server is permitted per JCo

installation. The Oracle Application Adapter for SAP R/3 maps between ports and channels. The changes are transparent to the end-user, however in load balanced and multi-threaded installations, special care must be taken to match the server thread count of the adapter and the active server thread count of the SAP Gateway. This topic can be investigated further in the SAP R/3 help file “Configuring the SAP Gateway”, where comprehensive information is exposed on load balancing and server threads.

3.6 Changing Parameters and Table Parameters

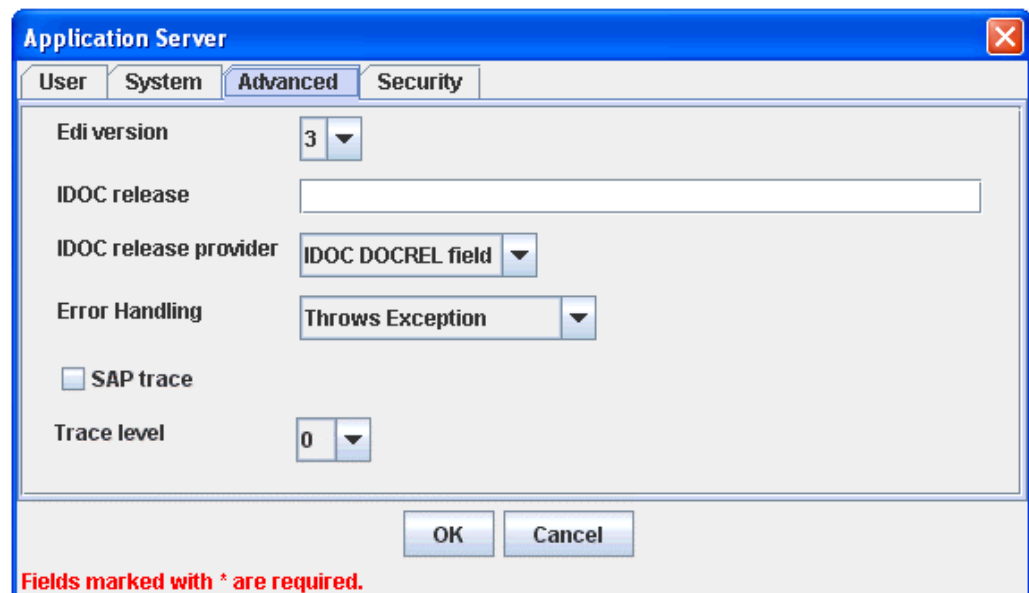
Oracle Application Adapter for SAP R/3 and SAP JCo 3.0 introduce support for SAP Changing parameters in function modules. SAP R/3 Table parameters are limited to Flat data structures (relational) with fixed columns of defined lengths and a required header line. Changing parameters can take almost any SAP R/3 type, including nested structures (tables where a column is itself a structure) and data of no fixed length, such as String data types. Changing parameters can be used as input to a function module, exported from a function module, or both. This depends on the requirements of the designer for the specific SAP function.

The XML schemas for functions that use Changing parameters do not list them as a separate category. However, just like Table parameters, they appear in the request and response XML schemas. Depending on the function design, if the parameters are marked as *optional*, you do not have to supply a value. The optional indicator displays in Application Explorer and in the XML schema. For more information on using Changing parameters, see your SAP R/3 documentation.

3.7 Trace Level Parameter

Oracle Application Adapter for SAP R/3 (using SAP JCo 3.0) includes a new parameter called *Trace level*, which can be found in the Advanced tab of Application Explorer, as shown in [Figure 3-1](#).

Figure 3-1 Advanced Tab



This parameter indicates the level of detail in the SAP traces. Select a value that ranges from 0 through 10 from the list. The common values that are used include:

- 0 - nothing
- 1 - errors and warnings
- 2 - execution path, errors, and warnings
- 3 - full execution path, errors, and warnings
- 4 - execution path, info messages, errors, and warnings
- 6 - full execution path, info messages, errors, and warnings
- 7 - debug messages, full execution path, info messages, errors, and warnings
- 8 - verbose debug messages, full execution path, info messages, errors, and warnings

Path values null, stdout, and stderr are allowed. An existing path is also allowed. If the path is equal to null, stdout, or stderr, then SAP JCo generates a trace to the standard output (error) stream. If at least one JCoTraceListener is registered, then the trace output is sent to the listener only. To redirect the SAP JCo trace into a file, the path value has to be set to an existing directory.

The following environment variables have to be set at ORACLE_JAVA_INVOKE_HOME:

```
Java -Djco.trace_path=drive:/directory
```

The following is an example of a path on a Solaris platform:

```
/path1/dir1/
```

The following variables can be set at the operating system level:

```
RFC_TRACE=1  
CPIC_TRACE=(1,2,3)  
RFC_TRACE_DIR=  
CPIC_TRACE_DIR=
```

Where 1 is an error trace, 2 is a complete process trace, and 3 is a complete process trace, short data trace.

It is recommended to check your environment settings, especially under a hosted environment.

Configuring Oracle Application Adapter for SAP R/3

This chapter describes how to use Oracle Adapter Application Explorer (Application Explorer) to define a target to connect to a SAP R/3 system, view system objects, and create XML schemas and Web services. This chapter also explains how to configure an event adapter.

This chapter contains the following topics:

- Section 4.1, "Starting Application Explorer"
- Section 4.2, "Configuring Repository Settings"
- Section 4.3, "Creating a Repository Configuration"
- Section 4.4, "Establishing a Connection (Target) for SAP R/3"
- Section 4.5, "Viewing Application System Objects"
- Section 4.6, "Creating XML Schemas"
- Section 4.7, "Generating WSDL (J2CA Configurations Only)"
- Section 4.8, "Creating and Testing a Web Service (BSE Configurations Only)"
- Section 4.9, "Configuring an Event Adapter"

4.1 Starting Application Explorer

To start Application Explorer:

1. Ensure that Oracle WebLogic Server is started, which is where Application Explorer is deployed.
2. Open the command prompt.
3. Navigate to the following directory:

```
<WLS_Home>\user_projects\domains\base_domain\bin
```

4. Execute `setDomainEnv.cmd` (Windows) or `./setDomainEnv.sh` (UNIX/Linux).

This command sets the class path and other environment variables for Application Explorer in the Oracle WebLogic Server environment. In addition, it allows Application Explorer to access the Oracle WebLogic Server APIs to publish WSDL files to the Oracle Service Bus (OSB) Console.

5. Do not close the command prompt.

- Navigate to the following directory:

For Oracle SOA Suite:

```
<ORACLE_HOME>\soa\thirdparty\ApplicationAdapters\tools\iwae\bin\ae.bat
```

In this example, `<ORACLE_HOME>` is the location where Oracle SOA Suite is installed.

For OSB:

```
<OSB_HOME>\Oracle_OSB1\3rdparty\ApplicationAdapters\tools\iwae\bin\ae.bat
```

In this example, `<OSB_HOME>` is the location where Oracle Service Bus is installed.

```
<OSB_Home>\3rdparty\ApplicationAdapters\tools\iwae\bin
```

- Execute `ae.bat` (Windows) or `iwae.sh` (UNIX/Linux) to start Application Explorer.

Application Explorer starts. You are ready to define new targets to your SAP R/3 system.

Note: Before you run the `iwae.sh` file on UNIX or Linux platforms, the permissions must be changed. For example:

```
chmod +x iwae.sh
```

4.2 Configuring Repository Settings

A repository holds information about configuration details, adapter targets, channels, and other configuration information. For more information on how to configure BSE and J2CA repository settings, see the *Oracle Fusion Middleware Application Adapters Installation Guide for Oracle WebLogic Server* (Section 2.8.4, "Configuring the Database Repository").

4.3 Creating a Repository Configuration

Before you use Application Explorer with Oracle Application Adapter for SAP R/3, you must create a repository configuration. You can create two kinds of repository configurations, Web services and J2CA, depending on the container to which the adapter is deployed.

During design time, the repository is used to store metadata created when using Application Explorer to configure adapter connections, browse EIS objects, configure services, and configure listeners to listen for EIS events. The information in the repository is also referenced at run-time.

Web services and BSE refer to the same type of deployment. For more information, see "[Adapter Features](#)" on page 1-1.

4.3.1 Creating a Configuration for BSE

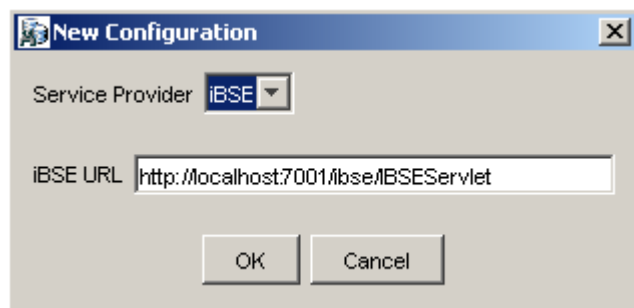
To create a configuration for BSE using Application Explorer, you must first define a new configuration.

Defining a New Configuration for BSE

To define a new configuration for BSE:

1. Start the Application Explorer.
2. Right-click Configurations and select New.
The New Configuration dialog is displayed.
3. Enter a name for the new configuration, for example, SampleConfig, and click OK.

Figure 4–1 New Configuration Dialog



4. From the **Service Provider** list, select **iBSE**, as shown in [Figure 4–1](#).
5. In the **iBSE URL** field, accept the default URL or replace it with a different URL with the following format:

`http://host name:port/ibse/IBSEServlet`

Where *host name* is the system on which Oracle WebLogic Server resides and *port* is the HTTP port number of the managed Oracle WebLogic Server (for example, *soa_server1*).

6. Click OK.
A node representing the new configuration appears beneath the root Configurations node, as shown in [Figure 4–2](#).

Figure 4–2 New Configuration Node



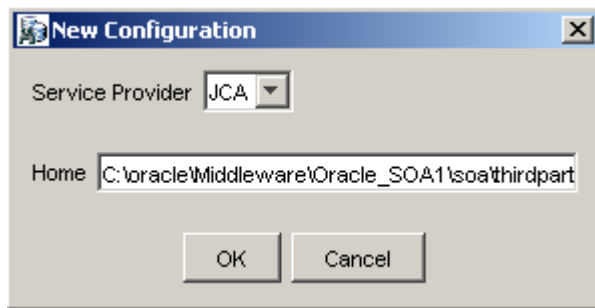
4.3.2 Creating a Configuration for J2CA

To create a configuration for Oracle Adapter J2CA using Application Explorer, you must first define a new configuration.

Defining a New Configuration for J2CA

To define a new configuration for J2CA:

1. Start the Application Explorer.
2. Right-click Configurations and select New.
The New Configuration dialog is displayed.
3. Enter a name for the new configuration, for example, SampleConfig, and click OK.

Figure 4–3 New Configuration Dialog

4. From the **Service Provider** list, select JCA, as shown in [Figure 4–3](#).
5. Click OK.

A node representing the new configuration appears beneath the root Configurations node, as shown in [Figure 4–4](#).

Figure 4–4 SampleConfig Node

The Oracle Adapter J2CA configuration folder is stored in a location based on your adapter installation:

For Oracle SOA Suite:

```
<ORACLE_HOME>\soa\thirdparty\ApplicationAdapters\config\configuration_name
```

In this example, *<ORACLE_HOME>* is the location where Oracle SOA Suite is installed.

For OSB:

```
<OSB_HOME>\Oracle_OSB1\3rdparty\ApplicationAdapters\config\configuration_name
```

In this example, *<OSB_HOME>* is the location where Oracle Service Bus is installed.

The *configuration_name* is the name of the configuration you created (for example, SampleConfig).

HTTP Repository Connection

J2CA users can create an HTTP repository connection, which enables them to generate and store WSDL documents remotely. Perform the following steps to create an HTTP repository connection in Application Explorer. To use the HTTP repository, ensure that the iwafjcaivp test tool is successfully deployed and running.

1. Start the Application Explorer.
2. Right-click the **Configurations** node in the left pane and select **New**.
The New Configuration dialog opens.
3. Type a name for the configuration and click **OK**.
4. Select **JCA** from the Service Provider list box and enter an HTTP target value in the Home field.

Use the following format for the HTTP target value:

`http://host name:port/iwafjca/JCAServlet`

For example:

`http://iwserv14:7777/iwafjca/JCAServlet`

5. Click **OK**.

The new HTTP repository connection is added to the Configurations node.

Once you connect to the remote server, you can create new Adapter targets, generate WSDL documents, and store them in the remote server.

Note: When you configure an Adapter target with the J2CA HTTP repository, you are not required to restart the Oracle WebLogic Server for run time purposes.

4.3.3 Connecting to a BSE or J2CA Configuration

To connect to a new configuration:

1. Right-click the configuration to which you want to connect, for example, **SampleConfig**.
2. Select **Connect**.

Nodes appear for Adapters, Events, and Business Services (also known as Web services). The Business Services node is only available for BSE configurations. If you are connected to a J2CA configuration, then the Business Services node is not shown.

Events are not applicable when using a BSE configuration. You can configure events using a J2CA configuration only.

An example of a BSE configuration named **SampleConfig**, is shown in [Figure 4-5](#).

Figure 4-5 *SampleConfig*



- Use the **Adapters** folder to create inbound interaction with SAP R/3. For example, you use the SAP node in the Adapters folder to configure a service that updates SAP R/3.
- Use the **Events** folder to configure listeners that listen for events in SAP R/3.
- Use the **Business Services** folder (available for BSE configurations only) to test Web services created in the Adapters folder. You can also control security settings for the Web services by using the security features of the Business Services folder.

You can now define new targets to SAP R/3.

4.4 Establishing a Connection (Target) for SAP R/3

Defining the application includes adding a target for Oracle Application Adapter for SAP R/3. Setting up the target in Application Explorer requires information that is specific to the target.

To browse the available business functions, you must first define a target to SAP R/3. After you define the target, it is automatically saved. You must connect to the SAP R/3 system every time you start Application Explorer or after you disconnect.

When you launch Application Explorer, the left pane displays (as nodes) the application systems supported by Application Explorer, based on the adapters that are installed.

4.4.1 Defining a Target to SAP R/3

To connect to SAP R/3 for the first time, you must define a new target. Oracle Application Adapter for SAP R/3 supports SAP R/3 standard security and the additional protocol of SNC. Once connected to the SAP R/3 application server, application security is managed by user ID, roles and profiles. For more information on SAP application security, see the appropriate SAP documentation.

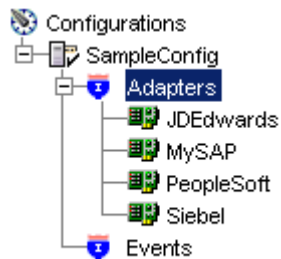
When you are working with a J2CA configuration, creating, updating, and deleting a target requires you to restart the application server. The application server must also be restarted after you create a target, connect to a target, and generate a WSDL for a SAP R/3 business object. In addition, ensure to close Application Explorer before you restart the application server.

To define a target:

1. In the left pane, expand the Adapters node, as shown in [Figure 4-6](#).

The application systems supported by Application Explorer appear as nodes based on the adapters that are installed.

Figure 4-6 Adapters Node



2. Right-click the MySAP node and select **Add Target**, as shown in [Figure 4-7](#).

Figure 4-7 MySAP Node



The Add Target dialog is displayed. Provide the following information:

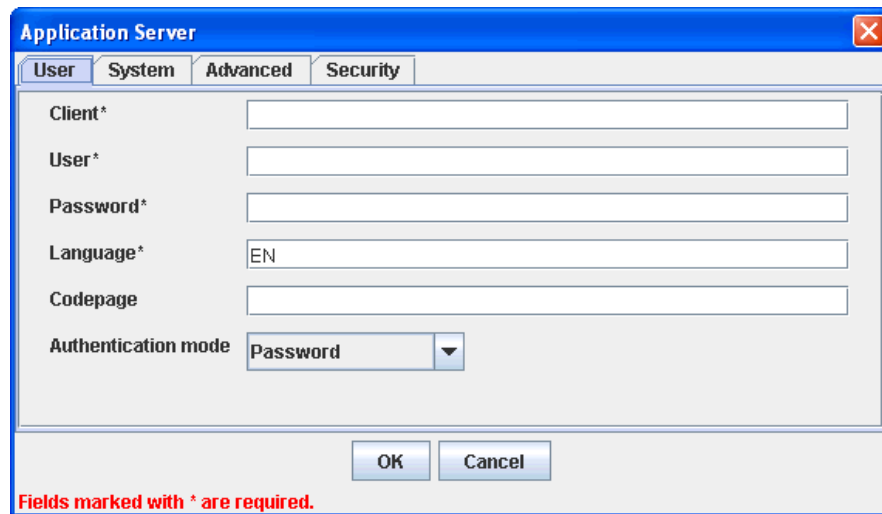
- a. In the **Name** field, enter a descriptive name, for example, **SAPTarget**.
- b. In the **Description** field, enter a description for the target (optional).
- c. From the **Type** list, select the type of target you are connecting to. The supported target types include **Message Server** or **Application Server** (default).

Note: For load balancing purposes, application servers from one SAP R/3 system are usually configured in logon groups, where each group serves a particular kind of user. The application servers in each group are assigned to users by a least-heavily-loaded strategy. This load balancing is done by message servers. Each SAP R/3 system has exactly one message server, which can be reached through TCP on a specific message server port.

3. Click **OK**.

The Application Server dialog is displayed, as shown in [Figure 4-8](#).

Figure 4-8 Application Server Dialog



The screenshot shows the 'Application Server' dialog box with the 'User' tab selected. The fields are: Client* (empty), User* (empty), Password* (empty), Language* (EN), Codepage (empty), and Authentication mode (Password). The 'OK' and 'Cancel' buttons are at the bottom. A red note at the bottom left reads 'Fields marked with * are required.'

The following tabs are available:

- User (Required)
- System (Required)
- Advanced
- Security

4. For the **User** tab (required), enter the appropriate information for your SAP R/3 target based on the information in the following table.

Table 4-1 User Tab Parameters

Target Parameter	Description
Client	The client number defined for the SAP R/3 application for client communications.
User	A valid user ID for the SAP R/3 application.
Password	A valid password for the SAP R/3 application.
Language	A language key. EN (English) is the default.
Codepage	A character code page value.

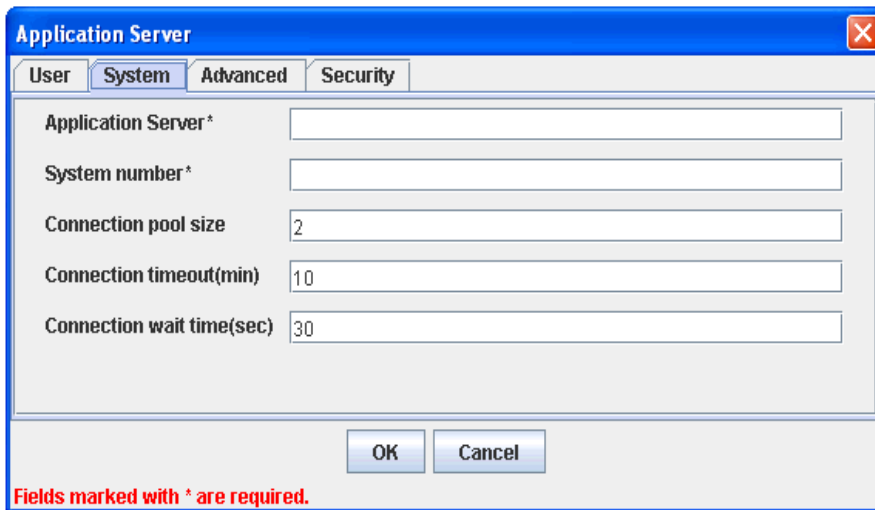
Table 4–1 (Cont.) User Tab Parameters

Target Parameter	Description
Authentication Mode	The authentication mode you want to use when connecting to your SAP R/3 system. By default, Password is selected from the drop-down list.

For more information, see your SAP R/3 system documentation.

- For the **System** tab (required), enter the appropriate information for your SAP R/3 target based on the information in this section, as shown in [Figure 4–9](#).

Figure 4–9 System Tab



The System tab enables you to provide the application server name, system number, and connection pooling information for the SAP R/3 system to which you are connecting.

Table 4–2 System Tab Parameters

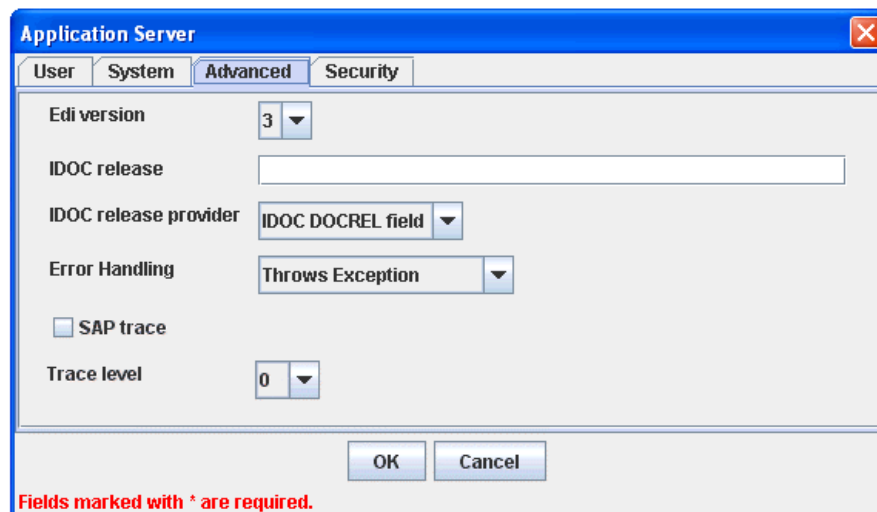
Target Parameter	Description
Application Server	The host name or IP address for the system that is hosting the SAP R/3 application.
System number	The system number defined to SAP R/3 for client communications.
Connection pool size	<p>The number of client connections in a pool you want to make available to SAP R/3 for Web service calls. A default connection pool size of 2 is available by default.</p> <p>Important: The default value of 1 does not create a connection pool. Instead, a single SAP R/3 connection with sequential processing is shared. A pooled connection invokes multiple connections to SAP R/3 with parallel processing.</p> <p>If you are using Application Explorer to create Web services, then the connection pool size value is used by your Web service during run-time. As a result, ensure that the connection pool size is sufficient for your purposes.</p>
Connection timeout(min)	The timeout value for your connection pool in minutes. The default value is 10 minutes.

Table 4–2 (Cont.) System Tab Parameters

Target Parameter	Description
Connection wait time(sec)	The wait time for your connection pool in seconds. The default value is 30 seconds. Connections to an ERP server take up valuable resources on both the client and the remote server. You can create a pool of connections to minimize the resource and time constraints. In estimating the size of the pool, you may calculate pool size by the amount of server resources to be consumed, the number and size of the documents to be received, and the size of your Java Virtual Machine. The section of SAP documentation “Memory Management (BC-CST-MM)” explains in detail the resources required on the SAP R/3 system.

6. For the **Advanced** tab (optional), enter the appropriate information for your SAP R/3 target based on the information in this section.

The Advanced tab enables you to specify your EDI and IDoc versions, and configure error handling, as shown in [Figure 4–10](#).

Figure 4–10 Advanced Tab**Table 4–3 Advanced Tab Parameters**

Target Parameter	Description
Edi version	The Electronic Data Interchange (EDI) document version you are using with the adapter. Version 3 is the default value.
IDOC release	The IDOC versioning you want to use for your connection.
IDOC release provider	The IDOC release provider for your connection. Select IDOC DOCREL field (default), SAP release, or user input from the drop-down list.

Table 4–3 (Cont.) Advanced Tab Parameters

Target Parameter	Description
Error Handling	<p>From the list In the event of an exception, you can select Creates Error Document or Throws Exception. To receive more detailed error messages, select Creates Error Document.</p> <p>As a rule:</p> <ul style="list-style-type: none"> ■ If your application is Java centric, then select Throws Exception so that code components can catch the exception and react accordingly. ■ If your application is document based, then select Creates Document to create an XML document that contains the Java exception. <p>It is up to your application to read the XML document and obtain the error.</p>
Commit with Wait	<p>If a high degree of accuracy is required in your application, then select the Commit with Wait option.</p> <p>The adapter waits until all records are physically written to the database before returning from the function call. The “Commit With Wait” has a performance impact on adapter performance, so consider carefully before selecting it. For more information about the commit behavior of BAPIs, see the SAP documentation under “BAPI Programming Guide and Reference (CA-BFA).”</p> <p>All SAP Business Objects that change data must commit work to the database. Some BAPIs developed in version 3.1 of the R/3 system use an internal commit behavior, and their commit behavior cannot be changed by the adapter. As soon as they are called, they commit the work they did.</p> <p>BAPIs developed since release 3.1 use the external commit method. The adapter issues a commit command, and the commit is put in the database queue. If there is an application error in the first part of the commit, then the error message “Posting could not be carried out” is returned, and the adapter rolls back the transaction. If writing to the database, a database error occurs, then a short dump is issued in the database records of SAP, but no message is returned to the adapter about the failure.</p> <p>This option is disabled by default.</p>
SAP trace	<p>Select this option to enable SAP traces.</p> <p>The SAP traces are stored in the following locations during design time and run time:</p> <p>Design Time:</p> <pre><ADAPTER_HOME>\soa\thirdparty\ApplicationAdapters\tools\iwae\bin</pre> <p>Run Time:</p> <pre><ADAPTER_HOME>\user_projects\domains\base_domain</pre> <p>The file name formats that are used for the SAP traces are as follows (for design time and run time):</p> <ul style="list-style-type: none"> ■ rfc02664_04332.trc ■ JCO100226_043846994.trc
Trace level	<p>Indicates the level of detail in the SAP traces. Select a value that ranges from 0 through 10 from the list.</p>

7. For the **Security** tab (optional), enter the appropriate information for your SAP R/3 target based on the information in this section, as shown in [Figure 4–11](#).

Figure 4–11 Security Tab

The Security tab enables you to specify Secure Network Communication (SNC) information for the SAP R/3 system to which you are connecting.

Table 4–4 Security Tab Parameters

Target Parameter	Description
SNC mode	By default, SNC is disabled. To enable SNC, select 1 from the list.
SNC partner	Enter the name of the RFC server or message server (load balancing) that provides the SNC services.
SNC level	From the list select the version of the SNC library.
SNC name	Enter the name of the SNC library you are using.
SNC library path	Enter the path to the SNC library.

SNC provides protection for the communication links between the distributed components of an SAP R/3 system. Using SNC, SAP R/3 can support products that adhere to the GSS-API Version 2 standard. SNC supports application level (end-to-end security), Smartcard authentication, and single sign-on.

If you are using SAP Enterprise Portal, then the J2EE engine generates the SAP logon ticket automatically. A possible SNC scenario would be from SAP Enterprise Portal to Oracle Application Adapter for SAP R/3.

If you want to use SAP logon tickets to enable single sign-on to non-SAP components, then consult the SAP documentation regarding Pluggable Authentication Services. A possible SNC scenario in this case would be from a non-SAP Enterprise Portal to Oracle Application Adapter for SAP R/3.

8. When you have provided all the required information for your target, click **OK**.
After the extraction finishes, the new target, MySAP Target, appears under the MySAP adapter node, as shown in [Figure 4–12](#).

Figure 4–12 MySAP Target

You can now connect to your SAP R/3 target.

For information on how to create schemas for the adapter, see "[Creating XML Schemas](#)" on page 4-14.

4.4.2 Connecting to a Defined SAP R/3 Target

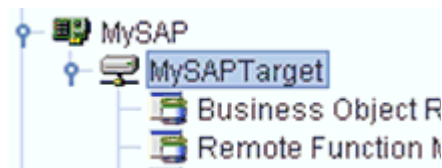
To connect to an existing target:

1. In the left pane, expand the Adapters node.
2. Expand the MySAP node.
3. Click the target name under the MySAP node (for example, SAPTarget).

The Connection dialog displays the values you entered for connection parameters.

4. Verify your connection parameters.
5. Right-click the target name and select Connect.

The x icon disappears, indicating that the node is connected, as shown in [Figure 4–13](#).

Figure 4–13 Connected MySAP Target

4.4.3 Managing a Connection to SAP R/3

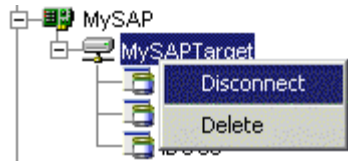
To manage SAP R/3 connections, you can:

- Disconnect from a connection that is not currently in use.
Although you can maintain multiple open connections to different transaction processing systems, it is recommended to disconnect from connections not in use.
- Edit a target.
You can modify the connection parameters when your system properties change. After you disconnect, you can modify an existing target.
- Delete a connection that is no longer needed.

Disconnecting from a Connection to SAP R/3

To disconnect a target:

1. Expand the Adapters node.
2. Expand the MySAP node.
3. Right-click the target to which you are connected, for example, SAPTarget, and select Disconnect, as shown in [Figure 4–14](#).

Figure 4–14 Disconnect Option

Disconnecting from the SAP R/3 target drops the connection with SAP R/3, but the node remains.

The x icon appears, indicating that the node is disconnected, as shown in [Figure 4–15](#).

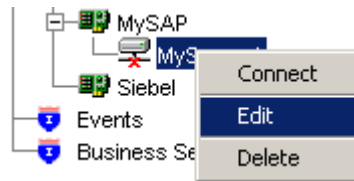
Figure 4–15 Disconnected Target

Modifying Connection Parameters

After you create a target for SAP R/3 using Application Explorer, you can edit any of the information that you provided previously. After you edit the target, you must restart the Oracle WebLogic Server to update the repository for run time purposes.

To edit a target:

1. Verify that the target you want to edit is disconnected.
2. Right-click the target and select **Edit**, as shown in [Figure 4–16](#).

Figure 4–16 Edit Option

The Application Server dialog displays the target connection information.

3. Change the properties in the dialog as required and click **OK**.

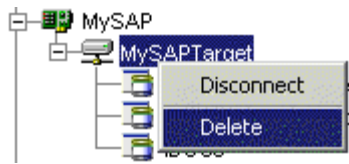
Deleting a Connection to SAP R/3

You can delete a connection, rather than just disconnecting and closing it. When you delete the connection, the node disappears from the list of SAP R/3 connections in the left pane of Application Explorer.

When you delete a connection, you must restart the Oracle WebLogic Server to update the repository for run time purposes.

To delete a connection to SAP R/3:

1. Locate the target you want to delete.
2. Right-click the target (for example, SAPTarget), and select **Delete**, as shown in [Figure 4–17](#).

Figure 4–17 Delete Option

The node disappears from the list of available connections.

4.5 Viewing Application System Objects

As you connect to SAP R/3, Application Explorer enables you to explore and browse SAP R/3 business objects that are used to support existing business processes.

Note: Depending on the release or service pack installed, certain RFCs, for example, RFC_CUSTOMER_GET, may not exist in your particular SAP R/3 system. Therefore, the examples included in this documentation may not be relevant to your system. If this is the case, then you should use the examples as a general reference for adapter functionality and choose an RFC that exists within your SAP R/3 application environment.

As described in SAP Release Note 109533, SAP Function Modules (RFCs) can be delivered with different release statuses. SAP supports only RFCs that are awarded the Released for Customer status. There is no claim to the release independencies of the interfaces and the continued existence/functionality of the modules. For more information on the status of a specific function module, consult your SAP Service Marketplace.

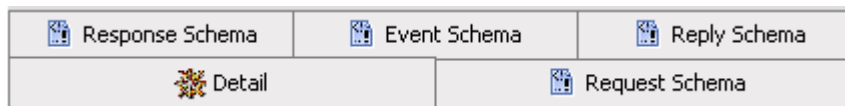
4.6 Creating XML Schemas

After you explore the SAP R/3 business function library and select an object, you can use Application Explorer to create the XML request schema and the XML response schema for that function.

To create request and response schemas for a SAP R/3 business function.

1. Connect to a SAP R/3 target as described in "[Connecting to a Defined SAP R/3 Target](#)" on page 4-12.
2. Expand the **Business Object Repository** node.
3. Click the icon to the left of the **Financial Accounting** node.
4. Scroll down and click the icon to the left of the **CompanyCode** business object.
5. Scroll down and select the BAPI named `GetDetail`.

The XML schema tabs appear on the right, as shown in [Figure 4–18](#).

Figure 4–18 XML Schema Tabs

- To view the XML for each schema type, click the appropriate tab.

4.7 Generating WSDL (J2CA Configurations Only)

The Web Service Definition Language (WSDL) description of a service enables you to make the service available to other services within a host server. You use Application Explorer to create both request-response (outbound) and event notification (inbound) J2CA services of the adapter.

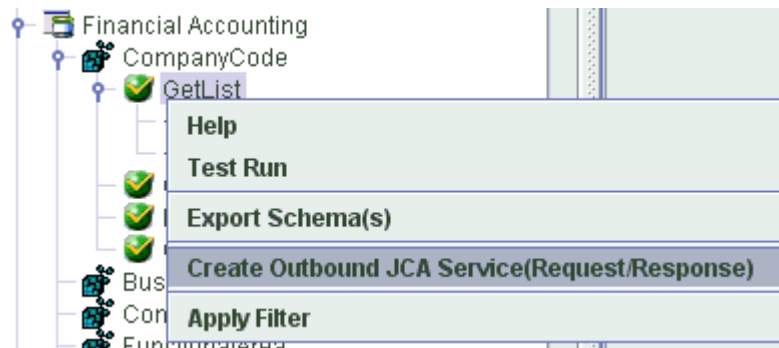
Note: The **Create Inbound JCA Service (Event)** option is only available when the selected node supports events.

To generate a WSDL file for request-response service:

- After you create a schema, right-click the respective object.

The GetList menu is displayed, as shown in [Figure 4–19](#).

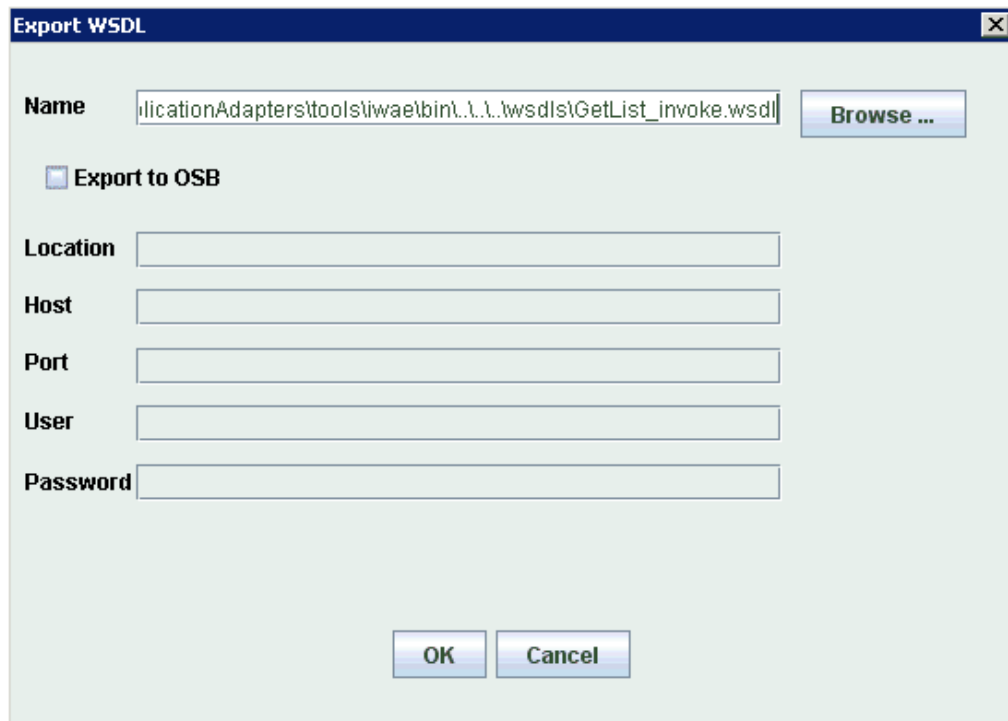
Figure 4–19 Create Outbound JCA Service (Request/Response)



- Select **Create Outbound JCA Service (Request/Response)**.

The Export WSDL dialog is displayed, as shown in [Figure 4–20](#).

Figure 4–20 Export WSDL Dialog



3. Accept the default name for the file.

The .wsdl file extension is added automatically. By default, the names of WSDL files generated for request-response services end with `_invoke`, while those generated for event notification end with `_receive`.

4. Click **OK**.

The WSDL file is saved in the specified location.

The procedure for generating WSDL for event notification is similar to request-response. To generate WSDL for event notification, you must first create a channel for every event. For more information, see ["Generating WSDL for Event Integration"](#) on page 6-41.

4.8 Creating and Testing a Web Service (BSE Configurations Only)

Using Application Explorer, you can explore the business function repository and generate Web services (also known as a **business service**) for the SAP R/3 functions you want to use with the adapter. The following procedure uses the SAP R/3 BAPI method called `BAPI_MATERIAL_GETLIST` as an example and returns a list of materials from SAP R/3.

Note: In a J2EE Connector Architecture (J2CA) implementation of the adapter, Web services are not available. When the adapter is deployed to use the Oracle Adapter J2CA, the Common Client Interface provides integration services using the adapter.

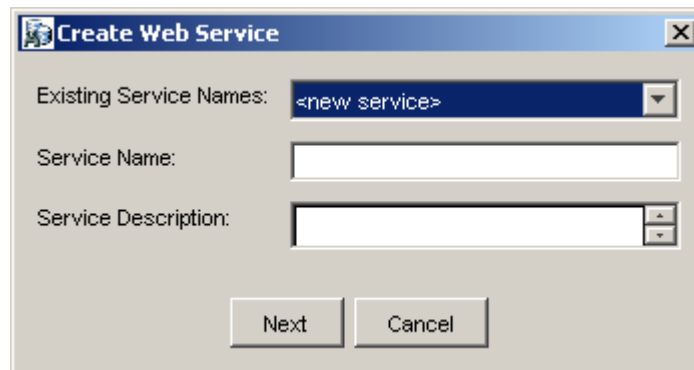
Creating a Web Service

To create a Web service for a SAP R/3 business function:

1. Connect to your **SAP R/3** target and expand the **Business Object Repository** node.
2. Select the `BAPI_MATERIAL_GETLIST` method from the **Business Object Repository**.
3. Right-click the node from which you want to create a business service and select **Create Web Service**.

The Create Web Service dialog is displayed. You can add the business function as a method for a new Web service or as a method for an existing one, as shown in [Figure 4–21](#).

Figure 4–21 Create Web Service Dialog



Perform the following steps:

- a. From the **Existing Service Names** list, select either `<new service>` or an existing service.
 - b. If you are creating a new service, then specify a service name. This name identifies the Web service in the list of services under the **Business Services** node.
 - c. Enter a brief description for the service (optional).
4. Click **Next**.

The License and Method dialog is displayed.

Provide the following information:

- a. In the **License Name** field, select one or more license codes to assign to the Web service. To make multiple selections, press the Ctrl key and click the licenses.
 - b. In the **Method Name** field, leave the default method name.
 - c. In the **Method Description** field, enter a brief description of the method (optional).
 - d. In the DTD Directory field, specify the location of the DTD you want to use.
5. Click **OK**.

Application Explorer switches the view to the **Business Services** node, and the new Web service appears in the left pane.

6. Right-click the new Web service and select **Save WSDL** from the menu.
The Save dialog is displayed.

7. Provide a name for the WSDL file and a location to save the WSDL file on your file system.
8. Click **Save**.

Testing a Web Service

After a Web service is created, you can test it to ensure it functions properly. A test tool is provided for testing the Web service.

To test a Web service:

1. Click the **Business Services** node to access your Web services.
2. Expand the **Services** node.
3. Select the name of the business service you want to test.

The business service name appears as a link in the right pane.

4. In the right pane, click the named business services link.

The test option appears in a separate BSE Servlet page. If you are testing a Web service that requires XML input, then an input field is displayed.

5. Enter the appropriate input.
6. Click **Invoke**.

The BSE Servlet page displays the results.

Identity Propagation

If you test or run a Web service using a third party XML editor, then the user name and password values that you specify in the SOAP header must be valid and are used to connect to SAP R/3. The user name and password values that you provided for SAP R/3 during target creation using Application Explorer are overwritten for this Web service request. The following is a sample SOAP header that is included in the WSDL file for a Web service:

```
<SOAP-ENV:Header>
  <m:ibsinfo xmlns:m="urn:schemas-iwaysoftware-com:iwse">
    <m:service>String</m:service>
    <m:method>String</m:method>
    <m:license>String</m:license>
    <m:disposition>String</m:disposition>
    <m:Username>String</m:Username>
    <m>Password>String</m>Password>
    <m:language>String</m:language>
  </m:ibsinfo>
</SOAP-ENV:Header>
```

You can remove the `<m:disposition>` and `<m:language>` tags from the SOAP header, since they are not required.

Oracle ERP Adapter WSDL Definition Limitations

This section describes certain limitations with WSDL definitions that are generated by Oracle ERP Adapters, and provides workarounds where applicable.

Qualified/Unqualified Options

The *qualified* and *unqualified* options are not enforced by the Oracle ERP Adapter when WSDL definition are generated. For example:

1. Export a WSDL with the *qualified* option specified.

2. Create a Web service based on this WSDL.
3. Send XML data that contains unqualified elements to this Web service.
A correct response document is received.

Namespaces

Namespaces that are defined in the generated WSDL definition are not enforced by the Oracle ERP Adapter. For example:

1. Create a Web service based on a generated WSDL.
2. Send XML data where all namespaces have been removed to this Web service.
A correct response document is received.

Unchecked Data

The Oracle ERP Adapter does not verify if XML data conforms to the generated WSDL definition. For demonstration purposes only, the following example uses SAP R/3:

1. Create a Web service for the `RFC_SYSTEM_INFO` function module.
2. Invoke this Web service (`RFC_SYSTEM_INFO`) with XML data pertaining to `BAPI_COMPANYCODE_GETLIST`.

A response document is received with data for `BAPI_COMPANYCODE_GETLIST`.

This behavior should be taken into consideration when designing an application using Oracle ERP Adapters. As a best practice, always validate the XML data that is received according to the WSDL definition before a Web service is invoked. Otherwise, all functions can be exposed on a system (for example, SAP R/3) if only one function is called. In this example, only the `RFC_SYSTEM_INFO` function module was called, but an end-user could have invoked any function on SAP R/3 using this function. Only a valid XML document that is recognized by the Oracle ERP Adapter for a given function is required.

4.9 Configuring an Event Adapter

Events are generated by activity in a database or in an application system. You can use events to trigger an action in your application. For example, an update to a database can reflect an update to customer information. If your application must perform when this happens, then your application is a consumer of this event.

After you create a connection to your application system, you can add events using Application Explorer. To create an event, you must create a channel.

Note: If you are using a J2CA configuration, then you must create a new channel for every different event object and select this channel when creating an inbound service. Creating a channel is required for J2CA configurations only. In addition, each channel must be associated with a unique SAP R/3 Program ID. For example, if you are working with MATMAS and DEBMAS, then two separate channels are required for each object and two unique SAP R/3 Program IDs.

A **channel** represents configured connections to particular instances of back-end systems. For more information, see "[Creating and Editing a Channel](#)" on page 4-20.

4.9.1 Creating and Editing a Channel

The following procedure describes how to create a channel for your event. All defined event ports must be associated with a channel.

When you create, modify, or delete a channel, you must restart the Oracle WebLogic Server to recognize the change and update the repository for run time purposes.

Note: Channels can be configured and started only on the system where the Oracle Application Adapter for SAP R/3 is installed. Configuring and starting a channel for a remote host is not supported.

Events are not applicable when using a BSE configuration. You can configure events using a J2CA configuration only.

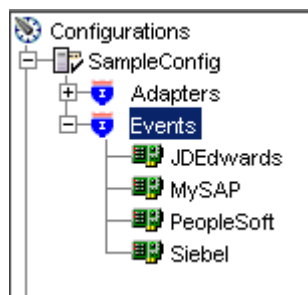
Creating and updating a channel requires you to restart the application server. The application server must also be restarted after you create a channel and generate an inbound WSDL. In addition, ensure to close Application Explorer before you restart the application server.

Creating a Channel

To create a channel:

1. Click the **Events** node, as shown in [Figure 4–22](#).

Figure 4–22 Events Node



2. Expand the **MySAP** node.
The ports and channels nodes appear in the left pane.
3. Right-click **Channels** and select **Add Channel**.
The Add Channel dialog is displayed, as shown in [Figure 4–23](#).

Figure 4–23 Add Channel Dialog

Perform the following steps:

- a. Enter a name for the channel, for example, TEST_CHANNEL.
 - b. Enter a brief description.
 - c. From the **Protocol** list, select **Application Server - mySAP** or **Message Server - mySAP**.
4. Click Next.
- The Message Server dialog is displayed. The following tabs are available:
- User (Required)
 - System (Required)
 - Security
 - Advanced
5. For the **User** tab, enter the appropriate information for your SAP R/3 channel based on the information in the following table.

Table 4–5 User Tab Parameters

Target Parameter	Description
Client	The client number defined for the SAP application for client communications.
User	A valid user ID for the SAP application.
Password	A valid password for the SAP application.
Authentication Mode	The authentication mode you want to use when connecting to your SAP R/3 system. By default, Password is selected from the drop-down list.

6. For the **System** tab, enter the appropriate information for your SAP R/3 channel based on the information in the following table.

Table 4–6 System Tab Parameters

Target Parameter	Description
Gateway host	A host name for the SAP R/3 Gateway.
Gateway service	A service for the SAP R/3 Gateway.
Program ID of the server	A SAP R/3 program ID you want to use for this channel.
Application Server	A host name for the application server.
System Number	The system number defined to SAP R/3 for client communications.
Connection pool size	<p>The number of client connections in a pool you want to make available to SAP R/3 for Web service calls. A default connection pool size of 2 is available by default.</p> <p>Important: The default value of 1 does not create a connection pool. Instead, a single SAP R/3 connection with sequential processing is shared. A pooled connection invokes multiple connections to SAP R/3 with parallel processing.</p> <p>If you are using Application Explorer to create Web services, then the connection pool size value is used by your Web service during run-time. As a result, ensure that the connection pool size is sufficient for your purposes.</p>
Connection timeout(min)	The timeout value for your connection pool in minutes. The default value is 10 minutes.
Connection wait time(sec)	<p>The wait time for your connection pool in seconds. The default value is 30 seconds.</p> <p>Connections to an ERP server take up valuable resources on both the client and the remote server. You can create a pool of connections to minimize the resource and time constraints. In estimating the size of the pool, you may calculate pool size by the amount of server resources to be consumed, the number and size of the documents to be received, and the size of your Java Virtual Machine. The section of SAP documentation "Memory Management (BC-CST-MM)" explains in detail the resources required on the SAP R/3 system.</p>

7. For the **Security** tab (optional), enter the appropriate information for your SAP R/3 channel based on the information in the following table.

Table 4–7 Security Tab Parameters

Target Parameter	Description
SNC mode	By default, SNC is disabled. To enable SNC, select 1 from the list.
SNC partner	Enter the name of the RFC server or message server (load balancing) that provides the SNC services.
SNC level	From the list select the version of the SNC library.
SNC name	Enter the name of the SNC library you are using.
SNC library path	Enter the path to the SNC library.

8. For the **Advanced** tab (optional), enter the appropriate information for your SAP R/3 channel based on the information in the following table.

Table 4–8 Advanced Tab Parameters

Target Parameter	Description
IDOC Format	Select an IDOC type from the list: <ul style="list-style-type: none"> ■ XML (default) ■ XML-CDATA-ENVELOPED ■ NATIVE IDOC
IDOC release	The IDOC versioning you want to use for your connection.
IDOC release provider	The IDOC release provider for your connection. Select IDOC DOCREL field (default), SAP release, or user input from the drop-down list.
IDOC(flat) encoding	The type of encoding for IDOC processing.
SAP trace	Select this option to enable SAP traces. The SAP traces are stored in the following locations during design time and run time: Design Time: <ADAPTER_HOME>\soa\thirdparty\ApplicationAdapters\tools\iwaeb\bin Run Time: <ADAPTER_HOME>\user_projects\domains\base_domain The file name formats that are used for the SAP traces are as follows (for design time and run time): <ul style="list-style-type: none"> ■ rfc02664_04332.trc ■ JCO100226_043846994.trc
Trace level	Indicates the level of detail in the SAP traces. Select a value that ranges from 0 through 10 from the list.
Thread count	The number of open threads. By default, three threads are specified.
Processing Mode	Select the type of synchronous processing from the list. Possible values include REQUEST and REQUEST_RESPONSE.

9. Click OK.

The channel appears under the channels node in the left pane, as shown in [Figure 4–24](#).

Figure 4–24 MySAP_Channel

An X over the icon indicates that the channel is currently disconnected. You must start the channel to activate your event configuration.

Note: If you are planning to integrate Oracle Application Adapter for SAP R/3 with BPM, BPEL, or OSB inbound process components, then do not start the channel. The channel is managed by the run-time server after the BPM, BPEL, or OSB process component is deployed. If you start the channel from Application Explorer for testing and debugging purposes, then stop it before run-time (when working with BPM, BPEL, or OSB process components).

10. Right-click the **channels** node and select **Start**.

The channel you created becomes active, as shown in [Figure 4-25](#).

Figure 4-25 Active MySAP_Channel



The X over the icon disappears.

11. To stop the channel, right-click the connected channel node and select **Stop**.

The channel becomes inactive and an X appears over the icon.

Editing a Channel

To edit a channel:

1. In the left pane, locate the channel you want to edit.
2. Right-click the channel and select **Edit**.
The Edit Channel pane is displayed.
3. Make the required changes to the channel configuration and click **Finish**.

When you edit a channel, you must restart the Oracle WebLogic Server to recognize the change and update the repository for run time purposes.

Deleting a Channel

To delete a channel:

1. In the left pane, locate the channel you want to delete.
2. Right-click the channel and select **Delete**.

The channel disappears from the list in the left pane.

When you delete a channel, you must restart the Oracle WebLogic Server to recognize the change and update the repository for run time purposes.

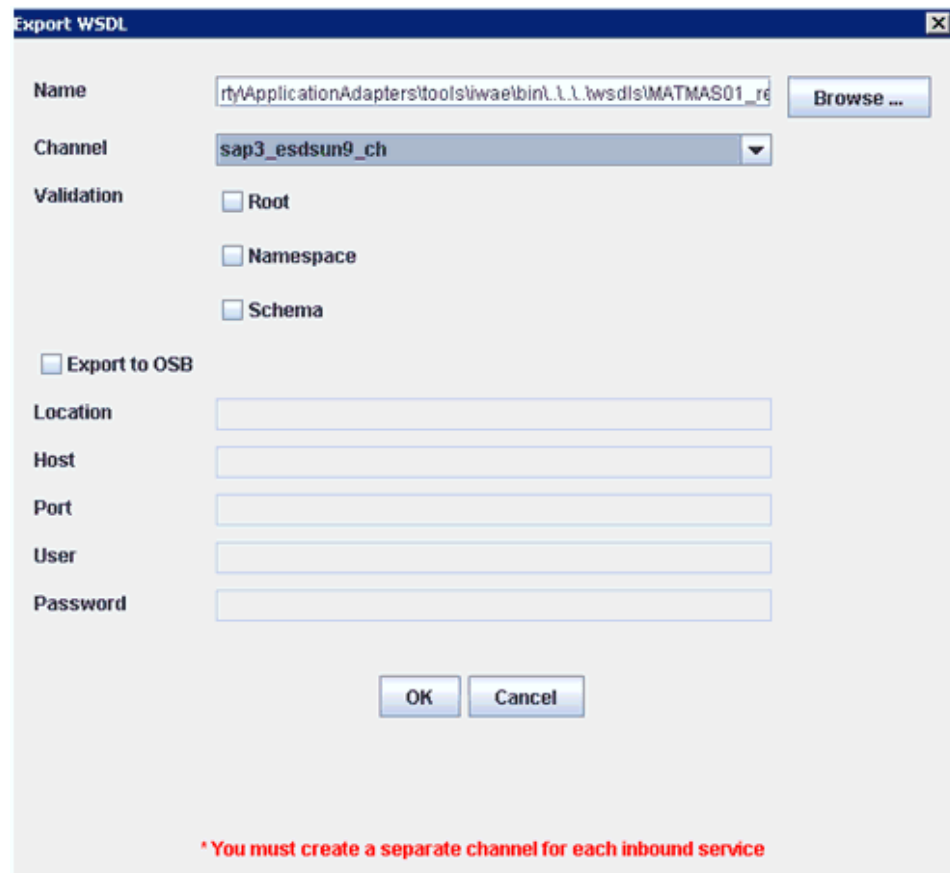
4.9.2 Schema Validation

Root validation, namespace validation, and schema validation for inbound processing (events) are supported for the Oracle Application Adapter for SAP R/3 with BPEL.

To validate inbound processing using the Oracle Application Adapter for SAP R/3, perform the following steps. This procedure uses MATMAS (Material Master) as an example for inbound processing.

1. Start Application Explorer.
2. Connect to the MySAP target.
3. Expand the IDOCs node.
4. Verify that you created a channel for the MySAP adapter.
5. Select and expand the MATMAS – Material Master node.
6. Right-click MATMAS01 select **Create Inbound JCA Service (event)**.
The Export WSDL dialog opens and includes three check boxes for Root, Namespace, and Schema validation, as shown in [Figure 4–26](#).

Figure 4–26 Export WSDL Dialog



- Selection of multiple validation options is allowed.
- Root validation is used to validate the root element in the inbound XML document.
- Namespace validation is used to validate the namespace in the inbound XML document.
- Schema validation is used to validate the inbound XML document with the schema in the WSDL document.
- During run time, validation is processed based on the validation options that are selected.

- If multiple validation options are selected, then during run time if the first validation option fails, the remaining validation options are not processed.
 - Root and namespace validations are considered modest levels of validation. Schema validation is a stricter validation level.
 - It is recommended to use root and namespace validation options, unless the root element and namespace are different between the IDOCs in the SAP environment.
7. Generate the WSDL document and create the BPEL process.
 8. Trigger the transactions (IDOCs) from the SAP GUI.

Inbound transactions that fail for the validation are shown in the SAP Transaction Monitor (SM58).

The status text field shows "java.lang.exception" for the documents that have failed the validation process.

Oracle WebLogic Server Deployment and Integration

This chapter describes Oracle WebLogic Server (OracleWLS) deployment and integration with Oracle Application Adapter for SAP R/3. It contains the following topics:

- [Section 5.1, "Adapter Integration with Oracle WebLogic Server"](#)
- [Section 5.2, "Deployment of Adapter"](#)
- [Section 5.3, "Updating Adapter Configuration"](#)

See Also:

- *Oracle WebLogic Server Adapter Concepts*

5.1 Adapter Integration with Oracle WebLogic Server

Oracle Application Adapter for SAP R/3 is deployed within an OracleWLS container during installation. All client applications run within the OracleWLS environment. In J2CA deployment, the Common Client Interface (CCI) integrates an OracleWLS client application with a resource adapter.

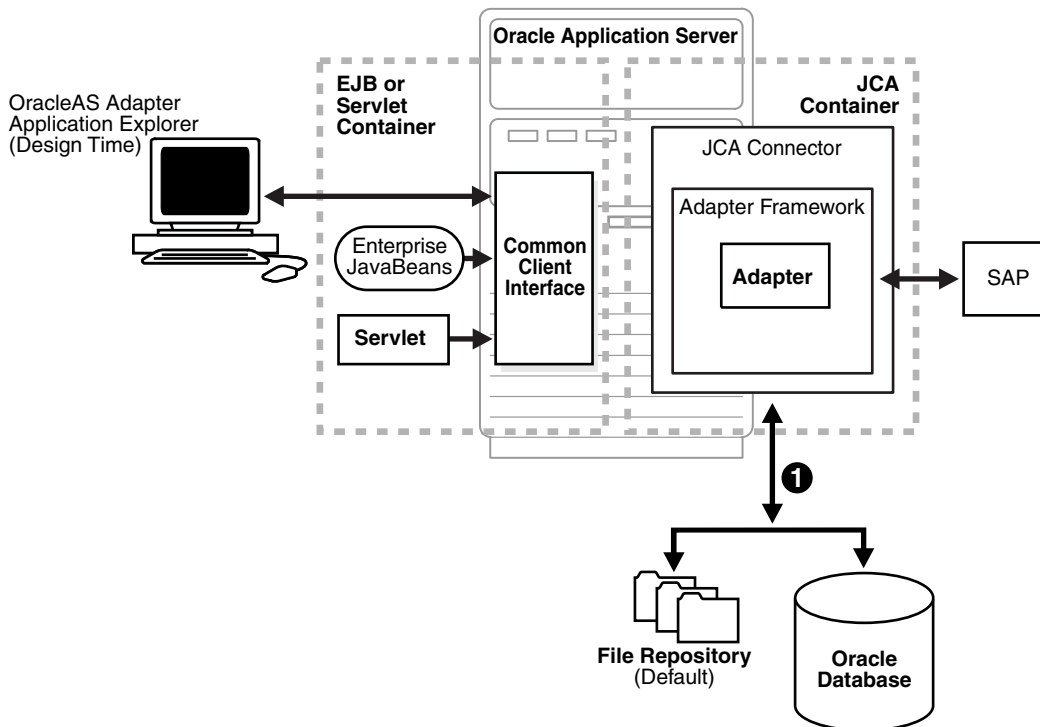
See Also:

- *Oracle WebLogic Server Adapter Concepts*

5.2 Deployment of Adapter

[Figure 5–1](#) shows deployment of the J2CA Connector to the Oracle Application Server. In a run-time service scenario, an Enterprise Java Bean, servlet, or Java program client makes CCI calls to J2CA 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.

Figure 5–1 Oracle Application Server J2CA Architecture



❶ Use either the default file repository or an Oracle database as your repository.

See Also:

- *Oracle WebLogic Server Adapter Concepts*

5.3 Updating Adapter Configuration

During the J2CA deployment of Oracle Application Adapter for SAP R/3, OracleWLS generates a deployment descriptor called `ra.xml`, located in:

```
<ADAPTER_HOME>\soa\thirdparty\ApplicationAdapters\iwafjca.rar\META-INF
```

The OracleWLS deployment descriptor is located in the directory specified above.

Note: Multiple managed connection factories are supported only for outbound processing (services).

Creating a Managed Connector Factory Object

The `ra.xml` descriptor provides OracleWLS-specific deployment information for resource adapters. For example, the `jca_sample` configuration in Application Explorer is represented in the `ra.xml` file as follows:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE connector PUBLIC "-//Sun Microsystems, Inc.//DTD Connector 1.0//EN"
'http://java.sun.com/dtd/connector_1_0.dtd'>
<connector>
  <display-name>IWAFJCA10</display-name>
  <vendor-name>IWAY Software</vendor-name>
```

```

<spec-version>1.0</spec-version>
<eis-type>IWAF</eis-type>
<version>1.0</version>
<license>
  <license-required>>false</license-required>
</license>
<resourceadapter>

<managedconnectionfactory-class>com.ibi.afjca.spi.IWAFManagedConnectionFactory</ma
nagedconnectionfactory-class>

<connectionfactory-interface>javax.resource.cci.ConnectionFactory</connectionfacto
ry-interface>

<connectionfactory-impl-class>com.ibi.afjca.cci.IWAFConnectionFactory</connectionf
actory-impl-class>
  <connection-interface>javax.resource.cci.Connection</connection-interface>

<connection-impl-class>com.ibi.afjca.cci.IWAFConnection</connection-impl-class>
  <transaction-support>NoTransaction</transaction-support>
  <config-property>
    <config-property-name>AdapterName</config-property-name>
    <config-property-type>java.lang.String</config-property-type>
    <config-property-value></config-property-value>
  </config-property>
  <config-property>
    <config-property-name>Config</config-property-name>
    <config-property-type>java.lang.String</config-property-type>
    <config-property-value></config-property-value>
  </config-property>
  <config-property>
    <config-property-name>IWayHome</config-property-name>
    <config-property-type>java.lang.String</config-property-type>
    <config-property-value>C:\oracle\Middleware\Oracle_
SOA1\soa\thirdparty\ApplicationAdapters</config-property-value>
  </config-property>
  <config-property>
    <config-property-name>IWayConfig</config-property-name>
    <config-property-type>java.lang.String</config-property-type>
    <config-property-value>jca_sample</config-property-value>
  </config-property>
  <config-property>
    <config-property-name>IWayRepoDriver</config-property-name>
    <config-property-type>java.lang.String</config-property-type>
    <config-property-value></config-property-value>
  </config-property>
  <config-property>
    <config-property-name>IWayRepoURL</config-property-name>
    <config-property-type>java.lang.String</config-property-type>
    <config-property-value></config-property-value>
  </config-property>
  <config-property>
    <config-property-name>IWayRepoUser</config-property-name>
    <config-property-type>java.lang.String</config-property-type>
    <config-property-value></config-property-value>
  </config-property>
  <config-property>
    <config-property-name>IWayRepoPassword</config-property-name>
    <config-property-type>java.lang.String</config-property-type>
    <config-property-value></config-property-value>

```

```

    </config-property>
    <config-property>
      <config-property-name>LogLevel</config-property-name>
      <config-property-type>java.lang.String</config-property-type>
      <config-property-value>DEBUG</config-property-value>
    </config-property>
    <authentication-mechanism>
      <authentication-mechanism-type>BasicPassword</authentication-mechanism-type>

<credential-interface>javax.resource.spi.security.PasswordCredential</credential-i
nterface>
  </authentication-mechanism>
  <reauthentication-support>true</reauthentication-support>
</resourceadapter>
</connector>

```

The parameters defined in the ra.xml file are described in the following table:

Parameter Name	Description
IWayHome	The base installation directory for the OracleWLS packaged application adapter.
IWayConfig	The adapter configuration name as defined in Application Explorer. For example, Oracle Application Adapter for SAP R/3 has a preconfigured <code>jca_sample</code> configuration in Application Explorer.
IWayRepoURL	The URL to use when opening a connection to the database. This is necessary only when using an Oracle database as the repository.
IWayRepoUser	User name to use when connecting to the database. This is necessary only when using an Oracle database as the repository.
IWayRepoPassword	Password. If provided, then it overwrites the configuration. This is necessary only when using an Oracle database as the repository.
loglevel	It overwrites the level set by the ManagedConnectorFactory property.

Creating Multiple Managed Connector Factory Objects

To establish multiple managed connector factory objects, you must edit the `weblogic-ra.xml` file and add more `<connection-instance>` nodes. This file is located in:

```
<ADAPTER_HOME>\soa\thirdparty\ApplicationAdapters\iwafjca.rar\META-INF
```

For example, the first `jca_configuration` in Application Explorer is represented in the `weblogic-ra.xml` file as follows:

```

<?xml version="1.0"?>
<weblogic-connector xmlns="http://www.bea.com/ns/weblogic/90">
  <enable-access-outside-app>true</enable-access-outside-app>
  <enable-global-access-to-classes>true</enable-global-access-to-classes>
  <outbound-resource-adapter>
    <default-connection-properties>
    <pool-params>
      <initial-capacity>0</initial-capacity>
    </pool-params>

```

```

        <transaction-support>LocalTransaction</transaction-support>
    </default-connection-properties>
    <connection-definition-group>

<connection-factory-interface>javax.resource.cci.ConnectionFactory</connection-factory-interface>
    <connection-instance>
        <jndi-name>eis/OracleJCAAdapter/DefaultConnection</jndi-name>
    </connection-instance>
    </connection-definition-group>
</outbound-resource-adapter>
</weblogic-connector>

```

To create multiple managed connector factory objects, you must add new <connection-instance> nodes in the file. For example:

```

<?xml version="1.0"?>
<weblogic-connector xmlns="http://www.bea.com/ns/weblogic/90">

    <enable-access-outside-app>true</enable-access-outside-app>
    <enable-global-access-to-classes>true</enable-global-access-to-classes>

    <outbound-resource-adapter>
        <default-connection-properties>
        <pool-params>
        <initial-capacity>0</initial-capacity>
        </pool-params>
        <transaction-support>LocalTransaction</transaction-support>
        </default-connection-properties>
        <connection-definition-group>

<connection-factory-interface>javax.resource.cci.ConnectionFactory</connection-factory-interface>
    <connection-instance>
        <jndi-name>eis/OracleJCAAdapter/DefaultConnection</jndi-name>
    </connection-instance>
    <connection-instance>
        <jndi-name>eis/OracleJCAAdapter/DefaultConnection1</jndi-name>
        <connection-properties>
        <properties>
        <property>
<name>IWayHome</name>
<value>C:\oracle\Middleware\Oracle_SOA1\soa\thirdparty\ApplicationAdapters</value>
        </property>
        <property>
        <name>IWayConfig</name>
        <value>jca_sample2</value>
        </property>
        <property>
        <name>IWayRepoURL</name>
        <value></value>
        </property>
        <property>
        <name>IWayRepoUser</name>
        <value></value>
        </property>
        <property>
        <name>IWayRepoPassword</name>
        <value></value>
        </property>
        <property>

```

```

        <name>LogLevel</name>
        <value>Debug</value>
      </property>
    </properties>
  </connection-properties>
</connection-instance>
</connection-definition-group>
</outbound-resource-adapter>
</weblogic-connector>

```

If you do not specify a `<property>` element in the `<connection-instance>` section, then the value is taken from the `ra.xml` file. You can specify the default properties in the `ra.xml` file and then override them as required in the `weblogic-ra.xml` file. In addition, note that the J2CA configuration (for example, `jca_sample2`) must be created in Application Explorer.

Note: When you modify the `ra.xml` and `weblogic-ra.xml` files, the application server must be restarted. If the application server is running, then stop the application server and then restart it.

In addition, the `iwafjca.rar` file must be redeployed in the Oracle WebLogic Administration Console to activate these changes.

Modifying WSDL Files for Additional Connection Factory Values

Application Explorer generates the J2CA properties file using the default connection factory name `eis/OracleJCAAdapter/DefaultConnection`. If you created additional connection factories, then the WSDLs generated for the additional configuration and connection factory should be changed to reflect the location field of the `jca:address` section in the J2CA properties file. The default J2CA properties file for the Oracle Application Adapter for SAP R/3 with a configuration of `isdsrv2_conn2` is shown in the following example.

Notice that the J2CA properties file has the following default connection factory:
`eis/OracleJCAAdapter/DefaultConnection`

```

<jca:address location="eis/OracleJCAAdapter/DefaultConnection"
  ConnectionSpec="com.ibi.afjca.cci.IWAFConnectionSpec"
  cs.AdapterName="MySAP" cs.Config="isdsrv2_conn2"
  UIConnectionName="Connection1"/>

```

The connection factory value must be changed to the following:
`eis/OracleJCAAdapter/DefaultConnection1`

For example:

```

<jca:address location="eis/OracleJCAAdapter/DefaultConnection1"
  ConnectionSpec="com.ibi.afjca.cci.IWAFConnectionSpec"
  cs.AdapterName="MySAP" cs.Config="isdsrv2_conn2"
  UIConnectionName="Connection1"/>

```

Note that only the value for the location field in the `jca:address` section should be modified. Do not modify any other field or section.

Integration With BPEL Service Components in the Oracle SOA Suite

Oracle Application Adapter for SAP R/3 integrates seamlessly with Business Process Execution Language (BPEL) Process Manager to facilitate Web service integration. Oracle BPEL Process Manager is based on the Service-Oriented Architecture (SOA). It consumes adapter services exposed as Web Service Definition Language (WSDL) documents.

This chapter contains the following topics:

- [Section 6.1, "Overview"](#)
- [Section 6.2, "Deployment of Adapter"](#)
- [Section 6.3, "Configuring a New Application Server Connection"](#)
- [Section 6.4, "Designing an Outbound BPEL Process for Service Integration"](#)
- [Section 6.5, "Designing an Inbound BPEL Process for Event Integration"](#)

6.1 Overview

To integrate with Oracle BPEL Process Manager, Oracle Application Adapter for SAP R/3 must be deployed in the same WLS container as Oracle BPEL Process Manager. The underlying adapter services must be exposed as WSDL files, which are generated during design time in Oracle Adapter Application Explorer (Application Explorer) for both request-response (outbound) and event notification (inbound) services of the adapter. For more information, see "[Generating WSDL \(J2CA Configurations Only\)](#)" on page 4-15.

The generated WSDL files are used to design the appropriate BPEL processes for inbound or outbound adapter services. A completed BPEL process must be successfully compiled in JDeveloper and deployed to a BPEL server. Upon deployment to the BPEL server, every newly built process is automatically deployed to the Oracle Enterprise Manager console, where you run, monitor, and administer BPEL processes, and listen to adapter events.

6.2 Deployment of Adapter

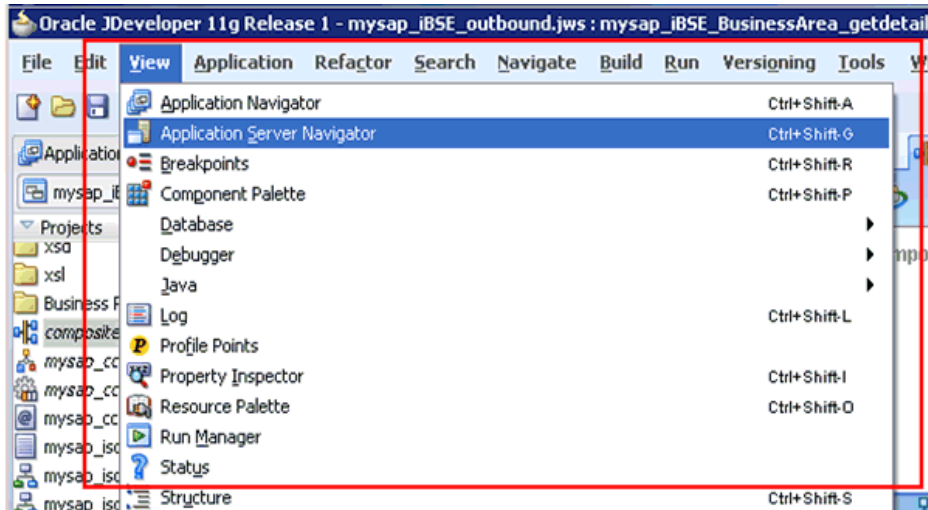
During installation, Oracle Application Adapter for SAP R/3 is deployed as a J2CA 1.0 resource adapter within the WLS container. The adapter must be deployed in the same WLS container as Oracle BPEL Process Manager.

6.3 Configuring a New Application Server Connection

To configure a new Application Server connection in Oracle JDeveloper:

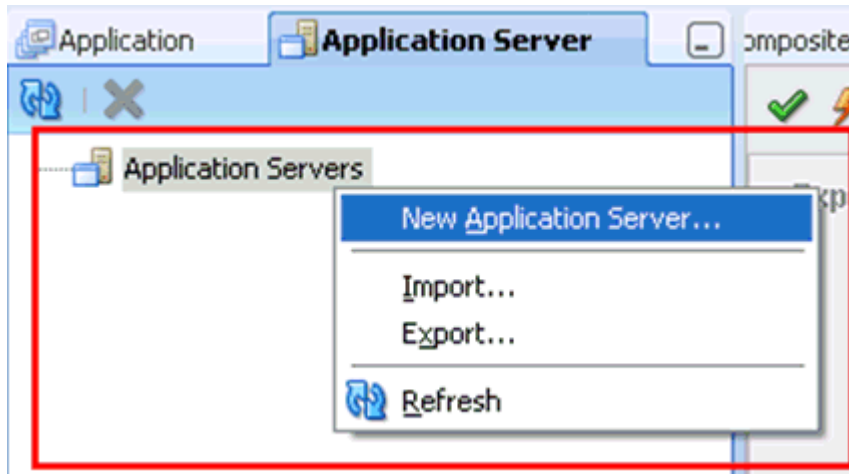
1. Open **Oracle JDeveloper** on your system.
2. From the menu bar, click **View** and select **Application Server Navigator**, as shown in [Figure 6-1](#).

Figure 6-1 Application Server Navigator



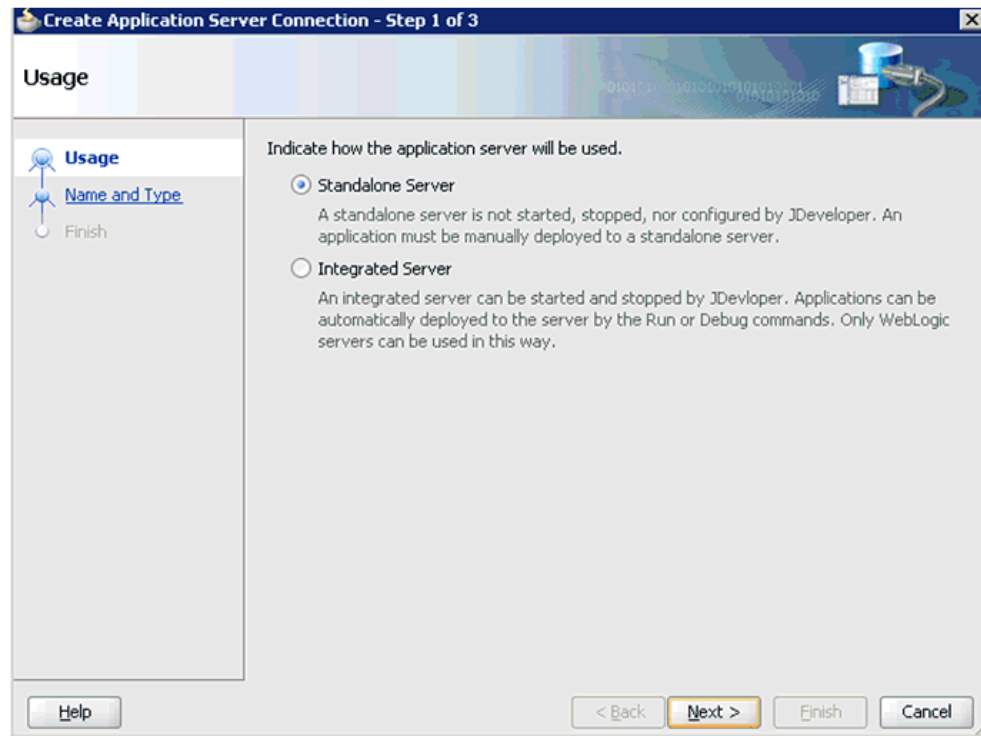
The Application Server tab is displayed, as shown in [Figure 6-2](#).

Figure 6-2 Application Server Tab

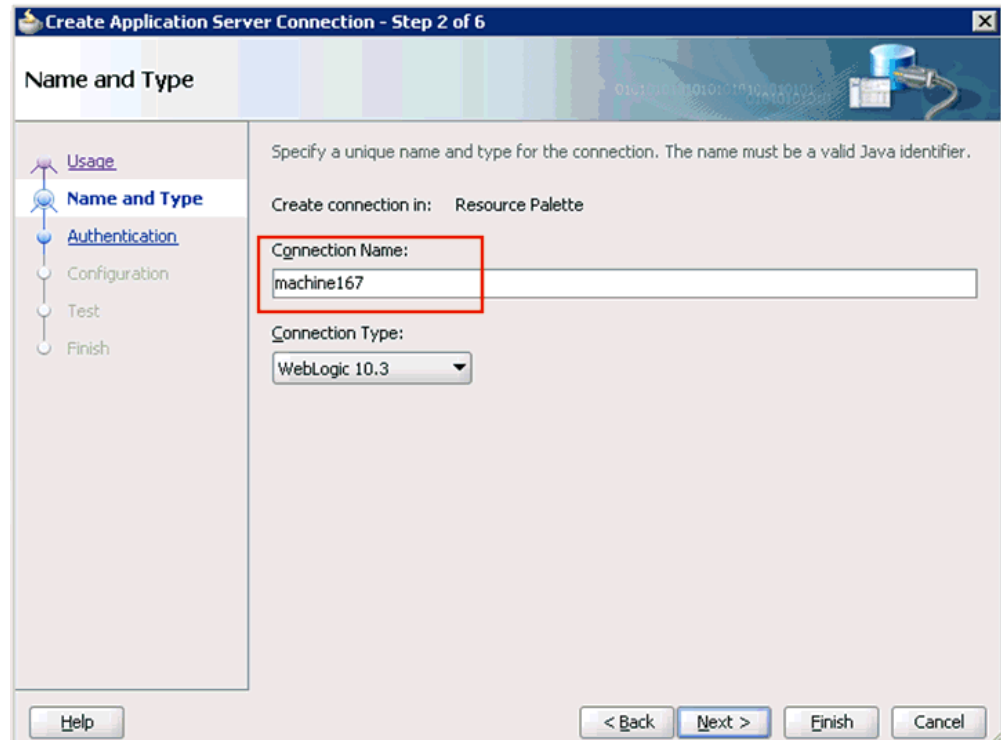


3. Right-click **Application Servers** and select **New Application Server**.

The Create Application Server Connection Wizard is displayed, as shown in [Figure 6-3](#).

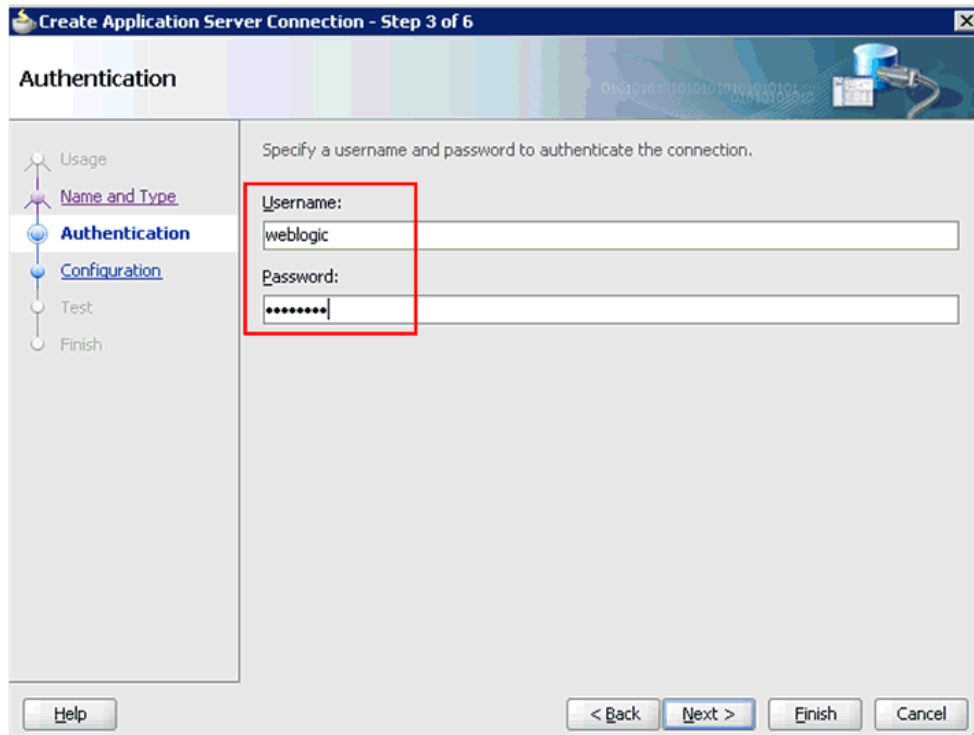
Figure 6–3 Create Application Server Connection Wizard

4. Accept the default selection (Standalone Server) and click **Next**.
The Name and Type page is displayed, as shown in [Figure 6–4](#).

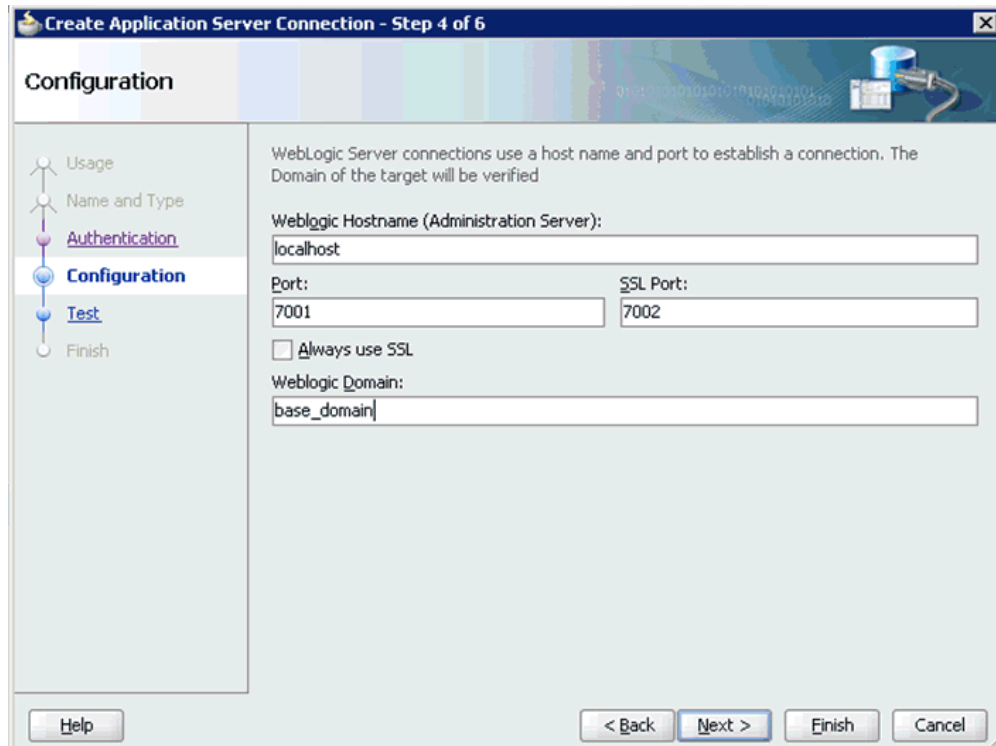
Figure 6–4 Name and Type Page

5. Specify a new name for the Application Server connection and click **Next**.
The Authentication page is displayed, as shown in [Figure 6–5](#).

Figure 6–5 Authentication Page



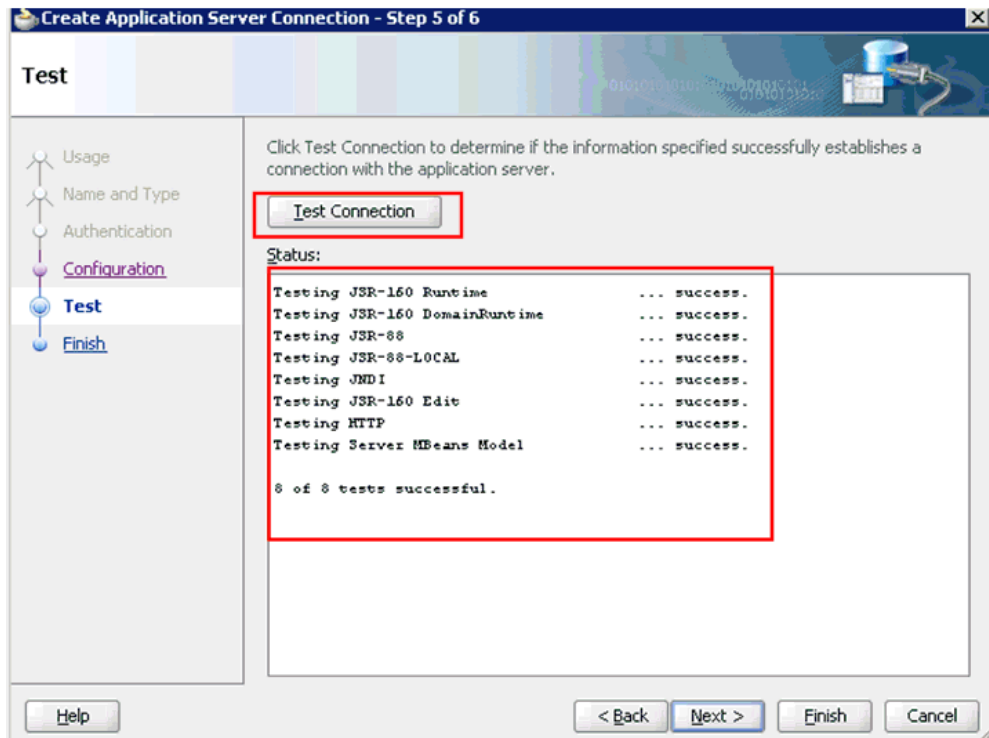
6. Specify a valid user name (for example, weblogic) and a password (for example, welcome1) for your new connection.
7. Click **Next**.
The Configuration page is displayed, as shown in [Figure 6–6](#).

Figure 6–6 Configuration Page

8. Specify the Oracle WebLogic host name (for example, localhost), which is the system IP where the process must deploy and Oracle WebLogic domain (for example, base_domain).
9. Click Next.

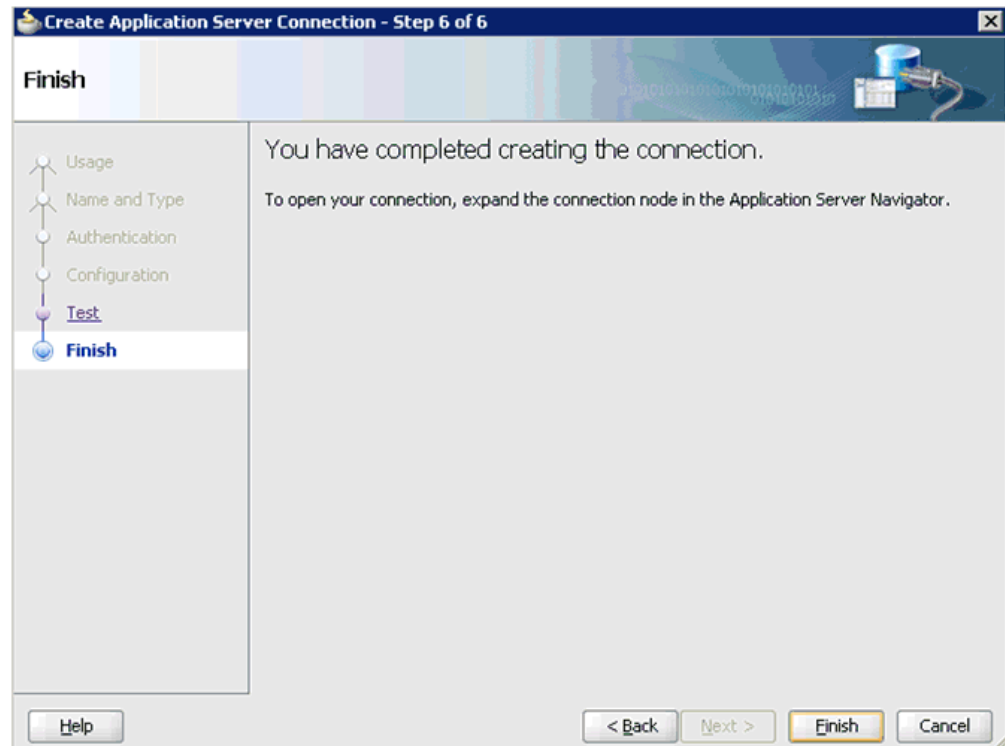
The Test page is displayed, as shown in [Figure 6–7](#).

Figure 6–7 Test Page

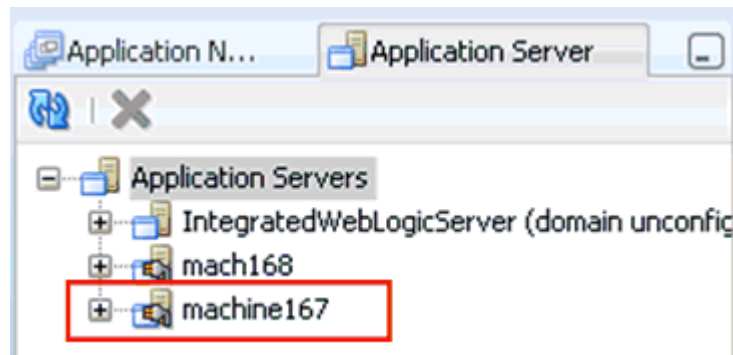


10. Click **Test Connection**.
11. Make sure that the test status is successful.
12. Click **Next**.

The Finish page is displayed, as shown in [Figure 6–8](#).

Figure 6–8 *Finish Page***13. Click Finish.**

The new Application Server connection is listed in the left pane (Application Server tab), as shown in [Figure 6–9](#).

Figure 6–9 *New Application Server Connection*

6.4 Designing an Outbound BPEL Process for Service Integration

The following tools are required to complete your outbound design-time configuration:

- Oracle Adapter Application Explorer (Application Explorer)
- Oracle JDeveloper BPEL Designer (JDeveloper) or Eclipse

Note: The examples in this chapter demonstrate the use of JDeveloper.

Before you design a BPEL process, you must generate the respective WSDL file using Application Explorer. For more information, see ["Generating WSDL for Request/Response Service"](#) on page 6-8.

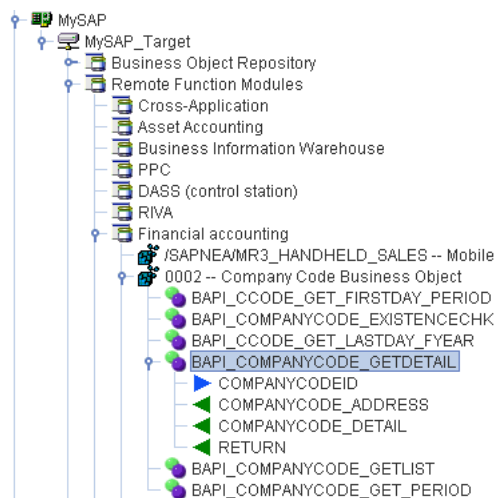
Samples have been provided for this use case scenario under the *etc/sample* folder of the Application Adapters installation.

6.4.1 Generating WSDL for Request/Response Service

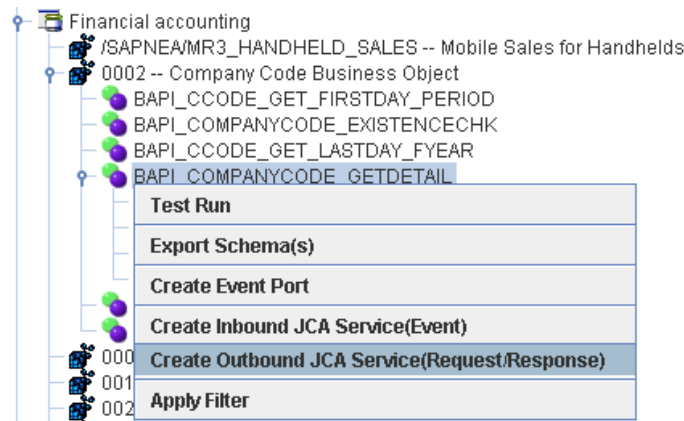
Perform the following steps to generate a WSDL for request/response service:

1. Start **Application Explorer** and connect to a defined MySAP target (a J2CA configuration).
For more information on defining a target and connecting to SAP R/3, see ["Defining a Target to SAP R/3"](#) on page 4-6.
2. Expand the MySAP target to which you are connected.
3. Expand **Remote Function Modules**, **Financial Accounting**, **0002 -- Company Code Business Object**, and then select **BAPI_COMPANYCODE_GETDETAIL**, as shown in [Figure 6–10](#).

Figure 6–10 Connected MySAP_Target

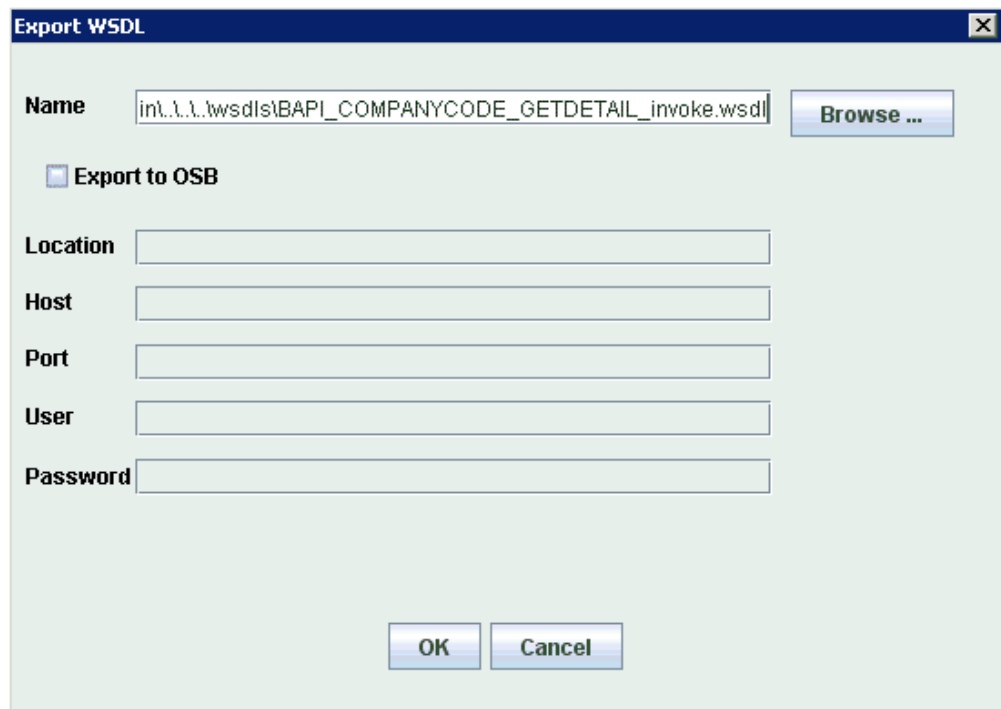


4. Right-click the **BAPI_COMPANYCODE_GETDETAIL** node.
A menu is displayed, as shown in [Figure 6–11](#).

Figure 6–11 BAPI_COMPANYCODE_GETDETAIL Node

5. Click **Create Outbound JCA Service (Request/Response)**.

The Export WSDL dialog is displayed, as shown in [Figure 6–12](#).

Figure 6–12 Export WSDL Dialog

6. Click **OK**.

You can now create an empty composite for SOA, which is the first step that is required to define a BPEL outbound process in JDeveloper.

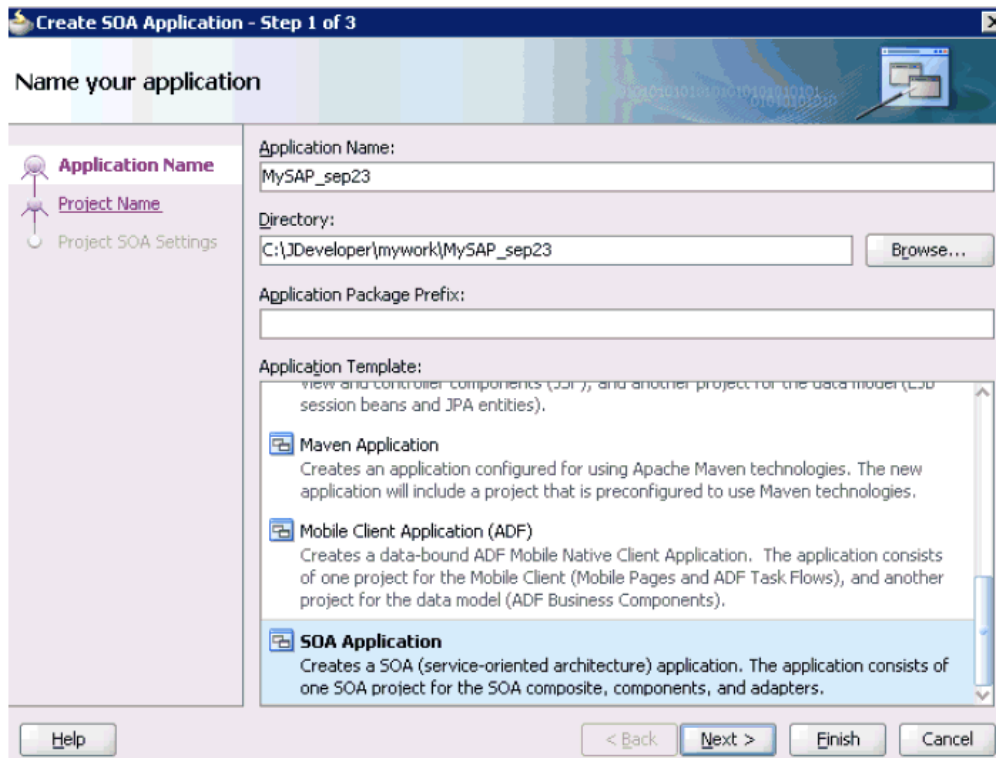
6.4.2 Creating an Empty Composite for SOA

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

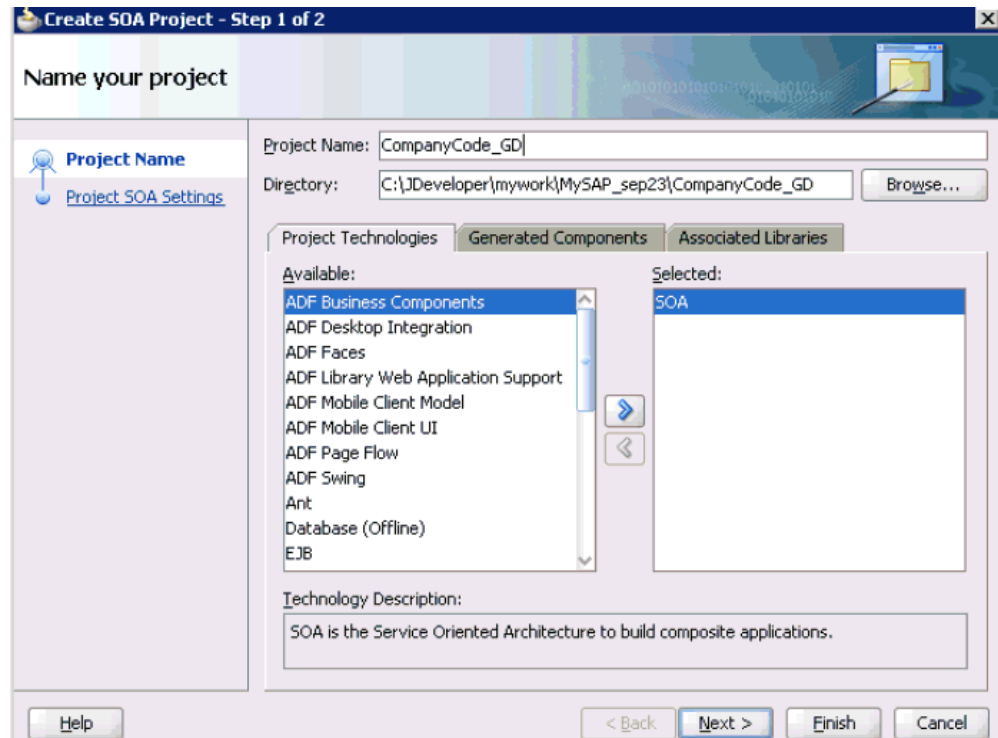
1. Create a new SOA application.

2. Enter a name for the new SOA Application and click **Next**, as shown in [Figure 6–13](#).

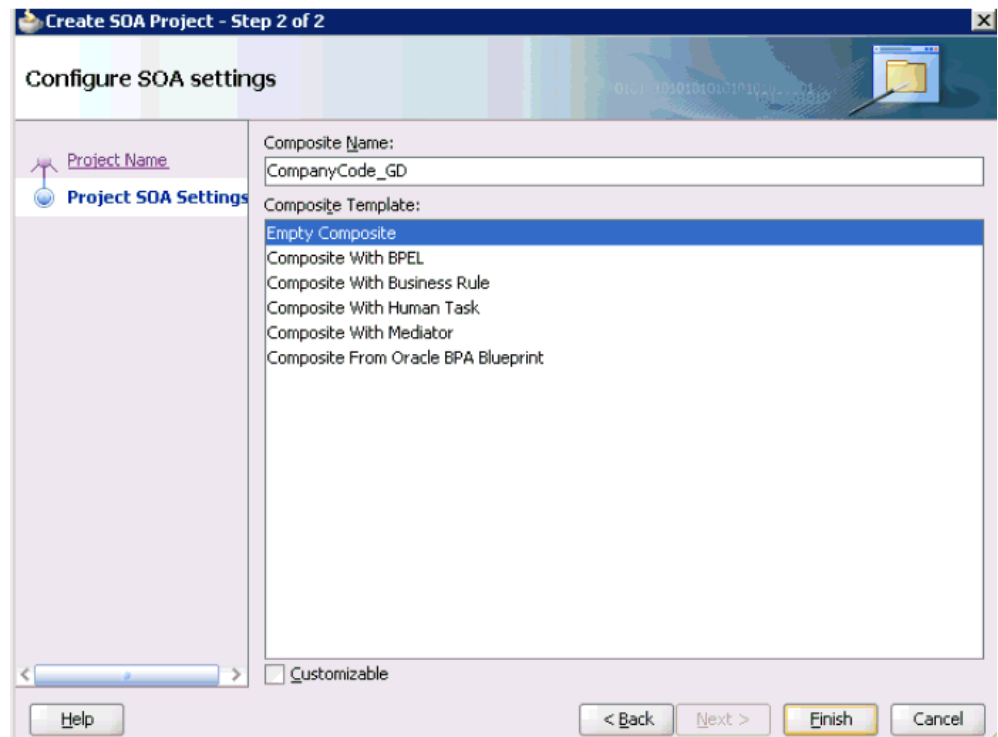
Figure 6–13 Name Your Application Page



The Name your project page is displayed, as shown in [Figure 6–14](#).

Figure 6–14 Name Your Project Page

3. Enter a project name (for example, CompanyCode_GD) and click **Next**.
The Configure SOA settings page is displayed, as shown in [Figure 6–15](#).

Figure 6–15 Configure SOA Settings Page

4. From the Composite Template list, select **Empty Composite** and click **Finish**.

6.4.3 Defining a BPEL Outbound Process

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

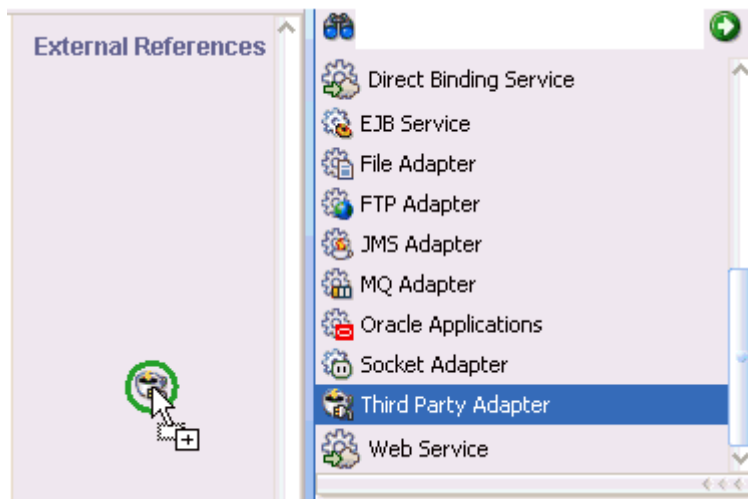
1. Configuring a Third Party Adapter Service Component
2. Configuring an Outbound BPEL Process Component

Configuring a Third Party Adapter Service Component

Perform the following steps to create a third party adapter service component:

1. Drag and drop the **Third Party Adapter** component from the Service Adapters pane to the External References pane, as shown in [Figure 6–16](#).

Figure 6–16 *Third Party Adapter Component*



The Create Third Party Adapter Service dialog is displayed, as shown in [Figure 6–17](#).

Figure 6–17 Create Third Party Adapter Service Dialog


Create Third Party Adapter Service

Third Party Adapter Service

Create a JCA adapter service for a third party adapter.

Name:

Type:


WSDL URL: 

Port Type:

Operation:

Callback Port Type:

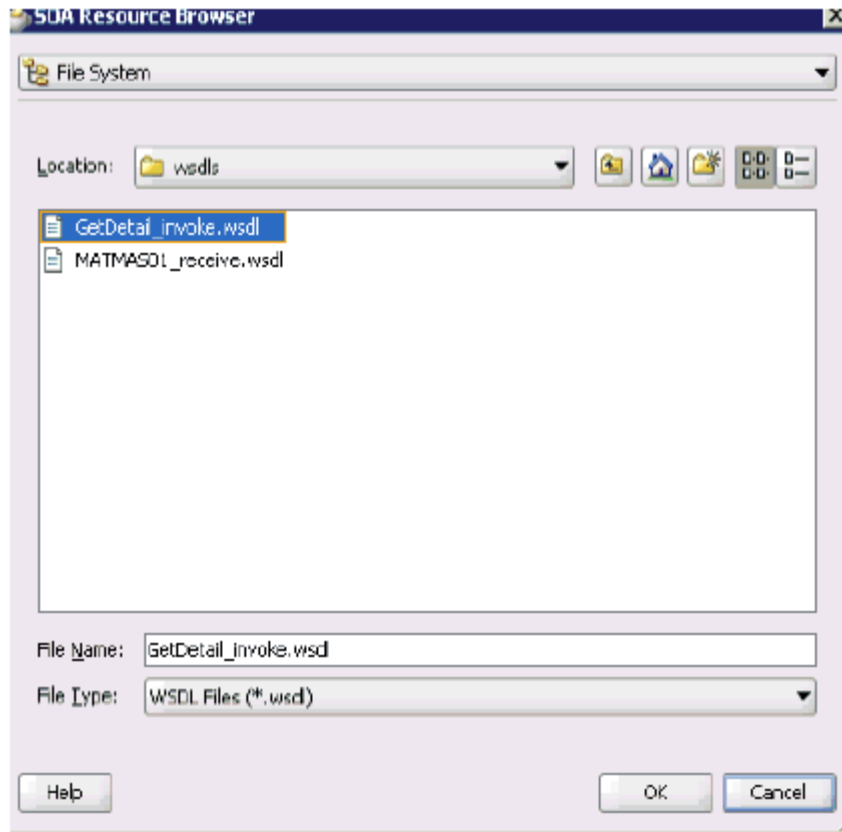
Callback Operation:

JCA File: 

2. Enter a name for the third party adapter service.
3. Ensure that **Reference** is selected from the Type list (default).
4. Click the **Find existing WSDLs** icon, which is located to the right of the WSDL URL field.

The SOA Resource Browser dialog is displayed, as shown in [Figure 6–18](#).

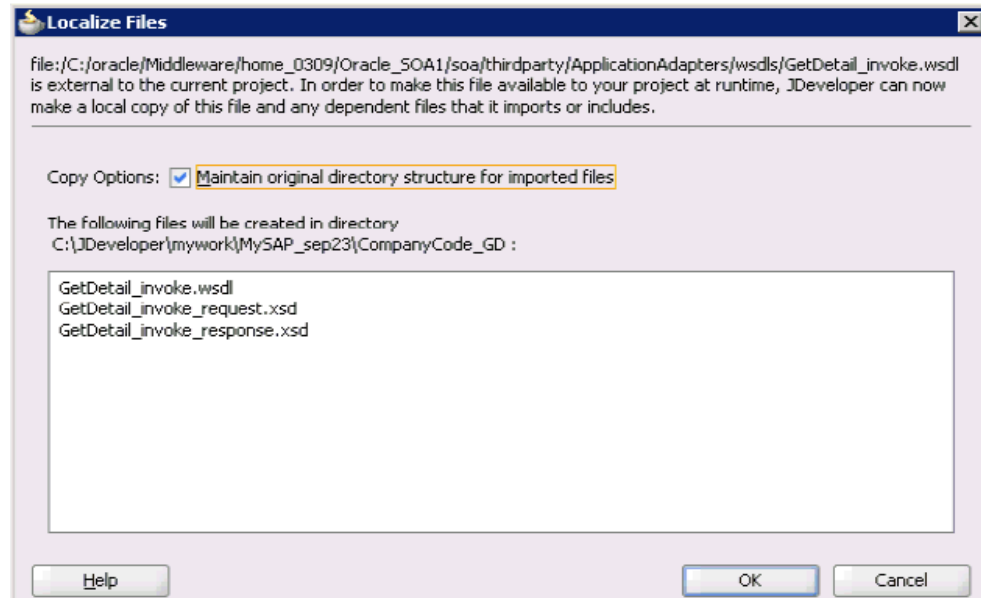
Figure 6–18 SOA Resource Browser Dialog



5. Browse and select an outbound WSDL file from the following directory:
<ADAPTER_HOME>\soa\thirdparty\ApplicationAdapters\wsdl

6. Click **OK**.

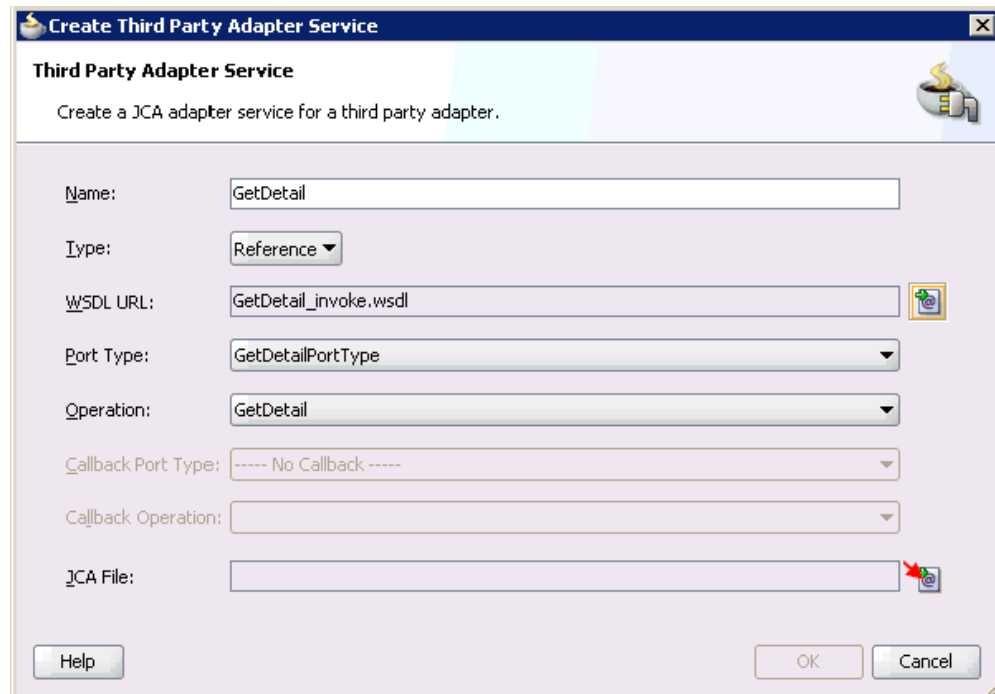
The Localize Files dialog is displayed, as shown in [Figure 6–19](#).

Figure 6–19 Localize Files Dialog

7. Click **OK**.

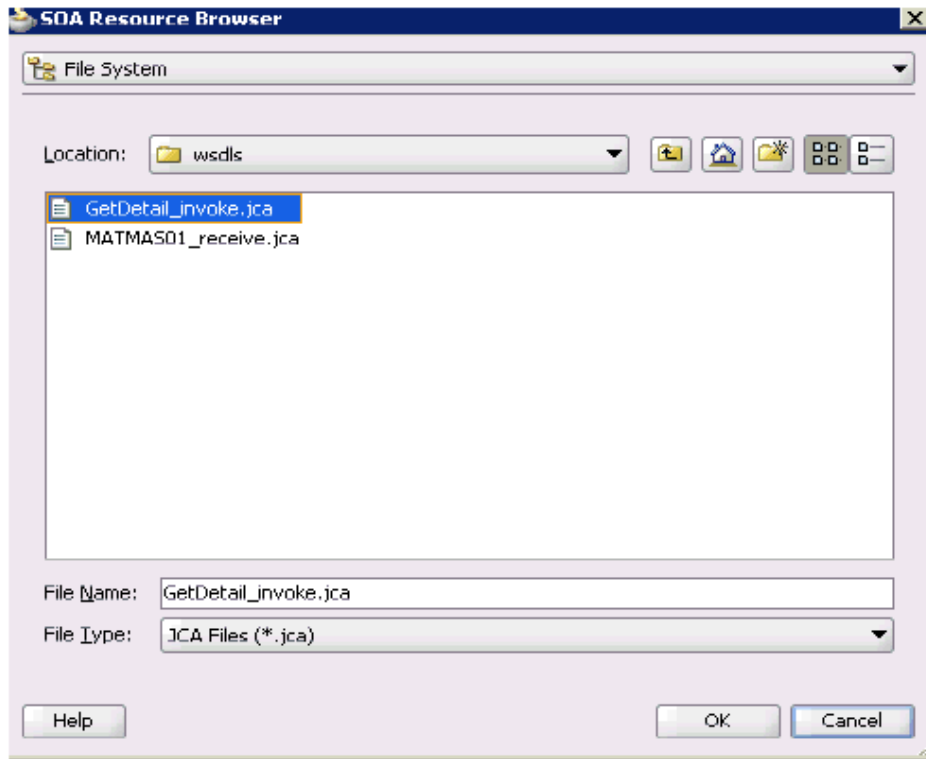
The outbound WSDL file and associated request and response XML schema files (.xsd) are imported to the project folder that has been created.

You are returned to the Create Third Party Adapter Service dialog, as shown in [Figure 6–20](#).

Figure 6–20 Create Third Party Adapter Service Dialog

8. Click the **Find JCA file** icon, which is located to the right of the JCA File field. The SOA Resource Browser dialog is displayed, as shown in [Figure 6–21](#).

Figure 6–21 SOA Resource Browser Dialog

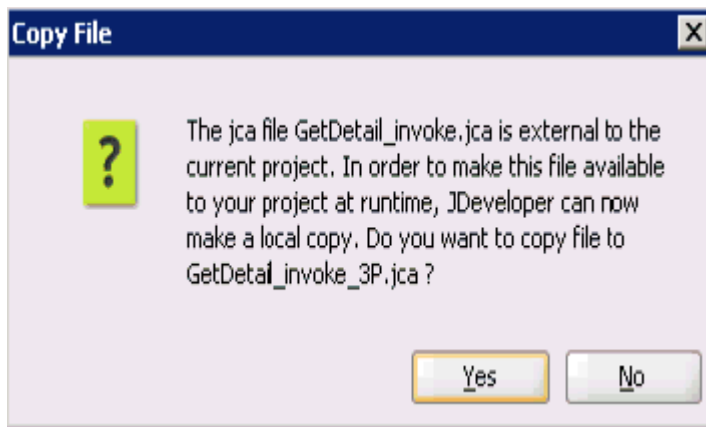


9. Browse and select the JCA properties file from the following directory:
`<ADAPTER_HOME>\soa\thirdparty\ApplicationAdapters\wsdls`

10. Click OK.

The Copy File message is displayed, as shown in [Figure 6–22](#).

Figure 6–22 Copy File Message



11. Click Yes.

A copy of the JCA properties file is made in the project folder.

You are returned to the Create Third Party Adapter Service dialog, as shown in [Figure 6–23](#).

Figure 6–23 Create Third Party Adapter Service Dialog

Create Third Party Adapter Service

Third Party Adapter Service

Create a JCA adapter service for a third party adapter.

Name: GetDetail

Type: Reference

WSDL URL: GetDetail_invoke.wsdl

Port Type: GetDetailPortType

Operation: GetDetail

Callback Port Type: ----- No Callback -----

Callback Operation:

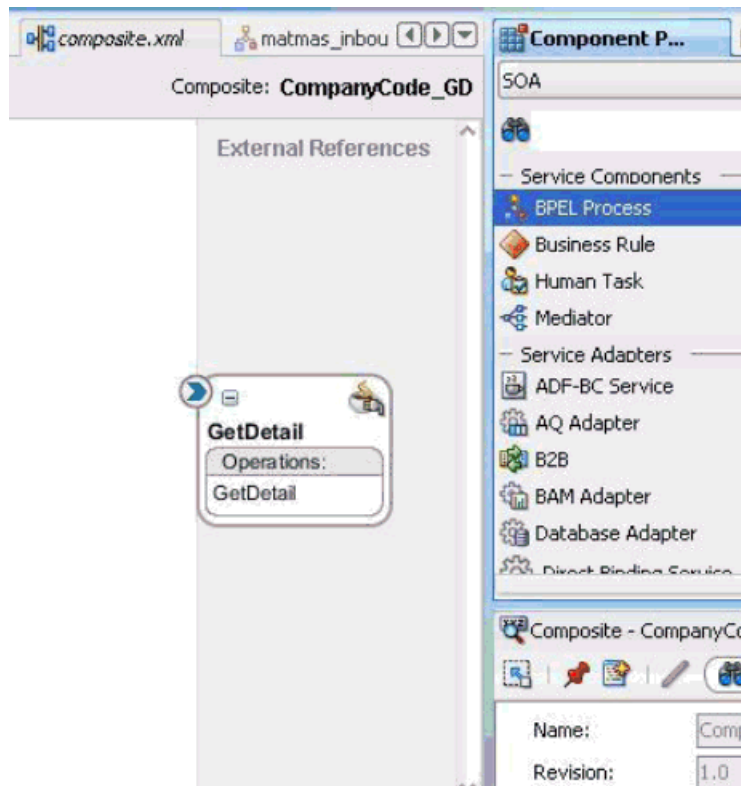
JCA File: GetDetail_invoke_3P.jca

Help OK Cancel

12. Click OK.

The third party adapter service component (GetDetail) is created and displayed in the External References pane, as shown in [Figure 6–24](#).

Figure 6–24 Third Party Adapter Service Component



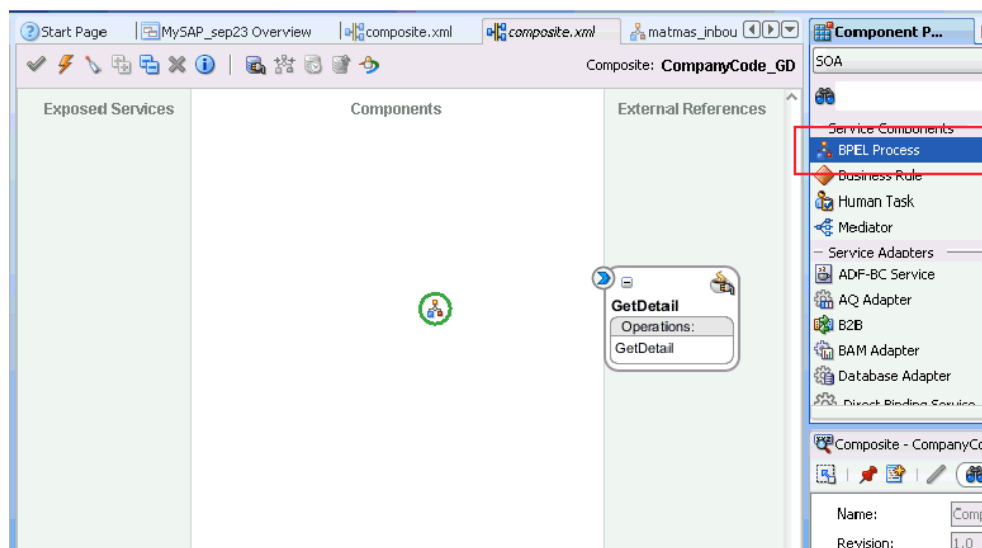
You are now ready to configure an outbound BPEL process component.

Configuring an Outbound BPEL Process Component

Perform the following steps to configure an outbound BPEL process component:

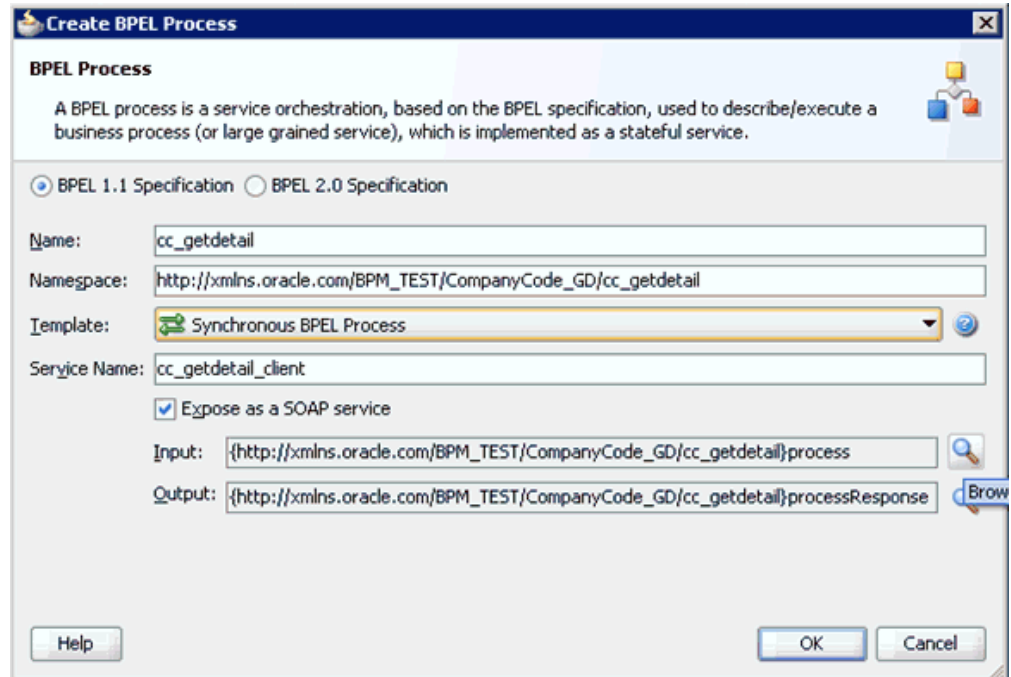
1. Drag and drop the **BPEL Process** component from the Service Components pane to the Components pane, as shown in [Figure 6–25](#).

Figure 6–25 BPEL Process Component



The Create BPEL Process dialog is displayed, as shown in [Figure 6–26](#).

Figure 6–26 Create BPEL Process Dialog



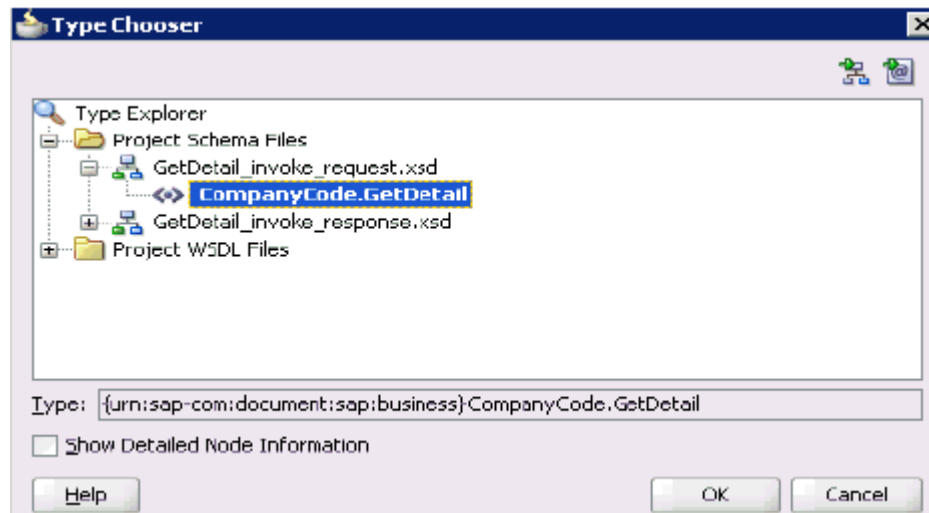
2. In the Name field, enter a name to identify the new outbound BPEL process component (for example, cc_getdetail).

By default, the BPEL 1.1 Specification option is selected. The BPEL 2.0 Specification option is also available.

3. From the Template list, select **Synchronous BPEL Process**.
4. Click the **Browse** icon, which is located to the right of the Input field to select the associated XML request schema file.

The Type Chooser dialog is displayed, as shown in [Figure 6–27](#).

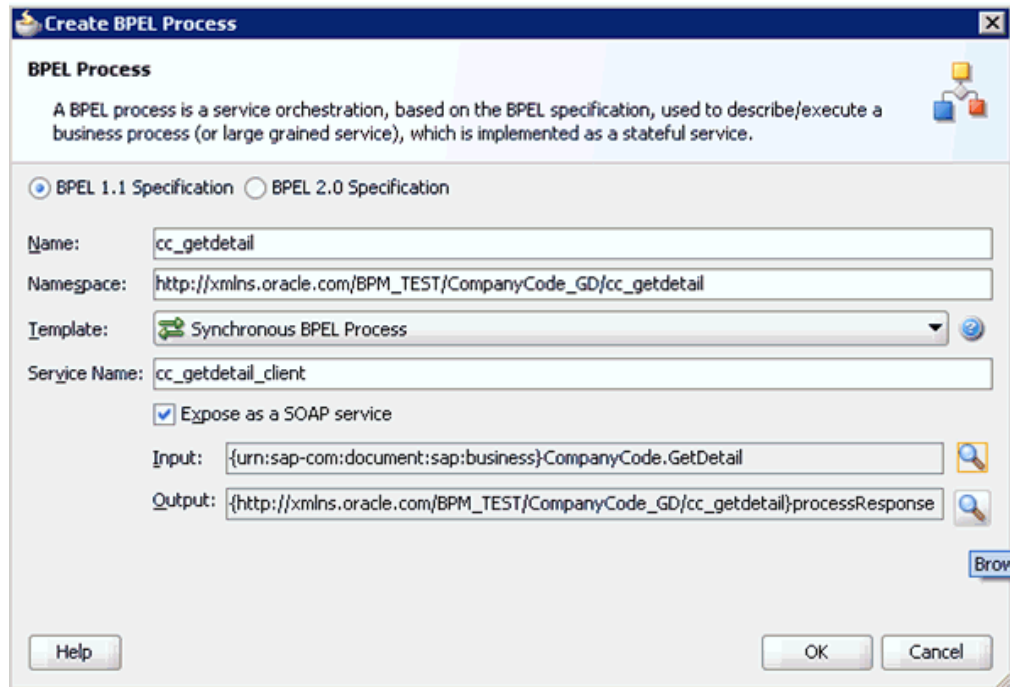
Figure 6–27 Type Chooser Dialog



5. Expand **Project Schema Files**, **GetDetail_invoke_request.xsd**, and select **CompanyCode.GetDetail**.
6. Click **OK**.

You are returned to the Create BPEL Process dialog, as shown in [Figure 6–28](#).

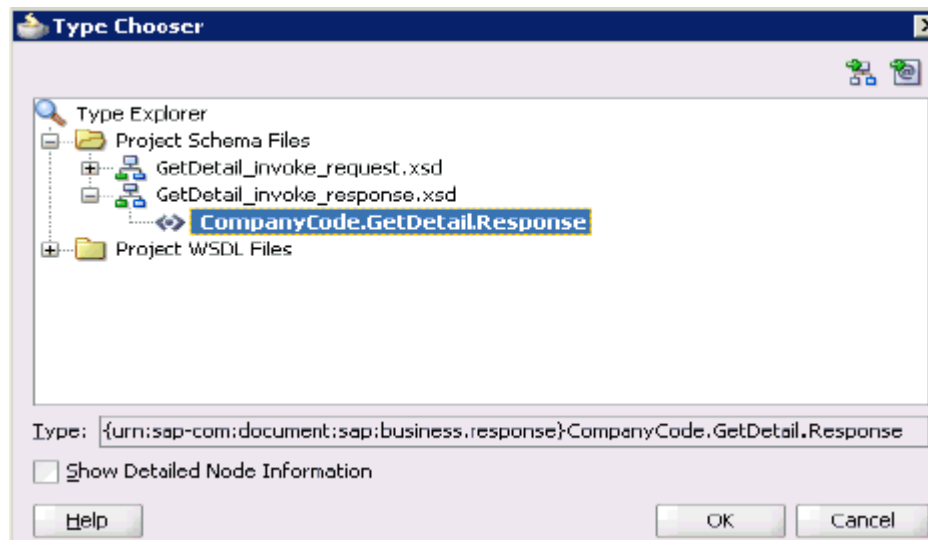
Figure 6–28 Create BPEL Process Dialog



7. Click the **Browse** icon, which is located to the right of the Output field to select the associated XML response schema file.

The Type Chooser dialog is displayed, as shown in [Figure 6–29](#).

Figure 6–29 Type Chooser Dialog



8. Expand **Project Schema Files**, **GetDetail_invoke_response.xsd**, and select **CompanyCode.GetDetailResponse**.
9. Click **OK**.

You are returned to the Create BPEL Process dialog, as shown in [Figure 6–30](#).

Figure 6–30 Create BPEL Process Dialog

Create 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 1.1 Specification BPEL 2.0 Specification

Name:

Namespace:

Template:

Service Name:

Expose as a SOAP service

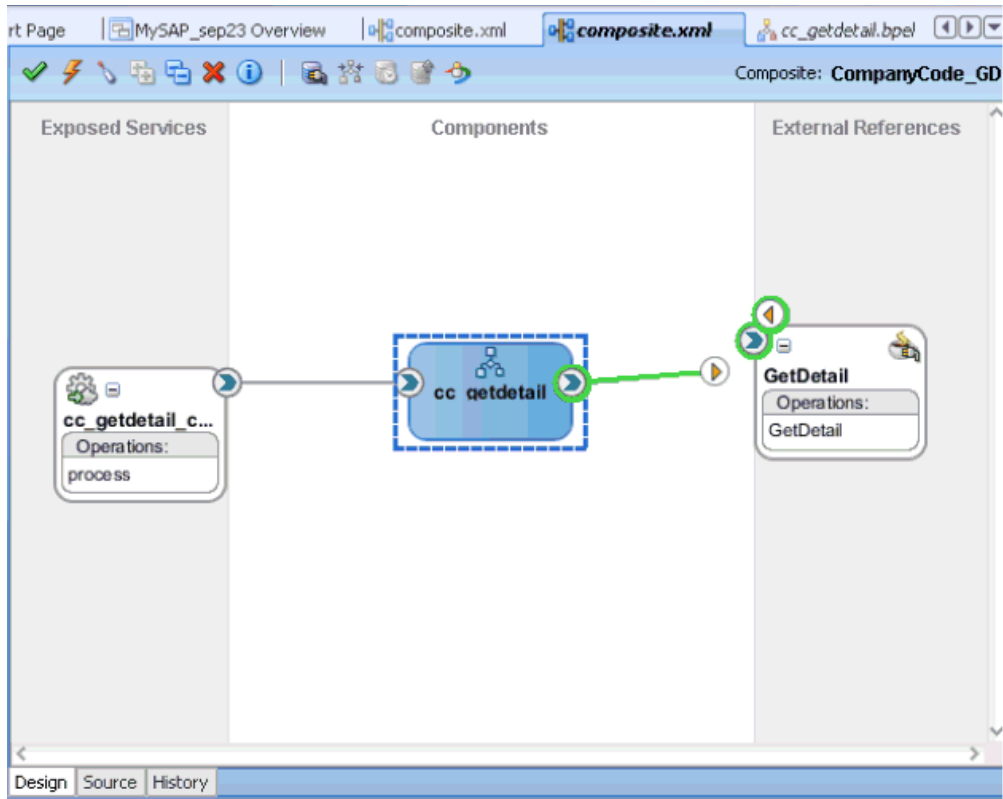
Input:

Output:

Buttons: Help, OK, Cancel

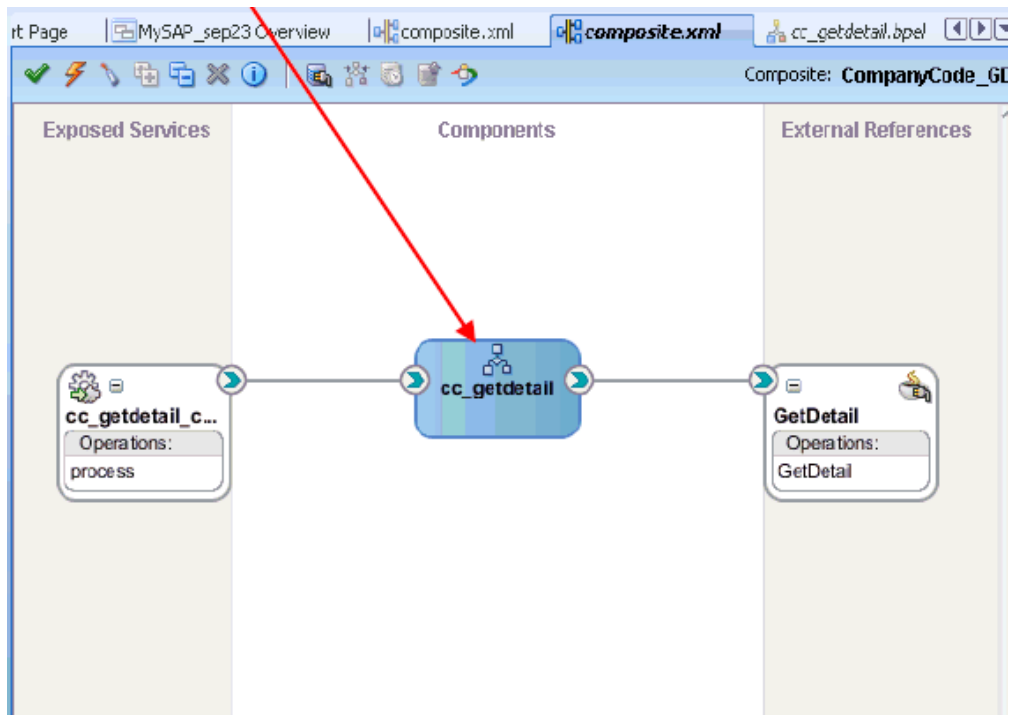
10. Click **OK**.
11. Create a connection between the outbound BPEL process component (cc_getdetail) and the third party adapter service component (GetDetail), as shown in [Figure 6–31](#).

Figure 6–31 Created Connection



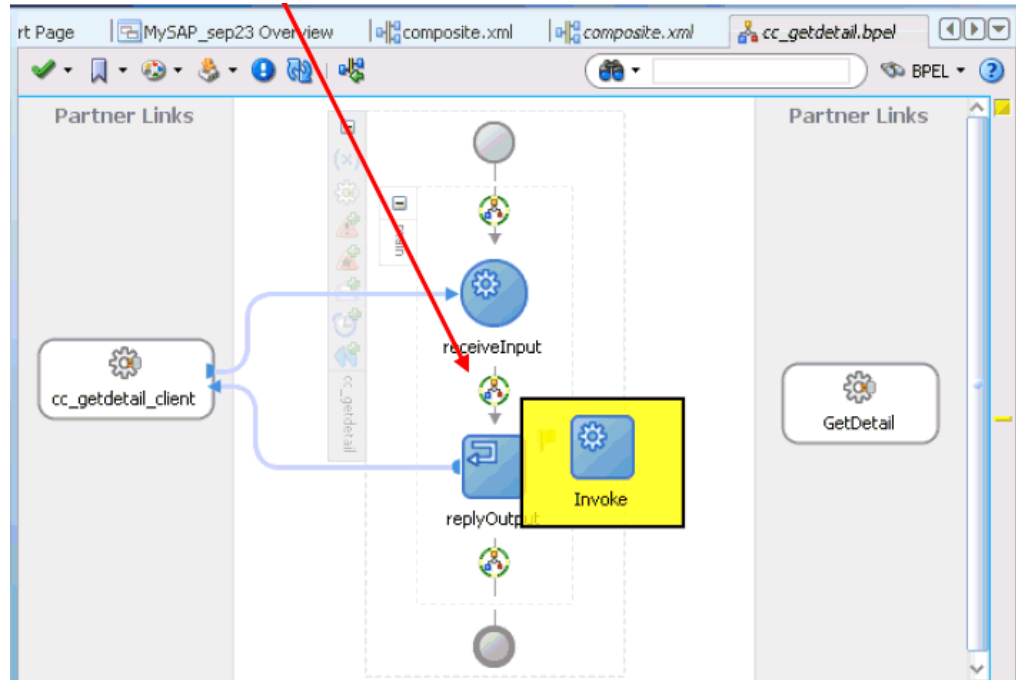
12. Double-click the outbound BPEL process component (cc_getdetail) in the Components pane, as shown in [Figure 6–32](#).

Figure 6–32 Outbound BPEL Process Component



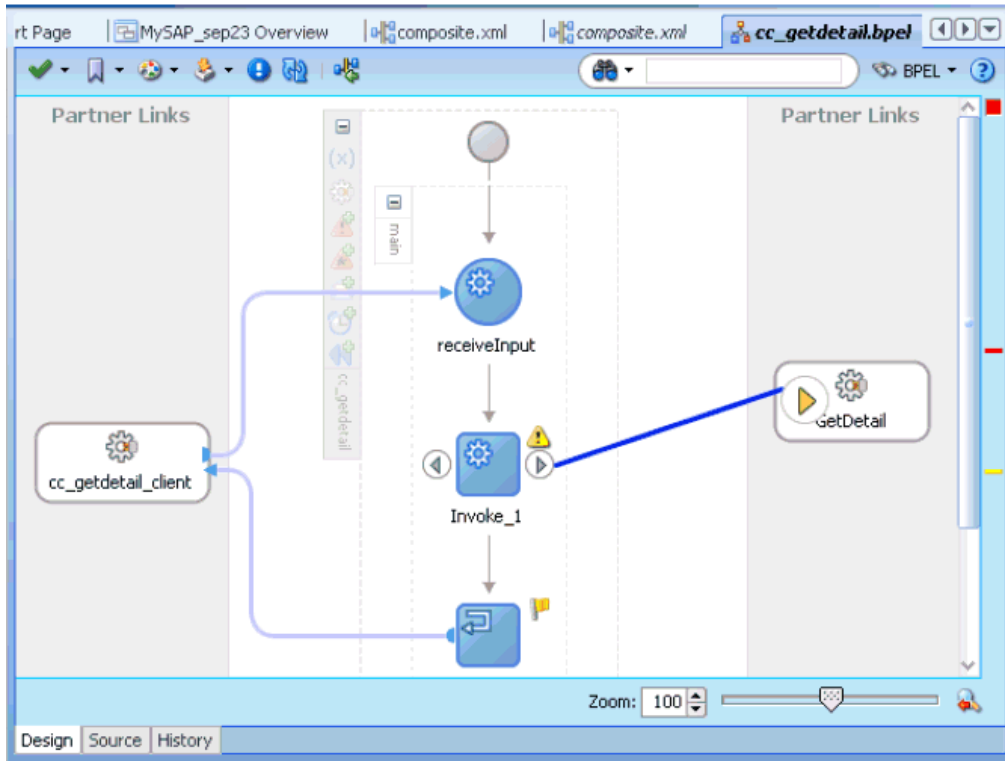
13. Drag and drop the **Invoke** activity component to the Components pane and place it between the **receiveInput** activity component and the **replyOutput** activity component, as shown in [Figure 6–33](#).

Figure 6–33 Invoke Activity Component



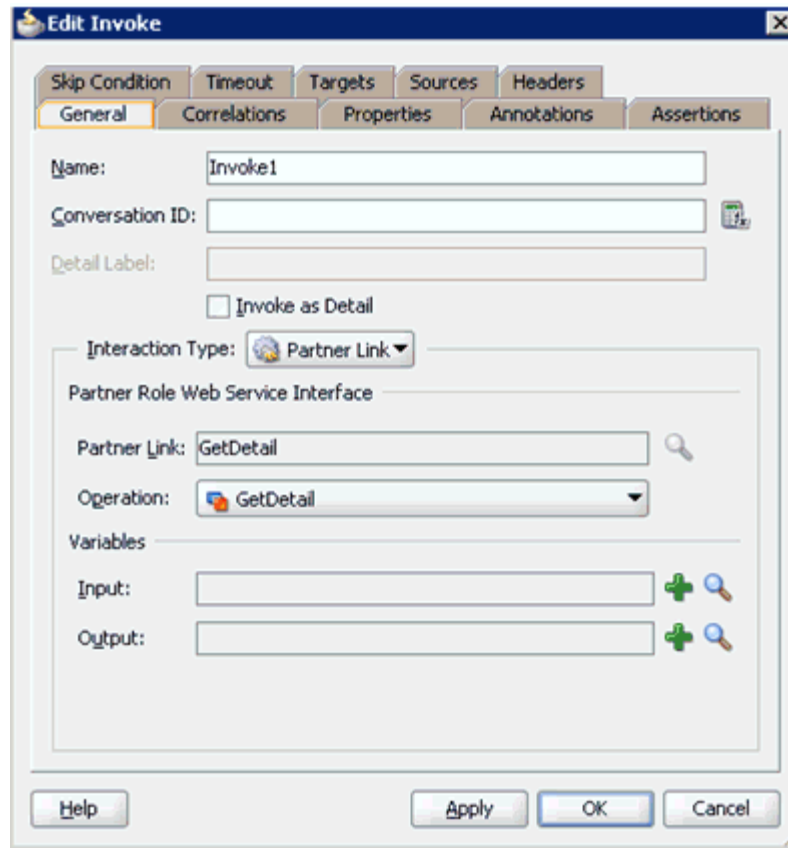
14. Create a connection between the new Invoke activity component (Invoke1) and the third party adapter service component (GetDetail), as shown in [Figure 6–34](#).

Figure 6–34 Created Connection



The Edit Invoke dialog is displayed, as shown in Figure 6–35.

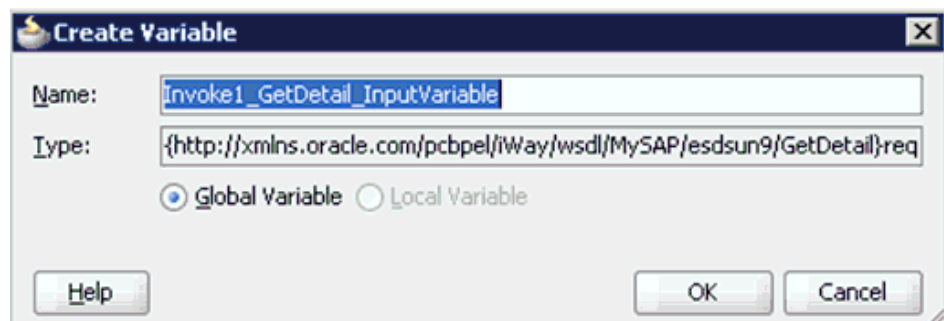
Figure 6–35 Edit Invoke Dialog



15. Click the **Plus sign** icon, which is located to the right of the Input field to configure a new input variable.

The Create Variable dialog is displayed, as shown in [Figure 6–36](#).

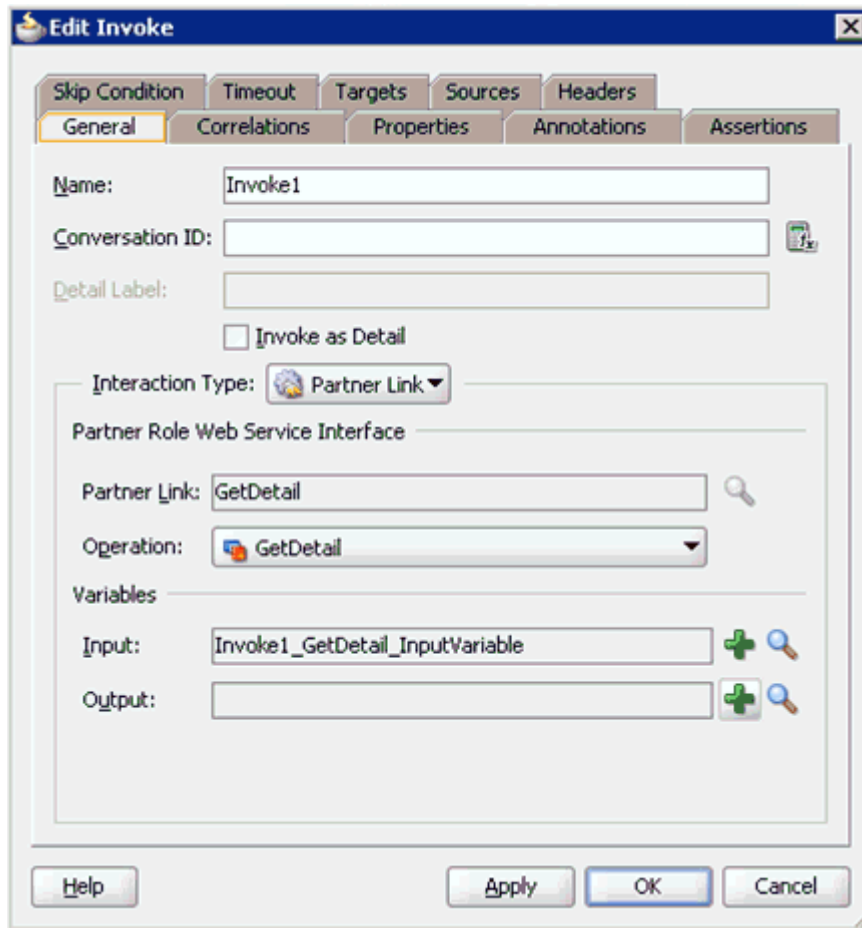
Figure 6–36 Create Variable Dialog



16. Accept the default values that are provided for the new input variable and click **OK**.

You are returned to the Edit Invoke dialog, as shown in [Figure 6–37](#).

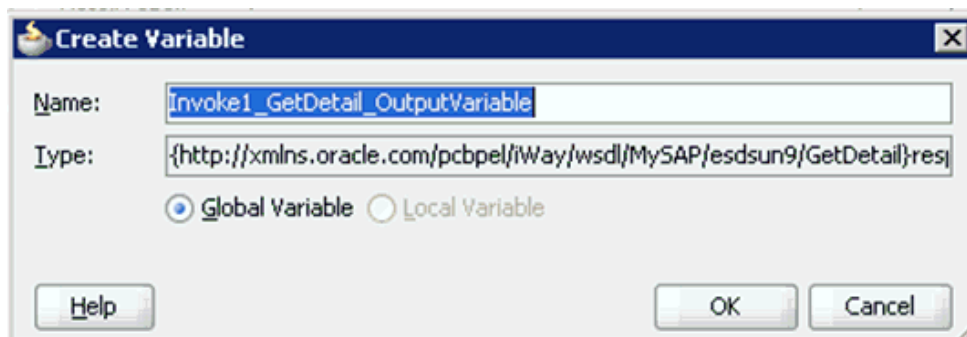
Figure 6–37 Edit Invoke Dialog



17. Click the **Plus sign** icon, which is located to the right of the Output field to configure a new output variable.

The Create Variable dialog is displayed, as shown in [Figure 6–38](#).

Figure 6–38 Create Variable Dialog



18. Accept the default values that are provided for the new output variable and click **OK**.

You are returned to the Edit Invoke dialog, as shown in [Figure 6–39](#).

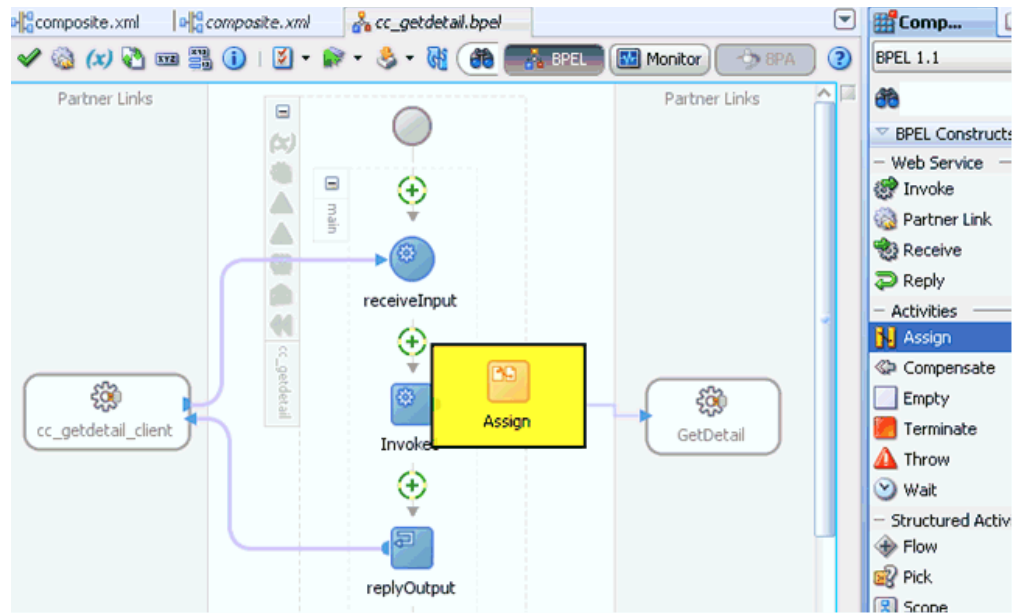
Figure 6–39 Edit Invoke Dialog

The screenshot shows the 'Edit Invoke' dialog box with the following configuration:

- Name:** Invoke1
- Conversation ID:** (empty)
- Detail Label:** (empty)
- Invoke as Detail:**
- Interaction Type:** Partner Link
- Partner Role Web Service Interface:**
 - Partner Link:** GetDetail
 - Operation:** GetDetail
- Variables:**
 - Input:** Invoke1_GetDetail_InputVariable
 - Output:** Invoke1_GetDetail_OutputVariable

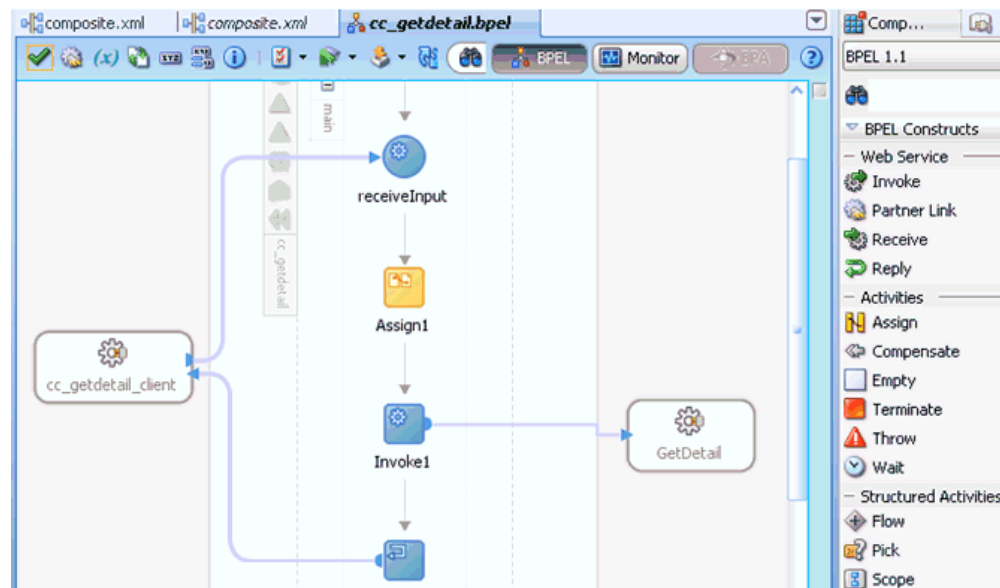
19. Click **Apply** and then **OK**.
20. Drag and drop the **Assign** activity component to the Components pane and place it between the Receive activity component (receiveInput) and the Invoke activity component (Invoke1), as shown in [Figure 6–40](#).

Figure 6–40 Assign Activity Component



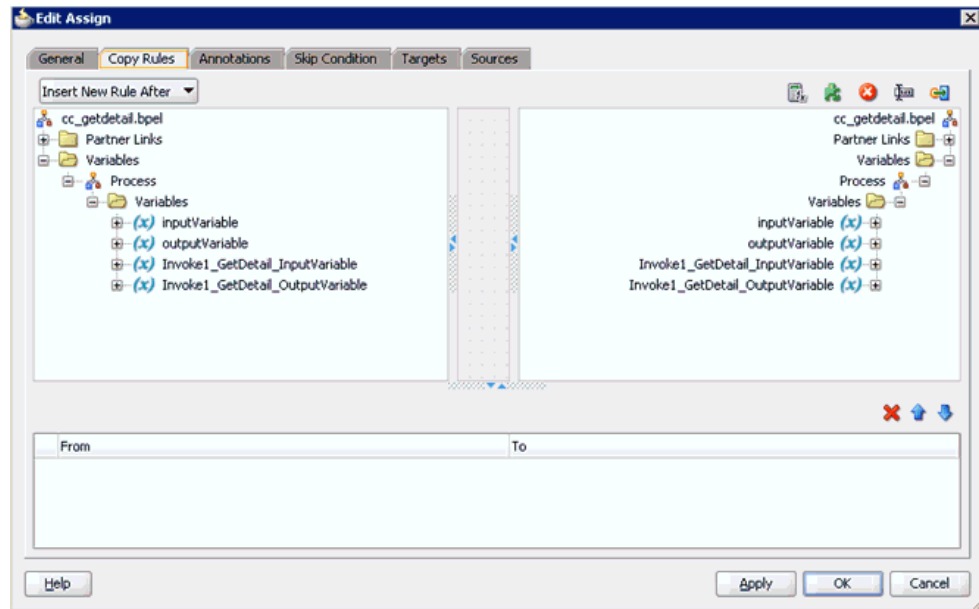
21. Double-click the new Assign activity component (**Assign1**), as shown in Figure 6–41.

Figure 6–41 Assign Activity Component



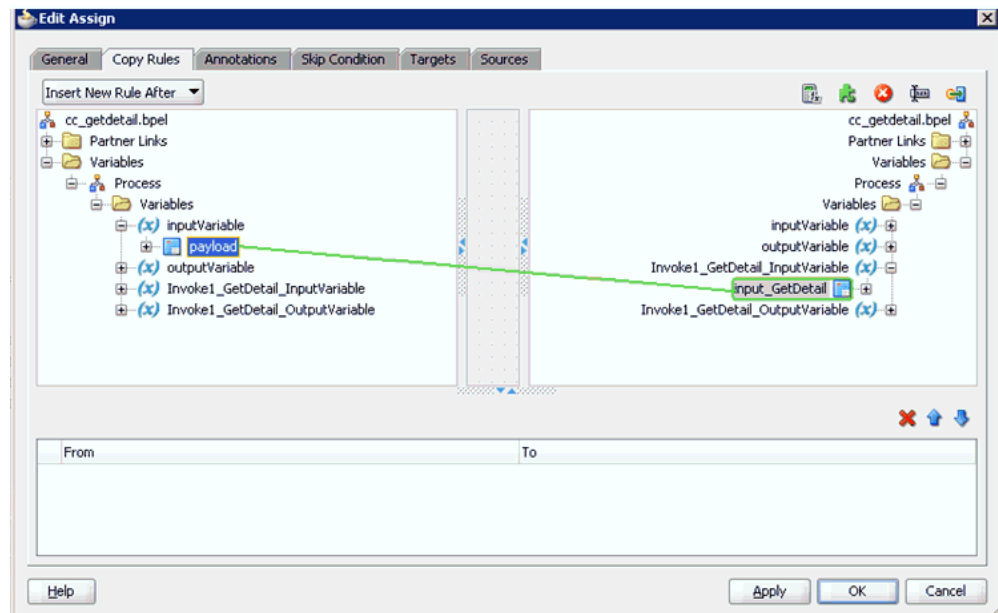
The Edit Assign dialog is displayed, as shown in figure Figure 6–42.

Figure 6–42 Edit Assign Dialog



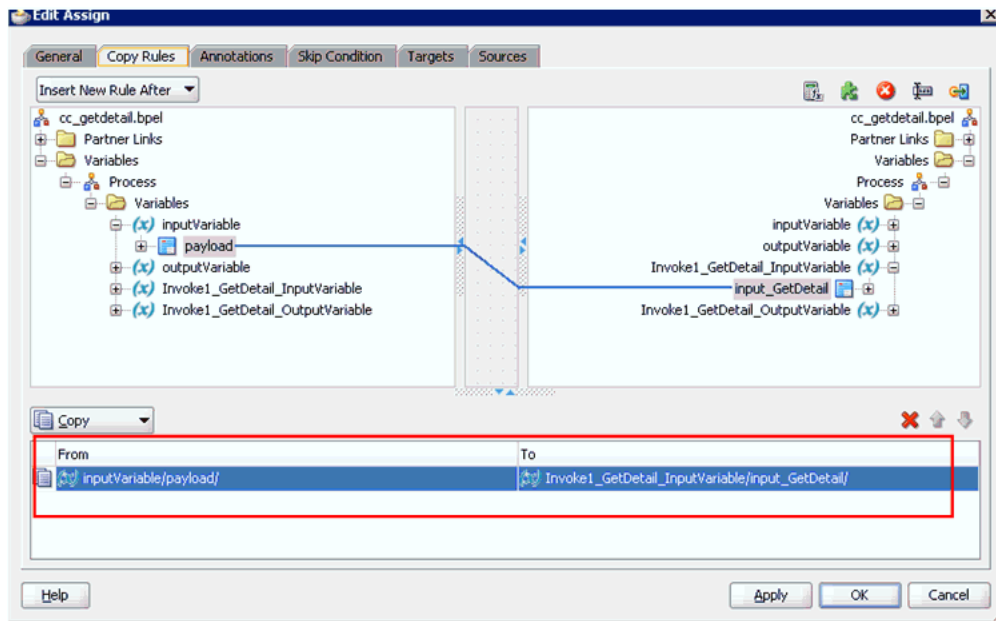
22. In the left pane, under Variables, expand **InputVariable**, and then select **payload**.
23. In the right pane, under Variables, expand **Invoke1_GetDetail_InputVariable**, and then select **input_GetDetail**.
24. Drag and map the **payload** variable to the **input_GetDetail** variable as shown in Figure 6–43.

Figure 6–43 Edit Assign Dialog



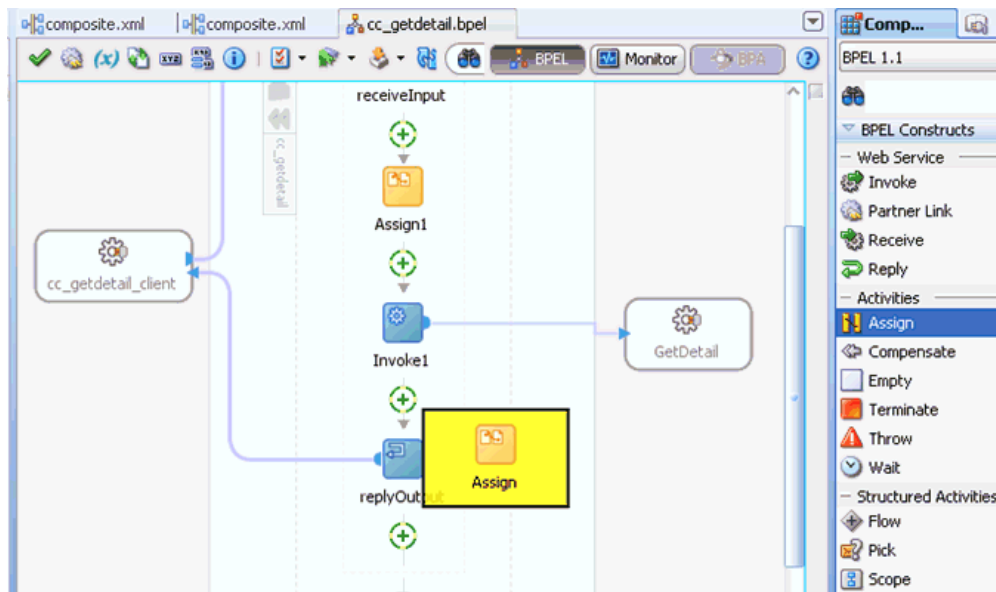
The mapped variables are populated in the highlighted area as shown in Figure 6–44.

Figure 6–44 Edit Assign Dialog

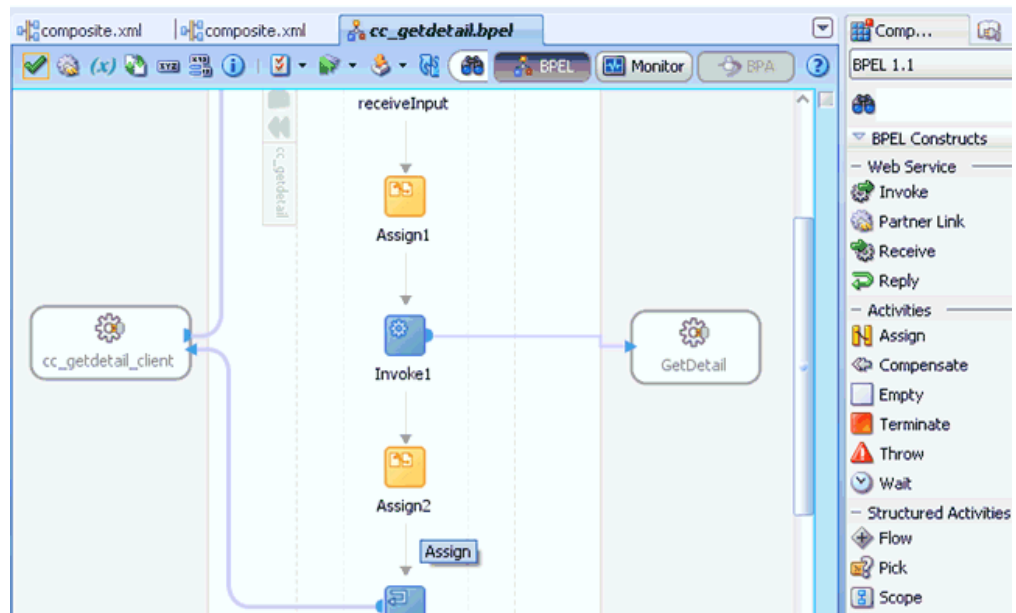


25. Click **Apply** and then **OK**.
26. Drag and drop the **Assign** activity component to the Components pane and place it between the Invoke activity (Invoke1) and the Reply activity (replyOutput), as shown in [Figure 6–45](#).

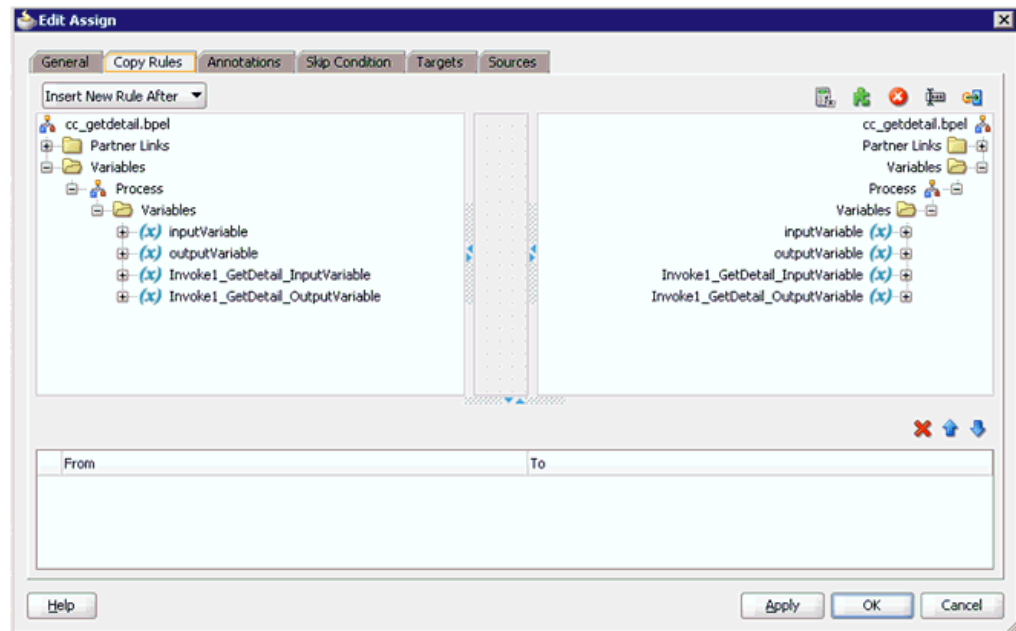
Figure 6–45 Assign Activity Component



27. Double-click the new Assign activity component (**Assign2**), as shown in [Figure 6–46](#).

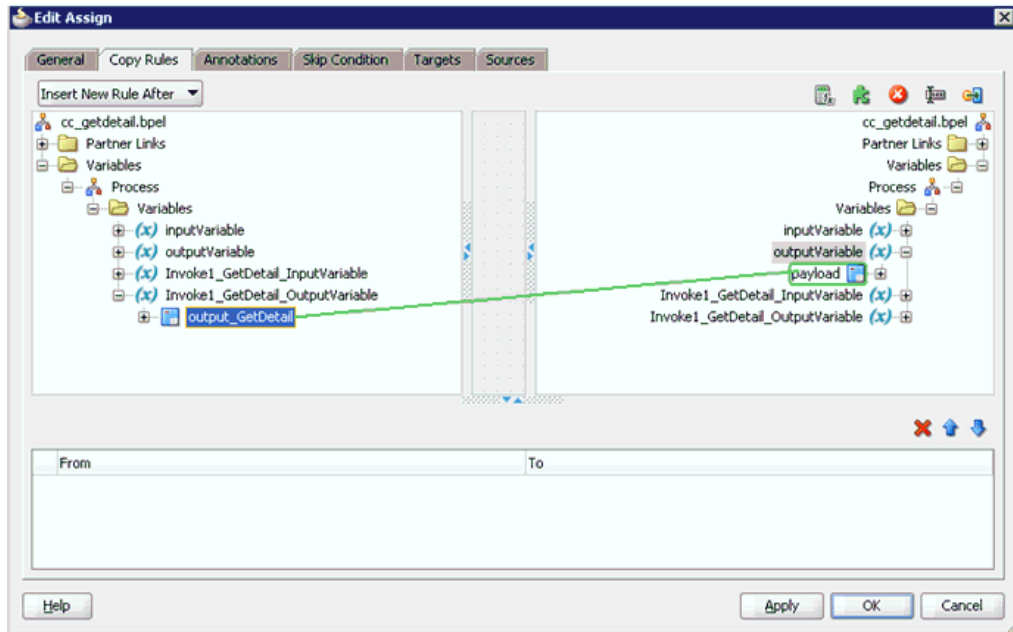
Figure 6–46 New Assign Activity Component

The Edit Assign dialog is displayed, as shown in [Figure 6–47](#).

Figure 6–47 Edit Assign Dialog

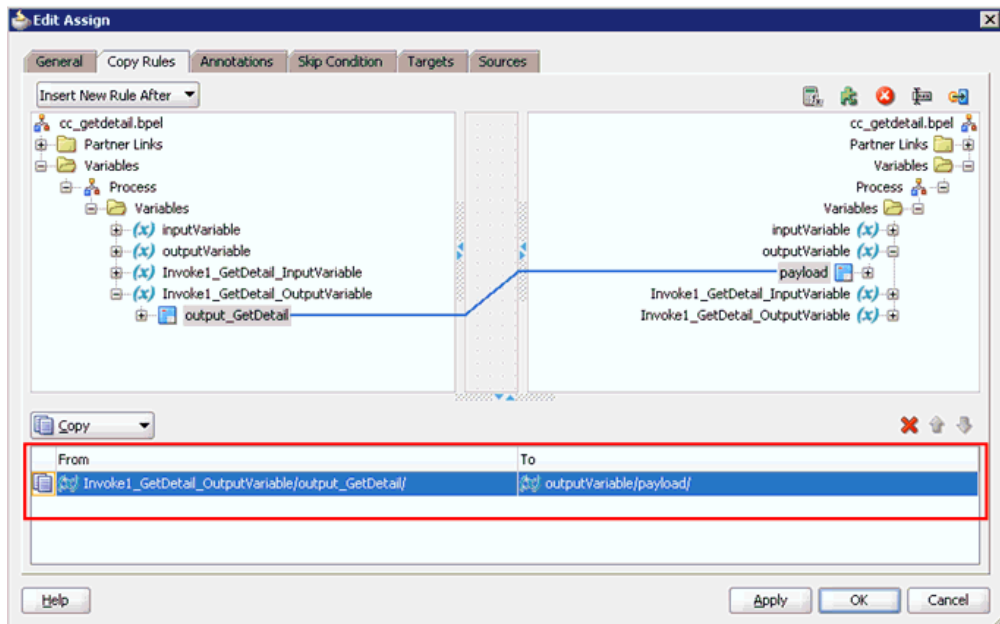
28. In the left pane, under Variables, expand **Invoke1_GetDetail_OutputVariable**, and then select **output_GetDetail**.
29. In the right pane, under Variables, expand **outputVariable** and select **payload**.
30. Drag and map the **output_GetDetail** variable to the **payload** variable as shown in [Figure 6–48](#).

Figure 6–48 Edit Assign Dialog



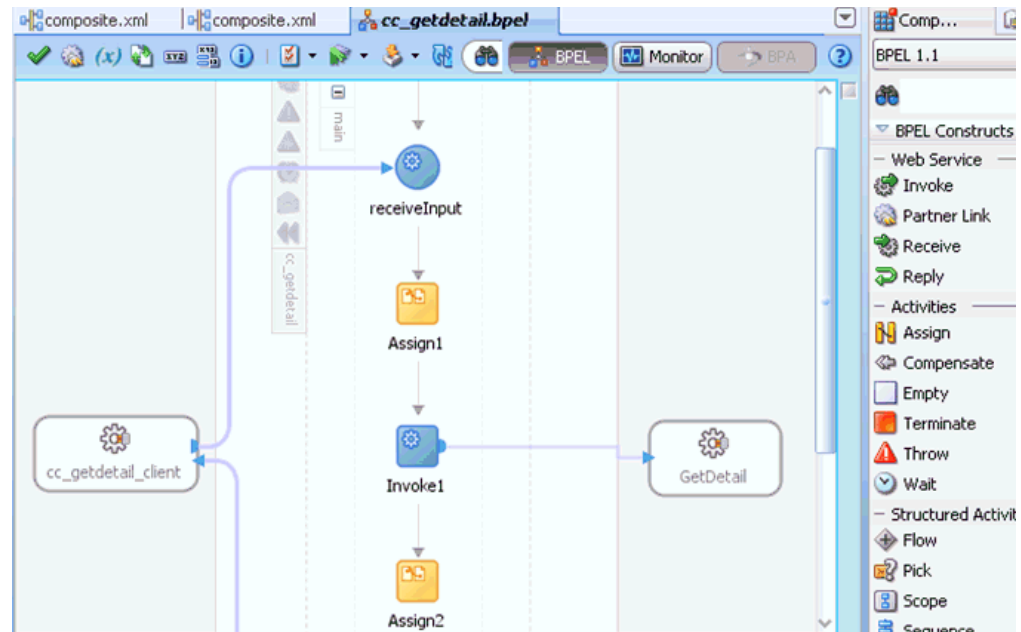
The mapped variables are populated in the highlighted area as shown in Figure 6–49.

Figure 6–49 Edit Assign Dialog



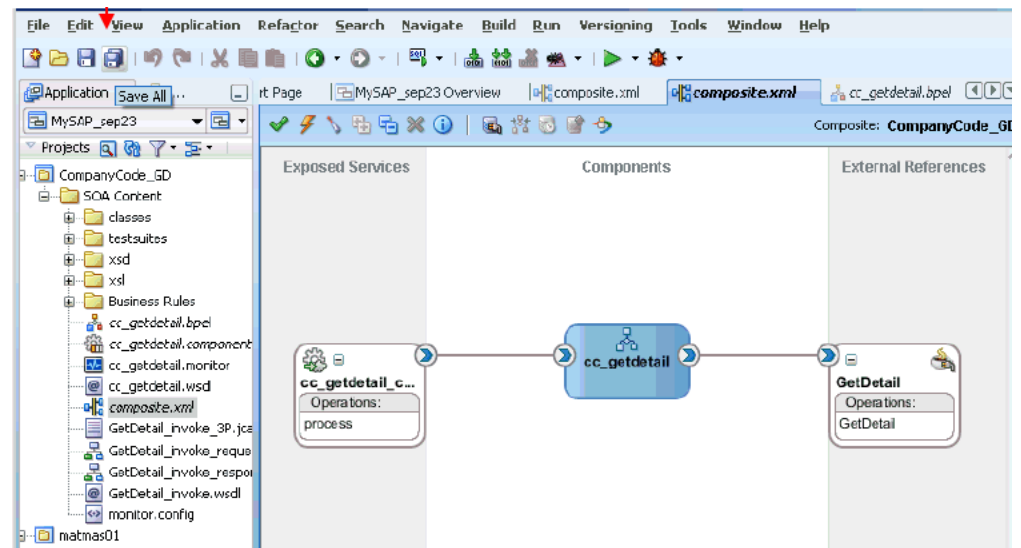
31. Click **Apply** and then **OK**.

Figure 6–50 Composite.xml File



32. Double-click `composite.xml` in the left pane, as shown in Figure 6–50.

Figure 6–51 Save All Icon



33. Click the **Save All** icon in the menu bar to save the new outbound BPEL process component that was configured, as shown in Figure 6–51.

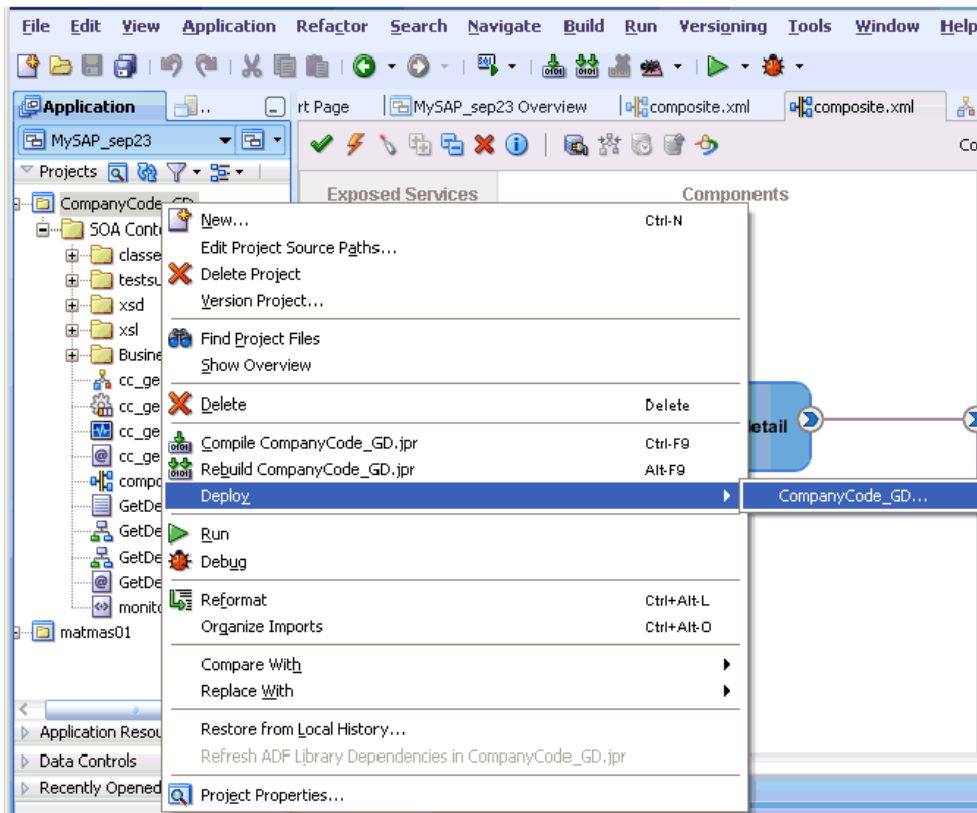
You are now ready to deploy the BPEL outbound process.

6.4.4 Deploying the BPEL Outbound Process

Perform the following steps to deploy the BPEL outbound process.

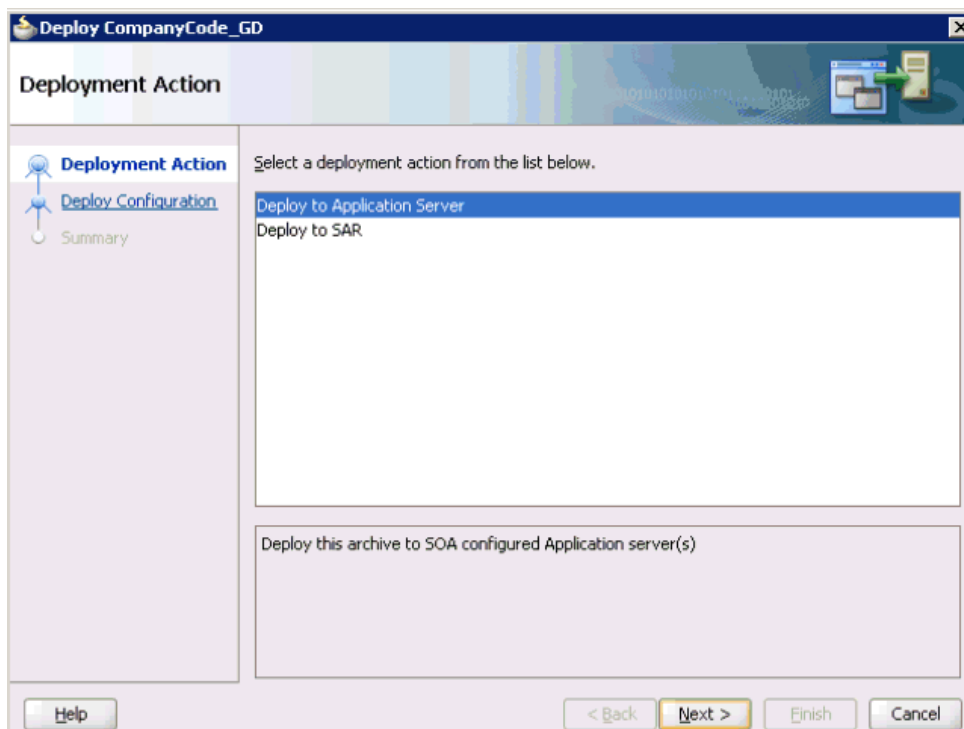
1. Right-click the project name in the left pane (for example, `CompanyCode_GD`), select **Deploy**, and then click `CompanyCode_GD`, as shown in Figure 6–52.

Figure 6–52 CompanyCode_GD Option



The Deployment Action page is displayed, as shown in Figure 6–53.

Figure 6–53 Deployment Action Page



2. Ensure that **Deploy to Application Server** is selected.
3. Click **Next**.

The Deploy Configuration page is displayed, as shown in [Figure 6-54](#).

Figure 6-54 *Deploy Configurations Page*

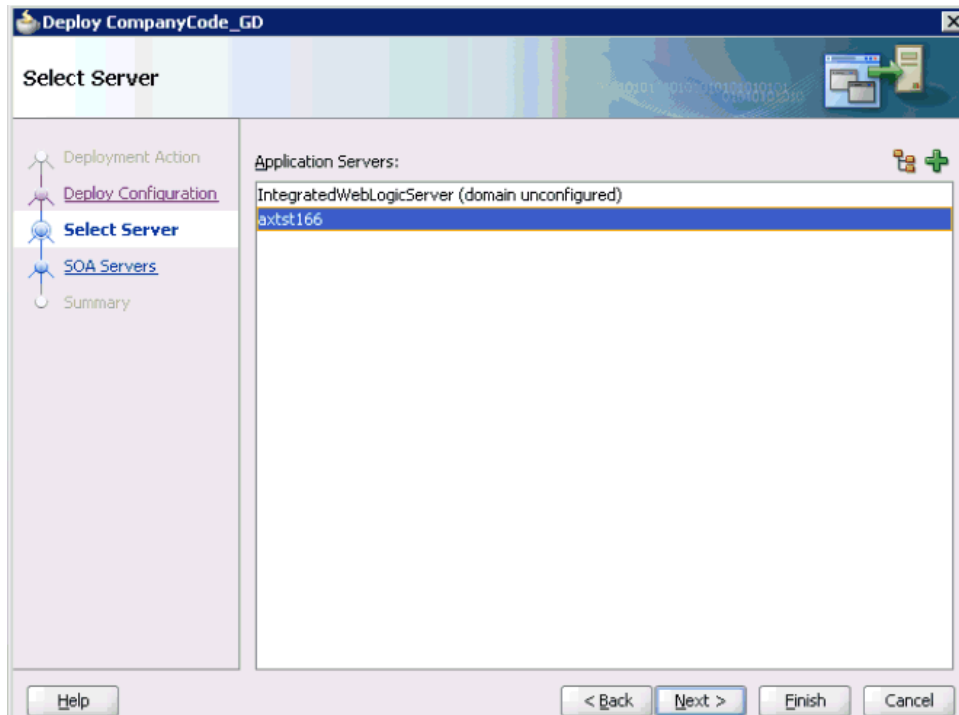
The screenshot shows a dialog box titled "Deploy Configuration" for the project "CompanyCode_GD". The dialog is divided into several sections:

- Deployment Action:** A vertical sidebar on the left contains four options: "Deployment Action", "Deploy Configuration" (which is selected and highlighted), "Select Server", and "Summary".
- Project Information:** Fields for "Project:" (CompanyCode_GD), "Current Revision ID:" (1.0), and "New Revision ID:" (1.0).
- SOA Configuration Plan:** A section with two radio buttons: "Do not attach" (selected) and "Select a configuration plan from the list." (with an empty list box below it).
- BPEL Monitor:** A checkbox labeled "Ignore BPEL Monitor deployment errors" which is checked.
- Deployment Options:** Three checkboxes: "Mark composite revision as default." (checked), "Overwrite any existing composites with the same revision ID." (unchecked), and "Use the following SOA configuration plan for all composites:" (unchecked).
- Navigation:** At the bottom, there are buttons for "< Back", "Next >", "Finish", and "Cancel". A "Browse" button is also present next to the "Use the following SOA configuration plan" field.

4. Leave the default values selected and click **Next**.

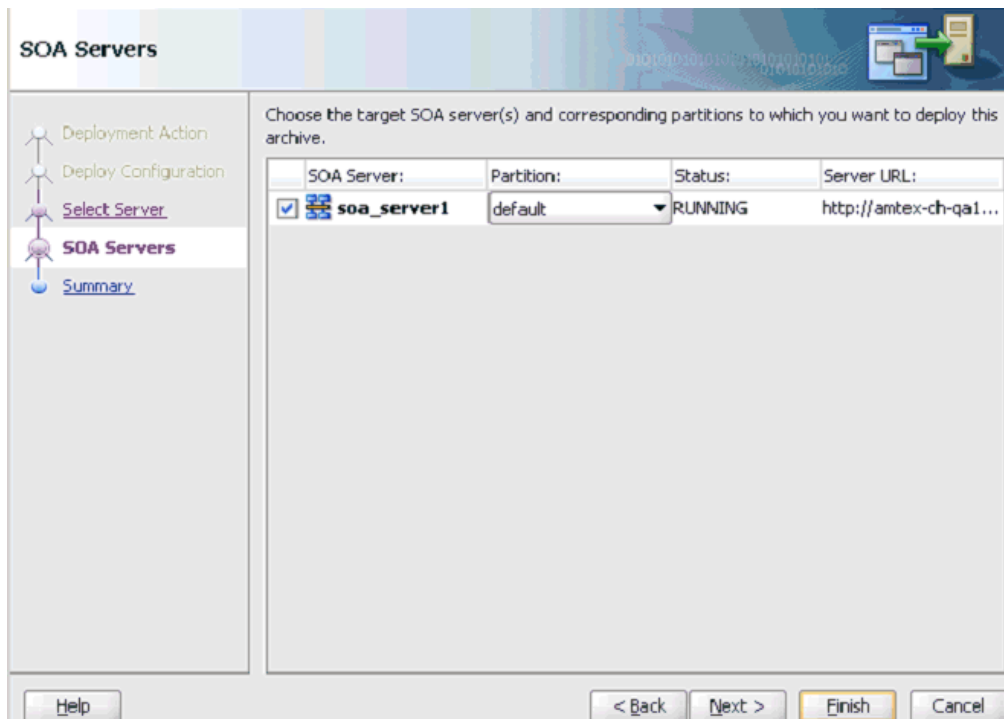
The Select Server page is displayed, as shown in [Figure 6-55](#).

Figure 6–55 Select Server Page



5. Select an available application server that was configured and click **Next**.
The SOA Servers page is displayed, as shown in [Figure 6–56](#).

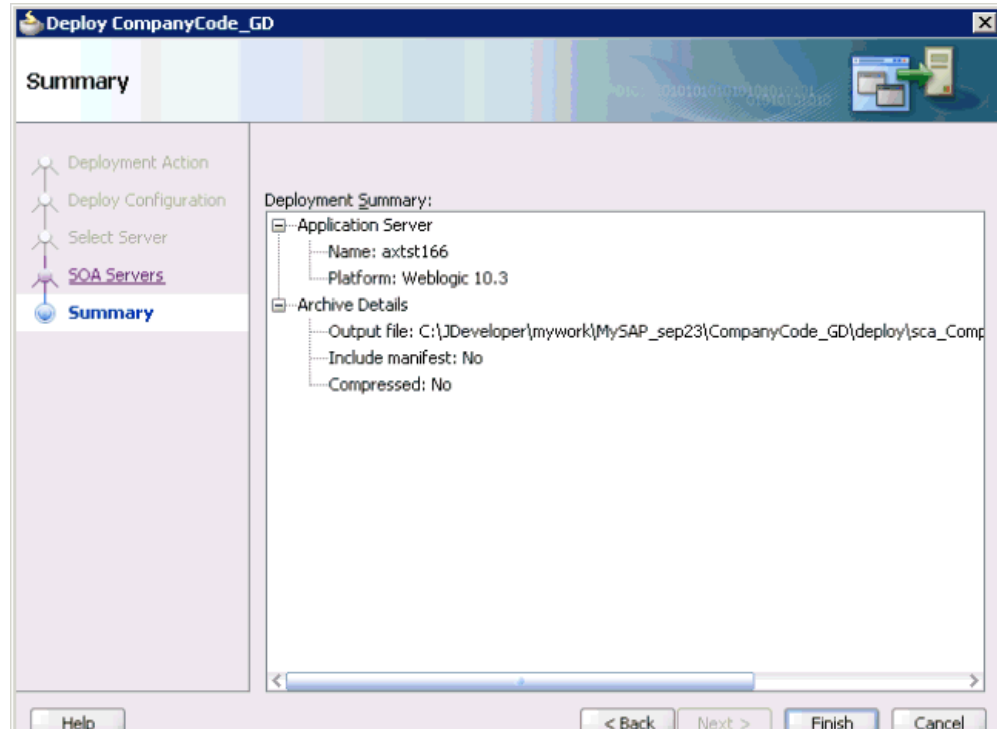
Figure 6–56 SOA Servers Page



6. Select a target SOA server and click **Next**.

The Summary page is displayed, as shown in [Figure 6-57](#).

Figure 6-57 Summary Page



7. Review and verify all the available deployment information for your project and click **Finish**.

The process is deployed successfully, as shown in [Figure 6-58](#).

Figure 6-58 Successful Deployment Message

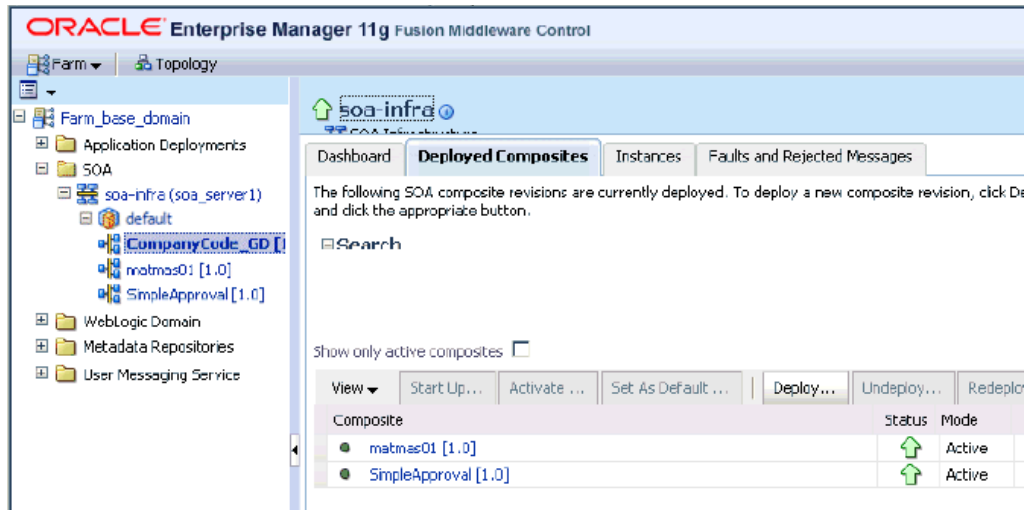


6.4.5 Invoking the Input XML Document in the Oracle Enterprise Manager Console

Perform the following steps to invoke the input XML document in the Oracle Enterprise Manager console.

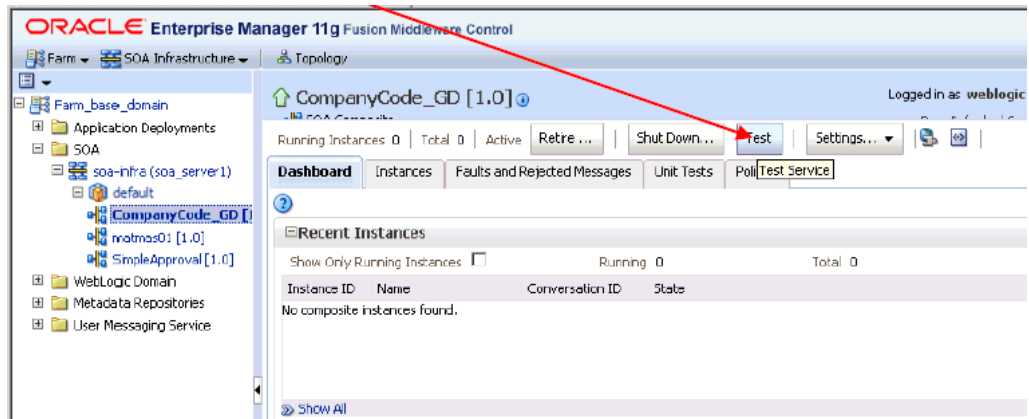
1. Logon to the Oracle Enterprise Manager console, as shown in [Figure 6-59](#).

Figure 6–59 Oracle Enterprise Manager Console



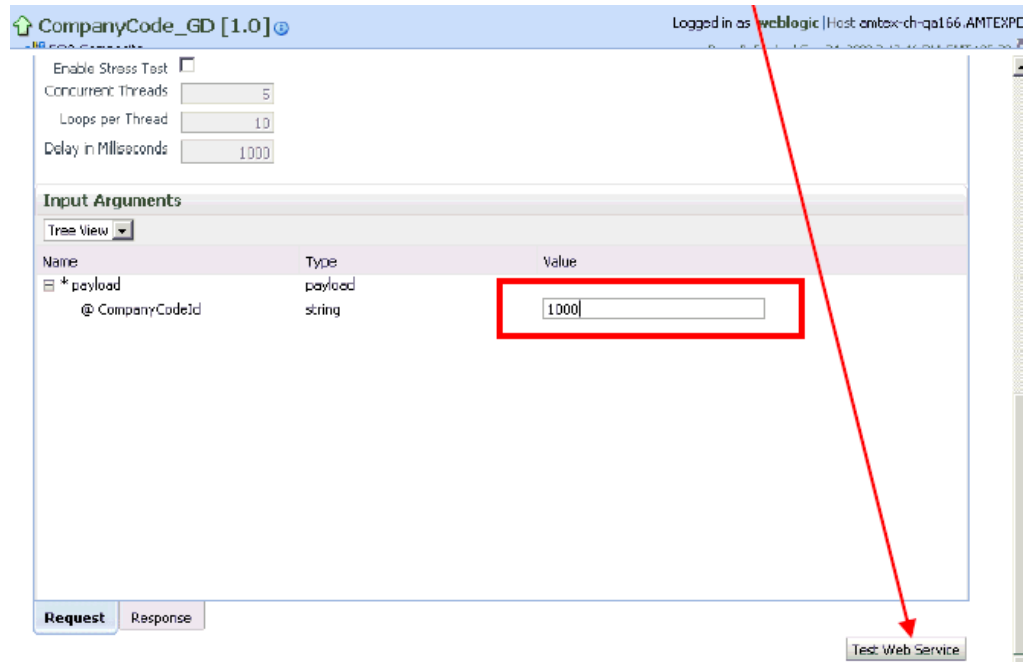
2. Expand your domain in the left pane followed by the **SOA** folder.
3. Select an available project (for example, `CompanyCode_GD`).

Figure 6–60 Test Button



4. Click **Test**, as shown in [Figure 6–60](#).

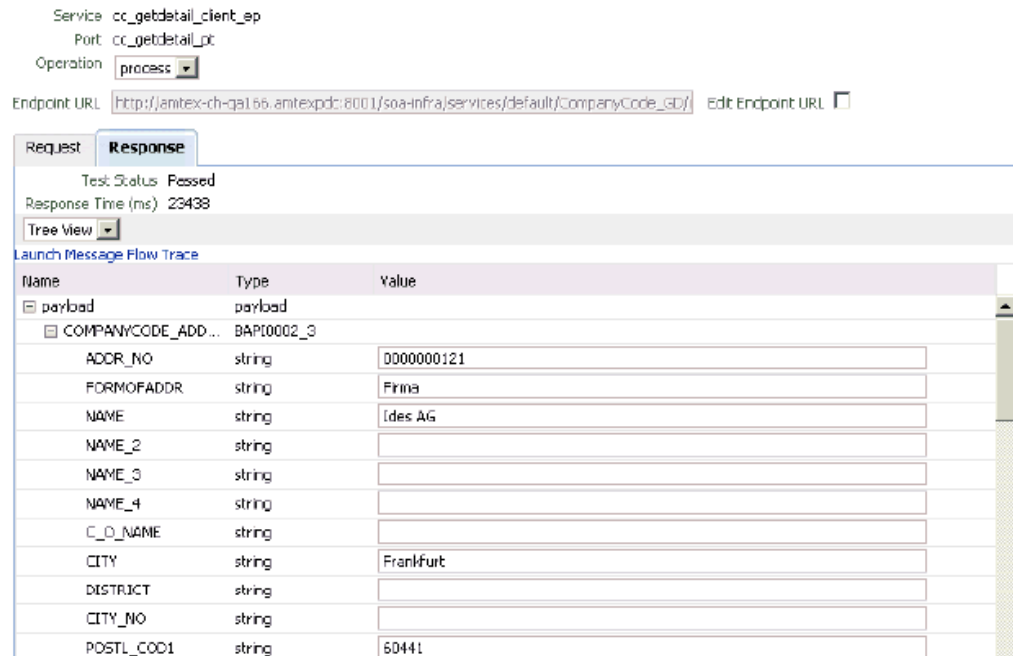
Figure 6–61 Request Tab



5. Click the **Request** tab, as shown in [Figure 6–61](#).
6. Provide an appropriate input value in the Value field and click **Test Web Service**.

The output response is received in the Oracle Enterprise Manager console, as shown in [Figure 6–62](#).

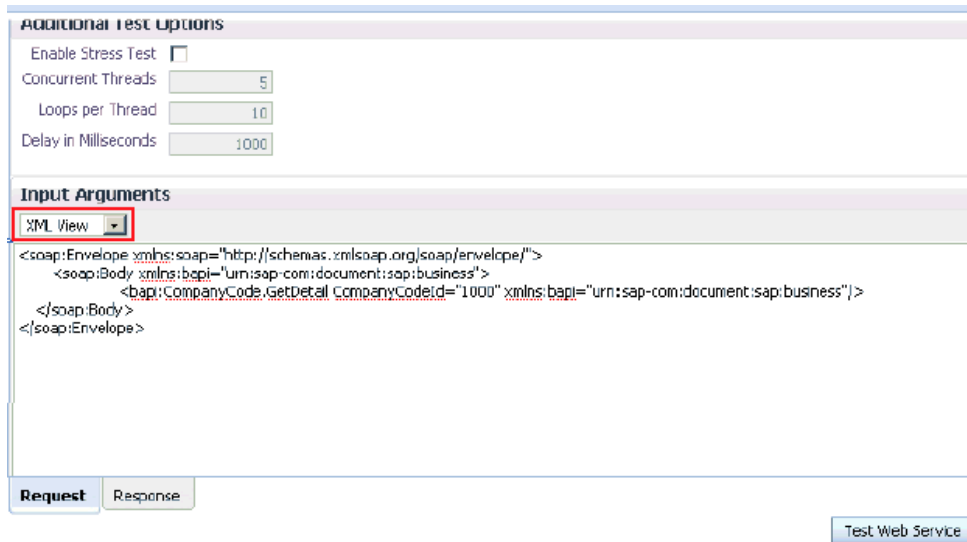
Figure 6–62 Output Response



Perform the following steps to invoke the input XML document using XML View:

- a. Select **XML View** from the list, as shown in [Figure 6–63](#).

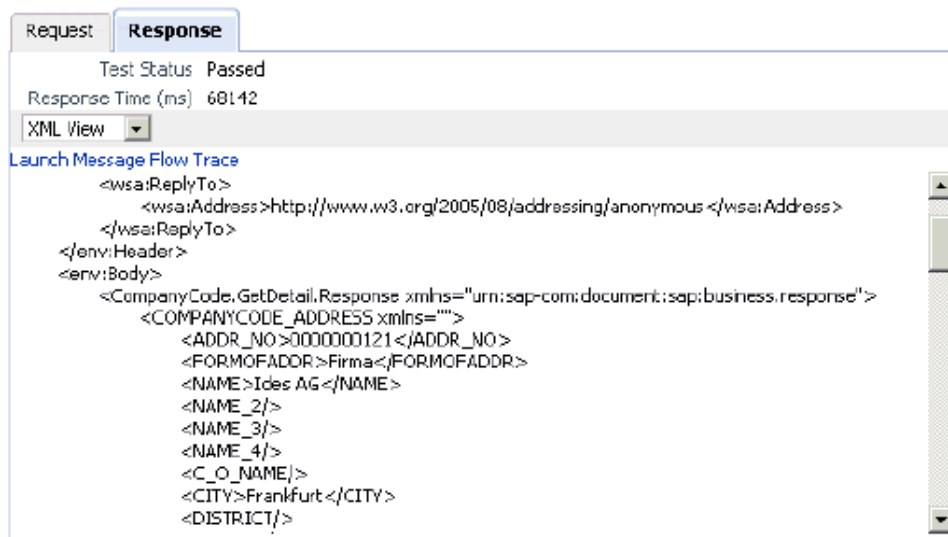
Figure 6–63 Input Arguments List



- b. Provide an appropriate input XML document in the Input Arguments area and click **Test Web Service**.

The output response is received in the Oracle Enterprise Manager console, as shown in [Figure 6–64](#).

Figure 6–64 Received Output Response



6.4.6 Testing Outbound BPEL and Mediator Processes

When testing an outbound BPEL process or an outbound Mediator process from the Oracle Enterprise Manager console, do not use the XML envelopes that are generated by these consoles. Instead, remove them and use the XML payloads that are generated from the schemas, which conform to the WSDLs for namespace qualifications.

The Mediator data flows can be tested using the Enterprise Manager console. When creating a Mediator data flow and interactions, the Web services are created and registered with the Oracle Application Server. For more information on creating a

Mediator outbound process, see [Chapter 7, "Integration With Mediator Service Components in the Oracle SOA Suite"](#).

6.5 Designing an Inbound BPEL Process for Event Integration

This section demonstrates how Oracle Application Adapter for SAP R/3 integrates with SAP R/3 to receive event data. In this example, an SAP R/3 event occurs when a customer record is added to a SAP R/3 system.

The following tools are required to complete your adapter design-time configuration:

- Oracle Adapter Application Explorer (Application Explorer)
- Oracle JDeveloper BPEL Designer (JDeveloper) or Eclipse

Note: The examples in this chapter demonstrate the use of JDeveloper.

Before you design a BPEL process, you must generate the respective WSDL file using Application Explorer. For more information, see "[Generating WSDL for Event Integration](#)" on page 6-41.

Samples have been provided for this use case scenario under the *etc/sample* folder of the Application Adapters installation.

6.5.1 Generating WSDL for Event Integration

You must create a separate channel for every inbound J2CA service and select that channel when you generate WSDL for inbound interaction using Application Explorer.

Note: If two or more events share the same channel, then event messages may not be delivered to the right BPEL process.

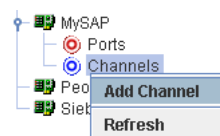
Creating a Channel

To create a channel:

1. Start **Application Explorer** and connect to a J2CA configuration.
2. In the left pane, expand the **Events** node.
3. Expand the **MySAP** node.

The Ports and Channels nodes appear in the left pane, as shown in [Figure 6-65](#).

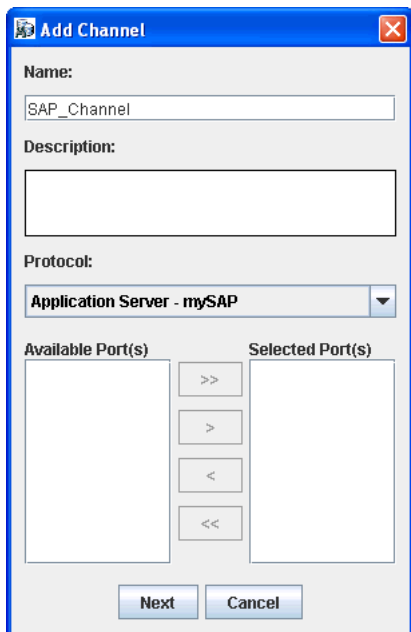
Figure 6-65 MySAP Channel Node



4. Right-click **Channels** and select **Add Channel**.

The Add Channel dialog is displayed, as shown in [Figure 6-66](#).

Figure 6–66 Add Channel Dialog



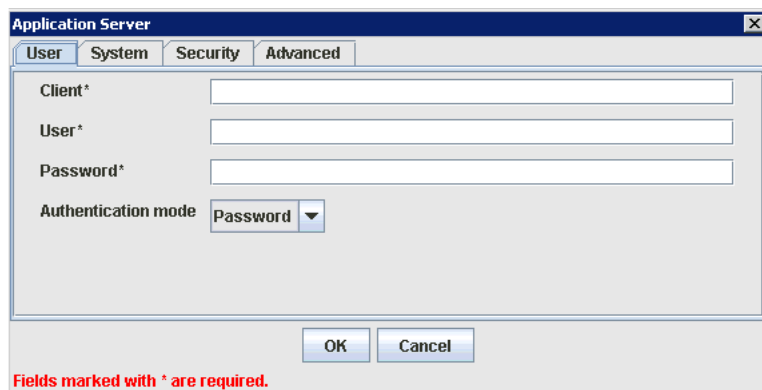
Perform the following steps:

- a. Enter a name for the channel, for example, `SAP_Channel1`.
 - b. Enter a brief description (optional).
 - c. From the **Protocol** list, select **Application Server - mySAP**.
5. Click **Next**.

The Application Server dialog is displayed, as shown in [Figure 6–67](#). The following tabs are available:

- User (Required)
- System (Required)
- Security
- Advanced

Figure 6–67 Application Server Dialog



6. For the **User** tab, enter the appropriate information for your SAP R/3 channel based on the information in the following table.

Table 6–1 User Tab Parameters

Target Parameter	Description
Client	The client number defined for the SAP R/3 application for client communications.
User	A valid user ID for the SAP R/3 application.
Password	A valid password for the SAP R/3 application.
Authentication Mode	The authentication mode you want to use when connecting to your SAP R/3 system. By default, Password is selected from the list.

7. Click the **System** tab, as shown in [Figure 6–68](#).

Figure 6–68 System Tab

8. For the **System** tab, enter the appropriate information for your SAP R/3 channel based on the information in the following table.

Table 6–2 System Tab Parameters

Target Parameter	Description
Gateway host	A host name for the SAP R/3 Gateway.
Gateway service	A service for the SAP R/3 Gateway.
Program ID of the server	An SAP R/3 program ID you want to use for this channel.
Application Server	The name of the SAP R/3 application server you are using.
System Number	An SAP R/3 system number.

9. For the **Security** tab (optional), enter the appropriate information for your SAP R/3 channel based on the information in the following table.

Table 6–3 Security Tab Parameters

Target Parameter	Description
SNC mode	By default, SNC is disabled. To enable SNC, select 1 from the list.

Table 6–3 (Cont.) Security Tab Parameters

Target Parameter	Description
SNC partner	Enter the name of the RFC server or message server (load balancing) that provides the SNC services.
SNC level	From the list select the version of the SNC library.
SNC name	Enter the name of the SNC library you are using.
SNC library path	Enter the path to the SNC library.

10. For the **Advanced** tab (optional), enter the appropriate information for your SAP R/3 channel based on the information in the following table.

Table 6–4 Advanced Tab Parameters

Target Parameter	Description
IDOC Format	Select an IDOC type from the list: <ul style="list-style-type: none"> ■ XML (default) ■ XML-CDATA-ENVELOPED ■ NATIVE IDOC
IDOC release	The IDOC versioning you want to use for your connection.
IDOC release provider	The IDOC release provider for your connection. Select IDOC DOCREL field (default), SAP release , or user input from the list.
SAP trace	Select this option to enable SAP traces. The SAP traces are stored in the following locations during design time and run time: Design Time: <code><ADAPTER_HOME>\soa\thirdparty\ApplicationAdapters\tools\iwae\bin</code> Run Time: <code><ADAPTER_HOME>\user_projects\domains\base_domain</code> The file name formats that are used for the SAP traces are as follows (for design time and run time): <ul style="list-style-type: none"> ■ rfc02664_04332.trc ■ JCO100226_043846994.trc
Processing Mode	Select the type of synchronous processing from the list. Possible values include REQUEST and REQUEST_RESPONSE .

11. Click **OK**.

The channel appears under the channels node in the left pane. An X over the icon indicates that the channel is currently disconnected.

Note: Do not start the channel, as it is managed by BPEL PM Server. If you start the channel for testing and debugging purposes, then stop it before run-time.

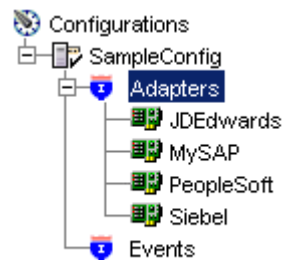
Generating WSDL for Event Notification

After you create a channel and verify that it is not started, you must generate WSDL for the event using Application Explorer.

1. Start Application Explorer.
2. Expand the **Adapters** node.

A list of all adapters is displayed, as shown in [Figure 6–69](#).

Figure 6–69 Adapters Node



Perform the following steps:

- a. Expand the **MySAP** node.

A list of your available targets is displayed, as shown in [Figure 6–70](#).

Figure 6–70 Disconnected MySAP Target Node



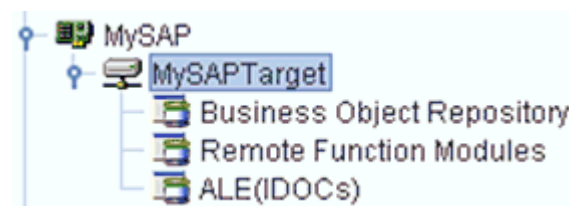
- b. Click a target name under the **MySAP** node, for example, **SAPTarget**.

The Connection dialog displays the saved parameters.

3. Verify your connection parameters.
4. Right-click the target name and select **Connect**.

The x icon disappears, indicating that the node is connected, as shown in [Figure 6–71](#).

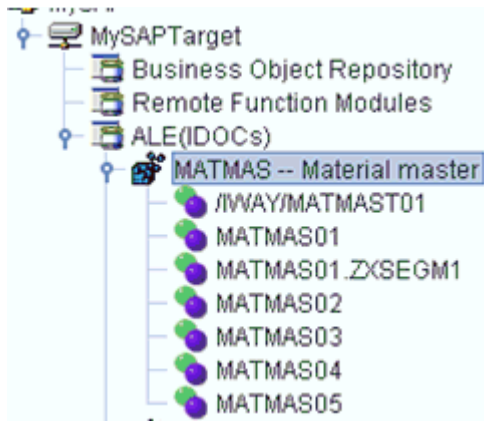
Figure 6–71 Connected MySAP Target



5. Expand the **ALE(IDOCs)** node and select **MATMAS - Material Master**.

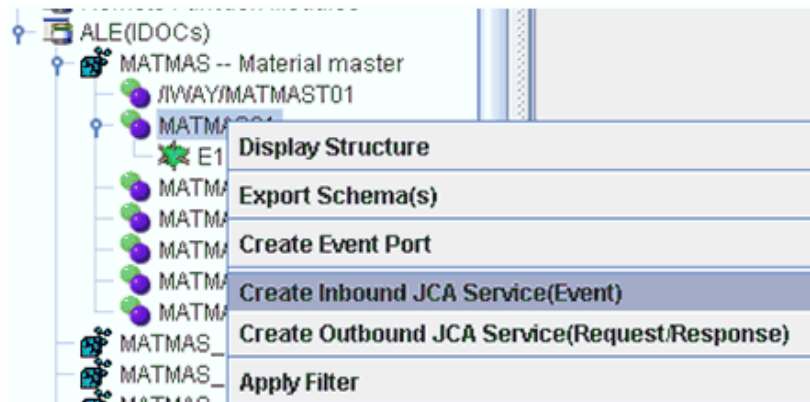
The MATMAS list is displayed, as shown in [Figure 6–72](#).

Figure 6–72 MATMAS Material Master List



6. Right-click **MATMAS01** from the **MATMAS** list.

Figure 6–73 Create Inbound JCA Service (Event) Option



7. Select **Create Inbound JCA Service (Event)**, as shown in [Figure 6–73](#).
The Export WSDL dialog is displayed, as shown in [Figure 6–74](#).

Figure 6–74 Export WSDL Dialog

Perform the following steps:

- a. In the **Name** field, specify a name for the WSDL file.
- b. From the **Channel** list, select the channel you created for this inbound service.

Important: You must create a separate channel for every event. Verify that the channel is stopped before run-time.

- c. Three check boxes for Root, Namespace, and Schema validation are also available. Selection of multiple validation options is allowed.

- Root validation is used to validate the root element in the inbound XML document.

- Namespace validation is used to validate the namespace in the inbound XML document.

- Schema validation is used to validate the inbound XML document with the schema in the WSDL document.

During run time, validation is processed based on the validation options that are selected. If multiple validation options are selected, then during run time if the first validation option fails, the remaining validation options are not processed. Root and namespace validations are considered modest levels of validation. Schema validation is a stricter validation level. It is recommended to use root and namespace validation options, unless the root element and namespace are different between the IDOCs in the SAP environment.

8. Click **OK**.

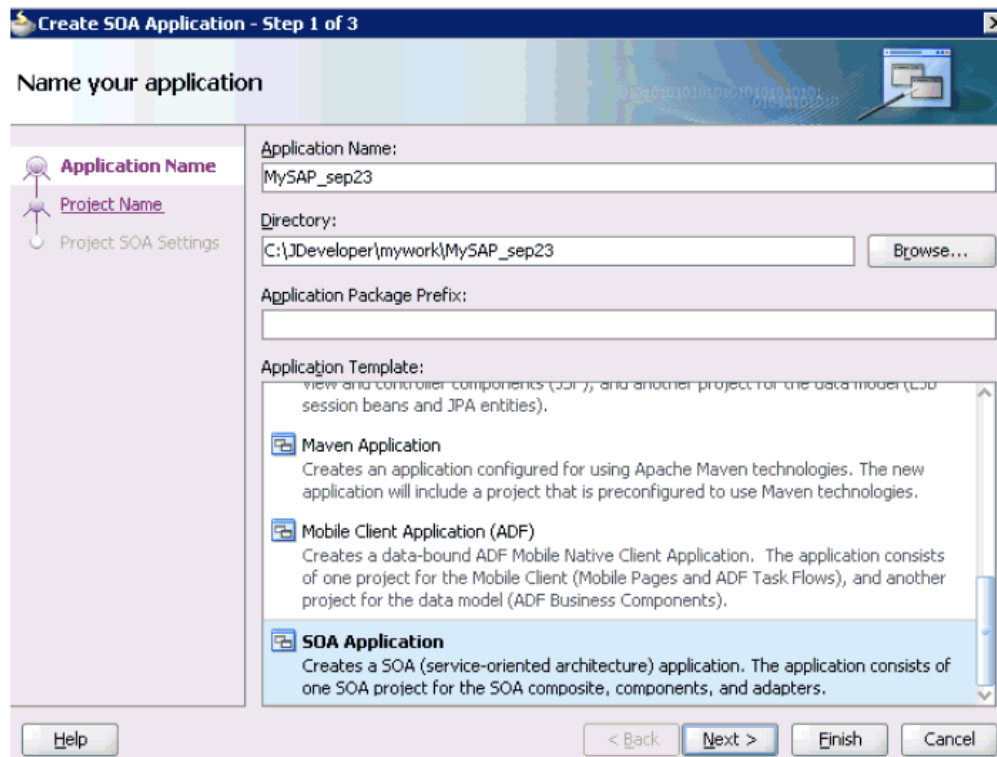
You can now create an empty composite for SOA, which is the first step that is required to define a BPEL inbound process in JDeveloper.

6.5.2 Creating an Empty Composite for SOA

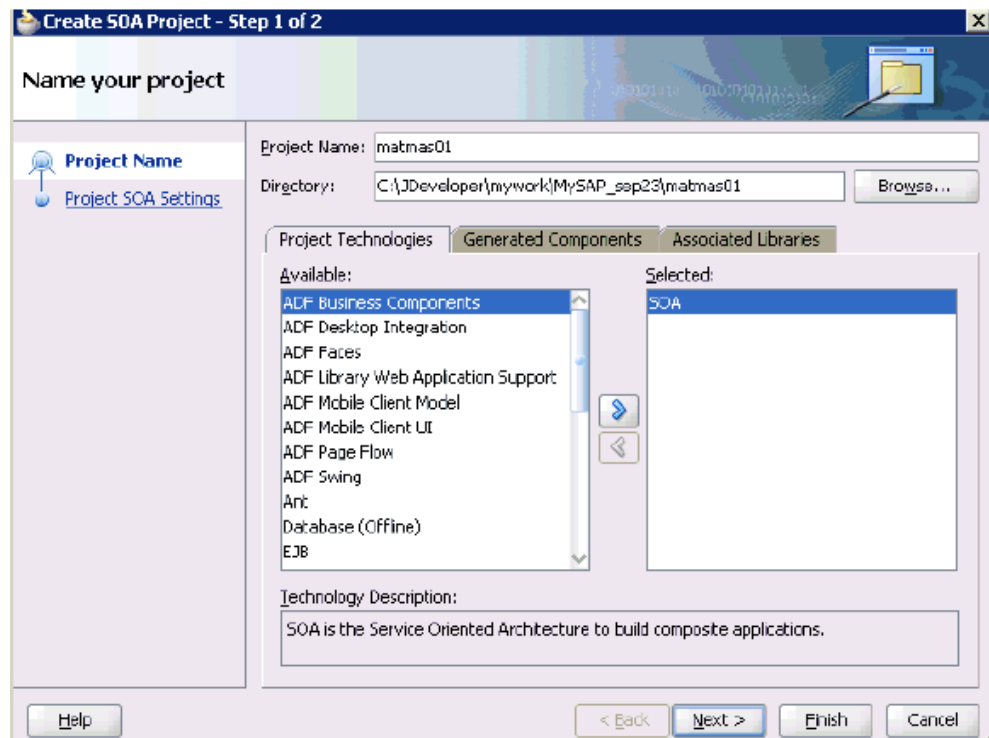
Perform the following steps to create an empty composite for SOA:

1. Create a new SOA application.
2. Enter a name for the new SOA Application and click **Next**, as shown in [Figure 6-75](#).

Figure 6-75 Name Your Application Page

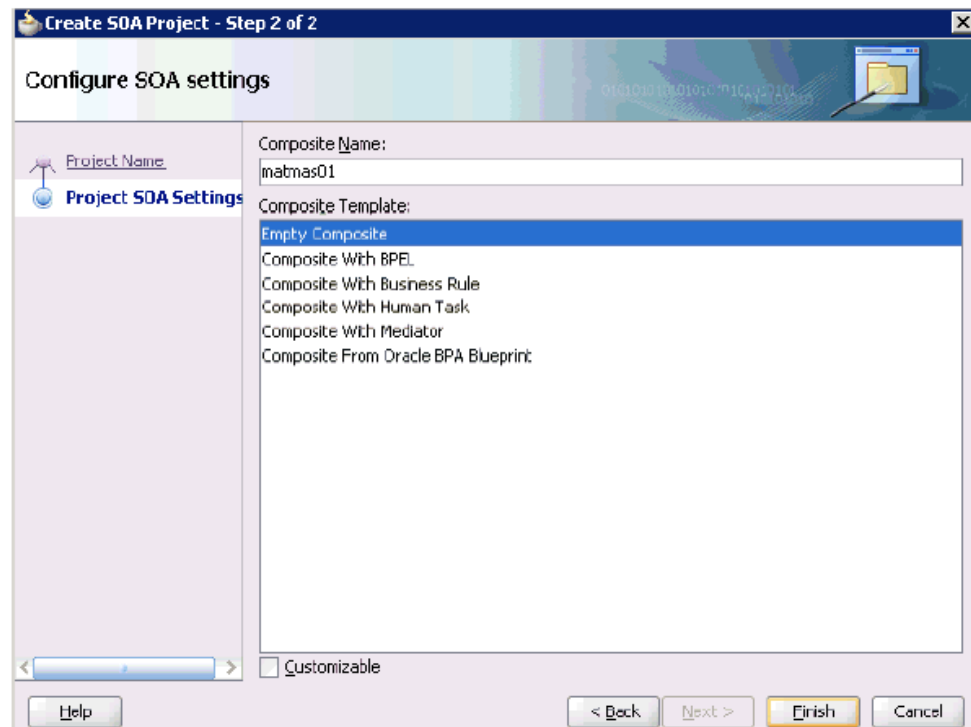


The Name your project page is displayed, as shown in [Figure 6-76](#).

Figure 6–76 Name Your Project Page

3. Enter a project name (for example, matmas01) and click **Next**.

The Configure SOA settings page is displayed, as shown in [Figure 6–77](#).

Figure 6–77 Configure SOA Settings Page

4. From the Composite Template list, select **Empty Composite** and click **Finish**.

6.5.3 Defining a BPEL Inbound Process

This section describes how to define a BPEL inbound process, which consists of the following stages:

1. Configuring a Third Party Adapter Service Component
2. Configuring an Inbound BPEL Process Component

Creating a Third Party Adapter Service Component

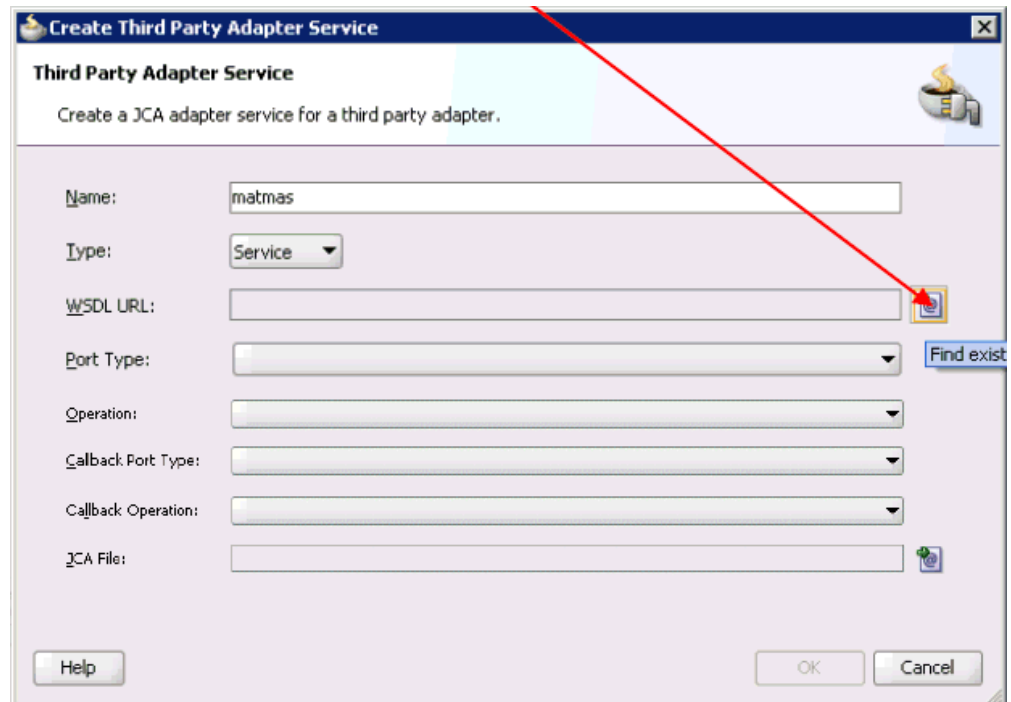
Perform the following steps to create a third party adapter service component:

1. Drag and drop the **Third Party Adapter** component from the Service Adapters pane to the Exposed Services pane, as shown in [Figure 6–78](#).

Figure 6–78 Third Party Adapter Component



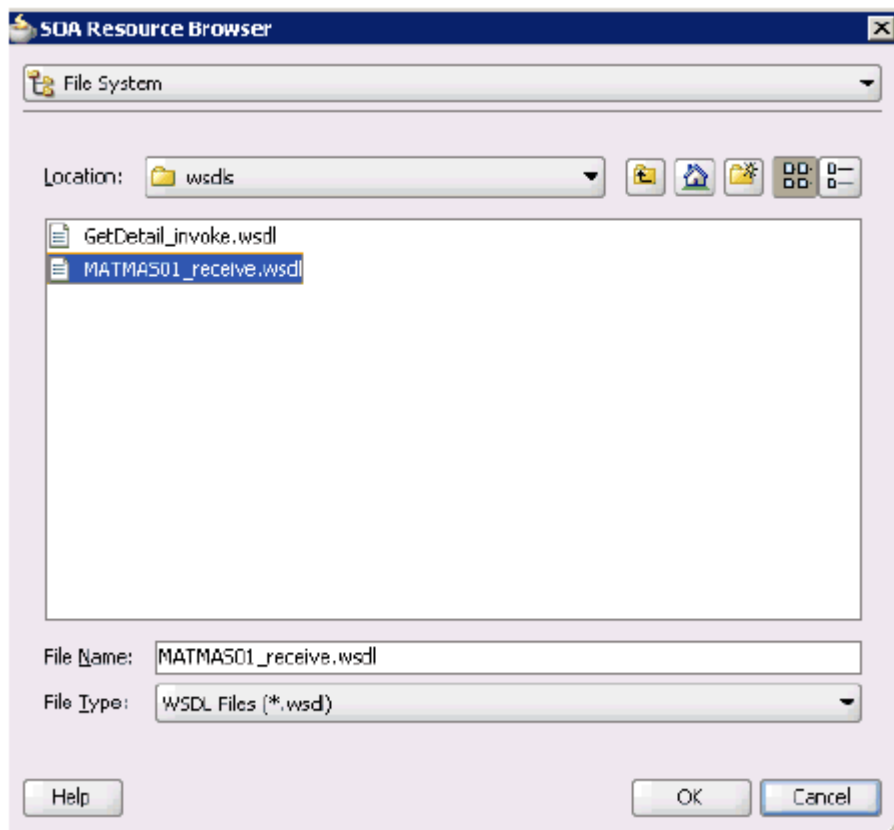
The Create Third Party Adapter Service dialog is displayed, as shown in [Figure 6–79](#).

Figure 6–79 Create Third Party Adapter Service Dialog

2. Enter a name for the third party adapter service.
3. Ensure that **Service** is selected from the Type list (default).
4. Click the **Find existing WSDLs** icon, which is located to the right of the WSDL URL field.

The SOA Resource Browser dialog is displayed, as shown in [Figure 6–80](#).

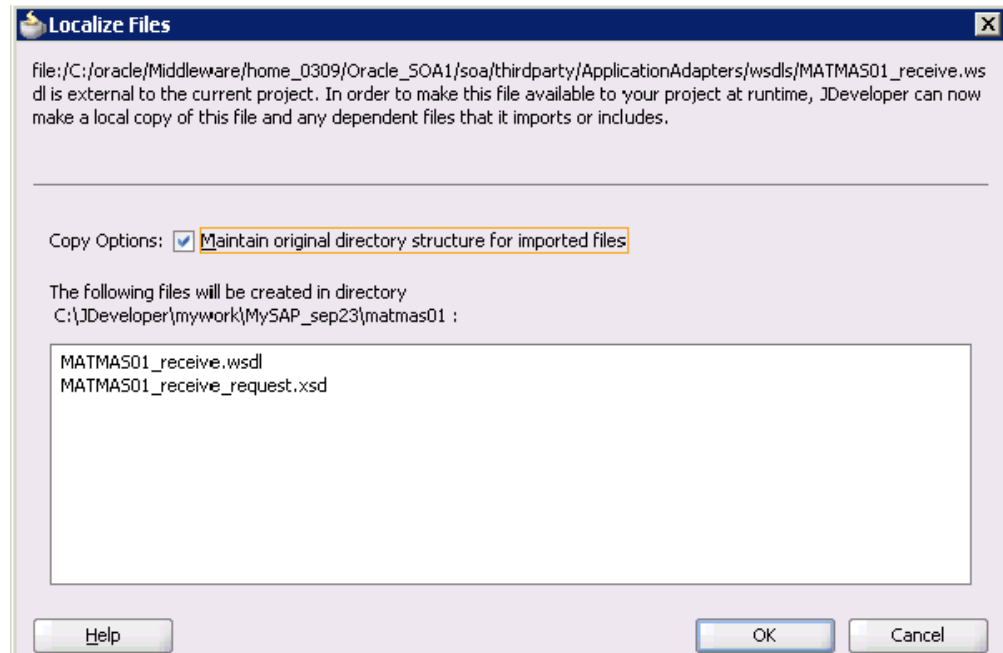
Figure 6–80 SOA Resource Browser Dialog



5. Browse and select an inbound WSDL file from the following directory:
 <ADAPTER_HOME>\soa\thirdparty\ApplicationAdapters\wsdl

6. Click **OK**.

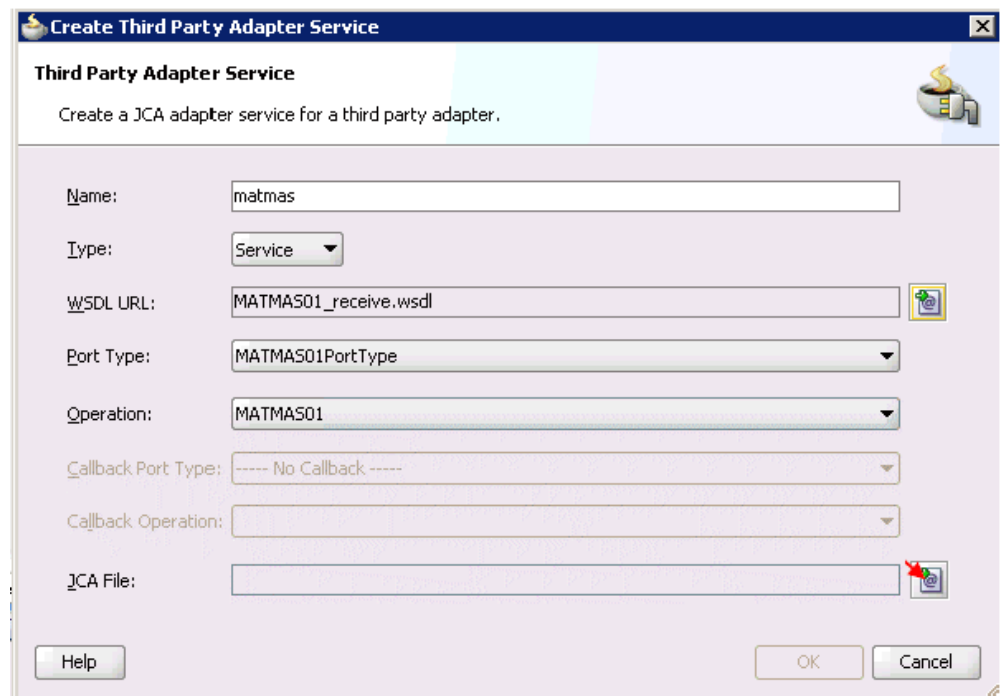
The Localize Files dialog is displayed, as shown in [Figure 6–81](#).

Figure 6–81 Localize Files Dialog

7. Click **OK**.

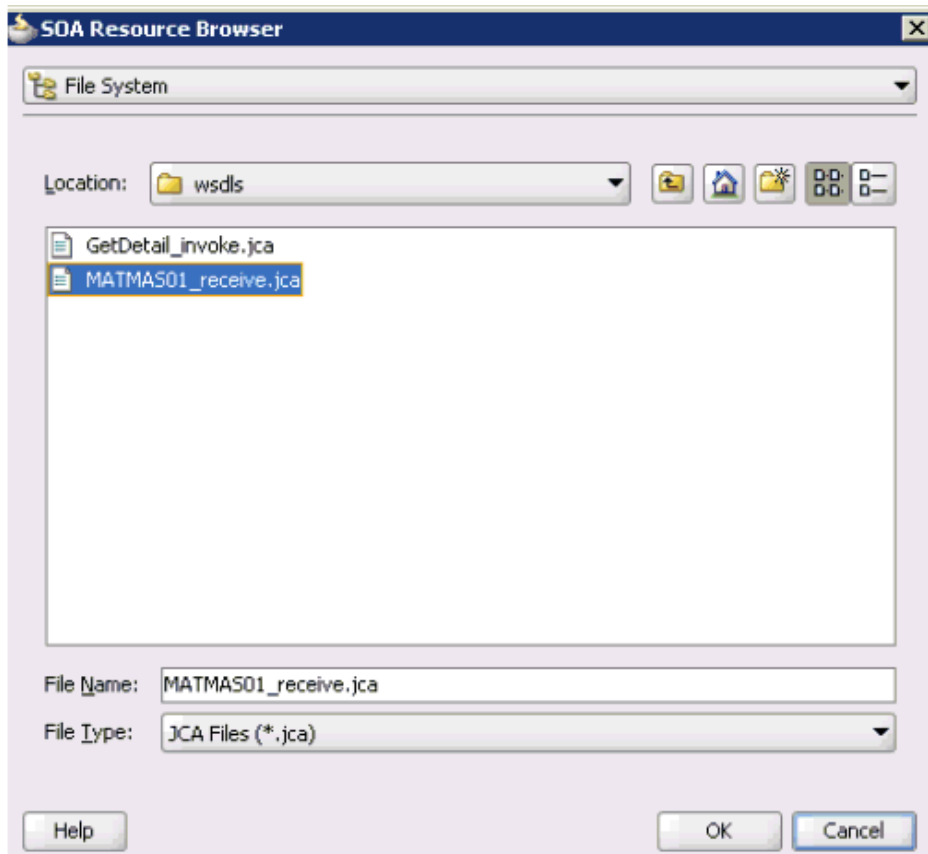
The inbound WSDL file and associated receive/request XML schema file (.xsd) are imported to the project folder that has been created.

You are returned to the Create Third Party Adapter Service dialog, as shown in [Figure 6–82](#).

Figure 6–82 Create Third Party Adapter Service Dialog

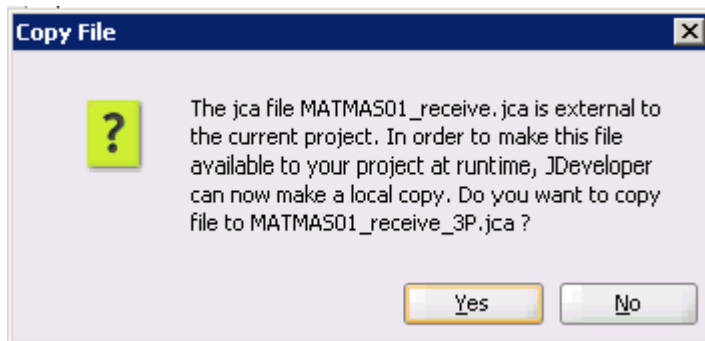
8. Click the **Find JCA file** icon, which is located to the right of the JCA File field. The SOA Resource Browser dialog is displayed, as shown in [Figure 6–83](#).

Figure 6–83 SOA Resource Browser Dialog



9. Browse and select the JCA properties file from the following directory:
`<ADAPTER_HOME>\soa\thirdparty\ApplicationAdapters\wsdl's`
10. Click **OK**.
 A Copy File message is displayed, as shown in [Figure 6–84](#).

Figure 6–84 Copy File Confirmation Message

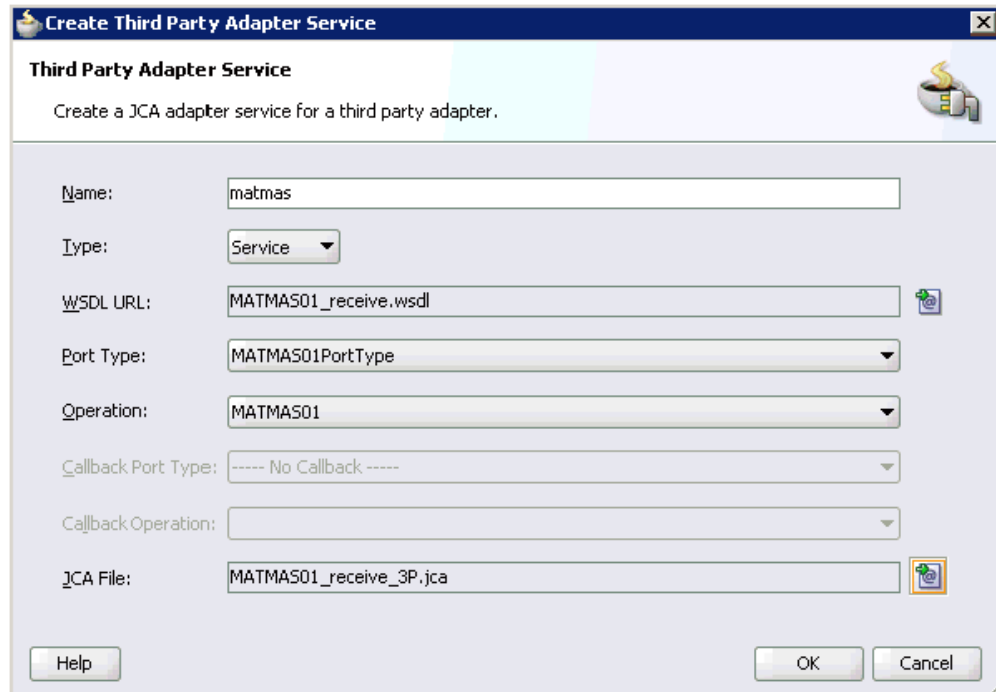


11. Click **Yes**.

A copy of the JCA properties file is made in the project folder.

You are returned to the Create Third Party Adapter Service dialog, as shown in [Figure 6–85](#).

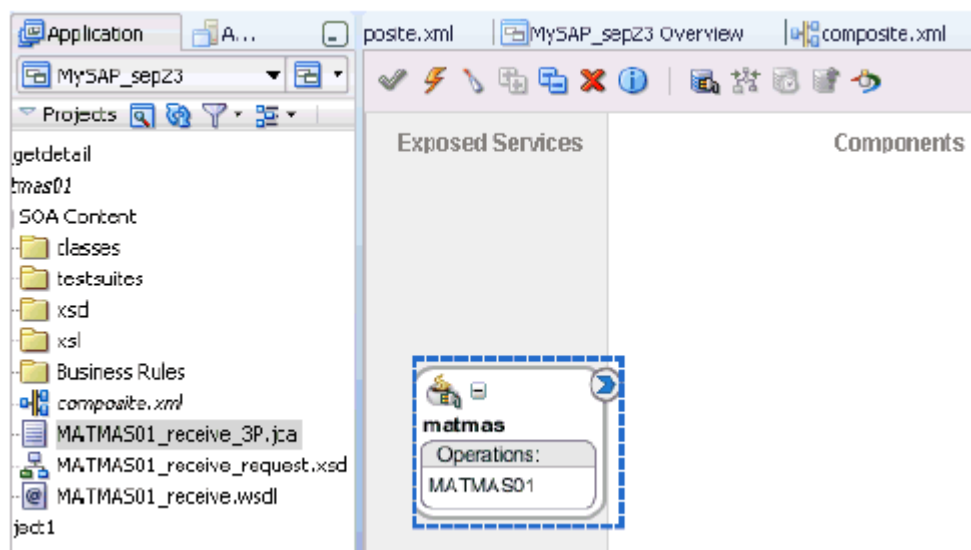
Figure 6–85 Create Third Party Adapter Service Dialog



12. Click **OK**.

The third party adapter service component (matmas) is created and displayed in the Exposed Services pane, as shown in [Figure 6–86](#).

Figure 6–86 Third Party Adapter Service Component



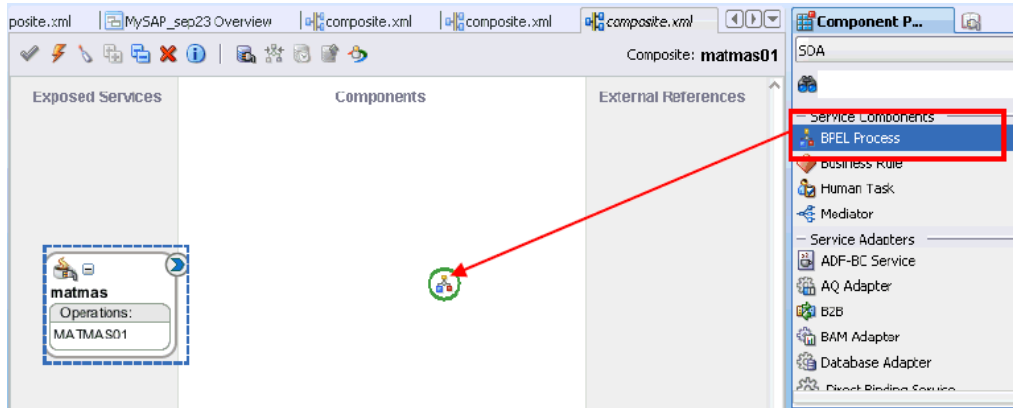
You are now ready to configure an inbound BPEL process component.

Creating an Inbound BPEL Process Component

Perform the following steps to create an inbound BPEL process component:

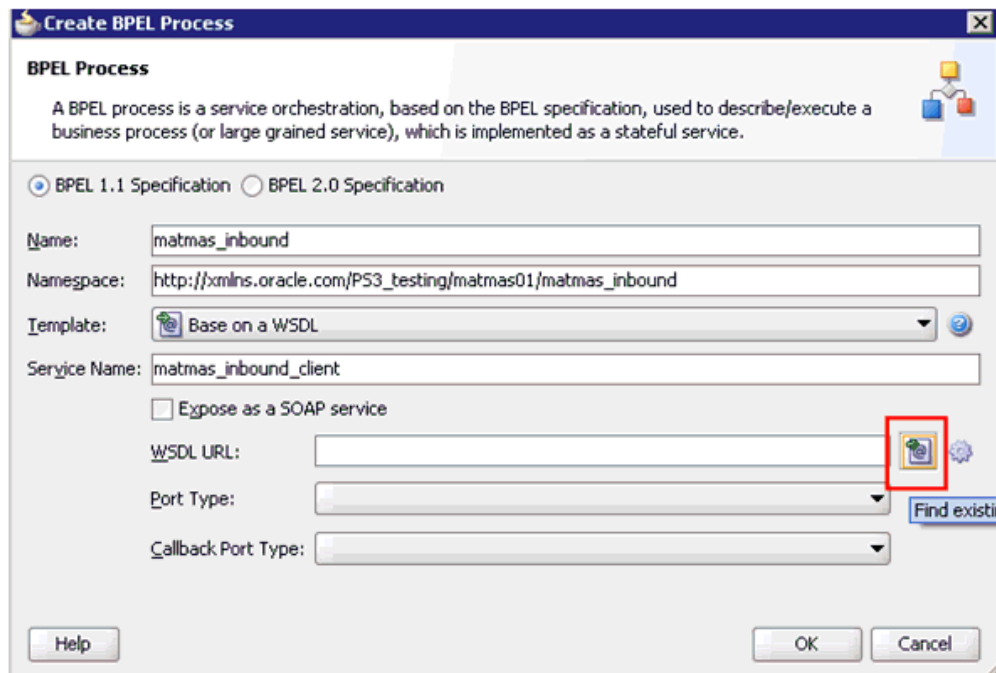
1. Drag and drop the **BPEL Process** component from the Service Components pane to the Components pane, as shown in [Figure 6–87](#).

Figure 6–87 BPEL Process Component



The Create BPEL Process dialog is displayed, as shown in [Figure 6–88](#).

Figure 6–88 Create BPEL Process Dialog



2. In the Name field, enter a name to identify the new inbound BPEL process component (for example, matmas_inbound).

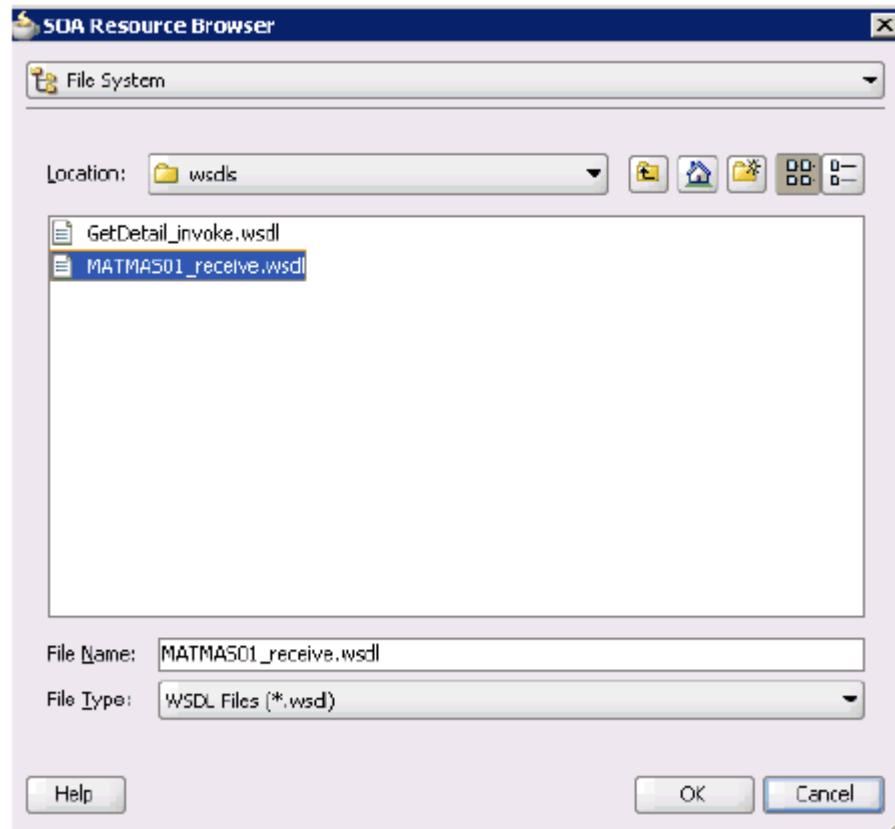
By default, the BPEL 1.1 Specification option is selected. The BPEL 2.0 Specification option is also available.

3. From the Template list, select **Base on a WSDL**.
4. Uncheck the **Expose as SOAP service** check box.

5. Click the **Find existing WSDLs** icon, which is located to the right of the WSDL URL field.

The SOA Resource Browser dialog is displayed, as shown in [Figure 6–89](#).

Figure 6–89 SOA Resource Browser Dialog



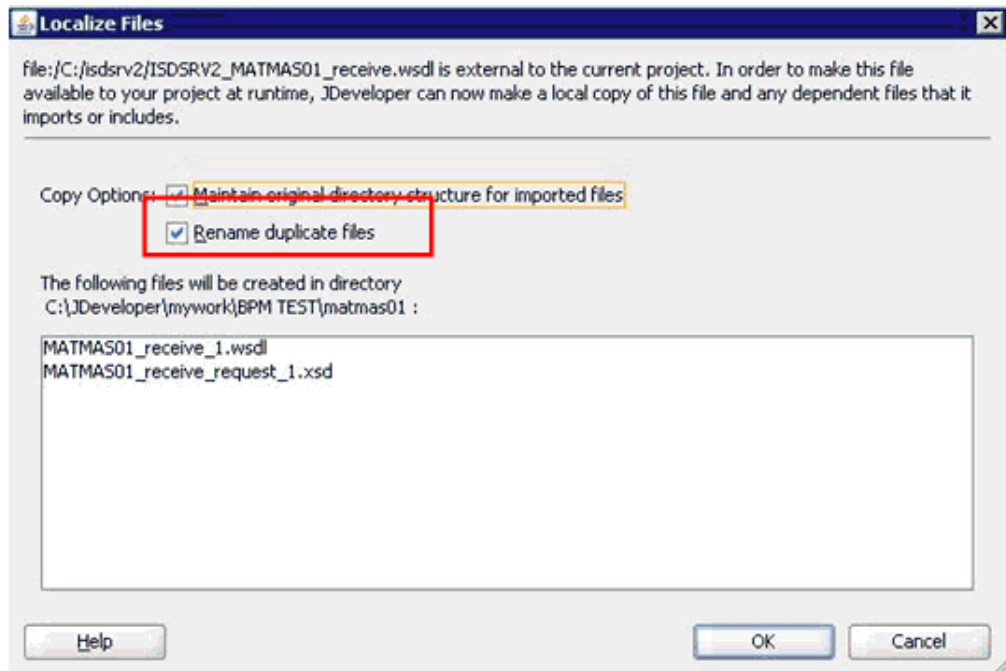
6. Select an inbound WSDL file from the following directory:

`<ADAPTER_HOME>\soa\thirdparty\ApplicationAdapters\wsdl`

7. Click **OK**.

The Localize Files dialog is displayed, as shown in [Figure 6–90](#).

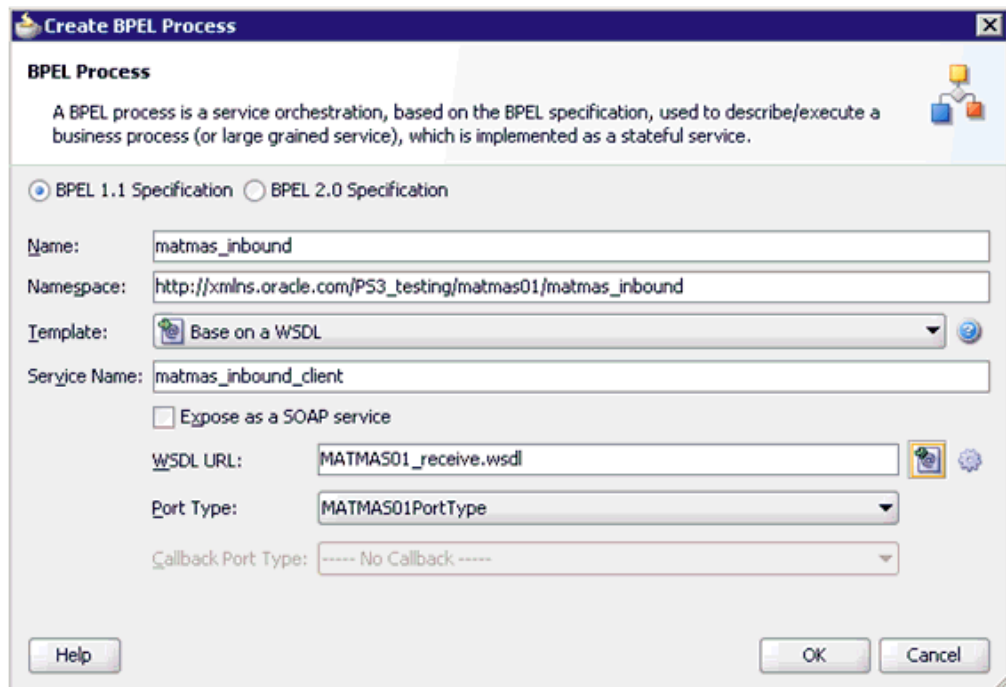
Figure 6–90 Localize Files Dialog



8. Uncheck the **Rename duplicate files** option.
9. Click **OK**.

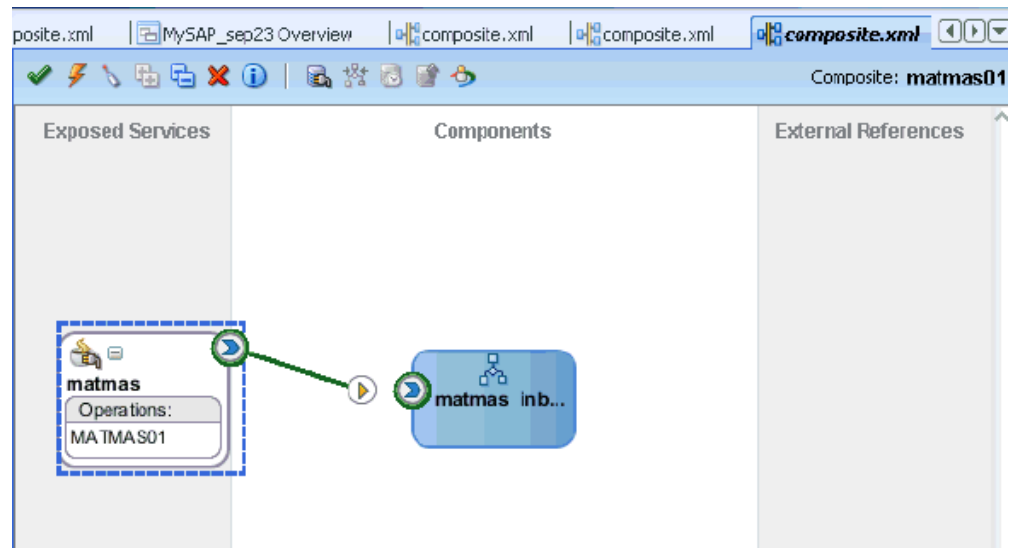
You are returned to the Create BPEL Process dialog, as shown in [Figure 6–91](#).

Figure 6–91 Create BPEL Process Dialog



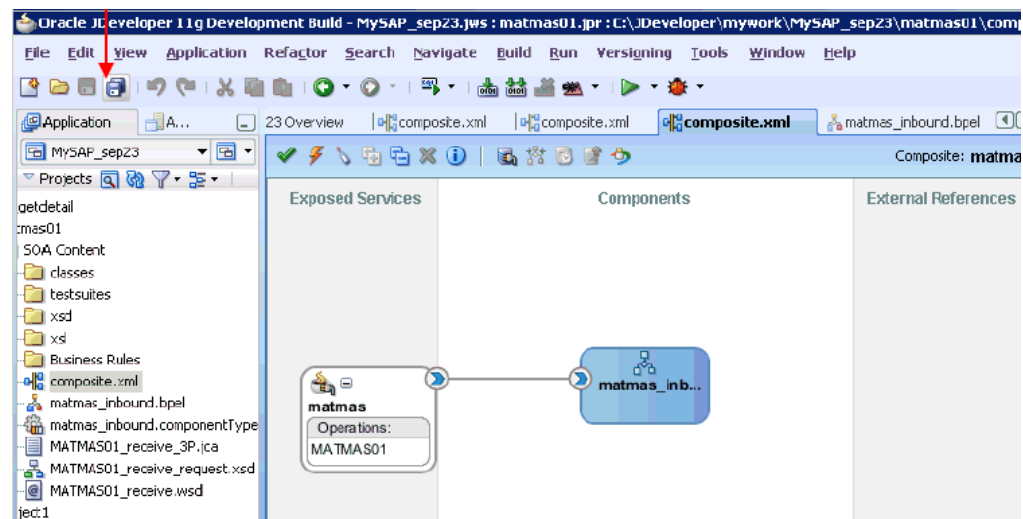
10. Click **OK**.

Figure 6–92 Created Connection



11. Create a connection between the third party adapter service component (matmas) and the inbound BPEL process component (matmas_inbound), as shown in Figure 6–92.
12. Double-click **composite.xml** in the left pane.

Figure 6–93 Save All Icon



13. Click the **Save All** icon in the menu bar to save the new inbound BPEL process component that was configured, as shown in Figure 6–93.

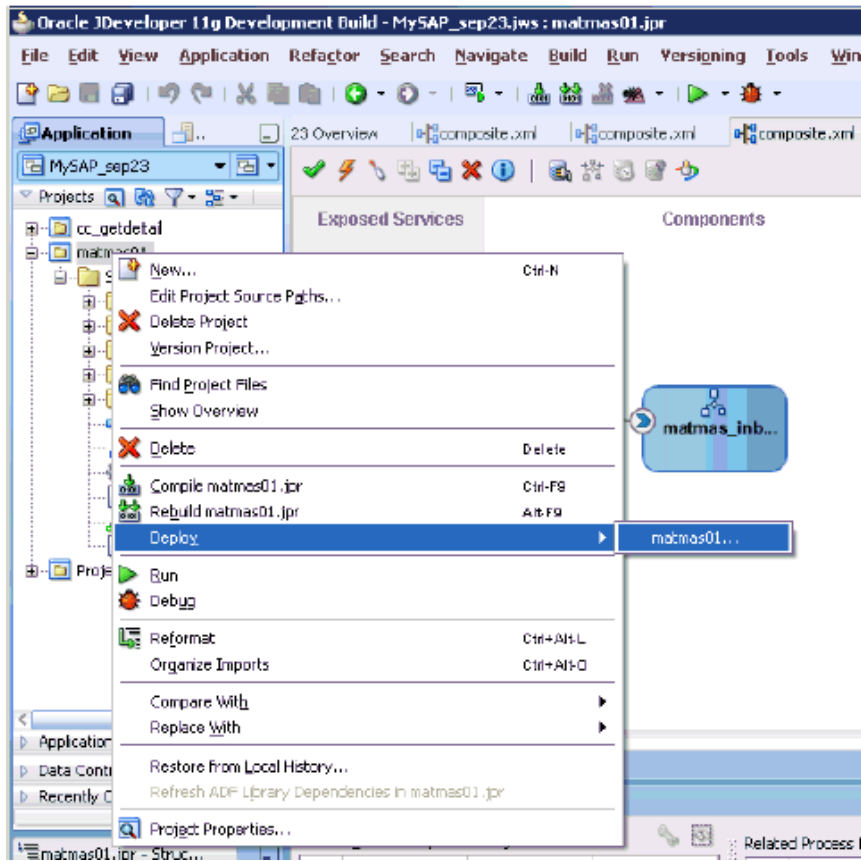
You are now ready to deploy the BPEL inbound process.

6.5.4 Deploying the BPEL Inbound Process

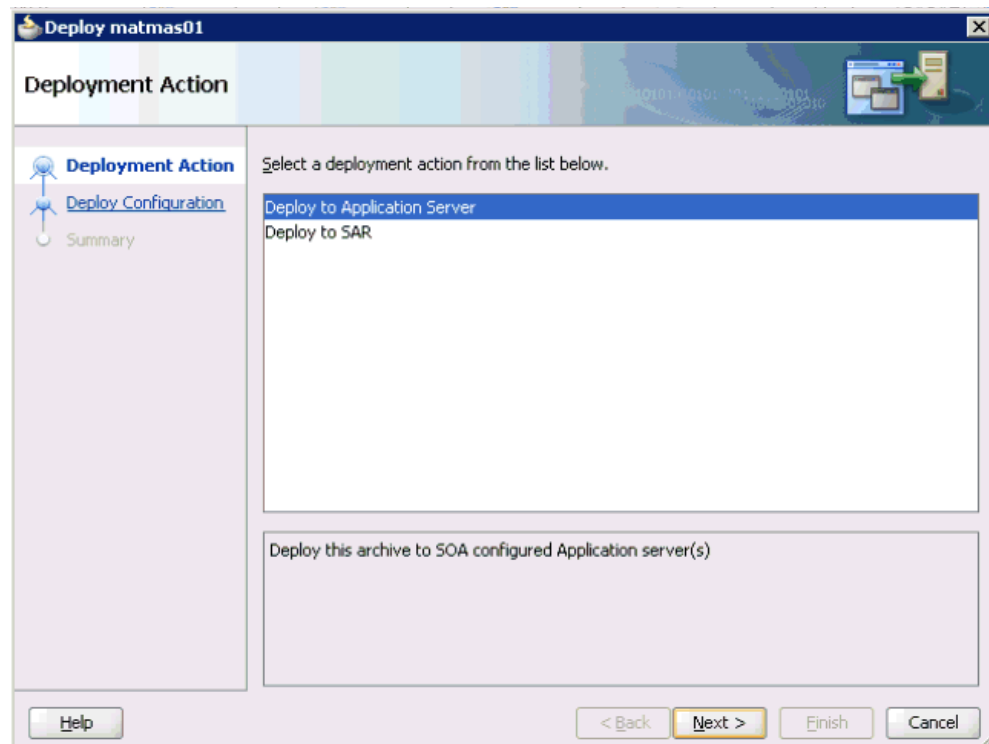
Perform the following steps to deploy the BPEL inbound process.

1. Right-click the project name in the left pane (for example, **matmas01**), select **Deploy**, and click **matmas01**, as shown in Figure 6–94.

Figure 6–94 Matmas01 Option



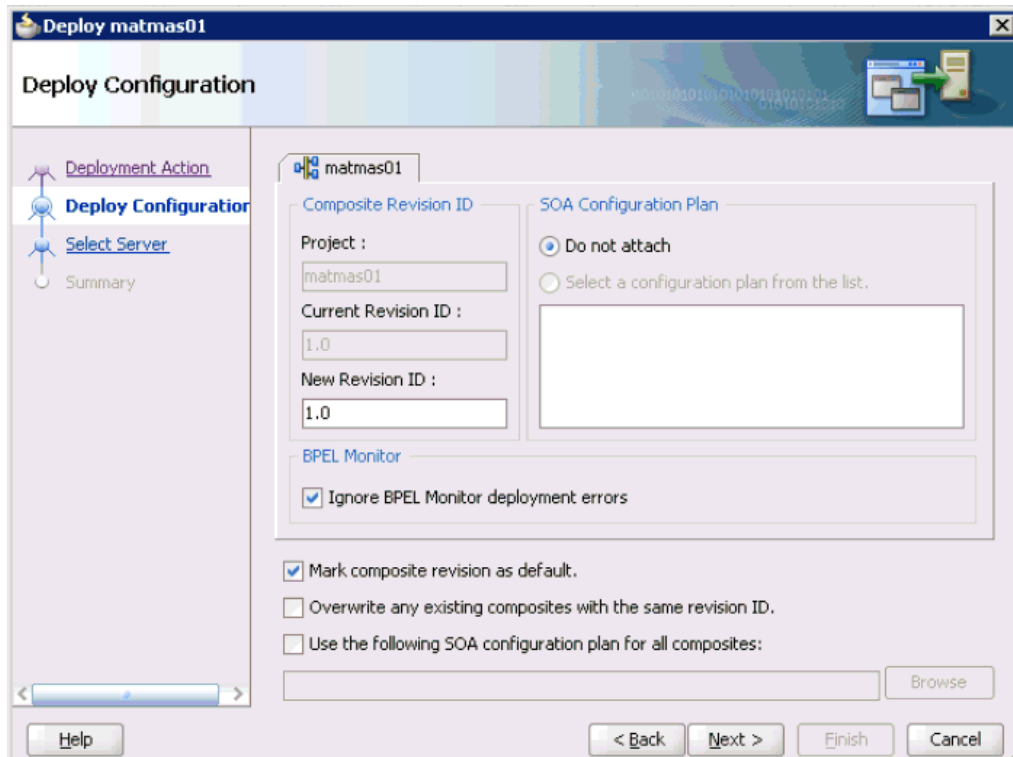
The Deployment Action page is displayed, as shown in [Figure 6–95](#).

Figure 6–95 Deployment Action Page

2. Ensure that **Deploy to Application Server** is selected.
3. Click **Next**.

The Deploy Configuration page is displayed, as shown in [Figure 6–96](#).

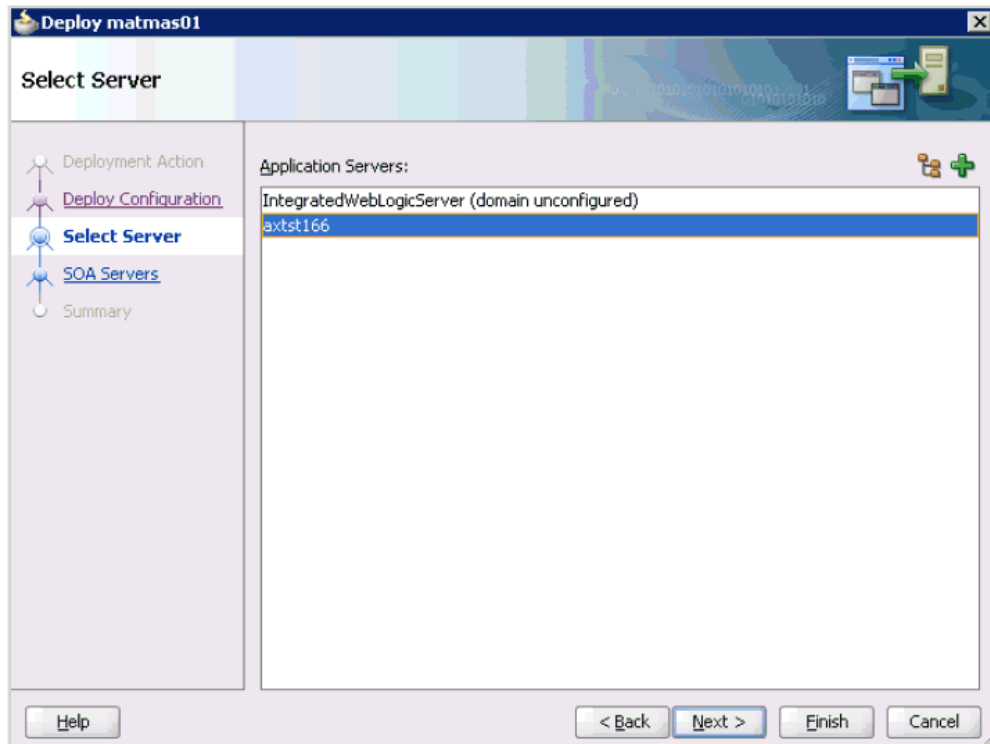
Figure 6–96 Deploy Configuration Page



4. Leave the default values selected and click **Next**.

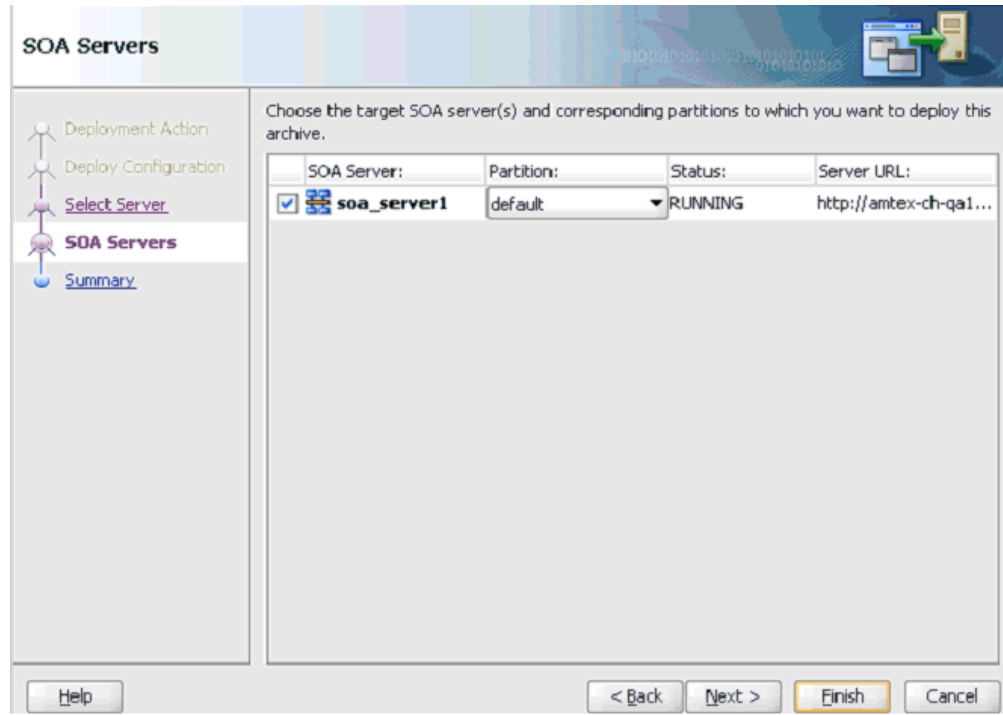
The Select Server page is displayed, as shown in [Figure 6–97](#).

Figure 6–97 Select Server Page



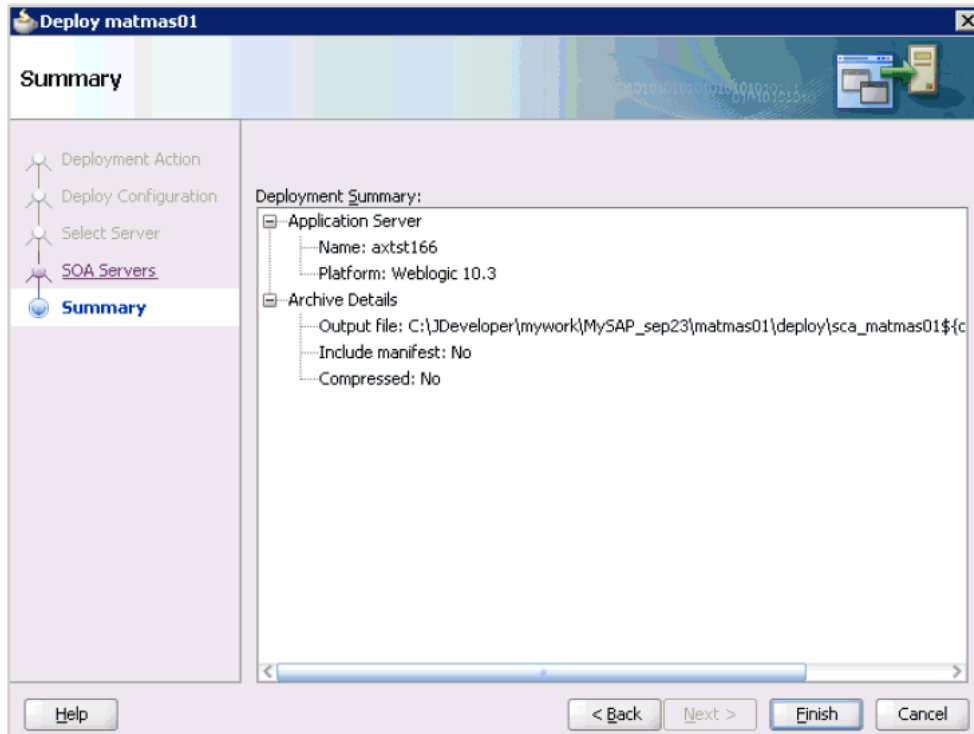
5. Select an available application server that was configured and click **Next**.
The SOA Servers page is displayed, as shown in [Figure 6–98](#).

Figure 6–98 SOA Servers Page



6. Select a target SOA server and click **Next**.
The Summary page is displayed, as shown in [Figure 6–99](#).

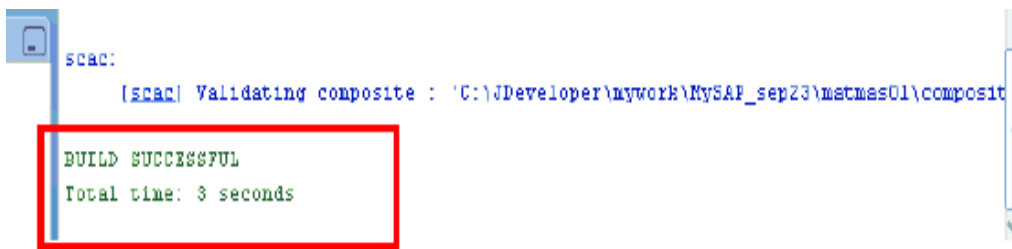
Figure 6–99 Summary Page



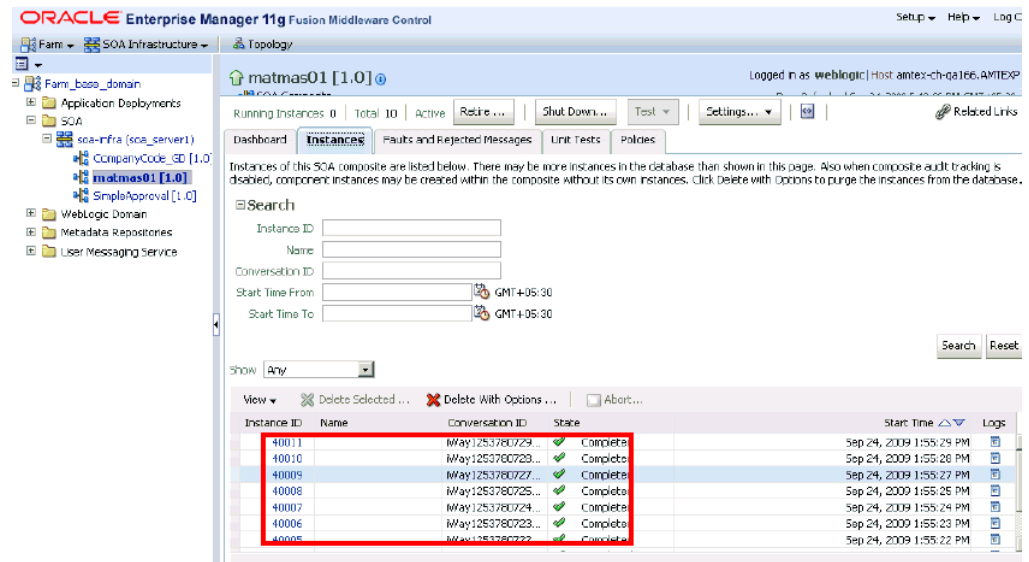
- Review and verify all the available deployment information for your project and click **Finish**.

The process is deployed successfully, as shown in [Figure 6–100](#).

Figure 6–100 Successful Deployment Message



Once event messages are triggered through SAP GUI, successful instances are received in the Oracle Enterprise Manager console, as shown in [Figure 6–101](#).

Figure 6–101 Received Instances

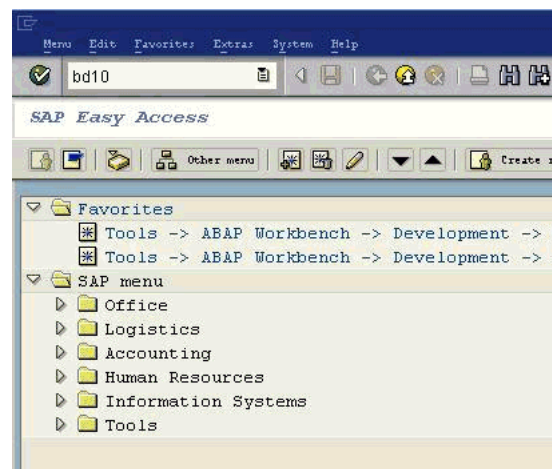
6.5.5 Triggering an Event in SAP R/3

Events are generated by activity in an application system. For example, SAP R/3 may generate an event as customer information is updated in the system. For more information on events, see ["Configuring an Event Adapter"](#) on page 4-19.

The following topics describe how to trigger an event in SAP R/3 and verify event integration using Oracle Application Adapter for SAP R/3.

To trigger an event in SAP R/3:

1. Start the SAP Workbench and log in to the SAP R/3 system, as shown in [Figure 6–102](#).

Figure 6–102 SAP Workbench

2. Run the **bd10** transaction.

Figure 6–103 Send Material Window

Material	1	to	100	↔
Class		to		↔
Message type (R/3 Standard)	MATMAS			
Logical system	UMALOG			
<input type="checkbox"/> Send material in full				
Parallel processing				
Server group				
Number of materials per proces	20			

Enter the following information in the Send Material window:

- a. In the Material field, enter a material number with a range from 1 to 100, as shown in [Figure 6–103](#).
 - b. In the Logical system field, specify the logical system you are using with SAP R/3.
3. Click the **Execute** button.

Material master data is sent to the logical system specified. If a channel in Application Explorer defined the Program ID with the same value, then the channel receives this material master data from SAP R/3.

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, `matmas01`), as shown in [Figure 6–104](#).

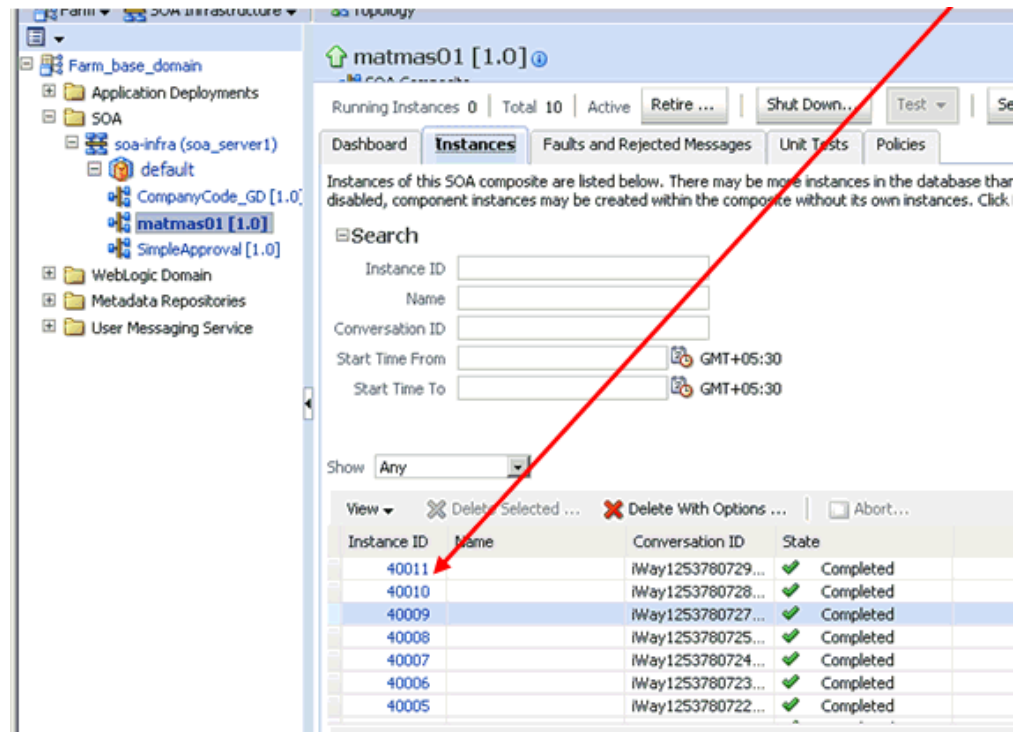
Figure 6–104 Available Inbound BPEL Process



4. Click the **Instances** tab.

Recently received run-time event messages are displayed in the Instances tab, as shown in Figure 6–105.

Figure 6–105 Instances Tab



5. Click the Instance ID to view the received event message.

Integration With Mediator Service Components in the Oracle SOA Suite

This chapter describes integration with Mediator service components in the Oracle SOA Suite. It contains the following topics:

- [Section 7.1, "Configuring a New Application Server Connection"](#)
- [Section 7.2, "Configuring a Mediator Outbound Process"](#)
- [Section 7.3, "Configuring a Mediator Inbound Process"](#)

The scenarios shown in this chapter require the following prerequisites.

Prerequisites

The following are installation and configuration requirements:

- Oracle Application Adapter for SAP R/3 must be installed on Oracle WebLogic Server.
- SAP R/3 must be configured for inbound and outbound processing. For more information, see [Appendix A, "Understanding the SAP System Role in Remote Processing"](#).

The examples in this chapter present the configuration steps necessary for demonstrating service and event integration with SAP R/3. Prior to using this material, you must be familiar with the following:

- How to configure Oracle Application Adapter for SAP R/3 for services and events. For more information, see [Chapter 4, "Configuring Oracle Application Adapter for SAP R/3"](#).
- How to configure Oracle JDeveloper. For more information, see [Chapter 6, "Integration With BPEL Service Components in the Oracle SOA Suite"](#).

Overview of Mediator Integration

Mediator provides a comprehensive application integration framework. Oracle Application Adapter for SAP R/3 used with Mediator enables you to seamlessly integrate enterprise software, eliminating custom code. Functional modeling, as opposed to custom coding solutions, allows for software reuse and reduces the complexity and management challenges that arise over the software lifecycle. This integration model consists of two components--high-level integration logic and low-level platform services.

Adapter integration with Oracle Mediator is a two-step process:

1. **Design Time:** Oracle Application Adapter for SAP R/3 is configured in Application Explorer for services and events, as described in [Chapter 4](#),

"[Configuring Oracle Application Adapter for SAP R/3](#)". Integration logic is modeled in Mediator.

2. **Runtime:** The underlying platform treats this metadata as run-time instructions to enable the communication between participating applications.

7.1 Configuring a New Application Server Connection

For more information on how to configure a new Application Server connection in Oracle JDeveloper, see [Section 6.3, "Configuring a New Application Server Connection"](#).

7.2 Configuring a Mediator Outbound Process

The following example describes how to configure a Mediator outbound process to your SAP R/3 system, using a Mediator project in Oracle JDeveloper.

Samples have been provided for this use case scenario under the *etc/sample* folder of the Application Adapters installation.

Prerequisites

Before you design a Mediator outbound process, you must generate the respective WSDL file using Application Explorer. For more information, see "[Generating WSDL for Request/Response Service](#)" on page 6-8.

7.2.1 Creating an Empty Composite for SOA

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

1. Create a new SOA application.
2. Enter a name for the new SOA Application and click **Next**, as shown in [Figure 7-1](#).

Figure 7-1 Name Your Application Page

Create SOA Application - Step 1 of 3

Name your application

Application Name
 Application Name:

Project Name
 Directory:

Project SOA Settings
 Application Package Prefix:

Application Template:

- Java Desktop Application (ADF)**
 Creates a databound rich client application. The application consists of one project for the client (ADF Swing), and another project for the ADF Model (ADF Business Components).
- Java EE Web Application**
 Creates a databound web application. The application consists of one project for the view and controller components (JSF), and another project for the data model (EJB session beans and JPA entities).
- SOA Application**
 Creates a SOA (service-oriented architecture) application. The application consists of one SOA project for the SOA composite, components, and adapters.

The Name your project page is displayed, as shown in Figure 7-2.

Figure 7-2 Name Your Project Page

Create SOA Application - Step 2 of 3

Name your project

Application Name
 Project Name:

Project Name
 Directory:

Project SOA Settings
 Project Technologies: **Generated Components** | Associated Libraries

Available:

- ADF Business Components
- ADF Desktop Integration
- ADF Faces
- ADF Library Web Application Support
- ADF Page Flow
- ADF Swing
- Ant
- Database (Offline)
- EJB
- HTML
- Java

Selected:

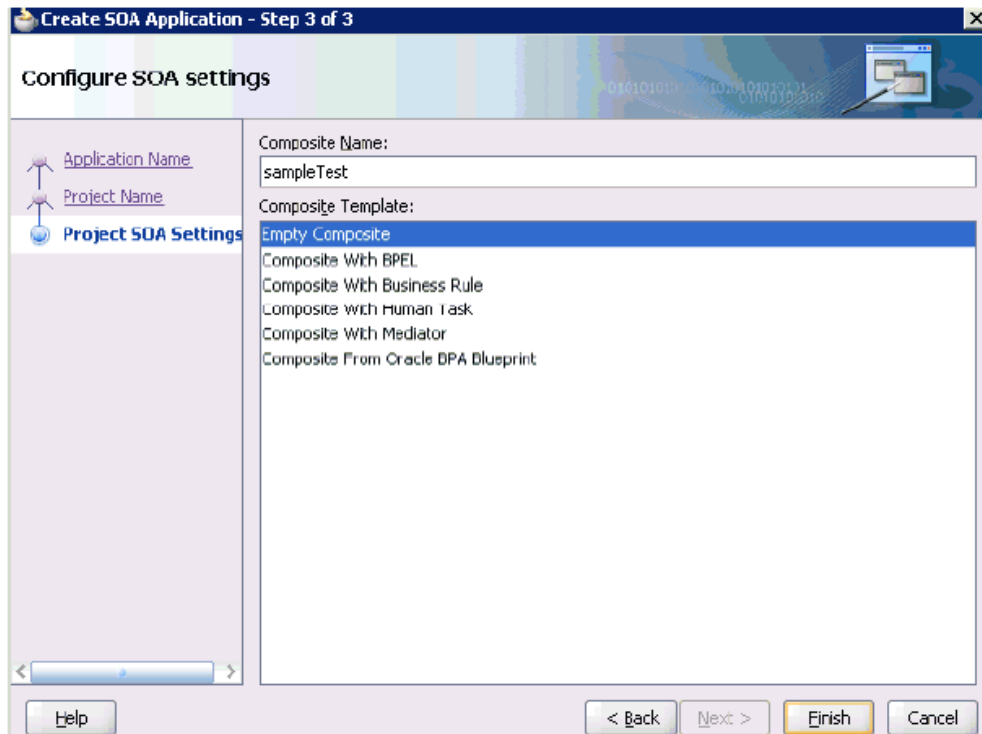
- SOA

Technology Description:
 SOA is the Service Oriented Architecture to build composite applications.

3. Enter a project name (for example, sampleTest) and click **Next**.

The Configure SOA settings page is displayed, as shown in [Figure 7-3](#).

Figure 7-3 Configure SOA Settings Page



4. From the Composite Template list, select **Empty Composite** and click **Finish**.

7.2.2 Defining a Mediator Outbound Process

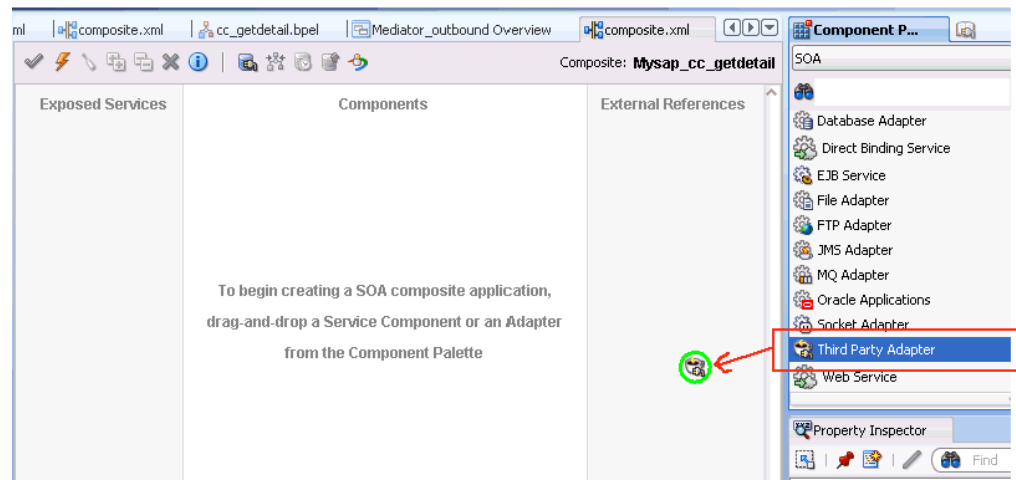
This section describes how to define a Mediator outbound process, which consists of the following stages:

1. Configuring a Third Party Adapter Service Component
2. Configuring an Outbound Mediator Process Component
3. Configuring the Routing Rules

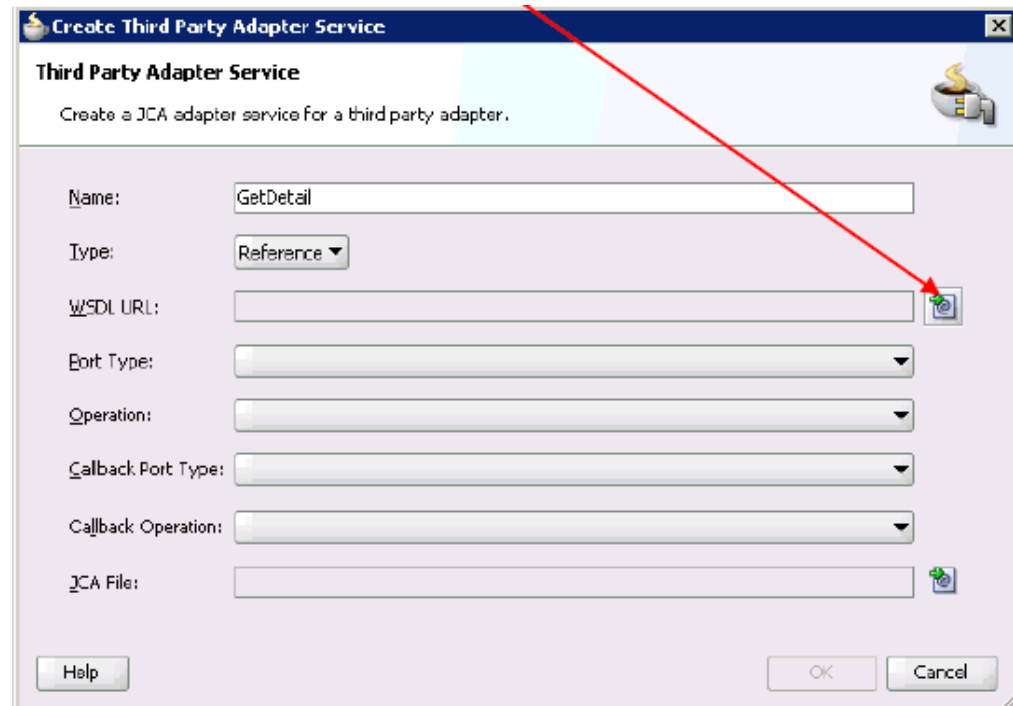
Configuring a Third Party Adapter Service Component

Perform the following steps to create a third party adapter service component:

1. Drag and drop the **Third Party Adapter** component from the Service Adapters pane to the External References pane, as shown in [Figure 7-4](#).

Figure 7-4 Third Party Adapter Component

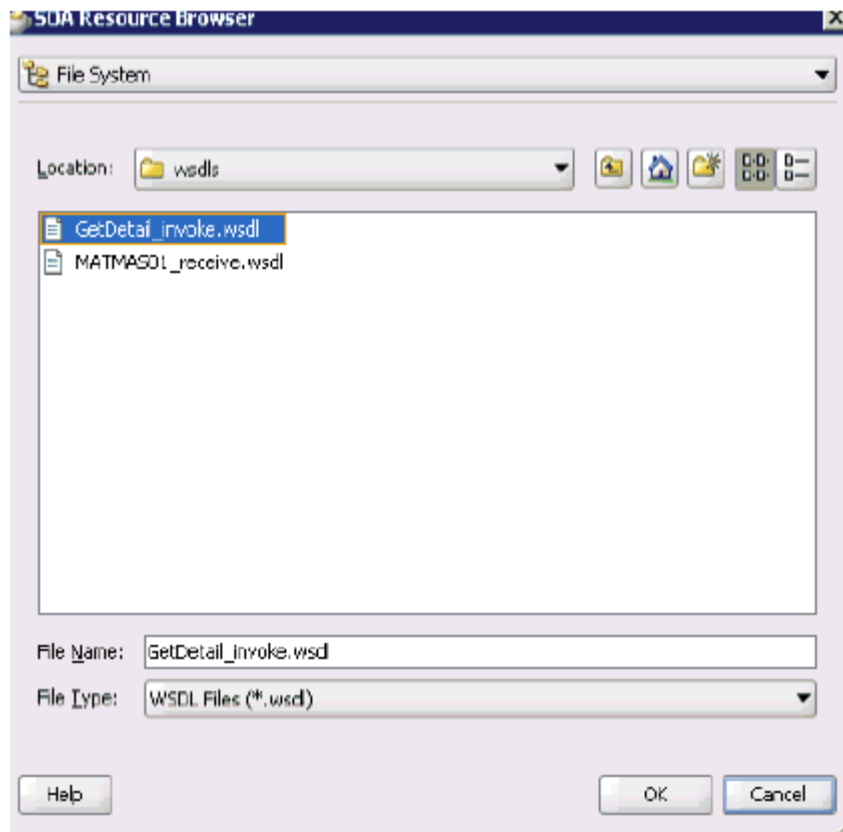
The Create Third Party Adapter Service dialog is displayed, as shown in [Figure 7-5](#).

Figure 7-5 Create Third Party Adapter Service Dialog

2. Enter a name for the third party adapter service.
3. Ensure that **Reference** is selected from the Type drop-down list (default).
4. Click the **Find existing WSDLs** icon, which is located to the right of the WSDL URL field.

The SOA Resource Browser dialog is displayed, as shown in [Figure 7-6](#).

Figure 7-6 SOA Resource Browser Dialog

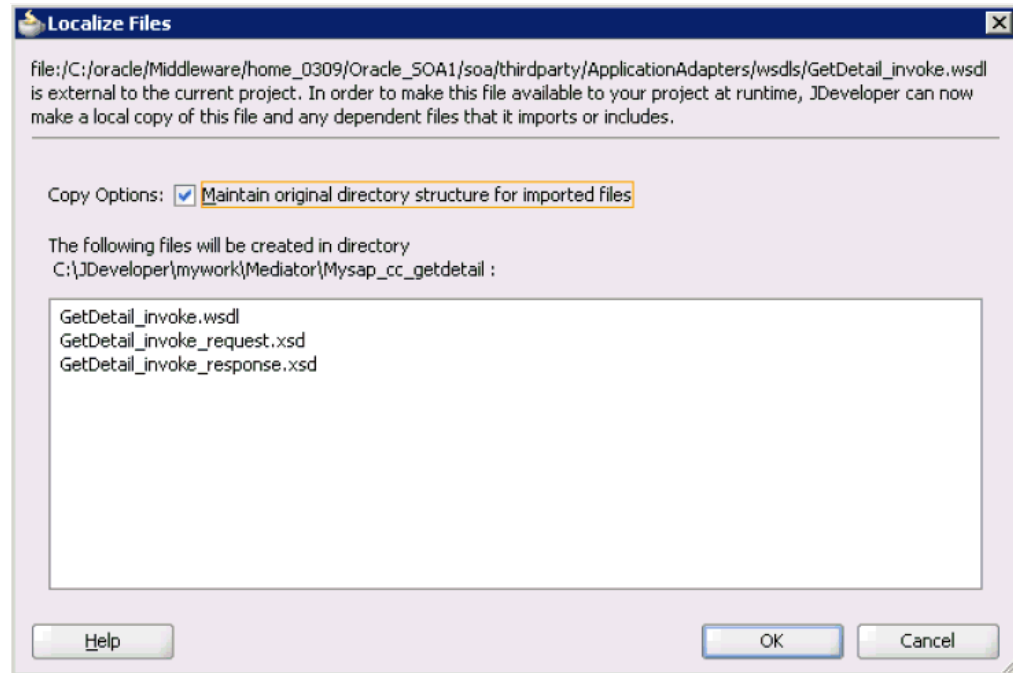


5. Browse and select an outbound WSDL file from the following directory:

<ADAPTER_HOME>\soa\thirdparty\ApplicationAdapters\wsdl's

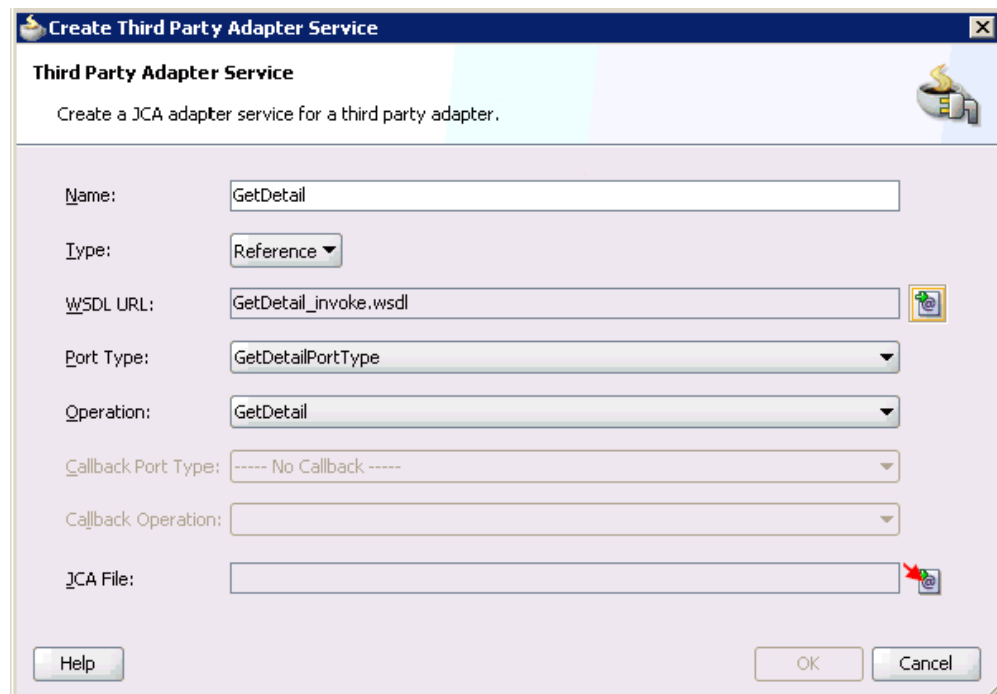
6. Click **OK**.

The Localize Files dialog is displayed, as shown in [Figure 7-7](#).

Figure 7-7 Localize Files Dialog**7. Click OK.**

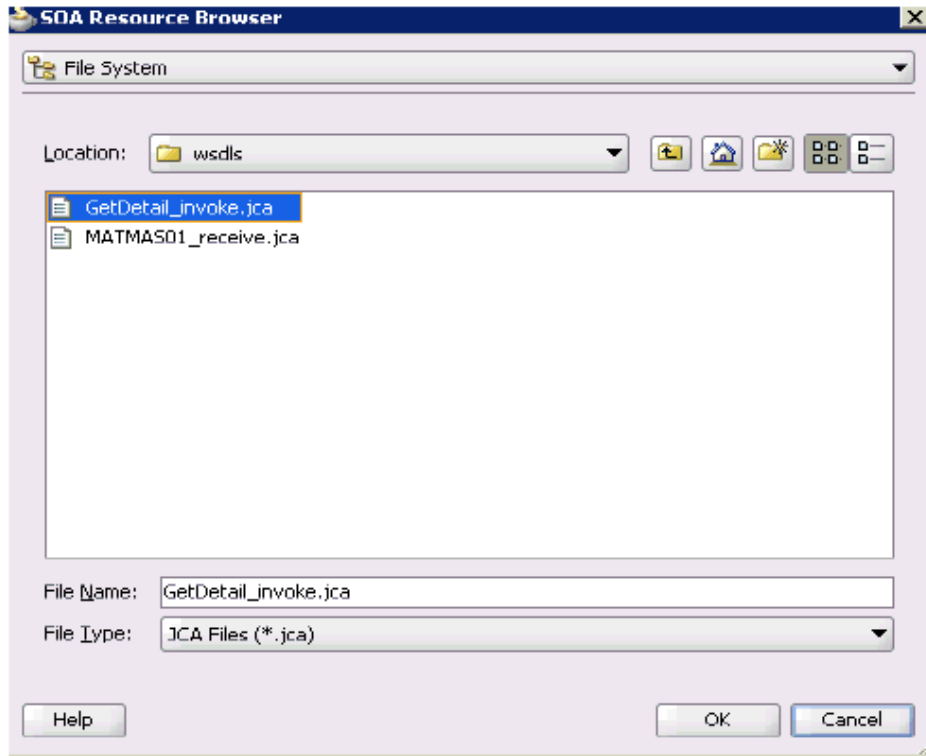
The outbound WSDL file and associated request and response XML schema files (.xsd) are imported to the project folder that has been created.

You are returned to the Create Third Party Adapter Service dialog, as shown in [Figure 7-8](#).

Figure 7-8 Create Third Party Adapter Service Dialog

8. Click the **Find JCA file** icon, which is located to the right of the JCA File field. The SOA Resource Browser dialog is displayed, as shown in [Figure 7-9](#).

Figure 7-9 SOA Resource Browser Dialog



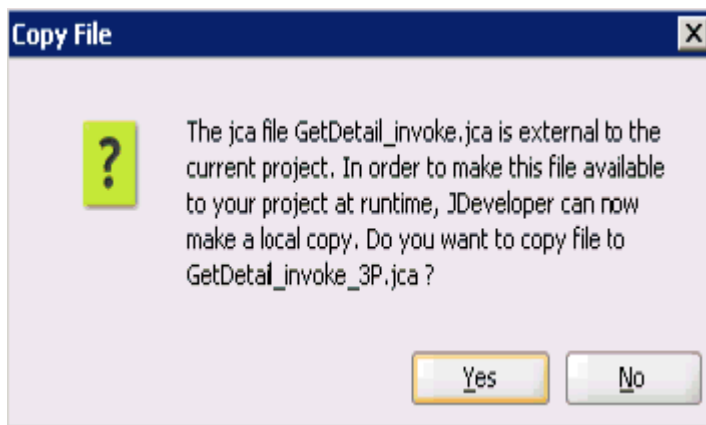
9. Browse and select the JCA properties file from the following directory:

`<ADAPTER_HOME>\soa\thirdparty\ApplicationAdapters\wsdls`

10. Click **OK**.

A Copy File confirmation message is displayed, as shown in [Figure 7-10](#).

Figure 7-10 Copy File Confirmation Message

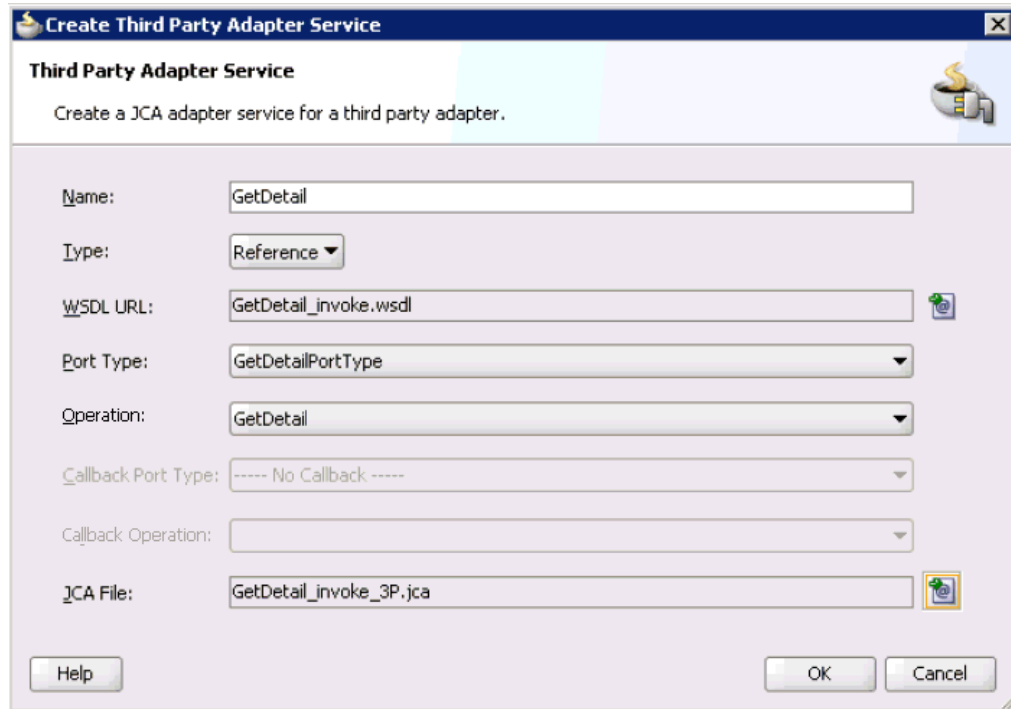


11. Click **Yes**.

A copy of the JCA properties file is made in the project folder.

You are returned to the Create Third Party Adapter Service dialog, as shown in [Figure 7-11](#).

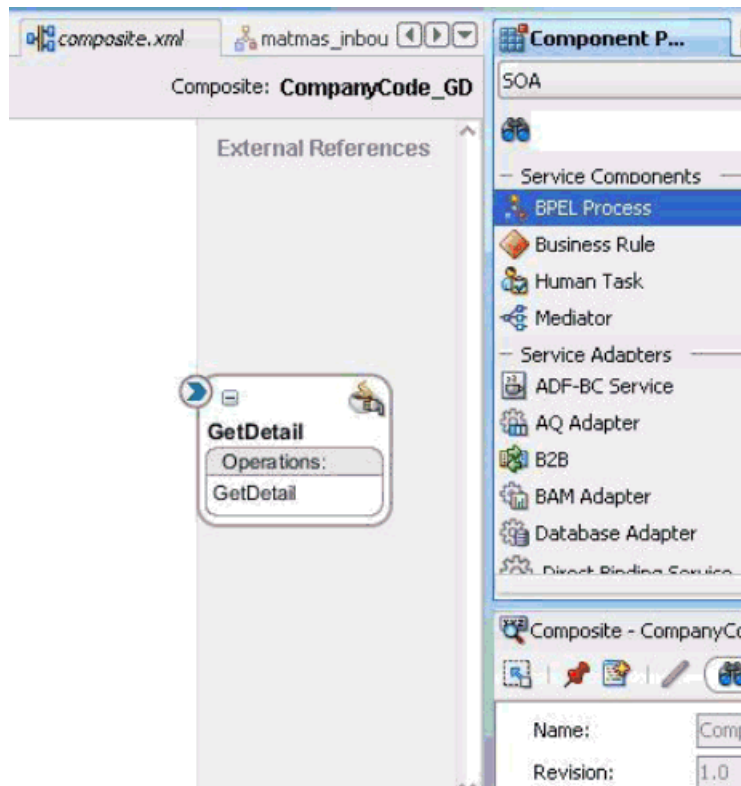
Figure 7-11 Create Third Party Adapter Service Dialog



12. Click **OK**.

The third party adapter service component (GetDetail) is created in the External References pane, as shown in [Figure 7-12](#).

Figure 7–12 Third Party Adapter Service Component (Get Detail)



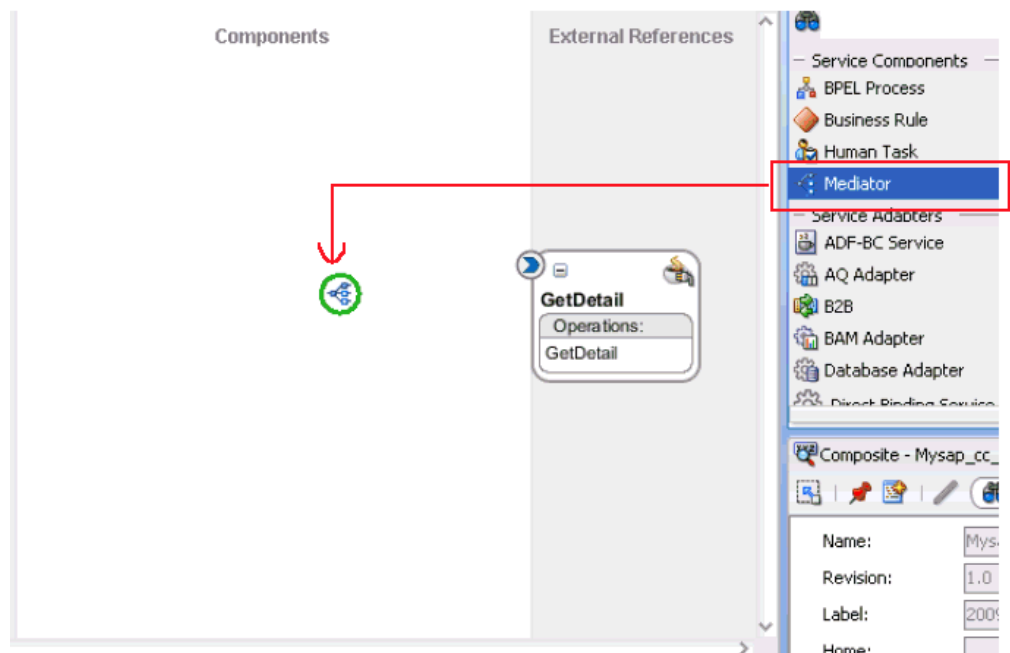
You are now ready to configure an outbound Mediator process component.

Configuring an Outbound Mediator Process Component

Perform the following steps to configure an outbound Mediator process component:

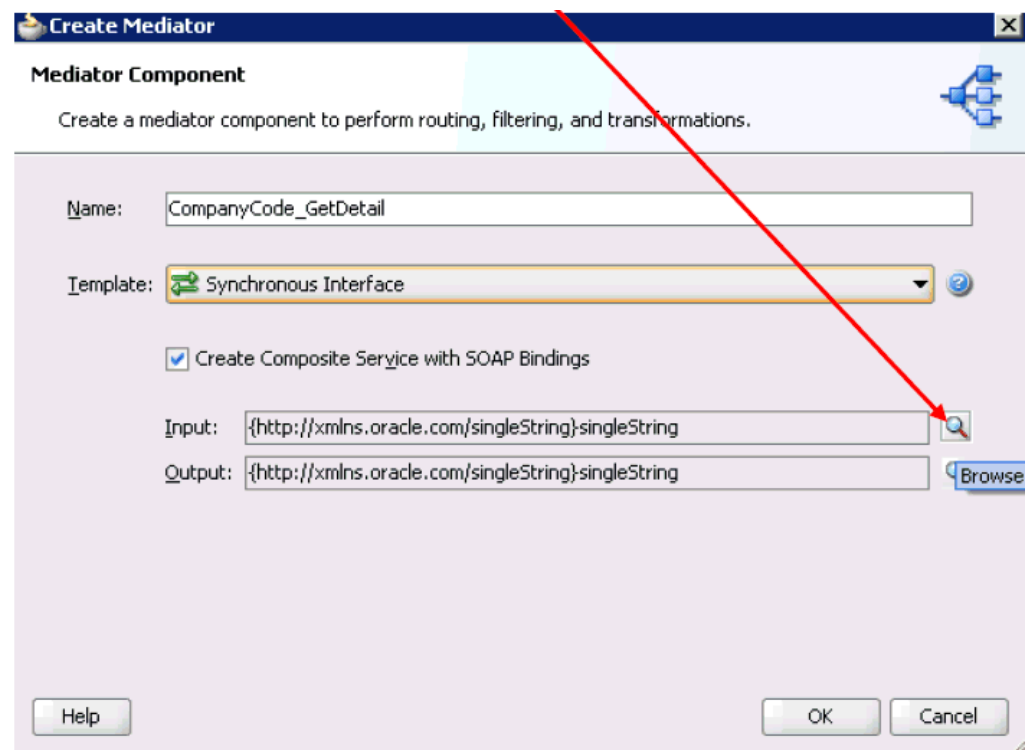
1. Drag and drop the **Mediator Process** component from the Service Components pane to the Components pane, as shown in [Figure 7–13](#).

Figure 7–13 Mediator Process Component



The Create Mediator dialog is displayed, as shown in Figure 7–14.

Figure 7–14 Create Mediator Dialog

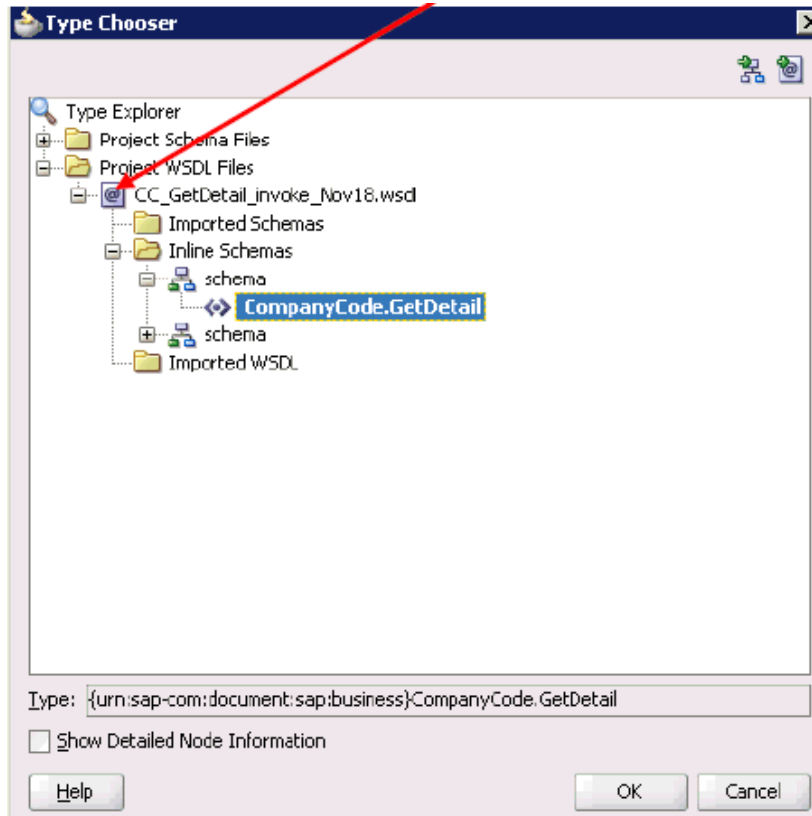


2. In the Name field, enter a name to identify the new outbound Mediator process component (for example, CompanyCode_GetDetail).
3. From the Template drop-down list, select **Synchronous Interface**.

4. Click the **Browse** icon, which is located to the right of the Input field to select the associated XML request schema file.

The Type Chooser dialog is displayed, as shown in [Figure 7-15](#).

Figure 7-15 Type Chooser Dialog



5. Expand **Project WSDL Files**, **CC_GetDetail_invoke_Nov18.wsdl**, **Inline Schemas**, and select **CompanyCode.GetDetail**.
6. Click **OK**.

You are returned to the Create Mediator dialog, as shown in [Figure 7-16](#).

Figure 7-16 Create Mediator Dialog

Create Mediator

Mediator Component

Create a mediator component to perform routing, filtering, and transformations.

Name:

Template:

Create Composite Service with SOAP Bindings

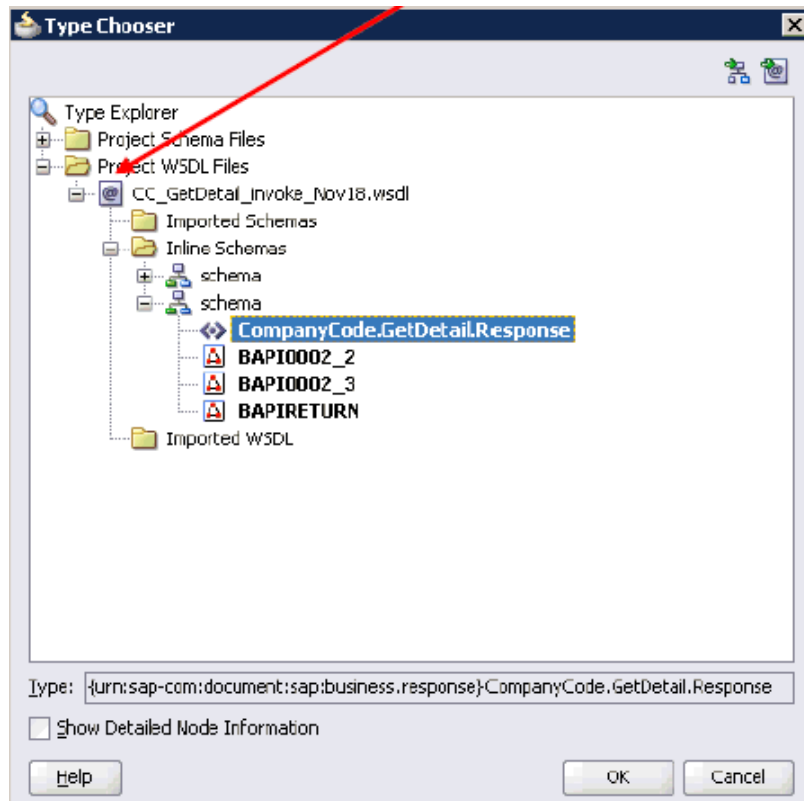
Input:

Output:

7. Click the **Browse** icon, which is located to the right of the Output field to select the associated XML response schema file.

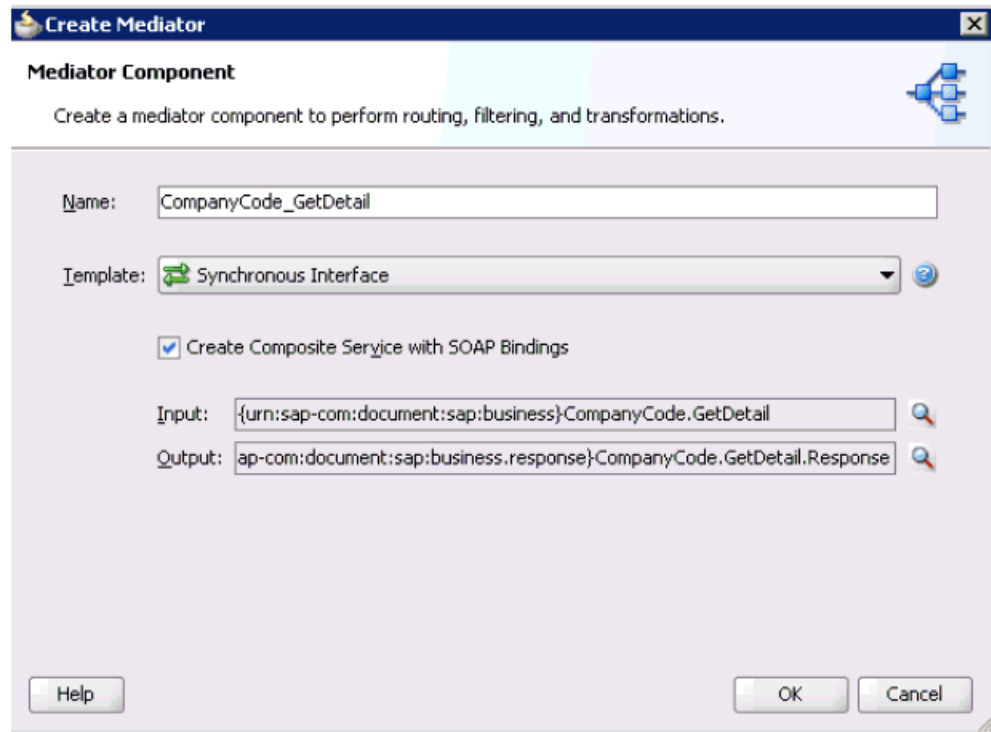
The Type Chooser dialog is displayed, as shown in [Figure 7-17](#).

Figure 7–17 Type Chooser Dialog

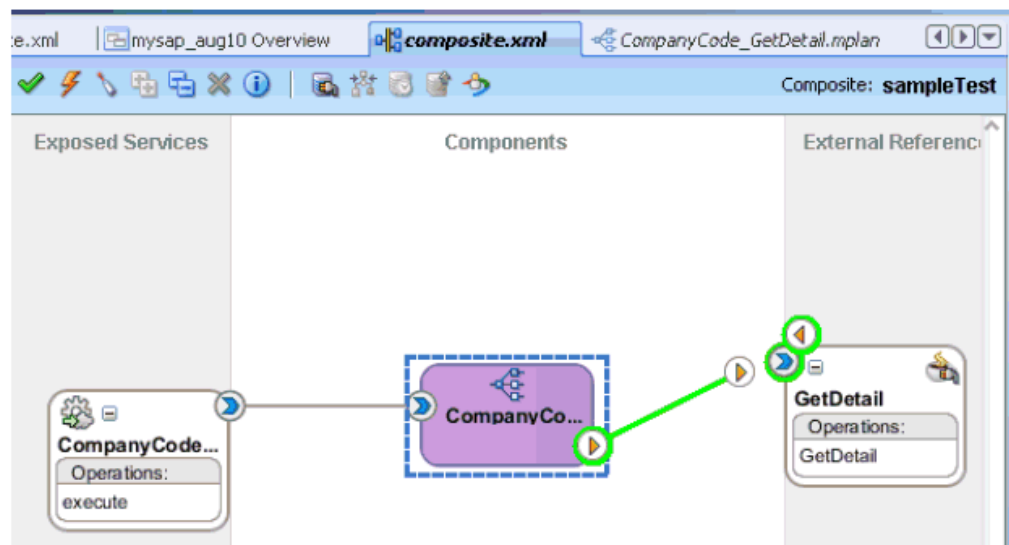


8. Expand **Project WSDL Files**, **CC_GetDetail_invoke_Nov18.wsdl**, **Inline Schemas**, **schema**, and select **CompanyCode.GetDetail.Response**.
9. Click **OK**.

You are returned to the Create Mediator dialog, as shown in [Figure 7–18](#).

Figure 7–18 Create Mediator Dialog

10. Click OK.
11. Create a connection between the outbound Mediator process component (CompanyCode_GetDetail) and the third party adapter service component (GetDetail), as shown in [Figure 7–19](#).

Figure 7–19 Created Connection

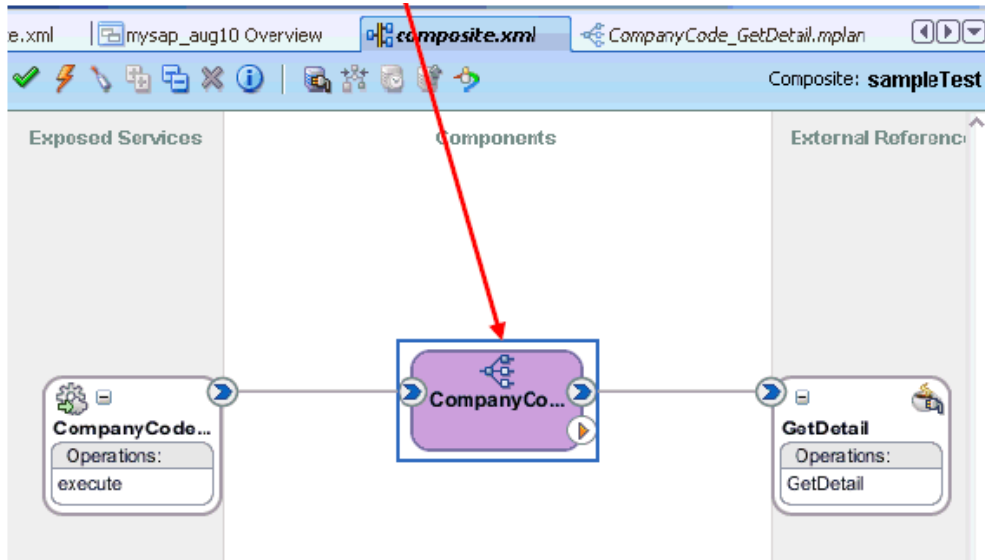
You are now ready to configure the routing rules.

Configuring the Routing Rules

Perform the following steps to configure routing rules for the Mediator outbound process component:

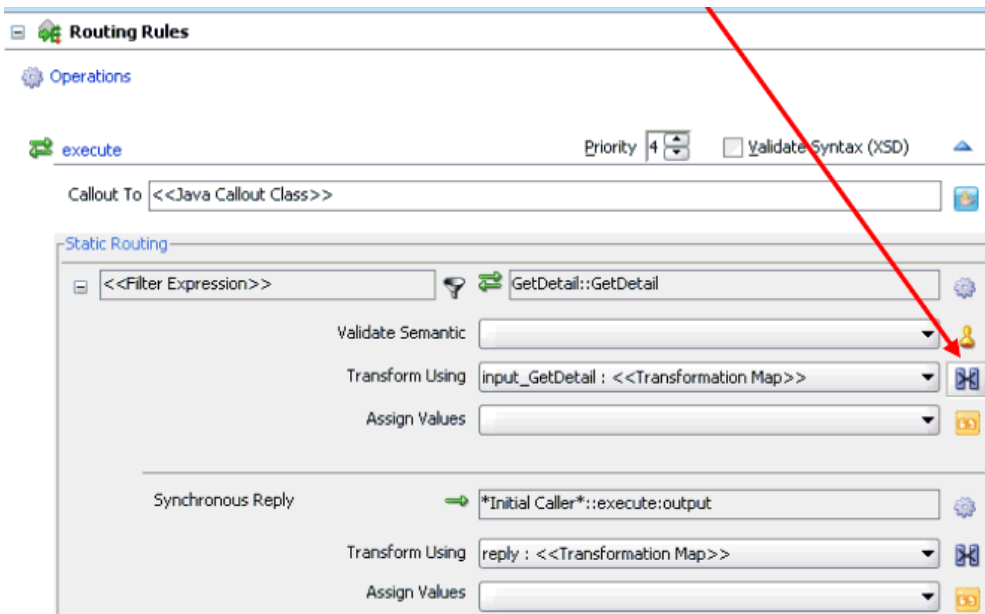
1. Double-click the outbound Mediator process component (CompanyCode_GetDetail) in the Components pane, as shown in [Figure 7-20](#).

Figure 7-20 Mediator Process Component



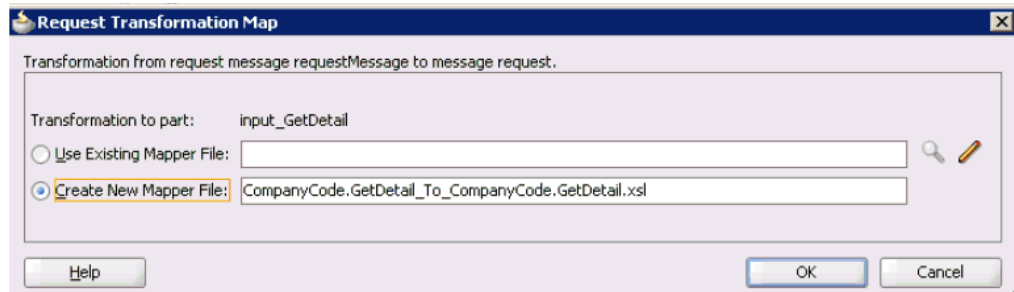
The Routing Rules dialog is displayed, as shown in [Figure 7-21](#).

Figure 7-21 Routing Rules Dialog



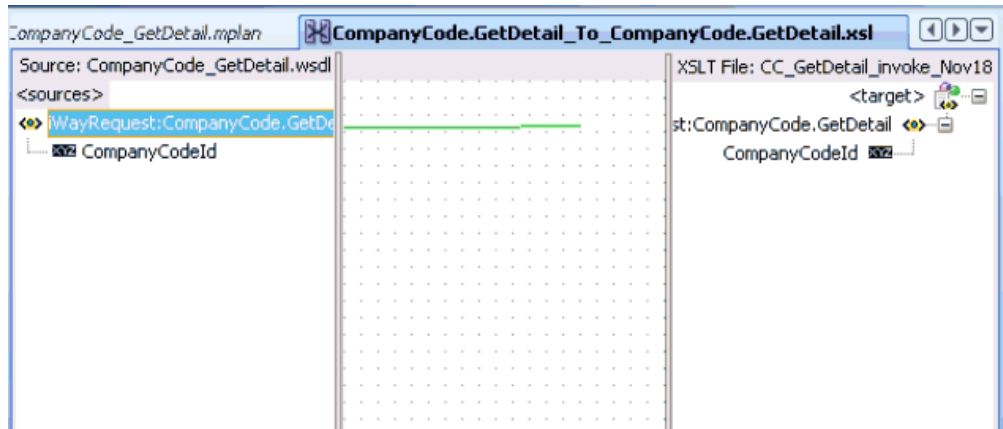
2. In the <<Filter Expression>> area, click the icon to the right of the Transform Using field.

The Request Transformation Map dialog is displayed, as shown in [Figure 7-22](#).

Figure 7–22 Request Transformation Map Dialog

3. Select the **Create New Mapper File** option and click **OK**.

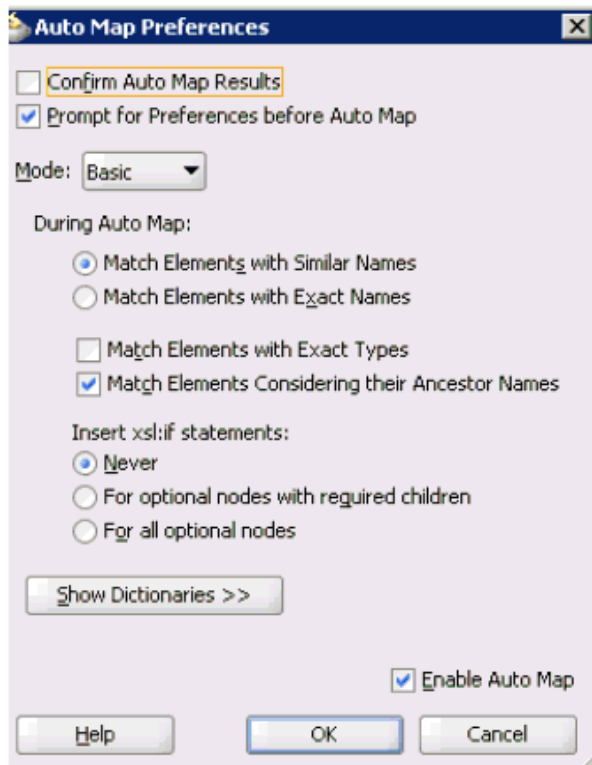
The following mapping page is displayed, as shown in [Figure 7–23](#).

Figure 7–23 Mapping Page

4. Map the **iWayRequest:CompanyCode.GetDetail** source element to the **iWayRequest:CompanyCode.GetDetail** target element.

The Auto Map Preferences dialog is displayed, as shown in [Figure 7–24](#).

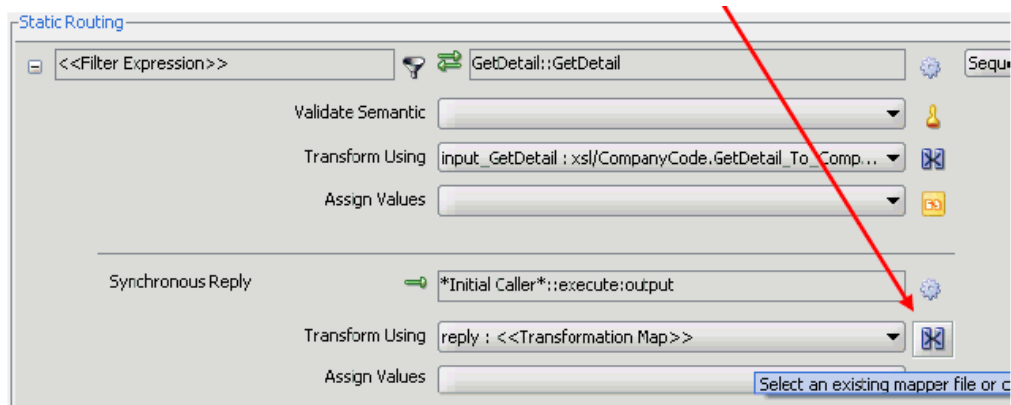
Figure 7-24 Auto Map Preferences Dialog



5. Retain the default values and click **OK**.

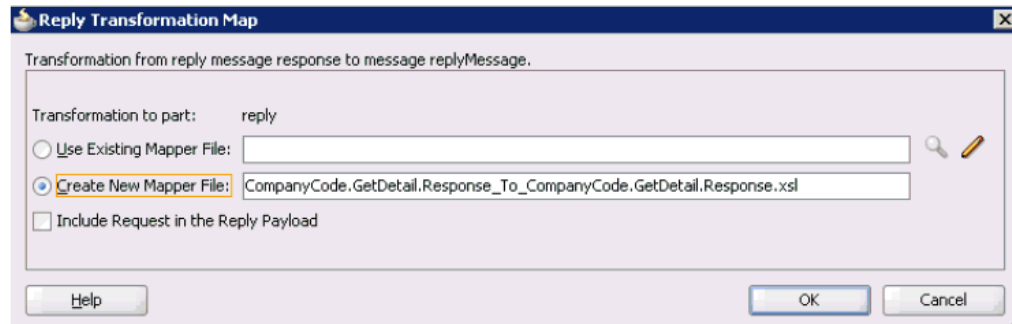
You are returned to the Routing Rules dialog, as shown in [Figure 7-25](#).

Figure 7-25 Routing Rules Dialog



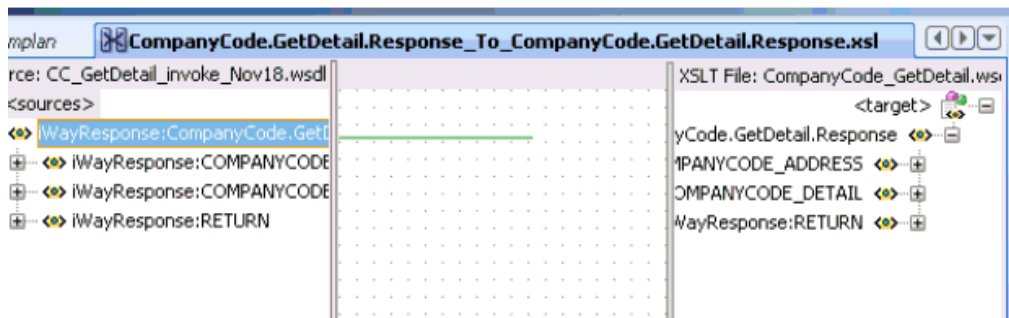
6. In the Synchronous Reply area, click the icon to the right of the Transform Using field.

The Reply Transformation Map dialog is displayed, as shown in [Figure 7-26](#).

Figure 7–26 Reply Transformation Map Dialog

7. Select the **Create New Mapper File** option and click **OK**.

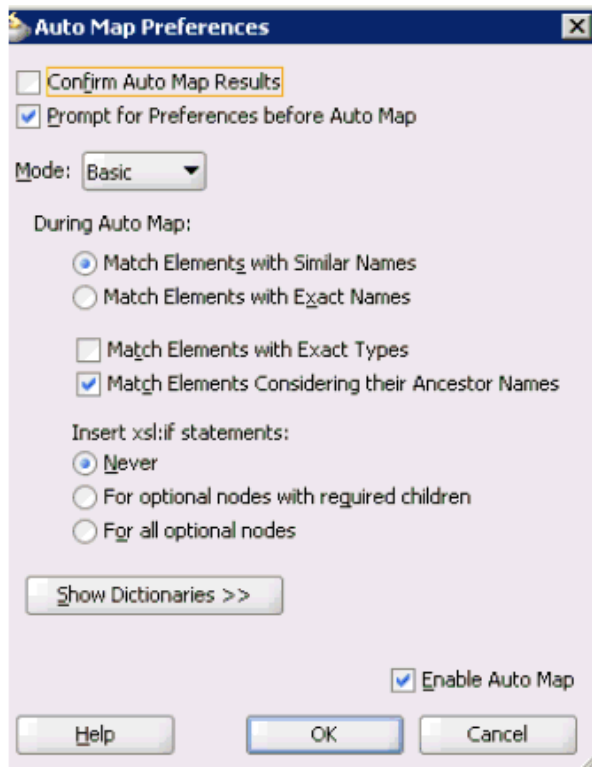
A mapping page is displayed, as shown in [Figure 7–27](#).

Figure 7–27 Mapping Page

8. Map the **iWayResponse:CompanyCode.GetDetail.Response** source element to the **iWayResponse:CompanyCode.GetDetail.Response** target element.

The Auto Map Preferences dialog is displayed, as shown in [Figure 7–28](#).

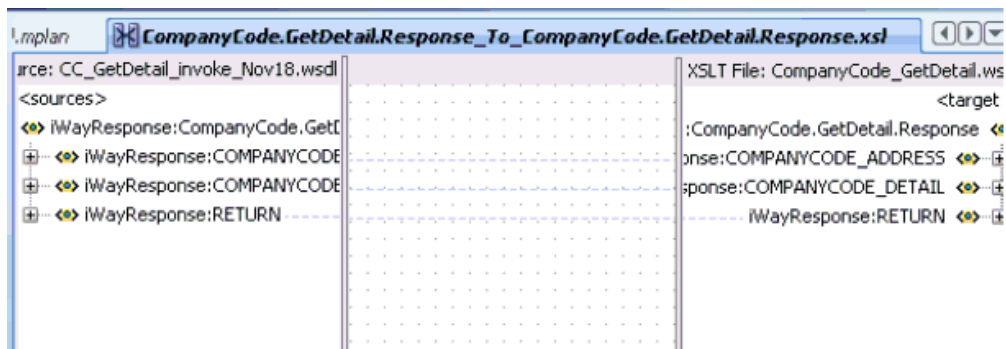
Figure 7–28 Auto Map Preferences Dialog



9. Retain the default values and click **OK**.

The mapping is completed, as shown in [Figure 7–29](#).

Figure 7–29 Completed Mapping



10. Click the **Save All** icon in the menu bar to save the new outbound Mediator process component that was configured.

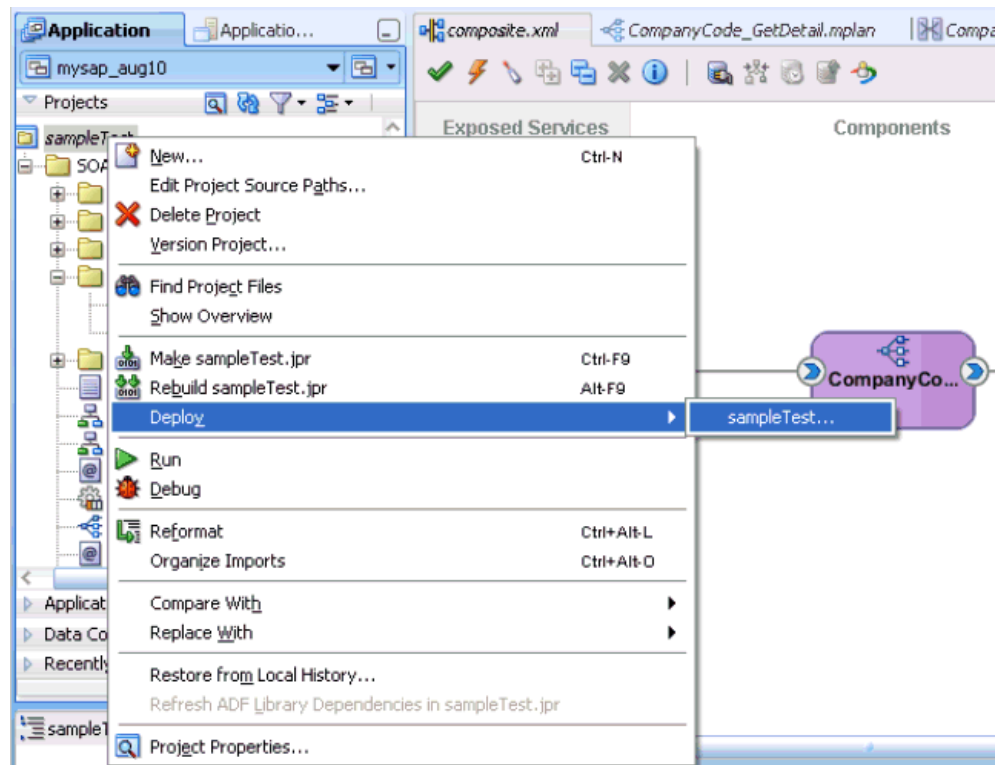
You are now ready to deploy the Mediator outbound process.

7.2.3 Deploying the Mediator Outbound Process

Perform the following steps to deploy the Mediator outbound process.

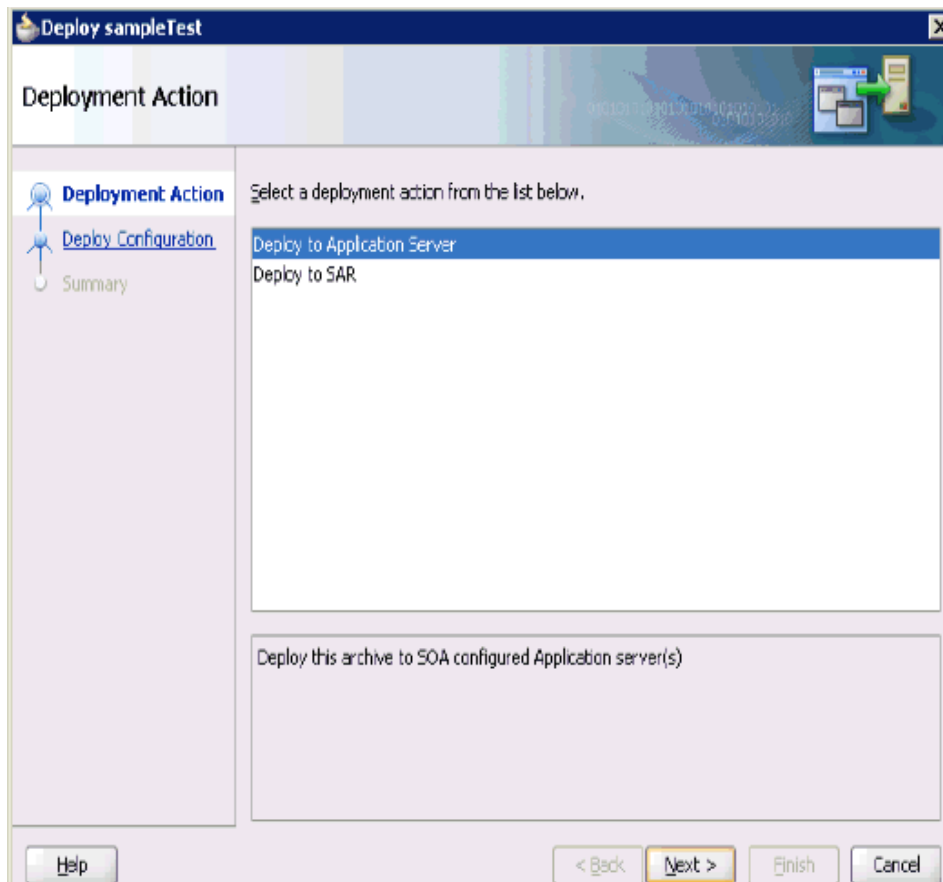
1. Right-click the project name in the left pane (for example, **sampleTest**), select **Deploy** from the context menu, and click **sampleTest**, as shown in [Figure 7–30](#).

Figure 7-30 SampleTest Option



The Deployment Action page is displayed, as shown in [Figure 7-31](#).

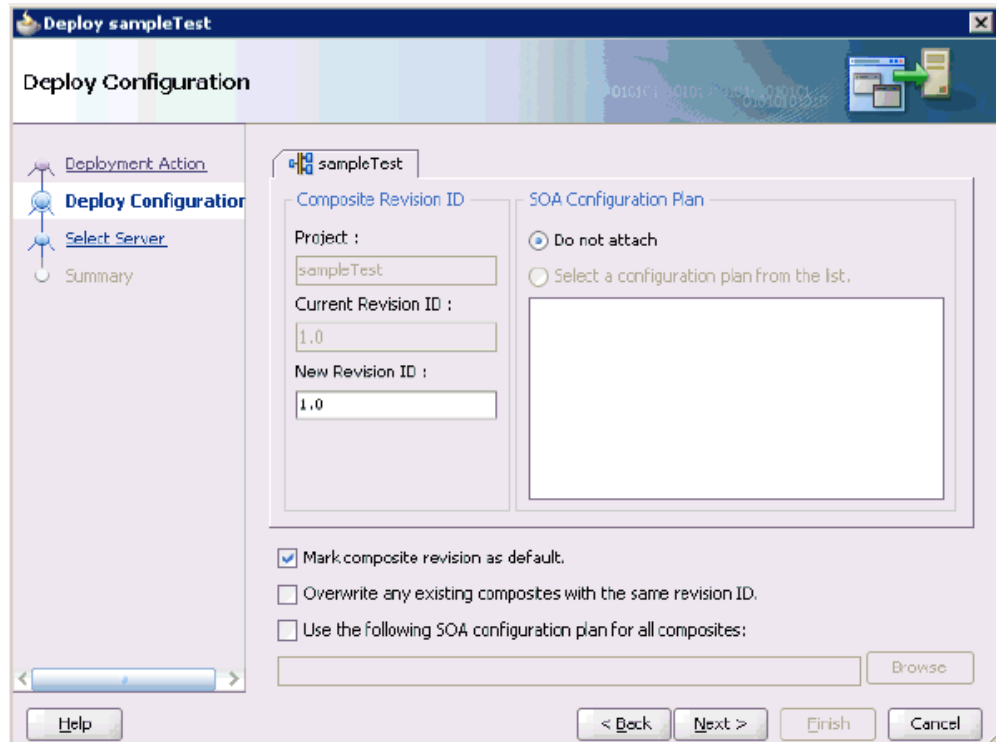
Figure 7-31 Deployment Action



2. Ensure that **Deploy to Application Server** is selected.
3. Click **Next**.

The Deploy Configuration page is displayed, as shown in [Figure 7-32](#).

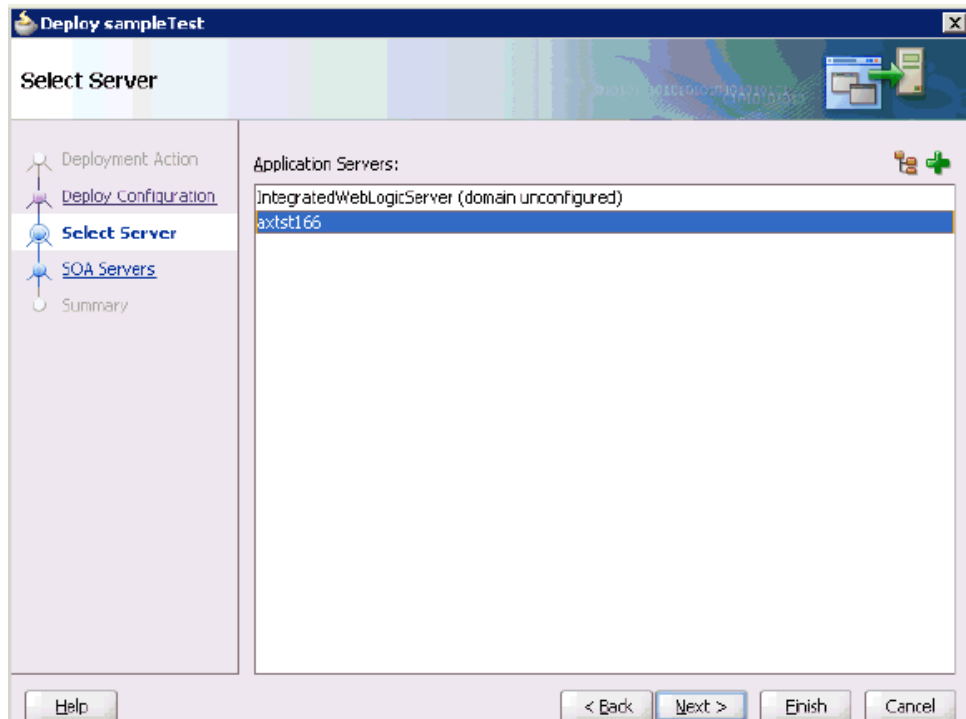
Figure 7–32 Deploy Configuration Page



4. Leave the default values selected and click **Next**.

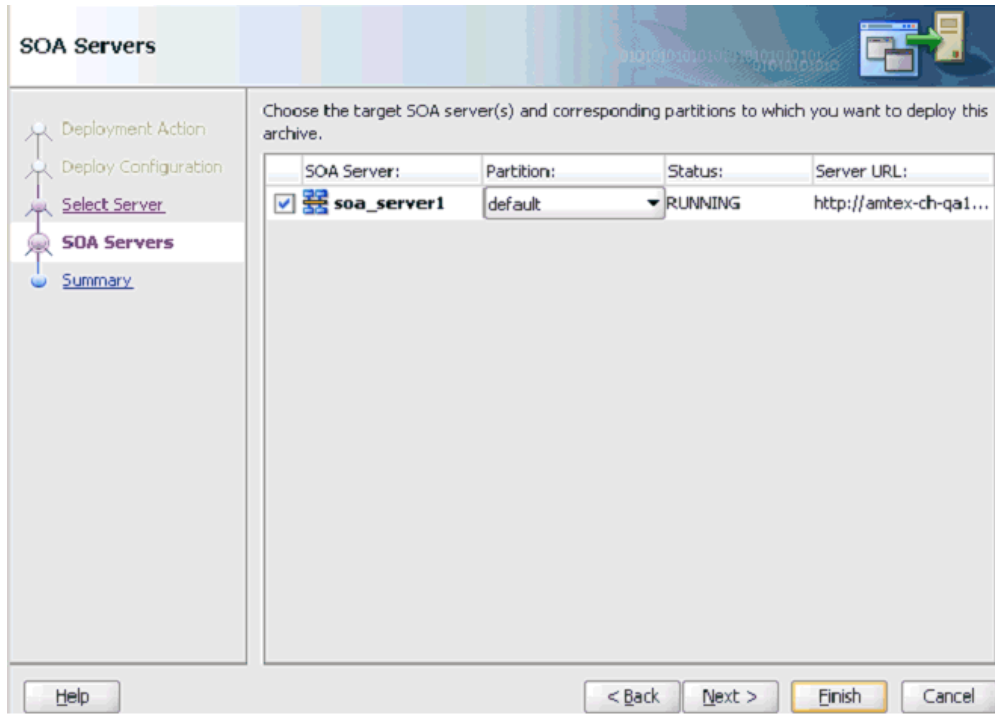
The Select Server page is displayed, as shown in [Figure 7–33](#).

Figure 7–33 Select Server Page

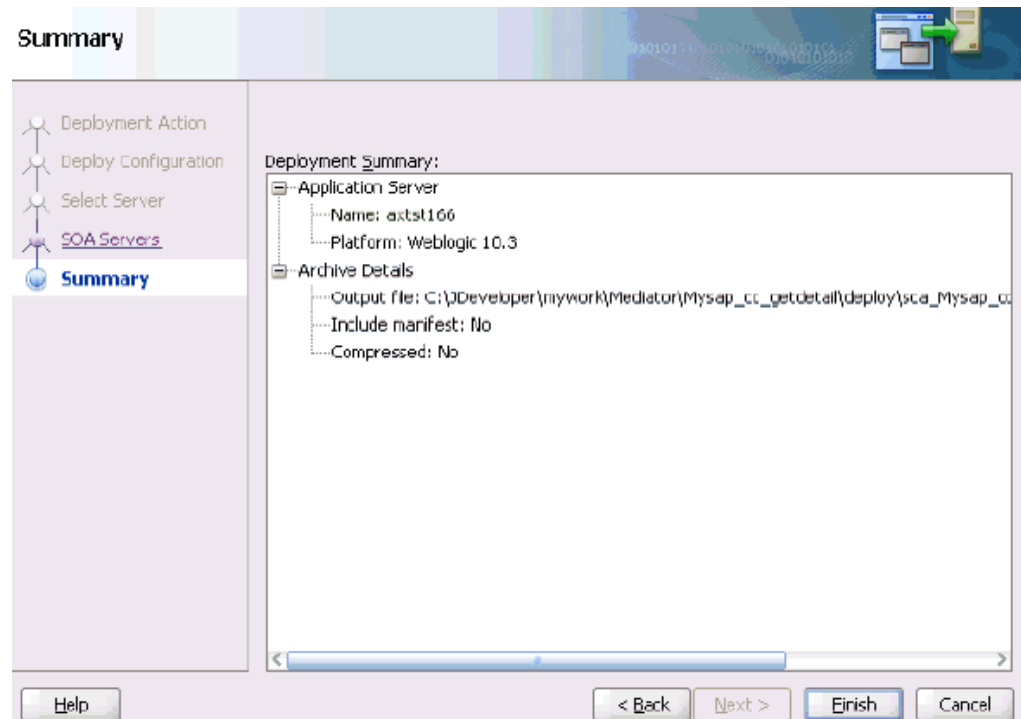


5. Select an available application server that was configured and click **Next**.
The SOA Servers page is displayed, as shown in [Figure 7-34](#).

Figure 7-34 SOA Servers Page

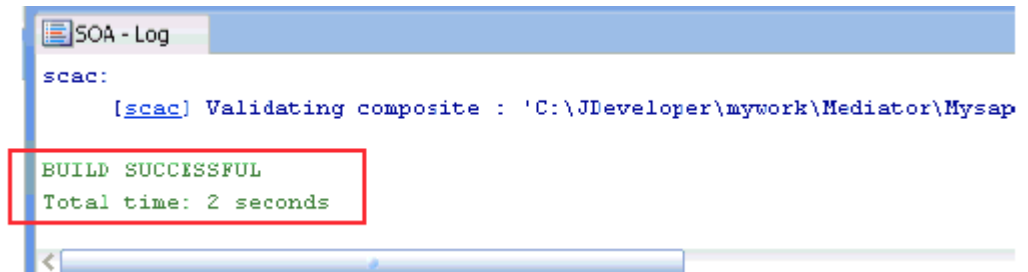


6. Select a target SOA server and click **Next**.
The Summary page is displayed, as shown in [Figure 7-35](#).

Figure 7–35 Summary Page

7. Review and verify all the available deployment information for your project and click **Finish**.

The process is deployed successfully, as shown in [Figure 7–36](#).

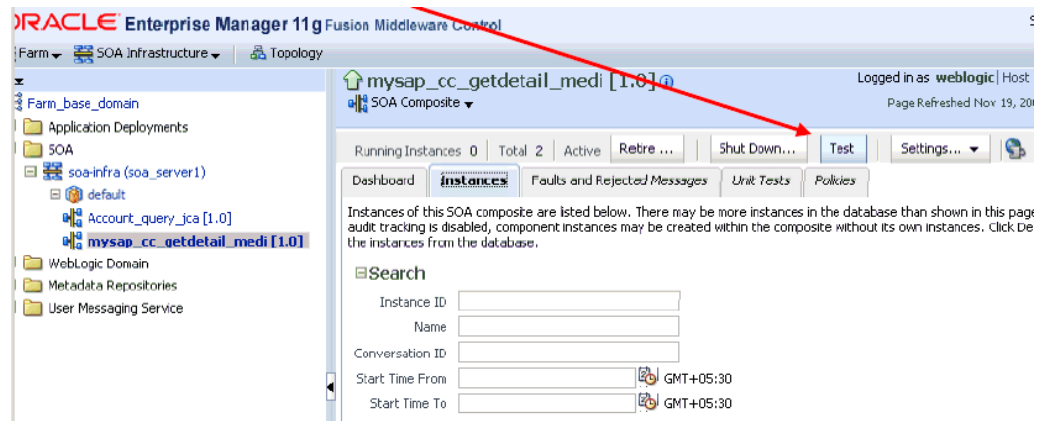
Figure 7–36 Successful Deployment Message

7.2.4 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.

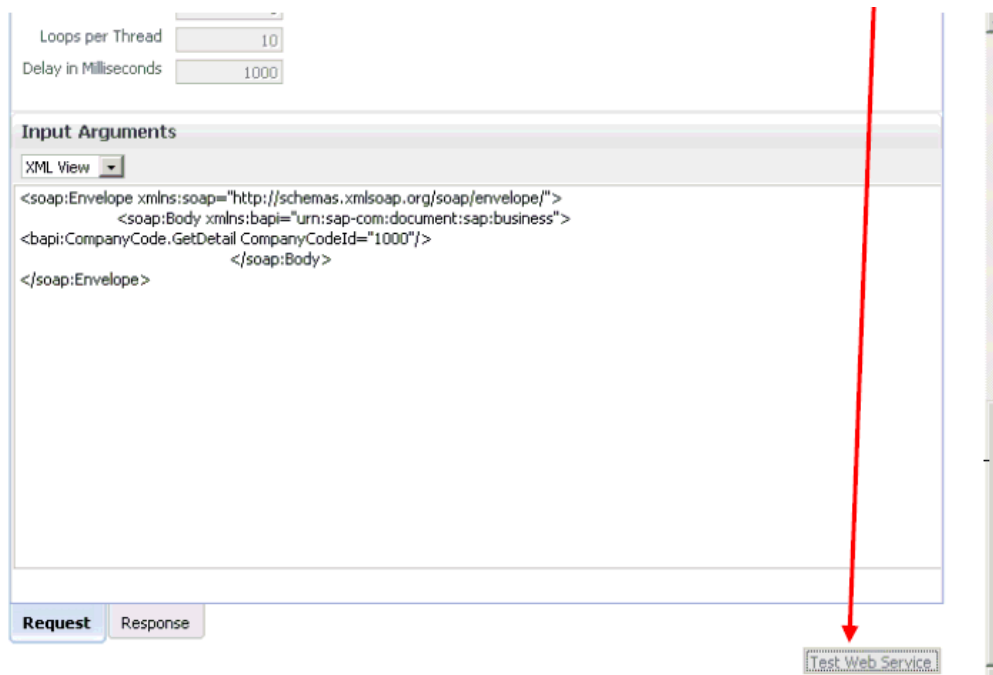
1. Logon to the Oracle Enterprise Manager console, as shown in [Figure 7–37](#).

Figure 7–37 Oracle Enterprise Manager Console



2. Expand your domain in the left pane followed by the **SOA** folder.
3. Select an available project in the left pane.
4. Click **Test**.
5. Click the **Request** tab, as shown in [Figure 7–38](#).

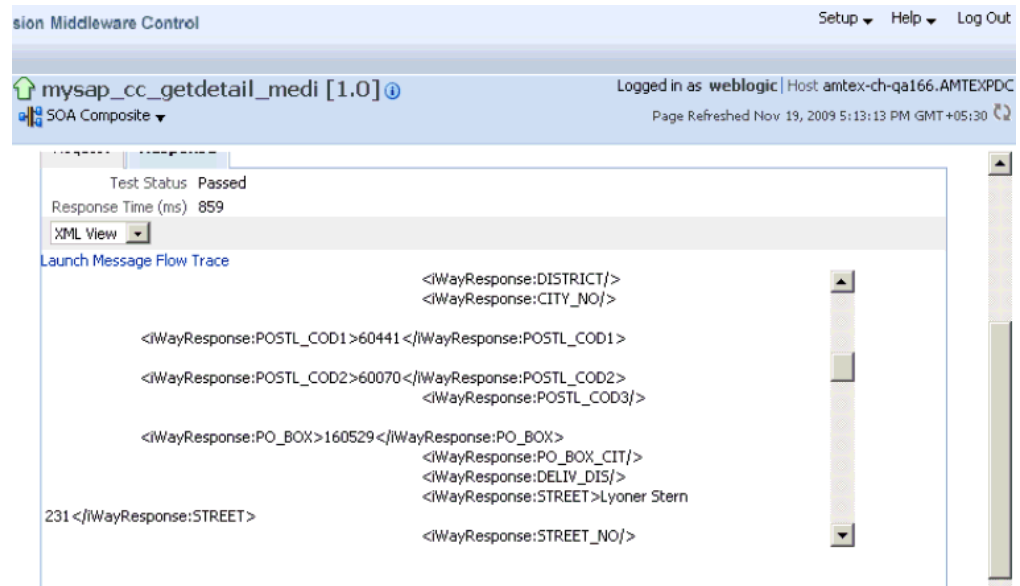
Figure 7–38 Request Tab



6. Provide an appropriate input value in the Input Arguments area and click **Test Web Service**.

The output response is received in the Oracle Enterprise Manager console, as shown in [Figure 7–39](#).

Figure 7–39 Oracle Enterprise Manager Console



7.3 Configuring a Mediator Inbound Process

The following example describes how to configure a Mediator inbound process to your SAP R/3 system, using a Mediator project in Oracle JDeveloper.

Samples have been provided for this use case scenario under the *etc/sample* folder of the Application Adapters installation.

Prerequisites

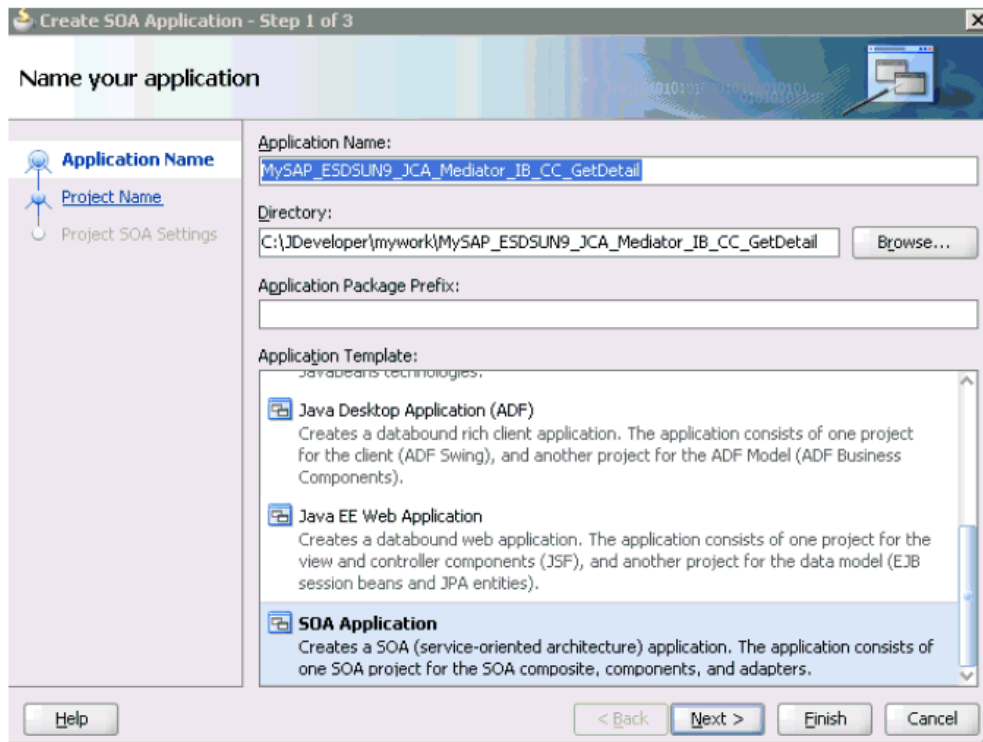
Before you design a Mediator inbound process, you must generate the respective WSDL file using Application Explorer. For more information, see ["Generating WSDL for Event Integration"](#) on page 6-41.

7.3.1 Creating an Empty Composite for SOA

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

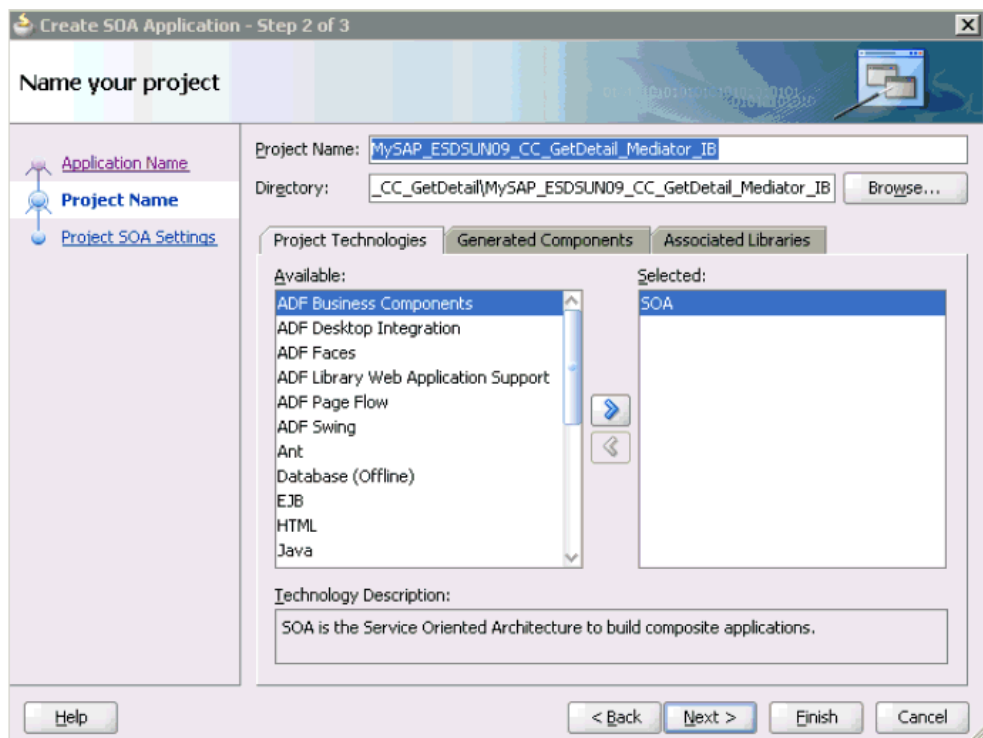
1. Create a new SOA application.
2. Enter a name for the new SOA Application and click **Next**, as shown in [Figure 7–40](#).

Figure 7–40 Name Your Application Page



The Name your project page is displayed, as shown in [Figure 7–41](#).

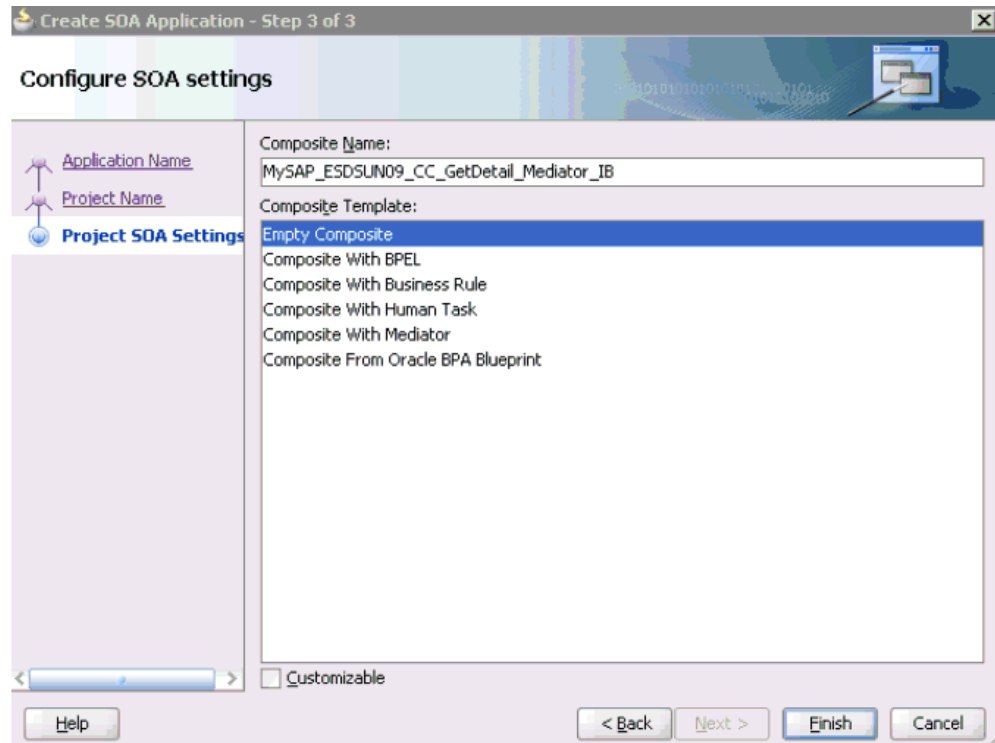
Figure 7–41 Name Your Project Page



3. Enter a project name and click **Next**.

The Configure SOA settings page is displayed, as shown in [Figure 7-42](#).

Figure 7-42 Configure SOA Settings Page



4. From the Composite Template list, select **Empty Composite** and click **Finish**.

7.3.2 Defining a Mediator Inbound Process

This section describes how to define a Mediator inbound process, which consists of the following stages:

1. Configuring a Third Party Adapter Service Component
2. Configuring an Inbound Mediator Process Component With a File Adapter
3. Configuring the Routing Rules

Configuring a Third Party Adapter Service Component

Perform the following steps to create a third party adapter service component:

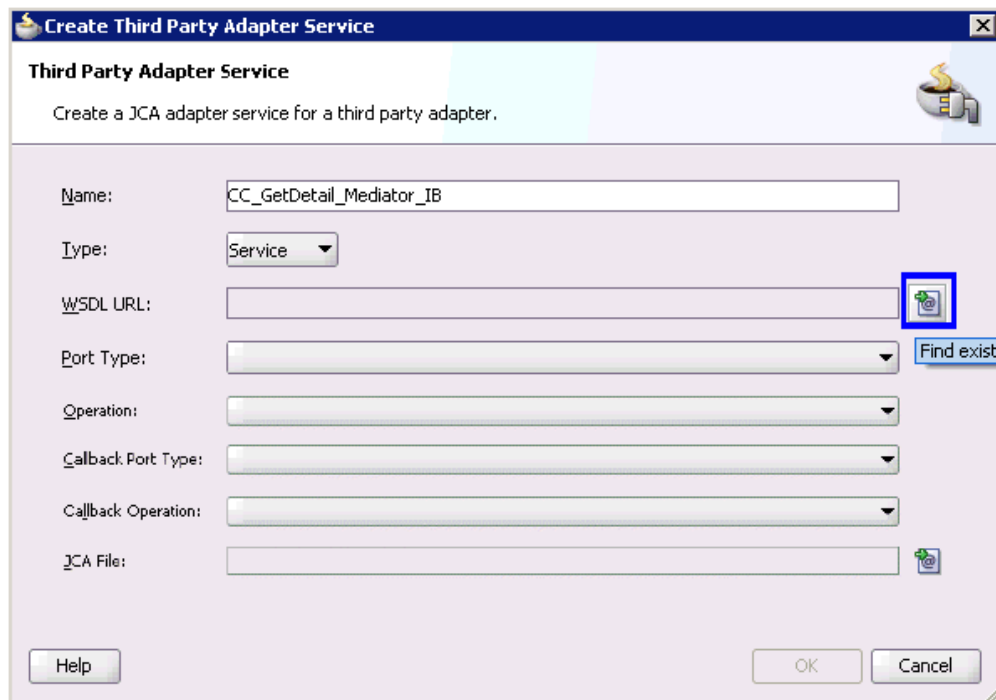
1. Drag and drop the **Third Party Adapter** component from the Service Adapters pane to the Exposed Services pane, as shown in [Figure 7-43](#).

Figure 7-43 Third Party Adapter Component



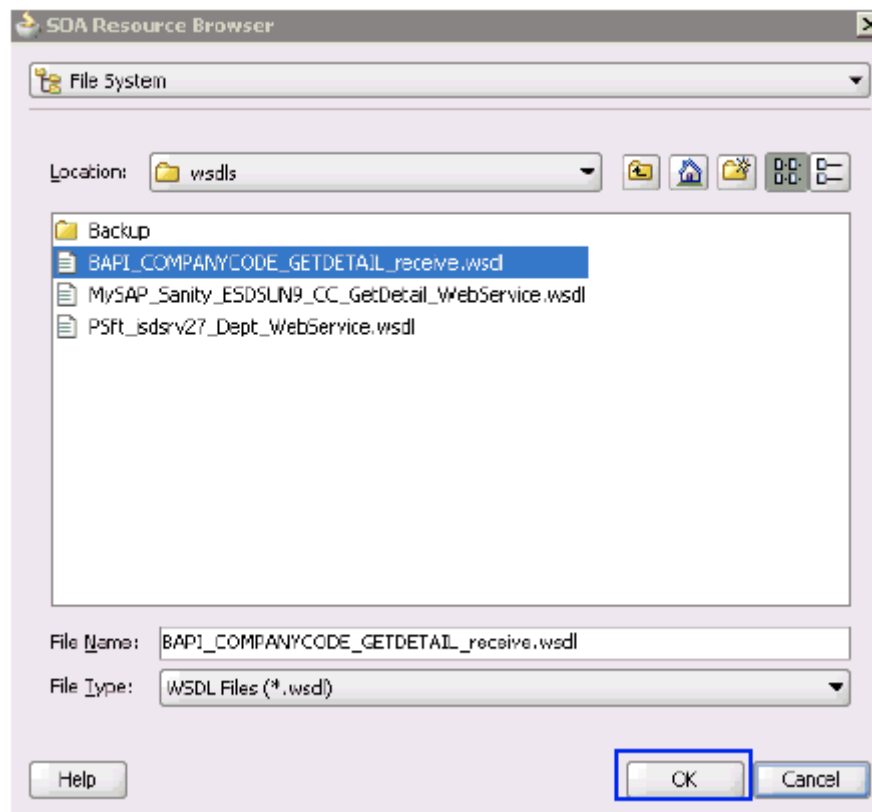
The Create Third Party Adapter Service dialog is displayed, as shown in [Figure 7-44](#).

Figure 7-44 Create Third Party Adapter Service Dialog



2. Enter a name for the third party adapter service (for example, CC_GetDetail_Mediator_IB).
3. Ensure that **Service** is selected from the Type drop-down list (default).
4. Click the **Find existing WSDLs** icon, which is located to the right of the WSDL URL field.

The SOA Resource Browser dialog is displayed, as shown in [Figure 7-45](#).

Figure 7–45 SOA Resource Browser Dialog

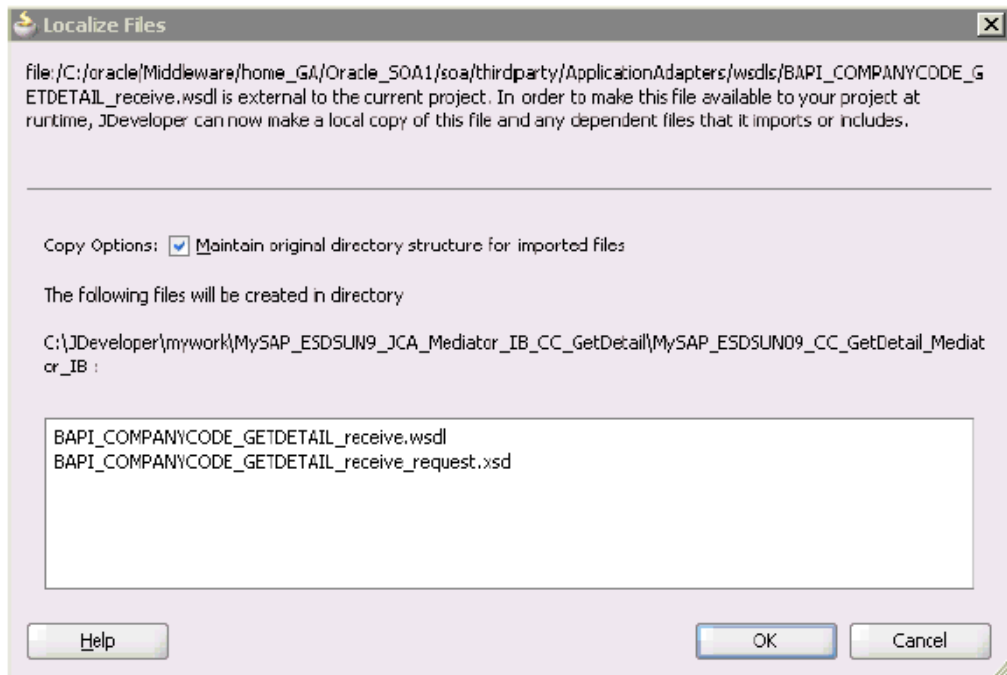
5. Browse and select an inbound WSDL file from the following directory:

<ADAPTER_HOME>\soa\thirdparty\ApplicationAdapters\wsdls

6. Click **OK**.

The Localize Files dialog is displayed, as shown in [Figure 7–46](#).

Figure 7–46 Localize Files Dialog

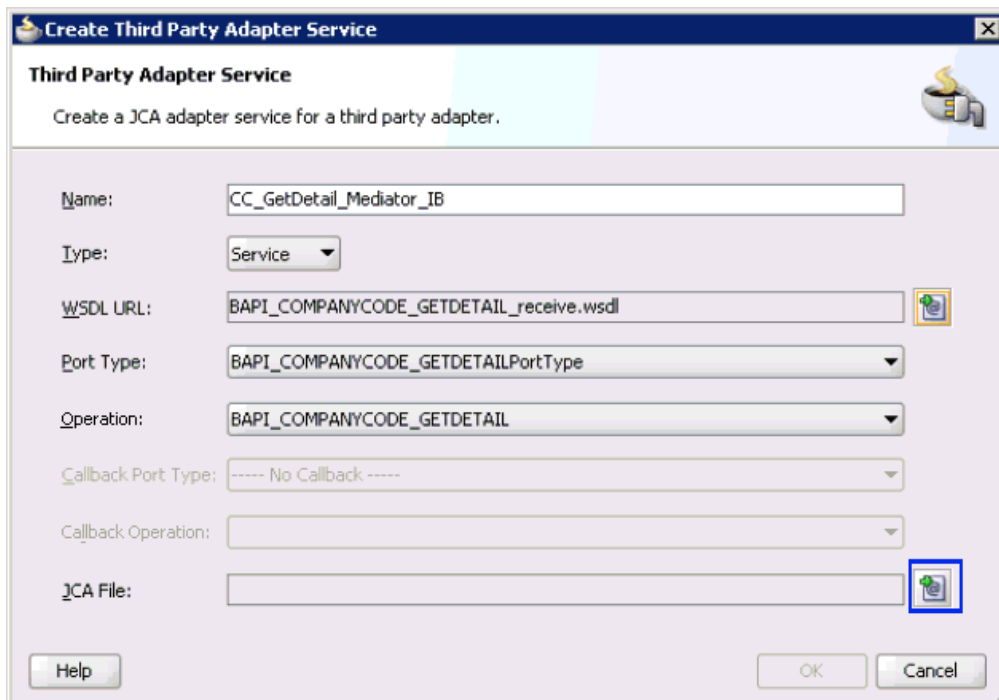


7. Click **OK**.

The inbound WSDL file and associated receive/request schema file (.xsd) are imported to the project folder that has been created.

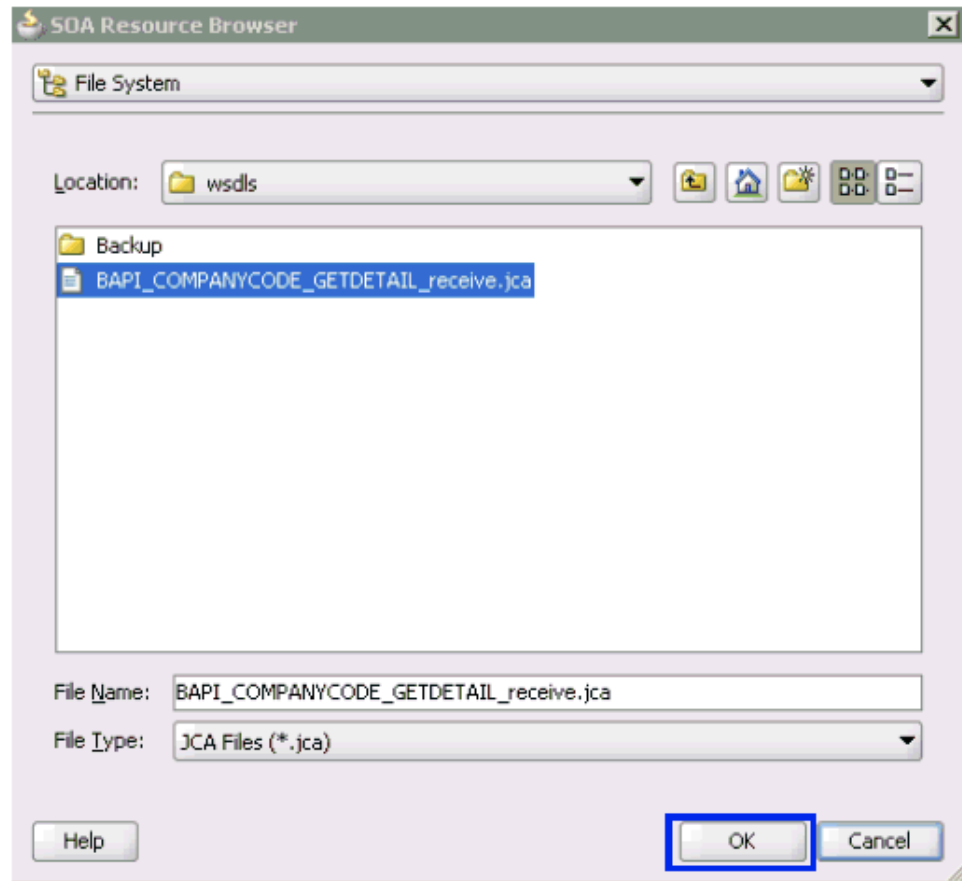
You are returned to the Create Third Party Adapter Service dialog, as shown in [Figure 7–47](#).

Figure 7–47 Create Third Party Adapter Service Dialog



8. Click the **Find JCA file** icon, which is located to the right of the JCA File field.
The SOA Resource Browser dialog is displayed, as shown in [Figure 7-48](#).

Figure 7-48 SOA Resource Browser Dialog



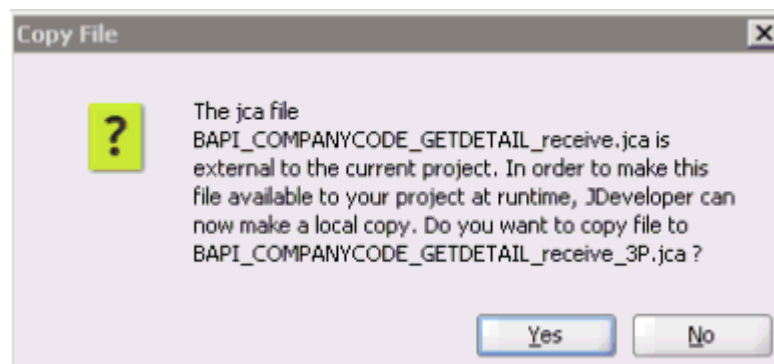
9. Browse and select the JCA properties file from the following directory:

```
<ADAPTER_HOME>\soa\thirdparty\ApplicationAdapters\wsdls
```

10. Click **OK**.

The following message is displayed, as shown in [Figure 7-49](#).

Figure 7-49 Copy File Confirmation Message

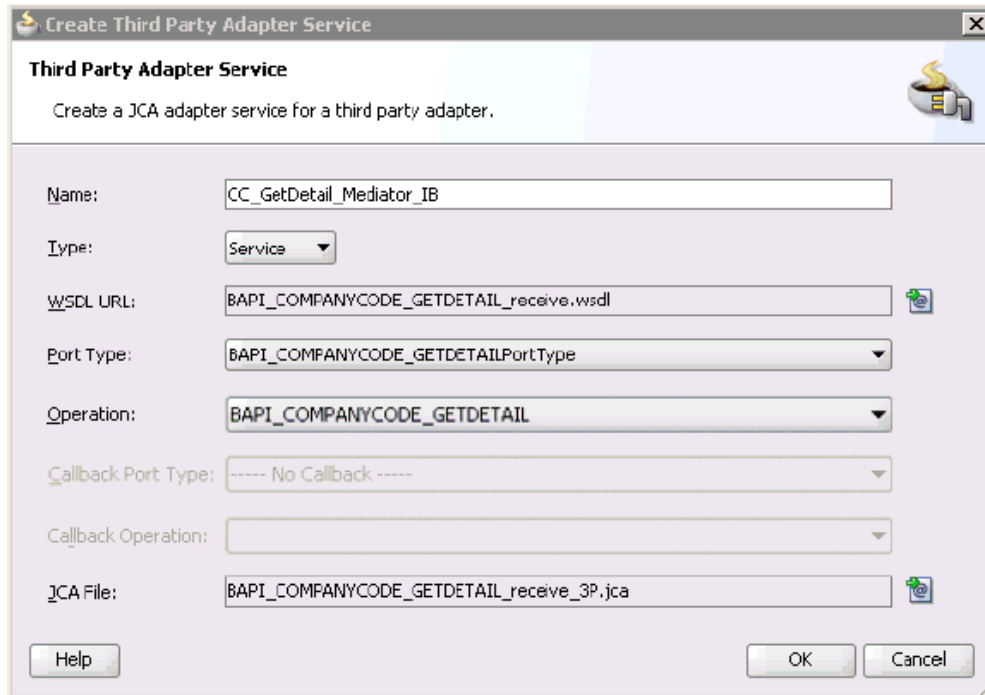


11. Click **Yes**.

A copy of the JCA properties file is made in the project folder.

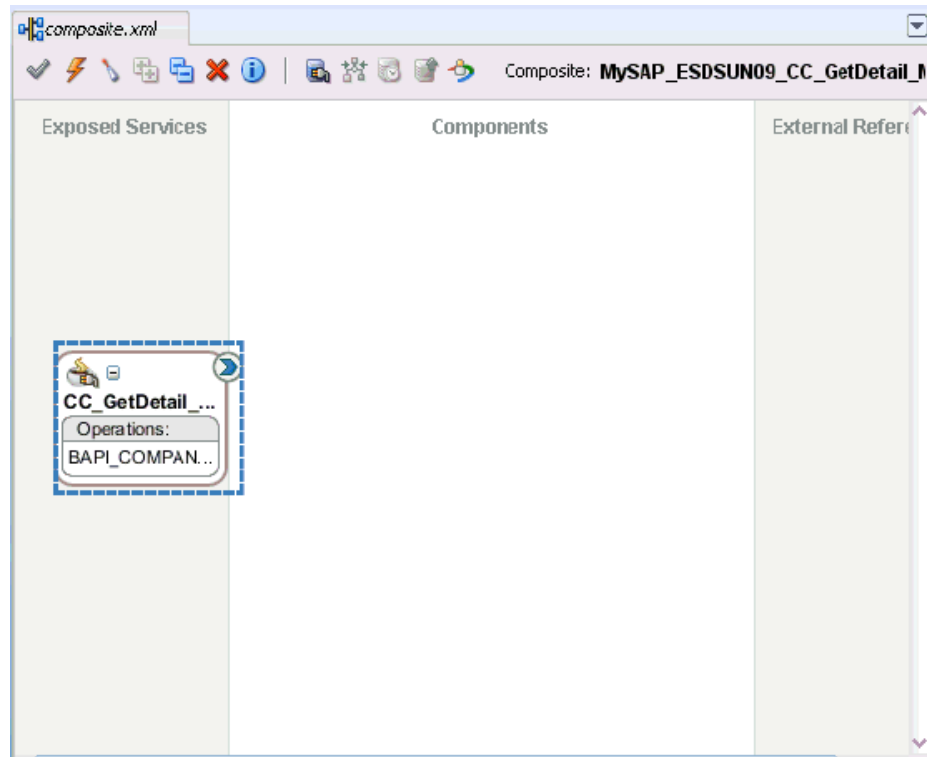
You are returned to the Create Third Party Adapter Service dialog, as shown in [Figure 7-50](#).

Figure 7-50 Create Third Party Adapter Service Dialog



12. Click **OK**.

The third party adapter service component (CC_GetDetail_Mediator_IB) is created in the Exposed Services pane, as shown in [Figure 7-51](#).

Figure 7-51 Third Party Adapter Service Component

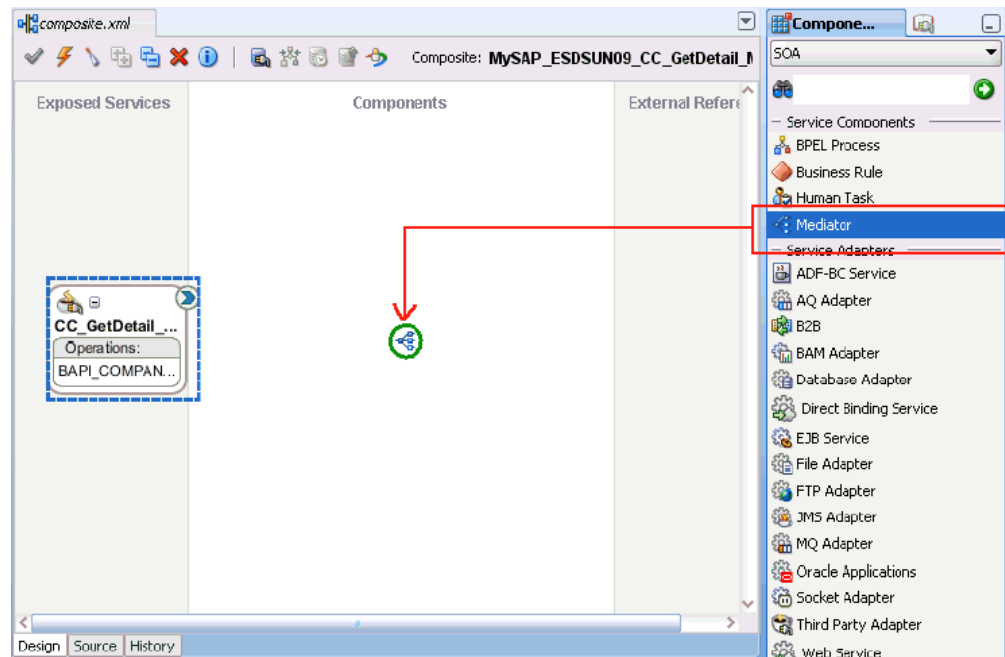
You are now ready to configure an inbound Mediator process component.

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.

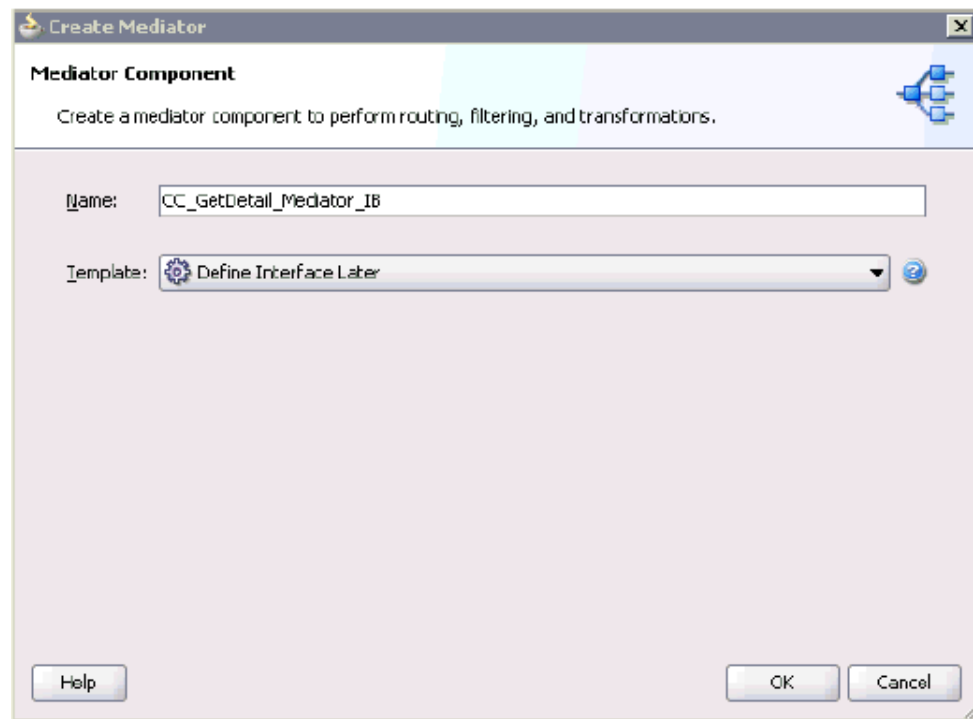
1. Drag and drop the **Mediator Process** component from the Service Components pane to the Components pane, as shown in [Figure 7-52](#).

Figure 7–52 Mediator Process Component



The Create Mediator dialog is displayed, as shown in [Figure 7–53](#).

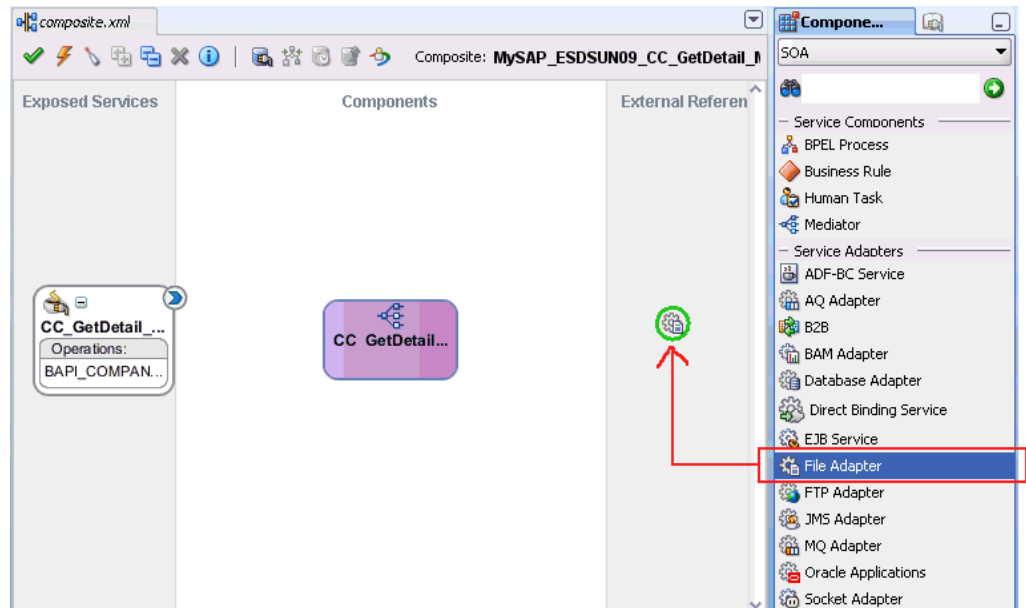
Figure 7–53 Create Mediator Dialog



2. In the Name field, enter a name to identify the new inbound Mediator process component (for example, CC_GetDetail_Mediator_IB).
3. From the Template drop-down list, select **Define Interface Later**.
4. Click the **OK**.

The new Mediator process component is added to the Components pane, as shown in [Figure 7-54](#).

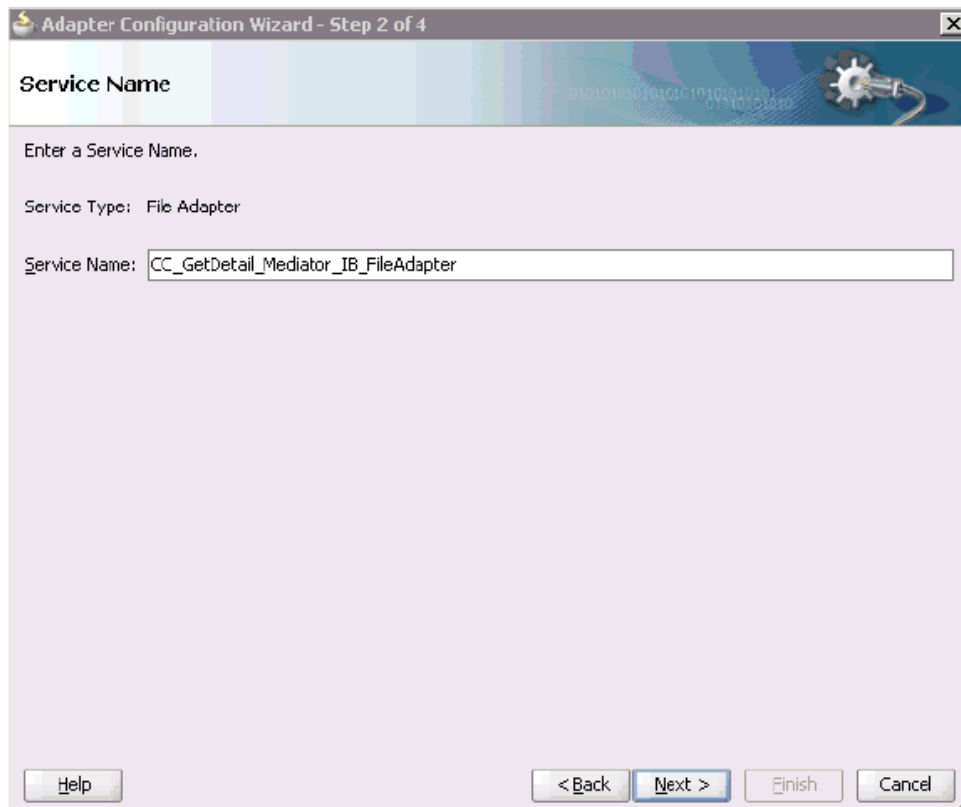
Figure 7-54 Mediator Process Component



5. Drag and drop the **File Adapter** component from the Service Adapters pane to the External References pane.

The Adapter Configuration Wizard is displayed, showing the Service Name page, as shown in [Figure 7-55](#).

Figure 7-55 Adapter Configuration Wizard



6. Type a name for the new File adapter in the Service Name field and click **Next**. The Adapter Interface page is displayed, as shown in [Figure 7-56](#).


Figure 7–56 Adapter Interface Page

Adapter Configuration Wizard - Step 3 of 4

Adapter Interface

The adapter interface is defined by a wsdl that is generated using the operation name and schema(s) specified later in this wizard. Optionally, the adapter interface may be defined by importing an existing WSDL.

Interface: Define from operation and schema (specified later)
 Import an existing WSDL

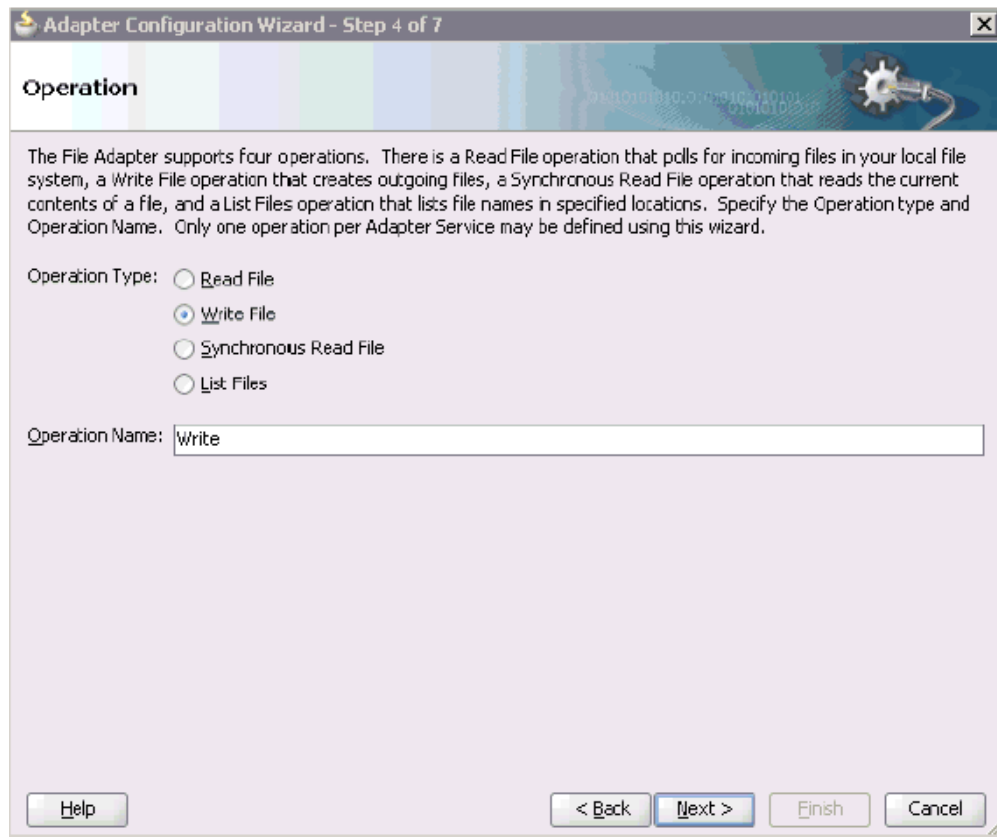
WSDL URL: 

Port Type:

Operation:

Help < Back Next > Finish Cancel

7. Ensure that the **Define from operation and schema (specified later)** option is selected.
8. Click **Next**.
The Operation page is displayed, as shown in [Figure 7–57](#).

Figure 7-57 Operation Page

9. Select **Write File** from the list of Operation Type options and specify an Operation Name (for example, Write).
10. Click **Next**.

The File Configuration page is displayed, as shown in [Figure 7-58](#).

Figure 7-58 File Configuration Page

Adapter Configuration Wizard - Step 5 of 7

File Configuration

Specify the parameters for the Write File operation.

Directory specified as Physical Path Logical Name

Directory for Outgoing Files (physical path):
C:\MySAP_Output

File Naming Convention (po_%SEQ%.txt): MySAP_ESDSUN9_OUTPUT.xml

Append to existing file

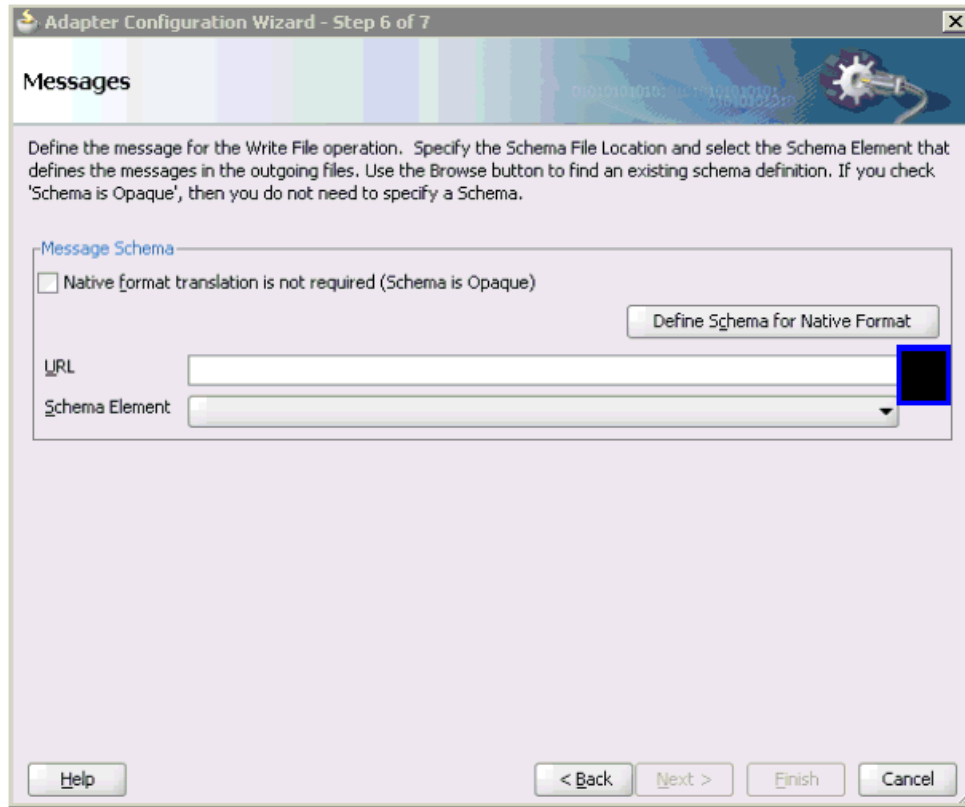
Write to output file when any of these conditions are met

<input checked="" type="checkbox"/> Number of Messages Equals:	1	
<input type="checkbox"/> Elapsed Time Exceeds:	1	minutes
<input type="checkbox"/> File Size Exceeds:	1000	kilobytes

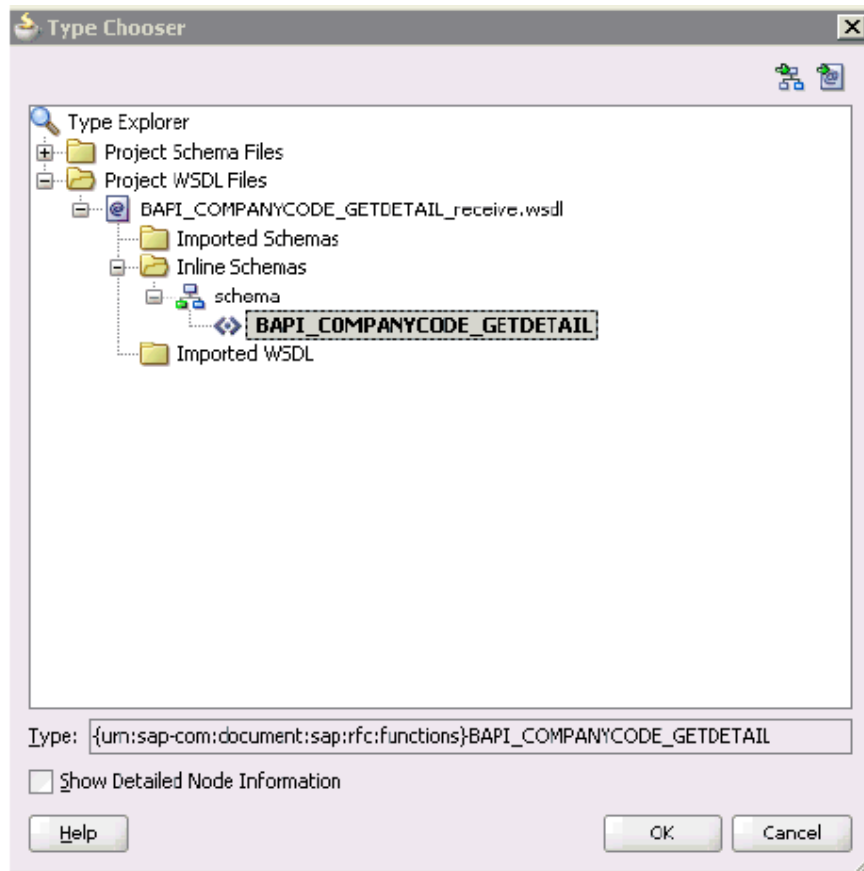
11. Specify a location on your file system where the output file is written.
12. In the File Naming Convention field, specify a name for the output file.
13. Click Next.

The Messages page is displayed, as shown in [Figure 7-59](#).

Figure 7–59 Messages Page



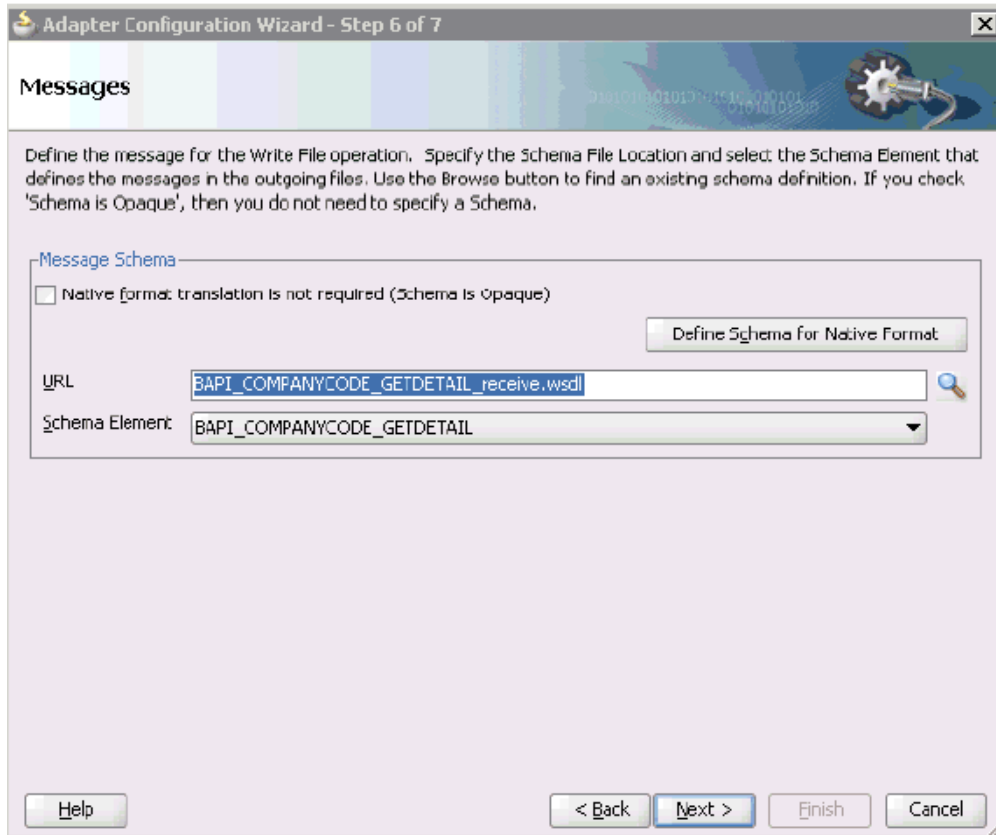
14. Click **Browse**, which is located to the right of the URL field.
The Type Chooser dialog is displayed, as shown in [Figure 7–60](#).

Figure 7–60 Type Chooser Dialog

15. Expand **Project WSDL Files**, **BAPI_COMPANYCODE_GETDETAIL_receive.wSDL**, **Inline Schemas**, and **schema**.
16. Select the available schema (for example, **BAPI.CompanyCode.GetDetail**)
17. Click **OK**.

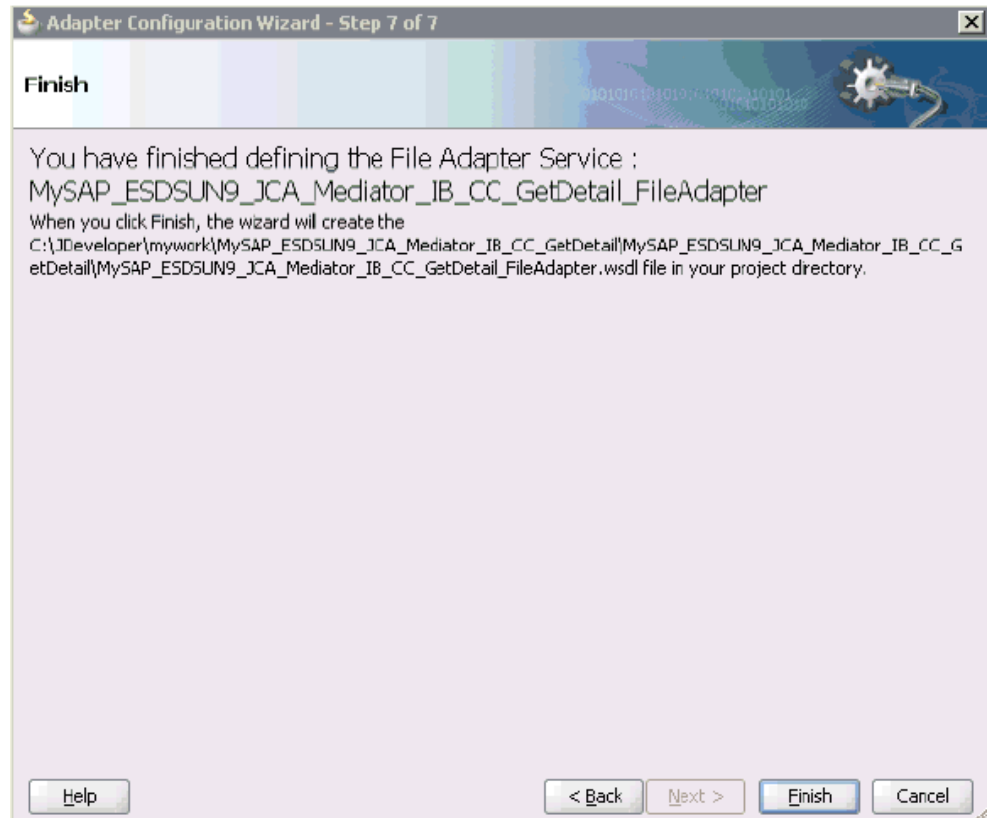
You are returned to the Messages page, as shown in [Figure 7–61](#).

Figure 7–61 Messages Page

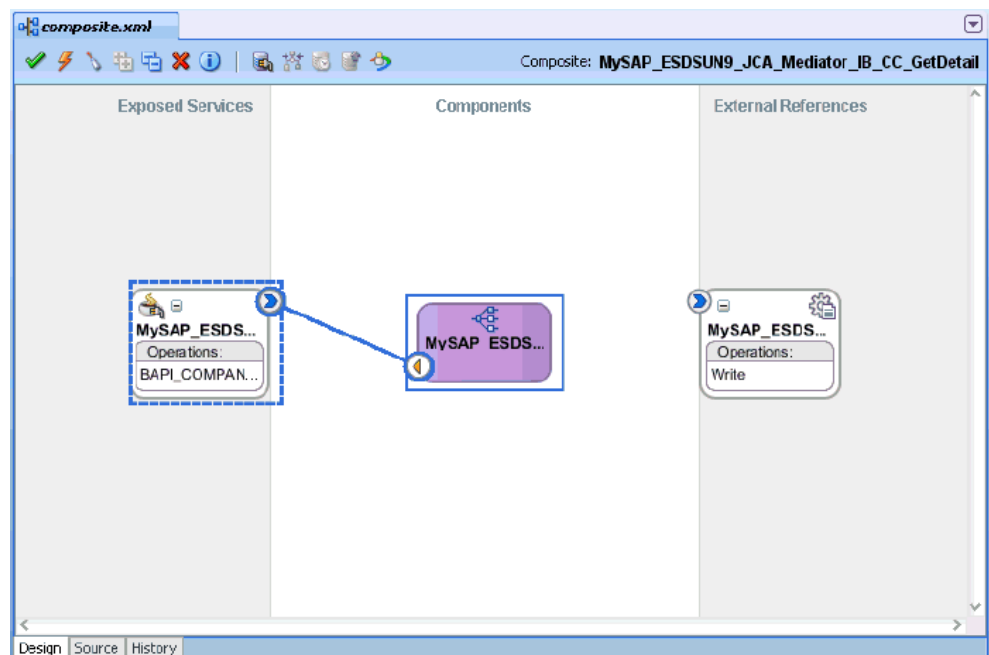


18. Click Next.

The Finish page is displayed, as shown in [Figure 7–62](#).

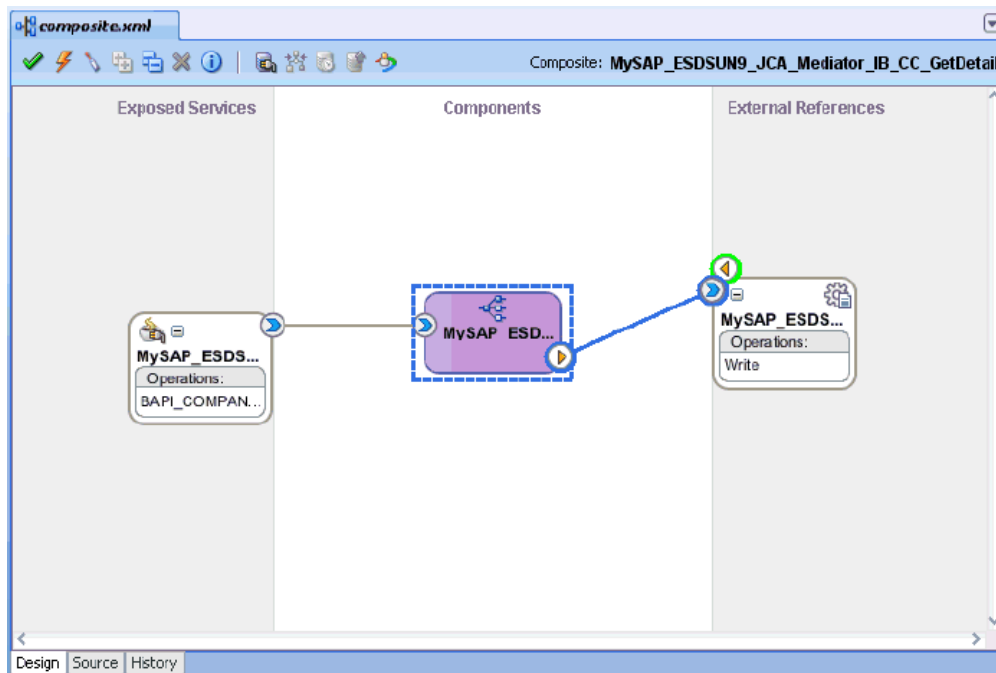
Figure 7–62 Finish Page

19. Click **Finish**.
20. Create a connection between the inbound Mediator process component and the third party adapter service component, as shown in [Figure 7–63](#).

Figure 7–63 Created Connection

21. Create a connection between the inbound Mediator process component and the File adapter component, as shown in [Figure 7-64](#).

Figure 7-64 Created Connection



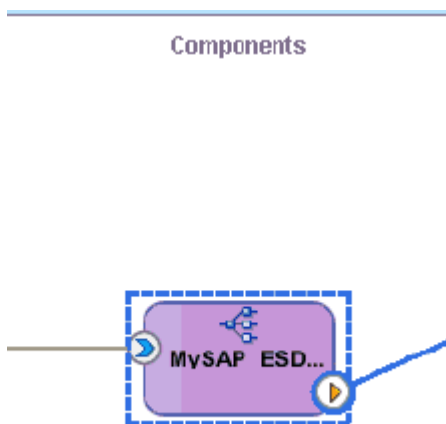
You are now ready to configure the routing rules.

Configuring the Routing Rules

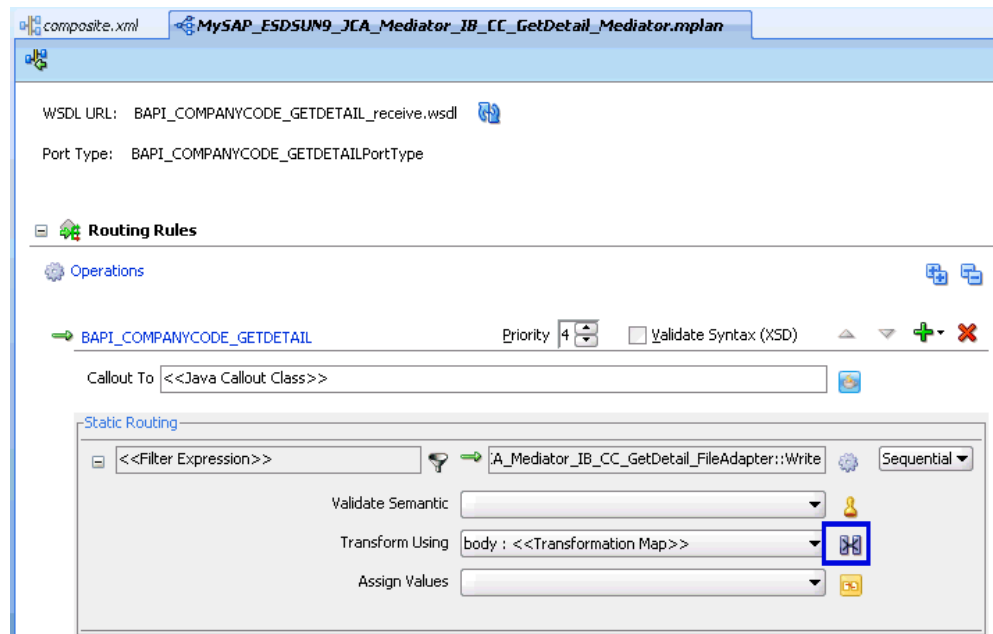
Perform the following steps to configure routing rules for the Mediator inbound process component:

1. Double-click the inbound Mediator process component in the Components page, as shown in [Figure 7-65](#).

Figure 7-65 Inbound Mediator Process Component

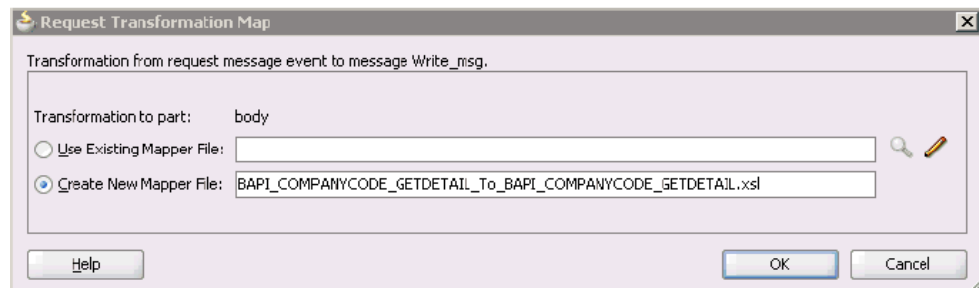


The Routing Rules dialog is displayed, as shown in [Figure 7-66](#).

Figure 7–66 Routing Rules Dialog

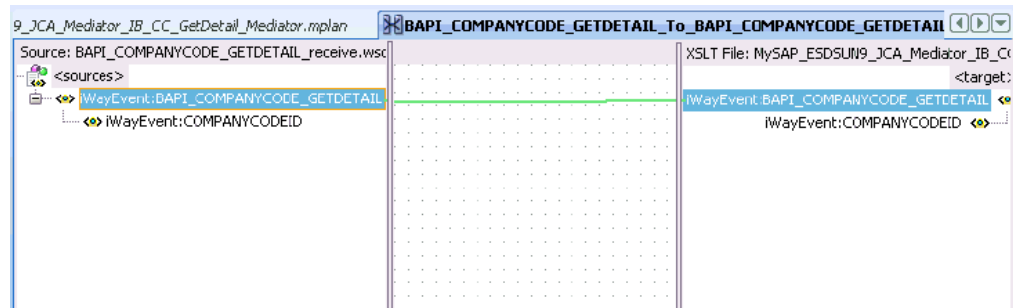
2. In the <<Filter Expression>> area, click the icon to the right of the Transform Using field.

The Request Transformation Map dialog is displayed, as shown in [Figure 7–67](#).

Figure 7–67 Request Transformation Map Dialog

3. Select the **Create New Mapper File** option and click **OK**.

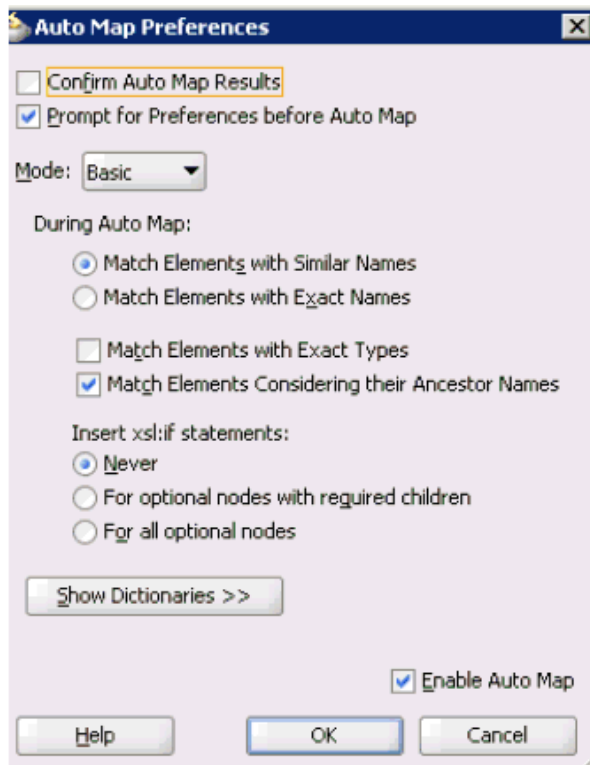
The mapping page is displayed, as shown in [Figure 7–68](#).

Figure 7–68 Mapping Page

4. Map the `iWayEvent:BAPI_COMPANYCODE_GETDETAIL` source element to the `iWayEvent:BAPI_COMPANYCODE_GETDETAIL` target element.

The Auto Map Preferences dialog is displayed, as shown in [Figure 7-69](#).

Figure 7-69 Auto Map Preferences Dialog



5. Retain the default values and click **OK**.

You are returned to the Routing Rules dialog. The mapping is now complete.

6. Click the **Save All** icon in the menu bar to save the new inbound Mediator process component that was configured.

You are now ready to deploy the Mediator inbound process. You can follow the same procedure in ["Deploying the BPEL Inbound Process"](#) on page 6-59.

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 triggering events in SAP R/3, see ["Triggering an Event in SAP R/3"](#) on page 6-65.

Integration With BPM Service Components in the Oracle SOA Suite

Oracle Application Adapter for SAP R/3 integrates seamlessly with Business Process Management (BPM) to facilitate Web service integration. Oracle BPM is based on the Service-Oriented Architecture (SOA). It consumes adapter services exposed as Web Service Definition Language (WSDL) documents.

This chapter contains the following topics:

- [Section 8.1, "Overview"](#)
- [Section 8.2, "Deployment of Adapter"](#)
- [Section 8.3, "Configuring a New Application Server Connection"](#)
- [Section 8.4, "Designing an Outbound BPM Process Using Transformations for Service Integration"](#)
- [Section 8.5, "Designing an Inbound BPM Process Using Transformations for Event Integration"](#)

8.1 Overview

To integrate with Oracle BPM, Oracle Application Adapter for SAP R/3 must be deployed in the same WLS container as Oracle BPM. The underlying adapter services must be exposed as WSDL files, which are generated during design time in Oracle Adapter Application Explorer (Application Explorer) for both request-response (outbound) and event notification (inbound) services of the adapter. For more information, see "[Generating WSDL \(J2CA Configurations Only\)](#)" on page 4-15.

The generated WSDL files are used to design the appropriate BPM processes for inbound or outbound adapter services. A completed BPM process must be successfully compiled in JDeveloper and deployed to a BPM server. Upon deployment to the BPM server, every newly built process is automatically deployed to the Oracle Enterprise Manager console, where you run, monitor, and administer BPM processes, and listen to adapter events.

8.2 Deployment of Adapter

During installation, Oracle Application Adapter for SAP R/3 is deployed as a J2CA 1.0 resource adapter within the WLS container. The adapter must be deployed in the same WLS container as Oracle BPM.

8.3 Configuring a New Application Server Connection

For more information on how to configure a new Application Server connection in Oracle JDeveloper, see [Section 6.3, "Configuring a New Application Server Connection"](#).

8.4 Designing an Outbound BPM Process Using Transformations for Service Integration

The following tools are required to complete your outbound design-time configuration:

- Oracle Adapter Application Explorer (Application Explorer)
- Oracle JDeveloper BPM Designer (JDeveloper) or Eclipse

Note: The examples in this chapter demonstrate the use of JDeveloper.

Samples have been provided for this use case scenario under the *etc/sample* folder of the Application Adapters installation.

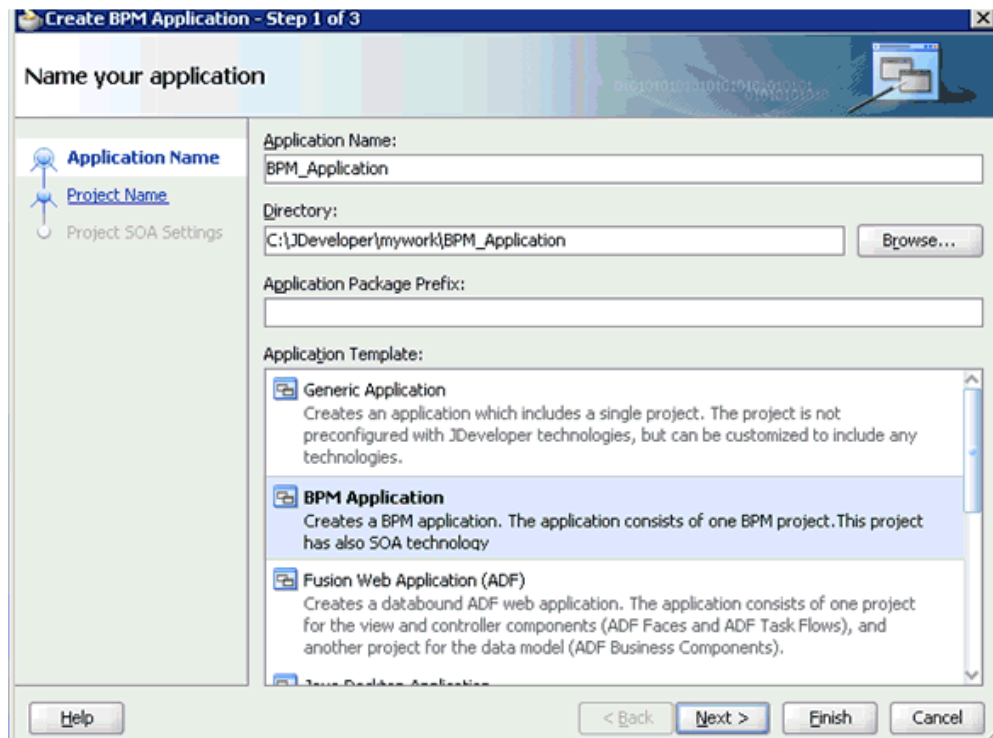
Before you design a BPM process, you must generate the respective WSDL file using Application Explorer. For more information, see "[Generating WSDL for Request/Response Service](#)" on page 6-8.

8.4.1 Creating an Empty Composite for BPM

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

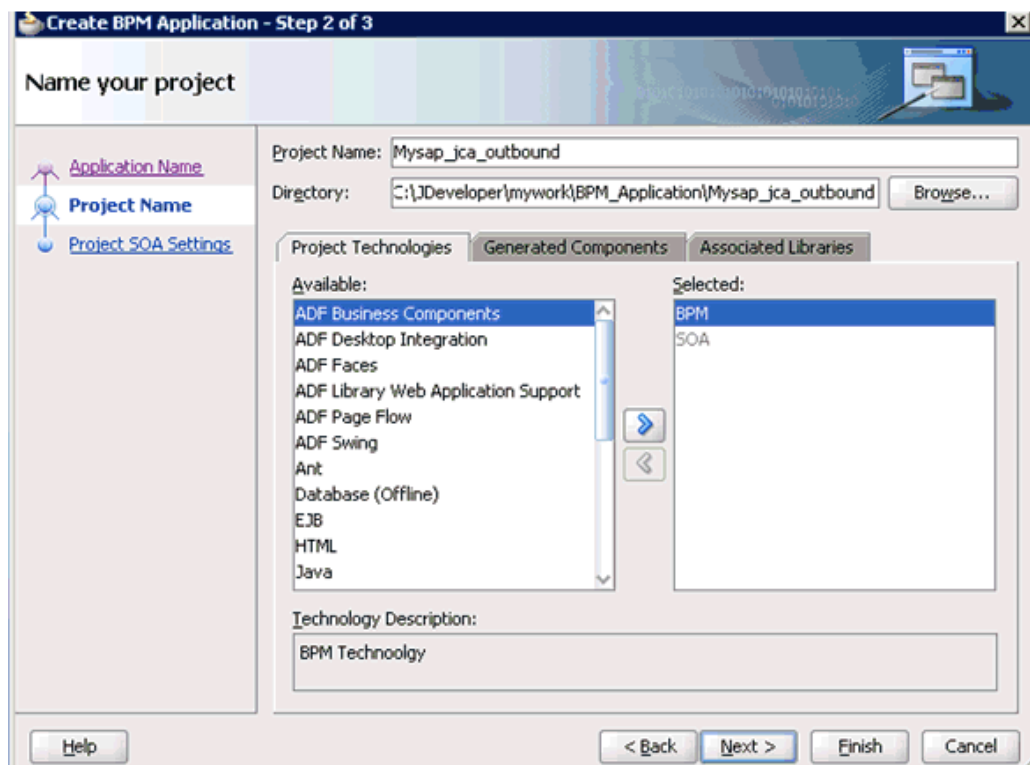
1. Create a new BPM application.
2. Enter a name for the new BPM application and click **Next**, as shown in [Figure 8-1](#).

Figure 8–1 Name Your Application Page



The Name your project page is displayed, as shown in Figure 8–2.

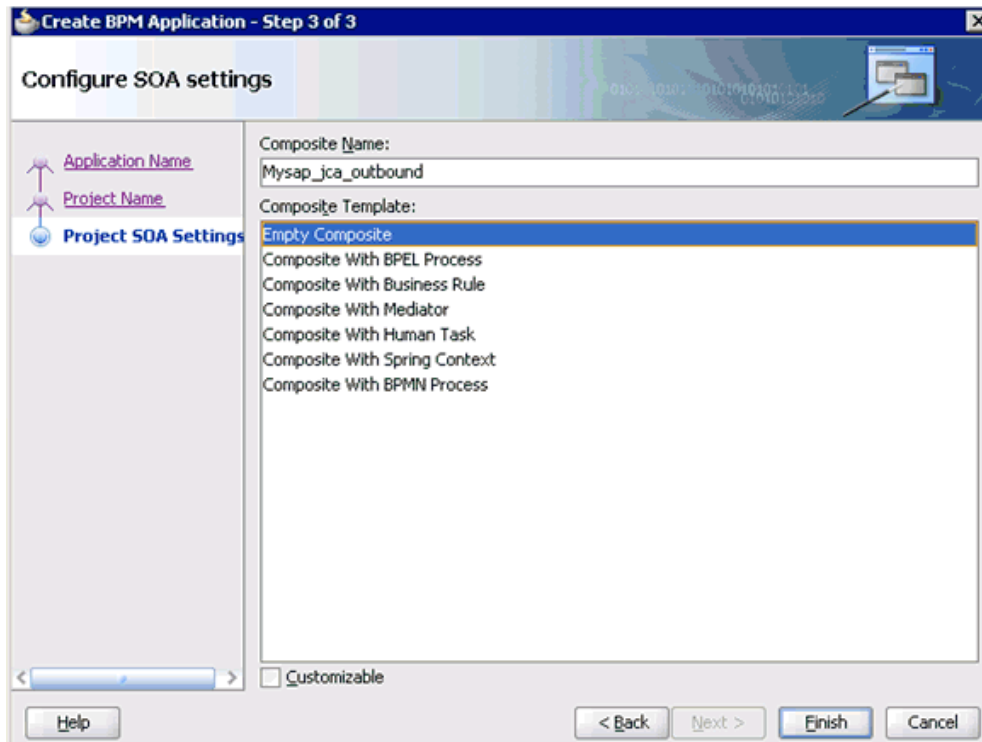
Figure 8–2 Name Your Project Page



3. Enter a project name (for example, Mysap_jca_outbound) and click Next.

The Configure SOA settings page is displayed, as shown in [Figure 8-3](#).

Figure 8-3 Configure SOA Settings Page



4. From the Composite Template list, select **Empty Composite** and click **Finish**.

8.4.2 Defining a BPM Outbound Process

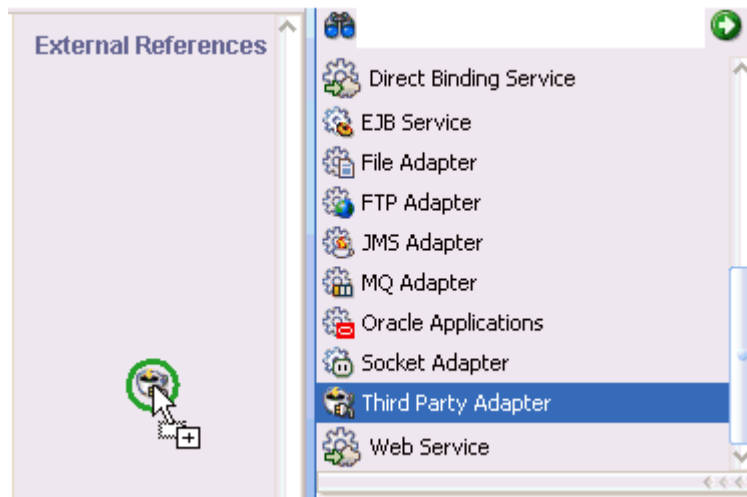
This section describes how to define a BPM outbound process, which consists of the following stages:

1. Configuring a Third Party Adapter Service Component
2. Configuring an Outbound BPM Process Component
3. Creating a File Adapter for the Write Operation

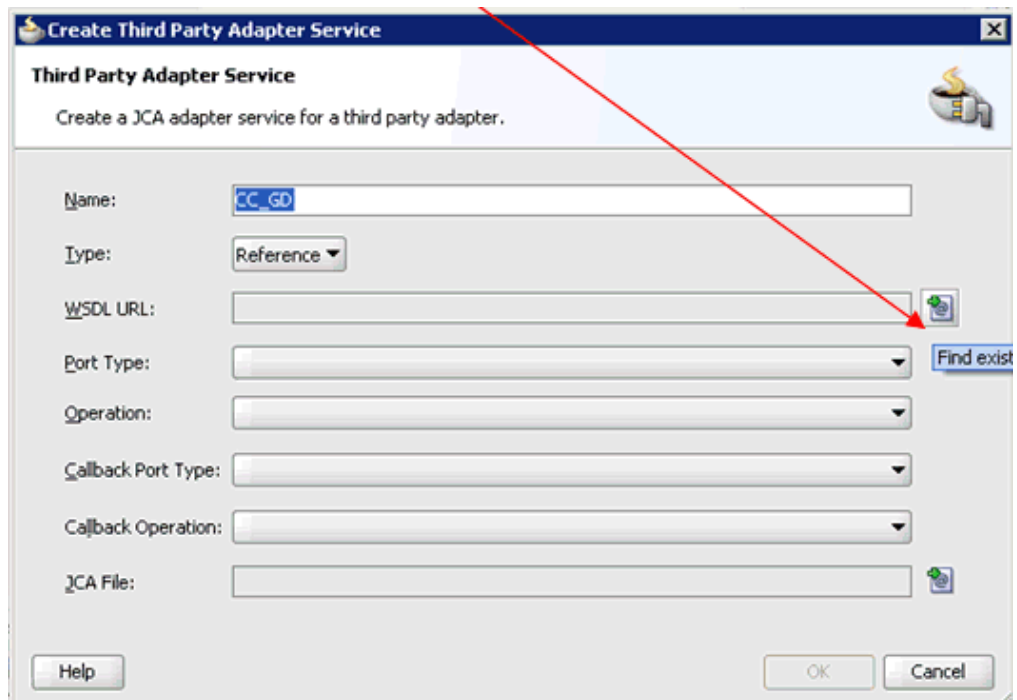
Configuring a Third Party Adapter Service Component

Perform the following steps to create a third party adapter service component:

1. Drag and drop the **Third Party Adapter** component from the Service Adapters pane to the External References pane, as shown in [Figure 8-4](#).

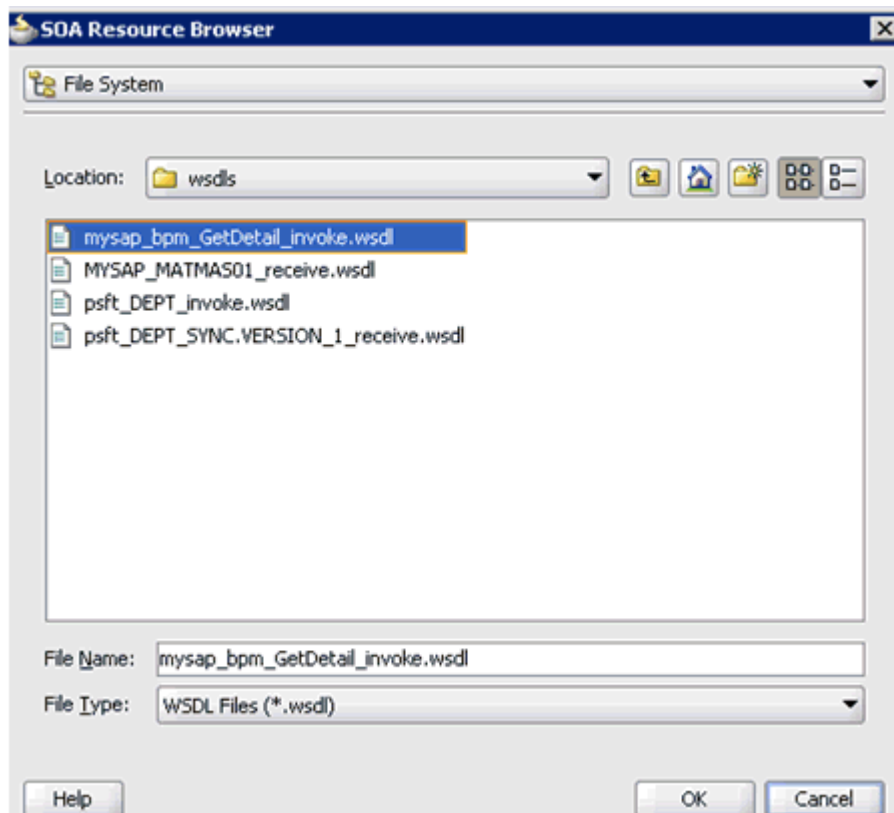
Figure 8–4 Third Party Adapter Component

The Create Third Party Adapter Service dialog is displayed, as shown in [Figure 8–5](#).

Figure 8–5 Create Third Party Adapter Service Dialog

2. Enter a name for the third party adapter service.
3. Ensure that **Reference** is selected from the Type list (default).
4. Click the **Find existing WSDLs** icon, which is located to the right of the WSDL URL field.

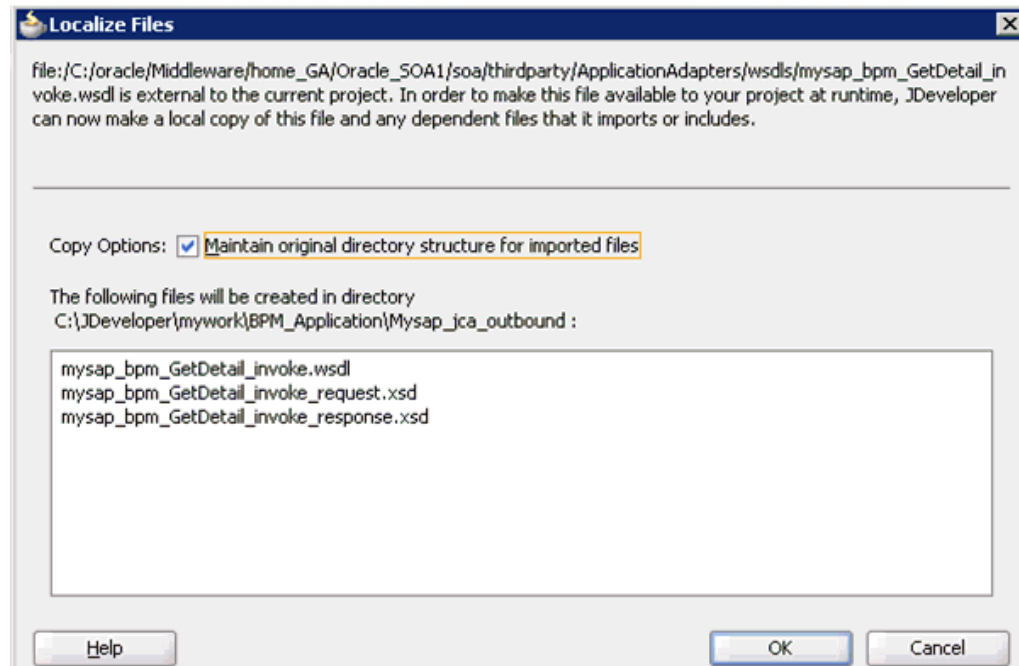
The SOA Resource Browser dialog is displayed, as shown in [Figure 8–6](#).

Figure 8–6 SOA Resource Browser Dialog

5. Browse and select an outbound WSDL file from the following directory:
<ADAPTER_HOME>\soa\thirdparty\ApplicationAdapters\wsdls

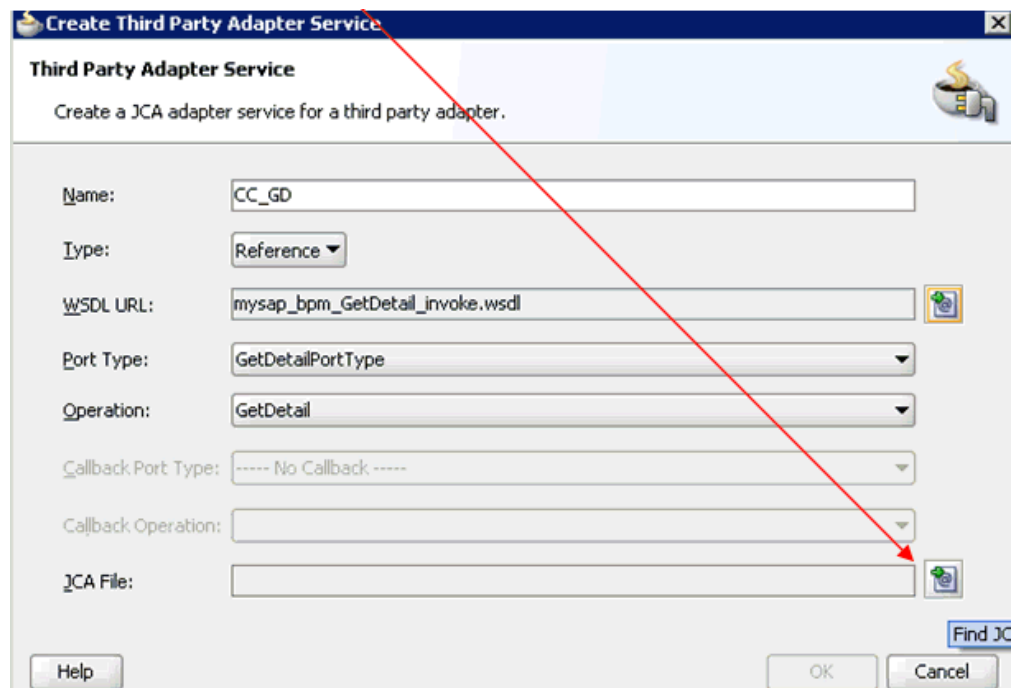
6. Click **OK**.

The Localize Files dialog is displayed, as shown in [Figure 8–7](#).

Figure 8–7 Localize Files Dialog7. Click **OK**.

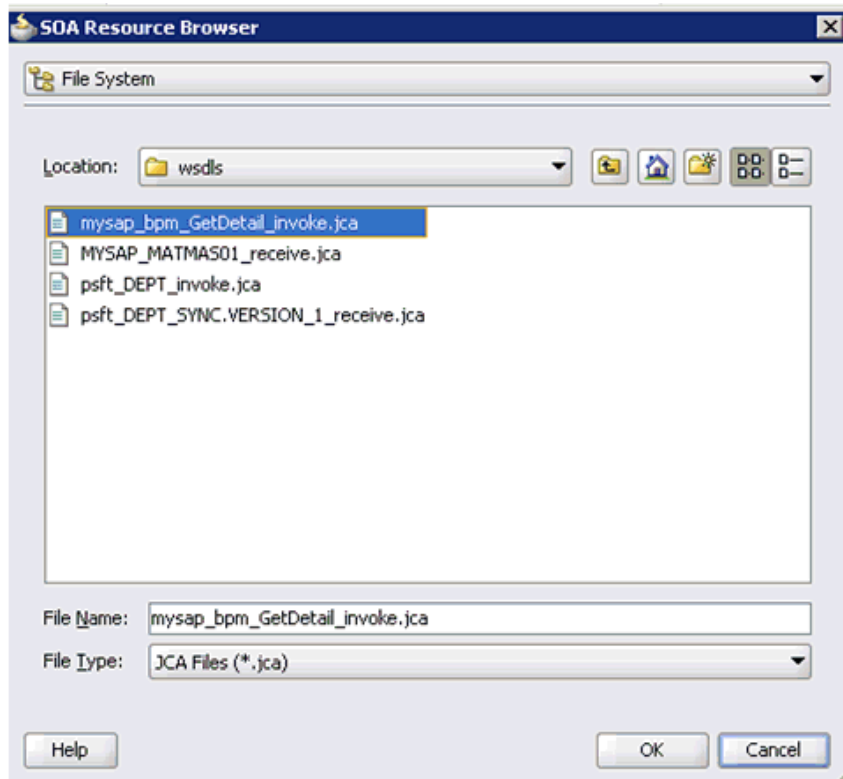
The outbound WSDL file and associated request and response XML schema files (.xsd) are imported to the project folder that has been created.

You are returned to the Create Third Party Adapter Service dialog, as shown in [Figure 8–8](#).

Figure 8–8 Create Third Party Adapter Service Dialog

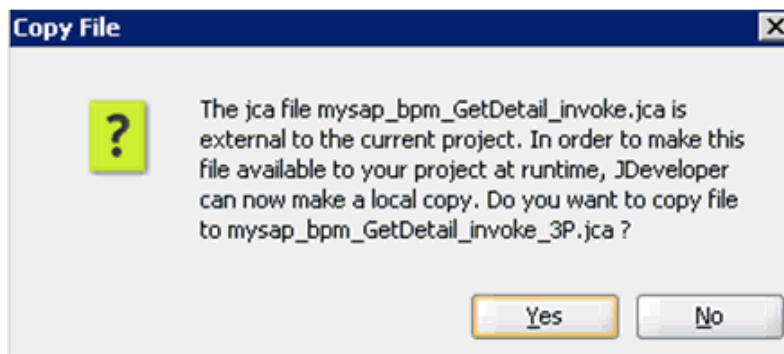
8. Click the **Find JCA file** icon, which is located to the right of the JCA File field.
The SOA Resource Browser dialog is displayed, as shown in [Figure 8–9](#).

Figure 8–9 SOA Resource Browser Dialog



9. Browse and select the JCA properties file from the following directory:
<ADAPTER_HOME>\soa\thirdparty\ApplicationAdapters\wsdls
10. Click **OK**.
The Copy File message is displayed, as shown in [Figure 8–10](#).

Figure 8–10 Copy File Confirmation Message



11. Click **Yes**.
A copy of the JCA properties file is made in the project folder.

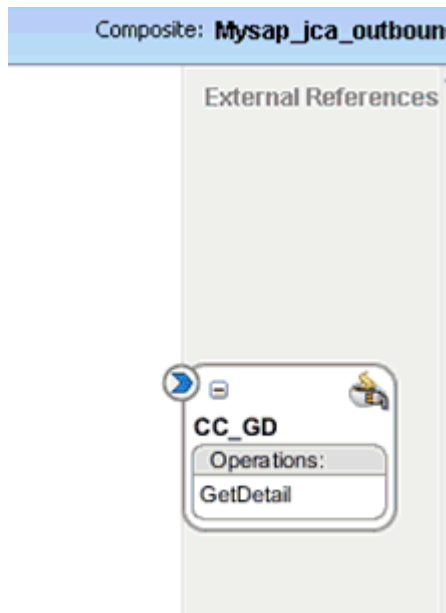
You are returned to the Create Third Party Adapter Service dialog, as shown in Figure 8–11.

Figure 8–11 Create Third Party Adapter Service Dialog

12. Click OK.

The third party adapter service component (CC_GD) is created and displayed in the External References pane, as shown in Figure 8–12.

Figure 8–12 Third Party Adapter Service Component



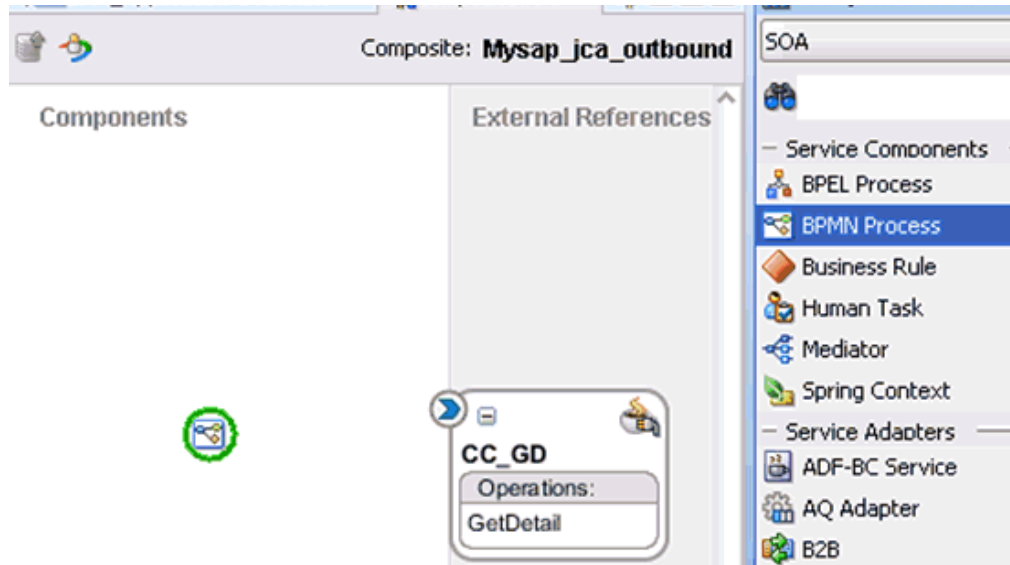
You are now ready to configure an outbound BPM process component.

Configuring an Outbound BPM Process Component

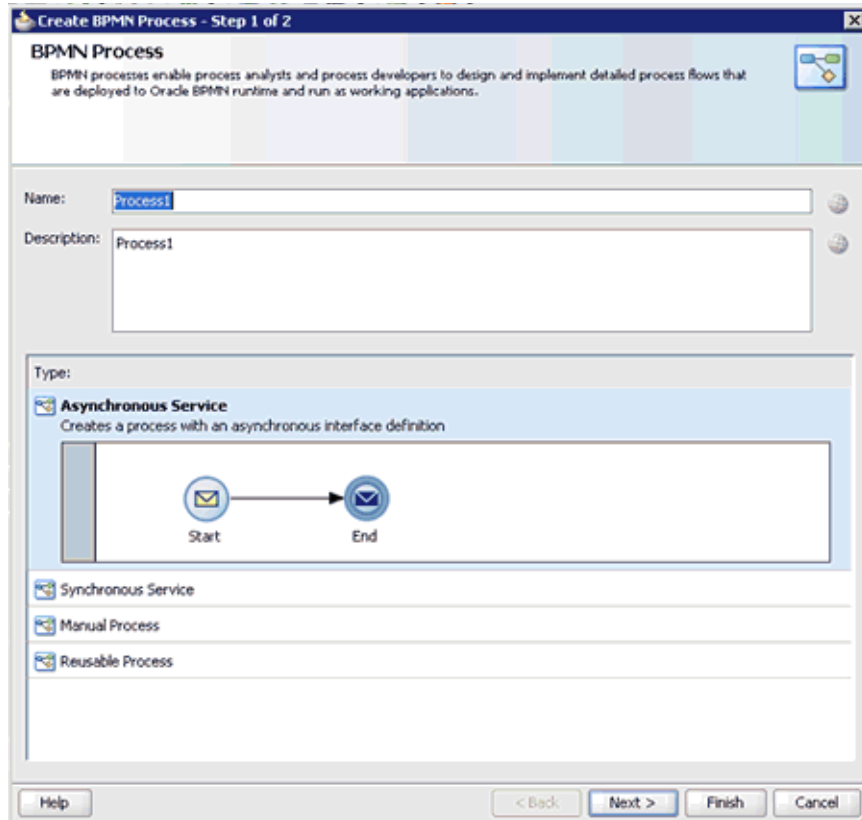
Perform the following steps to configure an outbound BPM process component:

1. Drag and drop the **BPMN Process** component from the Service Components pane to the Components pane, as shown in [Figure 8–13](#).

Figure 8–13 BPMN Process Component

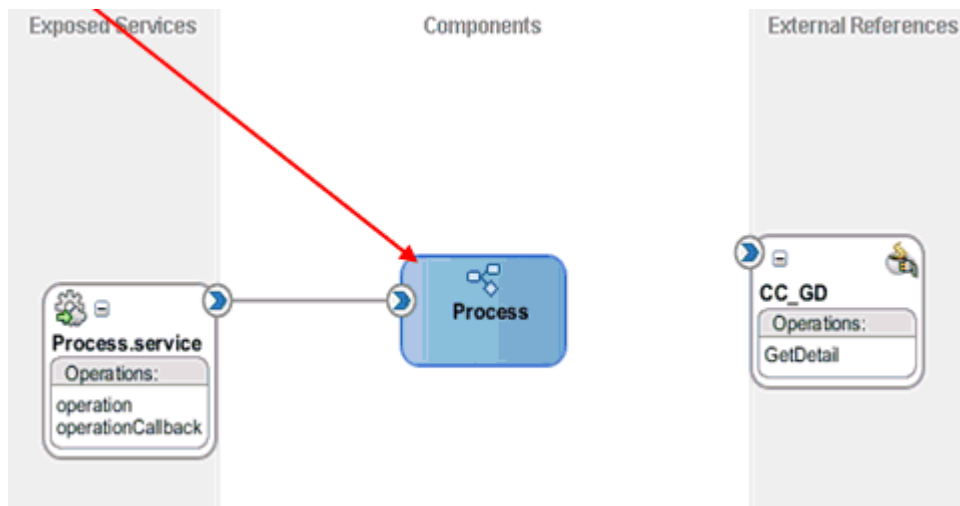


The Create BPMN Process dialog is displayed, as shown in [Figure 8–14](#).

Figure 8–14 Create BPMN Process Dialog

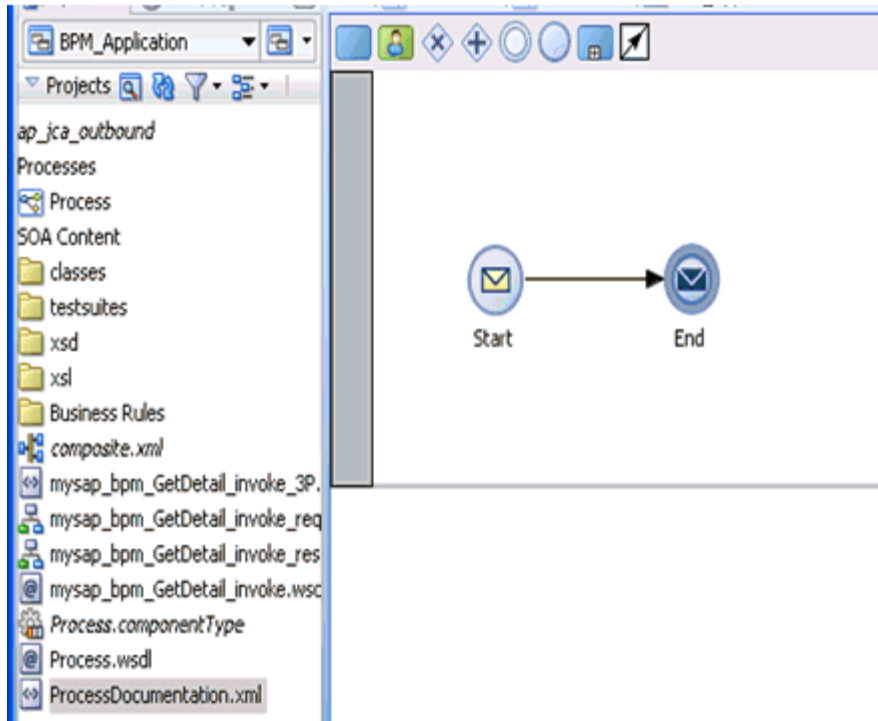
2. Accept the default option that is selected under Type area (Asynchronous Service) and click **Finish**.

The BPMN Process component is created, as shown in [Figure 8–15](#).

Figure 8–15 BPMN Process Component

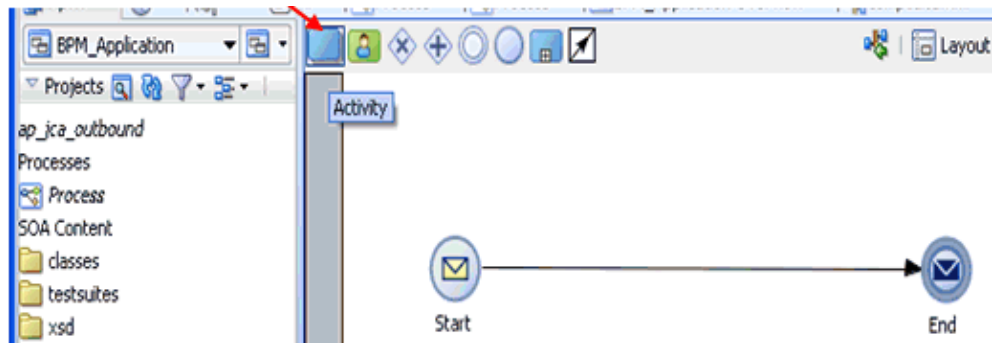
3. Double-click the BPMN Process component in the Components pane.
The BPMN process is displayed, as shown in [Figure 8–16](#).

Figure 8–16 BPMN Process

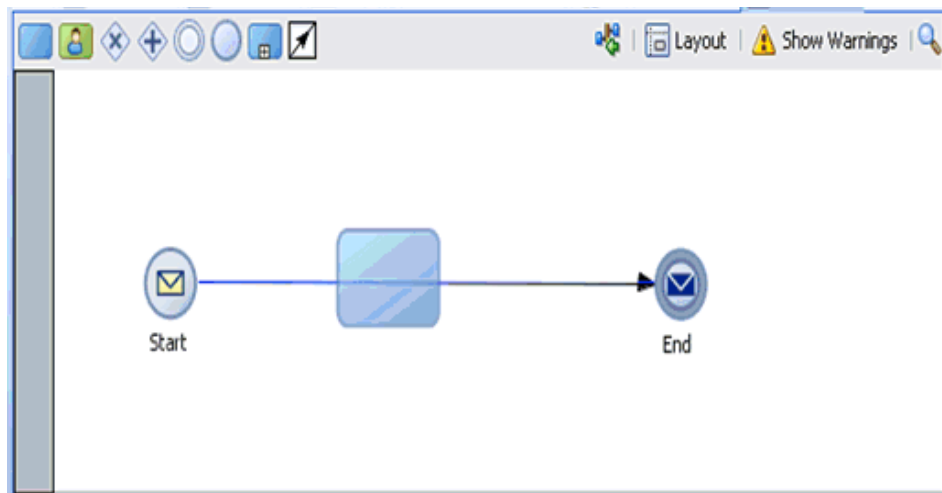


4. Click the **Activity** icon, as shown in Figure 8–17.

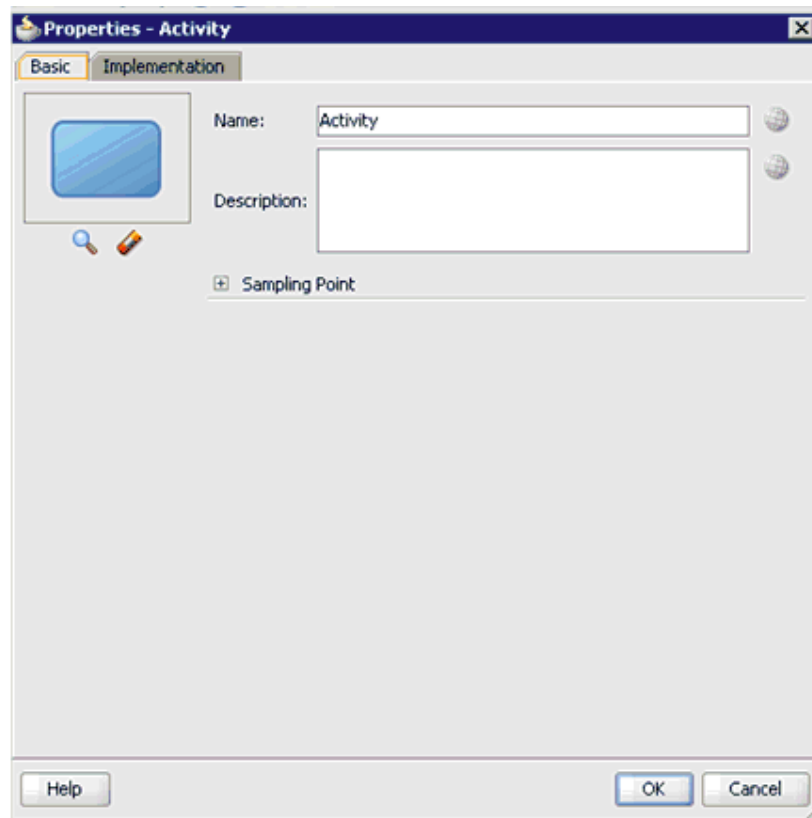
Figure 8–17 Activity Icon



5. Drop the **Activity** icon on the wire between the **Start** and **End** event components, as shown in Figure 8–18.

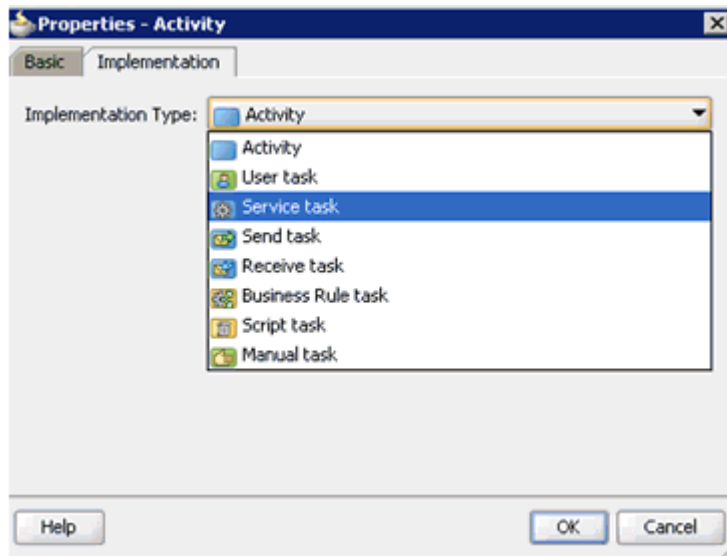
Figure 8–18 Activity Icon

The Properties - Activity dialog is displayed, as shown in [Figure 8–19](#).

Figure 8–19 Properties - Activity Dialog

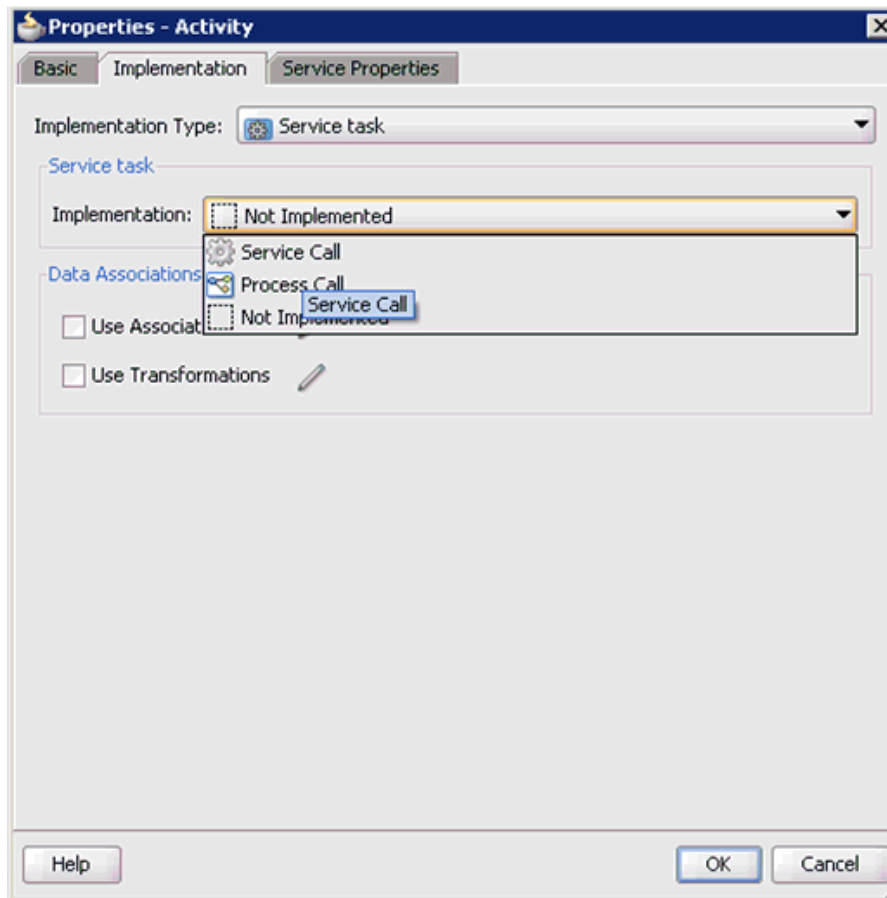
6. Click the **Implementation** tab, as shown in [Figure 8–20](#).

Figure 8–20 Implementation Tab

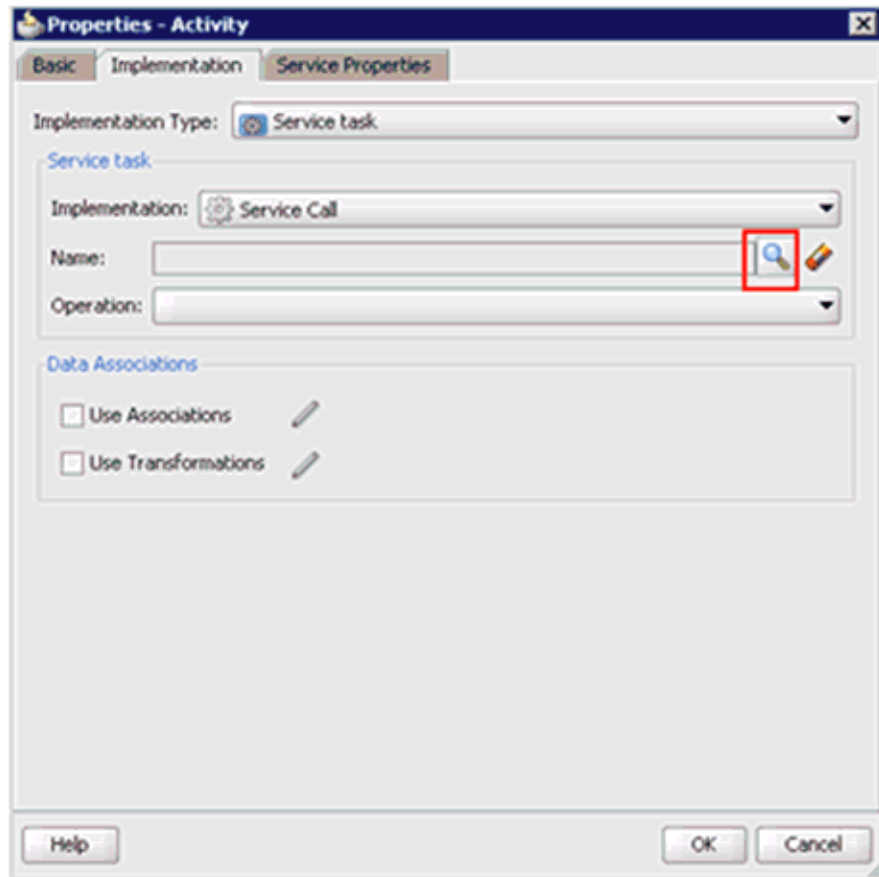


7. Select **Service Task** from the Implementation Type list, as shown in [Figure 8–21](#).

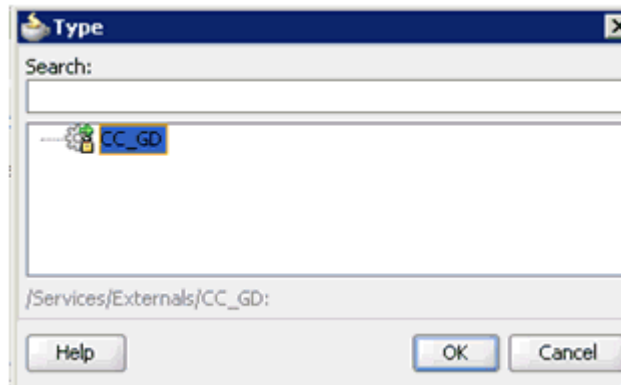
Figure 8–21 Properties - Activity Dialog



8. Select **Service Call** from the Implementation list.
9. Click the Browse icon to the right of the Name field, as shown in [Figure 8–22](#).

Figure 8–22 Browse Icon

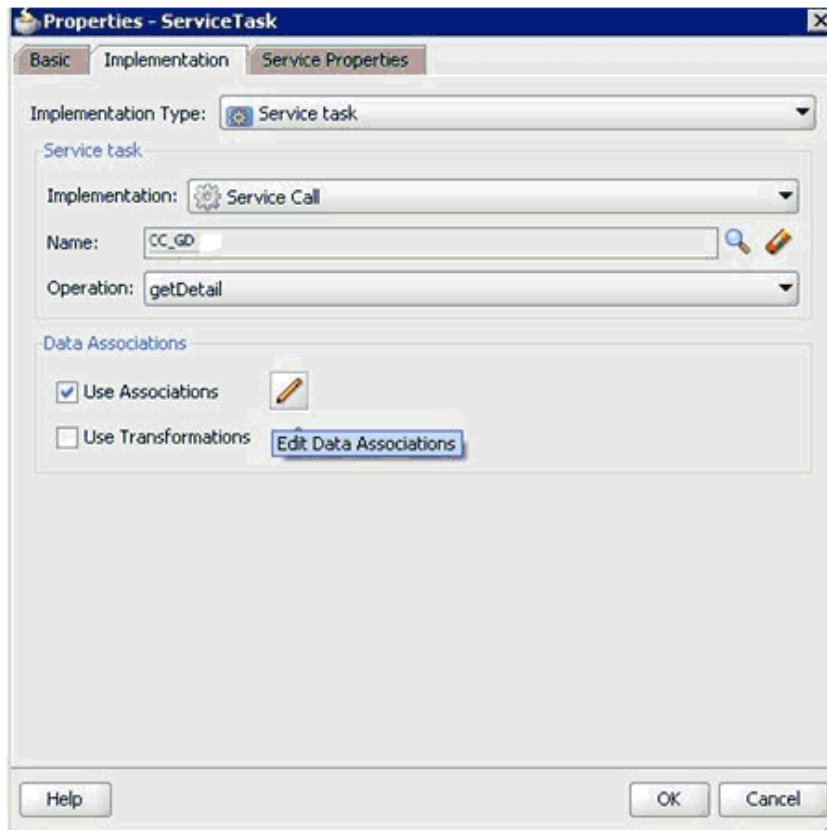
The Type dialog is displayed, as shown in [Figure 8–23](#).

Figure 8–23 Type Dialog

10. Select the Third Party Service that has been created and click **OK**.

You are returned to the Properties - Activity dialog, as shown in [Figure 8–24](#).

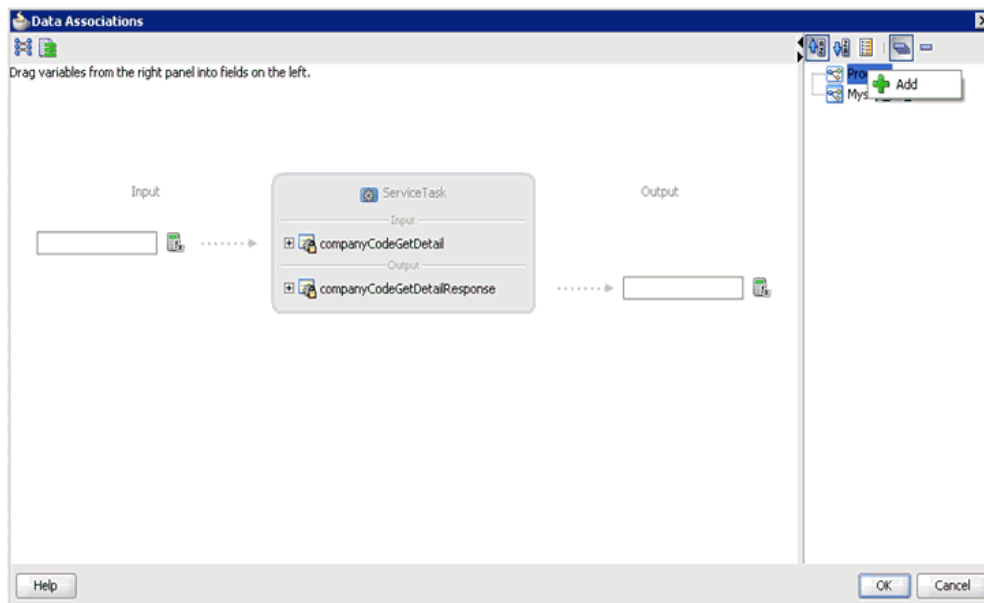
Figure 8–24 Properties - Activity Dialog



11. Select the **Use Associations** option that is located under Data Associations.
12. Click the **Edit Data Associations** icon.

The Data Associations dialog is displayed, as shown in [Figure 8–25](#).

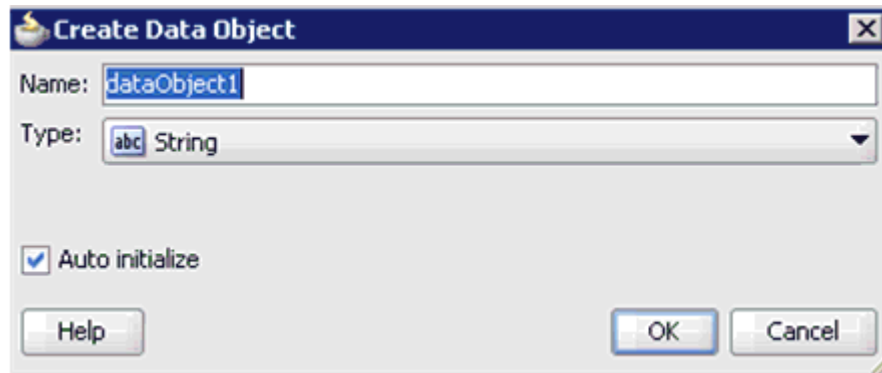
Figure 8–25 Data Associations Dialog



13. Right-click the **Process** node in the right pane and select **Add**.

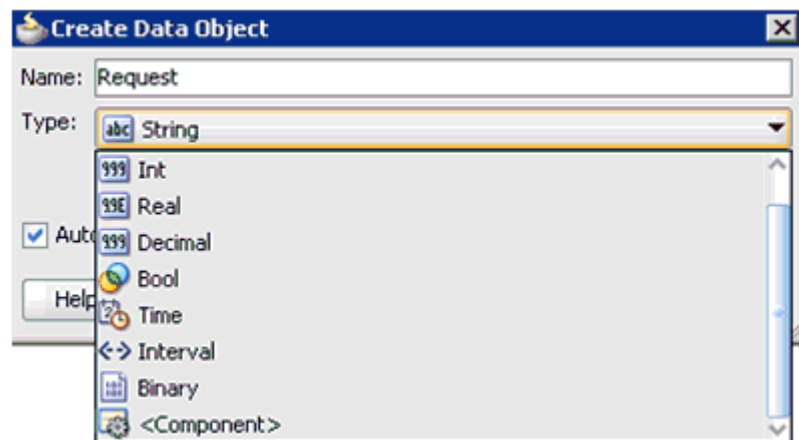
The Create Data Object dialog is displayed, as shown in [Figure 8–26](#).

Figure 8–26 Create Data Object Dialog



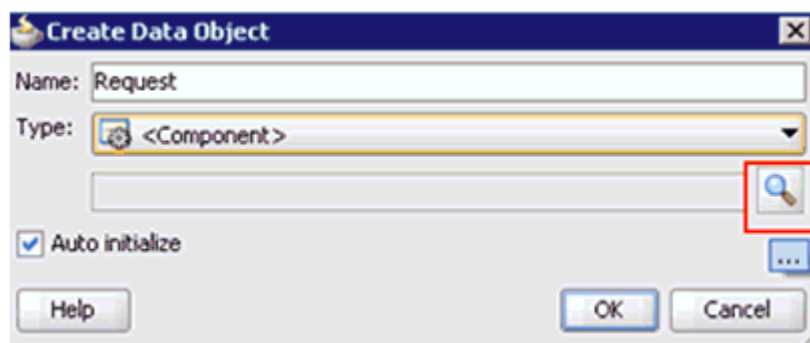
14. Enter a name in the Name field (for example, Request), and then click the drop-down button in the Type field and select **<Component>** from the list, as shown in [Figure 8–27](#).

Figure 8–27 Create Data Object Dialog



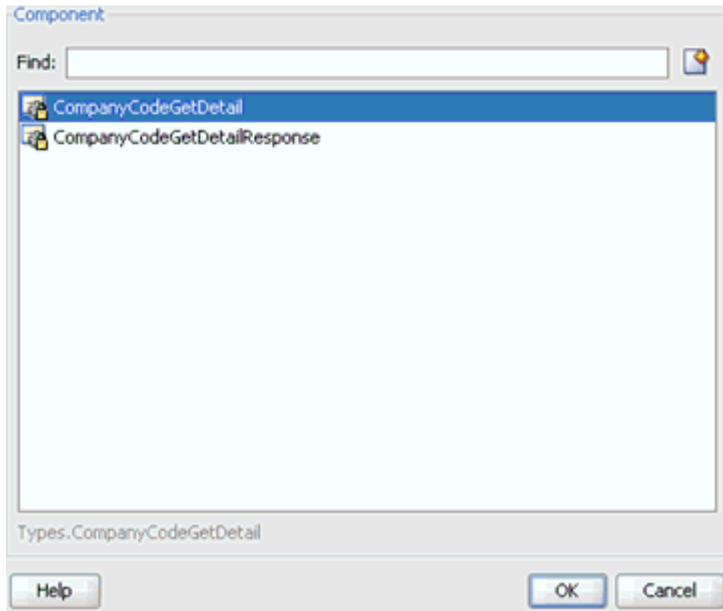
15. Click the **Browse** icon below the Type field, as shown in [Figure 8–28](#).

Figure 8–28 Create Data Object Dialog



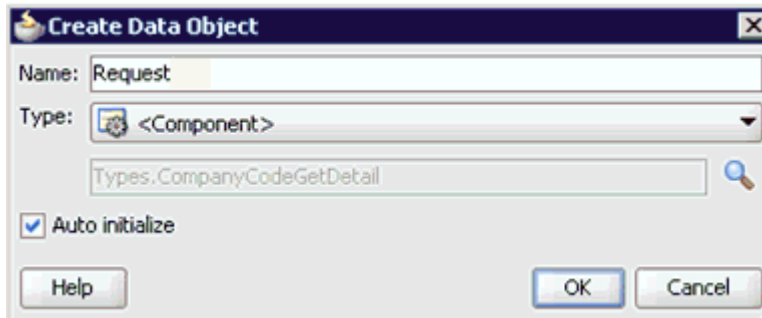
The Browse Types dialog is displayed, as shown in [Figure 8–29](#).

Figure 8–29 Browse Types Dialog

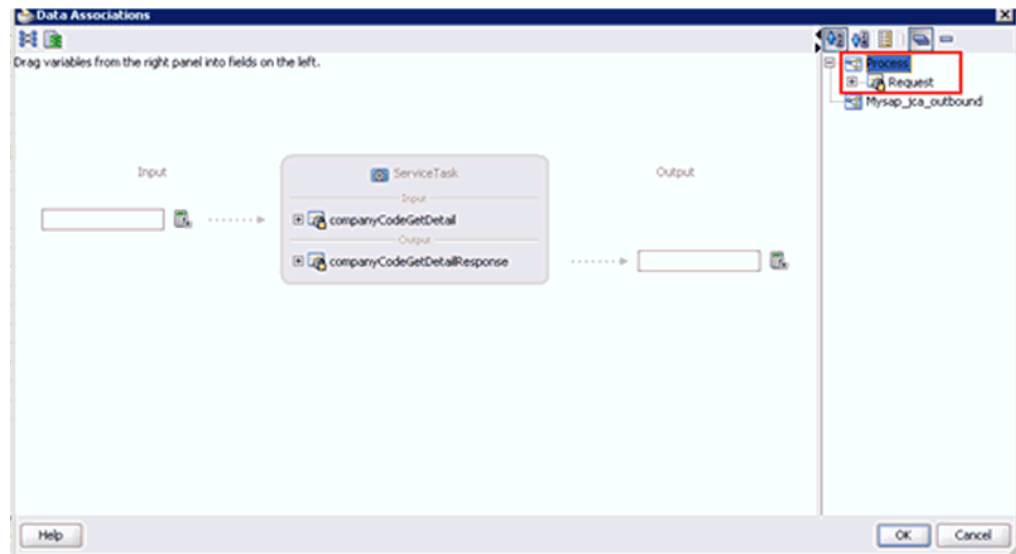


16. Select the first component (for example, CompanyCodeGetDetail) and click **OK**.
You are returned to the Create Data Object dialog, as shown in [Figure 8–30](#).

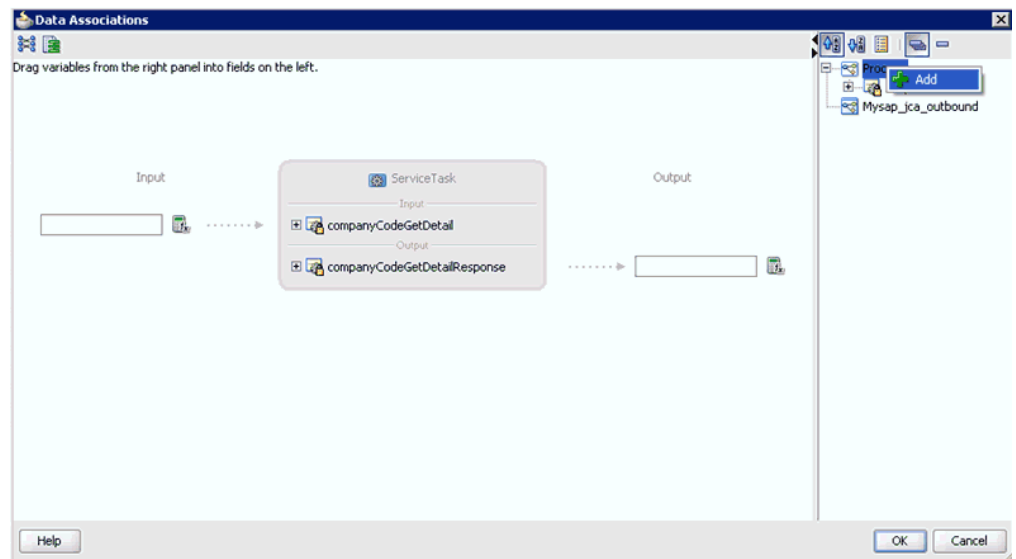
Figure 8–30 Create Data Object Dialog



17. Click **OK**.
The Data Object (for example, Request) that has been created is displayed under the Process node in the Data Associations dialog, as shown in [Figure 8–31](#).

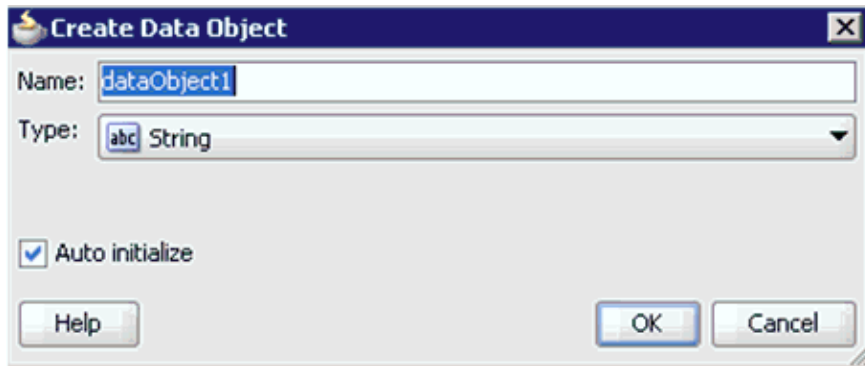
Figure 8–31 Data Associations Dialog

18. Create another Data Object by right-clicking the **Process** node in the right pane and selecting **Add**, as shown in Figure 8–32.

Figure 8–32 Data Associations Dialog

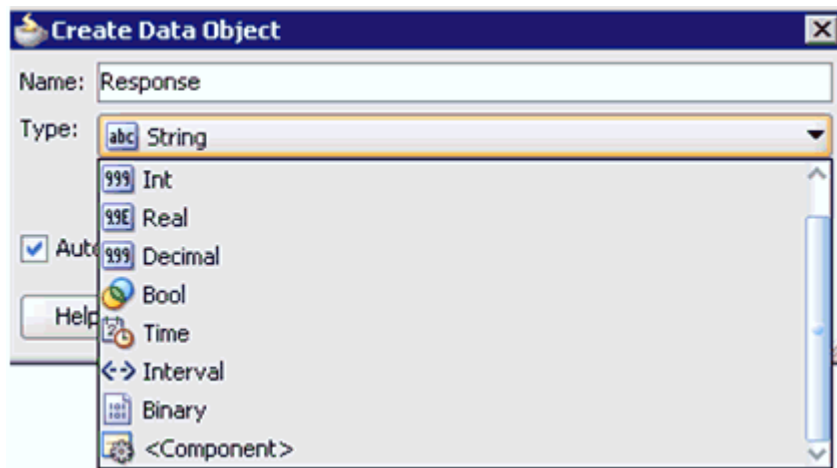
The Create Data Object dialog is displayed, as shown in Figure 8–33.

Figure 8–33 Create Data Object Dialog



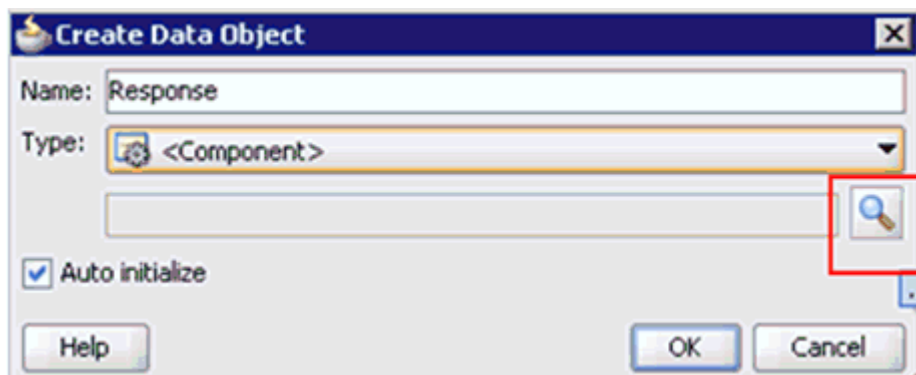
19. Enter a name in the Name field (for example, Response), and then click the drop-down button in the Type field and select **<Component>** from the list, as shown in [Figure 8–34](#).

Figure 8–34 Create Data Object Dialog

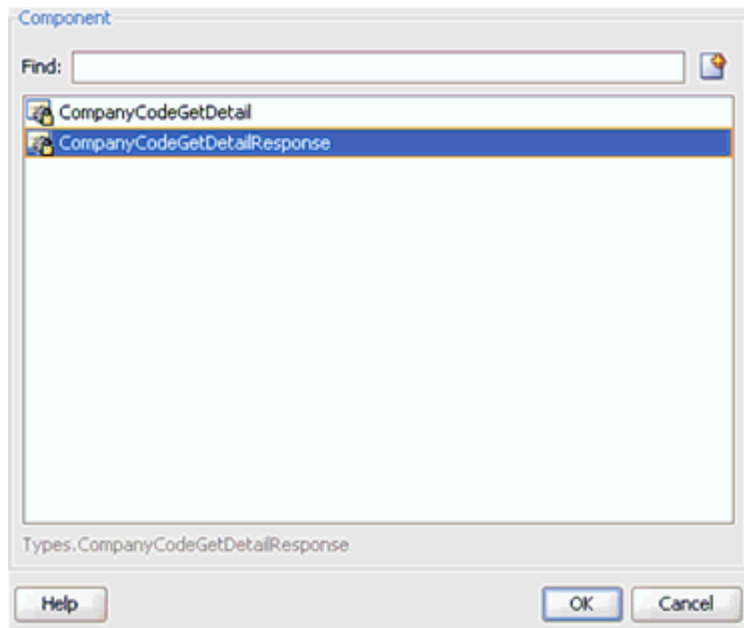


20. Click the **Browse** icon below the Type field, as shown in [Figure 8–35](#).

Figure 8–35 Create Data Object Dialog

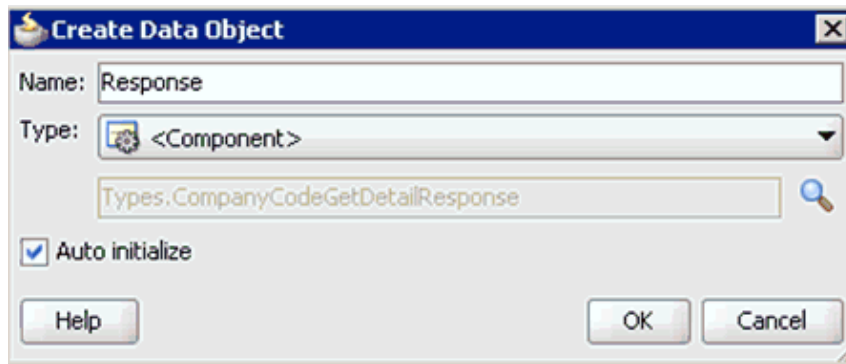


The Browse Types dialog is displayed, as shown in [Figure 8–36](#).

Figure 8–36 Browse Types Dialog

21. Select the second component (for example, `CompanyCodeGetDetailResponse`) and click **OK**.

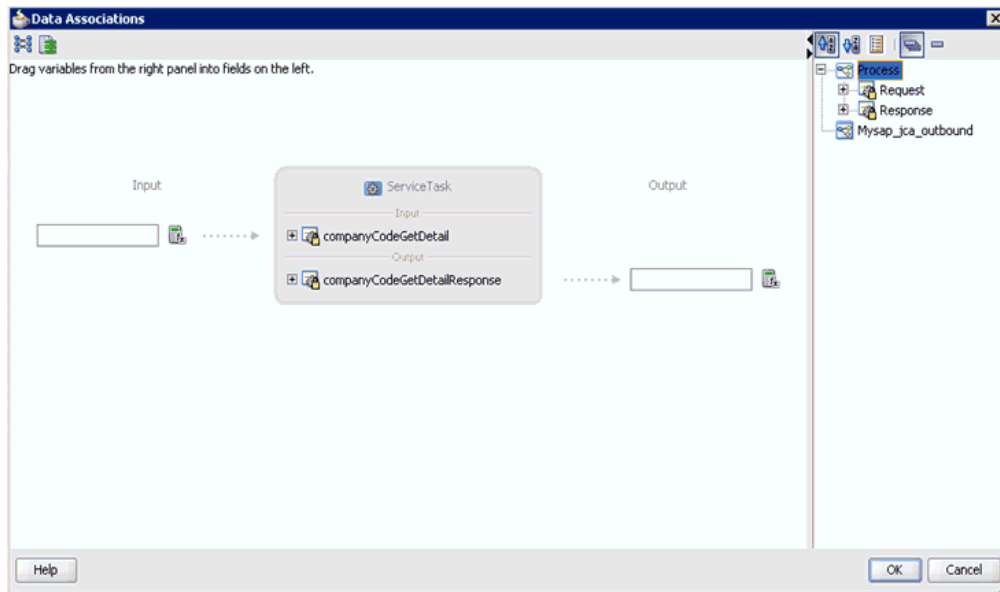
You are returned to the Create Data Object dialog, as shown in [Figure 8–30](#).

Figure 8–37 Create Data Object Dialog

22. Click **OK**.

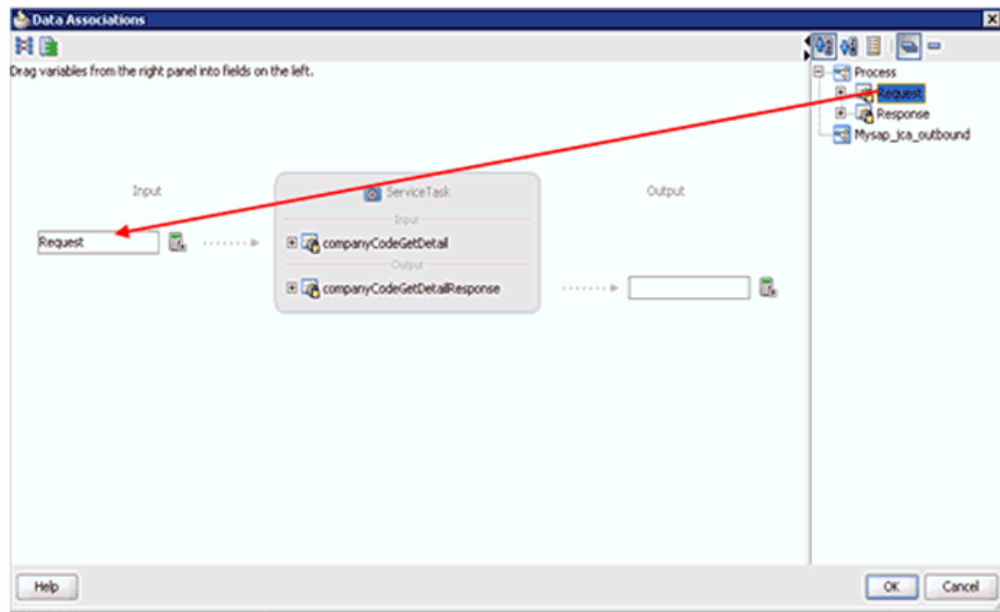
The Data Object (for example, `Response`) that has been created is displayed under the Process node in the Data Associations dialog, as shown in [Figure 8–38](#).

Figure 8–38 Data Associations Dialog



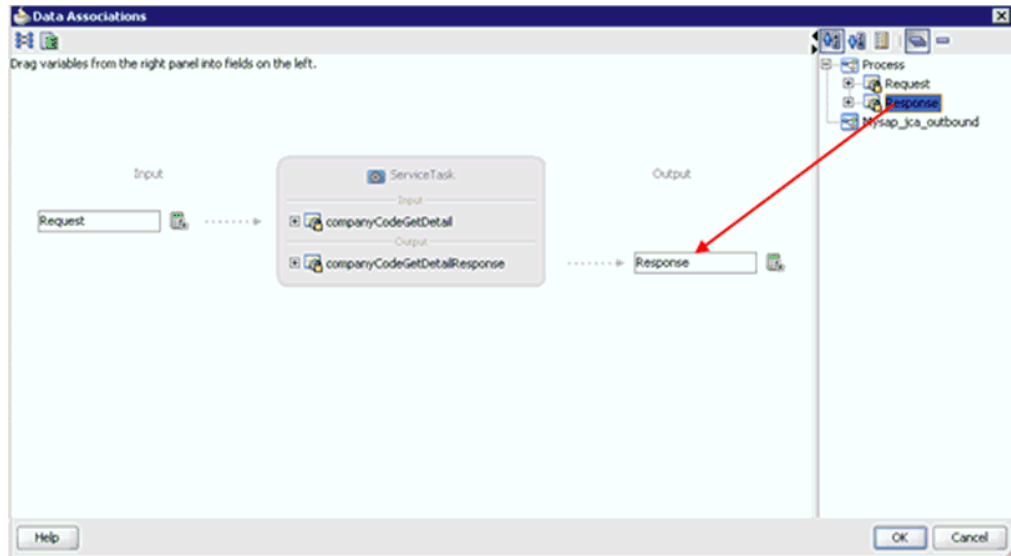
23. Select the Request Data Object under the Process node in the right pane and drag it to the field below the Inputs area, as shown in [Figure 8–39](#).

Figure 8–39 Request Data Object



24. Select the Response Data Object under the Process node in the right pane and drag it to the field below the Outputs area, as shown in [Figure 8–40](#).

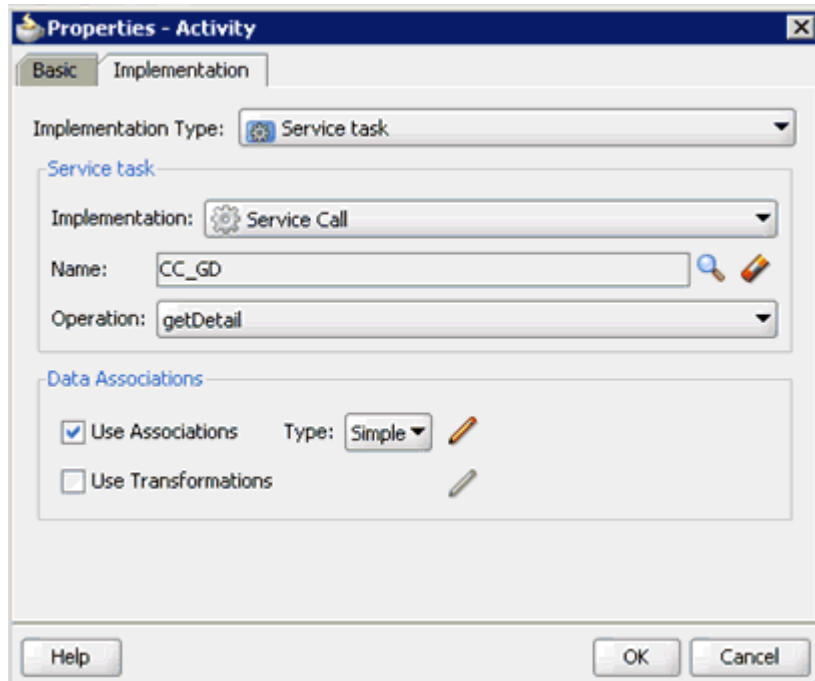
Figure 8–40 Response Data Object



25. Click OK.

You are returned to the Properties - Activity dialog, as shown in [Figure 8–41](#).

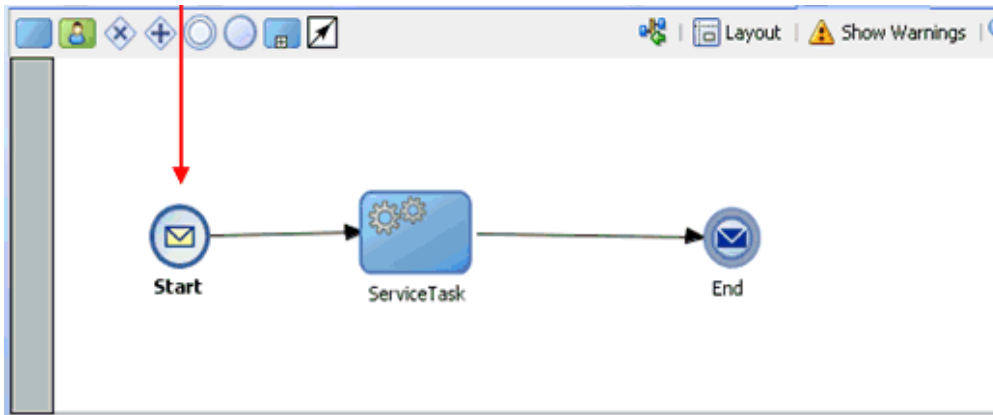
Figure 8–41 Properties - Activity Dialog



26. Click OK.

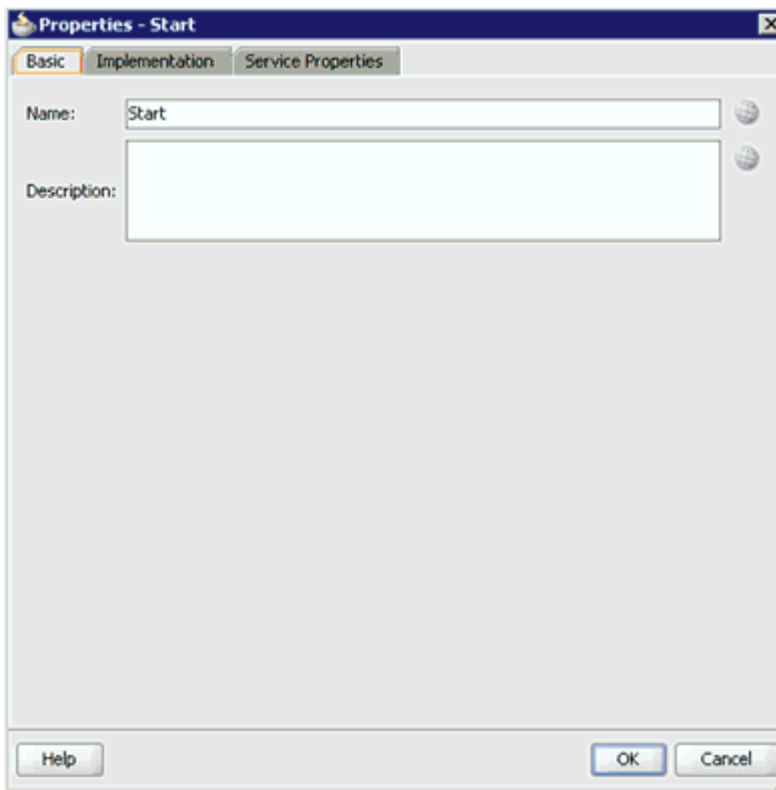
The Service Task is created between the Start and End Event components, as shown in [Figure 8–42](#).

Figure 8–42 Service Task

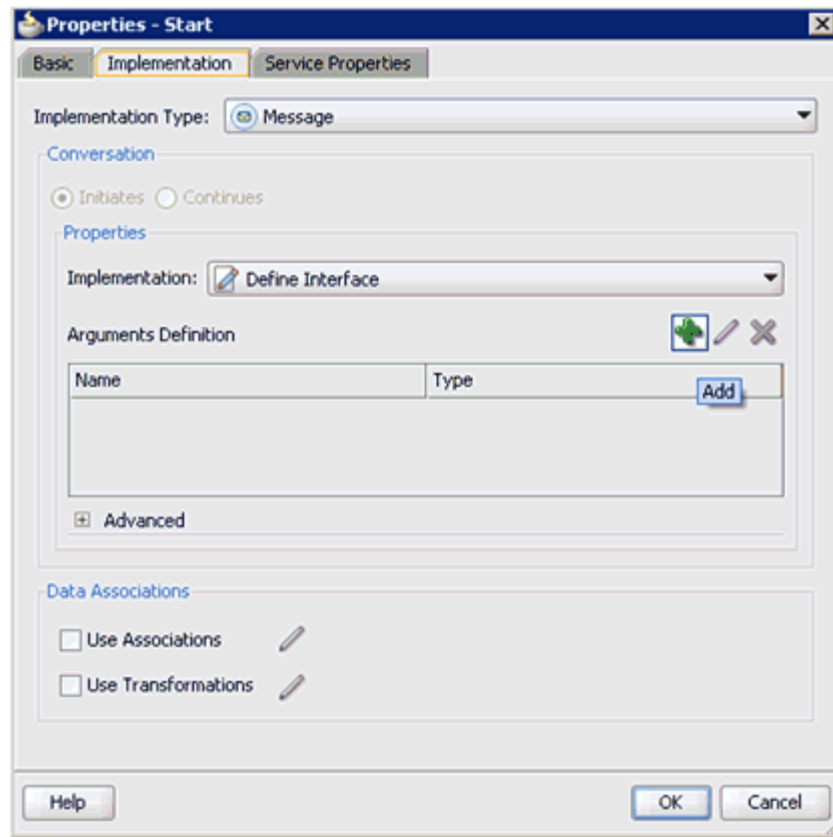


27. Save the process and double-click the Start event component.
The Properties - Start dialog is displayed, as shown in [Figure 8–43](#).

Figure 8–43 Properties - Start Dialog

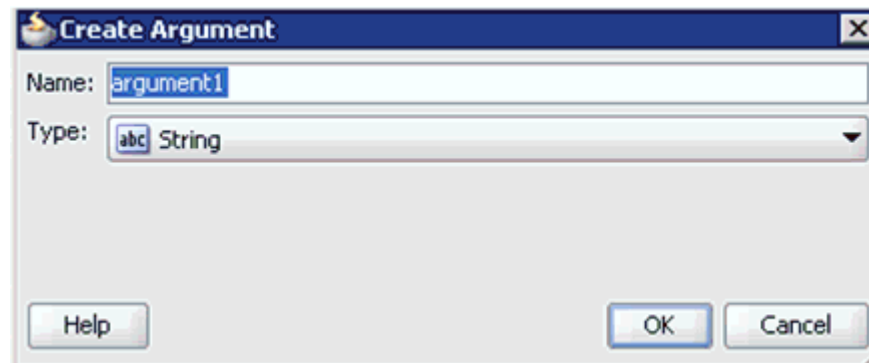


28. Click the **Implementation** tab, as shown in [Figure 8–44](#).

Figure 8–44 Implementation Tab

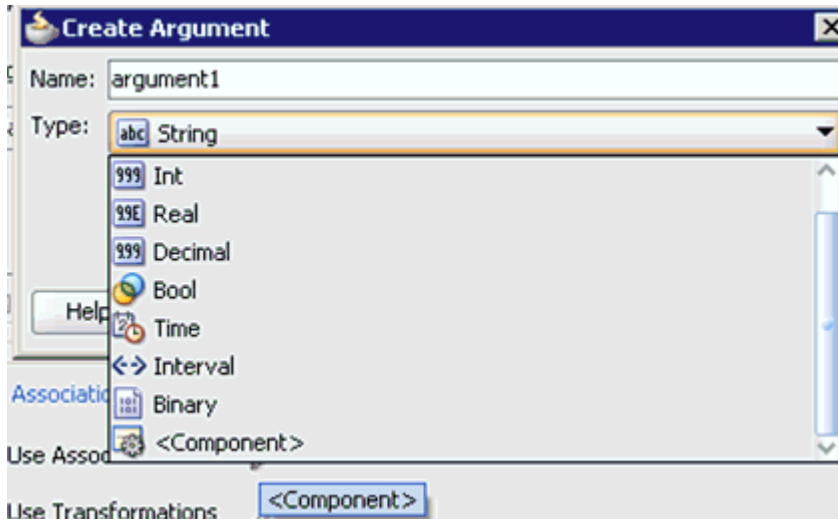
29. Click the **Plus** icon to the right of the Arguments Definition field.

The Create Argument dialog is displayed, as shown in [Figure 8–45](#).

Figure 8–45 Create Argument Dialog

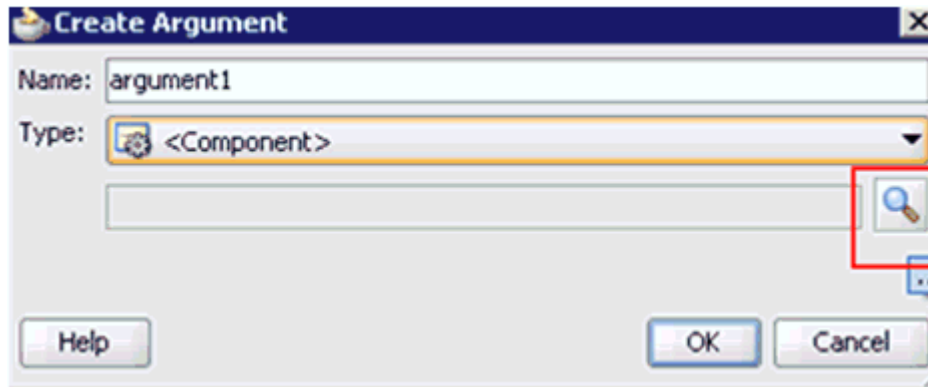
30. Enter a name in the Name field (by default, argument1), and then click the drop-down button in the Type field and select **<Component>** from the list, as shown in .

Figure 8–46 Create Argument Dialog

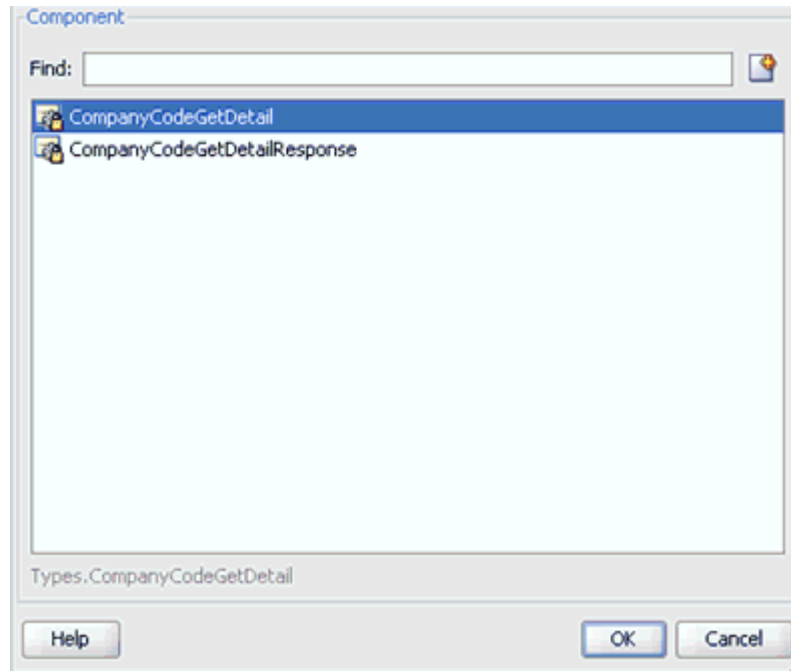


31. Click the **Browse** icon below the Type field, as shown in Figure 8–47.

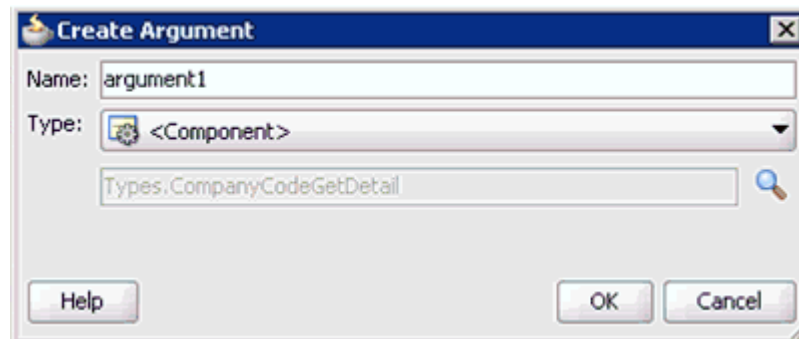
Figure 8–47 Create Data Object Dialog



The Browse Types dialog is displayed, as shown in Figure 8–48.

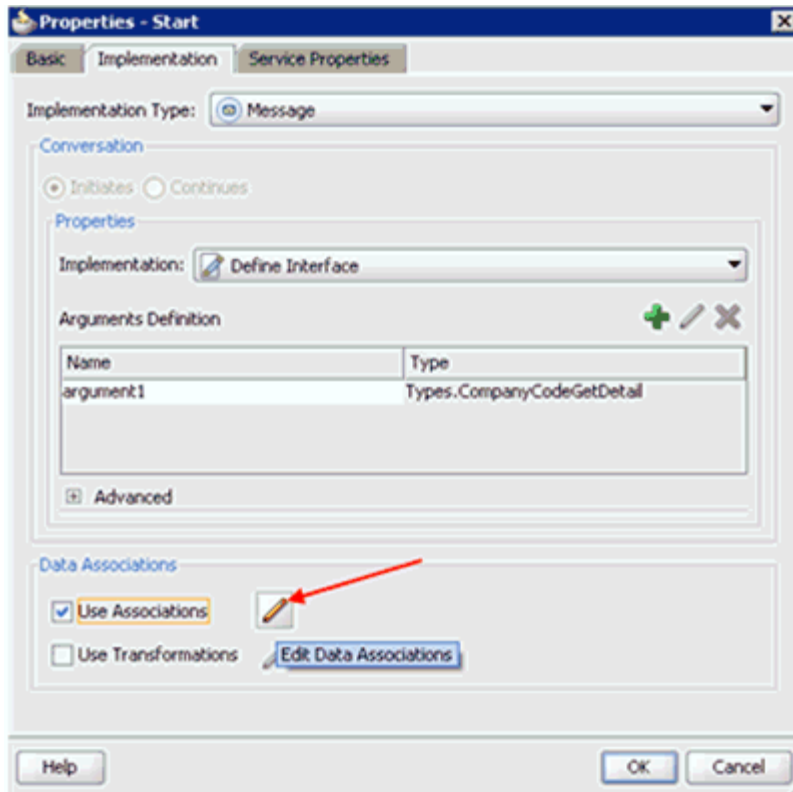
Figure 8–48 Browse Types Dialog

32. Select the first component (for example, `CompanyCodeGetDetail`) and click **OK**.
You are returned to the Create Argument dialog, as shown in [Figure 8–49](#).

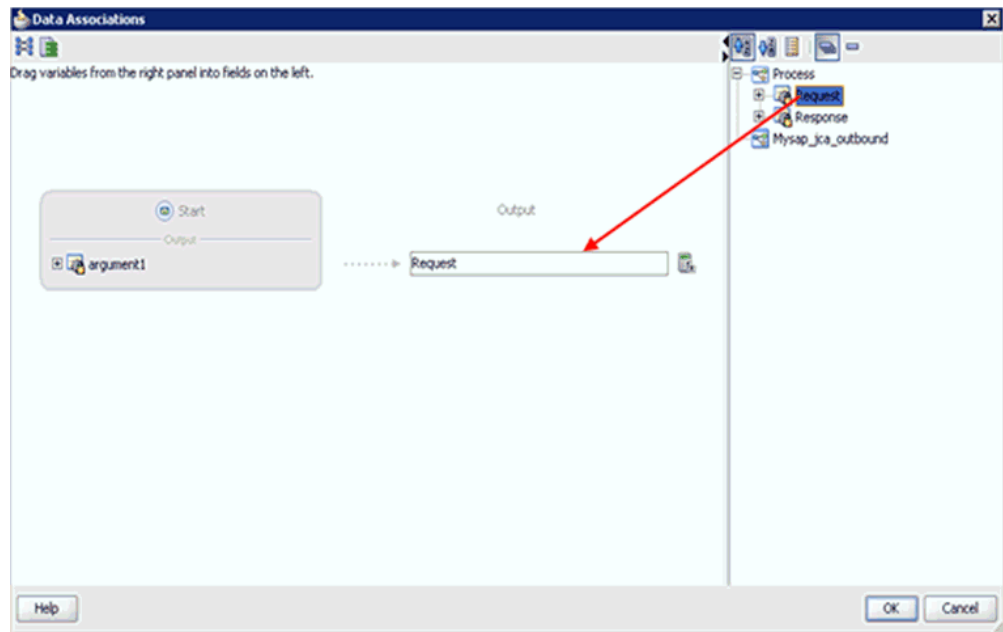
Figure 8–49 Create Argument Dialog

33. Click **OK**.
You are returned to the Properties - Start dialog, as shown in [Figure 8–50](#).

Figure 8–50 Properties - Start Dialog



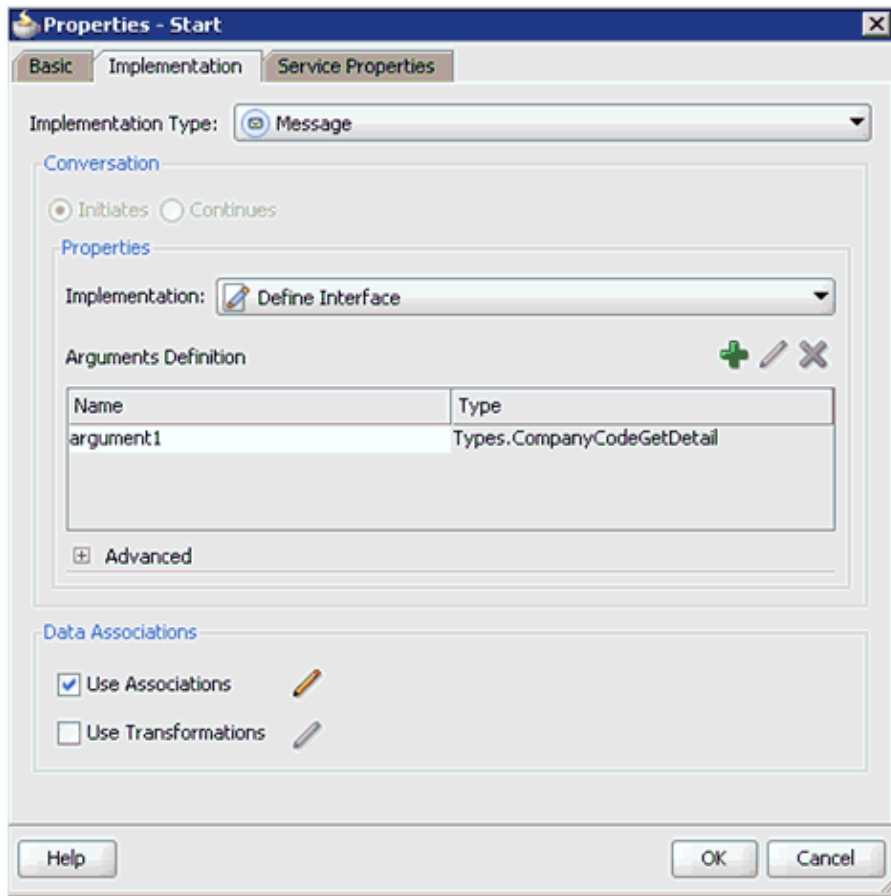
34. Select the **Use Associations** option that is located under Data Associations.
35. Click the **Edit Data Associations** icon.
The Data Associations dialog is displayed, as shown in [Figure 8–51](#).
36. Select the Request Data Object under the Process node in the right pane and drag it to the field below the Outputs area.

Figure 8–51 Data Associations Dialog

37. Click **OK**.

You are returned to the Properties - Start dialog, as shown in [Figure 8–52](#).

Figure 8–52 Properties - Start Dialog

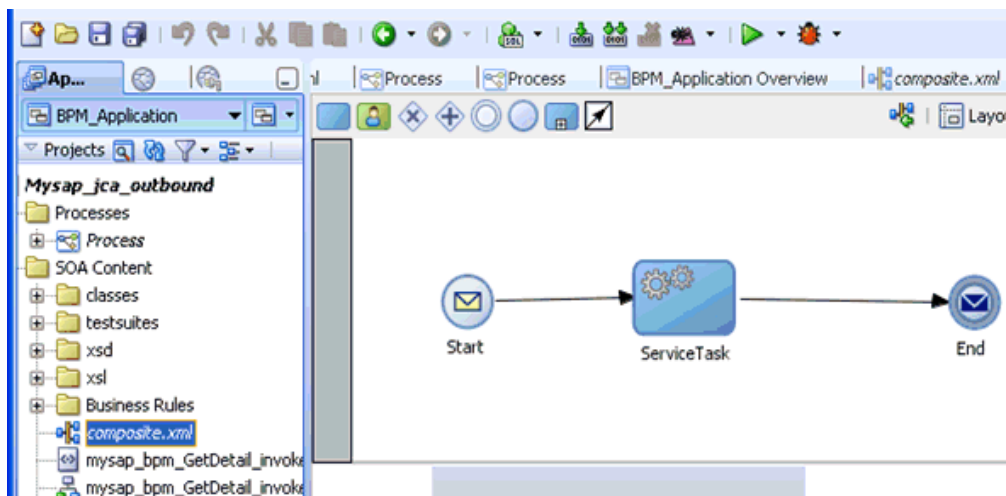


38. Click OK.

You are returned to the Process workspace area, as shown in [Figure 8–53](#).

39. Double-click **composite.xml** in the left pane.

Figure 8–53 Process Workspace Area



40. Click the **Save All** icon in the menu bar to save the new outbound BPM process component that was configured.

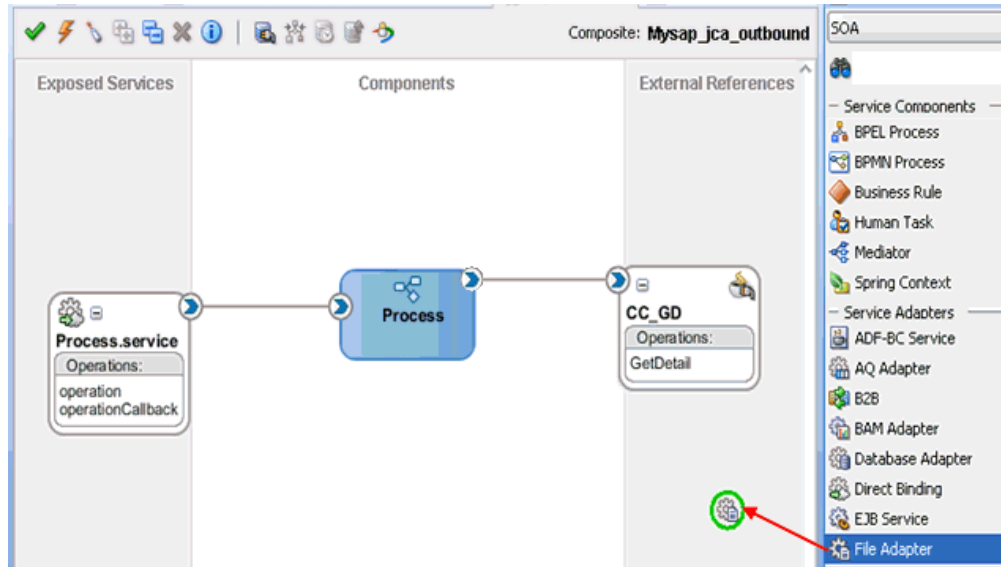
You are now ready to create a File adapter for the write operation.

Creating a File Adapter for the Write Operation

Perform the following steps to create a File adapter for the write operation:

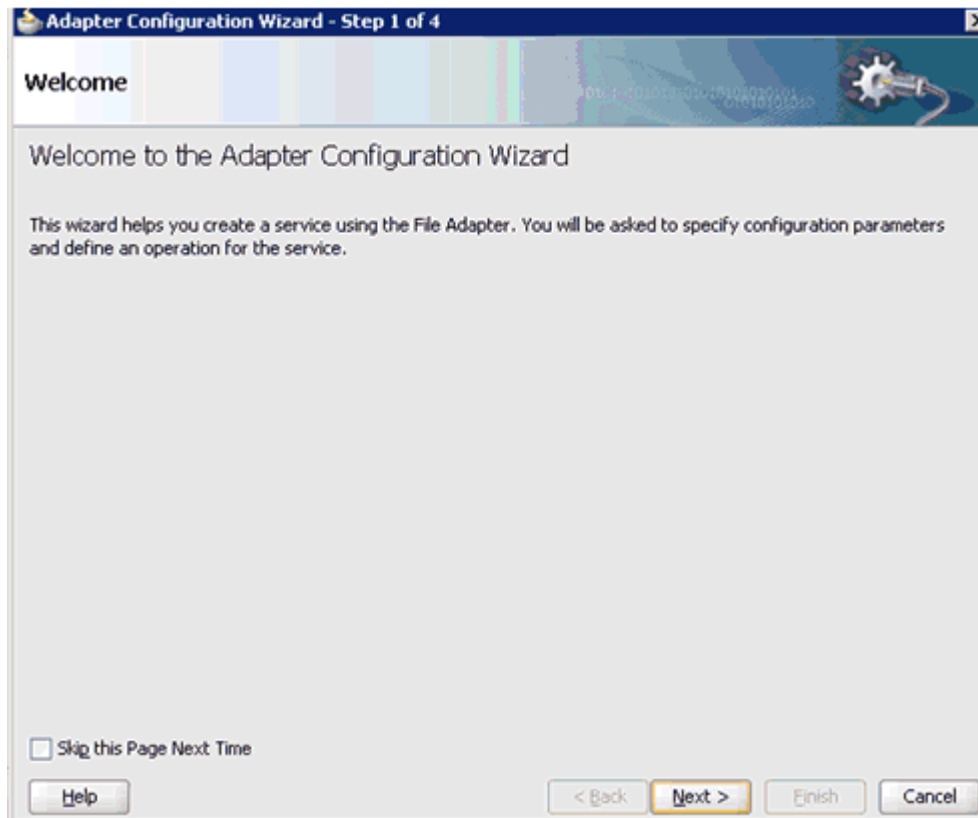
1. Drag and drop the **File Adapter** component from the Service Adapters pane to the External References pane, as shown in [Figure 8-54](#).

Figure 8-54 File Adapter Component



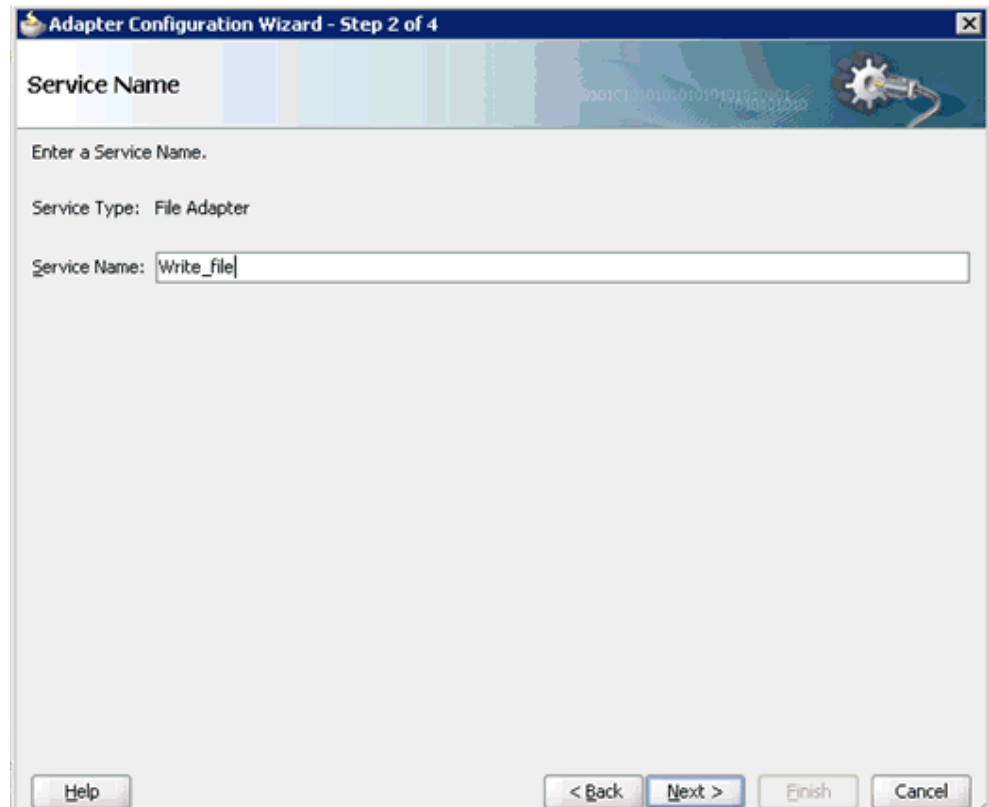
The Adapter Configuration Wizard is displayed, as shown in [Figure 8-55](#).

Figure 8–55 Adapter Configuration Wizard



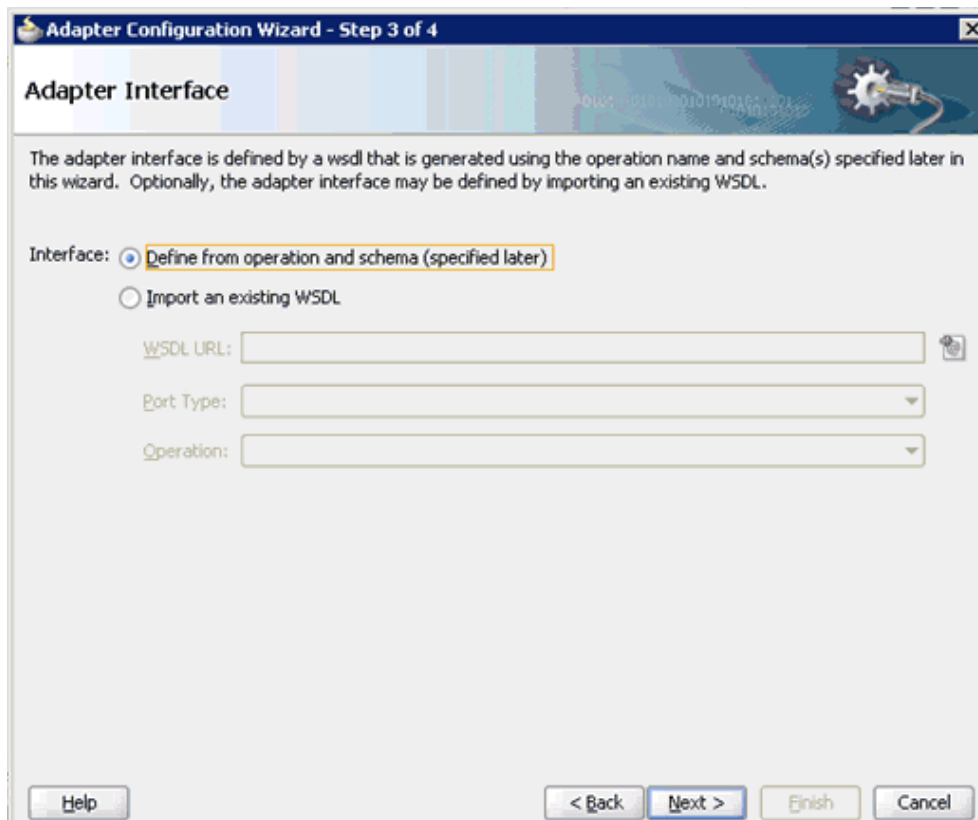
2. Click **Next**.

The Service Name page is displayed, as shown in [Figure 8–56](#).

Figure 8–56 Service Name Page

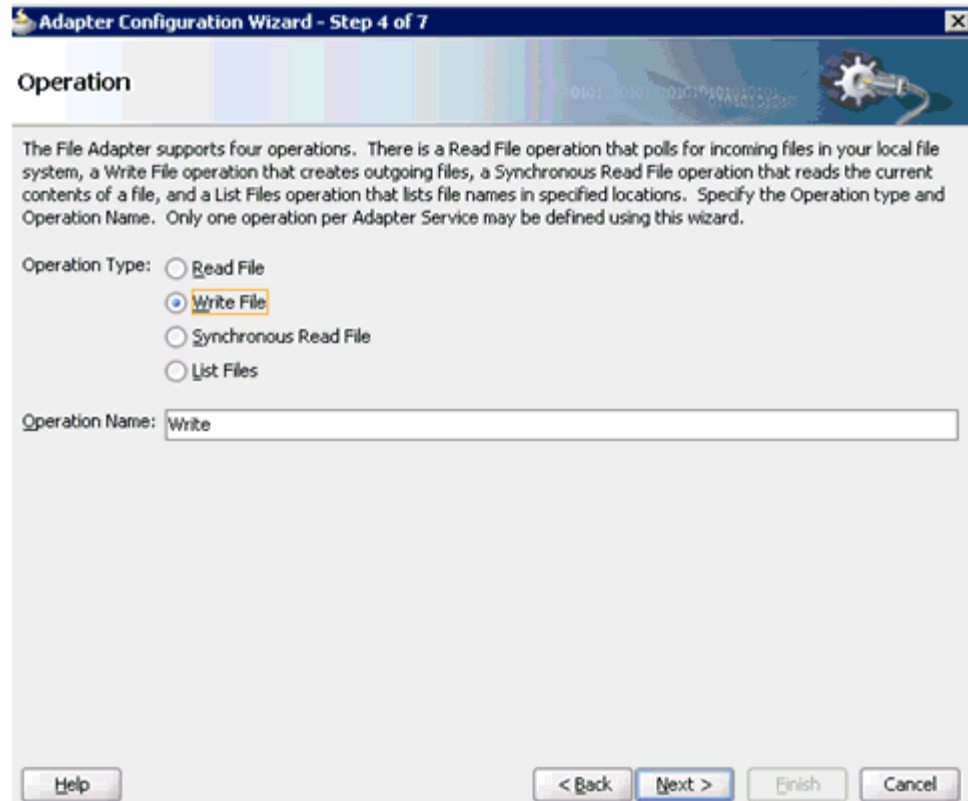
3. Type a name for the new File adapter in the Service Name field and click **Next**. The Adapter Interface page is displayed, as shown in [Figure 8–57](#).

Figure 8–57 Adapter Interface Page



4. Ensure that the **Define from operation and schema (specified later)** option is selected.
5. Click **Next**.

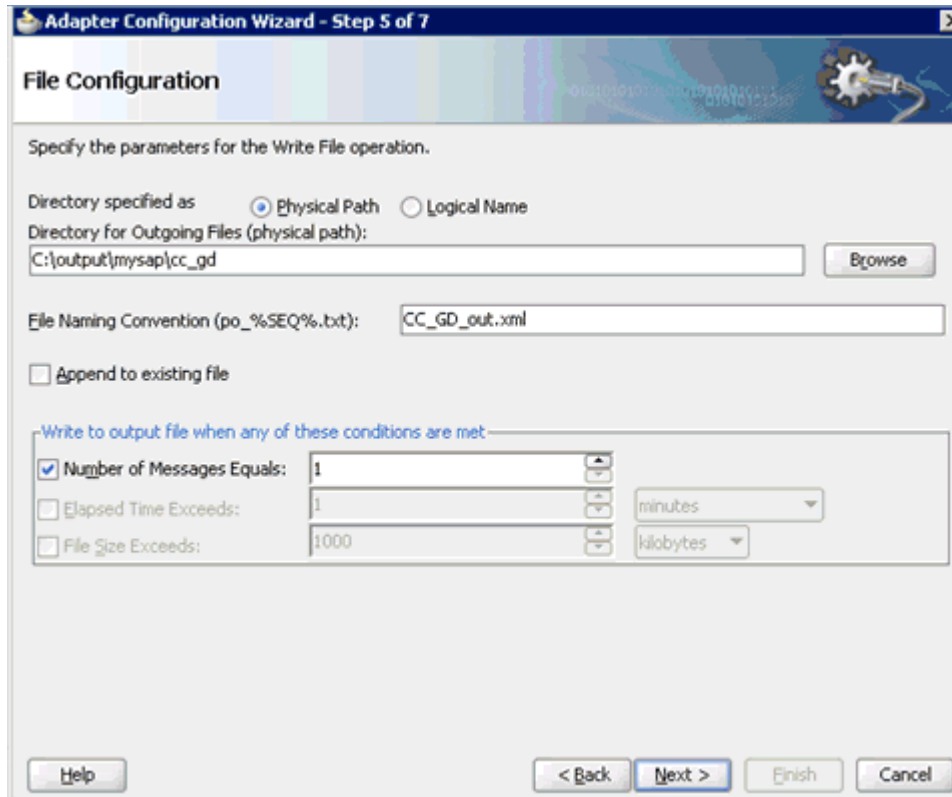
The Operation page is displayed, as shown in [Figure 8–58](#).

Figure 8–58 Operation Page

6. Select **Write File** from the list of Operation Type options and specify an Operation Name (for example, Write).
7. Click **Next**.

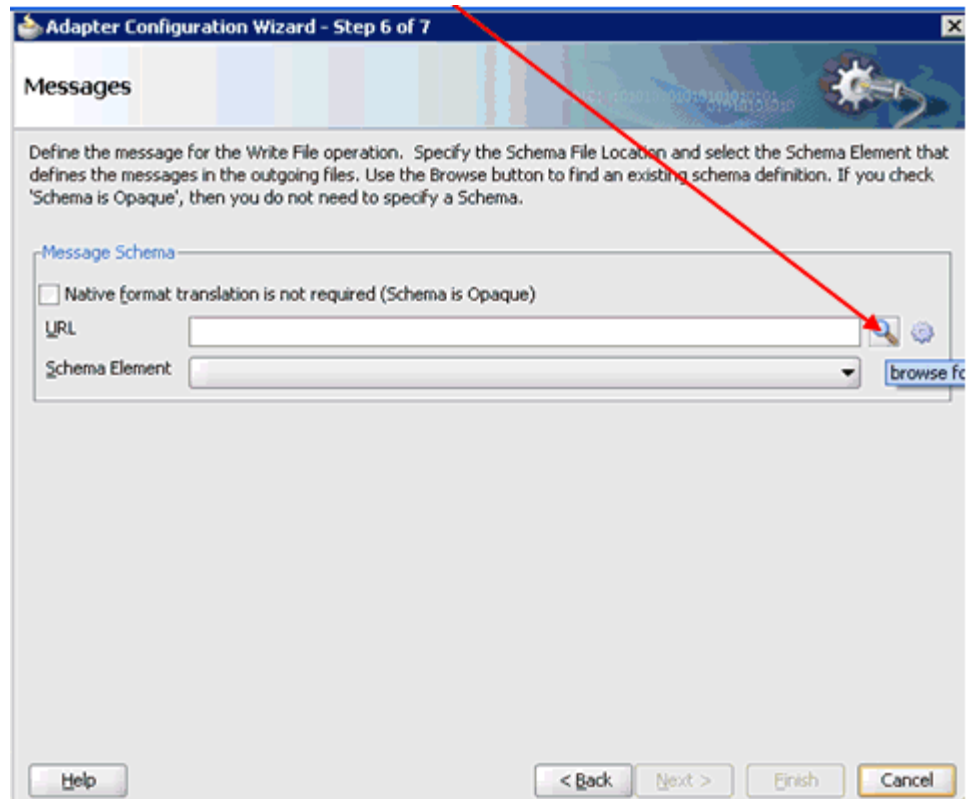
The File Configuration page is displayed, as shown in [Figure 8–59](#).

Figure 8–59 File Configuration Page



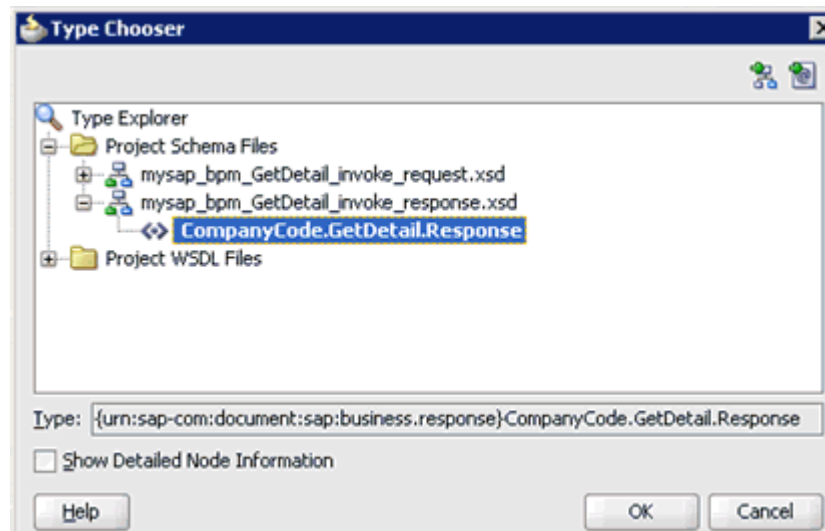
8. Specify a location on your file system where the output file is written.
9. In the File Naming Convention field, specify a name for the output file.
10. Click **Next**.

The Messages page is displayed, as shown in [Figure 8–60](#).

Figure 8–60 Messages Page

11. Click **Browse**, which is located to the right of the URL field.

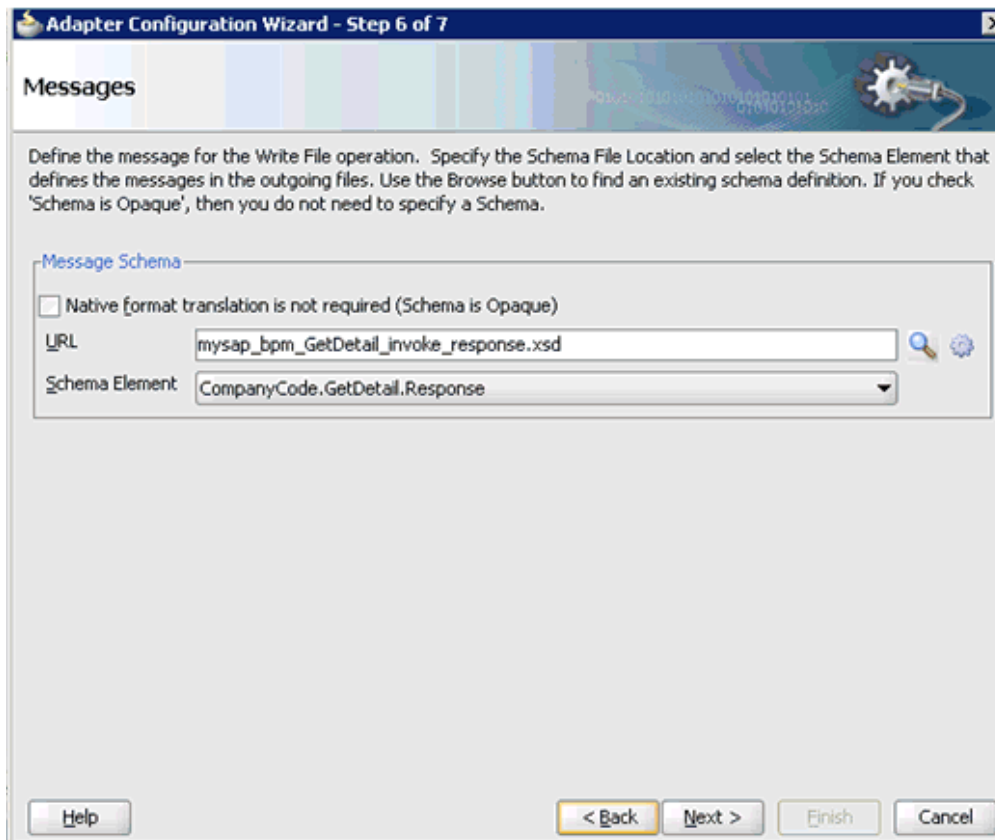
The Type Chooser dialog is displayed, as shown in [Figure 8–61](#).

Figure 8–61 Type Chooser Dialog

12. Expand **Project Schema Files** and **mysap_bpm_GetDetail_invoke_response.xsd**.
13. Select the available schema (for example, **CompanyCode.GetDetail.Response**).
14. Click **OK**.

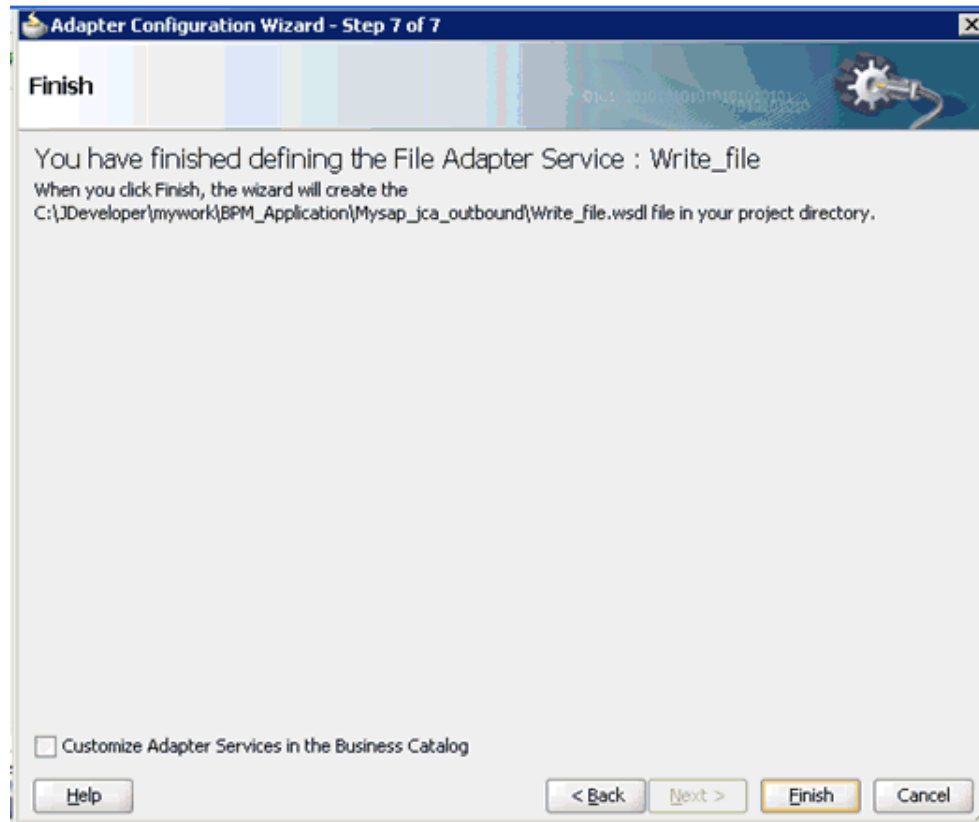
You are returned to the Messages page, as shown in [Figure 8–62](#).

Figure 8–62 Messages Page

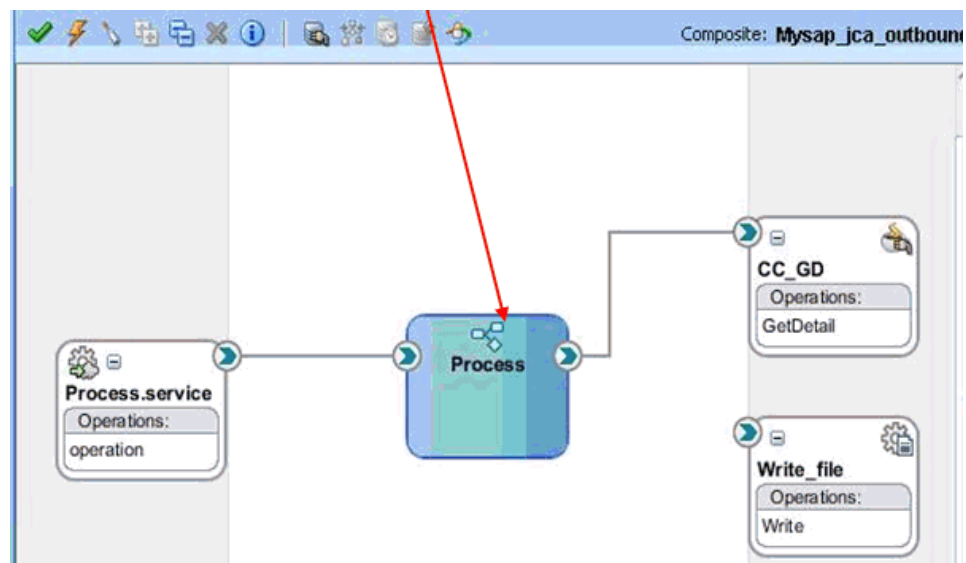


15. Click **Next**.

The Finish page is displayed, as shown in [Figure 8–63](#).

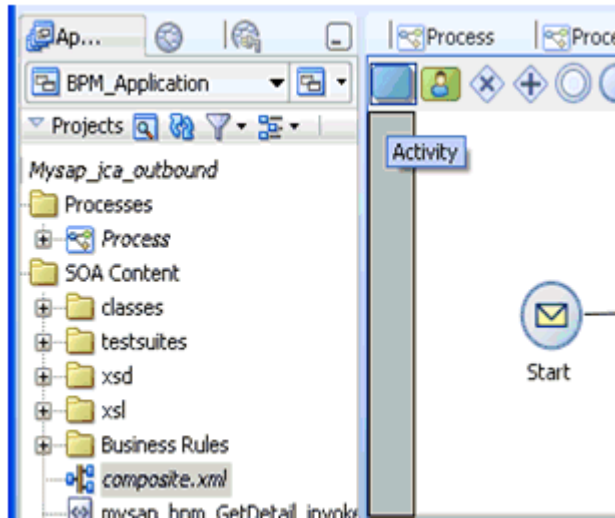
Figure 8–63 Finish Page**16. Click Finish.**

The File Adapter service is created in the External References pane, as shown in [Figure 8–64](#).

Figure 8–64 File Adapter Service**17. Double-click the BPMN Process component.**

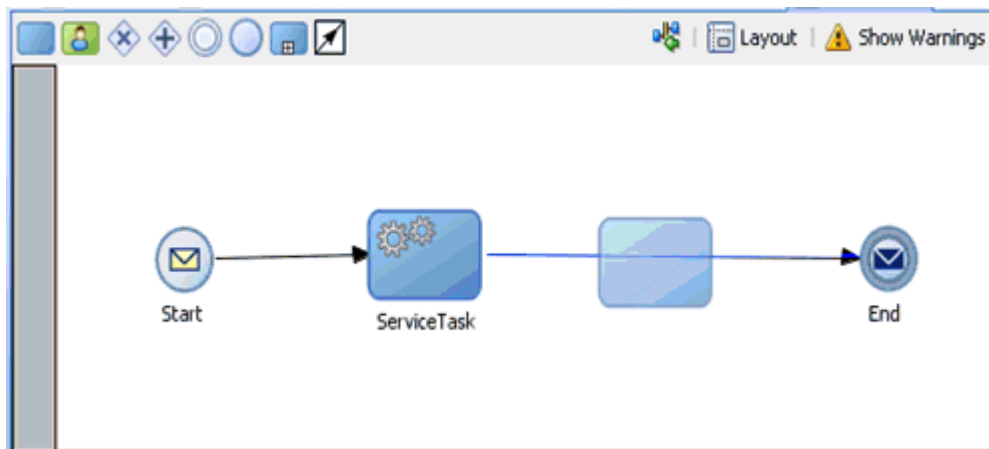
The BPMN process is displayed, as shown in [Figure 8–65](#).

Figure 8–65 *BPMN Process*

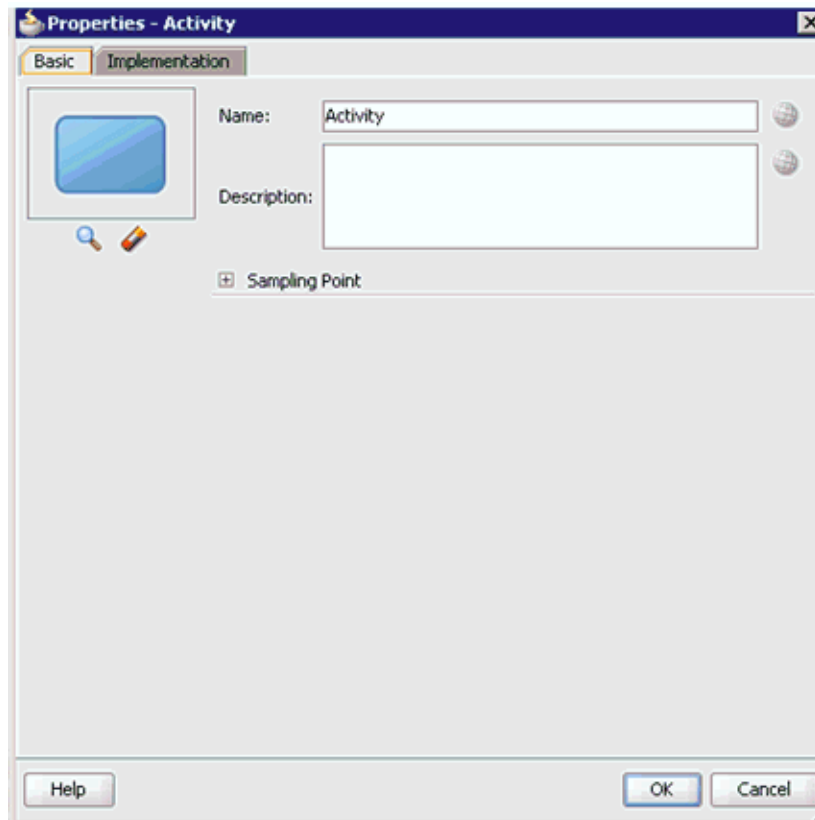


18. Click the **Activity** icon.
19. Drop the Activity icon on the wire between the Service Task and End event components, as shown in [Figure 8–66](#).

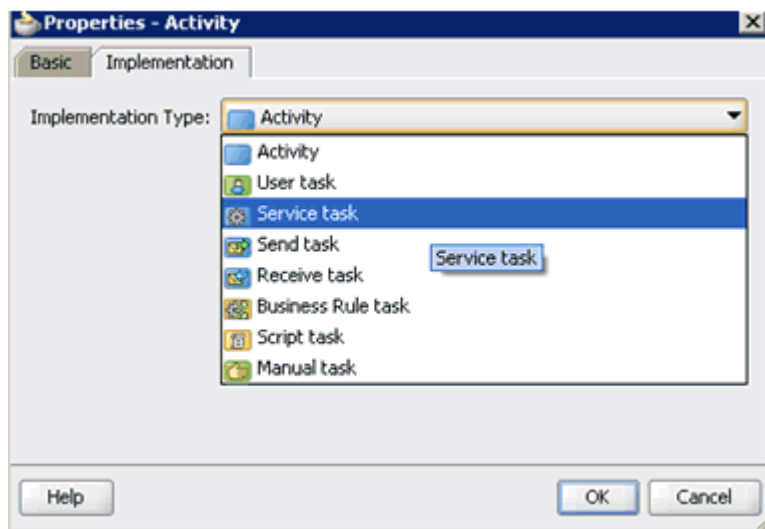
Figure 8–66 *Activity Icon*



The Properties - Activity dialog is displayed, as shown in [Figure 8–67](#).

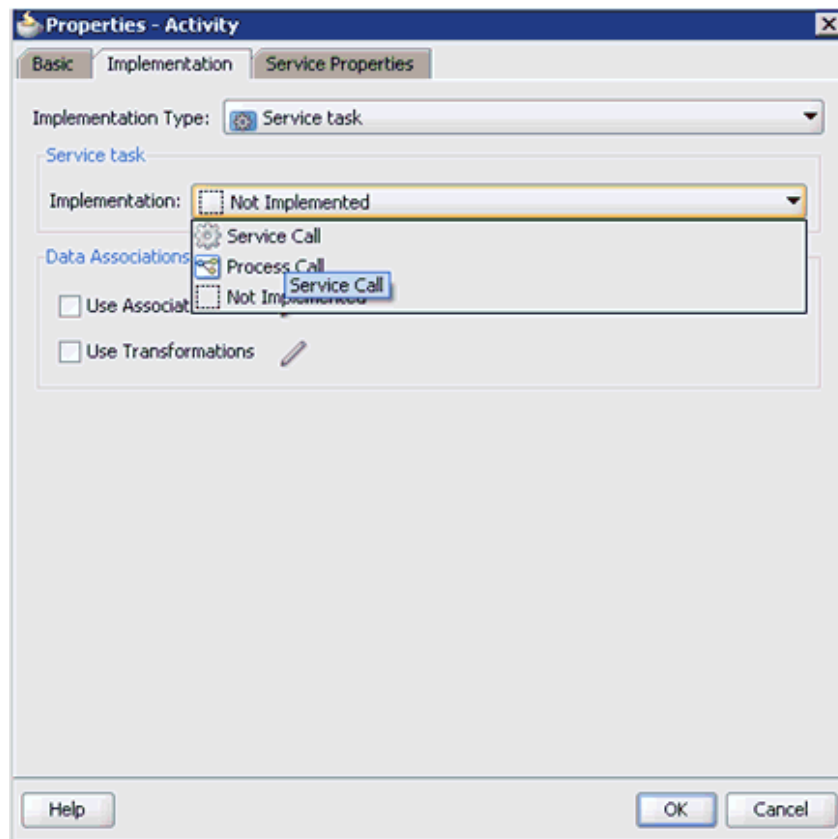
Figure 8–67 Properties - Activity Dialog

20. Click the **Implementation** tab, as shown in [Figure 8–68](#).

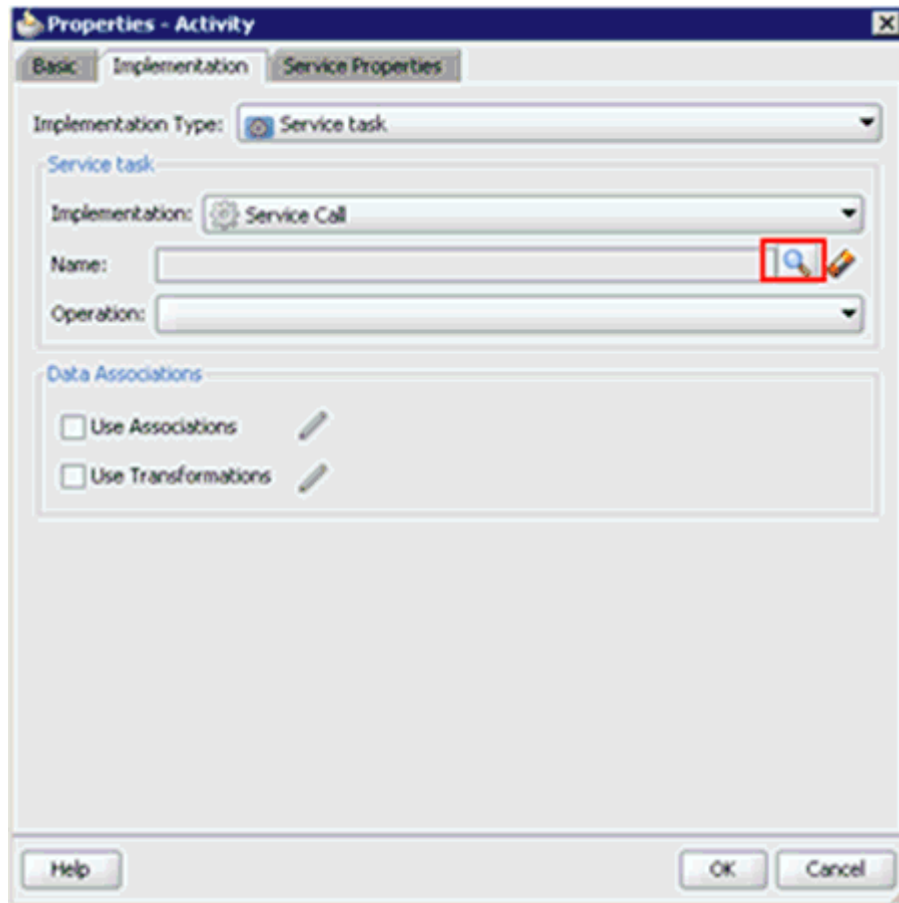
Figure 8–68 Implementation Tab

21. Select **Service Task** from the Implementation Type list, as shown in [Figure 8–69](#).

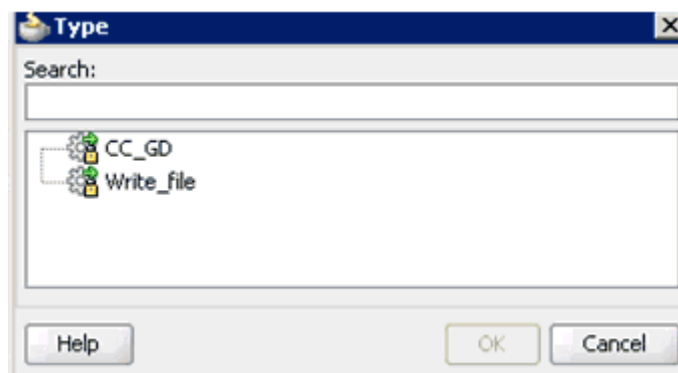
Figure 8–69 Service Task



22. Select **Service Call** from the Implementation list.
23. Click the **Browse** icon to the right of the Name field, as shown in [Figure 8–70](#).

Figure 8–70 Browse Icon

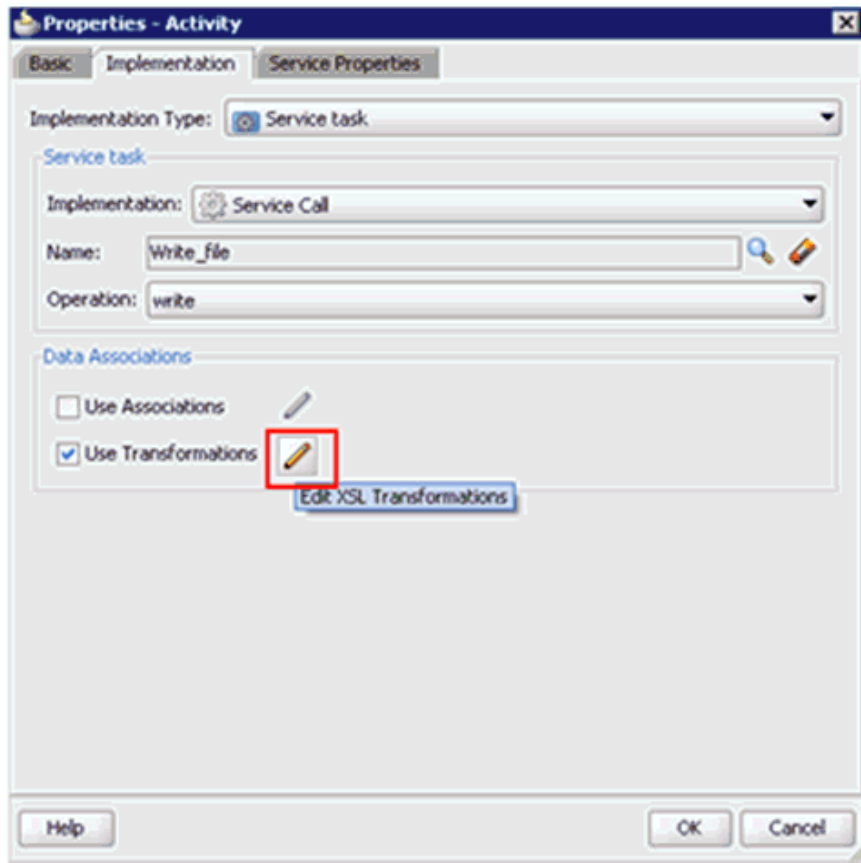
The Type dialog is displayed, as shown in [Figure 8–71](#).

Figure 8–71 Type Dialog

24. Select the service for write operation that has been created (for example, Write_file) and click **OK**.

You are returned to the Properties - Activity dialog, as shown in [Figure 8–72](#).

Figure 8–72 Properties - Activity Dialog

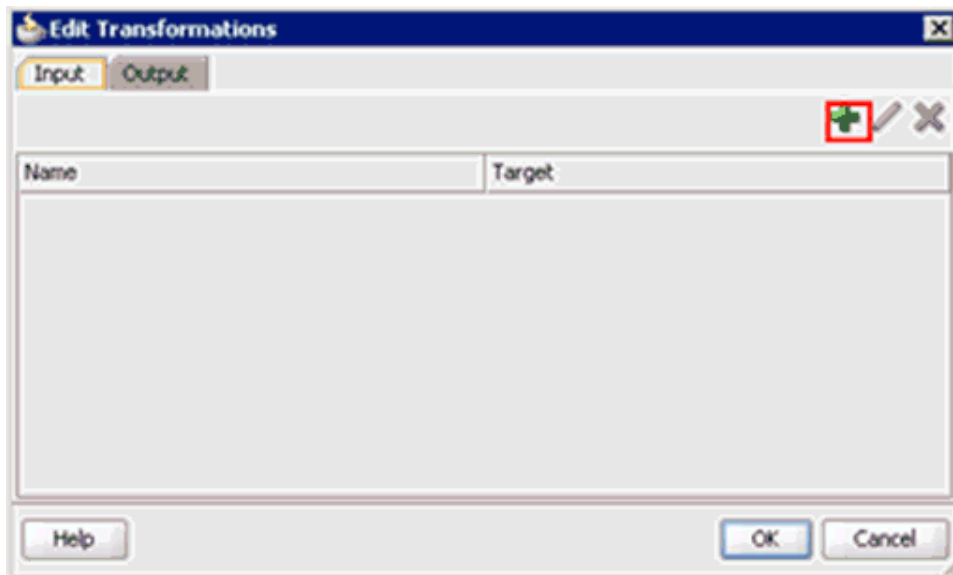


25. Select the **Use Transformations** option that is located under Data Associations.

26. Click the **Edit XSL Transformations** icon.

The Edit Transformations dialog is displayed, as shown in [Figure 8–73](#).

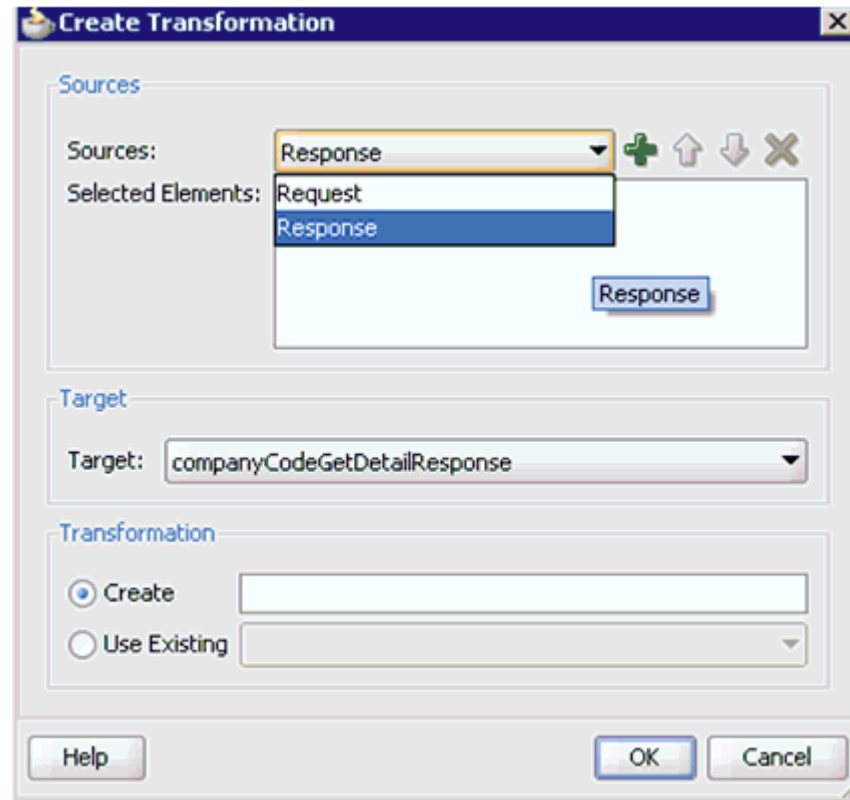
Figure 8–73 Edit Transformations Dialog



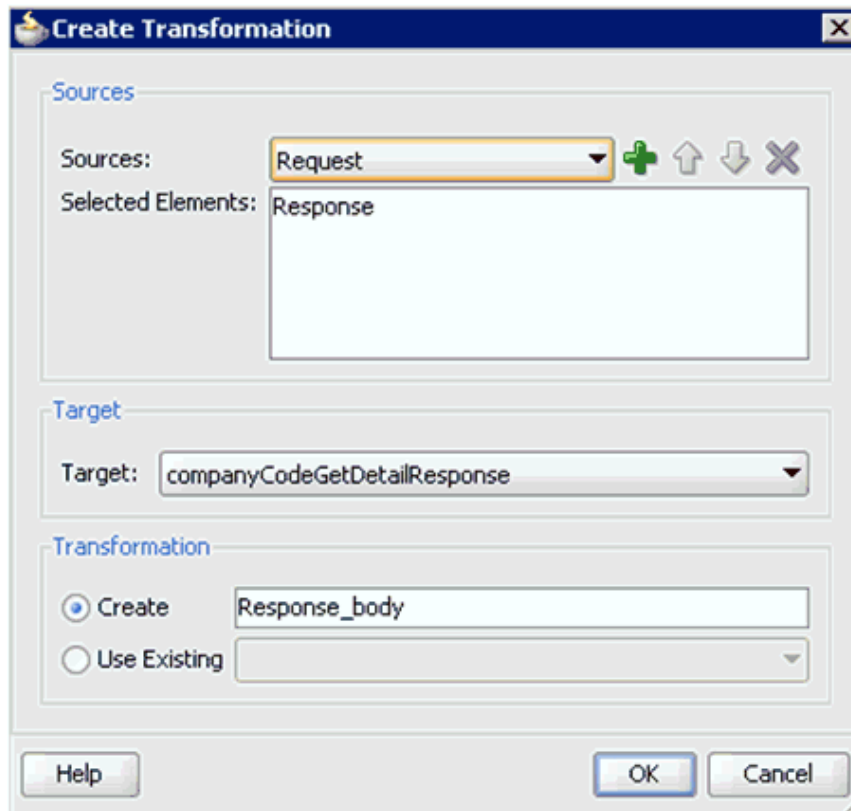
27. Click the **Plus** icon.

The Create Transformation dialog is displayed, as shown in [Figure 8-74](#).

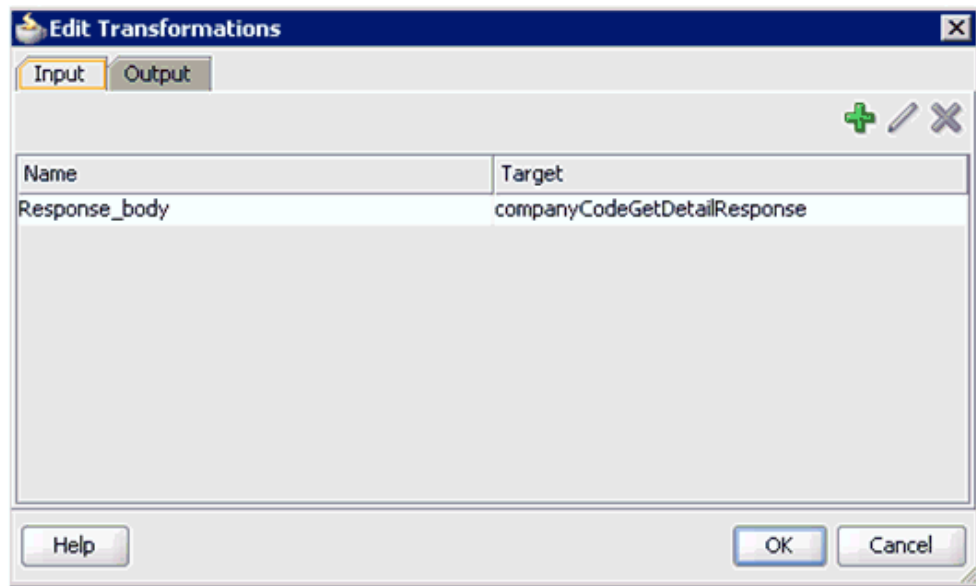
Figure 8-74 Create Transformation Dialog



28. Select the **Response** Data Object that was created from the Sources list.

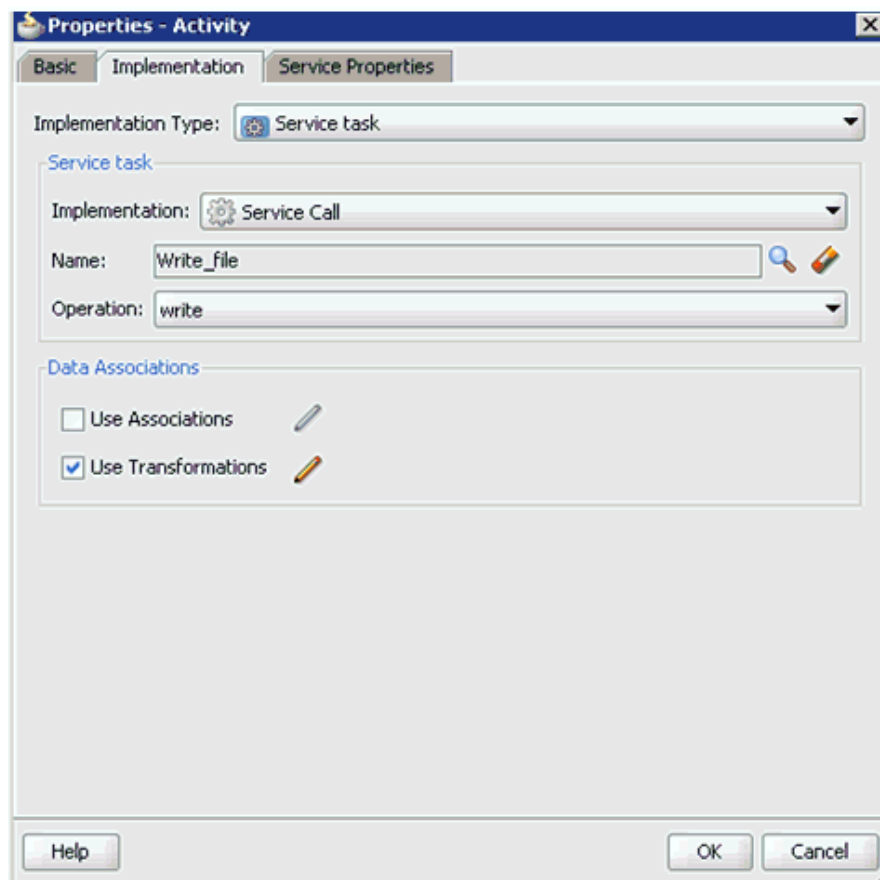
Figure 8–75 Plus Icon

29. Click the **Plus** icon so that the Data Object 'Response' is added to the Selected Elements area, as shown in [Figure 8–75](#).
30. Accept the default value that is selected in the Target list, as shown in [Figure 8–75](#).
31. Leave the default name displayed in the Create field and click **OK**.
You are returned to the Edit Transformations dialog, as shown in [Figure 8–76](#).

Figure 8–76 Edit Transformations Dialog

32. Click OK.

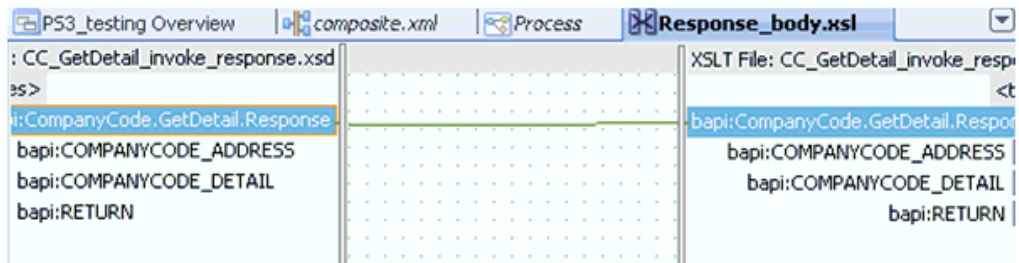
You are returned to the Properties - Activity dialog, as shown in [Figure 8–77](#).

Figure 8–77 Properties - Activity Dialog

33. Click **OK**.

The `Response_body.xml` tab is displayed, as shown in [Figure 8-78](#).

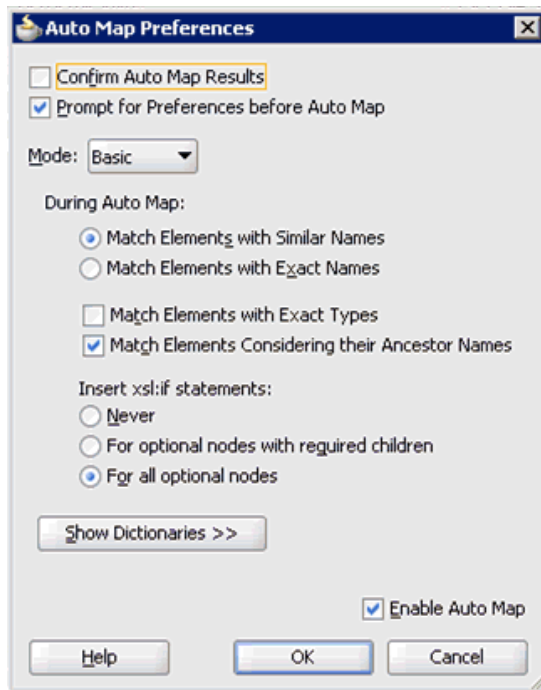
Figure 8-78 *Response_body.xml Tab*



34. Automap the Source and Target elements.

The Auto Map Preferences dialog is displayed, as shown in [Figure 8-79](#).

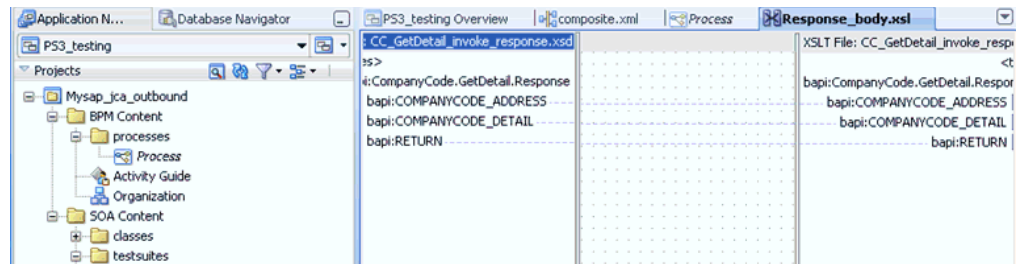
Figure 8-79 *Auto Map Preferences Dialog*



35. Accept the default values and click **OK**.

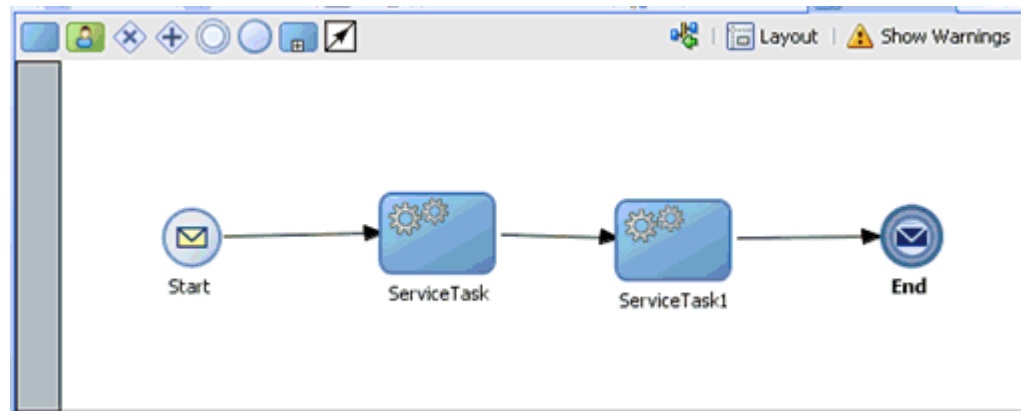
The transformation is completed, as shown in [Figure 8-80](#).

Figure 8–80 Completed Transformation



36. Save the transformation.
37. Return to the Process workspace area, as shown in [Figure 8–81](#).

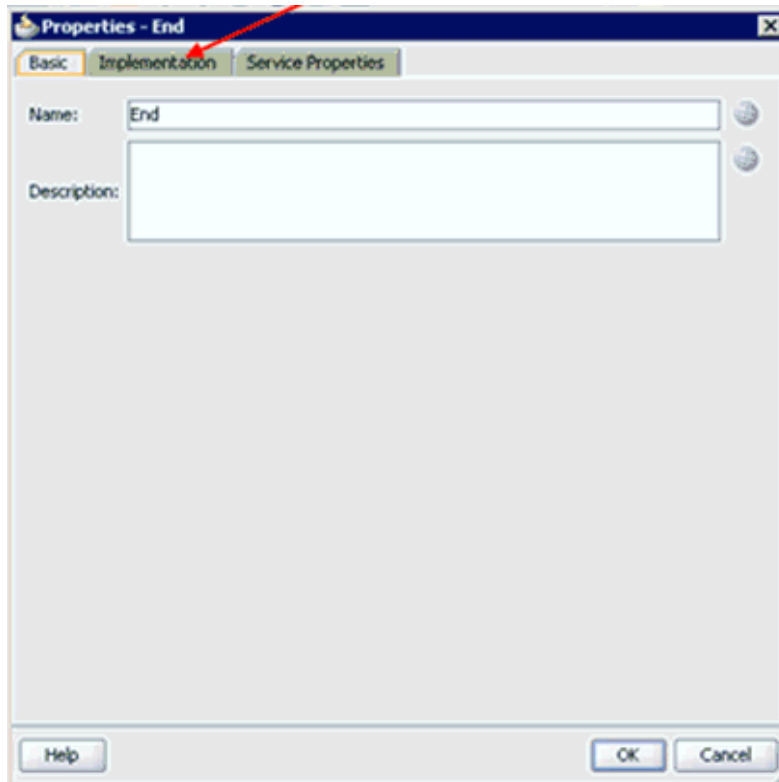
Figure 8–81 Process Workspace Area



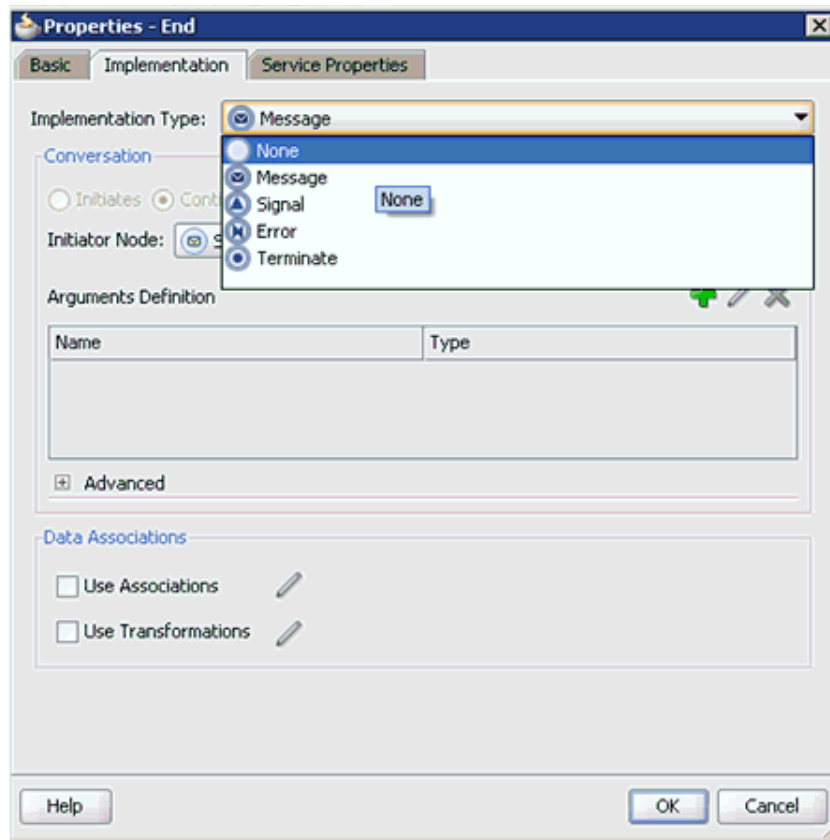
The ServiceTask1 component is created between the ServiceTask component and the End event component.

38. Save the process.
39. Double-click the **End** event component.
The Properties - End dialog is displayed.
40. Click the **Implementation** tab, as shown in [Figure 8–82](#).

Figure 8–82 Implementation Tab

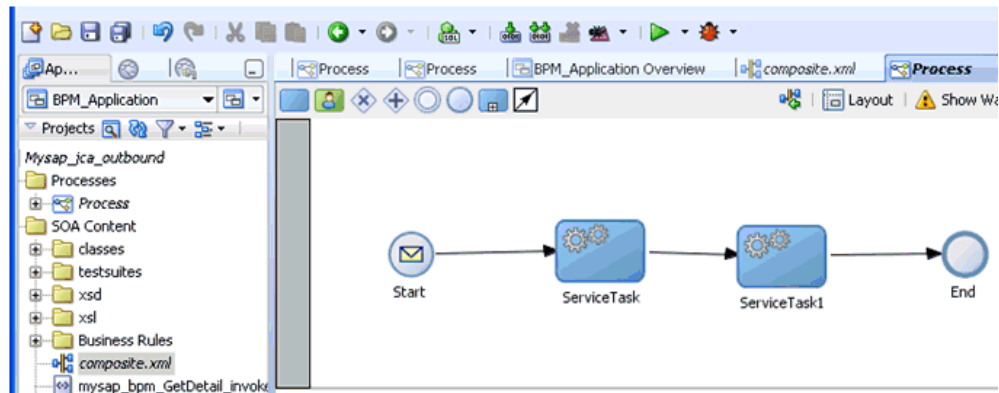


41. Select **None** from the Implementation Type list, as shown in [Figure 8–83](#).

Figure 8–83 Implementation Type List

42. Click OK.

You are returned to the Process workspace area, as shown in [Figure 8–84](#).

Figure 8–84 Process Workspace Area

43. Save the Process and double-click the **composite.xml** file.

44. Click the **Save All** icon in the menu bar to save the new outbound BPM process component that was configured.

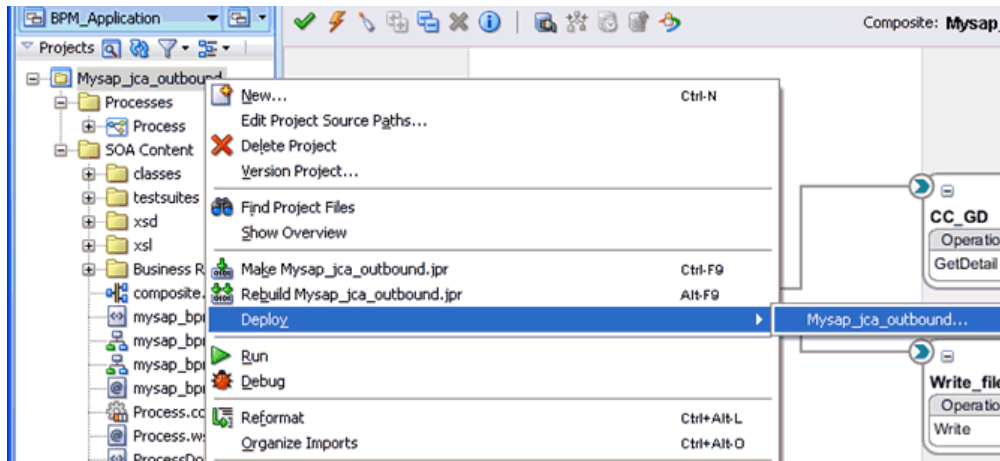
You are now ready to deploy the outbound BPM process.

8.4.3 Deploying the BPM Outbound Process

Perform the following steps to deploy the BPM outbound process.

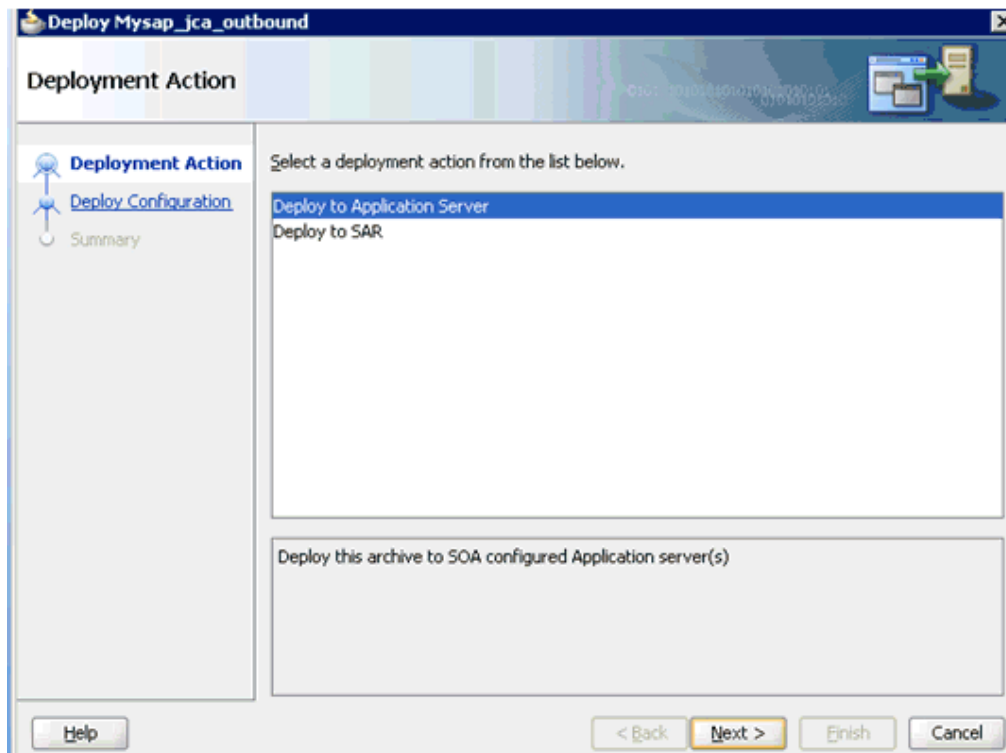
1. Right-click the project name in the left pane (for example, **Mysap_jca_outbound**), select **Deploy**, and then click **Mysap_jca_outbound**, as shown in [Figure 8–85](#).

Figure 8–85 *Mysap_jca_outbound Option*



The Deployment Action page is displayed, as shown in [Figure 8–86](#).

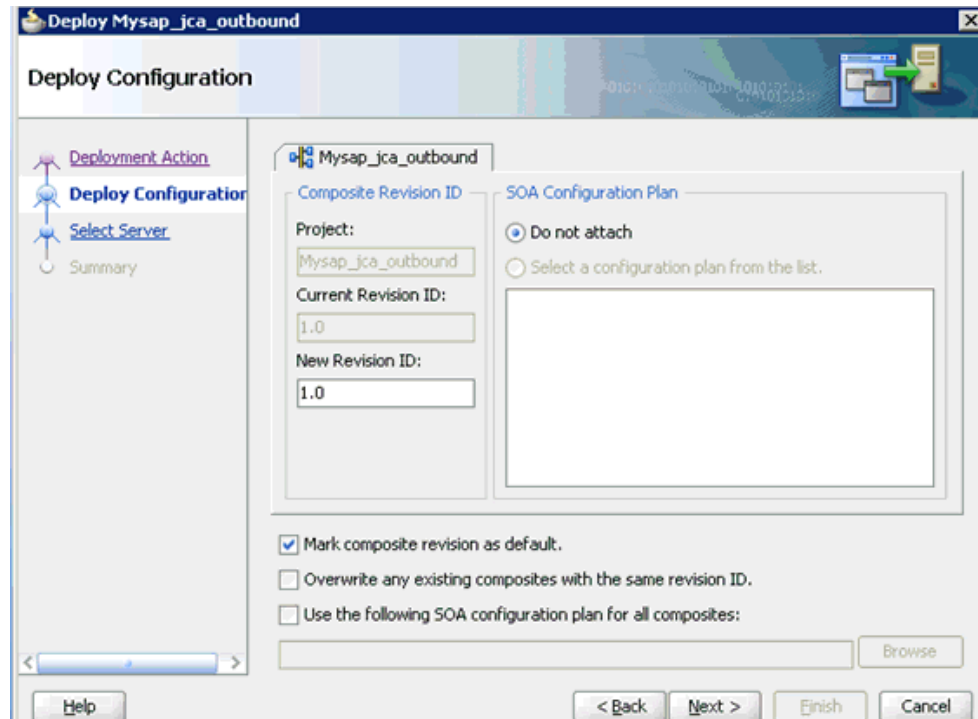
Figure 8–86 *Deployment Action Page*



2. Ensure that **Deploy to Application Server** is selected.
3. Click **Next**.

The Deploy Configuration page is displayed, as shown in [Figure 8-87](#).

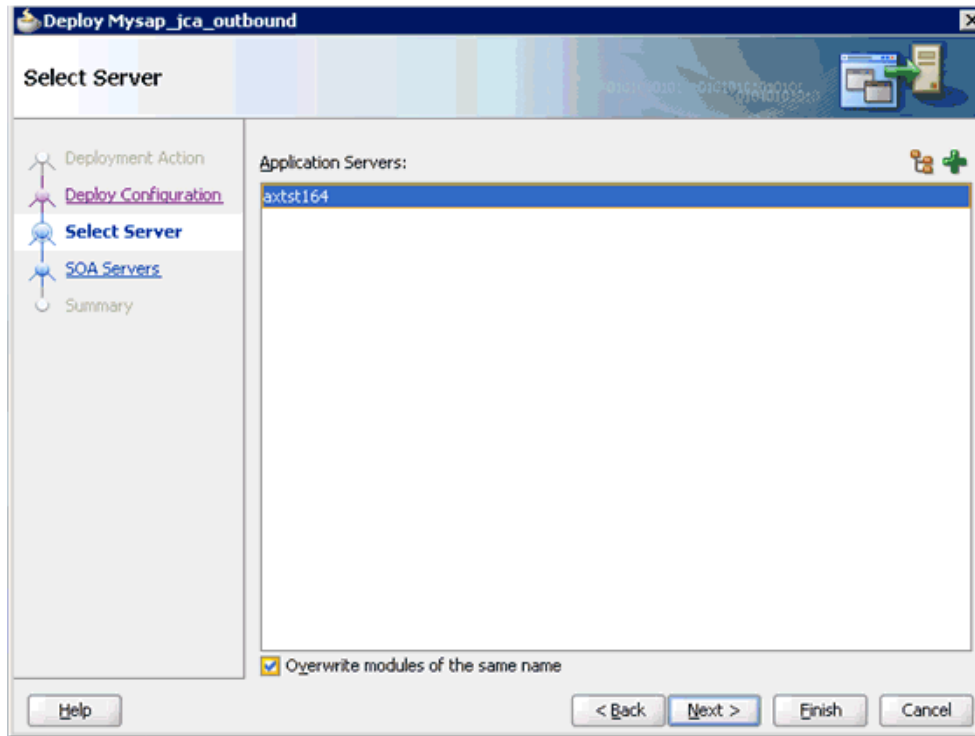
Figure 8-87 Deploy Configuration Page



4. Leave the default values selected and click **Next**.

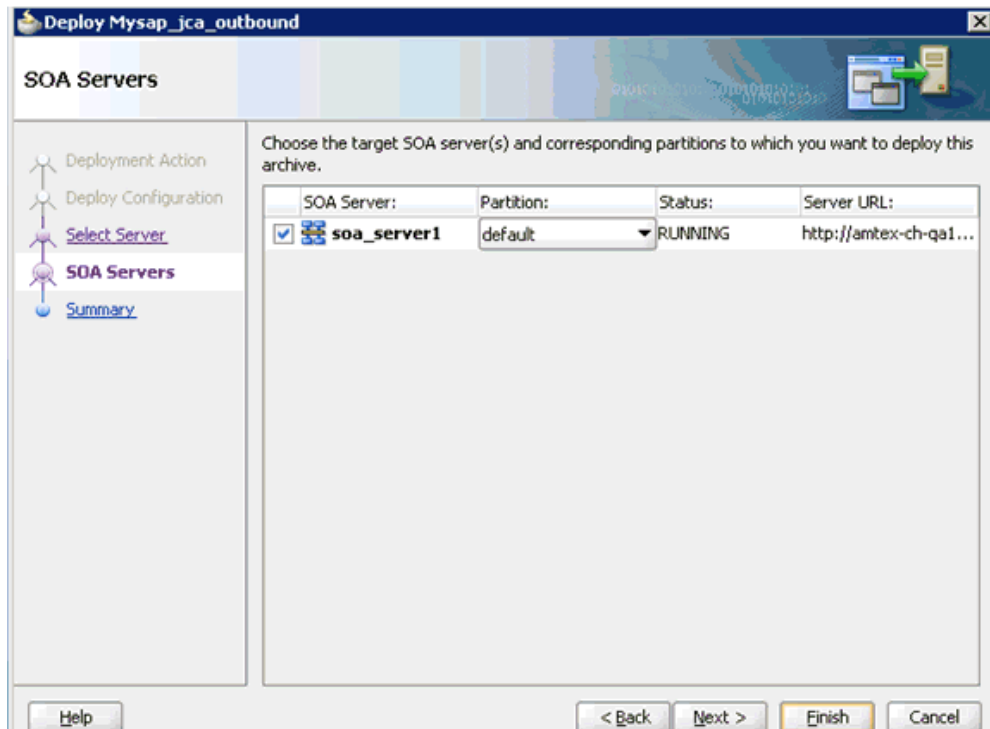
The Select Server page is displayed, as shown in [Figure 8-88](#).

Figure 8–88 Select Server Page



5. Select an available application server that was configured and click **Next**.
The SOA Servers page is displayed, as shown in [Figure 8–89](#).

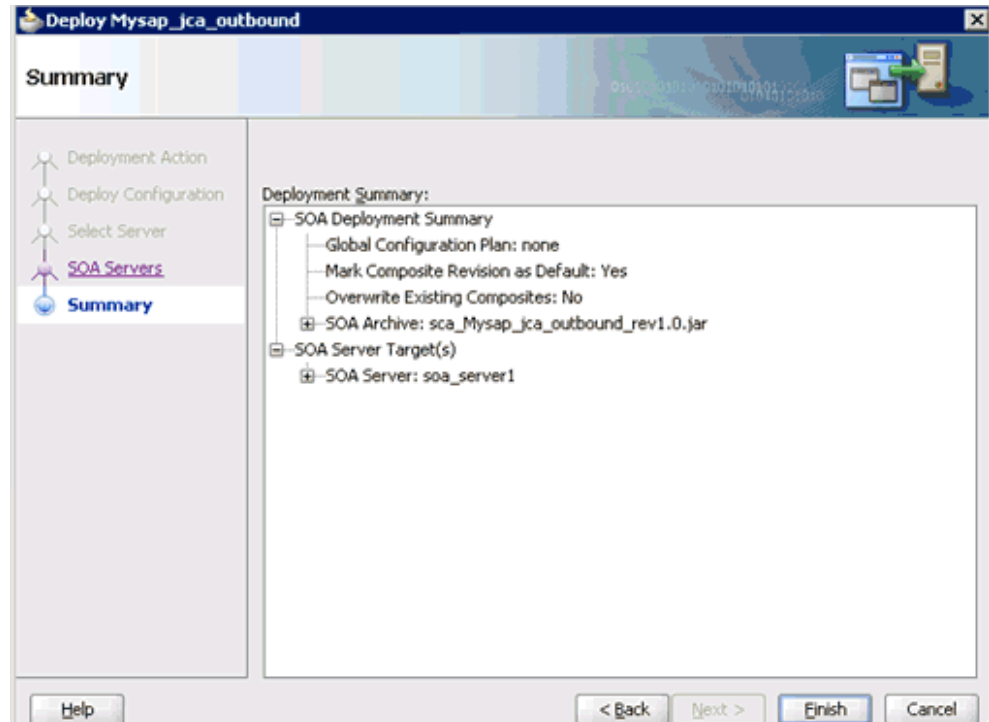
Figure 8–89 SOA Servers Page



6. Select a target SOA server and click **Next**.

The Summary page is displayed, as shown in [Figure 8–90](#).

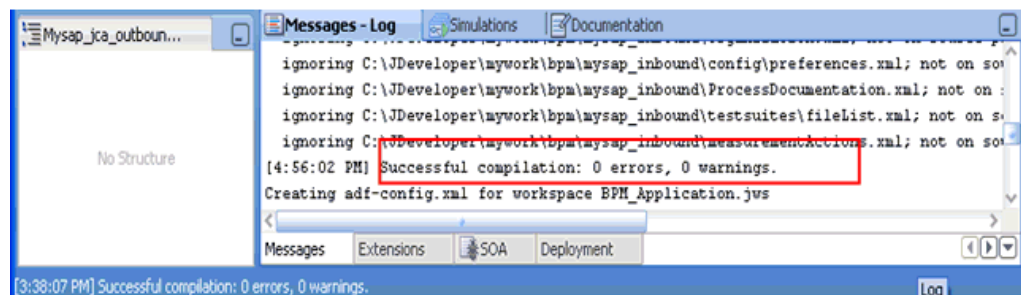
Figure 8–90 Summary Page



7. Review and verify all the available deployment information for your project and click **Finish**.

The process is deployed successfully, as shown in [Figure 8–91](#).

Figure 8–91 Successful Deployment Message



8.4.4 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.

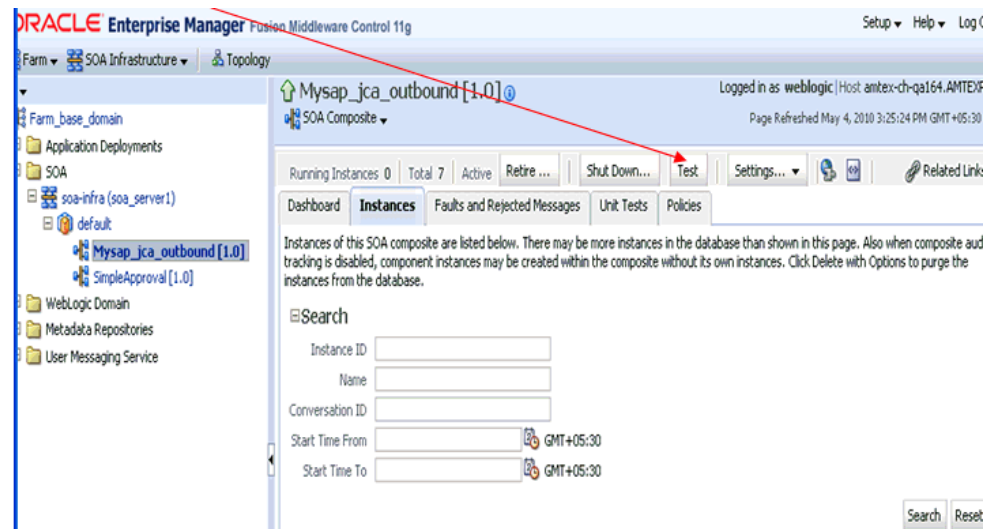
1. Logon to the Oracle Enterprise Manager console, as shown in [Figure 8–92](#).

Figure 8–92 Oracle Enterprise Manager Console

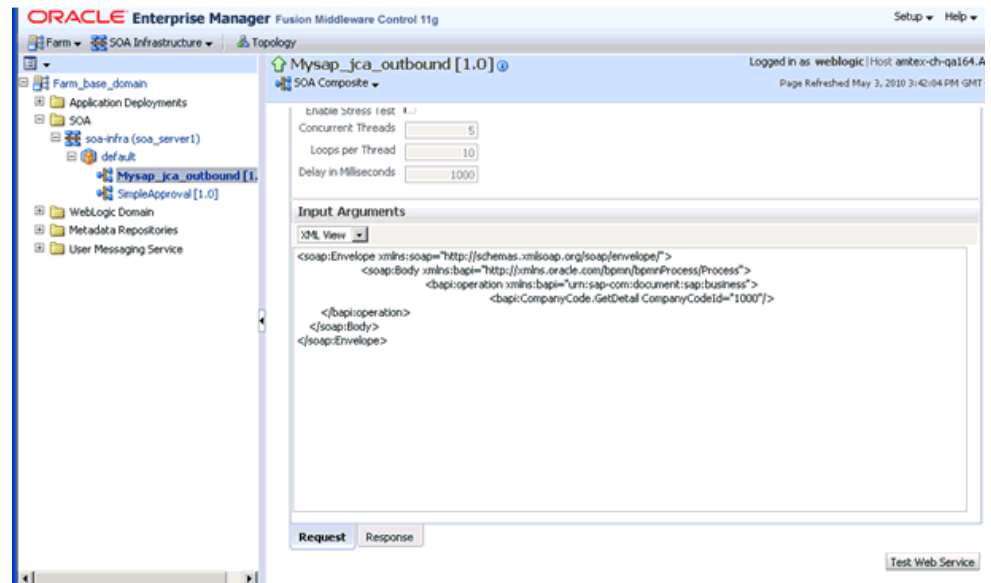


2. Expand your domain in the left pane followed by the **SOA** folder.
3. Select an available project (for example, Mysap_jca_outbound).

Figure 8–93 Test Button

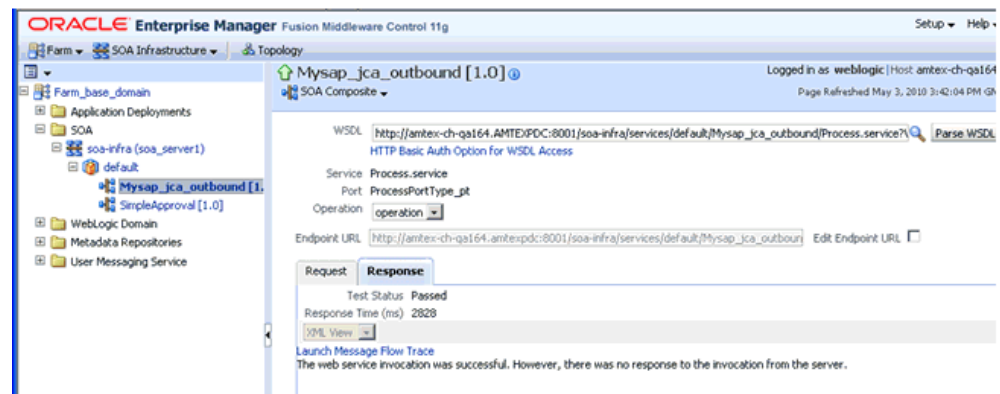


4. Click **Test**, as shown in Figure 8–93.

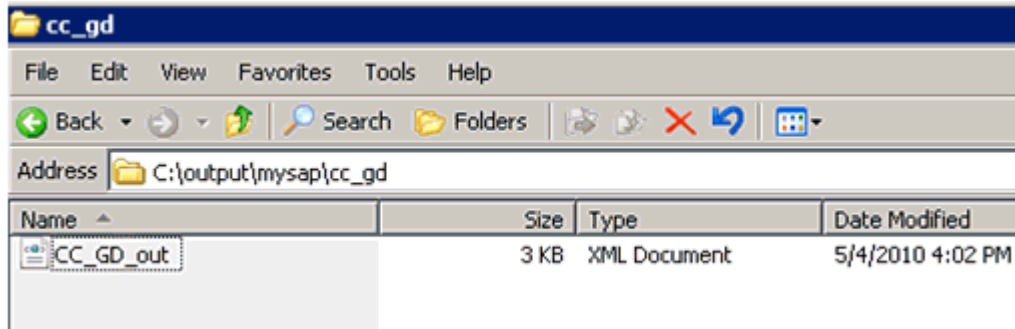
Figure 8–94 Request Tab


5. Click the **Request** tab.
6. Provide an appropriate input value in the Value field and click **Test Web Service**, as shown in [Figure 8–94](#).

A response is received in the Response tab to indicate that invocation was successful in the Oracle Enterprise Manager console, as shown in [Figure 8–95](#).

Figure 8–95 Received Response


7. Navigate to the defined output directory on your file system and open the XML response document that was received, as shown in [Figure 8–96](#).

Figure 8–96 XML Response Document

The XML response document contains the generated output with values. For example:

```
<?xml version="1.0" encoding="UTF-8" ?><bapi:CompanyCode.GetDetail.Response
xmlns:bapi="urn:sap-com:document:sap:business.response"
xmlns="urn:sap-com:document:sap:business.response">
  <bapi:COMPANYCODE_ADDRESS>
    <bapi:ADDR_NO>000000121</bapi:ADDR_NO>
    <bapi:FORMOFADDR>Firma</bapi:FORMOFADDR>
    <bapi:NAME>Ides AG</bapi:NAME>
    <bapi:NAME_2/>
    <bapi:NAME_3/>
    <bapi:NAME_4/>
    <bapi:C_O_NAME/>
    <bapi:CITY>Frankfurt</bapi:CITY>
    <bapi:DISTRICT/>
    <bapi:CITY_NO/>
    <bapi:POSTL_COD1>60441</bapi:POSTL_COD1>
    <bapi:POSTL_COD2>60070</bapi:POSTL_COD2>
    <bapi:POSTL_COD3/>
    <bapi:PO_BOX>160529</bapi:PO_BOX>
    <bapi:PO_BOX_CIT/>
    <bapi:DELIV_DIS/>
    <bapi:STREET>Lyoner Stern 231</bapi:STREET>
    <bapi:STREET_NO/>
    <bapi:STR_ABBR/>
    <bapi:HOUSE_NO/>
    <bapi:STR_SUPPL1/>
    <bapi:STR_SUPPL2/>
    <bapi:LOCATION/>
    <bapi:BUILDING/>
    <bapi:FLOOR/>
    <bapi:ROOM_NO/>
    <bapi:COUNTRY>DE</bapi:COUNTRY>
    <bapi:LANGU>D</bapi:LANGU>
    <bapi:REGION>06</bapi:REGION>
    <bapi:SORT1>IDES</bapi:SORT1>
    <bapi:SORT2/>
    <bapi:TIME_ZONE>CET</bapi:TIME_ZONE>
    <bapi:TAXJURCODE/>
    <bapi:ADR_NOTES/>
    <bapi:COMM_TYPE/>
    <bapi:TEL1_NUMBR/>
    <bapi:TEL1_EXT/>
    <bapi:FAX_NUMBER/>
    <bapi:FAX_EXTENS/>
  </bapi:COMPANYCODE_ADDRESS>
</bapi:CompanyCode.GetDetail.Response>
```

```

</bapi:COMPANYCODE_ADDRESS>
<bapi:COMPANYCODE_DETAIL>
  <bapi:COMP_CODE>1000</bapi:COMP_CODE>
  <bapi:COMP_NAME>IDES AG</bapi:COMP_NAME>
  <bapi:CITY>Frankfurt</bapi:CITY>
  <bapi:COUNTRY>DE</bapi:COUNTRY>
  <bapi:CURRENCY>EUR</bapi:CURRENCY>
  <bapi:LANGU>D</bapi:LANGU>
  <bapi:CHRT_ACCTS>INT</bapi:CHRT_ACCTS>
  <bapi:FY_VARIANT>K4</bapi:FY_VARIANT>
  <bapi:VAT_REG_NO>DE123456789</bapi:VAT_REG_NO>
  <bapi:COMPANY>001000</bapi:COMPANY>
  <bapi:ADDR_NO>000000121</bapi:ADDR_NO>
  <bapi:COUNTRY_ISO>DE</bapi:COUNTRY_ISO>
  <bapi:CURRENCY_ISO>EUR</bapi:CURRENCY_ISO>
  <bapi:LANGU_ISO>DE</bapi:LANGU_ISO>
</bapi:COMPANYCODE_DETAIL>
<bapi:RETURN>
  <bapi:TYPE/>
  <bapi:CODE/>
  <bapi:MESSAGE/>
  <bapi:LOG_NO/>
  <bapi:LOG_MSG_NO>000000</bapi:LOG_MSG_NO>
  <bapi:MESSAGE_V1/>
  <bapi:MESSAGE_V2/>
  <bapi:MESSAGE_V3/>
  <bapi:MESSAGE_V4/>
</bapi:RETURN>
</bapi:CompanyCode.GetDetail.Response>

```

8.5 Designing an Inbound BPM Process Using Transformations for Event Integration

This section demonstrates how Oracle Application Adapter for SAP R/3 integrates with SAP R/3 to receive event data.

The following tools are required to complete your adapter design-time configuration:

- Oracle Adapter Application Explorer (Application Explorer)
- Oracle JDeveloper BPM Designer (JDeveloper) or Eclipse

Note: The examples in this chapter demonstrate the use of JDeveloper.

Samples have been provided for this use case scenario under the *etc/sample* folder of the Application Adapters installation.

Before you design a BPM process, you must generate the respective WSDL file using Application Explorer. For more information, see "[Generating WSDL for Event Integration](#)" on page 6-41.

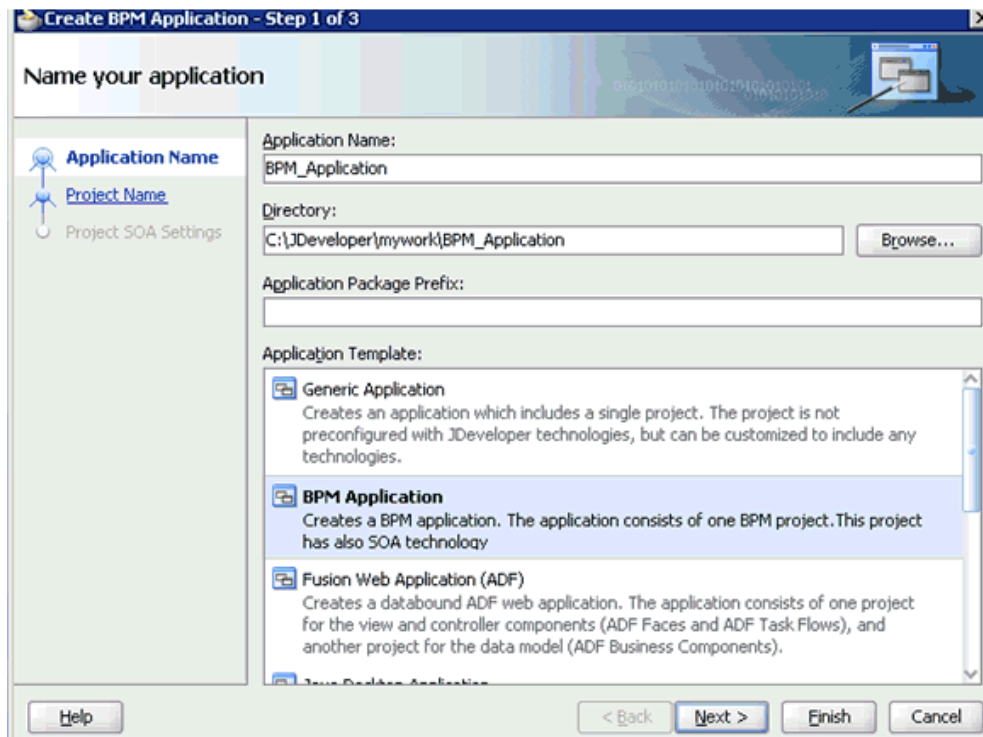
8.5.1 Creating an Empty Composite for BPM

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

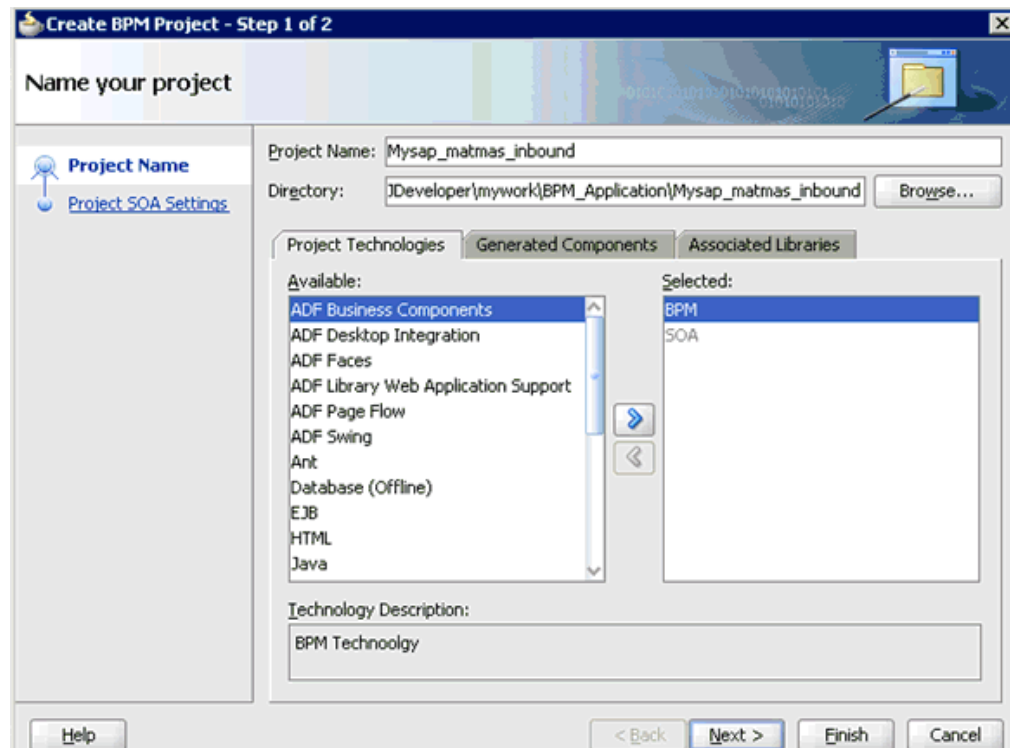
1. Create a new BPM application.

2. Enter a name for the new BPM application and click **Next**, as shown in [Figure 8–97](#).

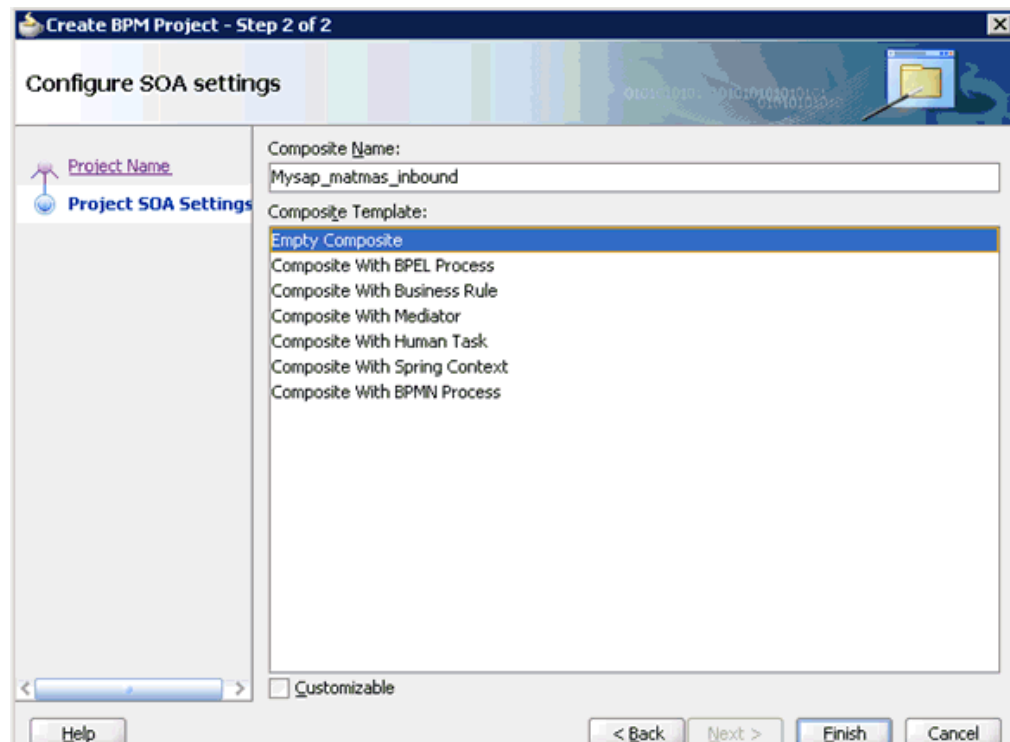
Figure 8–97 Name Your Application Page



The Name your project page is displayed, as shown in [Figure 8–98](#).

Figure 8–98 Name Your Project Page

3. Enter a project name (for example, Mysap_matmas_inbound) and click Next. The Configure SOA settings page is displayed, as shown in Figure 8–99.

Figure 8–99 Configure SOA Settings Page

4. From the Composite Template list, select **Empty Composite** and click **Finish**.

8.5.2 Defining a BPM Inbound Process

This section describes how to define a BPM inbound process, which consists of the following stages:

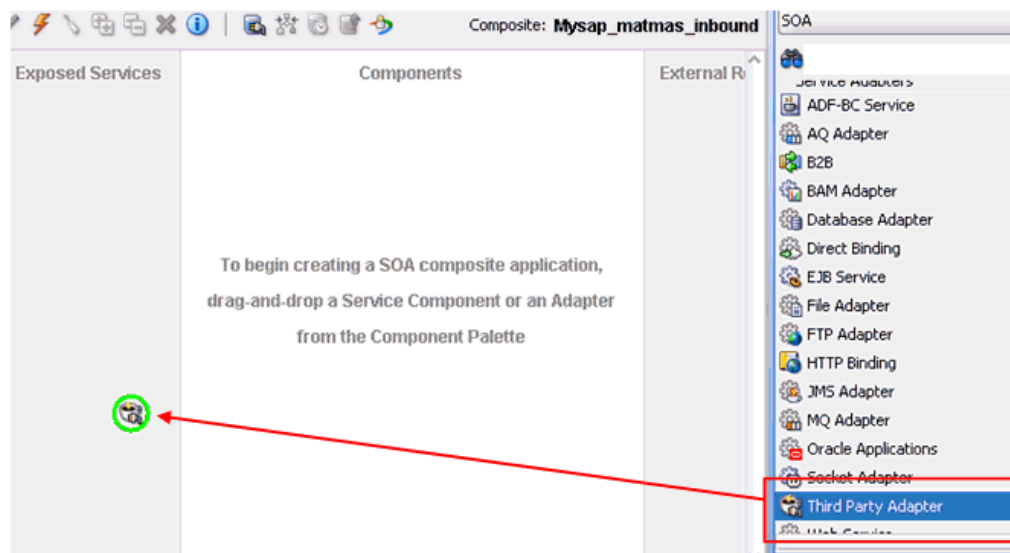
1. Configuring a Third Party Adapter Service Component
2. Configuring an Inbound BPM Process Component
3. Creating a File Adapter for the Write Operation

Configuring a Third Party Adapter Service Component

Perform the following steps to create a third party adapter service component:

1. Drag and drop the **Third Party Adapter** component from the Service Adapters pane to the Exposed References pane, as shown in [Figure 8–100](#).

Figure 8–100 *Third Party Adapter Component*



The Create Third Party Adapter Service dialog is displayed, as shown in [Figure 8–101](#).

Figure 8–101 Create Third Party Adapter Service Dialog


Create Third Party Adapter Service


Third Party Adapter Service

Create a JCA adapter service for a third party adapter.

Name:

Type:


WSDL URL: 

Port Type:  Find ex

Operation:

Callback Port Type:

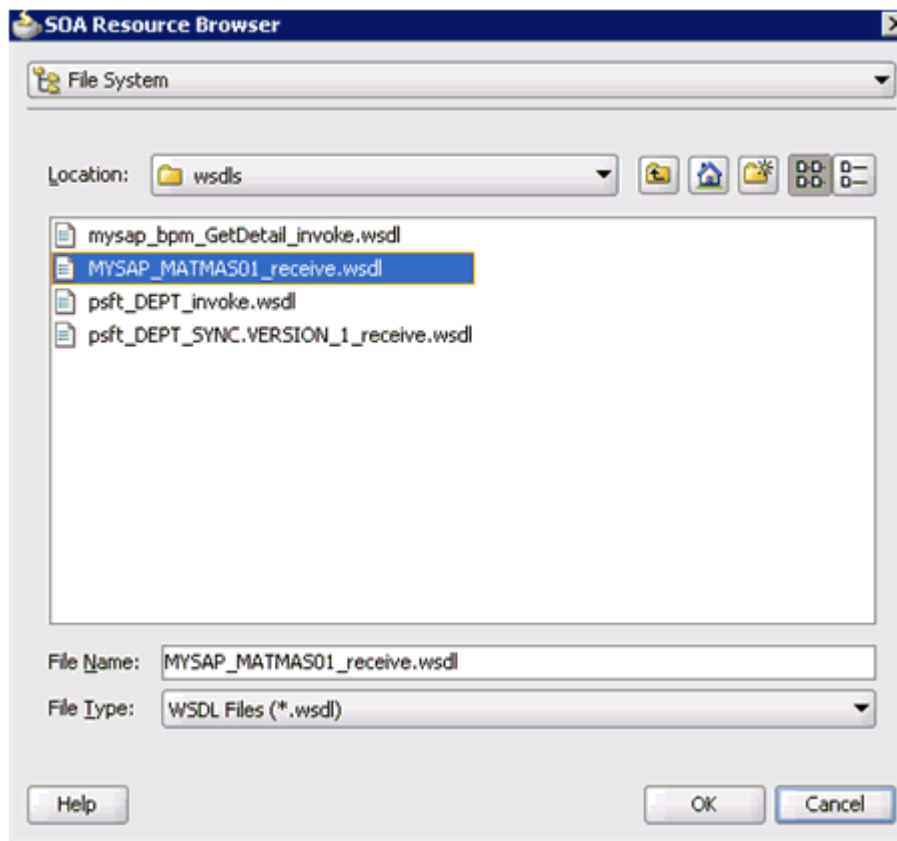
Callback Operation:

JCA File: 

Help OK Cancel

2. Enter a name for the third party adapter service.
3. Ensure that **Service** is selected from the Type list (default).
4. Click the **Find existing WSDLs** icon, which is located to the right of the WSDL URL field.

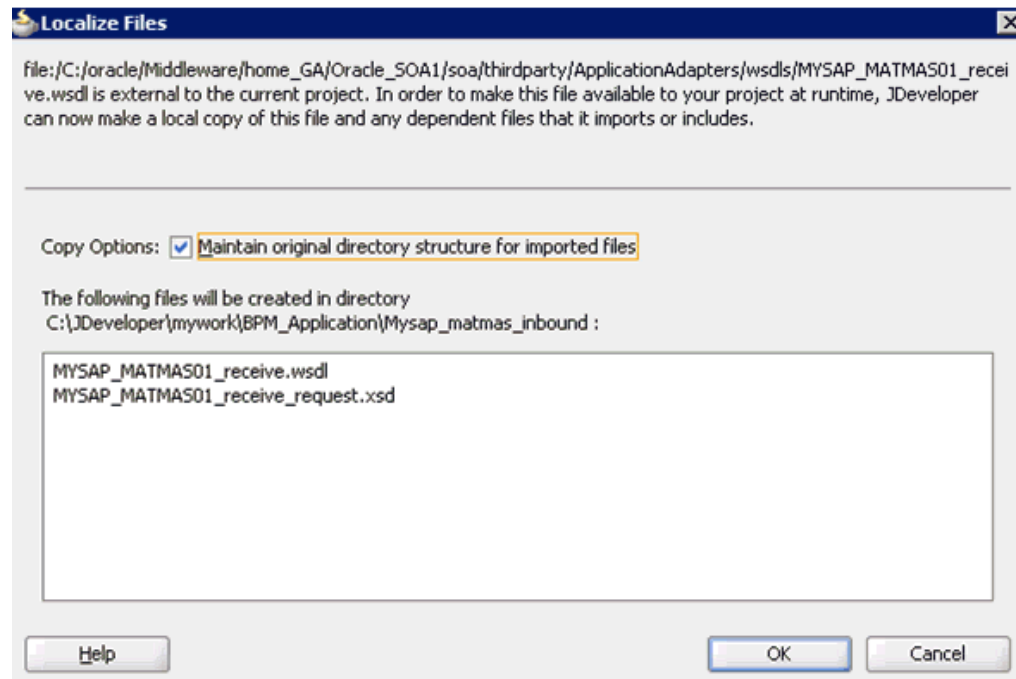
The SOA Resource Browser dialog is displayed, as shown in [Figure 8–102](#).

Figure 8–102 SOA Resource Browser Dialog

5. Browse and select an inbound WSDL file from the following directory:
<ADAPTER_HOME>\soa\thirdparty\ApplicationAdapters\wsdls

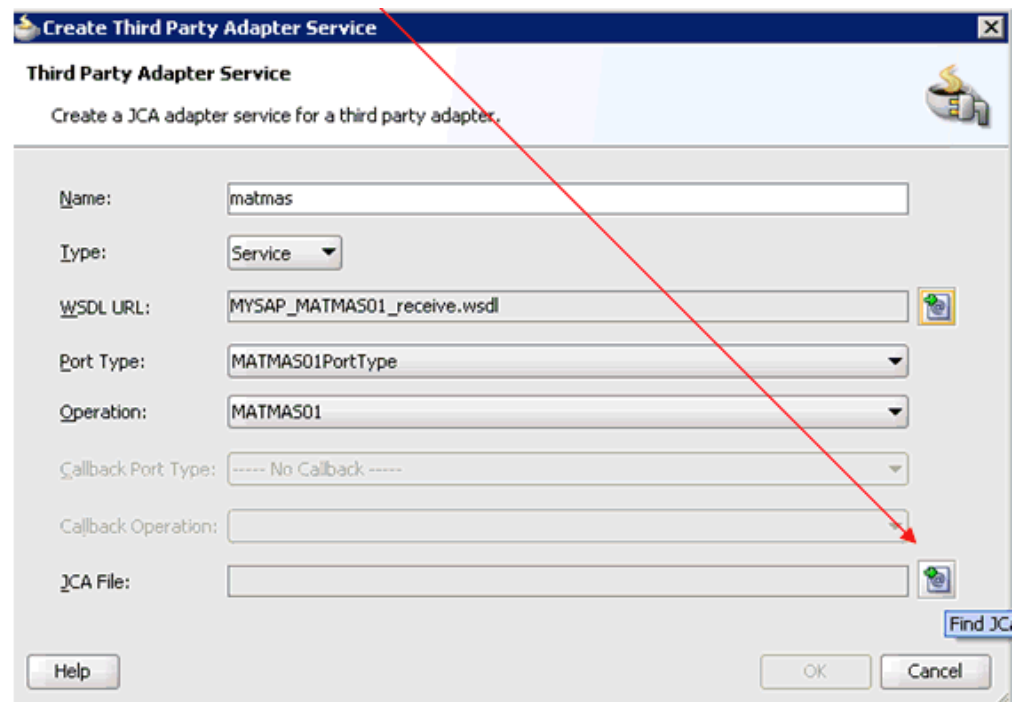
6. Click **OK**.

The Localize Files dialog is displayed, as shown in [Figure 8–103](#).

Figure 8–103 Localize Files Dialog7. Click **OK**.

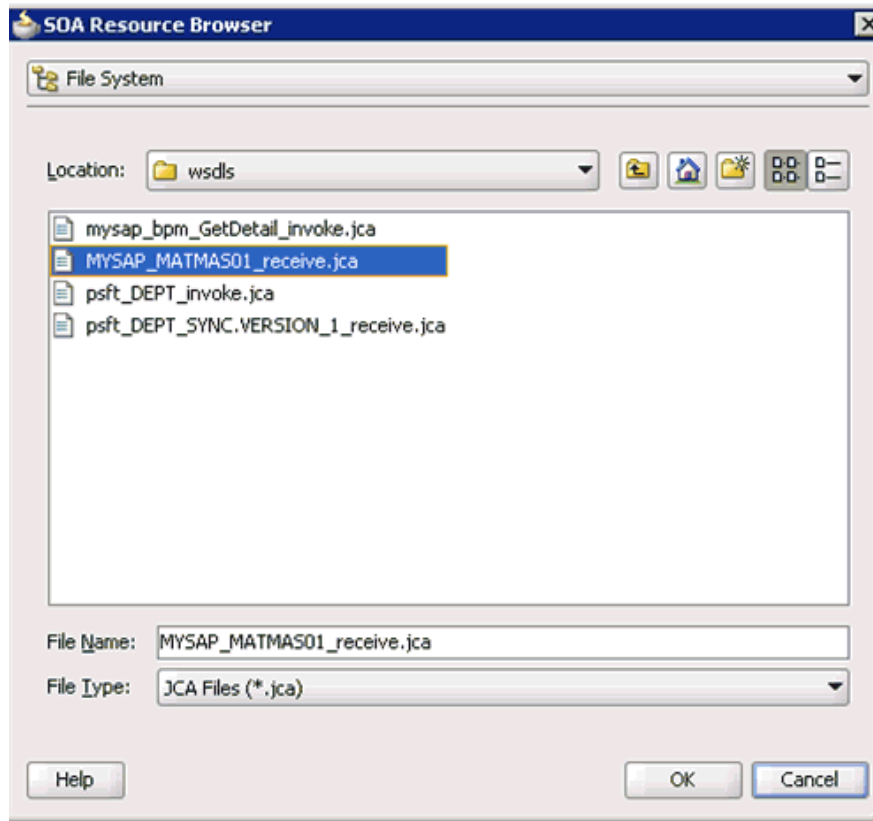
The inbound WSDL file and associated receive_request XML schema file (.xsd) are imported to the project folder that has been created.

You are returned to the Create Third Party Adapter Service dialog, as shown in [Figure 8–104](#).

Figure 8–104 Create Third Party Adapter Service Dialog

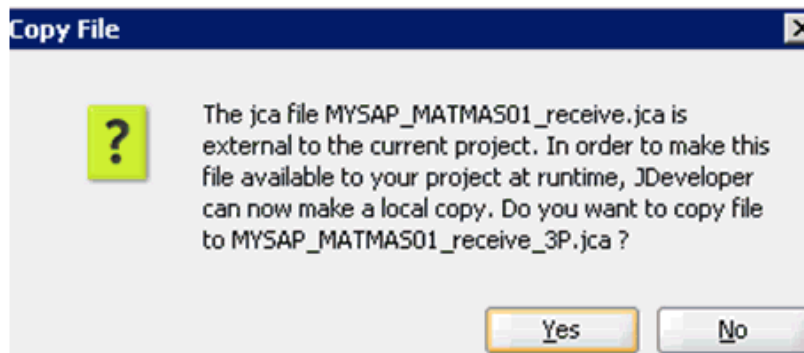
8. Click the **Find JCA file** icon, which is located to the right of the JCA File field. The SOA Resource Browser dialog is displayed, as shown in [Figure 8–105](#).

Figure 8–105 SOA Resource Browser Dialog



9. Browse and select the JCA properties file from the following directory:
`<ADAPTER_HOME>\soa\thirdparty\ApplicationAdapters\wsdls`
10. Click **OK**.
 The Copy File message is displayed, as shown in [Figure 8–106](#).

Figure 8–106 Copy File Confirmation Message



11. Click **Yes**.

A copy of the JCA properties file is made in the project folder.

You are returned to the Create Third Party Adapter Service dialog, as shown in [Figure 8–107](#).

Figure 8–107 Create Third Party Adapter Service Dialog

Create Third Party Adapter Service

Third Party Adapter Service

Create a JCA adapter service for a third party adapter.

Name:

Type:

WSDL URL:

Port Type:

Operation:

Callback Port Type:

Callback Operation:

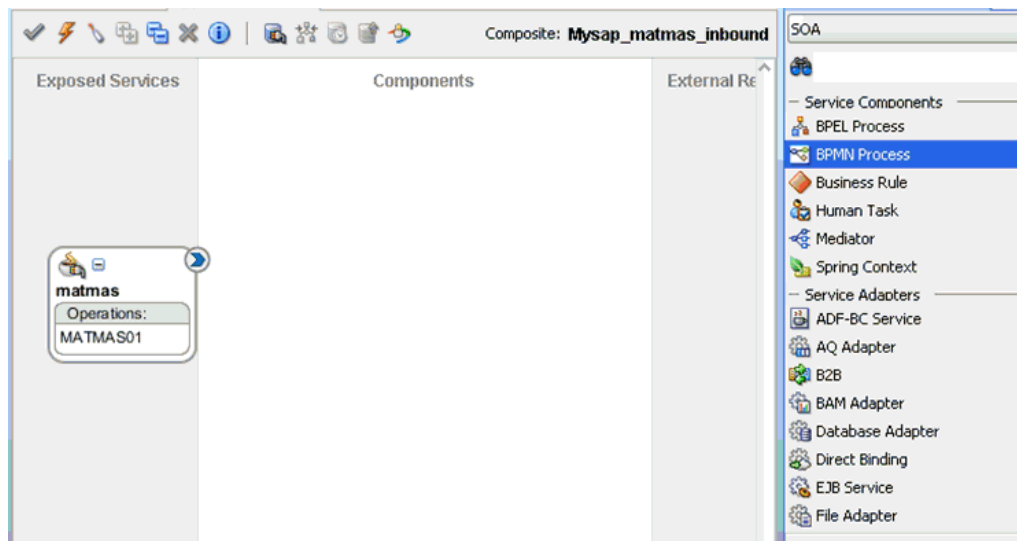
JCA File:

Help OK Cancel

12. Click OK.

The third party adapter service component (matmas) is created in the Exposed References pane, as shown in [Figure 8–108](#).

Figure 8–108 Third Party Adapter Service Component



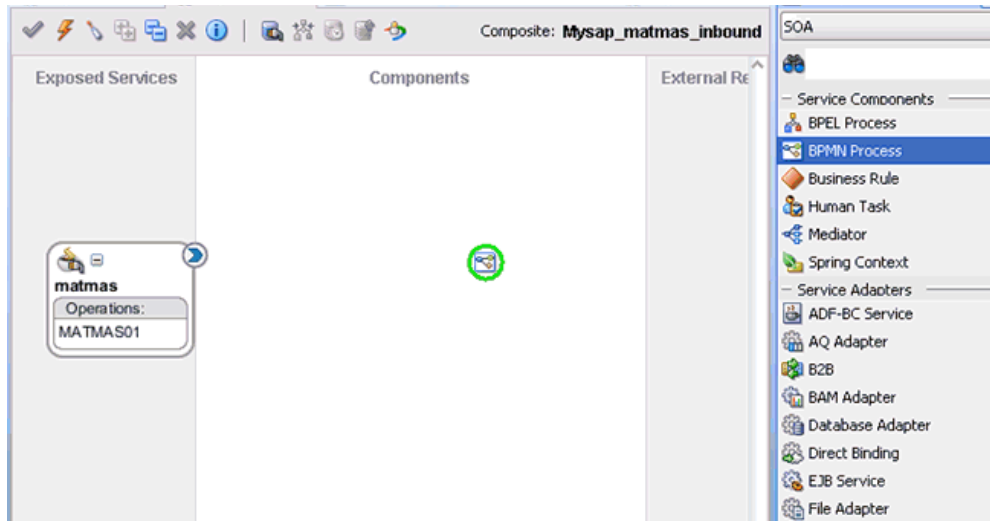
You are now ready to configure an inbound BPM process component.

Configuring an Inbound BPM Process Component

Perform the following steps to configure an inbound BPM process component:

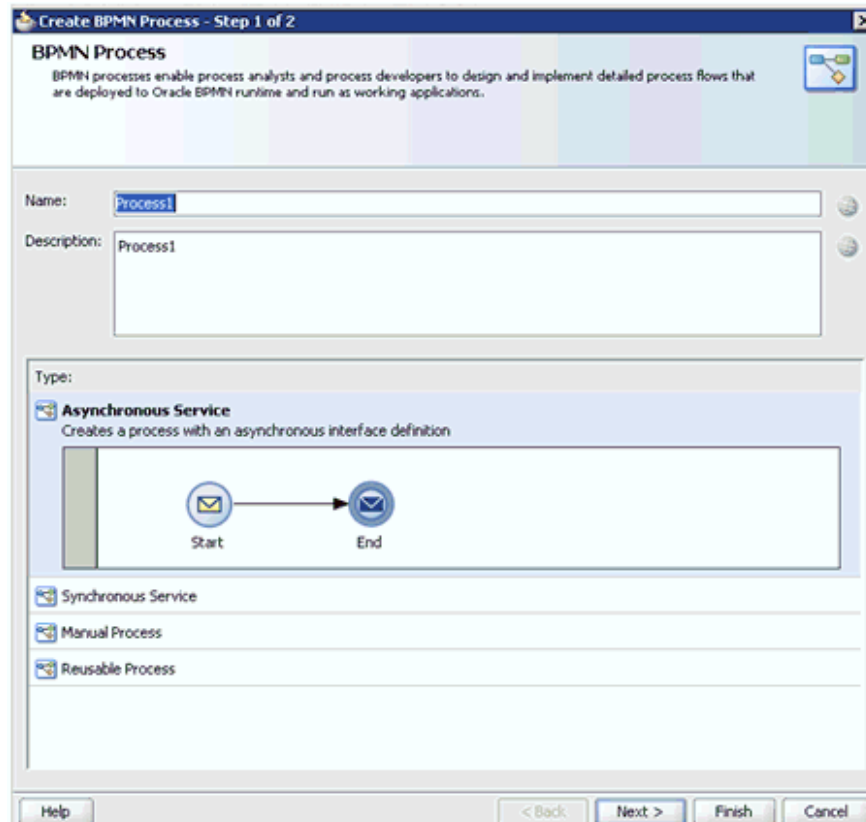
1. Drag and drop the **BPMN Process** component from the Service Components pane to the Components pane, as shown in [Figure 8–109](#).

Figure 8–109 *BPMN Process Component*



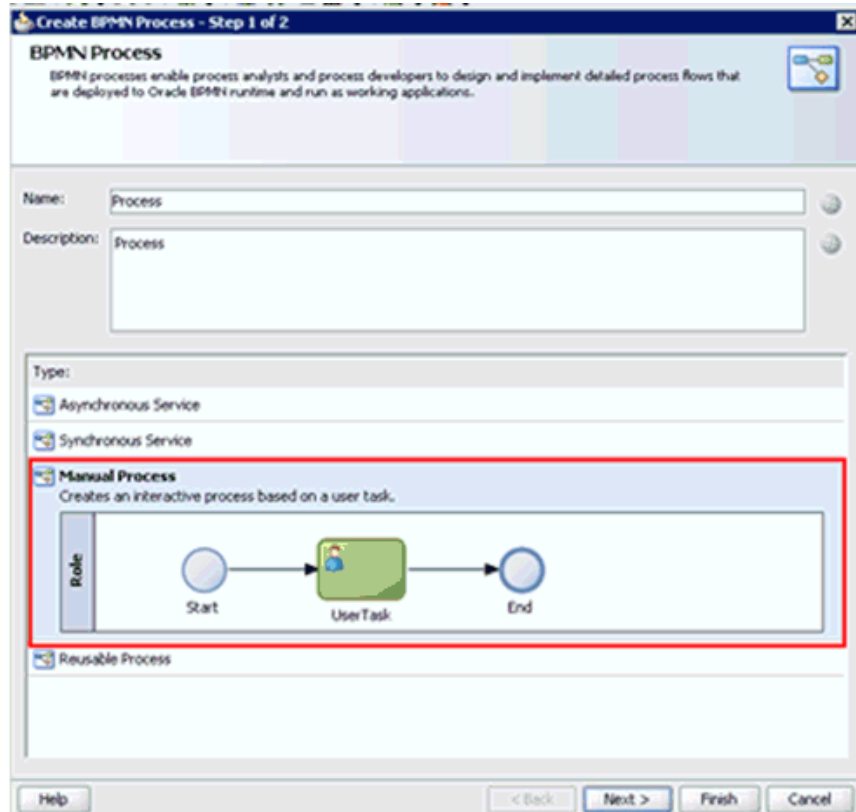
The Create BPMN Process dialog is displayed, as shown in [Figure 8–110](#).

Figure 8–110 *Create BPMN Process Dialog*



2. Select **Manual Process** in the Type section, as shown in [Figure 8-111](#).

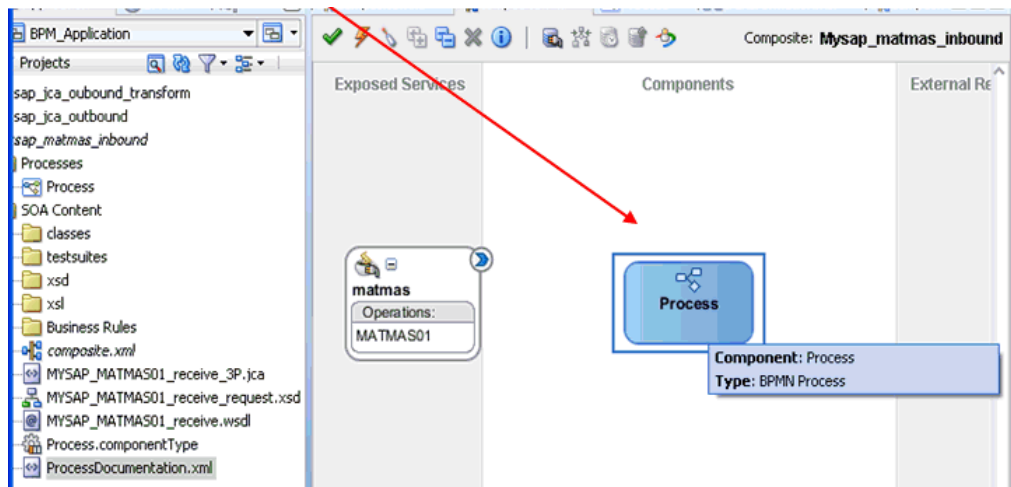
Figure 8-111 Create BPMN Process Dialog



3. Click **Finish**.

The BPMN Process component is created, as shown in [Figure 8-112](#).

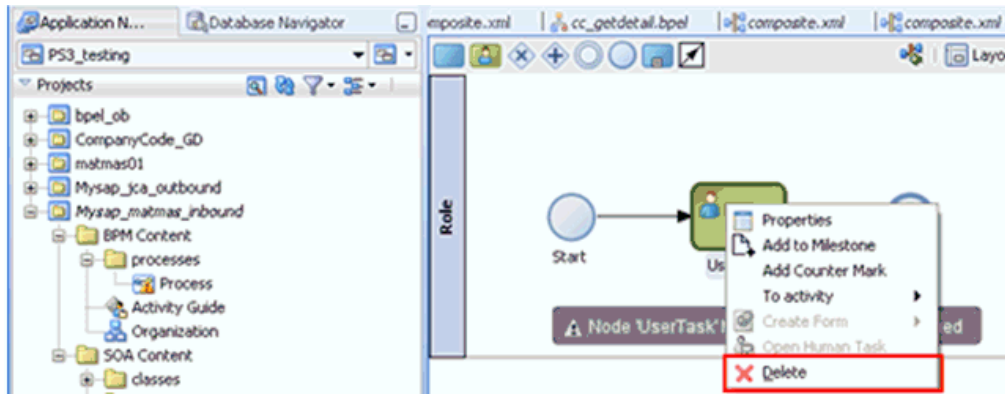
Figure 8-112 BPMN Process Component



4. Double-click the BPMN Process component in the Components pane.

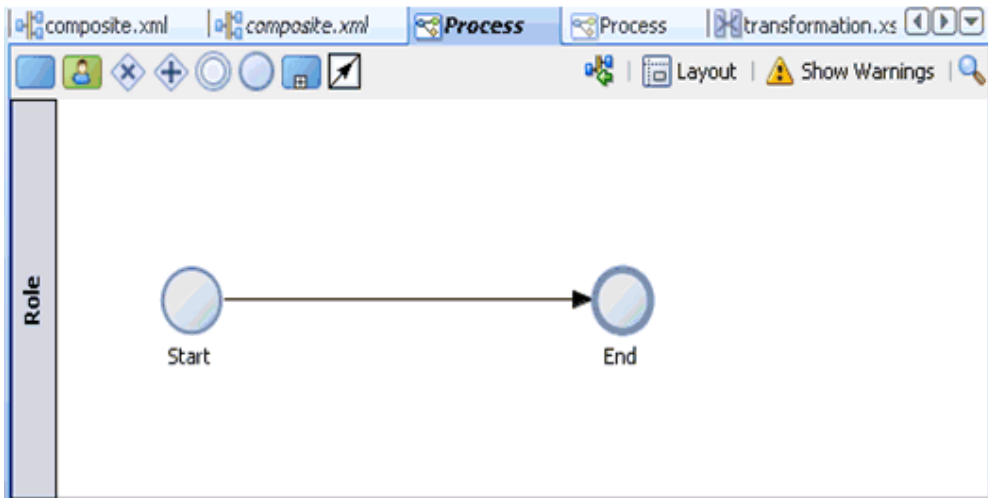
The BPMN process is displayed, as shown in [Figure 8-113](#).

Figure 8–113 BPMN Process



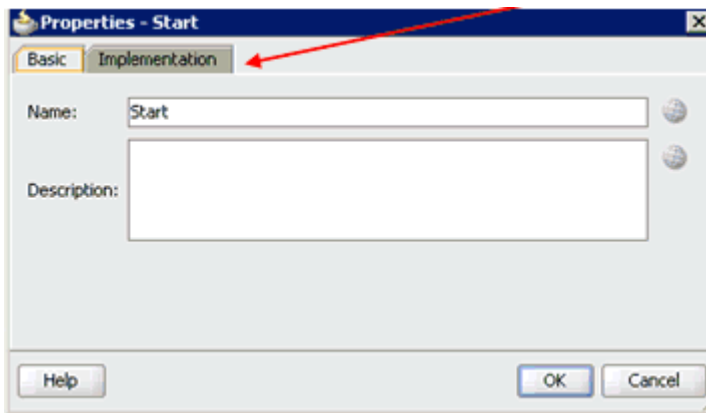
5. Right-click **UserTask** and select **Delete** from the menu.
6. Double-click the **Start** event component, as shown in [Figure 8–114](#).

Figure 8–114 Start Event Component



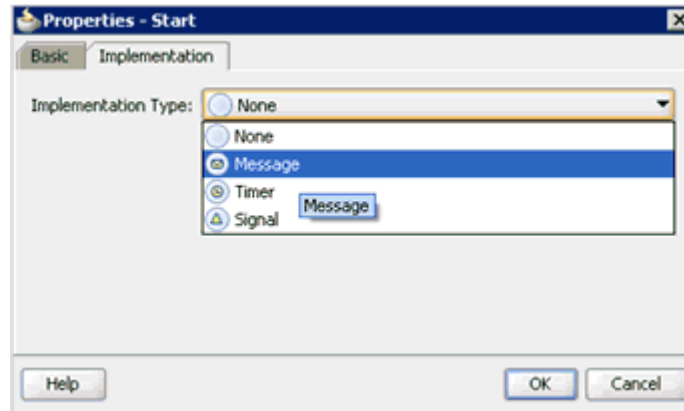
The Properties - Start dialog is displayed, as shown in [Figure 8–115](#).

Figure 8–115 Properties - Start Dialog



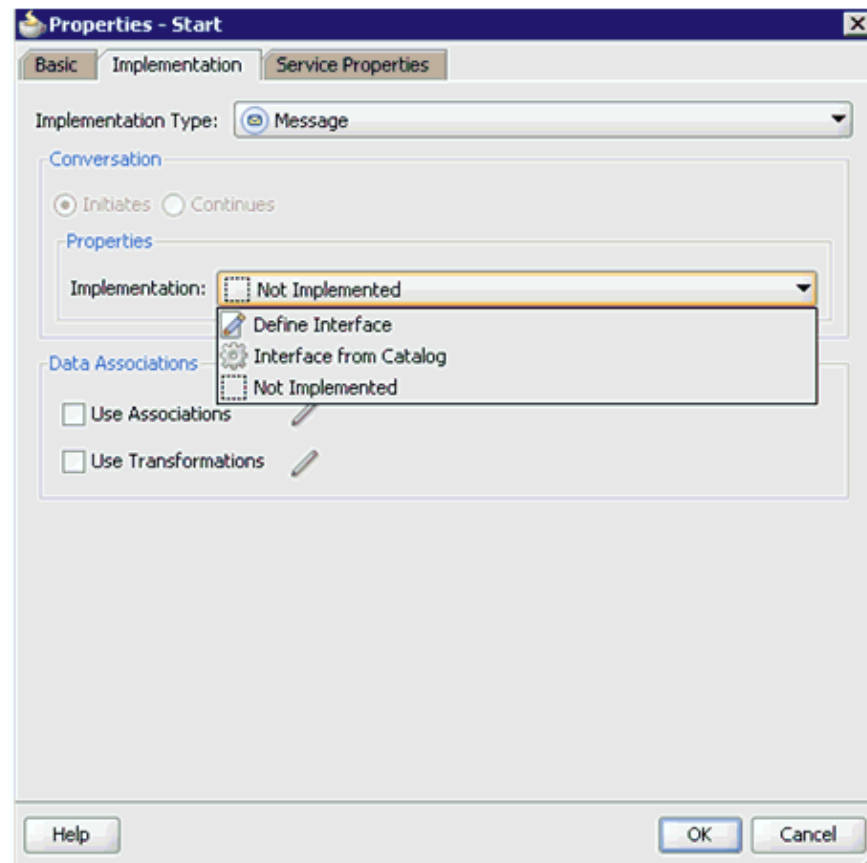
- Click the **Implementation** tab, as shown in [Figure 8–116](#).

Figure 8–116 Implementation Tab



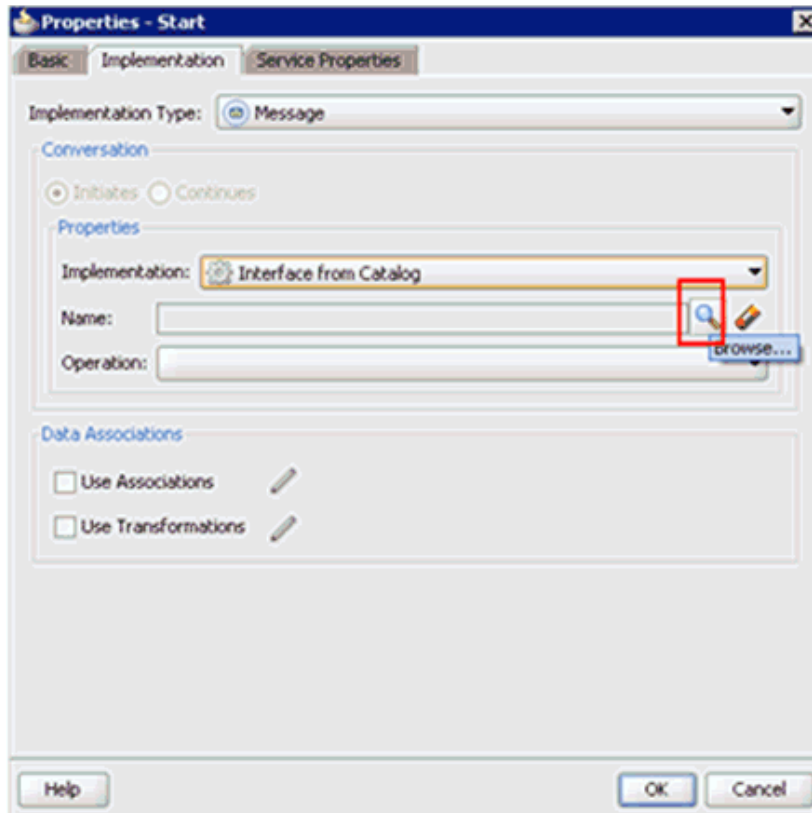
- Select **Message** from the Implementation Type list, as shown in [Figure 8–117](#).

Figure 8–117 Implementation Type List



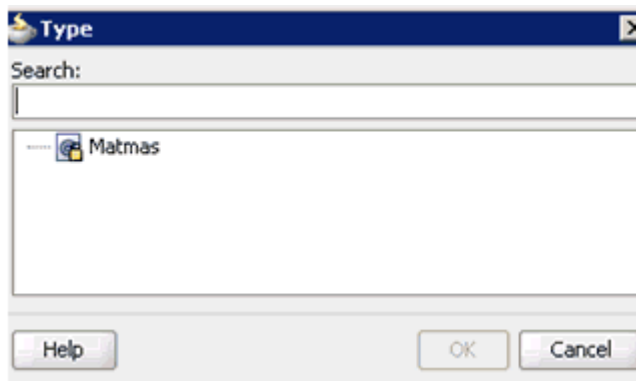
- Select **Interface from Catalog** from the Implementation list.
- Click the **Browse** icon to the right of the Name field, as shown in [Figure 8–118](#).

Figure 8–118 Browse Icon



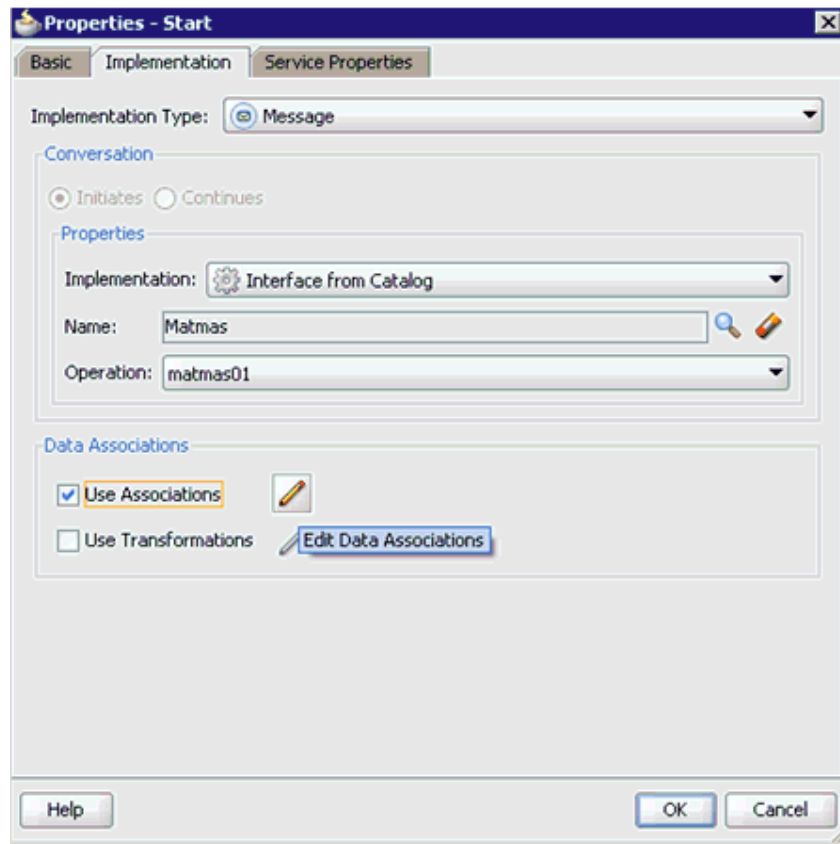
The Type dialog is displayed, as shown in [Figure 8–119](#).

Figure 8–119 Type Dialog



11. Select the Third Party Service that has been created and click **OK**.

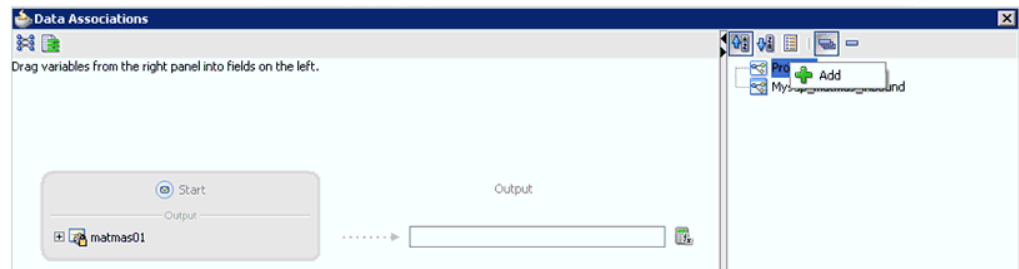
You are returned to the Properties - Start dialog, as shown in [Figure 8–120](#).

Figure 8–120 Properties - Start Dialog

12. Select the **Use Associations** option that is located under Data Associations.

13. Click the **Edit Data Associations** icon.

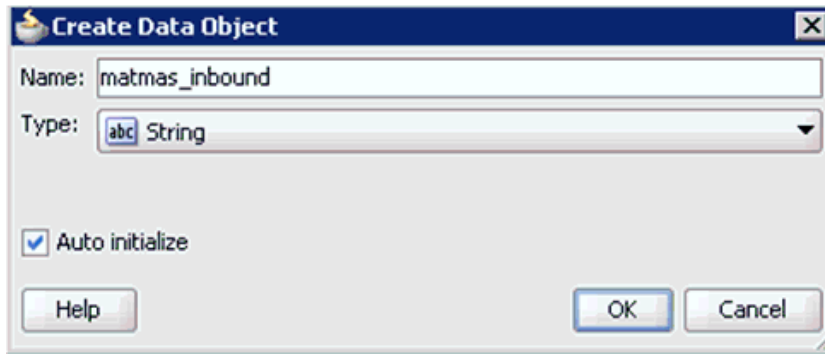
The Data Associations dialog is displayed, as shown in [Figure 8–121](#).

Figure 8–121 Data Associations Dialog

14. Right-click the **Process** node in the right pane and select **Add**.

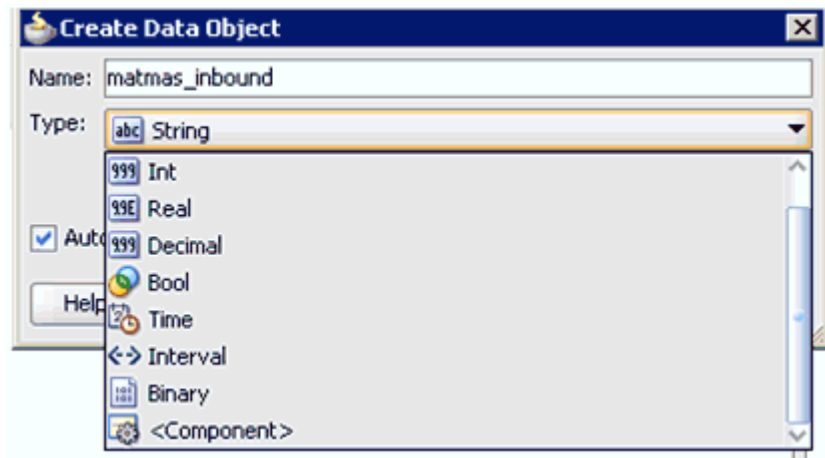
The Create Data Object dialog is displayed, as shown in [Figure 8–122](#).

Figure 8–122 Create Data Object Dialog



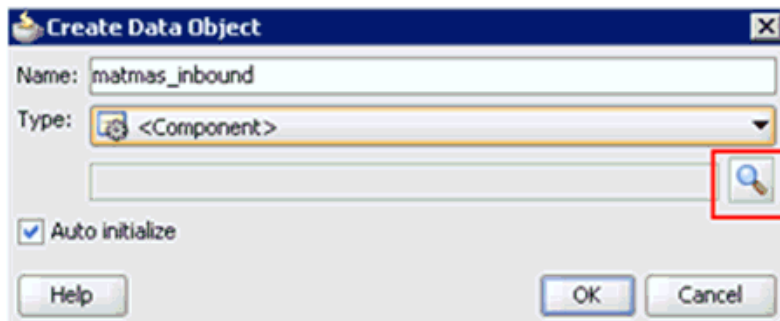
15. Enter a name in the Name field (for example, matmas_inbound), and then click the drop-down button in the Type field and select **<Component>** from the list, as shown in [Figure 8–123](#).

Figure 8–123 Create Data Object Dialog

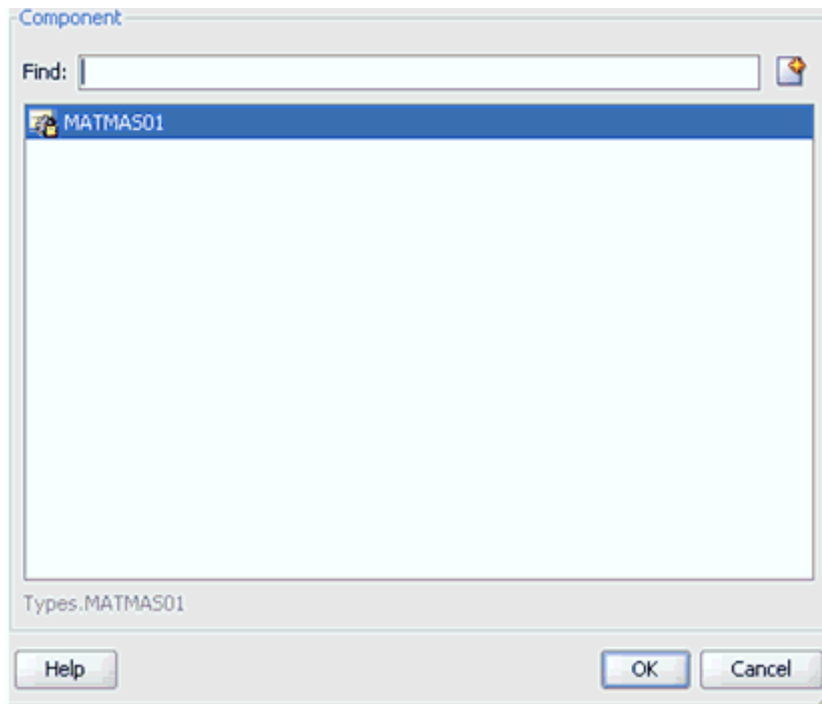


16. Click the **Browse** icon below the Type field, as shown in [Figure 8–124](#).

Figure 8–124 Create Data Object Dialog

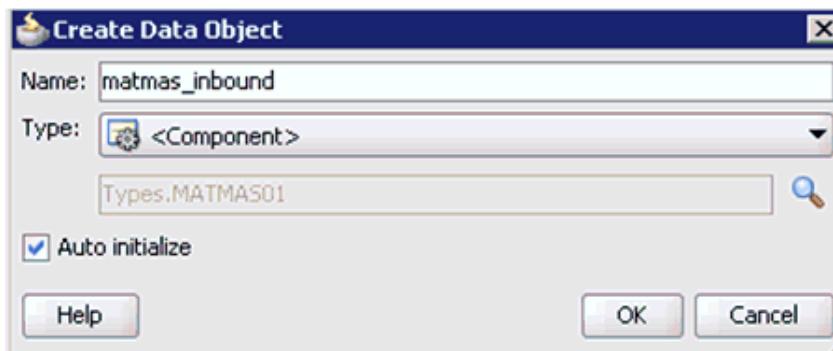


The Browse Types dialog is displayed, as shown in [Figure 8–125](#).

Figure 8–125 Browse Types Dialog

17. Select the first component (for example, MATMAS01) and click **OK**.

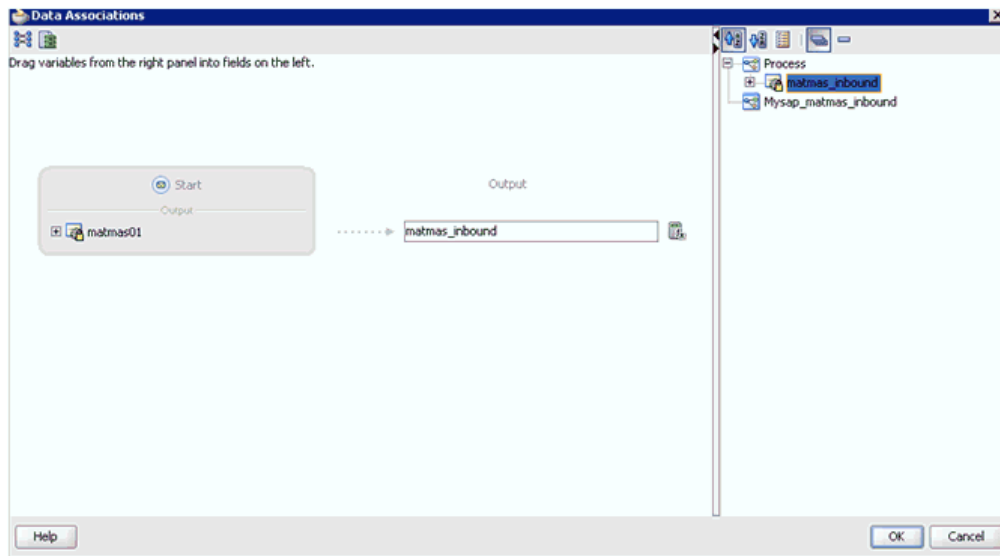
You are returned to the Create Data Object dialog, as shown in [Figure 8–126](#).

Figure 8–126 Create Data Object Dialog

18. Click **OK**.

The Data Object (for example, matmas_inbound) that has been created is displayed under the Process node in the Data Associations dialog, as shown in [Figure 8–127](#).

Figure 8–127 Data Associations Dialog

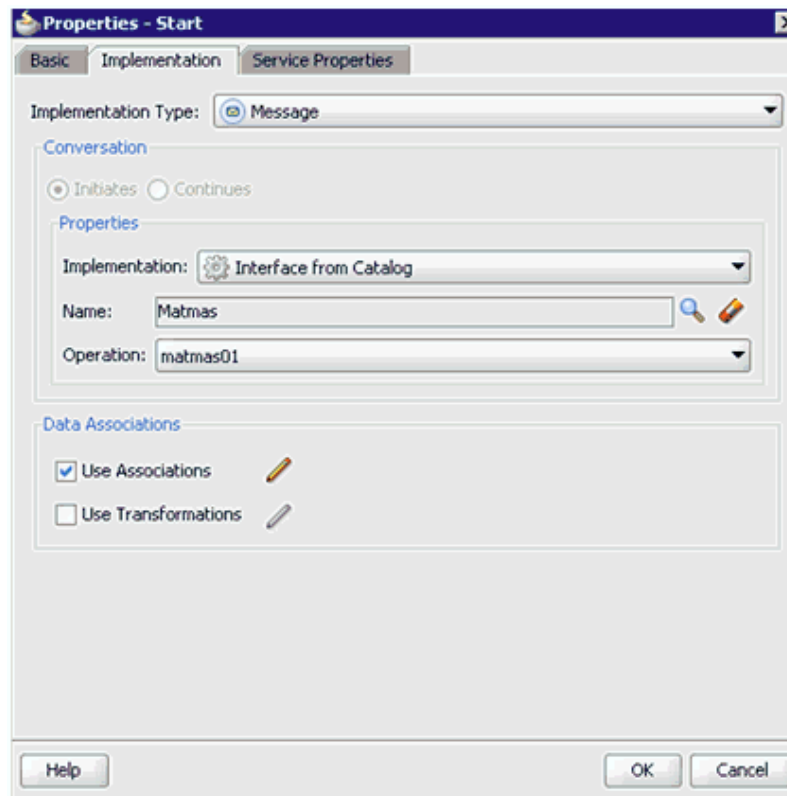


19. Select the **matmas_inbound** Data Object under the Process node in the right pane and drag it to the field below the Outputs area.

20. Click **OK**.

You are returned to the Properties - Start dialog, as shown in [Figure 8–128](#).

Figure 8–128 Properties - Start Dialog

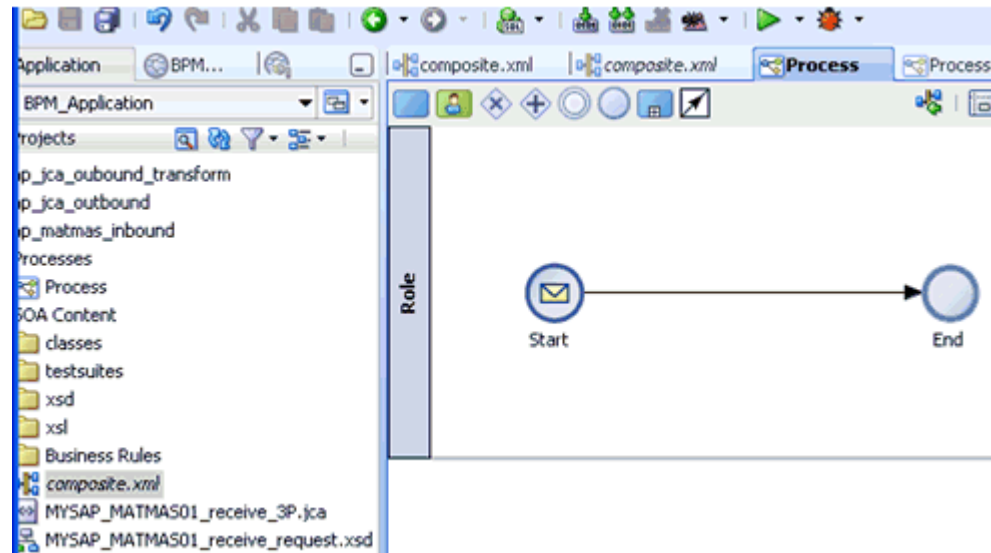


21. Click **OK**.

You are returned to the Process workspace area, as shown in [Figure 8-129](#).

22. Double-click **composite.xml** in the left pane.

Figure 8-129 Process Workspace Area



23. Click the **Save All** icon in the menu bar to save the new inbound BPM process component that was configured.

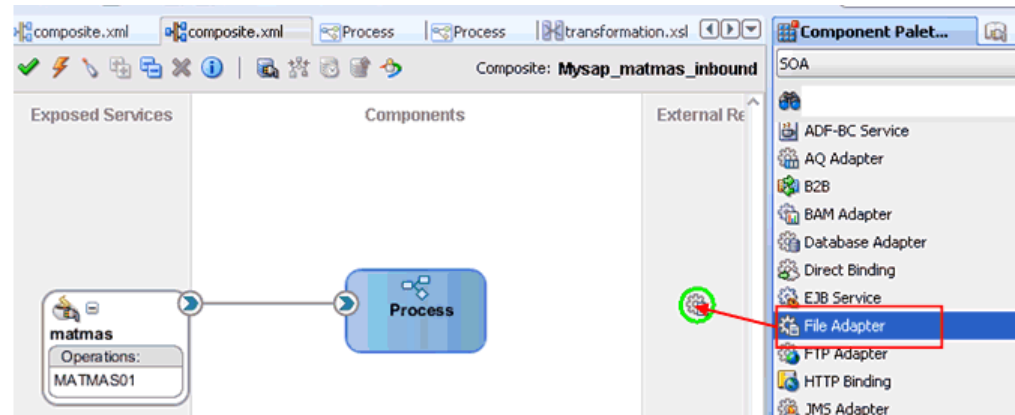
You are now ready to create a File adapter for the write operation.

Creating a File Adapter for the Write Operation

Perform the following steps to create a File adapter for the write operation:

1. Drag and drop the **File Adapter** component from the Service Adapters pane to the External References pane, as shown in [Figure 8-130](#).

Figure 8-130 File Adapter Component



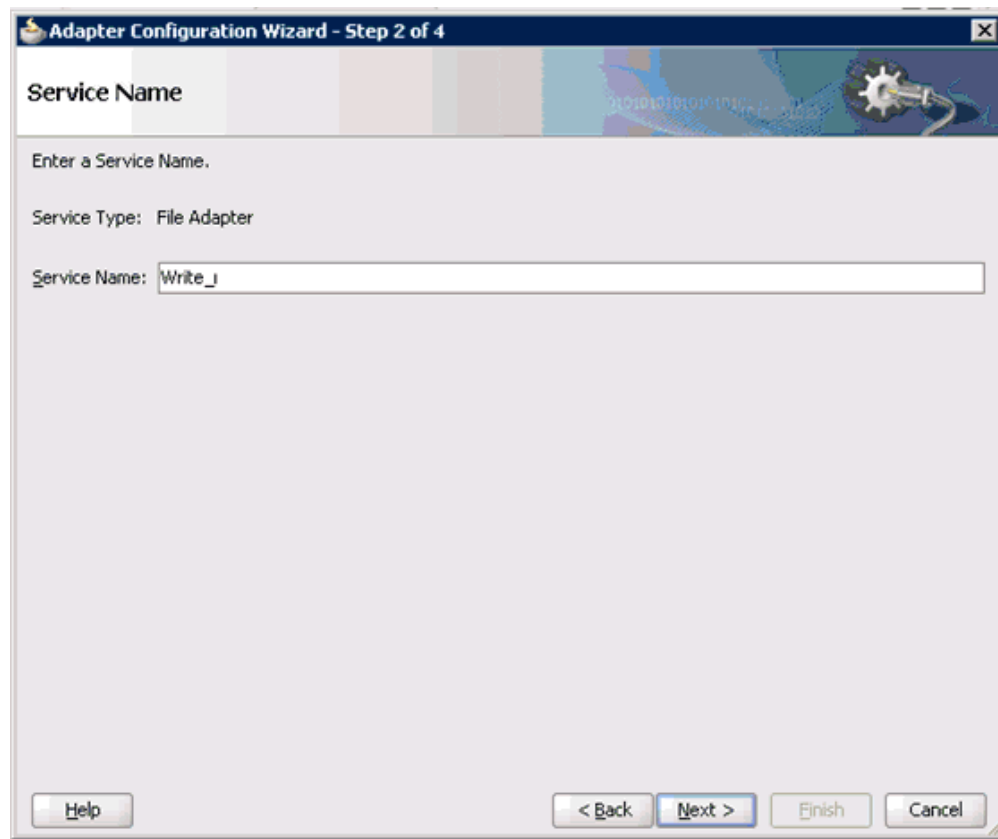
The Adapter Configuration Wizard is displayed, as shown in [Figure 8-131](#).

Figure 8–131 Adapter Configuration Wizard



2. Click **Next**.

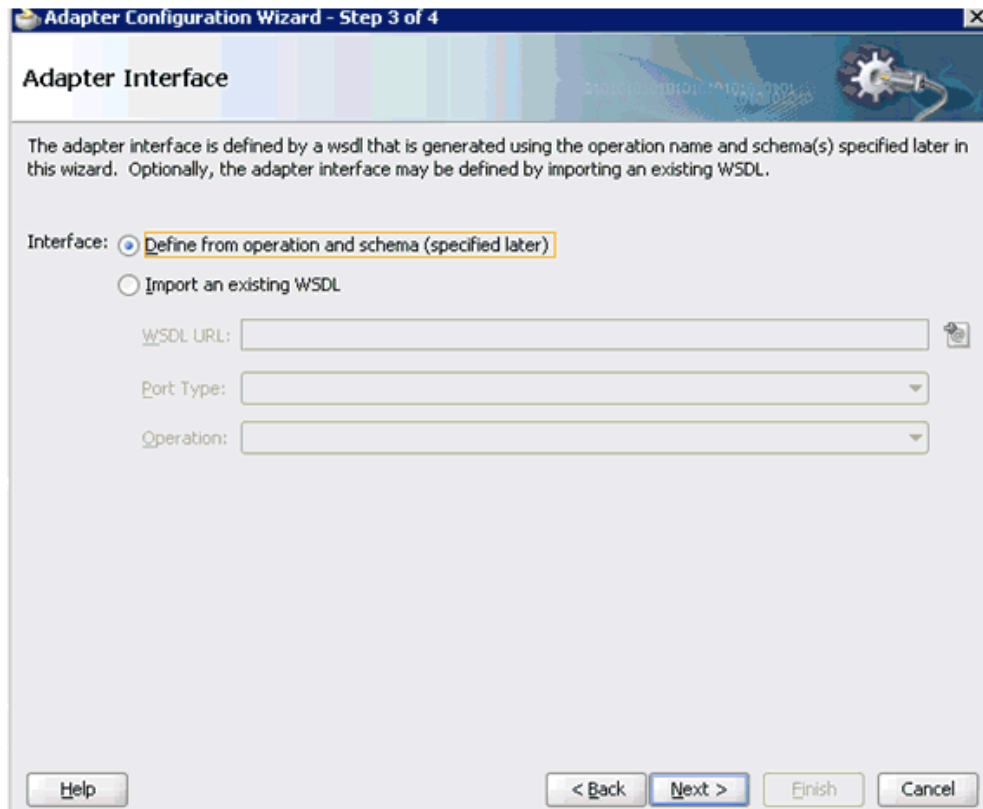
The Service Name page is displayed, as shown in [Figure 8–132](#).

Figure 8–132 Service Name Page

The screenshot shows a window titled "Adapter Configuration Wizard - Step 2 of 4". The window has a decorative header with a gear icon and binary code. Below the header, the text "Service Name" is displayed. The main area contains the instruction "Enter a Service Name." followed by "Service Type: File Adapter". A text input field labeled "Service Name:" contains the text "Write_1". At the bottom of the window, there are four buttons: "Help", "< Back", "Next >", and "Finish", with a "Cancel" button also present.

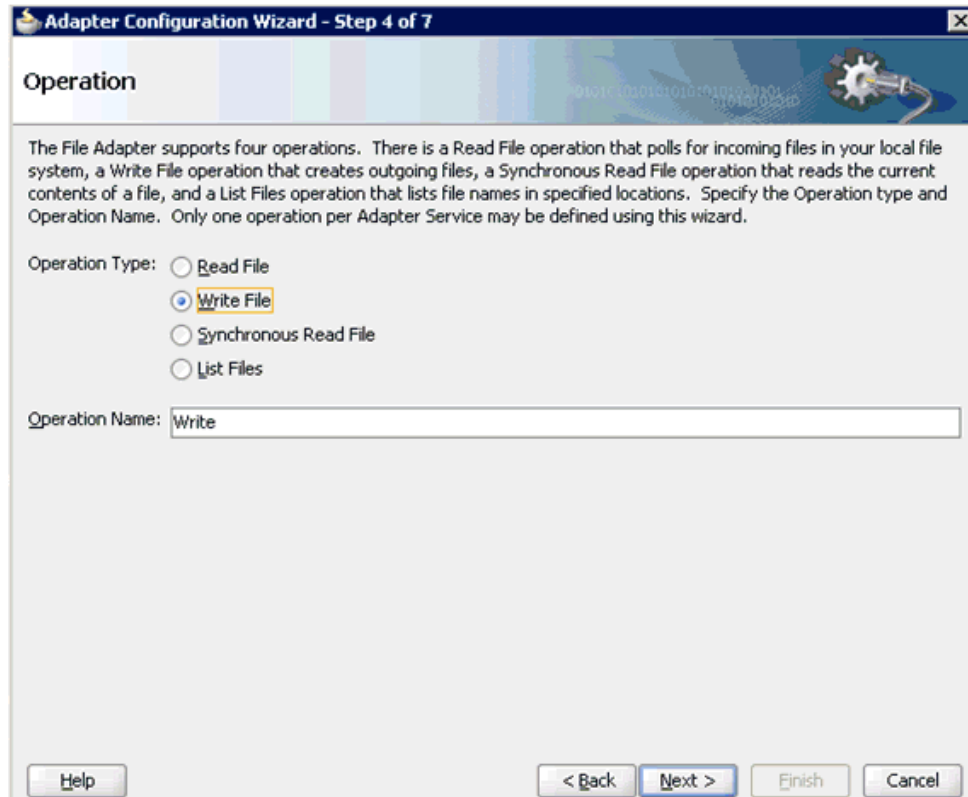
3. Type a name for the new File adapter in the Service Name field and click **Next**. The Adapter Interface page is displayed, as shown in [Figure 8–133](#).

Figure 8–133 Adapter Interface Page



4. Ensure that the **Define from operation and schema (specified later)** option is selected.
5. Click **Next**.

The Operation page is displayed, as shown in [Figure 8–134](#).

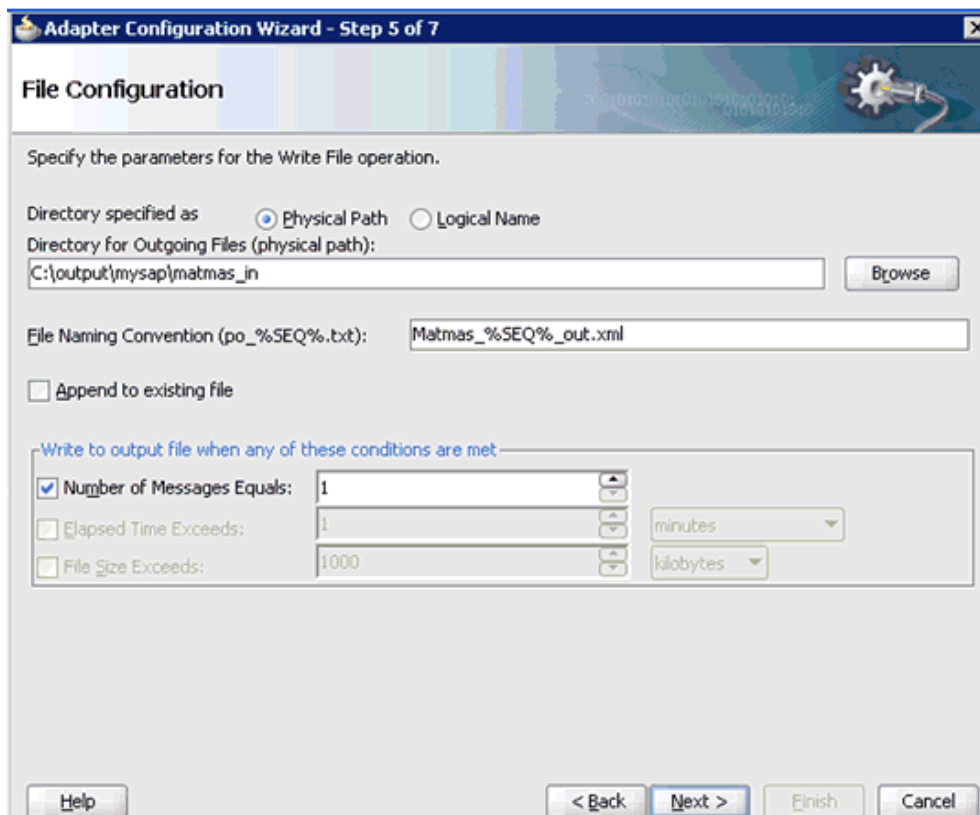
Figure 8–134 Operation Page

The screenshot shows a window titled "Adapter Configuration Wizard - Step 4 of 7". The main heading is "Operation". Below the heading is a paragraph of text: "The File Adapter supports four operations. There is a Read File operation that polls for incoming files in your local file system, a Write File operation that creates outgoing files, a Synchronous Read File operation that reads the current contents of a file, and a List Files operation that lists file names in specified locations. Specify the Operation type and Operation Name. Only one operation per Adapter Service may be defined using this wizard." Below this text are four radio button options under the label "Operation Type": "Read File", "Write File" (which is selected and highlighted with a yellow box), "Synchronous Read File", and "List Files". Below the radio buttons is a text input field labeled "Operation Name:" with the word "Write" entered. At the bottom of the window are four buttons: "Help", "< Back", "Next >", "Finish", and "Cancel".

6. Select **Write File** from the list of Operation Type options and specify an Operation Name (for example, Write).
7. Click **Next**.

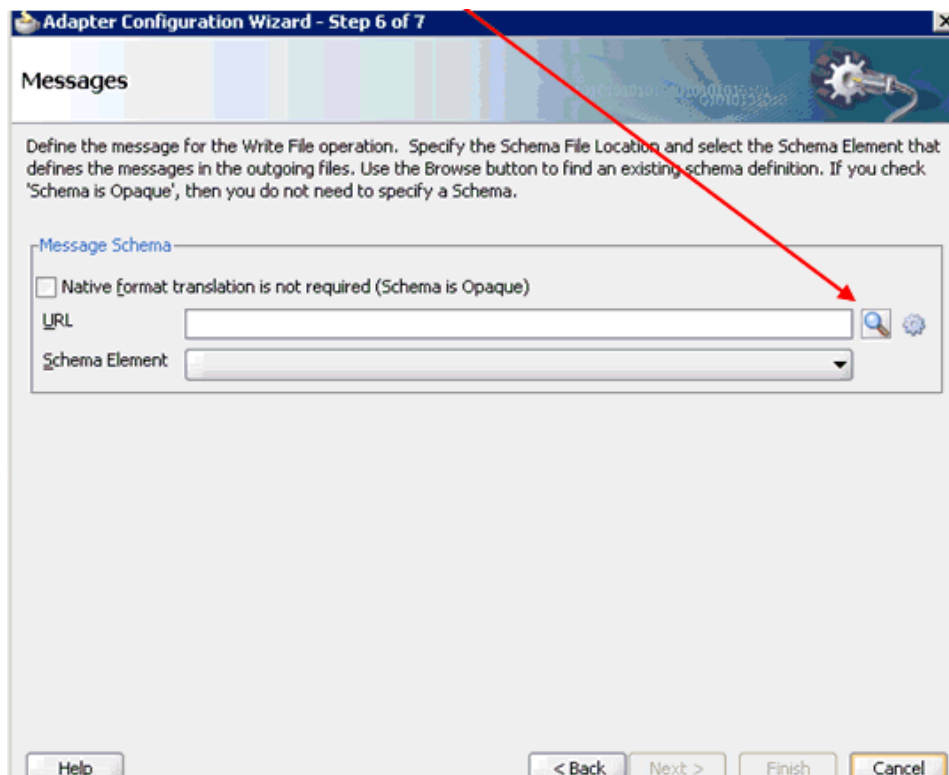
The File Configuration page is displayed, as shown in [Figure 8–135](#).

Figure 8–135 File Configuration Page



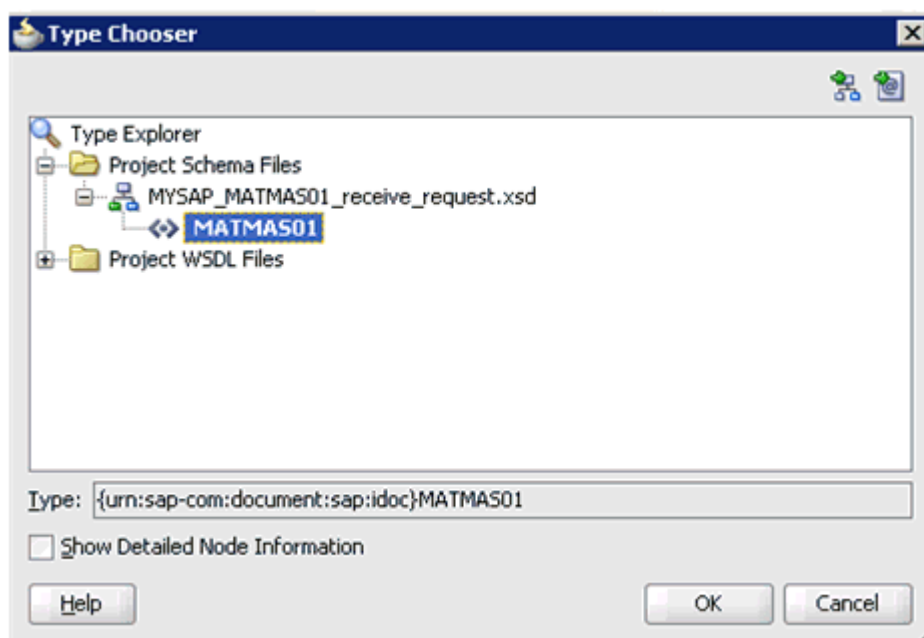
8. Specify a location on your file system where the output file is written.
9. In the File Naming Convention field, specify a name for the output file.
10. Click **Next**.

The Messages page is displayed, as shown in [Figure 8–136](#).

Figure 8–136 Messages Page

11. Click **Browse**, which is located to the right of the URL field.

The Type Chooser dialog is displayed, as shown in [Figure 8–137](#).

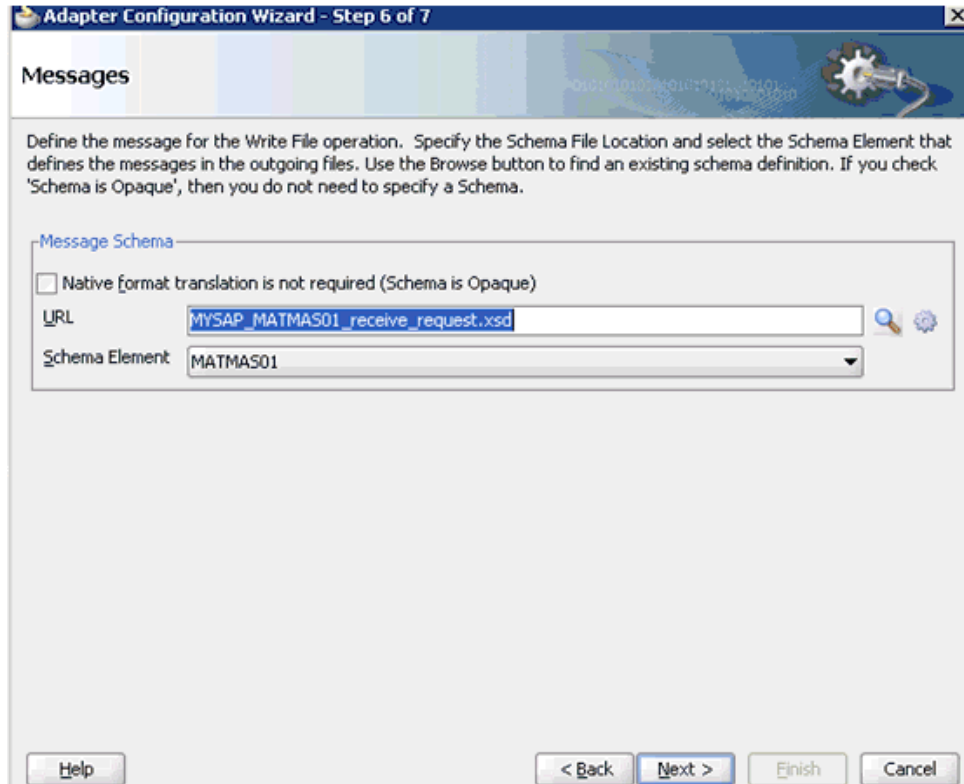
Figure 8–137 Type Chooser Dialog

12. Expand **Project Schema Files** and **MYSAP_MATMAS01_receive_request.xsd**.

13. Select the available schema (for example, MATMAS01).
14. Click OK.

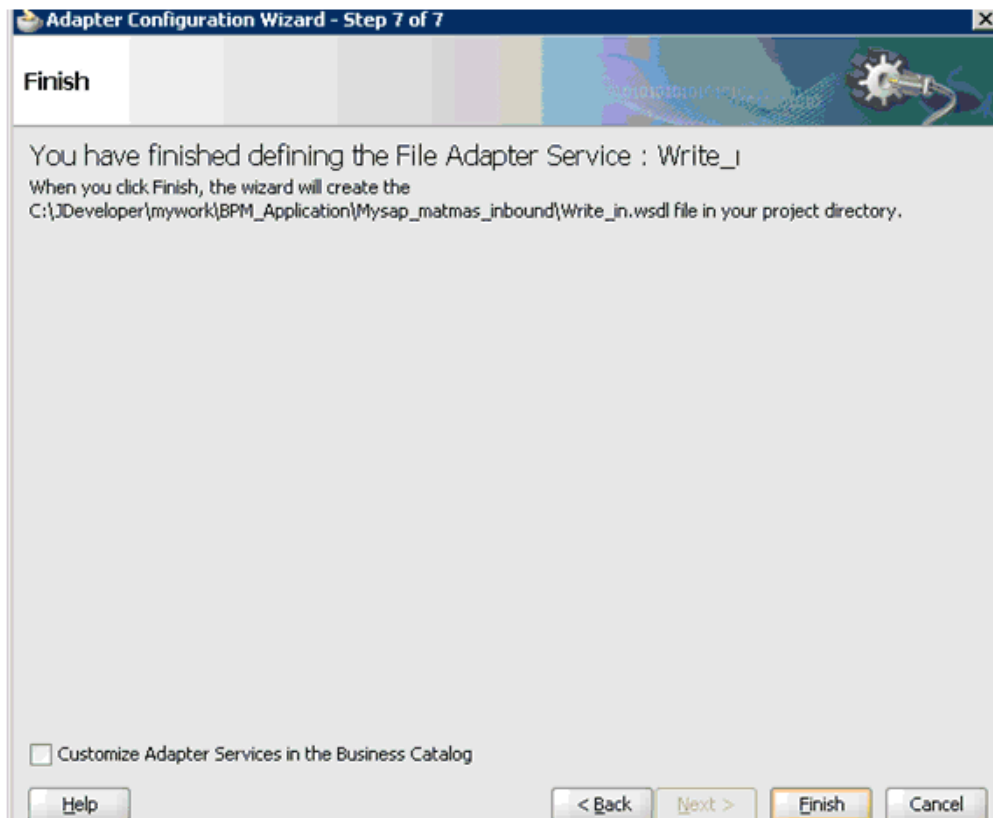
You are returned to the Messages page, as shown in [Figure 8–138](#).

Figure 8–138 Messages Page

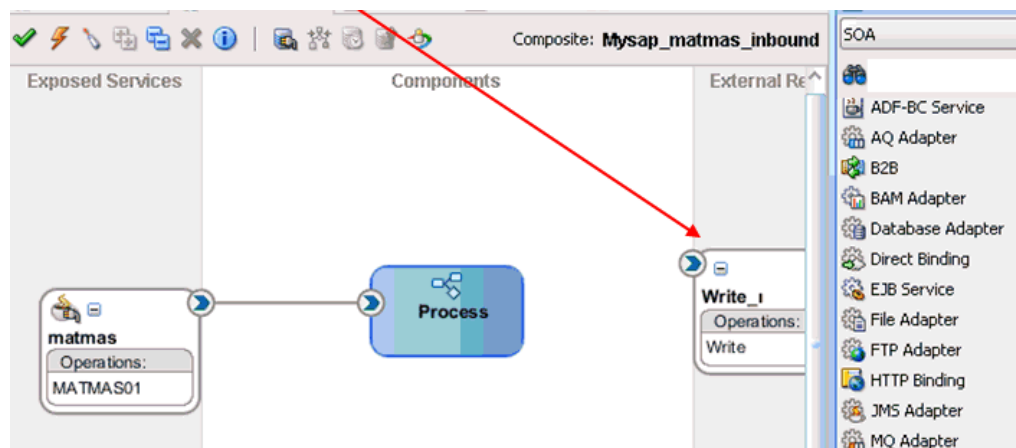


15. Click Next.

The Finish page is displayed, as shown in [Figure 8–139](#).

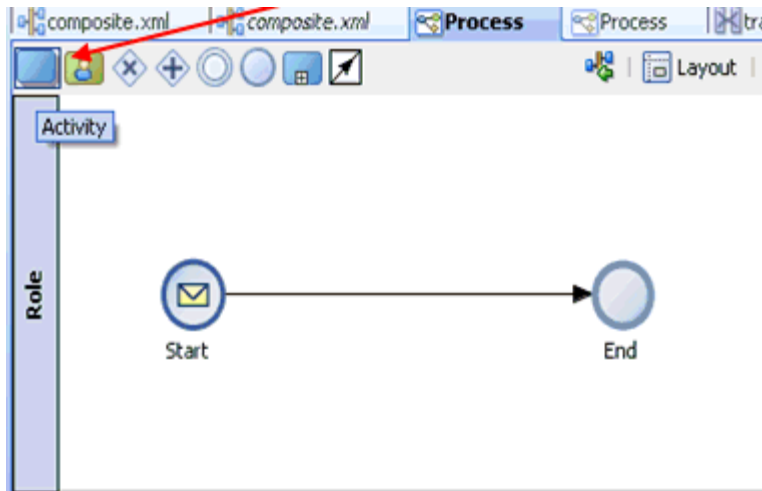
Figure 8–139 Finish Page**16. Click Finish.**

The File Adapter service is created in the External References pane, as shown in [Figure 8–140](#).

Figure 8–140 File Adapter Service**17. Double-click the BPMN Process component.**

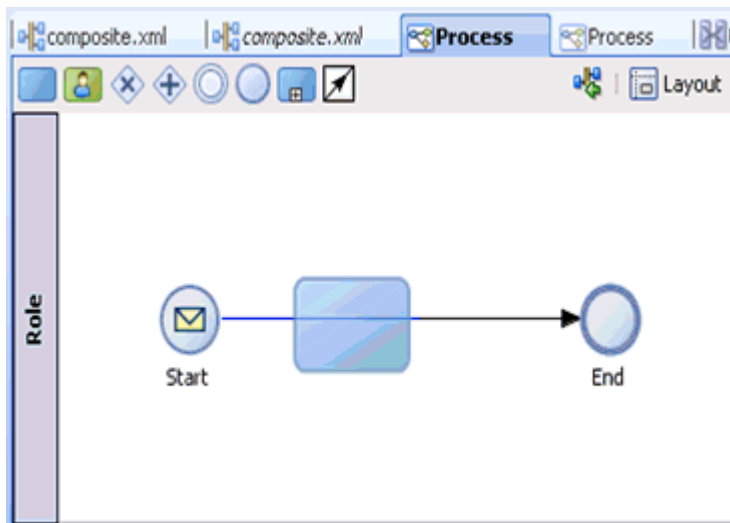
The BPMN process is displayed, as shown in [Figure 8–141](#).

Figure 8–141 BPMN Process

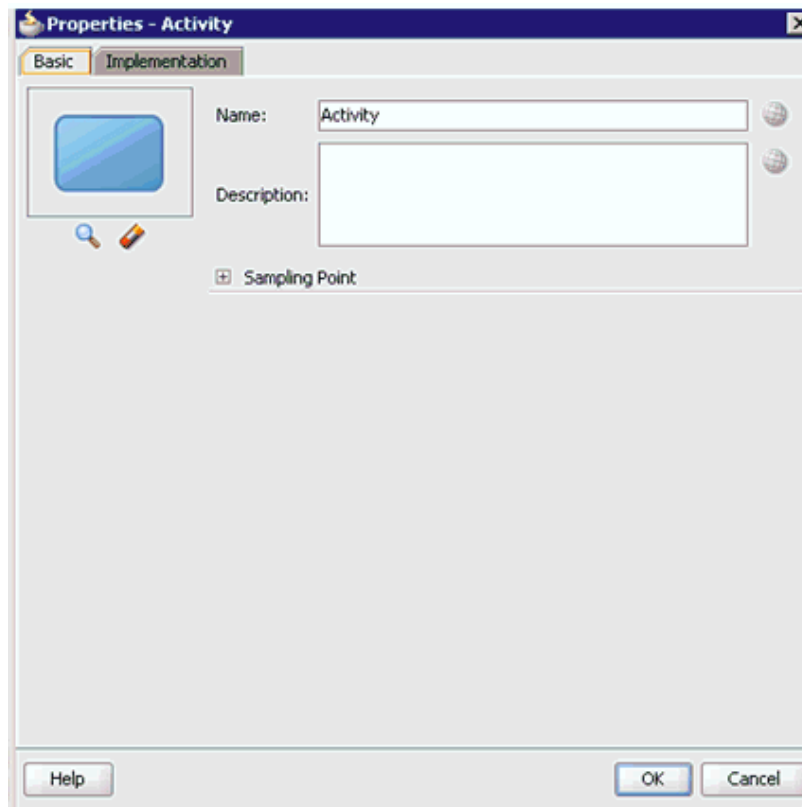


18. Click the **Activity** icon.
19. Drop the Activity icon on the wire between the Start and End event components, as shown in [Figure 8–142](#).

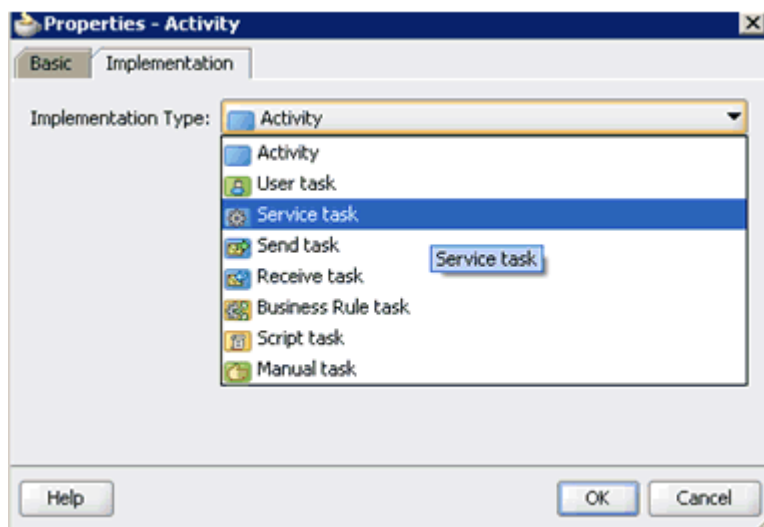
Figure 8–142 Activity Icon



The Properties - Activity dialog is displayed, as shown in [Figure 8–143](#).

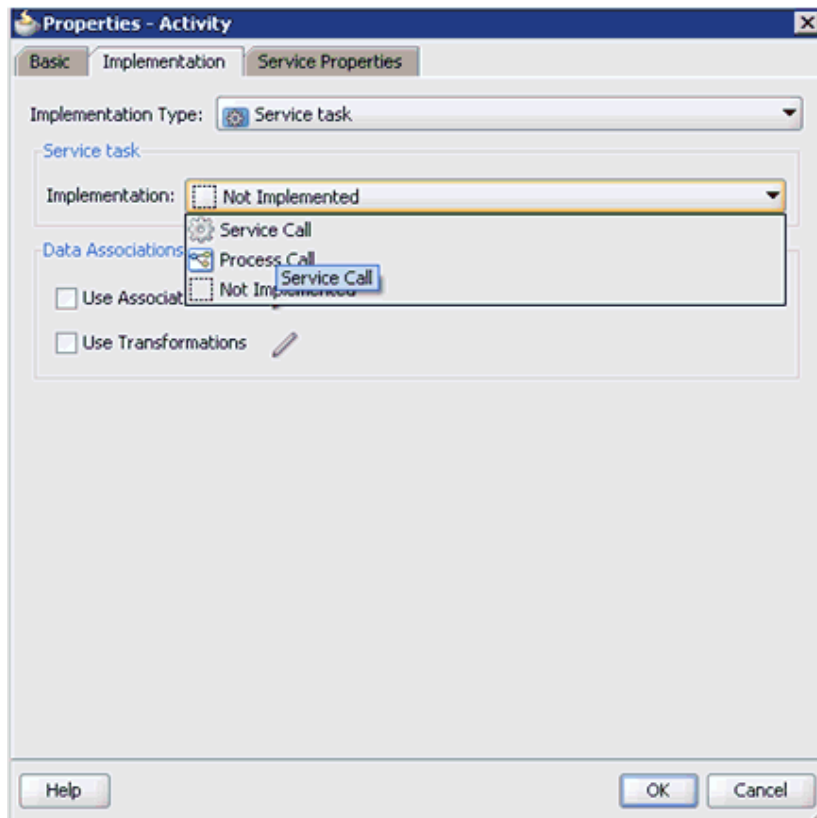
Figure 8–143 Properties - Activity Dialog

20. Click the **Implementation** tab, as shown in [Figure 8–144](#).

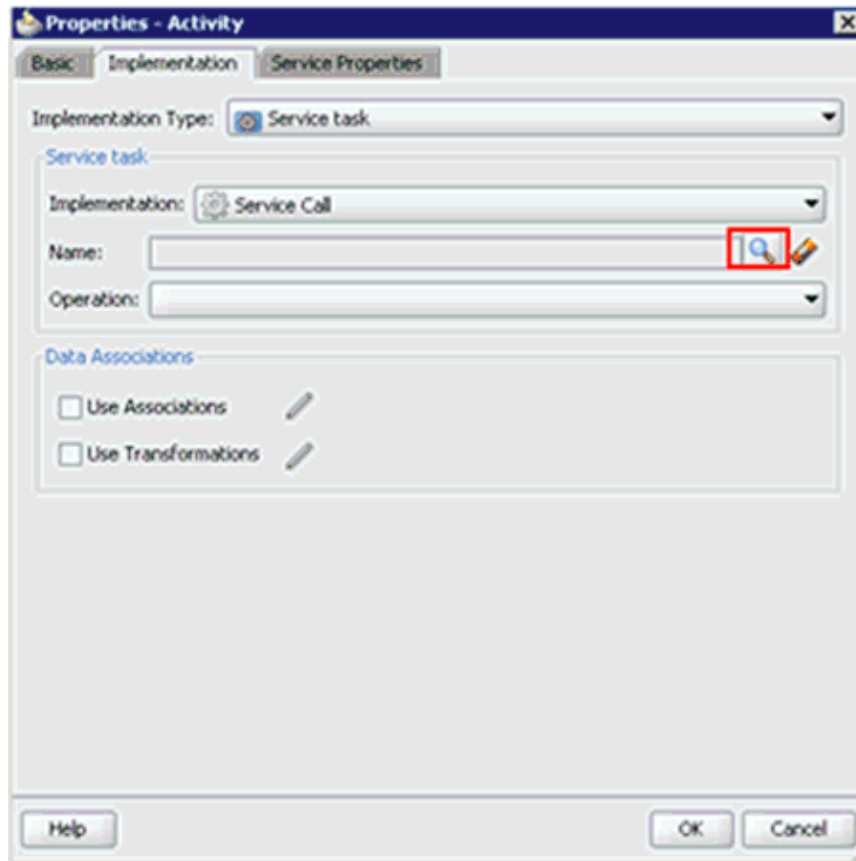
Figure 8–144 Implementation Tab

21. Select **Service Task** from the Implementation Type list, as shown in [Figure 8–145](#).

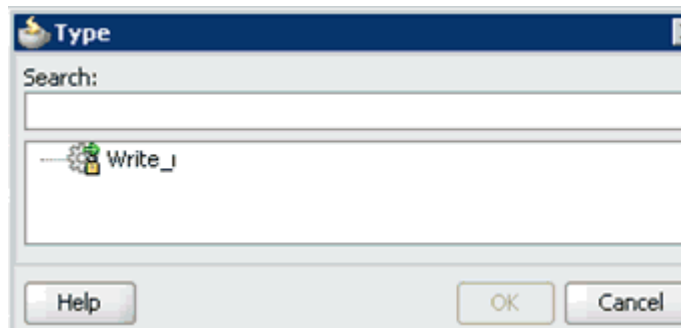
Figure 8–145 Service Task



22. Select **Service Call** from the Implementation list.
23. Click the **Browse** icon to the right of the Name field, as shown in [Figure 8–146](#).

Figure 8–146 Browse Icon

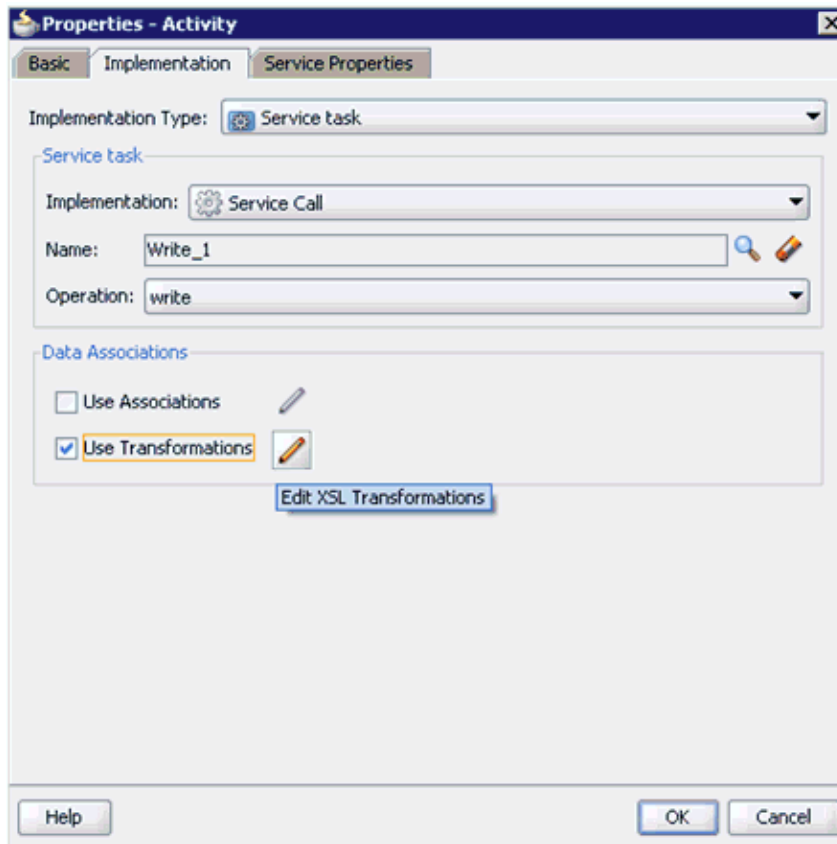
The Type dialog is displayed, as shown in [Figure 8–147](#).

Figure 8–147 Type Dialog

24. Select the service for write operation that has been created and click **OK**.

You are returned to the Properties - Activity dialog, as shown in [Figure 8–148](#).

Figure 8–148 Properties - Activity Dialog

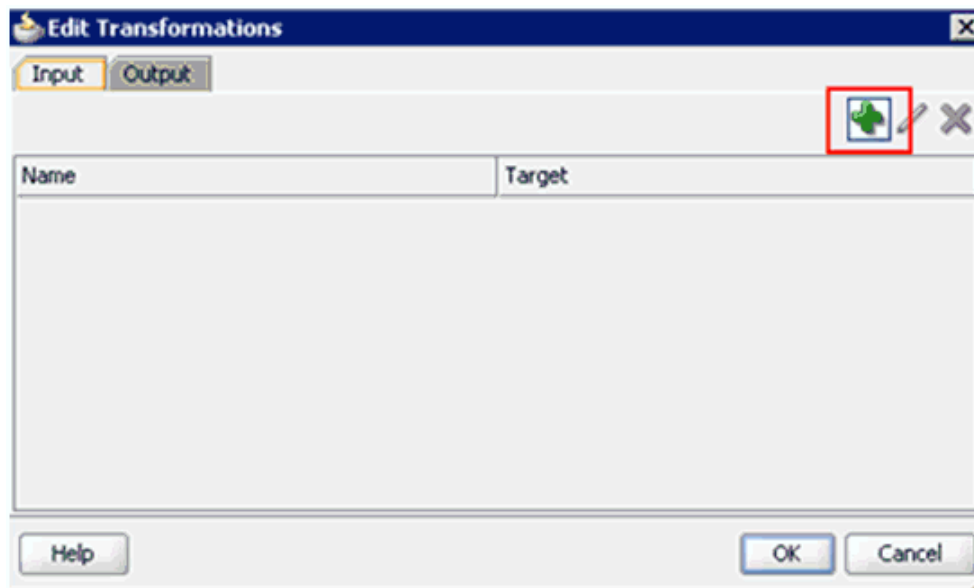


25. Select the **Use Transformations** option that is located under Data Associations.

26. Click the **Edit XSL Transformations** icon.

The Edit Transformations dialog is displayed, as shown in [Figure 8–149](#).

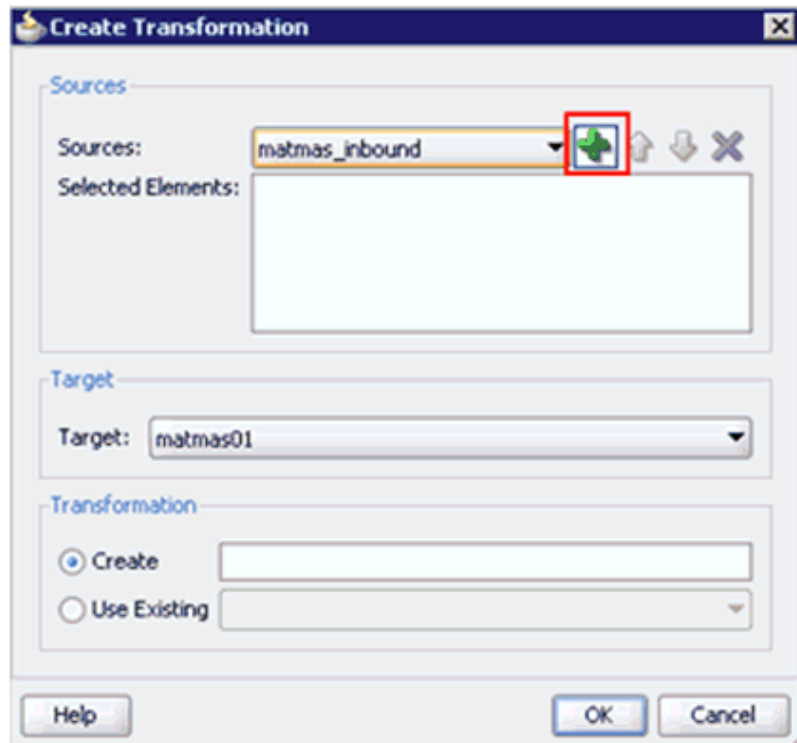
Figure 8–149 Edit Transformations Dialog



27. Click the **Plus** icon.

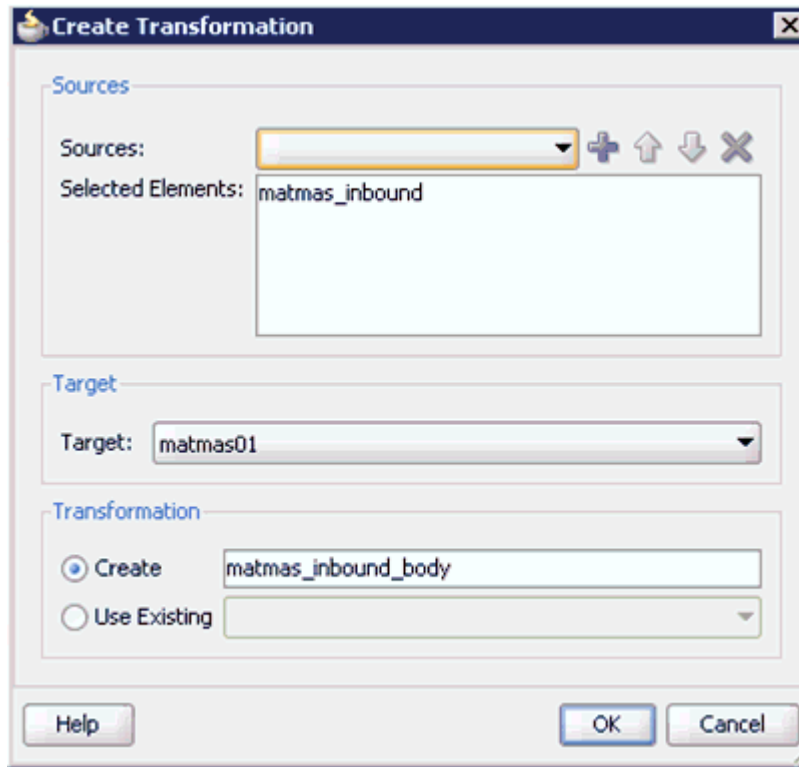
The Create Transformation dialog is displayed, as shown in [Figure 8–150](#).

Figure 8–150 Create Transformation Dialog



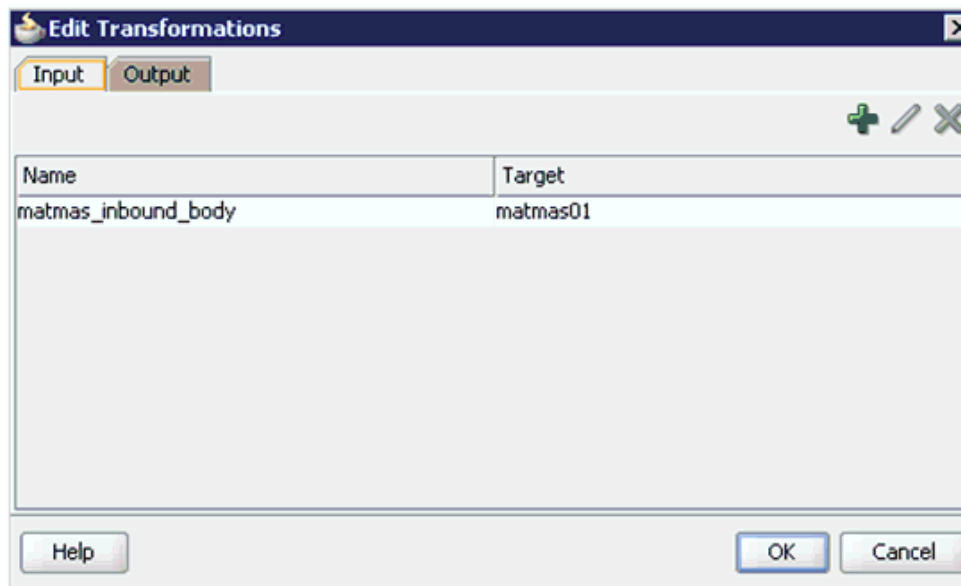
28. Click the **Plus** icon so that the Data Object 'matmas_inbound' is added to the Selected Elements area.

Figure 8–151 Target Default Value



29. Accept the default value that is selected in the Target list, as shown in [Figure 8–151](#).
30. Leave the default name as displayed in the Create field and click **OK**, as shown in [Figure 8–151](#).
You are returned to the Edit Transformations dialog, as shown in [Figure 8–152](#).

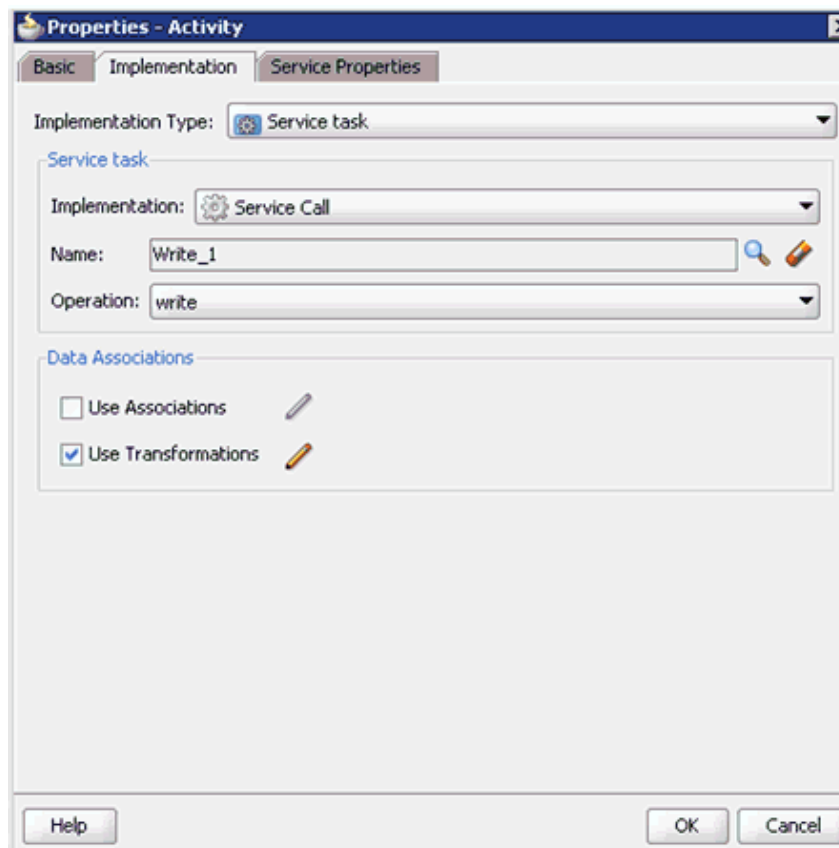
Figure 8–152 Edit Transformations Dialog



31. Click OK.

You are returned to the Properties - Activity dialog, as shown in [Figure 8-153](#).

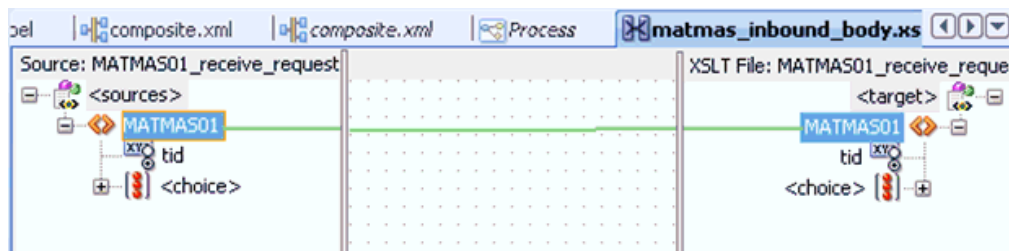
Figure 8-153 Properties - Activity Dialog



32. Click OK.

The `matmas_inbound_body.xsl` tab is displayed, as shown in [Figure 8-154](#).

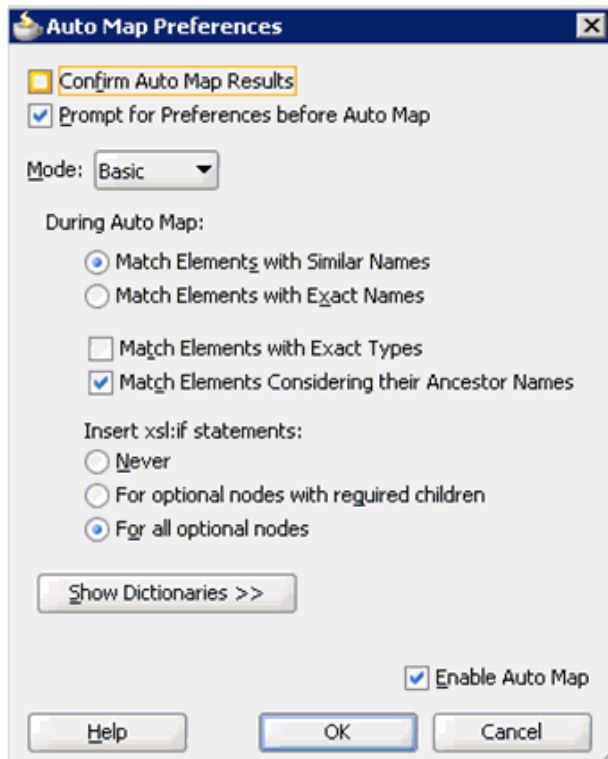
Figure 8-154 Matmas_inbound_body.xsl Tab



33. Automap the Source and Target elements.

The Auto Map Preferences dialog is displayed, as shown in [Figure 8-155](#).

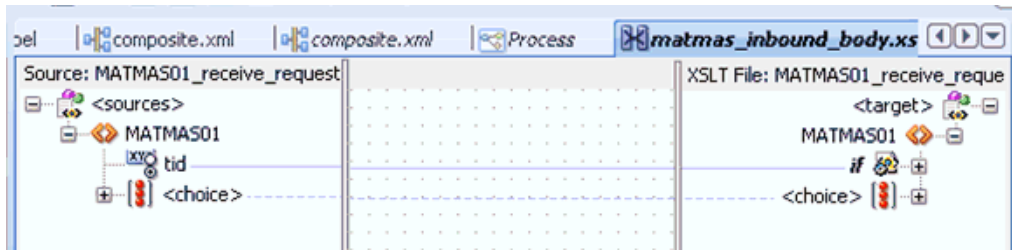
Figure 8–155 Auto Map Preferences Dialog



34. Accept the default values and click **OK**.

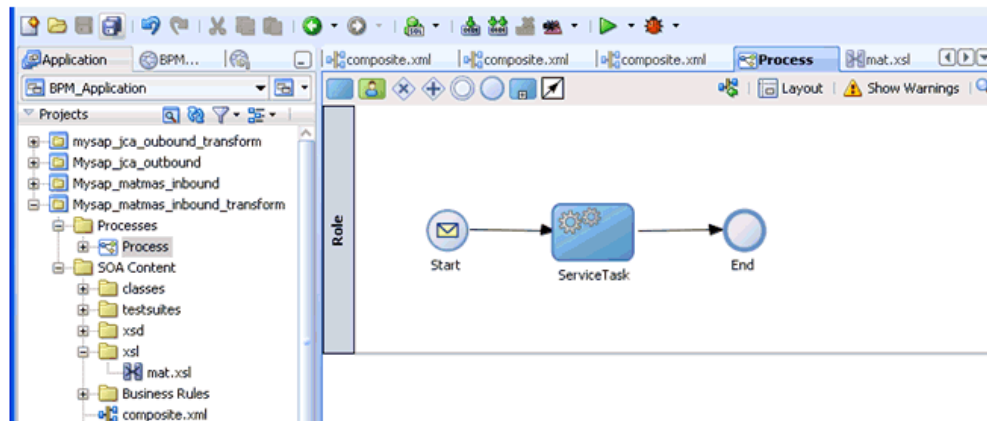
The transformation is completed, as shown in [Figure 8–156](#).

Figure 8–156 Completed Transformation



35. Save the transformation.

36. Return to the Process workspace area, as shown in [Figure 8–157](#).

Figure 8–157 Process Workspace Area

The ServiceTask component is created between the Start event component and the End event component.

37. Save the Process and double-click the **composite.xml** file.
38. Click the **Save All** icon in the menu bar to save the new inbound BPM process component that was configured.

You are now ready to deploy the inbound BPM process. You can follow the same procedure that is described in ["Deploying the BPEL Inbound Process"](#) on page 6-59. For more information on how to trigger events in SAP R/3, see ["Triggering an Event in SAP R/3"](#) on page 6-65.

Configuring Outbound and Inbound Processing Using Oracle Service Bus

Oracle Application Adapter for SAP R/3 integrates seamlessly with Oracle Service Bus (OSB) to facilitate Web service integration. OSB is based on the Service-Oriented Architecture (SOA). It consumes adapter services exposed as Web Service Definition Language (WSDL) documents.

This chapter contains the following topics:

- [Section 9.1, "Overview of Application Adapter Integration with Oracle Service Bus"](#)
- [Section 9.2, "Configuring Outbound Processing Using Oracle Service Bus \(J2CA Configuration\)"](#)
- [Section 9.3, "Configuring Inbound Processing Using Oracle Service Bus \(J2CA Configuration\)"](#)
- [Section 9.4, "Configuring Outbound Processing Using Oracle Service Bus \(BSE Configuration\)"](#)

9.1 Overview of Application Adapter Integration with Oracle Service Bus

To integrate with Oracle Service Bus (OSB), Oracle Application Adapter for SAP R/3 must be deployed in the same Oracle WebLogic Server as OSB. The underlying adapter services must be exposed as WSDL files, which are generated during design time in Oracle Adapter Application Explorer (Application Explorer) for both request-response (outbound) and event notification (inbound) services of the adapter.

9.2 Configuring Outbound Processing Using Oracle Service Bus (J2CA Configuration)

This section describes how to configure outbound processing using Oracle Service Bus for J2CA configurations.

This section includes the following topics:

- [Section 9.2.1, "Starting Oracle Service Bus and Creating Project Folders"](#)
- [Section 9.2.2, "Setting the Class Path for Application Explorer to Integrate With Oracle Service Bus"](#)
- [Section 9.2.3, "Publishing a WSDL From Application Explorer to Oracle Service Bus"](#)
- [Section 9.2.4, "Configuring a WSDL-based Business Service"](#)

- [Section 9.2.5, "Configuring a File Type Business Service"](#)
- [Section 9.2.6, "Configuring a Proxy Service"](#)
- [Section 9.2.7, "Configuring a Pipeline"](#)

Samples have been provided for this use case scenario under the *etc/sample* folder of the Application Adapters installation.

9.2.1 Starting Oracle Service Bus and Creating Project Folders

This section describes how to start Oracle Service Bus (OSB) and create project folders.

Note: If you are using Oracle Application Adapter for SAP R/3 (SAP JCo 3.0) with OSB on 64-bit machines, you must add the *d64* flag with the JAVA options in the *startWebLogic.sh* file, which is located in the following directory:

```
<OSB_Home>\user_projects\domains\base_domain\bin
```

For example:

```
JAVA_OPTIONS="${SAVE_JAVA_OPTIONS} -Dfile.encoding=ISO8859_1 -d64"
```

The Oracle WebLogic Server must be started only after this change has been made.

Perform the following steps to start Oracle Service Bus and create project folders:

1. Start the Oracle WebLogic Server for the Oracle WebLogic Server domain that you have configured.
2. Open the Oracle Service Bus Console in a Web browser by entering the following URL:

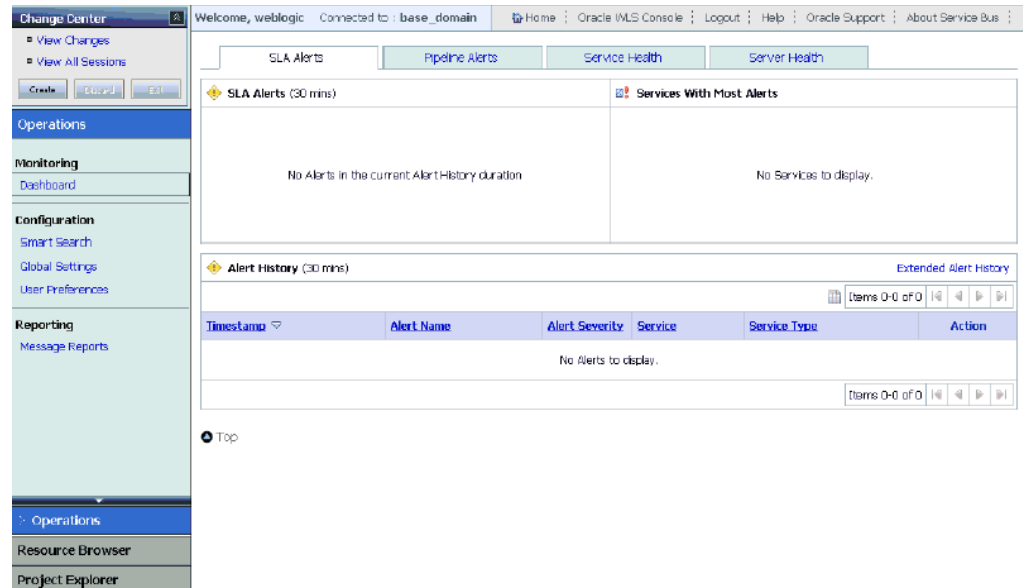
```
http://hostname:port/sbconsole
```

Where *hostname* is the name of the machine where Oracle WebLogic Server is running and *port* is the port for the domain you are using. The port for the default domain is 7001.

The Oracle Service Bus Console logon page is displayed.

3. Log on to the Oracle Service Bus Console using a valid user name and password. The Oracle Service Bus Console home page is displayed, as shown in [Figure 9–1](#).

Figure 9–1 Oracle Service Bus Console Home Page



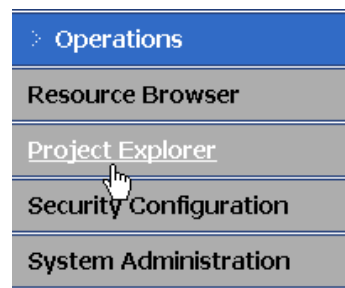
4. Click **Create** in the Change Center area to start a new Oracle Service Bus session, as shown in [Figure 9–2](#).

Figure 9–2 Change Center



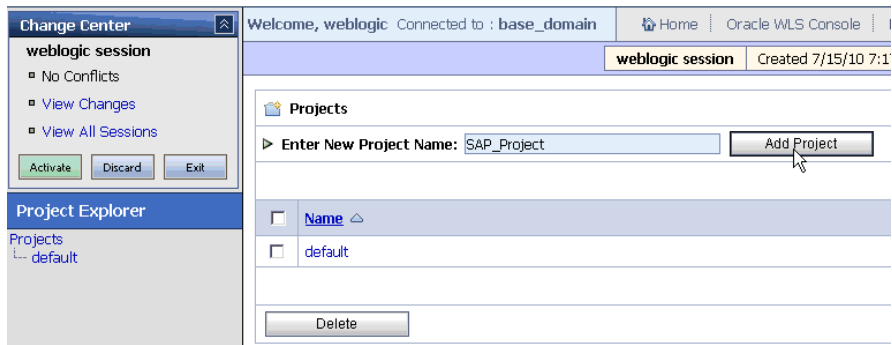
5. Click **Project Explorer** in the left pane, as shown in [Figure 9–3](#).

Figure 9–3 Project Explorer



The Project Explorer page is displayed, as shown in [Figure 9–4](#).

Figure 9–4 Project Explorer Page



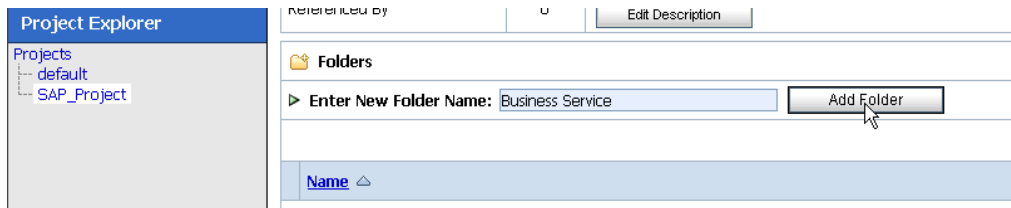
6. Provide a valid name for the new project (for example, SAP_Project) and click **Add Project**.

The new project is successfully created and listed in the left pane.

7. Click the new project node in the left pane.

The project page is displayed, as shown in [Figure 9–5](#).

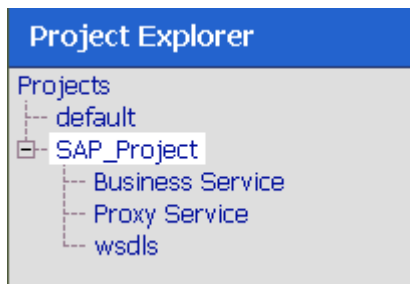
Figure 9–5 Project Page



8. In the Enter New Folder Name field, type **Business Service** and click **Add Folder**.
9. In the Enter New Folder Name field, type **Proxy Service** and click **Add Folder**.
10. In the Enter New Folder Name field, type **wsdls** and click **Add Folder**.

The Business Service, Proxy Service, and wsdls folders are listed in the left pane below the new SAP_Project node, as shown in [Figure 9–6](#).

Figure 9–6 SAP_Project Node



9.2.2 Setting the Class Path for Application Explorer to Integrate With Oracle Service Bus

Before starting and using Application Explorer to publish a WSDL directly to the Oracle Service Bus (OSB) Console (project/folder), OSB users must perform the following steps:

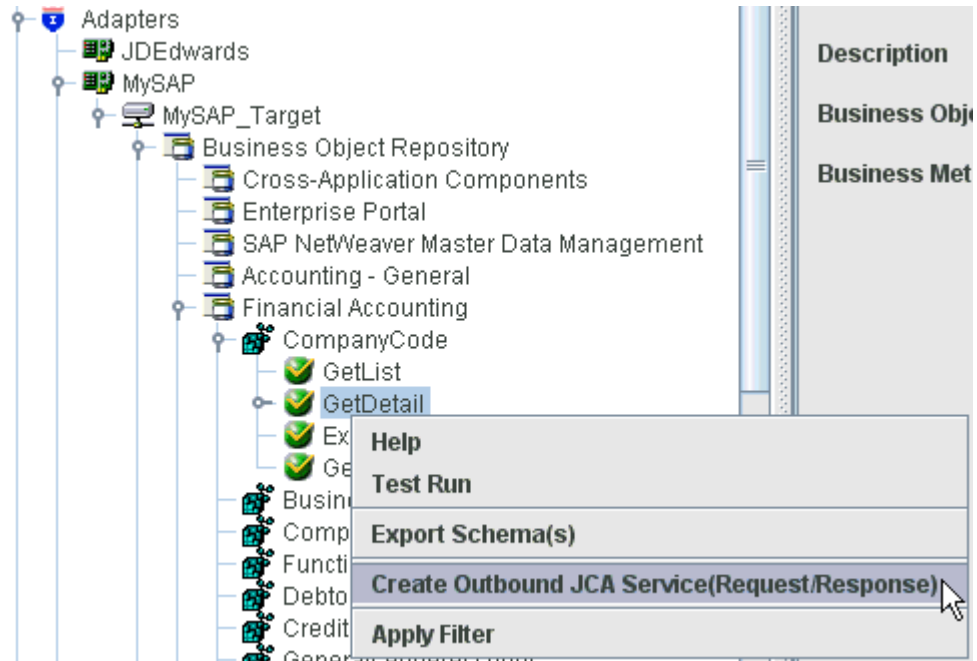
1. Open the command prompt window.
2. Navigate to the following directory:
`<OSB_Home>\user_projects\domains\base_domain\bin`
3. Execute **setDomainEnv.cmd** (Windows) or **./setDomainEnv.sh** (UNIX/Linux).
This command sets the class path for Application Explorer to access the Oracle WebLogic Server APIs to publish the WSDLs to the OSB Console.
4. Do not close the command prompt window.
5. Navigate to the following directory:
`<OSB_Home>\3rdparty\ApplicationAdapters\tools\iwaeb\bin`
6. Execute **ae.bat** (Windows) or **iwaeb.sh** (UNIX/Linux) to start Application Explorer.
You are now ready to publish WSDLs from Application Explorer to the OSB Console.

9.2.3 Publishing a WSDL From Application Explorer to Oracle Service Bus

Perform the following steps to publish a WSDL from Application Explorer to Oracle Service Bus:

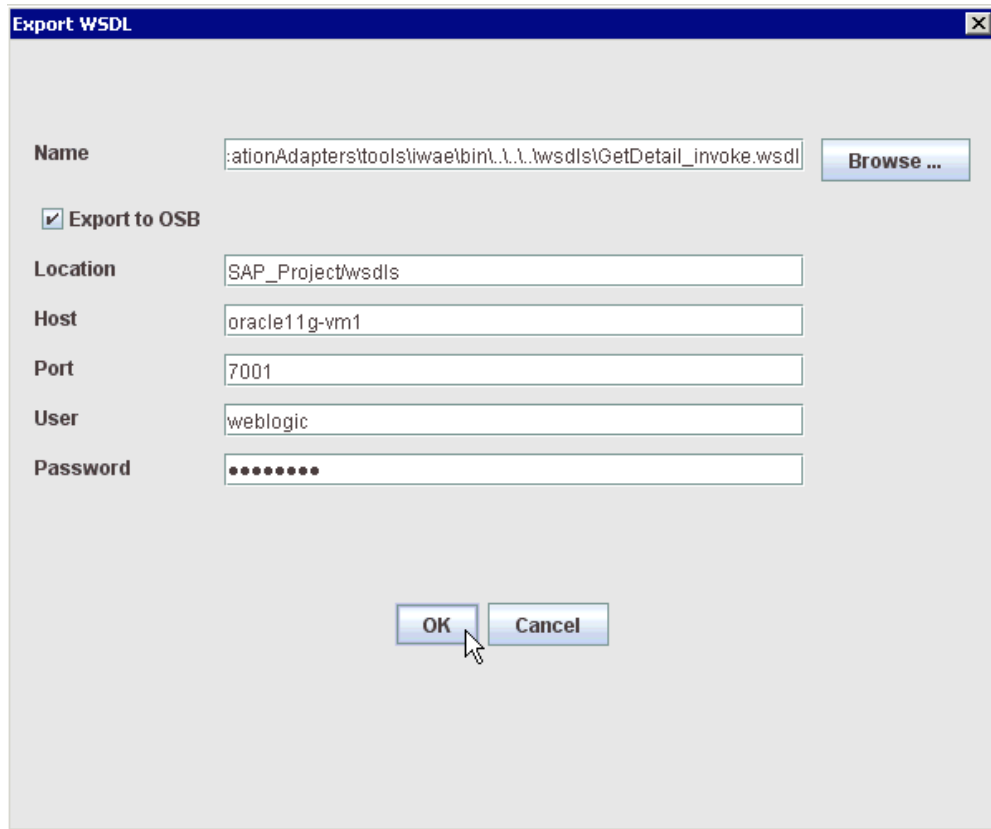
1. Start Application Explorer, connect to a J2CA configuration, and connect to a SAP R/3 target.
For more information, see [Chapter 4, "Configuring Oracle Application Adapter for SAP R/3"](#).
2. Expand **Business Object Repository**, **Financial Accounting**, and then **CompanyCode**.
3. Right-click the **GetDetail** method and select **Create Outbound JCA Service(Request/Response)** from the menu, as shown in [Figure 9-7](#).

Figure 9–7 Create Outbound JCA Service (Request/Response) Option



The Export WSDL dialog is displayed, as shown in [Figure 9–8](#).

Figure 9–8 Export WSDL Dialog



4. In the Name field, a default file name for the WSDL file is provided. You can accept the default or provide your own.
5. Select the **Export to OSB** option.
6. In the Location field, enter the folder name in Oracle Service Bus where you want to publish the WSDL document.

The location is composed of an Oracle Service Bus project name and optionally, one or more folder names. The project name and any folder names must be separated by a forward slash character “/”.

7. In the Host field, enter the name of the machine where Oracle Service Bus is installed.
8. In the Port field, enter the port that is being used by Oracle Service Bus.
9. In the User field, enter your username to access Oracle Service Bus.
10. In the Password field, enter your password to access Oracle Service Bus.
11. Click **OK**.

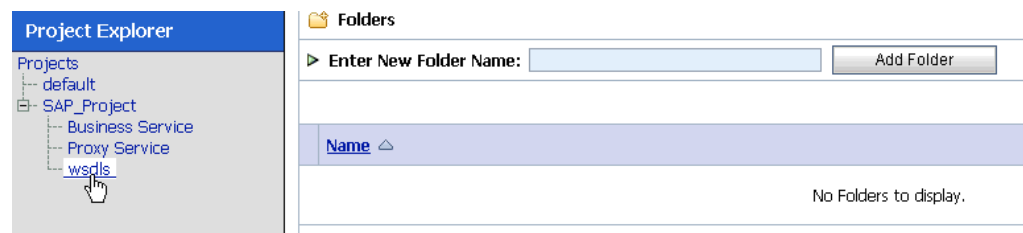
The WSDL is published to the location specified in the Export WSDL dialog and is now available for use with a Business Service or Proxy Service in Oracle Service Bus.

9.2.4 Configuring a WSDL-based Business Service

Perform the following steps to configure a WSDL-based Business Service:

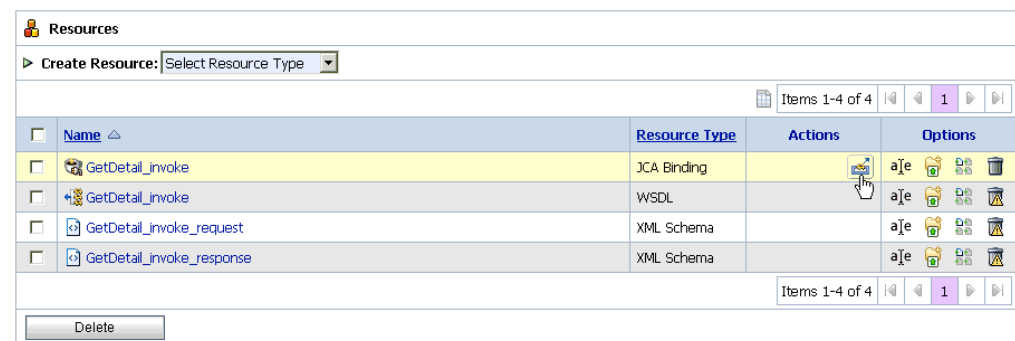
1. Open the Oracle Service Bus Console and select the created WSDL folder in the left pane (for example, wsdl), as shown in [Figure 9–9](#).

Figure 9–9 Created WSDL Folder



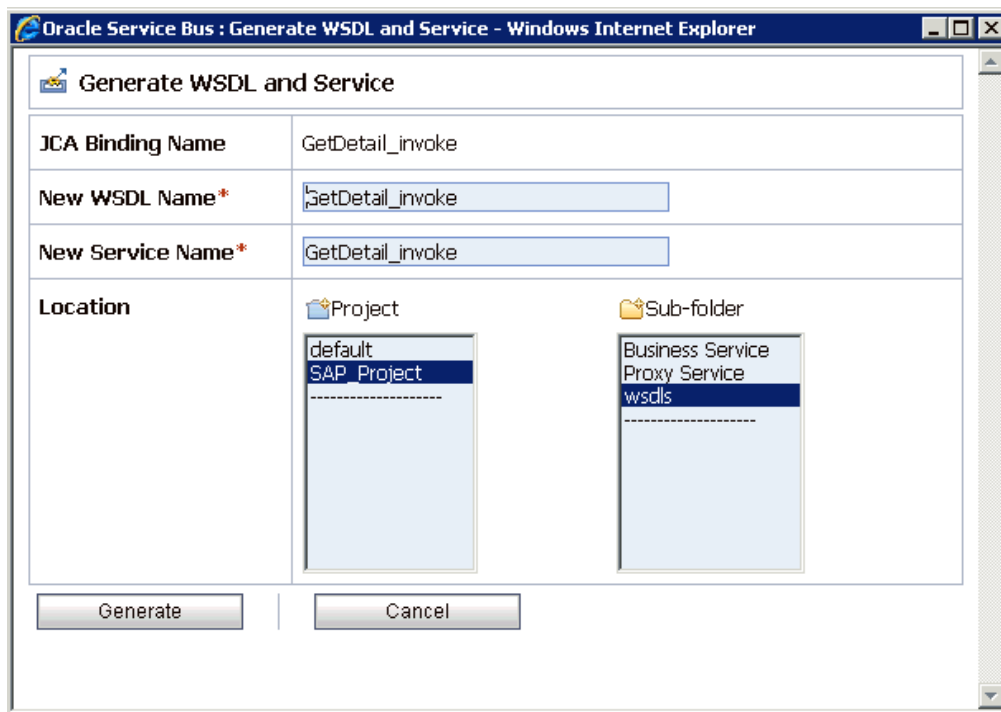
2. Ensure that the exported WSDL is listed, as shown in [Figure 9–10](#).

Figure 9–10 Exported WSDL



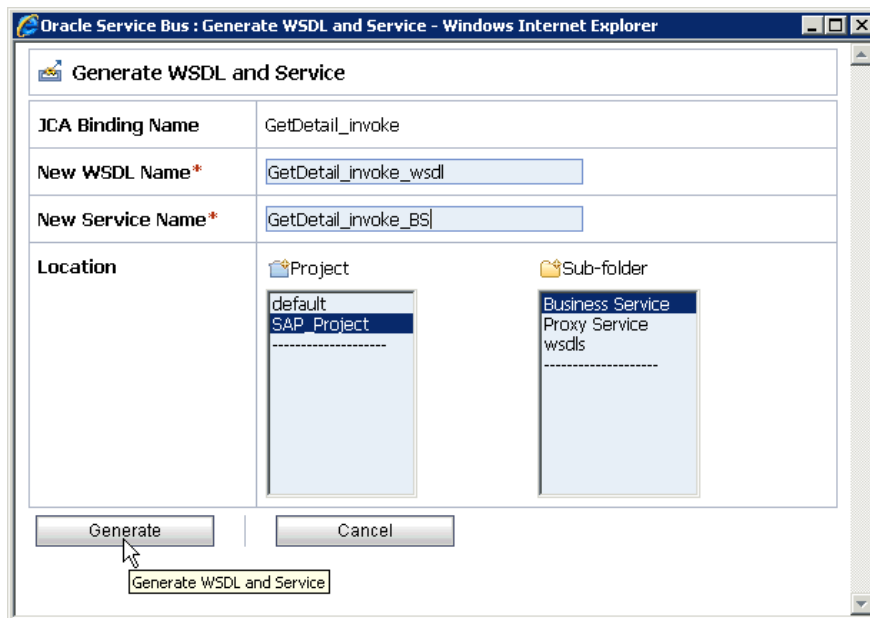
- Click the icon that corresponds to the exported WSDL in the Actions column.
The Generate WSDL and Service page is displayed, as shown in [Figure 9–11](#).

Figure 9–11 Generate WSDL and Service Page



- Provide a new WSDL name and a new service name in the corresponding fields, as shown in [Figure 9–12](#).

Figure 9–12 WSDL Name and Service Name



5. In the Location area, select an available project and the sub-folder that is designated for Business Services.
6. Click **Generate**.
If the WSDL and Service resources are successfully created, then the following message is displayed, as shown in [Figure 9–13](#).

Figure 9–13 Successful Creation Message

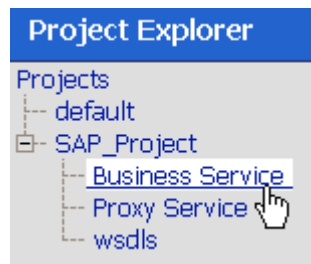


9.2.5 Configuring a File Type Business Service

Perform the following steps to configure a File type Business Service:

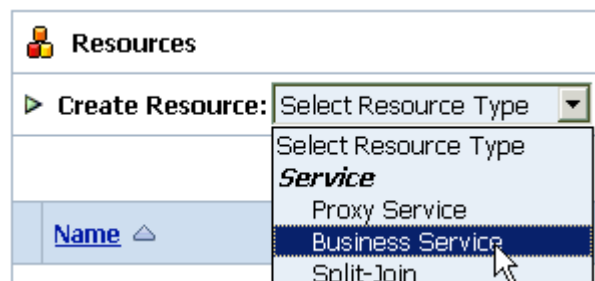
1. Select the **Business Service** folder you created in the left pane, as shown in [Figure 9–14](#).

Figure 9–14 Business Service Folder



2. In the right pane, select **Business Service** from the Create Resource menu, as shown in [Figure 9–15](#).

Figure 9–15 Business Service



The General Configuration page is displayed, as shown in [Figure 9–16](#).

Figure 9–16 General Configuration Page

3. Provide a name for the new Business Service and select **Messaging Service** from the Service Type area.
4. Click **Next**.

The Message Type Configuration page is displayed, as shown in [Figure 9–17](#).

Figure 9–17 Message Type Configuration Page

5. Select **XML** as the Request Message Type and **None** as the Response Message Type.
6. Click **Next**.

The Transport Configuration page is displayed, as shown in [Figure 9–18](#).

Figure 9–18 Transport Configuration Page

Create a Business Service (SAP_Project/Business Service/SAP_File_Out)

Transport Configuration

Protocol* file

Load Balancing Algorithm round-robin

Endpoint URI* Format: file:///root-dir/dir1
file:///C:/output/sap/getdetail Add

EXISTING URIS OPTIONS

There are no URI configured. At least one URI must be configured.

Retry Count 0

Retry Iteration Interval 30

<< Prev. Next >> Last >> Cancel

7. Select **file** from the Protocol list.
8. Enter the path to a destination folder on your file system in the Endpoint URI field and click **Add**.
9. Click **Next**, as shown in [Figure 9–19](#).

Figure 9–19 Transport Configuration Page

Create a Business Service (SAP_Project/Business Service/SAP_File_Out)

Transport Configuration

Protocol* file

Load Balancing Algorithm round-robin

Endpoint URI* Format: file:///root-dir/dir1
file:/// Add

EXISTING URIS

file:///C:/output/sap/getdetail

Retry Count 0

Retry Iteration Interval 30

<< Prev. Next >> Last >> Cancel

The FILE Transport Configuration page is displayed, as shown in [Figure 9–20](#).

Figure 9–20 FILE Transport Configuration Page

FILE Transport Configuration	
Prefix	get_detail
Suffix	.xml
Request encoding	utf-8

<< Prev. Next >> Last >> Cancel

10. Enter the prefix and suffix for the output file to be received and click **Next**.
The Message Handling and Advanced Settings page is displayed, as shown in [Figure 9–21](#).

Figure 9–21 Message Handling and Advanced Settings Page

Message Handling

There are no basic configuration options.

Advanced Settings

<< Prev. Next >> Last >> Cancel

11. Click **Next**.
The following Summary page is displayed, as shown in [Figure 9–22](#).

Figure 9–22 Summary Page

Create a Business Service - Summary (SAP_Project/Business Service/SAP_File_Out)

General Configuration	
Service Name	SAP_File_Out
Description	
Service Type	Messaging Service
Message Type Configuration	
Request Message Type	XML
Response Message Type	None
Transport Configuration	
Protocol	file
Load Balancing Algorithm	round-robin
Endpoint URI	file:///C:/output/sap/getdetail
Retry Count	0
Retry Iteration Interval	30
FILE Transport Configuration	
Prefix	get_detail
Suffix	.xml
Request encoding	utf-8
Message Handling Configuration	
Result Caching	Not Supported

12. Review all the information for your Business Service and click **Save**.
13. Check if the success message is displayed once it is saved, as shown in [Figure 9–23](#).

Figure 9–23 Success Message

The Service "SAP_File_Out" was created successfully.

SAP_Project/Business Service

Folders

▶ Enter New Folder Name:

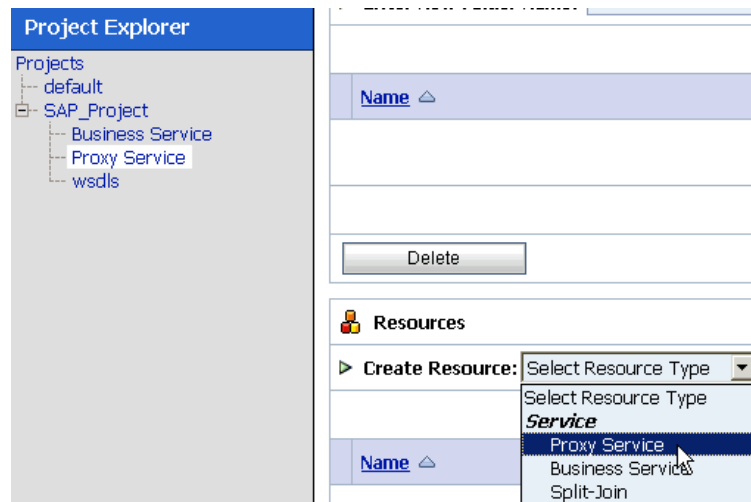
[Name](#) ▲

9.2.6 Configuring a Proxy Service

Perform the following steps to configure a Proxy Service:

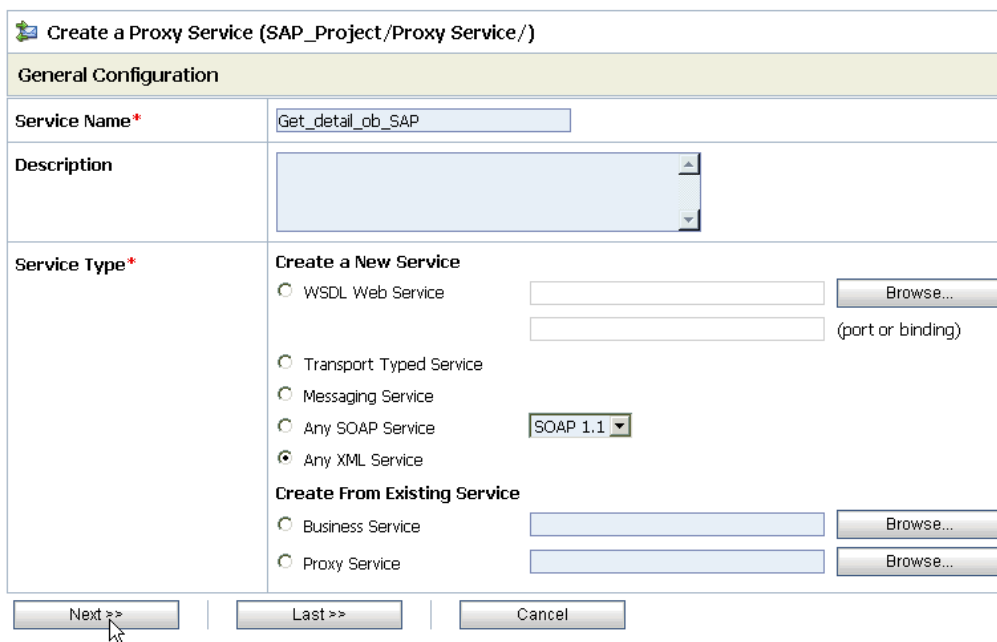
1. Select the **Proxy Service** folder you created in the left pane, as shown in [Figure 9–24](#).

Figure 9–24 Proxy Service Folder



2. In the right pane, select **Proxy Service** from the Create Resource menu. The General Configuration page is displayed, as shown in [Figure 9–25](#).

Figure 9–25 General Configuration Page



3. Provide a name for the Proxy Service and from the Service Type area select **Any XML Service**.
4. Click **Next**, as shown in [Figure 9–26](#).

Figure 9–26 Transport Configuration Page

Create a Proxy Service (SAP_Project/Proxy Service/Get_detail_ob_SAP)

Transport Configuration

Protocol*	file				
Endpoint URI*	Format: file:///root-dir/dir1 file:///C:/input/sap/getdetail				
Get All Headers	<input type="radio"/> Yes <input checked="" type="radio"/> No Header <input type="text"/> <input type="button" value="Add"/> <table border="1"> <thead> <tr> <th>HEADER</th> <th>ACTION</th> </tr> </thead> <tbody> <tr> <td colspan="2">There are no headers configured.</td> </tr> </tbody> </table>	HEADER	ACTION	There are no headers configured.	
HEADER	ACTION				
There are no headers configured.					

<< Prev. | Next >> | Last >> | Cancel

5. Select **file** from the Protocol list.
6. Enter the path to an input folder on your file system in the Endpoint URI field.
7. Click **Next**, as shown in [Figure 9–27](#).

Figure 9–27 FILE Transport Configuration Page

Create a Proxy Service (SAP_Project/Proxy Service/Get_detail_ob_SAP)

FILE Transport Configuration

File Mask*	*.*
Polling Interval*	60
Read Limit*	10
Sort By Arrival	<input type="checkbox"/>
Scan SubDirectories	<input type="checkbox"/>
Pass By Reference	<input type="checkbox"/>
Post Read Action*	delete
Stage Directory*	c:\input\stage
Archive Directory	
Error Directory*	c:\input\error
Request encoding	utf-8

<< Prev. | Next >> | Last >> | Cancel

8. Provide any folder locations on your file system for the Stage Directory and Error Directory fields.
9. Click **Next**, as shown in [Figure 9–28](#).

Figure 9–28 Message Handling Page

Create a Proxy Service (SAP_Project/Proxy Service/Get_detail_ob_SAP)

Message Handling

Transaction Required	<input type="checkbox"/> Enabled
Same Transaction For Response	<input type="checkbox"/> Enabled
Content Streaming	<input type="checkbox"/> Enabled Buffer Type <input checked="" type="radio"/> Memory Buffer <input type="radio"/> Disk Buffer Compression <input type="checkbox"/> Enabled

<< Prev. Next >> Last >> Cancel

10. Accept the default values and click **Next**.

The following Summary page is displayed, as shown in [Figure 9–29](#).

Figure 9–29 Summary Page

General Configuration	
Service Name	Get_detail_ob_SAP
Description	
Service Type	Any XML Service
Transport Configuration	
Protocol	file
Endpoint URI	file:///C:/input/sap/getdetail
Get All Headers	No
Headers	
FILE Transport Configuration	
File Mask	*.*
Polling Interval	60
Read Limit	10
Sort By Arrival	false
Scan SubDirectories	false
Pass By Reference	false
Post Read Action	delete
Stage Directory	c:\input\stage
Error Directory	c:\input\error
Request encoding	utf-8
Message Handling Configuration	
Transaction Required	Disabled
Same Transaction For Response	Disabled
Content Streaming	Disabled

11. Review all the information for your Proxy Service and click **Save**.
12. Check if the success message is displayed, as shown in [Figure 9–30](#).

Figure 9–30 Success Message

✔ The Service "Get_detail_ob_SAP" was created successfully.

SAP_Project/Proxy Service

Folders

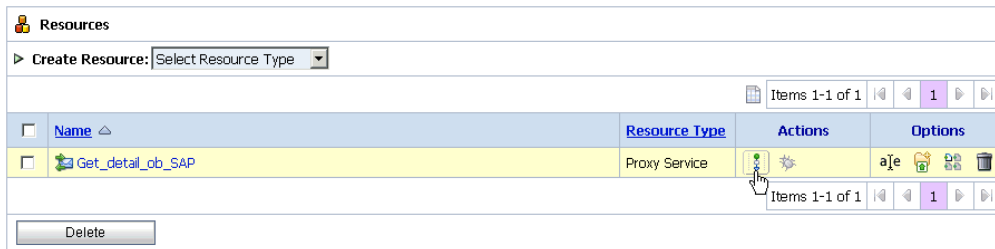
▶ Enter New Folder Name:

9.2.7 Configuring a Pipeline

Perform the following steps to configure a Pipeline:

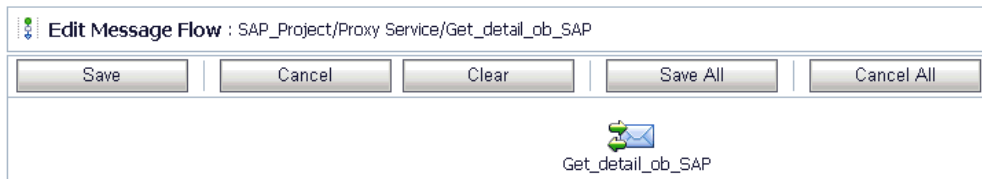
1. Click the **Edit Message Flow** icon in the row of the Proxy Service you created, as shown in [Figure 9-31](#).

Figure 9-31 Edit Message Flow Icon



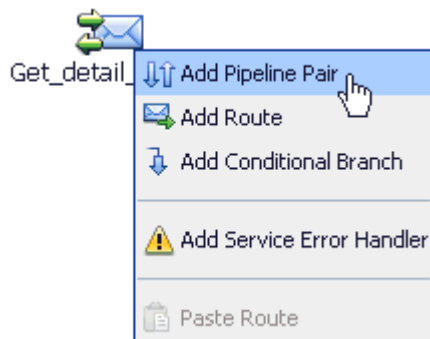
The Edit Message Flow workspace area is displayed, as shown in [Figure 9-32](#).

Figure 9-32 Edit Message Flow Workspace



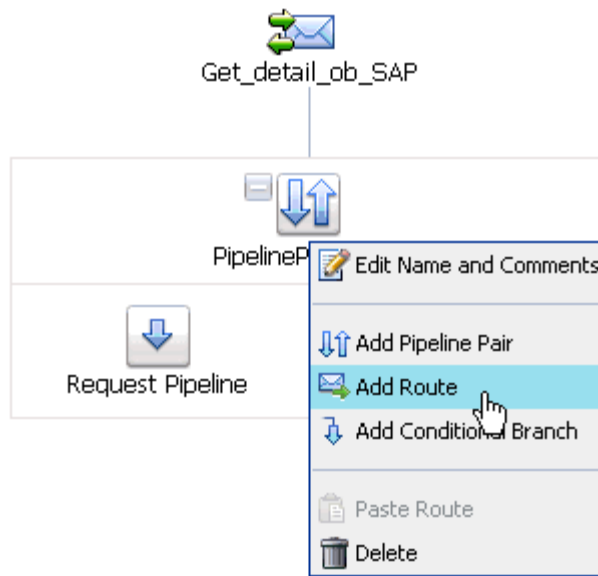
2. Click the **Proxy Service** icon and select **Add Pipeline Pair** from the menu, as shown in [Figure 9-33](#).

Figure 9-33 Add Pipeline Pair Option



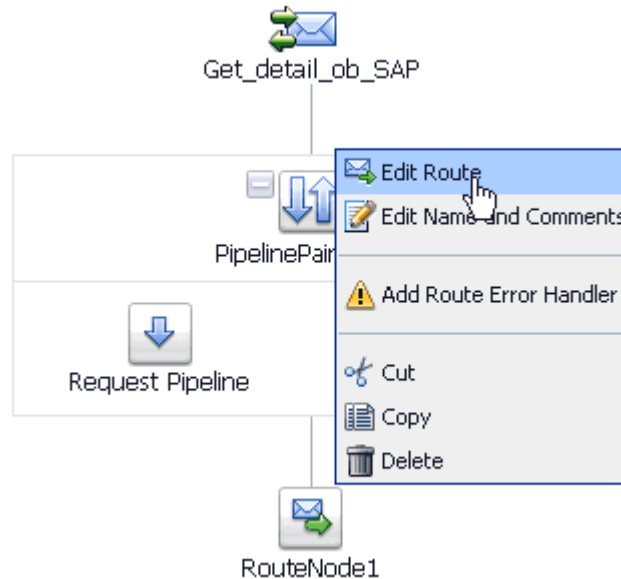
3. Click the **PipelinePairNode1** icon and select **Add Route** from the menu, as shown in [Figure 9-34](#).

Figure 9–34 Add Route Option



The RouteNode1 icon is added below the Request Pipeline icon, as shown in [Figure 9–35](#).

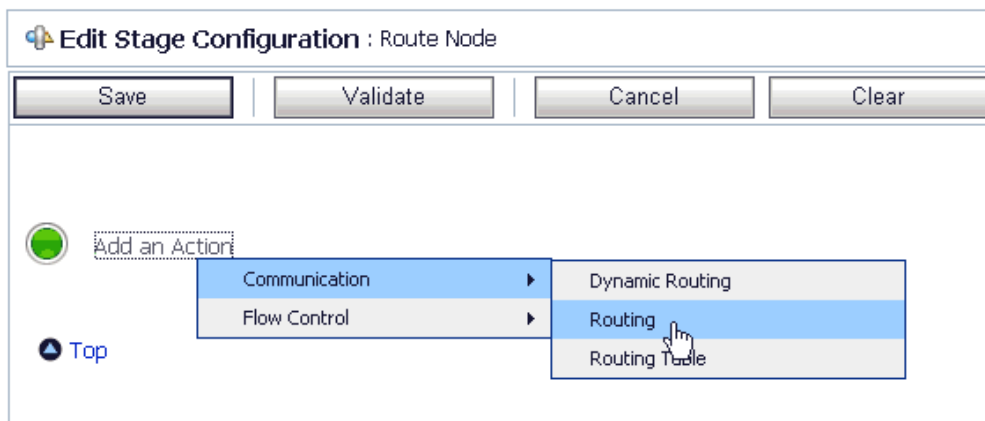
Figure 9–35 RouteNode1 Icon



4. Click the **RouteNode1** icon and select **Edit Route** from the menu.

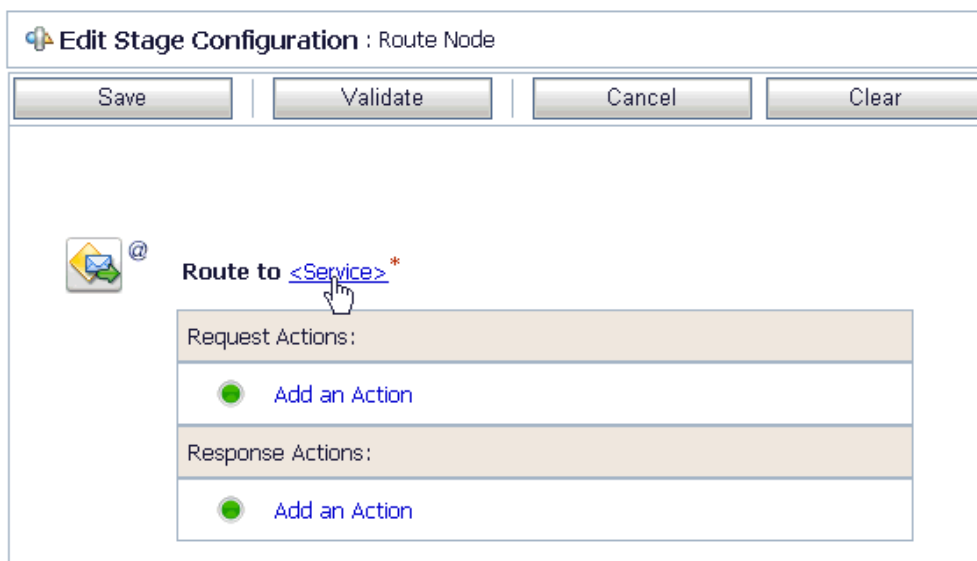
The Edit Stage Configuration workspace area is displayed, as shown in [Figure 9–36](#).

Figure 9–36 Edit Stage Configuration Workspace Area



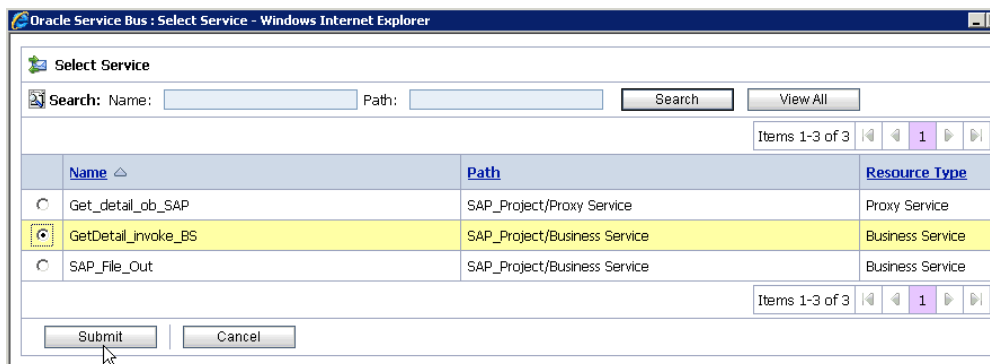
5. Click **Add an Action**, select **Communication** from the menu, and click **Routing**.

Figure 9–37 Edit Stage Configuration Workspace Area



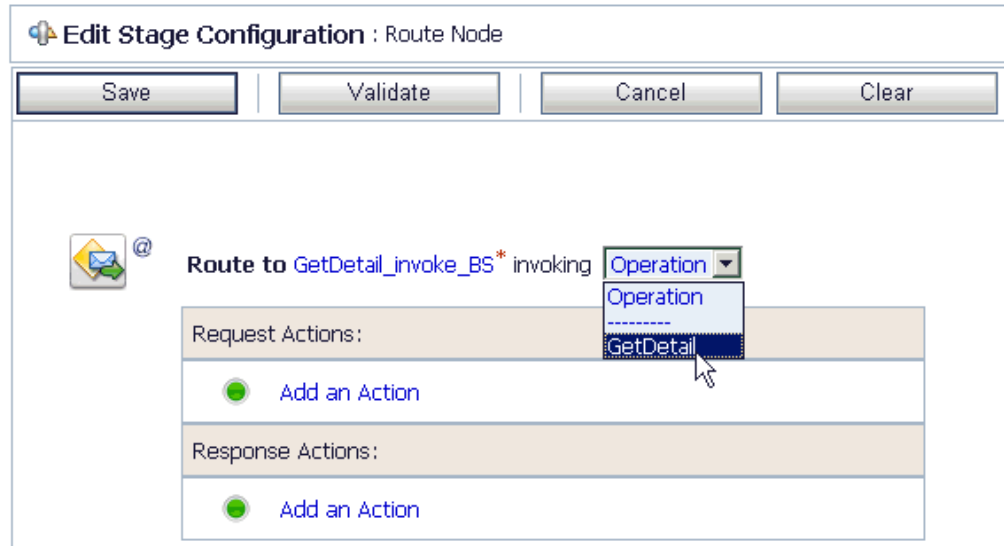
6. Click **<Service>**, as shown in Figure 9–37.
The Select Service dialog is displayed, as shown in Figure 9–38.

Figure 9–38 Select Service Dialog



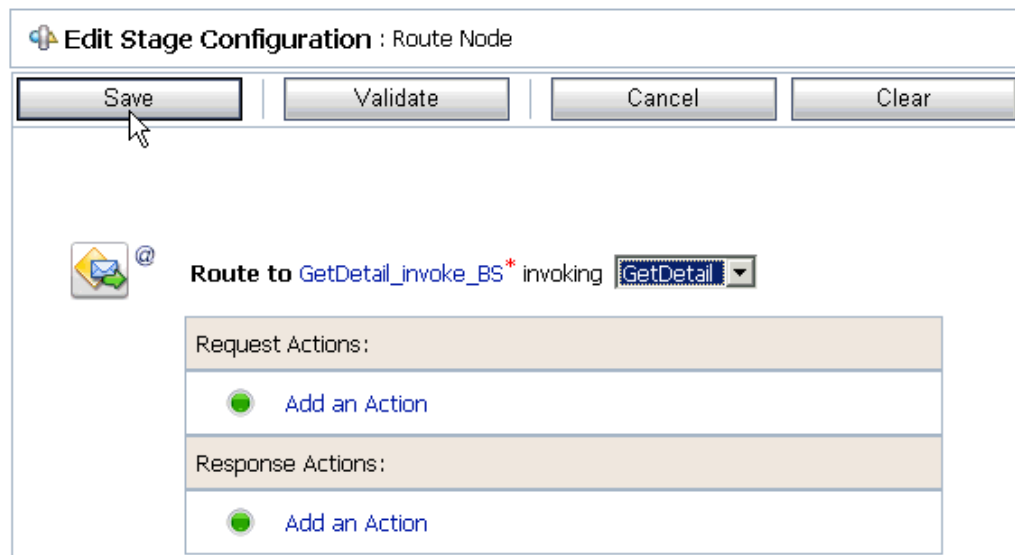
7. Select the WSDL type Business Service configured for SAP R/3 and click **Submit**.
You are returned to the Edit Stage Configuration workspace area, as shown in [Figure 9–39](#).

Figure 9–39 Edit Stage Configuration Workspace Area



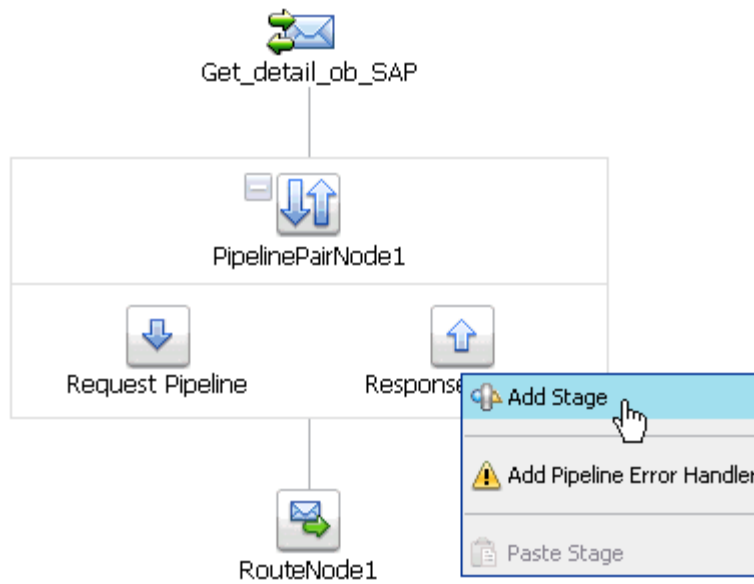
8. Select the name of the SAP R/3 business object (for example, GetDetail) as the operational attribute from the list, as shown in [Figure 9–40](#).

Figure 9–40 Business Object



9. Click **Save**.

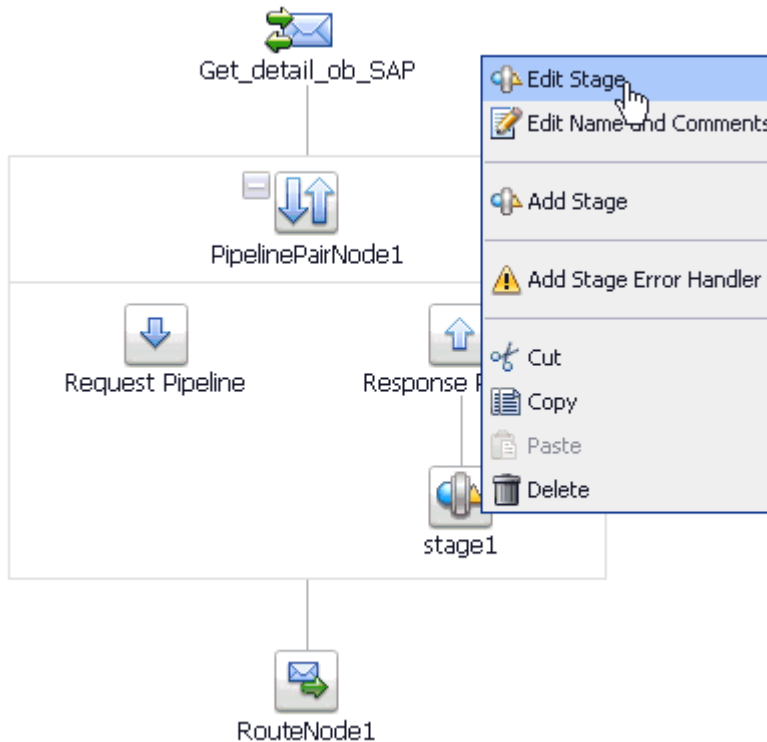
Figure 9–41 Add Stage Option



10. Click the **Response Pipeline** icon and select **Add Stage** from the menu, as shown in [Figure 9–41](#).

The Stage1 icon is added below the Response Pipeline icon.

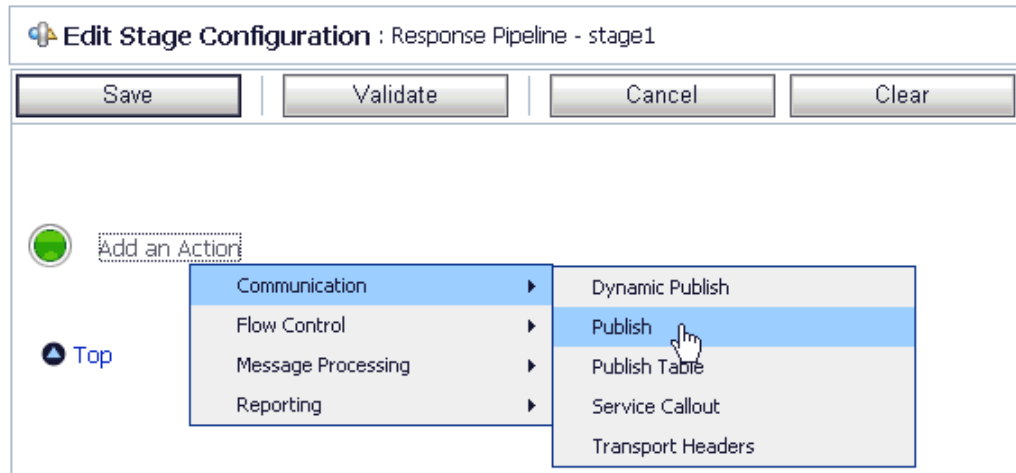
Figure 9–42 Edit Stage Option



11. Click the **Stage1** icon and select **Edit Stage** from the menu, as shown in [Figure 9–42](#).

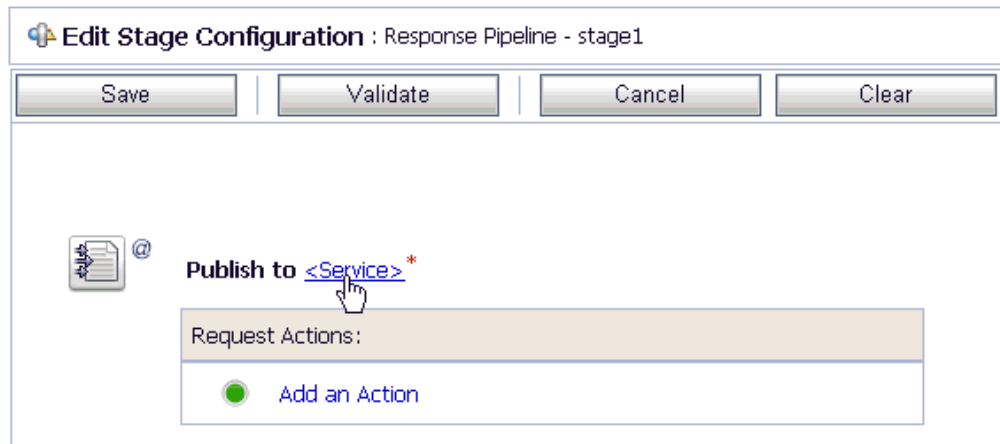
The Edit Stage Configuration workspace area is displayed, as shown in Figure 9–43.

Figure 9–43 Edit Stage Configuration Workspace Area



12. Click **Add an Action**, select **Communication** from the menu, and click **Publish**.

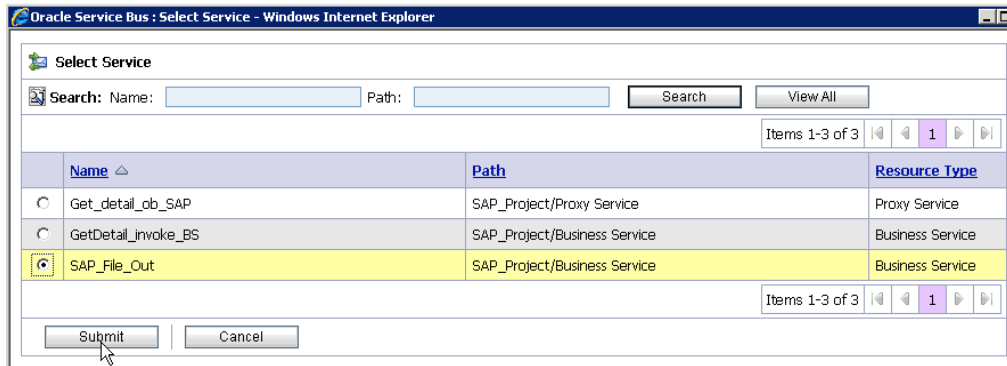
Figure 9–44 Edit Stage Configuration Workspace Area



13. Click **<Service>**, as shown in Figure 9–44.

The Select Service dialog is displayed, as shown in Figure 9–45.

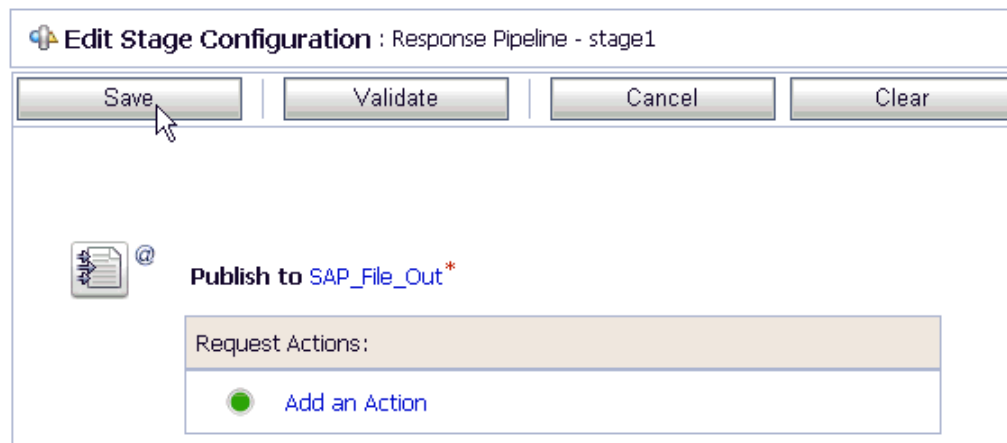
Figure 9–45 Select Service Dialog



14. Select a File type Business Service and click **Submit**.

You are returned to the Edit Stage Configuration workspace area.

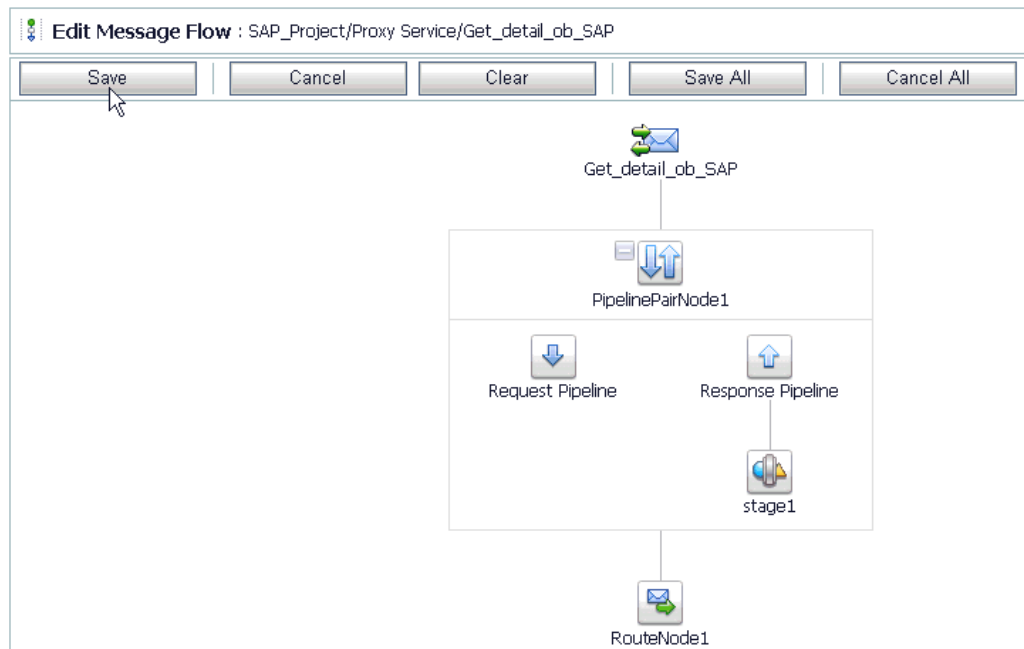
Figure 9–46 Save



15. Click **Save**, as shown in Figure 9–46.

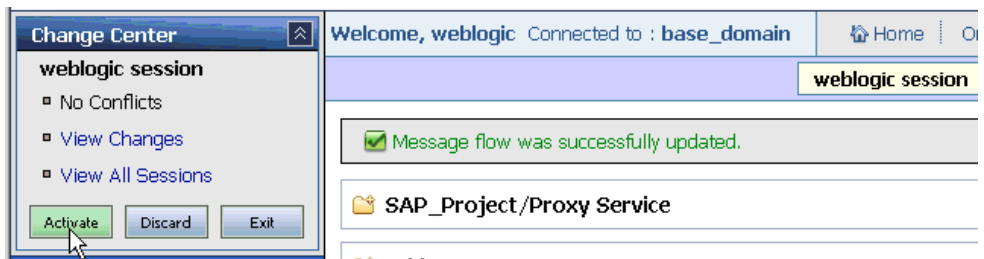
You are returned to the Edit Message Flow workspace area, as shown in Figure 9–47.

Figure 9–47 Edit Message Flow Workspace Area



16. Click **Save**.

Figure 9–48 Successful Update Message



17. Check if the success message is displayed and click **Activate** in the Change Center, as shown in [Figure 9–48](#).

The Activate Session page is displayed, as shown in [Figure 9–49](#).

Figure 9–49 Activate Session Page

The screenshot shows a web form titled "Activate Session". It has three main sections: "Session Name" with the value "weblogic", "User" with the value "weblogic", and "Description" which is an empty text area. Below the form is a "Submit" button with a mouse cursor pointing to it.

18. Click **Submit**.

19. Check if the View Configuration Changes page is displayed, as shown in [Figure 9–50](#).

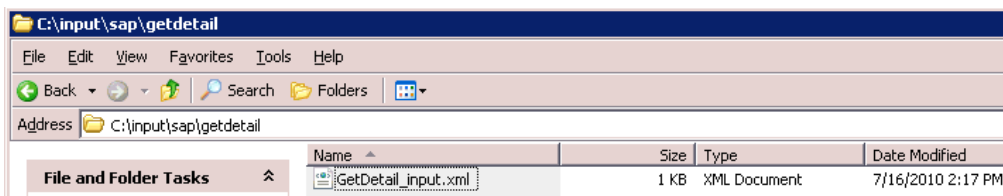
Figure 9–50 View Configuration Changes Page

The screenshot shows a table titled "View Configuration Changes" with a "Purge Tasks" link in the top right. The table has columns for Task, Description, Execution Time, User, Task Status, Undone By, and Options. It lists several "Activate session" tasks performed by "weblogic" and a "System Initialization" task performed by "<anonymous>".

Task	Description	Execution Time	User	Task Status	Undone By	Options
Activate session weblogic		7/16/10 2:14 PM	weblogic	Activated	None	
Activate session weblogic		7/16/10 1:45 PM	weblogic	Activated	None	
Activate session iwsession.1279301358349	wsdl import	7/16/10 1:29 PM	weblogic	Activated	None	
Activate session weblogic		7/16/10 1:27 PM	weblogic	Activated	None	
Activate session iwsession.1279301160912	wsdl import	7/16/10 1:26 PM	weblogic	Activated	None	
Activate session weblogic		7/16/10 1:25 PM	weblogic	Activated	None	
Activate session iwsession.1279298782833	wsdl import	7/16/10 12:46 PM	weblogic	Activated	None	
Activate session weblogic		7/15/10 8:06 PM	weblogic	Activated	None	
System Initialization		7/14/10 6:58 AM	<anonymous>	Activated	None	

20. Copy and paste an input XML file in the input folder you have configured, as shown in [Figure 9–51](#).

Figure 9–51 Input XML File



21. Output is received in the configured output location.

9.3 Configuring Inbound Processing Using Oracle Service Bus (J2CA Configuration)

This section describes how to configure inbound processing using Oracle Service Bus for J2CA configurations.

This section includes the following topics:

- [Section 9.3.1, "Starting Oracle Service Bus and Creating Project Folders"](#)
- [Section 9.3.2, "Setting the Class Path for Application Explorer to Integrate With Oracle Service Bus"](#)
- [Section 9.3.3, "Publishing a WSDL From Application Explorer to Oracle Service Bus"](#)
- [Section 9.3.4, "Configuring a WSDL-based Proxy Service"](#)
- [Section 9.3.5, "Configuring a File Type Business Service"](#)
- [Section 9.3.6, "Configuring a Pipeline"](#)

Samples have been provided for this use case scenario under the *etc/sample* folder of the Application Adapters installation.

9.3.1 Starting Oracle Service Bus and Creating Project Folders

This section describes how to start Oracle Service Bus (OSB) and create project folders.

Note: If you are using Oracle Application Adapter for SAP R/3 (SAP JCo 3.0) with OSB on 64-bit machines, you must add the *d64* flag with the JAVA options in the *startWebLogic.sh* file, which is located in the following directory:

```
<OSB_Home>\user_projects\domains\base_domain\bin
```

For example:

```
JAVA_OPTIONS="${SAVE_JAVA_OPTIONS} -Dfile.encoding=ISO8859_1 -d64"
```

The Oracle WebLogic Server must be started only after this change has been made.

Perform the following steps to start Oracle Service Bus and create project folders:

1. Start the Oracle WebLogic Server for the Oracle WebLogic Server domain that you have configured.
2. Open the Oracle Service Bus Console in a Web browser by entering the following URL:

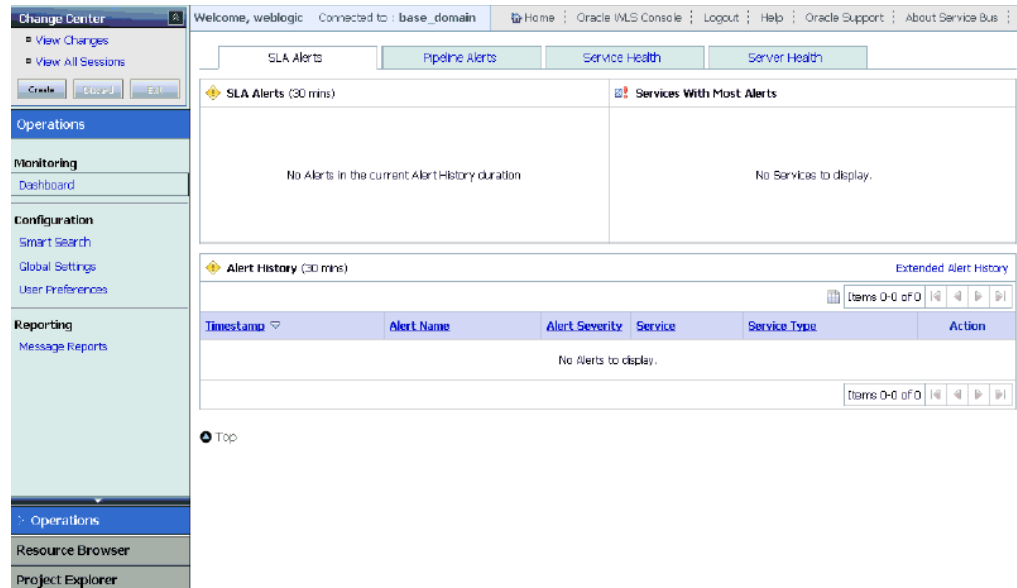
```
http://hostname:port/sbconsole
```

Where *hostname* is the name of the machine where Oracle WebLogic Server is running and *port* is the port for the domain you are using. The port for the default domain is 7001.

The Oracle Service Bus Console logon page is displayed.

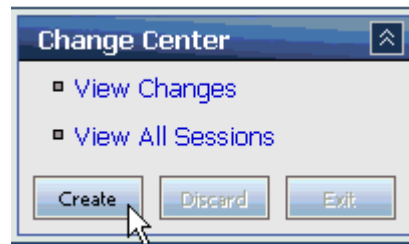
3. Log on to the Oracle Service Bus Console using a valid user name and password. The Oracle Service Bus Console home page is displayed, as shown in [Figure 9-52](#).

Figure 9–52 Oracle Service Bus Console



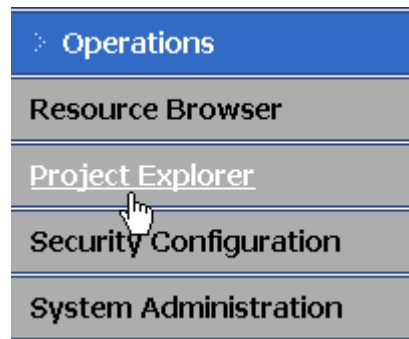
4. Click **Create** in the Change Center area to start a new Oracle Service Bus session, as shown in [Figure 9–53](#).

Figure 9–53 Change Center

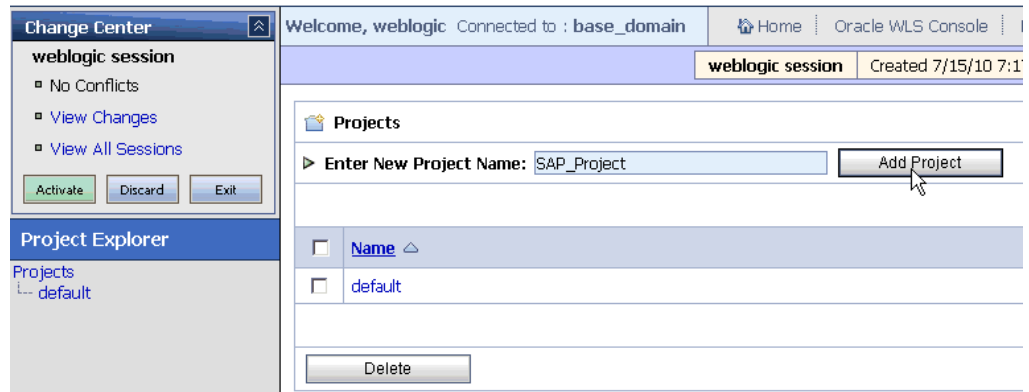


5. Click **Project Explorer** in the left pane, as shown in [Figure 9–54](#).

Figure 9–54 Project Explorer Option



The Project Explorer page is displayed, as shown in [Figure 9–55](#).

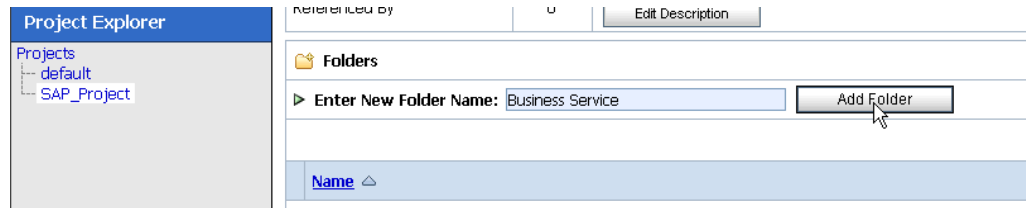
Figure 9–55 Project Explorer Page

6. Provide a valid name for the new project and click **Add Project**.

The project is successfully created and listed.

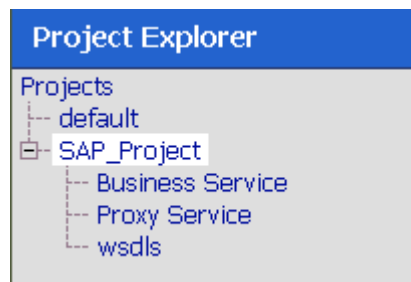
7. Click on the created project.

The project page is displayed, as shown in [Figure 9–56](#).

Figure 9–56 Project Page

8. In the Enter New Folder Name field, type **Business Service** and click **Add Folder**.
9. In the Enter New Folder Name field, type **Proxy Service** and click **Add Folder**.
10. In the Enter New Folder Name field, type **wsdls** and click **Add Folder**.

The Business Service, Proxy Service, and wsdls folders are listed in the left pane below the project node., as shown in [Figure 9–57](#)

Figure 9–57 SAP_Project Node

9.3.2 Setting the Class Path for Application Explorer to Integrate With Oracle Service Bus

Before starting and using Application Explorer to publish a WSDL directly to the Oracle Service Bus (OSB) Console (project/folder), OSB users must perform the following steps:

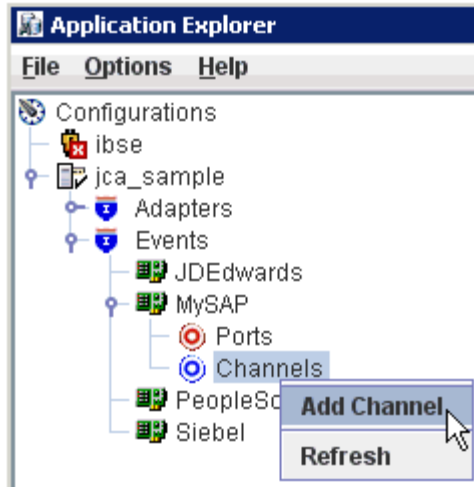
1. Open the command prompt window.
2. Navigate to the following directory:
`<OSB_Home>\user_projects\domains\base_domain\bin`
3. Execute **setDomainEnv.cmd** (Windows) or **./setDomainEnv.sh** (UNIX/Linux).
This command sets the class path for Application Explorer to access the Oracle WebLogic Server APIs to publish the WSDLs to the OSB Console.
4. Do not close the command prompt window.
5. Navigate to the following directory:
`<OSB_Home>\3rdparty\ApplicationAdapters\tools\iwae\bin`
6. Execute **ae.bat** (Windows) or **iwae.sh** (UNIX/Linux) to start Application Explorer.
You are now ready to publish WSDLs from Application Explorer to the OSB Console.

9.3.3 Publishing a WSDL From Application Explorer to Oracle Service Bus

Perform the following steps to publish a WSDL from Application Explorer to Oracle Service Bus:

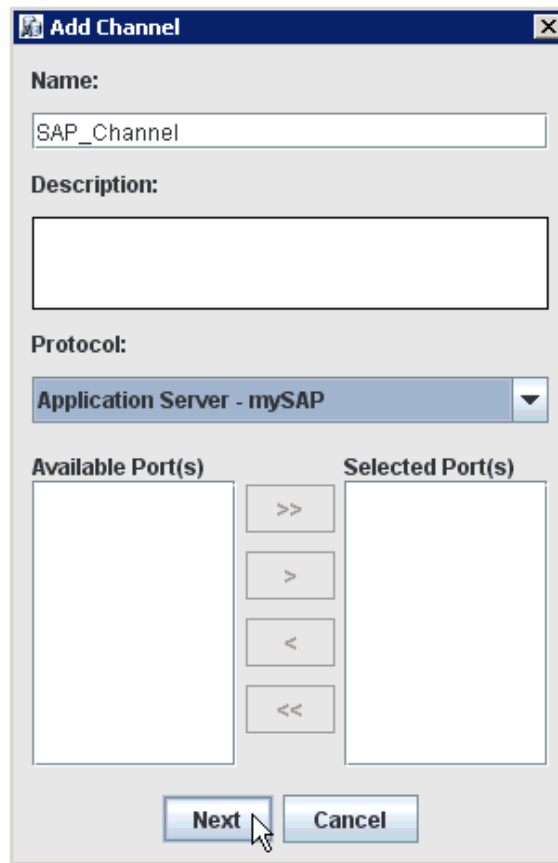
1. Start Application Explorer, connect to a J2CA configuration, and connect to a SAP R/3 target.
For more information, see [Chapter 4, "Configuring Oracle Application Adapter for SAP R/3"](#).
2. Expand the **Events** node.
3. Right-click the **Channels** node for MySAP and select **Add Channel** from the menu, as shown in [Figure 9-58](#).

Figure 9–58 Add Channel Option



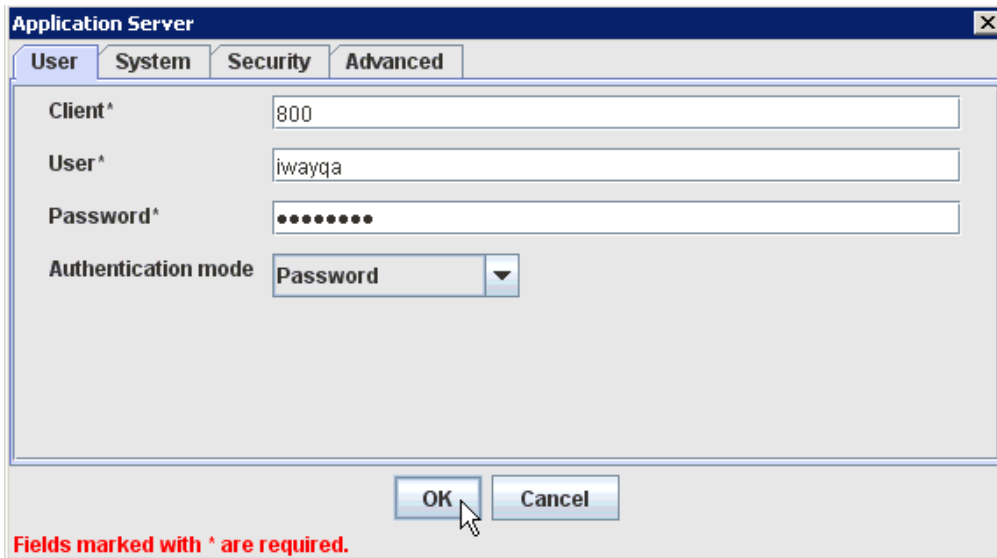
The Add Channel dialog is displayed, as shown in [Figure 9–59](#).

Figure 9–59 Add Channel Dialog



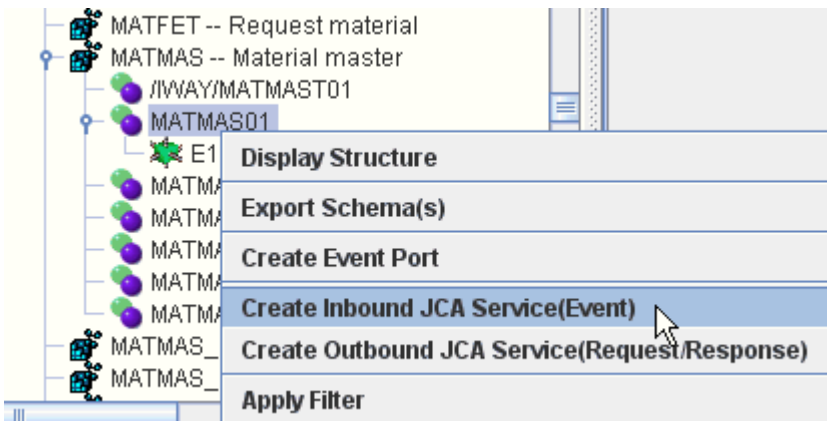
The Application Server dialog is displayed, as shown in [Figure 9–60](#).

Figure 9–60 Application Server Dialog



4. Provide the required connection information for your SAP R/3 system and click **OK**.
The new channel is added below the Channels node.
5. Expand the **Adapters** node and then the **MySAP** node.
6. Expand the **ALE (IDOCs)** node and then the **MATMAS -- Material** node.

Figure 9–61 Create Inbound JCA Service(Event) Option



7. Right-click **MATMAS01** and select **Create Inbound JCA Service(Event)** from the menu, as shown in [Figure 9–61](#).
The Export WSDL dialog is displayed, as shown in [Figure 9–62](#).

Figure 9–62 Export WSDL Dialog

8. In the Name field, a default file name for the WSDL file is provided. You can accept the default or provide your own.
9. From the Channel list, select the channel you created for this inbound service.
10. Three check boxes for Root, Namespace, and Schema validation are also available. Selection of multiple validation options is allowed.
11. Select the **Export to OSB** option.
12. In the Location field, enter the folder name in Oracle Service Bus where you want to publish the WSDL document.
The location is composed of an Oracle Service Bus project name and optionally, one or more folder names. The project name and any folder names must be separated by a forward slash character “/”.
13. In the Host field, enter the name of the machine where Oracle Service Bus is installed.
14. In the Port field, enter the port that is being used by Oracle Service Bus.
15. In the User field, enter your username to access Oracle Service Bus.
16. In the Password field, enter your password to access Oracle Service Bus.
17. Click **OK**.

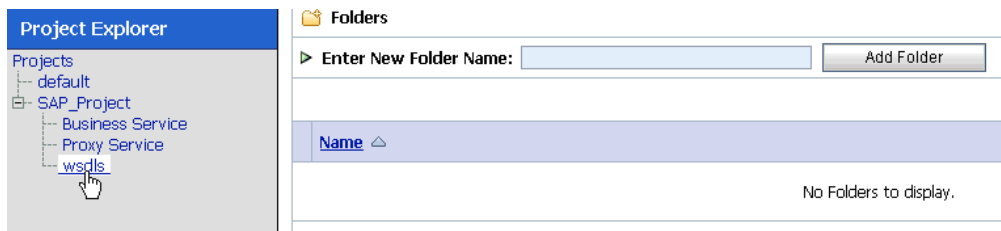
The inbound WSDL is published to the location specified in the Export WSDL dialog and is now available for use with a Proxy Service in Oracle Service Bus.

9.3.4 Configuring a WSDL-based Proxy Service

Perform the following steps to configure a WSDL-based Proxy Service:

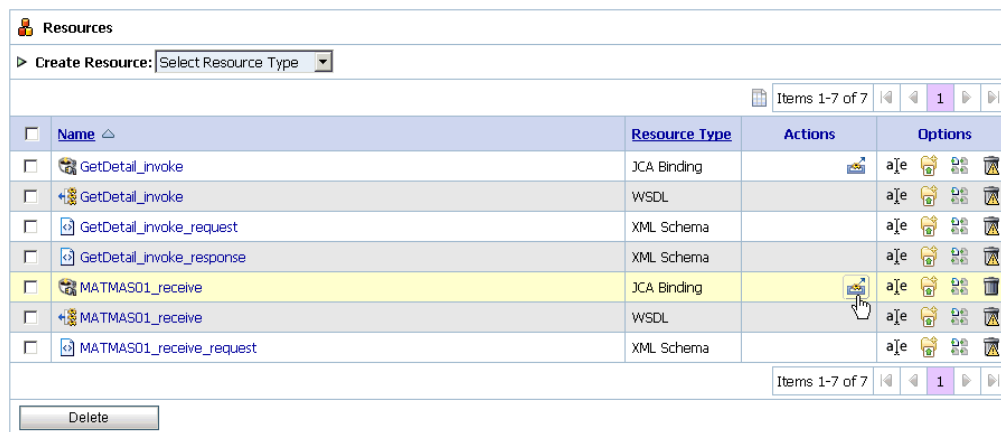
1. Open the Oracle Service Bus Console and select the created WSDL folder in the left pane (for example, wsdl1), as shown in [Figure 9–63](#).

Figure 9–63 Created WSDL Folder



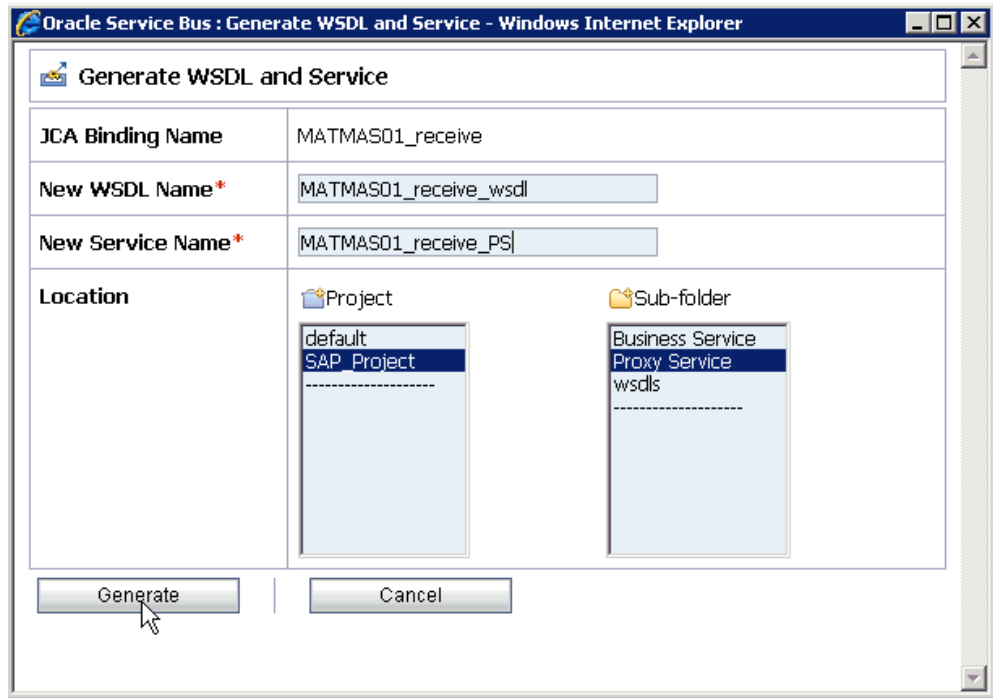
2. Ensure that the exported WSDL is listed, as shown in [Figure 9–64](#).

Figure 9–64 Exported WSDL



3. Click the icon that corresponds to the exported WSDL in the Actions column.
The Generate WSDL and Service page is displayed, as shown in [Figure 9–65](#).

Figure 9–65 Generate WSDL and Service Page



4. Provide a new WSDL name and a new service name in the corresponding fields.
5. In the Location area, select an available project and the sub-folder that is designated for Proxy Services.
6. Click **Generate**.

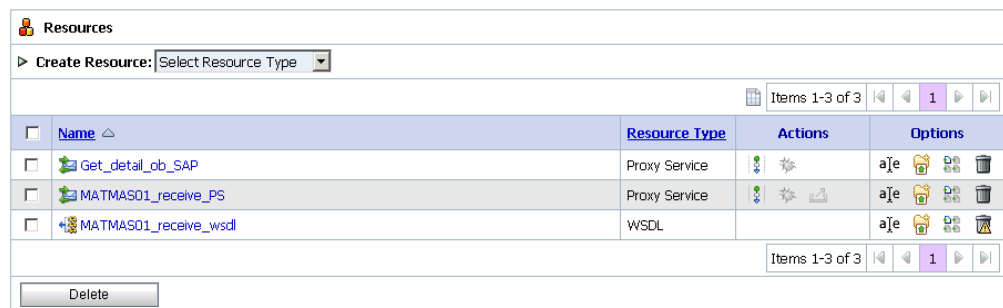
If the WSDL and Service resources are successfully created, then the following message is displayed, as shown in [Figure 9–66](#).

Figure 9–66 Success Message



7. Click **Proxy Service** under Project Explorer and check if the generated WSDL and Proxy Service are listed, as shown in [Figure 9–67](#).

Figure 9–67 Generated WSDL

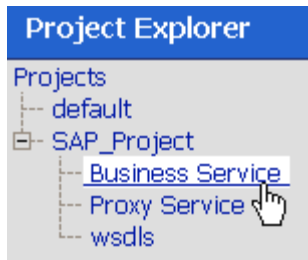


9.3.5 Configuring a File Type Business Service

Perform the following steps to configure a File type Business Service:

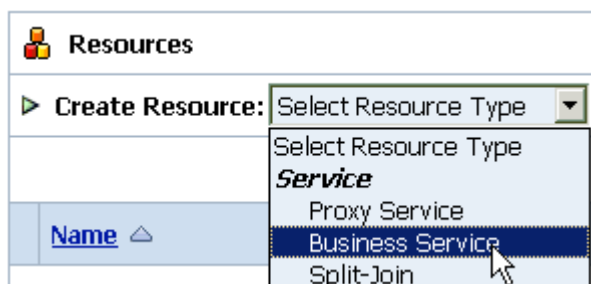
1. Select the **Business Service** folder you created in the left pane, as shown in [Figure 9–68](#).

Figure 9–68 Business Service Folder



2. In the right pane, select **Business Service** from the Create Resource menu, as shown in [Figure 9–69](#).

Figure 9–69 Business Service



The General Configuration page is displayed, as shown in [Figure 9–70](#).

Figure 9–70 General Configuration Page

Create a Business Service (SAP_Project/Business Service/)

General Configuration

Service Name* SAP_Out_Matmas

Description

Service Type*

Create a New Service

WSDL Web Service
 (port or binding)

Transport Typed Service

Messaging Service

Any SOAP Service SOAP 1.1

Any XML Service

Create From Existing Service

Business Service

Proxy Service

| |

3. Provide a name for the Business Service and from the Service Type area select **Messaging Service**.

4. Click **Next**.

The Message Type Configuration page is displayed, as shown in [Figure 9–71](#).

Figure 9–71 Message Type Configuration Page

Create a Business Service (SAP_Project/Business Service/SAP_Out_Matmas)

Message Type Configuration

Request Message Type

None

Binary

Text

MFL

XML
 (element or type)

Java

Response Message Type

None

Binary

Text

MFL

XML
 (element or type)

Java

| | |

5. Select **XML** as the Request Message Type and **None** as the Response Message Type.
6. Click **Next**.

The Transport Configuration page is displayed, as shown in [Figure 9-72](#).

Figure 9-72 Transport Configuration Page

7. Select **file** from the Protocol list.
8. Enter the path to a destination folder on your file system in the Endpoint URI field and click **Add**.
9. Click **Next**.

The FILE Transport Configuration page is displayed, as shown in [Figure 9-73](#).

Figure 9-73 FILE Transport Configuration Page

10. Enter the prefix and suffix for the output file to be received and click **Next**.

The Message Handling and Advanced Settings page is displayed, as shown in [Figure 9-74](#).

Figure 9–74 Message Handling and Advanced Settings Page

Create a Business Service (SAP_Project/Business Service/SAP_Out_Matmas)

Message Handling

There are no basic configuration options.

Advanced Settings

<< Prev. Next >> Last >> Cancel

11. Click Next.

The following Summary page is displayed, as shown in [Figure 9–75](#).

Figure 9–75 Summary Page

Create a Business Service - Summary (SAP_Project/Business Service/SAP_Out_Matmas)

General Configuration

Service Name	SAP_Out_Matmas
Description	
Service Type	Messaging Service

Message Type Configuration

Request Message Type	XML
Response Message Type	None

Transport Configuration

Protocol	file
Load Balancing Algorithm	round-robin
Endpoint URI	file:///C:/output/sap/matmas
Retry Count	0
Retry Iteration Interval	30

FILE Transport Configuration

Prefix	matmas_out
Suffix	.xml
Request encoding	utf-8

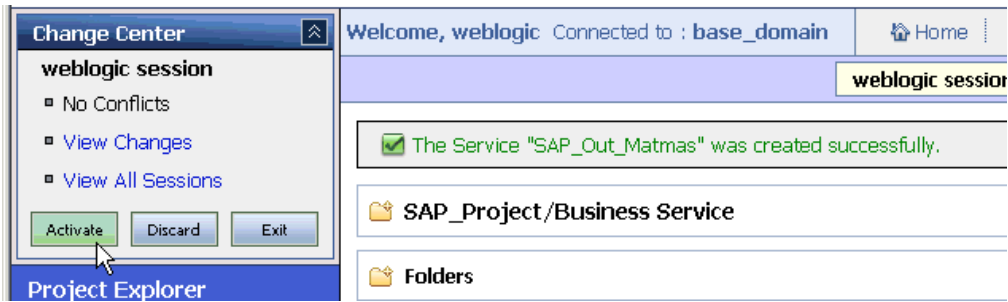
Message Handling Configuration

Result Caching	Not Supported
----------------	---------------

<< Prev. Save Cancel

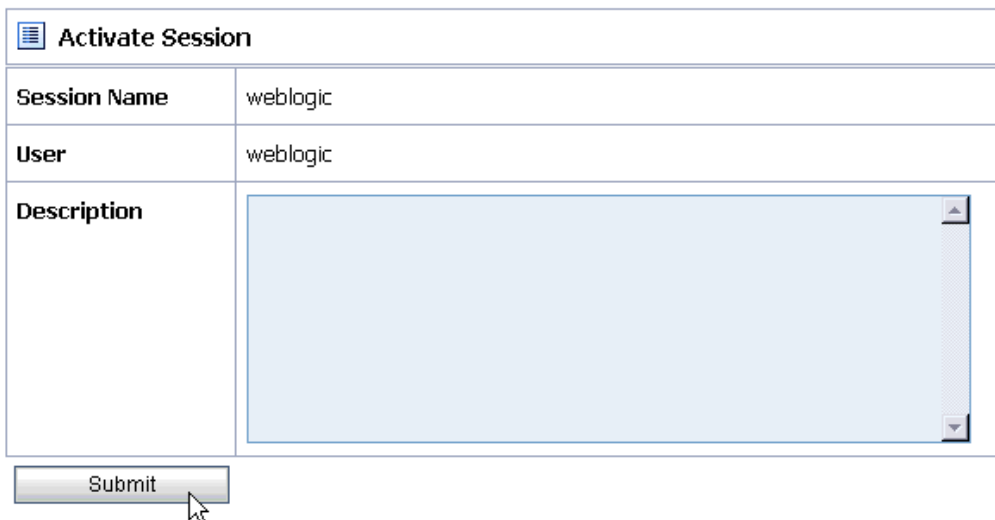
12. Review all the information for your Business Service and click Save.**13. Check if the success message is displayed and click **Activate** in the Change Center, as shown in [Figure 9–76](#).**

Figure 9–76 Change Center



The Activate Session page is displayed, as shown in [Figure 9–77](#).

Figure 9–77 Activate Session Page



14. Click **Submit**.

15. Check if the View Configuration Changes page is displayed, as shown in [Figure 9–78](#).

Figure 9–78 View Configuration Changes Page

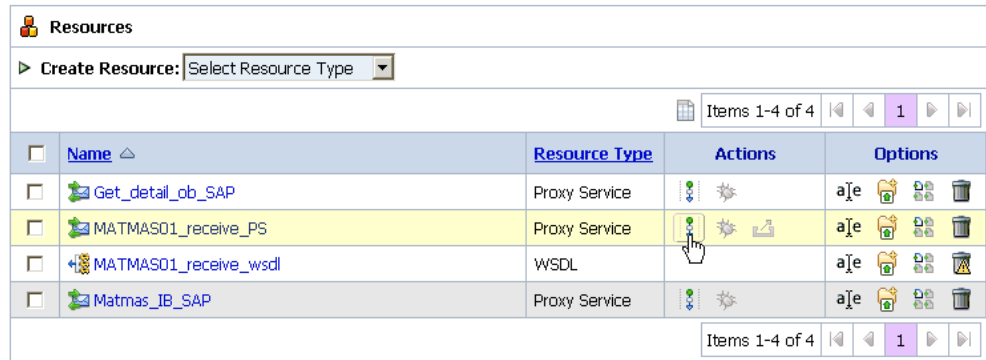
View Configuration Changes							Purge Tasks
Task	Description	Execution Time	User	Task Status	Undone By	Options	
Activate session weblogic		7/16/10 7:07 PM	weblogic	Activated	None	↶ ↷	
Activate session iwsession.1279312181286	wSDL import	7/16/10 4:29 PM	weblogic	Activated	None	↶ ↷	
Activate session weblogic		7/16/10 2:14 PM	weblogic	Activated	None	↶ ↷	
Activate session weblogic		7/16/10 1:45 PM	weblogic	Activated	None	↶ ↷	
Activate session iwsession.1279301358349	wSDL import	7/16/10 1:29 PM	weblogic	Activated	None	↶ ↷	
Activate session weblogic		7/16/10 1:27 PM	weblogic	Activated	None	↶ ↷	
Activate session iwsession.1279301160912	wSDL import	7/16/10 1:26 PM	weblogic	Activated	None	↶ ↷	
Activate session weblogic		7/16/10 1:25 PM	weblogic	Activated	None	↶ ↷	
Activate session iwsession.1279298782833	wSDL import	7/16/10 12:46 PM	weblogic	Activated	None	↶ ↷	
Activate session weblogic		7/15/10 8:06 PM	weblogic	Activated	None	↶ ↷	
System Initialization		7/14/10 6:58 AM	<anonymous>	Activated	None	↶ ↷	

9.3.6 Configuring a Pipeline

Perform the following steps to configure a Pipeline:

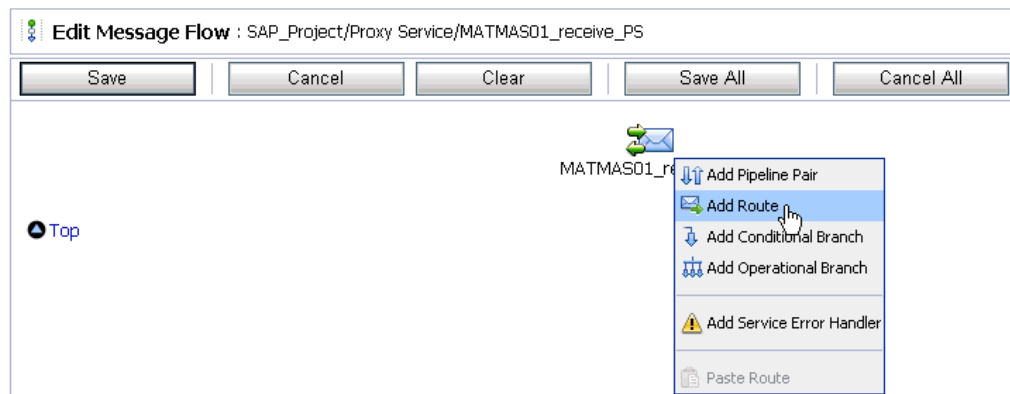
1. Click the **Edit Message Flow** icon in the row of the Proxy Service you created, as shown in [Figure 9–79](#).

Figure 9–79 Edit Message Flow Icon



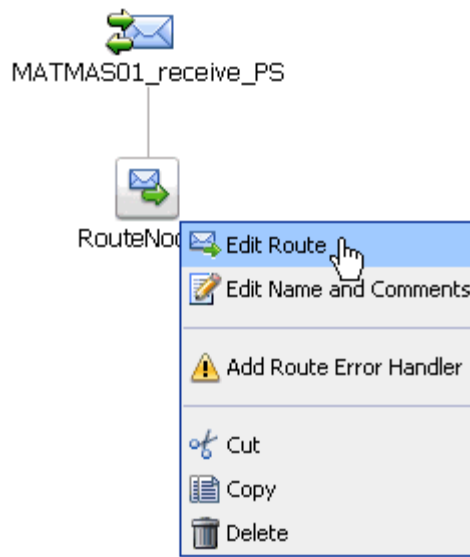
The Edit Message Flow workspace area is displayed, as shown in [Figure 9–80](#).

Figure 9–80 Edit Message Flow Workspace Area



2. Click the displayed Proxy service icon and select **Add Route** from the menu. The RouteNode1 icon is added below the Request Pipeline icon.

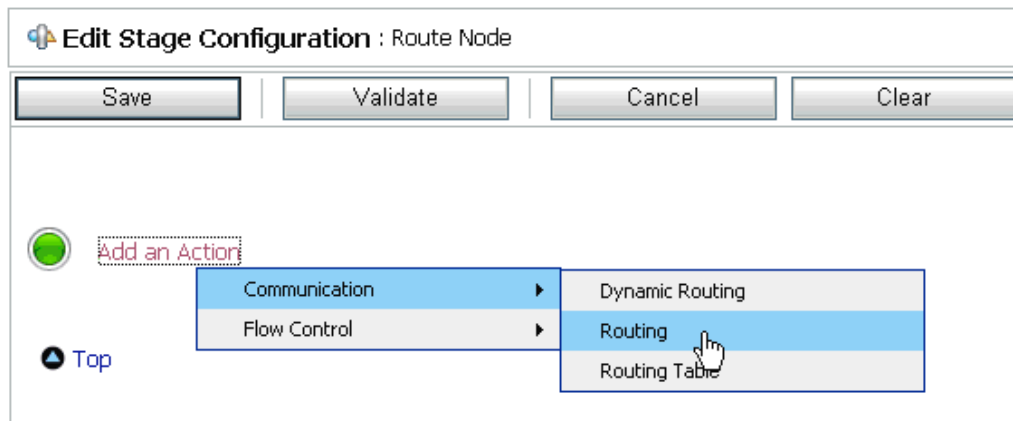
Figure 9–81 Edit Route Option



3. Click the **RouteNode1** icon and select **Edit Route** from the menu, as shown in [Figure 9–81](#).

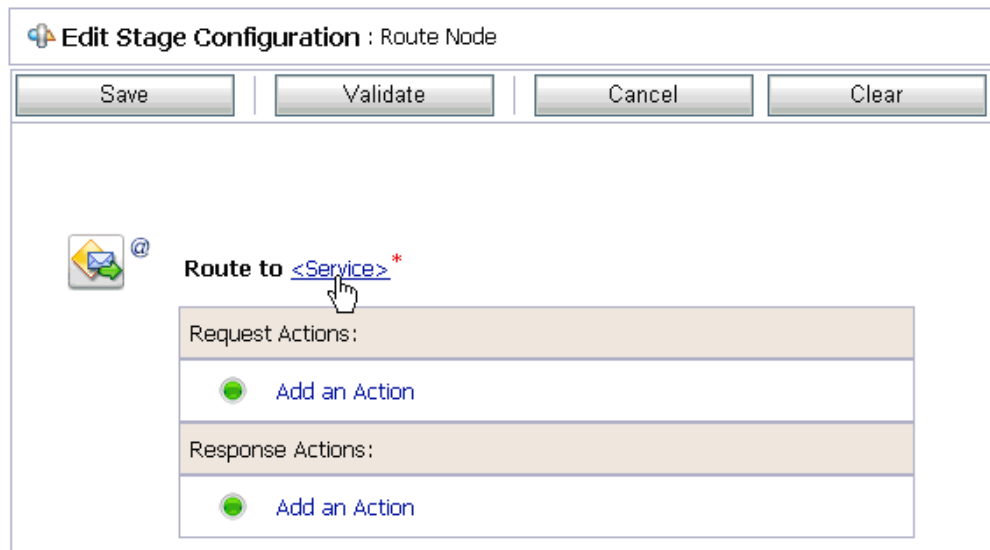
The Edit Stage Configuration workspace area is displayed, as shown in [Figure 9–82](#).

Figure 9–82 Edit Stage Configuration Workspace Area



4. Click **Add an Action**, select **Communication** from the menu, and click **Routing**, as shown in [Figure 9–83](#).

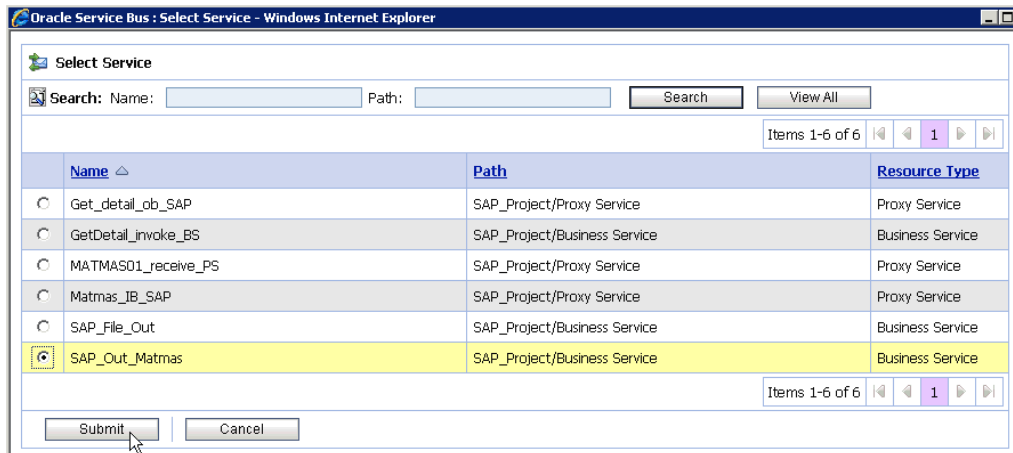
Figure 9–83 Edit Stage Configuration Page



5. Click **<Service>**.

The Select Service dialog is displayed, as shown in [Figure 9–84](#).

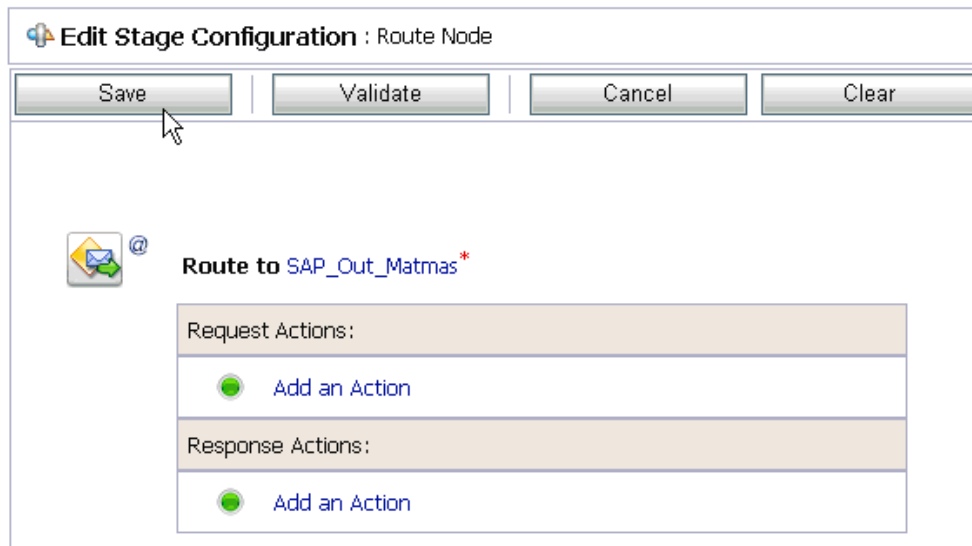
Figure 9–84 Select Service Dialog



6. Select a File type Business Service and click **Submit**.

You are returned to the Edit Stage Configuration workspace area, as shown in [Figure 9–85](#).

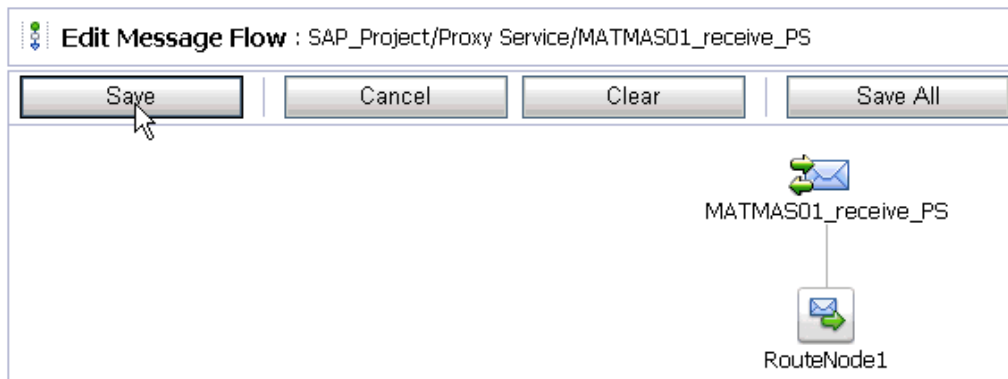
Figure 9–85 Edit Stage Configuration Workspace Area



7. Click **Save**.

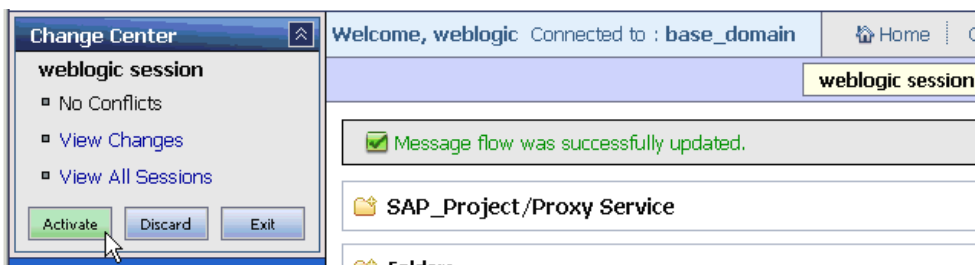
You are returned to the Edit Message Flow workspace area, as shown in [Figure 9–86](#).

Figure 9–86 Edit Message Flow Workspace Area



8. Click **Save**.

Figure 9–87 Successful Update Message



9. Check if the success message is displayed and click **Activate** in the Change Center, as shown in [Figure 9–87](#).

The Activate Session page is displayed, as shown in [Figure 9–88](#).

Figure 9–88 Activate Session Page

10. Click **Submit**.
11. Check if the View Configuration Changes page is displayed, as shown in [Figure 9–89](#).

Figure 9–89 View Configuration Changes Page

Task	Description	Execution Time	User	Task Status	Undone By	Options
Activate session weblogic		7/16/10 7:52 PM	weblogic	Activated	None	↶ ↷
Activate session weblogic		7/16/10 7:31 PM	weblogic	Activated	None	↶ ↷
Activate session weblogic		7/16/10 7:07 PM	weblogic	Activated	None	↶ ↷
Activate session iwsession.1279312181286	wSDL import	7/16/10 4:29 PM	weblogic	Activated	None	↶ ↷
Activate session weblogic		7/16/10 2:14 PM	weblogic	Activated	None	↶ ↷
Activate session weblogic		7/16/10 1:45 PM	weblogic	Activated	None	↶ ↷
Activate session iwsession.1279301358349	wSDL import	7/16/10 1:29 PM	weblogic	Activated	None	↶ ↷
Activate session weblogic		7/16/10 1:27 PM	weblogic	Activated	None	↶ ↷
Activate session iwsession.1279301160912	wSDL import	7/16/10 1:26 PM	weblogic	Activated	None	↶ ↷
Activate session weblogic		7/16/10 1:25 PM	weblogic	Activated	None	↶ ↷
Activate session iwsession.1279298782833	wSDL import	7/16/10 12:46 PM	weblogic	Activated	None	↶ ↷
Activate session weblogic		7/15/10 8:06 PM	weblogic	Activated	None	↶ ↷
System Initialization		7/14/10 6:58 AM	<anonymous>	Activated	None	↶ ↷

12. Trigger an event from the SAP R/3 system and check if the output is received in the configured output location.

9.4 Configuring Outbound Processing Using Oracle Service Bus (BSE Configuration)

This section describes how to configure outbound processing using Oracle Service Bus for BSE configurations.

This section includes the following topics:

- [Section 9.4.1, "Starting Oracle Service Bus and Creating Project Folders"](#)
- [Section 9.4.2, "Setting the Class Path for Application Explorer to Integrate With Oracle Service Bus"](#)
- [Section 9.4.3, "Publishing a WSDL From Application Explorer to Oracle Service Bus"](#)
- [Section 9.4.4, "Configuring a File Type Business Service"](#)
- [Section 9.4.5, "Configuring a WSDL Type Business Service"](#)
- [Section 9.4.6, "Configuring a Proxy Service"](#)
- [Section 9.4.7, "Configuring a Pipeline"](#)

Samples have been provided for this use case scenario under the *etc/sample* folder of the Application Adapters installation.

9.4.1 Starting Oracle Service Bus and Creating Project Folders

This section describes how to start Oracle Service Bus (OSB) and create project folders.

Note: If you are using Oracle Application Adapter for SAP R/3 (SAP JCo 3.0) with OSB on 64-bit machines, you must add the *d64* flag with the JAVA options in the *startWebLogic.sh* file, which is located in the following directory:

```
<OSB_Home>\user_projects\domains\base_domain\bin
```

For example:

```
JAVA_OPTIONS="${SAVE_JAVA_OPTIONS} -Dfile.encoding=ISO8859_1 -d64"
```

The Oracle WebLogic Server must be started only after this change has been made.

Perform the following steps to start Oracle Service Bus and create project folders:

1. Start the Oracle WebLogic Server for the Oracle WebLogic Server domain that you have configured.
2. Open the Oracle Service Bus Console in a Web browser by entering the following URL:

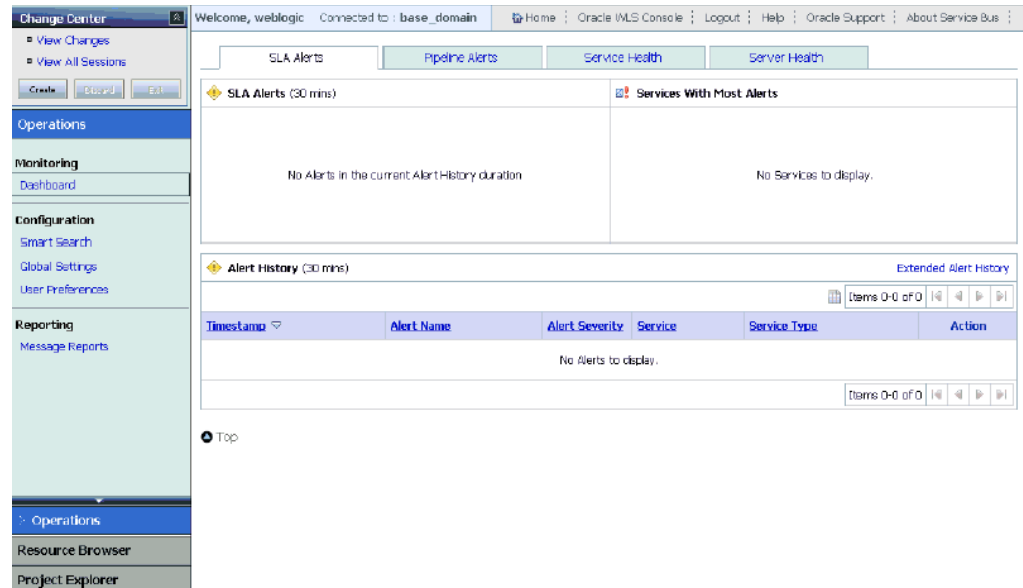
```
http://hostname:port/sbconsole
```

Where *hostname* is the name of the machine where Oracle WebLogic Server is running and *port* is the port for the domain you are using. The port for the default domain is 7001.

The Oracle Service Bus Console logon page is displayed.

3. Log on to the Oracle Service Bus Console using a valid user name and password. The Oracle Service Bus Console home page is displayed, as shown in [Figure 9–90](#).

Figure 9–90 Oracle Service Bus Console



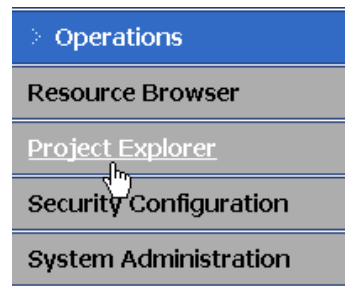
4. Click **Create** in the Change Center area to start a new Oracle Service Bus session, as shown in [Figure 9–91](#).

Figure 9–91 Change Center



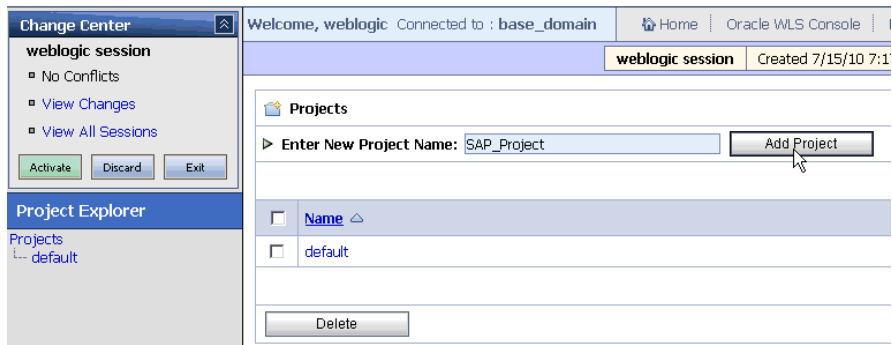
5. Click **Project Explorer** in the left pane, as shown in [Figure 9–92](#).

Figure 9–92 Project Explorer Option



The Project Explorer page is displayed, as shown in [Figure 9–93](#).

Figure 9–93 Project Explorer Page



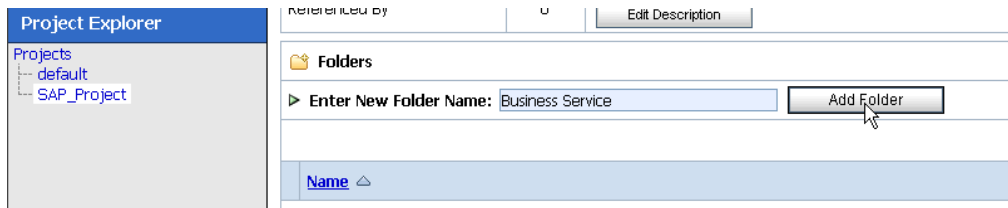
6. Provide a valid name for the new project (for example, SAP_Project) and click **Add Project**.

The new project is successfully created and listed in the left pane.

7. Click the new project node in the left pane.

The project page is displayed, as shown in [Figure 9–94](#).

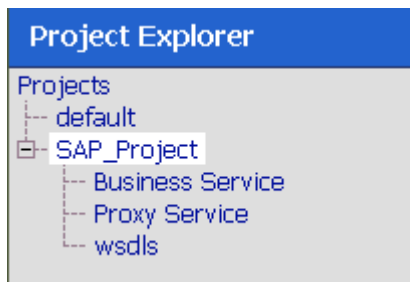
Figure 9–94 Project Page



8. In the Enter New Folder Name field, type **Business Service** and click **Add Folder**.
9. In the Enter New Folder Name field, type **Proxy Service** and click **Add Folder**.
10. In the Enter New Folder Name field, type **wsdls** and click **Add Folder**.

The Business Service, Proxy Service, and wsdls folders are listed in the left pane below the new SAP_Project node, as shown in [Figure 9–95](#).

Figure 9–95 SAP_Project Node



9.4.2 Setting the Class Path for Application Explorer to Integrate With Oracle Service Bus

Before starting and using Application Explorer to publish a WSDL directly to the Oracle Service Bus (OSB) Console (project/folder), OSB users must perform the following steps:

1. Open the command prompt window.
2. Navigate to the following directory:

```
<OSB_Home>\user_projects\domains\base_domain\bin
```
3. Execute **setDomainEnv.cmd** (Windows) or **./setDomainEnv.sh** (UNIX/Linux).
 This command sets the class path for Application Explorer to access the Oracle WebLogic Server APIs to publish the WSDLs to the OSB Console.
4. Do not close the command prompt window.
5. Navigate to the following directory:

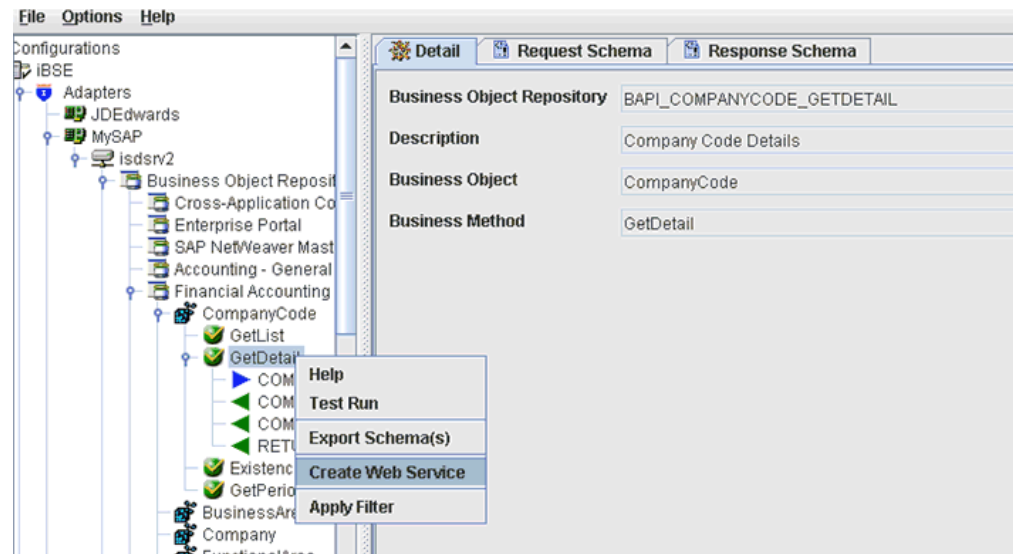
```
<OSB_Home>\3rdparty\ApplicationAdapters\tools\iwae\bin
```
6. Execute **ae.bat** (Windows) or **iwae.sh** (UNIX/Linux) to start Application Explorer.
 You are now ready to publish WSDLs from Application Explorer to the OSB Console.

9.4.3 Publishing a WSDL From Application Explorer to Oracle Service Bus

This section describes how to publish a WSDL from Application Explorer (BSE configuration) to Oracle Service Bus.

1. Start Application Explorer, connect to a BSE configuration, and connect to a SAP R/3 target.

Figure 9–96 Create Web Service Option

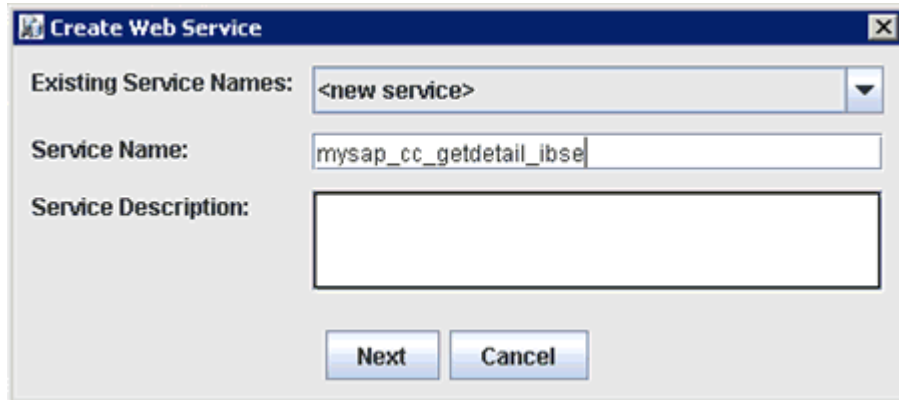


2. Expand the **Business Object Repository** node, **Financial Accounting** node, and the **CompanyCode** business object.

3. Right-click the **GetDetail** method and select **Create Web Service** from the menu, as shown in [Figure 9-96](#).

The Create Web Service dialog is displayed, as shown in [Figure 9-97](#).

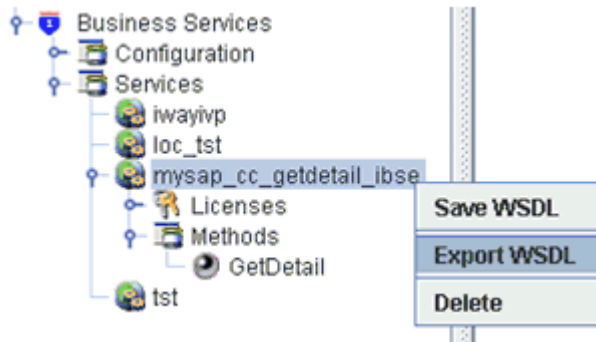
Figure 9-97 Create Web Service Dialog



4. Enter a service name and click **Next**.
5. Click **OK** on the next dialog that is displayed.

Application Explorer switches the view to the Business Services node, and the new Web service appears in the left pane.

Figure 9-98 Export WSDL Option



6. Right-click the new Web service and select **Export WSDL** from the menu, as shown in [Figure 9-98](#).

The Export WSDL dialog is displayed, as shown in [Figure 9-99](#).

Figure 9–99 Export WSDL Dialog

Field	Value
Name	mysap_cc_getdetail_ibse_invoke.wSDL
Location	default/wsdls
Host	localhost
Port	7001
User	weblogic
Password	••••••••

7. In the Name field, a default file name for the WSDL file is provided. You can accept the default or provide your own.
8. In the Location field, enter the location where you want to publish the WSDL document.

The location is composed of an Oracle Service Bus project name and optionally, one or more folder names. The project name and any folder names must be separated by a forward slash character “/”.
9. In the Host field, enter the name of the machine where Oracle WebLogic Server is running.
10. In the Port field, enter the port for the domain you are using.
11. In the User field, enter your username to access Oracle Service Bus.
12. In the Password field, enter your password to access Oracle Service Bus.
13. Click **OK**.

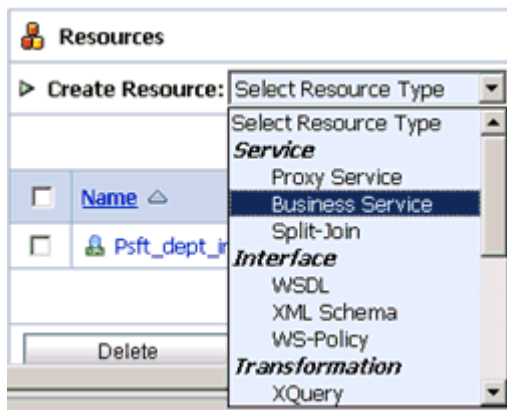
The WSDL is published to the location specified in the Export WSDL dialog and is now available for use with a Business Service or Proxy Service in Oracle Service Bus.

9.4.4 Configuring a File Type Business Service

This section describes how to configure a File type Business Service using the Oracle Service Bus Console.

1. Select the **Business Service** folder you created in the left pane.

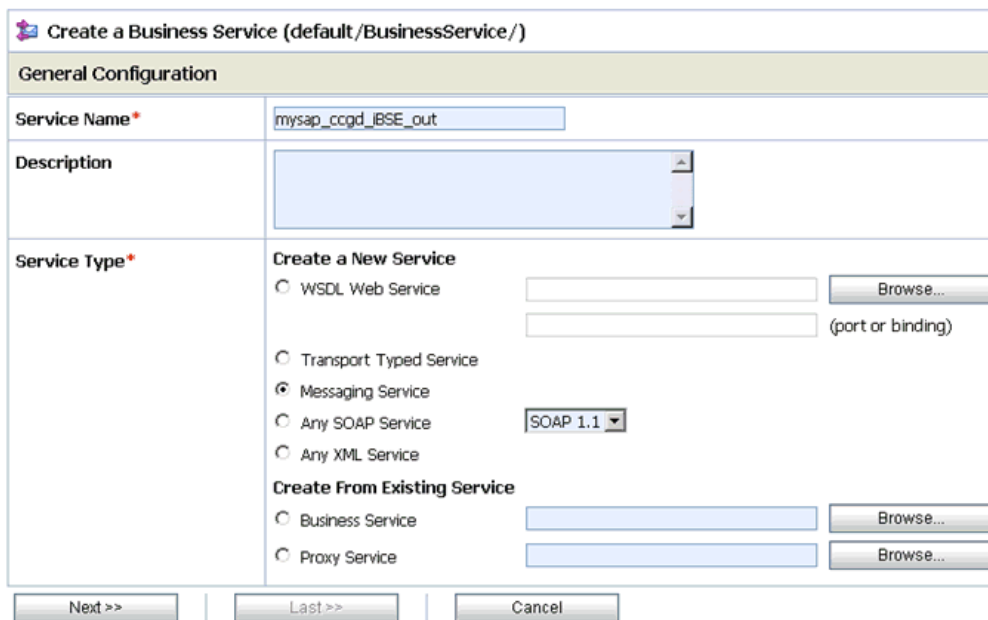
Figure 9–100 Business Service Option



- In the right pane, select **Business Service** from the Create Resource menu, as shown in [Figure 9–100](#).

The General Configuration page is displayed, as shown in [Figure 9–101](#).

Figure 9–101 General Configuration Page



- Provide a name for the Business Service and from the Service Type area select **Messaging Service**.
- Click **Next**.

The Message Type Configuration page is displayed, as shown in [Figure 9–102](#).

Figure 9–102 Message Type Configuration Page

5. Select **XML** as the Request Message Type and **None** as the Response Message Type.
6. Click **Next**.
The Transport Configuration page is displayed, as shown in [Figure 9–103](#).

Figure 9–103 Transport Configuration Page

7. Select **file** from the Protocol list.
8. Enter the path to a destination folder on your file system in the Endpoint URI field and click **Add**.
9. Click **Next**.
The FILE Transport Configuration page is displayed, as shown in [Figure 9–104](#).

Figure 9–104 FILE Transport Configuration Page

FILE Transport Configuration	
Prefix	mysap_ccgd_out
Suffix	.xml
Request encoding	utf-8

<< Prev. Next >> Last >> Cancel

10. Enter the prefix and suffix for the output file to be received and click **Next**.
The Summary page is displayed, as shown in [Figure 9–105](#).

Figure 9–105 Summary Page

Protocol	file
Load Balancing Algorithm	round-robin
Endpoint URI	file:///C:/output
Retry Count	0
Retry Iteration Interval	30
FILE Transport Configuration	
Prefix	mysap_ccgd_out
Suffix	.xml
Request encoding	utf-8

<< Prev. Save Cancel

11. Review all the information for your Business Service and click **Save**.

9.4.5 Configuring a WSDL Type Business Service

This section describes how to configure a WSDL type Business Service using the Oracle Service Bus Console.

1. Select the **Business Service** folder you created in the left pane.

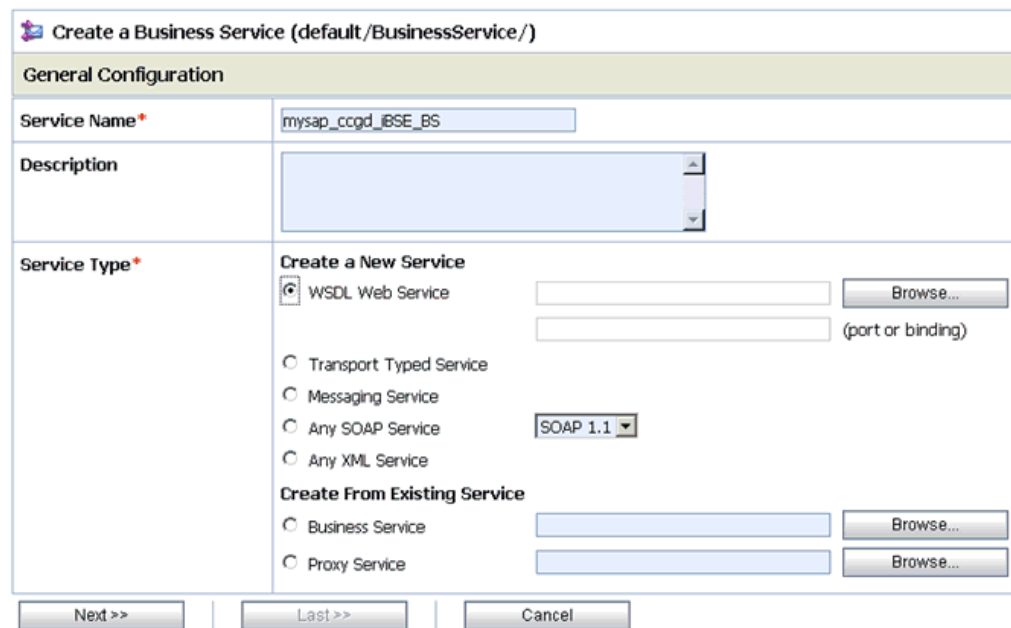
Figure 9–106 Business Service Option



- In the right pane, select **Business Service** from the Create Resource menu, as shown in [Figure 9–106](#).

The General Configuration page is displayed, as shown in [Figure 9–107](#).

Figure 9–107 General Configuration Page



- Provide a name for the Business Service and from the Service Type area select **WSDL Web Service**.
- Click **Browse**.

The Select a WSDL dialog is displayed, as shown in [Figure 9–108](#).

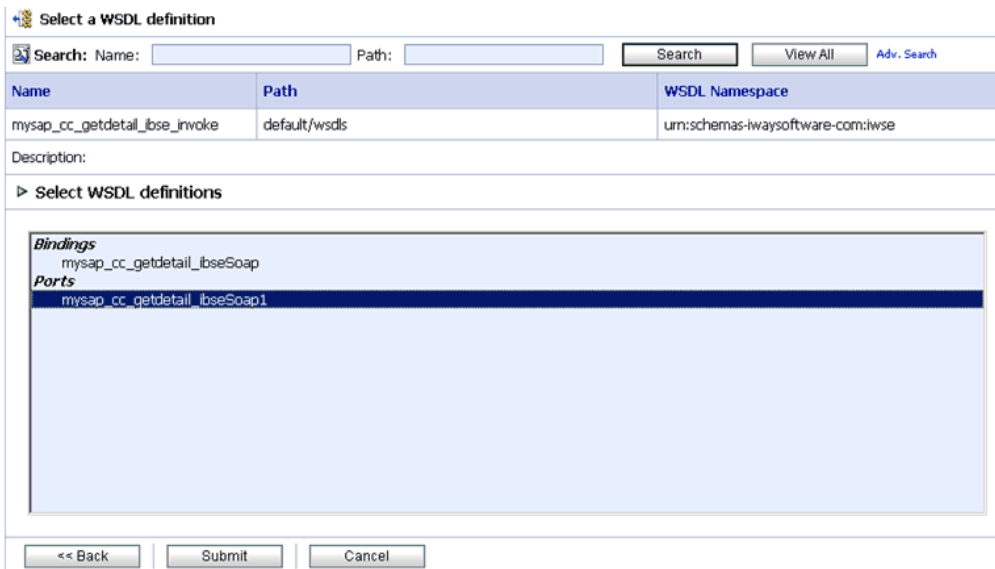
Figure 9–108 Select a WSDL Dialog



5. Select a BSE WSDL that you published for Oracle Application Adapter for SAP R/3 using Application Explorer and click **Submit**.

The Select a WSDL Definition dialog is displayed, as shown in [Figure 9–109](#).

Figure 9–109 Select a WSDL Definition Dialog



6. Select the WSDL definition under the Ports section and click **Submit**.
You are returned to the General Configuration page where the WSDL you selected is now available.
7. Click **Next**.
The Transport Configuration page is displayed, as shown in [Figure 9–110](#).

Figure 9–110 Transport Configuration Page

Transport Configuration	
Protocol*	http
Load Balancing Algorithm	round-robin
Endpoint URI*	Format: http://host:port/someService <input type="text" value="http://"/> <input type="button" value="Add"/> EXISTING URIS <input type="text" value="http://AMTEX-CH-QA163.AMTEXPDC:7001/lbse/lBSEServlet/XDSOAPRouter"/>
Retry Count	0
Retry Iteration Interval	30
Retry Application Errors	<input checked="" type="radio"/> Yes <input type="radio"/> No
<input type="button" value=" << Prev."/> <input type="button" value=" Next >>"/> <input type="button" value=" Last >>"/> <input type="button" value=" Cancel"/>	

8. Leave the default values and click **Next**.
The HTTP Transport Configuration page is displayed, as shown in [Figure 9–111](#).

Figure 9–111 HTTP Transport Configuration Page

HTTP Transport Configuration	
Timeout	0
HTTP Request Method	POST
Authentication	<input checked="" type="radio"/> None <input type="radio"/> Basic <input type="radio"/> Client Certificate
Service Account	<input type="text"/> <input type="button" value="Browse..."/>
Dispatch Policy	default
Request Encoding	<input type="text"/>
Response Encoding	<input type="text"/>
Advanced Settings	
<input type="button" value=" << Prev."/> <input type="button" value=" Next >>"/> <input type="button" value=" Last >>"/> <input type="button" value=" Cancel"/>	

9. Leave the default values and click **Next**.
The SOAP Binding Configuration page is displayed, as shown in [Figure 9–112](#).

Figure 9–112 SOAP Binding Configuration Page

SOAP Binding Configuration	
Enforce WS-I Compliance	<input type="checkbox"/>
<< Prev.	Next >>
Last >>	Cancel

10. Click Next.

The Message Content Handling page is displayed, as shown in [Figure 9–113](#).

Figure 9–113 Message Content Handling Page

Message Content Handling	
XDP/MTOM Support	<input type="checkbox"/> Enabled <input checked="" type="radio"/> Include Binary Data by Reference <input checked="" type="radio"/> Include Binary Data by Value
Attachments	<input type="checkbox"/> Page Attachments to Disk
<< Prev.	Next >>
Last >>	Cancel

11. Click Next.

The Summary page is displayed, as shown in [Figure 9–114](#).

Figure 9–114 Summary Page

Protocol	http
Load Balancing Algorithm	round-robin
Endpoint URI	http://AMTEX-CH-QA163.AMTEXPDC:7001/libse/IBSEServlet/XDSOAPRouter
Retry Count	0
Retry Iteration Interval	30
Retry Application Errors	Yes
HTTP Transport Configuration	
Timeout	0
HTTP Request Method	POST
Authentication	None
Proxy Server	
Follow HTTP redirects	DISABLED
Use Chunked Streaming Mode	ENABLED
SOAP Binding Configuration	
Enforce WS-I Compliance	No
Message Content Handling Configuration	
XOP/MTOM Support	Disabled
Page Attachments to Disk	No
<input style="margin-right: 10px;" type="button" value=" << Prev. "/> <input style="margin-right: 10px;" type="button" value=" Save "/> <input style="margin-right: 10px;" type="button" value=" Cancel "/>	

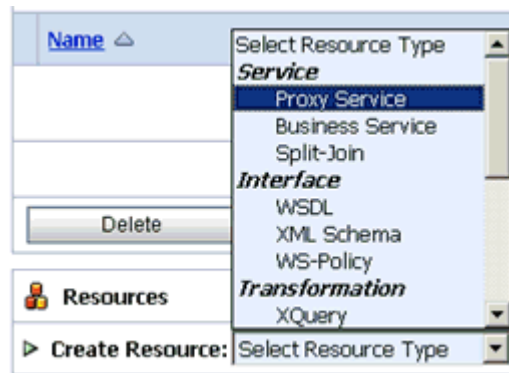
12. Review all the information for your Business Service and click **Save**.

9.4.6 Configuring a Proxy Service

This section describes how to configure a Proxy Service using the Oracle Service Bus Console.

1. Select the **Proxy Service** folder you created in the left pane.

Figure 9–115 Proxy Service Option



2. In the right pane, select **Proxy Service** from the Create Resource menu, as shown in [Figure 9–115](#).

The General Configuration page is displayed, as shown in [Figure 9–116](#).

Figure 9–116 General Configuration Page

Create a Proxy Service (default/ProxyService/)

General Configuration

Service Name*

Description

Service Type*

Create a New Service

WSDL Web Service
 (port or binding)

Messaging Service

Any SOAP Service

Any XML Service

Create From Existing Service

Business Service

Proxy Service

| |

3. Provide a name for the Proxy Service and from the Service Type area select **Any XML Service**.
4. Click **Next**.

The Transport Configuration page is displayed, as shown in [Figure 9–117](#).

Figure 9–117 Transport Configuration Page

Transport Configuration

Protocol*

Endpoint URI* Format: file:///root-dir/dir1

Get All Headers

Yes

No

Header

HEADER	ACTION
There are no headers configured.	

| | |

5. Select **file** from the Protocol list.
6. Enter the path to an input folder on your file system in the Endpoint URI field.
7. Click **Next**.

The FILE Transport Configuration page is displayed, as shown in [Figure 9–118](#).

Figure 9–118 FILE Transport Configuration Page

FILE Transport Configuration	
File Mask*	*.*
Polling Interval*	60
Read Limit*	10
Sort By Arrival	<input type="checkbox"/>
Scan SubDirectories	<input type="checkbox"/>
Pass By Reference	<input type="checkbox"/>
Post Read Action*	delete
Stage Directory*	C:\input\stage
Archive Directory	
Error Directory*	C:\input\error
Request encoding	utf-8
<input type="button" value=" << Prev."/> <input type="button" value=" Next >>"/> <input type="button" value=" Last >>"/> <input type="button" value=" Cancel"/>	

8. Provide any folder locations on your file system for the Stage Directory and Error Directory fields.
9. Click Next.

The Message Content Handling page is displayed, as shown in [Figure 9–119](#).

Figure 9–119 Message Content Handling Page

Message Content Handling	
Content Streaming	<input type="checkbox"/> Enabled Buffer Type <input checked="" type="radio"/> Memory Buffer <input type="radio"/> Disk Buffer Compression <input type="checkbox"/> Enabled
<input type="button" value=" << Prev."/> <input type="button" value=" Next >>"/> <input type="button" value=" Last >>"/> <input type="button" value=" Cancel"/>	

10. Click Next.

The Summary page is displayed, as shown in [Figure 9–120](#).

Figure 9–120 Summary Page

FILE Transport Configuration	
File Mask	*,*
Polling Interval	60
Read Limit	10
Sort By Arrival	false
Scan SubDirectories	false
Pass By Reference	false
Post Read Action	delete
Stage Directory	C:\input\stage
Error Directory	C:\input\error
Request encoding	utf-8
Message Content Handling Configuration	
Content Streaming	Disabled















11. Review all the information for your Proxy Service and click **Save**.

9.4.7 Configuring a Pipeline

This section describes how to configure a Pipeline using the Oracle Service Bus Console.

1. Click the **Edit Message Flow** icon in the row of the Proxy Service you created, as shown in Figure 9–121.

Figure 9–121 Edit Message Flow Icon

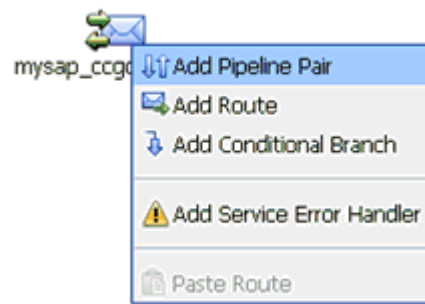
<input type="checkbox"/>	Name <small>△</small>	Resource Type	Actions
<input type="checkbox"/>	 mysap_ccgd_BSE_PS	Proxy Service	 
<input type="checkbox"/>	 mysap_inbound_Proxy	Proxy Service	  
<input type="checkbox"/>	 Mysap_PS	Proxy Service	 
<input type="checkbox"/>	 wsd_h849_PS	Proxy Service	  

Items 1-4 of 4

The Edit Message Flow workspace area is displayed.

2. Click the **Proxy Service** icon and select **Add Pipeline Pair** from the menu, as shown in Figure 9–122.

Figure 9–122 Add Pipeline Pair Option



3. Click the **PipelinePairNode1** icon and select **Add Route** from the menu, as shown in [Figure 9–123](#).

Figure 9–123 Add Route Option

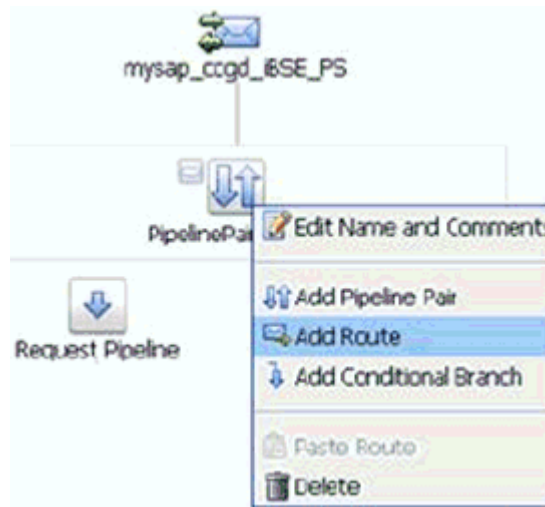
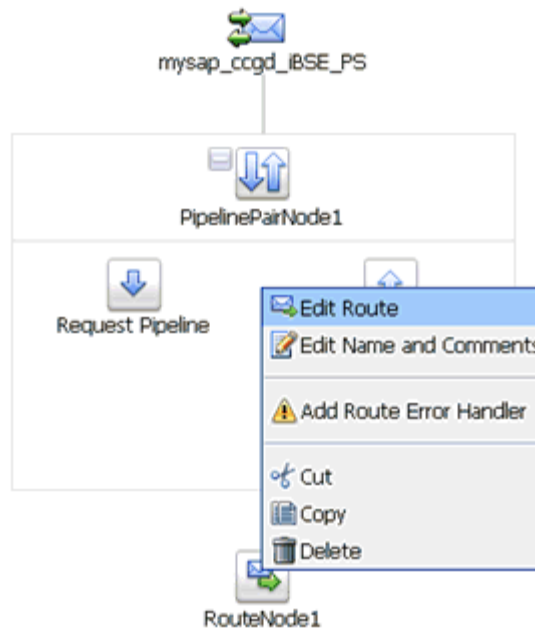
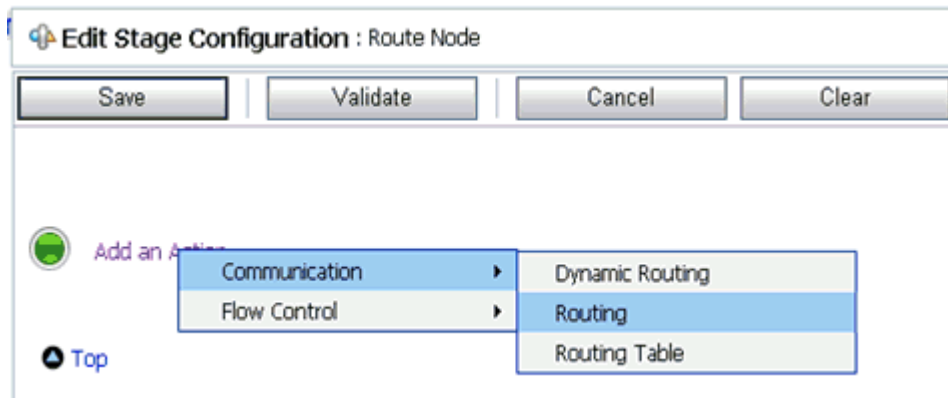


Figure 9–124 Edit Route Option



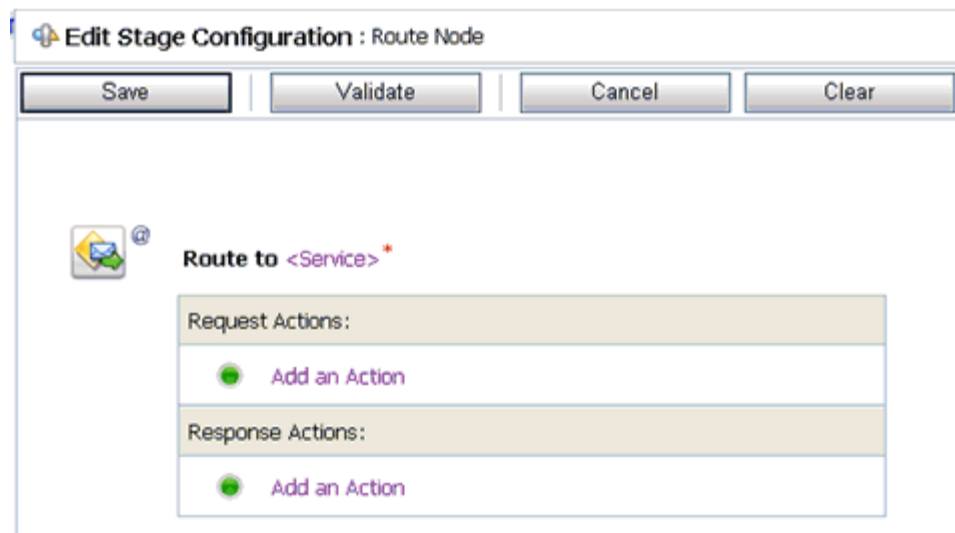
4. Click the **RouteNode1** icon and select **Edit Route** from the menu, as shown in [Figure 9–124](#).

Figure 9–125 Routing Option



5. Click **Add an Action**, select **Communication** from the menu, and click **Routing**, as shown in [Figure 9–125](#).

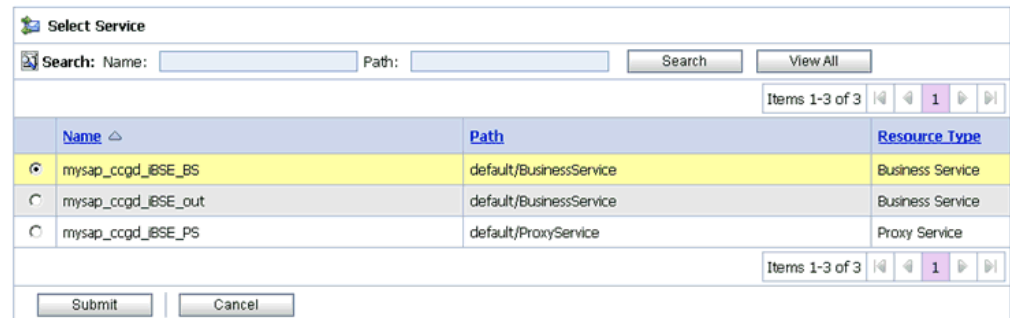
Figure 9–126 Edit Stage Configuration Workspace Area



6. Click <Service>, as shown in [Figure 9–126](#).

The Select Service dialog is displayed, as shown in [Figure 9–127](#).

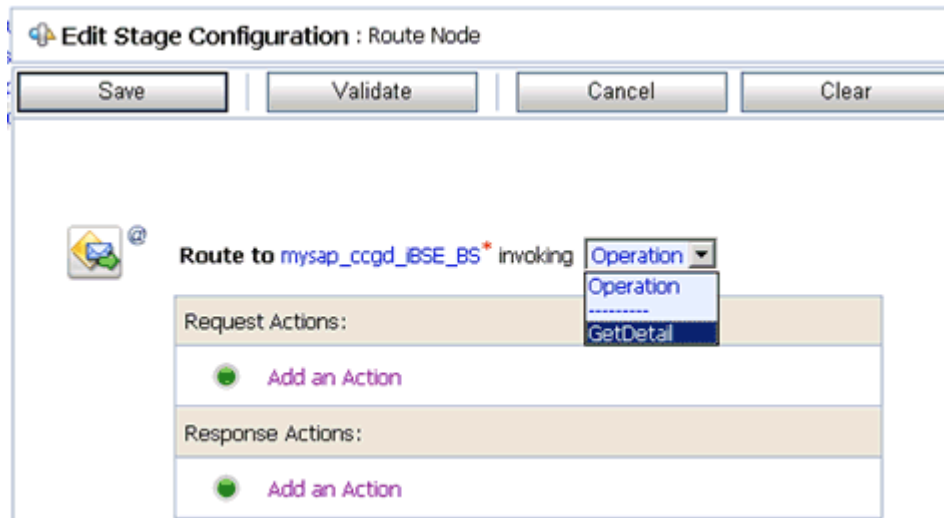
Figure 9–127 Select Service Dialog



7. Select a WSDL type Business Service and click **Submit**.

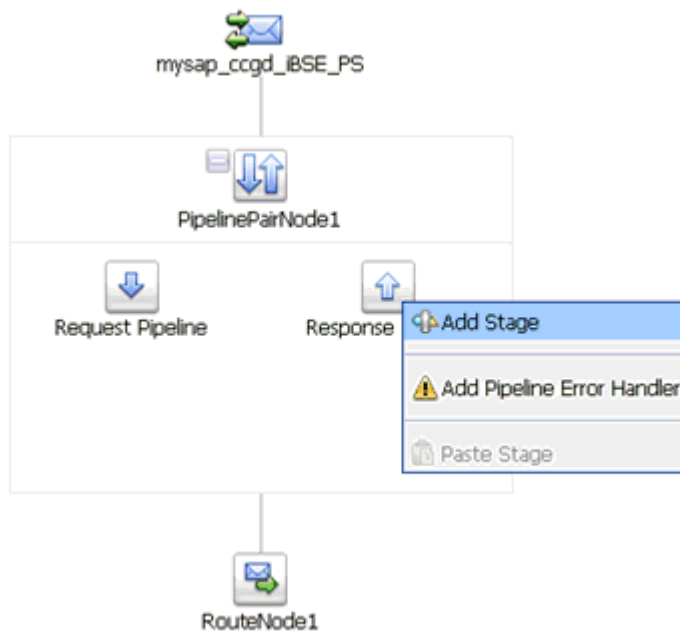
You are returned to the Edit Stage Configuration workspace area, as shown in [Figure 9–128](#).

Figure 9–128 Edit Stage Configuration Workspace Area



8. Select **GetDetail** as the operational attribute from the list.
9. Click **Validate** and then **Save**.

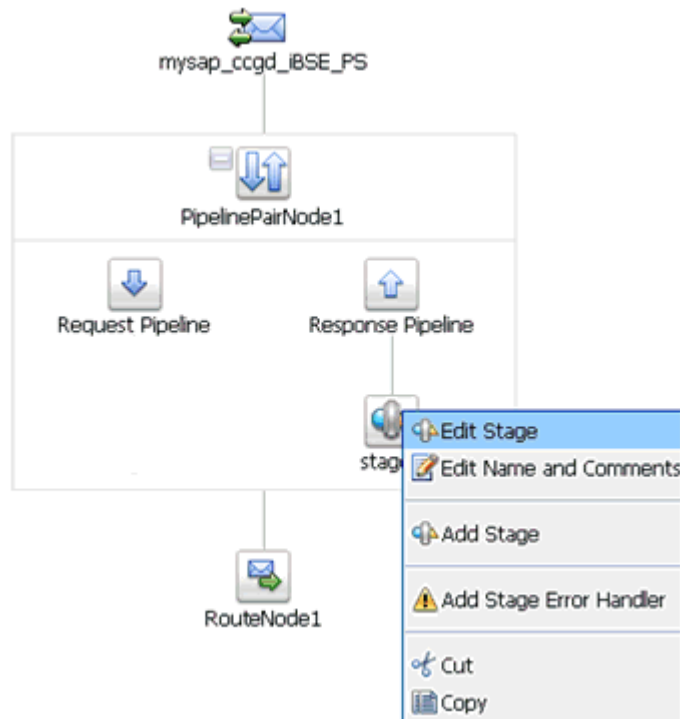
Figure 9–129 Add Stage Option



10. Click the **Response Pipeline** icon and select **Add Stage** from the menu, as shown in [Figure 9–129](#).

The Stage1 icon is added below the Response Pipeline icon.

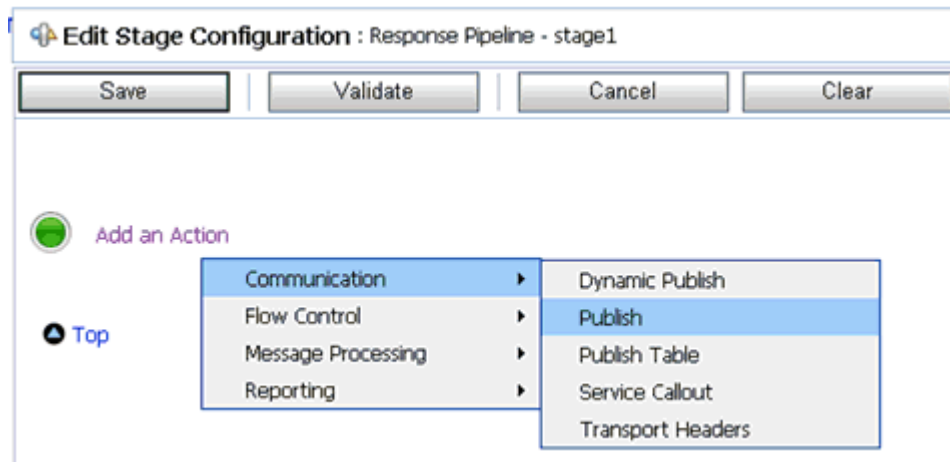
Figure 9–130 Edit Stage Option



11. Click the **Stage1** icon and select **Edit Stage** from the menu, as shown in [Figure 9–130](#).

The Edit Stage Configuration workspace area is displayed, as shown in [Figure 9–131](#).

Figure 9–131 Edit Stage Configuration Workspace Area



12. Click **Add an Action**, select **Communication** from the menu, and click **Publish**.

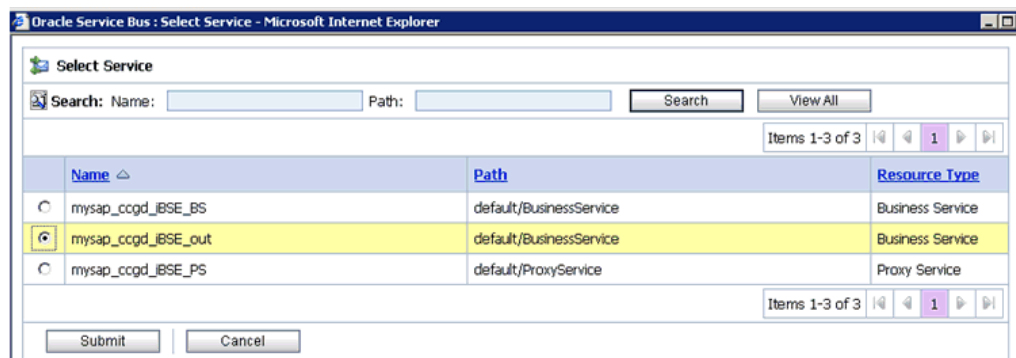
Figure 9–132 Edit Stage Configuration Workspace Area



13. Click <Service>, as shown in [Figure 9–132](#).

The Select Service dialog is displayed, as shown in [Figure 9–133](#).

Figure 9–133 Select Service Dialog

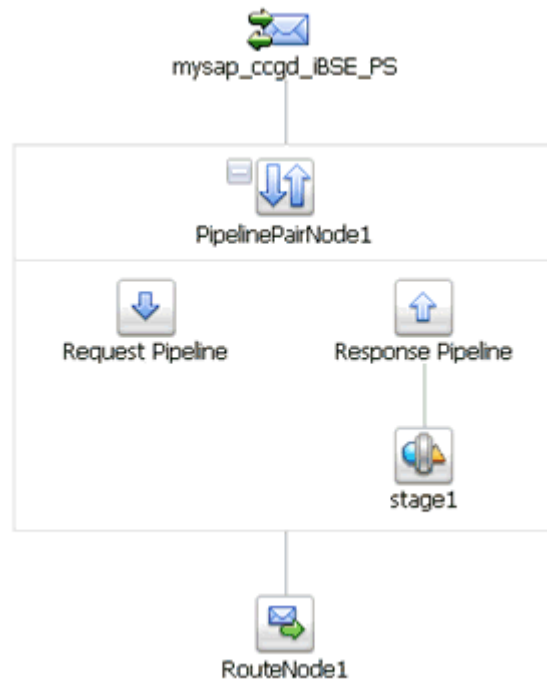


14. Select a File type Business Service and click **Submit**.

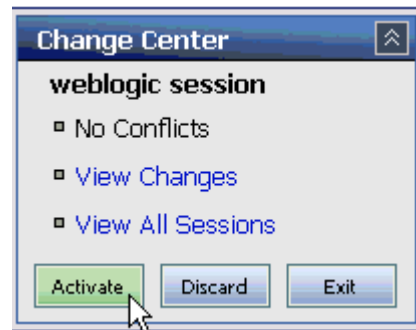
You are returned to the Edit Stage Configuration workspace area.

15. Click **Validate** and then **Save**.

The completed Pipeline is displayed, as shown in [Figure 9–134](#).

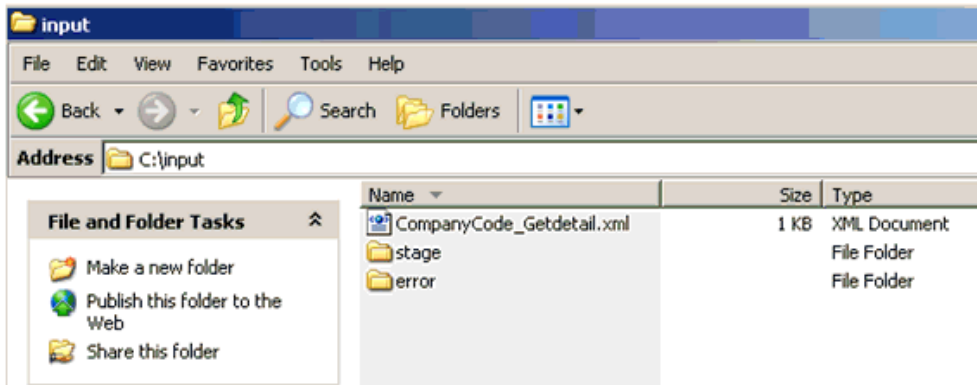
Figure 9–134 Completed Pipeline

16. Click Save.
17. Click **Activate** in the Change Center area to activate your changes in the Oracle Service Bus session, as shown in [Figure 9–135](#).

Figure 9–135 Change Center

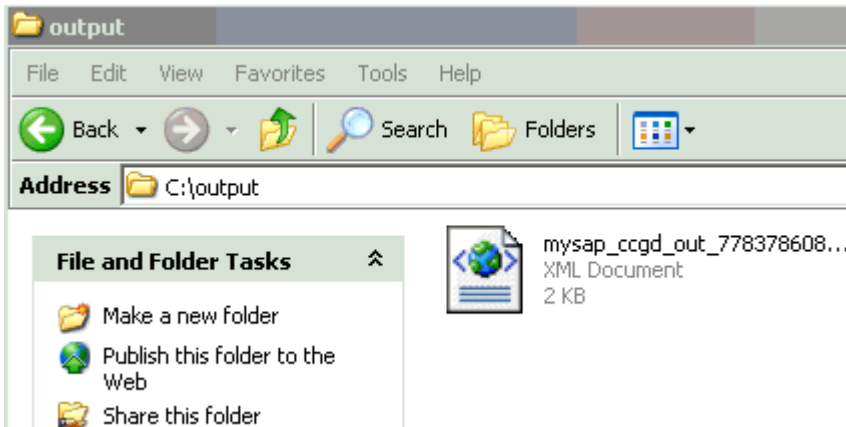
18. Copy and paste an input XML file in the input folder you have configured, as shown in [Figure 9–136](#).

Figure 9–136 Input XML File



An output XML file is received in the destination folder, as shown in [Figure 9–137](#).

Figure 9–137 Received Output XML File



11g Release 1 (11.1.1.4.0) provides new features for the Oracle Application Adapter for SAP R/3, which are described in this chapter. This chapter contains the following sections:

- [Section 10.1, "Exception Filter"](#)
- [Section 10.2, "Credential Mapping for Oracle SOA Suite \(BPEL, Mediator, or BPM\)"](#)
- [Section 10.3, "Credential Mapping for Oracle Service Bus \(OSB\)"](#)

10.1 Exception Filter

This section describes how to configure exception filter functionality for the Oracle Application Adapter for SAP R/3 and includes a sample testing scenario. This section contains the following topics:

- [Section 10.1.1, "Prerequisites"](#)
- [Section 10.1.2, "Configuring the Exception Filter"](#)

The exception filter is supported only for outbound processes that use J2CA configurations. This feature is not supported for BSE configurations and inbound processes that use J2CA configurations.

The exception filter uses the `com.ibi.afjca.oracle.SAPExceptionFilter` class to filter the generated exceptions. This class filters the exceptions and categorizes them into the following categories:

- `PCRetriableResourceException`
- `PCResourceException`

The following exceptions are represented in the fault policies file:

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

Note: The `com.ibi.afjca.oracle.AdapterExceptionFilter` class can also be used to filter the generated exceptions.

10.1.1 Prerequisites

This section lists the prerequisites for the exception filter.

- Oracle PS3 SOA Suite must be installed.

- Oracle JDeveloper for PS3 must be installed with the updated SOA composite editor.
- Oracle Application Adapter for SAP R/3 for 11g Release 1 (11.1.1.4.0) must be installed.

For more information, see the *Oracle Fusion Middleware Application Adapters Installation Guide for Oracle WebLogic Server*.

10.1.2 Configuring the Exception Filter

Exception filter configuration consists of the following steps:

1. Generate a WSDL file.
For more information, see ["Generating a WSDL File"](#) on page 10-2.
2. Create a BPEL outbound process with exception filter functionality.
For more information, see ["Creating a BPEL Outbound Process With Exception Filter Functionality"](#) on page 10-2.
3. Create fault policies and fault binding files.
For more information, see ["Creating Fault Policies and Fault Binding Files"](#) on page 10-3.
4. Deploy and test the BPEL outbound process with exception filter functionality.
For more information, see ["Deploying and Testing the BPEL Outbound Process With Exception Filter Functionality"](#) on page 10-6.

10.1.2.1 Generating a WSDL File

To generate a WSDL file:

1. Open Application Explorer and create a J2CA configuration.
For more information, see ["Creating a Configuration for J2CA"](#) on page 4-3.
2. Create a target for the SAP R/3 adapter and then connect to the target.
For more information, see ["Establishing a Connection \(Target\) for SAP R/3"](#) on page 4-5.
3. Generate a WSDL for the appropriate object (for example, the GetDetail BAPI for the CompanyCode business object).
For more information, see ["Generating WSDL \(J2CA Configurations Only\)"](#) on page 4-15.

10.1.2.2 Creating a BPEL Outbound Process With Exception Filter Functionality

To create a BPEL outbound process with exception filter functionality:

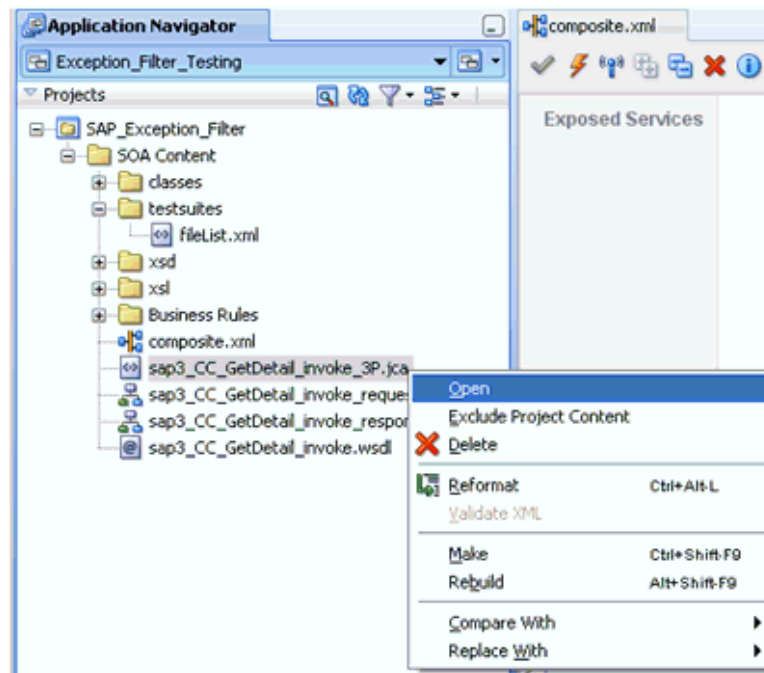
1. Open JDeveloper and create a new SOA application.
For more information, see ["Creating an Empty Composite for SOA"](#) on page 6-9.
2. Create a new SOA project (for example, SAP_Exception_Filter).
3. Create a third party adapter service component.
For more information, see ["Configuring a Third Party Adapter Service Component"](#) on page 6-12.

Once the third party adapter service component is created, the WSDL file (with corresponding schemas and JCA file) is imported to the JDeveloper project.

For more information, see ["Defining a BPEL Outbound Process"](#) on page 6-12.

4. Modify the imported JCA file.
 - a. Right-click the imported JCA file and select **Open** from the menu, as shown in [Figure 10-1](#).

Figure 10-1 Application Navigator Tab



- b. In the <interaction-spec> element, add the ExceptionFilter property. For example:


```
<interaction-spec className="com.ibi.afjca.cci.IWAFInteractionSpec">
<property name="FunctionName" value="PROCESS"/><property
name="ExceptionFilter"
value="com.ibi.afjca.oracle.SAPExceptionFilter"/></interaction-spec>
```
 - c. Save the modified JCA file.
5. Once the third party adapter service component is created and the JCA file is modified, continue with the remainder of the BPEL process creation.

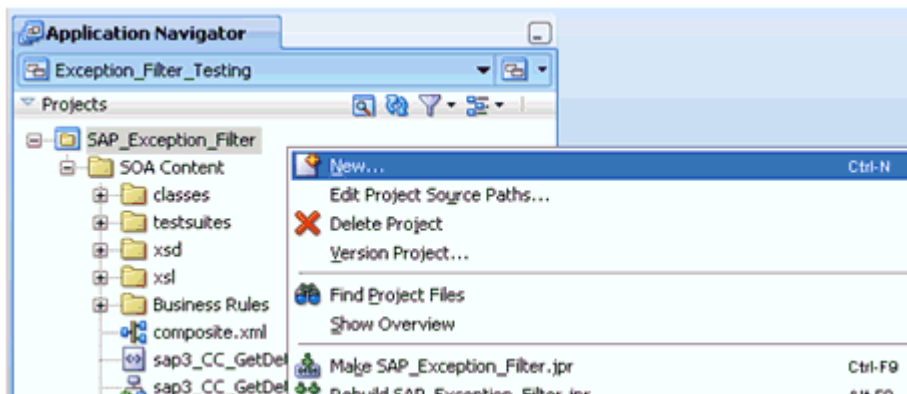
For more information, see ["Defining a BPEL Outbound Process"](#) on page 6-12.

10.1.2.3 Creating Fault Policies and Fault Binding Files

To create fault policies and fault binding files:

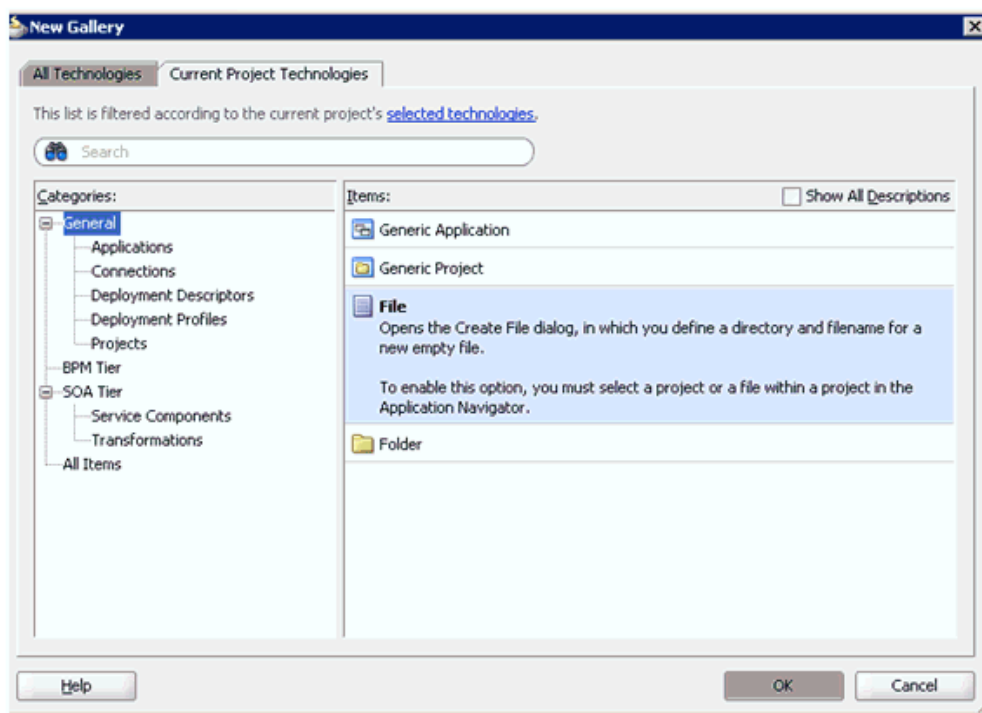
1. Right-click the created SOA project (for example, SAP_Exception_Filter) and select **New** from the menu, as shown in [Figure 10-2](#).

Figure 10–2 Application Navigator Tab



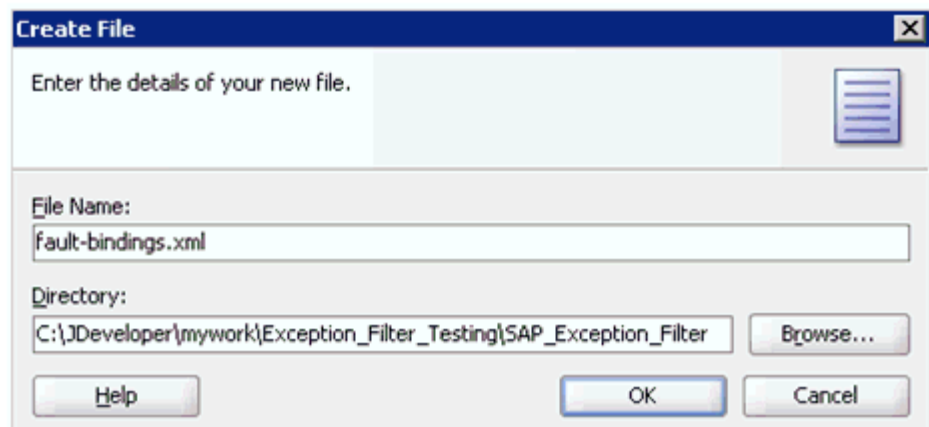
The New Gallery dialog is displayed, as shown in [Figure 10–3](#).

Figure 10–3 New Gallery Dialog



2. Select **File** and click **OK**.

The Create File dialog is displayed, as shown in [Figure 10–4](#).

Figure 10–4 Create File Dialog

3. In the File Name field, type **fault-bindings.xml** and click **OK**.
4. Add the appropriate fault binding functions in the **fault-bindings.xml** file.
To view a sample **fault-bindings.xml** file, see "[Sample Fault-Bindings.xml File](#)" on page 10-5.

Note: The parameter in the <name> element is the name of the created BPEL process.

5. Save the **fault-bindings.xml** file.
6. Repeat steps 1 to 5 for the **fault-policies.xml** file, but ensure to add the appropriate fault policies functions.
To view a sample **fault-policies.xml** file, see "[Sample Fault-Policies.xml File](#)" on page 10-6.

Note: The parameter ID in the <fault policy> element is obtained from the **fault-bindings.xml** file, which can be found in the <Component> element of the **fault-bindings.xml** file. This ID can have any name as long as it is identical in the **fault-policies.xml** and **fault-bindings.xml** files.

Tip: The **fault-bindings.xml** and **fault-policies.xml** files can also be created externally and manually copied to the JDeveloper project.

Sample Fault-Bindings.xml File

```
<?xml version="1.0" encoding="UTF-8" ?>
<faultPolicyBindings version="2.0.1"
xmlns="http://schemas.oracle.com/bpel/faultpolicy"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

  <component faultPolicy="bpelFaultHandling">
    <name>BPELProcess1</name>
  </component>

</faultPolicyBindings>
```

Sample Fault-Policies.xml File

```

<?xml version="1.0" encoding="UTF-8"?>

<faultPolicies xmlns="http://schemas.oracle.com/bpel/faultpolicy">

  <faultPolicy version="2.0.1" id="bpelFaultHandling"
xmlns:env="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns="http://schemas.oracle.com/bpel/faultpolicy"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

<Conditions>

<faultName xmlns:bpelx="http://schemas.oracle.com/bpel/extension"
name="bpelx:remoteFault">
  <condition>
    <action ref="ora-retry-3"/>
  </condition>

  </faultName>

  <faultName xmlns:bpelx="http://schemas.oracle.com/bpel/extension"
name="bpelx:bindingFault">
    <condition>
      <action ref="ora-retry-5"/>
    </condition>
  </faultName>
</Conditions>
<Actions>
  <Action id="ora-retry-3">
    <retry>
      <retryCount>3</retryCount>
      <retryInterval>2</retryInterval>
      <retryFailureAction ref="ora-terminate"/>
      <exponentialBackoff/>
    </retry>
  </Action>
  <Action id="ora-retry-5">
    <retry>
      <retryCount>5</retryCount>
      <retryInterval>2</retryInterval>
      <retryFailureAction ref="ora-terminate"/>
      <exponentialBackoff/>
    </retry>
  </Action>
  <Action id="ora-terminate">
    <abort/>
  </Action>
</Actions>
</faultPolicy>
</faultPolicies>

```

10.1.2.4 Deploying and Testing the BPEL Outbound Process With Exception Filter Functionality

To deploy and test the BPEL outbound process with exception filter functionality:

1. Deploy the created BPEL outbound process.

For more information, see ["Deploying the BPEL Outbound Process"](#) on page 6-33.

2. Simulate a communication error by disconnecting the system (where the servers are running) from the network.
3. Invoke the deployed BPEL outbound process with a valid input.

For more information, see ["Invoking the Input XML Document in the Oracle Enterprise Manager Console"](#) on page 6-37.

4. Select the process ID.

You can observe the BPEL outbound process being retried or aborted based on the configuration of the `fault-policies.xml` file.

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

This section describes how to configure credential mapping functionality for the Oracle Application Adapter for SAP R/3 in a configuration that uses Oracle SOA Suite (BPEL, Mediator, or BPM). A sample testing scenario is also included. This section contains the following topics:

- [Section 10.2.1, "Prerequisites"](#)
- [Section 10.2.2, "Configuring Credential Mapping"](#)

Credential mapping is supported only for outbound processes that use J2CA configurations. This feature is not supported for BSE configurations and inbound processes that use J2CA configurations.

Note: The J2CA connector is common to all four application adapters (SAP R/3, PeopleSoft, Siebel, and J.D. Edwards OneWorld). If credential mapping is required, then ensure that only one application adapter is used in a particular instance. For example, in one adapter instance only the SAP R/3 application adapter can be used. Credential mapping cannot be configured at the individual adapter level. If you require the use of credential mapping for two adapters, then both adapters must be running in two independent adapter instances.

To pass user credentials to the iWay J2CA resource adapter, 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, or BPM 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 iWay J2CA container, which uses them to connect with the EIS adapter (SAP R/3).

10.2.1 Prerequisites

This section lists the prerequisites for credential mapping.

- Oracle PS3 SOA Suite with an extended BPM domain must be installed.
- Oracle JDeveloper for PS3 must be installed with the updated SOA/BPM composite editor.
- Oracle Application Adapter for SAP R/3 for 11g Release 1 (11.1.1.4.0) must be installed.

For more information, see the *Oracle Fusion Middleware Application Adapters Installation Guide for Oracle WebLogic Server*.

10.2.2 Configuring Credential Mapping

Configuring credential mapping consists of the following steps:

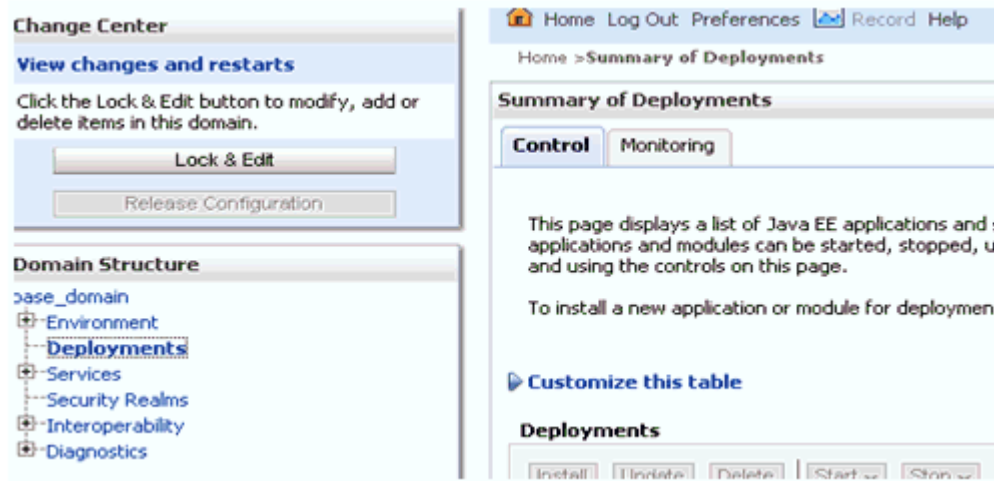
1. Deploy the adapter.
For more information, see [Chapter 5, "Oracle WebLogic Server Deployment and Integration"](#).
2. Associate Oracle WebLogic Server credentials with EIS credentials.
For more information, see ["Associating Oracle WebLogic Server Credentials With EIS Credentials"](#) on page 10-8.
3. Generate a WSDL file.
For more information, see ["Generating a WSDL File"](#) on page 10-11.
4. Create an outbound process.
For more information, see ["Creating an Outbound Process"](#) on page 10-11.
5. Attach a security policy to an outbound process.
For more information, see ["Attaching a Security Policy to an Outbound Process Using the Oracle Enterprise Manager Console"](#) on page 10-12.

10.2.2.1 Associating Oracle WebLogic Server Credentials With EIS Credentials

To associate Oracle WebLogic Server credentials with EIS credentials:

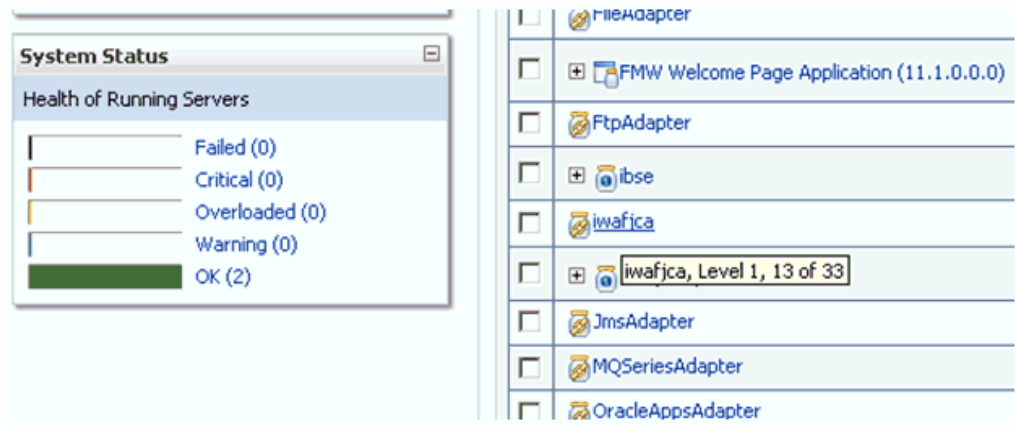
1. Log in to the Oracle WebLogic Server Administration Console.
2. In the Domain Structure section in the left pane, click **Deployments**, as shown in [Figure 10-5](#).

Figure 10-5 Domain Structure Section



The Deployments page is displayed, as shown in [Figure 10-6](#).

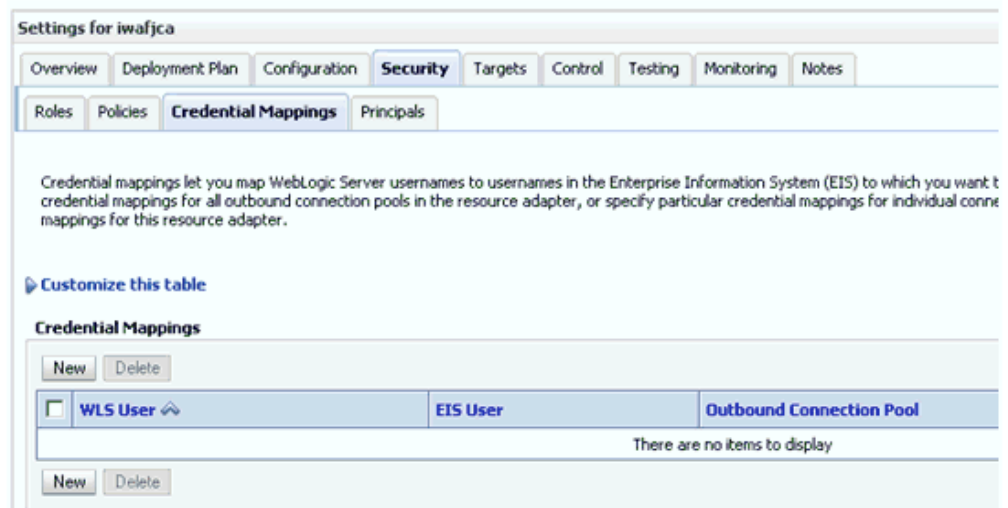
Figure 10–6 Deployments Page



3. Click the **iwafjca** resource adapter.

The Settings for iwafjca page is displayed, as shown in [Figure 10–7](#).

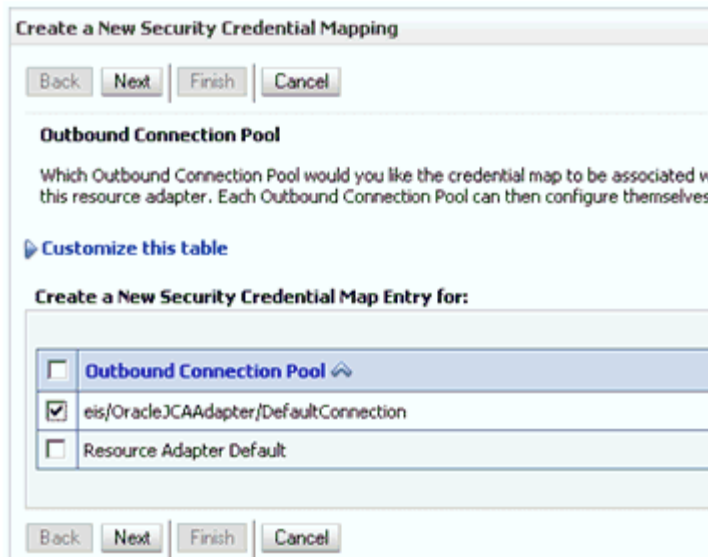
Figure 10–7 Settings for iwafjca Page



4. Click the **Credential Mappings** tab under the Security tab, and then click **New**.

The Create a New Security Credential Mapping page is displayed, as shown in [Figure 10–8](#).

Figure 10–8 Create a New Security Credential Mapping Page



5. Select the outbound connection pool.

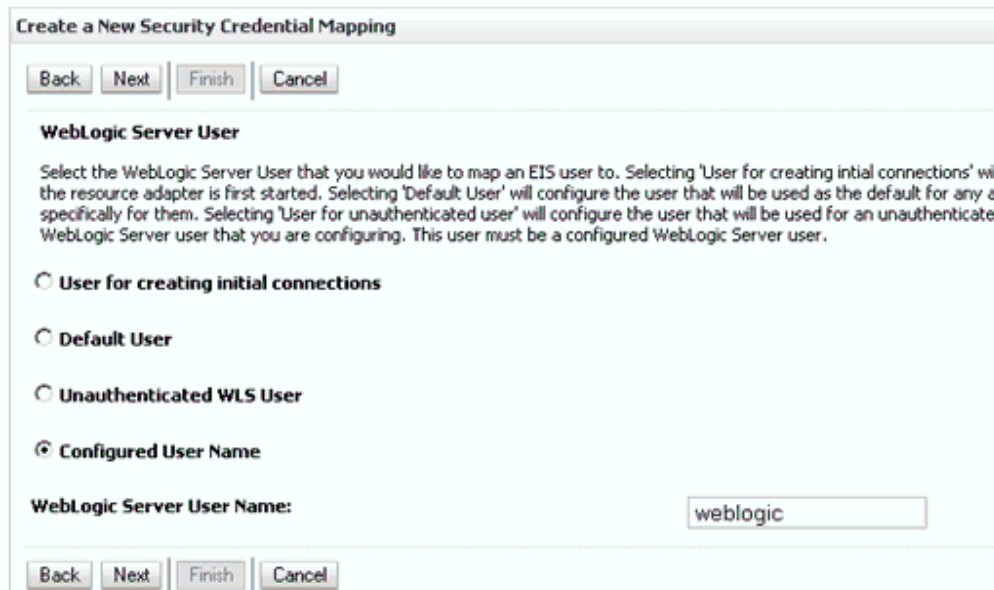
For example:

`eis/OracleJCAAdapter/DefaultConnection`

6. Click **Next**.

The WebLogic Server User page is displayed, as shown in [Figure 10–9](#).

Figure 10–9 WebLogic Server User Page



7. Select **Configured User Name**, enter a valid Oracle WebLogic Server user name, and then click **Next**.

The EIS User Name and Password page is displayed, as shown in [Figure 10–10](#).

Figure 10–10 EIS User Name and Password Page

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 like to map the WebLogic Server User to:

* Indicates required fields

Enter the EIS User Name:

* EIS User Name::

Enter the EIS Password:

* EIS Password::

* Confirm Password::

Back Next Finish Cancel

8. Enter the user name and password for the EIS and click **Finish**.

The credentials for an Oracle WebLogic Server user are now mapped with an EIS user (SAP R/3). The mapping is invoked automatically before invoking the J2CA service.

10.2.2.2 Generating a WSDL File

To generate a WSDL file:

1. Open Application Explorer and create a J2CA configuration.
For more information, see ["Creating a Configuration for J2CA"](#) on page 4-3.
2. Create a target for the SAP R/3 adapter and then connect to the target.
For more information, see ["Establishing a Connection \(Target\) for SAP R/3"](#) on page 4-5.
3. Generate a WSDL for the appropriate object (for example, the GetDetail BAPI for the CompanyCode business object).
For more information, see ["Generating WSDL \(J2CA Configurations Only\)"](#) on page 4-15.

10.2.2.3 Creating an Outbound Process

This section describes how to configure an outbound process. For demonstration purposes, specific references to the BPEL outbound process are made. However, the same steps apply to Mediator and BPM outbound processes.

For more information about creating a Mediator outbound process, see [Chapter 7, "Integration With Mediator Service Components in the Oracle SOA Suite"](#).

For more information about creating a BPM outbound process, see [Chapter 8, "Integration With BPM Service Components in the Oracle SOA Suite"](#).

To create a BPEL outbound process:

1. Open JDeveloper and create a new SOA application.

For more information, see ["Creating an Empty Composite for SOA"](#) on page 6-9.

2. Create a new SOA project (for example, Credential_Mappings).
3. Deploy the BPEL outbound process.

For more information, see ["Deploying the BPEL Outbound Process"](#) on page 6-33.

10.2.2.4 Attaching a Security Policy to an Outbound Process Using the Oracle Enterprise Manager Console

To attach a security policy to an outbound process using the Oracle Enterprise Manager console:

1. Log in to the Oracle Enterprise Manager console and navigate to the deployed composite.
2. Click the **Policies** tab.

From the Attach To/Detach From list, select the BPEL, Mediator, or BPM outbound process.

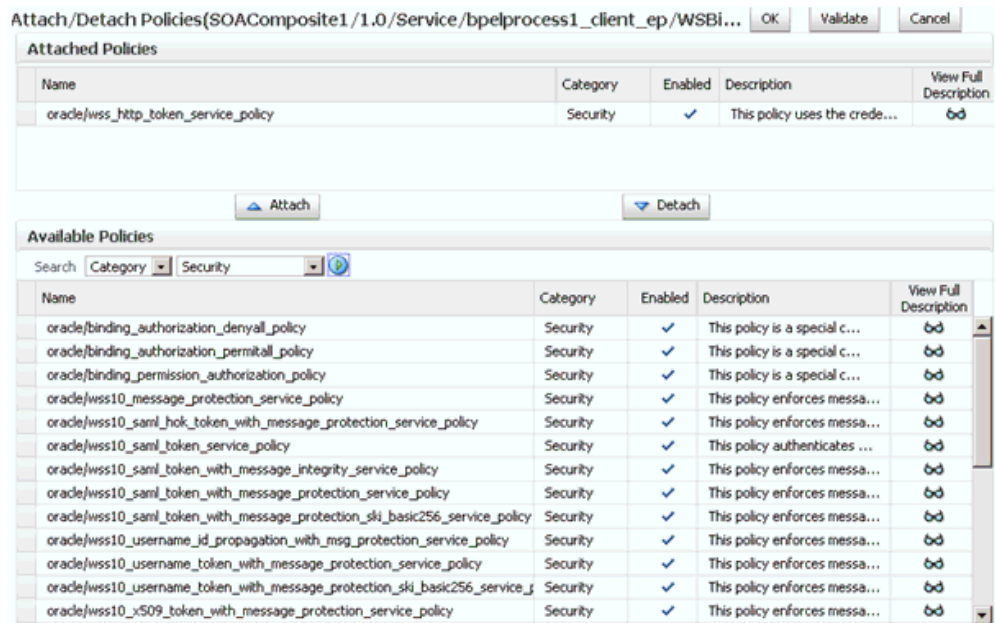
BPEL or Mediator outbound processes have `_client` appended to the process name. BPM outbound processes use the `Process.service` naming convention.

Figure 10–11 Policies Tab



The Attached Policies page is displayed, as shown in [Figure 10–12](#).

Figure 10–12 Attached Policies Page

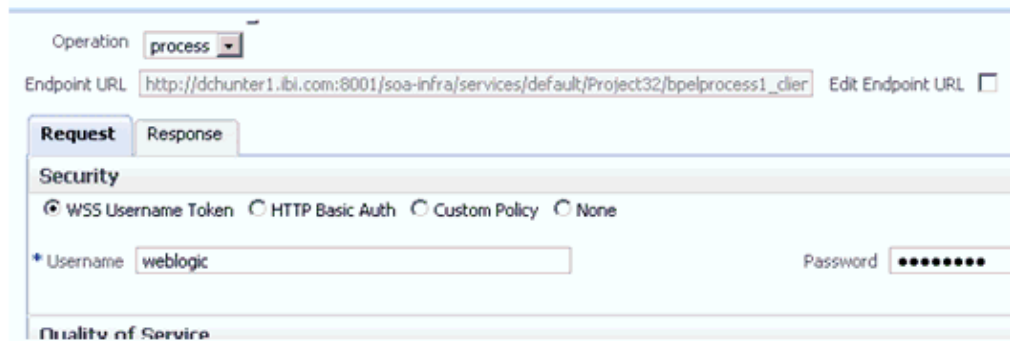


3. Select the **Security** category and click **Search**.
4. Scroll through the list and select **oracle/wss_http_token_service_policy**.
5. Click **Attach** and then **OK**.

The selected policy is now displayed in the Policies tab.

6. Click the **Test** tab and select **WSS Username Token** in the Security section of the Request tab. Enter a valid Oracle WebLogic Server user name and password, as shown in [Figure 10–13](#)

Figure 10–13 Test Tab



7. Invoke the deployed BPEL outbound process with a valid input.
For more information, see ["Invoking the Input XML Document in the Oracle Enterprise Manager Console"](#) on page 6-37.
8. Check the J2CA log files and locate the encrypted password, which shows that the user credentials have been passed to the EIS through Oracle WebLogic Server.

For example:

```
FINEST IWAFManagedConnectionFactory com.ibi.afjca.Util
```

```
getPasswordCredential(78) InLoop:  
User-iwayqa:Password-ENCR(3109311731831131382333215315332323192322731773172)  
FINEST IWAManagedConnectionFactory com.ibi.afjca.Util  
getPasswordCredential(90) Use the system PasswordCredential:  
User-iwayqa:Password-ENCR(3109311731831131382333215315332323192322731773172)
```

10.3 Credential Mapping for Oracle Service Bus (OSB)

This section describes how to configure credential mapping functionality for the Oracle Application Adapter for SAP R/3 in a configuration that uses Oracle Service Bus (OSB). A sample testing scenario is also included. This section contains the following topics:

- [Section 10.3.1, "Prerequisites"](#)
- [Section 10.3.2, "Configuring Credential Mapping"](#)

Credential mapping is supported only for outbound processes that use J2CA configurations. This feature is not supported for BSE configurations and inbound processes that use J2CA configurations.

Note: The J2CA connector is common to all four application adapters (SAP R/3, PeopleSoft, Siebel, and J.D. Edwards OneWorld). If credential mapping is required, then ensure that only one application adapter is used in a particular instance. For example, in one adapter instance only the SAP R/3 application adapter can be used. Credential mapping cannot be configured at the individual adapter level. If you require the use of credential mapping for two adapters, then both adapters must be running in two independent adapter instances.

To pass user credentials to the iWay J2CA resource adapter, 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 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 iWay J2CA container, which uses them to connect with the EIS adapter (SAP R/3).

10.3.1 Prerequisites

This section lists the prerequisites for credential mapping.

- Oracle Service Bus (OSB) for PS3 must be installed.
- Oracle Application Adapter for SAP R/3 for 11g Release 1 (11.1.1.4.0) must be installed.

For more information, see the *Oracle Fusion Middleware Application Adapters Installation Guide for Oracle WebLogic Server*.

10.3.2 Configuring Credential Mapping

Configuring credential mapping consists of the following steps:

1. Deploy the adapter.

For more information, see [Chapter 5, "Oracle WebLogic Server Deployment and Integration"](#).

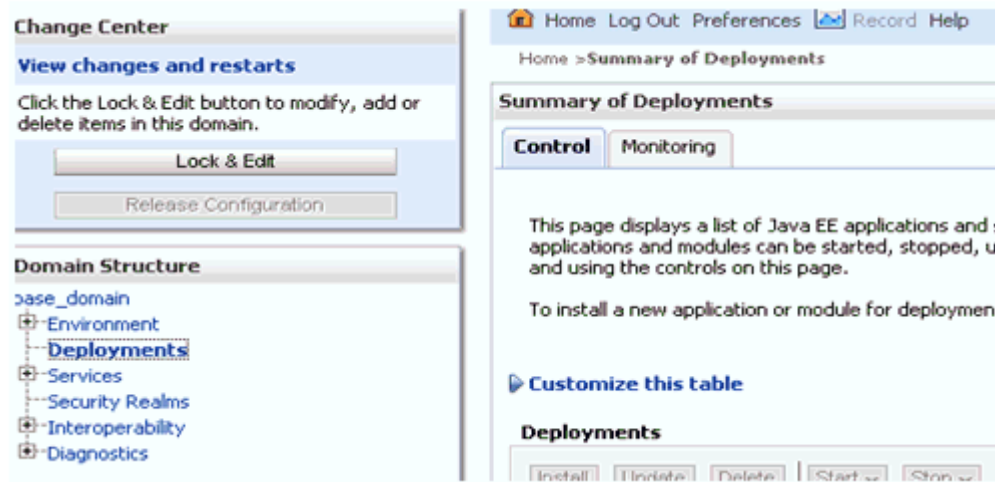
2. Associate Oracle WebLogic Server credentials with EIS credentials.
For more information, see ["Associating Oracle WebLogic Server Credentials With EIS Credentials"](#) on page 10-15.
3. Generate a WSDL file.
For more information, see ["Generating a WSDL File"](#) on page 10-18.
4. Create an Oracle Service Bus (OSB) outbound process.
For more information, see ["Creating an Oracle Service Bus \(OSB\) Outbound Process"](#) on page 10-18.

10.3.2.1 Associating Oracle WebLogic Server Credentials With EIS Credentials

To associate Oracle WebLogic Server credentials with EIS credentials:

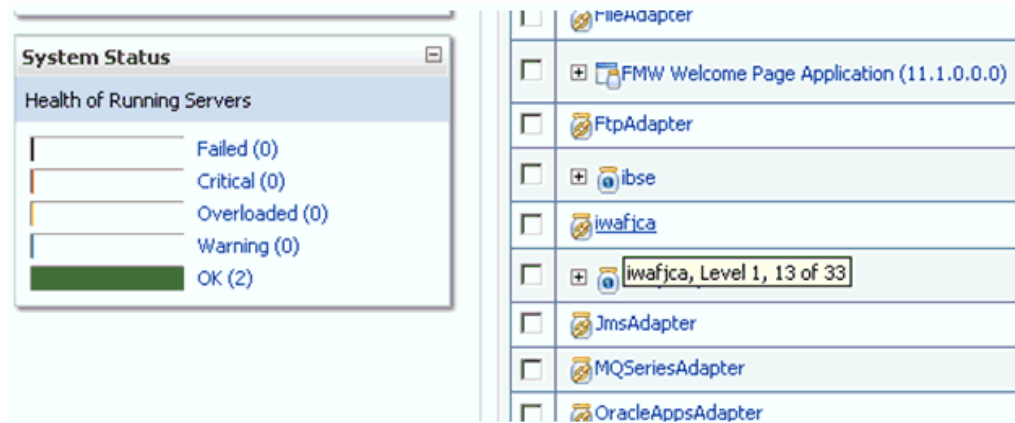
1. Log in to the Oracle WebLogic Server Administration Console.
2. In the Domain Structure section in the left pane, click **Deployments**, as shown in [Figure 10-14](#).

Figure 10-14 Domain Structure Section



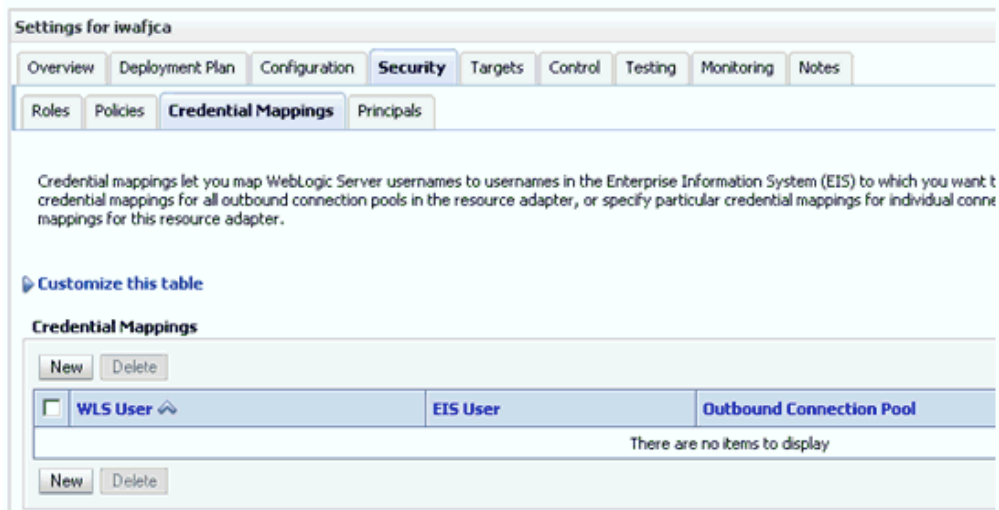
The Deployments page is displayed, as shown in [Figure 10-15](#).

Figure 10-15 Deployments Page



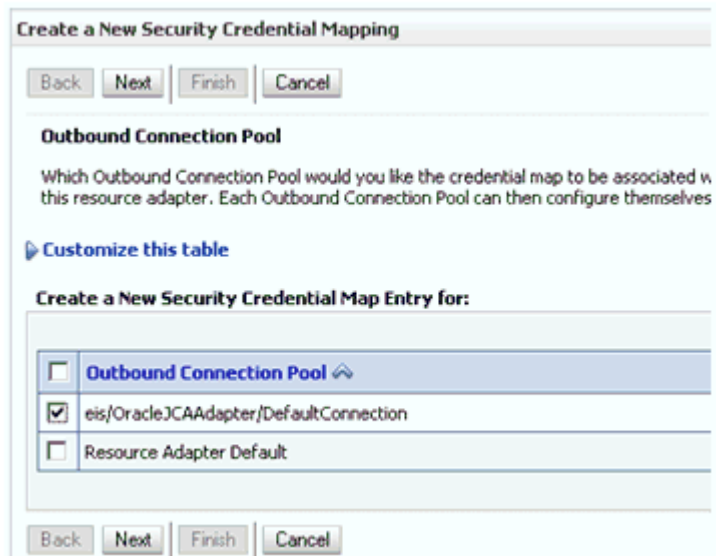
3. Click the **iwafjca** resource adapter.
The Settings for iwafjca page is displayed, as shown in [Figure 10–16](#).

Figure 10–16 Settings for iwafjca Page



4. Click the **Credential Mappings** tab under the Security tab, and then click **New**.
The Create a New Security Credential Mapping page is displayed, as shown in [Figure 10–17](#).

Figure 10–17 Create a New Security Credential Mapping Page



5. Select the outbound connection pool.
For example:
`eis/OracleJCAAdapter/DefaultConnection`
6. Click **Next**.
The WebLogic Server User page is displayed, as shown in [Figure 10–18](#).

Figure 10–18 WebLogic Server User Page

7. Select **Configured User Name**, enter a valid Oracle WebLogic Server user name, and then click **Next**.

The EIS User Name and Password page is displayed, as shown in [Figure 10–19](#).

Figure 10–19 EIS User Name and Password Page

8. Enter the user name and password for the EIS and click **Finish**.

The credentials for an Oracle WebLogic Server user are now mapped with an EIS user (SAP R/3). The mapping is invoked automatically before invoking the J2CA service.

10.3.2.2 Generating a WSDL File

To generate a WSDL file:

1. Set the class path for Application Explorer to integrate with Oracle Service Bus (OSB).

For more information, see ["Setting the Class Path for Application Explorer to Integrate With Oracle Service Bus"](#) on page 9-5.

2. Open Application Explorer and create a J2CA configuration.

For more information, see ["Creating a Configuration for J2CA"](#) on page 4-3.

3. Create a target for the SAP R/3 adapter and then connect to the target.

For more information, see ["Establishing a Connection \(Target\) for SAP R/3"](#) on page 4-5.

4. Publish a WSDL to OSB for the appropriate object (for example, the GetDetail BAPI for the CompanyCode business object).

For more information, see ["Publishing a WSDL From Application Explorer to Oracle Service Bus"](#) on page 9-5.

10.3.2.3 Creating an Oracle Service Bus (OSB) Outbound Process

To create an Oracle Service Bus (OSB) outbound process with credential mapping functionality:

1. Start Oracle Service Bus and create project folders.

For more information, see ["Starting Oracle Service Bus and Creating Project Folders"](#) on page 9-2.

2. Configure a File type Business Service.

For more information, see ["Configuring a File Type Business Service"](#) on page 9-9.

3. Configure a Business Service.

For more information, see ["Configuring a WSDL-based Business Service"](#) on page 9-7.

4. Configure a Proxy Service.

For more information, see ["Configuring a Proxy Service"](#) on page 9-13.

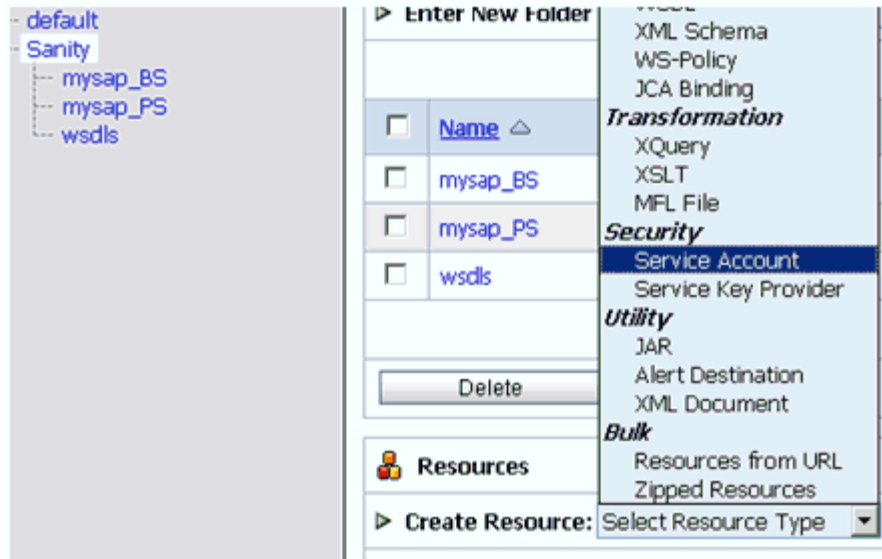
5. Configure a Pipeline.

For more information, see ["Configuring a Pipeline"](#) on page 9-17.

6. Configure a Service account by selecting the created folder in the left pane.

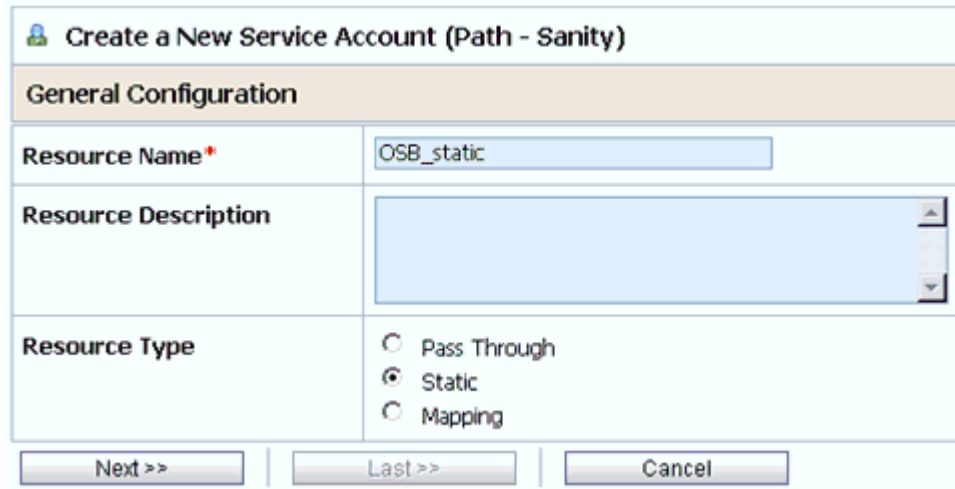
In the right pane, select **Service Account** from the Create Resource list, as shown in [Figure 10-20](#).

Figure 10–20 Select Service Account Option



The Create a New Service Account page is displayed, as shown in [Figure 10–21](#).

Figure 10–21 General Configuration Page



7. Provide a name for the resource and select **Static** as the resource type.
8. Click Next.

The Static User Configuration page is displayed, as shown in [Figure 10–22](#).

Figure 10–22 Static User Configuration Page

Create a New Service Account (Path - Sanity)	
Static User Configuration	
User Name*	weblogic
Password*	*****
Confirm Password*	*****
<input type="button" value=" << Prev. "/> <input type="button" value=" Last >> "/> <input type="button" value=" Cancel "/> 	

9. Provide a valid user name and password for Oracle WebLogic Server, and then click **Last**.

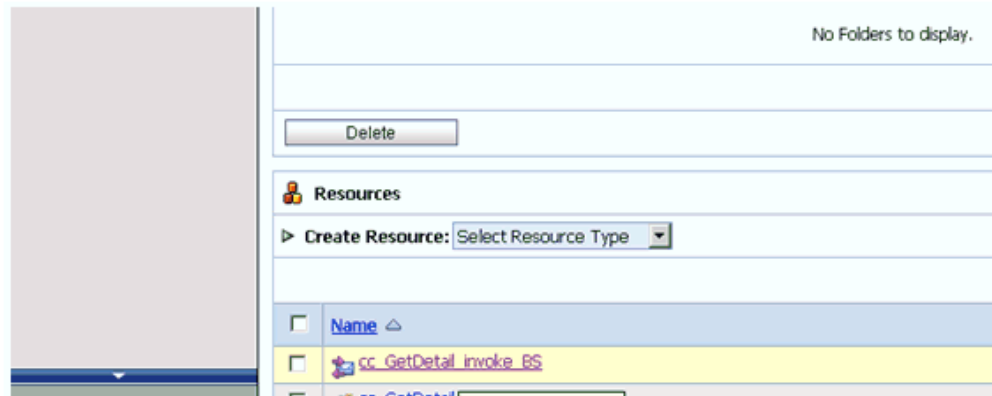
The Summary page is displayed, as shown in [Figure 10–23](#).

Figure 10–23 Summary Page

Create New Service Account - Summary [Path -Sanity]	
General Configuration	
Name	OSB_static
Description	
Type	Static
Static Credentials	
User Name	weblogic
Password	*****
<input type="button" value=" << Prev. "/> <input type="button" value=" Save "/> <input type="button" value=" Cancel "/> 	

10. Review the information and click **Save**.
11. In the left pane, select the Business Service that was created while publishing the WSDL, as shown in [Figure 10–24](#).

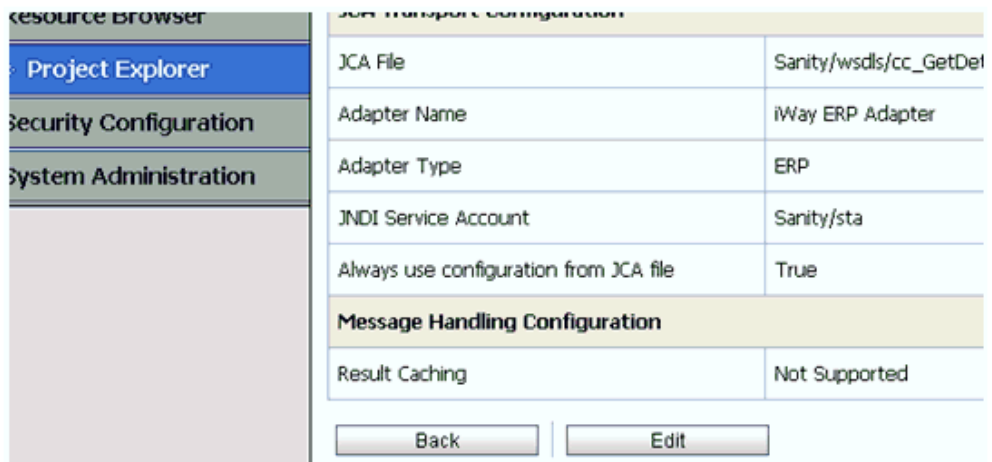
Figure 10–24 Select the Business Service



For more information, see "Configuring a WSDL-based Business Service" on page 9-7.

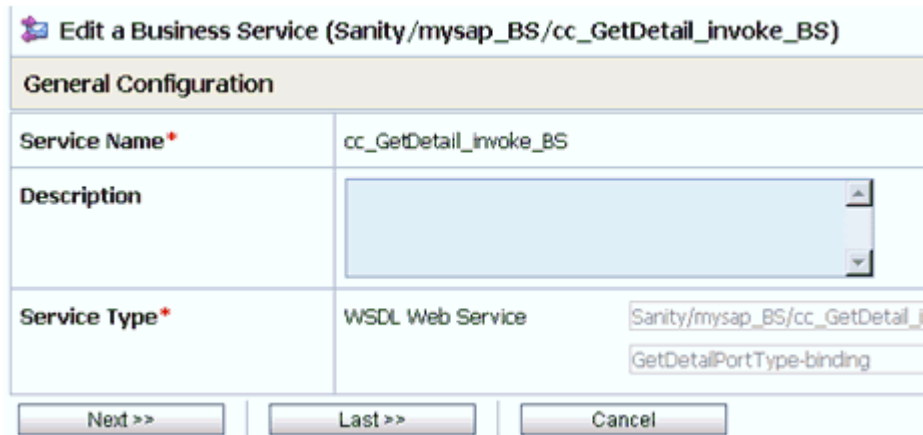
12. Click **Edit** to edit the process, as shown in [Figure 10–25](#).

Figure 10–25 Edit Option



The General Configuration page is displayed, as shown in [Figure 10–26](#).

Figure 10–26 General Configuration Page



13. Click Next.

The Transport Configuration page is displayed, as shown in [Figure 10–27](#).

Figure 10–27 Transport Configuration Page

Protocol*	jca
Load Balancing Algorithm	round-robin
Endpoint URI*	<p>Format: jca://<resource_adapter_<_jndi></p> <p>jca://</p> <p>EXISTING URIS</p> <p>jca://eis/OracleJCAAdapter/DefaultConnection</p>
Retry Count	0
Retry Iteration Interval	30
Retry Application Errors	<input checked="" type="radio"/> Yes <input type="radio"/> No
<p><< Prev. Next >> Last >> Cancel</p>	

14. Click Next.

The JCA Transport Configuration page is displayed, as shown in [Figure 10–28](#).

Figure 10–28 JCA Transport Configuration Page

JCA Transport Configuration		
JCA File	Sanity/wsdls/cc_GetDetail_invoke	
Adapter Name	jWay ERP Adapter	
Adapter Type	ERP	
Dispatch Policy	default	
JNDI Service Account	Sanity/sta	
EndPoint Properties	PROPERTY	VALUE
		ACTI

15. Browse the JNDI service account that was created and click **Last**.

The Summary page is displayed, as shown in [Figure 10–29](#).

Figure 10–29 Summary Page

JCA Transport Configuration	
JCA File	Sanity/wsdl/cc_GetDetail_invoke
Adapter Name	iWay ERP Adapter
Adapter Type	ERP
JNDI Service Account	Sanity/sta
Always use configuration from JCA file	True
Message Handling Configuration	
Result Caching	Not Supported
<input style="margin-right: 10px;" type="button" value=" << Prev. "/> <input style="margin-right: 10px;" type="button" value=" Save "/> <input style="margin-right: 10px;" type="button" value=" Cancel "/>	

16. Review the information and click **Save**.
17. Check if the success message is displayed and click **Activate** in the Change Center, as shown in [Figure 10–30](#).

Figure 10–30 Success Message

The screenshot shows the 'weblogic session' management window. On the left, there are options: 'No Conflicts', 'View Changes', and 'View All Sessions', along with 'Activate', 'Discard', and 'Exit' buttons. The main area displays a success message: 'The Service "cc_GetDetail_invoke_BS" was u...'. Below this, the session details for 'Sanity/mysap_BS' are shown, including 'References: 3 Ref(s)' and 'Referenced By: 2 Ref(s)'. A 'Project Explorer' pane on the left shows a tree structure with 'projects', 'dchunter', and 'default'.

The Activate Session page is displayed, as shown in [Figure 10–31](#).

Figure 10–31 Activate Session Page

Session Name	weblogic
User	weblogic
Description	
<input type="button" value="Submit"/>	

18. Click **Submit**.
19. Copy and paste a valid input XML file in the input folder you configured and check to see that the output is received in the configured output location.
20. Check the J2CA log files and locate the encrypted password, which shows that the user credentials have been passed to the EIS through Oracle WebLogic Server.

For example:

```

FINEST IWAFManagedConnectionFactory com.ibi.afjca.Util
getPasswordCredential(78) InLoop:
User-iwayqa:Password-ENCR(3189321331831132502333215312132323192322731773156)
Tue FINEST IWAFManagedConnectionFactory com.ibi.afjca.Util
getPasswordCredential(90) Use the system PasswordCredential:
User-iwayqa:Password-ENCR(3189321331831132502333215312132323192322731773156)
    
```

Troubleshooting and Error Messages

This chapter explains the limitations and workarounds when connecting to SAP R/3. It contains the following topics:

- [Section 11.1, "Troubleshooting"](#)
- [Section 11.2, "BSE Error Messages"](#)

The adapter-specific errors listed in this chapter can arise whether using the adapter with an Oracle Adapter J2CA or with an Oracle Adapter Business Services Engine (BSE) configuration.

11.1 Troubleshooting

This topic provides troubleshooting information for SAP R/3, separated into four categories:

- Application Explorer
- SAP R/3
- Oracle Adapter J2CA
- Oracle Adapter Business Services Engine (BSE)

Log file information that can be relevant in troubleshooting can be found in the following locations based on your adapter installation:

- The Oracle Adapter J2CA trace information can be found under the following directory:

For Oracle SOA Suite:

```
<ORACLE_HOME>\soa\thirdparty\ApplicationAdapters\config\configuration_name\log
```

For OSB:

```
<OSB_HOME>\Oracle_OSB1\3rdparty\ApplicationAdapters\config\configuration_name\log
```

- BSE trace information can be found under the following directory:

```
<ADAPTER_HOME>\user_projects\domains\base_domain\servers\soa_server1\stage\ibse\ibse.war\ibselogs
```

- The log file for Application Explorer can be found under the following directory:

For Oracle SOA Suite:

```
<ORACLE_HOME>\soa\thirdparty\ApplicationAdapters\tools\iwaeb\bin
```

For OSB:

<OSB_HOME>\Oracle_OSB1\3rdparty\ApplicationAdapters\tools\iwaeb\bin

Application Explorer

This topic discusses the different types of errors that can occur when using Application Explorer.

Error	Solution
SAP R/3 does not appear in the Application Explorer Adapter node list.	Ensure that the <code>sapjco3.jar</code> and <code>sapjco3.dll</code> files are added to the <code>lib</code> directory.
Cannot connect to Oracle Application Adapter for SAP R/3 from Application Explorer. Problem activating adapter	Ensure that: <ul style="list-style-type: none"> ■ SAP R/3 is running. ■ The Application Server name, System Number, and Client Number are correct. ■ The SAP R/3 user ID and password are correct.
Cannot connect to the SAP R/3 target through Application Explorer. The following error message appears: Error getting target [SAP] - java.lang.Exception: Error Logon to SAP System	Ensure that you enter the correct connection parameters when connecting to the SAP R/3 target.
Cannot connect to your SAP R/3 system through Application Explorer. The following error message appears: Problem activating adapter. (com.ibi.sapr3.SapAdapterException : com.sap.mw.jco.JCO\$Exception: (102) RFC_ERROR_COMMUNICATION: Connect to SAP gateway failed Connect_PM GWHOST=isdsvr8, GWSERV=sapgw00, ASHOST=isdsvr8, SYSNR=00 LOCATION CPIC (TCP/IP) on local host ERROR partner not reached (host isdsvr8, service 3300) TIME Fri Aug 27 11:49:14 2004 RELEASE 620 COMPONENT NI (network interface) VERSION 36 RC -10 MODULE ninti.c LINE 979 DETAIL NiPConnect2 SYSTEM CALL SO_ERROR ERRNO 10061 ERRNO TEXT WSAECONNREFUSED: Connection refused COUNTER 1). Check logs for more information	Ensure that SAP R/3 is running and that you are using the correct parameter values to connect to your application server.

Error	Solution
<p>Cannot connect to your SAP R/3 system through Application Explorer even though SAP R/3 is running. The following error message appears:</p>	<p>Ensure that the <code>sapjco3.dll</code> file is added to the lib directory and to the Windows system32 folder.</p>
<pre>Problem activating adapter. (com.ibi.sapr3.SapAdapterException : java.lang.ExceptionInInitializerEr ror: JCO.classInitialize(): Could not load middleware layer 'com.sap.mw.jco.rfc.MiddlewareRFC' JCO.nativeInit(): Could not initialize dynamic link library sapjco3 [no sapjco3 in java.library.path]. java.library.path</pre>	<p>Add <code>sapjco3.jar</code> to the server classpath.</p>
<p>The dll is loaded in another classloader (BSE and J2CA are installed on the same server). The following error message appears:</p> <pre>com.ibi.sapr3.SapAdapterException: java.lang.ExceptionInInitializerEr ror: JCO.classInitialize(): Could not load middleware layer 'com.sap.mw.jco.rfc.MiddlewareRFC' JCO.nativeInit(): Could not initialize dynamic link library sapjco3 [Native Library F:\iWay55.008.0628\lib\sapjco3.dll loaded in another classloader]. java.library.path</pre>	
<p>Unable to start Application Explorer in a Solaris environment. The following exception is thrown in the console:</p> <pre>javax.resource.ResourceException: IWAFFManagedConnectionFactory: License violation.at com.ibi.afjca.spi.IWAFFManagedConne ctionFactory.createConnectionFacto ry(IWAFFManagedConnectionFactory.ja va:98)at com.iwaysoftware.iwae.common.JCATr ansport.getConnectionFactory(JCATr ansport.java:133) at com.iwaysoftware.iwae.common.JCATr ansport.initJCA(JCATransport.java: 69)at com.iwaysoftware.iwae.common.JCATr ansport.<init>(JCATransport.java:6 2)at com.iwaysoftware.iwae.common.Adapt erClient.<init>(AdapterClient.java :85)at com.ibi.bse.ConfigWorker.run(Config Worker.java:41) at java.lang.Thread.run(Thread.java:5 34) Could not create the connection factory.</pre>	<p>JAVACMD is not set on the user system. Before starting Application Explorer, export JAVACMD as follows:</p> <p>JAVACMD=/<jdk_home>/bin/java, where <jdk_home> is the directory where JDK is installed on your system.</p>

Error	Solution
Logon failure error at run-time	If the password for connecting to your SAP R/3 system is not specified when creating a target or with the Edit option in Application Explorer, then you are unable to connect to SAP R/3. The connection password is not saved in <code>repository.xml</code> . Update the password using the Edit option in Application Explorer, then restart the application server.
<p>The following exception occurs when you start Application Explorer by activating <code>ae.bat</code> (not <code>iaexplorer.bat</code>):</p> <pre>java.lang.ClassNotFoundException: org.bouncycastle.jce.provider.BouncycastleProvider</pre>	<p>This is a benign exception. It does not affect adapter functionality. Download BouncyCastle files from:</p> <p><code>ftp://ftp.bouncycastle.org/pub</code></p>

SAP R/3

Error	Solution
<p>When executing a request, the following error message appears:</p> <pre>AdapterException: java.lang.Exception: Function module CUSTOMER_GETDETAIL2 does NOT exist.</pre>	Check the syntax of your input XML document and make sure the name of the Remote Function module is correct, available in SAP R/3, and activated.
<p>When executing a request, the following error message appears:</p> <pre>AdapterException: java.lang.Exception: Object type unknown for business object: CUST</pre>	Check the syntax of your input XML document and verify that the Business Object type exists in SAP R/3 and is correct and activated. Also verify that the name of your document is correct.
<p>When executing a request, the following error message appears:</p> <pre>AdapterException: java.lang.Exception: Unable to retrieve BAPI name for: CUSTOMER.DETAIL2</pre>	Check the syntax of your input XML document and verify that the name of the BAPI is correct, available in SAP R/3, and activated.
<p>When executing a request, the following error message appears:</p> <pre>java.lang.RuntimeException: com.sap.mw.jco.JCO\$AbapException: (126) OBJECT_UNKNOWN: Basic type or extension does not exist.</pre>	Check the syntax of your input XML document and verify that the IDoc type or extension type is correct, available in SAP R/3, and activated.
<p>When executing a request, the following error message appears:</p> <pre>AdapterException: java.lang.Exception: BapiError/BapiAbort: You are not authorized to display customers.</pre>	Verify that your user ID has the correct permissions configured in SAP R/3. Consult your SAP R/3 administrator for more information.

Note: Activation is an important SAP concept. If an object does not exist in an activated state, it may appear as present on the system, but is not available for use. This is especially important for IDOCs and SAP Business Objects. Consult your SAP documentation for further information.

Oracle Adapter J2CA

Error	Solution
In Application Explorer, the following error message appears when you attempt to connect to an Oracle Adapter J2CA configuration: Could not initialize JCA	In the Details tab in the right pane, ensure that the directory specified in the Home field points to the correct directory, for example: <code><ADAPTER_HOME>\soa\thirdparty\ApplicationAdapters\tools\iwaeb\bin\..\..\..\</code>

11.2 BSE Error Messages

This topic discusses the different types of errors that can occur when processing Web services through BSE.

11.2.1 General Error Handling in BSE

BSE serves as both a SOAP gateway into the adapter framework and as the engine for the adapters. In both design-time and run-time, various conditions can cause errors in BSE when Web services that use adapters run. These conditions and resulting errors are exposed the same way, regardless of the specific adapter; others are exposed differently, based on the adapter being used. This topic explains what you can expect if you encounter the more common error conditions on an adapter-specific basis. Usually the SOAP gateway (**agent**) inside BSE passes a SOAP request message to the adapter required for the Web service. If an error occurs, then how it is exposed depends on the adapter and the API or interfaces that the adapter uses. A few scenarios cause the SOAP gateway to generate a SOAP fault. In general, anytime the SOAP agent inside BSE receives an invalid SOAP request, a SOAP fault element is generated in the SOAP response. The SOAP fault element contains fault string and fault code elements. The fault code contains a description of the SOAP agent error.

The following SOAP response document results when BSE receives an invalid SOAP request:

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
  <SOAP-ENV:Body>
    <SOAP-ENV:Fault>
      <faultcode>SOAP-ENV:Client</faultcode>
      <faultstring>Parameter node is missing</faultstring>
    </SOAP-ENV:Fault>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

In this example, BSE did not receive an element in the SOAP request message that is mandatory for the WSDL for this Web service.

11.2.2 Adapter-Specific Error Handling

When an adapter raises an exception during run-time, the SOAP agent in BSE 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 in BSE and that request is invalid based on the WSDL for that service, then the adapter may raise an exception yielding a SOAP fault. While it is almost impossible to anticipate every error condition that an adapter may encounter, the following is a description of how adapters handle common error conditions and how they are then exposed to the Web services consumer application.

Oracle Application Adapter for SAP R/3 Invalid SOAP Request

If Oracle Application Adapter for SAP R/3 receives a SOAP request message that does not conform to the WSDL for the Web services being carried out, then the following SOAP response is generated.

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
<SOAP-ENV:Fault>
  <faultcode>SOAP-ENV:Server</faultcode>
  <faultstring>Error processing agent [XDSapIfrAgent] - XD[FAIL] SapIFRException:
java.sql.SQLException:
com.ibi.sapjco3.SapCallableStatement: execute() j
java.util.NoSuchElementException</faultstring>
  </SOAP-ENV:Fault>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

Empty Result From SOAP Request

If Oracle Application Adapter for SAP R/3 carries out an SAP R/3 object using input parameters passed in the SOAP request message that do not match records in SAP R/3, then the following SOAP response is generated.

```
<?xml version="
1.0" encoding="ISO-8859-1" ?>
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
<SOAP-ENV:Fault>
  <faultcode>SOAP-ENV:Server</faultcode>
  <faultstring>Error processing agent [XDSapIfrAgent] - XD[FAIL] SapIFRException:
java.sql.SQLException: com.ibi.sapjco3.SapCallableStatement: execute()
java.sql.SQLException: JCO Error Key: NO_RECORD_FOUND Short Description:
com.sap.mw.jco.JCO$AbapException: (126) NO_RECORD_FOUND: NO_RECORD_
FOUND</faultstring>
  </SOAP-ENV:Fault>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

Failure to Connect to SAP R/3

If Oracle Application Adapter for SAP R/3 cannot connect to SAP R/3 when executing a Web service, then the following SOAP response is generated:

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
```

```

<SOAP-ENV:Body>
  <SOAP-ENV:Fault>
    <faultcode>SOAP-ENV:Server</faultcode>
    <faultstring>Error processing agent [XDSapIfrAgent] - XD[RETRY]
Connect to SAP gateway failed Connect_PM GWHOST=ESDSUN, GWSERV=sapgw00,
ASHOST=ESDSUN,
SYSNR=00 LOCATION CPIC (TCP/IP) on local host ERROR partner not reached (host
ESDSUN, service 3300)
TIME Mon Jun 30 16:01:02 2003 RELEASE 620 COMPONENT NI (network interface) VERSION
36 RC -10 MODULE ninti.c LINE 976 DETAIL NipConnect2
SYSTEM CALL SO_ERROR ERRNO 10061 ERRNO TEXT WSAECONNREFUSED: Connection refused
COUNTER 1</faultstring>
  </SOAP-ENV:Fault>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>

```

Invalid SOAP Request

If Oracle Application Adapter for SAP R/3 receives a SOAP request message that does not conform to the WSDL for the Web services being carried out, then the following SOAP response is generated.

```

<?xml version="1.0" encoding="ISO-8859-1"
  ?>
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
  <SOAP-ENV:Fault>
    <faultcode>SOAP-ENV:Server</faultcode>
    <faultstring>RPC server connection failed: Connection refused:
connect</faultstring>
  </SOAP-ENV:Fault>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>

```

Empty Result From Oracle Application Adapter for SAP R/3 Request

If Oracle Application Adapter for SAP R/3 carries out a SOAP request using input parameters passed that do not match records in the target system, then the following SOAP response is generated.

Note: The condition for this adapter does not yield a SOAP fault.

```

<SOAP-ENV:Envelope xmlns:xsi="http://www.w3.org/1999/XMLSchema-instance"
xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsd="http://www.w3.org/1999/XMLSchema">
  <SOAP-ENV:Body>
    <m:RunDBQueryResponse xmlns:m="urn:schemas-iwaysoftware-com:iwse"
xmlns="urn:schemas-iwaysoftware-com:iwse"
      cid="2A3CB42703EB20203F91951B89F3C5AF">
      <RunDBQueryResult run="1" />
    </m:RunDBQueryResponse>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>

```

Advanced User Tools

This chapter contains the following topics:

- [Section 12.1, "Web Services Policy-Based Security"](#)
- [Section 12.2, "Migrating Repositories"](#)

12.1 Web Services Policy-Based Security

Application Explorer provides a security model called Web services policy-based security. The following topics describe how the feature works and how to configure it.

Web services provide a layer of abstraction between the back-end business logic and the user or application running the Web service, which enables easy application integration. However, the issue of controlling the use and implementation of critical and sensitive business logic that is run as a Web service is raised.

Application Explorer controls the use of Web services that use adapters, using a feature called policy-based security. This feature enables an administrator to apply "policies" to Business Services (Web services) to deny or permit their execution.

A policy is a set of privileges dealing with the execution of a Business Service (BS) that can be applied to an existing or new BS. When you set specific rights or privileges inside a policy, you do not have to re-create privileges for every BS that has security concerns in common with other Business Services. Instead, you reuse a policy on multiple Business Services.

The goal of the feature is to secure requests at both the transport and the SOAP request level transmitted on the wire. Some of the policies do not deal with security issues directly, but do affect the run-time behavior of the Web services to which they have been applied.

The Business Services administrator creates an "instance" of a policy type, names it, associates individual users or groups (a collection of users), and then applies that policy to one or more Business Services.

You can assign a policy to a Business Service, or to a method within a Business Service. If a policy is only applied to a method, then other methods in that Business Service are not governed by it. However, if a policy is applied to the Business Service, all methods are governed by it. At run-time, the user ID and password that are sent to BSE in the SOAP request message are verified against the list of users for all policies applied to that specific Business Service. The policy type that is supported is Resource Execution, which dictates who can or cannot perform the Business Service.

When a policy is not applied, the default value for a Business Service is to "grant all". For example, anybody can run the Business Service, until the Resource Execution policy is associated to the Business Service. At that time, only those granted execution

permissions, or users not part of the group that has been denied execution permissions, have access to the Business Service.

12.1.1 Configuring Web Services Policy-Based Security

The following procedures describe how to configure Web services policy-based security.

Creating and Associating a User with a Policy

Before you create instances of policies, you must have a minimum of one user or one group to associate to an instance. You can create users and groups using Application Explorer.

1. Open Application Explorer.
2. Right-click the configuration to which you want to connect, for example, `SampleConfig`. For information on creating a new configuration, see [Chapter 4, "Configuring Oracle Application Adapter for SAP R/3"](#).
3. Select **Connect**.

Nodes appear for Adapters and Business Services (also known as Web services), as shown in [Figure 12-1](#).

Figure 12-1 Adapters and Business Services Nodes



Perform the following steps:

- a. Expand the **Business Services** node.
- b. Expand the **Configuration** node.
- c. Expand the **Security** node.
- d. Expand the **Users and Groups** node, as shown in [Figure 12-2](#).

Figure 12-2 Users and Groups Node



4. Right-click **Users** and click **New User**.

The New User dialog is displayed, as shown in [Figure 12-3](#).

Figure 12–3 New User Dialog

Provide the following information:

- a. In the **Name** field, enter a user ID.
 - b. In the **Password** field, enter the password associated with the user ID.
 - c. In the **Description** field, enter a description of the user (optional).
5. Click **OK**.

Figure 12–4 New User

The new user is added under the Users node, as shown in [Figure 12–4](#).

Creating a Group to Use With a Policy

To create a group to use with a policy:

1. Open Application Explorer.
2. Right-click the configuration to which you want to connect, for example, SampleConfig. For information on creating a new configuration, see [Chapter 4, "Configuring Oracle Application Adapter for SAP R/3"](#).
3. Select **Connect**.

Nodes appear for Adapters and Business Services (also known as Web services), as shown in [Figure 12–5](#).

Figure 12–5 Adapters and Business Services Nodes

Perform the following steps:

- a. Expand the **Business Services** node.

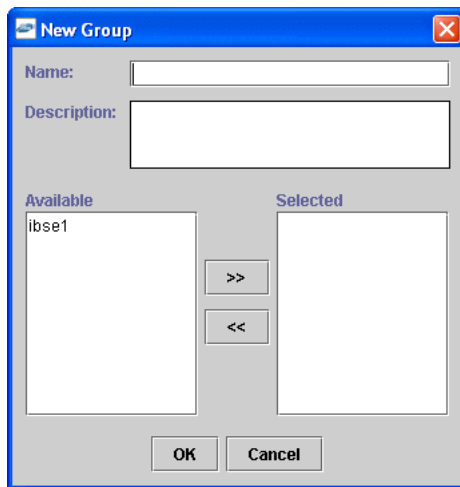
- b. Expand the **Configuration** node.
 - c. Expand the **Security** node.
 - d. Expand the **Users and Groups** node.
4. Right-click **Groups** and select **New Group**, as shown in [Figure 12–6](#).

Figure 12–6 New Group



The New Group dialog is displayed, as shown in [Figure 12–7](#).

Figure 12–7 New Group Dialog



Provide the following information:

- a. In the Name field, enter a name for the group.
 - b. In the Description field, enter a description for the group (optional).
 - c. From the available list of users in the left pane, select one or more users and add them to the Selected list by clicking the double right-facing arrow.
5. When you have selected at least one user, click **OK**.

The new group is added under the Group node.

Creating an Execution Policy

An execution policy governs who can run the Business Services to which the policy is applied.

To create an execution policy:

1. Open Application Explorer.
2. Right-click the configuration to which you want to connect, for example, SampleConfig. For information on creating a new configuration, see [Chapter 4, "Configuring Oracle Application Adapter for SAP R/3"](#).

3. Select **Connect**.

Nodes appear for Adapters and Business Services (also known as Web services), as shown in [Figure 12-8](#).

Figure 12-8 Adapters and Business Services Nodes



Perform the following steps:

- a. Expand the **Business Services** node.
- b. Expand the **Configuration** node.
- c. Expand the **Security** node.
- d. Expand the **Policies** node.

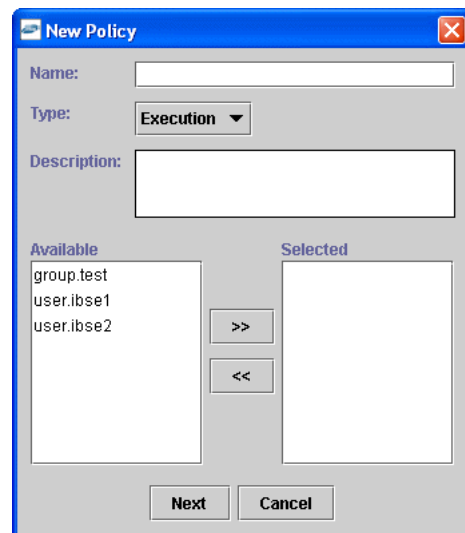
4. Right-click **Policies** and select **New Policy**, as shown in [Figure 12-9](#).

Figure 12-9 New Policy Option



The New policy dialog is displayed, as shown in [Figure 12-10](#).

Figure 12-10 New Policy Dialog



Provide the following information:

- a. In the Name field, enter a name for the policy.

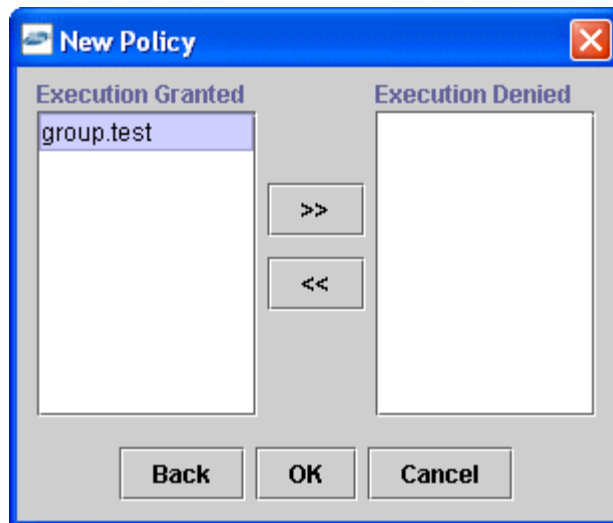
- b. From the Type list, select **Execution**.
- c. In the Description field, enter a description for the policy (optional).
- d. From the available list of users in the left pane, select one or more users and add them to the Selected list by clicking the double right-facing arrow.

Note: This user ID is verified against the value in the user ID element of the SOAP header sent to BSE in a SOAP request.

5. When you have selected at least one user selected, click **OK**.
6. Click **Next**.

The New Policy permissions dialog is displayed, as shown in [Figure 12–11](#).

Figure 12–11 *New Policy Permissions Dialog*



- To grant permission to a user or group to run a Business Service, select the user or group and move them into the Execution Granted list by selecting the double left-facing arrow.
 - To deny permission to a user or group to run a Business Service, select the user or group and move them into the Execution Denied list by selecting the double right-facing arrow.
7. Click **OK**.

A pane is displayed to summarize your configuration, as shown in [Figure 12–12](#).

Figure 12–12 Configuration Summary

- **Name** test
- **Type** Execution
- **Description**
- **User and Group Restrictions**
 - group.test Execution Granted

Using the IP and Domain Restrictions Policy Type

You configure the IP and Domain Restriction policy type slightly differently from other policy types. The IP and Domain Restriction policy type controls connection access to BSE and therefore need not be applied to individual Web services. You need not create a policy; however, you must enable the Security Policy option in Application Explorer.

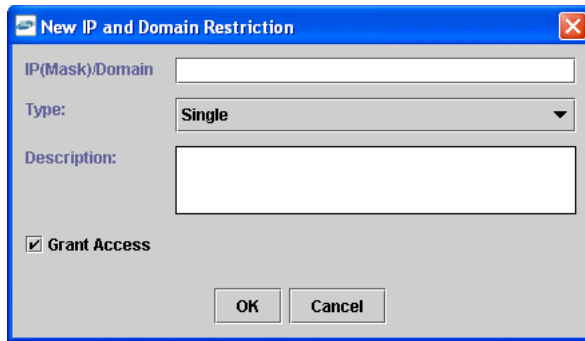
1. Open Application Explorer.
2. Right-click the configuration to which you want to connect, for example, SampleConfig. For information on creating a new configuration, see [Chapter 4, "Configuring Oracle Application Adapter for SAP R/3"](#).
3. Select **Connect**.

Nodes appear for Adapters and Business Services (also known as Web services).

 - a. Expand the **Business Services** node.
 - b. Expand the **Configuration** node.
 - c. Expand the **Security** node.
4. Right-click **IP and Domain** and select **New IP and Domain Restriction**, as shown in [Figure 12–13](#).

Figure 12–13 New IP and Domain Restriction Option

The New IP and Domain Restriction dialog is displayed, as shown in [Figure 12–14](#).

Figure 12–14 New IP and Domain Restriction Dialog

Provide the following information:

- a. In the IP(Mask)/Domain field, enter the IP or domain name using the following guidelines.
 - If you select Single (Computer) from the Type list, then you must provide the IP address for that computer. If you only know the DNS name for the computer, then click DNS Lookup to obtain the IP Address based on the DNS name.
 - If you select Group (of Computers), then you must provide the IP address and subnet mask for the computer group.
 - If you select Domain, then you must provide the domain name.
 - b. From the Type list, select the type of restriction.
 - c. In the Description field, enter a description (optional).
 - d. To grant access, select the **Grant Access** check box.
5. Click **OK**.

The new domain is added under the IP and Domain node.

A pane is displayed to summarize your configuration, as shown in [Figure 12–15](#).

Figure 12–15 Configuration Summary

- **IP Address (Mask) /Domain** www.yahoo.com
- **Type** Domain
- **Access** Denied
- **Description**

12.2 Migrating Repositories

During design time, the Oracle repository is used to store metadata created when using Application Explorer to configure adapter connections, browse EIS objects, configure services, and configure listeners to listen for EIS events. The information in the repository is also referenced at run-time. For management purposes, you can migrate BSE and J2CA repositories that are configured for Oracle to new destinations without affecting your existing configuration. For example, you may want to migrate a repository from a test environment to a production environment.

Migrating a BSE Repository

To migrate a BSE repository:

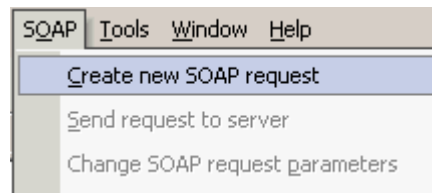
1. Copy the BSE control service URL, for example:

```
http://localhost:8001/ibse/IBSEServlet/admin/iwcontrol.ibs
```

2. Open a third-party XML editor, for example, XMLSPY.
3. From the menu bar, click **SOAP**.

A list of options appears, as shown in [Figure 12-16](#).

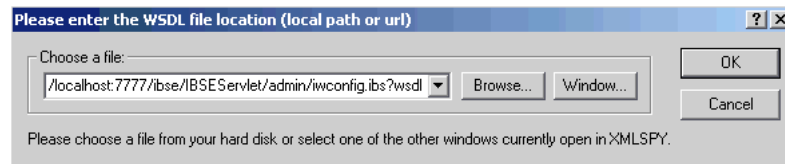
Figure 12-16 SOAP Menu



4. Select **Create new SOAP request**.

The WSDL file location dialog is displayed, as shown in [Figure 12-17](#).

Figure 12-17 WSDL File Location Dialog



Perform the following steps:

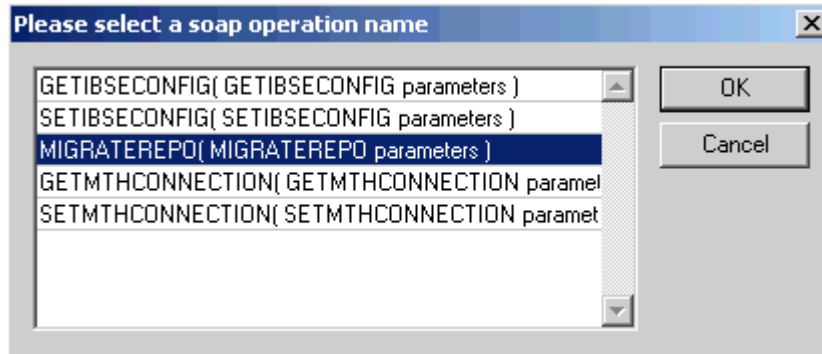
- a. In the Choose a file field, paste the BSE control service URL.
- b. Append ?wsdl to the URL, for example:

```
http://localhost:8001/ibse/IBSEServlet/admin/iwcontrol.ibs?wsdl
```

5. Click **OK**.

The soap operation name dialog is displayed and the available control methods are listed, as shown in [Figure 12-18](#).

Figure 12–18 Soap Operation Name Dialog

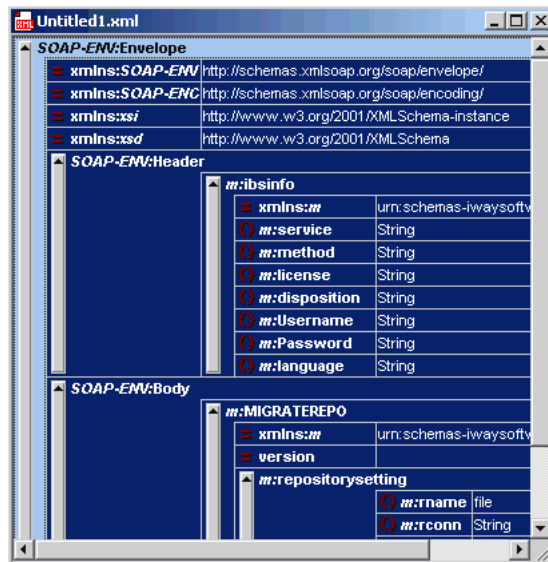


6. Select the MIGRATEREPO(MIGRATEREPO parameters) control method and click OK.

Note: The MIGRATEREPO(MIGRATEREPO parameters) control method is available from the BSE administration console. This control method migrates all Web services to the new (empty) repository. You can choose to migrate select Web services only.

The structure of the SOAP envelope is displayed, as shown in [Figure 12–19](#).

Figure 12–19 SOAP Envelope



7. Locate the Text view icon in the toolbar, as shown in [Figure 12–20](#).

Figure 12–20 Text View Icon



8. To display the structure of the SOAP envelope as text, click **Text view**.

The `<SOAP-ENV:Header>` tag is not required and can be deleted from the SOAP envelope.

9. Locate the following section:

```
<m:MIGRATEREPO xmlns:m="urn:schemas-iwaysoftware-com:jul2003:ibse:config"
version=" ">
  <m:repositorysetting>
    <m:rname>oracle</m:rname>
    <m:rconn>String</m:rconn>
    <m:rdriver>String</m:rdriver>
    <m:ruser>String</m:ruser>
    <m:rpwd>String</m:rpwd>
  </m:repositorysetting>
  <m:servicename>String</m:servicename>
</m:MIGRATEREPO>
```

Perform the following steps:

- a. For the `<m:rconn>` tag, replace the String placeholder with a repository URL where you want to migrate your existing BSE repository.

The Oracle repository URL has the following format:

```
jdbc:oracle:thin:@[host]:[port]:[sid]
```

- b. For the `<m:rdriver>` tag, replace the String placeholder with the location of your Oracle driver.
- c. For the `<m:ruser>` tag, replace the String placeholder with a valid user name to access the Oracle repository.
- d. For the `<m:rpwd>` tag, replace the String placeholder with a valid password to access the Oracle repository.

10. Select and perform a migration option:

- If you want to migrate a single Web service from the current BSE repository, then enter the Web service name in the `<m:servicename>` tag, for example:

```
<m:servicename>SAPService1</m:servicename>
```

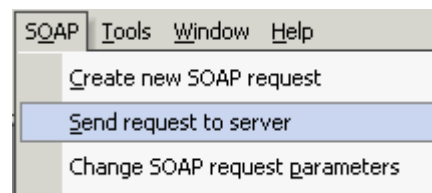
- If you want to migrate multiple Web services from the current BSE repository, then duplicate the `<m:servicename>` tag for each Web service, for example:

```
<m:servicename>SAPService1</m:servicename>
<m:servicename>SAPService2</m:servicename>
```

- If you want to migrate all Web services from the current BSE repository, then remove the `<m:servicename>` tag.

11. From the menu bar, click **SOAP and select **Send request to server**, as shown in [Figure 12-21](#).**

Figure 12-21 Send Request to Server Option



Your BSE repository and any Web services you specified are now migrated to the new Oracle repository URL you specified.

Migrating a J2CA Repository

To migrate a J2CA repository:

1. Navigate to the location of your J2CA configuration directory where the repository schemas and other information is stored, for example:

```
<ADAPTER_HOME>\soa\thirdparty\ApplicationAdapters\config\JCA_CONFIG
```

Where *JCA_CONFIG* is the name of your J2CA configuration.

2. Locate and copy the `repository.xml` file.
3. Place this file in a new J2CA configuration directory to migrate the existing repository.

Your J2CA repository is migrated to the new J2CA configuration directory.

Understanding the SAP System Role in Remote Processing

The Oracle Application Adapter for SAP R/3 exchanges messages with SAP using three different message type scenarios and two communication roles. Each role has configuration options that must be enabled on the SAP server and on the adapter to enable communications and send messages. This appendix explains the role types, message types, and their related terms. In an SAP Productive system environment, only the proper administrator for a particular configuration role has the authority to change or create the communications entries. This appendix provides a checklist for administrators for the required tasks and describes the entire process of configuring inbound and outbound message processing. This information can be used to configure non-productive systems or for reference purposes.

This appendix contains the following topics:

- [Section A.1, "Functionality of the Adapter"](#)
- [Section A.2, "SAP Inbound Message Processing"](#)
- [Section A.3, "SAP Outbound Message Processing"](#)

A.1 Functionality of the Adapter

Implementation of the Oracle Application Adapter for SAP R/3 uses the SAP Java Connector (JCo), a Java interface that communicates via Java Native Interface (JNI) to a native C communications layer. The RFC (Remote Function Call) API, implements the CPIC (Common Programming Interface - Communications) and TCP/IP protocols to communicate with a corresponding component on the SAP system. Each message is serialized to or from XML to RFC format, then marshaled into the current SAP message type for transmission to SAP. The SAP server unmarshalls the message into the current runtime object and executes the object. The response message is marshaled into RFC and returned to the adapter for unmarshalling and serialization to XML. This process is seamless and very rapid. Errors can arise from improper credentials, document encoding or actual application errors (for example, a wrong value for a given field).

A.1.1 Roles

The RFC protocol is a dynamic protocol depending on the mode of the request. When a request is inbound to a RFC connected node, the function of that node is a server to fill the request. When a request is outbound from a node, the function of that node is a client, waiting for a server to respond to the request. Outbound events, which need no response, are also processed by servers.

A.1.2 Client

The system instantiating a connection to another system is a client, and the client role processes request/response messages in a synchronous manner. A client system does not execute, but enables message processing. Messages begin and end on the client. The adapter functions as a client when it sends messages from Oracle to SAP.

Types of client connections include:

- Application Server, which connects to a single SAP application server.
- Message Server, which connects to an SAP logon load balancer message server for connection to a group of SAP application servers for distributed load processing.

Both connection types use a special type of connection called a Connection Pool, which is discussed later in this appendix.

Types of client message types include:

- BAPI messages, which are object-style messages with parameters as XML attributes.
- RFC messages, which are RFC-style messages with parameters as XML elements.
- Intermediate Documents (IDocs), which use the ALE message system to send positional delimited flat text or XML element parameters.

A.1.3 Server

The system receiving a connection request from another system is a server. A server executes message processing and returns results to a client. A server can reject a message request if it does not implement the processing for a given message with an exception for NOT_IMPLEMENTED. A server can process two types of messages:

- Inbound messages, which contain the message request and the parameters for the request.
- Synchronous messages, which take the inbound message request and either perform additional work, pass it to another system, or process it for additional processing before returning it to SAP.

The SAP application server waits for a synchronous message process to finish before continuing.

Types of server connections include:

- Processing Mode (Request), a simple receipt of message type and parameters.
- Response, which executes a synchronous process.

Types of server message types include:

- RFC messages, which are RPC-style messages with parameters as elements.
- Intermediate Documents (IDocs), which use the ALE message system to send positional delimited flat text or XML element parameters.

A.2 SAP Inbound Message Processing

Sending request / response (client) messages to an SAP system for Remote Function Call (RFC) or Business Application Interface (BAPI) objects requires a valid set of logon credentials. For more information on how to configure adapter targets, including the list of required parameters, see ["Identifying SAP R/3 Logon Parameters"](#)

on page 2-3. For the valid values for the adapter target, see your SAP system administrator.

Obtain the following values before initial logon:

- Valid SAP connection parameters.
- SAP Communications user (a SAP GUI DIALOG user is not recommended for security reasons).
- The correct SAP authorizations for the tasks the adapter is expected to perform.

SAP Authorizations

The proper SAP authorizations must be obtained before connecting to the server. It is a recommended SAP security practice to not allow RFC and DIAG access to the same user ID.

The basic authorization object used to secure RFC access is:

S_RFC: Secures the Function Group (located in authorization object class AAAB).

- *Authorization Object+S_RFC:*
 - *Authorization Field:* RFC_TYPE
 - *Authorization Value:* 'FUGR' is the only valid value.
 - *Authorization Field:* RFC_NAME
 - *Authorization Value:* The name of an activated function group. For example: ("ABCD") or '*'.
 - *Authorization Field:* ACTVT
 - *Authorization Value:* 16 (Execute) is the only valid value.

Individual function modules may have additional security inside their executable code. It is the requirement of the function developer or application creator to inform the users of the function or application of the authorization requirements to use the function or application. Consult the administrator to determine if there are additional authorizations required.

Individual tables may be secured from access by using the following authorization object:

S_TABU_DIS: Secures tables (located in authorization object class BC_A)

- *Authorization Object+S_TABU_DIS:*
 - *Authorization Field:* DICBERCLS: Or ("Authorization Group").
 - *Authorization Value:* For example, Table: MARA is in group "MA".
 - *Authorization Field:* ACTVT
 - *Authorization Value:* 03 (Display)

For a complete explanation on using this authorization object, see the SAP system documentation.

Once the correct credentials are specified for the adapter target and the correct authorizations are assembled on the SAP application system, the adapter is ready to be initialized.

Request / Response (Client) Messages

Business Object Repository

Use Application Explorer to expand the appropriate application tree branch, such as *Financial Accounting*, and then navigate to and expand a Business Object, such as *Company Code*. Click the object to view the methods of that object. BAPIs have release and versioning. All BAPIs used at runtime must be in "release" status or a runtime exception is generated. Select a method to generate the XML schema. Create an XML instance document from the XML schema and populate it with data. Create an Oracle process with an appropriate input and output (file/html/etc) transmission method. Submit the document to the adapter for processing to receive a result.

Remote Function Call

Use Application Explorer to expand the appropriate application tree branch such as *Financial Accounting* and then navigate to and expand a Function Group, such as *0002 - Company Code*. Each function exposes a different method of processing. All BAPIs are present as RFC objects because their implementation is via RFC. They can be called in this manner allowing for event processing, for example, when BAPI processing does not. Not all RFCs are present as BAPIs. Select a function and generate the XML schema. Create an XML instance document from the XML schema and populate it with data. Create an Oracle process with an appropriate input and output (file/html/etc) transmission method. Submit the document to the adapter for processing to receive a result.

ALE IDOC Message

SAP ERP ALE* Inbound Message processing, where IDocs are sent and stored in the SAP R/3 system, requires some configuration on the SAP server to be used. In this role, messages are sent to SAP as transactional data and stored on the SAP server. The document data is processed in a second step inside SAP, during a triggered workflow.

A.2.1 Configuring SAP R/3 Inbound Processing

Sending an IDoc to SAP ERP requires the following information about the message parties:

- Sender of the message
- Receiver of the message
- Type of message that is being sent

The Sender and Receiver must be defined in the ALE system, and for each party, what kind of message each party is accepting and how it is being processed.

The Sending and Receiving system information are defined in units called Logical Systems, because the connection information does not involve physical connection information. A Logical System acts as a container for all the information about a particular Sender or Receiver.

Once a Logical System is defined, information about the different messages it sends and receives is stored in a Distribution Model. This model must be defined before any processing can occur, and it must be defined precisely to avoid Sender or Receiver errors. In the Distribution Model, the IDoc Message Application may also enable filters, which allow only specific parts of the IDoc to be sent, or distributed. There is a one-to-one correspondence between Logical System, Distribution Model, and Message Type. Complex filter rules can be configured by filter groups, filter objects, rules, and dependencies. For a complete explanation on configuring distribution models with filters, see the SAP system documentation.

Processing an IDoc by the SAP system is defined in Partner Profiles. For each partner and message, it is possible to define process codes to (possibly) process messages differently.

Adapter Check List

For sending messages to SAP, an ALE administrator must assign (after logon credentials):

1. Logical System name.
2. Message Types and IDoc Basic Types to be transmitted to the SAP application server.

Inside the SAP ERP system, the ALE Administrator must:

1. Create the Logical System.
2. Create the Distribution Model.
 - a. Assign the Sender for the model.
 - b. Assign the Receiver for the model.
 - c. Assign the Message Types.
3. Create a Partner Profile for the Logical System.
 - a. For each message type, assign a process code for SAP to process the message.

Example

- Logical System "ORACLIENT" is created (via SAP transaction SALE).
- Distribution Model "ZORACLNT" is created (via SAP transaction BD64).
- Message Type "MATMAS" is added for sending partner "ORACLIENT" and receiving partner "T90ALECNT" (ALE component of central host).
- Partner Profile "ORACLIENT" is created (via SAP transaction WE20) and Inbound Message "MATMAS" is assigned with Process code "MATM".

Note: The steps for configuring SAP ERP for inbound messages are described here as a reference. For more comprehensive information, see the SAP ERP documentation.

You must perform the following steps to configure SAP R/3 for inbound IDoc processing:

1. Configure a Logical System.
2. Configure a Distribution Model.
3. Define an inbound Partner Profile.

A.2.2 Configuring a Logical System

A Logical System is the container object for configuration information about the Sender or Receiver party of a message. It is a Logical System because no connection information is stored, only information about the message that the end point is able to process and the method used to process the message(s).

SAP Transaction Shortcuts

- `/n` - Ends the current transaction and opens a new one immediately.
- `/o` - Keeps the current transaction context and opens a new transaction in a new window.

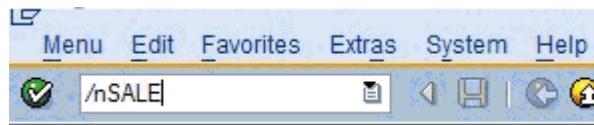
Defining a Logical System

A Logical System definition is created by creating an entry in the SAP Implementation Guide for Customizing (IMG).

ALE is the SAP ERP Application Link Enablement system, so use the `/nSALE` transaction to navigate to the IMG for ALE.

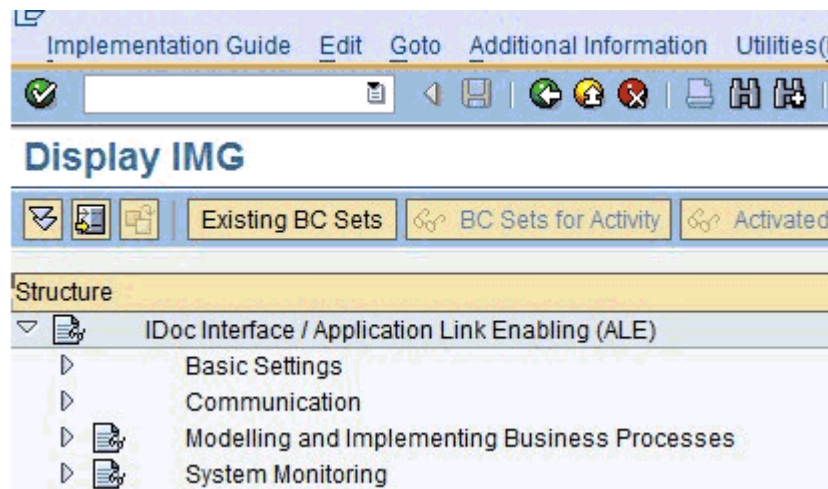
1. Navigate to the SALE transaction, as shown in [Figure A-1](#).

Figure A-1 SALE Transaction



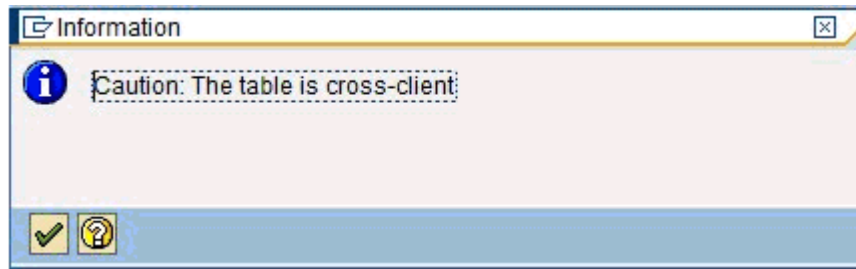
The Display IMG window displays the ALE configuration tree, as shown in [Figure A-2](#).

Figure A-2 Display IMG Window



2. Perform the following steps:
 - a. Expand the **Basic Settings** node.
 - b. Expand **Logical Systems**.
 - c. Click **Define Logical System**.
 - d. Since SAP R/3 users may see a slightly different screen, expand the extra node, **Sending and Receiving Systems**.

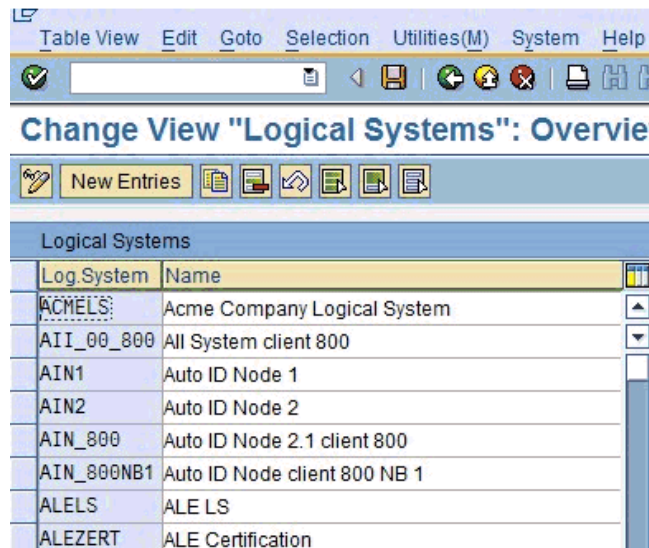
The "Caution: The table is cross-client" message is displayed, as shown in [Figure A-3](#).

Figure A-3 Caution Message

This message appears to inform you that changes to customizing data in Logical Systems applies to all users of the SAP ERP server. This is in contrast to most application data, which is specifically bound to a logon client. Do not make any changes to Logical System entries. Only add the new information. Use an SAP logon ID with the correct privileges to do so.

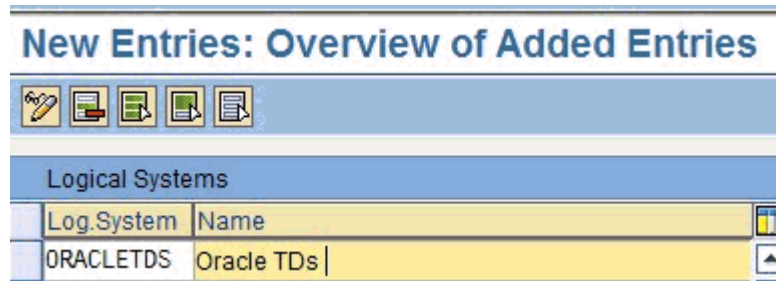
3. Click the green check mark to continue.

The Change View "Logical Systems" window is displayed, as shown in [Figure A-4](#).

Figure A-4 Change View "Logical Systems" Window

4. Click the **New Entries** button.

The New Entries: Overview of Added Entries window is displayed, as shown in [Figure A-5](#).

Figure A-5 New Entries: Overview of Added Entries Window

5. Enter the Logical System (for example, ORACLETDS) in the Log.System column and provide a description in the Name column.

Note: The fields are highlighted in yellow to remind you that they are required fields.

6. Click the **Save** icon on the top menu bar, as shown in [Figure A-6](#).

Figure A-6 Save Icon

The Prompt for Workbench request dialog is displayed.

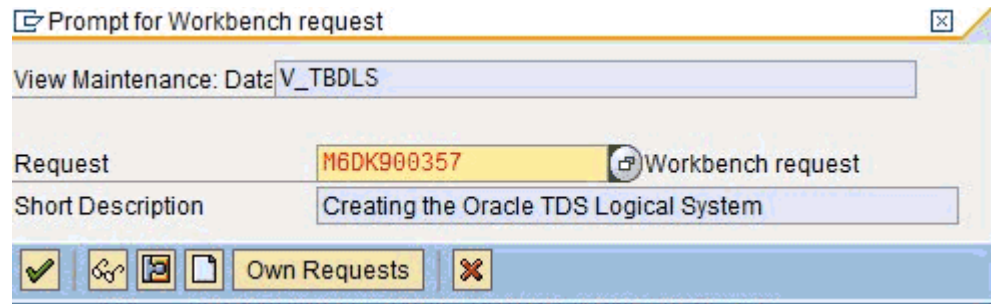
Note: Depending on system usage, the last workbench request number appears in the dialog. Do not use it and proceed to the next step.

7. Click the **New Request** icon to create a new request, as shown in [Figure A-7](#).

Figure A-7 New Request Icon

8. Enter the description for your entry in the request system. The remaining fields are filled in automatically and do not need to be changed.

The Prompt for Workbench Request dialog is displayed again, with the new request number filled in with the last request number created in the Workbench; do not use it. Click the check mark to create a new request number, as shown in [Figure A-8](#).

Figure A-8 Prompt for Workbench Request Dialog

The Logical System Entries window refreshes with the new Logical System information. The new Logical System is highlighted in blue to indicate the successful completion of this step, as shown in [Figure A-9](#).

Figure A-9 Logical System Entries Window

Logical Systems	
Log.System	Name
ORACLETDS	Oracle TDs

A.2.3 Configuring a Distribution Model for a Logical System

A Distribution Model contains a Sender Logical System and a Receiver Logical System the type of Messages sent and received. If a given Sender or Receiver does not have a valid Distribution Model, then the message is not processed and routed to an error location. For advanced topics in Distribution Model, including SAP BAPI Objects and filtering, see the SAP documentation.

Defining a Distribution Model

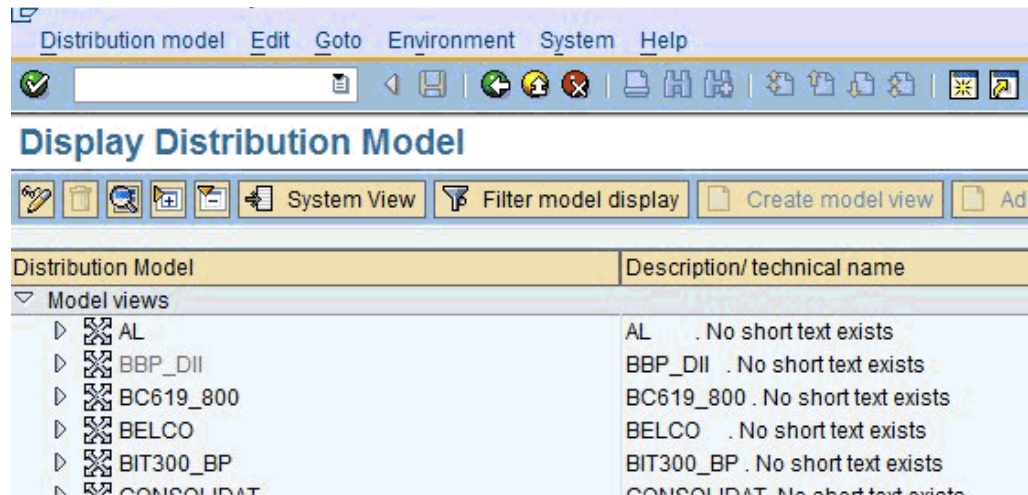
To define a distribution model:

1. Run the **bd64** transaction, as shown in [Figure A-10](#).

Figure A-10 Bd64 Transaction

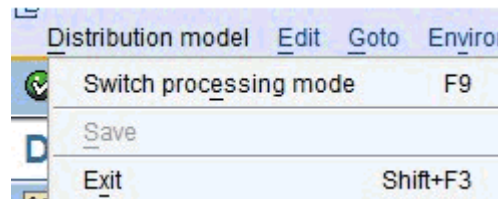
The Display Distribution Model window is displayed in the default Display mode, which shows the current model view entries, as shown in [Figure A-11](#).

Figure A-11 Display Distribution Model



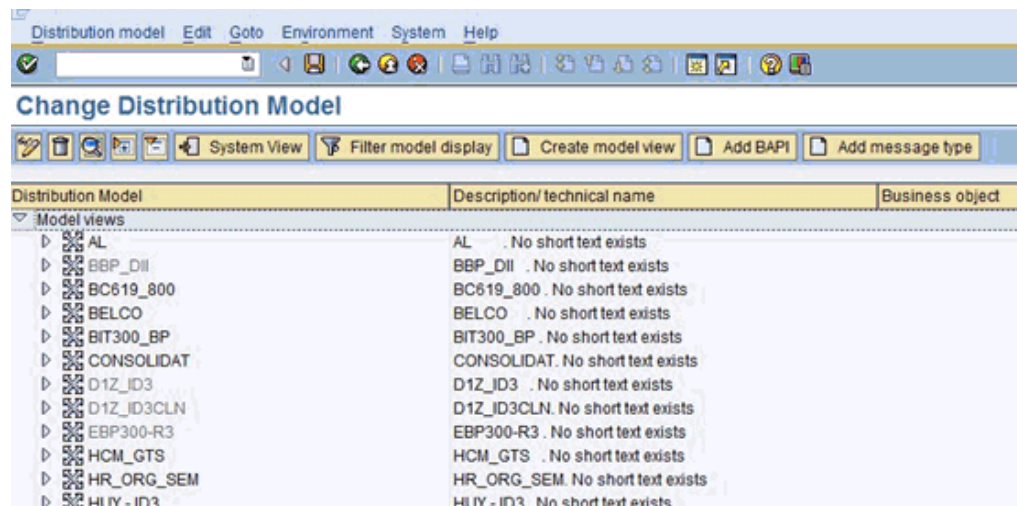
2. Expand the tree to view the entries for each model view.
To add items, the transaction must be switched into "change mode".
3. Click **Distribution model** and select **Switch processing mode**, as shown in [Figure A-12](#).

Figure A-12 Switch Processing Mode Option



The screen refreshes and the model view window is switched to Change Distribution Model, as shown in [Figure A-13](#).

Figure A-13 Change Distribution Model



4. From the available menu buttons, select **Create Model View**.

The Create Model View dialog is displayed, as shown in [Figure A-14](#).

Figure A-14 Create Model View Dialog

Short text	OracleTds Model View
Technical name	ZTDSView
Start date	06-24-2010
End Date	12-31-9999

5. Enter a Model View name in the Short text field and a name in the Technical name field, which also serves as a description.

A good convention is to use names starting with the letter Z, since SAP does not overwrite these names in case of system updates. This is only the name of the Model View.

6. Click the green check mark icon to enter the information.

The screen refreshes and returns to the main Change Distribution Model window. The Distribution Model configured is now added to the list, as shown in [Figure A-15](#).

Figure A-15 Change Distribution Model Window

oracle debmas channel tests	ZODEBMAS
oracle matmas channel tests	ZOMATMAS
OracleTds Model View	ZTDSVIEW

The Model View is in temporary transaction storage (and the entry appears in lighter color) until you click the Save icon. If the system connection is lost or times out, then the entry is lost. As a best practice, save your changes after each dialog during the Distribution Model configuration process to avoid losing changes.

7. Place the cursor on the entry previously defined.

Figure A-16 New Distribution Model

OracleTds Model View	ZTDSVIEW
----------------------	----------

The entry is now highlighted, as shown in [Figure A-16](#).

8. In the middle menu bar, click the **Add Message Type** button.

The Add Message Type dialog is displayed.

9. Perform the following steps:

- a. In the Sender field, enter the name of the sending Logical System for the Oracle system (for example, ORACLETDS). For more information, see ["Configuring a Logical System"](#) on page A-5.

- b. In the Receiver field, enter the name of the Client ALE Logical System for the SAP system (ALE receiver), or select from the drop-down (for example, T90CLNT090).
- c. In the Message type field, enter the message type you want to use (for example, MATMAS).

You can click the drop-down icon to the right of each field to browse available values from a list.

- d. Click the green check mark icon to enter the information.

The main Change Distribution Model window refreshes.

10. Click **Save**.

11. Navigate the ALE Hierarchy tree to the Distribution Model recently created. The Sender and Receiver are depicted in a graphical relationship with Sender, Receiver, and Message, as shown in [Figure A-17](#).

Figure A-17 Sender, Receiver, and Message Components

Oracle TDs	ORACLETDS
M6D Client 800	T90CLNT090
MATMAS	Material master

For subsequent message types for the same systems, expand the Model View to the receiver name and place the cursor on the name. Then click the **Add Message Type** button. All the fields are populated automatically. You can then add the message type.

A.2.4 Defining a Partner Profile

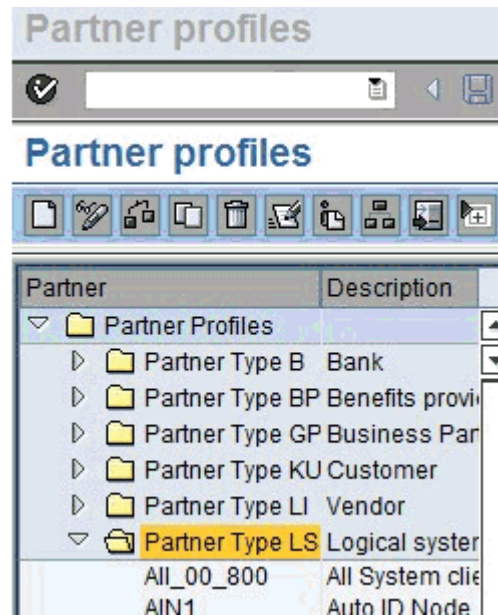
A Partner Profile defines for each logical system, the messages processed, and how the message is processed. This allows for flexible configuration of processing details for partners. Each message type may have only one entry in a Partner Profile. To define a Partner Profile:

1. Run the **we20** transaction, as shown in [Figure A-18](#).

Figure A-18 We20 Transaction



The Partner profiles window is displayed, as shown in [Figure A-19](#).

Figure A-19 Partner Profiles Window

2. Select **Partner Type LS** and click the white icon on the middle menu bar. You can also select **Create** from the top menu.

The right side of the screen changes to a blank Partner Profile form, as shown in [Figure A-20](#).

Figure A-20 Partner Profile Form

3. Enter the name of the Logical System (for example, ORACLETDS) in the partner number field and click the **Save** icon.

The screen changes with the new profile, as shown in [Figure A-21](#).

Figure A-21 New Partner Profile

Partner No. Oracle TDs
 Partn.Type Logical system

Post processing: permitted agent Classification

Ty. Organizational unit
 Agent EDI Department
 Lang. English

4. Scroll down until the embedded text "Inbound parmtrs" entry is displayed.
5. Click the green plus sign icon.

The Partner profiles: Inbound parameters dialog is displayed, as shown in [Figure A-22](#).

Figure A-22 Partner Profiles: Inbound Parameters Dialog

Inbound parameters Edit Goto System Help

Partner profiles: Inbound parameters

Partner No. Oracle TDs
 Partn.Type
 Partner Role

Message type
 Message code
 Message function Test

Inbound options Post processing: permitted agent Telephony

Process code Inbound Process Code (1) 34 Entries found

Cancel Processing After S

Processing by Function Mod
 Trigger by background pr
 Trigger Immediately

Process code	Description of process
BBPC	
CATT	Application for Automatic Tests
CMS_LINKGEN	
DOLMAS	DOLMAS Object Linking
ECM_UPS	Change Management with UPS
ED00	Display IDoc Using Work Item
ED00_XML	Display IDoc using work item (XML)
ED08	Forward IDoc
HRSM_D	External Time Data for SAP CAMPBELL
IV01	BBPIV inbound invoice
MAT2	MDM: Input Material from CRM via IS
MATM	MATMAS Material master data
ME01	Order acknowledgment with ORD_ID01 (ME_ORDRSP)
PEYC	PI Incoming Payment Processing Clearing (ERP1 0)

6. Enter **MATMAS** as the Message Type.
7. Use the Process code drop down to find and select **MATM** for MATMAS.
8. Select **Immediate** or **Background** as the Process Mode.

Note: Consult your SAP administrator for the proper settings.

9. Click the **Save** icon on the menu bar to save the Inbound Partner Profile entry for MATMAS.
10. Click the **Back** button on the menu bar to return to the previous window, as shown in [Figure A-23](#).

Figure A-23 Back Button



MATMAS is displayed in the entry list, as shown in [Figure A-24](#).

Figure A-24 MATMAS Message Type

Partner No.	ORACLETDS	Oracle TDs
Partn.Type	LS	Logical system

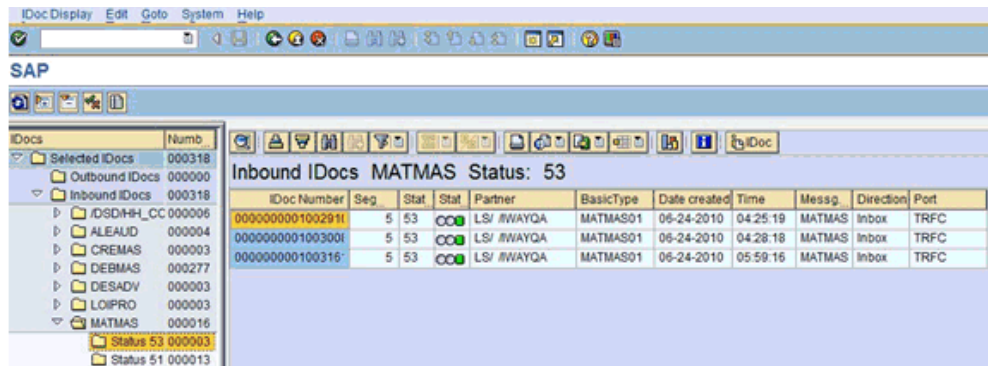
Inbound parmtrs.

Partner Role	Message Type	Message var...	MessageFu...	Test
	MATMAS			<input type="checkbox"/>

This completes the inbound configuration for Logical System/Partner Profile: OracleTDS/MATMAS. To add additional inbound IDoc Message Type entries, repeat the steps beginning with "[Configuring a Distribution Model for a Logical System](#)" on page A-9. To add another Logical System and Message Type, repeat the steps from "[Configuring a Logical System](#)" on page A-5.

You can now begin sending IDocs after configuring the appropriate Oracle process.

From the SAP IDoc monitor console, you can monitor the IDoc transactions in SAP transaction **WE02**. The processing state and status of IDocs are available, as well as the Sender, Receiver, and the data, as shown in [Figure A-25](#).

Figure A–25 SAP IDoc Monitor Console

A.3 SAP Outbound Message Processing

The Oracle Application Adapter for SAP R/3 can process two types of outbound from SAP application server messages, Remote Function Call messages or Transactional RFC messages with transaction ID. All communications processing via the SAP JCO is synchronous (request /response), but message processing can either be asynchronous (delivery only) or synchronous (an orchestrated process performs work and returns information to waiting SAP application server). RFC messages can be sent from SAP ABAP programs or the SAP workflow system or even the SAP function test transaction.

Outbound processing often is implemented as Events. On the SAP application server, there are many stages of defined events. Event processing is held together by linkages. Not all linkages are enabled by default on a Productive SAP server. For an Event to be active, and capable of sending messages, there must be an object capable of sending changes in the status of the object, a link to list of valid events, and event handlers. An event handler implements the processing of the message.

Active SAP Events are status changes on defined components with implemented event handlers. There are many types of events in the SAP application server, the most well known event handler is ALE Message Control, implemented by SAP around objects like the Material Master and Customer Master. Changes in these objects can generate outbound event IDocs.

Event creation is usually implemented by SAP, but many objects can be enabled for event handling, but this often requires advanced configuration or programming. Consult the SAP documentation for information on the type of SAP events and how they are configured.

For RFC outbound messages, only a SAP RFC Destination and Program ID are needed to receive the Remote Function Call.

For IDoc processing, a Logical System, Distribution Model, Partner Profile and Port must be created to receive message control events via tRFC.

SAP Outbound Terminology

- JCO/RFC Client, which is the system making the RFC request, and optionally waiting for a response.
- JCO/ RFC Server, which is the system receiving the RFC request, handling the request, and optionally receiving a response.

A.3.1 SAP Gateway

The SAP Gateway is a process that runs on an SAP application server or a dedicated gateway server. The gateway process manages all connections to SAP. No server connections to SAP are accepted unless they are configured previously as registered programs in the SAP application and present the required program identifier.

A server connection presents itself to the Gateway and exposes a Program Identifier. If the Program Identifier is found in the list of registered Program IDs, then the Gateway server offers a connection to the server, which "accepts" a connection. This ProgramID is then linked with an RFC Destination within SAP, which enables SAP Function Modules and ALE documents (IDocs or BAPI IDocs) to be routed to the destination. The RFC Destination functions as a key to identify the SAP Program ID. The Program ID is also exposed by the application server making the connection to SAP and is the direct link to the IP address of the connecting server. Messages are routed to the application server via the RFC Destination. A good security practice is to separate Oracle Application Adapter for SAP R/3 users with access to the adapter instance implementing the Program id and the users with SAP transaction authority to change or view the Program ID inside SAP, all requests are routed through the RFC Destination.

Note: An RFC server program is registered with the SAP gateway and waits for incoming RFC call requests. An RFC server program registers itself under a Program ID at a SAP Gateway and not for a specific SAP system. In SAPGUI, the destination must be defined with transaction SM59, using connection type T and Register Mode. Moreover, this entry must contain information on the SAP gateway at which the RFC server program is registered.

A.3.2 Program IDs and Load Balancing

If the Gateway Server has a connection to a particular server instance and another server instance presents itself to the gateway, then the gateway offers the connection and then begins functioning in Load Balancing mode. Using a proprietary algorithm, the Gateway sends different messages to each server depending on demand and total processing time. This may cause unpredictable results when messages are validated by schema and application.

When configuring multiple events in the Oracle using a single SAP program ID, SAP load balances the event data. For example, if multiple remote function calls or BAPIs use the same program ID (for example, ORACLETDS) and multiple SAP listeners are configured with this programID, then SAP sends one request to one listener and the next to another listener, and so on. There is a load-balancing algorithm present in the SAP Gateway Server. This mechanism is proprietary to SAP application development and might work by comparing total throughput of the connection, the number of times in wait state, and so on. One connection might receive nine messages and a second connection might receive one message. If five of the nine messages are rejected for schema validation and the one message on the other connection is rejected for schema validation, then you might suspect that you are missing SAP event handling messages.

Load balancing in server (inbound to adapter from SAP) situations is handled by connecting multiple instances of the adapter to the SAP system. The SAP system then load balances the connections. You cannot tune this performance.

SAP RFC Outbound Outline

1. Create a RFC Destination (via SM59).

- a. Enter a Destination Name.
 - b. Enter a Registered Program ID.
 - c. In the MDMP & Unicode tab, ensure that the Unicode option is selected.
 - d. Start Oracle BPEL/Mediator.
 - e. Enter the same registered Program ID value from step b for the BPEL or Mediator channel.
 - f. Start the channel.
 - g. Test the connection using the Test button in SAP.
2. Simulate a SAP RFC message (via SE37).
ABAP Workbench authorization is required.
 - a. Enter the RFC Destination name from step 1a in the Destination field.
 - b. Enter a valid SAP RFC Function name in the Function field.
 - c. Enter data in the parameters for the function.
 - d. Click the Execute (clock) button.
Data arrives at the BPEL channel.

SAP IDoc Events

Before IDocs can be received from SAP, a channel for the Oracle Application Adapter for SAP R/3 must be configured using Application Explorer. In addition, configuration on the SAP application server is also required.

1. Create a RFC Destination (via SM59) or use the same destination defined in the previous section (SAP RFC Outbound Outline).
 - a. Enter a Destination Name.
 - b. Enter a Registered Program ID.
 - c. In the MDMP & Unicode tab, ensure that the Unicode option is selected.
 - d. Start Oracle BPEL/Mediator.
 - e. Enter the same Registered Program ID value from step b for the BPEL or Mediator channel.
 - f. Start the channel.
 - g. Test the connection using the Test button in SAP.
2. Create or use a Logical System as described in ["Configuring a Logical System"](#) on page A-5.
3. Define or use a Distribution Model as described in ["Configuring a Distribution Model for a Logical System"](#) on page A-9.
4. Create an SAP Transactional RFC Port via transaction WE21.
5. Create an SAP Outbound Partner Profile via transaction WE20.

A.3.3 Registering a RFC Destination and Program ID in SAP GUI

To enable your SAP R/3 system to issue the following calls or interfaces to the SAP R/3 event adapter, you must register your program ID under an RFC destination.

- Remote Function Calls (RFC)

- Business Application Programming Interfaces (BAPI) - Bapis have no external events, use the RFC form
- Intermediate Documents (IDocs)

The RFC Destination is a symbolic name (for example, ORACLETDS) that is used to direct events to a target system, masking the Program ID. The Program ID is configured in SAP GUI and the event adapter.

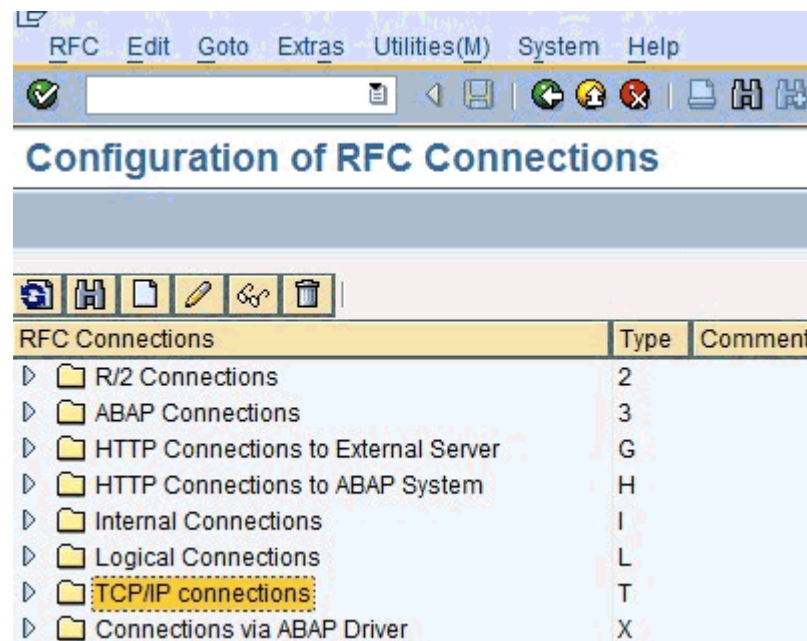
Registering a Program ID

To register a Program ID:

1. Launch the SAP GUI and log in to the SAP R/3 system.
2. Select **Tools, Administration, Network**, and then **RFC destination**.
3. Run the **SM59** transaction.

The Configuration of RFC Connections window is displayed, as shown in [Figure A-26](#).

Figure A-26 Configuration of RFC Connections Window



4. Select **TCP/IP connections** and click **Create** (white paper icon).

The RFC Destination window is displayed, as shown in [Figure A-27](#).

Figure A–27 RFC Destination Window

RFC Destination	
Connection Test	Unicode Test
RFC Destination	ORACLETDS
Connection Type	T TCP/IP Connection Description
Description	
Description 1	Oracle Test Demo System
Description 2	
Description 3	

5. Provide the following information:
 - a. In the RFC destination field, enter a name, for example, ORACLETDS.
This field value is case-sensitive. Match the same case in the sending programs.
 - b. In the Connection type field, enter T for destination type TCP/IP.
 - c. In the Description field, enter a brief description.
6. Click the Save icon (Disk) from the tool bar or select Connection, Save from the top menu bar.
The window refreshes and the Technical Settings tab is highlighted in the second panel.
7. Immediately click the **Registered Server Program** button.
The screen refreshes again.
8. Enter the case sensitive Program Id, this must match the same name in the adapter channel
9. Click the Save icon (Disk) from the tool bar or select Connection, Save from the top menu bar.
10. Select the **MDMP & Unicode** tab and click the **Unicode** button.
11. Click the Save icon (Disk) from the tool bar or select Connection, Save from the top menu bar.
The RFC Destination and Program ID are now defined. Any Remote Function Call (RFC) can now be sent to the server via the Destination parameter of the Call Function API. The data for the function must be marshaled and sent to the adapter as this is a reverse invocation.

Testing the Configuration

To test the configuration:

1. Enter the Program ID in the BPEL process / channel for Oracle Application Adapter for SAP R/3 and start the channel.
2. Enter SAP GUI and navigate to SE37.
ABAP Workbench authorization is required.

3. Enter a valid function name and click the Test Run (tool) icon, as shown in [Figure A-28](#).

Figure A-28 Test Run (Tool) Icon



The Test Function Module: Initial Screen window is displayed, as shown in [Figure A-29](#).

Figure A-29 Test Function Module: Initial Screen Window

Test Function Module: Initial Screen

Debugging Test data directory

Test for function group 0014
 Function module BAPI_COMPANY_GETLIST
 Uppercase/Lowercase
 RFC target sys: ORACLETDS

Tables	Value
COMPANY_LIST	0 Entries

4. Enter the name of the RFC Destination, any data, and then click the Execute (clock) icon.

Since this is reverse invocation, all data must be passed to the function for sending to the adapter. After a success, the execution time is displayed, as shown in [Figure A-30](#). The first run is always the longest, subsequent runs are faster.

Figure A-30 RFC Destination

Test for function group 0014
 Function module BAPI_COMPANY_GETLIST
 Uppercase/Lowercase
 Runtime: 5,361 Microseconds

Synchronous RFC Calls

Synchronous RFC calls are defined in the same way as asynchronous on the SAP side. On the adapter side, ensure "request_response" is selected as the mode for the call. Orchestrate a process that takes the SAP delivered data, processes it, and returns it to SAP in the function format. Any format errors immediately terminate the request. Example (in pseudo code):

Function: MY_COMPANY_GETLIST DESTINATION 'ORACLETDS'

```
tables mycompanies
  field1: name(20)
  field2: company(20)
```

The synchronous Get List call passes the empty table *mycompanies* to BPEL server and SAP waits. BPEL orchestration includes an object that has the following SQL statement:

```
select name(20), company(20) into mycompanies where country eq us
```

The SQL statement is executed on an Oracle database and the result set is returned and passed into the *mycompanies* table by an assignment statement in the orchestration. Remember that the SAP application is waiting during the entire process, and that the SAP server may have a maximum online process time at which the process is automatically terminated by SAP.

The function returns to SAP via synchronous call and the table is returned with data to the calling process.

Time outs can occur if the execution time is longer than the connection pool execution time. Format exceptions can occur for type, length, or decimal places.

A.3.4 Application Link Embedding Configuration for the Event Adapter

The SAP R/3 event adapter receives IDocs (Intermediate Documents) from SAP R/3. To configure an SAP R/3 system to send IDocs to the SAP R/3 event adapter, use the ALE (Application Link Embedding) configuration to:

1. Register your program ID in SAP GUI.
2. Define a Port.
3. Create a Logical System.
4. Create a Partner Profile.
5. Create a Distribution Model for the Partner and Message Type.
6. Test the SAP R/3 event adapter.

A.3.5 Defining a Port

A Port identifies where to send messages. The Port type used by Oracle Application Adapter for SAP R/3 is the *Transactional RFC port*. By defining an ALE port and linking it to the RFC Destination, this creates the message execution process pathway.

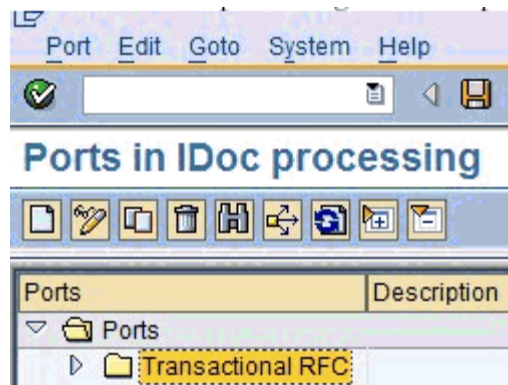
Defining a Port

To define a port:

1. In the ALE configuration, select **Tools, Business Communications, IDocs Basis, IDoc**, and then **Port Definition**.

You can also run the **WE21** transaction.

The Ports in IDoc processing window is displayed, as shown in [Figure A-31](#).

Figure A–31 Ports in IDoc Processing Window

2. In the left pane under Ports, select **Transactional RFC** and click **Create** (white paper icon).
3. Click **Generate port name**.
The system generates the port name.
4. Enter the version of the IDocs to send through this port (usually 4).
5. Type or select the name of the RFC Destination created (for example, ORACLETDS) or enter the first letters and an asterisk for the select list, as shown in [Figure A–32](#).
6. Save the session, making note of the generated RFC port.

Figure A–32 RFC Destination Field

Port	A000000078
Description	OracleTDS
<div style="border: 1px solid gray; padding: 5px;"> Version <input type="radio"/> IDoc rec.types SAP Release 3.0/3.1 <input checked="" type="radio"/> IDoc record types SAP Release 4.x </div>	
RFC destination	ORA*

A.3.6 Configuring a Logical System

Note: You can skip this section if you are reusing a Logical System that has been previously defined.

A Logical System is the container object for configuration information about the Sender or Receiver party of a message. It is a Logical System because no connection information is stored, only information about the message that the end point is able to process and the method used to process the message(s).

SAP Transaction Shortcuts

- `/n` - Ends the current transaction and opens a new one immediately.
- `/o` - Keeps the current transaction context and opens a new transaction in a new window.

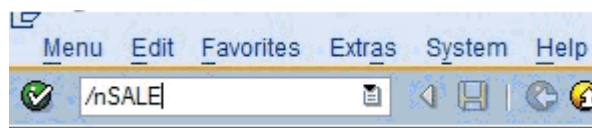
Defining a Logical System

A Logical System definition is created by creating an entry in the SAP Implementation Guide for Customizing (IMG).

ALE is the SAP ERP Application Link Enablement system, so use the `/nSALE` transaction to navigate to the IMG for ALE.

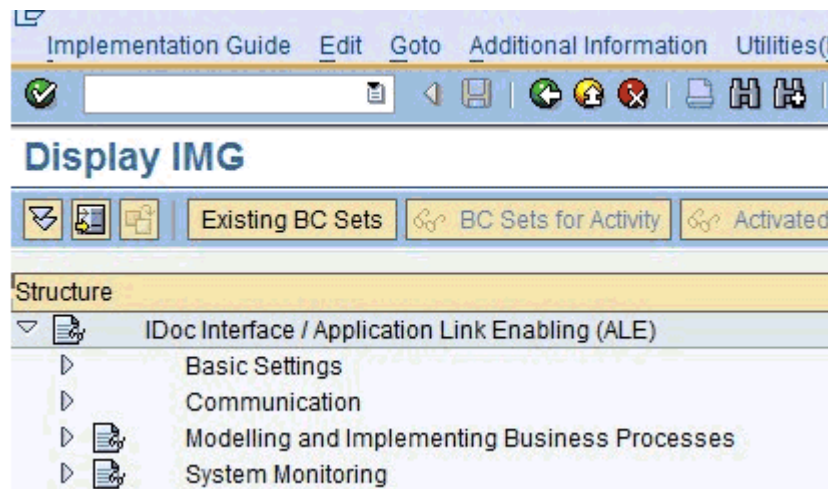
1. Navigate to the SALE transaction, as shown in [Figure A-33](#).

Figure A-33 SALE Transaction



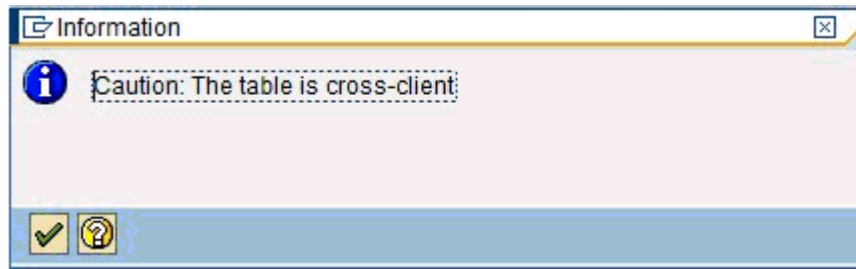
The Display IMG window displays the ALE configuration tree, as shown in [Figure A-34](#).

Figure A-34 Display IMG Window



2. Perform the following steps:
 - a. Expand the **Basic Settings** node.
 - b. Expand **Logical Systems**.
 - c. Click **Define Logical System**.
 - d. Since SAP R/3 users may see a slightly different screen, expand the extra node, **Sending and Receiving Systems**.

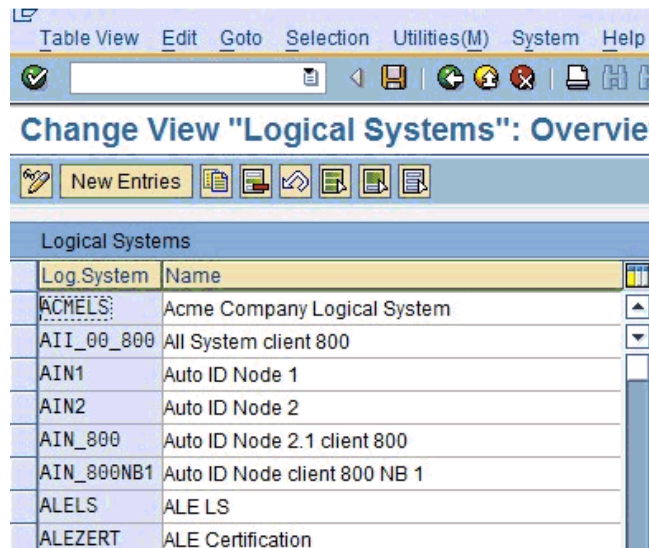
The "Caution: The table is cross-client" message is displayed, as shown in [Figure A-35](#).

Figure A–35 Caution Message

This message appears to inform you that changes to customizing data in Logical Systems applies to all users of the SAP ERP server. This is in contrast to most application data, which is specifically bound to a logon client. Do not make any changes to Logical System entries. Only add the new information. Use an SAP logon ID with the correct privileges to do so.

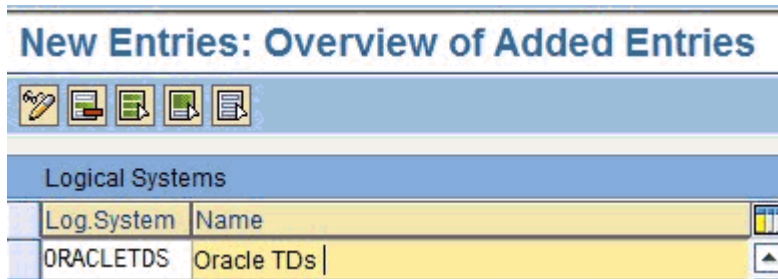
3. Click the green check mark to continue.

The Change View "Logical Systems" window is displayed, as shown in [Figure A–36](#).

Figure A–36 Change View "Logical Systems" Window

4. Click the **New Entries** button.

The New Entries: Overview of Added Entries window is displayed, as shown in [Figure A–37](#).

Figure A–37 New Entries: Overview of Added Entries Window

5. Enter the Logical System (for example, ORACLETDS) in the Log.System column and provide a description in the Name column.

Note: The fields are highlighted in yellow to remind you that they are required fields.

6. Click the **Save** icon on the top menu bar, as shown in [Figure A–38](#).

Figure A–38 Save Icon

The Prompt for Workbench request dialog is displayed.

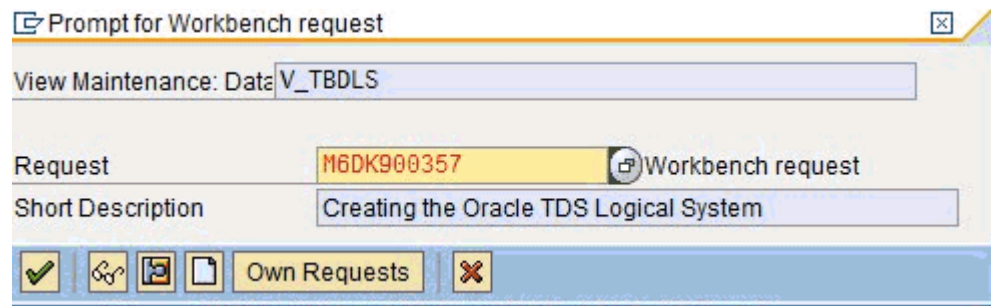
Note: Depending on system usage, the last workbench request number appears in the dialog. Do not use it and proceed to the next step.

7. Click the **New Request** icon to create a new request, as shown in [Figure A–39](#).

Figure A–39 New Request Icon

8. Enter the description for your entry in the request system. The remaining fields are filled in automatically and do not need to be changed.

The Prompt for Workbench Request dialog is displayed again, with the new request number filled in with the last request number created in the Workbench; do not use it. Click the check mark to create a new request number, as shown in [Figure A–40](#).

Figure A-40 Prompt for Workbench Request Dialog

The Logical System Entries window refreshes with the new Logical System information. The new Logical System is highlighted in blue to indicate the successful completion of this step, as shown in [Figure A-41](#).

Figure A-41 Logical System Entries Window

Logical Systems	
Log.System	Name
ORACLETDS	Oracle TDs

A.3.7 Configuring a Distribution Model for a Logical System

A Distribution Model contains a Sender Logical System and a Receiver Logical System the type of Messages sent and received. If a given Sender or Receiver does not have a valid Distribution Model, then the message is not processed and routed to an error location. For advanced topics in Distribution Model, including SAP BAPI Objects and filtering, see the SAP documentation.

Defining a Distribution Model

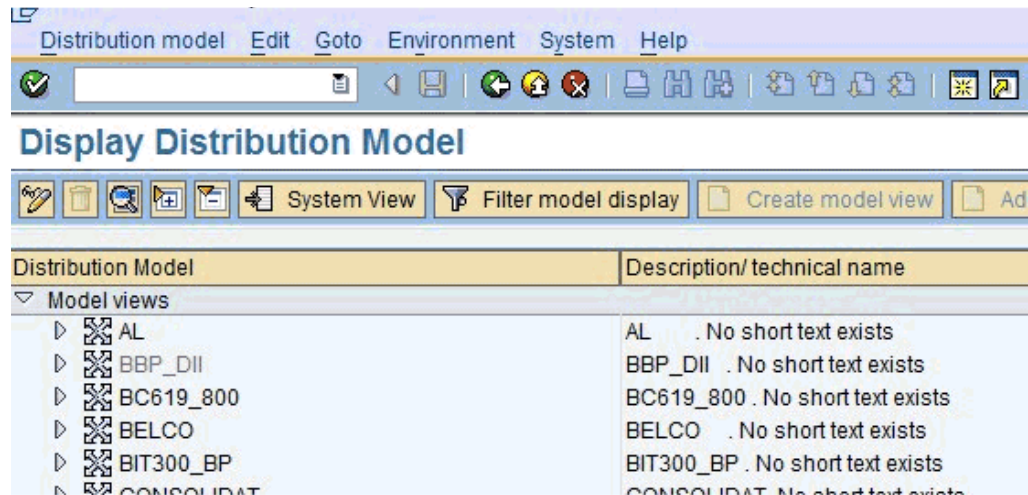
To define a distribution model:

1. Run the **bd64** transaction, as shown in [Figure A-42](#).

Figure A-42 Bd64 Transaction

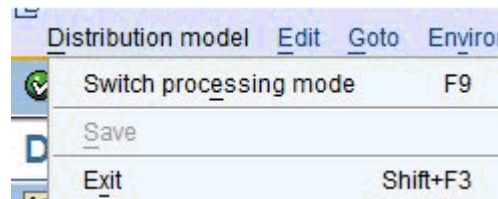
The Display Distribution Model window is displayed in the default Display mode, which shows the current model view entries, as shown in [Figure A-43](#).

Figure A-43 Display Distribution Model Window



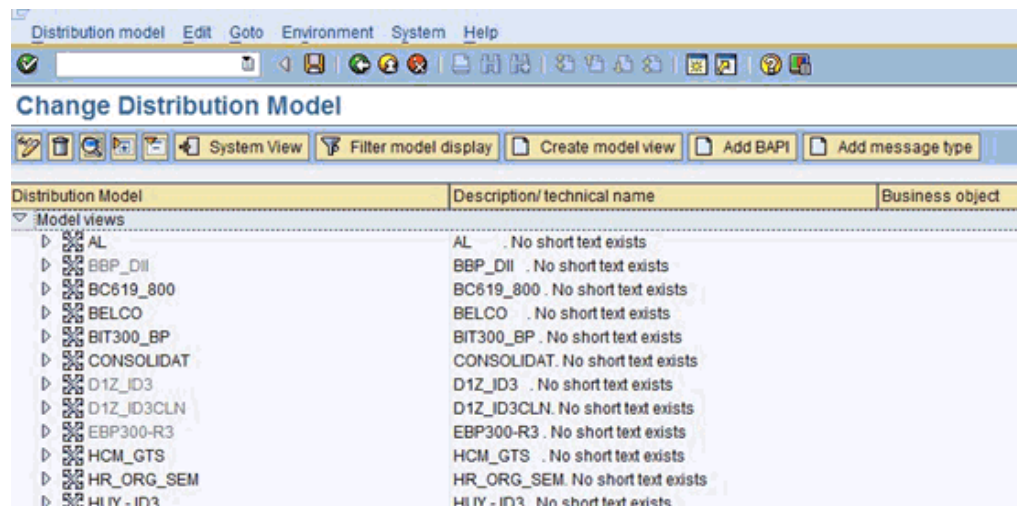
2. Expand the tree to view the entries for each model view.
To add items, the transaction must be switched into "change mode".
3. Click **Distribution model** and select **Switch processing mode**, as shown in [Figure A-44](#).

Figure A-44 Switch Processing Mode Option



The screen refreshes and the model view window is switched to Change Distribution Model, as shown in [Figure A-45](#).

Figure A-45 Change Distribution Model Window



- From the available menu buttons, select **Create Model View**.

The Create Model View dialog is displayed, as shown in [Figure A-46](#).

Figure A-46 Create Model View Dialog

Short text	OracleTds Model View
Technical name	ZTDSView
Start date	06-24-2010
End Date	12-31-9999

- Enter a Model View name in the Short text field and a name in the Technical name field, which also serves as a description.

A good convention is to use names starting with the letter Z, since SAP does not overwrite these names in case of system updates. This is only the name of the Model View.

- Click the green check mark icon to enter the information.

The screen refreshes and returns to the main Change Distribution Model window. The Distribution Model configured is now added to the list, as shown in [Figure A-47](#).

Figure A-47 Change Distribution Model Window

oracle debmas channel tests	ZODEBMAS
oracle matmas channel tests	ZOMATMAS
OracleTds Model View	ZTDSVIEW

The Model View is in temporary transaction storage (and the entry appears in lighter color) until you click the Save icon. If the system connection is lost or times out, then the entry is lost. As a best practice, save your changes after each dialog during the Distribution Model configuration process to avoid losing changes.

- Place the cursor on the entry previously defined.

Figure A-48 New Distribution Model

OracleTds Model View	ZTDSVIEW
----------------------	----------

The entry is now highlighted, as shown in [Figure A-48](#).

- In the middle menu bar, click the **Add Message Type** button.

The Add Message Type dialog is displayed.

- Enter the ALE Central Instance Sender.

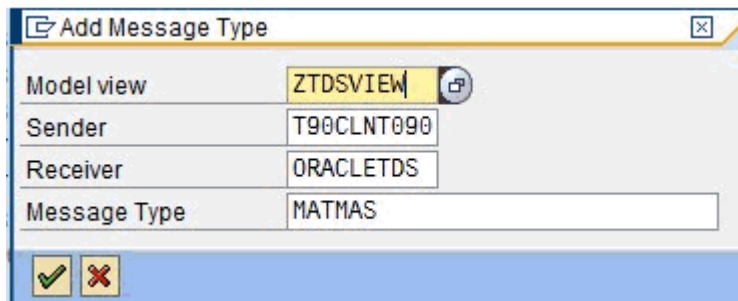
Consult your SAP administrator for this information.

- Enter the Receiver (for example, ORACLETDS) in the Receiver field.

- Enter a valid Message Type.

- Repeat this procedure for each outbound Message Type in this partner scenario, as shown in [Figure A-49](#).

Figure A-49 Add Message Type Dialog



Model view	ZTDSVIEW
Sender	T90CLNT090
Receiver	ORACLETDS
Message Type	MATMAS

A.3.8 Defining a Partner Profile

Note: You can skip this section if you are reusing a Partner Profile that has been previously defined.

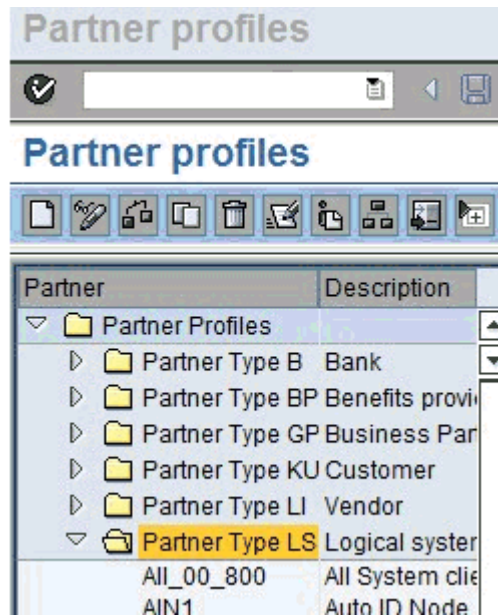
A Partner Profile defines for each logical system, the messages processed, and how the message is processed. This allows for flexible configuration of processing details for partners. Each message type may have only one entry in a Partner Profile. To define a Partner Profile:

- Run the `we20` transaction, as shown in [Figure A-50](#).

Figure A-50 We20 Transaction



The Partner profiles window is displayed, as shown in [Figure A-51](#).

Figure A-51 Partner Profiles Window

2. Select **Partner Type LS** and click the white icon on the middle menu bar. You can also select **Create** from the top menu.

The right side of the screen changes to a blank Partner Profile form, as shown in [Figure A-52](#).

Figure A-52 Partner Profile Form

3. Enter the name of the Logical System (for example, ORACLETDS) in the partner number field and click the **Save** icon.

The screen changes with the new profile, as shown in [Figure A-53](#).

Figure A–53 Partner Profiles: Outbound Parameters

Partner profiles: Outbound parameters

Partner No. Oracle TDs
 Parth.Type Logical system
 Partner Role

Message Type
 Message code
 Message function Test

Outbound Options | Message Control | Post Processing: Permitted Agent | Tele...

Receiver port

Output Mode

Transfer IDoc Immed. Start subsystem Output Mode
 Collect IDocs Do not start subsystem

IDoc Type

Basic type
 Extension
 View
 Cancel Processing After Syntax Error
 Seg. release in IDoc type Segment Appl. Rel.

4. Enter the Message Type in the Message Type field.
5. Enter the Port Number in the Receiver Port field
6. Select the **Transfer IDoc immed.** button or select **Collect IDoc**, specify a batch size, and use bd87 to release IDocs for processing.
7. Enter the Basic Type (MATMAS05 for MATMAS, etc.).
8. Click the **Save** icon.

A.3.9 Testing the SAP R/3 ALE Configuration

In the SAP Server, the BD12 transaction enables the sending of Master Data IDocs to any logical system, for example, to an event adapter.

Testing the SAP R/3 ALE Configuration

To test the SAP R/3 Application Link Embedding (ALE) configuration:

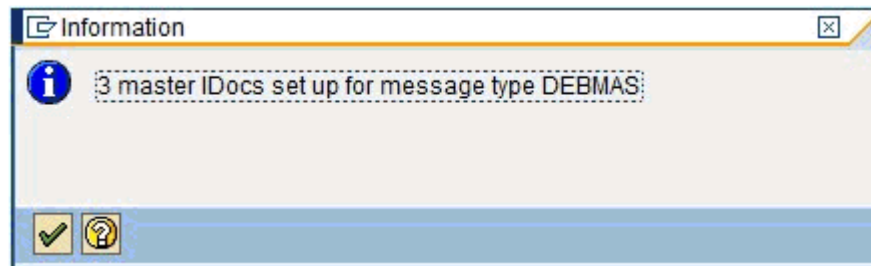
1. In the Send Customers window, enter the IDoc message type (for example, DEBMAS) in the Output type field, as shown in [Figure A–54](#).

Figure A-54 Send Customers Window

2. In the Logical system field, enter the logical system, for example, ORACLETDS
3. Click **Run**.

The SAP R/3 event adapter receives the IDoc in XML format. No response is expected from the event adapter.

A confirmation message is displayed, as shown in [Figure A-55](#).

Figure A-55 Confirmation Message

The same number of communication IDocs should also be generated. The IDocs should appear at the adapter server shortly. If no IDocs appear, then check the following:

1. The Collect IDocs option is selected in the Partner Profile (go to bd87 to release).
2. No other server exposing the same Program ID.

SAP IDoc Events

Before IDocs can be received from SAP, a channel for the Oracle Application Adapter for SAP R/3 must be configured using Application Explorer. In addition, configuration on the SAP application server is also required.

1. Create a RFC Destination (via SM59) or use the same destination defined in the previous section (SAP RFC Outbound Outline).
 - a. Enter a Destination Name.
 - b. Enter a Registered Program ID.

- c. In the MDMP & Unicode tab, ensure that the Unicode option is selected.
 - d. Start Oracle BPEL/Mediator.
 - e. Enter the same Registered Program ID value from step b for the BPEL or Mediator channel.
 - f. Start the channel.
 - g. Test the connection using the Test button in SAP.
2. Create or use a Logical System as described in ["Configuring a Logical System"](#) on page A-5.
3. Define or use a Distribution Model as described in ["Configuring a Distribution Model for a Logical System"](#) on page A-9.
4. Create an SAP Transactional RFC Port via transaction WE21.
5. Create an SAP Outbound Partner Profile via transaction WE20.

Glossary

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.

business service

Also known as a Web service. A Web service is a self-contained, modularized function that can be published and accessed across a network using open standards. It is the implementation of an interface by a component and is an executable entity.

channel

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.

listener

A component that accepts requests from client applications.

port

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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