Oracle® WebLogic Integration

JCA Event Generator and Control User Guide

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Oracle WebLogic Integration JCA Event Generator and Control User Guide, 10*g* Release 3 (10.3.1)

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CHAPTER 1

Introduction to JCA Event Generator and Control

Oracle WebLogic Integration provides connectivity to Enterprise Information Systems (EIS) like Oracle Applications E-Business Suite, Oracle Advanced Queueing, and SAP systems using adapters. These adapters are implemented as Java EE Connector Architecture (JCA) resource adapters. JCA is a Java standard that provides a generic architecture to connect JEE-compliant application servers to Enterprise Information Systems (EIS).

A resource adapter is a system library specific to an EIS and provides connectivity to the EIS. The resource adapter plugs into an application server, such as Oracle WebLogic Server, and provides seamless connectivity between the EIS, application server, and enterprise application.

Oracle WebLogic Integration interacts with the resource adapters through the JCA Adapter Development Framework (ADF). The Oracle Adapter Framework is a layer on top of the JCA resource adapters and is a framework that exposes JCA 1.5 resource adapters by using XML and Web service technologies. A web service associated with the resource adapter stores the information that is required by client components to invoke the adapter, and for the Adapter Framework to make appropriate JCA adapter calls. The adapter service WSDL contains JCA-specific extensions to store adapter-related information. This information may be used by clients like Oracle WebLogic Integration to invoke the adapter.

JCA interoperability supports both inbound and outbound connectivity. Oracle WebLogic Integration uses the JCA control for invoking adapter services and the JCA event generator for publishing adapter events.

The JCA event generator listens for messages that have arrived via EIS-specific adapters from the EIS using the channel associated with it and publishes these messages to Oracle WebLogic

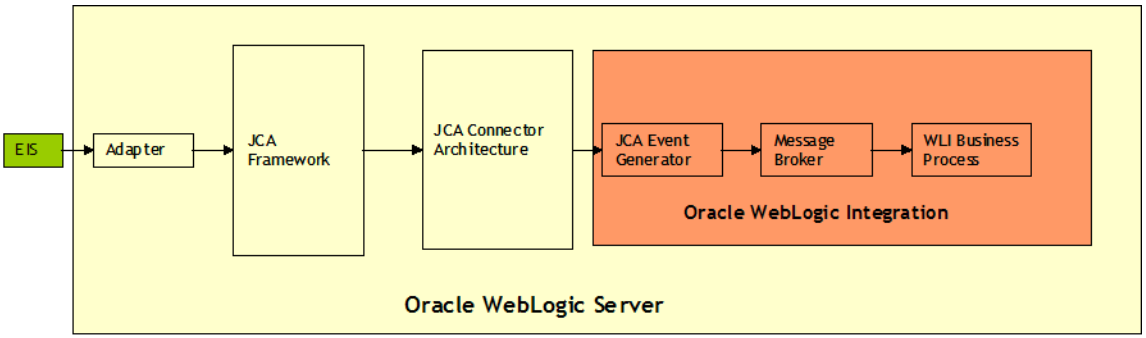
Integration via the Message Broker. For more information about message brokers, see Message Broker in *Overview of Oracle WebLogic Integration*.

A JCA control invokes EIS-specific adapter services to perform operations on the EIS. Each JCA control can be configured to do operations that are specific to the associated EIS. The EIS can then be accessed by the business process using the JCA control.

Using the JCA Event Generator for Inbound Operations

You can use the JCA event generator for inbound operation. For inbound operations, the JCA event generator listens for messages that are received via EIS-specific adapters from the EIS and publishes the messages to Oracle WebLogic Integration via the Message Broker.

Figure 1-1 JCA Connectivity Architecture for Inbound Operations

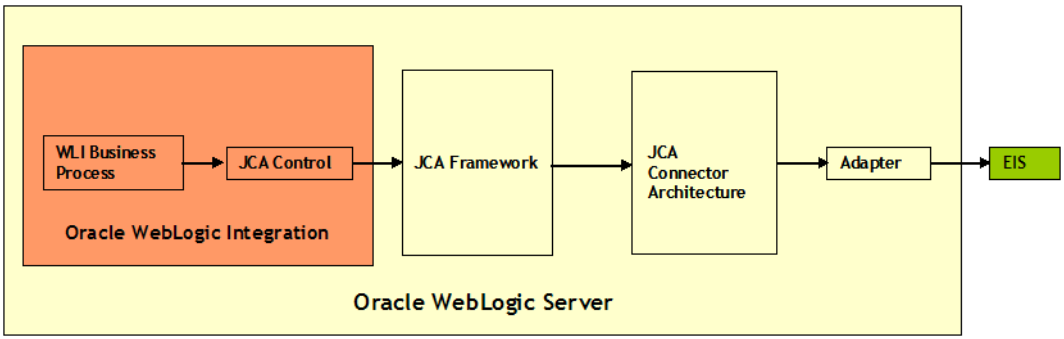


To do inbound operations, you need to use the adapter services created in the EIS to create the JCA event generator. In the case of Oracle E-Business Suite and Oracle Advanced Queueing, you need to use Oracle JDeveloper 10.1.3.4 for creating the adapter service. For more information, see Oracle Applications Adapter, Oracle AQ Adapter and Creating a JCA Event Generator. For information about inbound operations on SAP systems, see Oracle Application Adapter for SAP R/3 User's Guide.

Using the JCA Control for Outbound Operations

In the case of outbound operations, the adapter receives requests from Oracle WebLogic Integration via the WLI JCA control, translates these requests into the data format native to the EIS using the JCA adapter framework, and invokes the appropriate method on the EIS application.

Figure 1-2 JCA Connectivity Architecture for Outbound Operations



To do outbound operations, you need to use the adapter services created in the EIS to create the JCA control. In the case of Oracle E-Business Suite and Oracle Advanced Queueing, you need to use Oracle JDeveloper 10.1.3.4 for creating the adapter service. For more information, see Oracle Applications Adapter, Oracle AQ Adapter, and Creating a JCA Integration Control. For information about outbound operations on SAP systems, see Oracle Application Adapter for SAP R/3 User's Guide.

CHAPTER 2

Working with Adapters

A resource adapter is a system library specific to an Enterprise Information System (EIS) and provides connectivity to that EIS. A resource adapter is analogous to a JDBC driver, which provides connectivity to a database management system. The interface between a resource adapter and the EIS is specific to the underlying EIS. These resource adapters are based on JCA 1.5 standards and need to be deployed in the application server. The resource adapter plugs into an application server, such as Oracle WebLogic Server, and provides seamless connectivity between the EIS, application server, and enterprise application.

Oracle WebLogic Integration integrates with resource adapters via the Adapter Framework. The Adapter Framework enables a resource adapter to expose its functionality as a web service, which is expressed in a WSDL. The adapter framework uses the Web Service Invocation Framework (WSIF) standard to convert a web service call from a WLI business process into a JCA interaction for the resource adapter.

To use the resource adapter to connect to the EIS, you need to create the WSDL representing the EIS-specific resource adapter services in the EIS environment. The adapter service WSDL contains JCA-specific extensions to store adapter-related information. You can then create Oracle WebLogic Integration event generators and controls using these adapter services.

This section provides information about:

- Oracle Applications Adapter
- Oracle AQ Adapter
- Oracle Application Adapter for SAP R/3

Supported Resource Adapters

The following resource adapters are supported in this release:

- Oracle Applications Adapter for the Oracle E-Business Suite. For more information, see Oracle Applications Adapter.
- Oracle AQ Adapter for Oracle Advanced Queuing. For more information, see Oracle AQ Adapter.
- Oracle Application Adapter for SAP R/3. For more information, see Oracle Application Adapter for SAP R/3.

Deploying Resource Adapters

You need to manually deploy the JCA compliant resource adapters before you can use them for EIS connectivity. Login to Oracle WebLogic Server Administration Console using the `http://<host:port>/console` URL and deploy the resource adapters, where `host` is the host name or IP address of the Oracle WebLogic Server administrative server, and `port` is the server listening port.

To use the Oracle Applications adapter, deploy the following files in the specified order:

1. DBAdapter.rar
2. AppsAdapter.rar

To use the Oracle AQ adapter, deploy the following files in the specified order:

1. DBAdapter.rar
2. AqAdapter.rar

Note: Because the Oracle AQ adapter and the Oracle Applications adapter require some of the classes that are available in the DBAdapter.rar file, make sure that you deploy these resource adapters in the specified order.

These adapter resources (the .rar files) are located in the `WLI_HOME\lib` directory.

For more information about deploying the resource adapters in Oracle WebLogic Server Administration Console, see Deploy resource adapters.

After deploying the resource adapter, to invoke an EIS in managed or non-managed mode, you need to configure the resource adapter. For more information see Managed and Non-managed Connections.

For information about installing, configuring, and deploying the Oracle Application Adapter for SAP R/3, see Oracle Application Adapter for SAP R/3 Installation Guide.

Managed and Non-managed Connections

Based on how resource adapters establish a connection to an EIS, resource adapters are said to invoke the EIS in a managed mode or a non-managed mode. The EIS is invoked in the managed mode when you use a data source and Oracle WebLogic Server manages the transaction. The EIS is invoked in the non-managed mode when you do not specify any data source and the resource adapter takes care of the connection management.

For non-managed connections, to invoke an EIS, Oracle WebLogic Integration uses the connection details specified while generating the resource adapter service WSDL in the EIS environment. These connections are not made within the context of a transaction.

If you want a managed connection between Oracle WebLogic Integration and the EIS via the resource adapter, create a data source in Oracle WebLogic Server Administration Console. In addition, after deploying the resource adapters, you need to configure the outbound connection instance properties in the Outbound Configuration page of the resource adapter in the Oracle WebLogic Server Administration Console. The JNDI name of the data source is maintained in the WSDL file of the resource adapter service and is used to obtain the connection details specified in the data source and invoke the EIS. For more information, see Creating a Data Source and Configuring Deployed Resource Adapters.

Creating a Data Source

A data source is a J2EE standard method of configuring connectivity to a database. Each WebLogic data source contains a pool of database connections. Applications look up the data source on the JNDI tree or in the local application context and then use a database connection from the pool of connections. Data sources and their connection pools provide connection management processes that help keep your system running and performing. To invoke an EIS in a managed mode, you need to use a data source.

To create a JDBC data source:

1. Login to Oracle WebLogic Server Administration Console using the following URL:
   `http://<local host:port>/console`

   The Oracle WebLogic Server Administration Console home page appears.

2. Click Data Sources in the Services section of the home page.

3. In the Summary of JDBC Data Sources section, click New.

Configure the data source using information available in configuring JDBC data sources and Create JDBC data sources in the Oracle WebLogic Server Administration Console Help.

After you configure the JDBC data source, you need to configure the deployed resource adapters to use this new data source. For more information see Configuring Deployed Resource Adapters.

Configuring Deployed Resource Adapters

To invoke an EIS in a managed, configure a deployed resource adapter by modifying its outbound connection pool properties and associating it with outbound connection instances.

To configure a resource adapter:

1. After deploying the resource adapter, in the Summary of Deployments page in Oracle WebLogic Server Administration Console, click on the deployed resource adapter name.

2. On the Settings page for the resource adapter, expand Configuration > Outbound Connection Pools.

3. Click New, to create a new outbound connection instance.

4. Select the outbound connection group in which you want to create an outbound connection instance and click Next.

5. Enter the JNDI name for the outbound connection instance and click Finish.

6. Click on the JNDI name of the outbound connection pool instance to modify its properties.

7. In the Outbound Connection Properties page, specify the data source name as the property value of the dataSourceName property.

The resource adapter is now configured to use this outbound connection instance for invoking the EIS.

Oracle Applications Adapter

The Oracle Applications Adapter provides bi-directional connectivity to the Oracle E-Business Suite. The Oracle Applications adapter service provides the necessary infrastructure to integrate with other applications in a heterogeneous enterprise environment.

Creating Oracle Applications Adapter Services

Use the JDeveloper application to create Oracle Applications adapter services. You can use these services to send or receive messages from Oracle E-Business Suite.

Oracle JDeveloper provides wizards that assist you in creating inbound and outbound adapter services. The wizard collects the necessary information to generate the WSDL file that defines the service.

You can create both inbound and outbound services. While creating a service, you can select outbound operations on a table like Insert, Update, or Delete to create outbound services. Use the WSDL generated for these outbound operations to create a JCA control and use the control to invoke the services in the EIS. You can select inbound operations like polling for new or changed records in a table to create inbound services. Use the WSDL generated for these inbound operations to create a JCA event generator and use the event generator to receive events from the EIS.

To create an Oracle Applications adapter service:

1. Launch Oracle JDeveloper 10.1.3.4.
2. Open your business process in the JDeveloper Application Navigator.
3. Select Services in the Component Palette.
4. Drag-and-drop Oracle Application from the Services list to the process diagram. The Adapter Configuration Wizard appears.
5. Enter the following details in the configuration wizard:
    a. Service name and description. After configuration, a WSDL of this name is generated and placed in the Application Navigator.
    b. Specify the database connection. The database connection details must include the connection name, and JNDI name for the database. If you are creating a new database connection, specify the connection name and type, user name and password for

authentication, driver name, and connection string details like host, port and SID details for connecting to the database machine.

c. Add the database object required for the service.

d. Select the operation that needs to be performed on the database object. This can be an operation in the outbound or inbound direction.

   Based on the operation you select, the generator service is either an inbound service or an outbound service. Use the inbound service to create a JCA control and use the outbound service to create a JCA event generator.

After you configure the Oracle Applications adapter service, the WSDL is generated and placed in the project directory. An XSD file that contains the schema for the database object and the inbound / outbound header fie is also created.

All required WSDLs and schema files are created in a folder with the same name as the service name that you provide during the adapter configuration. Use the generated WSDL to create a JCA event generator or control in Oracle WebLogic Integration.

For more information, see Creating Inbound and Outbound Services in Oracle Enterprise Service Bus Developer's Guide and Oracle Application Server Adapter for Oracle Applications User's Guide.

Oracle AQ Adapter

Oracle Advanced Queuing (Oracle AQ) is a database integrated message queue. The Oracle Advanced Queuing (AQ) adapter handles enqueuing (posting of messages) to a queue and dequeuing (removal of messages) from a queue.

Creating Oracle AQ Adapter Services

Use the JDeveloper application to create Oracle AQ adapter services. You can use these services to enqueue or dequeue messages in Oracle AQ.

Oracle JDeveloper provides wizards that assist you in creating inbound and outbound adapter services. The wizard collects the necessary information to generate the WSDL file that defines the service.

You can create both inbound and outbound adapter services. While creating a service, select the enqueue operation to create an outbound service. Use the WSDL generated for this outbound service to create a JCA control. While creating a service, select the dequeue operation to create

inbound services. Use the WSDL generated for the inbound service to create a JCA event generator.

To create an Oracle AQ adapter service:

1. Launch Oracle JDeveloper 10.1.3.4.
2. Open your business process in the JDeveloper Application Navigator.
3. Select Services in the Component Palette.
4. Drag-and-drop AQ Adapter from the Services list to the process diagram. The Adapter Configuration Wizard appears.
5. Enter the following details in the configuration wizard:
    a. Service name and description. After configuration, a WSDL of this name is generated and placed in the Application Navigator.
    b. Specify the database connection. The database connection details must include the connection name, JNDI name for the database, and data source. If you are creating a new database connection, specify the connection name and type, user name and password for authentication, driver name, and connection string details like host, port and SID details for connecting to the database machine.
    c. Select the Dequeue operation to create an inbound service (used to create an event generator) or the Enqueue operation to create an outbound service (used to create the JCA control)
    d. Specify the queue, queue parameters, and payload details.

For more information about creating the resource adapter service, see Oracle Application Server Adapter for Advanced Queuing.

After you configure the Oracle AQ service, the WSDL is generated and placed in the project directory. An XSD file that contains the payload schema is also created along with the inbound / outbound header WSDLs.

All required WSDLs and schema files are created in a folder with the same name as the service name that you provide during adapter configuration. Use the generated WSDL to create a JCA event generator or control in Oracle WebLogic Integration.

Oracle Application Adapter for SAP R/3

Oracle WebLogic Integration connects to a SAP R/3 system through Oracle Application Adapter for SAP R/3. Oracle Application Adapter for SAP R/3 is an application adapter that provides connectivity and carries out interactions on a SAP R/3 system.

Using the Oracle Application Adapter for SAP R/3

To use the Oracle Application Adapter for SAP R/3 with Oracle WebLogic Integration, you need to:

1. Install, configure, and deploy the SAP adapter.
2. Start the Application Explorer.
3. Add and connect to a configuration.

   For information about these tasks, see Oracle Application Adapter for SAP R/3 Installation Guide.
4. Establish a connection to SAP R/3 by defining targets.

Based on your requirements, you can now configure inbound and outbound processing using Oracle WebLogic Integration. For information about these tasks, see Oracle Application Adapter for SAP R/3 User's Guide.

CHAPTER 3

Using the JCA Event Generator

The JCA event generator is one of the Oracle WebLogic Integration event generators that you can create from the Oracle WebLogic Integration Administration Console.

The JCA event generator listens for messages that are received via EIS-specific resource adapters from the EIS and publishes the messages to Oracle WebLogic Integration via the Message Broker. For example, these messages could be triggered because of events like polling for new or changed records in a table in Oracle E-Business Suite using the Oracle Applications Adapter or these messages could be triggered when messages are dequeued from Oracle Advanced Queueing using Oracle AQ Adapter.

This section provides information about:

- Tasks you need to do Before You Start
- Creating a JCA Event Generator
- Defining a Channel Rule
- Managing Event Generators and Channel Rules

Before You Start

Before you create a JCA event generator,

- Create resource adapter-specific services. For more information, see Creating Oracle Applications Adapter Services, Creating Oracle AQ Adapter Services, and the Oracle Application Adapter for SAP R/3 User's Guide.

- If you do not want to use the defaults, create new connection factories and work managers. For more information, see Creating a Connection Factory and Creating a Work Manager.

Creating a Connection Factory

Oracle WebLogic Server defines two default connection factories, which can be looked up using the following JNDI names:

- weblogic.jms.ConnectionFactory
- weblogic.jms.XAConnectionFactory

You can use these default connection factories when you configure the JCA event generator or you can configure new connection factories based on the requirements of your environment. For more information, see Configuring Basic JMS System Resources and Configure connection factories.

Creating a Work Manager

When you create an event generator, you need to specify a dispatch policy for the event generator. A dispatch policy refers to the instance of Oracle WebLogic Server Work Manager that you want to use with the event generator. Oracle WebLogic Server lets you configure how your application prioritizes the execution of its work by defining work managers. After you define the rules and constraints for your application when you define a Work Manger, you can apply it either globally to a Oracle WebLogic Server domain or to a specific application component.

You can use the default Work Manager or, based on your requirements, you can override the default work manager by defining global work managers or application-scoped work managers. For information about work managers, see Using Work Managers to Optimize Scheduled Work and Create Work Manager in the Oracle WebLogic Server Administration Console Online Help.

Creating a JCA Event Generator

To create a JCA event generator:

1. Login to Oracle WebLogic Integration Administration Console using the following URL:

   `http://<host>:<port>/wliconsole`

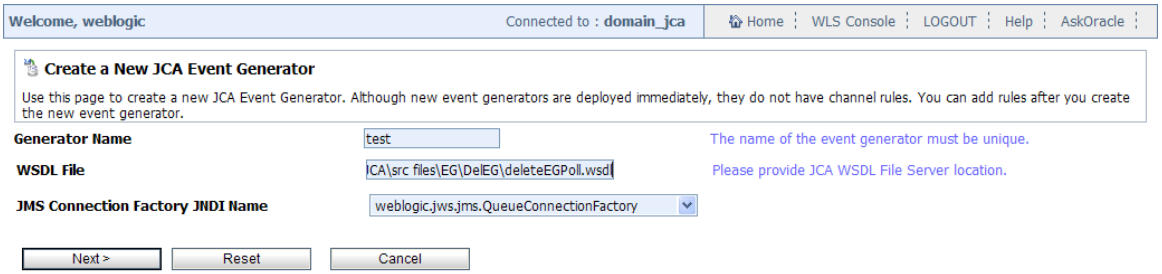
   The Oracle WebLogic Integration Administration Console home page appears.

   Note: You must be logged in as a member of the Administrators, IntegrationAdministrators, or IntegrationOperators group to create, change, or delete event generators. For more

information, see “About WebLogic Integration Users, Groups, Roles, and Security Policies” in User Management in Using Worklist Console.

2. Click Event Generators.
3. Click Create New in the JCA section.

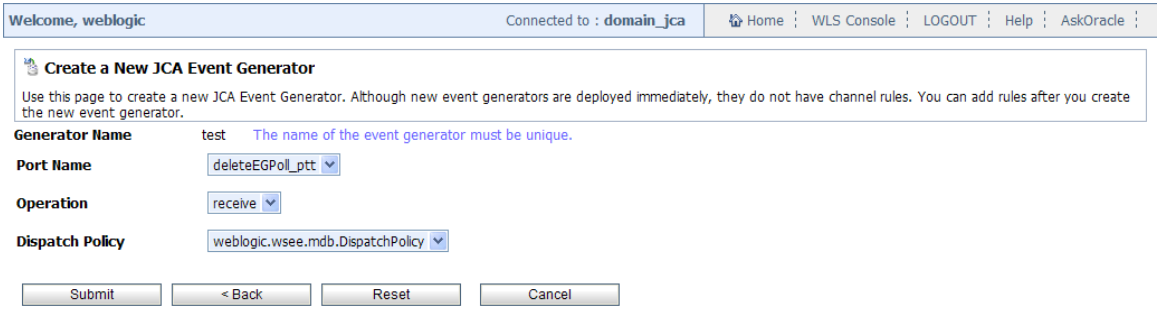
   The Create a New JCA Event Generator page appears.



4. Enter a unique name for the event generator
5. Enter the location of a resource adapter service WSDL file that contains the binding information.

   Based on your requirements, the service can be an Oracle Applications adapter service, an Oracle AQ adapter service, an Oracle Application Adapter for SAP R/3 service. For more information, see Creating Oracle Applications Adapter Services, Creating Oracle AQ Adapter Services, and the Oracle Application Adapter for SAP R/3 User's Guide.
6. Enter the JNDI name of the JMS connection factory used to publish incoming messages via the Message Broker and click Next.

   You can use any existing JMS connection factory or you can create a connection factory based on your requirement. For more information, see Creating a Connection Factory.



7. Select the port name associated with the operations that you need to do.
8. Select the name of the operation for which event messages need to be registered.

   Event messages received for this operation are published to the channel associated with this event generator.

   The port name and operations are based on the WSDL specified for the event generator.
9. Select the dispatch policy for the event generator.

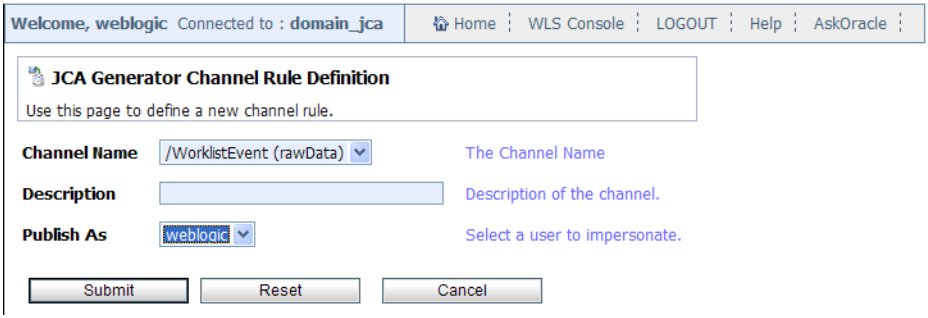
   You can use any existing policy or create a global work manager based on your requirement. For more information, see Creating a Work Manager.
10. Click Submit.

You must now define a channel for the event generator. For more information, see Defining a Channel Rule.

Defining a Channel Rule

To define a channel rule for a JCA event generator:

1. Click Define a New Channel Rule.



2. Specify a channel name.
3. Enter a brief description of the channel.
4. Specify the user credentials that should be used while publishing the events.
5. Click Submit.

The channel is created and associated with the JCA event generator.

Managing Event Generators and Channel Rules

For information about generic tasks that are relevant to the JCA event generator and all WLI event generators, see:

- Listing and Locating Event Generators
- Suspending and Resuming Event Generators
- Resetting Counters
- Deleting Event Generators
- Viewing and Updating Event Generator Channel Rules
- Deleting Channel Rules

CHAPTER 4

Using the JCA Control

A JCA control performs an operation on a EIS. Each JCA control can be configured to do operations that are specific to the associated EIS. The EIS can then be accessed by the business process using the JCA control.

For information on how to add control instances to business processes, see Using Controls in Business Processes.

A JCA control can do outbound operations such as enqueue operations (posting messages) to a queue in Oracle Advanced Queueing to create an outbound service. These operations could be outbound operations on a table like Insert, Update, or Delete to create outbound services in the Oracle E-Business Suite or outbound operations on SAP systems.

This section provides information about:

- Tasks you need to do Before You Start
- Creating a JCA Integration Control

Before You Start

Before you create a JCA control:

- Create adapter-specific services. For more information, see “Creating Oracle Applications Adapter Services”, “Creating Oracle AQ Adapter Services” in Working with Adapters and see Oracle Application Adapter for SAP R/3 User's Guide.
- After generating the adapter-specific services, make sure that the WSDL and the associated artifacts are available in the project folder in Oracle Workshop for WebLogic IDE.

Typically for WLI, the WSDL files should be in the `Web project/src` folder and the business object / payload schema file should be in the `Utility project/schema` folder. However, for the JCA control, the WSDL files and the associated schema files can be stored anywhere in the project folder. But, you need to make sure that the schema file associated with the WSDL file is properly referenced in the WSDL file. If the WSDL and the schema files are in the same folder, just specify the schema file name in the WSDL. If the WSDL and the schema files are located in different folders, in the WSDL file, use relative path to specify the name and location of the schema file.

Creating a JCA Integration Control

To create a new JCA control

1. In the Package Explorer pane, double-click the business process to which you want to add the JCA control. The business process is displayed in the Design view.
2. Click ▪ on the Data Palette and from the drop-down list choose Integration Controls to display the list of controls used for integrating applications.

   Note: If the Data Palette view is not visible in Oracle Workshop for WebLogic, click Window > Show View > Data Palette from the menu bar.
3. Select JCA. The Insert Control : JCA Control dialog appears.
4. Enter the following details.
   a. In the Field Name, type the variable name used to access the new JCA control instance from your business process. The name you enter must be a valid Java identifier.
   b. In the Insertion point, from the drop-down list, select the point where you want the field name to be inserted in the process file. This can be after the last field, the context, or after serial version UID.
   c. Decide whether you want to make this a control factory and select or clear the Make this a control factory that can create multiple instances at runtime check box.
   d. Click Next. The Create Control wizard appears.
5. Enter the following details.
   a. In the Source folder field, specify the location of the project source folder.
   b. In the Packages field, specify the package in the project source folder in which the new control is created.

c. In the Name field, type the name of your new control extension file.

   In the Extended interfaces field, the JCA Control interface that is extended by the new control is displayed.

d. Decide whether you want to add comments as configured in the properties of the current project and select or clear the Generate comments check box.

e. Click Next. The Insert Control : JCA Control dialog appears.

6. Enter the following details.

   a. In the WSDL field, enter the location of the WSDL file of the adapter service.

      Based on your requirements, the service can be an Oracle Applications adapter service, an Oracle AQ adapter service, or an Oracle Application Adapter for SAP R/3 service. For more information, see “Creating Oracle Applications Adapter Services” and “Creating Oracle AQ Adapter Services” in Working with Adapters; and see the Oracle Application Adapter for SAP R/3 User's Guide.

   b. In the Service field, select the service associated with the specified WSDL.

   c. In the Port type field, select the required port type from the list of port types available in the specified WSDL.

   d. Click Next. The Select Types JAR File Location dialog appears.

7. In the File name field, specify the name of the JAR file.

   This JAR file contains the specified WSDL, any WSDLs referenced in the specified WSDL, and the class files and XML Beans for each of the elements defined in the WSDL.

8. Click Finish.

The JAR file is created and placed in the Web project/WebContent/WEB_INF/lib folder.

The JCA control methods are created and listed in the data palette.

You can use any of these methods in the business process to interact with the EIS.